
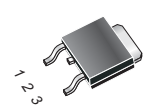


### HAOPIN MICROELECTRONICS CO.,LTD.

#### 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 600 V
- ◆ On-state RMS current to 4 A

SYMBOL	PARAMETER	Value	Unit
$V_{DRM}$	Repetitive peak off-state voltages	600	V
$I_{T(RMS)}$	RMS on-state current (full sine wave)	4	A
$I_{TSM}$	Non-repetitive peak on-state current (full cycle, $T_j$ initial=25°C)	30	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$R_{th(j-c)}$	Junction to case(AC)		-	2.6	-	°C/W
$R_{th(j-a)}$	Junction to ambient	$s=0.5\text{ cm}^2$	-	70	-	°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		-	600	V
$I_{T(RMS)}$	RMS on-state current Full sine wave	$T_c=110^{\circ}C$	-	4	A
$I^2t$	$I^2t$ value for fusing	$T_p=10ms$	-	5.1	$A^2s$
$DI/dt$	Critical rate of rise of on-state current $I_G=2 \times I_{GT}, tr \leq 100 ns$	$F=120Hz$ $T_j=125^{\circ}C$	-	50	$A/\mu s$
$I_{GM}$	Peak gate current	$T_p=20 \mu s$ $T_j=125^{\circ}C$	-	4	A
$V_{GD}$		$V_D=V_{DRM}; R_L=33k\Omega$ $T_j=125^{\circ}C$	0.2	-	V
$V_{GT}$		$V_D=12V; R_L=30\Omega$	-	1.3	V
$P_{G(AV)}$	Average gate power	$T_j=125^{\circ}C$	-	1	W
$T_{stg}$	Storage temperature		-40	150	$^{\circ}C$
$T_j$	Operating junction Temperature range		-40	125	$^{\circ}C$

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

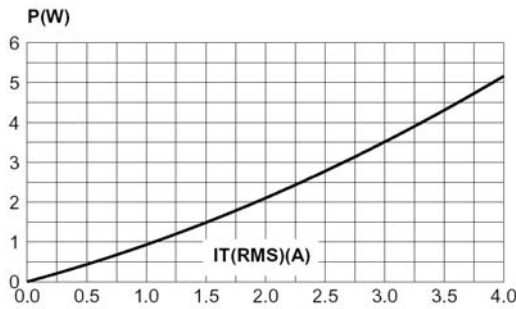
SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Static characteristics						
$I_{GT}$	Gate trigger current	$V_D=12V; R_L=30\Omega$ I-II-III	-	-	5	mA
$I_L$	Latching current	$I_G=1.2I_{GT}$ I-III II	-	-	10 15	mA
$I_{DRM}$ $I_{RRM}$	$V_{DRM}=V_{RRM}$	$T_j=25^{\circ}C$ $T_j=125^{\circ}C$	-	-	5 1	$\mu A$ mA
$I_H$	Holding current	$I_T=100mA$	-	-	10	mA
$V_{TM}$	$I_{TM}=5.5A$ $t_p=380 \mu s$	$T_j=25^{\circ}C$	-	-	1.6	V
$V_{TO}$	Threshold voltage	$T_j=125^{\circ}C$	-	-	0.9	V
$R_D$	Dynamic resistance	$T_j=125^{\circ}C$	-	-	120	$M\Omega$

#### Dynamic Characteristics

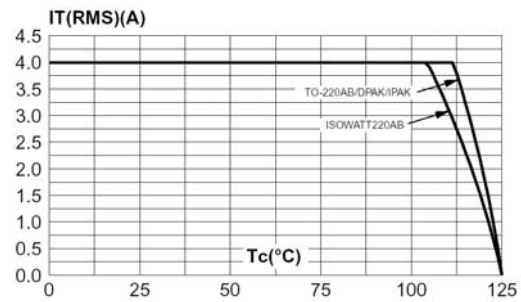
$D_V/dt$	Critical rate of rise of Off-state voltage	$V_D=67\% V_{DRM}$ gate open; $T_j=125^{\circ}C$ ;	20	-	-	$V/\mu s$
$(di/dt)_c$		$(dV/dt)_c=0.1V/\mu s$ $T_j=125^{\circ}C$ $(dv/dt)_c=10V/\mu s$ $T_j=125^{\circ}C$	1.8 0.9	-	-	A/ms

#### Description

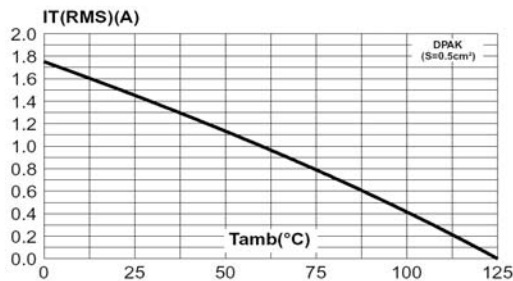
**Fig. 1:** Maximum power dissipation versus RMS on-state current (full cycle).



