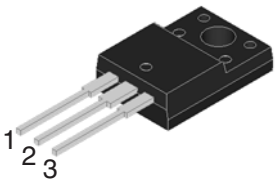
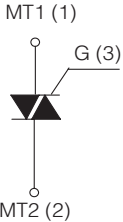


STANDARD TRIAC

TO-220F (FULLY ISOLATED CASE)  	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> On-State Current 12 Amp </td><td style="width: 50%; text-align: center;"> Gate Trigger Current $\leq 100 \text{ mA}$ </td></tr> <tr> <td colspan="2" style="text-align: center;"> Off-State Voltage 400 V ÷ 800 V </td></tr> </table> FEATURES • Glass/passivated die junctions • Medium current Triac • Ideal for automated placement • Low thermal resistance • 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 MECHANICAL DATA • Case: TO-220F. 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. TYPICAL APPLICATIONS Suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, induction motor starting circuits... or for phase control operation in light dimmers, motor speed controllers, ...   RoHS COMPLIANT	On-State Current 12 Amp	Gate Trigger Current $\leq 100 \text{ mA}$	Off-State Voltage 400 V ÷ 800 V	
On-State Current 12 Amp	Gate Trigger Current $\leq 100 \text{ mA}$				
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, $T_c = 56^\circ\text{C}$	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	$20 \mu\text{s max.}$ $T_j = 125^\circ\text{C}$	4	A
$P_{G(AV)}$	Average Gate Power Dissipation	$T_j = 125^\circ\text{C}$	1	W
di/dt	Critical rate of rise of on-state current	$I_G = 2 \times I_{GT}$, $t_r \leq 100\text{ns}$ $f = 120 \text{ Hz}$, $T_j = 125^\circ\text{C}$	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	$^\circ\text{C}$
V_{iso}	R.M.S. isolation voltage 50/60 Hz sinusoidal waveform		2.500	Vac

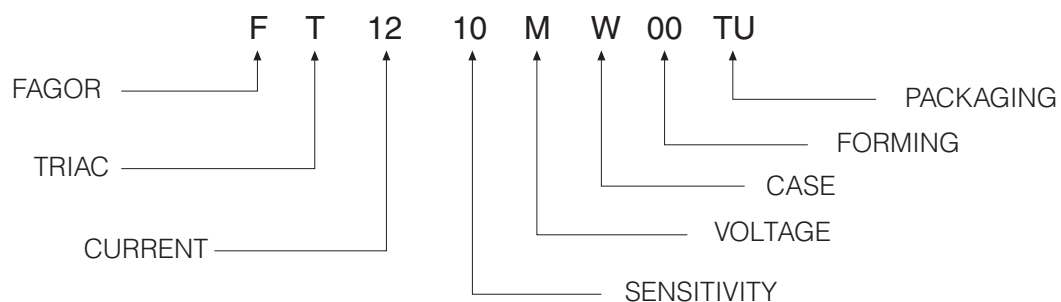
SYMBOL	PARAMETER	VOLTAGE			Unit
		D	M	N	
V_{DRM}/V_{RRM}	Repetitive Peak Off State Voltage	400	600	800	V

