

SNUBBERLESS, LOGIC LEVEL & STANDARD

6A TRIACs

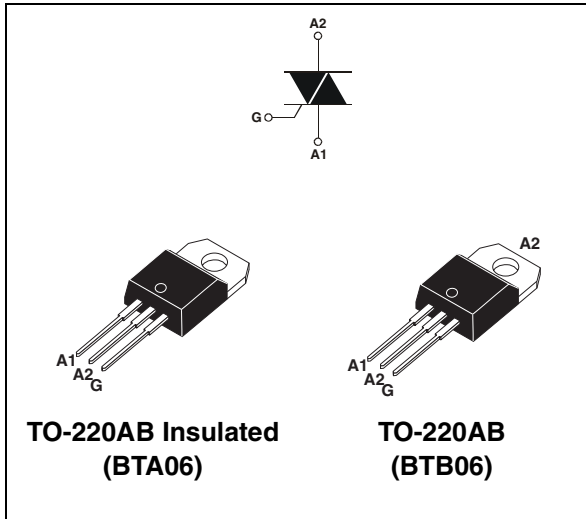


Table 1: Main Features

Symbol	Value	Unit
$I_{T(RMS)}$	6	A
V_{DRM}/V_{RRM}	600 and 800	V
$I_{GT} (Q_1)$	5 to 50	mA

DESCRIPTION

Available either in through-hole or surface-mount packages, the **BTA06** and **BTB06** triac series is suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, induction motor starting circuits... or for phase control operation in light dimmers, motor speed controllers,...

The snubberless and logic level versions (BTA/ BTB...W) are specially recommended for use on inductive loads, thanks to their high commutation performances.

By using an internal ceramic pad, the BTA series provides voltage insulated tab (rated at 2500V_{RMS}).

