



# BTA20 Series

SNUBBERLESSTM

20A TRIACs

**Table 1: Main Features**

Symbol	Value	Unit
$I_{T(RMS)}$	20	A
$V_{DRM}/V_{RRM}$	600 and 700	V
$I_{GT(Q_1)}(max)$	35 and 50	mA

## DESCRIPTION

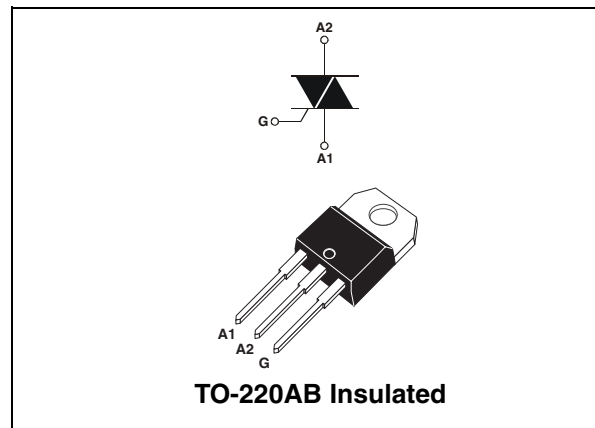
The **BTA20 BW/CW** triac family are high performance glass passivated chips technology. The snubberless concept offer suppression of RC network and it is suitable for application such as phase control and static switching on inductive or resistive load.

Thanks to their clip assembly technique, they provide a superior performance in surge current handling capabilities.

By using an internal ceramic pad, the BTA series provides voltage insulated tab (rated at  $2500V_{RMS}$ ) complying with UL standards (File ref.: E81734).

**Table 3: Absolute Maximum Ratings**

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	RMS on-state current (full sine wave)		$T_c = 70^\circ C$ 20	A	
$I_{TSM}$	Non repetitive surge peak on-state current (full cycle, $T_j$ initial = $25^\circ C$ )	F = 50 Hz    t = 10 ms	210	A	
		F = 60 Hz    t = 8.3 ms	200		
$I^2t$	$I^2t$ Value for fusing	$t_p = 10$ ms	200	$A^2s$	
di/dt	Critical rate of rise of on-state current $I_G = 500$ mA $dI_G/dt = 1$ A/ $\mu s$	Repetitive F = 50 Hz	$T_j = 125^\circ C$	20	A/ $\mu s$
		Non repetitive		100	
$V_{DSM}/V_{RSM}$	Non repetitive peak off-state voltage	$t_p = 10$ ms	$T_j = 25^\circ C$	$V_{DSM}/V_{RSM} + 100$	V
$I_{GM}$	Peak gate current	$t_p = 20$ $\mu s$	$T_j = 125^\circ C$	4	A
$V_{GM}$	Peak positive gate voltage	$t_p = 20$ $\mu s$		16	V
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125^\circ C$	1	W
$T_{stg}$ $T_j$	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 125	$^\circ C$



**Table 2: Order Codes**

Part Numbers	Marking
BTA20-600BWRG	BTA20-600BW
BTA20-600CWRG	BTA20-600CW
BTA20-700BWRG	BTA20-700BW
BTA20-700CWRG	BTA20-700CW

## BTA20 Series

**Tables 4: Electrical Characteristics** ( $T_j = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Test Conditions	Quadrant		BTA20		Unit
				BW	CW	
$I_{GT}$ (1)	$V_D = 12\text{ V}$ $R_L = 33\ \Omega$	ALL	MIN.	2	1	mA
			MAX.	50	35	
$V_{GT}$		ALL	MAX.	1.5		V
$V_{GD}$	$V_D = V_{DRM}$ $R_L = 3.3\text{ k}\Omega$ $T_j = 125^\circ\text{C}$	ALL	MIN.	0.2		V
$I_H$ (2)	$I_T = 500\text{ mA}$ gate open		MAX.	75	50	mA
$I_L$	$I_G = 1.2\ I_{GT}$	I - III	TYP.	50	-	mA
		II		90	-	
		I - II - III	MAX.	-	80	
dV/dt (2)	$V_D = 67\ \%V_{DRM}$ gate open	$T_j = 125^\circ\text{C}$	TYP.	750	500	V/ $\mu\text{s}$
			MIN.	500	250	
(dV/dt)c (2)	(dI/dt)c = 20 A/ms	$T_j = 125^\circ\text{C}$	TYP.	36	22	V/ $\mu\text{s}$
			MIN.	18	11	

