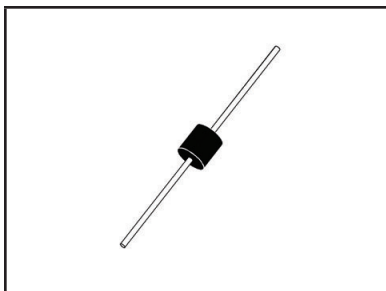


1500 WATT TVS COMPONENT**AXIAL LEAD PACKAGE****DESCRIPTION**

The 1.5KE Series, are discrete 15,00 Watt, silicon transient voltage suppressors (TVS) designed for use in applications where large voltage transients can permanently damage voltage sensitive components and equipment.

The 1.5KE series is available in voltages ranging from 6.8V to 600V and is compatible with IEC 61000-4-5 (Surge) requirements.

FEATURES

- UL File Recognition #E208219
- Compatible with IEC 61000-4-5 (Surge)
- 1,500 Watts Peak Pulse Power per Line ($t_p = 10/1000\mu s$)
- Unidirectional and Bidirectional Configurations
- Low Leakage
- Excellent Clamping Capability
- Glass Passivated Chip
- Very Fast Response Time
- Easy Mounting to Printed Circuit Board
- Available in Multiple Voltages Ranging From 6.8V to 600V
- RoHS Complaint (Exemption #7)

APPLICATIONS

- DC & AC Applications
- Remote Transmission Lines
- Industrial Wiring

MECHANICAL CHARACTERISTICS

- Molded Case
- Approximate Weight: 0.84 grams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:
Pure-Tin - Sn, 100: 260-270°C
- Flammability Rating UL 94V-0

TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

PARAMETER	SYMBOL	VALUE	UNITS
Operating Temperature	T_A	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Peak Pulse Power (tp =10/1000µs) - See Figure 1 and Note 2	P_{PP}	1,500	Watts
Power Dissipation on Infinite Heatsink at $T_L = 75°C$	P_D	6.5	Watts
Peak Forward Surge Current, 8.3ms single half sinewave - Unidirectional Only (Note 2)	I_{FSM}	200	Amps
Maximum Instantaneous Forward Voltage at 100A - Unidirectional Only (Note 3)	V_F	3.5/5.0	V

NOTE

1. Non-repetitive current pulse per Figure 2 and derated above $T_A = 25°C$ per Figure 2.
2. Measured on 8.3ms single half sinewave or equivalent square wave, duty cycle = 4 pulses per minute maximum.
3. $V_F < 3.5V$ for devices of $V_{BR} < 200V$ and $V_F < 5.0V$ for devices of $V_{BR} > 201V$.

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (Notes 1-3)	REVERSE STAND-OFF VOLTAGE V_{RWM} VOLTS	BREAKDOWN VOLTAGE $V_{(BR)} @ I_T$ VOLTS		TEST CURRENT @ I_T mA	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ I_P V_C VOLTS	MAXIMUM REVERSE SURGE CURRENT @ I_{PP} AMPS	MAXIMUM REVERSE LEAKAGE CURRENT @ V_{RWM} I_R µA
		MIN	MAX				
1.5KE6.8	5.5	6.12	7.48	10	10.8	139.0	1000
1.5KE6.8A	5.8	6.46	7.14	10	10.5	143.0	1000
1.5KE7.5	6.1	6.75	8.25	10	11.7	128.0	500
1.5KE7.5A	6.4	7.13	7.88	10	11.3	133.0	500
1.5KE8.2	6.6	7.38	9.02	10	12.5	120.0	200
1.5KE8.2A	7.0	7.79	8.61	10	12.1	124.0	200
1.5KE9.1	7.4	8.19	10.01	1	13.8	109.0	50
1.5KE9.1A	7.8	8.65	9.56	1	13.4	112.0	50
1.5KE10	8.1	9.00	11.00	1	15.0	100.0	10
1.5KE10A	8.6	9.50	10.50	1	14.5	103.0	10
1.5KE11	8.9	9.90	12.10	1	16.2	92.6	5
1.5KE11A	9.4	10.45	11.55	1	15.6	96.2	5
1.5KE12	9.7	10.80	13.20	1	17.3	86.7	5
1.5KE12A	10.2	11.40	12.60	1	16.7	89.8	5
1.5KE13	10.5	11.70	14.30	1	19.0	79.0	1
1.5KE13A	11.1	12.35	13.65	1	18.2	82.4	1
1.5KE15	12.1	13.50	16.50	1	22.0	68.2	1
1.5KE15A	12.8	14.25	15.75	1	21.2	70.8	1
1.5KE16	12.9	14.40	17.60	1	23.5	63.8	1
1.5KE16A	13.6	15.20	16.80	1	22.5	66.7	1
1.5KE18	14.5	16.20	19.80	1	26.5	56.6	1
1.5KE18A	15.3	17.10	18.90	1	25.2	59.5	1

