



### 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> 	
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 12A

SYMBOL	PARAMETER	Value	Unit
$V_{DRM}$	Repetitive peak off-state voltages	600	V
$I_T (RMS)$	RMS on-state current	12	A
$I_{TSM}$	Non-repetitive peak on-state current	95	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$R_{thj-mb}$	Thermal resistance Junction to mounting base	full cycle half cycle	- -	- -	1.5 2.0	K/W K/W
$R_{thj-a}$	Thermal resistance Junction to ambient	in free air	-	60	-	K/W

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

SYMBOL	PARAMETER	CONDITIONS	MIN	Value	UNIT
$V_{DRM}$	Repetitive peak off-state voltages		-	600	V
$I_{T(RMS)}$	RMS on-state current	Full sine wave; $T_{mb} \leq 99^{\circ}C$	-	12	A
$I_{TSM}$	Non repetitive surge peak on-state current	full sine wave; $T_j = 25^{\circ}C$ prior to surge	-	95 105	A A
$I^2t$	$I^2t$ for fusing		-	45	A <sup>2</sup> S
$di_T/dt$	Repetitive rate of rise of on-state current after triggering	$I_{TM}=20A; I_G=0.2A_T,$ $di_G/dt=0.2A/\mu s$	-	100	A/ $\mu s$
$I_{GM}$	Peak gate current		-	2	A
$P_{GM}$	Peak gate power		-	5	W
$P_{G(AV)}$	Average gate power	over any 20 ms period	-	0.5	W
$T_{stg}$	Storage temperature		-40	150	$^{\circ}C$
$T_j$	Operating junction temperature		-	125	$^{\circ}C$

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$I_{GT}$	Gate trigger current	$V_D=12V; I_T=0.1A$	-	-	25	mA
		T2+G+	-	-	25	mA
		T2+G-	-	-	25	mA
		T2-G-	-	-	25	mA
$V_{GT}$	Gate trigger voltage	$V_D=12V; I_T=0.1A$ $V_D=400V; I_T=0.1A; T_j=125^{\circ}C$	0.25	-	1.5	V
				-	-	V
$I_L$	Latching current	$V_D=12V; I_{GT}=0.1A$	-	-	25	mA
		T2+G+	-	-	40	mA
		T2+G-	-	-	40	mA
		T2-G-	-	-	40	mA
$I_D$	Off-state leakage current	$V_D=V_{DRM(max)}; T_j=125^{\circ}C$	-	-	0.5	mA
$I_H$	Holding current	$V_D=12V; I_{GT}=0.1A$	-	-	30	mA
$V_T$	On-state voltage	$I_T=17A$	-	-	1.6	V
$dV_D/dt$	Critical rate of rise of off-state voltage	$V_{DM}=67\%V_{DRM(max)}; T_j=110^{\circ}C;$ exponential waveform; gate open circuit	70	-	-	V/ $\mu s$

### Dynamic Characteristics

$di_{com}/dt$	Critical rate of change of commutating current	$V_{DM}=400V; T_j=125^{\circ}C; I_{T(RMS)}=12A;$ $dV_{com}/dt=20V/\mu s;$ gate open circuit	5	-	-	A/ms
$di_{com}/dt$	Critical rate of change of commutating current	$V_{DM}=400V; T_j=125^{\circ}C; I_{T(RMS)}=12A;$ $dV_{com}/dt=0.1V/\mu s;$ gate open circuit	19	-	-	A/ms

Note 1 : Although not recommended, off-state voltages up to 800V may be applied without damage, but the triac may switch to the on-state. the rate of current should not exceed 15A/us.

Note 2 : Device does not trigger in the T2-,G+ quadrant.

#### Description

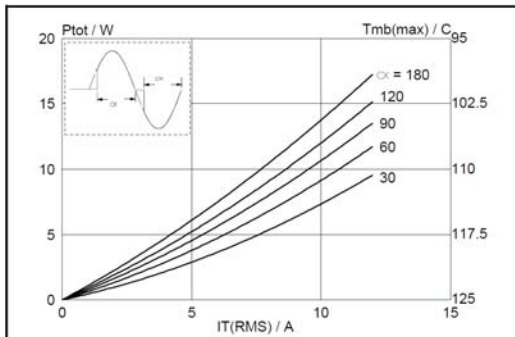


Fig. 1. Maximum on-state dissipation,  $P_{tot}$ , versus rms on-state current,  $I_{T(RMS)}$ , where  $\alpha =$  conduction angle.

