

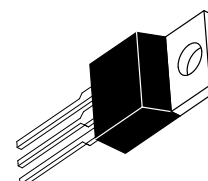
Silicon Controlled Rectifiers Reverse Blocking Triode Thyristors

... designed for industrial and consumer applications such as temperature, light and speed control; process and remote controls; warning systems; capacitive discharge circuits and MPU interface.

- Center Gate Geometry for Uniform Current Density
- All Diffused and Glass-Passivated Junctions for Parameter Uniformity and Stability
- Small, Rugged Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation and Durability
- Low Trigger Currents, 200 μ A Maximum for Direct Driving from Integrated Circuits

MCR72 Series

SCRs
8 AMPERES RMS
50 thru 800 VOLTS



CASE 221A-04
(TO-220AB)
STYLE 3

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted.)

| Rating | Symbol | Value | Unit |
|--|------------------------------|---------------------------------------|----------------------|
| Peak Repetitive Forward and Reverse Blocking Voltage ⁽¹⁾ ($T_J = -40$ to 110°C , 1/2 Sine Wave, $R_{GK} = 1\text{k}\Omega$) | V_{DRM} or V_{RRM} | 50 100 200 400 600 800 | Volts |
| On-State RMS Current ($T_C = 83^\circ\text{C}$) | $I_T(\text{RMS})$ | 8 | Amps |
| Peak Non-repetitive Surge Current (1/2 Cycle, 60 Hz, $T_J = -40$ to 110°C) | I_{TSM} | 100 | Amps |
| Circuit Fusing ($t = 8.3$ ms) | I^2t | 40 | A^2s |
| Peak Gate Voltage ($t \leq 10$ μs) | V_{GM} | ± 5 | Volts |
| Peak Gate Current ($t \leq 10$ μs) | I_{GM} | 1 | Amp |
| Peak Gate Power ($t \leq 10$ μs) | P_{GM} | 5 | Watts |
| Average Gate Power | $P_{G(AV)}$ | 0.75 | Watts |
| Operating Junction Temperature Range | T_J | -40 to +110 | $^\circ\text{C}$ |

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. (cont.)

MCR72 Series

MAXIMUM RATINGS — continued

| Rating | Symbol | Value | Unit |
|---------------------------|-----------|--------------|---------|
| Storage Temperature Range | T_{stg} | -40 to + 150 | °C |
| Mounting Torque | — | 8 | in. lb. |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|-----|------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 2.2 | °C/W |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 60 | °C/W |

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, $R_{GK} = 1\text{ k}\Omega$ unless otherwise noted.)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|--------------------|----------|----------|-----------|--------------------------------|
| Peak Forward or Reverse Blocking Current ⁽¹⁾ ($V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}$) $T_J = 25^\circ\text{C}$ $T_J = 110^\circ\text{C}$ | I_{DRM}, I_{RRM} | — — | — — | 10 500 | μA μA |
| On-State Voltage ($I_{TM} = 16\text{ A Peak}$, Pulse Width $\leq 1\text{ ms}$, Duty Cycle $\leq 2\%$) | V_{TM} | — | 1.7 | 2 | Volts |
| Gate Trigger Current (Continuous dc) ⁽²⁾ ($V_D = 12\text{ V}$, $R_L = 100\ \Omega$) | I_{GT} | — | 30 | 200 | μA |
| Gate Trigger Voltage (Continuous dc) ($V_D = 12\text{ V}$, $R_L = 100\ \Omega$) ($V_D = \text{Rated } V_{DRM}$, $R_L = 10\text{ k}\Omega$, $T_J = 110^\circ\text{C}$) | V_{GT} | — 0.1 | 0.5 — | 1.5 — | Volts |
| Holding Current ($V_D = 12\text{ V}$, $I_{TM} = 100\text{ mA}$) | I_H | — | — | 6 | mA |
| Critical Rate-of-Rise of Forward Blocking Voltage ($V_D = \text{Rated } V_{DRM}$, $T_J = 110^\circ\text{C}$, Exponential Waveform) | dv/dt | — | 10 | — | $\text{V}/\mu\text{s}$ |
| Gate Controlled Turn-On Time ($V_D = \text{Rated } V_{DRM}$, $I_{TM} = 16\text{ A}$, $I_G = 2\text{ mA}$) | t_{gt} | — | 1 | — | μs |

1. Ratings apply for negative gate voltage or $R_{GK} = 1\text{ k}\Omega$. Devices shall not have a positive gate voltage concurrently with a negative voltage on the anode. Devices should not be tested with a constant current source for forward and reverse blocking capability such that the voltage applied exceeds the rated blocking voltage.
2. Does not include R_{GK} current.

