

## HIGH COMMUTATION TRIAC

<p style="text-align: center; font-weight: bold; font-size: 1.2em;">TO-263AB (D2PAK)</p> <div style="text-align: center; margin: 10px 0;"> </div> <div style="text-align: center; margin: 10px 0;"> </div>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding: 5px;"> <p><b>On-State Current</b> 12 Amp</p> </td> <td style="width: 50%; padding: 5px;"> <p><b>Gate Trigger Current</b> ≤ 50 mA</p> </td> </tr> <tr> <td colspan="2" style="text-align: center; padding: 5px;"> <p><b>Off-State Voltage</b> 400 V ÷ 800 V</p> </td> </tr> </table> <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> <div style="text-align: right; margin-top: 10px;">     <b>RoHS</b> COMPLIANT         </div> <p><b>MECHANICAL DATA</b></p> <ul style="list-style-type: none"> <li><b>Case:</b> TO-263AB (D2PAK). 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>	<p><b>On-State Current</b> 12 Amp</p>	<p><b>Gate Trigger Current</b> ≤ 50 mA</p>	<p><b>Off-State Voltage</b> 400 V ÷ 800 V</p>	
<p><b>On-State Current</b> 12 Amp</p>	<p><b>Gate Trigger Current</b> ≤ 50 mA</p>				
<p><b>Off-State Voltage</b> 400 V ÷ 800 V</p>					

### 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, $T_c = 95\text{ °C}$	12	A
$I_{TSM}$	Non-repetitive On-State Current	Full Cycle, 60 Hz ( $t = 16.7\text{ ms}$ )	110	A
$I_{TSM}$	Non-repetitive On-State Current	Full Cycle, 50 Hz ( $t = 20\text{ ms}$ )	100	A
$I^2t$	Fusing Current	$t_p = 10\text{ ms}$ , Half Cycle	50	A <sup>2</sup> s
$I_{GM}$	Peak Gate Current	20 $\mu$ s max. $T_j = 125\text{ °C}$	4	A
$P_{G(AV)}$	Average Gate Power Dissipation	$T_j = 125\text{ °C}$	1	W
$di/dt$	Critical rate of rise of on-state current	$I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ ns}$ $f = 120\text{ Hz}$ , $T_j = 125\text{ °C}$	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

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

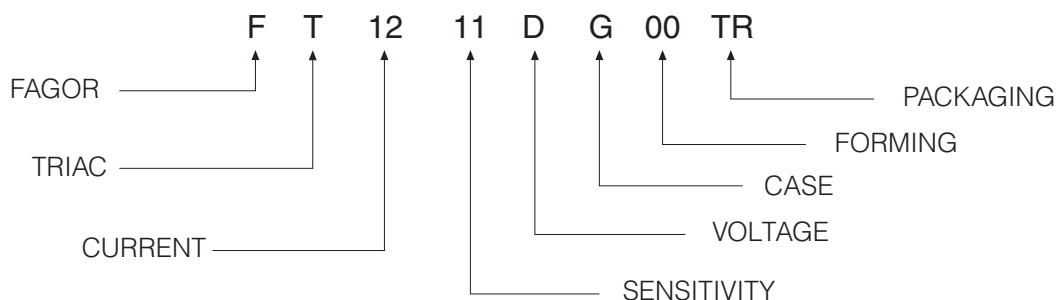
SYMBOL	PARAMETER	CONDITIONS	Quadrant		SENSITIVITY			Unit
					11	14	16	
$I_{GT}^{(1)}$	Gate Trigger Current	$V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25\text{ °C}$	Q1÷Q3	MAX	25	35	50	mA
$V_{GT}$	Gate Trigger Voltage	$V_D = 12 V_{DC}, R_L = 33\Omega, T_j = 25\text{ °C}$	Q1÷Q3	MAX	1.3			V
$V_{GD}$	Gate Non Trigger Voltage	$V_D = V_{DRM}, R_L = 3.3\text{ K}\Omega, T_j = 125\text{ °C}$	Q1÷Q3	MIN	0.2			V
$I_H^{(2)}$	Holding Current	$I_T = 100\text{ mA}, \text{Gate open}, T_j = 25\text{ °C}$		MAX	25	35	50	mA
$I_L$	Latching Current	$I_G = 1.2 I_{GT}, T_j = 25\text{ °C}$	Q1, Q3	MAX	40	50	70	mA
			Q2	MAX	50	60	80	
$dv/dt^{(2)}$	Critical Rate of Voltage Rise	$V_D = 0.67 \times V_{DRM}, \text{Gate open}$ $T_j = 125\text{ °C}$		MIN	200	500	1000	V/ $\mu$ s
$(di/dt)_c^{(2)}$	Critical Rate of Current Rise	$(dv/dt)_c = 0.1\text{ V}/\mu\text{s} \quad T_j = 125\text{ °C}$ $(dv/dt)_c = 10\text{ V}/\mu\text{s} \quad T_j = 125\text{ °C}$ without snubber $T_j = 125\text{ °C}$		MIN	-	-	-	A/ms
				MIN	-	-	-	
				MIN	5.3	6.5	12	
$V_{TM}^{(2)}$	On-state Voltage	$I_T = 17\text{ Amp}, t_p = 380\text{ }\mu\text{s}, T_j = 25\text{ °C}$		MAX	1.55			V
$V_{t(o)}^{(2)}$	Threshold Voltage	$T_j = 125\text{ °C}$		MAX	0.85			V
$r_d^{(2)}$	Dynamic resistance	$T_j = 125\text{ °C}$		MAX	35			m $\Omega$
$I_{DRM}/I_{RRM}$	Off-State Leakage Current	$V_D = V_{DRM}, T_j = 125\text{ °C}$		MAX	1			mA
		$V_R = V_{RRM}, T_j = 25\text{ °C}$		MAX	5			$\mu$ A
$R_{th(j-c)}$	Thermal Resistance Junction-Case	for AC 360° conduction angle			1.4			°C/W
$R_{th(j-a)}$	Thermal Resistance Junction-Ambient	$S^{(3)} = 1\text{ cm}^2$			45			°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.

