T405-600T

Three quadrant triacs

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.

Symbol	Simplified outline
	

Pin	Description
1	Main terminal 1 (T1)
2	Main terminal 2 (T2)
3	gate (G)
TAB	Main teminal 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,Tj initial=25℃)	30	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Rth(j-c)	Junction to case(AC)		-	2.6	-	℃/W
Rth(j-a)	Junction to ambient		-	60	-	℃/W

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	Tc=110℃	-	4	A
I^2t	I^2t value for fusing	Tp=10ms	-	5.1	A^2s
DI/dt	Critical rate of rise of on-state current I_G=2×I_{GT},tr≤100 ns	F=120H_z Tj=125℃	-	50	A/μS
I_{GM}	Peak gate current	Tp=20μs Tj=125℃	-	4	A
V_{GD}		V_D=V_{DRM};R_L=33kΩ Tj=125℃	0.2	-	V
V_{GT}		V_D=12V;R_L=30Ω	-	1.3	V
$P_{G(AV)}$	Average gate power	Tj=125℃	-	1	W
T_{stg}	Storage temperature		-40	150	℃
T_j	Operating junction Temperature range		-40	125	℃

T_J=25°C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNIT
Static characteristics							
I_{GT}	Gate trigger current	V_D=12V;R_L=30Ω	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}	Tj=25℃ Tj=125℃		-	-	5 1	μA mA
I_H	Holding current	I_T=100mA		-	-	10	mA
V_{TM}	I_{TM}=5.5A tp=380μs	Tj=25℃		-	-	1.6	V
V_{To}	Threshold voltage	Tj=125℃		-	-	0.9	V
R_D	Dynamic resistance	Tj=125℃		-	-	120	MΩ

Dynamic Characteristics

D_V/dt	Critical rate of rise of Off-state voltage	V_D=67% V_{DRM} gate open;Tj=125℃;	20	-	-	V/μs
(dI/dt)c		(dV/dt)c=0.1V/μs Tj=125℃ (dv/dt)c=10V/μs Tj=125℃	1.8 0.9	-	-	A/ms

Description

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

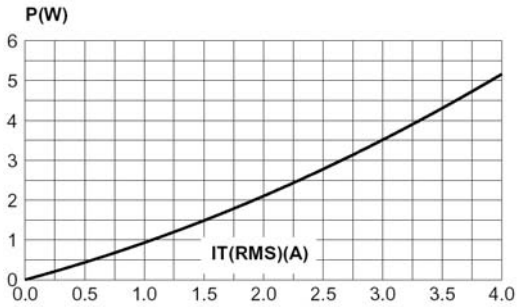


Fig. 2-1: RMS on-state current case versus temperature (full cycle).

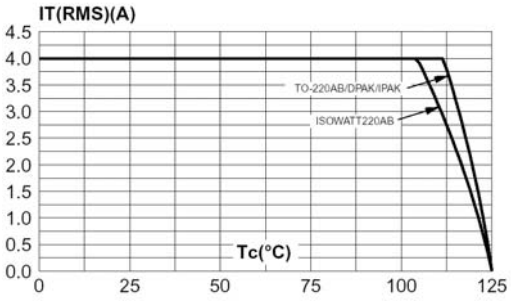


Fig. 2-2: RMS on-state current versus ambient temperature (printed circuit FR4, copper thickness: 35µm),full cycle.

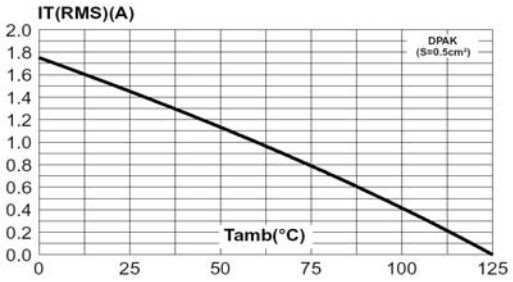


Fig. 3: Relative variation of thermal impedance versus pulse duration.

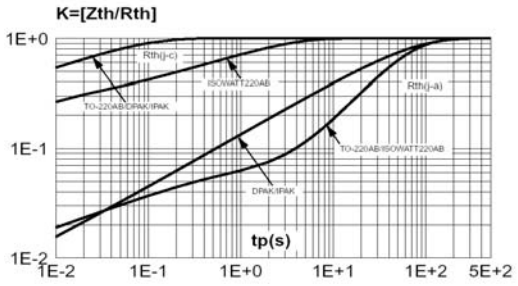


Fig. 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

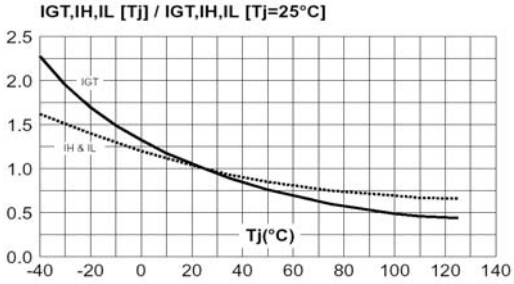
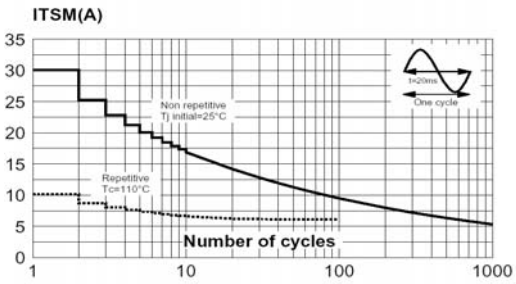


