

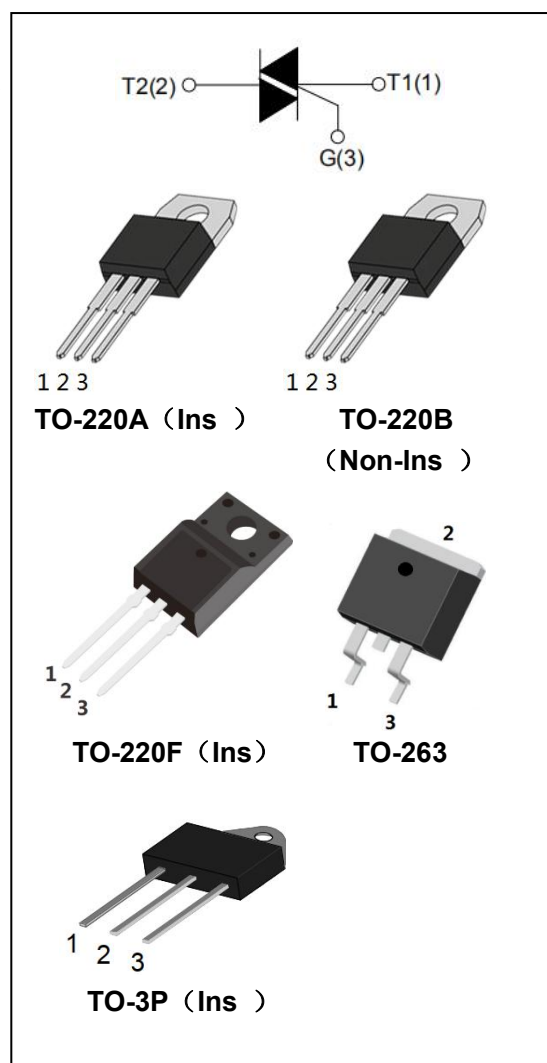


Jiangsu Weida Semiconductor Co., Ltd.

BTA24/BTB24 Series 25A Triacs

DESCRIPTION:

With high ability to withstand the shock loading of Large current, BTA24/BTB24 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, BTA24 provides a rated insulation voltage of 2500 V_{RMS} complying with UL standards (File ref: E516503).



MAIN FEATURES:

symbol	value	unit
$I_{T(RMS)}$	25	A
V_{DRM}/V_{RRM}	600/800/1200/1600	V
V_{TM}	≤ 1.5	V

ABSOLUTE MAXIMUM RATINGS:

Parameter	Symbol	Value	Unit
Storage junction temperature range	T_{stg}	-40~150	$^{\circ}C$
Operating junction temperature range	T_j	-40~125	$^{\circ}C$
Repetitive peak off-state voltage ($T_j=25^{\circ}C$)	V_{DRM}	600/800/1200/1600	V
Repetitive peak reverse voltage ($T_j=25^{\circ}C$)	V_{RRM}	600/800/1200/1600	V
RMS on-state current	$I_{T(RMS)}$	25	A
Non repetitive surge peak on-state current (full cycle, F=50Hz)	I_{TSM}	250	A
I^2t value for fusing ($t_p=10ms$)	I^2t	340	A^2s
Critical rate of rise of on-state current($I_G=2 \times I_{GT}$)	di/dt	50	$A/\mu s$



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Peak gate current	I_{GM}	4	A
Average gate power dissipation	$P_{G(AV)}$	1	W
Peak gate power	P_{GM}	10	W

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

3 Quadrants:

Parameter	Test Condition	Quadrant		Value		Unit
				CW	BW	
I_{GT}	$V_D=12\text{V}$, $R_L=33\Omega$	I - II - III	MAX	35	50	mA
V_{GT}				1.3		V
V_{GD}	$V_D=V_{DRM}$	I - II - III	MIN	0.2		V
I_H	$I_T=100\text{mA}$		MAX	60	80	mA
I_L	$I_G=1.2I_{GT}$	I - III	MAX	70	90	mA
		II		80	100	
dV/dt	$V_D=2/3V_{DRM}$ $T_j=125^\circ\text{C}$ Gate open		MIN	1000	1500	V/ μs