TYPICAL DEVICE CHARACTERISTICS

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (Notes 1-3)	REVERSE STAND-OFF VOLTAGE V_{RWM} VOLTS	BREAKDOWN VOLTAGE		TEST CURRENT @ I_T mA	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ I_P V_C VOLTS	MAXIMUM REVERSE SURGE CURRENT @ I_{PP} AMPS	MAXIMUM REVERSE LEAKAGE CURRENT @ V_{RWM} I_R μA
		$V_{(BR)}$ @ I_T VOLTS					
		MIN	MAX				
1.5KE20	16.2	18.00	22.00	1	29.1	51.6	1
1.5KE20A	17.1	19.00	21.00	1	27.7	54.2	1
1.5KE22	17.8	19.80	24.20	1	31.9	47.0	1
1.5KE22A	18.8	20.90	23.10	1	30.6	49.0	1
1.5KE24	19.4	21.60	26.40	1	34.7	43.2	1
1.5KE24A	20.5	22.80	25.20	1	33.2	45.2	1
1.5KE27	21.8	24.30	29.70	1	39.1	38.4	1
1.5KE27A	23.1	25.65	28.35	1	37.5	40.0	1
1.5KE30	24.3	27.00	33.00	1	43.5	34.5	1
1.5KE30A	25.6	28.50	31.50	1	41.4	36.2	1
1.5KE33	26.8	29.70	36.30	1	47.7	31.5	1
1.5KE33A	28.2	31.35	34.65	1	45.7	32.8	1
1.5KE36	29.1	32.40	39.60	1	52.0	28.9	1
1.5KE36A	30.8	34.20	37.80	1	49.9	30.1	1
1.5KE39	31.6	35.10	42.90	1	56.4	26.6	1
1.5KE39A	33.3	37.05	40.95	1	53.9	27.8	1
1.5KE43	34.8	38.70	47.30	1	61.9	24.2	1
1.5KE43A	36.8	40.85	45.15	1	59.3	25.3	1
1.5KE47	38.1	42.30	51.70	1	67.8	22.1	1
1.5KE47A	40.2	44.65	49.35	1	64.8	23.2	1
1.5KE51	41.3	45.90	56.10	1	73.5	20.4	1
1.5KE51A	43.6	48.45	53.55	1	70.1	21.4	1
1.5KE56	45.4	50.40	61.60	1	80.5	18.6	1
1.5KE56A	47.8	53.20	58.80	1	77.0	19.5	1
1.5KE62	50.2	55.80	68.20	1	89.0	16.9	1
1.5KE62A	53.0	58.90	65.10	1	85.0	17.7	1
1.5KE68	55.1	61.20	74.80	1	98.0	15.3	1
1.5KE68A	58.1	64.60	71.40	1	92.0	16.3	1
1.5KE75	60.7	67.50	82.50	1	108.0	13.9	1
1.5KE75A	64.1	71.25	78.75	1	103.0	14.6	1
1.5KE82	66.4	73.80	90.20	1	118.0	12.7	1
1.5KE82A	70.1	77.90	86.10	1	113.0	13.3	1
1.5KE91	73.7	81.90	100.10	1	131.0	11.5	1
1.5KE91A	77.8	86.45	95.55	1	125.0	12.0	1

