

Transient Voltage Suppression Diodes AxialLeaded-3kA

Description

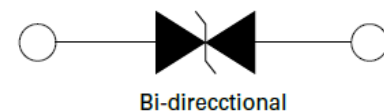
The AK3 series of high power TVS diode is specially designed for meeting severe surge test environment of both AC and DC line protection applications. It features a very fast response and ultra low clamping characteristics over traditional metal oxide (MOV) solutions. They can be connected in series and / or parallel to create a very high surge current protection solution..

Features

- Very low clamping voltage
- Ultra compact: less than one-tenth the size of traditional discrete solutions
- Sharp breakdown voltage
- Low slope resistance
- Bi-directional Foldback technology for superior clamping factor
- Symmetric in leads width for easier soldering during assembly
- IEC-61000-4-2 ESD 15kV(Air), 8kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2
- EFT protection of data lines in accordance with IEC 61000-4-4
- Halogen-free
- RoHS compliant
- Glass passivated junction
- Pb-free E4 means 2nd level interconnect is Pb-free and the terminal finish material is Silver



Functional Diagram



Maximum Ratings and Thermal Characteristics

(TA=25°C unless otherwise noted)

| Parameter | Symbols | Value | Unit |
|--------------------------------------|------------------|-------------|------|
| Operating Storage Temperature Range | T _{STG} | -55 to +150 | °C |
| Operating Junction Temperature Range | T _J | -55 to +125 | °C |
| Current Rating ¹ | I _{PP} | 3 | kA |

Note:1) Rated IPP measured with 8/20µS pulse.

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Electrical Characteristics

| Part Numbers | Part Marking | Standoff Voltage (VSO) Volts | Max. Reverse Leakage (I_R)@VSO (μ A) | Typical I_R @85°C (μ A) | Reverse Breakdown Voltage(V_{BR})@ I_T | | Test Current I_T mA | Max. clamping Voltage VCL@IPP Peak Pulse Current(I_{PP})(Note 1) | | Max.Temp Coefficient OF V_{BR} %/°C | Max. Capacitance 0 Bias 10KHZ nF |
|--------------|--------------|---------------------------------|--|-----------------------------------|--|-----------|--------------------------|--|------------------------------|--|-------------------------------------|
| | | | | | Min Volts | Max Volts | | VCL Volts | I_{PP} (8/20 μ S) A | | |
| | | | | | AK3-015C | 3-015C | | 15 | 10 | 15 | 16 |
| AK3-030C | 3-030C | 30 | 10 | 15 | 32 | 37 | 10 | 90 | 3,000 | 0.1 | 11.0 |
| AK3-058C | 3-058C | 58 | 10 | 15 | 64 | 70 | 10 | 110 | 3,000 | 0.1 | 6.0 |
| AK3-066C | 3-066C | 66 | 10 | 15 | 72 | 80 | 10 | 120 | 3,000 | 0.1 | 6.0 |
| AK3-076C | 3-076C | 76 | 10 | 15 | 85 | 95 | 10 | 140 | 3,000 | 0.1 | 6.0 |
| AK3-150C | 3-150C | 150 | 10 | 15 | 158 | 194 | 10 | 230 | 3,000 | 0.1 | 2.6 |
| AK3-170C | 3-170C | 170 | 10 | 15 | 179 | 220 | 10 | 260 | 3,000 | 0.1 | 2.4 |
| AK3-208C | 3-208C | 208 | 10 | 15 | 223 | 246 | 10 | 262 | 3,000 | 0.1 | 2.4 |
| AK3-380C | 3-380C | 380 | 10 | 15 | 401 | 443 | 10 | 520 | 3,000 | 0.1 | 2.0 |
| AK3-430C | 3-430C | 430 | 10 | 15 | 440 | 490 | 10 | 625 | 3,000 | 0.1 | 2.0 |

Physical Specifications

| | |
|----------|---|
| Weight | Contact manufacturer |
| Case | Epoxy encapsulated |
| Terminal | Silver plated leads, solderable per MIL-STD-750 Method 2026 |

Flow/Wave Soldering (Solder Dipping)

| | |
|--------------------|------------|
| Peak Temperature : | 265°C |
| Dipping Time : | 10 seconds |
| Soldering : | 1 time |

