



**THE DATASHEET OF
LES08C05L04**



DATA SHEET

**ELECTROSTATIC DISCHARGE
PROTECTION DEVICES**

INDUSTRIAL / CONSUMER

LES08CXXL04 SERIES

RoHS compliant & Halogen free



Product specification—June 30, 2023 V.3



Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

Brightking's LES08CXXL04 series have 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 of the series 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.

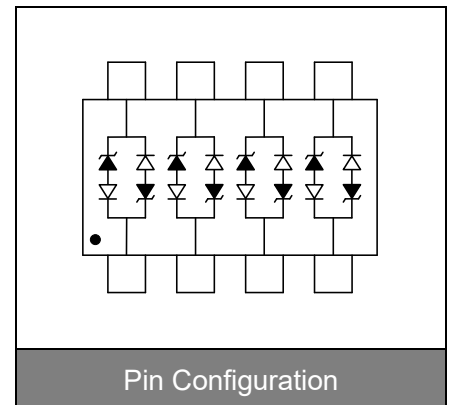


Contact : ±30kV
Air : ±30kV



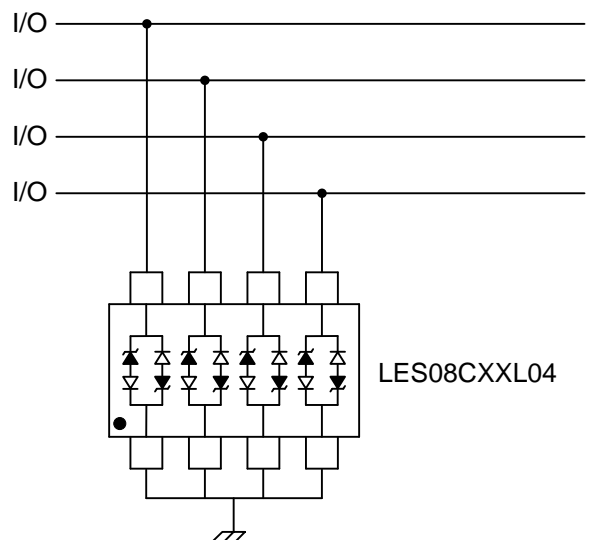
Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- SOIC-08 surface mount package
- Protects four I/O lines
- Peak power dissipation of 500W under 8/20µs waveform
- Working voltage: 5V, 15V and 24V
- 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



Applications

- Multi-Mode transceiver protection
- WAN equipment
- CSU/DSU
- Multiplexers
- Routers
- RS-232 (V.28)
- RS-422 (V.11, X.21)
- Ethernet-10/100 base T
- Low-voltage ASICs



Maximum Ratings

| Rating | Symbol | Value | Unit |
|---------------------------------------|-----------------------------------|----------|------|
| Peak pulse power (tp=8/20μs waveform) | P _{PP} | 500 | W |
| ESD voltage (Contact discharge) | V _{ESD} | ±30 | kV |
| ESD voltage (Air discharge) | | ±30 | |
| Storage & operating temperature range | T _{STG} , T _J | -55~+150 | °C |

Electrical Characteristics (T_J=25°C)

LES08C05L04 (Marking: B LC05C-4)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|------------------|---|------|------|------|------|
| Reverse stand-off voltage | V _{RWM} | | | | 5 | V |
| Reverse breakdown voltage | V _{BR} | I _{BR} =1mA | 6 | | | V |
| Reverse leakage current | I _R | V _R =5V each I/O pin | | | 10 | μA |
| Clamping voltage (tp=8/20μs) | V _C | I _{PP} =1A | | | 9.8 | V |
| Clamping voltage (tp=8/20μs) | V _C | I _{PP} =10A | | | 17 | V |
| Peak pulse current (tp=8/20μs) | I _{PP} | | | | 25 | A |
| Off state junction capacitance | C _J | 0Vdc, f=1MHz Between I/O pins and GND | | | 15 | pF |

Electrical Characteristics (T_J=25°C)

