JCT151 Series 12A SCRs

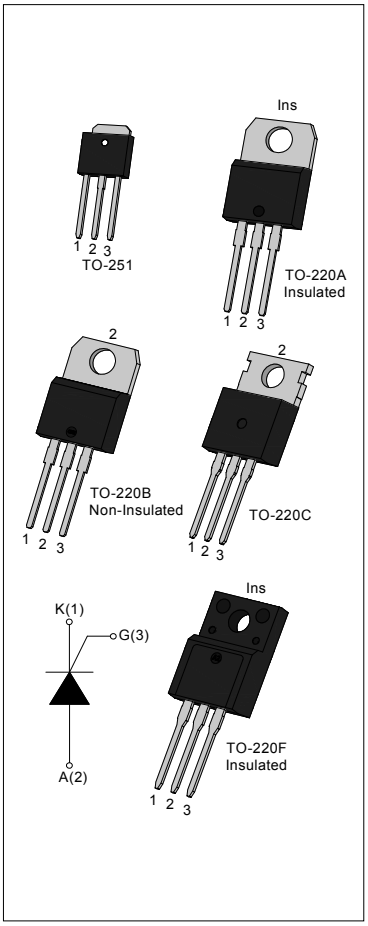
Rev.14.0

DESCRIPTION:

With high ability to withstand the shock loading of large current, JCT151 series of silicon controlled rectifiers provide high dv/dt rate with strong resistance to electromagnetic interference. They are especially recommended for use on solid state relay, motorcycle, power charger, T-tools etc.

From all three terminals to external heatsink, JCT151A provides a rated insulation voltage of 2500 V_{RMS}, and JCT151F provides a rated insulation voltage of 2000 V_{RMS}, complying with UL standards (File ref: E252906).

All the packages listed above are RoHS compliant. (2011/65/EU)



MAIN FEATURES

Symbol	Value	Symbol
V_{DRM}/ V_{RRM}	650/800	V
$I_{T(RMS)}$	12	A
I_{GT}	≤15	mA

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junction temperature range		T_{stg}	-40 - 150	℃
Operating junction temperature range		T_j	-40 - 150	℃
Repetitive peak off-state voltage (T_j=25℃)		V_{DRM}	650/800	V
Repetitive peak reverse voltage (T_j=25℃)		V_{RRM}	650/800	V
RMS on-state current	TO-251/ TO-220C/ TO-220B (Non-Ins) (T_C=130℃)	$I_{T(RMS)}$	12	A
	TO-220A (Ins)/ TO-220F (Ins) (T_C=125℃)			
Non repetitive surge peak on-state current (F=50Hz tp=10ms)		I_{TSM}	120	A

Non repetitive surge peak on-state current (F=60Hz tp=8.3ms)	I_{TSM}	132	A
I^2t value for fusing (tp=10ms)	I^2t	72	A^2s
Repetitive rate of rise of on-state current (I_G=2×I_{GT})	dI_T/dt	50	A/μs
Peak gate current	I_{GM}	2	A
Peak gate power	P_{GM}	5	W
Average gate power dissipation	$P_{G(AV)}$	0.5	W

ELECTRICAL CHARACTERISTICS (T_j=25℃ unless otherwise specified)

Symbol	Test Condition	Value			Unit
		MIN.	TYP.	MAX.	
I_{GT}	V_D=12V R_L=33Ω	-	4	15	mA
V_{GT}		-	0.75	1.5	V
V_{GD}	V_D=V_{DRM} T_j=150℃ R_L=3.3KΩ	0.2	-	-	V
I_L	I_G=1.2I_{GT}	-	12	40	mA
I_H	I_T=500mA	-	12	30	mA
dV/dt	V_D=540V Gate Open T_j=150℃	50	-	-	V/μs
dV/dt	V_D=436V Gate Open T_j=150℃	80	-	-	V/μs
t_{on}	I_{GT}=20mA I_A=100mA I_R=10mA T_j=25℃	-	2	-	μs
t_{off}		-	30	-	μs
R_d	Dynamic resistance T_j=125℃	-	-	35	mΩ

