

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

Brightking's LHS08A12L04 has been specifically designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by electrostatic discharge (ESD), electrical fast transients (EFT), and lightning.

The low capacitance array configuration allows the user to protect four high-speed data or I/O lines. The high surge capability makes the series suitable for telecommunication systems operating in harsh transient environments.

The low inductance construction minimizes voltage overshoot during high current surges.

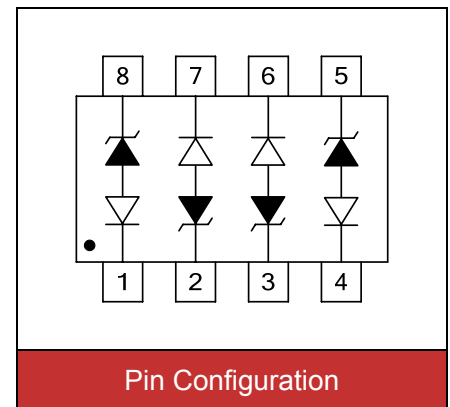


Contact : ±8kV  
Air : ±15kV



### Features

- IEC61000-4-2 ESD 15KV Air, 8KV contact compliance
- SOIC-08 surface mount package
- Protects four I/O lines
- Peak power dissipation of 800W under 8/20µs waveform
- Working voltage: 12V
- Low leakage current
- Low capacitance and clamping voltage
- 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: B 8LC12



### Applications

- Multi-Mode transceiver protection
- RS-422 interfaces
- Ethernet 10/100 Base T
- RS-232 interfaces
- Audio/Video inputs
- RS-499 interfaces
- ADSL interfaces

### Maximum Ratings

| Rating                                | Symbol                            | Value    | Unit |
|---------------------------------------|-----------------------------------|----------|------|
| Peak pulse power (tp=8/20µs waveform) | P <sub>PP</sub>                   | 800      | W    |
| ESD voltage (Contact discharge)       | V <sub>ESD</sub>                  | ±8       | kV   |
| ESD voltage (Air discharge)           |                                   | ±15      |      |
| Storage & operating temperature range | T <sub>STG</sub> , T <sub>J</sub> | -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                  | $V_{BR}$  | $I_{BR}=1\text{mA}$                               | 13.4 |      |      | V             |
| Reverse leakage current                    | $I_R$     | $V_R=12\text{V}$<br>Each I/O pin                  |      |      | 4    | $\mu\text{A}$ |
| Clamping voltage ( $t_p=8/20\mu\text{s}$ ) | $V_C$     | $I_{PP}=1\text{A}$                                |      |      | 19   | V             |
| Clamping voltage ( $t_p=8/20\mu\text{s}$ ) | $V_C$     | $I_{PP}=5\text{A}$                                |      |      | 32.9 | V             |
| Off state junction capacitance             | $C_J$     | 0Vdc, $f=1\text{MHz}$<br>Between I/O pins and GND |      |      | 25   | pF            |

