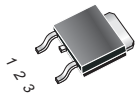
T410-600B

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
	 TO-252

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	s=0.5 cm^2	-	70	-	℃/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	-	-	10	mA
I_L	Latching current	I_G=1.2I_{GT}	I-III II	-	-	25 30	mA
I_{DRM} I_{RRM}	V_{DRM}=V_{RRM}	Tj=25℃ Tj=125℃		-	-	5 1	μA mA
I_H	Holding current	I_T=100mA		-	-	15	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℃;	40	-	-	V/μs
(dI/dt)c		(dV/dt)c=0.1V/μs Tj=125℃ (dv/dt)c=10V/μs Tj=125℃	2.7 2.0	-	-	A/ms

Description

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

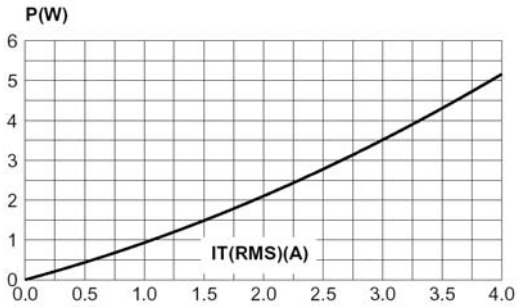


Fig. 2-1: RMS on-state current case versus temperature (full cycle).

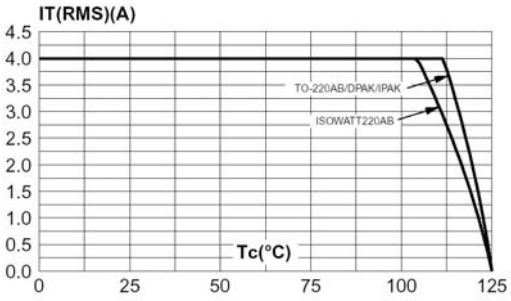


Fig. 2-2: RMS on-state current versus ambient temperature (printed circuit FR4, copper thickness: 35µm),full cycle.

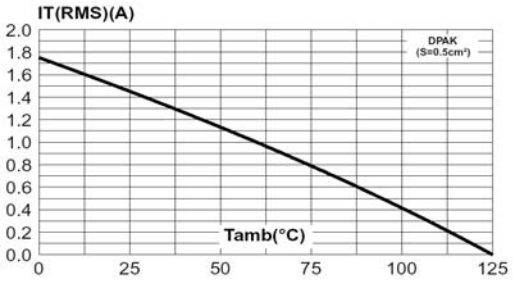


Fig. 3: Relative variation of thermal impedance versus pulse duration.

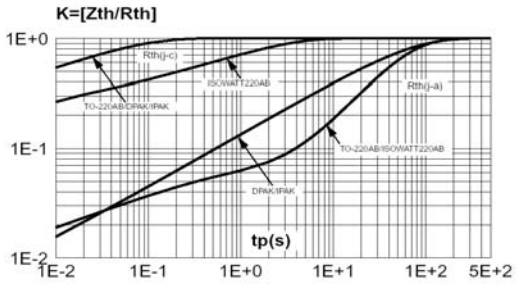


Fig. 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

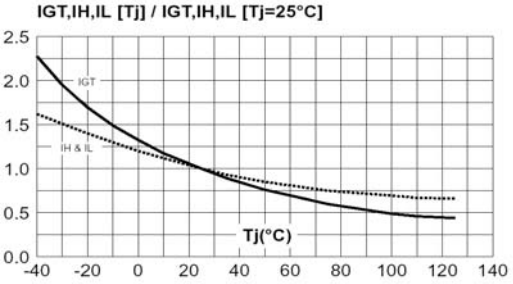
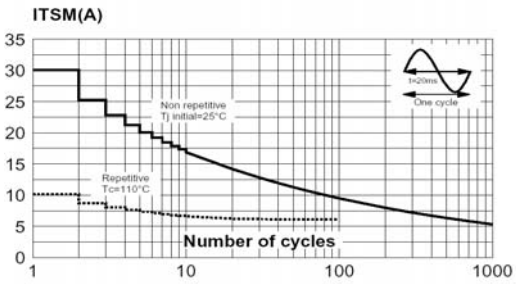


Fig. 5: Surge peak on-state current versus number of cycles.



