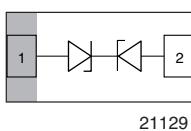
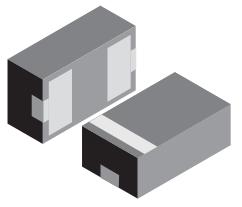


Bidirectional Symmetrical (BiSy) Low Capacitance, Single-Line ESD Protection Diode in LLP1006-2M



21129



20855

MARKING (example only)


Bar = pin 1 marking

X = date code

Y = type code (see table below)

DESIGN SUPPORT TOOLS

[click logo to get started](#)
FEATURES

- Ultra compact LLP1006-2M package
- Low package height < 0.4 mm
- 1-line ESD protection
- Working range ± 5.5 V
- Low leakage current $I_R < 0.1$ μ A
- Very low load capacitance $C_D = 0.3$ pF
- ESD immunity acc. IEC 61000-4-2
 ± 15 kV contact discharge
 ± 16 kV air discharge
- Soldering can be checked by standard vision inspection;
no X-ray necessary
- Pin plating NiPdAu (e4) no whisker growth
- 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


RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL (8 mm TAPE ON 7" REEL)	MINIMUM ORDER QUANTITY
VBUS05L1-DD1	VBUS05L1-DD1-G-08	8000	8000

PACKAGE DATA

DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VBUS05L1-DD1	LLP1006-2M	R	0.72 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C

ABSOLUTE MAXIMUM RATINGS VBUS05L1-DD1

PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	Acc. IEC 61000-4-5; $t_p = 8/20$ μ s; single shot	I_{PPM}	2	A
Peak pulse power	Pin 1 to pin 2, acc. IEC 61000-4-5; $t_p = 8/20$ μ s; single shot	P_{PP}	34	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V_{ESD}	± 15	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 16	kV
Operating temperature	Junction temperature	T_J	-40 to +125	°C
Storage temperature		T_{STG}	-40 to +150	°C

PATENT(S): www.vishay.com/patents

This Vishay product is protected by one or more United States and international patents.

ELECTRICAL CHARACTERISTICS VBUS05L1-DD1

($T_{amb} = 25^{\circ}\text{C}$, 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}	-	-	5.5	V
Reverse voltage	at $I_R = 0.05 \mu\text{A}$	V_R	5.5	-	-	V
Reverse current	at $V_{RWM} = 5.5 \text{ V}$	I_R	-	-	0.05	μA
Reverse breakdown voltage	at $I_R = 1 \text{ mA}$	V_{BR}	7	8.4	9.5	V
Reverse clamping voltage	at $I_{PP} = 1 \text{ A}$	V_C	-	11.5	14	V
	at $I_{PP} = I_{PPM} = 2 \text{ A}$	V_C	-	14	17	V
Capacitance	at $V_R = 0 \text{ V}, f = 1 \text{ MHz}$	C_D	-	0.33	0.4	pF
	at $V_R = 2.5 \text{ V}, f = 1 \text{ MHz}$	C_D	-	0.34	-	pF

VBUS05L1-DD1: ESD PROTECTION WITH LOWEST LOAD CAPACITANCE

The VBUS05L1-DD1 is a bidirectional and symmetrical (BiSy) ESD protection device which clamps positive and negative overvoltage transients to ground. Connected between the signal or data line and the ground the VBUS05L1-DD1 offers a high isolation (low leakage current, lowest capacitance) within the specified working range. Due to the short leads and small package size of the tiny LLP1006-2M package the line inductance is very low, so that fast transients like an ESD strike can be clamped with minimal over- or undershoots.

