

# Silicon Avalanche Diodes

## 1500 Watt Axial Leaded Transient Voltage Suppressors

### RoHS 1.5KE Series



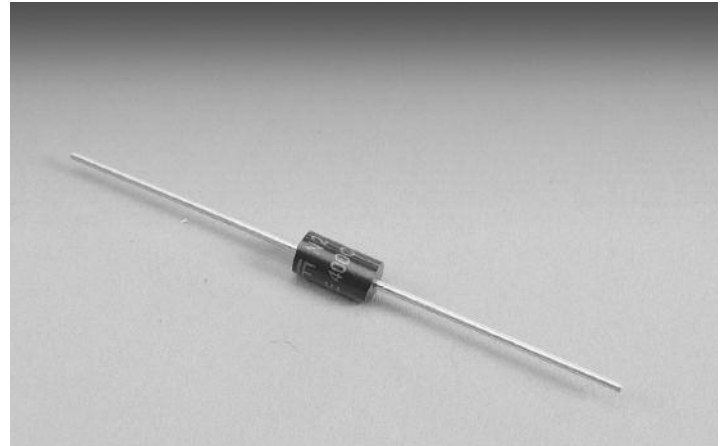
The 1.5KE Series is designed specifically to protect sensitive electronics equipment from voltage transients induced by lightning and other transient voltage events. These devices are ideal for the protection of I/O interfaces, Vcc bus and other vulnerable circuits used in telecom, computer, industrial and consumer electronic applications.

#### FEATURES

- RoHS Compliant
- 6.8V to 550Volts
- Uni-directional and Bi-directional
- Glass passivated chip junction in DO-201 package
- 1500W surge capability at 10/1000µs wave form
- Excellent clamping capability
- Low zener impedance to BV min.
- Typical IR less than 1µA above 10V, (9.5mm) lead length, 5lbs., (2.3kg) tension

**Agency Approvals:** Recognized under the Components Program of Underwriters Laboratories.

**Agency File Number:** E128662



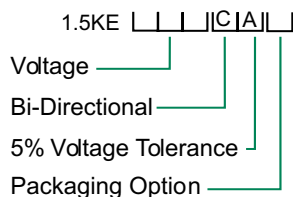
#### MAXIMUM RATINGS AND CHARACTERISTICS @25°C AMBIENT TEMPERATURE (unless otherwise noted)

| RATING                                                                                                  | SYMBOL         | VALUE       | UNIT               |
|---------------------------------------------------------------------------------------------------------|----------------|-------------|--------------------|
| Peak Pulse Power Dissipation at<br>$T_A=25^{\circ}\text{C}$ , $T_p=1\text{ms}$ (Note 1)                 | $P_{PPM}$      | Min<br>1500 | Watts              |
| Steady State Power Dissipation at<br>$T_L=75^{\circ}\text{C}$ , Lead lengths .375",<br>(9.5mm) (Note 2) | $P_M(AV)$      | 6.5         | Watts              |
| Superimposed on Rated Load,<br>(JEDEC Method) (Note 3)                                                  | $I_{FSM}$      | 200         | Amps               |
| Operating junction and Storage<br>Temperature Range                                                     | $T_j, T_{STG}$ | -55 to +175 | $^{\circ}\text{C}$ |

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^{\circ}\text{C}$  per Fig.2
3. 8.3 ms single half sine-wave, or equivalent square wave, Duty cycle= 4 pulses per minutes maximum.

#### ORDERING INFORMATION



B = Bulk (500 pcs)

T = Tape and reeled (1200 pcs)

#### Mechanical Specifications:

**Weight:** 0.045 ounce, 1.2 grams  
**Case:** JEDEC DO-201 Molded plastic  
**Mounting Position:** Any  
**Polarity:** Color band denotes cathode except Bipolar  
**Terminal:** Axial leads, solderable per MIL-STD-750, Method 2026

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#### ELECTRICAL SPECIFICATION @ Tamb 25°C

