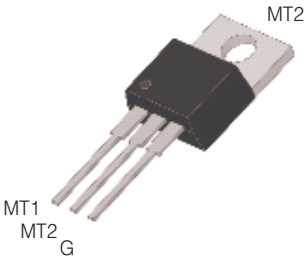
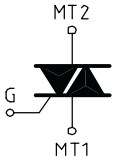
FAGOR

# HIGH COMMUTATION TRIAC

## TO220-AB




**On-State Current**
16 Amp

**Gate Trigger Current**
≤ 50 mA

**Off-State Voltage**
200 V ÷ 800 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 °C | 16 | A |
| $I_{TSM}$ | Non-repetitive On-State Current | Full Cycle, 60 Hz (t = 16.7 ms) | 176 | A |
| $I_{TSM}$ | Non-repetitive On-State Current | Full Cycle, 50 Hz (t = 20 ms) | 160 | A |
| $I^2t$ | Fusing Current | $t_p$ = 10 ms, Half Cycle | 128 | $A^2s$ |
| $I_{GM}$ | Peak Gate Current | 20 µs max. $T_j$ =125°C | 4 | A |
| $P_{G(AV)}$ | Average Gate Power Dissipation | $T_j$ =125°C | 1 | W |
| dI/dt | Critical rate of rise of on-state current | $I_G$ = 2x $I_{GT}$, tr ≤100ns<br>f= 120 Hz, $T_j$ =125°C | 50 | A/µs |
| $T_j$ | Operating Temperature | | (-40 +125) | °C |
| $T_{stg}$ | Storage Temperature | | (-40 +150) | °C |
| $T_{sld}$ | Soldering Temperature | 10s max | 260 | °C |

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

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## Electrical Characteristics

| SYMBOL | PARAMETER | CONDITIONS | Quadrant | | SENSITIVITY | | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | | 11 | 14 | 16 | |
| $I_{GT}$ (1) | Gate Trigger Current | $V_D$ = 12 $V_{DC}$ , $R_L$ = 33Ω, $T_j$ = 25 °C | Q1÷Q3 | MAX | 25 | 35 | 50 | mA |
| $V_{GT}$ | Gate Trigger Voltage | $V_D$ = 12 $V_{DC}$ , $R_L$ = 33Ω, $T_j$ = 25 °C | Q1÷Q3 | MAX | 1.3 | | | V |
| $V_{GD}$ | Gate Non Trigger Voltage | $V_D$ = $V_{DRM}$ , $R_L$ = 3.3KΩ, $T_j$ = 125 °C | Q1÷Q3 | MIN | 0.2 | | | V |
| $I_H$ (2) | Holding Current | $I_T$ = 100 mA , Gate open, $T_j$ = 25 °C | | MAX | 25 | 35 | 50 | mA |
| $I_L$ | Latching Current | $I_G$ = 1.2 $I_{GT}$, $T_j$ = 25 °C | Q1, Q3<br>Q2 | MAX<br>MAX | 40<br>50 | 50<br>60 | 70<br>80 | mA |
| dV/dt (2) | Critical Rate of Voltage Rise | $V_D$ = 0.67 x $V_{DRM}$ , Gate open $T_j$ = 125 °C | | MIN | 200 | 500 | 1000 | V/µs |
| (dI/dt)c (2) | Critical Rate of Current Rise | (dv/dt)c= 0.1 V/µs $T_j$ = 125 °C<br>(dv/dt)c= 10 V/µs $T_j$ = 125 °C<br>without snubber $T_j$ = 125 °C | | MIN<br>MIN<br>MIN | -<br>-<br>6 | -<br>-<br>8.5 | -<br>-<br>14 | A/ms |
| $V_{TM}$ (2) | On-state Voltage | $I_T$ = 22.5 Amp, tp = 380 µs, $T_j$ = 25 °C | | MAX | 1.6 | | | V |
| $V_{t(o)}$ (2) | Threshold Voltage | $T_j$ = 125 °C | | MAX | 0.77 | | | V |
| $r_d$ (2) | Dynamic Resistance | $T_j$ = 125 °C | | MAX | 40 | | | mΩ |
| $I_{DRM}/I_{RRM}$ | Off-State Leakage Current | $V_D$ = $V_{DRM}$ , $T_j$ = 125 °C<br>$V_R$ = $V_{RRM}$ , $T_j$ = 25 °C | | MAX<br>MAX | 2<br>5 | | | mA<br>µA |
| $R_{th(j-c)}$ | Thermal Resistance Junction-Case | for AC 360° conduction angle | | | 1.1 | | | °C/W |
| $R_{th(j-a)}$ | | | | | 60 | | | °C/W |

