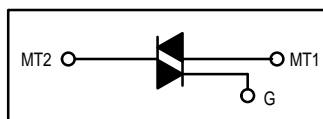


Triacs

Silicon Bidirectional Triode Thyristors

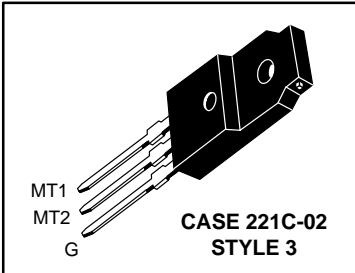
... designed primarily for full-wave ac control applications, such as lighting systems, heater controls, motor controls and power supplies; or wherever full-wave silicon-gate-controlled devices are needed.

- Off-State Voltages to 800 Volts
- All Diffused and Glass Passivated Junctions for Parameter Uniformity and Stability
- Small, Rugged Thermowatt Construction for Thermal Resistance and High Heat Dissipation
- Gate Triggering Guaranteed in Four Modes



MAC223AFP Series

**ISOLATED TRIACs
THYRISTORS
25 AMPERES RMS
400 thru 800 VOLTS**



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

| Rating | Symbol | Value | Unit |
|---|---------------------|-------------------|------------------|
| Peak Repetitive Off-State Voltage ⁽¹⁾ (T _J = -40 to +125°C, 1/2 Sine Wave 50 to 60 Hz, Gate Open) | V _{DRM} | 400 600 800 | Volts |
| On-State RMS Current (T _C = +80°C) Full Cycle Sine Wave 50 to 60 Hz ⁽²⁾ | I _{T(RMS)} | 25 | Amps |
| Peak Nonrepetitive Surge Current (One Full Cycle, 60 Hz, T _C = 80°C, preceded and followed by rated current) | I _{TSM} | 250 | Amps |
| Circuit Fusing (t = 8.3 ms) | I ² t | 260 | A ² s |
| Peak Gate Power (t ≤ 2 μs) | P _{GM} | 20 | Watts |
| Average Gate Power (T _C = +80°C, t ≤ 8.3 ms) | P _{G(AV)} | 0.5 | Watt |
| Peak Gate Current (t ≤ 2 μs) | I _{GM} | 2 | Amps |
| Peak Gate Voltage (t ≤ 2 μs) | V _{GM} | ± 10 | Volts |
| RMS Isolation Voltage (T _A = 25°C, Relative Humidity ≤ 20%) | V _(ISO) | 1500 | Volts |
| Operating Junction Temperature | T _J | -40 to +125 | °C |
| Storage Temperature Range | T _{stg} | -40 to +150 | °C |
| Mounting Torque | — | 8 | in. lb. |

1. V_{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.
2. The case temperature reference point for all T_C measurements is a point on the center lead of the package as close as possible to the plastic body.

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|------------------|-----|------|
| Thermal Resistance, Junction to Case | R _{θJC} | 1.2 | °C/W |
| Thermal Resistance, Case to Sink | R _{θCS} | 2.2 | °C/W |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 60 | °C/W |

MAC223AFP Series

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|------------|-----|--------------------------|---------------|------------------------|
| Peak Blocking Current(1) ($V_D = \text{Rated } V_{DRM}$, Gate Open) | I_{DRM} | — | — | 10 | μA mA |
| Peak On-State Voltage ($I_{TM} = 35 \text{ A Peak}$, Pulse Width $\leq 2 \text{ ms}$, Duty Cycle $\leq 2\%$) | V_{TM} | — | 1.4 | 1.85 | Volts |
| Gate Trigger Current (Continuous dc) ($V_D = 12 \text{ V}$, $R_L = 100 \Omega$) MT2(+), G(+); MT2(-), G(-); MT2(+), G(-) MT2(-), G(+) | I_{GT} | — | 20 | 50 | mA |
| Gate Trigger Voltage (Continuous dc) ($V_D = 12 \text{ V}$, $R_L = 100 \Omega$) MT2(+), G(+); MT2(-), G(-); MT2(+), G(-) MT2(-), G(+) ($V_D = \text{Rated } V_{DRM}$, $T_J = 125^\circ\text{C}$, $R_L = 10 \text{ k}$) MT(+), G(+); MT2(-), G(-); MT2(+), G(-) MT2(-), G(+) | V_{GT} | — | 1.1 1.3 0.2 0.2 | 2 2.5 — | Volts |
| Holding Current ($V_D = 12 \text{ V}$, $I_{TM} = 200 \text{ mA}$, Gate Open) | I_H | — | 10 | 50 | mA |
| Gate Controlled Turn-On Time ($V_D = \text{Rated } V_{DRM}$, $I_{TM} = 35 \text{ A Peak}$, $I_G = 200 \text{ mA}$) | t_{gt} | — | 1.5 | — | μs |
| Critical Rate of Rise of Off-State Voltage ($V_D = \text{Rated } V_{DRM}$, Exponential Waveform, $T_C = 125^\circ\text{C}$) | dv/dt | — | 40 | — | $\text{V}/\mu\text{s}$ |
| Critical Rate of Rise of Commutation Voltage ($V_D = \text{Rated } V_{DRM}$, $I_{TM} = 35 \text{ A Peak}$, Commutating $di/dt = 12.6 \text{ A/ms}$, Gate Unenergized, $T_C = 80^\circ\text{C}$) | $dv/dt(c)$ | — | 5 | — | $\text{V}/\mu\text{s}$ |

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.

