

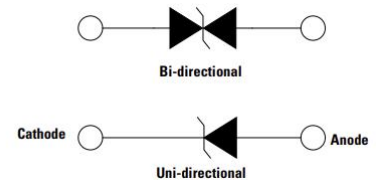


TVS Diodes 1.5KE series

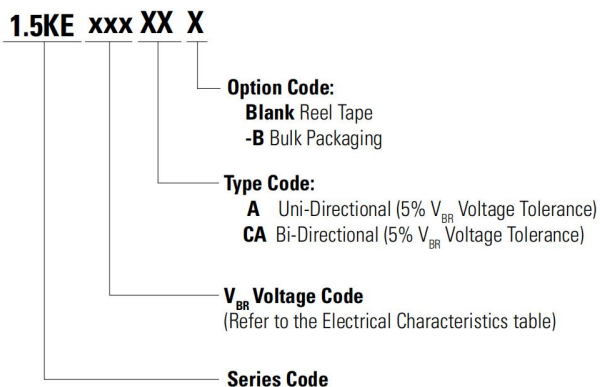
Transient Voltage Suppressors

Features

- ◆ 1500W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycle): 0.01%
- ◆ Low incremental surge impedance
- ◆ Excellent clamping capability
- ◆ Typical IR less than 1 μA when V_{BR} min > 12V
- ◆ High temperature to reflow soldering guaranteed: 260°C/30 sec / 0.375", (9.5mm) lead length, 5 lbs., (2.3kg) tension
- ◆ Plastic package has underwriters laboratory flammability 94V-0
- ◆ Meets MSL level 1, per J-STD-020.
- ◆ Meet Halogen free and RoHS compliant



Part Number Coding System



Mechanical Data

- ◆ Case: JEDEC DO-201 Moulded plastic, Axial lead
- ◆ Polarity: Color band denotes positive end (cathode) except bi-directional models
- ◆ Weight: About 1.2g

Applications

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

Maximum Rating and Characteristics

Parameters at 25°C ambient temperature unless otherwise Noted.

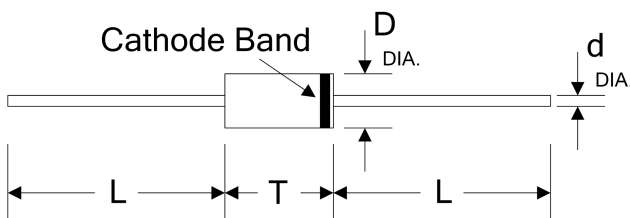
Rating	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000μs Test Waveform (Fig.2) (Note 1)-Single Die Parts	P_{PPM}	1500	Watts
Peak Pulse Power Dissipation by 10/1000μs Test Waveform(Fig.2)(Note 1) -Stacked Die Parts (Note 4)	P_{PPM}	2000	Watts
Steady State Power Dissipation on Infinite Heat Sink at $T_L=75^{\circ}\text{C}$	P_D	6.5	Watts
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only (Note 3)	V_F	3.5/5.0	V
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only (Note 2)	I_{FSM}	200	Amps
Operating junction and Storage Temperature Range.	T_J, T_{STG}	-55 to +175	°C

Notes:

- 1.Non-repetitive current pulse, per Fig.1 and derated above $T_A=25^{\circ}\text{C}$.
- 2.8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.
3. $V_F<3.5\text{V}$ for $V_{BR} \leq 200\text{V}$ and $V_F<5.0\text{V}$ for $V_{BR} \geq 201\text{V}$.
4. For stacked die component details, please refer to part numbers labeled by * in Electrical Characteristics.

