DESCRIPTION

The 5KP 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 5.0 volts to 250 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

- Excellent clamping capability.
- Repetition rate (duty cycle): 0.01%.
- Color band denoted cathode except bidirectional.
- 5000W Peak Pulse power capability at 10×1000μs waveform.
- Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- High temperature soldering: 260℃/10s at terminals.

APPLICATION

- I/O Interface.
- AC/DC Power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

MECHANICAL DATA

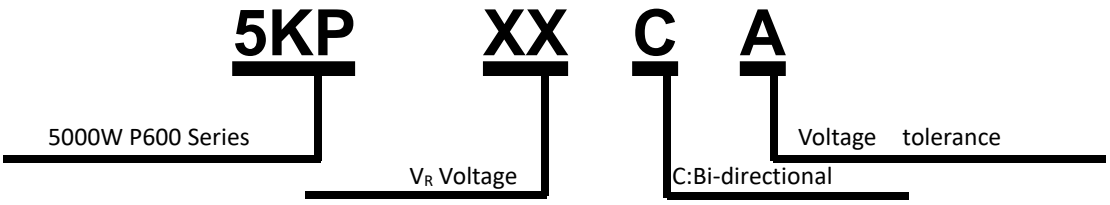
- Case Material: "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Polarity: Color band denotes cathode except bi-directional models
- Terminal Connections: See Diagram Below
- Marking Information: See Below

5KPXX(C)A
GK

Absolute maximum ratings (TA=25ºC, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage temperature range	T_{stg}	-55 to +150	℃
Operating junction temperature range	T_j	-55 to +150	℃
Steady state power dissipation at T_L=75℃	$P_{M(AV)}$	8.0	W
Peak pulse power dissipation on 10/1000μs waveform	P_{PP}	5000	W
Peak forward surge current, 8.3ms single half sine-wave	I_{FSM}	400	A
Typical thermal resistance	$R_{\theta JA}$	8	^{O}C/W

Part number code



Ratings and V-I characteristics curves (T_A=25ºC, unless otherwise noted)

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

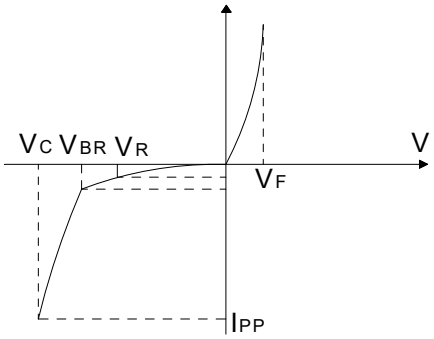


FIG.2:V- I curve characteristics (Bi-directional)

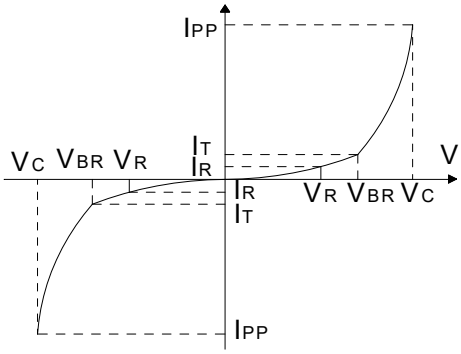


FIG.3: Pulse waveform

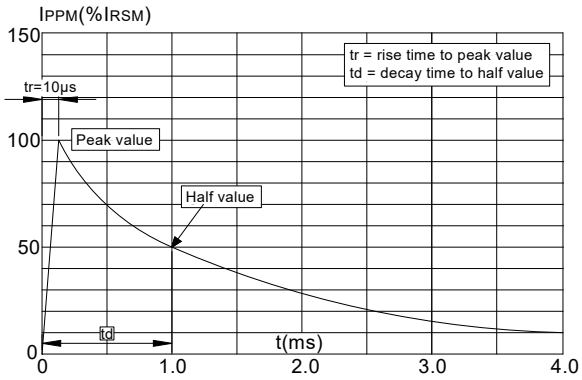
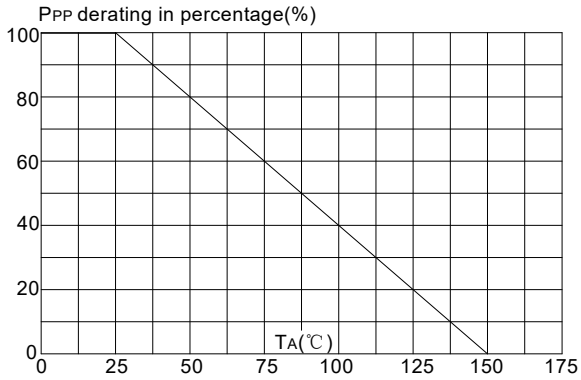


