

## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- Glass passivated junction
- Low zener impedance
- Excellent clamping capability
- 1500W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical  $I_R$  less than 1µA above 12V.
- High Temperature soldering guaranteed: 265°C/10 seconds/.375", (9.5mm) lead length, 5lbs (2.3kg) tension
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020.
- Safety certification: UL: E244458
- AEC-Q101 qualified
- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance



### Mechanical Data

- Case: JEDEC DO-201 Moulded plastic
- Terminal: Plated Axial leads, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any
- Weight: 0.97g

### Applications

- I/O interface
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

### Maximum Ratings and Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000µs waveform (Note1, Fig.1)	$P_{PPM}$	Minimum 1500	Watts
Peak pulse current of at 10/1000µs waveform (Note 1, Fig.3)	$I_{PPM}$	See Table	Amps
Steady state power dissipation at $T_L=75^\circ\text{C}$ (Fig.5)	$P_{M(AV)}$	6.5	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2, Fig.6)	$I_{FSM}$	200	Amps
Operating junction and Storage Temperature Range.	$T_J, T_{STG}$	-55 to +150	°C
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	°C/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^\circ\text{C}$  per Fig.2.

2. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

**Dimensions (DO-201)**

	Symbol	Millimeters		Inches	
		Min.	Max.	Min.	Max.
	L	25.40	-	1.000	-
	T	7.20	9.50	0.285	0.375
	d	4.80	5.30	0.190	0.210
s	0.96	1.07	0.038	0.042	

**Electrical Characteristics (T<sub>A</sub>=25°C)**

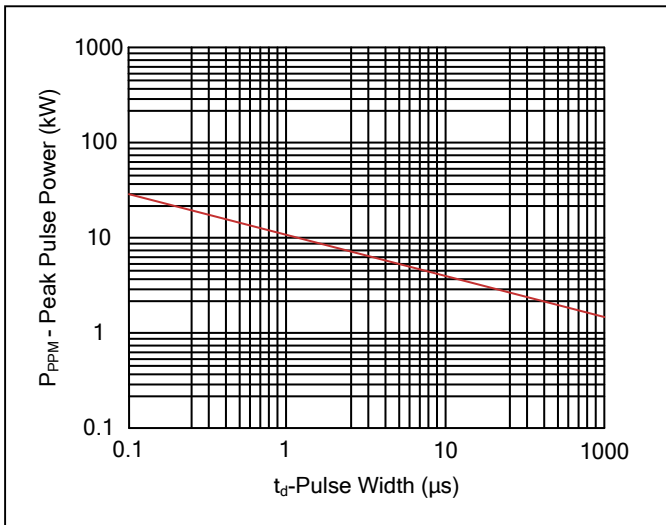
Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
Unidirectional	Bidirectional	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
1.5KE6.8A-AT	1.5KE6.8CA-AT	5.80	6.45~7.14	10	10.5	144.8	1000
1.5KE7.5A-AT	1.5KE7.5CA-AT	6.40	7.13~7.88	10	11.3	134.5	500
1.5KE8.2A-AT	1.5KE8.2CA-AT	7.02	7.79~8.61	10	12.1	125.6	200
1.5KE9.1A-AT	1.5KE9.1CA-AT	7.78	8.65~9.55	1	13.4	113.4	50
1.5KE10A-AT	1.5KE10CA-AT	8.55	9.50~10.50	1	14.5	104.8	10
1.5KE11A-AT	1.5KE11CA-AT	9.40	10.50~11.60	1	15.6	97.4	5
1.5KE12A-AT	1.5KE12CA-AT	10.20	11.40~12.60	1	16.7	91.0	5
1.5KE13A-AT	1.5KE13CA-AT	11.10	12.40~13.70	1	18.2	83.5	1
1.5KE15A-AT	1.5KE15CA-AT	12.80	14.30~15.80	1	21.2	71.7	1
1.5KE16A-AT	1.5KE16CA-AT	13.60	15.20~16.80	1	22.5	67.6	1
1.5KE18A-AT	1.5KE18CA-AT	15.30	17.10~18.90	1	25.2	60.3	1
1.5KE20A-AT	1.5KE20CA-AT	17.10	19.00~21.00	1	27.7	54.9	1
1.5KE22A-AT	1.5KE22CA-AT	18.80	20.90~23.10	1	30.6	49.7	1
1.5KE24A-AT	1.5KE24CA-AT	20.50	22.80~25.20	1	33.2	45.8	1
1.5KE27A-AT	1.5KE27CA-AT	23.10	25.70~28.40	1	37.5	40.5	1
1.5KE30A-AT	1.5KE30CA-AT	25.60	28.50~31.50	1	41.4	36.7	1
1.5KE33A-AT	1.5KE33CA-AT	28.20	31.40~34.70	1	45.7	33.3	1
1.5KE36A-AT	1.5KE36CA-AT	30.80	34.20~37.80	1	49.9	30.5	1
1.5KE39A-AT	1.5KE39CA-AT	33.30	37.10~41.00	1	53.9	28.2	1

