SIEMENS

Power Semiconductors

1984

SIEMENS

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U.S. Edition
Data Book 1984

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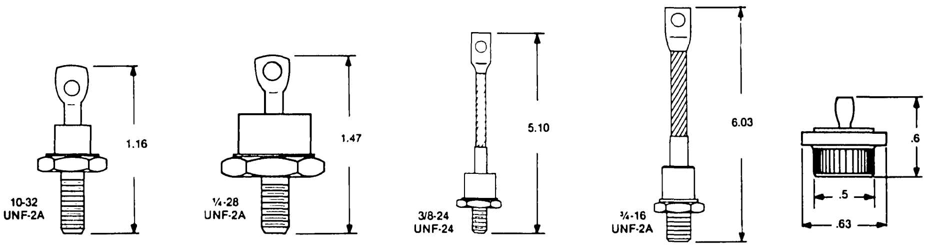
Power Semiconductors Selector Guide

	I_F (avg.) Average DC Forward Current (AMPS)								
	12	12	16	22	35	35	40	40	45
PACKAGE OUTLINE	**DO203AA (DO4)**	**DO203AA (DO4)**	**DO203AA (DO4)**	**DO203AA (DO4)**	**(Note 1) PRESSFIT**	**(Note 2) PRESSFIT**	**DO203AB (DO5)**	**DO203AB (DO5)**	**DO203AB (DO5)**
V_{RRM} (Volts)						Avalanche Diode			
					SSiE1105				
100	1N1200,A	S20410			SSiE1110		1N1184,A	S30410	S3410
200	1N1202,A	S20420			SSiE1120		1N1186,A	S30420	S3420
300					SSiE1130				
400	1N1204,A	S20440	S2040	S2140	SSiE1140		1N1188,A	S30440	S3440
500									
600	1N1206,A	S20460	S2060	S2160			1N1190,A	S30460	S3460
700									
800			S2080	S2180					S3480
900									
1000			S20100	S21100					S34100
1100					SSiE4360	SSiE4360A			
1200			S20120	S21120					S34120
1300									
1400									
1500					SSiE4383	SSiE4383A			
I_{TSM}(Amps)	240	200	200	250	375		600	800	700
T_C at I_O (°C)	150	150	126	131	120		155	155	122
Max T_J (°C)	190	190	190	190	175		200	200	190
Refer to page:	26	26	30	34	38	49	54	54	59

Notes:
1. For Reverse Polarity change SSiE11 to SSiE12
   For Reverse Polarity change SSiE43 to SSiE44
2. For Reverse Polarity change SSiE43A to SSiE44A

Rectifiers, Standard

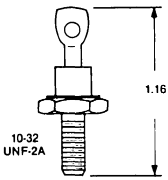


DO203AA (DO4) | DO203AB (DO5) | DO205AA (DO8) | DO205AB (DO9) | Press Fit*

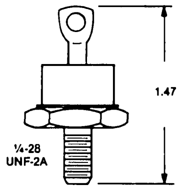
I_F (avg.) Average DC Forward Current (AMPS)								
70	70	85	85	125	150	250	300	
DO203AB (DO5)	DO203AB (DO5)	DO203AB (DO5)	DO203AB (DO5)	DO205AA (DO8)	DO205AA (DO8)	DO205AB (DO9)	DO205AB (DO9)	PACKAGE OUTLINE
								V_{RRM} (Volts)
S3610	S30601OF	S3710	S30701OF	S4210	S4310		S50410	100
S3620	S30602OF	S3720	S30702OF	S4220	S4320		S50420	200
				S4230	S4330		S50430	300
S3640	S30604OF	S3740	S30704OF	S4240	S4340		S50440	400
				S4250	S4350			500
S3660	S30606OF	S3760	S30706OF	S4260	S4360		S50460	600
								700
S3680	S30608OF	S3780		S4280	S4380	S5380		800
								900
S36100	S30610OF	S37100		S42100	S43100	S53100		1000
								1100
S36120	S30612OF	S37120		S42120	S43120	S53120		1200
								1300
								1400
								1500
1200	1200	1500	1500	1800	3000	4500	5000	I_{TSM}(Amps)
138	125	132	105	130	125	122	136	T_C at I_O (°C)
190	190	190	190	190	190	190	190	Max T_J (°C)
63	67	71	75	79	83	87	91	

	I_F (avg.) Average DC Forward Current (AMPS)				
	6	6	12	12	15
PACKAGE OUTLINE	DO203AA (DO4)	DO203AA (DO4)	DO203AA (DO4)	DO203AA (DO4)	DO203AA (DO4)
V_{RRM} (Volts)					
50	1N3879	S006AADF	1N3889	S012AADF	S016AADF
100	1N3880	S00601DF	1N3890	S01201DF	S01601DF
150					
200	1N3881	S00602DF	1N3891	S01202DF	S01602DF
300	1N3882	S00603DF	1N3892	S01203DF	S01603DF
400	1N3883	S00604DF	1N3893	S01204DF	
I_{TSM}(Amps)	75	75	250	150	250
T_C at I_O (°C)	100	100	100	100	100
Max T_J (°C)	150	150	150	150	150
t_{rr} (ns)	200	200	200	200	100
Max V_F (Volts)	1.4	1.4	1.4	1.4	1.15
at I_{FM} = (Amps)	6	6	12	12	30
Refer to page:	96	96	101	101	106

Rectifiers, Fast Recovery



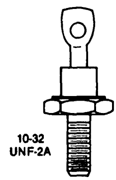
DO203AA
DO4



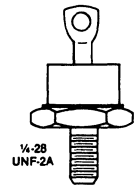
DO203AB
DO5

I_F (avg.) Average DC Forward Current (AMPS)				
25	35	45	55	
DO203AB (DO5)	DO203AB (DO5)	DO203AB (DO5)	DO203AB (DO5)	**PACKAGE OUTLINE**
				V_{RRM} (Volts)
1N3899	1N3909	S045AADF	S055AADF	**50**
1N3900	1N3910	S04501DF	S05501DF	**100**
				150
1N3901	1N3911	S04502DF	S05502DF	**200**
1N3902	1N3912	S04503DF	S05503DF	**300**
1N3903	1N3913	S04504DF		**400**
225	300	600	800	**I_{TSM}(Amps)**
100	100	100	100	**T_C at I_O (°C)**
150	150	150	150	**Max T_J (°C)**
200	200	200	100	**t_{rr} (ns)**
1.4	1.4	1.15	1.15	**Max V_F (Volts)**
20	30	90	90	**at I_{FM} = (Amps)**
111	116	121	126	

Rectifiers, Schottky



DO203AA
DO4



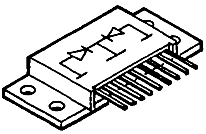
DO203AB
DO5

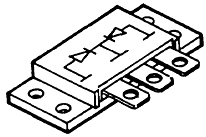
	I_F (avg.) Average DC Forward Current (AMPS)			
	30	30	30*	30*
PACKAGE OUTLINE	**DO-203AA (DO4)**	**DO-203AA (DO4)**	**TO-204AA (TO3)**	**TO-204AA (TO3)**
V_{RRM} (Volts)				
30				
35	SD4135	SBR3035	SD24135	SBT3035
40		SBR3040		SBT3040
45	SD4145	SBR3045	SD24145	SBT3045
50		SBR3050		SBT3050
I_{TSM}(Amps)	600	600	400	600
T_C at Rated I_O (°C)	90	120	93	110
T_J Max (°C)	160	175	160	175
Max V_F (Volts) at I_{FM} = (Amps)	.55 at 30 $T_J = 125°C$	.63 at 30 $T_J = 25°$	.6 at 20 $T_J = 125°C$	.66 at 30 $T_J = 25°$
Refer to page:	132	135	138	141

* Center Tap Current

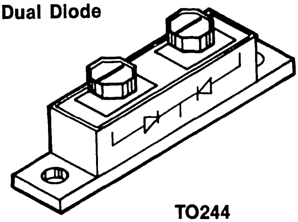
Rectifiers, Schottky

60A 160A
Isolated Mounting
Dual Diode





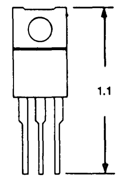
200A 300A
Dual Diode



TO244

I_F (avg.) Average DC Forward Current (AMPS)						
60	60*	80	160*	200*	300*	
DO-203AB (DO5)	MODULE	DO-203AB (DO5)	MODULE	(TO244) MODULE	(TO244) MODULE	PACKAGE OUTLINE
						V_{RRM} (Volts)
						30
SD5135	FST6035	SBR8035	FST16035	FST20035	FST30035	35
	FST6040	SBR8040	FST16040	FST20040	FST30040	40
SD5145	FST6045	SBR8045	FST16045	FST20045	FST30045	45
	FST6050	SBR8050	FST16050	FST20050	FST30050	50
800	1000	1000	1000	2000	2000	I_{TSM}(Amps)
94	150	120	103	131	113	T_C at I_O (°C)
160	175	175	175	175	175	T_J Max (°C)
.6 at 60 $T_J = 125°C$	.7 at 60 $T_J = 25°C$	.74 at 80 $T_J = 25°C$	.74 at 80 $T_J = 25°C$	.8 at 200 $T_J = 25°$	.78 at 300 $T_J = 125°C$	Max V_F (Volts) at I_{FM} = (Amps)
144	147	150	153	156	159	

TO220 TRIACS

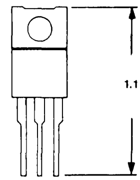


TO220AB

	V_{DRM} (volts)	I_{TRMS} (Amps)		I_{GT} @ 25°C MT2+G+ (mA)	MT2+G+ (mA)	MT2−G− (mA)	MT2−G+ (mA)	Refer to page:
TXC10*40	400V	4	*H:	25	25	25	50	
TXC10*50	500V		K:	50	50	50	—	
TXC10*60	600V		L:	75	75	75	—	164
TXC10*70	700V							
TXC10*80	800V							
TXC10*40M	400V	6	*H:	25	25	25	50	
TXC10*50M	500V		K:	50	50	50	—	
TXC10*60M	600V		L:	75	75	75	—	164
TXC10*70M	700V							
TXC10*80M	800V							
2N6343	400V	8		70	75	50	75	
2N6344	600V			50	75	50	75	168
2N6345	800V							
TXD10*40	400V	8	*H:	25	25	25	50	
TXD10*50	500V		K:	50	50	50	—	
TXD10*60	600V		L:	75	75	75	—	170
TXD10*70	700V							
TXD10*80	800V							
TXD10*40M	400V	10	*H:	25	25	25	50	
TXD10*50M	500V		K:	50	50	50	—	
TXD10*60M	600V		L:	75	75	75	—	170
TXD10*70M	700V							
TXD10*80M	800V							
TXD10*40P	400V	12	*H:	25	25	25	50	
TXD10*50P	500V		K:	50	50	50	—	
TXD10*60P	600V		L:	75	75	75	—	170
TXD10*70P	700V							
TXD10*80P	800V							
2N6343A	400V	12		50	75	50	75	
2N6344A	600V							175
2N6345A	800V							
TXE10*40	400V	20	*L:	50	50	50	75	Consult
TXE10*60	600V		M:	50	50	50	—	factory for
TXE10*80	800V							data sheet

* Note: Not all I_{GT} combinations are available for all voltages.

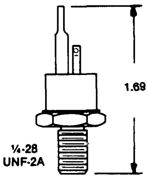
SCRs, Phase Control



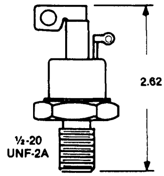
TO220AB

	On-State (RMS) Current (AMPS)				
	4	9.4	12	16	25
PACKAGE OUTLINE	TO220	TO220	TO220	TO220	TO220
V_{DRM}/V_{RRM} (Volts)					
25					
50					
100					
200					
300					BSTE1020
400	BSTC1226	BSTC1026M	BSTD1026 2N6397	BSTD1026M 2N6403	BSTE1026
500	BSTC1233	BSTC1033M	BSTD1033 2N6398	BSTD1033M 2N6404	
600	BSTC1240	BSTC1040M	BSTD1040	BSTD1040M	BSTE1040
700	BSTC1246	BSTC1046M	BSTD1046	BSTD1046M	
800	BSTC1253	BSTC1053M	BSTD1053 2N6399	BSTD1053M 2N6405	BSTE1053
1000			BSTD1666N		
1100					
1200		BSTD1680N			
1300					
1400					
I_{TSM}(Amps)	50	95	130	160	240
Max I_{GT} (mA) at $T_J = 25°C$	50	50	50	50	40
Max V_{GT} (Volts) at $T_J = 25°C$	2.0	2.0	2.0	2.0	2
Max V_{TM} (Volts) at $T_J = 25°C$ at $1_T =$	3.4 at 7.5A	2.94 at 24A	1.98 at 24A	1.7 at 32A	1.5 at 48A
Refer to page:	178	182	189	189	**

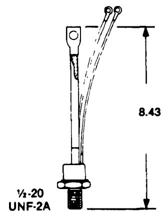
** Consult factory for data sheet



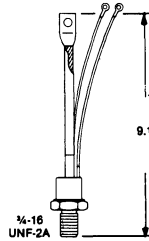
TO208AC
(TO65)



TO208AD
(TO83)



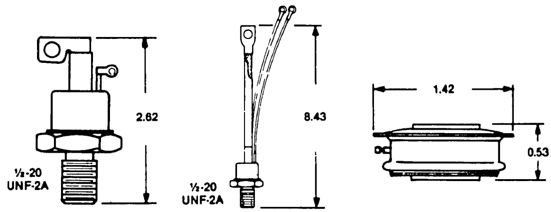
TO209AC
(TO94)



TO209AB
(TO93)

On-State (RMS) Current (AMPS)						
63	80	86	86	110	110	
TO208AC	TO208AC	TO209AC	TO209AC	TO209AC	TO209AC	PACKAGE OUTLINE
						V_{DRM}/V_{RRM} (Volts)
						25
						50
40C10B	05001GOF					100
40C20B	05002GOF	05202GOA		07102GOA		200
		05203GOA		07103GOA		300
40C40B	05004GOF	05204GOA		07104GOA		400
		05205GOA		07105GOA		500
40C60B	05006GOF	05206GOA		07106GOA		600
						700
40C80B	05008GOF		55C80B		70C80B	800
40C100B	05010GOF		55C100B		70C100B	1000
						1100
40C120B	05012GOF		55C120B		70C120B	1200
						1300
						1400
1000	1200	1200	1200	1600	1600	I_{TSM}(Amps)
100	100	100	100	100	100	Max I_{GT} (mA) at $T_J = 25°C$
3	3	3	3	3	3	Max V_{GT} (Volts) at $T_J = 25°C$
3.2 at 500	2.55 at 500	2.0 at 220	2.2 at 220	1.6 at 220	1.85 at 220	Max V_{TM} (Volts) at $T_J = 25°C$ at $1_T =$
198	202	206	210	214	218	

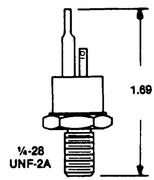
SCRs, Phase Control (cont'd)



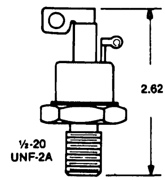
TO208AD (TO83) | TO209AC (TO94) | TO200AB

	On-State (RMS) Current (AMPS)				
	125	235	400	470	550
PACKAGE OUTLINE	TO209AC	TO209AB	TO200AB	TO200AB	
V_{DRM}/V_{RRM} (Volts)					
100	0801GOA	15101GOA			35001GOF
200	08002GOA	15102GOA			35002GOF
300	08003GOA	15103GOA			35003GOF
400	08004GOA	15104GOA			35004GOF
500	08005GOA	15105GOA			35005GOF
600	08006GOA	15106GOA			35006GOF
800		150C80B	24008GOF	30008GOF	
1000		150C100B	24010GOF	30010GOF	
1200		150C120B	24012GOF	30012GOF	
I_{TSM}(Amps)	1800	3500	4500	5500	7500
Max I_{GT} (mA) at $T_J = 25°C$	100	150	150	150	150
Max V_{GT} (Volts) at $T_J = 25°C$	3	3	3	3	3
Max V_{TM} (Volts) at $T_J = 25°C$ at $1_T =$	1.4 at 220	1.7 at 500	2.3 at 1000	1.80 at 1000	1.48 at 1000
Refer to page:	222	226	234	237	240

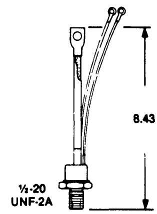
SCRs, Inverter



TO208AC
(TO65)



TO208AD
(TO83)



TO209AC
(TO94)

	On-State (RMS) Current (AMPS)					
	63	63	63	126	126	126
PACKAGE OUTLINE	TO208AC (TO65)	TO208AC (TO65)	TO208AC (TO65)	TO205AC (TO65)	TO205AC (TO65)	TO205AC (TO65)
V_{DRM}/V_{RRM} (Volts)						
200	03902GRF	03902GPF	03902GUF	07902GRF	07902GPF	07902GUF
300						
400	03904GRF	03904GPF	03904GUF	07904GRF	07904GPF	07904GUF
500						
600	03906GRF	03906GPF	03906GUF	07906GRF	07906GPF	07906GUF
I_{TSM}(Amps)	1000	1000	1000	1800	1800	1800
t_q (μs), max	10	15	20	10	15	20
Max I_{GT} (mA) at $T_J = 25°C$	150	150	150	150	150	150
Max V_{TM} (Volts) at $T_J = 25°C$ at $1_T =$	3.0 at 500	3.0 at 500	3.0 at 500	2.6 at 500	2.6 at 500	2.6 at 500
Refer to page:	244	244	244	249	249	249

	On-State (RMS) Current (AMPS)			
	250	250	550	550
PACKAGE OUTLINE	TO 200	HOCKEY	PUK	STYLE
V_{DRM}/V_{RRM} (Volts)				
200	BSTH6113F	BSTH6113G	BSTL6113F	BSTL6113G
300	BSTH6120F	BSTH6120G	BSTL6120F	BSTL6120G
400	BSTH6126F	BSTH6126G	BSTL6126F	BSTL6126G
500	BSTH6133F	BSTH6133G	BSTL6133F	BSTL6133G
600	BSTH6140F	BSTH6140G	BSTL6140F	BSTL6140G
I_{TSM}(Amps)	1850	1850	4460	4460
t_q (μs), max	15	18	15	18
Max I_{GT} (mA) at $T_J = 25°C$	250	250	250	250
Max V_{TM} (Volts) at $T_J = 25°C$ at $1_T =$	1.85V at 400A	1.85V at 400A	1.53V at 500A	1.53V at 500A
	254	254	258	258

On-State (RMS) Current (AMPS)				
950	950	1730	1730	
TO 200	HOCKEY	PUK	STYLE	PACKAGE OUTLINE
				V_{DRM}/V_{RRM} (Volts)
BSTN6113F	BSTN6113G	BSTP6113F	BSTP6113G	200
BSTN6120F	BSTN6120G	BSTP6120F	BSTP6120G	300
BSTN6126F	BSTN6126G	BSTP6126F	BSTP6126G	400
BSTN6133F	BSTN6133G	BSTP6133F	BSTP6133G	500
BSTN6140F	BSTN6140G	BSTP6140F	BSTP6140G	600
8950	8950	16,000	16,000	I_{TSM}(Amps)
15	18	15	18	t_q (μs), max
250	250	250	250	Max I_{GT} (mA) at $T_J = 25°C$
1.63V at 1200A	1.63V at 1200A	1.70V at 2400A	1.70V at 2400A	Max V_{TM} (Volts) at $T_J = 25°C$ at $1_T =$
266	266	279	279	

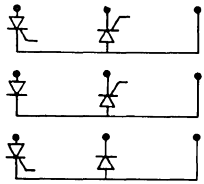
SCR PowerMod
(Consult factory for data sheet)

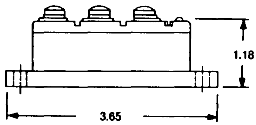
UL Recognized

Full-control Version

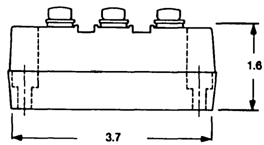
Half-controlled Version 1

Half-controlled Version 2





MTT18, MTT25, MTT40
MTT50, MTT65, MTT95



F125, F160

Inverters (Note: 1)

I_{RMS} (Amps)	65	65	65	65
I_{TSM} (Amps)	520	520	520	620
t_q (μs)	25	35	15	18
Volts				
600	FO41T06V	FO41T06S	FO42T06P	FO42T06Q
1000				
1200	FO41T12V	FO41T12S		

*Note 1: Available in half control version with Fast Recovery Diode. For half controlled version #1, replace "T" with "H" in the catalog number. For half controlled version #2, replace "T" with "S" in the catalog number.

Inverters (Note: 1)

I_{RMS}(Amps)	120	120	120	120	250	250	250	250
I_{TSM}(Amps)	1200	1200	1200	1200	4770	4770	4770	4770
t_q (μs)	25	35	15	18	15	18	25	35
(Volts)								
600	FO76T06V	FO76T06S	FO77T06P	FO77T06Q	F177T06P	F177T06P	F176T06V	F176T06S
1000								
1200	FO76T12V	FO76T12S					F176T12V	F176T12S

*Note 1: Available in halt control version with Fast Recovery Diode. for half controlled version #1, replace "T" with "H" in the catalog number. For half controlled version #2, replace "T" with "S" in the catalog number.

Rectifiers

I (Amps Avg)	65	95	160
I_{TSM} (Amps)	1000	3600	6700
(Volts)			
600	MDD65A06N	MDD95A06N	MDD160A06N
1200	MDD65A12N	MDD95A12N	MDD160A12N
1500	MDD65A16N	MDD95A16N	MDD160A16N

SCR PowerMod
(Consult factory for data sheet)

Phase Control

I(Amps Avg) at $T_{BP}=85°C$	18	25	40	50	65	95	125	160
I_{TSM}(Amps)	275	440	700	900	1500	1900	3500	5100
(Volts) 600 1200 1600	 MTT18L06N MTT18L12N MTT18L16N	 MTT25L06N MTT25L12N MTT25L16N	 MTT40(A)06N* MTT40(A)12N* MTT40(A)16N*	 MTT50(A)06N* MTT50(A)12N* MTT50(A)16N*	 MTT65A06N MTT65A12N MTT65A16N	 MTT95A06N MTT95A12N MTT95A16N	 F125T060 F125T120 F125T160	 F160T060 F160T120 F160T160
Refer to Page:	284	289	294	299	304	309	**	314

*Available in soldered (L) version [i.e. MTT40(L)06N] or
Compression Bonded (A) [i.e. MTT40(A)06N]

**Consult factory for data sheet

Half-Controlled Version 1

I (Amps Avg) at $T_{BP}=85°C$	40	50	65	95
I_{TSM} (Amps)	700	900	1500	1900
(Volts) 600 1200 1600	 MTD40(A)06N* MTD40(A)12N* MTD40(A)16N*	 MTD50(A)06N* MTD50(A)12N* MTD50(A)16N*	 MTD65A06N MTD65A12N MTD65A16N	 MTD95A06N MTD95A12N MTD96A16N
Refer to page:	294	299	304	309

*For soldered version replace "A" with "L" [i.e. MTD40L06N]

Half-Controlled Version 2

I (Amps Avg) at $T_{BP}=85°C$	40	50	65	95
I_{TSM} (Amps)	700	900	1500	1900
(Volts) 600 1200 1600	 MDT40(A)06N* MDT40(A)12N* MDT40(A)16N*	 MDT50(A)06N* MDT50(A)12N* MDT50(A)16N*	 MDT65A06N MDT65A12N MDT65A16N	 MDT95A06N MDT95A12N MDT96A16N
Refer to page:	294	299	304	309

*For soldered version replace "A" with "L" [i.e. MDT40L06N]

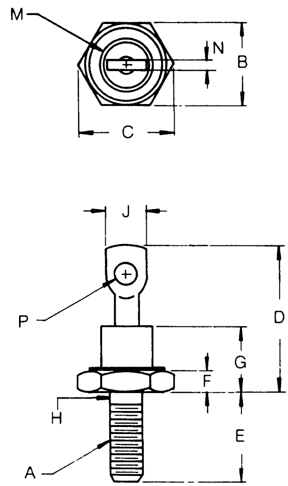
Rectifiers, Standard

Silicon Power Rectifiers

Series 204

12 AMP Avg; V_{RRM} to 600 Volts

- High surge current capability
- High case temperature
- Glass to metal construction,
- Designed for medium voltage and low cost applications



DO-203AA (DO-4)

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	.427	.437	10.84	11.09	
C	----	.505	----	12.82	
D	----	.800	----	20.32	
E	.432	.442	10.97	11.22	
F	.095	.105	2.41	2.66	
G	----	.386	----	9.80	
H	.163	.189	4.15	4.80	2
J	----	.250	----	6.35	
M	----	.280	----	7.11	
N	----	.063	----	1.27	
P	.088	.095	2.23	2.41	

Note 1:
10-32 UNF-2A

Standard polarity: Stud is cathode
Reverse polarity: Stud is anode

Note 2:
Full threads within 2½ threads

Catalog Number		JEDEC Numbers	Peak Reverse Voltage
Standard	**Reverse**		
S20410	R20410	1N1200, 1N1200A	100
S20420	R20420	1N1202, 1N1202A	200
S20440	R20440	1N1204, 1N1204A	400
S20460	R20460	1N1206, 1N1206A	600

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	100V to 600V	
Maximum peak reverse current	I_{RRM}	1.0mA	$T_C = 150°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	12 Amps	Single phase, half-wave rating at $T_C = 150°C$
Maximum surge current series 204,1N1199-1N1206	I_{FSM}	200 Amps	One cycle of 60HZ sinewave
Maximum surge current series 1N1199A-1N1206A	I_{FSM}	240 Amps	one cycle of 60 HZ sinewave
Maximum peak forward voltage	V_{FM}	1.2V max.	$I_F = 30A$; $T_C = 25°C$
Maximum I^2t	I^2t	167 A^2S	less than 8.33 ms 204, 1N1199-1N1206
Maximum I^2t	I^2t	$240A^2S$	less than 8.33 ms series 1N1199-1N1206A
Maximum recommended operating frequency		10kHz	
Thermal values			
Storage temp range	T_{stg}	$-65°C$ to $+200°C$	
Operating junction temp range	T_J	$-65°C$ to $+190°C$	
Maximum thermal resistance junction to case	$R_{\Theta JC}$	3.0°C/W	

Mechanical Characteristics	
Base	Steel stud and base with a #10-32 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.16 ounce (4.5 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AA (DO-4) outline

Figure 1
Maximum load current versus case temperature

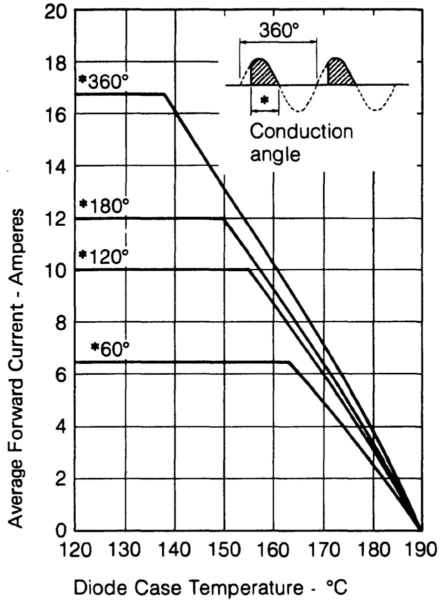


Figure 2
Maximum power dissipation versus forward current

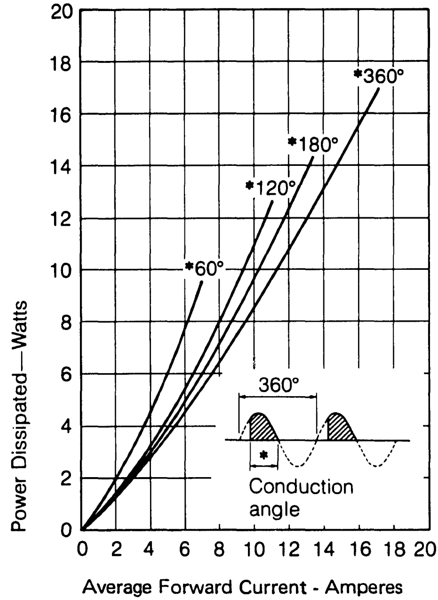


Figure 3
Maximum forward characteristics

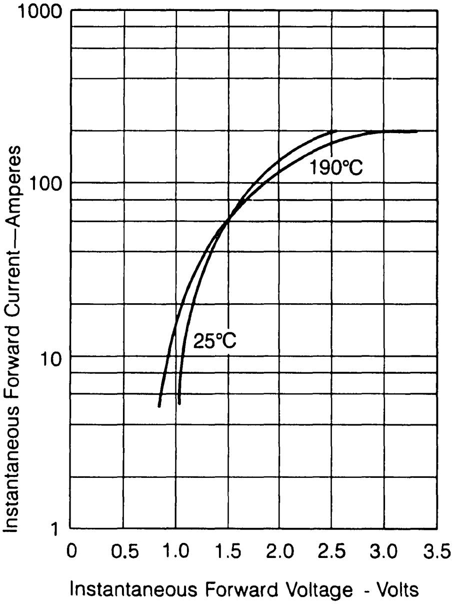


Figure 4
Transient thermal impedance

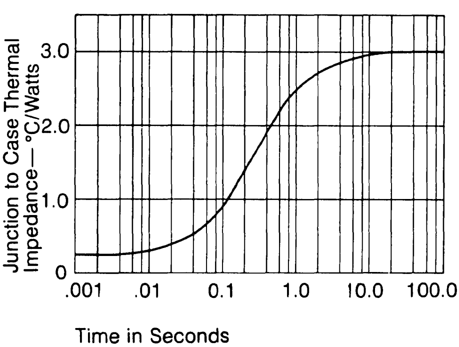
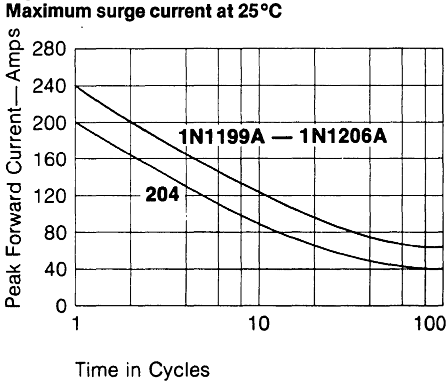


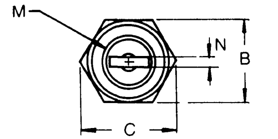
Figure 5
Maximum surge current at 25°C

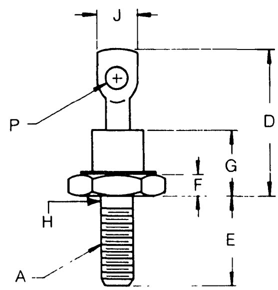


Silicon Power Rectifiers

16 AMP Avg; V_{RRM} to 1200 Volts

- High surge current capability
- Glass to metal construction,
- Excellent thermal fatigue capability





**DO-203AA
(DO-4)**

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	.427	.437	10.84	11.09	
C	----	.505	----	12.82	
D	----	.800	----	20.32	
E	.432	.442	10.97	11.22	
F	.095	.105	2.41	2.66	
G	----	.386	----	9.80	
H	.163	.189	4.15	4.80	2
J	----	.250	----	6.35	
M	----	.280	----	7.11	
N	----	.063	----	1.27	
P	.088	.095	2.23	2.41	

Note 1: Standard polarity: Stud is cathode
10-32 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads

Catalog Number		JEDEC Numbers	Peak Reverse
Standard	Reverse		
S2040	R2040	1N1126, 1N1346, 1N1346A, 1N1345B	400
S2060	R2060	1N1128, 1N1348, 1N1348A, 1N1348B 1N1587, 1N1616, 1N2238, 1N2497	600
S2080	R2080	1N2240	800
S20100	R20100		1000
S20120	R20120		1200

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	400V to 1200V	
Maximum peak reverse current	I_{RRM}	1.0mA	$T_C = 150°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	16 Amps	Single phase, half-wave rating at $T_C = 126°C$
Maximum surge current	I_{FSM}	200 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.3V max.	$I_F = 30A$; $T_C = 25°C$
Maximum I^2t	I^2t	165 A^2S	less than 8.33 ms
Maximum recommended operating frequency		10kHz	
Thermal values			
Storage temp range	T_{stg}	$-65°C$ to $+200°C$	
Operating junction temp range	T_J	$-65°C$ to $+190°C$	
Maximum thermal resistance junction to case	$R_{\Theta JC}$	3.0°C/W	

Mechanical Characteristics

Base	Steel stud and base with a #10-32 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.16 ounce (4.5 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AA (DO-4) outline

Figure 1
Maximum load current versus case temperature

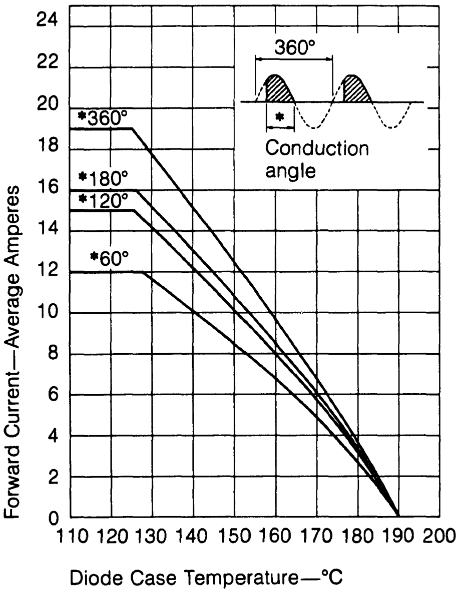


Figure 2
Maximum power dissipation versus forward current

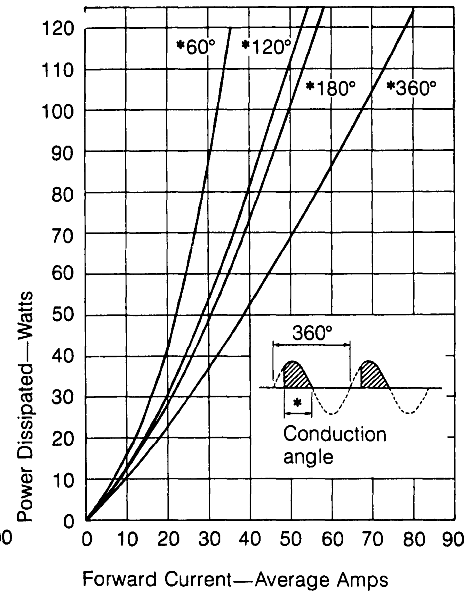


Figure 3
Maximum forward characteristics

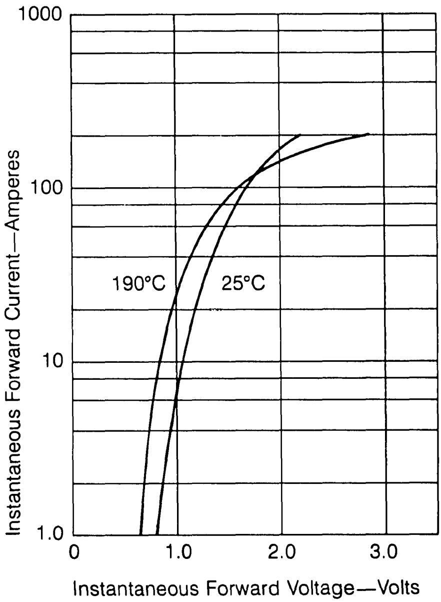


Figure 4
Transient thermal impedance

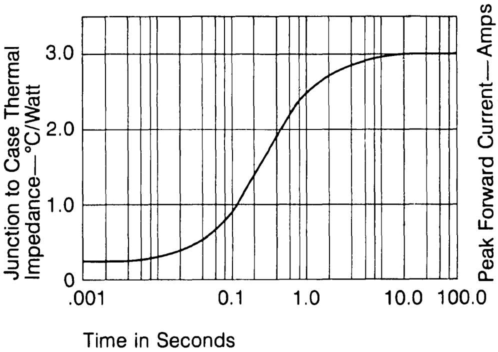
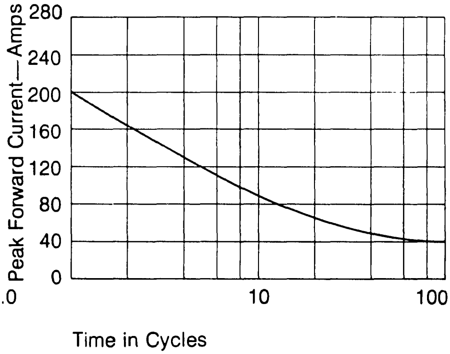


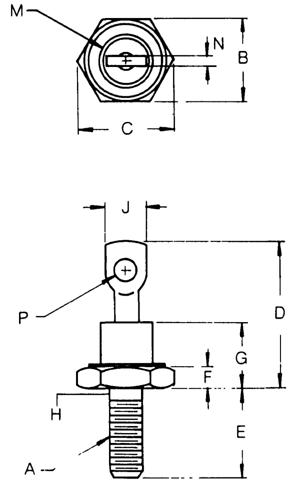
Figure 5
Maximum surge current at rated load



Silicon Power Rectifiers

22 AMP AVG; V_{RRM} Up To 1200 Volts

- Glass to metal construction
- Low forward voltage drop
- Excellent reliability
- 250 amps surge rating provides high in-rush current capability



DO-203AA
(DO-4)

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	.427	.437	10.84	11.09	
C	----	.505	----	12.82	
D	----	.800	----	20.32	
E	.432	.442	10.97	11.22	
F	.095	.105	2.41	2.66	
G	----	.386	----	9.80	
H	.163	.189	4.15	4.80	2
J	----	.250	----	6.35	
M	----	.280	----	7.11	
N	----	.063	----	1.27	
P	.088	.095	2.23	2.41	

Note 1: Standard polarity: Stud is cathode
10-32 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads

Catalog Number		JEDEC Numbers	Peak Reverse Voltage
Standard	**Reverse**		
S2140	R2140	1N1204, 1N1204A, 1N2254, 1N2785, 1N3620, 1N3965, 1N4507	400
S2160	R2160	1N1206, 1N1206A, 1N2258, 1N3622, 1N3966, 1N4508	600
S2180	R2180	1N2260, 1N3623, 1N3671, 1N3671A, 1N3967, 1N4509	800
S21100	R21100	1N2262, 1N3624, 1N3673, 1N3673A, 1N4510	1000
S21120	R21120	1N4511, 1N5331	1200

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	400V to 1200V	
Maximum peak reverse current	I_{RRM}	1.0mA	$T_C = 150\,°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	22 Amps	Single phase, half-wave rating at $T_C = 131\,°C$
Maximum surge current	I_{FSM}	250 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.2 V max.	$I_F = 30A$; $T_C = 25\,°C$
Maximum I^2t	I^2t	250 A^2S	less than 8.33 ms
Maximum recommended operating frequency		10kHz	
Thermal values			
Storage temp range	T_{stg}	$-65\,°C$ to $+200\,°C$	
Operating junction temp range	T_J	$-65\,°C$ to $+190\,°C$	
Maximum thermal resistance junction to case	$R\Theta_{JC}$	2.0 °C/W	

Mechanical Characteristics	
Base	Steel stud and base with a #10-32 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.16 ounce (4.5 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AA (DO-4) outline

Figure 1
Maximum load current versus case temperature

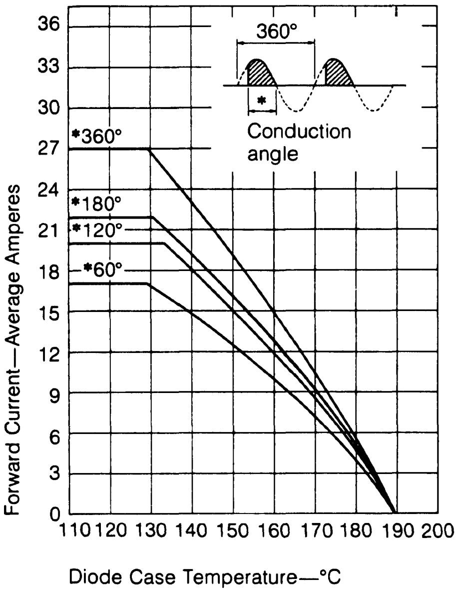


Figure 2
Maximum power dissipation versus forward current

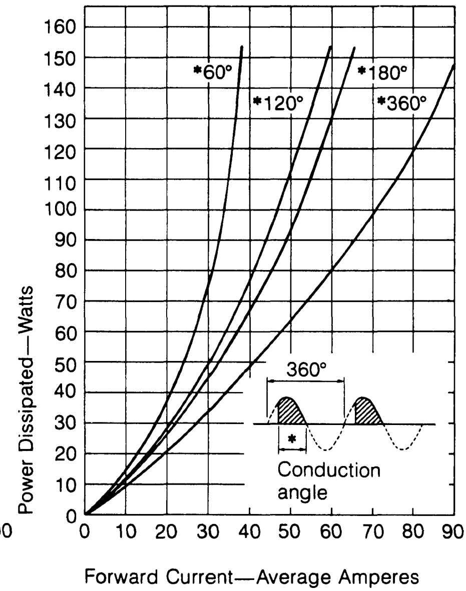


Figure 3
Maximum forward characteristics

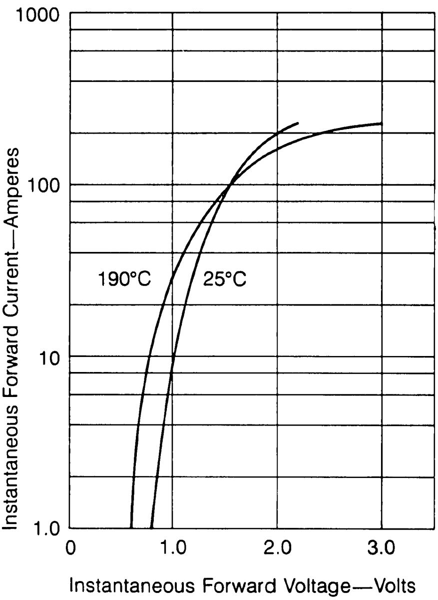


Figure 4
Transient thermal impedance

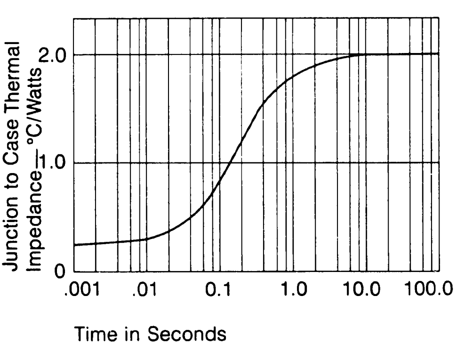
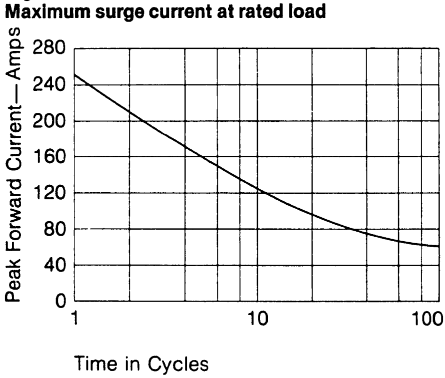


Figure 5
Maximum surge current at rated load



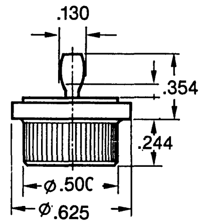
Silicon Power Rectifiers

Press-fit diode for 30 V to 700 V; 35A

Series SSiE11, SSiE12

- Copper case press fit, knurled and tin-plated
- Designed for high thermal fatigue applications

  Polarity: Case = cathode, red stamp (SSiE11)
  Case = anode, black stamp (SSiE12)



Dimensions in inches

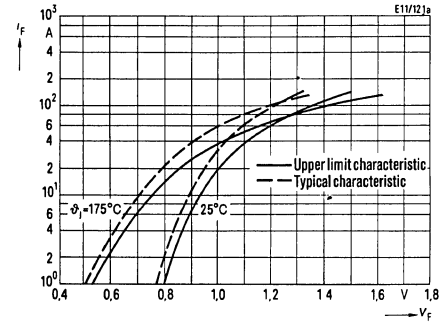
Type	Ordering Code	Repetitive peak reverse voltage V_{RRM}	Surge peak reverse voltage V_{RSM}
SSiE1102	C66047-A1020-A4	30V	30V
SSiE1105	C66047-A1020-A5	75V	75V
SSiE1110	C66047-A1020-A7	150V	150V
SSiE1120	C66047-A1020-A8	300V	300V
SSiE1130	C66047-A1020-A9	500V	500V
SSiE1140	C66047-A1020-A10	700V	700V
SSiE1202	C66047-A1020-A13	30V	30V
SSiE1205	C66047-A1020-A15	75V	75V
SSiE1210	C66047-A1020-A16	150V	150V
SSiE1220	C66047-A1020-A17	300V	300V
SSiE1230	C66047-A1020-A18	500V	500V
SSiE1240	C66047-A1020-A19	700V	700V

Electrical Characteristics

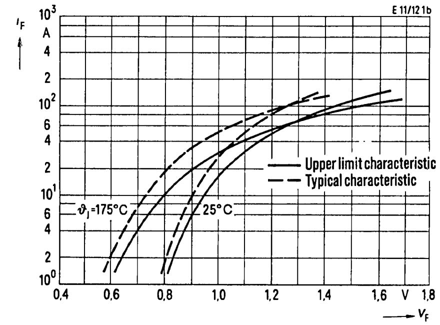
Blocking				
Repetitive peak reverse voltage	V_{RRM}	30 to 150V	300 to 700V	See ordering code
Max. reverse leaking current	I_{RRM}	6 mA	3 mA	T_J = 175°C, V_R = V_{RRM}
Forward Conducting				
Max. RMS current	$I_{F\,(RMS)}$	55 Amps	55 Amps	T_C = 120°C
Max. average current	$I_{F\,(AVG)}$	35 Amps	35 Amps	T_C = 120°C, half sine
Max. peak voltage	V_{FM}	1.15 Volts	1.20 Volts	I_{FM} = 50 Amps
Max. peak 1 cycle surge current	I_{FSM}	330 Amps	300 Amps	T_J = 175°C, 60HZ
Max. I^2t for fusing	I^2t	450A²sec	390 A²sec	T_J = 175°C, t = 8.3 ms.
Thermal Values				
Max. DC thermal resistance, junction to case	$R\Theta_{JC}$	0.7°C/W		
Operating junction temp. range	T_J	-40°C to +175°C		
Storage temperature range	T_{stg}	-65°C to +175°C		
Mechanical Characteristics				
Max. press-in force		867 lb		
Weight		Approximately 0.35 ounces (10 grams)		

(1) T_C = 25°C unless otherwise indicated

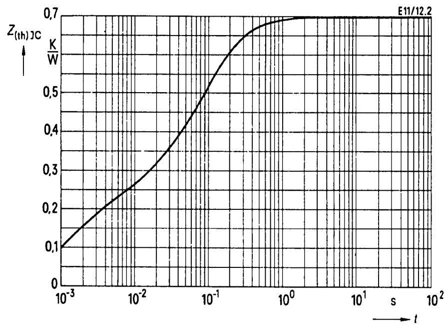
Forward characteristic curves
Parameter: junction temperature ϑ_j
V_{RRM} = 30 V to 150 V



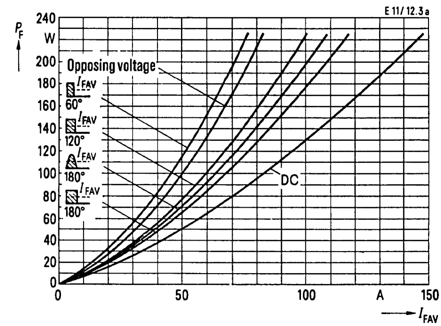
Forward characteristic curves
Parameter: junction temperature ϑ_j
V_{RRM} = 300 V to 700 V



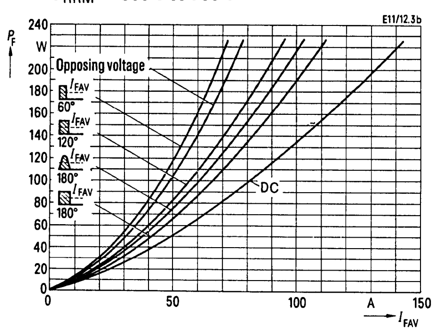
Transient thermal resistance
for constant current $Z_{(th)JC}$



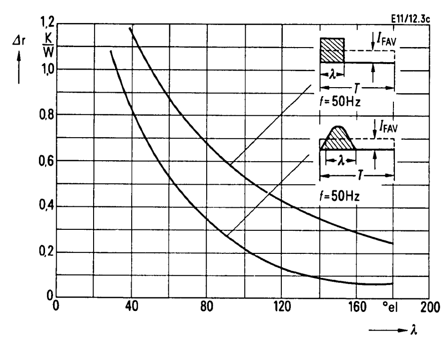
Forward power dissipation characteristic curves
Parameter: current waveform
V_{RRM} = 30 V to 150 V



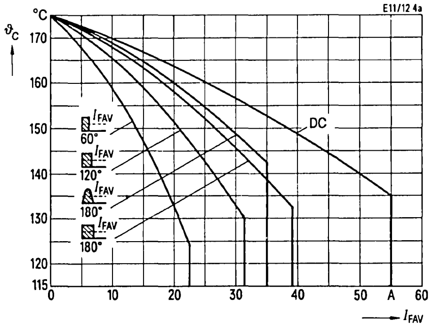
Forward power dissipation characteristic curves
Parameter: current waveform
V_{RRM} = 300 V to 700 V



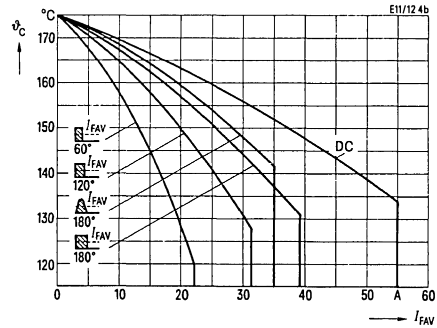
Thermal resistance Δr
Parameters: frequency f, current waveform



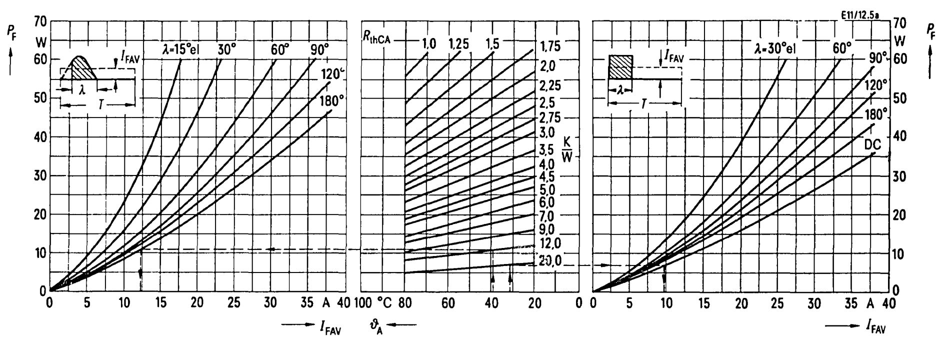
Permissible case temperature ϑ_c
versus forward current,
mains operation 40 to 60 Hz
V_{RRM} = 30 V to 150 V



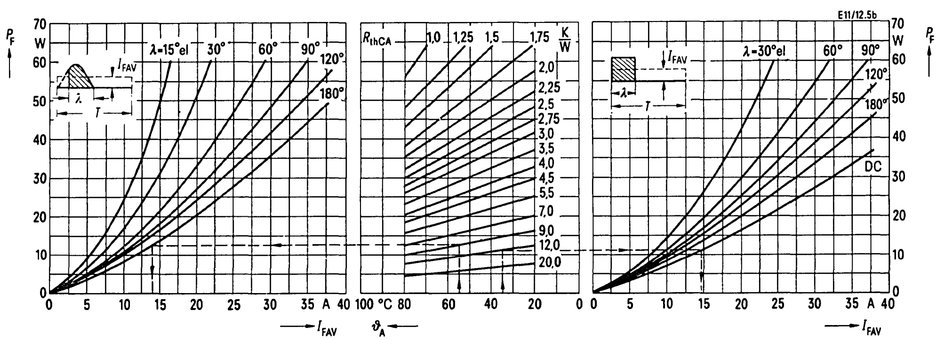
Permissible case temperature ϑ_c
versus forward current,
mains operation 40 to 60 Hz
V_{RRM} = 300 V to 700 V



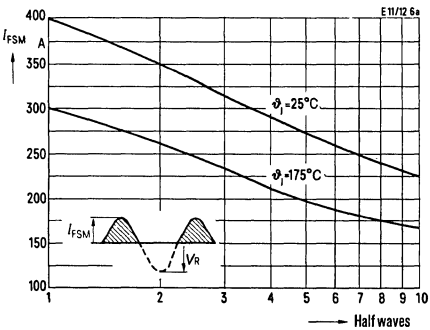
Forward power dissipation characteristic curves,
nomogram for determining max. mean forward currents (limit values)
for various cooling conditions, mains operation 40 to 60 Hz. V_{RRM} = 30 V to 150 V



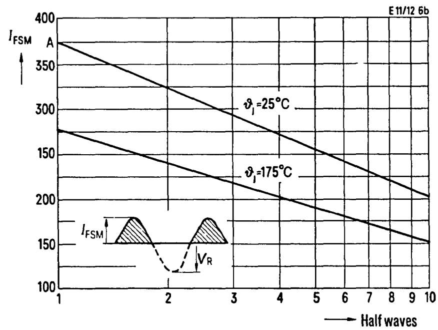
Forward power dissipation characteristic curves,
nomogram for determining max. mean forward currents (limit values)
for various cooling conditions, mains operation 40 to 60 Hz. V_{RRM} = 300 V to 700 V



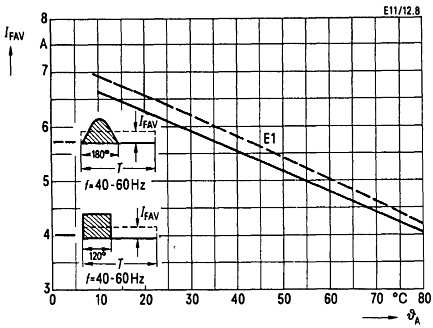
Forward characteristic curves
Parameter: junction temperature ϑ_j
$V_R \leqq 0.8\ V_{RRM}$. $V_{RRM} = 30\ V$ to $150\ V$



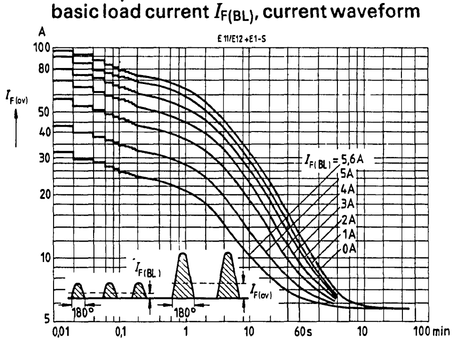
Forward characteristic curves
Parameter: junction temperature ϑ_j
$V_R \leqq 0.8\ V_{RRM}$. $V_{RRM} = 300\ V$ to $700\ V$



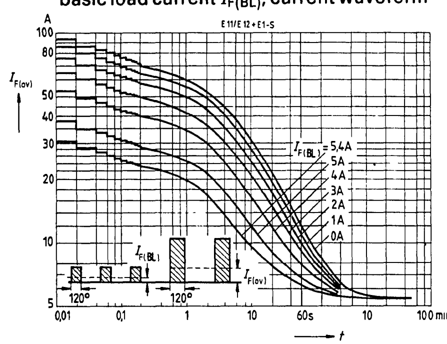
Max. mean forward currents $I_{FAV(I)}$
for heat sink E1 and mounting on printed circuit board,
versus cooling air temperature ϑ_A, mains operation 40 to 60 Hz



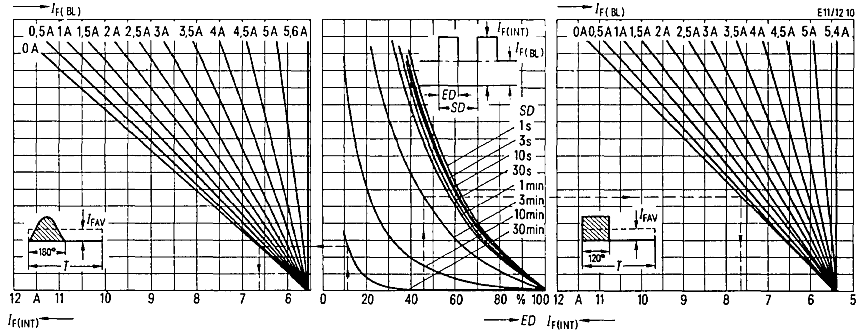
Overcurrent characteristic curves
for heat sink E1, cooling type (S), $\vartheta_A = 45°\ C$,
mains operation 40 to 60 Hz. Parameters:
basic load current $I_{F(BL)}$, current waveform



Overcurrent characteristic curves
for heat sink E1, cooling type (S), $\vartheta_A = 45°\ C$,
mains operation 40 to 60 Hz. Parameters:
basic load current $I_{F(BL)}$, current waveform



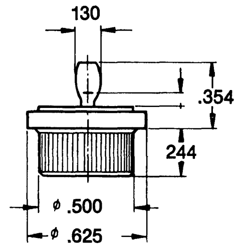
Intermittent operation with basic load for heat sink E1,
cooling type (S), $\vartheta_A = 45°C$,
mains operation 40 to 60 Hz. Parameters:
basic load current $I_{F(BL)}$, cycle time SD, current waveform

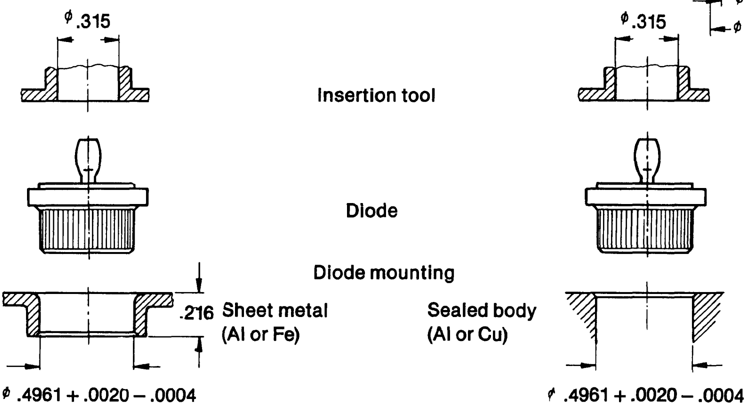


Silicon Power Rectifiers

Press-fit diode for 1100 V and 1500 V; 35 A

- Copper case press fit, knurled and tin-plated
- Designed for high thermal fatigue applications
- Polarity: Case = cathode, red stamp (SSiE43)
  Case = anode, black stamp (SSiE44)





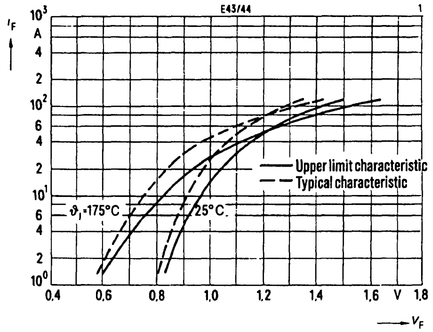
Type	Ordering Code	Repetitive peak reverse voltage V_{RRM}	Surge peak reverse voltage V_{RRM}
SSIE4360	C66047-A1066-A4	1100V	1100V
SSIE4383	C66047-A1066-A5	1500V	1500V
SSIE4460	C66047-A1066-A9	1100V	1100V
SSIE4483	C66047-A1066-A10	1500V	1500V

Electrical Characteristics

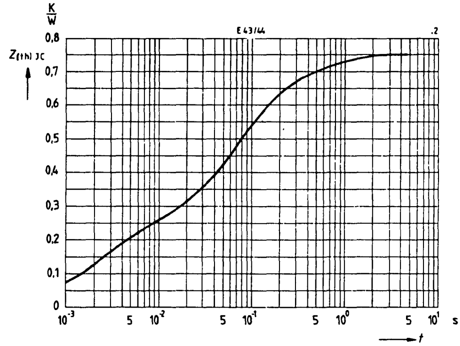
Forward Conducting			
Max. RMS current	$I_{F\,(RMS)}$	55 Amps	T_C = 120°C
Max. average current	$I_{F\,(AVG)}$	35 Amps	T_C = 120°C, half sine
Max. peak voltage	V_{FM}	1.2 Volts	I_{FM} = 50 Amps
Max. peak 1 cycle surge current	I_{FSM}	300 Amps	T_J = 175°C, 60HZ
Max. I^2t for fusing	I^2t	340 A^2sec	T_J = 175°C, t = 8.3 ms
Thermal Values			
Max. DC thermal resistance, junction to case	$R_{\Theta JC}$	1.0C/W	
Operating junction temp. range	T_J	-40°C to +175°C	
Storage temperature range	T_{stg}	-40°C to +175°C	
Blocking			
Max. reverse leaking current	I_{RRM}	4 mA	T_J = 175°C, V_R = V_{RRM}
Mechanical Characteristics			
Max. press-in force	867 lb		
Weight	Approximately 0.35 ounces (10 grams)		

(1) T_C = 25°C unless otherwise indicated

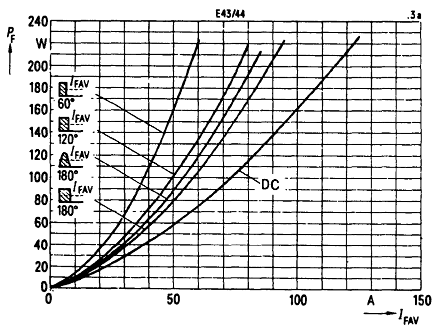
Forward characteristic curves
Parameter: junction temperature ϑ_j



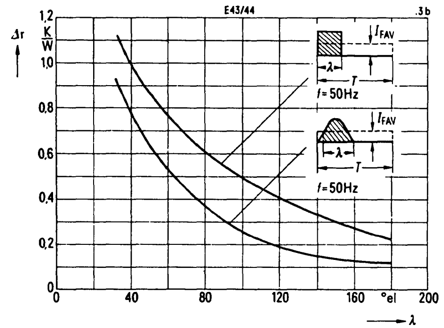
Transient thermal resistance
for constant current $Z_{(th)JC}$



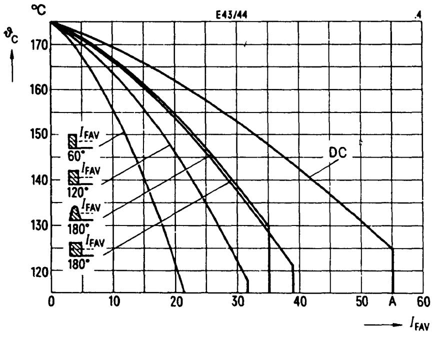
Forward power dissipation characteristic curves
Parameter: current waveform



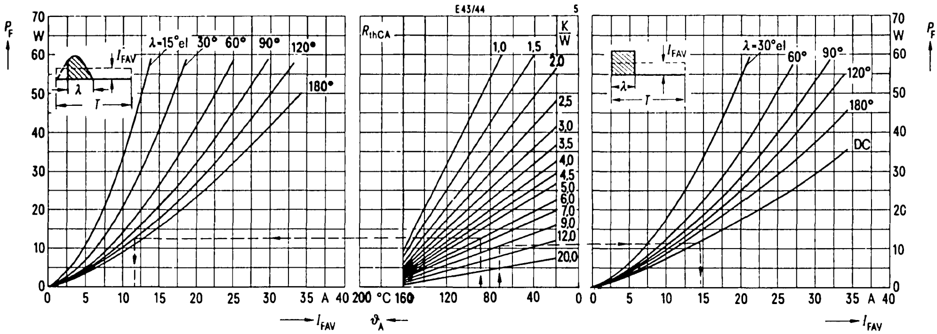
Thermal resistance Δr
Parameters: frequency f, current waveform



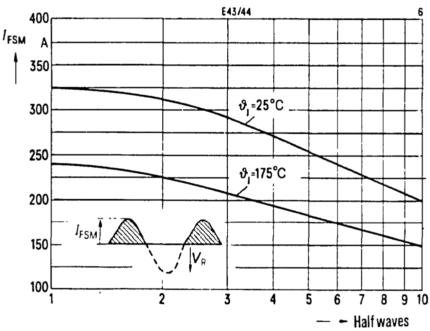
Permissible case temperature ϑ_c
versus forward current,
mains operation 40 to 60 Hz



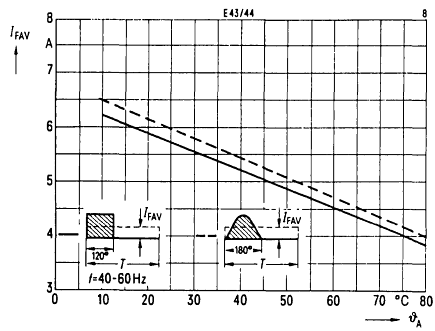
Forward power dissipation characteristic curves,
nomogram for determining max. mean forward currents (limit value) for various cooling conditions, mains operation 40 to 1000 Hz



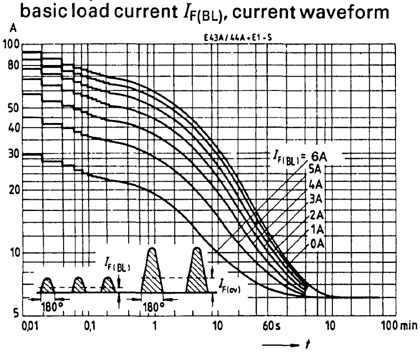
Maximum current characteristic curves
Parameter: junction temperature ϑ_j
$V_R \leqq 0.8\ V_{RRM}$



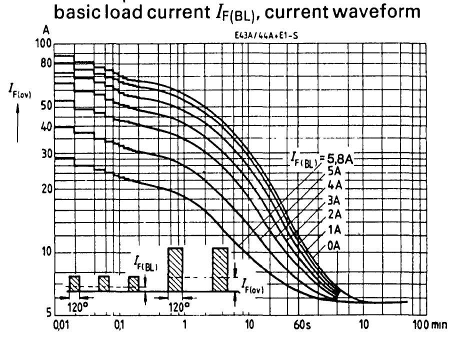
Max. mean forward current $I_{FAV(I)}$ **for heat sink E1** and mounting on a printed circuit board versus cooling air temperature ϑ_A, mains operation 40 to 60 Hz, natural air cooling



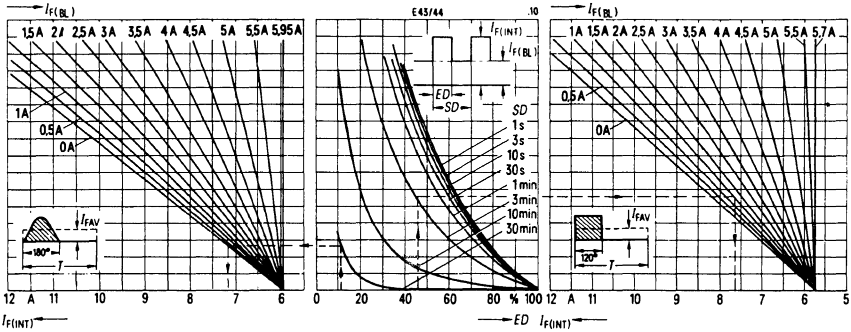
Overcurrent characteristic curves (mean value) for heat sink E 1, cooling type (S), $\vartheta_A = 45°$ C, mains operation 40 to 60 Hz. Parameters: basic load current $I_{F(BL)}$, current waveform



Overcurrent characteristic curves (mean value) for heat sink E 1, cooling type (S), $\vartheta_A = 45°$ C, mains operation 40 to 60 Hz. Parameters: basic load current $I_{F(BL)}$, current waveform

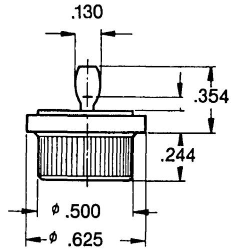


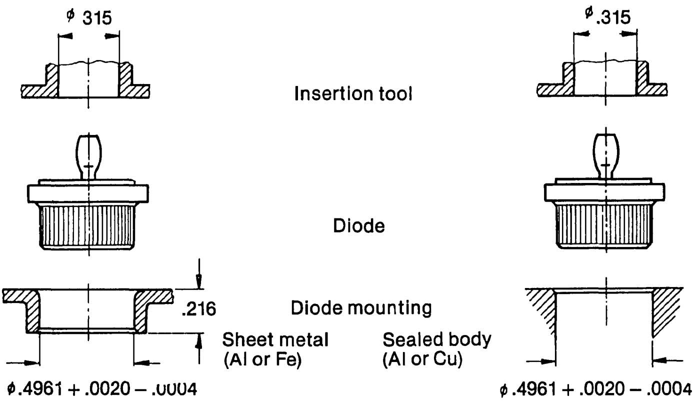
Intermittent operation with basic load for heat sink E 1,
cooling type (S), $\vartheta_A = 25°C$, mains operation 40 to 60 Hz. Parameters:
basic load current $I_{F(BL)}$, cycle time SD, current waveform



Press-fit diode with avalanche characteristic for 1100 V and 1500 V; 35 A

- Copper case press fit, knurled and tin-plated
- Designed for high thermal fatigue applications
- Polarity: Case = cathode, red stamp (SSiE43A)
  Case = anode, black stamp (SSiE44A)





Type	Ordering Code	Repetitive peak reverse voltage V_{RRM}	Breakdown voltage at I_R = 4MA, ϑ_j = 25°C V_{BR}
SSiE4360 A	C66047-A1066-A12	—	1200 V to 2000 V
SSiE4383 A	C66047-A1066-A13	—	1650 V to 2400 V
SSiE4460 A	C66047-A1066-A17	—	1200 V to 2000 V
SSiE4483 A	C66047-A1066-A18	—	1650 V to 2400 V

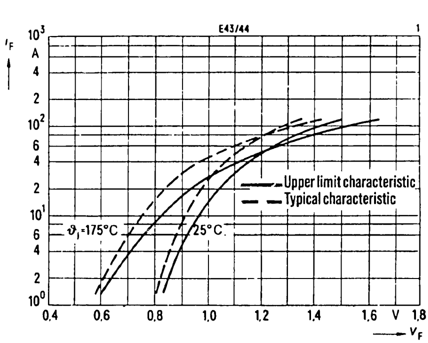
Electrical Characteristics

Forward Conducting			
Max. RMS current	$I_{F\,(RMS)}$	55 Amps	T_C = 120°C
Max. average current	$I_{F\,(AVG)}$	35 Amps	T_C = 120°C, half sine
Max. peak voltage	V_{FM}	1.2 Volts	I_{FM} = 50 Amps
Max. peak 1 cycle surge current	I_{FSM}	300 Amps	T_J = 175°C, 60HZ
Max. I^2t for fusing	I^2t	390 A^2sec	T_J = 175°C, t = 8.3 ms
Thermal Values			
Max. DC thermal resistance, junction to case	$R_{\Theta JC}$	1.0C/W	
Operating junction temp. range	T_J	-40°C to +175°C	
Storage temperature range	T_{stg}	-40°C to +175°C	
Blocking			
Max. reverse leaking current	I_{RRM}	4 mA	T_J = 175°C, V_R = V_{RRM}

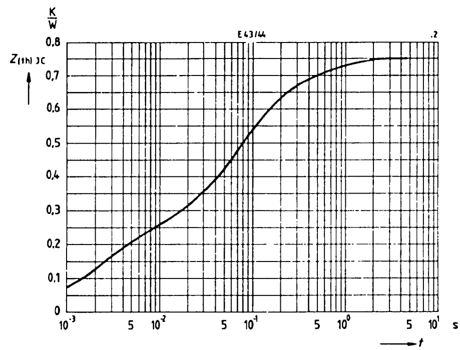
Mechanical Characteristics	
Max. press-in force	867 lb
Weight	Approximately 0.35 ounces (10 grams)

(1) T_C = 25°C unless otherwise indicated

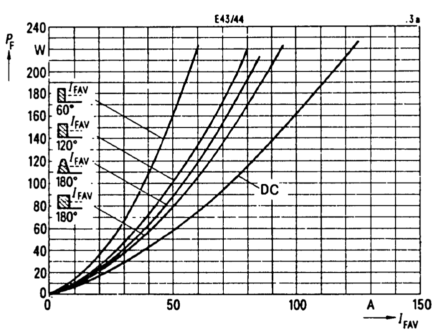
Forward characteristic curves
Parameter: junction temperature ϑ_j



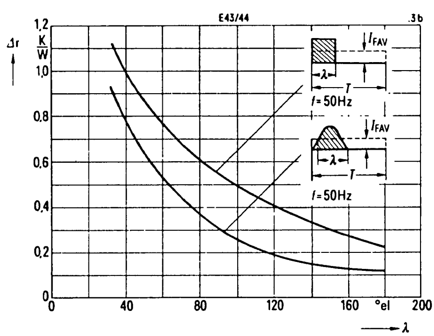
Transient thermal resistance
for constant current $Z_{(th)JC}$



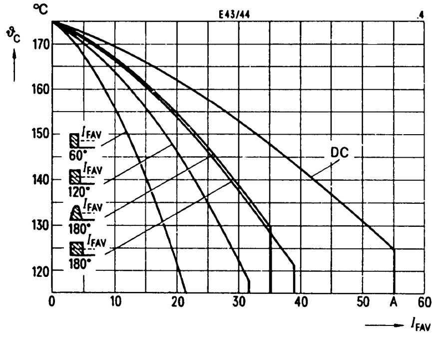
Forward power dissipation characteristic curves
Parameter: current waveform



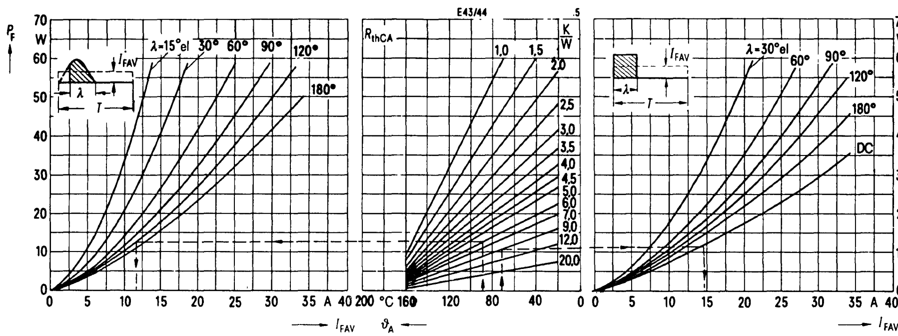
Thermal resistance Δr
Parameters: frequency f, current waveform



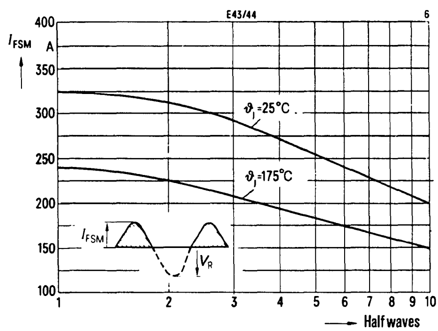
Permissible case temperature ϑ_c
versus forward current,
mains operation 40 to 60 Hz



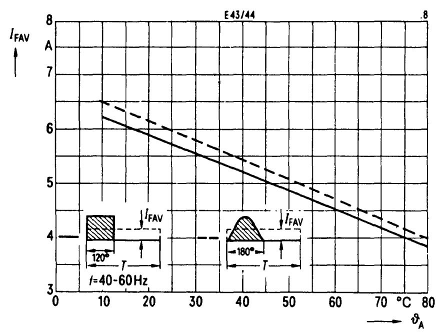
Forward power dissipation characteristic curves,
nomogram for determining max. mean forward currents (limit value) for various cooling conditions, mains operation 40 to 60 Hz



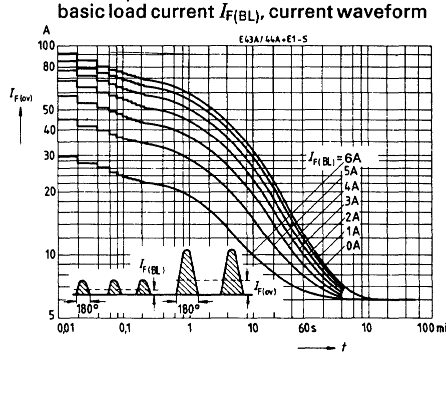
Maximum current characteristic curves
Parameter: junction temperature ϑ_j
$V_R \leqq 0.8\ V_{RRM}$



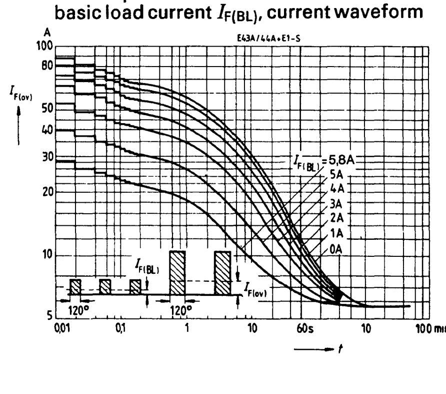
Max. mean forward current $I_{FAV(I)}$ for heat sink E 1 and mounting on a PCB,
versus cooling air temperature ϑ_A,
mains operation 40 to 60 Hz, natural air cooling



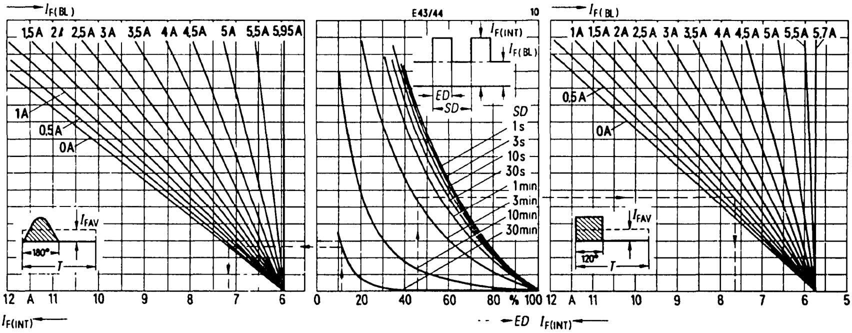
Overcurrent characteristic curves (mean value) for heat sink E 1, cooling type (S), $\vartheta_A = 25°$ C, mains operation 40 to 60 Hz. Parameters: basic load current $I_{F(BL)}$, current waveform



Overcurrent characteristic curves (mean value) for heat sink E 1, cooling type (S), $\vartheta_A = 25°$ C, mains operation 40 to 60 Hz. Parameters: basic load current $I_{F(BL)}$, current waveform



Intermittent operation with basic load for heat sink E 1,
cooling type (S), $\vartheta_A = 45°$ C, mains operation 40 to 60 Hz
Parameters: basic load current $I_{F(BL)}$, cycle time SD, current waveform

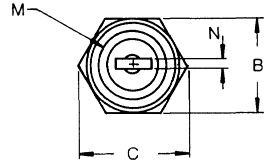


Silicon Power Rectifiers

Series 304

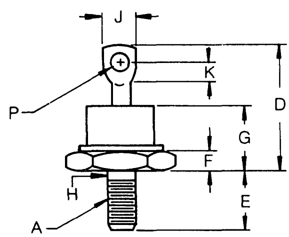
40 AMP Avg; V_{RRM} to 600 Volts

- Glass to metal construction
- Economical, general purpose rectifier
- High surge current capability
- Excellent reliability



Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.427	.447	10.84	11.35	
F	.125	.142	3.17	3.60	
G	----	.450	----	11.43	
H	.220	.249	5.59	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.97	----	
M	----	.590	----	14.98	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.56	4.44	Dia.

Note 1: Standard polarity: Stud is cathode
¼-28 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads



DO-203AB
(DO-5)

Catalog Number		JEDEC Numbers	Peak Reverse Voltage
Standard	**Reverse**		
S30410	R30410	1N1184, 1N1184A	100
S30420	R30420	1N1186, 1N1186A	200
S30440	R30440	1N1188, 1N1188A	400
S30460	R30460	1N1190, 1N1190A	600

Electrical Characteristics

Reverse Blocking				
Repetitive peak reverse voltage	V_{RRM}	100V to 600V		
Maximum peak reverse current	I_{RRM}	2.0mA		$T_C = 150°C$
Forward Direction		**1N1184A-1N1190A**	**1N1184-1N1190**	
Maximum average forward current	$I_{F(AV)}$	40 Amps $T_C = 155°C$	35 Amps $T_C = 144°C$	Single phase, half-wave
Maximum surge current	I_{FSM}	800 Amps	500 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.19V max.	1.45V max.	$I_F = 90A$; $T_C = 25°C$
Maximum I^2t	I^2t	2600 A^2S	1000A^2S	less than 8.33 ms
Maximum recommended operating frequency		10kHz	10kHz	
Thermal values				
Storage temp range	T_{stg}	$-65°C$ to $+200°C$		
Operating junction temp range	T_J	$-65°C$ to $+190°C$		
Maximum thermal resistance junction to case	$R\Theta_{JC}$	1.0°C/W		

Mechanical Characteristics

Base	Steel stud and base with a #10-32 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.5 ounce (14 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO-5) outline

Figure 1
Maximum load current versus case temperature

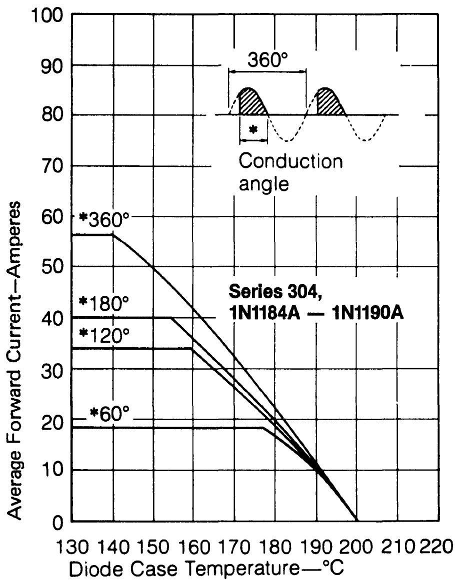


Figure 2
Maximum power dissipation versus forward current

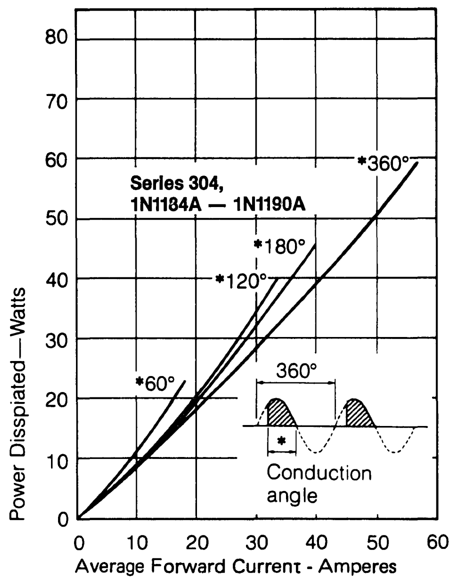


Figure 3
Maximum forward characteristics

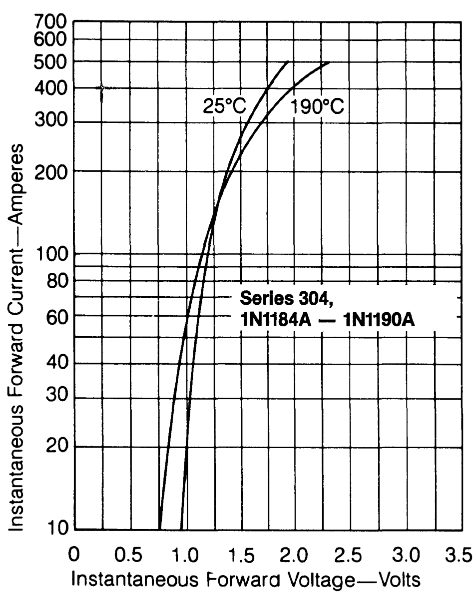


Figure 4
Maximum load current versus case temperature

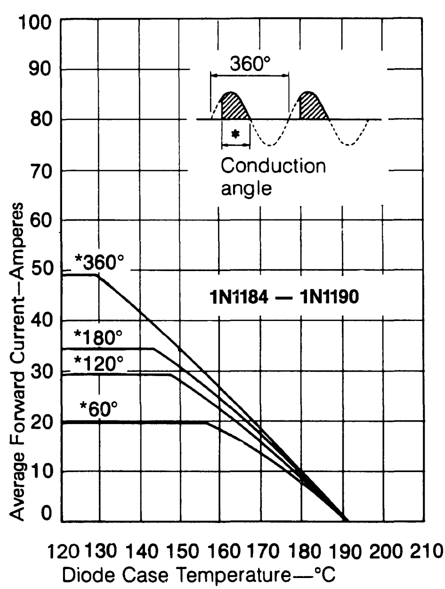


Figure 5
Maximum power dissipation versus forward current.

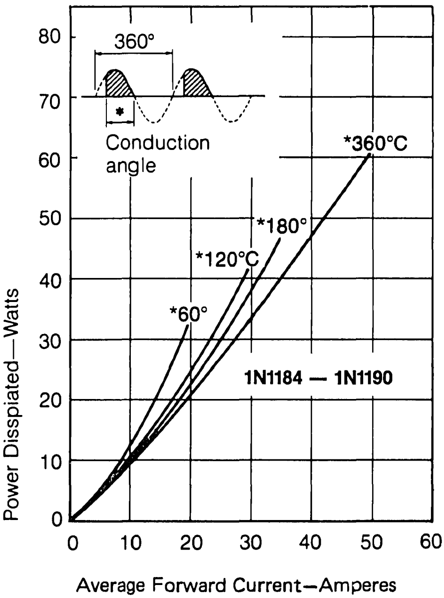


Figure 6
Maximum forward characteristics

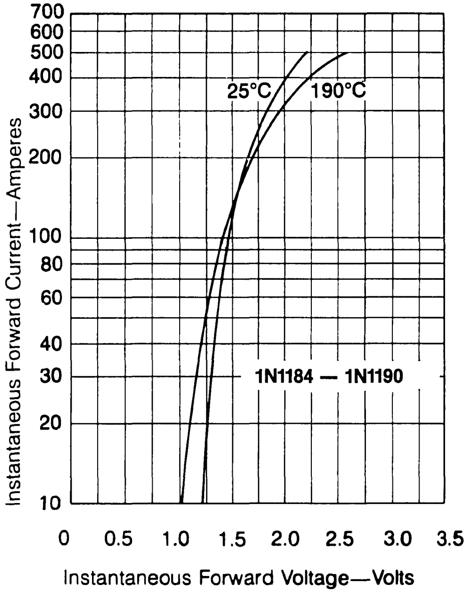


Figure 7
Transient thermal impedance

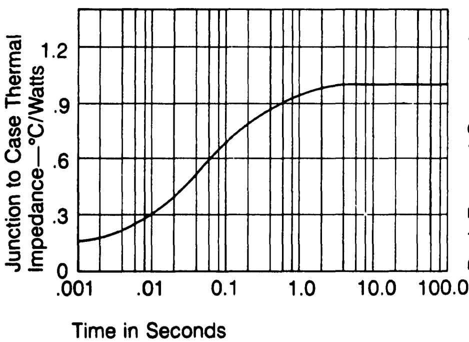


Figure 8
Maximum surge current at 25°C

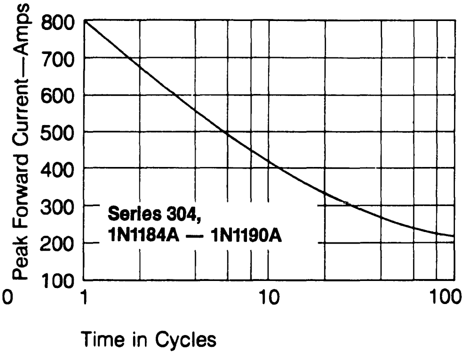
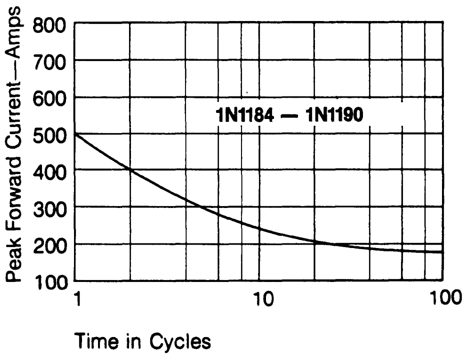


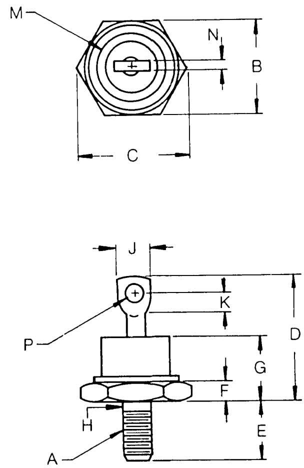
Figure 9
Maximum surge current



Silicon Power Rectifiers

45 AMP Avg; V_{RRM} to 1200 Volts

- Glass to metal construction
- Low forward voltage drop
- Excellent thermal fatigue capability
- High surge current capability
- Excellent reliability



**DO-203AB
(DO-5)**

Dim.	Inches Minimum	Inches Maximum	Millimeter Minimum	Millimeter Maximum	Notes
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.427	.447	10.84	11.35	
F	.125	.142	3.17	3.60	
G	----	.450	----	11.43	
H	.220	.249	5.59	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.97	----	
M	----	.590	----	14.98	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.56	4.44	Dia.

Note 1: Standard polarity: Stud is cathode
¼-28 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads

Catalog Number Standard	Catalog Number Reverse	JEDEC Numbers	Peak Reverse Voltage
S3410	R3410	1N1184, 1N2459	100
S3420	R3420	1N1186, 1N2461, 1N2788, 1N3968, 1N4525	200
S3440	R3440	1N1190, 1N2285, 1N2467, 1N3970, 1N3969, 1N4526	400
S3460	R3460	1N1190, 1N2285, 1N2467, 1N3970, 1N4527	600
S3480	R3480	1N2286, 1N3766, 1N3971, 1N4528	800
S34100	R34100	1N2287, 1N3768, 1N4529	1000
S34120	R34120	1N2288, 1N4530, 1N5332	1200

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	100V to 1200V	
Maximum peak reverse current	I_{RRM}	2.0mA	$T_C = 150\,°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	45 Amps	Single phase, half-wave rating at $T_C = 122\,°C$
Maximum surge current	I_{FSM}	700 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.15V max.	$I_F = 90A$; $T_C = 25\,°C$
Maximum I^2t	I^2t	2100 A^2S	less than 8.33 ms
Maximum recommended operating frequency		10kHz	
Thermal values			
Storage temp range	T_{stg}	$-65\,°C$ to $+200\,°C$	
Operating junction temp range	T_J	$-65\,°C$ to $+190\,°C$	
Maximum thermal resistance junction to case	$R\Theta_{JC}$	1.25 °C/W	

Mechanical Characteristics	
Base	Steel stud and base with a #10-32 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.5 ounce (14 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO-5) outline

Figure 1
Maximum load current versus case temperature

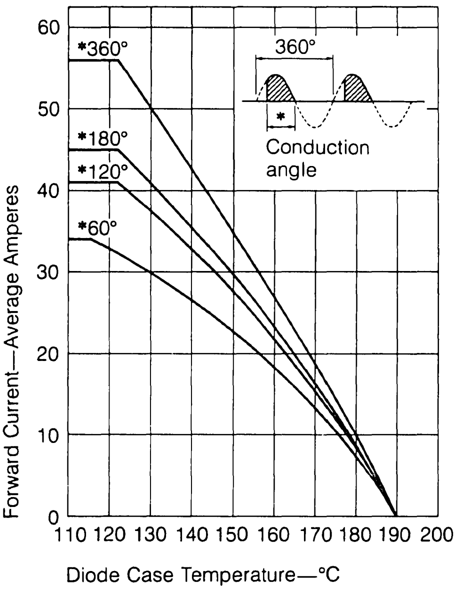


Figure 2
Maximum power dissipation versus forward current

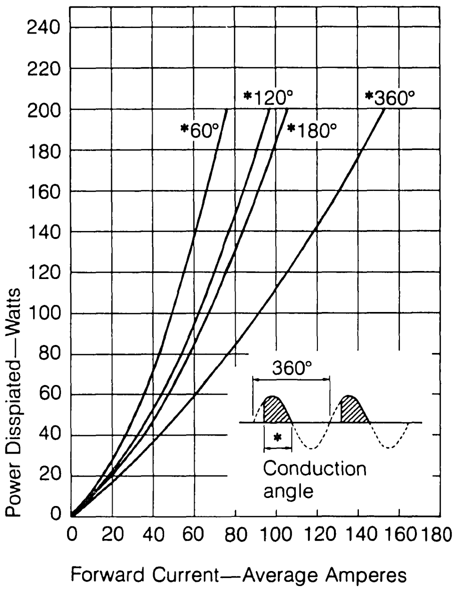


Figure 3
Maximum forward characteristics

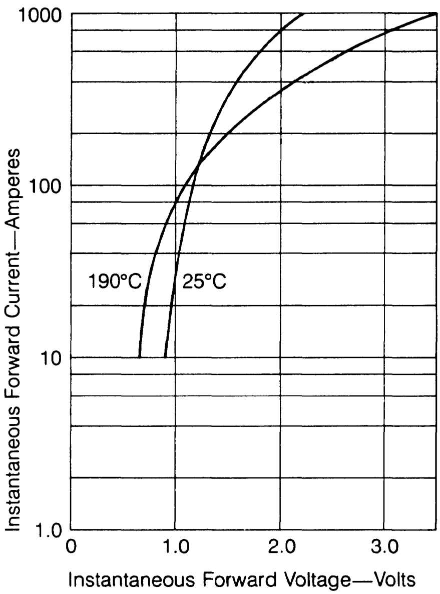


Figure 4
Transient thermal impedance

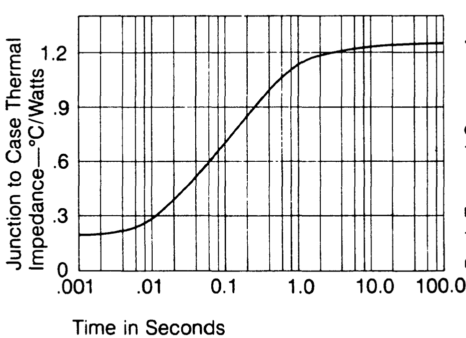
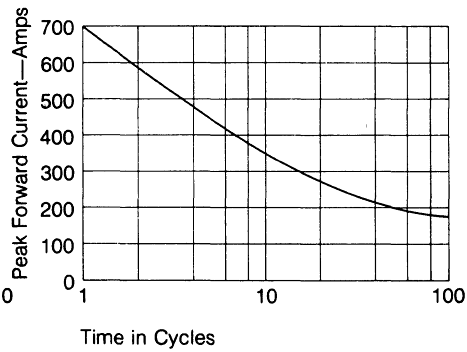
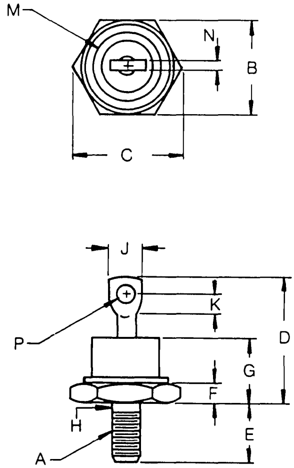


Figure 5
Maximum surge current at rated load



- Glass to metal construction
- Low leakage current series
- High surge current capability
- Low thermal resistance
- High case temperature
- Will meet high reliability requirements



DO-203AB (DO-5)

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.427	.447	10.84	11.35	
F	.125	.142	3.17	3.60	
G	----	.450	----	11.43	
H	.220	.249	5.59	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.97	----	
M	----	.590	----	14.98	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.56	4.44	Dia.

