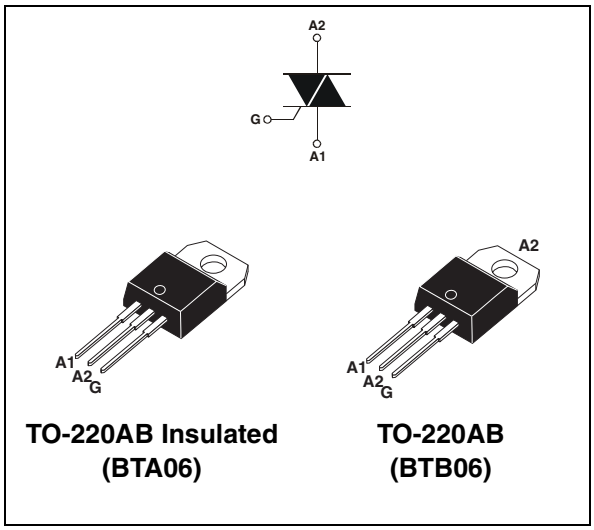
SNUBBERLESS™, LOGIC LEVEL & STANDARD

6A TRIACs



TO-220AB Insulated (BTA06)

TO-220AB (BTB06)

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

Table 2: Order Codes

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

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 applic-ations 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 $3500V_{RMS}$).

Figure 1: Ordering Information Scheme

BT A 06 - 600 BW (RG)

Triac series

Insulation
A = insulated
B = non insulated

Current
06 = 6A

Voltage
600 = 600V
800 = 800V

Sensitivity and type

B = 50mA Standard	BW = 50mA Snubberless
C = 25mA Standard	CW = 35mA Snubberless
SW = 10mA Logic Level	TW = 5mA Logic Level

Packing mode
RG = Tube

Table 3: Absolute Maximum Ratings

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)	TO-220AB	T_c = 110°C	6	A
		TO-220AB Ins.	T_c = 105°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 x I_{GT} , $t_r \leq$ 100 ns	F = 120 Hz	T_j = 125°C	50	A/µs
I_{GM}	Peak gate current	t_p = 20 µs	T_j = 125°C	4	A
$P_{G(AV)}$	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)

■ **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 kΩ T_j = 125°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°C		MIN.	20	40	400	1000	V/µs
(dI/dt)c (2)	(dV/dt)c = 0.1 V/µs T_j = 125°C		MIN.	2.7	3.5	-	-	A/ms
	(dV/dt)c = 10 V/µs T_j = 125°C			1.2	2.4	-	-	
	Without snubber T_j = 125°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 kΩ T_j = 125°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°C		MIN.	200	400	V/µs
(dV/dt)c (2)	(dI/dt)c = 2.7 A/ms T_j = 125°C		MIN.	5	10	V/µs

Table 6: Static Characteristics

Symbol	Test Conditions			Value	Unit
V_{TM} (2)	I_{TM} = 8.5 A t_p = 380 µs	T_j = 25°C	MAX.	1.55	V
V_{t0} (2)	Threshold voltage	T_j = 125°C	MAX.	0.85	V
R_d (2)	Dynamic resistance	T_j = 125°C	MAX.	60	mΩ
I_{DRM} I_{RRM}	V_{DRM} = V_{RRM}	T_j = 25°C	MAX.	5	µA
		T_j = 125°C		1	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 7: The rmal resistanc

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

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

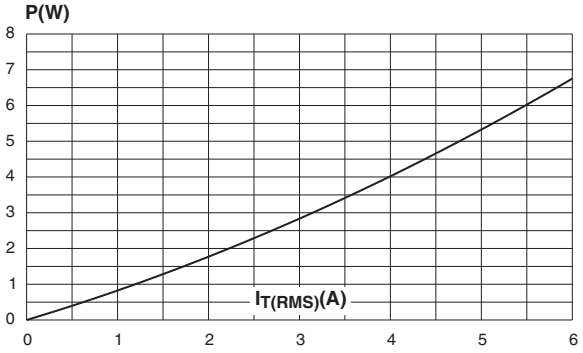


Figure 3: RMS on-state current versus case temperature (full cycle)

