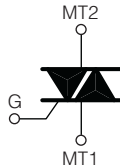
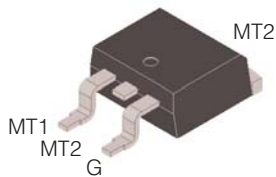


## HIGH COMMUTATION TRIAC

**D<sup>2</sup>PAK**

**On-State Current**

16 Amp

**Gate Trigger Current**
 $\leq 50 \text{ mA}$ 
**Off-State Voltage**
 $200 \text{ V} \div 800 \text{ V}$ 

This series of **TRIACs** uses a high performance PNPN technology.

These parts are intended for general purpose AC switching applications with highly inductive loads.

### Absolute Maximum Ratings, according to IEC publication No. 134

| SYMBOL       | PARAMETER                                 | CONDITIONS   | Value         | Unit                   |
|--------------|---|--|---------------|------------------------|
| $I_{T(RMS)}$ | RMS On-state Current (full sine wave)     | All Conduction Angle, $T_c = 95 \text{ }^\circ\text{C}$  | 16            | A                      |
| $I_{TSM}$    | Non-repetitive On-State Current           | Full Cycle, 60 Hz ( $t = 16.7 \text{ ms}$ )  | 176           | A                      |
| $I_{TSM}$    | Non-repetitive On-State Current           | Full Cycle, 50 Hz ( $t = 20 \text{ ms}$ )  | 160           | A                      |
| $I^2t$       | Fusing Current                            | $t_p = 10 \text{ ms}$ , Half Cycle   | 128           | $\text{A}^2\text{s}$   |
| $I_{GM}$     | Peak Gate Current                         | $20 \mu\text{s max.}$ $T_j = 125 \text{ }^\circ\text{C}$   | 4             | A                      |
| $P_{G(AV)}$  | Average Gate Power Dissipation            | $T_j = 125 \text{ }^\circ\text{C}$   | 1             | W                      |
| $di/dt$      | Critical rate of rise of on-state current | $I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ns}$<br>$f = 120 \text{ Hz}$ , $T_j = 125 \text{ }^\circ\text{C}$ | 50            | $\text{A}/\mu\text{s}$ |
| $T_j$        | Operating Temperature                     |  | $(-40 + 125)$ | $^\circ\text{C}$       |
| $T_{stg}$    | Storage Temperature                       |  | $(-40 + 150)$ | $^\circ\text{C}$       |
| $T_{sld}$    | Soldering Temperature                     | 10s max  | 260           | $^\circ\text{C}$       |

| SYMBOL    | PARAMETER                         | VOLTAGE |     |     |     |     | Unit |
|-----------|-----------------------------------|---------|-----|-----|-----|-----|------|
|           |                                   | B       | D   | M   | S   | N   |      |
| $V_{DRM}$ | Repetitive Peak Off State Voltage | 200     | 400 | 600 | 700 | 800 | V    |
| $V_{RRM}$ |                                   |         |     |     |     |     |      |

