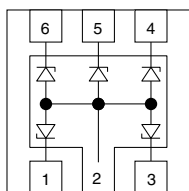
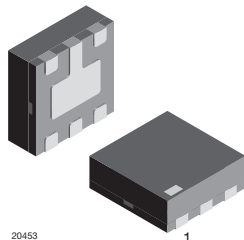


5-Line ESD Protection Diode Array in LLP75



19956



20453

1

MARKING (example only)



Dot = pin 1 marking

XX = date code

YY = type code (see table below)

DESIGN SUPPORT TOOLS

[click logo to get started](#)


FEATURES

- Ultra compact LLP75-6L package
- Low profile < 0.6 mm
- 5-line ESD protection
- Low leakage current $I_R < 0.1 \mu A$
- Low load capacitance $C_D = 13 \text{ pF}$
- ESD immunity acc. IEC 61000-4-2
± 15 kV contact discharge
± 15 kV air discharge
- Working voltage range $V_{RWM} = 5 \text{ V}$
- e4 - precious metal (e.g. Ag, Au, NiPd, NiPdAu) (no Sn)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL (8 mm TAPE ON 7" REEL)	MINIMUM ORDER QUANTITY
VESD05A5A-HSF	VESD05A5A-HSF-GS08	3000	15 000

PACKAGE DATA

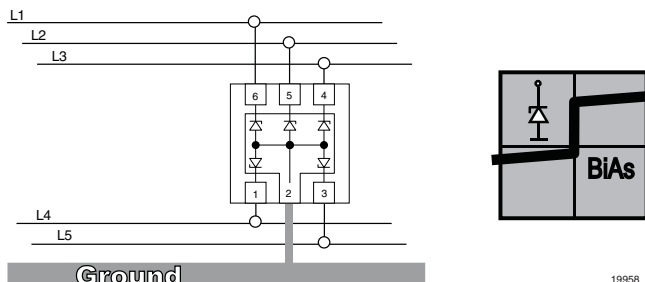
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VESD05A5A-HSF	LLP75-6L	AR	4.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C

ABSOLUTE MAXIMUM RATINGS VESD05A5A-HSF

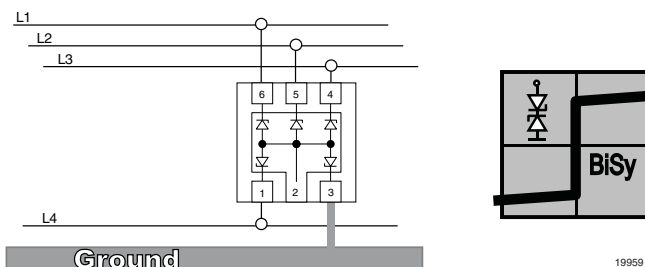
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	BiAs-mode: each input (pin 1 to pin 6) to ground (pin 2); acc. IEC 61000-4-5; $t_p = 8/20 \mu s$; single shot	I_{PPM}	2.5	A
	BiSy-mode: each input (pin 1 to pin 6) to any other input pin. Pin 2 not connected. Acc. IEC 61000-4-5; $t_p = 8/20 \mu s$; single shot		2.5	A
Peak pulse power	BiAs-mode: each input (pin 1 to pin 6) to ground (pin 2); acc. IEC 61000-4-5; $t_p = 8/20 \mu s$; single shot	P_{PP}	33	W
	BiSy-mode: each input (pin 1 - pin 6) to any other input pin. Pin 2 not connected. Acc. IEC 61000-4-5; $t_p = 8/20 \mu s$; single shot		43	W
ESD immunity	acc. IEC61000-4-2; 10 pulses BiAs-mode: each input (pin 1 to pin 6) to ground (pin 2)	Contact discharge	± 15	kV
		Air discharge	± 15	kV
ESD immunity	acc. IEC 61000-4-2 ; 10 pulses BiSy-mode: each input (pin 1 to pin 6) to any other input pin. Pin 2 not connected.	Contact discharge	± 10	kV
		Air discharge	± 10	kV
Operating temperature	Junction temperature	T_J	-40 to +125	°C
Storage temperature		T_{STG}	-55 to +150	°C

APPLICATION NOTE:

- a. With the VESD05A5A-HSF 5 different signal or data lines can be clamped to ground. Due to the different clamping levels in forward and reverse direction the VESD05A5A-HSF clamping behavior is bidirectional and asymmetrical (BiAs).



- b. If symmetrical clamping behaviour is required the VESD05A5A-HSF can also be used as a bidirectional symmetrical protection device protecting up to 4 lines. In this case pin no. 2 must not be connected.