STANDARD TRIAC
Electrical Characteristics at Tamb = 25 °C

SYMBOL	PARAMETER	CONDITIONS	Quadrant		SENSITIVITY			Unit
					10	18	17	
$I_{GT}^{(1)}$	Gate Trigger Current	$V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25^\circ C$	Q1÷Q3 Q4	MAX MAX	25 25	25 50	50 100	mA
V_{GT}	Gate Trigger Voltage	$V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25^\circ C$	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÷Q4	MIN	0.2			V
$I_H^{(2)}$	Holding Current	$I_T = 100 \text{ mA}, \text{Gate open}, T_j = 25^\circ C$		MAX	25	25	50	mA
I_L	Latching Current	$I_G = 1.2 I_{GT}, T_j = 25^\circ C$	Q1, Q3, Q4 Q2	MAX MAX	40 60	40 80	70 100	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	200	200	400	V/ μs
$(dV/dt)_c^{(2)}$	Critical Rate of Commu- tating off-state voltage	$(dI/dt)_c = 2.7 \text{ A/ms } T_j = 125^\circ C$		MIN	3	5	10	V/ μs
$V_{TM}^{(2)}$	On-state Voltage	$I_T = 17 \text{ Amp}, t_p = 380 \mu s, T_j = 25^\circ C$		MAX	1.55			V
$V_{t(o)}^{(2)}$	Threshold Voltage	$T_j = 125^\circ C$		MAX	0.85			V
$r_d^{(2)}$	Dynamic resistance	$T_j = 125^\circ C$		MAX	35			m Ω
I_{DRM}/I_{RRM}	Off-State Leakage Current	$V_D = V_{DRM}, T_j = 125^\circ C$ $V_R = V_{RRM}, T_j = 25^\circ C$		MAX MAX	1 5			mA μA
$R_{th(j-c)}$	Thermal Resistance Junction-Case	for AC 360° conduction angle			4			°C/W
$R_{th(j-a)}$	Thermal Resistance Junction-Ambient				55			°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.

