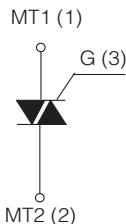
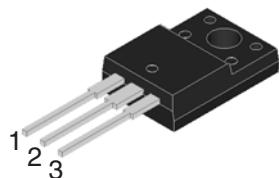


## HIGH COMMUTATION TRIAC

**TO-220F**  
(FULLY ISOLATED CASE)



**On-State Current**      **Gate Trigger Current**

4 Amp       $\leq 35$  mA

**Off-State Voltage**

400 V ÷ 800 V

**FEATURES**

- Glass/passivated die junctions
- Medium current Triac
- Low thermal resistance
- Ideal for automated placement
- 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



**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**

- Used on inductive loads, thanks to their high commutation performances.

## Maximum 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, $T_c = 95$ °C	4	A
$I_{TSM}$	Non-repetitive On-State Current	Full Cycle, 60 Hz ( $t = 16.7$ ms)	33	A
$I_{TSM}$	Non-repetitive On-State Current	Full Cycle, 50 Hz ( $t = 20$ ms)	30	A
$I^2t$	Fusing Current	$t_p = 10$ ms, Half Cycle	4.5	$A^2s$
$I_{GM}$	Peak Gate Current	$20 \mu s$ max. $T_j = 125$ °C	4	A
$P_{G(AV)}$	Average Gate Power Dissipation	$T_j = 125$ °C	1	W
$dl/dt$	Critical rate of rise of on-state current	$I_G = 2x I_{GT}$ , $t_r \leq 100ns$ $f = 120$ Hz, $T_j = 125$ °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
$V_{iso}$	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

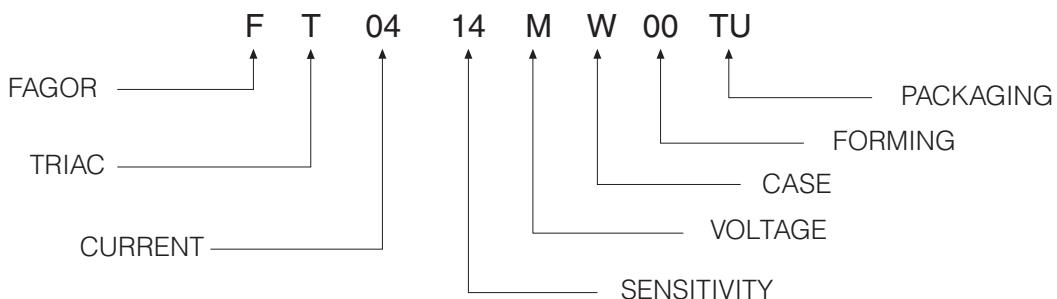
### Electrical Characteristics at Tamb = 25 °C

