

# BTA16, BTB16 and T16 Series

SNUBBERLESSTM, LOGIC LEVEL & STANDARD

16A TRIACs

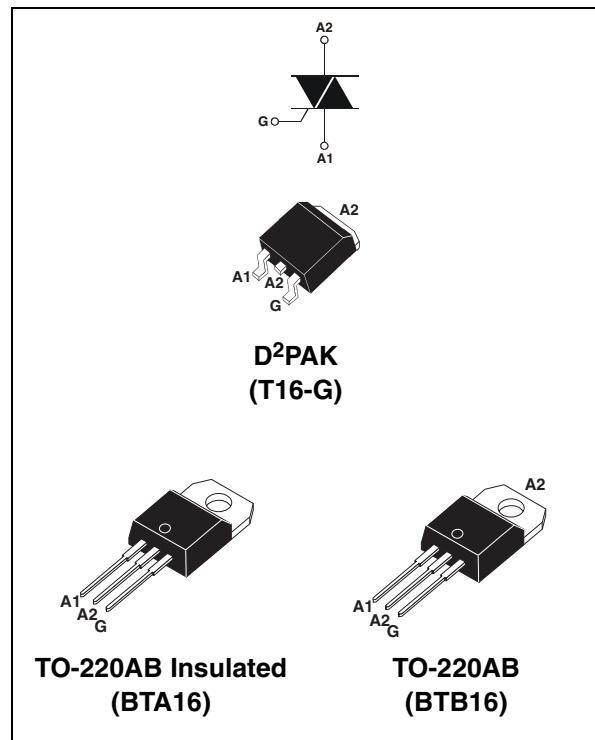
**Table 1: Main Features**

Symbol	Value	Unit
$I_{T(RMS)}$	16	A
$V_{DRM}/V_{RRM}$	600, 700 and 800	V
$I_{GT}(Q_1)$	10 to 50	mA

## DESCRIPTION

Available either in through-hole or surface-mount packages, the **BTA16**, **BTB16** and **T16** 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 versions (BTA/BTB...W and T16 series) 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  $2500V_{RMS}$ ) complying with UL standards (File ref.: E81734).



**Table 2: Order Codes**

Part Number	Marking
BTA16-xxxxxRG	See page table 8 on page 8
BTB16-xxxxxRG	
T16xx-xxxG	

**BTA16, BTB16 and T16 Series**
**Table 3: Absolute Maximum Ratings**

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)	D <sup>2</sup> PAK / TO-220AB	$T_c = 100^\circ\text{C}$	16	A
		TO-220AB Ins.	$T_c = 15^\circ\text{C}$		
$I_{TSM}$	Non repetitive surge peak on-state current (full cycle, $T_j$ initial = $25^\circ\text{C}$ )	F = 50 Hz	t = 20 ms	160	A
		F = 60 Hz	t = 16.7 ms	168	
$I^2t$	$I^2t$ Value for fusing	$t_p = 10$ ms		144	A <sup>2</sup> s
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/ $\mu\text{s}$
$V_{DSM}/V_{RSM}$	Non repetitive surge peak off-state voltage	$t_p = 10$ ms	$T_j = 25^\circ\text{C}$	$V_{DSM}/V_{RSM} + 100$	V
$I_{GM}$	Peak gate current	$t_p = 20$ $\mu\text{s}$	$T_j = 125^\circ\text{C}$	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		T16	BTA16 / BTB16			Unit
				T1635	SW	CW	BW	
$I_{GT}$ (1)	$V_D = 12$ V $R_L = 33$ $\Omega$	I - II - III	MAX.	35	10	35	50	mA
$V_{GT}$		I - II - III	MAX.	1.3				V
$V_{GD}$	$V_D = V_{DRM}$ $R_L = 3.3$ k $\Omega$ $T_j = 125^\circ\text{C}$	I - II - III	MIN.	0.2				V
$I_H$ (2)	$I_T = 500$ mA		MAX.	35	15	35	50	mA
$I_L$	$I_G = 1.2$ $I_{GT}$	I - III	MAX.	50	25	50	70	mA
		II		60	30	60	80	
dV/dt (2)	$V_D = 67\%$ $V_{DRM}$ gate open	$T_j = 125^\circ\text{C}$	MIN.	500	40	500	1000	V/ $\mu\text{s}$
(dI/dt)c (2)	(dV/dt)c = 0.1 V/ $\mu\text{s}$	$T_j = 125^\circ\text{C}$	MIN.	-	8.5	-	-	A/ms
	(dV/dt)c = 10 V/ $\mu\text{s}$	$T_j = 125^\circ\text{C}$		-	3.0	-	-	
	Without snubber	$T_j = 125^\circ\text{C}$		8.5	-	8.5	14	

**■ Standard (4 quadrants)**

Symbol	Test Conditions	Quadrant		BTA16 / BTB16		Unit
				C	B	
$I_{GT}$ (1)	$V_D = 12\text{ V}$ $R_L = 33\ \Omega$	I - II - III IV	MAX.	25 50	50 100	mA
$V_{GT}$		ALL	MAX.	1.3		V
$V_{GD}$	$V_D = V_{DRM}$ $R_L = 3.3\text{ k}\Omega$ $T_j = 125^\circ\text{C}$	ALL	MIN.	0.2		V
$I_H$ (2)	$I_T = 500\text{ mA}$		MAX.	25	50	mA
$I_L$	$I_G = 1.2 I_{GT}$	I - III - IV	MAX.	40	60	mA
		II		80	120	
$dV/dt$ (2)	$V_D = 67\% V_{DRM}$ gate open	$T_j = 125^\circ\text{C}$	MIN.	200	400	V/ $\mu\text{s}$
$(dV/dt)_c$ (2)	$(dI/dt)_c = 7\text{ A/ms}$	$T_j = 125^\circ\text{C}$	MIN.	5	10	V/ $\mu\text{s}$

**Table 5: Static Characteristics**

Symbol	Test Conditions			Value	Unit	
$V_T$ (2)	$I_{TM} = 22.5\text{ A}$	$t_p = 380\ \mu\text{s}$	$T_j = 25^\circ\text{C}$	MAX.	1.55	V
$V_{to}$ (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.	25	m $\Omega$
$I_{DRM}$ $I_{RRM}$	$V_{DRM} = V_{RRM}$		$T_j = 25^\circ\text{C}$	MAX.	5	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$		2	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 6: Thermal resistance**

Symbol	Parameter		Value	Unit	
$R_{th(j-c)}$	Junction to case (AC)		D <sup>2</sup> PAK / TO-220AB	1.2	$^\circ\text{C/W}$
			TO-220AB Insulated	2.1	
$R_{th(j-a)}$	Junction to ambient	S = 1 cm <sup>2</sup>	D <sup>2</sup> PAK	45	$^\circ\text{C/W}$
			TO-220AB / TO-220AB Insulated	60	

S = Copper surface under tab.