



TVS 5 KP Series — 5000W



R-6

Maximum Ratings and Thermal Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10x1000 μs test waveform (Fig.1) (Note 1)	P_{PPM}	5000	W
Steady State Power Dissipation on infinite heat sink at $T_L=75^{\circ}\text{C}$ (Fig. 5)	P_D	8.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional only (Note 2)	I_{FSM}	400	A
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	$^{\circ}\text{C}$
Typical Thermal Resistance Junction to Lead	R_{wJL}	8.0	$^{\circ}\text{C/W}$
Typical Thermal Resistance Junction to Ambient	R_{wJA}	40	$^{\circ}\text{C/W}$

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.

Features

- Available in uni-directional and bi-directional
- 5000 W peak pulse power capability with a 10/1000 μs waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Solder dip 260°C , 40 seconds

MECHANICAL DATA

Case: R-6

Epoxy meets UL 94V-0 flammability rating

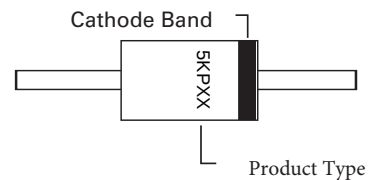
Terminals: Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D

Polarity: For uni-directional types the color band denotes cathode end, no marking on bi-directional types

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive and telecommunication.

Part Marking System





ELECTRICAL CHARACTERISTICS (TA = 25 °C unless otherwise noted)

5KP PART NUMBER		REVERSE STAND- OFF VOLTAGE V _{RWM} (V)	BREAKDOWN VOLTAGE V _{BR} (V) MIN. @I _T	BREAKDOWN VOLTAGE V _{BR} (V) MAX. @I _T	TEST CURREN T I _T (mA)	PEAK PULSE CURRENT I _{pp} (A)	REVERS E LEAKAG E @ V _{RWM} I _R (μA)	MAXIMUN CLAMPING VOLTAGE @I _{PP} V _C (V)
UNI-POLAR	BI-POLAR							
5KP5.0A	5KP5.0CA	5.0	6.40	7.00	50	554.3	5000	9.2
5KP6.0A	5KP6.0CA	6.0	6.67	7.37	50	495.1	5000	10.3
5KP6.5A	5KP6.5CA	6.5	7.22	7.98	50	455.4	2000	11.2
5KP7.0A	5KP7.0CA	7.0	7.78	8.60	50	425.0	1000	12.0
5KP7.5A	5KP7.5CA	7.5	8.33	9.21	5	395.3	250	12.9
5KP8.0A	5KP8.0CA	8.0	8.89	9.83	5	375.0	150	13.6
5KP8.5A	5KP8.5CA	8.5	9.44	10.40	5	354.2	50	14.4
5KP9.0A	5KP9.0CA	9.0	10.00	11.10	5	331.2	20	15.4
5KP10A	5KP10CA	10.0	11.10	12.30	5	300.0	15	17.0
5KP11A	5KP11CA	11.0	12.20	13.50	5	280.2	2	18.2
5KP12A	5KP12CA	12.0	13.30	14.70	5	256.3	2	19.9
5KP13A	5KP13CA	13.0	14.40	15.90	5	237.2	2	21.5
5KP14A	5KP14CA	14.0	15.60	17.20	5	219.8	2	23.2
5KP15A	5KP15CA	15.0	16.70	18.50	5	209.0	2	24.4
5KP16A	5KP16CA	16.0	17.80	19.70	5	196.2	2	26.0
5KP17A	5KP17CA	17.0	18.90	20.90	5	184.8	2	27.6
5KP18A	5KP18CA	18.0	20.00	22.10	5	174.7	2	29.2
5KP20A	5KP20CA	20.0	22.20	24.50	5	157.4	2	32.4
5KP22A	5KP22CA	22.0	24.40	26.90	5	143.7	2	35.5
5KP24A	5KP24CA	24.0	26.70	29.50	5	131.1	2	38.9
5KP26A	5KP26CA	26.0	28.90	31.90	5	121.1	2	42.1
5KP28A	5KP28CA	28.0	31.10	34.40	5	112.3	2	45.4
5KP30A	5KP30CA	30.0	33.30	36.80	5	105.4	2	48.4
5KP33A	5KP33CA	33.0	36.70	40.60	5	95.7	2	53.3
5KP36A	5KP36CA	36.0	40.00	44.20	5	87.8	2	58.1
5KP40A	5KP40CA	40.0	44.40	49.10	5	79.1	2	64.5
5KP43A	5KP43CA	43.0	47.80	52.80	5	73.5	2	69.4
5KP45A	5KP45CA	45.0	50.00	55.30	5	70.2	2	72.7
5KP48A	5KP48CA	48.0	53.30	58.90	5	65.9	2	77.4
5KP51A	5KP51CA	51.0	56.70	62.70	5	61.9	2	82.4
5KP54A	5KP54CA	54.0	60.00	66.30	5	58.6	2	87.1
5KP58A	5KP58CA	58.0	64.40	71.20	5	54.5	2	93.6
5KP60A	5KP60CA	60.0	66.70	73.70	5	52.7	2	96.8
5KP64A	5KP64CA	64.0	71.10	78.60	5	49.5	2	103.0
5KP70A	5KP70CA	70.0	77.80	86.00	5	45.1	2	113.0
5KP75A	5KP75CA	75.0	83.30	92.10	5	42.1	2	121.0
5KP78A	5KP78CA	78.0	86.70	95.80	5	40.5	2	126.0
5KP85A	5KP85CA	85.0	94.40	104.00	5	37.2	2	137.0
5KP90A	5KP90CA	90.0	100.00	111.00	5	34.9	2	146.0
5KP100A	5KP100CA	100.0	110.00	123.00	5	31.5	2	162.0
5KP110A	5KP110CA	110.0	122.00	135.00	5	28.8	2	177.0
5KP120A	5KP120CA	120.0	133.00	147.00	5	26.4	2	193.0
5KP130A	5KP130CA	130.0	144.00	159.00	5	24.4	2	209.0
5KP150A	5KP150CA	150.0	167.00	185.00	5	21.0	2	243.0
5KP160A	5KP160CA	160.0	178.00	197.00	5	19.7	2	259.0
5KP170A	5KP170CA	170.0	189.00	209.00	5	18.5	2	275.0
5KP180A	5KP180CA	180.0	200.00	222.00	5	17.5	2	289.0
5KP190A	5KP190CA	190.0	211.00	233.00	5	16.5	2	310.0
5KP200A	5KP200CA	200.0	222.00	246.00	5	15.5	2	329.2
5KP210A	5KP210CA	210.0	233.00	258.00	5	14.6	2	349.5
5KP220A	5KP220CA	220.0	244.00	270.00	5	13.7	2	371.1
5KP250A	5KP250CA	250.0	277.00	306.00	5	12.0	2	425.0

