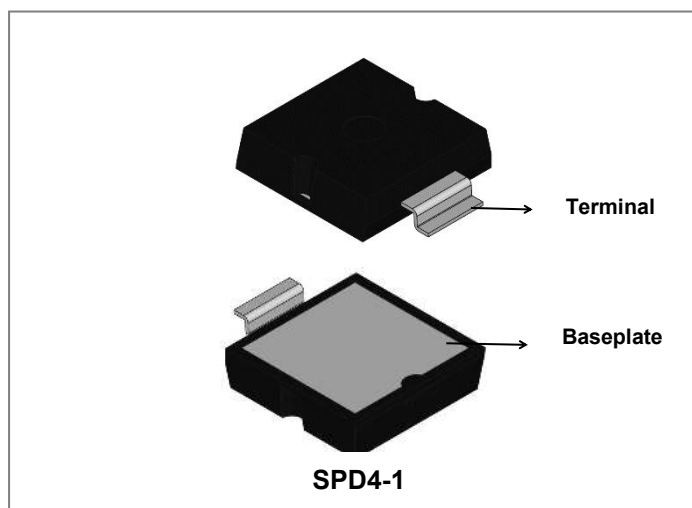


STPK30KP Series Transient Voltage Suppressor



Features

- Low profile surface mount
- Fast response
- Suppresses transients up to 30kW @ 10/1000 μ s and 200kW @ 8/20 μ s
- This is a Pb – Free Device
- Baseplate: Pure Sn plated; Terminal: Pure Sn plated
- Polarity: "A" Suffix designates unidirectional, baseplate is cathode; "CA" Suffix designates bidirectional
- All SMC parts are traceable to the wafer lot
- Adding the U, UA, UX prefixes to part numbers for desired level of screening.
- 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}	1.0	°C/W
Peak Pulse Power@10/1000 μ s (Note 2)	P _{PP}	30,000	W
T _{Pclamping} (0 volts to V _(BR) min) Unidirectional		<100	ps
Forward Clamping Voltage @ 500 Amps (Note 3)	V _{FS}	4.0	V
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) 50 (Note 4)	W
Approximate Weight	wt	2.35	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} (μA) Max	Stand By Current I _R @ V _{WM} T _J =150°C (μA) Max	Peak Pulse Current I _{PP} Max (A)	Temperature Coefficient Of V _{BR} mV/°C Max
STPK30KP20A	STPK30KP20CA	20	22.2-24.5	5	34.0	45	800	882	18
STPK30KP22A	STPK30KP22CA	22	24.4-26.9	5	36.4	10	200	822	20
STPK30KP24A	STPK30KP24CA	24	26.7-29.5	5	39.8	10	200	753	22
STPK30KP26A	STPK30KP26CA	26	28.9-31.9	5	43.0	10	200	696	24
STPK30KP28A	STPK30KP28CA	28	31.1-34.4	5	46.4	10	200	645	26
STPK30KP30A	STPK30KP30CA	30	33.3-36.8	5	48.8	10	200	618	30
STPK30KP33A	STPK30KP33CA	33	36.7-40.6	5	53.3	10	200	564	35
STPK30KP36A	STPK30KP36CA	36	40.0-44.2	5	58.1	10	200	516	38
STPK30KP40A	STPK30KP40CA	40	44.4-49.1	5	64.5	10	200	468	44
STPK30KP43A	STPK30KP43CA	43	47.8-52.8	5	69.4	10	200	432	50
STPK30KP45A	STPK30KP45CA	45	50.0-55.3	5	72.7	10	200	414	51
STPK30KP48A	STPK30KP48CA	48	53.3-58.9	5	77.4	10	200	390	54
STPK30KP51A	STPK30KP51CA	51	56.7-62.7	5	82.4	10	200	366	58
STPK30KP54A	STPK30KP54CA	54	60.0-66.3	5	87.1	10	200	342	64
STPK30KP58A	STPK30KP58CA	58	64.4-71.2	5	93.6	10	200	318	70
STPK30KP60A	STPK30KP60CA	60	66.7-73.7	5	96.8	10	200	312	72
STPK30KP64A	STPK30KP64CA	64	71.1-78.6	5	103.0	10	200	294	75
STPK30KP70A	STPK30KP70CA	70	77.8-86.0	5	113	10	200	264	84
STPK30KP75A	STPK30KP75CA	75	83.3-92.1	5	121	10	200	246	90
STPK30KP78A	STPK30KP78CA	78	86.7-95.8	5	126	10	200	240	95
STPK30KP85A	STPK30KP85CA	85	94.4-104.0	5	137	10	200	216	104
STPK30KP90A	STPK30KP90CA	90	100-111	5	146	10	200	204	109
STPK30KP100A	STPK30KP100CA	100	111-123	5	162	10	200	186	122
STPK30KP110A	STPK30KP110CA	110	122-135	5	177	10	200	168	132
STPK30KP120A	STPK30KP120CA	120	133-147	5	193	10	200	156	145
STPK30KP130A	STPK30KP130CA	130	144-159	5	209	10	200	142	157
STPK30KP150A	STPK30KP150CA	150	167-185	5	243	10	200	124	183
STPK30KP160A	STPK30KP160CA	160	178-197	5	259	10	200	116	195
STPK30KP170A	STPK30KP170CA	170	189-209	5	275	10	200	110	207
STPK30KP180A	STPK30KP180CA	180	200-221	5	291	10	200	104	219
STPK30KP200A	STPK30KP200CA	200	222-245	5	322	10	200	94	243
STPK30KP220A	STPK30KP220CA	220	245-271	5	356	10	200	84	269
STPK30KP260A	STPK30KP260CA	260	289-320	5	419	10	200	71	318
STPK30KP280A	STPK30KP280CA	280	311-345	5	451	10	200	66	344