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

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

## PART NUMBER INFORMATION

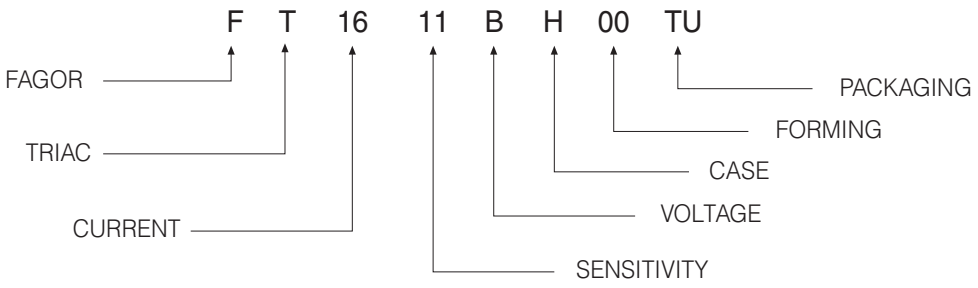

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Fig. 1: Maximum power dissipation versus RMS on-state curren (full cycle).

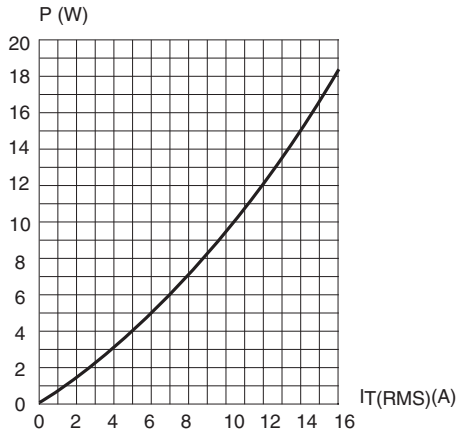


Fig. 2: RMS on-state current versus case temperature (full cycle).

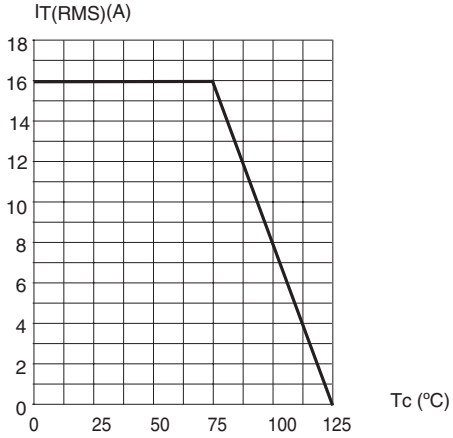


Fig. 3: : Relative variation of thermal impedance versus pulse duration.

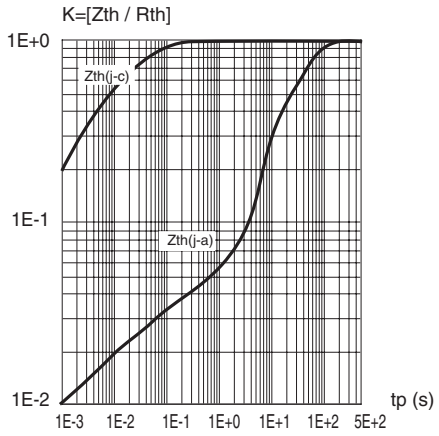


Fig. 4: On-state characteristics (maximum values)

