

## 1、Description

BTB12 series triacs, with high ability to withstand the shock loading of large current, provide high dv/dt rate with strong resistance to electromagnetic interference. With high commutation performances, 3 quadrant products especially recommended for use on inductive load.

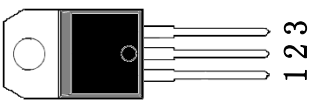
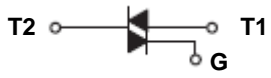
## 2、Applications

- Motor control
- Industrial and domestic lighting
- Heating
- Static switching

## 3、Features

- Blocking voltage to 600 V
- On-state RMS current to 12 A
- Ultra low gate trigger current
- Low cost package.

## 4、Pinning information

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

## 5、Quick reference data

SYMBOL	PARAMETER	MAX	UNIT
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltages	600	V
$I_{T(RMS)}$	RMS on-state current	12	A
$I_{TSM}$	Non-repetitive peak on-state current	95	A

## 6、Thermal characteristics

SYMBOL	PARAMETER	Value	UNIT	
$R_{th(j-c)}$	junction to case(AC)	TO-220B	3.0	°C/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		-	600	V
$I_{T(RMS)}$	RMS on-state current	Full Cycle Sine Wave 50 to 60 Hz (TC = 90°C)	-	12	A
$I_{TSM}$	Non-repetitive peak Surge current	One Full cycle, 60 Hz, $T_J = +110^\circ\text{C}$	-	95	A
$I^2t$	$I^2t$ for fusing	$t = 8.3\text{ms}$	-	45	$\text{A}^2\text{s}$
$I_{GM}$	Peak gate current	Pulse Width $\leq 1.0 \mu\text{s}$ , TC = 85°C	-	2	A
$P_{GM}$	Peak gate power	Pulse Width $\leq 1.0 \mu\text{s}$ , TC = 85°C	-	5	W
$P_{G(AV)}$	Average gate power	Pulse Width $\leq 1.0 \mu\text{s}$ , TC = 85°C	-	0.5	W
$T_{stg}$	Storage temperature		-40	150	°C
$T_J$	Operating junction temperature		-40	125	°C

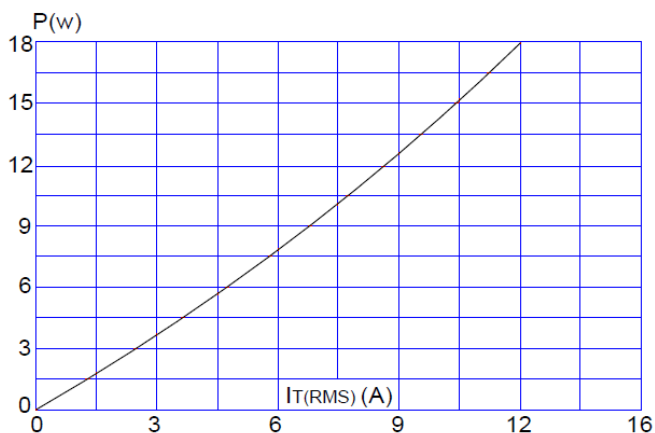
## 8、Characteristics

$T_J = 25^\circ\text{C}$  unless otherwise stated

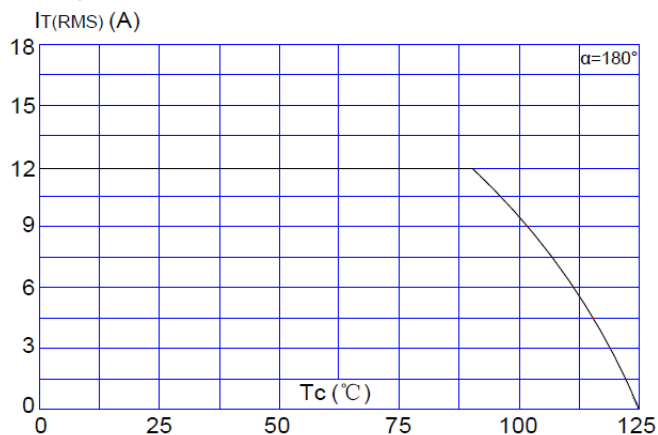
SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
<b>Static characteristics</b>						
$I_{GT}$	Gate trigger current	$V_D = 12 \text{ V}$ ; $I_T = 0.1\text{A}$ T2+ G+ T2+ G- T2- G-	-	-	35	mA mA mA
$I_L$	Latching current	$V_D = 12 \text{ V}$ ; $I_{GT} = 0.1\text{A}$ T2+ G+ T2+ G- T2- G-	-	-	50 60 50	mA mA mA
$I_H$	Holding current	Main Terminal Voltage = 12 Vdc, Gate Open, Initiating Current $\leq 1 \text{ Adc}$ $T_J = 25^\circ\text{C}$	-	-	40	mA
$V_{TM}$	On-state voltage	$I_{TM} = 15\text{A}$ , $t_p = 380\mu\text{s}$	-	-	1.65	V
$V_{GT}$	Gate trigger voltage (Continuous dc)	Main Terminal Voltage = 12 Vdc, $R_L = 100 \text{ Ohms}$ , $T_J = -40^\circ\text{C}$ All Quadrants	-	-	1.5	V
$V_{GD}$	Gate Non-Trigger Voltage	$V_D = V_{DRM}$ $T_J = 125^\circ\text{C}$ $R_L = 3.3\text{K}\Omega$	0.2	-	-	V
<b>Dynamic Characteristics</b>						
dV/dt	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)}$ ; $T_J = 125^\circ\text{C}$ ; Exponential wave form; $R_{GK} = 1\text{K}\Omega$	200	-	-	V/ $\mu\text{s}$

