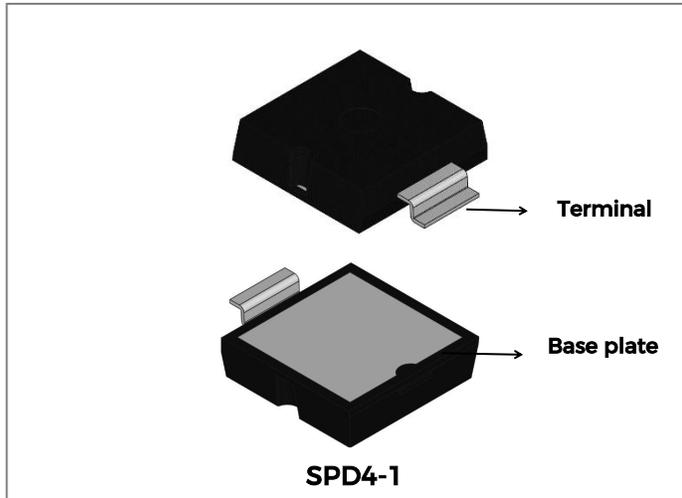


STPK15KP Series Transient Voltage Suppressor



Features

- Low profile surface mount
- Unidirectional and Bidirectional
- Fast response
- Suppresses transients up to 15kW @ 10/1000 μ s
- This is a Pb - Free Device
- Base plate: Pure Sn plated; Terminal: Pure Sn plated
- Base plate is cathode, Terminal is anode
- "A" Suffix designates unidirectional
- "CA" Suffix designates bidirectional
- All SMC parts are traceable to the wafer lot
- All part are 100% tested: electrical, 1x surge test, visual inspection
- Additional testing can be offered upon request

Applications

- Protection from switching transients and induced RF

Maximum Ratings and Thermal Characteristics@T_A=25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Junction and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C
Thermal Resistance Junction to Ambient (Note 1)	R _{θJA}	50	°C/W
Thermal Resistance Junction to Case	R _{θJC}	0.7	°C/W
Peak Pulse Power@10/1000 μ s(Note 2)	P _{PP}	15,000	W
Forward Surge Current (Note 3)	I _{FSM}	1500	A
Solder Temperature @ 10 s	T _{SP}	260	°C
Steady-State Power dissipation @T _A = 25°C @T _C = 100°C	P _D	2.5 (Note 1) 71 (Note 4)	W
Approximate Weight	wt	2.5	g

Note:1. When mounted on FR4 board with recommended mounting pad(see pad layout).

2. With impulse repetition rate (duty factor) of 0.05% or less.
3. At 8.3ms Single half sine-wave (unidirectional devices only)
4. Case temperature controlled heat sink as specified.
5. Derating when P_{PP} also applying steady-state power.

