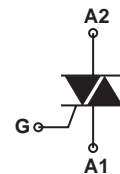


**FEATURES**

- High commutation:  $(di/dt)_c > 18A/ms$  without snubber
- High surge current:  $I_{TSM} = 200A$
- $V_{DRM}$  up to 800V
- BTA Family:  
Insulating voltage = 2500V<sub>(RMS)</sub>  
(UL recognized: E81734)

**DESCRIPTION**

The BTA/BTB20 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.

**TO-220AB**

**ABSOLUTE RATINGS** (limiting values)

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	RMS on-state current (360° conduction angle)	BTA	$T_c = 70^\circ C$	20	A
		BTB	$T_c = 90^\circ C$		
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = 25°C)		$t_p = 8.3ms$	210	A
			$t_p = 10ms$	200	
$I^2t$	$I^2t$ value		$t_p = 10ms$	200	A <sup>2</sup> s
di/dt	Critical rate of rise of on-state current Gate supply: $I_G = 500mA$ $di_G/dt = 1A/\mu s$		Repetitive $F = 50Hz$	20	A/ $\mu s$
			Non repetitive	100	
$T_{stg}$ $T_j$	Storage and operating junction temperature range		-40 to +150 -40 to +125		°C
TI	Maximum lead soldering temperature during 10s at 4.5mm from case		260		°C

Symbol	Parameter	BTA/BTB20...BW/CW		Unit
		600	700	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 125^\circ C$	600	700	V

**THERMAL RESISTANCE**

Symbol	Parameter	Value	Unit
Rth (j-a)	Junction to ambient	60	°C/W
Rth (j-c) DC	Junction to case for DC	BTA	2.8
		BTB	1.7
Rth (j-c) AC	Junction to case for 360° conduction angle (F = 50Hz)	BTA	2.1
		BTB	1.3

**GATE CHARACTERISTICS (maximum values)**
 $P_{G(AV)} = 1W$   $P_{GM} = 10W$  ( $t_p = 20\mu s$ )  $I_{GM} = 4A$  ( $t_p = 20\mu s$ )  $V_{GM} = 16V$  ( $t_p = 20\mu s$ )

