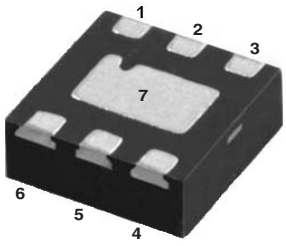
6-line ESD Protection Diode Array in LLP75

Features

- Ultra compact LLP75 package
- 6-line ESD-protection
- Low leakage current
- ESD protection to **IEC 61000-4-2 30 kV (Air)**
- ESD protection to **IEC 61000-4-2 30 kV (Contact)**
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



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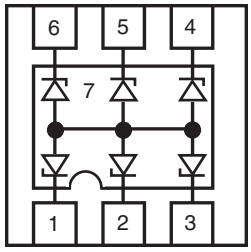

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Mechanical Data

Case: LLP75-7A (plastic package).
Non magnetic

Molding Compound Flammability Rating:
UL 94 V-0

Terminals: High temperature soldering guaranteed: 260 °C/10 sec. at terminals

Weight: 5 mg

Packaging Codes/Options:

GS18 = 10 k per 13" reel (8 mm tape), 10 k/box

GS08 = 3 k per 7" reel (8 mm tape), 15 k/box

Marking:

Square = Pin 1 marking

"AL" = Type Code for VESD05A6C-HA3

SD = Date Code (Example only)

Absolute Maximum Ratings

Ratings at 25 °C, ambient temperature unless otherwise specified valid for each single diode between Pin 1-6 and Pin 7

Parameter	Symbol	Value	Unit
ESD Air Discharge per IEC 61000-4-2	V_{ESD}	± 30	kV
ESD Contact Discharge per IEC 61000-4-2	V_{ESD}	± 30	kV
Peak pulse power 8/20 µs waveform	P_{PPM}	210	W
Peak pulse current 8/20 µs waveform	I_{PPM}	14	A

Thermal Characteristics

Ratings at 25 °C, ambient temperature unless otherwise specified

Parameter	Symbol	Value	Unit
Operating Temperature	T_J	- 40 to + 125	°C
Storage Temperature	T_{STG}	- 55 to + 150	°C

Electrical Characteristics

(T_A = 25 °C unless otherwise specified) valid for each single diode between Pin 1-6 and Pin 7

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse Stand-Off Voltage	at max. reverse current	V_{RWM}	5			V
Max. Reverse current	at V_R = 5 V	I_R			1	µA
Max. Clamping voltage	at I_{PP} = 14 A Acc. IEC 61000-4-5	V_C			15	V
Max. Forward Clamping voltage	at I_{PP} = 14 A Acc. IEC 61000-4-5	V_F		5.2	6	V
Max. Peak pulse current	Acc. IEC 61000-4-5 See Fig. 1	I_{PPM}	- 30		14	A
Min. Reverse Breakdown Voltage	at I_R = 1 mA	V_{BR}	6.0	6.8	7.5	V
Capacitance	at V_R = 0 V ; f = 1 MHz	C_D		120	150	pF
Forward voltage	at I_F = 1 A ; t_p < 300 µs	V_F		1.3	1.5	V
ESD-Clamping voltage (Overshoot)	at + 8 kV ESD-pulse acc. IEC 61000-4-2	$V_{C\text{-}ESD}$		45		V
ESD-Clamping voltage (Undershoot)	at - 8 kV ESD-pulse acc. IEC 61000-4-2	$V_{C\text{-}ESD}$		- 38		V

Typical Characteristics (T_{amb} = 25 °C unless otherwise specified)