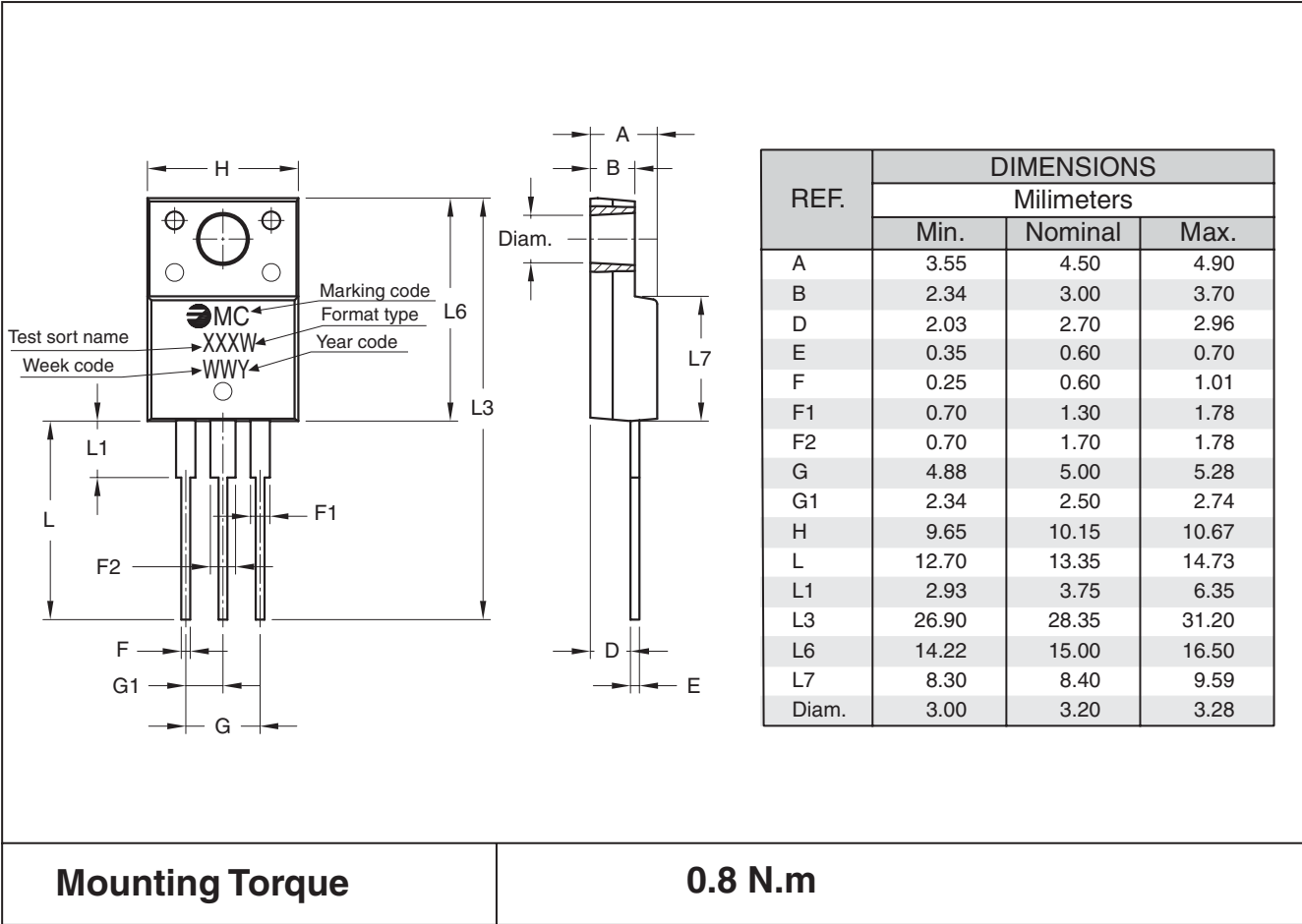
Part Number Information


STANDARD TRIAC

Ordering information

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FT1210MW 00TU	TU	TUBE	1,000	2.00

Package Outline Dimensions: (mm) TO-220F



STANDARD TRIAC

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

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

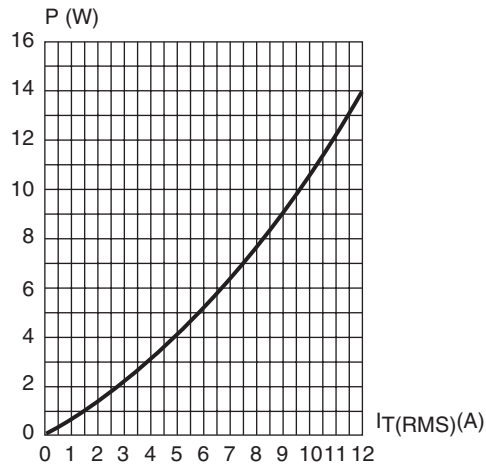


Fig. 2: RMS on-state current versus case temperature (full cycle).

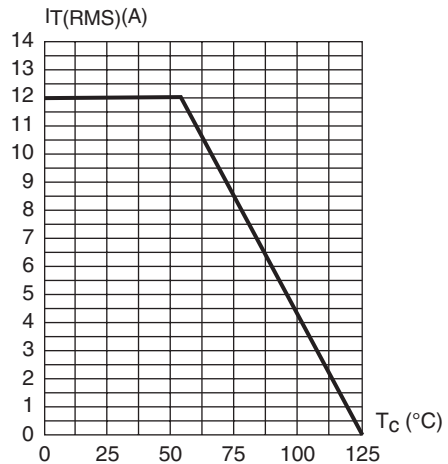


Fig. 3: Relative variation of thermal impedance versus pulse duration.

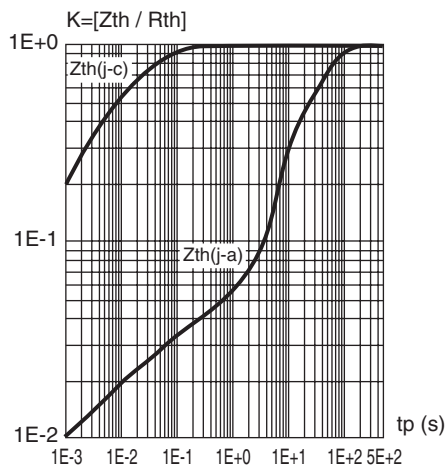


Fig. 4: On-state characteristics (maximum values)