9. Electrical Characteristics Curve

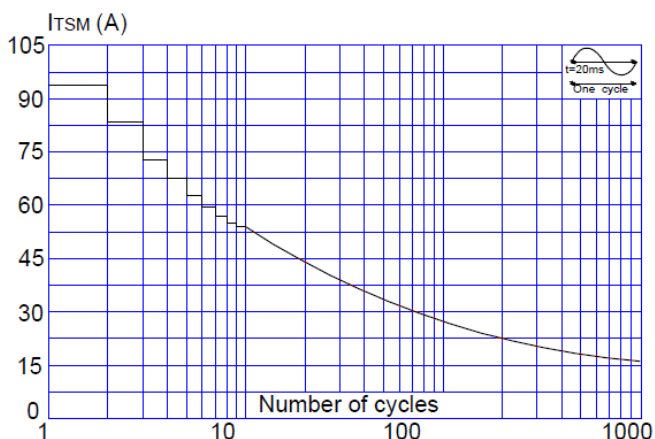
**FIG.1** Maximum power dissipation versus RMS on-state current



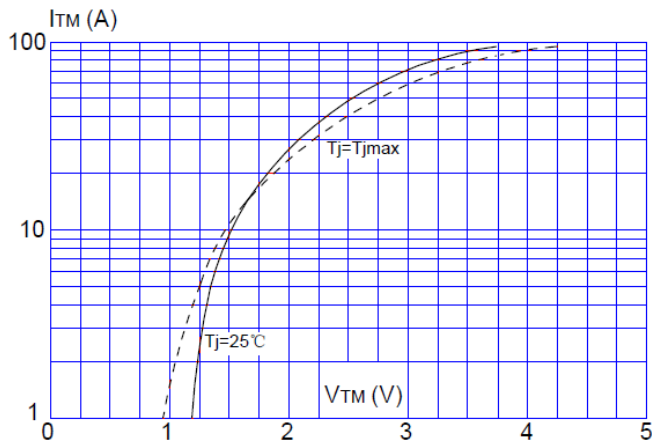
**FIG.2:** RMS on-state current versus case temperature



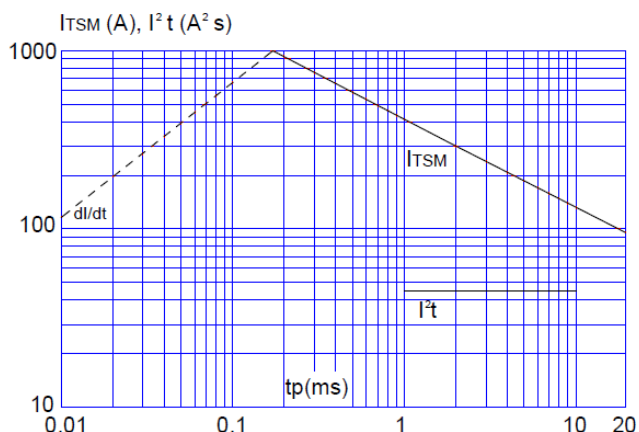
**FIG.3:** Surge peak on-state current versus number of cycles



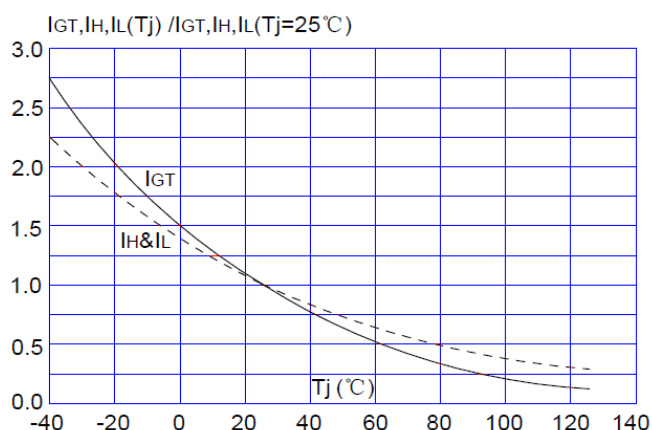
**FIG.4:** On-state characteristics (maximum values)