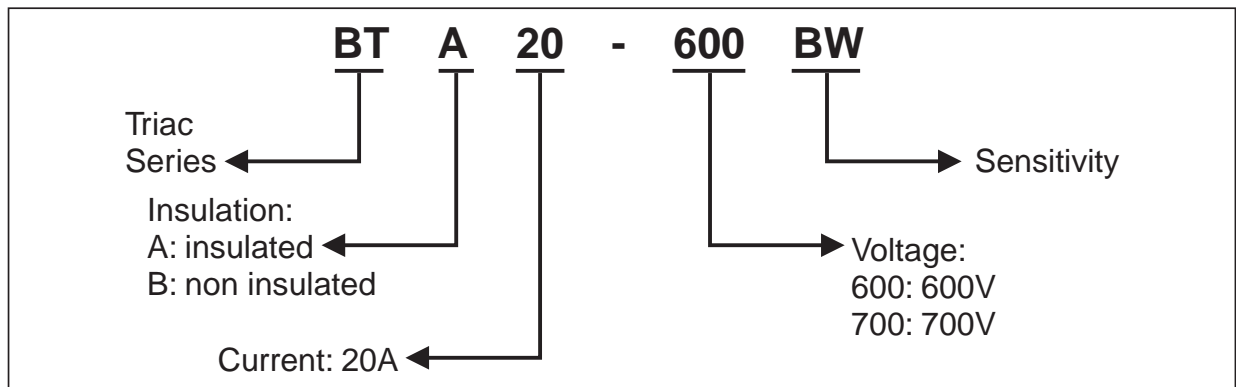
**ELECTRICAL CHARACTERISTICS**

Symbol	Test conditions		Quadrant		BTA / BTB20		Unit
					BW	CW	
$I_{GT}$	$V_D = 12V$ (DC) $R_L = 33\Omega$	$T_j = 25^\circ C$	I - II - III	MIN.	2	1	mA
				MAX.	50	35	
$V_{GT}$	$V_D = 12V$ (DC) $R_L = 33\Omega$	$T_j = 25^\circ C$	I - II - III	MAX.	1.5		V
$V_{GD}$	$V_D = V_{DRM}$ $R_L = 3.3k\Omega$	$T_j = 125^\circ C$	I - II - III	MIN.	0.2		V
tgt	$V_D = V_{DRM}$ $I_G = 500mA$ $di_G/dt = 3A/\mu s$	$T_j = 25^\circ C$	I - II - III	TYP.	2		$\mu s$
$I_L$	$I_G = 1.2I_{GT}$	$T_j = 25^\circ C$	I - III	TYP.	50	-	mA
			II		90	-	
			I - II - III	MAX.	-	80	
$I_H^*$	$I_T = 500mA$ Gate open	$T_j = 25^\circ C$		MAX.	75	50	mA
$V_{TM}^*$	$I_{TM} = 28A$ $t_p = 380\mu s$	$T_j = 25^\circ C$		MAX.	1.70		V
$I_{DRM}$ $I_{RRM}$	$V_{DRM}$ rated $V_{RRM}$ rated	$T_j = 25^\circ C$		MAX.	0.01		mA
		$T_j = 125^\circ C$		MAX.	3		
dV/dt *	Linear slope up to $V_D = 67\% V_{DRM}$ gate open	$T_j = 125^\circ C$		TYP.	750	500	V/ $\mu s$
				MIN.	500	250	
(di/dt)c*	Without snubber	$T_j = 125^\circ C$		TYP.	36	22	A/ms
				MIN.	18	11	

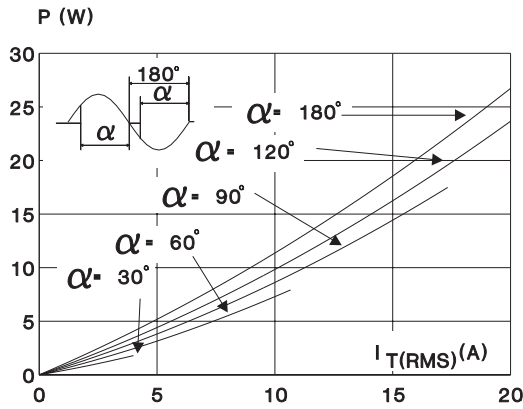
\* For either polarity of electrode  $A_2$  voltage with reference to electrode  $A_1$

**PRODUCT INFORMATION**

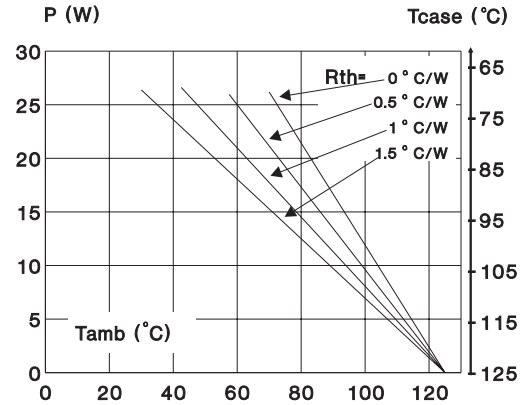
Package	$I_{T(RMS)}$	$V_{DRM} / V_{RRM}$	Sensitivity Specification	
	A	V	BW	CW
BTA (Insulated)	20	600	X	X
		700	X	X
BTB (Uninsulated)		600		X

**ORDERING INFORMATION**


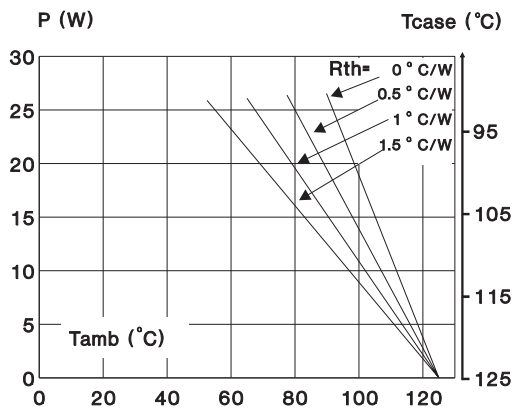
**Fig. 1:** Maximum RMS power dissipation versus RMS on-state current ( $F = 50\text{Hz}$ ). (Curves are cut off by  $(di/dt)_c$  limitation)



