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[Vishay Semiconductor/Diodes Division](#)  
[VCUT0505B-HD1-GS08](#)

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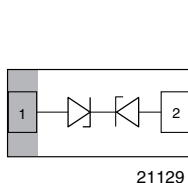


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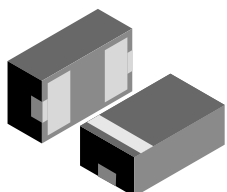
## VCUT0505B-HD1

Vishay Semiconductors

### Bidirectional Symmetrical (BiSy) Single Line ESD-Protection Diode in LLP1006-2L



21129



20855

#### MARKING (example only)



Bar = pin 1 marking  
 X = date code  
 Y = type code (see table below)

#### FEATURES

- Ultra compact LLP1006-2L package
- Low package profile < 0.4 mm
- 1-line ESD-protection
- Working range  $\pm 5$  V
- Low leakage current  $I_R < 0.1 \mu A$
- Low load capacitance  $C_D = 18$  pF
- ESD-protection acc. IEC 61000-4-2  
 $\pm 20$  kV contact discharge  
 $\pm 25$  kV air discharge
- Soldering can be checked by standard vision inspection; no X-ray necessary
- Pin plating NiPdAu (e4) no whisker growth
- e4 - precious metal (e.g. Ag, Au, NiPd, NiPdAu) (no Sn)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



ORDERING INFORMATION			
DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL (8 mm TAPE on 7" REEL)	MINIMUM ORDER QUANTITY
VCUT0505B-HD1	VCUT0505B-HD1-GS08	8000	8000

PACKAGE DATA						
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VCUT0505B-HD1	LLP1006-2L	L	0.72 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

ABSOLUTE MAXIMUM RATINGS VCUT0505B-HD1					
PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Peak pulse current	Acc. IEC 61000-4-5; $t_p = 8/20 \mu s$ ; single shot		$I_{PPM}$	3.5	A
Peak pulse power	Pin 1 to pin 2 acc. IEC 61000-4-5; $t_p = 8/20 \mu s$ ; single shot		$P_{PP}$	56	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses		$V_{ESD}$	$\pm 20$	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses			$\pm 25$	kV
Operating temperature	Junction temperature		$T_J$	-40 to +125	°C
Storage temperature			$T_{stg}$	-55 to +150	°C

PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)

This Vishay product is protected by one or more United States and International patents.



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<b>ELECTRICAL CHARACTERISTICS VCUT0505B-HD1</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of lines which can be protected	$N_{channel}$	-	-	1	lines
Reverse stand-off voltage	Max. reverse working voltage	$V_{RWM}$	-	-	5	V
Reverse voltage	at $I_R = 0.1\text{ }\mu\text{A}$	$V_R$	5	-	-	V
Reverse current	at $V_R = 5\text{ V}$	$I_R$	-	-	0.1	$\mu\text{A}$
Reverse breakdown voltage	at $I_R = 1\text{ mA}$	$V_{BR}$	7	-	-	V
Reverse clamping voltage	at $I_{PP} = 1\text{ A}$	$V_C$	-	-	12	V
	at $I_{PP} = I_{PPM} = 3.5\text{ A}$	$V_C$	-	-	16	V
Capacitance	at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$	$C_D$	-	18	20	pF
	at $V_R = 2.5\text{ V}$ ; $f = 1\text{ MHz}$	$C_D$	-	14.5	-	pF

**CUT THE SPIKES WITH VCUT0505B-HD1:**

The VCUT0505B-HD1 is a bidirectional and symmetrical (BiSy) ESD-protection device which clamps positive and negative overvoltage transients to ground. Connected between the signal or data line and the ground the VCUT0505B-HD1 offers a high isolation (low leakage current, low capacitance) within the specified working range. Due to the short leads and small package size of the tiny LLP1006-2L package the line inductance is very low, so that fast transients like an ESD-strike can be clamped with minimal over- or undershoots.

