

SR70 Series

70V 40A Diode Array



Additional Information



Resources



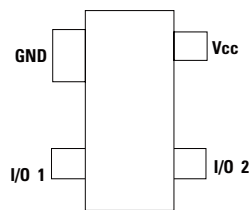
Accessories



Samples

Pinout

SOT-143-4



Description

The SR70 consists of four, low capacitance, rail-to-rail diodes that provide protection against ESD and lightning surge events. These robust diodes can safely absorb up to 40A ($t_p=8/20\mu s$) and repetitive ESD strikes at the maximum level (Level 4) specified in the IEC 61000-4-2 international standard without performance degradation.

Its low loading capacitance makes it ideal for protecting high-speed data lines such as VDSL and VDSL2.

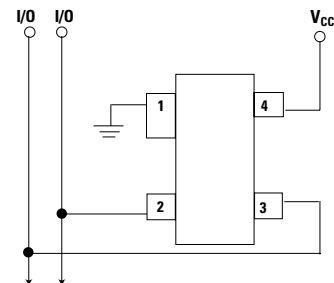
Features & Benefits

- ESD, IEC61000-4-2, $\pm 30kV$ contact discharge, $\pm 30kV$ air discharge
- EFT, IEC61000-4-4, 80A ($t_p=5/50ns$)
- Lightning protection, IEC61000-4-5, 40A ($t_p=8/20\mu s$)
- Low capacitance of 2.0pF (TYP) per I/O
- Low clamp voltage
- Small SOT143 (JEDEC TO-253) packaging

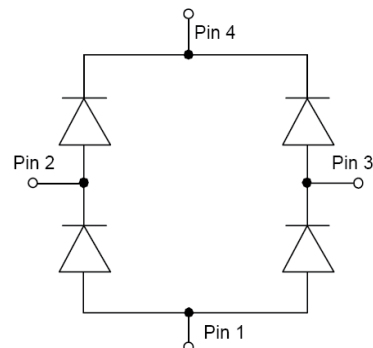
Applications

- xDSL Lines
- Video Lines
- Customer Premises Equipment
- 10/100/1000 Ethernet

Application Example



Functional Block Diagram



Life Support Note:

Not Intended for Use in Life Support or Life Saving Applications

The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.

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Absolute Maximum Ratings

| Symbol | Parameter | Value | Units |
|------------|----------------------------------|------------|-------|
| I_{PP} | Peak Current ($t_p=8/20\mu s$) | 40.0 | A |
| T_{OP} | Operating Temperature | -40 to 125 | °C |
| T_{STOR} | Storage Temperature | -55 to 150 | °C |

Caution: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Thermal Information

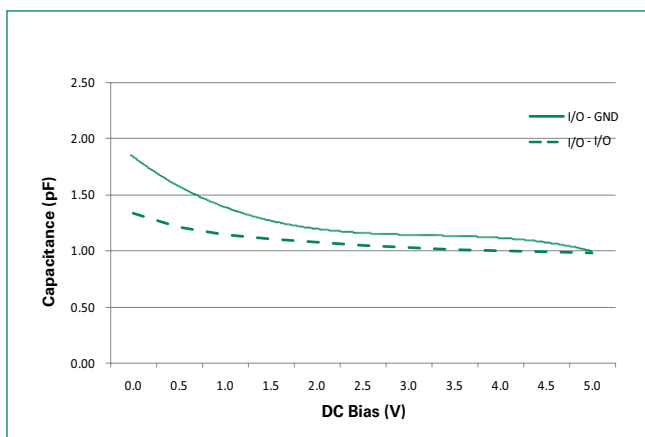
| Parameter | Rating | Units |
|---|------------|-------|
| Storage Temperature Range | -55 to 150 | °C |
| Maximum Junction Temperature | 150 | °C |
| Maximum Lead Temperature (Soldering 20-40s) | 260 | °C |

Electrical Characteristics ($T_{OP}=25^\circ C$)

