

Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

The LBD8C12L01 is designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computer, and PDAs. It offer superior electrical characteristics such as lower clamping voltage and no device degradation when compared to MLVs. It is designed to protect sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD), lightning, electrical fast transients (EFT), and cable discharge events (CDE).

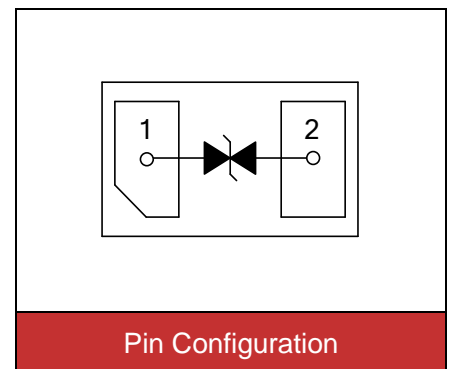


Contact: ±25kV
Air: ±25kV



Features

- IEC61000-4-2 ESD 25KV Air, 25KV contact compliance
- SOD882 surface mount package
- Working voltage: 12V
- Low leakage current
- Low operating and clamping voltages
- Solid-state silicon avalanche technology
- RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270°C
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020
- Marking: 12B



Applications

- Cellular Handsets & Accessories
- Personal Digital Assistants (PDAs)
- Notebooks & Handhelds
- Portable Instrumentation
- Digital Cameras

Maximum Ratings

| Rating | Symbol | Value | Unit |
|---------------------------------------|----------------|----------|------|
| ESD voltage (Contact discharge) | V_{ESD} | ±25 | kV |
| ESD voltage (Air discharge) | | ±25 | |
| Storage & operating temperature range | T_{STG}, T_J | -55~+150 | °C |

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

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---------------|------------------------------|------|------|------|---------------|
| Reverse stand-off voltage | V_{RWM} | | | | 12 | V |
| Reverse breakdown voltage | V_{BR} | $I_{BR}=1.0\text{mA}$ | 13.3 | | | V |
| Reverse leakage current | I_R | $V_R=12\text{V}$ | | | 1.0 | μA |
| Clamping voltage ($t_p=8/20\mu\text{s}$) | V_C | $I_{PP}=5.0\text{A}$ | | 15 | 25 | V |
| ESD Clamping voltage (TLP) | V_C | $I_{PP}=8.0\text{A}$ | | 16 | | V |
| ESD Clamping voltage (TLP) | V_C | $I_{PP}=16\text{A}$ | | 20 | | V |
| Peak Pulse Current($t_p=8/20\mu\text{s}$) | I_{PP} | | | | 5 | A |
| ESD Dynamic Turn-on Resistance | $R_{dynamic}$ | | | 0.33 | | Ω |
| Off state junction capacitance | C_J | $0\text{Vdc}, f=1\text{MHz}$ | | 10 | 15 | pF |

