

## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- Glass passivated junction
- Low incremental surge resistance.
- Excellent clamping capability
- 5000W peak pulse power capability at 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.05%
- Fast response time
- Typical  $I_R$  less than 2 $\mu$ A above 10V.
- High Temperature soldering guaranteed: 265 $^{\circ}$ C/10 seconds/.375", (9.5mm) lead length, 5lbs (2.3kg) tension
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020.
- Safety certification: UL: E244458



### Mechanical Data

- Case: Moulded plastic over glass passivated junction
- Terminal: Plated Axial leads, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any
- Weight: 2.10g

### Applications

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

### Maximum Ratings and Characteristics

Ratings at 25 $^{\circ}$ C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000 $\mu$ s waveform (Note1, Fig.1)	$P_{PPM}$	Minimum 5000	Watts
Peak pulse current of at 10/1000 $\mu$ s waveform (Note 1, Fig.3)	$I_{PPM}$	See Table	Amps
Steady state power dissipation at $T_L=75^{\circ}$ C (Fig.5)	$P_{M(AV)}$	8.0	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2, Fig.6)	$I_{FSM}$	400	Amps
Operating junction and Storage Temperature Range.	$T_J, T_{STG}$	-55 to +150	$^{\circ}$ C
Typical thermal resistance junction to lead	$R_{\theta JL}$	8	$^{\circ}$ C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	40	$^{\circ}$ C/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^{\circ}$ C per Fig.2.

2. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

**Dimensions (P600)**

	Symbol	Millimeters		Inches	
		Min.	Max.	Min.	Max.
L	25.40	-	1.000	-	
T	8.60	9.10	0.340	0.360	
d	8.60	9.10	0.340	0.360	
s	1.19	1.32	0.047	0.052	

**Electrical Characteristics (T<sub>A</sub>=25°C)**

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
Unidirectional	Bidirectional	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
5KP5.0A	5KP5.0CA	5.0	6.40~7.00	50	9.2	554.3	5000
5KP6.0A	5KP6.0CA	6.0	6.67~7.37	50	10.3	495.1	5000
5KP6.5A	5KP6.5CA	6.5	7.22~7.98	50	11.2	455.4	2000
5KP7.0A	5KP7.0CA	7.0	7.78~8.60	50	12.0	425.0	1000
5KP7.5A	5KP7.5CA	7.5	8.33~9.21	5	12.9	395.3	250
5KP8.0A	5KP8.0CA	8.0	8.89~9.83	5	13.6	375.0	150
5KP8.5A	5KP8.5CA	8.5	9.44~10.40	5	14.4	354.2	50
5KP9.0A	5KP9.0CA	9.0	10.00~11.10	5	15.4	331.2	20
5KP10A	5KP10CA	10.0	11.10~12.30	5	17.0	300.0	15
5KP11A	5KP11CA	11.0	12.20~13.50	5	18.2	280.2	2
5KP12A	5KP12CA	12.0	13.30~14.70	5	19.9	256.3	2
5KP13A	5KP13CA	13.0	14.40~15.90	5	21.5	237.2	2
5KP14A	5KP14CA	14.0	15.60~17.20	5	23.2	219.8	2
5KP15A	5KP15CA	15.0	16.70~18.50	5	24.4	209.0	2
5KP16A	5KP16CA	16.0	17.80~19.70	5	26.0	196.2	2
5KP17A	5KP17CA	17.0	18.90~20.90	5	27.6	184.8	2
5KP18A	5KP18CA	18.0	20.00~22.10	5	29.2	174.7	2
5KP20A	5KP20CA	20.0	22.20~24.50	5	32.4	157.4	2
5KP22A	5KP22CA	22.0	24.40~26.90	5	35.5	143.7	2
5KP24A	5KP24CA	24.0	26.70~29.50	5	38.9	131.1	2
5KP26A	5KP26CA	26.0	28.90~31.90	5	42.1	121.1	2

