

HBL21000RP

Product Preview

1-Channel ESD Protector

Product Description

The HBL21000RP 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.

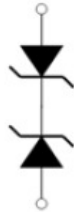
Features

- 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

Aluminum (Al) Pad on the Topside



Gold-Tin (AuSn) on the Backside

Figure 1. Electrical Schematic



ON Semiconductor®

<http://onsemi.com>

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

ORDERING INFORMATION

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

HBL21000RP

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.

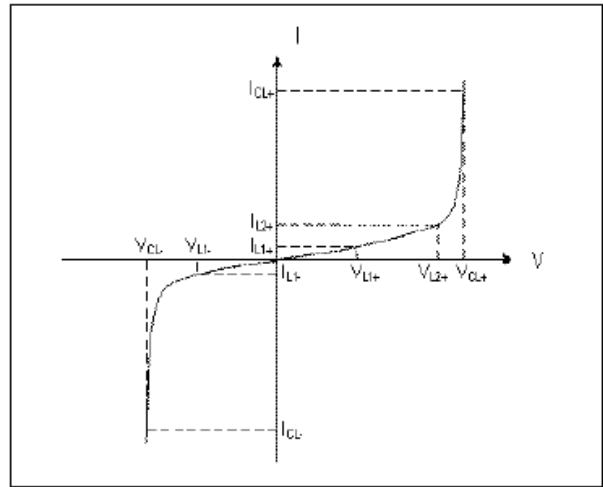


Figure 2.

ORDERING INFORMATION

Ordering Part Number	Topside Metal	Backside Metal	Thickness	Shipping Method
HBL21000RP	Al	AuSn	4 mils	Ring Pack

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

HBL21000RP

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

- 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)	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)	AuSn (Gold-Tin)	

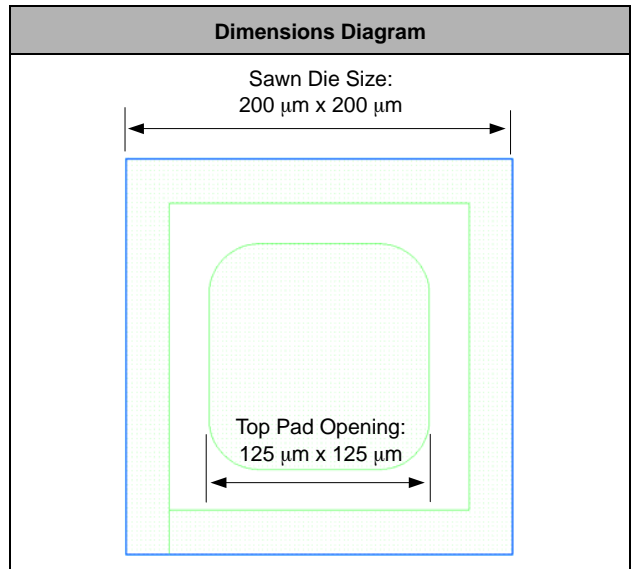



Figure 3. Die Dimensions

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
For additional information, please contact your local
Sales Representative