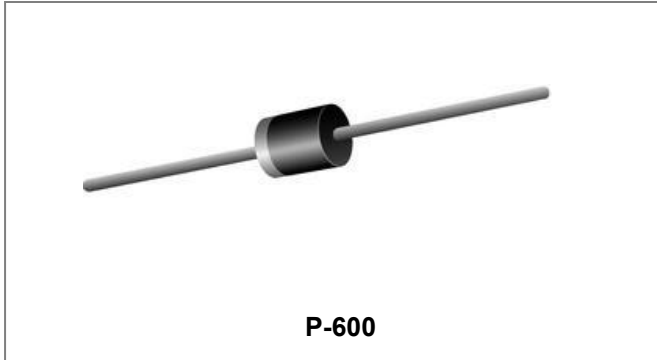




**THE DATASHEET OF  
15KPA90A**



# 15KPA SERIES GLASS PASSIVATED TRANSIENT VOLTAGE SUPPRESSOR



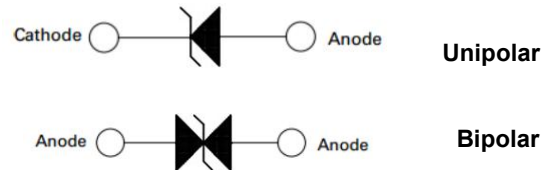
## Features

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- Glass Passivated Junction
- 15000W Peak Pulse Power Capability on 10/1000  $\mu$ s waveform
- Voltage-17.0 to 280 Volts
- Excellent Clamping Capability
- Repetition rate (duty cycle): 0.05%
- Low incremental surge resistance
- Fast Response Time: typically less than 1.0 ps from volts to BV
- High temperature soldering guaranteed: 265°C/10 seconds/.375" , (9.5mm) lead length, 5lbs., (2.3kg) tension
- This is a Pb – Free Device
- All SMC Parts are Traceable to the Wafer Lot
- Additional testing can be offered upon request

## Mechanical Data

- Case: Molded Plastic over glass passivated junction
- Terminals: Plated Axial leads , Solderable per MIL-STD 750, Method 2026
- Polarity: Color Band denoted positive end (cathode) except Bipolar
- Mounting Position: Any
- Weight:2.1 grams(approx.)

## Circuit Diagram



## Maximum Ratings and Thermal Characteristics@T<sub>A</sub>=25°C unless otherwise specified

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10x1000 $\mu$ s Waveform(Note 1)	P <sub>PPM</sub>	15000	W
Steady State Power Dissipation at T <sub>L</sub> =75°C Lead Lengths .375", (9.5mm)(Note 2)	P <sub>M(AV)</sub>	8.0	W
Peak Forward Surge Current, 8.3ms Sine-Wave Superimposed on Rated Load, (JEDEC Method)(Note 3)	I <sub>FSM</sub>	400.0	A
Typical Thermal Resistance Junction to Lead	R <sub><math>\theta</math>JL</sub>	8.0	°C/W
Typical Thermal Resistance Junction to Ambient	R <sub><math>\theta</math>JA</sub>	40	°C/W
Operating Junction and Storage Temperature Range	T <sub>J</sub> ,T <sub>STG</sub>	-55 to 175	°C

- Notes:**
1. Non-repetitive current pulse, per Fig. 3 and derated above T<sub>A</sub> = 25°C per Fig. 2.
  2. Mounted on copper pad area of 0.8" × 0.8" (20 × 20mm)
  3. 8.3ms single half sine wave, or equivalent square, duty cycle=4 pulses per minute maximum.

