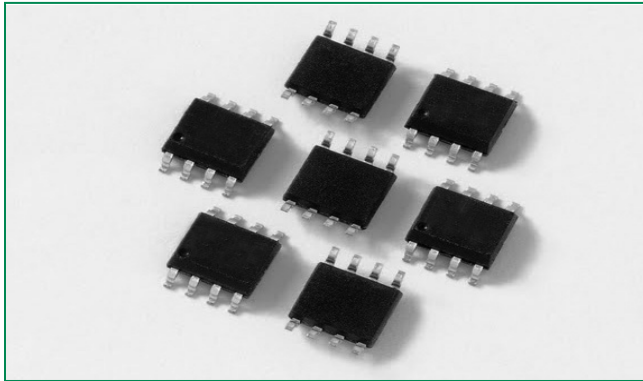
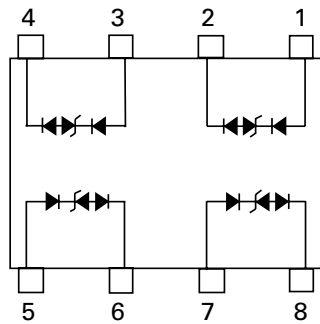


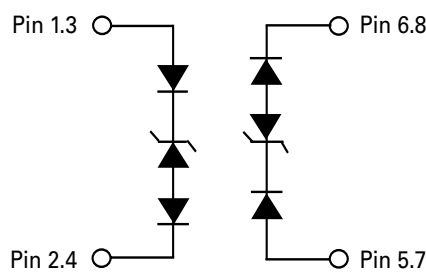
SLVU2.8-4 Series 2.8V 40A TVS Array



Pinout



Functional Block Diagram



Additional Information



Description

The SLVU2.8-4 was designed to protect low voltage, CMOS devices from ESD and lightning induced transients. There is a compensating diode in series with each low voltage TVS to present a low loading capacitance to the line being protected. These robust structures can safely absorb repetitive ESD strikes at $\pm 30\text{kV}$ (contact discharge) per IEC 61000-4-2 standard and each structure can safely dissipate up to 40A (IEC 61000-4-5 2nd edition, $t_p=8/20\mu\text{s}$) with very low clamping voltages.

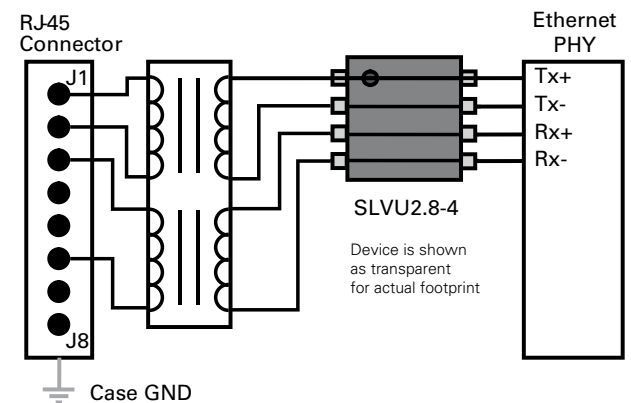
Features

- ESD, IEC 61000-4-2, $\pm 30\text{kV}$ contact, $\pm 30\text{kV}$ air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, IEC 61000-4-5 2nd edition, 40A (8/20 μs)
- Low capacitance of 2pF per line
- Low leakage current of 1 μA (MAX) at 2.8V
- SOIC-8 (JEDEC MO-012) pin configuration allows for simple flow-through layout
- RoHS Compliant and Lead Free
- Moisture Sensitivity Level (MSL-1)

Applications

- 10/100/1000 Ethernet
- WAN/LAN Equipment
- Switching Systems
- Desktops, Servers, and Notebooks
- Analog Inputs
- Base Stations

Application Example



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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|------------------------------------|------------|---|----------|------|------|---------------|
| Reverse Standoff Voltage | V_{RWM} | $I_R \leq 1\mu\text{A}$ | | | 2.8 | V |
| Reverse Breakdown Voltage | V_{BR} | $I_T = 2\mu\text{A}$ | 3.0 | | | V |
| Snap Back Voltage | V_{SB} | $I_T = 50\text{mA}$ | 2.8 | | | V |
| Reverse Leakage Current | I_{LEAK} | $V_R = 2.8\text{V}$ (Each Line) | | | 1 | μA |
| Clamping Voltage ¹ | V_C | $I_{PP} = 5\text{A}$, $t_p = 8/20\mu\text{s}$ (Each Line) | | 7.0 | 8.5 | V |
| Clamping Voltage ¹ | V_C | $I_{PP} = 24\text{A}$, $t_p = 8/20\mu\text{s}$ (Each Line) | | 13.9 | 15.0 | V |
| ESD Withstand Voltage ¹ | V_{ESD} | IEC61000-4-2 (Contact) | ± 30 | | | kV |
| | | IEC61000-4-2 (Air) | ± 30 | | | kV |
| Dynamic Resistance | R_{DYN} | $(V_{C2} - V_{C1}) / (I_{PP2} - I_{PP1})$ (Each Line) | | 0.4 | | Ω |
| Diode Capacitance ¹ | C_D | $V_R = 0\text{V}$, $f = 1\text{MHz}$ (Each Line) | | 2.0 | 2.5 | pF |

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

Absolute Maximum Ratings

| Parameter | Rating | Units |
|--|------------|--------------------|
| Peak Pulse Power ($t_p = 8/20\mu\text{s}$) | 600 | W |
| Peak Pulse Current ($t_p = 8/20\mu\text{s}$) | 40 | A |
| Operating Temperature | -40 to 125 | $^{\circ}\text{C}$ |
| Storage Temperature | -55 to 150 | $^{\circ}\text{C}$ |

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.