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	60	75	mA
I_L	$I_G=1.2I_{GT}$	I - III - IV	MAX	70	80	mA
		II		90	100	
dV/dt	$V_D=2/3V_{DRM}$ $T_j=125^\circ\text{C}$ Gate open		MIN	200	500	V/ μs



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STATIC CHARACTERISTICS

Symbol	Test Condition			Value	Unit
V_{TM}	$I_{TM}=35A$ $t_p=380\mu s$	$T_j=25^\circ C$	MAX	1.5	V
I_{DRM} I_{RRM}	$V_{DRM}=V_{RRM}$	$T_j=25^\circ C$	MAX	10	μA
		$T_j=125^\circ C$		3	mA

THERMAL RESISTANCES

Symbol	Test Condition		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-220A(Ins)	1.5	$^\circ C/W$
		TO-220F(Ins)	1.6	
		TO-263	2.1	
		TO-3P	0.68	

ORDERING INFORMATION

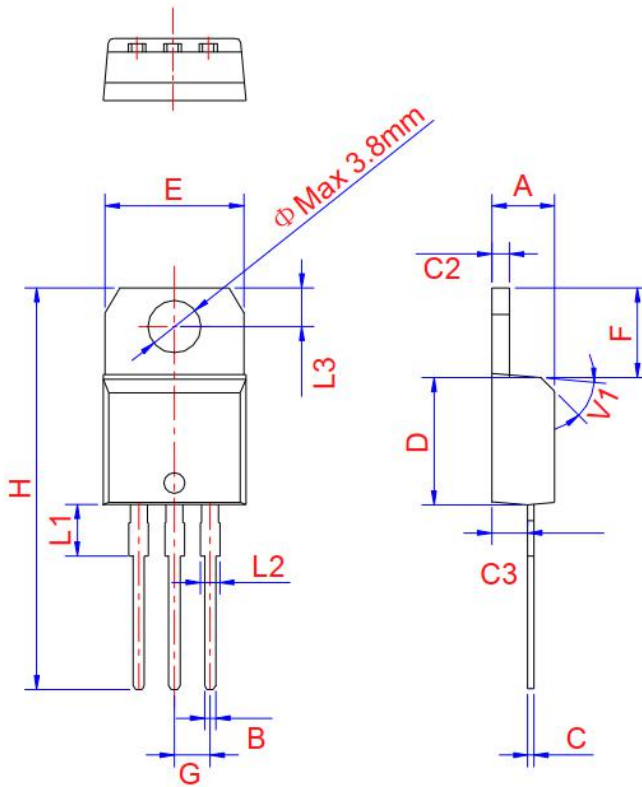
B T	A	24 - 800	C W
Triacs		$I_{T(RMS)}:25A$	
A: Insulated B: Non-Insulated		V_{DRM}, V_{RRM} : 600: 600V 800: 800V 1200: 1200V 1600: 1600V	B: $I_{GT1-3}\leq 50mA, I_{GT4}\leq 100mA$ C: $I_{GT1-3}\leq 25mA, I_{GT4}\leq 50mA$ CW: $I_{GT1-3}\leq 35mA$ BW: $I_{GT1-3}\leq 50mA$



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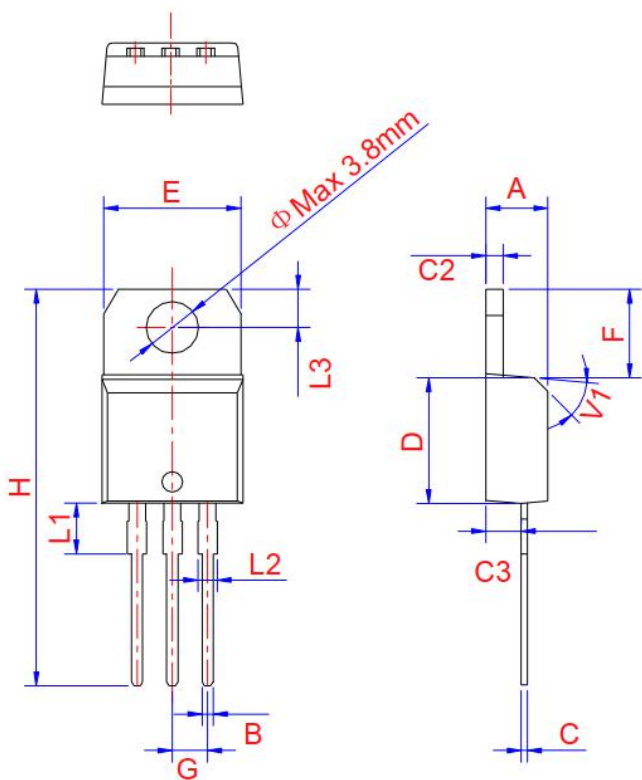
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PACKAGE MECHANICAL DATA



