



# 1.5KExx(C)A

## Power Transient Voltage Suppressor

### Features

- 1500 watts Peak Pulse Power (10/1000 $\mu$ s)
- Unidirectional and Bidirectional Protection
- Fast Response Time: Typically < 1ns
- Excellent Clamping Capability
- Low incremental surge resistance
- Plastic package has Underwriters Laboratory Flammability classification 94V-0
- High temperature soldering guaranteed:260 $^{\circ}$ C/10 seconds/.375",(9.5mm) lead length/5lbs.,(2.3kg) tension



### Mechanical Characteristics

- JEDEC DO-201AE molded plastic
- Polarity: Color band denoted cathode except Bipolar
- Marking : Marking Code
- Mounting Position: Any
- RoHS &UL497B Compliant

### Applications

- I/O Interfaces
- Power lines
- Automotive and Telecommunication
- Signal lines of sensor units for consumer
- Industrial Electronics
- Computer

Absolute Maximum Rating			
Rating	Symbol	Value	Units
Peak Pulse Power ( $t_p = 10/1000\mu s$ ) (see Note1)	$P_{PPM}$	1500	Watts
Peak pulse current (10/1000 $\mu s$ ) (see Note2)	$I_{PPM}$	See Electrical Characteristics	A
Peak Forward surge current (see Note2)	$I_{FSM}$	200	A
Power Dissipation on infinite heat sink $T_L = 50^{\circ}C$ (Fig5)	$P_D$	6.5	W
Operating Junction Temperature range	$T_J$	-55 to + 175	$^{\circ}C$
Typical Thermal Resistance Junction to Lead	$R_{uJL}$	20	$^{\circ}C/W$

**Note1:** Non-repetitive current pulse, per Fig.3 and derated above  $T_A = 25^{\circ}C$  per Fig.2.

**Note2:** Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.

**Note3:**  $V_F < 3.5V$  for devices of  $V_{BR} \leq 200V$  and  $V_F < 5.0V$  for devices of  $V_{BR} \geq 201V$ .

## Electrical Characteristics

Part Number		Reverse Stand off Voltage $V_{RWM}$ (Volts)	Breakdown Voltage		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C@I_{PP}$ (Volts)	Maximum Peak Current $I_{PP}$ (Amps)	Maximum Reverse Leakage $I_R@V_{RWM}$ ( $\mu$ A)
			$V_{BR}(\text{Volts})@I_T$					
UNI-POLAR	BI-POLAR		MIN	MAX				
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	9.50	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

## Electrical Characteristics (Cont.)

Part Number		Reverse Stand off Voltage $V_{RWM}$ (Volts)	Breakdown Voltage $V_{BR}(\text{Volts})@I_T$		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C@I_{PP}$ (Volts)	Maximum Peak Pulse Current $I_{PP}$ (Amps)	Maximum Reverse Leakage $I_R@V_{RWM}$ ( $\mu\text{A}$ )
UNI-POLAR	BI-POLAR		MIN	MAX				
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
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	3.7	1
1.5KE350A	1.5KE350CA	300.00	332.00	368.00	1	482.0	3.2	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	2.5	1
1.5KE480A	1.5KE480CA	408.00	456.00	504.00	1	658.0	2.3	1
1.5KE510A	1.5KE510CA	434.00	485.00	535.00	1	698.0	2.1	1
1.5KE530A	1.5KE530CA	477.00	503.50	556.50	1	725.0	2.1	1
1.5KE540A	1.5KE540CA	459.00	513.00	567.00	1	740.0	2.0	1
1.5KE550A	1.5KE550CA	495.00	522.50	577.50	1	760.0	2.0	1

For bidirectional type VR of 10 volts and less, the IR limit is double.

For parts without A, the VBR is  $\pm 10\%$  and VC is 5% higher than with A parts.

