

HF RoHS **Fixed Voltage Series - DO-214**



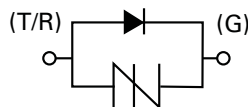
Agency Approvals

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

Pinout Designation



Schematic Symbol



Description

Fixed Voltage Series DO-214 are uni-directional SIDACTor® devices designed to protect SLICs (Subscriber Line Interface Circuit) from damaging overvoltage transients.

The series provides single line protection using a fixed voltage switching device for negative surges. All positive surges are routed through an internal diode to a ground reference.

Features and Benefits

- Low voltage overshoot
- Low on-state voltage
- Does not degrade with use
- Fails short circuit when surged in excess of ratings
- Integrated diode for positive voltage surges

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
- YD/T 1082
- YD/T 993
- YD/T 950

*A-rated parts require series resistance

Electrical Characteristics

| Part Number | Marking | V_{DRM} | V_S | I_H | I_S | I_T | V_T | V_F | Capacitance @ 1MHz, -2V bias | |
|-------------|---------|----------------------|-----------------|--------|--------|-------|--------------------|-------|------------------------------|--------|
| | | @ $I_{DRM} = 5\mu A$ | @ 100V/ μs | | | | @ $I_T = 2.2$ Amps | | pF | |
| | | V min | V max | mA min | mA max | A max | V max | | V max | pF min |
| P0641SALRP | P61A | 58 | 77 | 120 | 800 | 2.2 | 4 | 5 | 50 | 90 |
| P0721SALRP | P71A | 65 | 88 | 120 | 800 | 2.2 | 4 | 5 | 45 | 85 |
| P0901SALRP | P91A | 75 | 98 | 120 | 800 | 2.2 | 4 | 5 | 45 | 80 |
| P1101SALRP | P01A | 95 | 130 | 120 | 800 | 2.2 | 4 | 5 | 40 | 70 |
| P1301SALRP | P131A | 120 | 160 | 120 | 800 | 2.2 | 4 | 5 | 40 | 70 |
| P1701SALRP | P17A | 160 | 200 | 120 | 800 | 2.2 | 4 | 5 | 30 | 55 |
| P0641SCLRP | P61C | 58 | 77 | 120 | 800 | 2.2 | 4 | 5 | 65 | 200 |
| P0721SCLRP | P71C | 65 | 88 | 120 | 800 | 2.2 | 4 | 5 | 60 | 190 |
| P0901SCLRP | P91C | 75 | 98 | 120 | 800 | 2.2 | 4 | 5 | 60 | 180 |
| P1101SCLRP | P01C | 95 | 130 | 120 | 800 | 2.2 | 4 | 5 | 50 | 160 |
| P1301SCLRP | P131C | 120 | 160 | 120 | 800 | 2.2 | 4 | 5 | 50 | 160 |
| P1701SCLRP | P17C | 160 | 200 | 120 | 800 | 2.2 | 4 | 5 | 40 | 130 |

Notes:
- Absolute maximum ratings measured at $T_A = 25^\circ C$ (unless otherwise noted).
- Devices are uni-directional

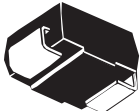
Surge Ratings

| Series | I_{PP} | | | | | | | | | I_{TSM} 50/60 Hz | di/dt |
|--------|----------------------------------------------|----------------------------------------|------------------------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------|--------------------------------------------|----------------------------------------------|-------------------------------------------|-----------------------|-------|
| | 0.2x310 ¹ 0.5x700 ² | 2x10 ¹ 2x10 ² | 8x20 ¹ 1.2x50 ² | 10x160 ¹ 10x160 ² | 10x560 ¹ 10x560 ² | 5x320 ¹ 9x720 ² | 10x360 ¹ 10x360 ² | 10x1000 ¹ 10x1000 ² | 5x310 ¹ 10x700 ² | | |
| | 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 | 20 | 500 |
| C | 50 | 500 | 400 | 200 | 150 | 200 | 175 | 100 | 200 | 30 | 500 |

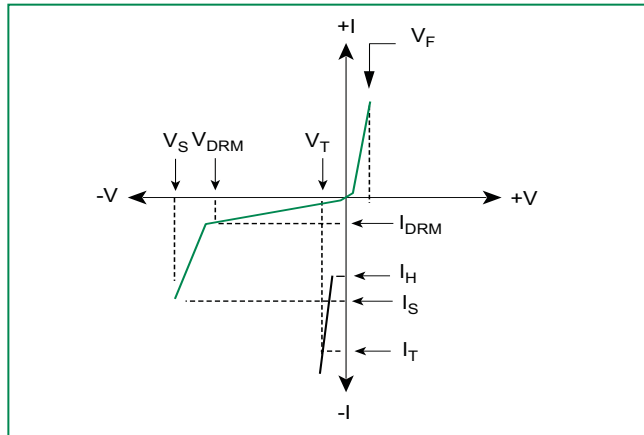
Notes:

- 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°C to +85°C
- The device must initially be in thermal equilibrium with -40°C $\leq T_J \leq$ +150°C

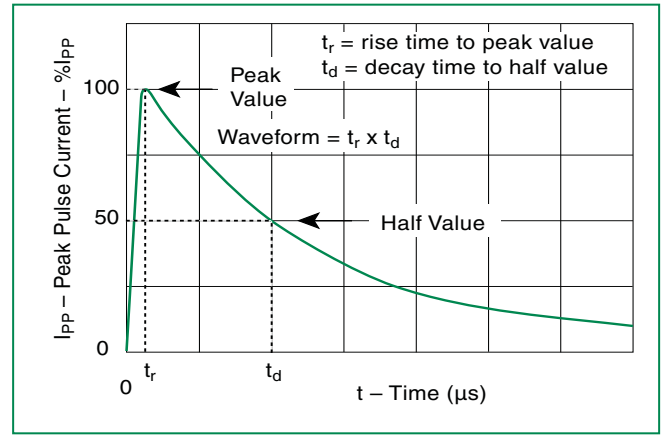
Thermal Considerations

| Package | Symbol | Parameter | Value | Unit |
|-----------------------------------------------------------------------------------------------|-----------------|-----------------------------------------|-------------|------|
| DO-214AA  | T_J | Operating Junction Temperature Range | -40 to +150 | °C |
| | T_S | Storage Temperature Range | -65 to +150 | °C |
| | $R_{\theta JA}$ | Thermal Resistance: Junction to Ambient | 90 | °C/W |

