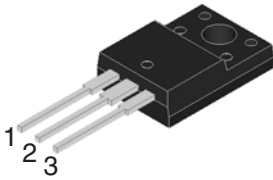
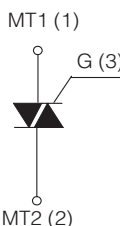




## HIGH COMMUTATION TRIAC

<p><b>TO-220F</b> (FULLY ISOLATED CASE)</p>  	<p><b>On-State Current</b> 4 Amp</p> <p><b>Gate Trigger Current</b> <math>\leq 35 \text{ mA}</math></p> <p><b>Off-State Voltage</b> 400 V ÷ 800 V</p>
	<p><b>FEATURES</b></p> <ul style="list-style-type: none"> <li>• Glass/passivated die junctions</li> <li>• Medium current Triac</li> <li>• Low thermal resistance</li> <li>• Ideal for automated placement</li> <li>• High commutation</li> <li>• High surge current capability</li> <li>• Low forward voltage drop</li> <li>• Solder dip 260°C, 10s</li> <li>• Component in accordance to RoHS 2011/65/EU and WEEE 2002/96/EC</li> <li>• Meets MSL level 3, per J-STD-020, LF maximum peak of 260° C</li> </ul> <p>  <b>RoHS</b> COMPLIANT</p>
	<p><b>MECHANICAL DATA</b></p> <ul style="list-style-type: none"> <li>• <b>Case:</b> TO-220F. Epoxy meets UL 94V-0 flammability rating.</li> <li>• <b>Polarity:</b> As marked on the body.</li> <li>• <b>Terminals:</b> 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.</li> </ul>
	<p><b>TYPICAL APPLICATIONS</b></p> <ul style="list-style-type: none"> <li>• Used on inductive loads, thanks to their high commutation performances.</li> </ul>

### 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, $T_c = 95^\circ\text{C}$	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	$\text{A}^2\text{s}$
$I_{GM}$	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

## HIGH COMMUTATION TRIAC

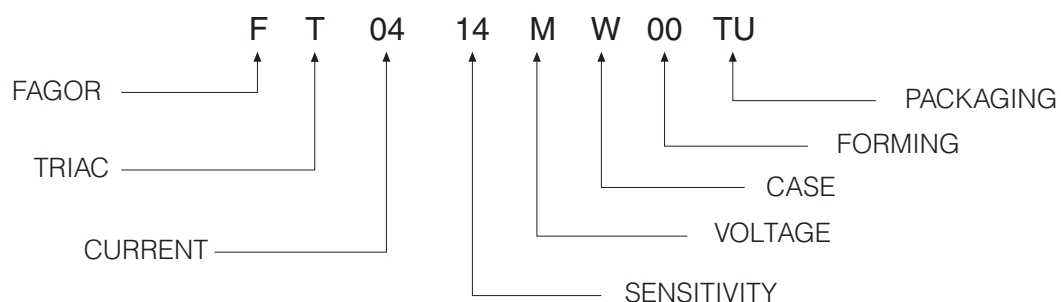
### Electrical Characteristics at Tamb = 25 °C

