

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 commute the full rated ms current at the maximum rated junction temperature without the aid of a snubber.

Symbol 		Simplified outline  TO-220	
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 16 A

SYMBOL	PARAMETER	Value	Unit
V_{DRM}	Repetitive peak off-state voltages	600	V
$I_T (RMS)$	RMS on-state current	16	A
I_{TSM}	Non-repetitive peak on-state current	140	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
R_{thj-mb}	Thermal resistance Junction to mounting base	full cycle half cycle	- -	- -	1.2 1.7	K/W K/W
R_{thj-a}	Thermal resistance Junction to ambient	in free air	-	60	-	K/W

HAOPIN MICROELECTRONICS CO.,LTD.

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; $T_{mb} \leq 99^{\circ}\text{C}$	-	16	A
I_{TSM}	Non repetitive surge peak on-state current	Full sine wave; $T_j = 25^{\circ}\text{C}$ prior to surge	-	140	A
			-	150	A
I^2t	I^2t for fusing	$T_p = 10\text{ms}$	-	98	A^2S
di_T/dt	Repetitive rate of rise of on-state current after triggering	$I_{TM} = 20\text{A}; I_G = 0.2\text{A}; di_G/dt = 0.2\text{A}/\mu\text{s}$	-	100	$\text{A}/\mu\text{s}$
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 range		-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 ²	$V_D = 12\text{V}; I_T = 0.1\text{A}$	-	-	25	mA
			-	-	25	mA
			-	-	25	mA
I_L	Latching current	$V_D = 12\text{V}; I_{GT} = 0.1\text{A}$	-	-	30	mA
			-	-	40	mA
			-	-	40	mA
I_H	Holding current	$V_D = 12\text{V}; I_{GT} = 0.1\text{A}$	-	-	30	mA
V_T	On-state voltage	$I_T = 20\text{A}$	-	-	1.5	V
V_{GT}	Gate trigger voltage	$V_D = 12\text{V}; I_T = 0.1\text{A}$	-	-	1.5	V
		$V_D = 400\text{V}; I_T = 0.1\text{A}; T_j = 125^{\circ}\text{C}$	0.25	-	-	V
I_D	Off-state leakage current	$V_D = V_{DRM(max)}; T_j = 125^{\circ}\text{C}$	-	-	0.5	mA

Dynamic Characteristics

dV_D/dt	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)}; T_j = 110^{\circ}\text{C}$ exponential waveform; gate open circuit	70	-	-	$\text{V}/\mu\text{s}$
dI_{com}/dt	Critical rate of change of commutating current	$V_{DM} = 400\text{V}; T_j = 125^{\circ}\text{C}; I_{T(RMS)} = 16\text{A}$ $dV_{com}/dt = 10\text{V}/\mu\text{s}$; gate open circuit	18	-	-	A/ms
dI_{com}/dt	Critical rate of change of commutating current	$V_{DM} = 400\text{V}; T_j = 125^{\circ}\text{C}; I_{T(RMS)} = 16\text{A}$ $dV_{com}/dt = 10\text{V}/\mu\text{s}$; gate open circuit	50	-	-	A/ms

Description

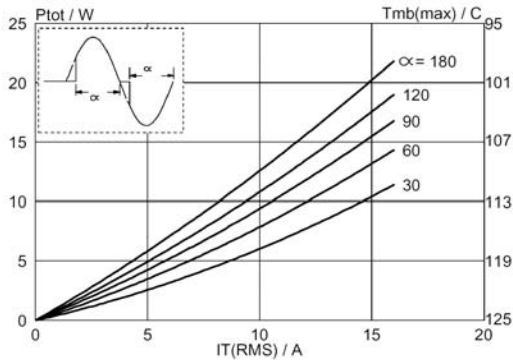


Fig.1. Maximum on-state dissipation, P_{tot} , versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

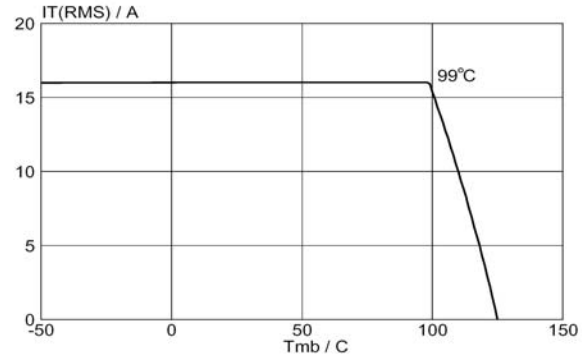


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb} .

