6-Line ESD-Protection Diode Array in LLP75

Features

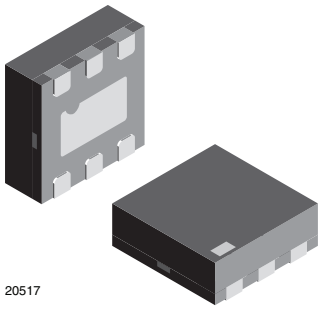
- Ultra compact LLP75-7L package
- 6-line ESD-protection
- Low leakage current I_R < 0.1 µA
- Low load capacitance C_D = 13 pF
- ESD-immunity acc. IEC 61000-4-2
  - ± 15 kV contact discharge
  - ± 15 kV air discharge
- Working voltage range V_{RWM} = 5 V
- e4 - precious metal (e.g. Ag, Au, NiPd, NiPdAu) (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)**



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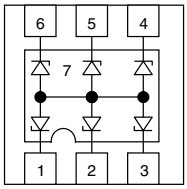
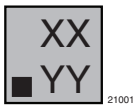


Marking (example only)



Dot = Pin 1 marking
XX = Date code
YY = Type code (see table below)

Ordering Information

Device name	Ordering code	Taped units per reel (8 mm tape on 7" reel)	Minimum order quantity
VESD05A6A-HAF	VESD05A6A-HAF-GS08	3000	15000

Package Data

Device name	Package name	Type code	Weight	Molding compound flammability rating	Moisture sensitivity level	Soldering conditions
VESD05A6A-HAF	LLP75-7L	AT	4.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

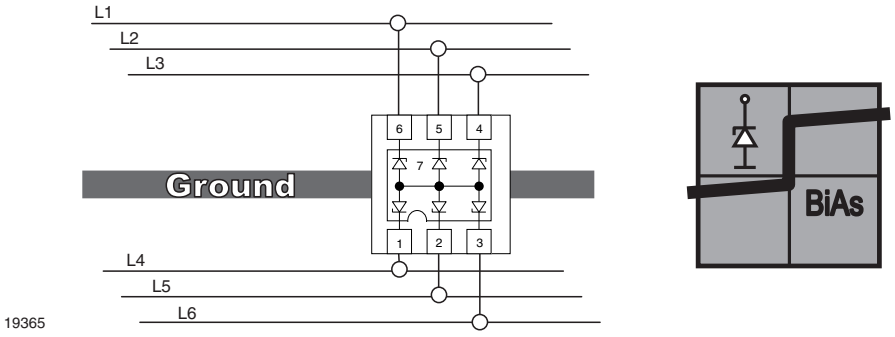
** Please see document “Vishay Material Category Policy” www.vishay.com/doc?99902

Absolute Maximum Ratings

Rating	Test condition		Symbol	Value	Unit
Peak pulse current	BiAs-Mode: each input (pin 1 - pin 6) to ground (pin 2); acc. IEC 61000-4-5; t_p = 8/20 µs; single shot		I_{PPM}	2.5	A
	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 µs; single shot		I_{PPM}	2.5	A
Peak pulse power	BiAs-mode: each input (pin 1 - pin 6) to ground (pin 2); acc. IEC 61000-4-5; t_p = 8/20 µs; 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 µs; single shot		P_{PP}	43	W
ESD immunity	Acc. IEC61000-4-2; 10 pulses BiAs-mode: each input (pin 1 - pin 6) to ground (pin 2)	Contact discharge	V_{ESD}	± 15	kV
		Air discharge	V_{ESD}	± 15	kV
	Acc. IEC 61000-4-2 ; 10 pulses BiSy-mode: each input (pin 1 - pin 6) to any other input pin. Pin 2 not connected	Contact discharge	V_{ESD}	± 10	kV
		Air discharge	V_{ESD}	± 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 **VESD05A6A-HAF** 6 different signal or data lines can be clamped to ground. Due to the different clamping levels in forward and reverse direction the **VESD05A6A-HAF** clamping behavior is **Bi**directional and **As**ymmetrical **(BiAs).**