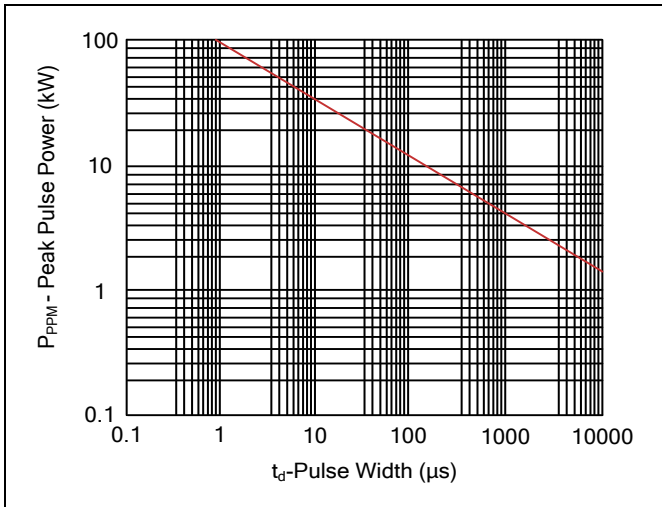
**Electrical Characteristics (T<sub>A</sub>=25°C)**

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
Unidirectional	Bidirectional	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
5KP28A	5KP28CA	28.0	31.10~34.40	5	45.4	112.3	2
5KP30A	5KP30CA	30.0	33.30~36.80	5	48.4	105.4	2
5KP33A	5KP33CA	33.0	36.70~40.60	5	53.3	95.7	2
5KP36A	5KP36CA	36.0	40.00~44.20	5	58.1	87.8	2
5KP40A	5KP40CA	40.0	44.40~49.10	5	64.5	79.1	2
5KP43A	5KP43CA	43.0	47.80~52.80	5	69.4	73.5	2
5KP45A	5KP45CA	45.0	50.00~55.30	5	72.7	70.2	2
5KP48A	5KP48CA	48.0	53.30~58.90	5	77.4	65.9	2
5KP51A	5KP51CA	51.0	56.70~62.70	5	82.4	61.9	2
5KP54A	5KP54CA	54.0	60.00~66.30	5	87.1	58.6	2
5KP58A	5KP58CA	58.0	64.40~71.20	5	93.6	54.5	2
5KP60A	5KP60CA	60.0	66.70~73.70	5	96.8	52.7	2
5KP64A	5KP64CA	64.0	71.10~78.60	5	103.0	49.5	2
5KP70A	5KP70CA	70.0	77.80~86.00	5	113.0	45.1	2
5KP75A	5KP75CA	75.0	83.30~92.10	5	121.0	42.1	2
5KP78A	5KP78CA	78.0	86.70~95.80	5	126.0	40.5	2
5KP85A	5KP85CA	85.0	94.40~104.00	5	137.0	37.2	2
5KP90A	5KP90CA	90.0	100.00~111.00	5	146.0	34.9	2
5KP100A	5KP100CA	100.0	110.00~123.00	5	162.0	31.5	2
5KP110A	5KP110CA	110.0	122.00~135.00	5	177.0	28.8	2
5KP120A	5KP120CA	120.0	133.00~147.00	5	193.0	26.4	2
5KP130A	5KP130CA	130.0	144.00~159.00	5	209.0	24.4	2
5KP150A	5KP150CA	150.0	167.00~185.00	5	243.0	21.0	2
5KP160A	5KP160CA	160.0	178.00~197.00	5	259.0	19.7	2
5KP170A	5KP170CA	170.0	189.00~209.00	5	275.0	18.5	2
5KP180A	5KP180CA	180.0	201.00~222.00	5	292.0	17.5	2
5KP190A	5KP190CA	190.0	211.00~233.00	5	310.0	16.5	2
5KP200A	5KP200CA	200.0	224.00~247.00	5	329.2	15.5	2
5KP210A	5KP210CA	210.0	237.00~263.00	5	349.5	14.6	2
5KP220A	5KP220CA	220.0	246.00~272.00	5	371.1	13.7	2
5KP250A	5KP250CA	250.0	277.00~306.00	5	425.0	12.0	2

