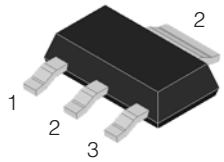
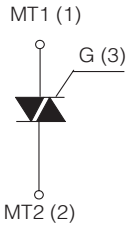
LOGIC LEVEL TRIAC

SOT-223





On-State Current
1 Amp

Gate Trigger Current
< 10 mA

Off-State Voltage
400 V ÷ 800 V

FEATURES

- Glass/passivated die junctions
- Low 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

Pb

e3

RoHS
COMPLIANT

MECHANICAL DATA

- **Case:** SOT-223. 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

Logic level versions are designed to interface directly with low power drivers such as microcontrollers.

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	1	A
I_{TSM}	Non-repetitive On-State Current	Full Cycle, 60 Hz (t = 16.7 ms)	8.5	A
I_{TSM}	Non-repetitive On-State Current	Full Cycle, 50 Hz (t = 20 ms)	8	A
I^2t	Fusing Current	tp = 10 ms, Half Cycle	0.32	A^2s
I_{GM}	Peak Gate Current	20 µs max. T_j = 125 °C	1	A
$P_{G(AV)}$	Average Gate Power Dissipation	T_j = 125 °C	0.1	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	20	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

LOGIC LEVEL TRIAC

Electrical Characteristics at Tamb = 25 °C

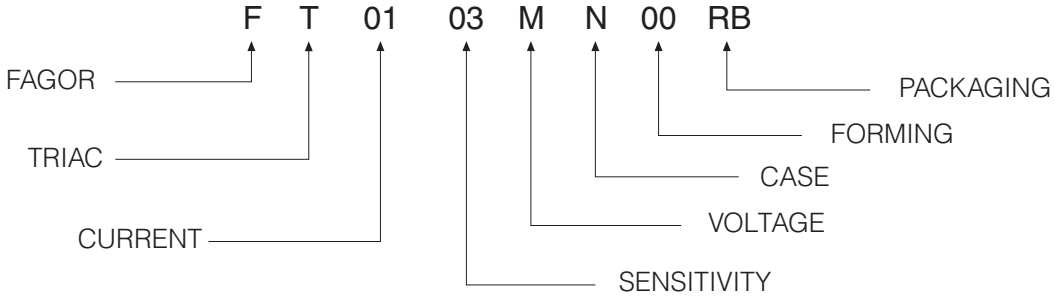
SYMBOL	PARAMETER	CONDITIONS	Quadrant		SENSITIVITY			Unit
					03	07	09	
I_{GT} (1)	Gate Trigger Current	V_D = 12 V_{DC}, R_L = 33Ω. T_j = 25 °C	Q1÷Q3	MAX	3	5	10	mA
			Q4	MAX	5	7	10	mA
V_{GT}	Gate Trigger Voltage	V_D = 12 V_{DC}, R_L = 33Ω, T_j = 25 °C	Q1÷Q4	MAX	1.3			V
V_{GD}	Gate Non Trigger Voltage	V_D = V_{DRM}, R_L = 3.3kΩ, T_j = 125 °C	Q1÷Q4	MIN	0.2			V
I_H (2)	Holding Current	I_T = 50 mA, Gate open, T_j = 25 °C		MAX	7	10	10	mA
I_L	Latching Current	I_G = 1.2 I_{GT}, T_j = 25 °C	Q1,Q3,Q4	MAX	7	10	15	mA
			Q2	MAX	15	20	25	mA
dV/dt (2)	Critical Rate of Voltage Rise	V_D = 0.67 x V_{DRM},Gate open T_j = 125 °C		MIN	10	20	50	V/µs
(dI/dt)c (2)	Critical Rate of Current Rise	(dv/dt)c = 0.1 V/µs T_j = 125 °C		MIN	1.2	1.8	2.5	A/ms
		(dv/dt)c = 10 V/µs T_j = 125 °C		MIN	0.6	0.9	1.5	A/ms
		without snubber T_j = 125 °C		MIN				
V_{TM} (2)	On-state Voltage	I_T = 1.1 Amp, tp = 380 µs, T_j = 25 °C		MAX	1.5			V
V_{to} (2)	Threshold Voltage	T_j = 125 °C		MAX	0.95			V
r_d (2)	Dynamic resistance	T_j = 125 °C		MAX	500			mΩ
I_{DRM}/I_{RRM}	Off-State Leakage Current	V_D = V_{DRM}, V_R = V_{RRM}, T_j = 125 °C		MAX	0.5			mA
		T_j = 25 °C		MAX	5			µA
$R_{th(j-c)}$	Thermal Resistance Junction-Case	for AC 360° conduction angle			15			°C/W
$R_{th(j-a)}$	Thermal Resistance Junction-Ambient	S(3) = 5 cm^2			60			°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.

