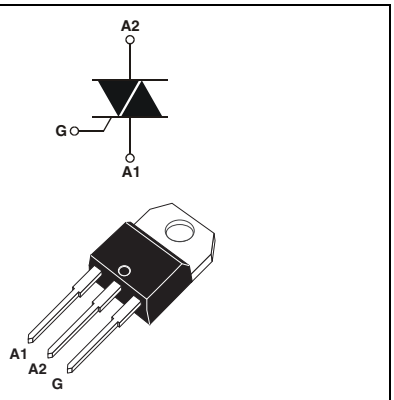
BTA20

20 A Snubberless™ Triacs

Datasheet – production data

Features

- $I_{T(RMS)}$ = 20 A
- V_{DRM}, V_{RRM} = 600 and 700 V
- $I_{GT\ (Q1)}$ (max) = 35 and 50 mA



TO-220AB Insulated

Description

The BTA20 Triacs use high performance glass passivated chip technology. The Snubberless concept offers suppression of the RC network and is suitable for applications such as phase control and static switching on inductive or resistive load.

Thanks to their clip assembly technique, the BTA20 Triacs provide a superior performance in surge current handling capabilities.

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

TM: Snubberless is a trademark of STMicroelectronics.

1 Characteristics

Table 1. Absolute maximum ratings

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	On-state rms 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 = 2 x I_{GT}, $t_r \leq$ 100 ns	Repetitive F = 50 Hz	T_j = 125 °C	50	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}	Storage junction temperature range			- 40 to + 150	°C
T_j	Operating junction temperature range			- 40 to + 125	

Table 2. 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	

1. Minimum I_{GT} is guaranteed at 5% of I_{GT} max.
2. For both polarities of A2 referenced to A1.

Table 3. Static characteristics

Symbol	Parameter			Value	Unit
V_{TM} (1)	I_{TM} = 28 A, t_p = 380 µs	T_j = 125 °C	Max.	1.70	V
I_{DRM}	$V_{DRM} = V_{RRM}$	T_j = 125 °C	Max.	10	µA
I_{RRM}		T_j = 125 °C		3	mA

1. For both polarities of A2 referenced to A1.

Table 4. Thermal resistances

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

Figure 1. Maximum power dissipation versus on-state rms current (full cycle)

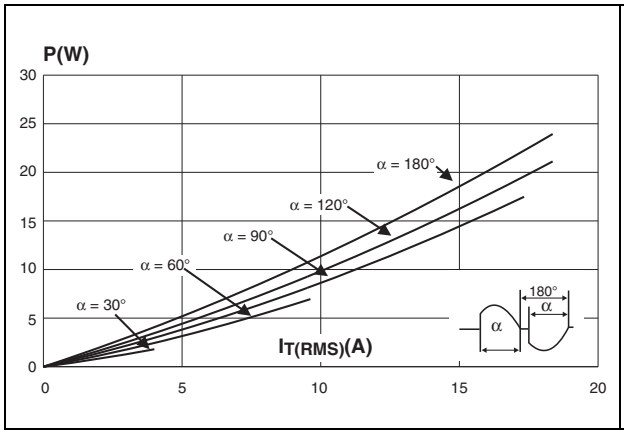


Figure 2. Correlation between maximum rms power dissipation and maximum allowable temperatures

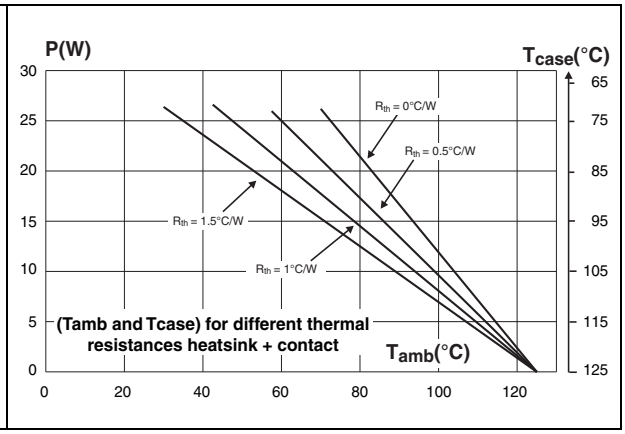


Figure 3. On-state rms current versus case temperature (full cycle)

