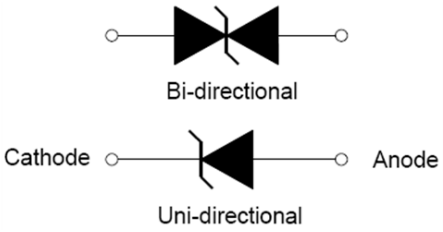
15KP Series

15000W Transient Voltage Suppressor

DESCRIPTION:

The 15KP series of high current uni/bi-directional transient suppressors are designed for A.C. line protection and high power DC bus clamping applications. These devices offer uni/bi-directional port protection from 17 volts to 280 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 2μA above 30V.
- ✧ Color band denoted cathode except bidirectional.
- ✧ High temperature soldering: 265℃/10s at terminals.
- ✧ Plastic package has under writers laboratory flammability 94V-0.
- ✧ 15000W peak pulse power capability at 10/1000μs waveform.
- ✧ Terminal: solder plated, solderable per J-STD-002.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ✧ UL 497B item recognized. (File No.:E480698).

ABSOLUTE MAXIMUM RATINGS(T_A=25ºC, 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}	15000	W
Steady state power dissipation at T_L=75℃	$P_{M(AV)}$	8.0	W
Peak forward surge current, 8.3ms single half sine-wave for unidirectional only	I_{FSM}	400	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	μA	min(V)	max(V)	mA	max(V)	A
15KP17A	15KP17CA	17.0	5000	18.90	20.90	50	29.3	515.4
15KP18A	15KP18CA	18.0	5000	20.00	22.10	50	30.9	488.7
15KP20A	15KP20CA	20.0	1500	22.20	24.50	20	34.3	440.2
15KP22A	15KP22CA	22.0	500	24.40	26.90	10	37.1	407.0
15KP24A	15KP24CA	24.0	150	26.70	29.50	5	40.7	371.0
15KP26A	15KP26CA	26.0	50	28.90	31.90	5	44.0	343.2
15KP28A	15KP28CA	28.0	25	31.10	34.40	5	47.5	317.9
15KP30A	15KP30CA	30.0	15	33.30	36.80	5	50.7	297.8
15KP33A	15KP33CA	33.0	2	36.70	40.60	5	54.7	276.1
15KP36A	15KP36CA	36.0	2	40.00	44.20	5	59.8	252.5
15KP40A	15KP40CA	40.0	2	44.40	49.10	5	65.8	229.5
15KP43A	15KP43CA	43.0	2	47.80	52.80	5	69.8	216.3
15KP45A	15KP45CA	45.0	2	50.00	55.30	5	72.8	207.4
15KP48A	15KP48CA	48.0	2	53.30	58.90	5	77.7	194.3
15KP51A	15KP51CA	51.0	2	56.70	62.70	5	82.9	182.1
15KP54A	15KP54CA	54.0	2	60.00	66.30	5	87.7	172.2
15KP58A	15KP58CA	58.0	2	64.40	71.20	5	93.8	161.0
15KP60A	15KP60CA	60.0	2	66.70	73.70	5	97.4	155.0
15KP64A	15KP64CA	64.0	2	71.10	78.60	5	104.2	144.9
15KP70A	15KP70CA	70.0	2	77.80	86.00	5	113.6	132.9
15KP75A	15KP75CA	75.0	2	83.30	92.10	5	122.0	123.8
15KP78A	15KP78CA	78.0	2	86.70	95.80	5	126.1	119.7
15KP85A	15KP85CA	85.0	2	94.40	104.0	5	137.6	109.7
15KP90A	15KP90CA	90.0	2	100.0	111.0	5	145.6	103.7
15KP100A	15KP100CA	100.0	2	111.0	123.0	5	161.3	93.6
15KP110A	15KP110CA	110.0	2	122.0	135.0	5	178.6	84.5
15KP120A	15KP120CA	120.0	2	133.0	147.0	5	192.3	78.5
15KP130A	15KP130CA	130.0	2	144.0	159.0	5	208.3	72.5
15KP150A	15KP150CA	150.0	2	167.0	185.0	5	241.9	62.4
15KP160A	15KP160CA	160.0	2	178.0	197.0	5	258.6	58.4

