6-Line ESD-Protection Diode Array in LLP75

Features

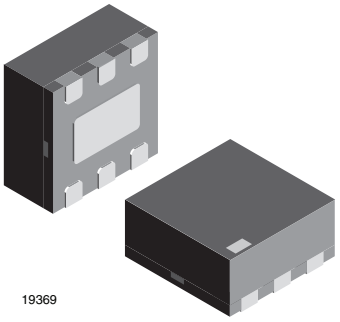
- Ultra compact LLP75-7A package
- 6-line ESD-protection
- Low leakage current I_R < 1 µA
- Low load capacitance C_D = 40 pF
- ESD-immunity acc. IEC 61000-4-2
  - ± 30 kV contact discharge
  - ± 30 kV air discharge
- Working voltage range V_{RWM} = 5 V
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb-free

e3

RoHS COMPLIANT

GREEN (5-2008)*



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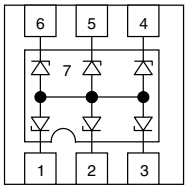

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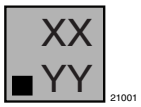
Marking (example only)



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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
VESD05A6-HA3	VESD05A6-HA3-GS08	3000	15000

Package Data

Device name	Package name	Type code	Weight	Molding compound flammability rating	Moisture sensitivity level	Soldering conditions
VESD05A6-HA3	LLP75-7A	AF	5 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

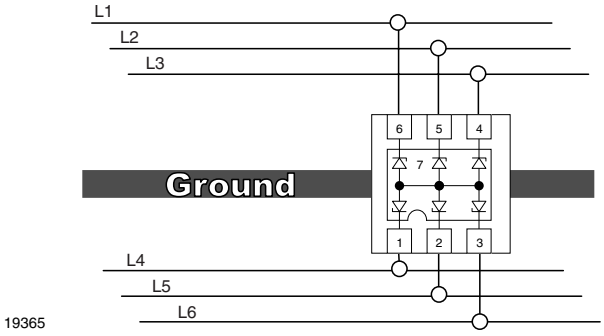
* Please see document “Vishay Green and Halogen-Free Definitions (5-2008)” http://www.vishay.com/doc?99902

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 µs; single shot		I_{PPM}	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}	60	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}	± 30	kV
		Air discharge	V_{ESD}	± 30	kV
Operating temperature	Junction temperature		T_J	- 40 to + 125	°C
Storage temperature			T_{STG}	- 55 to + 150	°C

Application Note:

a) With the **VESD05A6-HA3** 6 different signal or data lines can be clamped to ground. Due to the different clamping levels in forward and reverse direction the **VESD05A6-HA3** clamping behavior is **Bi**directional and **As**ymmetrical **(BiAs).**



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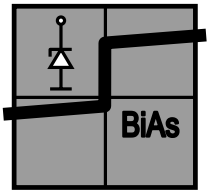
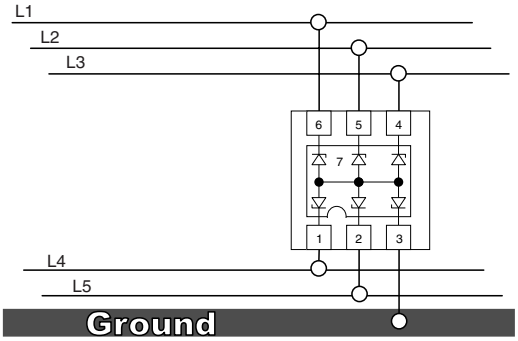
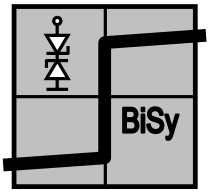


b) If symmetrical clamping behaviour is required the **VESD05A6-HA3** can also be used as a **Bi**directional **Sy**mmetrical protection device protecting up to 5 lines. In this case pin no. 7 must not be connected.





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Electrical Characteristics

Ratings at 25 °C, ambient temperature unless otherwise specified

VESD05A6-HA3

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 = 1 µA	V_{RWM}	5			V
Max. reverse current	at V_R = 5 V	I_R		< 0.1	1	µA
Reverse break down voltage	at I_R = 1 mA	V_{BR}	6	6.6	7.5	V
Reverse clamping voltage	at I_{PP} = 1 A	V_C		8.1	10	V
	at $I_{PP} = I_{PPM}$ = 5 A	V_C		11.3	12	V
Forward clamping voltage	at I_{PP} = 1 A	V_F		1.5	1.8	V
	at $I_{PP} = I_{PPM}$ = 5 A	V_F		3.2	4.5	V
Line capacitance	at V_R = 0 V; f = 1 MHz	C_D		40	50	pF
	at V_R = 2.5 V; f = 1 MHz	C_D		24		pF