(3) S: Cooper surface under tab.

### Part Number Information

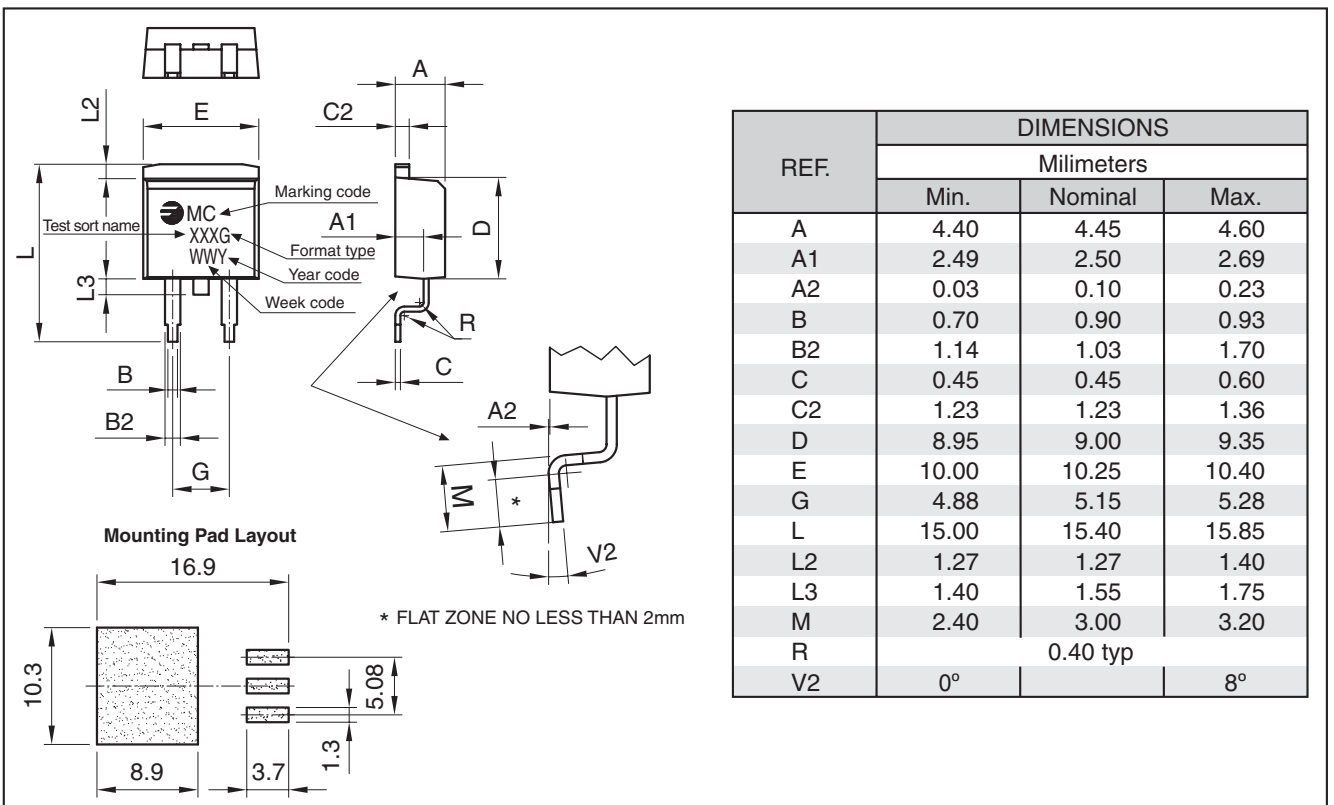


**HIGH COMMUTATION TRIAC**

**Ordering information**

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FT1214MG 00TR	TR	13" diameter tape and reel	800	1.50

**Package Outline Dimensions: (mm) TO-263AB (D2PAK)**



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

