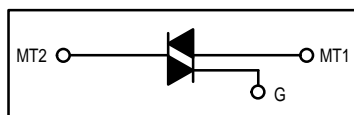


## Triacs

### Silicon Bidirectional Thyristors

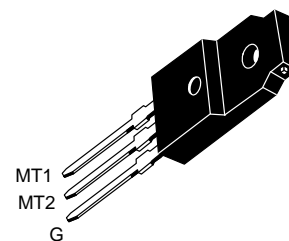
... designed primarily for full-wave ac control applications, such as solid-state relays, motor controls, heating controls and power supplies; or wherever full-wave silicon gate controlled solid-state devices are needed. Triac type thyristors switch from a blocking to a conducting state for either polarity of applied anode voltage with positive or negative gate triggering.

- Blocking Voltage to 800 Volts
- All Diffused and Glass Passivated Junctions for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation and Durability
- Gate Triggering Guaranteed in Four Modes



**MAC320A8FP**

**ISOLATED TRIACs  
THYRISTORS  
20 AMPERES RMS  
600 VOLTS**



**CASE 221C-02  
STYLE 3**

#### MAXIMUM RATINGS (T<sub>C</sub> = 25°C unless otherwise noted.)

| Rating  | Symbol              | Value       | Unit  |
|---|---------------------|-------------|-------|
| Peak Repetitive Off-State Voltage <sup>(1)</sup> (T <sub>J</sub> = -40 to +125°C, 1/2 Sine Wave 50 to 60 Hz, Gate Open)<br>MAC320A8FP | V <sub>DRM</sub>    | 600         | Volts |
| Peak Gate Voltage   | V <sub>GM</sub>     | 10          | Volts |
| On-State RMS Current (T <sub>C</sub> = +75°C, Full Cycle Sine Wave 50 to 60 Hz) <sup>(2)</sup>  | I <sub>T(RMS)</sub> | 20          | Amps  |
| Peak Nonrepetitive Surge Current (One Full Cycle, 60 Hz, T <sub>C</sub> = +75°C, preceded and followed by rated current)              | I <sub>TSM</sub>    | 150         | Amps  |
| Peak Gate Power (T <sub>C</sub> = +75°C, Pulse Width = 2 μs)  | P <sub>GM</sub>     | 20          | Watts |
| Average Gate Power (T <sub>C</sub> = +75°C, t = 8.3 ms)   | P <sub>G(AV)</sub>  | 0.5         | Watt  |
| Peak Gate Current   | I <sub>GM</sub>     | 2           | Amps  |
| RMS Isolation Voltage (T <sub>A</sub> = 25°C, Relative Humidity ≤ 20%)  | V <sub>(ISO)</sub>  | 1500        | Volts |
| Operating Junction Temperature  | T <sub>J</sub>      | -40 to +125 | °C    |
| Storage Temperature Range   | T <sub>stg</sub>    | -40 to +150 | °C    |

#### THERMAL CHARACTERISTICS

| Characteristic                          | Symbol           | Max       | Unit |
|---|------------------|-----------|------|
| Thermal Resistance, Junction to Case    | R <sub>θJC</sub> | 1.8       | °C/W |
| Thermal Resistance, Case to Sink        | R <sub>θCS</sub> | 2.2 (typ) | °C/W |
| Thermal Resistance, Junction to Ambient | R <sub>θJA</sub> | 60        | °C/W |

1. V<sub>DRM</sub> 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.
2. The case temperature reference point for all T<sub>C</sub> measurements is a point on the center lead of the package as close as possible to the plastic body.