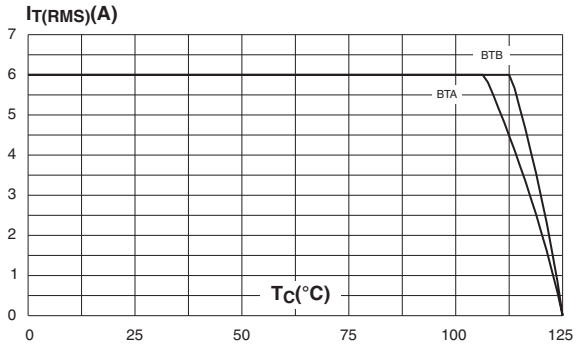


Figure 4: Relative variation of thermal impedance versus pulse duration

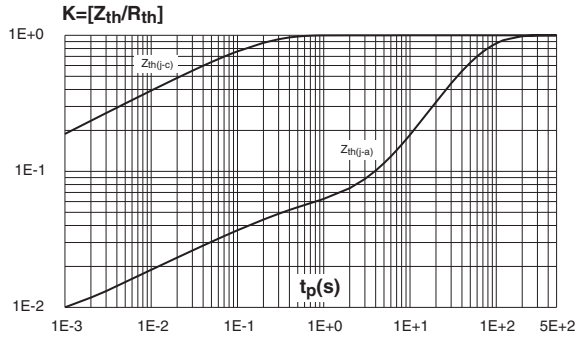


Figure 5: On-state characteristics (maximum values)

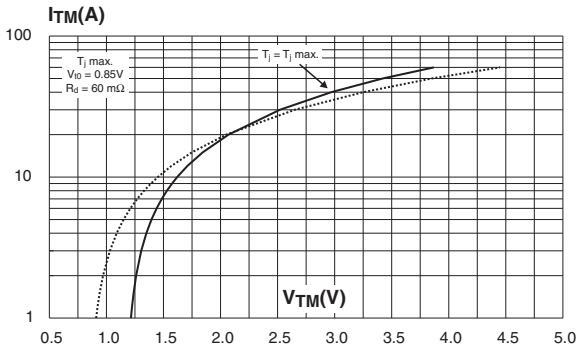


Figure 6: Surge peak on-state current versus number of cycles

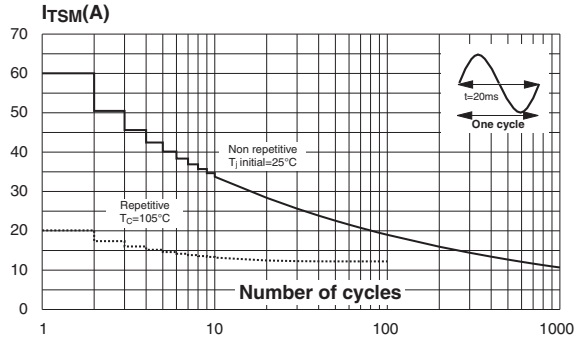


Figure 7: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10$ ms and corresponding value of I^2t

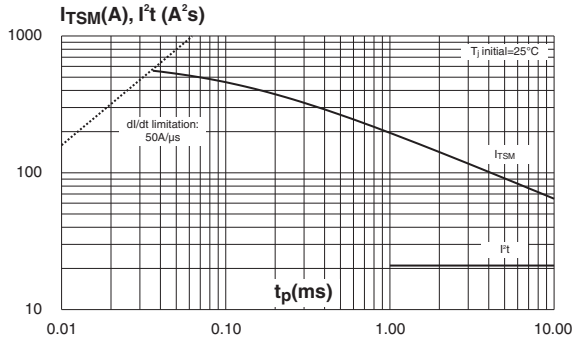


Figure 8: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)

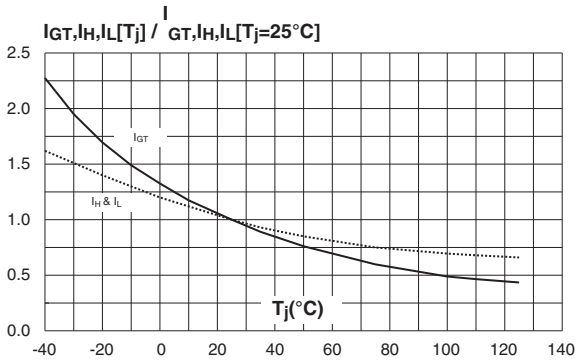


Figure 9: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (Snubberless & logic level types)