Typical Characteristics Curves

Figure 1. Power Derating Curve

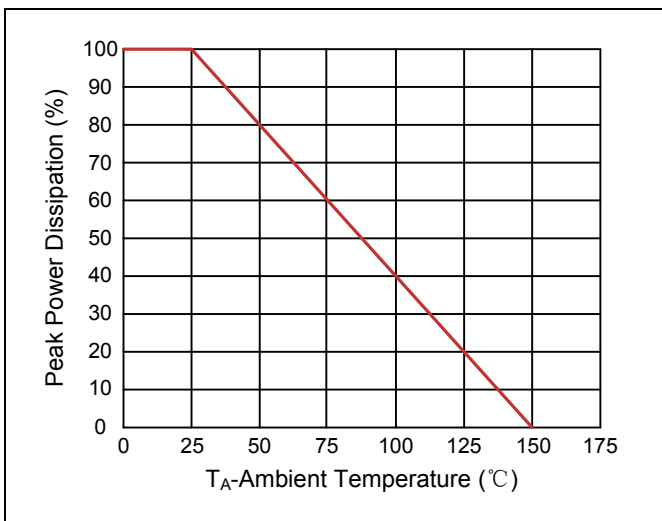


Figure 2. Pulse Waveforms

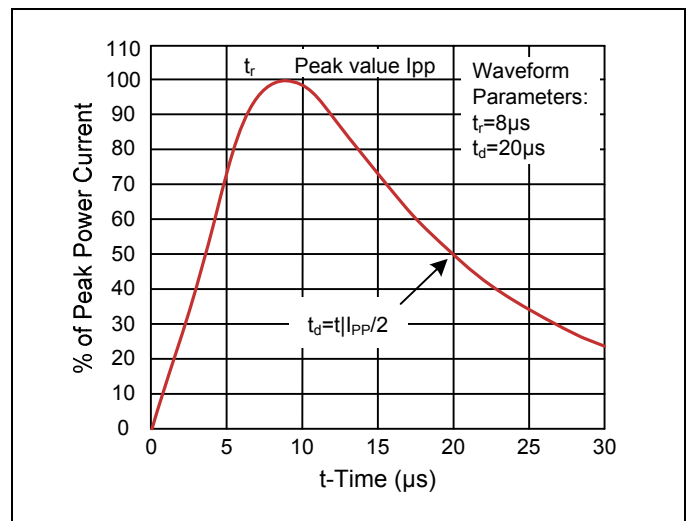


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time

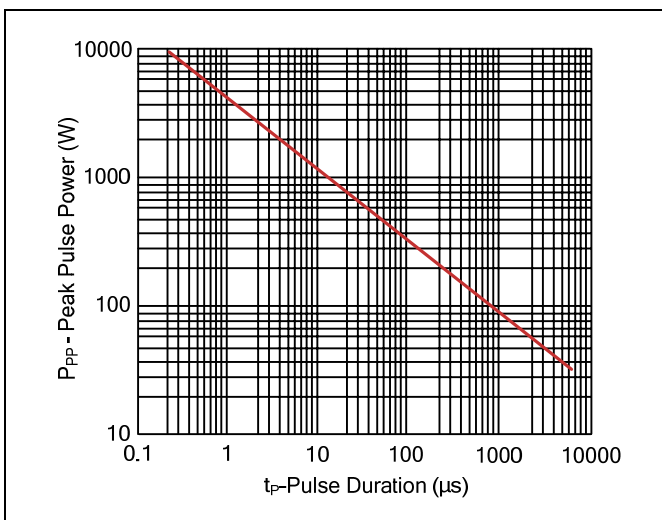
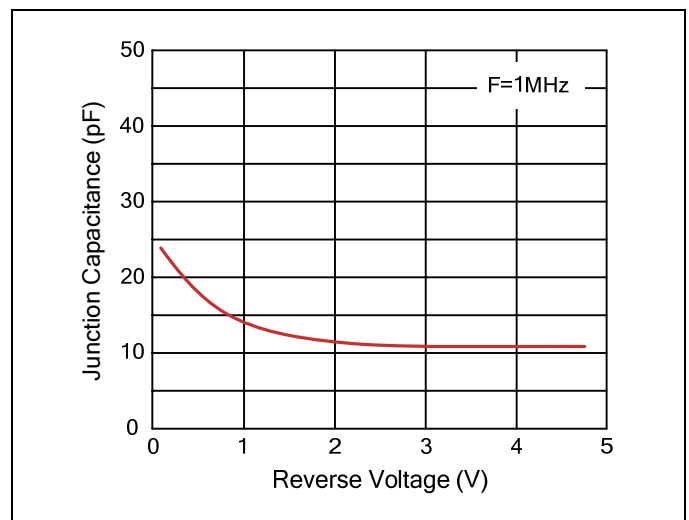
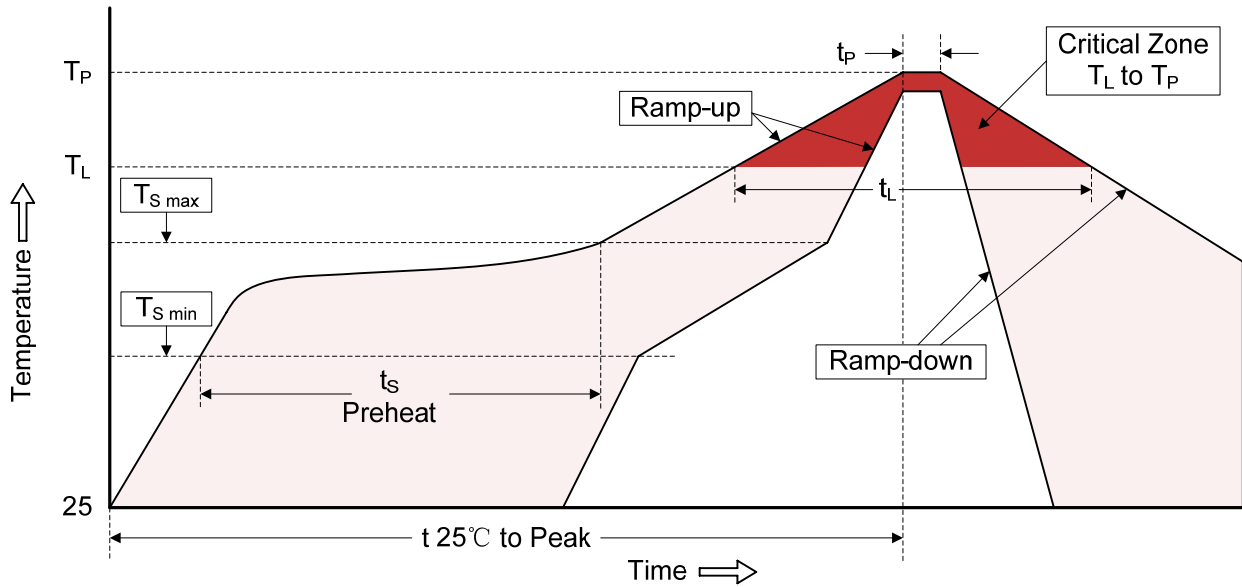