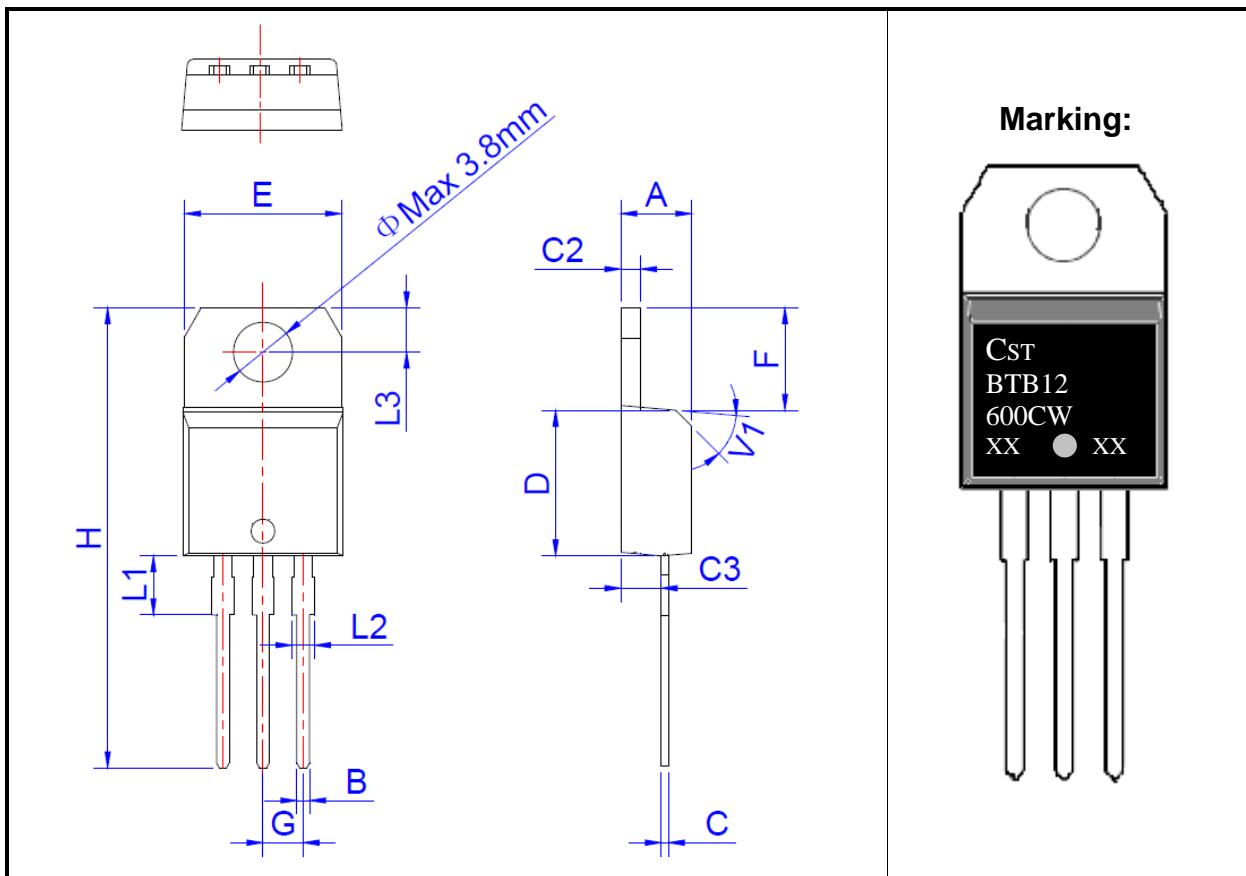
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 50\text{A}/\mu\text{s}$ )



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature



10、 Package outline (TO-220B Non-Ins)



DIM	Milimeters			Inches		
	Min	Type	Max	Min	Type	Max
A	4.40	-	4.60	0.173	-	0.181
B	0.71	-	0.91	0.028	-	0.036
C	0.40	-	0.65	0.016	-	0.026
C2	1.25	-	1.35	0.049	-	0.053
C3	2.40	-	2.72	0.094	-	0.107
D	8.60	-	9.70	0.339	-	0.382
E	9.60	-	10.4	0.378	-	0.409
F	6.20	-	6.60	0.244	-	0.260
G		2.54			0.1	
H	28.0	-	29.8	1.102	-	1.173
L1		3.75			0.148	
L2	1.14	-	1.70	0.045	-	0.067
L3	2.65	-	2.95	0.104	-	0.116
V1		45°			45°	