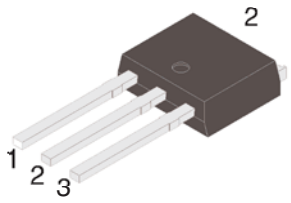
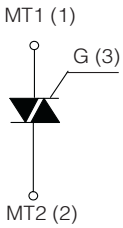
HIGH COMMUTATION TRIAC

TO-251AA (IPAK)





On-State Current 8 Amp

Gate Trigger Current ≤ 50 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-251AA (IPAK). 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.

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 °C	8	A
I_{TSM}	Non-repetitive On-State Current	Full Cycle, 60 Hz (t = 16.7 ms)	84	A
I_{TSM}	Non-repetitive On-State Current	Full Cycle, 50 Hz (t = 20 ms)	80	A
I^2t	Fusing Current	tp = 10 ms, Half Cycle	36	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

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

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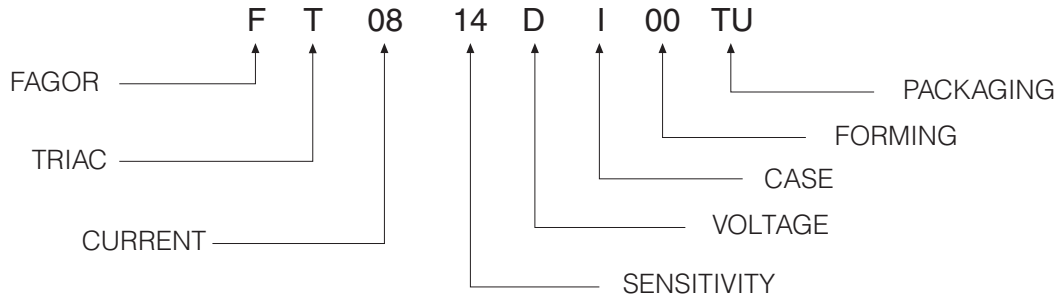
Electrical Characteristics at Tamb = 25 °C

SYMBOL	PARAMETER	CONDITIONS	Quadrant		SENSITIVITY			Unit
					11	14	16	
I_{GT} (1)	Gate Trigger Current	V_D = 12 V_{DC}, R_L = 33Ω, T_j = 25 °C	Q1÷Q3	MAX	25	35	50	mA
V_{GT}	Gate Trigger Voltage	V_D = 12 V_{DC}, R_L = 33Ω, T_j = 25 °C	Q1÷Q3	MAX		1.3		V
V_{GD}	Gate Non Trigger Voltage	V_D = V_{DRM}, R_L = 3.3 KΩ, T_j = 125 °C	Q1÷Q3	MIN		0.2		V
I_H (2)	Holding Current	I_T =100 mA,Gate open, T_j = 25 °C		MAX	25	35	50	mA
I_L	Latching Current	I_G = 1.2 I_{GT}, T_j = 25 °C	Q1, Q3	MAX	40	50	70	mA
			Q2	MAX	50	60	80	
dV/dt (2)	Critical Rate of Voltage Rise	V_D = 0.67 x V_{DRM}, Gate open T_j = 125 °C		MIN	200	400	1000	V/µs
(dI/dt)c (2)	Critical Rate of Current Rise	(dv/dt)c = 0.1 V/µs T_j = 125 °C		MIN	-	-	-	A/ms
		(dv/dt)c = 10 V/µs T_j = 125 °C		MIN	-	-	-	
		without snubber T_j = 125 °C		MIN	4	4.5	7	
V_{TM} (2)	On-state Voltage	I_T = 11 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		50		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				1.6		°C/W
$R_{th(j-a)}$	Thermal Resistance Junction-Ambient					100		°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

