

TPK15KPXX TVS Rectifier



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
- Open top for heat dissipation and different connection options
- Base plate: Pure Sn plated; Terminals: 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@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 (with 10/1000 μ s waveform) (Note 2)	P _{PPM}	15000	W
Steady-State Power dissipation (Note 5) @T _A = 25°C @T _C = 100°C	P _D	2.5 (Note 1) 71 (Note 4)	W
Peak Forward Surge Current(JEDEC Method)(Note 3)	I _{FSM}	1500	A

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)		Test Current I _{BR} (mA)	Clamping Voltage V _C (10*1000) @ I _{PP} (V) Max	Stand By Current I _R @ V _{WM} (μA) Max	Peak Pulse Current I _{PP} (A) Max	Temperatur e Coefficient Of V _{BR} mV/°C Max
			Min	Max					
TPK15KP7.0A	TPK15KP7.0CA	7	7.78	8.60	150	12	3000	1251*	5.0
TPK15KP7.5A	TPK15KP7.5CA	7.5	8.33	9.21	5	12.9	750	1164*	6.0
TPK15KP8.0A	TPK15KP8.0CA	8	8.89	9.83	5	13.6	450	1101*	6.0
TPK15KP8.5A	TPK15KP8.5CA	8.5	9.44	10.4	5	14.4	150	1141*	7.0
TPK15KP9.0A	TPK15KP9.0CA	9	10	11.1	5	15.4	60	975	8.0
TPK15KP10A	TPK15KP10CA	10	11.1	12.3	5	17	45	882	9.0
TPK15KP11A	TPK15KP11CA	11	12.2	13.5	5	18.2	10	822	10
TPK15KP12A	TPK15KP12CA	12	13.3	14.7	5	19.9	10	753	11
TPK15KP13A	TPK15KP13CA	13	14.4	15.9	5	21.5	10	696	12
TPK15KP14A	TPK15KP14CA	14	15.6	17.2	5	23.2	10	645	13
TPK15KP15A	TPK15KP15CA	15	16.7	18.5	5	24.4	10	618	15
TPK15KP16A	TPK15KP16CA	16	17.8	19.7	5	26	10	576	16
TPK15KP17A	TPK15KP17CA	17	18.9	20.9	5	27.6	10	543	18
TPK15KP18A	TPK15KP18CA	18	20	22.1	5	29.2	10	516	19
TPK15KP20A	TPK15KP20CA	20	22.2	24.5	5	32.4	10	462	22
TPK15KP22A	TPK15KP22CA	22	24.4	26.9	5	35.5	10	423	24
TPK15KP24A	TPK15KP24CA	24	26.7	29.5	5	38.9	10	384	27
TPK15KP26A	TPK15KP26CA	26	28.9	31.9	5	42.1	10	357	29
TPK15KP28A	TPK15KP28CA	28	31.1	34.4	5	45.5	10	330	30
TPK15KP30A	TPK15KP30CA	30	33.3	36.8	5	48.4	10	309	35
TPK15KP33A	TPK15KP33CA	33	36.7	40.6	5	53.3	10	282	38
TPK15KP36A	TPK15KP36CA	36	40	44.2	5	58.1	10	258	40
TPK15KP40A	TPK15KP40CA	40	44.4	49.1	5	64.5	10	234	45
TPK15KP43A	TPK15KP43CA	43	47.8	52.8	5	69.4	10	216	49
TPK15KP45A	TPK15KP45CA	45	50	55.3	5	72.7	10	207	51
TPK15KP48A	TPK15KP48CA	48	53.3	58.9	5	77.4	10	195	55
TPK15KP51A	TPK15KP51CA	51	56.7	62.7	5	82.4	10	183	60
TPK15KP54A	TPK15KP54CA	54	60	66.3	5	87.1	10	171	64
TPK15KP58A	TPK15KP58CA	58	64.4	71.2	5	93.6	10	159	69
TPK15KP60A	TPK15KP60CA	60	66.7	73.7	5	96.8	10	156	70
TPK15KP64A	TPK15KP64CA	64	71.1	78.6	5	103	10	147	75

