

## Triacs

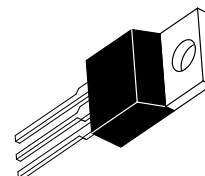
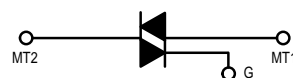
### Silicon Bidirectional Triode Thyristors

... designed primarily for industrial and consumer applications for full wave control of ac loads such as appliance controls, heater controls, motor controls, and other power switching applications.

- All Diffused and Glass-Passivated Junctions for Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal resistance and High Heat Dissipation
- Center Gate Geometry for Uniform Current Spreading
- Gate Triggering Guaranteed in Three Modes (MAC229 Series) or Four Modes (MAC229A Series)

## MAC229 Series MAC229A Series

TRIACs  
8 AMPERES RMS  
200 thru 800 VOLTS



CASE 221A-04  
(TO-220AB)  
STYLE 4

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

| Rating   | Symbol              | Value          | Unit                 |
|--|---------------------|----------------|----------------------|
| Peak Repetitive Off-State Voltage <sup>(1)</sup><br>( $T_J = -40$ to $110^\circ\text{C}$<br>1/2 Sine ave 50 to 60 Hz, Gate Open) | $V_{\text{DRM}}$    |                | Volts                |
| MAC229-4, MAC229A4   |                     | 200            |                      |
| MAC229-6, MAC229A6   |                     | 400            |                      |
| MAC229-8, MAC229A8   |                     | 600            |                      |
| MAC229-10, MAC229A10   |                     | 800            |                      |
| On-State RMS Current ( $T_C = 80^\circ\text{C}$ )<br>Full Cycle Sine Wave 50 to 60 Hz  | $I_{\text{T(RMS)}}$ | 8              | Amps                 |
| Peak Non-repetitive Surge Current<br>(One Full Cycle 60 Hz, $T_J = 110^\circ\text{C}$ )  | $I_{\text{TSM}}$    | 80             | Amps                 |
| Circuit Fusing<br>( $t = 8.3$ ms)  | $I^2t$              | 26             | $\text{A}^2\text{s}$ |
| Peak Gate Current ( $t \leq 2$ $\mu\text{s}$ )   | $I_{\text{GM}}$     | $\pm 2$        | Amps                 |
| Peak Gate Voltage ( $t \leq 2$ $\mu\text{s}$ )   | $V_{\text{GM}}$     | $\pm 10$       | Volts                |
| Peak Gate Power ( $t \leq 2$ $\mu\text{s}$ )   | $P_{\text{GM}}$     | 20             | Watts                |
| Average Gate Power<br>( $T_C = 80^\circ\text{C}$ , $t \leq 8.3$ ms)  | $P_{\text{G(AV)}}$  | 0.5            | Watts                |
| Operating Junction Temperature Range   | $T_J$               | $-40$ to $110$ | $^\circ\text{C}$     |
| Storage Temperature Range  | $T_{\text{stg}}$    | $-40$ to $150$ | $^\circ\text{C}$     |
| Mounting Torque  |                     | 8              | in. lb.              |

1.  $V_{\text{DRM}}$  for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded. (cont.)

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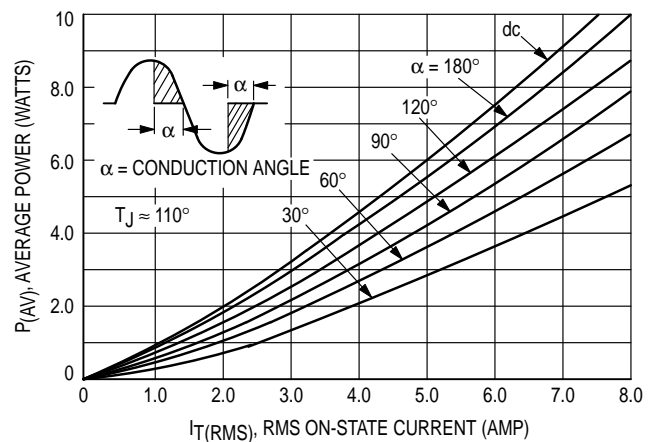
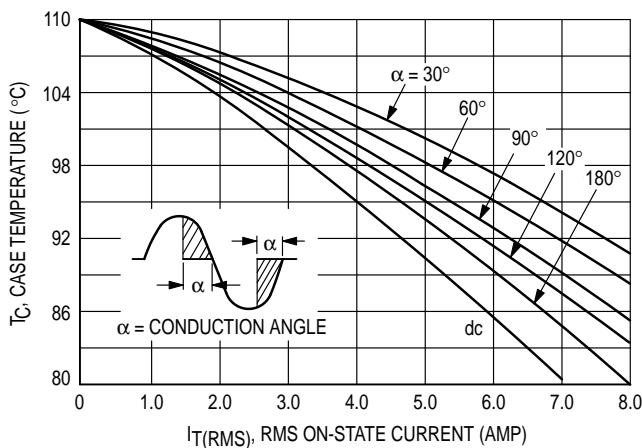
### THERMAL CHARACTERISTICS

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

### ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}C$ and either polarity of MT2 to MT1 voltage unless otherwise noted.)

