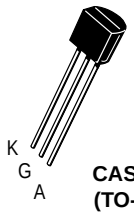
Silicon Controlled Rectifiers

. . . designed and tested for repetitive peak operation required for CD ignition, fuel ignitors, flash circuits, motor controls and low-power switching applications.

- 150 Amperes for 2 µs Safe Area
- High dv/dt
- Very Low Forward “On” Voltage at High Current
- Low-Cost TO-226AA (TO-92)

MCR22-2 thru MCR22-8

SCRs
1.5 AMPERES RMS
50 thru 600 VOLTS



CASE 29-04
(TO-226AA)
STYLE 10

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage (R_{GK} = IK, T_J = 25 to 125°C) MCR22-2 MCR22-3 MCR22-4 MCR22-6 MCR22-8	V_{DRM}, V_{RRM}	 50 100 200 400 600	Volts
On-State Current RMS (All Conduction Angles)	$I_{T(RMS)}$	1.5	Amps
Peak Non-repetitive Surge Current, T_A = 25°C (1/2 Cycle, Sine Wave, 60 Hz)	I_{TSM}	15	Amps
Circuit Fusing Considerations (t = 8.3 ms)	I^2t	0.9	A^2s
Peak Gate Power, T_A = 25°C	P_{GM}	0.5	Watt
Average Gate Power, T_A = 25°C	$P_{G(AV)}$	0.1	Watt
Peak Forward Gate Current, T_A = 25°C (300 µs, 120 PPS)	I_{FGM}	0.2	Amp
Peak Reverse Gate Voltage	V_{RGM}	5	Volts
Operating Junction Temperature Range @ Rated V_{RRM} and V_{DRM}	T_J	–40 to +125	°C
Storage Temperature Range	T_{stg}	–40 to +150	°C
Lead Solder Temperature (Lead Length ⩾ 1/16″ from case, 10 s Max)	—	+230	°C

1. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	50	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	160	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted. R_{GK} = 1000 Ohms.)

Characteristic		Symbol	Min	Typ	Max	Unit
Peak Forward or Reverse Blocking Current (V_{AK} = Rated V_{DRM} or V_{RRM})	T_C = 25°C T_C = 125°C	I_{DRM}, I_{RRM}	— —	— —	10 200	μA μA
Forward "On" Voltage (I_{TM} = 1 A Peak)		V_{TM}	—	1.2	1.7	Volts
Gate Trigger Current (Continuous dc)(1) (Anode Voltage = 6 Vdc, R_L = 100 Ohms)	T_C = 25°C T_C = –40°C	I_{GT}	— —	30 —	200 500	μA
Gate Trigger Voltage (Continuous dc) (Anode Voltage = 7 Vdc, R_L = 100 Ohms) (Anode Voltage = Rated V_{DRM}, R_L = 100 Ohms)	T_C = 25°C T_C = –40°C T_C = 125°C	V_{GT} V_{GD}	— — 0.1	— — —	0.8 1.2 —	Volts
Holding Current (Anode Voltage = 12 Vdc)	T_C = 25°C T_C = –40°C	I_H	— —	2 —	5 10	mA
Forward Voltage Application Rate (T_C = 125°C)		dv/dt	—	25	—	V/μs

