

Description

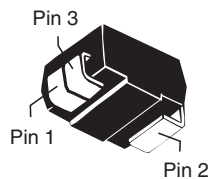
The A0609CA2LRP is a LCAS protector that does not require an external voltage reference. It specifically provides protection for a balanced ringing system with a ringing voltage range of +54 volts and -78 volts.

This three pin modified DO-214AA solution provides a smaller footprint and lower component count than the typical dual polarity programmable SLIC protector. This new overvoltage protector is applicable for WLL (Wireless local loops), VoIP (Voice over IP) and regenerated POTS (Plain Old Telephone Systems) applications.

Agency Approvals

| Agency | Agency File Number |
|--------|--------------------|
| | E133083 |

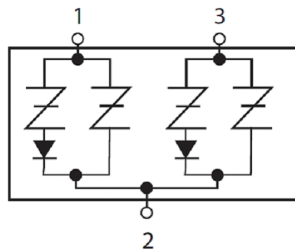
Pinout Designation



Features and Benefits

- Robust surge rating
- Switching speeds of nanoseconds
- Eliminates the need for large, bulky capacitors and blocking diodes required by traditional programmable solutions
- Solid-State transient protection
- Modified DO-214AA
- Fixed voltage asymmetrical design
- Lower component count solution
- Halogen free and RoHS compliant
- 2nd level interconnect is Pb-free per IPC/ JEDEC J-STD-609A.01

Schematic Symbol



Applicable Global Standards

- ITU K.20/21 Enhanced Level* Edition*
 - ITU K.20/21 Basic Level
 - GR 1089 Inter-building*
 - GR 1089 Intra-building
 - IEC 61000-4-5 2nd
 - YD/T 1082
 - YD/T 993
 - YD/T 950
- * Line impedance required to pass operationally

Electrical Characteristics

| Part Number | Marking | V_{DRM} | V_S | V_{DRM} | V_S | V_T | I_{DRM} | I_H | I_S | I_T | Capacitance |
|-------------|---------|--------------------|----------------|--------------------|----------------|---------------|-----------|--------|--------|-------|-----------------|
| | | @ $I_{DRM}=5\mu A$ | @ $100V/\mu s$ | @ $I_{DRM}=5\mu A$ | @ $100V/\mu s$ | @ $I_T=2.2 A$ | | | | | @ 1MHz, 3V bias |
| | | V min | V max | V min | V max | V max | μA | mA min | mA max | A max | pF typ |
| A0609CA2LRP | A0609A | 54* | 95* | 78** | 120** | 4 | 5 | 120 | 800 | 2.2 | 32 |

Notes:
- Absolute maximum ratings measured at $T_A = 25^\circ C$ (unless otherwise noted).
- Component is asymmetrical

* Positive voltage threshold
** Negative voltage threshold

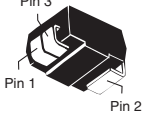
Surge Ratings

| Series | I_{PP} | | | I_{TSM} 50/60 Hz | di/dt |
|--------|--|--|---|-----------------------|-------|
| | 8/20 ¹ 1.2/50 ² | 10/1000 ¹ 10/1000 ² | 5/310 ¹ 10/700 ² | | |
| | A min | A min | A min | | |
| A | 150 | 50 | 100 | 12 | 500 |

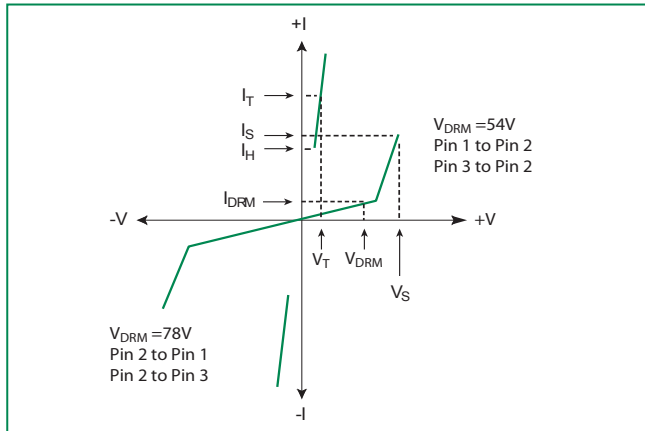
Notes:

- 1 Current waveform in μs
 - 2 Voltage waveform in μs
- Peak pulse current rating (I_{pp}) is repetitive and guaranteed for the life of the product.
 - I_{PP} ratings applicable over temperature range of $-40^{\circ}C$ to $+85^{\circ}C$
 - The component must initially be in thermal equilibrium with $-40^{\circ}C \leq T_J \leq +150^{\circ}C$

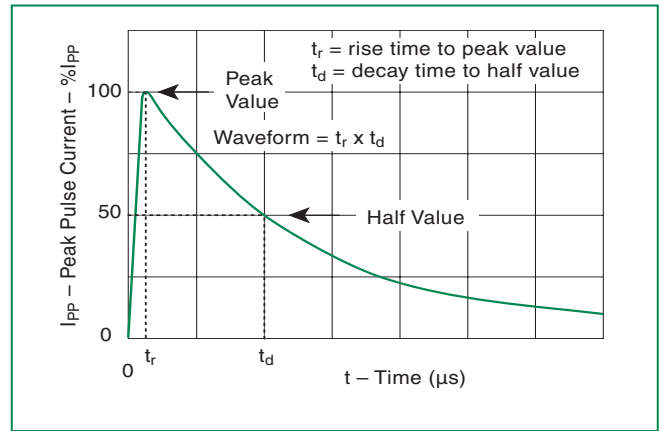
Thermal Considerations

| Package | Symbol | Parameter | Value | Unit |
|---|-----------------|---|-------------|---------------|
| Modified DO-214AA Pin 3  Pin 1 Pin 2 | T_J | Operating Junction Temperature Range | -40 to +150 | $^{\circ}C$ |
| | T_S | Storage Temperature Range | -65 to +150 | $^{\circ}C$ |
| | $R_{\theta JA}$ | Thermal Resistance: Junction to Ambient | 85 | $^{\circ}C/W$ |

