



# BTA20 BW/CW BTB20 BW/CW

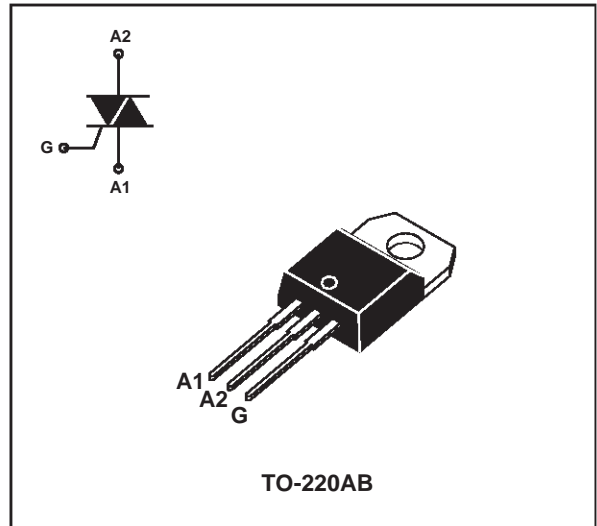
## SNUBBERLESS TRIACS

### 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 = $25^{\circ}C$ )		$t_p = 8.3ms$	210	A
			$t_p = 10ms$	200	
$I^2t$	$I^2t$ value		$t_p = 10ms$	200	$A^2s$
$di/dt$	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	$^{\circ}C$
$Tl$	Maximum lead soldering temperature during 10s at 4.5mm from case			260	$^{\circ}C$

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	°C/W
		BTB	1.7	
Rth (j-c) AC	Junction to case for 360° conduction angle (F = 50Hz)	BTA	2.1	°C/W
		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**

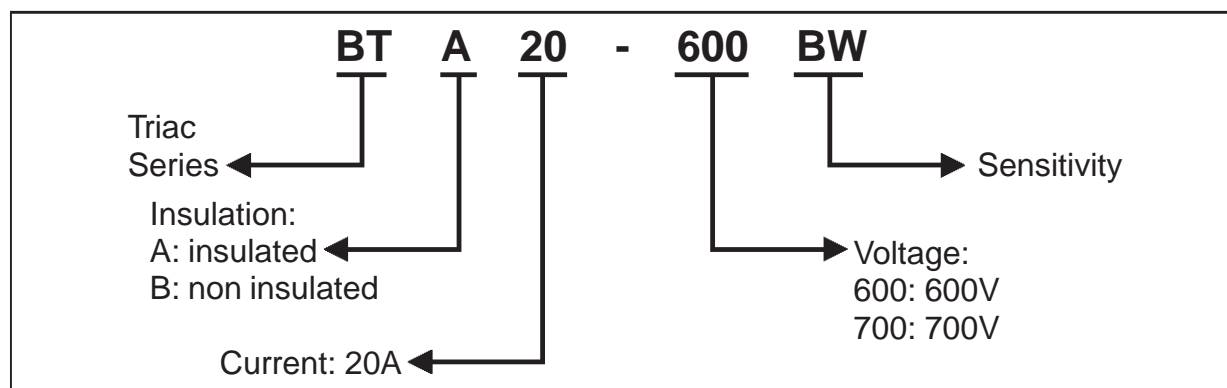
Symbol	Test conditions		Quadrant		BTA / BTB20		Unit
					BW	CW	
I <sub>GT</sub>	V <sub>D</sub> = 12V (DC)    R <sub>L</sub> = 33Ω	T <sub>j</sub> = 25°C	I - II - III	MIN.	2	1	mA
				MAX.	50	35	
V <sub>GT</sub>	V <sub>D</sub> = 12V (DC)    R <sub>L</sub> = 33Ω	T <sub>j</sub> = 25°C	I - II - III	MAX.	1.5		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
tgt	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        t <sub>p</sub> = 380μs	T <sub>j</sub> = 25°C		MAX.	1.70		V
I <sub>DRM</sub> I <sub>RRM</sub>	V <sub>DRM</sub> rated V <sub>RRM</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)c*	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>