FIGURE 1 – AVERAGE CURRENT DERATING

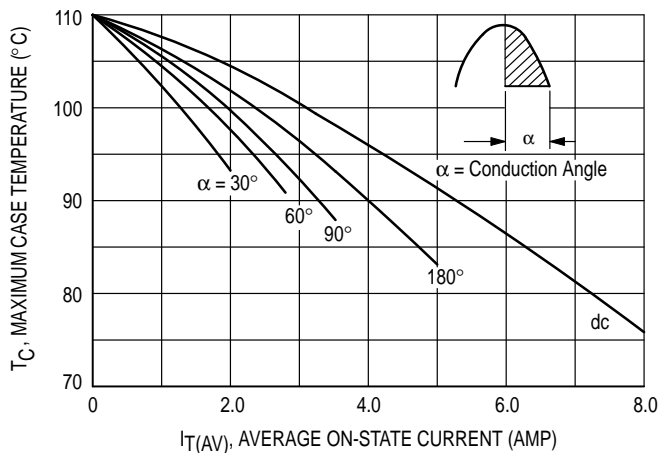


FIGURE 2 – ON-STATE POWER DISSIPATION

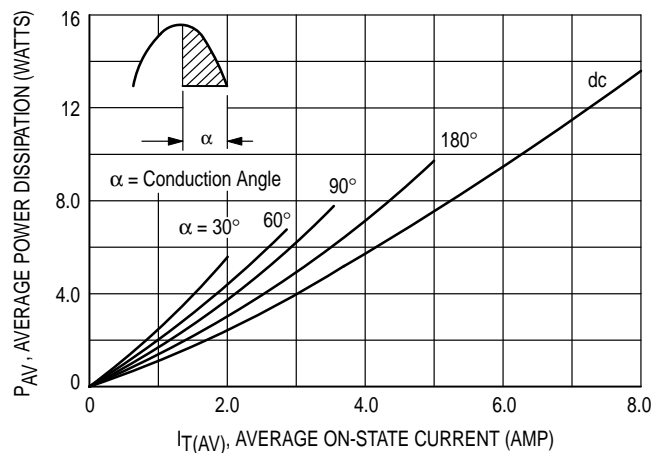


FIGURE 3 – NORMALIZED GATE CURRENT

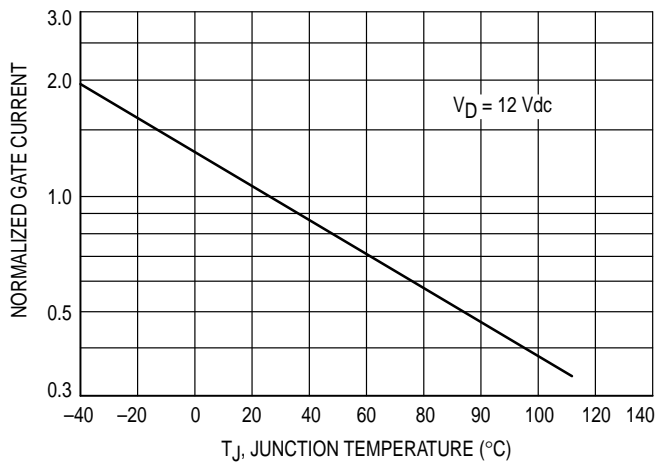
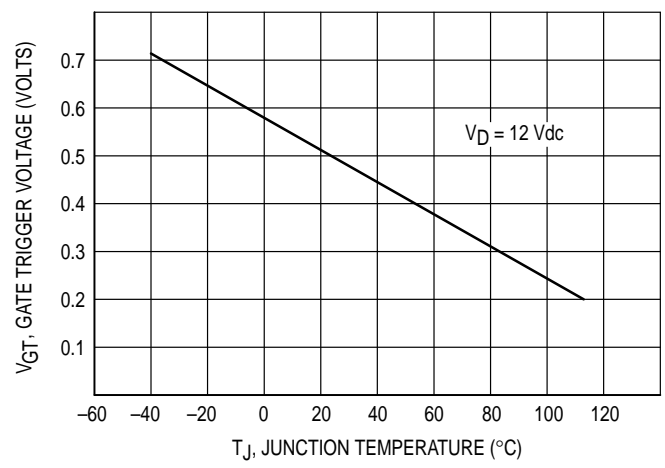
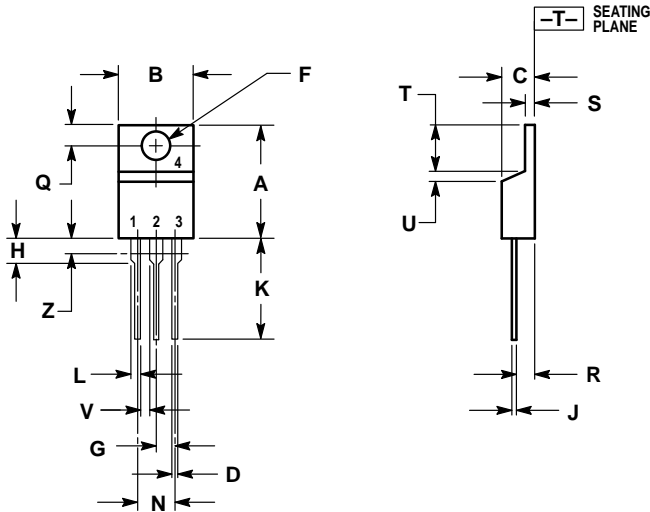


FIGURE 4 – GATE VOLTAGE



PACKAGE DIMENSIONS




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

- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.570 | 0.620 | 14.48 | 15.75 |
| B | 0.380 | 0.405 | 9.66 | 10.28 |
| C | 0.160 | 0.190 | 4.07 | 4.82 |
| D | 0.025 | 0.035 | 0.64 | 0.88 |
| F | 0.142 | 0.147 | 3.61 | 3.73 |
| G | 0.095 | 0.105 | 2.42 | 2.66 |
| H | 0.110 | 0.155 | 2.80 | 3.93 |
| J | 0.014 | 0.022 | 0.36 | 0.55 |
| K | 0.500 | 0.562 | 12.70 | 14.27 |
| L | 0.045 | 0.055 | 1.15 | 1.39 |
| N | 0.190 | 0.210 | 4.83 | 5.33 |
| Q | 0.100 | 0.120 | 2.54 | 3.04 |
| R | 0.080 | 0.110 | 2.04 | 2.79 |
| S | 0.045 | 0.055 | 1.15 | 1.39 |
| T | 0.235 | 0.255 | 5.97 | 6.47 |
| U | 0.000 | 0.050 | 0.00 | 1.27 |
| V | 0.045 | — | 1.15 | — |
| Z | — | 0.080 | — | 2.04 |

CASE 221A-04
 (TO-220AB)

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