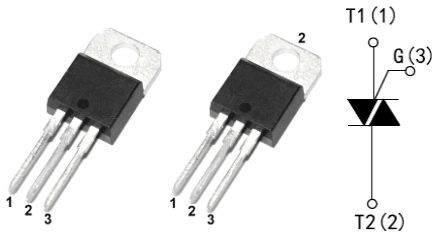
BTA/BTB12

12A TRIACS

Description

- Package：TO-220T
- Available either in through-hole or surface-mount packages, the BTA/BTB12 is suitable for general purpose AC switching. They can be used as an ON/OFF function in application such as static relays, heating regulation ,Induction motor starting circuits…or for phase control operation in light dimmers, motor speed controllers.

DRAWING



BTA12 **BTB12**

(Insulated)

Absolute Maximum Ratings

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current(full since wave)	TO-220T	TC=105℃	12	A
		TO-220T Ins.	TC=90℃		
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	
I^2t	I^2t Value for fusing	tp=10ms		78	A^2s
DI/DT	Critical rate of rise of on-state current IG=2X$I_{GT,tr\leq100ns}$	F=120Hz	Tj=125℃	50	A/us
VDSM/V RSM	Non repetitive surge peak off-state voltage	tp=10ms	Tj=25℃	Vdrm / vrrm + 100V	V
IGM	Peak gate current	tp=20us	Tj=125℃	4	A
$P_{G(AV)}$	Average gate power dissipation		Tj=125℃	1	W
T_{stg}	Storage junction temperature range			-40 to +150	℃
T_j	Operating junction temperature range			-40 to +125	

Electrical Characteristics (Tj=25℃,unless otherwise specified)

Snubberless™ and Logic Level(3 quadrant)

Symbol	Test conditions	Quadrant	BTA12		Unit
I_{GT}(1)	V_D=12V R_L=30Ω	Ⅰ-Ⅱ-Ⅲ	MAX	50	mA
V_{GT}		Ⅰ-Ⅱ-Ⅲ	MAX	1.3	V
V_{GD}	V_D=V_{DRM} R_L=3.3KΩTj=125℃	Ⅰ-Ⅱ-Ⅲ	MIN	0.2	V
IH(2)	IT=100mA		MAX	50	mA
IL	I_G=1.2I_{GT}	Ⅰ-Ⅲ	MAX	70	mA
		Ⅱ		80	
Dv / Dt(2)	VD=67%V_{DRM} Gate open Tj=125℃		MIN	1000	V/us
(Dl/dt)c(2)	(Dv/dt)c=0.1 V/us Tj=125℃		MIN	-	A/ms
	(Dv/dt)c=10V/us Tj=125℃			-	
	Without snubber Tj=125℃			12	

Standard (4 Quadrants)

Symbol	Test conditions	Quadrant	BTA12		Unit
IGT(1)	VD=12V RL=30Ω	Ⅰ-Ⅱ-Ⅲ	MAX	50	mA
		Ⅳ		100	
VGT		ALL	MAX	1.3	V
VGD	VD=VDRM RL=3.3KΩTj=125℃	ALL	MIN	0.2	V
IH(2)	IT=500mA		MAX	50	mA
IL	IG=1.2IGT	Ⅰ-Ⅲ-Ⅳ	MAX	50	mA
		Ⅱ		100	
(Dl/dt)(2)	VD=67%VDRM Gate open Tj=125℃		MIN	400	V/us
(Dl/dt)c(2)	(Dv/dt)c=5.3 A/ms Tj=125℃		MIN	10	V/us

Static Characteristics

Symbol	Test conditions			Value	Unit
VTM(2)	ITM=11A tp=380us	TJ=25℃	MAX	1.55	V
Vto(2)	Threshold voltage	TJ=125℃	MAX	0.85	V
Rd(2)	Dynamic resistance	TJ=125℃	MAX	35	mΩ
I_{DRM}	$V_{DRM}=V_{RRM}$	TJ=25℃		5	uA
I_{RRM}		TJ=125℃	MAX	1	mA
V_{DRM}/V_{RRM}	Voltage	TJ=25℃	MIN	600 and 800	V

