

## Triacs

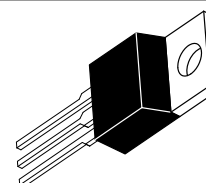
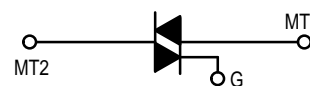
### Silicon Bidirectional Triode Thyristors

... 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 (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

**2N6342  
thru  
2N6349**

**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>(Gate Open, $T_J = -40$ to $+110^\circ\text{C}$ )<br>1/2 Sine Wave 50 to 60 Hz, Gate Open | $V_{DRM}$    | 200<br>400<br>600<br>800 | Volts                |
| *RMS On-State Current<br>Full Cycle Sine Wave 50 to 60 Hz  | $I_{T(RMS)}$ | 8<br>4                   | Amps                 |
| *Peak Non-repetitive Surge Current<br>(One Full Cycle, 60 Hz, $T_C = +80^\circ\text{C}$ )<br>Preceded and followed by Rated Current            | $I_{TSM}$    | 100                      | Amps                 |
| Circuit Fusing<br>( $t = 8.3$ ms)  | $I^2t$       | 40                       | $\text{A}^2\text{s}$ |
| *Peak Gate Power ( $T_C = +80^\circ\text{C}$ , Pulse Width = 2 $\mu\text{s}$ )   | $P_{GM}$     | 20                       | Watts                |
| *Average Gate Power ( $T_C = +80^\circ\text{C}$ , $t = 8.3$ 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              | $^\circ\text{C}$     |
| *Storage Temperature Range   | $T_{stg}$    | -40 to +150              | $^\circ\text{C}$     |

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.

REV 1

# 2N6342 thru 2N6349

## THERMAL CHARACTERISTICS

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

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

\*Indicates JEDEC Registered Data.