**Electrical Characteristics (T<sub>A</sub>=25°C)**

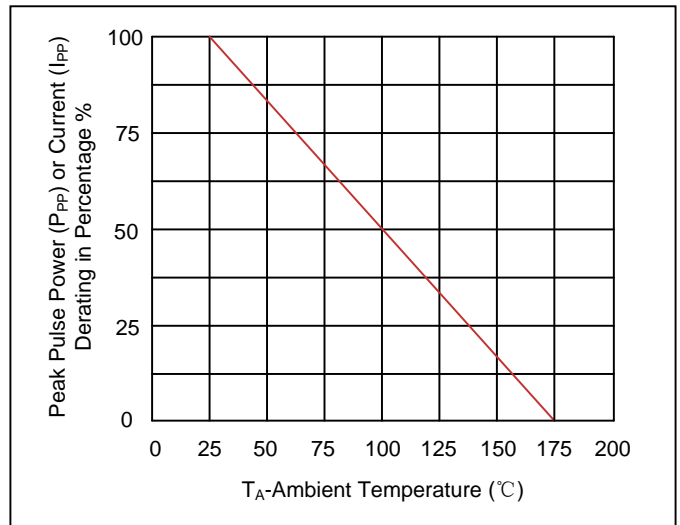
Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
Unidirectional	Bidirectional	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
1.5KE43A-AT	1.5KE43CA-AT	36.80	40.90~45.20	1	59.3	25.6	1
1.5KE47A-AT	1.5KE47CA-AT	40.20	44.70~49.40	1	64.8	23.5	1
1.5KE51A-AT	1.5KE51CA-AT	43.60	48.50~53.60	1	70.1	21.7	1
1.5KE56A-AT	1.5KE56CA-AT	47.80	53.20~58.80	1	77.0	19.7	1
1.5KE62A-AT	1.5KE62CA-AT	53.00	58.90~65.10	1	85.0	17.9	1
1.5KE68A-AT	1.5KE68CA-AT	58.10	64.60~71.40	1	92.0	16.5	1
1.5KE75A-AT	1.5KE75CA-AT	64.10	71.30~78.80	1	103.0	14.8	1
1.5KE82A-AT	1.5KE82CA-AT	70.10	77.90~86.10	1	113.0	13.5	1
1.5KE91A-AT	1.5KE91CA-AT	77.80	86.50~95.50	1	125.0	12.2	1
1.5KE100A-AT	1.5KE100CA-AT	85.50	95.00~105.00	1	137.0	11.1	1
1.5KE110A-AT	1.5KE110CA-AT	94.00	105.00~116.00	1	152.0	10.0	1
1.5KE120A-AT	1.5KE120CA-AT	102.00	114.00~126.00	1	165.0	9.2	1
1.5KE130A-AT	1.5KE130CA-AT	111.00	124.00~137.00	1	179.0	8.5	1
1.5KE150A-AT	1.5KE150CA-AT	128.00	143.00~158.00	1	207.0	7.3	1
1.5KE160A-AT	1.5KE160CA-AT	136.00	152.00~168.00	1	219.0	6.9	1
1.5KE170A-AT	1.5KE170CA-AT	145.00	162.00~179.00	1	234.0	6.5	1
1.5KE180A-AT	1.5KE180CA-AT	154.00	171.00~189.00	1	246.0	6.2	1
1.5KE200A-AT	1.5KE200CA-AT	171.00	190.00~210.00	1	274.0	5.5	1
1.5KE220A-AT	1.5KE220CA-AT	185.00	209.00~231.00	1	328.0	4.6	1
1.5KE250A-AT	1.5KE250CA-AT	214.00	237.00~263.00	1	344.0	4.4	1
1.5KE300A-AT	1.5KE300CA-AT	256.00	285.00~315.00	1	414.0	3.7	1
1.5KE350A-AT	1.5KE350CA-AT	300.00	332.00~368.00	1	482.0	3.2	1
1.5KE400A-AT	1.5KE400CA-AT	342.00	380.00~420.00	1	548.0	2.8	1
1.5KE440A-AT	1.5KE440CA-AT	376.00	418.00~462.00	1	602.0	2.5	1
1.5KE480A-AT	1.5KE480CA-AT	408.00	456.00~504.00	1	658.0	2.3	1
1.5KE510A-AT	1.5KE510CA-AT	434.00	485.00~535.00	1	698.0	2.1	1
1.5KE530A-AT	1.5KE530CA-AT	450.00	503.50~556.50	1	725.0	2.1	1
1.5KE540A-AT	1.5KE540CA-AT	459.00	513.00~567.00	1	740.0	2.0	1
1.5KE550A-AT	1.5KE550CA-AT	467.00	522.50~577.50	1	760.0	2.0	1
1.5KE600A-AT	1.5KE600CA-AT	510.00	570.00~630.00	1	828.0	1.8	1

**Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$  unless otherwise noted)**

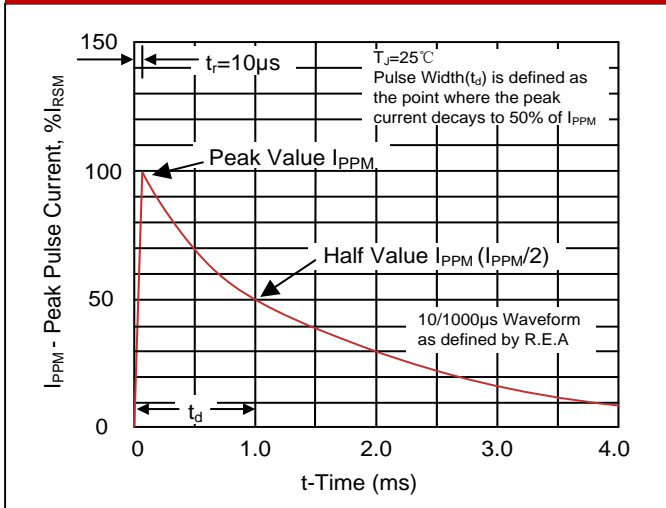
**Figure 1. Peak Pulse Power Rating Curve**



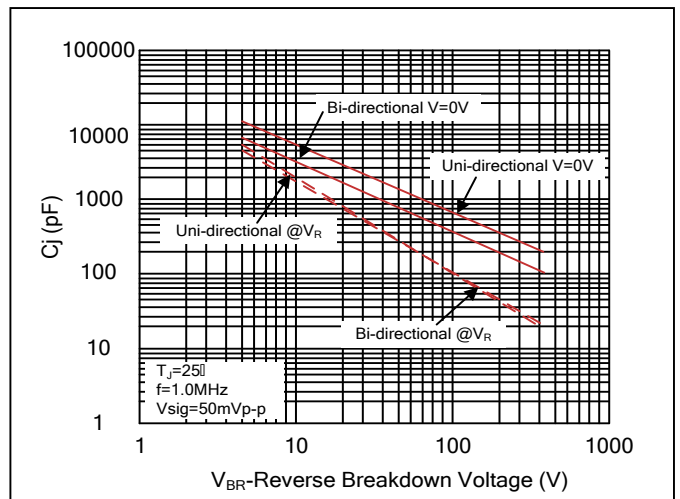
**Figure 2. Pulse Derating Curve**



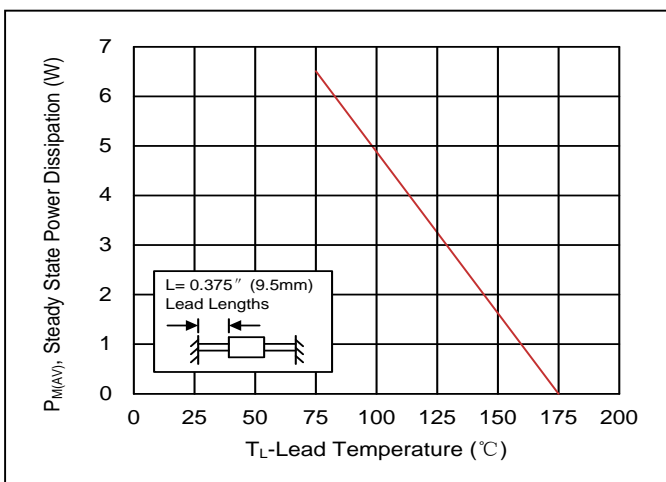
**Figure 3. Pulse Waveform**



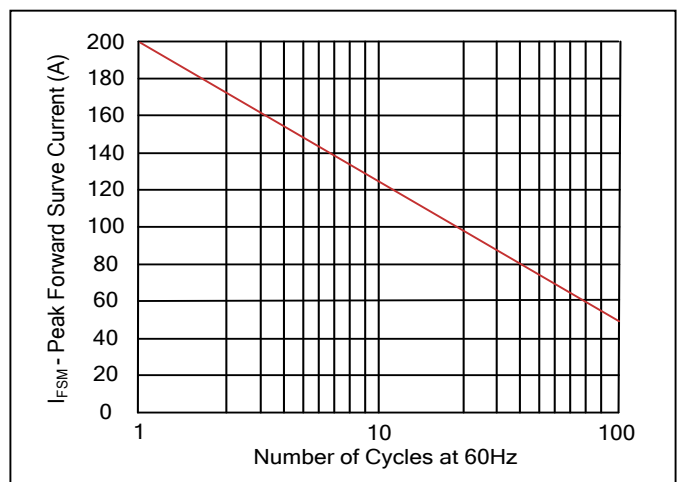
**Figure 4. Typical Junction Capacitance**