(3) S: Cooper surface under tab.

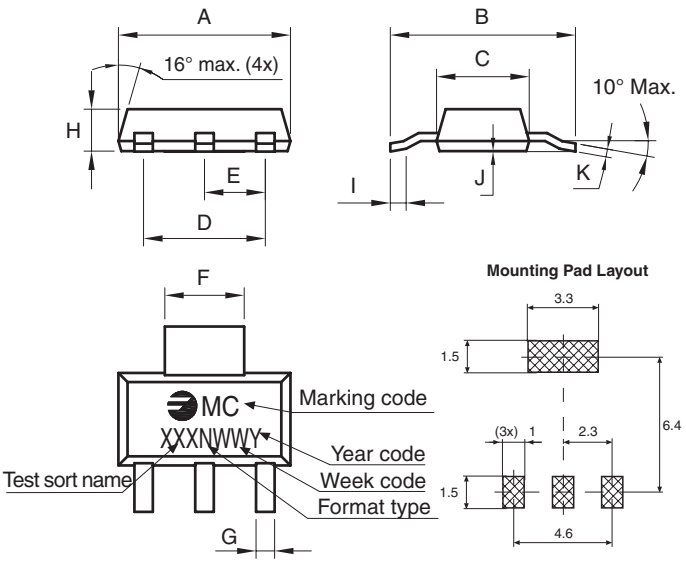
Part Number Information



Ordering information

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FT0103DN 00RS	RS	REEL	1,000	0.116
FT0103DN 00RB	RB	REEL	2,500	0.116

Package Outline Dimensions: (mm) (SOT-223)



REF.	DIMENSIONS		
	Milimeters		
	Min.	Nominal	Max.
A	6.30	6.50	6.70
B	6.70	7.00	7.30
C	3.30	3.50	3.70
D	-	4.60	-
E	-	2.30	-
F	2.95	3.00	3.15
G	0.65	0.70	0.85
H	1.50	1.60	1.70
I	0.50	0.60	0.70
J	-	0.02	0.05
K	0.25	0.30	0.35

Ratings and Characteristics (Ta 25 ºC unless otherwise noted)

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

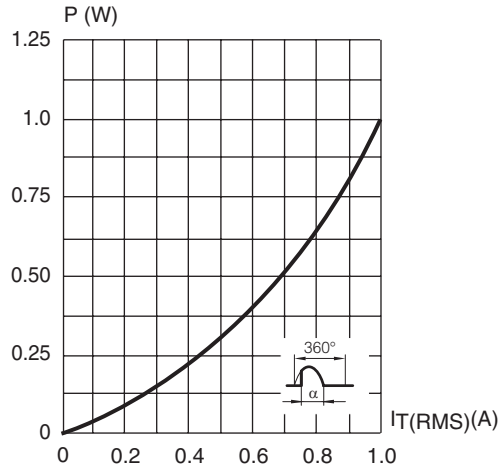


Fig. 2: RMS on-state current versus case temperature (full cycle).

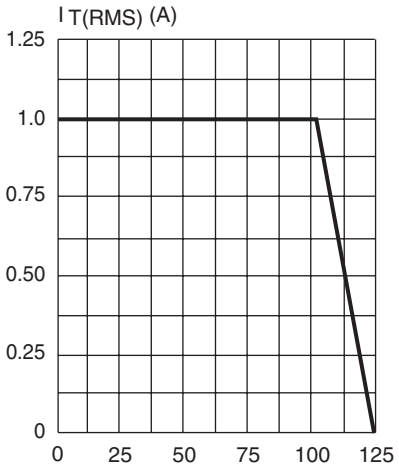


Fig. 3: Relative variation of thermal impedance versus pulse duration.

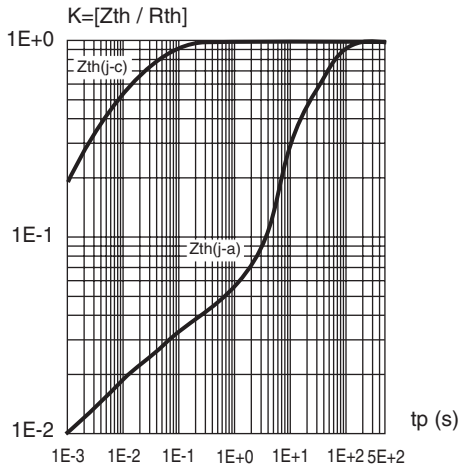
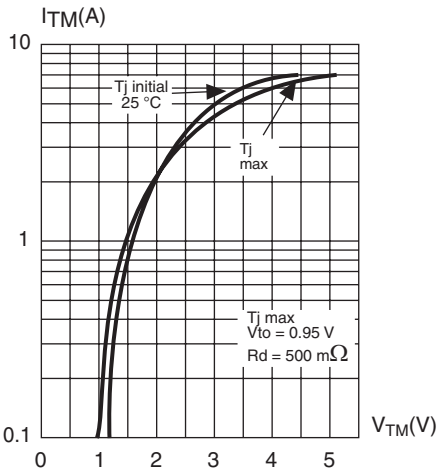