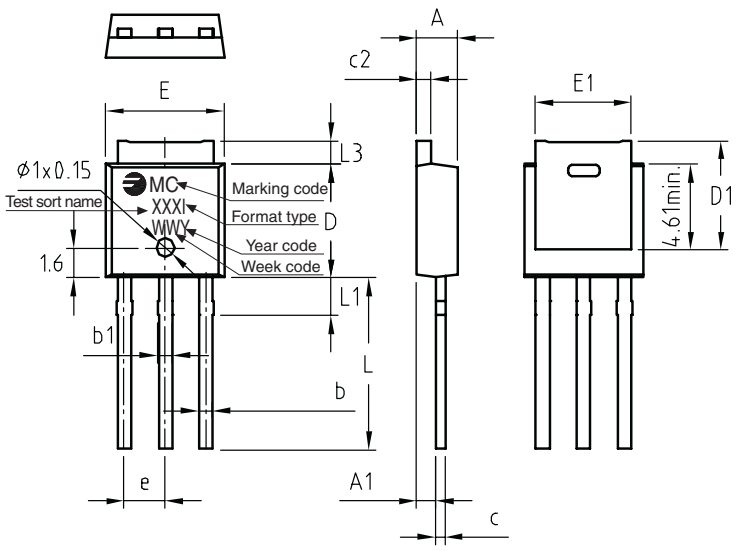


HIGH COMMUTATION TRIAC

Ordering information

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FT0814MI 00TU	TU	TUBE	4000	0.40

Package Outline Dimensions: (mm) TO-251AA (IPAK)



REF.	DIMENSIONS Milimeters		
	Min.	Nominal	Max.
A	2.19	2.30 ± 0.11	2.41
A1	0.89	1.08 ± 0.19	1.27
b	0.50	0.70 ± 0.20	0.90
b1	0.70	0.92 ± 0.22	1.14
c	0.43	0.51 ± 0.08	0.59
c2	0.43	0.62 ± 0.19	0.81
D	5.40	5.81 ± 0.41	6.22
D1	5.70	5.90 ± 0.20	6.10
E	6.35	6.54 ± 0.19	6.73
E1	5.20	5.33 ± 0.13	5.46
e	2.25	2.30 ± 0.05	2.35
L	7.50	8.58 ± 1.08	9.66
L1	1.90	2.10 ± 0.20	2.28
L3	0.89	1.27 ± 0.38	1.65

Ratings and Characteristics (Ta 25 ºC unless otherwise noted)

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

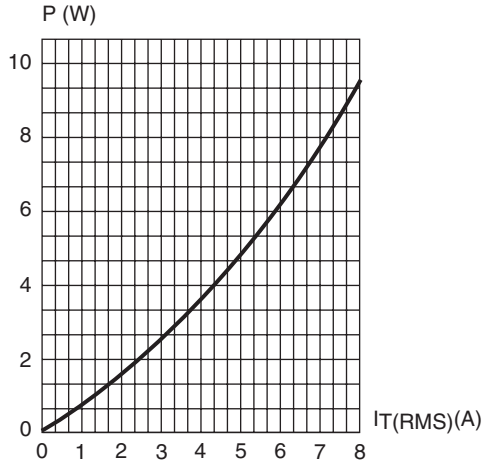


Fig. 2: RMS on-state current versus case temperature (full cycle).

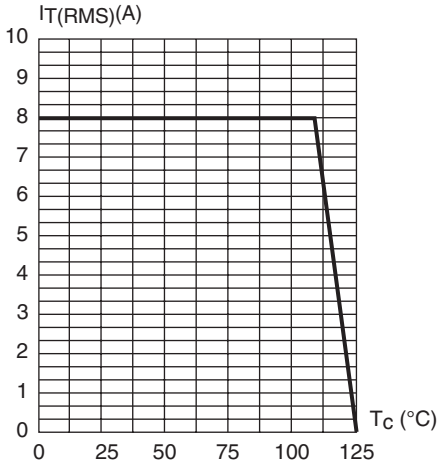


Fig. 3: Relative variation of thermal impedance versus pulse duration.

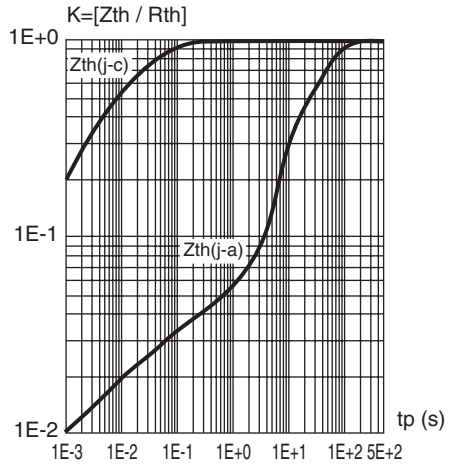


Fig. 4: On-state characteristics (maximum values)

