

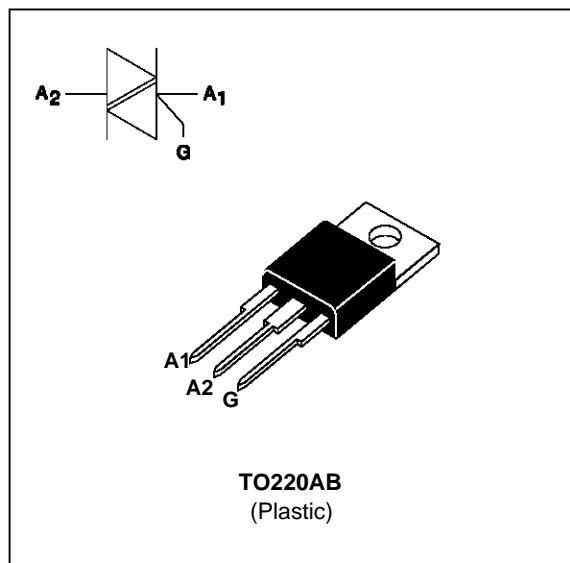
## LOGIC LEVEL TRIACS

### FEATURES

- LOW  $I_{GT} = 10\text{mA max}$
- HIGH EFFICIENCY SWITCHING ON COMMUTATION
- BTA Family :  
INSULATING VOLTAGE =  $2500V_{(RMS)}$   
(UL RECOGNIZED : E81734)

### DESCRIPTION

The BTA/BTB12 SW Triac family are high performance products glass passivated PNP devices. These parts are suited for low power trigger circuit (integrated circuits, microcontroller, microprocessors).



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	RMS on-state current (360° conduction angle)	BTA	$T_c = 70\text{ °C}$	12	A
		BTB	$T_c = 75\text{ °C}$		
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = $25\text{ °C}$ )		$t_p = 8.3\text{ ms}$	126	A
			$t_p = 10\text{ ms}$	120	
$i^2t$	$i^2t$ value		$t_p = 10\text{ ms}$	72	$A^2s$
$di/dt$	Critical rate of rise of on-state current Gate supply : $I_G = 50\text{mA}$ $di_G/dt = 0.1A/\mu s$		Repetitive $F = 50\text{ Hz}$	20	$A/\mu s$
			Non Repetitive	100	
$T_{stg}$ $T_j$	Storage and operating junction temperature range		- 40 to + 150 - 40 to + 110	$^{\circ}C$ $^{\circ}C$	
$T_l$	Maximum lead temperature for soldering during 10 s at 4.5 mm from case		260	$^{\circ}C$	

Symbol	Parameter	BTA / BTB12-			Unit
		400 SW	600 SW	700 SW	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 110\text{ °C}$	400	600	700	V

## BTA12 SW / BTB12 SW

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
Rth (j-a)	Junction to ambient		60	°C/W
Rth (j-c) DC	Junction to case for DC	BTA	3.3	°C/W
		BTB	2.7	
Rth (j-c) AC	Junction to case for 360° conduction angle ( F= 50 Hz)	BTA	2.5	°C/W
		BTB	2	

### GATE CHARACTERISTICS (maximum values)

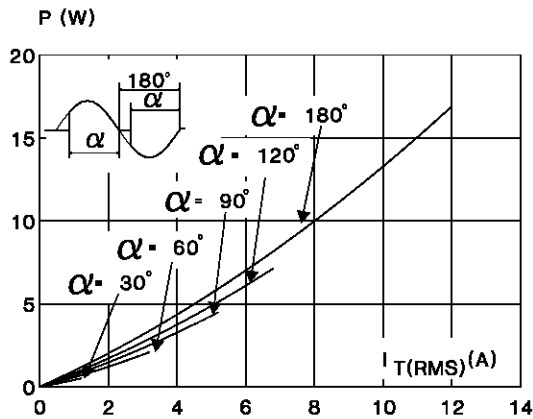
PG (AV) = 1W    PGM = 10W (tp = 20 μs)    IGM = 4A (tp = 20 μs)    VGM = 16V (tp = 20 μs).