**Table 5: Static Characteristics**

Symbol	Test Conditions			Value	Unit
$V_{TM}$ (2)	$I_{TM} = 28\text{ A}$ $t_p = 380\ \mu\text{s}$	$T_j = 25^\circ\text{C}$	MAX.	1.70	V
$I_{DRM}$ $I_{RRM}$	$V_{DRM} = V_{RRM}$	$T_j = 25^\circ\text{C}$	MAX.	10	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$		3	mA

**Note 1:** minimum  $I_{GT}$  is guaranteed at 5% of  $I_{GT}$  max.

**Note 2:** for both polarities of A2 referenced to A1.

**Table 6: Thermal resistance**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case (AC)	2.1	$^\circ\text{C/W}$
$R_{th(j-c)}$	Junction to case (DC)	2.8	
$R_{th(j-a)}$	Junction to ambient	60	$^\circ\text{C/W}$

Figure 1: Maximum power dissipation versus RMS on-state current (full cycle)

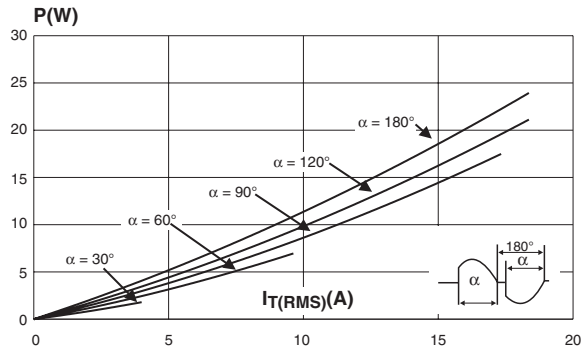


Figure 2: Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact

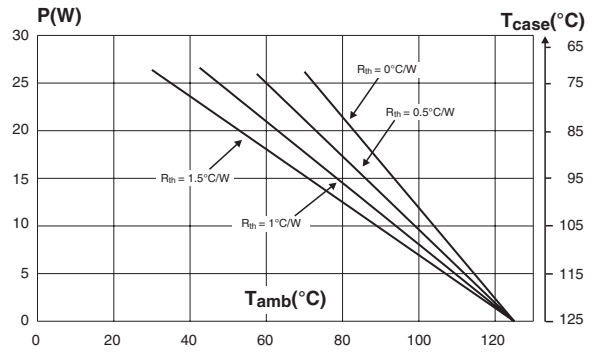


Figure 3: RMS on-state current versus case temperature (full cycle)

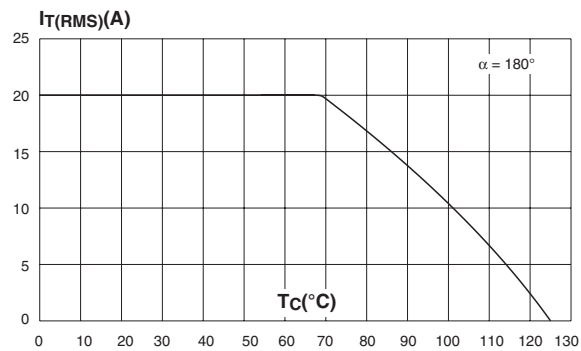


Figure 4: Relative variation of thermal impedance versus pulse duration

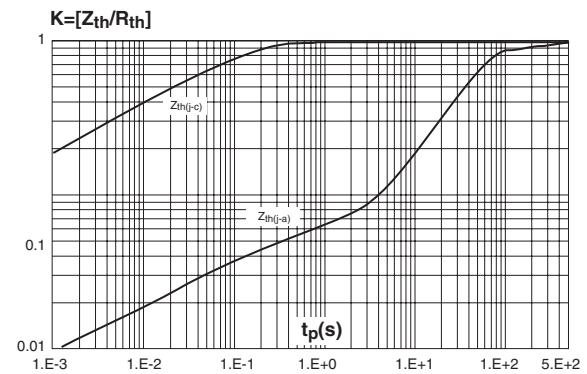


Figure 5: On-state characteristics (maximum values)