# MAC320A8FP

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted.)

| Characteristic   | Symbol           | Min                            | Typ                                | Max                          | Unit     |
|--|------------------|--------------------------------|------------------------------------|------------------------------|----------|
| Peak Blocking Current<br>(V <sub>D</sub> = Rated V <sub>DRM</sub> , Gate Open) T <sub>J</sub> = 25°C<br>T <sub>J</sub> = +125°C  | I <sub>DRM</sub> | —<br>—                         | —<br>—                             | 10<br>2                      | μA<br>mA |
| Peak On-State Voltage (Either Direction)<br>(I <sub>TM</sub> = 28 A Peak; Pulse Width = 1 to 2 ms, Duty Cycle ≤ 2%)  | V <sub>TM</sub>  | —                              | 1.4                                | 1.7                          | Volts    |
| Peak Gate Trigger Current<br>(Main Terminal Voltage = 12 Vdc, R <sub>L</sub> = 100 Ohms<br>Minimum Gate Pulse Width = 2 μs)<br>MT2(+), G(+)<br>MT2(+), G(-)<br>MT2(-), G(-)<br>MT2(-), G(+)  | I <sub>GT</sub>  | —<br>—<br>—<br>—               | —<br>—<br>—<br>—                   | 50<br>50<br>50<br>75         | mA       |
| Peak Gate Trigger Voltage<br>(Main Terminal Voltage = 12 Vdc, R <sub>L</sub> = 100 Ohms<br>Minimum Gate Pulse Width = 2 μs)<br>MT2(+), G(+)<br>MT2(+), G(-)<br>MT2(-), G(-)<br>MT2(-), G(+)<br>(Main Terminal Voltage = Rated V <sub>DRM</sub> , R <sub>L</sub> = 10, T <sub>J</sub> = +110°C)<br>MT2(+), G(+); MT2(+), G(-)<br>MT2(-), G(-); MT2(-), G(+) | V <sub>GT</sub>  | —<br>—<br>—<br>—<br>0.2<br>0.2 | 0.9<br>0.9<br>1.1<br>1.4<br>—<br>— | 2<br>2<br>2<br>2.5<br>—<br>— | Volts    |
| Holding Current (Either Direction)<br>(Main Terminal Voltage = 12 Vdc, Gate Open,<br>Initiating Current = 200 mA)  | I <sub>H</sub>   | —                              | 6                                  | 40                           | mA       |
| Turn-On Time<br>(V <sub>D</sub> = Rated V <sub>DRM</sub> , I <sub>TM</sub> = 28 A, I <sub>GT</sub> = 120 mA,<br>Rise Time = 0.1 μs, Pulse Width = 2 μs)  | t <sub>gt</sub>  | —                              | 1.5                                | 10                           | μs       |
| Critical Rate of Rise of Commutation Voltage<br>(V <sub>D</sub> = Rated V <sub>DRM</sub> , I <sub>TM</sub> = 28 A, Commutating di/dt = 10 A/ms,<br>Gate Unenergized, T <sub>C</sub> = +75°C)   | dv/dt(c)         | —                              | 5                                  | —                            | V/μs     |