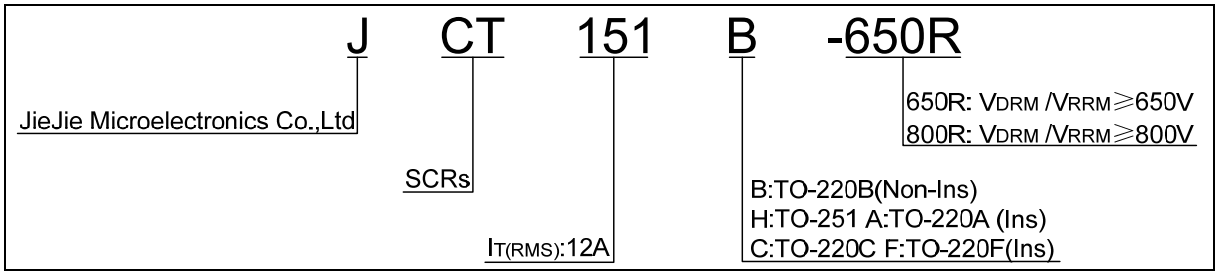
STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX)	Unit
V_{TM}	I_{TM}=23A tp=380μs	T_j=25℃	1.6	V
I_{DRM}	V_D=V_{DRM} V_R=V_{RRM}	T_j=25℃	10	μA
I_{RRM}		T_j=150℃	1	mA

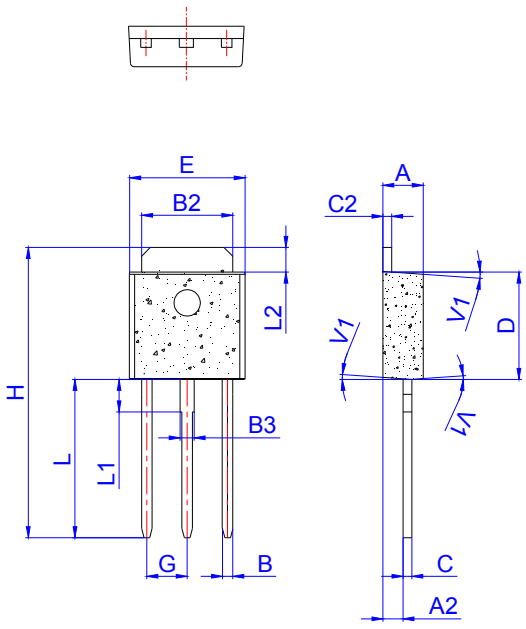
THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-251/ TO-220C/ TO-220B (Non-Ins)	1.3	℃/W
		TO-220A (Ins)	1.6	
		TO-220F (Ins)	1.7	