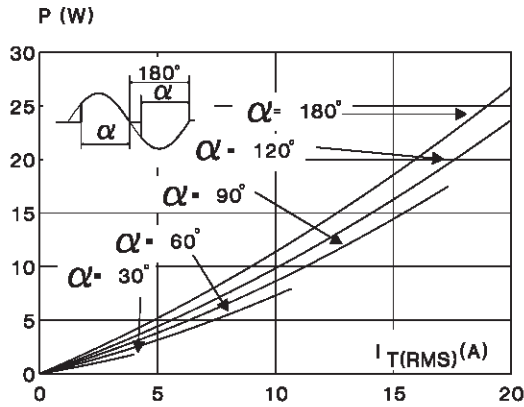
## PRODUCT INFORMATION

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

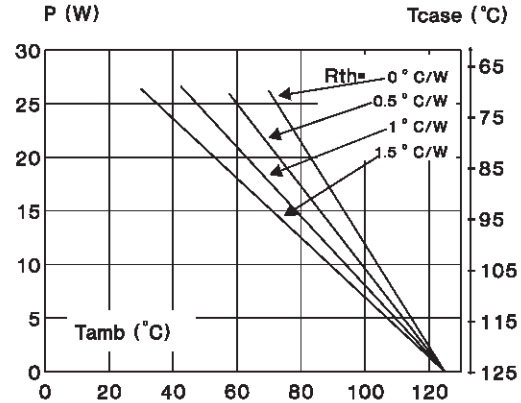
## ORDERING INFORMATION



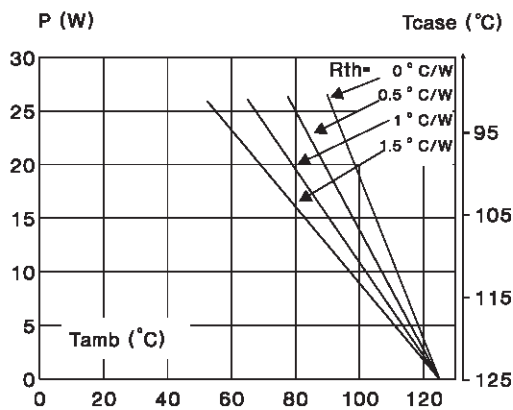
**Fig. 1:** Maximum RMS power dissipation versus RMS on-state current ( $F = 50\text{Hz}$ ). (Curves are cut off by  $(di/dt)_c$  limitation)



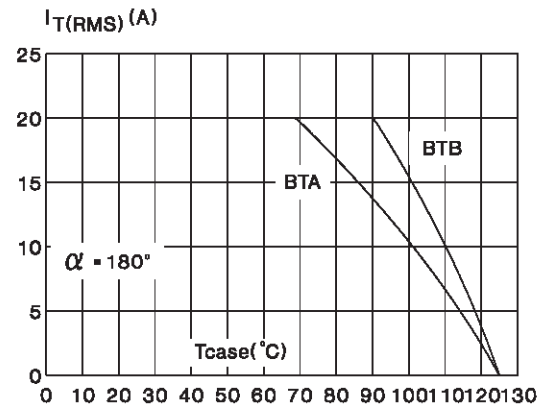
**Fig. 2:** Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTA).