TYPICAL DEVICE CHARACTERISTICS

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (Notes 1-3)	REVERSE STAND-OFF VOLTAGE V_{RWM} VOLTS	BREAKDOWN VOLTAGE $V_{(BR)} @ I_T$ VOLTS		TEST CURRENT @ I_T mA	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ I_P V_C VOLTS	MAXIMUM REVERSE SURGE CURRENT @ I_{PP} AMPS	MAXIMUM REVERSE LEAKAGE CURRENT @ V_{RWM} I_R μA
		MIN	MAX				
		1.5KE100	81.0				
1.5KE100A	85.5	95.00	105.00	1	137.0	11.0	1
1.5KE110	89.2	99.00	121.00	1	158.0	9.5	1
1.5KE110A	94.0	104.50	115.50	1	152.0	9.9	1
1.5KE120	97.2	108.00	132.00	1	173.0	8.7	1
1.5KE120A	102.0	114.00	126.00	1	165.0	9.1	1
1.5KE130	105.0	117.00	143.00	1	187.0	8.0	1
1.5KE130A	111.0	123.50	136.50	1	179.0	8.4	1
1.5KE150	121.0	135.00	165.00	1	215.0	7.0	1
1.5KE150A	128.0	142.50	157.50	1	207.0	7.3	1
1.5KE160	130.0	144.00	176.00	1	230.0	6.5	1
1.5KE160A	136.0	152.00	168.00	1	219.0	6.9	1
1.5KE170	138.0	153.00	187.00	1	244.0	6.2	1
1.5KE170A	145.0	161.50	178.50	1	234.0	6.4	1
1.5KE180	146.0	162.00	198.00	1	258.0	5.8	1
1.5KE180A	154.0	171.00	189.00	1	246.0	6.1	1
1.5KE200	162.0	180.00	220.00	1	287.0	5.2	1
1.5KE200A	171.0	190.00	210.00	1	274.0	5.5	1
1.5KE220	175.0	198.00	242.00	1	344.0	4.4	1
1.5KE220A	185.0	209.00	231.00	1	328.0	4.6	1
1.5KE250	202.0	225.00	275.00	1	360.0	4.2	1
1.5KE250A	214.0	237.50	262.50	1	344.0	4.4	1
1.5KE300	243.0	270.00	330.00	1	430.0	3.5	1
1.5KE300A	256.0	285.00	315.00	1	414.0	3.6	1
1.5KE350	284.2	315.00	385.00	1	504.0	3.0	1
1.5KE350A	299.3	332.50	367.50	1	482.0	3.1	1
1.5KE380	308.6	342.00	418.00	1	547.2	2.7	1
1.5KE380A	324.9	361.00	399.00	1	524.4	2.9	1
1.5KE400	324.8	360.00	440.00	1	574.0	2.6	1
1.5KE400A	342.0	380.00	420.00	1	548.0	2.7	1
1.5KE440	357.3	396.00	484.00	1	631.0	2.4	1
1.5KE440A	376.2	418.00	462.00	1	602.0	2.5	1
1.5KE500	406.0	450.00	550.00	1	720.0	2.1	1
1.5KE500A	427.5	475.00	525.00	1	690.0	2.2	1

TYPICAL DEVICE CHARACTERISTICS

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

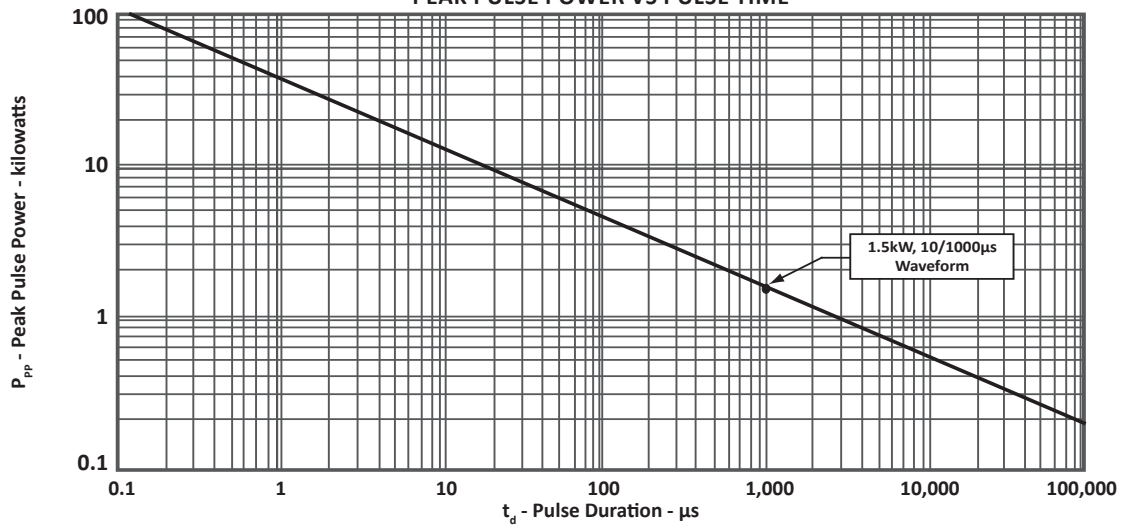
PART NUMBER (Notes 1-3)	REVERSE STAND-OFF VOLTAGE V_{RWM} VOLTS	BREAKDOWN VOLTAGE		TEST CURRENT @ I_T mA	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ I_p V_c VOLTS	MAXIMUM REVERSE SURGE CURRENT @ I_{PP} AMPS	MAXIMUM REVERSE LEAKAGE CURRENT (Fig. 2) @ V_{RWM} I_R μA
		$V_{(BR)} @ I_T$ VOLTS					
		MIN	MAX				
1.5KE520	422.2	468.00	572.00	1	748.8	2.0	1
1.5KE520A	444.6	494.00	546.00	1	717.6	2.1	1
1.5KE550	446.6	495.00	605.00	1	792.0	1.9	1
1.5KE550A	470.3	522.50	577.50	1	759.0	2.0	1
1.5KE600	487.2	540.00	660.00	1	864.0	1.7	1
1.5KE600A	513.0	570.00	630.00	1	828.0	1.8	1