SYMBOL	PARAMETER	CONDITIONS	Quadrant	SENSITIVITY		Unit
				14		
I <sub>GT</sub> <sup>(1)</sup>	Gate Trigger Current	V <sub>D</sub> = 12 V <sub>DC</sub> , R <sub>L</sub> = 33Ω, T <sub>j</sub> = 25 °C	Q1÷Q3	MAX	35	mA
V <sub>GT</sub>	Gate Trigger Voltage	V <sub>D</sub> = 12 V <sub>DC</sub> , R <sub>L</sub> = 33Ω, T <sub>j</sub> = 25 °C	Q1÷Q3	MAX	1.3	V
V <sub>GD</sub>	Gate Non Trigger Voltage	V <sub>D</sub> = V <sub>DRM</sub> , R <sub>L</sub> = 3.3 KΩ, T <sub>j</sub> = 125 °C	Q1÷Q3	MIN	0.2	V
I <sub>H</sub> <sup>(2)</sup>	Holding Current	I <sub>T</sub> = 100 mA, Gate open, T <sub>j</sub> = 25 °C		MAX	35	mA
I <sub>L</sub>	Latching Current	I <sub>G</sub> = 1.2 I <sub>GT</sub> , T <sub>j</sub> = 25 °C	Q1,Q3	MAX	50	mA
			Q2	MAX	60	
dV/dt <sup>(2)</sup>	Critical Rate of Voltage Rise	V <sub>D</sub> = 0.67 x V <sub>DRM</sub> , Gate open T <sub>j</sub> = 125 °C		MIN	400	V/μs
(dI/dt)c <sup>(2)</sup>	Critical Rate of Current Rise	(dV/dt)c = 0.1 V/μs T <sub>j</sub> = 125 °C (dV/dt)c = 10 V/μs T <sub>j</sub> = 125 °C without snubber T <sub>j</sub> = 125 °C		MIN	-	A/ms
V <sub>TM</sub> <sup>(2)</sup>	On-state Voltage	I <sub>T</sub> = 5.5 Amp, t <sub>p</sub> = 380 μs, T <sub>j</sub> = 25 °C		MAX	1.6	V
V <sub>t(o)</sub> <sup>(2)</sup>	Threshold Voltage	T <sub>j</sub> = 125 °C		MAX	0.9	V
r <sub>d</sub> <sup>(2)</sup>	Dynamic resistance	T <sub>j</sub> = 125 °C		MAX	140	mΩ
I <sub>DRM</sub> /I <sub>RRM</sub>	Off-State Leakage Current	V <sub>D</sub> = V <sub>DRM</sub> , T <sub>j</sub> = 125 °C V <sub>R</sub> = V <sub>RRM</sub> , T <sub>j</sub> = 25 °C		MAX	0.5	mA
R <sub>th(j-c)</sub>	Thermal Resistance Junction-Case	for AC 360° conduction angle			4.0	°C/W
R <sub>th(j-a)</sub>	Thermal Resistance Junction-Ambient				50	°C/W

(1) Minimum I<sub>GT</sub> is guaranteed at 5% of I<sub>GT</sub> 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

REF.	DIMENSIONS		
	Millimeters		
	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

<b>Mounting Torque</b>	<b>0.8 N.m</b>
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## HIGH COMMUTATION TRIAC

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

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

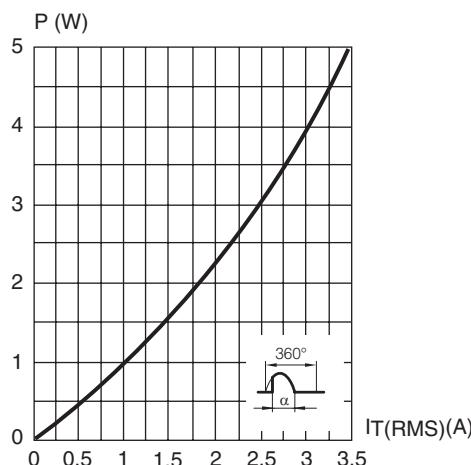


Fig. 2: RMS on-state current versus case temperature (full cycle).

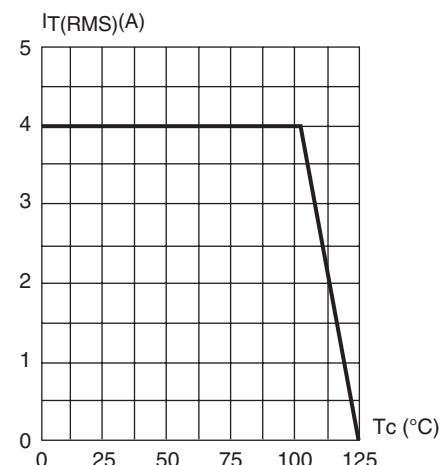


Fig. 3: Relative variation of thermal impedance versus pulse duration.

