

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

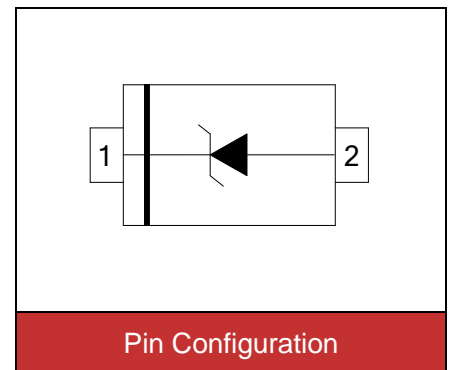
### Description

The LBD52A36L01 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).



### Features

- IEC61000-4-2 ESD 20KV Air, 20KV contact compliance
- SOD523 surface mount package
- Working voltage:36V
- Low leakage current
- Low operating and clamping voltages
- Solid-state silicon avalanche technology
- Lead Free/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: L36



### Maximum Ratings

| Rating                                | Symbol         | Value    | Unit |
|---------------------------------------|----------------|----------|------|
| ESD voltage (Contact discharge)       | $V_{ESD}$      | $\pm 20$ | kV   |
| ESD voltage (Air discharge)           |                | $\pm 20$ |      |
| 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                    | $V_{RWM}$ |                       |      |      | 36   | V             |
| Reverse breakdown voltage                    | $V_{BR}$  | $I_{BR}=1\text{mA}$   | 40   |      |      | V             |
| Reverse leakage current                      | $I_R$     | $V_R=36\text{V}$      |      |      | 1    | $\mu\text{A}$ |
| Clamping voltage ( $t_p=8/20\mu\text{s}$ )   | $V_C$     | $I_{PP}=3\text{A}$    |      |      | 75   | V             |
| Peak pulse current ( $t_p=8/20\mu\text{s}$ ) | $I_{PP}$  |                       |      |      | 3    | A             |
| Off state junction capacitance               | $C_J$     | 0Vdc, $f=1\text{MHz}$ |      | 20   |      | pF            |