FIGURE 1 – RMS CURRENT DERATING

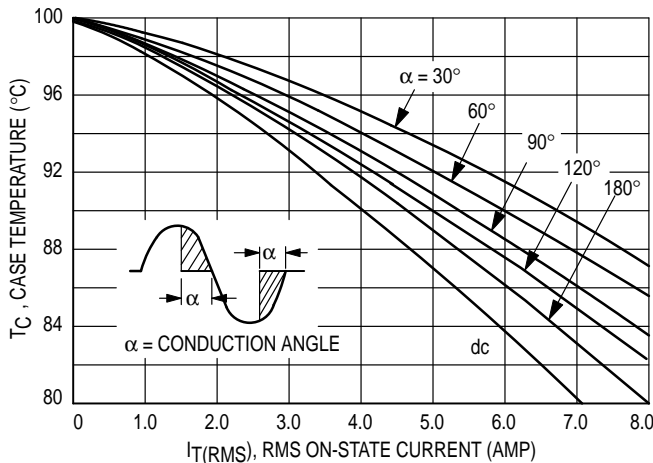


FIGURE 2 – ON-STATE POWER DISSIPATION

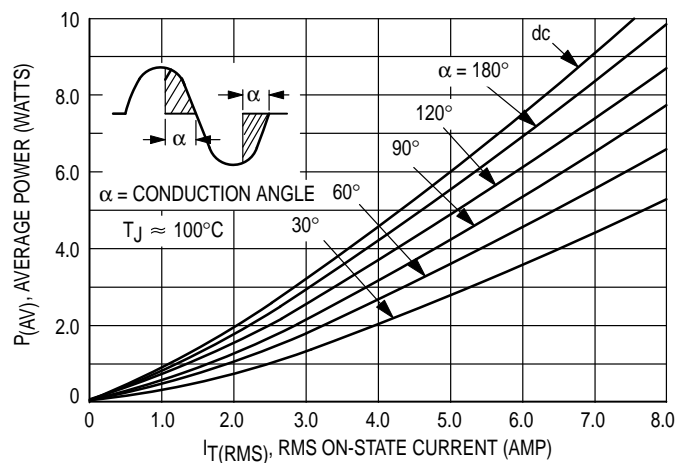


FIGURE 3 – TYPICAL GATE TRIGGER VOLTAGE

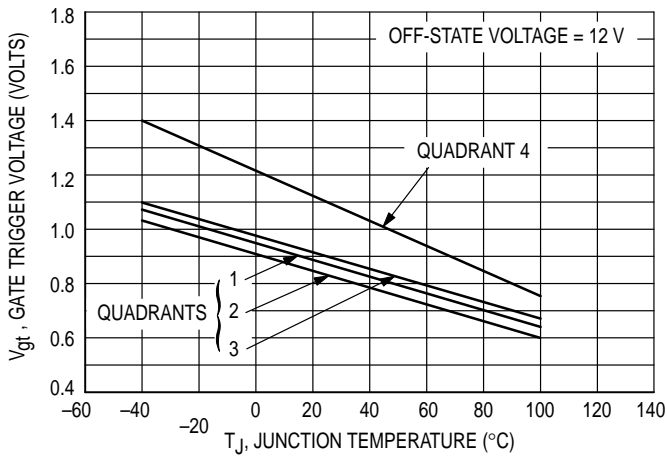


FIGURE 4 – TYPICAL GATE TRIGGER CURRENT

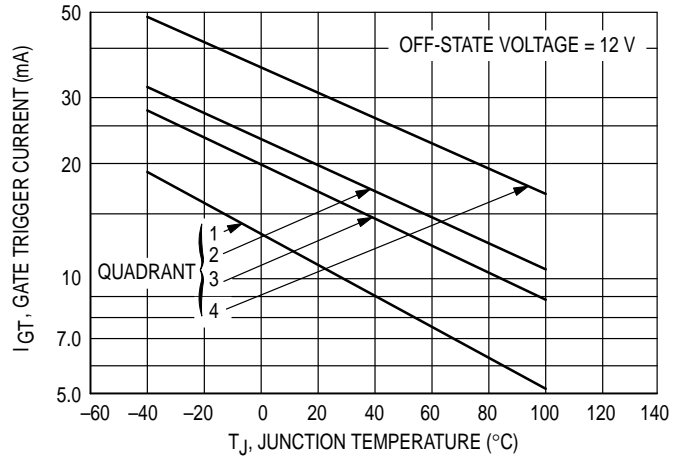


FIGURE 5 – ON-STATE CHARACTERISTICS

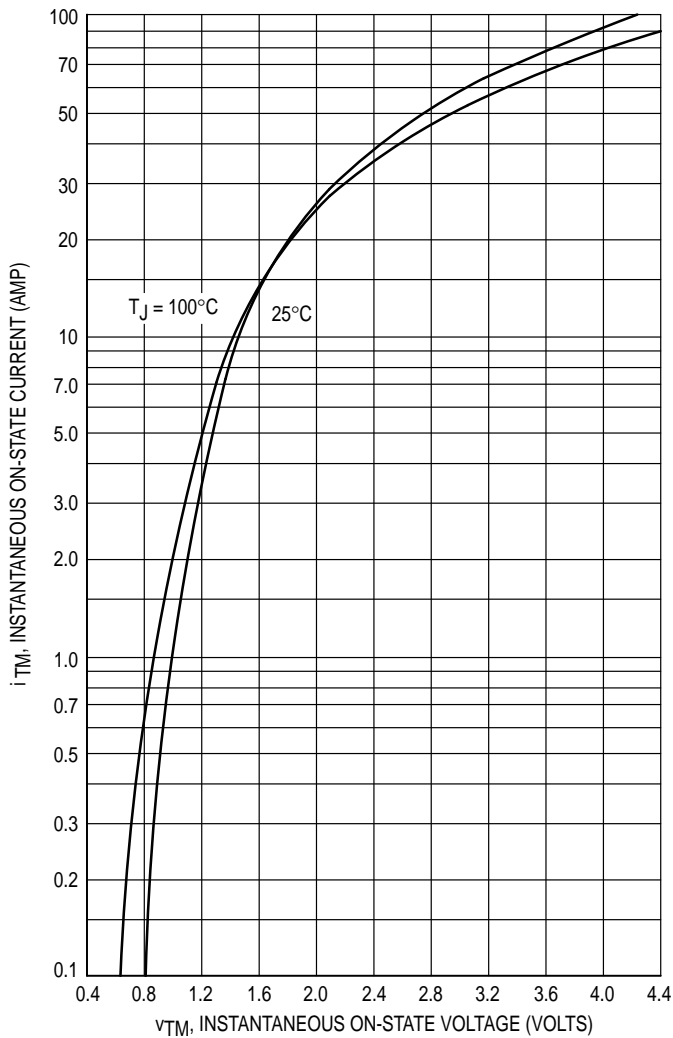


FIGURE 6 – TYPICAL HOLDING CURRENT

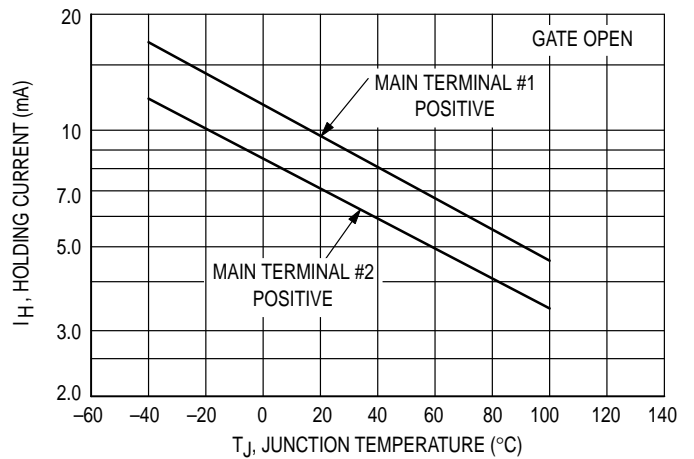


