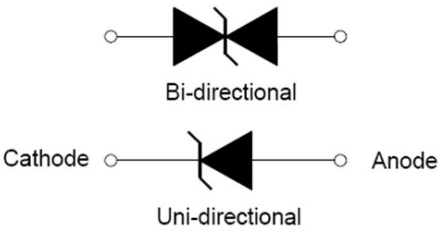
JRC-T Series 12000W Transient Voltage Suppressor

Rev.2.5

DESCRIPTION:

The JRC-T series of high current uni/bi-directional transient suppressors are designed for high power DC bus clamping applications. These devices offer uni/bi-directional port protection from 20 volts to 72 volts. They provide a clamping voltage lower than the avalanche voltage. Therefore, any voltage rise due to increased current conduction is contained to a minimum, providing the best possible protection level. They can also be connected in series and/or parallel to create very high capacity protection solutions.

R-6/P-600



Symbol

FEATURES:

- ✧ Low incremental surge resistance.
- ✧ Excellent clamping capability.
- ✧ Typical I_R less than 5μA above 22V.
- ✧ Color band denoted cathode except bidirectional.
- ✧ High temperature soldering: 265℃/10s at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ 12000W peak pulse power capability at 10/1000μs waveform.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ✧ Terminal: solder plated, solderable per J-STD-002.
- ✧ UL 497B item recognized. (File No.:E480698).
- ✧ High reliability application and automotive grade (AEC-Q101 qualified).

IEC COMPATIBILITY

- ✧ ISO16750-2 P5A 12V system (DC14V 87V/0.5Ω/400ms).
- ✧ ISO16750-2 P5A 24V system (DC28V 174V/2Ω/350ms).

ABSOLUTE MAXIMUM RATINGS (T_A=25℃, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175	℃
Peak pulse power dissipation at 10/1000μs waveform	P_{PP}	12000	W
Steady state power dissipation at T_L=75℃	$P_{M(AV)}$	8	W

ABSOLUTE MAXIMUM RATINGS (T_A=25℃, RH=45%-75%, unless otherwise noted, continued)

Parameter	Symbol	Value	Unit
Maximum instantaneous forward voltage at 100A for unidirectional only	V_F	5	V
Peak forward surge current, 8.3ms single half sine-wave	I_{FSM}	600	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	8.0	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	40	℃/W

ELECTRICAL CHARACTERISTICS (T_A=25℃)

Part Number		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Bi-Polar	V	max(μA)	min(V)	max(V)	mA	max(V)	A
JRC-T20A	JRC-T20CA	20.0	15	22.20	24.50	5	34.3	349.9
JRC-T22A	JRC-T22CA	22.0	10	24.40	26.90	5	37.1	323.5
JRC-T24A	JRC-T24CA	24.0	5	26.70	29.50	5	40.7	294.9
JRC-T26A	JRC-T26CA	26.0	5	28.90	31.90	5	44.0	272.8
JRC-T28A	JRC-T28CA	28.0	5	31.10	34.40	5	47.5	252.7
JRC-T30A	JRC-T30CA	30.0	5	33.30	36.80	5	50.7	236.7
JRC-T33A	JRC-T33CA	33.0	5	36.70	40.60	5	54.7	219.4
JRC-T36A	JRC-T36CA	36.0	5	40.00	44.20	5	59.8	200.7
JRC-T40A	JRC-T40CA	40.0	5	44.40	49.10	5	65.8	182.4
JRC-T43A	JRC-T43CA	43.0	5	47.80	52.80	5	69.8	171.9
JRC-T48A	JRC-T48CA	48.0	5	53.60	58.70	5	77.7	154.5
JRC-T58A	JRC-T58CA	58.0	5	64.40	71.20	5	93.6	128.2
JRC-T64A	JRC-T64CA	64.0	5	71.10	78.60	5	103	116.5
JRC-T72A	JRC-T72CA	72.0	5	80.00	88.50	5	116	103.4

① Surge waveform:10/1000μs

V_R: Stand-off voltage -- Maximum voltage that can be applied

V_{BR}: Breakdown voltage

V_C: Clamping voltage -- Peak voltage measured across the suppressor at a specified I_{PP}