Dimensions (DO-201)

Ref.	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
d	0.96	1.07	0.038	0.042



Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @ I_T	Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RWM}
Unidirectional	Bidirectional	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
1.5KE6.8A	1.5KE6.8CA	5.80	6.45~7.14	10	10.5	144.8	1000
1.5KE7.5A	1.5KE7.5CA	6.40	7.13~7.88	10	11.3	134.5	500
1.5KE8.2A	1.5KE8.2CA	7.02	7.79~8.61	10	12.1	125.6	200
1.5KE9.1A	1.5KE9.1CA	7.78	8.65~9.55	1	13.4	113.4	50
1.5KE10A	1.5KE10CA	8.55	9.50~10.50	1	14.5	104.8	10
1.5KE11A	1.5KE11CA	9.40	10.50~11.60	1	15.6	97.4	5
1.5KE12A	1.5KE12CA	10.20	11.40~12.60	1	16.7	91.0	5
1.5KE13A	1.5KE13CA	11.10	12.40~13.70	1	18.2	83.5	1
1.5KE15A	1.5KE15CA	12.80	14.30~15.80	1	21.2	71.7	1
1.5KE16A	1.5KE16CA	13.60	15.20~16.80	1	22.5	67.6	1
1.5KE18A	1.5KE18CA	15.30	17.10~18.90	1	25.2	60.3	1
1.5KE20A	1.5KE20CA	17.10	19.00~21.00	1	27.7	54.9	1
1.5KE22A	1.5KE22CA	18.80	20.90~23.10	1	30.6	49.7	1
1.5KE24A	1.5KE24CA	20.50	22.80~25.20	1	33.2	45.8	1
1.5KE27A	1.5KE27CA	23.10	25.70~28.40	1	37.5	40.5	1
1.5KE30A	1.5KE30CA	25.60	28.50~31.50	1	41.4	36.7	1
1.5KE33A	1.5KE33CA	28.20	31.40~34.70	1	45.7	33.3	1
1.5KE36A	1.5KE36CA	30.80	34.20~37.80	1	49.9	30.5	1
1.5KE39A	1.5KE39CA	33.30	37.10~41.00	1	53.9	28.2	1
1.5KE43A	1.5KE43CA	36.80	40.90~45.20	1	59.3	25.6	1
1.5KE47A	1.5KE47CA	40.20	44.70~49.40	1	64.8	23.5	1
1.5KE51A	1.5KE51CA	43.60	48.50~53.60	1	70.1	21.7	1
1.5KE56A	1.5KE56CA	47.80	53.20~58.80	1	77.0	19.7	1
1.5KE62A	1.5KE62CA	53.00	58.90~65.10	1	85.0	17.9	1
1.5KE68A	1.5KE68CA	58.10	64.60~71.40	1	92.0	16.5	1
1.5KE75A	1.5KE75CA	64.10	71.30~78.80	1	103.0	14.8	1
1.5KE82A	1.5KE82CA	70.10	77.90~86.10	1	113.0	13.5	1
1.5KE91A	1.5KE91CA	77.80	86.50~95.50	1	125.0	12.2	1
1.5KE100A	1.5KE100CA	85.50	95.00~105.00	1	137.0	11.1	1

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @ I_T	Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RWM}
Unidirectional	Bidirectional	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
1.5KE110A	1.5KE110CA	94.00	105.00~116.00	1	152.0	10.0	1
1.5KE120A	1.5KE120CA	102.00	114.00~126.00	1	165.0	9.2	1
1.5KE130A	1.5KE130CA	111.00	124.00~137.00	1	179.0	8.5	1
1.5KE150A	1.5KE150CA	128.00	143.00~158.00	1	207.0	7.3	1
1.5KE160A	1.5KE160CA	136.00	152.00~168.00	1	219.0	6.9	1
1.5KE170A	1.5KE170CA	145.00	162.00~179.00	1	234.0	6.5	1
1.5KE180A	1.5KE180CA	154.00	171.00~189.00	1	246.0	6.2	1
1.5KE200A	1.5KE200CA	171.00	190.00~210.00	1	274.0	5.5	1
1.5KE220A	1.5KE220CA	185.00	209.00~231.00	1	328.0	4.6	1
1.5KE250A	1.5KE250CA*	214.00	237.00~263.00	1	344.0	4.4	1
1.5KE300A*	1.5KE300CA*	256.00	285.00~315.00	1	414.0	4.9	1
1.5KE320A*	1.5KE320CA*	273.00	304.00~336.00	1	441.0	4.6	1
1.5KE350A*	1.5KE350CA*	300.00	332.00~368.00	1	482.0	4.2	1
1.5KE400A*	1.5KE400CA*	342.00	380.00~420.00	1	548.0	2.8	1
1.5KE440A*	1.5KE440CA*	376.00	418.00~462.00	1	602.0	3.1	1
1.5KE480A*	1.5KE480CA*	408.00	456.00~504.00	1	658.0	3.1	1
1.5KE510A*	1.5KE510CA*	434.00	485.00~535.00	1	698.0	2.9	1
1.5KE530A*	1.5KE530CA*	451.00	503.50~556.50	1	725.0	2.8	1
1.5KE540A*	1.5KE540CA*	460.00	513.00~567.00	1	740.0	2.8	1
1.5KE550A*	1.5KE550CA*	468.00	522.50~577.50	1	760.0	2.7	1
1.5KE600A*	1.5KE600CA*	512.00	570.00~630.00	1	828.0	2.5	1

