



BTA20 Series

SNUBBERLESS™

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°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 ² s
di/dt	Critical rate of rise of on-state current $I_G = 500$ mA $di_G/dt = 1$ A/μs	Repetitive F = 50 Hz	$T_j = 125^\circ C$	20	A/μs
		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	$t_p = 20$ μs	$T_j = 125^\circ C$	4	A
V_{GM}	Peak positive gate voltage	$t_p = 20$ μs		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	°C

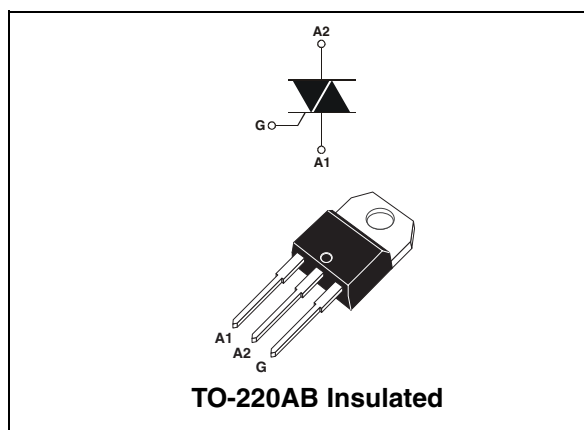


Table 2: Order Codes

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

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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/ μs
			MIN.	500	250	
$(dV/dt)_c$ (2)	$(dI/dt)_c = 20\text{ A/ms}$	$T_j = 125^\circ\text{C}$	TYP.	36	22	V/ μs
			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	μA
		$T_j = 125^\circ\text{C}$		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)

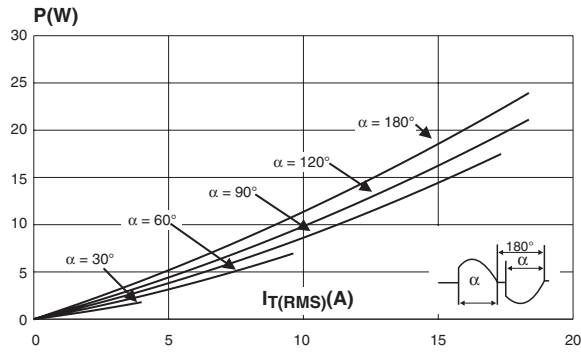


Figure 2: Correlation between maximum RMS power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact

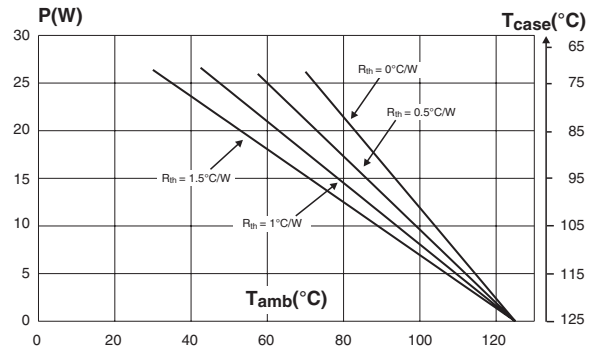


Figure 3: RMS on-state current versus case temperature (full cycle)

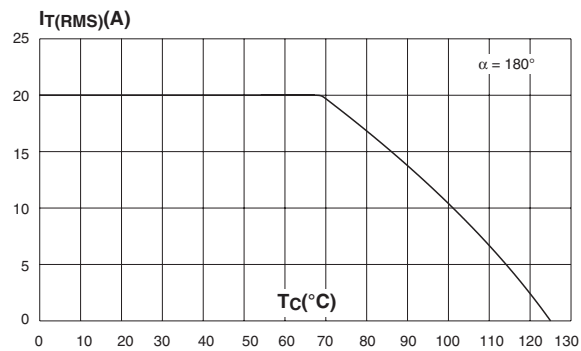


Figure 4: Relative variation of thermal impedance versus pulse duration

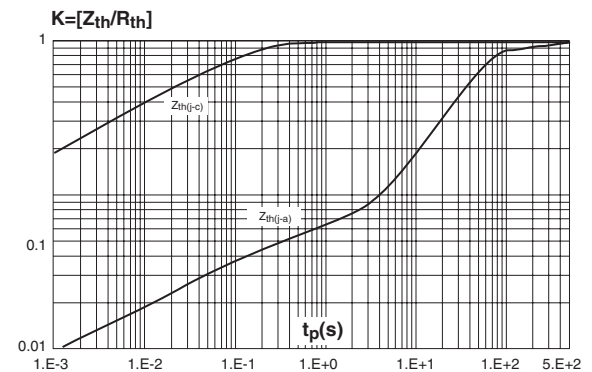


Figure 5: On-state characteristics (maximum values)

