Four quadrant Triacs BTA12 800B

1、Description

Glass passivated high commutation triacs in a full pack, plastic envelope intended for use in circuits where high static and dynamic dV/dt and high dI/dt can occur. These devices will commutate the full rated rms current at the maximum rated junction temperature, without the aid of a snubber.

2、Applications

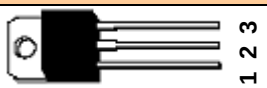
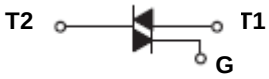
Typical applications include motor control, industrial and domestic lighting, heating and static switching.

- Heating regulation
- Motor control
- Phase control

3、Features

- Blocking voltage to 800 V
- On-state RMS current to 12A
- Ultra low gate trigger current
- Low cost package.

4、Pinning information

PIN	Description	Simplified outline	Symbol
1	main terminal 1 (T1)	 TO-220	
2	main terminal 2 (T2)		
3	gate (G)		
tab	main terminal		

5、Quick reference data

SYMBOL	PARAMETER	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state voltages	800	V
$I_{T(RMS)}$	RMS on-state current	12	A
I_{TSM}	Non-repetitive peak on-state current	90	A

6、Thermal characteristics

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$R_{th\ j\text{-}mb}$	Thermal resistance junction to mounting base	full cycle	-	-	1.5	K/W
		half cycle	-	-	2.0	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air		60	-	K/W

7、Limiting value

Limiting values in accordance with the Maximum System(IEC 134).

SYMBOL	PARAMETER	CONDITIONS		MIN	MAX	UNIT
V_{DRM} V_{RRM}	Repetitive peak off-state voltages			-	800	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; T_{mb} <= 102 °C		-	12	A
	Non-repetitive peak on-state current	full sine wave; T_j = 25 °C prior to surge	t = 20 ms	-	90	A
			t = 16.7 ms	-	105	A
I^2t	I^2t for fusing	t = 10 ms		-	45	A^2s
dI_T/dt	Repetitive rate of rise of on-state current after triggering	I_{TM} = 12 A; IG = 0.2 A; DI_G/dt = 0.2 A/s				
			T2+ G+	-	100	A/μs
			T2+ G-	-	100	A/μs
			T2- G-	-	100	A/μs
I_{GM}	Peak gate current			-	2	A
V_{GM}	Peak gate voltage			-	8	V
P_{GM}	Peak gate power			-	16	W
$P_{G(AV)}$	Average gate power	over any 20 ms period		-	0.35	W
T_{stg}	Storage temperature			-40	150	°C
T_j	Junction temperature			-40	125	°C

8、Characteristics

T_J = 25℃ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNIT
Static characteristics							
I_{GT}	Gate trigger current	V_D = 12 V; I_T = 0.1A	T2+ G+		-	50	mA
			T2+ G-	-	-	50	mA
			T2- G-		-	50	mA
			T2- G+		-	75	mA
I_L	Latching current	V_D = 12 V; I_{GT} = 0.1A	T2+ G+			50	mA
			T2+ G-	-		50	mA
			T2- G-	-		100	mA
			T2- G+	-		100	mA
I_H	Holding current	V_D = 12 V; I_{GT} = 0.15A		-	30	50	mA
V_T	On-state voltage	I_T = 17A		-	-	1.85	V
V_{GT}	Gate trigger voltage	V_D = 12 V; I_T = 0.1A	T2+ G+	0.5	0.80	1.5	V
			T2+ G-	0.5	0.78	1.5	V
			T2- G-	0.5	0.70	1.5	V
			T2- G+	0.5	0.71	1.5	V
Dynamic Characteristics							
dV_D/dt	Critical rate of rise of off-state voltage	V_{DM} = 67% $V_{DRM(max)}$; T_j = 125 °C; Exponential wave form; gate open circuit		250	500	-	V/μs
dI_{com}/dt	Critical rate of change of commutating current	V_D = 400 V; T_j = 125 °C $I_{T(RMS)}$=4.4A; Commutating dv/dt = 18 V/ s, Without snubber; gate open circuit		6.5	-	-	A/ms
dI/dt	Repetitive Critical Rate of Rise of On-State Current	I_{PK} = 50 A; PW = 40 sec; di_G/dt = 200 mA/ sec; f = 60 Hz		-	-	10	A/μs

