

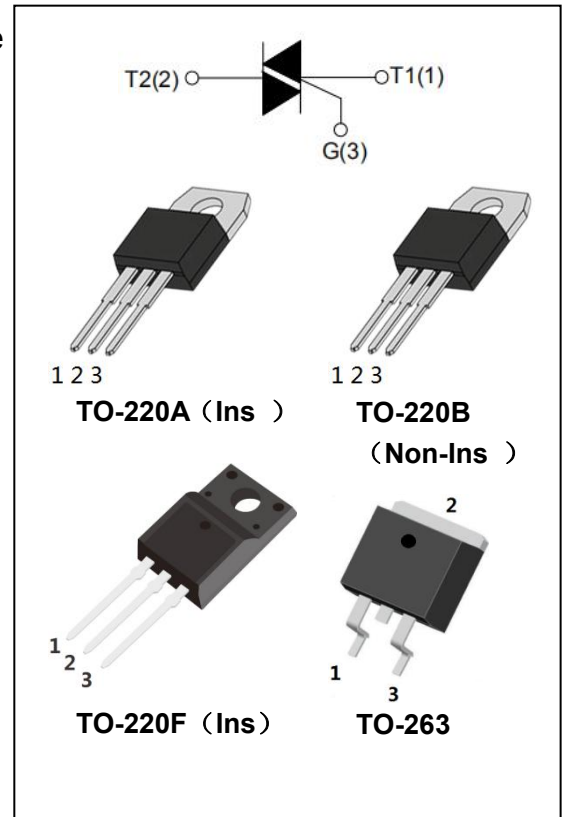
**BTA16/BTB16 ( BT139 ) Series16ATriacs**

**DESCRIPTION:**

With high ability to withstand the shock loading of Large current, BTA16/BTB16 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, BTA16 provides a rated insulation voltage of 2500 V<sub>RMS</sub> complying with UL standards

**MAIN FEATURES:**

symbol	value	unit
I <sub>T(RMS)</sub>	16	A
V <sub>DRM</sub> /V <sub>RRM</sub>	600/800/1200	V
V <sub>TM</sub>	≤1.5	V



**ABSOLUTE MAXIMUM RATINGS:**

Parameter	Symbol	Value	Unit
Storage junction temperature range	T <sub>stg</sub>	-40~150	°C
Operating junction temperature range	T <sub>j</sub>	-40~125	°C
Repetitive peak off-state voltage (T <sub>j</sub> =25°C)	V <sub>DRM</sub>	600/800/1200	V
Repetitive peak reverse voltage (T <sub>j</sub> =25°C)	V <sub>RRM</sub>	600/800/1200	V
RMS on-state current	I <sub>T(RMS)</sub>	16	A
Non repetitive surge peak on-state current (full cycle, F=50Hz)	I <sub>TSM</sub>	160	A
I <sup>2</sup> t value for fusing (t <sub>p</sub> =10ms)	I <sup>2</sup> t	128	A <sup>2</sup> s
Critical rate of rise of on-state current(I <sub>G</sub> =2×I <sub>GT</sub> )	di/dt	50	A/μs
Peak gate current	I <sub>GM</sub>	4	A
Average gate power dissipation	P <sub>G(AV)</sub>	1	W
Peak gate power	P <sub>GM</sub>	5	W

## BTA16/BTB16 ( BT139 ) Series16ATriacs

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

#### 3 Quadrants:

Parameter	Test Condition	Quadrant		Value				Unit
				TW	SW	CW	BW	
I <sub>GT</sub>	V <sub>D</sub> =12V, R <sub>L</sub> =33Ω	I - II -III	MAX	5	10	35	50	mA
V <sub>GT</sub>				1.3				V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub>	I - II -III	MIN	0.2				V
I <sub>H</sub>	I <sub>T</sub> =100mA		MAX	15	25	40	60	mA
I <sub>L</sub>	I <sub>G</sub> =1.2I <sub>GT</sub>	I -III	MAX	20	30	50	70	mA
		II		25	40	60	90	
dV/dt	V <sub>D</sub> =2/3V <sub>DRM</sub> T <sub>j</sub> =125°C Gate open		MIN	100	200	500	1000	V/μs