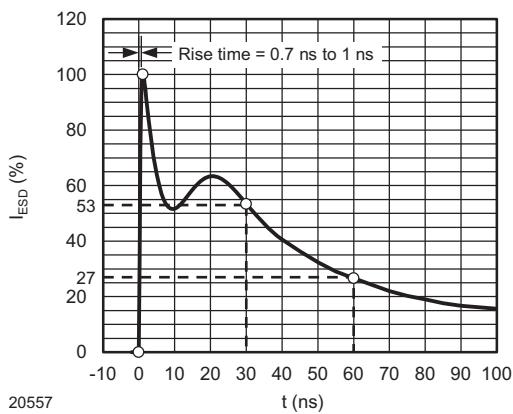
TYPICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, unless otherwise specified)


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

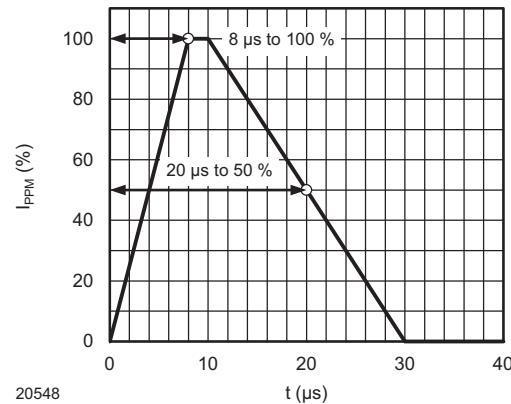


Fig. 2 - 8/20 μs Peak Pulse Current Wave Form
acc. IEC 61000-4-5

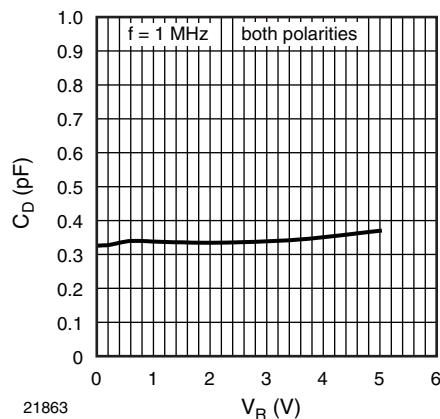


Fig. 3 - Typical Capacitance C_D vs. Reverse Voltage V_R

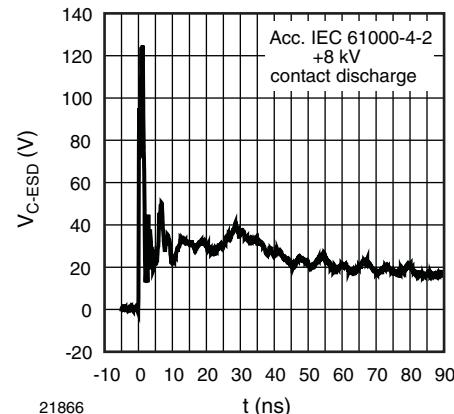


Fig. 6 - Typical Clamping Performance at + 8 kV Contact Discharge (acc. IEC 61000-4-2)