Wave Solder Profile

Figure 1- Non Lead-free Profile

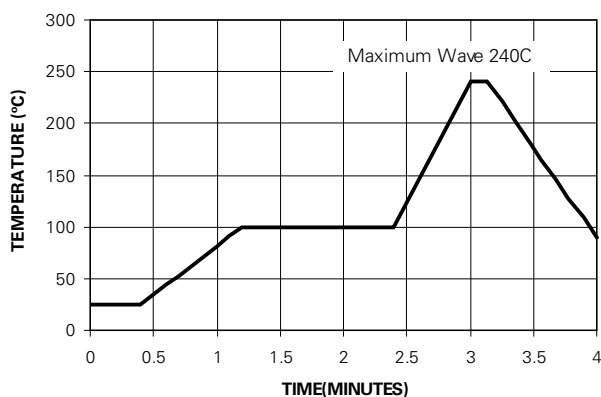
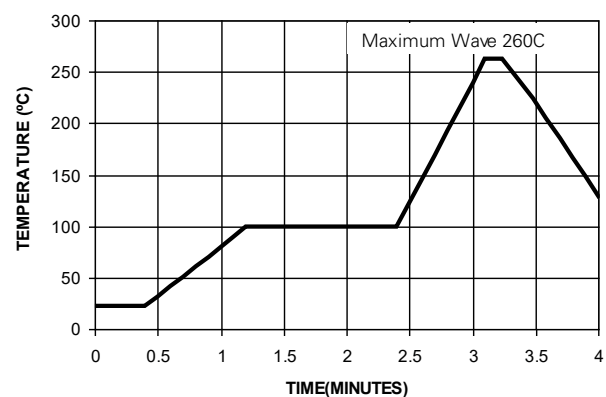


Figure 2- Lead-free Profile



Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

Figure 3 - Peak Power Derating

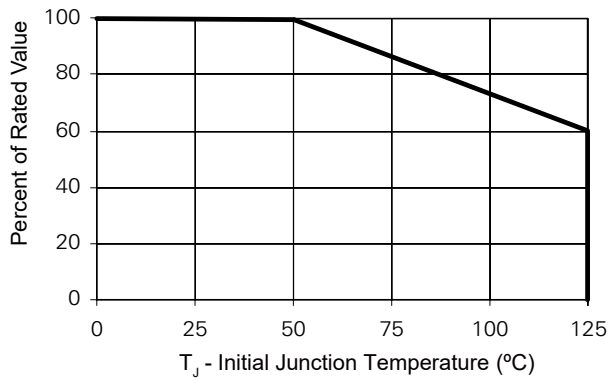


Figure 4 - Surge Response

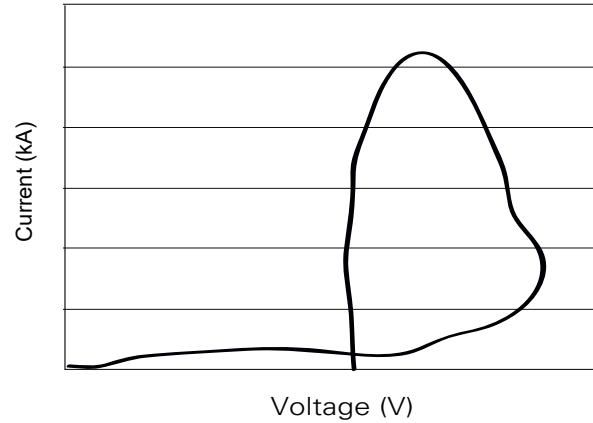


Figure 5 - Typical Peak Pulse Power Rating Curve

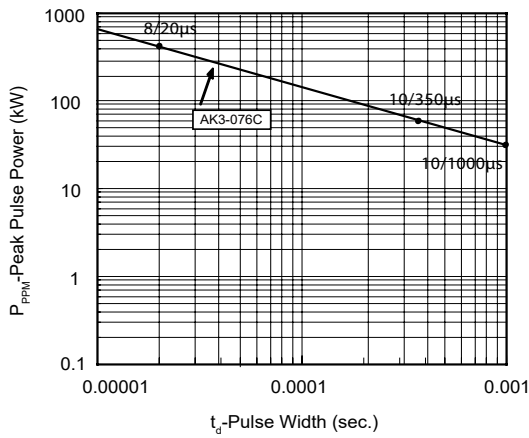


Figure 6 - Typical V_{BR} Vs Junction Temperature

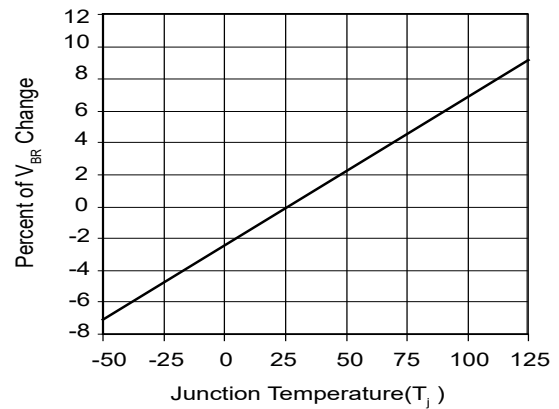


Figure 7 - Surge Response (8/20 Surge current waveform)