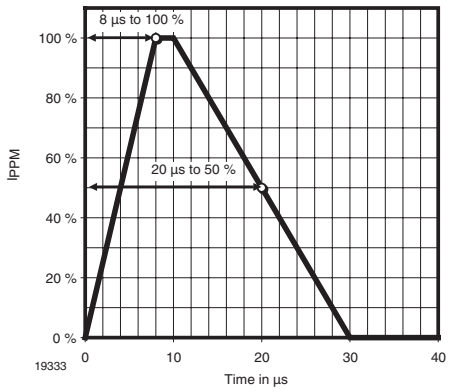


Figure 1. 8/20 µs Peak Pulse Current wave form acc. IEC 61000-4-5

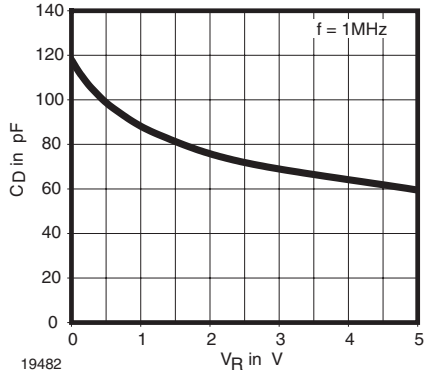


Figure 2. Typical Capacitance C_D vs. Reverse Voltage V_R

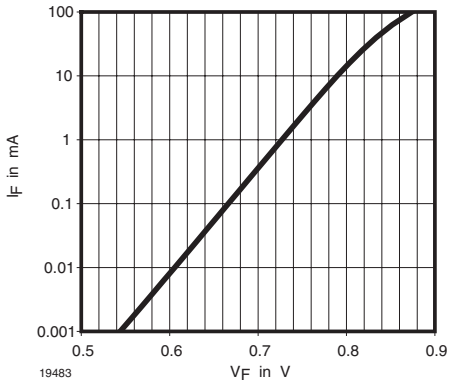


Figure 3. Typical Forward Current I_F vs. Forward Voltage V_F

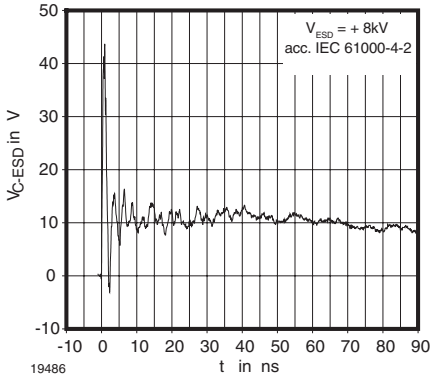


Figure 6. Typical Clamping performance on + 8 kV - ESD events (Acc. IEC 61000-4-2)

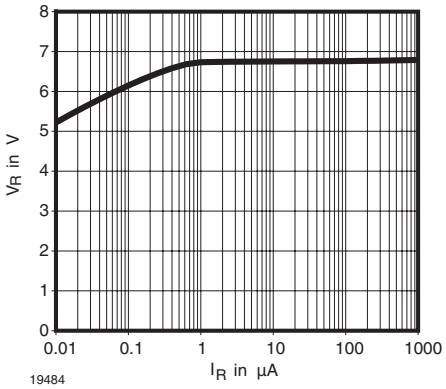


Figure 4. Typical Reverse Voltage V_R vs. Reverse Current I_R

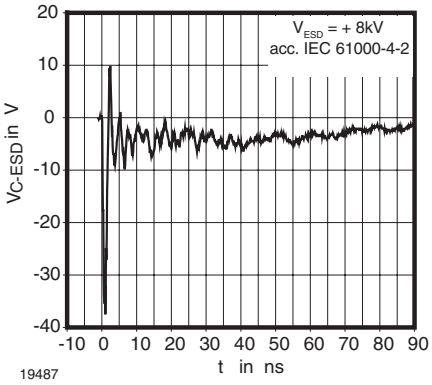


Figure 7. Typical Clamping performance on - 8 kV - ESD events (Acc. IEC 61000-4-2)