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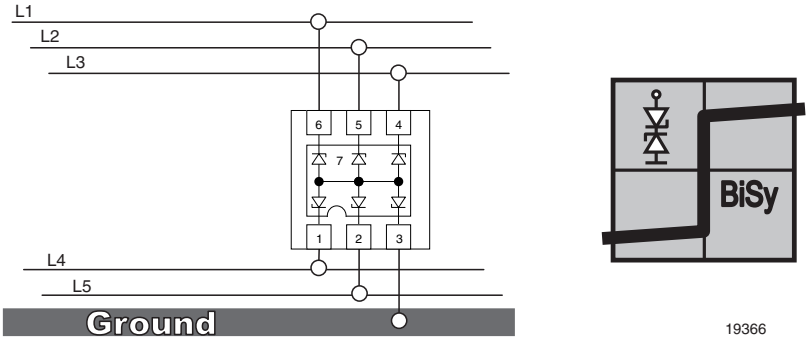
b) If symmetrical clamping behaviour is required the **VESD05A6A-HAF** can also be used as a **Bi**directional **Sy**mmetrical protection device protecting up to 5 lines. In this case pin no. 7 must not be connected.



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Electrical Characteristics

Ratings at 25 °C, ambient temperature unless otherwise specified

VESD05A6A-HAF

BiAs mode (between pin 1, 2, 3, 4, 5 or 6 and pin 7)

Parameter	Test conditions/remarks	Symbol	Min.	Typ.	Max.	Unit
Protection paths	Number of lines which can be protected	N_{lines}			6	lines
Reverse stand off voltage	at I_R = 0.1 µA	V_{RWM}	5			V
Max. reverse current	at V_R = 5 V	I_R		< 0.01	0.1	µA
Reverse break down voltage	at I_R = 1 mA	V_{BR}	6	6.7	7.5	V
Reverse clamping voltage	at I_{PP} = 1 A	V_C		9	10	V
	at I_{PP} = I_{PPM} = 2.5 A	V_C		12	13	V
Forward clamping voltage	at I_{PP} = 1 A	V_F		2	2.5	V
	at I_{PP} = I_{PPM} = 2.5 A	V_F		3.2	4	V
Line capacitance	at V_R = 0 V; f = 1 MHz	C_D		13	15	pF
	at V_R = 2.5 V; f = 1 MHz	C_D		8		pF

Typical Characteristics

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

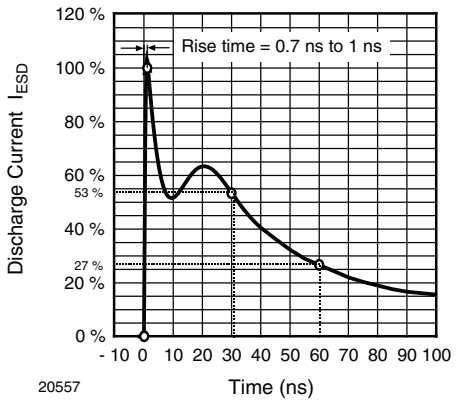


Figure 1. ESD Discharge Current Wave Form
acc. IEC 61000-4-2 (330 Ω/150 pF)