- Notes:**
- 1.For bidirectional type having V_{RWM} of 10V and less, the I_R limit is double.
 - 2.For parts without A, the V_{BR} is $\pm 10\%$ and V_C is 5% higher than with A parts, the parts without A are currently available, but not recommended for new designs. The parts with A are preferred.
 - 3.For stack-die parts, use * to label the part number.

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

Figure 1. Peak Pulse Power Derating Curve

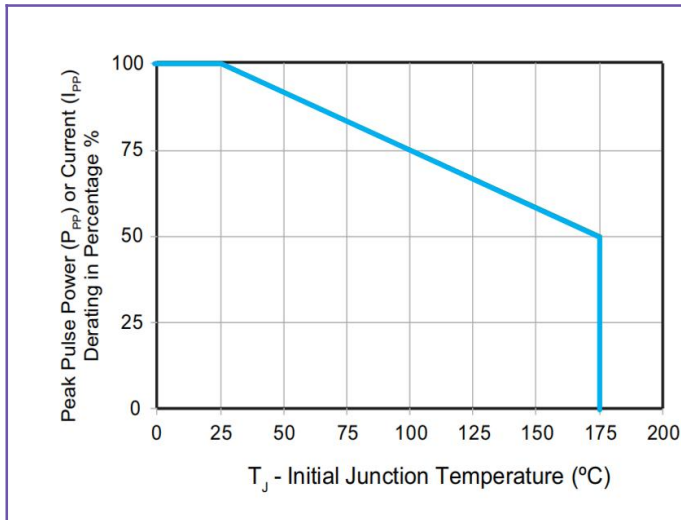


Figure 2. Pulse Waveform

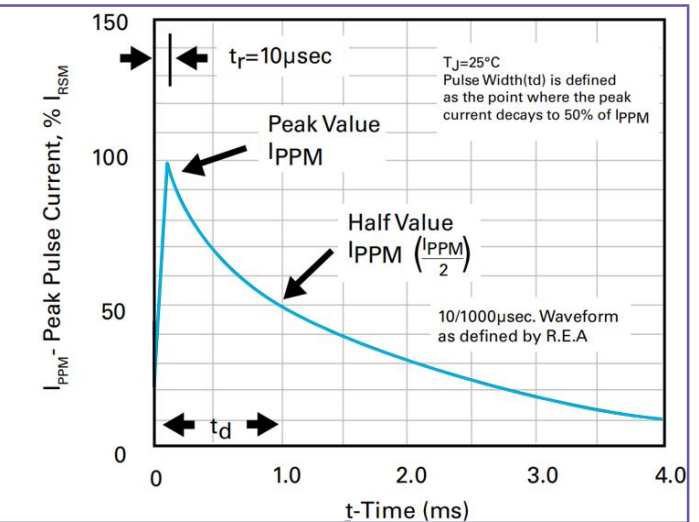


Figure 3. Typical Junction Capacitance

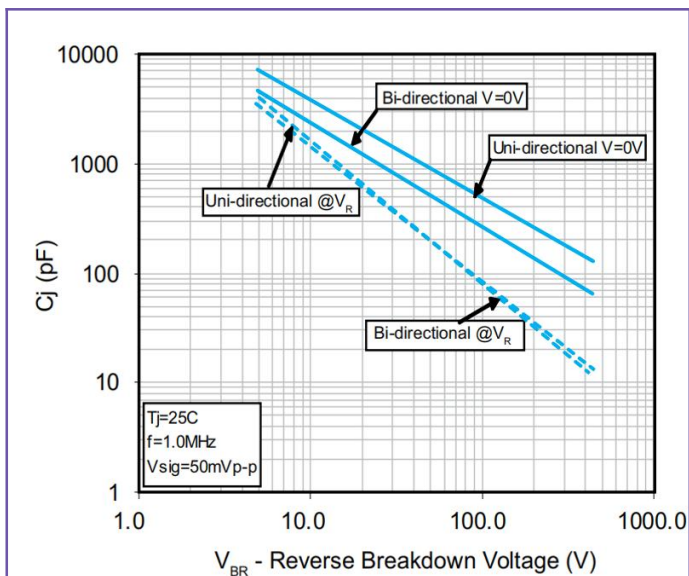


Figure 4. Typical Transient Thermal Impedance

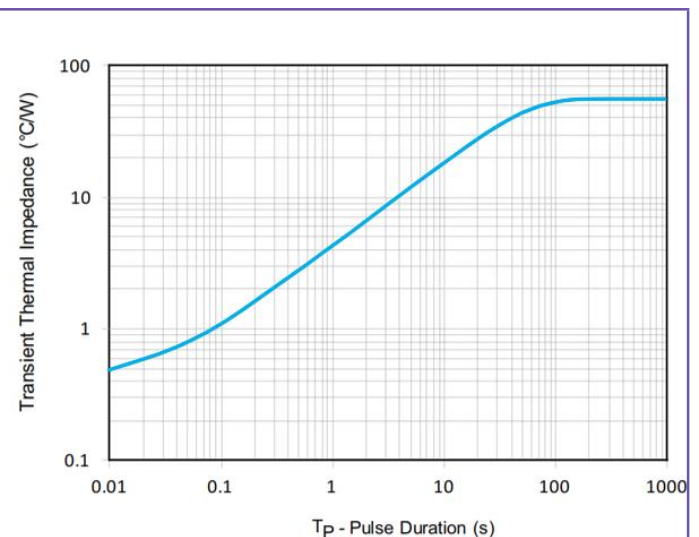


Figure 5. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

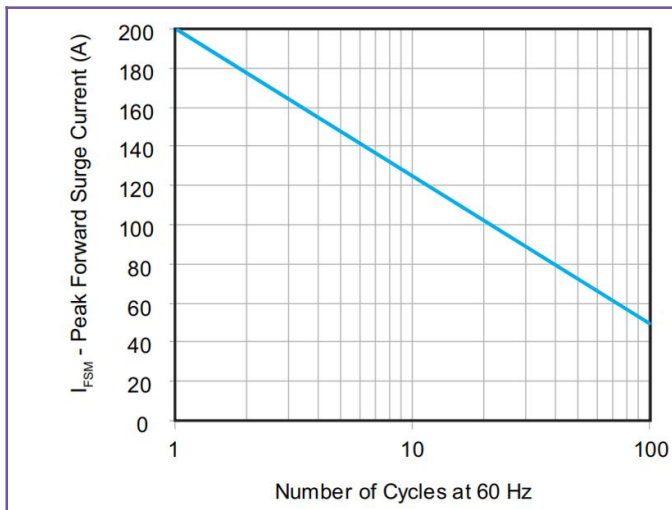
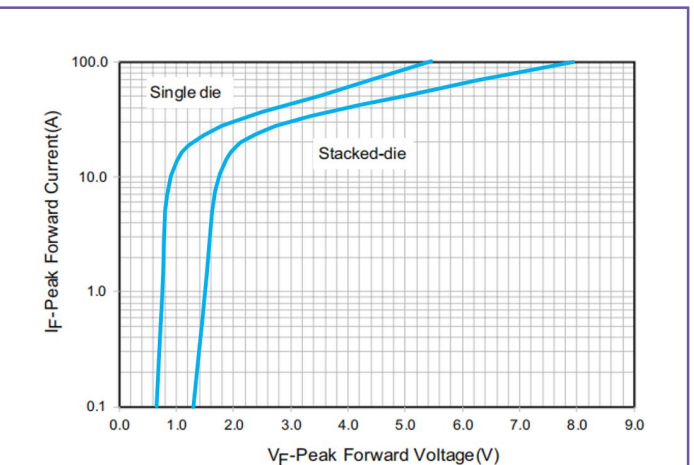
