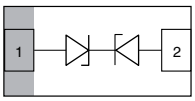
Bidirectional Symmetrical (BiSy) Low Capacitance, Single-Line ESD-Protection Diode in LLP1006-2M



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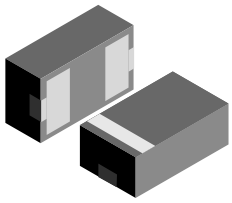
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FEATURES

- 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 µA
- Very low load capacitance C_D = 0.3 pF
- ESD-protection 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)
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free

e4

RoHS COMPLIANT

GREEN (5-2008)**

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
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)	260 °C/10 s at terminals

ABSOLUTE MAXIMUM RATINGS VBUS05L1-DD1

PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	Acc. IEC 61000-4-5; t_p = 8/20 µs; single shot	I_{PPM}	2	A
Peak pulse power	Pin 1 to pin 2, acc. IEC 61000-4-5; t_p = 8/20 µs; 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

ELECTRICAL CHARACTERISTICS VBUS05L1-DD1 (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	at I_R = 0.05 µA	V_{RWM}	5.5	-	-	V
Reverse current	at V_R = 5.5 V	I_R	-	-	0.05	µA
Reverse breakdown voltage	at I_R = 1 mA	V_{BR}	7	8.4	9.5	V
Reverse clamping voltage	at I_{PP} = 1 A	V_C	-	11.5	14	V
	at I_{PP} = I_{PPM} = 2 A	V_C	-	14	17	V
Capacitance	at V_R = 0 V, f = 1 MHz	C_D	-	0.33	0.4	pF
	at V_R = 2.5 V, f = 1 MHz	C_D	-	0.34	-	pF

** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

VBUS05L1-DD1: ESD PROTECTION WITH LOWEST LOAD CAPACITANCE

The **VBUS05L1-DD1** is a **Bi**directional and **Sy**mmetrical (**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 °C, unless otherwise specified)

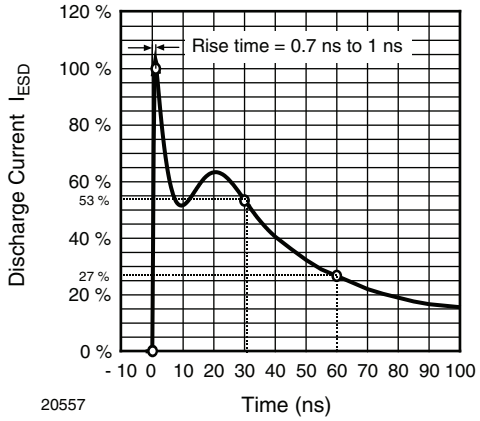


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330 Ω/150 pF)

