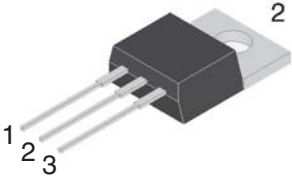
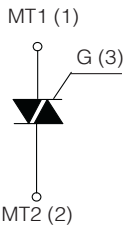




HIGH COMMUTATION TRIAC

| | | | | | |
|--|---|-----------------------------------|--|---|--|
| <p>TO-220AB</p>   | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">On-State Current 12 Amp</td> <td style="width: 50%;">Gate Trigger Current ≤ 50 mA</td> </tr> <tr> <td colspan="2" style="text-align: center;">Off-State Voltage 400 V ÷ 800 V</td> </tr> </table> <p>FEATURES</p> <ul style="list-style-type: none"> Glass/passivated die junctions Medium current Triac Low thermal resistance High commutation High surge current capability Low forward voltage drop Solder dip 260°C, 10s Component in accordance to RoHS 2011/65/EU and WEEE 2002/96/EC Meets MSL level 3, per J-STD-020, LF maximum peak of 260° C <div style="text-align: right;">   RoHS COMPLIANT </div> <p>MECHANICAL DATA</p> <ul style="list-style-type: none"> Case: TO-220AB. Epoxy meets UL 94V-0 flammability rating. Polarity: As marked on the body. Terminals: Matte tin plated leads, solderable per MIL-STD-750 Method 2026, J-STD-002 and JESD22-B102. Consumer grade, meets JESD 201 class 1A whisker test. <p>TYPICAL APPLICATIONS</p> <ul style="list-style-type: none"> Used on inductive loads, thanks to their high commutation performances. | On-State Current 12 Amp | Gate Trigger Current ≤ 50 mA | Off-State Voltage 400 V ÷ 800 V | |
| On-State Current 12 Amp | Gate Trigger Current ≤ 50 mA | | | | |
| Off-State Voltage 400 V ÷ 800 V | | | | | |

Maximun Ratings and Electrical Characteristics at 25°C

| SYMBOL | PARAMETER | CONDITIONS | Value | Unit |
|--------------|---|---|------------|-----------|
| $I_{T(RMS)}$ | RMS On-state Current (full sine wave) | All Conduction Angle, $T_c = 105\text{ °C}$ | 12 | A |
| I_{TSM} | Non-repetitive On-State Current | Full Cycle, 60 Hz ($t = 16.7\text{ ms}$) | 110 | A |
| I_{TSM} | Non-repetitive On-State Current | Full Cycle, 50 Hz ($t = 20\text{ ms}$) | 100 | A |
| I^2t | Fusing Current | $t_p = 10\text{ ms}$, Half Cycle | 50 | A^2s |
| I_{GM} | Peak Gate Current | $20\text{ }\mu s$ max. $T_j = 125\text{ °C}$ | 4 | A |
| $P_{G(AV)}$ | Average Gate Power Dissipation | $T_j = 125\text{ °C}$ | 1 | W |
| di/dt | Critical rate of rise of on-state current | $I_G = 2 \times I_{GT}$, $t_r \leq 100ns$ $f = 120\text{ Hz}$, $T_j = 125\text{ °C}$ | 50 | $A/\mu s$ |
| 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 |
|-------------------|-----------------------------------|---------|-----|-----|------|
| | | D | M | N | |
| V_{DRM}/V_{RRM} | Repetitive Peak Off State Voltage | 400 | 600 | 800 | V |

HIGH COMMUTATION TRIAC

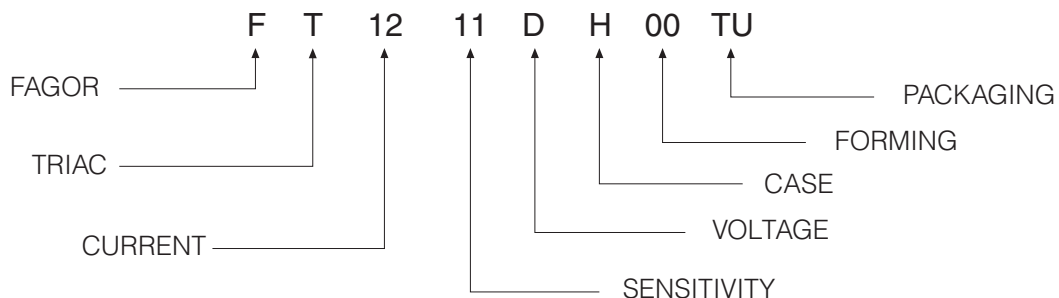
Electrical Characteristics at Tamb = 25 °C

