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

Features

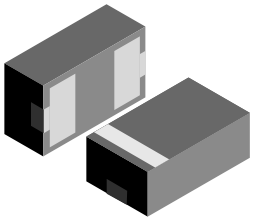
- Ultra compact LLP1006-2L package
- Low package height < 0.4 mm
- 1-line ESD-protection
- Working range - 7 V up to + 14 V or - 14 V up to + 7 V
- Low leakage current < 0.1 µA
- Low load capacitance C_D = 8.0 pF
- ESD-protection acc. IEC 61000-4-2
  ± 25 kV contact discharge
  ± 30 kV air discharge
- Soldering can be checked by standard vision inspection. No X-ray necessary
- AEC Q101 qualified
- Lead (Pb)-free component
- Pin plating NiPdAu (e4) no whisker growth
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb-free

e4

RoHS COMPLIANT

GREEN (5-2008)**



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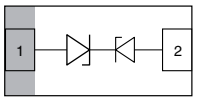

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Marking (example only)

21121

Bar = Pin 1 marking
X = Date code
Y = Type code (see table below)

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

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	I_{PPM}	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	P_{PP}	54	W
ESD immunity	Contact discharge acc. IEC61000-4-2; 10 pulses	V_{ESD}	± 25	kV
	Air discharge acc. IEC61000-4-2; 10 pulses		± 30	
Operating temperature	Junction temperature	T_j	- 40 to + 125	°C
Storage temperature		T_{STG}	- 55 to + 150	°C

** Please see document “Vishay Green and Halogen-Free Definitions (5-2008)” http://www.vishay.com/doc?99902

Cut the spikes with VCUT0714A-HD1:

The **VCUT0714A-HD1** is a **Bi**directional but **As**ymmetrical (**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.

Electrical Characteristics

T_{amb} = 25 °C, unless otherwise specified

VCUT0714A-HD1

(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_{lines}			1	lines
Reverse stand-off voltage	at I = 0.1 µA	V_{RWM}	14			V
Reverse current	at V = 14 V	I_R			0.1	µA
Reverse breakdown voltage	at I = 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 = 0 V; f = 1 MHz	C_D		8	8.5	pF
	at V = 7 V; f = 1 MHz	C_D		4		pF

VCUT0714A-HD1

(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_{lines}			1	lines
Reverse stand-off voltage	at I = 0.1 µA	V_{RWM}	7			V
Reverse current	at V = 7 V	I_R			0.1	µA
Reverse breakdown voltage	at I = 1 mA	V_{BR}	7.3			V
Reverse clamping voltage	at I_{P2} = 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

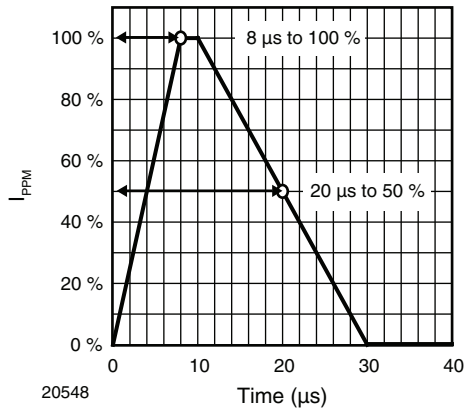


Figure 1. 8/20 µs Peak Pulse Current Wave Form (acc. IEC 61000-4-5)

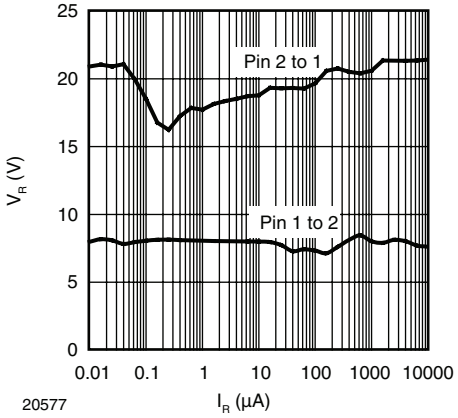


Figure 4. Typical Reverse Voltage V_R vs. Reverse Current I_R

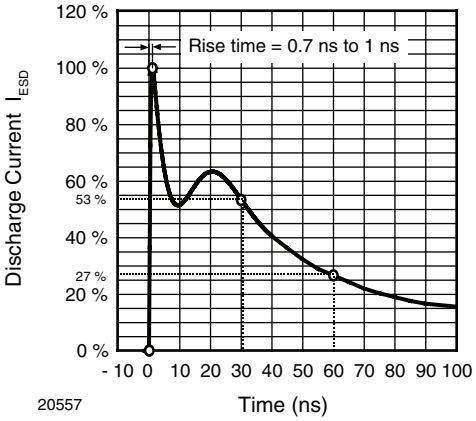


Figure 2. ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330 Ω/150 pF)

