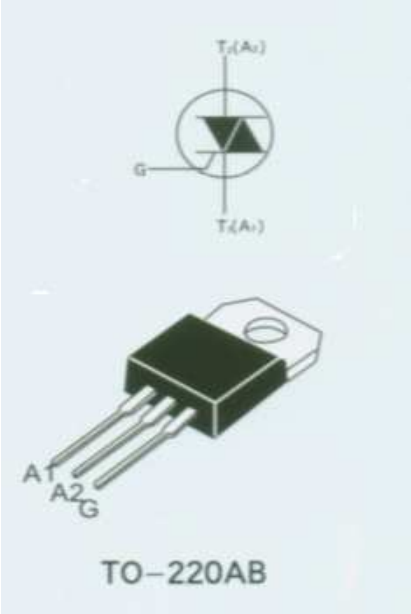
STANDARD

12A TRIACs

■ MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
$V_{(DRM)}/V_{RRM}$	600 to 800	V
$I_{GT(Q1)}$	5 to 50	mA



■ GENERAL DESCRIPTION

Available either in through-hole or surface-mount packages, the BTA/BTB12 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 in light dimmers, motor speed controllers,…

By using an internal ceramic pad, the BTA12series provides voltage insulated tab (rated at 2500V RMS)

■ ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)	TO-220AB	Tc=105℃	12	A
		TO-220AB Ins.	Tc=95℃		A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, Tj initial=25℃)	F=50Hz	t=20ms	120	A
		F=60Hz	t=16.7ms	126	
I^2T	I^2T Value for fusing	tp=10ms		78	A^2s
dI/dt	Critical rate of rise of on-state current I_G=2 × I_{GT}, tr≤100ns	F=120Hz	Tj=125℃	50	A/μs
V_{DSM}/ V_{RSM}	Non repetitive surge peak off-state voltage	tp=10ms	Tj=25℃	V_{DSM}/ V_{RSM} +100	V
I_{GM}	Peak gate current	tp=20μs	Tj=125℃	4	A
$P_{G(AV)}$	Average gate power dissipation		Tj=125℃	1	W
T_{stg}	Storage junction temperature range			-40 to+150	℃
T_j	Operating junction temperature range			-40 to+125	

■ STATIC CHARACTERISTICS

Tj=25℃ unless otherwise stated

Symbol	Test Conditions	Quadrant		Value		Unit
				C	B	
I_{GT}(1)	V_D=12V R_L=30Ω	I-II-III	MAX.	25	50	mA
		IV		50	100	
V_{GT}		ALL	MAX.	1.5		V
V_{GD}	V_D=V_{DRM} R_L=3.3KΩ Tj=125℃	ALL	MIN.	0.2		V
I_H(2)	I_T=500mA		MAX.	25	50	mA
I_L	I_G=1.2I_{GT}	I-III-IV	MAX.	40	50	mA
		II		80	100	
V_{TM}(2)	I_{TM}=17A tp=380μs	Tj=25℃	MAX.	1.6		V
V_{t0}(2)	Threshold voltage	Tj=125℃	MAX.	0.85		V
R_d(2)	Dynamic resistance	Tj=125℃	MAX.	35		mΩ
I_{DRM}	V_{DRM}=V_{RRM}	Tj=25℃	MAX.	100		μA
I_{RRM}		Tj=125℃		1		mA

■ DYNAMIC CHARACTERISTICS

Symbol	Test Condition		C	B	Unit
dV/dt(2)	V_D=67% V_{DRM} gate open Tj=125℃	MIN.	200	400	V/μs
(dV/dt)c(2)	(dI/dt)c=5.3A/ms Tj=125℃	MIN.	5	10	V/μs

Note1: minimum I_{GT} is guaranteed at 5% of I_{GT} max.

Note2: for both polarities of A2 referenced to A1.

■ THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to case (AC)	TO-220AB	1.4	℃/W
		TO-220AB Insulated	2.3	
$R_{th(j-a)}$	Junction to ambient	TO-220AB	60	℃/W
		TO-220AB Insulated		

PERFORMANCE CURVES

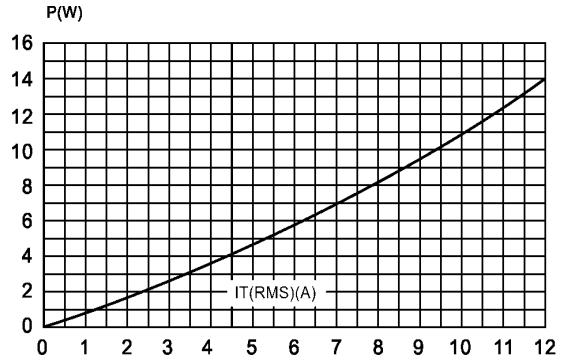


Fig.1. Maximum power dissipation versus RMS on-state current (full cycle)

