



## BTA12/BTB12 Series 12A TRIACs

### DESCRIPTION:

High current density due to double mesa technology; SIPOS and Glass Passivation.

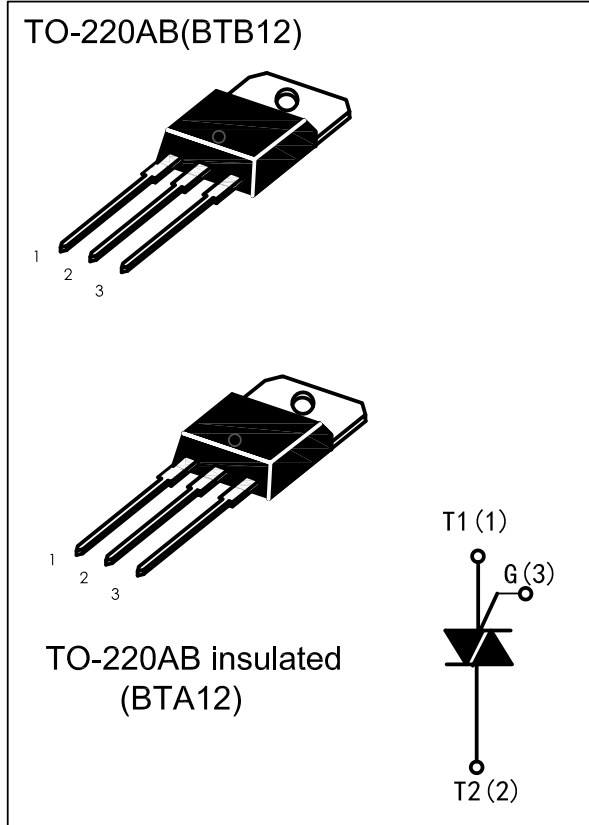
BTA12/BTB12 series triacs is suitable for general purpose AC switching. They can be used as an ON/OFF Function in applications such as static relays, heating regulation, induction motor starting circuits... or for phase control operation light dimmers, motorspeed controllers.

BTA12/BTB12- $\times\times\times$ TW、 $-\times\times\times$ SW、 $-\times\times\times$ CW、 $-\times\times\times$ BW are 3 Quadrants triacs, They are specially recommended for use on inductive loads.

BTA12 are isolated internally, they provides a 2500V RMS isolation voltage from all three terminals to external heatsink.

### MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
$V_{DRM}/V_{RRM}$	600and800	V
$V_{TM}$	$\leq 1.55$	V



### ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Storage junction temperature range	Tstg	-40 to +150	°C
Operating junction temperature range	Tj	-40 to +125	°C
Repetitive Peak Off-state Voltage	$V_{DRM}$	600and800	V
Repetitive Peak Reverse Voltage	$V_{RRM}$	600and800	V
Non repetitive Surge Peak Off-state Voltage	$V_{DSM}$	700and900	V
Non repetitive Peak Reverse Voltage	$V_{RSM}$	700and900	V
RMS on-state current (full sine wave)	TO-220AB Tc=105°C	12	A
	TO-220AB Ins Tc=90°C		
Non repetitive surge peak on-state current (full cycle, Tj=25°C)	f = 50 Hz t=20ms	120	A
	f = 60 Hz t=16.7ms		
I <sup>2</sup> t Value for fusing tp=10ms	I <sup>2</sup> t	78	A <sup>2</sup> s
Critical rate of rise of on-state current IG=2×IGT, tr≤100 ns, f=120Hz, Tj=125°C	di/dt	50	A/us
Peak gate current tp=20us, Tj=125°C	IGM	4	A
Average gate power dissipation Tj=125°C	PG(AV)	1	W

ELECTRICAL CHARACTERISTICS(T<sub>j</sub>=25°C unless otherwise specified)

## ● 3 Quadrants

Symbol	Test Condition	Quadrant		BTA12/BTB12				Unit
				TW	SW	CW	BW	
IGT	V <sub>D</sub> =12V R <sub>L</sub> =30Ω	I - II - III	MAX.	5	10	35	50	mA
VGT		I - II - III	MAX.	1.3				V
VGD	V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3KΩ T <sub>j</sub> =125°C	I - II - III	MIN..	0.2				V
IL	I <sub>G</sub> =1.2I <sub>GT</sub>	I - III	MAX.	10	25	50	70	mA
		II		15	30	60	80	
IH	I <sub>T</sub> =100mA		MAX.	10	15	35	50	mA
dV/dt	V <sub>D</sub> =67%V <sub>DRM</sub> gate open T <sub>j</sub> =125°C		MIN.	20	40	500	1000	V/μs
(dI/dt) <sub>c</sub>	(dV/dt) c=0.1V/μs T <sub>j</sub> =125°C		MIN.	3.5	6.5	---	---	A/ms
	(dV/dt) c=10V/μs T <sub>j</sub> =125°C			1.0	2.9	---	---	
	Without snubber T <sub>j</sub> =125°C			---	---	6.5	12	