FIGURE 7 – MAXIMUM NON-REPETITIVE SURGE CURRENT

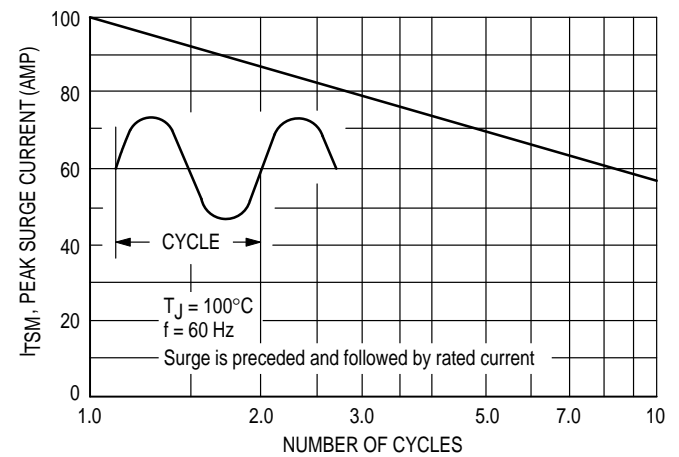
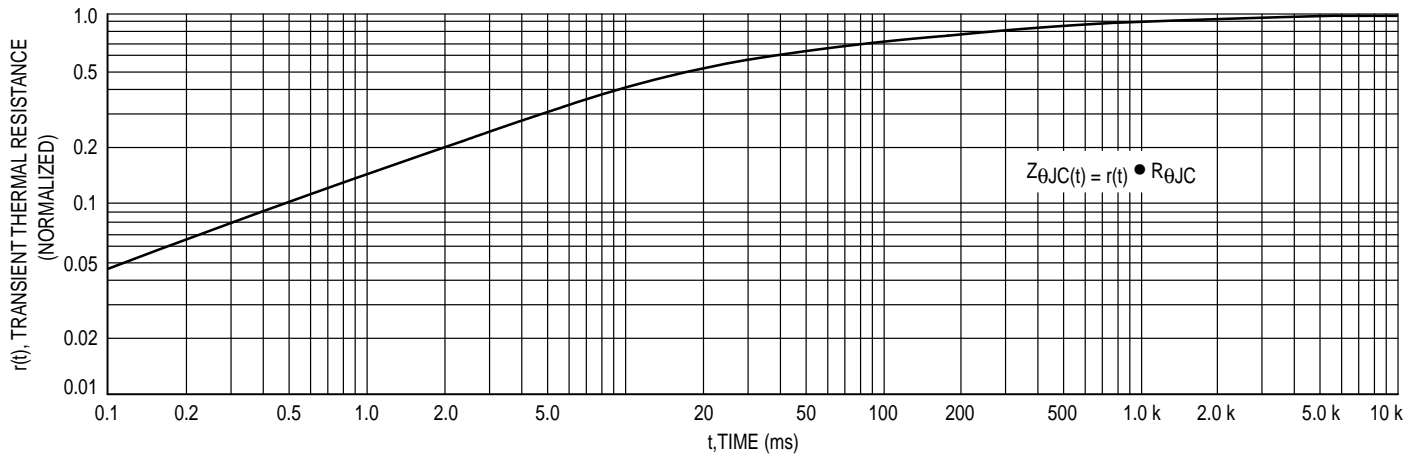
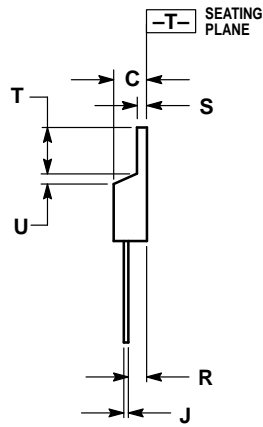
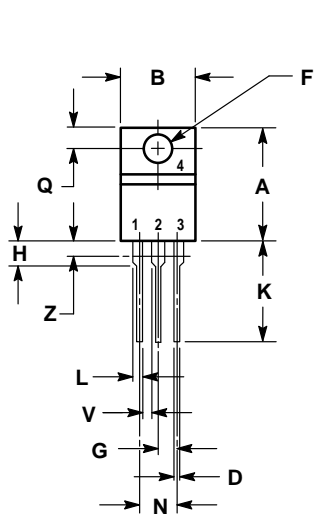


FIGURE 8 – TYPICAL THERMAL RESPONSE



PACKAGE DIMENSIONS



STYLE 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  | 0.055 | 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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