CST

9、Electrical Characteristics Curve

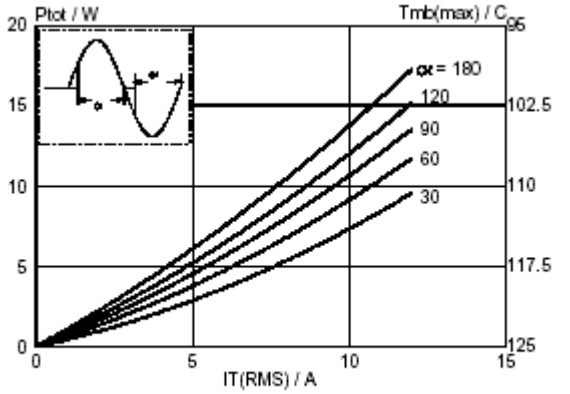


Fig.1. Maximum on-state dissipation, P_{tot}, versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

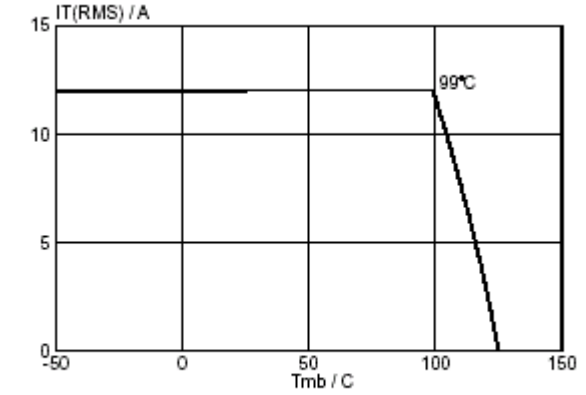


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb}.

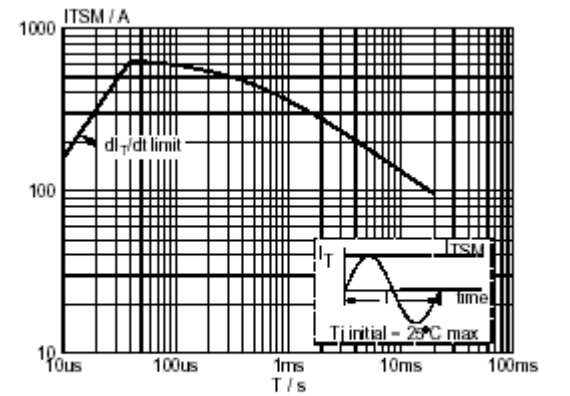


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus pulse width t_p, for sinusoidal currents, $t_p \leq 20ms$.

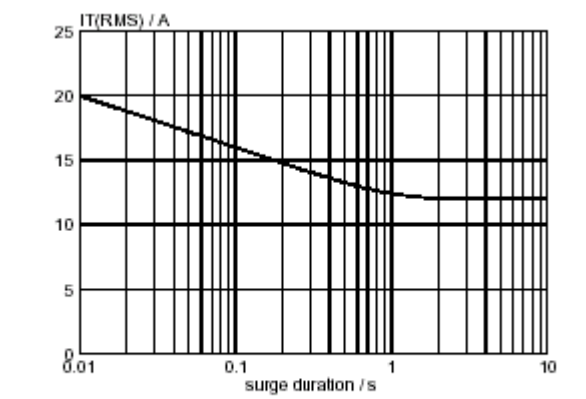


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, f = 50 Hz; $T_{mb} \leq 99°C$.

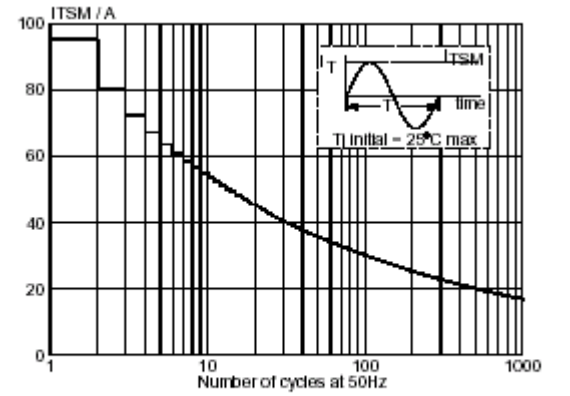


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for sinusoidal currents, f = 50 Hz.