**Technical Data
Data Sheet N2375, Rev. B**



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} (μ A) Max	Stand By Current I_R @ V_{WM} $T_J=150^\circ\text{C}$ (μ A) Max	Peak Pulse Current I_{PP} Max	Temperature Coefficient Of V_{BR} $\text{mV}/^\circ\text{C}$ Max
STPK30KP300A	STPK30KP300CA	300	333-369	5	483	10	200	62	368
STPK30KP350A	STPK30KP350CA	350	389-431	5	564	10	200	53	430
STPK30KP400A	STPK30KP400CA	400	444-492	5	644	10	200	46	490

NOTE 1: Transient Voltage Suppressors are normally selected with reverse "Stand Off Voltage" V_{WM} which should be equal to or greater than the dc or continuous peak operating voltage level.

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

Ratings and Characteristics Curves

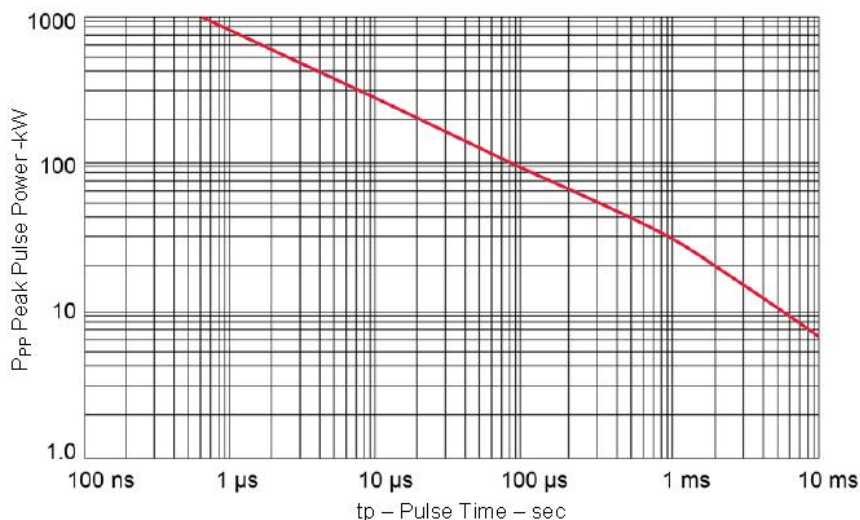


FIGURE 1
Peak Pulse Power vs. Pulse Time

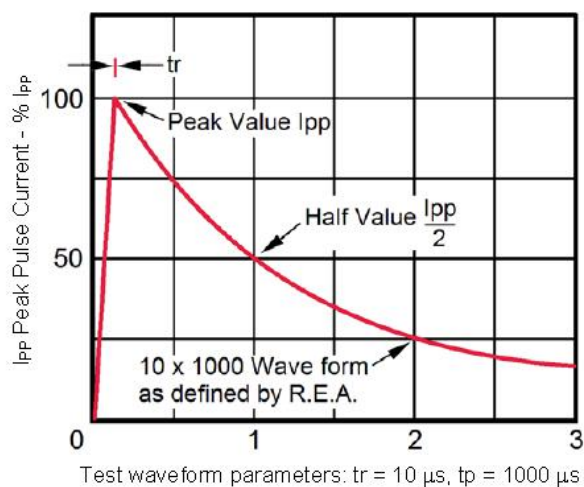