Note 1: Standard polarity: Stud is cathode
¼-28 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads

Catalog Number		Peak Reverse Voltage
Standard	**Reverse**	
S3610	R3610	100
S3620	R3620	200
S3640	R3640	400
S3660	R3660	600
S3680	R3680	800
S36100	R36100	1000
S36120	R36120	1200

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	100V to 1200V	
Maximum peak reverse current	I_{RRM}	2.0mA	$T_C = 150\,°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	70 Amps	Single phase, half-wave rating at $T_C = 138\,°C$
Maximum surge current	I_{FSM}	1200 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.25V max.	$I_F = 200A$; $T_C = 25\,°C$
Maximum I^2t	I^2t	6000 A^2S	less than 8.33 ms
Maximum recommended operating frequency		10kHz	
Thermal values			
Storage temp range	T_{stg}	$-65\,°C$ to $+200\,°C$	
Operating junction temp range	T_J	$-65\,°C$ to $+190\,°C$	
Maximum thermal resistance junction to case	$R\Theta_{JC}$	0.65 °C/W	

Mechanical Characteristics

Base	High strength copper stud and base with a 1/4-28 UNF-2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.6 ounce (17 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO-5) outline

Figure 1
Maximum load current versus case temperature

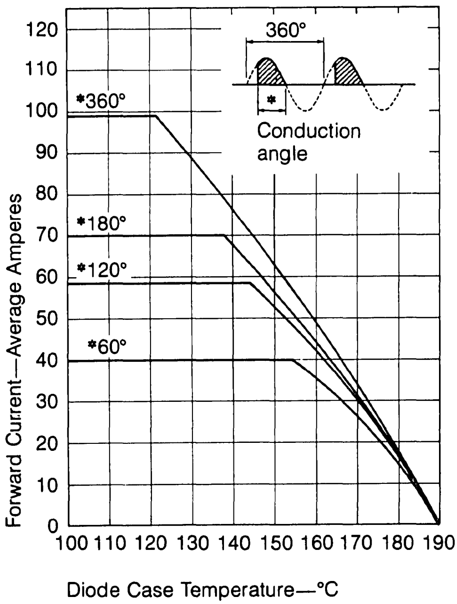


Figure 2
Maximum power dissipation versus forward current

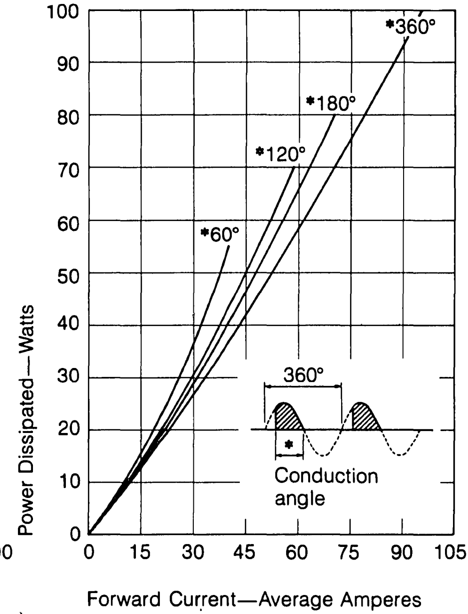


Figure 3
Maximum forward characteristics

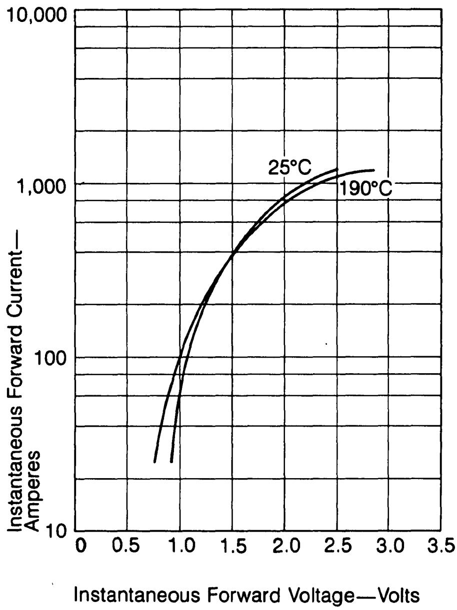


Figure 4
Transient thermal impedance

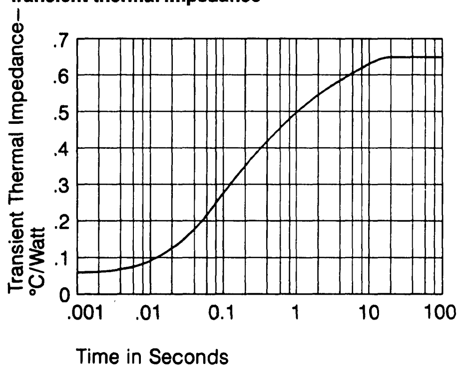
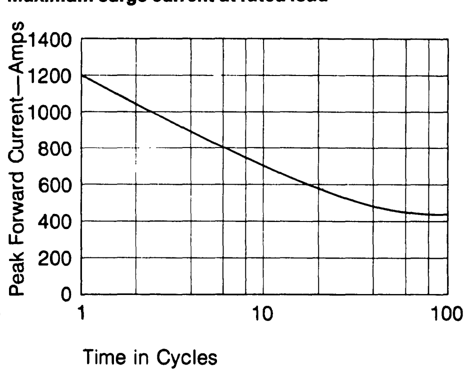


Figure 5
Maximum surge current at rated load

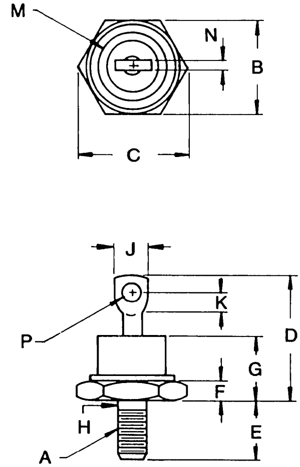


Silicon Power Rectifiers

Series 306

70 AMP Avg; V_{RRM} to 1200 Volts

- Glass to metal construction
- Economical, general purpose silicon rectifier
- Soft recovery
- High surge current capability



DO-203AB
(DO-5)

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.427	.447	10.84	11.35	
F	.125	.142	3.17	3.60	
G	----	.450	----	11.43	
H	.220	.249	5.59	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.97	----	
M	----	.590	----	14.98	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.56	4.44	Dia.

Note 1: Standard polarity: Stud is cathode
¼-28 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads

Catalog Number		JEDEC	Peak Reverse Voltage
Standard	Reverse		
S306010F	R306010F	1N2129A	100
S306020F	R306020F	1N2131A	200
S306040F	R306040F	1N2135A	400
S306060F	R306060F	1N2138A	600
S306080F	R306080F		800
S306100F	R306100F		1000
S306120F	R306120F		1200

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	100V to 1200V	
Maximum peak reverse current	I_{RRM}	4.0mA	$T_C = 150°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	70 Amps	Single phase, half-wave rating at $T_C = 125°C$
Maximum surge current	I_{FSM}	1200 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.25V max.	$I_F = 200A$; $T_C = 25°C$
Maximum I^2t	I^2t	6000 A^2S	less than 8.33 ms
Maximum recommended operating frequency		10kHz	
Thermal values			
Storage temp range	T_{stg}	$-65°C$ to $+200°C$	
Operating junction temp range	T_J	$-65°C$ to $+190°C$	
Maximum thermal resistance junction to case	$R_{\Theta JC}$	0.80 °C/W	

Mechanical Characteristics	
Base	Steel stud and base with a 1/4-28 UNF-2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.5 ounce (14 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO-5) outline

Figure 1
Maximum load current versus case temperature

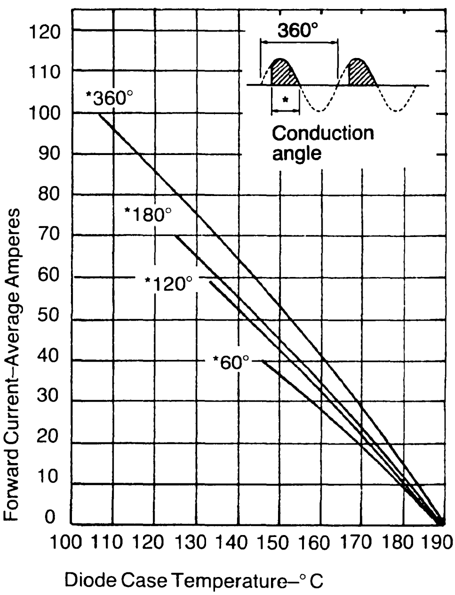


Figure 2
Maximum power dissipation versus forward current

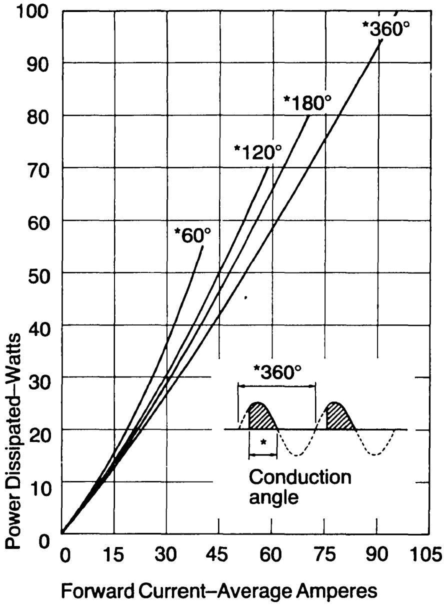


Figure 3
Maximum forward characteristics

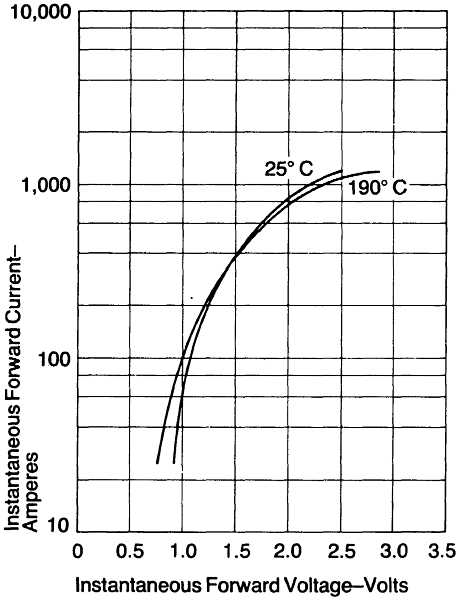


Figure 4
Transient thermal impedance

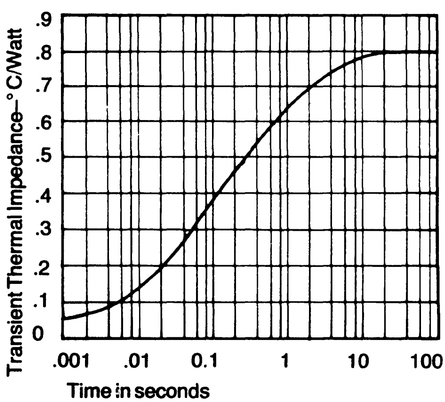
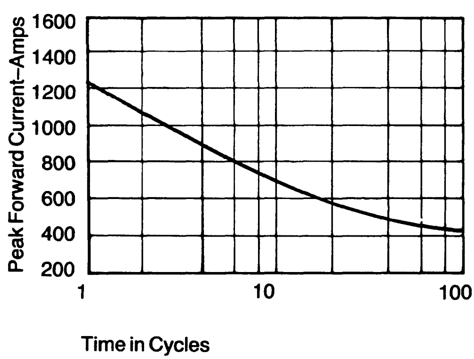


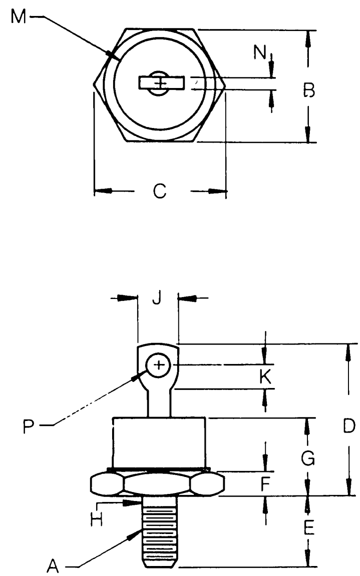
Figure 5
Maximum surge current at rated load



Silicon Power Rectifiers

85 AMP Avg; V_{RRM} to 1200 Volts

- Glass to metal construction
- Low leakage current series
- Highest current DO-5 available
- High surge current capability
- Excellent thermal fatigue capability
- Low thermal resistance
- Will meet high reliability requirements



DO-203AB (DO-5)

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.427	.447	10.84	11.35	
F	.125	.142	3.17	3.60	
G	----	.450	----	11.43	
H	.220	.249	5.59	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.97	----	
M	----	.590	----	14.98	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.56	4.44	Dia.

Note 1:
¼-28 UNF-2A

Standard polarity: Stud is cathode
Reverse polarity: Stud is anode

Note 2:
Full threads within 2½ threads

Catalog Number		Peak Reverse Voltage
Standard	**Reverse**	
S3710	R3710	100
	R3715	
S3720	R3720	200
S3740	R3740	400
S3760		
	R3770	700
S3780	R3780	800
S37100	R37100	1000
S37120	R37120	1200

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	100V to 1200V	
Maximum peak reverse current	I_{RRM}	2.0mA	$T_C = 150°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	85 Amps	Single phase, half-wave rating at $T_C = 132°C$
Maximum surge current	I_{FSM}	1500 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.15V max.	$I_F = 200A$; $T_C = 25°C$
Maximum I^2t	I^2t	9300 A^2S	less than 8.33 ms
Maximum recommended operating frequency		10kHz	
Thermal values			
Storage temp range	T_{stg}	$-65°C$ to $+200°C$	
Operating junction temp range	T_J	$-65°C$ to $+190°C$	
Maximum thermal resistance junction to case	$R_{\Theta JC}$	0.6 °C/W	

Mechanical Characteristics

Base	High strength copper stud and base with a 1/4-28 UNF-2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.6 ounce (17 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO-5) outline

Figure 1
Maximum load current versus case temperature

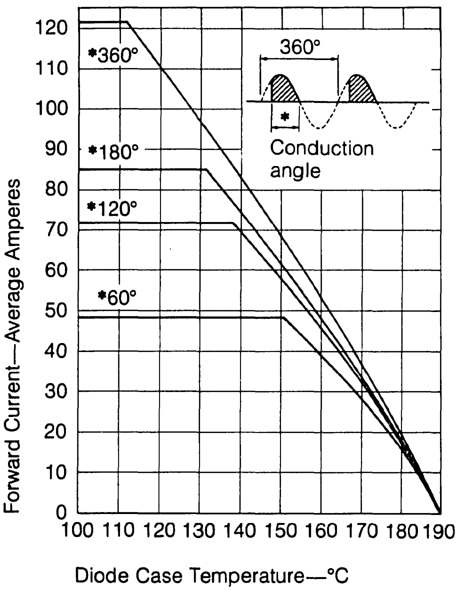


Figure 2
Maximum power dissipation versus forward current

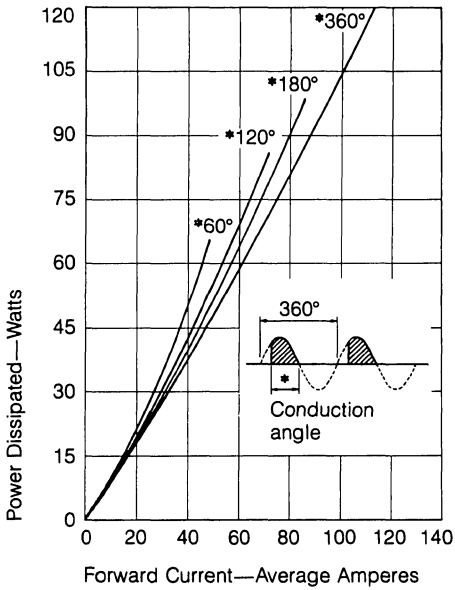


Figure 3
Maximum forward characteristics

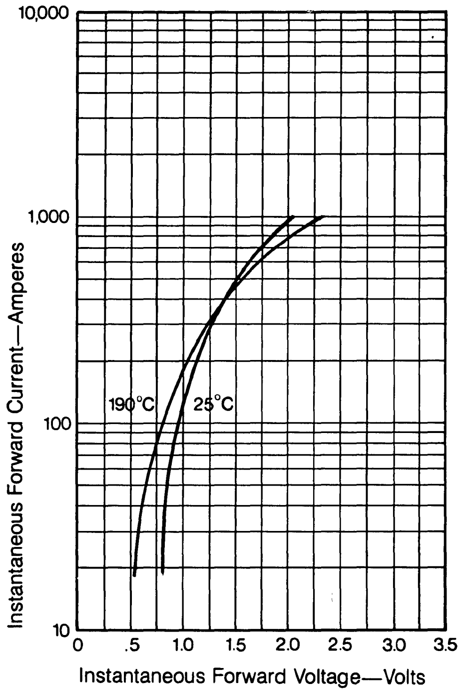


Figure 4
Transient thermal impedance

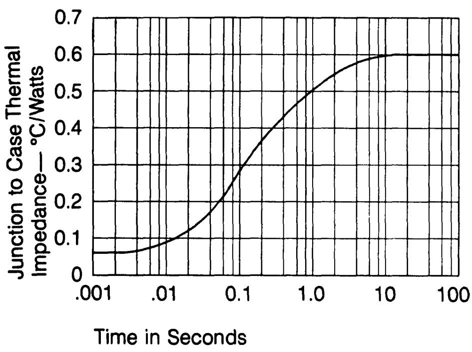
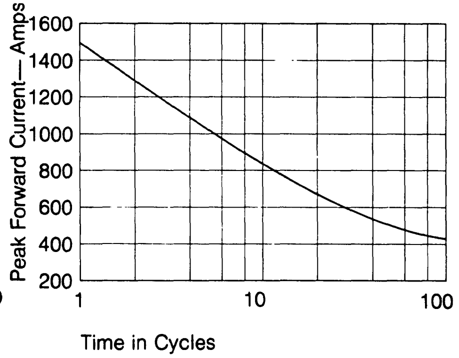


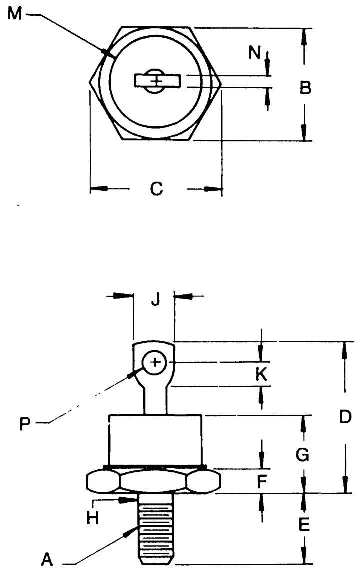
Figure 5
Maximum surge current at rated load



Silicon Power Rectifiers

85 AMP Avg; V_{RRM} to 600 Volts

- Glass to metal construction
- Low forward voltage drop
- Designed for a wide range of applications
- Economical, high current, low voltage rectifier
- High surge current capabilities



DO-203AB
(DO-5)

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.427	.447	10.84	11.35	
F	.125	.142	3.17	3.60	
G	----	.450	----	11.43	
H	.220	.249	5.59	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.97	----	
M	----	.590	----	14.98	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.56	4.44	Dia.

Note 1:
¼-28 UNF-2A
Note 2:
Full threads within 2½ threads

Standard polarity: Stud is cathode
Reverse polarity: Stud is anode

Catalog Number		Peak Reverse Voltage
Standard	Reverse	
S307010F	R307010F	100
S307020F	R307020F	200
S307040F	R307040F	400
S307060F	R307060F	600

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	100V to 600V	
Maximum peak reverse current	I_{RRM}	4.0mA	$T_C = 150\,°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	85 Amps	Single phase, half-wave rating at $T_C = 105\,°C$
Maximum surge current	I_{FSM}	1500 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.1V max.	$I_F = 200A$; $T_C = 25\,°C$
Maximum I^2t	I^2t	9300 A^2S	less than 8.33 ms
Maximum recommended operating frequency		10kHz	
Thermal values			
Storage temp range	T_{stg}	$-65\,°C$ to $+200\,°C$	
Operating junction temp range	T_J	$-65\,°C$ to $+190\,°C$	
Maximum thermal resistance junction to case	$R\Theta_{JC}$	0.80 °C/W	

Mechanical Characteristics

Base	Steel stud and base with a 1/4-28 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.5 ounce (14 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO-5) outline

Figure 1
Maximum load current versus case temperature

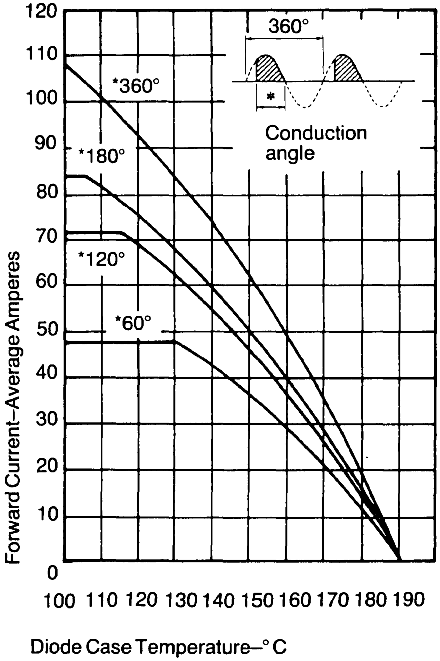


Figure 2
Maximum power dissipation versus forward current

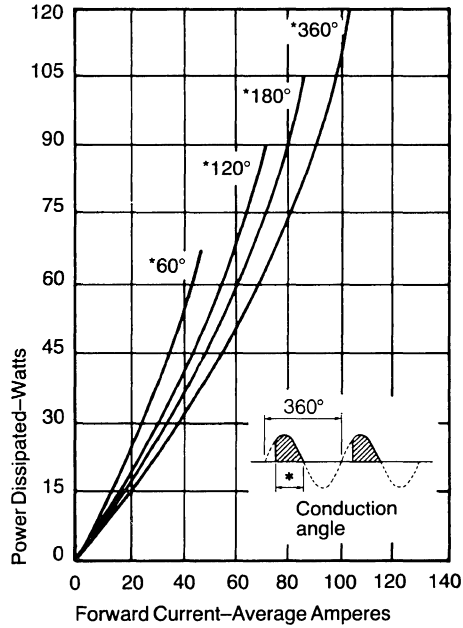


Figure 3
Maximum forward characteristics

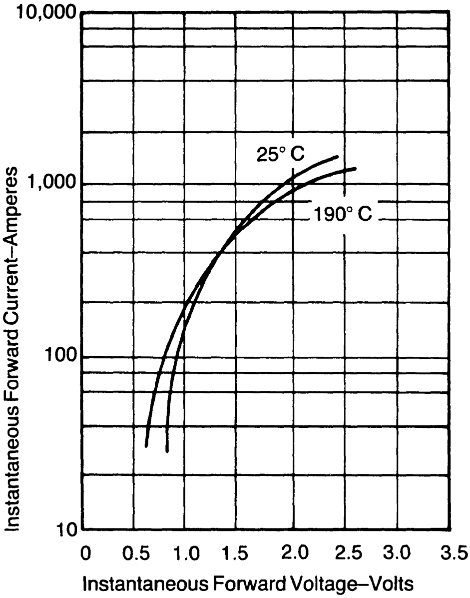


Figure 4
Transient thermal impedance

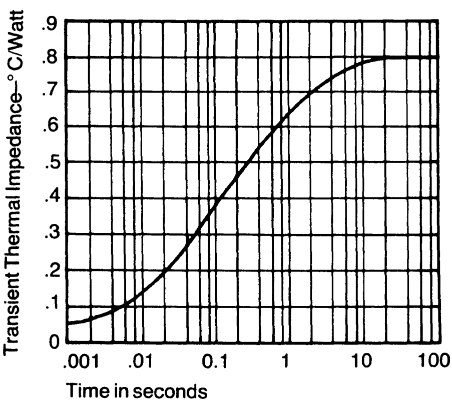
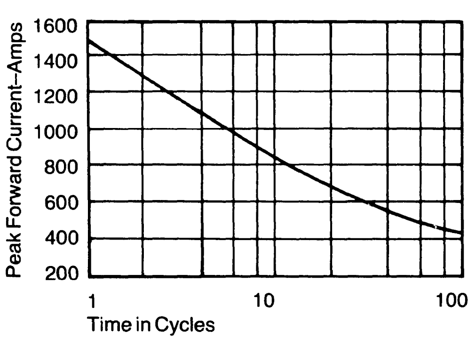


Figure 5
Maximum surge current at rated load



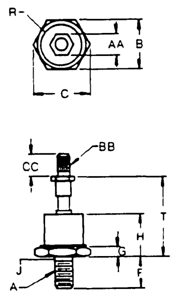
Silicon Power Rectifiers

125 AMP Avg; V_{RRM} up to 1200 Volts

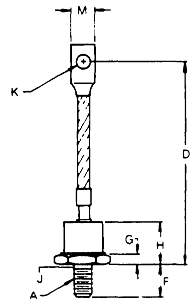
- Glass to metal construction
- Available in two types of lead configurations
- Soft recovery
- Rugged construction for industrial service

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	1.050	1.060	26.67	26.92	
C	----	1.166	----	29.61	
D	4.3	4.7	109.22	119.38	
F	.610	.640	15.49	16.25	
G	.213	.233	5.41	5.66	
H	----	.745	----	18.92	
J	.344	.373	8.74	9.47	
K	.276	.286	7.01	7.26	
M	.465	.515	11.81	13.08	
R	----	.850	----	21.59	Dia.
T	1.426	----	36.22	----	
AA	.427	.437	10.84	11.09	
BB	----	----	----	----	3
CC	.407	----	10.33	----	

Note 1: Standard Polarity: Stud is cathode
3/8-24 UNF-2A Reverse Polarity: Stud is anode
Note 2:
Full threads within 2 1/2 threads
Note 3:
¼-28 UNF-2A



Top Stud



DO-205AA (DO-8)

Catalog Number		JEDEC Numbers	Peak Reverse Voltage
Standard	Reverse		
S4210	R4210	1N412B, 1N1397, 1N2427, 1N2437, 1N3140, 1N3288, 1N4878	100
S4220	R4220	1N413B, 1N1399,1N2429, 1N2439, 1N3142, 1N3289, 1N3972	200
S4230	R4230	1N1400, 1N2431, 1N2441, 1N3290	300
S4240	R4240	1N1401, 1N2433, 1N2443, 1NH3921, 1N3973	400
S4250	R4250	1N1402, 1N2434, 1N2444, 1N3292	500
S4260	R4260	1N1403, 1N2435, 1N2445, 1N3293, 1N3974	600
S4280	R4280	1N3294, 1N3975	800
S42100	R42100	1N3295	1000
S42120	R42120	1N3296	1200

Note: All Series 42 Rectifiers are available with either a lead terminal or top stud terminal. When ordering a top stud device, add the suffix "TS" to the catalog number.

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	100V to 1200V	
Maximum peak reverse current	I_{RRM}	5.0mA	$T_C = 150°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	125 Amps	Single phase, half-wave rating at $T_C = 130°C$
Maximum surge current	I_{FSM}	1800 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.2V max.	$I_F = 200A$; $T_C = 25°C$
Maximum I^2t	I^2t	13500 A^2S	less than 8.33 ms
Maximum recommended operating frequency		7.5kHz	
Thermal values			
Storage temp range	T_{stg}	$-60°C$ to $+200°C$	
Operating junction temp range	T_J	$-65°C$ to $+190°C$	
Maximum thermal resistance junction to case	$R\Theta_{JC}$	0.4°C/W	

Mechanical Characteristics	
Base	High strength copper stud and base with a 3/8-24 UNF-2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 2.75 ounce (78 grams)
Mounting Position	May be mounted in any position
Mounting Torque	125 inch pounds maximum
Dimensions	In accordance with JEDEC DO-205AA (DO8) outline or Top Stud

Figure 1
Maximum load current versus case temperature

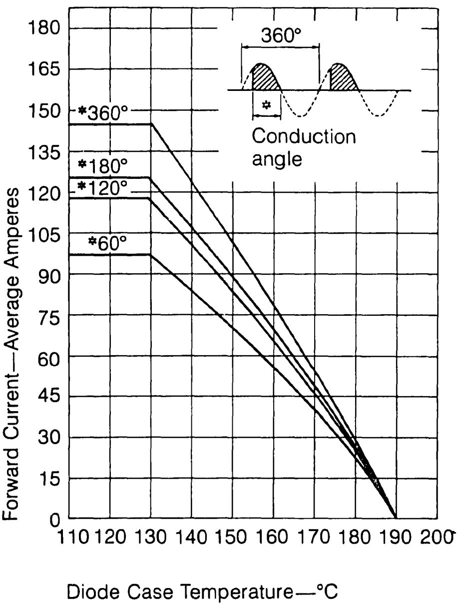


Figure 2
Maximum power dissipation versus forward current

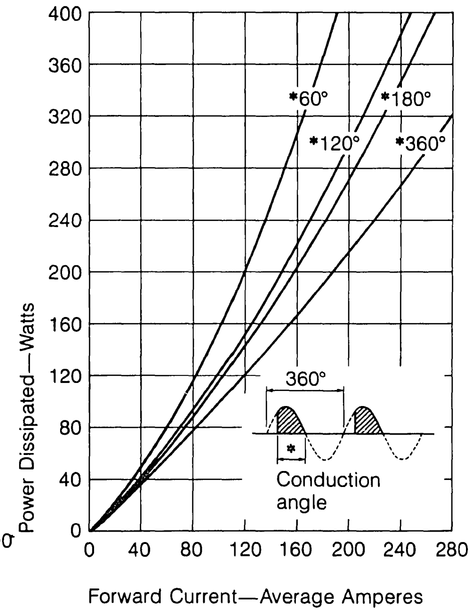


Figure 3
Maximum forward characteristics

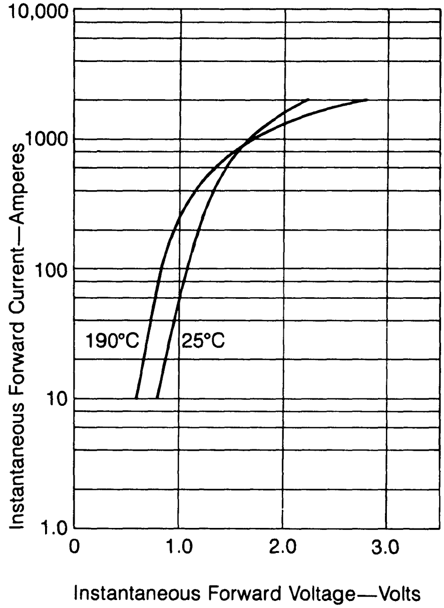


Figure 4
Transient thermal impedance

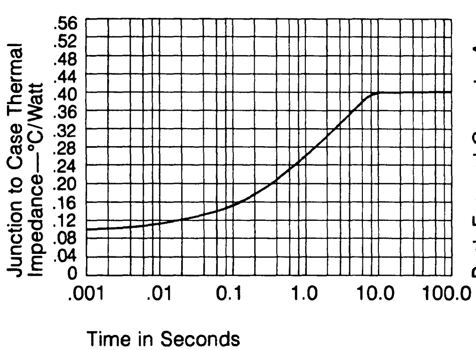
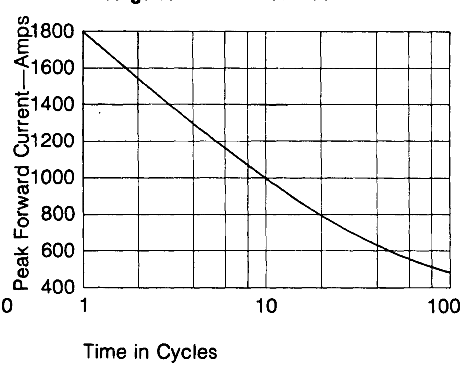


Figure 5
Maximum surge current at rated load

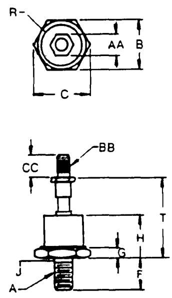


Silicon Power Rectifiers

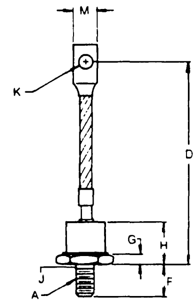
150 AMP Avg; V_{RRM} up to 1200 Volts

Series 43

- Glass to metal construction
- Available in two types of lead configurations
- Highest current DO-8 available
- Low thermal resistance
- High surge current capability
- Excellent reliability



Top Stud



DO-205AA (DO-8)

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	1.050	1.060	26.67	26.92	
C	----	1.166	----	29.61	
D	4.3	4.7	109.22	119.38	
F	.610	.640	15.49	16.25	
G	.213	.233	5.41	5.66	
H	----	.745	----	18.92	
J	.344	.373	8.74	9.47	
K	.276	.286	7.01	7.26	
M	.465	.515	11.81	13.08	
R	----	.850	----	21.59	Dia.
T	1.426	----	36.22	----	
AA	.427	.437	10.84	11.09	
BB	----	----	----	----	3
CC	.407	----	10.33	----	

Note 1: Standard Polarity: Stud is cathode
3/8-24 UNF-2A Reverse Polarity: Stud is anode
Note 2:
Full threads within 2 1/2 threads
Note 3:
¼-28 UNF-2A

Catalog Number		JEDEC Numbers	Peak Reverse Voltage
Standard	**Reverse**		
S4310	R4310	1N412B, 1N3288A,	100
S4320	R4320	1N3289A,	200
S4330	R4330	1N3290A,	300
S4340	R4340	1N3291A,	400
S4350	R4350	1N3292A,	500
S4360	R4360	1N3293A,	600
S4380	R4380	1N3294A,	800
S43100	R34100	1N3295A,	1000
S43120	R43120	1N3296A,	1200

Note: All Series 42 Rectifiers are available with either a lead terminal or top stud terminal. When ordering a top stud device, add the suffix "TS" to the catalog number.

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	100V to 1200V	
Maximum peak reverse current	I_{RRM}	5.0mA	$T_C = 150\,°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	150 Amps	Single phase, half-wave rating at $T_C = 125\,°C$
Maximum surge current	I_{FSM}	2500 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.1V max.	$I_F = 200A$; $T_C = 25\,°C$
Maximum I^2t	I^2t	26000 A^2S	less than 8.33 ms
Maximum recommended operating frequency		7.5kHz	
Thermal values			
Storage temp range	T_{stg}	$-65\,°C$ to $+200\,°C$	
Operating junction temp range	T_J	$-65\,°C$ to $+190\,°C$	
Maximum thermal resistance junction to case	$R\Theta_{JC}$	0.35 °C/W	

Mechanical Characteristics	
Base	High strength copper stud and base with a 3/8-24 UNF-2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 2.75 ounce (78 grams)
Mounting Position	May be mounted in any position
Mounting Torque	125 inch pounds maximum
Dimensions	In accordance with JEDEC DO-205AA (DO8) outline or Top Stud

Figure 1
Maximum load current versus case temperature

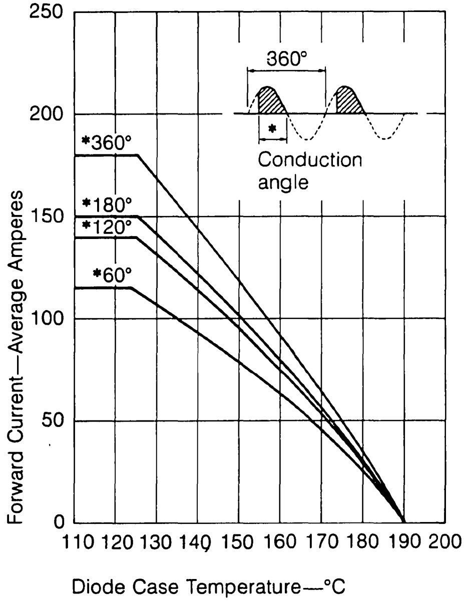


Figure 2
Maximum power dissipation versus forward current

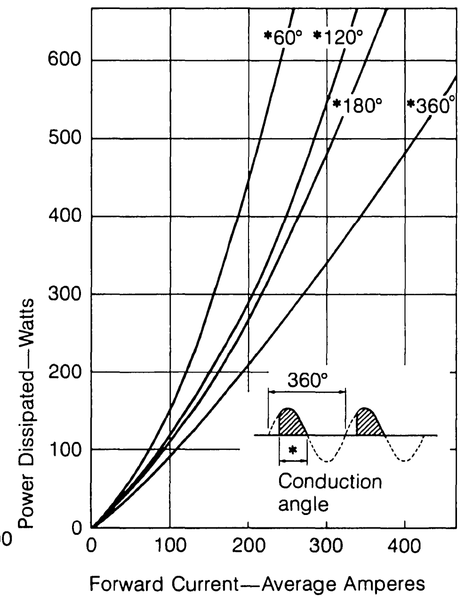


Figure 3
Maximum forward characteristics

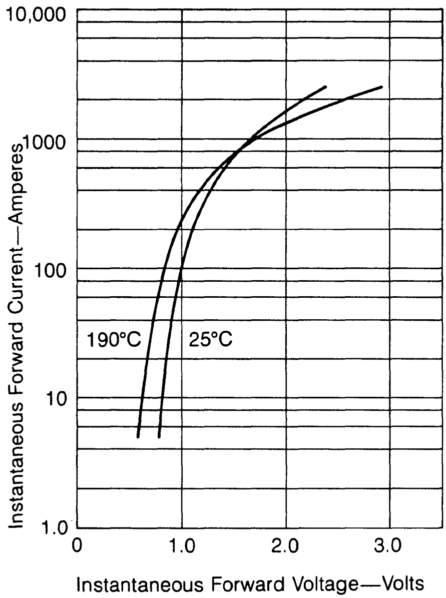


Figure 4
Transient thermal impedance

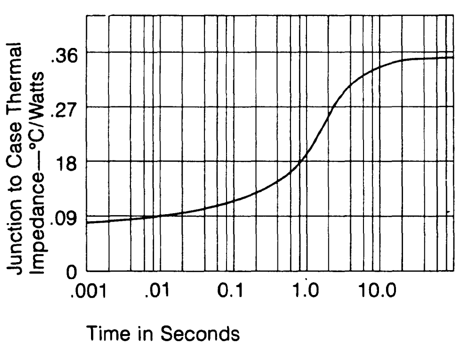
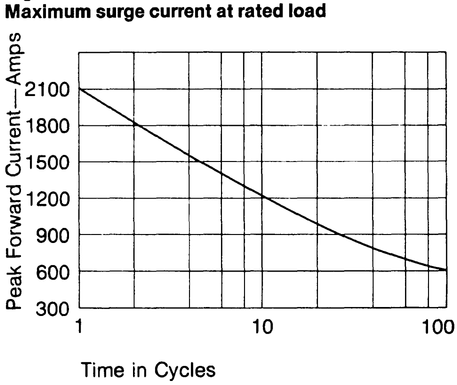


Figure 5
Maximum surge current at rated load

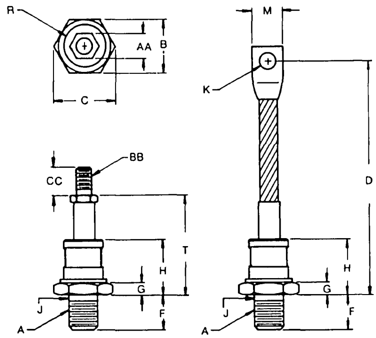


Silicon Power Rectifiers

Series 53

250 AMP Avg; V_{RRM} up to 1200 Volts

- Ceramic header with top stud or flex lead
- High surge current capability
- Excellent reliability



Top Stud

DO-205AB (DO-9)

Dim.	Inches Minimum	Inches Maximum	Millimeter Minimum	Millimeter Maximum	Notes
A	----	----	----	----	1
B	1.237	1.243	31.41	31.57	
C	----	1.360	----	34.54	
D	5.00	6.00	127.00	152.40	
F	.797	.827	20.24	21.00	
G	.302	.322	7.67	8.17	
H	----	1.377	----	34.97	
J	.660	.749	16.77	19.02	2
K	.338	.348	8.58	8.83	
M	.665	.755	16.89	19.17	
R	----	1.020	----	259.08	
T	2.419	----	61.44	----	
AA	.552	.562	14.02	14.27	
BB	----	----	----	----	3
CC	.605	----	15.36	----	

Note 1: Standard Polarity: Stud is cathode
3/4-16 UNF-2A Reverse Polarity: Stud is anode
Note 2:
Full threads within 2 1/2 threads
Note 3:
3/8-24 UNF-2A

NOTE:
All Series 53 Rectifiers are available with either a lead terminal or top stud terminal. When ordering a top stud device, add the suffix "TS" to the catalog number.

Catalog Number Standard	Catalog Number Reverse	JEDEC Numbers	Peak Reverse Voltage
S5380	R5380	1N2066, 1N3172, 1N3172A, 1N3741, 1N3979	800
S53100	R53100	1N2068, 1N3174, 1N31744, 1N3742	1000
S53120	R53120	1N3743	1200

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	800V to 1200V	
Maximum peak reverse current	I_{RRM}	10mA	$T_C = 150°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	250 Amps	Single phase, half-wave rating at $T_C = 122°C$
Maximum surge current	I_{FSM}	4500 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.2V max.	$I_F = 300A$; $T_C = 25°C$
Maximum I^2t	I^2t	84000 A^2S	less than 8.33 ms
Maximum recommended operating frequency		7.5kHz	
Thermal values			
Storage temp range	T_{stg}	$-65°C$ to $+200°C$	
Operating junction temp range	T_J	$-65°C$ to $+190°C$	
Maximum thermal resistance junction to case	$R\Theta_{JC}$	0.18°C/W	

Mechanical Characteristics	
Base	High strength copper stud and base with a 3/4-16 UNF-2A thread foı through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Ceramic header construction.
Weight	Approximately 8.5 ounce (240 grams)
Mounting Position	May be mounted in any position
Mounting Torque	300 inch pounds ±/- 25 inch pounds
Dimensions	In accordance with JEDEC DO-205AB (DO9) outline or Top Stud

Figure 1
Maximum load current versus case temperature

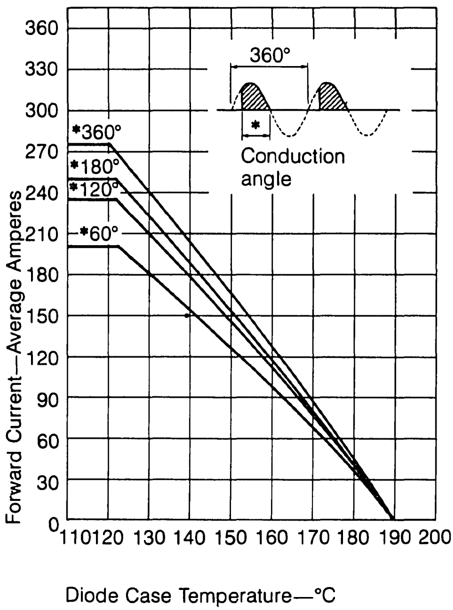


Figure 2
Maximum power dissipation versus forward current

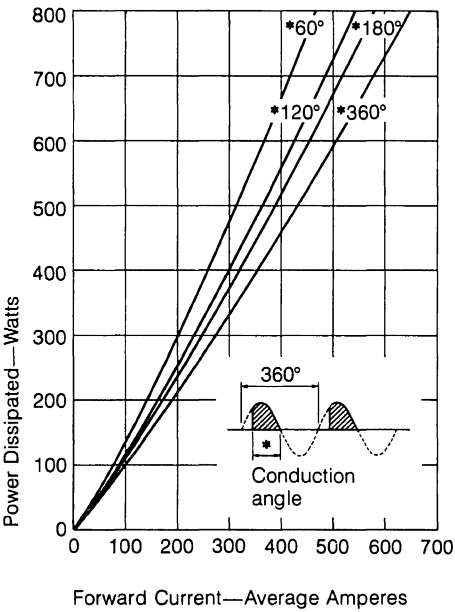


Figure 3
Maximum forward characteristics

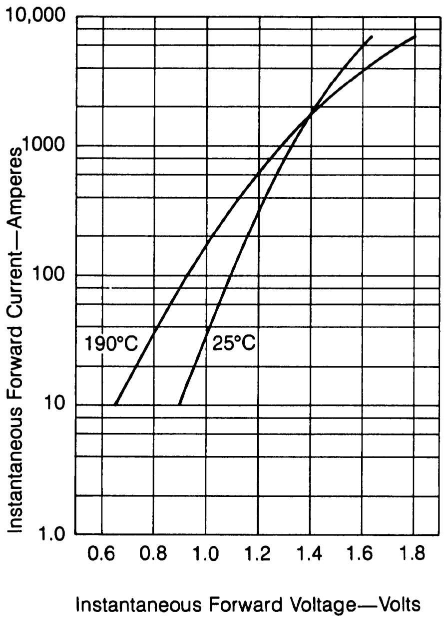


Figure 4
Transient thermal impedance

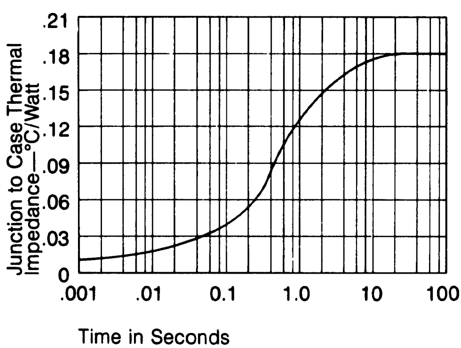
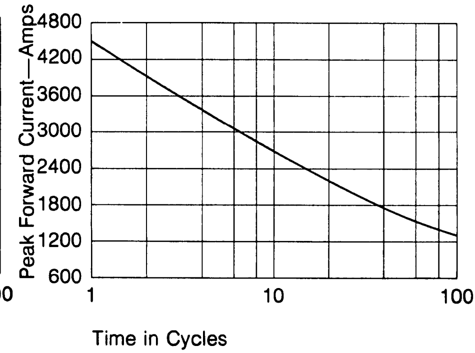


Figure 5
Maximum surge current at rated load

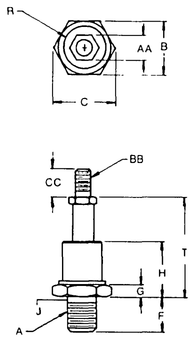


Silicon Power Rectifiers

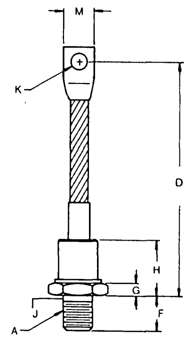
300 AMP Avg; V_{RRM} up to 600 Volts

Series 504

- Glass to metal header construction
- High surge current capability
- Two case styles available
- Soft recovery
- Rugged construction for industrial service
- Highest current DO-9 available



Top Stud



DO-205AB (DO-9)

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	1.237	2.243	31.41	56.97	
C	----	1.360	----	34.54	
D	4.948	5.242	125.67	133.14	
F	.797	.827	20.24	21.00	
G	.302	.322	7.67	8.17	
H	----	1.377	----	34.97	
J	.660	.749	16.77	19.02	2
K	.338	.348	8.58	8.83	
M	.665	.755	16.89	19.17	
R	----	1.020	----	259.08	
T	2.419	----	61.44	----	
AA	.552	.562	14.02	14.27	
BB	----	----	----	----	3
CC	.605	----	15.36	----	

Note 1: Standard Polarity: Stud is cathode
¾-16 UNF-2A Reverse Polarity: Stud is anode
Note 2:
Full threads within 2 1/2 threads
Note 3:
3/8-24 UNF-2A

Catalog Number		Peak Reverse Voltage
Standard	Reverse	
S50410	R50410	100
S50420	R50420	200
S50430	R50430	300
S50440	R50440	400
S50450	R50450	500
S50460	R50460	600

* All Series 504 Rectifiers are available with either a lead terminal or top stud terminal. When ordering a top stud device, add the suffix "TS" to the catalog number.

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	100V to 600V	
Maximum peak reverse current	I_{RRM}	10mA	$T_C = 150°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	300 Amps	Single phase, half-wave rating at $T_C = 132°C$
Maximum surge current	I_{FSM}	5000 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.45V max.	$I_F = 1500A$: $T_C = 25°C$
Maximum I^2t	I^2t	104000 A^2S	less than 8.33 ms
Maximum recommended operating frequency		7.5kHz	
Thermal values			
Storage temp range	T_{stg}	$-65°C$ to $+200°C$	
Operating junction temp range	T_J	$-65°C$ to $+190°C$	
Maximum thermal resistance junction to case	$R_{\Theta JC}$	0.18°C/W	

Mechanical Characteristics	
Base	High strength copper stud and base with a 3/4-16 UNF-2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 8.5 ounce (240 grams)
Mounting Position	May be mounted in any position
Mounting Torque	300 inch pounds ±/- 25 inch pounds
Dimensions	In accordance with JEDEC DO-205AB (DO9) outline or Top Stud

Figure 1
Maximum load current versus case temperature

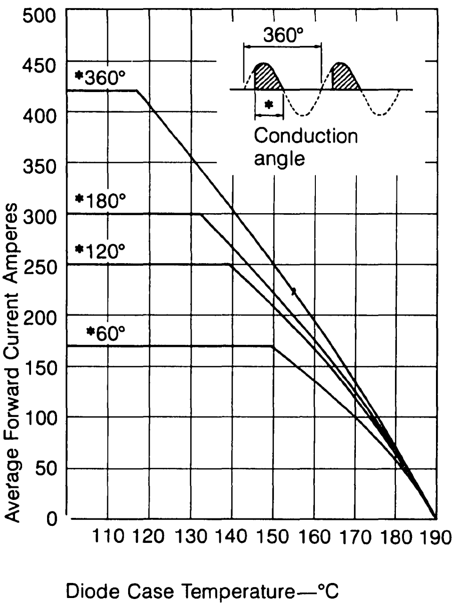


Figure 2
Maximum power dissipation versus forward current

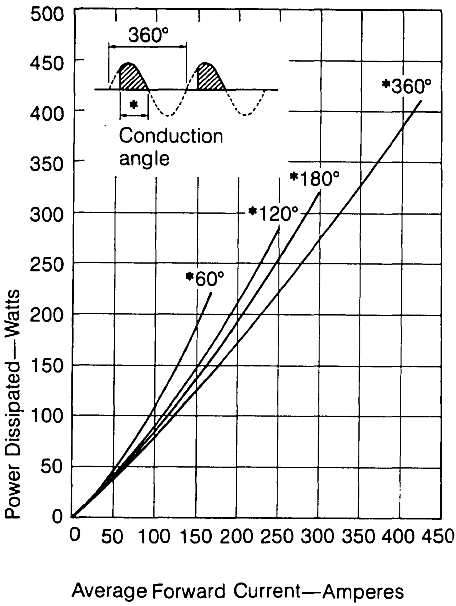


Figure 3
Maximum forward characteristics

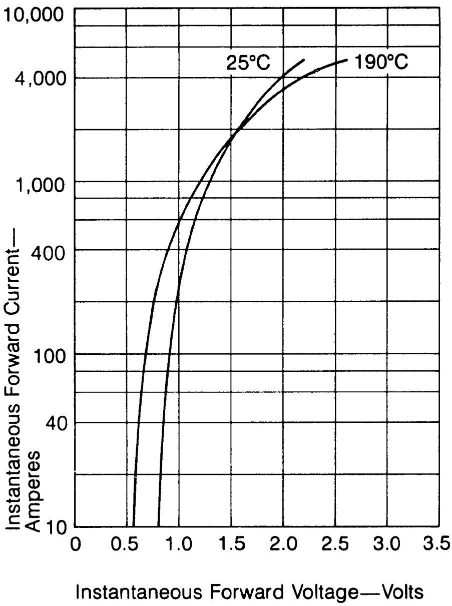


Figure 4
Transient thermal impedance

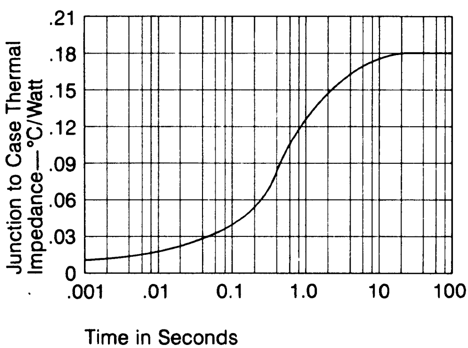
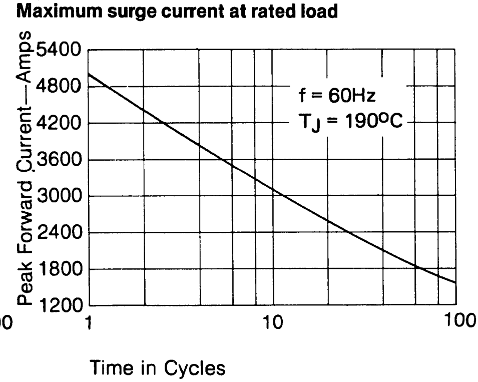


Figure 5
Maximum surge current at rated load



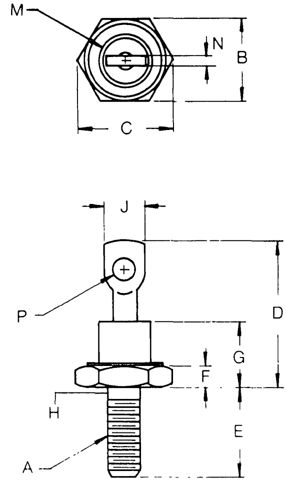
Rectifiers, Fast Recovery

Silicon Rectifiers/Fast Recovery

6 AMP Avg; V_{RRM} up to 400 Volts

Series 006
1N3879-1N3883

- 6 Amperes Average, $T_C = 100°C$
- 300 Nanoseconds Recovery Time at 20 Amperes
- 200 Nanoseconds Recovery Time at 1.0 Amperes
- Blocking Voltage to 400 Volts



DO-203AA (DO-4)

Dim.	Inches Minimum	Inches Maximum	Millimeter Minimum	Millimeter Maximum	Notes
A	----	----	----	----	1
B	.427	.437	10.84	11.09	
C	----	.505	----	12.82	
D	----	.800	----	20.32	
E	.432	.442	10.97	11.22	
F	.095	.105	2.41	2.66	
G	----	.386	----	9.80	
H	.163	.189	4.15	4.80	2
J	----	.250	----	6.35	
M	----	.280	----	7.11	
N	----	.050	----	1.27	
P	.088	.095	2.23	2.41	

Note 1: Standard polarity: Stud is cathode
No. 10-32 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads

Catalog Number Standard	Catalog Number Reverse	JEDEC Numbers*	Peak Reverse Voltage
S006AADF	R006AADF	1N3879	50
S00601DF	R00601DF	1N3880	100
S00602DF	R00602DF	1N3881	200
S00603DF	R00603DF	1N3882	300
S00604DF	R00604DF	1N3883	400

*To indicate reverse polarity, add suffix "R" to JEDEC number; Example: 1N3879R

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	50V to 400V	
Maximum peak reverse current	I_{RRM}	1.0mA	$T_C = 100\,°C$
		15μA	$T_C = 25\,°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	6.0 Amps	Single phase, half-wave rating at $T_C = 100\,°C$
Maximum surge current	I_{FSM}	75 Amps	One half cycle of 60 Hz sinewave
Maximum peak forward voltage	V_{FM}	1.4V max.	$I_{FM} = 19A$, $T_C = 25\,°C$
	V_{FM}	1.5V max.	$I_{FM} = 19A$, $T_C = 100\,°C$
Maximum I^2t	I^2t	23 A^2S	less than 8.33 ms
Reverse Recovery Values			
Maximum reverse recovery time	t_{rr}	200 ns	$I_{FM} = 1.0A$, $V_R = 30V$ (see figure 7)
Maximum reverse recovery time	t_{rr}	300 ns	$I_{FM} = 20A$, di/dt = 25A/μs $t_p \geq 2\,\mu s$, $I_{RM}(REC) = 4.0A$ (see figure 8)
Thermal values			
Storage temp range	T_{stg}	$-65\,°C$ to $+175\,°C$	
Operating junction temp range	T_J	$-65\,°C$ to $+150\,°C$	
Maximum thermal resistance junction to case	$R_{\Theta JC}$	3.0°C/W	

Mechanical Characteristics

Base	Steel stud and base with a 10-32 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.16 ounce (4.5 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AA (DO4) outline

Figure 1
Maximum case temperature

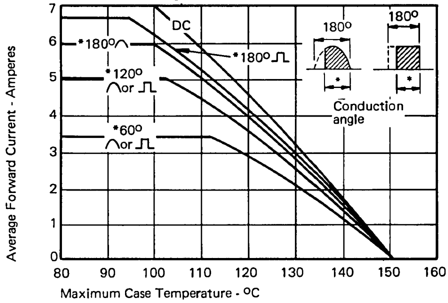


Figure 2
Maximum forward on-state characteristics

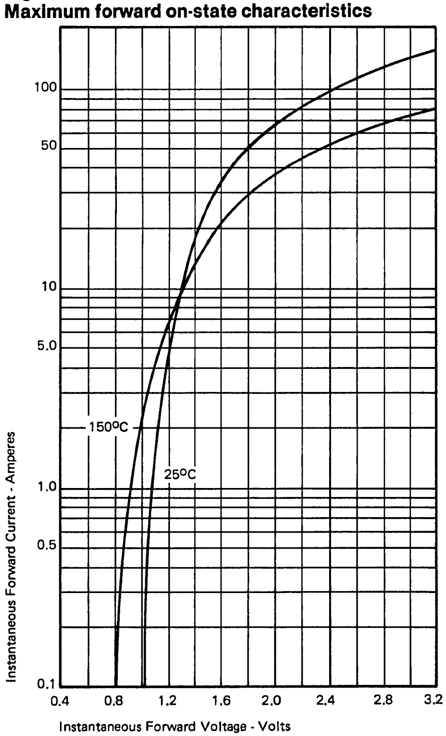


Figure 3
Maximum power dissipation

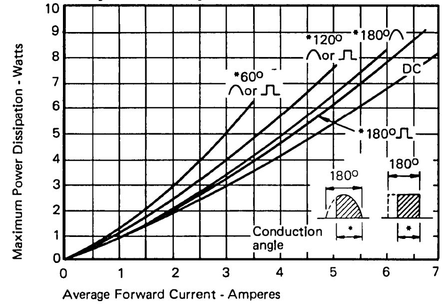


Figure 4
Maximum nonrepetitive surge current at rated load conditions

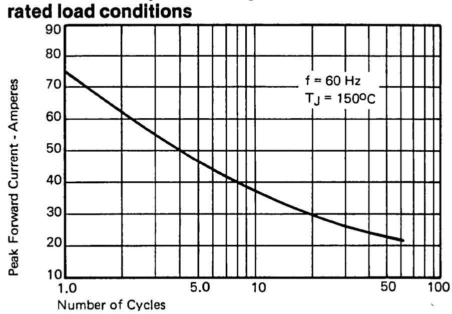


Figure 5
Maximum transient thermal impedance

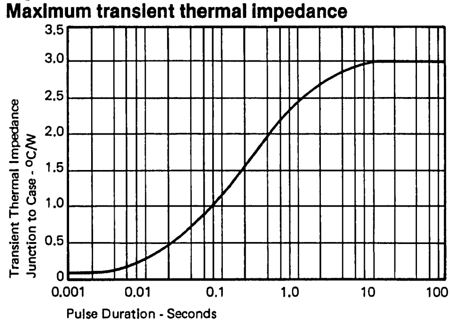


Figure 6
Reverse recovery time

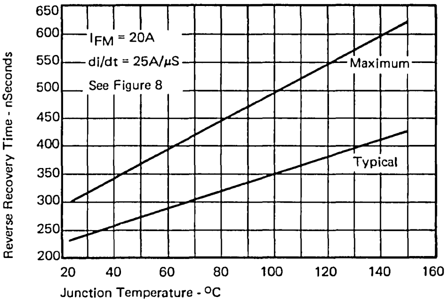


Figure 9
Typical recovered charge at $T_J = 25°C$

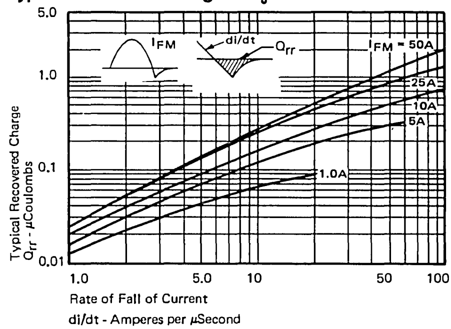


Figure 7
Former JEDEC reverse recovery circuit

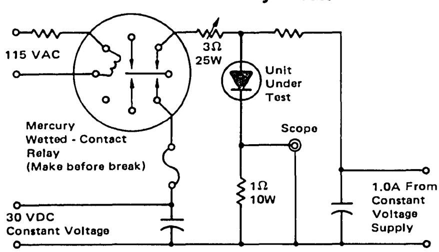


Figure 10
Typical recovered charge at $T_J = 100°C$

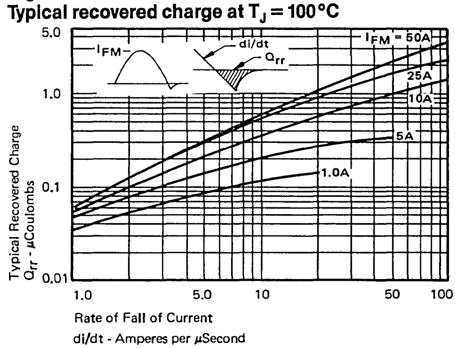


Figure 8
JEDEC Reverse recovery circuit

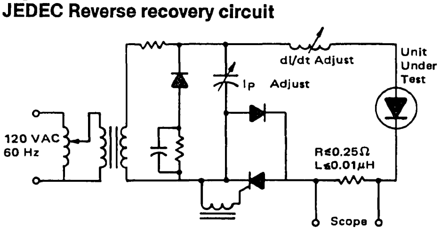


Figure 11
Typical recovered charge at $T_J = 150°C$

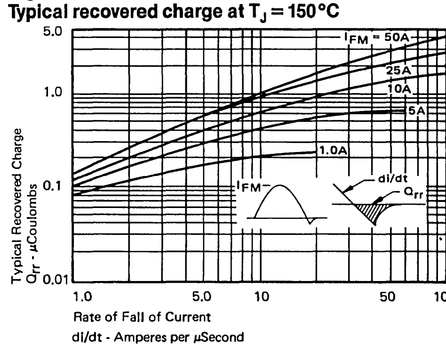
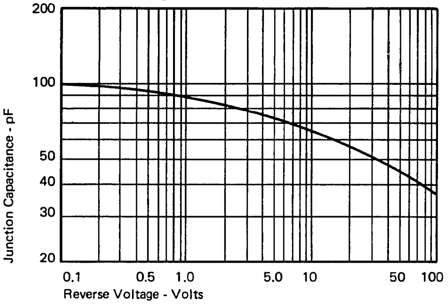


Figure 12
Typical junction capacitance



Reverse current

Figure 13
Effects of temperature

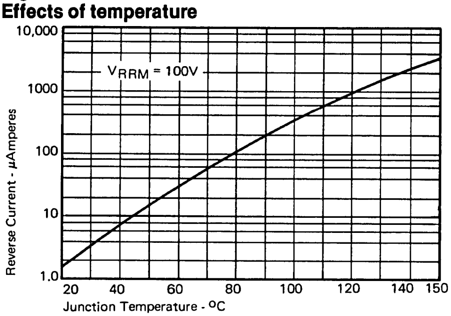
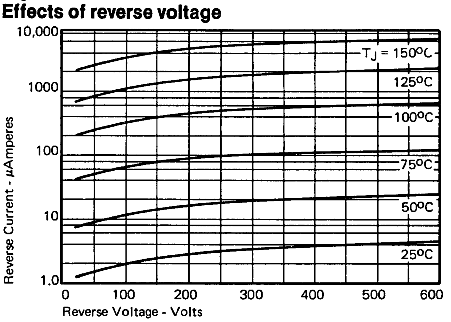


Figure 14
Effects of reverse voltage

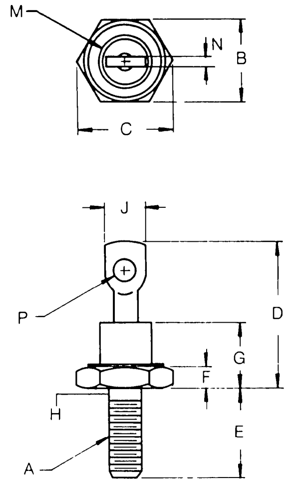


Silicon Rectifiers/Fast Recovery

12 AMP Avg; V_{RRM} up to 400 Volts

Series 012
1N3889-1N3893

- 12 Amperes Average, $T_C = 100\,°C$
- 200 Nanoseconds Recovery Time at 1.0 Amperes
- Blocking Voltage to 400 Volts



DO-203AA
(DO-4)

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	.427	.437	10.84	11.09	
C	----	.505	----	12.82	
D	----	.800	----	20.32	
E	.432	.442	10.97	11.22	
F	.095	.105	2.41	2.66	
G	----	.386	----	9.80	
H	.163	.189	4.15	4.80	2
J	----	.250	----	6.35	
M	----	.280	----	7.11	
N	----	.050	----	1.27	
P	.088	.095	2.23	2.41	

Note 1: Standard polarity: Stud is cathode
No. 10-32 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads

Catalog Number Polarity		JEDEC Numbers*	Peak Reverse Voltage
Standard	Reverse		
S012AADF	R012AADF	1N3889	50
S01201DF	R01201DF	1N3890	100
S01202DF	R01202DF	1N3891	200
S01203DF	R01203DF	1N3892	300
S01204DF	R01204DF	1N3893	400

*To indicate reverse polarity,
add suffix "R" to JEDEC number;
Example: 1N3879R

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	50V to 400V	
Maximum peak reverse current	I_{RRM}	3.0mA	$T_C = 100\,°C$
		25μA	$T_C = 25\,°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	12 Amps	Single phase, half-wave rating at $T_C = 100\,°C$
Maximum surge current	I_{FSM}	150 Amps	One half cycle of 60 Hz sinewave
Maximum peak forward voltage	V_{FM}	1.4V max.	$I_{FM} = 38A$, $T_C = 25\,°C$
	V_{FM}	1.5V max.	$I_{FM} = 38A$, $T_C = 100\,°C$
Maximum I^2t	I^2t	93 A^2S	less than 8.33 ms
Reverse Recovery Values			
Maximum reverse recovery time	t_{rr}	200 ns	$I_{FM} = 1.0A$, $V_R = 30V$ (see figure 7)
Maximum reverse recovery time	t_{rr}	300 ns	$I_{FM} = 40A$, $di/dt = 25A/\mu s$ $t_p \geq 4\,\mu s$, $I_{RM}(REC) = 5.0A$ (see figure 8)
Thermal values			
Storage temp range	T_{stg}	$-65\,°C$ to $+175\,°C$	
Operating junction temp range	T_J	$-65\,°C$ to $+150\,°C$	
Maximum thermal resistance junction to case	$R_{\Theta JC}$	3.0 °C/W	

Mechanical Characteristics

Base	Steel stud and base with a 10-32 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.16 ounce (4.5 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AA (DO4) outline

Figure 1
Maximum case temperature

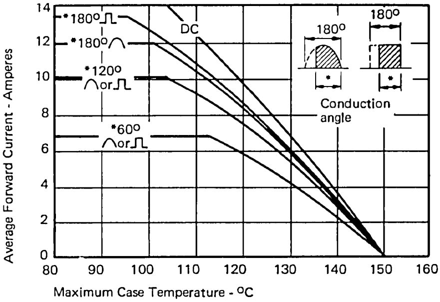


Figure 3
Maximum power dissipation

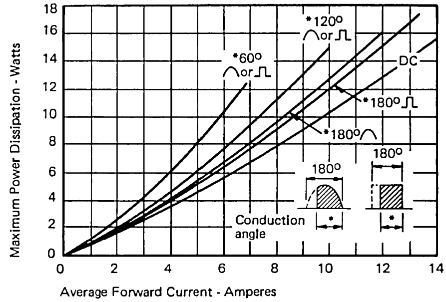


Figure 2
Maximum forward on-state characteristics

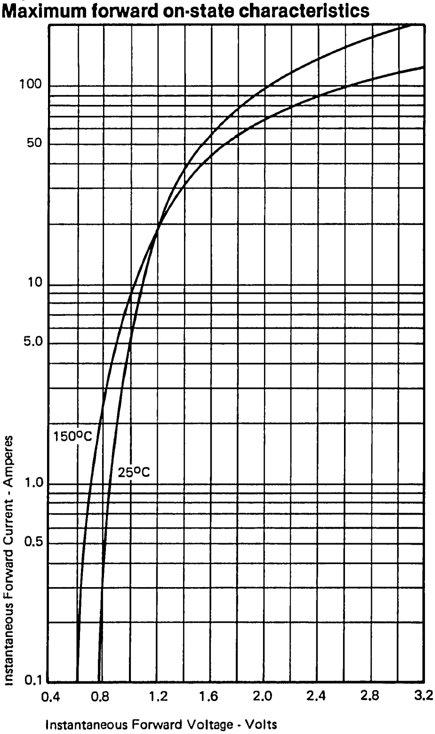


Figure 4
Maximum nonrepetitive surge current at rated load conditions

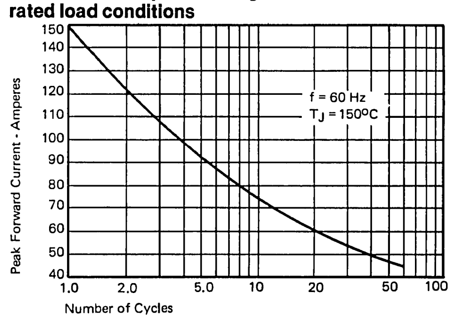


Figure 5
Maximum transient thermal impedance

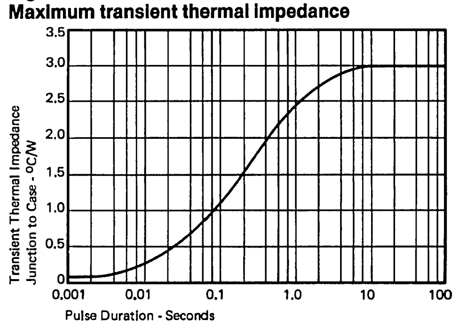


Figure 6
Reverse recovery time

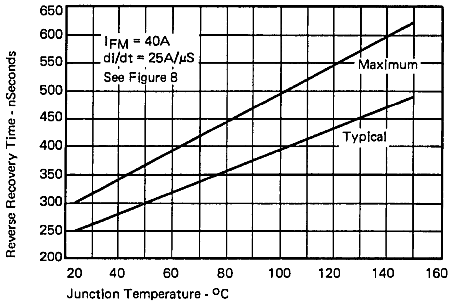


Figure 9
Typical recovered charge at $T_J = 25°C$

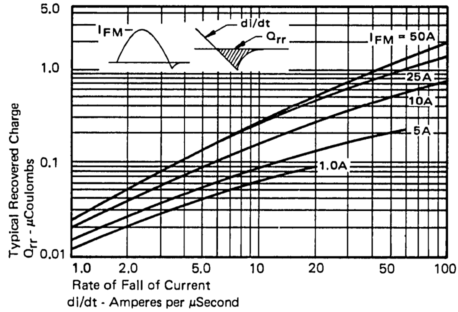


Figure 7
Former JEDEC reverse recovery circuit

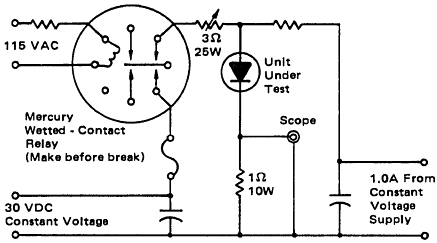


Figure 10
Typical recovered charge at $T_J = 100°C$

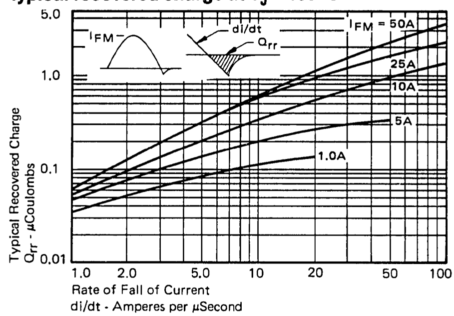


Figure 8
JEDEC Reverse recovery circuit

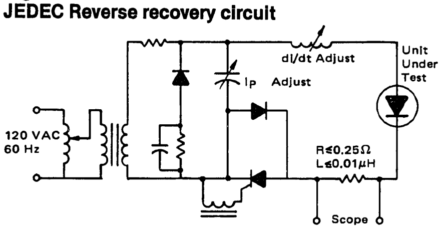


Figure 11
Typical recovered charge at $T_J = 150°C$

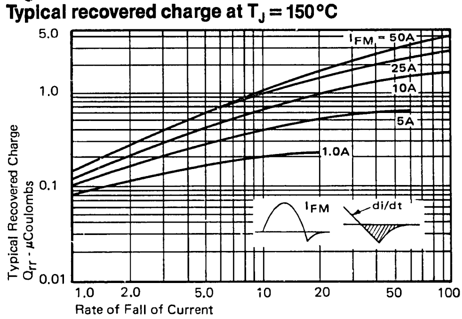
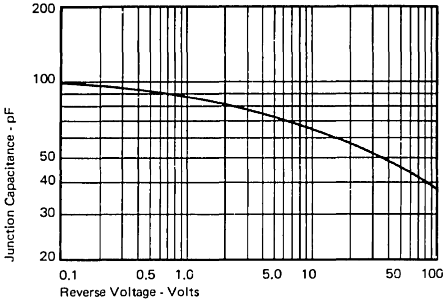


Figure 12
Typical junction capacitance



Typical Reverse current

Figure 13
Effects of temperature

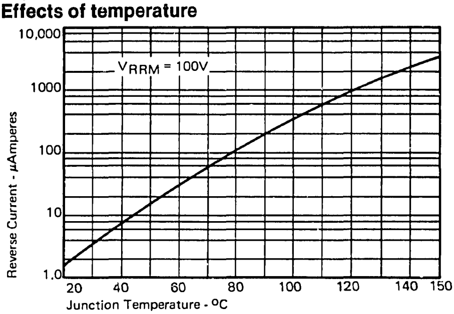
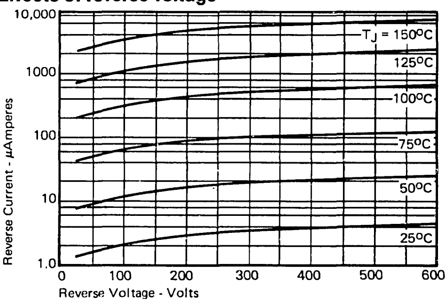


Figure 14
Effects of reverse voltage

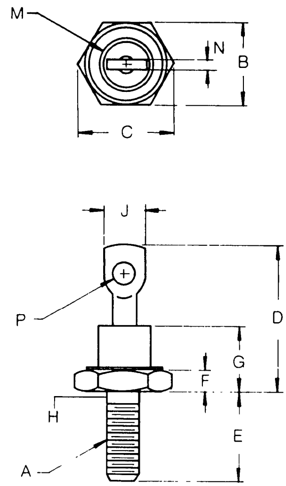


Silicon Rectifiers/Fast Recovery

Series 016

15 AMP Avg; V_{RRM} up to 300 Volts

- 15 Amperes Average, $T_C = 100\,°C$
- 225 Nanoseconds Recovery Time at 50 Amperes
- 100 Nanoseconds Recovery Time at 1.0 Amperes
- Blocking Voltage to 300 Volts



DO-203AA (DO-4)

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	.427	.437	10.84	11.09	
C	----	.505	----	12.82	
D	----	.800	----	20.32	
E	.432	.442	10.97	11.22	
F	.095	.105	2.41	2.66	
G	----	.386	----	9.80	
H	.163	.189	4.15	4.80	2
J	----	.250	----	6.35	
M	----	.280	----	7.11	
N	----	.050	----	1.27	
P	.088	.095	2.23	2.41	

Note 1: Standard polarity: Stud is cathode
No. 10-32 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads

Catalog Number		Peak Reverse Voltage
Standard	Reverse	
S016AADF	R016AADF	50
S01601DF	R01601DF	100
S01602DF	R01602DF	200
S01603DF	R01603DF	300

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	50V to 300V	
Maximum peak reverse current	I_{RRM}	5.0mA	$T_C = 150\,°C$
		15μA	$T_C = 25\,°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	15 Amps	Single phase, half-wave rating at $T_C = 100\,°C$
Maximum surge current	I_{FSM}	250 Amps	One half cycle of 60 Hz sinewave
Maximum peak forward voltage	V_{FM}	1.15V max.	$I_{FM} = 30A$, $T_C = 25\,°C$
Maximum I^2t	I^2t	260 A^2S	less than 8.33 ms
Reverse Recovery Values			
Maximum reverse recovery time	t_{rr}	100 ns	$I_{FM} = 1.0A$, $V_R = 30V$ (see figure 7)
Maximum reverse recovery time	t_{rr}	225 ns	$I_{FM} = 50A$, di/dt $= 25A/\mu s$ $t_p \geq 6.3\mu s$, $I_{RM(REC)} = 6.0A$ (see figure 8)
Thermal values			
Storage temp range	T_{stg}	$-65\,°C$ to $+175\,°C$	
Operating junction temp range	T_J	$-65\,°C$ to $+150\,°C$	
Maximum thermal resistance junction to case	$R\Theta_{JC}$	3.2°C/W	

Mechanical Characteristics

Base	Steel stud and base with a 10-32 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.16 ounce (4.5 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AA (DO4) outline

Figure 1
Maximum case temperature

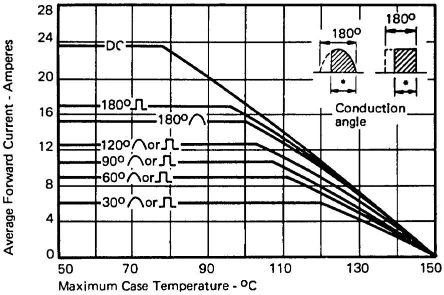


Figure 3
Maximum power dissipation

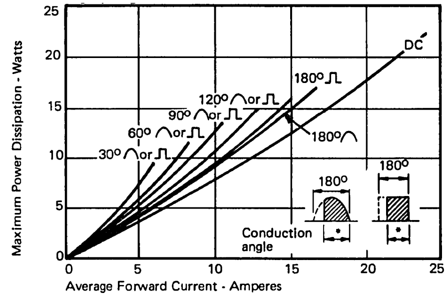


Figure 2
Maximum forward characteristics

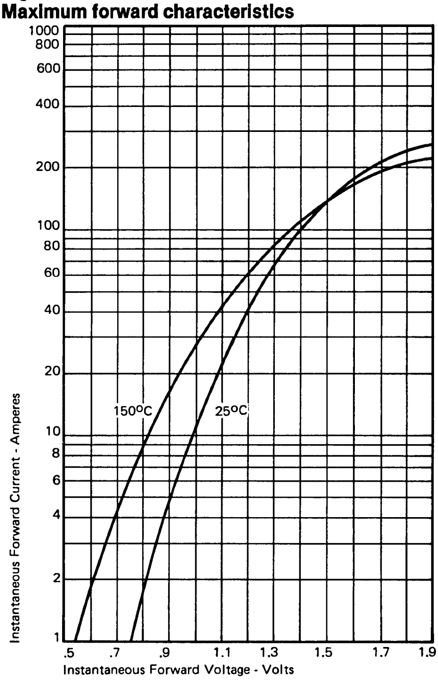


Figure 4
Maximum nonrepetitive surge current at rated load conditions

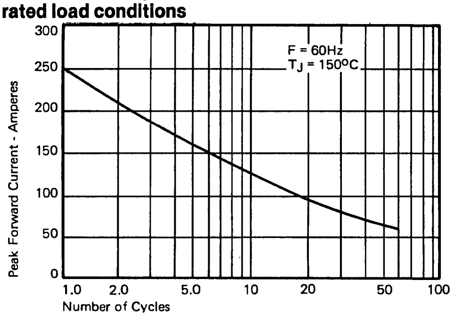


Figure 5
Maximum transient thermal impedance

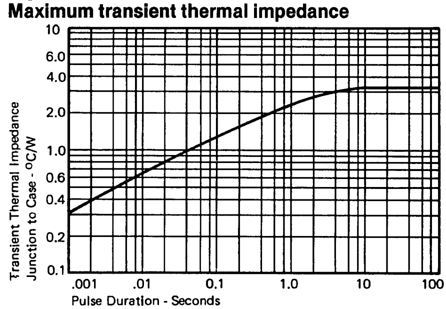


Figure 6
Reverse recovery time

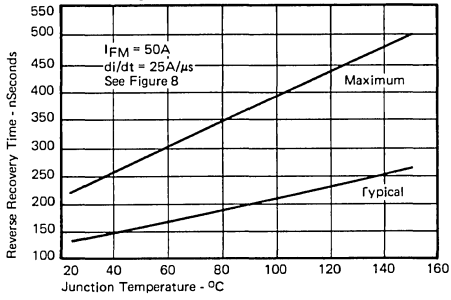


Figure 9
Typical recovered charge at $T_J = 25°C$

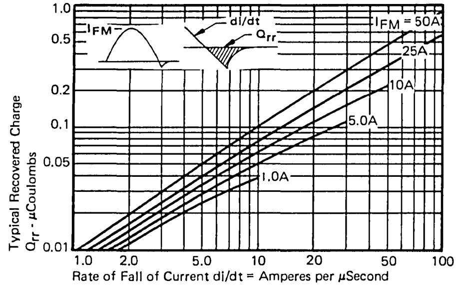


Figure 7
Former JEDEC reverse recovery circuit

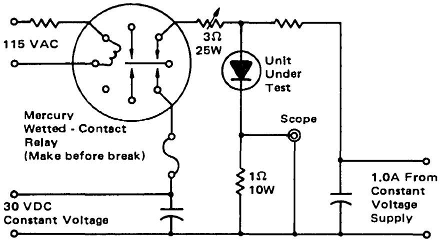


Figure 10
Typical recovered charge at $T_J = 100°C$

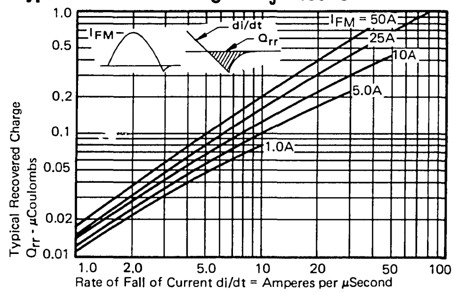


Figure 8
JEDEC Reverse recovery circuit

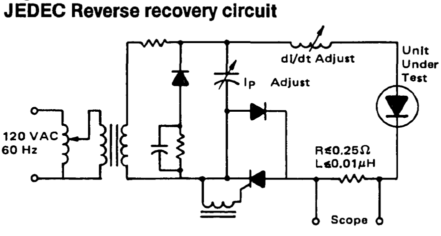


Figure 11
Typical recovered charge at $T_J = 150°C$

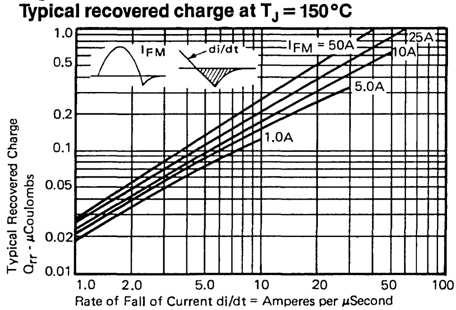
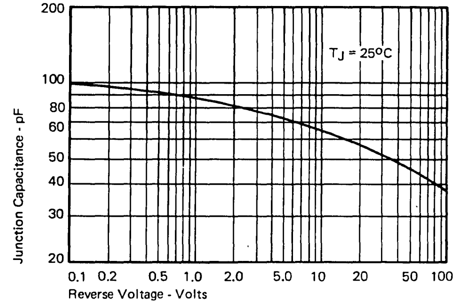


Figure 12
Typical junction capacitance



Typical Reverse current

Figure 13
Effects of temperature

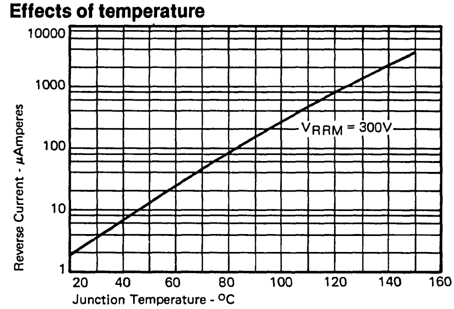
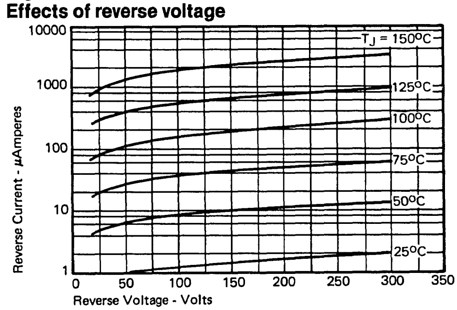


Figure 14
Effects of reverse voltage



Silicon Rectifiers/Fast Recovery

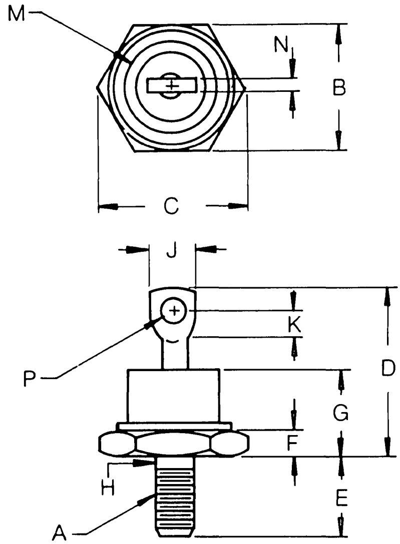
1N3899-1N3903

20 AMP Avg; V_{RRM} up to 400 Volts

- 20 Amperes Average, $T_C = 100\,°C$
- 200 Nanoseconds Recovery Time at 1.0 Amperes
- Blocking Voltage to 400 Volts

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.427	.447	10.84	11.35	
F	.125	.142	3.17	3.60	
G	----	.450	----	11.43	
H	.220	.249	5.59	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.97	----	
M	----	.590	----	14.98	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.55	4.44	Dia

Note 1: Standard polarity: Stud is cathode
¼-28 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads



DO-203AB
(DO-5)

JEDEC Numbers*	Peak Reverse Voltage
1N3899	50
1N3900	100
1N3901	200
1N3902	300
1N3903	400

*To indicate reverse polarity, add suffix "R" to JEDEC number; Example: 1N3899R

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	50V to 600V	
Maximum peak reverse current	I_{RRM}	6.0mA	$T_C = 150°C$
		50μA	$T_C = 25°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	20 Amps	Single phase, half-wave DC rating at $T_C = 100°C$
Maximum surge current	I_{FSM}	225 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.4V max.	$I_{FM} = 63A$, $T_C = 25°C$
Maximum I^2t	I^2t	260 A^2S	greater than 5.0 ms
Reverse Recovery Values			
Maximum reverse recovery time	t_{rr}	200 ns	$I_{FM} = 1.0A$, $V_R = 30V$ (see figure 7)
Maximum reverse recovery time	t_{rr}	350 ns	$I_{FM} = 65A$, di/dt $= 25A/\mu s$ $t_p \geq 6.5\mu s$, $I_{RM(REC)} = 9.0A$ (see figure 8)
Thermal values			
Storage temp range	T_{stg}	$-65°C$ to $+175°C$	
Operating junction temp range	T_J	$-65°C$ to $+150°C$	
Maximum thermal resistance junction to case	$R_{\Theta JC}$	1.8°C/W	

Mechanical Characteristics	
Base	Steel stud and base with a 10-32 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.5 ounce (14 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO-5) outline

