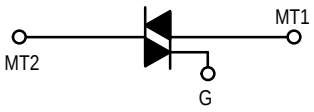
# 2N6344, A
# 2N6348A
# 2N6349

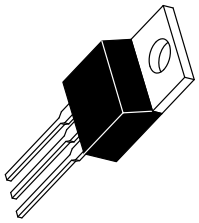
# Triacs
## Silicon Bidirectional Triode Thyristors

. . . 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 (2N6344, 2N6344A) or Four Modes (2N6348A, 2N6349)
- For 400 Hz Operation, Consult Factory

**TRIACs**
**8 to 12 AMPERES RMS**
**600 thru 800 VOLTS**



**CASE 221A-07**
**(TO-220AB)**
**STYLE 4**

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

| Rating | | Symbol | Value | Unit |
|---|---|---|---|---|
| *Peak Repetitive Off–State Voltage(1)<br>(Gate Open, $T_J$ = –40 to +110°C)<br>1/2 Sine Wave 50 to 60 Hz, Gate Open | <br><br>2N6344, 2N6344A, 2N6348<br>2N6349 | $V_{DRM}$ | <br><br>600<br>800 | Volts |
| *RMS On–State Current<br>Full Cycle Sine Wave 50 to 60 Hz | ($T_C$ = +80°C) 2N6344, 2N6349<br>($T_C$ = +90°C)<br>($T_C$ = +80°C) 2N6344A, 2N6348A<br>($T_C$ = +90°C) | $I_{T(RMS)}$ | 8<br>4<br>12<br>6 | Amps |
| *Peak Non-repetitive Surge Current<br>(One Full Cycle, 60 Hz, $T_C$ = +80°C)<br>Preceded and followed by Rated Current | | $I_{TSM}$ | 100 | Amps |
| Circuit Fusing<br>(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 |

1. VDRM 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.

**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(–) 2N6349 | | — | 12 | 75 | |
| MT2(–), G(–) All Types | | — | 20 | 50 | |
| MT2(–), G(+) 2N6349 | | — | 35 | 75 | |
| *MT2(+), G(+); MT2(–), G(–) $T_C$ = –40°C All Types | | — | — | 100 | |
| *MT2(+), G(–); MT2(–), G(+) $T_C$ = –40°C 2N6349 | | — | — | 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(–) 2N6349 | | — | 0.9 | 2.5 | |
| MT2(–), G(–) All Types | | — | 1.1 | 2 | |
| MT2(–), G(+) 2N6349 | | — | 1.4 | 2.5 | |
| *MT2(+), G(+); MT2(–), G(–) $T_C$ = –40°C All Types | | — | — | 2.5 | |
| *MT2(+), G(–); MT2(–), G(+) $T_C$ = –40°C 2N6349 | | — | — | 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(–) 2N6349 | | 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**