SYMBOL	PARAMETER	CONDITIONS	Quadrant		SENSITIVITY	Unit
					14	
$I_{GT}^{(1)}$	Gate Trigger Current	$V_D = 12 V_{DC}$ , $R_L = 33\Omega$ , $T_j = 25^\circ C$	Q1÷Q3	MAX	35	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
$V_{GD}$	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
$I_H^{(2)}$	Holding Current	$I_T = 100$ mA, Gate open, $T_j = 25^\circ C$		MAX	35	mA
$I_L$	Latching Current	$I_G = 1.2 I_{GT}$ , $T_j = 25^\circ C$	Q1,Q3	MAX	50	mA
			Q2	MAX	60	
$dV/dt^{(2)}$	Critical Rate of Voltage Rise	$V_D = 0.67 \times V_{DRM}$ , Gate open $T_j = 125^\circ C$		MIN	400	V/ $\mu s$
$(dI/dt)_C^{(2)}$	Critical Rate of Current Rise	$(dv/dt)_C = 0.1$ V/ $\mu s$ $T_j = 125^\circ C$		MIN	-	A/ms
		$(dv/dt)_C = 10$ V/ $\mu s$ $T_j = 125^\circ C$		MIN	-	
		without snubber $T_j = 125^\circ C$		MIN	2.5	
$V_{TM}^{(2)}$	On-state Voltage	$I_T = 5.5$ Amp, $t_p = 380 \mu s$ , $T_j = 25^\circ C$		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 $\Omega$
$I_{DRM}/I_{RRM}$	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	$\mu A$
$R_{th(j-c)}$	Thermal Resistance Junction-Case	for AC 360° conduction angle			4.0	°C/W
$R_{th(j-a)}$	Thermal Resistance Junction-Ambient				50	°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