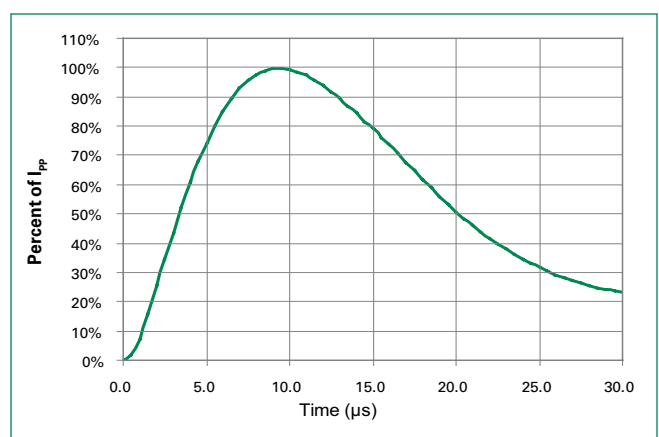
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|------------------------------------|---------------|-------------------------------------|----------|------|-----|----------|
| Reverse Standoff Voltage | V_{RWM} | | | | 70 | V |
| Reverse Leakage Current | I_{LEAK} | $V_R=70V$ | | | 5 | μA |
| Clamp Voltage ¹ | V_C | $I_{PP}=1A, t_p=8/20\mu s, Fwd$ | | 1.4 | | V |
| | | $I_{PP}=10A, t_p=8/20\mu s, Fwd$ | | 4.7 | | V |
| | | $I_{PP}=30A, t_p=8/20\mu s, Fwd$ | | 12 | | V |
| Dynamic Resistance | R_{DYN} | $(V_{C2}-V_{C1})/(I_{PP2}-I_{PP1})$ | | 0.35 | | Ω |
| ESD Withstand Voltage ¹ | V_{ESD} | IEC61000-4-2 (Contact) | ± 30 | | | kV |
| | | IEC61000-4-2 (Air) | ± 30 | | | kV |
| Diode Capacitance ¹ | $C_{I/O-GND}$ | Reverse Bias=0V, f=1MHz | | 2.0 | 3.0 | pF |
| | $C_{I/O-I/O}$ | Reverse Bias=0V, f=1MHz | | 1.3 | 2.0 | pF |

Note: 1. Parameter is guaranteed by design and/or device characterization.

Capacitance vs. Reverse Bias



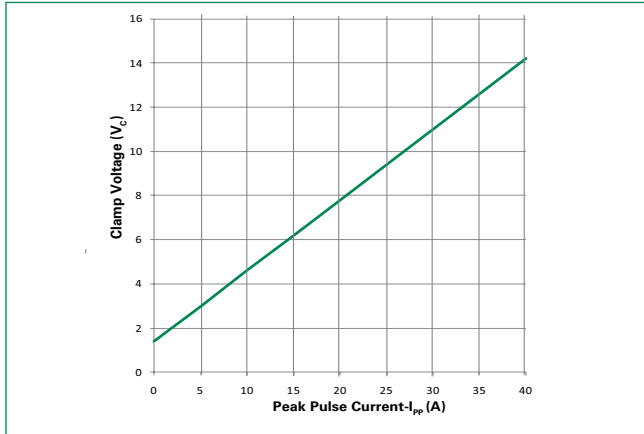
Pulse Waveform



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Clamping Voltage vs. I_{pp}



Product Characteristics

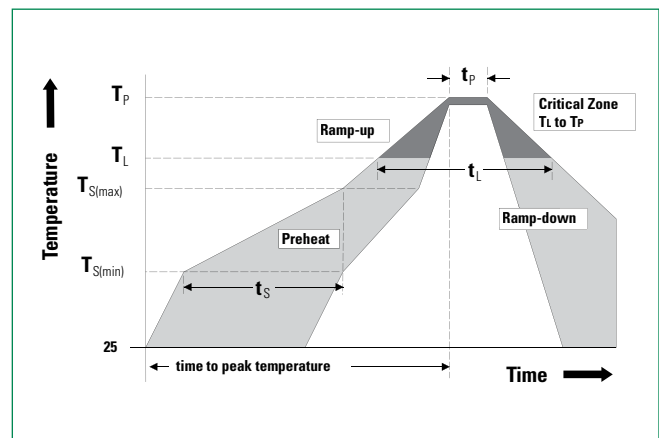
| | |
|----------------------------|-------------------------|
| Lead Plating | Matte Tin |
| Lead Material | Copper Alloy |
| Lead Coplanarity | 0.0004 inches (0.102mm) |
| Substitute Material | Silicon |
| Body Material | Molded Epoxy |
| Flammability | UL 94 V-0 |

Notes :

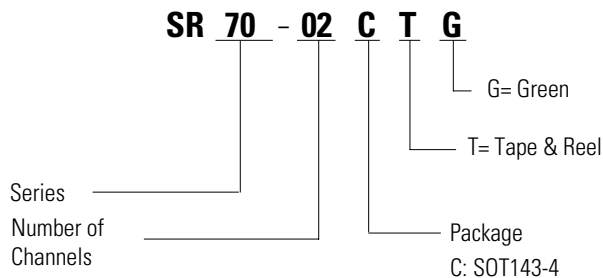
1. All dimensions are in millimeters
2. Dimensions include solder plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. Blo is facing up for mold and facing down for trim/form, i.e. reverse trim/form.
5. Package surface matte finish VDI 11-13.

