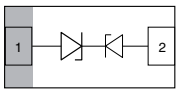
Bidirectional Asymmetrical (BiAs) Single Line ESD Protection Diode in LLP1006-2L



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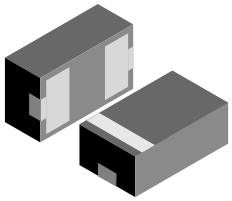

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FEATURES

- Ultra compact LLP1006-2L
- Low package height < 0.4 mm
- 1-line ESD protection
- Working range -7 V up to +14 V or -14 V up to +7 V
- Low leakage current < 0.1 µA
- Low load capacitance typical C_D = 8 pF
- ESD immunity acc. IEC 61000-4-2
  ± 25 kV contact discharge
  ± 30 kV air discharge
- e4 - precious metal (e.g. Ag, Au, NiPd, NiPdAu) (no Sn)
- PATENT(S): www.vishay.com/patents
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

MARKING (example only)

21121

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

LINKS TO ADDITIONAL RESOURCES

3D Models

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

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

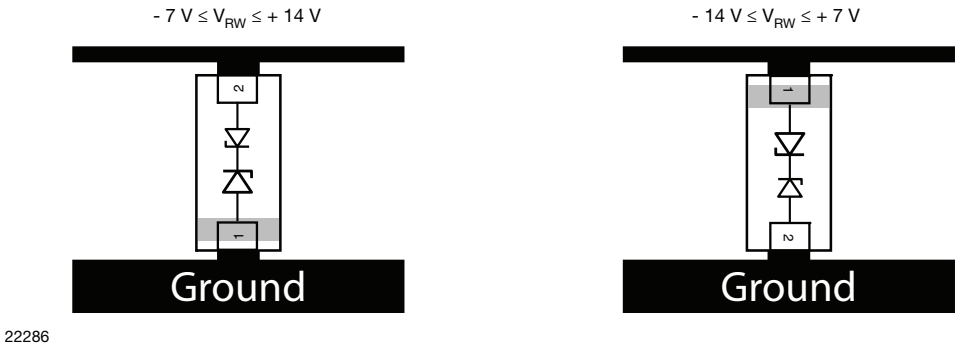
ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	Pin 1 to pin 2, acc. IEC 61000-4-5, 8/20 µs/single shot	I_{PPM}	5	A
	Pin 2 to pin 1, acc. IEC 61000-4-5, 8/20 µs/single shot		2	A
Peak pulse power	Pin 1 to pin 2, acc. IEC 61000-4-5, 8/20 µs/single shot	P_{PP}	63	W
	Pin 2 to pin 1, acc. IEC 61000-4-5, 8/20 µs/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
Storage temperature		T_{STG}	-55 to +150	°C
Operating temperature	Junction temperature	T_J	-40 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

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 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 (pin 2 to pin 1) (T_{amb} = 25 °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 µA	V_R	14	-	-	V
Reverse current	At V_{RWM} = 14 V	I_R	-	-	0.1	µA
Reverse breakdown voltage	At I_R = 1 mA	V_{BR}	14.5	-	-	V
Reverse clamping voltage	At I_{PP} = 1 A	V_C	-	-	27	V
	At I_{PP} = I_{PPM} = 2 A	V_C	-	-	30	V
Capacitance	At V_R = 0 V; f = 1 MHz	C_D	-	8	8.5	pF
	At V_R = 7 V; f = 1 MHz	C_D	-	4	-	pF

ELECTRICAL CHARACTERISTICS (pin 1 to pin 2) (T_{amb} = 25 °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 µA	V_R	7	-	-	V
Reverse current	At V_{RWM} = 7 V	I_R	-	-	0.1	µA
Reverse breakdown voltage	At I_R = 1 mA	V_{BR}	7.3	-	-	V
Reverse clamping voltage	At I_{PP} = 1 A	V_C	-	-	13	V
	At I_{PP} = I_{PPM} = 5 A	V_C	-	-	17	V
Capacitance	At V = 0 V; f = 1 MHz	C_D	-	8	8.5	pF
	At V = 3.5 V; f = 1 MHz	C_D	-	6.4	-	pF