Table 2: Order Codes

Part Number	Marking
BTA06-xxxxxRG	See page table 8 on page 6
BTB06-xxxxxRG	

Figure 1: Ordering Information Scheme

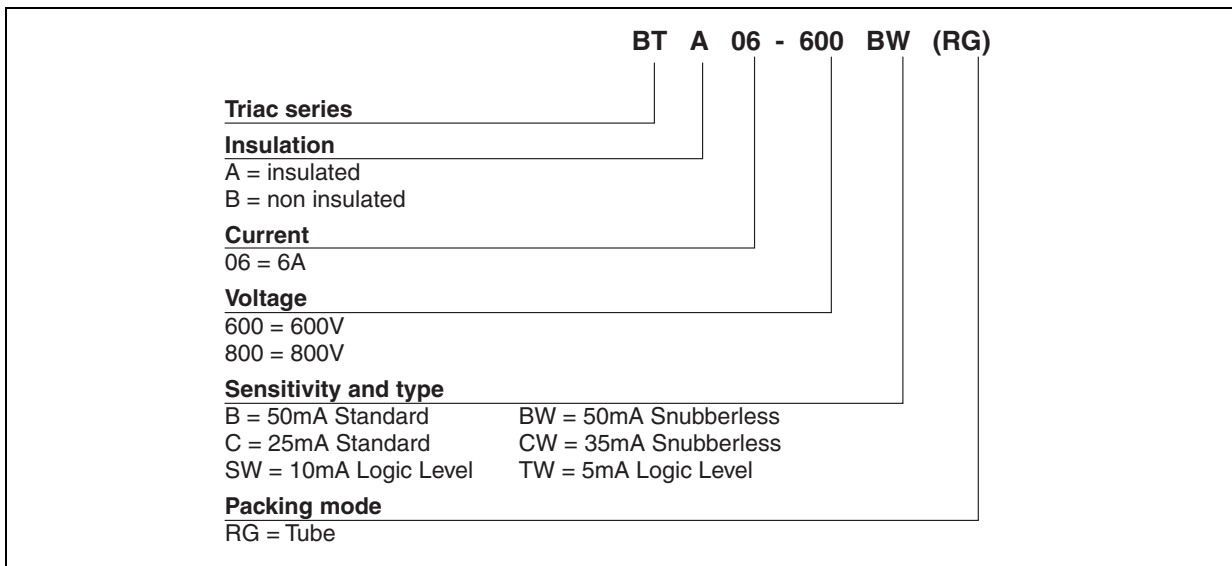


Table 3: Absolute Maximum Ratings

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)	TO-220AB	$T_c = 110^\circ\text{C}$	6	A
		TO-220AB Ins.	$T_c = 105^\circ\text{C}$		
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_j initial = 25°C)	F = 50 Hz	t = 20 ms	60	A
		F = 60 Hz	t = 16.7 ms	63	
I^2t	I^2t Value for fusing	$t_p = 10$ ms		21	A^2s
dI/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100$ ns	F = 120 Hz	$T_j = 125^\circ\text{C}$	50	A/ μs
I_{GM}	Peak gate current	$t_p = 20$ μs	$T_j = 125^\circ\text{C}$	4	A
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125^\circ\text{C}$	1	W
T_{stg} T_j	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 125	$^\circ\text{C}$

Tables 4: Electrical Characteristics ($T_j = 25^\circ\text{C}$, unless otherwise specified)

■ **SNUBBERLESS and Logic Level (3 quadrants)**

Symbol	Test Conditions	Quadrant		BTA 06 / BTB06				Unit
				TW	SW	CW	BW	
I_{GT} (1)	$V_D = 12$ V $R_L = 30$ Ω	I - II - III	MAX.	5	10	35	50	mA
V_{GT}		I - II - III	MAX.	1.3				V
V_{GD}	$V_D = V_{DRM}$ $R_L = 3.3$ k Ω $T_j = 125^\circ\text{C}$	I - II - III	MIN.	0.2				V
I_H (2)	$I_T = 100$ mA		MAX.	10	15	35	50	mA
I_L	$I_G = 1.2$ I_{GT}	I - III	MAX.	10	25	50	70	mA
		II		15	30	60	80	
dV/dt (2)	$V_D = 67\%$ V_{DRM} gate open $T_j = 125^\circ\text{C}$		MIN.	20	40	400	1000	V/ μs
(dI/dt)c (2)	(dV/dt)c = 0.1 V/ μs $T_j = 125^\circ\text{C}$		MIN.	2.7	3.5	-	-	A/ms
	(dV/dt)c = 10 V/ μs $T_j = 125^\circ\text{C}$			1.2	2.4	-	-	
	Without snubber $T_j = 125^\circ\text{C}$			-	-	3.5	5.3	

■ **Standard (5quadrants)**

Symbol	Test Conditions	Quadrant		BTA06 / BTB06		Unit
				C	B	
I_{GT} (1)	$V_D = 12$ V $R_L = 30$ Ω	I - II - III IV	MAX.	25 50	50 100	mA
V_{GT}		ALL	MAX.	1.3		V
V_{GD}	$V_D = V_{DRM}$ $R_L = 3.3$ k Ω $T_j = 125^\circ\text{C}$	ALL	MIN.	0.2		V
I_H (2)	$I_T = 500$ mA		MAX.	25	50	mA
I_L	$I_G = 1.2$ I_{GT}	I - III - IV	MAX.	40	50	mA
		II		80	100	
dV/dt (2)	$V_D = 67\%$ V_{DRM} gate open $T_j = 125^\circ\text{C}$		MIN.	200	400	V/ μs
(dV/dt)c (2)	(dI/dt)c = 2.7 A/ms $T_j = 125^\circ\text{C}$		MIN.	5	10	V/ μs

