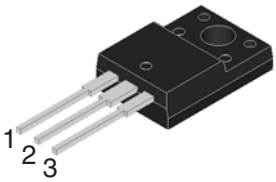
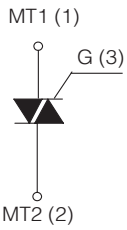
STANDARD TRIAC

TO-220F
(FULLY ISOLATED CASE)





On-State Current 12 Amp

Gate Trigger Current ≤ 100 mA

Off-State Voltage 400 V ÷ 800 V

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

RoHS COMPLIANT

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, ...

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 °C	12	A
I_{TSM}	Non-repetitive On-State Current	Full Cycle, 60 Hz (t = 16.7 ms)	110	A
I_{TSM}	Non-repetitive On-State Current	Full Cycle, 50 Hz (t = 20 ms)	100	A
I^2t	Fusing Current	tp = 10 ms, Half Cycle	50	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}, t_r ≤100ns 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
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

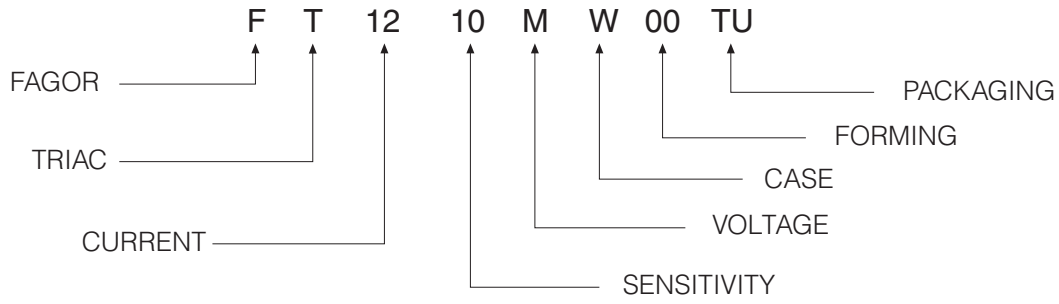
STANDARD TRIAC

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 = 33Ω, T_j = 25 °C	Q1÷Q3	MAX	25	25	50	mA
			Q4	MAX	25	50	100	
V_{GT}	Gate Trigger Voltage	V_D = 12 V_{DC}, R_L = 33Ω, T_j = 25 °C	Q1÷Q4	MAX	1.3			V
V_{GD}	Gate Non Trigger Voltage	V_D = V_{DRM}, R_L = 3.3 KΩ, T_j = 125 °C	Q1÷Q4	MIN	0.2			V
I_H (2)	Holding Current	I_T =100 mA,Gate open, T_j = 25 °C		MAX	25	25	50	mA
I_L	Latching Current	I_G = 1.2 I_{GT}, T_j = 25 °C	Q1, Q3, Q4	MAX	40	40	70	mA
			Q2	MAX	60	80	100	
dV/dt (2)	Critical Rate of Voltage Rise	V_D = 0.67 x V_{DRM}, Gate open T_j = 125 °C		MIN	200	200	400	V/µs
(dV/dt)c(2)	Critical Rate of Commutating off-state voltage	(dI/dt)c = 2.7 A/ms T_j = 125 °C		MIN	3	5	10	V/µs
V_{TM} (2)	On-state Voltage	I_T = 17 Amp, tp = 380 µs, T_j = 25 °C		MAX	1.55			V
$V_{t(o)}$ (2)	Threshold Voltage	T_j = 125 °C		MAX	0.85			V
r_d (2)	Dynamic resistance	T_j = 125 °C		MAX	35			mΩ
I_{DRM}/I_{RRM}	Off-State Leakage Current	V_D = V_{DRM}, T_j = 125 °C		MAX	1			mA
		V_R = V_{RRM}, T_j = 25 °C		MAX	5			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 guaranted at 5% of I_{GT} max.
(2) For either polarity of electrode MT2 voltage with reference to electrode MT1.