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

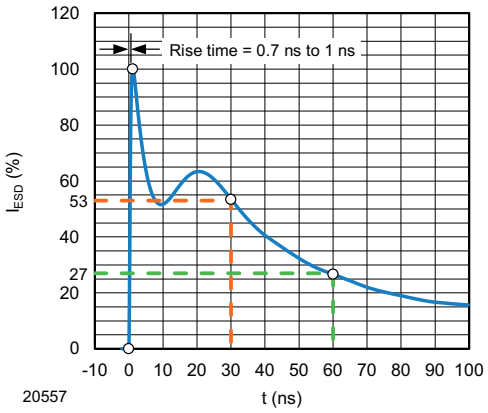


Fig. 1 - ESD Discharge Current Wave Form
acc. IEC 61000-4-2 (330 Ω/150 pF)

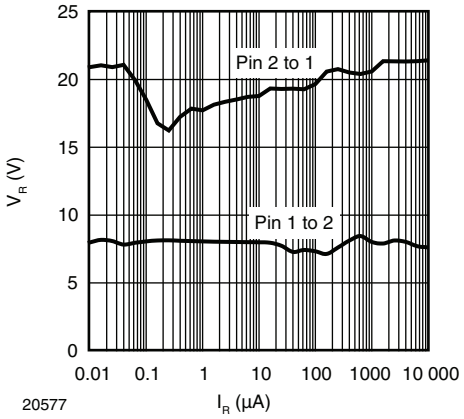


Fig. 4 - Typical Reverse Voltage V_R vs. Reverse Current I_R

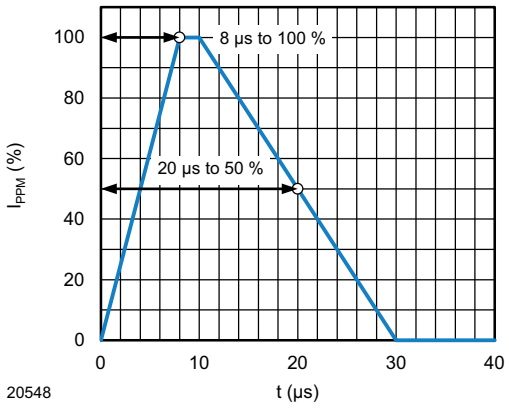


Fig. 2 - 8/20 µs Peak Pulse Current Wave Form
acc. IEC 61000-4-5

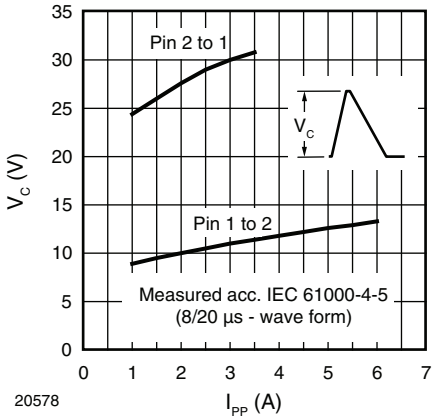


Fig. 5 - Typical Peak Clamping Voltage V_C vs.
Peak Pulse Current I_{PP}

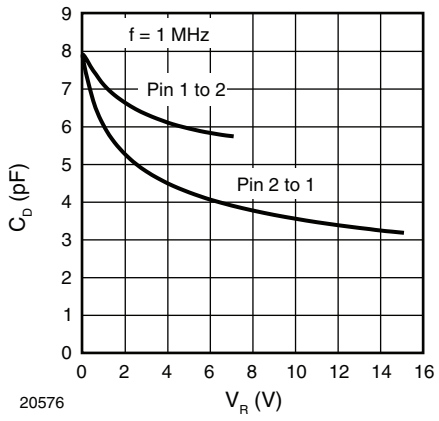


Fig. 3 - Typical Capacitance C_D vs. Reverse Voltage V_R

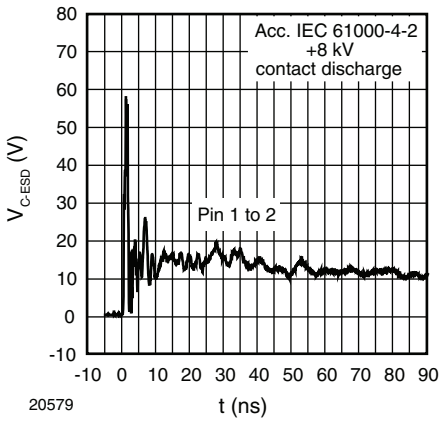


Fig. 6 - Typical Clamping Performance at + 8 kV
Contact Discharge (acc. IEC 61000-4-2)