#### 4 Quadrants:

Parameter	Test Condition	Quadrant		Value		Unit
				C	B	
I <sub>GT</sub>	V <sub>D</sub> =12V, R <sub>L</sub> =33Ω	I - II -III	MAX	25	50	mA
		IV		50	70	mA
V <sub>GT</sub>		ALL		1.5		V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub>	ALL	MIN	0.2		V
I <sub>H</sub>	I <sub>T</sub> =100mA		MAX	40	60	mA
I <sub>L</sub>	I <sub>G</sub> =1.2I <sub>GT</sub>	I -III-IV	MAX	50	70	mA
		II		70	90	
dV/dt	V <sub>D</sub> =2/3V <sub>DRM</sub> T <sub>j</sub> =125°C Gate open		MIN	200	500	V/μs

**STATIC CHARACTERISTICS**

Symbol	Test Condition			Value	Unit
$V_{TM}$	$I_{TM}=22.5A$ $t_p=380\mu s$	$T_j=25^\circ C$	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

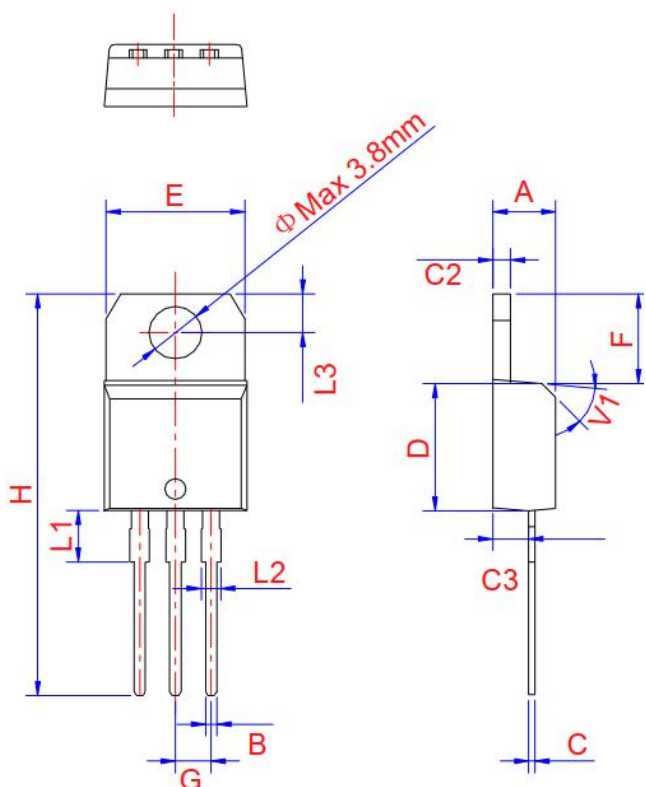
**THERMAL RESISTANCES**

Symbol	Test Condition		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-220A(Ins)	2.1	$^\circ C/W$
		TO-220B(Non-Ins)	1.3	
		TO-220F(Ins)	2.3	
		TO-263	2.4	

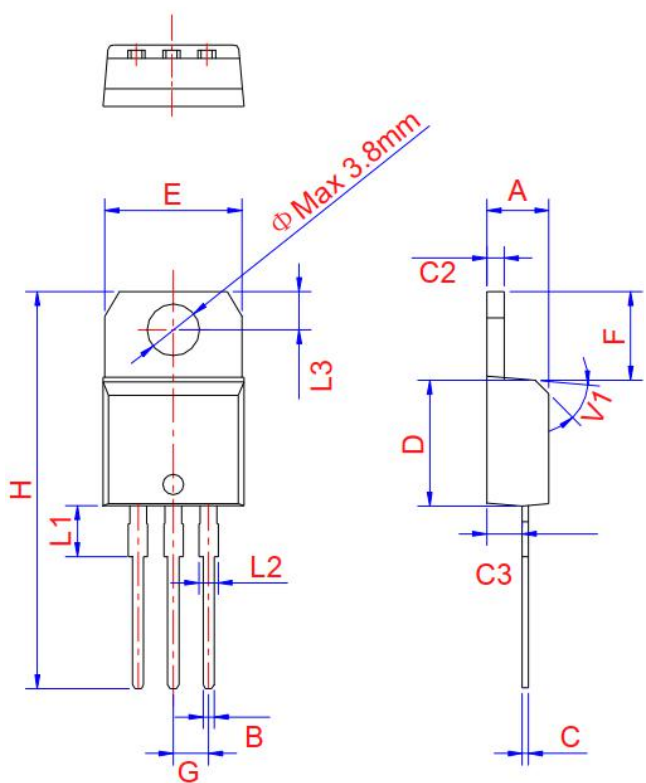
**ORDERING INFORMATION**

<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)}: 16A</math></p>	<p><b>16 - 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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**PACKAGE MECHANICAL DATA**