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

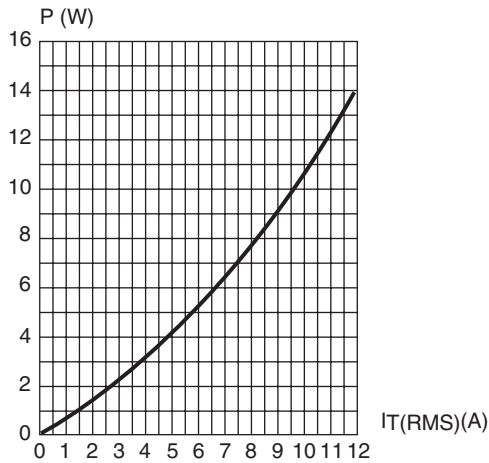


Fig. 2: RMS on-state current versus case temperature (full cycle).

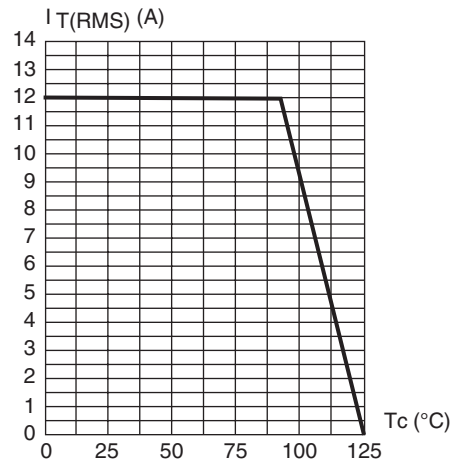


Fig. 3: Relative variation of thermal impedance versus pulse duration.

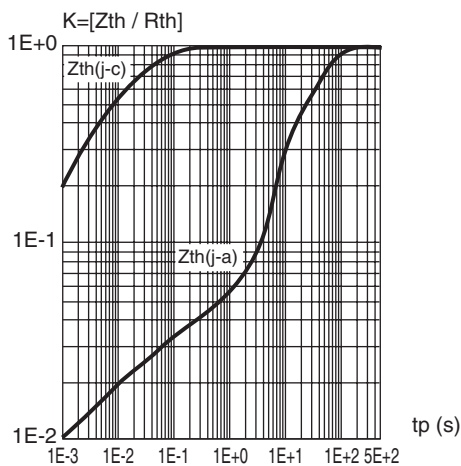


Fig. 4: On-state characteristics (maximum values)

