

FEATURES

- Glass Passivated Junctions
- High voltage and surge capability
- Low Thermal Resistance and Durability
- Triggering in three quadrants

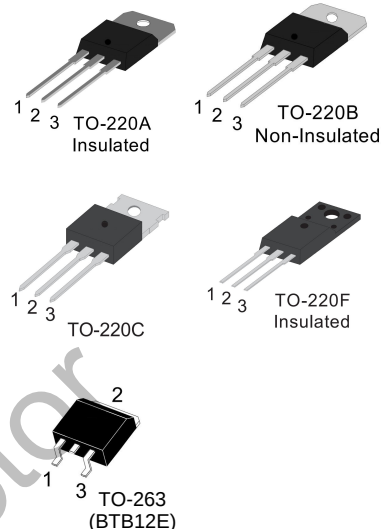
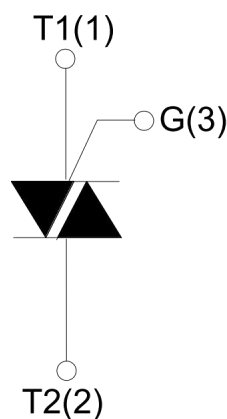
APPLICATIONS

- Static relays
- Heating regulation
- In-duction motor starting circuits
- Phase control operation in light dimmers
- Motor speed controllers



Parameters Summary

VD/VR:600/800/1200V IT(RMS):12A IGT:05 to 50mA



ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junctiontemperature range		T _{stg}	-40~150	°C
Operating junction temperature range		T _j	-40~125	°C
Repetitive peak off-state voltage (T =25°C)		V _{DRM}	600/800/1200	V
Repetitive peak reverse voltage (T =25°C)		V _{RRM}	600/800/1200	V
RMS on-state current	TO-220A(TC=90°C)	I _{T(RMS)}	12	A
	TO-220B/TO-220C(TC=105°C)			
	TO-220F(TC=79°C)			
	TO-263(TC=115°C)			
Non repetitive surge peak on-state current (full cycle, F=50Hz)		I _{TSM}	120	A
I²t value for fusing (tp=10ms)		I²t	72	A²S
Critical rate of rise of on-state current(I =2×I _{GT})		di/dt	50	A/μS
Peak gate current		I _{GM}	4	A
Peakgate power dissipation		P _{GM}	5	W
Average gate power dissipation		P _{G(AV)}	1	W

Thermal Resistances

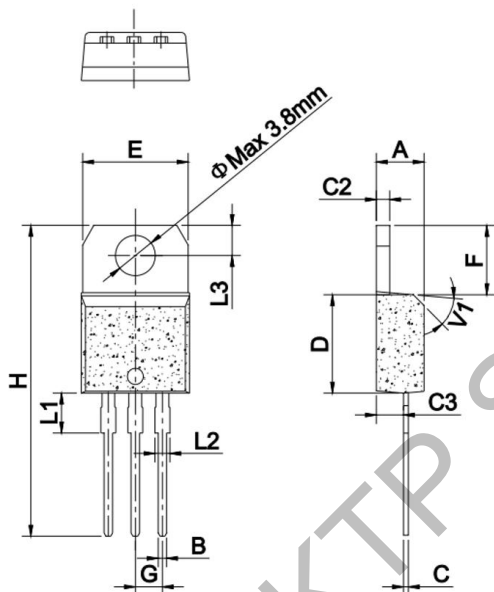
Symbol	Parameter		Value	Unit
Rth(j-c)	Junction to case (DC)	TO-220A	2.3	°C/W
		TO-220B/TO-220C	1.4	
		TO-220F	2.5	
		TO-263	0.95	

ELECTRICAL CHARACTERISTICS (T=25°C unless otherwise specified)

Symbol	Test Condition	Quadrant		Value				Unit
				5	10	35	50	
I_{GT}	$V_D=12V, I_T=0.1A, T_j=25^\circ C$	I II III	MAX.	5	10	35	50	mA
V_{GT}	$^\circ C$	I II III	MAX.	1.3				V
V_{GD}	$V_D=V_{DRM}, T_j=125^\circ C$	I II III	MIN.	0.2				V
I_L	$I_G=1.2I_{GT}$	I-III	MAX.	20	30	90	100	mA
		II		30	40	100	120	
I_H	$I_T=100mA$		MAX.	50	20	50	60	mA
dV/dt	$V_D=2/3V_{DRM}$ Gate Open $T_j=125^\circ C$		MIN.	100	200	1000	1500	V/ μs