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°	

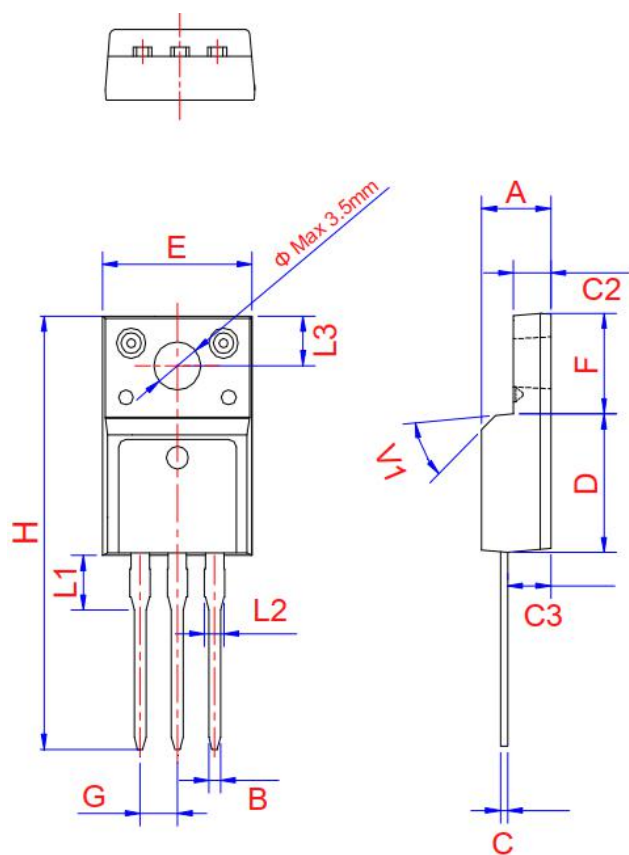


TO-220B Non-Ins

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°	

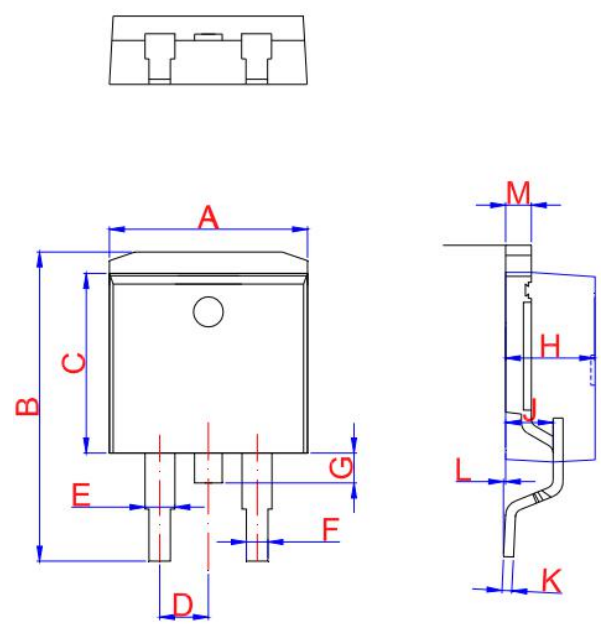


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TO-220F Ins

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°	

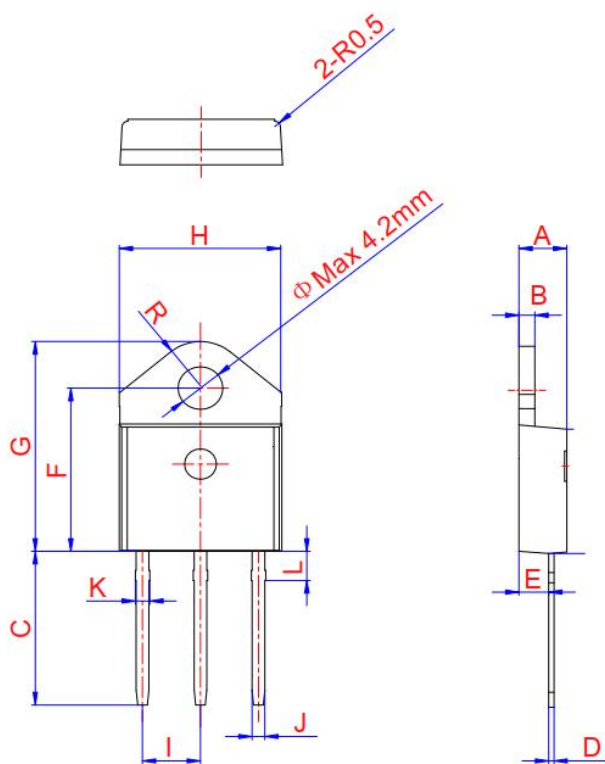


TO-263

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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TO-3P Ins

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40	4.50	4.60	0.173	0.177	0.181
B	1.45	1.50	1.55	0.057	0.059	0.061
C	14.35		15.60	0.565		0.614
D	0.50	0.60	0.70	0.02	0.024	0.028
E	2.70	2.80	2.90	0.106	0.110	0.114
F	15.80		16.50	0.622		0.650
G	20.40		21.10	0.803		0.831
H	15.10	15.30	15.50	0.594	0.602	0.610
I	5.40		5.65	0.213		0.222
J	1.10		1.40	0.043		0.055
K	1.35		1.50	0.053		0.059
L	2.80	2.90	3.00	0.110	0.114	0.118
R		4.35			0.171	