| SYMBOL | PARAMETER | CONDITIONS | Quadrant | | SENSITIVITY | | | Unit |
|-------------------|--|---|----------|-----|-------------|-----|------|------------|
| | | | | | 11 | 14 | 16 | |
| $I_{GT}^{(1)}$ | Gate Trigger Current | $V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25\text{ °C}$ | Q1÷Q3 | MAX | 25 | 35 | 50 | mA |
| V_{GT} | Gate Trigger Voltage | $V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25\text{ °C}$ | Q1÷Q3 | MAX | 1.3 | | | V |
| V_{GD} | Gate Non Trigger Voltage | $V_D = V_{DRM}, R_L = 3.3\text{ K}\Omega, T_j = 125\text{ °C}$ | Q1÷Q3 | MIN | 0.2 | | | V |
| $I_H^{(2)}$ | Holding Current | $I_T = 100\text{ mA}, \text{Gate open}, T_j = 25\text{ °C}$ | | MAX | 25 | 35 | 50 | mA |
| I_L | Latching Current | $I_G = 1.2 I_{GT}, T_j = 25\text{ °C}$ | Q1,Q3 | MAX | 40 | 50 | 70 | mA |
| | | | Q2 | MAX | 50 | 60 | 80 | mA |
| $dV/dt^{(2)}$ | Critical Rate of Voltage Rise | $V_D = 0.67 \times V_{DRM}, \text{Gate open}$ $T_j = 125\text{ °C}$ | | MIN | 200 | 500 | 1000 | V/ μ s |
| $(dI/dt)_c^{(2)}$ | Critical Rate of Current Rise | $(dv/dt)_c = 0.1\text{ V}/\mu\text{s}$ $T_j = 125\text{ °C}$ | | MIN | - | - | - | A/ms |
| | | $(dv/dt)_c = 10\text{ V}/\mu\text{s}$ $T_j = 125\text{ °C}$ | | MIN | - | - | - | |
| | | without snubber $T_j = 125\text{ °C}$ | | MIN | 5.3 | 6.5 | 12 | |
| $V_{TM}^{(2)}$ | On-state Voltage | $I_T = 17\text{ Amp}, t_p = 380\text{ }\mu\text{s}, T_j = 25\text{ °C}$ | | MAX | 1.55 | | | V |
| $V_{t(o)}^{(2)}$ | Threshold Voltage | $T_j = 125\text{ °C}$ | | MAX | 0.85 | | | V |
| $r_d^{(2)}$ | Dynamic resistance | $T_j = 125\text{ °C}$ | | MAX | 3.5 | | | m Ω |
| I_{DRM}/I_{RRM} | Off-State Leakage Current | $V_D = V_{DRM}, T_j = 125\text{ °C}$ | | MAX | 1 | | | mA |
| | | $V_R = V_{RRM}, T_j = 25\text{ °C}$ | | MAX | 5 | | | μ A |
| $R_{th(j-c)}$ | Thermal Resistance Junction-Case | for AC 360° conduction angle | | | 1.4 | | | °C/W |
| $R_{th(j-a)}$ | Thermal Resistance Junction-Ambient | | | | 60 | | | °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

