BTB12-600CW

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 terminal 2 (T2)

Applications:

- Motor control
- Industrial and domestic lighting
- Heating
- Static switching

Features

- Blocking voltage to 600 V
- On-state RMS current to 12 A

SYMBOL	PARAMETER	Value	Unit
V_{DRM}	Repetitive peak off-state voltages	600	V
$I_{T(RMS)}$	RMS on-state current （full sine wave）	12	A
I_{TSM}	Non-repetitive peak on-state current (full cycle,Tj initial=25℃)	126	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Rth(j-c)	Junction to case(AC)		-	1.4	-	℃/W
Rth(j-a)	Junction to ambient		-	60	-	℃/W

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

SYMBOL	PARAMETER	CONDITIONS			MIN	Value	UNIT
V_{DSM}/V_{RSM}	Non repetitive surge peak off-state voltage	tp=10ms		Tj=25℃	-	V_{DRM}/V_{RRM} +100	V
$I_{T(RMS)}$	RMS on-state current	full sine wave;Tc=105℃			-	12	A
I_{TSM}	Non repetitive surge peak on-state current	full cycle, Tj initial= 25 ℃	F=50Hz	t=20ms	-	120	A
			F=60Hz	t=16.7ms	-	126	A
I^2t	I^2t Value for fusing	tp=10ms			-	78	A^2S
dI/dt	Critical rate of rise of on-state current	I_G=2x I_{GT},tr<=100ns	F=120Hz	Tj=125℃	-	50	A/μs
I_{GM}	Peak gate current		tp=20us	Tj=125℃	-	4	A
I_{DRM}	$V_{DRM}=V_{RRM}$			Tj=25℃	-	5	μA
I_{RRM}	$V_{DRM}=V_{RRM}$			Tj=125℃	-	1	mA
$P_{G(AV)}$	Average gate power dissipation			Tj=125℃	-	1	W
T_{stg}	Storage junction temperature range				-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}(1) V_{GT}		V_D=12V; R_L=30Ω	I-II-III I-II-III	- -	- -	35 1.3	mA V
I_L		I_G=1.2 I_{GT}	I-III II	- -	- -	50 60	mA
I_H(2)		I_T=100mA		-	-	35	mA
V_{GD}		$V_D=V_{DRM}$ R_L=3.3KΩ Tj=125℃	I-II-III	0.2	-	-	V
dV/dt(2)		V_D=67%V_{DRM} gate open;Tj=125℃		500	-	-	V/μs
(dI/dt)c(2)		without snubber Tj=125℃		6.5	-	-	A/ms

Dynamic Characteristics

V_T(2)	I_{TM}=17A tp=380μs	Tj=25℃	-	-	1.55	V
V_{to}(2) R_d(2)	Threshold voltage Dynamic resistance	Tj=125℃ Tj=125℃	-	-	0.85 35	V mΩ

Note 1: minimum I_{GT} is guaranted at 5% of I_{GT} max.

Note 2: for both polarities of A2 referenced to A1.

Description

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

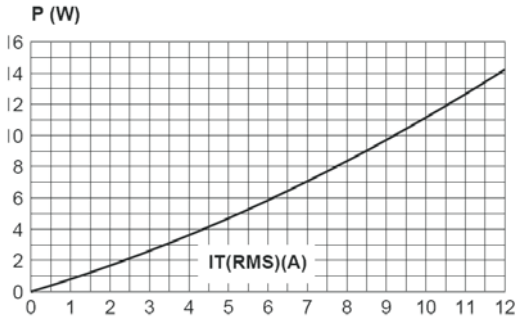


Fig. 2-1: RMS on-state current versus case temperature (full cycle).

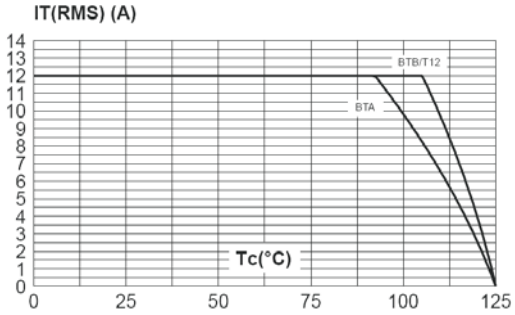


Fig. 2-2: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35µm),full cycle.

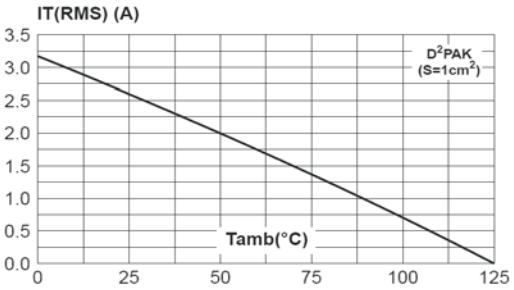


Fig. 3: Relative variation of thermal impedance versus pulse duration.

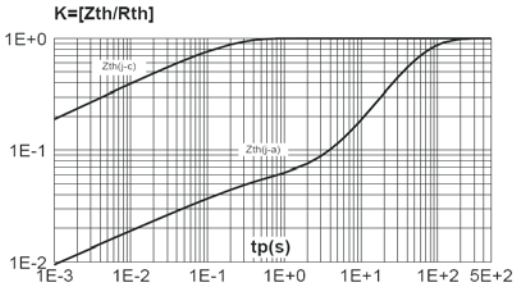


Fig. 4: On-state characteristics (maximum values).