## HIGH COMMUTATION TRIAC

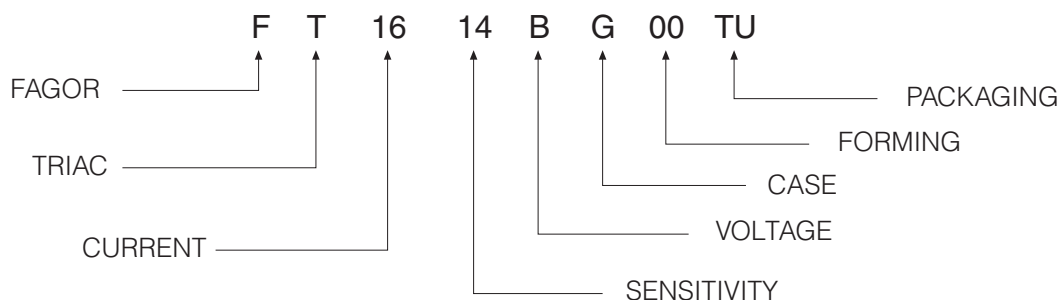
### Electrical Characteristics

| SYMBOL            | PARAMETER                           | CONDITIONS   | Quadrant |     | SENSITIVITY |      | Unit         |
|-------------------|-------------------------------------|--|----------|-----|-------------|------|--------------|
|                   |                                     |  |          |     | 14          | 16   |              |
| $I_{GT}^{(1)}$    | Gate Trigger Current                | $V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25^\circ C$  | Q1÷Q3    | MAX | 35          | 50   | mA           |
| $V_{GT}$          | Gate Trigger Voltage                | $V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25^\circ C$  | Q1÷Q3    | MAX | 1.3         |      | V            |
| $V_{GD}$          | Gate Non Trigger Voltage            | $V_D = V_{DRM}, R_L = 3.3 K\Omega, T_j = 125^\circ C$  | Q1÷Q3    | MIN | 0.2         |      | V            |
| $I_H^{(2)}$       | Holding Current                     | $I_T = 100 \text{ mA}, \text{Gate open}, T_j = 25^\circ C$   |          | MAX | 35          | 50   | mA           |
| $I_L$             | Latching Current                    | $I_G = 1.2 I_{GT}, T_j = 25^\circ C$   | Q1, Q3   | MAX | 50          | 70   | mA           |
|                   |                                     |  | Q2       | MAX | 60          | 80   |              |
| $dV/dt^{(2)}$     | Critical Rate of Voltage Rise       | $V_D = 0.67 \times V_{DRM}, \text{Gate open}$<br>$T_j = 125^\circ C$   |          | MIN | 500         | 1000 | V/ $\mu s$   |
| $(dI/dt)_C^{(2)}$ | Critical Rate of Current Rise       | $(dv/dt)_c = 0.1 \text{ V}/\mu s \quad T_j = 125^\circ C$<br>$(dv/dt)_c = 10 \text{ V}/\mu s \quad T_j = 125^\circ C$<br>without snubber $T_j = 125^\circ C$ |          | MIN | -           | -    | A/ms         |
|                   |                                     |  |          | MIN | -           | -    |              |
|                   |                                     |  |          | MIN | 8.5         | 14   |              |
| $V_{TM}^{(2)}$    | On-state Voltage                    | $I_T = 22.5 \text{ Amp}, t_p = 380 \mu s, T_j = 25^\circ C$  |          | MAX | 1.6         |      | V            |
| $V_{t(o)}^{(2)}$  | Threshold Voltage                   | $T_j = 125^\circ C$  |          | MAX | 0.77        |      | V            |
| $r_d^{(2)}$       | Dynamic resistance                  | $T_j = 125^\circ C$  |          | MAX | 70          |      | m $\Omega$   |
| $I_{DRM}/I_{RRM}$ | Off-State Leakage Current           | $V_D = V_{DRM}, T_j = 125^\circ C$<br>$V_R = V_{RRM}, T_j = 25^\circ C$  |          | MAX | 2           |      | mA           |
|                   |                                     |  |          | MAX | 5           |      | $\mu A$      |
| $R_{th(j-c)}$     | Thermal Resistance Junction-Case    | for AC 360° conduction angle   |          |     | 1.1         |      | $^\circ C/W$ |
| $R_{th(j-a)}$     | Thermal Resistance Junction-Ambient | $S = 1 \text{ cm}^2$   |          |     | 45          |      | $^\circ C/W$ |

(1) Minimum  $I_{GT}$  is guaranteed at 5% of  $I_{GT}$  max.

(2) For either polarity of electrode MT2 voltage with reference to electrode MT1.

### PART NUMBER INFORMATION



### HIGH COMMUTATION TRIAC

Fig. 1: Maximum power dissipation versus RMS on-state current (full cycle)

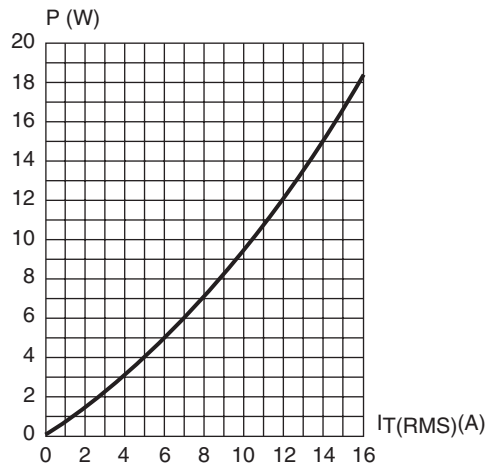


Fig. 2: RMS on-state current versus case temperature (full cycle).