**Electrical Characteristics @T<sub>A</sub>=25°C unless otherwise specified**

UNI-POLAR	BI-POLAR	REVERSE STAND-OFF VOLTAGE V <sub>RWM</sub> (V)	BREAKDOWN VOLTAGE V <sub>BR</sub> (V) MIN. @I <sub>T</sub>	BREAKDOWN VOLTAGE V <sub>BR</sub> (V) MAX. @I <sub>T</sub>	TEST CURRENT I <sub>T</sub> (MA)	MAXIMUM CLAMPING VOLTAGE @I <sub>PP</sub> V <sub>C</sub> (V)	PEAK PULSE CURRENT I <sub>PP</sub> (A)	REVERSE LEAKAGE @V <sub>RWM</sub> I <sub>R</sub> (μA)
15KPA17A	15KPA17CA	17	18.99	20.79	50	29.3	515.4	5000
15KPA18A	15KPA18CA	18	20.11	20.01	50	30.9	488.7	5000
15KPA20A	15KPA20CA	20	22.34	24.46	20	34.3	440.2	1500
15KPA22A	15KPA22CA	22	24.57	26.91	10	37.1	407	500
15KPA24A	15KPA24CA	24	26.81	29.35	5	40.7	371	150
15KPA26A	15KPA26CA	26	29.04	31.8	5	44	343.2	50
15KPA28A	15KPA28CA	28	31.28	34.24	5	47.5	317.9	25
15KPA30A	15KPA30CA	30	33.51	36.7	5	50.7	297.8	15
15KPA33A	15KPA33CA	33	36.9	40.4	5	54.7	276.1	2
15KPA36A	15KPA36CA	36	40.2	44	5	59.8	252.5	2
15KPA40A	15KPA40CA	40	44.7	48.90	5	65.8	229.5	2
15KPA43A	15KPA43CA	43	48	52.6	5	69.8	216.3	2
15KPA45A	15KPA45CA	45	50.3	55	5	72.8	207.4	2
15KPA48A	15KPA48CA	48	53.6	58.7	5	77.7	194.3	2
15KPA51A	15KPA51CA	51	57	62.4	5	82.8	182.1	2
15KPA54A	15KPA54CA	54	60.3	66	5	87.7	172.2	2
15KPA58A	15KPA58CA	58	64.8	70.9	5	93.8	161	2
15KPA60A	15KPA60CA	60	67	73.4	5	97.4	155	2
15KPA64A	15KPA64CA	64	71.5	78.3	5	104.2	144.9	2
15KPA70A	15KPA70CA	70	78.2	85.6	5	113.6	132.9	2
15KPA75A	15KPA75CA	75	83.8	91.7	5	122	123.8	2
15KPA78A	15KPA78CA	78	87.1	95.4	5	126.1	119.7	2
15KPA85A	15KPA85CA	85	94.9	104	5	137.6	109.7	2
15KPA90A	15KPA90CA	90	100.5	110.1	5	145.6	103.7	2
15KPA100A	15KPA100CA	100	111.7	122.3	5	161.3	93.6	2
15KPA110A	15KPA110CA	110	122.9	134.5	5	178.6	84.5	2
15KPA120A	15KPA120CA	120	134	146.8	5	192.3	78.5	2
15KPA130A	15KPA130CA	130	145.2	159	5	208.3	72.5	2
15KPA150A	15KPA150CA	150	167.6	183.5	5	241.9	62.4	2
15KPA160A	15KPA160CA	160	178.7	195.7	5	258.6	58.4	2
15KPA170A	15KPA170CA	170	189.9	207.9	5	272.7	55.4	2
15KPA180A	15KPA180CA	180	201.1	220.1	5	288.5	52.3	2
15KPA200A	15KPA200CA	200	223.4	244.6	5	319.1	47.3	2
15KPA220A	15KPA220CA	220	245.7	269.1	5	356	42	2
15KPA240A	15KPA240CA	240	268.1	293.5	5	384.6	39.3	2
15KPA260A	15KPA260CA	260	290.4	318	5	416.7	36.2	2
15KPA280A	15KPA280CA	280	312.8	342.4	5	454.5	33.2	2

For bidirectional type having V<sub>RWM</sub> of 30 volts and less, the IR limit is double.  
For parts without A, the V<sub>BR</sub> is + 10% and V<sub>C</sub> is 5% higher than with A parts