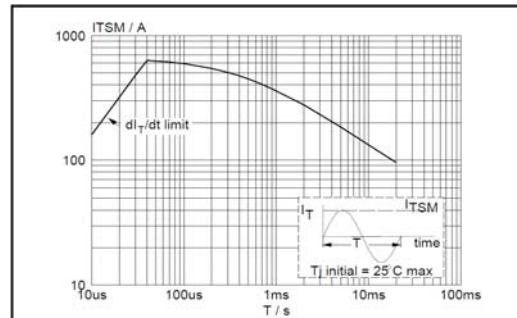


Fig. 2. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus pulse width  $t_p$ , for sinusoidal currents,  $t_p \leq 20ms$ .

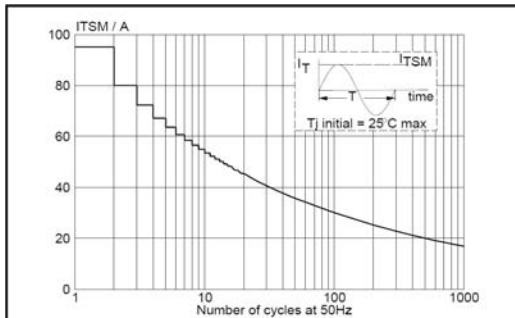


Fig. 3. Maximum permissible non-repetitive peak on-state current  $I_{TSM}$ , versus number of cycles, for sinusoidal currents,  $f = 50 Hz$ .

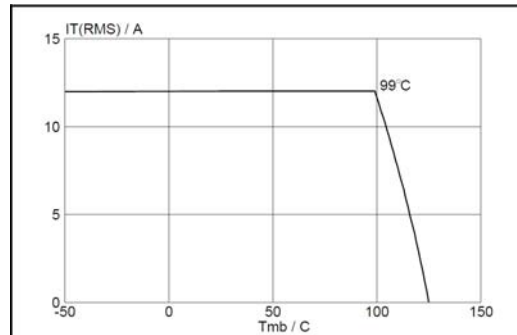


Fig. 4. Maximum permissible rms current  $I_{T(RMS)}$ , versus mounting base temperature  $T_{mb}$ .

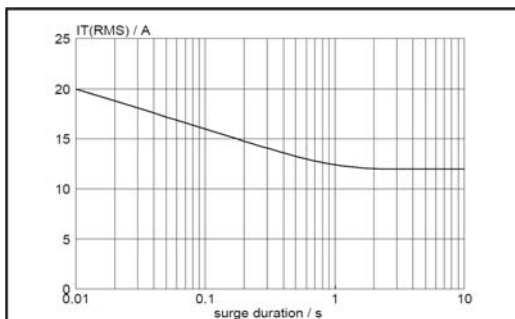


Fig. 5. Maximum permissible repetitive rms on-state current  $I_{T(RMS)}$ , versus surge duration, for sinusoidal currents,  $f = 50 Hz$ ;  $T_{mb} \leq 99 C$ .