Electrical Characteristics @T_A=25°C unless otherwise specified

Part Number (Unidirectional)	Part Number (Bidirectional)	Stand-off Voltage V _{WM} (Note 1) (V)	Breakdown Voltage V _{BR} @ I _{BR} (mA) (V)		Clamping Voltage V _C (10*1000) @ I _{PP} (V) Max	Stand By Current I _R @ V _{WM} (A) Max	Peak Pulse Current I _{PP} (A) Max	Temperatur e Coefficient of V _{BR} mV/ C Max
				150				
STPK15KP7.0A	STPK15KP7.0CA	7	7.78-8.60	150	12	3000	1251*	5.0
STPK15KP7.5A	STPK15KP7.5CA	7.5	8.33-9.21	5	12.9	750	1164*	6.0
STPK15KP8.0A	STPK15KP8.0CA	8	8.89-9.83	5	13.6	450	1101*	6.0
STPK15KP8.5A	STPK15KP8.5CA	8.5	9.44-10.4	5	14.4	150	1141*	7.0
STPK15KP9.0A	STPK15KP9.0CA	9	10.0-10.1	5	15.4	60	975	8.0
STPK15KP10A	STPK15KP10CA	10	11.1-12.3	5	17	45	882	9.0
STPK15KP11A	STPK15KP11CA	11	12.2-13.5	5	18.2	10	822	10
STPK15KP12A	STPK15KP12CA	12	13.3-14.7	5	19.9	10	753	11
STPK15KP13A	STPK15KP13CA	13	14.4-15.9	5	21.5	10	696	12
STPK15KP14A	STPK15KP14CA	14	15.6-17.2	5	23.2	10	645	13
STPK15KP15A	STPK15KP15CA	15	16.7-18.5	5	24.4	10	618	15
STPK15KP16A	STPK15KP16CA	16	17.8-19.7	5	26	10	576	16
STPK15KP17A	STPK15KP17CA	17	18.9-20.9	5	27.6	10	543	18
STPK15KP18A	STPK15KP18CA	18	20.0-22.1	5	29.2	10	516	19
STPK15KP20A	STPK15KP20CA	20	22.2-24.5	5	32.4	10	462	22
STPK15KP22A	STPK15KP22CA	22	24.4-26.9	5	35.5	10	423	24
STPK15KP24A	STPK15KP24CA	24	26.7-29.5	5	38.9	10	384	27
STPK15KP26A	STPK15KP26CA	26	28.9-31.9	5	42.1	10	357	29
STPK15KP28A	STPK15KP28CA	28	31.1-34.4	5	45.5	10	330	30
STPK15KP30A	STPK15KP30CA	30	33.3-36.8	5	48.4	10	309	35
STPK15KP33A	STPK15KP33CA	33	36.7-40.6	5	53.3	10	282	38
STPK15KP36A	STPK15KP36CA	36	40.0-44.2	5	58.1	10	258	40
STPK15KP40A	STPK15KP40CA	40	44.4-49.1	5	64.5	10	234	45
STPK15KP43A	STPK15KP43CA	43	47.8-52.8	5	69.4	10	216	49
STPK15KP45A	STPK15KP45CA	45	50.0-55.3	5	72.7	10	207	51
STPK15KP48A	STPK15KP48CA	48	53.3-58.9	5	77.4	10	195	55
STPK15KP51A	STPK15KP51CA	51	56.7-62.7	5	82.4	10	183	60
STPK15KP54A	STPK15KP54CA	54	60.0-66.3	5	87.1	10	171	64
STPK15KP58A	STPK15KP58CA	58	64.4-71.2	5	93.6	10	159	69
STPK15KP60A	STPK15KP60CA	60	66.7-73.7	5	96.8	10	156	70

Part Number (Unidirectional)	Part Number (Bidirectional)	Stand-off Voltage V_{WM} (Note 1) (V)	Breakdown Voltage V_{BR} @ I_{BR} (mA) (V)		Clampin g Voltage V_C (10*1000) @ I_{PP} (V) Max	Stand By Current I_R @ V_{WM} (A) Max	Peak Pulse Current I_{PP} (A) Max	Temperatu re Coefficient of V_{BR} mV/ C Max
STPK15KP64A	STPK15KP64CA	64	71.1-78.6	5	103	10	147	75
STPK15KP70A	STPK15KP70CA	70	77.8-86.0	5	113	10	132	84
STPK15KP75A	STPK15KP75CA	75	83.3-92.1	5	121	10	123	90
STPK15KP78A	STPK15KP78CA	78	86.7-95.8	5	126	10	120	94
STPK15KP85A	STPK15KP85CA	85	94.4-104	5	137	10	108	102
STPK15KP90A	STPK15KP90CA	90	100-111	5	146	10	402	109
STPK15KP100A	STPK15KP100CA	100	111-123	5	162	10	93	122
STPK15KP110A	STPK15KP110CA	110	122-135	5	177	10	84	132
STPK15KP120A	STPK15KP120CA	120	133-147	5	193	10	78	145
STPK15KP130A	STPK15KP130CA	130	144-159	5	209	10	71	157
STPK15KP150A	STPK15KP150CA	150	167-185	5	243	10	62	183
STPK15KP160A	STPK15KP160CA	160	178-197	5	259	10	58	195
STPK15KP170A	STPK15KP170CA	170	189-209	5	275	10	55	207
STPK15KP180A	STPK15KP180CA	180	200-221	5	291	10	52	219
STPK15KP200A	STPK15KP200CA	200	222-245	5	322	10	47	243