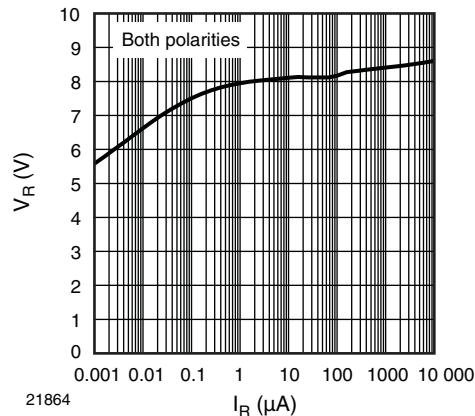


Fig. 4 - Typical Reverse Voltage V_R vs. Reverse Current I_R

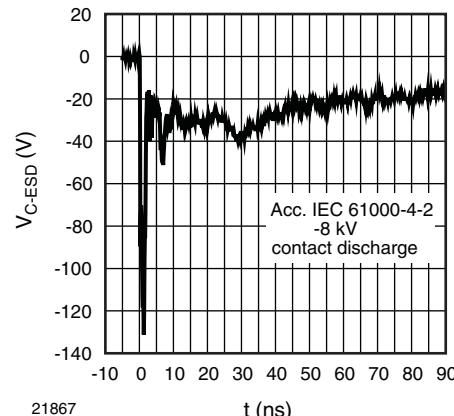


Fig. 7 - Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

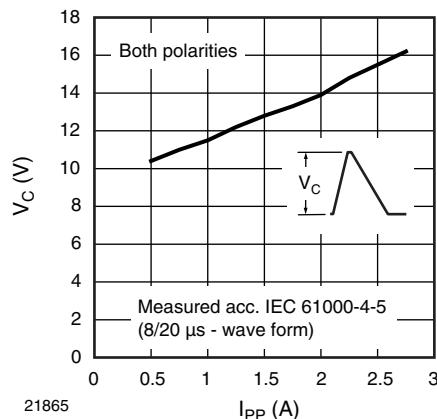


Fig. 5 - Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}

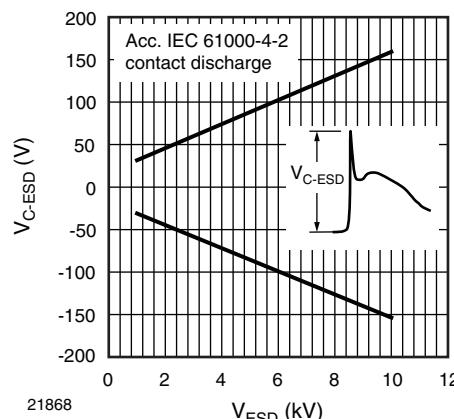
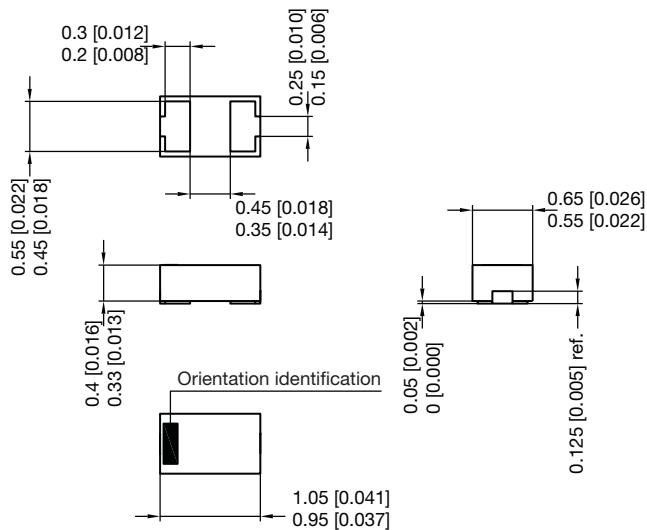
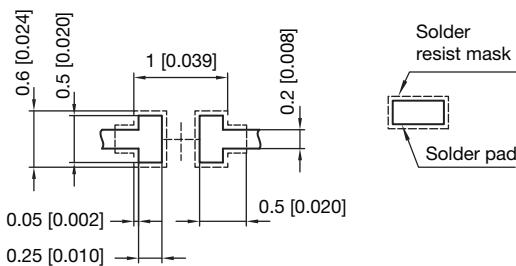


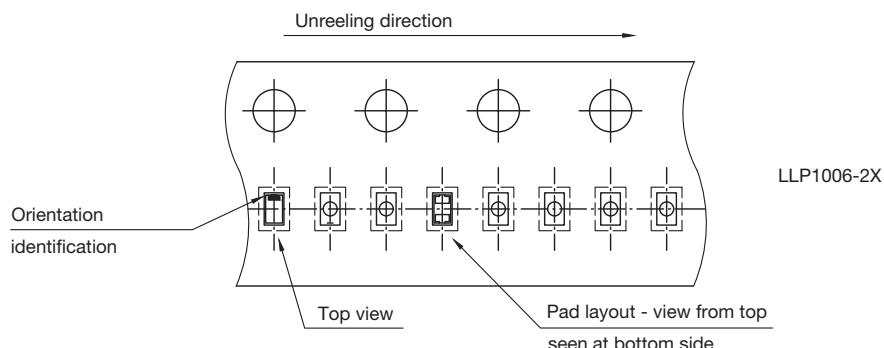
Fig. 8 - Typical Peak Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

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


Foot print recommendation:


Pad Design Patented:
(US 9,018,537 B2)

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Rev. 7 - Date: 11.May 2016
20812



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02.05.2017
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