ORDERING INFORMATION



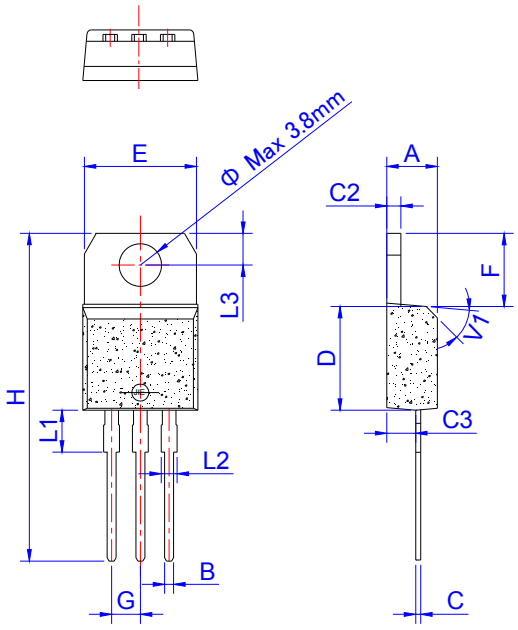
PACKAGE MECHANICAL DATA



TO-251

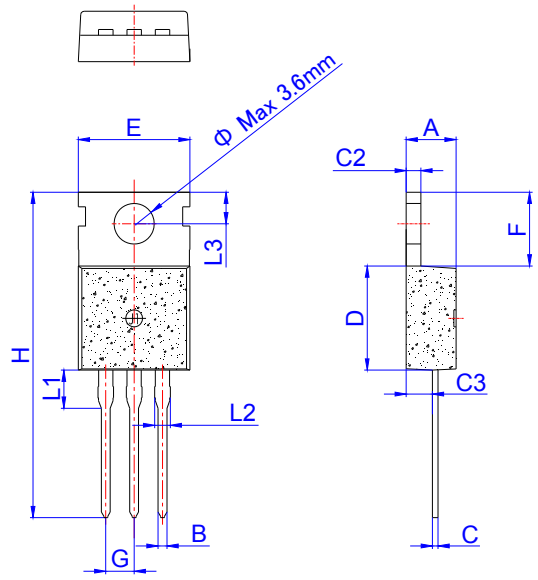
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.095
A2	0.90		1.20	0.035		0.047
B	0.55		0.65	0.022		0.026
B2	5.10		5.40	0.200		0.213
B3	0.76		0.85	0.030		0.033
C	0.45		0.62	0.018		0.024
C2	0.48		0.62	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.70	0.252		0.264
G		2.30			0.091	
H	16.0		17.0	0.630		0.669
L	8.90		9.40	0.350		0.370
L1	1.80		1.90	0.071		0.075
L2	1.37		1.50	0.054		0.059
V1		4°			4°	

PACKAGE MECHANICAL DATA



TO-220B Non-Ins

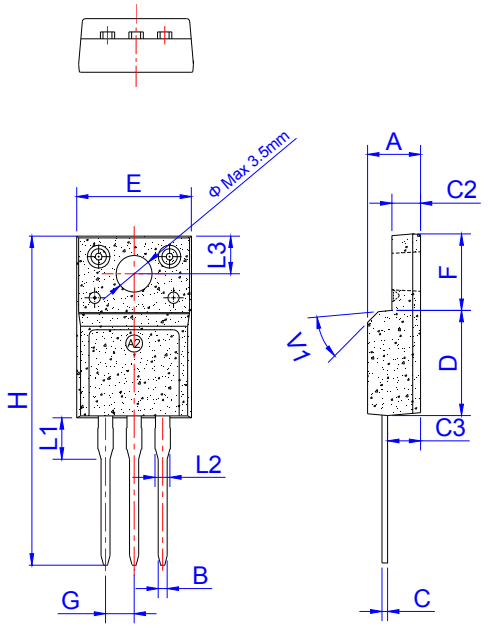
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.61		0.88	0.024		0.035
C	0.46		0.70	0.018		0.028
C2	1.21		1.32	0.048		0.052
C3	2.40		2.72	0.094		0.107
D	8.60		9.70	0.339		0.382
E	9.60		10.4	0.378		0.409
F	6.20		6.60	0.244		0.260
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.75			0.148	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45°			45°	



TO-220C

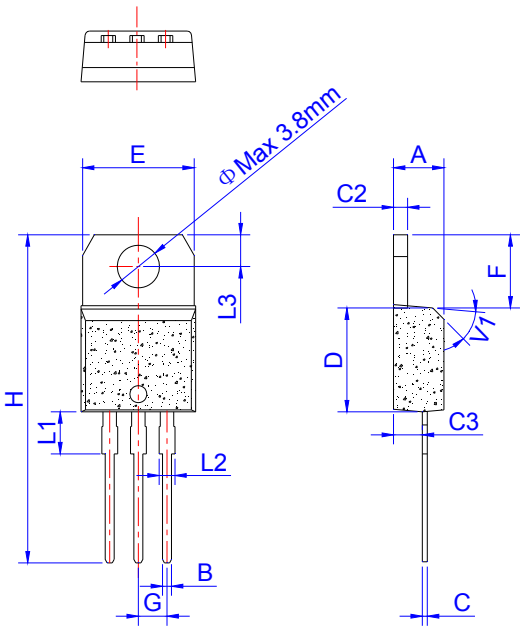
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	

