

SOT-143 Plastic-Encapsulate Diodes

DESCRIPTION

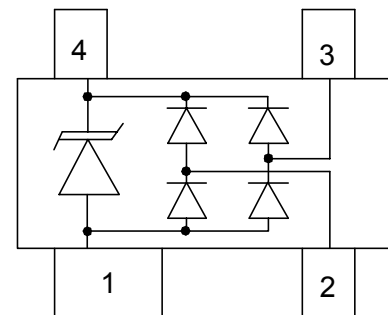
SR05LC provides a typical line to line capacitance of 0.6pF and low insertion loss up to 3GHz providing greater signal integrity making it ideally suited for USB 2.0 applications, such as Digital TVs, DVD players, Computing, set-top boxes and MDDI applications in mobile computing devices.

This device has been specifically designed to protect sensitive components which are connected to high-speed data and transmission lines from overvoltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients).

Features

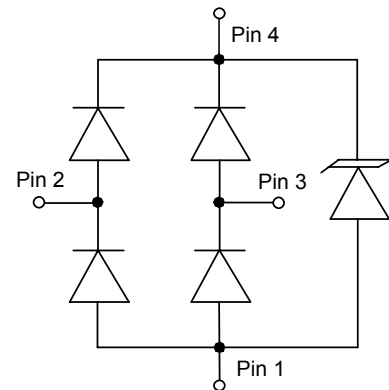
- ◆ Protects two I/O lines and one Vcc line
- ◆ Transient protection for asymmetrical data lines to IEC61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact)
IEC61000-4-4 (EFT) 40A (5/50ns)
- ◆ Low capacitance
- ◆ Low leakage current
- ◆ Low clamping voltage
- ◆ No insertion to 3.0 GHz
- ◆ 5V operating voltage
- ◆ Response time < 1ns
- ◆ Solid-state silicon avalanche technology
- ◆ Meets MSL 1 Requirements

Schematic & Pin Configuration



SOT-143 (Top View)

Circuit Diagram



Applications

- ◆ xDSL
- ◆ USB 1.1/2.0/OTG
- ◆ IEEE 1394 Firewire Ports
- ◆ Notebooks & Handhelds
- ◆ Projection TV & Monitors
- ◆ Set-top box
- ◆ Flat Panel Displays

Mechanical Characteristics

- ◆ Package: SOT-143
- ◆ Flammability Rating: UL 94V-0
- ◆ Terminal: Matte tin plated.
- ◆ High temperature soldering guaranteed: 260 °C/10s
- ◆ Marking: SL3 or R05
- ◆ Packaging: Tape and Reel

**Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)**

| Parameter | Symbol | Value | Unit |
|--|------------------|---------------------|------|
| Peak Pulse Power(8/20us) | P _{PP} | 125 | W |
| Peak Pulse Current(8/20us) | I _{PP} | 5 | A |
| ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact) | V _{ESD} | ± 15 ± 8 | KV |
| Operating Temperature | T _{OPT} | -55 to +150 | °C |
| Storage Temperature | T _{STG} | -55 to +150 | °C |
| Lead Solder Temperature – Maximum (10 Second Duration) | T _L | 260(10 sec.) | °C |

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

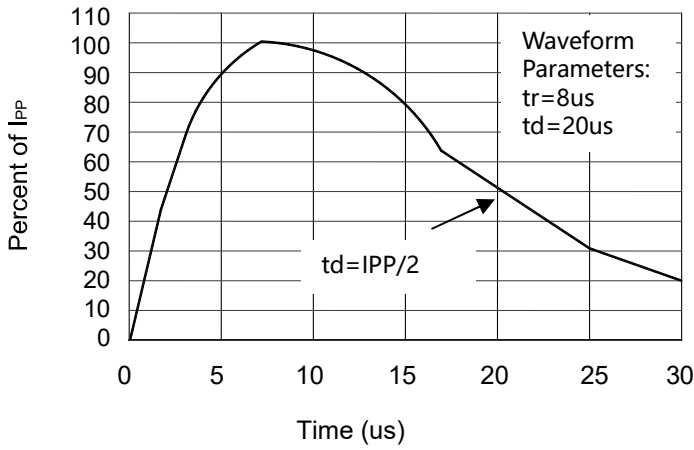
| Symbol | Parameter | Test Condition | Min | Typ | Max | Units |
|------------------|---------------------------|---|-----|------|------|-------|
| V _{RWM} | Reverse Working Voltage | Any I/O pin to GND | | | 5.0 | V |
| V _{BR} | Reverse Breakdown Voltage | I _T = 1mA Any I/O pin to GND | 6.0 | | | V |
| I _R | Reverse Leakage Current | V _{RWM} = 5V Any I/O pin to GND | | | 1 | μA |
| V _F | Diode Forward Voltage | I _F = 15mA | | 0.85 | 1.2 | V |
| V _{C1} | Clamping Voltage 1 | I _{PP} = 1A, t _p = 8/20μs Any I/O pin to GND | | | 15.5 | V |
| V _{C2} | Clamping Voltage 2 | I _{PP} = 5A, t _p = 8/20μs Any I/O pin to GND | | | 25 | V |
| I _{PP} | Peak Pulse Current | t _p = 8/20μs Any I/O pin to GND | | | 5 | A |
| C _{J1} | Junction Capacitance 1 | V _R = 0V, f = 1MHz Between I/O pins | | 0.45 | 0.6 | pF |
| C _{J2} | Junction Capacitance 2 | V _R = 0V, f = 1MHz Any I/O pin to GND | | 0.9 | 1.2 | pF |

Note: I/O pins are pin2,3.