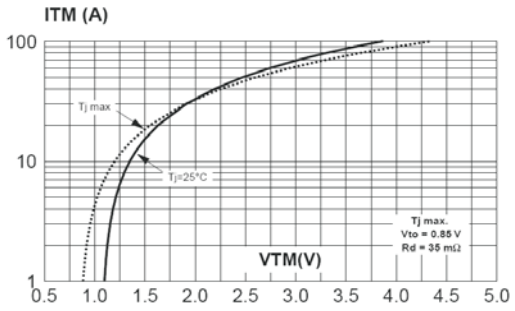
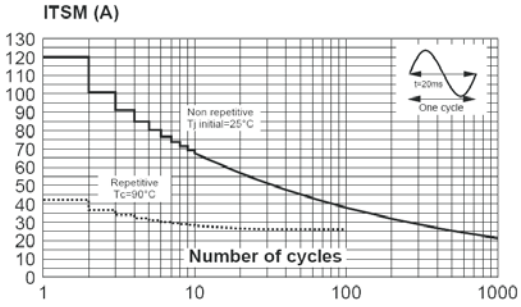


Fig. 5: Surge peak on-state current versus number of cycles.



Description

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

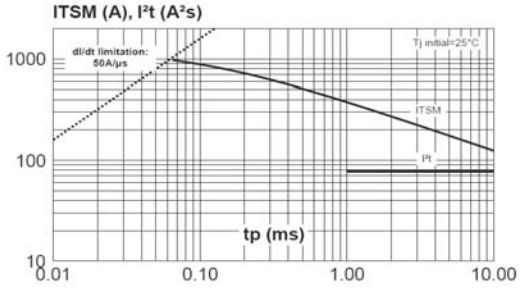


Fig. 7: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

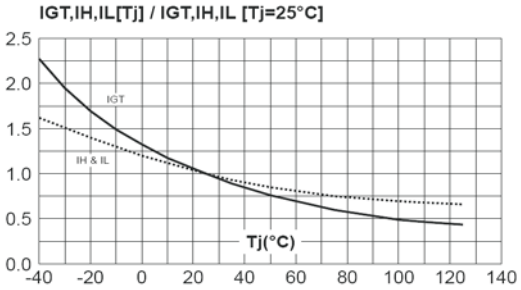


Fig. 8-1: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (BW/CW/T1235).

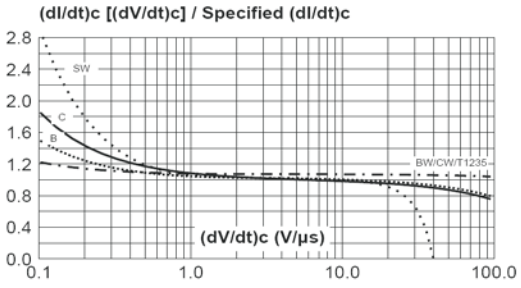


Fig. 8-2: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (TW).

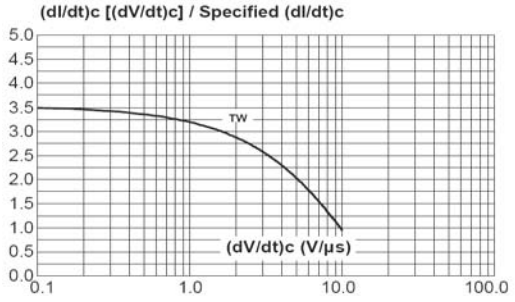


Fig. 9: Relative variation of critical rate of decrease of main current versus junction temperature.

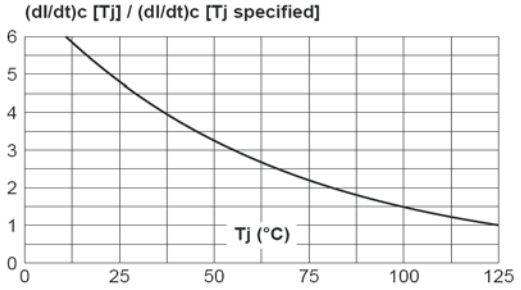
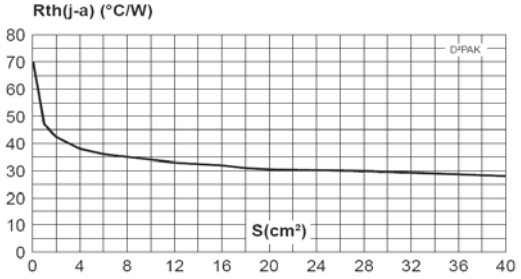
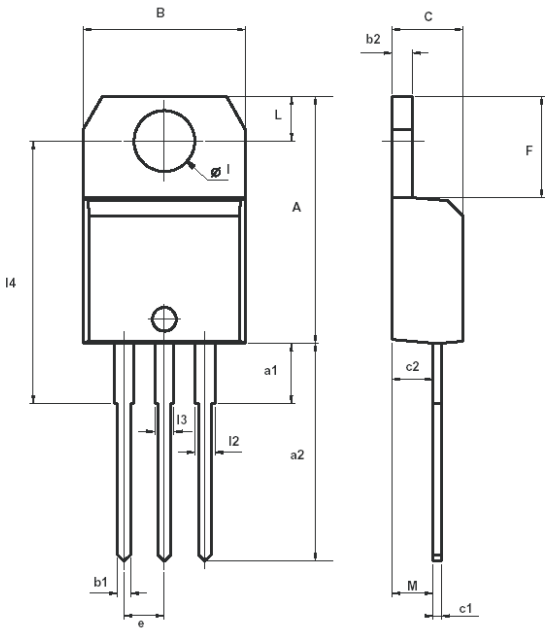


Fig. 10: D²PAK Thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: 35 µm).



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	