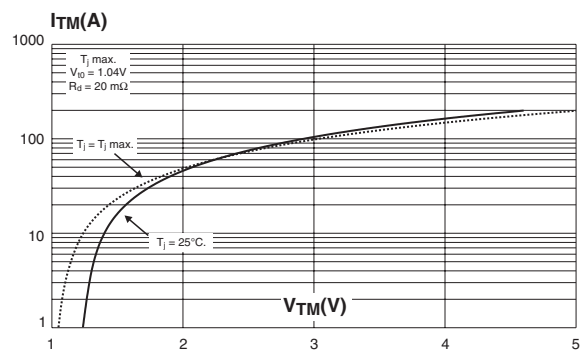
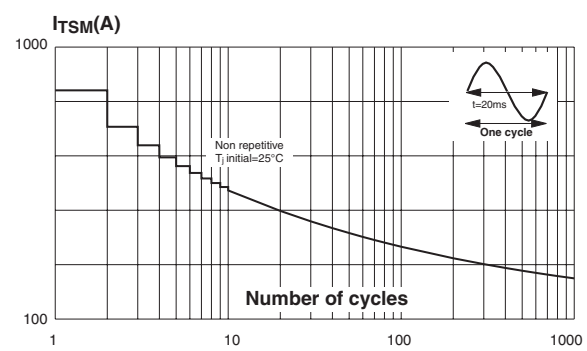
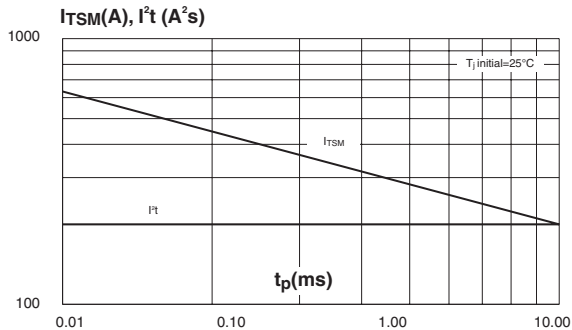


Figure 6: Non repetitive surge peak on-state current versus number of cycles

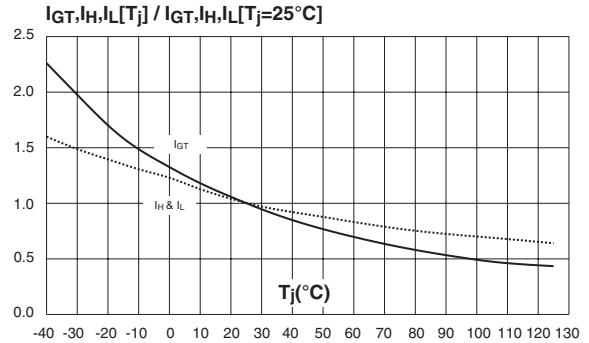


## BTA20 Series

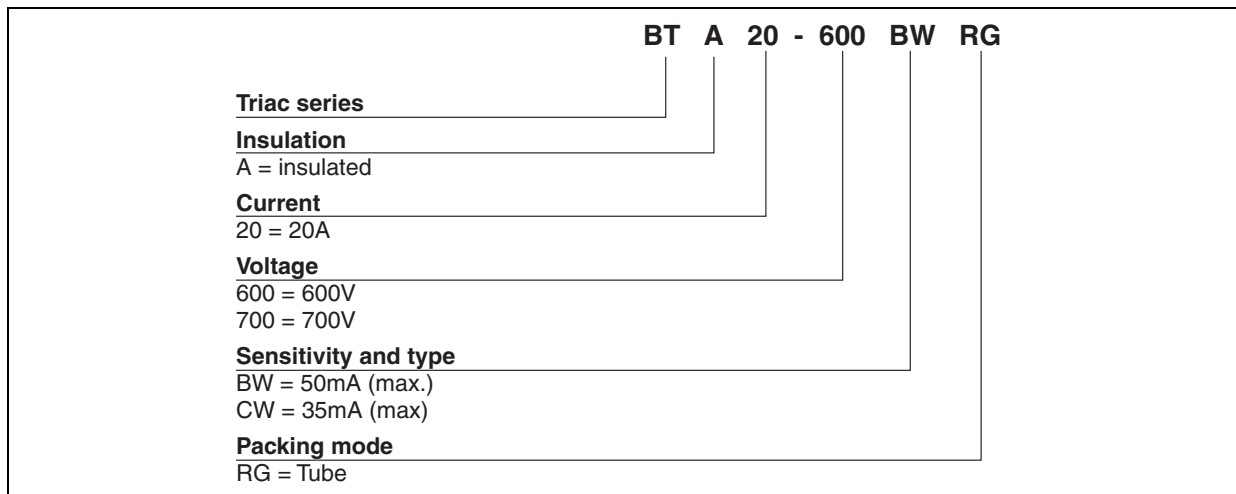
**Figure 7: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10$  ms and corresponding value of  $I^2t$**



