

# SURGiNG

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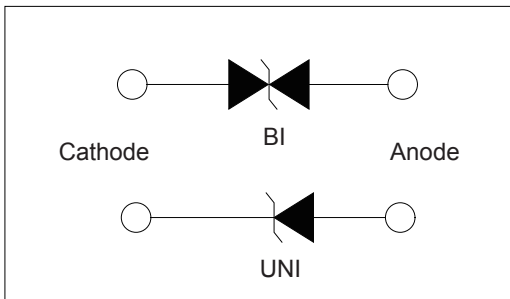
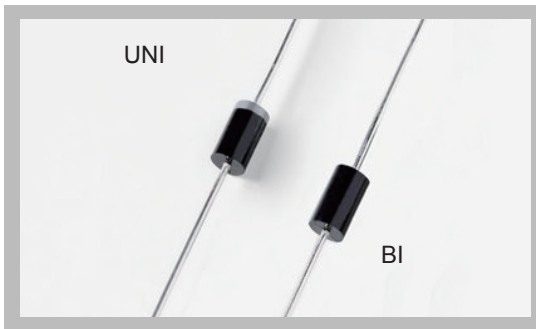


# Transient Voltage Suppressor

瞬态抑制二极管

3KP Series

## Transient Voltage Suppressors - 3KP Series



### Features

1. Halogen-free
2. Rohs compliant
3. Typical maximum temperature coefficient
4.  $\Delta V_{BR} = 0.1\% \times V_{BR} @ 25^{\circ}\text{C} \times \Delta T$
5. Glass passivated Chip junction in P600 package
6. 3000W peak pulse capability at 10x1000 $\mu\text{s}$  waveform, repetition rate (duty cycles): 0.01%
7. Fast response time: typically less than 1.0ps from 0 Volts to BV min
8. Excellent clamping capability
9. Low incremental surge resistance
10. Typical IR less than 3 $\mu\text{A}$  above 11V
11. High temperature soldering guaranteed: 260 $^{\circ}\text{C}$ /40 seconds / 0.375", (9.5mm) lead length, 5lbs., (2.3kg) tension
12. Plastic package has underwriters laboratory flammability classification 94v-0

### Applications

TVS devices are ideal for the protection of I/O interfaces,  $V_{CC}$  bus and other vulnerable circuits used in telecom, computer, industrial and consumer electronic applications.

### Mechanical Characteristics

Rating	Symbol	Value	Units
Peak Pulse Power Dissipation by 10x1000 $\mu\text{s}$ test waveform (Fig.1)(Note 1)	$P_{PPM}$	3000	Watts
Steady State Power Dissipation on infinite heat sink at $T_L=75^{\circ}\text{C}$ (Fig. 5)	$P_D$	7.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional only (Note 2)	$I_{FSM}$	300	Amps
Maximum Instantaneous Forward Voltage at 25A for Unidirectional only (Note 3)	$V_F$	3.5/5.0	V
Operating junction and Storage Temperature Range.	$T_J, T_{STG}$	-55 $^{\circ}\text{C}$ to 175 $^{\circ}\text{C}$	$^{\circ}\text{C}$
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	8.0	$^{\circ}\text{C}/\text{W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	40	$^{\circ}\text{C}/\text{W}$

Notes:

1. Non-repetitive current pulse, per Fig. 3 and derated above  $T_A = 25^{\circ}\text{C}$  per Fig. 2.
2. Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.