Description

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

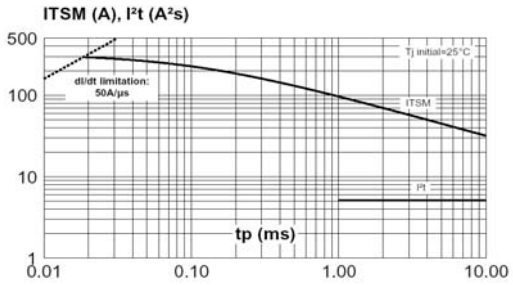


Fig. 7: On-state characteristics (maximum values).

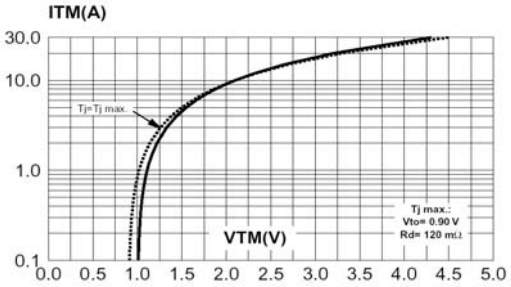


Fig. 8: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values).

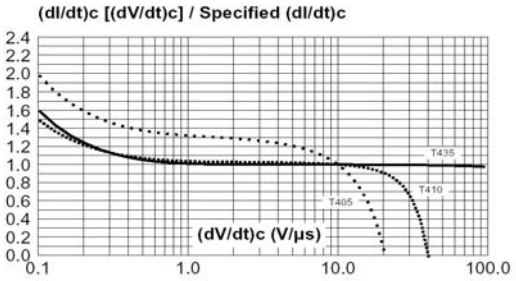


Fig. 9: Relative variation of critical rate of decrease of main current versus junction temperature.

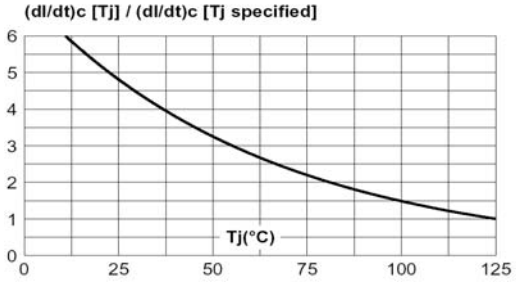
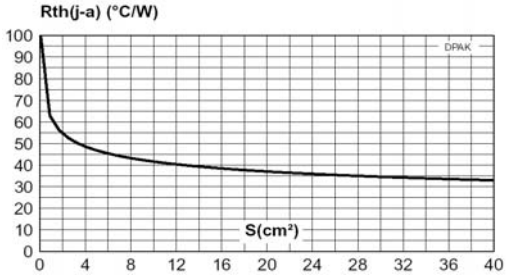
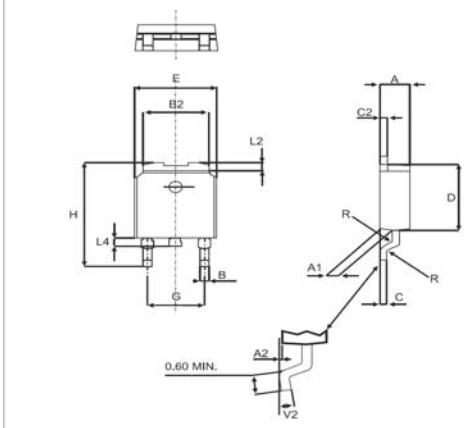


Fig. 10: DPAK thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: 35µm).



MECHANICAL DATA

Dimensions in mm
Net Mass: 0.3 g
TO-252



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	0.45	0.60	0.017	0.023
C2	0.48	0.60	0.018	0.023
D	6.00	6.20	0.236	0.244
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
H	9.35	10.10	0.368	0.397
L2	0.80 typ.		0.031 typ.	
L4	0.60	1.00	0.023	0.039
R	0.2 typ.		0.007 typ.	
V2	0°	8°	0°	8°