

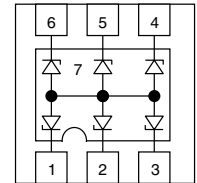
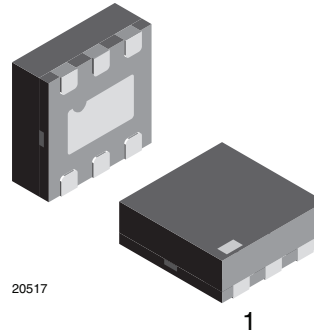
## 6-Line ESD-Protection Diode Array in LLP75

### Features

- Ultra compact LLP75-7L package
- 6-line ESD-protection
- Low leakage current  $I_R < 0.1 \mu\text{A}$
- 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)
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

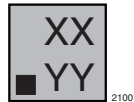


**RoHS**  
COMPLIANT  
**GREEN**  
(5-2008)\*\*



19371

### 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

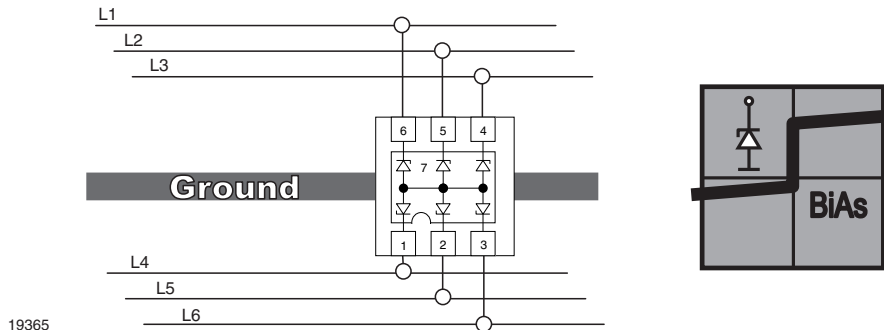
\*\* Please see document "Vishay Material Category Policy" [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

## Absolute Maximum Ratings

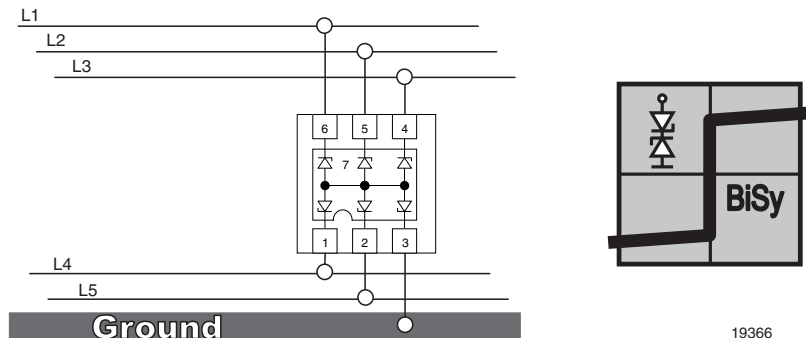
Rating	Test condition	Symbol	Value	Unit	
Peak pulse current	BiAs-Mode: each input (pin 1 - pin 6) to ground (pin 2); acc. IEC 61000-4-5; $t_p = 8/20 \mu s$ ; single shot	$I_{PPM}$	2.5	A	
	BiSy-mode: each input (pin 1 - pin 6) to any other input pin. Pin 2 not connected. Acc. IEC 61000-4-5; $t_p = 8/20 \mu s$ ; 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; $t_p = 8/20 \mu s$ ; 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	$P_{PP}$	43	W	
ESD immunity	Acc. IEC61000-4-2; 10 pulses BiAs-mode: each input (pin 1 - pin 6) to ground (pin 2)	Contact discharge	$V_{ESD}$	$\pm 15$	kV
		Air discharge	$V_{ESD}$	$\pm 15$	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	$V_{ESD}$	$\pm 10$	kV
		Air discharge	$V_{ESD}$	$\pm 10$	kV
Operating temperature	Junction temperature	$T_J$	- 40 to + 125	$^{\circ}C$	
Storage temperature		$T_{STG}$	- 55 to + 150	$^{\circ}C$	

### 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 **B**idirectional and **A**symmetrical (**BiAs**).



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



## 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 $I_R = 0.1 \mu A$	$V_{RWM}$	5			V
Max. reverse current	at $V_R = 5 V$	$I_R$		< 0.01	0.1	$\mu A$
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