LES08C15L04 (Marking: B LC15C-4)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|------------------|---|------|------|------|------|
| Reverse stand-off voltage | V _{RWM} | | | | 15 | V |
| Reverse breakdown voltage | V _{BR} | I _{BR} =1mA | 16.7 | | | V |
| Reverse leakage current | I _R | V _R =15V each I/O pin | | | 1 | μA |
| Clamping voltage (tp=8/20μs) | V _C | I _{PP} =1A | | | 24 | V |
| Clamping voltage (tp=8/20μs) | V _C | I _{PP} =10A | | | 30 | V |
| Peak pulse current (tp=8/20μs) | I _{PP} | | | | 10 | A |
| Off state junction capacitance | C _J | 0Vdc, f=1MHz Between I/O pins and GND | | | 15 | pF |

LES08C24L04 (Marking: B LC24C-4)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--|-----------|--|------|------|------|---------|
| Reverse stand-off voltage | V_{RWM} | | | | 24 | V |
| Reverse breakdown voltage | V_{BR} | $I_{BR}=1mA$ | 26.7 | | | V |
| Reverse leakage current | I_R | $V_R=24V$ each I/O pin | | | 1 | μA |
| Clamping voltage ($t_p=8/20\mu s$) | V_C | $I_{PP}=1A$ | | | 43 | V |
| Clamping voltage ($t_p=8/20\mu s$) | V_C | $I_{PP}=10A$ | | | 49 | V |
| Peak pulse current ($t_p=8/20\mu s$) | I_{PP} | | | | 10 | A |
| Off state junction capacitance | C_J | 0Vdc, f=1MHz Between I/O pins and GND | | | 15 | pF |

