

**LOGIC LEVEL TRIAC**

|   |   |
|---|---|
| <p><b>TO220-AB</b></p>  | <p><b>On-State Current</b><br/>16 Amp</p> <p><b>Gate Trigger Current</b><br/>&lt; 10 mA</p> <p><b>Off-State Voltage</b><br/>200 V ÷ 600 V</p> |
| <p>This series of <b>TRIACs</b> uses a high performance PNPN technology.</p> <p>These parts are intended for general purpose AC switching applications with highly inductive loads.</p> |   |

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

| SYMBOL       | PARAMETER                                 | CONDITIONS   | Min. | Max. | Unit             |
|--------------|---|--|------|------|------------------|
| $I_{T(RMS)}$ | RMS On-state Current                      | All Conduction Angle, $T_C = 100\text{ }^\circ\text{C}$  | 16   |      | A                |
| $I_{TSM}$    | Non-repetitive On-State Current           | Full Cycle, 60 Hz  | 168  |      | A                |
| $I_{TSM}$    | Non-repetitive On-State Current           | Full Cycle, 50 Hz  | 160  |      | A                |
| $I^2t$       | Fusing Current                            | $t_p = 10\text{ ms}$ , Half Cycle  | 144  |      | A <sup>2</sup> 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 | $I_G = 2x I_{GT}$ , $t_r = 100\text{ ns}$<br>$f = 120\text{ Hz}$ , $T_j = 125\text{ }^\circ\text{C}$ | 50   |      | A/ $\mu\text{s}$ |
| $T_j$        | Operating Temperature                     |  | -40  | +125 | $^\circ\text{C}$ |
| $T_{stg}$    | Storage Temperature                       |  | -40  | +150 | $^\circ\text{C}$ |

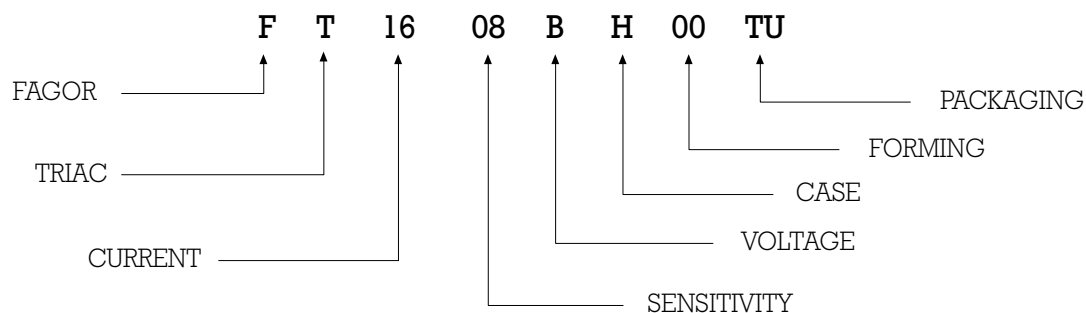
| SYMBOL                 | PARAMETER                         | VOLTAGE |     |     | Unit |
|------------------------|-----------------------------------|---------|-----|-----|------|
|                        |                                   | B       | D   | M   |      |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive Peak Off State Voltage | 200     | 400 | 600 | V    |

