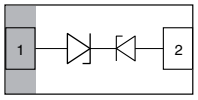
Bidirectional Asymmetrical (BiAs) Single Line ESD Protection Diode in LLP1006-2L



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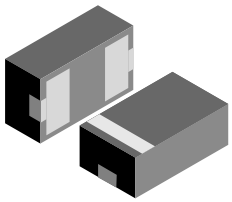

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FEATURES

- Ultra compact LLP1006-2L
- Low package height = 0.4 mm
- 1-line ESD protection
- Working range -6 V up to +10 V or -10 V up to +6 V
- Low leakage current < 0.1 µA
- Low load capacitance typical C_D = 5.4 pF at 0 V
- ESD immunity acc. IEC 61000-4-2
  ± 18 kV contact discharge
  ± 18 kV air discharge
- Tin plated exposed side wall of leadframe; soldering can be checked by standard vision inspection; (AOI = Automated Outgoing Inspection); no X-ray necessary
- e3 - Sn
- PATENT(S): www.vishay.com/patents
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

MARKING (example only)

21121

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

DESIGN SUPPORT TOOLS click logo to get started

3D Models Available

ORDERING INFORMATION			
DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL (8 mm TAPE ON 7" REEL)	MINIMUM ORDER QUANTITY
VCUT0610AHD1	VCUT0610AHD1-G3-08	10 000	100 000

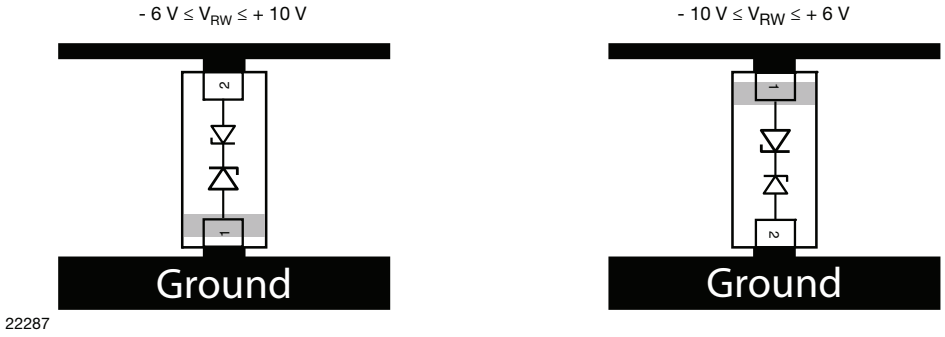
PACKAGE DATA						
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VCUT0610AHD1	LLP1006-2L	6	0.72 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

ABSOLUTE MAXIMUM RATINGS VCUT0610AHD1				
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	Pin 1 to pin 2 acc. IEC 61000-4-5, 8/20 µs/single shot; T_{amb} = 25 °C	I_{PPM}	3.2	A
	Pin 2 to pin 1 acc. IEC 61000-4-5, 8/20 µs/single shot; T_{amb} = 25 °C		2.3	A
Peak pulse power	Pin 1 to pin 2 acc. IEC 61000-4-5, 8/20 µs/single shot; T_{amb} = 25 °C	P_{PP}	54	W
	Pin 2 to pin 1 acc. IEC 61000-4-5, 8/20 µs/single shot; T_{amb} = 25 °C		64	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses; T_{amb} = 25 °C	V_{ESD}	± 18	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 18	kV
Operating temperature	Junction temperature	T_J	-40 to +125	°C
Storage temperature		T_{STG}	-55 to +125	°C

PATENT(S): www.vishay.com/patents
This Vishay product is protected by one or more United States and international patents.

CUT THE SPIKES WITH VCUT0610AHD1

The VCUT0610AHD1 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 VCUT0610AHD1 offers a high isolation (low leakage current, small capacitance) within the specified working range of -6 V to +10 V or -10 V and +6 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 VCUT0610AHD1 (T_{amb} = 25 C°, unless otherwise specified)
Measured from pin 2 to pin 1

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}	-	-	10	V
Reverse voltage	At I_R = 0.1 µA	V_R	10	-	-	V
Reverse current	At V = 10 V	I_R	-	-	0.1	µA
Reverse breakdown voltage	At I = 1 mA	V_{BR}	12	-	-	V
Reverse clamping voltage	At I_{PP} = 1 A; t_p = 8/20 µs	V_C	-	19	23	V
	At I_{PP} = I_{PPM} = 2.3 A; t_p = 8/20 µs		-	24	28	V
Capacitance	At V = 0 V; f = 1 MHz	C_D	-	5.4	6.5	pF
	At V = 3.3 V; f = 1 MHz		-	3.4	-	pF