1. R_{GK} Current Not Included in Measurement.

CURRENT DERATING

FIGURE 1 — MAXIMUM CASE TEMPERATURE

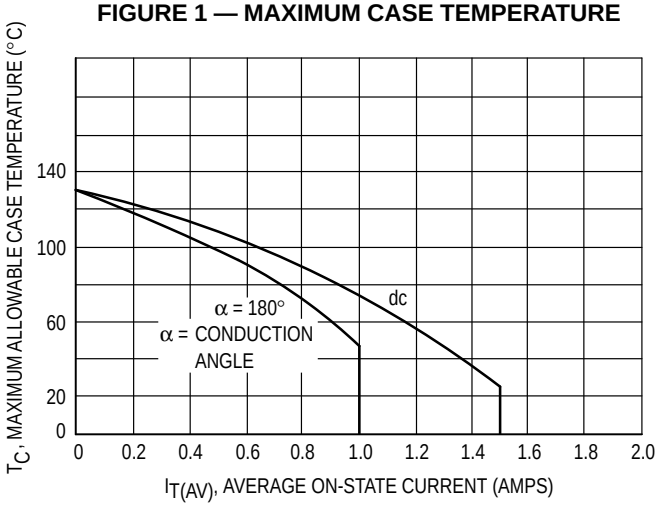


FIGURE 2 — MAXIMUM AMBIENT TEMPERATURE