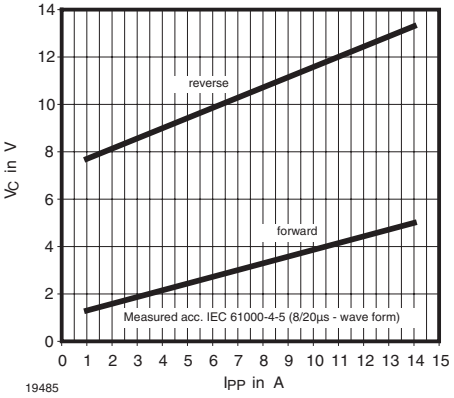


Figure 5. Typical Clamping Voltage vs. Peak Pulse Current I_{PP}

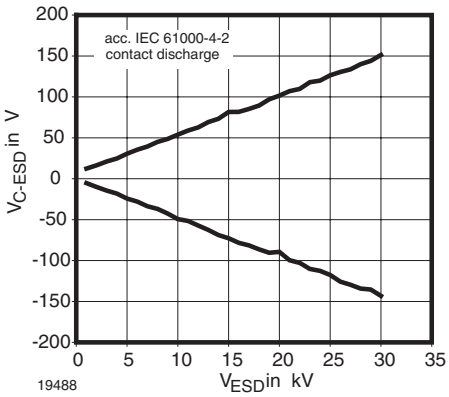
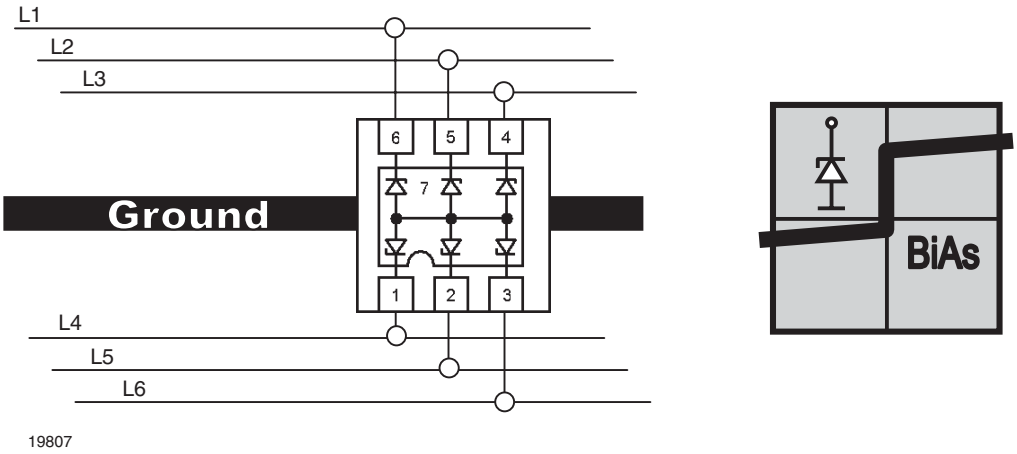


Figure 8. Typical max. clamping voltage at ESD contact discharge (Acc. IEC 61000-4-2)

Application Note:

a) With the **VESD05A6C-HA3** 6 different signal or data lines can be clamped to ground. Due to the different clamping levels in forward and reverse direction the **VESD05A6C-HA3** clamping behavior is **Bi**directional and **As**ymmetrical **(BiAs)**



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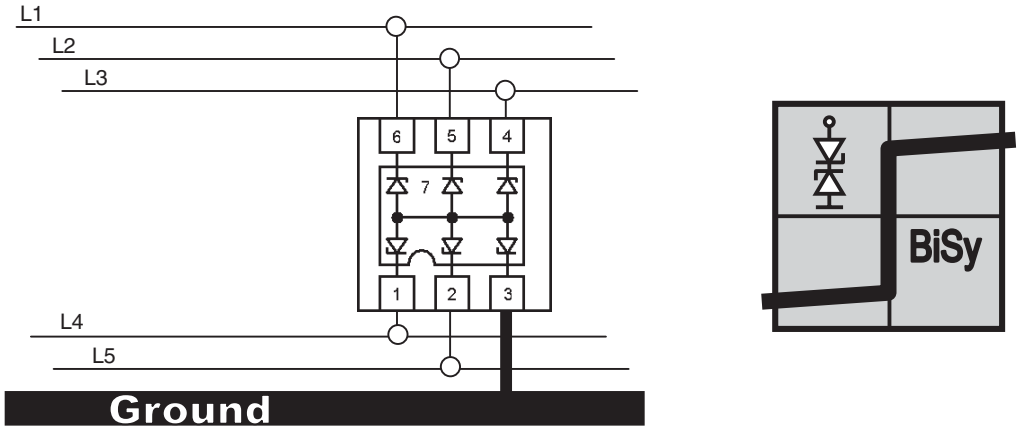
b) If symmetrical clamping behaviour is required the **VESD05A6C-HA3** can also be used as a **Bi**directional **Sy**mmetrical protection up to 5 lines. In this case pin no. 7 must not be connected.



