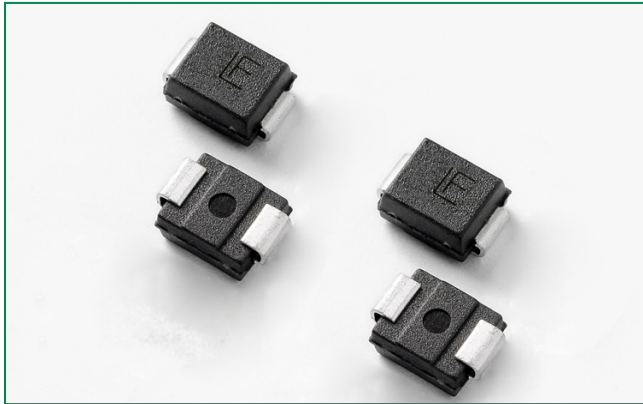


## Pxxx0SxL-A Series - D0-214AA



### Agency Approvals

| AGENCY | AGENCY FILE NUMBER |
|--------|--------------------|
|        | E133083            |

### Schematic Symbol



### Description

Pxxx0SxL-A series is designed to protect automotive grade equipments such as vehicle infotainment system, device communication line and automotive camera data lines from damaging overvoltage transients.

The series provides a surface mount solution that enables equipments to comply with global regulatory standards.

### Features and Benefits

- Automotive grade AEC-Q101 qualified
- Low voltage overshoot
- Low on-state voltage
- Does not degrade surge capability after multiple surge events within limit.
- Fails short circuit when surged in excess of currents
- Low capacitance
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)
- UL Recognized to UL 497B as an Isolated Loop Circuit Protector.

### Applicable Global Standards

- TIA-968-A
- TIA-968-B
- ITU K.20/21 Enhanced Level\*
- ITU K.20/21 Basic Level
- GR 1089 Inter-building\*
- GR 1089 Intra-building
- IEC 61000-4-5 2nd Edition
- YD/T 1082
- YD/T 993
- YD/T 950

\*A rated parts require series resistance

### Electrical Characteristics

| Part Number  | Marking | $V_{DRM}$<br>@ $I_{DRM}=5\mu A$ | $V_S$<br>@ $100V/\mu s$ | $I_H$  | $I_S$  | $I_T$ | $V_T$<br>@ $I_T=2.2 A$ | Capacitance<br>@ 1MHz, 2V bias |        |
|--------------|---------|---------------------------------|-------------------------|--------|--------|-------|------------------------|--------------------------------|--------|
|              |         | V min                           | V max                   | mA min | mA max | A max | V max                  | pF min                         | pF max |
| P0080SALRP-A | A-8A    | 6                               | 25                      | 50     | 800    | 2.2   | 4                      | 20                             | 35     |
| P0220SALRP-A | A22A    | 15                              | 32                      | 50     | 800    | 2.2   | 4                      | 20                             | 40     |
| P0300SALRP-A | A03A    | 25                              | 47                      | 50     | 800    | 2.2   | 4                      | 15                             | 40     |
| P0640SALRP-A | A06A    | 58                              | 77                      | 150    | 800    | 2.2   | 4                      | 15                             | 40     |
| P0720SALRP-A | A07A    | 65                              | 88                      | 150    | 800    | 2.2   | 4                      | 15                             | 40     |
| P0900SALRP-A | A09A    | 75                              | 98                      | 150    | 800    | 2.2   | 4                      | 15                             | 40     |
| P1100SALRP-A | A11A    | 90                              | 130                     | 150    | 800    | 2.2   | 4                      | 15                             | 40     |
| P1300SALRP-A | A13A    | 120                             | 160                     | 150    | 800    | 2.2   | 4                      | 15                             | 40     |
| P1500SALRP-A | A15A    | 140                             | 180                     | 150    | 800    | 2.2   | 4                      | 15                             | 40     |
| P1800SALRP-A | A18A    | 170                             | 220                     | 150    | 800    | 2.2   | 4                      | 15                             | 35     |
| P2100SALRP-A | A21A    | 180                             | 240                     | 150    | 800    | 2.2   | 4                      | 15                             | 35     |
| P2300SALRP-A | A23A    | 190                             | 260                     | 150    | 800    | 2.2   | 4                      | 15                             | 35     |
| P2600SALRP-A | A26A    | 220                             | 300                     | 150    | 800    | 2.2   | 4                      | 15                             | 35     |
| P3100SALRP-A | A31A    | 275                             | 350                     | 150    | 800    | 2.2   | 4                      | 15                             | 35     |