Fig. 5: Surge peak on-state current versus number of cycles.



Description

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

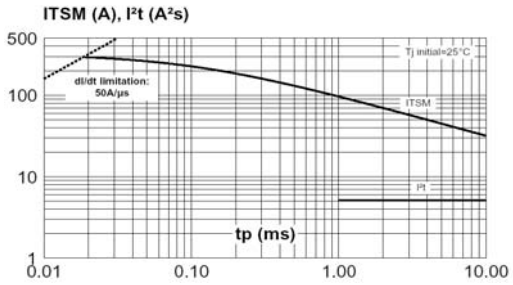


Fig. 7: On-state characteristics (maximum values).

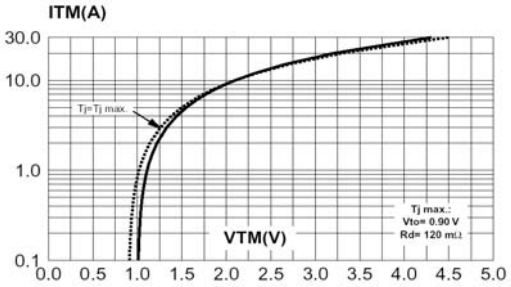


Fig. 8: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values).

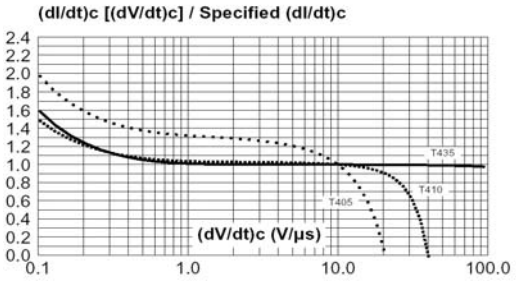


Fig. 9: Relative variation of critical rate of decrease of main current versus junction temperature.

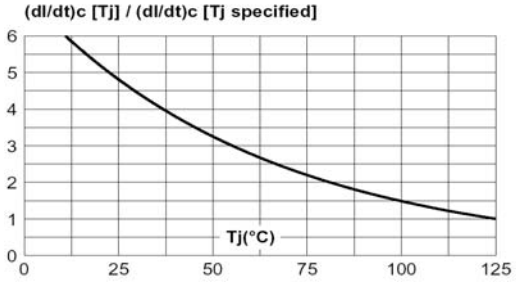
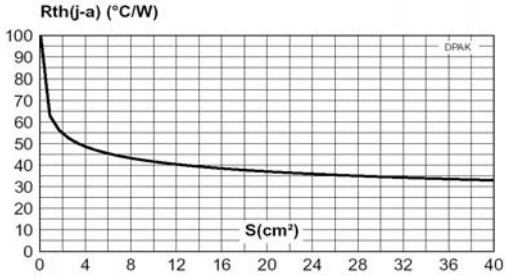
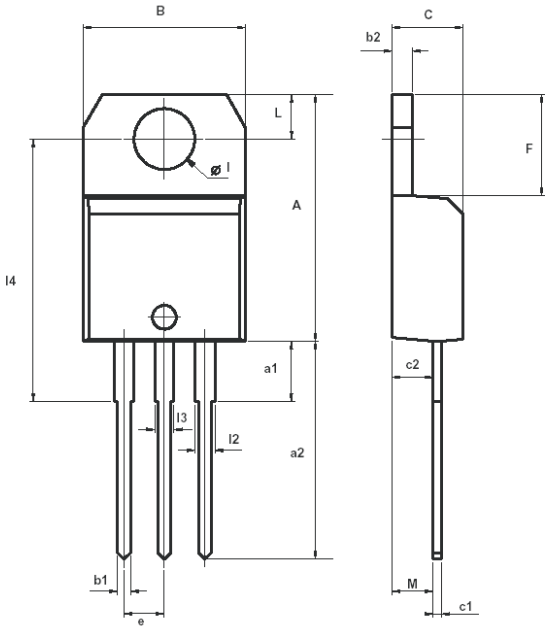


Fig. 10: DPAK thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: 35µm).



MECHANICAL DATA

Dimensions in mm
Net Mass: 2.3 g
TO-220



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	