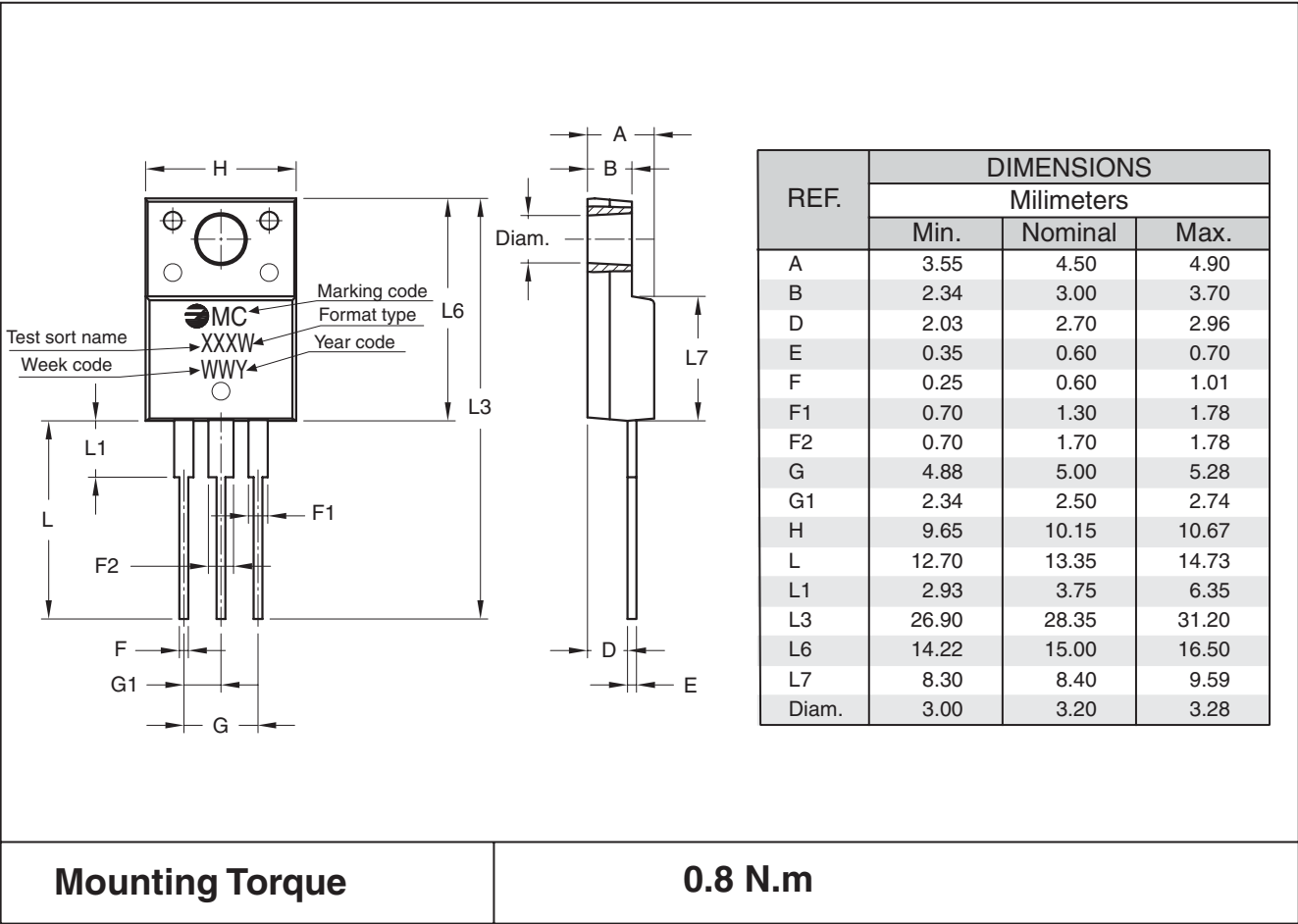


HIGH COMMUTATION TRIAC

Ordering information

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FT0414MW 00TU	TU	TUBE	1,000	2.00

Package Outline Dimensions: (mm) TO-220F



## HIGH COMMUTATION TRIAC

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

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

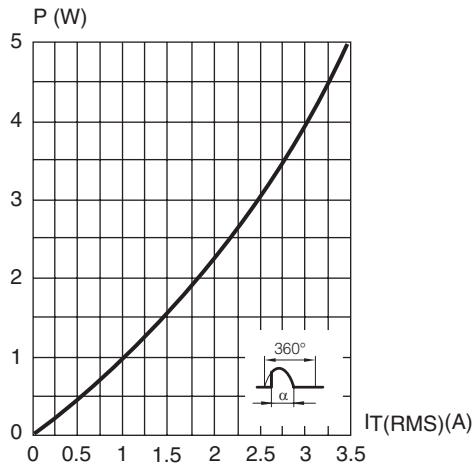


Fig. 2: RMS on-state current versus case temperature (full cycle).

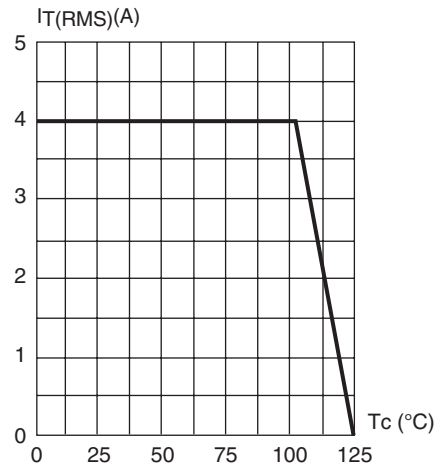


Fig. 3: Relative variation of thermal impedance versus pulse duration.