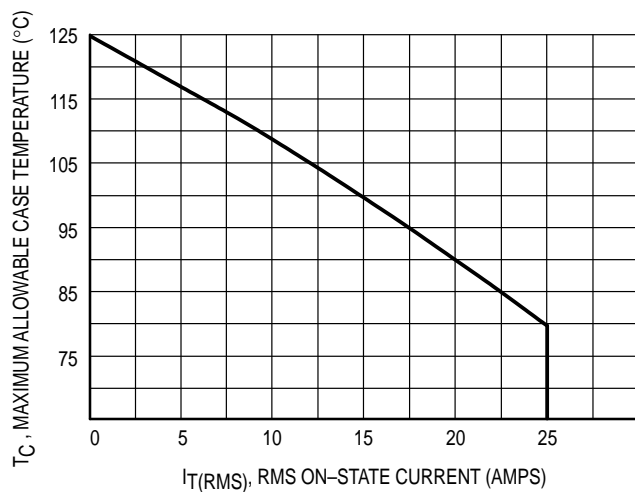


Figure 1. RMS Current Derating

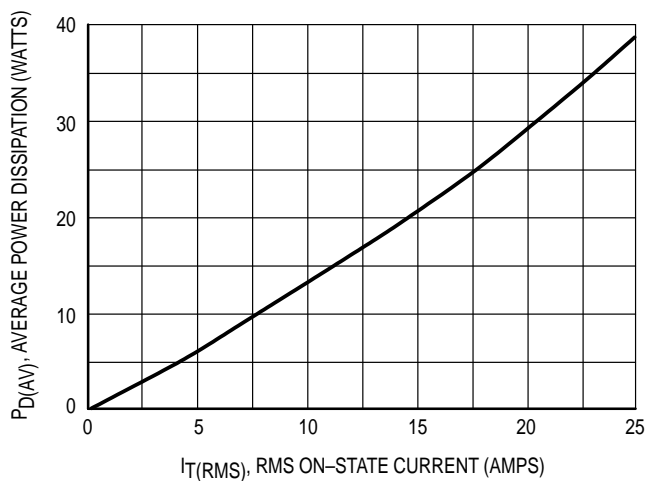


Figure 2. On-State Power Dissipation

TYPICAL CHARACTERISTICS

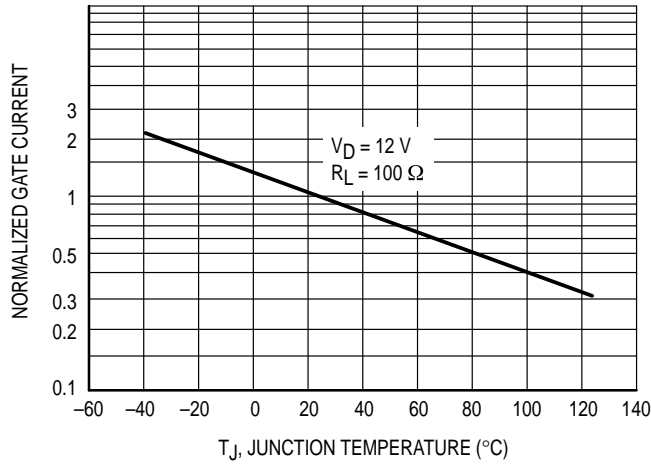


Figure 3. Gate Trigger Current

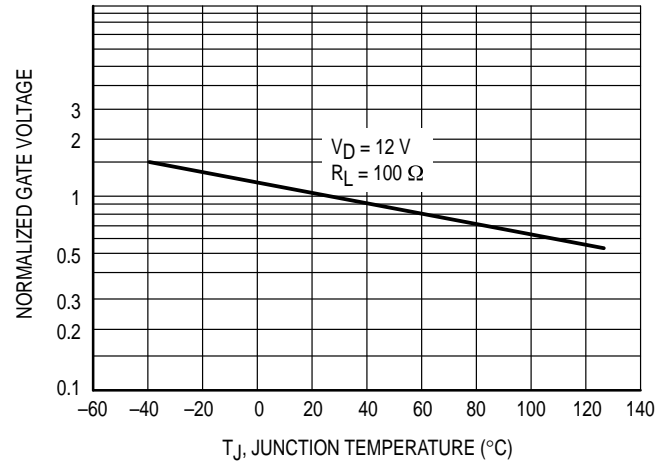


