

# DATA SHEET

## TRANSIENT VOLTAGE SUPPRESSORS

### AC/DC POWER SUPPLY

1.5KE-AT series

RoHS compliant & Halogen free



Product specification— November 20, 2022 V.3



## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- Glass passivated junction
- Low zener impedance
- Excellent clamping capability
- 1500W peak pulse power capability at 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical  $I_R$  less than 1 $\mu$ A above 12V.
- High Temperature soldering guaranteed: 265 $^{\circ}$ 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
- 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 $^{\circ}$ C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000 $\mu$ s waveform (Note1, Fig.1)	$P_{PPM}$	Minimum 1500	Watts
Peak pulse current of at 10/1000 $\mu$ s waveform (Note 1, Fig.3)	$I_{PPM}$	See Table	Amps
Steady state power dissipation at $T_L=75^{\circ}$ 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	$^{\circ}$ C
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	$^{\circ}$ C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	$^{\circ}$ C/W

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

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1.5KE-AT

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

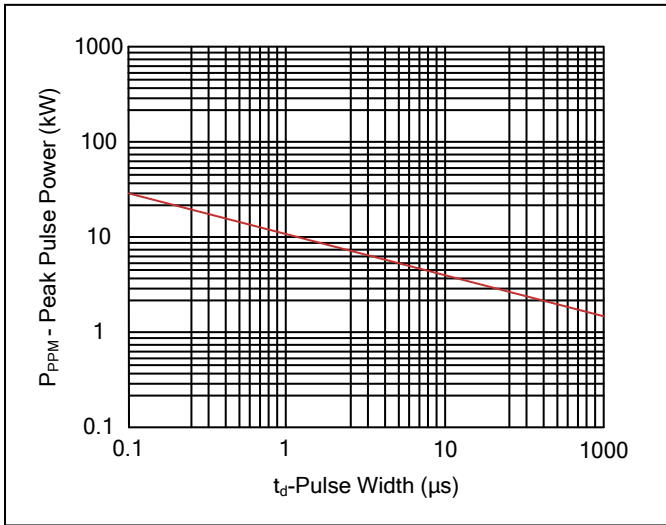


Figure 2. Pulse Derating Curve

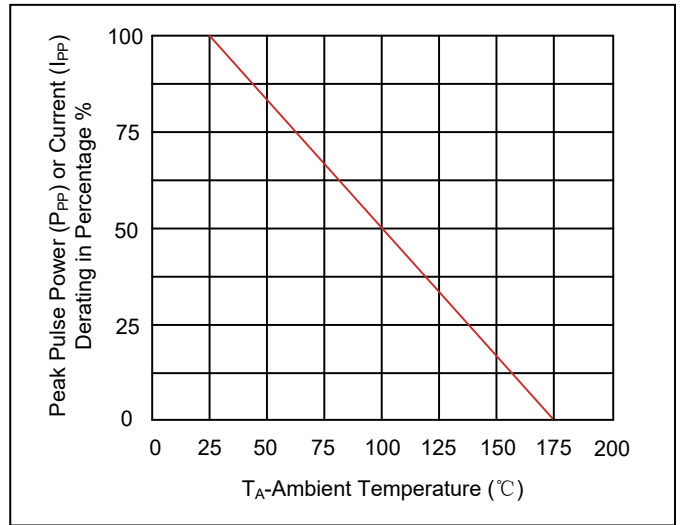


Figure 3. Pulse Waveform

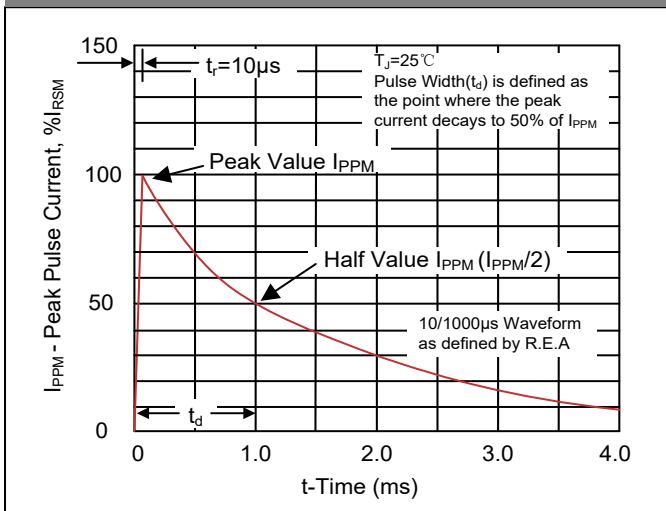


Figure 4. Typical Junction Capacitance

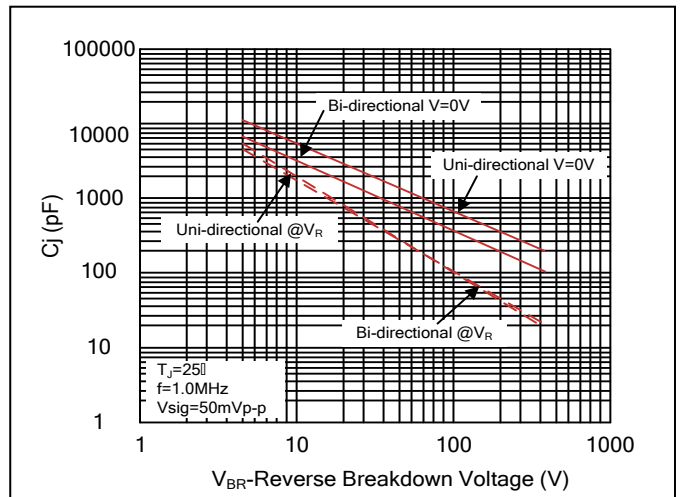


Figure 5. Steady State Power Dissipation Derating Curve

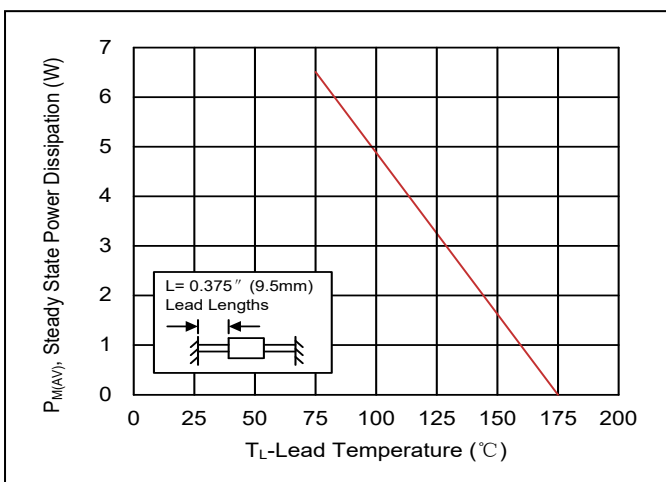
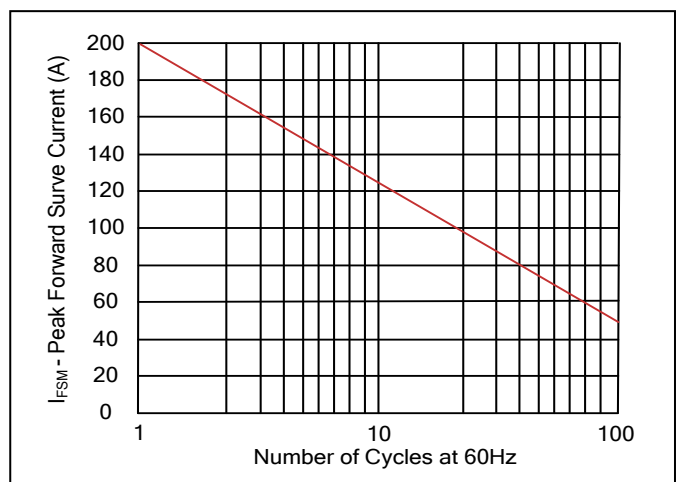
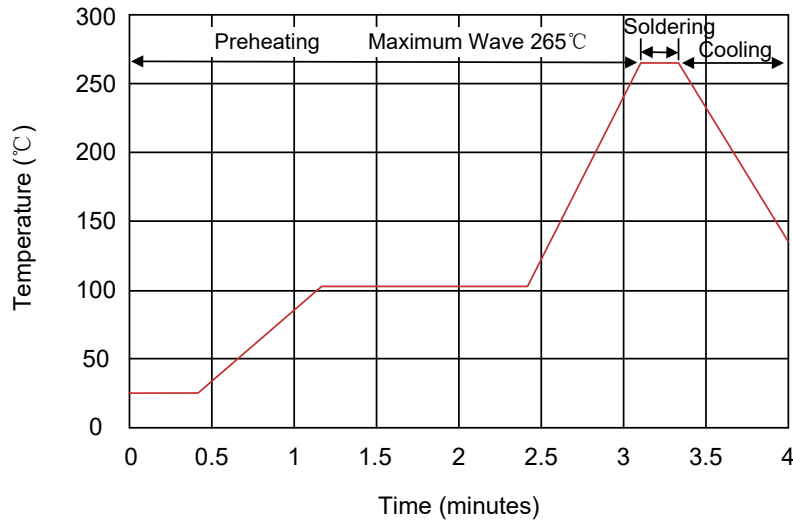