ELECTRICAL CHARACTERISTICS (T_A=25℃, continued)

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	μA	min(V)	max(V)	mA	max(V)	A
15KP170A	15KP170CA	170.0	2	189.0	209.0	5	272.7	55.4
15KP180A	15KP180CA	180.0	2	201.0	222.0	5	288.5	52.3
15KP200A	15KP200CA	200.0	2	224.0	247.0	5	319.1	47.3
15KP220A	15KP220CA	220.0	2	246.0	272.0	5	352.5	42.8
15KP240A	15KP240CA	240.0	2	268.0	292.0	5	384.6	39.3
15KP260A	15KP260CA	260.0	2	289.0	317.0	5	416.7	36.2
15KP280A	15KP280CA	280.0	2	311.0	341.0	5	454.5	33.2

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=25ºC, unless otherwise noted)

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

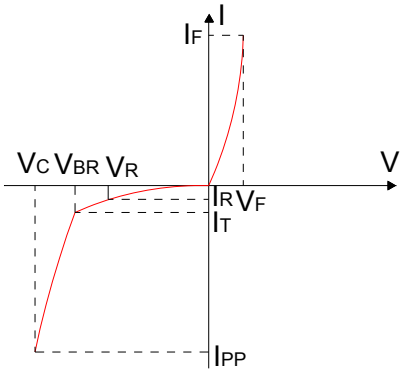


FIG.2:V- I curve characteristics (Bi-directional)

