

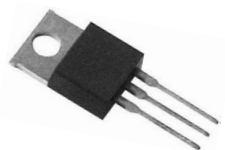
Features

Medium current Triac
Low thermal resistance with clip bonding
Low thermal resistance insulation ceramic for insulated BTA
High commutation (4Q) or very high commutation (3Q, Snubberless™) capability

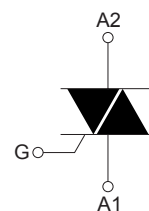
BTA series UL1557 certified (file ref: 81734)
Packages are RoHS (2002/95/EC) compliant
insulated tab (BTA series, rated at 2500 V_{RMS})

VOLTAGE 600/800 V

CURRENT 4.0 A



TO-220AB



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

ELECTRICAL CHARACTERISTICS (T_j = 25°C, unless otherwise specified)

Symbol	Parameter			Value	Unit
V _{DRM}	Repetitive peak off-state voltage			600 / 800	V
V _{RRM}	Repetitive peakreverse voltage			600 / 800	V
I _{T(RMS)}	RMS on-state current (360° conduction angle)	BTA	T _c = 90°C	4	A
		BTB	T _c = 95°C		
I _{TSM}	Non repetitive surge peak on-state current (T _j initial = 25°C)		tp = 8.3 ms	42	A
			tp = 10 ms	40	
I ² _t	I ² _t value		tp = 10 ms	8	A ² s
di/dt	Critical rate of rise of on-state current Gate supply : I _G = 50mA di _G /dt = 0.1A/μs		Repetitive F = 50 Hz	10	A/μs
			Repetitive Non	50	
T _{stg} T _j	Storage and operating junction temperature range			- 40 to + 150 - 40 to + 110	°C °C
TI	Maximum lead temperature for soldering during 10 s at 4.5 mm from case			260	°C

Symbol	Parameter	BTA / BTB04-			Unit
		400 T/D/S/A	600 T/D/S/A	700 T/D/S/A	
V _{DRM} V _{RRM}	Repetitive peak off-state voltage T _j = 110°C	400	600	700	V

Electrical Characteristics (Tj=25°C unless otherwise specified)

Symbol	Test Conditions		Quadrant		Suffix				Unit
					T	D	S	A	
I _{GT}	V _D =12V (DC) R _L =33Ω	T _j =25°C	I-II-III	MAX	5	5	10	10	mA
			IV	MAX	5	10	10	25	
V _{GT}	V _D =12V (DC) R _L =33Ω	T _j =25°C	I-II-III-IV	MAX	1.5				V
V _{GD}	V _D =V _{DRM} R _L =3.3kΩ	T _j =110°C	I-II-III-IV	MIN	0.2				V
t _{gt}	V _D =V _{DRM} I _G = 40mA dI _G /dt = 0.5A/μs	T _j =25°C	I-II-III-IV	TYP	2				μs
I _L	I _G = 1.2 I _{GT}	T _j =25°C	I-III-IV	TYP	10	10	20	20	mA
			II		20	20	40	40	
I _H *	I _T = 100mA gate open	T _j =25°C		MAX	15	15	25	25	mA
V _{TM} *	I _{TM} = 5.5A tp= 380μs	T _j =25°C		MAX	1.65				V
I _{DRM} I _{RRM}	V _{DRM} Rated V _{RRM} Rated	T _j =25°C		MAX	0.01				mA
		T _j =110°C		MAX	0.75				
dV/dt *	Linear slope up to V _D =67%V _{DRM} gate open	T _j =110°C		TYP	10	10	-	-	V/μs
				MIN	-	-	10	10	
(dV/dt) _c *	(dI/dt) _c = 1.8A/ms	T _j =110°C		TYP	1	1	5	5	V/μs

* For either polarity of electrode A2 voltage with reference to electrode A1.

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
Rth (j-a)	Junction to ambient		60	°C/W
Rth (j-c) DC	Junction to case for DC	BTA	4.4	°C/W
		BTB	3.2	
Rth (j-c) AC	Junction to case for 360° conduction angle (F= 50 Hz)	BTA	3.3	°C/W
		BTB	2.4	

GATE CHARACTERISTICS (maximum values)

PG (AV) = 1W PGM = 40W (tp = 20 μs) IGM = 4A (tp = 20 μs) VGM = 16V (tp = 20 μs).