ELECTRICAL CHARACTERISTICS VESD05A5A-HSF (Between pin 1, 3, 4, 5 or 6, and pin 2)

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

PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of lines which can be protected	$N_{channel}$	-	-	5	lines
Reverse stand-off voltage	Max. reverse working voltage	V_{RWM}	-	-	5	V
Reverse voltage	at $I_R = 0.1\text{ }\mu\text{A}$	V_R	5	-	-	V
Max. reverse current	at $V_R = 5\text{ V}$	I_R	-	< 0.01	0.1	μA
Reverse breakdown voltage	at $I_R = 1\text{ mA}$	V_{BR}	6	6.7	7.5	V
Reverse clamping voltage	at $I_{PP} = 1\text{ A}$	V_C	-	9	10	V
	at $I_{PP} = I_{PPM} = 2.5\text{ A}$	V_C	-	12	13	V
Forward clamping voltage	at $I_{PP} = 1\text{ A}$	V_F	-	2	2.5	V
	at $I_{PP} = I_{PPM} = 2.5\text{ A}$	V_F	-	3.2	4	V
Line capacitance	at $V_R = 0\text{ V}; f = 1\text{ MHz}$	C_D	-	13	15	pF
	at $V_R = 2.5\text{ V}; f = 1\text{ MHz}$	C_D	-	8	-	pF

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

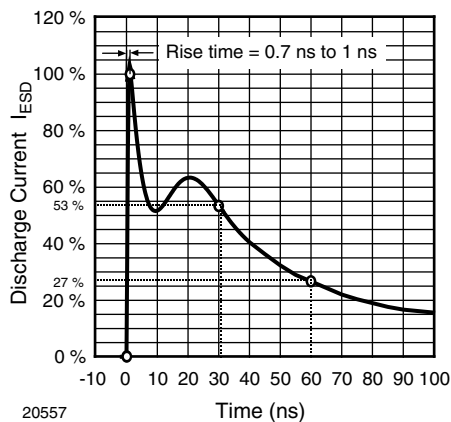


Fig. 1 - ESD Discharge Current Wave Form
acc. IEC 61000-4-2 (330 Ω /150 pF)

