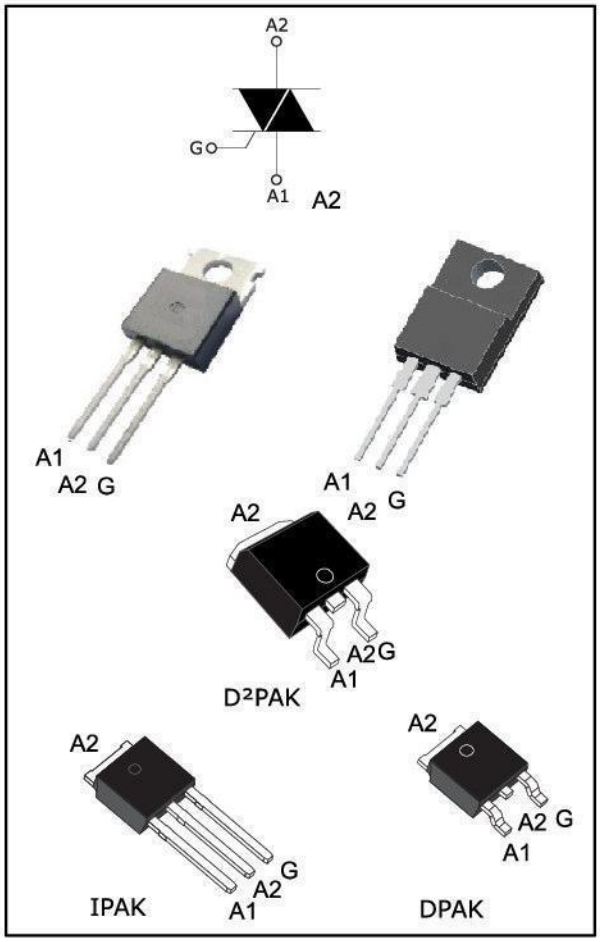
BTB08/BTA08



Features

- On-state rms current, $I_{T(RMS)}$ 8 A
- Repetitive peak off-state voltage, V_{DRM} / V_{RRM} 600 V to 800 V
- Triggering gate current, $I_{GT\ (Q1)}$ 5 to 50 mA

Description

Available either in through-hole and surface-mount packages, these devices are 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 and motor speed controllers, etc.

The Snubberless versions (BTA, BTB08_xxxxW and T8 series) are specially recommended for use on inductive loads, thanks to their high commutation performance.

Logic level versions are designed to interface directly with low power drivers such as Microcontrollers.

Characteristics

Table 1: Absolute maximum ratings (T_j = 25 °C unless otherwise stated)

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)	IPAK, DPAK, TO-220AB, D²PAK	T_c = 110 °C	8	A
		TO-220ABIns.	T_c = 100 °C		
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_j initial = 25 °C)	f = 50 Hz	t = 20 ms	80	A
		f = 60 Hz	t_p = 16.7 ms	84	
I^2t	I^2t value for fusing		t_p = 10 ms	36	A^2s
dI/dt	Critical rate of rise of on-state current I_G = 2 x I_{GT}, tr ≤ 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}	Storage junction temperature range			-40 to +150	°C
T_j	Operating junction temperature range			-40 to +125	°C

Table 2: Electrical characteristics (T_j = 25 °C, unless otherwise specified) Snubberless and logic level (3 quadrants)

Symbol	Parameter	Quadrant		T8			BTA08/BTB08				Unit
				10	35	50	TW	SW	CW	BW	
I_{GT}(1)	V_D = 12 V, R_L = 100 Ω	I - II - III	Max.	10	35	50	5	10	35	50	mA
V_{GT}		I - II - III	Max.	1.2							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.	15	35	50	10	15	35	50	mA
I_L	I_G = 1.2 x I_{GT}	I - III	Max.	25	50	70	10	25	50	70	mA
		II	Max.	30	60	80	15	30	60	80	
dV/dt	V_D = 67% V_{DRM}, gate open, T_j = 125 °C		Max.	40	400	1000	20	40	400	1000	V/µs
(dI/dt)c	(dV/dt)c = 0.1 V/µs, T_j = 125 °C		Min.	5.4			3.5	5.4			A/ms
	(dV/dt)c = 10 V/µs, T_j = 125 °C		Min.	2.8			1.5	2.98			
	Without snubber, T_j = 125 °C		Min.		4.5	7			4.5	7	

Notes:

(1)Minimum I_{GT} is guaranteed at 5 % of I_{GT} max.

(2)For both polarities of A2 referenced to A1

Table 3: Standard (4 quadrants)

Symbol	Parameter	Quadrant		BTA08/BTB08		Unit
				C	B	
I_{GT}(1)	V_D = 12 V, R_L =100Ω	I - II - III	Max.	25	35	mA
		IV		50	100	
V_{GT}		All	Max.	1.3		V
V_{GD}	V_D = V_{DRM}, R_L = 33 Ω, 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	
(dI/dt)c(2)	(dI/dt)c = 5.3 A/ms, T_j = 125 °C		Min.	5	10	V/µA

Notes:

(1) Minimum I_{GT} is guaranteed at 5 % of I_{GT} max.