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

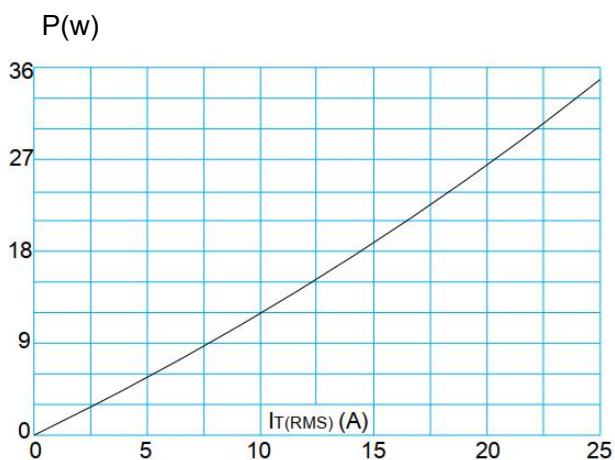


FIG.2: RMS on-state current versus case temperature

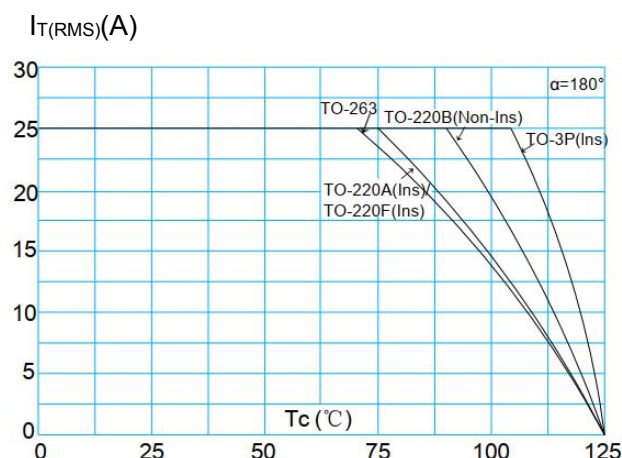


FIG.3: Surge peak on-state current versus number of cycles

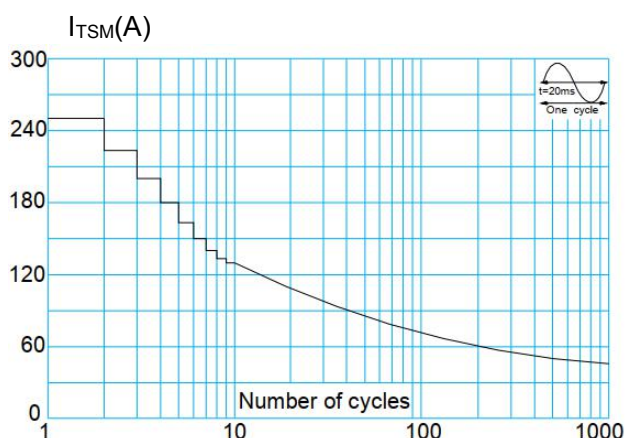


FIG.4: On-state characteristics (maximum values)

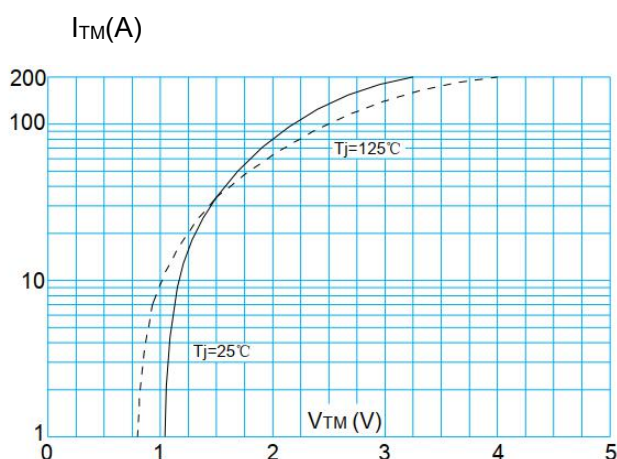