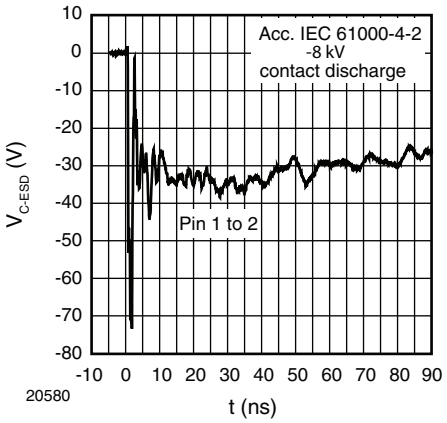


Fig. 7 - Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

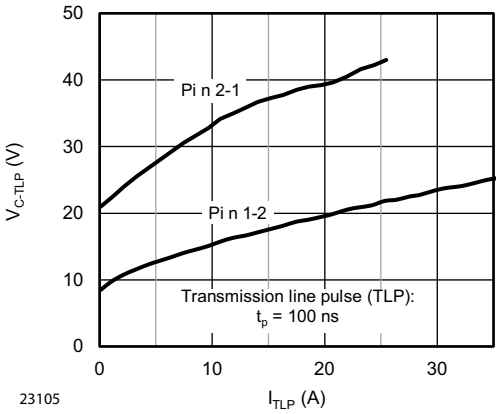
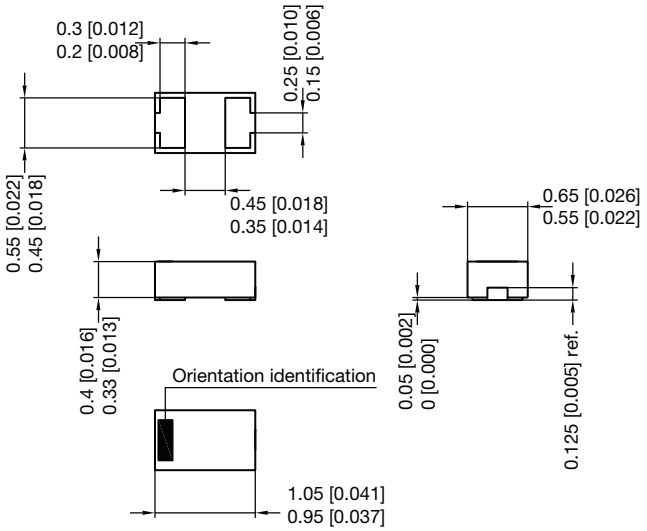
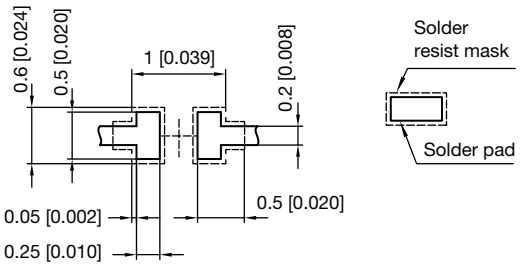


Fig. 8 - Typical Peak Clamping Voltage vs. Peak Pulse Current

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



Foot print recommendation:



Pad Design Patented:
(Ⓟ US 9.018.537 B2)

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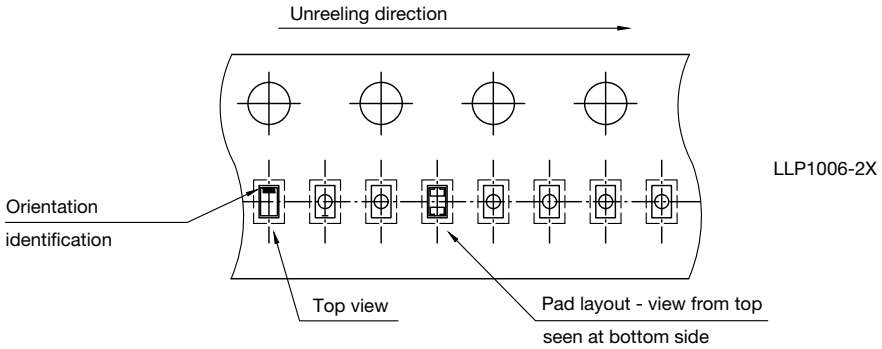

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02.05.2017
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