

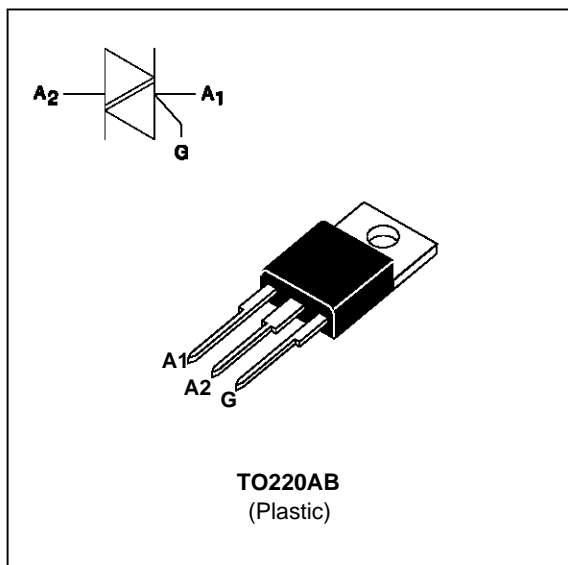
## SNUBBERLESS TRIACS

### FEATURES

- HIGH COMMUTATION :  $(di/dt)_c > 14A/ms$  without snubber
- HIGH SURGE CURRENT :  $I_{TSM} = 160A$
- $V_{DRM}$  UP TO 800V
- BTA Family :  
INSULATING VOLTAGE = 2500V<sub>(RMS)</sub>  
(UL RECOGNIZED : E81734)

### DESCRIPTION

The BTA/BTB16 BW/CW triac family are high performance glass passivated chips technology. The SNUBBERLESS™ concept offer suppression of RC network and it is suitable for application such as phase control and static switching on inductive or resistive load.



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit	
I <sub>T(RMS)</sub>	RMS on-state current (360° conduction angle)	BTA	T <sub>c</sub> = 80 °C	16	A
		BTB	T <sub>c</sub> = 90 °C		
I <sub>TSM</sub>	Non repetitive surge peak on-state current ( T <sub>j</sub> initial = 25°C )		tp = 8.3 ms	170	A
			tp = 10 ms	160	
I <sup>2</sup> t	I <sup>2</sup> t value		tp = 10 ms	128	A <sup>2</sup> s
di/dt	Critical rate of rise of on-state current Gate supply : I <sub>G</sub> = 500mA di <sub>G</sub> /dt = 1A/μs		Repetitive F = 50 Hz	20	A/μs
			Non Repetitive	100	
T <sub>stg</sub> T <sub>j</sub>	Storage and operating junction temperature range		- 40 to + 150 - 40 to + 125	°C °C	
TI	Maximum lead temperature for soldering during 10 s at 4.5 mm from case		260	°C	

Symbol	Parameter	BTA / BTB16-... BW/CW				Unit
		400	600	700	800	
V <sub>DRM</sub> V <sub>RRM</sub>	Repetitive peak off-state voltage T <sub>j</sub> = 125 °C	400	600	700	800	V

# BTA16 BW/CW / BTB16 BW/CW

## 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	3.1	°C/W
		BTB	2.3	
Rth (j-c) AC	Junction to case for 360° conduction angle ( F= 50 Hz)	BTA	2.3	°C/W
		BTB	1.75	

## GATE CHARACTERISTICS (maximum values)

$P_G (AV) = 1W$     $P_{GM} = 10W$  ( $t_p = 20 \mu s$ )    $I_{GM} = 4A$  ( $t_p = 20 \mu s$ )    $V_{GM} = 16V$  ( $t_p = 20 \mu s$ ).

## ELECTRICAL CHARACTERISTICS

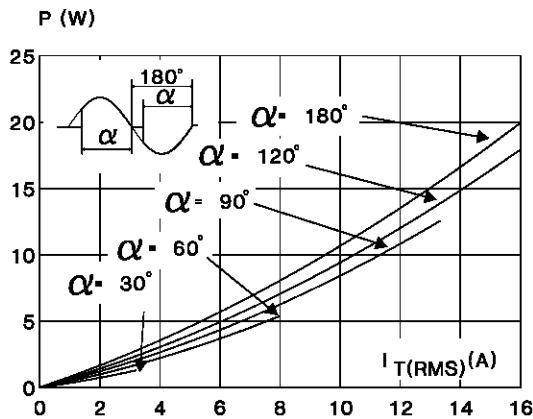
Symbol	Test Conditions	Quadrant		Suffix		Unit	
				BW	CW		
I <sub>GT</sub>	V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω	T <sub>j</sub> =25°C	I-II-III	MIN	2	1	mA
				MAX	50	35	
V <sub>GT</sub>	V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω	T <sub>j</sub> =25°C	I-II-III	MAX	1.5		V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3kΩ	T <sub>j</sub> =125°C	I-II-III	MIN	0.2		V
t <sub>gt</sub>	V <sub>D</sub> =V <sub>DRM</sub> I <sub>G</sub> = 500mA dI <sub>G</sub> /dt = 3A/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	40	-	mA
			II	TYP	80	-	
			I-III	MAX	-	50	
			II	MAX	-	80	
I <sub>H</sub> *	I <sub>T</sub> = 500mA gate open	T <sub>j</sub> =25°C		MAX	50	35	mA
V <sub>TM</sub> *	I <sub>TM</sub> = 22.5A t <sub>p</sub> = 380μs	T <sub>j</sub> =25°C		MAX	1.60		V
I <sub>DRM</sub> I <sub>RDM</sub>	V <sub>DRM</sub> Rated V <sub>RDM</sub> Rated	T <sub>j</sub> =25°C		MAX	0.01		mA
		T <sub>j</sub> =125°C		MAX	2		
dV/dt *	Linear slope up to V <sub>D</sub> =67%V <sub>DRM</sub> gate open	T <sub>j</sub> =125°C		MIN	500	250	V/μs
				TYP	750	500	
(di/dt) <sub>c</sub> *	Without snubber	T <sub>j</sub> =125°C		MIN	14	8.5	A/ms
				TYP	28	17	