### TYPICAL CHARACTERISTICS

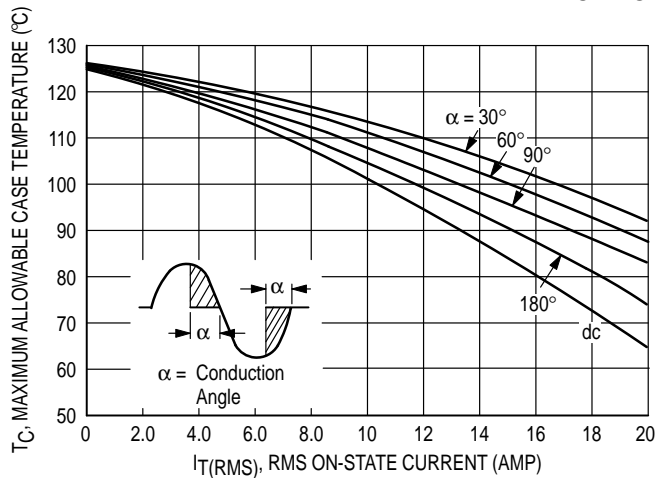


Figure 1. RMS Current Derating

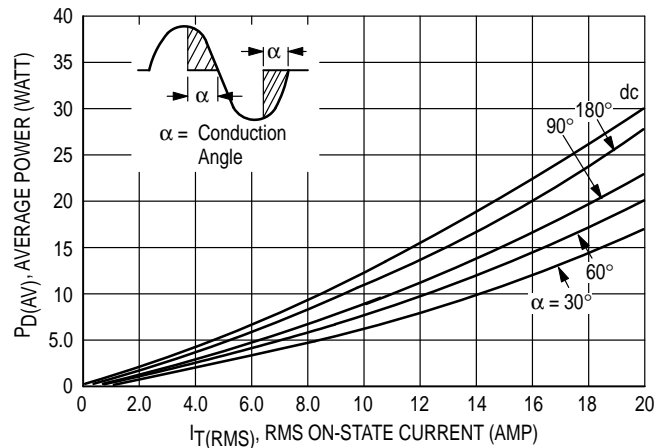


Figure 2. On-State Power Dissipation

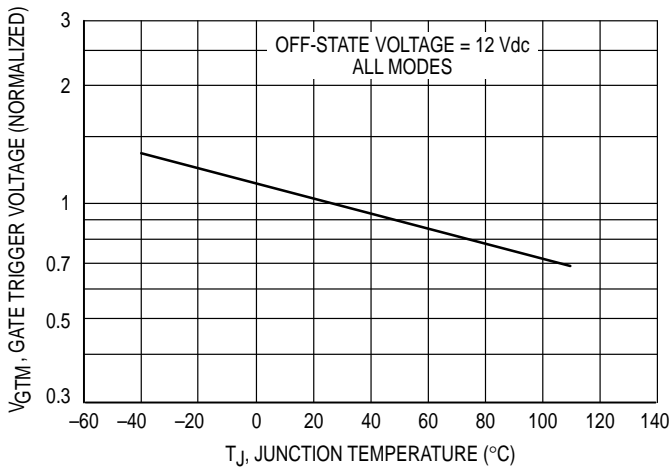


Figure 3. Typical Gate Trigger Voltage

