



# BTA20 BW/CW BTB20 BW/CW

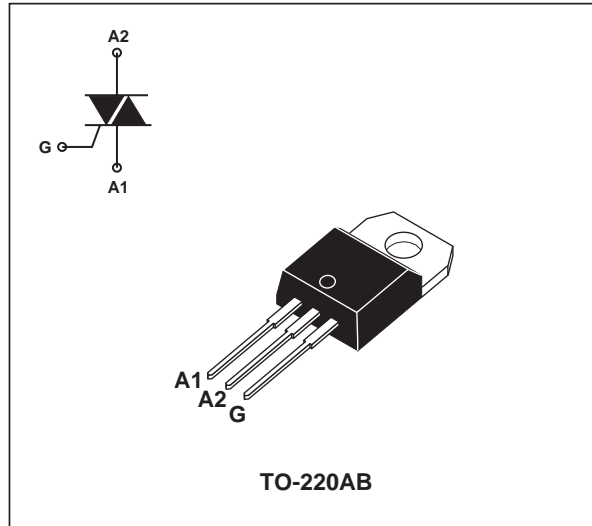
## SNUBBERLESS TRIACS

### 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.



### 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

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### 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)

$P_{G(AV)} = 1W$   $P_{GM} = 10W$  (tp = 20µs)  $I_{GM} = 4A$  (tp = 20µs)  $V_{GM} = 16V$  (tp = 20µs)

### ELECTRICAL CHARACTERISTICS

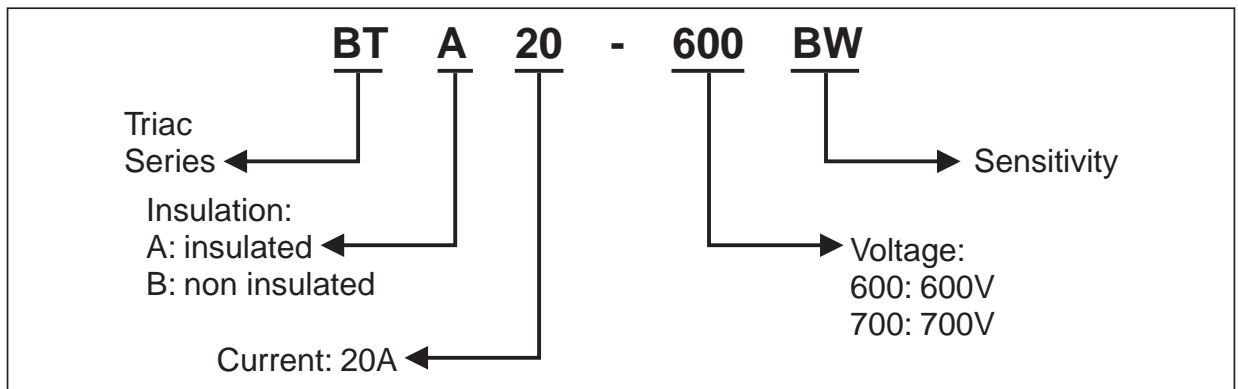
Symbol	Test conditions		Quadrant		BTA / BTB20		Unit
					BW	CW	
I <sub>GT</sub>	V <sub>D</sub> = 12V (DC) R <sub>L</sub> = 33Ω	T <sub>j</sub> = 25°C	I - II - III	MIN.	2	1	mA
				MAX.	50	35	
V <sub>GT</sub>	V <sub>D</sub> = 12V (DC) R <sub>L</sub> = 33Ω	T <sub>j</sub> = 25°C	I - II - III	MAX.	1.5		V
V <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> = 1.2I <sub>GT</sub>	T <sub>j</sub> = 25°C	I - III	TYP.	50	-	mA
			II		90	-	
			I - II - III	MAX.	-	80	
I <sub>H</sub> *	I <sub>T</sub> = 500mA Gate open	T <sub>j</sub> = 25°C		MAX.	75	50	mA
V <sub>TM</sub> *	I <sub>TM</sub> = 28A tp = 380µs	T <sub>j</sub> = 25°C		MAX.	1.70		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.	3		
dV/dt*	Linear slope up to V <sub>D</sub> = 67% V <sub>DRM</sub> gate open	T <sub>j</sub> = 125°C		TYP.	750	500	V/µs
				MIN.	500	250	
(dI/dt) <sub>c</sub> *	Without snubber	T <sub>j</sub> = 125°C		TYP.	36	22	A/ms
				MIN.	18	11	

