

## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 3000W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical  $I_R$  less than 2µA above 10V.
- High Temperature soldering guaranteed: 265°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
- AEC-Q101 qualified
- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance



### 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: 2.02g

### Applications

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

### Maximum Ratings and Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000µs waveform (Note1, Fig.1)	$P_{PPM}$	Minimum 3000	Watts
Peak pulse current of at 10/1000µs waveform (Note 1, Fig.3)	$I_{PPM}$	See Table	Amps
Steady state power dissipation at $T_L=75^\circ\text{C}$ (Fig.5)	$P_{M(AV)}$	7.0	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2, Fig.6)	$I_{FSM}$	300	Amps
Operating junction and Storage Temperature Range.	$T_J, T_{STG}$	-55 to +150	°C
Typical thermal resistance junction to lead	$R_{\theta JL}$	8	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	40	°C/W

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

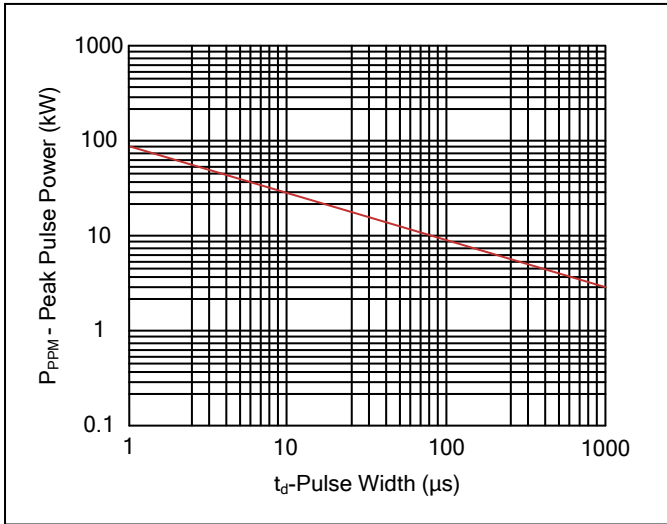
**Electrical Characteristics (T<sub>A</sub>=25°C)**

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)
3KP5.0A-AT	3KP5.0CA-AT	5.0	6.40~7.00	10	9.2	326.1	5000
3KP6.0A-AT	3KP6.0CA-AT	6.0	6.67~7.37	10	10.3	291.3	5000
3KP6.5A-AT	3KP6.5CA-AT	6.5	7.22~7.98	10	11.2	267.9	2000
3KP7.0A-AT	3KP7.0CA-AT	7.0	7.78~8.60	10	12.0	250.0	1000
3KP7.5A-AT	3KP7.5CA-AT	7.5	8.33~9.21	1	12.9	232.6	250
3KP8.0A-AT	3KP8.0CA-AT	8.0	8.89~9.83	1	13.6	220.6	150
3KP8.5A-AT	3KP8.5CA-AT	8.5	9.44~10.40	1	14.4	208.3	50
3KP9.0A-AT	3KP9.0CA-AT	9.0	10.00~11.10	1	15.4	194.8	20
3KP10A-AT	3KP10CA-AT	10.0	11.10~12.30	1	17.0	176.5	15
3KP11A-AT	3KP11CA-AT	11.0	12.20~13.50	1	18.2	164.8	2
3KP12A-AT	3KP12CA-AT	12.0	13.30~14.70	1	19.9	150.8	2
3KP13A-AT	3KP13CA-AT	13.0	14.40~15.90	1	21.5	139.5	2
3KP14A-AT	3KP14CA-AT	14.0	15.60~17.20	1	23.2	129.3	2
3KP15A-AT	3KP15CA-AT	15.0	16.70~18.50	1	24.4	123.0	2
3KP16A-AT	3KP16CA-AT	16.0	17.80~19.70	1	26.0	115.4	2
3KP17A-AT	3KP17CA-AT	17.0	18.90~20.90	1	27.6	108.7	2
3KP18A-AT	3KP18CA-AT	18.0	20.00~22.10	1	29.2	102.7	2
3KP20A-AT	3KP20CA-AT	20.0	22.20~24.50	1	32.4	92.6	2
3KP22A-AT	3KP22CA-AT	22.0	24.40~26.90	1	35.5	84.5	2
3KP24A-AT	3KP24CA-AT	24.0	26.70~29.50	1	38.9	77.1	2
3KP26A-AT	3KP26CA-AT	26.0	28.90~31.90	1	42.1	71.3	2
3KP28A-AT	3KP28CA-AT	28.0	31.10~34.40	1	45.4	66.1	2
3KP30A-AT	3KP30CA-AT	30.0	33.30~36.80	1	48.4	62.0	2