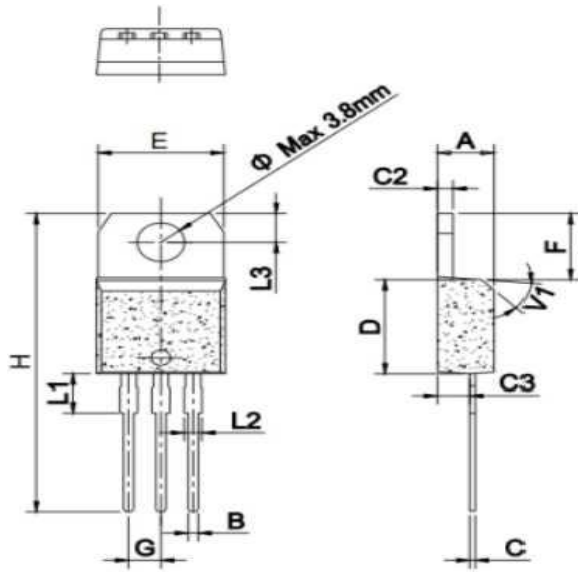
STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX.)	Unit
V_{TM}	$I_{TM}=17A$ $t_p=380\mu s$	$T_j=25^\circ C$	1.5	V
I_{DRM}	$V_D=V_{DRM}, V_R=V_{RRM}$	$T_j=25^\circ C$	5	μA
I_{RRM}		$T_j=125^\circ C$	1.5	mA

TO-220A Package Mechanical Data

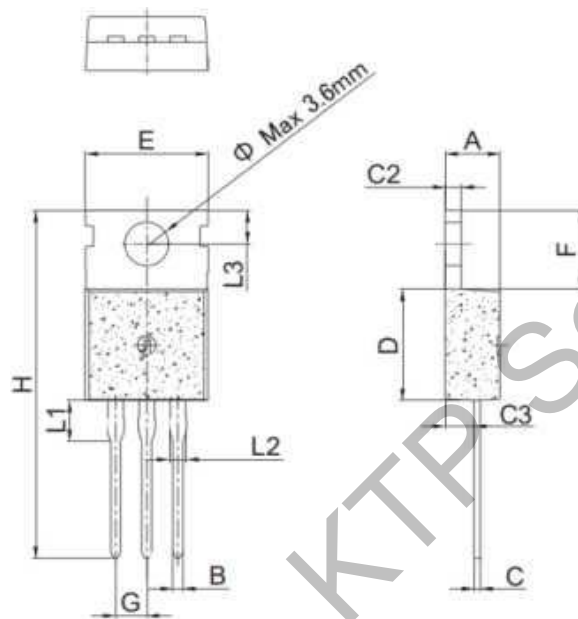
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40	4.50	4.60	0.173	0.177	0.181
B	0.61	0.80	0.88	0.024	0.031	0.035
C	0.40	0.45	0.70	0.015	0.017	0.028
C2	1.21	1.30	1.32	0.048	0.051	0.052
C3	2.40	2.60	2.72	0.094	0.102	0.107
D	8.60	9.00	9.70	0.339	0.354	0.382
E	9.80	10.10	10.4	0.386	0.397	0.409
F	6.00	6.30	6.60	0.236	0.248	0.259
G		2.54			0.100	
H	28.00	28.80	29.80	1.102	1.133	1.173
L1		3.75			0.148	
L2	1.14	1.30	1.70	0.045	0.051	0.067
L3	2.65	2.80	2.95	0.104	0.110	0.116
V1		45°			45°	