FIG.4: Pulse derating curve



Electrical characteristics (T_A=25℃)

Part Number		Marking		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
5KP5.0A	5KP5.0CA	5KP5.0A	5KP5.0CA	5.0	500	6.40	7.00	10	9.2	544.0
5KP6.0A	5KP6.0CA	5KP6.0A	5KP6.0CA	6.0	300	6.67	7.37	10	10.3	486.0
5KP6.5A	5KP6.5CA	5KP6.5A	5KP6.5CA	6.5	250	7.22	7.98	10	11.2	448.0
5KP7.0A	5KP7.0CA	5KP7.0A	5KP7.0CA	7.0	200	7.78	8.60	10	12.0	417.0
5KP7.5A	5KP7.5CA	5KP7.5A	5KP7.5CA	7.5	150	8.33	9.21	1	12.9	388.0
5KP8.0A	5KP8.0CA	5KP8.0A	5KP8.0CA	8.0	100	8.89	9.83	1	13.6	367.0
5KP8.5A	5KP8.5CA	5KP8.5A	5KP8.5CA	8.5	50	9.44	10.40	1	14.4	347.0
5KP9.0A	5KP9.0CA	5KP9.0A	5KP9.0CA	9.0	20	10.00	11.10	1	15.4	325.0
5KP10A	5KP10CA	5KP10A	5KP10CA	10.0	5	11.10	12.30	1	17.0	294.0
5KP11A	5KP11CA	5KP11A	5KP11CA	11.0	5	12.20	13.50	1	18.2	275.0
5KP12A	5KP12CA	5KP12A	5KP12CA	12.0	2	13.30	14.70	1	19.9	252.0
5KP13A	5KP13CA	5KP13A	5KP13CA	13.0	2	14.40	15.90	1	21.5	233.0
5KP14A	5KP14CA	5KP14A	5KP14CA	14.0	1	15.60	17.20	1	23.2	216.0
5KP15A	5KP15CA	5KP15A	5KP15CA	15.0	1	16.70	18.50	1	24.4	205.0
5KP16A	5KP16CA	5KP16A	5KP16CA	16.0	1	17.80	19.70	1	26.0	193.0
5KP17A	5KP17CA	5KP17A	5KP17CA	17.0	1	18.90	20.90	1	27.6	181.0
5KP18A	5KP18CA	5KP18A	5KP18CA	18.0	1	20.00	22.10	1	29.2	172.0
5KP20A	5KP20CA	5KP20A	5KP20CA	20.0	1	22.20	24.50	1	32.4	155.0
5KP22A	5KP22CA	5KP22A	5KP22CA	22.0	1	24.40	26.90	1	35.5	141.0
5KP24A	5KP24CA	5KP24A	5KP24CA	24.0	1	26.70	29.50	1	38.9	129.0
5KP26A	5KP26CA	5KP26A	5KP26CA	26.0	1	28.90	31.90	1	42.1	119.0
5KP28A	5KP28CA	5KP28A	5KP28CA	28.0	1	31.10	34.40	1	45.4	110.0
5KP30A	5KP30CA	5KP30A	5KP30CA	30.0	1	33.30	36.80	1	48.4	103.0
5KP33A	5KP33CA	5KP33A	5KP33CA	33.0	1	36.70	40.60	1	53.3	93.9
5KP36A	5KP36CA	5KP36A	5KP36CA	36.0	1	40.00	44.20	1	58.1	86.1
5KP40A	5KP40CA	5KP40A	5KP40CA	40.0	1	44.40	49.10	1	64.5	77.6
5KP43A	5KP43CA	5KP43A	5KP43CA	43.0	1	47.80	52.80	1	69.4	72.1
5KP45A	5KP45CA	5KP45A	5KP45CA	45.0	1	50.00	55.30	1	72.7	68.8
5KP48A	5KP48CA	5KP48A	5KP48CA	48.0	1	53.30	58.90	1	77.4	64.7
5KP51A	5KP51CA	5KP51A	5KP51CA	51.0	1	56.70	62.70	1	82.4	60.7