Fig. 4: On-state characteristics (maximum values)



tp (s) Fig. 5: Surge peak on-state current versus number of cycles

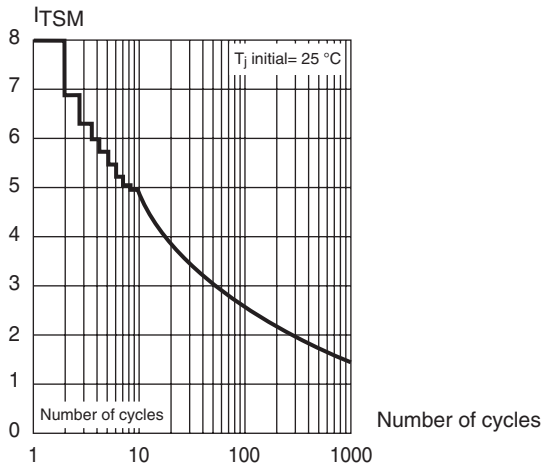
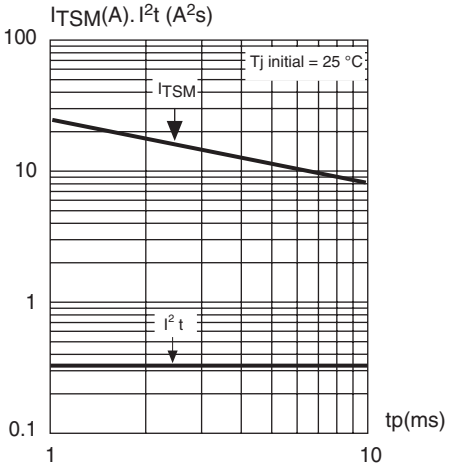


Fig. 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponding value of I^2t.



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)

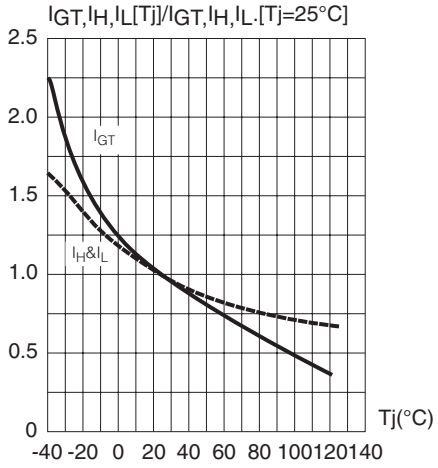


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature

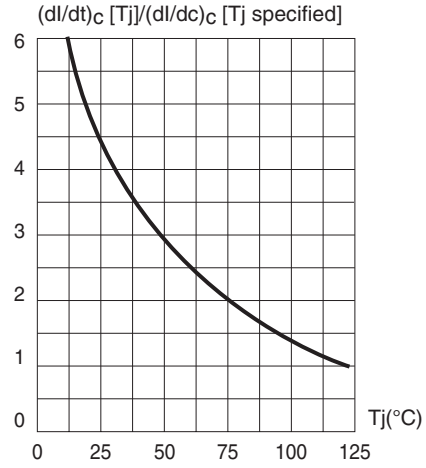
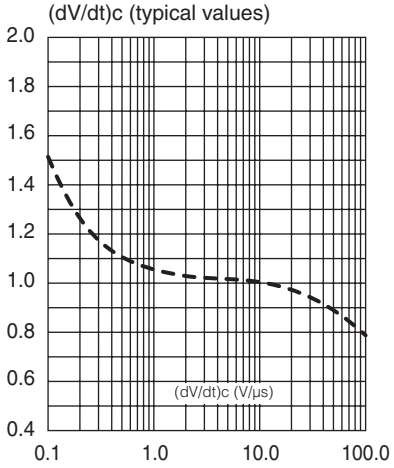


Fig. 9: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values)



Revision History

Date	Revision	Description of Changes
Oct-2014	0	Original Data Sheet
May-2016	1	Sensitivity 05 eliminated

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