ORDERING INFORMATION

Package	IT(RMS)	VDRM / VRRM	Sensitivity Specification			
	A	V	T	D	S	A
BTA (Insulated) BTB (Uninsulated)	4	400	X	X	X	X
		600	X	X	X	X
		700	X	X	X	X
		400	X	X	X	X
		600	X	X	X	X
		700	X	X	X	X

RATING AND CHARACTERISTIC CURVES

Fig.1 : Maximum RMS power dissipation versus RMS on-state current ($F=50\text{Hz}$).
(Curves are cut off by $(di/dt)_c$ limitation)

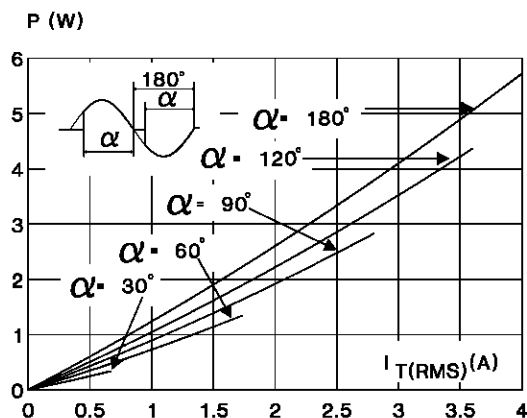


Fig.2 : Correlation between maximum RMS power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact (BTA).

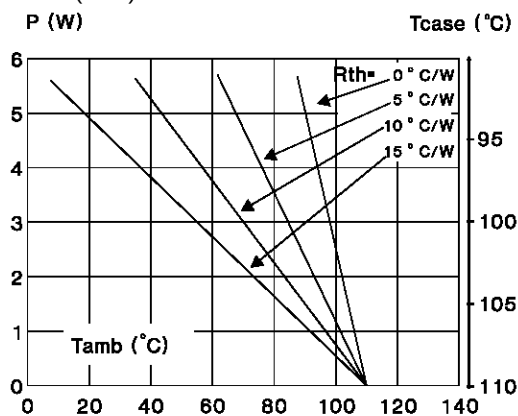


Fig.3 : Correlation between maximum RMS power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact (BTB).

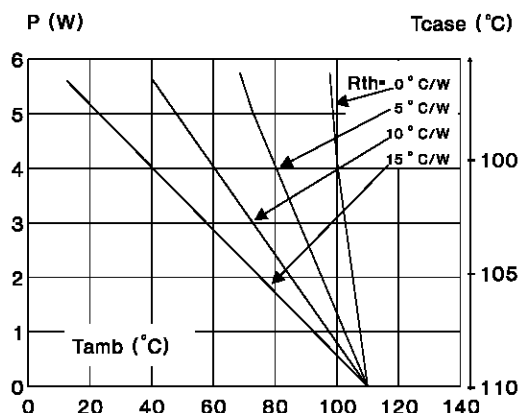


Fig.4 : RMS on-state current versus case temperature.

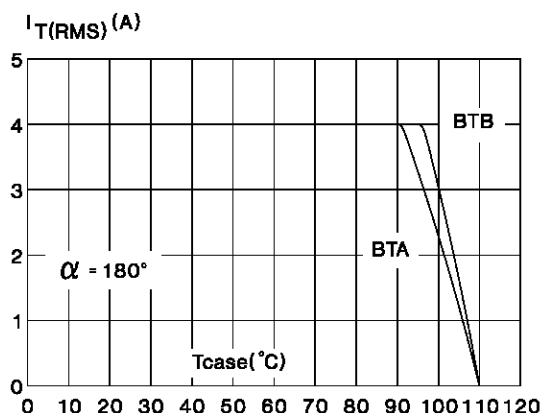


Fig.5 : Relative variation of thermal impedance versus pulse duration.