Figure 2
Pulse Waveform

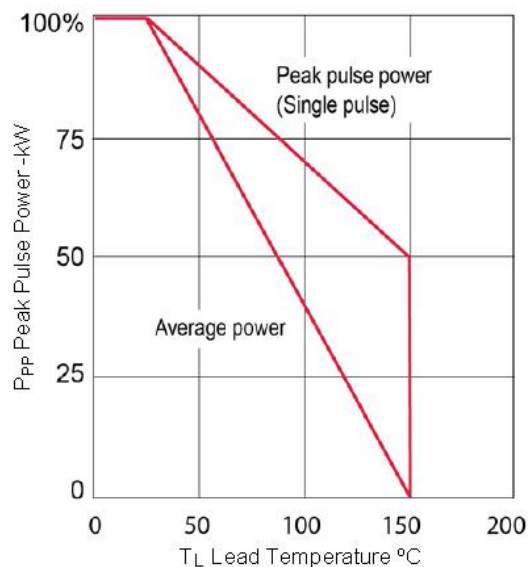
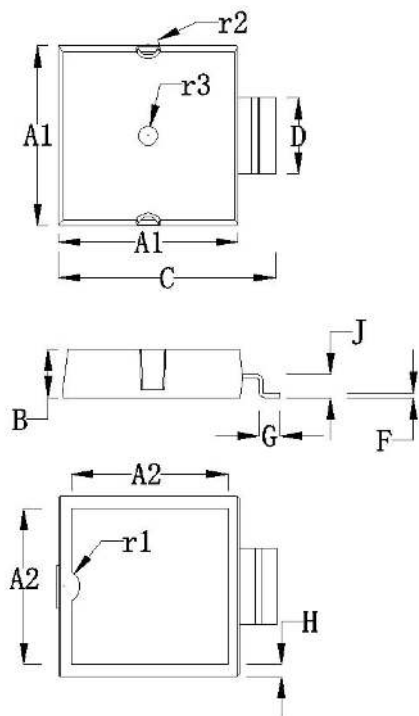


FIGURE 3
Derating Curve

- China - Germany - Korea - Singapore - United States •
- <http://www.smc-diodes.com> - sales@smc-diodes.com •

Mechanical Dimensions SPD4-1(Inches/Millimeters)



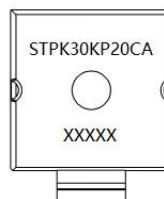
Ref.	Dimensions			
	Inches		Millimeters	
	min	max	min	max
A1	0.488	0.498	12.40	12.66
A2	0.414	0.442	10.52	11.22
B	0.128	0.144	3.24	3.66
C	0.587	0.610	14.90	15.50
D	0.208	0.214	5.28	5.43
F	0.009	0.014	0.23	0.35
G	0.054	0.066	1.37	1.67
J	0.057	0.069	1.45	1.75
H	0.032 TYP		0.83 TYP	
r1	0.045 TYP		1.14 TYP	
r2	0.027 TYP		0.70 TYP	
r3	0.039 TYP		1.00 TYP	

Ordering Information

Device	Package	Shipping
STPK30KPXX	SPD4-1 (Pb-Free)	64pcs/bag
STPK30KPXXTR	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.

