

DATA SHEET

TRANSIENT VOLTAGE SUPPRESSORS

AC/DC POWER SUPPLY

5KP-AT series

RoHS compliant & Halogen free



Product specification— November 20, 2022 V.3



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 μ s waveform, repetition rate (duty cycle): 0.05%
- Fast response time
- Typical I_R less than 2 μ 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
- 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: 2.10g

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 μ s waveform (Note1, Fig.1)	P_{PPM}	Minimum 5000	Watts
Peak pulse current of at 10/1000 μ 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_A=25°C)

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

Electrical Characteristics (T_A=25°C)

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

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

Figure 1. Peak Pulse Power Rating Curve

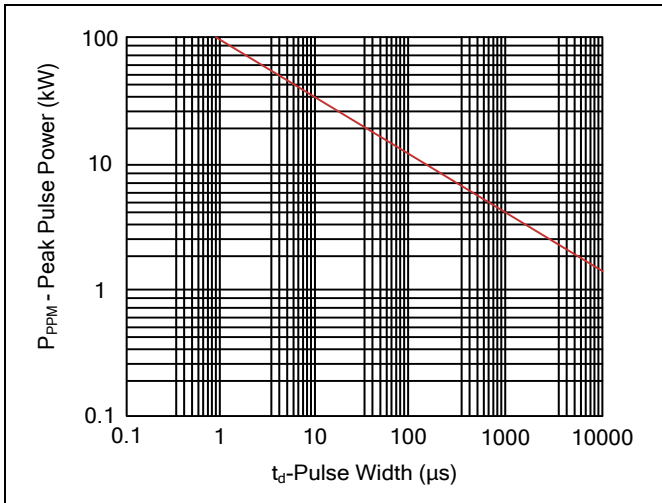


Figure 2. Pulse Derating Curve

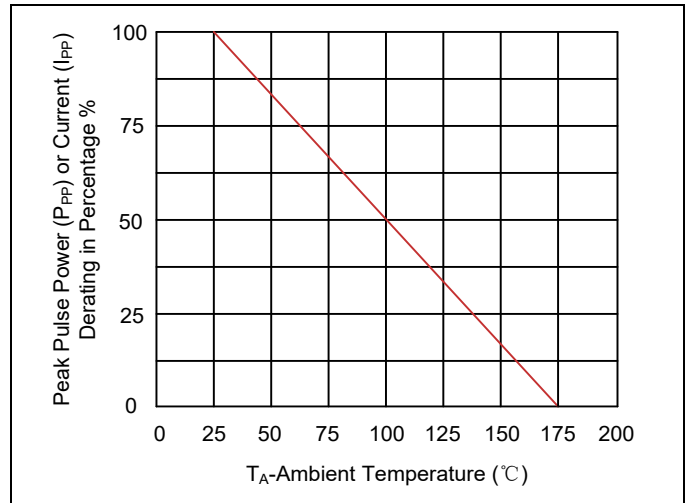


Figure 3. Pulse Waveform

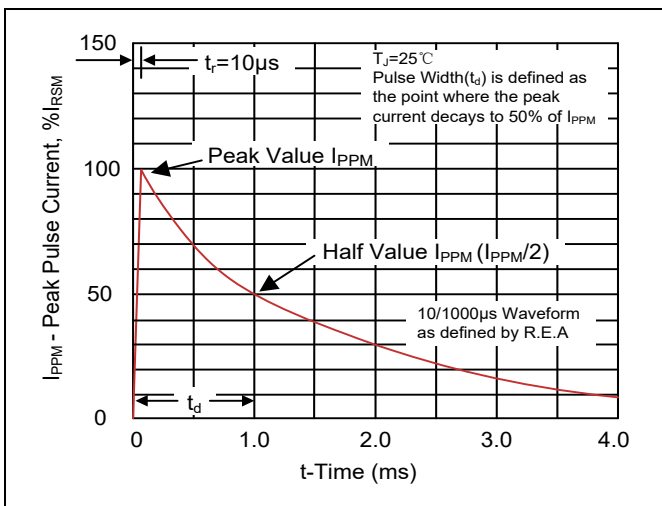


Figure 4. Typical Junction Capacitance

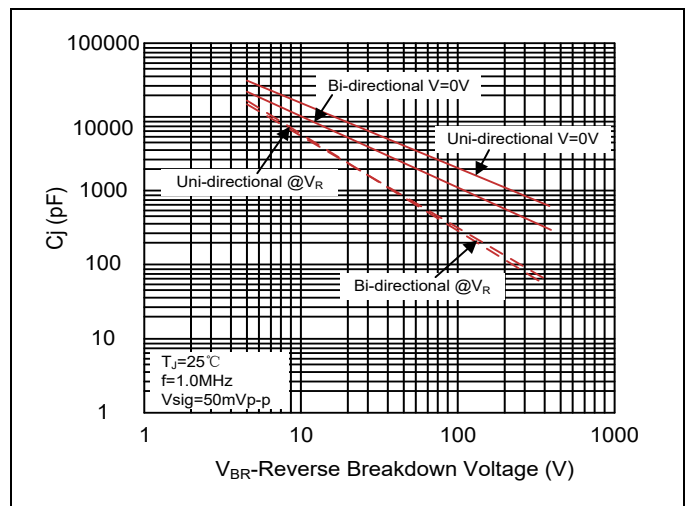


Figure 5. Steady State Power Dissipation Derating Curve

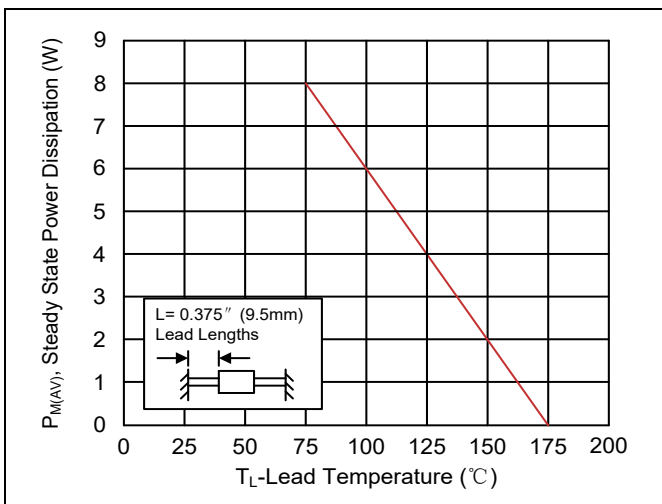
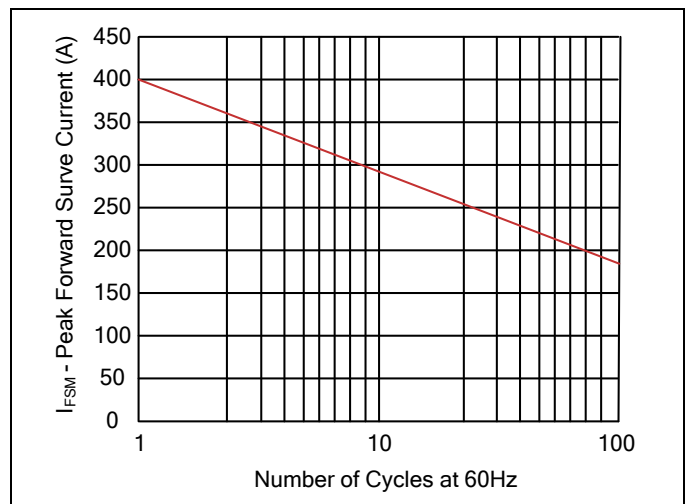
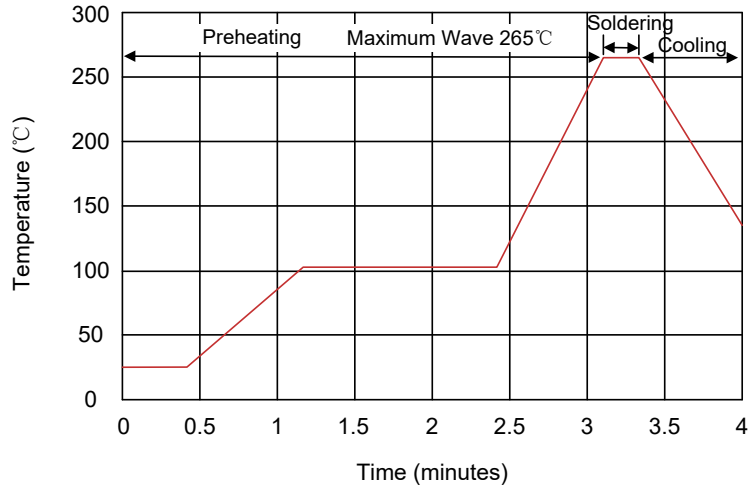


