
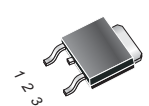


### HAOPIN MICROELECTRONICS CO.,LTD.

#### Description

Passivated high commutation triacs in a plastic envelope intended for use in circuits where high static and dynamic  $dV/dt$  and high  $dI/dt$  can occur. These devices will commutate the full rated ms current at the maximum rated junction temperature without the aid of a snubber.

<p>Symbol</p> 		<p>Simplified outline</p>  <p>TO-252</p>	
Pin	Description		
1	Main terminal 1 (T1)		
2	Main terminal 2 (T2)		
3	gate (G)		
TAB	Main terminal 2(T2)		

#### Applications:

- ◆ Motor control
- ◆ Industrial and domestic lighting
- ◆ Heating
- ◆ Static switching

#### Features

- ◆ Blocking voltage to 800 V
- ◆ On-state RMS current to 4 A

SYMBOL	PARAMETER	Value	Unit
$V_{DRM}$	Repetitive peak off-state voltages	800	V
$I_{T(RMS)}$	RMS on-state current (full sine wave)	4	A
$I_{TSM}$	Non-repetitive peak on-state current (full cycle, $T_j = 125^\circ\text{C}$ )	40	A

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta jc}$	Thermal Resistance - Junction-to-case	-	3.5	-	$^\circ\text{C/W}$
$R_{\theta ja}$	Thermal resistance - Junction to ambient	-	88	-	$^\circ\text{C/W}$

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Limiting values in accordance with the Maximum system(IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
$V_{DRM}$	Repetitive peak off-state Voltages	$T_j = -40$ to $125^\circ\text{C}$ , sine wave, 50 to 60 Hz, Gate open	-	800	V
$I_{T(RMS)}$	RMS on-state current Full sine wave 60 Hz	$T_c = 110^\circ\text{C}$	-	4	A
$I^2t$	Circuit fusing consideration	$t = 8.3\text{ms}$	-	6.6	$\text{A}^2\text{s}$
$I_{GM}$	Peak gate current	Pulse width $\leq 10 \mu\text{s}$ $T_c = 108^\circ\text{C}$	-	0.5	A
$V_{GM}$	Peak gate voltage	Pulse width $\leq 10 \mu\text{s}$ $T_c = 108^\circ\text{C}$	-	5	V
$P_{GM}$	Peak gate power	Pulse width $\leq 10 \mu\text{s}$ $T_c = 108^\circ\text{C}$	-	0.5	W
$P_{G(AV)}$	Average gate power	$t = 8.3\text{ms}$ $T_c = 108^\circ\text{C}$	-	0.1	W
$T_{stg}$	Storage temperature		-40	150	$^\circ\text{C}$
$T_j$	Operating junction Temperature range		-40	125	$^\circ\text{C}$

$T_j = 25^\circ\text{C}$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Static characteristics						
$I_{GT}$	Gate trigger current	$V_o = 12\text{V}; R_L = 100 \Omega$ MT2(+),G(+) MT2(+),G(-) MT2(-),G(-)	8 8 8	12 18 22	35 35 35	mA
$V_{GT}$	Gate trigger voltage	$V_o = 12\text{V}; R_L = 100 \Omega$ MT2(+),G(+) MT2(+),G(-) MT2(-),G(-)	0.5 0.5 0.5	0.8 0.8 0.8	1.3 1.3 1.3	V
$I_L$	Latching current	$V_o = 12\text{V}, I_g = 35\text{mA}$ MT2(+),G(+) MT2(+),G(-) MT2(-),G(-)	-	30 50 20	60 80 60	mA
$I_{DRM}$ $I_{RRM}$	$V_{DRM} = V_{RRM}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	-	-	0.01 2.0	mA
$I_H$	Holding current	$V_o = 12\text{V}$ , gate open, Initiating current = $\pm 200\text{mA}$	6	22	35	mA
$V_{TM}$	Peak on-state voltage	$I_{TM} = \pm 6.0\text{A}$	-	1.3	1.6	V
$V_{GD}$	Gate non-trigger voltage	$V_o = 12\text{V}; R_L = 100 \Omega$ $T_j = 125^\circ\text{C}$	0.2	0.4	-	V

### Dynamic Characteristics

$D_v/dt$	Critical rate of rise of Off-state voltage	$V_o = 67\% V_{DRM}$ gate open; $T_j = 125^\circ\text{C}$ ;	500	1700	-	$\text{V}/\mu\text{s}$
$(di/dt)_c$	Rate of change of commutating current	$V_o = 400\text{V}$ , $I_{TM} = 4.0\text{A}$ $dv/dt = 18\text{V}/\mu\text{s}$ $T_j = 125^\circ\text{C}$	6.0	8.4	-	A/ms