Typical Characteristics

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

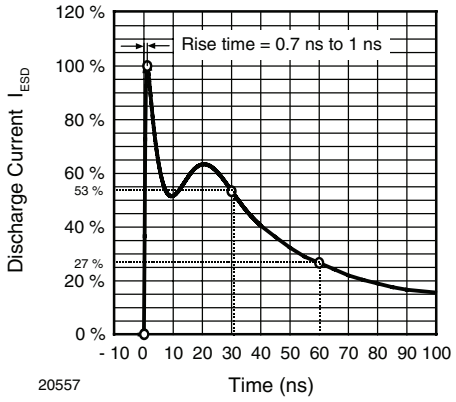


Figure 1. ESD Discharge Current Wave Form
acc. IEC 61000-4-2 (330 Ω/150 pF)

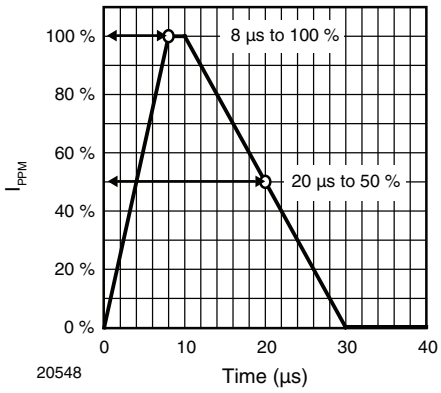


Figure 2. 8/20 µs Peak Pulse Current Wave Form
acc. IEC 61000-4-5

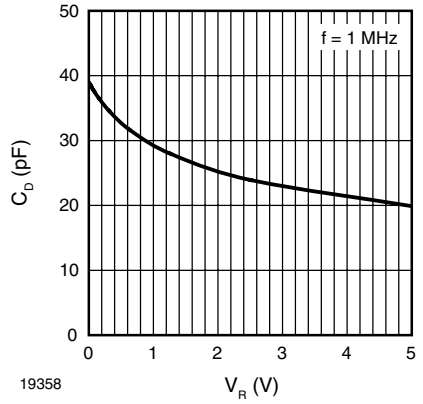


Figure 3. Typical Capacitance C_D vs. Reverse Voltage V_R

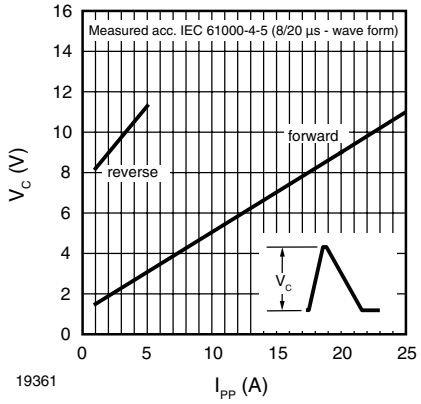


Figure 6. Typical Clamping Voltage vs. Peak Pulse Current I_{PP}

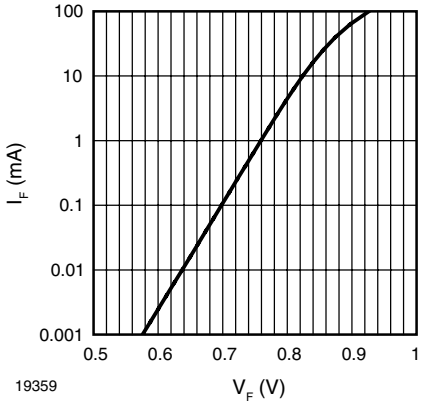


Figure 4. Typical Forward Current I_F vs. Forward Voltage V_F

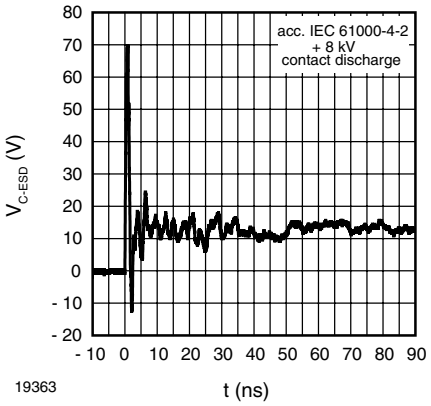


Figure 7. Typical Clamping Performance on + 8 kV - ESD Events (acc. IEC 61000-4-2)