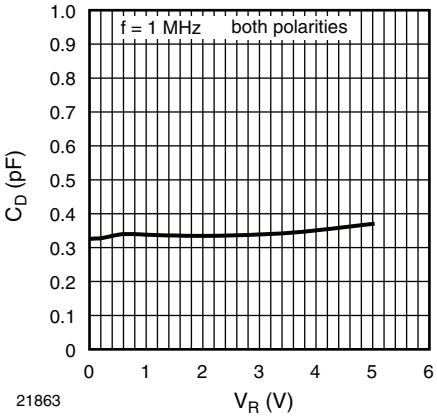


Fig. 3 - Typical Capacitance C_D vs. Reverse Voltage V_R

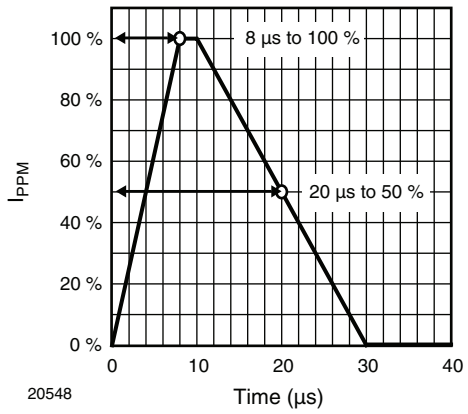


Fig. 2 - 8/20 µs Peak Pulse Current Wave Form acc. IEC 61000-4-5

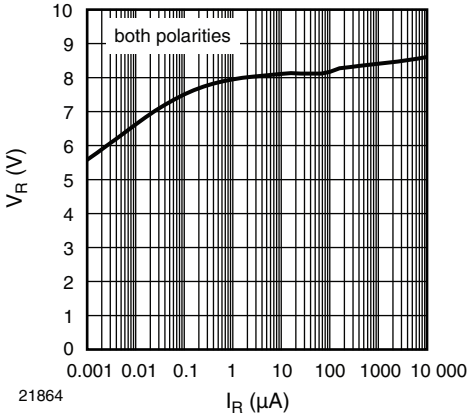


Fig. 4 - Typical Reverse Voltage V_R vs. Reverse Current I_R

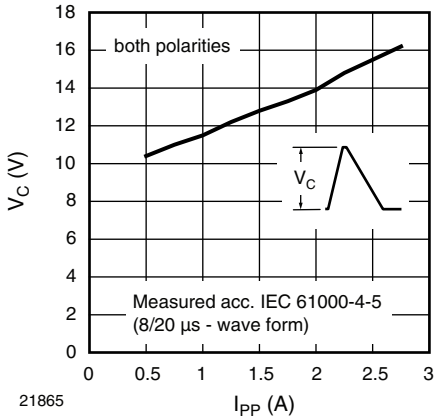


Fig. 5 - Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}

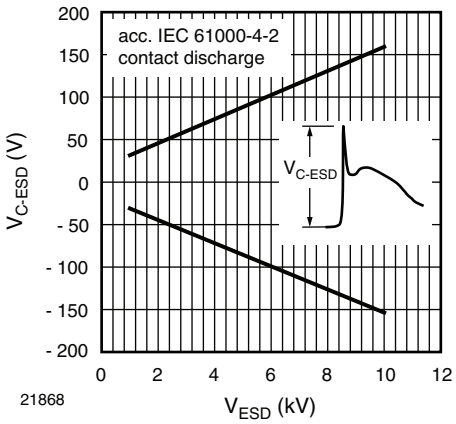


Fig. 8 - Typical Peak Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

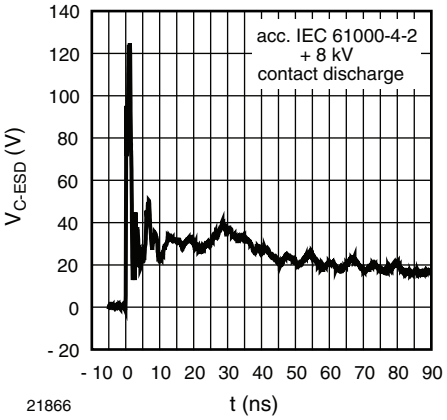


Fig. 6 - Typical Clamping Performance at + 8 kV Contact Discharge (acc. IEC 61000-4-2)