**Ratings and Characteristics Curves**

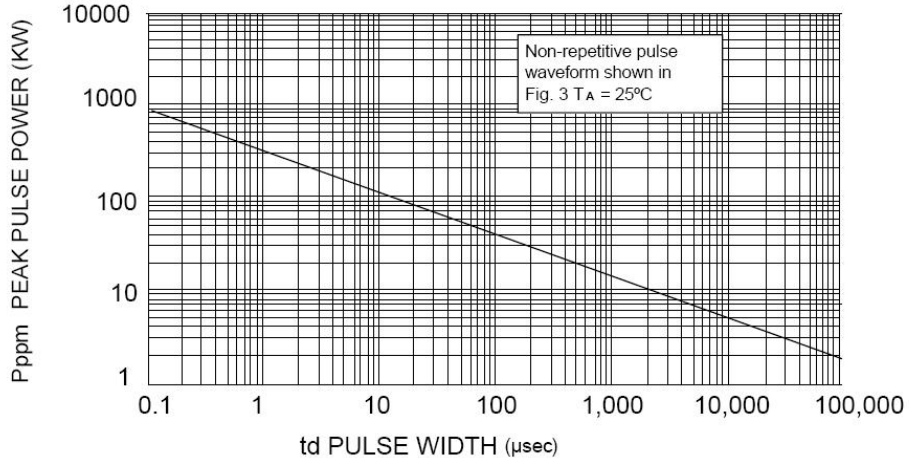


FIG. 1 PEAK PULSE POWER RATING

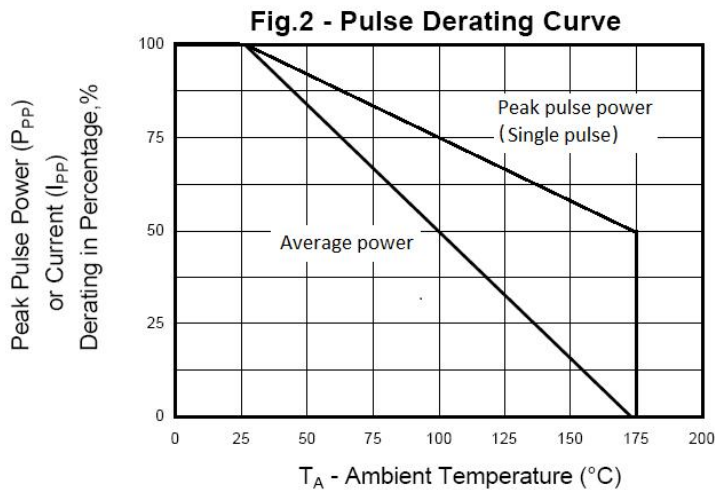
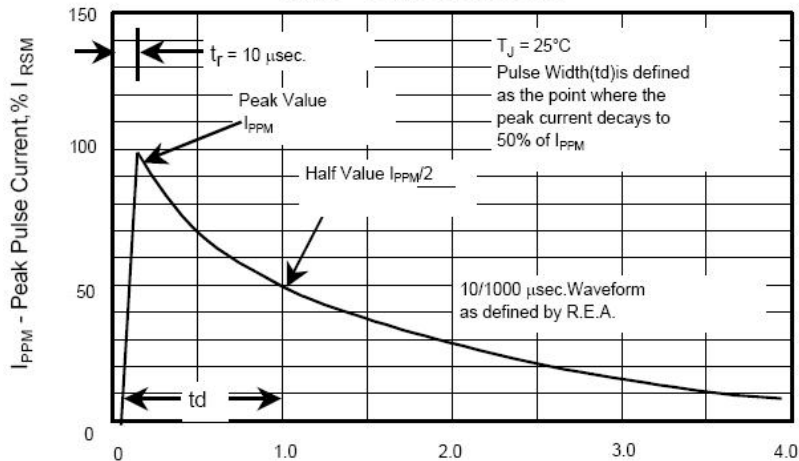
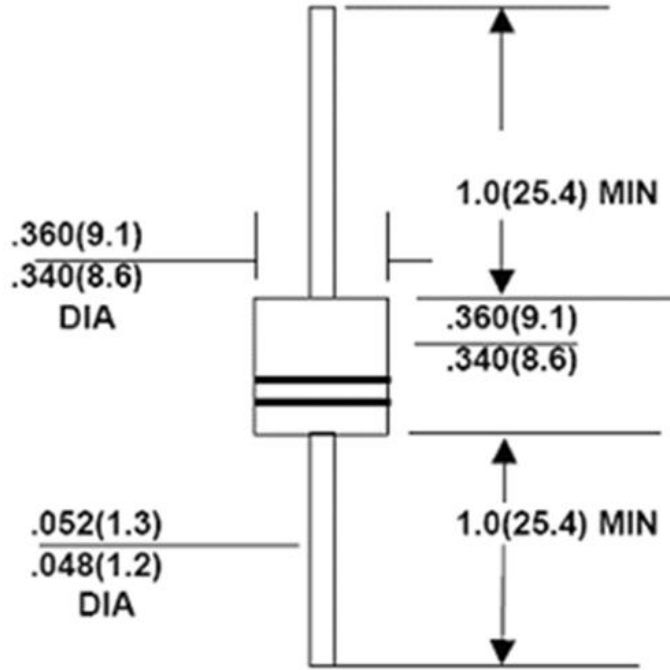