Typical Characteristics Curves

Figure 1. Pulse Waveforms

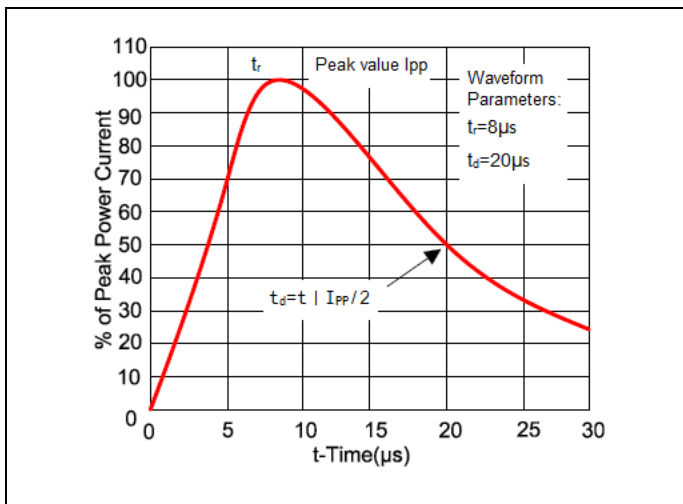


Figure 2. Clamping Voltage vs. Peak Pulse Current

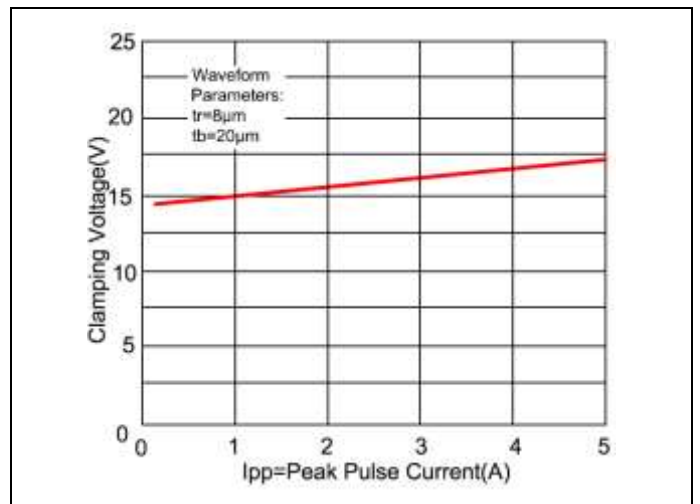


Figure 3. Capacitance vs. Reverse Voltage

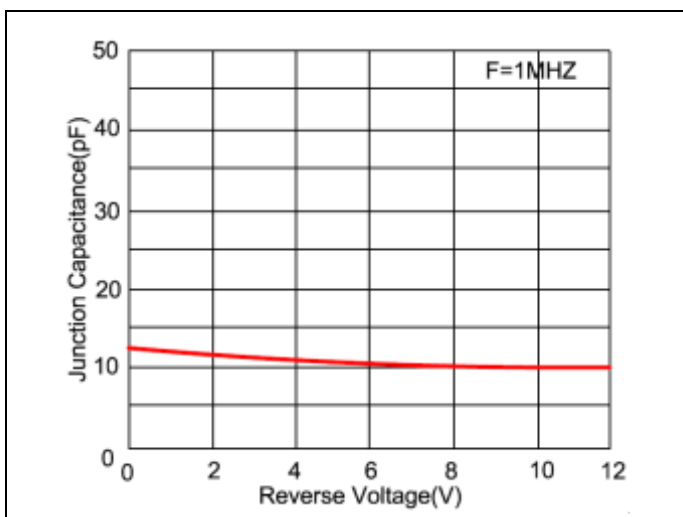
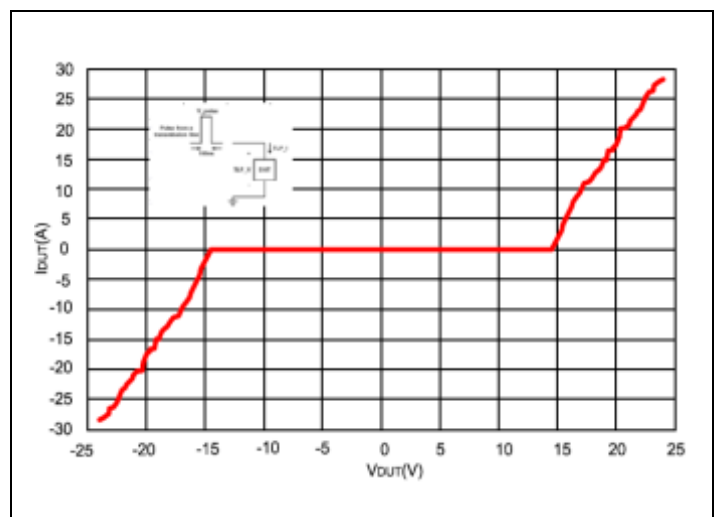
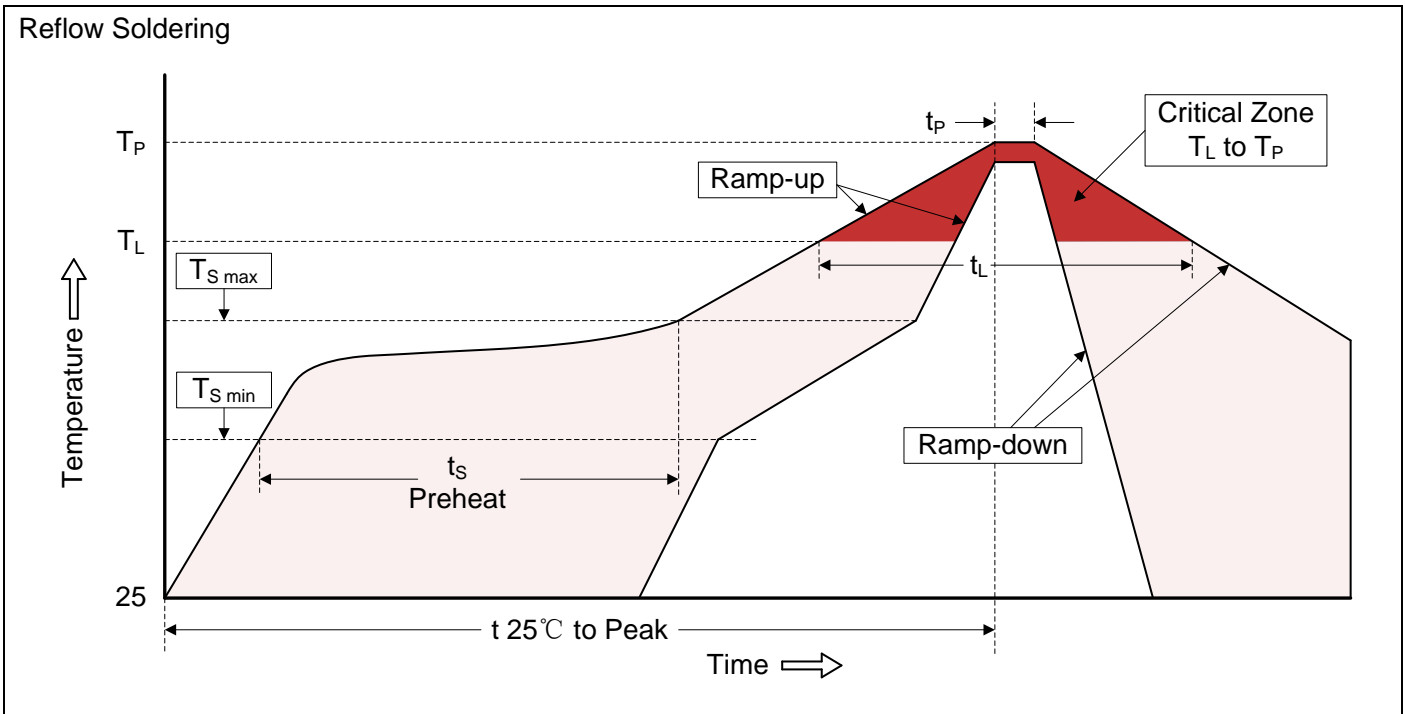


