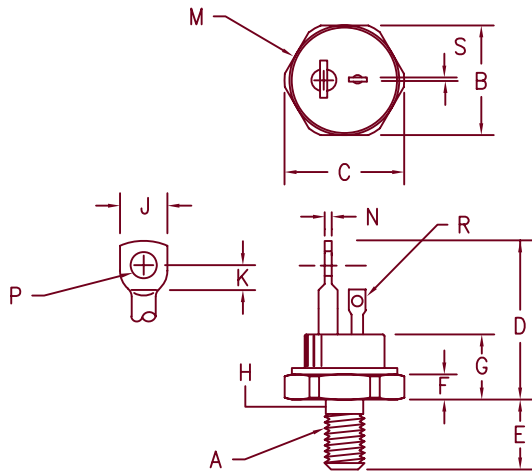


# Silicon Controlled Rectifier/Inverter Series 039



Dim.	Inches		Millimeter		Notes
	Minimum	Maximum	Minimum	Maximum	
A	---	---	---	---	1
B	.677	.685	17.20	17.40	
C	---	.770	---	19.56	
D	1.200	1.250	30.48	31.75	
E	.427	.447	10.84	11.35	
F	.115	.155	2.92	3.94	
G	---	.515	---	13.08	
H	---	.249	---	6.32	2
J	.200	.300	5.08	7.62	
K	.120	---	3.05	---	
M	---	.667	---	16.94	Dia.
N	.065	.085	1.65	2.15	
P	.145	.155	3.68	3.93	Dia.
R	.055	.065	1.40	1.65	Dia.
S	.025	.030	.64	.76	

Note 1: 1/4-28 UNF-3A

Note 2: Full thread within 2 1/2 threads

## TO-208AC (TO-65)

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

To specify dv/dt other than 200V/usec., enter appropriate letter in place of "G": K 300V/usec.  
H 500V/usec.

- dv/dt-200 V/usec
- 1000 amperes surge current
- Low forward on-state voltage
- Blocking voltages up to 600 volts
- Primarily for forced commutated applications

### Electrical Characteristics

Max. RMS on-state current	I <sub>T(RMS)</sub> 63 Amps	T <sub>C</sub> = 105°C, half sine wave, R <sub>θJC</sub> = 0.35°C/W
Max. average on-state cur.	I <sub>T(AV)</sub> 40 Amps	T <sub>C</sub> = 105°C, half sine wave, R <sub>θJC</sub> = 0.35°C/W
Max. peak on-state voltage	V <sub>TM</sub> 1.8 Volts	I <sub>TM</sub> = 120 A(peak)
Max. holding current	I <sub>H</sub> 500 mA	
Max. peak one cycle surge current	I <sub>TSM</sub> 1000 A	T <sub>C</sub> = 105°C, 60Hz
Max. I <sup>2</sup> t capability for fusing	I <sup>2</sup> t 4150A <sup>2</sup> S	t = 8.3 ms

T<sub>C</sub> = 25°C unless otherwise noted

### Thermal and Mechanical Characteristics

Operating junction temp range	T <sub>J</sub>	-65°C to 125°C
Storage temperature range	T <sub>STG</sub>	-65°C to 150°C
Maximum thermal resistance	R <sub>θJC</sub>	0.35°C/W Junction to case
Typical thermal resistance (greased)	R <sub>θCS</sub>	0.20°C/W Case to sink
Mounting torque		25-30 inch pounds
Weight		0.56 ounces (16 grams) typical



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# 039

## Switching

Critical rate of rise of on-state current (note 1)	$di/dt$	400A/usec.	$T_J = 125^\circ\text{C}$
Typical delay time (note 1)	$t_d$	2.0 usec.	
Maximum circuit commuted turn-off time (note 2)	$t_q$ (R)	10 usec.	$T_J = 125^\circ\text{C}$
	$t_q$ (T)	12 usec.	$T_J = 125^\circ\text{C}$
	$t_q$ (P)	15 usec.	$T_J = 125^\circ\text{C}$
	$t_q$ (U)	20 usec.	$T_J = 125^\circ\text{C}$