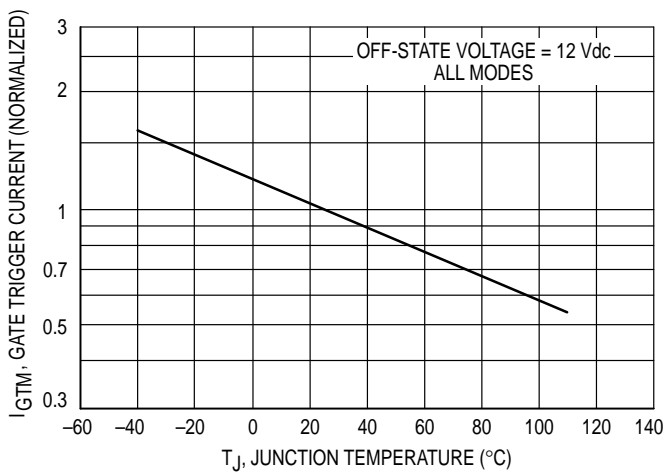


Figure 4. Typical Gate Trigger Current

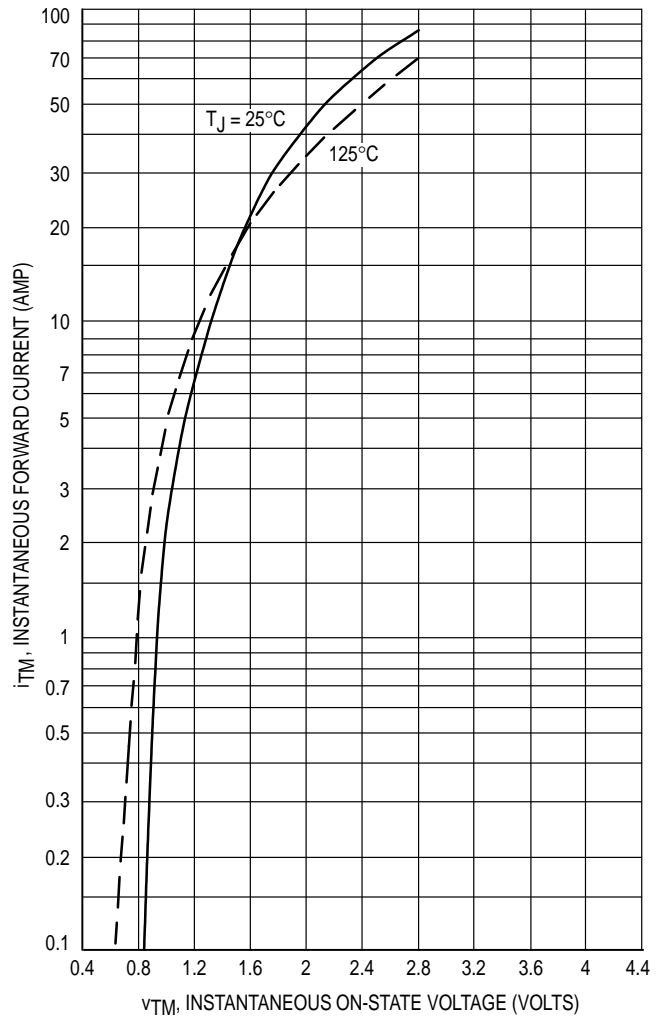


Figure 5. Maximum On-State Characteristics

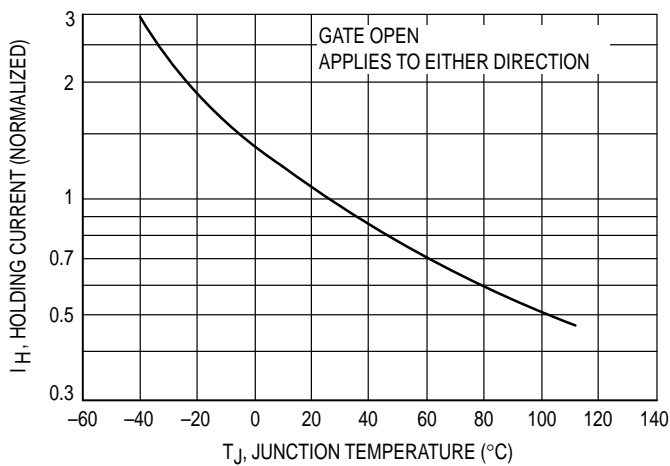


Figure 6. Typical Holding Current

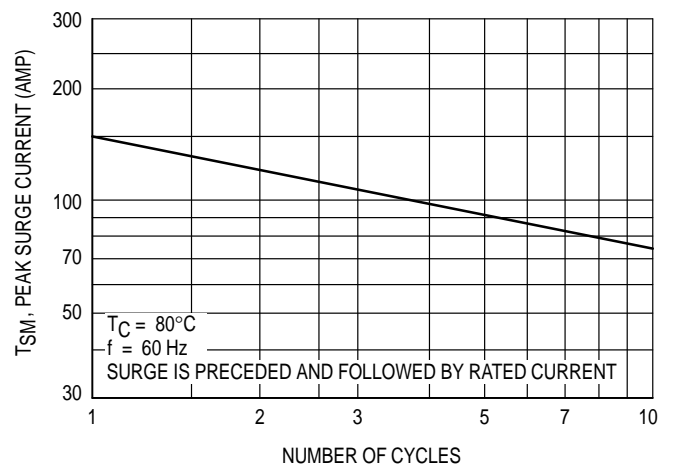