### ELECTRICAL CHARACTERISTICS

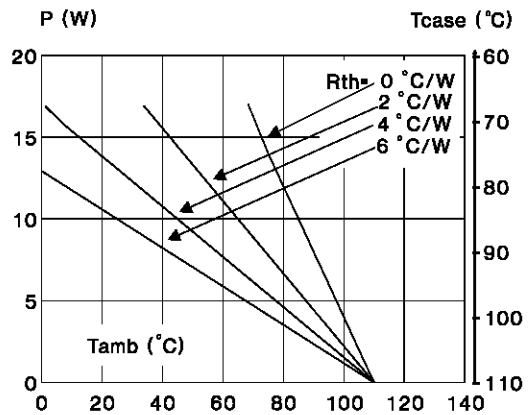
Symbol	Test Conditions		Quadrant		Suffix	Unit
					SW	
IGT	V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω	T <sub>j</sub> =25°C	I-II-III	MAX	10	mA
V <sub>GT</sub>	V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω	T <sub>j</sub> =25°C	I-II-III	MAX	1.5	V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3kΩ	T <sub>j</sub> =110°C	I-II-III	MIN	0.2	V
tgt	V <sub>D</sub> =V <sub>DRM</sub> I <sub>G</sub> = 40mA dI <sub>G</sub> /dt = 0.5A/μs	T <sub>j</sub> =25°C	I-II-III	TYP	2	μs
I <sub>L</sub>	I <sub>G</sub> =1.2 I <sub>GT</sub>	T <sub>j</sub> =25°C	I-III	TYP	15	mA
			II		25	
I <sub>H</sub> *	I <sub>T</sub> = 100mA gate open	T <sub>j</sub> =25°C		MAX	25	mA
V <sub>TM</sub> *	I <sub>TM</sub> = 17A tp= 380μs	T <sub>j</sub> =25°C		MAX	1.75	V
I <sub>DRM</sub> I <sub>R</sub> RM	V <sub>DRM</sub> Rated V <sub>R</sub> RM Rated	T <sub>j</sub> =25°C		MAX	0.01	mA
		T <sub>j</sub> =110°C		MAX	1	
dV/dt *	Linear slope up to V <sub>D</sub> =67%V <sub>DRM</sub> gate open	T <sub>j</sub> =110°C		MIN	50	V/μs
(dI/dt) <sub>c</sub> *	dV/dt= 0.1V/μs	T <sub>j</sub> =110°C		MIN	5.3	A/ms
	dV/dt= 20V/μs			MIN	3.5	

\* For either polarity of electrode A<sub>2</sub> voltage with reference to electrode A<sub>1</sub>.

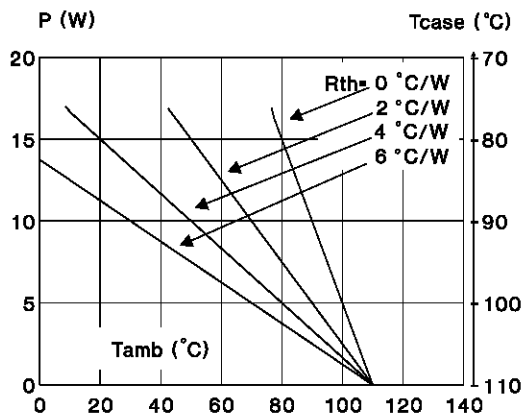
**Fig.1** : Maximum RMS power dissipation versus RMS on-state current (F=50Hz).  
(Curves are cut off by (di/dt)c limitation)



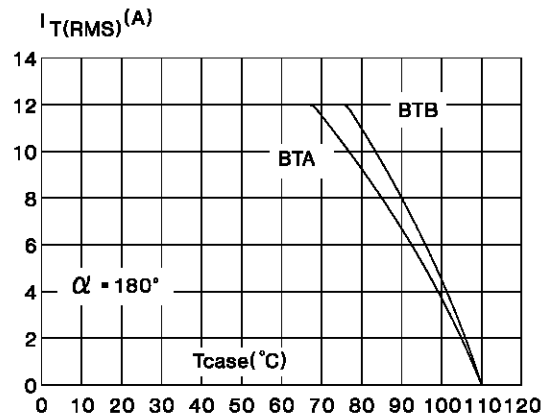
**Fig.2** : Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (BTA).