| Part Numbers |            | Reverse Stand off Voltage<br>V <sub>R</sub><br>(Volts) | Breakdown Voltage<br>V <sub>BR</sub> (Volts) @ I <sub>T</sub> |        | Test Current<br>I <sub>T</sub> (mA) | Maximum Clamping Voltage<br>V <sub>C</sub> @ I <sub>PP</sub><br>(Volts) | Maximum Peak Pulse Current<br>I <sub>PP</sub><br>(A) | Maximum Reverse Leakage<br>I <sub>R</sub> @ V <sub>R</sub><br>(μA) |
|--------------|------------|--------------------------------------------------------|---------------------------------------------------------------|--------|-------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|
| 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                                                 | 5                                                                  |
| 1.5KE15A     | 1.5KE15CA  | 12.80                                                  | 14.30                                                         | 15.80  | 1                                   | 21.2                                                                    | 71.7                                                 | 5                                                                  |
| 1.5KE16A     | 1.5KE16CA  | 13.60                                                  | 15.20                                                         | 16.80  | 1                                   | 22.5                                                                    | 67.6                                                 | 5                                                                  |
| 1.5KE18A     | 1.5KE18CA  | 15.30                                                  | 17.10                                                         | 18.90  | 1                                   | 25.2                                                                    | 60.3                                                 | 5                                                                  |
| 1.5KE20A     | 1.5KE20CA  | 17.10                                                  | 19.00                                                         | 21.00  | 1                                   | 27.7                                                                    | 54.9                                                 | 5                                                                  |
| 1.5KE22A     | 1.5KE22CA  | 18.80                                                  | 20.90                                                         | 23.10  | 1                                   | 30.6                                                                    | 49.7                                                 | 5                                                                  |
| 1.5KE24A     | 1.5KE24CA  | 20.50                                                  | 22.80                                                         | 25.20  | 1                                   | 33.2                                                                    | 45.8                                                 | 5                                                                  |
| 1.5KE27A     | 1.5KE27CA  | 23.10                                                  | 25.70                                                         | 28.40  | 1                                   | 37.5                                                                    | 40.5                                                 | 5                                                                  |
| 1.5KE30A     | 1.5KE30CA  | 25.60                                                  | 28.50                                                         | 31.50  | 1                                   | 41.4                                                                    | 36.7                                                 | 5                                                                  |
| 1.5KE33A     | 1.5KE33CA  | 28.20                                                  | 31.40                                                         | 34.70  | 1                                   | 45.7                                                                    | 33.3                                                 | 5                                                                  |
| 1.5KE36A     | 1.5KE36CA  | 30.80                                                  | 34.20                                                         | 37.80  | 1                                   | 49.9                                                                    | 30.5                                                 | 5                                                                  |
| 1.5KE39A     | 1.5KE39CA  | 33.30                                                  | 37.10                                                         | 41.00  | 1                                   | 53.9                                                                    | 28.2                                                 | 5                                                                  |
| 1.5KE43A     | 1.5KE43CA  | 36.80                                                  | 40.90                                                         | 45.20  | 1                                   | 59.3                                                                    | 25.6                                                 | 5                                                                  |
| 1.5KE47A     | 1.5KE47CA  | 40.20                                                  | 44.70                                                         | 49.40  | 1                                   | 64.8                                                                    | 23.5                                                 | 5                                                                  |
| 1.5KE51A     | 1.5KE51CA  | 43.60                                                  | 48.50                                                         | 53.60  | 1                                   | 70.1                                                                    | 21.7                                                 | 5                                                                  |
| 1.5KE56A     | 1.5KE56CA  | 47.80                                                  | 53.20                                                         | 58.80  | 1                                   | 77.0                                                                    | 19.7                                                 | 5                                                                  |
| 1.5KE62A     | 1.5KE62CA  | 53.00                                                  | 58.90                                                         | 65.10  | 1                                   | 85.0                                                                    | 17.9                                                 | 5                                                                  |
| 1.5KE68A     | 1.5KE68CA  | 58.10                                                  | 64.60                                                         | 71.40  | 1                                   | 92.0                                                                    | 16.5                                                 | 5                                                                  |
| 1.5KE75A     | 1.5KE75CA  | 64.10                                                  | 71.30                                                         | 78.80  | 1                                   | 103.0                                                                   | 14.8                                                 | 5                                                                  |
| 1.5KE82A     | 1.5KE82CA  | 70.10                                                  | 77.90                                                         | 86.10  | 1                                   | 113.0                                                                   | 13.5                                                 | 5                                                                  |
| 1.5KE91A     | 1.5KE91CA  | 77.80                                                  | 86.50                                                         | 95.50  | 1                                   | 125.0                                                                   | 12.2                                                 | 5                                                                  |
| 1.5KE100A    | 1.5KE100CA | 85.50                                                  | 95.00                                                         | 105.00 | 1                                   | 137.0                                                                   | 11.1                                                 | 5                                                                  |
| 1.5KE110A    | 1.5KE110CA | 94.00                                                  | 105.00                                                        | 116.00 | 1                                   | 152.0                                                                   | 10.0                                                 | 5                                                                  |
| 1.5KE120A    | 1.5KE120CA | 102.00                                                 | 114.00                                                        | 126.00 | 1                                   | 165.0                                                                   | 9.2                                                  | 5                                                                  |
| 1.5KE130A    | 1.5KE130CA | 111.00                                                 | 124.00                                                        | 137.00 | 1                                   | 179.0                                                                   | 8.5                                                  | 5                                                                  |
| 1.5KE150A    | 1.5KE150CA | 128.00                                                 | 143.00                                                        | 158.00 | 1                                   | 207.0                                                                   | 7.3                                                  | 5                                                                  |
| 1.5KE160A    | 1.5KE160CA | 136.00                                                 | 152.00                                                        | 168.00 | 1                                   | 219.0                                                                   | 6.9                                                  | 5                                                                  |
| 1.5KE170A    | 1.5KE170CA | 145.00                                                 | 162.00                                                        | 179.00 | 1                                   | 234.0                                                                   | 6.5                                                  | 5                                                                  |
| 1.5KE180A    | 1.5KE180CA | 154.00                                                 | 171.00                                                        | 189.00 | 1                                   | 246.0                                                                   | 6.2                                                  | 5                                                                  |
| 1.5KE200A    | 1.5KE200CA | 171.00                                                 | 190.00                                                        | 210.00 | 1                                   | 274.0                                                                   | 5.5                                                  | 5                                                                  |
| 1.5KE220A    | 1.5KE220CA | 185.00                                                 | 209.00                                                        | 231.00 | 1                                   | 328.0                                                                   | 4.6                                                  | 5                                                                  |
| 1.5KE250A    | 1.5KE250CA | 214.00                                                 | 237.00                                                        | 263.00 | 1                                   | 344.0                                                                   | 4.4                                                  | 5                                                                  |
| 1.5KE300A    | 1.5KE300CA | 256.00                                                 | 285.00                                                        | 315.00 | 1                                   | 414.0                                                                   | 3.7                                                  | 5                                                                  |
| 1.5KE350A    | 1.5KE350CA | 300.00                                                 | 332.00                                                        | 368.00 | 1                                   | 482.0                                                                   | 3.2                                                  | 5                                                                  |
| 1.5KE400A    | 1.5KE400CA | 342.00                                                 | 380.00                                                        | 420.00 | 1                                   | 548.0                                                                   | 2.8                                                  | 5                                                                  |
| 1.5KE440A    | 1.5KE440CA | 376.00                                                 | 418.00                                                        | 462.00 | 1                                   | 602.0                                                                   | 2.5                                                  | 5                                                                  |
| 1.5KE480A    | 1.5KE480CA | 408.00                                                 | 456.00                                                        | 504.00 | 1                                   | 658.0                                                                   | 2.3                                                  | 5                                                                  |
| 1.5KE510A    | 1.5KE510CA | 434.00                                                 | 485.00                                                        | 535.00 | 1                                   | 698.0                                                                   | 2.1                                                  | 5                                                                  |
| 1.5KE530A    | 1.5KE530CA | 450.00                                                 | 503.50                                                        | 556.50 | 1                                   | 725.0                                                                   | 2.1                                                  | 5                                                                  |
| 1.5KE540A    | 1.5KE540CA | 459.00                                                 | 513.00                                                        | 567.00 | 1                                   | 740.0                                                                   | 2.0                                                  | 5                                                                  |
| 1.5KE550A    | 1.5KE550CA | 467.00                                                 | 522.50                                                        | 577.50 | 1                                   | 760.0                                                                   | 2.0                                                  | 5                                                                  |

