

HBL21000WP

1-Channel ESD Protector

Product Description

The HBL21000WP 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



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ELECTRICAL SCHEMATIC

Aluminum (Al) Pad on the Topside



Silicon Substrate on the Backside

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

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

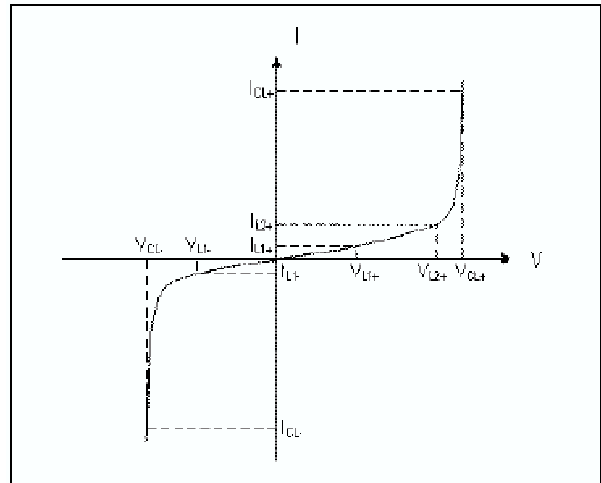


Figure 1.

ORDERING INFORMATION

Ordering Part Number	Topside Metal	Backside Metal	Thickness	Shipping Method
HBL21000WP	Al	none	4 mils	Wafer Jar

HBL21000WP

ABSOLUTE MAXIMUM RATINGS

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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

STANDARD OPERATING CONDITIONS

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

ELECTRICAL OPERATING CHARACTERISTICS (See Note 1)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I_{LEAK}	Leakage Current	$V = \pm 4$ V, 150°C (Note 2) $V = \pm 4$ V, 25°C ($V_{L1\pm}$) $V = +14$ V, 25°C (V_{L2+})			4.0 0.3 ($I_{L1\pm}$) 0.5 (I_{L2+})	mA μ A μ A
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
V_{CL_ESD}	Clamping Voltage during transient events on signal node	$I_{PP} = 1$ A; $t_P = 8/20$ μ s Positive Transients (Note 2) Negative Transients (Note 2)		35 -15		V
C_{IN}	Input Capacitance	- At 1 MHz, 30 mV osc. level, 0 VDC bias; - At 1 MHz, 30 mV osc. level, 3 VDC bias; (Note 2)		4.7 3.0		pF

- Operating characteristics are over standard operating conditions unless otherwise specified.
- 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)	220	μ m
Width (sawn)	220	μ m
Thickness	4	mils
Top pad length	125	μ m
Top pad width	125	μ m
Top pad composition	Al (Aluminum)	

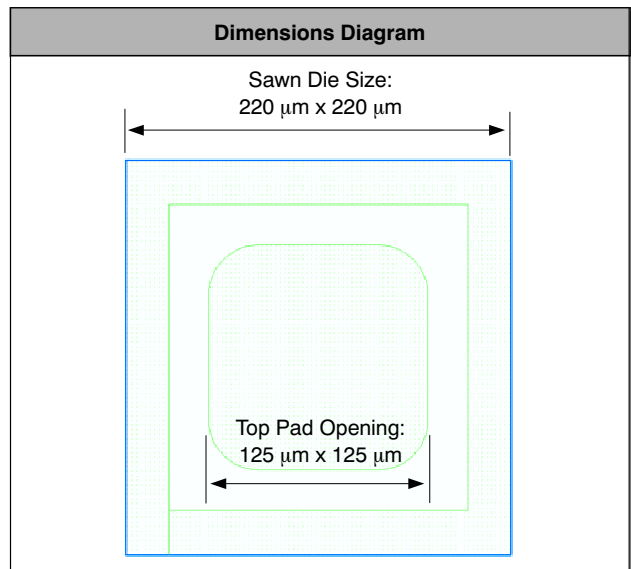



Figure 2. Die Dimensions

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