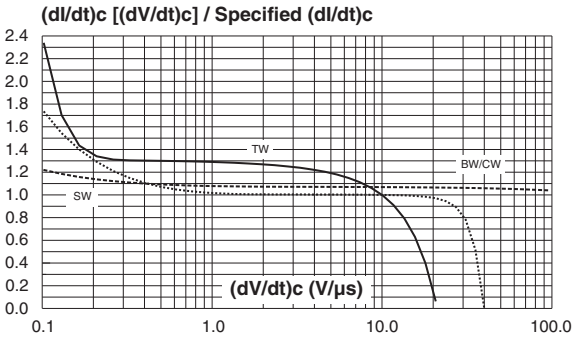


Figure 10: Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values) (Standard types)

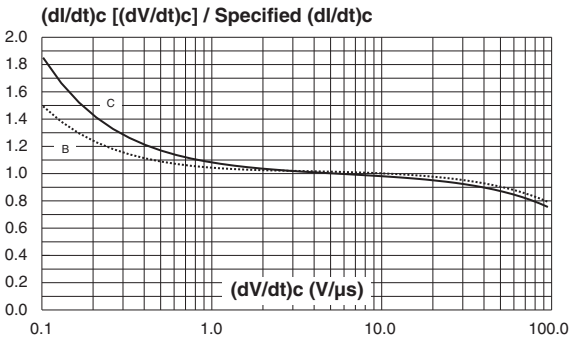


Figure 11: Relative variation of critical rate of decrease of main current versus junction temperature

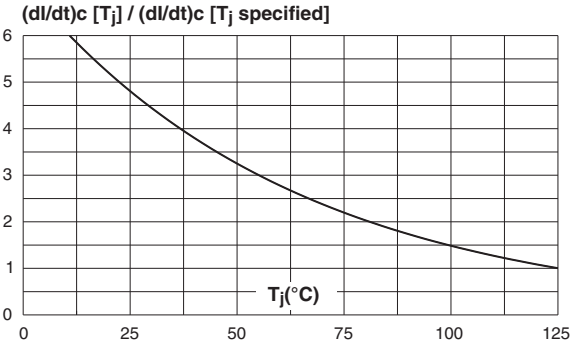
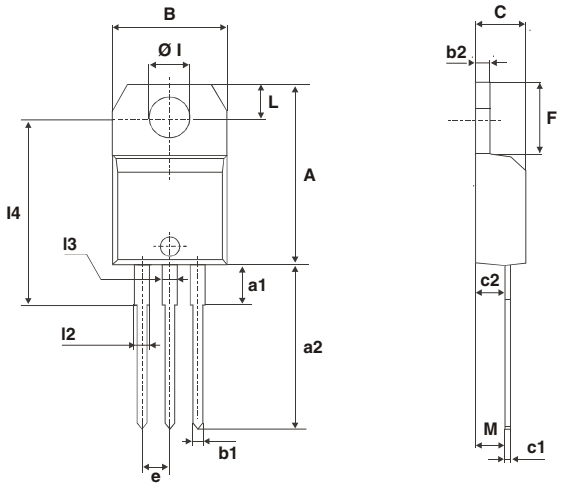


Table 8: Product Selector

Part Number	Voltage (xxx)		Sensitivity	Type	Package
	600 V	800 V			
BTA/LTB06-xxxB	X	X	50 mA	Standard	TO-220AB
BTA/LTB06-xxxBW	X	X	50 mA	Snubberless	TO-220AB
BTA/LTB06-xxxC	X	X	25 mA	Standard	TO-220AB
BTA/LTB06-xxxCW	X	X	35 mA	Snubberless	TO-220AB
BTA/LTB06-xxxSW	X	X	10 mA	Logic level	TO-220AB
BTA/LTB06-xxxTW	X	X	5 mA	Logic Level	TO-220AB

BTB: non insulated TO-220AB package

Figure 12: TO-220AB (insulated and non 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	