

BTA20/BTB20 Series 20A Triacs

DESCRIPTION:

With high ability to withstand the shock loading of Large current, BTA20/BTB20 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, BTA20 (TO-220A) provides a rated insulation voltage of 2500 V_{RMS}.

MAIN FEATURES:

symbol	value	unit
$I_{T(RMS)}$	20	A
V_{DRM}/V_{RRM}	600/800/1200	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	$I_{T(RMS)}$	20	A
Non repetitive surge peak on-state current (full cycle, $F=50\text{Hz}$)	I_{TSM}	200	A
Pt value for fusing ($t_p=10\text{ms}$)	Pt	200	A ² s
Critical rate of rise of on-state current($I_G=2 \times I_{GT}$)	di/dt	100	A/ μs
Peak gate current	I_{GM}	4	A
Average gate power dissipation	$P_{G(AV)}$	1	W
Peak gate power	P_{GM}	10	W

BTA20/BTB20 Series 20A Triacs**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	50	60	mA
I_L	$I_G=1.2I_{GT}$	I -III	MAX	60	70	mA
		II		70	90	
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	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/ μs



BTA20/BTB20 Series 20A Triacs

STATIC CHARACTERISTICS

Symbol	Test Condition			Value	Unit
V_{TM}	$I_{TM}=28A$ $t_p=380\mu s$	$T_j=25^{\circ}C$	MAX	1.5	V
I_{DRM} I_{RRM}	$V_{DRM}=V_{RRM}$	$T_j=25^{\circ}C$	MAX	5	μA
		$T_j=125^{\circ}C$		2	mA
V_{TO}	Threshold voltage	$T_j=125^{\circ}C$	MAX	0.75	V
R_D	Dynamic resistance	$T_j=125^{\circ}C$	MAX	21	m Ω

THERMAL RESISTANCES

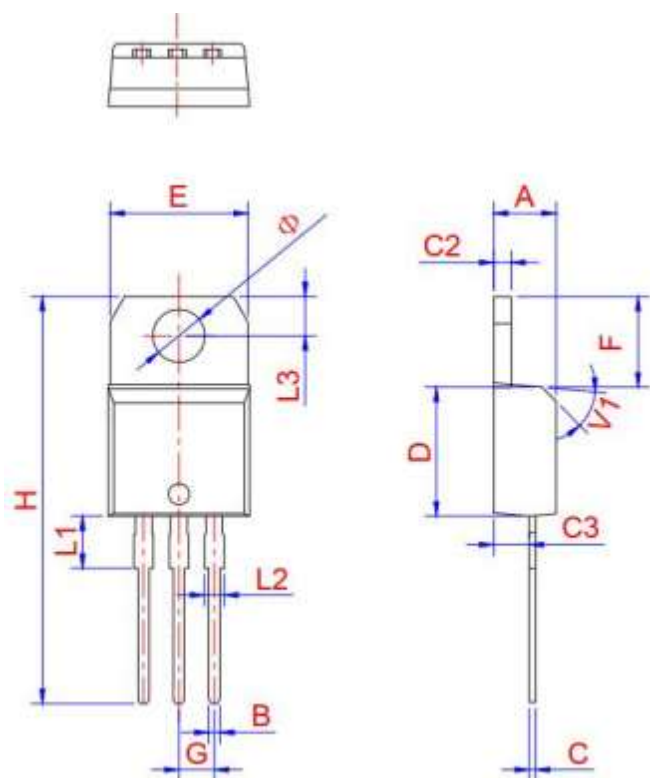
Symbol	Test Condition		Value	Unit
$R_{th(j-c)}$	junction to case(AC)	TO-220A(Ins)	1.9	$^{\circ}C/W$
		TO-220B(Non-Ins)	1.1	
		TO-220F(Ins)	2.1	
		TO-263	2.4	
$R_{th(j-a)}$	junction to ambient(AC)	TO-220A(Ins) /TO-263 TO-220B(Non-Ins) TO-220F(Ins)	60	$^{\circ}C/W$

ORDERING INFORMATION

B T		A	20-800	CW
Triacs				
A:Insulated B:Non-Insulated		$I_{T(RMS)}:20A$	V_{DRM}, V_{RRM} : 600: 600V 800: 800V 1200: 1200V	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: $I_{GT1-3}\leq 50mA$

