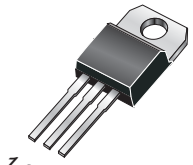
BTA216-600B

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
	

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
$R_{th\ j-a}$	Thermal resistance Junction to ambient	in free air	-	60	-	K/W

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}\leqslant$99℃		-	16	A
I_{TSM}	Non repetitive surge peak on-statecurrent	Full sine wave;Tj=25℃ prior to surge	t=20ms	-	140	A
			t=16.7ms	-	150	A
I^2t	I^2t for fusing	T_p=10ms		-	98	A^2S
dI_T/dt	Repetitive rate of rise of on-state current after triggering	I_{TM}=20A;I_G=0.2A ; dI_G/dt=0.2A/μs		-	100	A/μs
I_{GM}	Peak gate current			-	2	A
V_{GM}	Peak gate voltage			-	5	V
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	℃
T_j	Operating junction Temperature range			-40	125	℃

T_J=25℃ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNIT
Static characteristics							
I_{GT}	Gate trigger current[2]	V_D=12V; I_T=0.1A	T2+G+ T2+G- T2-G-	2 2 2	18 21 34	50 50 50	mA mA mA
I_L	Latching current	V_D=12V; I_{GT}=0.1A	T2+G+ T2+G- T2-G-	- - -	31 34 30	60 90 60	mA mA mA
I_H	Holding current	V_D=12V; I_{GT}=0.1A		-	31	60	mA
V_T	On-state voltage	I_T=20A		-	1.2	1.5	V
V_{GT}	Gate trigger voltage	V_D=12V; I_T=0.1A V_D=400V; I_T=0.1A;T_J=125℃		- 0.25	0.7 0.4	1.5 -	V
I_D	Off-state leakage current	V_D=$V_{DRM(max)}$; T_J=125℃		-	0.1	0.5	mA

Dynamic Characteristics

dV_D/dt	Critical rate of rise of off-state voltage	V_{DM}=67% $V_{DRM(max)}$;T_J=25℃ exponential waveform;gate open circuit	1000	4000	-	V/μs
dI_{com}/dt	Critical rate of change of commutating current	V_{DM}=400 V;T_J=25℃ $I_{T(RMS)}$=16A without snubber; gate open circuit	-	28	-	A/ms
t_{gt}	Gate controlled turn-on time	I_{TM}=20 A V_D=$V_{DRM(max)}$; I_G=0.1A dI_G/dt=5 A/μs	-	2	-	μs

Description

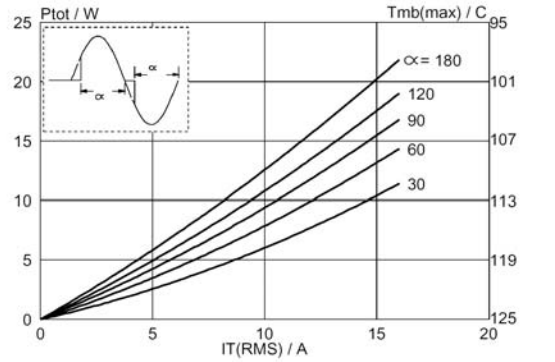


Fig.1. Maximum on-state dissipation, P_{tot}, versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

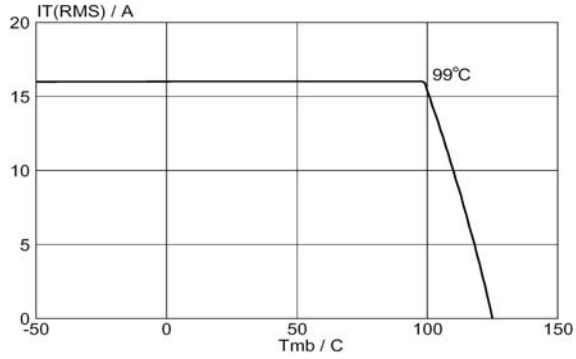


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb}.