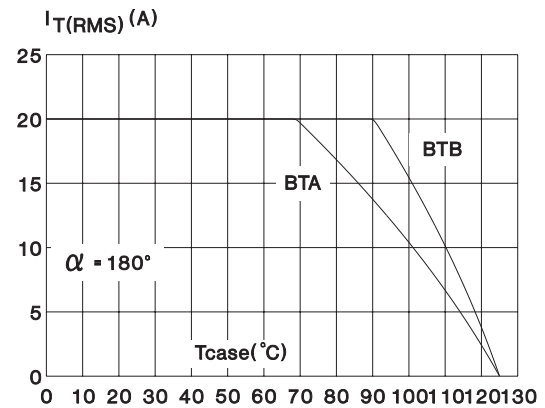
**Fig. 2:** Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTA).



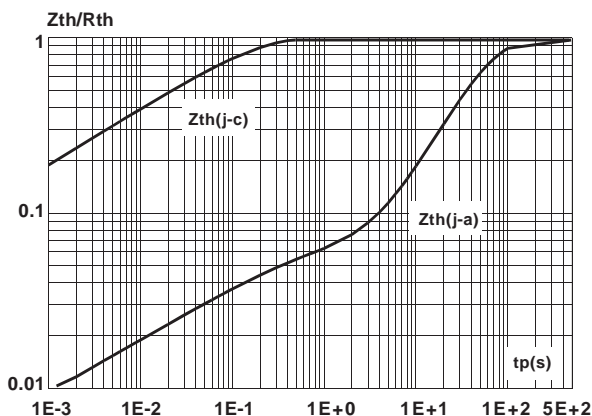
**Fig. 3:** Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTB).



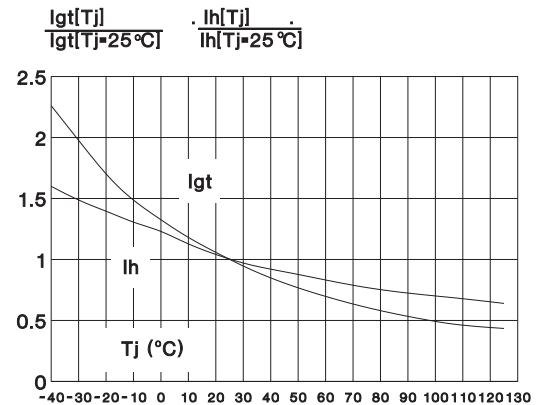
**Fig. 4:** RMS on-state current versus case temperature.



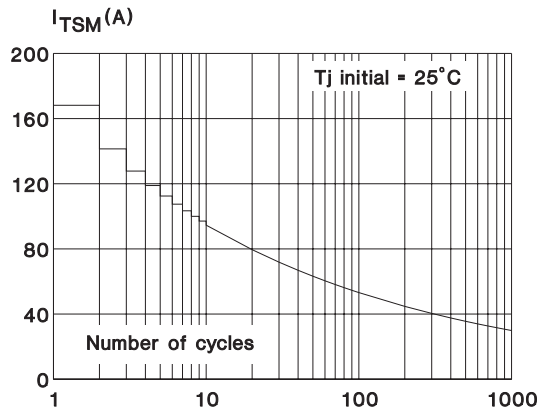
**Fig. 5:** Relative variation of thermal impedance versus pulse duration.



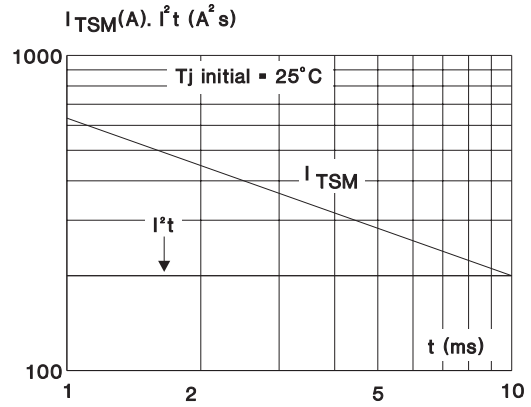
**Fig. 6:** Relative variation of gate trigger current and holding current versus junction temperature.



**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).

