

# BTA20 BW/CW BTB20 BW/CW

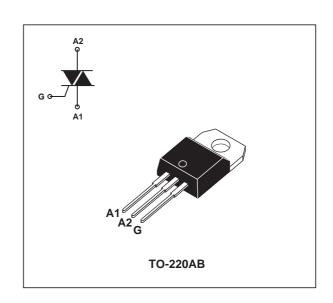
# **SNUBBERLESS TRIACS**

#### **FEATURES**

- High commutation: (dl/dt)c > 18A/ms without snubber
- High surge current: I<sub>TSM</sub> = 200A
- V<sub>DRM</sub> 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 <sub>T(RMS)</sub>	RMS on-state current (360° conduction angle) BTA		Tc = 70°C	20	Α
		ВТВ	Tc = 90°C		
I <sub>TSM</sub>			tp = 8.3ms	210	Α
	(Tj initial = 25°C)	tp = 10ms	200		
l <sup>2</sup> t	I <sup>2</sup> t value	tp = 10ms	200	A <sup>2</sup> s	
dl/dt	Critical rate of rise of on-state current Gate supply: I <sub>G</sub> = 500mA dI <sub>G</sub> /dt = 1A/µs	20	A/µs		
	Non repetitive				
Tstg Tj	Storage and operating junction temperature range	-40 to +150 -40 to +125	°C		
TI	Maximum lead soldering temperature during 10s a	260	°C		

Symbol	Parameter	BTA/BTB20	Unit		
Syl	Symbol	Farameter	600	700	Onit
	DRM RRM	Repetitive peak off-state voltage Tj = 125°C	600	700	V

September 2001 - Ed: 1A 1/6

# BTA20 BW/CW BTB20 BW/CW

## THERMAL RESISTANCE

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

## **GATE CHARACTERISTICS** (maximum values)

 $P_{G(AV)}=1W \quad P_{GM}=10W \; (tp=20\mu s) \quad I_{GM}=4A \; (tp=20\mu s) \quad V_{GM}=16V \; (tp=20\mu s)$ 

#### **ELECTRICAL CHARACTERISTICS**

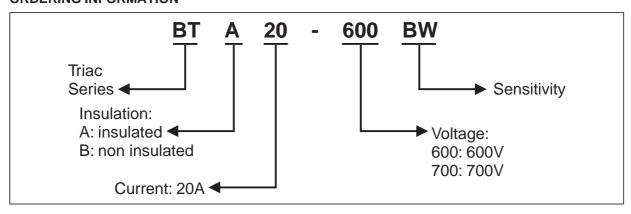
					BTA/I	BTB20	
Symbol	Test conditions	Quadrant		BW	CW	Unit	
I <sub>GT</sub>	$V_D = 12V (DC)$ $R_L = 33\Omega$	Tj = 25°C	1 - 11 - 111	MIN.	2	1	mA
				MAX.	50	35	
V <sub>GT</sub>	$V_D = 12V (DC)$ $R_L = 33\Omega$	Tj = 25°C	1 - 11 - 111	MAX.	1.	5	V
$V_{GD}$	$V_D = V_{DRM}$ $R_L = 3.3k\Omega$	Tj =125°C	1 - 11 - 111	MIN.	0.2		V
tgt	$V_D = V_{DRM}$ $I_G = 500$ mA $dI_G/dt = 3$ A/ $\mu$ s	Tj = 25°C	1 - 11 - 111	TYP.	2		μs
ΙL	I <sub>G</sub> = 1.2I <sub>GT</sub>	Tj = 25°C	1 - 111	TYP.	50	-	mA
			II		90	-	
			1 - 11 - 111	MAX.	-	80	
l <sub>H</sub> *	I <sub>T</sub> = 500mA Gate open	Tj = 25°C		MAX.	75	50	mA
V <sub>TM</sub> *	$I_{TM} = 28A$ tp = 380µs	Tj = 25°C		MAX.	1.70		V
I <sub>DRM</sub>	V <sub>DRM</sub> rated	Tj = 25°C		MAX.	0.01		mA
I <sub>RRM</sub>	V <sub>RRM</sub> rated	Tj = 125°C		MAX.	3		
dV/dt *	Linear slope up to	Tj = 125°C		TYP.	750	500	V/µs
	$V_D = 67\% V_{DRM}$ gate open			MIN.	500	250	
(dl/dt)c*	Without snubber	Tj = 125°C		TYP.	36	22	A/ms
				MIN.	18	11	