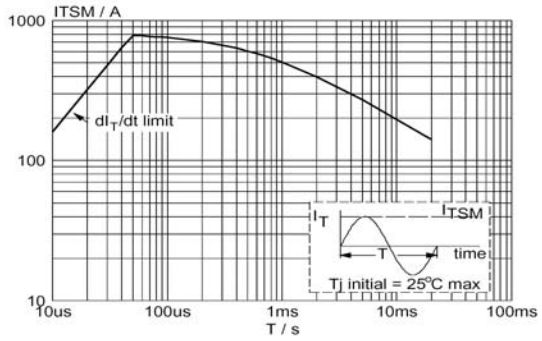


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus pulse width t_p, for sinusoidal currents, $t_p \leq 20ms$.

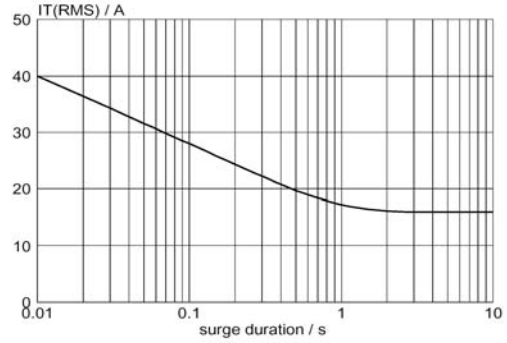


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, f = 50 Hz; $T_{mb} \leq 99°C$.

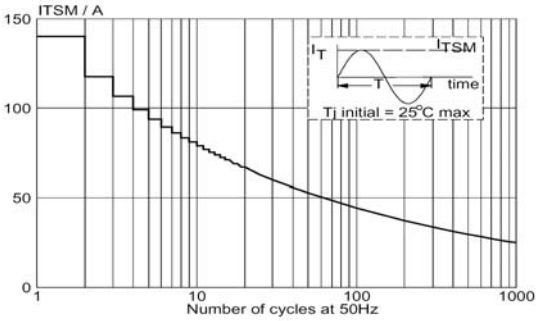


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for sinusoidal currents, f = 50 Hz.

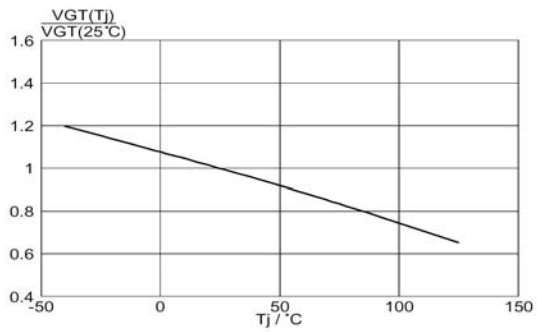


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/ V_{GT}(25°C)$, versus junction temperature T_j.

Description

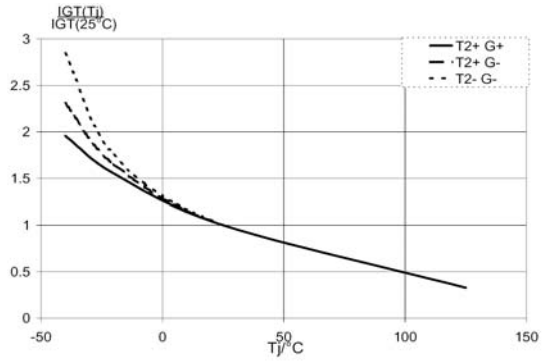


Fig.7. Normalised gate trigger current $I_{GT}(T_j)/ I_{GT}(25^{\circ}C)$, versus junction temperature T_j.

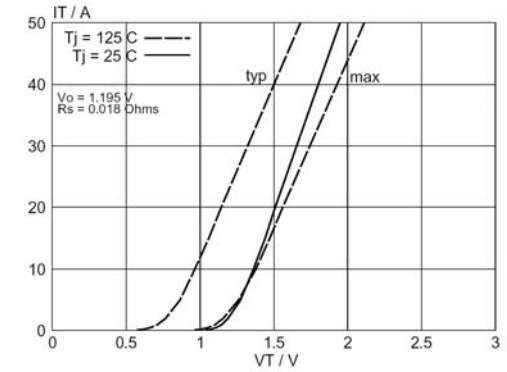


Fig.10. Typical and maximum on-state characteristic.

