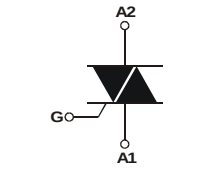
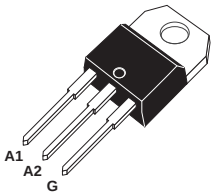
20 A Snubberless Triacs

Datasheet - production data





TO-220AB Insulated

Features

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

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).

Figure 1. Ordering information scheme

BT A 20 - 600 BW RG

Triac series

Insulation
A = insulated

Current
20 = 20A

Voltage
600 = 600V
700 = 700V

Sensitivity and type
BW = 50mA (max.)
CW = 35mA (max)

Packing mode
RG = Tube

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_{DRM}/V_{RRM} 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 2. Maximum power dissipation versus on-state rms current (full cycle)

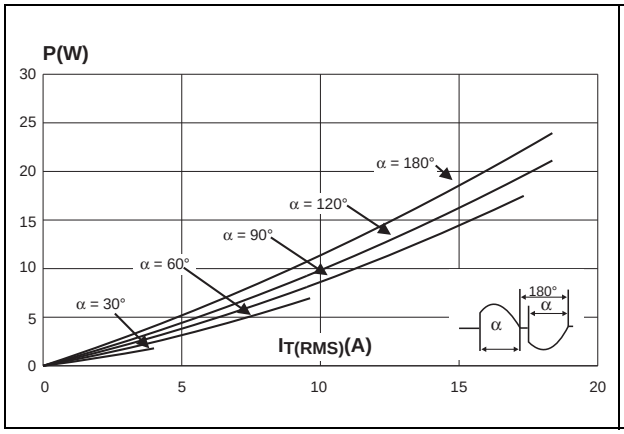


Figure 3. Correlation between maximum rms power dissipation and maximum allowable temperatures

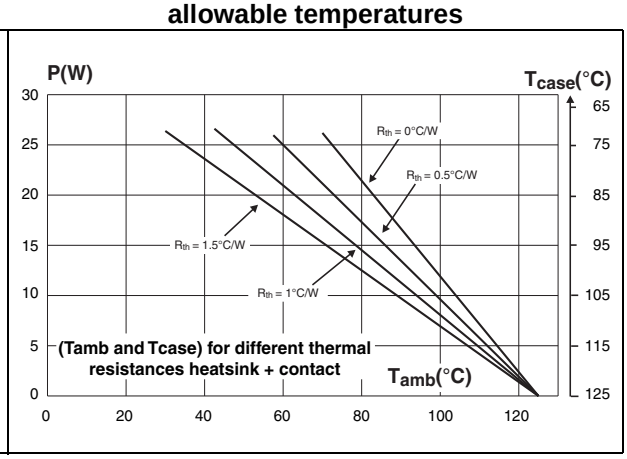


Figure 4. On-state rms current versus case temperature (full cycle)

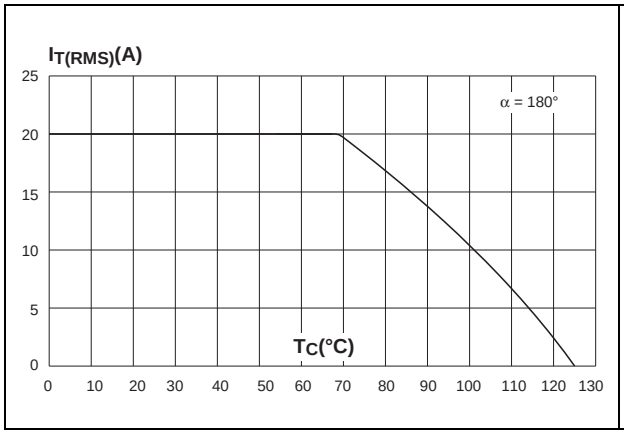


Figure5. Relative variation of thermal impedance versus pulse duration

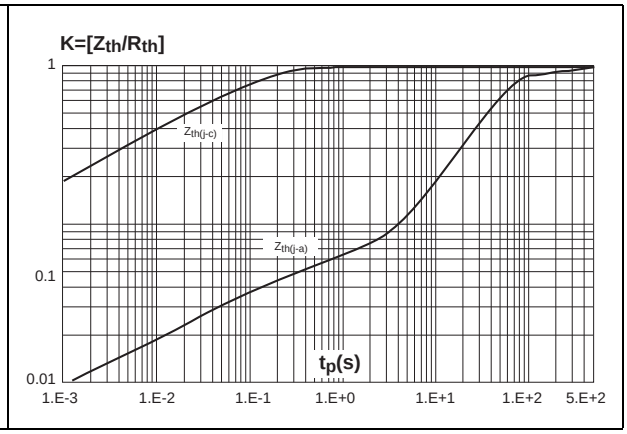


Figure6. On-state characteristics (maximum values)