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

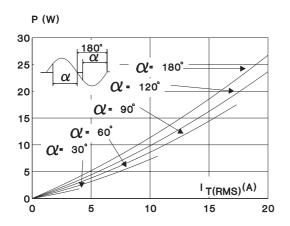
## PRODUCT INFORMATION

Paakaga	I <sub>T(RMS)</sub>	V <sub>DRM</sub> / V <sub>RRM</sub>	Sensitivity Specification		
Package	Α	V	BW	cw	
BTA	20	600	X	X	
(Insulated)		700	Х	Х	
BTB (Uninsulated)		600		Х	

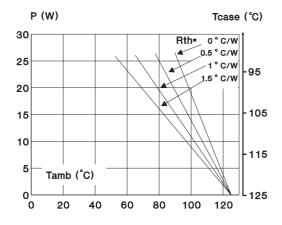
#### **ORDERING INFORMATION**



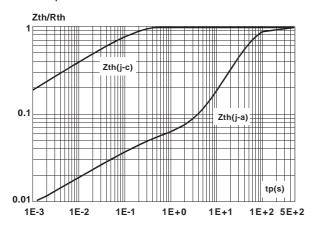
**Fig. 1:** Maximum RMS power dissipation versus RMS on-state current (F = 50Hz).(Curves are cut off by (dl/dt)c limitation)



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



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



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

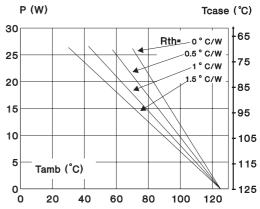
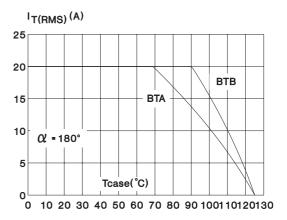
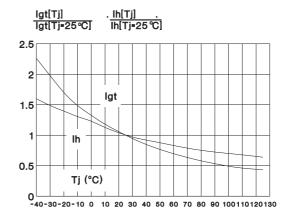


Fig. 4: RMS on-state current versus case temperature.



**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.

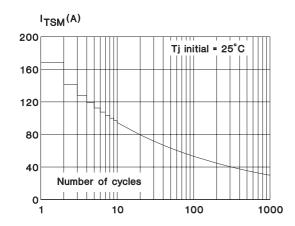


Fig. 8: Non repetitive surge peak on-state current for a sinusoidal pulse with width:  $t \le 10$ ms, and corresponding value of  $l^2t$ .

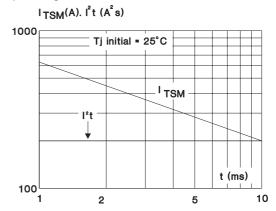
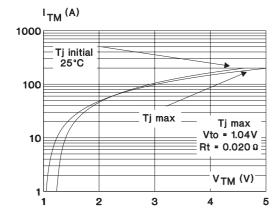
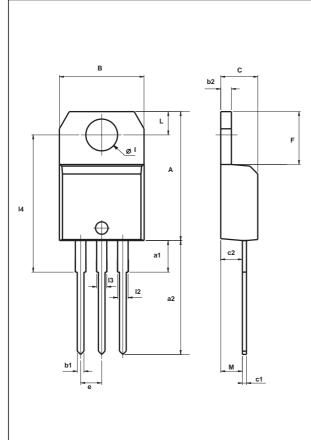


Fig. 9: On-state characteristics (maximum values).



#### **PACKAGE MECHANICAL DATA**

TO-220AB (Plastic)



	DIMENSIONS							
REF.	Millimeters			Inches				
	Min.	Тур.	Max.	Min.	Тур.	Max.		
Α	15.20		15.90	0.598		0.625		
a1		3.75			0.147			
a2	13.00		14.00	0.511		0.551		
В	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		
С	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		
е	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		
14	15.80	16.40	16.80	0.622	0.646	0.661		
L	2.65		2.95	0.104		0.116		
12	1.14		1.70	0.044		0.066		
13	1.14		1.70	0.044		0.066		
М		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.

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied.

STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2001 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

http://www.st.com

577

# This datasheet has been downloaded from:

www. Data sheet Catalog.com

Datasheets for electronic components.