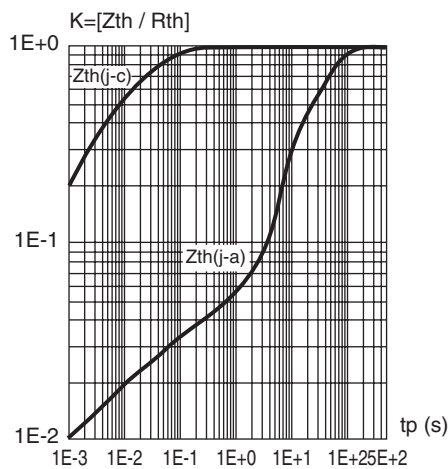


Fig. 5: Surge peak on-state current versus number of cycles

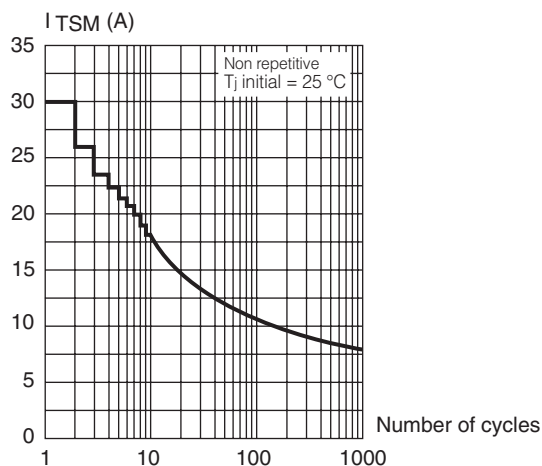


Fig. 4: On-state characteristics (maximum values)

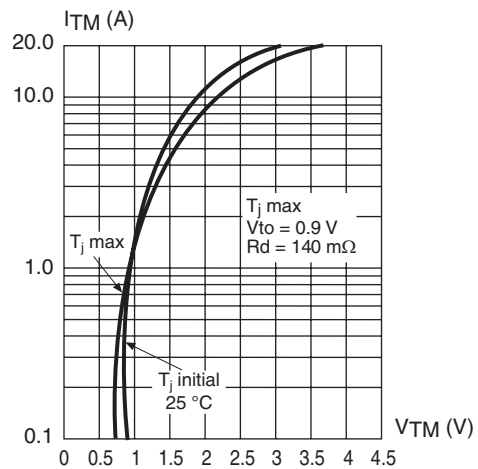
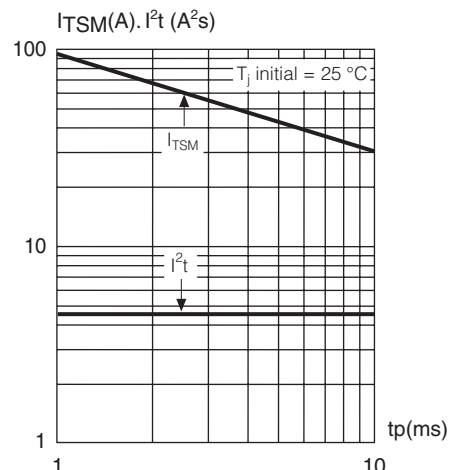


Fig. 6: Non repetitive surge peak on-state current for a sinusoidal pulse with width:  $t_p < 10$  ms, and corresponding value of  $I^2t$ .



## 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)

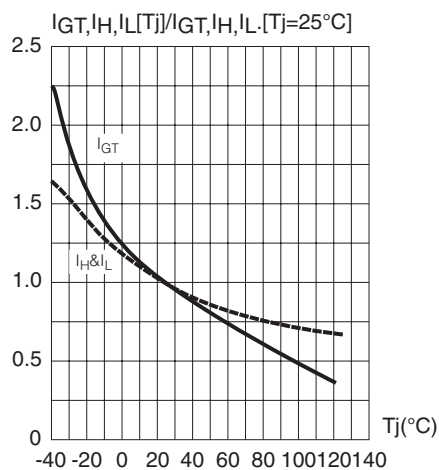
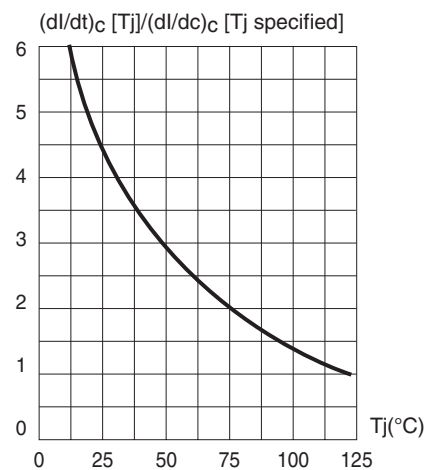


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature



**HIGH COMMUTATION TRIAC****Revision History**

Date	Revision	Description of Changes
14-Apr-2005	0	Original Data Sheet
05-May-2017	1	200V and 700V eliminated

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