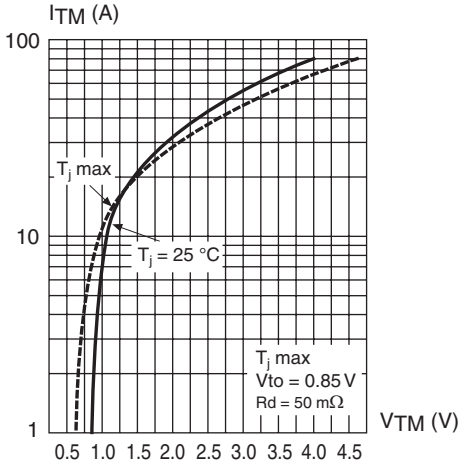


Fig. 5: Surge peak on-state current versus number of cycles

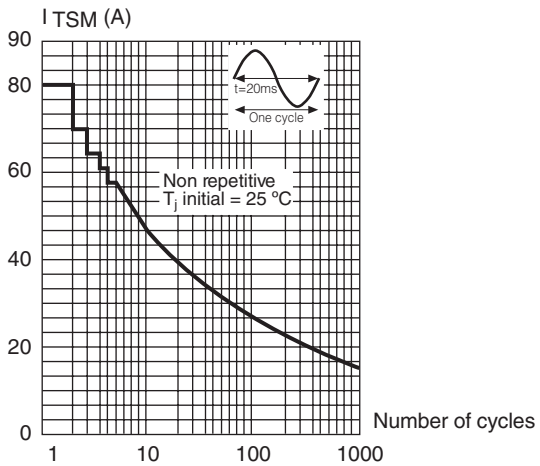
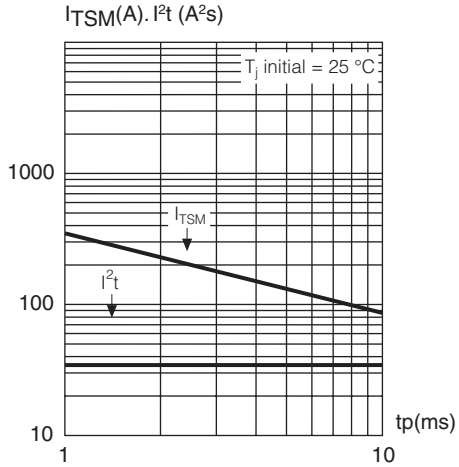


Fig. 6: Non repetitive surge peak on-state current for a sinusoidal pulse with width: tp < 10 ms, and corresponding value of I^2t.



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)

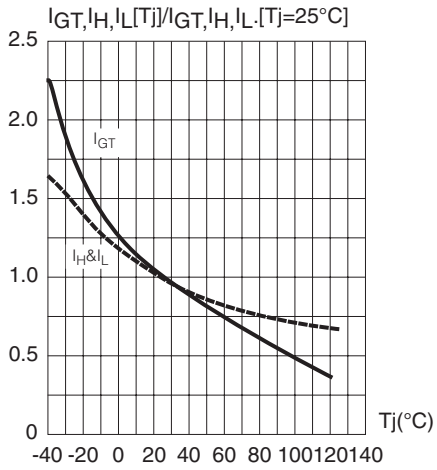
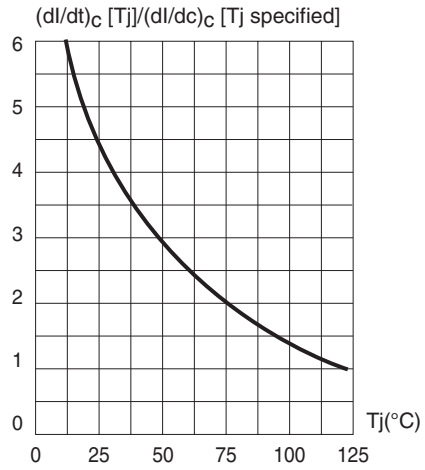


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature



Revision History

Date	Revision	Description of Changes
12-Nov-2005	0	Original Data Sheet
17-May-2013	1	200V and 700V eliminated
29-Mar-2017	2	Changed values of: I^2t / dV/dt / V_{TM} / r_d / $R_{th(j-a)}$

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