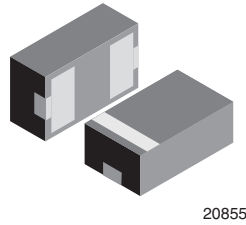
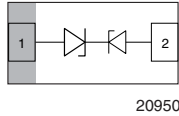




## Bidirectional Asymmetrical (BiAs) Single Line ESD Protection Diode in LLP1006-2L



### 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 immunity acc. IEC 61000-4-2
  - $\pm 25$  kV contact discharge
  - $\pm 30$  kV air discharge
- e4 - precious metal (e.g. Ag, Au, NiPd, NiPdAu) (no Sn)
- e3 - Sn
  - Tin plated exposed side wall of lead frame
  - Soldering can be checked by standard vision inspection
  - AOI = automated optical inspection
  - No X-ray necessary
- PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### MARKING (example only)



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

### ADDITIONAL RESOURCES



ORDERING INFORMATION				
PIN PLATING	DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL (8 mm TAPE ON 7" REEL)	MINIMUM ORDER QUANTITY
e4	VCUT0714A-HD1	VCUT0714A-HD1-GS08	8k	8k
e3	VCUT0714AHD1	VCUT0714AHD1-G3-08	10k	10k

PACKAGE DATA							
DEVICE NAME	PACKAGE NAME	PIN PLATING	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VCUT0714A-HD1	LLP1006-2L	e4	B	0.72 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C
VCUT0714AHD1	LLP1006-2L	e3	7	0.72 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C

ABSOLUTE MAXIMUM RATINGS				
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	$V_{ESD}$	$\pm 25$	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		$\pm 30$	kV
Storage temperature		$T_{STG}$	-55 to +150	°C
Operating temperature	Junction temperature	$T_J$	-40 to +125	°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.

## CUT THE SPIKES

The VCUT0714Ax 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 VCUT0714Ax 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 package the line inductance is very low, so that fast transients like an ESD strike can be clamped with minimal over- or undershoots.



22286

<b>ELECTRICAL CHARACTERISTICS</b> (pin 2 to pin 1) ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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	$V_{RWM}$	-	-	14	V
Reverse voltage	At $I_R = 0.1\text{ }\mu\text{A}$	$V_R$	14	-	-	V
Reverse current	At $V_{RWM} = 14\text{ V}$	$I_R$	-	-	0.1	$\mu\text{A}$
Reverse breakdown voltage	At $I_R = 1\text{ mA}$	$V_{BR}$	14.5	-	-	V
Reverse clamping voltage	At $I_{PP} = 1\text{ A}$	$V_C$	-	-	27	V
	At $I_{PP} = I_{PPM} = 2\text{ A}$	$V_C$	-	-	30	V
Capacitance	At $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$	$C_D$	-	8	8.5	pF
	At $V_R = 7\text{ V}$ ; $f = 1\text{ MHz}$	$C_D$	-	4	-	pF

<b>ELECTRICAL CHARACTERISTICS</b> (pin 1 to pin 2) ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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	$V_{RWM}$	-	-	7	V
Reverse voltage	At $I_R = 0.1\text{ }\mu\text{A}$	$V_R$	7	-	-	V
Reverse current	At $V_{RWM} = 7\text{ V}$	$I_R$	-	-	0.1	$\mu\text{A}$
Reverse breakdown voltage	At $I_R = 1\text{ mA}$	$V_{BR}$	7.3	-	-	V
Reverse clamping voltage	At $I_{PP} = 1\text{ A}$	$V_C$	-	-	13	V
	At $I_{PP} = I_{PPM} = 5\text{ A}$	$V_C$	-	-	17	V
Capacitance	At $V = 0\text{ V}$ ; $f = 1\text{ MHz}$	$C_D$	-	8	8.5	pF
	At $V = 3.5\text{ V}$ ; $f = 1\text{ MHz}$	$C_D$	-	6.4	-	pF

