

HBL2020RP

1-Channel ESD Protector

Product Description

The HBL2020RP provides robust ESD protection for sensitive parts that may be subjected to electrostatic discharge (ESD). The tiny form factor and single wirebond requirement enables it to be used in very confined spaces. The electrical 'back-to-back zener' configuration also provides ESD protection in cases where nodes with AC signals are present. This device is designed and characterized to safely dissipate ESD strikes of at least ± 8 kV, according to the MIL-STD-883 (Method 3015) specification for Human Body Model (HBM) ESD.

Features

- Compact Die Protects from ESD Discharges
- Almost No Conduction at Signal Amplitudes Less Than ± 4 V
- ESD Protection Over ± 8 kV Contact Discharge per MIL_STD_883 International ESD Standard

Applications

- LED Lighting
- Modules
- Interface Circuits

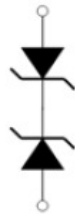


Figure 1. Electrical Schematic



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ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

HBL2020RP

CURRENT/VOLTAGE GRAPH

| Symbol | Description |
|-----------|------------------------------|
| I_{CL+} | Positive Clamping Current |
| V_{CL+} | Positive Clamping Voltage |
| I_{L2+} | Leakage Current at V_{L2+} |
| V_{L2+} | Voltage Condition: +14V |
| I_{L1+} | Leakage Current at V_{L1+} |
| V_{L1+} | Voltage Condition: +4V |
| I_{CL-} | Negative Clamping Current |
| V_{CL-} | Negative Clamping Voltage |
| I_{L1-} | Leakage Current at V_{L1-} |
| V_{L1-} | Voltage Condition: -4V |

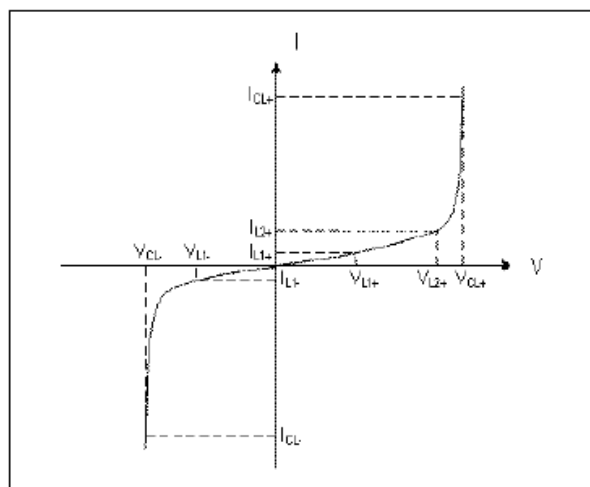


Figure 2.

NOTE: The polarity in the above graph corresponds to the polarity convention shown in the application diagram.

ORDERING INFORMATION

| Ordering Part Number | Topside Metal | Backside Metal | Thickness | Shipping Method |
|----------------------|---------------|----------------|-----------|-----------------|
| HBL2020RP | Al | LCBM | 4 mils | Metal Frame |

ABSOLUTE MAXIMUM RATINGS

| Parameter | Rating | Unit |
|-----------------------------|-------------|------|
| Operating Temperature Range | -40 to +150 | °C |
| Storage Temperature Range | -65 to +150 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

STANDARD OPERATING CONDITIONS

| Parameter | Rating | Unit |
|-----------------------------|-------------|------|
| Operating Temperature Range | -40 to +150 | °C |

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ELECTRICAL OPERATING CHARACTERISTICS (See Note 1)

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------------------------------------------------|--------------------------------------|
| I_{LEAK} | Leakage Current | $V = \pm 4\text{ V}$, 150°C (Note 2) $V = \pm 4\text{ V}$, 25°C ($V_{L1\pm}$) $V = +14\text{ V}$, 25°C (V_{L2+}) | | | 4.0 0.3 ($I_{L1\pm}$) 0.5 (I_{L2+}) | mA μA μA |
| V_{CL} | Signal Clamp Voltage Positive polarity on signal node (V_{CL+}) Negative polarity on signal node (V_{CL-}) | $T_A = 25^\circ\text{C}$; at 10 mA (I_{CL+}) at -10 mA (I_{CL-}) | +16 -9.0 | +19 -7.0 | +22 -5.0 | V |
| V_{ESD} | ESD Protection – withstand voltage: Human Body Model (MIL-STD-883, Method 3015) | $T_A = 25^\circ\text{C}$ (Note 2) | ± 8 | | | kV |

1. Operating characteristics are over standard operating conditions unless otherwise specified.
2. This parameter is guaranteed by design and/or characterization.

MECHANICAL DETAILS

MECHANICAL SPECIFICATIONS

| Parameter | Condition | Unit |
|------------------------|----------------------------|---------------|
| Composition | Silicon wafer, p+ doped | |
| Die shape | Square | |
| Length (sawn) | 200 | μm |
| Width (sawn) | 200 | μm |
| Thickness | 4 | mils |
| Top pad length | 125 | μm |
| Top pad width | 125 | μm |
| Top pad composition | Al (Aluminum) | |
| Back metal (underside) | LCBM | |

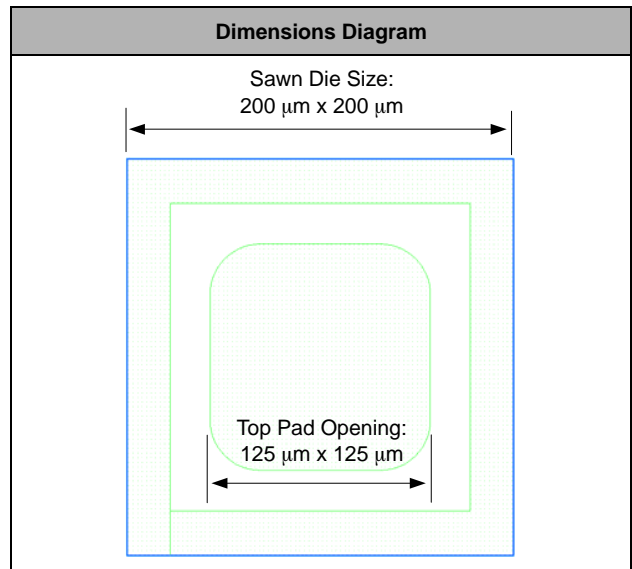


Figure 3. Die Dimensions

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