



## Jiangsu Weida Semiconductor Co., Ltd.

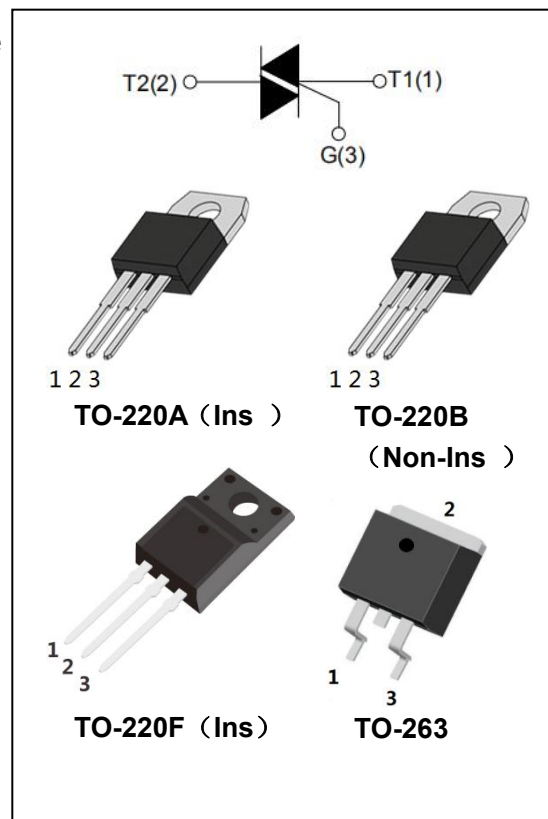
### BTA12/BTB12 Series 12A Triacs

#### DESCRIPTION:

With high ability to withstand the shock loading of Large current, BTA12/BTB12 series triacs provide high dv/dt rate with strong resistance to electromagnetic interface. With high commutation performances, 3 quadrants products especially recommended for use on inductive load. From all three terminals to external heatsink, BTA12 provides a rated insulation voltage of 2500 V<sub>RMS</sub> complying with UL standards (File ref: E516503).

#### MAIN FEATURES:

symbol	value	unit
$I_{T(RMS)}$	12	A
$V_{DRM}/V_{RRM}$	600/800/1200	V
$V_{TM}$	≤1.5	V



#### ABSOLUTE MAXIMUM RATINGS:

Parameter	Symbol	Value	Unit
Storage junction temperature range	$T_{stg}$	-40~150	°C
Operating junction temperature range	$T_j$	-40~125	°C
Repetitive peak off-state voltage ( $T_j=25^\circ\text{C}$ )	$V_{DRM}$	600/800/1200	V
Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )	$V_{RRM}$	600/800/1200	V
RMS on-state current	$I_{T(RMS)}$	12	A
Non repetitive surge peak on-state current (full cycle, F=50Hz)	$I_{TSM}$	120	A
$I^2t$ value for fusing ( $t_p=10\text{ms}$ )	$I^2t$	78	A <sup>2</sup> s
Critical rate of rise of on-state current( $I_G=2\times I_{GT}$ )	$di/dt$	50	A/ $\mu\text{s}$
Peak gate current	$I_{GM}$	4	A
Average gate power dissipation	$P_{G(AV)}$	1	W
Peak gate power	$P_{GM}$	5	W



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**ELECTRICAL CHARACTERISTICS** ( $T_j=25^\circ\text{C}$  unless otherwise specified)

#### 3 Quadrants:

Parameter	Test Condition	Quadrant		Value				Unit
				TW	SW	CW	BW	
$I_{GT}$	$V_D=12\text{V}$ , $R_L=33\Omega$	I - II - III	MAX	5	10	35	50	mA
$V_{GT}$				1.5				V
$V_{GD}$	$V_D=V_{DRM}$	I - II - III	MIN	0.2				V
$I_H$	$I_T=100\text{mA}$		MAX	5	10	40	60	mA
$I_L$	$I_G=1.2I_{GT}$	I - III	MAX	20	30	50	70	mA
		II		25	40	60	80	
dV/dt	$V_D=2/3V_{DRM}$ $T_j=125^\circ\text{C}$ Gate open		MIN	100	200	500	1000	V/ $\mu\text{s}$

