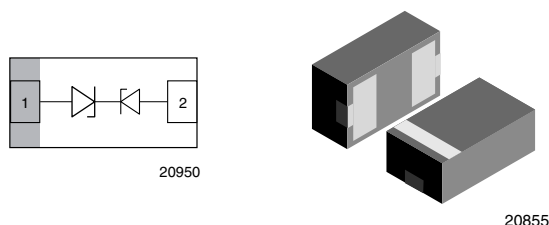


# Bidirectional Asymmetrical (BiAs) Single Line ESD-Protection Diode in LLP1006-2L



## FEATURES

- Ultra compact LLP1006-2L
- Low package height < 0.4 mm
- 1-line ESD-protection
- Working range - 7 V up to + 14 V or - 14 V up to + 7 V
- Low leakage current < 0.1  $\mu$ A
- Low load capacitance typical  $C_D = 8$  pF
- ESD-protection acc. IEC 61000-4-2  
± 25 kV contact discharge  
± 30 kV air discharge
- Soldering can be checked by standard vision inspection.  
No X-ray necessary
- e4 - precious metal (e.g. Ag, Au, NiPd, NiPdAu) (no Sn)
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



**RoHS**  
COMPLIANT  
**GREEN**  
[5-2008]\*\*

## MARKING (example only)



Bar = pin 1 marking

Y = type code (see table below)

X = date code

## ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL (8 mm TAPE ON 7" REEL)	MINIMUM ORDER QUANTITY
VCUT0714A-HD1	VCUT0714A-HD1-GS08	8000	8000

## PACKAGE DATA

DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VCUT0714A-HD1	LLP1006-2L	B	0.72 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

## ABSOLUTE MAXIMUM RATINGS VCUT0714A-02Z

PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	Pin 1 to pin 2 acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot	$I_{PPM}$	5	A
	Pin 2 to pin 1 acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot		2	A
Peak pulse power	Pin 1 to pin 2 acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot	$P_{PP}$	63	W
	Pin 2 to pin 1 acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot		54	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	$V_{ESD}$	± 25	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	kV
Operating temperature	Junction temperature	$T_J$	- 40 to + 125	°C
Storage temperature		$T_{STG}$	- 55 to + 150	°C

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

### CUT THE SPIKES WITH VCUT0714A-HD1

The VCUT0714A-HD1 is a bidirectional but asymmetrical (BiAs) ESD-protection device which clamps positive and negative overvoltage transients to ground. Connected between the signal or data line and the ground the VCUT0714A-HD1 offers a high isolation (low leakage current, small capacitance) within the specified working range of - 7 V to + 14 V or - 14 V and + 7 V. 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.



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#### ELECTRICAL CHARACTERISTICS VCUT0714A-HD1

PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of lines which can be protected	$N_{\text{channel}}$	-	-	1	lines
Reverse working voltage	at $I = 0.1\text{ }\mu\text{A}$	$V_{\text{RWM}}$	14	-	-	V
Reverse current	at $V = 14\text{ V}$	$I_{\text{R}}$	-	-	0.1	$\mu\text{A}$
Reverse breakdown voltage	at $I = 1\text{ mA}$	$V_{\text{BR}}$	14.5	-	-	V
Reverse clamping voltage	at $I_{\text{PP}} = 1\text{ A}$	$V_{\text{C}}$	-	-	27	V
	at $I_{\text{PP}} = I_{\text{PPM}} = 2\text{ A}$		-	-	30	V
Capacitance	at $V = 0\text{ V}$ ; $f = 1\text{ MHz}$	$C_{\text{D}}$	-	8	8.5	pF
	at $V = 7\text{ V}$ ; $f = 1\text{ MHz}$		-	4	-	pF

#### Note

- Ratings at 25 °C, ambient temperature unless otherwise specified. Measured from pin 2 to pin 1.

#### ELECTRICAL CHARACTERISTICS VCUT0714A-HD1

PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of lines which can be protected	$N_{\text{channel}}$	-	-	1	lines
Reverse working voltage	at $I = 0.1\text{ }\mu\text{A}$	$V_{\text{RWM}}$	7	-	-	V
Reverse current	at $V = 7\text{ V}$	$I_{\text{R}}$	-	-	0.1	$\mu\text{A}$
Reverse breakdown voltage	at $I = 1\text{ mA}$	$V_{\text{BR}}$	7.3	-	-	V
Reverse clamping voltage	at $I_{\text{P2}} = 1\text{ A}$	$V_{\text{C}}$	-	-	13	V
	at $I_{\text{PP}} = I_{\text{PPM}} = 5\text{ A}$		-	-	17	V
Capacitance	at $V = 0\text{ V}$ ; $f = 1\text{ MHz}$	$C_{\text{D}}$	-	8	8.5	pF
	at $V = 3.5\text{ V}$ ; $f = 1\text{ MHz}$		-	6.4	-	pF

#### Note

- Ratings at 25 °C, ambient temperature unless otherwise specified. Measured from pin 1 to pin 2.