Typical Characteristics

Figure 1: Peak Pulse Power Rating Curve



Figure 2: Pulse Derating Curve

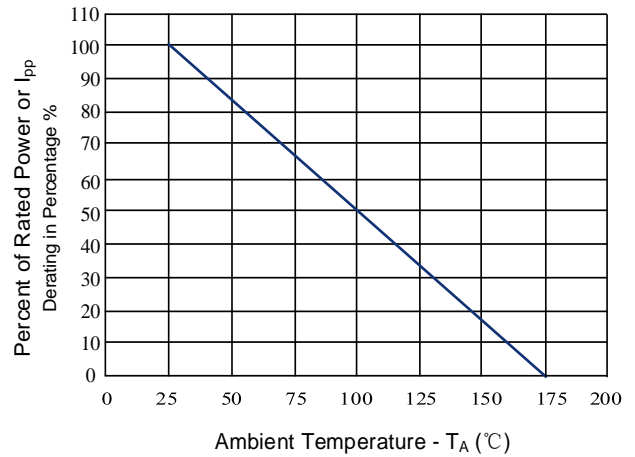


Figure 3: Pulse Waveform

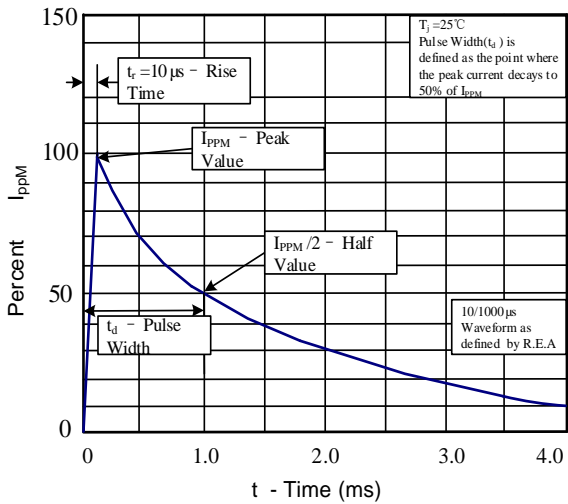


Figure 4: Typical Junction Capacitance

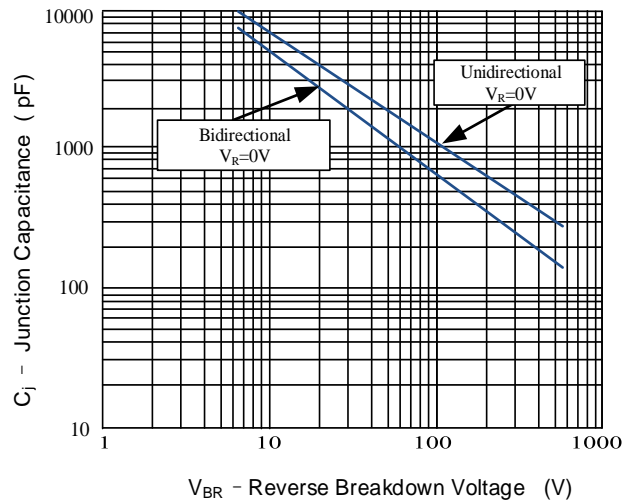


Figure 5: Steady State Power Dissipation Derating Curve

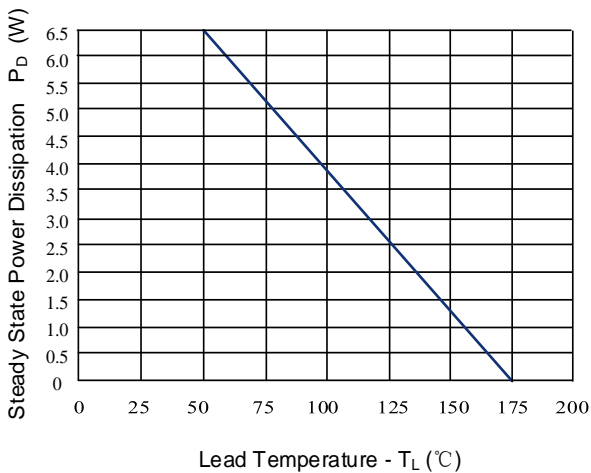
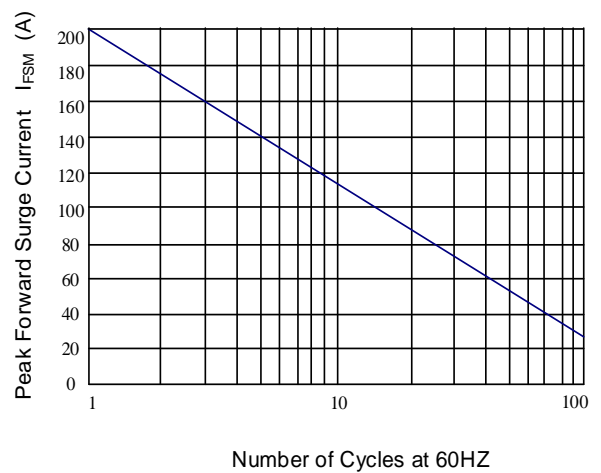
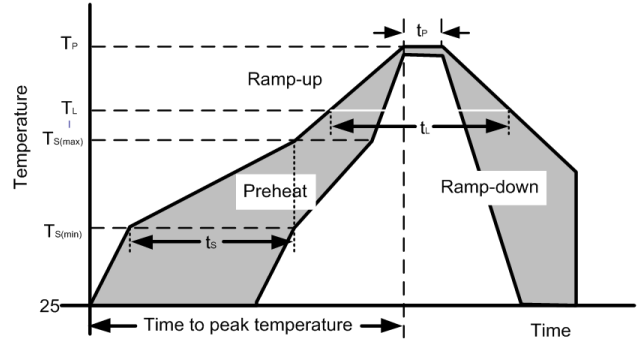