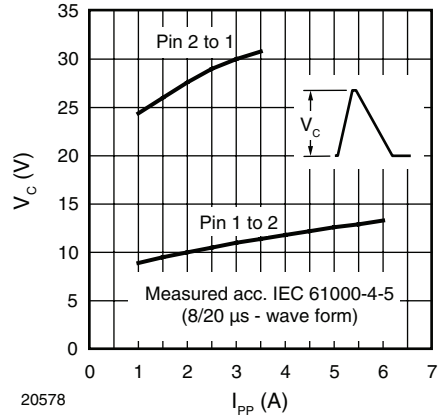


Figure 5. Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}

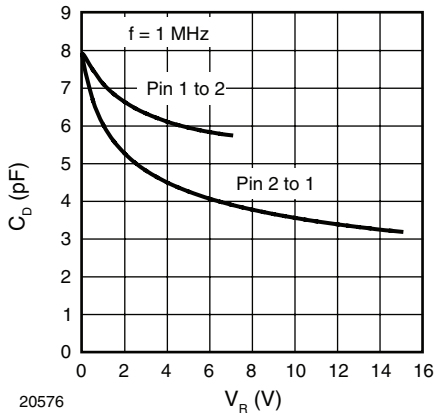


Figure 3. Typical Capacitance C_D vs. Reverse Voltage V_R

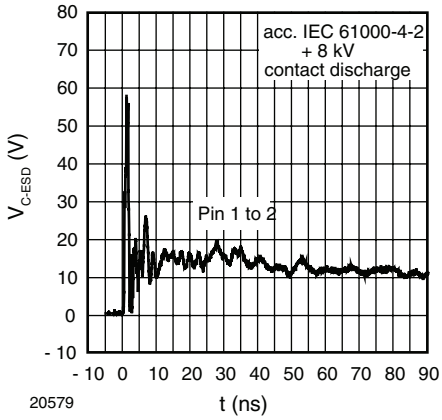


Figure 6. Typical Clamping Performance at + 8 kV Contact Discharge (acc. IEC 61000-4-2)

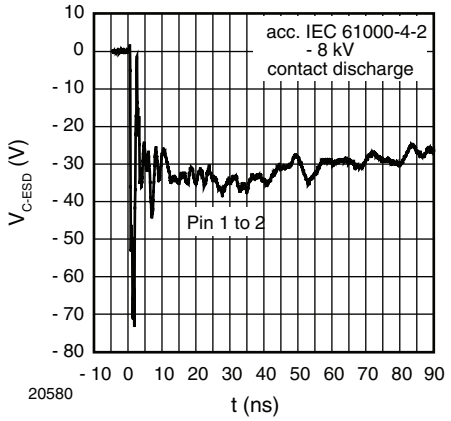


Figure 7. Typical Clamping Performance at - 8 kV
Contact Discharge (acc. IEC 61000-4-2)

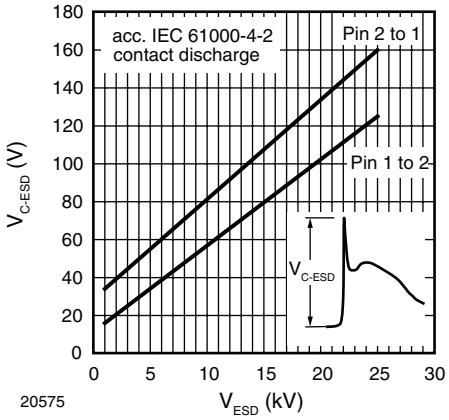
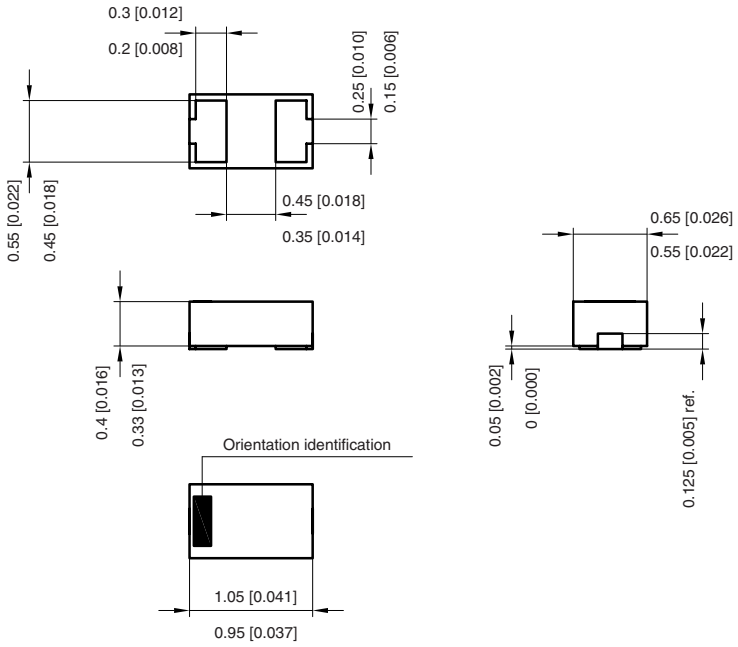
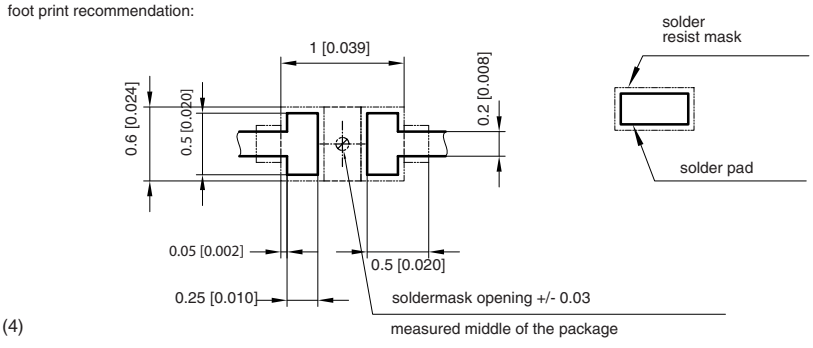


Figure 8. Typical Peak Clamping Voltage at ESD
Contact Discharge (acc. IEC 61000-4-2)

Package Dimensions in millimeters (inches): **LLP1006-2L**





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Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively.
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA.
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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