**LOGIC LEVEL TRIAC**
**Electrical Characteristics**

| SYMBOL              | PARAMETER                           | CONDITIONS  | Quadrant |     | SENSITIVITY |      | Unit         |
|---------------------|-------------------------------------|---|----------|-----|-------------|------|--------------|
|                     |                                     |   |          |     |             | 08   |              |
| $I_{CT}^{(1)}$      | Gate Trigger Current                | $V_D = 12 V_{DC}, R_L = 30 \Omega, T_j = 25^\circ C$                  | Q1÷Q3    | MAX |             | 10   | mA           |
| $I_{DRM} / I_{RRM}$ | Off-State Leakage Current           | $V_D = V_{DRM}, R_{GK} = 1K, T_j = 125^\circ C$                       |          | MAX |             | 2    | mA           |
|                     |                                     | $V_R = V_{RRM}, T_j = 25^\circ C$                                     |          | MAX |             | 5    | $\mu A$      |
| $V_{to}^{(2)}$      | Threshold Voltage                   | $T_j = 125^\circ C$   |          | MAX |             | 0.85 | V            |
| $R_d^{(2)}$         | Dynamic Resistance                  | $T_j = 125^\circ C$   |          | MAX |             | 25   | m            |
| $V_{TM}^{(2)}$      | On-state Voltage                    | $I_T = 22.5 \text{ Amp}, t_p = 380 \mu s, T_j = 25^\circ C$           |          | MAX |             | 1.55 | V            |
| $V_{GT}$            | Gate Trigger Voltage                | $V_D = 12 V_{DC}, R_L = 30 \Omega, T_j = 25^\circ C$                  | Q1÷Q3    | MAX |             | 1.3  | V            |
| $V_{GD}$            | Gate Non Trigger Voltage            | $V_D = V_{DRM}, R_L = 3.3K, T_j = 125^\circ C$                        | 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 |             | 15   | mA           |
| $I_L$               | Latching Current                    | $I_G = 1.2 I_{CT}, T_j = 25^\circ C$                                  | Q1,Q3    | MAX |             | 25   | mA           |
|                     |                                     |   | Q2       | MAX |             | 30   |              |
| $dv / dt^{(2)}$     | Critical Rate of Voltage Rise       | $V_D = 0.67 \times V_{DRM}, \text{ Gate open}$<br>$T_j = 125^\circ C$ |          | MIN |             | 40   | V/ $\mu s$   |
| $(dI/dt)_c^{(2)}$   | Critical Rate of Current Rise       | $(dv/dt)_c = 0.1 \text{ V}/\mu s, T_j = 125^\circ C$                  |          | MIN |             | 8.5  | A/ms         |
|                     |                                     | $(dv/dt)_c = 10 \text{ V}/\mu s, T_j = 125^\circ C$                   |          | MIN |             | 3.0  |              |
|                     |                                     | without snubber, $T_j = 125^\circ C$                                  |          | MIN |             | -    |              |
| $R_{th(j-c)}$       | Thermal Resistance Junction-Case    | for AC 360° conduction angle  |          |     |             | 1.2  | $^\circ C/W$ |
| $R_{th(j-a)}$       | Thermal Resistance Junction-Ambient |   |          |     |             | 60   | $^\circ C/W$ |

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

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

**PART NUMBER INFORMATION**


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

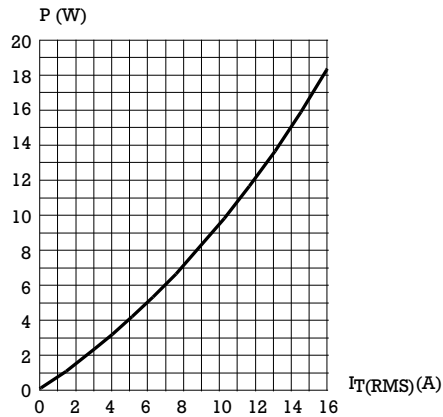


Fig. 3: Relative variation of thermal impedance versus pulse duration.

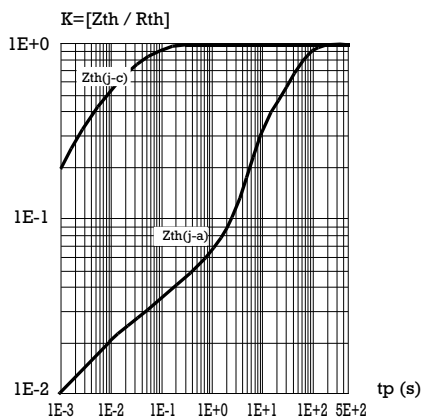


Fig. 5: Surge peak on-state current versus number of cycles.

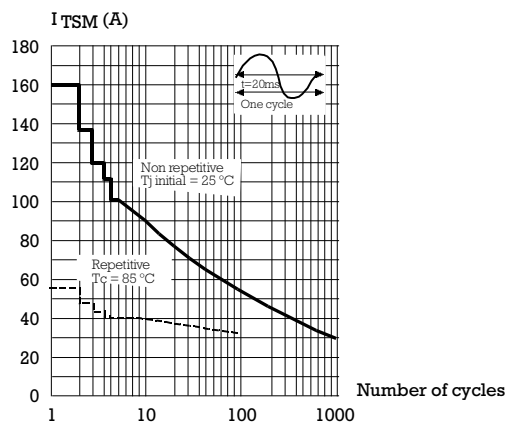


Fig. 2: RMS on-state current versus case temperature (full cycle).