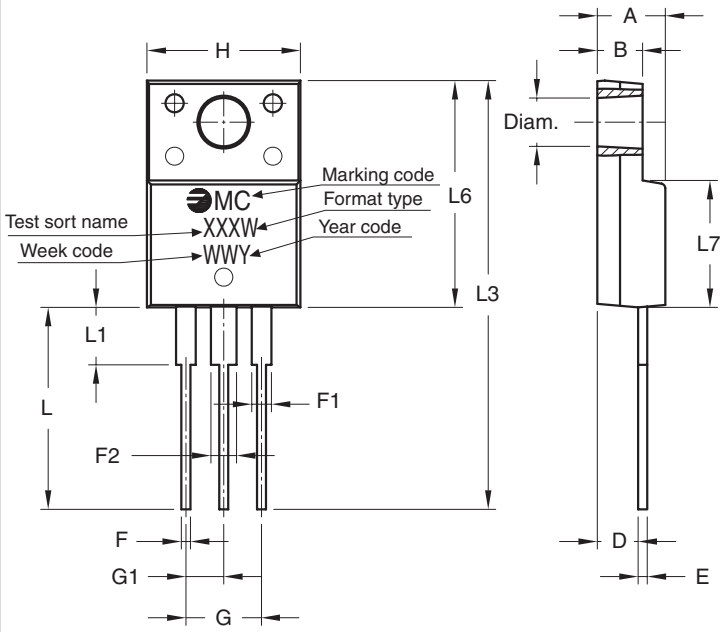
Part Number Information



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



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

Mounting Torque	0.8 N.m

Ratings and Characteristics (Ta 25 ºC unless otherwise noted)

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

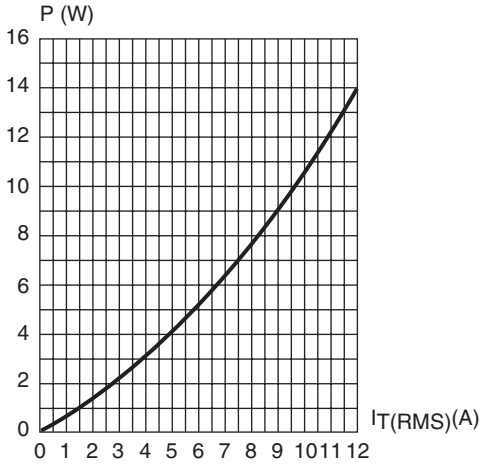


Fig. 2: RMS on-state current versus case temperature (full cycle).

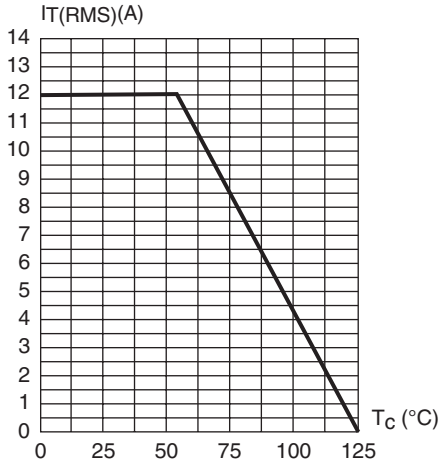


Fig. 3: Relative variation of thermal impedance versus pulse duration.

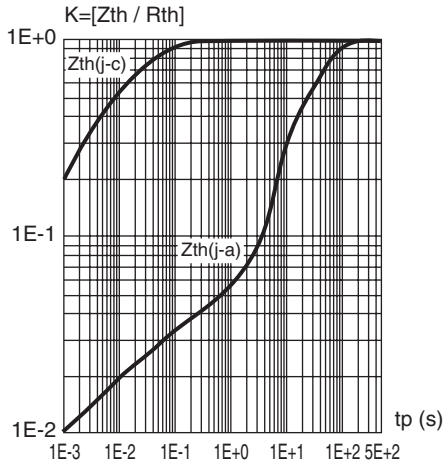


Fig. 4: On-state characteristics (maximum values)

