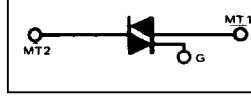
# Triacs
## Silicon Bidirectional Triode Thyristors

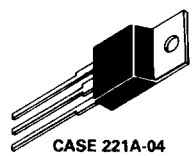
**2N6342 thru 2N6349**

**TRIACs**
**8 AMPERES RMS**
**200 thru 800 VOLTS**

. . . designed primarily for full-wave ac control applications, such as light dimmers, 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 Two Modes (2N6342, 2N6343, 2N6344, 2N6345) or Four Modes (2N6346, 2N6347, 2N6348, 2N6349)
- For 400 Hz Operation, Consult Factory
- 12 Ampere Devices Available as 2N6342A thru 2N6349A



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

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

| Rating | | Symbol | Value | Unit |
|---|---|---|---|---|
| *Peak Repetitive Off-State Voltage, Note 1 (Gate Open, $T_J$ = −40 to +110°C) 1/2 Sine Wave 50 to 60 Hz, Gate Open | 2N6342, ***2N6346*** ***2N6343, 2N6347*** ***2N6344, 2N6348*** 2N6345, ***2N6349*** | $V_{DRM}$ | 200 400 600 800 | Volts |
| *RMS On-State Current Full Cycle Sine Wave 50 to 60 Hz | ($T_C$ = +80°C) ($T_C$ = +90°C) | $I_{T(RMS)}$ | 8 4 | Amps |
| *Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz, $T_C$ = +80°C) Preceded and followed by Rated Current | | $I_{TSM}$ | 100 | Amps |
| Circuit Fusing (t = 8.3 ms) | | $I^2t$ | 40 | $A^2s$ |
| *Peak Gate Power ($T_C$ = +80°C, Pulse Width = 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 | | $I_{GM}$ | 2 | Amps |
| *Peak Gate Voltage | | $V_{GM}$ | 10 | Volts |
| *Operating Junction Temperature Range | | $T_J$ | −40 to +125 | °C |
| *Storage Temperature Range | | $T_{stg}$ | −40 to +150 | °C |

Note 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.

Devices listed in bold, italic are Motorola preferred devices.

## THERMAL CHARACTERISTICS

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

## ELECTRICAL CHARACTERISTICS ($T_C$ = 25°C, and Either Polarity of MT2 to MT1 Voltage, unless otherwise noted.)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| *Peak Blocking Current ($V_D$ = Rated $V_{DRM}$, gate open) $T_J$ = 25°C | $I_{DRM}$ | — | — | 10 | μA |
| $T_J$ = 100°C | | — | — | 2 | mA |
| *Peak On-State Voltage ($I_{TM}$ = 11 A Peak; Pulse Width = 1 to 2 ms, Duty Cycle ≤ 2%) | $V_{TM}$ | — | 1.3 | 1.55 | Volts |
| Gate Trigger Current (Continuous dc) ($V_D$ = 12 Vdc, $R_L$ = 100 Ohms) (Minimum Gate Pulse Width = 2 μs) | $I_{GT}$ | | | | mA |
| MT2(+), G(+) All Types | | — | 12 | 50 | |
| MT2(+), G(−) 2N6346 thru 49 | | — | 12 | 75 | |
| MT2(−), G(−) All Types | | — | 20 | 50 | |
| MT2(−), G(+) 2N6346 thru 49 | | — | 35 | 75 | |
| *MT2(+), G(+); MT2(−), G(−) $T_C$ = −40°C All Types | | — | — | 100 | |
| *MT2(+), G(−); MT2(−), G(+) $T_C$ = −40°C 2N6346 thru 49 | | — | — | 125 | |
| Gate Trigger Voltage (Continuous dc) ($V_D$ = 12 Vdc, $R_L$ = 100 Ohms) (Minimum Gate Pulse Width = 2 μs) | $V_{GT}$ | | | | Volts |
| MT2(+), G(+) All Types | | — | 0.9 | 2 | |
| MT2(+), G(−) 2N6346 thru 49 | | — | 0.9 | 2.5 | |
| MT2(−), G(−) All Types | | — | 1.1 | 2 | |
| MT2(−), G(+) 2N6346 thru 49 | | — | 1.4 | 2.5 | |
| *MT2(+), G(+); MT2(−), G(−) $T_C$ = −40°C All Types | | — | — | 2.5 | |
| *MT2(+), G(−); MT2(−), G(+) $T_C$ = −40°C 2N6346 thru 49 | | — | — | 3 | |
| ($V_D$ = Rated $V_{DRM}$, $R_L$ = 10 k Ohms, $T_J$ = 100°C) | | | | | |
| *MT2(+), G(+); MT2(−), G(−) All Types | | 0.2 | — | — | |
| *MT2(+), G(−); MT2(−), G(−) 2N6346 thru 49 | | 0.2 | — | — | |
| *Holding Current ($V_D$ = 12 Vdc, Gate Open) $T_C$ = 25°C | $I_H$ | — | 6 | 40 | mA |
| ($I_T$ = 200 mA) *$T_C$ = −40°C | | — | — | 75 | |
| *Turn-On Time ($V_D$ = Rated $V_{DRM}$, $I_{TM}$ = 11 A, $I_{GT}$ = 120 mA, Rise Time = 0.1 μs, Pulse Width = 2 μs) | $t_{gt}$ | — | 1.5 | 2 | μs |
| Critical Rate of Rise of Commutation Voltage ($V_D$ = Rated $V_{DRM}$, $I_{TM}$ = 11 A, Commutating di/dt = 4.0 A/ms, Gate Unenergized, $T_C$ = 80°C) | dv/dt(c) | — | 5 | — | V/μs |