ELECTRICAL CHARACTERISTICS VCUT0610AHD1 (T_{amb} = 25 C°, unless otherwise specified)
Measured from pin 1 to pin 2

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}	-	-	6	V
Reverse voltage	At I_R = 0.1 µA	V_R	6	-	-	V
Reverse current	At V = 6 V	I_R	-	-	0.1	µA
Reverse breakdown voltage	At I = 1 mA	V_{BR}	6.5	-	-	V
Reverse clamping voltage	At I_{PP} = 1 A; t_p = 8/20 µs	V_C	-	10.3	12	V
	At I_{PP} = I_{PPM} = 3.2 A; t_p = 8/20 µs		-	13.8	17	V
Capacitance	At V = 0 V; f = 1 MHz	C_D	-	5.4	6.5	pF
	At V = 3.3 V; f = 1 MHz		-	4	-	pF

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

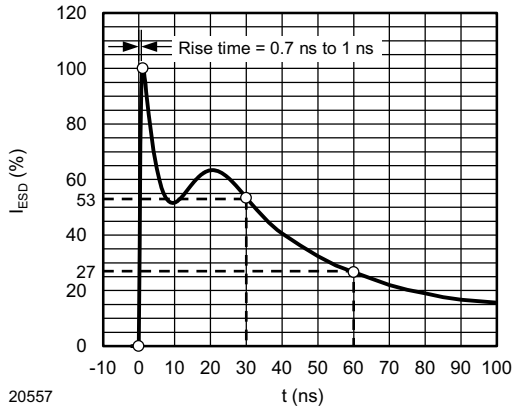


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330 Ω/150 pF)