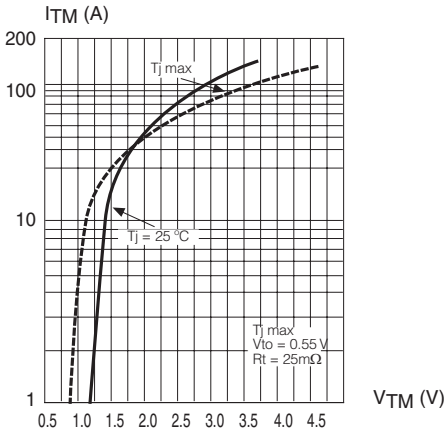


Fig. 5: Surge peak on-state current versus number of cycles

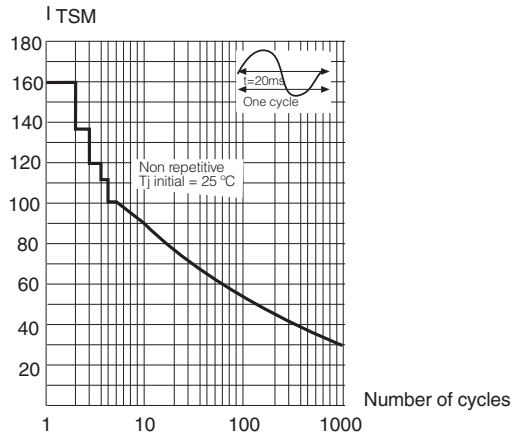


Fig. 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponding value of $I^2t$.

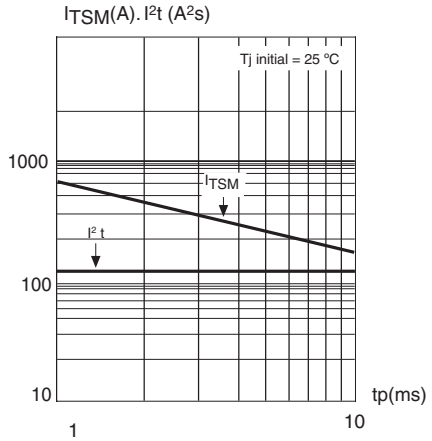

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Fig. 7: Relative variation of gate trigger current, holding current and latching versus junction temperature (typical values)

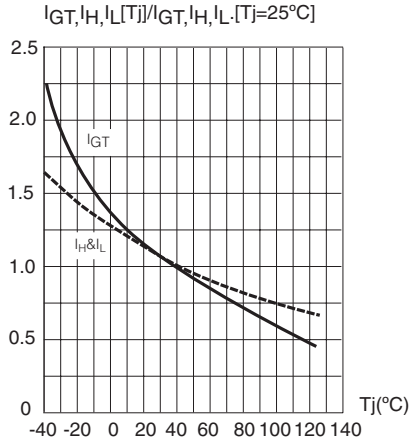
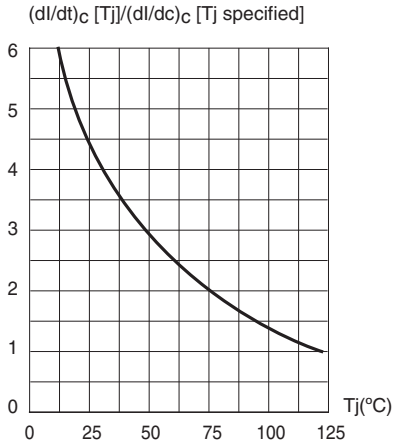
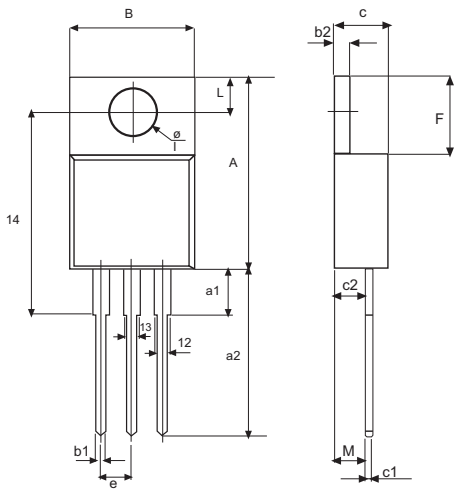



Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature




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




| REF. | DIMENSIONS | | |
|---|---|---|---|
| | Milimeters | | |
| | 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 | |