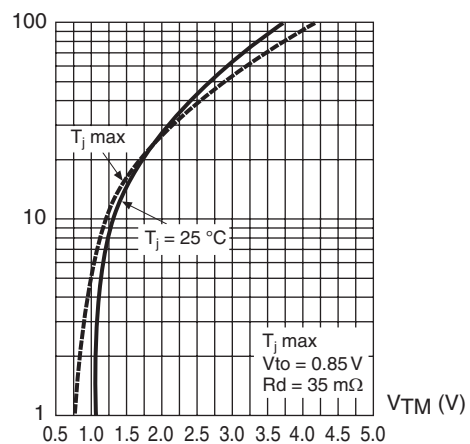


Fig. 5: Surge peak on-state current versus number of cycles

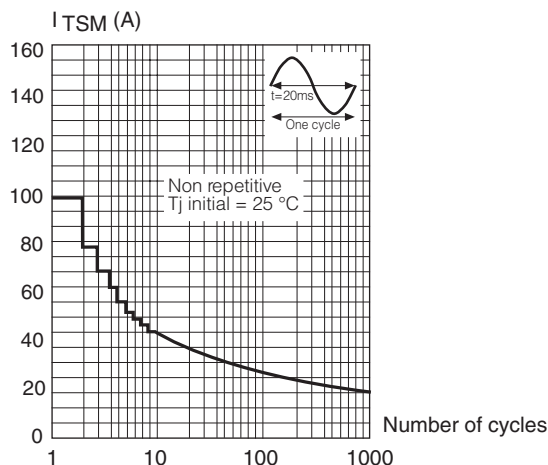
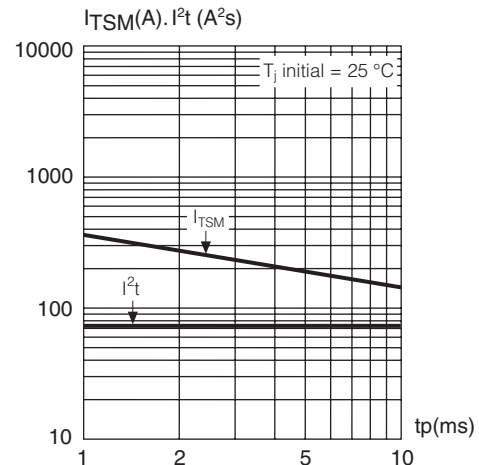


Fig. 6: Non repetitive surge peak on-state current for a sinusoidal pulse with width: $t_p < 10$ ms, and corresponding value of I^2t .



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

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

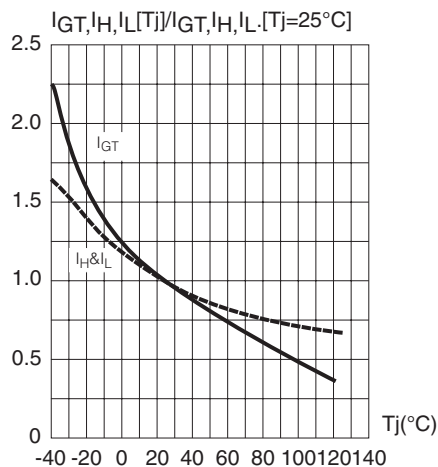


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature

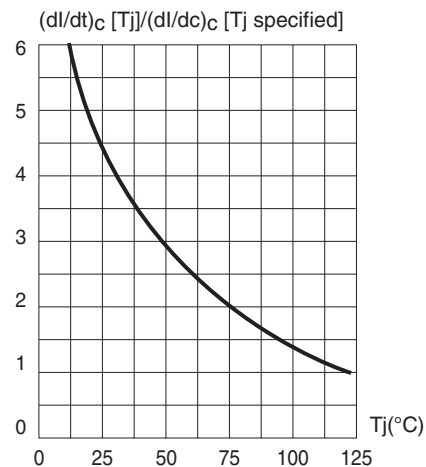
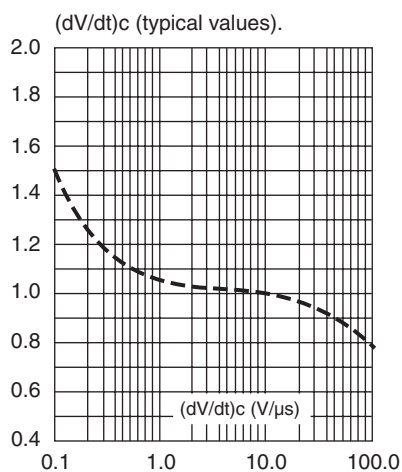


Fig. 9: Relative variation of critical rate of decrease of main current versus



STANDARD TRIAC

Revision History

Date	Revision	Description of Changes
14-Apr-2005	0	Original Data Sheet
11-Jun-2013	1	Change values of: $I_{T(RMS)}$ / I_{TSM} / I^2t / $V_{t(o)}$ / r_d / $R_{th(j-c)}$ / $R_{th(j-a)}$

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