Fig.3 - Pulse Waveform



**Mechanical Dimensions P-600(Inches/Millimeters)**



**Ordering Information**

Device	Package	Shipping
15KPA Series	P-600(Pb-Free)	300pcs / tape
15KPA Series TA	P-600(Pb-Free)	300pcs / tape
15KPA Series TR	P-600(Pb-Free)	800pcs / 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**

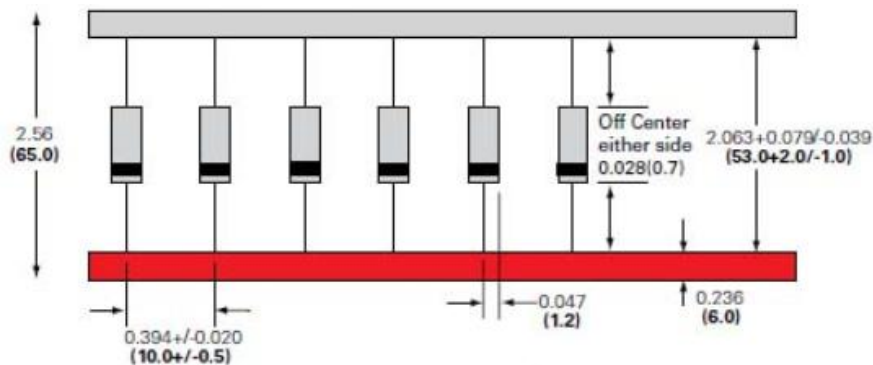


Where XXXXX is YYWWL

15KPA17A = Part Name  
YY = Year  
WW = Week  
L = Lot Number

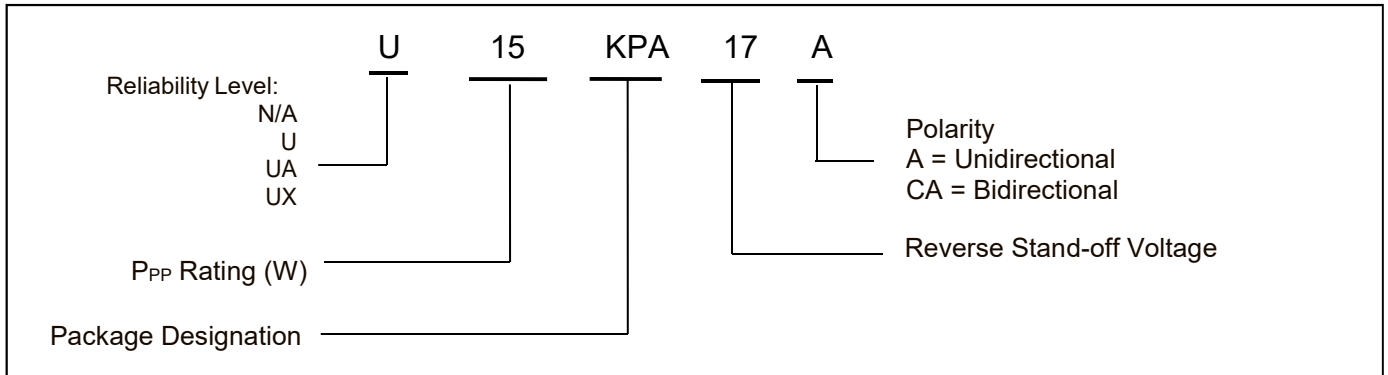
Cautions: Molding resin  
Epoxy resin UL:94V-0

**Carrier Tape Specification P-600**



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

**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 ( $\mu$ ) and standard deviation ( $\sigma$ ) 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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