#### 4 Quadrants:

Parameter	Test Condition	Quadrant		Value		Unit
				C	B	
$I_{GT}$	$V_D=12\text{V}$ , $R_L=33\Omega$	I - II - III	MAX	25	50	mA
		IV		50	70	mA
$V_{GT}$		ALL		1.5		V
$V_{GD}$	$V_D=V_{DRM}$	ALL	MIN	0.2		V
$I_H$	$I_T=100\text{mA}$		MAX	40	60	mA
$I_L$	$I_G=1.2I_{GT}$	I - III - IV	MAX	50	70	mA
		II		70	90	
dV/dt	$V_D=2/3V_{DRM}$ $T_j=125^\circ\text{C}$ Gate open		MIN	200	500	V/ $\mu\text{s}$



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### STATIC CHARACTERISTICS

Symbol	Test Condition			Value	Unit
$V_{TM}$	$I_{TM}=17A$ $t_p=380\mu s$	$T_j=25^\circ C$	MAX	1.5	V
$I_{DRM}$ $I_{RRM}$	$V_{DRM}=V_{RRM}$	$T_j=25^\circ C$	MAX	5	$\mu A$
		$T_j=125^\circ C$		1	mA

### THERMAL RESISTANCES

Symbol	Test Condition		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-220A(Ins)	2.3	$^\circ C/W$
		TO-220B(Non-Ins)	1.5	
		TO-220F(Ins)	2.5	
		TO-263	1.5	

### ORDERING INFORMATION

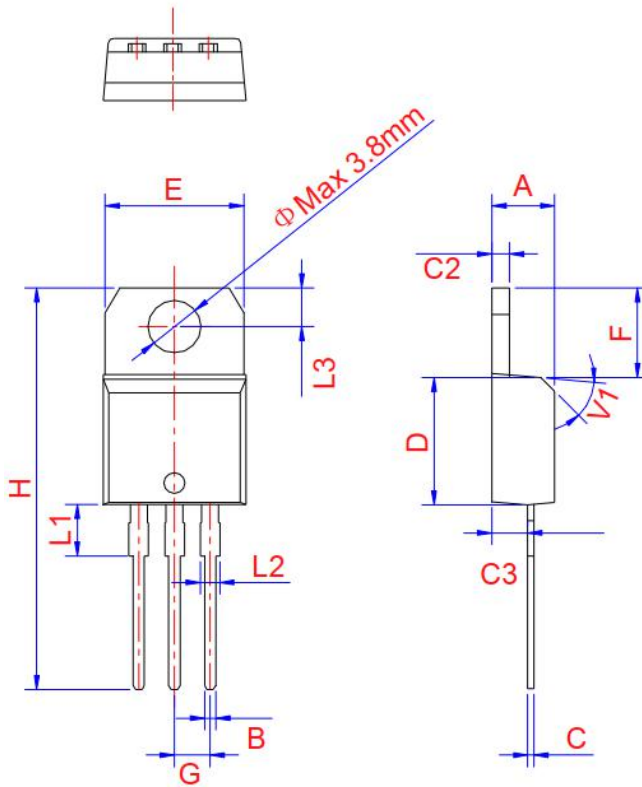
<p><b>B T</b></p> <p>Triacs</p> <hr/> <p>A: Insulated</p> <p>B: Non-Insulated</p>	<p><b>A</b></p> <hr/> <p><math>I_{T(RMS)}: 12A</math></p>	<p><b>12 - 600</b></p> <hr/> <p><math>V_{DRM}, V_{RRM}</math>:</p> <p>600: 600V</p> <p>800: 800V</p> <p>1200: 1200V</p>	<p><b>C W</b></p> <hr/> <p>B: <math>I_{GT1-3} \leq 50mA, I_{GT4} \leq 100mA</math></p> <p>C: <math>I_{GT1-3} \leq 25mA, I_{GT4} \leq 50mA</math></p> <p>TW: <math>I_{GT1-3} \leq 5mA</math></p> <p>SW: <math>I_{GT1-3} \leq 10mA</math></p> <p>CW: <math>I_{GT1-3} \leq 35mA</math></p> <p>BW: <math>I_{GT1-3} \leq 50mA</math></p>
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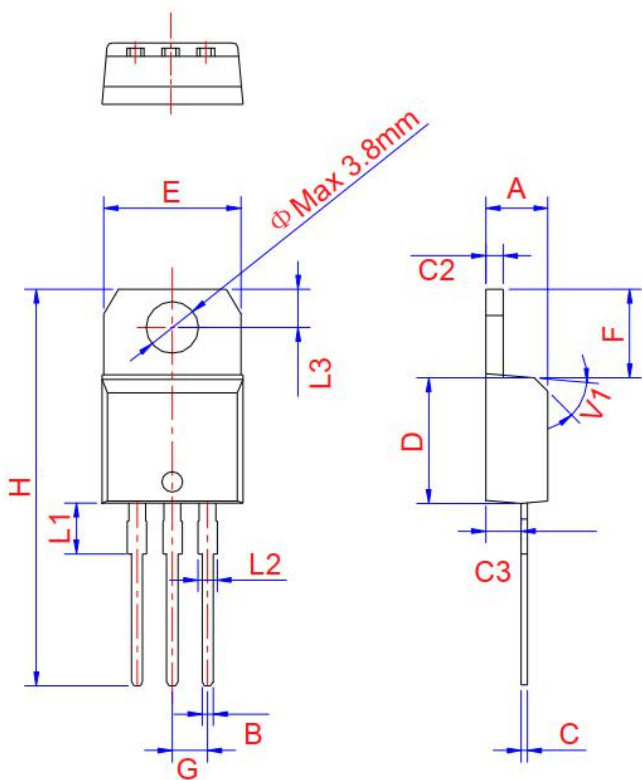
**BTA12/BTB12 Series 12A Triacs**