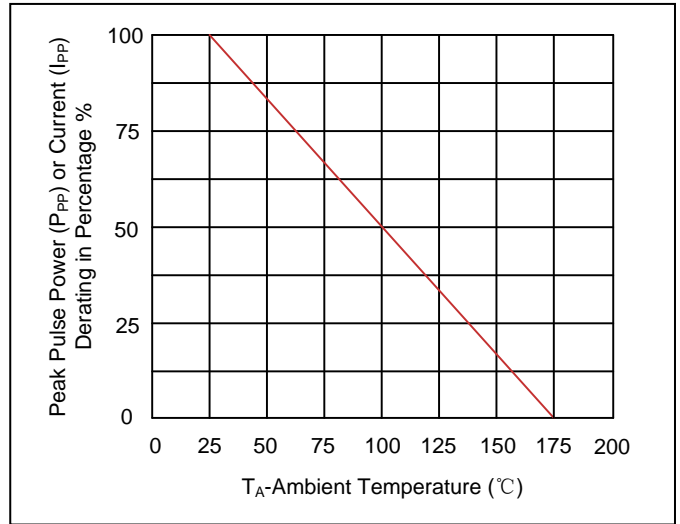
Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @ $I_T$	Test Current	Maximum Clamping Voltage @ $I_{PP}$	Peak Pulse Current	Reverse Leakage @ $V_{RWM}$
Unidirectional	Bidirectional	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
3KP33A-AT	3KP33CA-AT	33.0	36.70~40.60	1	53.3	56.3	2
3KP36A-AT	3KP36CA-AT	36.0	40.00~44.20	1	58.1	51.6	2
3KP40A-AT	3KP40CA-AT	40.0	44.40~49.10	1	64.5	46.5	2
3KP43A-AT	3KP43CA-AT	43.0	47.80~52.80	1	69.4	43.2	2
3KP45A-AT	3KP45CA-AT	45.0	50.00~55.30	1	72.7	41.3	2
3KP48A-AT	3KP48CA-AT	48.0	53.30~58.90	1	77.4	38.8	2
3KP51A-AT	3KP51CA-AT	51.0	56.70~62.70	1	82.4	36.4	2
3KP54A-AT	3KP54CA-AT	54.0	60.00~66.30	1	87.1	34.4	2
3KP58A-AT	3KP58CA-AT	58.0	64.40~71.20	1	93.6	32.1	2
3KP60A-AT	3KP60CA-AT	60.0	66.70~73.70	1	96.8	31.0	2
3KP64A-AT	3KP64CA-AT	64.0	71.10~78.60	1	103.0	29.1	2
3KP70A-AT	3KP70CA-AT	70.0	77.80~86.00	1	113.0	26.5	2
3KP75A-AT	3KP75CA-AT	75.0	83.30~92.10	1	121.0	24.8	2
3KP78A-AT	3KP78CA-AT	78.0	86.70~95.80	1	126.0	23.8	2
3KP85A-AT	3KP85CA-AT	85.0	94.40~104.00	1	137.0	21.9	2
3KP90A-AT	3KP90CA-AT	90.0	100.00~111.00	1	146.0	20.5	2
3KP100A-AT	3KP100CA-AT	100.0	111.00~123.00	1	162.0	18.5	2
3KP110A-AT	3KP110CA-AT	110.0	122.00~135.00	1	177.0	16.9	2
3KP120A-AT	3KP120CA-AT	120.0	133.00~147.00	1	193.0	15.5	2
3KP130A-AT	3KP130CA-AT	130.0	144.00~159.00	1	209.0	14.4	2
3KP150A-AT	3KP150CA-AT	150.0	167.00~185.00	1	243.0	12.3	2
3KP160A-AT	3KP160CA-AT	160.0	178.00~197.00	1	259.0	11.6	2
3KP170A-AT	3KP170CA-AT	170.0	189.00~209.00	1	275.0	10.9	2
3KP180A-AT	3KP180CA-AT	180.0	201.00~222.00	1	292.0	10.3	2
3KP190A-AT	3KP190CA-AT	190.0	211.00~233.00	1	308.0	9.7	2
3KP200A-AT	3KP200CA-AT	200.0	224.00~247.00	1	324.0	9.3	2
3KP210A-AT	3KP210CA-AT	210.0	237.00~263.00	1	340.0	8.8	2
3KP220A-AT	3KP220CA-AT	220.0	246.00~272.00	1	356.0	8.4	2