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

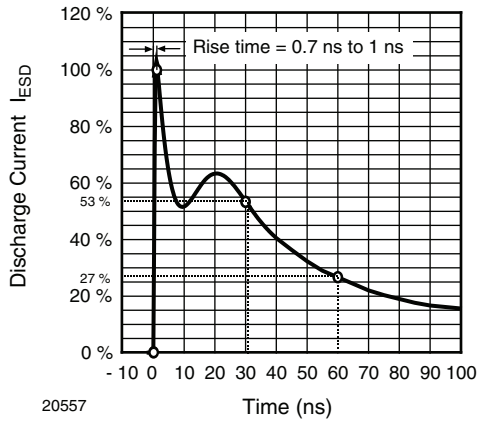


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330  $\Omega$ /150 pF)

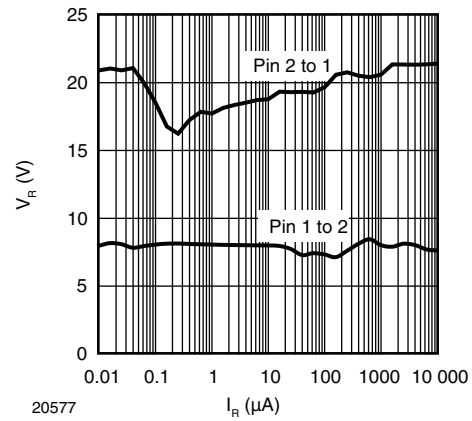


Fig. 4 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$

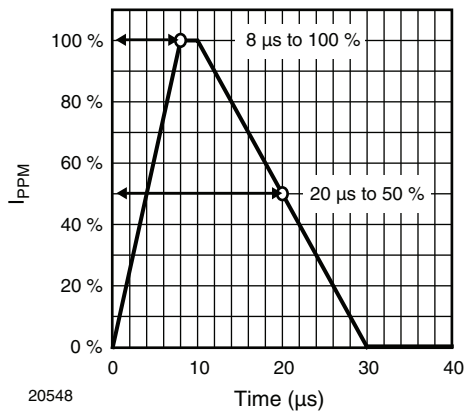


Fig. 2 - 8/20  $\mu\text{s}$  Peak Pulse Current Wave Form acc. IEC 61000-4-5

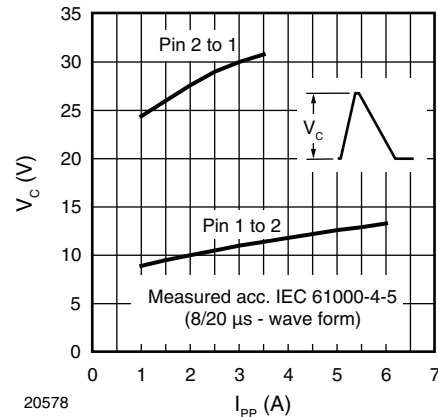


Fig. 5 - Typical Peak Clamping Voltage  $V_C$  vs. Peak Pulse Current  $I_{PP}$

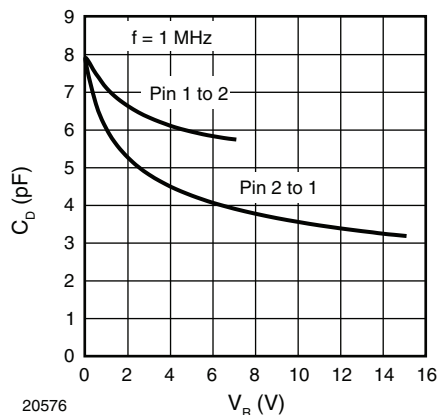


Fig. 3 - Typical Capacitance  $C_D$  vs. Reverse Voltage  $V_R$

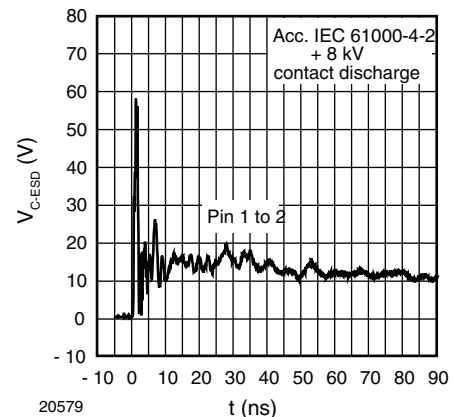


Fig. 6 - Typical Clamping Performance at +8 kV Contact Discharge (acc. IEC 61000-4-2)