Table 6: Static Characteristics

Symbol	Test Conditions			Value	Unit	
$V_{TM}(2)$	$I_{TM} = 8.5\text{ A}$	$t_p = 380\ \mu\text{s}$	$T_j = 25^\circ\text{C}$	MAX.	1.55	V
$V_{i0}(2)$	Threshold voltage		$T_j = 125^\circ\text{C}$	MAX.	0.85	V
$R_d(2)$	Dynamic resistance		$T_j = 125^\circ\text{C}$	MAX.	60	m Ω
I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$		$T_j = 25^\circ\text{C}$	MAX.	5	μA
			$T_j = 125^\circ\text{C}$		1	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 7: The rmal resistanc

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case (AC)	TO-220AB	1.8	$^\circ\text{C/W}$
		TO-220AB Insulated	2.7	
$R_{th(j-a)}$	Junction to ambient	TO-220AB TO-220AB Insulated	60	$^\circ\text{C/W}$

Figure 2: Maximum power dissipation versus RMS on-state current (full cycle)

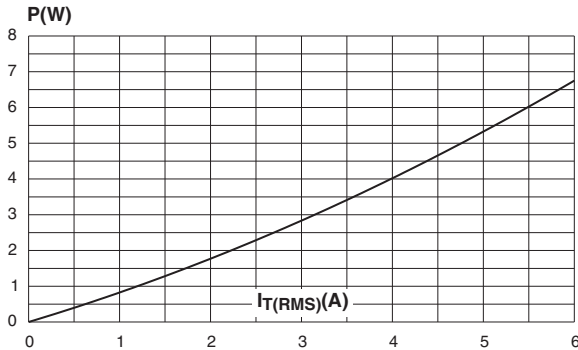


Figure 3: RMS on-state current versus case temperature (full cycle)

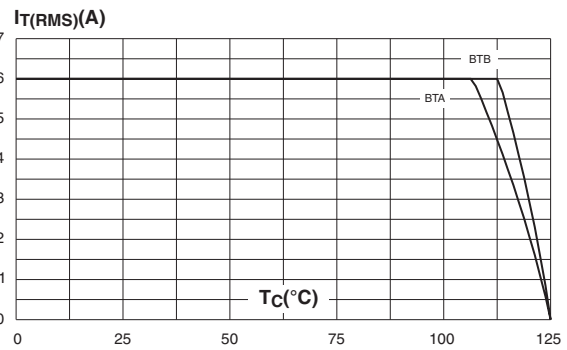


Figure 4: Relative variation of thermal impedance versus pulse duration

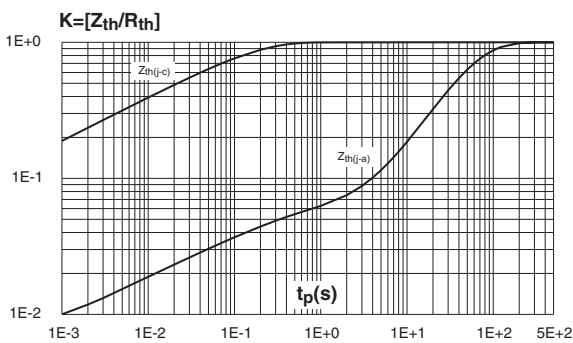


Figure 5: On-state characteristics (maximum values)