## Surge Ratings

| Series | I <sub>PP</sub>      |                   |                     |                     |                     |                    |                     |                      |                     | I <sub>TSM</sub><br>50/60 Hz | di/dt |
|--------|----------------------|-------------------|---------------------|---------------------|---------------------|--------------------|---------------------|----------------------|---------------------|------------------------------|-------|
|        | 0.2/310 <sup>1</sup> | 2/10 <sup>1</sup> | 8/20 <sup>1</sup>   | 10/160 <sup>1</sup> | 10/560 <sup>1</sup> | 5/320 <sup>1</sup> | 10/360 <sup>1</sup> | 10/1000 <sup>1</sup> | 5/310 <sup>1</sup>  |                              |       |
|        | 0.5/700 <sup>2</sup> | 2/10 <sup>2</sup> | 1.2/50 <sup>2</sup> | 10/160 <sup>2</sup> | 10/560 <sup>2</sup> | 9/720 <sup>2</sup> | 10/360 <sup>2</sup> | 10/1000 <sup>2</sup> | 10/700 <sup>2</sup> |                              |       |
|        | A min                | A min             | A min               | A min               | A min               | A min              | A min               | A min                | A min               |                              |       |
| A      | 20                   | 150               | 150                 | 90                  | 50                  | 75                 | 75                  | 45                   | 75                  | 25                           | 500   |

Notes:

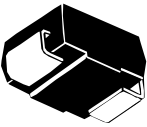
1 Current waveform in μs

2 Voltage waveform in μs

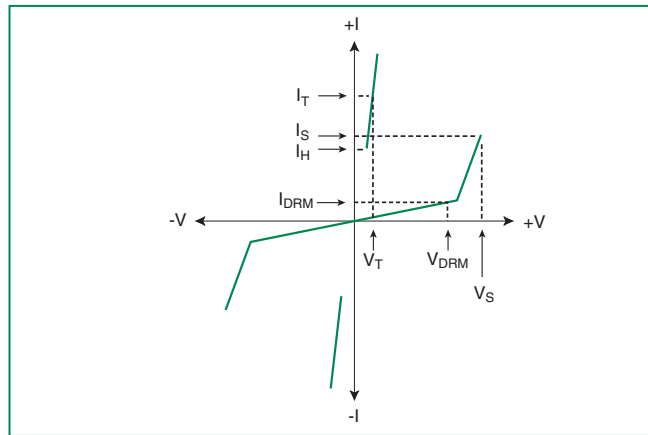
- Peak pulse current rating ( $I_{PP}$ ) is repetitive and guaranteed for the life of the product.

- 1ms non-repetitive square pulse at  $T_A=85^\circ\text{C}$  minimum surge current is 18A

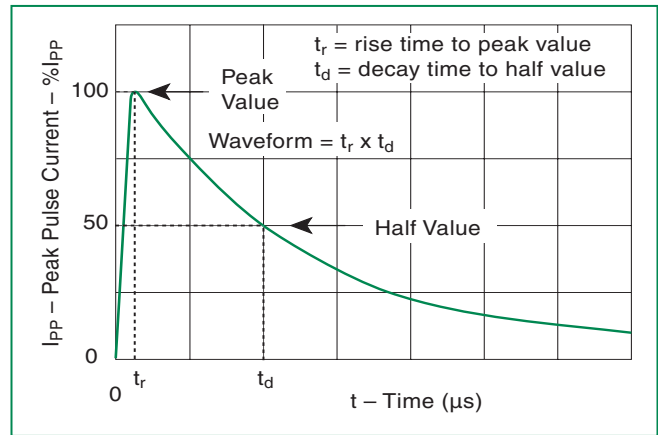
## Thermal Considerations

| Package                                                                                       | Symbol          | Parameter                               | Value       | Unit               |
|-----------------------------------------------------------------------------------------------|-----------------|-----------------------------------------|-------------|--------------------|
| <br>DO-214AA | $T_J$           | Operating Junction Temperature Range    | -55 to +150 | $^\circ\text{C}$   |
|                                                                                               | $T_S$           | Storage Temperature Range               | -65 to +150 | $^\circ\text{C}$   |
|                                                                                               | $R_{\theta JA}$ | Thermal Resistance: Junction to Ambient | 90          | $^\circ\text{C/W}$ |