**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

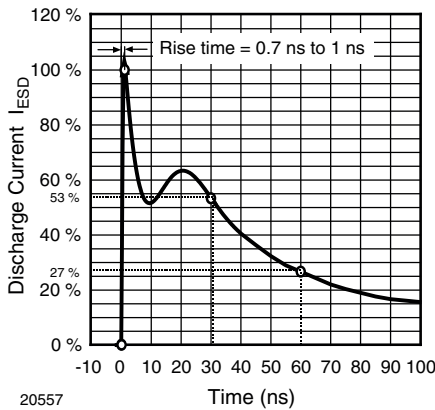


Fig. 1 - ESD Discharge Current Wave Form  
 acc. IEC 61000-4-2 (330  $\Omega$ /150 pF)

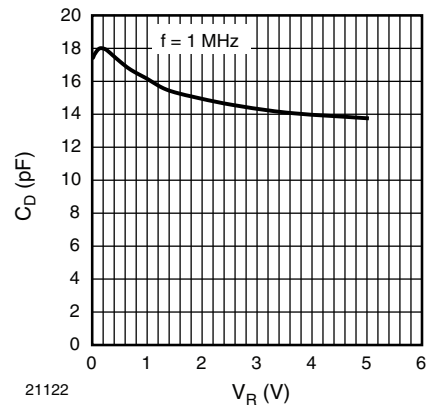


Fig. 3 - Typical Capacitance  $C_D$  vs. Reverse Voltage  $V_R$

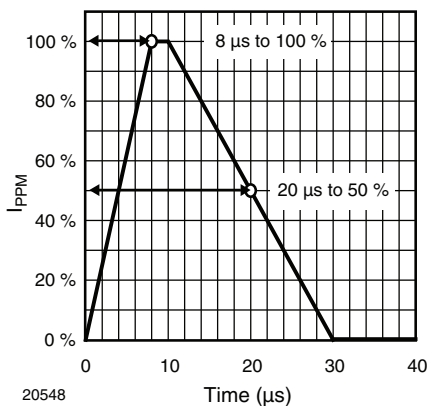


Fig. 2 - 8/20  $\mu\text{s}$  Peak Pulse Current Wave Form  
 acc. IEC 61000-4-5

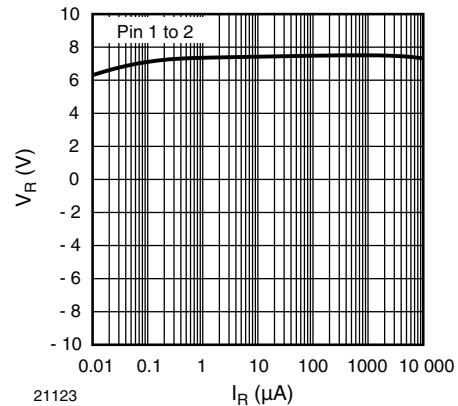


Fig. 4 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$



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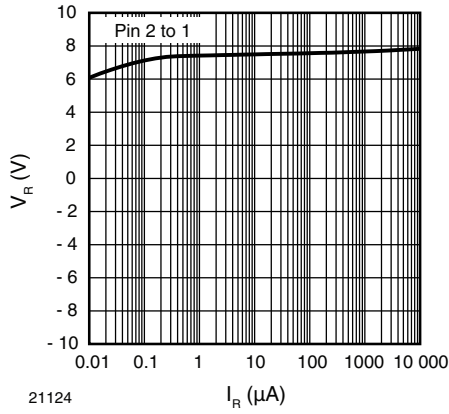