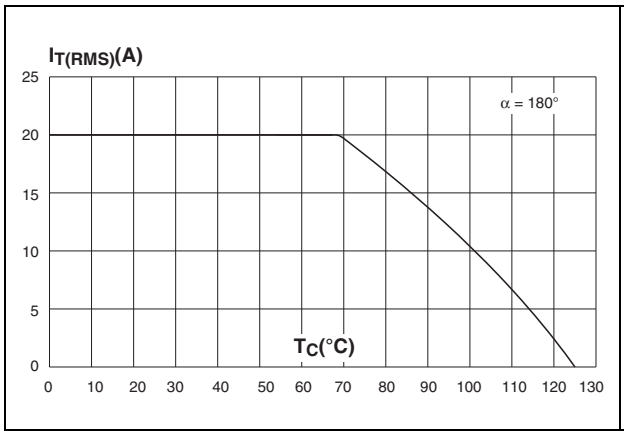


Figure 4. Relative variation of thermal impedance versus pulse duration

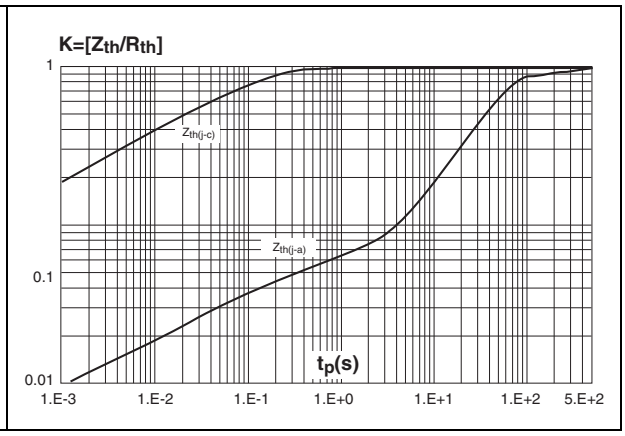


Figure 5. On-state characteristics (maximum values)

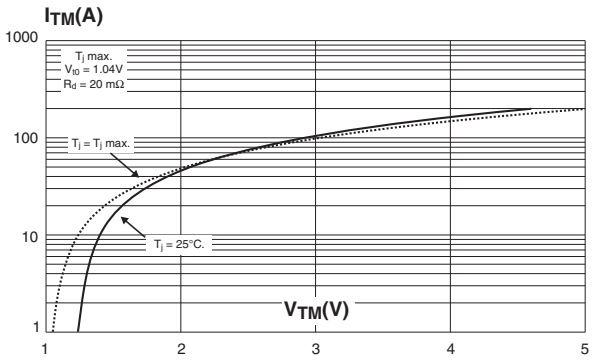


Figure 6. Non repetitive surge peak on-state current versus number of cycles

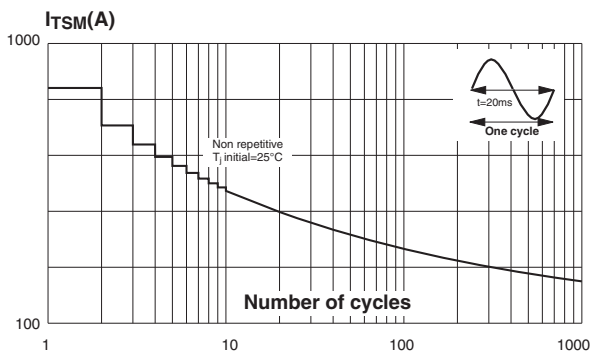


Figure 7. Non repetitive surge peak on-state current for a sinusoidal pulse and corresponding value of I^2t