**PACKAGE MECHANICAL DATA**



TO-220A Ins

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	4.47	4.6	0.173	0.176	0.181
B	0.61		0.88	0.024		0.035
C	0.46	0.50	0.7	0.018	0.02	0.028
C2	1.21	1.27	1.32	0.048	0.050	0.052
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.339		0.382
E	9.8		10.4	0.386		0.409
F	6.55		6.95	0.258		0.274
G		2.54			0.1	
H	28		29.8	1.102		1.173
L1		3.75			0.148	
L2	1.14		1.7	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45°			45°	

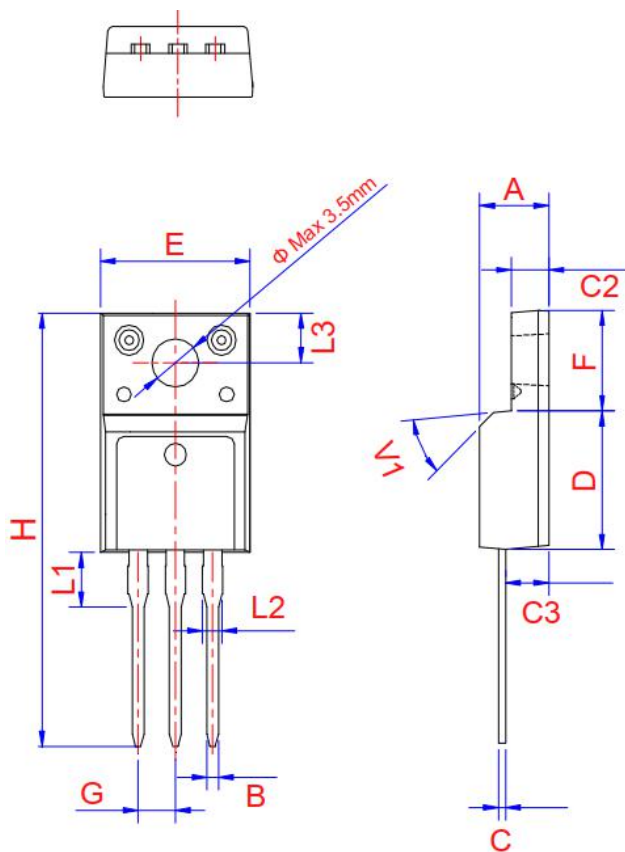


TO-220B Non-Ins

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	4.47	4.6	0.173	0.176	0.181
B	0.61		0.88	0.024		0.035
C	0.46	0.50	0.7	0.018	0.02	0.028
C2	1.21	1.27	1.32	0.048	0.050	0.052
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.339		0.382
E	9.8		10.4	0.386		0.409
F	6.55		6.95	0.258		0.274
G		2.54			0.1	
H	28		29.8	1.102		1.173
L1		3.75			0.148	
L2	1.14		1.7	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45°			45°	