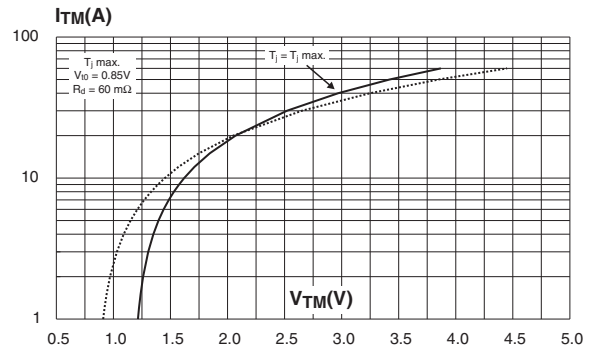


Figure 6: Surge peak on-state current versus number of cycles

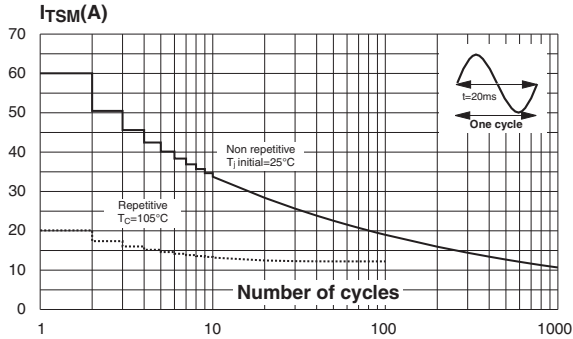


Figure 8: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)

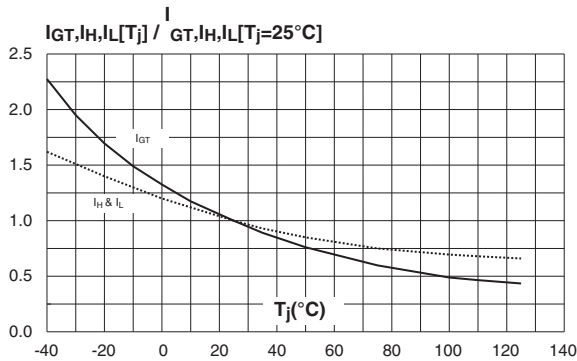


Figure 10: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (Standard types)

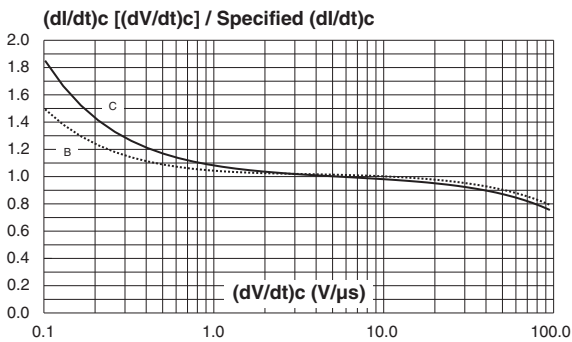


Figure 7: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10 ms and corresponding value of I²t

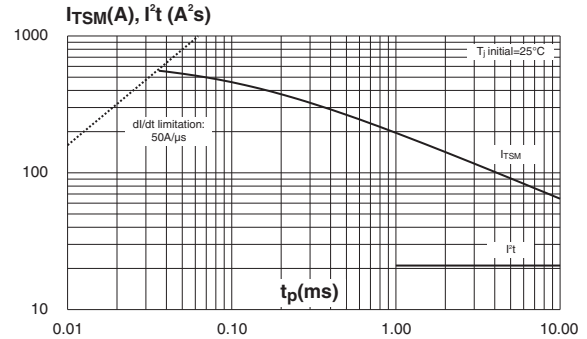


Figure 9: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (Snubberless & logic level types)

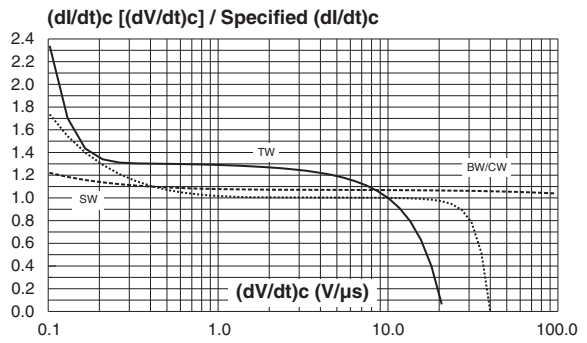


Figure 11: Relative variation of critical rate of decrease of main current versus junction temperature