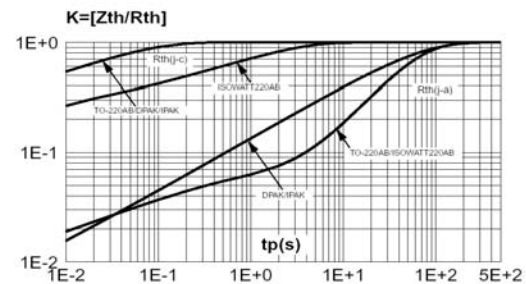
**Fig. 2-1:** RMS on-state current case versus temperature (full cycle).



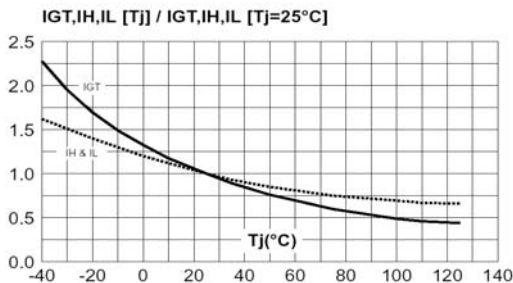
**Fig. 2-2:** RMS on-state current versus ambient temperature (printed circuit FR4, copper thickness: 35 $\mu$ m), full cycle.



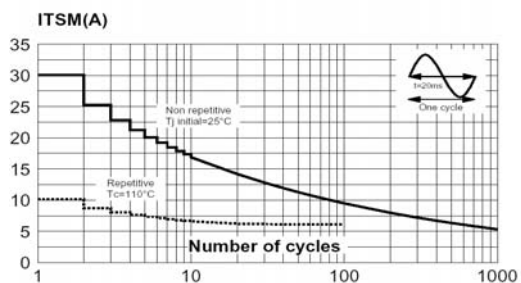
**Fig. 3:** Relative variation of thermal impedance versus pulse duration.



**Fig. 4:** Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).



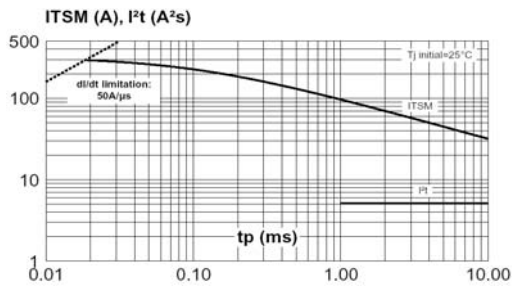
**Fig. 5:** Surge peak on-state current versus number of cycles.



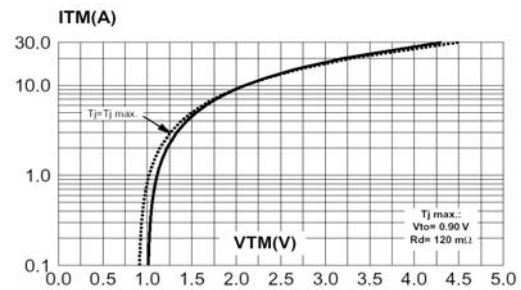
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#### Description

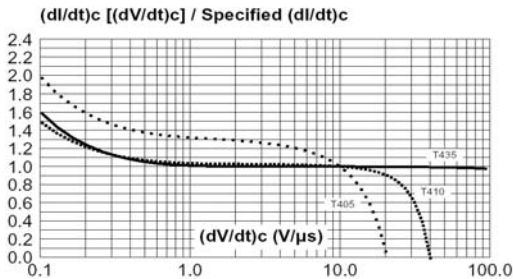
**Fig. 6:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$ .



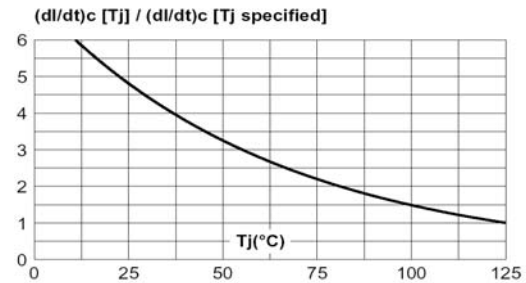
**Fig. 7:** On-state characteristics (maximum values).



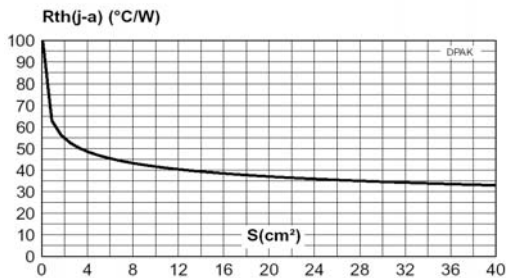
**Fig. 8:** Relative variation of critical rate of decrease of main current versus  $(dV/dt)_c$  (typical values).



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



**Fig. 10:** DPAK thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness:  $35\mu\text{m}$ ).



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#### MECHANICAL DATA

Dimensions in mm  
 Net Mass: 0.4 g  
 TO-252