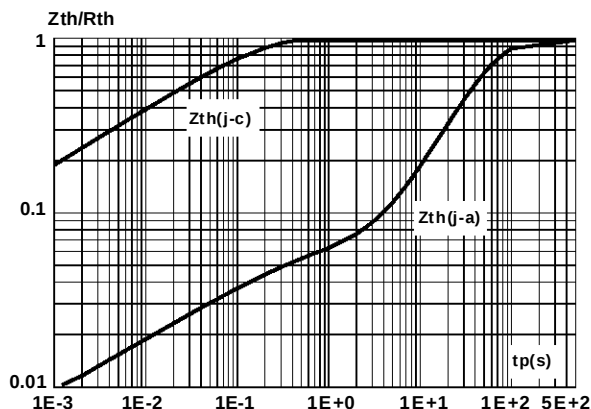
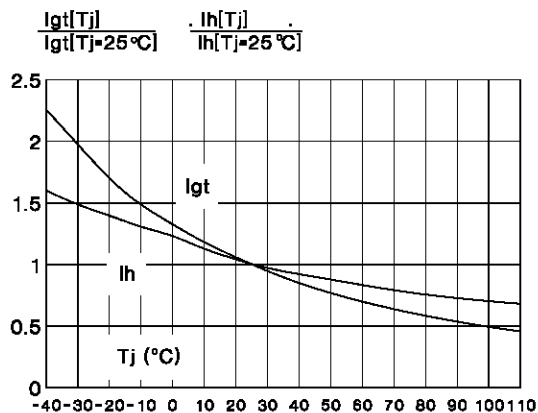


Fig.6 : Relative variation of gate trigger current and holding current versus junction temperature.



RATING AND CHARACTERISTIC CURVES

Fig.7 : Non Repetitive surge peak on-state current versus number of cycles.

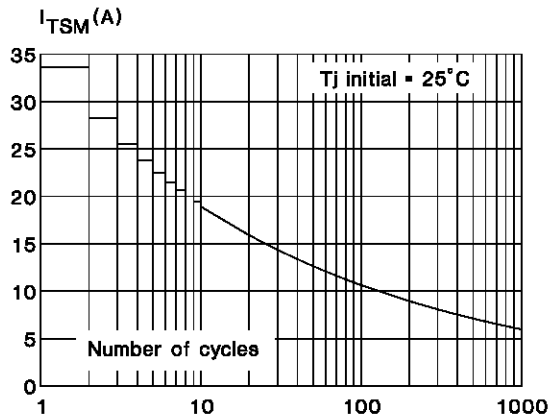


Fig.8 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : $t \leq 10\text{ms}$, and corresponding value of I^2t

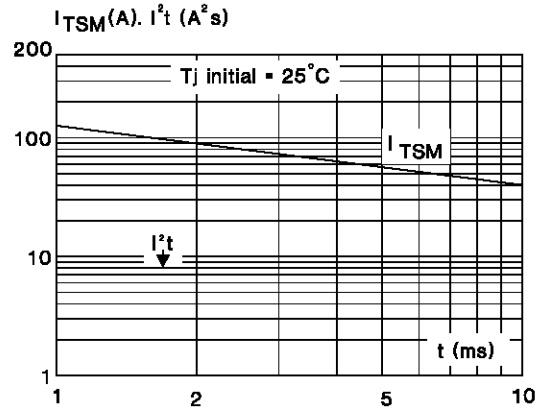
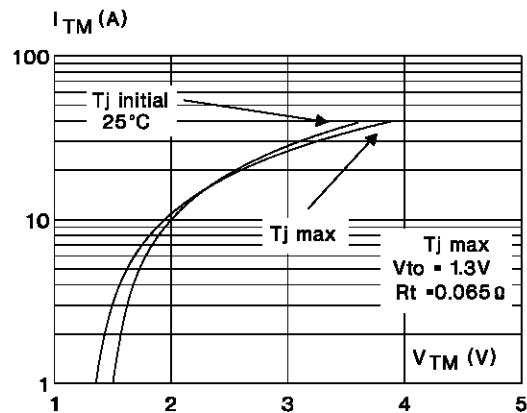
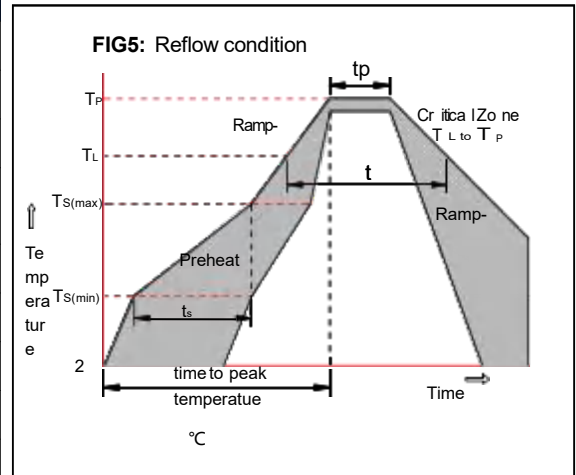


Fig.9 : On-state characteristics (maximum values).



Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C



Package Dimensions & Suggested Pad Layout

TO-220AB

