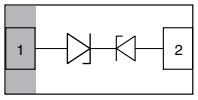
Bidirectional Asymmetrical (BiAs) Single Line ESD-Protection Diode in LLP1006-2L



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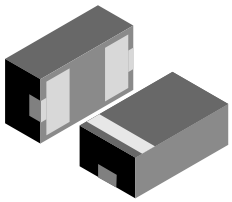

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FEATURES

- 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-protection 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
- 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

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

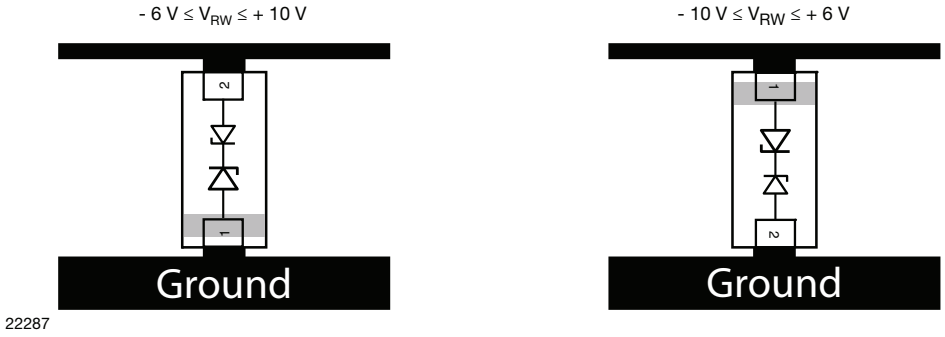
ABSOLUTE MAXIMUM RATINGS VCUT0610AHD1

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 working voltage	at I = 0.1 µA	V_{RWM}	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 working voltage	at I = 0.1 µA	V_{RWM}	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)

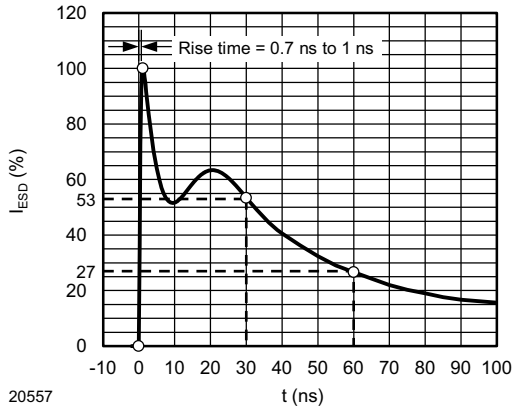


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330 Ω/150 pF)