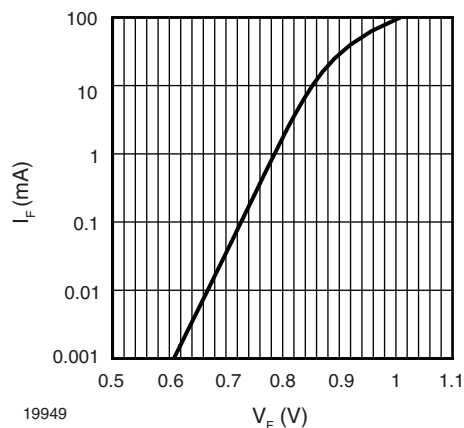


Fig. 4 - Typical Forward Current I_F vs. Forward Voltage V_F

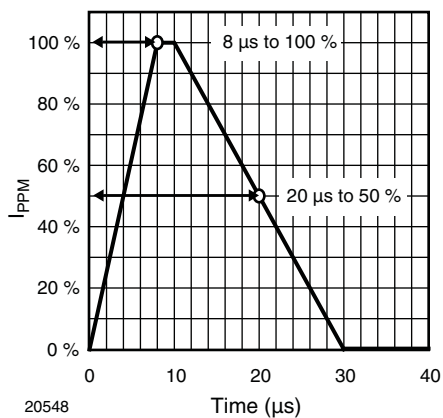


Fig. 2 - 8/20 μ s Peak Pulse Current Wave Form
acc. IEC 61000-4-5

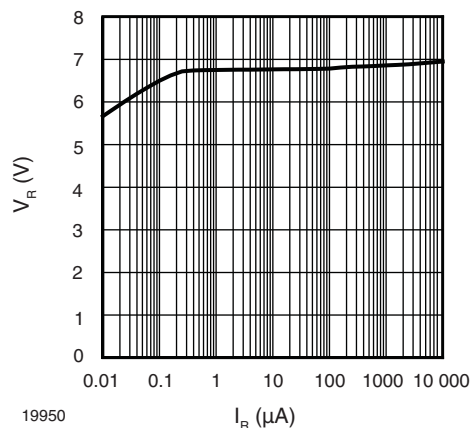


Fig. 5 - Typical Reverse Voltage V_R vs. Reverse Current I_R

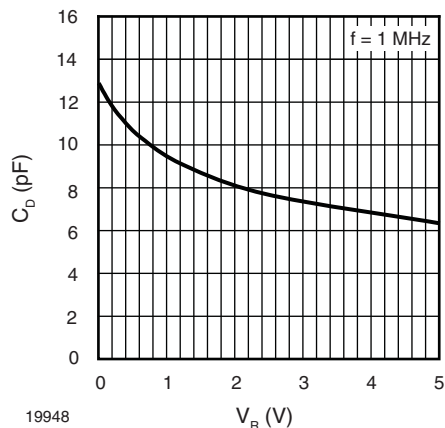


Fig. 3 - Typical Capacitance C_D vs. Reverse Voltage V_R

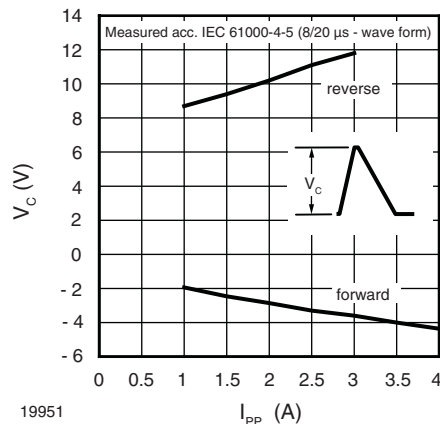


Fig. 6 - Typical Peak Clamping Voltage V_C vs.
Peak Pulse Current I_{PP}

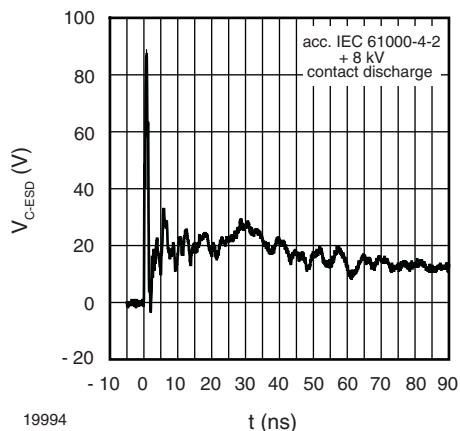


Fig. 7 - Typical Clamping Performance at + 8 kV Contact Discharge (acc. IEC 61000-4-2)