Figure 4. Gate Trigger Voltage

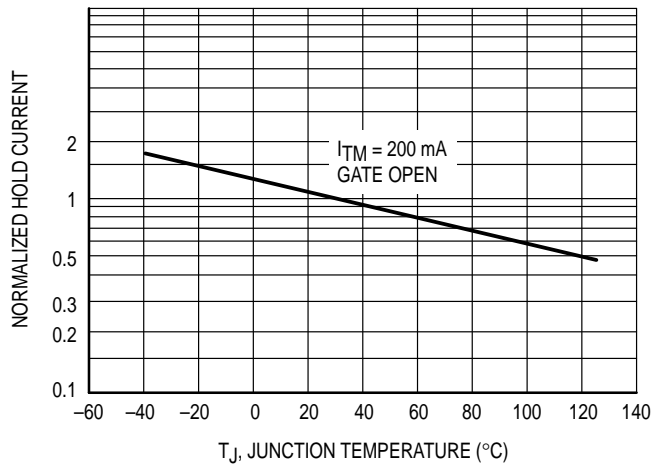


Figure 5. Hold Current

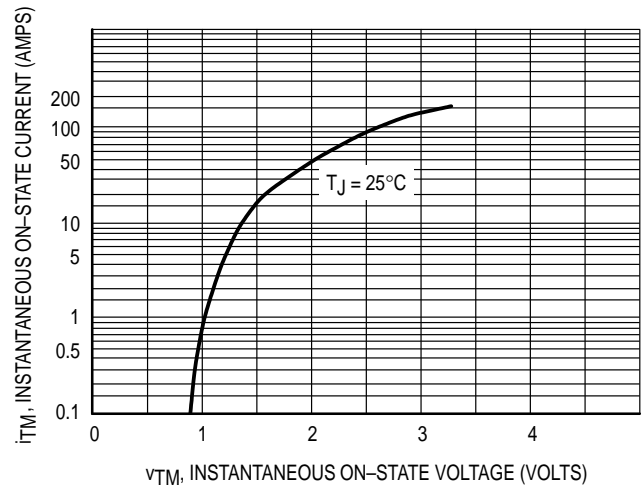
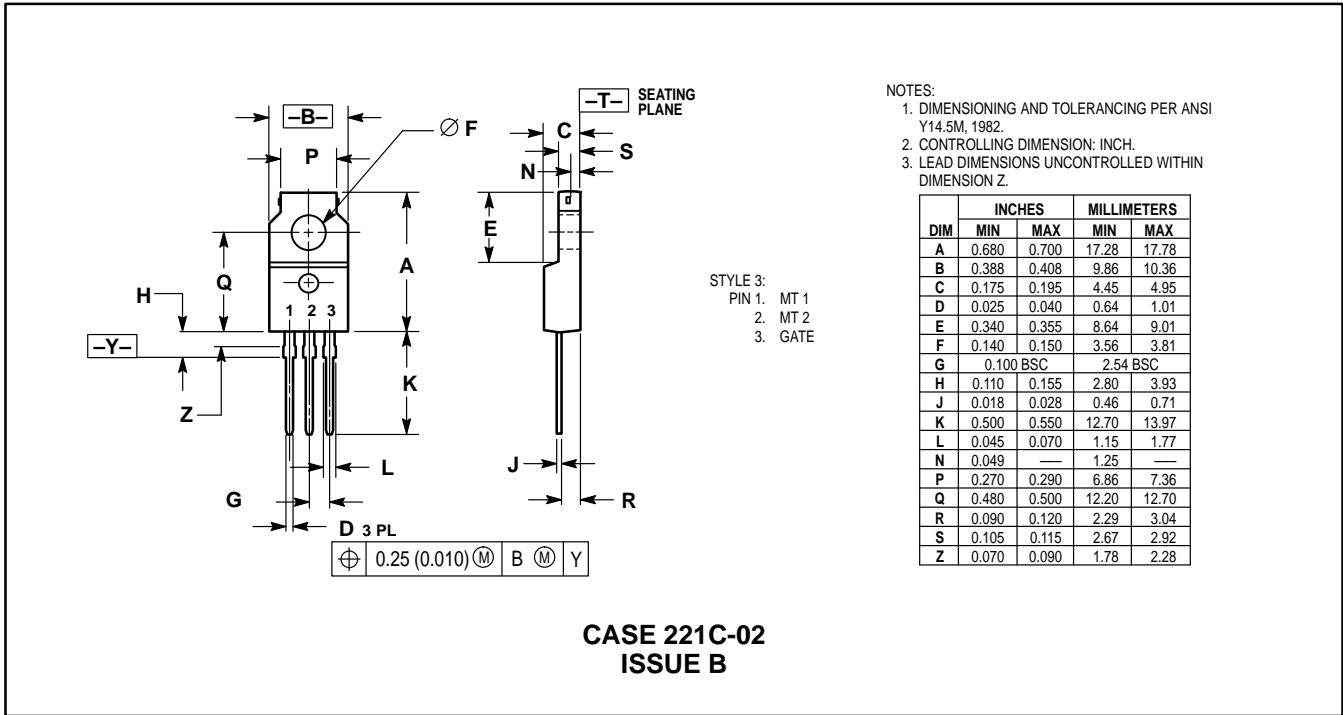


Figure 6. Typical On-State Characteristics

PACKAGE DIMENSIONS



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