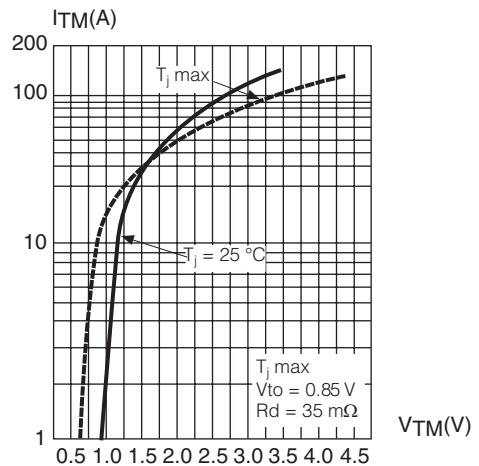


Fig. 5: Surge peak on-state current versus number of cycles

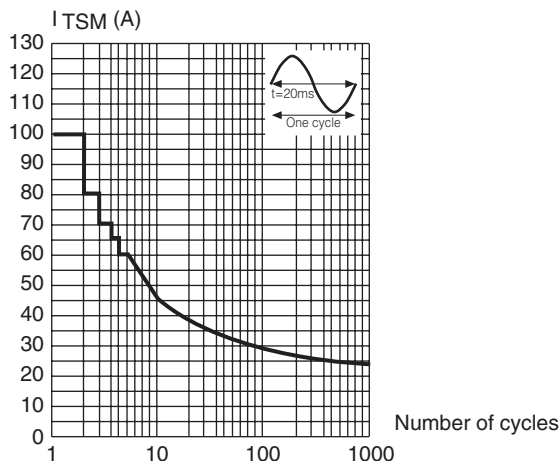
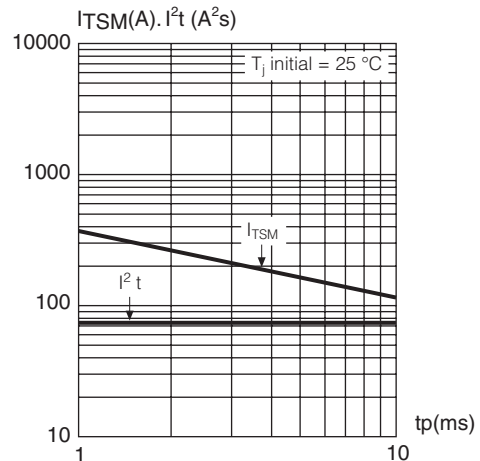


Fig. 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10ms, and corresponding value of I²t.



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

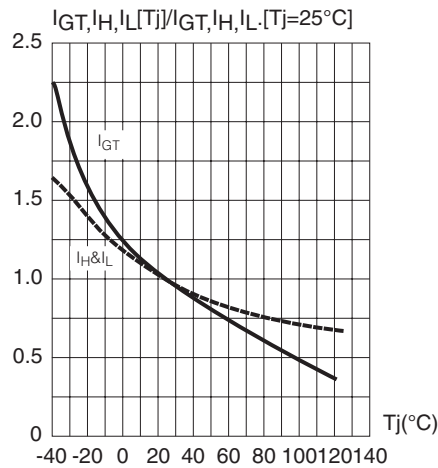


Fig. 8: Relative variation of critical rate of decrease of main current versus junction temperature

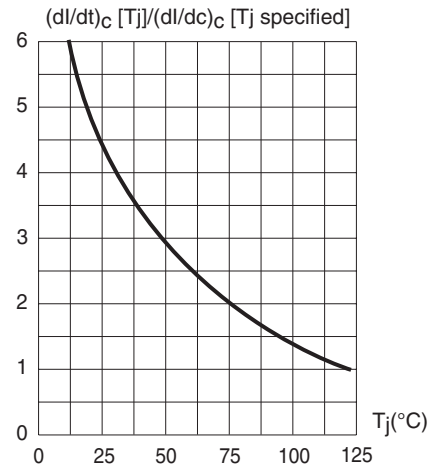


Fig. 9: Relative variation of critical rate of decrease of main current versus

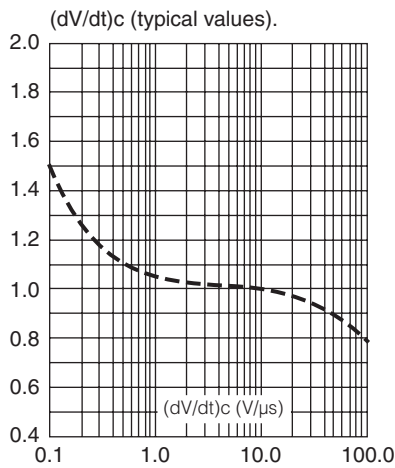
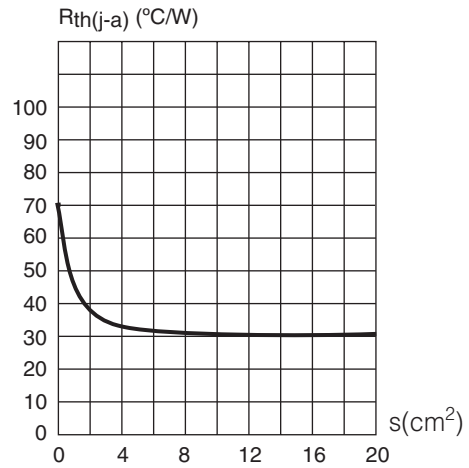


Fig. 10: D2PAK thermal resistance junction to ambient versus copper surface under tab (printed circuit board copper thickness: 35μ)



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

<b>Date</b>	<b>Revision</b>	<b>Description of Changes</b>
12-Feb-2012	0	Original Data Sheet
29-May-2017	1	Eliminated: 200V and 700V

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