

1 Characteristics

Table 1. Absolute maximum ratings

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	On-state rms current (full sine wave)		$T_c = 70\text{ °C}$	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	$t_p = 10\text{ ms}$		200	A ² s
di/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100\text{ ns}$	Repetitive F = 50 Hz	$T_j = 125\text{ °C}$	50	A/μs
		Non repetitive		100	
V_{DSM} , V_{RSM}	Non repetitive peak off-state voltage	$t_p = 10\text{ ms}$	$T_j = 25\text{ °C}$	V_{DRM}/V_{RRM} 100	V
I_{GM}	Peak gate current	$t_p = 20\text{ μs}$	$T_j = 125\text{ °C}$	4	A
V_{GM}	Peak positive gate voltage	$t_p = 20\text{ μs}$		16	V
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125\text{ °C}$	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 ($T_j = 25\text{ °C}$, unless otherwise specified)

Symbol	Test conditions	Quadrant		BTA20		Unit
				BW	CW	
$I_{GT}^{(1)}$	$V_D = 12\text{ V}$, $R_L = 33\text{ Ω}$	ALL	Min.	2	1	mA
			Max.	50	35	
V_{GT}		ALL	Max.	1.5		V
V_{GD}	$V_D = V_{DRM}$, $R_L = 3.3\text{ kΩ}$, $T_j = 125\text{ °C}$	ALL	Min.	0.2		V
$I_H^{(2)}$	$I_T = 500\text{ mA}$, gate open		Max.	75	50	mA
I_L	$I_G = 1.2\text{ }I_{GT}$	I - III	Typ.	50	-	mA
		II		90	-	
		I - II - III	Max.	-	80	
dV/dt ⁽²⁾	$V_D = 67\% V_{DRM}$, gate open	$T_j = 125\text{ °C}$	Typ.	750	500	V/μs
			Min.	500	250	
(dV/dt) _C ⁽²⁾	(di/dt) _C = 20 A/ms	$T_j = 125\text{ °C}$	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
$V_{TM}^{(1)}$	$I_{TM} = 28\text{ A}$, $t_p = 380\text{ }\mu\text{s}$	$T_j = 125\text{ }^\circ\text{C}$	Max.	1.70	V
I_{DRM}	$V_{DRM} = V_{RRM}$	$T_j = 125\text{ }^\circ\text{C}$	Max.	10	μA
I_{RRM}		$T_j = 125\text{ }^\circ\text{C}$		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	$^\circ\text{C/W}$
$R_{th(j-c)}$	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)

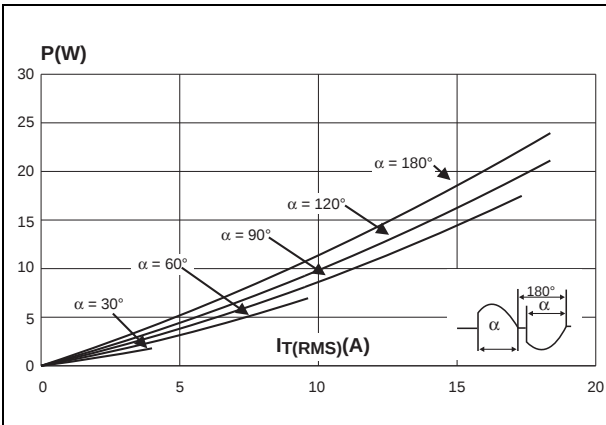


Figure 2. Correlation between maximum rms power dissipation and maximum allowable temperatures

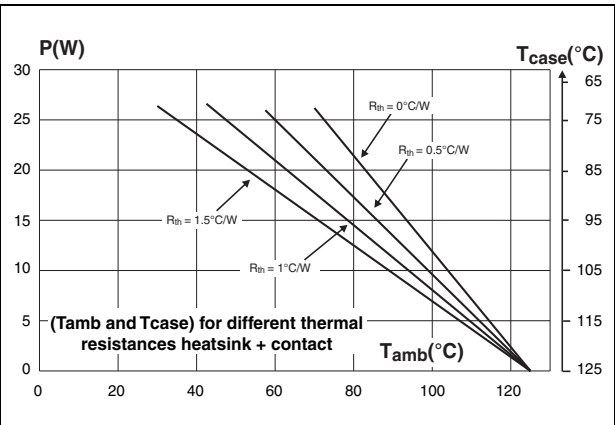


Figure 3. On-state rms current versus case temperature (full cycle)