(2) For both polarities of A2 referenced to A1

Table 4: Static electrical characteristics

Symbol	Test conditions			Value	Unit
V_{TM}(1)	I_{TM} = 11 A, t_p = 380 µs	T_j = 25 °C	Max.	1.55	V
V_{TO}(1)	threshold on-state voltage	T_j = 125 °C	Max.	0.85	V
R_D(1)	Dynamic resistance	T_j = 125 °C	Max.	50	mΩ
I_{DRM} I_{RRM}	V_{DRM} = V_{RRM}	T_j = 25 °C	Max.	5	µA
		T_j = 125 °C	Max.	1	mA

Notes:

(1)For both polarities of A2 referenced to A1

Table 5: Thermal resistance

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Max. junction to case thermal resistance (AC)		IPAK / D2PAK / DPAK / TO-220AB	1.6	°C/W
			TO-220AB Insulated	2.5	
$R_{th(j-a)}$	Junction to ambient	S(1) = 1 cm²	D²PAK	45	°C/W
		S = 1 cm²	DPAK	70	
	Junction to ambient		TO-220AB / TO-220AB Insulated	60	
			IPAK	100	

Notes:

(1)S = Copper surface under tab

Characteristics (curves)

Figure 1: Maximum power dissipation versus on-state RMS current (full cycle)

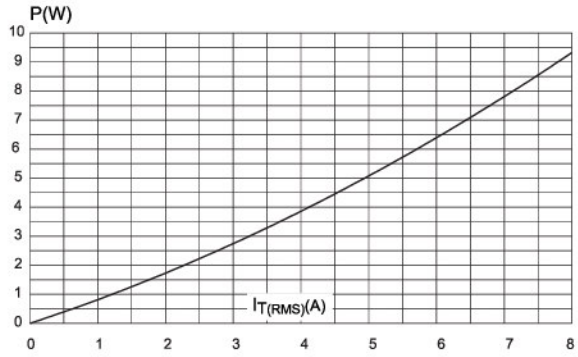


Figure 2: RMS on-state current versus temperature (full cycle)

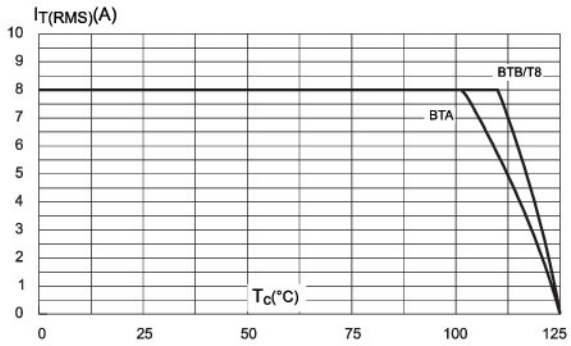


Figure 3: RMS on-state current versus ambient temperature (full cycle)

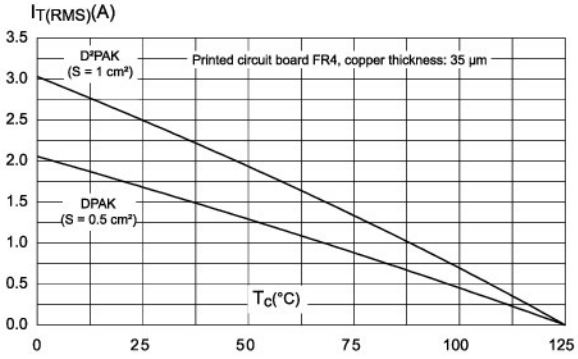


Figure 4: Relative variation of thermal impedance versus pulse duration

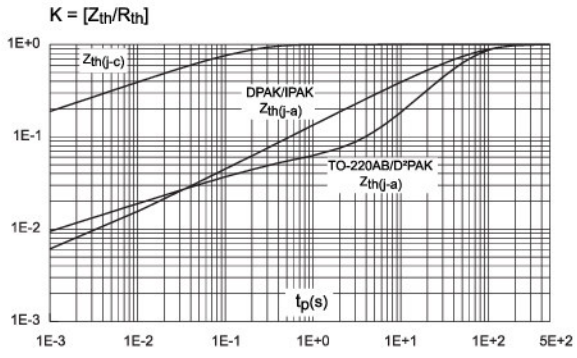


Figure 5: On-state characteristics (maximum values)

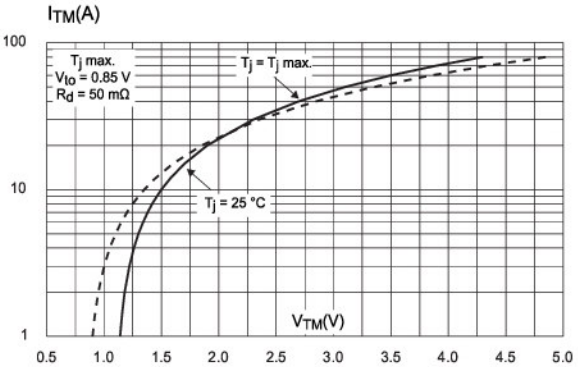


Figure 6: Surge peak on-state current versus number of cycles