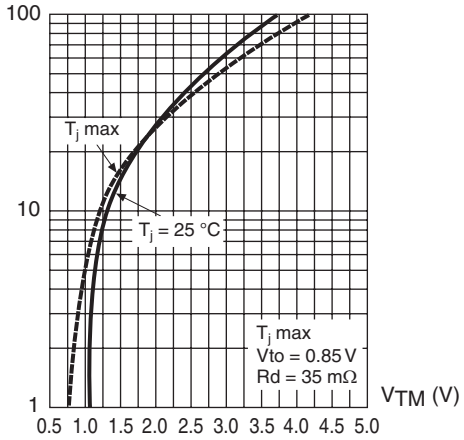


Fig. 5: Surge peak on-state current versus number of cycles

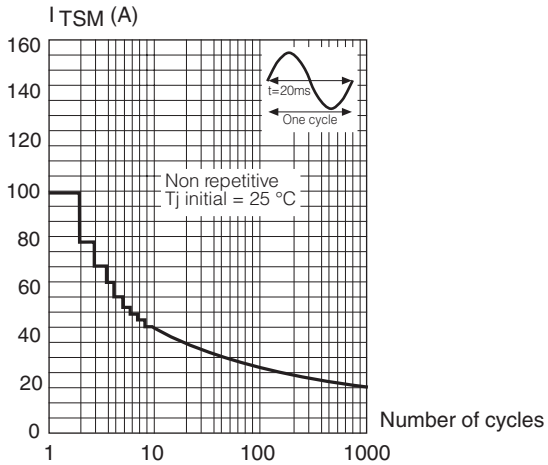
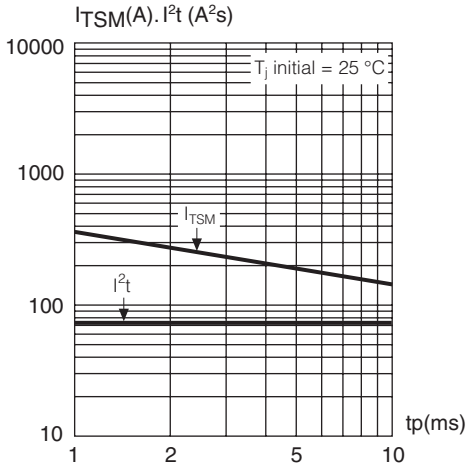


Fig. 6: Non repetitive surge peak on-state current for a sinusoidal pulse with width: tp < 10 ms, and corresponding value of I^2t.



Ratings and Characteristics (Ta 25 ºC unless otherwise noted)

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

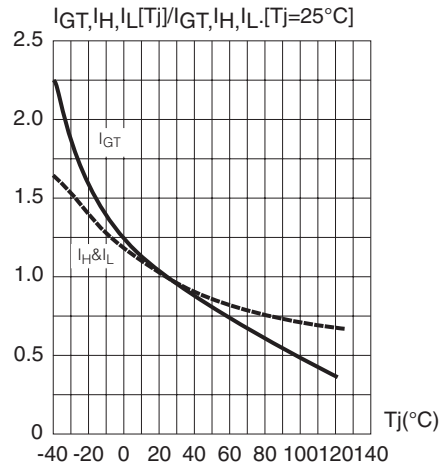


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature

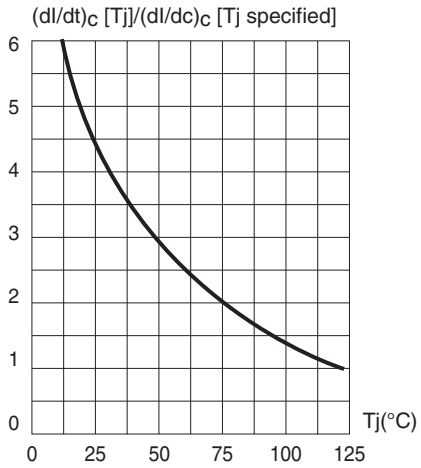
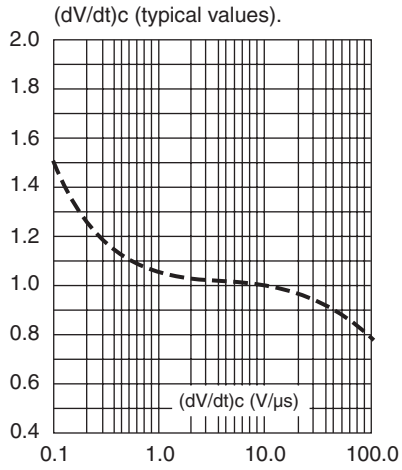


Fig. 9: Relative variation of critical rate of decrease of main current versus

(dV/dt)c (typical values).



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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