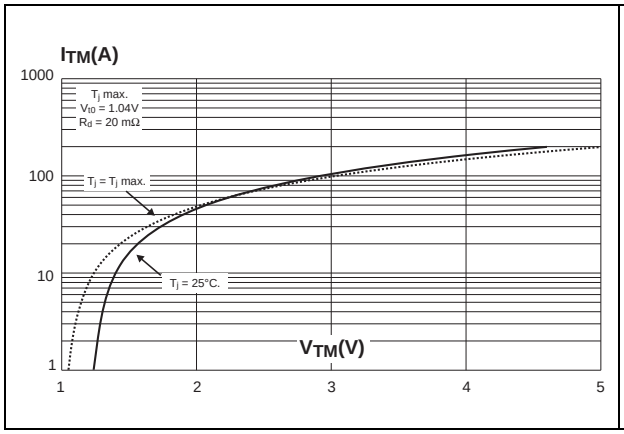


Figure7. Non repetitive surge peak on-state current versus number of cycles

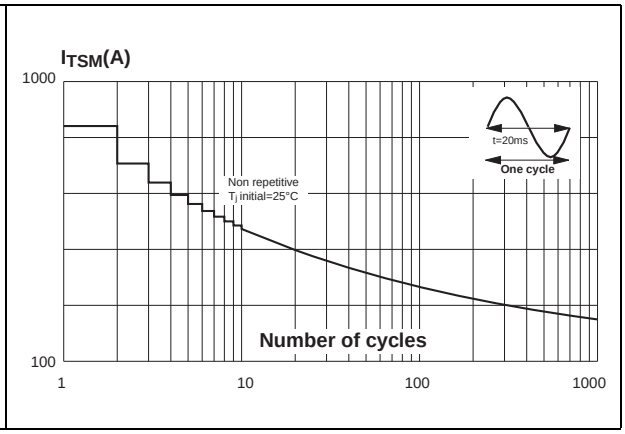


Figure8. Non repetitive surge peak on-state current for a sinusoidal pulse and corresponding value of I^2t

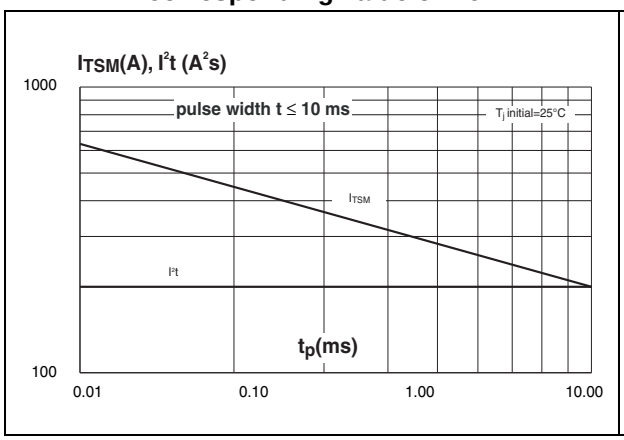
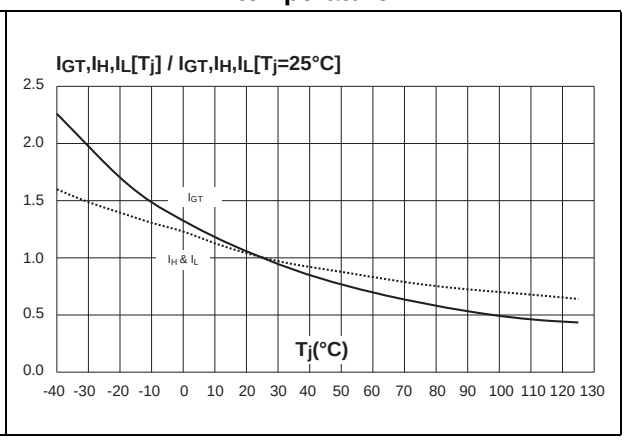


Figure9. Relative variation of gate trigger current and holding current versus junction temperature



2 Package information

Figure10. TO-220AB package dimensions (definitions)

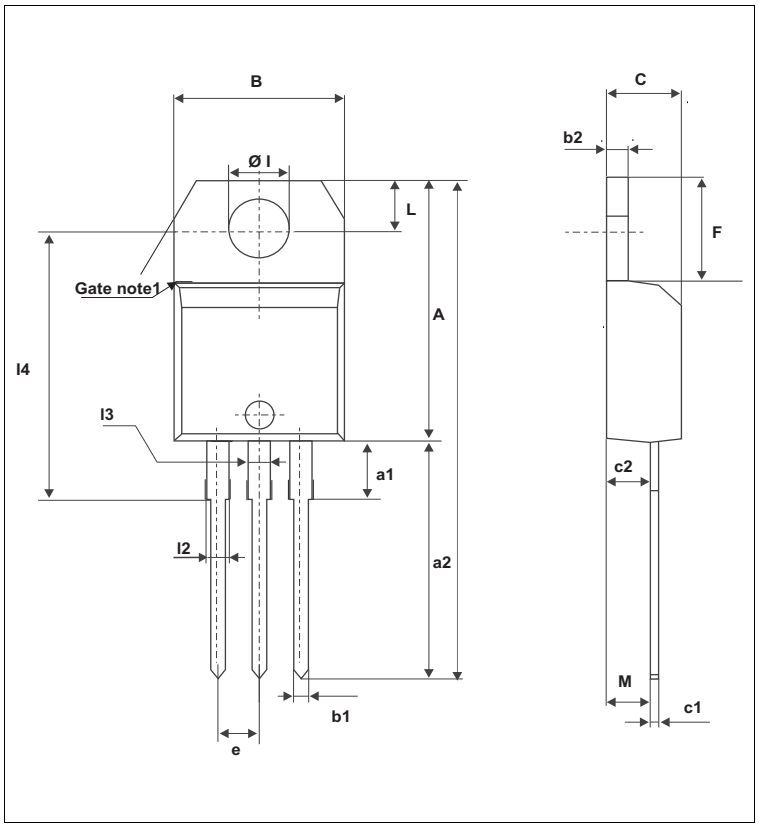


Table 5. TO-220AB package dimension values

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
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	