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

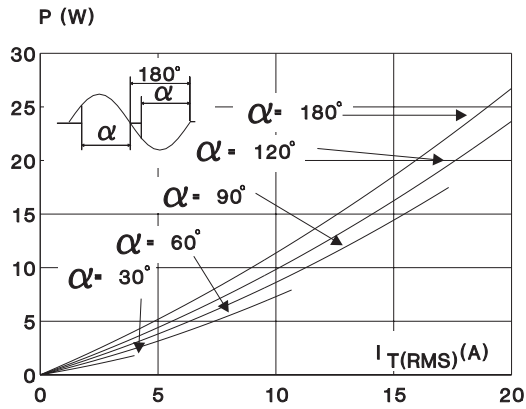
**PRODUCT INFORMATION**

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

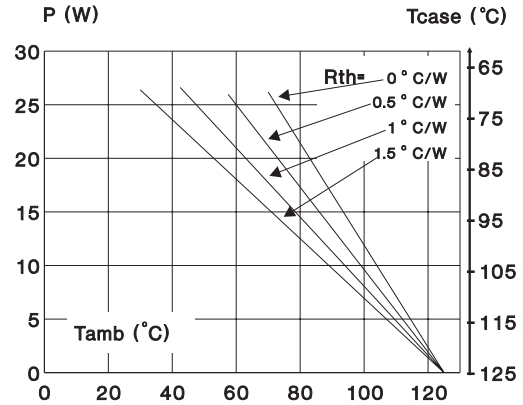
**ORDERING INFORMATION**



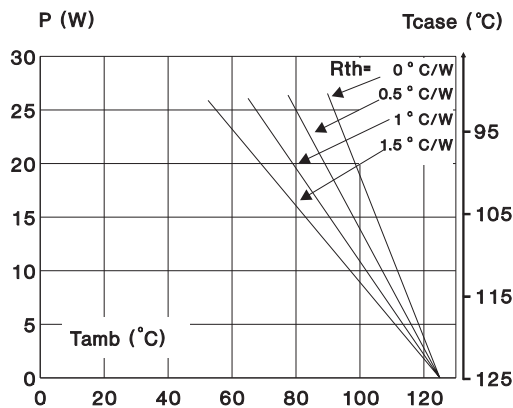
**Fig. 1:** Maximum RMS power dissipation versus RMS on-state current ( $F = 50\text{Hz}$ ). (Curves are cut off by  $(di/dt)_c$  limitation)



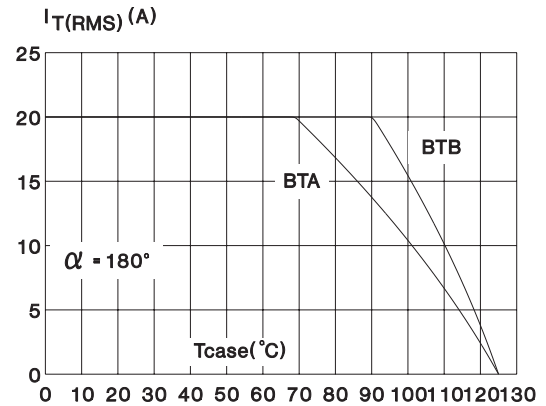
**Fig. 2:** Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTA).