Figure 1
Maximum case temperature

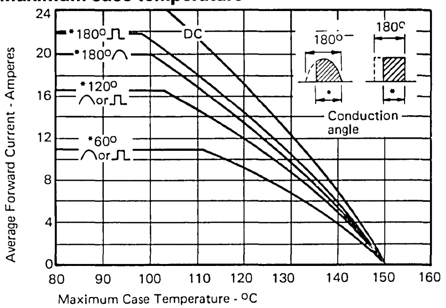


Figure 2
Maximum forward characteristics

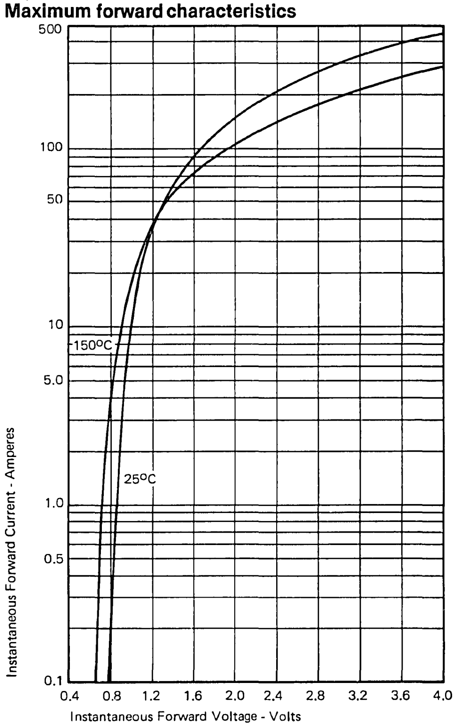


Figure 3
Maximum power dissipation

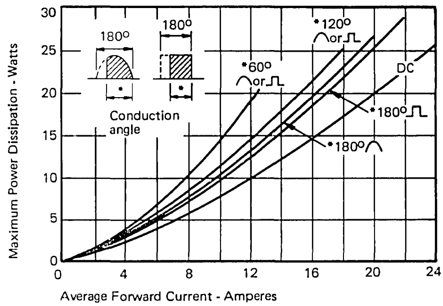


Figure 4
Maximum nonrepetitive surge current at rated load conditions

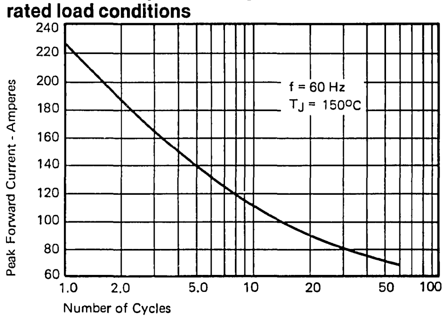


Figure 5
Maximum transient thermal impedance

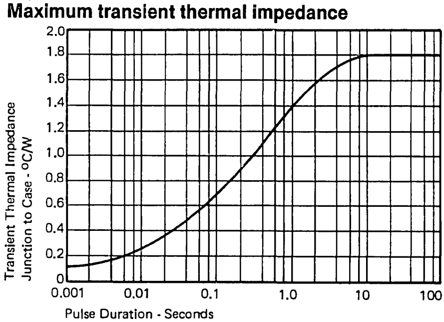


Figure 6
Reverse recovery time

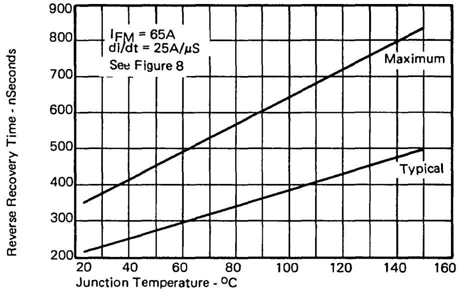


Figure 7
Former JEDEC reverse recovery circuit

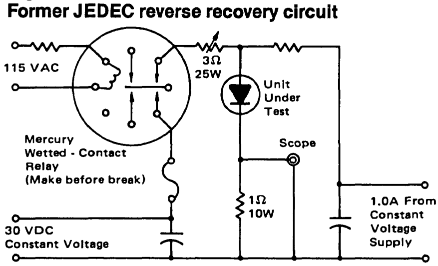


Figure 8
JEDEC Reverse recovery circuit

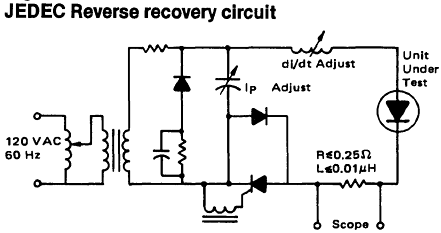


Figure 9
Typical recovered charge at $T_J = 25°C$

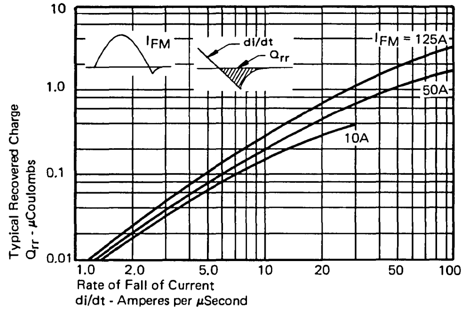


Figure 10
Typical recovered charge at $T_J = 100°C$

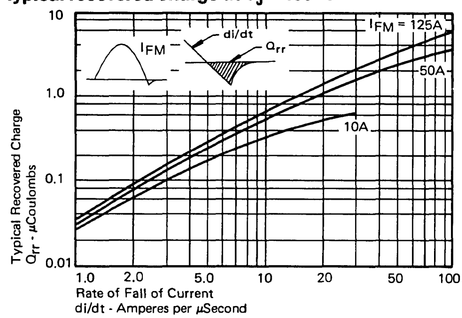


Figure 11
Typical recovered charge at $T_J = 150°C$

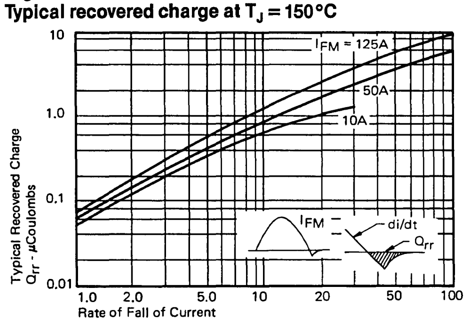
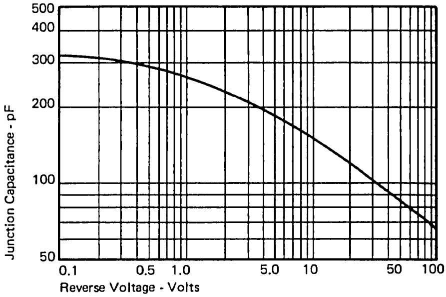


Figure 12
Typical junction capacitance



Typical Reverse current

Figure 13
Effects of temperature

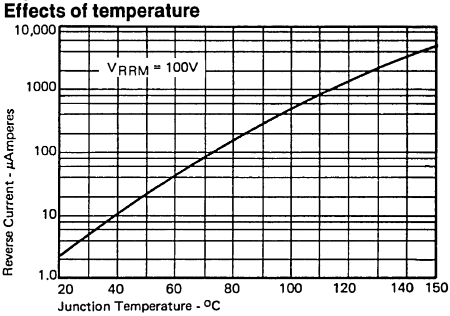
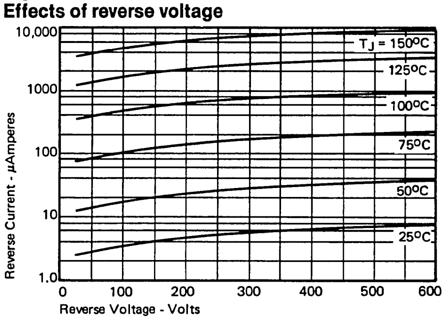


Figure 14
Effects of reverse voltage



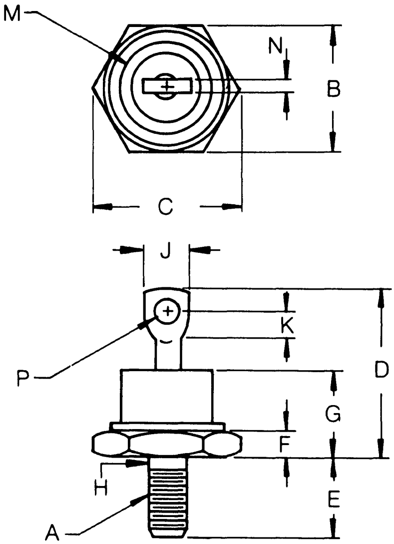
Silicon Rectifiers/Fast Recovery

30 AMP Avg; V_{RRM} up to 400 Volts

- 30 Amperes Average, $T_C = 100\,°C$
- 200 Nanoseconds Recovery Time at 1.0 Amperes
- Blocking Voltage to 400 Volts

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.427	.447	10.84	11.35	
F	.125	.142	3.17	3.60	
G	----	.450	----	11.43	
H	.220	.249	5.59	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.97	----	
M	----	.590	----	14.98	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.56	4.44	Dia

Note 1: Standard polarity: Stud is cathode
¼-28 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads



DO-203AB
(DO-5)

Catalog Number

JEDEC Numbers*	Peak Reverse Voltage
1N3909	50
1N3910	100
1N3911	200
1N3912	300
1N3913	400

*To indicate reverse polarity,
add suffix "R" to JEDEC number;
Example: 1N3909R

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	50V to 400V	
Maximum peak reverse current	I_{RRM}	10mA	$T_C = 150°C$
		80μA	$T_C = 25°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	30 Amps	Single phase, half-wave rating $T_C = 100°C$
Maximum surge current	I_{FSM}	300 Amps	One half cycle of 60 Hz sinewave
Maximum peak forward voltage	V_{FM}	1.4V max.	$I_{FM} = 93A$, $T_C = 25°C$
		1.5V max.	$I_{FM} = 93A$, $T_C = 100°C$
Maximum I^2t	I^2t	375 A^2S	less than 8.33 ms
Reverse Recovery Values			
Maximum reverse recovery time	t_{rr}	200 ns	$I_{FM} = 1.0A$, $V_R = 30V$ (see figure 7)
Maximum reverse recovery time	t_{rr}	350 ns	$I_{FM} = 100A$, $di/dt = 25A/\mu s$ $t_p \geq 10\mu s$, $I_{RM(REC)} = 9.0A$ (see figure 8)
Thermal values			
Storage temp range	T_{stg}	$-65°C$ to $+175°C$	
Operating junction temp range	T_J	$-65°C$ to $+150°C$	
Maximum thermal resistance junction to case	$R_{\Theta JC}$	1.2°C/W	

Mechanical Characteristics

Base	Steel stud and base with a 1/4-28 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.5 ounce (14 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO5) outline

Figure 1
Maximum case temperature

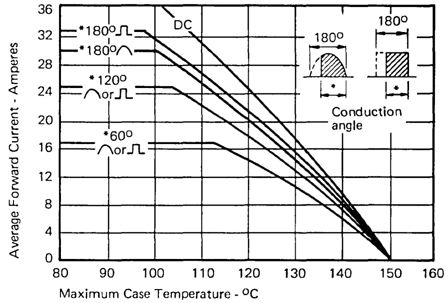


Figure 3
Maximum power dissipation

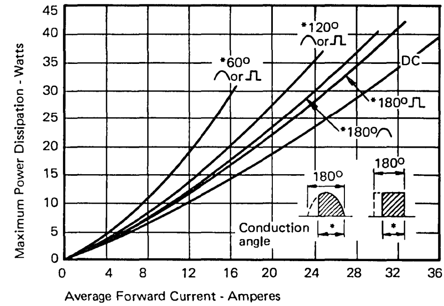


Figure 2
Maximum forward characteristics

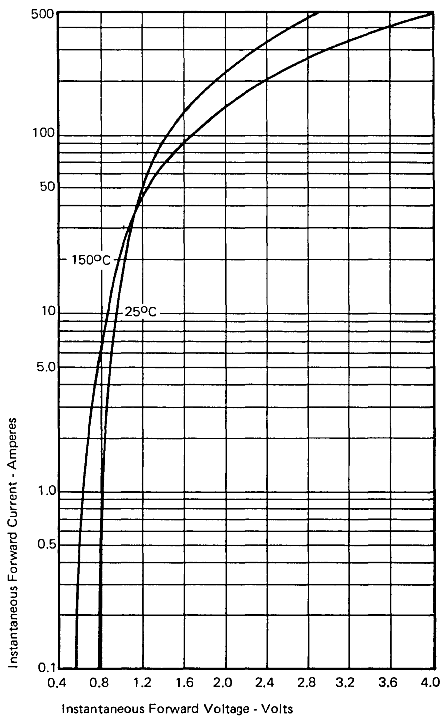


Figure 4
Maximum nonrepetitive surge current at rated load conditions

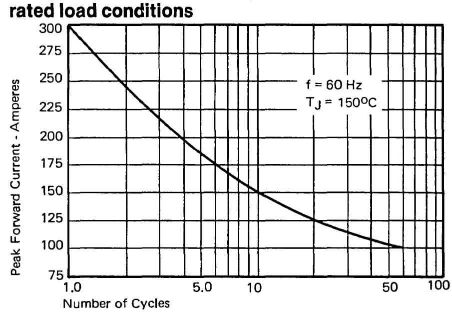


Figure 5
Maximum transient thermal impedance

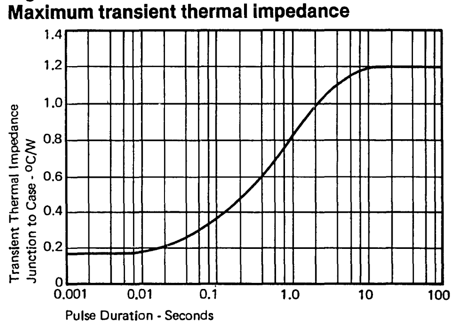


Figure 6
Reverse recovery time

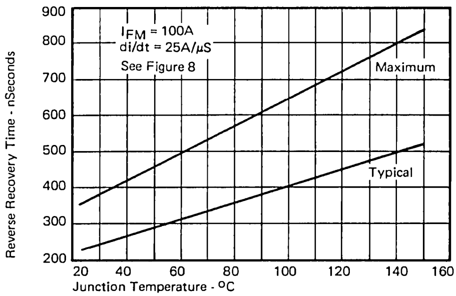


Figure 9
Typical recovered charge at $T_J = 25°C$

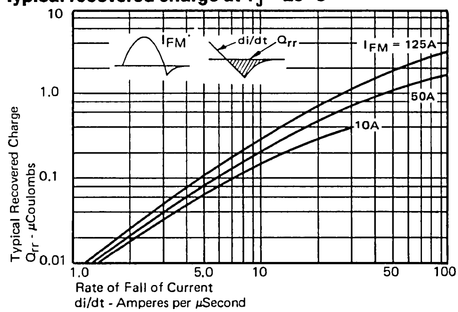


Figure 7
Former JEDEC reverse recovery circuit

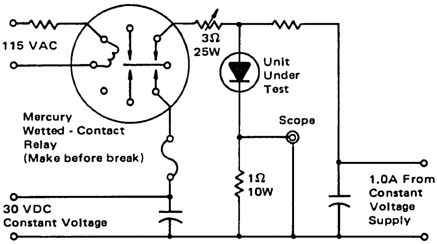


Figure 10
Typical recovered charge at $T_J = 100°C$

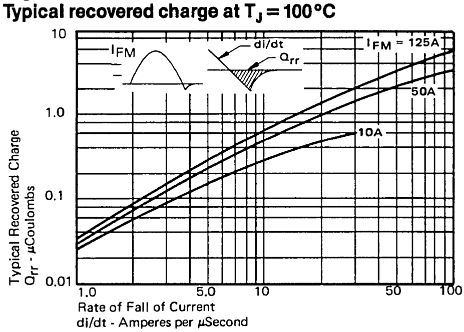


Figure 8
JEDEC Reverse recovery circuit

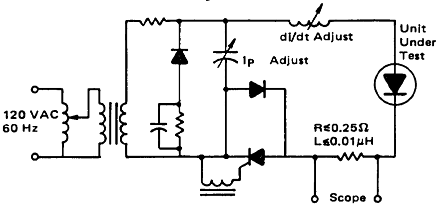


Figure 11
Typical recovered charge at $T_J = 150°C$

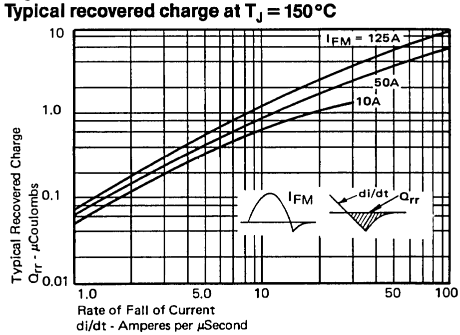
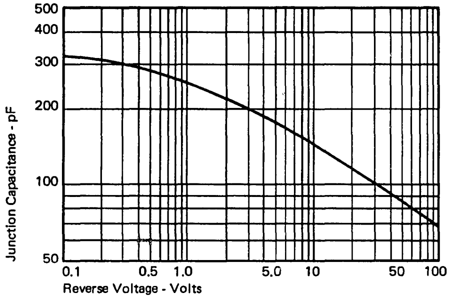


Figure 12
Typical junction capacitance



Typical Reverse current

Figure 13
Effects of temperature

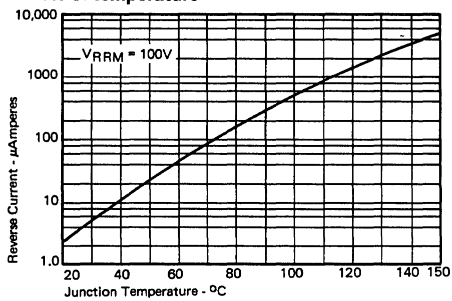
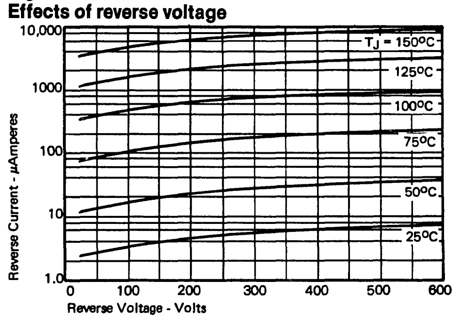


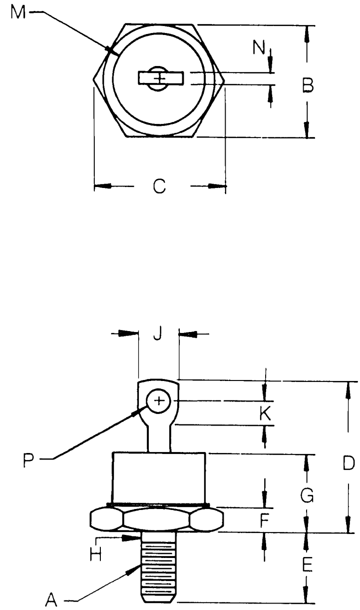
Figure 14
Effects of reverse voltage



Silicon Rectifiers/Fast Recovery

45 AMP Avg; V_{RRM} up to 400 Volts

- 45 Amperes Average, $T_C = 100\,°C$
- 200 Nanoseconds Recovery Time at 1.0 Amperes
- 1.15 Volts Forward Voltage at 90 Amperes
- 400 Volts Peak Reverse Voltage Maximum
- Offers lower Forward Characteristics than the 1N3909-1N3913 Family



DO-203AB (DO-5)

Dim.	**Inches**		**Millimeter**		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.427	.447	10.84	11.35	
F	.125	.142	3.17	3.60	
G	----	.450	----	11.43	
H	.220	.249	5.59	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.97	----	
M	----	.590	----	14.98	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.56	4.44	Dia

Note 1: Standard polarity: Stud is cathode
¼-28 UNF-2A Reverse polarity: Stud is anode
Note 2:
Full threads within 2½ threads

Catalog Number		
Standard Polarity	Reverse Polarity	Peak Reverse Voltage
SO45AADF	R045AADF	50
S04501DF	R04501DF	100
S04502DF	R04502DF	200
S04503DF	R04503DF	300
S04504DF	R04504DF	400

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	50V to 400V	
Maximum peak reverse current	I_{RRM}	20mA	$T_C = 150°C$
		80μA	$T_C = 25°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	45 Amps	Single phase, half-wave rating $T_C = 100°C$
Maximum surge current	I_{FSM}	600 Amps	One cycle of 60 Hz sinewave
Maximum peak forward voltage	V_{FM}	1.15V max.	$I_{FM} = 90A$, $T_C = 25°C$
Maximum I^2t	I^2t	1500 A^2S	less than 8.33 ms
Reverse Recovery Values			
Maximum reverse recovery time	t_{rr}	200 ns	$I_{FM} = 1.0A$, $V_R = 30V$ (see figure 7)
Maximum reverse recovery time	t_{rr}	350 ns	$I_{FM} = 125A$, di/dt $= 25A/\mu s$ $t_p \geq 16\mu s$, $I_{RM}(REC) = < 9.0A$ (see figure 8)
Thermal values			
Storage temp range	T_{stg}	$-65°C$ to $+175°C$	
Operating junction temp range	T_J	$-65°C$ to $+150°C$	
Maximum thermal resistance junction to case	$R\Theta_{JC}$	1.0°C/W	

Mechanical Characteristics	
Base	Steel stud and base with a 1/4-28 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.5 ounce (14 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO5) outline

Characteristic Curves

Figure 1
Maximum case temperature

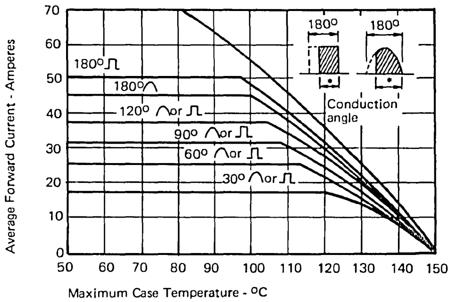


Figure 3
Maximum power dissipation

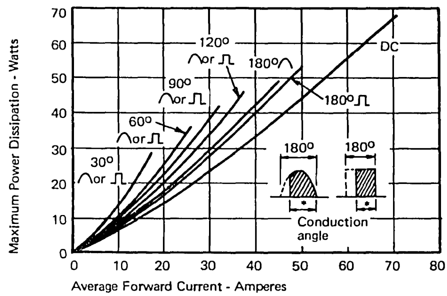


Figure 2
Maximum forward characteristics

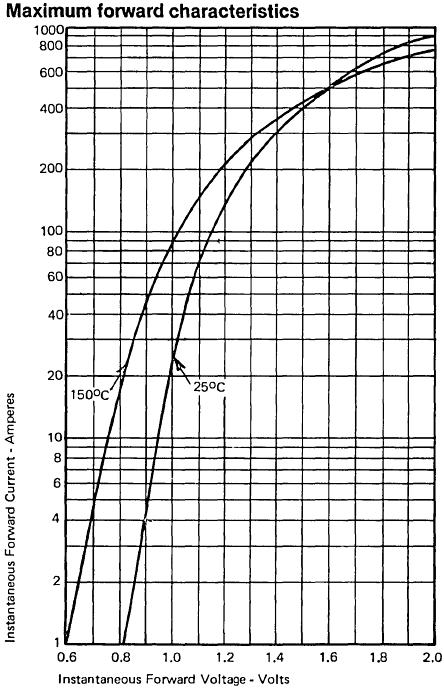


Figure 4
Maximum nonrepetitive surge current at rated load conditions

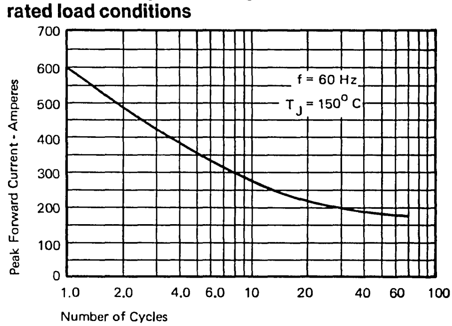


Figure 5
Maximum transient thermal impedance

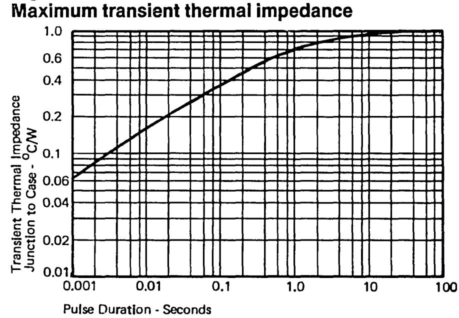


Figure 6
Reverse recovery time

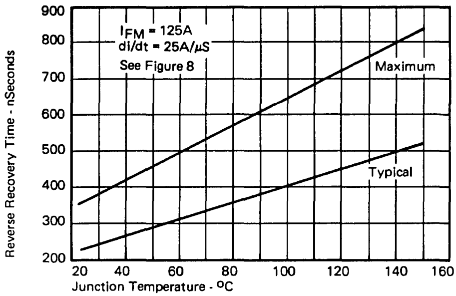


Figure 7
Former JEDEC reverse recovery circuit

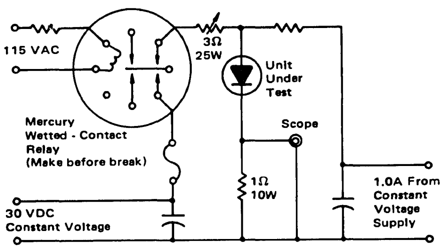


Figure 8
JEDEC Reverse recovery circuit

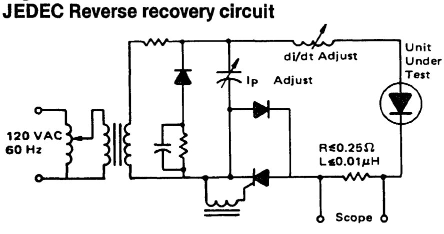


Figure 9
Typical recovered charge at $T_J = 25°C$

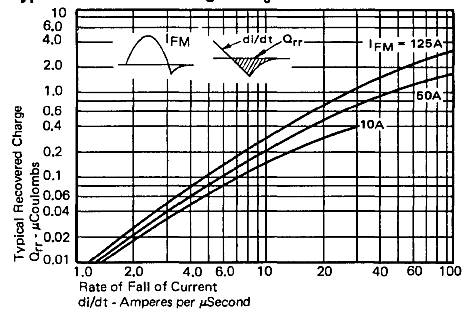


Figure 10
Typical recovered charge at $T_J = 100°C$

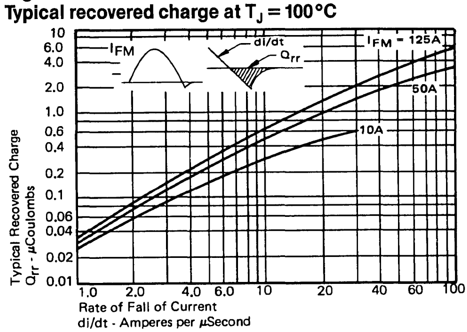


Figure 11
Typical recovered charge at $T_J = 150°C$

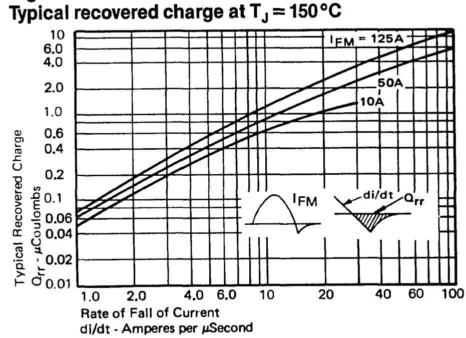
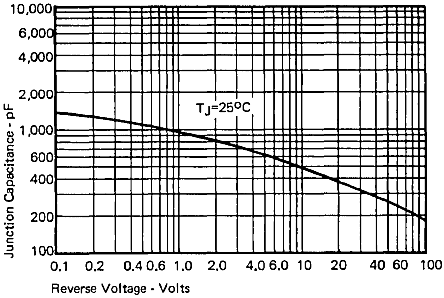


Figure 12
Typical junction capacitance



Typical Reverse current

Figure 13
Effects of temperature

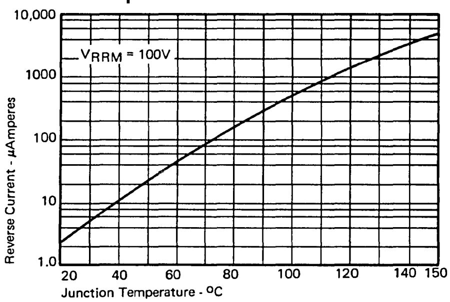
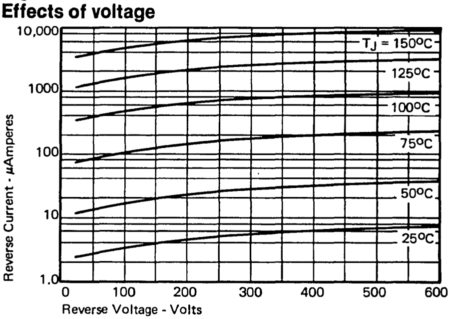


Figure 14
Effects of voltage

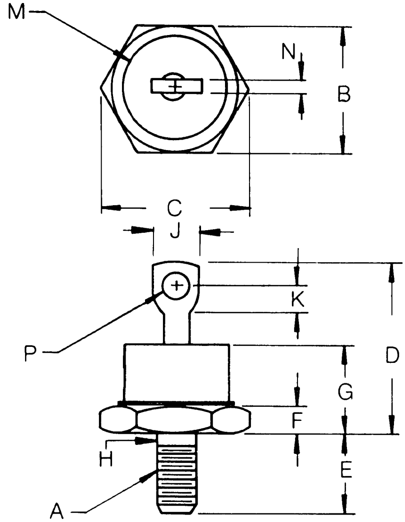


Silicon Rectifiers/Fast Recovery

55 Amp Avg; V_{RRM} Up To 300 Volts

Series 055

- 55 Amperes Average, $T_C = 100°C$
- 225 Nanoseconds Recovery Time at 175 Amperes
- 100 Nanoseconds Recovery Time at 1.0 Amperes
- Blocking Voltage to 300 Volts



DO-203AB (DO-5)

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.427	.447	10.84	11.35	
F	.125	.142	3.17	3.60	
G	----	.450	----	11.43	
H	.220	.249	5.59	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.97	----	
M	----	.590	----	14.98	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.56	4.44	Dia

Note 1: ¼-28 UNF-2A

Standard polarity: Stud is cathode
Reverse polarity: Stud is anode

Note 2:
Full threads within 2½ threads

Catalog Number		Peak Reverse Voltage
Standard	Reverse	
SO55AADF	R055AADF	50
S05501DF	R05501DF	100
S05502DF	R05502DF	200
S05503DF	R05503DF	300

Electrical Characteristics

Reverse Blocking			
Repetitive peak reverse voltage	V_{RRM}	50V to 300V	
Maximum peak reverse current	I_{RRM}	10mA	$T_C = 150\,°C$
		80μA	$T_C = 25\,°C$
Forward Direction			
Maximum average forward current	$I_{F(AV)}$	55 Amps	Single phase, half-wave DC rating $T_C = 100\,°C$
Maximum surge current	I_{FSM}	800 Amps	One cycle of 60HZ sinewave
Maximum peak forward voltage	V_{FM}	1.15V max.	$I_{FM} = 90A$, $T_C = 25\,°C$
Maximum I^2t	I^2t	2650 A^2S	less than 8.33 ms
Reverse Recovery Values			
Maximum reverse recovery time	t_{rr}	100 ns	$I_{FM} = 1.0A$, $V_R = 30V$ (see figure 7)
Maximum reverse recovery time	t_{rr}	225 ns	$I_{FM} = 175A$, di/dt $= 25A/\mu s$ $t_p \geq 22\mu s$, $I_{RM}(REC) = < 4.0A$ (see figure 8)
Thermal values			
Storage temp range	T_{stg}	$-65\,°C$ to $+175\,°C$	
Operating junction temp range	T_J	$-65\,°C$ to $+150\,°C$	
Maximum thermal resistance junction to case	$R\Theta_{JC}$	0.8 °C/W	

Mechanical Characteristics	
Base	Copper stud and base with a 1/4-28 UNF-2A thread for through mounting on a heat sink. Nickel plating prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.6 ounce (17 grams)
Mounting Position	May be mounted in any position
Mounting Torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO5) outline

Figure 1
Maximum case temperature

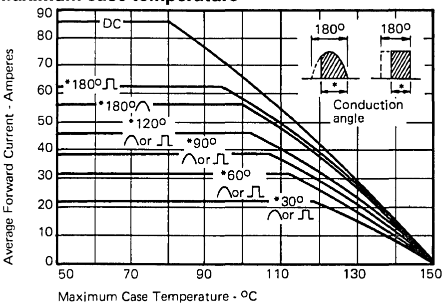


Figure 3
Maximum power dissipation

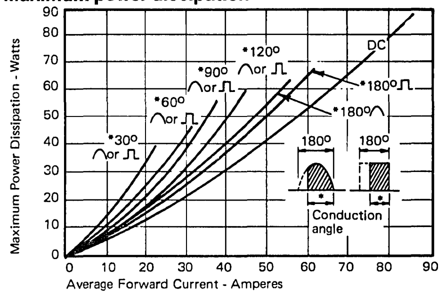


Figure 2
Maximum forward characteristics

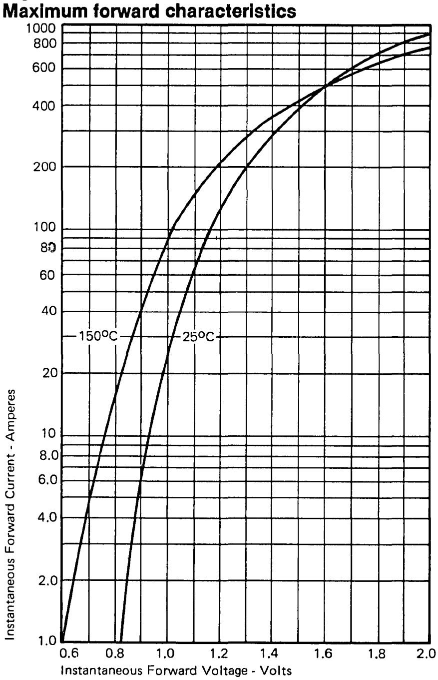


Figure 4
Maximum nonrepetitive surge current at rated load conditions

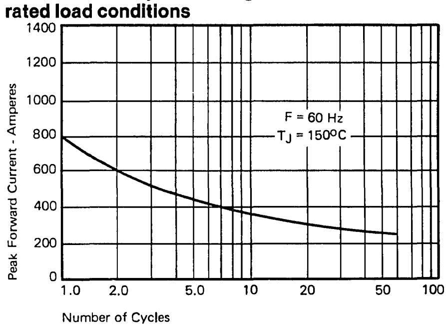


Figure 5
Maximum transient thermal impedance

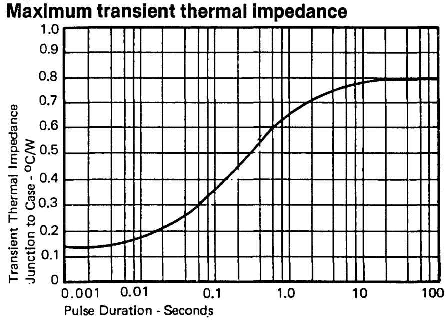


Figure 6
Reverse recovery time

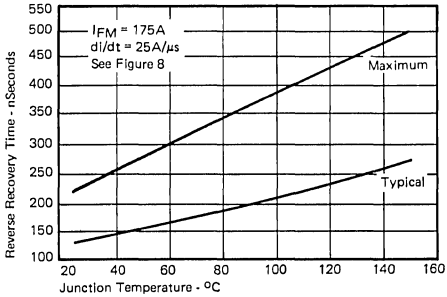


Figure 7
Former JEDEC reverse recovery circuit

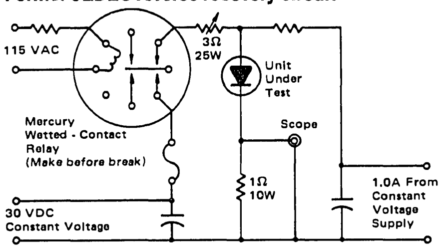


Figure 8
JEDEC Reverse recovery circuit

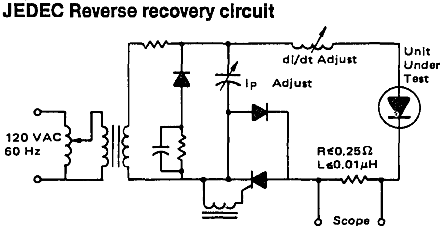


Figure 9
Typical recovered charge at $T_J = 25°C$

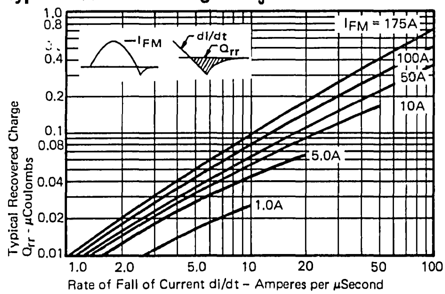


Figure 10
Typical recovered charge at $T_J = 100°C$

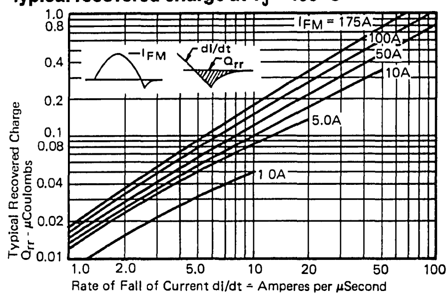


Figure 11
Typical recovered charge at $T_J = 150°C$

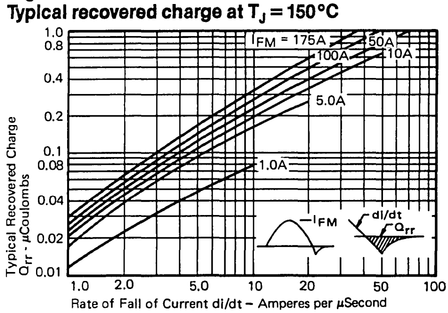
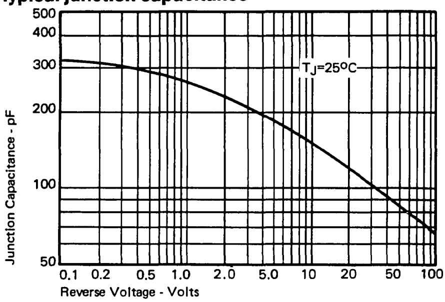


Figure 12
Typical junction capacitance



Typical Reverse current

Figure 13
Effects of temperature

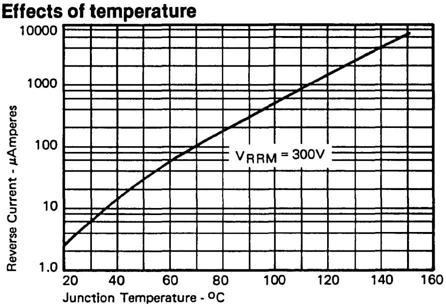
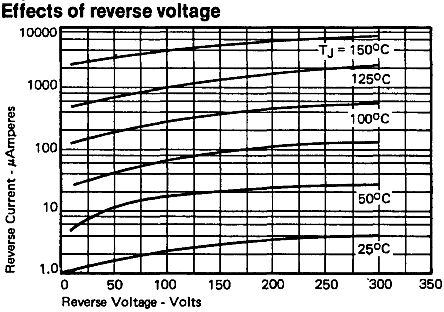


Figure 14
Effects of reverse voltage

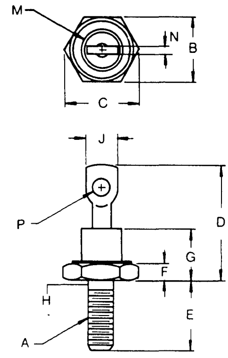


Rectifiers, Schottky

Schottky Rectifier

30 A Avg; V_{RRM} up to 45 Volts

- Guard ring reverse protection
- 45 Volts V_{RRM} / V_{RWM}
- 30 Amperes
- 160° (T_J)



DO-203AA
(DO-4)

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	.427	.437	10.84	11.09	
C	----	.505	----	12.82	
D	----	.800	----	20.32	
E	.432	.442	10.97	11.22	
F	0.95	.105	2.41	2.66	
G	.349	.386	8.86	9.80	
H	.163	.189	4.14	4.80	2
J	----	.250	----	6.35	
M	----	.280	----	7.11	
N	----	0.50	----	1.27	
P	.088	.098	2.23	2.48	

Note 1:
No. 10-32 UNF-2A Standard Polarity: Stud is cathode
Note 2:
Full thread within 2½ threads

Catalog Number	JEDEC Numbers	Working Peak Reverse Voltage V_{RWM}
SD41		35 @ 125°C T_J
SD4145		45 @ 125°C T_J

Schottky Rectifier

30 A Avg; V_{RRM} up to 45 Volts

Series SD 41

Electrical characteristics

Maximum average forward current	$I_{F(AV)}$	30 Amps	Sine wave at $T_C = 90°C$
		33 Amps	Square wave at $T_C = 87°C$
Maximum surge current	I_{FSM}	600 Amps	8.3 ms, half sine, $T_J = 160°C$
Maximum peak forward voltage	V_{FM}	0.55 volts	$I_{FM} = 30A$: $T_J = 125°C$*
Maximum peak reverse current	I_{RM}	125mA	V_{RRM}, $T_C = 125°C$*
Typical junction capacitance	C_J	1500pF	$V_R = 5.0V$, $T_C = 25°C$

Thermal Characteristics

Storage temp range	T_{stg}	$-55°C$ to $+165°C$	
Operating junction temp range	T_J	$-55°C$ to $+160°C$	
Maximum thermal resistance	$R_{\Theta JC}$	2.0°C/W	Junction to case
Typical thermal resistance	$R_{\Theta CS}$	0.3°C/W	Case to sink

Mechanical Characteristics

Base	Copper stud base with a #10-32 UNF-2A; thread for through mounting on a heat sink. Nickel plating of base produces low contact resistance and prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.16 ounce (4.5 grams)
Mounting torque	15 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AA (DO-4) outline

*Pulse test: Pulse width 300 μsec, Duty cycle 2%

Figure 1
Maximum forward characteristics

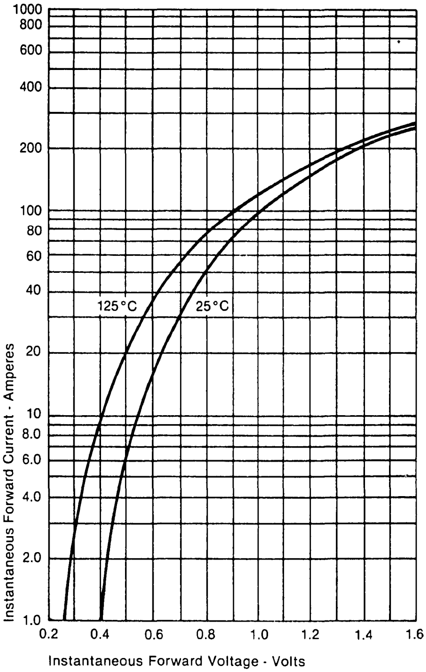


Figure 2
Max. nonrepetitive surge current at rated load conditions

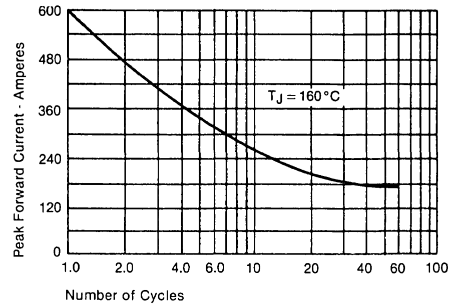


Figure 3
Typical junction capacitance

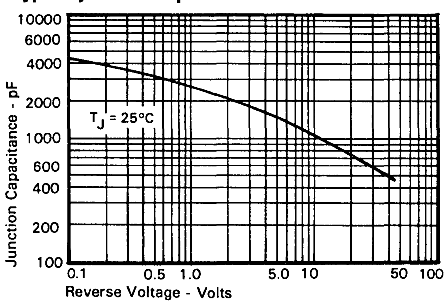


Figure 4
Effects of reverse voltage

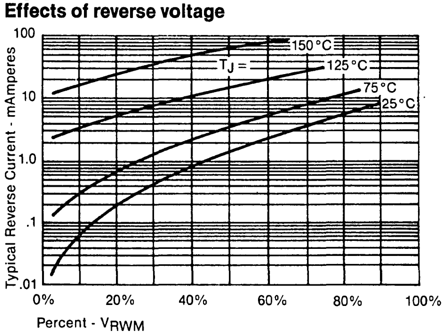
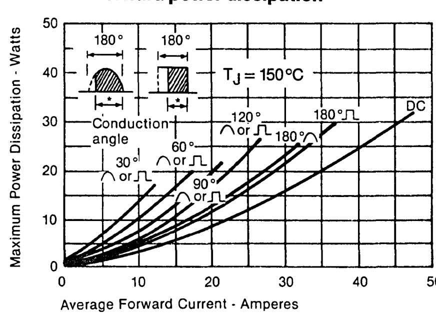


Figure 5
Maximum forward power dissipation

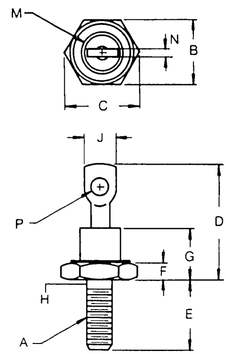


Schottky Rectifier

30 A Avg; V_{RRM} up to 50 Volts

Series SBR30
BYS 31

- Guard ring reverse protection
- 50 Volts V_{RRM} / V_{RWM}
- 30 Amperes
- 175° (T_J)
- Reverse Avalanche Tested



DO-203AA
DO-4

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	.427	.437	10.84	11.09	
C	----	.505	----	12.82	
D	----	.800	----	20.32	
E	.432	.442	10.97	11.22	
F	.095	.105	2.41	2.66	
G	.349	.386	8.86	9.80	
H	.163	.189	4.14	4.80	2
J	----	.250	----	6.35	
M	----	.280	----	7.11	
N	----	0.50	----	1.27	
P	.088	.098	2.23	2.48	

Note 1:
No. 10-32 UNF-2A Standard Polarity: Stud is cathode
Note 2:
Full thread within 2½ threads

Catalog Number	Pro Electron Number	Working Peak Reverse Voltage V_{RWM}	Rep. Peak Reverse Voltage V_{RRM}
SBR3035	BYS31-35	35	35
SBR3040	BYS31-40	40	40
SBR3045	BYS31-45	45	45
SBR3050	BYS31-50	50	50

Electrical characteristics

Maximum average forward current	$I_{F(AV)}$	30 Amps	$T_C = 132\,°C$
Maximum surge current	I_{FSM}	600 Amps	8.3 ms, half sine, $T_J = 175\,°C$
Maximum repetitive peak reverse current	$I_{R(OV)}$	2 Amps	f = I KHz, 25 °C
Maximum peak forward voltage	V_{FM}	0.63 volts	$I_{FM} = 30A$; $T_J = 25\,°C$*
Maximum peak reverse current	I_{RM}	50mA	V_{RRM}, $T_C = 125\,°C$*
Typical reverse current, per leg	I_{RM}	2mA	V_{RRM}, $T_J = 25\,°C$*
Typical junction capacitance	C_J	2000pF	$V_R = 5.0V$, $T_C = 25\,°C$

Thermal Characteristics

Storage temp range	T_{stg}	− 55 °C to + 175 °C	
Operating junction temp range	T_J	− 55 °C to + 175 °C	
Maximum thermal resistance	$R_{\Theta JC}$	1.8 °C/W	Junction to case
Typical thermal resistance	$R_{\Theta CS}$	0.3 °C/W	Case to sink

Mechanical Characteristics

Base	Copper stud base with a #10-32 UNF-2A; thread for through mounting on a heat sink. Nickel plating of base produces low contact resistance and prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.16 ounce (4.5 grams)
Mounting torque	15 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AA (DO-4) outline

*Pulse test: Pulse width 300 μsec, Duty cycle 2%

Figure 1
Maximum forward characteristics

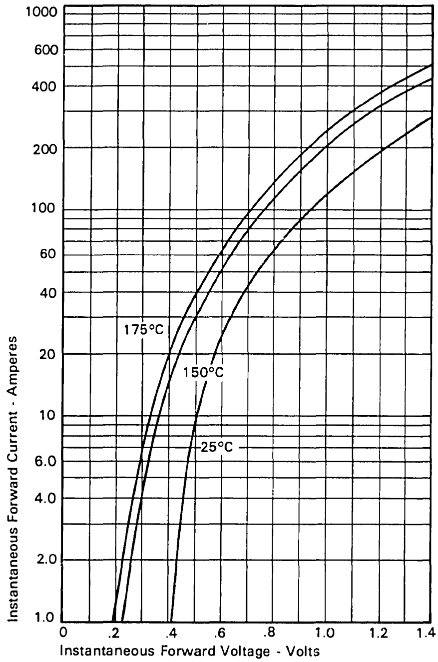


Figure 2
Forward current derating

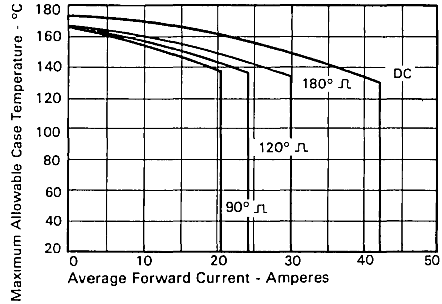


Figure 3
Typical junction capacitance

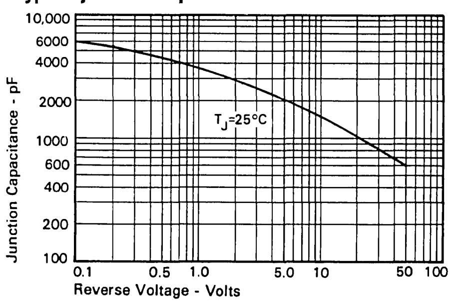


Figure 4
Typical reverse characteristics

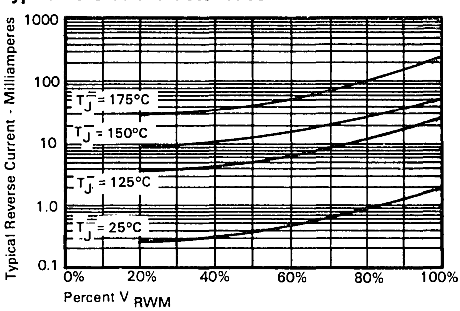
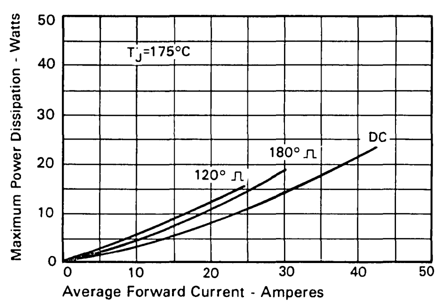


Figure 5
Maximum forward power dissipation

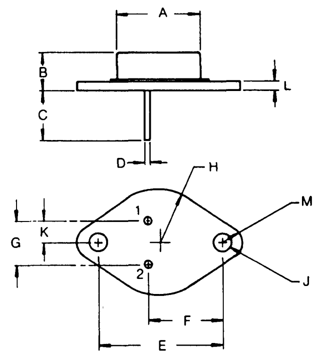


Dual Schottky Rectifier

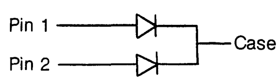
30 A Avg; V_{RRM} up to 45 Volts

Series SD 241

- Designed for center tap rectification and commutation
- 45 Volts V_{RRM} / V_{RWM}
- 160° (T_J)
- Guard ring reverse protection



Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	0.875	----	22.23	Dia.
B	0.250	0.450	6.35	11.43	
C	0.312	----	7.92	----	
D	0.038	0.043	0.97	1.09	Dia.
E	1.177	1.197	29.90	30.40	
F	0.655	0.675	16.64	17.15	
G	0.420	0.440	10.67	11.18	
H	----	0.525	----	13.34	Rad.
J	0.151	0.161	3.84	4.09	Dia.
K	0.205	0.225	5.21	5.72	
L	----	0.135	----	3.43	
M	----	0.188	----	4.78	Rad.



Terminal Connections
Pin 1 Anode 1
Pin 2 Anode 2
Case - Common Cathode

TO-204AA
(TO-3)

Catalog Number	Working Peak Reverse Voltage V_{RWM}
SD241	35 @ 125°C T_J
SD24145	45 @ 125°C T_J

Dual Schottky Rectifier

30 A Avg; V_{RRM} up to 45 Volts

Electrical characteristics

Maximum average forward current	$I_{F(AV)}$	30 Amps	Sine wave at $T_C = 96\,°C$
		33 Amps	Square wave at $T_C = 93\,°C$
Maximum surge current	I_{FSM}	400 Amps	8.3 ms, half sine, $T_J = 160\,°C$
Maximum peak forward voltage	V_{FM}	0.47 volts	$I_{FM} = 10A$: $T_J = 125\,°C$*
		0.6 volts	$I_{FM} = 20A$: $T_J = 125\,°C$*
Maximum peak reverse current	I_{RM}	100mA	V_{RRM}, $T_C = 125\,°C$*
Typical junction capacitance	C_J	1500pF	$V_R = 5.0V$, $T_C = 25\,°C$

Thermal Characteristics

Storage temp range	T_{stg}	$-55\,°C$ to $+175\,°C$	
Operating junction temp range	T_J	$-55\,°C$ to $+160\,°C$	
Maximum thermal resistance	$R_{\Theta JC}$	1.4 °C/W	Junction to case
Typical thermal resistance	$R_{\Theta CS}$	0.1 °C/W	Case to sink

Mechanical Characteristics

Base	Nickel plated steel.
Header	Glass to metal construction.
Weight	Approximately 1.0 ounce (28 grams)
Dimensions	In accordance with JEDEC TO-204AA (TO-3) outline

*Pulse test: Pulse width 300 μsec, Duty cycle 2%

Figure 1
Maximum forward characteristics

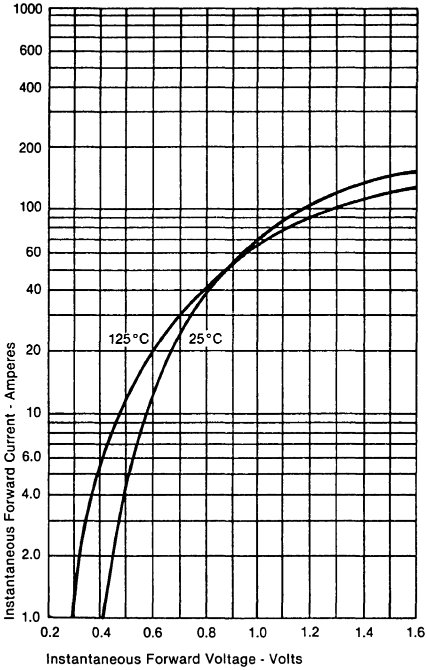


Figure 2
Max. nonrepetitive surge current at rated load conditions

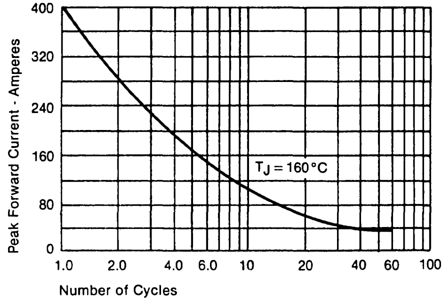


Figure 3
Typical junction capacitance / per leg

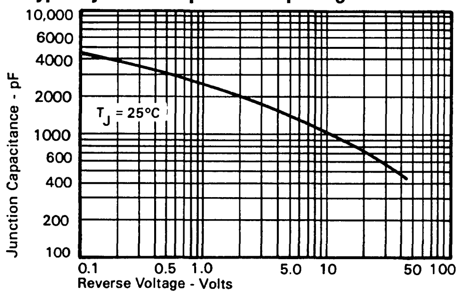


Figure 4
Effects of reverse voltage

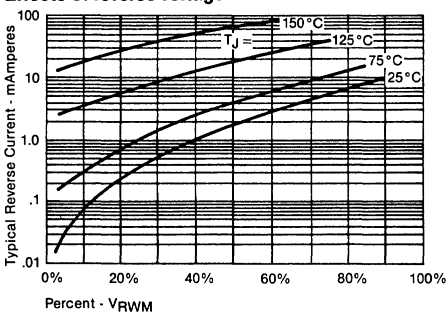
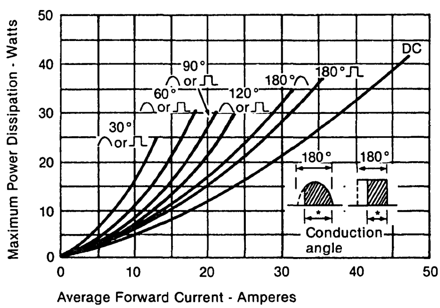


Figure 5
Maximum forward power dissipation



Dual Schottky Rectifier

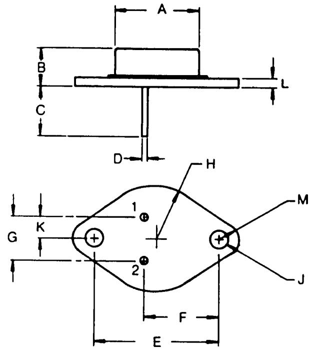
30 A Avg; V_{RRM} up to 50 Volts

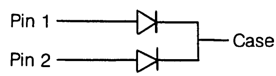
Series SBT30
BYS 79

- Guard ring reverse protection
- 50 Volts V_{RRN} / V_{RWM}
- 30 Amperes
- 175° (T_J)
- Center tap

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	0.875	----	22.23	Dia.
B	0.250	0.450	6.35	11.43	
C	0.312	----	7.92	----	
D	0.038	0.043	0.97	1.09	Dia.
E	1.177	1.197	29.90	30.40	
F	0.655	0.675	16.64	17.15	
G	0.420	0.440	10.67	11.18	
H	----	0.525	----	13.34	Rad.
J	0.151	0.161	3.84	4.09	Dia.
K	0.205	0.225	5.21	5.72	
L	----	0.135	----	3.43	
M	----	0.188	----	4.78	Rad.

Catalog Number	Pro Electron Number	Working Peak Reverse Voltage V_{RWM}	Rep. Peak Reverse Voltage V_{RRM}
SBT3035	BYS79-35	35	35
SBT3040	BYS79-40	40	40
SBT3045	BYS79-45	45	45
SBT3050	BYS79-50	50	50





Terminal Connections
Pin 1 Anode 1
Pin 2 Anode 2
Case - Common Cathode

TO-204AA
(TO-3)

Dual Schottky Rectifier

30 A Avg; V_{RRM} up to 50 Volts

Series SBT30
BYS 79

Electrical characteristics

Average output current per pkg	$I_{F(AV)}$	30 Amps	$T_C = 150\,°C$
Max average forward current, per leg	$I_{F(AV)}$	15 Amps	$T_C = 155\,°C$
Maximum surge current	I_{FSM}	600 Amps	8.3 ms, half sine, $T_J = 175\,°C$
Maximum repetitive peak reverse current	$I_{R(OV)}$	2 Amps	f = I KHz, 25°
Maximum peak forward voltage	V_{FM}	0.66 volts	$I_{FM} = 30A$: $T_J = 25\,°C$*
Maximum peak reverse current	I_{RM}	50mA	V_{RRM}, $T_C = 125\,°C$*
Typical Reverse current, per leg	I_{RM}	2mA	V_{RRM}, $T_J = 25\,°C$*
Typical junction capacitance	C_J	2000pF	$V_R = 5.0V$, $T_C = 25\,°C$

Thermal Characteristics

Storage temp range	T_{stg}	$-55\,°C$ to $+175\,°C$	
Operating junction temp range	T_J	$-55\,°C$ to $+175\,°C$	
Maximum thermal resistance per leg, per package,	$R_{\Theta JC}$	1.4 °C/W	Junction to case 0.84 °C/W
$R_{\Theta CS}$ Typical thermal resistance	0.1 °C/W	Case to sink	

Mechanical Characteristics

Base	Nickel plated steel. Glass to metal construction.
Header	Nickel plated steel.
Weight	Approximately 1.0 ounce (28 grams)
Dimensions	In accordance with JEDEC TO-204AA (TO-3) outline

*Pulse test: Pulse width 300μsec, Duty cycle 2%

Dual Schottky Rectifier

30 A Avg; V_{RRM} up to 50 Volts

Series SBT30
BYS 79

Figure 1
Maximum forward characteristics

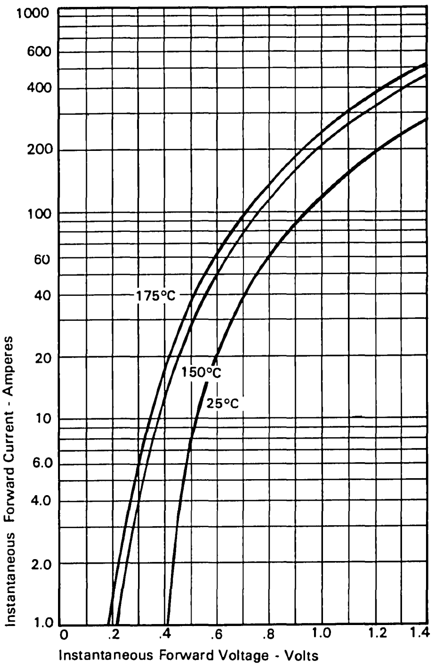


Figure 2
Forward current derating

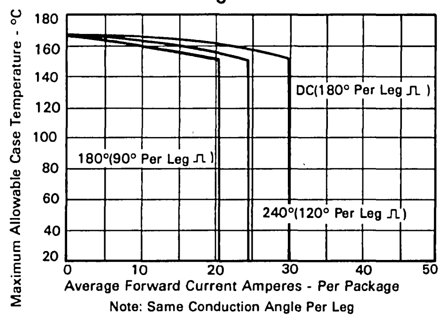


Figure 3
Typical junction capacitance per leg

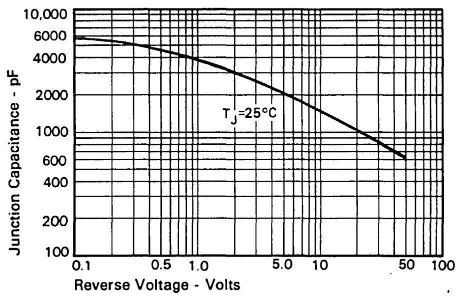


Figure 4
Typical reverse characteristics

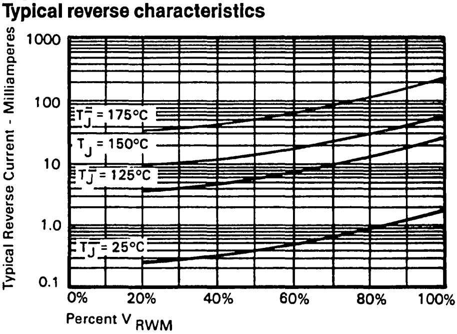
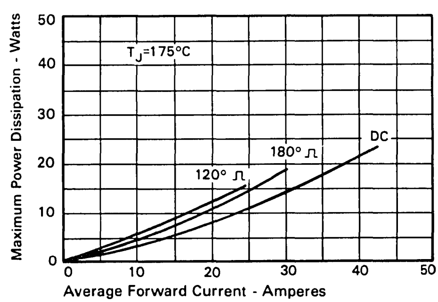


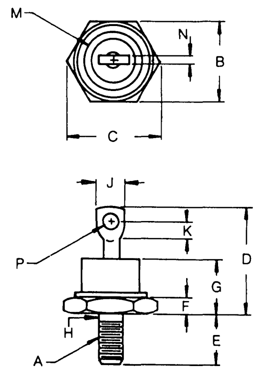
Figure 5
Maximum forward power dissipation



Schottky Rectifier

60 A Avg; V_{RRM} up to 45 Volts

- Guard ring reverse protection
- 45 Volts V_{RRM} / V_{RWM}
- 60 Amperes
- 160° (T_J)



DO-203AB
(DO-5)

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.432	.442	10.97	11.22	
F	.125	.135	3.17	3.42	
G	.323	.353	8.20	8.96	
H	.220	.249	5.58	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.96	----	
M	----	.510	----	12.95	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.55	4.45	Dia

Note 1: Standard polarity: Stud is cathode
¼-28 UNF-2A
Note 2:
Full threads within 2½ threads

Catalog Number	JEDEC Numbers	Working Peak Reverse Voltage V_{RWM}
SD51		35 @ 125°C T_J
SD5145		45 @ 125°C T_J

Schottky Rectifier

60 A Avg; V_{RRM} up to 45 Volts

Series SD 51

Electrical characteristics

Maximum average forward current	$I_{F(AV)}$	60 Amps	Sine wave at $T_C = 94\,°C$
		66 Amps	Square wave at $T_C = 90\,°C$
Maximum surge current	I_{FSM}	800 Amps	8.3 ms, half sine, $T_J = 160\,°C$
Maximum peak forward voltage	V_{FM}	0.6 volts	$I_{FM} = 60A$: $T_J = 125\,°C$*
Maximum peak reverse current	I_{RM}	200mA	V_{RRM}, $T_C = 125\,°C$*
Typical junction capacitance	C_J	2300pF	$V_R = 5.0V$, $T_C = 25\,°C$

Thermal Characteristics

Storage temp range	T_{stg}	$-55\,°C$ to $+165\,°C$	
Operating junction temp range	T_J	$-55\,°C$ to $+160\,°C$	
Maximum thermal resistance	$R_{\Theta JC}$	1.0 °C/W	Junction to case
Typical thermal resistance	$R_{\Theta CS}$	0.30 °C/W	Case to sink

Mechanical Characteristics

Base	Copper stud base with a 1/4-28 UNF-2A; thread for through mounting on a heat sink. Nickel plating of base produces low contact resistance and prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.5 ounce (14 grams)
Mounting torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO-5) outline

*Pulse test: Pulse width 300μsec, Duty cycle 2%

Figure 1
Maximum forward characteristics

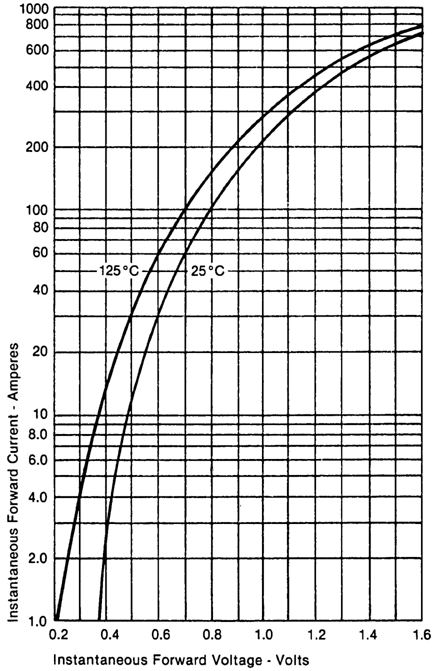


Figure 2
Max. nonrepetitive surge current at rated load conditions

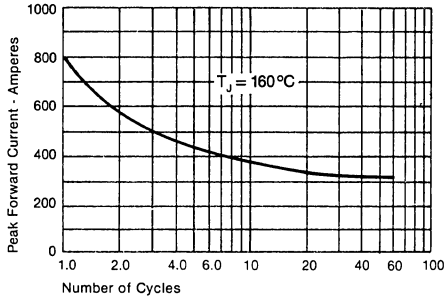


Figure 3
Typical junction capacitance

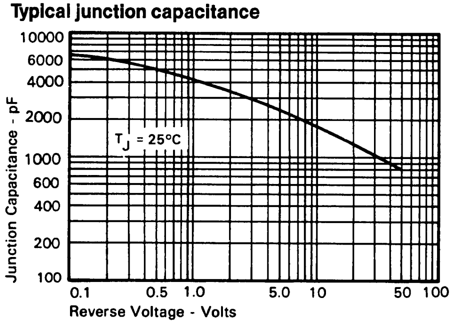


Figure 4
Effects of reverse voltage

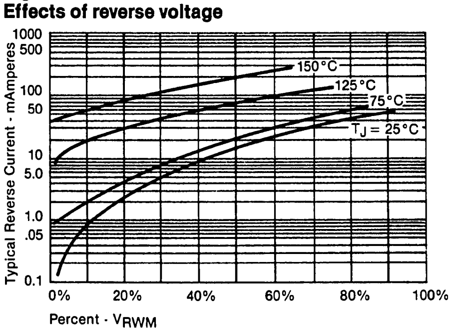
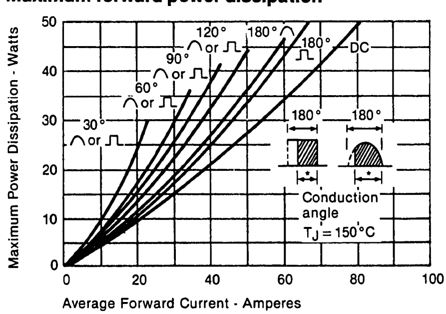
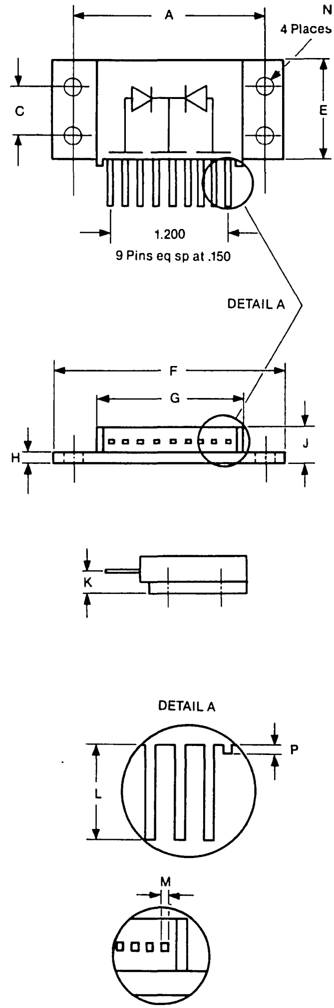


Figure 5
Maximum forward power dissipation



- Electrically Isolated Base
- Guard ring reverse protection
- Center Tap
- 50 Volts V_{RRM} / V_{RWM}
- 60 Amperes
- 175 °C Junction Temperature



Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	1.995	2.005	50.67	50.93	
C	0.495	0.505	12.57	12.83	
E	0.990	1.010	25.15	25.65	
F	2.390	2.410	60.71	61.21	
G	1.490	1.510	37.85	38.35	
H	0.120	0.130	3.05	3.30	
J	----	0.400	----	10.16	
K	0.240	0.260	6.10	6.60	to Lead C_L
L	0.490	0.510	12.45	12.95	
M	0.035	0.045	0.89	1.14	Square
N	0.175	0.195	4.45	4.95	Diameter
P	0.032	0.052	0.81	1.32	

Notes:
BASEPLATE: Nickel plated copper; electrically isolated
PINS: Nickel plated copper
CENTER TERMINALS: Common cathode

Catalog Number	Pro Electron Number	Working Peak Reverse Voltage V_{RWM}	Rep. Peak Reverse Voltage V_{RRM}
FST6035	BYS98-35	35	35
FST6040	BYS98-40	40	40
FST6045	BYS98-45	45	45
FST6050	BYS98-50	50	50

Electrical characteristics

Average forward current per pkg	$I_{F(AV)}$	60 Amps	$T_C = 150\,°C$
Average forward current per leg	$I_{F(AV)}$	60 Amps	$T_C = 128\,°C$
Maximum surge current per leg	I_{FSM}	1000 Amps	8.3 ms, half sine, $T_J = 175\,°C$
Maximum repetitive peak reverse current per leg	$I_{R(OV)}$	2 Amps	f = l KHz, 25°
Maximum peak forward voltage per leg	V_{FM}	0.70 volts	$I_{FM} = 60A$: $T_J = 25\,°C$*
Maximum peak reverse current per leg	I_{RM}	60mA	V_{RRM}, $T_C = 125\,°C$*
Typical Reverse current, per leg	I_{RM}	3mA	V_{RRM}, $T_J = 25\,°C$*
Typical junction capacitance	C_J	2300pF	$V_R = 5.0V$, $T_C = 25\,°C$

Thermal Characteristics

Storage temp range	T_{stg}	$-40\,°C$ to $+175\,°C$	
Operating junction temp range	T_J	$-40\,°C$ to $+175\,°C$	
Maximum thermal resistance per leg,	$R_{\Theta JC}$	1.0 °C/W	Junction to case
per package,		0.6 °C/W	
Typical thermal resistance	$R_{\Theta CS}$	0.1 °C/W	Case to sink

Mechanical Characteristics

Weight 2.5 ounce (71 grams) typical

*Pulse test: Pulse width 300μsec, Duty cycle 2%

Figure 1
Maximum forward characteristics

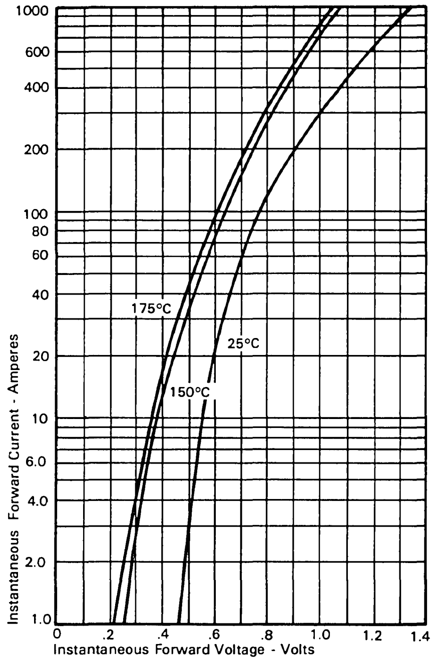


Figure 2
Forward current derating

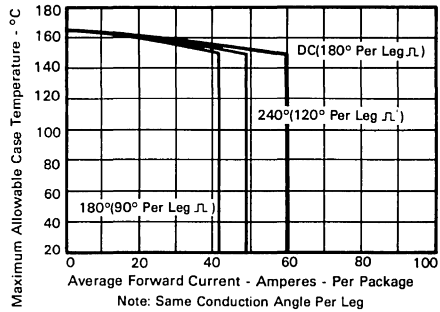


Figure 3
Typical junction capacitance

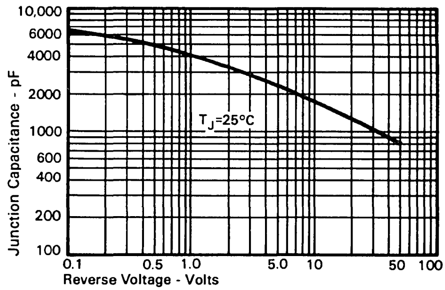


Figure 4
Typical reverse characteristics

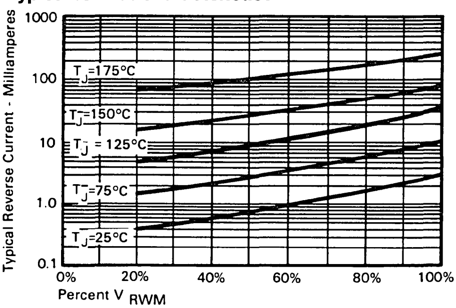
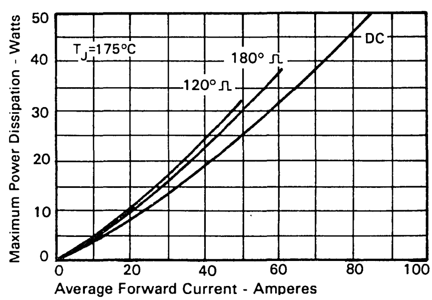
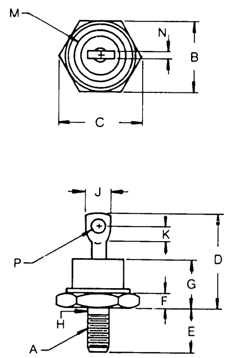


Figure 5
Maximum forward power dissipation



- Guard ring reverse protection
- 50 Volts V_{RRM} / V_{RWM}
- 80 Amperes
- 175° (T_J)



DO-203AB
(DO-5)

Dim.	**Inches**		**Millimeter**		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	.677	.687	17.19	17.44	
C	----	.793	----	20.14	
D	----	1.000	----	25.40	
E	.432	.442	10.97	11.22	
F	.125	.135	3.17	3,42	
G	.323	.353	8.20	8.96	
H	.220	.249	5.58	6.32	2
J	----	.375	----	9.52	
K	.156	----	3.96	----	
M	----	.510	----	12.95	Dia.
N	----	.080	----	2.03	
P	.140	.175	3.55	4.45	Dia.

Note 1:
No. ¼-28 UNF-2A Standard Polarity: Stud is cathode
Note 2:
Full thread within 2½ threads

Catalog Number	Pro Electron Number	Working Peak Reverse Voltage V_{RWM}	Rep. Peak Reverse Voltage V_{RRM}
SBR8035	BYS71-35	35	35
SBR8040	BYS71-40	40	40
SBR8045	BYS71-45	45	45
SBR8050	BYS71-50	50	50

Schottky Rectifier
80 A Avg; V_{RRM} up to 50 Volts

Series SBR 80
BYS 71

Electrical characteristics			
Maximum average forward current	$I_{F(AV)}$	80 Amps	$T_C = 120\,°C$
Maximum surge current	I_{FSM}	1000 Amps	8.3 ms, half sine, $T_J = 175\,°C$
Maximum repetitive peak reverse current	$I_{R(OV)}$	2 Amps	f = I KHz, 25 °C
Maximum peak forward voltage	V_{FM}	0.74 volts	$I_{FM} = 80A$: $T_J = 25\,°C$*
Maximum peak reverse current	I_{RM}	60mA	V_{RRM}, $T_C = 125\,°C$*
Typical reverse current, per leg	I_{RM}	3mA	V_{RRM}, $T_J = 25\,°C$*
Typical junction capacitance	C_J	2300pF	$V_R = 5.0V$, $T_C = 25\,°C$

Thermal Characteristics			
Storage temp range	T_{stg}	− 55 °C to + 175 °C	
Operating junction temp range	T_J	− 55 °C to + 175 °C	
Peak junction temp.	T_{JM}		
Maximum thermal resistance	$R\Theta_{JC}$	0.83 °C/W	Junction to case
Typical thermal resistance	$R\Theta_{CS}$	0.3 °C/W	Case to sink

Mechanical Characteristics	
Base	Copper stud base with a ¼-28 UNF-2A; thread for through mounting on a heat sink. Nickel plating of base produces low contact resistance and prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 0.5 ounce (14 grams)
Mounting torque	30 inch pounds maximum
Dimensions	In accordance with JEDEC DO-203AB (DO-5) outline

*Pulse test: Pulse width 300 μsec, Duty cylce 2%

Figure 1
Maximum forward characteristics

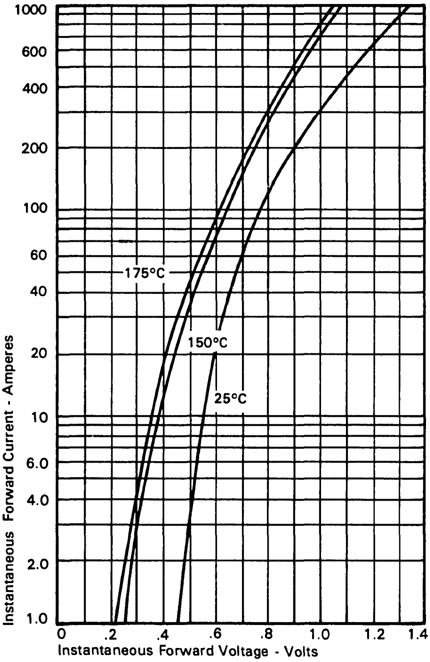


Figure 2
Forward current derating

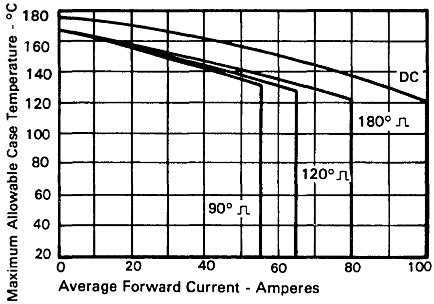


Figure 3
Typical junction capacitance

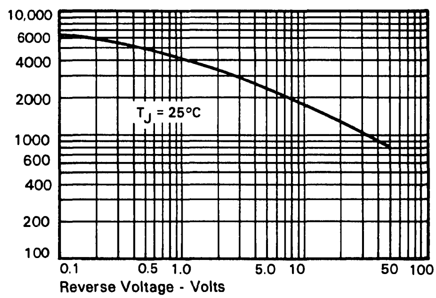


Figure 4
Typical reverse characteristics

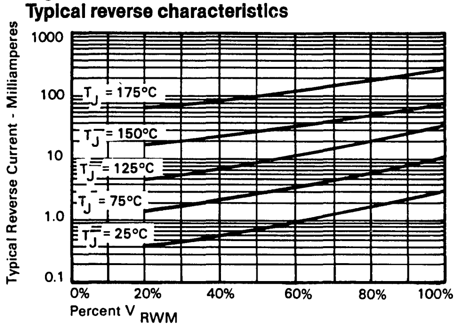
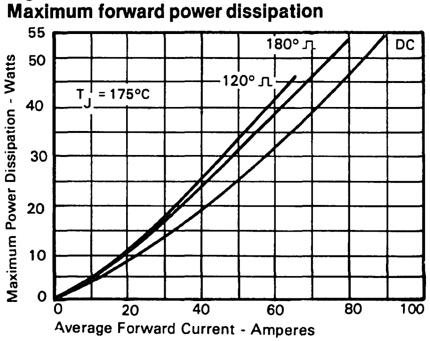


Figure 5
Maximum forward power dissipation

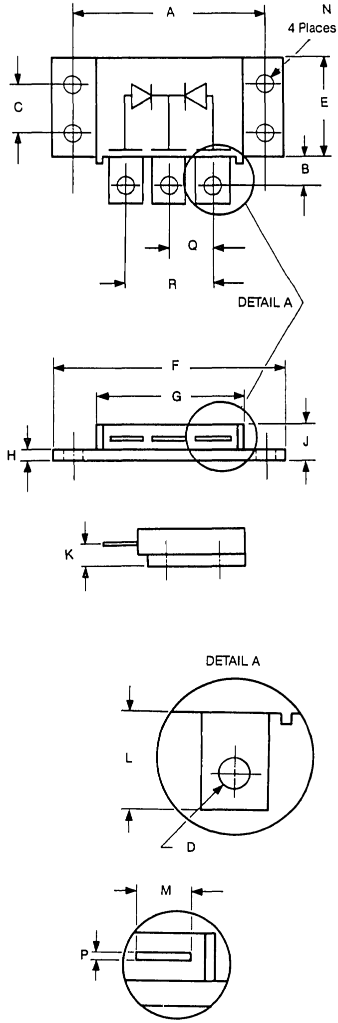


- Electrically Isolated Base
- Guard ring reverse protection
- Center Tap
- 50 Volts
- 160 Amperes
- 175°C Junction Temperature

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	1.995	2.005	50.67	50.93	
B	0.300	0.325	7.62	8.26	
C	0.495	0.505	12.57	12.83	
D	0.182	0.192	4.62	4.88	Diameter
E	0.990	1.010	25.15	25.65	
F	2.390	2.410	60.71	61.21	
G	1.490	1.510	37.85	38.35	
H	0.120	0.130	3.05	3.30	
J	—	0.400	—	10.16	
K	0.240	0.260	6.10	6.60	to Lead C_L
L	0.490	0.510	12.45	12.95	
M	0.330	0.350	8.38	8.90	
N	0.175	0.195	4.45	4.95	Diameter
P	0.035	0.045	0.89	1.14	
Q	0.445	0.455	11.30	11.56	
R	0.890	0.910	22.61	23.11	

Notes:

BASEPLATE: Nickel plated copper; electrically isolated
PINS: Nickel plated copper
CENTER TERMINALS: Common cathode



Catalog Number	Pro Electron Number	Working Peak Reverse Voltage V_{RWM}	Rep. Peak Reverse Voltage V_{RRM}
FST16035	BYS92-35	35	35
FST16040	BYS92-40	40	40
FST16045	BYS92-45	45	45
FST16050	BYS92-50	50	50

Electrical characteristics

Average forward current per pkg	$I_{F(AV)}$	160 Amps	$T_C = 103°C$
Average forward current per leg	$I_{F(AV)}$	80 Amps	$T_C = 112°C$
Maximum surge current per leg	I_{FSM}	1000 Amps	8.3 ms, half sine, $T_J = 175°C$
Maximum repetitive peak reverse current per leg	$I_{R(OV)}$	2 Amps	f = I KHz, 25°C 1 μsec square wave
Maximum peak forward voltage per leg	V_{FM}	0.74 volts	$I_{FM} = 80A$: $T_J = 25°C$*
Maximum peak forward voltage per leg	V_{FM}	0.58 volts	$I_{FM} = 80A$: $T_J = 175°C$*
Maximum peak reverse current per leg	I_{RM}	60mA	V_{RRM}, $T_C = 125°C$*
Typical Reverse current, per leg	I_{RM}	3mA	V_{RRM}, $T_J = 25°C$*
Typical junction capacitance	C_J	2300pF	$V_R = 5.0V$, $T_C = 25°C$

Thermal Characteristics

Storage temp range	T_{stg}	−40°C to +175°C	
Operating junction temp range	T_J	−40°C to +175°C	
Maximum thermal resistance per leg,	$R_{\Theta JC}$	1.0°C/W	Junction to case
per package,		0.6°C/W	
Typical thermal resistance	$R_{\Theta CS}$	0.1°C/W	Case to sink

Mechanical Characteristics

Weight — 2.5 ounce (71 grams) typical

*Pulse test: Pulse width 300μsec, Duty cycle 2%

Figure 1
Maximum forward characteristics

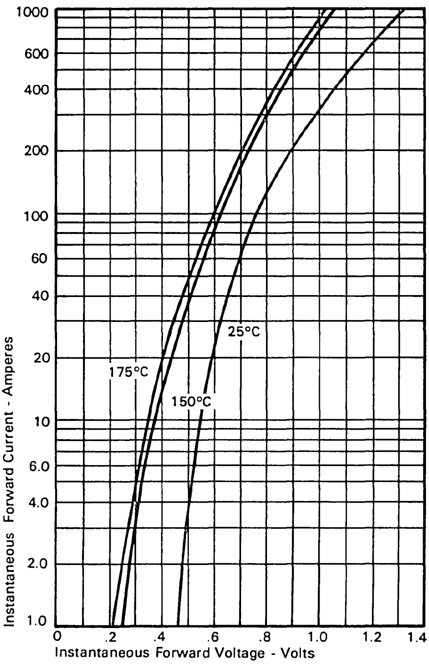


Figure 2
Forward current derating

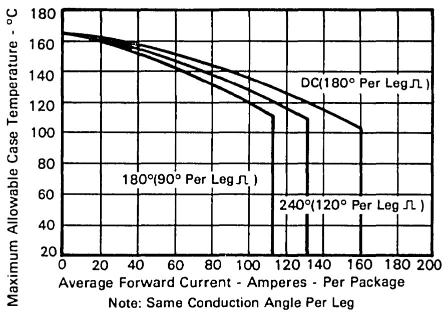


Figure 3
Typical junction capacitance

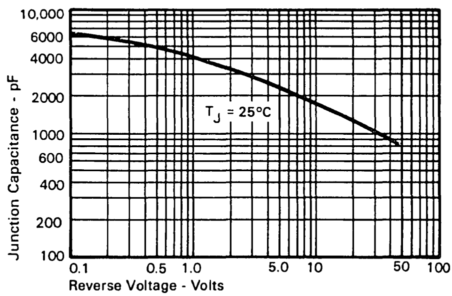


Figure 4
Typical reverse characteristics

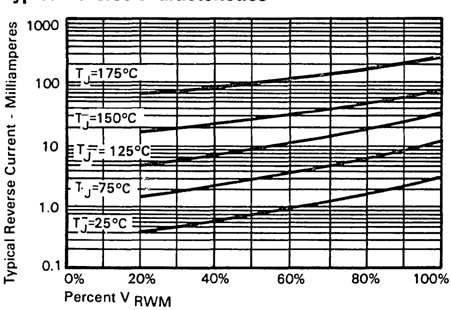
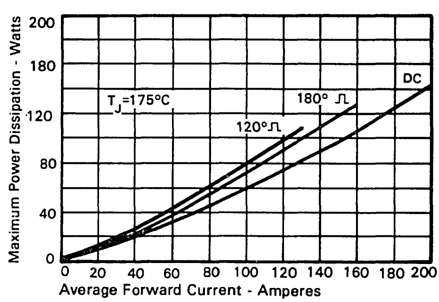
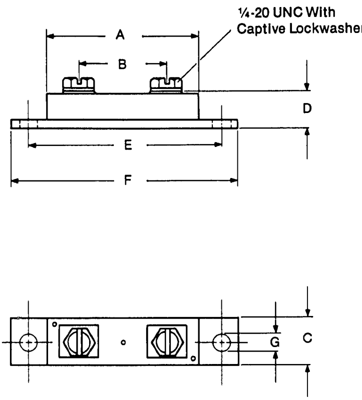


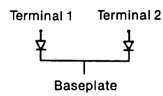
Figure 5
Maximum forward power dissipation



- Guard Ring Reverse Protection
- Center Tap
- 50 Volts V_{RRM} / V_{RWM}
- 200 Amperes
- 175 °C Junction Temperature
- Reverse Avalanche Tested



Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	2.45	----	62.23	
B	1.35	1.40	34.29	35.56	
C	.70	.80	17.78	20.32	
D	----	.625	----	15.88	
E	3.14	3.16	79.76	80.26	
F	----	3.65	----	92.71	
G	.28	.30	7.14	7.67	



Catalog Number	Pro Electron Number	Working Peak Reverse Voltage V_{RWM}	Rep. Peak Reverse Voltage V_{RRM}
FST20035	BYS97-35	35	35
FST20040	BYS97-40	40	40
FST20045	BYS97-45	45	45
FST20050	BYS97-50	50	50

Electrical characteristics

Average forward current per pkg	$I_{F(AV)}$	200 Amps	$T_C = 131\,°C$
Average forward current per leg	$I_{F(AV)}$	100 Amps	$T_C = 135\,°C$
Maximum surge current per leg	I_{FSM}	2000 Amps	8.3 ms, half sine, $T_J = 175\,°C$
Maximum repetitive peak reverse current per leg	$I_{R(OV)}$	2 Amps	f = I KHz, 25° 1 μsec square wave
Maximum peak forward voltage per leg	V_{FM}	0.8 volts	$I_{FM} = 200A$: $T_J = 25\,°C$*
Maximum peak forward voltage per leg	V_{FM}	0.6 volts	$I_{FM} = 200A$: $T_J = 175\,°C$*
Maximum peak reverse current per leg	I_{RM}	120mA	V_{RRM}, $T_C = 125\,°C$*
Typical Reverse current, per leg	I_{RM}	6mA	V_{RRM}, $T_J = 25\,°C$*
Typical junction capacitance	C_J	4600pF	$V_R = 5.0V$, $T_C = 25\,°C$

Thermal Characteristics

Storage temp range	T_{stg}	− 40 °C to + 175 °C	
Operating junction temp range	T_J	− 40 °C to + 175 °C	
Maximum thermal resistance per leg,	$R_{\Theta JC}$	.50 °C/W	Junction to case
per package,		.30 °C/W	
Typical thermal resistance	$R_{\Theta CS}$	.04 °C/W	Case to sink

Mechanical Characteristics

Weight	3.4 ounce (95 grams) typical
Dimensions	In accordance with JEDEC TO-244 outline

*Pulse test: Pulse width 300μsec, Duty cycle 2%

Figure 1
Maximum forward characteristics

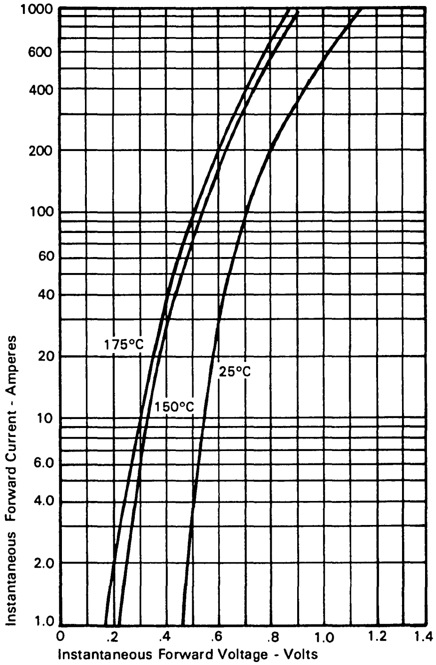


Figure 2
Forward current derating

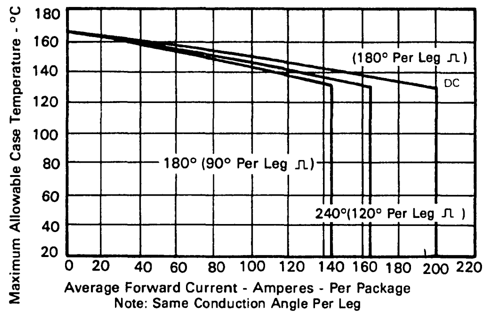


Figure 3
Typical junction capacitance

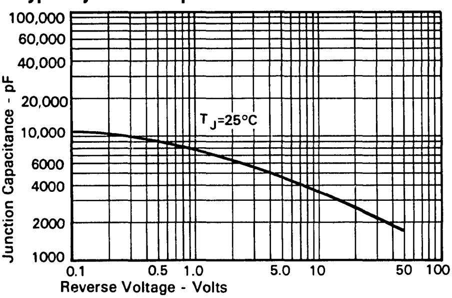


Figure 4
Typical reverse characteristics

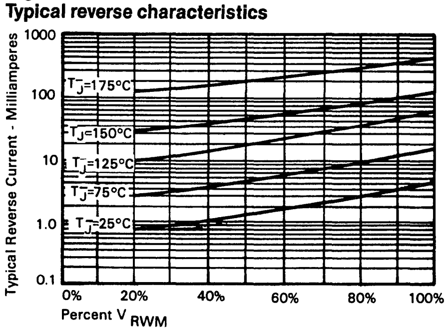
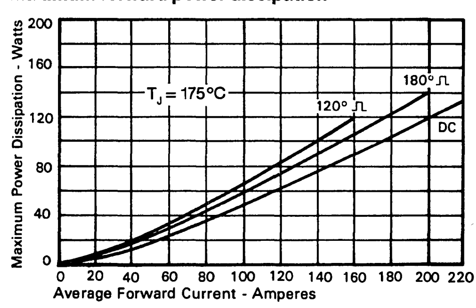


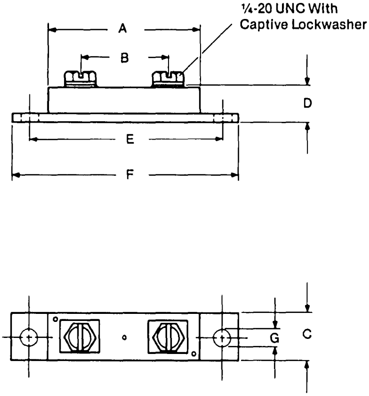
Figure 5
Maximum forward power dissipation



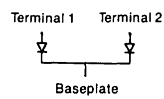
Schottky PowerMod

FST 300
BYS 93

- Guard Ring Reverse Protection
- Center Tap
- 50 Volts V_{RRM} / V_{RWM}
- 300 Amperes
- 175 °C Junction Temperature
- Reverse Avalanche Tested



Dim.	Inches Minimum	Inches Maximum	Millimeter Minimum	Millimeter Maximum	Notes
A	----	2.45	----	62.23	
B	1.35	1.40	34.29	35.56	
C	.70	.80	17.78	20.32	
D	----	.625	----	15.88	
E	3.14	3.16	79.76	80.26	
F	----	3.65	----	92.71	
G	.28	.30	7.14	7.67	



Catalog Number	Pro Electron Number	Working Peak Reverse Voltage V_{RWM}	Rep. Peak Reverse Voltage V_{RRM}
FST30035	BYS93-35	35	35
FST30040	BYS93-40	40	40
FST30045	BYS93-45	45	45
FST30050	BYS93-50	50	50

Electrical characteristics

Average forward current per pkg	$I_{F(AV)}$	300 Amps	$T_C = 113\,°C$
Average forward current per leg	$I_{F(AV)}$	150 Amps	$T_C = 122\,°C$
Maximum surge current per leg	I_{FSM}	2000 Amps	8.3 ms, half sine, $T_J = 175\,°C$
Maximum repetitive peak reverse current per leg	$I_{R(OV)}$	2 Amps	f = I KHz, 25° 1 μsec square wave
Maximum peak forward voltage per leg	V_{FM}	0.78 volts	$I_{FM} = 300A$; $T_J = 125\,°C$*
Maximum peak forward voltage per leg	V_{FM}	0.78 volts	$I_{FM} = 200A$: $T_J = 25\,°C$*
Maximum peak reverse current per leg	I_{RM}	120mA	V_{RRM}, $T_C = 125\,°C$*
Typical Reverse current, per leg	I_{RM}	6mA	V_{RRM}, $T_J = 25\,°C$*
Typical junction capacitance	C_J	4600pF	$V_R = 5.0V$, $T_C = 25\,°C$

Thermal Characteristics

Storage temp range	T_{stg}	− 40 °C to + 175 °C	
Operating junction temp range	T_J	− 40 °C to + 175 °C	
Maximum thermal resistance per leg,	$R_{\Theta JC}$	.45 °C/W	Junction to case
per package,		.27 °C/W	
Typical thermal resistance	$R_{\Theta CS}$	.04 °C/W	Case to sink

Mechanical Characteristics

Weight	3.4 ounce (95 grams) typical
Dimensions	In accordance with JEDEC TO-244 outline

*Pulse test: Pulse width 300 μsec, Duty cycle 2%

Figure 1
Maximum forward characteristics

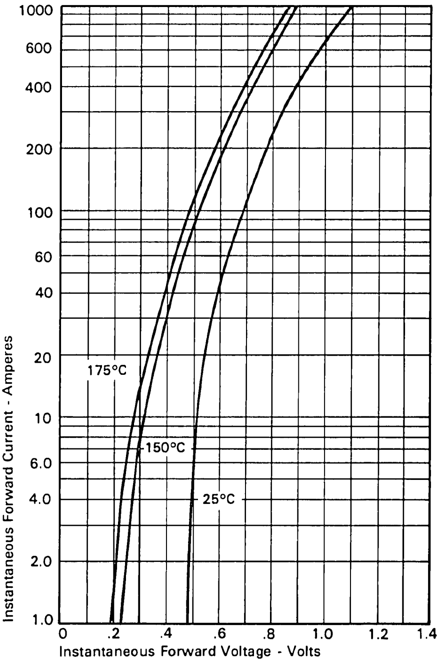
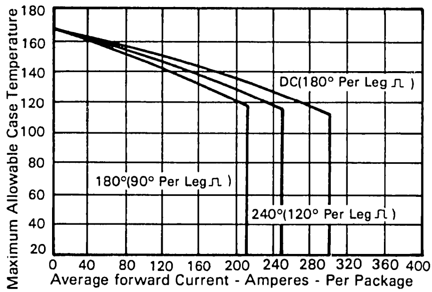


Figure 2
Forward current derating



Note: Same conduction angle per leg

Figure 3
Typical junction capacitance

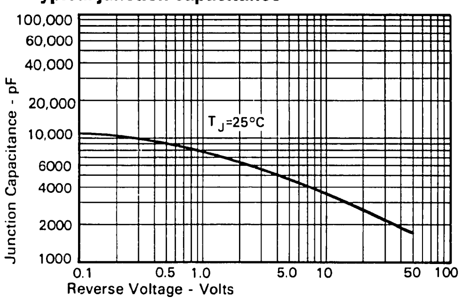


Figure 4
Typical reverse characteristics

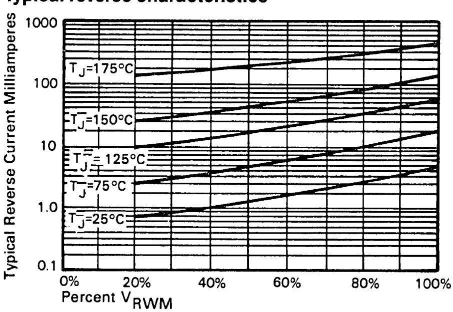
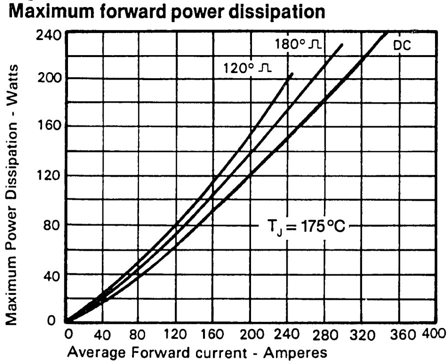


Figure 5
Maximum forward power dissipation

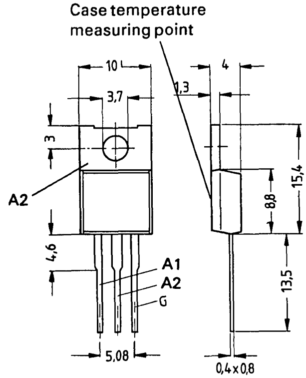


TO-220 Triacs

Triacs for 400 to 800 V peak off-state voltage and maximum rms on-state currents of 4A and 6 A

Application	Mainly for ac power controllers in power supply units and devices of the consumer electronics, e.g. for motor controls, brightness controls and electronical switches.	
Case	Plastic case TO 220 AB, the anode is connected to the mounting flange.	
Associated parts	Matching plate	C67067-A9000-C 166
	Mica washer	C67067-A9000-C 165
System	Silicon, fully diffused, glass passivated	

A1 anode 1
A2 anode 2 (case)
G gate



Dimensions in mm

Type	Maximum repetitive peak off-state or reverse voltage V_{DRM}, V_{RRM}	Maximum rms on-state current I_{TRMS}	Minimum gate trigger current I_{GT} Polarity to terminal A1: A2 + , G +	A2 + , G-	A2; G-	A2; G +	Minimum holding current I_H
TX C10K40	400V	4A	50mA	50mA	50mA	—	50mA
TX C10K40M		6A	50mA	50mA	50mA	—	50mA
TX C10K50	500V	4A	50mA	50mA	50mA	—	50mA
TX C10K50M		6A	50mA	50mA	50mA	—	50mA
TX C10H60	600V	4A	25mA	25mA	25mA	50mA	25mA
TX C10K60			50mA	50mA	50mA	—	50mA
TX C10L60			75mA	75mA	75mA	—	75mA
TX C10H60M		6A	25mA	25mA	25mA	50mA	25mA
TX C10K60M			50mA	50mA	50mA	—	50mA
TX C10L60M			75mA	75mA	75mA	—	75mA
TX C10H70	700V	4A	25mA	25mA	25mA	50mA	25mA
TX C10K70			50mA	50mA	50mA	—	50mA
TX C10L70			75mA	75mA	75mA	—	75mA
TX C10H70M		6A	25mA	25mA	25mA	50mA	25mA
TX C10K70M			50mA	50mA	50mA	—	50mA
TX C10L70M			75mA	75mA	75mA	—	75mA
TX C10K80	800V	4A	50mA	50mA	50mA	—	50mA
TX C10K80M		6A	50mA	50mA	50mA	—	50mA

Main circuit limit values		Type TXC 10...	TXC 10...M	Secondary conditions
Maximum continuous off-state or reverse blocking current	I_D, I_R	0.4 mA		ϑ_j = 115°C, at V_{DRM}, V_{RRM}
Maximum on-state voltage in both directions	V_T	3.53 V	2.36 V	ϑ_j = 25°C, $i_T = 3\,I_{TRMS(I)}$
Threshold voltage	$V_{(TO)}$	2.04 V	1.32 V	Equivalent straight line for loss calculation, ϑ_j = 115°C
Slope resistance	r_T	115 mΩ	57 mΩ	
Maximum rms on-state current	$I_{TRMS(I)}$	4 A	6 A	ϑ_c = 90°C
Single cycle surge current sine wave 50 Hz	$I_{TSM(I)}$	40 A	55 A	ϑ_j = 25°C
i^2t value (loading in one direction)	$\int i^2 dt$	8 A²s	15 A²s	ϑ_j = 25°C, t = 10 ms

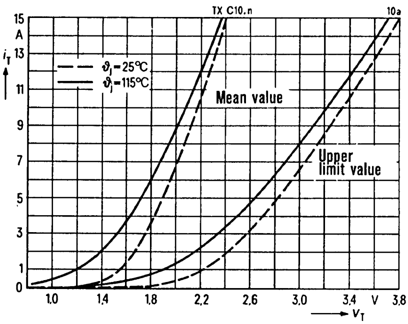
Gate circuit limit values			
Minimum gate trigger current	I_{GT}	see table	ϑ_j = 25°C, $V_{A1A2} \geqq 12$ V
Minimum gate trigger voltage in both directions	V_{GT}	2 V	ϑ_j = 25°C, $V_{A1A2} \geqq 12$ V
Temperature dependence of the gate trigger voltage	α_{VGT}	−3 mV/K (typ.)	ϑ_j = −40 to 115°C
Maximum gate non-trigger voltage in both directions	V_{GD}	0.2 V	ϑ_j = 115°C, 0.5 V_{DRM} or 0.5 V_{RRM}
Maximum permissible positive and negative gate current	I_{GM}	3 A	Peak value, $t_p \leqq 10\,\mu s$

Dynamic values, switching behavior			
Minimum holding current in both directions	I_H	see table	ϑ_j = 25°C, V_{A1A2} = 12 V
Critical rate of rise of on-state current in both directions	$(di/dt)_{cr}$	20 A/µs	ϑ_j = 115°C
Critical rate of rise of off-state voltage in both directions	$(dv/dt)_{cr}$	20 V/µs	ϑ_j = 115°C, $V_{max.}$ = 0.67 V_{DRM} or V_{RRM}
Critical rate of rise of off-state voltage following commutation in both directions	$(dv/dt)_{crq}$	5 V/µs	ϑ_j = 115°C, $V_{max.}$ = 0.67 V_{DRM} or V_{RRM} $(di/dt)_q$ = 0.53 $I_{TRMS(I)}$ A/ms

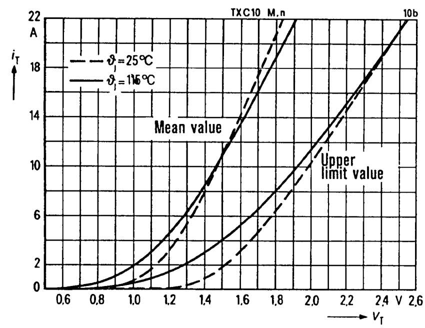
Thermal values			
Maximum continuously permissible junction temperature	$\vartheta_{j(I)}$	+115°C	
Operating temperature range	ϑ_j	−40 to +115°C	
Storage temperature range	ϑ_s	−40 to +150°C	
Thermal resistance	R_{thJC}	2.7 K/W	Loading with sinusoidal current, 360° angle of current flow and f = 40 Hz to 60 Hz

Mechanical values		
Leakage path	approx. 2 mm	Anode 1 – anode 2
Weight	approx. 2 g	
Vibration resistance	10 g	At 50 Hz, without heat sink
Humidity category	F	In accordance with DIN 40 040

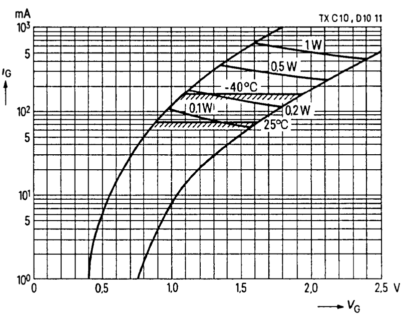
On-state characteristic curves, TX C 10...