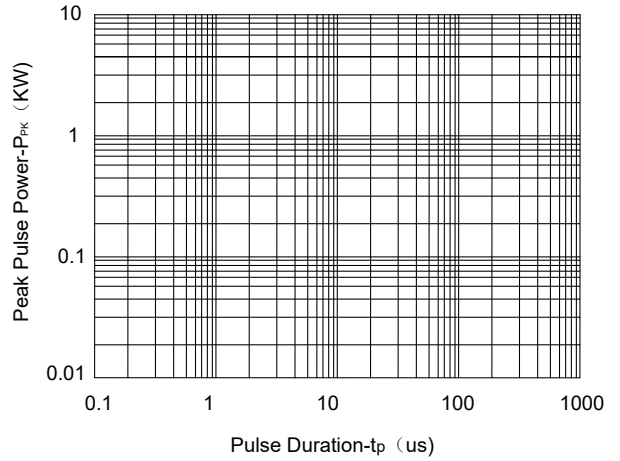
The above data are for reference only.



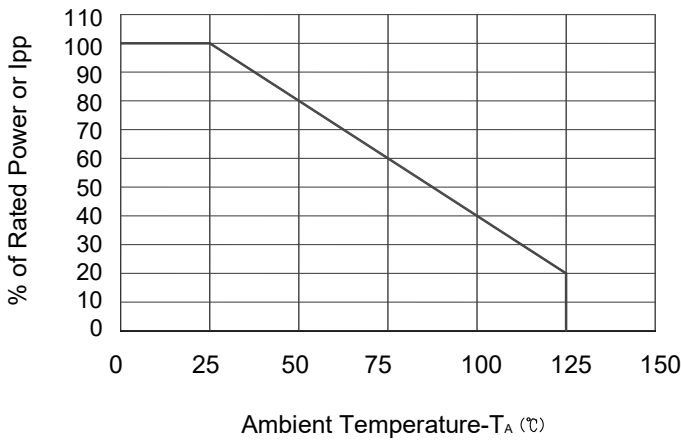
ELECTRICAL CHARACTERISTICS CURVE



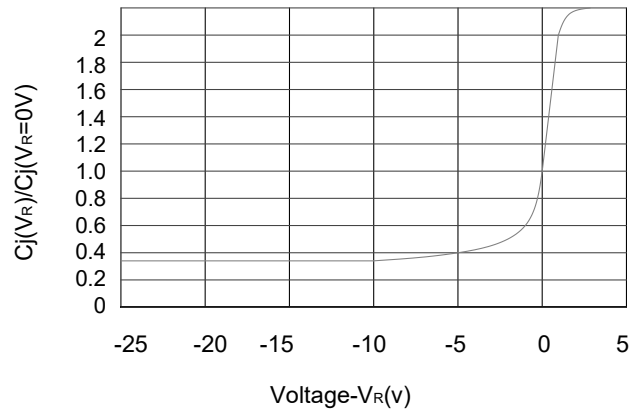
Pulse Waveform



Non-Repetitive Peak Pulse Power vs. Pulse Time



Power Derating Curve

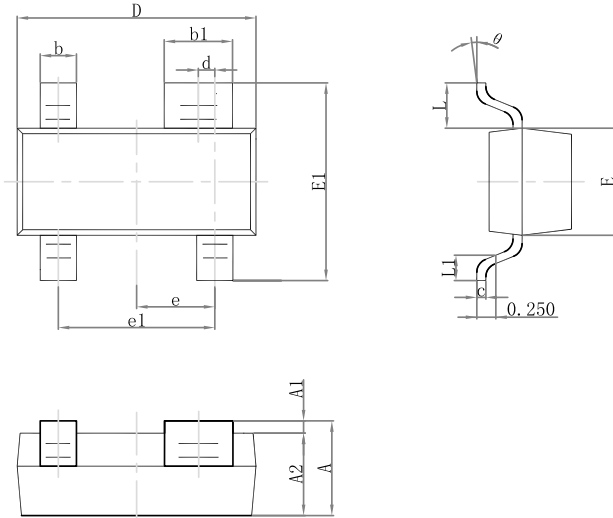


Junction Capacitance vs. Reverse Voltage

The curve above is for reference only.