For bidirectional type having V<sub>rrm</sub> of 10 volts and less, the I<sub>R</sub> limit is double.  
For parts without A , the V<sub>BR</sub> is ± 10%

**6**
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Ratings and Characteristic Curves  $T_A=25^\circ\text{C}$  unless otherwise noted



Fig. 1 Peak Pulse Power Rating Curve



Fig. 2 Pulse Derating Curve



Fig. 3 Pulse Waveform

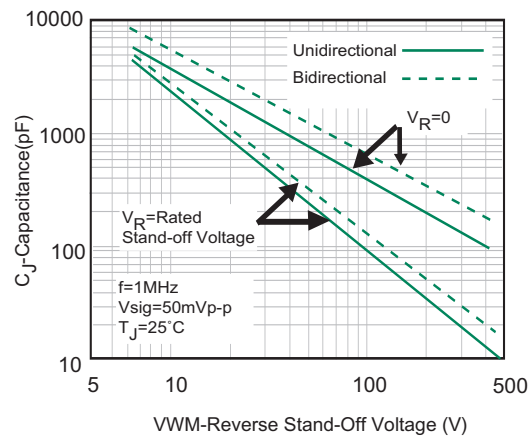


Fig. 4- Typical Junction Capacitance



Fig. 5 Steady State Power Derating Curve



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

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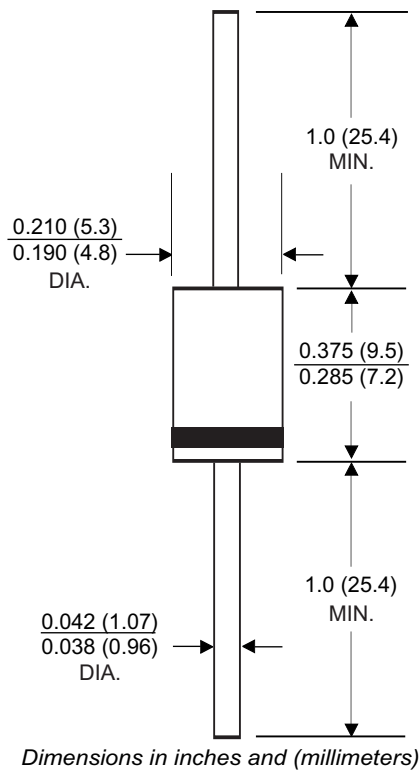
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### RoHS 1.5KE Series



#### Outline Dimensions

Case Style 1.5KE  
(DO-201)



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