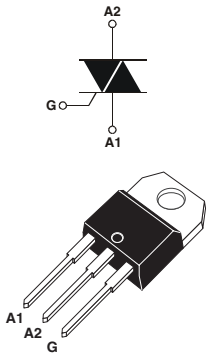
BTA20 Series

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



TO-220AB Insulated

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 2: Order Codes

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

Table 3: Absolute Maximum Ratings

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)		T_c = 70°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^2s
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°C	20	A/µs
		Non repetitive		100	
V_{DSM}/V_{RSM}	Non repetitive peak off-state voltage	t_p = 10 ms	T_j = 25°C	V_{DSM}/V_{RSM} + 100	V
I_{GM}	Peak gate current	t_p = 20 µs	T_j = 125°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°C	1	W
T_{stg} T_j	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 125	°C

Tables 4: Electrical Characteristics (T_j = 25°C, unless otherwise specified)

Symbol	Test Conditions	Quadrant		BTA20		Unit
				BW	CW	
I_{GT} (1)	V_D = 12 V R_L = 33 Ω	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 kΩ T_j = 125°C	ALL	MIN.	0.2		V
I_H (2)	I_T = 500 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°C	TYP.	750	500	V/µs
			MIN.	500	250	
(dV/dt)c (2)	(dI/dt)c = 20 A/ms	T_j = 125°C	TYP.	36	22	V/µs
			MIN.	18	11	

Table 5: Static Characteristics

Symbol	Test Conditions			Value	Unit
V_{TM} (2)	I_{TM} = 28 A t_p = 380 µs	T_j = 25°C	MAX.	1.70	V
I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$	T_j = 25°C	MAX.	10	µA
		T_j = 125°C		3	mA

Note 1: minimum I_{GT} is guaranted 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	°C/W
$R_{th(j-c)}$	Junction to case (DC)	2.8	
$R_{th(j-a)}$	Junction to ambient	60	°C/W

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

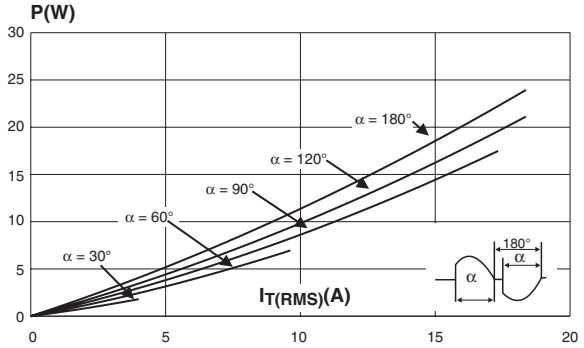


Figure 2: Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact

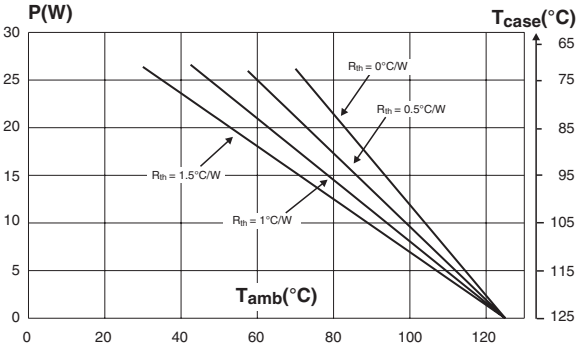


Figure 3: RMS on-state current versus case temperature (full cycle)

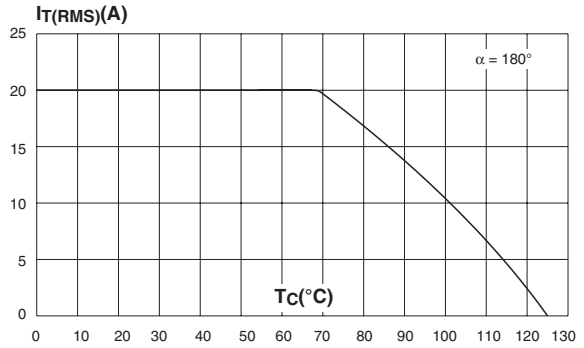


Figure 4: Relative variation of thermal impedance versus pulse duration

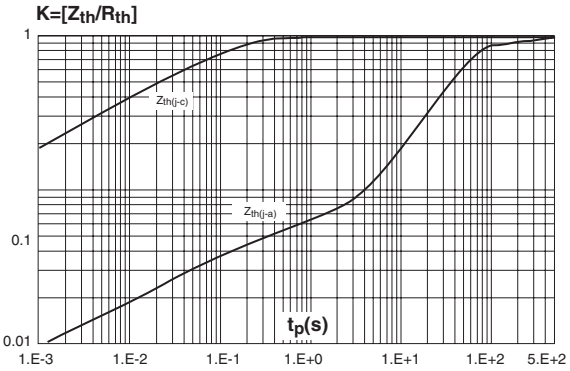


Figure 5: On-state characteristics (maximum values)