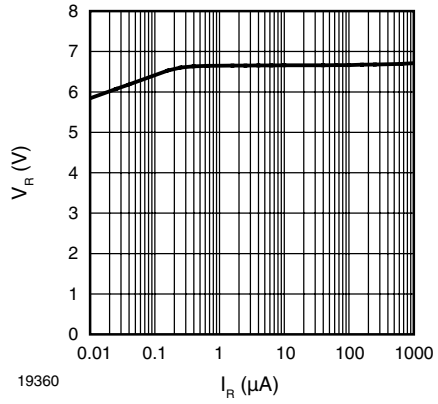


Figure 5. Typical Reverse Voltage V_R vs. Reverse Current I_R

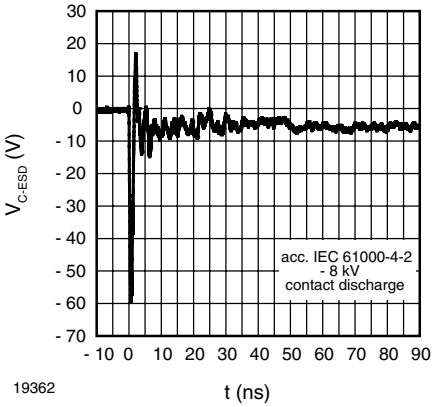


Figure 8. Typical Clamping Performance on - 8 kV - ESD Events (acc. IEC 61000-4-2)

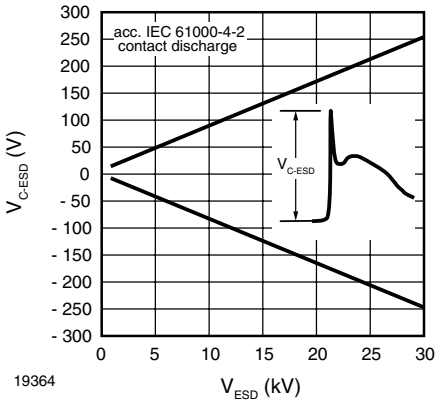
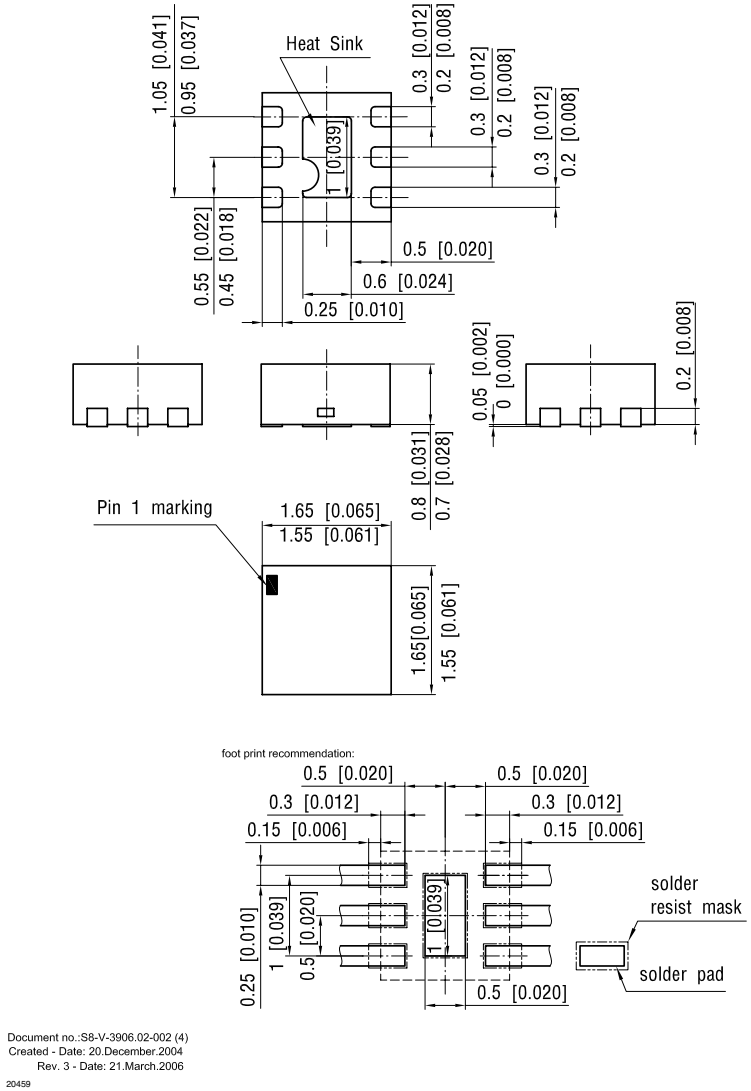


Figure 9. Typical max. Clamping Voltage at ESD Contact Discharge (acc. IEC 61000-4-2)

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



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20459

Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively.
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA.
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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