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

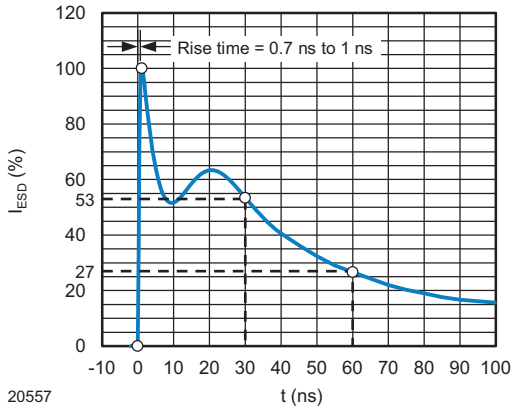


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330  $\Omega$ /150 pF)

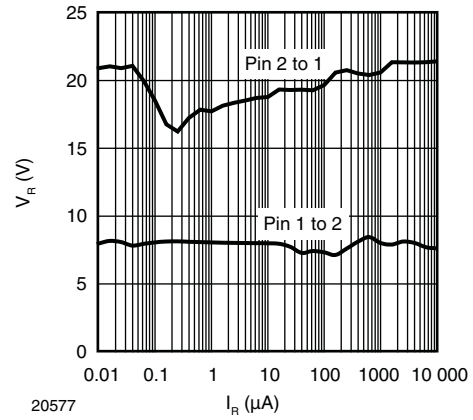


Fig. 4 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$

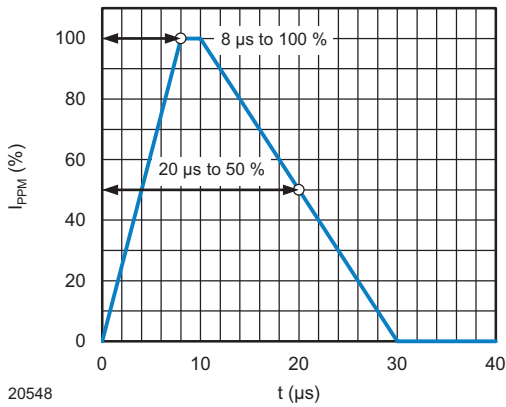


Fig. 2 - 8/20  $\mu\text{s}$  Peak Pulse Current Wave Form acc. IEC 61000-4-5

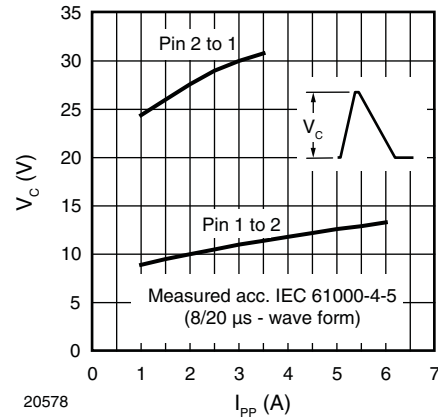


Fig. 5 - Typical Peak Clamping Voltage  $V_C$  vs. Peak Pulse Current  $I_{PP}$

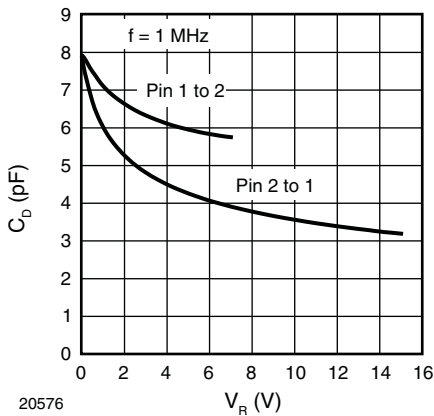


Fig. 3 - Typical Capacitance  $C_D$  vs. Reverse Voltage  $V_R$

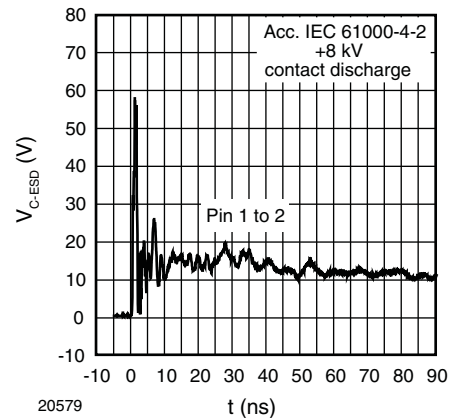


Fig. 6 - Typical Clamping Performance at +8 kV Contact Discharge (acc. IEC 61000-4-2)