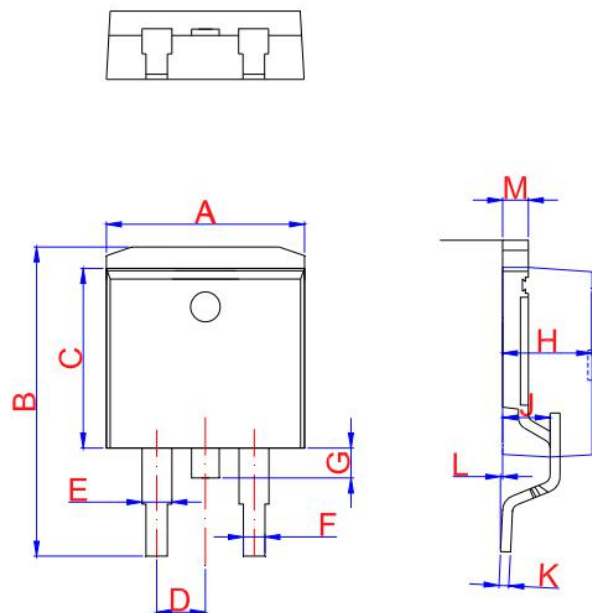


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TO-220F Ins

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.5		4.9	0.177		0.193
B	0.74	0.8	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.6		3	0.102		0.118
D	8.8		9.3	0.346		0.366
E	9.8		10.4	0.386		0.41
F	6.4		6.8	0.252		0.268
G		2.54			0.1	
H	28		29.8	1.102		1.173
L1		3.63			0.148	
L2	1.14		1.7	0.045		0.067
L3	2.65	3.3	0		0.13	0.116
V1		45°			45°	



TO-263

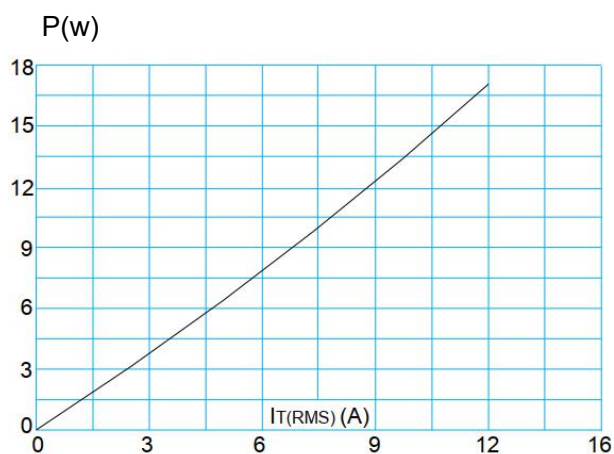
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.9		10.3	0.390		0.406
B	14.7		15.8	0.579		0.622
C	8.5		8.9	0.370		0.378
D		2.54			0.100	
E	1.20		1.40	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40	4.60	4.80	0.173	0.181	0.189
J	2.40	2.60	2.80	0.094	0.102	0.110
L	0	0.1	0.25	0	0.004	0.010
M	1.17	1.27	1.37	0.046	0.05	0.054