## ● 4 Quadrants

Symbol	Test Condition	Quadrant		BTA12/BTB12		Unit
				C	B	
IGT	V <sub>D</sub> =12V R <sub>L</sub> =30Ω	I - II - III IV	MAX.	25 50	50 100	mA
VGT		ALL	MAX.	1.3		V
VGD	V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3KΩ T <sub>j</sub> =125°C	ALL	MIN.	0.2		v
IL	I <sub>G</sub> =1.2I <sub>GT</sub>	I - III - IV	MAX.	40	50	mA
		II		80	100	
IH	I <sub>T</sub> =100mA		MAX.	25	50	mA
dV/dt	V <sub>D</sub> =67%V <sub>DRM</sub> gate open T <sub>j</sub> =125°C		MIN.	200	400	V/μs
(dI/dt) <sub>c</sub>	(dV/dt) c=0.1V/μs T <sub>j</sub> =125°C		MIN.	---	---	
	(dV/dt) c=10V/μs T <sub>j</sub> =125°C			---	---	
	Without snubber T <sub>j</sub> =125°C			---	---	

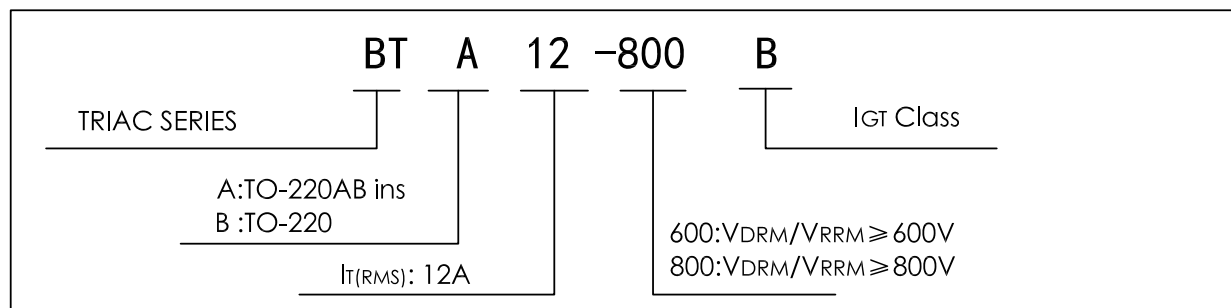
## STATIC CHARACTERISTICS

Symbol	Test Conditions		Value (MAX)	Unit
$V_{TM}$	$I_{TM}=17A$ , $t_p=380\mu s$	$T_j=25^\circ C$	1.55	V
$I_{DRM}$	$V_D=V_{DRM}$	$T_j=25^\circ C$	5	$\mu A$
$I_{RRM}$	$V_R=V_{RRM}$	$T_j=125^\circ C$	1	mA

## THERMAL RESISTANCES

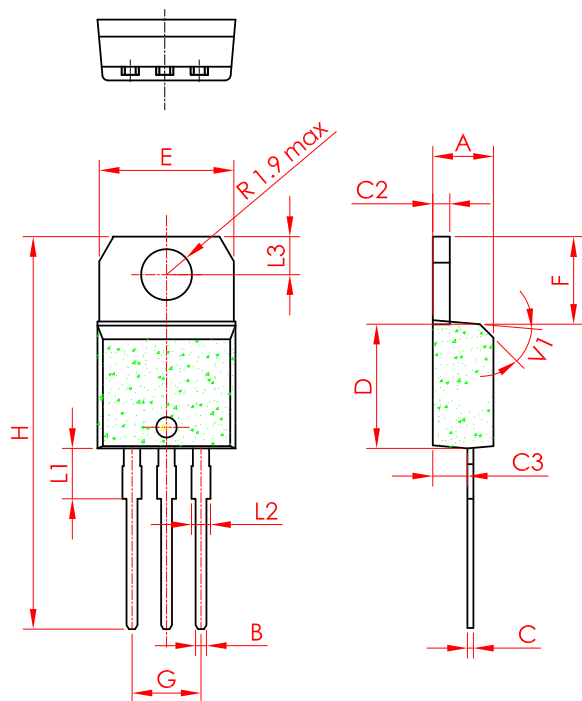
Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case (AC)	TO-220AB	1.4	$^\circ C/W$
		TO-220AB Insulated	2.3	