Typical Characteristics Curves

Figure 1. Power Derating Curve

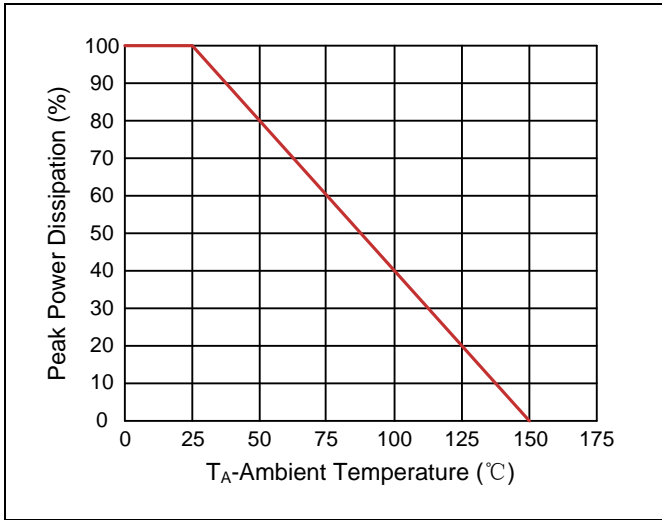


Figure 2. Pulse Waveforms

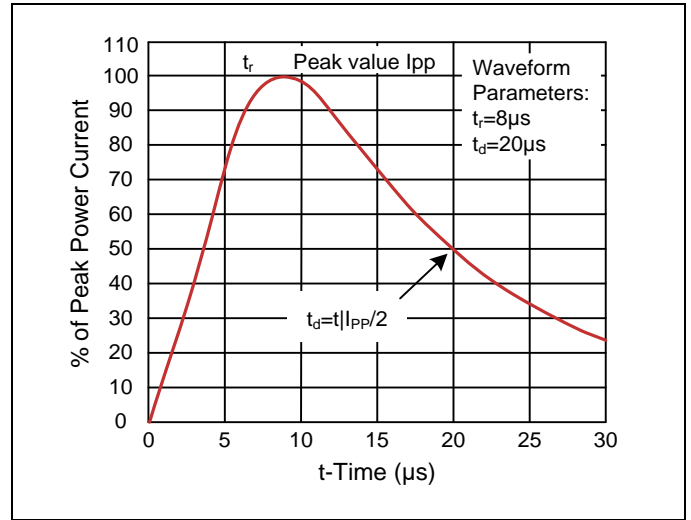