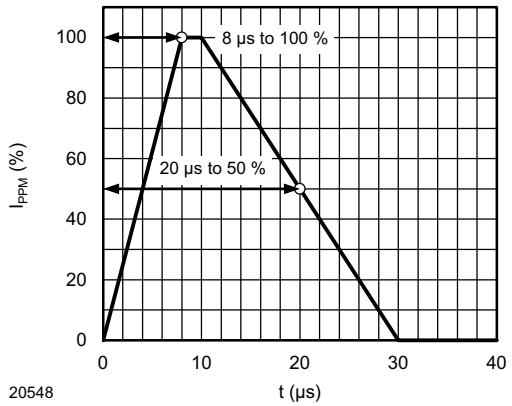


Fig. 2 - 8/20 µs Peak Pulse Current Wave Form acc. IEC 61000-4-5

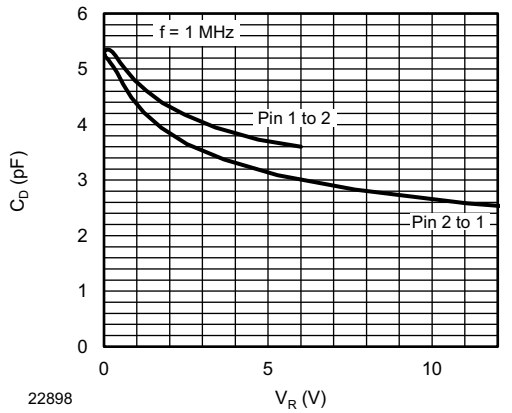


Fig. 3 - Typical Capacitance vs. Reverse Voltage

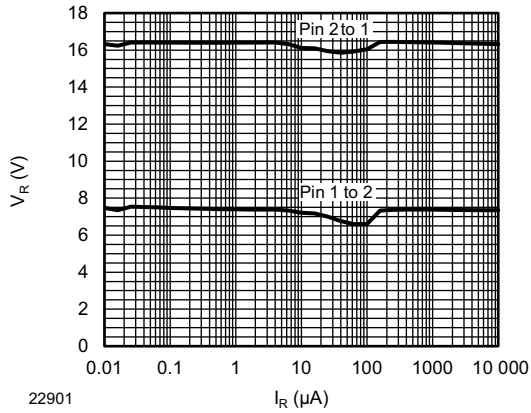


Fig. 4 - Typical Forward and Reverse Voltage vs. Reverse Current

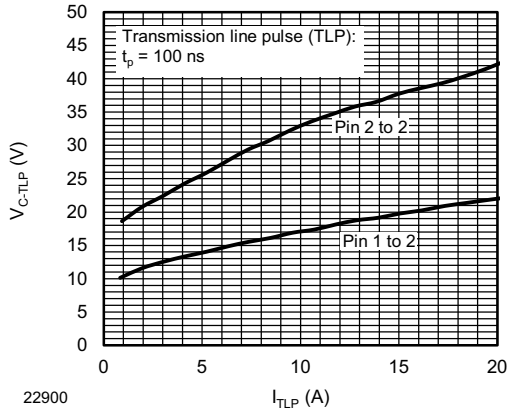


Fig. 5 - Typical Clamping Voltage vs. Peak Pulse Current

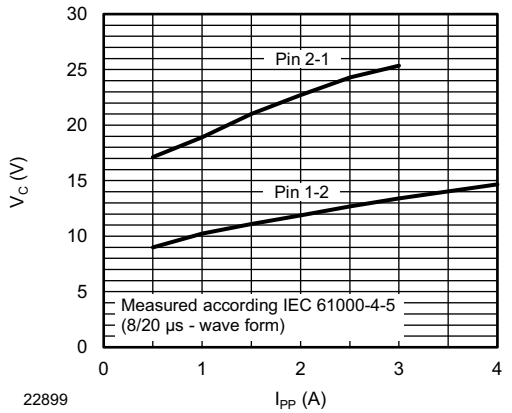
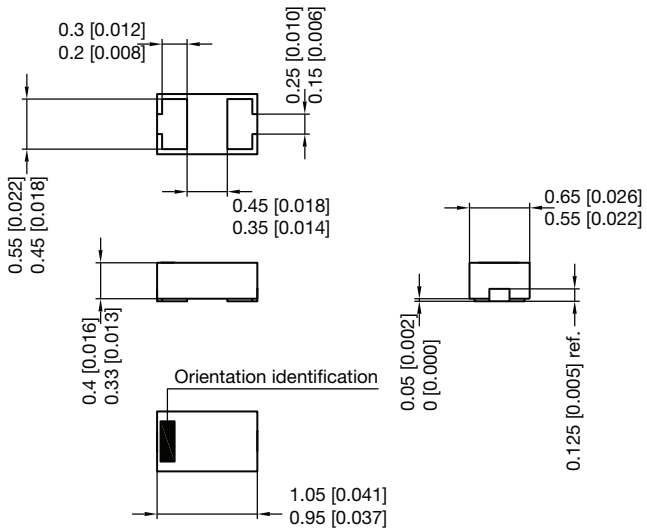
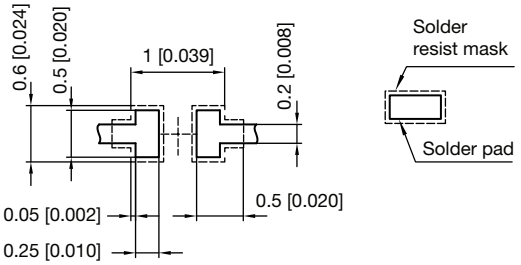


Fig. 6 - Typical Peak Clamping Voltage vs. Peak Pulse Current

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



Foot print recommendation:



Pad Design Patented:
(Ⓟ US 9.018.537 B2)

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Rev. 7 - Date: 11.May 2016
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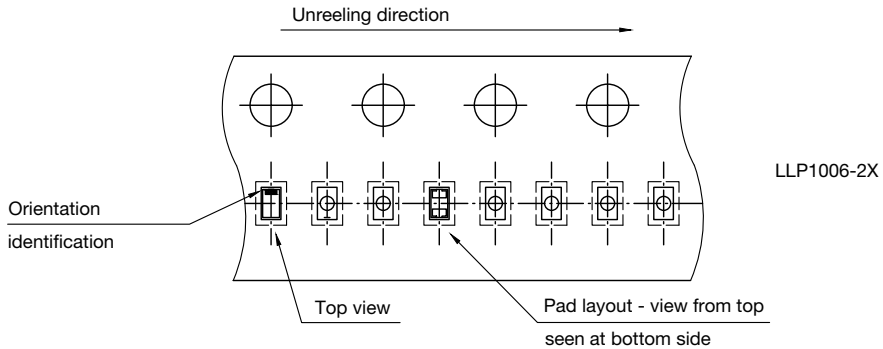

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02.05.2017
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