## ORDERING INFORMATION



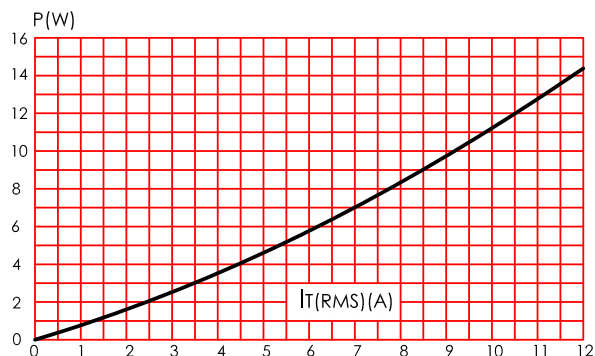
PACKAGE MECHANICAL DATA

TO-220AB

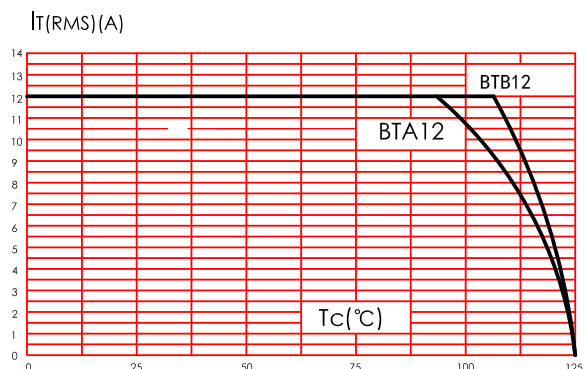


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4		4.6	0.173		1.181
B	0.61		0.88	0.024		0.034
C	0.49		0.70	0.019		0.027
C2	1.23		1.32	0.048		0.051
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.338		0.382
E	10		10.4	0.393		0.409
F	6.2		6.6	0.244		0.259
G	4.8		5.4	0.189		0.213
H	28.0		29.8	11.0		11.7
L1		3.75			0.147	
L2	1.14		1.7	0.044		0.066
L3	2.65		2.95	0.104		0.116
V1		40°			40°	

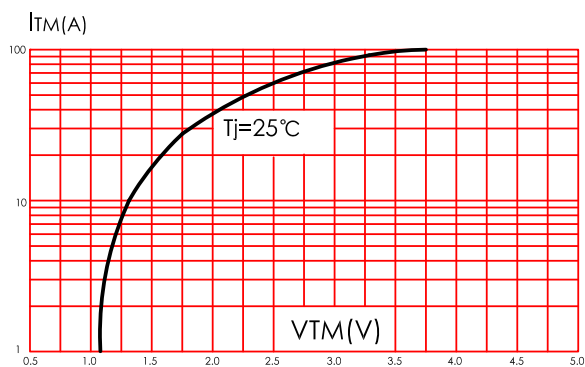
**Fig. 1:** Maximum power dissipation versus RMS on-state current(full cycle)



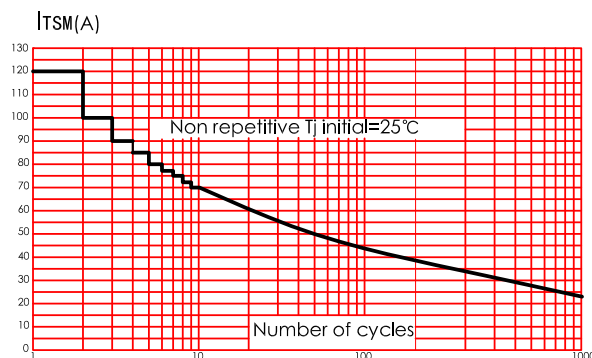
**Fig. 2:** RMS on-state current versus case temperature(full cycle)



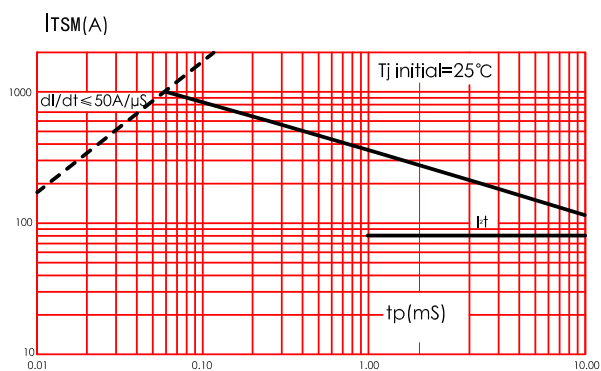
**Fig. 3:** on-state characteristics (maximum values)



**Fig. 4:** Surge peak on-state current versus number of cycles



**Fig. 5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$



**Fig. 6:** Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)