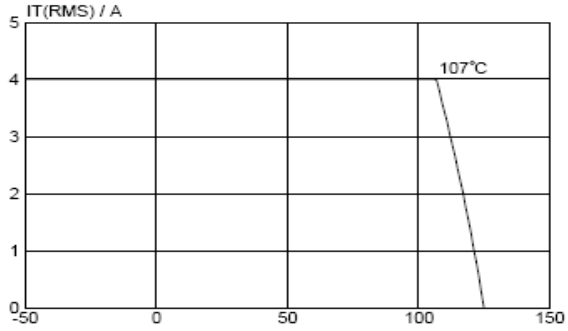


Fig.4. RMS on-state current versus case temperature (full cycle)

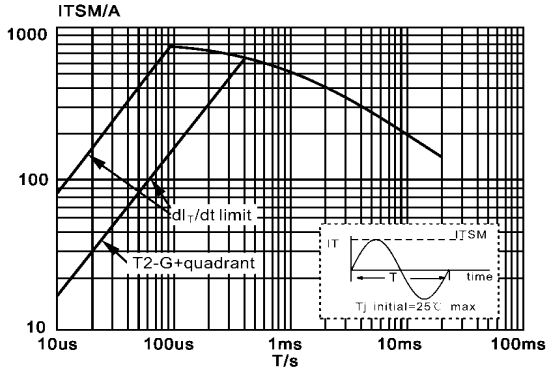


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM} versus pulse width t_p, for sinusoidal currents, $t_p \leqslant 20ms$

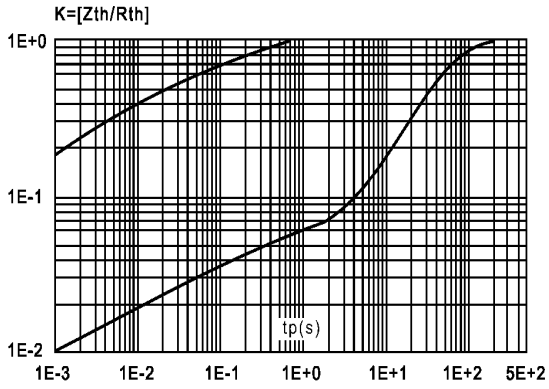


Fig.5. Relative variation of thermal impedance versus pulse duration

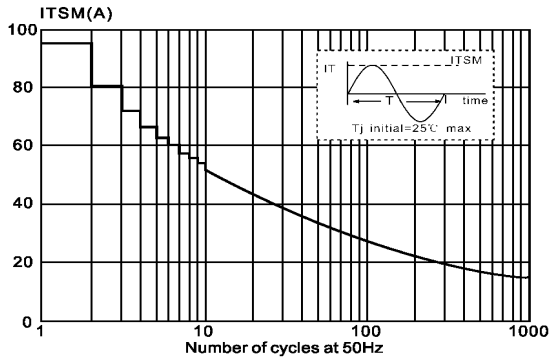


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM} versus number of cycles, for sinusoidal currents, f=50Hz

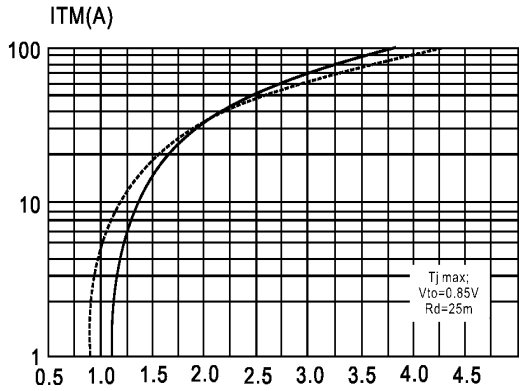


Fig.6. On-state characteristics (maximum values),

PERFORMANCE CURVES

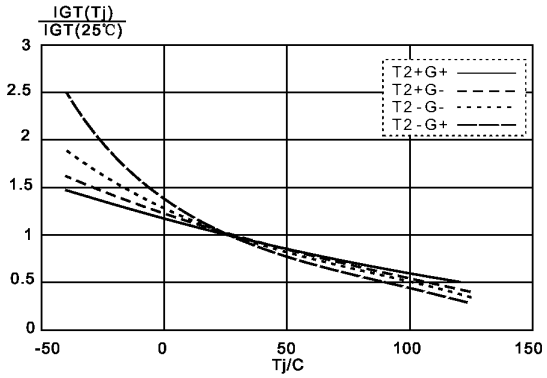


Fig.7. Normalized gate trigger current $I_{GT}(T_j)/I_{GT}(25^oC)$, versus junction temperature T_j

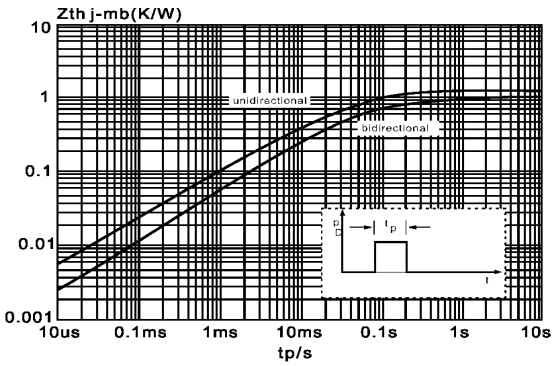


Fig.10. Transient thermal impedance $Z_{th\ j\text{-}mb}$, versus pulse width t_p