- Note:** 1. Transient Voltage Suppressors are normally selected with reverse standoff voltage V_{WM} , which should be equal to or greater than the peak operating voltage.
 2. STPK15KPXXXXA, "A" Suffix Designates Unidirectional Devices; STPK15KPXXXXCA, "CA" Suffix Designates Bidirectional Devices.
 * Surge Testing is performed to 1000Amps due to Equipment limitations.

SYMBOLS & DEFINITIONS			
Symbol	Definition	Symbol	Definition
V_{WM}	Working Peak(Standoff) Voltage	I_{PP}	Peak Pulse Current
$V_{(BR)}$	Breakdown Voltage	V_C	Clamping Voltage
I_R	Standby Current	$I_{(BR)}$	Breakdown Current for $V_{(BR)}$

Ratings and Characteristics Curves

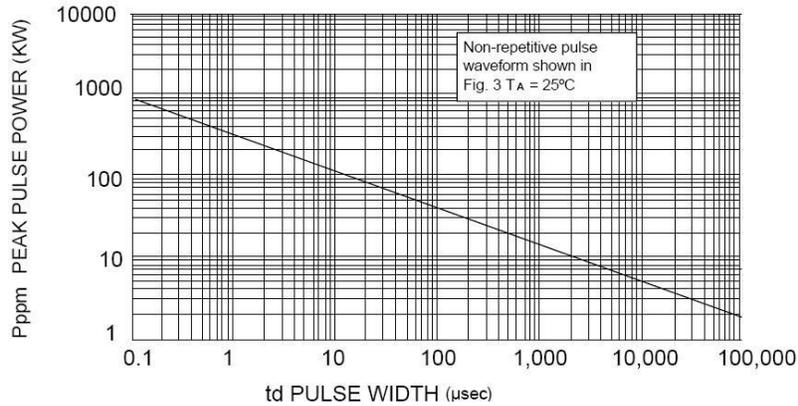


Fig.1-PEAK PULSE POWER RATING

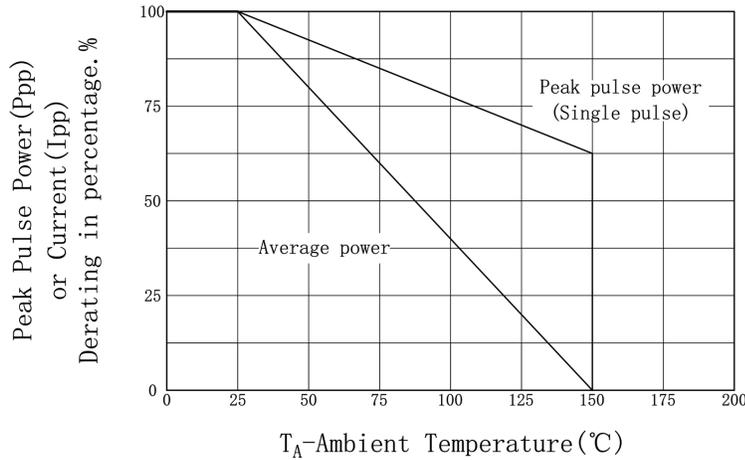


Fig.2-Pulse Derating Curve

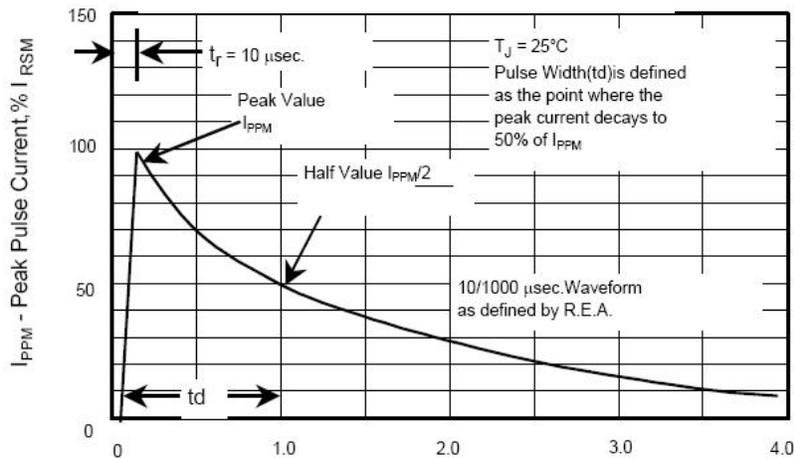
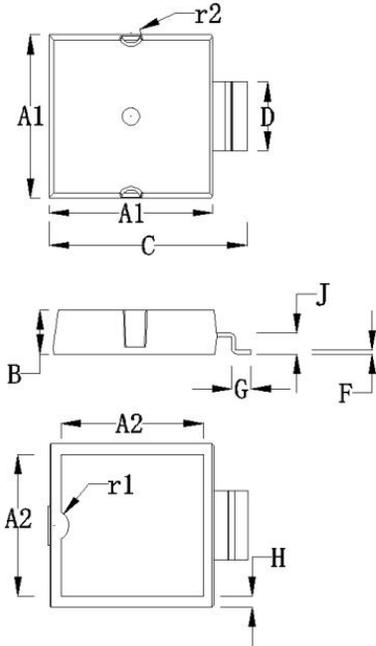