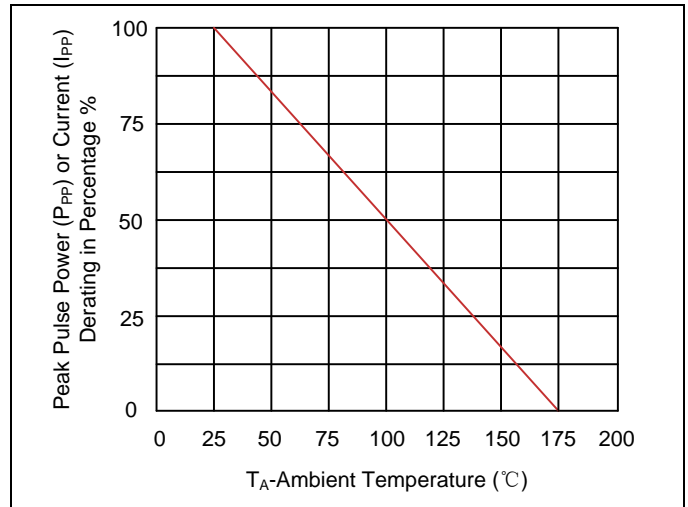
Notes: For bidirectional type having V<sub>RWM</sub> of 10V and less, the I<sub>R</sub> limit is double.

**Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$  unless otherwise noted)**

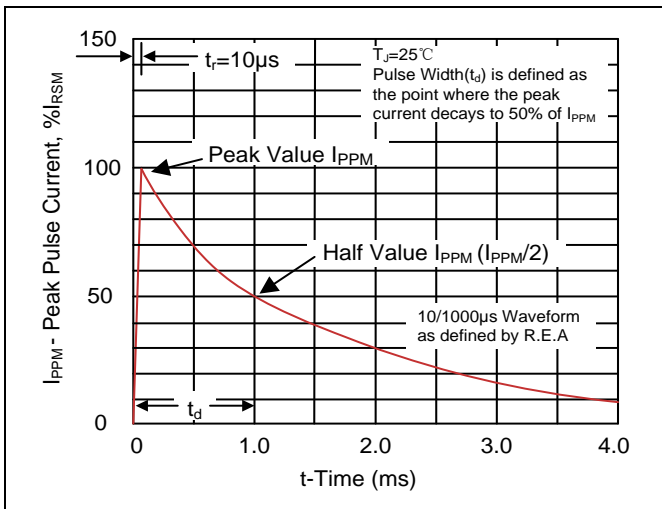
**Figure 1. Peak Pulse Power Rating Curve**