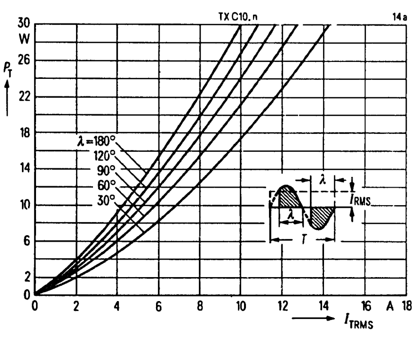
On-state characteristic curves, TX C 10... M



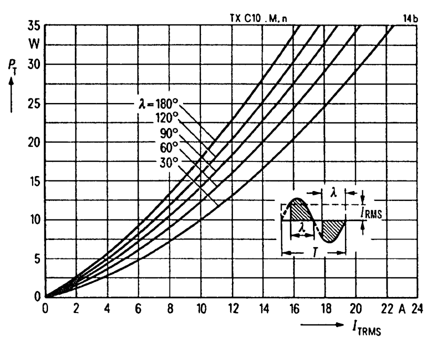
Input characteristic curves, triggering ranges and curves of constant power dissipation



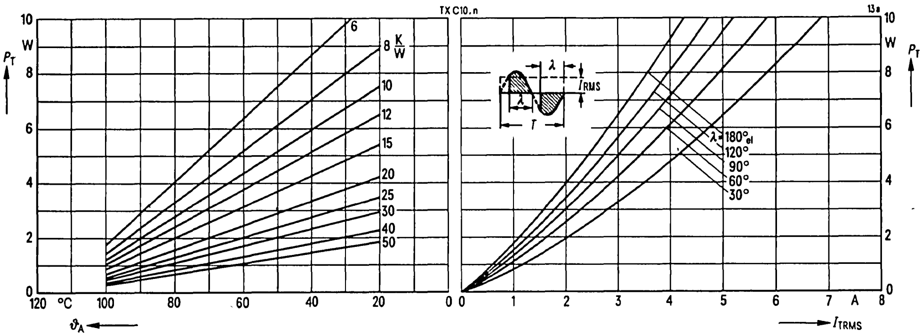
On-state power dissipation characteristic curves (overcurrent range), mains operation 40 to 60 Hz, **TX C 10...**



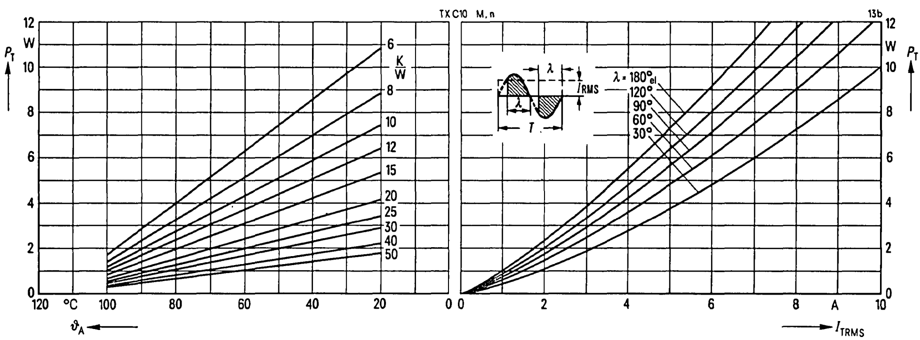
On-state power dissipation characteristic curves (overcurrent range), mains operation 40 to 60 Hz, **TX C 10... M**



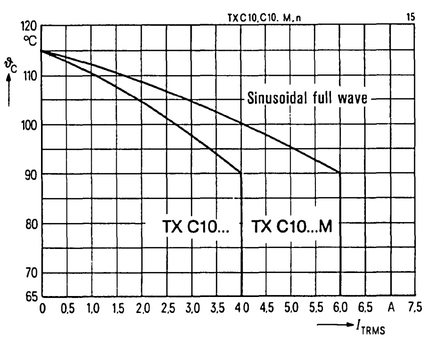
On-state power dissipation characteristic curves, TX C 10...,
nomogram for determination of max. rms on-state currents (limit values) for various cooling conditions, mains operation 40 to 60 Hz



On-state power dissipation characteristic curves, TX C 10... M,
nomogram for determination of max. rms on-state currents (limit values) for various cooling conditions, mains operation 40 to 60 Hz



Permissible case temperature ϑ_c
versus on-state current,
mains operation 40 to 60 Hz



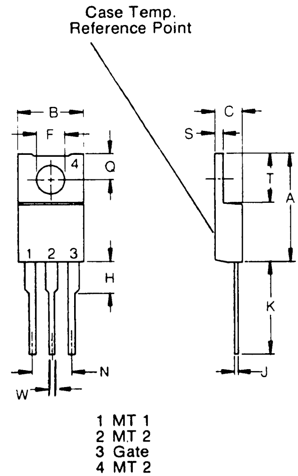
Triac

8 AMPS RMS; V_{DRM} up to 800 Volts

Series 2N6343 2N6344 2N6345

- 8 Amperes RMS
- Blocking voltage up to 800 volts
- Glass passivated chip for maximum reliability

Dim.	Inches		Millimeter	
	Minimum	Maximum	Minimum	Maximum
A	0.560	0.625	14.23	15.87
B	0.380	0.420	9.66	10.66
C	0.140	0.190	3.56	4.82
F	0.139	0.147	3.531	3.733
H	----	0.250	----	6.35
J	0.014	0.022	0.35	0.56
K	0.500	0.502	12.70	14.27
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
S	0.020	0.055	0.51	1.39
T	0.230	0.270	5.85	6.85
W	0.027	0.035	0.68	0.89



TO-220AB

Catalog Number	Rep. Peak Off-State Voltage. V_{DRM} V_{RRM} (Volts)
2N6343	400
2N6344	600
2N6345	800

Electrical Characteristics

On State			
Max. RMS on-state current	$I_{T(RMS)}$	8 Amps	$T_c = 90\,°C$ all conduction angles
Max. peak one cycle non-repetitive surge current	I_{TSM}	100 Amps	one cycle, 60HZ, T_J max $= 100\,°C$
Max. I^2t capability for fusing	I^2t	40A²S	
Switching			
Max. peak on-state voltage	V_{TM}	1.55 Volts	I_{TM} = 11A peak either direction, 25 °C
Max. thermal resistance	$R\Theta_{JC}$	2.2 °C/W	DC, junction to case
Max. holding current	I_H	40mA	25 °C, V supply = 12V
Max. holding current	I_H	75mA	-40 °C, V supply = 12V
Thermal values			
Operating junction temp range	T_J	− 40 °C to + 100 °C	
Storage temperature range	T_{stg}	− 40 °C to + 150 °C	
Off State			
Max. leakage current	I_{DRM}	2 mA	T_J = 100 °C and V_{DRM}
Critical rate of rise of commutation voltage	dv/dt	5v/μSec.	T_J = 80 °C, Vmax = .67 V_{DRM}
Triggering			
Max. peak gate current	I_{GM}	2.0A	positive or negative gate current, tp = 10μSec.
Max. required DC gate current	I_{GT}	50mA	MT2 +, G +
to trigger 25 °C, $V_D \geq 12$V		75mA	MT2 +, G-
Note 1		50mA	MT2-, G-
		75mA	MT2-, G +
Max. required DC gate voltage to trigger (note 1)	V_{GT}	2.5volts	25 °C, $V_D \geq 12$V
Min. required DC gate voltage to trigger (note 2)	V_{GD}	0.2 volts	115 °C, 0.5V_{DRM}, or 0.5V_{RRM}

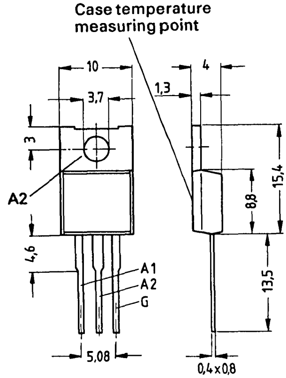
Note 1 — Max. required gate trigger current (or voltage) is the lowest value which will trigger all units under the conditions shown.

Note 2 — Min. required gate trigger voltage is the value below which no unit will trigger with rated V_{DRM} principal voltage.

Triacs for 400 to 800 V peak off-state voltage and maximum rms on-state currents of 8A and 12A

Application	Mainly for ac power controllers in power supply units and devices of the consumer electronics, e.g. for motor controls, brightness controls and electronical switches.
Case	Plastic case TO 220 AB, the anode is connected to the mounting flange.
Associated parts	Matching plate C67067-A9000-C 166 Mica washer C67067-A9000-C 165
System	Silicon, fully diffused, glass passivated

A1 anode 1
A2 anode 2 (case)
G gate

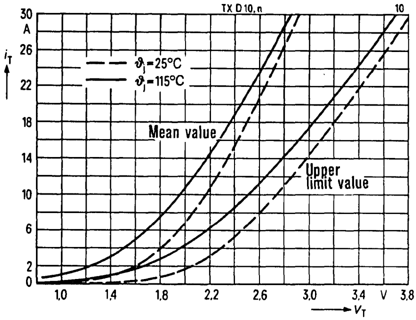


Dimensions in mm

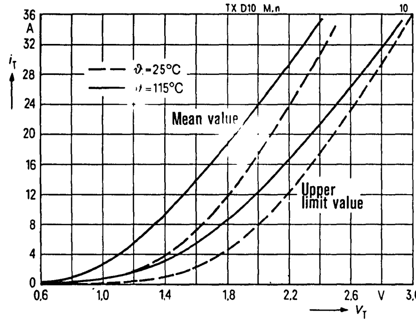
Type	Maximum repetitive peak off-state or reverse voltage V_{DRM}, V_{RRM}	Maximum rms on-state current I_{TRMS}	Minimum gate trigger current I_{GT} Polarity to terminal A1 A2+, G+	A2+, G−	A2−, G−	A2−, G+	Minimum holding current I_H
TX D10K40 TX D10L40	400V	8A	50mA 75mA	50mA 75mA	50mA 75mA	— —	50mA 75mA
TX D10K40M TX D10L40M		10A	50mA 75mA	50mA 75mA	50mA 75mA	— —	50mA 75mA
TX D10K40P TX D10L40P		12A	50mA 75mA	50mA 75mA	50mA 75mA	— —	50mA 75mA
TX D10K50	500V	8A	50mA	50mA	50mA	—	50mA
TX D10K50M		10A	50mA	50mA	50mA	—	50mA
TX D10K50P		12A	50mA	50mA	50mA	—	50mA
TX D10H60 TX D10K60 TX D10L60	600V	8A	25mA 50mA 75mA	25mA 50mA 75mA	25mA 50mA 75mA	50mA — —	25mA 50mA 75mA
TX D10H60M TX D10K60M TX D10L60M		10A	25mA 50mA 75mA	25mA 50mA 75mA	25mA 50mA 75mA	50mA — —	25mA 50mA 75mA
TX D10H60P TX D10K60P TX D10L60P		12A	25mA 50mA 75mA	25mA 50mA 75mA	25mA 50mA 75mA	50mA — —	25mA 50mA 75mA
TX D10H70 TX D10K70 TX D10L70	700V	8A	25mA 50mA 75mA	25mA 50mA 75mA	25mA 50mA 75mA	50mA — —	25mA 50mA 75mA
TX D10H70M TX D10K70M TX D10L70M		10A	25mA 50mA 75mA	25mA 50mA 75mA	25mA 50mA 75mA	50mA — —	25mA 50mA 75mA
TX D10H70P TX D10K70P TX D10L70P		12A	25mA 50mA 75mA	25mA 50mA 75mA	25mA 50mA 75mA	50mA — —	25mA 50mA 75mA
TX D10K80	800V	8A	50mA	50mA	50mA	—	50mA
TX D10K80M		10A	50mA	50mA	50mA	—	50mA
TX D10K80P		12A	50mA	50mA	50mA	—	50mA

Main circuit limit values	Type TX D10..		D10 ...M	D10 ...P	Secondary conditions
Maximum continuous off-state or reverse blocking current	I_D, I_R		0.4 mA		$\vartheta_j = 115°C$, at V_{DRM}, V_{RRM}
Maximum on-state voltage in both directions	U_T	3.52 V	–	–	$\vartheta_j = 25°C$, $i_T = 24$ A
		–	2.82 V	–	$i_T = 30$ A
		–	–	2.5 V	$i_T = 36$ A
Threshold voltage	$V_{(TO)}$	1.85 V	1.45 V	1.1 V	Equivalent straight line for loss calculation, $\vartheta_j = 115°C$
Slope resistance	r_T	64 mΩ	43 mΩ	38 mΩ	
Maximum rms on-state current	$I_{TRMS(I)}$	8 A	10 A	12 A	$\vartheta_c = 80°C$
Single cycle surge current sine wave 50 Hz	$I_{TSM(I)}$	80 A	90 A	100 A	$\vartheta_j = 25°C$
i^2t value (loading in one direction)	$\int i^2 dt$	32 A^2s	40 A^2s	50 A^2s	$\vartheta_j = 25°C$, $t = 10$ ms
Gate circuit limit values					
Minimum gate trigger current	I_{GT}		see table		$\vartheta_j = 25°C$, $V_{A1A2} \geqq 12$ V
Minimum gate trigger voltage in both directions	V_{GT}		2 V		$\vartheta_j = 25°C$, $V_{A1A2} \geqq 12$ V
Temperature dependency of the gate trigger voltage	α_{VGT}		−3 mV/K (typ.)		$\vartheta_j = -40$ to $+115°C$
Maximum gate non-trigger voltage in both directions	V_{GD}		0.2 V		$\vartheta_j = 115°C$, 0.5 V_{DRM} or 0.5 V_{RRM}
Maximum permissible positive and negative gate current	I_{GM}		3 A		Peak value, $t_p \leqq 10\ \mu s$
Dynamic values, switching behavior					
Minimum holding current in both directions	I_H		see table		$\vartheta_j = 25°C$, $V_{A1A2} = 12$ V
Critical rate of rise of on-state current in both directions	$(di/dt)_{cr}$		20 A/µs		$\vartheta_j = 115°C$
Critical rate of rise of off-state voltage in both directions	$(dv/dt)_{cr}$		20 V/µs		$\vartheta_j = 115°C$, $V_{max.} = 0.67\ V_{DRM}$ or V_{RRM}
Critical rate of rise of off-state voltage following commutation in both directions	$(dv/dt)_{crq}$		5 V/µs		$\vartheta_j = 115°C$, $V_{max.} = 0.67\ V_{DRM}$ $(di/dt)_q = 0.53\ I_{TRMS(I)}$ A/ms
Thermal values					
Maximum continuously permissible junction temperature	$\vartheta_{j(I)}$		115°C		
Operating temperature range	ϑ_j		−40 to +115°C		
Storage temperature range	ϑ_s		−40 to +150°C		
Thermal resistance	R_{thJC}		2.0 K/W		Loading with sinusoidal current, 360° angle of current flow and $f = 40$ Hz to 60 Hz
Mechanical values					
Leakage path			approx. 2 mm		Anode 1 – anode 2
Weight			approx. 2 g		
Vibration resistance			10 *g*		At 50 Hz, without heat sink
Humidity category			F		In accordance with DIN 40040

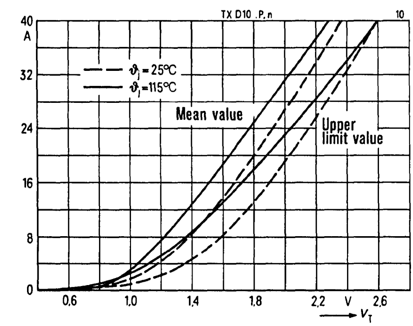
On-state characteristic curves, TX D 10...



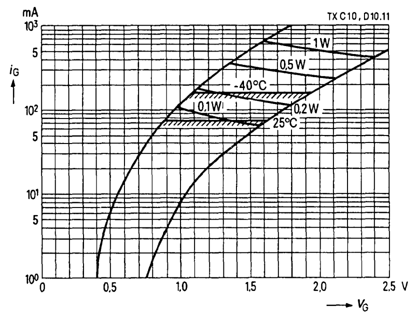
On-state characteristic curves, TX D 10... M



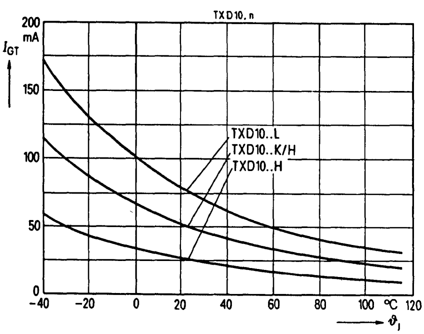
On-state characteristic curves, TX D 10... P



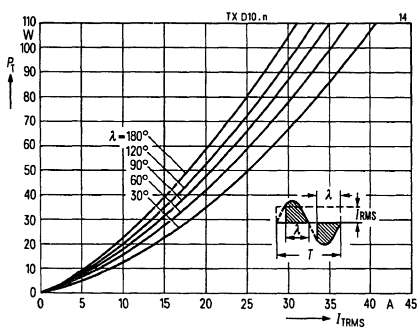
Input characteristic curves, triggering ranges and curves of constant power dissipation



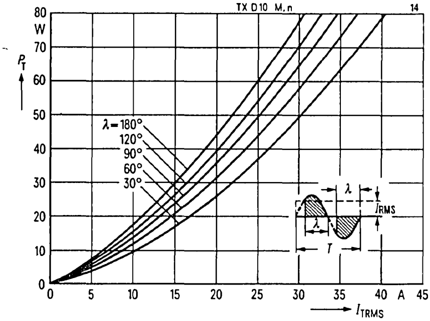
Temperature dependency of the gate trigger currents



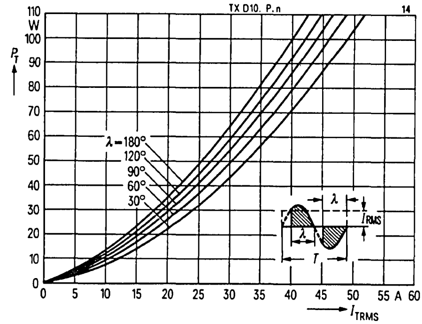
On-state power dissipation characteristic curves (overcurrent range), mains operation 40 to 60 Hz, TX D 10...



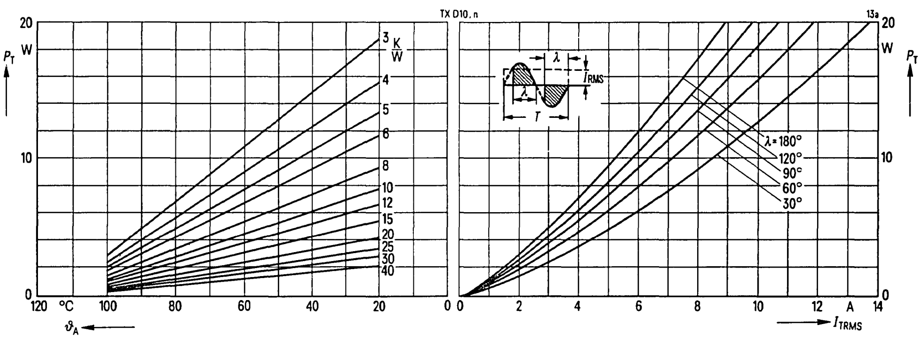
On-state power dissipation characteristic curves (overcurrent range), mains operation 40 to 60 Hz, **TX D 10 . . . M**



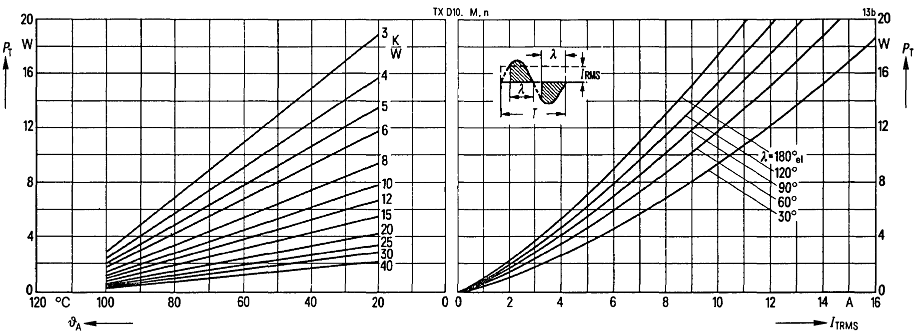
On-state power dissipation characteristic curves (overcurrent range), mains operation 40 to 60 Hz, **TX D 10 . . . P**



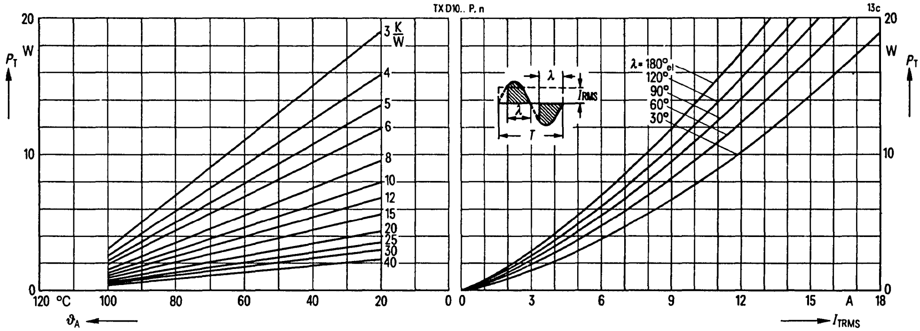
On-state power dissipation characteristic curves, TX D 10 . . .,
nomogram for determination of max. rms on-state currents (limit values) for various cooling conditions, mains operation 40 to 60 Hz



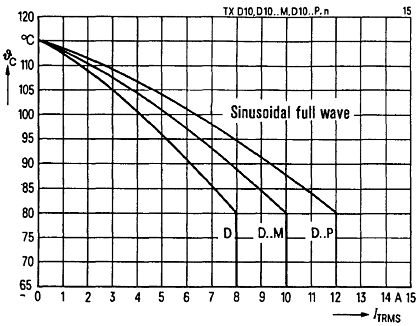
On-state power dissipation characteristic curves, TX D 10 . . . M
nomogram for determination of max. rms on-state currents (limit values) for various cooling conditions, mains operation 40 to 60 Hz



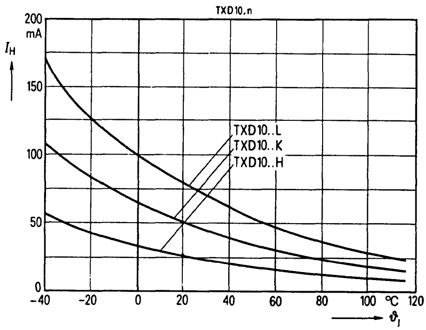
On-state power dissipation characteristic curves, TX D 10 . . . P,
nomogram for determination of max. rms on-state currents (limit values) for various cooling conditions, mains operation 40 to 60 Hz



Permissible case temperature ϑ_C
versus on-state current,
mains operation 40 to 60 Hz



Temperature dependency of the holding currents



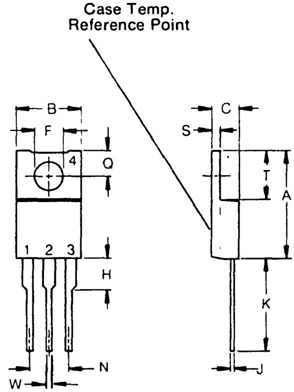
Triac

12 AMPS RMS; V_{DRM} up to 800 Volts

Series 2N6343A 2N6344A 2N6345A

- 12 Amperes RMS
- Blocking voltage up to 800 volts
- Glass passivated chip for maximum reliability

Dim.	Inches		Millimeter	
	Minimum	Maximum	Minimum	Maximum
A	0.560	0.625	14.23	15.87
B	0.380	0.420	9.66	10.66
C	0.140	0.190	3.56	4.82
F	0.139	0.147	3.531	3.733
H	----	0.250	----	6.35
J	0.014	0.022	0.35	0.56
K	0.500	0.502	12.70	14.27
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
S	0.020	0.055	0.51	1.39
T	0.230	0.270	5.85	6.85
W	0.027	0.035	0.68	0.89



1 MT 1
2 MT 2
3 Gate
4 MT 2

TO-220AB

Catalog Number	Rep. Peak Off-State Voltage. V_{DRM} V_{RRM} (Volts)
2N6343A	400
2N6344A	600
2N6345A	800

Electrical Characteristics

On State			
Max. RMS on-state current	$I_{T(RMS)}$	12 Amps	$T_c = 80\,°C$
Max. peak one cycle 60HZ non-repetitive surge current	I_{TSM}	120 Amps	T_J max $= 100\,°C$
Max. I^2t capability for fusing	I^2t	$59A^2S$	
Switching			
Max. peak on-state voltage	V_{TM}	1.75 Volts	I_{TM} = 17 Amps
Max. thermal resistance	$R\Theta_{JC}$	2.0 °C/W	
Max. holding current	I_H	40mA	I_T = 200mA, V supply = 12V
Max. holding current	I_H	75mA	-40 °C, I_T = 200mA, V supply = 12V
Thermal values			
Operating junction temp range	T_J	-40 °C to + 110 °C	
Storage temperature range	T_{stg}	-40 °C to + 150 °C	
Off State			
Max. leakage current	I_{DRM}	2 mA	T_J = 110 °C
Critical rate of rise of commutation voltage	dv/dt	5v/μSec.	T_J = 25 °C, Vmax = .67 V_{DRM}
Triggering			
Max. peak gate current	I_{GM}	2.0A	positive or negative gate current, tp = 10μSec.
Max. required DC gate current to trigger 25 °C, $V_D \geq 12V$ Note 1	I_{GT}	50mA	MT2 +, G +
		75mA	MT2 +, G-
		50mA	MT2-, G-
		75mA	MT2-, G +
Max. required DC gate voltage to trigger (note 1)	V_{GT}	2.5volts	25 °C, $V_D \geq 12V$
Min. required DC gate voltage to trigger (note 2)	V_{GD}	0.2 volts	115 °C, 0.5 V_{DRM}, or 0.5 V_{RRM}

Note 1 — Max. required gate trigger current (or voltage) is the lowest value which will trigger all units under the conditions shown.

SCR's, Phase Control

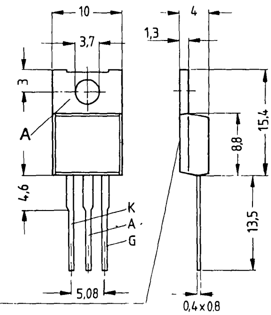
Thyristors with short turn-off time for 400 V to 750 V; maximum mean on-state current (limit value) 2.5 A

Application: Deflection circuits in television receivers, regulation and control circuits in industrial and household electronics

Case: Plastic case TO 220 AB, the anode is connected to the mounting flange

Associated parts: Matching plate C67067-A9000-C 166
Mica washer C67067-A9000-C 165

System: Silicon, fully diffused, glass passivated



Case temperature measuring point

Dimensions in mm

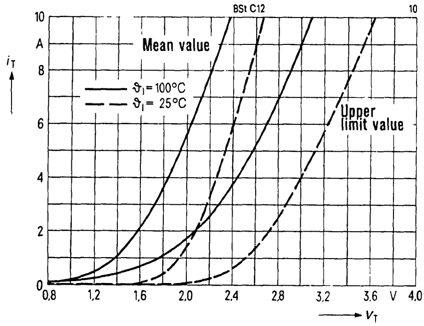
Type	Ordering code	Maximum repetitive peak off-state or reverse voltage V_{DRM}, V_{RRM}	Maximum gate trigger current $V_D = 6$ V $\vartheta_j = 25°$C I_{GT}	$\vartheta_j = -40°$C	Maximum holding current $\vartheta_j = 25°$C I_H	Critical rate of rise of off-state voltage 0.67 V_{DRM} $\vartheta_j = 100°$C $(dv/dt)_{cr}$
BSt C 1226	C67048-A1428-A2	400 V				
BSt C 1233	C67048-A1428-A3	500 V				
BSt C 1240	C67048-A1428-A4	600 V	50 mA	90 mA	100 mA	100 V/µs
BSt C 1246	C67048-A1428-A5	700 V				
BSt C 1250	C67048-A1428-A7	750 V				

Max. mean on-state currents $I_{TAV(I)}$ or max. rms on-state currents $I_{TRMS(I)}$ for mains operation 40 to 60 Hz

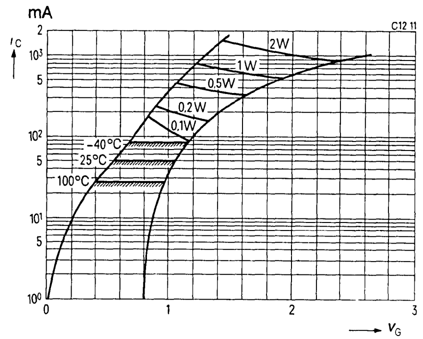
Mounting	Case temperature	I_{TAV} λ = 180°	I_{TAV} 180°	I_{TAV} 120°	I_{TAV} 60°	I_{TRMS} 180°
Chassis mounting	$\vartheta_c = 80°$C	2.5 A	2.1 A	1.75 A	1.2 A	4 A

Main circuit limit values			Secondary conditions
Maximum continuous off-state or reverse blocking current	I_D, I_R	1 mA	$\vartheta_j = 100°C$, at V_{DRM}, V_{RRM}
Maximum on-state voltage	V_T	3.4 V	$\vartheta_j = 25°C$, $i_T = 7.5$ A
Threshold voltage	$V_{(TO)}$	1.85 V	Equivalent straight line for loss calculation, $\vartheta_j = 100°C$
Slope resistance	r_T	134 mΩ	
Maximum mean on-state current	$I_{TAV(I)}$	2.5 A	$\vartheta_c = 80°C$, sinusoidal current, $\lambda = 180°$
Maximum rms on-state current	$I_{TRMS(I)}$	4 A	
Surge on-state current	$I_{TSM(I)}$	50 A 35 A	$\vartheta_j = 25°C$ $\vartheta_j = 100°C$ Sinusoidal half wave $f = 50$ Hz, $V_R = 0$ V
i^2t value	$\int i^2 dt$	12.5 A²s 6 A²s	$\vartheta_j = 25°C$ $\vartheta_j = 100°C$ $t = 10$ ms, $V_R = 0$ V
Gate circuit limit values			
Maximum gate trigger current	I_{GT}	50 mA	$\vartheta_j = 25°C$, $V_D \geqq 6$ V
Maximum gate trigger voltage	V_{GT}	2 V	$\vartheta_j = 25°C$
Temperature dependency of the gate trigger voltage	α_{VGT}	−2.7 mV/K	$\vartheta_j = -40°C$ to $+100°C$
Maximum gate non-trigger voltage	V_{GD}	0.2 V	$\vartheta_j = 100°C$, 0.5 V_{DRM}
Maximum permissible gate current	I_{GM}	3 A	Peak value, $t_p \leqq 10$ µs
Maximum negative gate voltage	V_{GRM}	10 V	Peak value
Dynamic values, switching behavior			
Maximum holding current	I_H	100 mA	$\vartheta_j = 25°C$, $V_D = 6$ V
Latching current	I_{LAT}	200 mA	$\vartheta_j = 25°C$, $t_{gt} \geqq 100$ µs, $I_G \geqq 5\,I_{GT}$
Delay time	t_{gd}	1.5 µs	$\vartheta_j = 25°C$, $I_G = 250$ mA, $di_G/dt = 1$ A/µs
Critical rate of rise of on-state current	$(di/dt)_{cr}$	100 A/µs	$\vartheta_j = 100°C$, 0.67 V_{DRM}, $di_G/dt = 1$ A/µs
Critical rate of rise of off-state voltage	$(dv/dt)_{cr}$	100 V/µs	$\vartheta_j = 100°C$, 0.67 V_{DRM}
Turn-off time	t_q	20 µs	$\vartheta_j = 100°C$, $V_R \geqq 100$ V
Thermal values			
Maximum continuously permissible junction temperature	$\vartheta_{j(I)}$	100°C	
Operating temperature range	ϑ_j	−40 to +100°C	
Storage temperature range	ϑ_s	−40 to +150°C	
Thermal resistance for constant current	R_{thJC}	2.6 K/W	Calculated value
Mechanical values			
Leakage path		approx. 2 mm	Anode – cathode
Weight		2 g	
Vibration resistance		10 g	At 50 Hz, without heat sink
Humidity category		F	In accordance with DIN 40 040

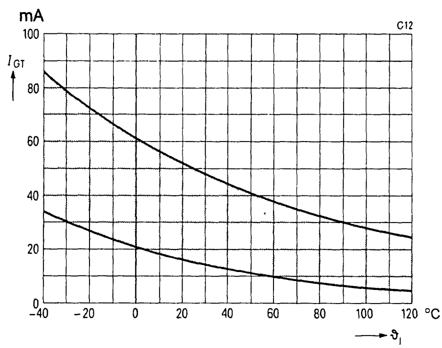
On-state characteristic curves



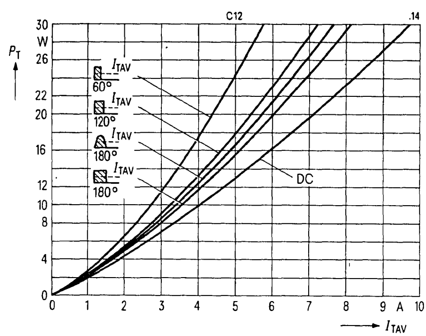
Input characteristic curves, triggering ranges and curves of constant power dissipation



Temperature dependency of the gate trigger currents (spread)

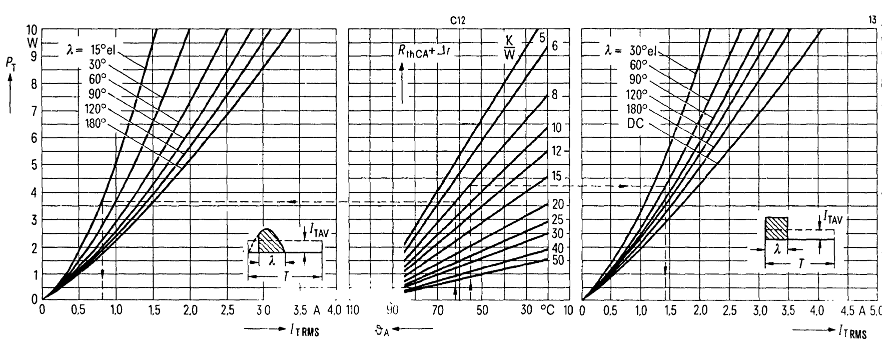


On-state power dissipation characteristic curves (overcurrent range), mains operation 40 to 60 Hz

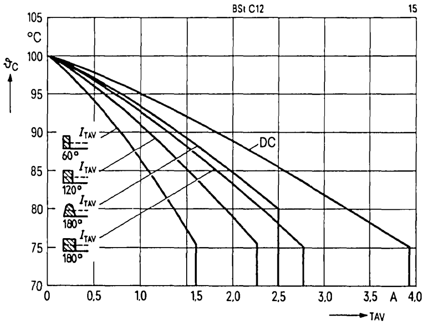


On-state power dissipation characteristic curves,

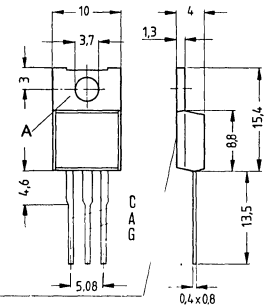
diagram for determination of max. mean on-state currents (limit values) for various cooling conditions, mains operation 40 to 60 Hz



Permissible case temperature
versus on-state current,
mains operation 40 to 60 Hz



Thyristors in plastic cases for 400 to 800 V;
maximum mean on-state current (limit value) 4 A and 6 A



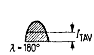
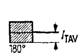
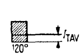
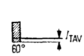
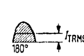
Dimensions in mm

Case temperature measuring point

Application	Mainly for mains-commutated converters of all types, e.g. motor controls, switch applications, regulation and control circuits for industrial and household electronics
Case	Plastic case TO 220 AB, the anode is connected to the mounting flange
Associated parts	Matching plate C67067-A9000-C 166
	Mica washer C67067-A9000-C 165
System	Silicon, fully diffused, glass passivated

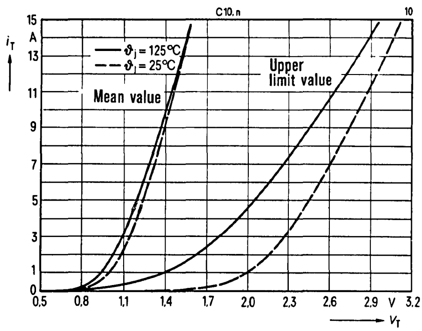
Type	Ordering code	Maximum repetitive peak off-state or reverse voltage V_{DRM}, V_{RRM}	Maximum mean on-state current $I_{TAV(l)}$	Maximum gate trigger current $V_D \geqq 6\,V$ $\vartheta_j = 25°C$ I_{GT}	Maximum holding current I_H	Latching current I_{LAT}	Critical rate of rise of off-state voltage $(dv/dt)_{cr}$
BSt C 10 26	C66048-A1425-A 2	400 V	4 A	25 mA	80 mA	160 mA	50 V/µs
BSt C 10 26 M	C66048-A1425-A 3		6 A	25 mA	80 mA	160 mA	50 V/µs
BSt C 10 33	C66048-A1425-A 4	500 V	4 A	25 mA	80 mA	160 mA	50 V/µs
BSt C 10 33 M	C66048-A1425-A 5		6 A	25 mA	80 mA	160 mA	50 V/µs
BSt C 10 40	C66048-A1425-A 6	600 V	4 A	25 mA	80 mA	160 mA	50 V/µs
BSt C 10 40 S2	C67048-A1425-A 29			1.5 mA	10 mA	20 mA	5 V/µs
BSt C 10 40 S1	C67048-A1425-A 25			3 mA	10 mA	20 mA	10 V/µs
BSt C 10 40 B	C66048-A1425-A 7			5 mA	20 mA	40 mA	50 V/µs
BSt C 10 40 C	C66048-A1425-A 8			10 mA	50 mA	100 mA	100 V/µs
BSt C 10 40 D	C66048-A1425-A 9			25 mA	80 mA	160 mA	100 V/µs
BSt C 10 40 M	C66048-A1425-A 10		6 A	25 mA	80 mA	160 mA	50 V/µs
BSt C 10 40 M S2	C67048-A1425-A 30			1.5 mA	10 mA	20 mA	5 V/µs
BSt C 10 40 M S1	C67048-A1425-A 26			3 mA	10 mA	20 mA	10 V/µs
BSt C 10 40 MB	C66048-A1425-A 11			5 mA	20 mA	40 mA	50 V/µs
BSt C 10 40 MC	C66048-A1425-A 12			10 mA	50 mA	100 mA	100 V/µs
BSt C 10 40 MD	C66048-A1425-A 13			25 mA	80 mA	160 mA	100 V/µs
BSt C 10 46	C66048-A1425-A 14	700 V	4 A	25 mA	80 mA	160 mA	50 V/µs
BSt C 10 46 S2	C67048-A1425-A 31			1.5 mA	10 mA	20 mA	5 V/µs
BSt C 10 46 S1	C67048-A1425-A 27			3 mA	10 mA	20 mA	10 V/µs
BSt C 10 46 B	C66048-A1425-A 15			5 mA	20 mA	40 mA	50 V/µs
BSt C 10 46 C	C66048-A1425-A 16			10 mA	50 mA	100 mA	100 V/µs
BSt C 10 46 D	C66048-A1425-A 17			25 mA	80 mA	160 mA	100 V/µs
BSt C 10 46 M	C66048-A1425-A 18		6 A	25 mA	80 mA	160 mA	50 V/µs
BSt C 10 46 M S2	C67048-A1425-A 32			1.5 mA	10 mA	20 mA	5 V/µs
BSt C 10 46 M S1	C67048-A1425-A 28			3 mA	10 mA	20 mA	10 V/µs
BSt C 10 46 MB	C66048-A1425-A 19			5 mA	20 mA	40 mA	50 V/µs
BSt C 10 46 MC	C66048-A1425-A 20			10 mA	50 mA	100 mA	100 V/µs
BSt C 10 46 MD	C66048-A1425-A 21			25 mA	80 mA	160 mA	100 V/µs
BSt C 10 53	C66048-A1425-A 22	800 V	4 A	25 mA	80 mA	160 mA	50 V/µs
BSt C 10 53 M	C66048-A1425-A 23		6 A	25 mA	80 mA	160 mA	50 V/µs

Max. mean on-state currents $I_{TAV(l)}$ or max. rms on-state currents $I_{TRMS(l)}$ for mains operation 40 to 60 Hz

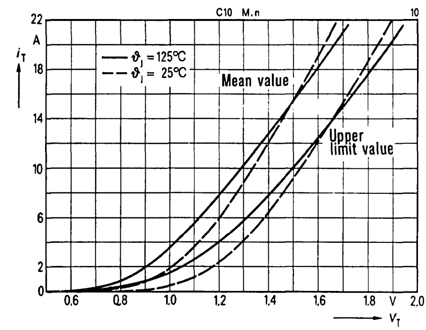
Type	Case temperature ϑ_c					
BSt C 10..	85°C	4 A	3.8 A	3.1 A	2.1 A	6.3 A
BSt C 10.. M	85°C	6 A	5.7 A	4.6 A	3.2 A	9.4 A

Main circuit limit values	Type	BSt C 10...	C 10..M	Secondary conditions
Maximum continuous off-state or reverse blocking current	I_D, I_R	0.4 mA		$\vartheta_j = 115°C$, at V_{DRM}, V_{RRM}
Maximum on-state voltage	V_T	2.94 V	1.78 V	$\vartheta_j = 25°C$, $i_T = 3\,I_{TAV(I)}$
Threshold voltage	$V_{(TO)}$	1.54 V	1.06 V	Equivalent straight line for loss calculation, $\vartheta_j = 115°C$
Slope resistance	r_T	98 mΩ	42 mΩ	
Max. mean on-state current	$I_{TAV(I)}$	4 A	6 A	$\vartheta_c = 85°C$, sinusoidal current, $\lambda = 180°$
Max. rms on-state current	$I_{TRMS(I)}$	6.3 A	9.4 A	
Surge on-state current	$I_{TSM(I)}$	60 A 40 A	95 A 60 A	$\vartheta_j = 25°C$ $\vartheta_j = 115°C$ } $t = 10$ ms, sinusoidal half wave, $f = 50$ Hz, $V_R = 0$ V
i^2t value	$\int i^2dt$	18 A²s 8 A²s	45 A²s 18 A²s	$\vartheta_j = 25°C$ $\vartheta_j = 115°C$ } $t = 10$ ms, $V_R = 0$ V
Gate circuit limit values				
Maximum gate trigger current	I_{GT}	see table		$\vartheta_j = 25°C$, $V_D \geqq 6$ V
Maximum gate trigger voltage	V_{GT}	2 V		$\vartheta_j = 25°C$
Temperature dependency of the gate trigger voltage	α_{VGT}	−3 mV/K (typ.)		$\vartheta_j = -40$ to $+115°C$
Maximum gate non-trigger voltage	V_{GD}	0.2 V		$\vartheta_j = 115°C$, 0.5 V_{DRM}
Maximum permissible gate current	I_{GM}	5 A		Peak value, $t_p \leqq 10\,\mu s$
Maximum negative gate voltage	V_{GRM}	10 V		Peak value
Dynamic values, switching behavior				
Maximum holding current	I_H	see table		$\vartheta_j = 25°C$, $V_D = 6$ V
Latching current	I_{LAT}	see table		$t_{gt} \geqq 100\,\mu s$, $I_G \geqq 5\,I_{GT}$, $\vartheta_j = 25°C$
Delay time	t_{gd}	1.5 µs		$\vartheta_j = 25°C$, $I_G = 250$ mA, $di_G/dt = 1$ A/µs
Critical rate of rise of on-state current	$(di/dt)_{cr}$	50 A/µs		$\vartheta_j = 115°C$, 0.67 V_{DRM}
Critical rate of rise of off-state voltage	$(dv/dt)_{cr}$	see table		$\vartheta_j = 115°C$, 0.67 V_{DRM}
Turn-off time	t_q	50 µs (typ.)		$\vartheta_j = 115°C$, $V_R \geqq 100$ V
Thermal values				
Maximum continuously permissible junction temperature	$\vartheta_{j(I)}$	+115°C		
Operating temperature range	ϑ_j	−40 to +115°C		
Storage temperature range	ϑ_s	−40 to +150°C		
Thermal resistance for constant current	R_{thJC}	2.6 K/W		Calculated value
Mechanical values				
Leakage path		approx. 2 mm		Anode – cathode
Weight		2 g		
Vibration resistance		10 *g*		At 50 Hz, without heat sink
Humidity category		F		In accordance with DIN 40 040

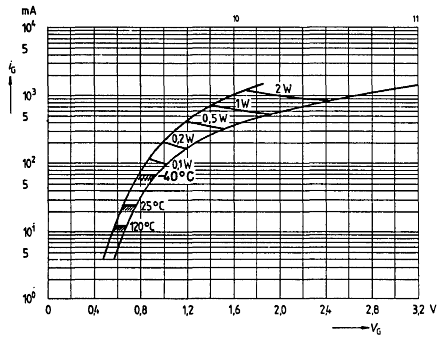
On-state characteristic curves, BSt C 10...



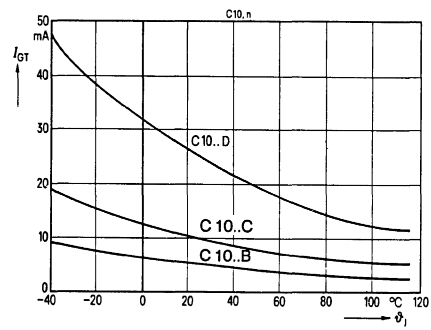
On-state characteristic curves, BSt C 10..M



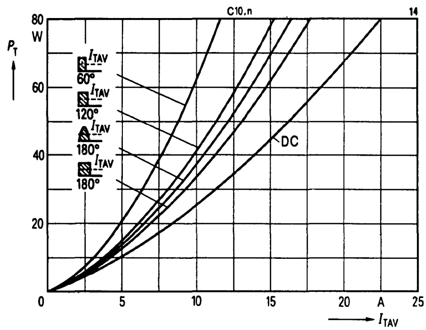
Input characteristic curves, triggering ranges and curves of constant power dissipation



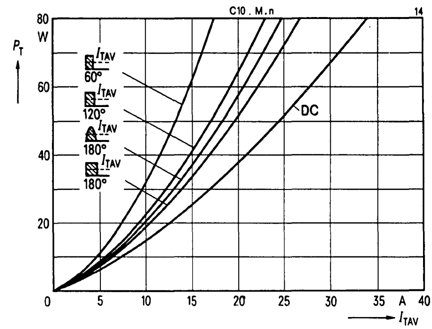
Temperature dependency of the gate trigger currents



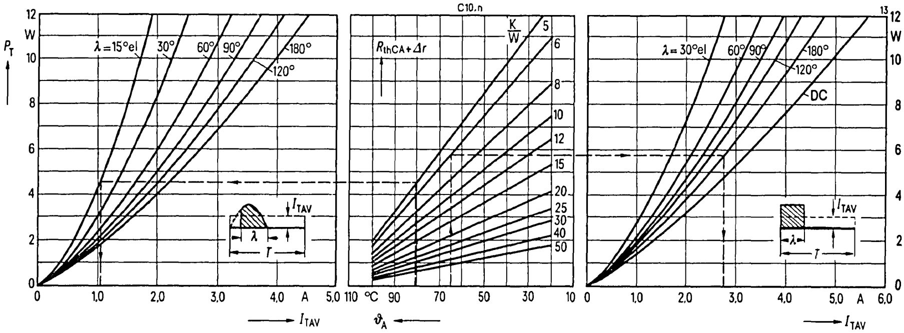
On-state power dissipation characteristic curves (overcurrent range) mains operation 40 to 60 Hz, BSt C 10...



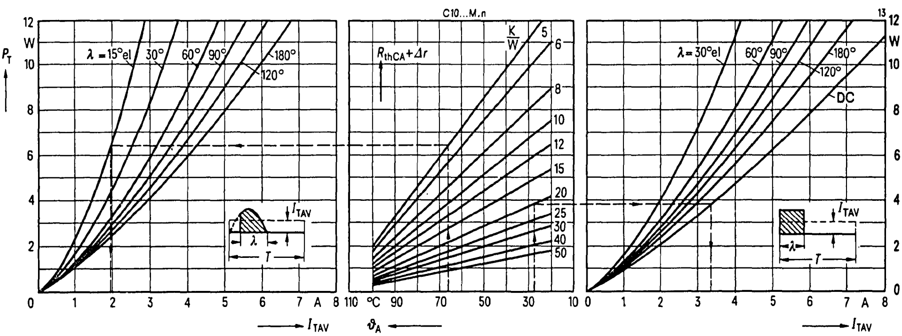
On-state power dissipation characteristic curves (overcurrent range) mains operation 40 to 60 Hz, BSt C 10..M



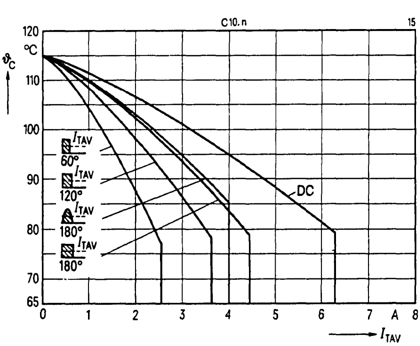
On-state power dissipation characteristic curves, BSt C 10...,
diagram for determination of max. mean on-state currents (limit values) for various cooling conditions, mains operation 40 to 60 Hz



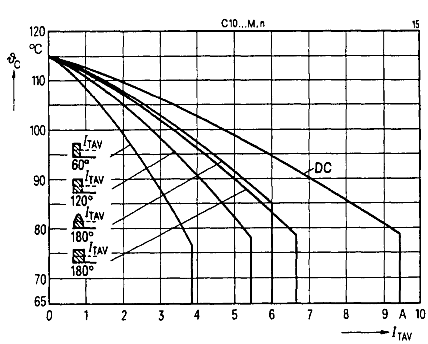
On-state power dissipation characteristic curves, BSt C 10..M,
diagram for determination of max. mean on-state currents (limit values) for various cooling conditions, mains operation 40 to 60 Hz



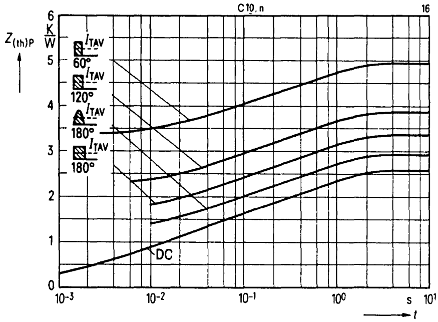
Permissible case temperature, BSt C 10...,
versus on-state current,
mains operation 40 to 60 Hz



Permissible case temperature, BSt C 10..M,
versus on-state current,
mains operation 40 to 60 Hz



Transient thermal resistances
for constant current and pulse current 40 to 60 Hz

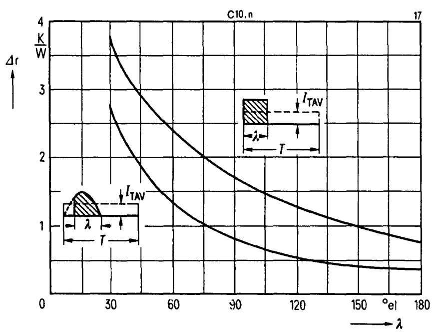


Analytical function for dc:

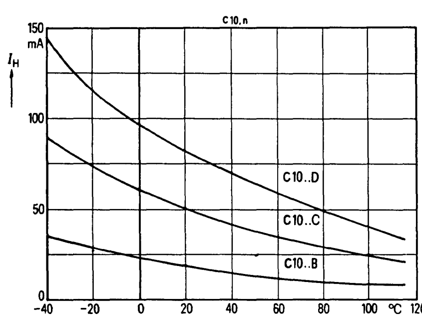
$$Z_{(th)JC} = \sum_{i=1}^{n} r_i \left(1 - e^{-\frac{t}{\tau_i}}\right)$$

i	1	2	3	4	5	
r_i	0.928	0.512	0.535	0.40	0.225	K/W
τ_i	652	84.5	15.5	4.45	0.715	ms

Thermal resistance Δr



Temperature dependency of the holding currents

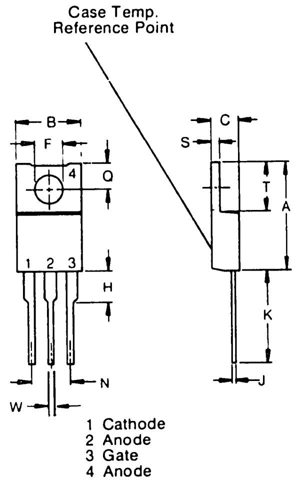


Silicon Controlled Rectifiers

12 Amps RMS; V_{DRM} and V_{RRM} up to 1200 Volts

- 16 Amperes RMS
- Industry standard TO-220AB package
- Blocking voltage up to 1200 volts
- Glass passivated chip
- Available without anode lead for increased creepage path (add "S3" to part number)

Dim.	Inches		Millimeter	
	Minimum	Maximum	Minimum	Maximum
A	0.560	0.625	14.23	15.87
B	0.380	0.420	9.66	10.66
C	0.140	0.190	3.56	4.82
F	0.139	0.147	3.531	3.733
H	----	0.250	----	6.35
J	0.014	0.022	0.35	0.56
K	0.500	0.502	12.70	14.27
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
S	0.020	0.055	0.51	1.39
T	0.230	0.270	5.85	6.85
W	0.027	0.035	0.68	0.89



TO220AB

Type Note 1	Maximum repetitive peak off-state voltage V_{DRM}, V_{RRM}	Maximum gate trigger current $V_D \geq 6$ V $T_J = 25°C$ I_{GT}	Maximum holding current I_H	Latching current	Critical rate of rise of off-state voltage dv/dt
BStD1666M		10 mA	50 mA	60 mA	50 V/μs
BStD1666N	1000 V	20 mA	80 mA	100 mA	100 V/μs
BStD1666P		50 mA	150 mA	200 mA	200 V/μs
BStD1680M		10 mA	50 mA	60 mA	50 V/μs
BStD1680N	1200V	20 mA	80 mA	100 mA	100 V/μs
BStD1680P		50 mA	150 mA	200 mA	200 V/μs

Note 1.: Add "S3" to part number to specify no anode lead for increased creepage path. Example: BStD1680MS3.

Electrical Characteristics

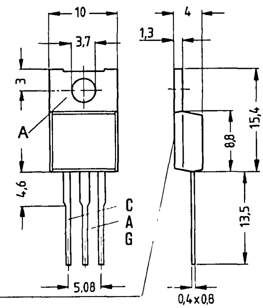
On State			
Max. RMS on-state current	$I_{T(RMS)}$	12 Amps	$T_c = 75\,°C$
Max. peak one cycle 60 Hz non-repetitive surge current	I_{TSM}	100 Amps	$T_J = 115\,°C$
Max. I^2t capability for fusing	I^2t	$40A^2S$	$T_J = 115\,°C$, t = 8.3 ms
Switching			
Critical rate of rise of on-state current	di/dt	100A/μSec.	$T_J = 115\,°C$, .67 V_{DRM}
Max. peak on-state voltage in either direction	V_{TM}	1.98 Volts	I_{TM} = 22.5 Amps
Max. holding current	I_H	see table	$V_D = 6$ V
Thermal values			
Operating junction temp range	T_J	− 40 °C to + 115 °C	
Storage temperature range	T_{stg}	− 40 °C to + 150 °C	
Max. thermal resistance	$R_{\Theta JC}$	2 °C/W	
Blocking			
Max. leakage current	I_{RRM}	2.5 mA	$T_J = 115\,°C$ and V_{DRM}
Critical rate of rise of off-state voltage	dv/dt	see table	$T_J = 115\,°C$, .67 V_{DRM}
Triggering			
Max. gate voltage to trigger	V_{GT}	2V	
Max. gate current to trigger	I_{GT}	see table	
Max. peak gate current	I_{GM}	5A	$t_p = 10\,\mu$Sec.
Max. negative gate voltage	V_{GM}	10.0volts	Forward
Max. peak gate voltage	V_{GM}	5.0 volts	Reverse
Max. peak gate power	P_{GM}	5.0W	t = 10μSec.
Average gate power	$P_{G(AV)}$	.5W	
Mechanical values			
Leakage path*		approx. 2 mm	anode-cathode
Weight		approx. 2 g	
Vibration resistance		10 g	at 50 Hz without heatsink
Humidity category		F	in accordance with DIN40 040

*Also available without anode lead for increased creepage path - Add S3 to part number.

Thyristors in plastic cases for 400 V to 800 V;
maximum mean on-state current (limit value) 8 A and 10 A

Application	Mainly for mains-commutated converters of all types, e.g. motor controls, switch applications, regulation and control circuits for industrial and household electronics
Case	Plastic case TO 220 AB, the anode is connected to the mounting flange
Associated parts	Matching plate C67067-A9000-C 166
	Mica washer C67067-A9000-C 165
System	Silicon, fully diffused, glass passivated

Dimensions in mm



Case temperature measuring point

Type	Ordering code	Maximum repetitive peak off-state or reverse voltage V_{DRM}, V_{RRM}	Maximum mean on-state current $I_{TAV(l)}$	Maximum gate trigger current $V_D \geqq 6\,V$ $\vartheta_j = 25°C$ I_{GT}	Maximum holding current I_H	Latching current I_{LAT}	Critical rate of rise of off-state voltage $(dv/dt)_{cr}$
BSt D 10 26	C66048-A1420-A 2	400 V	8 A	25 mA	80 mA	100 mA	50 V/µs
BSt D 10 26 M	C66048-A1420-A 6		10 A	25 mA	80 mA	100 mA	50 V/µs
BSt D 10 33	C66048-A1420-A 3	500 V	8 A	25 mA	80 mA	100 mA	50 V/µs
BSt D 10 33 M	C66048-A1420-A 7		10 A	25 mA	80 mA	100 mA	50 V/µs
BSt D 10 40	C66048-A1420-A 4	600 V	8 A	25 mA	80 mA	100 mA	50 V/µs
BSt D 10 40 S 2	C67048-A1420-A 31			1.5 mA	10 mA	20 mA	5 V/µs
BSt D 10 40 S 1	C67048-A1420-A 27			3 mA	10 mA	20 mA	10 V/µs
BSt D 10 40 B	C66048-A1420-A 10			5 mA	20 mA	30 mA	50 V/µs
BSt D 10 40 C	C66048-A1420-A 14			10 mA	50 mA	60 mA	100 V/µs
BSt D 10 40 D	C66048-A1420-A 18			25 mA	80 mA	100 mA	200 V/µs
BSt D 10 40 M	C66048-A1420-A 8		10 A	25 mA	80 mA	100 mA	50 V/µs
BSt D 10 40 M S 2	C67048-A1420-A 32			1.5 mA	10 mA	20 mA	5 V/µs
BSt D 10 40 M S 1	C67048-A1420-A 29			3 mA	10 mA	20 mA	10 V/µs
BSt D 10 40 MB	C66048-A1420-A 12			5 mA	20 mA	30 mA	50 V/µs
BSt D 10 40 MC	C66048-A1420-A 16			10 mA	50 mA	60 mA	100 V/µs
BSt D 10 40 MD	C66048-A1420-A 20			25 mA	80 mA	100 mA	200 V/µs
BSt D 10 46	C66048-A1420-A 5	700 V	8 A	25 mA	80 mA	100 mA	50 V/µs
BSt D 10 46 S 2	C67048-A1420-A 33			1.5 mA	10 mA	20 mA	5 V/µs
BSt D 10 46 S 1	C67048-A1420-A 24			3 mA	10 mA	20 mA	10 V/µs
BSt D 10 46 B	C66048-A1420-A 11			5 mA	20 mA	30 mA	50 V/µs
BSt D 10 46 C	C66048-A1420-A 15			10 mA	50 mA	60 mA	100 V/µs
BSt D 10 46 D	C66048-A1420-A 19			25 mA	80 mA	100 mA	200 V/µs
BSt D 10 46 M	C66048-A1420-A 9		10 A	25 mA	80 mA	100 mA	50 V/µs
BSt D 10 46 M S 2	C67048-A1420-A 34			1.5 mA	10 mA	20 mA	5 V/µs
BSt D 10 46 M S 1	C67048-A1420-A 30			3 mA	10 mA	20 mA	10 V/µs
BSt D 10 46 MB	C66048-A1420-A 13			5 mA	20 mA	30 mA	50 V/µs
BSt D 10 46 MC	C66048-A1420-A 17			10 mA	50 mA	60 mA	100 V/µs
BSt D 10 46 MD	C66048-A1420-A 21			25 mA	80 mA	100 mA	200 V/µs
BSt D 10 53	C66048-A1420-A 25	800 V	8 A	25 mA	80 mA	100 mA	50 V/µs
BSt D 10 53 M	C66048-A1420-A 26		10 A	25 mA	80 mA	100 mA	50 V/µs

Max. mean on-state currents $I_{TAV(l)}$ or max. rms on-state currents $I_{TRMS(l)}$ for mains operation 40 to 60 Hz

Type	Case temperature ϑ_c	I_{TAV} λ = 180°	I_{TAV} 180°	I_{TAV} 120°	I_{TAV} 60°	I_{TRMS} 180°
BSt D 10...	85°C	8 A	7.8 A	6.5 A	4.7 A	12.5 A
BSt D 10..M	85°C	10 A	9.8 A	8.1 A	5.7 A	16.0 A

Main circuit limit values	Type	BSt D 10...	D 10..M	Secondary conditions
Maximum continuous off-state or reverse blocking current	I_D, I_R	0.4 mA		$\vartheta_j = 115°C$, at V_{DRM}, V_{RRM}
Maximum on-state voltage	V_T	1.8 V	1.46 V	$\vartheta_j = 25°C$, $i_T = 3\,I_{TAV(l)}$
Threshold voltage	$V_{(TO)}$	1.18 V	0.85 V	Equivalent straight line for loss calculation, $\vartheta_j = 115°C$
Slope resistance	r_T	25 mΩ	20 mΩ	
Max. mean on-state current	$I_{TAV(l)}$	8 A	10 A	$\vartheta_c = 85°C$, sinusoidal current, $\lambda = 180°$
Max. rms on-state current	$I_{TRMS(l)}$	12.5 A	16 A	
Surge on-state current	$I_{TSM(l)}$	130 A	160 A	$\vartheta_j = 25°C$ Sinusoidal half wave,
		90 A	110 A	$\vartheta_j = 115°C$ $f = 50$ Hz, $V_R = 0$ V
i^2t value	$\int i^2 dt$	85 A^2s	130 A^2s	$\vartheta_j = 25°C$ $t = 10$ ms, $V_R = 0$ V
		40 A^2s	60 A^2s	$\vartheta_j = 115°C$

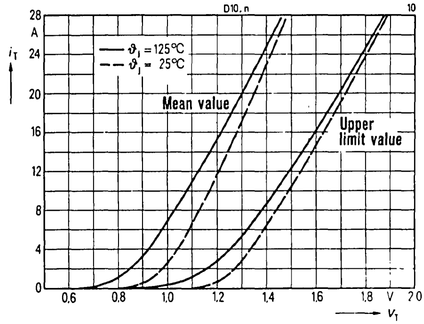
Gate circuit limit values			
Maximum gate trigger current	I_{GT}	see table	$\vartheta_j = 25°C$, $V_D \geqq 6$ V
Maximum gate trigger voltage	V_{GT}	2.0 V	$\vartheta_j = 25°C$
Temperature dependency of the gate trigger voltage	α_{VGT}	−3 mV/K (typ.)	$\vartheta_j = -40$ to $+115°C$
Maximum gate non-trigger voltage	V_{GD}	0.2 V	$\vartheta_j = 115°C$, 0.5 V_{DRM}
Maximum permissible gate current	I_{GM}	5 A	Peak value, $t_p \leqq 10\,\mu s$
Maximum negative gate voltage	V_{GRM}	10 V	Peak value

Dynamic values, switching behavior			
Maximum holding current	I_H	see table	$\vartheta_j = 25°C$, $V_D = 6$ V
Latching current	I_{LAT}	see table	$\vartheta_j = 25°C$ $t_{gt} \geqq 100\,\mu s$, $I_G \geqq 5\,I_{GT}$
Delay time	t_{gd}	1.5 µs	$\vartheta_j = 25°C$, $I_G = 250$ mA, $di_G/dt = 1$ A/µs
Critical rate of rise of on-state current	$(di/dt)_{cr}$	100 A/µs	$\vartheta_j = 115°C$, 0.67 V_{DRM}, $di_G/dt = 1$ A/µs
Critical rate of rise of off-state voltage	$(dv/dt)_{cr}$	see table	$\vartheta_j = 115°C$, 0.67 V_{DRM}
Turn-off time	t_q	50 µs (typ.)	$\vartheta_j = 115°C$, $V_R \geqq 100$ V

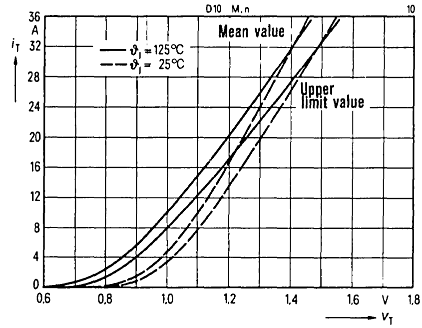
Thermal values			
Maximum continuously permissible junction temperature	$\vartheta_{j(l)}$	+115°C	
Operating temperature range	ϑ_j	−40 to +115°C	
Storage temperature range	ϑ_s	−40 to +150°C	
Thermal resistance for constant current	R_{thJC}	2.0 K/W	Calculated value

Mechanical values			
Leakage path		approx. 2 mm	Anode – cathode
Weight		2 g	
Vibration resistance		10 *g*	At 50 Hz, without heat sink
Humidity category		F	In accordance with DIN 40 040

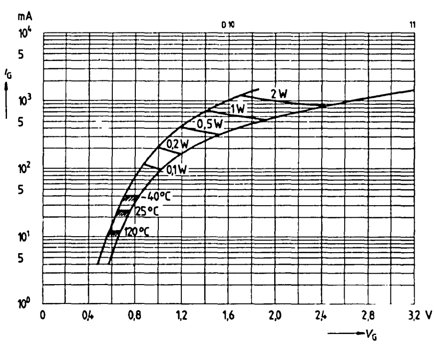
On-state characteristic curves, BSt D 10...



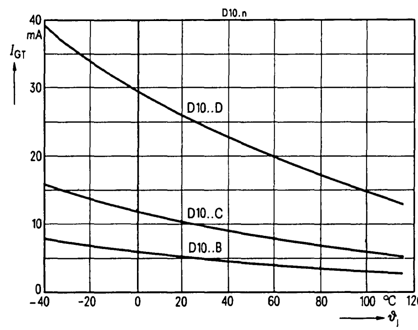
On-state characteristic curves, BSt D 10.. M



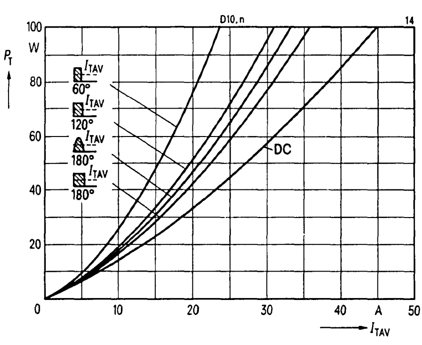
Input characteristic curves,
triggering ranges and
curves of constant power dissipation



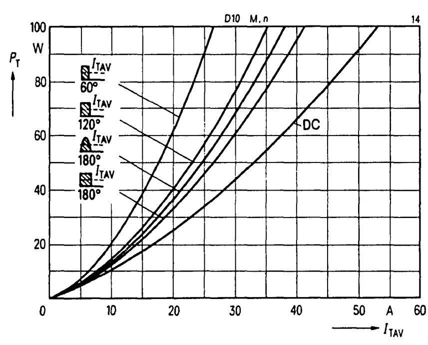
Temperature dependency of the gate trigger currents



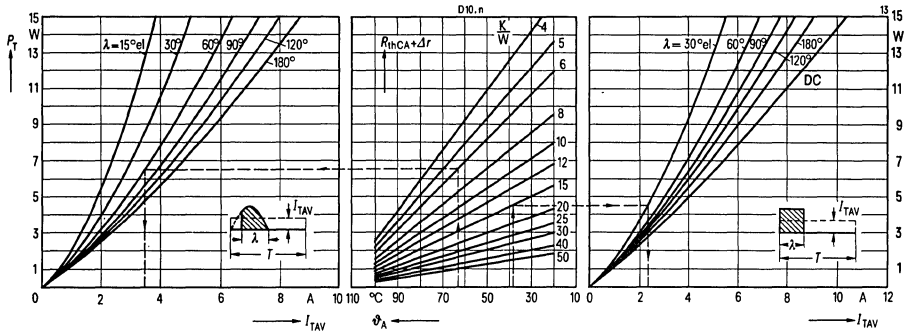
On-state power dissipation characteristic curves (overcurrent range), mains operation 40 to 60 Hz, BSt D 10...