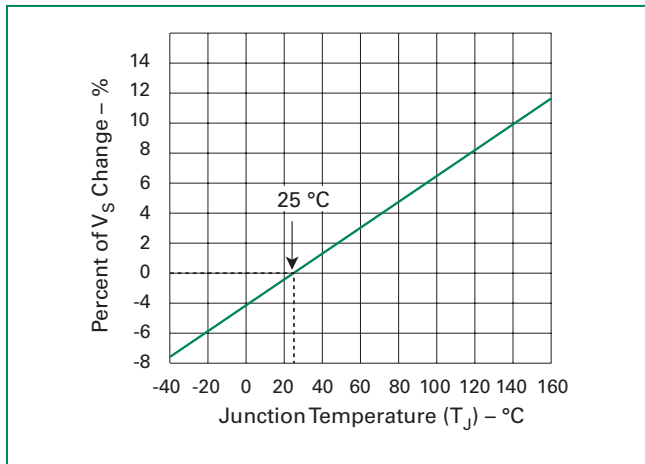
V-I Characteristics



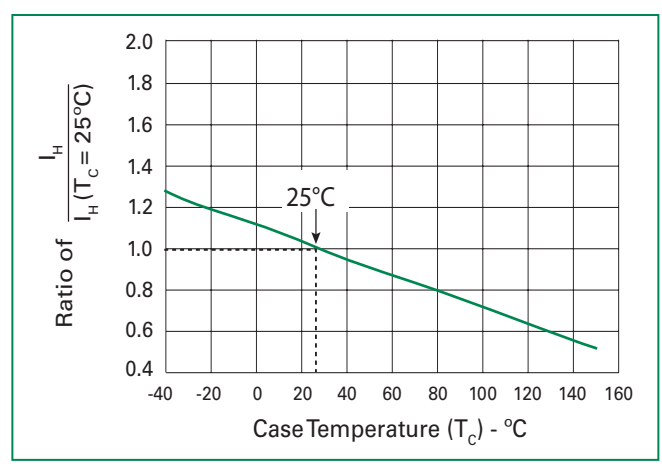
$t_r \times t_d$ Pulse Waveform



Normalized V_S Change vs. Junction Temperature

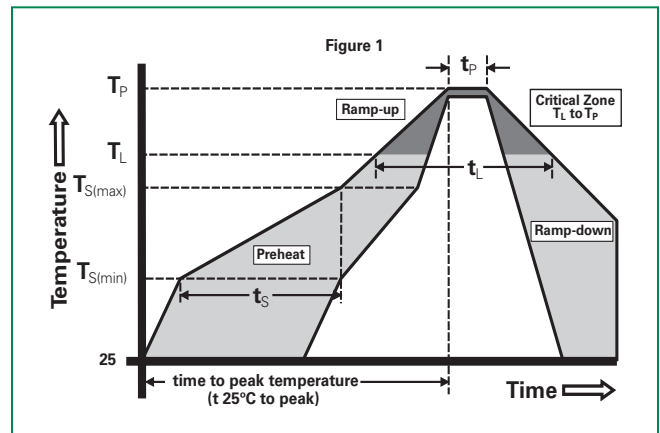


Normalized DC Holding Current vs. Case Temperature



Soldering Parameters

| | | |
|--|-----------------------------------|-------------------------------|
| Reflow Condition | | Pb-Free assembly (see Fig. 1) |
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150°C |
| | -Temperature Max ($T_{s(max)}$) | +200°C |
| | -Time (Min to Max) (t_s) | 60-180 secs. |
| Average ramp up rate (Liquidus Temp (T_L) to peak) | | 3°C/sec. Max. |
| $T_{s(max)}$ to T_L - Ramp-up Rate | | 3°C/sec. Max. |
| Reflow | -Temperature (T_L) (Liquidus) | +217°C |
| | -Temperature (t_L) | 60-150 secs. |
| Peak Temp (T_p) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (t_p) | | 30 secs. Max. |
| Ramp-down Rate | | 6°C/sec. Max. |
| Time 25°C to Peak Temp (T_p) | | 8 min. Max. |
| Do not exceed | | +260°C |



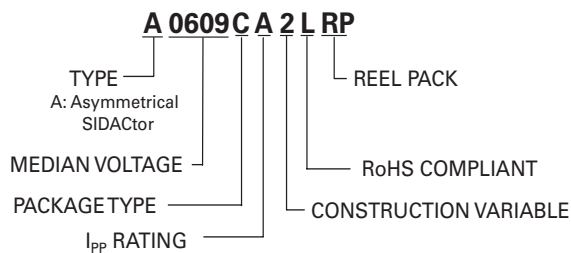
Physical Specifications

| | |
|------------------------|---|
| Lead Material | Copper Alloy |
| Terminal Finish | 100% Matte-Tin Plated |
| Body Material | UL Recognized epoxy meeting flammability classification V-0 |

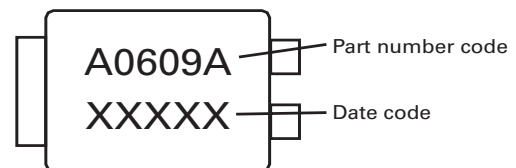
Environmental Specifications

| | |
|---|---|
| High Temp Voltage Blocking | 80% Rated V_{DRM} (V_{AC} Peak) +125°C or +150°C, 504 or 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101 |
| Temp Cycling | -65°C to +150°C, 15 min. dwell, 10 up to 100 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A104 |
| Biased Temp & Humidity | 52 V_{DC} (+85°C) 85%RH, 504 up to 1008 hrs. EIA/JEDEC, JESD22-A-101 |
| High Temp Storage | +150°C 1008 hrs. MIL-STD-750 (Method 1031) JEDEC, JESD22-A-101 |
| Low Temp Storage | -65°C, 1008 hrs. |
| Thermal Shock | 0°C to +100°C, 5 min. dwell, 10 sec. transfer, 10 cycles. MIL-STD-750 (Method 1056) JEDEC, JESD22-A-106 |
| Autoclave (Pressure Cooker Test) | +121°C, 100%RH, 2atm, 24 up to 168 hrs. EIA/JEDEC, JESD22-A-102 |
| Resistance to Solder Heat | +260°C, 30 secs. MIL-STD-750 (Method 2031) |
| Moisture Sensitivity Level | 85%RH, +85°C, 168 hrs., 3 reflow cycles (+260°C peak). JEDEC-J-STD-020, Level 1 |