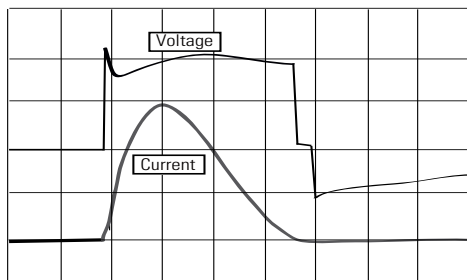
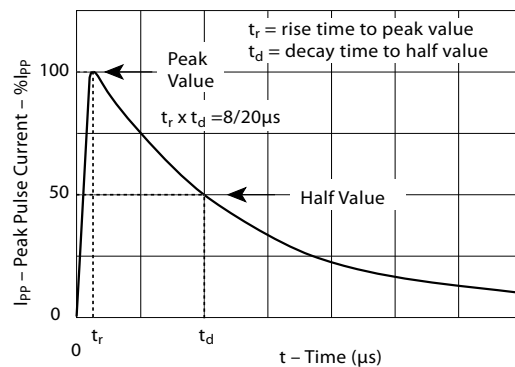


Figure 8 - Pulse Waveform

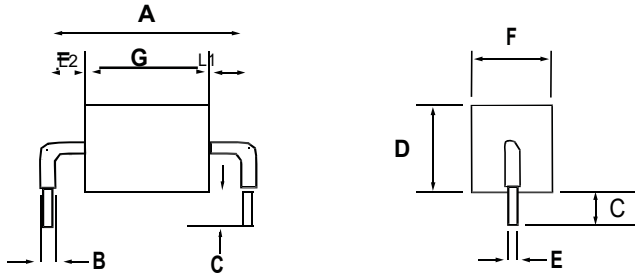


Note:

The power dissipation causes a change in avalanche voltage during the surge and the avalanche voltage eventually returns to the original value when the transient has passed.

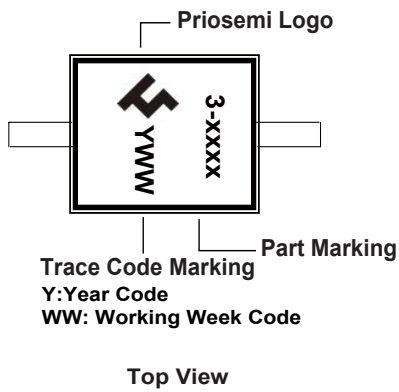
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Dimensions

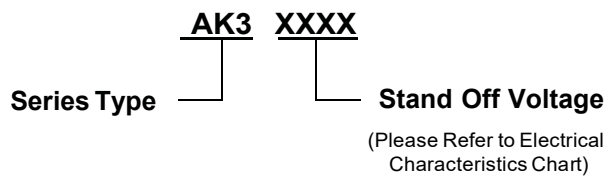


| Dimensions | | Inches | Millimeters |
|------------|-------------|---|----------------|
| A | | 0.951 +/- 0.040 | 24.15 +/- 1.00 |
| B | | 0.094 +/- 0.024 | 2.40 +/- 0.60 |
| C | | 0.236 +/- 0.039 | 6.00 +/- 1.00 |
| | -208C | 0.145 +/- 0.040 | 3.68 +/- 1.00 |
| D | | 0.433 max. | 11.0 max. |
| E | | 0.050 +/- 0.002 | 1.27 +/- 0.05 |
| F | | 0.374 max. | 9.50 max. |
| G | -015C | 0.093 +/- 0.039 | 2.36 +/- 1.00 |
| | -030C/-066C | 0.130 +/- 0.047 | 3.30 +/- 1.20 |
| | -058C/-076C | 0.168 +/- 0.047 | 4.27 +/- 1.20 |
| | -150C | 0.383 +/- 0.047 | 9.72 +/- 1.20 |
| | -170C | 0.420 +/- 0.047 | 10.67 +/- 1.20 |
| | -208C | 0.358 +/- 0.047 | 9.10 +/- 1.20 |
| | -380C | 0.547 +/- 0.047 | 13.90 +/- 1.20 |
| L1 | -430C | 0.583 +/- 0.047 | 14.80 +/- 1.20 |
| | -208C | 0.296 +/- 0.047 | 7.52 +/- 1.20 |
| L2 | | L1= L2 tolerance +/- 0.047 inch (+/- 1.20 mm) | |
| | -208C | = A - (G+L1) tolerance +/- 0.047 inch (+/- 1.20 mm) | |
| | | L1= L2 tolerance +/- 0.047 inch (+/- 1.20 mm) | |

Part Marking System



Part Marking System



Packing Options

| Part Number | Component Package | Quantity | Packaging Option |
|-------------|-------------------|-----------|------------------|
| AK3-XXXX | AK Package | 56pcs/Box | Bulk |