

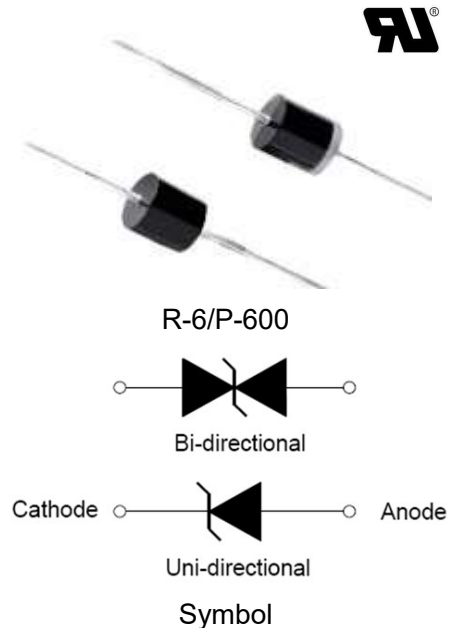


## JRC-T Series 12000W Transient Voltage Suppressor

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.



### FEATURES:

- ✧ Low incremental surge resistance.
- ✧ Excellent clamping capability.
- ✧ Typical  $I_R$  less than  $5\mu A$  above 22V.
- ✧ Color band denoted cathode except bidirectional.
- ✧ High temperature soldering:  $265^{\circ}C/10s$  at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ 12000W peak pulse power capability at 10/1000 $\mu s$  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/0.5 $\Omega$ /400ms).
- ✧ ISO16750-2 P5A 24V system (DC28V 174V/2 $\Omega$ /350ms).

### ABSOLUTE MAXIMUM RATINGS ( $T_A=25^{\circ}C$ , RH=45%-75%, unless otherwise noted)

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

**ABSOLUTE MAXIMUM RATINGS** ( $T_A=25^{\circ}\text{C}$ , 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	$^{\circ}\text{C/W}$
Typical thermal resistance junction to ambient	$R_{\theta JA}$	40	$^{\circ}\text{C/W}$

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$ )

Part Number		$V_R$	$I_R@V_R$	$V_{BR}@I_T$		$I_T$	$V_C@I_{PP}$	$I_{PP}^{\circ}$
Uni-Polar	Bi-Polar	V	max( $\mu\text{A}$ )	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:10/1000 $\mu\text{s}$

$V_R$ : 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<sub>A</sub>=25°C, unless otherwise noted)

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

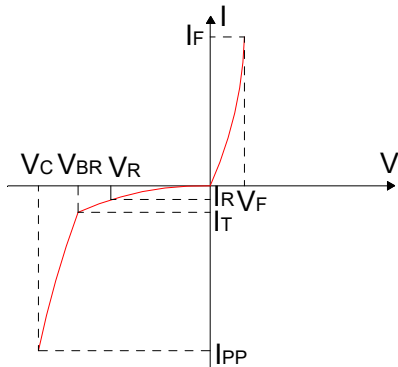


FIG.2:V- I curve characteristics (Bi-directional)