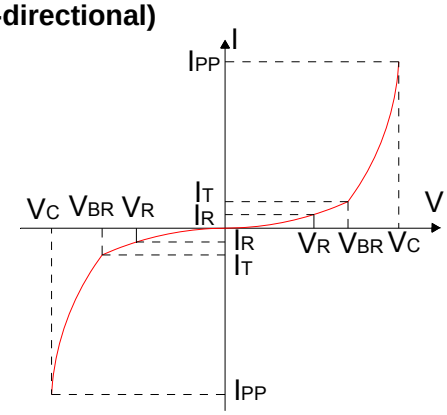


FIG.3: Pulse waveform

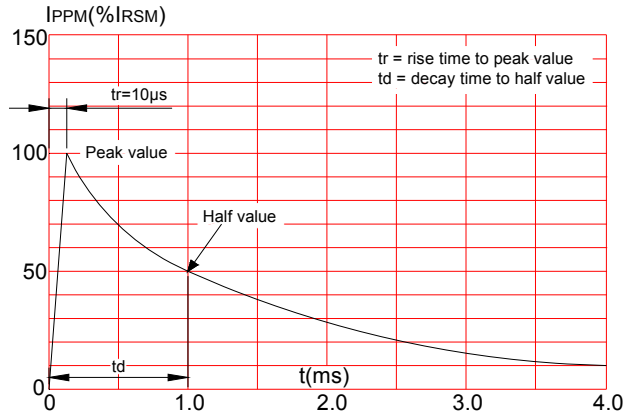


FIG.4: Pulse derating curve

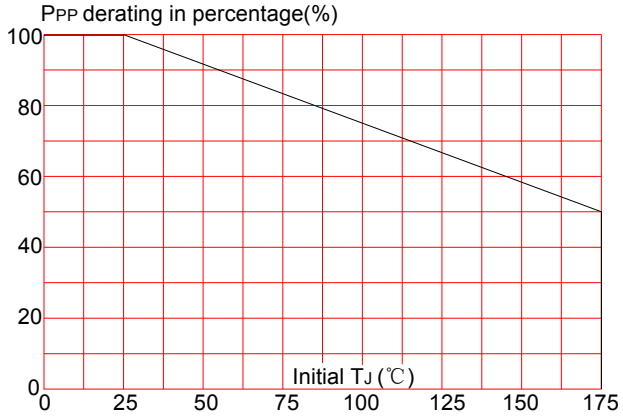
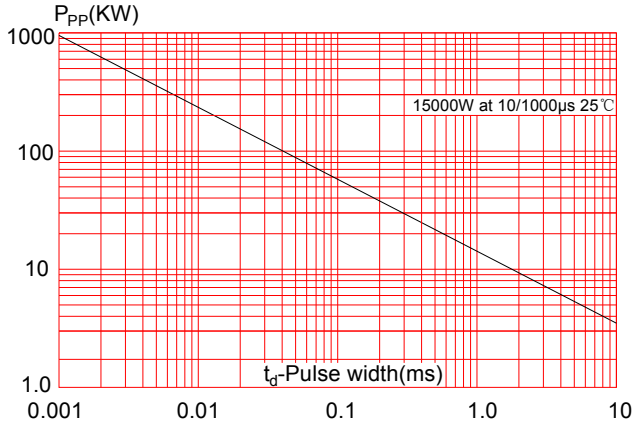
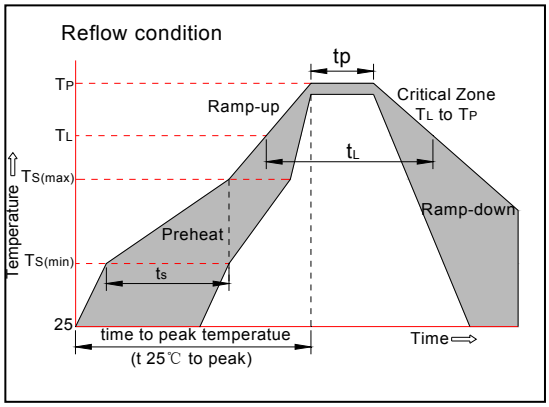


FIG.5:Peak pulse power dissipation vs. pulse width



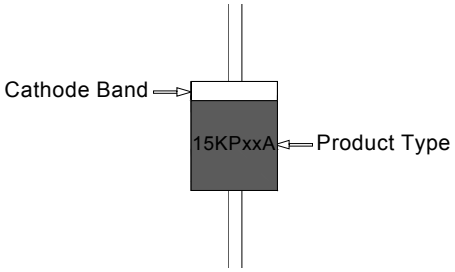
SOLDERING PARAMETERS

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℃

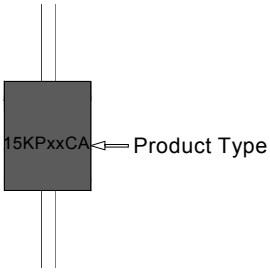


Flow/Wave Soldering(Solder Dipping)	
Peak temperature	265℃
Dipping time	10 sec.
Soldering	1 time

MARKING & ORDERING INFORMATION

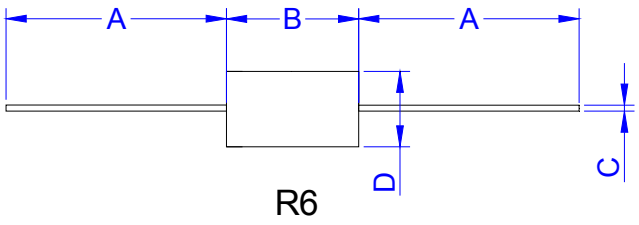


15KP xx A
(1) (2) (3)
(1)Series:15000 watts series
(2)Reverse stand-off voltage
(3)5% V_{BR} voltage tolerance



15KP xx C A
(1) (2) (3) (4)
(1)Series:15000 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

PART No.	UNIT WEIGHT (g/PCS) typ.	CASE TYPE	QUANTITY (PCS)	PACKING OPTION
15KPxxA/CA	3.24	R6/P600	300	Box