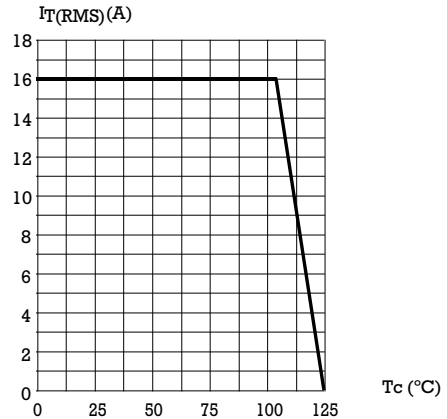
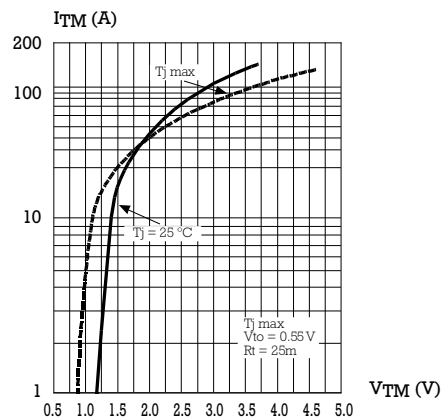
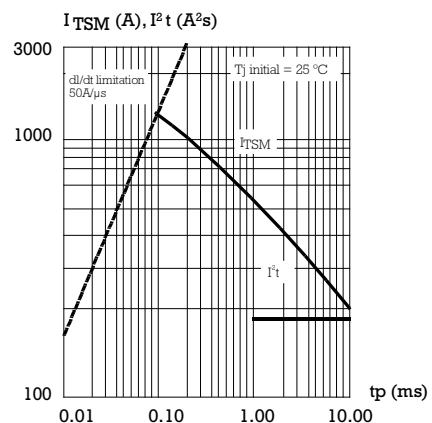


Fig. 4: On-state characteristics (maximum values)


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


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

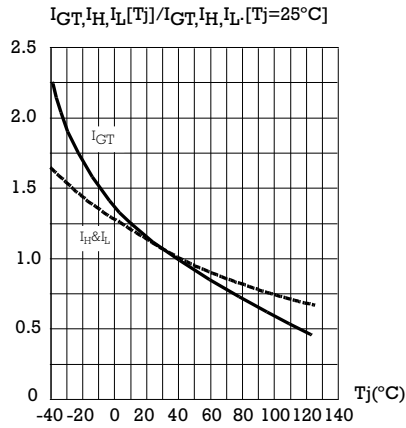
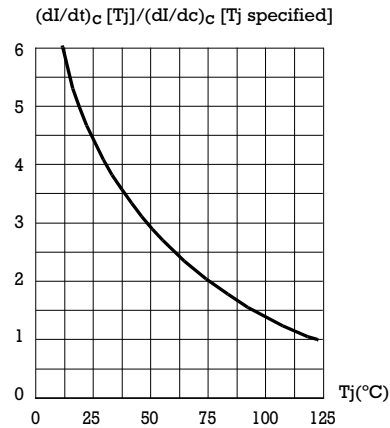


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature



**PACKAGE MECHANICAL DATA TO-220AB (Plastic)**

| REF. | DIMENSIONS  |         |       |
|------|-------------|---------|-------|
|      | Millimeters |         |       |
|      | Min.        | Nominal | Max.  |
| A    | 15.20       |         | 15.90 |
| a1   |             | 3.75    |       |
| a2   | 13.00       |         | 14.00 |
| B    | 10.00       |         | 10.40 |
| b1   | 0.61        |         | 0.88  |
| b2   | 1.23        |         | 1.32  |
| C    | 4.40        |         | 4.60  |
| c1   | 0.49        |         | 0.70  |
| c2   | 2.40        |         | 2.72  |
| e    | 2.40        |         | 2.70  |
| F    | 6.20        |         | 6.60  |
| I    | 3.75        |         | 3.85  |
| I4   | 15.80       | 16.40   | 16.80 |
| L    | 2.65        |         | 2.95  |
| I2   | 1.14        |         | 1.70  |
| I3   | 1.14        |         | 1.70  |
| M    |             | 2.60    |       |