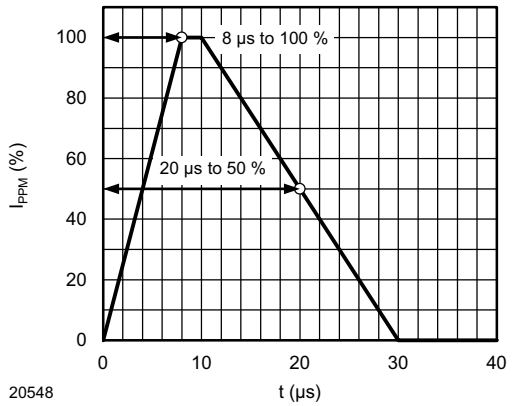


Fig. 2 - 8/20 µs Peak Pulse Current Wave Form acc. IEC 61000-4-5

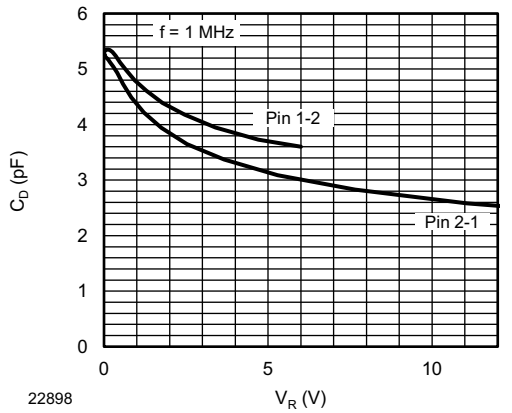


Fig. 3 - Typical Capacitance vs. Reverse Voltage

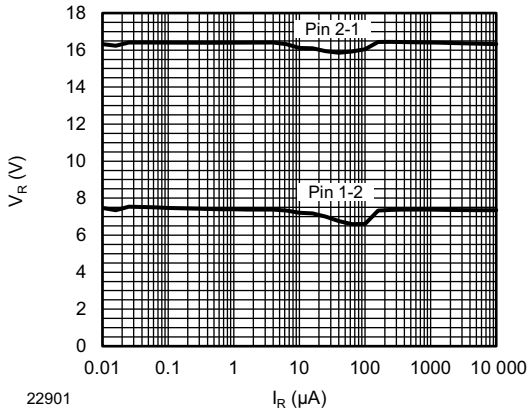


Fig. 4 - Typical Forward and Reverse Voltage vs. Reverse Current

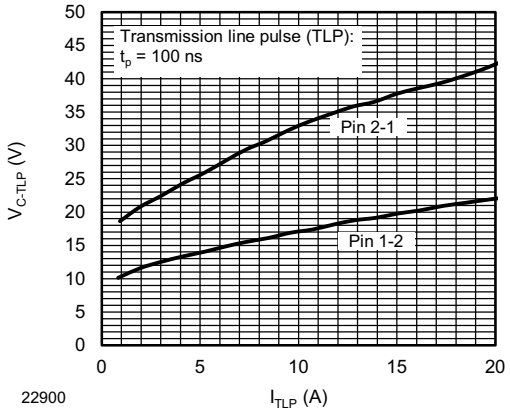


Fig. 5 - Typical Clamping Voltage vs. Peak Pulse Current

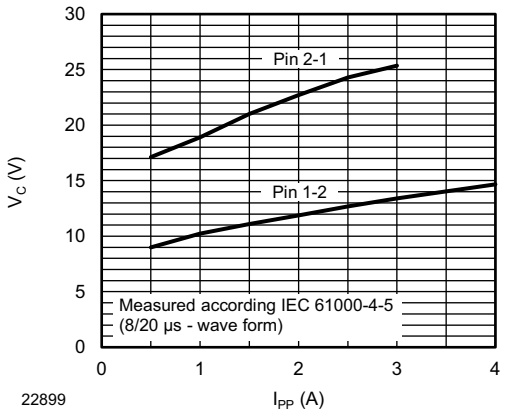
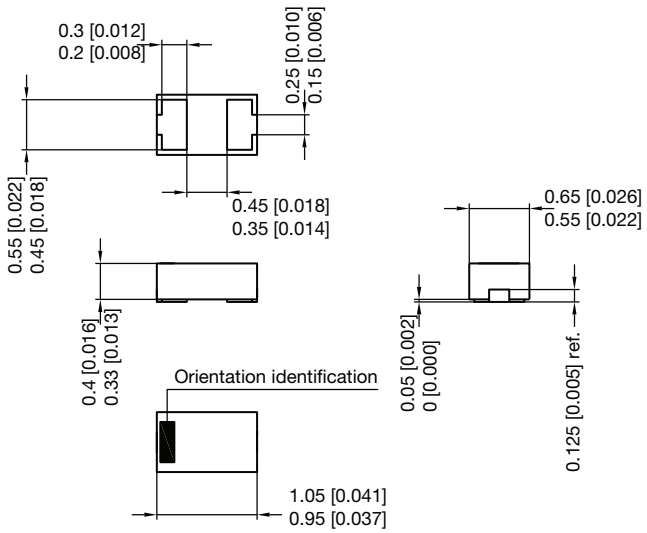
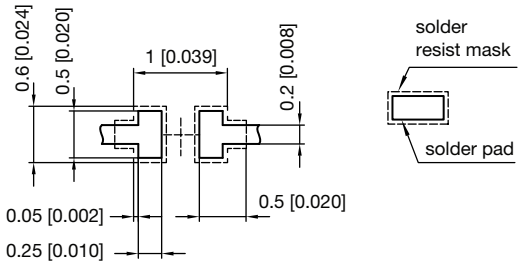


Fig. 6 - Typical Peak Clamping Voltage vs. Peak Pulse Current

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



Foot print recommendation:



Pad Design Patented:
(Ⓟ US 9.018.537 B2)

Document no.: S8-V-3906.04-005 (4)
Rev. 7 - Date: 11.May 2016
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