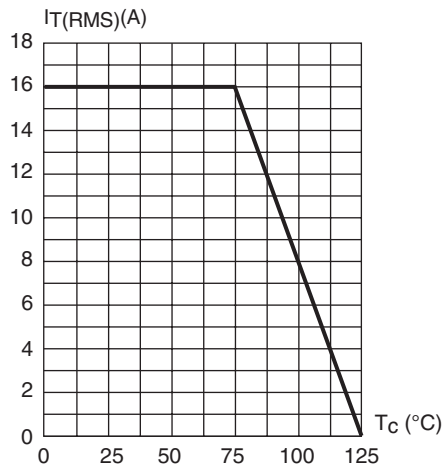


Fig. 3: Relative variation of thermal impedance versus pulse duration.

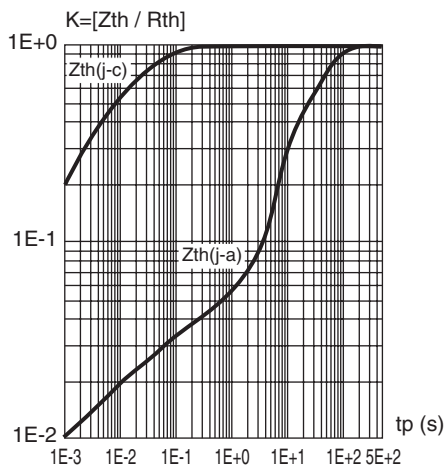


Fig. 4: On-state characteristics (maximum values)

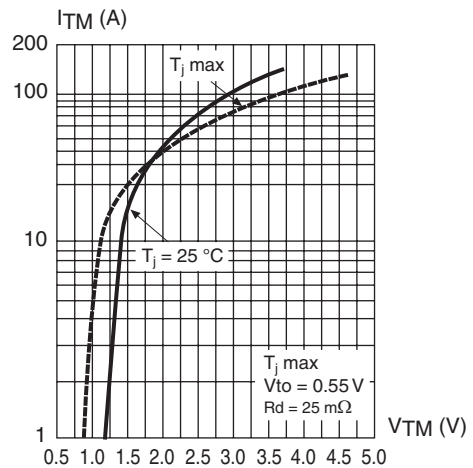


Fig. 5: Surge peak on-state current versus number of cycles

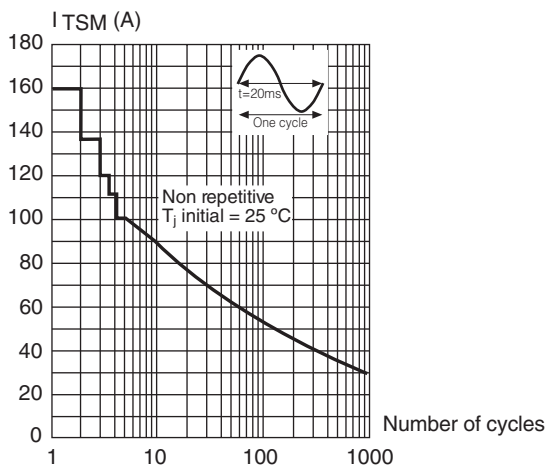
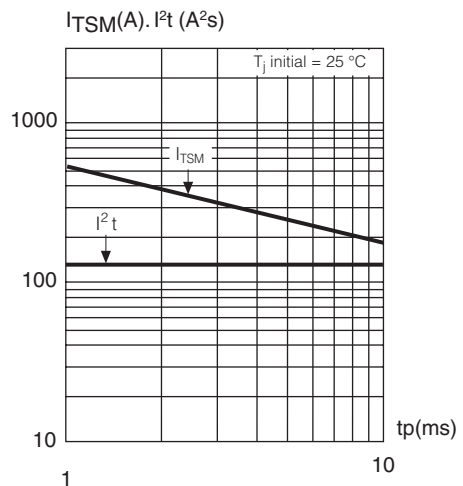


Fig. 6: Non repetitive surge peak on-state current for a sinusoidal pulse with width:  $t_p < 10$  ms, and corresponding value of  $I^2 t$ .