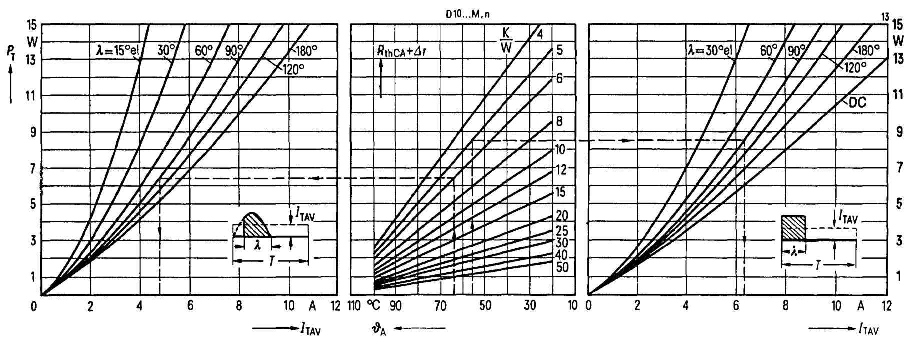
On-state power dissipation characteristic curves (overcurrent range), mains operation 40 to 60 Hz, BSt D 10.. M



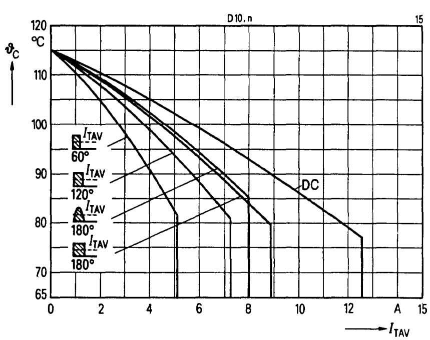
On-state power dissipation characteristic curves, BSt D 10...,
diagram for determination of max. mean on-state currents (limit values) for various cooling conditions, mains operation 40 to 60 Hz



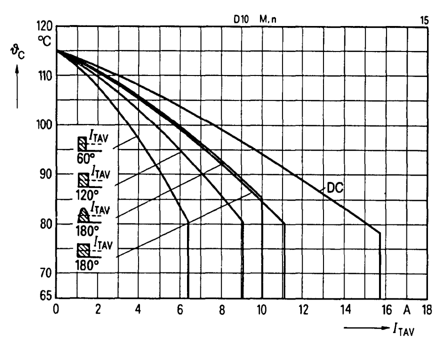
On-state power dissipation characteristic curves, BSt D 10..M,
diagram for determination of max. mean on-state currents (limit values) for various cooling conditions, mains operation 40 to 60 Hz



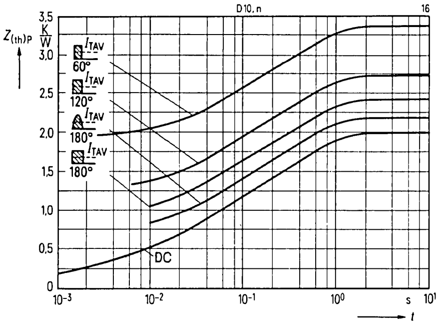
Permissible case temperature, BSt D 10...,
versus on-state current,
mains operation 40 to 60 Hz



Permissible case temperature, BSt D 10..M,
versus on-state current,
mains operation 40 to 60 Hz



Transient thermal resistances
for constant current and pulse current 40 to 60 Hz

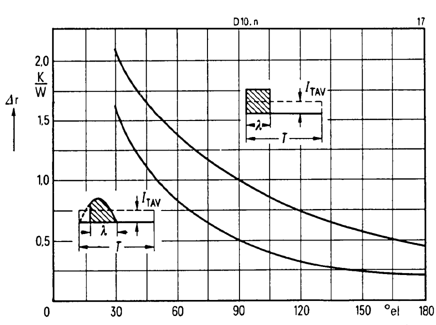


Analytical function for dc:

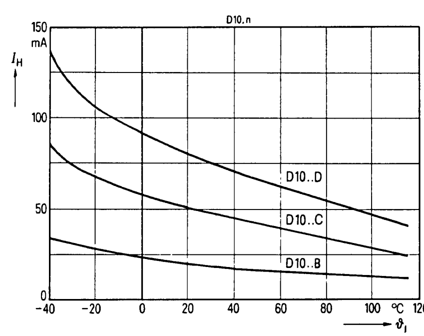
$$Z_{(th)JC} = \sum_{i=1}^{n} r_i \left(1 - e^{-\frac{t}{\tau_i}}\right)$$

i	1	2	3	4	5	
r_i	0.839	0.602	0.292	0.188	0.079	K/W
τ_i	465	76	11.25	2.43	0.656	ms

Thermal resistance Δr



Temperature dependency of the holding currents



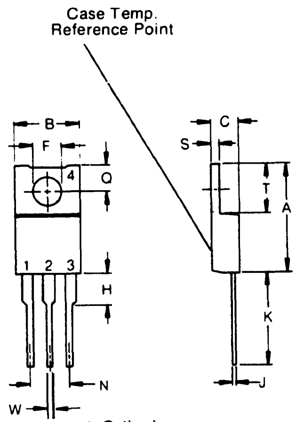
Silicon Controlled Rectifiers

Series 2N6397 2N6398 2N6399

12 Amps RMS; V_{DRM} and V_{RRM} up to 800 Volts

- 12 Amperes RMS
- Industry standard TO-220AB package
- Blocking voltage up to 800 volts

Dim.	Inches		Millimeter	
	Minimum	Maximum	Minimum	Maximum
A	0.560	0.625	14.23	15.87
B	0.380	0.420	9.66	10.66
C	0.140	0.190	3.56	4.82
F	0.139	0.147	3.531	3.733
H	----	0.250	----	6.35
J	0.014	0.022	0.35	0.56
K	0.500	0.502	12.70	14.27
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
S	0.020	0.055	0.51	1.39
T	0.230	0.270	5.85	6.85
W	0.027	0.035	0.68	0.89



1 Cathode
2 Anode
3 Gate
4 Anode

TO220AB

Type	Rep. Peak Off-State Voltage. Voltage, V_{DRM} $T_C = 40°$ to $+100°C$
2N6397	400 Volts
2N6398	600 Volts
2N6399	800 Volts

Electrical Characteristics

On State			
Max. RMS on-state current	$I_{T\,(RMS)}$	12 Amps	T_c90 °C
Max. peak one cycle 60 Hz non-repetitive surge current	I_{TSM}	100 Amps	T_J + 125 °C, T_J = 125 °C
Max. I^2t capability for fusing	I^2t	40A²S	
Max. forward leakage current	I_{DRM}	2 mA	T_J = 125 °C
Switching			
Max. peak on-state voltage	V_{TM}	2.2 V	I_{TM} = 24Amps
Max. holding current	I_H	40mA	25 °C, $V_D = 12 V_{dc}$
Max. holding current	I_H	100mA	-40 °C
Thermal values			
Operating junction temp range	T_J	− 40 °C to + 125 °C	
Storage temperature range	T_{stg}	− 40 °C to + 150 °C	
Max. thermal resistance	$R\Theta_{JC}$	2.0 °C/W	
Off State			
Max. leakage current	I_{RRM}	2 mA	T_J = 125 °C
Critical rate of rise of off-state voltage	dv/dt	5v/μSec.	T_J = 125 °C
Triggering			
Max. gate voltage to trigger	V_{GT}	1.5V	
Max. peak gate current	I_{GM}	2.0A	
Max. gate current to trigger	I_{GT}	30mA	
Max. peak gate power	P_{GM}	20W	
Average gate power	$P_{G(AV)}$	.5W	

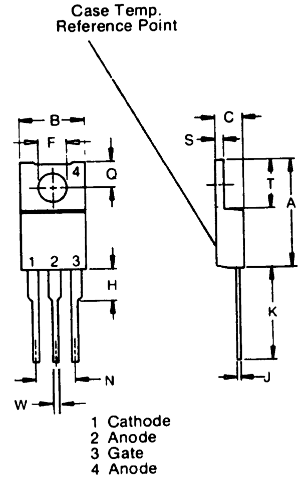
Silicon Controlled Rectifiers

Series 2N6403 2N6404 2N6405

16 Amps RMS; V_{DRM} and V_{RRM} up to 800 Volts

- 16 Amperes RMS
- Industry standard TO-220AB package
- Blocking voltage up to 800 volts

Dim.	Inches		Millimeter	
	Minimum	Maximum	Minimum	Maximum
A	0.560	0.625	14.23	15.87
B	0.380	0.420	9.66	10.66
C	0.140	0.190	3.56	4.82
F	0.139	0.147	3.531	3.733
H	----	0.250	----	6.35
J	0.014	0.022	0.35	0.56
K	0.500	0.502	12.70	14.27
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
S	0.020	0.055	0.51	1.39
T	0.230	0.270	5.85	6.85
W	0.027	0.035	0.68	0.89



TO220AB

Type	Rep. Peak Off-State Voltage. Voltage, V_{DRM} $T_C = 40°$ to $+100°C$
2N6403	400 Volts
2N6404	600 Volts
2N6405	800 Volts

($T_C = 25°C$ unless otherwise specified)

Electrical Characteristics

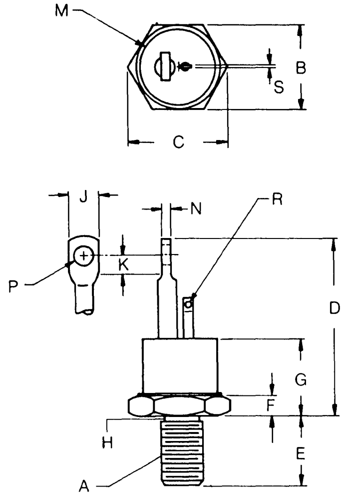
On State			
Max. RMS on-state current	$I_{T(RMS)}$	16 Amps	T_c90 °C
Max. peak one cycle 60 Hz non-repetitive surge current	I_{TSM}	160 Amps	T_J = 125 °C
Max. I^2t capability for fusing	I^2t	100A²S	t = 8.3 ms
Max. forward leakage current	I_{DRM}	2 mA	T_J = 125 °C
Switching			
Max. peak on-state voltage	V_{TM}	1.7 V	I_{TM} = 32 Amps
Max. holding current	I_H	40mA	
Max. holding current	I_H	60mA	−40 °C
Thermal values			
Operating junction temp range	T_J	−40 °C to +125 °C	
Storage temperature range	T_{stg}	−40 °C to +150 °C	
Max. thermal resistance	$R\Theta_{JC}$	1.5 °C/W	
Off State			
Max. leakage current	I_{RRM}	2 mA	T_J = 125 °C
Critical rate of rise of off-state voltage	dv/dt	50v/μSec.	T_J = 125 °C
Triggering			
Max. gate voltage to trigger	V_{GT}	2.5V	
Max. peak gate current	I_{GM}	2.0A	
Max. gate current to trigger	I_{GT}	30mA	
Max. peak gate power	P_{GM}	20W	
Average gate power	$P_{G(AV)}$	.5W	

Silicon Controlled Rectifiers

Series 40C

63 Amps RMS; V_{DRM} and V_{RRM} up to 1200 Volts

- High dv/dt - 200 V/μsec.
- 1000 Amperes surge current capability
- Economical for medium power applications
- Compact TO-208AC package



TO-208AC
(TO-65)

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	
A	----	----	----	----	1
B	.677	.683	17.19	17.34	
C	----	.755	----	19.17	
D	1.075	1.105	27.30	28.06	
E	.427	.447	10.84	11.35	
F	.135	.140	3.42	3.55	
G	----	.513	----	13.03	
H	.220	.249	5.58	6.32	2
J	.200	.300	5.08	7.62	
K	.120	----	3.05	----	
M	----	.590	----	14.98	Dia.
N	.065	.085	1.65	2.15	
P	.145	.155	3.68	3.93	Dia.
R	.061	.065	1.54	1.65	
S	.025	.030	.64	.76	

Note 1: ¼-28 UNF-2A
Note2: Full thread within 2½ threads

Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
40C10B	100	200
40C20B	200	300
40C40B	400	500
40C60B	600	700
40C80B	800	900
40C100B	1000	1100
40C120B	1200	1300

Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K ≥ 300V/μsec
H ≥ 500V/μsec

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	63 Amps	$T_c = 102°C$
Max. average on-state cur.	$I_{T(AV)}$	40 Amps	$T_c = 102°C$
Max. peak on-state voltage	V_{TM}	3.2 Volts	$I_{TM} = 500$ A (peak)
Max. holding current	I_H	200 mA	
Max peak one cycle surge current	I_{TSM}	1000 A	$T_c = 102°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	4100A²S	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	100A/μsec.	$T_J = 125°C$
Typical delay time (note 2)	t_d	3.0 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	100 μsec.	$T_J = 125°C$
Thermal values			
Maximum thermal resistance	$R\Theta_{JC}$	0.35°C/W	
Operating junction temp range	T_J	−40°C to +125°C	
Storage temperature range	T_{stg}	−40°C to +150°C	
Blocking			
Max. leakage current	I_{DRM}	6 mA	$T_J = 125°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	6 mA	$T_J = 125°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125°C$
Max. gate current to trigger	I_{GT}	100 mA	
Max. peak gate power	P_{GM}	10 W	
Average gate power	$P_{G(AV)}$	1.0 W	$t_p = 10$ μsec.
Max. peak gate current	I_{GM}	3.0A	
Max. peak gate voltage (forward)	V_{GM}	20V	
Max. peak gate voltage (reverse)	V_{GM}	10V	

Mechanical Characteristics	
Base	High strength copper stud and base with a 1/4-28 UNF 2A thread for through mounting on a heat sink. Tin plating of base prevents corrosion.
Header	Glass to metal construction
Weight	Approximately .635 ounce (18.0 grams)
Mounting Torque	30 in. lbs. max
Dimensions	In accordance with (TO-65) TO-208AC outline

Note 1	$T_C = 25°C$ unless otherwise noted
Note 2	$I_{TM} = 50A$, $V_D = V_{DRM}$, $V_{GT} = 12V$ open circuit, 20 ohm-0.1 μsec. rise time
Note 3	$I_{TM} = 50A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, $V_{GT} = 0V$

Figure 1
Maximum case temperature

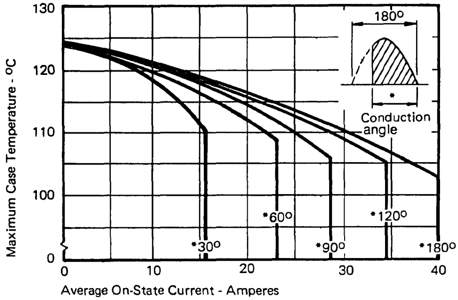


Figure 2
Maximum case temperature

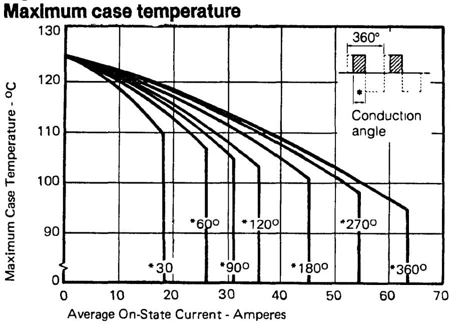


Figure 3
Maximum power dissipation

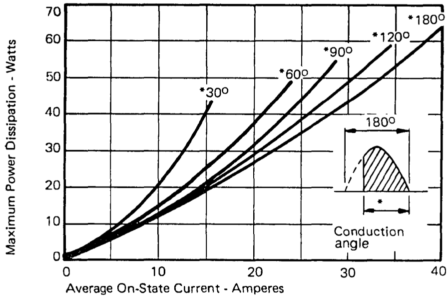


Figure 4
Maximum power dissipation

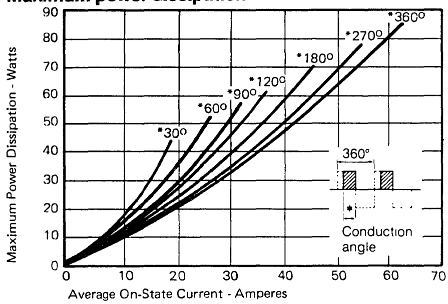


Figure 5
Maximum transient thermal impedance

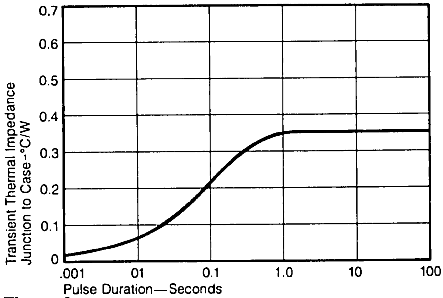


Figure 6
Maximum nonrepetitive surge current at rated load conditions

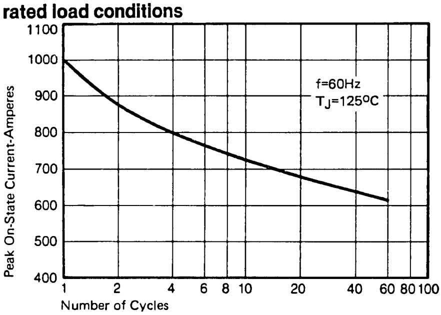


Figure 7
Maximum forward on-state characteristics

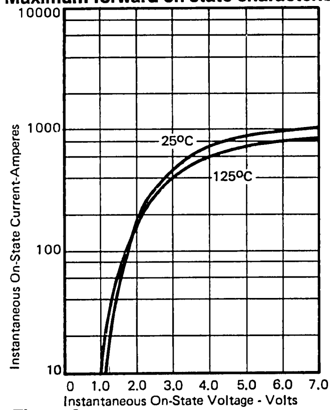
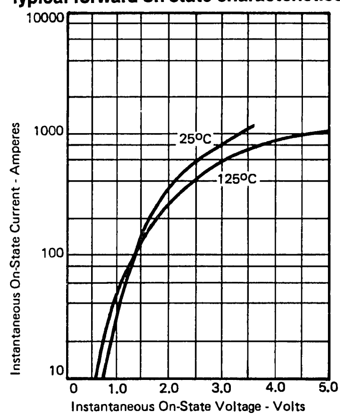


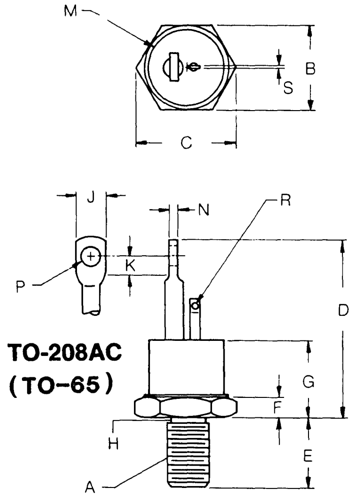
Figure 8
Typical forward on-state characteristics



Silicon Controlled Rectifiers

80 AMPS RMS; V_{DRM} and V_{RRM} up to 1200 Volts

- High dv/dt - 200 V/μsec.
- 1200 Amperes surge current capability
- Economical for medium power applications
- Compact TO-208AC package



Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	
A	----	----	----	----	1
B	.677	.683	17.19	17.34	
C	----	.755	----	19.17	
D	1.075	1.105	27.30	28.06	
E	.427	.447	10.84	11.35	
F	.135	.140	3.42	3.55	
G	----	.513	----	13.03	
H	.220	.249	5.58	6.32	2
J	.200	.300	5.08	7.62	
K	.120	----	3.05	----	
M	----	.590	----	14.98	Dia.
N	.065	.085	1.65	2.15	
P	.145	.155	3.68	3.93	Dia.
R	.061	.065	1.54	1.65	
S	.025	.030	.64	.76	

Note 1: ¼-28 UNF-2A
Note2: Full thread within 2½ threads

Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
05001GOF	100	200
05002GOF	200	300
05004GOF	400	500
05006GOF	600	700
05008GOF	800	900
05010GOF	1000	1100
05012GOF	1200	1300

Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K ≥ 300V/μsec
H ≥ 500V/μsec

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	80 Amps	$T_c = 94°C$
Max. average on-state cur.	$I_{T(AV)}$	50 Amps	$T_c = 94°C$
Max. peak on-state voltage	V_{TM}	2.55 Volts	$I_{TM} = 500$ A (peak)
Max. holding current	I_H	200 mA	
Max peak one cycle surge current	I_{TSM}	1200 A	$T_c = 94°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	$6000A^2S$	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	100A/μsec.	$T_J = 125°C$
Typical delay time (note 2)	t_d	3.0 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	100 μsec.	$T_J = 125°C$
Thermal values			
Maximum thermal resistance	$R\Theta_{JC}$	0.35 °C/W	
Operating junction temp range	T_J	− 40 °C to + 125 °C	
Storage temperature range	T_{stg}	− 40 °C to + 150 °C	
Blocking			
Max. leakage current	I_{DRM}	6 mA	$T_J = 125°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	6 mA	$T_J = 125°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125°C$
Max. gate current to trigger	I_{GT}	100 mA	
Max. peak gate power	P_{GM}	10 W	
Average gate power	$P_{G(AV)}$	1.0 W	$t_p = 10$ μsec.
Max. peak gate current	I_{GM}	3.0A	
Max. peak gate voltage (forward)	V_{GM}	20V	
Max. peak gate voltage (reverse)	V_{GM}	10V	

Mechanical Characteristics

Base	High strength copper stud and base with a 1/4-28 UNF 2A thread for through mounting on a heat sink. Tin plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately .635 ounce (18.0 grams)
Mounting Torque	30 in. lbs. max
Dimensions	In accordance with (TO-65) TO-208AC outline

Note 1	$T_C = 25°C$ unless otherwise noted
Note 2	$I_{TM} = 50A$, $V_D = V_{DRM}$, $V_{GT} = 12V$ open circuit, 20 ohm-0.1 μsec. rise time
Note 3	$I_{TM} = 50A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum case temperature

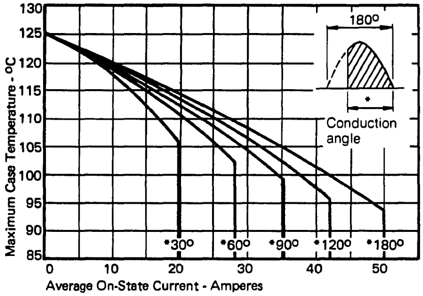


Figure 3
Maximum power dissipation

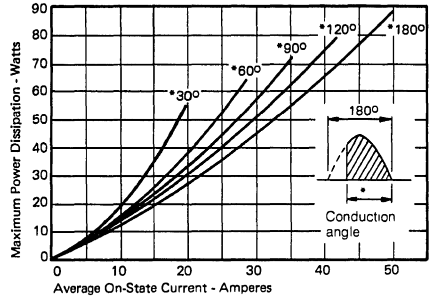


Figure 2
Maximum case temperature

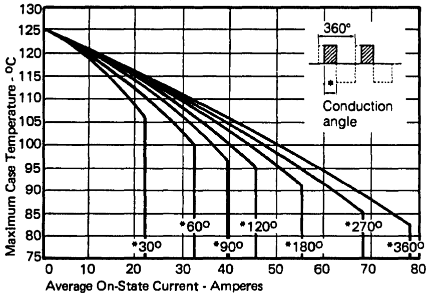


Figure 4
Maximum power dissipation

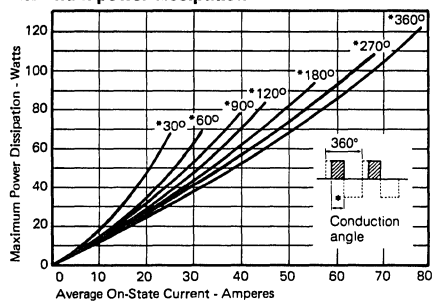


Figure 5
Maximum transient thermal impedance

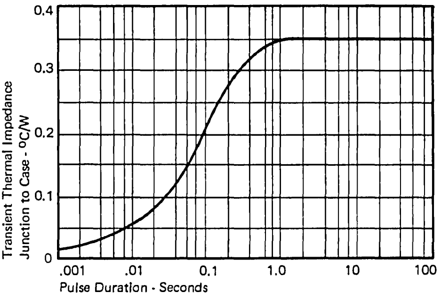


Figure 6
Maximum nonrepetitive surge current at rated load

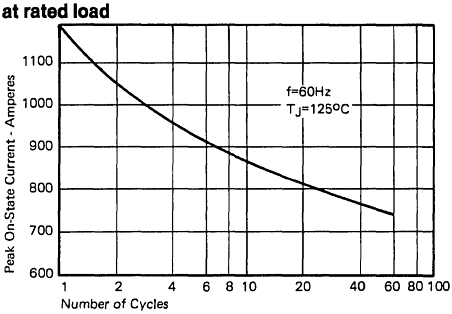
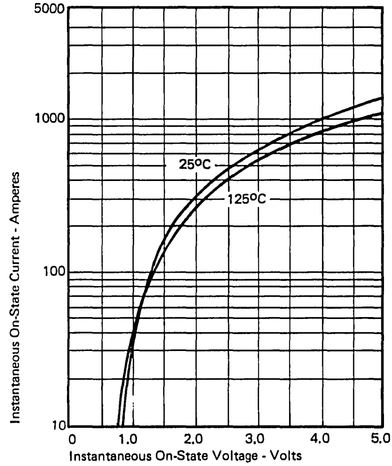


Figure 7
Maximum forward on-state characteristics



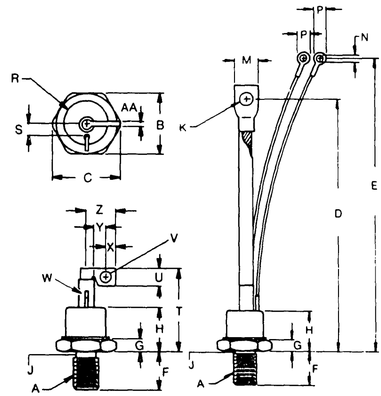
Silicon Controlled Rectifiers

86 Amps RMS, V_{DRM} AND V_{RRM} Up To 600 Volts

- High di/dt - 200 V/μsec
- 1200 Amperes surge current capability
- Low forward on-state voltage
- Package conforming to either TO-209AC or TO-208AD outline
- Economical for general purpose phase control applications

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	1.050	1.060	26.67	26.92	
C	----	1.161	----	29.49	
D	5.850	6.144	149.10	156.06	
E	6.850	7.375	173.99	187.33	
F	.797	.827	20.24	21.01	
G	.276	.286	.701	7.26	
H	----	.948	----	24.08	
J	.425	.499	10.80	12.67	2
K	.260	.280	6.60	7.11	Dia.
M	.500	.600	12.70	15.24	
N	.140	.150	3.56	3.81	
P	----	.295	----	7.49	
R	----	.900	----	22.86	Dia.
S	.225	.275	6.48	6.99	
T	----	1.750	----	44.45	
U	.370	.380	9.40	9.65	
V	.213	.223	5.41	5.66	Dia.
W	.065	.075	1.65	1.91	Dia.
X	.215	.225	5.46	5.72	
Y	.290	.315	7.37	8.00	
Z	.514	.530	13.06	13.46	
AA	.089	.099	2.26	2.51	

Note 1:
½-20 UNF-2A
Note 2:
Full thread within 2½ threads



TO-208AD (TO-83) TO-209AC (TO-94)

Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
05201GOA	100	200
05202GOA	200	300
05203GOA	300	400
05204GOA	400	500
05205GOA	500	600
05206GOA	600	700

Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K $\geq$ 300V/μsec
H $\geq$ 500V/μsec

Note 2:

To specify package designation other than standard lead, enter appropriate letter in place of "A".

B = Insulated Lead
D = Flag Terminal
C = Top Stud (consult factory)

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T\,(RMS)}$	86 Amps	$T_c = 87\,°C$
Max. average on-state cur.	$I_{T(AV)}$	55 Amps	$T_c = 87\,°C$
Max. peak on-state voltage	V_{TM}	2.0 Volts	$I_{TM} = 220$ A (peak)
Max. holding current	I_H	200 mA	
Max peak one cycle surge current	I_{TSM}	1200 A	$T_c = 87\,°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	6000A²S	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	100A/μsec.	$T_J = 125\,°C$
Typical delay time (note 2)	t_d	3.0 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	100 μsec.	$T_J = 125\,°C$
Thermal values			
Maximum thermal resistance	$R_{\Theta JC}$	0.40 °C/W	
Operating junction temp range	T_J	− 40 °C to + 125 °C	
Storage temperature range	T_{stg}	− 40 °C to + 150 °C	
Blocking			
Max. leakage current	I_{DRM}	10 mA	$T_J = 125\,°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	10 mA	$T_J = 125\,°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125\,°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125\,°C$
Max. gate current to trigger	I_{GT}	100 mA	
Max. peak gate power	P_{GM}	15 W	
Average gate power	$P_{G(AV)}$	3.0 W	$t_p = 10\,\mu$sec.
Max. peak gate current	I_{GM}	4.0A	
Max. peak gate voltage (forward)	V_{GM}	20V	
Max. peak gate voltage (reverse)	V_{GM}	10V	

Mechanical Characteristics

Base	High strength copper stud and base with a 1/2-20 UNF 2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	052 — GOA Approximately 3.6 ounces (102.0 grams) 052 — GOD Approximately 3.24 ounces (91.8 grams)
Mounting Torque	130 in. lbs. max
Dimensions	In accordance with TO-208AD or TO-209AC outlines

Note 1	$T_C = 25\,°C$ unless otherwise noted
Note 2	$I_{TM} = 50$A, $V_D = V_{DRM}$, $V_{GT} = 12$V open circuit, 20 ohm-0.1 μsec. rise time
Note 3	$I_{TM} = 50$A, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum case temperature

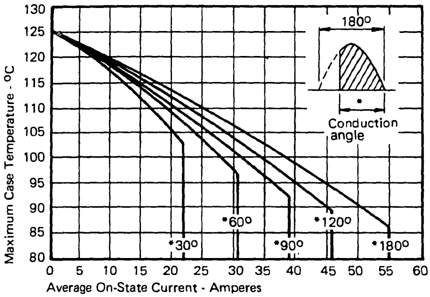


Figure 3
Maximum power dissipation

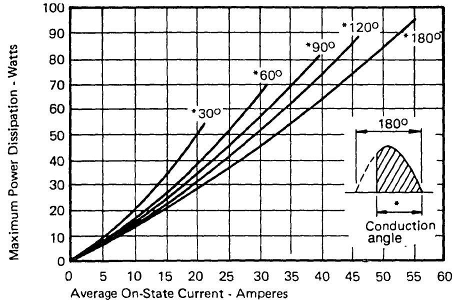


Figure 2
Maximum case temperature

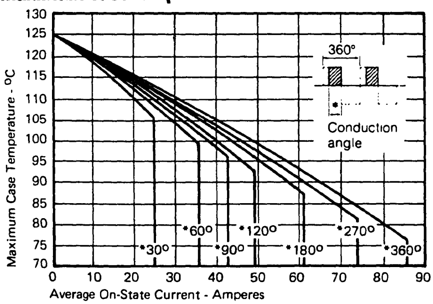


Figure 4
Maximum power dissipation

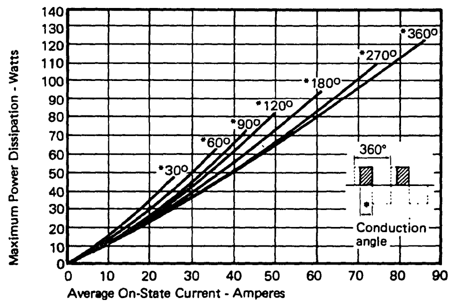


Figure 5
Maximum transient thermal impedance

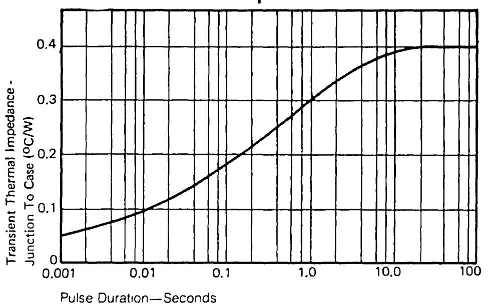


Figure 6
Maximum nonrepetitive surge current at rated load conditions

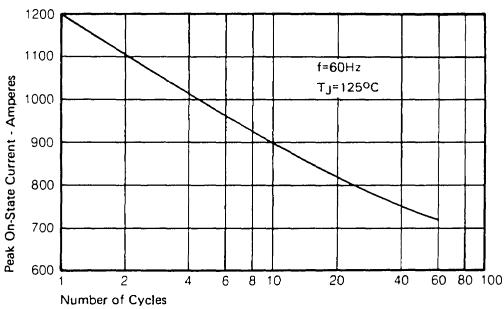
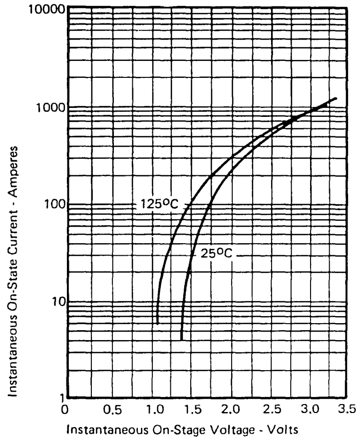


Figure 7
Maximum forward on-state characteristics



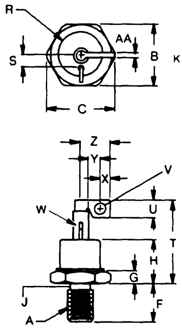
Silicon Controlled Rectifiers

86 Amps RMS, V_{DRM} AND V_{RRM} Up To 1200 Volts

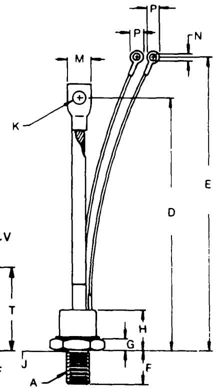
- High di/dt - 200 V/µsec
- 1200 Amperes surge current capability
- Package conforming to either TO-209AC or TO-208AD outline

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	1.050	1.060	26.67	26.92	
C	----	1.161	----	29.49	
D	5.850	6.144	149.10	156.06	
E	6.850	7.375	173.99	187.33	
F	.797	.827	20.24	21.01	
G	.276	.286	.701	7.26	
H	----	.948	----	24.08	
J	.425	.499	10.80	12.67	2
K	.260	.280	6.60	7.11	Dia.
M	.500	.600	12.70	15.24	
N	.140	.150	3.56	3.81	
P	----	.295	----	7.49	
R	----	.900	----	22.86	Dia.
S	.225	.275	6.48	6.99	
T	----	1.750	----	44.45	
U	.370	.380	9.40	9.65	
V	.213	.223	5.41	5.66	Dia.
W	.065	.075	1.65	1.91	Dia.
X	.215	.225	5.46	5.72	
Y	.290	.315	7.37	8.00	
Z	.514	.530	13.06	13.46	
AA	.089	.099	2.26	2.51	

Note 1:
½-20 UNF-2A
Note 2:
Full thread within 2½ threads



TO-208AD
(TO-83)



TO-209AC
(TO-94)

Catalog Number (Note 1)	Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
Std. Lead	Flag type		
55C80B	55C80BF	800	900
55C100B	55C100BF	1000	1100
55C120B	55C120BF	1200	1300

Note 1:

For insulated cathode lead, add suffix "IL" to catalog number.
Example: 55C100BIL

Note 2:

To specify dv/dt other than 200V/µsec, contact factory.

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	86 Amps	$T_c = 70\,°C$
Max. average on-state cur.	$I_{T(AV)}$	55 Amps	$T_c = 70\,°C$
Max. peak on-state voltage	V_{TM}	2.2 Volts	$I_{TM} = 220$ A (peak)
Max. holding current	I_H	200 mA	
Max peak one cycle surge current	I_{TSM}	1200 A	$T_c = 87\,°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	$6000A^2S$	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	100A/μsec.	$T_J = 125\,°C$
Typical delay time (note 2)	t_d	3.0 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	100 μsec.	$T_J = 125\,°C$
Thermal values			
Maximum thermal resistance	$R_{\Theta JC}$	0.32 °C/W	
Operating junction temp range	T_J	−40 °C to +125 °C	
Storage temperature range	T_{stg}	−40 °C to +150 °C	
Blocking			
Max. leakage current	I_{DRM}	10 mA	$T_J = 125\,°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	10 mA	$T_J = 125\,°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125\,°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125\,°C$
Max. gate current to trigger	I_{GT}	100 mA	
Max. peak gate power	P_{GM}	15 W	
Average gate power	$P_{G(AV)}$	3.0 W	$t_p = 10\,\mu$sec.
Max. peak gate current	I_{GM}	4.0A	
Max. peak gate voltage (forward)	V_{GM}	20V	
Max. peak gate voltage (reverse)	V_{GM}	10V	

Mechanical Characteristics

Base	High strength copper stud and base with a 1/2-20 UNF 2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Ceramic to metal construction.
Weight	55C—B Approximately 3.6 ounces (102.0 grams) 55C—BF Approximately 3.24 ounces (91.8 grams)
Mounting Torque	130 in. lbs. max
Dimensions	In accordance with TO-208AD or TO-209AC outlines

Note 1	$T_C = 25\,°C$ unless otherwise noted
Note 2	$I_{TM} = 50A$, $V_D = V_{DRM}$, $V_{GT} = 12V$ open circuit, 20 ohm-0.1 μsec. rise time
Note 3	$I_{TM} = 50A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum case temperature, sinusoidal half wave

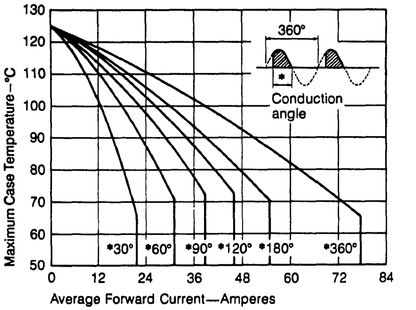


Figure 3
Maximum power dissipation, sinusoidal half wave

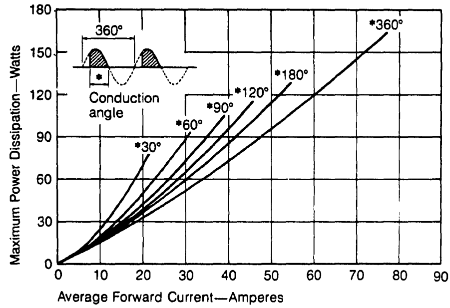


Figure 2
Maximum case temperature, rectangular wave

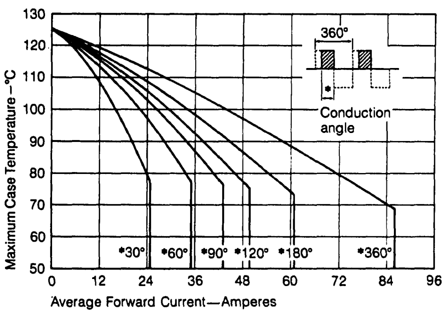


Figure 4
Maximum power dissipation, rectangular wave

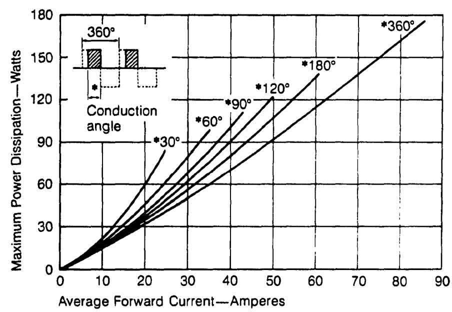


Figure 5
Maximum transient thermal impedance

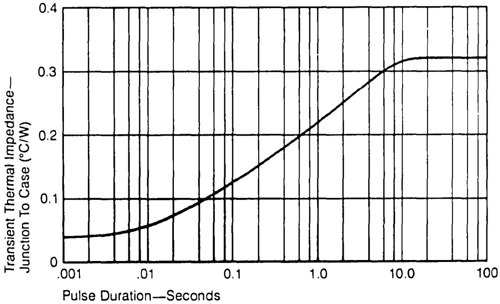


Figure 6
Maximum surge current (nonrepetitive) at rated load conditions

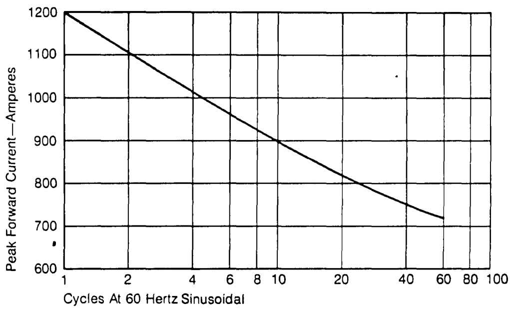
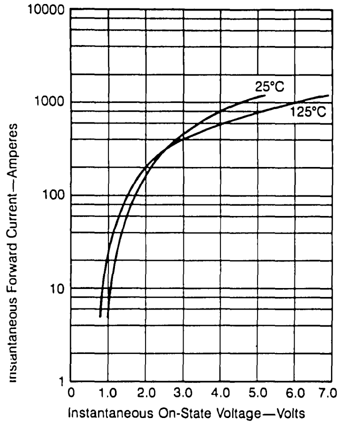


Figure 7
Maximum forward on-state characteristics

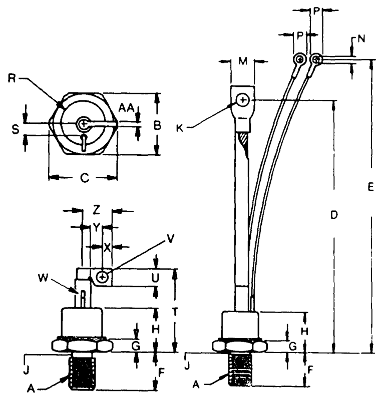


Silicon Controlled Rectifiers

Series 071

110 Amps RMS, V_{DRM} AND V_{RRM} Up To 600 Volts

- High di/dt - 200 V/μsec
- 1600 Amperes surge current capability
- Low forward on-state voltage
- Package conforming to either TO-209AC or TO-208AD outline
- Economical for general purpose phase control applications



TO-208AD (TO-83)
TO-209AC (TO-94)

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	1.050	1.060	26.67	26.92	
C	----	1.161	----	29.49	
D	5.850	6.144	149.10	156.06	
E	6.850	7.375	173.99	187.33	
F	.797	.827	20.24	21.01	
G	.276	.286	.701	7.26	
H	----	.948	----	24.08	
J	.425	.499	10.80	12.67	2
K	.260	.280	6.60	7.11	Dia.
M	.500	.600	12.70	15.24	
N	.140	.150	3.56	3.81	
P	----	.295	----	7.49	
R	----	.900	----	22.86	Dia.
S	.225	.275	6.48	6.99	
T	----	1.750	----	44.45	
U	.370	.380	9.40	9.65	
V	.213	.223	5.41	5.66	Dia.
W	.065	.075	1.65	1.91	Dia.
X	.215	.225	5.46	5.72	
Y	.290	.315	7.37	8.00	
Z	.514	.530	13.06	13.46	
AA	.089	.099	2.26	2.51	

Note 1:
½-20 UNF-2A
Note 2:
Full thread within 2½ threads

Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
07101GOA	100	200
07102GOA	200	300
07103GOA	300	400
07104GOA	400	500
07105GOA	500	600
07106GOA	600	700

Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K ≥ 300V/μsec
H ≥ 500V/μsec

Note 2:

To specify package designation other than standard lead, enter appropriate letter in place of "A".

B = Insulated Lead
D = Flag Terminal
C = Top Stud (consult factory)

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	110 Amps	$T_c = 87°C$
Max. average on-state cur.	$I_{T(AV)}$	70 Amps	$T_c = 87°C$
Max. peak on-state voltage	V_{TM}	1.60 Volts	$I_{TM} = 220$ A (peak)
Max. holding current	I_H	200 mA	
Max peak one cycle surge current	I_{TSM}	1600 A	$T_c = 87°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	10,624A²S	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	100A/μsec.	$T_J = 125°C$
Typical delay time (note 2)	t_d	3.0 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	100 μsec.	$T_J = 125°C$
Thermal values			
Maximum thermal resistance	$R_{\Theta JC}$	0.40°C/W	
Operating junction temp range	T_J	−40°C to +125°C	
Storage temperature range	T_{stg}	−40°C to +150°C	
Blocking			
Max. leakage current	I_{DRM}	10 mA	$T_J = 125°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	10 mA	$T_J = 125°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125°C$
Max. gate current to trigger	I_{GT}	100 mA	
Max. peak gate power	P_{GM}	15 W	
Average gate power	$P_{G(AV)}$	3.0 W	$t_p = 10$ μsec.
Max. peak gate current	I_{GM}	4.0A	
Max. peak gate voltage (forward)	V_{GM}	10V	
Max. peak gate voltage (reverse)	V_{GM}	5.0V	

Mechanical Characteristics

Base	High strength copper stud and base with a 1/2-20 UNF 2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	071—GOA Approximately 3.6 ounces (102.0 grams) 071-GOD Approximately 3.24 ounces (91.8 grams)
Mounting Torque	130 in. lbs. max
Dimensions	In accordance with TO-208AD or TO-209AC outlines

Note 1	$T_C = 25°C$ unless otherwise noted
Note 2	$I_{TM} = 50A$, $V_D = V_{DRM}$, $V_{GT} = 12V$ open circuit, 20 ohm-0.1 μsec. rise time
Note 3	$I_{TM} = 50A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, $V_{GT} = 0V$

Figure 1
Maximum case temperature

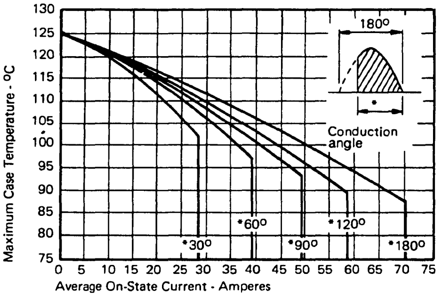


Figure 3
Maximum power dissipation

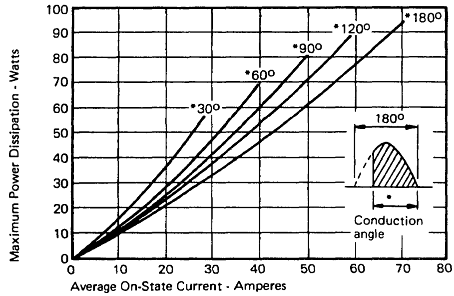


Figure 2
Maximum case temperature

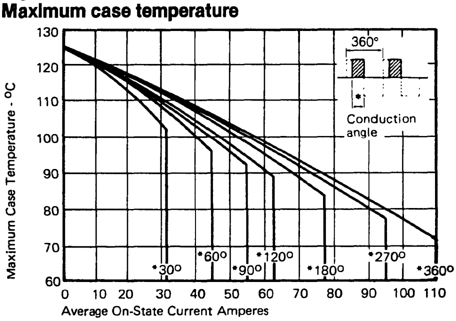


Figure 4
Maximum power dissipation

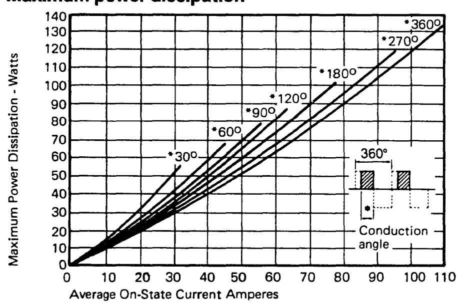


Figure 5
Maximum transient thermal impedance

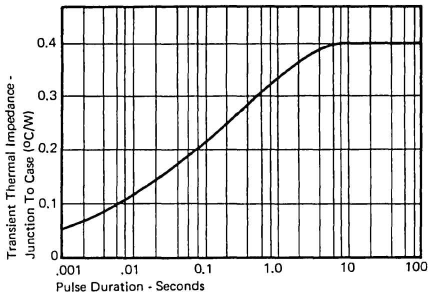


Figure 6
Maximum nonrepetitive surge current at rated load conditions

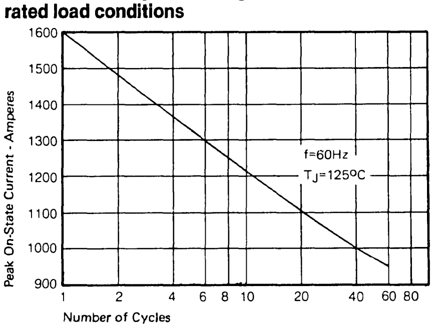
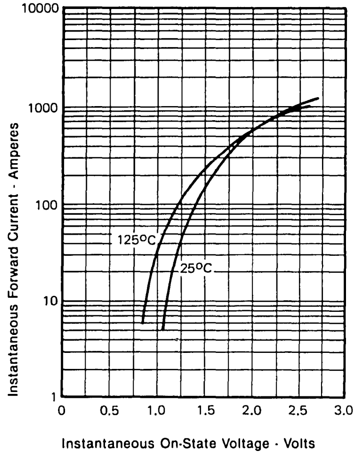


Figure 7
Maximum forward on-state characteristics



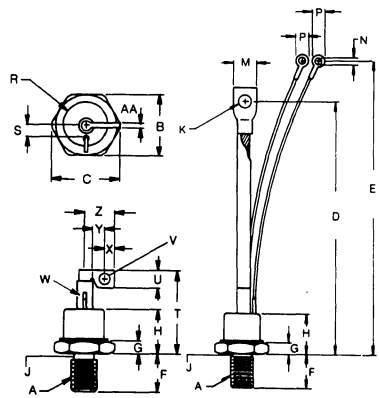
Silicon Controlled Rectifiers

110 Amps RMS, V_{DRM} AND V_{RRM} Up To 1200 Volts

- High di/dt - 200 V/μsec
- 1600 Amperes surge current capability
- Package conforming to either TO-209AC or TO-208AD outline

Dim.	Inches Minimum	Inches Maximum	Millimeter Minimum	Millimeter Maximum	Notes
A	----	----	----	----	1
B	1.050	1.060	26.67	26.92	
C	----	1.161	----	29.49	
D	5.850	6.144	149.10	156.06	
E	6.850	7.375	173.99	187.33	
F	.797	.827	20.24	21.01	
G	.276	.286	.701	7.26	
H	----	.948	----	24.08	
J	.425	.499	10.80	12.67	2
K	.260	.280	6.60	7.11	Dia.
M	.500	.600	12.70	15.24	
N	.140	.150	3.56	3.81	
P	----	.295	----	7.49	
R	----	.900	----	22.86	Dia.
S	.225	.275	6.48	6.99	
T	----	1.750	----	44.45	
U	.370	.380	9.40	9.65	
V	.213	.223	5.41	5.66	Dia.
W	.065	.075	1.65	1.91	Dia.
X	.215	.225	5.46	5.72	
Y	.290	.315	7.37	8.00	
Z	.514	.530	13.06	13.46	
AA	.089	.099	2.26	2.51	

Note 1:
½-20 UNF-2A
Note 2:
Full thread within 2½ threads



TO-208AD (TO-83)

TO-209AC (TO-94)

Catalog Number (Note 1)	Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
Std. Lead	Flag type		
70C80B	70C80BF	800	900
70C100B	70C100BF	1000	1100
70C120B	70C120BF	1200	1300

Note 1:

For insulated cathode lead, add suffix "IL" to catalog number.
Example: 70C100BIL

Note 2:

To specify dv/dt other than 200V/μsec, contact factory.

Silicon Controlled Rectifiers

(Note 1)

Series 70C

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	110 Amps	$T_c = 78\,°C$
Max. average on-state cur.	$I_{T(AV)}$	70 Amps	$T_c = 78\,°C$
Max. peak on-state voltage	V_{TM}	1.85 Volts	$I_{TM} = 220$ A (peak)
Max. holding current	I_H	200 mA	
Max peak one cycle surge current	I_{TSM}	1600 A	$T_c = 78\,°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	10,700A²S	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	100A/μsec.	$T_J = 125\,°C$
Typical delay time (note 2)	t_d	3.0 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	100 μsec.	$T_J = 125\,°C$
Thermal values			
Maximum thermal resistance	$R_{\Theta JC}$	0.28 °C/W	
Operating junction temp range	T_J	−40 °C to +125 °C	
Storage temperature range	T_{stg}	−40 °C to +150 °C	
Blocking			
Max. leakage current	I_{DRM}	10 mA	$T_J = 125\,°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	10 mA	$T_J = 125\,°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125\,°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125\,°C$
Max. gate current to trigger	I_{GT}	100 mA	
Max. peak gate power	P_{GM}	15 W	
Average gate power	$P_{G(AV)}$	3.0 W	$t_p = 10\ \mu$sec.
Max. peak gate current	I_{GM}	4.0A	
Max. peak gate voltage (forward)	V_{GM}	10V	
Max. peak gate voltage (reverse)	V_{GM}	5.0V	

Mechanical Characteristics

Base	High strength copper stud and base with a 1/2-20 UNF 2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Ceramic to metal construction.
Weight	70C—B Approximately 3.6 ounces (102.0 grams) 70C—BF Approximately 3.24 ounces (91.8 grams)
Mounting Torque	130 in. lbs. max
Dimensions	In accordance with TO-208AD or TO-209AC outlines

Note 1	$T_C = 25\,°C$ unless otherwise noted
Note 2	$I_{TM} = 50$A, $V_D = V_{DRM}$, $V_{GT} = 12$V open circuit, 20 ohm-0.1 μsec. rise time
Note 3	$I_{TM} = 50$A, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum case temperature, sinusoidal half wave

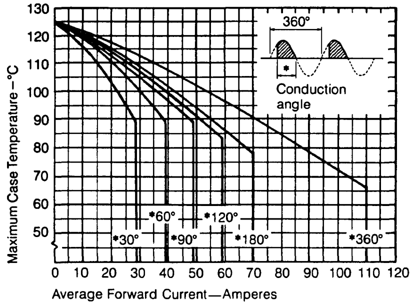


Figure 3
Maximum power dissipation, sinusoidal half wave

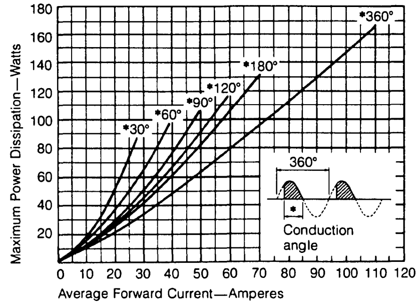


Figure 2
Maximum case temperature, rectangular wave

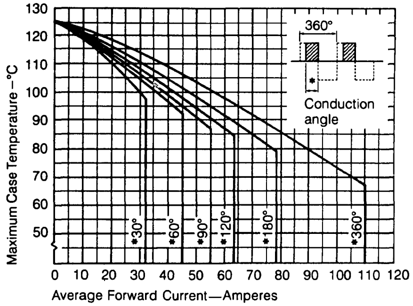


Figure 4
Maximum power dissipation, rectangular wave

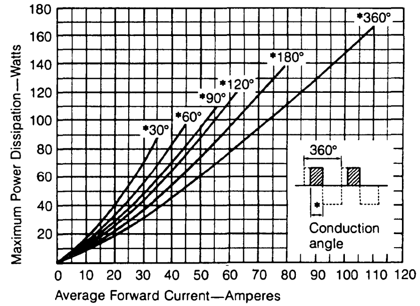


Figure 5
Maximum transient thermal impedance

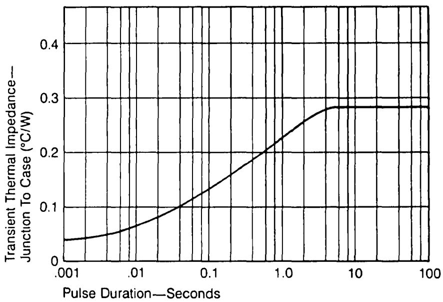


Figure 7
Maximum surge current (nonrepetitive) at rated load conditions

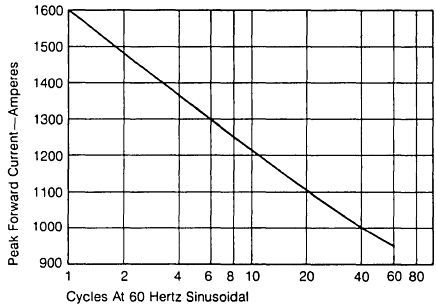
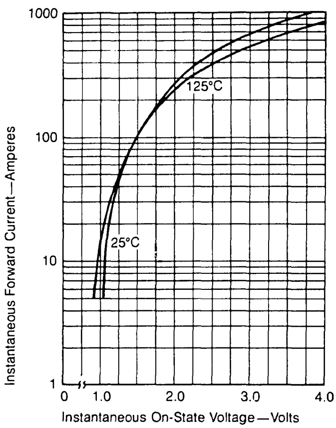


Figure 6
Maximum forward on-state characteristics



Silicon Controlled Rectifiers

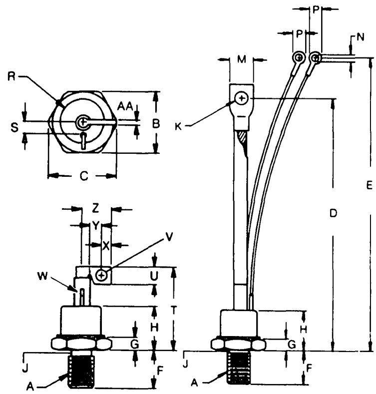
Series 080

125 Amps RMS, V_{DRM} AND V_{RRM} Up To 600 Volts

- High di/dt - 200 V/μsec
- 1800 Amperes surge current capability
- Low forward on-state voltage
- Package conforming to either TO-209AC or TO-208AD outline

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	1.050	1.060	26.67	26.92	
C	----	1.161	----	29.49	
D	5.850	6.144	149.10	156.06	
E	6.850	7.375	173.99	187.33	
F	.797	.827	20.24	21.01	
G	.276	.286	.701	7.26	
H	----	.948	----	24.08	
J	.425	.499	10.80	12.67	2
K	.260	.280	6.60	7.11	Dia.
M	.500	.600	12.70	15.24	
N	.140	.150	3.56	3.81	
P	----	.295	----	7.49	
R	----	.900	----	22.86	Dia.
S	.225	.275	6.48	6.99	
T	----	1.750	----	44.45	
U	.370	.380	9.40	9.65	
V	.213	.223	5.41	5.66	Dia.
W	.065	.075	1.65	1.91	Dia.
X	.215	.225	5.46	5.72	
Y	.290	.315	7.37	8.00	
Z	.514	.530	13.06	13.46	
AA	.089	.099	2.26	2.51	

Note 1:
½-20 UNF-2A
Note 2:
Full thread within 2½ threads



TO-208AD (TO-83)　　**TO-209AC (TO-94)**

Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
08001GOA	100	200
08002GOA	200	300
08003GOA	300	400
08004GOA	400	500
08005GOA	500	600
08006GOA	600	700

Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K ≥ 300V/μsec
H ≥ 500V/μsec

Note 2:

To specify package designation other than standard lead, enter appropriate letter in place of "A".

B = Insulated Lead
D = Flag Terminal
C = Top Stud (consult factory)

(Note 1)

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	125 Amps	$T_c = 87°C$
Max. average on-state cur.	$I_{T(AV)}$	80 Amps	$T_c = 87°C$
Max. peak on-state voltage	V_{TM}	1.40 Volts	$I_{TM} = 220$ A (peak)
Max. holding current	I_H	200 mA	
Max peak one cycle surge current	I_{TSM}	1800 A	$T_c = 87°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	13,500A^2S	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	100A/μsec.	$T_J = 125°C$
Typical delay time (note 2)	t_d	3.0 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	100 μsec.	$T_J = 125°C$
Thermal values			
Maximum thermal resistance	$R\Theta_{JC}$	0.40 °C/W	
Operating junction temp range	T_J	− 40°C to + 125°C	
Storage temperature range	T_{stg}	− 40°C to + 150°C	
Blocking			
Max. leakage current	I_{DRM}	10 mA	$T_J = 125°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	10 mA	$T_J = 125°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125°C$
Max. gate current to trigger	I_{GT}	100 mA	
Max. peak gate power	P_{GM}	15 W	
Average gate power	$P_{G(AV)}$	3.0 W	$t_p = 10$ μsec.
Max. peak gate current	I_{GM}	4.0A	
Max. peak gate voltage (forward)	V_{GM}	10V	
Max. peak gate voltage (reverse)	V_{GM}	5.0V	

Mechanical Characteristics	
Base	High strength copper stud and base with a 1/2-20 UNF 2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	080 — GOA Approximately 3.6 ounces (102.0 grams) 080 — GOD Approximately 3.24 ounces (91.8 grams)
Mounting Torque	130 in. lbs. max
Dimensions	In accordance with TO-208AD or TO-209AC outlines

Note 1	$T_C = 25°C$ unless otherwise noted
Note 2	$I_{TM} = 50A$, $V_D = V_{DRM}$, $V_{GT} = 12V$ open circuit, 20 ohm-0.1 μsec. rise time
Note 3	$I_{TM} = 50A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum case temperature

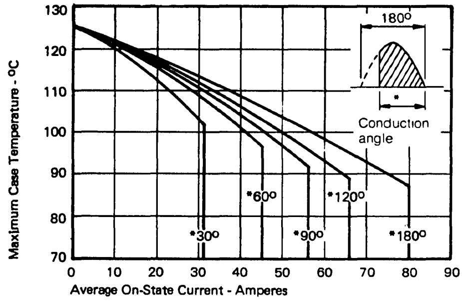


Figure 3
Maximum power dissipation

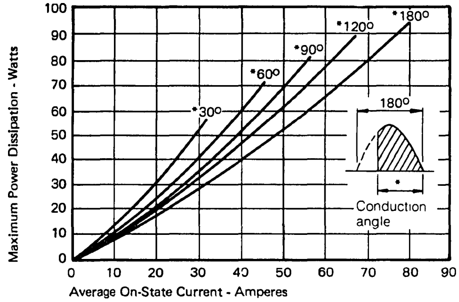


Figure 2
Maximum case temperature

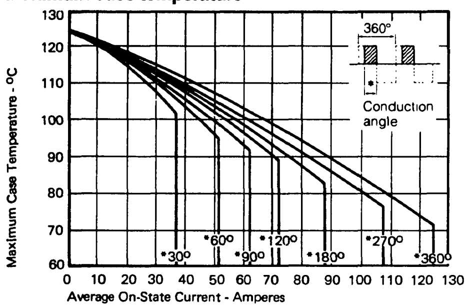


Figure 4
Maximum power dissipation

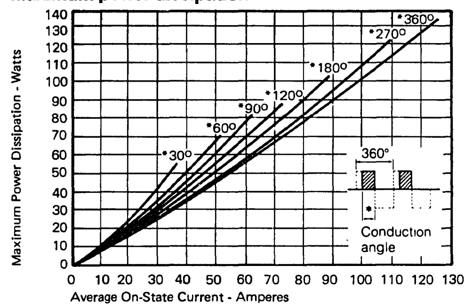


Figure 5
Maximum transient thermal impedance

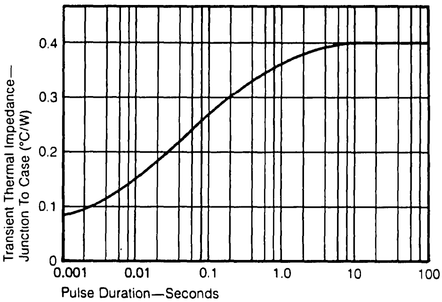


Figure 6
Maximum nonrepetitive surge current at rated load conditions

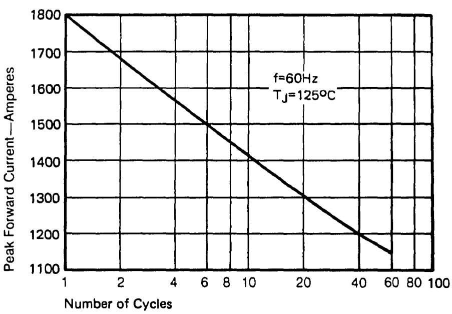


Figure 7
Maximum forward on-state characteristics

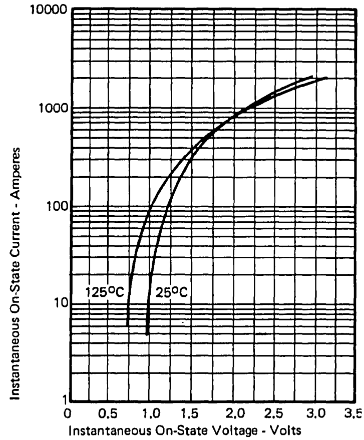
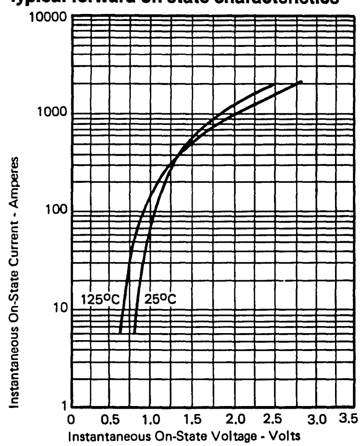


Figure 8
Typical forward on-state characteristics



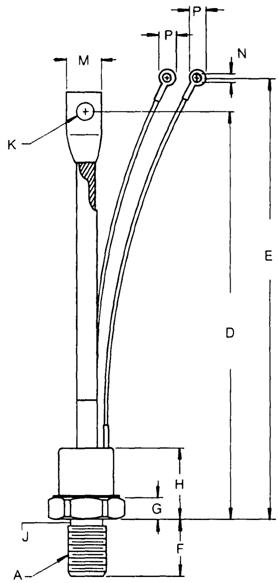
Silicon Controlled Rectifiers — Series 151

235 Amps RMS, V_{DRM} AND V_{RRM} Up To 600 Volts

- 3500 Amperes surge curreent capability
- Low forward on-state voltage
- Available with flex lead or flag terminal
- Economical for general purpose phase control applications

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	1.237	1.243	31.42	31.57	
C	1.350	1.360	34.29	34.54	
D	7.428	7.671	188.67	194.84	
E	7.382	8.100	187.50	205.74	
F	1.047	1.077	26.59	27.36	
G	.365	.385	9.27	9.78	
H	----	1.383	----	35.13	
J	.660	.749	16.76	19.02	2
K	.338	.348	8.59	8.84	Dia.
M	.625	.687	15.88	17.45	
N	.140	.150	3.56	3.81	Dia.
P	----	.295	----	7.49	

Note 1: 3/4-16 UNF-2A
Note 2: Full thread within 2½ threads



TO-209AB (TO-93)

Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
15101GOA	100	200
15102GOA	200	300
15103GOA	300	400
15104GOA	400	500
15105GOA	500	600
15106GOA	600	700

Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K $\geq$ 300V/μsec
H $\geq$ 500V/μsec

Note 2:

To specify package designation other than standard lead, enter appropriate letter in place of "A".

B = Insulated Lead

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	235 Amps	$T_c = 74°C$
Max. average on-state cur.	$I_{T(AV)}$	150 Amps	$T_c = 74°C$
Max. peak on-state voltage	V_{TM}	1.7 Volts	$I_{TM} = 500$ A (peak)
Max. holding current	I_H	200 mA	
Max peak one cycle surge current	I_{TSM}	3500 A	$T_c = 74°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	50,000A²S	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	100A/μsec.	$T_J = 125°C$
Typical delay time (note 2)	t_d	3.0 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	100 μsec.	$T_J = 125°C$
Thermal values			
Maximum thermal resistance	$R_{\Theta JC}$	0.2°C/W	
Operating junction temp range	T_J	−40°C to +125°C	
Storage temperature range	T_{stg}	−40°C to +150°C	
Blocking			
Max. leakage current	I_{DRM}	15 mA	$T_J = 125°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	15 mA	$T_J = 125°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125°C$
Max. gate current to trigger	I_{GT}	150 mA	
Max. peak gate power	P_{GM}	10 W	
Average gate power	$P_{G(AV)}$	2.0 W	$t_p = 10$ μsec.
Max. peak gate current	I_{GM}	2.0A	
Max. peak gate voltage (forward)	V_{GM}	10V	
Max. peak gate voltage (reverse)	V_{GM}	5.0V	

Mechanical Characteristics	
Base	High strength copper stud and base with a 3/4-16 UNF 2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately 7.44 ounces (211.1 grams)
Mounting Torque	300 in. lbs. max
Dimensions	In accordance with TO-209AB outline

Note 1	$T_C = 25°C$ unless otherwise noted
Note 2	$I_{TM} = 100A$, $V_D = V_{DRM}$, $V_{GT} = 12V$ open circuit, 20 ohms-0.1 μsec. rise time
Note 3	$I_{TM} = 100A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum case temperature, sinusoidal half wave

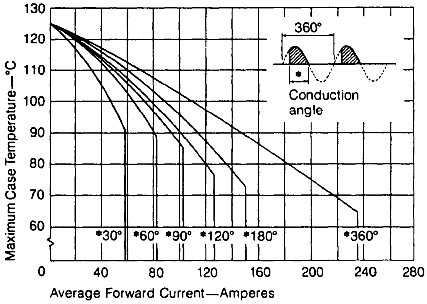


Figure 2
Maximum case temperature, rectangular wave

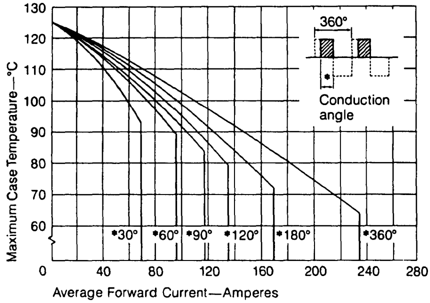


Figure 3
Maximum power dissipation, sinusoidal half wave

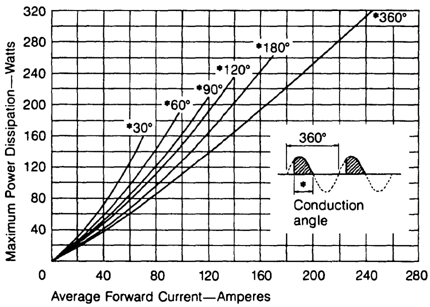


Figure 4
Maximum power dissipation, rectangular wave

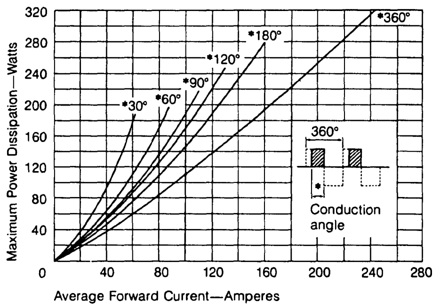


Figure 5
Maximum transient thermal impedance

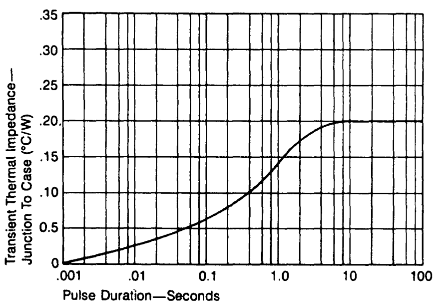


Figure 6
Maximum forward on-state characteristics

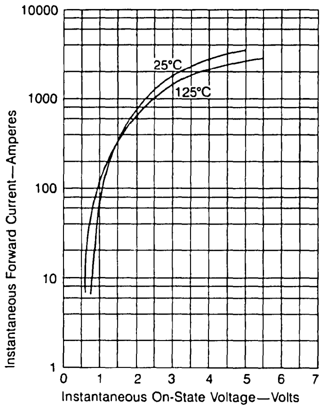


Figure 7
Maximum surge current (nonrepetitive) at rated load conditions

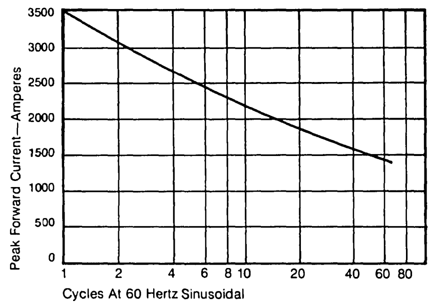


Figure 8
Maximum non-repetitive sub-cycle surge current and I²t following on-state rated load conditions

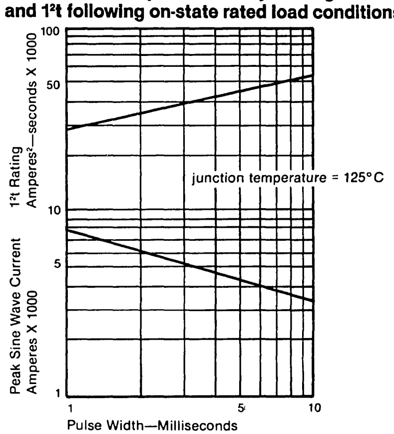


Figure 9
Gate characteristics

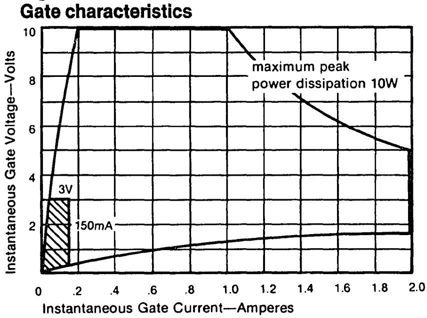
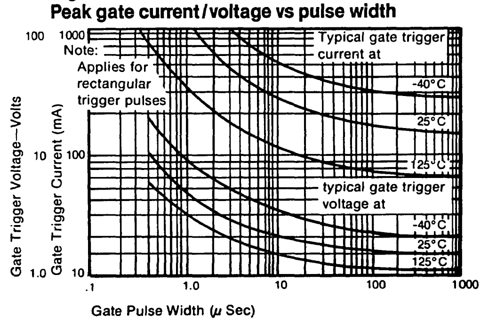


Figure 10
Peak gate current/voltage vs pulse width



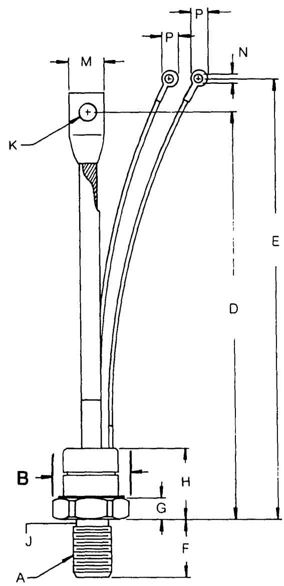
Silicon Controlled Rectifiers

235 Amps RMS, V_{DRM} AND V_{RRM} Up To 1200 Volts

- High di/dt - 200 V/μsec
- 3000 Amperes surge current capability
- Primarily for line commutated converters

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	----	----	----	----	1
B	1.237	1.243	31.42	31.55	Across
D	7.428	7.671	188.67	194.84	flats
E	7.382	8.100	187.50	205.74	
F	1.047	1.077	26.59	27.36	
G	.365	.385	9.27	9.78	
H	----	1.383	----	35.13	
J	.660	.749	16.76	19.02	2
K	.338	.348	8.59	8.84	Dia.
M	.625	.687	15.88	17.45	
N	.140	.150	3.56	3.81	Dia.
P	----	.295	----	7.49	

Note 1: 3/4-16 UNF-2A
Note 2: Full thread within 2½ threads



TO-209AB (TO-93)

Catalog Number (Note 1)	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
150C80B	800	900
150C100B	1000	1100
150C 120B	1200	1300

Note 1:

For insulated cathode lead, add suffix "IL" to catalog number.
Example: 150C100BIL

Note 2:

To specify dv/dt other than 200V/μsec, contact factory.

Silicon Controlled Rectifiers

(Note 1)

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	235 Amps	$T_c = 73°C$
Max. average on-state cur.	$I_{T(AV)}$	150 Amps	$T_c = 73°C$
Max. peak on-state voltage	V_{TM}	1.7 Volts	$I_{TM} = 500$ A (peak)
Max. holding current	I_H	200 mA	
Max peak one cycle surge current	I_{TSM}	3000 A	$T_c = 73°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	37,000A^2S	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	100A/μsec.	$T_J = 125°C$
Typical delay time (note 2)	t_d	3.0 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	100 μsec.	$T_J = 125°C$
Thermal values			
Maximum thermal resistance	$R\Theta_{JC}$	0.2°C/W	
Operating junction temp range	T_J	−40°C to +125°C	
Storage temperature range	T_{stg}	−40°C to +150°C	
Blocking			
Max. leakage current	I_{DRM}	20 mA	$T_J = 125°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	20 mA	$T_J = 125°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125°C$
Max. gate current to trigger	I_{GT}	150 mA	
Max. peak gate power	P_{GM}	10 W	
Average gate power	$P_{G(AV)}$	2.0 W	$t_p = 10$ μsec.
Max. peak gate current	I_{GM}	2.0A	
Max. peak gate voltage (forward)	V_{GM}	10V	
Max. peak gate voltage (reverse)	V_{GM}	5.0V	

Mechanical Characteristics

Base	High strength copper stud and base with a 3/4-16 UNF 2A thread for through mounting on a heat sink. Nickel plating of base prevents corrosion.
Header	Ceramic to metal construction.
Weight	Approximately 7.44 ounces (211.1 grams)
Mounting Torque	300 in. lbs. max
Dimensions	In accordance with TO-209AB outline

Note 1	$T_C = 25°C$ unless otherwise noted
Note 2	$I_{TM} = 100A$, $V_D = V_{DRM}$, $V_{GT} = 12V$ open circuit, 20 ohms-0.1 μsec. rise time
Note 3	$I_{TM} = 100A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum case temperature, sinusoidal half wave

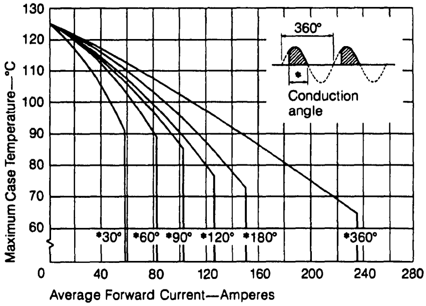


Figure 3
Maximum power dissipation, sinusoidal half wave

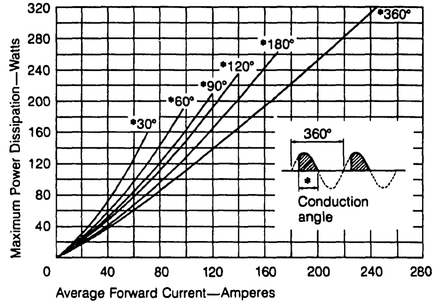


Figure 2
Maximum case temperture, rectangular wave

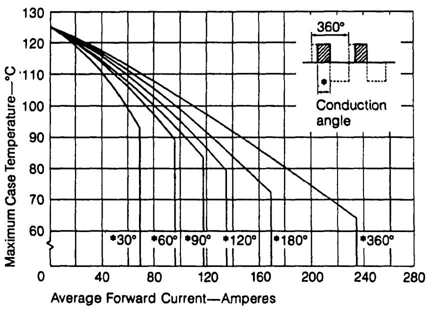


Figure 4
Maximum power dissipation, rectangular wave

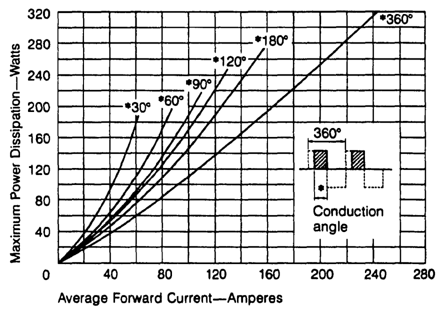


Figure 5
Maximum transient thermal impedance

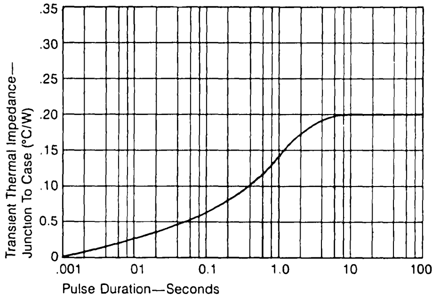


Figure 7
Maximum surge current (nonrepetitive) at rated load conditions

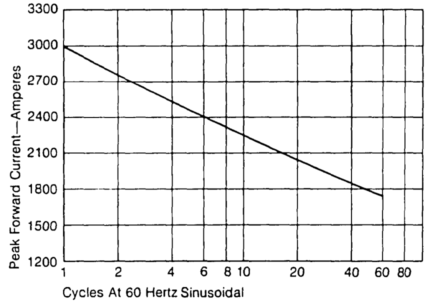
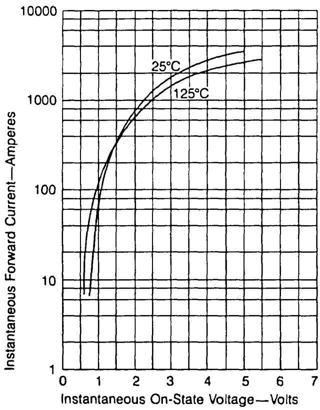


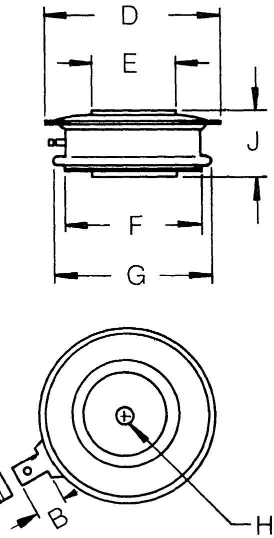
Figure 6
Maximum forward on-state characteristics



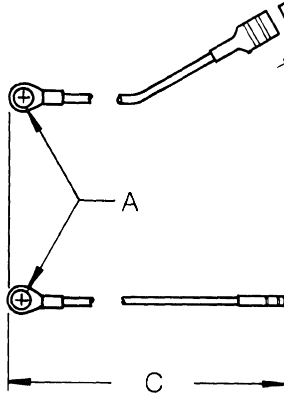
400 Amps RMS, V_{DRM} AND V_{RRM} Up To 1200 Volts

- High dv/dt - 200 v/μsec
- 4500 Amperes surge current capability
- Blocking voltage up to 1200 volts
- Excellent for rigorous thermal cyclic applications

Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
A	0.138	0.143	3.51	3.63	Dia.
B	0.245	0.255	6.45	6.48	
C	7.875	8.250	200.0	209.6	
D	1.620	1.640	41.14	41.65	Dia.
E	0.748	0.752	18.9	19.1	Dia.
F	1.245	1.275	31.62	32.39	Dia.
G	1.430	1.460	36.32	37.08	Dia.
H	0.137	0.143	3.48	3.63	Dia., 0.075
J	0.530	0.554	13.46	14.07	



Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
24008GOF	800	900
24010GOF	1000	1100
24012GOF	1200	1300



Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K $\geq$ 300V/μsec
H $\geq$ 500V/μsec

TO 200 AB

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	400 Amps	$T_c = 87°C$
Max. average on-state cur.	$I_{T(AV)}$	255 Amps	$T_c = 87°C$
Max. peak on-state voltage	V_{TM}	2.3 Volts	$I_{TM} = 1000$ A (peak)
Max. holding current	I_H	300 mA	
Max peak one cycle surge current	I_{TSM}	4500 A	$T_c = 87°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	84,000A^2S	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	500A/μsec.	$T_J = 125°C$
Typical delay time (note 2)	t_d	3 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	150 μsec.	$T_J = 125°C$
Thermal values			
Maximum thermal resistance	$R_{\Theta JC}$	0.08 °C/W	
Operating junction temp range	T_J	− 40 °C to + 125 °C	
Storage temperature range	T_{stg}	− 40 °C to + 150 °C	
Blocking			
Max. leakage current	I_{DRM}	20 mA	$T_J = 125°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	20 mA	$T_J = 125°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125°C$
Max. gate current to trigger	I_{GT}	150 mA	
Max. peak gate power	P_{GM}	16 W	
Average gate power	$P_{G(AV)}$	3 W	$t_p = 10$ μsec.
Max. peak gate current	I_{GM}	4.0A	
Max. peak gate voltage (forward)	V_{GM}	20V	
Max. peak gate voltage (reverse)	V_{GM}	5.0V	

Mechanical Characteristics	
Weight	**Approximately 2.3 ounces (66 grams)**
Mounting Force	**1000** ± 100 pounds
Dimensions	In accordance with TO-200AB outlines

Note 1	$T_C = 25°C$ unless otherwise noted
Note 2	$I_{TM} = 100A$, $V_D = V_{DRM}$, $V_{GT} = 20V$ open circuit, 20 ohms-0.1 μsec. rise time
Note3	$I_{TM} = 250A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum case temperature

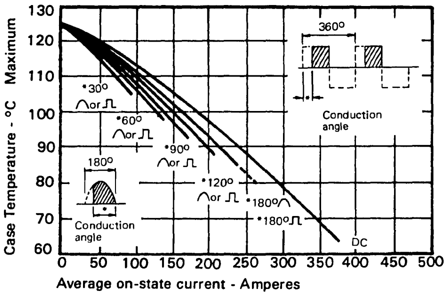


Figure 2
Maximum Power Dissipation - Watts

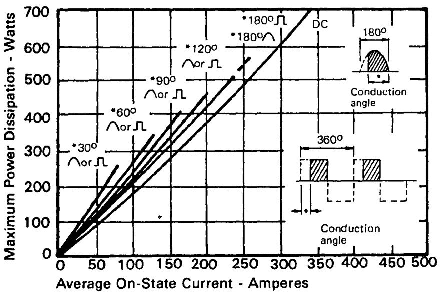


Figure 3
Maximum nonrepetitive surge current at rated load conditions

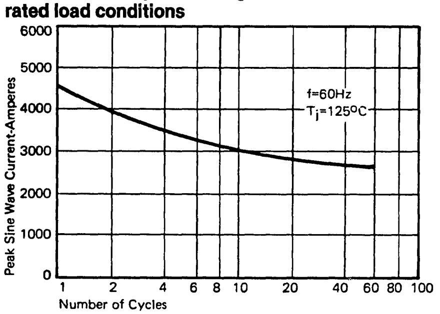


Figure 4
Maximum transient thermal impedance

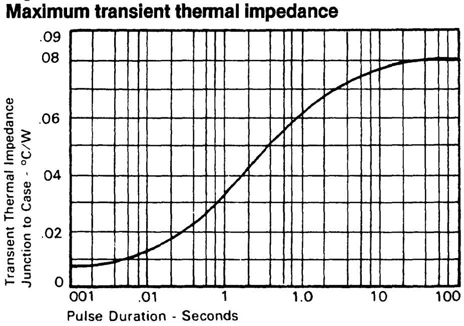
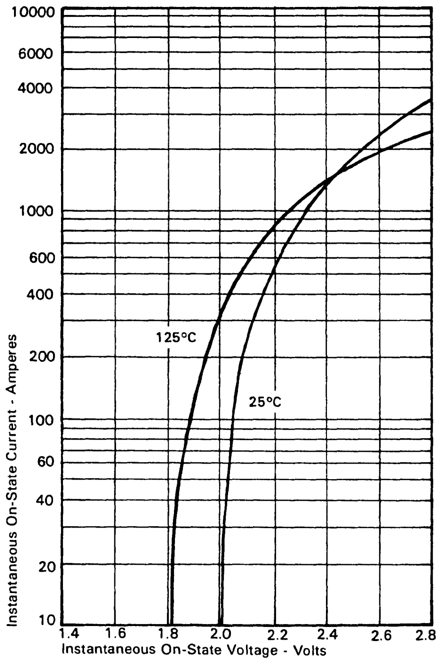


Figure 5
Maximum on-state characteristics



Silicon Controlled Rectifiers

470 Amps RMS, V_{DRM} AND V_{RRM} Up To 1200 Volts

- High dv/dt - 200 v/μsec
- 5500 Amperes surge current capability
- Blocking voltage up to 1200 volts
- Excellent for rigorous thermal cyclic applications

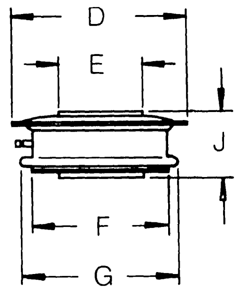
Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	0.138	0.143	3.51	3.63	Dia.
B	0.245	0.255	6.45	6.48	
C	7.875	8.250	200.0	209.6	
D	1.620	1.640	41.14	41.65	Dia.
E	0.748	0.752	18.9	19.1	Dia.
F	1.245	1.275	31.62	32.39	Dia.
G	1.430	1.460	36.32	37.08	Dia.
H	0.137	0.143	3.48	3.63	Dia., 0.075
J	0.530	0.554	13.46	14.07	

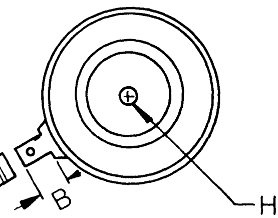
Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
30008GOF	800	900
30010GOF	1000	1100
30012GOF	1200	1300

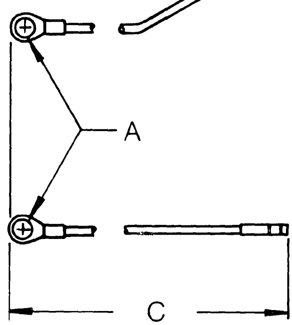
Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K $\geq$ 300V/μsec
H $\geq$ 500V/μsec







TO 200 AB

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	470 Amps	$T_c = 87\,°C$
Max. average on-state cur.	$I_{T(AV)}$	300 Amps	$T_c = 87\,°C$
Max. peak on-state voltage	V_{TM}	1.82 Volts	$I_{TM} = 1000$ A (peak)
Max. holding current	I_H	300 mA	
Max peak one cycle surge current	I_{TSM}	5500 A	$T_c = 87\,°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	125,000A^2S	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	500A/μsec.	$T_J = 125\,°C$
Typical delay time (note 2)	t_d	3 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	150 μsec.	$T_J = 125\,°C$
Thermal values			
Maximum thermal resistance	$R\Theta_{JC}$	0.08 °C/W	
Operating junction temp range	T_J	−40 °C to +125 °C	
Storage temperature range	T_{stg}	−40 °C to +150 °C	
Blocking			
Max. leakage current	I_{DRM}	20 mA	$T_J = 125\,°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	20 mA	$T_J = 125\,°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125\,°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125\,°C$
Max. gate current to trigger	I_{GT}	150 mA	
Max. peak gate power	P_{GM}	16 W	
Average gate power	$P_{G(AV)}$	3 W	$t_p = 10\ \mu$sec.
Max. peak gate current	I_{GM}	4.0A	
Max. peak gate voltage (forward)	V_{GM}	20V	
Max. peak gate voltage (reverse)	V_{GM}	5.0V	

Mechanical Characteristics

Weight	**Approximately 2.3 ounces (66 grams)**
Mounting Force	**1000** ± 100 pounds
Dimensions	In accordance with TO-200AB outlines

Note 1	$T_C = 25\,°C$ unless otherwise noted
Note 2	$I_{TM} = 100A$, $V_D = V_{DRM}$, $V_{GT} = 20V$ open circuit, 20 ohms-0.1 μsec. rise time
Note3	$I_{TM} = 250A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum case temperature

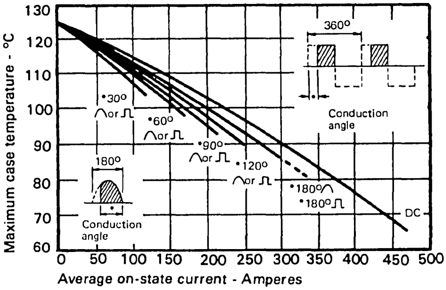


Figure 2
Maximum power dissipation

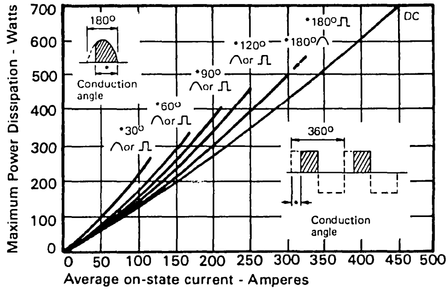


Figure 3
Maximum nonrepetive surge current at rated load conditions

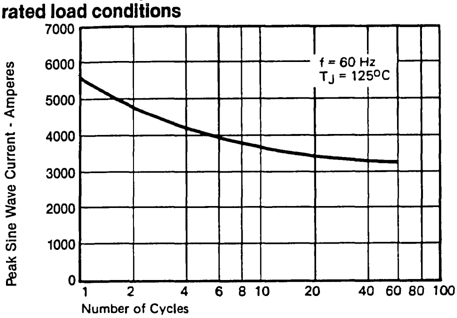


Figure 4
Maximum transient thermal impedance

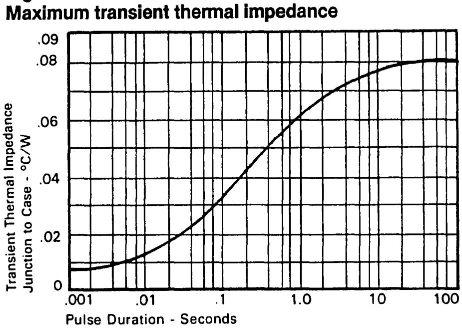
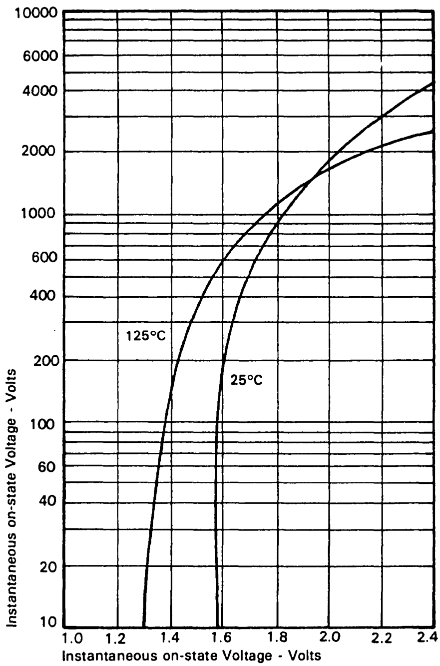


Figure 5
Maximum on-state characteristics



Silicon Controlled Rectifiers — Series 350

550 Amps RMS, V_{DRM} and V_{RRM} Up To 600 Volts

- High dv/dt - 200 v/μsec
- 7500 Amperes surge current capability
- Blocking voltage up to 600 volts
- Excellent for rigorous thermal cyclic applications

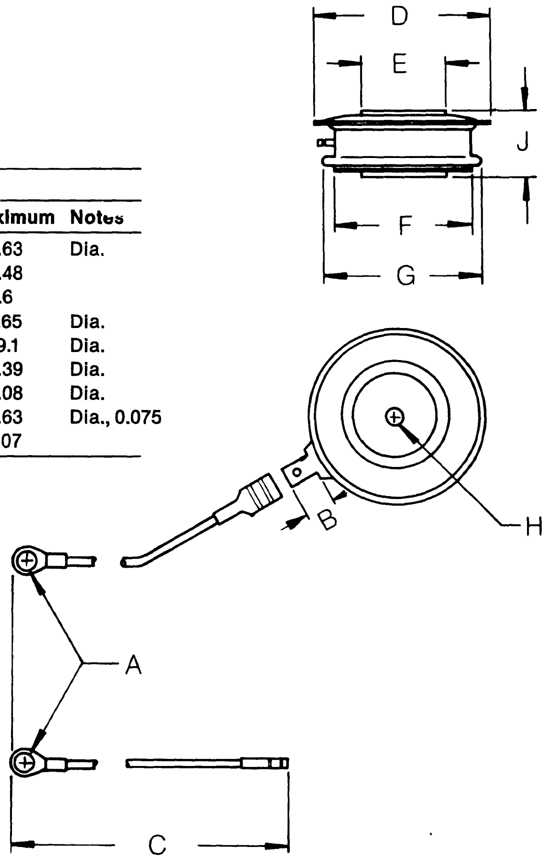
Dim.	Inches Minimum	Inches Maximum	Millimeter Minimum	Millimeter Maximum	Notes
A	0.138	0.143	3.51	3.63	Dia.
B	0.245	0.255	6.45	6.48	
C	7.875	8.250	200.0	209.6	
D	1.620	1.640	41.14	41.65	Dia.
E	0.748	0.752	18.9	19.1	Dia.
F	1.245	1.275	31.62	32.39	Dia.
G	1.430	1.460	36.32	37.08	Dia.
H	0.137	0.143	3.48	3.63	Dia., 0.075
J	0.530	0.554	13.46	14.07	

Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
35001GOF	100	200
35002GOF	200	300
35003GOF	300	400
35004GOF	400	500
35005GOF	500	600
35006GOF	600	700

Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K $\geq$ 300V/μsec
H $\geq$ 500V/μsec



TO 200 AB

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T\,(RMS)}$	550 Amps	$T_c = 86\,°C$
Max. average on-state cur.	$I_{T(AV)}$	350 Amps	$T_c = 86\,°C$
Max. peak on-state voltage	V_{TM}	1.48 Volts	$I_{TM} = 1000$ A (peak)
Max. holding current	I_H	300 mA	
Max peak one cycle surge current	I_{TSM}	7500 A	$T_c = 86\,°C$, 60 Hz
Max. I^2t capability for fusing	I^2t	230,000A²S	t = 8.3 ms
Switching			
Critical rate of rise of on-state current (note 2)	di/dt	500A/μsec.	$T_J = 125\,°C$
Typical delay time (note 2)	t_d	3 μsec.	
Typical circuit commutated turn-off time (note 3)	t_q	150 μsec.	$T_J = 125\,°C$
Thermal values			
Maximum thermal resistance	$R\Theta_{JC}$	0.08 °C/W	
Operating junction temp range	T_J	− 40 °C to + 125 °C	
Storage temperature range	T_{stg}	− 40 °C to + 150 °C	
Blocking			
Max. leakage current	I_{DRM}	20 mA	$T_J = 125\,°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	20 mA	$T_J = 125\,°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125\,°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max nontriggering gate voltage	V_{GD}	0.25V	$T_J = 125\,°C$
Max. gate current to trigger	I_{GT}	150 mA	
Max. peak gate power	P_{GM}	16 W	
Average gate power	$P_{G(AV)}$	3 W	$t_p = 10$ μsec.
Max. peak gate current	I_{GM}	4.0A	
Max. peak gate voltage (forward)	V_{GM}	20V	
Max. peak gate voltage (reverse)	V_{GM}	5.0V	

Mechanical Characteristics	
Weight	**Approximately 2.3 ounces (66 grams)**
Mounting Force	**1000** ± 100 pounds
Dimensions	In accordance with TO-200AB outlines

Note 1	$T_C = 25\,°C$ unless otherwise noted
Note 2	$I_{TM} = 100$A, $V_D = V_{DRM}$, $V_{GT} = 20$V open circuit, 20 ohms-0.1 μsec. rise time
Note3	$I_{TM} = 250$A, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec., linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum case temperature

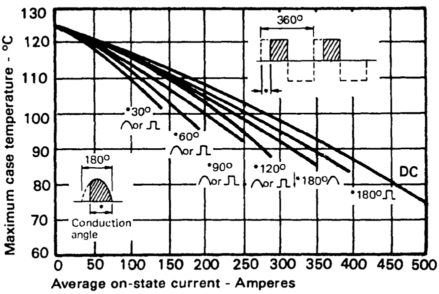


Figure 2
Maximum power dissipation

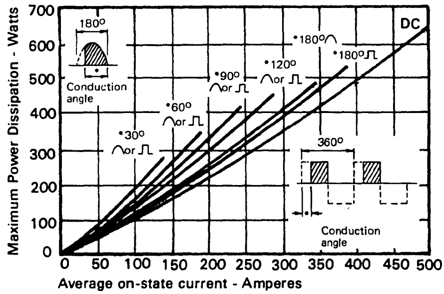


Figure 3
Maximum nonrepetitive surge current at rated load conditions

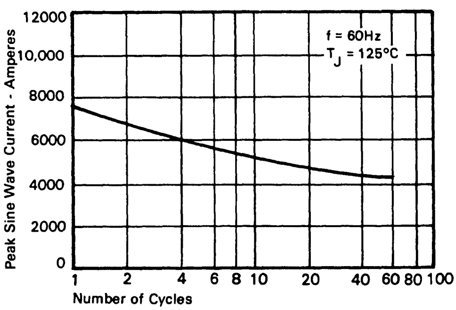


Figure 4
Maximum transient thermal impedance

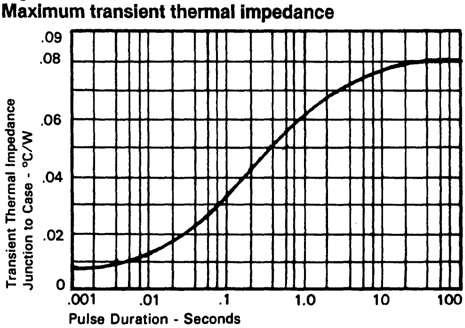
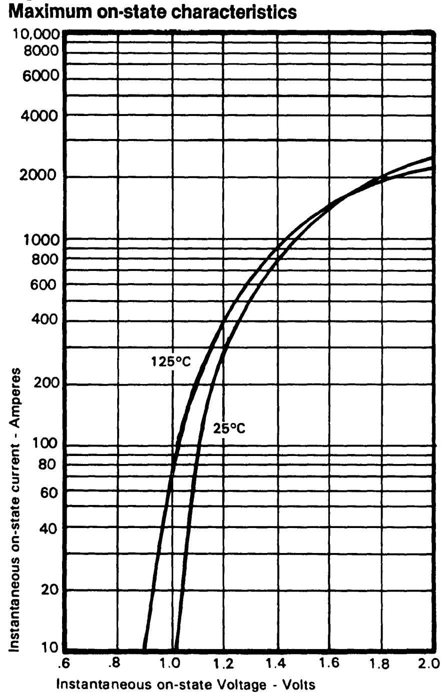


Figure 5
Maximum on-state characteristics



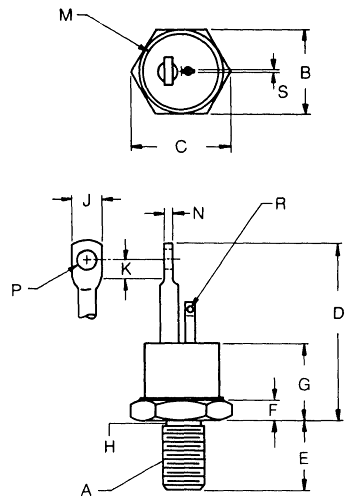
SCR's, Inverter

Silicon Controlled Rectifiers/Inverter

Series 039

63 Amps RMS, V_{DRM} AND V_{RRM} Up To 600 Volts

- 1000 Amperes surge current capability
- Blocking voltages up to 600 volts
- 10 μsec turn-off time available
- Primarily for forced commutated applications
- High dv/dt - 500 V/μsec available with selection
- Primarily for forced commutated applications



(TO-65)

TO-208AC

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	.677	.683	17.19	17.34	
C	.745	.755	18.92	19.17	
D	1.075	1.105	27.30	28.06	
E	.427	.447	10.84	11.35	
F	.135	.140	3.42	3.55	
G	.300	.513	7.62	13.03	
H	.220	.249	5.58	6.32	
J	.200	.300	5.08	7.62	
K	.120	----	3.05	----	
M	----	.590	----	14.98	Dia.
N	.065	.085	1.65	2.15	
P	.145	.155	3.68	3.93	Dia.
R	.061	.065	1.54	1.65	Dia.
S	.025	.030	.64	.76	

Note 1:
¼-28 UNF-2A

Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
03902GRF	200	300
03904GRF	400	500
03906GRF	600	700

Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K $\geq$ 300V/μsec
H $\geq$ 500V/μsec

Note 2:

To specify tq other than 10μsec, enter appropriate letter in place of "R".