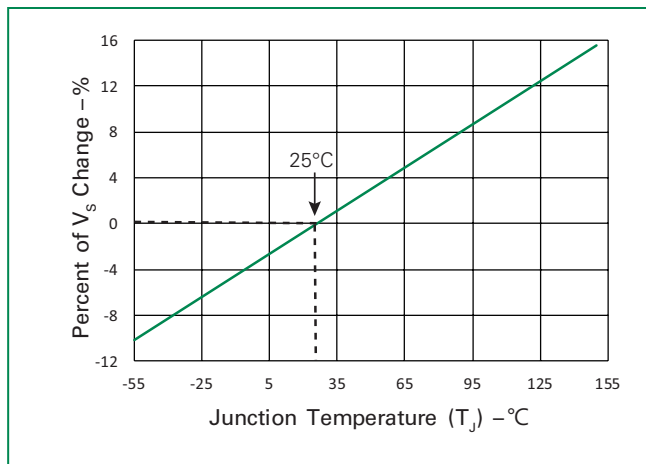
## V-I Characteristics



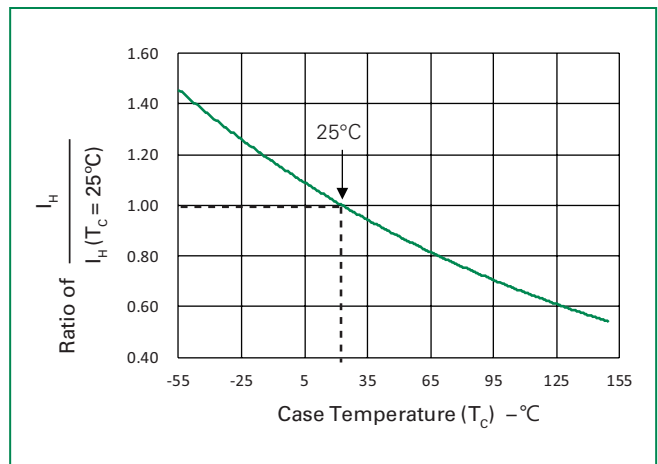
## $t_r \times t_d$ Pulse Waveform



## Normalized $V_S$ Change vs. Junction Temperature

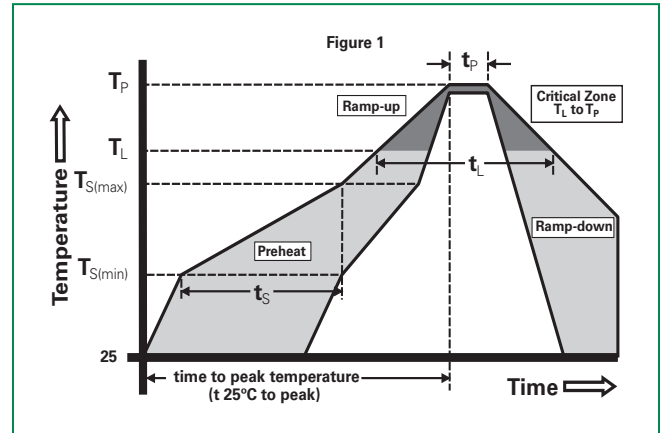


## Normalized DC Holding Current vs. Case Temperature



## 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                        |



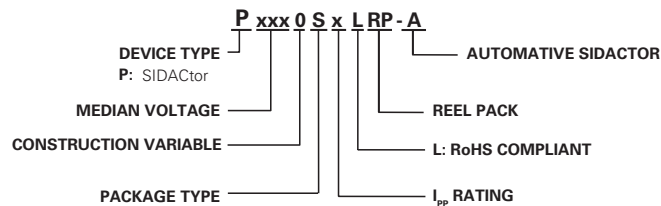
## Physical Specifications

|                        |                                                        |
|------------------------|--------------------------------------------------------|
| <b>Lead Material</b>   | Copper Alloy                                           |
| <b>Terminal Finish</b> | 100% Matte-Tin Plated                                  |
| <b>Body Material</b>   | UL Recognized compound meeting flammability rating V-0 |