Soldering Parameters

| | | |
|--|------------------------------------|------------------|
| Reflow Condition | Pb – Free assembly | |
| 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/second max | |
| $T_{s(max)}$ to T_L - Ramp-up Rate | 3°C/second max | |
| Reflow | - Temperature (T_L) (Liquidus) | 217°C |
| | - Temperature (t_L) | 60 – 150 seconds |
| Peak Temperature (T_p) | 260 ^{+0/-5} °C | |
| Time within 5°C of actual peak Temperature (t_p) | 20 – 40 seconds | |
| Ramp-down Rate | 6°C/second max | |
| Time 25°C to peak Temperature (T_p) | 8 minutes Max. | |
| Do not exceed | 260°C | |



Part Numbering System



Ordering Information

| Part Number | Package | Marking | Min. Order Qty. |
|-------------|---------|---------|-----------------|
| SR70-02CTG | SOT143 | 702C | 3000 |

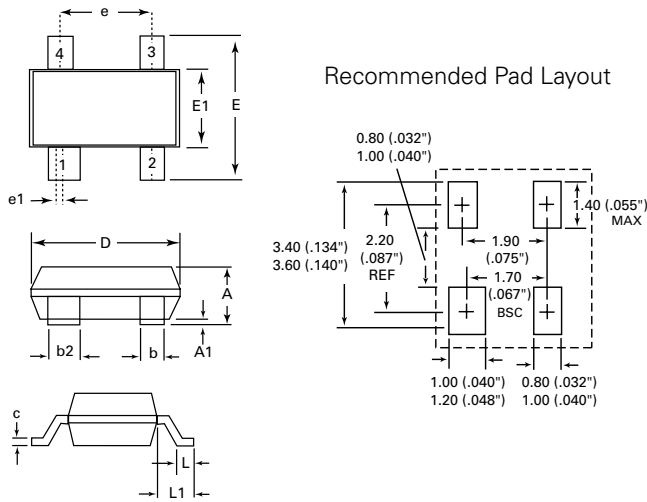
Part Marking System



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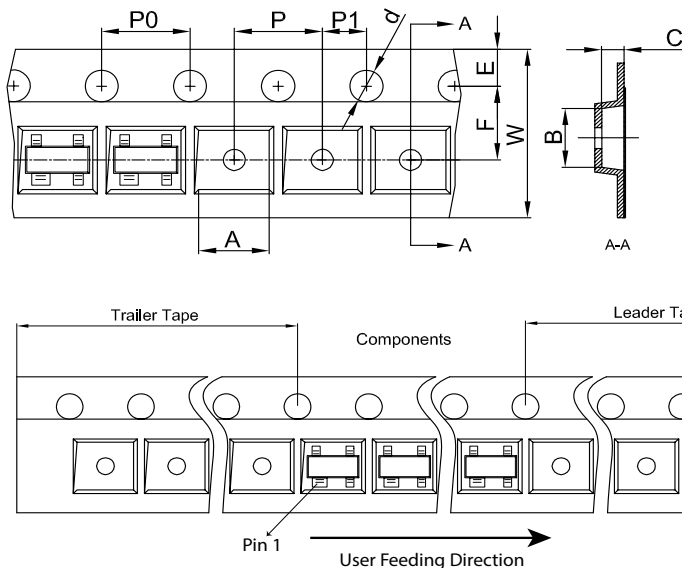
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Package Dimensions—SOT143



| Package | SOT143 | | | |
|-----------|-------------|------|-----------|-------|
| Pins | 4 | | | |
| JEDEC | TO-253 | | | |
| | Millimeters | | Inches | |
| | Min | Max | Min | Max |
| A | 0.8 | 1.22 | 0.03 | 0.048 |
| A1 | 0.05 | 0.15 | 0.002 | 0.006 |
| b | 0.30 | 0.50 | 0.012 | 0.020 |
| b2 | 0.76 | 0.89 | 0.030 | 0.035 |
| c | 0.08 | 0.20 | 0.003 | 0.008 |
| D | 2.80 | 3.04 | 0.110 | 0.120 |
| E | 2.10 | 2.64 | 0.082 | 0.104 |
| E1 | 1.20 | 1.40 | 0.047 | 0.055 |
| e | 1.92 BSC | | 0.076 BSC | |
| e1 | 0.20 BSC | | 0.008 BSC | |
| L | 0.4 | 0.6 | 0.016 | 0.024 |
| L1 | 0.550 REF | | 0.022 REF | |

Embossed Carrier Tape & Reel Specification—SOT143



| Symbol | Millimeters |
|-----------|-------------|
| A | 3.19±0.10 |
| B | 2.8±0.10 |
| C | 1.31±0.10 |
| d | ∅ 1.50±0.10 |
| E | 1.75±0.10 |
| F | 3.50±0.10 |
| P0 | 4.00±0.10 |
| P | 4.00±0.10 |
| P1 | 2.00±0.10 |
| W | 8.00±0.10 |

Notes:
1. All dimensions are in millimeters

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