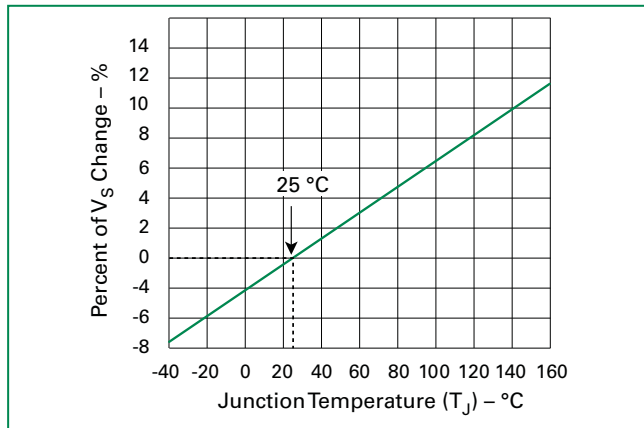
V-I Characteristics



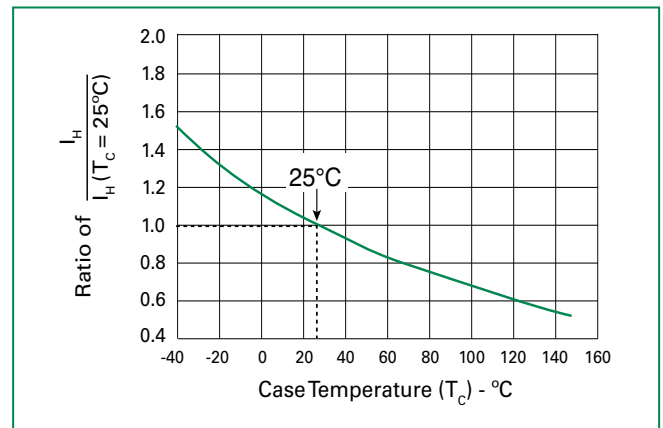
$t_r \times t_d$ Pulse Waveform



Normalized V_S Change vs. Junction Temperature

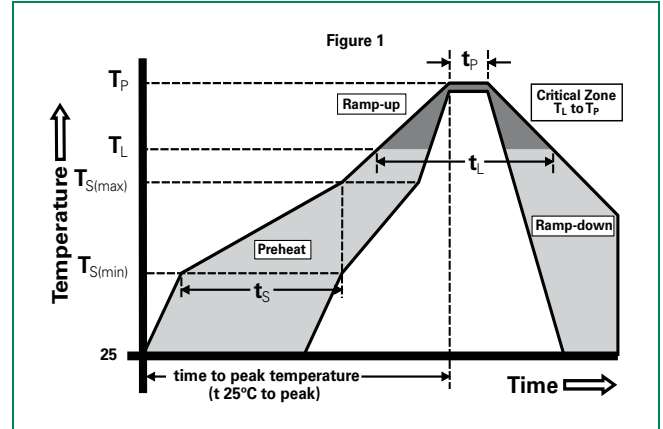


Normalized DC Holding Current vs. Case Temperature



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 |



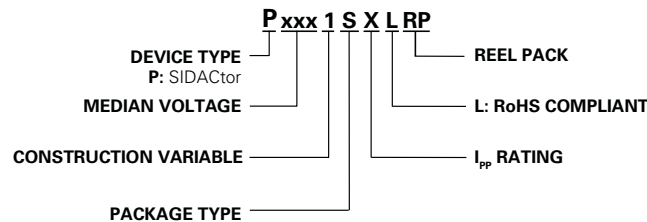
Physical Specifications

| | |
|------------------------|---------------------------------------------------------------|
| Lead Material | Copper Alloy |
| Terminal Finish | 100% Matte-Tin Plated |
| Body Material | UL recognized epoxy meeting flammability classification 94V-0 |

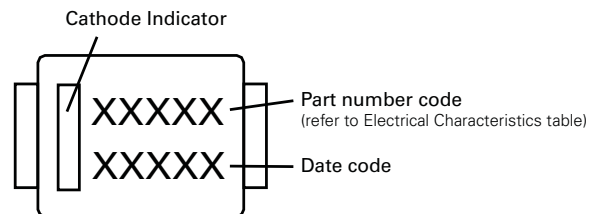
Environmental Specifications

| | |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 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-A-104 |
| 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 |

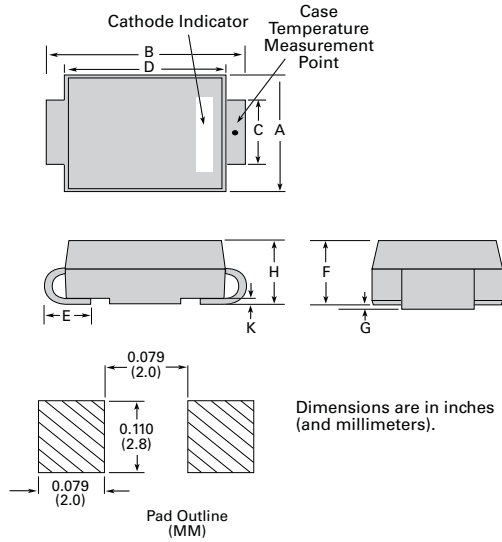
Part Numbering



Part Marking



Dimensions – DO-214AA

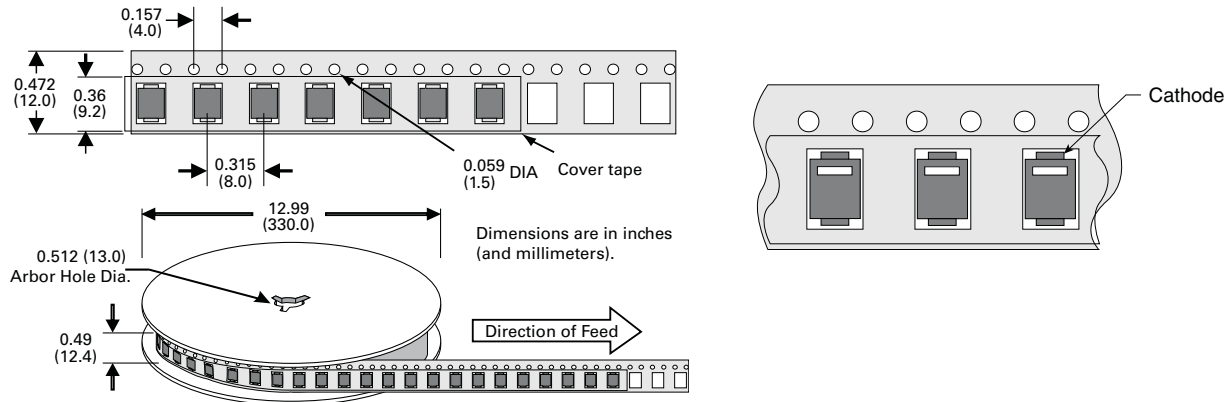


| Dimensions | Inches | | Millimeters | |
|------------|--------|-------|-------------|------|
| | Min | Max | Min | Max |
| A | 0.130 | 0.156 | 3.30 | 3.95 |
| B | 0.201 | 0.220 | 5.10 | 5.60 |
| C | 0.077 | 0.087 | 1.95 | 2.20 |
| D | 0.159 | 0.181 | 4.05 | 4.60 |
| E | 0.030 | 0.063 | 0.75 | 1.60 |
| 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 Tape & Reel Pack | 2500 | RP | EIA-481-D |

Tape and Reel Specification – DO-214AA



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