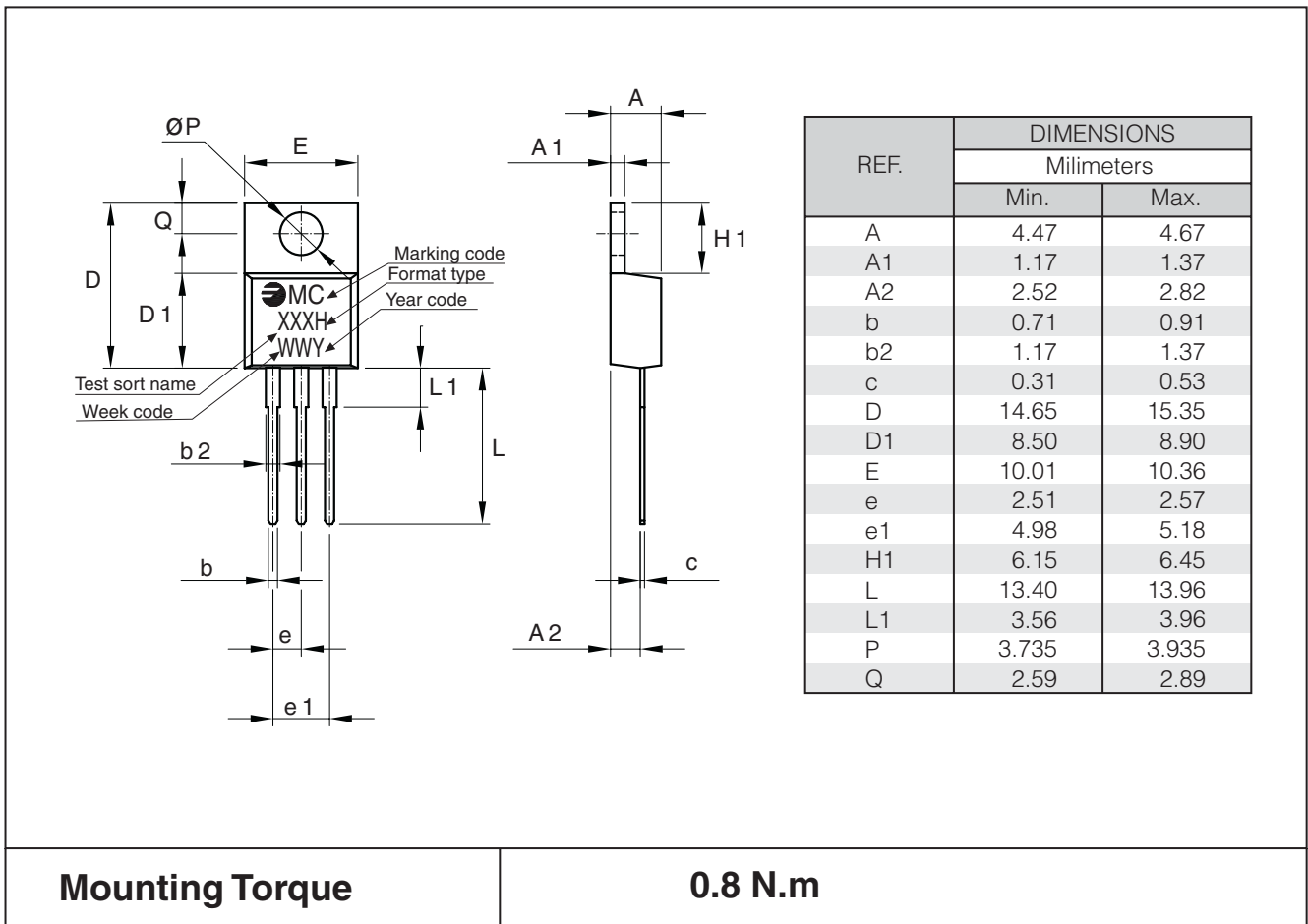


HIGH COMMUTATION TRIAC

Ordering information

| PREFERRED P/N | PACKAGE CODE | DELIVERY MODE | BASE QUANTITY | UNIT WEIGHT (g) |
|---------------|--------------|---------------|---------------|-----------------|
| FT1216DH 00TU | TU | TUBE | 1000 | 2.30 |

Package Outline Dimensions: (mm) TO-220AB



Mounting Torque

0.8 N.m

HIGH COMMUTATION TRIAC

Ratings and Characteristics (Ta 25 °C unless otherwise noted)

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

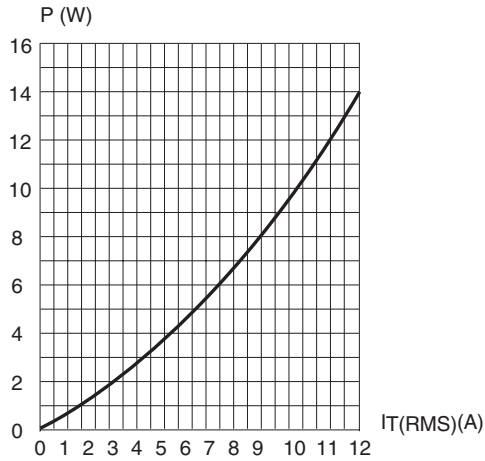


Fig. 2: RMS on-state current versus case temperature (full cycle)

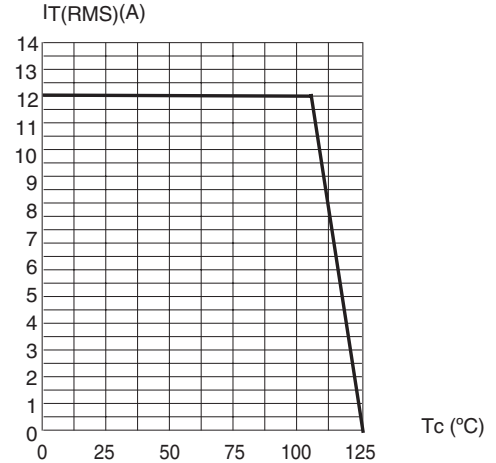


Fig. 3: Relative variation of thermal impedance versus pulse duration

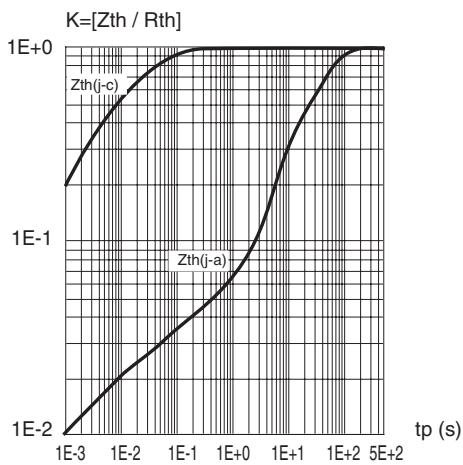


Fig. 4: On-state characteristics (maximum values)