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time

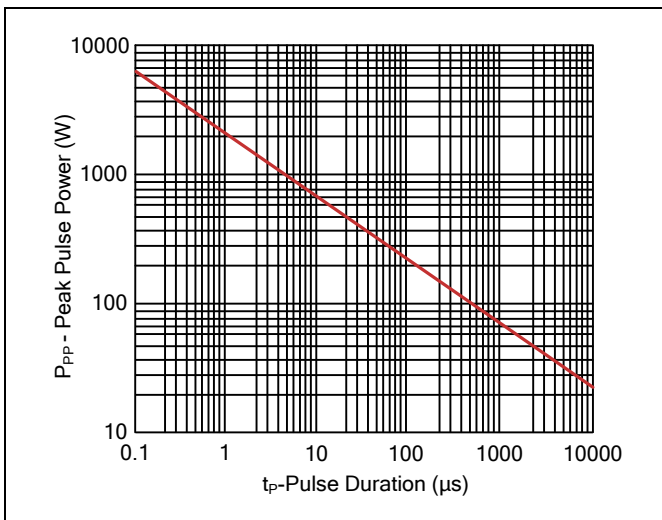
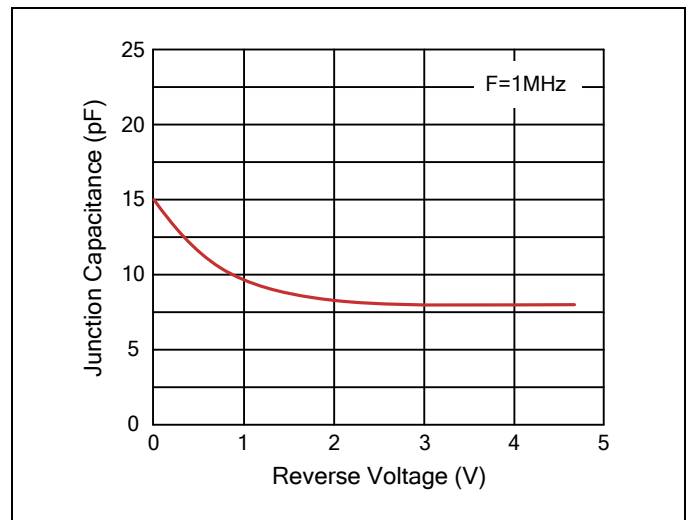
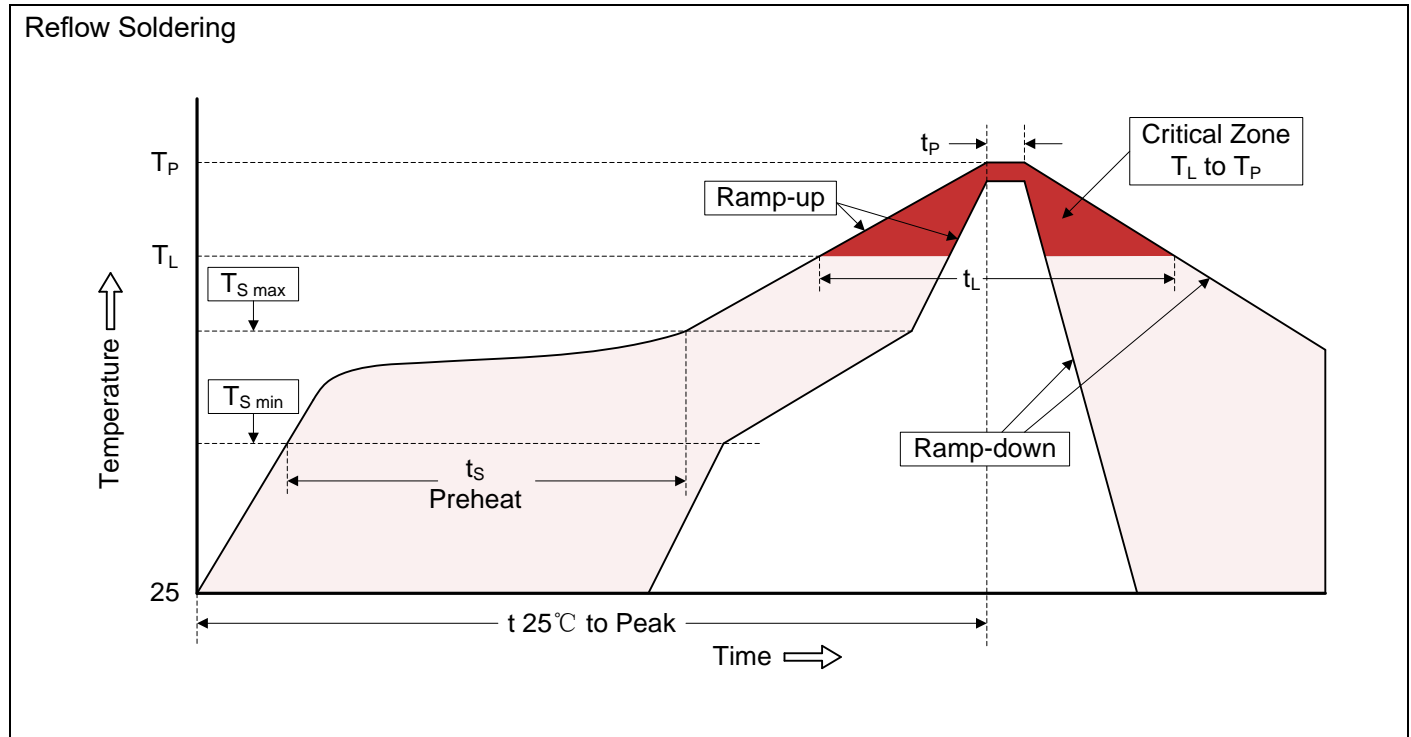