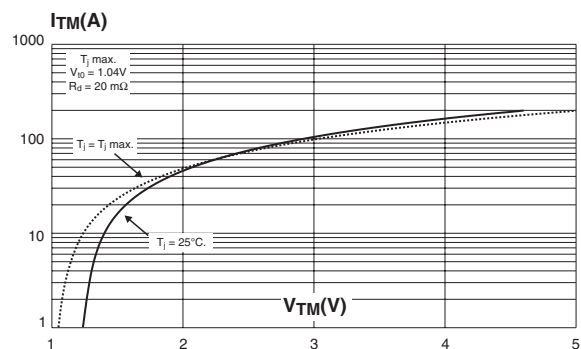
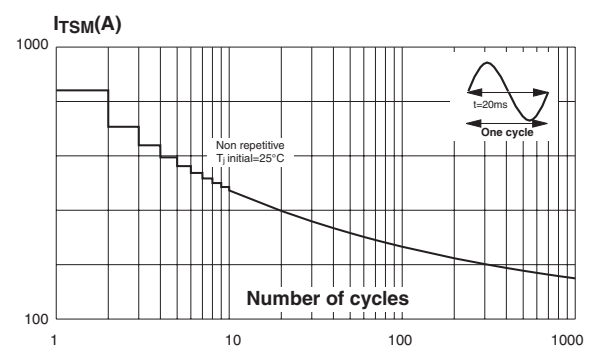


Figure 6: Non repetitive surge peak on-state current versus number of cycles



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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

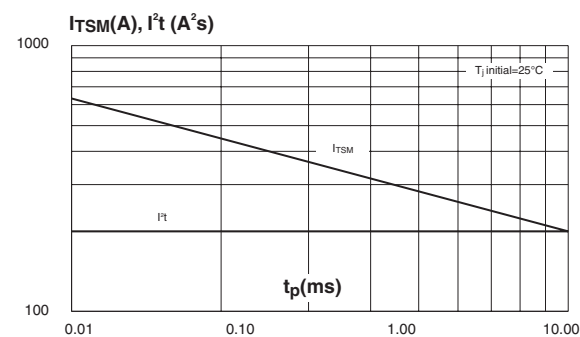


Figure 8: Relative variation of gate trigger current and holding current versus junction temperature

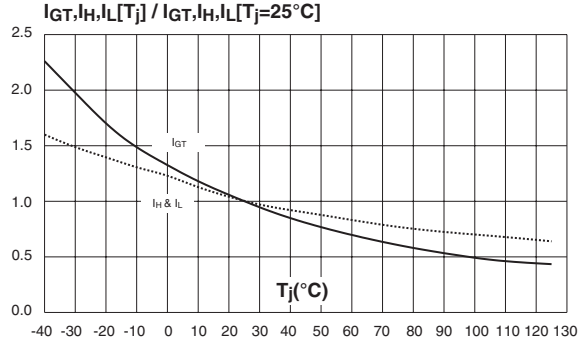


Figure 9: Ordering Information Scheme

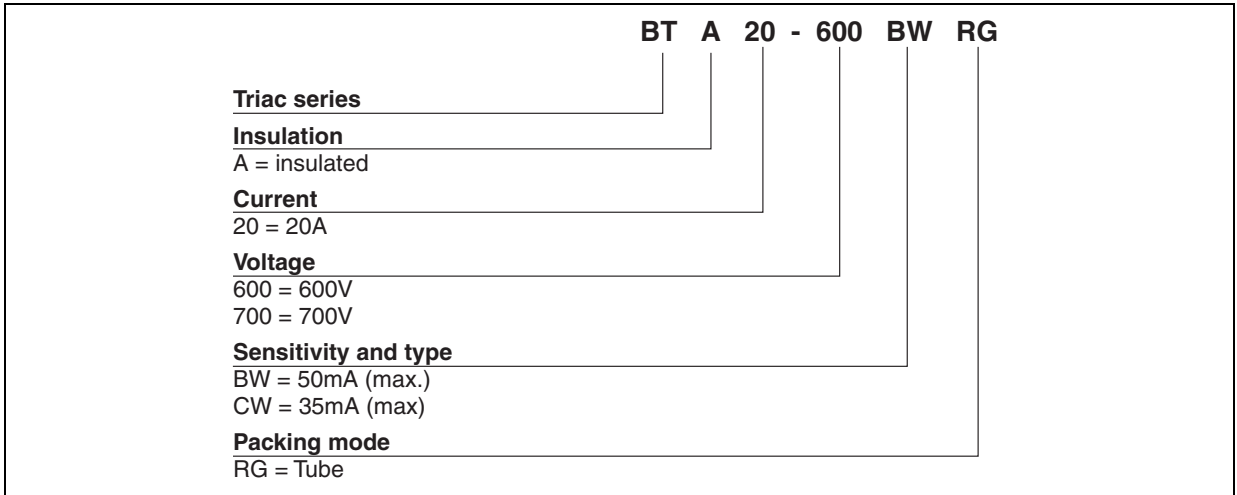


Table 7: Product Selector

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

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
ØI	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	

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.

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