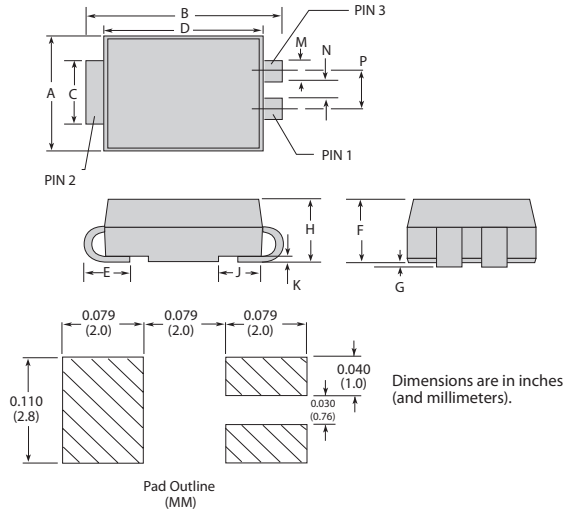
Part Numbering



Part Marking



Dimensions — Modified DO-214AA

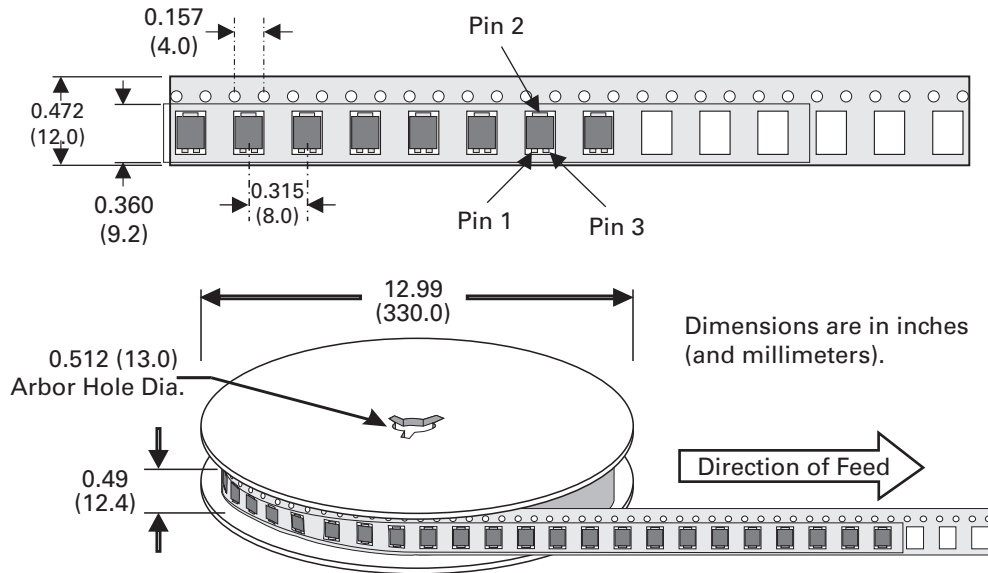


| Dimensions | Inches | | Millimeters | |
|------------|--------|-------|-------------|------|
| | Min | Max | Min | Max |
| A | 0.130 | 0.156 | 3.30 | 3.95 |
| B | 0.201 | 0.220 | 5.10 | 5.60 |
| C | 0.077 | 0.087 | 1.95 | 2.20 |
| D | 0.159 | 0.181 | 4.05 | 4.60 |
| E | 0.030 | 0.063 | 0.75 | 1.60 |
| F | 0.075 | 0.096 | 1.90 | 2.45 |
| G | 0.002 | 0.008 | 0.05 | 0.20 |
| H | 0.077 | 0.104 | 1.95 | 2.65 |
| K | 0.006 | 0.016 | 0.15 | 0.41 |
| M | 0.022 | 0.028 | 0.56 | 0.71 |
| N | 0.027 | 0.033 | 0.69 | 0.84 |
| P | 0.052 | 0.058 | 1.32 | 1.47 |

Packing Options

| Package Type | Description | Quantity | Added Suffix | Industry Standard |
|--------------|---|----------|--------------|-------------------|
| C | Modified DO-214AA 3-leaded Tape and Reel Pack | 2500 | RP | EIA-481-D |

Tape and Reel Specification — Modified DO-214AA



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