Figure 4. Capacitance vs. Reverse Voltage



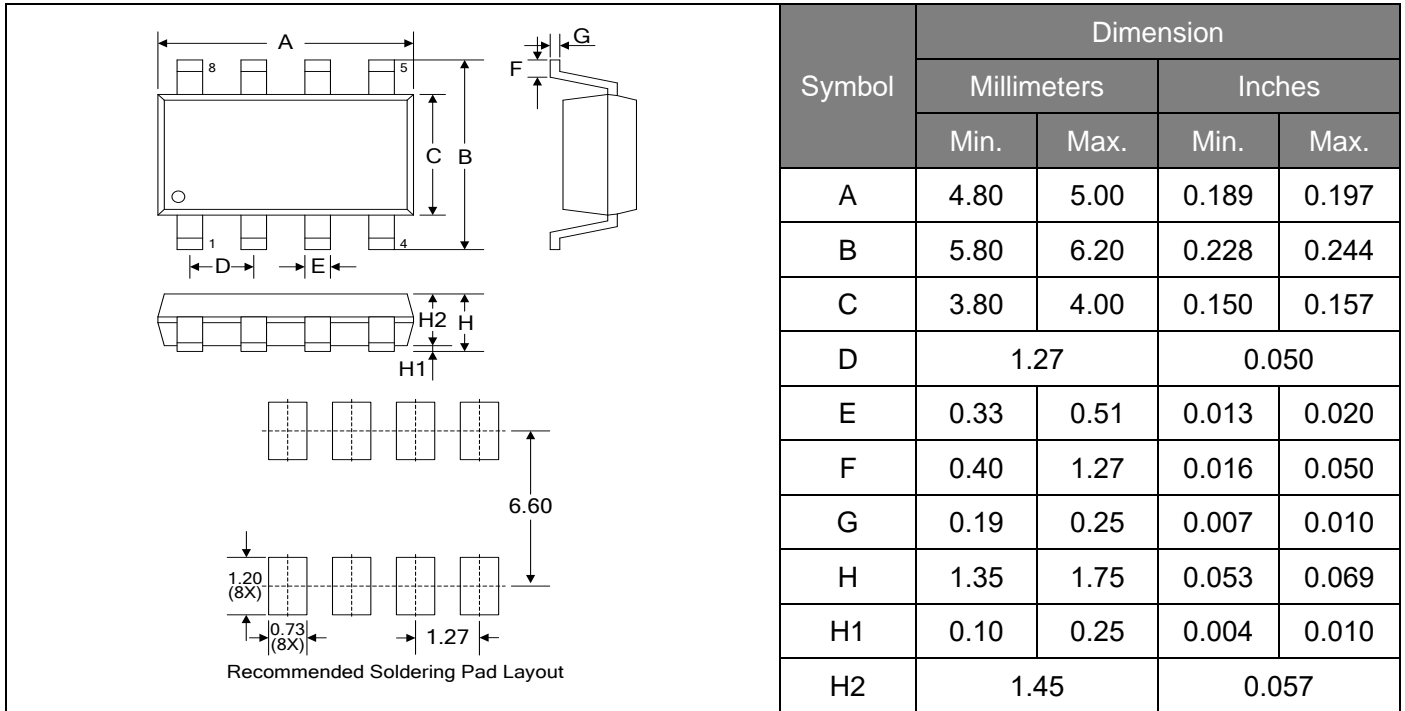
Recommended Soldering Conditions



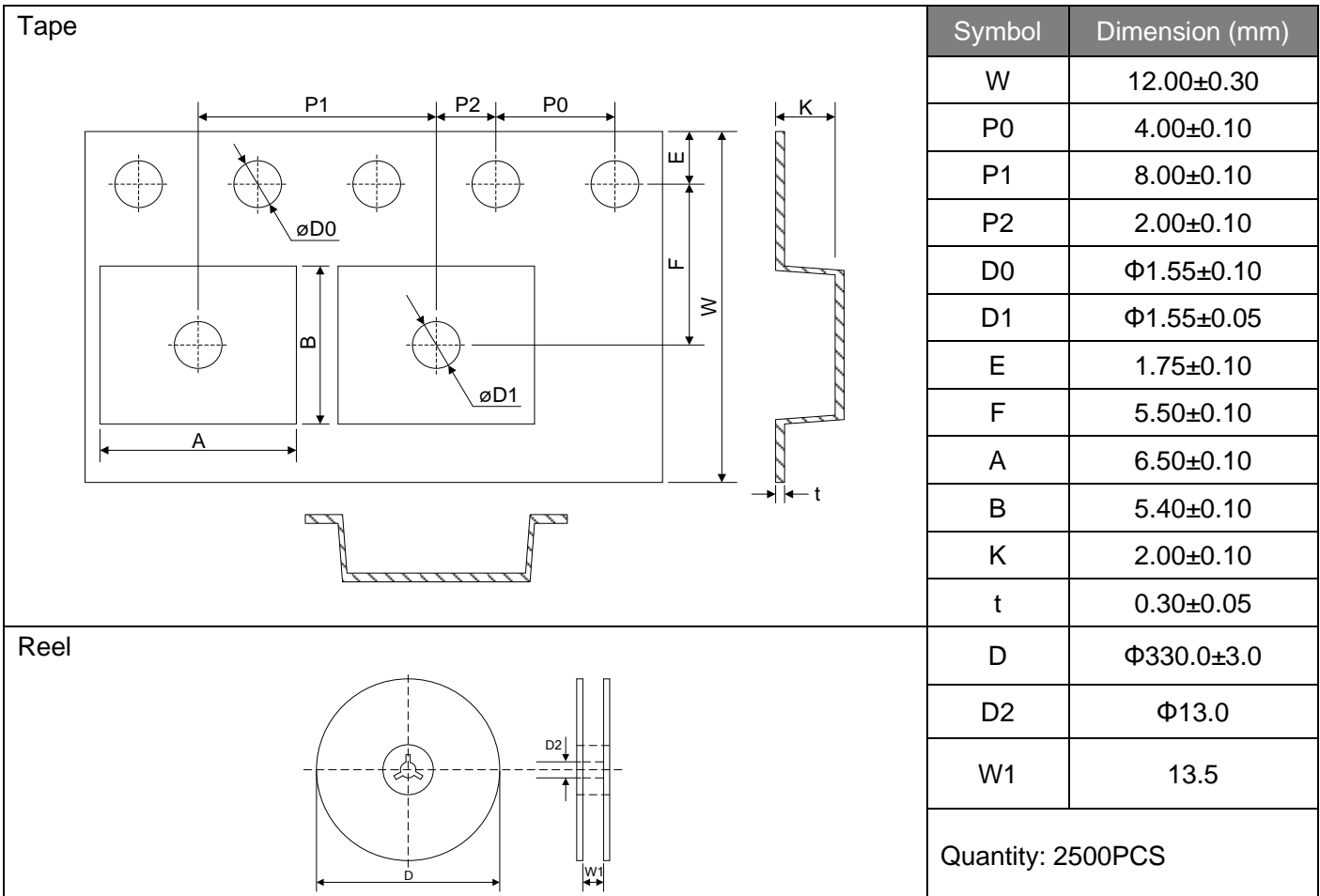
Recommended Conditions

| 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 (SOIC-08)



Packaging



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