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

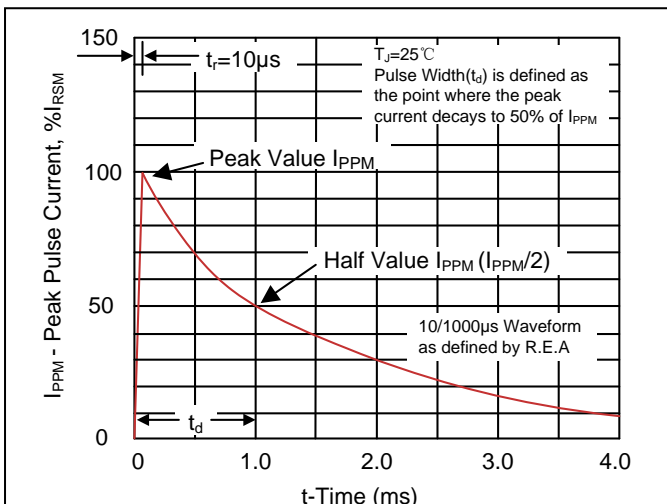
**Figure 1. Peak Pulse Power Rating Curve**



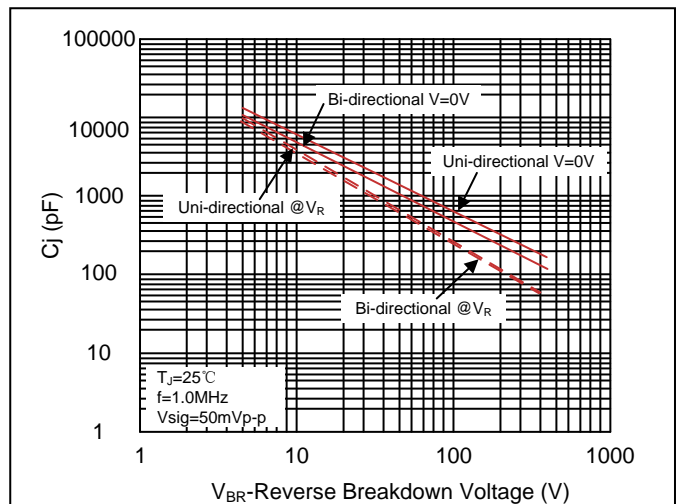
**Figure 2. Pulse Derating Curve**



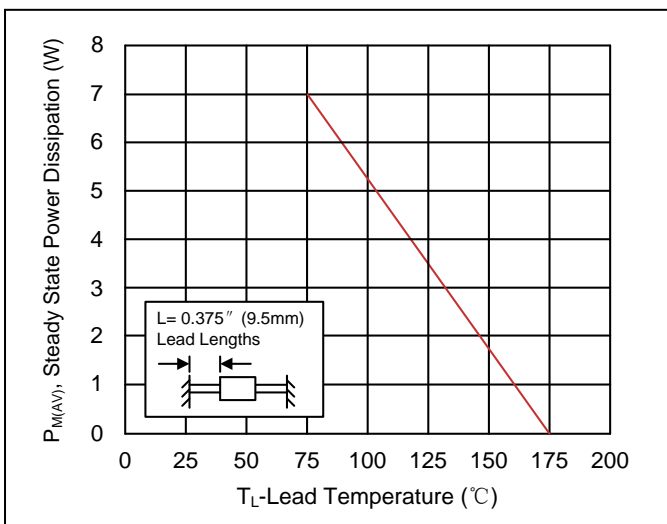