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)		Test Current I _{BR} (mA)	Clamping Voltage V _C (10*1000) @ I _{PP} (V) Max	Stand By Current I _R @ V _{WM} (μA) Max	Peak Pulse Current I _{PP} (A) Max	Temperature Coefficient Of V _{BR} mV/°C Max
			Min	Max					
TPK15KP70A	TPK15KP70CA	70	77.8	86	5	113	10	132	84
TPK15KP75A	TPK15KP75CA	75	83.3	92.1	5	121	10	123	90
TPK15KP78A	TPK15KP78CA	78	86.7	95.8	5	126	10	120	94
TPK15KP85A	TPK15KP85CA	85	94.4	104	5	137	10	108	102
TPK15KP90A	TPK15KP90CA	90	100	111	5	146	10	402	109
TPK15KP100A	TPK15KP100CA	100	111	123	5	162	10	93	122
TPK15KP110A	TPK15KP110CA	110	122	135	5	177	10	84	132
TPK15KP120A	TPK15KP120CA	120	133	147	5	193	10	78	145
TPK15KP130A	TPK15KP130CA	130	144	159	5	209	10	71	157
TPK15KP150A	TPK15KP150CA	150	167	185	5	243	10	62	183
TPK15KP160A	TPK15KP160CA	160	178	197	5	259	10	58	195
TPK15KP170A	TPK15KP170CA	170	189	209	5	275	10	55	207
TPK15KP180A	TPK15KP180CA	180	200	221	5	291	10	52	219
TPK15KP200A	TPK15KP200CA	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. TPK15KPXXXXA, "A" Suffix Designates Unidirectional Devices; TPK15KPXXXXCA, "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 _(BR0)