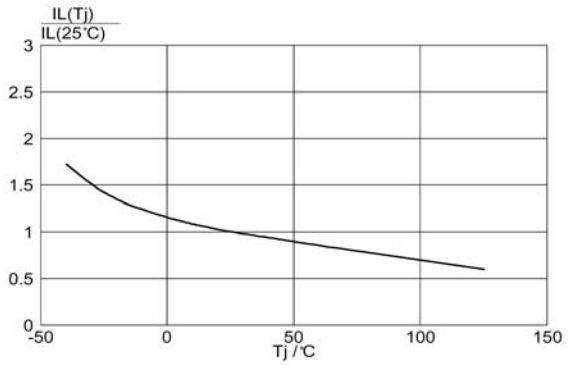


Fig.8. Normalised latching current $I_L(T_j)/ I_L(25^{\circ}C)$, versus junction temperature T_j.

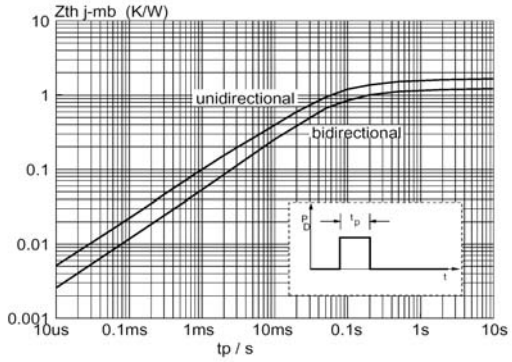


Fig.11. Transient thermal impedance $Z_{th\ j\text{-}mb}$, versus pulse width t_p.

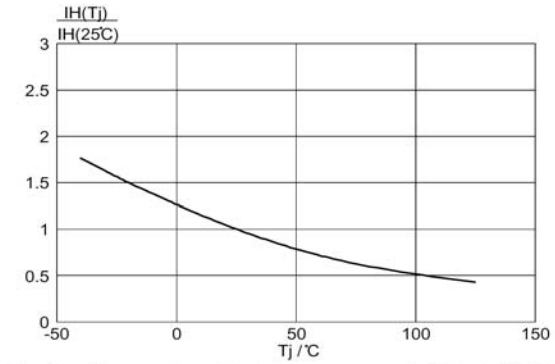


Fig.9. Normalised holding current $I_H(T_j)/ I_H(25^{\circ}C)$, versus junction temperature T_j.

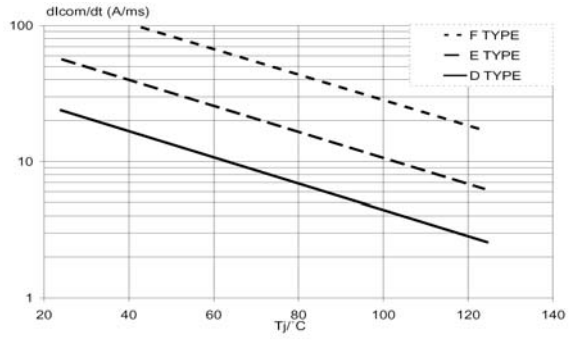
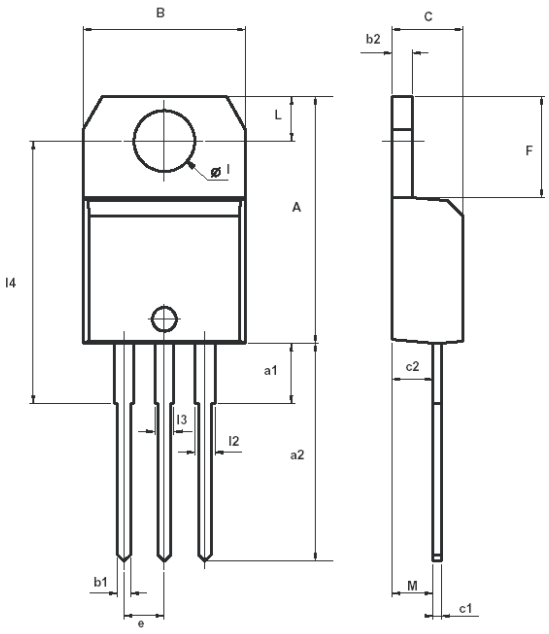


Fig.12. Minimum, critical rate of change of commutating current dI_{com}/dt versus junction temperature, dV_{com}/dt = 10V/µs.

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	