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

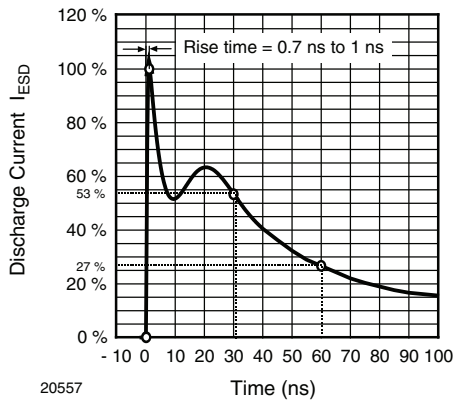


Figure 1. ESD Discharge Current Wave Form  
acc. IEC 61000-4-2 (330  $\Omega$ /150 pF)

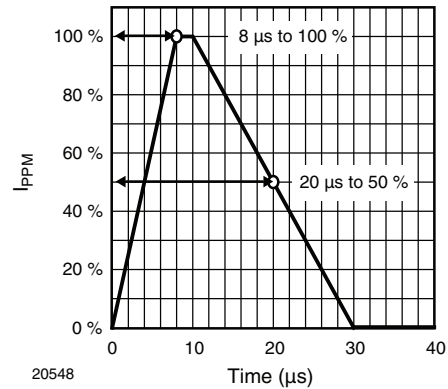


Figure 2. 8/20  $\mu s$  Peak Pulse Current Wave Form  
acc. IEC 61000-4-5

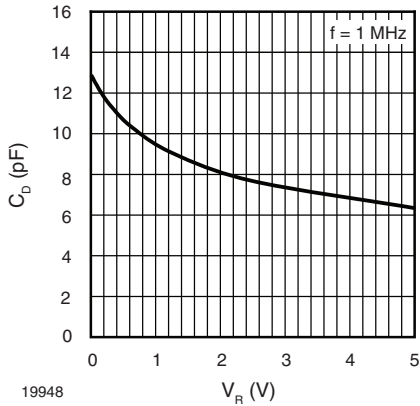


Figure 3. Typical Capacitance  $C_D$  vs. Reverse Voltage  $V_R$

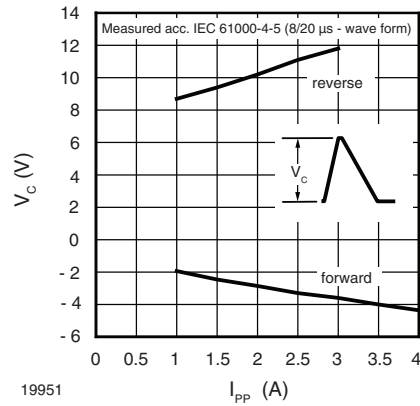


Figure 6. Typical Clamping Voltage vs. Peak Pulse Current  $I_{PP}$

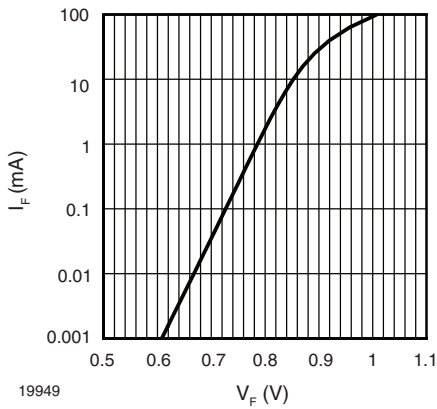


Figure 4. Typical Forward Current  $I_F$  vs. Forward Voltage  $V_F$

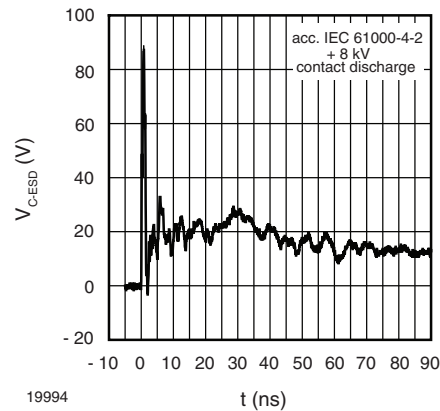


Figure 7. Typical Clamping Performance at + 8 kV Contact Discharge (acc. IEC 61000-4-2)