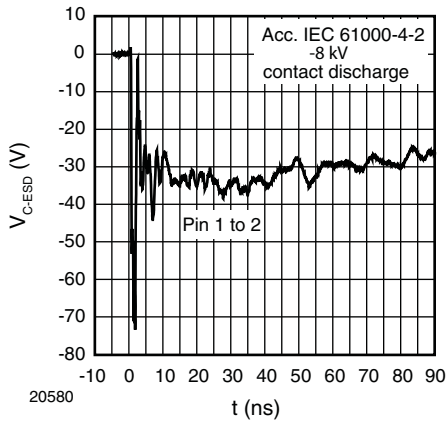


Fig. 7 - Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

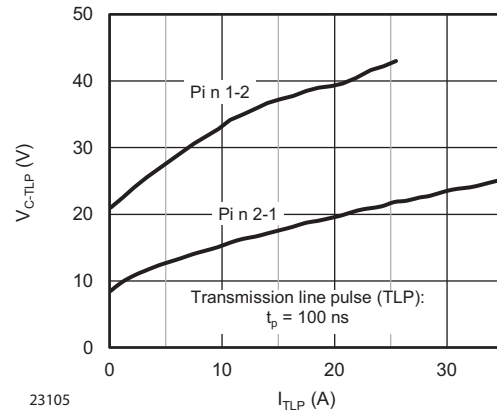
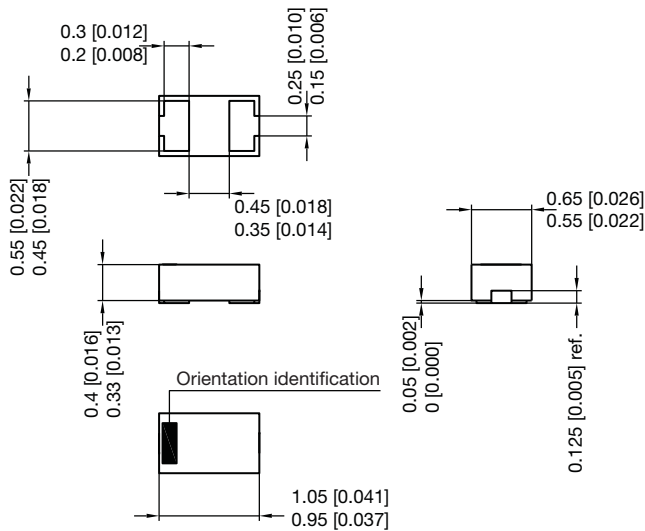
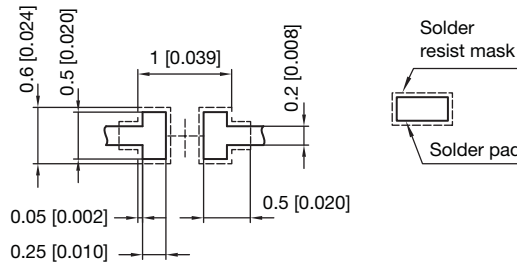


Fig. 8 - Typical Peak Clamping Voltage vs. Peak Pulse Current

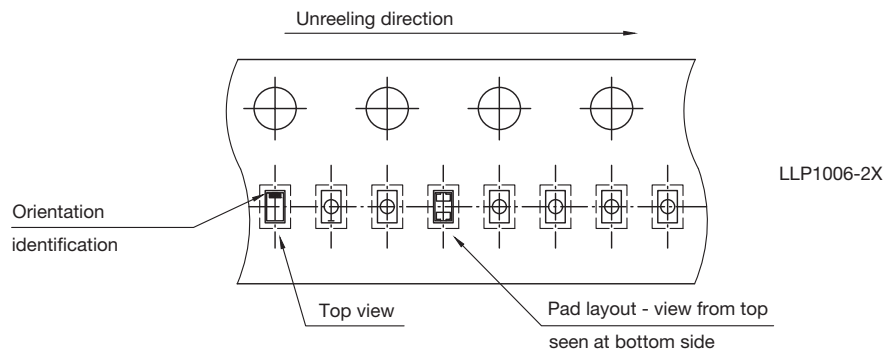
## PACKAGE DIMENSIONS in millimeters (inches): LLP1006-2L



Foot print recommendation:



Pad Design Patented:  
 (©US 9.018.537 B2)



S8-V-3906.04-017 (4)  
02.05.2017  
22965



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