Figure 4. Transmission Line Pulsing (TLP) Measurement



Recommended Soldering Conditions



Recommended Conditions

| Profile Feature | Pb-Free Assembly |
|---|----------------------------------|
| Average ramp-up rate (T_L to T_P) | 3°C/second max. |
| Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_s) | 150°C 200°C 60-180 seconds |
| $T_{S\ max}$ to T_L -Ramp-up Rate | 3°C/second max. |
| Time maintained above: -Temperature (T_L) -Time (t_L) | 217°C 60-150 seconds |
| Peak Temperature (T_P) | 260°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 | 8 minutes max. |

Dimensions (SOD882)

| | Dimension (mm) | | | | |
|---|----------------|-------------|-------|--------|-------|
| | Symbol | Millimeters | | Inches | |
| | | Min. | Max. | Min. | Max. |
| | A | 0.95 | 1.05 | 0.037 | 0.041 |
| B | 0.55 | 0.65 | 0.022 | 0.026 | |
| C | 0.32 | 0.55 | 0.013 | 0.022 | |
| D | 0.45 | | 0.018 | | |
| E | 0.20 | 0.30 | 0.008 | 0.012 | |
| F | 0.45 | 0.55 | 0.018 | 0.022 | |

Packaging

| <p>Tape</p> | Symbol | Dimension (mm) |
|--------------------|--------------------|----------------|
| | W | 8.00±0.30 |
| | P0 | 4.00±0.10 |
| | P1 | 2.00±0.10 |
| | P2 | 2.00±0.10 |
| | D0 | Φ1.55±0.10 |
| | D1 | Φ0.40±0.05 |
| | E | 1.75±0.10 |
| | F | 3.50±0.10 |
| | A | 0.75±0.10 |
| | B | 1.15±0.10 |
| | K | 0.60±0.05 |
| | t | 0.20±0.05 |
| <p>Reel</p> | D | Φ178.0±2.0 |
| | D2 | Φ13.00. |
| | W1 | 9.50 |
| | Quantity: 10000PCS | |