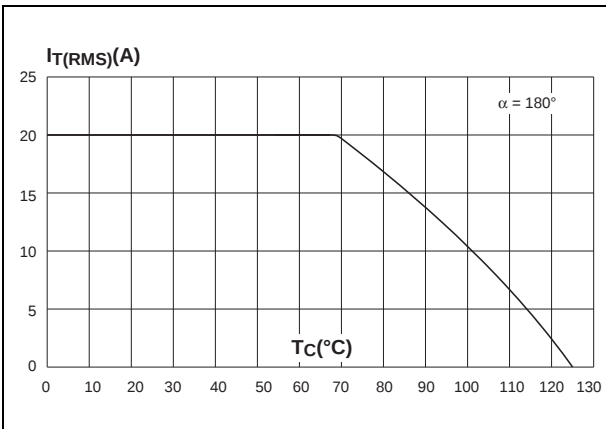


Figure 4. Relative variation of thermal impedance versus pulse duration

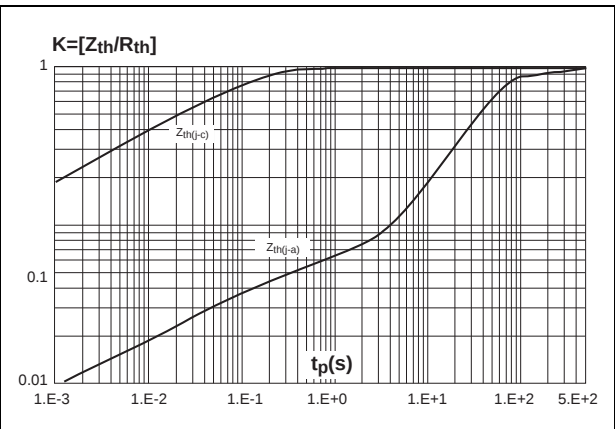


Figure 5. On-state characteristics (maximum values)

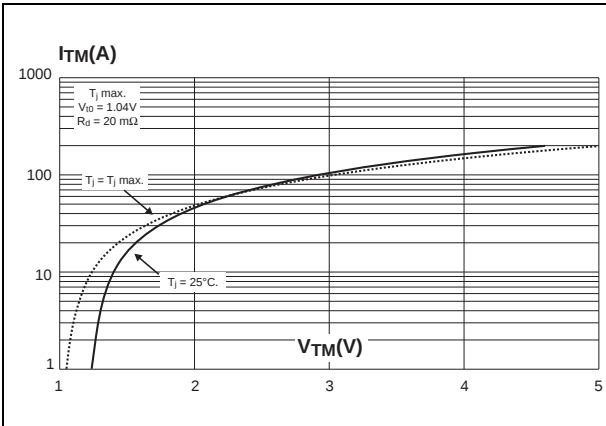


Figure 6. Non repetitive surge peak on-state current versus number of cycles

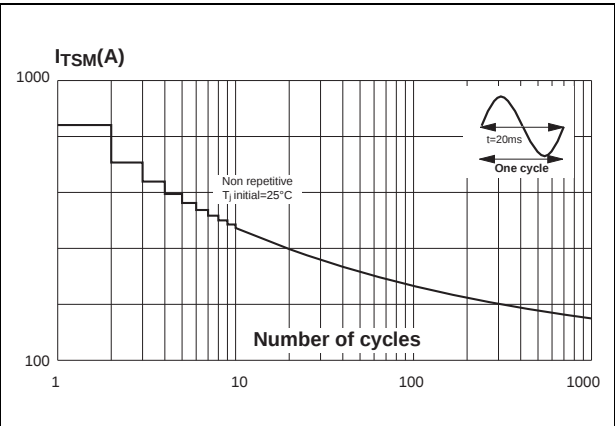


Figure 7. Non repetitive surge peak on-state current for a sinusoidal pulse and corresponding value of I^2t