## Electrical Characteristics

Type Number		Reverse Stand-Off Voltage	Breakdown Voltage Min.@I <sub>T</sub>		Test Current	Maximum Clamping Voltage@I <sub>pp</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
(UNI)	(BI)	V <sub>RWM</sub> (V)	V <sub>BR</sub> MIN.(V)	V <sub>BR</sub> .MAX.(V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>pp</sub> (A)	I <sub>R</sub> (μA)
3KP5.0A	3KP5.0CA	5.0	6.40	7.00	50	9.2	326.1	5000
3KP6.0A	3KP6.0CA	6.0	6.67	7.37	50	10.3	291.3	5000
3KP6.5A	3KP6.5CA	6.5	7.22	7.98	50	11.2	267.9	2000
3KP7.0A	3KP7.0CA	7.0	7.78	8.60	50	12.0	250.0	1000
3KP7.5A	3KP7.5CA	7.5	8.33	9.21	5	12.9	232.6	250
3KP8.0A	3KP8.0CA	8.0	8.89	9.83	5	13.6	220.6	150
3KP8.5A	3KP8.5CA	8.5	9.44	10.40	5	14.4	208.3	50
3KP9.0A	3KP9.0CA	9.0	10.00	11.10	5	15.4	194.8	20
3KP10A	3KP10CA	10.0	11.10	12.30	5	17.0	176.5	15
3KP11A	3KP11CA	11.0	12.20	13.50	5	18.2	164.8	5
3KP12A	3KP12CA	12.0	13.30	14.70	5	19.9	150.8	5
3KP13A	3KP13CA	13.0	14.40	15.90	5	21.5	139.5	5
3KP14A	3KP14CA	14.0	15.60	17.20	5	23.2	129.3	5
3KP15A	3KP15CA	15.0	16.70	18.50	5	24.4	123.0	5
3KP16A	3KP16CA	16.0	17.80	19.70	5	26.0	115.4	5
3KP17A	3KP17CA	17.0	18.90	20.90	5	27.6	108.7	5
3KP18A	3KP18CA	18.0	20.00	22.10	5	29.2	102.7	5
3KP20A	3KP20CA	20.0	22.20	24.50	5	32.4	92.6	5
3KP22A	3KP22CA	22.0	24.40	26.90	5	35.5	84.5	5
3KP24A	3KP24CA	24.0	26.70	29.50	5	38.9	77.1	5
3KP26A	3KP26CA	26.0	28.90	31.90	5	42.1	71.3	5
3KP28A	3KP28CA	28.0	31.10	34.40	5	45.4	66.1	5
3KP30A	3KP30CA	30.0	33.30	36.80	5	48.4	62.0	5
3KP33A	3KP33CA	33.0	36.70	40.60	5	53.3	56.3	5
3KP36A	3KP36CA	36.0	40.00	44.20	5	58.1	51.6	5
3KP40A	3KP40CA	40.0	44.40	49.10	5	64.5	46.5	5
3KP43A	3KP43CA	43.0	47.80	52.80	5	69.4	43.2	5
3KP45A	3KP45CA	45.0	50.00	55.30	5	72.7	41.3	5
3KP48A	3KP48CA	48.0	53.30	58.90	5	77.4	38.8	5
3KP51A	3KP51CA	51.0	56.70	62.70	5	82.4	36.4	5
3KP54A	3KP54CA	54.0	60.00	66.30	5	87.1	34.4	5
3KP58A	3KP58CA	58.0	64.40	71.20	5	93.6	32.1	5
3KP60A	3KP60CA	60.0	66.70	73.70	5	96.8	31.0	5
3KP64A	3KP64CA	64.0	71.10	78.60	5	103.0	29.1	5
3KP70A	3KP70CA	70.0	77.80	86.00	5	113.0	26.5	5
3KP75A	3KP75CA	75.0	83.30	92.10	5	121.0	24.8	5
3KP78A	3KP78CA	78.0	86.70	95.80	5	126.0	23.8	5
3KP85A	3KP85CA	85.0	94.40	104.00	5	137.0	21.9	5
3KP90A	3KP90CA	90.0	100.00	111.00	5	146.0	20.5	5
3KP100A	3KP100CA	100.0	111.00	123.00	5	162.0	18.5	5
3KP110A	3KP110CA	110.0	122.00	135.00	5	177.0	16.9	5
3KP120A	3KP120CA	120.0	133.00	147.00	5	193.0	15.5	5
3KP130A	3KP130CA	130.0	144.00	159.00	5	209.0	14.4	5
3KP150A	3KP150CA	150.0	167.00	185.00	5	243.0	12.3	5
3KP160A	3KP160CA	160.0	178.00	197.00	5	259.0	11.6	5
3KP170A	3KP170CA	170.0	189.00	209.00	5	275.0	10.9	5
3KP180A	3KP180CA	180.0	200.00	221.00	5	292.0	10.4	5
3KP190A	3KP190CA	190.0	211.00	233.00	5	308.0	9.7	5
3KP200A	3KP200CA	200.0	222.00	246.00	5	324.2	9.1	5
3KP210A	3KP210CA	210.0	233.00	258.00	5	340.5	8.6	5
3KP220A	3KP220CA	220.0	244.00	270.00	5	371.1	8.1	5

For parts without A, the V<sub>BR</sub> is ± 10% and V<sub>C</sub> is 5% higher than with A parts  
 For bidirectional type having V<sub>R</sub> of 10 volts and less, the I<sub>R</sub> limit is double.