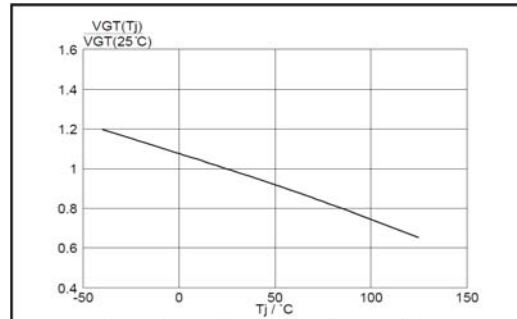
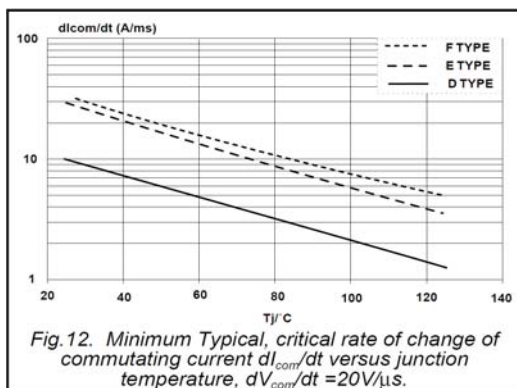
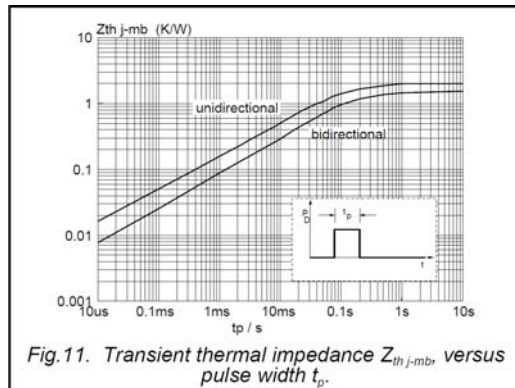
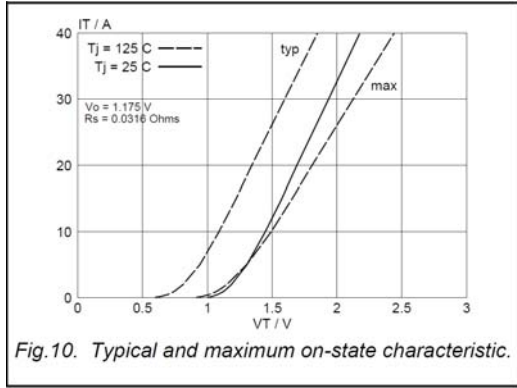
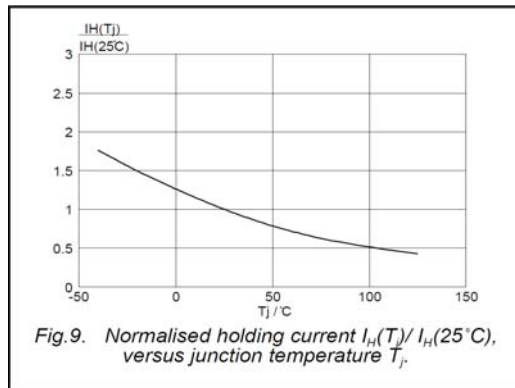
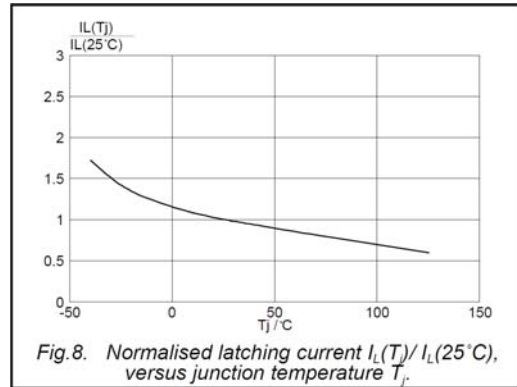
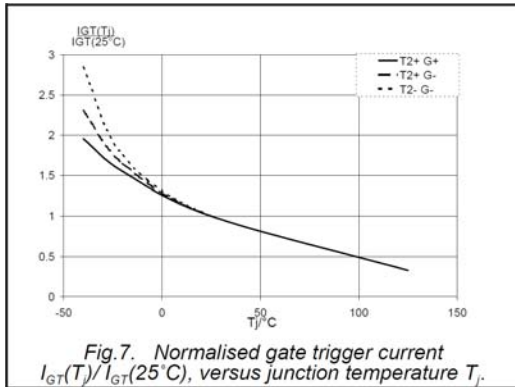


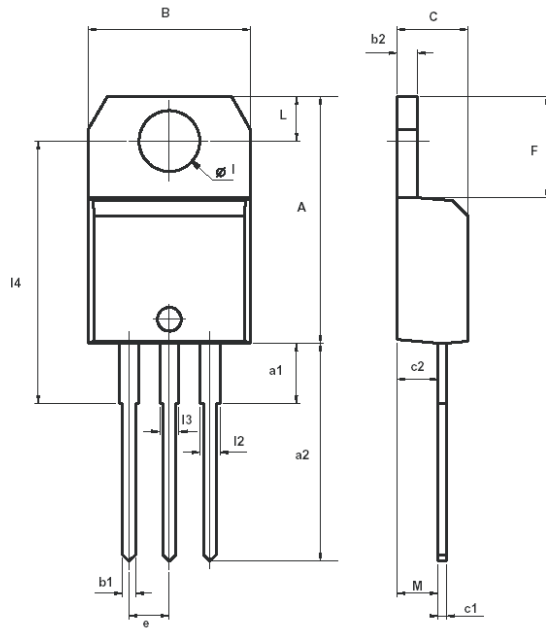
Fig. 6. Normalised gate trigger voltage  $V_{GT}(T) / V_{GT}(25 C)$ , versus junction temperature  $T_j$ .

#### Description



#### MECHANICAL DATA

Dimensions in mm  
Net Mass: 2 g



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
I	3.75		3.85	0.147		0.151
l4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
l2	1.14		1.70	0.044		0.066
l3	1.14		1.70	0.044		0.066
M		2.60			0.102	