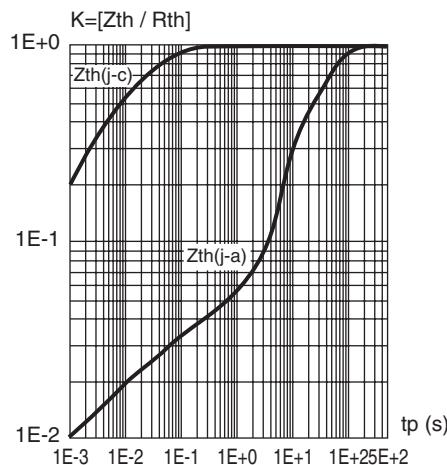


Fig. 5: Surge peak on-state current versus number of cycles

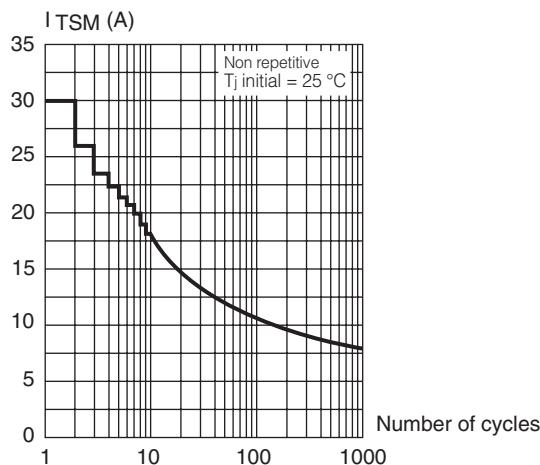


Fig. 4: On-state characteristics (maximum values)

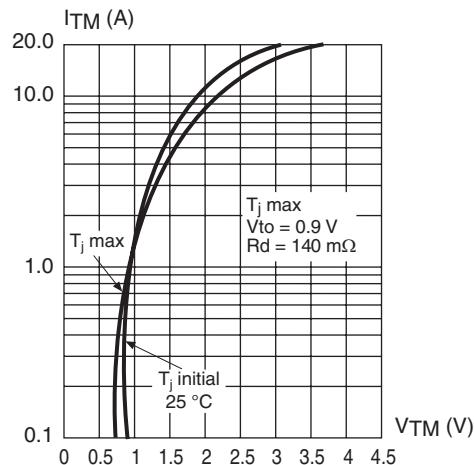
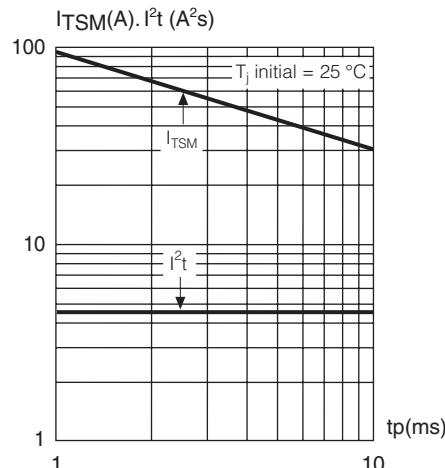


Fig. 6: Non repetitive surge peak on-state current for a sinusoidal pulse with width: tp < 10 ms, and corresponding value of I<sup>2</sup>t.



## 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)

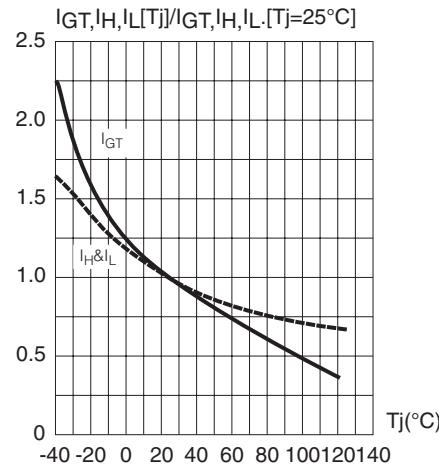
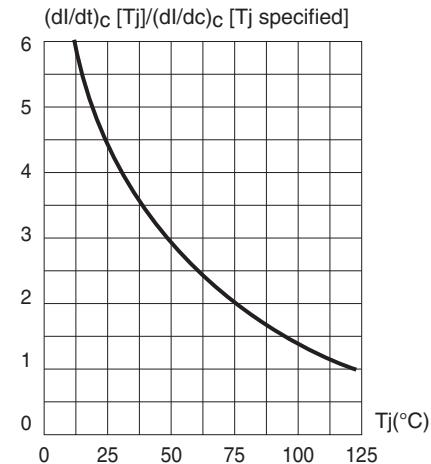


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature



## 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

### Disclaimer

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