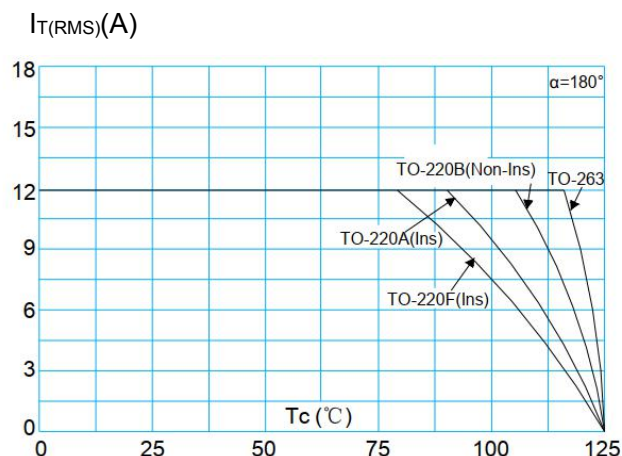
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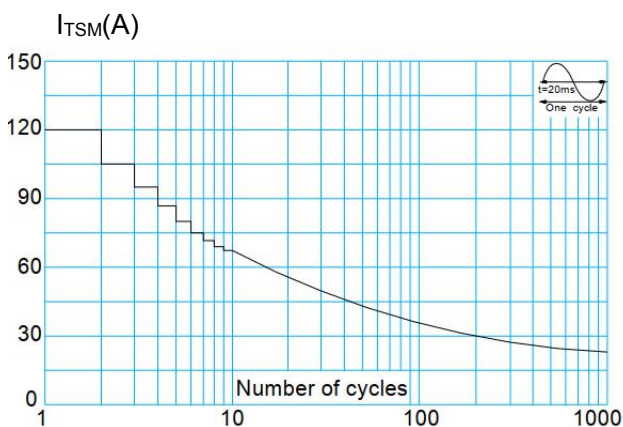
**FIG.1:** Maximum power dissipation versus RMS on-state current



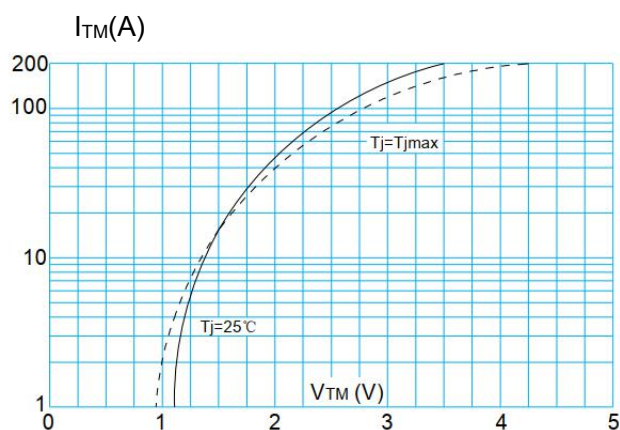
**FIG.2:** RMS on-state current versus case temperature



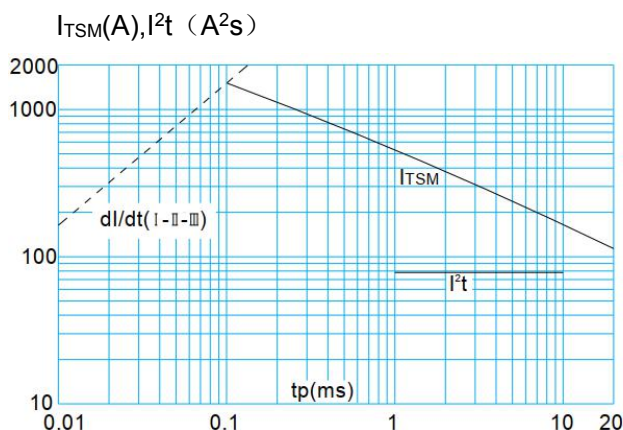
**FIG.3:** Surge peak on-state current versus number of cycles



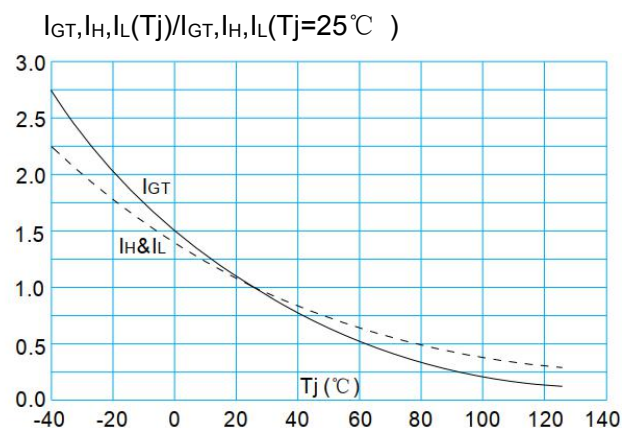
**FIG.4:** On-state characteristics (maximum values)



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20ms$ , and corresponding value of  $I^2t$  ( I - II - III:  $di/dt < 50A/\mu s$ ; IV:  $di/dt < 10A/\mu s$ )



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





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