BTB20 TO-220

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 20 A

SYMBOL	PARAMETER	Value	Unit
V_{DRM}	Repetitive peak off-state voltages	600	V
$I_{T\ (RMS)}$	RMS on-state current （full sine wave）	20	A
I_{TSM}	Non-repetitive peak on-state current (full cycle,Tj initial=25℃)	200	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Rth(j-c)	Junction to case(AC)		-	1.3	-	℃/W
Rth(j-a)	Junction to ambient		-	60	-	℃/W

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

SYMBOL	PARAMETER	CONDITIONS		MAX	Value	UNIT
V_{DRM}	Repetitive peak off-state Voltages	Tj=125°C		-	600	V
$I_{T(RMS)}$	RMS on-state current	360° conduction angle	Tc=90°C	-	20	A
I_{TSM}	Non repetitive surge peak on-statecurrent	Tj initial=25°C	tp=8.3ms	-	210	A
			tp=10ms	-	200	A
I^2t	I^2t value		T_p=10ms	-	200	A^2S
DI/dt	Critical rate of rise of on-state current	Gate supply:I_G=500mA dI_G/dt=1A/us	Repetitive F=50Hz	-	20	A/µs
			Non repetitive	-	100	
I_{DRM}	V_{DRM} rated	Tj=25°C		0.01	-	mA
I_{RRM}	V_{RRM} rated	Tj=125°C		3	-	mA
Tl	Maximum lead soldering temperature during 10s at 4.5mm form case			-	260	°C
T_{stg}	Storage and operating junction temperature range			-40	150	°C
T_j	Storage and operating junction temperature range			-40	125	°C

T_J=25°C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNIT
Static characteristics							
I_{GT}	V_D=12V(DC); R_L=33Ω	Tj=25°C	I-II-III	1	-	35	mA
V_{GT}			I-II-III	-	-	1.5	V
I_L	I_G=1.2 I_{GT}	Tj=25°C	I-III	-	-	-	mA
			II	-	-	-	
			I-II-III	-	-	80	
I_H	I_T=500mA Gate open	Tj=25°C		-	-	50	mA
V_{GD}	V_D=V_{DRM} R_L=3.3KΩ	Tj=125°C	I-II-III	0.2	-	-	V
dV/dt	V_D=67%V_{DRM} gate open;	Tj=125°C		250	500	-	V/µs
(dv/dt)c	Without snubber	T_J=125°C		11	22	-	A/ms

Dynamic Characteristics

V_{TM}(2)	I_{TM}=28A tp=380us	T_J=25°C		-	-	1.70	V
tgt	V_D=V_{DRM} I_G=500mA dI_G/dt=3A/us	T_J=25°C	I-II-III	-	2	-	µs

Description

Fig. 1: Maximum RMS power dissipation versus RMS on-state current (F = 50Hz).(Curves are cut off by (dI/dt)c limitation)

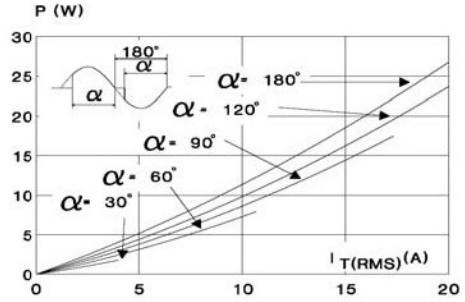


Fig. 2: Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (BTA).

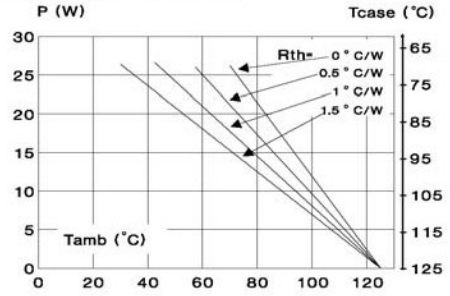


Fig. 3: Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (BTB).

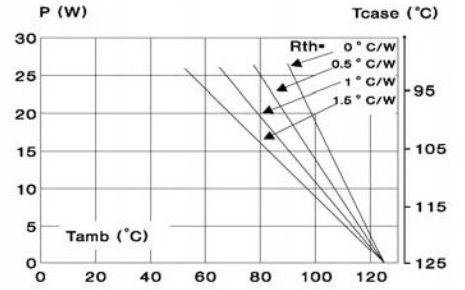


Fig. 4: RMS on-state current versus case temperature.

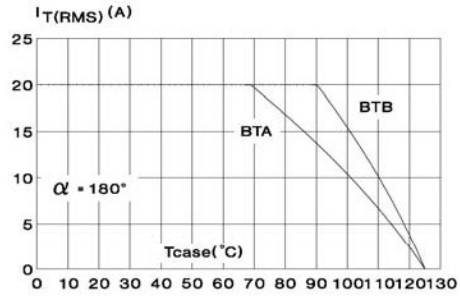


Fig. 5: Relative variation of thermal impedance versus pulse duration.

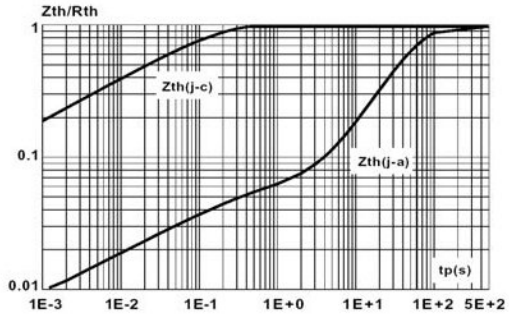
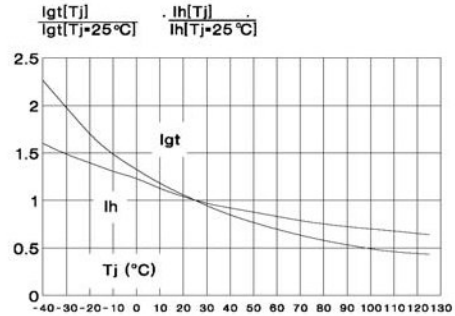


Fig. 6: Relative variation of gate trigger current and holding current versus junction temperature.



Description

Fig. 7: Non repetitive surge peak on-state current versus number of cycles.

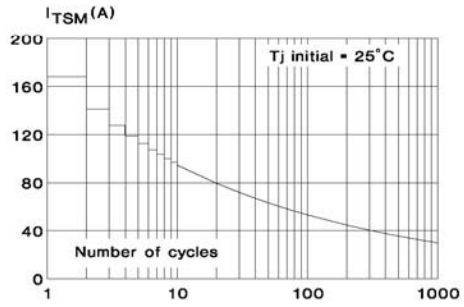


Fig. 8: Non repetitive surge peak on-state current for a sinusoidal pulse with width: t ≤ 10ms, and corresponding value of I^2t.

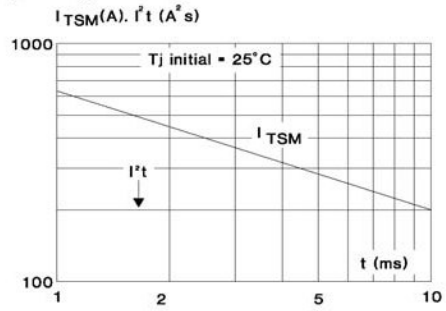


Fig. 9: On-state characteristics (maximum values).