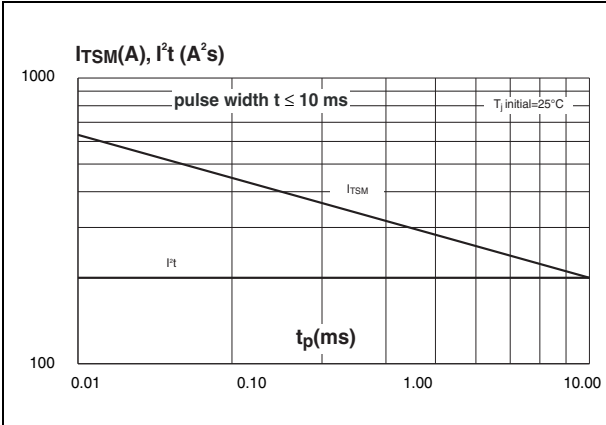
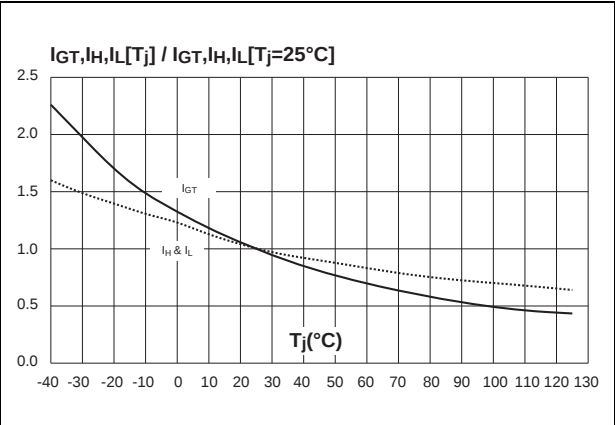


Figure 8. Relative variation of gate trigger current and holding current versus junction temperature



2 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.

Figure 9. TO-220AB package dimensions (definitions)