Note 1:  $I_{TM} = 50\text{A}$ ,  $V_D = V_{DRM}$ .  $V_{GT} = 12\text{V}$  open circuit, 20 ohm-0.1 usec. rise time

Note 2:  $I_{TM} = 50\text{A}$ ,  $di/dt = -5\text{A/usec.}$ ,  $V_R$  during turn-off interval = 50V min.,  
reapplied  $dv/dt = 20\text{V/usec.}$ , linear to rated  $V_{DRM}$ ,  $V_{GT} = 0\text{V}$

Note 3: To specify  $t_q$  other than 10 usec., enter appropriate letter in place of "R"  
T-12 usec., P-15 usec., U-20 usec.

## Triggering

Max. gate voltage to trigger	$V_{GT}$	3.0V	$T_J = 25^\circ\text{C}$
Typical gate voltage to trigger	$V_{GT}$	1.0V	$T_J = 25^\circ\text{C}$
Max. nontriggering gate voltage	$V_{GD}$	0.15V	$T_J = 125^\circ\text{C}$
Max. gate current to trigger	$I_{GT}$	150mA	$T_J = 25^\circ\text{C}$
Typical gate current to trigger	$I_{GT}$	48mA	$T_J = 25^\circ\text{C}$
Max. peak gate power	$P_{GM}$	10W	
Average gate power	$P_{G(AV)}$	2.0W	$t_p = 10$ usec.
Max. peak gate current	$I_{GM}$	3.0A	
Max. peak gate voltage (forward)	$V_{GM}$	20V	
Max. peak gate voltage (reverse)	$V_{GM}$	10V	

## Blocking

Max. leakage current	$I_{DRM}$	12mA	$T_J = 125^\circ\text{C}$ & $V_{DRM}$
Max. reverse leakage	$I_{RRM}$	12mA	$T_J = 125^\circ\text{C}$ & $V_{RRM}$
Critical rate of rise of off-state voltage	$dv/dt$	200V/usec.	$T_J = 125^\circ\text{C}$