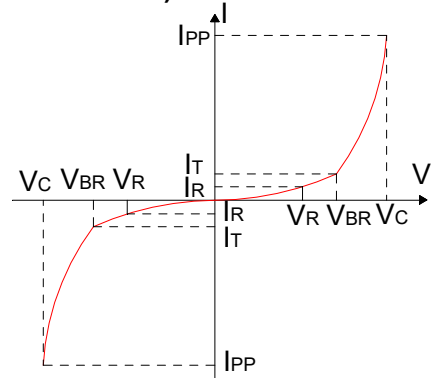


FIG.3: Pulse waveform

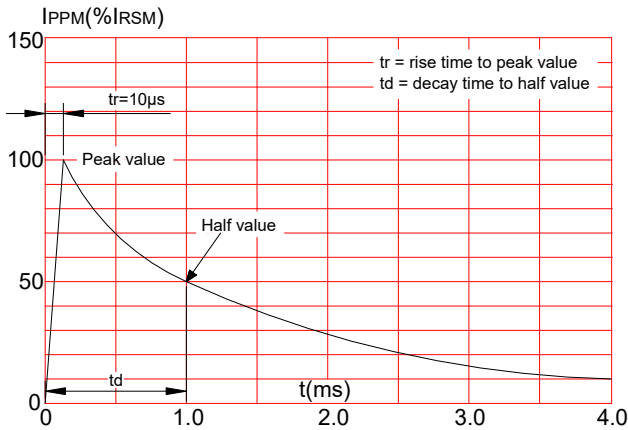
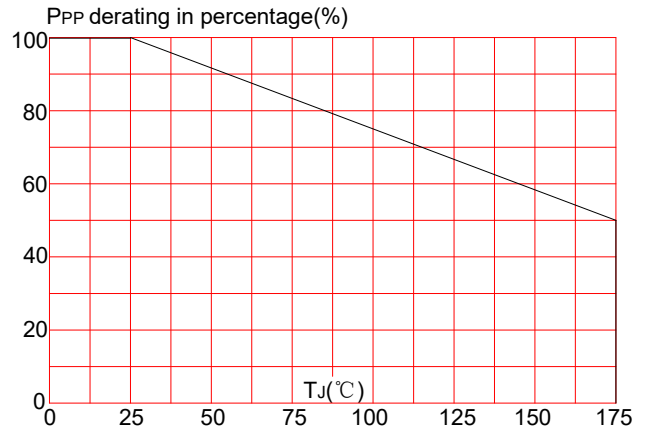
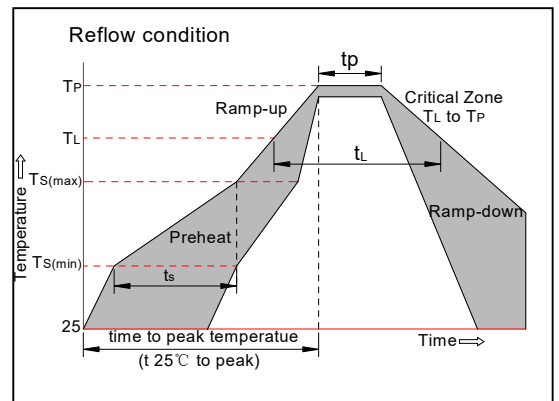


FIG.4: Pulse derating curve



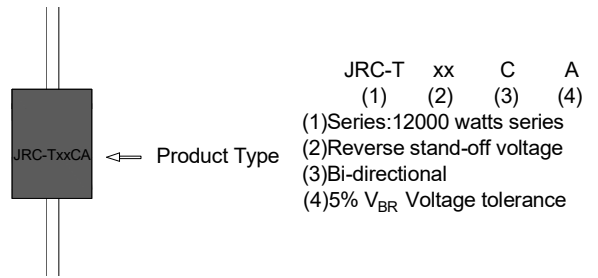
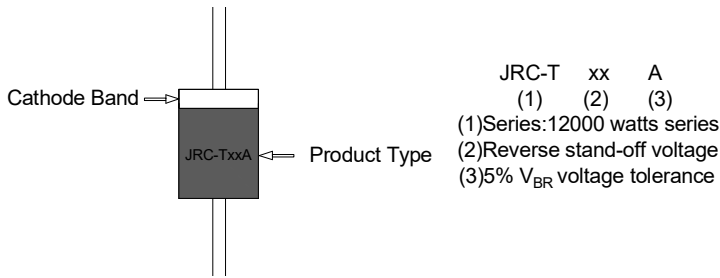
SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min (T <sub>s(min)</sub> )	+150°C
	-Temperature Max(T <sub>s(max)</sub> )	+200°C
	-Time (Min to Max) (t <sub>s</sub> )	60-180 secs.
Average ramp up rate (Liquidus Temp (T <sub>L</sub> )to peak)		3°C/sec. Max
T <sub>s(max)</sub> to T <sub>L</sub> - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T <sub>L</sub> )(Liquidus)	+217°C
	-Temperature(t <sub>L</sub> )	60-150 secs.
Peak Temp (T <sub>p</sub> )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t <sub>p</sub> )		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T <sub>p</sub> )		8 min. Max
Do not exceed		+260°C



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

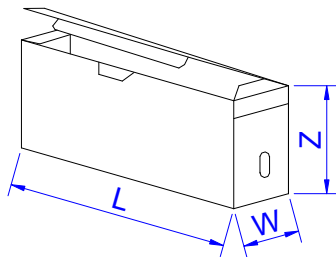
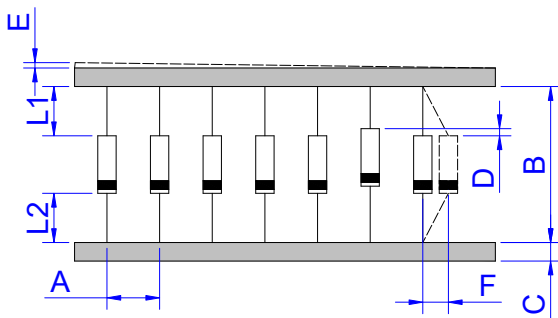
## MARKING & ORDERING INFORMATION



## 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

# 12000W JRC-T Series

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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