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## Ratings and Characteristic Curves

Figure 1 - Peak Pulse Power Rating Curve

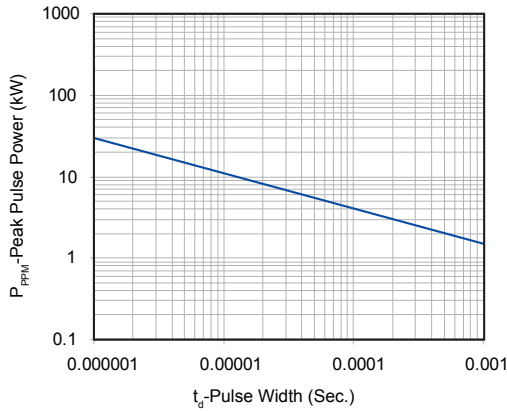


Figure 2 - Pulse Derating Curve

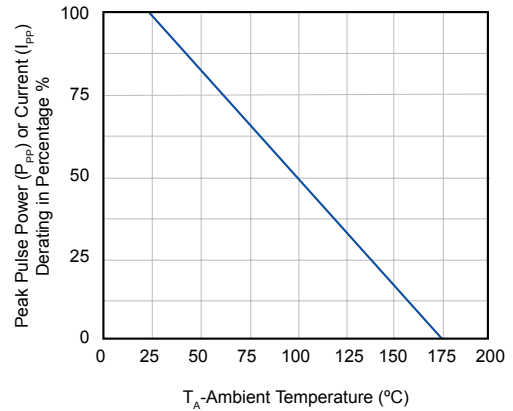


Figure 3 - Pulse Waveform

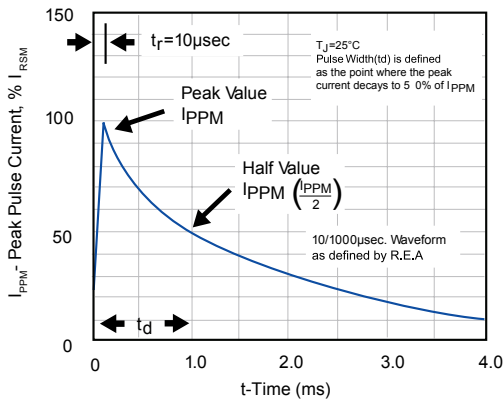


Figure 4 - Typical Junction Capacitance

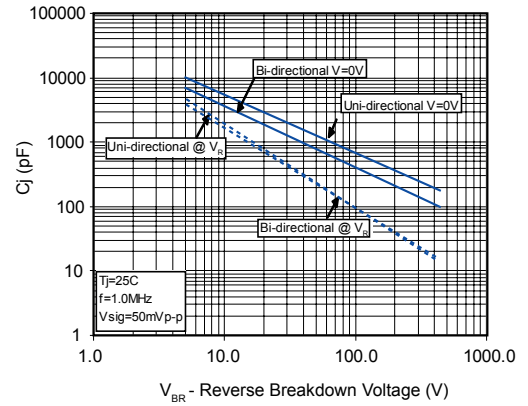


Figure 5 - Steady State Power Derating Curve

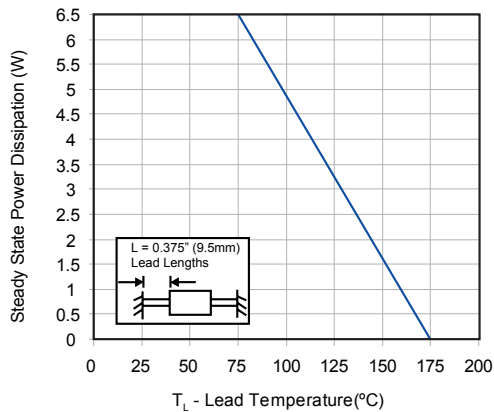
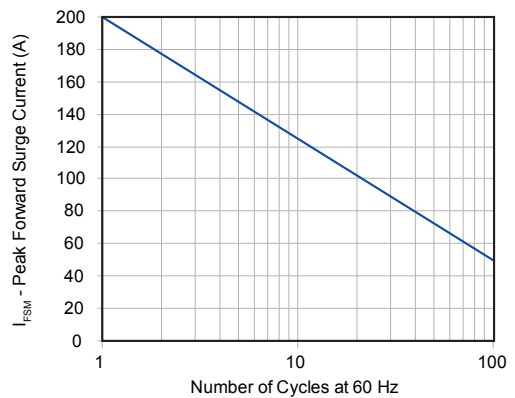