For bidirectional type having V_R of 30 volts and less, the I_R limit is double.

For parts without A, the V_{BR} is + 0% and V_C is 5% higher than with A parts



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

Figure 1 - Peak Pulse Power Rating Curve

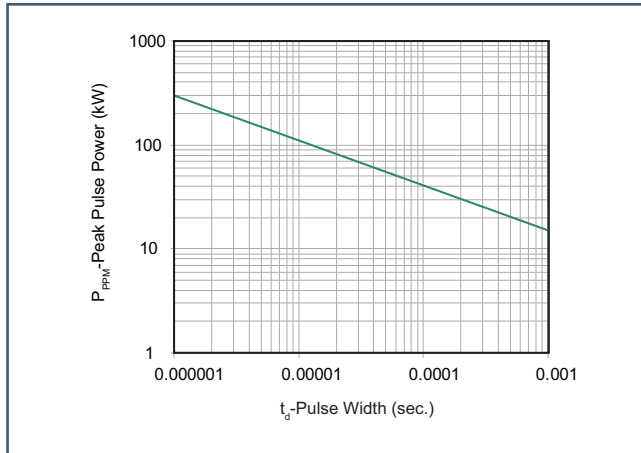


Figure 2 - Pulse Derating Curve

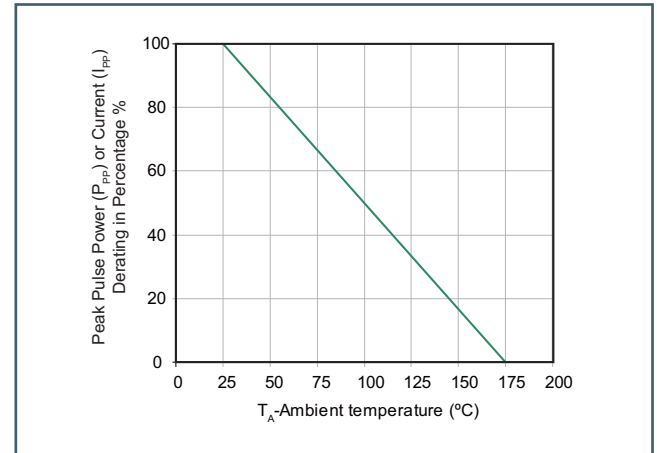


Figure 3 - Pulse Waveform

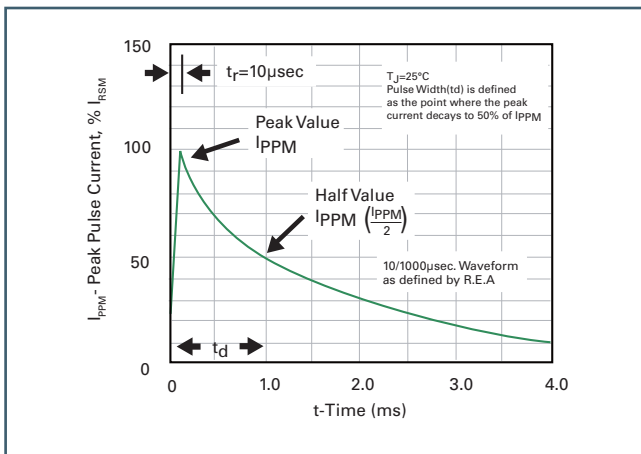


Figure 4 - Typical Junction Capacitance

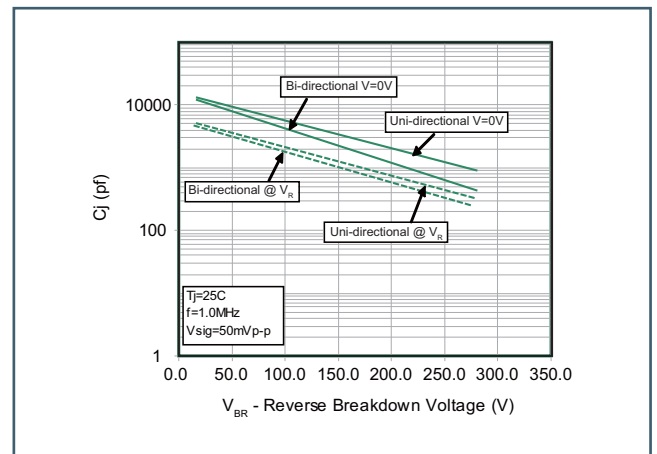


Figure 5 - Steady State Power Dissipation Derating Curve

