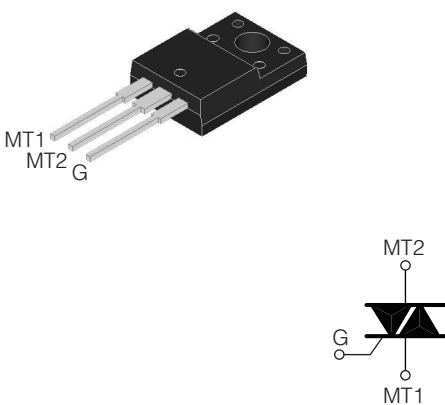


LOGIC LEVEL TRIAC

| | | | | | |
|---|---|----------------------------------|--|---|--|
| <p style="text-align: center;">TO220-F (FULLY ISOLATED CASE)</p>  | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">On-State Current 4 Amp</td> <td style="width: 50%; text-align: center;">Gate Trigger Current < 10 mA</td> </tr> <tr> <td colspan="2" style="text-align: center;">Off-State Voltage 200 V ÷ 800 V</td> </tr> </table> <p>This series of TRIACs uses a high performance PNPN technology.</p> <p>These parts are intended for general purpose AC switching applications with highly inductive loads.</p> | On-State Current 4 Amp | Gate Trigger Current < 10 mA | Off-State Voltage 200 V ÷ 800 V | |
| On-State Current 4 Amp | Gate Trigger Current < 10 mA | | | | |
| Off-State Voltage 200 V ÷ 800 V | | | | | |

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, $T_c = 95\text{ }^\circ\text{C}$ | 4 | A |
| I_{TSM} | Non-repetitive On-State Current | Full Cycle, 60 Hz ($t = 16.7\text{ ms}$) | 33 | A |
| I_{TSM} | Non-repetitive On-State Current | Full Cycle, 50 Hz ($t = 20\text{ ms}$) | 30 | A |
| I^2t | Fusing Current | $t_p = 10\text{ ms}$, Half Cycle | 4.5 | A^2s |
| I_{GM} | Peak Gate Current | $20\text{ }\mu\text{s max.}$ $T_j = 125\text{ }^\circ\text{C}$ | 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 | $I_G = 2 \times I_{GT}$, $t_r \leq 100\text{ ns}$ $f = 120\text{ Hz}$, $T_j = 125\text{ }^\circ\text{C}$ | 50 | $A/\mu\text{s}$ |
| T_j | Operating Temperature | | (-40 +125) | $^\circ\text{C}$ |
| T_{stg} | Storage Temperature | | (-40 +150) | $^\circ\text{C}$ |
| T_{sld} | Soldering Temperature | 10s max | 260 | $^\circ\text{C}$ |
| V_{iso} | R.M.S. isolation voltage 50/60 Hz sinusoidal waveform | | 2.500 | Vac |

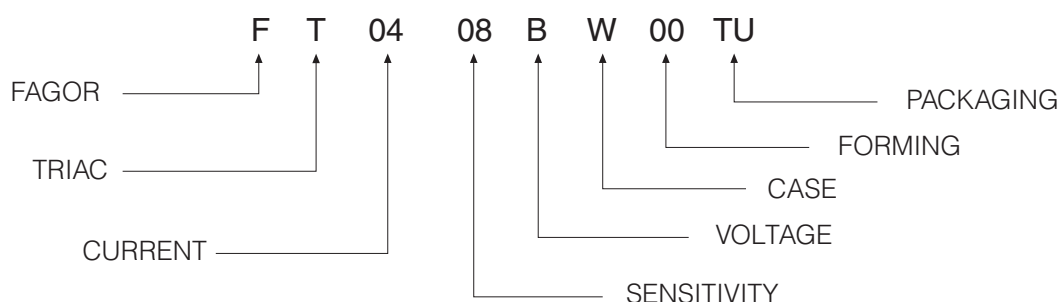
| SYMBOL | PARAMETER | VOLTAGE | | | | | Unit |
|------------------------|-----------------------------------|---------|-----|-----|-----|-----|------|
| | | B | D | M | S | N | |
| V_{DRM} V_{RRM} | Repetitive Peak Off State Voltage | 200 | 400 | 600 | 700 | 800 | V |