P $\leq$ 15μsec
U $\leq$20μsec

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	63 Amps	$T_C = 97\,°C$
Max. average on-state cur.	$I_{T(AV)}$	40 Amps	$T_C = 97\,°C$
Max. peak on-state voltage	V_{TM}	3.0 Volts	$I_{TM} = 500$ A (peak)
Max. holding current	I_H	500 mA	
Max. peak one cycle surge current	I_{TSM}	1000 A	$T_C = 97\,°C$, 60 HZ
Max. I^2t capability for fusing		4150 A^2S	t = 8.3 ms.
Switching			
Critical rate of rise on-state current (note 2)	di/dt	400 A/μsec.	$T_J = 125\,°C$
Typical delay time (note 2)	t_d	2.0 μsec.	
Maximum circuit commutated turn-off time (note 3)	t_q	10 μsec. (R) 15 μsec. (P) 20 μsec. (U)	$T_J = 125\ °C$
Thermal values			
Maximum thermal resistance junction to case (DC)	$R\Theta_{JC}$	0.35 °C/W	
Operating junction temp range	T_J	− 40 °C to + 125 °C	
Storage temp range	T_{stg}	− 40 °C to + 150 °C	
Blocking			
Max. leakage current	I_{DRM}	12 mA	$T_J = 125\,°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	12 mA	$T_J = 125\,°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125\,°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max. nontriggering gate voltage	V_{GD}	0.15V	$T_J =$ °125C
Max. gate current to trigger	I_{GT}	150 mA	
Max. peak gate power	P_{GM}	10W	$t_p = 10\ \mu$sec.
Average gate power	$P_{G(AV)}$	2.0 W	
Max. peak gate current	I_{GM}	3.0A	
Max. peak gate voltage (forward)	V_{GM}	20V	
Max. peak gate voltage (reverse)	V_{GM}	10V	

Mechanical Characteristics

Base	High strength copper stud and base with a 1/4-28 UNF 2A thread for through mounting on a heat sink. Tin plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately .635 ounce (18.0 grams)
Mounting Torque	30 in. lbs. maximum
Dimensions	In accordance with TO-208AC outline
Note 1	$T_C = 25\,°C$ unless otherwise noted
Note 2	$I_{TM} = 50A$, $V_D = V_{DRM}$, $V_{GT} = 12$ V open circuit, 20 ohm 0.1 μsec. rise time
Note 3	$I_{TM} = 150A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec. linear to rated V_{DRM}, $V_{GT} = OV$

Figure 1
Maximum transient thermal impedance

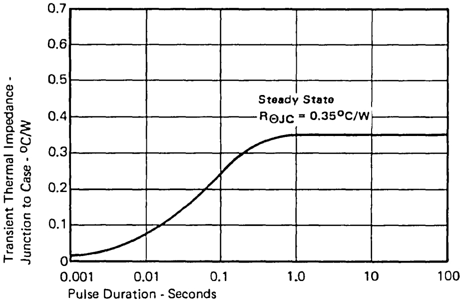


Figure 4
Maximum nonrepetitive surge current at rated load

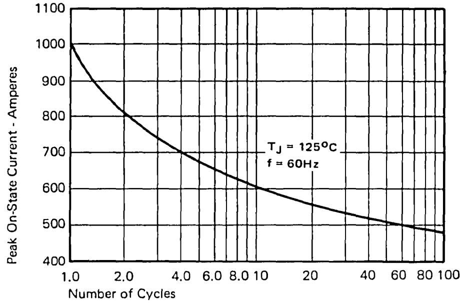


Figure 2
Maximum forward on-state characteristics

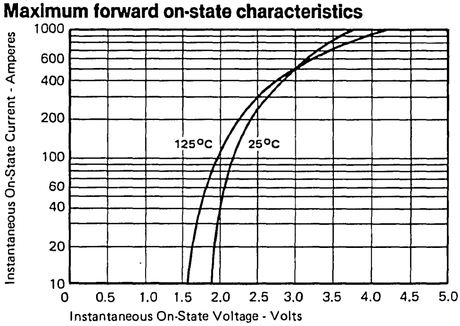


Figure 5
Gate characteristics

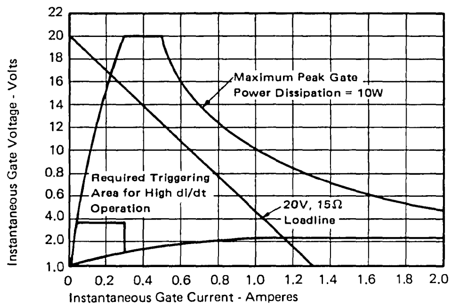


Figure 3
Typical recovery current

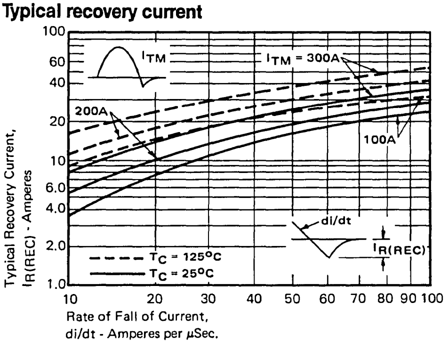


Figure 6
Typical recovered charge

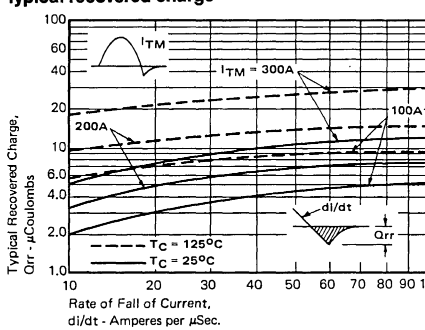


Figure 7
Sinewave peak current capability at $T_C = 65°C$

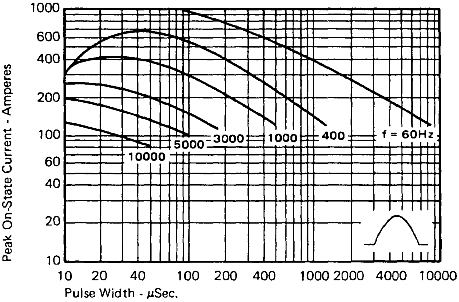


Figure 10
Trapezoidal waveform current capability at $T_C = 65°C$

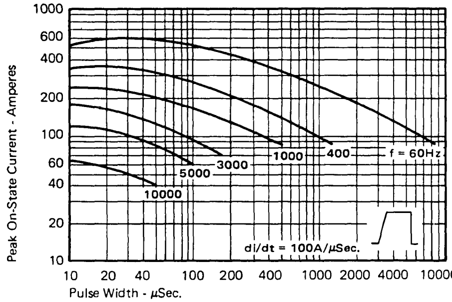


Figure 8
Sinewave peak current capability at $T_C = 90°C$

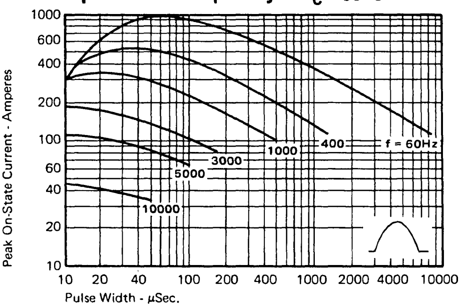


Figure 11
Trapezoidal waveform current capability at $T_C = 90°$

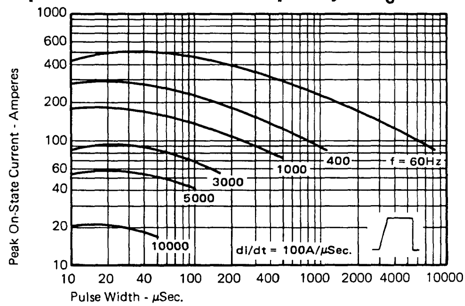


Figure 9
Sinewave energy per pulse

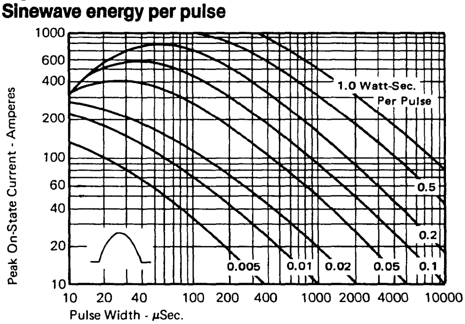
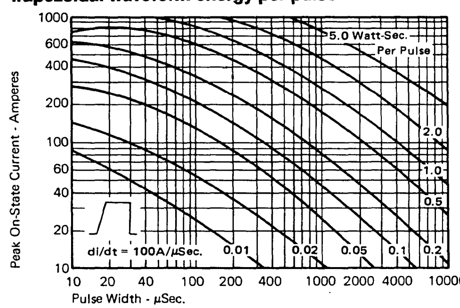


Figure 12
Trapezoidal waveform energy per pulse

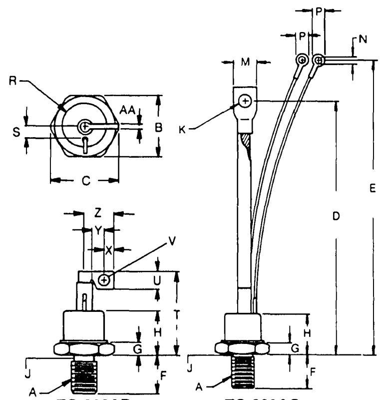


Note: Test conditions for Sine and Trapezoidal curves: Snubber :
$R = 20\Omega$
$C = 0.25\mu F$
$V_D = 400V$

Silicon Controlled Rectifiers/Inverter

125 Amps RMS, V_{DRM} AND V_{RRM} Up To 600 Volts

- High di/dt - 800 A/μsec non-repetitive
- 1800 Amperes surge current capability
- Package conforming to either TO-209AC or TO-208AS outline
- Blocking voltages up to 600 volts
- 10 μsec turn-off time available
- Primarily for forced commutated applications



TO-208AD (TO-83) **TO-209AC (TO-94)**

Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
A	----	----	----	----	1
B	1.050	1.060	26.67	26.92	
C	----	1.161	----	29.49	
D	5.850	6.144	149.10	156.06	
E	6.850	7.375	173.99	187.33	
F	.797	.827	20.24	21.01	
G	.276	.286	.701	7.26	
H	----	.948	----	24.08	
J	.425	.499	10.80	12.67	2
K	.260	.280	6.60	7.11	Dia.
M	.500	.600	12.70	15.24	
N	.140	.150	3.56	3.81	
P	----	.295	----	7.49	
R	----	.900	----	22.86	Dia.
S	.225	.275	6.48	6.99	
T	----	1.750	----	44.45	
U	.370	.380	9.40	9.65	
V	.213	.223	5.41	5.66	Dia.
W	.065	.075	1.65	1.91	Dia.
X	.215	.225	5.46	5.72	
Y	.290	.315	7.37	8.00	
Z	.514	.530	13.06	13.46	
AA	.089	.099	2.26	2.51	

Note 1:
½-20 UNF-2A
Note 2:
Full thread within 2½ threads

Catalog Number	Forward & Reverse Repetitive Blocking	Reverse Transient Blocking
07902GRA	200	300
07904GRA	400	500
07906GRA	600	700

Note 1:

To specify dv/dt other than 200V/μsec, enter appropriate letter in place of "G".

K ≥ 300V/μsec
H ≥ 500V/μsec

Note 2:

To specify tq other than 10μsec, enter appropriate letter in place of "R".

P ≤ 15μsec
U ≤20μsec

Note 3:

To specify package designation other than standard lead, enter appropriate letter in place of "A".

B = Insulated Lead
D = Flag Terminal
C = Top Stud (consult factory)

Electrical Characteristics

Forward Conducting			
Max. RMS on-state current	$I_{T(RMS)}$	63 Amps	$T_C = 97\,°C$
Max. average on-state cur.	$I_{T(AV)}$	40 Amps	$T_C = 97\,°C$
Max. peak on-state voltage	V_{TM}	3.0 Volts	$I_{TM} = 500$ A (peak)
Max. holding current	I_H	500 mA	
Max. peak one cycle surge current	I_{TSM}	1000 A	$T_C = 97\,°C$, 60 HZ
Max. I^2t capability for fusing		4150 A^2S	t = 8.3 ms.
Switching			
Critical rate of rise on-state current (note 2)	di/dt	400 A/μsec.	$T_J = 125\,°C$
Typical delay time (note 2)	t_d	2.0 μsec.	
Maximum circuit commutated turn-off time (note 3)	t_q	10 μsec. (R) 15 μsec. (P) 20 μsec. (U)	$T_J = 125\,°C$
Thermal values			
Maximum thermal resistance junction to case (DC)	$R\Theta_{JC}$	0.35 °C/W	
Operating junction temp range	T_J	− 40 °C to + 125 °C	
Storage temp range	T_{stg}	− 40 °C to + 150 °C	
Blocking			
Max. leakage current	I_{DRM}	12 mA	$T_J = 125\,°C$ and V_{DRM}
Max. reverse leakage	I_{RRM}	12 mA	$T_J = 125\,°C$ and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	$T_J = 125\,°C$
Triggering			
Max. gate voltage to trigger	V_{GT}	3.0V	
Max. nontriggering gate voltage	V_{GD}	0.15V	$T_J = 125\,°C$
Max. gate current to trigger	I_{GT}	150 mA	
Max. peak gate power	P_{GM}	10W	$t_p = 10\ \mu$sec.
Average gate power	$P_{G(AV)}$	2.0 W	
Max. peak gate current	I_{GM}	3.0A	
Max. peak gate voltage (forward)	V_{GM}	20V	
Max. peak gate voltage (reverse)	V_{GM}	10V	

Mechanical Characteristics

Base	High strength copper stud and base with a 1/4-28 UNF 2A thread for through mounting on a heat sink. Tin plating of base prevents corrosion.
Header	Glass to metal construction.
Weight	Approximately .635 ounce (18.0 grams)
Mounting Torque	30 in. lbs. maximum
Dimensions	In accordance with TO-208AC outline
Note 1	$T_C = 25\,°C$ unless otherwise noted
Note 2	$I_{TM} = 50A$, $V_D = V_{DRM}$, $V_{GT} = 12$ V open circuit, 20 ohm 0.1 μsec. rise time
Note 3	$I_{TM} = 150A$, di/dt = 5A/μsec., V_R during turn-off interval = 50V min., reapplied dv/dt = 20V/μsec. linear to rated V_{DRM}, V_{GT} = OV

Figure 1
Maximum nonrepetitive surge current at rated load

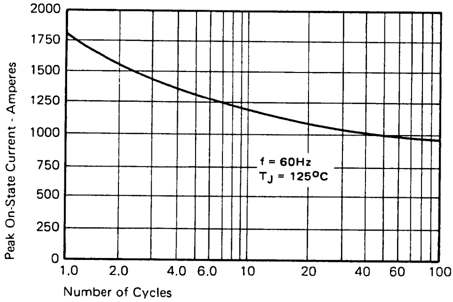


Figure 4
Maximum transient thermal impedance

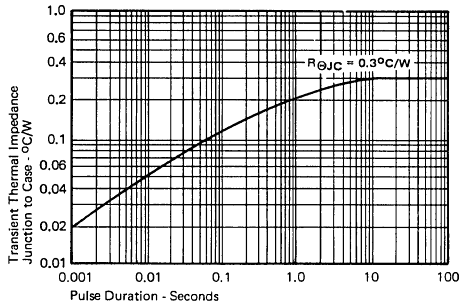


Figure 2
Maximum forward on-state characteristics

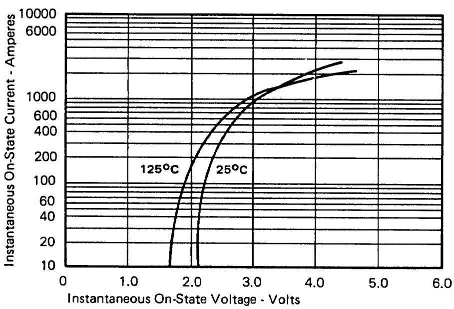


Figure 5
Gate characteristics

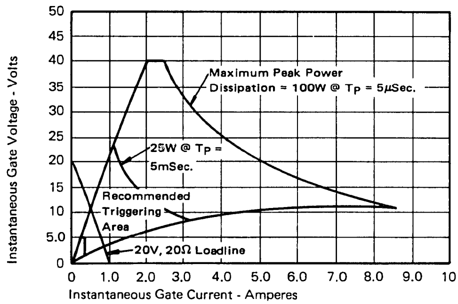
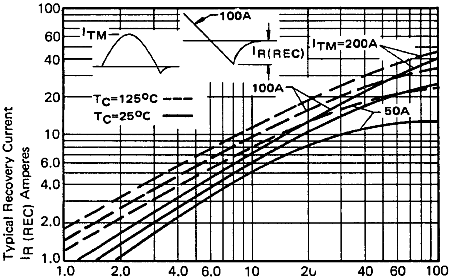
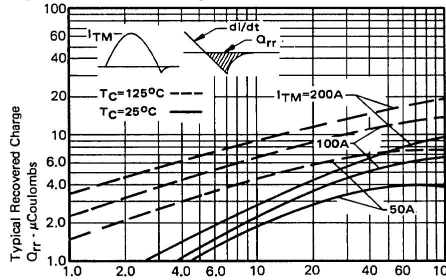


Figure 3
Typical recovery current



Rate of Fall of Current,
di/dt - Amperes per µSec.

Figure 6
Typical recovered charge



Rate of Fall of Current,
di/dt - Amperes per µSec.

Figure 7
Sinewave peak current capability at $T_C = 65°C$

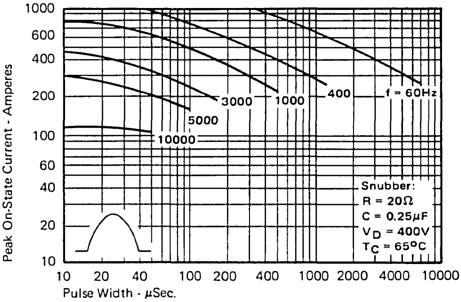


Figure 10
Trapezoidal waveform current capability at $T_C = 65°C$

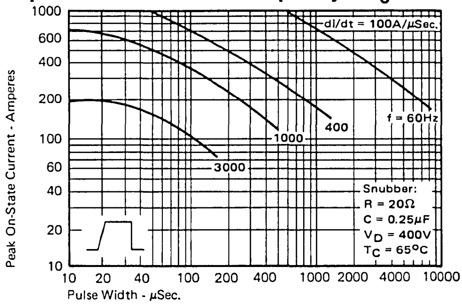


Figure 8
Sinewave peak current capability at $T_C = 90°C$

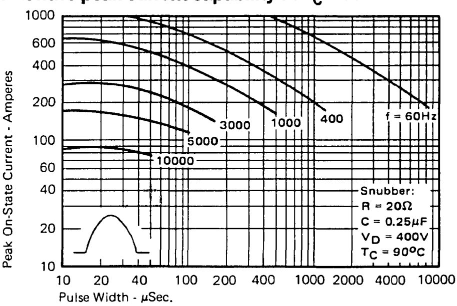


Figure 11
Trapezoidal waveform current capability at $T_C = 90°$

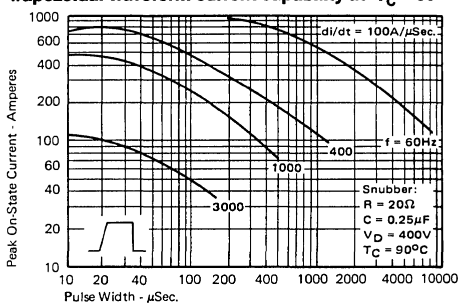


Figure 9
Sinewave energy per pulse

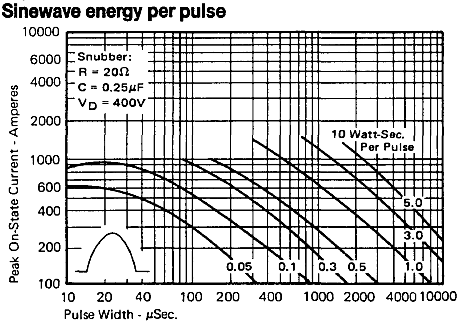
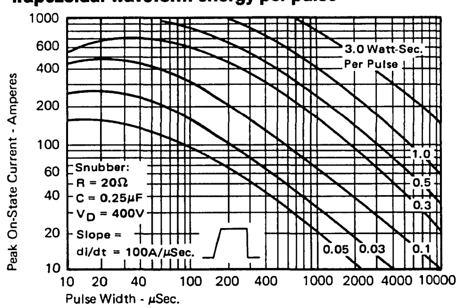
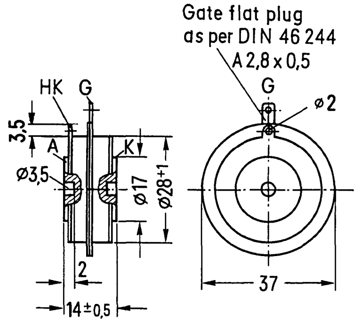


Figure 12
Trapezoidal waveform energy per pulse



Disc thyristors for 200 V to 600 V; $I_{TRMS} = 250$ A; t_q = 15 μs, 18 μs

Application	Primarily for self-commutated converters of all types, e.g. inverters, choppers, etc.
Chip	Fully diffused silicon Current and heat transfer: noble metal pressure contact
Case	Disc-type case, type 2 a as per DIN 44 499 (draft) Contact surfaces nickel-plated, ceramic insulation
Connections	Gate line yellow, 230 mm in length, included in delivery upon request
Polarity	as stamped



Dimensions in mm

Heat sinks

Type	KK31[1])	KK32[1])	KK33[1])	KK34[1])	LK18[2])
Ordering Code	—	—	—	—	C66055-A 6105-B4
Designation as per DIN 41 882	—	—	—	—	K0,55
Material	Alum.	Alum.	Alum.	Alum.	Alum.
Weight	500 g	950 g	730 g	1200 g	1600 g

Type

V_{DRM} / V_{RRM}	$t_q = 15\mu$s dvd$t$ = 200 V/μs	$t_q = 18\mu$s dvd$t$ = 200 V/μs	$t_q = 15\mu$s dvd$t$ = 500 V/μs	$t_q = 18\mu$s dvd$t$ = 500 V/μs
200V	BStH6113f	BStH6113g	BStH6113fS9	BSTH6113gS9
300V	BStH6120f	BStH6120g	BStH6120fS9	BStH6120gS9
400V	BStH6126f	BStH6126g	BStH6126fS9	BStH6126gS9
500V	BStH6133f	BStH6133g	BStH6133fS9	BStH6133gS9
600V	BSTH6140f*)	BStH6140g*)	BStH6140fS9*)	BStH6140gS9*

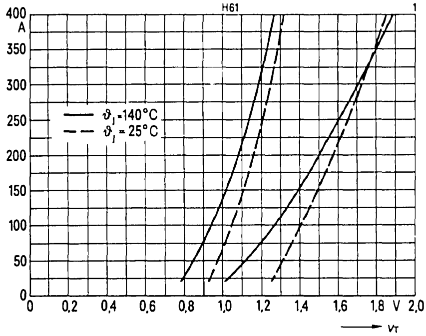
*) on request
[1]) Available only with component fitted

Blocking characteristics			Secondary conditions
Maximum off-state or reverse current	I_D, I_R	– 10 mA	$\vartheta_j = 140°C$, for 0.67 V_{DRM}, 0.67 V_{RRM} $= 140°C$, for V_{DRM}, V_{RRM}
Forward blocking characteristics			
Maximum rms on-state current	$I_{TRMS(I)}$	250 A	
Surge current	$I_{TSM(I)}$	1,850 A 1,650 A	$\vartheta_j = 25°C$ } half sine wave $= 140°C$ } 50 Hz, $V_R = 0V$
i^2t value	$\int i^2 dt$	17,200 A^2s 13,700 A^2s 10,000 A^2s 8,000 A^2s	$\vartheta_j = 25°C$, $= 140°C$ } $t = 10 ms$, $V_R = 0V$ $\vartheta_j = 25°C$, $= 140°C$ } $t = 2$ to 5 ms, $V_R = 0V$
Threshold voltage Slope resistance	$V_{(TO)}$ r_T	1.03 V 1.65 mΩ	} equivalent straight line for $\vartheta_j = 140°C$
Dynamic values, switching applications			
Latching current	I_L	0.5 A 1.0 A –	$\vartheta_j = 140°C$ $= 25°C$ $= -40°C$ } $V_D = 18V$, $I_G = 1A$, $di_G/dt = 1 A/\mu s$, $t_{gt} = 15 \mu s$
Delay time	t_{gd}	2.2 µs 1.5 µs	$I_G = 1A$ $I_G = 3A$ } $di_G/dt = 1 A/\mu s$, $\vartheta_j = 25°C$, $V_D = 0.5\ V_{DRM}$, $L/R = 2\ t_{gd}$ $I_{TM} = 16 A$
Critical periodical rate of rise of on-state current with additional load from an RC snubber	$(di/dt)_{cr}$	150 A/µs	$\vartheta_j = 140°C$, $f = 50 Hz$, $V_D = 0.67\ V_{DRM}$ Long pulse with linear current rise to $I_{TM} = 480 A$ Additionally permissible peak current of a discharging RC snubber, $I_{TM(RC)} = 100 A$ Drive required $I_G \geqq 1A$, $di_G/dt \geqq 1 A/\mu s$
Periodical current (peak value) of a discharging RC snubber	$I_{TM(RC)}$	100 A 50 A	$di/dt = (di/dt)_{cr}$ Drive required $I_G \geqq 1A$, $di_G/dt \geqq 1 A/\mu s$ $di/dt \leqq 10 A/\mu s$ Drive required $I_G \approx I_{GT}$ } $\vartheta_j \leqq 140°C$, $f = 50 Hz$, $V_D = 0.67\ V_{DRM}$
Critical rate of rise of off-state voltage (Type BSt H 61 ...) (Type BSt H 61 ... S 9)	$(dv/dt)_{cr}$	200 V/µs 1,000 V/µs 100 V/µs 500 V/µs 2,000 V/µs	0.67 V_{DRM} 0.33 V_{DRM} 1.0 V_{DRM} 0.67 V_{DRM} 0.33 V_{DRM} } $\vartheta_j = 140°C$ Linear voltage rise, control circuit open
Circuit commutated turn-off time (Type BSt H 61 .. f) (Type BSt H 61 .. g)	t_q	 15 µs 18 µs	$\vartheta_j = 140°C$, $-di/dt = -10 A/\mu s$ $V_R = 0.67\ V_{RRM}$, $V_D = 0.67\ V_{DRM}$ $dv/dt = 50 V/\mu s$, $I_{TM} = 160 A$ Chip current fully risen before commutation

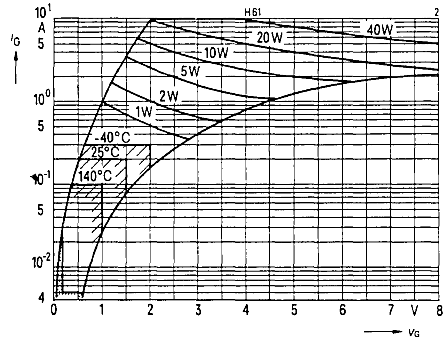
Gate circuit ratings			
Minimum gate trigger current	I_{GT}	100 mA 250 mA 450 mA	ϑ_j = 140°C = 25°C = −40°C } $V_D \geqq 2$ V
Minimum gate trigger voltage	V_{GT}	1.0 V 1.5 V 2.0 V	ϑ_j = 140°C = 25°C = −40°C } $V_D \geqq 2$ V
Maximum gate non-trigger current	I_{GD}	– 5 mA	ϑ_j = 140°C, V_D = 2 V = 140°C, $V_D \leqq 0.5\ V_{DRM}$
Maximum gate non-trigger voltage	V_{GD}	0.2 V	ϑ_j = 140°C, $V_D \leqq 0.5\ V_{DRM}$
Maximum admissible gate current	I_{GM} I_{GRMS}	10 A 3 A	peak value rms value
Maximum admissible gate power losses	$P_{GAV(l)}$	20 W	maximum value
Maximum negative gate voltage	V_{GRM}	10 V	peak value
Thermal ratings			Secondary conditions
Maximum continuously admissible junction temperature	$\vartheta_{j(l)}$	140°C	
Operating temperature range	ϑ_j	−40 to +140°C	
Storage temperature range	ϑ_s	−40 to +150°C	
Thermal resistance for constant current (excluding heat transfer)	R_{thJC}	0.17 K/W 0,30 K/W 0.40 K/W	double-sided cooling cooling on anode side cooling on cathode side
Thermal resistance case to heat sink	R_{thCK}	0.015 K/W 0.030 K/W	double-sided cooling one-sided cooling } see assembly instructions
Mechanical ratings			
Contact pressure	F	2000 N $^{+30}_{-10}$%	setpoint value
Leakage path	–	5 mm	anode–grid
Air path	–	5 mm	anode–grid
Weight	–	60 g	
Vibration resistance	–	50 m/s²	at 50 Hz, without heat sink
Humidity category	–	C	according to DIN 40 040

Characteristics

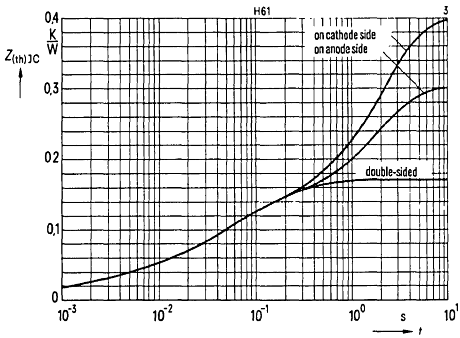
Forward characteristics (scatter bands)
Parameter: junction temperature ϑ_j



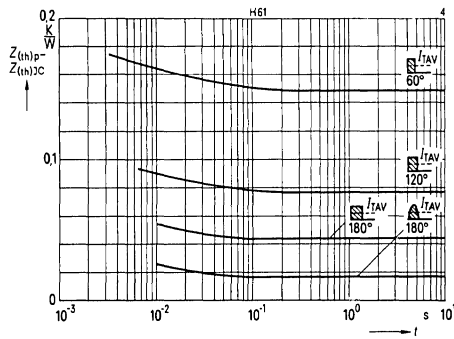
Input characteristics (scatter band)
with trigger ranges and
power dissipation hyperbolae



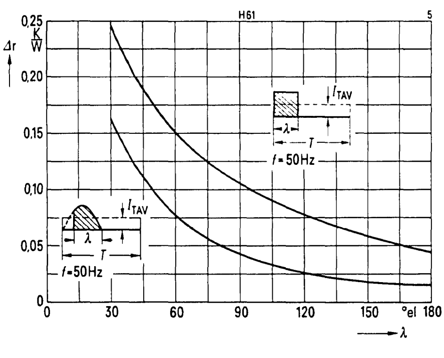
Transient thermal resistance for contrast current



Difference between transient pulse thermal resistances and transient thermal resistance for constant current, pulse currents 40 to 60 Hz



Thermal resistance Δr
Parameters: frequency f, current waveform



"Analytical function" for dc:

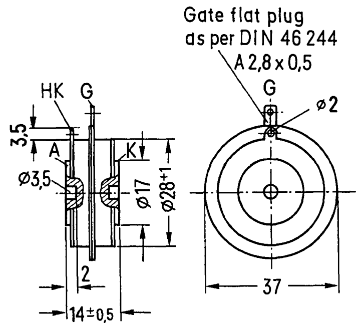
$$Z_{(th)JC} = \sum_{i=1}^{n} r_i \left(1 - e^{-\frac{t}{\tau_i}}\right)$$

	Double-sided cooling		Cooling on anode side		Cooling on cathode side	
i	r_i [K/W]	τ_i [s]	r_i [K/W]	τ_i [s]	r_i [K/W]	τ_i [s]
1	0.04504	0.28857	0.16935	1.95143	0.27361	2.30535
2	0.08282	0.05366	0.09240	0.05174	0.08815	0.05015
3	0.01222	0.00979	0.02149	0.00414	0.02149	0.00414
4	0.01849	0.00237	0.00532	0.00110	0.00532	0.00110
5	0.01143	0.00051	0.01143	0.00051	0.01143	0.00051

Formulae for determining the total thermal resistance

$R_{thJA} = R_{thJC} + R_{thCA} + \Delta r$
$Z_{(th)JA} = Z_{(th)JC} + Z_{(th)CA}$
$Z_{(th)p(JA)} = [Z_{(th)p} - Z_{(th)JC}] + Z_{(th)JA}$
R_{thCA} and $Z_{(th)CA}$ see section "Heatsinks"

Disc thyristors for 200 V to 600 V; $I_{TRMS} = 550$ A;
$t_q = 15\mu s$, 18 μs



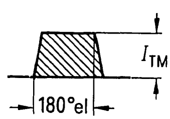
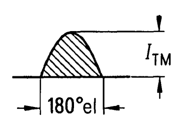
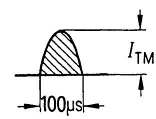
Dimensions in mm

Application	Primarily for self-commutated converters of all types, e.g. inverters, static converters, choppers, etc.
Chip	Fully diffused silicon Current and heat transfer: noble metal pressure contact
Case	Disc-type case, type 2 a as per DIN 44 499 (draft) Contact surfaces nickel-plated, ceramic insulation
Connections	Gate line yellow, 230 mm in length, included in delivery upon request
Polarity	as stamped

Heat sinks

Type	KK31[1])	KK32[1])	KK33[1])	KK34[1])	NK12[1])	NK15[1])	NK16[1])	KD20..V[1])[2])
Ordering Code	—	—	—	—	—	—	—	—
Designation as per DIN 41 882	—	—	—	—	—	—	—	—
Material	Alum.	Alum.	Alum.	Alum.	Alum.	Alum.	Alum.	Copper
Weight	500 g	950 g	730 g	1200 g	2100 g	2400g	2700 g	—

Type V_{DRM} V_{RRM}	$t_q = 15\mu s$ dv/dt = 200 V/μs	$t_q = 18\mu s$ dv/dt = 200 V/μs	$t_q = 15\mu s$ dv/dt = 500 V/μs	$t_q = 18\mu s$ dv/dt = 500 V/μs
200V	BStL6113f	BStL6113g	BStL6113fS9	BSTL6113gS9
300V	BStL6120f	BStL6120g	BStL6120fS9	BStL6120gS9
400V	BStL6126f	BStL6126g	BStL6126fS9	BStL6126gS9
500V	BStL6133f	BStL6133g	BStL6133fS9	BStL6133gS9
600V	BSTL6140f*)	BStL6140g*)	BStL6140fS9*)	BStL6140gS9*)

Current carrying capacity Double-sided cooling Frequency f	 I_{TM} 180°el		 I_{TM} 180°el		 I_{TM} 100µs	
50 Hz	780A	780A	1100A	1100A	—	—
250 Hz	780A	780A	1100A	1100A	3100A	3100A
500 Hz	780A	780A	1100A	1100A	2590A	2590A
1000 Hz	780A	780A	1100A	1100A	2030A	2030A
1500 Hz	740A	725A	1100A	1100A	1700A	1680A
2000 Hz	675A	650A	1150A	1100A	1400A	1380A
3000 Hz	555A	525A	1080A	1070A	1080A	1050A
4000 Hz	450A	425A	900A	800A	880A	840A
5000 Hz	365A	325A	700A	665A	710A	665A
6000 Hz	305A	260A	585A	560A	—	—
Recovery voltage V_R	appr. 1V	300V	appr. 1V	300V	appr. 1V	300V
Voltage before turn-on V_D	300V		300V		300V	
Rate of rise of on-state current di/dt	50 A/μs		—		—	
Case temperature ϑ_C	60°C		60°C		60°C	

*) on request. Available only with component fitted. [2]) For complete designation see chapter on heat sinks.

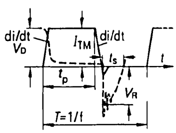
Blocking characteristics			Secondary conditions
Maximum off-state or reverse current	I_D, I_R	15 mA	$\vartheta_j = 140°C$, for 0.67 V_{DRM}, 0.67 V_{RRM} = 140° C, for V_{DRM}, V_{RRM}
Forward blocking characteristics			
Maximum rms on-state current	$I_{TRMS(I)}$	550 A	
Surge current	$I_{TSM(I)}$	4,460 A 3,870 A	ϑ_j = 25° C } half sine wave = 140° C } 50 Hz, V_R = 0 V
i^2t value	$\int i^2 dt$	100,000 A^2s 75,000 A^2s 47,000 A^2s 34,000 A^2s	ϑ_j = 25° C } t = 10 ms, V_R = 0 V = 140° C } ϑ_j = 25° C } t = 2 to 5 ms = 140° C } V_R = 0 V
Threshold voltage Slope resistance	$V_{(TO)}$ r_T	0.99 V 0.685 mΩ	} equivalent straight line for ϑ_j = 140° C
Dynamic values, switching applications			
Latching current	I_L	0.5 A 1.0 A	ϑ_j = 140° C } V_D = 18 V, = 25° C } I_G = 1 A, di_G/dt = 1 A/µs, = −40° C } t_{gt} = 15 µs
Delay time	t_{gd}	2.2 µs 1.5 µs	I_G = 1 A } di_G/dt = 1 A/µs, ϑ_j = 25° C I_G = 3 A } V_D = 0.5 V_{DRM}, L/R = 2 t_{gd} I_{TM} = 35 A
Critical periodical rate of rise of on-state current with additional load from an RC snubber	$(di/dt)_{cr}$	150 A/µs	ϑ_j = 140° C, f = 50 Hz, V_D = 0.67 V_{DRM} Long pulse with linear current rise to I_{TM} = 1050 A Additionally permissible peak current of a discharging RC snubber, $I_{TM(RC)}$ = 100 A Drive required $I_G \geqq$ 1 A, $di_G/dt \geqq$ 1 A/µs
Periodical current (peak value) of a discharging RC snubber	$I_{TM(RC)}$	100 A 50 A	$di/dt = (di/dt)_{cr}$ Drive required $I_G \geqq$ 1 A, $di_G/dt \geqq$ 1 A/µs $di/dt \leqq$ 10 A/µs Drive required $I_G \approx I_{GT}$ } $\vartheta_j \leqq$ 140° C, f = 50 Hz, V_D = 0.67 V_{DRM}
Critical rate of rise of off-state voltage (Type BSt L 61 ...) (Type BSt L 61 ... S 9)	$(dv/dt)_{cr}$	200 V/µs 1,000 V/µs 100 V/µs 500 V/µs 2,000 V/µs	0.67 V_{DRM} 0.33 V_{DRM} 1.0 V_{DRM} 0.67 V_{DRM} 0.33 V_{DRM} } ϑ_j = 140° C, Linear voltage rise, control circuit open
Circuit commutated turn-off time (Type BSt L 61 .. f) (Type BSt L 61 .. g)	t_q	 15 µs 18 µs	ϑ_j = 140° C, $-di/dt$ = −10 A/µs V_R = 0.67 V_{RRM}, V_D = 0.67 V_{DRM} dv/dt = 50 V/µs, I_{TM} = 350 A Chip current fully risen before commutation

Gate circuit ratings			
Minimum gate trigger current	I_{GT}	100 mA 250 mA 450 mA	ϑ_j = 140°C = 25°C = −40°C } $V_D \geqq 2$ V
Minimum gate trigger voltage	V_{GT}	1.0 V 1.5 V 2.3 V	ϑ_j = 140°C = 25°C = −40°C } $V_D \geqq 2$ V
Maximum gate non-trigger current	I_{GD}	20 mA 10 mA	ϑ_j = 140°C, V_D = 2 V = 140°C, $V_D \leqq 0.5\ V_{DRM}$
Maximum gate non-trigger voltage	V_{GD}	0.2 V	ϑ_j = 140°C, $V_D \leqq 0.5\ V_{DRM}$
Maximum admissible gate current	I_{GM} I_{GRMS}	10 A 3 A	peak value rms value
Maximum admissible gate power losses	$P_{GAV(I)}$	20 W	maximum value
Maximum negative gate voltage	V_{GRM}	10 V	peak value
Thermal ratings			Secondary conditions
Maximum continuously admissible junction temperature	$\vartheta_{j(I)}$	140°C	
Operating temperature range	ϑ_j	−40 to +140°C	
Storage temperature range	ϑ_s	−40 to +150°C	
Thermal resistance for constant current (excluding heat transfer)	R_{thJC}	0.095 K/W 0.180 K/W 0.200 K/W	double-sided cooling cooling on anode side cooling on cathode side
Thermal resistance case to heat sink	R_{thCK}	0.015 K/W 0.030 K/W	double-sided cooling one-sided cooling } see assembly instructions
Mechanical ratings			
Contact pressure	F	3000 N $^{+30}_{-10}$%	setpoint value
Leakage path	–	5 mm	anode–grid
Air path	–	5 mm	anode–grid
Weight	–	60 g	
Vibration resistance	–	50 m/s²	at 50 Hz, without heat sink
Humidity category	–	C	according to DIN 40 040

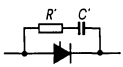
Trapezoidal pulse operation

Double-sided cooling

Pulse shape



CSE circuitry (see explanations)

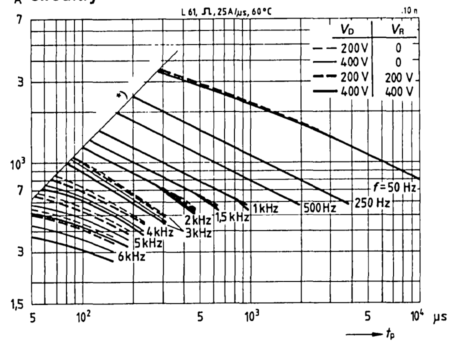


$R' = 6.8\,\Omega$
$C' = 0.47\,\mu F$

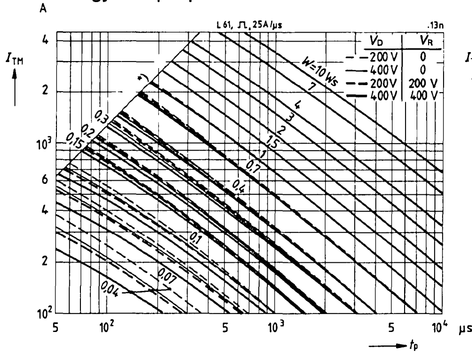
di/dt	=	Rate of current rise
f	=	Frequency = $1/T$
I_{TM}	=	Maximum dc peak current
V_R	=	Recovery voltage
V_D	=	Voltage before turn-on
t_p	=	Pulse duration
t_s	=	Idle period

25 A/µs

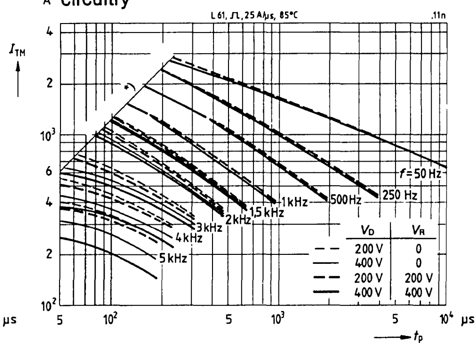
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: **d_i/d_t = 25 A/µs, ϑ_j = 60°C**, V_D, V_R, f, circuitry



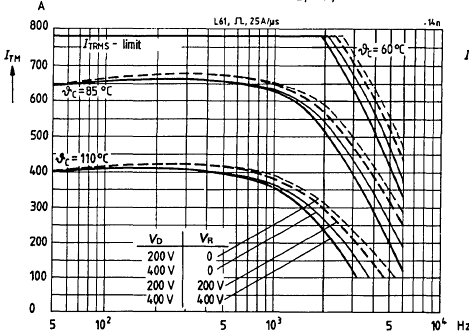
Graph for calculating power dissipation $P_{tot} = W \cdot f$
Parameters: **d_i/d_t = 25 A/µs**, V_D, V_R, circuitry
W = energy loss per pulse



Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: **d_i/d_t = 25 A µs, ϑ_j = 85°C**, V_D, V_R, circuitry

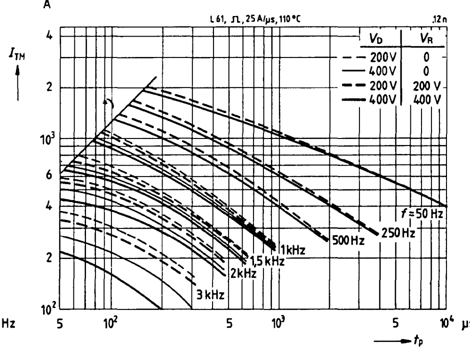


Maximum dc output current peak value
(trapezoidal current with $t_p = T/2$)
as a function of frequency
Parameters: **d_i/d_t = 25 A µs, ϑ_j**, V_D, V_R, circuitry



*) limiting value of trapezoidal current

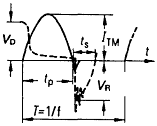
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: **d_i/d_t = 25 A/µs, ϑ_j = 110°C**, V_D, V_R, circuitry



Sinusoidal pulse operation

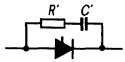
Cooling on anode side

Pulse shape



f = Frequency = $1/T$
I_{TM} = Maximum dc peak current
V_R = Recovery voltage
V_D = Voltage before turn-on
t_p = Pulse duration
t_s = Idle period

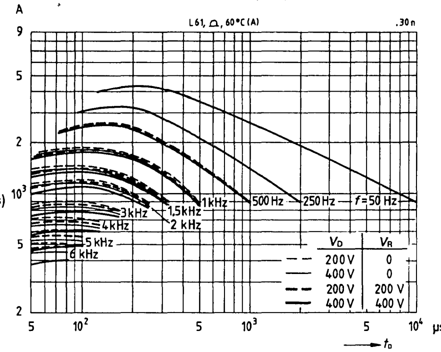
CSE circuitry
(see explanations)



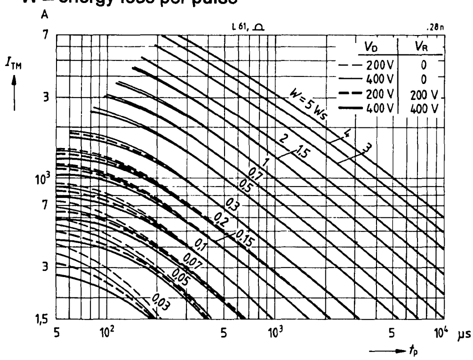
$R' = 6.8\,\Omega\ (3.9\,\Omega)$
$C' = 0.47\,\mu F\ (0.68\,\mu F)$

More CSE circuitry (values in brackets) may be necessary if the commutation voltage is too high

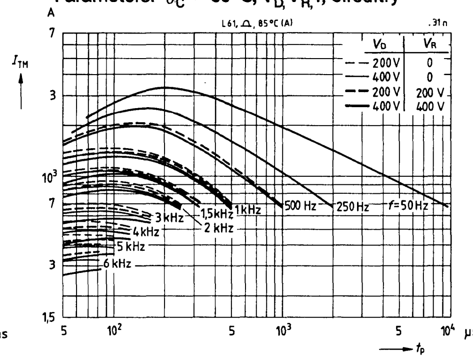
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C = **60°C**, V_D, V_R, f, circuitry



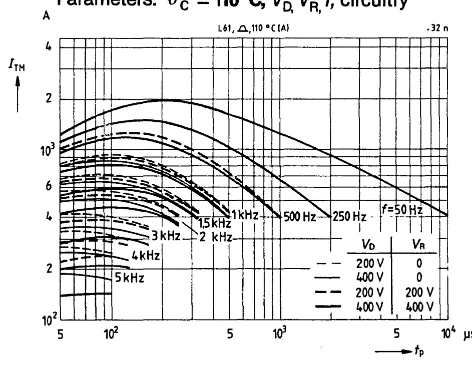
Graph for calculating power dissipation $P_{tot} = W \cdot f$
Parameters: V_D, V_R, circuitry
W = energy loss per pulse



Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C = **85°C**, V_D, V_R, f, circuitry



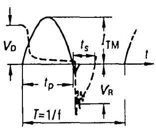
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C = **110°C**, V_D, V_R, f, circuitry



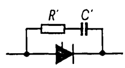
Sinusoidal pulse operation

Double-sided cooling

Pulse shape



CSE circuitry
(see explanations)

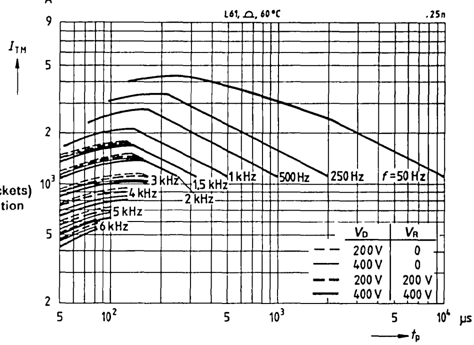


$R' = 6.8\,\Omega\,(3.9\,\Omega)$
$C' = 0.47\,\mu F\,(0.68\,\mu F)$

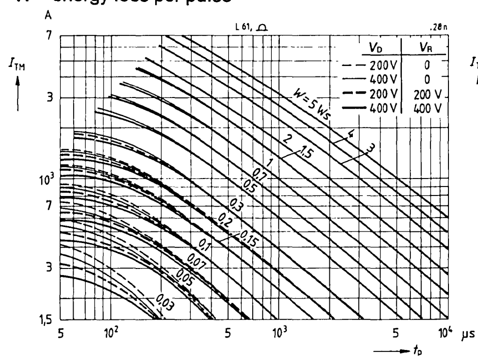
More CSE circuitry (values in brackets) may be necessary if the commutation voltage is too high

- f = Frequency = $1/T$
- I_{TM} = Maximum dc peak current
- V_R = Recovery voltage
- V_D = Voltage before turn-on
- t_p = Pulse duration
- t_s = Idle period

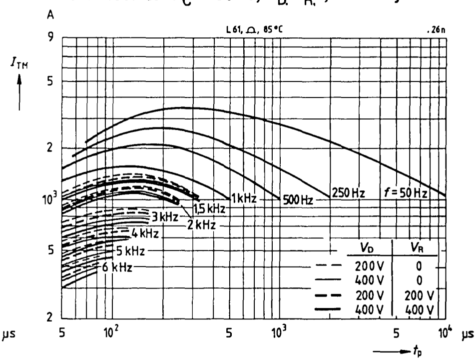
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C = **60 °C,** V_D, V_R, f, circuitry



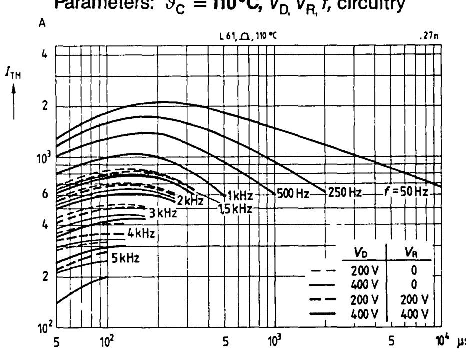
Graph for calculating power dissipation $P_{tot} = W \cdot f$
Parameters: V_D, V_R, circuitry
W = energy loss per pulse



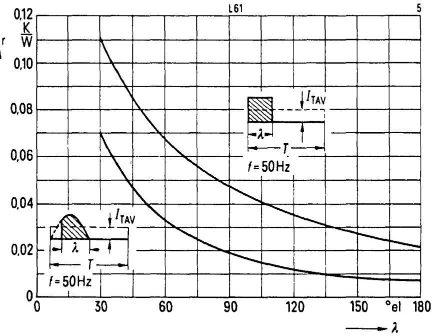
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C = **85 °C,** V_D, V_R, f, circuitry



Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C = **110 °C,** V_D, V_R, f, circuitry



Thermal resistance Δr
Parameters: frequency f, current waveform



"Analytical function" for dc:

$$Z_{(th)JC} = \sum_{i=1}^{n} r_i \left(1 - e^{-\frac{t}{\tau_i}}\right)$$

	Double-sided cooling		Cooling on anode side		Cooling on cathode side	
i	r_i [K/W]	τ_i [s]	r_i [K/W]	τ_i [s]	r_i [K/W]	τ_i [s]
1	0.03873	0.32498	0.12191	1.56818	0.14157	1.46215
2	0.03636	0.04335	0.03895	0.04217	0.04057	0.04263
3	0.01073	0.00685	0.00843	0.00709	0.01013	0.00472
4	0.00480	0.00135	0.00633	0.00181	0.00335	0.00125
5	0.00438	0.00040	0.00438	0.00040	0.00438	0.00040

Formulae for determining the total thermal resistance

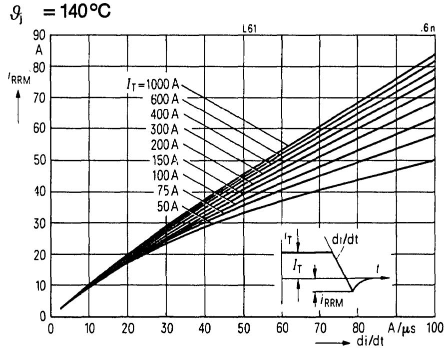
$R_{thJA} = R_{thJC} + R_{thCA} + \Delta r$

$Z_{(th)JA} = Z_{(th)JC} + Z_{(th)CA}$

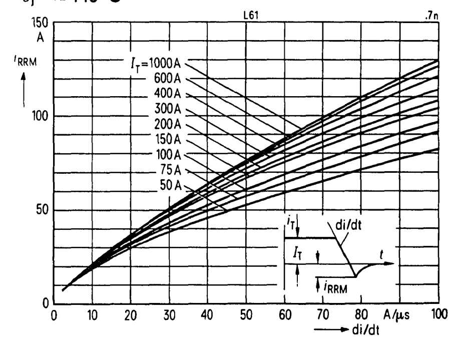
$Z_{(th)p(JA)} = [Z_{(th)p} - Z_{(th)JC}] + Z_{(th)JA}$

R_{thCA} and $Z_{(th)CA}$ see section "Heat sinks"

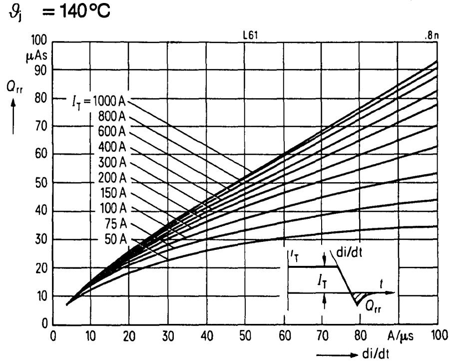
Peak reverse recovery current I_{RRM}
(lower limit of scatter range)
Parameters: on-state current, rate of current rise,
ϑ_j = 140 °C



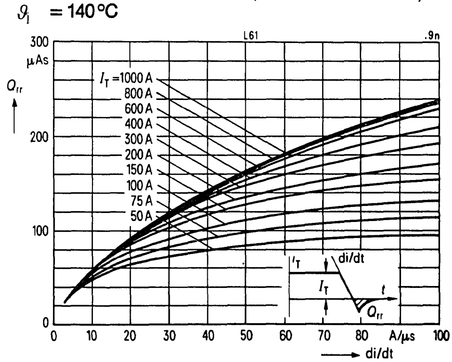
Peak reverse recovery current I_{RRM}
(upper limit of scatter range)
Parameters: on-state current, rate of current rise,
ϑ_j = 140 °C



Recovered charge Q_{rr} (lower limit of scatter range)
Parameters: on-state current, rate of current rise,
ϑ_j = 140 °C

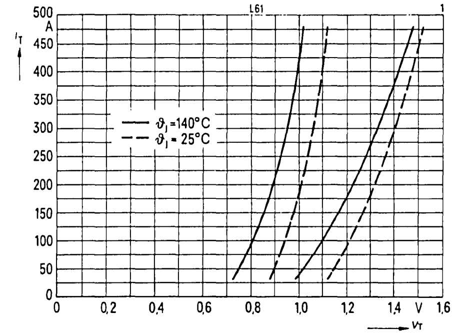


Recovered charge Q_{rr} (upper limit of scatter range)
Parameters: on-state current, rate of current rise,
ϑ_j = 140 °C

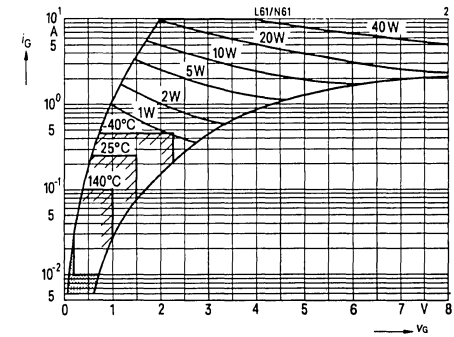


Characteristics

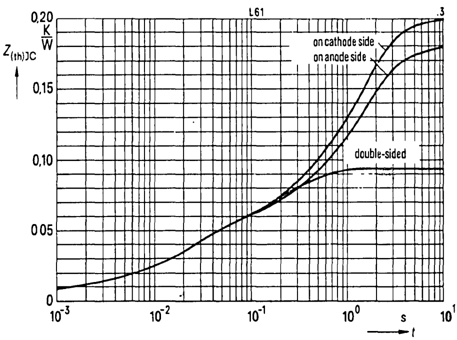
Forward characteristics (scatter bands)
Parameter: junction temperature ϑ_j



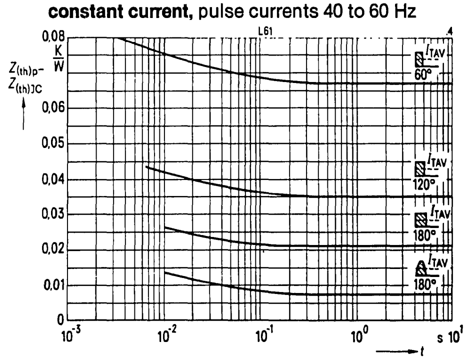
Input characteristics (scatter band)
with trigger ranges and
power dissipation hyperbolae



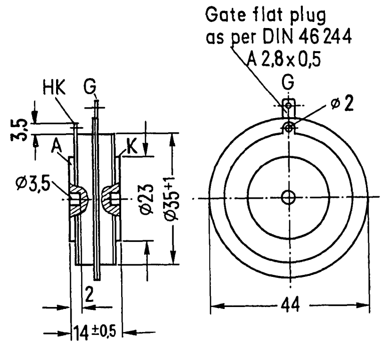
Transient thermal resistance for constant current



Difference between transient pulse thermal resistances and transient thermal resistance for constant current, pulse currents 40 to 60 Hz



Disc thyristors for 200 V to 600 V; $I_{TRMS} = 950$ A; $t_q =$ 15 μs, 18 μs



Dimensions in mm

Application	Primarily for self-commutated converters of all types with lower operating voltage, e.g. inverters, choppers, etc.
Chip	Fully diffused silicon Current and heat transfer: noble metal pressure contact
Case	Disc-type case, type 3 a as per DIN 44 499 (draft) Contact surfaces nickel-plated, ceramic insulation
Connections	Gate line yellow, 230 mm in length, included in delivery upon request
Polarity	as stamped

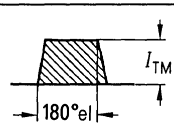
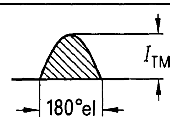
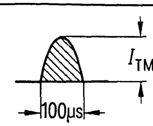
Heat sinks

Type	KK32[1]	KK34[1]	NK12[1]	NK15[1]	NK16[1]	KC14..[1][2]	KD20..V[1][2]
Ordering Code	—	—	—	—	—	—	—
Designation as per DIN 41 882	—	—	—	—	—	—	—
Material	Alum.	Alum.	Alum.	Alum.	Alum.	Copper	Copper
Weight	950 g	1200 g	2100 g	2400 g	2700 g	—	—

Type

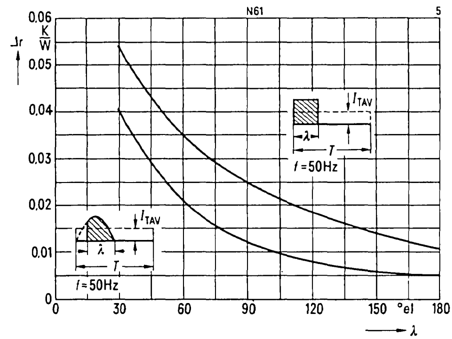
V_{DRM} V_{RRM}	$t_q = 15\mu$s dv/dt = 200 V/μs	$t_q = 18\mu$s dv/dt = 200 V/μs	$t_q = 15\mu$s dv/dt = 500 V/μs	$t_q = 18\mu$s dv/dt = 500 V/μs
200V	BStN6113f	BStN6113g	BStN6113fS9	BSTN6113gS9
300V	BStN6120f	BStN6120g	BStN6120fS9	BStN6120gS9
400V	BStN6126f	BStN6126g	BStN6126fS9	BStN6126gS9
500V	BStN6133f	BStN6133g	BStN6133fS9	BStN6133gS9
600V	BSTN6140f*)	BStN6140g*)	BStN6140fS9*)	BStN6140gS9*)

Current carrying capacity

Double-sided cooling Frequency f						
50 Hz	1340A	1340A	1900A	1900A	—	—
250 Hz	1340A	1340A	1900A	1900A	3200A	3200A
500 Hz	1340A	1340A	1900A	1900A	2600A	2600A
1000 Hz	1165A	1140A	1900A	1900A	2120A	2120A
2000 Hz	810A	775A	1800A	1785A	1480A	1420A
3000 Hz	590A	560A	1250A	1210A	1100A	1070A
4000 Hz	460A	420A	910A	860A	880A	850A
5000 Hz	370A	330A	720A	680A	720A	680A
6000 Hz	310A	260A	590A	555A	—	—
Recovery voltage V_R	appr. 1V	300V	appr. 1V	300V	appr. 1V	300V
Voltage before turn-on V_D	300V		300V		300V	
Rate of rise of on-state current di/dt	50 A/μs		—		—	
Case temperature ϑ_C	60°C		60°C		60°C	
Equivalent values for RC circuit	0.68μF, 5.6Ω		0.68μF, 5.6Ω		0.68μF, 5.6Ω	

*) on request. [1]) Available only with component fitted. [2]) For complete designation see chapter on heat sinks.

Thermal resistance Δr
Parameters: frequency f, current waveform



"Analytical function" for dc:

$$Z_{(th)JC} = \sum_{i=1}^{n} r_i \left(1 - e^{-\frac{t}{\tau_i}}\right)$$

	Double-sided cooling		Cooling on anode side		Cooling on cathode side	
i	r_i [K/W]	τ_i [s]	r_i [K/W]	τ_i [s]	r_i [K/W]	τ_i [s]
1	0.0177	0.5208	0.0594	2.0533	0.0793	1.7411
2	0.0179	0.0617	0.0109	0.0449	0.0220	0.0449
3	0.0057	0.0217	0.0110	0.0394	0.0056	0.0037
4	0.0056	0.0037	0.0056	0.0037	0.0031	0.0008
5	0.0031	0.0008	0.0031	0.0008	–	–

Formulae for determining the total thermal resistance

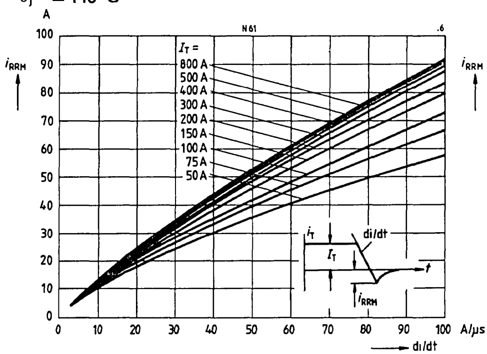
$R_{thJA} = R_{thJC} + R_{thCA} + \Delta r$

$Z_{(th)JA} = Z_{(th)JC} + Z_{(th)CA}$

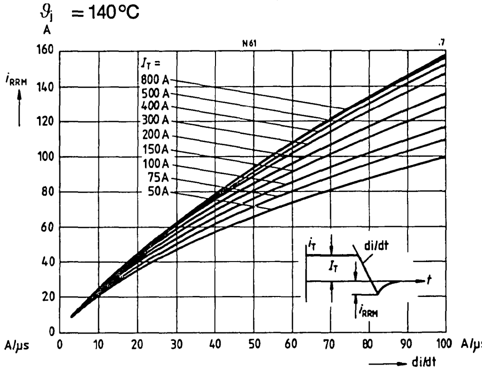
$Z_{(th)p(JA)} = [Z_{(th)p} - Z_{(th)JC}] + Z_{(th)JA}$

R_{thCA} and $Z_{(th)CA}$ see section "Heat sinks"

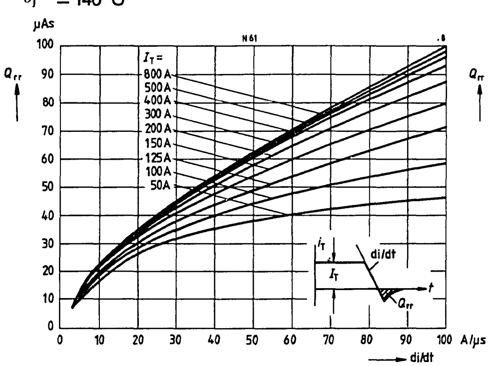
Peak reverse recovery current i_{RRM}
(lower limit of scatter range)
Parameters: on-state current, rate of current rise,
$\vartheta_j = 140\,°C$



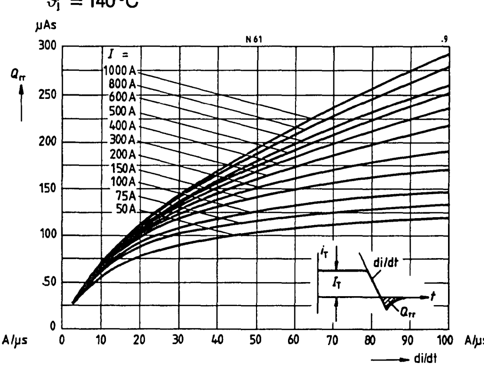
Peak reverse recovery current i_{RRM}
(upper limit of scatter range)
Parameters: on-state current, rate of current rise,
$\vartheta_j = 140\,°C$



Recovered charge Q_{rr} (lower limit of scatter range)
Parameters: on-state current, rate of current rise,
$\vartheta_j = 140\,°C$



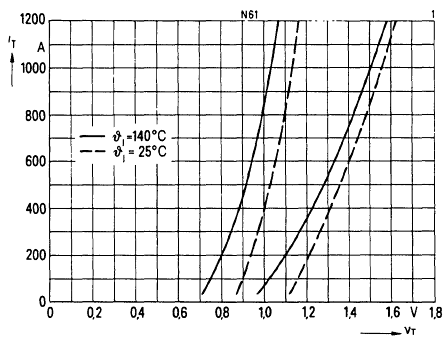
Recovered charge Q_{rr} (upper limit of scatter range)
Parameters: on-state current, rate of current rise,
$\vartheta_j = 140\,°C$



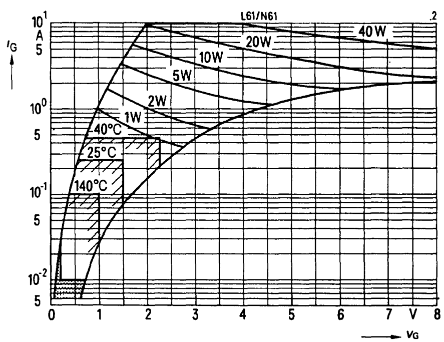
Thermal ratings			Secondary conditions
Maximum continuously admissible junction temperature	$\vartheta_{j(l)}$	140° C	
Operating temperature	ϑ_j	−40 to +140° C	
Storage temperature range	ϑ_s	−40 to +150° C	
Thermal resistance for constant current (excluding heat transfer)	R_{thJC}	0.05 K/W	double-sided cooling
		0.09 K/W	cooling on anode side
		0.11 K/W	cooling on cathode side
Thermal resistance case to heat sink	R_{thCK}	0.01 K/W	double-sided cooling } see assembly instructions
		0.02 K/W	one-sided cooling } see assembly instructions
Mechanical ratings			
Contact pressure	F	5500 N $^{+30}_{-10}$%	setpoint value
Leakage path	–	5 mm	anode – grid
Air path	–	5 mm	anode – grid
Weight	–	100 g	
Vibration resistance	–	50 m/s²	at 50 Hz, without heat sink
Humidity category	–	C	according to DIN 40 040

Characteristics

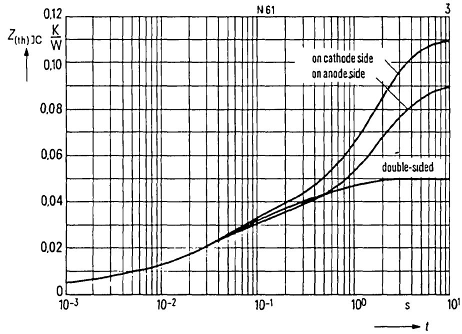
Forward characteristics (scatter bands)
Parameter: junction temperature ϑ_j



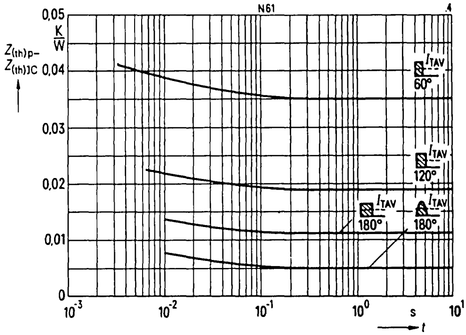
Input characteristics (scatter band)
with trigger ranges and
power dissipation hyperbolae



Transient thermal resistance for constant current



Difference between transient pulse thermal resistances and transient thermal resistance for constant current, pulse currents 40 to 60 Hz



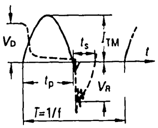
Blocking characteristics			Secondary conditions
Maximum off-state or reverse current	I_D, I_R	– 25 mA	$\vartheta_j = 140°C$, for 0.67 V_{DRM}, 0.67 V_{RRM} $= 140°C$, for V_{DRM}, V_{RRM}
Forward blocking characteristics			
Maximum rms on-state current	$I_{TRMS(I)}$	950 A	
Surge current	$I_{TSM(I)}$	8,950 A 7,750 A	$\vartheta_j = 25°C$ } half sine wave $= 140°C$ } 50 Hz, $V_R = 0V$
i^2t value	$\int i^2 dt$	400,000 A^2s 300,000 A^2s 190,000 A^2s 140,000 A^2s	$\vartheta_j = 25°C$ } $t = 10$ ms, $V_R = 0V$ $= 140°C$ } $\vartheta_j = 25°C$ } $t = 2$ to 5 ms $= 140°C$ } $V_R = 0V$
Threshold voltage Slope resistance	$V_{(TO)}$ r_T	0.945 V 0.434 mΩ	} equivalent straight line for $\vartheta_j = 140°C$
Dynamic values, switching applications			
Latching current	I_L	0.5 A 1.0 A	$\vartheta_j = 140°C$ $= 25°C$ $= -40°C$ } $V_D = 18V$, $I_G = 1A$, $di_G/dt = 1A/\mu s$, $t_{gt} = 15\mu s$
Delay time	t_{gd}	2.2 µs 1.5 µs	$I_G = 1A$ } $di_G/dt = 1A/\mu s$, $\vartheta_j = 25°C$ $I_G = 3A$ } $V_D = 0.5\ V_{DRM}$, L/R = 2 t_{gd} $I_{TM} = 60A$
Critical periodical rate of rise of on-state current with additional load from an RC snubber	$(di/dt)_{cr}$	150 A/µs	$\vartheta_j = 140°C$, $f = 50$ Hz, $V_D = 0.67\ V_{DRM}$ Long pulse with linear current rise to $I_{TM} = 1800A$ Additionally permissible peak current of a discharging RC snubber, $I_{TM(RC)} = 100A$ Drive required $I_G \geqq 1A$, $di_G/dt \geqq 1A/\mu s$
Periodical current (peak value) of a discharging RC snubber	$I_{TM(RC)}$	100 A 50 A	$di/dt = (di/dt)_{cr}$ Drive required $I_G \geqq 1A$, $di_G/dt \geqq 1A/\mu s$ $di/dt \leqq 10A/\mu s$ Drive required $I_G \approx I_{GT}$ } $\vartheta_j \leqq 140°C$, $f = 50$ Hz, $V_D = 0.67\ V_{DRM}$

Critical rate of rise of off-state voltage (Type BSt N 61 ...)	$(dv/dt)_{cr}$	200 V/µs 1,000 V/µs	0.67 V_{DRM} 0.33 V_{DRM} } ϑ_j = 140°C, Linear voltage rise, control circuit open
(Type BSt N 61 ... S 9)		100 V/µs 500 V/µs 2,000 V/µs	1.0 V_{DRM} 0.67 V_{DRM} 0.33 V_{DRM} } ϑ_j = 140°C, Linear voltage rise, control circuit open
Circuit commutated turn-off time (Type BSt N 61 .. f) (Type BSt N 61 .. g)	t_q	 15 µs 18 µs	ϑ_j = 140°C, $-di/dt = -10$ A/µs V_R = 0.67 V_{RRM}, V_D = 0.67 V_{DRM} dv/dt = 50 V/µs, I_{TM} = 600 A Chip current fully risen before commutation
Gate circuit ratings Minimum gate trigger current	I_{GT}	100 mA 250 mA 450 mA	ϑ_j = 140°C = 25°C = −40°C } $V_D \geqq 2$ V
Minimum gate trigger voltage	V_{GT}	1.0 V 1.5 V 2.3 V	ϑ_j = 140°C = 25°C = −40°C } $V_D \geqq 2$ V
Maximum gate non-trigger current	I_{GD}	20 mA 10 mA	ϑ_j = 140°C, V_D = 2 V = 140°C, $V_D \leqq 0.5$ V_{DRM}
Maximum gate non-trigger voltage	V_{GD}	0.2 V	ϑ_j = 140°C, $V_D \leqq 0.5$ V_{DRM}
Maximum admissible gate current	I_{GM} I_{GRMS}	10 A 3 A	peak value rms value
Maximum admissible gate power losses	$P_{GAV(I)}$	20 W	maximum value
Maximum negative gate voltage	V_{GRM}	10 V	peak value

Sinusoidal pulse operation

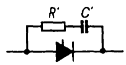
Cooling on cathode side

Pulse shape



f = Frequency = $1/T$
I_{TM} = Maximum dc peak current
V_R = Recovery voltage
V_D = Voltage before turn-on
t_p = Pulse duration
t_s = Idle period

CSE circuitry
(see explanations)

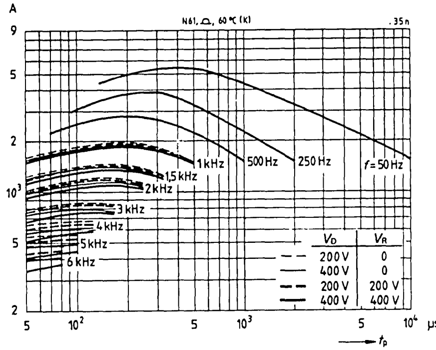


R' = 5.6 Ω (3.9 Ω)
C' = 0.68 µF (1 µF)

More CSE circuitry (values in brackets) may be necessary if the commutation voltage is too high

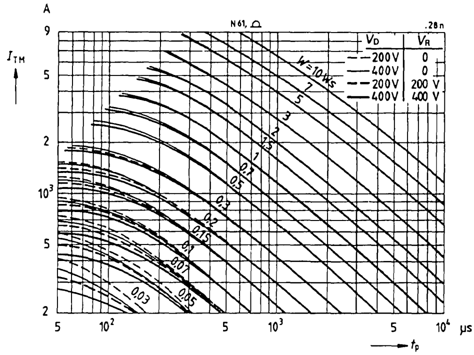
Maximum dc output current peak value

as a function of pulse duration t_p
Parameters: ϑ_C = **60 °C**, V_D, V_R, f, circuitry



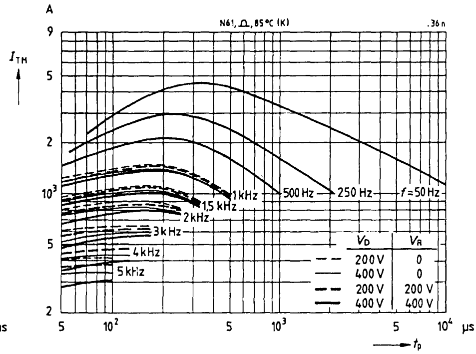
Graph for calculating power dissipation $P_{tot} = W \cdot f$

Parameters: V_D, V_R, circuitry
W = energy loss per pulse



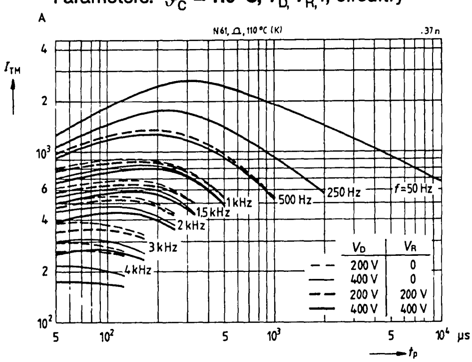
Maximum dc output current peak value

as a function of pulse duration t_p
Parameters: ϑ_C = **85 °C**, V_D, V_R, f, circuitry



Maximum dc output current peak value

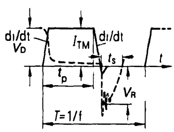
as a function of pulse duration t_p
Parameters: ϑ_C = **110 °C**, V_D, V_R, f, circuitry



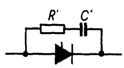
Trapezoidal pulse operation

Double-sided cooling

Pulse shape



CSE circuitry
(see explanations)

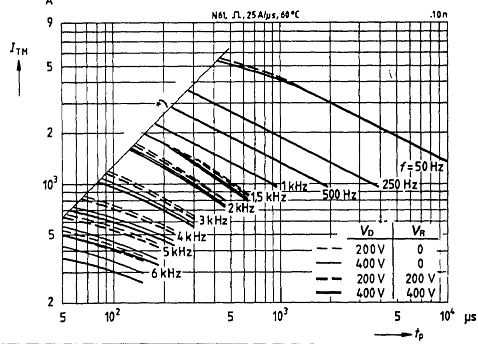


$R' = 5.6\,\Omega$
$C' = 0.68\,\mu F$

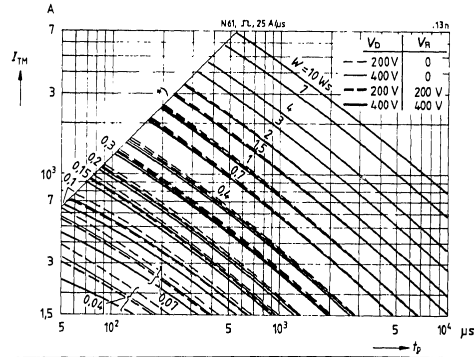
di/dt = Rate of current rise
f = Frequency = $1/T$
I_{TM} = Maximum dc peak current
V_R = Recovery voltage
V_D = Voltage before turn-on
t_p = Pulse duration
t_s = Idle period

25 A/μs

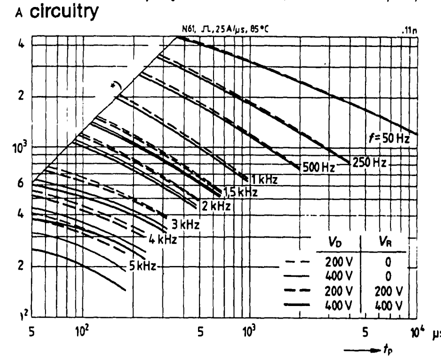
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: **d_i/d_t = 25 A/μs**, ϑ_C = **60°C**, V_D, V_R, f, circuitry



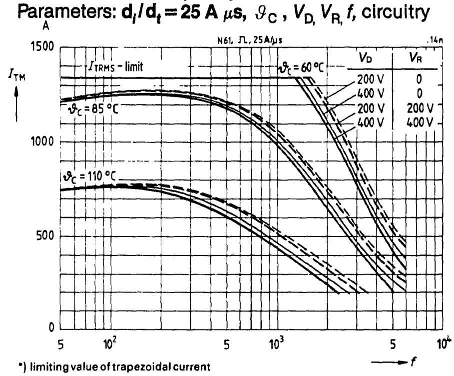
Graph for calculating power dissipation $P_{tot} = W \cdot f$
Parameters: **d_i/d_t = 25 A/μs**, V_D, V_R, circuitry
W = energy loss per pulse



Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: **d_i/d_t = 25 A μs**, ϑ_C = **85°C**, V_D, V_R, f, circuitry

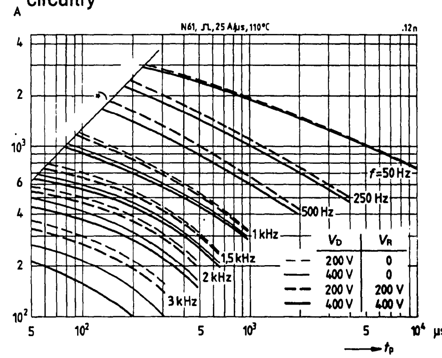


Maximum dc output current peak value
(trapezoidal current with $t_p = T/2$)
as a function of frequency
Parameters: **d_i/d_t = 25 A μs**, ϑ_C, V_D, V_R, f, circuitry



*) limiting value of trapezoidal current

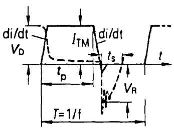
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: **d_i/d_i = 25 A/μs**, ϑ_C = **110°C**, V_D, V_R, f, circuitry



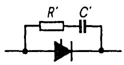
Trapezoidal pulse operation

Double-sided cooling

Pulse shape



CSE circuitry
(see explanations)



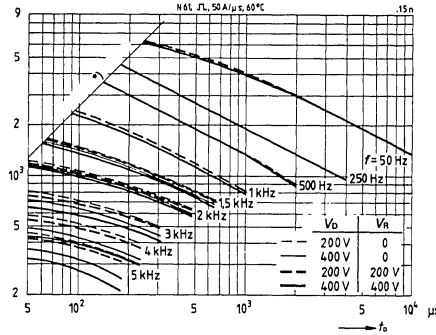
$R' = 5.6\,\Omega$
$C' = 0.68\,\mu F$

- di/dt = Rate of current rise
- f = Frequency = $1/T$
- I_{TM} = Maximum dc peak current
- V_R = Recovery voltage
- V_D = Voltage before turn-on
- t_p = Pulse duration
- t_s = Idle period

50 A/µs

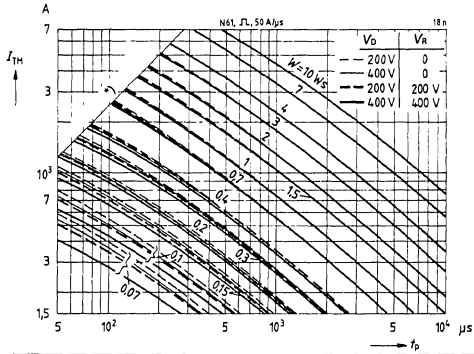
Maximum dc output current peak value

as a function of pulse duration t_p
Parameters: **d_i/d_t = 50 A/µs, ϑ_C = 60°C,** V_D, V_R, f circuitry



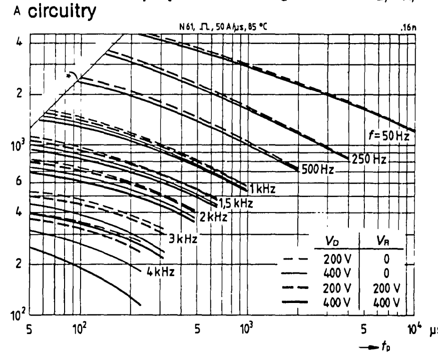
Graph for calculating power dissipation $P_{tot} = W \cdot f$

Parameters: **d_i/d_t = 50 A/µs,** V_D, V_R, circuitry
W = energy loss per pulse



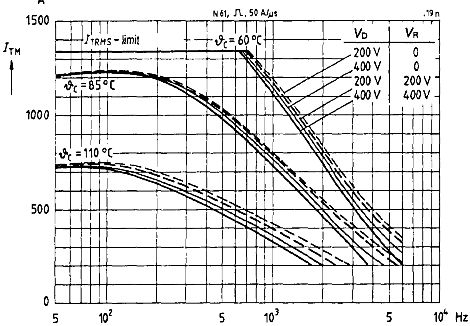
Maximum dc output current peak value

as a function of pulse duration t_p
Parameters: **d_i/d_t = 50 A µs, ϑ_C = 85°C,** V_D, V_R, f, circuitry



Maximum dc output current peak value

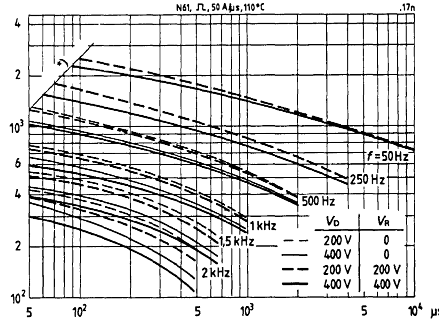
(trapezoidal current with $t_p = T/2$)
as a function of frequency
Parameters: **d_i/d_t = 50 A µs, ϑ_C**, V_D, V_R, f, circuitry



*) limiting value of trapezoidal current

Maximum dc output current peak value

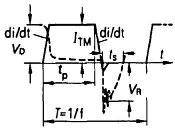
as a function of pulse duration t_p
Parameters: **d_i/d_t = 50 A/µs, ϑ_C = 110°C,** V_D, V_R, f, circuitry



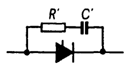
Trapezoidal pulse operation

Double-sided cooling

Pulse shape



CSE circuitry
(see explanations)

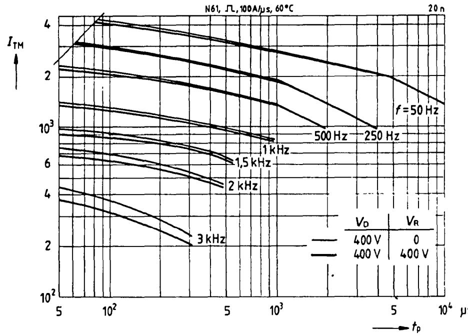


$R' = 3.9\,\Omega$
$C' = 1\,\mu F$

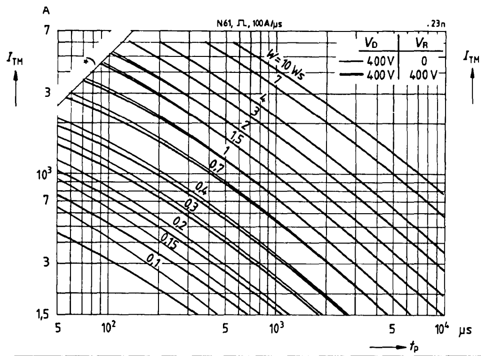
- di/dt = Rate of current rise
- f = Frequency = $1/T$
- I_{TM} = Maximum dc peak current
- V_R = Recovery voltage
- V_D = Voltage before turn-on
- t_p = Pulse duration
- t_s = Idle period

100 A/µs

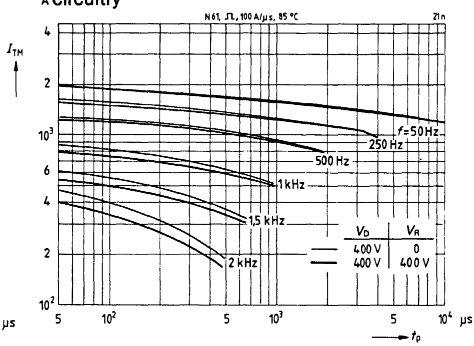
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: $d_i/d_t = 100$ A/µs, $\vartheta_C = 60°C$, V_D, V_R, f, circuitry



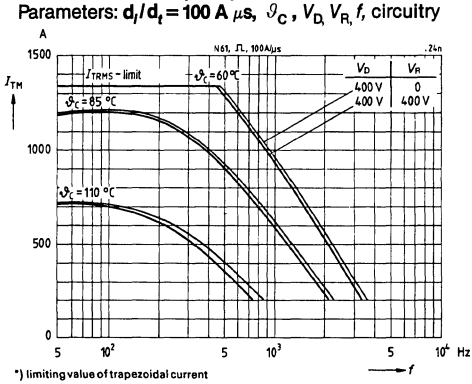
Graph for calculating power dissipation $P_{tot} = W \cdot f$
Parameters: $d_i/d_t = 100$ A/µs, V_D, V_R, circuitry
W = energy loss per pulse



Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: $d_i/d_t = 100$ A µs, $\vartheta_C = 85°C$, V_D, V_R, f, circuitry



Maximum dc output current peak value
(trapezoidal current with $t_p = T/2$)
as a function of frequency
Parameters: $d_i/d_t = 100$ A µs, ϑ_C, V_D, V_R, f, circuitry

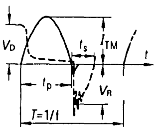


*) limiting value of trapezoidal current

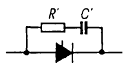
Sinusoidal pulse operation

Cooling on anode side

Pulse shape



CSE circuitry
(see explanations)

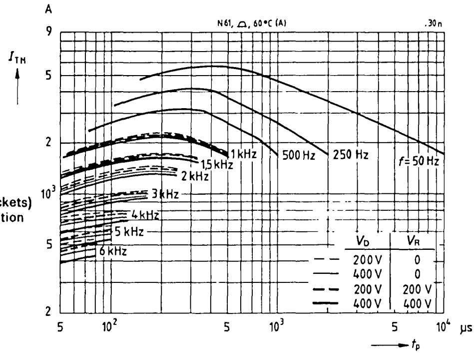


$R' = 5.6\,\Omega\,(3.9\,\Omega)$
$C' = 0.68\,\mu F\,(1\,\mu F)$

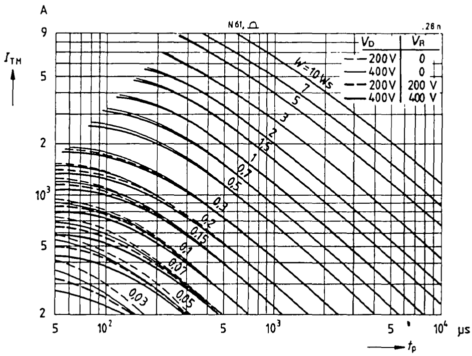
More CSE circuitry (values in brackets) may be necessary if the commutation voltage is too high

f = Frequency = $1/T$
I_{TM} = Maximum dc peak current
V_R = Recovery voltage
V_D = Voltage before turn-on
t_p = Pulse duration
t_s = Idle period

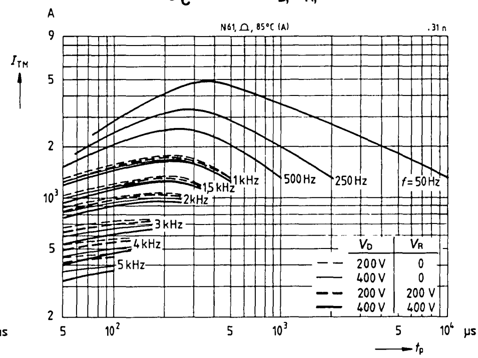
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C **= 60°C,** V_D, V_R, f, circuitry



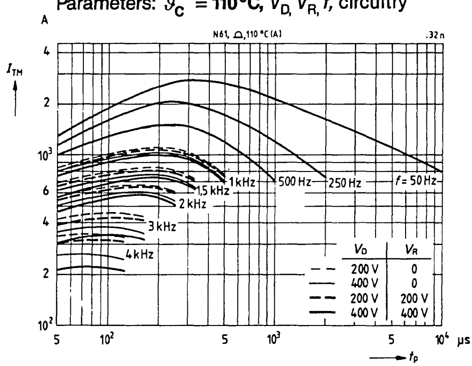
Graph for calculating power dissipation $P_{tot} = W \cdot f$
Parameters: V_D, V_R, circuitry
W = energy loss per pulse



Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C **= 85°C,** V_D, V_R, f, circuitry



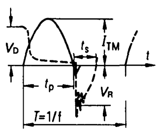
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C **= 110°C,** V_D, V_R, f, circuitry



Sinusoidal pulse operation

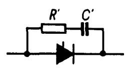
Double-sided cooling

Pulse shape



f = Frequency = $1/T$
I_{TM} = Maximum dc peak current
V_R = Recovery voltage
V_D = Voltage before turn-on
t_p = Pulse duration
t_s = Idle period

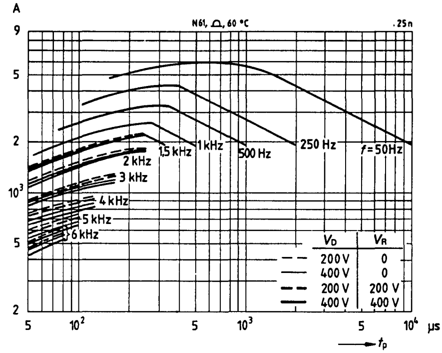
CSE circuitry
(see explanations)



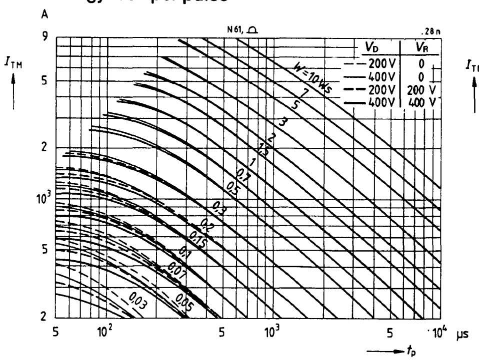
$R' = 5.6\,\Omega\,(3.9\,\Omega)$
$C' = 0.68\,\mu F\,(1\,\mu F)$

More CSE circuitry (values in brackets) may be necessary if the commutation voltage is too high

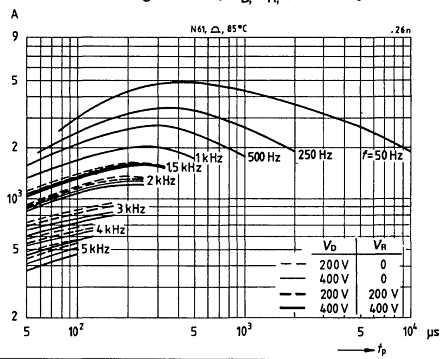
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C = **60°C**, V_D, V_R, f, circuitry



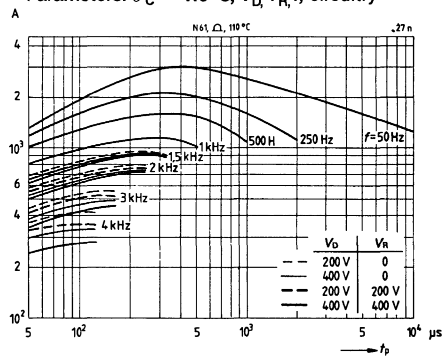
Graph for calculating power dissipation $P_{tot} = W \cdot f$
Parameters: V_D, V_R, circuitry
W = energy loss per pulse



Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C = **85°C**, V_D, V_R, f, circuitry



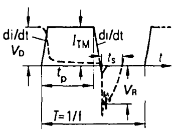
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: ϑ_C = **110°C**, V_D, V_R, f, circuitry



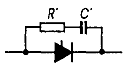
Trapezoidal pulse operation

Double-sided cooling

Pulse shape



CSE circuitry
(see explanations)

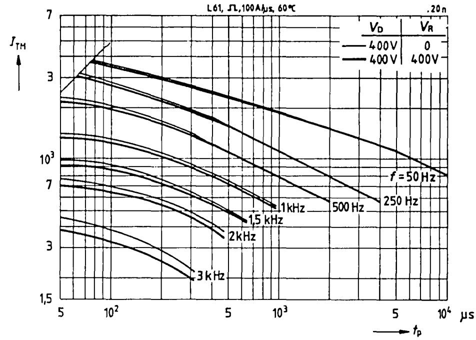


$R' = 3.9\,\Omega$
$C' = 0.68\,\mu F$

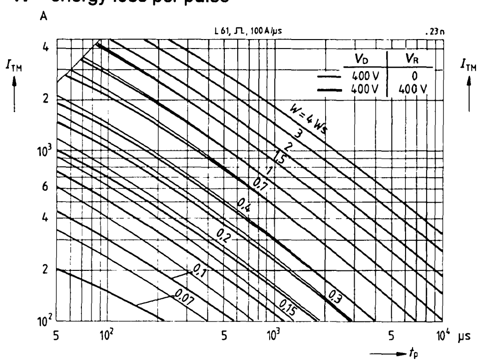
- di/dt = Rate of current rise
- f = Frequency = $1/T$
- I_{TM} = Maximum dc peak current
- V_R = Recovery voltage
- V_D = Voltage before turn-on
- t_p = Pulse duration
- t_s = Idle period

100 A/µs

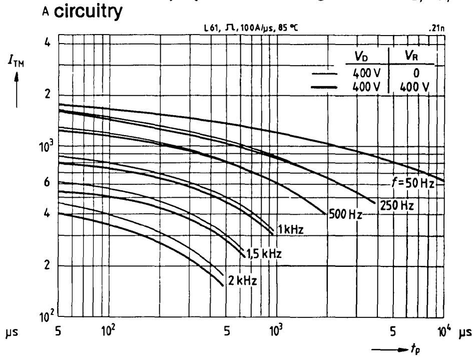
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: d_i/d_t = 100 A/µs, ϑ_C = 60 °C, V_D, V_R, f, circuitry



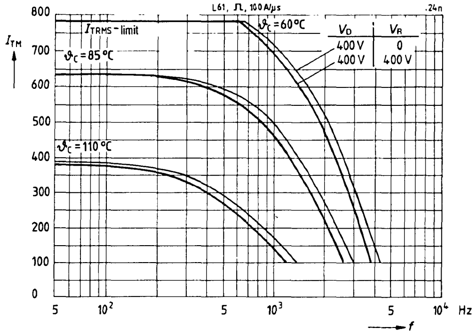
Graph for calculating power dissipation $P_{tot} = W \cdot f$
Parameters: d_i/d_t = 100 A/µs, V_D, V_R, circuitry
W = energy loss per pulse



Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: d_i/d_t = 100 A µs, ϑ_C = 85 °C, V_D, V_R, f, circuitry



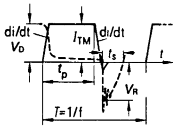
Maximum dc output current peak value
(trapezoidal current with $t_p = T/2$)
as a function of frequency
Parameters: d_i/d_t = 100 A µs, ϑ_C, V_D, V_R, f, circuitry



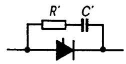
Trapezoidal pulse operation

Double-sided cooling

Pulse shape



CSE circuitry
(see explanations)

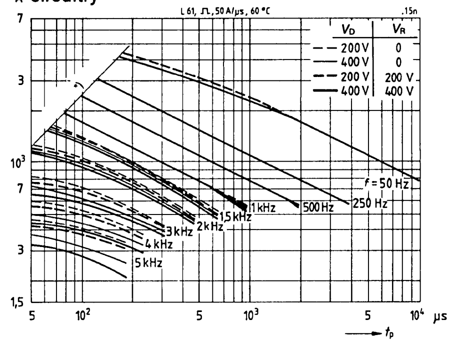


$R' = 6.8\,\Omega$
$C' = 0.47\,\mu F$

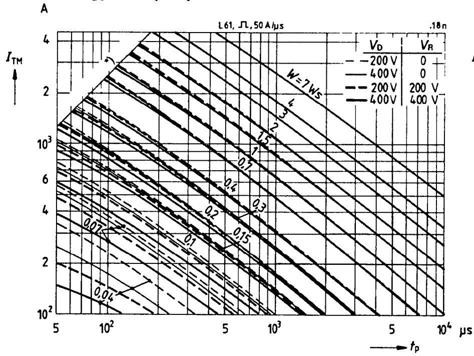
di/dt = Rate of current rise
f = Frequency = $1/T$
I_{TM} = Maximum dc peak current
V_R = Recovery voltage
V_D = Voltage before turn-on
t_p = Pulse duration
t_s = Idle period

50 A/µs

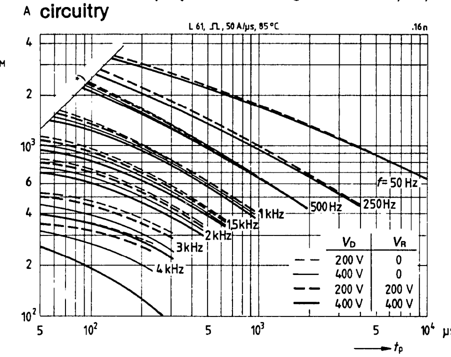
Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: **di/dt = 50 A/µs, ϑ_C = 60°C,** V_D, V_R, f, circuitry



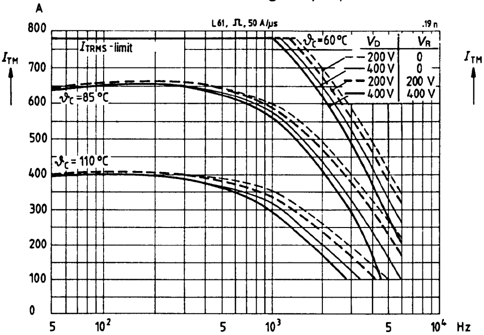
Graph for calculating power dissipation $P_{tot} = W \cdot f$
Parameters: **di/dt = 50 A/µs,** V_D, V_R, circuitry
W = energy loss per pulse



Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: **di/dt = 50 A µs, ϑ_C = 85°C,** V_D, V_R, f, circuitry

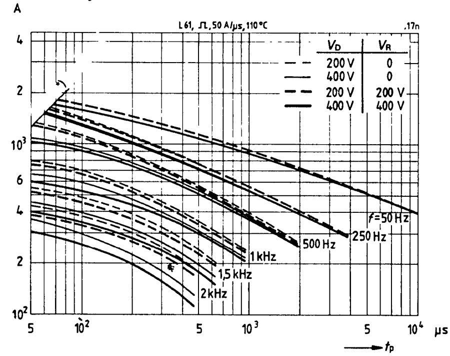


Maximum dc output current peak value
(trapezoidal current with $t_p = T/2$)
as a function of frequency
Parameters: **di/dt = 50 A µs, ϑ_C**, V_D, V_R, f, circuitry



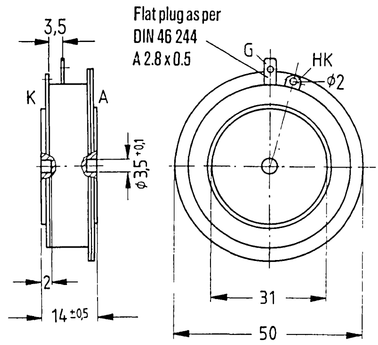
*) limiting value of trapezoidal current

Maximum dc output current peak value
as a function of pulse duration t_p
Parameters: **di/dt = 50 A/µs, ϑ_C = 110°C,** V_D, V_R, f, circuitry



Disc thyristors for 200 V to 600 V; $I_{TRMS} = 1730$ A; $t_q =$ 15 μs, 18 μs

Application	Primarily for self-commutated converters of all types, e.g. inverters, static converters, choppers, etc.
Chip	Fully diffused silicon, with internal gate trigger amplification Current and heat transfer: noble metal pressure contact
Case	Disc-type case, type 4 a as per DIN 44 499 (draft) Contact surfaces nickel-plated, ceramic insulation
Connections	Gate line yellow, 230 mm in length, included in delivery upon request
Polarity	as stamped



Dimensions in mm

Heat sinks

Type	NK12[1]	NK15[1]	PK20[1]	KC14..[1][2]	KD04/05[1][2]
Ordering Code	—	—	—	—	—
Designation as per DIN 41 882	—	—	—	—	—
Material	Alum.	Alum.	Alum.	Copper	Copper
Weight	2100 g	2400 g	7500 g	—	—

Type

V_{DRM} V_{RRM}	$t_q = 15$ μs dvd$t$ = 200 V/μs	$t_q = 18$ μs dvd$t$ = 200 V/μs	$t_q = 15$ μs dvd$t$ = 500 V/μs	$t_q = 18$ μs dvd$t$ = 500 V/μs
200V	BStP6113f	BStP6113g	BStP6113fS9	BSTP6113gS9
300V	BStP6120f	BStP6120g	BStP6120fS9	BStP6120gS9
400V	BStP6126f	BStP6126g	BStP6126fS9	BStP6126gS9
500V	BStP6133f	BStP6133g	BStP6133fS9	BStP6133gS9
600V	BSTP6140f	BStP6140g	BStP6140fS9	BStP6140gS9

[1]) Available only with component fitted

[2]) For complete designation see chapter on heat sinks.