NOTE

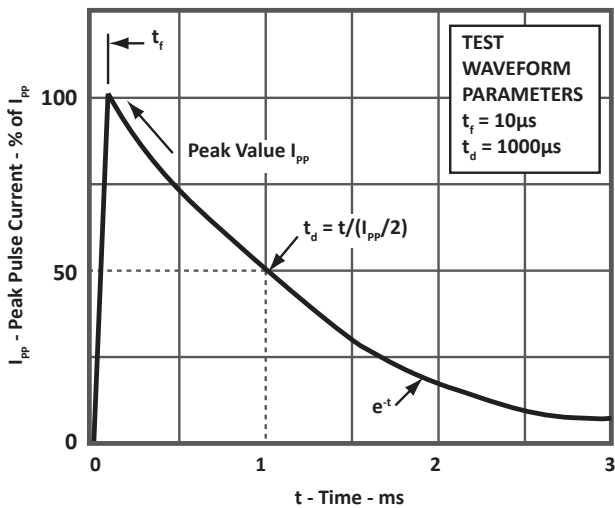
- Suffix 'A' denotes 5% tolerance, without 'A' denotes 10% tolerance.
- Add suffix 'C' or 'CA' after part number to specify a bidirectional device.
- For bidirectional devices having a V_{RWM} of 10 Volts and under, the I_R limit is double.

TYPICAL DEVICE CHARACTERISTICS

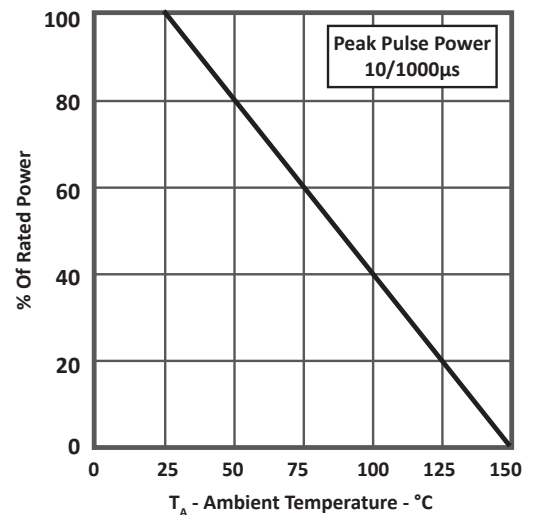
**FIGURE 1
PEAK PULSE POWER VS PULSE TIME**