LOGIC LEVEL TRIAC
Electrical Characteristics

| SYMBOL | PARAMETER | CONDITIONS | Quadrant | | SENSITIVITY | | | | | Unit |
|-------------------|-------------------------------------|--|----------|-----|-------------|-----|-----|-----|-----|--------------|
| | | | | | 04 | 05 | 07 | 08 | 09 | |
| $I_{GT}^{(1)}$ | Gate Trigger Current | $V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25^\circ C$ | Q1÷Q3 | MAX | 5 | 5 | 5 | 10 | 10 | mA |
| | | | Q4 | MAX | | 5 | 7 | | 10 | 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 |
| | | | Q1÷Q4 | 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 |
| | | | Q1÷Q4 | MIN | 0.2 | | | | | V |
| $I_H^{(2)}$ | Holding Current | $I_T = 100 \text{ mA}, \text{ Gate open}, T_j = 25^\circ C$ | | MAX | 10 | 10 | 15 | 15 | 20 | mA |
| I_L | Latching Current | $I_G = 1.2 I_{GT}, T_j = 25^\circ C$ | Q1,Q3 | MAX | 10 | | | 25 | | mA |
| | | | Q1,Q3,Q4 | MAX | | 10 | 20 | | 20 | mA |
| | | | Q2 | MAX | 20 | 20 | 30 | 30 | 25 | mA |
| $dV/dt^{(2)}$ | Critical Rate of Voltage Rise | $V_D = 0.67 \times V_{DRM}, \text{ Gate open}$ $T_j = 125^\circ C$ | | MIN | 20 | 20 | 20 | 40 | 40 | V/ μ s |
| $(dI/dt)^{(2)}$ | Critical Rate of Current Rise | $(dv/dt)_c = 0.1 \text{ V}/\mu\text{s} \quad T_j = 125^\circ C$ $(dv/dt)_c = 10 \text{ V}/\mu\text{s} \quad T_j = 125^\circ C$ without snubber $T_j = 125^\circ C$ | | MIN | 1.8 | 1.8 | 1.8 | 2.7 | 2.5 | A/ms |
| | | | | MIN | 0.9 | 0.9 | 0.9 | 2.0 | 1.5 | A/ms |
| | | | | MIN | | | | | | |
| $V_{TM}^{(2)}$ | On-state Voltage | $I_T = 5.5 \text{ Amp}, t_p = 380 \mu\text{s}, T_j = 25^\circ C$ | | MAX | 1.6 | | | | | V |
| $V_{t(o)}^{(2)}$ | Threshold Voltage | $T_j = 125^\circ C$ | | MAX | 0.9 | | | | | V |
| $r_d^{(2)}$ | Dynamic resistance | $T_j = 125^\circ C$ | | MAX | 140 | | | | | m Ω |
| I_{DRM}/I_{RRM} | Off-State Leakage Current | $V_D = V_{DRM}, T_j = 125^\circ C$ | | MAX | 0.5 | | | | | mA |
| | | $V_R = V_{RRM}, T_j = 25^\circ C$ | | MAX | 5 | | | | | μ A |
| $R_{th(j-c)}$ | Thermal Resistance Junction-Case | for AC 360° conduction angle | | | 4.0 | | | | | $^\circ C/W$ |
| $R_{th(j-a)}$ | Thermal Resistance Junction-Ambient | $S = 1 \text{ cm}^2$ | | | 50 | | | | | $^\circ C/W$ |

(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


LOGIC LEVEL TRIAC

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

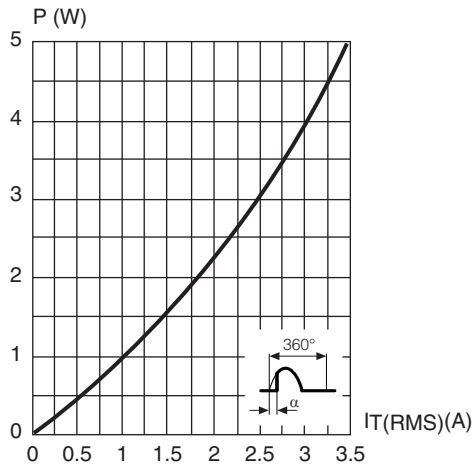


Fig. 2: RMS on-state current versus case temperature (full cycle).