Note 1: minimum IGT is guaranted at 5% of IGT max

Note 2: for both polarities of A2 referenced to A1

Thermal Resistances

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case(AC)	TO-220T	1.4	℃/W
		TO-220T(Insulated)	2.3	
Rth(j-a)	Junction to ambient	TO-220T/ TO-220T(Insulated)	60	℃/W

Typical Characteristics

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

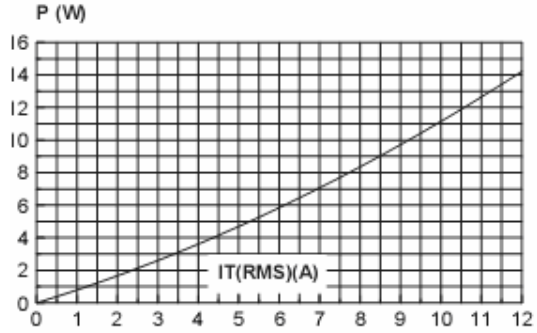


Fig. 2-1: RMS on-state current versus case temperature (full cycle).

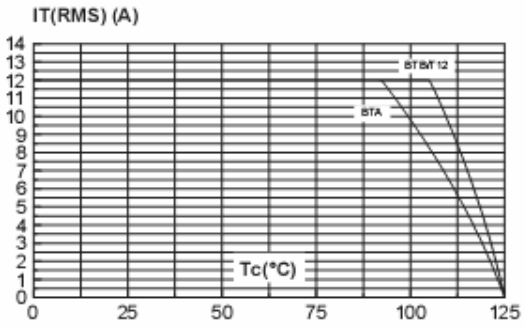


Fig. 2-2: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35µm),full cycle.

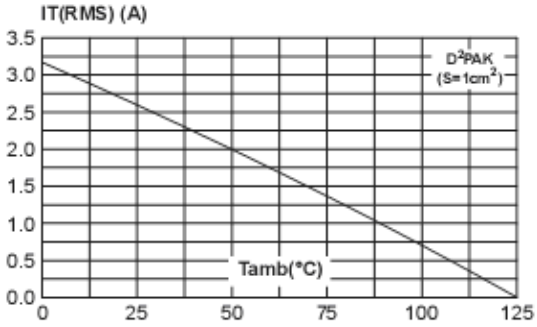


Fig. 3: Relative variation of thermal impedance versus pulse duration.

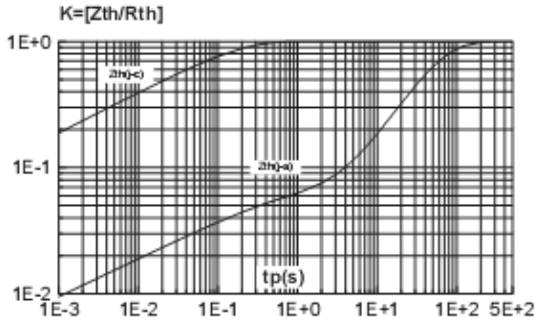


Fig. 4: On-state characteristics (maximum values).

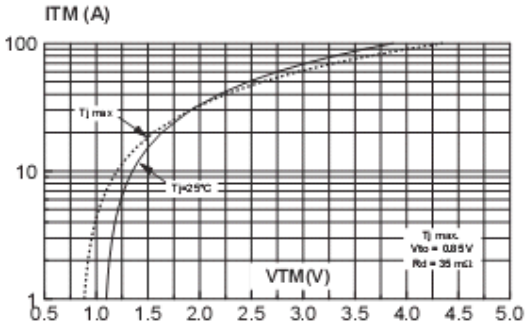


Fig. 5: Surge peak on-state current versus number of cycles.