**Figure 3. Pulse Waveform**



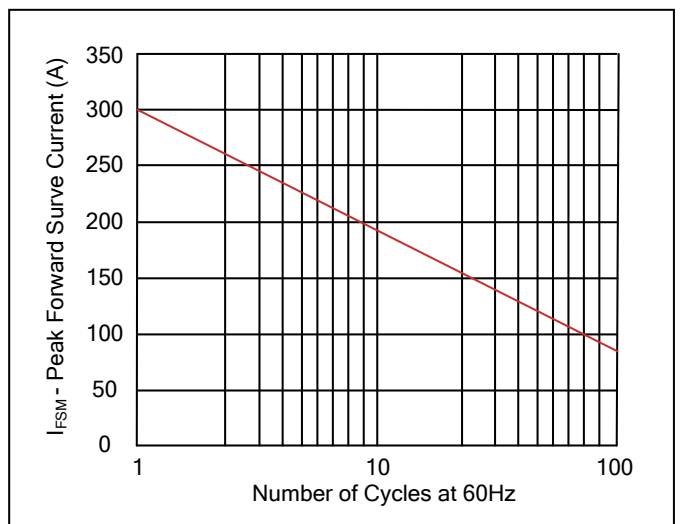
**Figure 4. AC Line Protection Application**



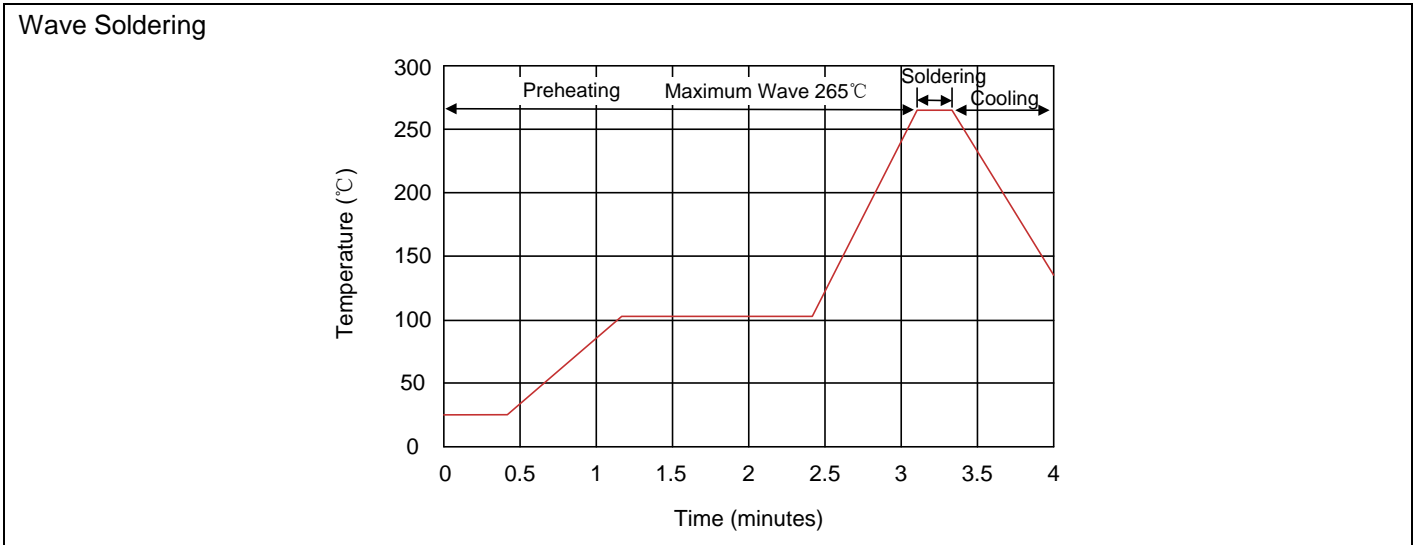
**Figure 5. Steady State Power Dissipation Derating Curve**