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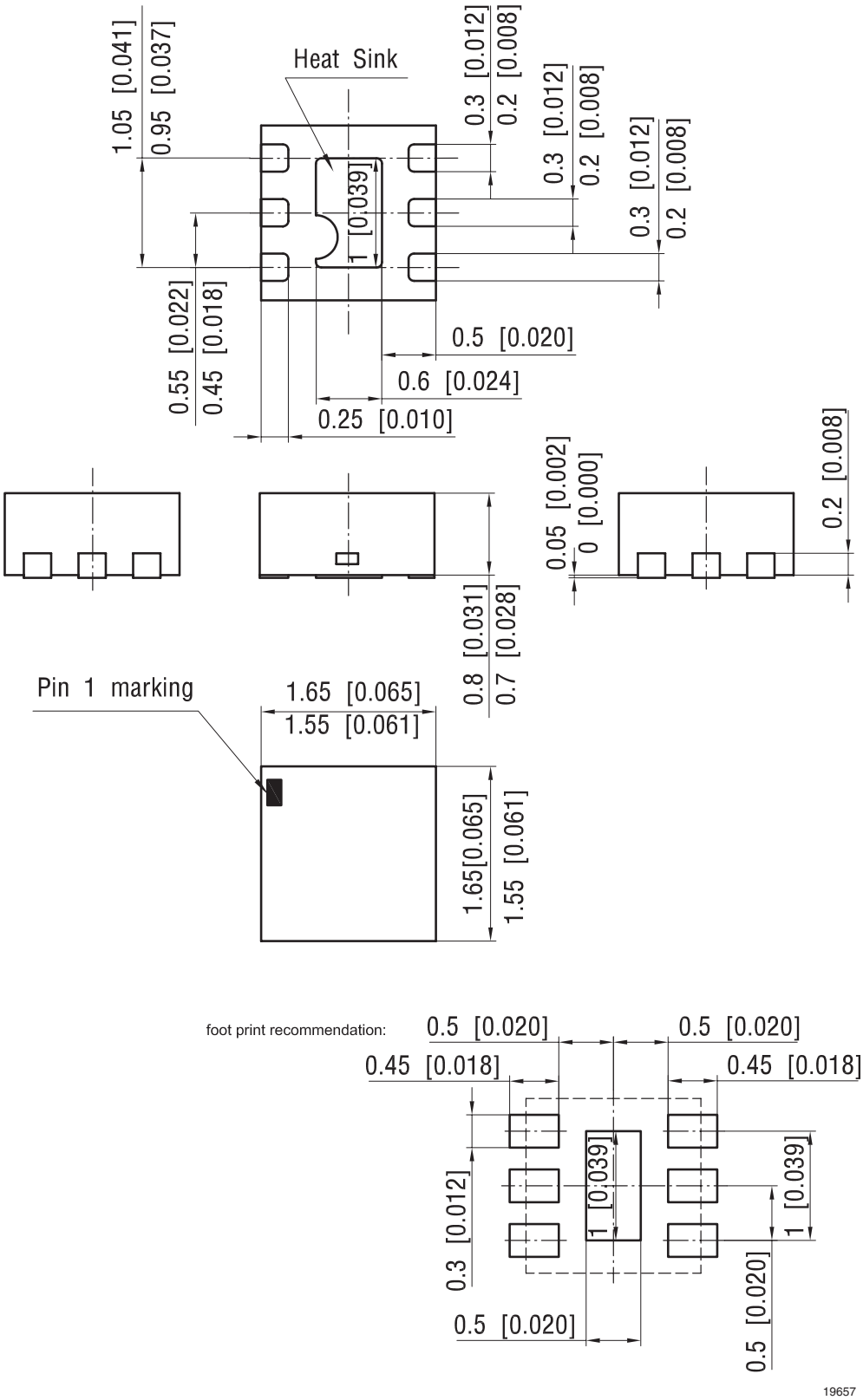
Package Dimensions in mm (Inches) LLP75-7A



foot print recommendation:

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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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