Blocking characteristics			Secondary conditions
Maximum off-state or reverse current	I_D, I_R	approx. 20 mA (approx. 25 mA)*) 40 (60) mA*)	$\vartheta_j = 140°C$, for 0.67 V_{DRM}, 0.67 V_{RRM} = 140° C, for V_{DRM}, V_{RRM}
Forward blocking characteristics			
Maximum rms on-state current	$I_{TRMS(I)}$	1,730 A	
Surge current	$I_{TSM(I)}$	16,000 A 14,150 A	ϑ_j = 25° C } half sine wave = 140° C } 50 Hz, $V_R = 0V$
i^2t value	$\int i^2 dt$	1,300,000 A²s 1,000,000 A²s	ϑ_j = 25° C } t = 10 ms, V_R = 0 V = 140° C } ϑ_j = 25° C } t = 2 to 5 ms = 140° C } V_R = 0 V
Threshold voltage Slope resistance	$V_{(TO)}$ r_T	1.03 V 0.198 mΩ	} equivalent straight line for ϑ_j = 140° C
Dynamic values, switching applications			
Latching current	I_L	– – –	ϑ_j = 140° C } V_D = 18 V, = 25° C } I_G = 1 A, di_G/dt = 1 A/µs, = −40° C } t_{gt} = 15 µs
Delay time	t_{gd}	– –	I_G = 1 A } di_G/dt = 1 A/µs, ϑ_j = 25° C I_G = 3 A } V_D = 0.5 V_{DRM}, L/R = 2 t_{gd} I_{TM} = 110 A
Critical periodical rate of rise of on-state current with additional load from an RC snubber	$(di/dt)_{cr}$	200 A/µs	ϑ_j = 140° C, f = 50 Hz, V_D = 0.67 V_{DRM} Long pulse with linear current rise to I_{TM} = 3300 A Additionally permissible peak current of a discharging RC snubber, $I_{TM(RC)}$ = 100 A Drive required $I_G \geqq 1$ A, di_G/d$t \geqq 1$ A/µs
Periodical current (peak value) of a discharging RC snubber	$I_{TM(RC)}$	100 A 50 A	di/dt = (di/dt)$_{cr}$ Drive required $I_G \geqq 1$ A, di_G/d$t \geqq 1$ A/µs di/d$t \leqq$ 10 A/µs Drive required $I_G \approx I_{GT}$ } $\vartheta_j \leqq$ 140° C, f = 50 Hz, V_D = 0.67 V_{DRM}
Critical rate of rise of off-state voltage (Type BSt P61 ...) (Type BSt P61 ... S 9)	$(dv/dt)_{cr}$	200 V/µs 1,000 V/µs 100 V/µs 500 V/µs 2,000 V/µs	0.67 V_{DRM} 0.33 V_{DRM} 1.0 V_{DRM} 0.67 V_{DRM} 0.33 V_{DRM} } ϑ_j = 140° C Linear voltage rise, control circuit open
Circuit commutated turn-off time (Type BSt P61 .. f) (Type BSt P61 .. g)	t_q	 15 µs 18 µs	ϑ_j = 140° C, −di/dt = −10 A/µs V_R = 0.67 V_{RRM}, V_D = 0.67 V_{DRM} dv/dt = 50 V/µs, I_{TM} = 1100 A Chip current fully risen before commutation

Gate circuit ratings			
Minimum gate trigger current	I_{GT}	150 mA 250 mA –	ϑ_j = 140°C = 25°C = –40°C } $V_D \geqq 6$ V
Minimum gate trigger voltage	V_{GT}	1.8 V 2.5 V –	ϑ_j = 140°C = 25°C = –40°C } $V_D \geqq 6$ V
Maximum gate non-trigger current	I_{GD}	20 mA 10 mA	ϑ_j = 140°C, V_D = 6 V = 140°C, $V_D \leqq 0.5\ V_{DRM}$
Maximum gate non-trigger voltage	V_{GD}	0.2 V	ϑ_j = 140°C, $V_D \leqq 0.5\ V_{DRM}$
Maximum admissible gate current	I_{GM} I_{GRMS}	10 A 3 A	peak value rms value
Maximum admissible gate power losses	$P_{GAV(I)}$	20 W	maximum value
Maximum negative gate voltage	V_{GRM}	10 V	peak value

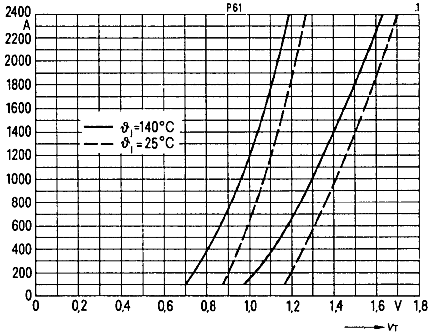
Thermal ratings			Secondary conditions
Maximum continuously admissible junction temperature	$\vartheta_{j(I)}$	140°C	
Operating temperature range	ϑ_j	–40 to +140°C	
Storage temperature range	ϑ_s	–40 to +150°C	
Thermal resistance for constant current (excluding heat transfer)	R_{thJC}	0.03 K/W 0.0565 K/W 0.064 K/W	double-sided cooling cooling on anode side cooling on cathode side
Thermal resistance case to heat sink	R_{thCK}	0.006 K/W 0.012 K/W	double-sided cooling one-sided cooling } see assembly instructions

Mechanical ratings			
Contact pressure	F	10 000 N $^{+30}_{-10}$%	setpoint value
Leakage path	–	8.5 mm	anode – grid
Air path	–	8.5 mm	anode – grid
Weight	–	130 g	
Vibration resistance	–	50 m/s²	at 50 Hz, without heat sink
Humidity category	–	C	according to DIN 40 040

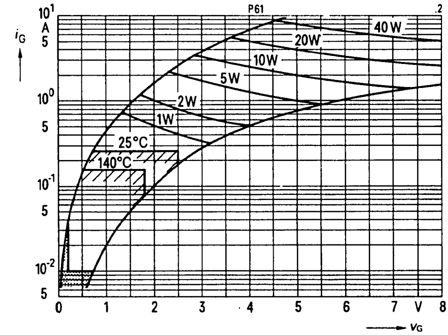
*) on request

Characteristics

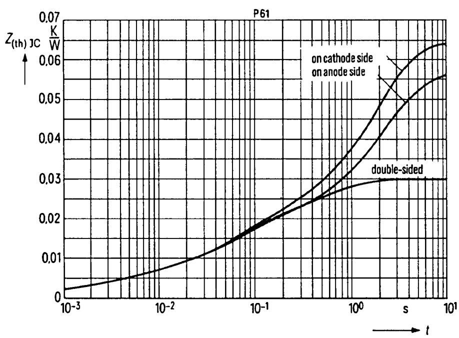
Forward characteristics (scatter bands)
Parameter: junction temperature ϑ_j



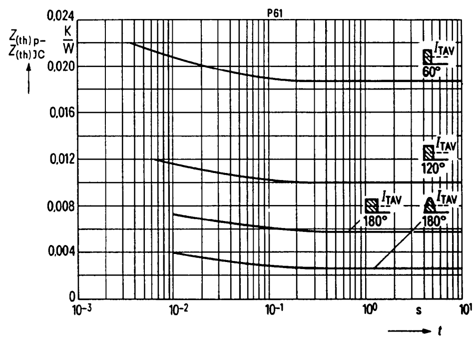
Input characteristics (scatter band)
with trigger ranges and
power dissipation hyperbolae



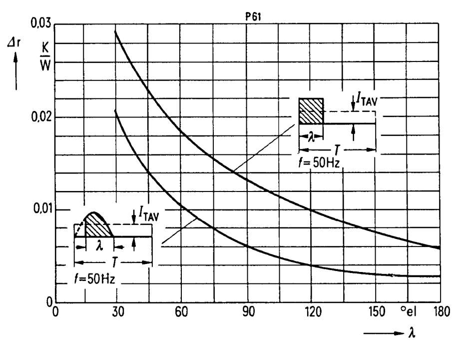
Transient thermal resistance for contrast current



Difference between transient pulse thermal resistances and transient thermal resistance for constant current, pulse currents 40 to 60 Hz



Thermal resistance Δr
Parameters: frequency *f*, current waveform



"Analytical function" for dc:

$$Z_{(th)JC} = \sum_{i=1}^{n} r_i \left(1 - e^{-\frac{t}{\tau_i}}\right)$$

	Double-sided cooling		Cooling on anode side		Cooling on cathode side	
i	r_i [K/W]	τ_i [s]	r_i [K/W]	τ_i [s]	r_i [K/W]	τ_i [s]
1	0.0111	0.523	0.0376	2.3	0.0451	1.87
2	0.0123	0.0722	0.0123	0.0722	0.0123	0.0722
3	0.0024	0.0127	0.0024	0.0127	0.0024	0.0127
4	0.0026	0.0034	0.0026	0.0034	0.0026	0.0034
5	0.0016	0.00064	0.0016	0.00064	0.0016	0.00064

Formulae for determining the total thermal resistance

$R_{thJA} = R_{thJC} + R_{thCA} + \Delta r$
$Z_{(th)JA} = Z_{(th)JC} + Z_{(th)CA}$
$Z_{(th)p(JA)} = [Z_{(th)p} - Z_{(th)JC}] + Z_{(th)JA}$
R_{thCA} and $Z_{(th)CA}$ see section "Heat sinks"

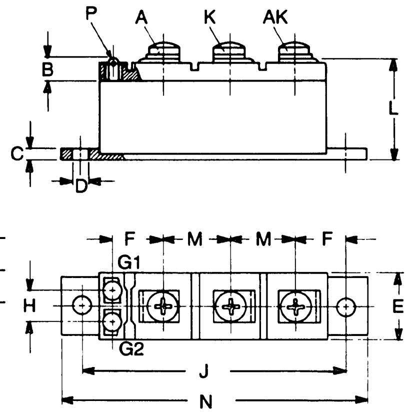
SCR PowerMods, Phase Control

PowerMod Encapsulated Assemblies

18 A Avg; V_{DRM} and V_{RRM} Up To 1600 Volts

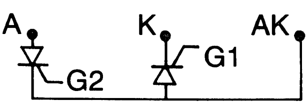
Series MTT 18L

- Maximum continuous current 2X18 amperes average $T_c = 87\,°C$
- Primarily used in line commutated converters
- Electrically isolated baseplate (2500V_{RMS})
- RΘCS optimized by fastening directly to metal baseplate
- Glass passivation for high reliability



Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
B	0.24	0.26	6.10	6.60	
C	0.11	0.12	2.80	3.05	
D	0.21	0.22	5.33	5.59	
E	0.78	0.80	19.81	20.32	
F	0.58	0.60	14.75	15.25	
H	0.38	0.40	9.65	10.16	
J	3.14	3.16	79.75	80.25	
L	1.17	1.19	29.40	30.60	
M	0.78	0.80	19.81	20.32	
N	----	3.65	----	92.70	
P	----	----	----	----	1

Notes: (1) Faston Tab (.110 x .032)



Fully-controlled version

Catalog Number	V_{DRM}/V_{RRM}
MTT18L06N	600V
MTT18L12N	1200V
MTT18L16N	1600V

Electrical Characteristics(1)

Forward Conducting			
Max. RMS on-state current per SCR	$I_{T(RMS)}$	30 Amps	
Max. average on-state cur. per SCR	$I_{T(AV)}$	18 Amps	T_c = 87 °C, half sine
Max. peak on-state voltage	V_{TM}	1.9 Volts	I_{TM} = 45 Amps
Max. holding current	I_H	200 mA	V_D = 6 Volts
Max peak one cycle 60 Hz surge	I_{TSM}	250 Amps	T_J = 125 °C
Max. I^2t capability for fusing	I^2t	260A²Sec	T_J = 125 °C, t = 8.3 ms
Switching			
Critical rate of rise of on-state current	di/dt	100A/μsec.	T_J = 125 °C, V_D = 0.67 V_{DRM}
Typical circuit commutated turn-off time	t_q	75 μsec.	T_J = 125 °C, di/dt = 10 A/μs
Maximum repetitive RC snubber discharge current	$I_{TM(RC)}$	40 Amps	V_D = 0.67 V_{DRM}, I_{TM} = 18 Amps T_J = 125 °C, di/dt = 100 A/μs, V_D = 0.67 V_{DRM}
Thermal values			
Maximum DC thermal resistance, junction to case per SCR	$R_{\Theta JC}$	1.0 °C/W	
Typical thermal resistance, case to sink per SCR	$R_{\Theta CS}$	0.1 °C/W	
Operating junction temp. range	T_J	-40 °C to + 125 °C	
Storage temperature range	T_{stg}	-40 °C to + 150 °C	
Blocking			
Max. forward leakage current	I_{DRM}	10 mA	T_J = 125 °C and V_{DRM}
Max. reverse leakage current	I_{RRM}	10 mA	T_J = 125 °C and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	T_J = 125 °C, V_D = V_{DRM}
Isolation voltage between connections and baseplate(2)	V_{ISO}	2500 V_{RMS}	
Triggering			
Max. gate voltage to trigger	V_{GT}	1.5V	V_D = 2 Volts
Max nontriggering gate voltage	V_{GD}	0.25V	T_J = 125 °C, V_D = 0.5, V_{DRM}
Max. nontriggering gate current	I_{GD}	2 mA	T_J = 125 °C, V_D = 0.5 V_{DRM}
Max. gate current to trigger	I_{GT}	100 mA	V_D = 2 Volts
Max. average gate power	P_{GM}	10 W	
Max. peak gate current	I_{GM}	3.5A	
Max. peak reverse gate voltage	V_{GM}	10V	

Mechanical Characteristics

Terminal torque	35 to 50 in. - lb.
Weight	Approximately 4.4 ounces (125 grams)

(1) T_C = 25 °C unless otherwise indicated

(2) Warning: The case must not be destroyed since this may release harmful beryllium oxide dust.

Figure 1
Maximum power dissipation for 1 SCR of the module

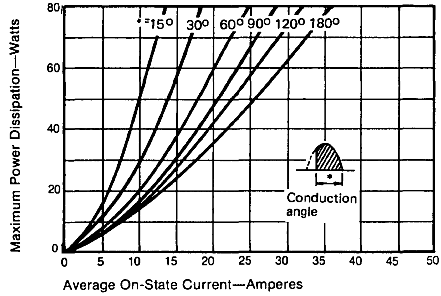


Figure 2
Maximum power dissipation for 1 SCR of the module

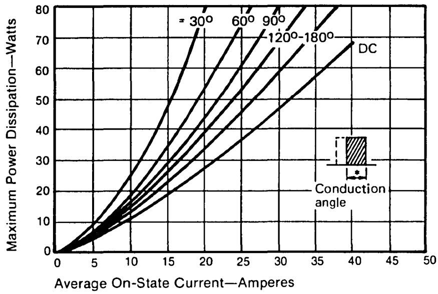


Figure 3
Maximum baseplate temperature as a function of on-state current for 1 SCR of the module

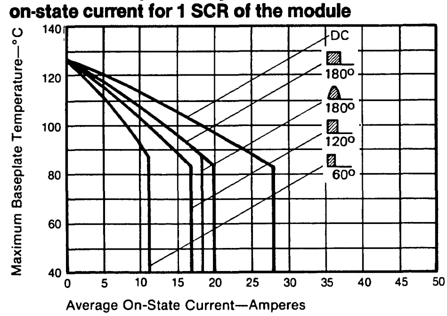


Figure 4
Maximum power dissipation for 1 SCR of the module - overcurrent range

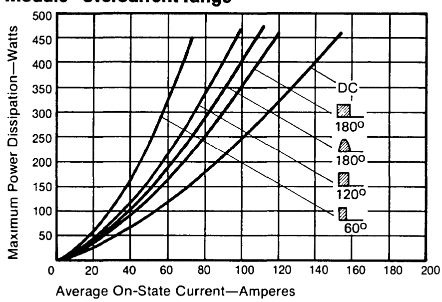


Figure 5
Maximum transient thermal impedance for 1 SCR of the module for constant current and pulse current

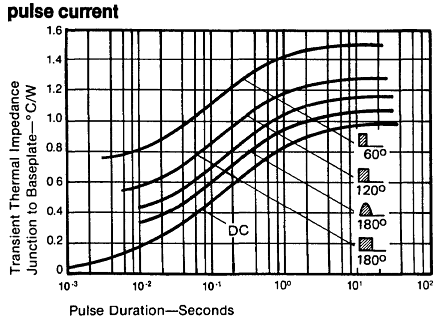


Figure 6
Increase in thermal resistance versus conduction angle for 1 SCR (Total $R_{\Theta JC}$ = DC $R_{\Theta JC} + \Delta r$)

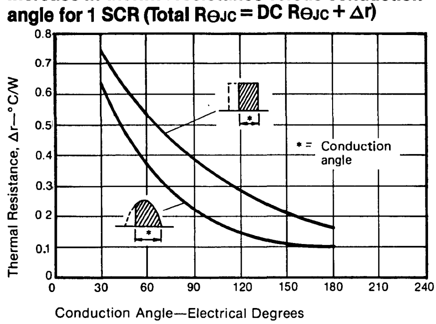


Figure 7
Gate characteristics

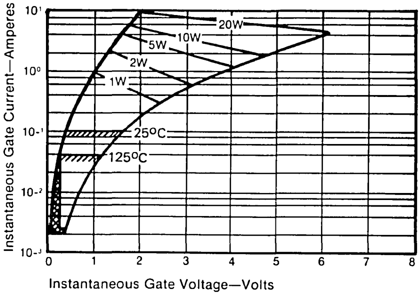


Figure 8
SCR on-state characteristics

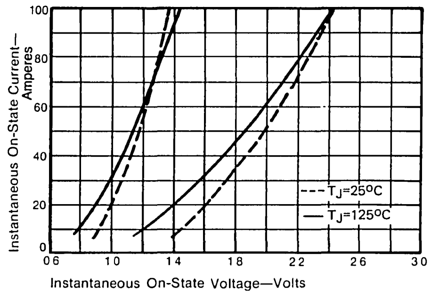


Figure 9
Single-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

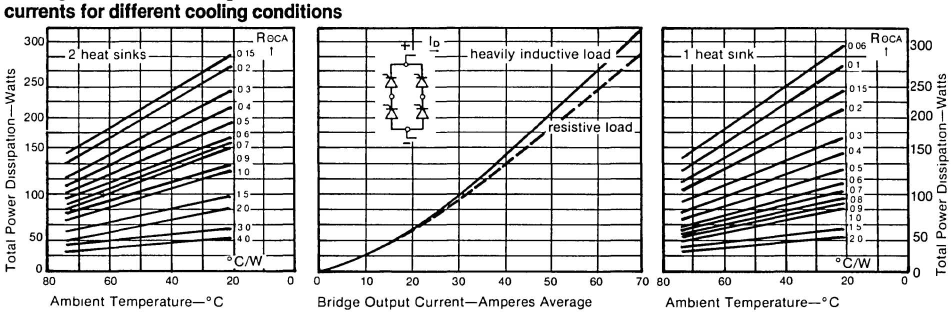


Figure 10
Three-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

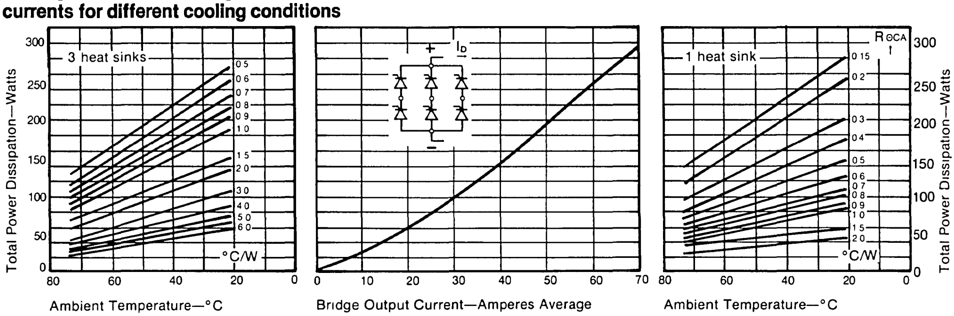


Figure 11
AC switch—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

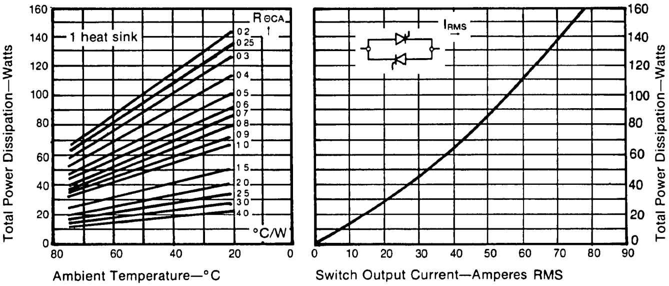
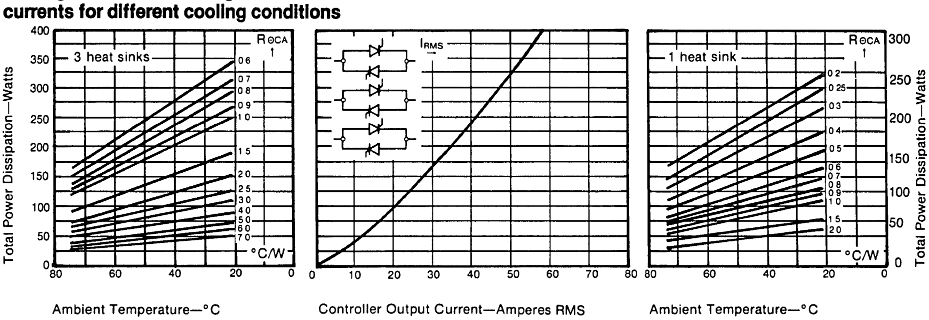


Figure 12
Three-phase controller—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

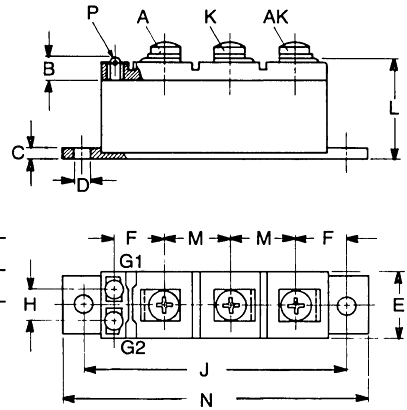


PowerMod Encapsulated Assemblies

25 A Avg; V_{DRM} and V_{RRM} Up To 1600 Volts

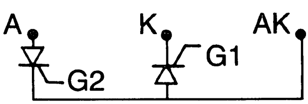
Series MTT25L

- Maximum continuous current 2X25 amperes average $T_c = 87\,°C$
- Primarily used in line commutated converters
- Electrically isolated baseplate (2500 V_{RMS})
- RΘCS optimized by fastening directly to metal baseplate
- Glass passivation for high reliability



Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
B	0.24	0.26	6.10	6.60	
C	0.11	0.12	2.80	3.05	
D	0.21	0.22	5.33	5.59	
E	0.78	0.80	19.81	20.32	
F	0.58	0.60	14.75	15.25	
H	0.38	0.40	9.65	10.16	
J	3.14	3.16	79.75	80.25	
L	1.17	1.19	29.40	30.60	
M	0.78	0.80	19.81	20.32	
N	----	3.65	----	92.70	
P	----	----	----	----	1

Notes: (1) Faston Tab (.110 x .032)



Fully-controlled version

Catalog Number	V_{DRM}/V_{RRM}
MTT25L06N	600V
MTT25L12N	1200V
MTT25L16N	1600V

Electrical Characteristics (1)

Forward Conducting			
Max. RMS on-state current per SCR	$I_{T(RMS)}$	40 Amps	
Max. average on-state cur. per SCR	$I_{T(AV)}$	25 Amps	T_c = 87°C, half sine
Max. peak on-state voltage	V_{TM}	1.8 Volts	I_{TM} = 60 Amps
Max. holding current	I_H	200 mA	V_D = 6 Volts
Max peak one cycle 60 Hz surge	I_{TSM}	440 Amps	T_J = 125°C
Max. I^2t capability for fusing	I^2t	800A²Sec	T_J = 125°C, t = 8.3 ms
Switching			
Critical rate of rise of on-state current	di/dt	100A/μsec.	T_J = 125°C, V_D = 0.67 V_{DRM}
Typical circuit commutated turn-off time	t_q	75 μsec.	T_J = 125°C, di/dt = 10 A/μs
Maximum repetitive RC snubber discharge current	$I_{TM(RC)}$	40 Amps	V_D = 0.67 V_{DRM}, I_{TM} = 18 Amps T_J = 125°C, di/dt = 100 A/μs, V_D = 0.67 V_{DRM}
Thermal values			
Maximum DC thermal resistance, junction to case per SCR	$R_{\Theta JC}$	0.8°C/W	
Typical thermal resistance, case to sink per SCR	$R_{\Theta CS}$	0.1°C/W	
Operating junction temp. range	T_J	−40°C to +125°C	
Storage temperature range	T_{stg}	−40°C to +150°C	
Blocking			
Max. forward leakage current	I_{DRM}	10 mA	T_J = 125°C and V_{DRM}
Max. reverse leakage current	I_{RRM}	10 mA	T_J = 125°C and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	T_J = 125°C, V_D = V_{DRM}
Isolation voltage between connections and baseplate(2)	v_{ISO}	2500 V_{RMS}	
Triggering			
Max. gate voltage to trigger	V_{GT}	1.5V	V_D = 2 Volts
Max nontriggering gate voltage	V_{GD}	0.25V	T_J = 125°C, V_D = 0.5, V_{DRM}
Max. nontriggering gate current	I_{GD}	2 mA	T_J = 125°C, V_D = 0.5 V_{DRM}
Max. gate current to trigger	I_{GT}	100 mA	V_D = 2 Volts
Max. average gate power	P_{GM}	10 W	
Max. peak gate current	I_{GM}	5A	
Max. peak reverse gate voltage	V_{GM}	10V	

Mechanical Characteristics

Terminal torque	35 to 50 in. - lb.
Weight	Approximately 4.4 ounces (125 grams)

(1) T_C = 25°C unless otherwise indicated

(2) Warning: The case must not be destroyed since this may release harmful beryllium oxide dust.

Figure 1
Maximum power dissipation for 1 SCR of the module

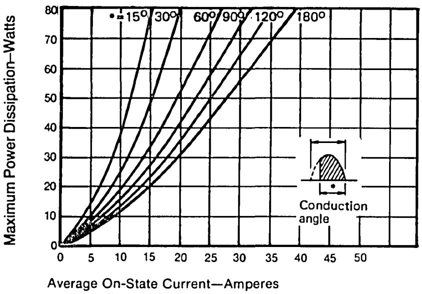


Figure 2
Maximum power dissipation for 1 SCR of the module

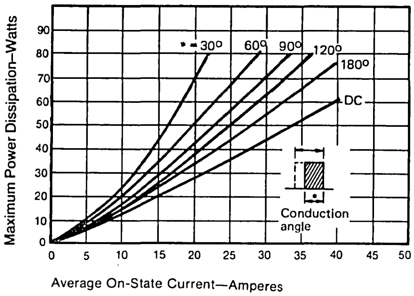


Figure 3
Maximum baseplate temperature as a function of on-state current for 1 SCR of the module

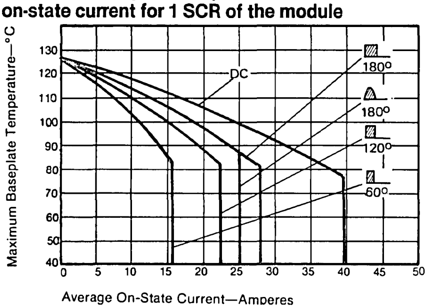


Figure 4
Maximum power dissipation for 1 SCR of the module - overcurrent range

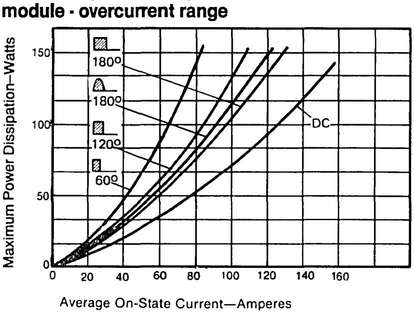


Figure 5
Maximum transient thermal impedance for 1 SCR of the module for constant current and pulse current

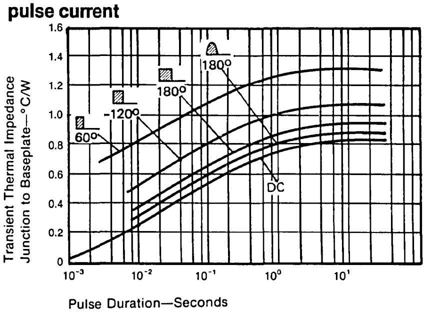


Figure 6
Increase in thermal resistance versus conduction angle for 1 SCR (Total $R_{\Theta JC}$ = DC $R_{\Theta JC}$ + Δr)

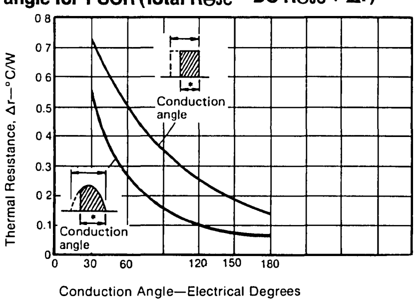


Figure 7
Gate characteristics

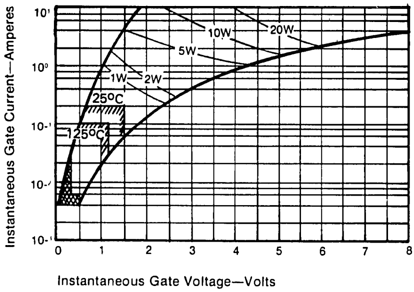


Figure 8
SCR on-state characteristics

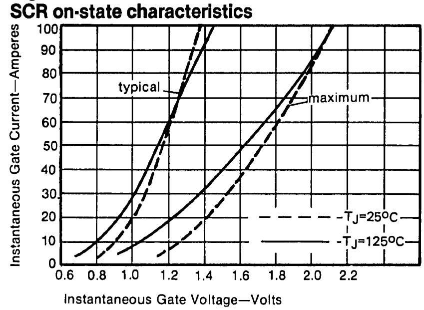


Figure 9
Single-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

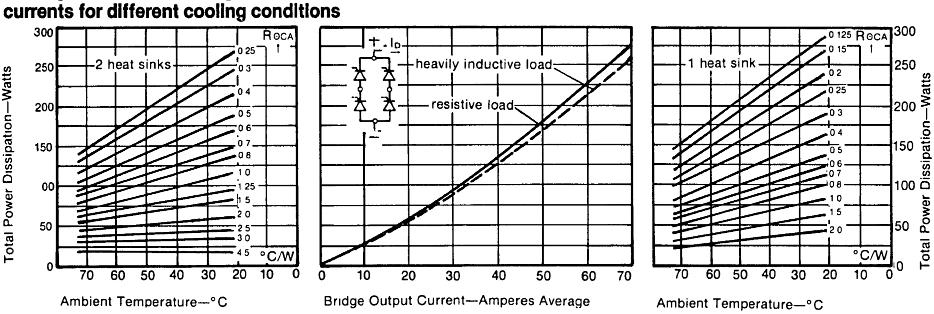
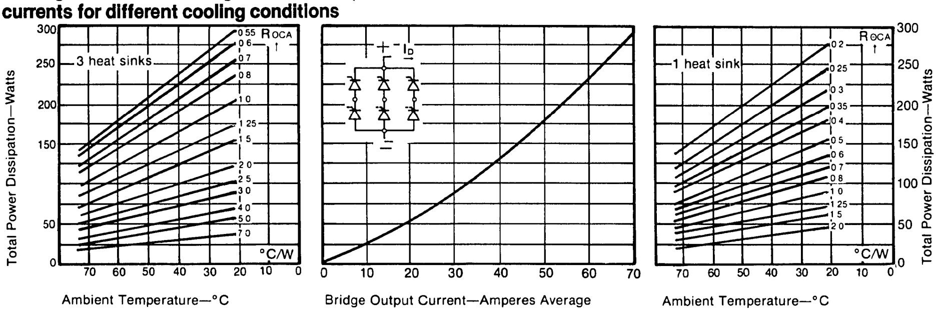


Figure 10
Three-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions



13

Figure 11
AC switch—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

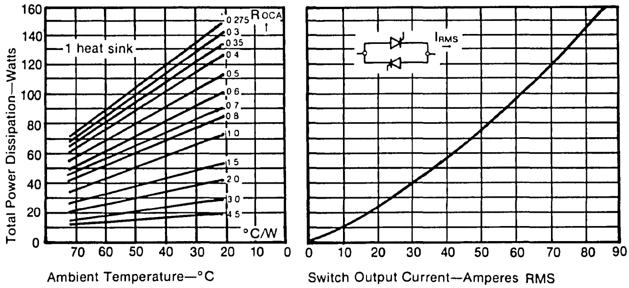
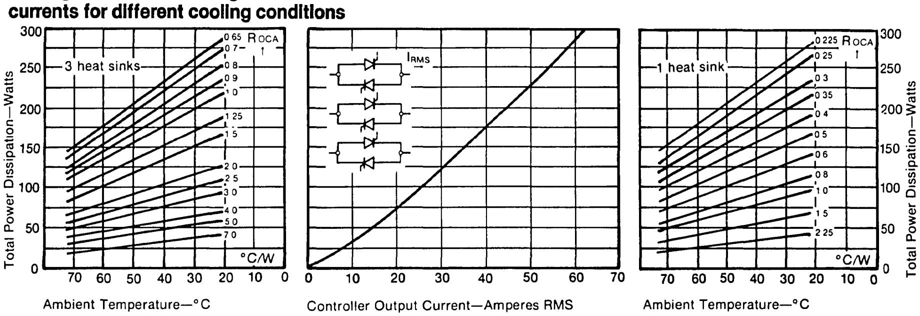


Figure 12
Three-phase controller—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

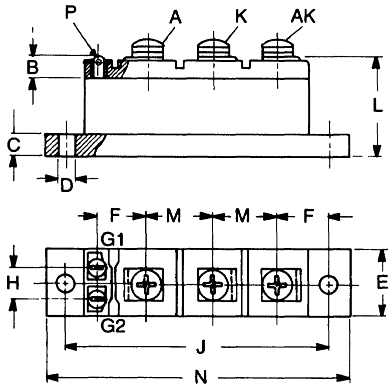


PowerMod Encapsulated Assemblies

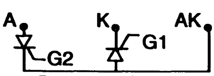
40 A Avg; V_{DRM} and V_{RRM} Up To 1600 Volts

Series MTT40A,L
MTD40A,L
MDT40A,L

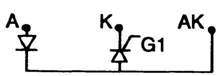
- UL recognized
- Maximum continuous current 2X40 amperes average $T_c = 85\,°C$
- Primarily used in line commutated converters
- Compression bonded structure for high reliability in cyclic applications
- Electrically isolated baseplate (2500 V_{RMS})
- RΘCS optimized by fastening directly to metal baseplate



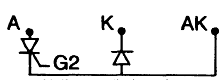
Dim.	Inches		Millimeter		
	Minimum	**Maximum**	**Minimum**	**Maximum**	**Notes**
B	0.24	0.26	6.10	6.60	
C	0.11	0.12	2.80	3.05	
D	0.21	0.22	5.33	5.59	
E	0.78	0.80	19.81	20.32	
F	0.58	0.60	14.75	15.25	
H	0.38	0.40	9.65	10.16	
J	3.14	3.16	79.75	80.25	
L	1.17	1.19	29.40	30.60	
M	0.78	0.80	19.81	20.32	
N	----	3.65	----	92.70	
P	----	----	----	----	(1)



Fully-controlled version



Half-controlled version 1



Half-controlled version 2

Catalog Number (2)	Catalog Number (2)	Catalog Number (2)	V_{DRM}/V_{RRM}
MTT40A06N	MTD40A06N	MDT40A06N	600V
MTT40A12N	MTD40A12N	MDT40A12N	1200V
MTT40A16N	MTD40A16N	MDT40A16N	1600V

Notes: (1) Faston Tab (.110 x .032 inches)

(2) For the soldered version, used in non-cyclical applications, replace the "A", in the catalog number, with "L".

Electrical Characteristics[1]

Forward Conducting			
Max. RMS on-state current per SCR or rectifier	$I_{T(RMS)}$	75 Amps	
Max. average on-state cur. per SCR or rectifier	$I_{T(AV)}$	40 Amps	T_c = 85 °C, half sine
Max. peak on-state voltage	V_{TM}	1.75 Volts	I_{TM} = 120 Amps
Max. holding current	I_H	250 mA	V_D = 6 Volts
Max peak one cycle 60 Hz surge	I_{TSM}	700 Amps	T_J = 125 °C
Max. I^2t capability for fusing	I^2t	2000A²Sec	T_J = 125 °C, t = 8.3 ms
Switching			
Critical rate of rise of on-state current	di/dt	100A/μsec.	T_J = 125 °C, V_D = 0.67 V_{DRM}
Typical delay time	t_d	3 μsec.	I_G = 1 Amp
Typical circuit commutated turn-off time	t_q	150 μsec.	T_J = 125 °C, di/dt = 10 A/μs
Maximum repetitive RC snubber discharge current	$I_{TM(RC)}$	80 Amps	V_D = 0.67 V_{DRM}, I_{TM} = 18 Amps T_J = 125 °C, di/dt = 100 A/μs, V_D = 0.67 V_{DRM}
Thermal values			
Maximum DC thermal resistance, junction to case per SCR or rectifier	$R_{\Theta JC}$	0.60 °C/W	
Typical thermal resistance, case to sink per SCR or rectifier	$R_{\Theta CS}$	0.08 °C/W	
Operating junction temp. range	T_J	− 40 °C to + 125 °C	
Storage temperature range	T_{stg}	− 40 °C to + 150 °C	
Blocking			
Max. forward leakage current	I_{DRM}	15 mA	T_J = 125 °C and V_{DRM}
Max. reverse leakage current	I_{RRM}	15 mA	T_J = 125 °C and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	T_J = 125 °C, V_D = V_{DRM}
Isolation voltage between connections and baseplate[2]	V_{ISO}	2500 V_{RMS}	
Triggering			
Max. gate voltage to trigger	V_{GT}	1.5V	V_D = 2 Volts
Max nontriggering gate voltage	V_{GD}	0.25V	T_J = 125 °C, V_D = 0.5, V_{DRM}
Max. nontriggering gate current	I_{GD}	6 mA	T_J = 125 °C, V_D = 0.5 V_{DRM}
Max. gate current to trigger	I_{GT}	200 mA	V_D = 2 Volts
Max. average gate power	P_{GM}	20 W	
Max. peak gate current	I_{GM}	10A	
Max. peak reverse gate voltage	V_{GM}	10V	

Mechanical Characteristics

Terminal torque	35 to 50 in. - lb.
Weight	Approximately 4.4 ounces (125 grams)

(1) T_C = 25 °C unless otherwise indicated

(2) Warning: The case must not be destroyed since this may release harmful beryllium oxide dust.

Figure 1
Maximum power dissipation for 1 SCR or rectifier of the module

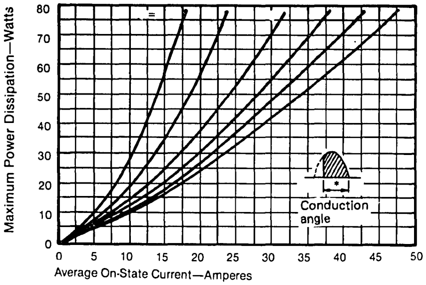


Figure 2
Maximum power dissipation for 1 SCR or rectifier of the module

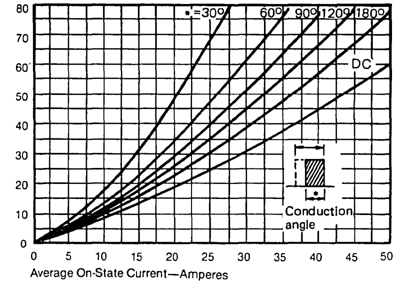


Figure 3
Maximum baseplate temperature as a function of on-state current for 1 SCR or rectifier of the module

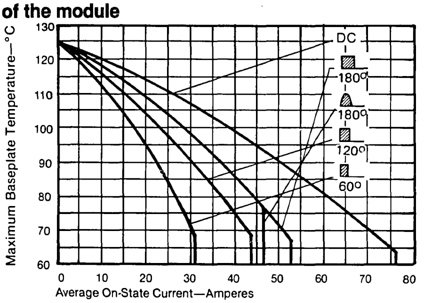


Figure 4
Maximum power dissipation for 1 SCR or rectifier of the module - overcurrent range

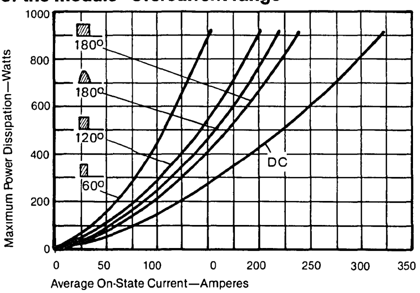


Figure 5
Maximum transient thermal impedance for 1 SCR or rectifier of the module for constant current and pulse current

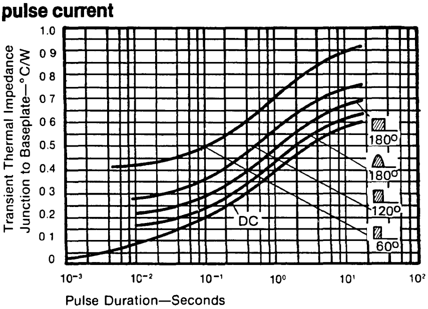


Figure 6
Increase in thermal resistance versus conduction angle for 1 SCR (Total RΘJC = DC)

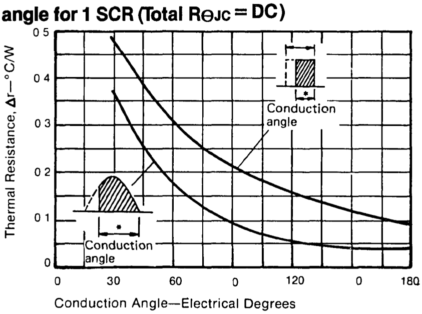


Figure 7
Gate characteristics

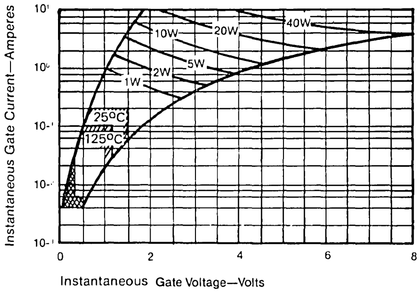


Figure 8
Single-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

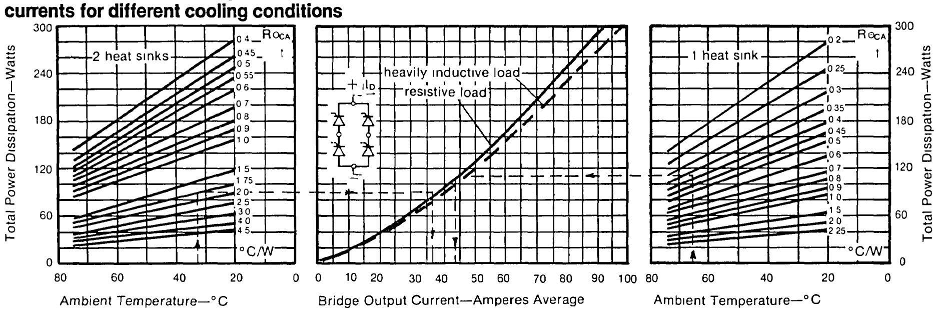


Figure 9
Three-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

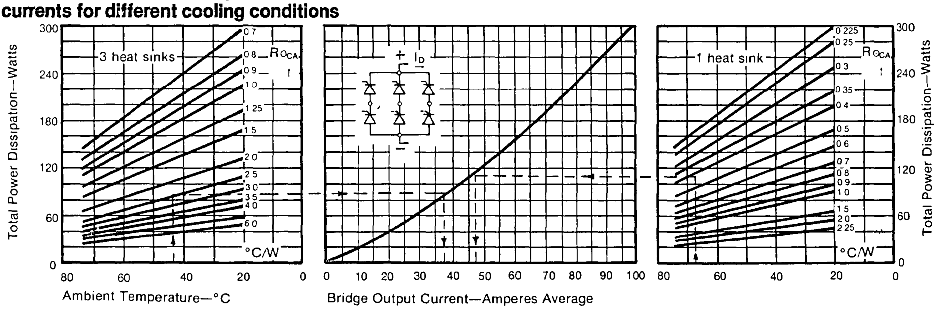


Figure 10
AC switch—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

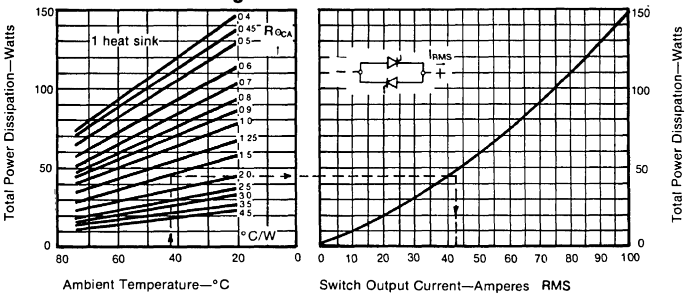
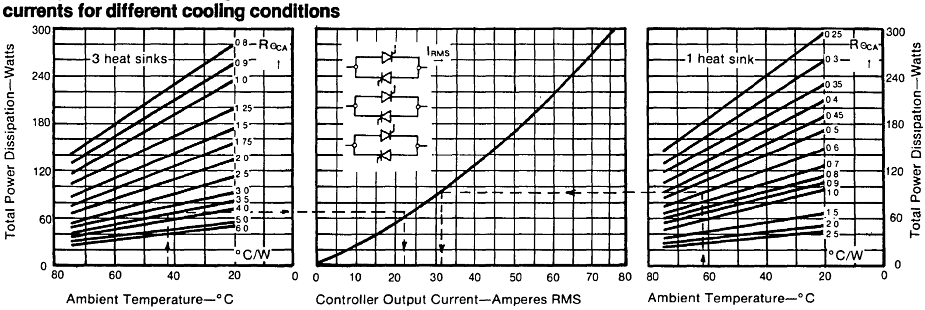


Figure 11
Three-phase controller—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

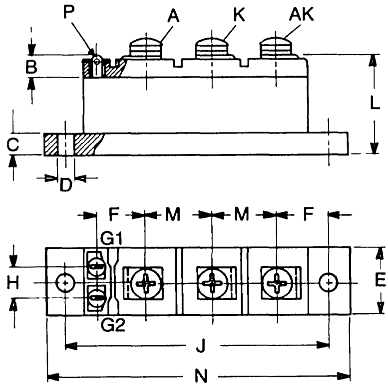


PowerMod Encapsulated Assemblies

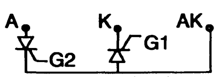
50A Avg; V_{DRM} and V_{RRM} Up To 1600 Volts

Series MTT50A,L
MTD50A,L
MDT50A,L

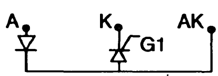
- UL recognized
- Maximum continuous current 2 x 50 amperes average $T_c = 80\,°C$
- Primarily used in line commutated converters
- Compression bonded structure for high reliability in cyclic applications.
- Electrically isolated baseplate (2500 V_{RMS})
- RөCS optimized by fastening directly to metal baseplate



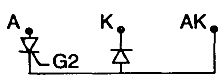
Dim.	Inches Minimum	Inches Maximum	Millimeter Minimum	Millimeter Maximum	Notes
B	0.24	0.26	6.10	6.60	
C	0.27	0.28	6.86	7.11	
D	0.21	0.22	5.33	5.59	
E	0.78	0.80	19.81	20.32	
F	0.58	0.60	14.75	15.25	
H	0.38	0.40	9.65	10.16	
J	3.14	3.16	79.75	80.25	
L	1.17	1.27	29.40	32.60	
M	0.78	0.80	19.81	20.32	
N	----	3.65	----	92.70	
P	----	----	----	----	(1)



Fully-controlled version



Half-controlled version 1



Half-controlled version 2

Catalog Number (2)	Catalog Number (2)	Catalog Number (2)	V_{DRM}/V_{RRM}
MTT50A06N	MTD50A06N	MDT50A06N	600V
MTT50A12N	MTD50A12N	MDT50A12N	1200V
MTT50A16N	MTD50A16N	MDT50A16N	1600V

Notes: (1) Faston Tab (.110 x .032 inches)

(2) For the soldered version, used in non-cyclical applications, replace the "A", in the catalog number, with "L".

Electrical Characteristics (1)

Forward Conducting			
Max. RMS on-state current per SCR or rectifier	$I_{T(RMS)}$	105 Amps	
Max. average on-state cur. per SCR or rectifier	$I_{T(AV)}$	50 Amps	T_c = 78 °C, half sine
Max. peak on-state voltage	V_{TM}	1.75 Volts	I_{TM} = 165 Amps
Max. holding current	I_H	250 mA	V_D = 6 Volts
Max peak one cycle 60 Hz surge	I_{TSM}	1100 Amps	T_J = 125 °C
Max. I^2t capability for fusing	I^2t	5000A²Sec	T_J = 125 °C, t = 8.3 ms
Switching			
Critical rate of rise of on-state current	di/dt	100A/μsec.	T_J = 125 °C, V_D = 0.67 V_{DRM}
Typical delay time	t_d	3 μsec.	I_G = 1 Amp
Typical circuit commutated turn-off time	t_q	150 μsec.	T_J = 125 °C, di/dt = 10 A/μs
Maximum repetitive RC snubber discharge current	$I_{TM(RC)}$	80 Amps	V_D = 0.67 V_{DRM}, I_{TM} = 18 Amps T_J = 125 °C, di/dt = 100 A/μs, V_D = 0.67 V_{DRM}
Thermal values			
Maximum DC thermal resistance, junction to case per SCR or rectifier	$R_{\Theta JC}$	0.60 °C/W	
Typical thermal resistance, case to sink per SCR or rectifier	$R_{\Theta CS}$	0.08 °C/W	
Operating junction temp. range	T_J	− 40 °C to + 125 °C	
Storage temperature range	T_{stg}	− 40 °C to + 150 °C	
Blocking			
Max. forward leakage current	I_{DRM}	15 mA	T_J = 125 °C and V_{DRM}
Max. reverse leakage current	I_{RRM}	15 mA	T_J = 125 °C and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	T_J = 125 °C, V_D = V_{DRM}
Isolation voltage between connections and baseplate(2)	V_{ISO}	2500 V_{RMS}	
Triggering			
Max. gate voltage to trigger	V_{GT}	1.5V	V_D = 2 Volts
Max nontriggering gate voltage	V_{GD}	0.25V	T_J = 125 °C, V_D = 0.5, V_{DRM}
Max. nontriggering gate current	I_{GD}	6 mA	T_J = 125 °C, V_D = 0.5 V_{DRM}
Max. gate current to trigger	I_{GT}	200 mA	V_D = 2 Volts
Max. average gate power	P_{GM}	20 W	
Max. peak gate current	I_{GM}	10A	
Max. peak reverse gate voltage	V_{GM}	10V	

Mechanical Characteristics	
Terminal torque	35 to 50 in. - lb.
Weight	Approximately 4.7 ounces (200 grams)

(1) T_C = 25 °C unless otherwise indicated

(2) Warning: The case must not be destroyed since this may release harmful beryllium oxide dust.

Figure 1
Maximum power dissipation for 1 SCR of the module

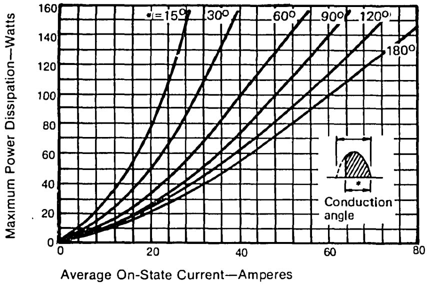


Figure 2
Maximum power dissipation for 1 SCR of the module

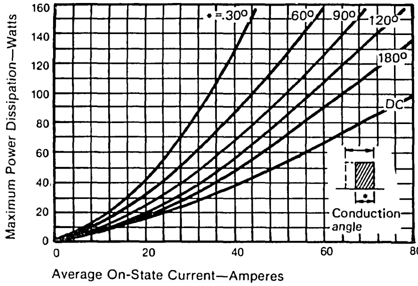


Figure 3
Maximum baseplate temperature as a function of on-state current for 1 SCR of the module

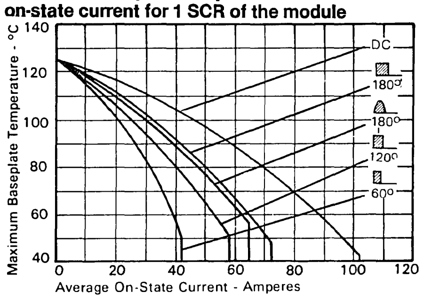


Figure 4
Maximum power dissipation for 1 SCR of the module - overcurrent range

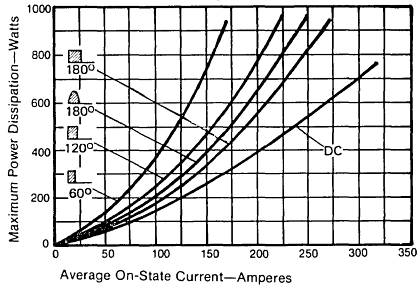


Figure 5
Maximum transient thermal impedance for 1 SCR of the module for constant current and pulse current

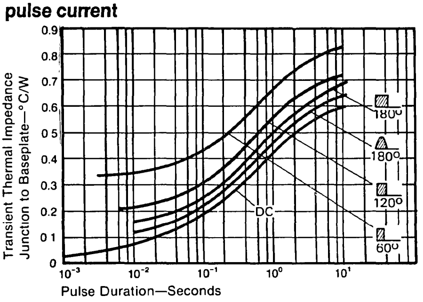


Figure 6
Increase in thermal resistance versus conduction angle for 1 SCR (Total $R_{\Theta JC}$ = DC $R_{\Theta JC} + \Delta r$)

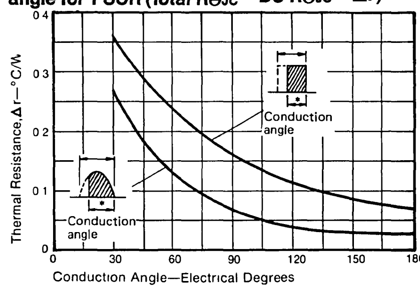


Figure 7
Gate characteristics

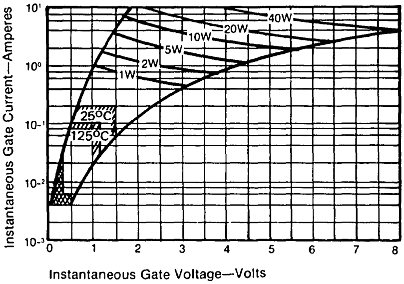


Figure 8
Single-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

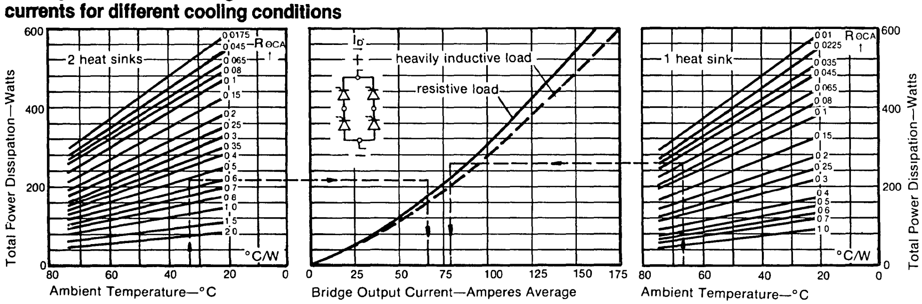


Figure 9
Three-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

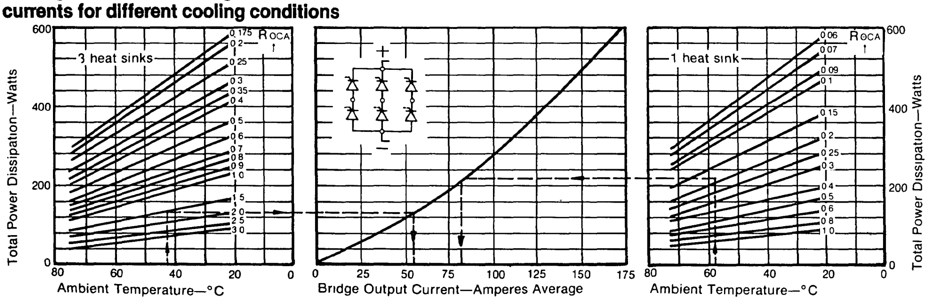


Figure 10
AC switch—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

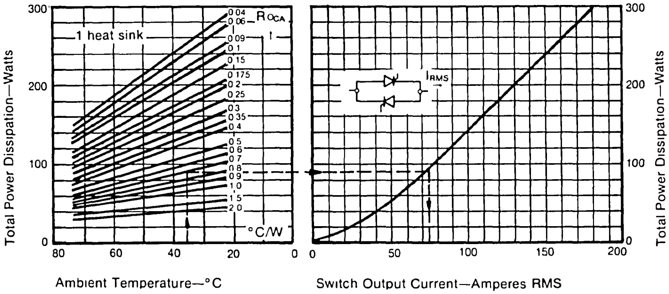
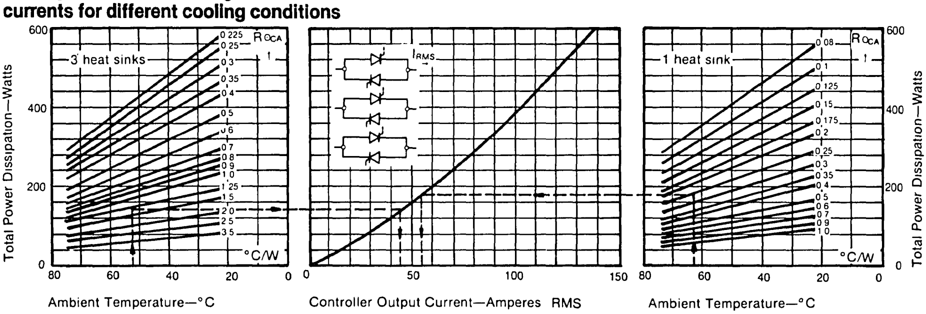


Figure 11
Three-phase controller—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

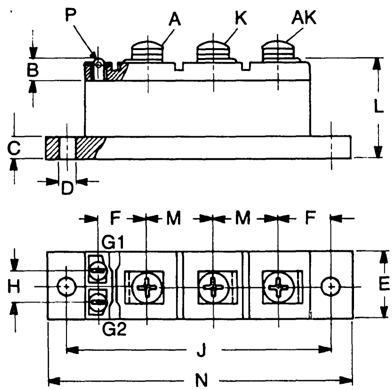


PowerMod Encapsulated Assemblies

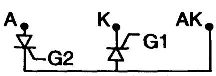
65A Avg; V_{DRM} and V_{RRM} Up To 1600 Volts

Series MTT65A MTD65A MDT65A

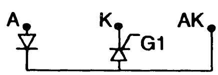
- UL recognized
- Maximum continuous current 50 amperes average $T_c = 80\,°C$
- Primarily used in line commutated converters
- Compression bonded structure for high reliability in cyclic applications.
- Electrically isolated baseplate (2500 V_{RMS})
- RθCS optimized by fastening directly to metal baseplate



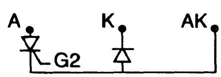
Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
B	0.24	0.26	6.10	6.60	
C	0.27	0.28	6.86	7.11	
D	0.21	0.22	5.33	5.59	
E	0.78	0.80	19.81	20.32	
F	0.58	0.60	14.75	15.25	
H	0.38	0.40	9.65	10.16	
J	3.14	3.16	79.75	80.25	
L	1.17	1.27	29.40	32.60	
M	0.78	0.80	19.81	20.32	
N	----	3.65	----	92.70	
P	----	----	----	----	(1)



Fully-controlled version



Half-controlled version 1



Half-controlled version 2

Catalog Number	Catalog Number	Catalog Number	V_{DRM}/V_{RRM}
MTT65A06N	MTD65A06N	MDT65A06N	600V
MTT65A12N	MTD65A12N	MDT65A12N	1200V
MTT65A16N	MTD65A16N	MDT65A16N	1600V

Notes: (1) Faston Tab (.110 x .032 inches)

Electrical Characteristics(1)

Forward Conducting			
Max. RMS on-state current per SCR or rectifier	$I_{T(RMS)}$	120 Amps	
Max. average on-state cur. per SCR or rectifier	$I_{T(AV)}$	65 Amps	T_c = 80°C, half sine
Max. peak on-state voltage	V_{TM}	1.45 Volts	I_{TM} = 150 Amps
Max. holding current	I_H	250 mA	V_D = 6 Volts
Max peak one cycle 60 Hz surge	I_{TSM}	1500 Amps	T_J = 125°C
Max. I^2t capability for fusing	I^2t	9300A²Sec	T_J = 125°C, t = 8.3 ms
Switching			
Critical rate of rise of on-state current	di/dt	100A/μsec.	T_J = 125°C, V_D = 0.67 V_{DRM}
Typical delay time	t_d	3 μsec.	I_G = 1 Amp
Typical circuit commutated turn-off time	t_q	150 μsec.	T_J = 125°C, di/dt = 10 A/μs
Maximum repetitive RC snubber discharge current	$I_{TM(RC)}$	100 Amps	V_D = 0.67 V_{DRM}, I_{TM} = 18 Amps T_J = 125°C, di/dt = 100 A/μs, V_D = 0.67 V_{DRM}
Thermal values			
Maximum DC thermal resistance, junction to case per SCR or rectifier	$R_{\Theta JC}$	0.50°C/W	
Typical thermal resistance, case to sink per SCR or rectifier	$R_{\Theta CS}$	0.08°C/W	
Operating junction temp. range	T_J	−40°C to +125°C	
Storage temperature range	T_{stg}	−40°C to +150°C	
Blocking			
Max. forward leakage current	I_{DRM}	15 mA	T_J = 125°C and V_{DRM}
Max. reverse leakage current	I_{RRM}	15 mA	T_J = 125°C and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	T_J = 125°C, V_D = V_{DRM}
Isolation voltage between connections and baseplate(2)	V_{ISO}	2500 V_{RMS}	
Triggering			
Max. gate voltage to trigger	V_{GT}	1.5V	V_D = 2 Volts
Max nontriggering gate voltage	V_{GD}	0.25V	T_J = 125°C, V_D = 0.5, V_{DRM}
Max. nontriggering gate current	I_{GD}	6 mA	T_J = 125°C, V_D = 0.5 V_{DRM}
Max. gate current to trigger	I_{GT}	200 mA	V_D = 2 Volts
Max. average gate power	P_{GM}	20 W	
Max. peak gate current	I_{GM}	10A	
Max. peak reverse gate voltage	V_{GM}	10V	

Mechanical Characteristics

Terminal torque	35 to 50 in. - lb.
Weight	Approximately 4.7 ounces (200 grams)

(1) T_C = 25°C unless otherwise indicated

(2) Warning: The case must not be destroyed since this may release harmful beryllium oxide dust.

Figure 1
Maximum power dissipation for 1 SCR of the module

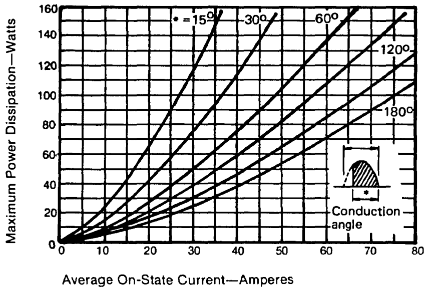


Figure 2
Maximum power dissipation for 1 SCR of the module

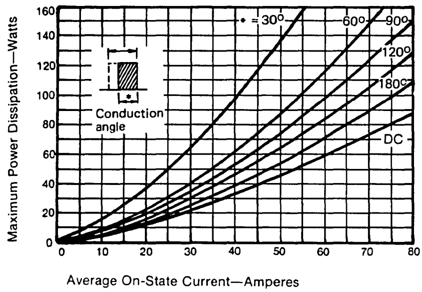


Figure 3
Maximum baseplate temperature as a function of on-state current for 1 SCR of the module

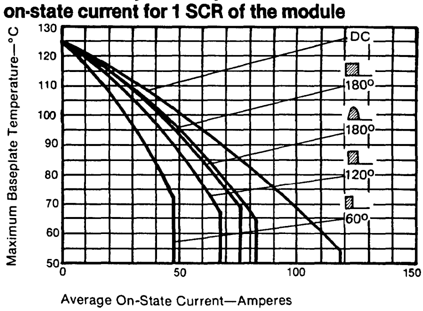


Figure 4
Maximum power dissipation for 1 SCR of the module - overcurrent range

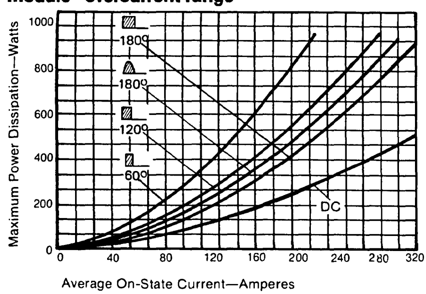


Figure 5
Maximum transient thermal impedance for 1 SCR of the module for constant current and pulse current

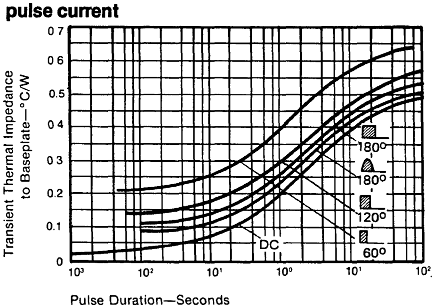


Figure 6
Increase in thermal resistance versus conduction angle for 1 SCR (Total $R_{\Theta JC}$ = DC $R_{\Theta JC}$ + Δr)

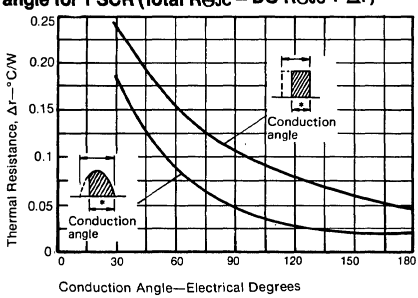


Figure 7
Gate characteristics

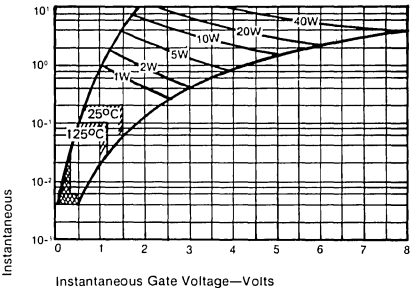


Figure 8
Single-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

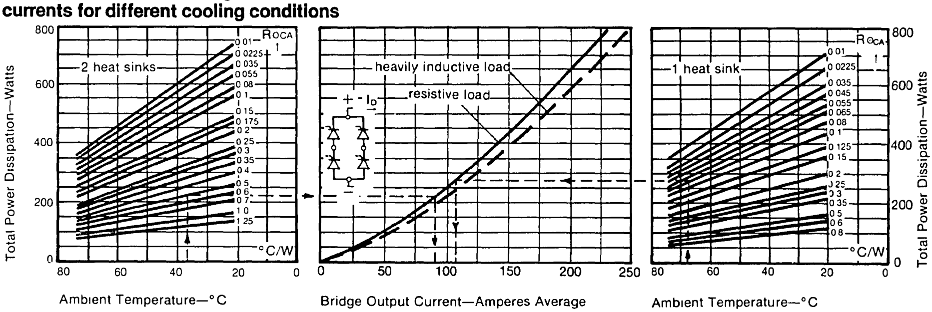


Figure 9
Three-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

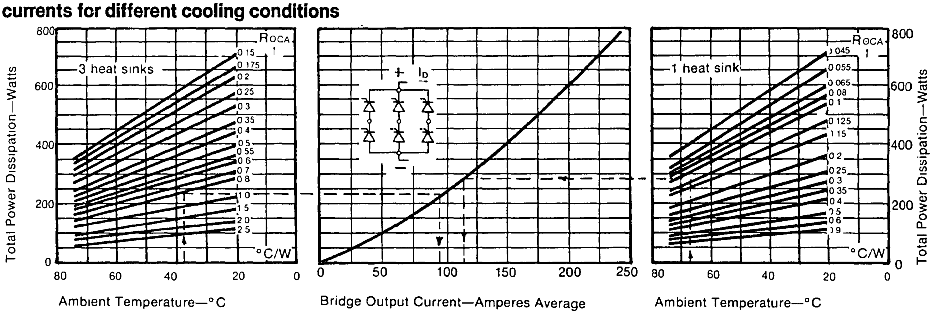


Figure 10
AC switch—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

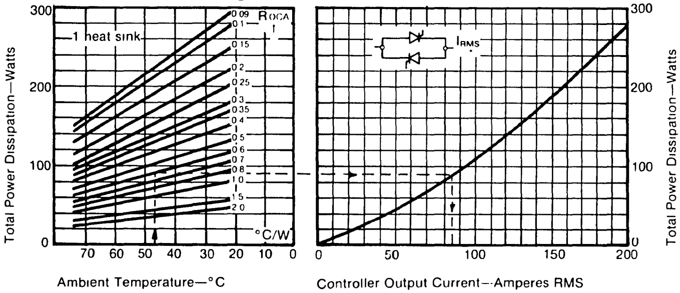
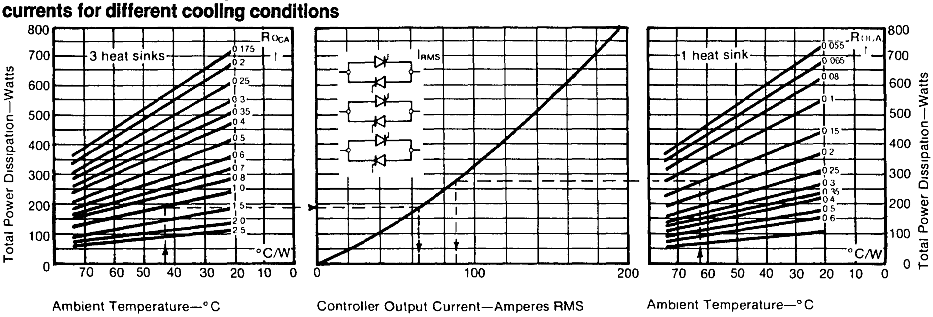


Figure 11
Three-phase controller—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

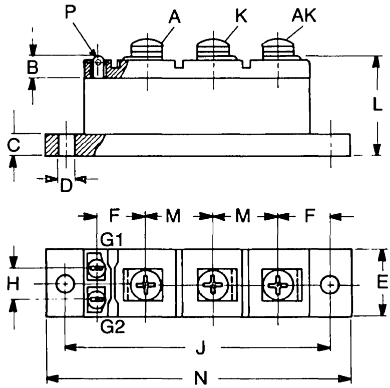


PowerMod Encapsulated Assembies

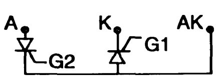
95 A Avg; V_{DRM} and V_{RRM} Up To 1600 Volts

Series MTT95A MTD95A MDT95A

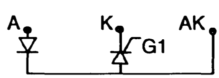
- UL recognized
- Maximum continuous current 2X95 amperes average $T_c = 86\,°C$
- Primarily used in line commutated converters
- Electrically isolated baseplate (2500 V_{RMS})
- RΘCS optimized by fastening directly to metal baseplate
- Compression bonded structure for high reliability in cyclic applications



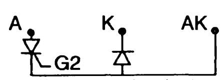
Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
B	0.24	0.26	6.10	6.60	
C	0.11	0.12	2.80	3.05	
D	0.21	0.22	5.33	5.59	
E	0.78	0.80	19.81	20.32	
F	0.58	0.60	14.75	15.25	
H	0.38	0.40	9.65	10.16	
J	3.14	3.16	79.75	80.25	
L	1.17	1.19	29.40	30.60	
M	0.78	0.80	19.81	20.32	
N	----	3.65	----	92.70	
P	----	----	----	----	Note 1



Fully-controlled version



Half-controlled version 1



Half-controlled version 2

Catalog Number	Catalog Number	Catalog Number	V_{DRM}/V_{RRM}
MTT95A06N	MTD95A06N	MDT95A06N	600V
MTT95A12N	MTD95A12N	MDT95A12N	1200V
MTT95A16N	MTD95A16N	MDT95A16N	1600V

Notes: (1) Faston Tab (.110 x .032 inches)

Electrical Characteristics (1)

Forward Conducting			
Max. RMS on-state current per SCR or rectifier	$I_{T(RMS)}$	150 Amps	
Max. average on-state cur. per SCR or rectifier	$I_{T(AV)}$	95 Amps	T_c = 86 °C, half sine
Max. peak on-state voltage	V_{TM}	1.34 Volts	I_{TM} = 150 Amps
Max. holding current	I_H	250 mA	V_D = 6 Volts
Max peak one cycle 60 Hz surge	I_{TSM}	1900 Amps	T_J = 140 °C
Max. I^2t capability for fusing	I^2t	15000A^2Sec	T_J = 140 °C, t = 8.3 ms
Switching			
Critical rate of rise of on-state current	di/dt	100A/μsec.	T_J = 140 °C, V_D = 0.67 V_{DRM}
Typical delay time	t_d	2 μsec.	I_G = 3A
Typical circuit commutated turn-off time	t_q	150 μsec.	T_J = 140 °C, di/dt = -10 A/μs V_D0.67V_{DRM}, I_{TM} = 95A
Maximum repetitive RC snubber discharge current	$I_{TM(RC)}$	100 Amps	V_D = 0.67 V_{DRM}, I_{TM} = 18 Amps T_J = 125 °C, di/dt = 100 A/μs, V_D = 0.67 V_{DRM}
Thermal values			
Maximum DC thermal resistance, junction to case per SCR or rectifier	$R_{\Theta JC}$	0.36 °C/W	
Typical thermal resistance, case to sink per SCR or rectifier	$R_{\Theta CS}$	0.08 °C/W	
Operating junction temp. range	T_J	− 40 °C to + 140 °C	
Storage temperature range	T_{stg}	− 40 °C to + 150 °C	
Blocking			
Max. forward leakage current	I_{DRM}	20 mA	T_J = 140 °C and V_{DRM}
Max. reverse leakage current	I_{RRM}	20 mA	T_J = 140 °C and V_{RRM}
Critical rate of rise of off-state voltage	dv/dt	200V/μsec.	T_J = 140 °C, V_D = V_{DRM}
Isolation voltage between connections and baseplate(2)	v_{ISO}	2500 V_{RMS}	
Triggering			
Max. gate voltage to trigger	V_{GT}	1.5V	V_D = 2 Volts
Max nontriggering gate voltage	V_{GD}	0.25V	T_J = 125 °C, V_D = 0.5, V_{DRM}
Max. nontriggering gate current	I_{GD}	6 mA	T_J = 125 °C, V_D = 0.5 V_{DRM}
Max. gate current to trigger	I_{GT}	200 mA	V_D = 2 Volts
Max. average gate power	P_{GM}	20 W	
Max. peak gate current	I_{GM}	10A	
Max. peak reverse gate voltage	V_{GM}	10V	

Mechanical Characteristics	
Terminal torque	35 to 50 in. - lb.
Weight	Approximately 7 ounces (200 grams)

(1) T_C = 25 °C unless otherwise indicated

(2) Warning: The case must not be destroyed since this may release harmful beryllium oxide dust.

Figure 1
Maximum power dissipation for 1 SCR of the module

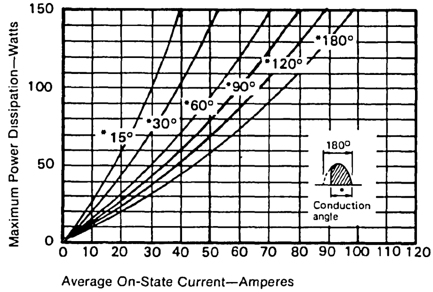


Figure 2
Maximum power dissipation for 1 SCR of the module

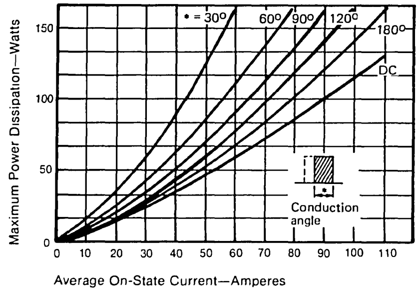


Figure 3
Maximum baseplate temperature as a function of on-state current for 1 SCR of the module

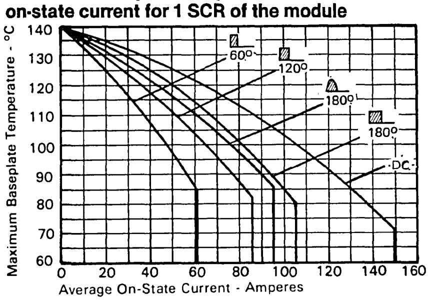


Figure 4
Maximum power dissipation for 1 SCR of the module - overcurrent range

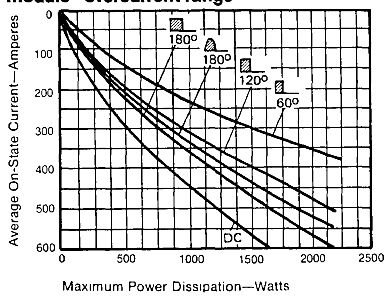


Figure 5
Maximum transient thermal impedance for 1 SCR of the module for constant current and pulse current

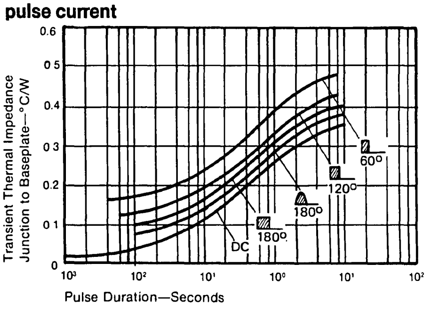


Figure 6
Increase in thermal resistance versus conduction angle for 1 SCR (Total $R_{\Theta JC}$ = DC $R_{\Theta JC}$ + Δr)

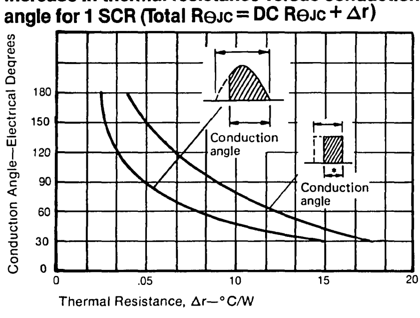


Figure 7
Gate characteristics

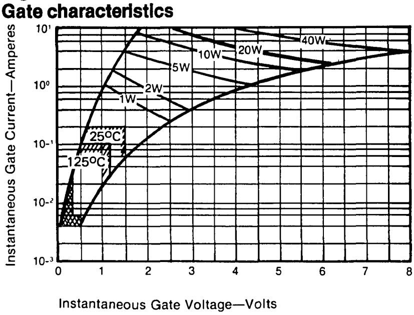


Figure 8
Single-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state
currents for different cooling conditions

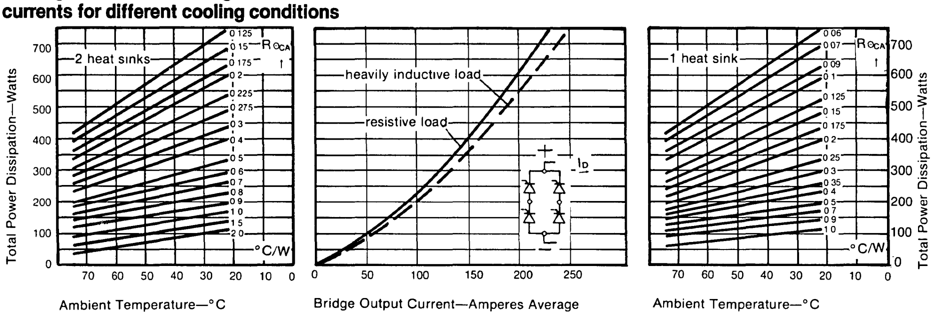


Figure 9
Three-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state
currents for different cooling conditions

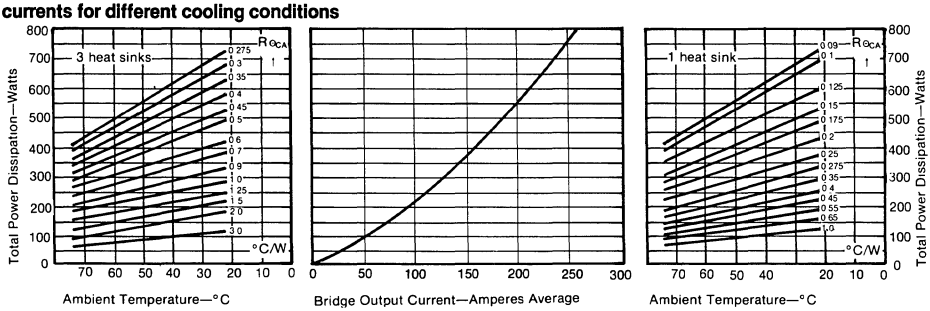


Figure 10
AC switch—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

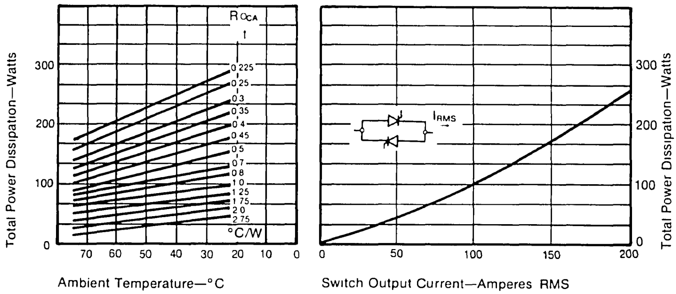
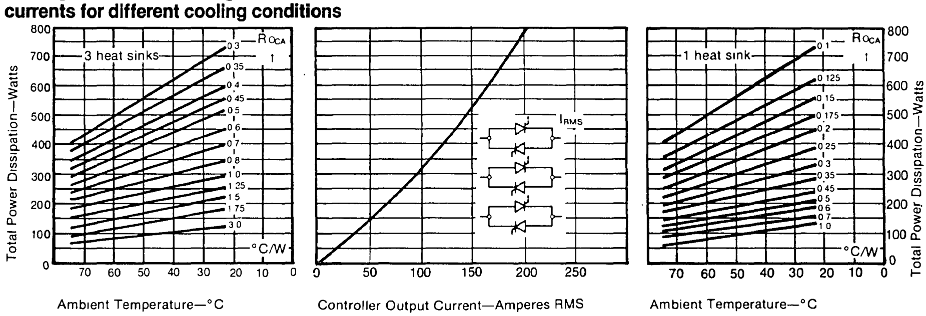


Figure 11
Three-phase controller—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

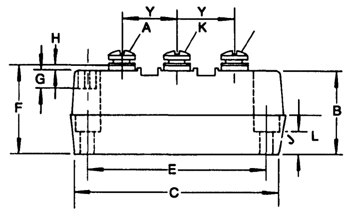


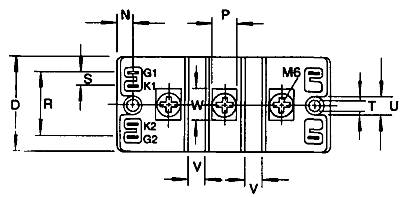
PowerMod Encapsulated Assemblies

Series F160T

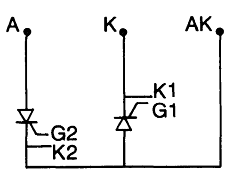
160 A Avg; V_{DRM} and V_{RRM} Up To 1600 Volts

- UL recognized
- Maximum continuous current 2X160 amperes average $T_c = 86\,°C$
- 1600 Volt V_{DRM} and V_{RRM}
- Primarily used in line commutated converters
- Electrically isolated baseplate (2500 V_{RMS})
- RΘCS optimized by fastening directly to metal baseplate





Dim.	Inches		Millimeter		
	Minimum	Maximum	Minimum	Maximum	Notes
B	1.53		39.5		
C	3.68	3.72	93.4	94.6	
D	1.79	1.83	45.4	46.6	
E	3.14	3.16	79.8	80.2	
F	1.55	1.63	39.5	41.5	
G	0.31		8.0		
H	0.039		1.0		
J	0.39		10.0		
L	0.17		18.0		
N	0.29		7.5		
P	.047		12.0		
R	1.26		32.0		
S	0.197		5.0		
T	0.25		6.3		
U	0.43		11.0		
V	0.27		7.0		
W	0.59		15.0		
X	0.12		3.0		
Y	0.98		25.0		



Catalog Number	V_{DRM}/V_{RRM} $T_J = 40°$ to $+125\,°C$	V_{RSM} $T_J = 125\,°C$
F160T060	600	700
F160T080	800	900
F160T120	1200	1300
F160T130	1300	1400
F160T160	1600	1700

Electrical Characteristics[1]

Forward Conducting			
Average on-state current per SCR	$I_{T(AV)}$	160A	$T_C = 86°C$, half sine
RMS current per SCR	$I_{T(RMS)}$	250 A	
Peak on-state voltage	V_{TM}	1.65 V	$T_J = 25°C$, $I_T = 480$ A
Maximum holding current	I_H	250 mA	$T_J = 25°C$, $V_D = 6V$, $I_{TM} = 1$ A
Typical latching current	I_L	1 A	$T_J = 25°C$, $V_D = 18$ V, $I_G = 1A$, $di_G/dt = 1A/\mu sec.$, $t_g = 15\ \mu sec.$
Maximum peak one cycle surge	I_{TSM}	5100 A	$T_J = 25°C$, $V_R = 0$
I^2t capability for fusing	i^2dt	130,000A²Sec	$T_J = 125°C$, t = 8.3 ms
Switching			
Critical rate of rise of on-state current	di/dt	100A/μsec.	$T_J = 125°C$, f = 60 Hz, $V_D = 0.67\ V_{DRM}$
Typical delay time	t_d	2.2 μsec.	$I_G = 1A$, } $di_G dt = 1A/\mu sec$, $T_J = 25°C$
			} $V_D = 0.5\ V_{DRM}$, $L/R = 2t_{gd}$
		1.5 μsec.	$I_G = 3A$, } $I_{TM} = 0.1\ I_{T(AV)}$
Typical circuit commutated turn-off time	t_q	200 μsec.	$T_J = 125°C$, -di/dt = -10 A/μs, $V_D = 0.67\ V_{DRM}$, $V_R = 50V$, $I_{TM} = 95A$
Maximum repetitive RC snubber discharge current	$I_{TM(RC)}$	100 A	di/dt = 100 A/μs, $I_G = 1A$, $di_G 1A\ \mu s$, $T_J = 125°C$, f = 60 to 50 Hz, $V_D = 0.67\ V_{DRM}$
Thermal values			
Maximum DC thermal resistance, junction to case (DC)	$R_{\Theta JC}$	0.16°C/W	per SCR
		0.08°C/W	per module
Typical thermal resistance, case to sink	$R_{\Theta CS}$	0.04°C/W	per SCR
		0.02°C/W	per module
Operating junction temp. range	T_J	− 40°C to + 125°C	
Storage temperature range	T_{stg}	− 40°C to + 150°C	
Blocking			
Maximum off-state current	I_{DRM}	25 mA	$T_J = 125°C$, V_{DRM}
Max. reverse current	I_{RRM}	25 mA	$T_J = 125°C$, V_{RRM}
Critical rate of rise of	dv/dt	200V/μsec.	$T_J = 125°C$, 1.0 V_{DRM}
		1000V/μsec.	$T_J = 125°C$, 0.67 V_{DRM}
		3000V/μsec.	$T_J = 125°C$, 0.33 V_{DRM}
Isolation voltage between-connections and baseplate-RMS	V_{ISO}	2500V	Warning: The case must not be destroyed since this may release harmful beryllium oxide dust.
Triggering			
Maximum gate voltage to trigger	V_{GT}	1.5V	$T_J = 25°C$,
		1.8V	$T_J = -40°C$
Maximum nontriggering gate voltage	V_{GD}	0.2V	$T_J = 125°C$, $V_D = 0.5\ V_{DRM}$
Maximum gate current to trigger	I_{GT}	250 mA	$T_J = 25°C$, } $V_D = 2V$
		350 mA	$T_J = -40°C$ }
Maximum non-triggering gate current	I_{GD}	20 mA	$T_J = 125°C$, $V_D = 2.0\ V_{DRM}$
		10 mA	$T_J = 125°C$, $V_D = 0.5\ V_{DRM}$
Maximum peak gate power	P_{GM}	20 W	
Maximum peak gate current	I_{GM}	10A	
Maximum peak gate voltage (reverse)	V_{GM}	10V	

Mechanical Characteristics

Terminal torque	35 min. -50 max. lb.-in. (4-5.6 N-m)
Mounting torque	36 lb.-in. min. (6 N-m min.) Module has no upper torque limit
Weight	Approximately 17.5 ounces (500 grams)

(1) $T_C = 25°C$ unless otherwise indicated

(2) Warning: The case must not be destroyed since this may release harmful beryllium oxide dust.

