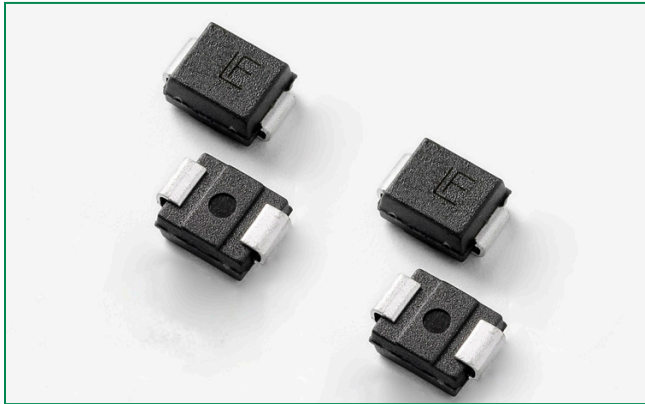



### Pxxx0SxL-A Series - DO-214AA



#### 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**

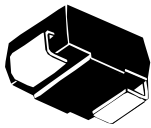
| Series | $I_{PP}$             |                   |                     |                     |                     |                    |                     |                      |                     | $I_{TSM}$<br>50/60 Hz | di/dt             |
|--------|----------------------|-------------------|---------------------|---------------------|---------------------|--------------------|---------------------|----------------------|---------------------|-----------------------|-------------------|
|        | 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 min                 | Amps/ $\mu$ s max |
| A      | 20                   | 150               | 150                 | 90                  | 50                  | 75                 | 75                  | 45                   | 75                  | 25                    | 500               |

Notes:

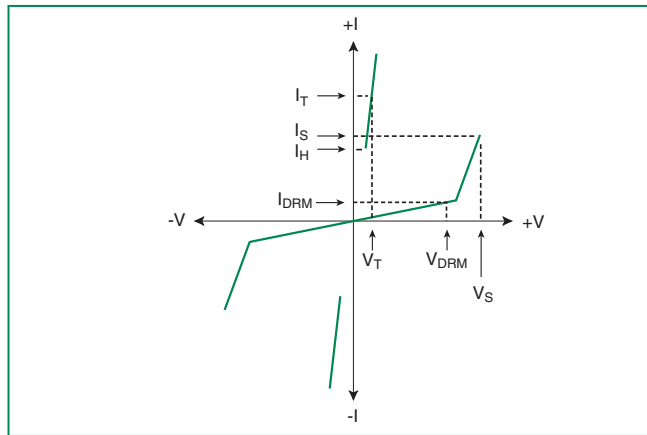
1 Current waveform in  $\mu$ s  
2 Voltage waveform in  $\mu$ s

- 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

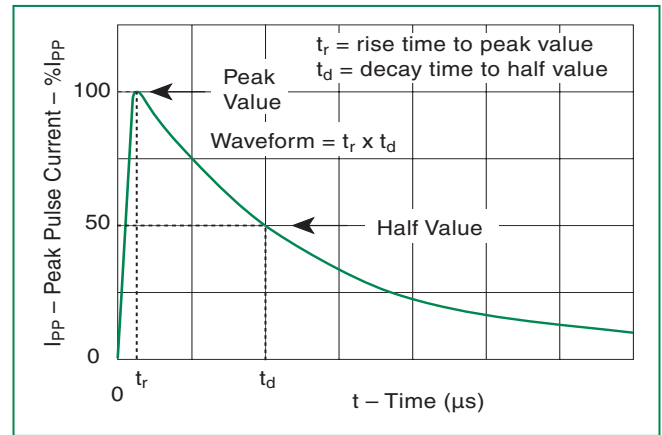
**Thermal Considerations**

| 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          | $^\circ\text{C}/\text{W}$ |

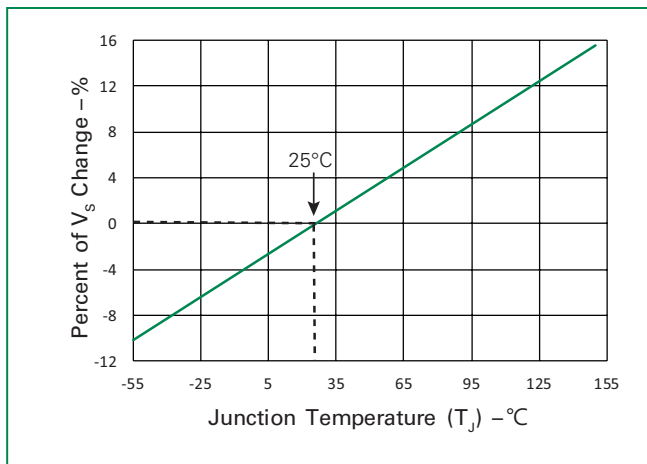
**V-I Characteristics**



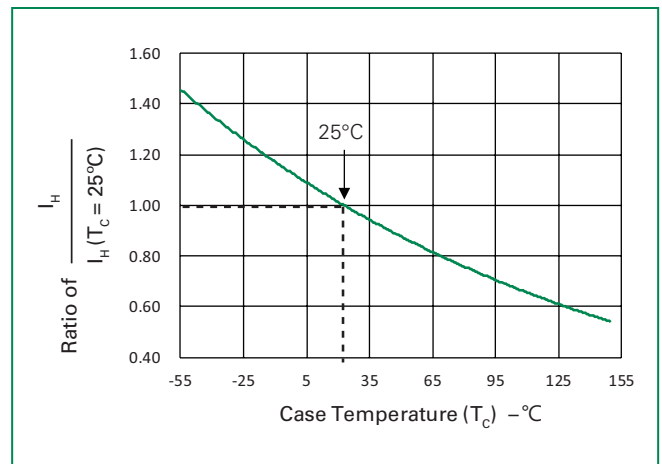
**$t_r \times t_d$  Pulse Waveform**



**Normalized  $V_S$  Change vs. Junction Temperature**

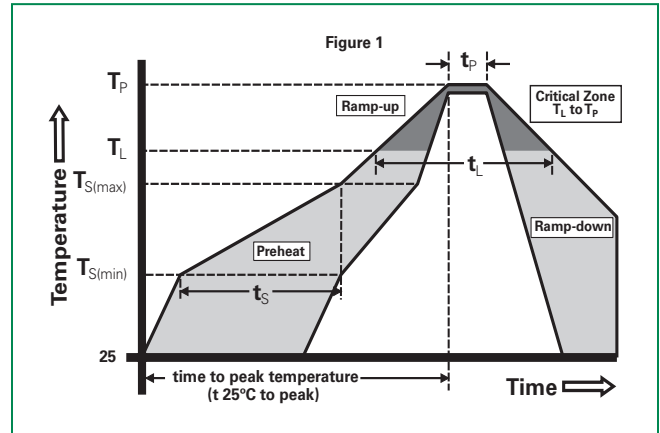


**Normalized DC Holding Current vs. Case Temperature**



**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 PeakTemp ( $t_p$ )           | 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                            |              |



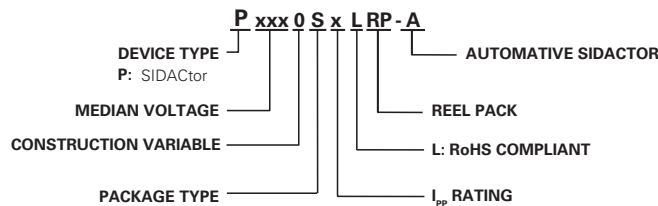
**Physical Specifications**

|                        |  |
|------------------------|--|
| <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**