\* For either polarity of electrode A2 voltage with reference to electrode A1.

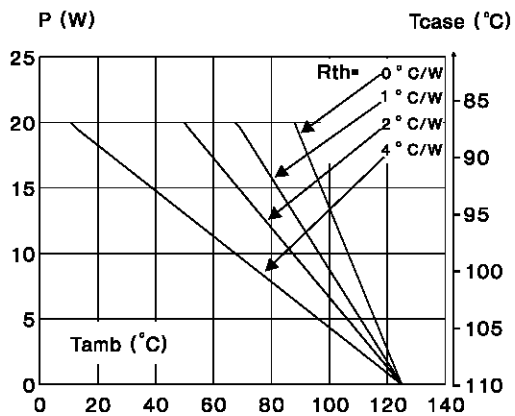
ORDERING INFORMATION

Package	$I_T(\text{RMS})$	$V_{\text{DRM}} / V_{\text{RRM}}$	Sensitivity Specification	
	A	V	BW	CW
BTA (Insulated)	16	400	X	X
		600	X	X
		700	X	X
		800	X	X
BTB (Uninsulated)	16	400	X	X
		600	X	X
		700	X	X
		800	X	X

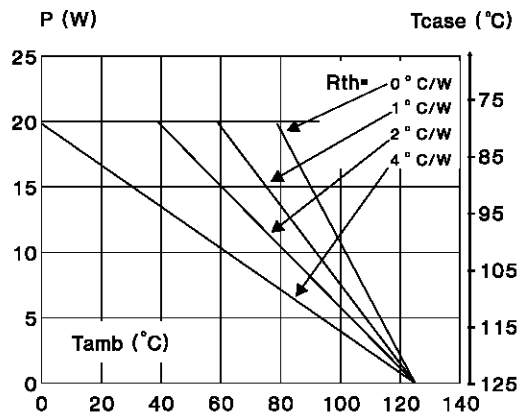
**Fig.1** : Maximum RMS power dissipation versus RMS on-state current ( $F=50\text{Hz}$ ).  
(Curves are cut off by  $(di/dt)_c$  limitation)



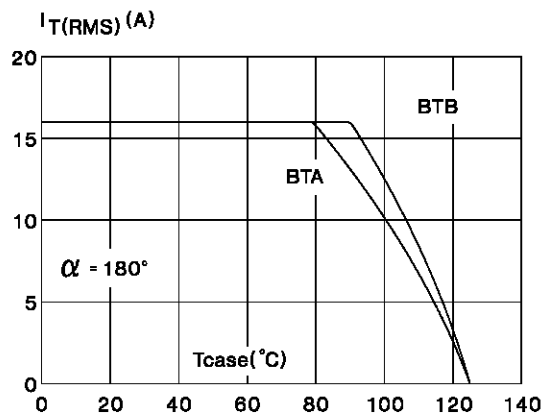
**Fig.3** : Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{\text{amb}}$  and  $T_{\text{case}}$ ) for different thermal resistances heatsink + contact (BTB).



**Fig.2** : Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{\text{amb}}$  and  $T_{\text{case}}$ ) for different thermal resistances heatsink + contact (BTA).