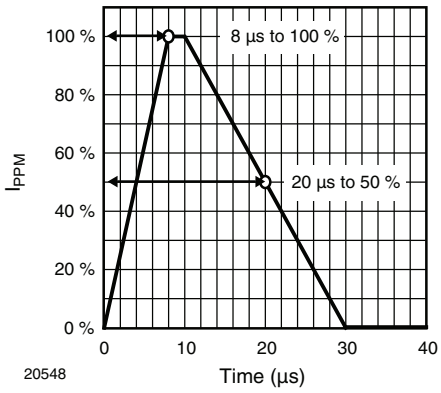


Figure 2. 8/20 µs Peak Pulse Current Wave Form
acc. IEC 61000-4-5

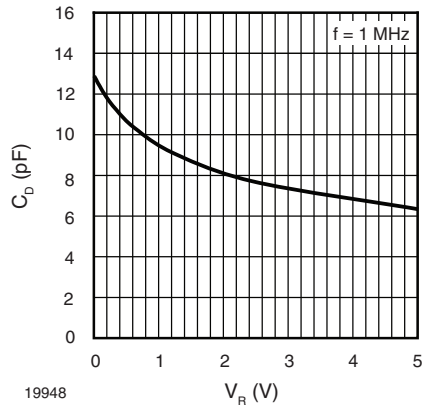


Figure 3. Typical Capacitance C_D vs. Reverse Voltage V_R

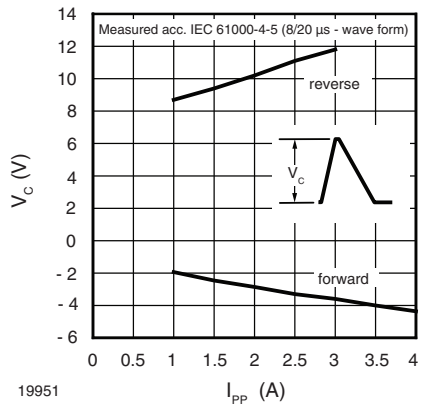


Figure 6. Typical Clamping Voltage vs. Peak Pulse Current I_{PP}

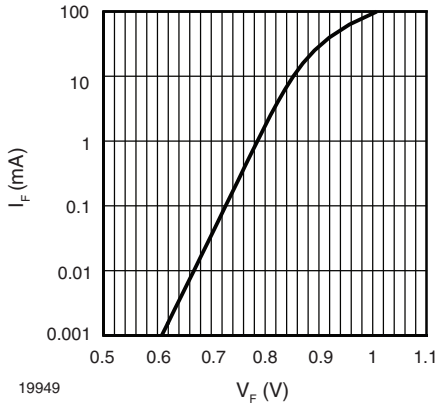


Figure 4. Typical Forward Current I_F vs. Forward Voltage V_F

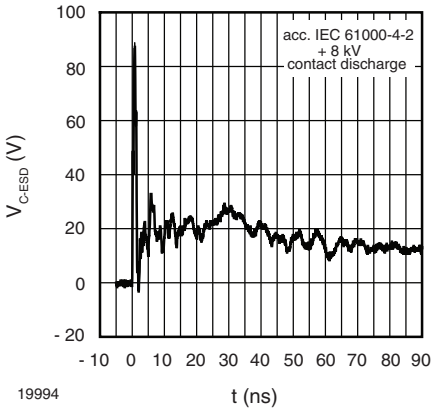


Figure 7. Typical Clamping Performance at + 8 kV Contact Discharge (acc. IEC 61000-4-2)