PACKAGE MECHANICAL DATA



TO-220F Ins

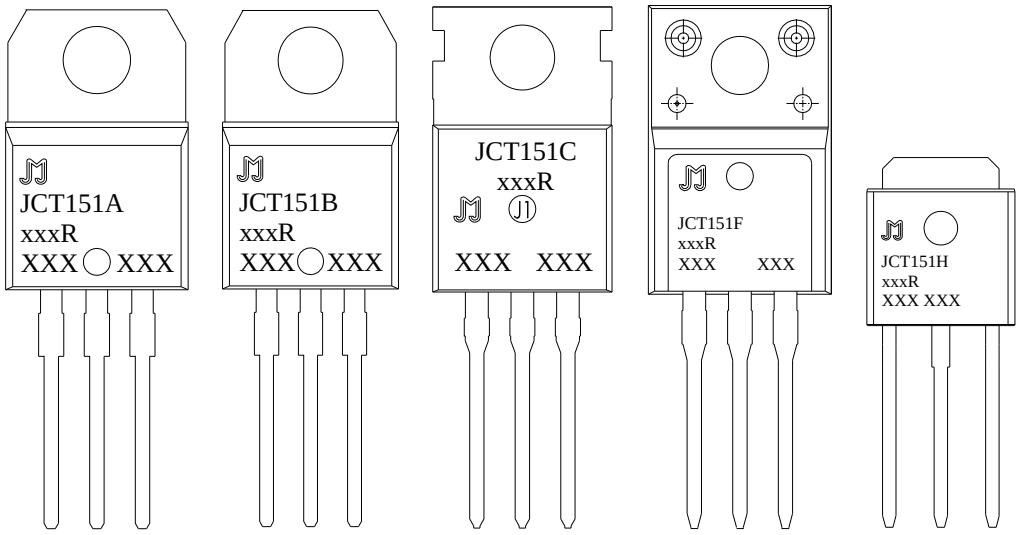
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.50		4.90	0.177		0.193
B	0.74	0.80	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.60		3.00	0.102		0.118
D	8.80		9.30	0.346		0.366
E	9.80		10.4	0.386		0.410
F	6.40		6.80	0.252		0.268
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.63			0.143	
L2	1.14		1.70	0.045		0.067
L3		3.30			0.130	
V1		45°			45°	



TO-220A Ins

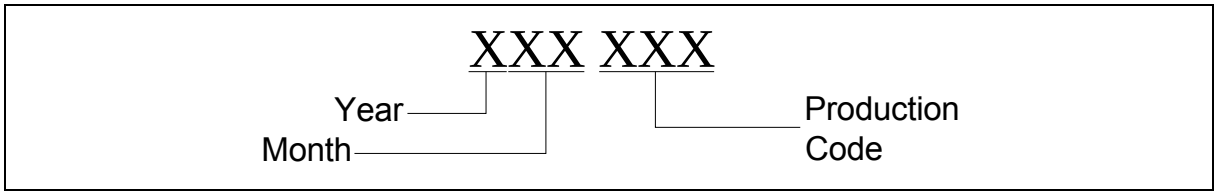
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.61		0.88	0.024		0.035
C	0.46		0.70	0.018		0.028
C2	1.21		1.32	0.048		0.052
C3	2.40		2.72	0.094		0.107
D	8.60		9.70	0.339		0.382
E	9.80		10.4	0.386		0.409
F	6.55		6.95	0.258		0.274
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.75			0.148	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
V1		45°			45°	

MARKING



TO-220A (Ins) TO-220B (Non-Ins) TO-220C TO-220F (Ins) TO-251

NOTE: xxxR--- 650R/800R



PACKAGE INFORMATION

PACKAGE	OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON
TO-220A	TUBE	50	1,000	8,000
TO-220B	TUBE	50	1,000	8,000
TO-220C	TUBE	50	1,000	8,000
TO-220F	TUBE	50	1,000	8,000
TO-251	TUBE	80	4,000	32,000