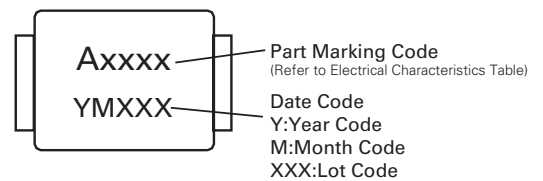
## Environmental Specifications

|                                                |                                                                                                      |
|------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>High Temp Voltage Blocking</b>              | 80% Rated $V_{DRM}$ ( $V_{AC}$ Peak) +150°C, 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101 |
| <b>Temp Cycling</b>                            | -55°C to +150°C, 15 min. dwell, 1000 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A104        |
| <b>Biased Temp &amp; Humidity</b>              | 80% Rated $V_{DRM}$ (+85°C) 85%RH, 504 up to 1008 hrs. EIA/JEDEC, JESD22-A-101                       |
| <b>Unbiased Highly Accelerated Stress Test</b> | +130°C, 85%RH, 2atm, 96hrs. JESD22A-118                                                              |
| <b>Resistance to Solder Heat</b>               | +260°C, 10 secs. MIL-STD-750 (Method 2031)                                                           |
| <b>Moisture Sensitivity Level</b>              | 85%RH, +85°C, 168 hrs., 3 reflow cycles (+260°C Peak). JEDEC-J-STD-020, Level 1                      |

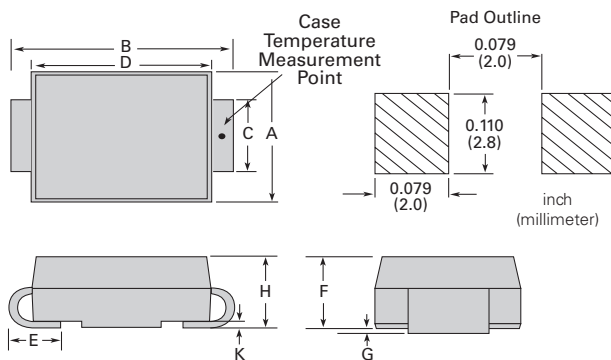
## Part Numbering



## Part Marking



## Dimensions — DO-214AA

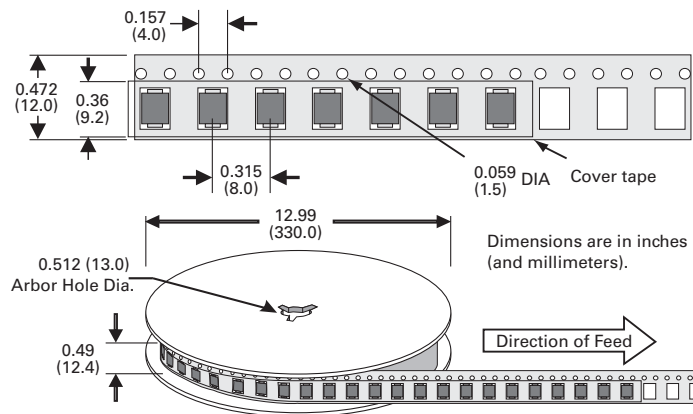


| Dimensions | Inches |       | Millimeters |      |
|------------|--------|-------|-------------|------|
|            | Min    | Max   | Min         | Max  |
| A          | 0.130  | 0.156 | 3.30        | 3.95 |
| B          | 0.201  | 0.220 | 5.10        | 5.60 |
| C          | 0.077  | 0.087 | 1.95        | 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 |

## Packing Options

| Package Type | Description                  | Quantity | Added Suffix | Industry Standard |
|--------------|------------------------------|----------|--------------|-------------------|
| S            | DO-214AA<br>Tape & Reel Pack | 2500     | RP           | EIA-481-D         |

## Tape and Reel Specification — DO-214AA



**Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at <http://www.littelfuse.com/disclaimer-electronics>.**

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Littelfuse:

[P0080SALRP-A](#) [P0220SALRP-A](#) [P0300SALRP-A](#) [P0640SALRP-A](#) [P0720SALRP-A](#) [P0900SALRP-A](#)  
[P1100SALRP-A](#) [P1300SALRP-A](#) [P1500SALRP-A](#) [P1800SALRP-A](#) [P2100SALRP-A](#) [P2300SALRP-A](#) [P2600SALRP-](#)  
[A P3100SALRP-A](#)