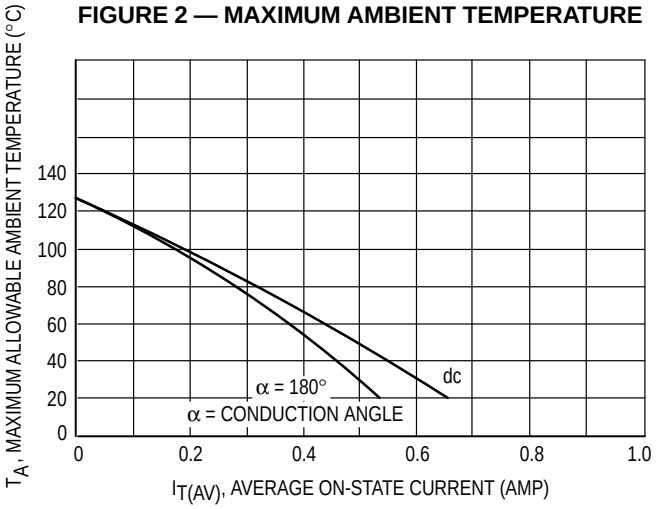


FIGURE 3 — TYPICAL FORWARD VOLTAGE

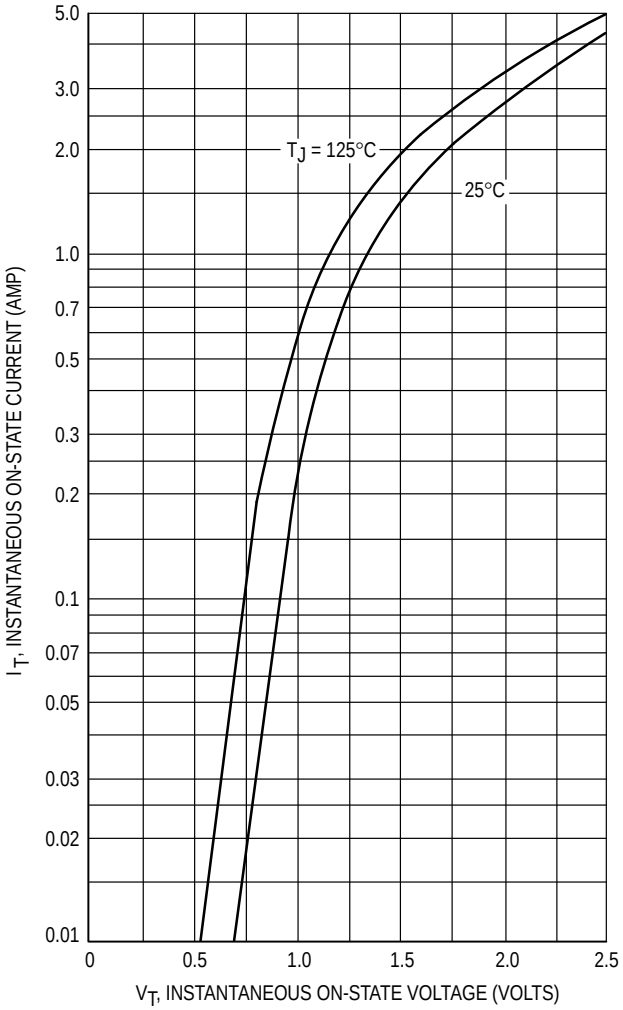
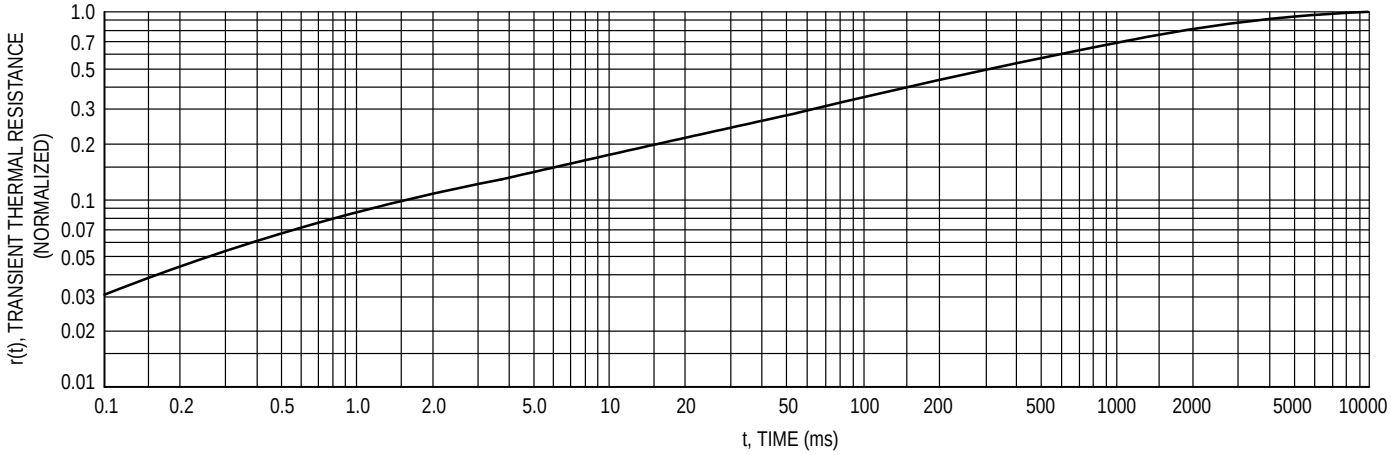