#### Description

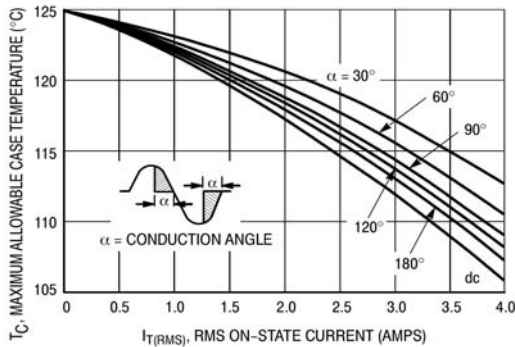


Figure 1. RMS Current Derating

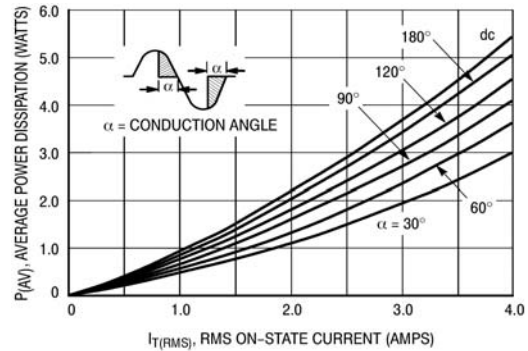


Figure 2. On-State Power Dissipation

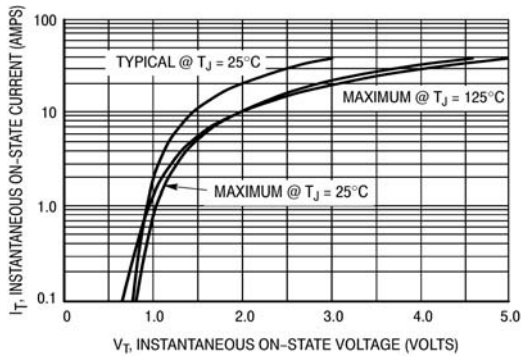


Figure 3. On-State Characteristics

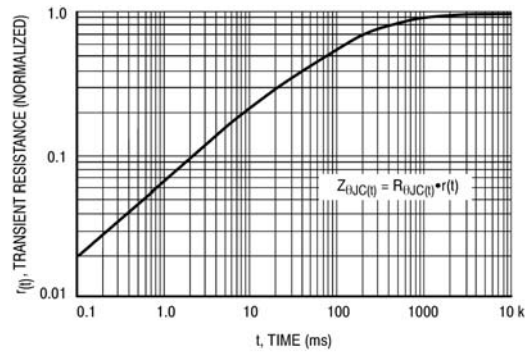


Figure 4. Transient Thermal Response

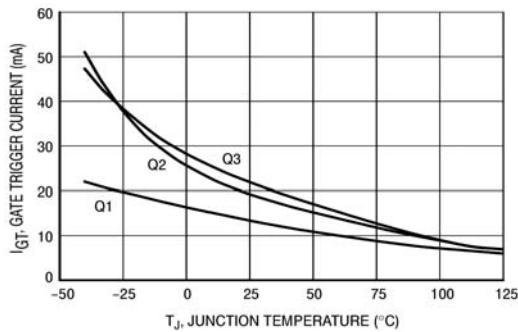


Figure 5. Typical Gate Trigger Current versus Junction Temperature

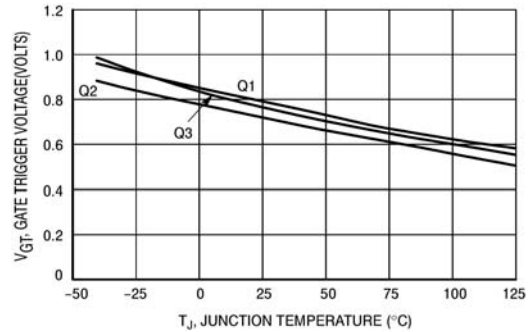


Figure 6. Typical Gate Trigger Voltage versus Junction Temperature

#### Description

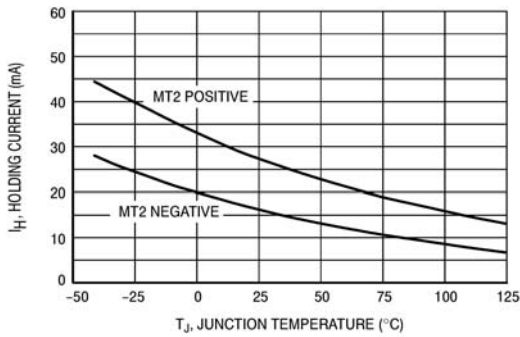


Figure 7. Typical Holding Current versus Junction Temperature

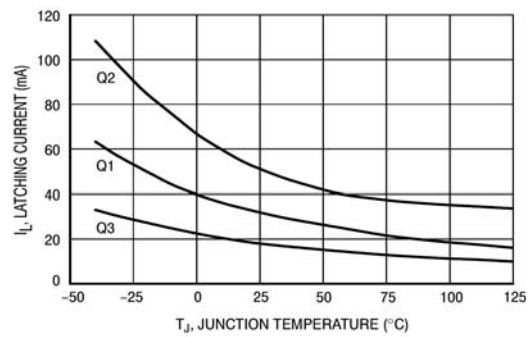


Figure 8. Typical Latching Current versus Junction Temperature

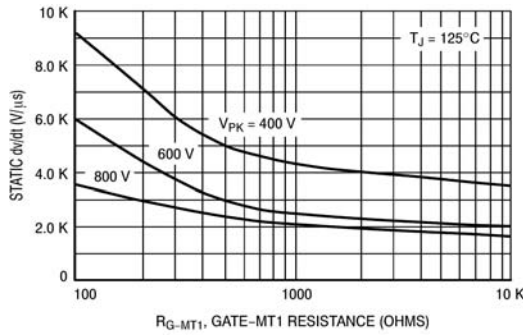