TO-220B Package Mechanical Data



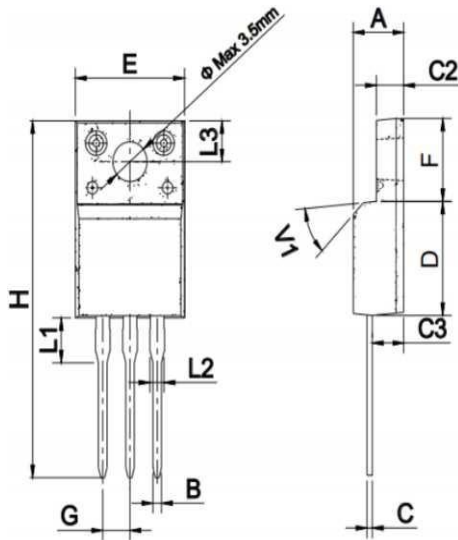
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.20	4.30	4.60	0.173	0.169	0.181
B	0.61	0.76	0.88	0.024	0.029	0.035
C	0.40	0.45	0.70	0.016	0.017	0.028
C2	1.21	1.25	1.32	0.048	0.049	0.052
C3	2.40	2.60	2.72	0.094	0.102	0.107
D	8.60	9.00	9.70	0.339	0.354	0.382
E	9.60	10.00	10.40	0.378	0.392	0.409
F	6.25	6.60	7.05	0.244	0.259	0.260
G		2.54			0.1	
H	28.00	29.00	29.80	1.102	1.141	1.173
L1		3.90			0.153	
L2	1.14	1.35	1.70	0.045	0.053	0.067
L3	2.65	3.00	3.25	0.104	0.118	0.127
V1		45°			45°	

TO-220C Package Mechanical Data



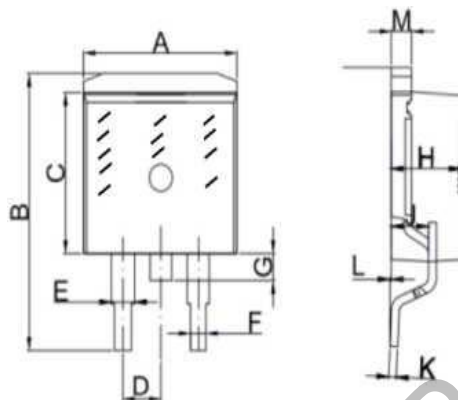
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40	4.50	4.60	0.173	0.177	0.181
B	0.70	0.78	0.90	0.028	0.030	0.035
C	0.45	0.50	0.60	0.018	0.019	0.024
C2	1.30	1.35	1.48	0.048	0.053	0.052
C3	2.20	2.40	2.60	0.087		0.102
D	8.90	9.00	9.90	0.350	0.354	0.390
E	9.90	10.00	10.3	0.390	0.393	0.406
F	6.30	6.50	6.90	0.248	0.255	0.272
G		2.54			0.100	
H	28.00	28.80	29.80	1.102	1.134	1.173
L1		2.90			0.114	
L2	1.14	1.35	1.70	0.045		0.067
L3	2.65	3.00	3.15	0.104	0.118	0.124

TO-220F Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.50	4.70	4.90	0.177	0.185	0.193
B	0.74	0.80	0.83	0.029	0.031	0.033
C	0.47	0.50	0.65	0.019	0.019	0.026
C2	2.50	2.70	3.10	0.098	0.106	0.122
C3	2.50	2.93	3.15	0.098	0.115	0.124
D	8.60	9.20	9.80	0.338	0.362	0.385
E	9.80	10.10	10.4	0.386	0.397	0.410
F	6.60	6.80	7.50	0.259	0.267	0.295
G		2.54			0.1	
H	28.0	28.8	29.8	1.102	1.133	1.173
L1		3.10			0.122	
L2	1.14	1.30	1.70	0.045	0.051	0.067
L3		3.30			0.130	
V1		45°			45°	

TO-263 Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90	10.2	10.5	0.390	0.401	0.402
B	14.70	15.50	15.80	0.579	0.610	0.622
C	8.80	9.00	9.20	0.37	0.354	0.378
D		2.54			0.100	
E	1.20	1.35	1.40	0.047	0.053	0.055
F	0.70	0.75	0.85	0.027	0.029	0.033
G			1.75			0.069
H	4.40	4.50	4.70	0.173	0.177	0.185
J	2.30		2.70	0.091		0.106
K	0.35	0.40	0.55	0.013	0.015	0.022
L	0		0.25	0	0.004	0.010
M	1.25	1.30	1.35	0.049	0.051	0.053