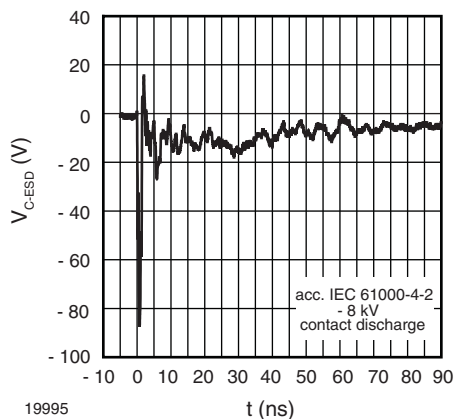


Fig. 8 - Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

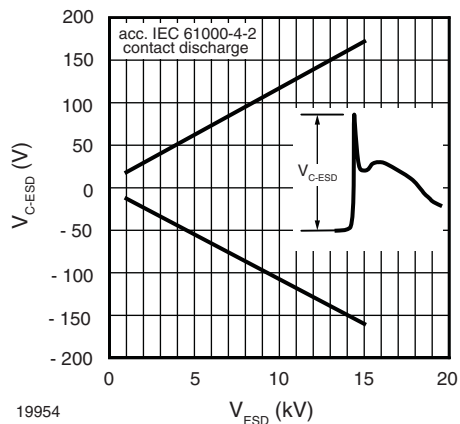
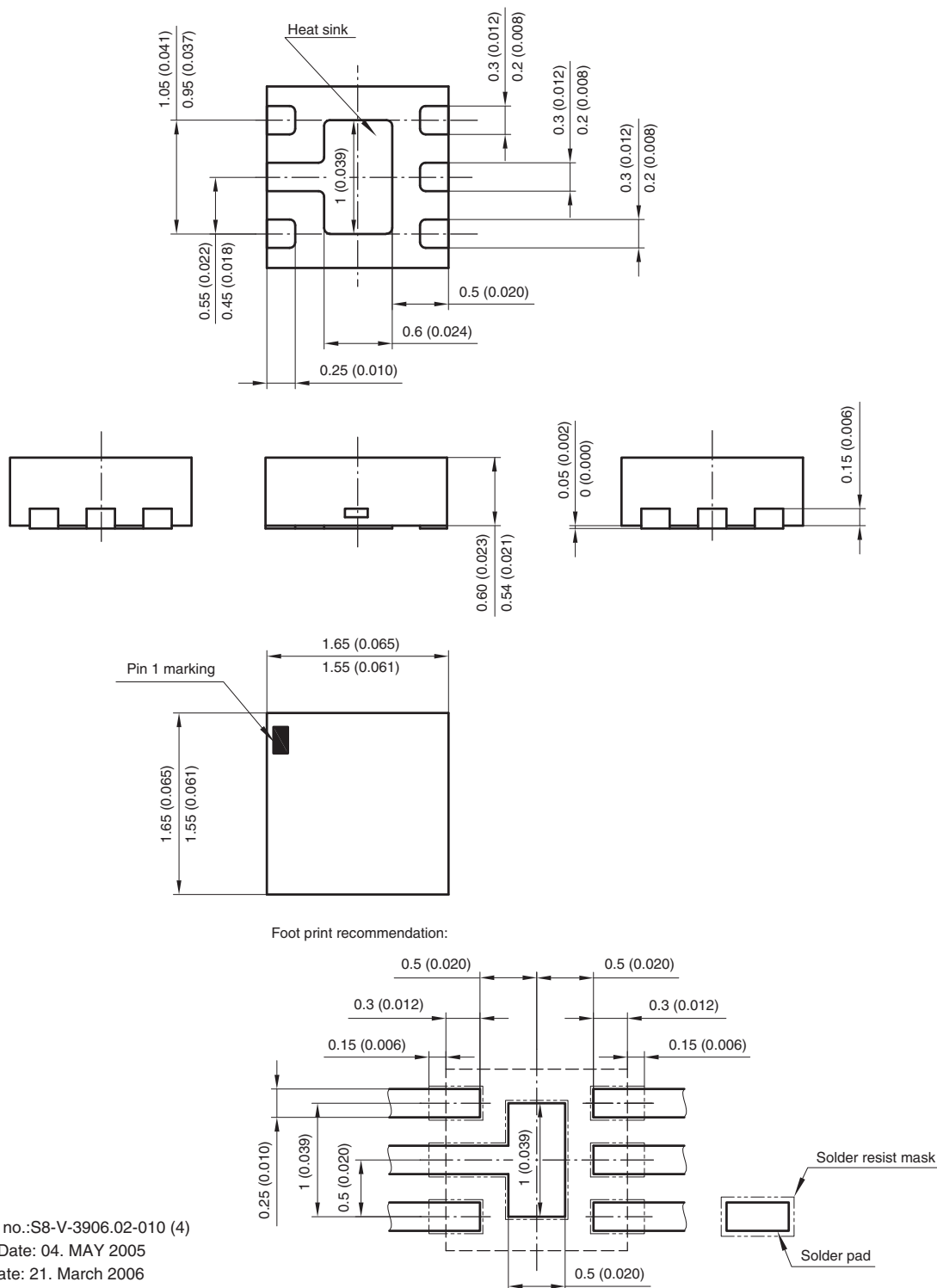
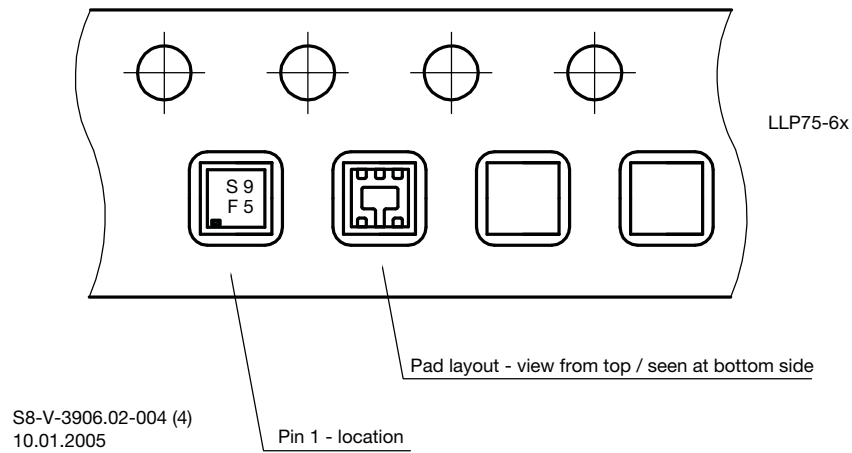


Fig. 9 - Typical max. Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

PACKAGE DIMENSIONS in millimeters (Inches): **LLP75-6L**

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Rev. 4 - Date: 21. March 2006
20454





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