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

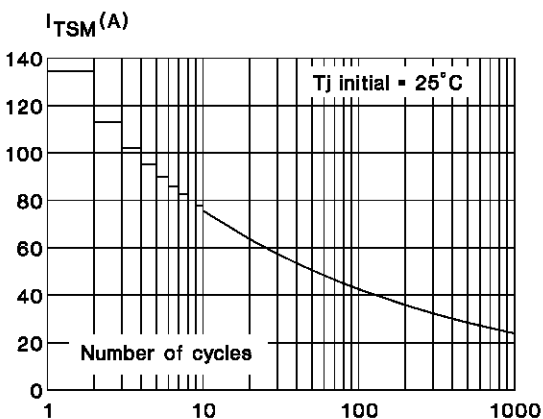


# BTA16 BW/CW / BTB16 BW/CW

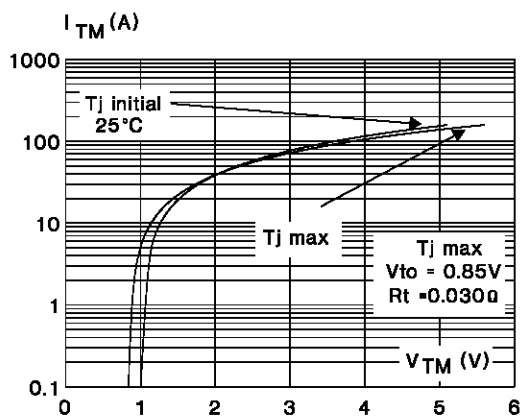
**Fig.5 :** Relative variation of thermal impedance versus pulse duration.



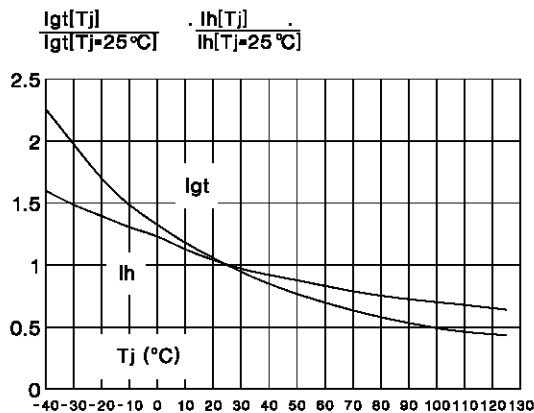
**Fig.7 :** Non Repetitive surge peak on-state current versus number of cycles.



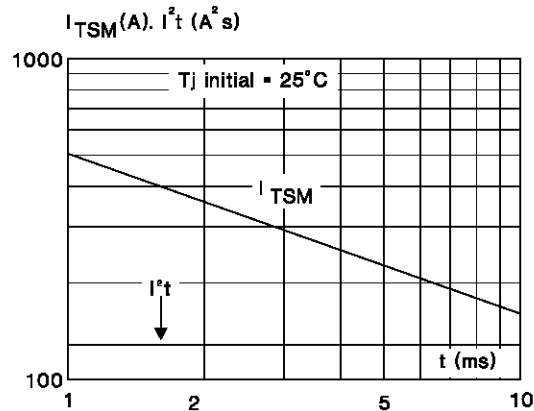
**Fig.9 :** On-state characteristics (maximum values).



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

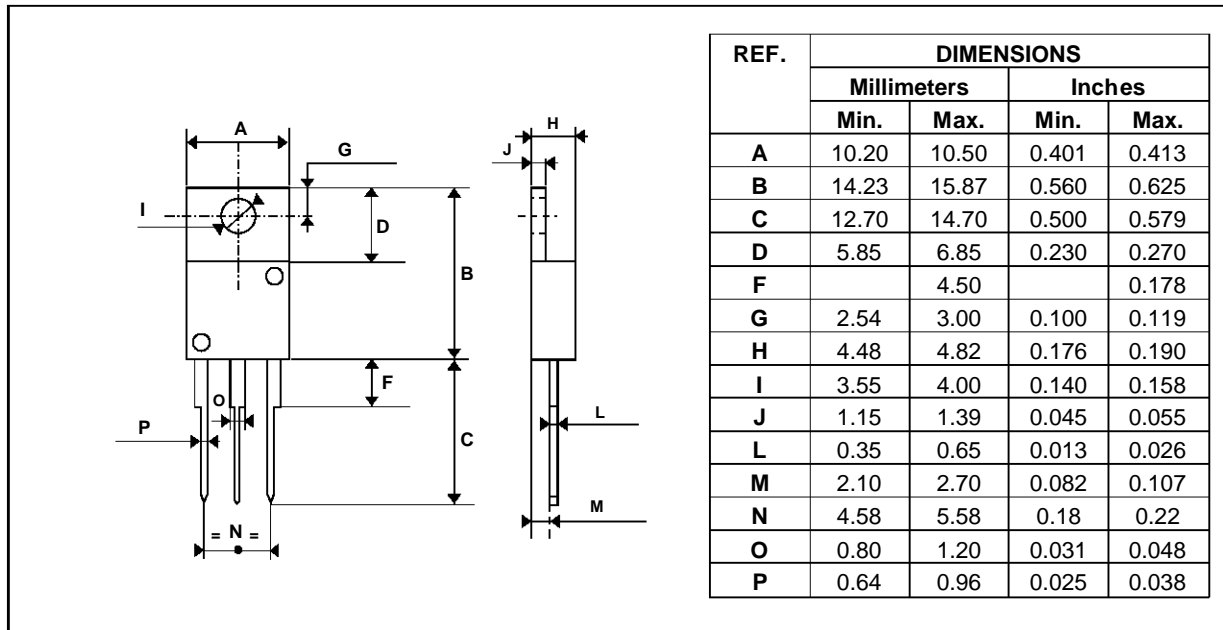


**Fig.8 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



**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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