**HIGH COMMUTATION TRIAC**

Fig. 7: Relative variation of gate trigger current, holding current and latching versus junction temperature (typical values)

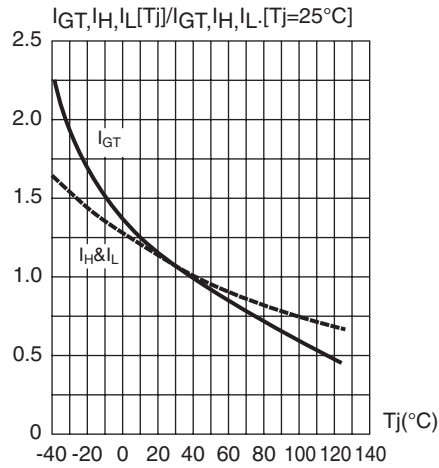
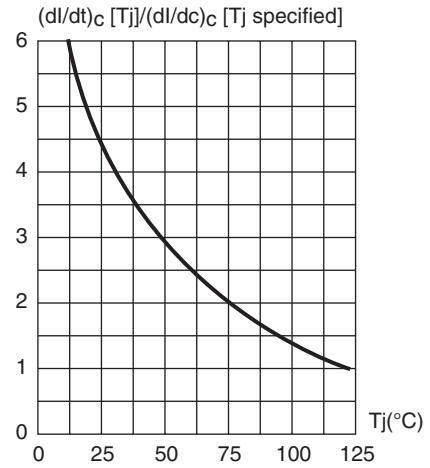
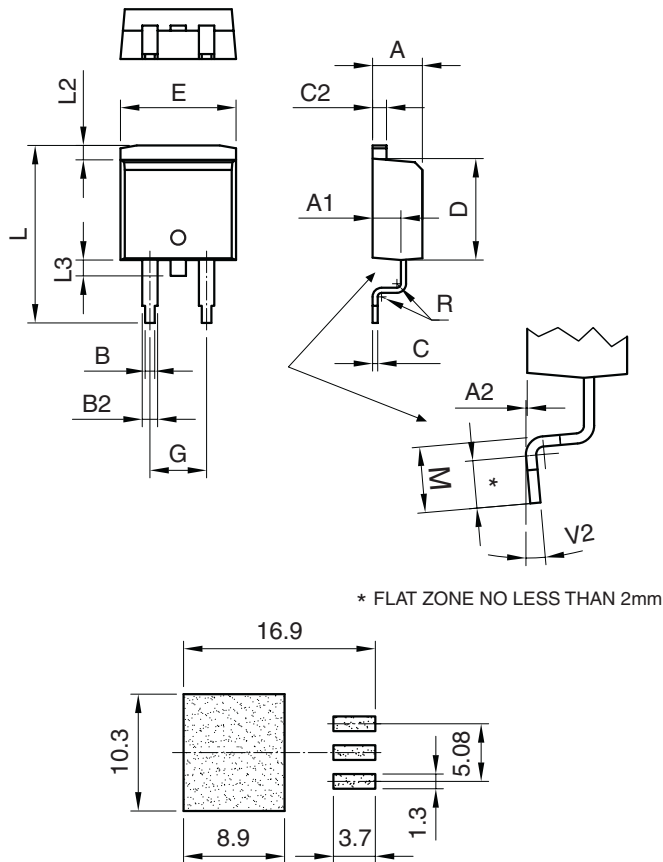


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature



**PACKAGE MECHANICAL DATA**

**D<sup>2</sup>PAK**



| REF. | DIMENSIONS |         |       |
|------|------------|---------|-------|
|      | Milimeters |         |       |
|      | Min.       | Nominal | Max.  |
| A    | 4.40       | 4.45    | 4.60  |
| A1   | 2.49       | 2.50    | 2.69  |
| A2   | 0.03       | 0.10    | 0.23  |
| B    | 0.70       | 0.90    | 0.93  |
| B2   | 1.14       | 1.03    | 1.70  |
| C    | 0.45       | 0.45    | 0.60  |
| C2   | 1.23       | 1.23    | 1.36  |
| D    | 8.95       | 9.00    | 9.35  |
| E    | 10.00      | 10.25   | 10.40 |
| G    | 4.88       | 5.15    | 5.28  |
| L    | 15.00      | 15.40   | 15.85 |
| L2   | 1.27       | 1.27    | 1.40  |
| L3   | 1.40       | 1.55    | 1.75  |
| M    | 2.40       | 3.00    | 3.20  |
| R    | 0.40 typ   |         |       |
| V2   | 0°         |         | 8°    |

NOTE: LIMITING VALUES AND LIFE SUPPORT APPLICATIONS (SEE WEB PAGE).