Fig.3-Pulse Waveform

Mechanical Dimensions SPD4-1 (Inches/Millimeters)



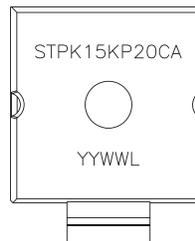
Ref.	Dimensions			
	Inches		Millimeters	
	min	max	min	max
A1	0.488	0.498	12.40	12.66
A2	0.414	0.442	10.52	11.22
B	0.128	0.144	3.24	3.66
C	0.587	0.610	14.90	15.50
D	0.208	0.214	5.28	5.43
F	0.009	0.014	0.23	0.35
G	0.054	0.066	1.37	1.67
J	0.057	0.069	1.45	1.75
H	0.032 TYP		0.83 TYP	
r1	0.045 TYP		1.14 TYP	
r2	0.027 TYP		0.70 TYP	

Ordering Information

Device	Package	Shipping
STPK15KPXX	SPD4-1 (Pb-Free)	64pcs/bag
STPK15KPXXTR	SPD4-1 (Pb-Free)	500pcs/reel

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification

Marking Diagram

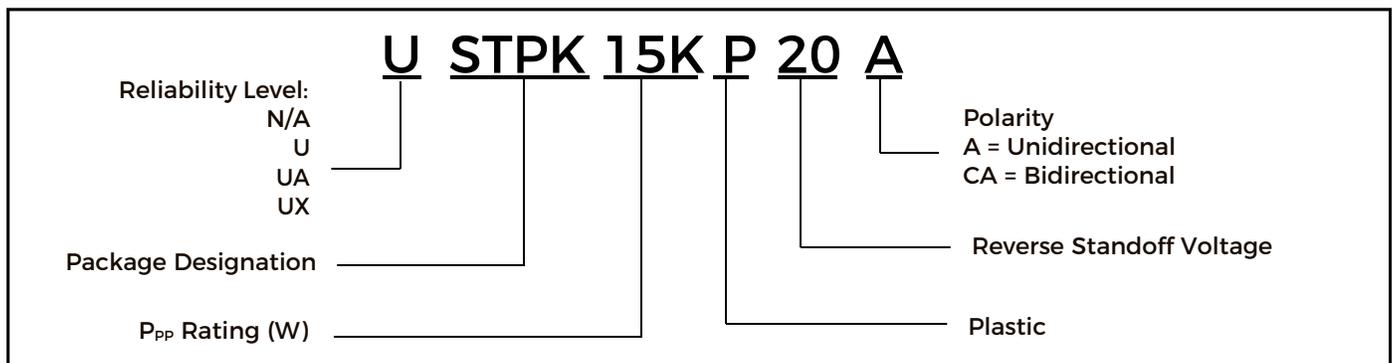


Where XXXXX is YYWWL
Part number's example like this

Part number = STPK15KP20CA
YY = Year
WW = Week
L = Lot Number

Notes: Reliability Level will Marking.