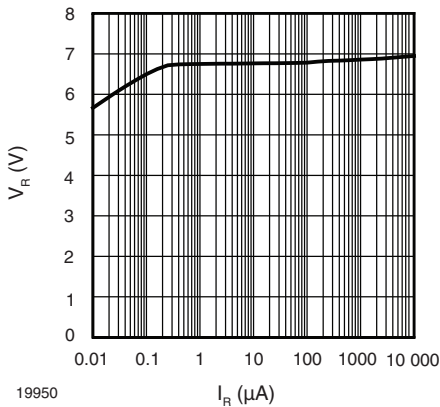


Figure 5. Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$

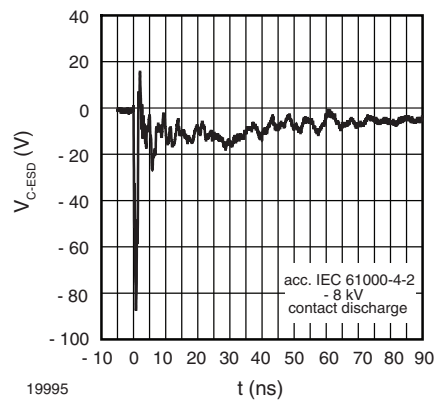


Figure 8. Typical Clamping Performance at - 8 kV Contact Discharge (acc. IEC 61000-4-2)

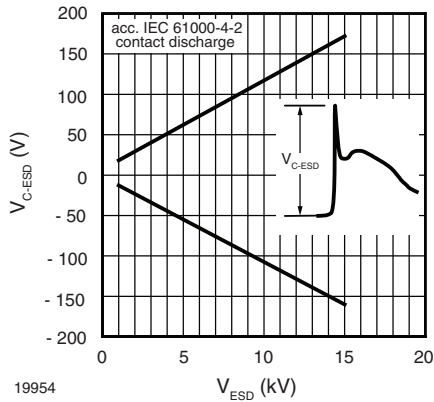
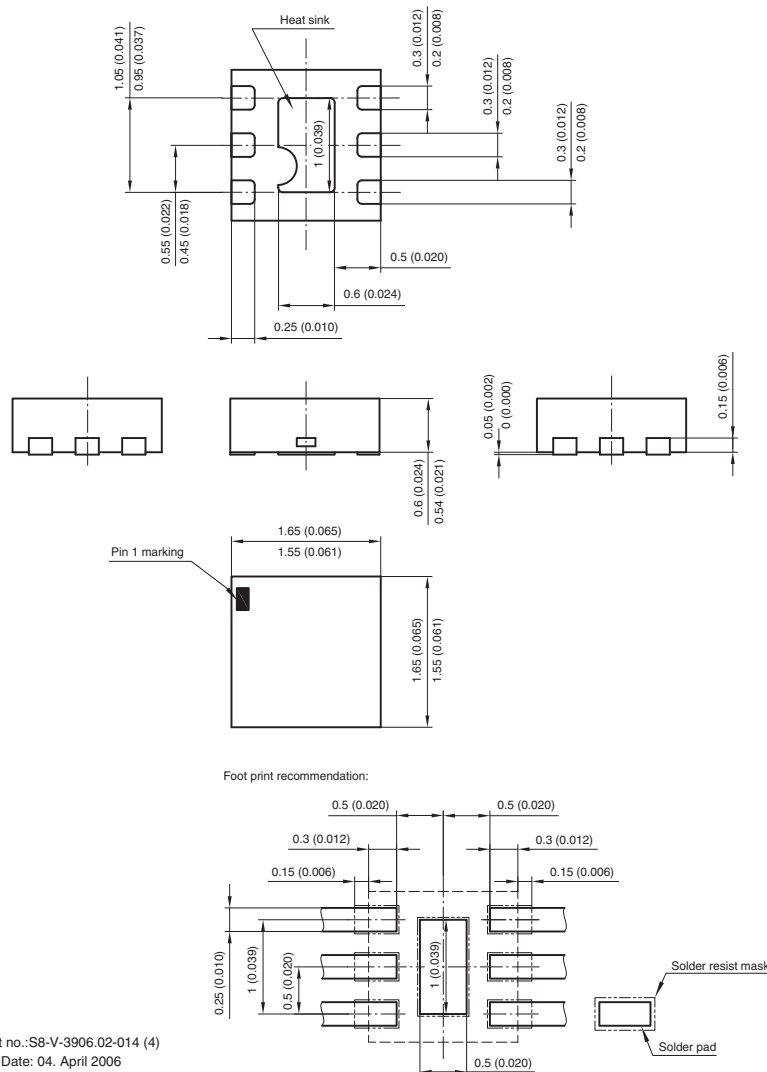


Figure 9. Typical max. Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

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



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 20500



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