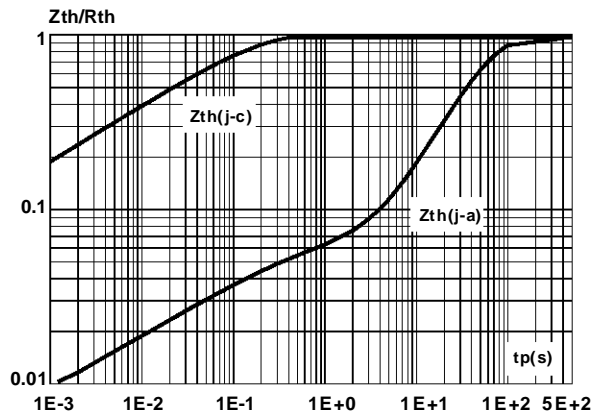
**Fig.3** : Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (BTB).



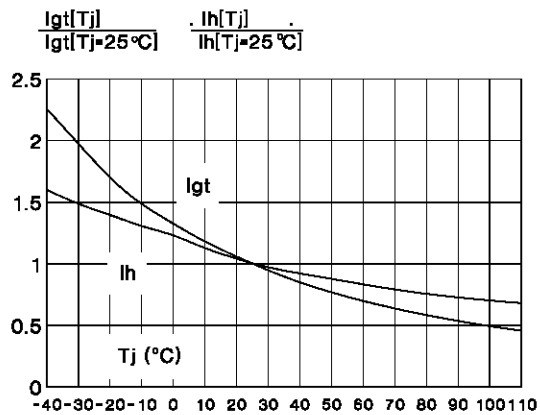
**Fig.4** : RMS on-state current versus case temperature.



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

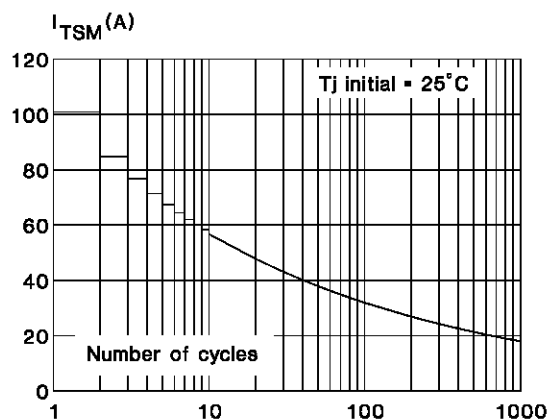


**Fig.6** : Relative variation of gate trigger current and holding current versus junction temperature.

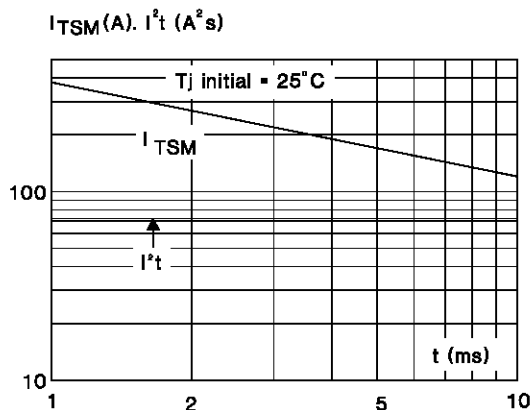


# BTA12 SW / BTB12 SW

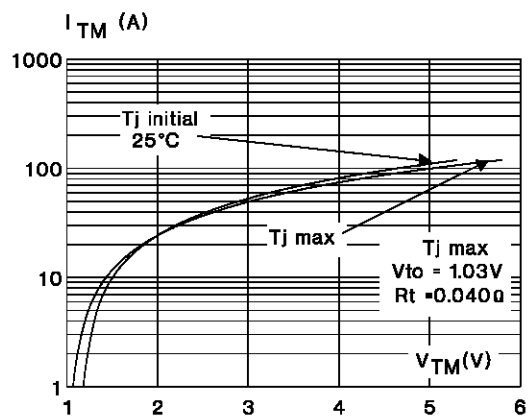
**Fig.7 :** Non Repetitive surge peak on-state current versus number of cycles.