FIG.1 Maximum power dissipation versus on-state current

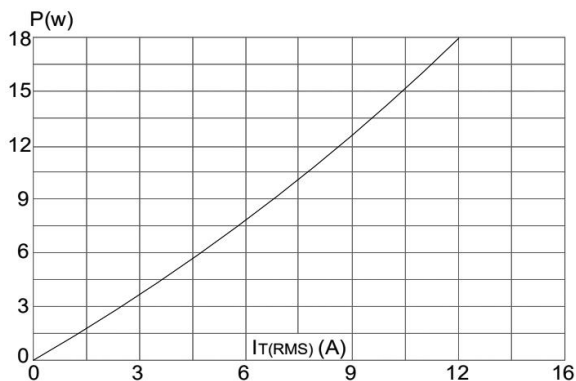


FIG.2: on-state current versus case temperature

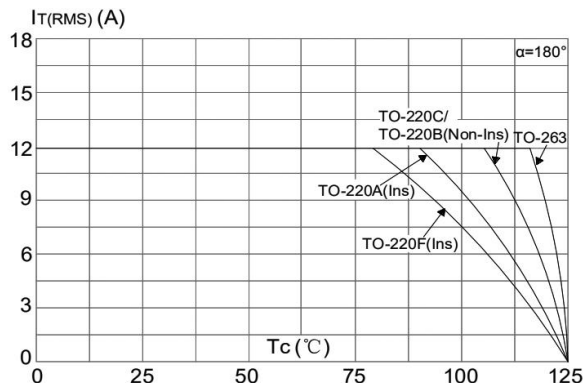


FIG.3: Surge peak on-state current versus number of cycles

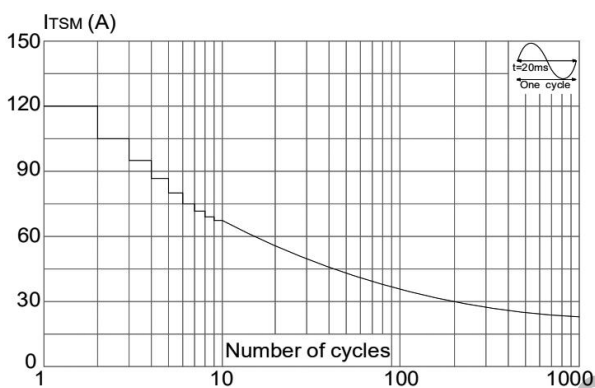


FIG.4: On-state characteristics (maximum values)

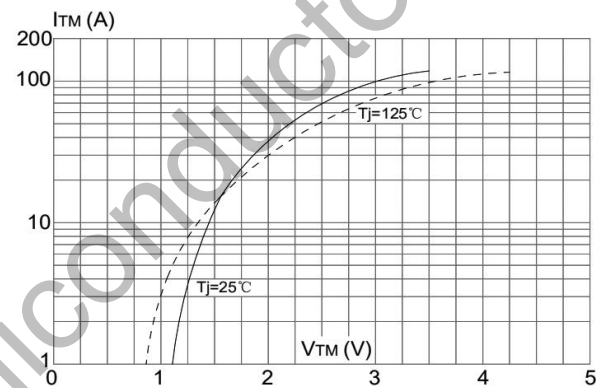


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10ms$, and corresponding value of $I_2 t$ ($di/dt < 50A/\mu s$)

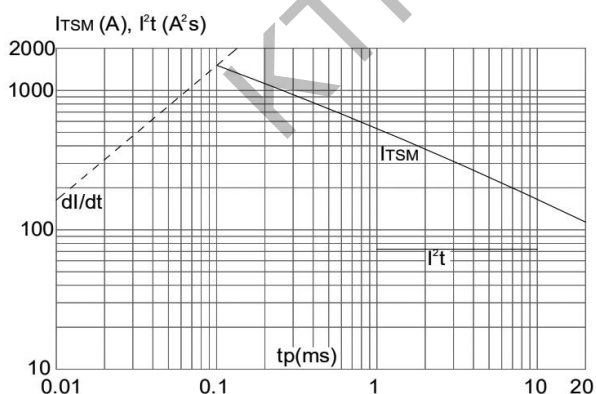


FIG.6: Relative variations of gate trigger current holding current and latching current versus junction temperature