**Figure 5. Steady State Power Dissipation Derating Curve**

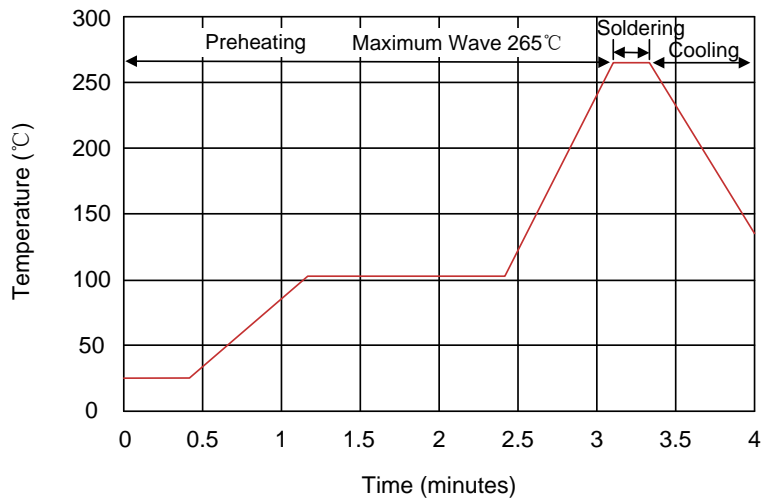


**Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only**



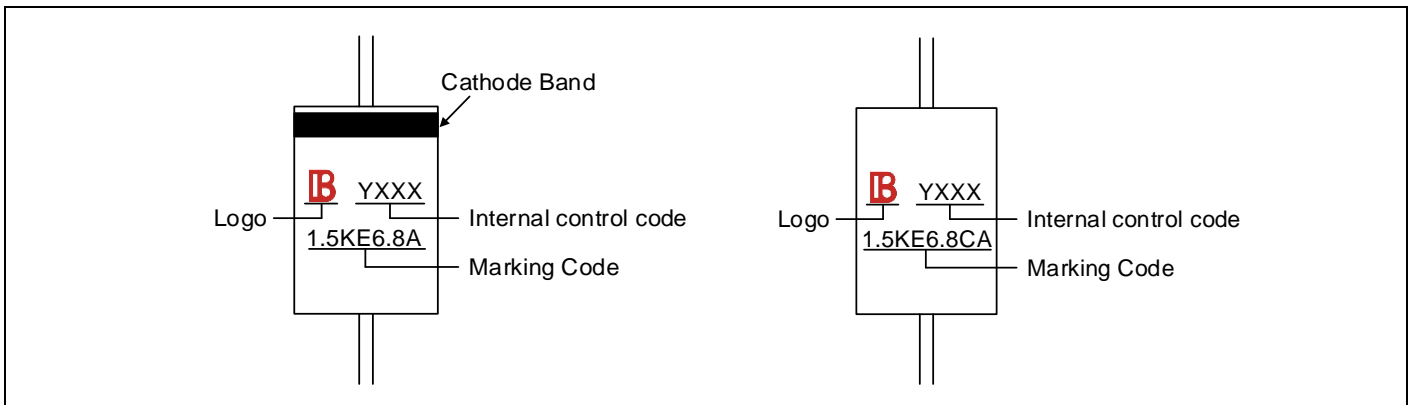
## Recommended Soldering Conditions

### Wave Soldering

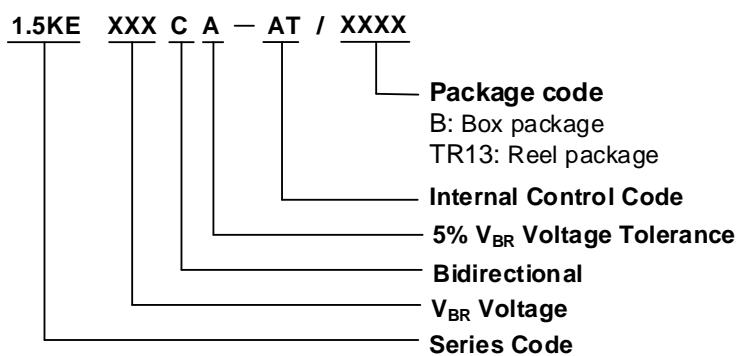


Item	Conditions
Peak Temperature	265°C
Dipping Time	10 seconds
Soldering	1 time

## Marking Code



## Part Number Code

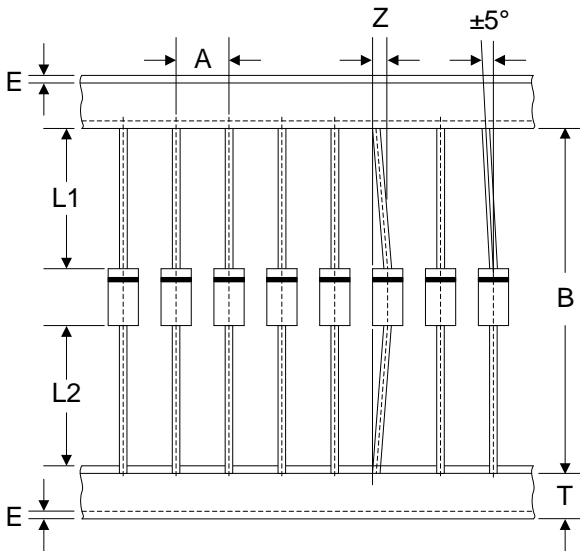
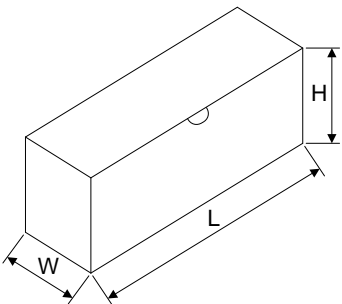
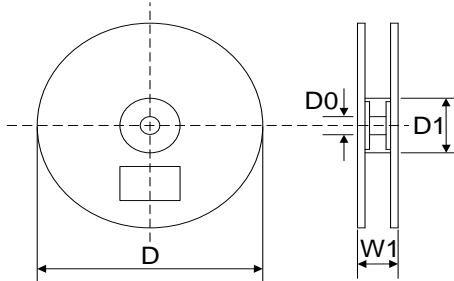


**Ordering Code for Different Package**

Box package: Add suffix "/B" at the end of the part number, such as 1.5KEXXXCA-AT/B

Reel package: Add suffix "/TR13" at the end of the part number, such as 1.5KEXXXCA-AT/TR13

**Packaging**

Tape	Symbol Dimension (mm)	
	A	10.0±0.5
	B	53.0±1.0
	Z	1.2Max.
	T	6.0±0.4
	E	0.8Max.
	L1-L2	1.0Max.
	<p data-bbox="103 1102 159 1131">Box</p> 	L
W		75.0±5.0
H		114.0±5.0
Quantity: 1000PCS		
<p data-bbox="103 1498 167 1527">Reel</p> 	D	330.0±3.0
	D0	16.4±2.0
	D1	86.0±2.0
	W1	76.0±3.0
	Quantity: 1200PCS	

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