Figure 4. Capacitance vs. Reverse Voltage



**Recommended Soldering Conditions**

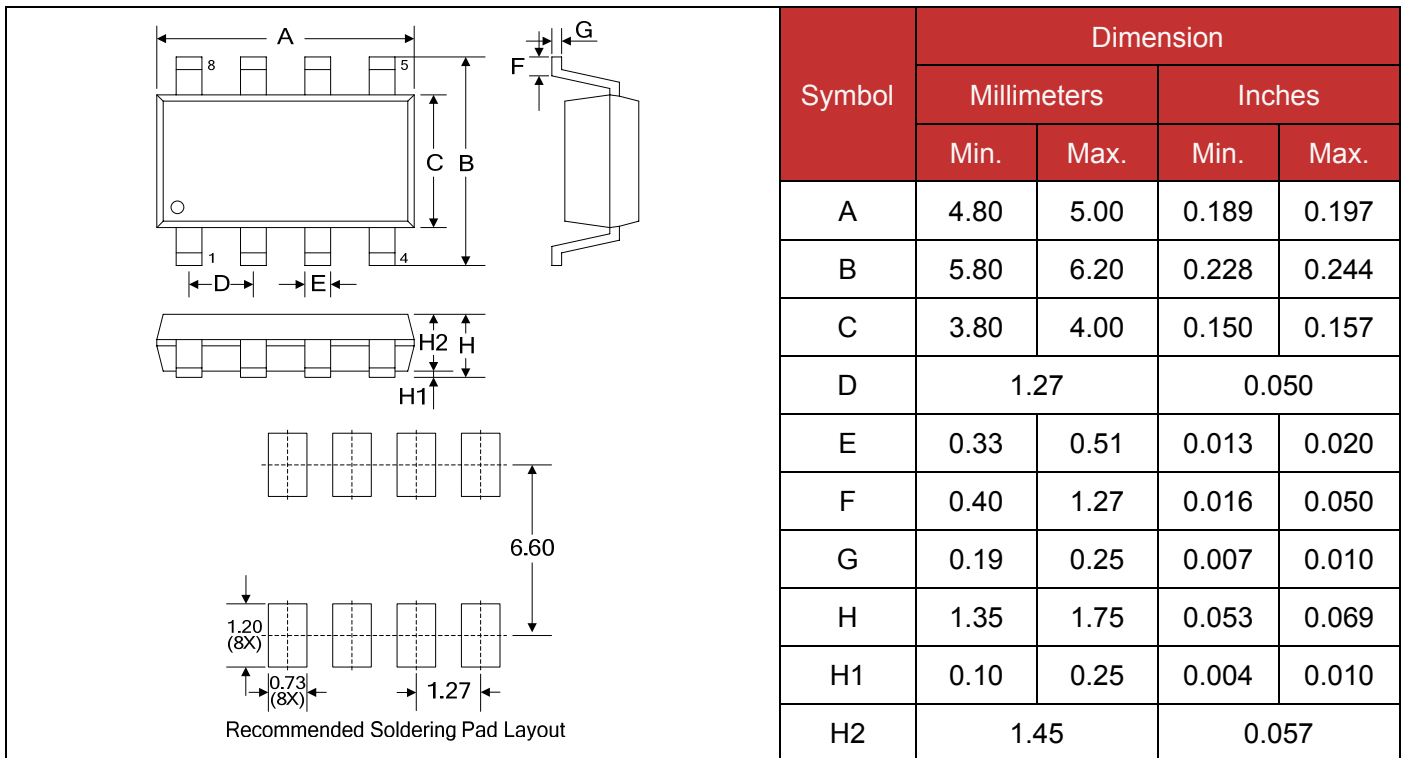
Reflow Soldering



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 (SOIC-08)



Packaging