Figure 1: Capacitance vs. Reverse Voltage

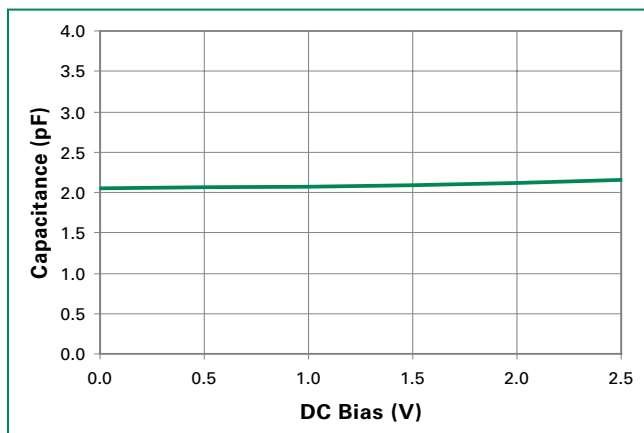


Figure 2: Clamping Voltage vs. I_{PP}

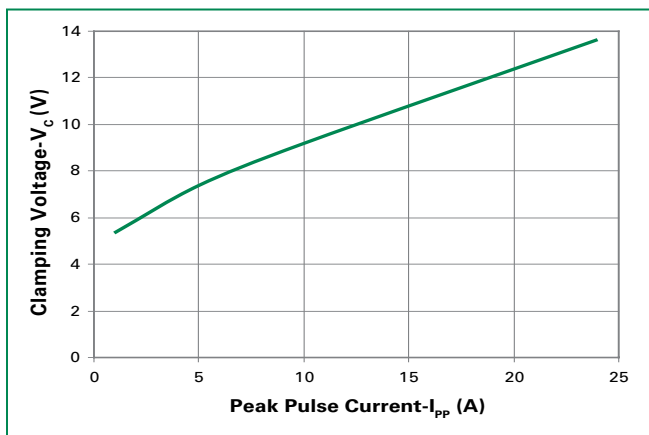
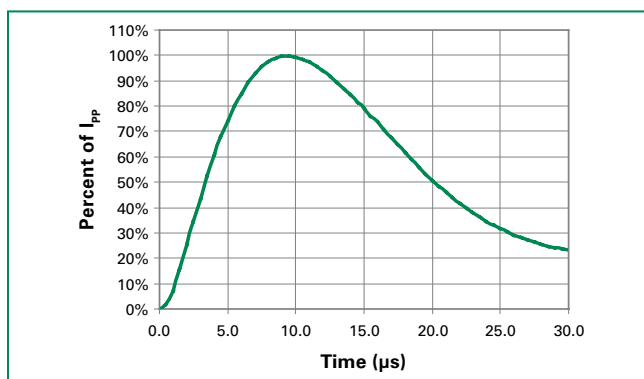


Figure 3: 8/20 μs Pulse Waveform



Product Characteristics

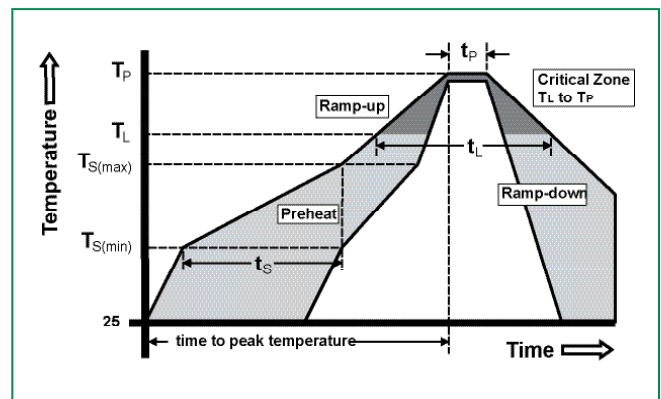
| | |
|----------------------------|----------------------------|
| Lead Plating | Matte Tin |
| Lead Material | Copper Alloy |
| Lead Coplanarity | 0.0004 inches (0.102mm) |
| Substitute Material | Silicon |
| Body Material | V-0 per UL 94 Molded Epoxy |

Notes :