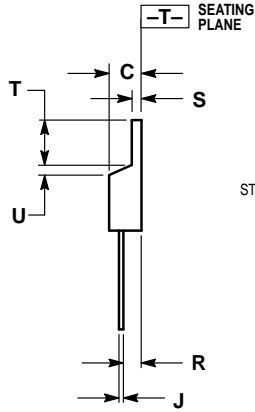
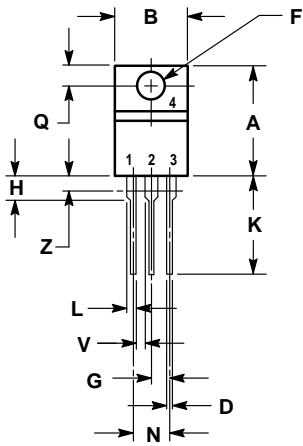
| Characteristic  | Symbol     | Min    | Typ    | Max      | Unit          |
|---|------------|--------|--------|----------|---------------|
| Peak Blocking Current <sup>(1)</sup><br>( $V_D = \text{Rated } V_{DRM}$ , Gate Open) $T_J = 25^{\circ}C$<br>$T_J = 110^{\circ}C$  | $I_{DRM}$  | —      | —      | 10<br>2  | $\mu A$<br>mA |
| Peak On-State Voltage<br>( $I_{TM} = 11 \text{ A Peak}$ , Pulse Width $\leq 2 \text{ ms}$ , Duty Cycle $\leq 2\%$ )   | $V_{TM}$   | —      | —      | 1.8      | Volts         |
| Gate Trigger Current (Continuous dc)<br>( $V_D = 12 \text{ V}$ , $R_L = 100 \Omega$ )<br>MT2(+), G(+); MT2(+), G(-); MT2(-), G(-)<br>MT2(-), G(+) "A" SUFFIX ONLY   | $I_{GT}$   | —      | —      | 10<br>15 | mA            |
| Gate Trigger Voltage (Continuous dc)<br>( $V_D = 12 \text{ V}$ , $R_L = 100 \Omega$ )<br>MT2(+), G(+); MT2(+), G(-); MT2(-), G(-)<br>MT2(-), G(+) "A" SUFFIX ONLY<br>( $V_D = \text{Rated } V_{DRM}$ , $T_C = 110^{\circ}C$ , $R_L = 10 \text{ k}$ )<br>MT2(+), G(+); MT2(+), G(-); MT2(-), G(-);<br>MT2(-), G(+) "A" SUFFIX ONLY | $V_{GT}$   | —<br>— | —<br>— | 2<br>2.5 | Volts         |
| Holding Current<br>( $V_D = 12 \text{ Vdc}$ , $I_{TM} = 200 \text{ mA}$ , Gate Open)  | $I_H$      | —      | —      | 15       | mA            |
| Gate-Controlled Turn-On Time<br>( $V_D = \text{Rated } V_{DRM}$ , $I_{TM} = 16 \text{ A Peak}$ , $I_G = 30 \text{ mA}$ )  | $t_{gt}$   | —      | 1.5    | —        | $\mu s$       |
| Critical Rate of Rise of Off-State Voltage<br>( $V_D = \text{Rated } V_{DRM}$ , Exponential Waveform, $T_C = 110^{\circ}C$ )  | $dv/dt$    | —      | 25     | —        | $V/\mu s$     |
| Critical Rate of Rise of Commutation Voltage<br>( $V_D = \text{Rated } V_{DRM}$ , $I_{TM} = 11.3 \text{ A}$ ,<br>Commutating $di/dt = 4.1 \text{ A/ms}$ , Gate Unenergized, $T_C = 80^{\circ}C$ )   | $dv/dt(c)$ | —      | 5      | —        | $V/\mu s$     |

1. Ratings apply for open gate conditions. Devices shall not be tested with a constant current source for blocking voltage such that the voltage applied exceeds the rated blocking voltage.



**MAC229 Series MAC229A Series**

**PACKAGE DIMENSIONS**




STYLE 4:  
 PIN 1. MAIN TERMINAL 1  
 2. MAIN TERMINAL 2  
 3. GATE  
 4. MAIN TERMINAL 2

- 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  | 0.065 | 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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MAC229/D