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



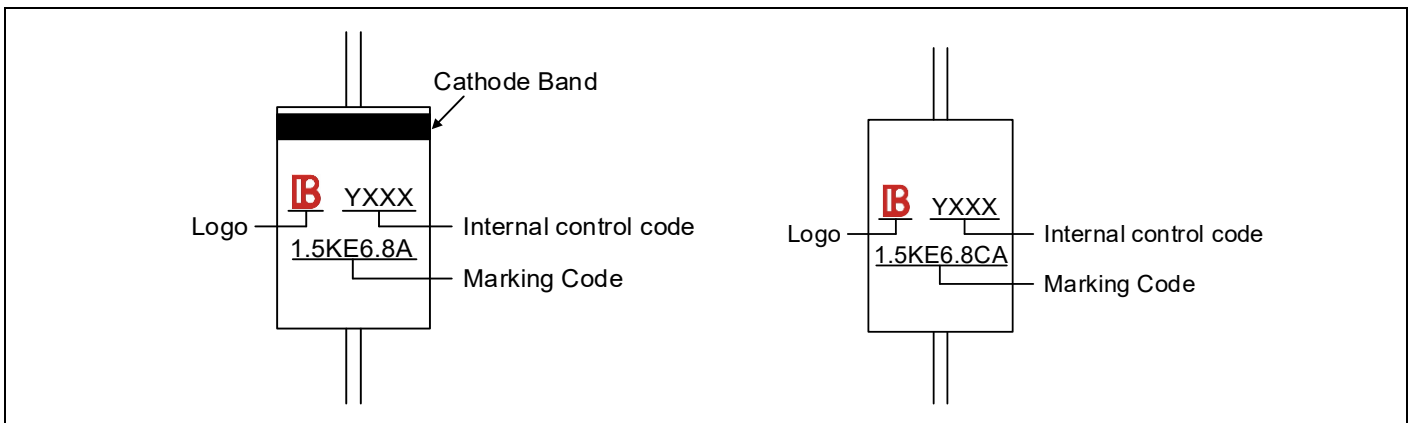
**Recommended Soldering Conditions**

Wave Soldering

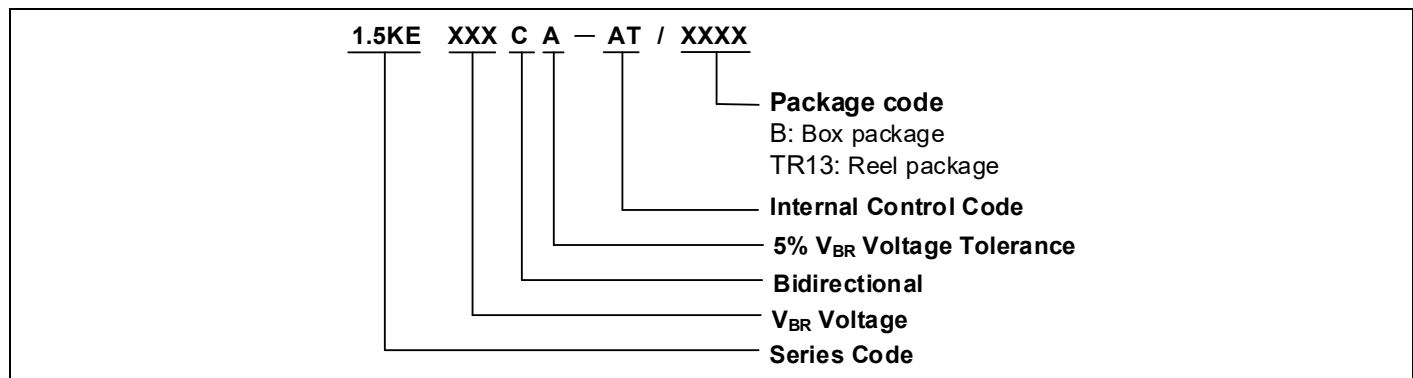


Item	Conditions
Peak Temperature	265°C
Dipping Time	10 seconds
Soldering	1 time

**Marking Code**



**Part Number Code**

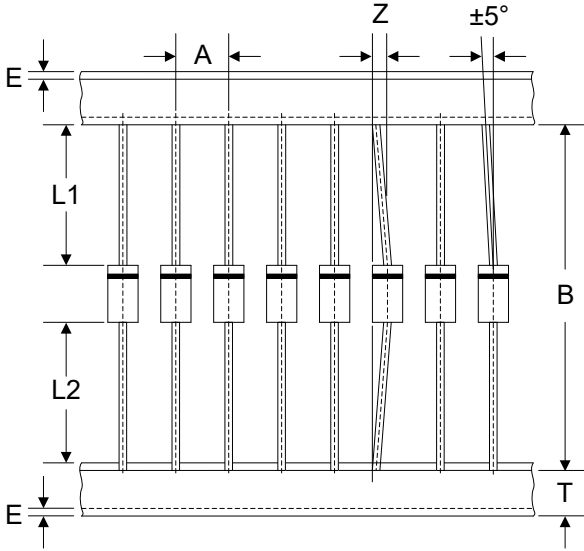
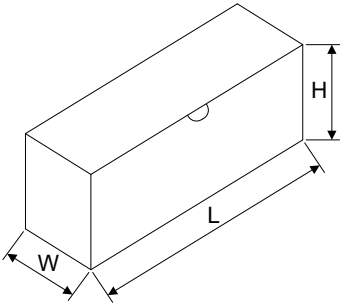
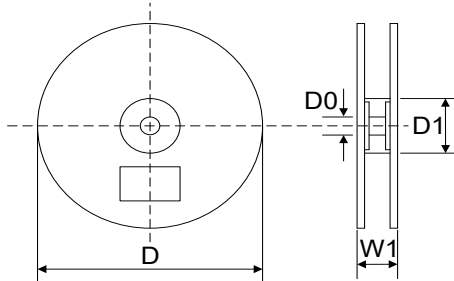


**Ordering Code for Different Package**

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 1093 159 1126">Box</p> 	L	250.0±5.0
	W	75.0±5.0
	H	114.0±5.0
	Quantity: 1000PCS	
<p data-bbox="103 1491 167 1525">Reel</p> 	D	330.0±3.0
	D0	16.4±2.0
	D1	86.0±2.0
	W1	76.0±3.0
	Quantity: 1200PCS	