*Indicates JEDEC Registered Data.

FIGURE 1 – RMS CURRENT DERATING

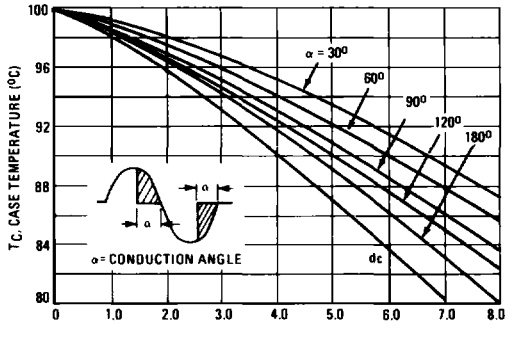



FIGURE 2 – ON-STATE POWER DISSIPATION

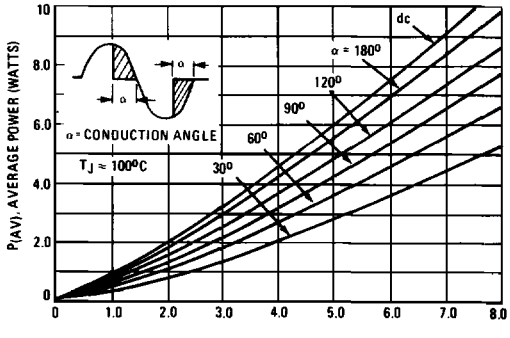


**FIGURE 3 – TYPICAL GATE TRIGGER VOLTAGE**

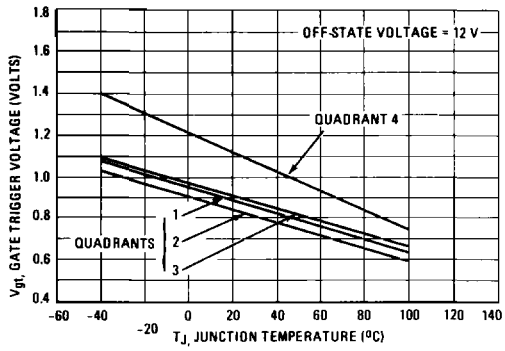



**FIGURE 4 – TYPICAL GATE TRIGGER CURRENT**

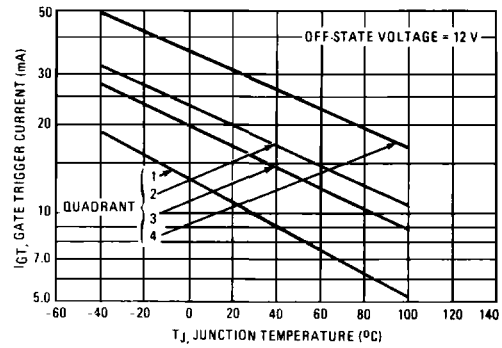