FIGURE 4 — THERMAL RESPONSE



TYPICAL CHARACTERISTICS

FIGURE 5 — GATE TRIGGER VOLTAGE

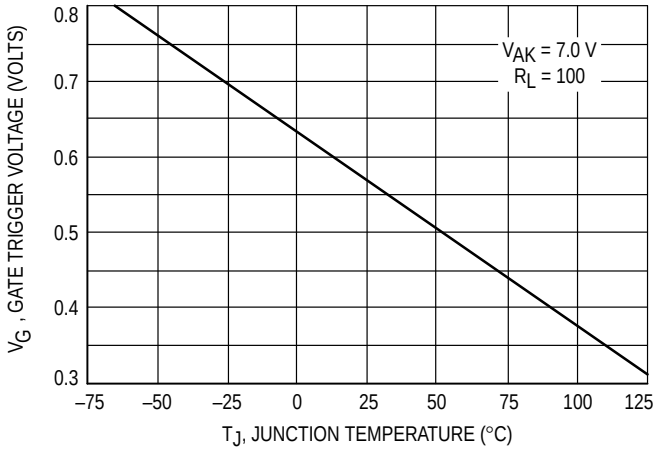


FIGURE 6 — TYPICAL GATE TRIGGER CURRENT

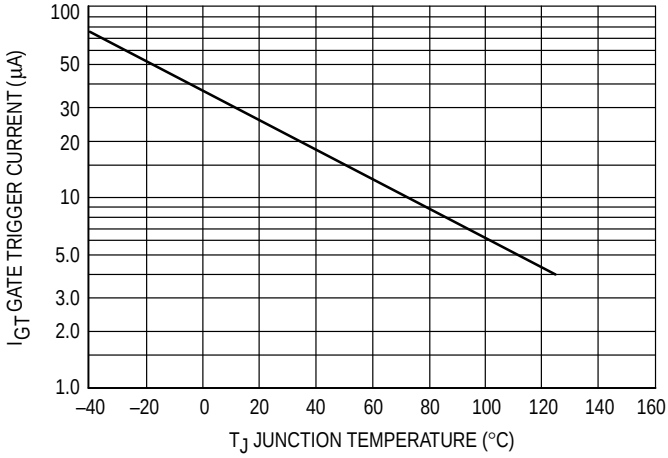


FIGURE 7 — HOLDING CURRENT

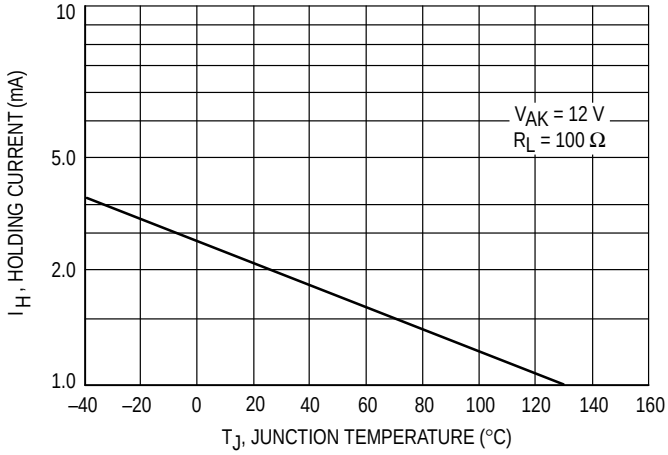
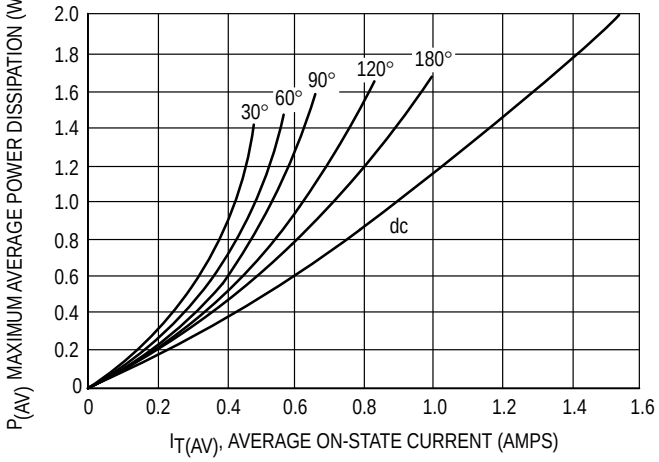
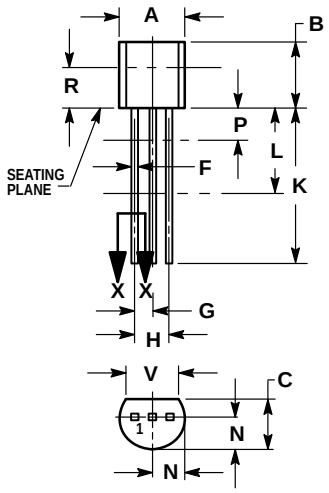


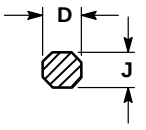
FIGURE 8 — POWER DISSIPATION



PACKAGE DIMENSIONS



STYLE 10:
PIN 1. CATHODE
2. GATE
3. ANODE



SECTION X–X

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	—	12.70	—
L	0.250	—	6.35	—
N	0.080	0.105	2.04	2.66
P	—	0.100	—	2.54
R	0.115	—	2.93	—
V	0.135	—	3.43	—

CASE 29-04
(TO–226AA)

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