Figure 6: Maximum Non-Repetitive Forward Surge Current Only Unidirectional



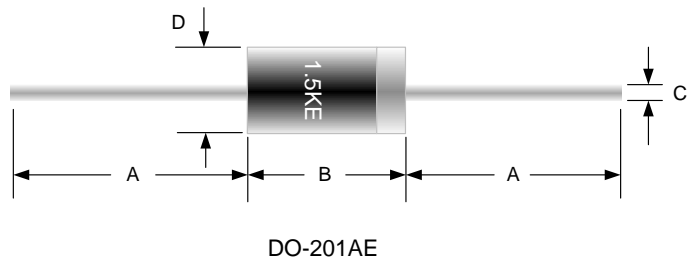
Recommended Soldering Parameters

Reflow Condition		
Pre-Heat	Temperature min ( $T_{s(min)}$ )	150°C
	Temperature max ( $T_{s(max)}$ )	200°C
	Time (min to max) ( $t_s$ )	60-190 s
Average ramp up rate (Liquidus Temp) ( $T_L$ ) to peak		3°C/s max
Ts(max) to TL - Ramp-up Rate		3°C/s max
Reflow	Temperature ( $T_L$ ) (Liquidus)	217°C
	Temperature ( $t_L$ )	60-150 s
Peak Temperature ( $T_P$ )		260 <sup>+0/-5</sup> °C
Time within actual peak Temperature ( $t_p$ )		20-40 s
Ramp-down Rate		5°C/s max
Time 25°C to peak Temperature ( $T_P$ )		8 minutes max
Do not exceed		260°C

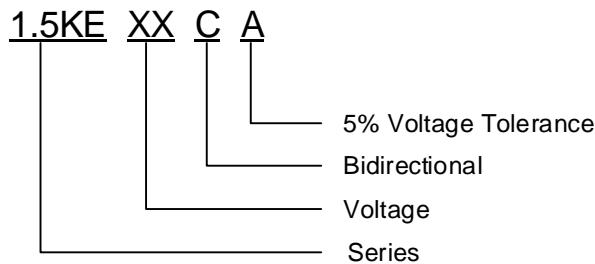


Outline Drawing - DO-201AE

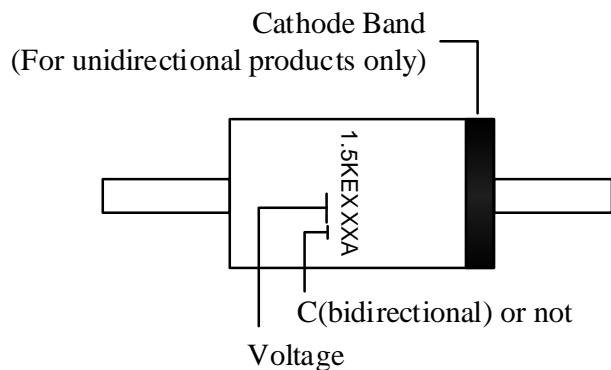
Ref. (mm)	Millimeters	
	Min.	Max.
A	25.40	-
B	7.20	9.50
C	0.96	1.07
D	4.80	5.30



Part Numbering System



### Part Marking System



### Package Information

Package Type	Description	Quantity (pcs)
DO-201AE(DO-27)	Tape & Box	1000

### CONTACT INFORMATION

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The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.  
Users should verify actual device performance in their specific applications.*

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