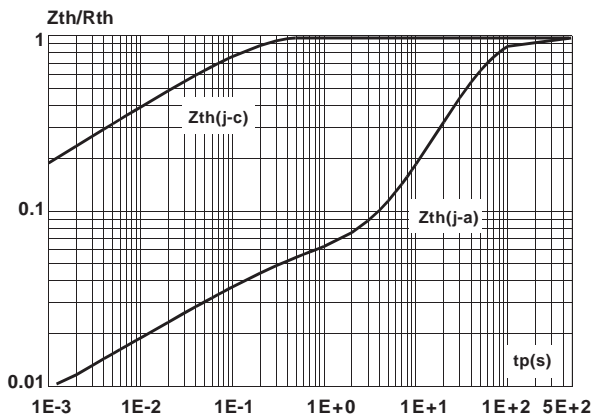
**Fig. 3:** Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTB).



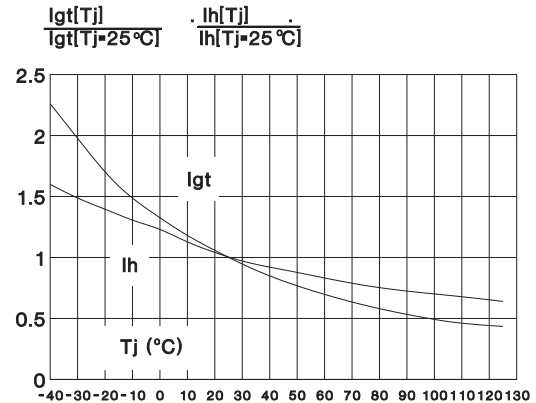
**Fig. 4:** RMS on-state current versus case temperature.



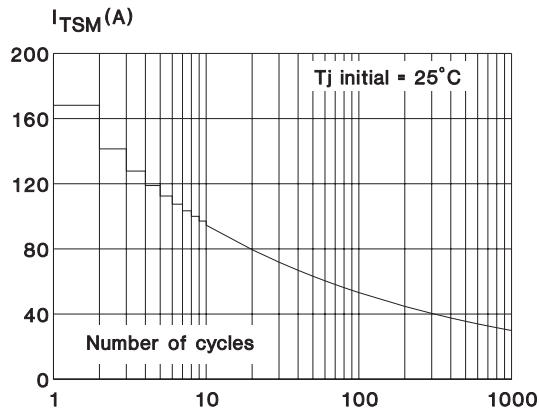
**Fig. 5:** Relative variation of thermal impedance versus pulse duration.



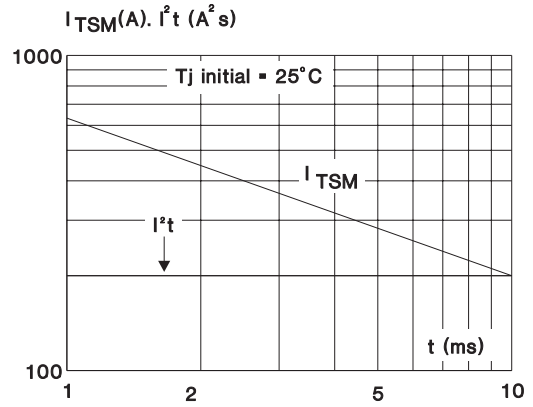
**Fig. 6:** Relative variation of gate trigger current and holding current versus junction temperature.



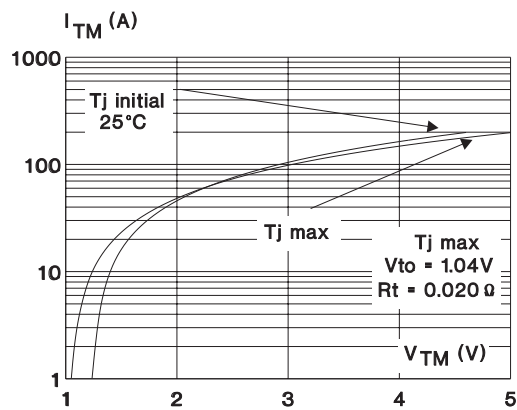
**Fig. 7:** Non repetitive surge peak on-state current versus number of cycles.



