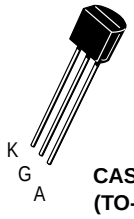
# Silicon Controlled Rectifiers

**MCR22-6**
**MCR22-8**

. . . 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)

**SCRs**
**1.5 AMPERES RMS**
**400 thru 600 VOLTS**


**CASE 29-11**
**(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) | MCR22-6<br>MCR22-8 | $V_{DRM}$, $V_{RRM}$ | <br>400<br>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<br>$T_C$ = 125°C | $I_{DRM}$, $I_{RRM}$ | —<br>— | —<br>— | 10<br>200 | μA<br>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<br>$T_C$ = –40°C | $I_{GT}$ | —<br>— | 30<br>— | 200<br>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<br>$T_C$ = –40°C<br>$T_C$ = 125°C | $V_{GT}$<br><br>$V_{GD}$ | —<br>—<br>0.1 | —<br>—<br>— | 0.8<br>1.2<br>— | Volts |
| Holding Current (Anode Voltage = 12 Vdc) | $T_C$ = 25°C<br>$T_C$ = –40°C | $I_H$ | —<br>— | 2<br>— | 5<br>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**

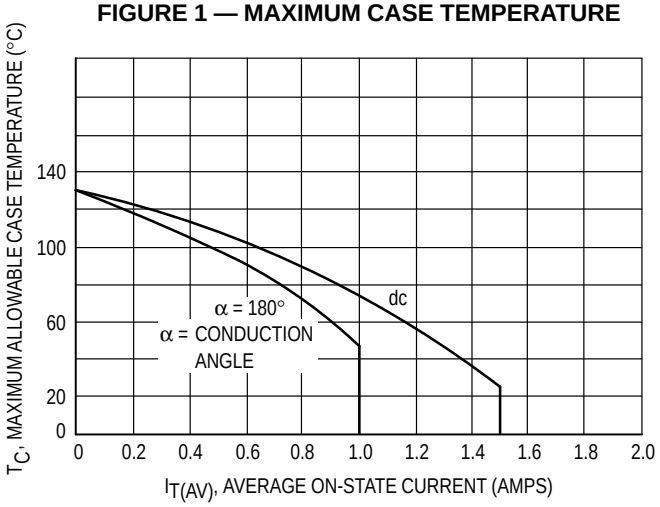



**FIGURE 2 — MAXIMUM AMBIENT TEMPERATURE**

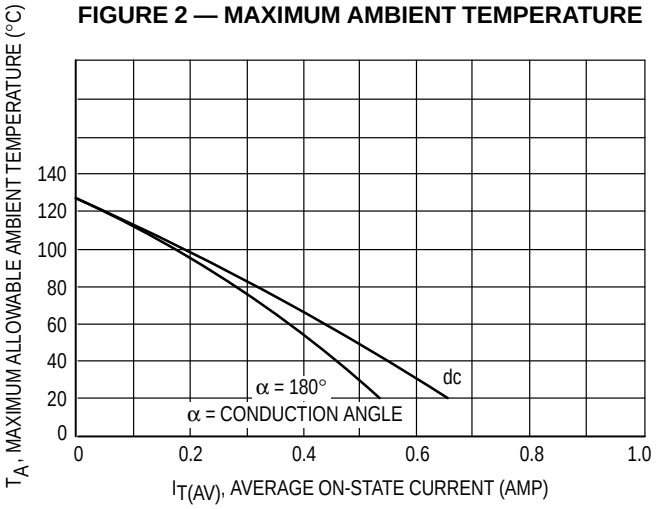


**FIGURE 3 — TYPICAL FORWARD VOLTAGE**

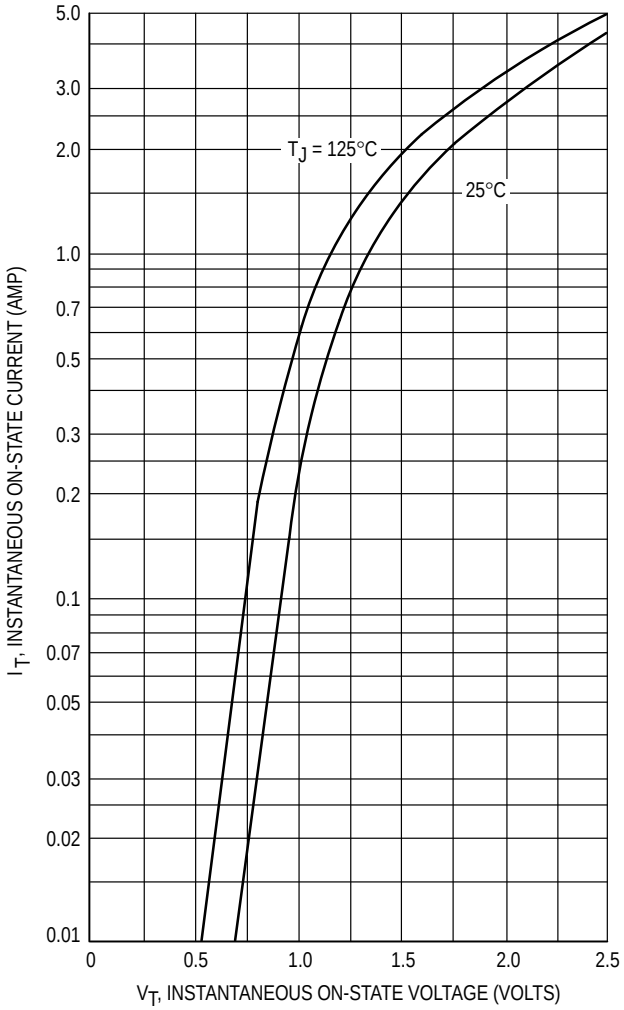
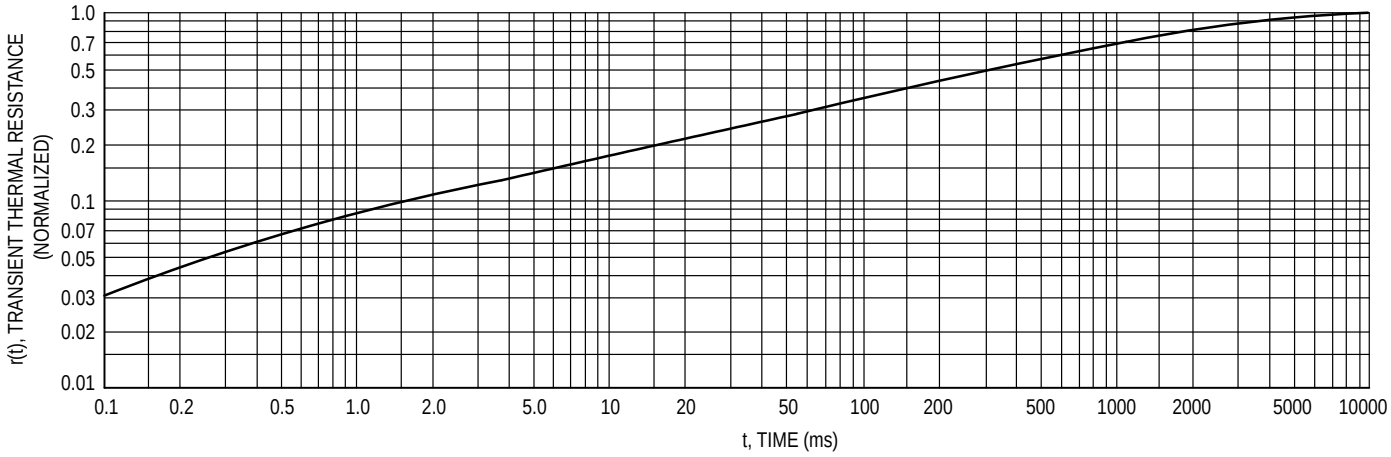
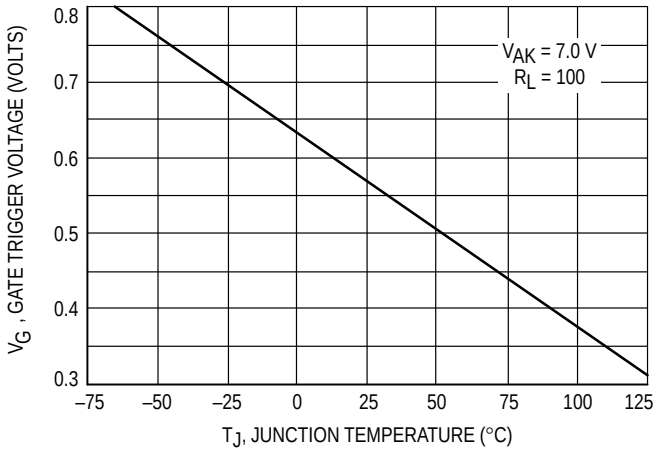