Electrical characteristics (T_A=25℃)

Part Number		Marking		V_R	I_R@V_R	V_{BR}@I_T		I_T	V_C@I_{PP}	I_{PP}①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
5KP54A	5KP54CA	5KP54A	5KP54CA	54.0	1	60.00	66.30	1	87.1	57.5
5KP58A	5KP58CA	5KP58A	5KP58CA	58.0	1	64.40	71.20	1	93.6	53.5
5KP60A	5KP60CA	5KP60A	5KP60CA	60.0	1	66.70	73.70	1	96.8	51.7
5KP64A	5KP64CA	5KP64A	5KP64CA	64.0	1	71.10	78.60	1	103.0	48.6
5KP70A	5KP70CA	5KP70A	5KP70CA	70.0	1	77.80	86.00	1	113.0	44.3
5KP75A	5KP75CA	5KP75A	5KP75CA	75.0	1	83.30	92.10	1	121.0	41.4
5KP78A	5KP78CA	5KP78A	5KP78CA	78.0	1	86.70	95.80	1	126.0	39.7
5KP85A	5KP85CA	5KP85A	5KP85CA	85.0	1	94.40	104.0	1	137.0	36.5
5KP90A	5KP90CA	5KP90A	5KP90CA	90.0	1	100.0	111.0	1	146.0	34.3
5KP100A	5KP100CA	5KP100A	5KP100CA	100.0	1	100.0	111.0	1	162.0	30.9
5KP110A	5KP110CA	5KP110A	5KP110CA	110.0	1	111.0	123.0	1	177.0	28.3
5KP120A	5KP120CA	5KP120A	5KP120CA	120.0	1	122.0	135.0	1	193.0	26.0
5KP130A	5KP130CA	5KP130A	5KP130CA	130.0	1	133.0	147.0	1	209.0	24.0
5KP150A	5KP150CA	5KP150A	5KP150CA	150.0	1	144.0	159.0	1	243.0	20.6
5KP160A	5KP160CA	5KP160A	5KP160CA	160.0	1	167.0	185.0	1	259.0	19.3
5KP170A	5KP170CA	5KP170A	5KP170CA	170.0	1	178.0	197.0	1	275.0	18.2
5KP180A	5KP180CA	5KP180A	5KP180CA	180.0	1	189.0	209.0	1	292.0	17.5
5KP190A	5KP190CA	5KP190A	5KP190CA	190.0	1	211.0	233.0	1	310.0	16.5
5KP200A	5KP200CA	5KP200A	5KP200CA	200.0	1	224.0	247.0	1	329.2	15.5
5KP210A	5KP210CA	5KP210A	5KP210CA	210.0	1	237.0	263.0	1	349.5	14.6
5KP220A	5KP220CA	5KP220A	5KP220CA	220.0	1	246.0	272.0	1	371.1	13.7
5KP250A	5KP250CA	5KP250A	5KP250CA	250.0	1	277.0	306.0	1	425.0	12.0