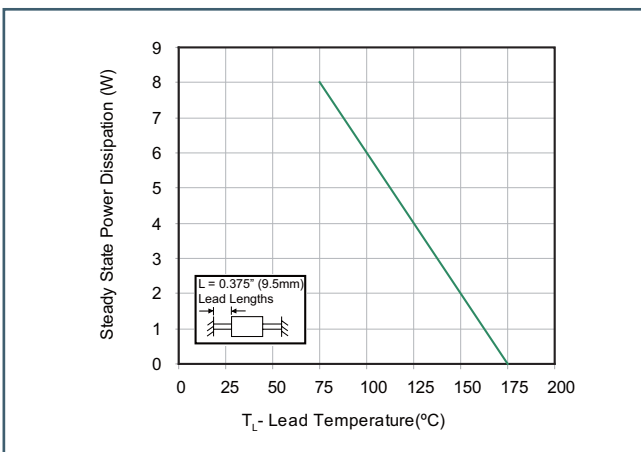
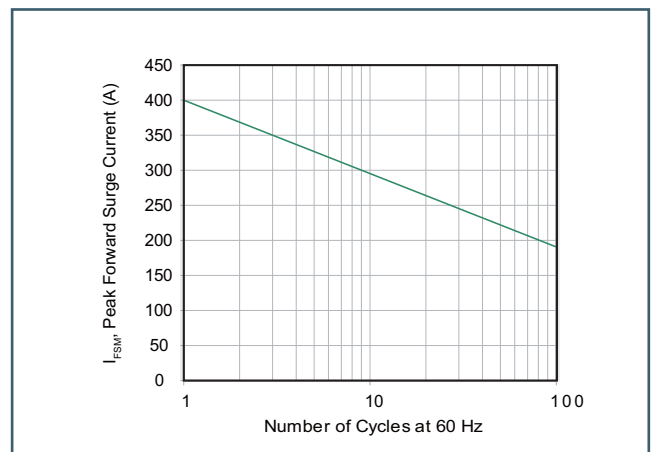


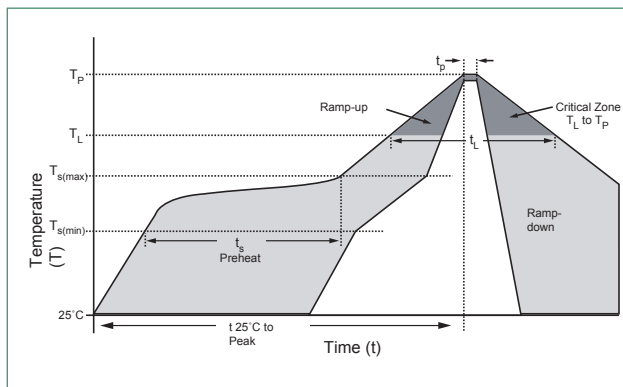
Figure 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only





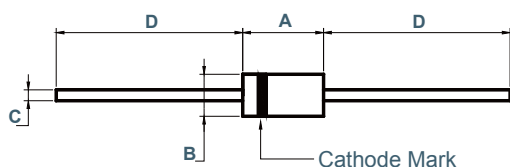
Soldering Parameters

Reflow 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+0/-5 °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



Dimensions

R-6



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.340	0.360	8.60	9.10	
B	0.340	0.360	8.60	9.10	Φ
C	0.048	0.052	1.20	1.30	Φ
D	1.000	—	25.4	—	