Figure 1  
Typical Forward On-State Characteristics

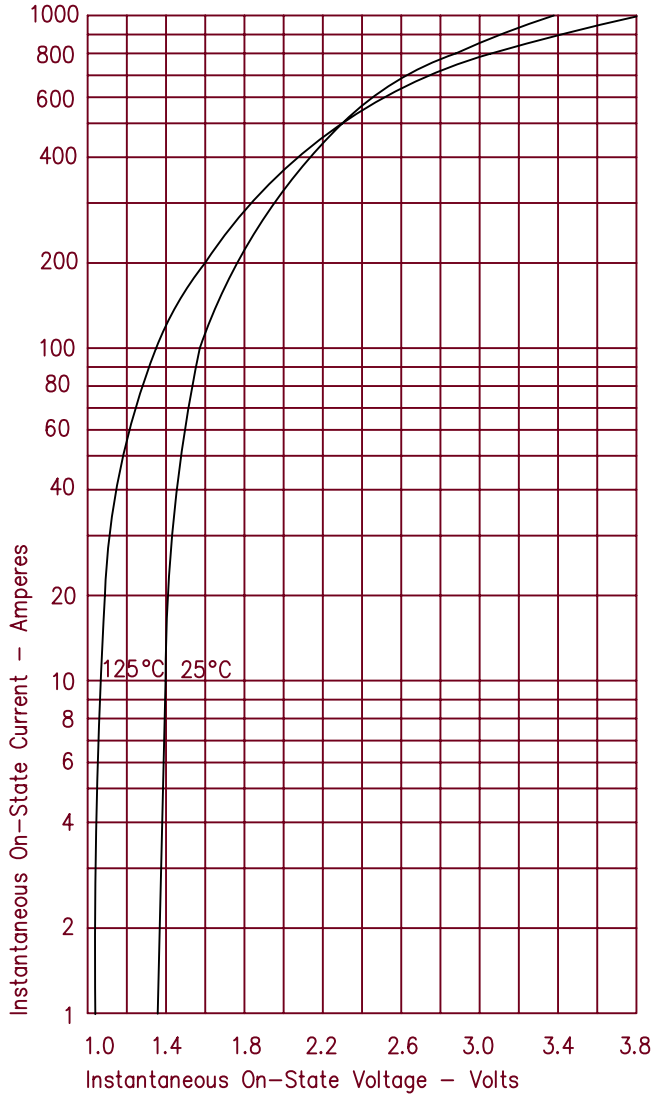


Figure 3  
Maximum Power Dissipation

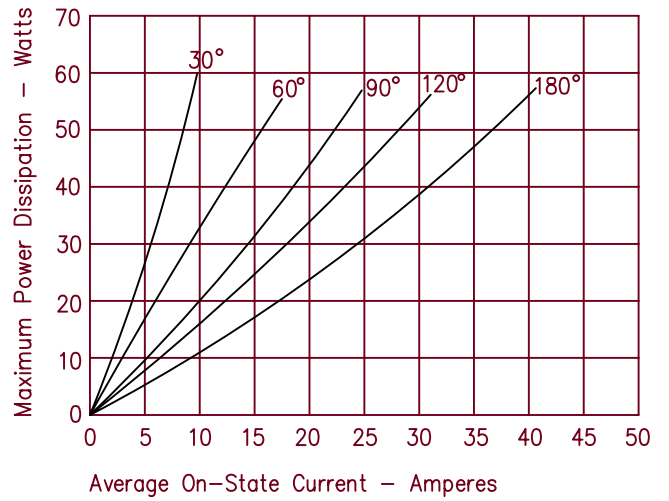


Figure 4  
Transient Thermal Impedance

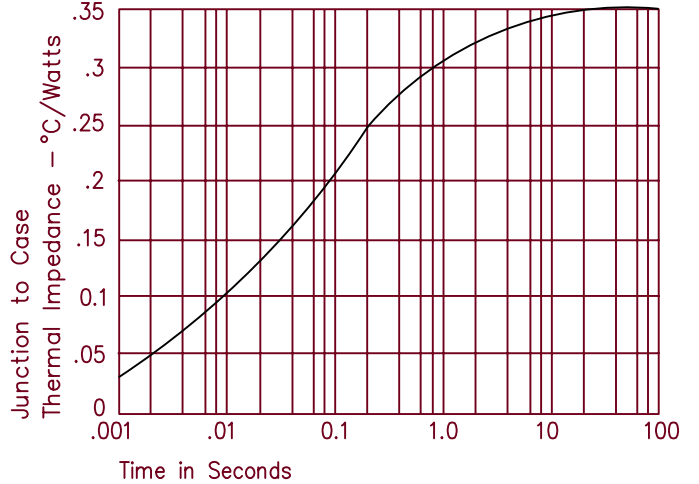


Figure 2  
Forward Current Derating

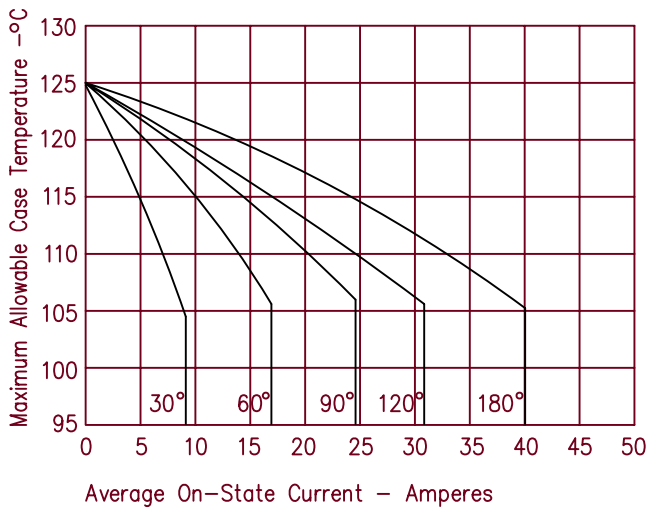


Figure 5  
Maximum Nonrepetitive Surge Current