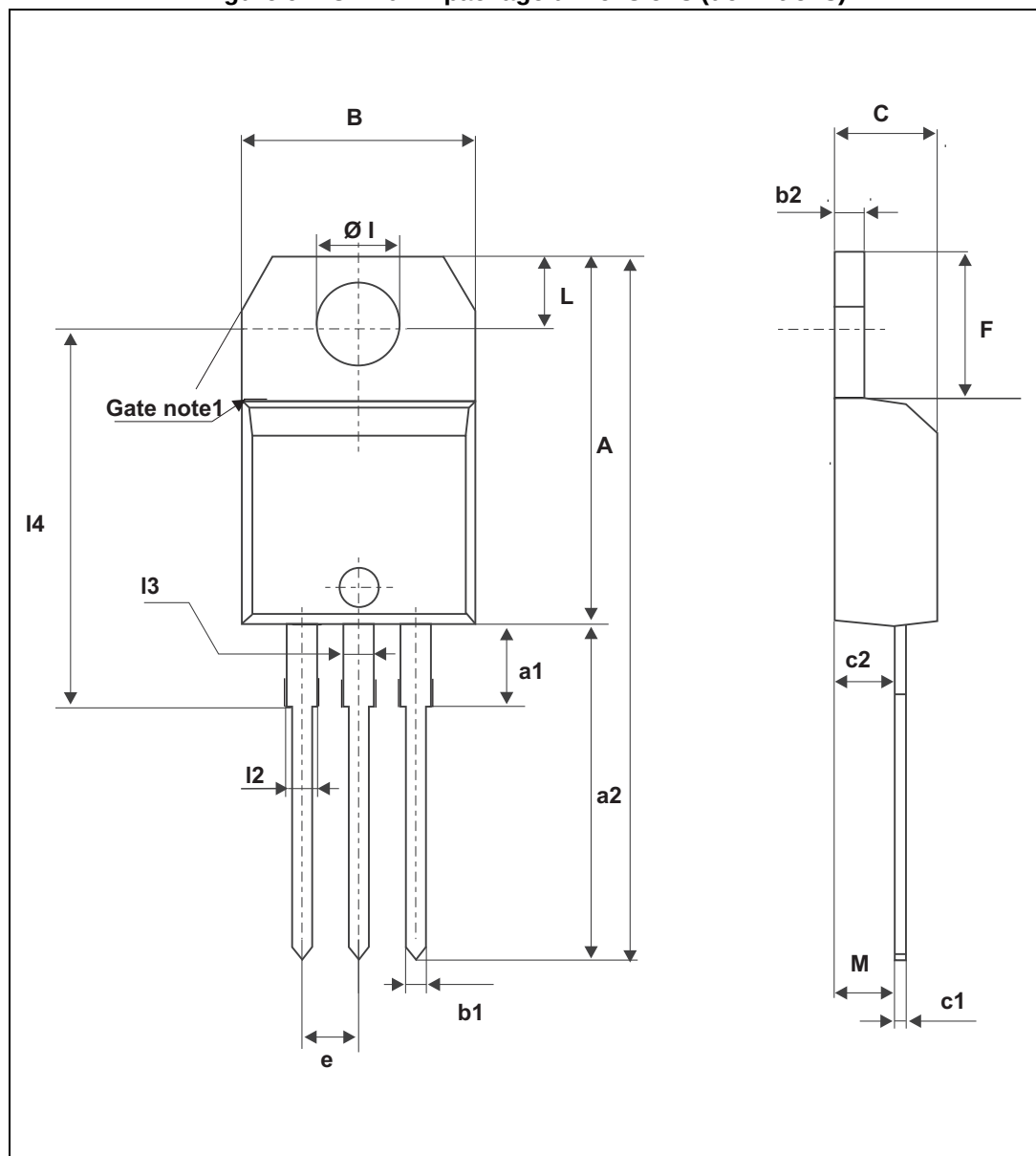


Table 5. TO-220AB package dimension values

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
I	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	

3 Ordering information

Figure 10. Ordering information scheme

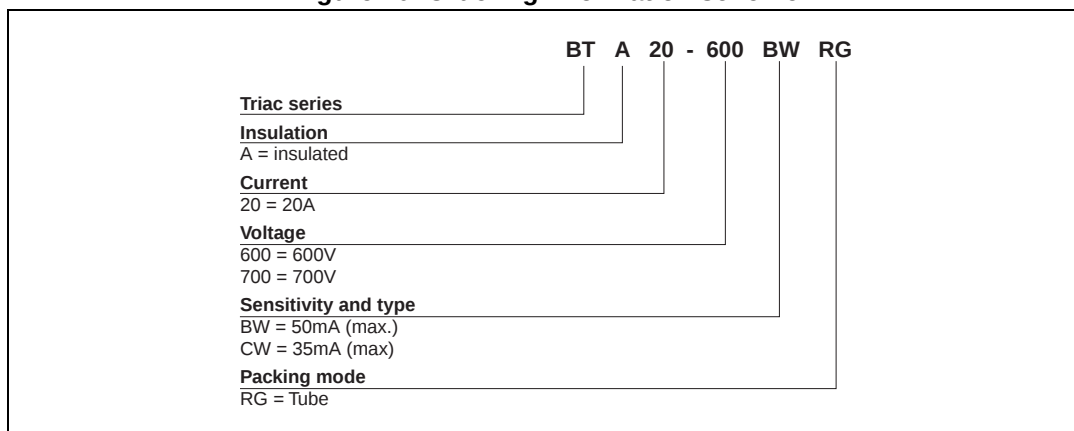


Table 6. Product selector

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		

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				

4 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 .
01-Sep-2014	4	Updated V_{DRM}/V_{RRM} value in Table 1 .

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