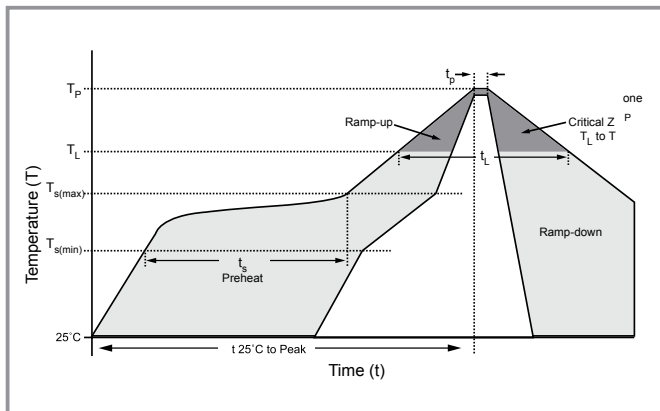
Figure 6 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only



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### Soldering Parameters

	Flow Condition	Lead-free assembly
Pre Heat	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60-180 secs
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/second max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Time (min to max) ( $t_s$ )	60-150 seconds
Peak Temperature ( $T_P$ )		260 <sup>+0/-5</sup> °C
Time within 5°C of actual peak Temperature ( $t_p$ )		20-40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ( $T_P$ )		8 minutes Max.
Do not exceed		280°C



### Flow/Wave Soldering

Peak Temperature :	265°C
Dipping Time :	10 seconds
Soldering :	1 time

### Physical Specifications

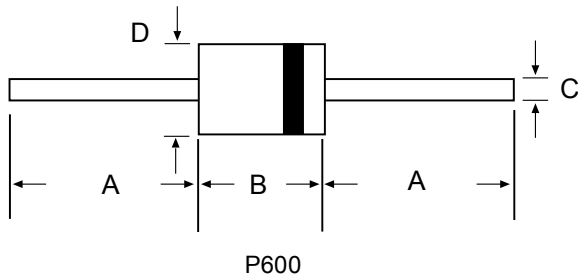
Weight	0.045oz., 1.2g
Case	JEDEC DO-201 molded plastic body over passivated junction.
Polarity	Color band denotes the cathode except Bipolar.
Termination	Matte Tin axial leads, solderable per JESD22-B102D.

### Environmental Specifications

Temperature Cycle	JESD22-A104
Pressure Cooker	JESD 22-A102
High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Thermal Shock	JESD22-A106

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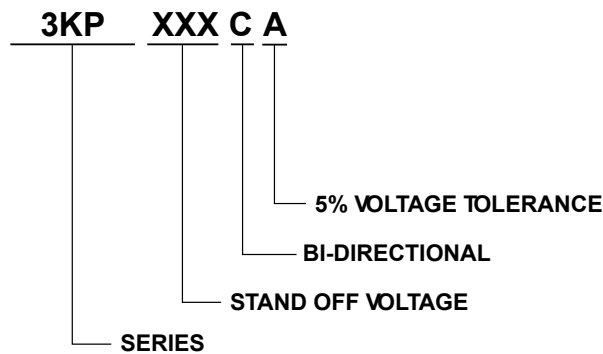
### Dimensions



Unit:mm

DIM	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.340	0.360	8.60	9.10
C	0.048	0.052	1.22	1.32
D	0.340	0.360	8.60	9.10

### Part Numbering System



### Packaging

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
3KPxxxXX	P600	400	Tape & Reel	ELA STD RS-296E
3KPxxxXX-B	P600	100	BULK	Concord Packing Spec

### Warehouse Storage Conditions of Products

- Storage Conditions:
  1. Storage Temperature: -10°C~+40°C
  2. Relative Humidity: ≤75%RH
  3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year