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



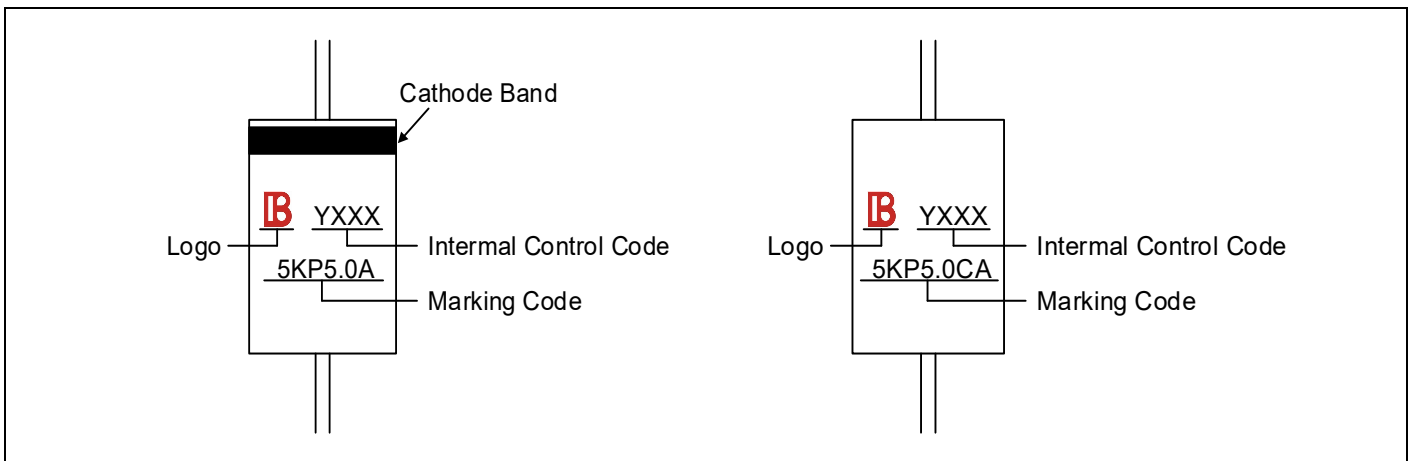
Recommended Soldering Conditions

Wave Soldering

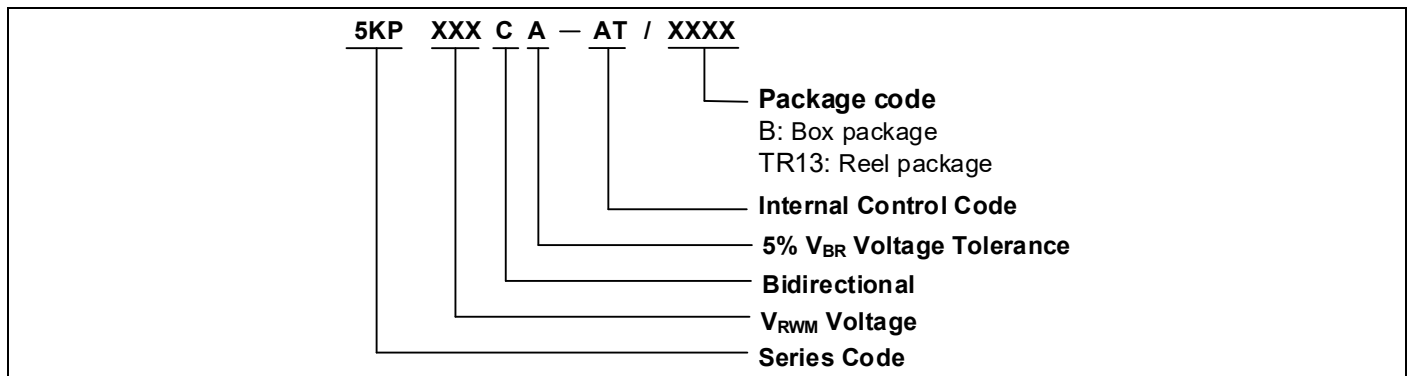


Item	Conditions
Peak Temperature	265°C
Dipping Time	10 seconds
Soldering	1 time

Marking Code



Part Number Code

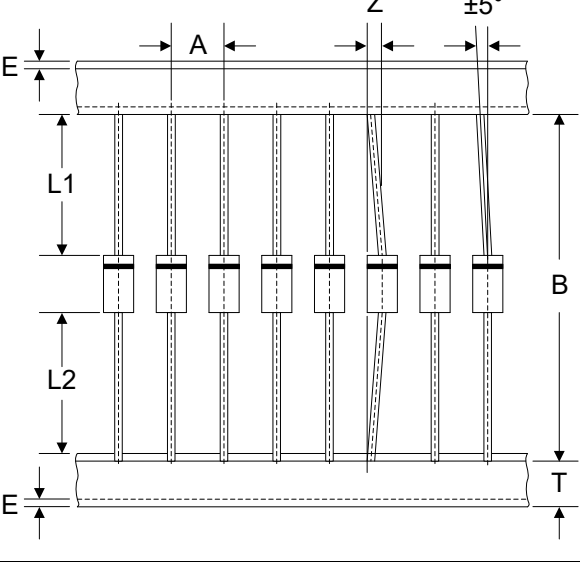
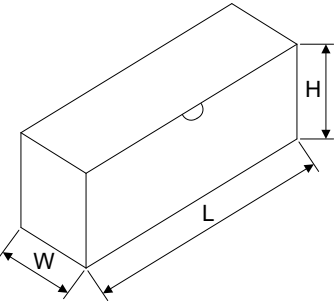
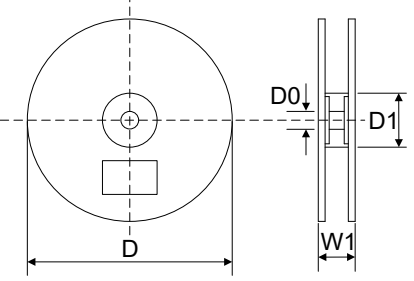


Ordering Code for Different Package

Box package: Add suffix "/B" at the end of the part number, such as 5KPXXXCA-AT/B

Reel package: Add suffix "/TR13" at the end of the part number, such as 5KPXXXCA-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.
	<p data-bbox="108 1059 164 1093">Box</p> 	L
W		75.0±5.0
H		114.0±5.0
Quantity: 300PCS		
<p data-bbox="108 1462 164 1496">Reel</p> 	D	330.0±3.0
	D0	16.4±2.0
	D1	86.0±2.0
	W1	76.0±3.0
	Quantity: 800PCS	