Figure 7. Maximum Nonrepetitive Surge Current

# MAC320A8FP

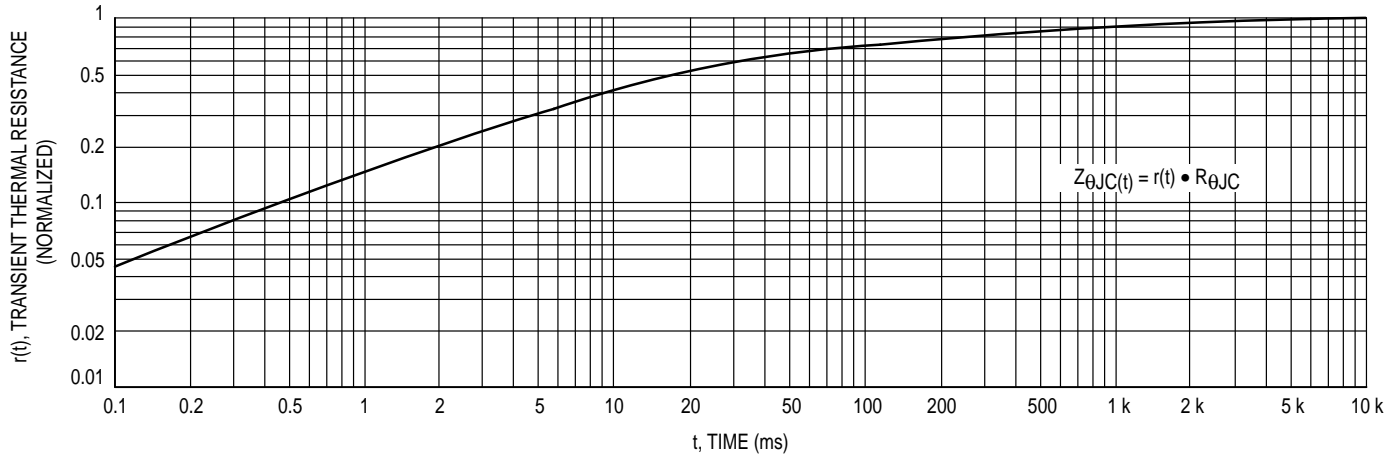
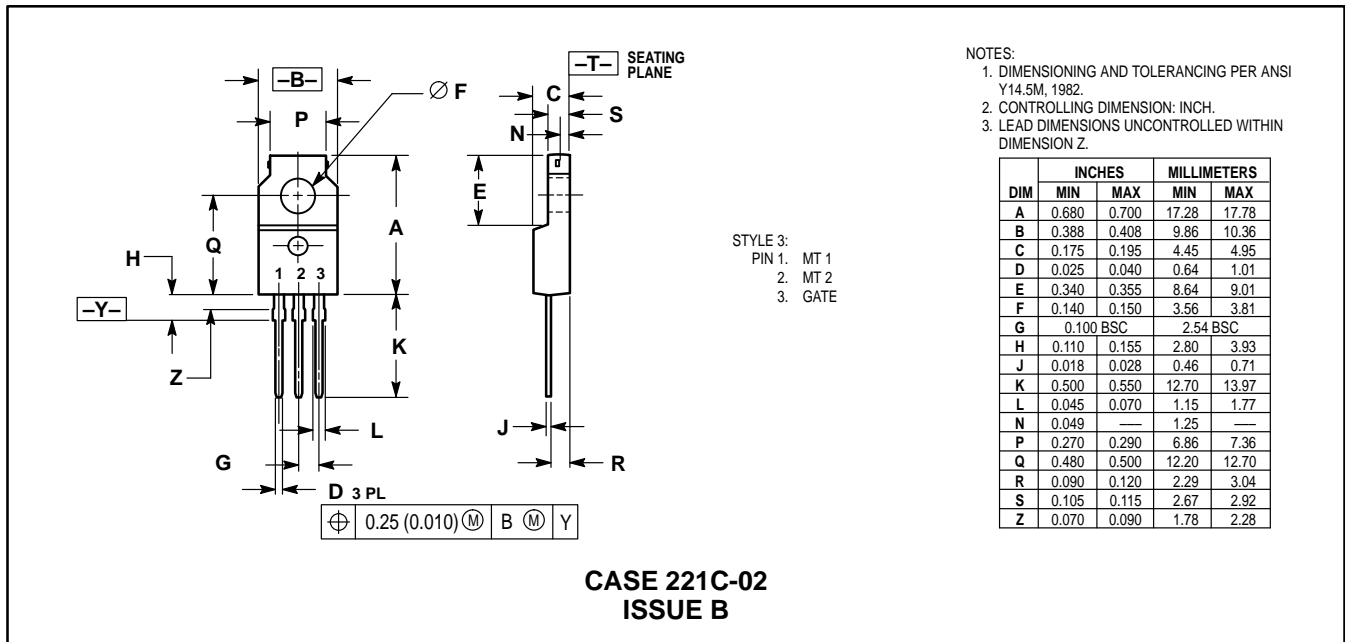


Figure 8. Thermal Response

## PACKAGE DIMENSIONS



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