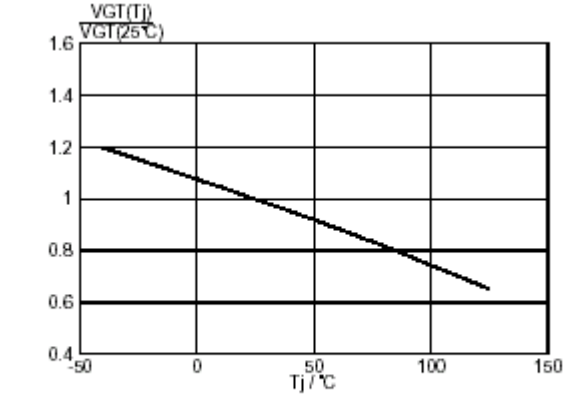


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/ V_{GT}(25°C)$, versus junction temperature T_j

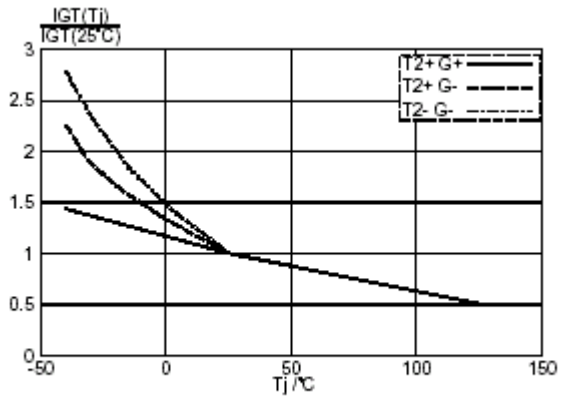


Fig.7. Normalised gate trigger current $I_{GT}(T_j)/I_{GT}(25°C)$, versus junction temperature T_j.

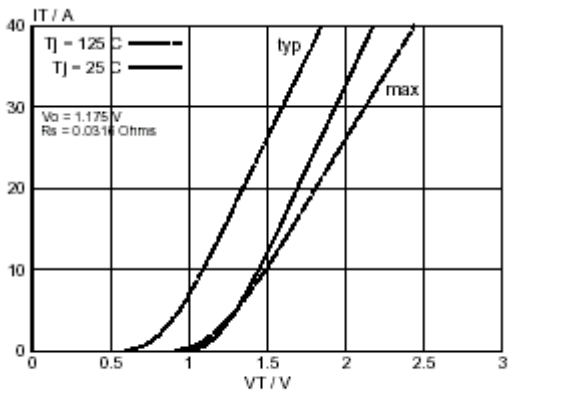


Fig.10. Typical and maximum on-state characteristic.

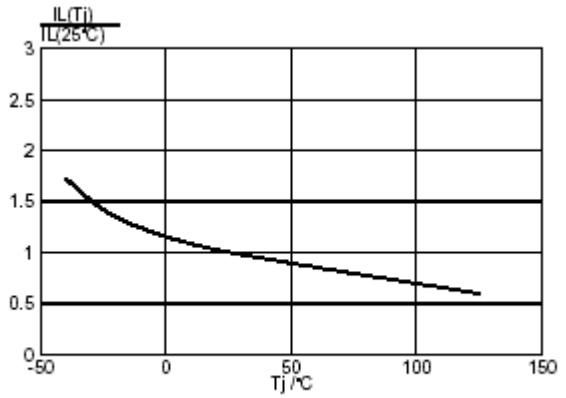


Fig.8. Normalised latching current $I_L(T_j)/ I_L(25°C)$, versus junction temperature T_j.

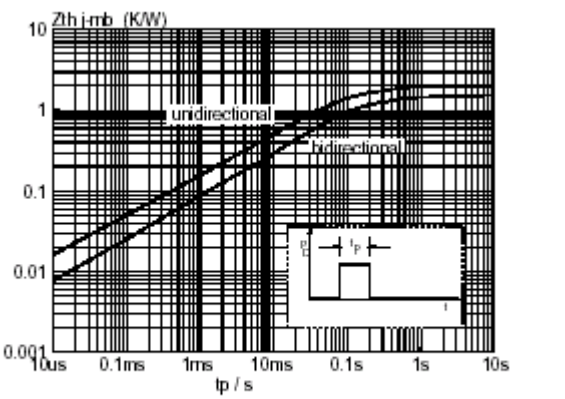


Fig.11. Transient thermal impedance $Z_{th\ j\text{-}mb}$ versus pulse width t_p.