**FIGURE 4 — THERMAL RESPONSE**

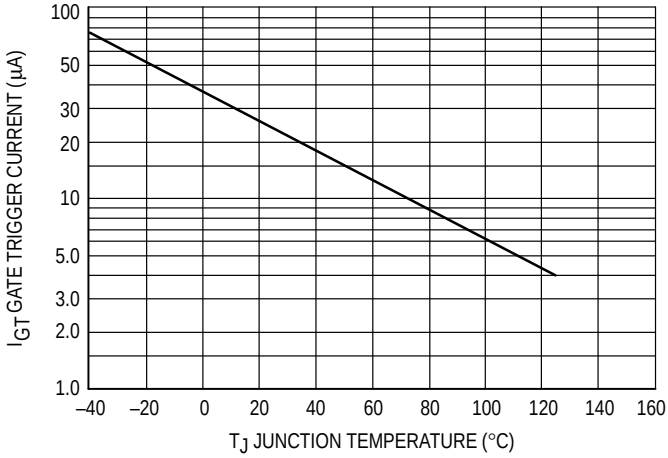


## TYPICAL CHARACTERISTICS

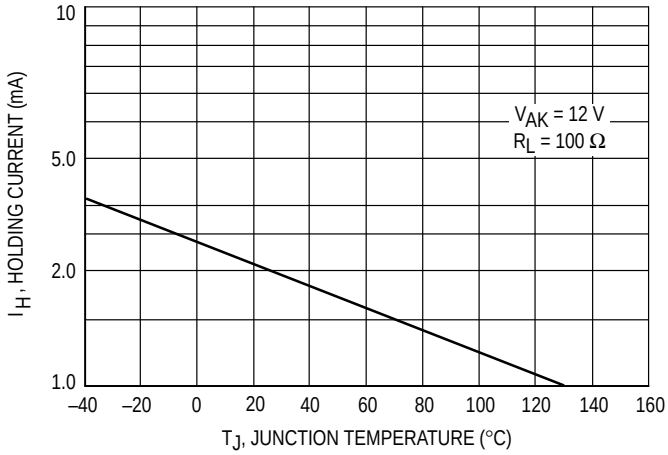
### FIGURE 5 — GATE TRIGGER VOLTAGE



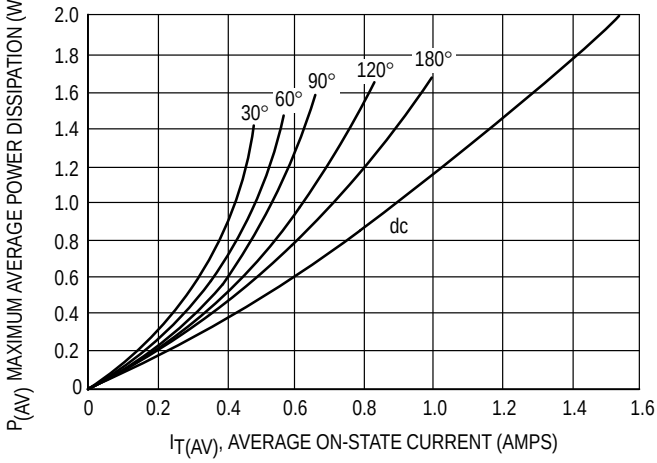

### FIGURE 6 — TYPICAL GATE TRIGGER CURRENT



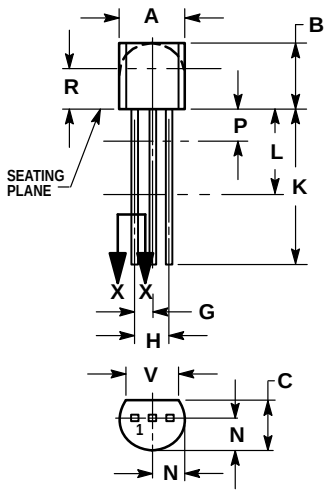

### FIGURE 7 — HOLDING CURRENT

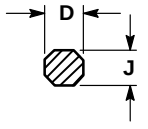



### FIGURE 8 — POWER DISSIPATION



## PACKAGE DIMENSIONS




SECTION X–X

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

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. 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 | 0.021 | 0.407 | 0.533 |
| 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 29-11**
**(TO-226AA)**
**ISSUE AJ**

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