Figure 1
Maximum power dissipation for 1 SCR of the module

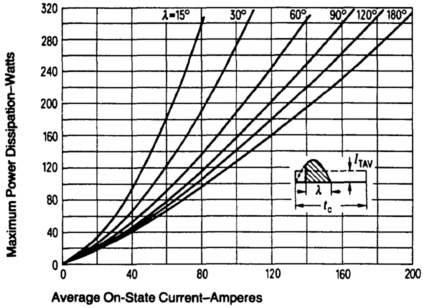


Figure 2
Maximum power dissipation for 1 SCR of the module

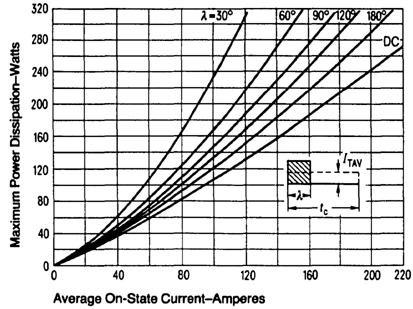


Figure 3
Maximum baseplate temperature as a function of on-state current for 1 SCR of the module

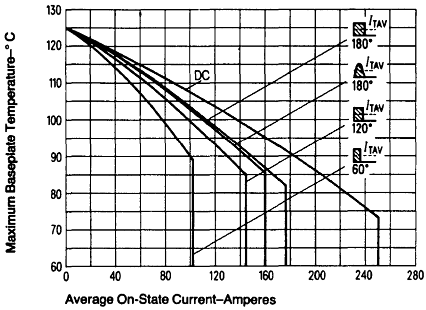


Figure 4
Maximum power dissipation for 1 SCR of the module - overcurrent range

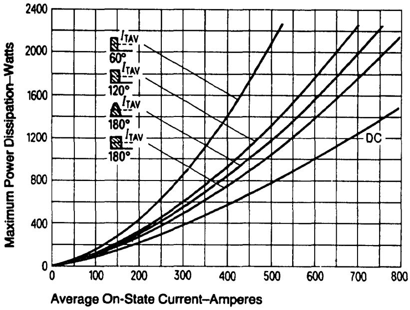
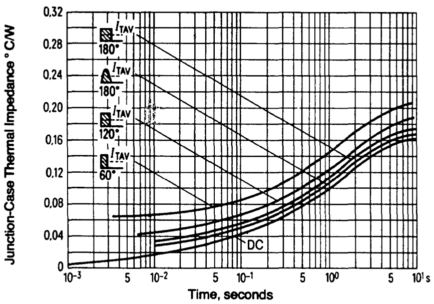


Figure 5
Transient thermal resistance for 1 thyristor of the module for constant current and pulse current



Analytical function for DC: for one thyristor

i	1	2	3	4	5	
r_i	0.0922	0.039	0.0154	0.0086	0.0048	°C/W
τ_i	2.11	0.415	0.0355	0.0048	0.0012	seconds

Figure 6
Thermal resistance Δr for 1 thyristor of the module

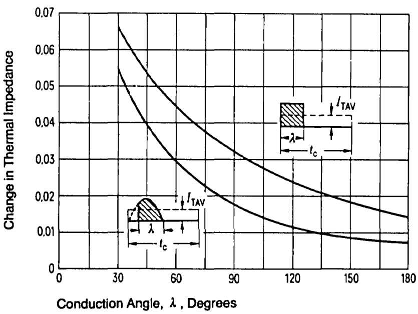


Figure 7
Gate characteristics

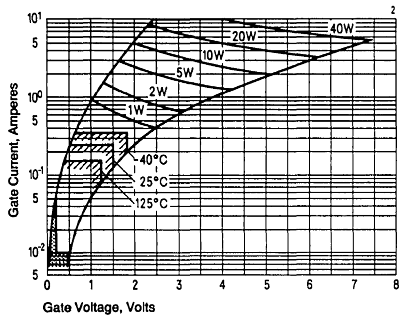


Figure 8
Single-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

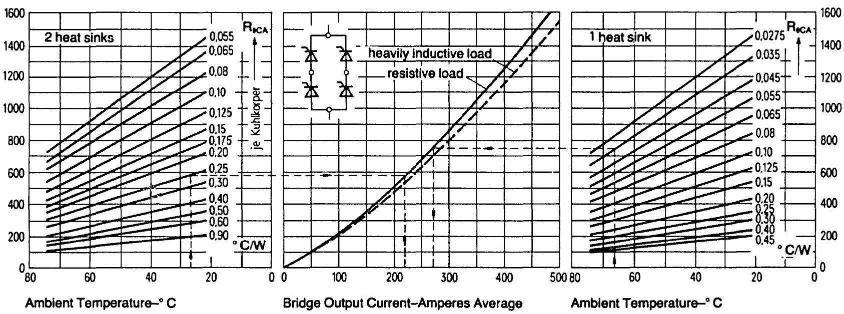


Figure 9
Three-phase bridge circuit—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

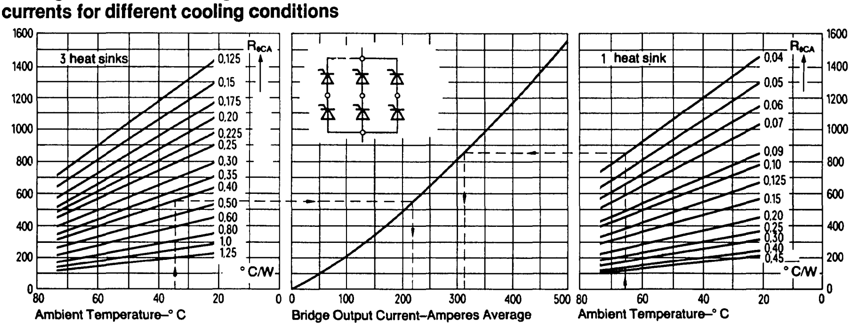


Figure 10
AC switch—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions

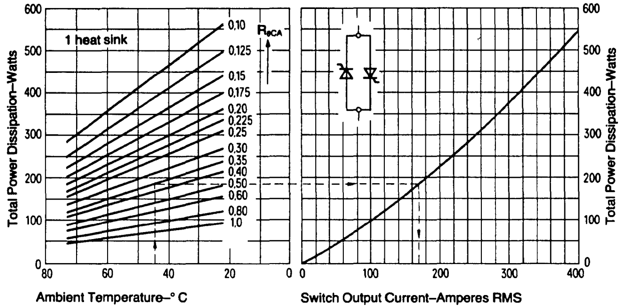
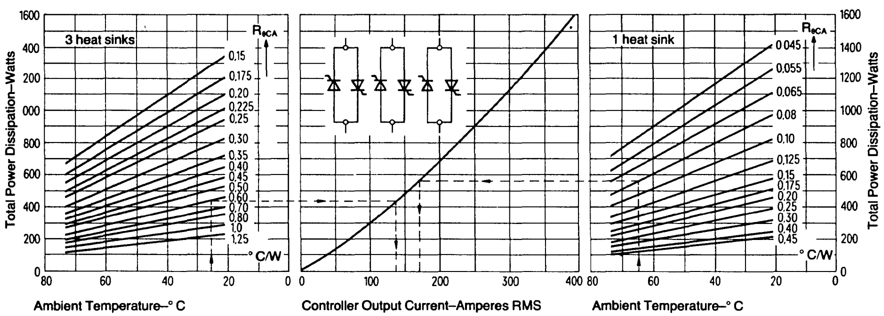


Figure 11
Three-phase controller—on-state loss characteristics
Nomogram for determining maximum on-state currents for different cooling conditions



Assemblies

Introduction

In response to special customer needs, our Applications Engineering group provides you with design support, while our Custom Assemblies Department provides quality products to fit your design.

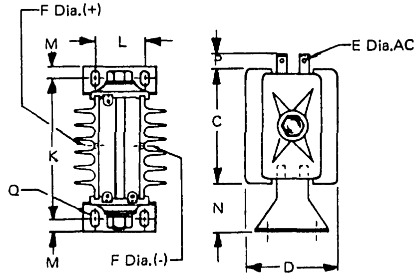
In the custom assembly situations, Siemens believes responsive, personal service is very important. We provide rapid response time and up-front technical assistance. We'll work with you in evaluating assembly requirements and special applications of the following product categories:

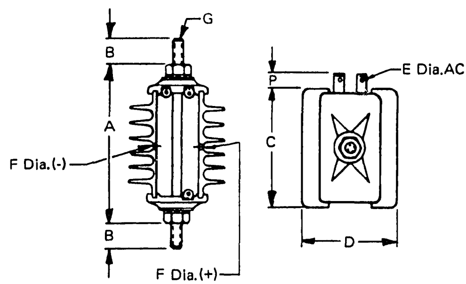
- High-voltage stacks (for applications requiring 8000 - 72000V).
- Power rectifier and SCR circuit assemblies.
- Rectifier and SCR circuit assemblies to 800A and 1600V using Al extrusions.
- Lower-current potted rectifier and SCR circuit assemblies.
- Single and three-phase bridge rectipoint assembly.
- High current module circuit assemblies up to 300A and 1600V on extended heat sinks forced air or N.C. cooled.

The result of the cooperative effort between a customer and our Custom Assemblies specialists is a quality product suited to customer needs.

Rectipoint Silicon Power Rectifiers

- Complete bridge with heatsinks - no assembly required
- Available in single or three phase bridge assemblies
- Available with bracket or bolt mounting
- Can be supplied with either DO-4 or DO-5 rectifiers
- Blocking voltages to 1600V





X Type

Dimension	Inches	Millimeters
A	4.31	109.4
B	0.625	15.87
C	4.0	101.6
D	3.12	79.2
E	0.201	5.10
F	0.265	6.731
G	3/8-16UNC-3A	----
K	3.93	99.8
L	1.5	38.1
M	0.281	7.137
N	0.875	22.22
P	0.625	15.87
Q	3/16 x 5/16	----

Y Type

Dimension	Inches	Millimeters
A	4.0	101.6
B	0.5	12.7
C	2.5	63.5
D	2.56	65.0
E	0.177	4.495
F	0.198	5.029
G	5/16-18UNC-2A	----
K	3.75	95.2
L	1.25	31.7
M	0.281	7.137
N	0.937	23.79
P	0.625	15.87
Q	3/16 x 5/16	----

Catalog No.	**Type of Circuit**	**Rated Continuous D-C Amperes at 40°C. Maximum Ambient Temperature**	
		Natural Convection	Forced Air at 800 LFM
Y20-B1-1	1 Phase Bridge	10	20
Y21-B1-1	4-1-1-B	14	28
Y20-Z1-1	3 Phase Bridge	12	36
Y21-Z1-1	6-1-1-Z	22	66
X20-B1-1	1 Phase	15	30
X21-B1-1	Bridge	25	50
X34-B1-1	4-1-1-B	35	70
X37-B1-1		43	86
X20-Z1-1	3 Phase	18	54
X21-Z1-1	Bridge	28	84
X34-Z1-1	6-1-1-Z	35	105
X37-Z1-1		43	130

Code Number Identification

Y 21 20 B 1 N 1 -S

Size of Heat Sink	Type of Diode	Peak Reverse Voltage	Type of Circuit	Number of Diodes in Series	Type of Mounting	Number of Diodes in Parallel	Special Features
X - 3"x4"	20		B - 1 Phase Bridge	1	N - Stud	1	S - Surge
Y - 2½"x2¾"	21		Z - 3 Phase Bridge		B - Brackets		Suppressor
	34	20-200					Furnished
	37	30-300					
		40-400					
		60-600					
		80-800					
		90-900					
		100-1000					
		120-1200					
		160-1600					

Figure 1
Overload Characteristics

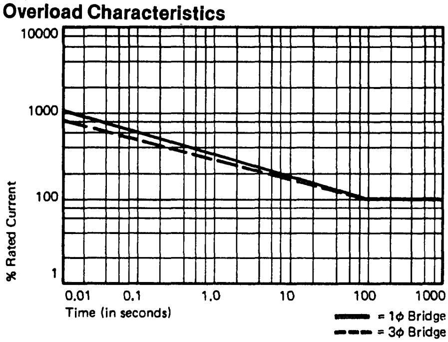
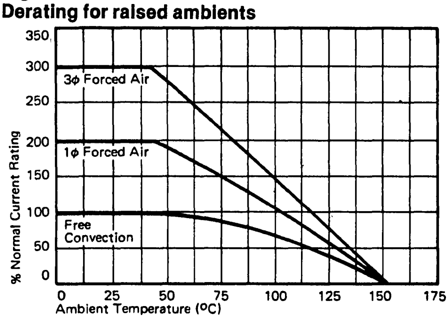


Figure 2
Derating for raised ambients



Electrical Specifications

Current range - 10 to 43 amperes (84 amperes with forced air cooling of 800 LFM) in single phase bridge 12 to 43 amperes (130 amperes with forced air of 800 LFM) in three-phase bridge. Input voltage - up to 460 volts RMS. Ambient temperature range - −65° to +150°C. Operating frequency - up to 10,000 Hz.

Material Specifications

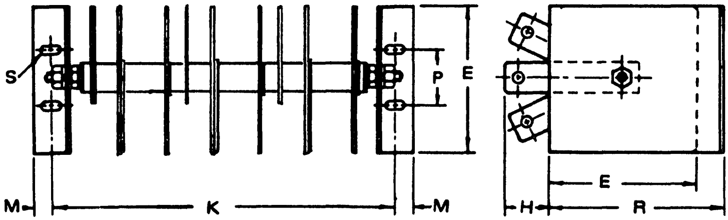
The finned heat sinks are corrosion resistant aluminum alloy. The end plates are molded from glass filled polyester resin. This material is non-flammable and self-extinguishing and shows no heat distortion at 200°C. It has a tensile strength of approximately 8000 lbs. per square inch and a dielectric strength in excess of 300 volts per mil.

- Complete bridge with heatsinks - no assembly required
- Available in many types of circuit configurations
- Incorporating a variety of heat sink sizes
- Characterized for natural convection or forced air cooling
- Designs include DO-4, DO-5, DO-8 and DO-9 diodes
- Blocking voltages to 1600V

Silicon Power Rectifier Assembly Coding System

K 34 20 B I E B I S

Size of Heat Sink	Type of Diode	Peak Reverse Voltage	Type of Circuit	Number of Diodes in Series	Type of Finish	Type of Mounting	Number of Diodes in Parallel	Special Features
E - 2"x2"	20 Series		Single Phase	Per leg	E - Commercial	B - Stud with	Per leg	Surge
K - 3"x3"	21 Series		H - Half Wave		T - High humidity	brackets		Suppressor
G - 5"x5"			C - Center Tap		salt spray	or insulating		
N - 7"x7"		20-200	Positive		F - Fungicide	board with		
	34 Series		N - Center Tap			mounting		
	37 Series	30-300	Negative			bracket		
	42 Series		D - Doubler			N - Stud with		
	43 Series	40-400	B - Bridge			no bracket		
	53 Series	50-500	M - Open bridge			C - Bolt		
	504 Series	60-600				BC - Bolt mounting		
						with one		
			Three Phase			bracket		
		80-800	Z - Bridge					
			X - Center Tap					
		100-1000	Y - Half Wave					
			DC Positive					
		120-1200	Q - Half Wave					
			DC Negative					
		160-1600	W - Double Wave					
			V - Open Bridge					



Circuit	Size	Dim.	Inches		Millimeters	
			Min.	Max.	Min.	Max.
1Φ Bridge	2x2	K	5.00	5.25	127.0	133.3
1Φ Bridge	3x3	K	5.87	6.12	149.0	155.4
3Φ Bridge	2x2	K	7.25	7.50	184.1	190.5
3Φ Bridge	3x3	K	8.12	8.37	206.2	212.5
	2x2	M	0.30	0.32	7.62	8.12
Same		P	0.74	0.76	18.7	19.3
for		E	1.99	2.01	50.5	51.0
both		R	2.61	2.63	66.2	66.8
circuits		H	0.86	0.88	21.8	22.3
		S	0.56x0.28 Nom.		14x7.1 Nom.	
	3x3	M	0.36	0.38	9.14	9.65
Same		P	1.49	1.51	37.8	38.3
for		E	2.99	3.01	75.9	76.4
both		R	3.67	3.69	93.2	93.7
circuits		H	0.99	1.01	25.1	25.6
		S	0.31x0.18 Nom.		7.9x4.7 Nom.	

Notes:

1. Current ratings shown are for natural convection cooling, resistive or inductive loads for single phase circuits and all loads for three phase circuits.
2. Use 2.0 times the above current ratings for forced convection cooling at 1000LFM.
3. For single phase battery, capacitive, or motor loads; the output current shown above should be derated to 80% of the values shown.
4. Assemblies with heat sink sizes other than those shown above are available on request for special applications. Refer to silicon power rectifier assembly coding system.

Ratings - Average Circuit Output Current - Amperes

Diode Series 20
Heat Sink Size 2x2x1/16 inches

AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	5.8	11.6	11.6	17.4	17.4	28.4	34.8
70	4.5	9.0	9.0	13.5	13.5	22.0	27.0
100	3.2	6.4	6.4	9.6	9.6	15.6	19.2

Diode Series 20
Heat Sink Size 3x3x1/16 inches

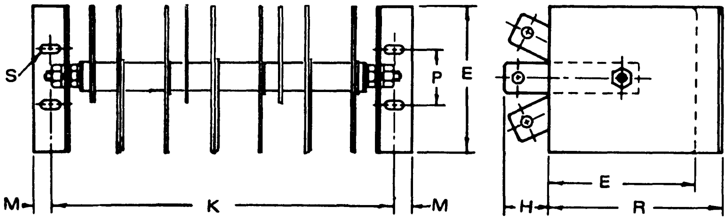
AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	8.2	16.4	16.4	24.6	24.6	40.0	49.2
70	6.6	13.2	13.2	19.8	19.8	32.3	39.6
100	4.7	9.4	9.4	14.1	14.1	23.0	28.2

Diode Series 21
Heat Sink Size 2x2x1/16 inches

AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	7.8	15.6	15.6	23.4	23.4	38.1	46.8
70	6.0	12.0	12.0	18.0	18.0	29.3	36.0
100	4.3	8.6	8.6	12.9	12.9	21.0	25.8

Diode Series 21
Heat Sink Size 3x3x1/16 inches

AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	11.0	22.0	22.0	33.0	33.0	53.8	66.0
70	8.8	17.6	17.6	26.4	26.4	43.0	52.8
100	6.3	12.6	12.6	18.9	18.9	30.8	37.8



Circuit	Size	Dim.	Inches		Millimeters	
			Min.	Max.	Min.	Max.
1ϕ Bridge	3x3	K	5.75	6.25	146.0	158.7
1ϕ Bridge	5x5	K	5.75	6.25	146.0	158.7
3ϕ Bridge	3x3	K	8.00	8.50	203.2	215.9
3ϕ Bridge	5x5	K	8.00	8.50	203.2	215.9
	3x3	M	0.36	0.38	9.14	9.65
Same		P	1.49	1.51	37.8	38.3
for		E	2.99	3.01	75.9	76.4
both		R	3.67	3.69	93.2	93.7
circuits		H	0.99	1.01	25.1	25.6
		S	0.56x0.28 Nom.		14x7.1 Nom.	
	5x5	M	0.36	0.38	9.14	9.65
Same		P	2.49	2.51	63.2	63.7
for		E	4.99	5.01	126.7	127.2
both		R	5.99	6.01	152.1	152.6
circuits		H	1.24	1.26	31.4	32.0
		S	0.56x0.28 Nom.		14x71.1 Nom.	

Notes:

1. Current ratings shown are for natural convection cooling, resistive or inductive loads for single phase circuits and all loads for three phase circuits.
2. Use 2.0 times the above current ratings for forced convection cooling at 1000LFM.
3. For single phase battery, capacitive, or motor loads; the output current shown above should be derated to 80% of the values shown.
4. Assemblies with heat sink sizes other than those shown above are available on request for special applications. Refer to silicon power rectifier assembly coding system.

Ratings - Average Circuit Output Current - Amperes

Diode Series 34
Heat Sink Size 3x3x1/16 inches

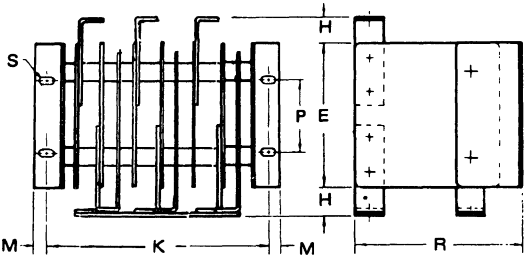
AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	18.0	36.0	36.0	54.0	54.0	88.0	108.0
70	14.5	29.0	29.0	43.5	43.5	70.9	87.0
100	10.5	21.0	21.0	31.5	31.5	51.3	63.0

Diode Series 34
Heat Sink Size 5x5x1/16 inches

AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	25.5	50.0	50.0	75.0	75.0	122.3	150.0
70	20.2	40.4	40.4	60.6	60.6	98.8	121.2
100	14.5	29.0	29.0	43.5	43.5	70.9	87.0

Diode Series 37
Heat Sink Size 5x5x1/16 inches

AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	29.3	57.5	57.5	86.3	86.3	140.6	172.5
70	23.2	46.5	46.5	69.7	69.5	113.6	139.4
100	16.6	33.3	33.3	50.0	50.0	81.5	100.0



Circuit	Size	Dim.	Inches Min.	Inches Max.	Millimeters Min.	Millimeters Max.
1Φ Bridge	5x5	K	9.25	9.75	234.9	247.6
1Φ Bridge	7x7	K	9.25	9.75	234.9	247.6
3Φ Bridge	5x5	K	13.0	13.5	330.2	342.9
3Φ Bridge	7x7	K	13.0	13.5	330.2	342.9
	5x5	M	0.36	0.38	9.14	9.65
Same		P	2.49	2.51	63.2	63.7
for		E	4.99	5.01	126.7	127.2
both		R	5.99	6.01	152.1	152.6
circuits		H	0.98	1.00	25.1	25.6
		S	0.56x0.28 Nom.		14x7.1 Nom.	
	7x7	M	0.36	0.38	9.14	9.65
Same		P	3.74	3.76	94.9	95.5
for		E	6.99	7.01	177.5	178.0
both		R	7.99	8.01	202.9	203.4
circuits		H	0.98	1.00	25.1	25.6
		S	0.56x0.28 Nom.		14x7.1 Nom.	

Notes:

1. Current ratings shown are for natural convection cooling, resistive or inductive loads for single phase circuits and all loads for three phase circuits.
2. Use 2.0 times the above current ratings for forced convection cooling at 1000LFM.
3. For single phase battery, capacitive, or motor loads; the output current shown above should be derated to 80% of the values shown.
4. Assemblies with heat sink sizes other than those shown above are available on request for special applications. Refer to silicon power rectifier assembly coding system.

Ratings - Average Circuit Output Current - Amperes

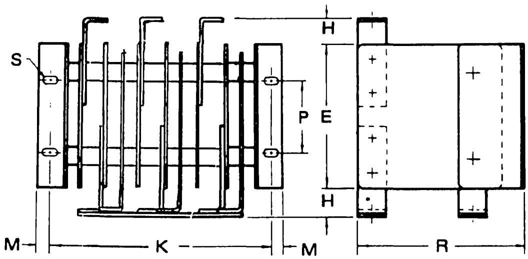
Diode Series 42
Heat Sink Size 5x5x1/8

AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	42.0	84.0	84.0	126.0	126.0	205.4	252.0
70	32.0	64.0	64.0	96.0	96.0	156.5	192.0
100	24.0	48.0	48.0	72.0	72.0	117.4	144.0

Diode Series 43
Heat Sink Size 7x7x1/8 inches

AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	52.0	104.0	104.0	156.0	156.0	254.3	312.0
70	40.0	80.0	80.0	120.0	120.0	195.6	240.0
100	28.0	56.0	56.0	84.0	84.0	137.0	168.0

Note: 53 available in blocking voltages from 800 to 1200 volts.
504 available in blocking voltages from 200 to 600 volts.



Circuit	Size	Dim.	Inches Min.	Inches Max.	Millimeters Min.	Millimeters Max.
1ϕ Bridge	5x5	K	10.5	11.0	266.7	279.4
1ϕ Bridge	7x7	K	10.5	11.0	266.7	279.4
3ϕ Bridge	5x5	K	15.0	15.5	381.0	393.7
3ϕ Bridge	7x7	K	15.0	15.5	381.0	393.7
	5x5	M	0.36	0.38	9.14	9.65
Same		P	2.49	2.51	63.2	63.7
for		E	4.99	5.01	126.7	127.2
both		R	5.99	6.01	152.1	153.6
circuits		H	0.98	1.00	24.8	25.4
		S	0.56x0.28 Nom.		14x7.1 Nom.	
	7x7	M	0.36	0.38	9.14	9.65
Same		P	3.74	3.76	94.9	95.5
for		E	6.99	7.01	177.5	178.0
both		R	7.99	8.01	202.9	203.4
circuits		H	0.98	1.00	24.8	25.4
		S	0.56x0.28 Nom.		14x7.1 Nom.	

Notes:

1. Current ratings shown are for natural convection cooling, resistive or inductive loads for single phase circuits and all loads for three phase circuits.
2. Use 2.0 times the above current ratings for forced convection cooling at 1000LFM.
3. For single phase battery, capacitive, or motor loads; the output current shown above should be derated to 80% of the values shown.
4. Assemblies with heat sink sizes other than those shown above are available on request for special applications. Refer to silicon power rectifier assembly coding system.

Ratings - Average Circuit Output Current - Amperes

Diode Series 53/504
Heat Sink Size 5x5x1/8 inches

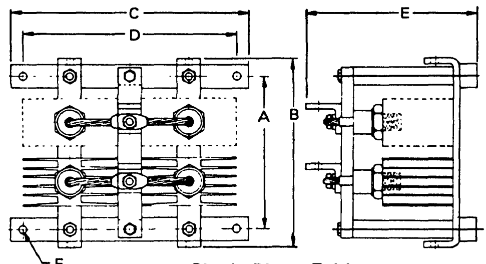
AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	62.0	124.0	124.0	186.0	186.0	303.0	372.0
70	47.0	94.0	94.0	141.0	141.0	230.0	282.0
100	33.0	66.0	66.0	99.0	99.0	161.0	198.0

Diode Series 53/504
Heat Sink Size 7x7x1/4 inches

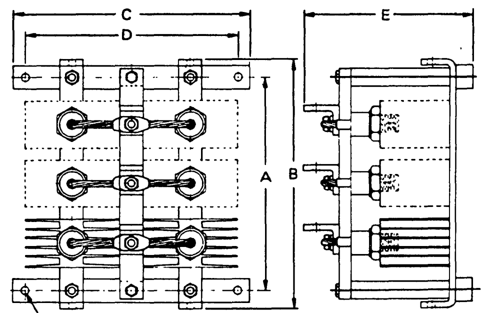
AMBIENT TEMP. °C	1-PHASE ½ WAVE	1-PHASE CTR. TAP	1-PHASE BRIDGE	3-PHASE ½ WAVE	3-PHASE BRIDGE	3-PHASE CTR. TAP	3-PHASE DBL.WYE
40	81.0	162.0	162.0	243.0	243.0	396.0	486.0
70	63.0	126.0	126.0	189.0	189.0	308.0	378.0
100	45.0	90.0	90.0	135.0	135.0	220.0	270.0

Silicon Rectifier Assemblies "W" Heatsinks

- Complete bridge with heatsinks - no assembly required
- Available in single and three phase bridge assemblies
- Characterized for natural convection or forced air cooling
- Designs include DO-8 and DO-9 diodes
- Blocking voltages to 1200 volts



Single Phase Bridge



Three Phase Bridge

Single Phase Bridge

Dimension	Inches		Millimeters	
	Minimum	Maximum	Minimum	Maximum
A	6.25	6.75	158.7	171.4
B	7.99	8.01	202.9	203.4
C	9.99	10.01	253.7	254.2
D	8.99	9.01	228.3	228.8
E	7.24	7.26	183.8	184.4
F	0.34 Dia.	—	8.63 Dia.	—

Three Phase Bridge

Dimension	Inches		Millimeters	
	Minimum	Maximum	Minimum	Maximum
A	8.75	9.25	222.2	234.9
B	9.99	10.01	253.7	254.2
C	10.01	253.7	254.2	
D	8.99	9.01	228.3	228.8
E	7.24	7.26	183.8	184.4
F	0.34 Dia.	—	8.63 Dia.	—

Silicon Rectifier Assemblies "W" Heatsinks

Silicon Rectifier Assemblies Coding System

W 43 20 B 1 1

Type of Diode	Peak Reverse Voltage	Type of Circuit	Number of Diodes in Series	Number of Diodes in Parallel
42 Series		Single Phase	1 Max.	1 Max.
43 Series		B - Bridge		
		Three Phase		
53/504 Series	20 = 200V	Z - Bridge		
	30 = 300V			
	40 = 400V			
	50 = 500V			
	60 = 600V			
	80 = 800V			
	100 = 1000V			
	120 = 1200V			

Note: Series 503 blocking voltages 800 to 1200 volts.
Series 504 blocking voltages 100 to 600 volts.

Average Output Current - Amperes
(Resistive or Inductive Loads)

Single Phase Bridge

Diode Series	Ambient Temp. °C	40	60
42 &	Natural Convection	120	110
43	Forced Convection*	320	285
503	Natural Convection	200	175
	Forced Convection*	500	450

Notes:
1. *At 1000 LFM.
2. For single phase battery, capacitive, or motor loads; the output current shown above should be derated to 80% of the values shown.
3. Assemblies with heat sink sizes other than those shown are available on request for special applications. Other circuit configurations are also available.
Please consult factory.

Average Output Current - Amperes
(Resistive or Inductive Loads)

Three Phase Bridge

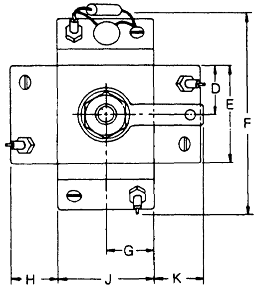
Diode Series	Ambient Temp. °C	40	60
42 &	Natural Convection	170	150
43	Forced Convection*	430	380
503	Natural Convection	300	265
	Forced Convection*	750	645

Notes:
1. *At 1000 LFM.
2. Assemblies with heat sink sizes other than those shown are available on request for special applications. Other circuit configurations are also available.
Please consult factory.

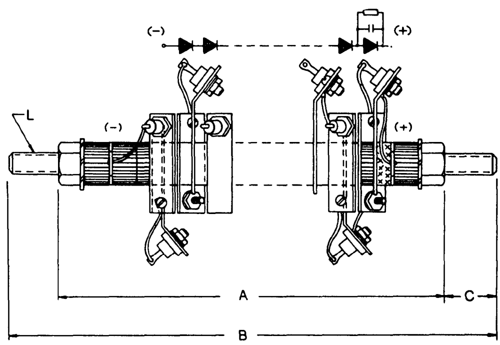
- Supplied in Single Phase Half Wave
- Gold Iridited Aluminum Heatsinks
- Each Diode is R-C Compensated
- 250 Amperes Surge Current (1 Cycle)
- Doubler configurations available up to 36 Kv per leg

Dimension	Inches	Millimeters	Notes
C	1.00	25.40	
D	1.00	25.40	
E	2.00	50.80	
F	4.50	114.30	
G	1.00	25.40	
H	.75	19.05	
J	2.00	50.80	
K	.87	22.26	
L			1

Note 1
½ - 13 Glass Melamine Studs

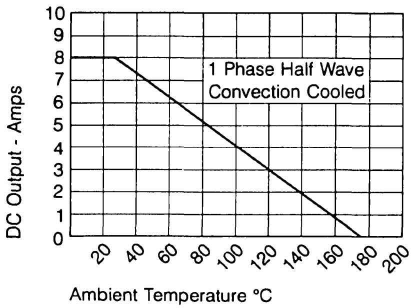


Load: Resistive - inductive.
(for capacitive derate 20%)

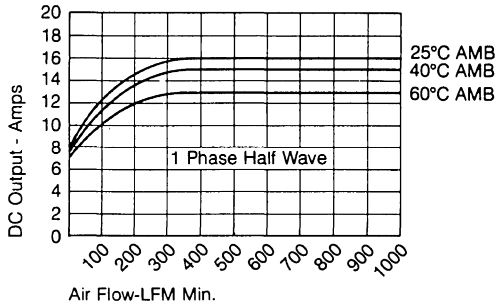


Mounting: Horizontal (convection cooling)
Horizontal or vertical (forced air)

Catalog Number	PRV Rating KV	Dimension A Inches	± 3/16 (4.76) Millimeters	Dimension B Inches	Millimeters
JHV21H8	8	5-1/8	130.18	7-1/4	185.15
JHV21H12	12	6-1/4	158.75	8-1/4	209.55
JHV21H16	16	7-3/8	187.33	9-1/2	241.30
JHV21H20	20	8-1/2	215.90	10-1/2	266.70
JHV21H24	24	9-5/8	244.48	11-3/4	298.45
JHV21H28	28	10-3/4	273.05	12-3/4	323.85
JHV21H32	32	11-7/8	301.63	14	355.60
JHV21H36	36	13	330.20	15	381.00
JHV21H40	40	14-1/8	358.78	16-1/4	412.75
JHV21H44	44	15-1/4	387.35	17-1/4	438.15
JHV21H48	48	16-3/8	415.92	19-1/2	469.90
JHV21H52	52	17-1/2	444.50	19-1/2	241.30
JHV21H56	56	18-5/8	473.07	20-3/4	527.05
JHV21H60	60	19-3/4	501.65	21-3/4	552.45
JHV21H64	64	20-7/8	530.22	23	589.20
JHV21H68	68	22	558.80	24	609.60
JHV21H72	72	23-1/8	587.37	25-1/4	641.35



DC Output - Amps
10
9
8
7
6
5
4
3
2
1
0
1 Phase Half Wave
Convection Cooled
20
40
60
80
100
120
140
160
180
200
Ambient Temperature °C



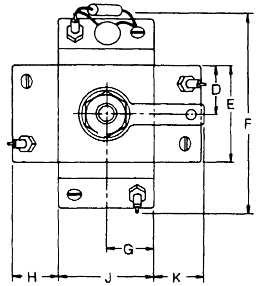
DC Output - Amps
20
18
16
14
12
10
8
6
4
2
0
25°C AMB
40°C AMB
60°C AMB
1 Phase Half Wave
100
200
300
400
500
600
700
800
900
1000
Air Flow-LFM Min.

High Voltage Silicon Rectifier Assembly — Series JHV34

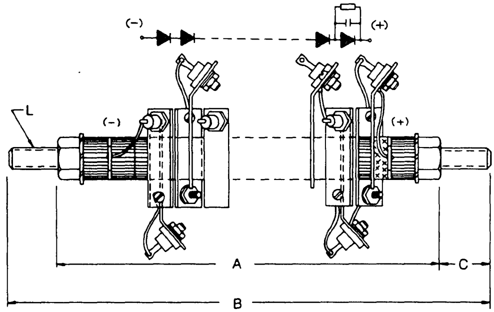
- Supplied in Single Phase Half Wave
- Gold Iridited Aluminum Heatsinks
- Each Diode is R-C Compensated
- 700 Amperes Surge Current (1 Cycle)
- Doubler configurations available up to 36 Kv per leg

Dimension	Inches	Millimeters	Notes
C	1.00	25.40	
D	1.00	25.40	
E	2.00	50.80	
F	4.50	114.30	
G	1.00	25.40	
H	.75	19.05	
J	2.00	50.80	
K	.87	22.26	
L			1

Note 1
½ - 13 Glass Melamine Studs

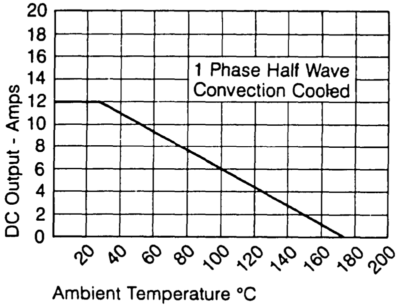


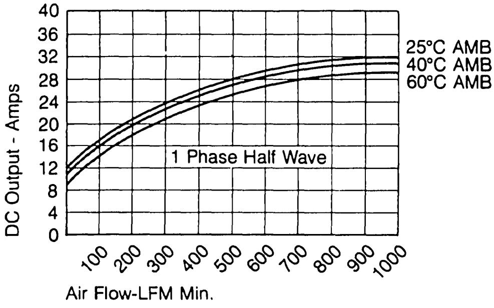
Load: Resistive - inductive.
(for capacitive derate 20%)



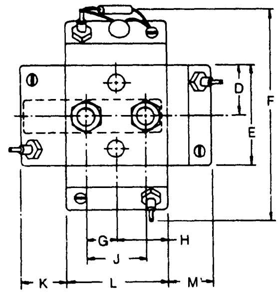
Mounting: Horizontal (convection cooling)
Horizontal or vertical (forced air)

Catalog Number	PRV Rating KV	Dimension A Inches	± 3/16 (4.76) Millimeters	Dimension B Inches	Millimeters
JHV34H8	8	5-1/8	130.18	7-1/4	185.15
JHV34H12	12	6-1/4	158.75	8-1/4	209.55
JHV34H16	16	7-3/8	187.33	9-1/2	241.30
JHV34H20	20	8-1/2	215.90	10-1/2	266.70
JHV34H24	24	9-5/8	244.48	11-3/4	298.45
JHV34H28	28	10-3/4	273.05	12-3/4	323.85
JHV34H32	32	11-7/8	301.63	14	355.60
JHV34H36	36	13	330.20	15	381.00
JHV34H40	40	14-1/8	358.78	16-1/4	412.75
JHV34H44	44	15-1/4	387.35	17-1/4	438.15
JHV34H48	48	16-3/8	415.92	19-1/2	469.90
JHV34H52	52	17-1/2	444.50	19-1/2	241.30
JHV34H56	56	18-5/8	473.07	20-3/4	527.05
JHV34H60	60	19-3/4	501.65	21-3/4	552.45
JHV34H64	64	20-7/8	530.22	23	589.20
JHV34H68	68	22	558.80	24	609.60
JHV34H72	72	23-1/8	587.37	25-1/4	641.35


DC Output - Amps
20
18
16
14
12
10
8
6
4
2
0
1 Phase Half Wave
Convection Cooled
20
40
60
80
100
120
140
160
180
200
Ambient Temperature °C


DC Output - Amps
40
36
32
28
24
20
16
12
8
4
0
25°C AMB
40°C AMB
60°C AMB
1 Phase Half Wave
100
200
300
400
500
600
700
800
900
1000
Air Flow-LFM Min.

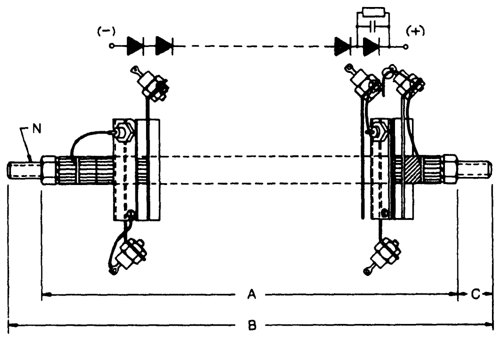
- Supplied in Single Phase Half Wave
- Gold Iridited Aluminum Heatsinks
- Each Diode Is R-C Compensated
- 700 Amperes Surge Current (1 Cycle)
- Doubler configuration available up to 36KV/leg



Load: Resistive - inductive.
(for capacitive derate 20%)

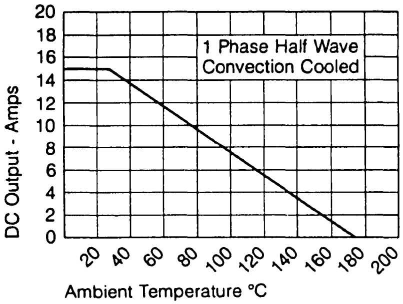
Dimension	Inches	Millimeters	Notes
C	1.00	25.40	
D	1.50	38.10	
E	3.00	76.20	
F	6.38	161.93	
G	.88	22.23	
H	1.50	38.10	
J	1.75	44.45	
K	1.69	42.86	
L	3.00	76.20	
M	1.69	42.86	
N			1

Note 1
½ - 13 Glass Melamine Studs

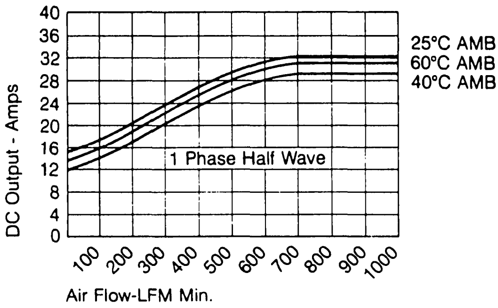


Mounting: Horizontal (convection cooling)
Horizontal or vertical (forced air)

Catalog Number	PRV Rating KV	Dimension A Inches	± 3/16 (4.76) Millimeters	Dimension B Inches	Millimeters
LHV34H8	8	5-5/8	142.88	7-3/4	196.85
LHV34H12	12	6-3/4	171.45	8-3/4	222.25
LHV34H16	16	7-7/8	200.03	10	254.00
LHV34H20	20	9	228.60	11	279.40
LHV34H24	24	10-1/8	257.18	12-1/4	311.15
LHV34H28	28	11-1/4	285.75	13-1/4	336.55
LHV34H32	32	12-3/8	314.33	14-1/2	368.30
LHV34H36	36	13-1/2	342.90	15-1/2	393.70
LHV34H40	40	14-5/8	371.48	16-3/4	425.45
LHV34H44	44	15-3/4	400.05	17-3/4	450.85
LHV34H48	48	16-7/8	428.63	19	482.60
LHV34H52	52	18	457.20	20	508
LHV34H56	56	19-1/8	485.77	21-1/4	539.75
LHV34H60	60	20-1/4	514.35	22-1/4	565.15
LHV34H64	64	21-3/8	542.92	23-1/2	596.90
LHV34H68	68	22-1/2	571.50	24-1/2	622.30
LHV34H72	72	23-5/8	600.07	25-3/4	654.05



DC Output - Amps
20
18
16
14
12
10
8
6
4
2
0
1 Phase Half Wave
Convection Cooled
20
40
60
80
100
120
140
160
180
200
Ambient Temperature °C



DC Output - Amps
40
36
32
28
24
20
16
12
8
4
0
1 Phase Half Wave
25°C AMB
60°C AMB
40°C AMB
100
200
300
400
500
600
700
800
900
1000
Air Flow-LFM Min.

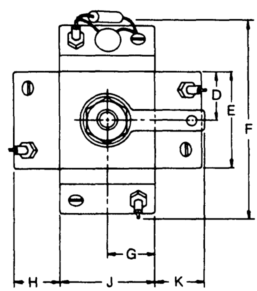
High Voltage Silicon Rectifier Assembly

Series JHV36

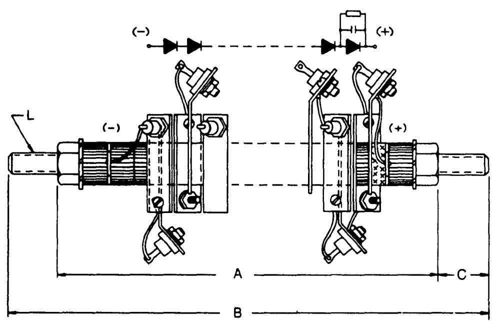
- Supplied in Single Phase Half Wave
- Gold Iridited Aluminum Heatsinks
- Each Diode is R-C Compensated
- 1200 Amperes Surge Current (1 Cycle)
- Doubler configurations available up to 36 Kv per leg

Dimension	Inches	Millimeters	Notes
C	1.00	25.40	
D	1.00	25.40	
E	2.00	50.80	
F	4.50	114.30	
G	1.00	25.40	
H	.75	19.05	
J	2.00	50.80	
K	.87	22.26	
L			1

Note 1
½ - 13 Glass Melamine Studs

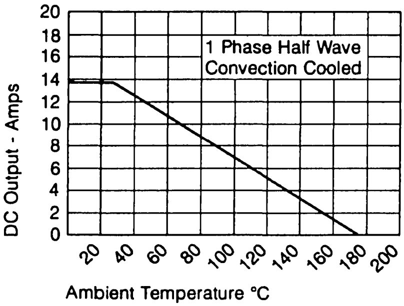


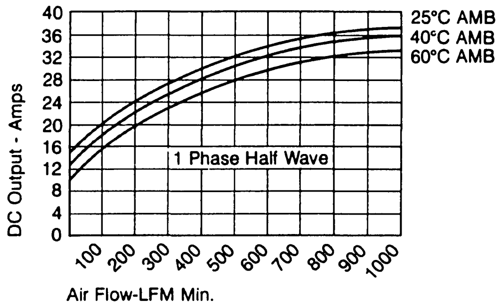
Load: Resistive - inductive.
(for capacitive derate 20%)



Mounting: Horizontal (convection cooling)
Horizontal or vertical (forced air)

Catalog Number	PRV Rating KV	Dimension A Inches	± 3/16 (4.76) Millimeters	Dimension B Inches	Millimeters
JHV36H8	8	5-1/8	130.18	7-1/4	185.15
JHV36H12	12	6-1/4	158.75	8-1/4	209.55
JHV36H16	16	7-3/8	187.33	9-1/2	241.30
JHV36H20	20	8-1/2	215.90	10-1/2	266.70
JHV36H24	24	9-5/8	244.48	11-3/4	298.45
JHV36H28	28	10-3/4	273.05	12-3/4	323.85
JHV36H32	32	11-7/8	301.63	14	355.60
JHV36H36	36	13	330.20	15	381.00
JHV36H40	40	14-1/8	358.78	16-1/4	412.75
JHV36H44	44	15-1/4	387.35	17-1/4	438.15
JHV36H48	48	16-3/8	415.92	19-1/2	469.90
JHV36H52	52	17-1/2	444.50	19-1/2	241.30
JHV36H56	56	18-5/8	473.07	20-3/4	527.05
JHV36H60	60	19-3/4	501.65	21-3/4	552.45
JHV36H64	64	20-7/8	530.22	23	589.20
JHV36H68	68	22	558.80	24	609.60
JHV36H72	72	23-1/8	587.37	25-1/4	641.35

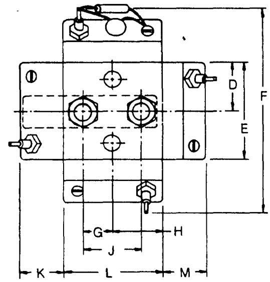

1 Phase Half Wave
Convection Cooled
DC Output - Amps
20
18
16
14
12
10
8
6
4
2
0
20
40
60
80
100
120
140
160
180
200
Ambient Temperature °C


25°C AMB
40°C AMB
60°C AMB
1 Phase Half Wave
DC Output - Amps
40
36
32
28
24
20
16
12
8
4
0
100
200
300
400
500
600
700
800
900
1000
Air Flow-LFM Min.

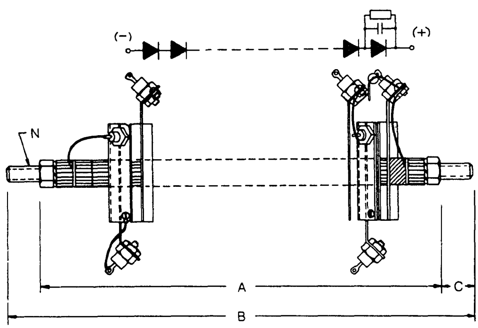
- Supplied in Single Phase Half Wave
- Gold Iridited Aluminum Heatsinks
- Each Diode is R-C Compensated
- 1200 Amperes Surge Current (1 Cycle)
- Doubler configuration available up to 36KV/leg

Dimension	Inches	Millimeters	Notes
C	1.00	25.40	
D	1.50	38.10	
E	3.00	76.20	
F	6.38	161.93	
G	.88	22.23	
H	1.50	38.10	
J	1.75	44.45	
K	1.69	42.86	
L	3.00	76.20	
M	1.69	42.86	
N			1

Note 1
½ - 13 Glass Melamine Studs

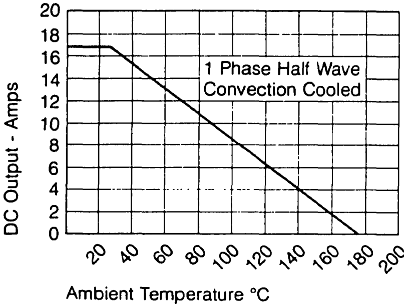


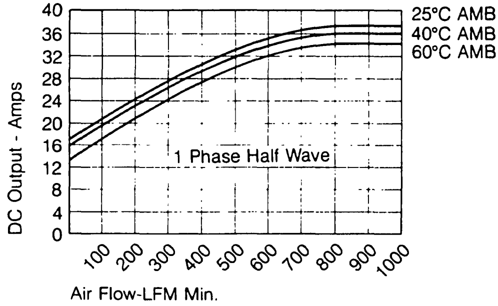
Load: Resistive - inductive.
(for capacitive derate 20%)



Mounting: Horizontal (convection cooling)
Horizontal or vertical (forced air)

Catalog Number	PRV Rating KV	Dimension A Inches	± 3/16 (4.76) Millimeters	Dimension B Inches	Millimeters
LHV36H8	8	5-5/8	142.88	7-3/4	196.85
LHV36H12	12	6-3/4	171.45	8-3/4	222.25
LHV36H16	16	7-7/8	200.03	10	254.00
LHV36H20	20	9	228.60	11	279.40
LHV36H24	24	10-1/8	257.18	12-1/4	311.15
LHV36H28	28	11-1/4	285.75	13-1/4	336.55
LHV36H32	32	12-3/8	314.33	14-1/2	368.30
LHV36H36	36	13-1/2	342.90	15-1/2	393.70
LHV36H40	40	14-5/8	371.48	16-3/4	425.45
LHV36H44	44	15-3/4	400.05	17-3/4	450.85
LHV36H48	48	16-7/8	428.63	19	482.60
LHV36H52	52	18	457.20	20	508
LHV36H56	56	19-1/8	485.77	21-1/4	539.75
LHV36H60	60	20-1/4	514.35	22-1/4	565.15
LHV36H64	64	21-3/8	542.92	23-1/2	596.90
LHV36H68	68	22-1/2	571.50	24-1/2	622.30
LHV36H72	72	23-5/8	600.07	25-3/4	654.05

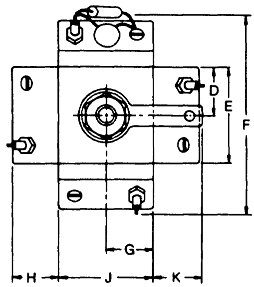

20
18
16
14
12
10
8
6
4
2
0
DC Output - Amps
1 Phase Half Wave
Convection Cooled
20
40
60
80
100
120
140
160
180
200
Ambient Temperature °C


40
36
32
28
24
20
16
12
8
4
0
DC Output - Amps
25°C AMB
40°C AMB
60°C AMB
1 Phase Half Wave
100
200
300
400
500
600
700
800
900
1000
Air Flow-LFM Min.

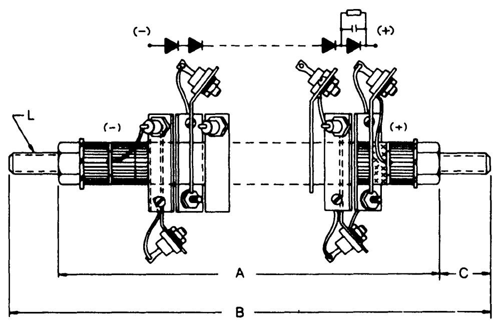
- Supplied in Single Phase Half Wave
- Gold Iridited Aluminum Heatsinks
- Each Diode is R-C Compensated
- 1500 Amperes Surge Current (1 Cycle)
- Doubler configurations available up to 36 Kv per leg

Dimension	Inches	Millimeters	Notes
C	1.00	25.40	
D	1.00	25.40	
E	2.00	50.80	
F	4.50	114.30	
G	1.00	25.40	
H	.75	19.05	
J	2.00	50.80	
K	.87	22.26	
L			1

Note 1
½ - 13 Glass Melamine Studs

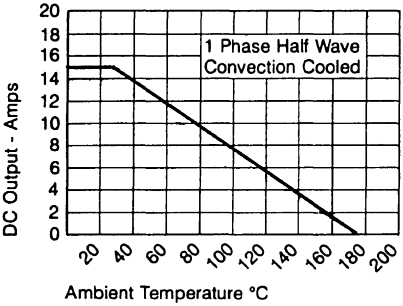


Load: Resistive - inductive.
(for capacitive derate 20%)

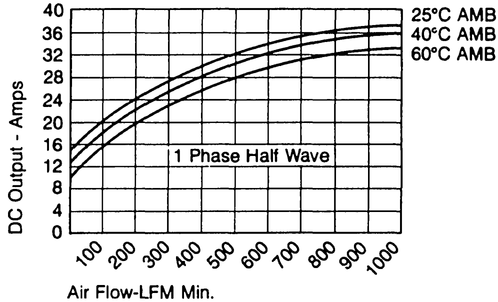


Mounting: Horizontal (convection cooling)
Horizontal or vertical (forced air)

Catalog Number	PRV Rating KV	Dimension A Inches	± 3/16 (4.76) Millimeters	Dimension B Inches	Millimeters
JHV37H8	8	5-1/8	130.18	7-1/4	185.15
JHV37H12	12	6-1/4	158.75	8-1/4	209.55
JHV37H16	16	7-3/8	187.33	9-1/2	241.30
JHV37H20	20	8-1/2	215.90	10-1/2	266.70
JHV37H24	24	9-5/8	244.48	11-3/4	298.45
JHV37H28	28	10-3/4	273.05	12-3/4	323.85
JHV37H32	32	11-7/8	301.63	14	355.60
JHV37H36	36	13	330.20	15	381.00
JHV37H40	40	14-1/8	358.78	16-1/4	412.75
JHV37H44	44	15-1/4	387.35	17-1/4	438.15
JHV37H48	48	16-3/8	415.92	19-1/2	469.90
JHV37H52	52	17-1/2	444.50	19-1/2	241.30
JHV37H56	56	18-5/8	473.07	20-3/4	527.05
JHV37H60	60	19-3/4	501.65	21-3/4	552.45
JHV37H64	64	20-7/8	530.22	23	589.20
JHV37H68	68	22	558.80	24	609.60
JHV37H72	72	23-1/8	587.37	25-1/4	641.35



DC Output - Amps
20
18
16
14
12
10
8
6
4
2
0
1 Phase Half Wave
Convection Cooled
20
40
60
80
100
120
140
160
180
200
Ambient Temperature °C

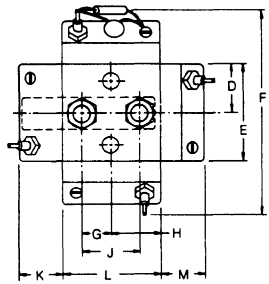


DC Output - Amps
40
36
32
28
24
20
16
12
8
4
0
25°C AMB
40°C AMB
60°C AMB
1 Phase Half Wave
100
200
300
400
500
600
700
800
900
1000
Air Flow-LFM Min.

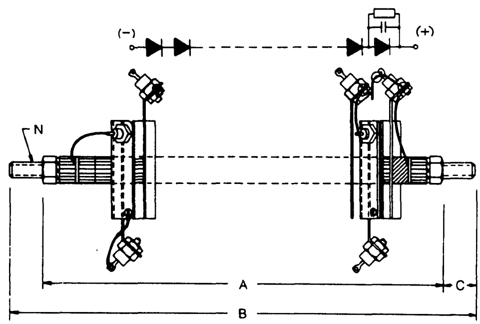
- Supplied in Single Phase Half Wave
- Gold Iridited Aluminum Heatsinks
- Each Diode is R-C Compensated
- 1500 Amperes Surge Current (1 Cycle)
- Doubler configuration available up to 36KV/leg

Dimension	Inches	Millimeters	Notes
C	1.00	25.40	
D	1.50	38.10	
E	3.00	76.20	
F	6.38	161.93	
G	.88	22.23	
H	1.50	38.10	
J	1.75	44.45	
K	1.69	42.86	
L	3.00	76.20	
M	1.69	42.86	
N			1

Note 1
½ - 13 Glass Melamine Studs

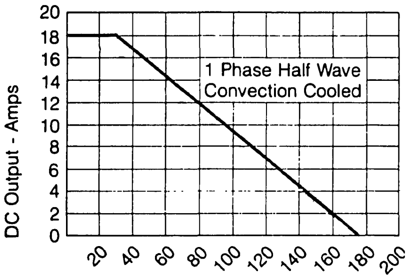


Load: Resistive - inductive.
(for capacitive derate 20%)

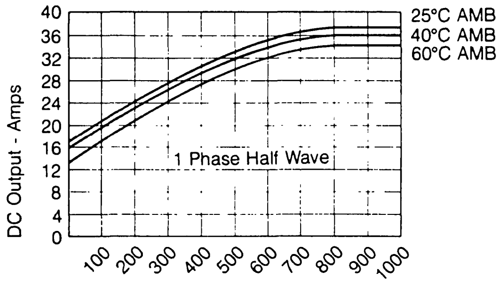


Mounting: Horizontal (convection cooling)
Horizontal or vertical (forced air)

Catalog Number	PRV Rating KV	Dimension A ± 3/16 (4.76) Inches	Millimeters	Dimension B Inches	Millimeters
LHV37H8	8	5-5/8	142.88	7-3/4	196.85
LHV37H12	12	6-3/4	171.45	8-3/4	222.25
LHV37H16	16	7-7/8	200.03	10	254.00
LHV37H20	20	9	228.60	11	279.40
LHV37H24	24	10-1/8	257.18	12-1/4	311.15
LHV37H28	28	11-1/4	285.75	13-1/4	336.55
LHV37H32	32	12-3/8	314.33	14-1/2	368.30
LHV37H36	36	13-1/2	342.90	15-1/2	393.70
LHV37H40	40	14-5/8	371.48	16-3/4	425.45
LHV37H44	44	15-3/4	400.05	17-3/4	450.85
LHV37H48	48	16-7/8	428.63	19	482.60
LHV37H52	52	18	457.20	20	508
LHV37H56	56	19-1/8	485.77	21-1/4	539.75
LHV37H60	60	20-1/4	514.35	22-1/4	565.15
LHV37H64	64	21-3/8	542.92	23-1/2	596.90
LHV37H68	68	22-1/2	571.50	24-1/2	622.30
LHV37H72	72	23-5/8	600.07	25-3/4	654.05



Ambient Temperature °C



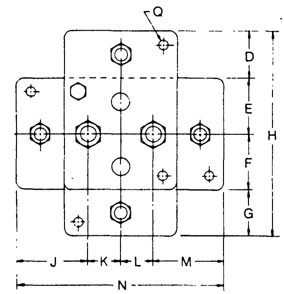
Air Flow-LFM Min.

- Supplied in Single Phase Half Wave
- Gold Iridited Aluminum Heatsinks
- Each Diode is R-C Compensated
- 2500 Amperes Surge Current (1 Cycle)
- Doubler configuration available up to 16KV/leg

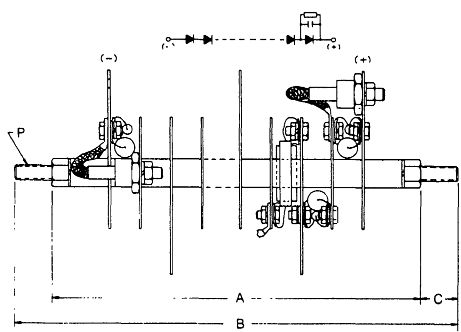
Dimension	Inches	Millimeters	Notes
C	1.00	25.40	
D	1.25	31.75	
E	1.50	38.10	
F	1.50	38.10	
G	1.25	31.75	
H	5.50	139.70	
J	1.88	47.75	
K	.88	22.35	
L	.88	22.35	
M	1.88	47.75	
N	5.50	139.10	
P			1
Q	.28 Dia.	7.14 Dia.	2

Note 1
½ - 13 Glass Melamine Studs

Note 2
Holes (+) (−) Conn.

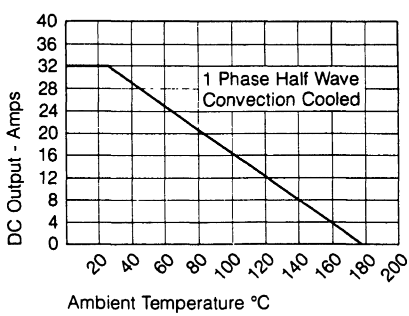


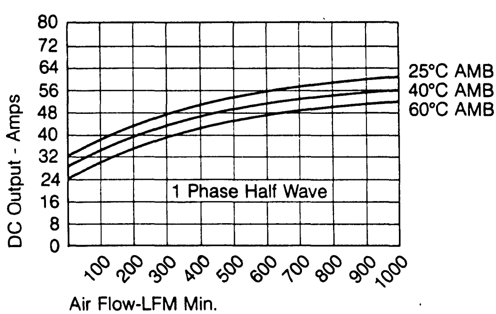
Load: Resistive - inductive.
(for capacitive derate 20%)



Mounting: Horizontal (convection cooling)
Horizontal or vertical (forced air)

Catalog Number	PRV Rating KV	Dimension A Inches	± 3/16 (4.76) Millimeters	Dimension B Inches	Millimeters
LHV43H8	8	10-1/8	257.30	12-1/2	317.50
LHV43H12	12	13-5/8	346.20	15-3/4	400.05
LHV43H16	16	17-1/8	435.10	19-1/4	488.95
LHV43H20	20	20-5/8	524.00	22-3/4	577.85
LHV43H24	24	24-1/8	612.90	26-1/4	666.75
LHV43H28	28	27-5/8	701.80	29-3/4	755.65
LHV43H32	32	31-1/8	790.70	33-1/4	844.55

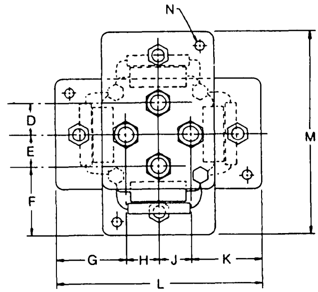




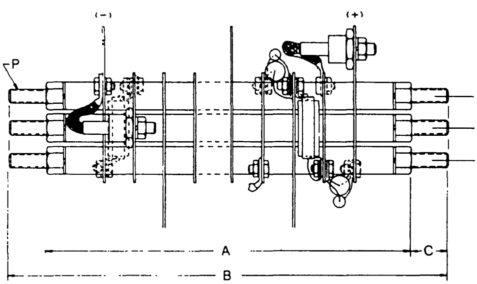
- Supplied in Single Phase Half Wave
- Gold Iridited Aluminum Heatsinks
- Each Diode is R-C Compensated
- 2500 Amperes Surge Current (1 Cycle)
- Doubler configurations available up to 16 Kv per leg

Dimension	Inches	Millimeters	Notes
C	1.00	25.40	
D	1.50	38.10	
E	1.50	38.10	
F	2.50	63.50	
G	2.50	63.50	
H	1.50	38.10	
J	1.88	47.75	
K	2.50	63.50	
L	8.00	203.20	
M	8.00	203.20	
N	.28 Dia.	7.14 Dia.	
P			1

Note 1
½ - 13 Glass Melamine Studs

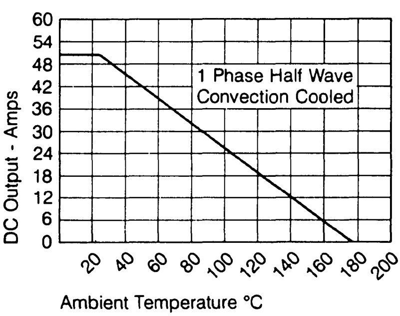


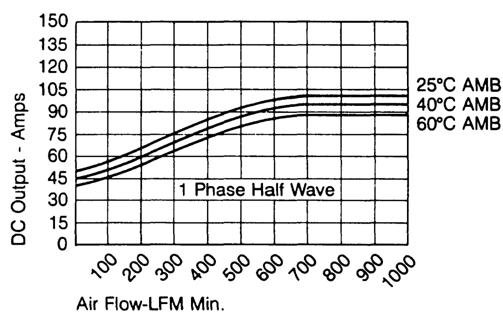
Load: Resistive - inductive.
(for capacitive derate 20%)



Mounting: Horizontal (convection cooling)
Horizontal or vertical (forced air)

Catalog Number	PRV Rating KV	Dimension A Inches	± 3/16 (4.76) Millimeters	Dimension B Inches	Millimeters
SHV43H8	8	10-1/8	257.30	12-1/2	317.50
SHV43H12	12	13-5/8	346.20	15-3/4	400.05
SHV43H16	16	17-1/8	435.10	19-1/4	488.95
SHV43H20	20	20-5/8	524.00	22-3/4	577.85
SHV43H24	24	24-1/8	612.90	26-1/4	666.75
SHV43H28	28	27-5/8	701.80	29-3/4	755.65
SHV43H32	32	31-1/8	790.70	33-1/4	844.55





Encapsulated Assemblies
12 Amp

Series EH

The Series EH is a high current encapsulated assembly with a single phase and three phase full wave bridge rating of 1600 PRV. It is completely sealed, compact, corrosion and moisture resistant.

Ratings for both single and three phase full wave bridge circuits are shown. These assemblies are available in a variety of circuit configurations. Information concerning special application is available on request.

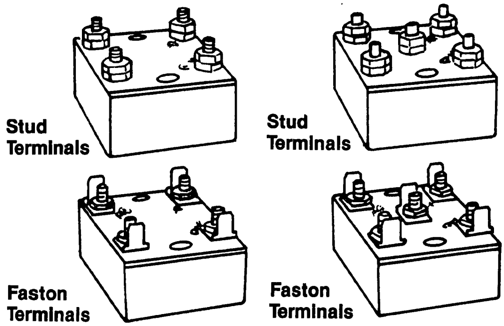
Dimension	Inches	Millimeters	Notes
A	2.25	57.2	
B			1
C	1.75	44.5	
D	1.75	44.5	
E	1.313	33.35	
F	0.875	22.23	

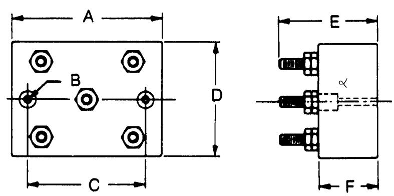
Note 1
Mounting hole .172 (4.37 mm) Dia.

Catalog Number (Single Phase)	Max. PRV Rating Per Circuit Arm	Catalog Number (Three Phase)
EH*1B1	100	EH*1Z1
EH*2B1	200	EH*2Z1
EH*3B1	300	EH*3Z1
EH*4B1	400	EH*4Z1
EH*5B1	500	EH*5Z1
EH*6B1	600	EH*6Z1
EH*7B1	700	EH*7Z1
EH*8B1	800	EH*8Z1
EH*9B1	900	EH*9Z1
EH*10B1	1000	EH*10Z1
EH*12B1	1200	EH*12Z1
EH*14B1	1400	EH*14Z1
EH*16B1	1600	EH*16Z1

* S—Stud Terminal
  F—Faston Terminal

Single Phase **Three Phase**

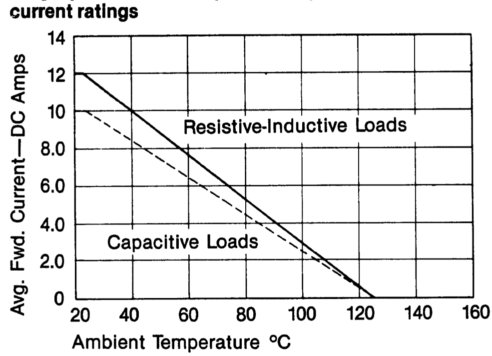




Electrical Characteristics

Circuit:	Single phase and three phase full wave bridge
AC Input:	up to 1600 PRV
DC Output:	up to 12 Amps DC (25°C Amb. - Chassis mounted)
Surge Current Rating:	250 Amps peak for one cycle (25°C Amb.)
Loads:	Resistive, Inductive, Capacitive
Duty Cycle:	Continuous
Cooling:	Convection
Design Features:	The series EH diodes are housed in an epoxy sealed case. Convenient faston or stud terminals as specified. High current rating for compact size.

Single-phase and three-phase bridge current ratings

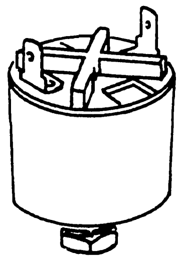


Encapsulated in a rounded case, this assembly is rated to 1600 PRV in a full wave bridge circuit. It is completely sealed, compact, corrosion, and moisture resistant.

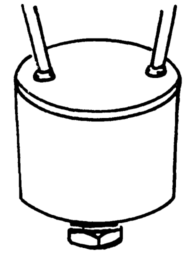
Ratings for the popular single phase full wave bridge circuit, incorporating Series 14 and Series 21 diodes, are given below.

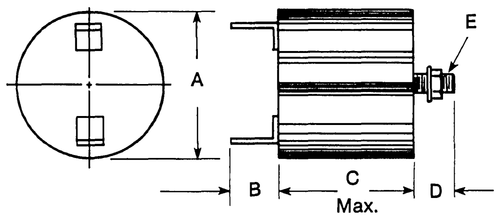
These assemblies are available in a variety of circuit configurations. Information concerning special application is available on request.

Faston Terminals



Flexible Leads





Dimension	Inches	Millimeters	Notes
A	1.31	33.3	
B	0.44	11.1	
C	1.06	26.9	
D	0.47	11.9	
E			1

Note 1
¼" - 20 Mounting Stud

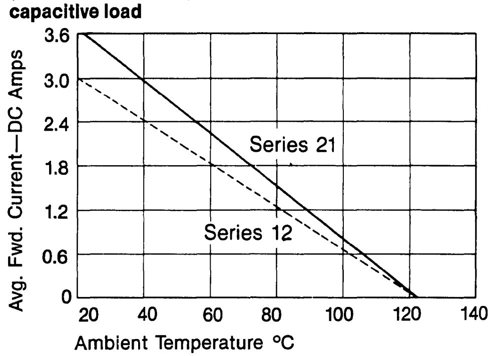
Catalog Number	Maximum PRV Rating Per Circuit Arm
ER*1B1	100
ER*2B1	200
ER*3B1	300
ER*4B1	400
ER*5B1	500
ER*6B1	600
ER*7B1	700
ER*8B1	800
ER*9B1	900
ER*10B1	1000
ER*12B1	1200
ER*14B1	1400
ER*16B1	1600

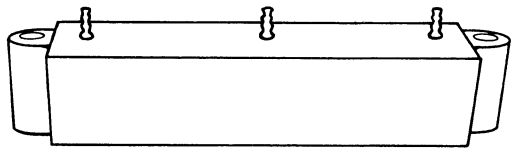
F12—Faston terminal with Series 14 diode
F21—Faston terminal with Series 21 diode
L12—Flexible lead with Series 14 diode (min. length - 4")
L21—Flexible lead with Series 21 diode (min. length - 4")

Electrical Characteristics

Circuit:	Single phase full wave bridge
AC Input:	up to 1600 PRV
DC Output:	(Series 14) up to 2.5 Amps DC (40 °C Amb.); (Series 21) up to 3. Amps DC (40 °CAmb.)
Surge Current Ratings:	(Series 14) 35 Amps peak for one cycle (25 °C Amb.); (Series 21) 250 Amps peak for one cycle (25 °C)
Loads:	Resistive, Inductive, Capacitive
Duty Cycle:	Continuous
Cooling:	Convection
Design Features:	diodes housed in an epoxy sealed case. Faston terminals or flexible leads.

Single-phase bridge current ratings (resistive—inductive) loads derate 20% for capacitive load





This high-voltage, encapsulated assembly carries a half-wave rating of 34,000 PRV and a doubler rating of 12,000 PRV. Completely sealed, compact, corrosion and moisture resistant.

Ratings for the popular single-phase half-wave circuit are given below.

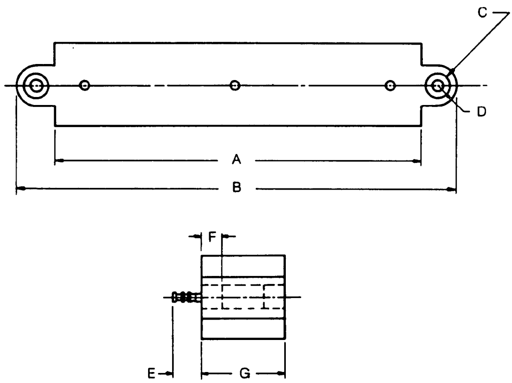
These assemblies are available in a variety of circuit configurations. Information concerning special application is available on request.

Catalog No.: EFTD12
Max. PRV Rating per circuit arm: 12KV

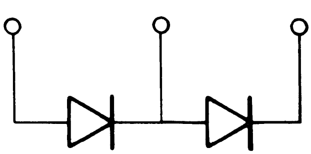
Dimension	Inches	Millimeters	Notes
A	5.50	139.7	
B	6.625	168.3	
C			1
D			2
E	4.38	11.1	
F	.313	7.14	
G	1.25	31.8	

Note 1
.375" (9.53 mm) Dia.
cs .1875" (4.763 mm) Dia.

Note 2
.313" (7.94 mm)



Circuit Diagram

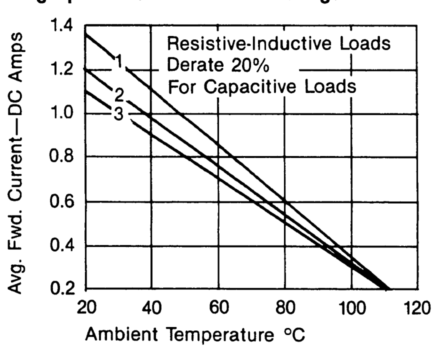


Curve #1	16	KV	Unit
" 2	20	"	"
" 3	24	"	"

Electrical Characteristics

Circuit:	Doubler
AC Input:	up to 12,000 PRV per arm
DC Output:	Up to 1.25 Amps DC (see curve)
Surge Current Ratings:	50 Amps peak for 1 cycle (25 °C Amb.)
Loads:	Resistive, Inductive, Capacitive
Duty Cycle:	Continuous
Cooling:	Convection
Design Features:	These diodes are housed in an epoxy sealed case with easily soldered turret terminals. Faston terminals or flexible leads.

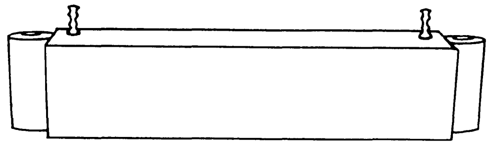
Single-phase half wave current ratings

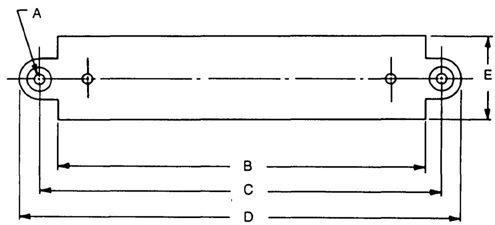


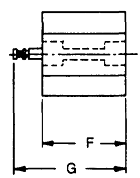
The Series EF high voltage, encapsulated assembly carries a half wave rating of up to 24,000 PRV. It is completely sealed, compact, corrosion and moisture resistant.

Ratings for the popular single phase half wave circuit are shown.

These assemblies are available in a variety of circuit configurations. Information concerning special application is available on request.







Dimension	Inches	Millimeters	Notes
A			1
B	5.50	139.7	
C	6.00	152.4	
D	6.625	168.3	
E	1.25	31.8	
F	1.25	31.8	
G	1.688	42.88	

Note 1
.2031" (5.159 mm) Dia. Hole

Catalog Number	Maximum PRV Rating Per Circuit Arm
EF*H16	16 KV
EF*H20	20 KV
EF*H24	24 KV

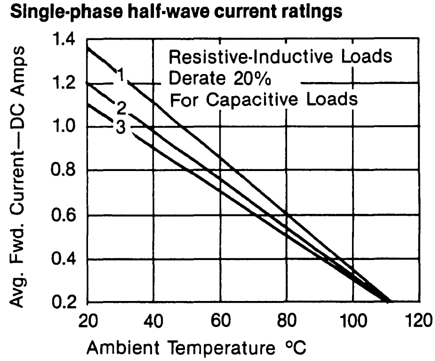
* T—Turret terminals
  F—Faston terminals available upon request
  L—Flexible leads (min. length - 4")

Electrical Characteristics

Circuit:	Single phase half wave
AC Input:	up to 24,000 PRV
DC Output:	up to 1.25 Amps DC (see curve)
Surge Current Ratings:	50 Amps peak for 1 cycle (25°C Amb.)
Loads:	Resistive, Inductive, Capacitive
Duty Cycle:	Continuous
Cooling:	Convection
Design Features:	These diodes are housed in an epoxy sealed case; Easily soldered faston terminals or flexible leads.

Single-phase half-wave current ratings

Curve	#1	16	KV	Unit
"	2	20	"	"
"	3	24	"	"



BUZ Cross Reference

Summary of Types

Small Signal Transistors

Type	Ordering code	V_{DS} V	I_D A	$R_{DS(on)}$ Ω	Case
P channel					
▼ BSS 110	Q62702-S0489	– 50	–0,17	10,0	TO 92
▼ BSS 92	Q62702-S0458	–200	–0,15	20,0	TO 92
N channel					
BSS 100	Q62702-S0483	100	0,23	6,0	TO 92
BSS 87	Q62702-S453	200	0,50	6,0	SOT 89
BSS 89	Q62702-S455	200	0,30	6,0	TO 92
BSS 91	Q62702-S457	200	0,35	6,0	TO 18
BSS 93	Q62702-S459	200	0,50	6,0	TO 39
BSS 95	Q62702-S461	200	0,80	6,0	TO 202
BSS 97	Q62702-S463	200	1,50	2,0	TO 202
BSS 101	Q62702-S0484	200	0,16	12,0	TO 92

Power Transistors

Type	Ordering code	V_{DS} V	I_D A	$R_{DS(on)}$ Ω	Case
N channel					
BUZ 10	C67078-A1300-A2	50	12	0,1	TO 220
BUZ 10A	C67078-A1300-A3	50	12	0,12	TO 220
▼ BUZ 11	C67078-A1301-A2	50	30	0,04	TO 220
▼ BUZ 11A	C67078-A1301-A3	50	25	0,06	TO 220
BUZ 14	C67078-A1000-A2	50	39	0,04	TO 3
BUZ 15	C67078-A1001-A2	50	45	0,03	TO 3
BUZ 17	C67078-A1600-A2	50	32	0,04	TO 238
BUZ 18	C67078-A1601-A2	50	37	0,03	TO 238
▼ BUZ 71	C67078-A1316-A2	50	12	0,1	TO 220
▼ BUZ 71A	C67078-A1316-A3	50	12	0,12	TO 220
BUZ 20	C67078-A1302-A2	100	12	0,2	TO 220
BUZ 21	C67078-A1308-A2	100	19	0,1	TO 220
BUZ 23	C67078-A1002-A2	100	10	0,2	TO 3
BUZ 24	C67078-A1003-A2	100	32	0,06	TO 3
▼ BUZ 25	C67078-A1011-A2	100	19	0,1	TO 3
BUZ 27	C67078-A1602-A2	100	26	0,06	TO 238
▼ BUZ 28	C67078-A1608-A2	100	18	0,1	TO 238
▼ BUZ 72A	C67078-A1313-A3	100	9,0	0,25	TO 220
■ BUZ 30	C67078-A1303-A2	200	7,0	0,75	TO 220
BUZ 31	C67078-A1304-A2	200	12,5	0,2	TO 220
BUZ 32	C67078-A1310-A2	200	9,5	0,4	TO 220
■ BUZ 33	C67078-A1004-A2	200	7,2	0,75	TO 3
BUZ 34	C67078-A1005-A2	200	14	0,2	TO 3
BUZ 35	C67078-A1014-A2	200	9,9	0,4	TO 3
▼ BUZ 36	C67078-A1018-A2	200	22	0,12	TO 3

▼ New type
■ Not for new design!

Summary of Types

Power Transistors

Type	Ordering code	V_{DS} V	I_D A	$R_{DS\,(on)}$ Ω	Case
BUZ 37	C67078-A1603-A2	200	13	0,2	TO 238
BUZ 38	C67078-A1611-A2	200	18	0,12	TO 238
▼ BUZ 73A	C67078-A1317-A3	200	5,8	0,6	TO 220
BUZ 60	C67078-A1312-A2	400	5,5	1,0	TO 220
▼ BUZ 60 B	C67078-A1312-A4	400	4,5	1,5	TO 220
BUZ 63	C67078-A1016-A2	400	5,9	1,0	TO 3
▼ BUZ 63 B	C67078-A1016-A4	400	4,5	1,5	TO 3
BUZ 64	C67078-A1017-A2	400	10,5	0,4	TO 3
BUZ 67	C67078-A1610-A2	400	9,6	0,4	TO 238
▼ BUZ 76	C67078-A1315-A2	400	3,0	1,8	TO 220
▼ BUZ 76A	C67078-A1315-A3	400	2,6	2,5	TO 220
■ BUZ 40	C67078-A1305-A2	500	2,5	4,5	TO 220
BUZ 41A	C67078-A1306-A3	500	4,5	1,5	TO 220
BUZ 42	C67078-A1311-A2	500	4,0	2,0	TO 220
■ BUZ 43	C67078-A1006-A2	500	2,8	4,5	TO 3
BUZ 44A	C67078-A1007-A3	500	4,8	1,5	TO 3
BUZ 45	C67078-A1008-A2	500	9,6	0,6	TO 3
BUZ 45A	C67078-A1008-A3	500	8,3	0,8	TO 3
▼ BUZ 45B	C67078-A1008-A4	500	10	0,5	TO 3
BUZ 46	C67078-A1015-A2	500	4,2	2,0	TO 3
BUZ 48	C67078-A1605-A2	500	7,8	0,6	TO 238
BUZ 48A	C67078-A1605-A3	500	6,8	0,8	TO 238
▼ BUZ 74	C67078-A1314-A2	500	2,4	3,0	TO 220
▼ BUZ 74A	C67078-A1314-A3	500	2,0	4,0	TO 220
BUZ 80	C67078-A1309-A2	800	2,6	4,0	TO 220
BUZ 80A	C67078-A1309-A3	800	3,0	3,0	TO 220
BUZ 83	C67078-A1012-A2	800	2,9	4,0	TO 3
BUZ 83A	C67078-A1012-A3	800	3,4	3,0	TO 3
BUZ 84	C67078-A1013-A2	800	5,3	2,0	TO 3
BUZ 84A	C67078-A1013-A3	800	6,0	1,5	TO 3
BUZ 88	C67078-A1609-A2	800	4,3	2,0	TO 238
BUZ 88A	C67078-A1609-A3	800	5,0	1,5	TO 238
BUZ 50A	C67078-A1307-A3	1000	2,5	5,0	TO 220
BUZ 50B	C67078-A1307-A4	1000	2,0	8,0	TO 220
▼ BUZ 53A	C67078-A1009-A3	1000	2,6	5,0	TO 3
▼ BUZ 54	C67078-A1010-A2	1000	5,3	2,0	TO 3
BUZ 54A	C67078-A1010-A3	1000	4,6	2,6	TO 3
BUZ 57A	C67078-A1606-A3	1000	2,5	5,0	TO 238
BUZ 58	C67078-A1607-A2	1000	4,3	2,0	TO 238
BUZ 58A	C67078-A1607-A3	1000	3,7	2,6	TO 238

▼ New type
■ Not for new design!

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Quality and Reliability

All Siemens power semiconductors are subjected to 100% testing in production of critical operating parameters, both at ambient and elevated case temperatures.

These parameters are ensured with comprehensive quality assurance procedures consistent with an 0.1 AQL.

These Siemens power semiconductor components have been designed to meet the following environmental tests:

	Test	Test Conditions	Failure Criteria	Standard
1.	High Temperature Storage	1000 hr. at $T_{stg\ max}$	class A	DIN 40046 part 4 IEC 68-2-2 B
2.	Low Temperature Storage	168 hr. at $T_{stg\ min}$	class B	DIN 40046 part 3 IEC 68-2-1 Aa
3.	Temperature Cycling	25 cycles $T_{stg\ max}$ to $T_{stg\ min}$	class B	DIN 40046 part 14 IEC 68-2-14 Na
4.	Humidity(1)	1000 hr., 40 °C, 93% RH	class B	DIN 40046 part 5 IEC 68-2-3 Ca
5.	Blocking Life (ac)	1000 hr., VDWM, VRWM, $T_{j\ max}$	class A	DIN 41794 part 1, 8, 9 IEC 147-4 III.1.3
6.	Thermal Fatigue	5000 to 50,000(3) T_j = 50 °C to $T_{j\ max}$	class A	DIN 41794 part 1, 8, 9 IEC 147-2E-1.3.5, II.1
7.	Solderability(2)	235 °C ± 5 °C	class B	DIN 40046 part 18 IEC 68-2-20 Ta1
8.	Resistance to Soldering Heat(2)	260 °C for 10 sec.	class B	DIN 40046 part 18 IEC 68-2-20 Ta1
9.	Vibration	5G, 24 hr. each axis	class B	DIN 40046 part 8 IEC 68-2-6 FC
10.	Hermeticity(2)	10^{-7} atm cc/sec.	—	DIN 40046 part 15, 44 IEC 68-2-17 Qk
11.	Terminal Strength, Tensile(2)	see standard	no damage	DIN 40046 part 19 IEC 68-2-21 μa1
12.	Terminal Strength, Bending(2)	see standard	no damage	DIN 40046 part 19 IEC 66-2-21 μb

Failure Criteria:

Class A: $I_R > 200\%\ I_{RM}$
$V_F > 110\%\ V_{FM}$
$I_{GT} > 100\%\ I_{GTM}$

Class B: $I_R > 100\%\ I_{RM}$
$V_F > V_{FM}$
$I_{GT} > 100\%\ I_{GTM}$

(1) For plastic encapsulated devices only.
(2) Where applicable
(3) Depending on application

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Siemens warrants to the original purchase that it will correct any defects in workmanship or material, by repair or replacement, F.O.B. factory or, at its option, issue credit at the original purchase price, for any silicon power semiconductor bearing the symbol § during the life of the equipment in which it is originally installed, provided said device is used within manufacturer's published ratings and applied in accordance with good engineering practice. The foregoing warranty is exclusive and in lieu of all other warranties of quality whether written, oral or implied (including any warranty of merchantability or fitness for purpose).

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