Ratings and Characteristics Curves

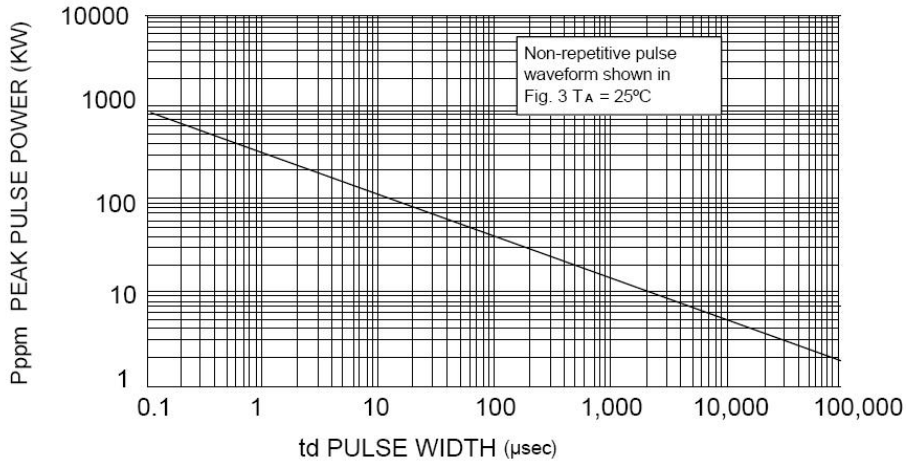


FIG. 1 PEAK PULSE POWER RATING

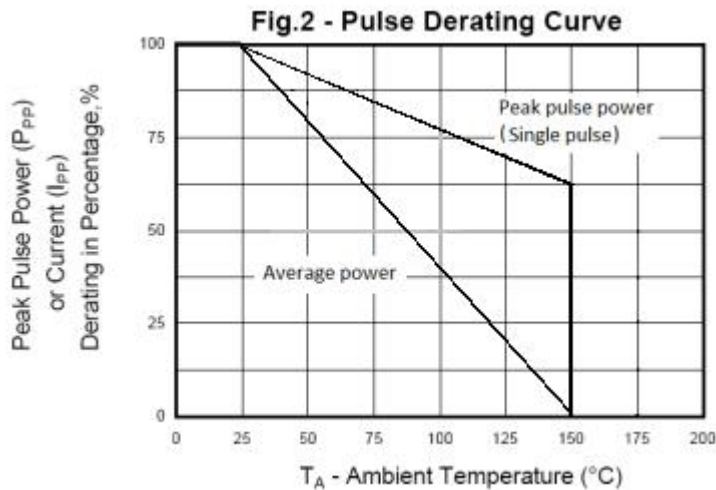
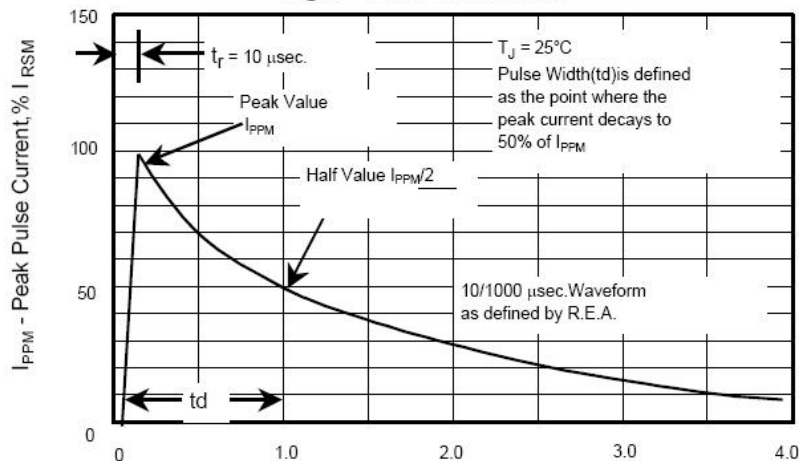
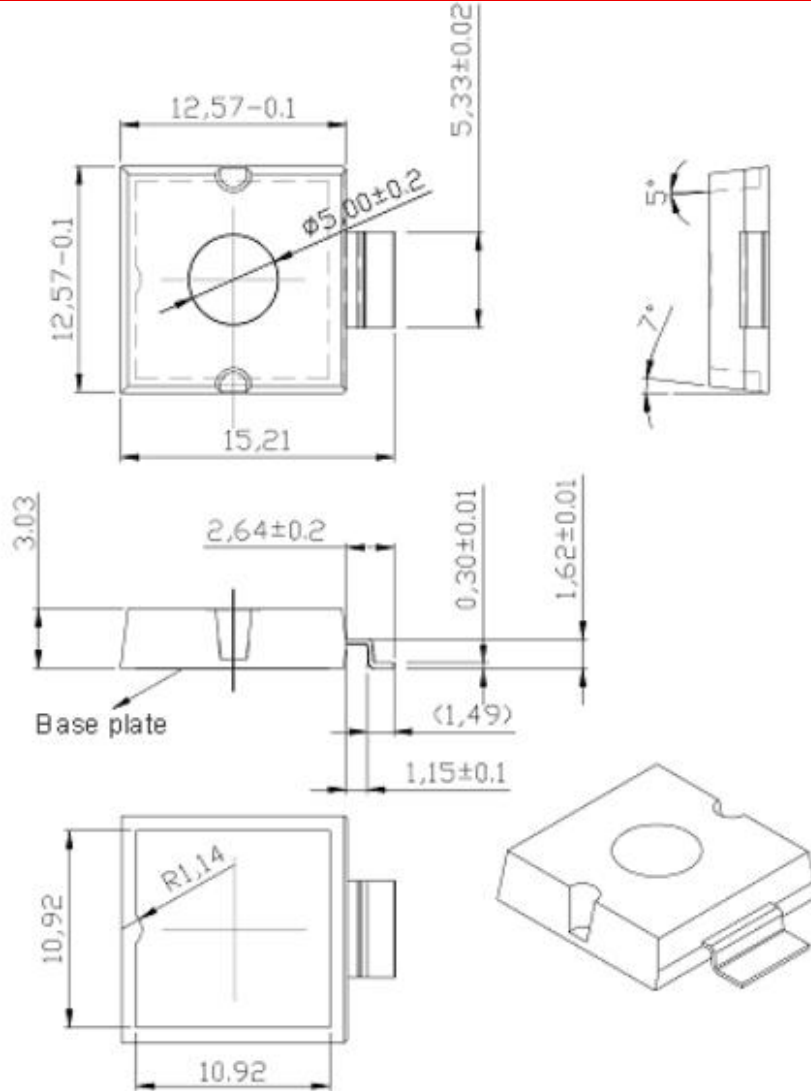