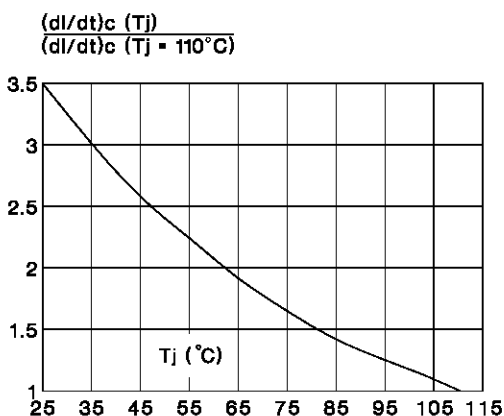
**Fig.8 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



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

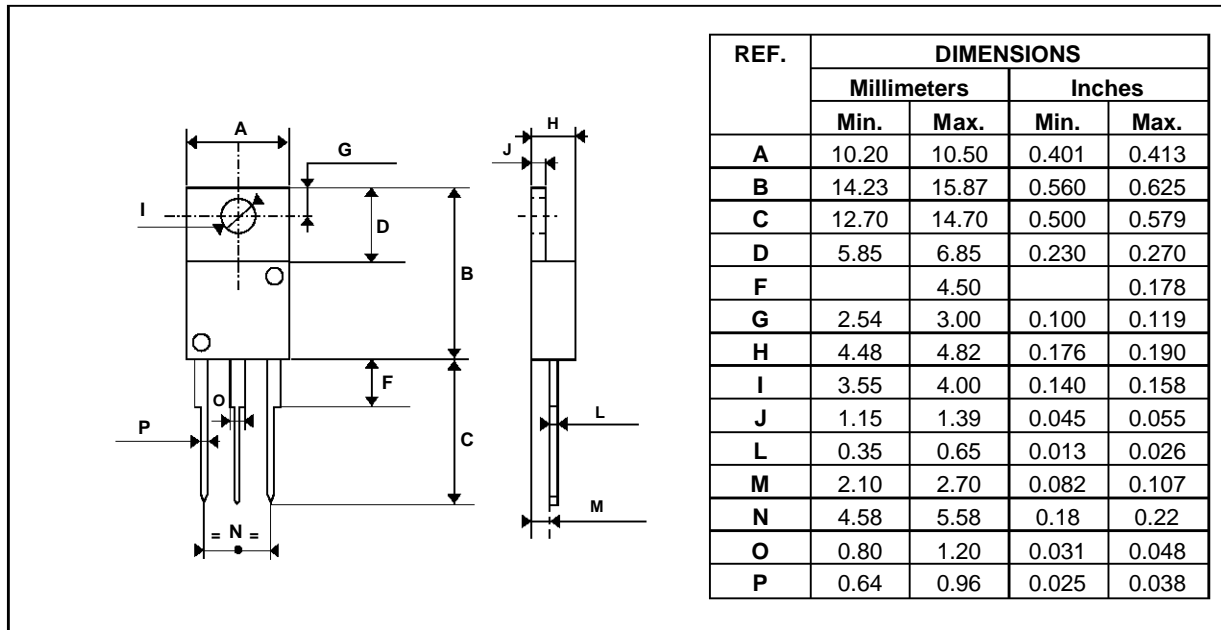


**Fig.10 :** Relative variation of  $(di/dt)c$  versus junction temperature.



**PACKAGE MECHANICAL DATA**

TO220AB Plastic



Cooling method : C  
 Marking : type number  
 Weight : 2.3 g  
 Recommended torque value : 0.8 m.N.  
 Maximum torque value : 1 m.N.

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