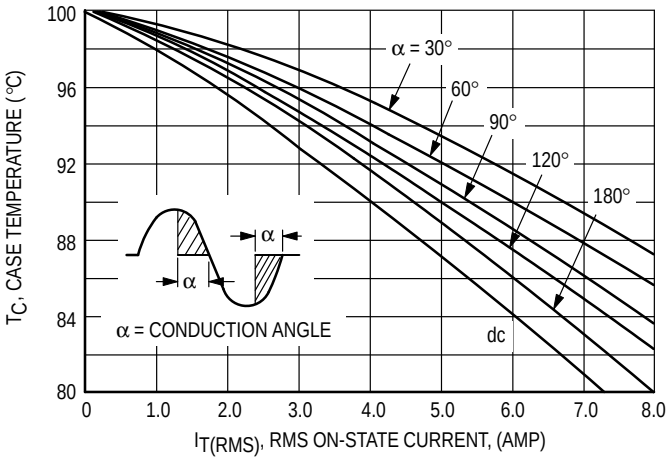



**FIGURE 2 – ON-STATE POWER DISSIPATION**

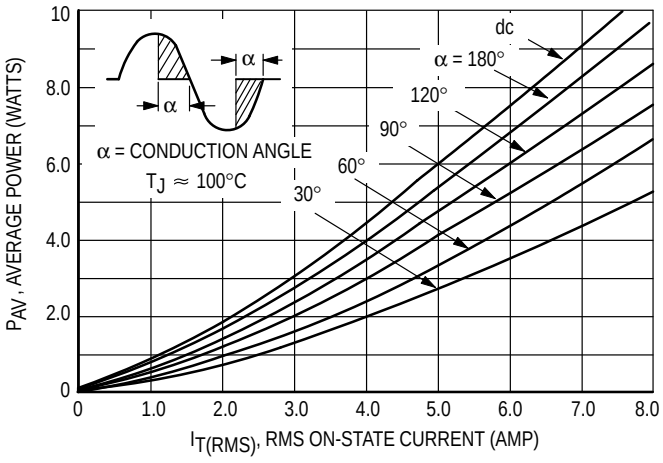


**FIGURE 3 – TYPICAL GATE TRIGGER VOLTAGE**

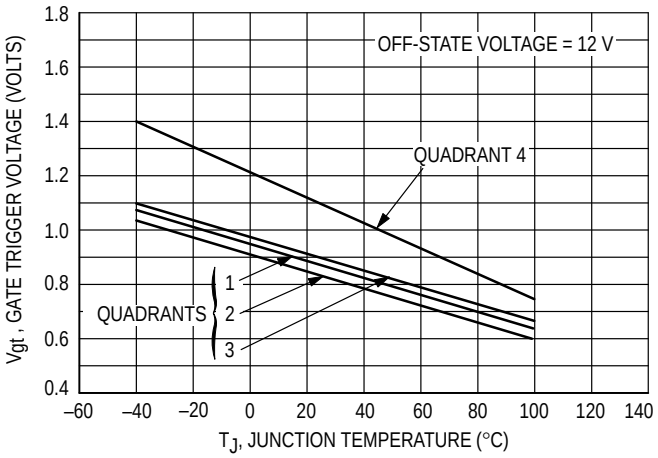



**FIGURE 4 – TYPICAL GATE TRIGGER CURRENT**

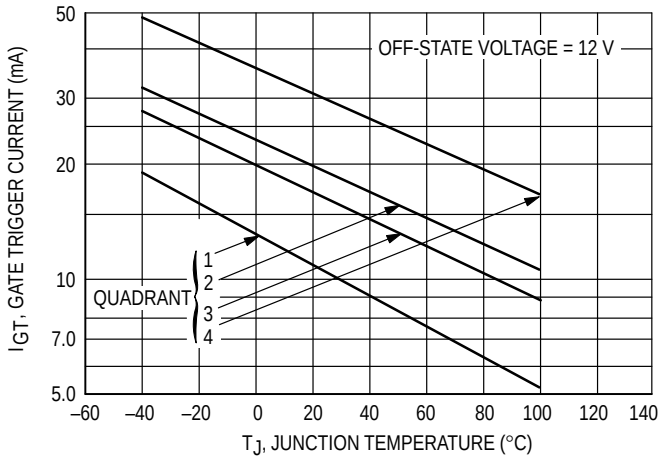



**FIGURE 5 – ON-STATE CHARACTERISTICS**

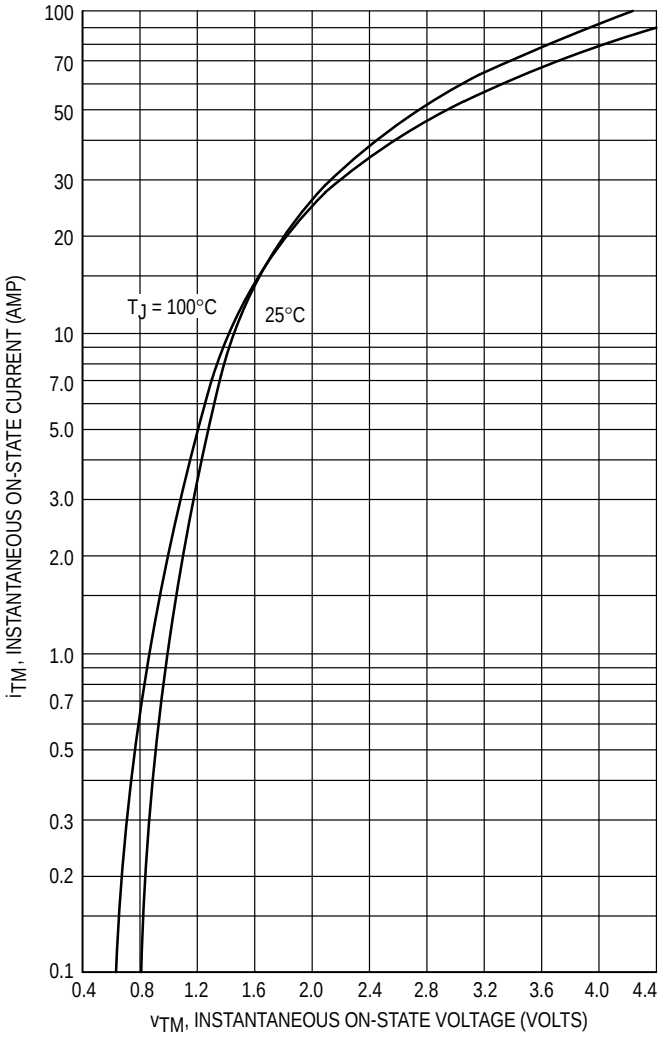



**FIGURE 6 – TYPICAL HOLDING CURRENT**

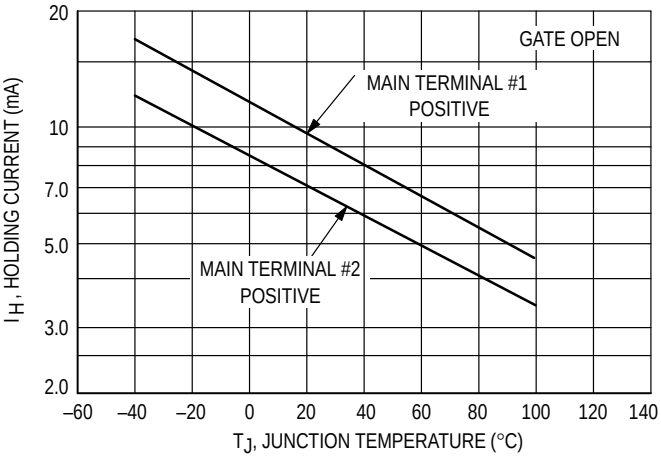



**FIGURE 7 – MAXIMUM NON-REPETITIVE SURGE CURRENT**

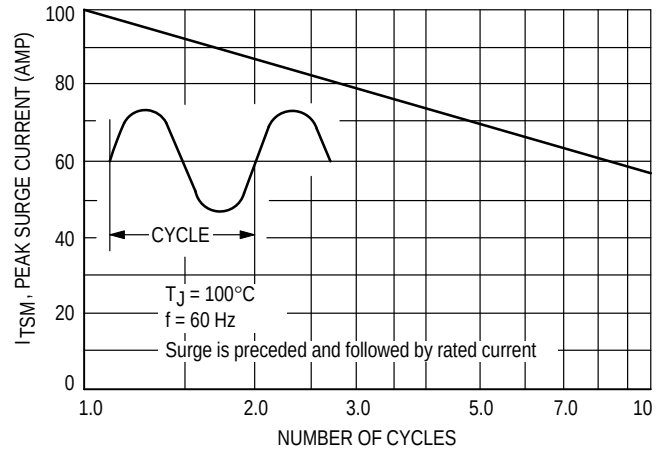