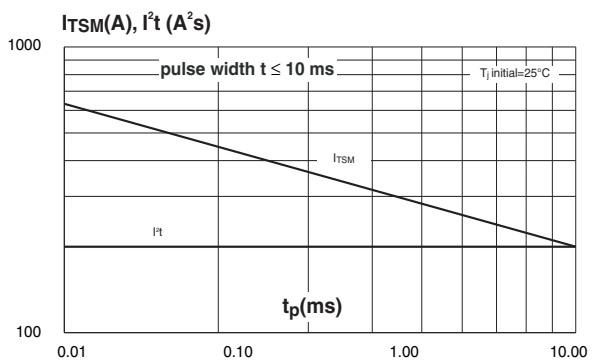
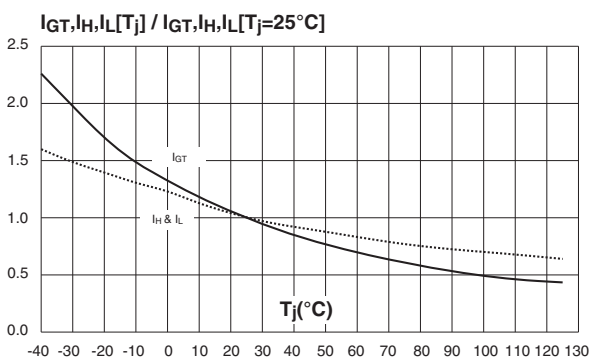


Figure 8. Relative variation of gate trigger current and holding current versus junction temperature



2 Ordering information scheme

Figure 9. Ordering information scheme

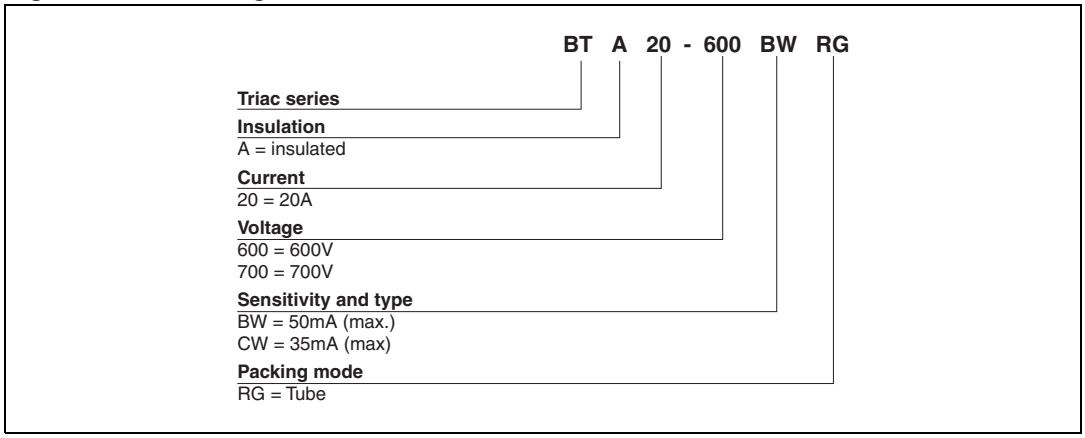


Table 5. Product selector

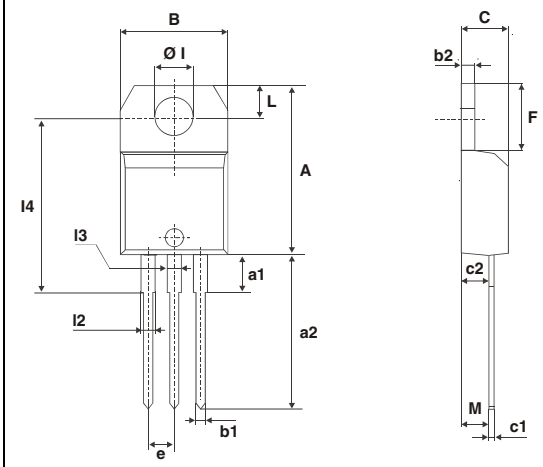
Order code	Voltage		Sensitivity	Type	Package
	600 V	700 V			
BTA20-600CWRG	X		35 mA	Snubberless	TO-220AB Ins.
BTA20-700BWRG		X	50 mA		
BTA20-700CWRG		X	35 mA		

3 Package information

- Epoxy meets UL94, V0
- Lead-free package

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 6. TO-220AB dimensions



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	

4 Ordering information

Table 7. Ordering information

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

5 Revision history

Table 8. Document revision history

Date	Revision	Changes
Sep-2001	1A	Initial release.
08-Feb-2006	2	TO-220AB Ins. delivery mode changed from bulk to tube.
09-Jul-2012	3	Updated dI/dt repetitive value in *Table 1.*