

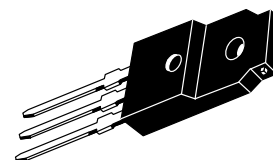
## Silicon Bidirectional Triode Thyristors

### T2500FP Series

... 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, Isolated Construction for Low Thermal Resistance, High Heat Dissipation and Durability

**ISOLATED TRIACs  
THYRISTORS  
6 AMPERES RMS  
200 thru 800 VOLTS**



**CASE 221C-02  
STYLE 3**

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

| Rating   | Symbol              | Value  | Unit             |
|--|---------------------|--|------------------|
| Repetitive Peak Off-State Voltage <sup>(1)</sup><br>(T <sub>J</sub> = -40 to +100°C, Gate Open)    | V <sub>DRM</sub>    | T2500BFP<br>200<br>T2500DFP<br>400<br>T2500MFP<br>600<br>T2500NFP<br>800 | Volts            |
| On-State RMS Current (T <sub>C</sub> = +80°C) <sup>(2)</sup><br>(Full Cycle Sine Wave 50 to 60 Hz) | I <sub>T(RMS)</sub> | 6  | Amps             |
| Peak Non-repetitive Surge Current<br>(One Full Cycle, 60 Hz, T <sub>C</sub> = +80°C)               | I <sub>TSM</sub>    | 60   | Amps             |
| Circuit Fusing Considerations<br>(t = 8.3 ms)  | I <sup>2</sup> t    | 40   | A <sup>2</sup> s |
| Peak Gate Power<br>(T <sub>C</sub> = +80°C, Pulse Width = 1 μs)                                    | P <sub>GM</sub>     | 1  | Watt             |
| Average Gate Power<br>(T <sub>C</sub> = +80°C, t = 8.3 ms)   | P <sub>G(AV)</sub>  | 0.2  | Watt             |
| Peak Gate Trigger Current (Pulse Width = 10 μs)  | I <sub>GTM</sub>    | 4  | Amps             |
| RMS Isolation Voltage (T <sub>A</sub> = 25°C, Relative Humidity ≤ 20%)                             | V <sub>ISO</sub>    | 1500   | Volts            |
| Operating Junction Temperature Range   | T <sub>J</sub>      | -40 to +100  | °C               |
| Storage Temperature Range  | T <sub>stg</sub>    | -40 to +150  | °C               |

#### THERMAL CHARACTERISTICS

| Characteristic                                      | Symbol           | Max      | Unit |
|---|------------------|----------|------|
| Thermal Resistance, Junction to Case <sup>(2)</sup> | R <sub>θJC</sub> | 2.7      | °C/W |
| Case to Sink  | R <sub>θCS</sub> | 2.2(typ) |      |
| Junction to Ambient                                 | R <sub>θJA</sub> | 60       |      |

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.

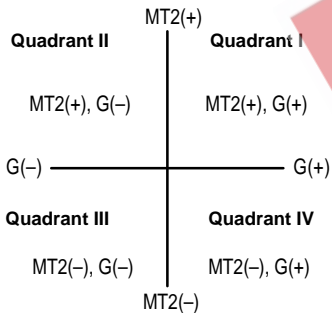
## T2500FP Series

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

| Characteristic  | Symbol           | Min      | Typ       | Max      | Unit  |
|---|------------------|----------|-----------|----------|-------|
| Peak Off-State Current (Either Direction)<br>(V <sub>D</sub> = Rated V <sub>DRM</sub> , T <sub>J</sub> = 100°C, Gate Open)  | I <sub>DRM</sub> | —        | —         | 2        | mA    |
| Maximum On-State Voltage (Either Direction)*<br>(I <sub>T</sub> = 30 A Peak)  | V <sub>TM</sub>  | —        | —         | 2        | Volts |
| Gate Trigger Current (Continuous dc)<br>(V <sub>D</sub> = 12 Vdc, R <sub>L</sub> = 12 Ohms)   | I <sub>GT</sub>  |          |           |          | mA    |
|   | MT2(+), G(+)     | —        | 10        | 25       |       |
|   | MT2(+), G(-)     | —        | 20        | 60       |       |
|   | MT2(-), G(-)     | —        | 15        | 25       |       |
|   | MT2(-), G(+)     | —        | 30        | 60       |       |
| Gate Trigger Voltage (Continuous dc) (All Quadrants)<br>(V <sub>D</sub> = 12 Vdc, R <sub>L</sub> = 12 Ohms)<br>(V <sub>D</sub> = V <sub>DROM</sub> , R <sub>L</sub> = 125 Ohms, T <sub>C</sub> = 100°C, All Trigger Models) | V <sub>GT</sub>  | —<br>0.2 | 1.25<br>— | 2.5<br>— | Volts |
| Holding Current (Either Direction)<br>(Main Terminal Voltage = 12 Vdc, Gate Open,<br>Initiating Current = 150 mA, T <sub>C</sub> = 25°C)  | I <sub>H</sub>   | —        | 15        | 30       | mA    |
| Gate Controlled Turn-On Time<br>(V <sub>D</sub> = Rated V <sub>DRM</sub> , I <sub>T</sub> = 10 A,<br>I <sub>GT</sub> = 160 mA, Rise Time ≤ 0.1 μs)  | t <sub>gt</sub>  | —        | 1.6       | —        | μs    |
| Critical Rate-of-Rise of Commutation Voltage<br>(V <sub>D</sub> = Rated V <sub>DRM</sub> , I <sub>T(RMS)</sub> = 6 A,<br>Commutating di/dt = 3.2 A/ms,<br>Gate Unenergized, T <sub>C</sub> = 80°C)                          | dv/dt(c)         | —        | 10        | —        | V/μs  |
| Critical Rate-of-Rise of Off-State Voltage<br>(V <sub>D</sub> = Rated V <sub>DRM</sub> , Exponential Voltage Rise,<br>Gate Open, T <sub>C</sub> = 100°C)  | dv/dt            | —        | 100       | —        | V/μs  |