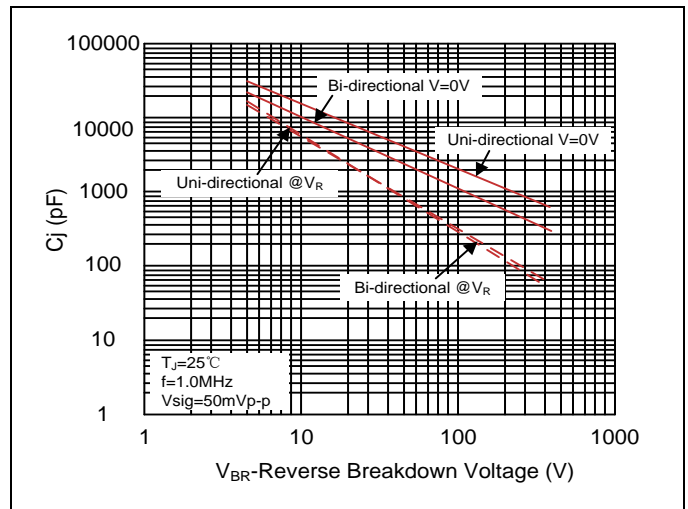
**Figure 2. Pulse Derating Curve**



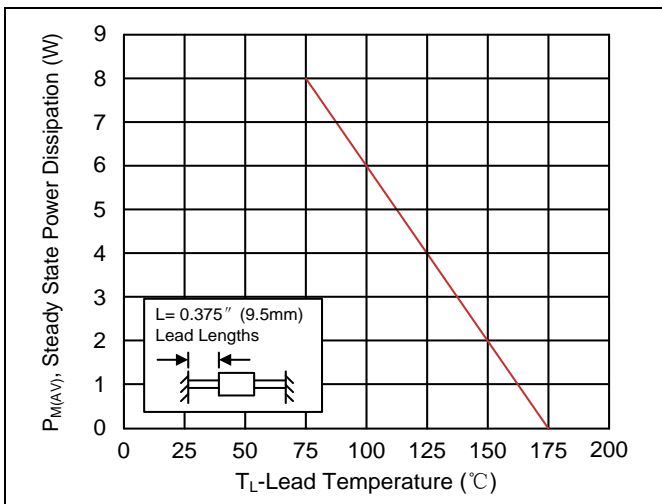
**Figure 3. Pulse Waveform**



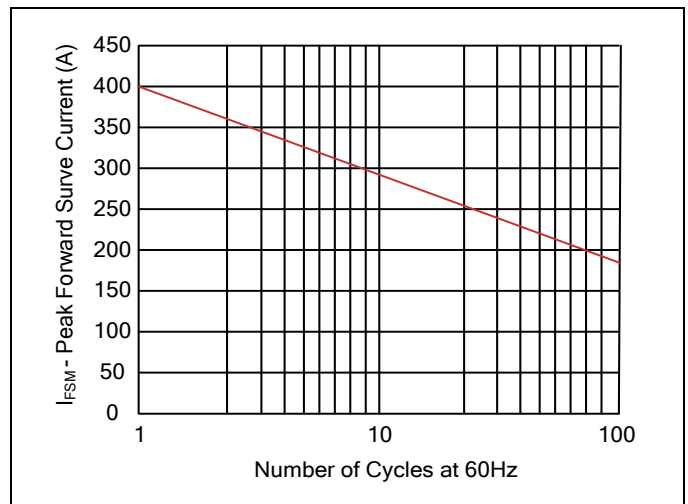
**Figure 4. Typical Junction Capacitance**