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

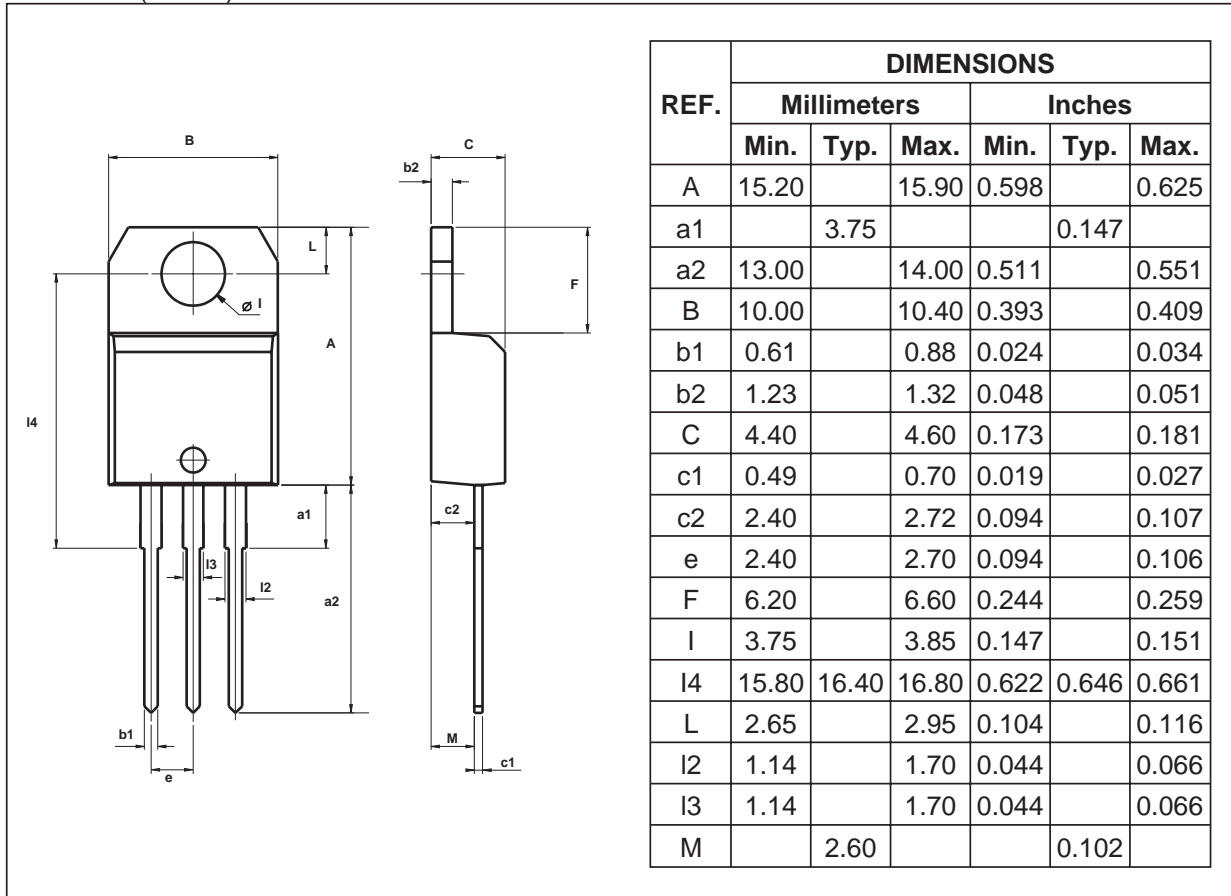


**Fig. 9:** On-state characteristics (maximum values).



**BTA20 BW/CW BTB20 BW/CW**

**PACKAGE MECHANICAL DATA**  
TO-220AB (Plastic)



**OTHER INFORMATION**

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BTA/BTB20-xxxxyz	BTA/BTB20-xxxxyz	TO-220AB	2.3 g	250	Bulk

- Epoxy meets UL94,V0
- Cooling method: C
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1 m.N.

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