Typical Characteristics Curves

Figure 1. Pulse Waveforms

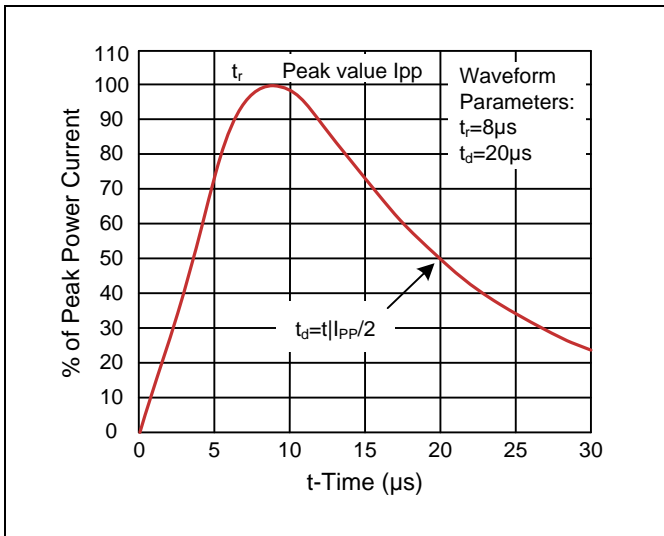


Figure 2. Clamping Voltage vs. Peak Pulse Current

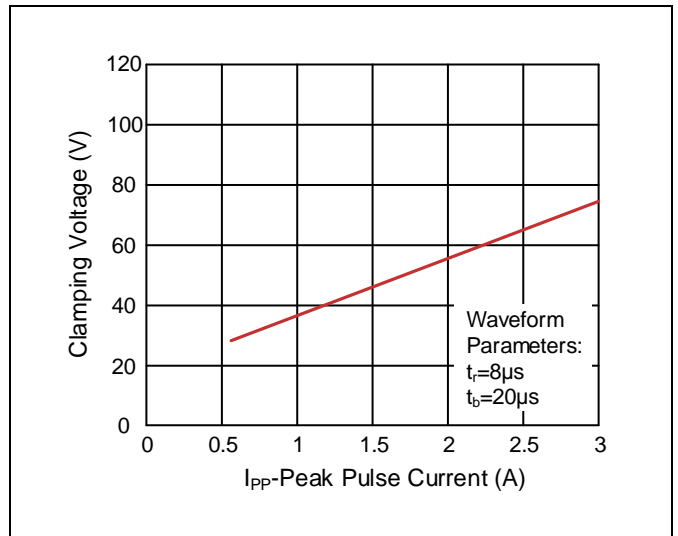


Figure 3. Capacitance vs. Reverse Voltage

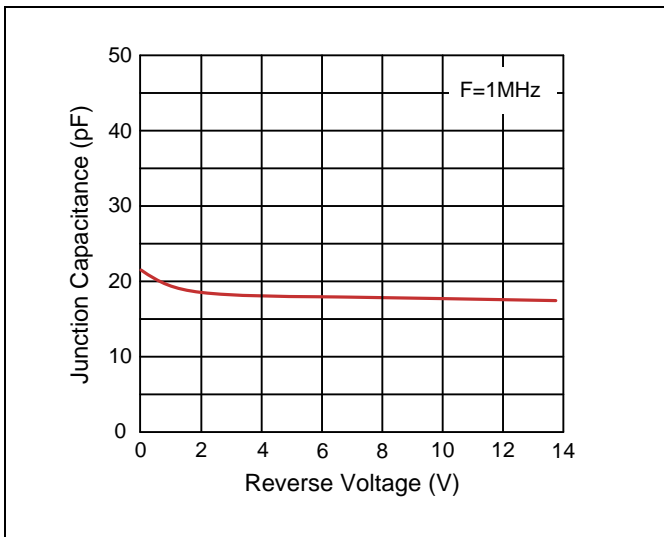
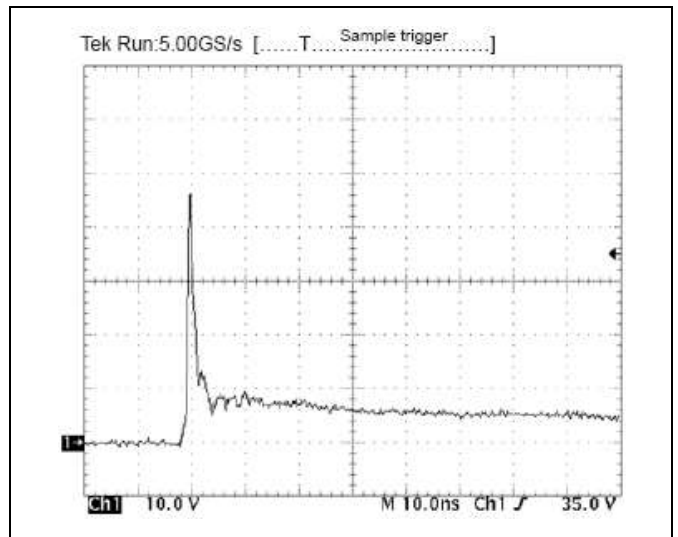
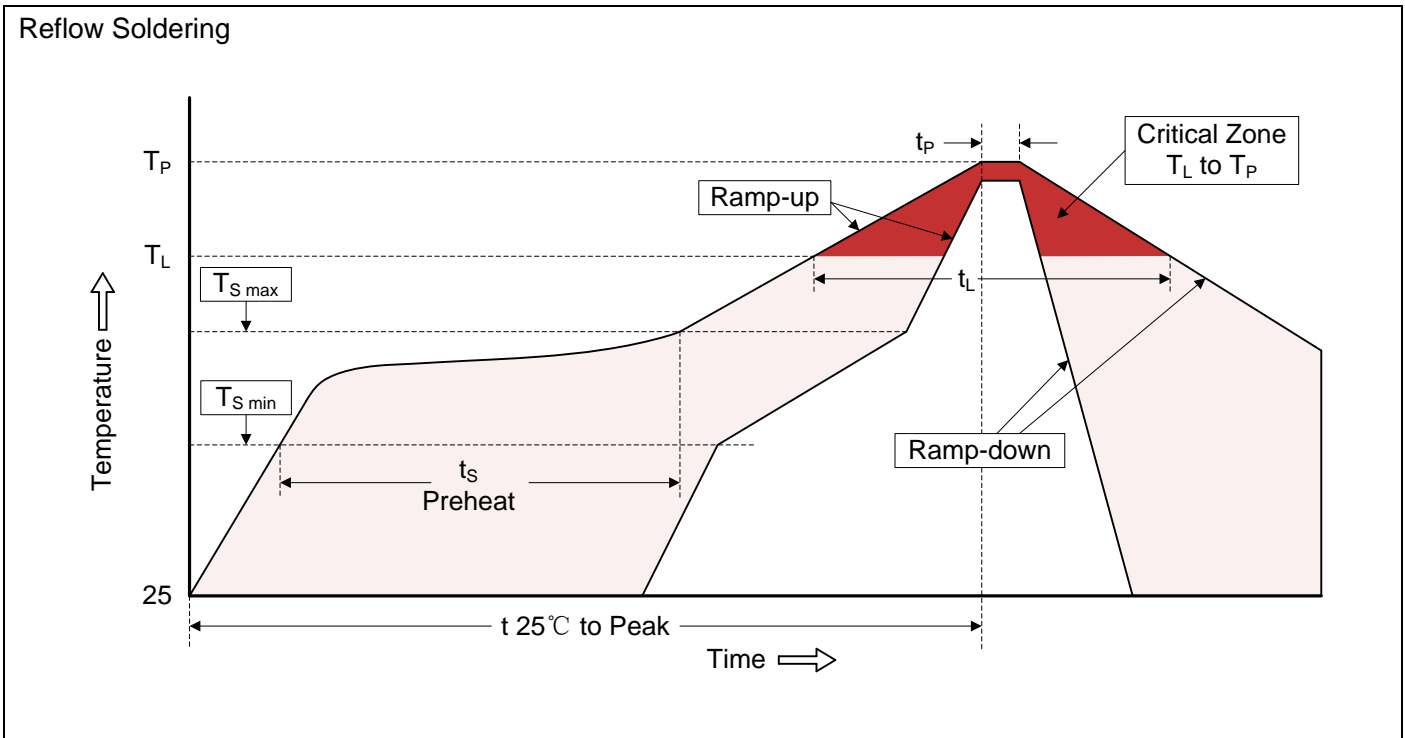