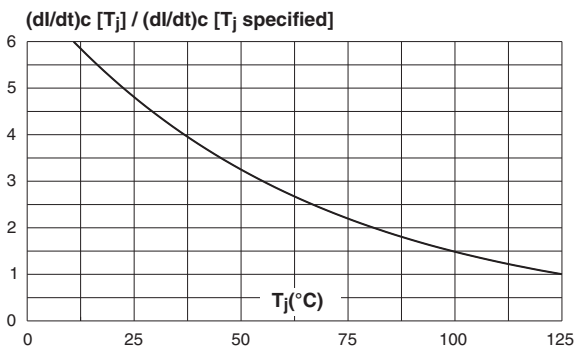
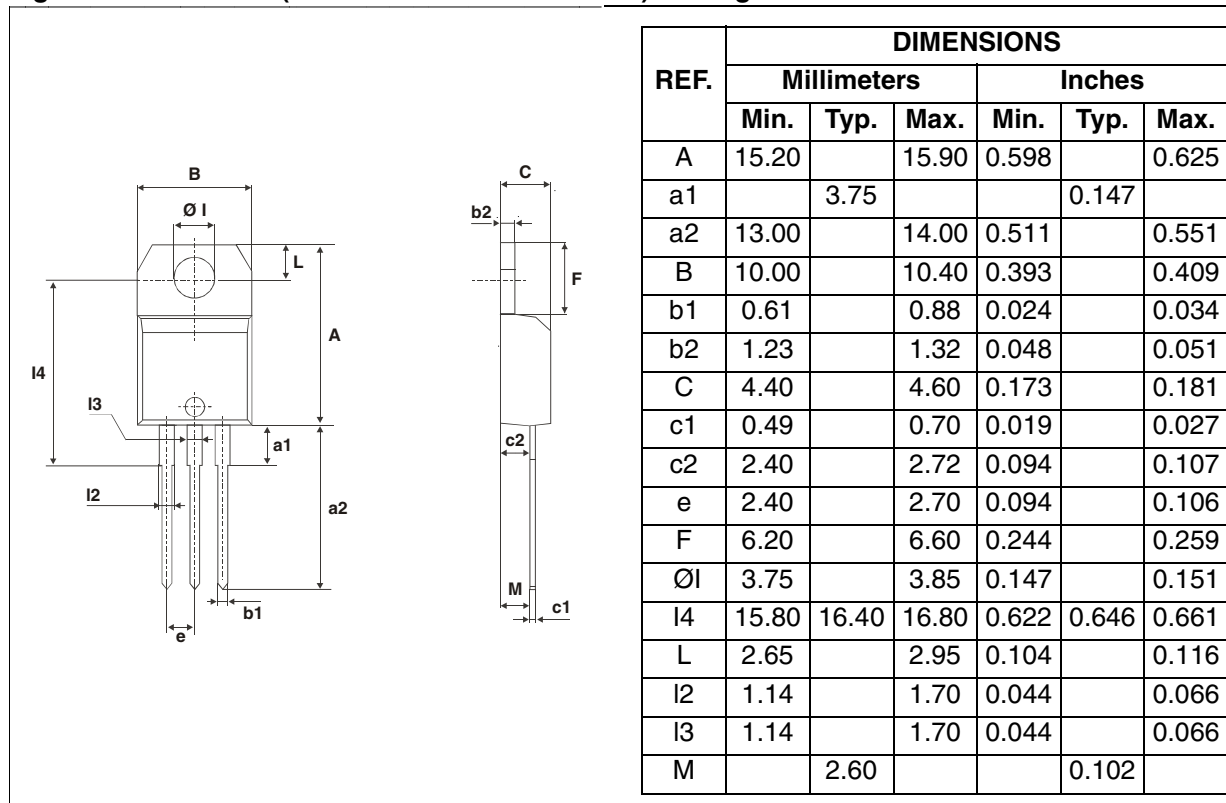


Figure 12: TO-220AB (insulated and non insulated) Package Mechanical Data



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