BTB12 TO-220

Description

Glass passivated triacs in a plastic envelope, intended for use in applications requiring high bidirectional transient and blocking voltage capability and high thermal cycling performance. Typical applications include motor control, industrial and domestic lighting,heating and static switching.

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
$R_{th(j-c)}$	Junction to case(AC)		-	2.3	-	℃/W
$R_{th(j-a)}$	Junction to ambient		-	60	-	℃/W

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

SYMBOL	PARAMETER	CONDITIONS			MIN	Value	UNIT
V_{DRM}	Repetitive peak off-state Voltages	Tj=110℃			-	600	V
$I_{T(RMS)}$	RMS on-state current	T_c=105℃			-	12	A
I_{TSM}	Non repetitive surge peak on-state current	Tj initial =25℃	F=50H_z	t=20ms	-	120	A
			F=60H_z	t=16.7ms	-	126	A
I^2t	I^2t value for fusing	T_p=10ms			-	78	A^2S
dI/dt	Critical rate of rise of on-state current	I_G=2×I_{GT} , tr≤100ns	F=120H_z	Tj=125℃	-	50	A/μs
I_{GM}	Peak gate current	Tp=20μs		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			Tj=125℃	-	1	W
T_{stg}	Storage 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}		V_D=12V; R_L=30Ω	I-II-III	-	-	50	mA
			IV			100	mA
I_L		I_G=1.2 I_{GT}	I-III-IV	-	-	50	mA
			II	-	-	100	mA
I_H		I_T=500mA		-	-	50	mA
V_{GT}		V_D=12V; R_L=30Ω	ALL	-	-	1.3	V
V_{GD}		V_D=V_{DRM} R_L=3.3KΩ Tj=125℃	ALL	0.2	-	-	V
dV/dt		V_D=67%V_{DRM} gate open; T_J=125℃		400	-	-	V/μs
(dV/dt)c	(dI/dt)c=5.3A/ms	T_J=125℃		10	-	-	V/μs

Dynamic Characteristics

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

Description

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

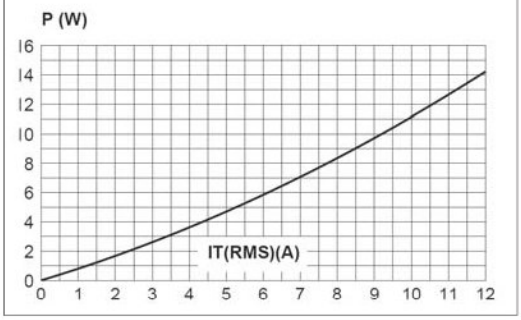

Fig. 2-1: RMS on-state current versus case temperature (full cycle).

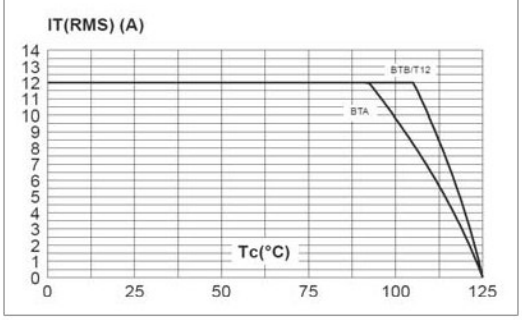

Fig. 2-2: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35µm),full cycle.

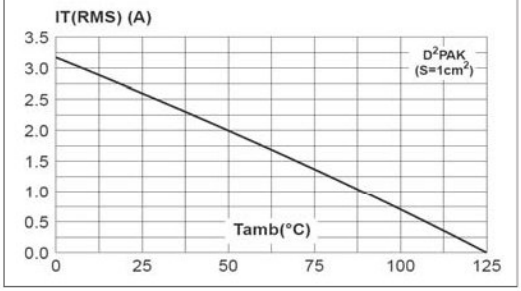

Fig. 3: Relative variation of thermal impedance versus pulse duration.

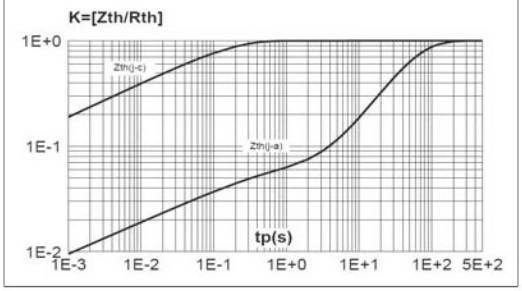

Fig. 4: On-state characteristics (maximum values).