Fig.3 - Pulse Waveform



Mechanical Dimensions SPD-4(Millimeters)

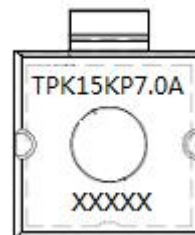


Ordering Information

Device	Package	Shipping
TPK15KPXX	SPD-4(Pb-Free)	64pcs/ bag
TPK15KPXXTR	SPD-4(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



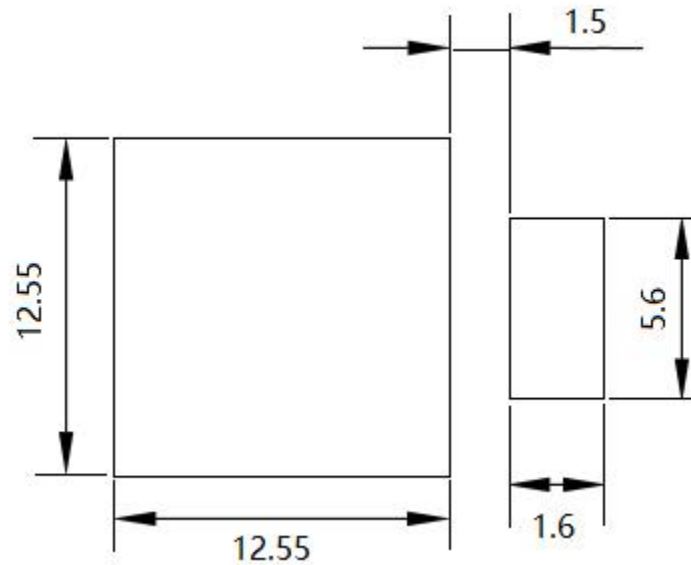
Where XXXXX is YYWWL
Part number's example like this

TPK15KP7.0A = Part Number
YY = Year
WW = Week
L = Lot Number

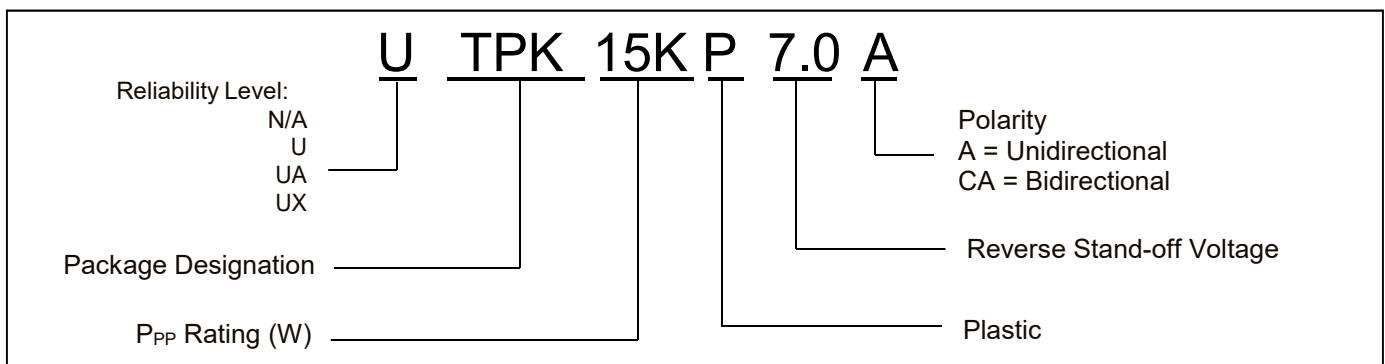
Notes: Reliability Level will Marking.

Date code "XXXXX" was added in marking from April 1, 2019.

PAD Layout Recommend Size(Millimeters)



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.

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