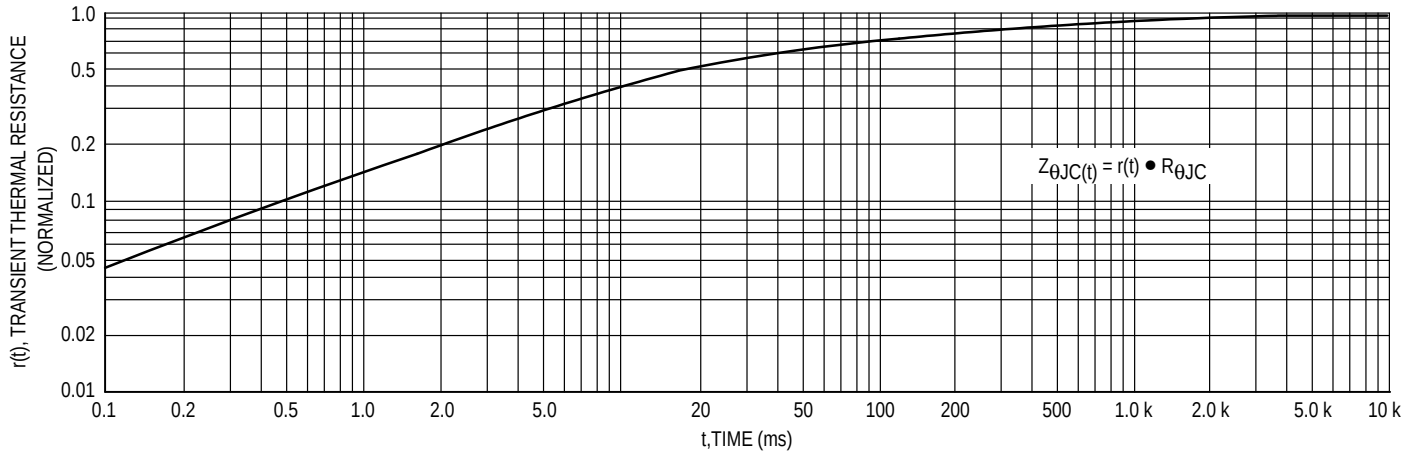
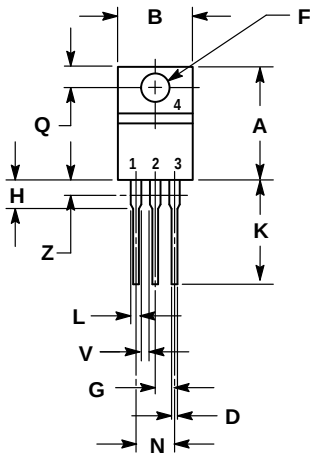
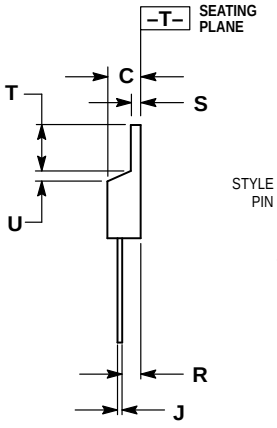


**FIGURE 8 – TYPICAL THERMAL RESPONSE**



## 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.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | 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 | 0.060 | 1.15 | 1.52 |
| 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-07**
**(TO–220AB)**
**ISSUE Z**

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