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

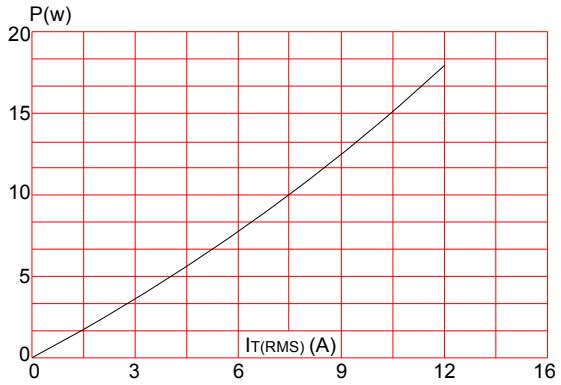


FIG.2: RMS on-state current versus case temperature

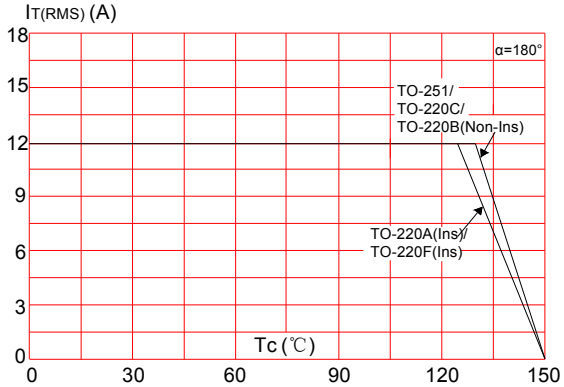


FIG.3: Surge peak on-state current versus number of cycles

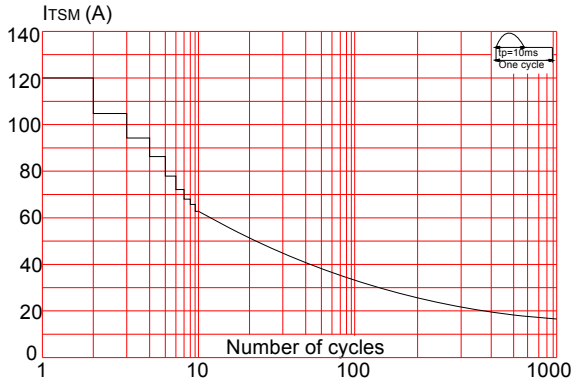


FIG.4: On-state characteristics (maximum values)

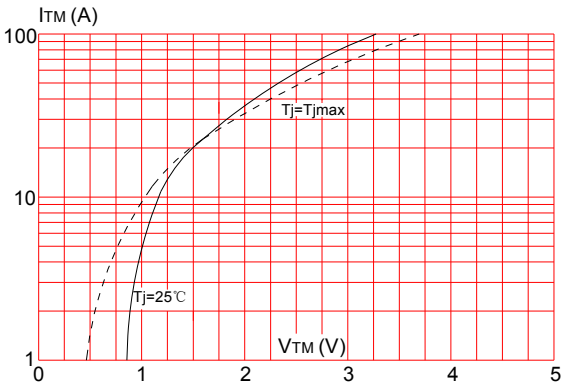


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponging value of I^2t (dI/dt < 50A/μs)

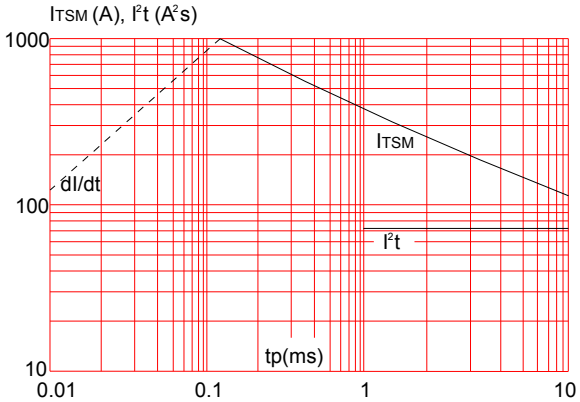
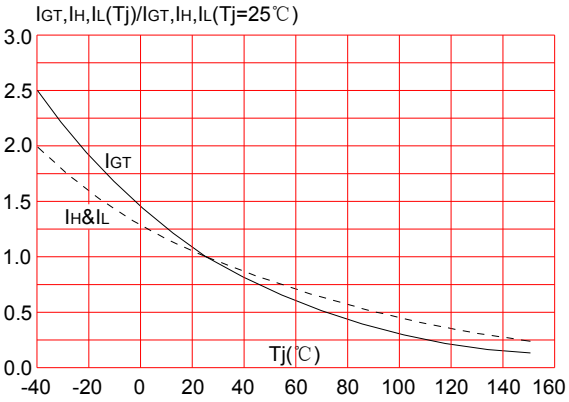


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature



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