



## DESCRIPTION

The SM15KPAN Series are high-powered surface mount transient voltage suppression components designed to protect equipment and systems from the damaging effects of high voltage spikes. The surface mount package configuration provides a lower profile compared to legacy axial lead package configurations.

These devices provide 15,000 Watts of peak pulse power dissipation for an 10/1000 $\mu$ s waveform. Applications include AC and DC power line protection, terrestrial base station protection as well as module lightning protection.

## FEATURES

- RTCA DO-160G COMPLIANT PRODUCT
- Compatible with IEC 61000-4-5 (Surge): 48A, 8/20 $\mu$ s - L3(Line-Ground), L4(Line-Line) & L1 (Power)
- 15,000 Watts Peak Pulse Power per Line (tp = 10/1000 $\mu$ s)
- Unidirectional and Bidirectional Configurations
- Easy Mounting to Printed Circuit Board
- Available in Multiple Voltages
- tClamping (0V to  $V_{(BR)}$  Min) < 100ps, Theoretical for Unidirectional and 5ns for Bidirectional
- RoHS Complaint (Exemption #7)

## APPLICATIONS

- Relay Drives
- Motor (Start/Stop) Back EMF Protection
- Module Lightning Protection
- Secondary Lightning Protection for AC/DC

## MECHANICAL CHARACTERISTICS

- Approximate Weight: 1.2 grams
- Lead-Free Silver Plating
- Solder Reflow Temperature: 240-250°C
- Flammability Rating UL 94V-0
- Marking: Logo and Marking Code

## CIRCUIT DIAGRAMS

Unidirectional



Bidirectional



## TYPICAL DEVICE CHARACTERISTICS

## RTCA DO-160G COMPLIANT PRODUCT

## MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 10/1000µs) - See Figure 1	$P_{PP}$	15,000	Watts
Forward Surge Rating	$I_F$	200	Amps
Steady State Power Dissipation	$P_P$	1.0	Watts
Storage Temperature	$T_{STG}$	-55 to 150	°C
Operating Temperature	$T_L$	-55 to 150	°C

## ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (Notes 1 - 2)	MARKING CODE		RATED STAND-OFF VOLTAGE  $V_{WM}$ VOLTS	BREAKDOWN VOLTAGE		MAXIMUM LEAKAGE CURRENT  $@V_{WM}$ $I_D$ µA	MAXIMUM CLAMPING VOLTAGE (Fig. 2)  $@ 10/1000\mu s$ $V_C @ I_{PP}$	TEMPERATURE COEFFICIENT OF $V_{(BR)}$  $qV_{(BR)}$ mV/°C
	UNI	BI		MIN $V_{(BR)}$ VOLTS	$@I_T$ mA			
SM15KPA17AN	17A	17C	17.0	18.9	50	5000	29.3V @ 512.0A	17
SM15KPA18AN	18A	18C	18.0	20.0	50	5000	30.9V @ 485.0A	18
SM15KPA20AN	20A	20C	20.0	22.2	20	1500	34.3V @ 437.0A	21
SM15KPA22AN	22A	22C	22.0	24.4	10	500	37.1V @ 404.0A	24
SM15KPA24AN	24A	24C	24.0	26.7	5	150	40.7V @ 369.0A	27
SM15KPA26AN	26A	26C	26.0	28.9	5	50	44.0V @ 341.0A	29
SM15KPA28AN	28A	28C	28.0	31.1	5	25	47.5V @ 316.0A	31
SM15KPA30AN	30A	30C	30.0	33.3	5	15	50.7V @ 296.0A	34
SM15KPA33AN	33A	33C	33.0	36.7	5	10	54.8V @ 274.0A	38
SM15KPA36AN	36A	36C	36.0	40.0	5	10	59.7V @ 251.0A	41
SM15KPA40AN	40A	40C	40.0	44.4	5	10	65.8V @ 228.0A	46
SM15KPA43AN	43A	43C	43.0	47.8	5	10	69.7V @ 215.0A	50
SM15KPA45AN	45A	45C	45.0	50.0	5	10	73.0V @ 205.0A	52
SM15KPA48AN	48A	48C	48.0	53.3	5	10	77.7V @ 193.0A	56
SM15KPA51AN	51A	51C	51.0	56.7	5	10	82.8V @ 181.0A	60
SM15KPA54AN	54A	54C	54.0	60.0	5	10	87.5V @ 171.0A	63
SM15KPA58AN	58A	58C	58.0	64.4	5	10	94.0V @ 160.0A	68
SM15KPA60AN	60A	60C	60.0	66.7	5	10	97.3V @ 154.0A	71
SM15KPA64AN	64A	64C	64.0	71.1	5	10	104.0V @ 144.0A	76
SM15KPA70AN	70A	70C	70.0	77.8	5	10	114.0V @ 132.0A	83
SM15KPA75AN	75A	75C	75.0	83.3	5	10	122.0V @ 123.0A	89
SM15KPA78AN	78A	78C	78.0	86.7	5	10	126.0V @ 119.0A	93
SM15KPA85AN	85A	85C	85.0	94.4	5	10	137.0V @ 109.0A	102
SM15KPA90AN	90A	90C	90.0	100.0	5	10	146.0V @ 103.0A	109
SM15KPA100AN	A0A	A0C	100.0	111.0	5	10	162.0V @ 93.0A	121
SM15KPA110AN	A1A	A1C	110.0	122.0	5	10	178.0V @ 84.0A	133