\*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

#### Quadrant Definitions



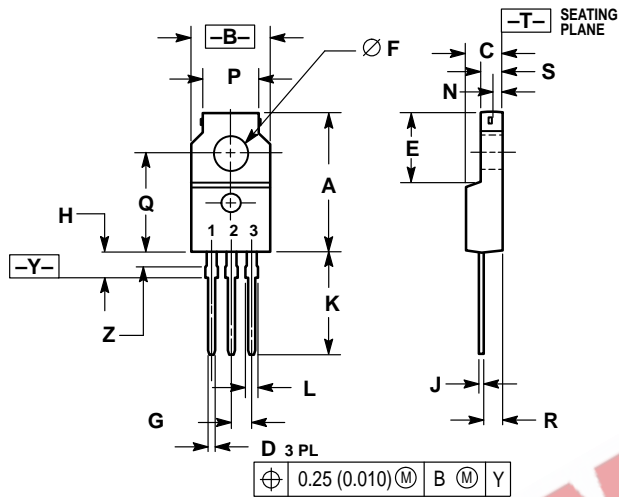
Trigger devices are recommended for gating on Triacs. They provide:

1. Consistent predictable turn-on points.
2. Simplified circuitry.
3. Fast turn-on time for cooler, more efficient and reliable operation.

#### Electrical Characteristics of Recommended Bidirectional Switches

| Usage                             | General      |            |
|-----------------------------------|--------------|------------|
|                                   | MBS4991      | MBS4992    |
| V <sub>S</sub>                    | 6 – 10 V     | 7.5 – 9 V  |
| I <sub>S</sub>                    | 350 μA Max   | 120 μA Max |
| V <sub>S1</sub> – V <sub>S2</sub> | 0.5 V Max    | 0.2 V Max  |
| Temperature Coefficient           | 0.02%/°C Typ |            |

PACKAGE DIMENSIONS



STYLE 3:  
 PIN 1. MT 1  
 2. MT 2  
 3. GATE


- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION: INCH.  
 3. LEAD DIMENSIONS UNCONTROLLED WITHIN DIMENSION Z.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.680     | 0.700 | 17.28       | 17.78 |
| B   | 0.388     | 0.408 | 9.86        | 10.36 |
| C   | 0.175     | 0.195 | 4.45        | 4.95  |
| D   | 0.025     | 0.040 | 0.64        | 1.01  |
| E   | 0.340     | 0.355 | 8.64        | 9.01  |
| F   | 0.140     | 0.150 | 3.56        | 3.81  |
| G   | 0.100 BSC |       | 2.54 BSC    |       |
| H   | 0.110     | 0.155 | 2.80        | 3.93  |
| J   | 0.018     | 0.028 | 0.46        | 0.71  |
| K   | 0.500     | 0.550 | 12.70       | 13.97 |
| L   | 0.045     | 0.070 | 1.15        | 1.77  |
| N   | 0.049     | —     | 1.25        | —     |
| P   | 0.270     | 0.290 | 6.86        | 7.36  |
| Q   | 0.480     | 0.500 | 12.20       | 12.70 |
| R   | 0.090     | 0.120 | 2.29        | 3.04  |
| S   | 0.105     | 0.115 | 2.67        | 2.92  |
| Z   | 0.070     | 0.090 | 1.78        | 2.28  |

CASE 221C-02

## T2500FP Series

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T2500FP/D