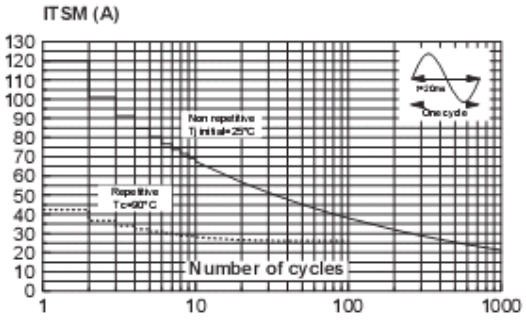


Fig. 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10ms, and corresponding value of I²t.

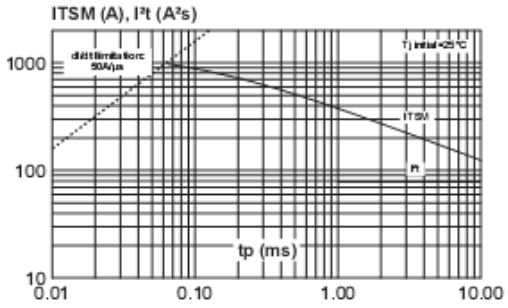


Fig. 7: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

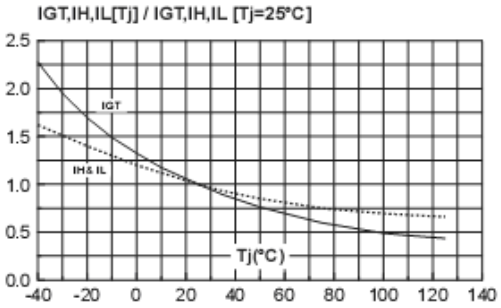


Fig. 8-1: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (BW/CW/T1235).

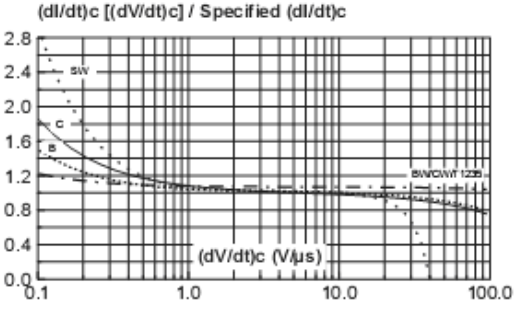


Fig. 8-2: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (TW).

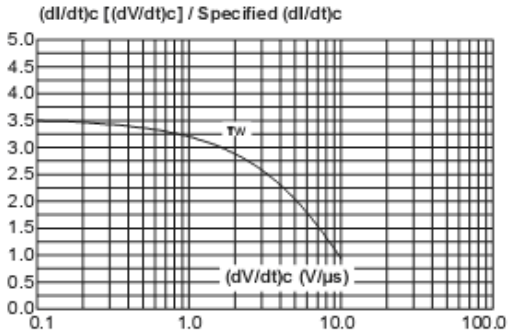


Fig. 9: Relative variation of critical rate of decrease of main current versus junction temperature.

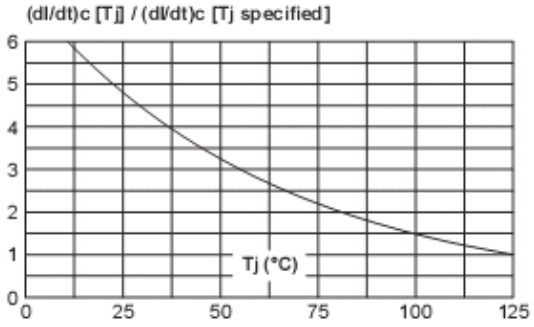
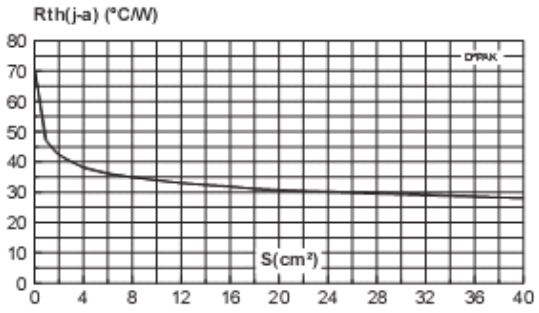


Fig. 10: D²PAK Thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: 35 μm).



Package Mechanical Data