## TYPICAL DEVICE CHARACTERISTICS

## RTCA DO-160G COMPLIANT PRODUCT

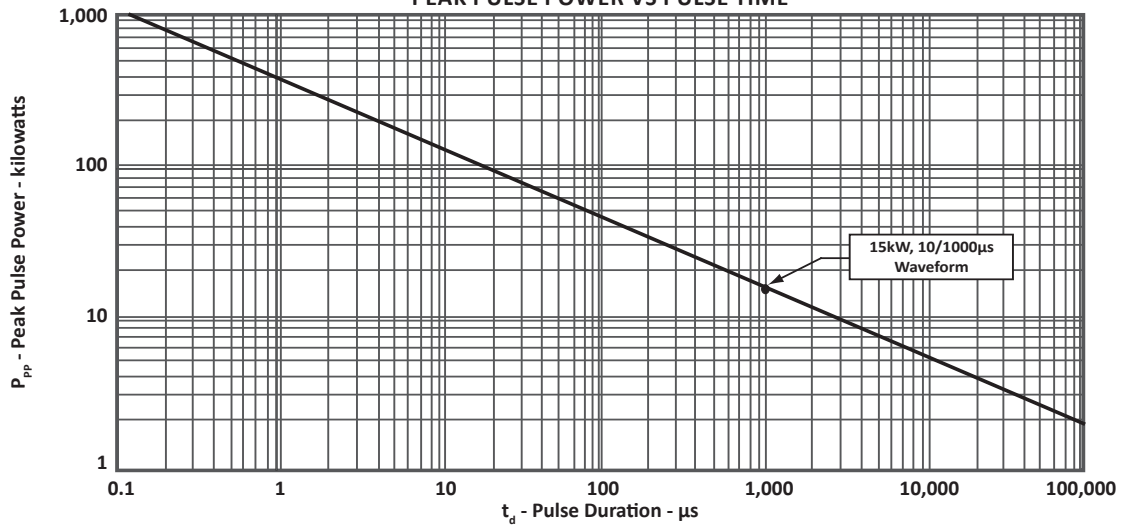
## ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (Notes 1 - 2)	MARKING CODE		RATED STAND-OFF VOLTAGE  $V_{WM}$ VOLTS	BREAKDOWN VOLTAGE		MAXIMUM LEAKAGE CURRENT  @ $V_{WM}$ $I_D$ $\mu A$	MAXIMUM CLAMPING VOLTAGE (Fig. 2)  @ 10/1000 $\mu s$ $V_C$ @ $I_{PP}$	TEMPERATURE COEFFICIENT OF $V_{(BR)}$  $qV_{(BR)}$ mV/°C
	UNI	BI		MIN $V_{(BR)}$ VOLTS	@ $I_T$ mA			
SM15KPA120AN	A2A	A2C	120.0	133.0	5	10	193.0V @ 78.0A	145
SM15KPA130AN	A3A	A3C	130.0	144.0	5	10	209.0V @ 72.0A	157
SM15KPA150AN	A5A	A5C	150.0	167.0	5	10	243.0V @ 62.0A	183
SM15KPA160AN	A6A	A6C	160.0	178.0	5	10	259.0V @ 58.0A	195
SM15KPA170AN	A7A	A7C	170.0	189.0	5	10	275.0V @ 55.0A	207
SM15KPA180AN	A8A	A8C	180.0	200.0	5	10	291.0V @ 52.0A	219
SM15KPA200AN	B0A	B0C	200.0	222.0	5	10	322.0V @ 47.0A	243
SM15KPA220AN	B2A	2CC	220.0	245.0	5	10	356.0V @ 42.0A	269
SM15KPA240AN	B4A	B4C	240.0	267.0	5	10	388.0V @ 39.0A	293
SM15KPA260AN	B6A	B6C	260.0	289.0	5	10	419.0V @ 36.0A	317
SM15KPA280AN	B8A	B8C	280.0	311.0	5	10	452.0V @ 33.0A	342
SM15KPA480AN	D8A	D8C	480.0	528.0	5	10	791.0V @ 18.9A	460