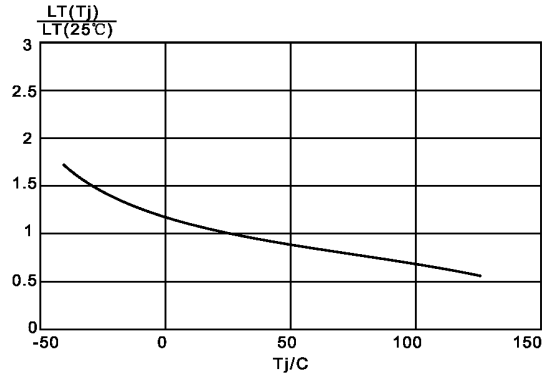


Fig.8. Normalized latching current $I_L(T_j)/I_L(25^oC)$, versus junction temperature T_j

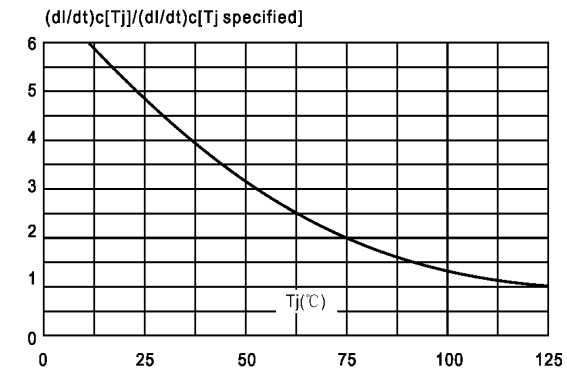


Fig.11. Relative variation of critical rate of decrease of main current versus junction temperature T_j

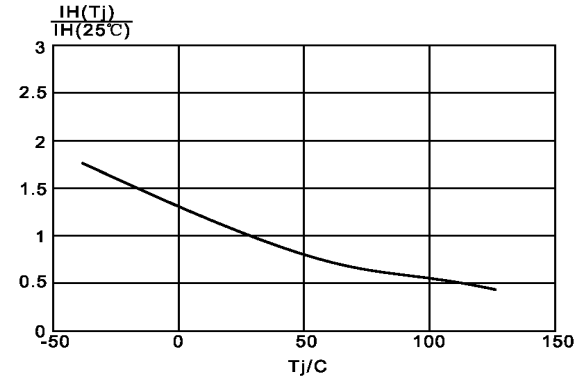


Fig.9. Normalized holding current $I_H(T_j)/I_H(25^oC)$, versus junction temperature T_j

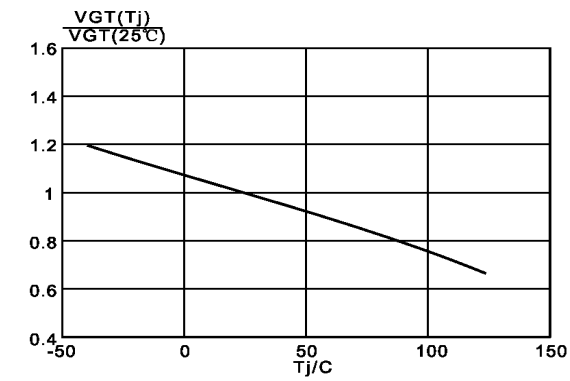
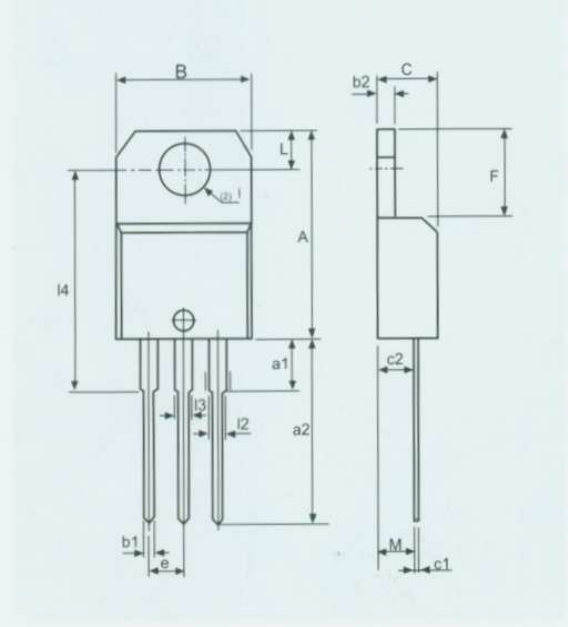


Fig.12. Normalized gate trigger voltage $V_{GT}(T_j)/I_{GT}(25^oC)$, versus junction temperature T_j

PACKAGE MECHANICAL DATA

TO-220AB/TO-220AB Ins.



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
I	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	