I_R: Reverse leakage current

RATINGS AND V-I CHARACTERISTICS CURVES (T_A=25℃, unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

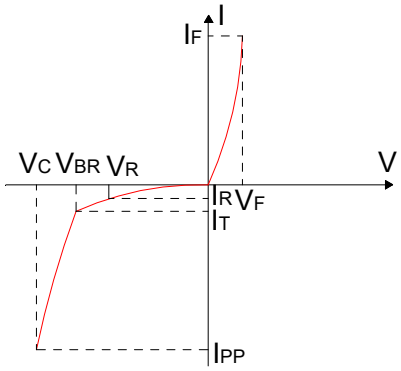


FIG.2:V- I curve characteristics (Bi-directional)

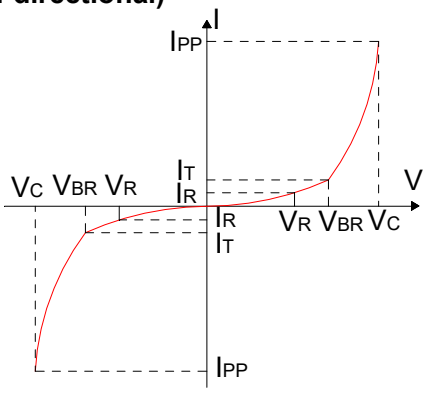


FIG.3: Pulse waveform

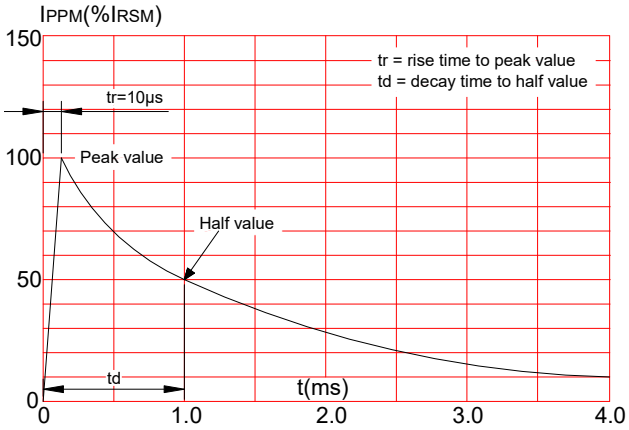
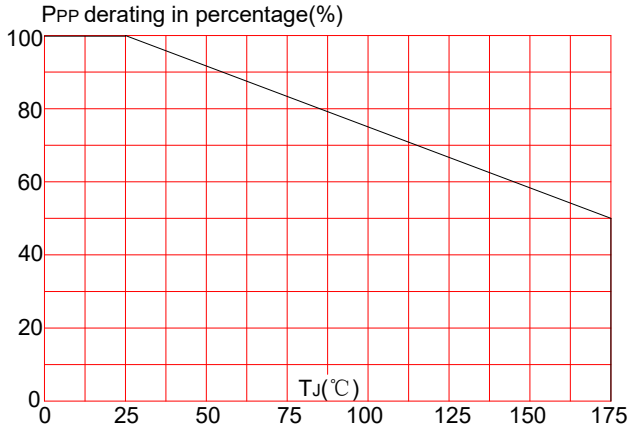
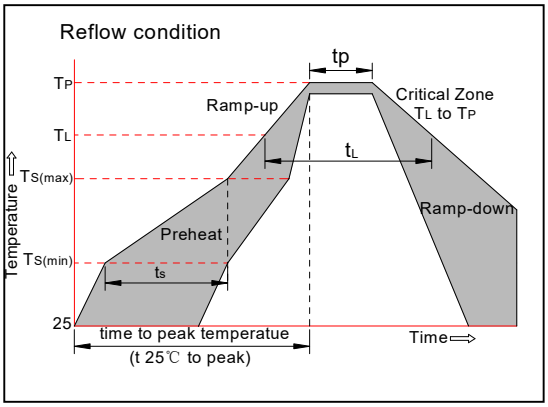