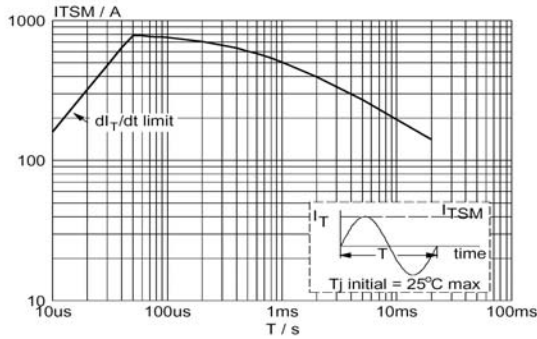


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus pulse width t_p , for sinusoidal currents, $t_p \leq 20ms$.

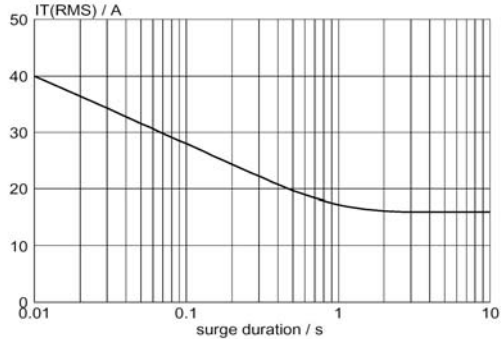


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, $f = 50 Hz$; $T_{mb} \leq 99^\circ C$.

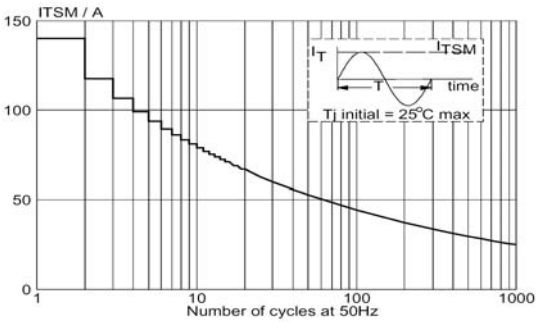


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM} , versus number of cycles, for sinusoidal currents, $f = 50 Hz$.

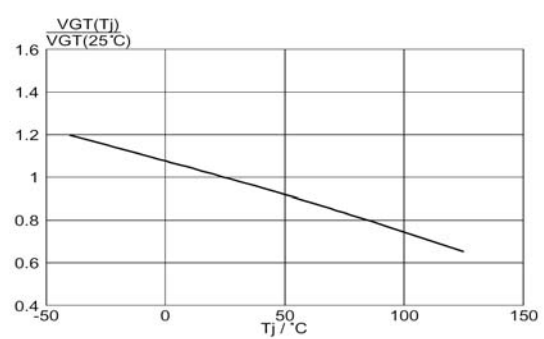


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/V_{GT}(25^\circ C)$, versus junction temperature T_j .

Description

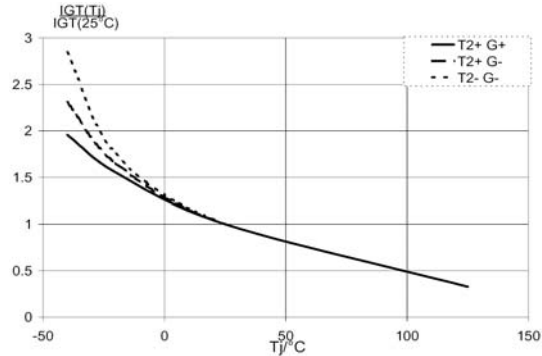


Fig.7. Normalised gate trigger current $I_{GT}(T_J)/I_{GT}(25^\circ\text{C})$, versus junction temperature T_J .

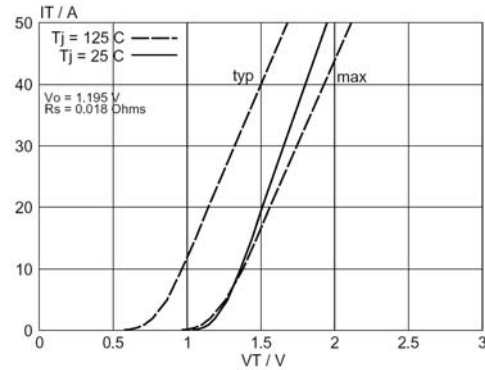


Fig.10. Typical and maximum on-state characteristic.