Fig. 5 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$

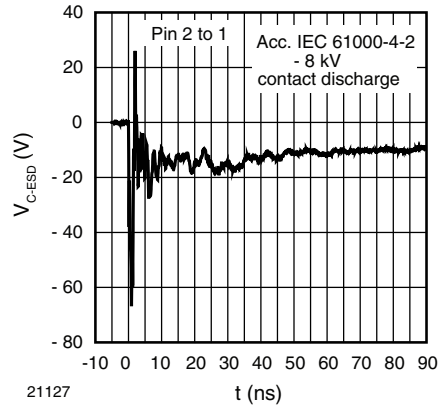


Fig. 8 - Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

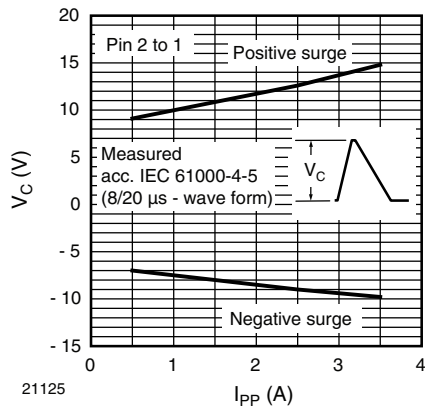


Fig. 6 - Typical Peak Clamping Voltage  $V_C$  vs. Peak Pulse Current  $I_{PP}$

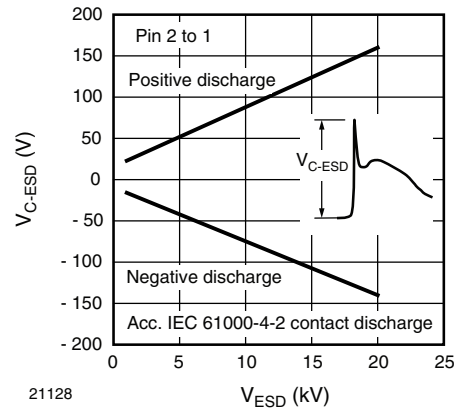


Fig. 9 - Typical Peak Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

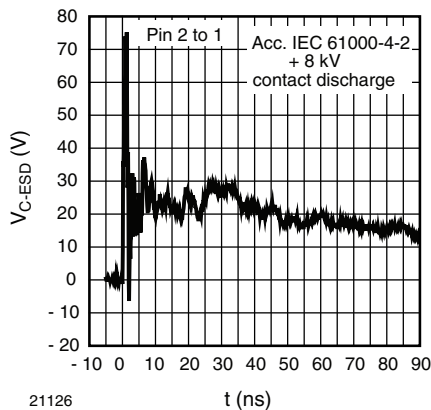


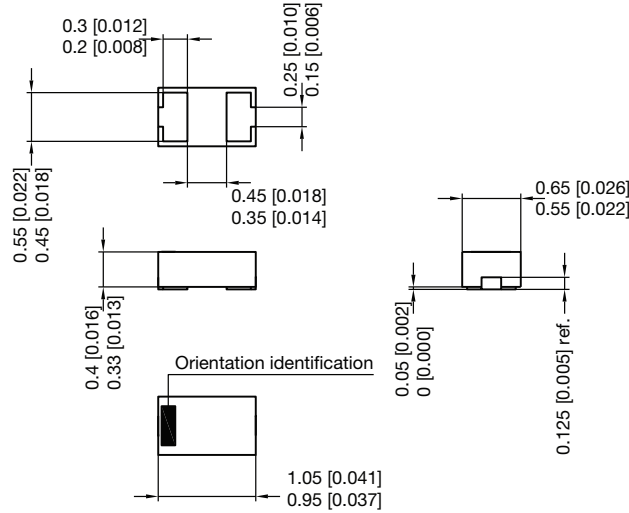
Fig. 7 - Typical Clamping Performance at + 8 kV Contact Discharge (acc. IEC 61000-4-2)



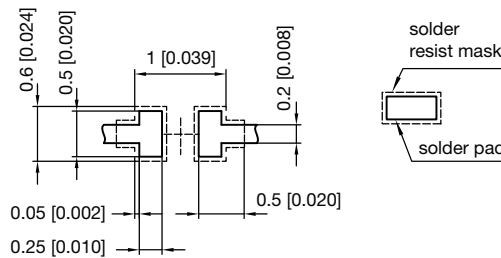
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**PACKAGE DIMENSIONS** in millimeters (Inches): **LLP1006-2L**

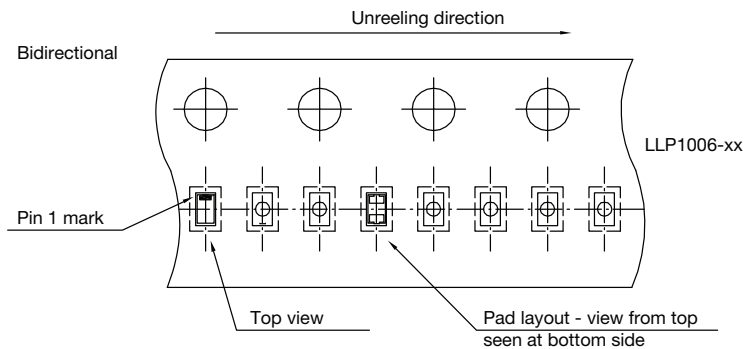


Foot print recommendation:



Pad Design Patented:  
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 Rev. 7 - Date: 11.May 2016  
 20812





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