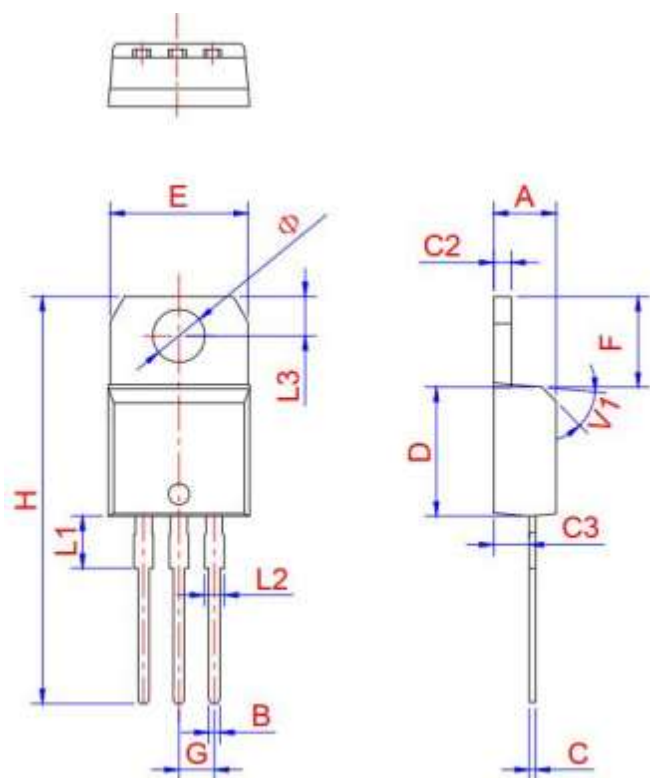
BTA20/BTB20 Series 20A Triacs

PACKAGE MECHANICAL DATA



TO-220A Ins

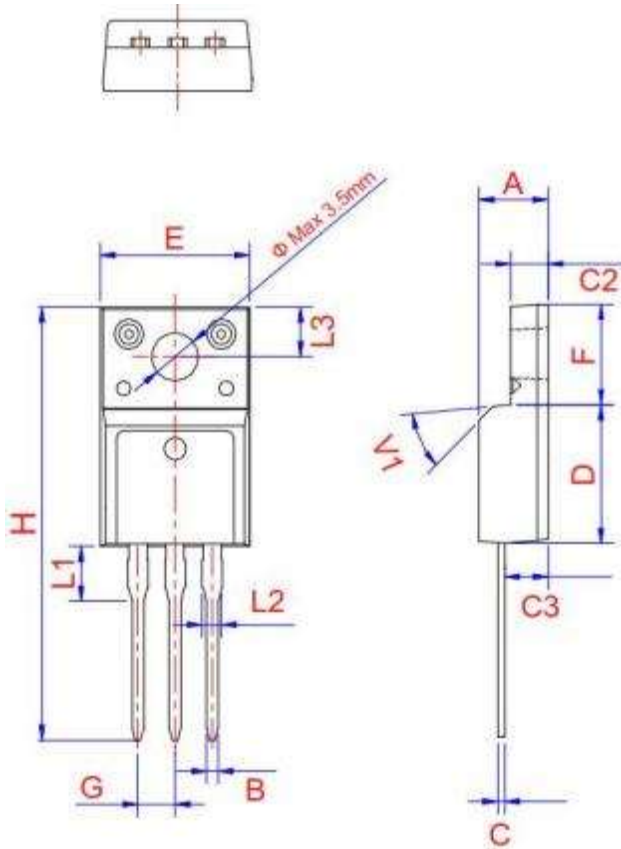
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	4.47	4.6	0.173	0.176	0.181
B	0.61		0.88	0.024		0.035
C	0.46	0.50	0.7	0.018	0.02	0.028
C2	1.21	1.27	1.32	0.048	0.050	0.052
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.339		0.382
E	9.8		10.4	0.386		0.409
F	6.4		6.8	0.252		0.267
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°	
Φ	3.7	3.75	3.8	0.145	0.147	0.149



TO-220B Non-Ins

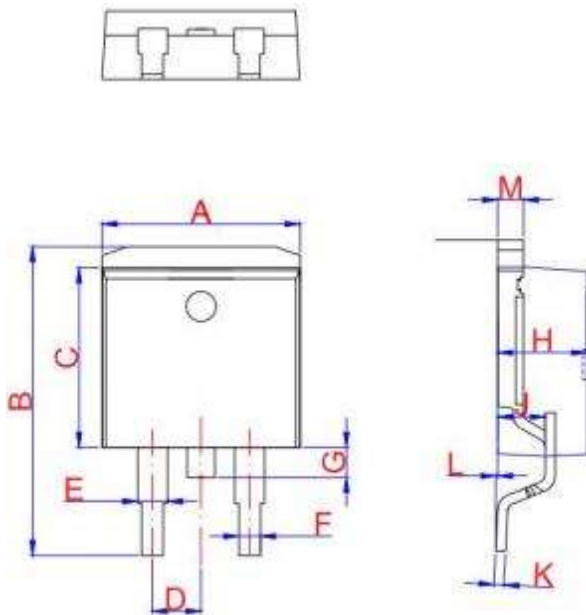
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	4.47	4.6	0.173	0.176	0.181
B	0.61		0.88	0.024		0.035
C	0.46	0.50	0.7	0.018	0.02	0.028
C2	1.21	1.27	1.32	0.048	0.050	0.052
C3	2.4		2.72	0.094		0.107
D	8.6		9.7	0.339		0.382
E	9.8		10.4	0.386		0.409
F	6.4		6.8	0.252		0.267
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°	
Φ	3.7	3.75	3.8	0.145	0.147	0.149