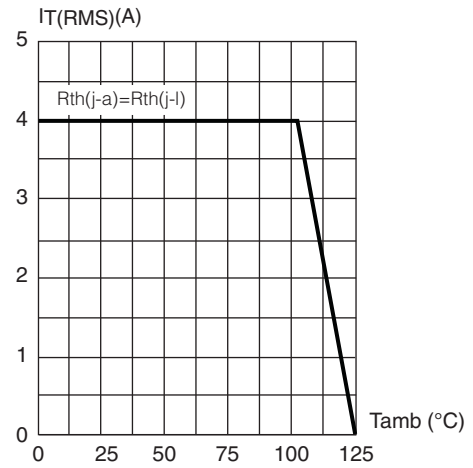


Fig. 3: Relative variation of thermal impedance versus pulse duration.

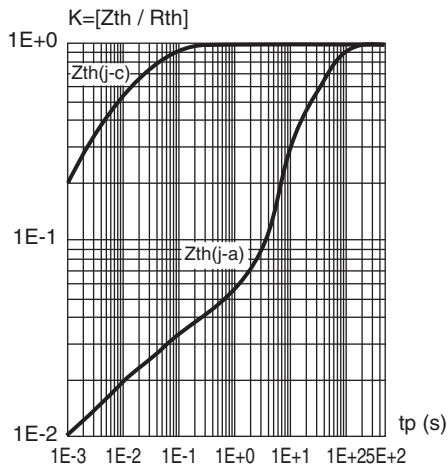


Fig. 5: Surge peak on-state current versus number of cycles

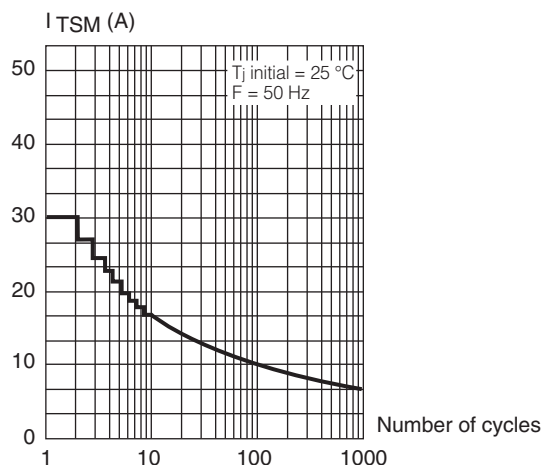


Fig. 4: On-state characteristics (maximum values)

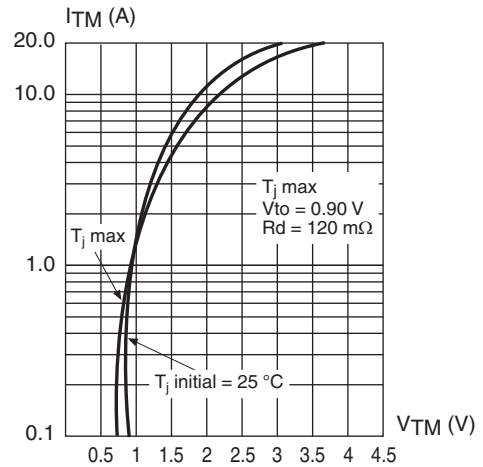
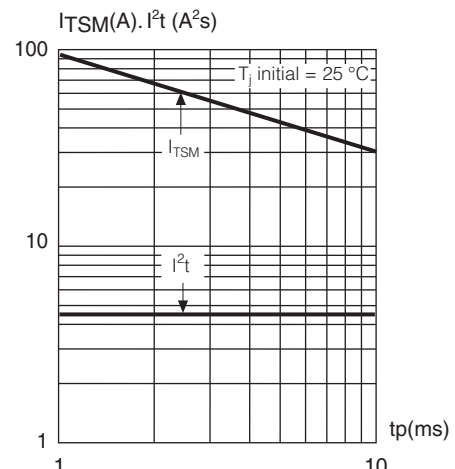


Fig. 6: Non repetitive surge peak on-state current for a sinusoidal pulse with width: $t_p < 10 \text{ ms}$, and corresponding value of I^2t .