Figure 4. ESD Clamping(8kV Contact IEC61000-4-2)



**Recommended Soldering Conditions**



Recommended Conditions

| Profile Feature   | Pb-Free Assembly                 |
|---|----------------------------------|
| Average ramp-up rate ( $T_L$ to $T_P$ )   | 3°C/second max.                  |
| Preheat<br>-Temperature Min ( $T_{S \min}$ )<br>-Temperature Max ( $T_{S \max}$ )<br>-Time (min to max) ( $t_s$ ) | 150°C<br>200°C<br>60-180 seconds |
| $T_{S \max}$ to $T_L$<br>-Ramp-up Rate  | 3°C/second max.                  |
| Time maintained above:<br>-Temperature ( $T_L$ )<br>-Time ( $t_L$ )   | 217°C<br>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 (SOD-523)**

| Symbol | Dimension (mm) |      |        |       |
|--------|----------------|------|--------|-------|
|        | Millimeters    |      | Inches |       |
|        | Min.           | Max. | Min.   | Max.  |
| A      | 0.50           | 0.70 | 0.020  | 0.028 |
| B      | 0.07           | 0.20 | 0.003  | 0.008 |
| C      | 0.70           | 0.90 | 0.028  | 0.035 |
| D      | 0.25           | 0.35 | 0.010  | 0.014 |
| E      | 1.10           | 1.30 | 0.043  | 0.051 |
| F      | 1.50           | 1.70 | 0.059  | 0.067 |
| G      | 0.15           | 0.25 | 0.006  | 0.010 |

**Packaging**

| 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                | Φ0.50±0.05     |
| E                 | 1.75±0.10      |
| F                 | 3.50±0.10      |
| A                 | 1.00±0.10      |
| A0                | 0.50±0.10      |
| B                 | 1.80±0.10      |
| B0                | 1.30±0.10      |
| K                 | 0.65±0.10      |
| t                 | 0.20±0.05      |
| D                 | Φ178.0±2.0     |
| D2                | Φ13.0          |
| W1                | 9.5            |
| Quantity: 3000PCS |                |