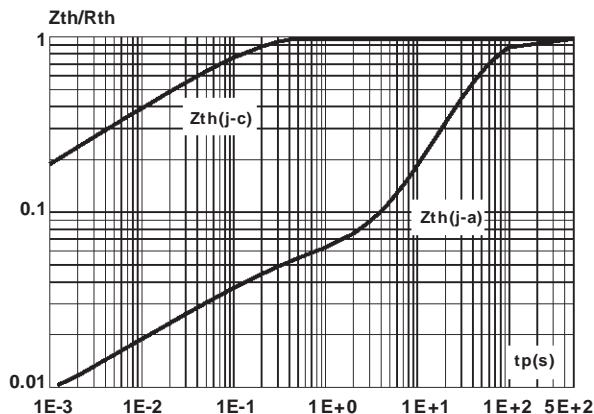
**Fig. 3:** Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTB).



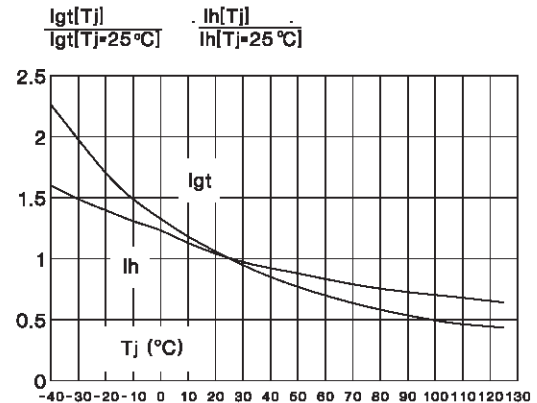
**Fig. 4:** RMS on-state current versus case temperature.



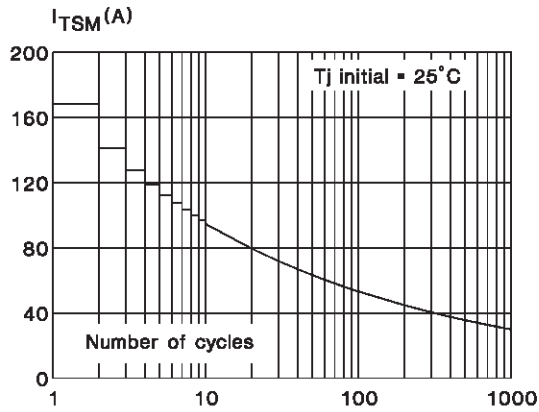
**Fig. 5:** Relative variation of thermal impedance versus pulse duration.



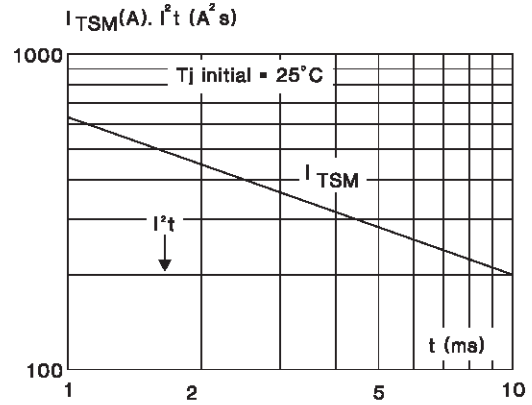
**Fig. 6:** Relative variation of gate trigger current and holding current versus junction temperature.



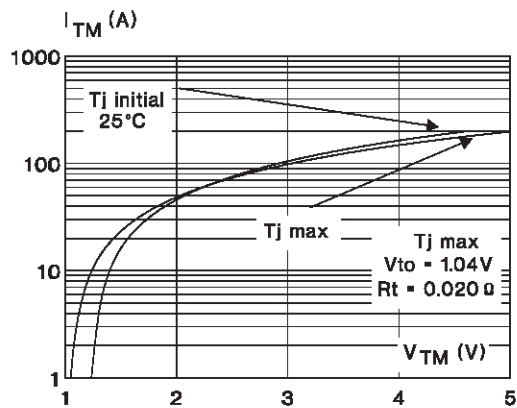
**Fig. 7:** Non repetitive surge peak on-state current versus number of cycles.



**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).



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

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
I	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	

**OTHER INFORMATION**

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BTA/BTB20-xxxyz	BTA/BTB20-xxxyz	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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