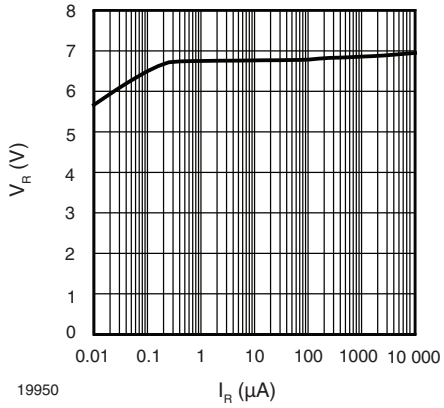


Figure 5. Typical Reverse Voltage V_R vs. Reverse Current I_R

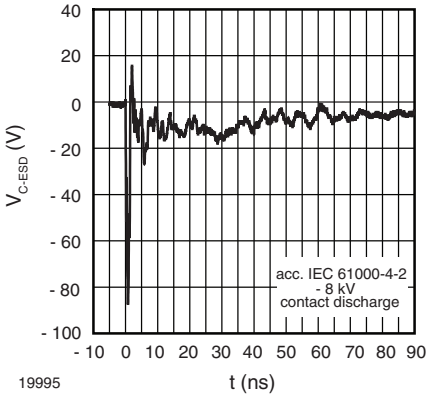


Figure 8. Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

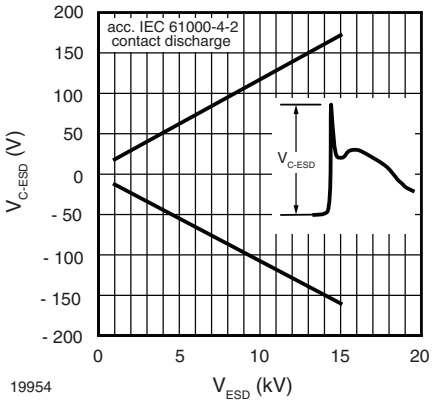
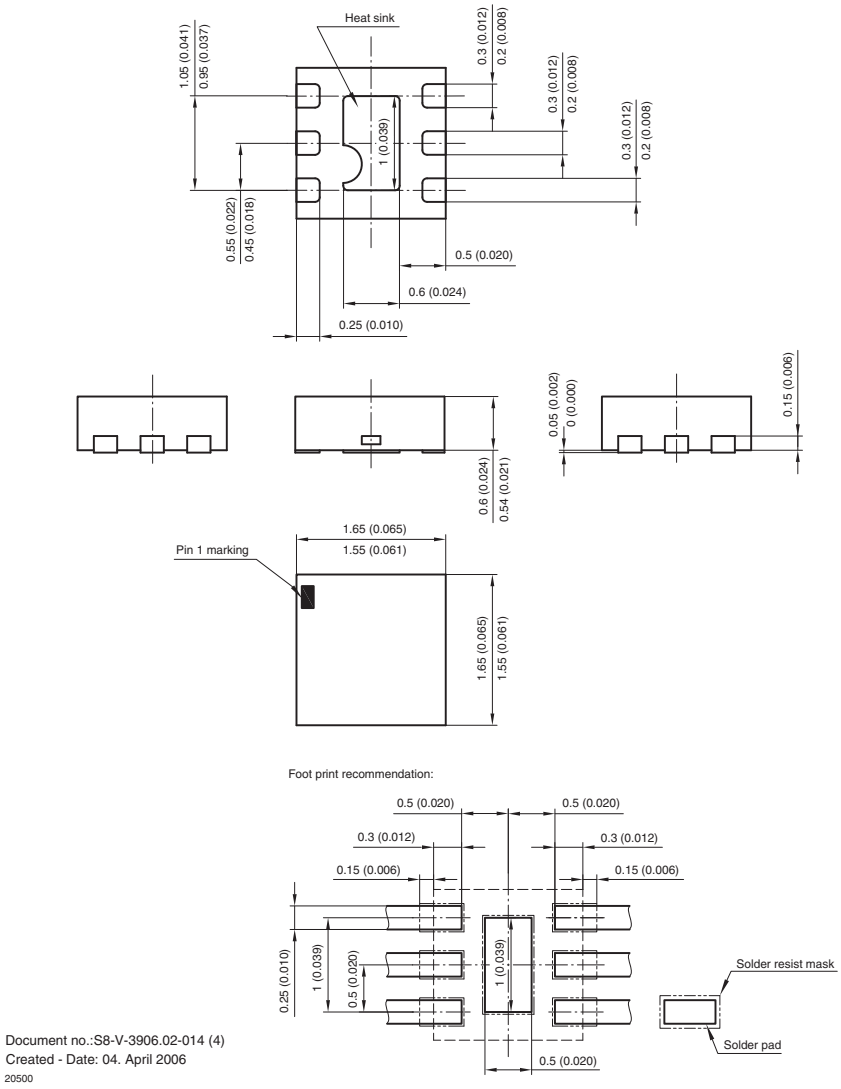


Figure 9. Typical max. Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

Package Dimensions in millimeters (inches): **LLP75-7L**



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