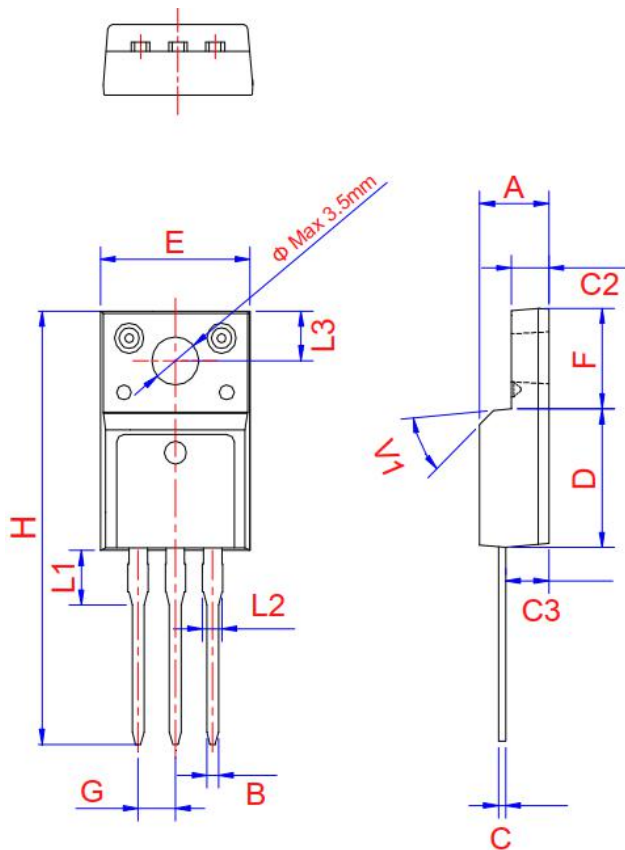


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	4.47	4.6	0.173	0.176	0.181
B	0.61		0.88	0.024		0.035
C	0.46	0.50	0.7	0.018	0.02	0.028
C2	1.21	1.27	1.32	0.048	0.050	0.052
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.339		0.382
E	9.8		10.4	0.386		0.409
F	6.55		6.95	0.258		0.274
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°	



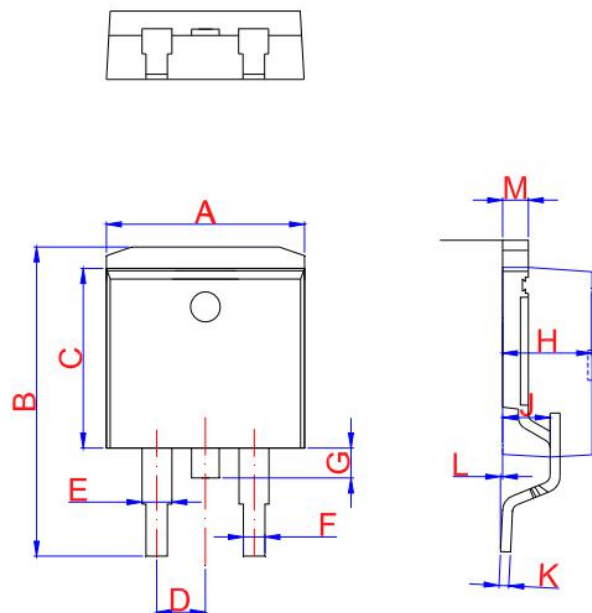
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	4.47	4.6	0.173	0.176	0.181
B	0.61		0.88	0.024		0.035
C	0.46	0.50	0.7	0.018	0.02	0.028
C2	1.21	1.27	1.32	0.048	0.050	0.052
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.339		0.382
E	9.8		10.4	0.386		0.409
F	6.55		6.95	0.258		0.274
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°	