**FIGURE 2
PULSE WAVEFORM**

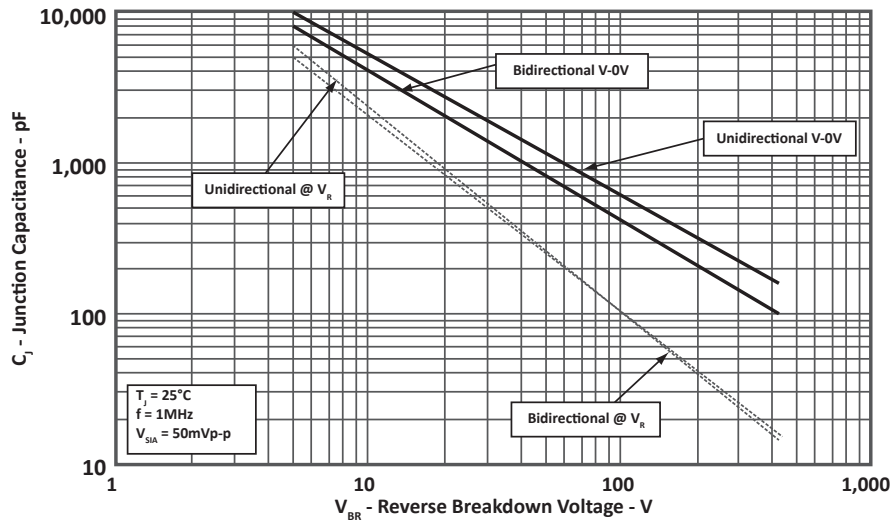


**FIGURE 3
POWER DERATING CURVE**

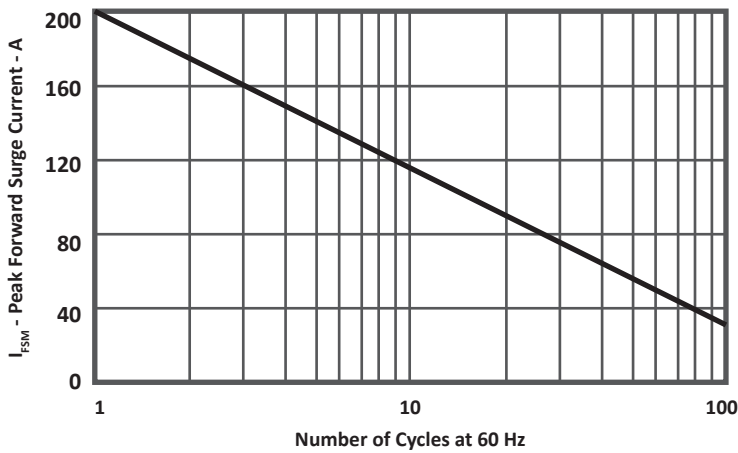


TYPICAL DEVICE CHARACTERISTICS

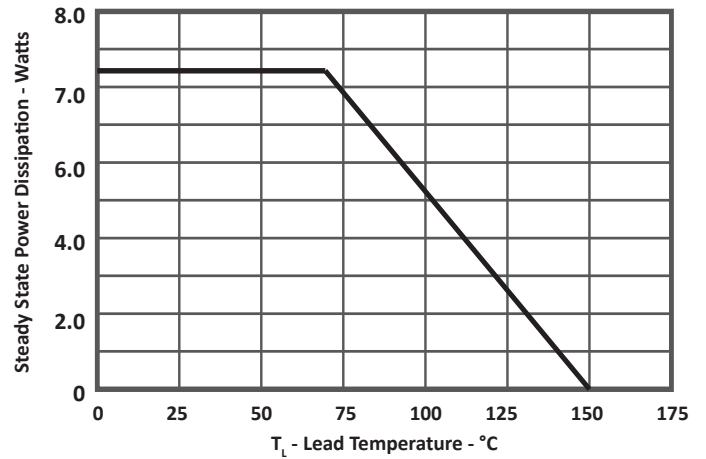
**FIGURE 4
TYPICAL JUNCTION CAPACITANCE**



**FIGURE 5
MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT**



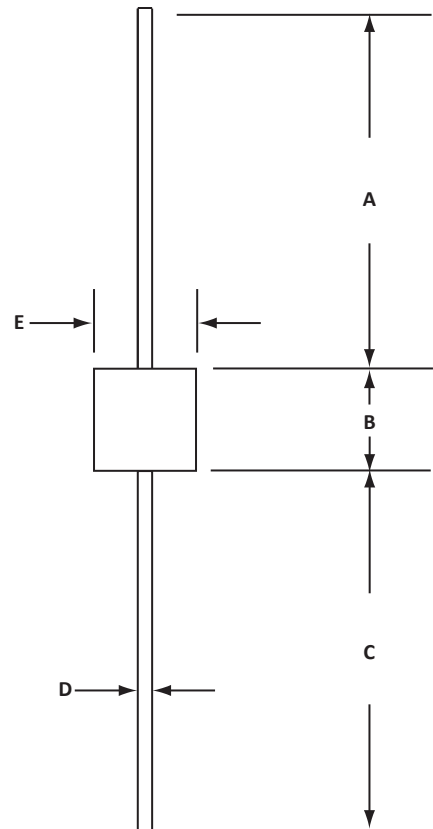
**FIGURE 6
STEADY STATE POWER DERATING CURVE**