Figure 9. Exponential Static dv/dt versus Gate-MT1 Resistance, MT2(+)

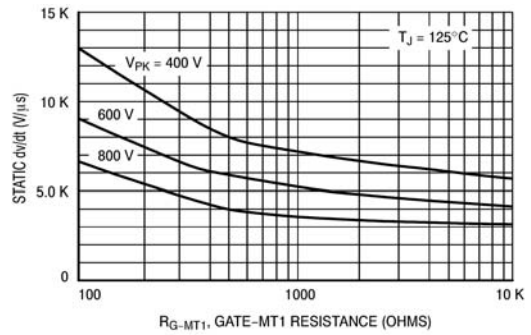


Figure 10. Exponential Static dv/dt versus Gate-MT1 Resistance, MT2(-)

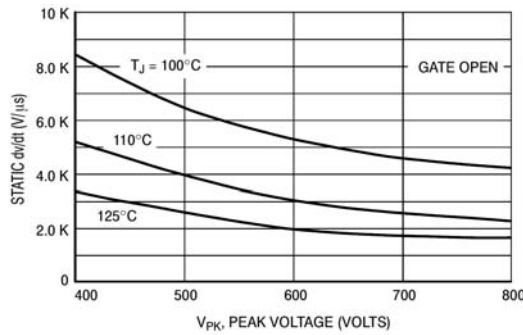


Figure 11. Exponential Static dv/dt versus Peak Voltage, MT2(+)

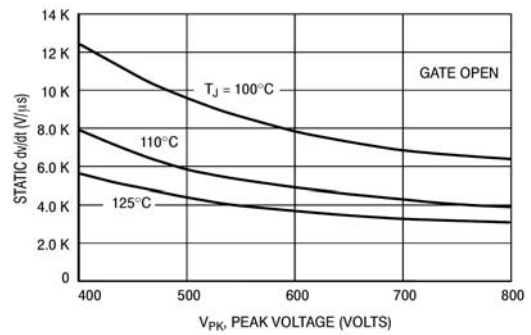
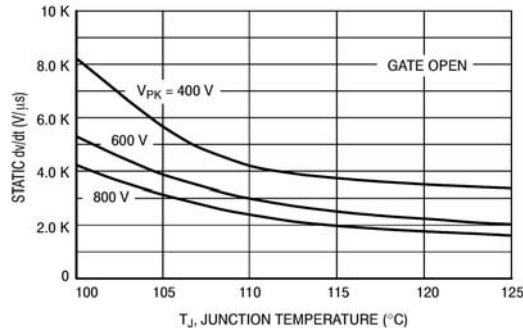
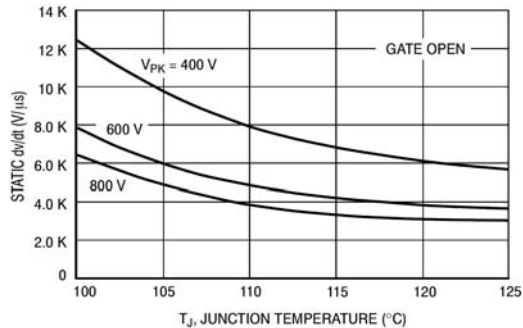
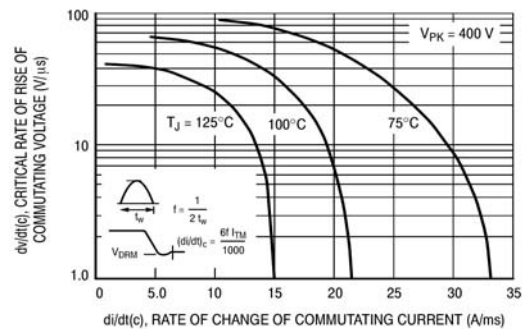


Figure 12. Exponential Static dv/dt versus Peak Voltage, MT2(-)

#### Description

 <p><b>Figure 13. Typical Exponential Static dv/dt versus Junction Temperature, MT2(+)</b></p>	 <p><b>Figure 14. Typical Exponential Static dv/dt versus Junction Temperature, MT2(-)</b></p>
 <p><b>Figure 15. Critical Rate of Rise of Commutating Voltage</b></p>	

#### MECHANICAL DATA

Dimensions in mm  
 Net Mass: 0.4 g  
 TO-252