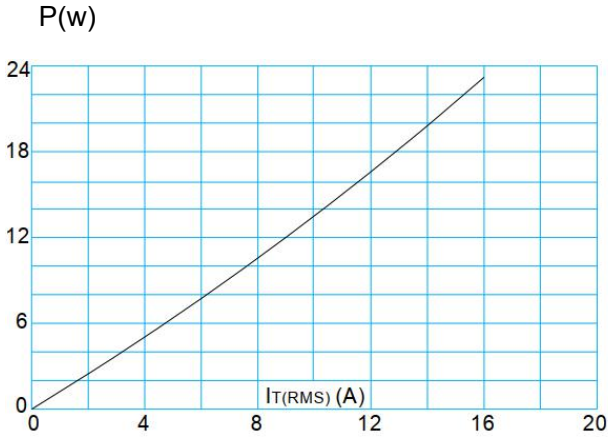


TO-263

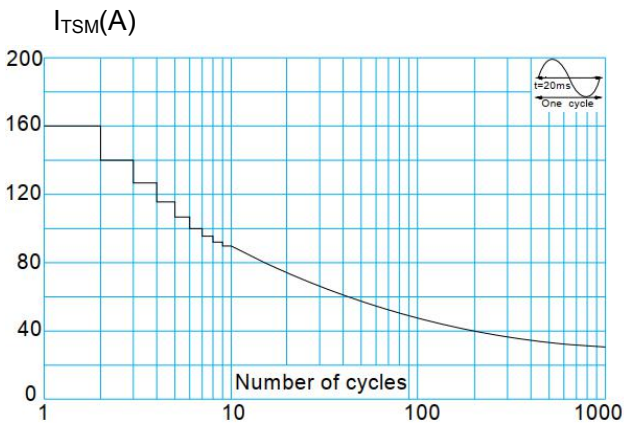
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.9		10.3	0.390		0.406
B	14.7		15.8	0.579		0.622
C	8.5		8.9	0.370		0.378
D		2.54			0.100	
E	1.20		1.40	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40	4.60	4.80	0.173	0.181	0.189
J	2.40	2.60	2.80	0.094	0.102	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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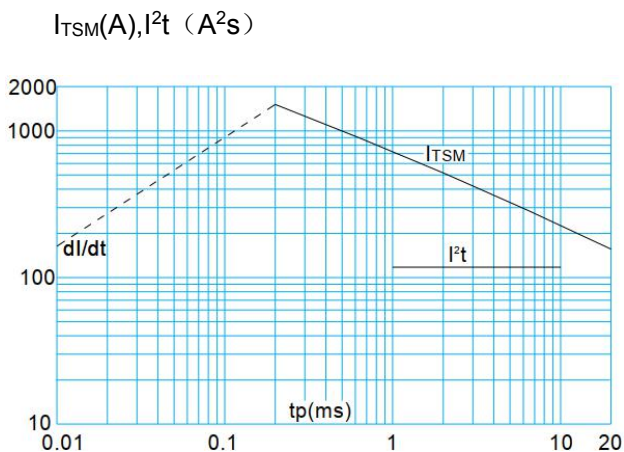
**FIG.1:** Maximum power dissipation versus RMS on-state current



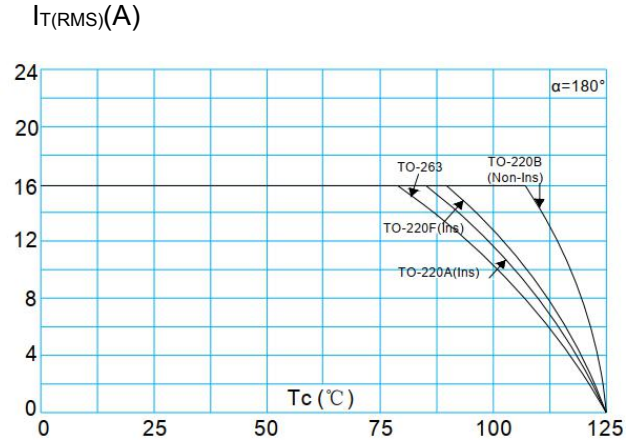
**FIG.3:** Surge peak on-state current versus number of cycles



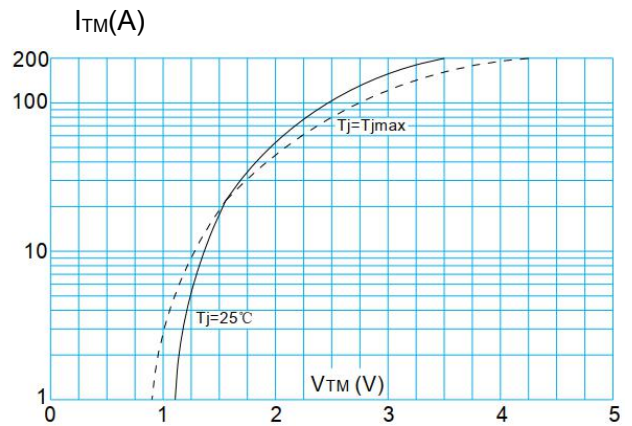
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  ( $I - II - III: dI/dt < 50\text{A}/\mu\text{s}; IV: dI/dt < 10\text{A}/\mu\text{s}$ )



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



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



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