**FIGURE 5 – ON-STATE CHARACTERISTICS**

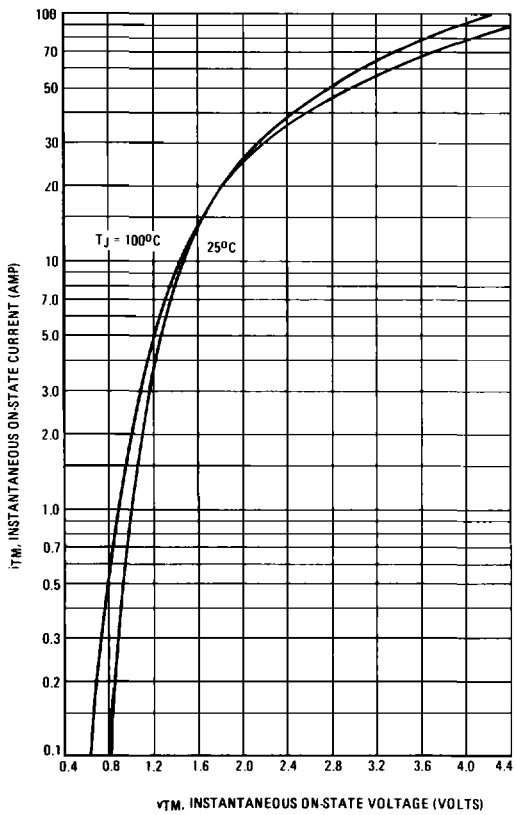



**FIGURE 6 – TYPICAL HOLDING CURRENT**

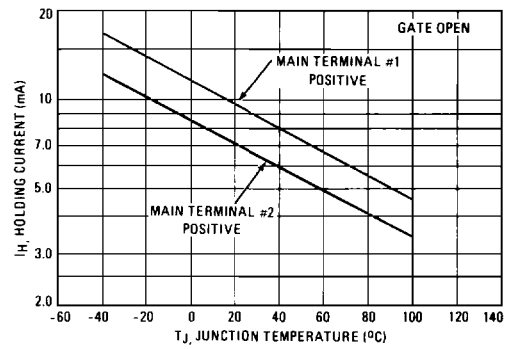



**FIGURE 7 – MAXIMUM NON-REPETITIVE SURGE CURRENT**

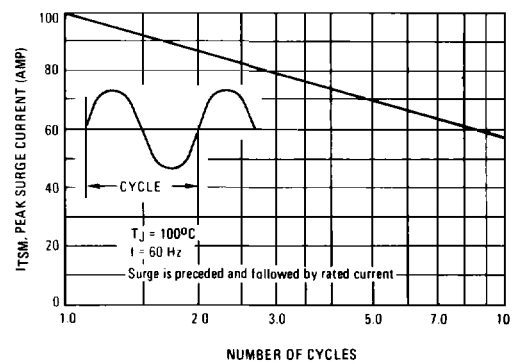
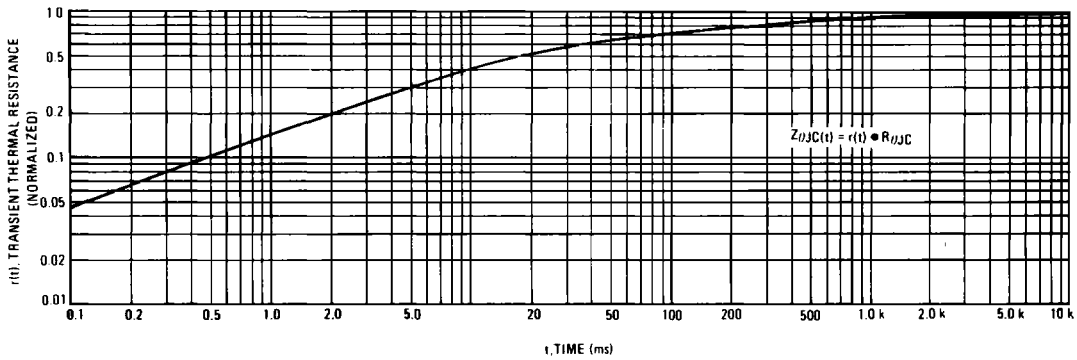


**FIGURE 8 – TYPICAL THERMAL RESPONSE**

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