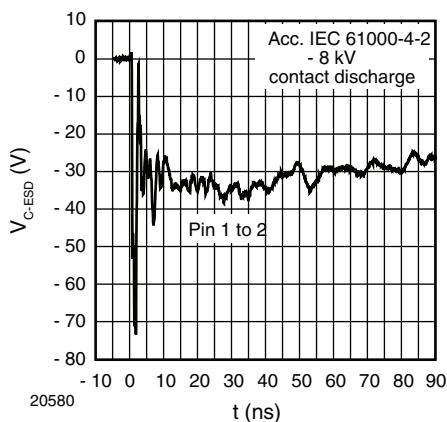


Fig. 7 - Typical Clamping Performance at -8 kV Contact Discharge (acc. IEC 61000-4-2)

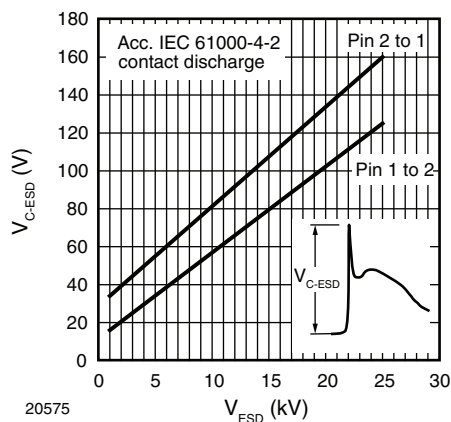
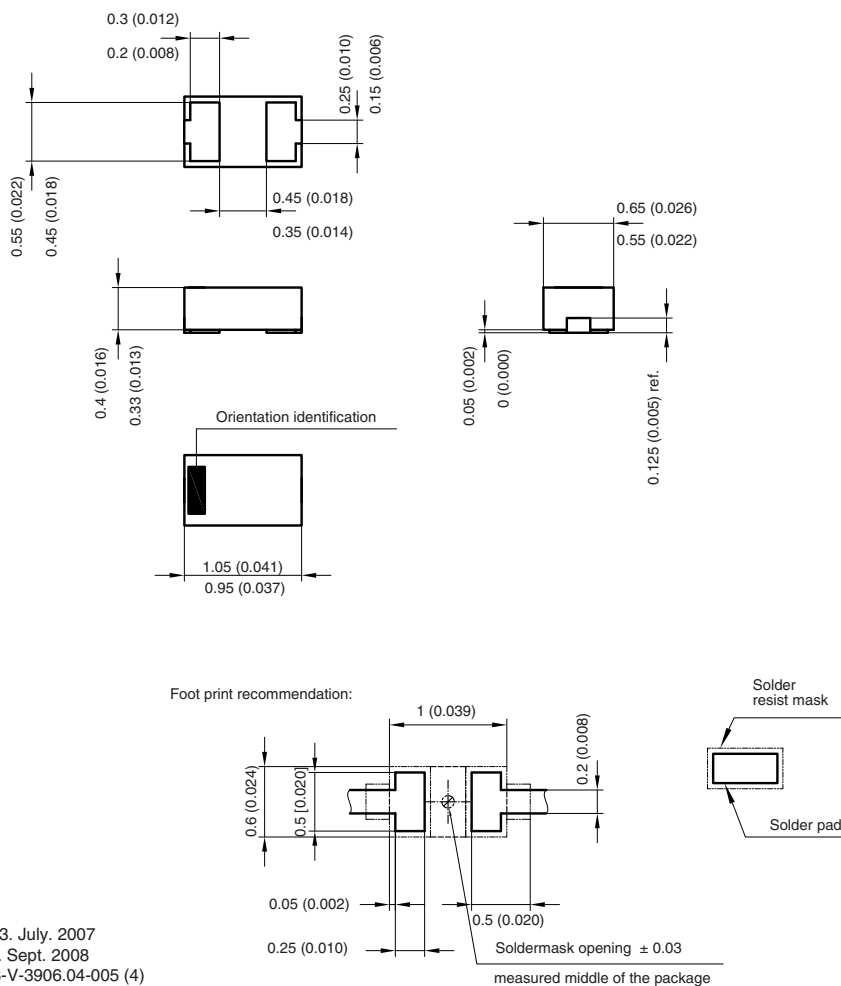


Fig. 8 - Typical Peak Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

## PACKAGE DIMENSIONS in millimeters (inches): LLP1006-2L



Created - Date: 13. July. 2007  
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 20812



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