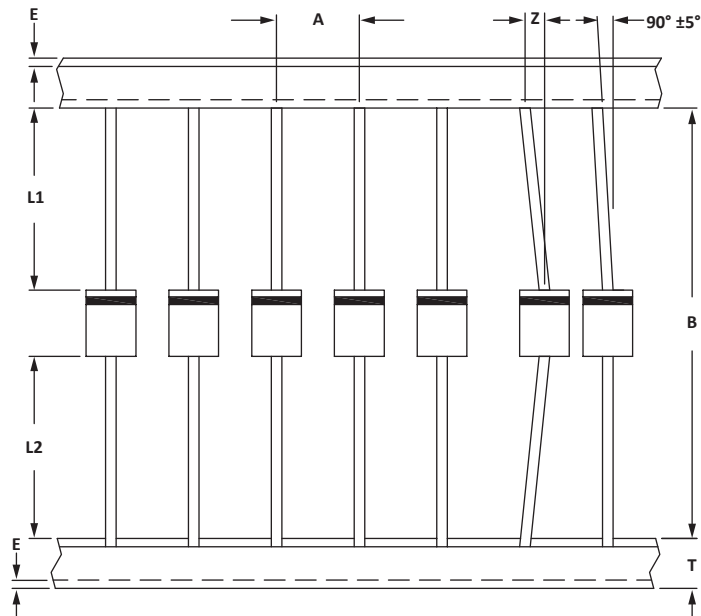
AXIAL LEAD PACKAGE INFORMATION

OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.5	-	1.00	-
B	7.24	9.53	0.285	0.375
C	24.5	-	1.00	-
D	0.97 DIA.	1.07 DIA.	0.038 DIA.	0.042 DIA.
E	4.79	5.30	0.189	0.209

NOTES
1. Dimensions are exclusive of mold flash and metal burrs.



TAPE AND REEL



SPECIFICATIONS

REEL DIA.	A	B	E _{MAX}	L1	L2	T	Z _{MAX}
330mm (13")	10.0 ± 0.5	52.0 ± 0.5	1.00	21.8 ± 0.5	21.8 ± 0.5	6.0 ± 0.4	1.20

NOTES

- Dimensions are in millimeters.
- Axial lead product is taped and reeled in accordance with RS-296-E.
- Marking on Part - part number, logo and polarity band (Unidirectional Only).

ORDERING INFORMATION

BASE PART NUMBER (xx = Voltage)	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
1.5KExxx	N/A	-T13	1,200	13"	n/a
1.5KExxxA	N/A	-T13	1,200	13"	n/a
1.5KExxxC	N/A	-T13	1,200	13"	n/a
1.5KExxxCA	N/A	-T13	1,200	13"	n/a

COMPANY INFORMATION

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 high performance interface and linear products. They include analog switches; multiplexers; LED drivers; LED wafer die for ESD protection; audio control ICs; RF and related high frequency products.

CONTACT US

Corporate Headquarters

2929 South Fair Lane
Tempe, Arizona 85282
USA

By Telephone

General: 602-431-8101
Sales: & Marketing: 602-414-5109
Customer Service: 602-414-5114
Product Technical Support: 602-414-5107

By Fax

General: 602-431-2288

By E-mail:

Asia Sales: asiasales@protekdevices.com
Europe Sales: europesales@protekdevices.com
U.S. Sales: ussales@protekdevices.com
Distributor Sales: distysales@protekdevices.com
Customer Service: service@protekdevices.com
Technical Support: support@protekdevices.com

ProTek Devices (Asia Pacific) Pte. Ltd.

8 Ubi Road 2, #06-19
Zervex
Singapore - 408538
Tel: +65-67488312
Fax: +65-67488313

Web

www.protekdevices.com

COPYRIGHT © ProTek Devices 2014 - This literature is subject to all applicable copyright laws and is not for resale in any manner.

SPECIFICATIONS: ProTek reserves the right to change the electrical and or mechanical characteristics described herein without notice.

DESIGN CHANGES: ProTek reserves the right to discontinue product lines without notice and that the final judgement concerning selection and specifications is the buyer's and that in furnishing engineering and technical assistance. ProTek assumes no responsibility with respect to the selection or specifications of such products. ProTek makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ProTek assume any liability arising out of the application or use of any product or circuit and specifically disclaims any and all liability without limitation special, consequential or incidental damages.

LIFE SUPPORT POLICY: ProTek Devices products are not authorized for use in life support systems without written consent from the factory.