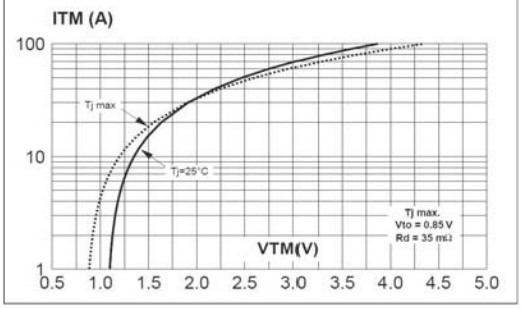

Fig. 5: Surge peak on-state current versus number of cycles.

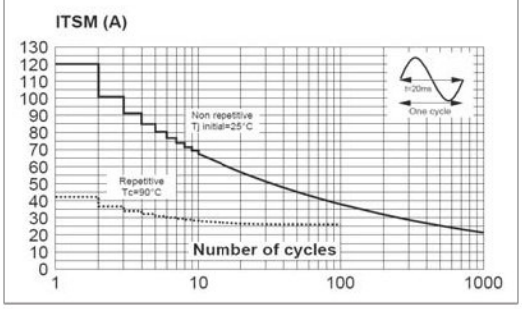

Fig. 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10ms, and corresponding value of I²t.

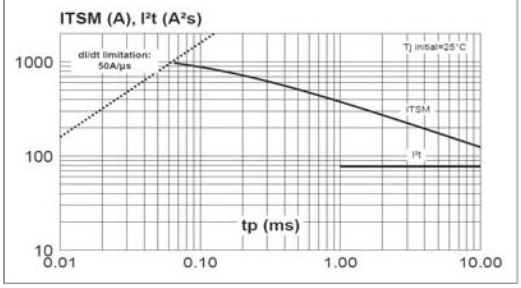

Fig. 7: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

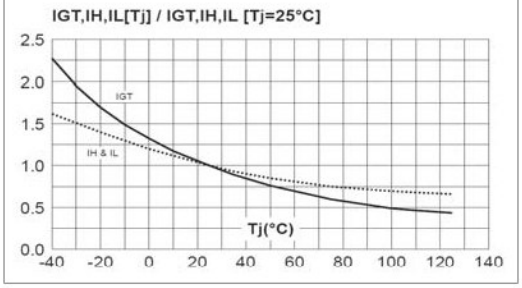

Fig. 8-1: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (BW/CW/T1235).

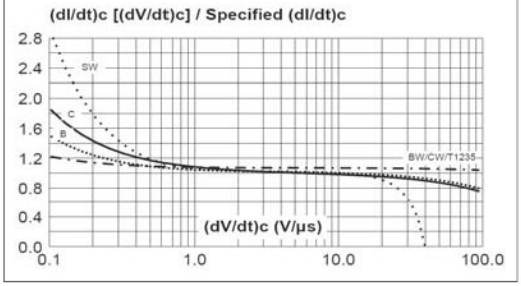

Fig. 8-2: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (TW).

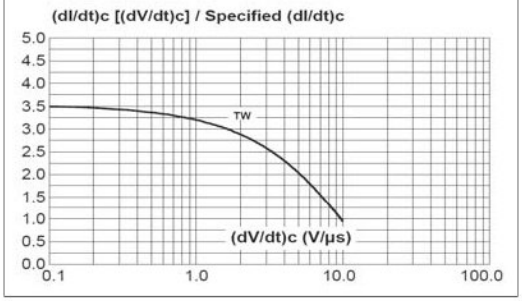

Fig. 9: Relative variation of critical rate of decrease of main current versus junction temperature.

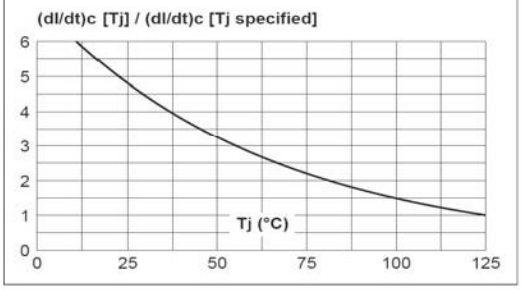

Fig. 10: D²PAK Thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: 35 µm).