Part Number Naming Rule



SMC TVS Screening Options					
Screen or Test Description	Screening Options				
	Prefix	1)	U	UA	UX
100% Wafer Probe		R	R	R	R
3-Sigma lot norm determination 2)			R	R	R
Surge Test		1x	1x	1x	1x
100% DC Electrical Test Go-No-Go			R	R	R
Temperature Cycling			10 Cycles 3)	10 Cycles	20 Cycles
Post TC Surge Test			1x 3)	3x	10x
100% Thermal Impedance 4)			R	R	R
100% DC Electrical Test				go-no-go	R
HTRB				24 hrs 5)	96 hrs 6)
100% DC Electrical Test		go-no-go	go-no-go	go-no-go	R
Delta Calculation					R
PDA Calculation					R
100% Visual Inspection		R	R	R	R
Certificate of Conformance		R	R	R	R
Group A Inspection					O
Group B Inspection					O
Group C Inspection					O

Notes:

R = to be performed. Electrical testing per datasheet limits

O = optional

1) Commercial flow

2) 3-Sigma lot norm to remove atypical devices. For detailed requirements see below.

3) Test to be performed on TPK & STPK Series only. The condition is below:

High temp. side: 150 °C; Low temp. side: -55 °C; Duration time: HT 15min, LT 15 min

4) To be performed any time before completion of screening for unidirectional devices only.

5) 24 hours for unidirectional, 24 hours each side for bidirectional

6) 96 hours for unidirectional, 48 hours each side for bidirectional

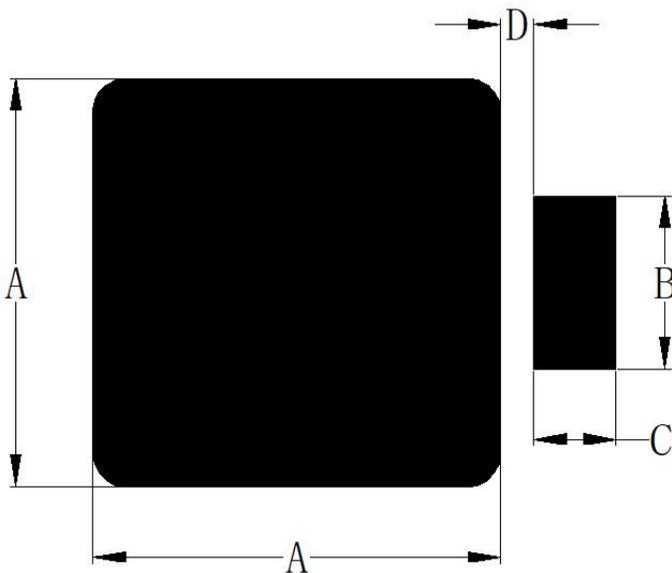
Test Procedure to remove Atypical Devices

This procedure will be used in the production testing and applied for each assembly lot when required by the screening option.

- read and record VBR and IR of 200 random samples of a particular assembly lot.
- calculate the average (μ) and standard deviation (σ) for each parameter.
- the testing limit will then be as follows:
 - $VBR\ min = \mu(VBR) - 3\sigma(VBR)$
 - $VBR\ max = \mu(VBR) + 3\sigma(VBR)$
 - $IR\ max = \mu(IR) + 3\sigma(IR)$

Once the testing limit is established for this assembly lot, the 100% production testing will be done based on the tighter limit for the parts of the same assembly lot.

PAD Layout Recommend Size(Millimeters)



Ref.	Dimensions			
	Inches		Millimeters	
	min	max	min	max
A	0.451	0.461	11.45	11.71
B	0.225	0.235	5.72	5.97
C	0.094	0.104	2.38	2.64
D	0.042	0.050	1.06	1.26

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