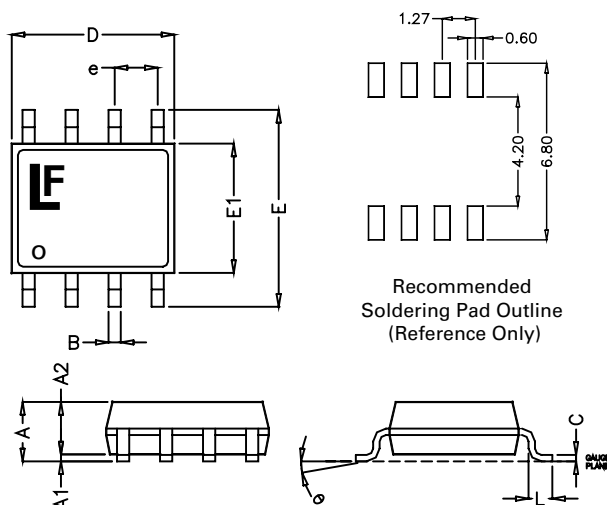
1. All dimensions are in millimeters
2. Dimensions include solder plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. All specifications comply to JEDEC SPEC MO-203 Issue A
5. Blo is facing up for mold and facing down for trim/form, i.e. reverse trim/form.
6. Package surface matte finish 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 | | 5°C/second max |
| $T_{S(max)}$ to T_L - Ramp-up Rate | | 5°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 | | 5°C/second max |
| Time 25°C to peak Temperature (T_p) | | 8 minutes Max. |
| Do not exceed | | 260°C |

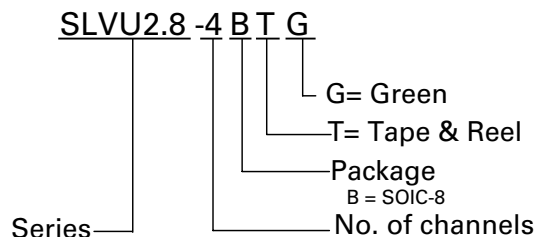


Package Dimensions — Mechanical Drawings and Recommended Solder Pad Outline



| | | | | |
|----------------|-------------|------|-----------|-------|
| Package | SOIC-8 | | | |
| Pins | 8 | | | |
| JEDEC | MS-012 | | | |
| | Millimetres | | Inches | |
| | Min | Max | Min | Max |
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A1 | 0.10 | 0.25 | 0.004 | 0.010 |
| A2 | 1.25 | 1.65 | 0.050 | 0.065 |
| B | 0.31 | 0.51 | 0.012 | 0.020 |
| c | 0.17 | 0.25 | 0.007 | 0.010 |
| D | 4.80 | 5.00 | 0.189 | 0.197 |
| E | 5.80 | 6.20 | 0.228 | 0.244 |
| E1 | 3.80 | 4.00 | 0.150 | 0.157 |
| e | 1.27 BSC | | 0.050 BSC | |
| L | 0.40 | 1.27 | 0.016 | 0.050 |

Part Numbering System



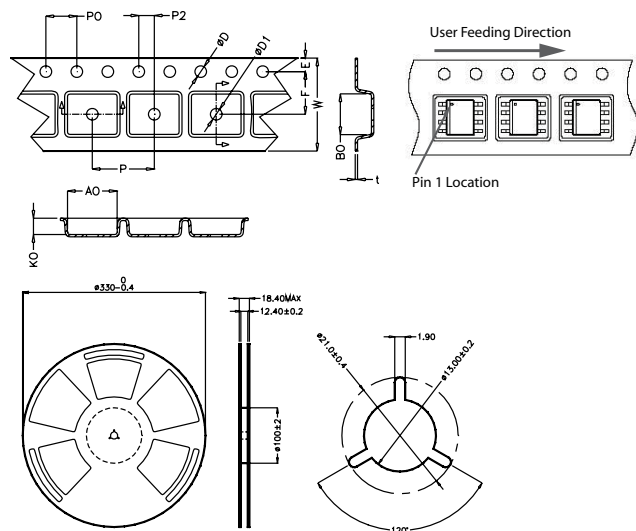
Part Marking System



Ordering Information

| Part Number | Package | Marking | Min. Order Qty. |
|--------------|---------|---------|-----------------|
| SLVU2.8-4BTG | SOIC-8 | U2.8-4 | 2500 |

Embossed Carrier Tape & Reel Specification — SOIC Package



| Symbol | Millimetres | | Inches | |
|-------------|-------------|------|---------------|-------|
| | Min | Max | Min | Max |
| E | 1.65 | 1.85 | 0.065 | 0.073 |
| F | 5.4 | 5.6 | 0.213 | 0.22 |
| P2 | 1.9 | 2.1 | 0.075 | 0.083 |
| D | 1.5 | 1.6 | 0.059 | 0.063 |
| D1 | 1.50 Min | | 0.059 Min | |
| P0 | 3.9 | 4.1 | 0.154 | 0.161 |
| 10P0 | 40.0 ± 0.20 | | 1.574 ± 0.008 | |
| W | 11.9 | 12.1 | 0.468 | 0.476 |
| P | 7.9 | 8.1 | 0.311 | 0.319 |
| A0 | 6.3 | 6.5 | 0.248 | 0.256 |
| B0 | 5.1 | 5.3 | 0.2 | 0.209 |
| K0 | 2 | 2.2 | 0.079 | 0.087 |
| t | 0.30 ± 0.05 | | 0.012 ± 0.002 | |

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.