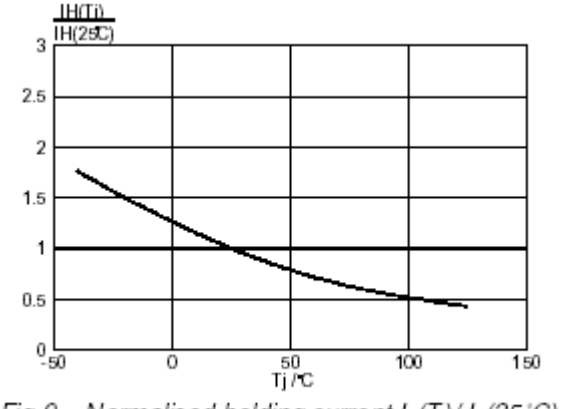


Fig.9. Normalised holding current $I_H(T_j)/ I_H(25°C)$, versus junction temperature T_j.

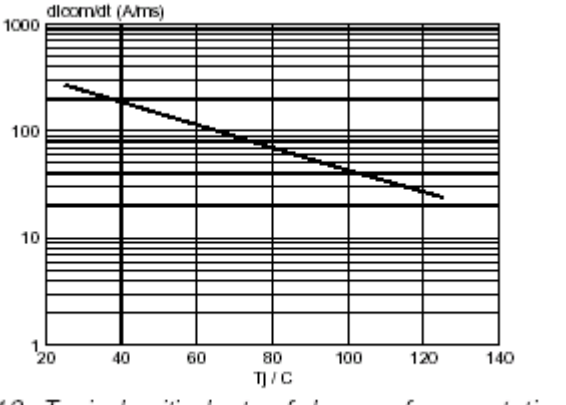
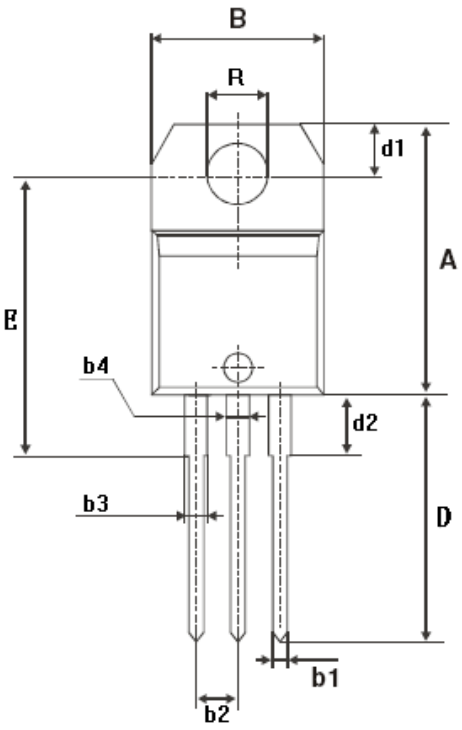
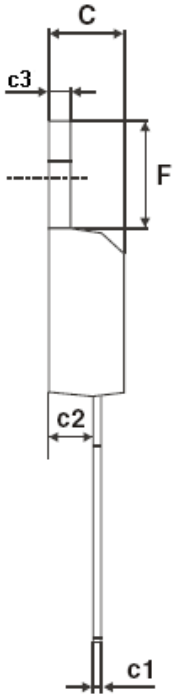


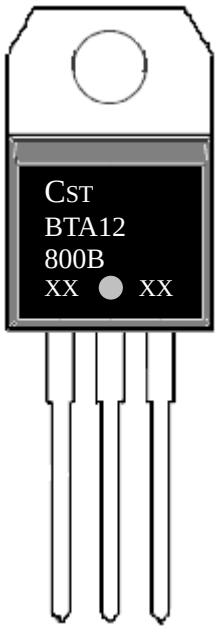
Fig.12. Typical, critical rate of change of commutating current dI_{com}/dt versus junction temperature.

10、Package outline (TO-220I)





Marking:



DIM	Inches			Milimeters		
	Min	Type	Max	Min	Type	Max
A	0.591	-	0.646	15.00	-	16.40
B	0.386	-	0.409	9.80	-	10.40
C	0.160	-	0.190	4.07	-	4.82
D	0.500	-	0.562	12.70	-	14.27
E	-	0.640	-	-	16.25	-
F	0.248	-	0.271	6.29	-	6.89
R	0.140	-	0.156	3.56	-	3.96
b1	0.030	-	0.037	0.75	-	0.95
b2	0.095	-	0.105	2.42	-	2.66
b3	0.046	-	0.054	1.17	-	1.37
b4	0.046	-	0.054	1.17	-	1.37
c1	0.017	-	0.023	0.42	-	0.58
c2	0.091	-	0.115	2.32	-	2.92
c3	0.045	-	0.055	1.15	-	1.39
d1	0.100	-	0.120	2.54	-	3.04
d2	0.125	-	0.155	3.18	-	3.93