**Figure 5. Steady State Power Dissipation Derating Curve**

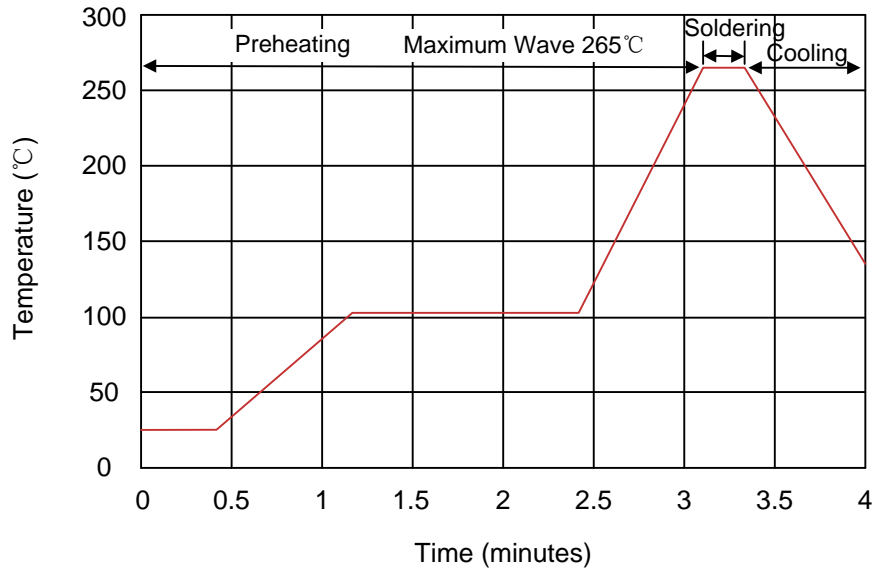


**Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only**



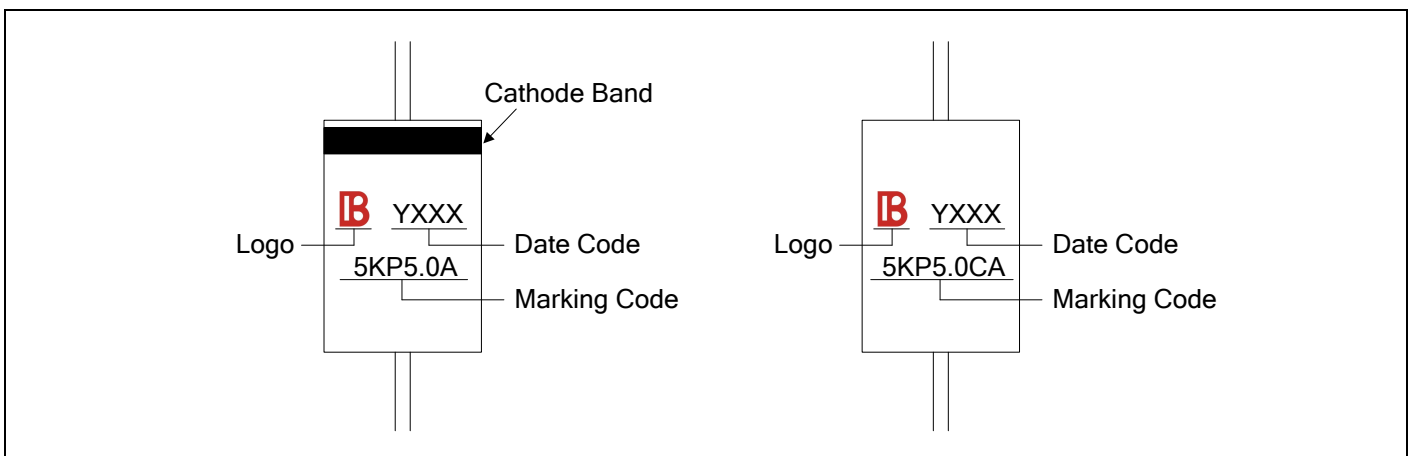
## Recommended Soldering Conditions

### Wave Soldering

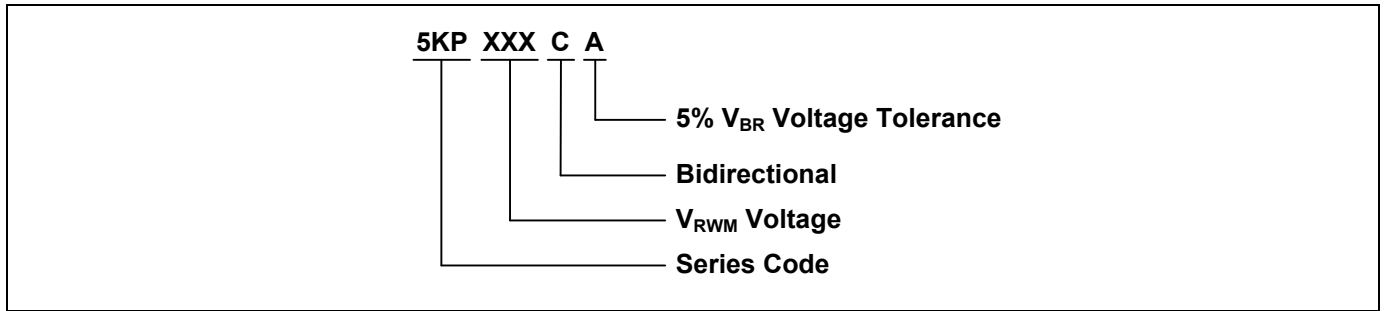


Item	Conditions
Peak Temperature	265°C
Dipping Time	10 seconds
Soldering	1 time

## Marking Code



**Part Number Code**



**Ordering Code for Different Package**

Box package: Add suffix “/B” at the end of the part number, such as 5KP15A-AT/B

Reel package: Add suffix “/TR13” at the end of the part number, such as 5KP100CA-AT/TR13

**Packaging**

	Symbol	Dimension (mm)
Tape	A	10.0±0.5
	B	53.0±1.0
	Z	1.2Max.
	T	6.0±0.4
	E	0.8Max.
	L1-L2	1.0Max.
	Box	L
W		75.0±5.0
H		114.0±5.0
Quantity: 300PCS		
Reel	D	330.0±3.0
	D0	16.4±2.0
	D1	86.0±2.0
	W1	76.0±3.0
	Quantity: 800PCS	

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