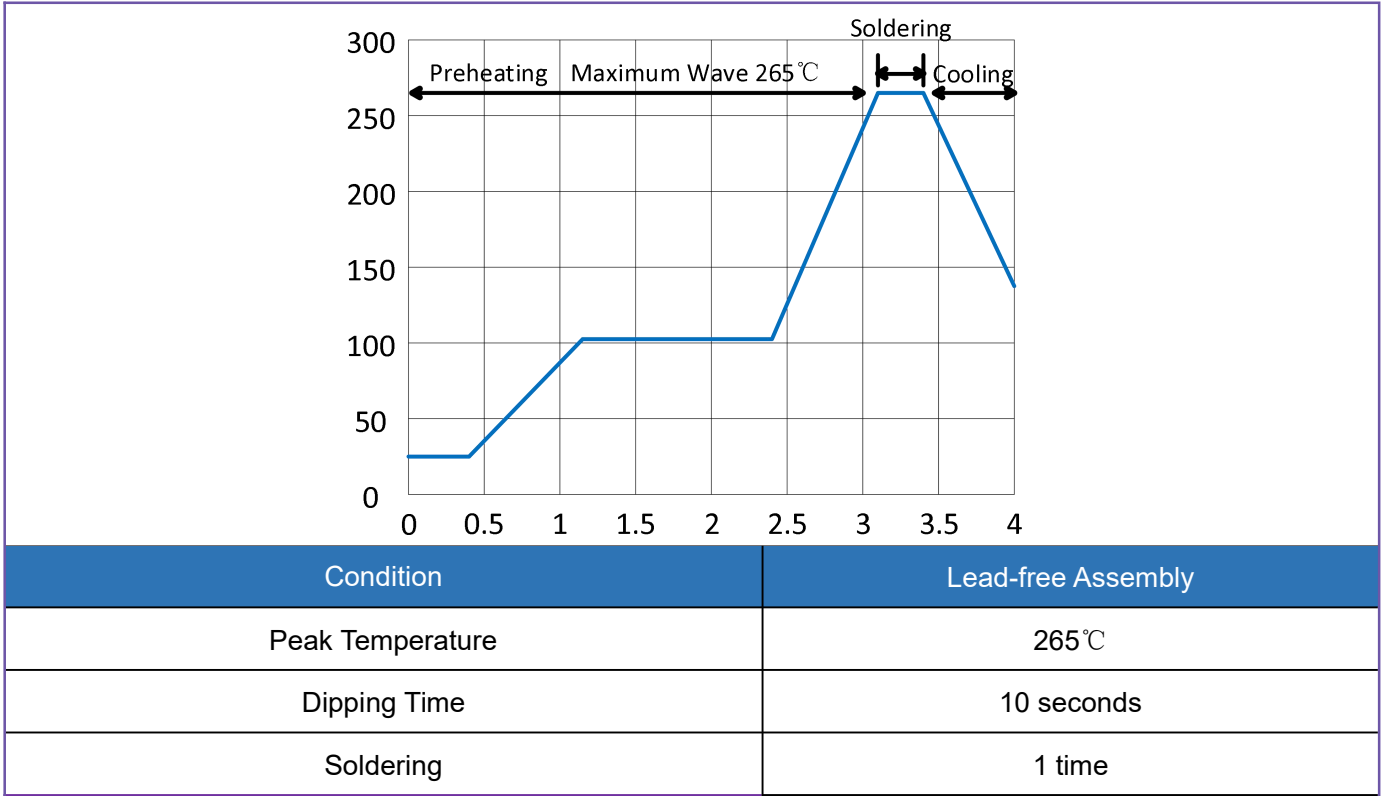


Figure 6. Peak Forward Voltage Drop vs Peak Forward Current (Typical Values)



Wave Soldering Parameters



Reliability

Items	Standards
Terminal strength	MIL-STD-750 Method 2036
Mechanical shock	JESD22-B104
Vibration	JESD22-B103
High Temp. Storage	JESD22-A103
High Temp Reverse Bias	JESD22-A108
Temperature Cycling	JESD22-A104
High Temp High Humidity Reverse Bias	JESD22-A101
Resistance to solder heat	JESD22-B106