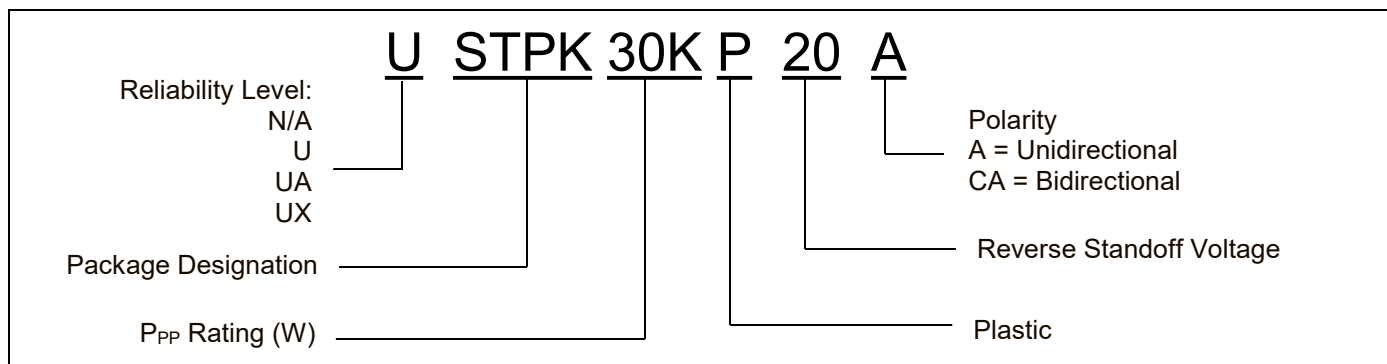
Marking Diagram



Where XXXXX is YYWWL
Part number's example like this

Part number = STPK30KP20CA
YY = Year
WW = Week
L = Lot Number

Part Nomenclature



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

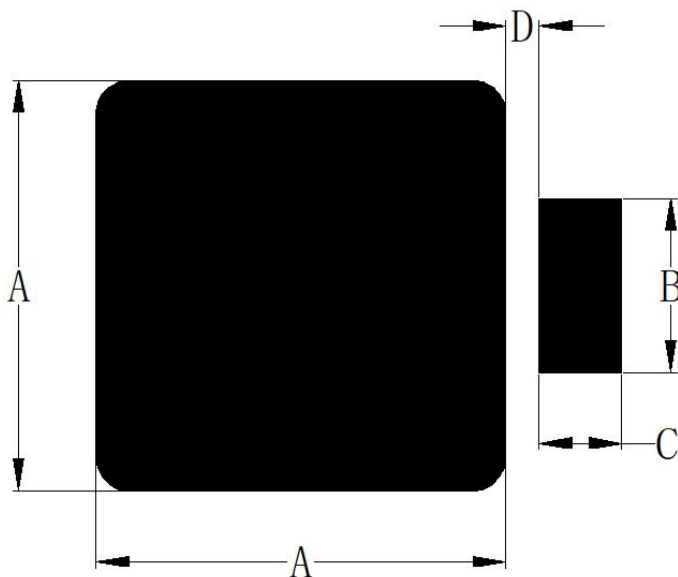
Test Procedure to remove Atypical Devices

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



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

DISCLAIMER:

- 1- The information given herein, including the specifications and dimensions, is subject to change without prior notice to improve product characteristics. Before ordering, purchasers are advised to contact the SMC Diode Solutions sales department for the latest version of the datasheet(s).
- 2- In cases where extremely high reliability is required (such as use in nuclear power control, aerospace and aviation, traffic equipment, medical equipment, and safety equipment), safety should be ensured by using semiconductor devices that feature assured safety or by means of users' fail-safe precautions or other arrangement.
- 3- In no event shall SMC Diode Solutions be liable for any damages that may result from an accident or any other cause during operation of the user's units according to the datasheet(s). SMC Diode Solution assumes no responsibility for any intellectual property claims or any other problems that may result from applications of information, products or circuits described in the datasheets.
- 4- In no event shall SMC Diode Solutions be liable for any failure in a semiconductor device or any secondary damage resulting from use at a value exceeding the absolute maximum rating.
- 5- No license is granted by the datasheet(s) under any patents or other rights of any third party or SMC Diode Solutions.
- 6- The datasheet(s) may not be reproduced or duplicated, in any form, in whole or part, without the expressed written permission of SMC Diode Solutions.
- 7- The products (technologies) described in the datasheet(s) are not to be provided to any party whose purpose in their application will hinder maintenance of international peace and safety nor are they to be applied to that purpose by their direct purchasers or any third party. When exporting these products (technologies), the necessary procedures are to be taken in accordance with related laws and regulations..