LOGIC LEVEL TRIAC

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

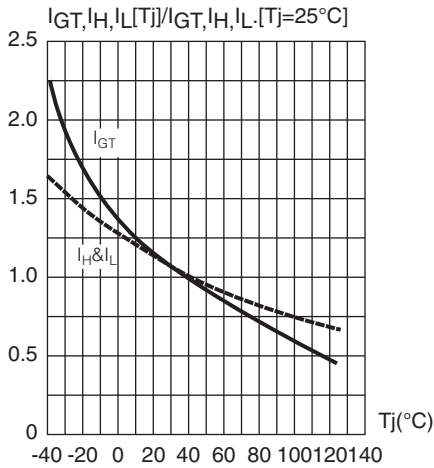


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature

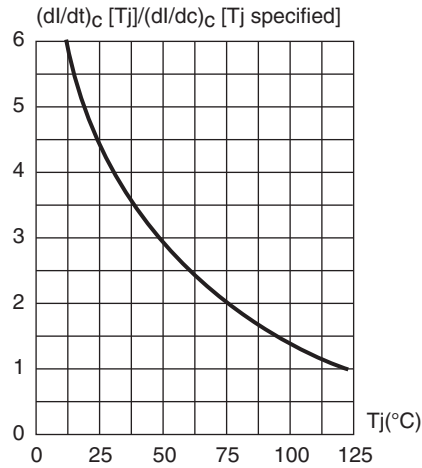
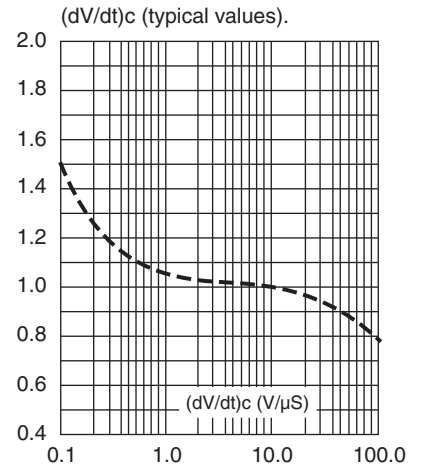
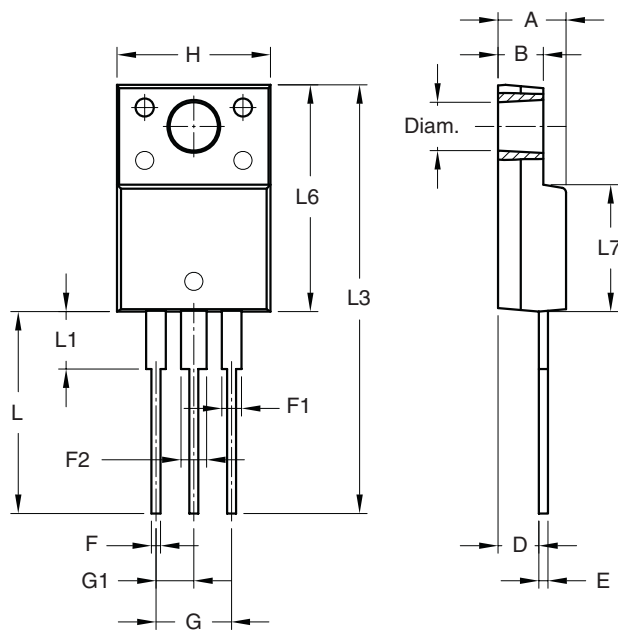


Fig. 9: Relative variation of critical rate of decrease of main current versus



PACKAGE MECHANICAL DATA

TO220-F



| REF. | DIMENSIONS | | |
|-------|------------|---------|-------|
| | Milimeters | | |
| | Min. | Nominal | Max. |
| A | 3.55 | 4.50 | 4.90 |
| B | 2.34 | 3.00 | 3.70 |
| D | 2.03 | 2.70 | 2.96 |
| E | 0.35 | 0.60 | 0.70 |
| F | 0.25 | 0.60 | 1.01 |
| F1 | 0.70 | 1.30 | 1.78 |
| F2 | 0.70 | 1.70 | 1.78 |
| G | 4.88 | 5.00 | 5.28 |
| G1 | 2.34 | 2.50 | 2.74 |
| H | 9.65 | 10.15 | 10.67 |
| L | 12.70 | 13.35 | 14.73 |
| L1 | 2.93 | 3.75 | 6.35 |
| L3 | 26.90 | 28.35 | 31.20 |
| L6 | 14.22 | 15.00 | 16.50 |
| L7 | 8.30 | 8.40 | 9.59 |
| Diam. | 3.00 | 3.20 | 3.28 |