BTA20/BTB20 Series 20A Triacs



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	2.2		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

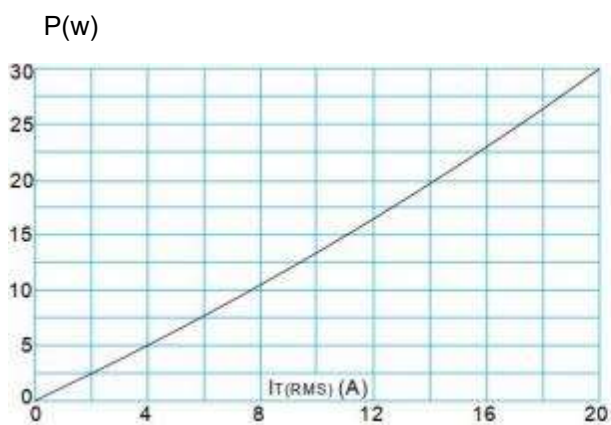


FIG.3: Surge peak on-state current versus number of cycles

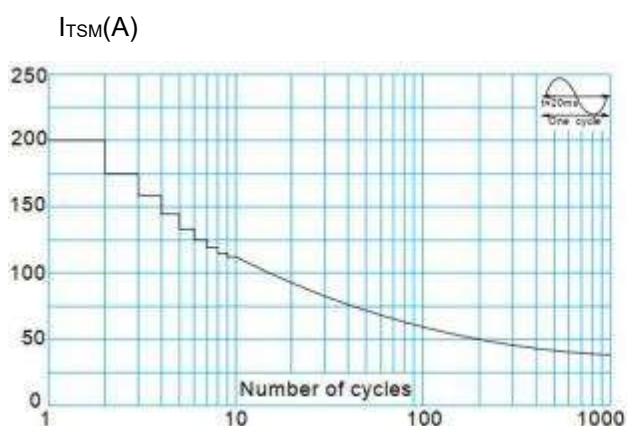


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I^2t (I - II -III: $dI/dt < 50\text{A}/\mu\text{s}$; IV: $dI/dt < 10\text{A}/\mu\text{s}$)

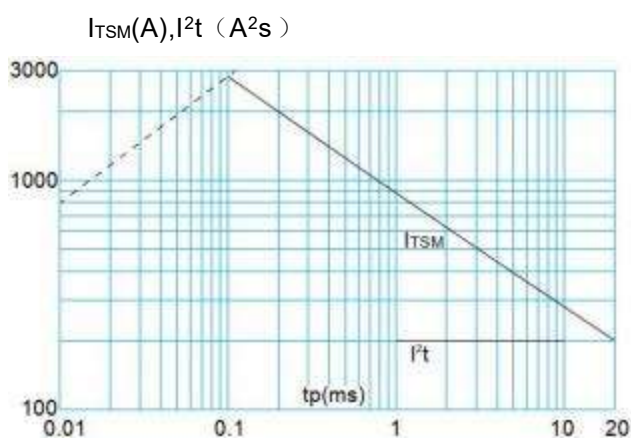


FIG.2: RMS on-state current versus case temperature

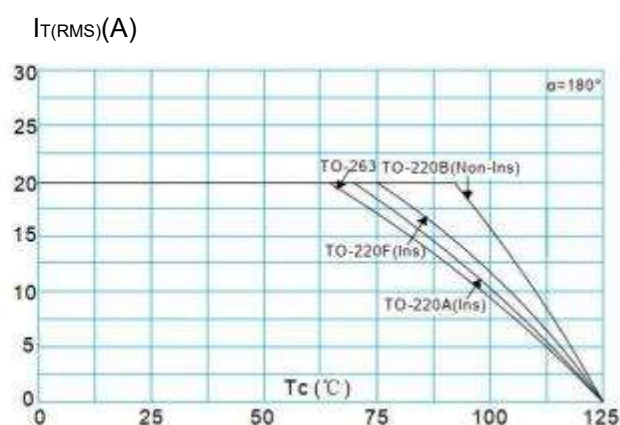


FIG.4: On-state characteristics (maximum values)

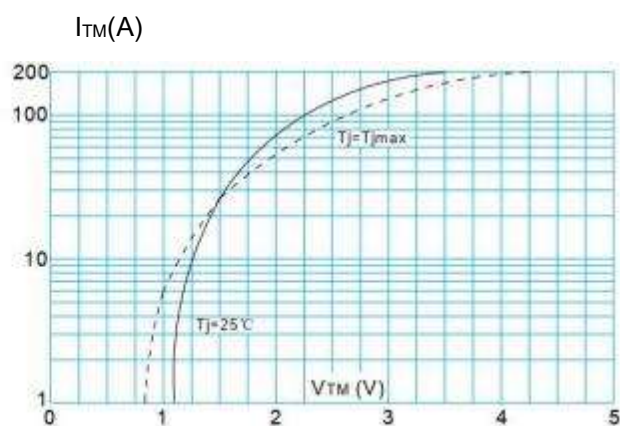


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature