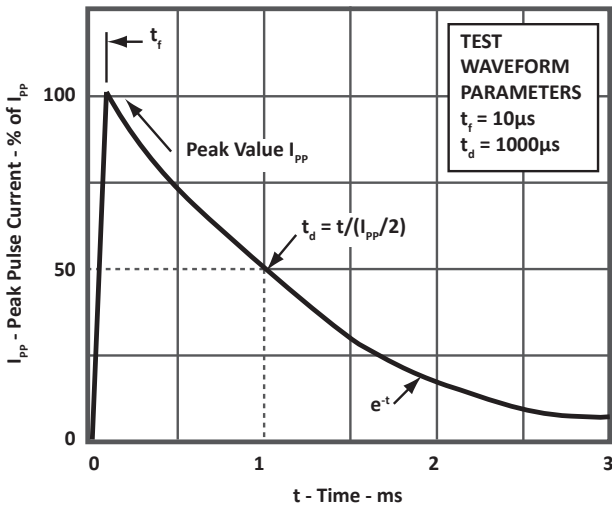
## NOTES

- Part numbers shown are unidirectional devices. Add a "C" suffix to specify bidirectional devices, such as SM15KPA20C**CAN**.
- $V_{F(MAX)}$  = 15 Volts @ 200A, 8.3ms(1/2 Sine Wave) - *Unidirectional devices only*.

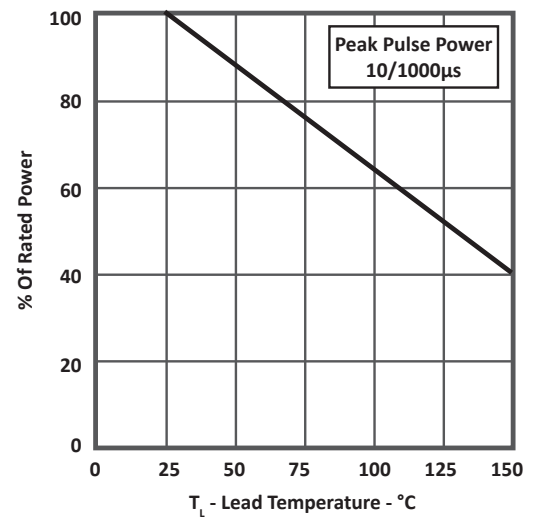
**FIGURE 1  
PEAK PULSE POWER VS PULSE TIME**



**FIGURE 2  
PULSE WAVEFORM**



**FIGURE 3  
POWER DERATING CURVE**

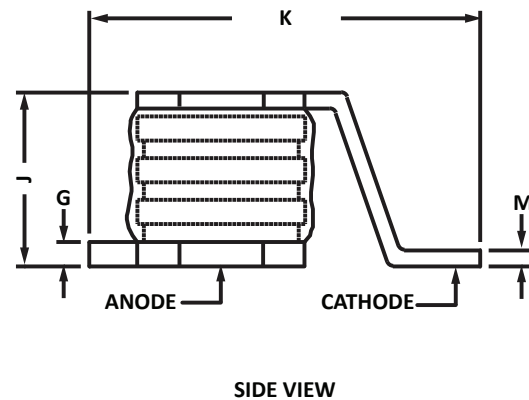
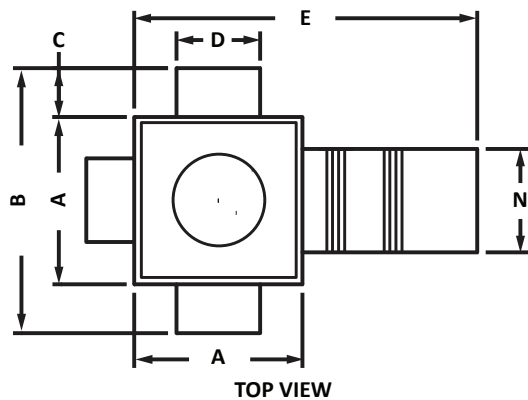


## SMD-15 PACKAGE INFORMATION

## RTCA DO-160G COMPLIANT PRODUCT

## PACKAGE OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.15	5.50	0.197	0.217
B	8.10	8.25	0.319	0.325
C	1.40	1.55	0.055	0.061
D	2.45	2.65	0.096	0.104
E	10.25	11.05	0.405	0.435
G	0.70	0.80	0.026	0.034
J	5.08	5.59	0.200	0.220
K	11.75	12.62	0.463	0.497
M	0.42	0.58	0.017	0.023
N	3.15	3.45	0.124	0.136



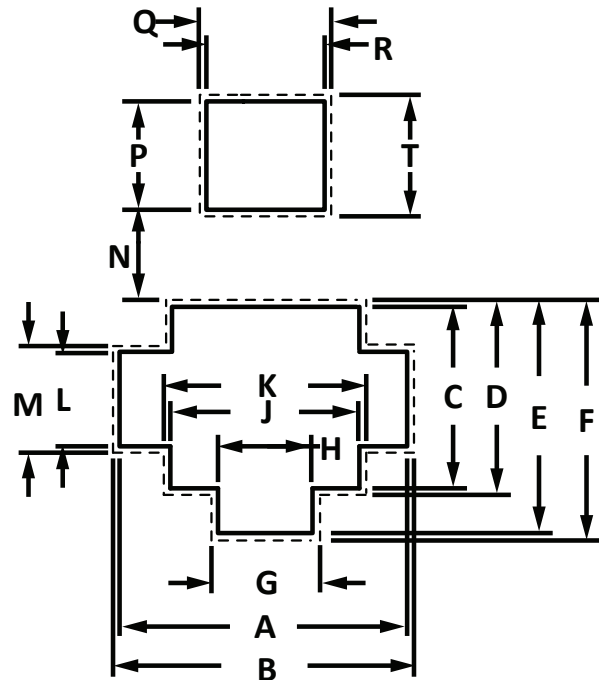
## SMD-15 PACKAGE INFORMATION

## RTCA DO-160G COMPLIANT PRODUCT

## SOLDER PAD OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.35	8.45	0.329	0.333
B	8.55	8.65	0.337	0.341
C	5.35	5.45	0.211	0.215
D	5.55	5.65	0.219	0.222
E	6.85	6.95	0.270	0.274
F	7.05	7.15	0.278	0.281
G	2.95	3.05	0.116	0.120
H	2.75	2.85	0.108	0.112
J	5.35	5.45	0.211	0.215
K	5.55	5.65	0.219	0.222
L	2.75	2.85	0.108	0.112
M	2.95	3.05	0.116	0.120
N	2.45	2.55	0.096	0.100
P	3.63	3.73	0.143	0.147
Q	3.95	4.05	0.156	0.159
R	3.55	3.65	0.140	0.144
T	4.06	4.19	0.160	0.165

## Suggested Solder Pad



## ORDERING INFORMATION

BASE PART NUMBER (Voltage = xx)	TRAY QTY (Note 1)	TRAY DIMENSIONS (Inches)	MIN. ORDER QTY
SM15KPAxxxAN	100	7 x 7 x 0.5	100
SM15KPAxxxCAN	100	7 x 7 x 0.5	100

## NOTES

1. Minimum order quantity required for plastic tray packaging. Standard product packaging for small quantities: cardboard box with foam insert.
2. This device is only available in a Lead-Free configuration.

**COMPANY INFORMATION****RTCA DO-160G COMPLIANT PRODUCT****COMPANY PROFILE**

In business more than 20 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products.

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