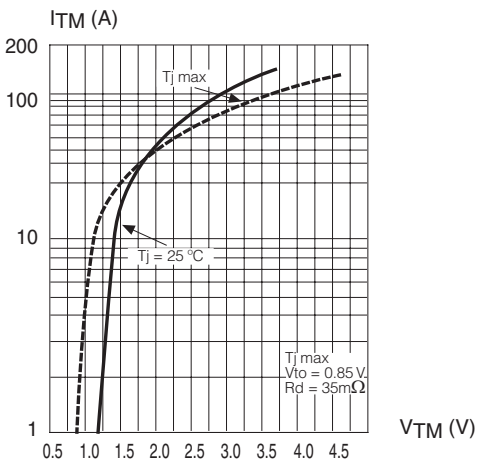


Fig. 5: Surge peak on-state current versus number of cycles

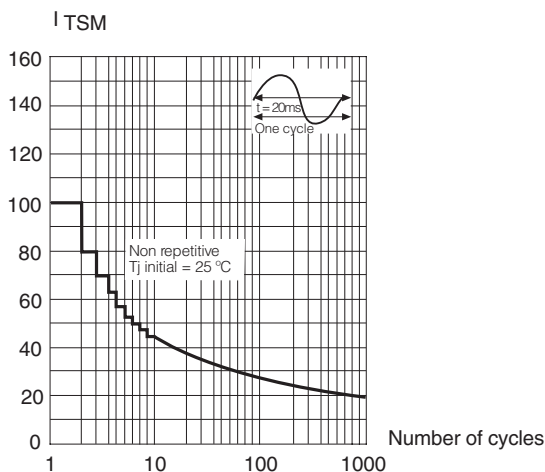
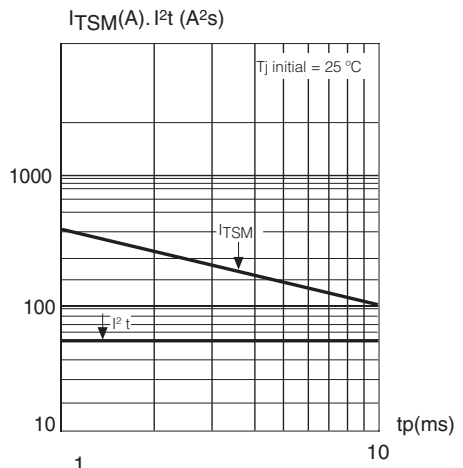


Fig. 6: Non repetitive surge peak on-state current for a sinusoidal pulse with width: tp < 10 ms, and corresponding value of I²t.



HIGH COMMUTATION TRIAC

Ratings and Characteristics (Ta 25 °C unless otherwise noted)

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

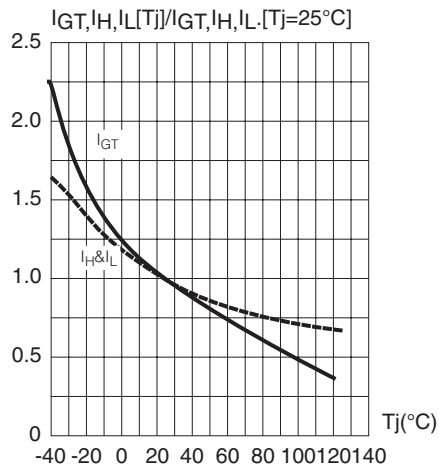
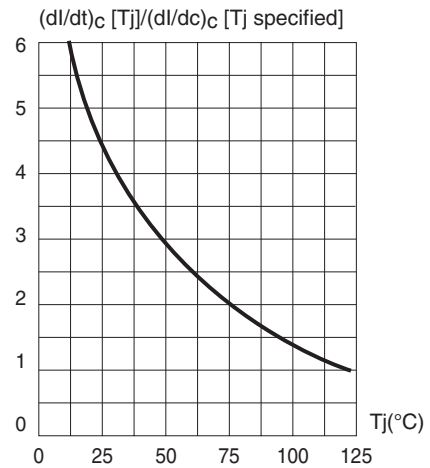


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature



HIGH COMMUTATION TRIAC

Revision History

| Date | Revision | Description of Changes |
|-------------|----------|---|
| 14-Jun-2011 | 0 | Original Data Sheet |
| 10-May-2013 | 1 | Change values of: $I_{T(RMS)}$ / I_{TSM} / I^2t / V_{TM} / $V_{t(o)}$ / r_d / $R_{th(j-c)}$ |
| 3-Jul-2013 | 2 | Rescale curves in Figure 7 |

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