**Figure 8: Relative variation of gate trigger current and holding current versus junction temperature**



**Figure 9: Ordering Information Scheme**



**Table 7: Product Selector**

Part Numbers	Voltage (xxx)		Sensitivity	Type	Package
	600 V	700 V			
BTA20-xxxBWRG	X	X	50 mA	Snubberless	TO-220AB Ins.
BTA20-xxxCWRG	X	X	35 mA		

Figure 10: TO-220AB Insulated Package Mechanical Data

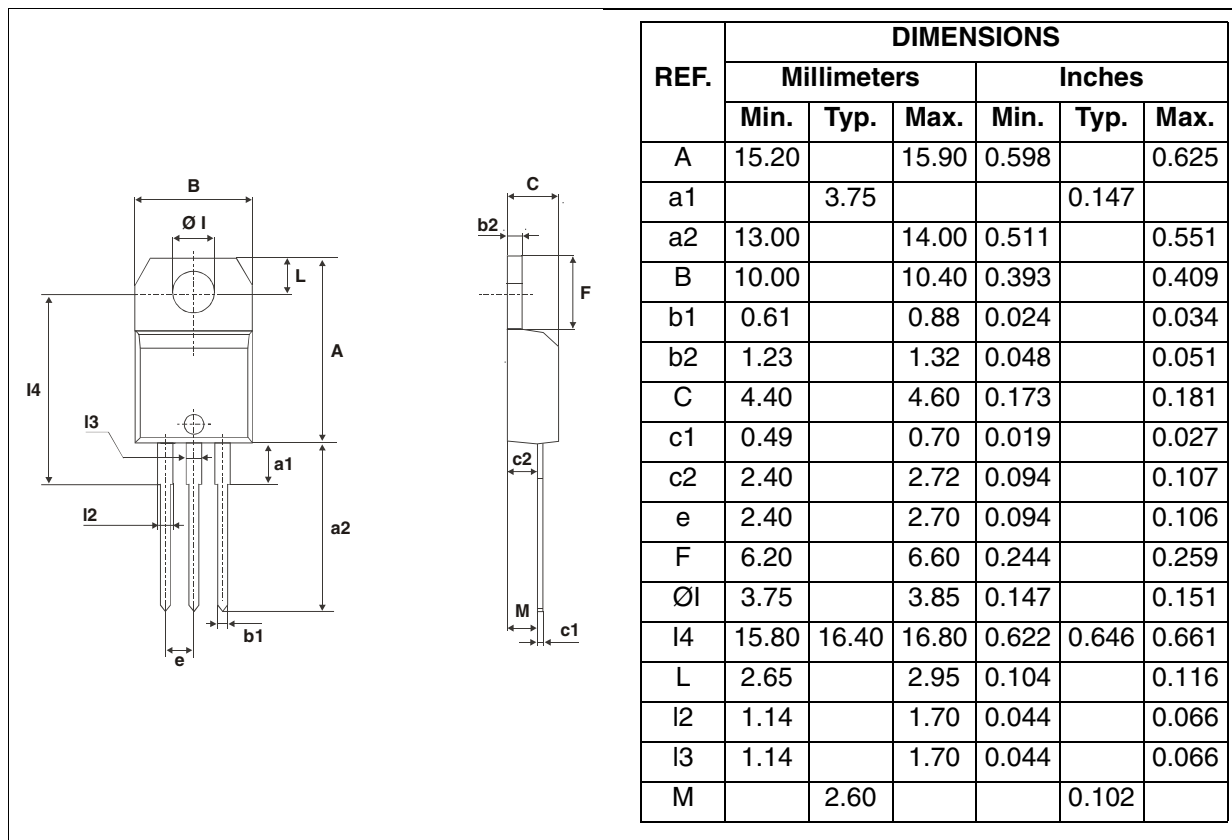


Table 8: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BTA20-600BWRG	BTA20-600BW	TO-220AB Ins.	2.3 g	50	Tube
BTA20-600CWRG	BTA20-600CW				
BTA20-700BWRG	BTA20-700BW				
BTA20-700CWRG	BTA20-700CW				

Table 9: Revision History

Date	Revision	Description of Changes
Sep-2001	1A	First issue.
08-Feb-2006	2	TO-220AB Ins. delivery mode changed from bulk to tube.

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.  
All other names are the property of their respective owners

© 2006 STMicroelectronics - All rights reserved

**STMicroelectronics group of companies**

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -  
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America  
[www.st.com](http://www.st.com)