① Surge waveform: 10/1000μs

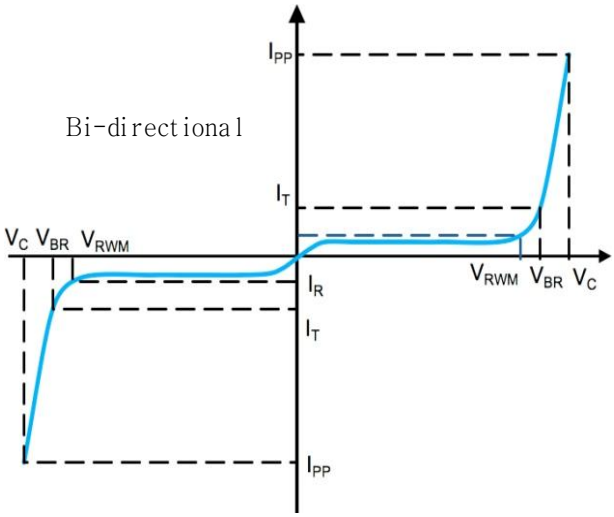
V_R ： Stand-off Voltage -- Maximum voltage that can be applied

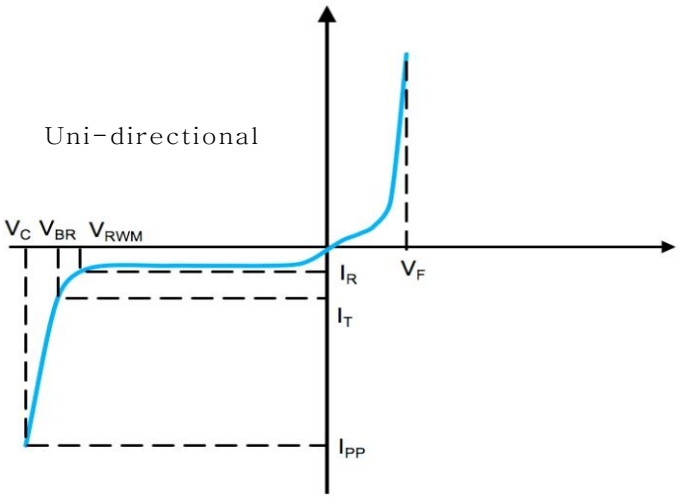
V_{BR}： Breakdown Voltage

V_C： Clamping Voltage -- Peak voltage measured across the suppressor at a specified Ipp

I_R： Reverse Leakage Current

I-V Curve Characteristics



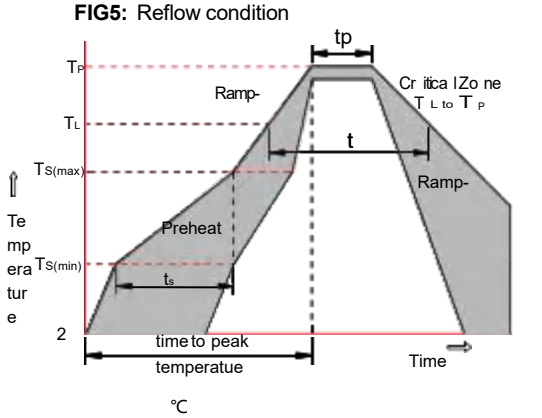


P_{PPM}	Peak Pulse Power Dissipation - Max power dissipation
V_{RWM}	Reverse Stand-off Voltage - Maximum voltage that can be applied to TVS without operation
V_{BR}	Breakdown Voltage – Maximum voltage that flows though the TVS at a specified current (I_T)
V_C	Clamping Voltage – Peak voltage measured across the TVS at a specified I_{PPM} (peak impulse current)
I_R	Reverse Leakage Current – Current measured at V_R
V_F	Forward Voltage Drop for Uni-directional

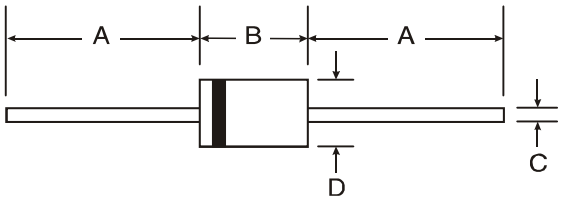
Soldering parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG5: Reflow condition



Package Dimensions & Suggested Pad Layout



R-6		
Dim	**Min**	**Max**
A	25.40	-
B	8.60	9.10
C	1.20	1.30
D	8.60	9.10
All Dimensions in mm		