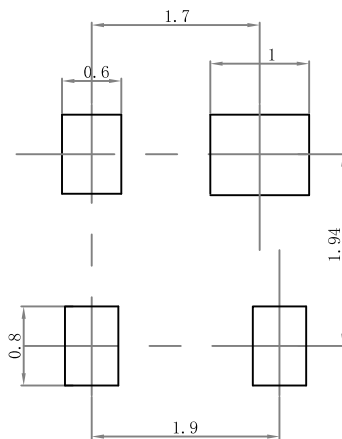
Outline Drawing

SOT-143 Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| b1 | 0.750 | 0.900 | 0.030 | 0.035 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| d | 0.200 TYP. | | 0.008 TYP. | |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP. | | 0.037 TYP. | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF. | | 0.022 REF. | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

Suggested Pad Layout

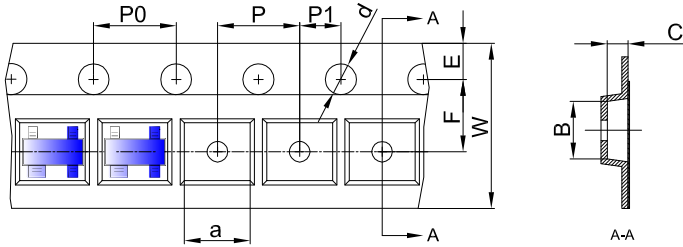


Note:

1. Controlling dimension: in/millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

Tape and Reel Information

SOT-143 Embossed Carrier Tape



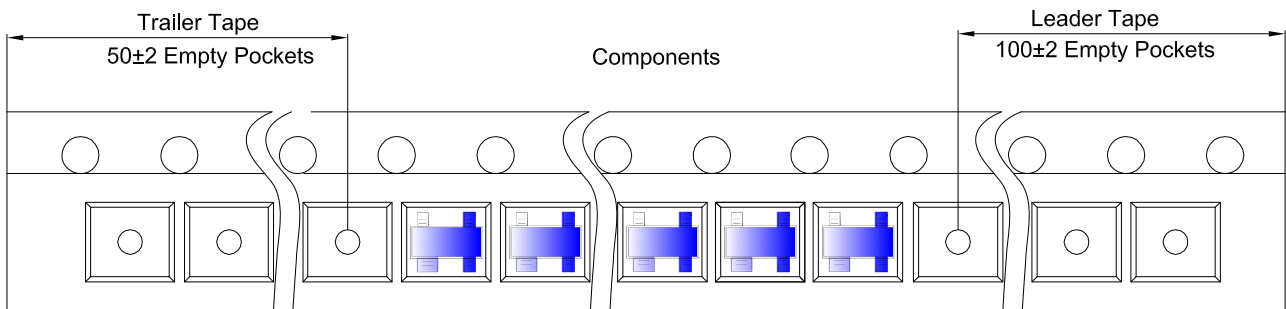
Packaging Description:

SOT-143 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

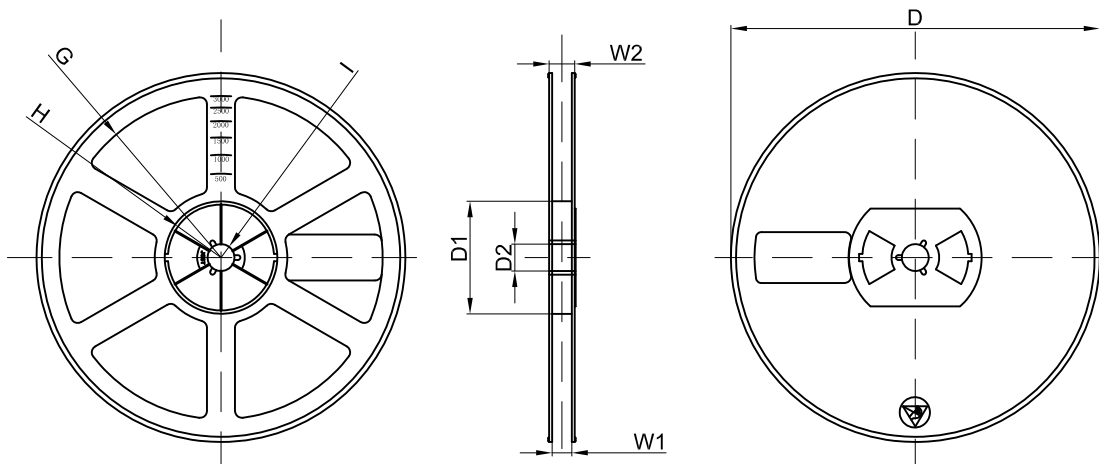
Dimensions are in millimeter

| Pkg type | a | B | C | d | E | F | P0 | P | P1 | W |
|----------|------|------|------|-------|------|------|------|------|------|------|
| SOT-143 | 3.19 | 2.80 | 1.31 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

SOT-143 Tape Leader and Trailer



SOT-143 Reel



Dimensions are in millimeter

| Reel Option | D | D1 | D2 | G | H | I | W1 | W2 |
|-------------|---------|-------|-------|--------|--------|-------|------|-------|
| 7" Dia | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |

| REEL | Reel Size | Box | Box Size(mm) | Carton | Carton Size(mm) | G.W.(kg) |
|----------|-----------|------------|--------------|-------------|-----------------|----------|
| 3000 pcs | 7 Inch | 45,000 pcs | 203×203×195 | 180,000 pcs | 438×438×220 | |