

RoHS SIDACtor® Series - DO-15



Agency Approvals

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

Pinout Designation

Not Applicable

Schematic Symbol



Description

The SIDACtor Series DO-15 are designed to protect baseband equipment such as modems, line cards, CPE and DSL from damaging overvoltage transients.

The series provides a cost-effective through-hole solution that enables equipment to comply with global regulatory standards.

Features and Benefits

- Low voltage overshoot
- Low on-state voltage
- Does not degrade with use
- Fails short circuit when surged in excess of ratings
- Low Capacitance

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/B-rated parts require series resistance

Electrical Characteristics

| Part Number | Marking | V_{DRM} @ $I_{DRM}=5\mu A$ | V_s @ 100V/ μs | I_H | I_s | I_T | V_T @ $I_T=2.2$ Amps | Capacitance @ 1MHz, 2V bias | |
|-------------|---------|---------------------------------|--------------------------|--------|--------|-------|---------------------------|--------------------------------|--------|
| | | V min | V max | mA min | mA max | A max | V max | pF min | pF max |
| P1100GALRP | P11A | 90 | 130 | 150 | 800 | 2.2 | 5 | 30 | 60 |
| P1300GALRP | P13A | 120 | 160 | 150 | 800 | 2.2 | 5 | 25 | 40 |
| P1500GALRP | P15A | 140 | 180 | 150 | 800 | 2.2 | 5 | 25 | 40 |
| P1800GALRP | P18A | 170 | 220 | 150 | 800 | 2.2 | 5 | 25 | 40 |
| P2300GALRP | P23A | 190 | 260 | 150 | 800 | 2.2 | 5 | 25 | 30 |
| P2600GALRP | P26A | 220 | 300 | 150 | 800 | 2.2 | 5 | 25 | 30 |
| P3100GALRP | P31A | 275 | 350 | 150 | 800 | 2.2 | 5 | 20 | 30 |
| P3500GALRP | P35A | 320 | 400 | 150 | 800 | 2.2 | 5 | 20 | 30 |
| P1100GBLRP | P11B | 90 | 130 | 150 | 800 | 2.2 | 5 | 30 | 60 |
| P1300GBLRP | P13B | 120 | 160 | 150 | 800 | 2.2 | 5 | 25 | 40 |
| P1500GBLRP | P15B | 140 | 180 | 150 | 800 | 2.2 | 5 | 25 | 40 |
| P1800GBLRP | P18B | 170 | 220 | 150 | 800 | 2.2 | 5 | 25 | 40 |
| P2300GBLRP | P23B | 190 | 260 | 150 | 800 | 2.2 | 5 | 25 | 30 |
| P2600GBLRP | P26B | 220 | 300 | 150 | 800 | 2.2 | 5 | 25 | 30 |
| P3100GBLRP | P31B | 275 | 350 | 150 | 800 | 2.2 | 5 | 20 | 30 |
| P3500GBLRP | P35B | 320 | 400 | 150 | 800 | 2.2 | 5 | 20 | 30 |

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

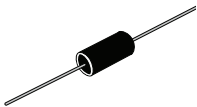
Surge Ratings

| Series | I_{PP} | | I_{TSM} |
|--------|--|--|------------|
| | 10x560 ¹ 10x560 ² | 10x1000 ¹ 10x1000 ² | 50 / 60 Hz |
| | Amps min | Amps min | Amps min |
| A | 50 | 45 | 20 |
| B | 100 | 80 | 25 |

Notes:

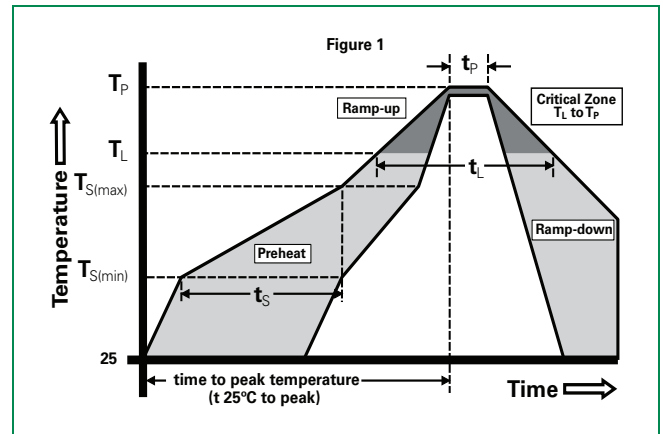
- 1 Current waveform in μs
- 2 Voltage waveform in μs
- Peak pulse current rating (I_{PP}) is repetitive and guaranteed for the life of the product.
- I_{PP} ratings applicable over temperature range of -40 to +85°C
- The device must initially be in thermal equilibrium with -40°C $\leq T_J \leq$ +150°C