FIG.4: Pulse derating curve



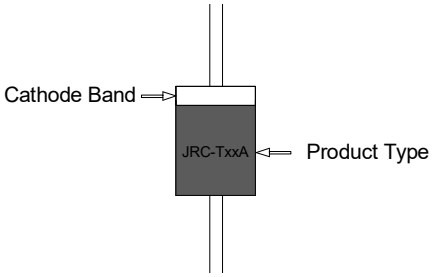
SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L)to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		20-40secs.
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

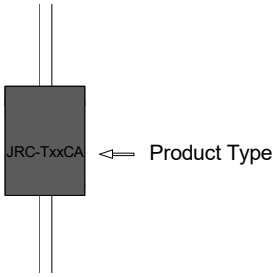


Flow/Wave Soldering(Solder Dipping)	
Peak temperature	265℃
Dipping time	10 sec.
Soldering	1 time

MARKING & ORDERING INFORMATION

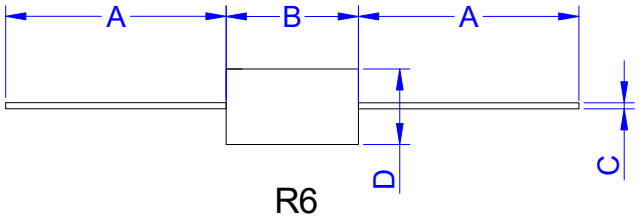


JRC-T xx A
(1) (2) (3)
(1)Series:12000 watts series
(2)Reverse stand-off voltage
(3)5% V_{BR} voltage tolerance



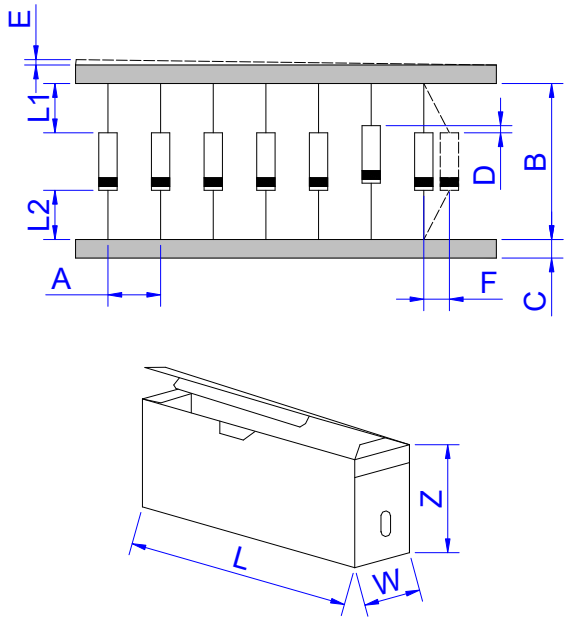
JRC-T xx C A
(1) (2) (3) (4)
(1)Series:12000 watts series
(2)Reverse stand-off voltage
(3)Bi-directional
(4)5% V_{BR} Voltage tolerance

PACKAGE MECHANICAL DATA



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	25.40	-	1.000	-
B	8.60	9.40	0.339	0.370
C	1.20	1.40	0.047	0.055
D	8.60	9.10	0.339	0.358

TAPE AND BOX SPECIFICATION-R-6/P-600



Ref.	Dimensions	
	Millimeters	Inches
A	10.0±0.5	0.394±0.020
B	53.0±1.5	2.087±0.059
C	6.0±0.5	0.236±0.020
D	1.2(MAX)	0.047(MAX)
E	0.8(MAX)	0.031(MAX)
F	1.5(MAX)	0.059(MAX)
|L1-L2|	1.0(MAX)	0.039(MAX)
W	80±5.0	3.150±0.197
L	250±5.0	9.843±0.197
Z	115±5.0	4.528±0.197

PART No.	UNIT WEIGHT (g/PCS) typ.	CASE TYPE	QUANTITY (PCS)	PACKING OPTION
JRC-TxxA/CA	3.25	R-6/P-600	300	Box

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