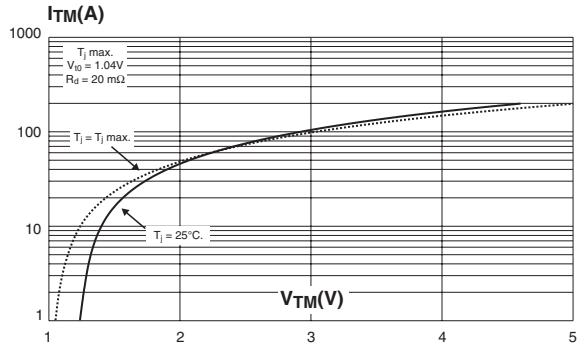


Figure 6: Non repetitive surge peak on-state current versus number of cycles

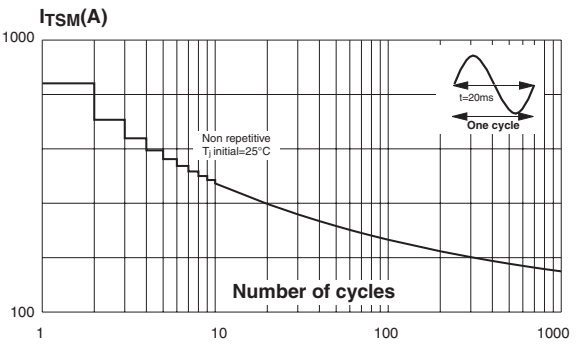


Figure 7: Non-repetitive surge peak on-state current for a sinusoidal pulse with width t_p < 10 ms and corresponding value of I^2t

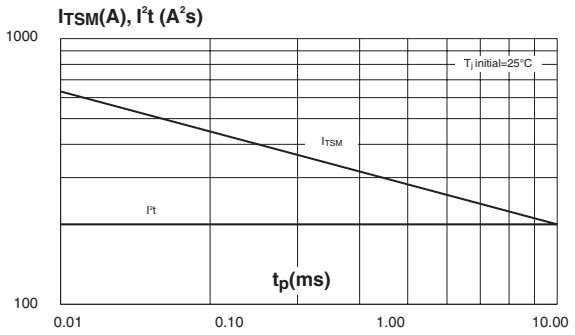


Figure 8: Relative variation of gate trigger current and holding current versus junction temperature

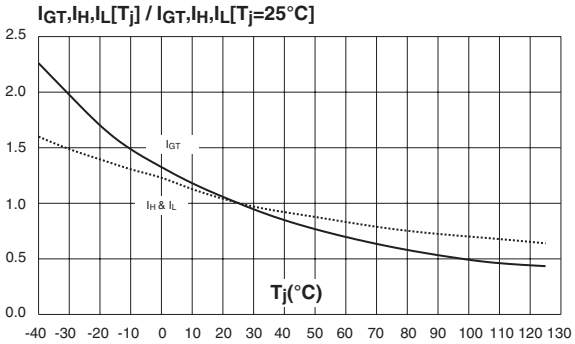


Figure 9: Ordering Information Scheme

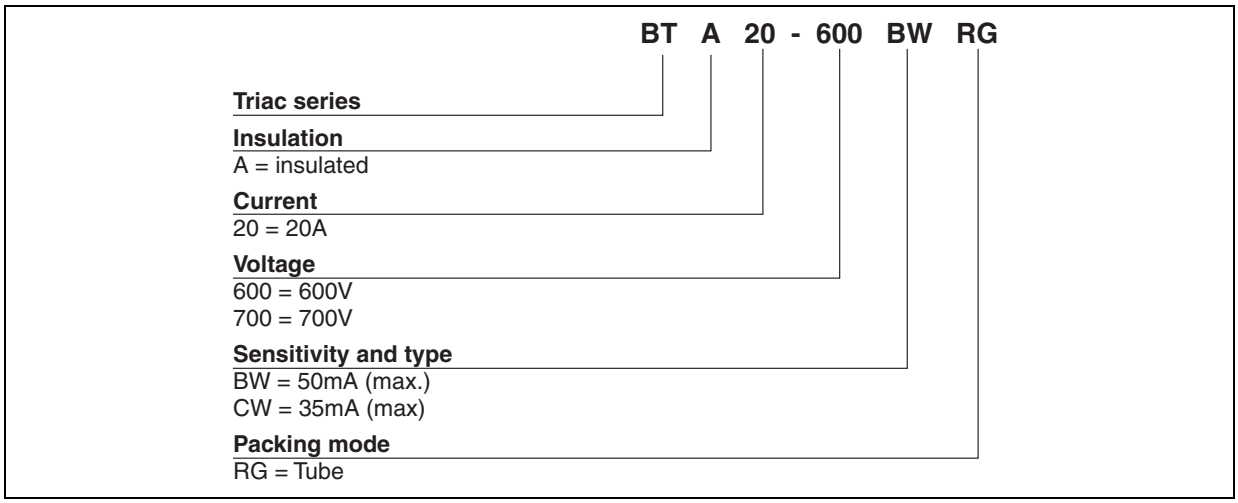
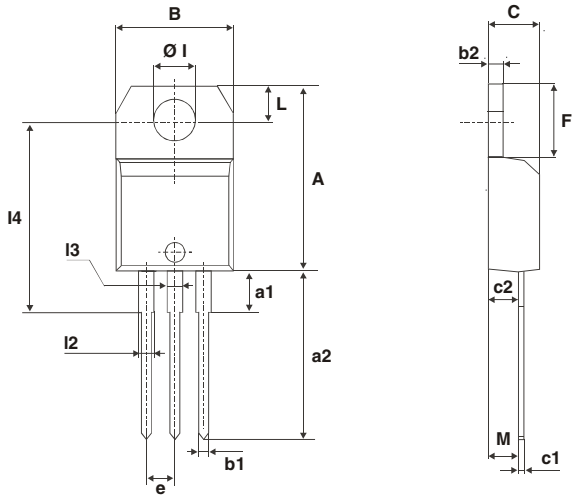


Table 7: Product Selector

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
l4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
l2	1.14		1.70	0.044		0.066
l3	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.