Thermal Considerations

| Package | Symbol | Parameter | Value | Unit |
|---|-----------------|---|-------------|------|
|  DO-15 | 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 | 60 | °C/W |

Soldering Parameters

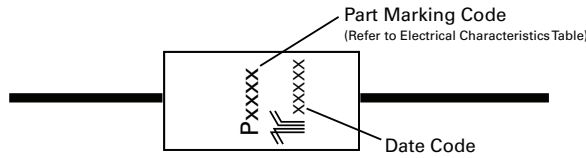
| | | |
|--|------------------------------------|-------------------------------|
| Reflow Condition | | Pb-Free assembly (see Fig. 1) |
| Pre Heat | - Temperature Min ($T_{s(min)}$) | +150°C |
| | - Temperature Max ($T_{s(max)}$) | +200°C |
| | - Time (Min to Max) (t_s) | 60-180 secs. |
| Average ramp 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 |



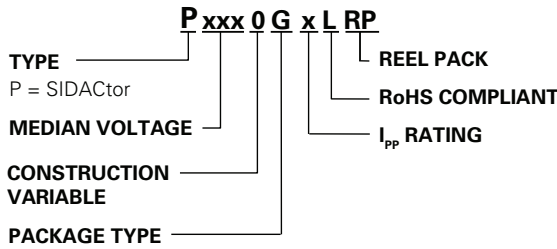
Physical Specifications

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

Part Marking



Part Numbering



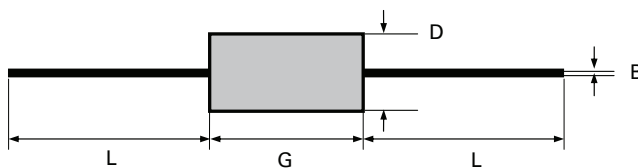
Environmental Specifications

| | |
|---|---|
| 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 |

Packing Options

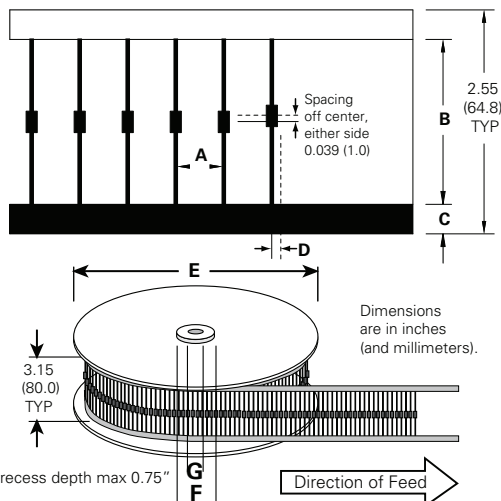
| Package Type | Description | Quantity | Added Suffix | Industry Standard |
|--------------|-------------------------|----------|--------------|-------------------|
| G | DO-15 Axial Tape & Reel | 5000 | RP | EIA-RS-296-D |

Dimensions — DO-15



| Dimension | Inches | | Millimeters | |
|-----------|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| B | 0.028 | 0.034 | 0.711 | 0.864 |
| D | 0.12 | 0.14 | 3.048 | 3.556 |
| G | 0.235 | 0.27 | 5.969 | 6.858 |
| L | 1 | | 25.4 | |

Tape and Reel Specification — DO-15



| Symbols | Description | Inches | MM |
|----------|----------------------------------|----------------|---------------|
| A | Component Spacing (lead to lead) | 0.200 ± 0.020" | 5.08 ± 0.508 |
| B | Inner Tape Pitch | 2.062 ± 0.059" | 52.37 ± 1.498 |
| C | Tape Width | 0.250" | 6.35 |
| D | Max. Off Alignment | 0.048" | 1.219 |
| E | Reel Dimension | 13" | 330.2 |
| F | Max. Hub Recess | 3" | 76.19 |
| G | Max. Arbor Hole | 0.68" | 17.27 |