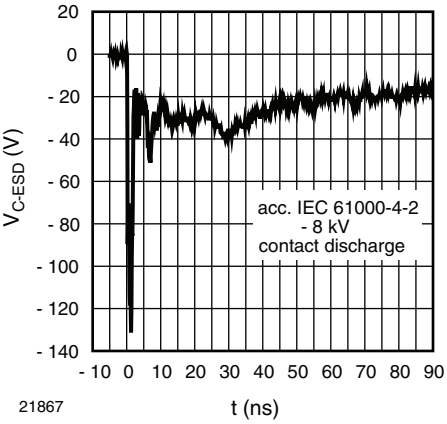
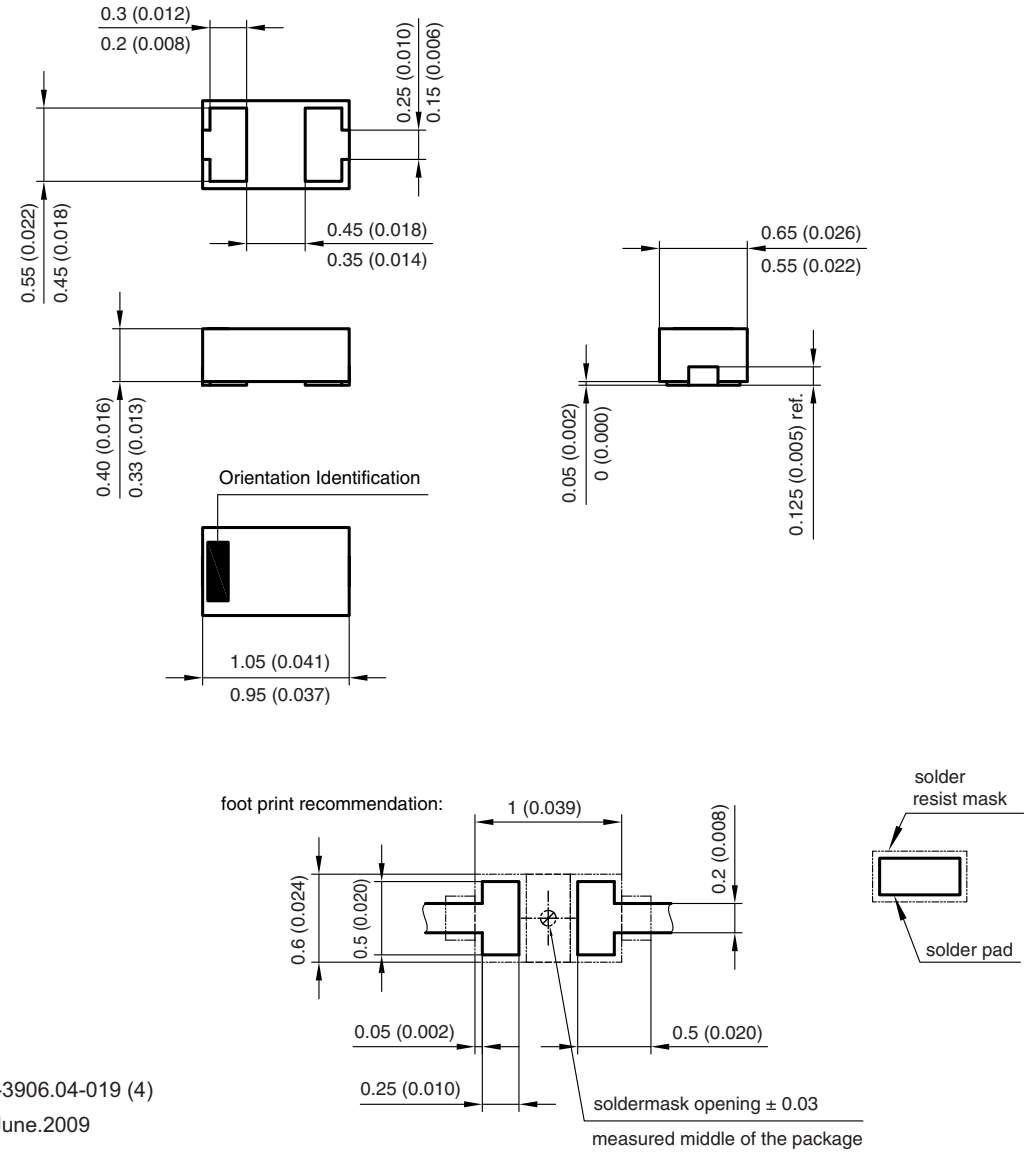


Fig. 7 - Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

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



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Created - Date: 24.June.2009

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