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20ms$, and corresponding value of I^2t (I - II - III: $dI/dt < 50A/\mu s$; IV: $dI/dt < 10A/\mu s$)

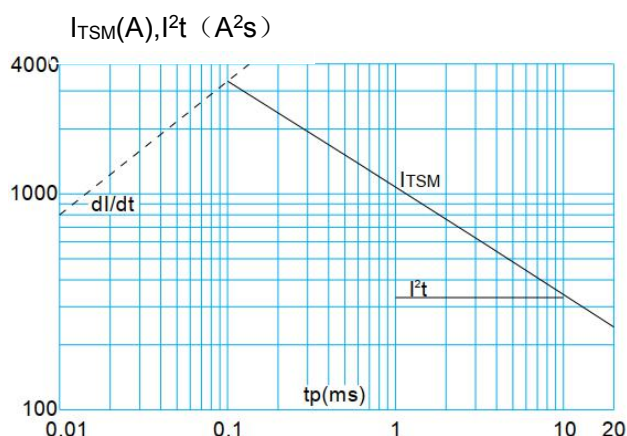
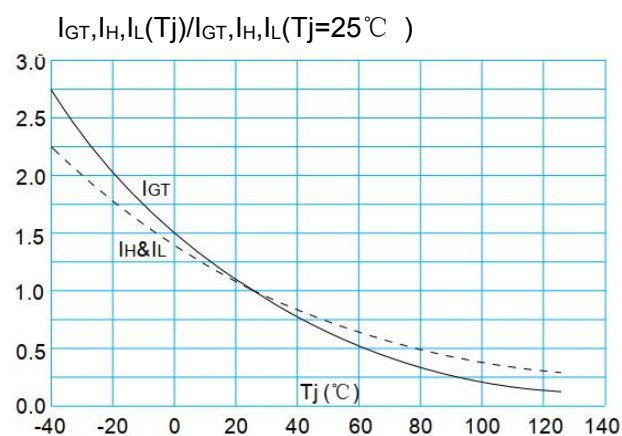


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature





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