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



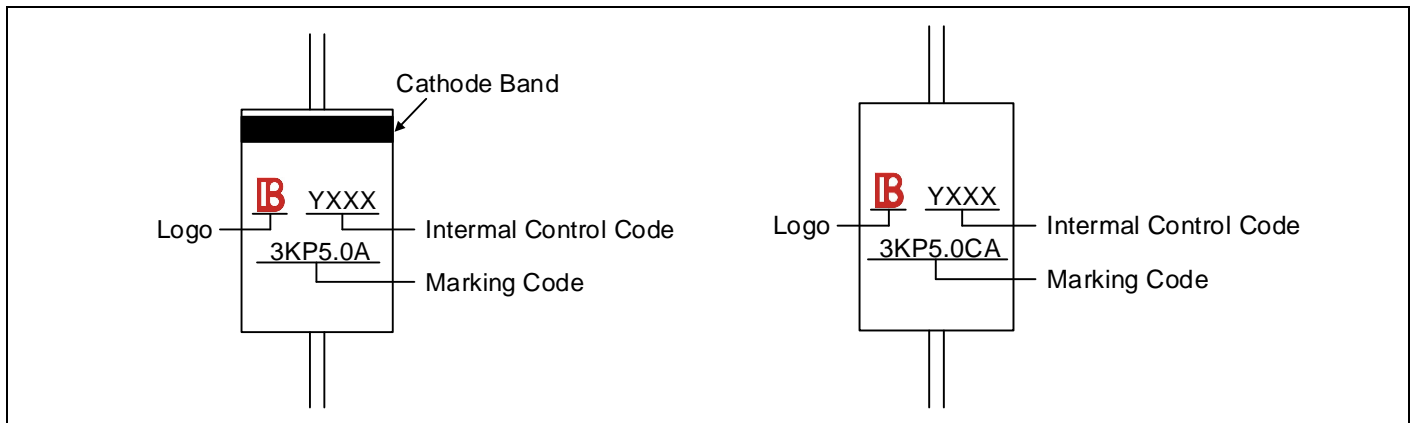
### Recommended Soldering Conditions



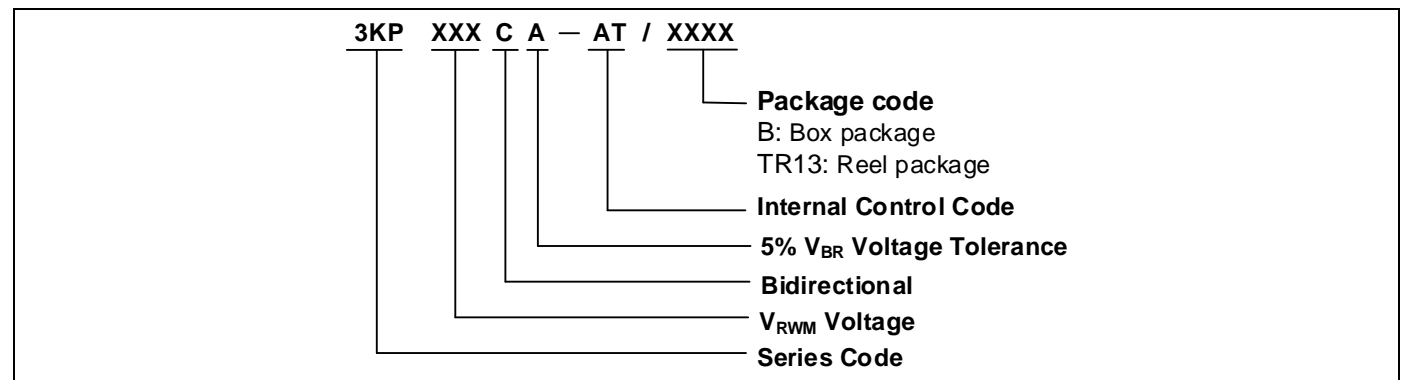
Recommended Conditions

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

### Marking Code



### Part Number Code

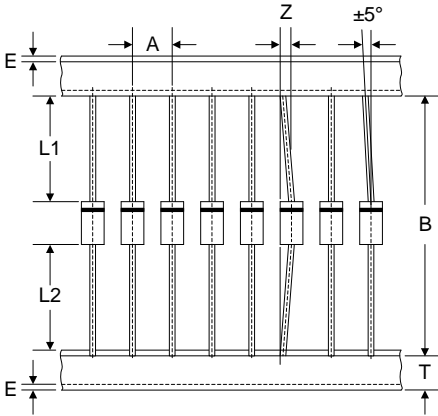


**Ordering Code for Different Package**

Box package: Add suffix “/B” at the end of the part number, such as 3KPXXXCA-AT/B

Reel package: Add suffix “/TR13” at the end of the part number, such as 3KPXXXCA-AT/TR13

**Packaging**

Tape	Symbol	Dimension (mm)	
	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.	
	<b>Box</b>	L	250.0±5.0
		W	75.0±5.0
		H	114.0±5.0
	<b>Reel</b>	Quantity: 300PCS	
D		330.0±3.0	
D0		16.4±2.0	
D1		86.0±2.0	
W1		76.0±3.0	
Quantity: 800PCS			