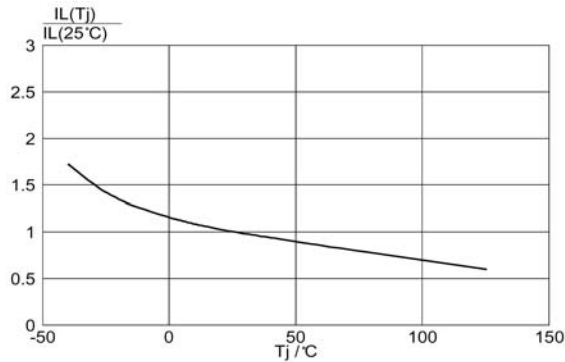


Fig.8. Normalised latching current $I_L(T_J)/I_L(25^\circ\text{C})$, versus junction temperature T_J .

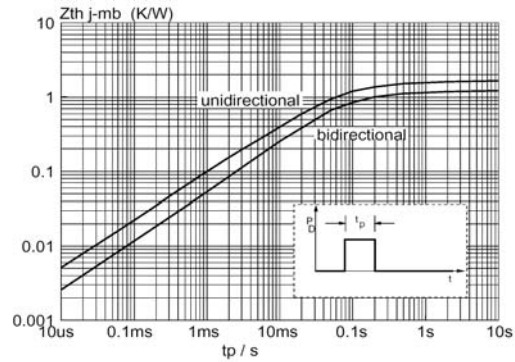


Fig.11. Transient thermal impedance $Z_{th j-mb}$, versus pulse width t_p .

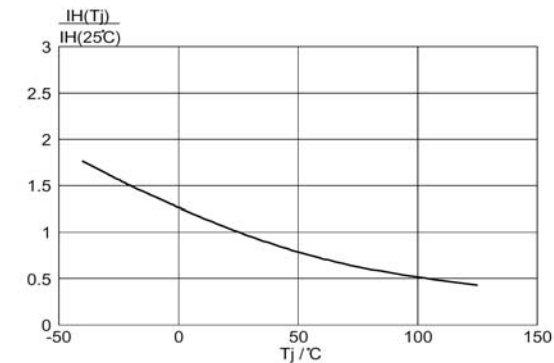


Fig.9. Normalised holding current $I_H(T_J)/I_H(25^\circ\text{C})$, versus junction temperature T_J .

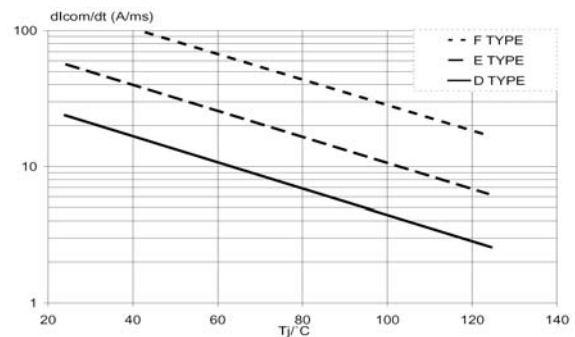
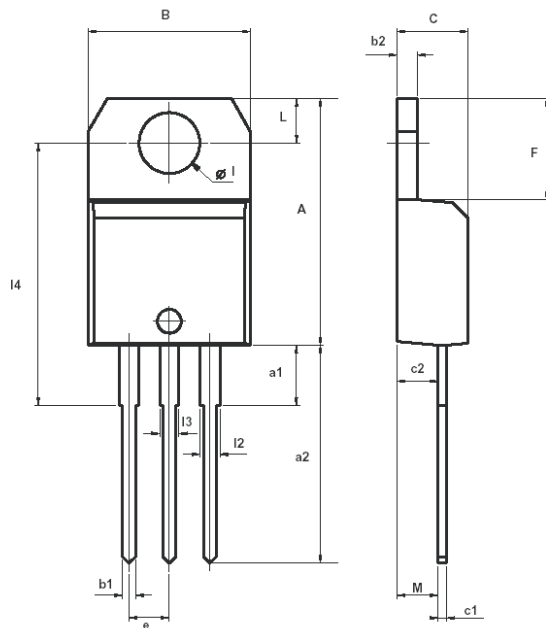


Fig.12. Minimum, critical rate of change of commutating current dI_{com}/dt versus junction temperature, $dV_{com}/dt = 10\text{V}/\mu\text{s}$.

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
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	