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[VESD05A1B-02V-GS08](#)

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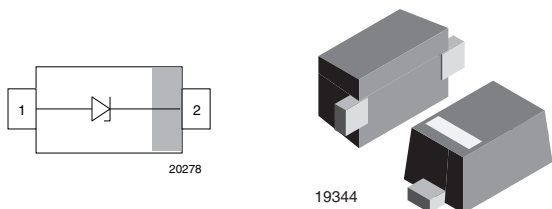
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VESD05A1B-02V

Vishay Semiconductors

Single ESD-Protection Diode in SOD-523



FEATURES

- Single-line ESD-protection
- Capacitance typical $C_D = 12 \text{ pF}$
($V_R = 2.5 \text{ V}$, $f = 1 \text{ MHz}$)
- Leakage current $I_R < 1 \mu\text{A}$ ($V_R = 5 \text{ V}$)
- ESD-protection acc. IEC 61000-4-2
 $\pm 20 \text{ kV}$ contact discharge
 $\pm 30 \text{ kV}$ air discharge
- e3 - Sn
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



MARKING (example only)



Bar = cathode marking

X = date code

Y = type code (see table below)

ORDERING INFORMATION

| DEVICE NAME | ORDERING CODE | TAPED UNITS PER REEL (8 mm TAPE ON 7" REEL) | MINIMUM ORDER QUANTITY |
|---------------|--------------------|--|------------------------|
| VESD05A1B-02V | VESD05A1B-02V-G-08 | 3000 | 3000 |

PACKAGE DATA

| DEVICE NAME | PACKAGE NAME | TYPE CODE | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
|---------------|--------------|-----------|--------|---|--------------------------------------|--------------------------|
| VESD05A1B-02V | SOD-523 | . H | 1.4 mg | UL 94 V-0 | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | TEST CONDITIONS | SYMBOL | VALUE | UNIT |
|-----------------------|---|-----------|---------------|------|
| Peak pulse current | acc. IEC 61000-4-5, 8/20 μs /single shot | I_{PPM} | 3 | A |
| Peak pulse power | acc. IEC 61000-4-5, 8/20 μs /single shot | P_{PP} | 33 | W |
| ESD immunity | Contact discharge acc. IEC 61000-4-2; 10 pulses | V_{ESD} | ± 20 | kV |
| | Air discharge acc. IEC 61000-4-2; 10 pulses | | ± 30 | kV |
| Operating temperature | Junction temperature | T_J | - 40 to + 125 | °C |
| Storage temperature | | T_{stg} | - 55 to + 150 | °C |

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

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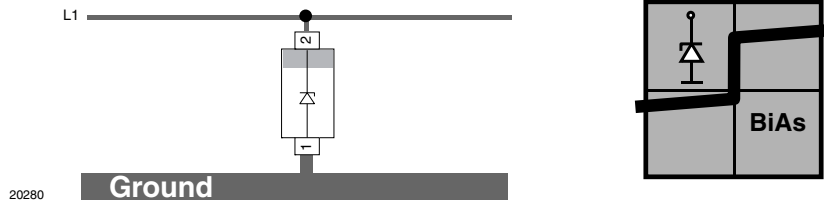
BiAs-MODE (bidirectional asymmetrical protection mode)

With the VESD05A1B-02V one signal- or data-lines (L1) can be protected against voltage transients. With pin 1 connected to ground and pin 2 connected to a signal- or data-line which has to be protected. As long as the voltage level on the data- or signal-line is between 0 V (ground level) and the specified maximum reverse working voltage (V_{RWM}) the protection diode between data line and ground offers a high isolation to the ground line. The protection device behaves like an open switch.

As soon as any positive transient voltage signal exceeds the break through voltage level of the protection diode, the diode becomes conductive and shorts the transient current to ground. Now the protection device behaves like a closed switch. The clamping voltage (V_C) is defined by the breakthrough voltage (V_{BR}) level plus the voltage drop at the series impedance (resistance and inductance) of the protection device.

Any negative transient signal will be clamped accordingly. The negative transient current is flowing in the forward direction of the protection diode. The low forward voltage (V_F) clamps the negative transient close to the ground level.

Due to the different clamping levels in forward and reverse direction the VESD05A1B-02V clamping behaviour is bidirectional and asymmetrical (BiAs).



| ELECTRICAL CHARACTERISTICS VESD05A1B-02V | | | | | | |
|--|--|---------------|------|------|------|---------|
| PARAMETER | TEST CONDITIONS/REMARKS | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Protection paths | Number of lines which can be protected | $N_{channel}$ | - | - | 1 | lines |
| Reverse working voltage | at $I_R = 1 \mu A$ | V_{RWM} | 5 | - | - | V |
| Reverse current | at $V_R = 5 V$ | I_R | - | 0.01 | 0.1 | μA |
| Reverse breakdown voltage | at $I_R = 1 mA$ | V_{BR} | 6 | 6.8 | 7.5 | V |
| | at $I_{PP} = 1 A$ | | - | 8 | 9.5 | V |
| Reverse clamping voltage | at $I_{PP} = I_{PPM} = 3 A$ | V_C | - | 8.9 | 11 | V |
| | at $I_{PP} = 0.2 A$ | | - | 0.95 | 1.2 | V |
| Forward clamping voltage | at $I_{PP} = 1 A$ | V_F | - | 1.3 | - | V |
| | at $I_{PP} = I_{PPM} = 3 A$ | | - | 1.9 | - | V |
| | at $V_R = 0 V; f = 1 MHz$ | | - | 19 | 23 | pF |
| Capacitance | at $V_R = 2.5 V; f = 1 MHz$ | C_D | - | 12 | - | pF |

Note

- Ratings at 25 °C, ambient temperature unless otherwise specified. BiAs mode (between pin 1 and pin 2).

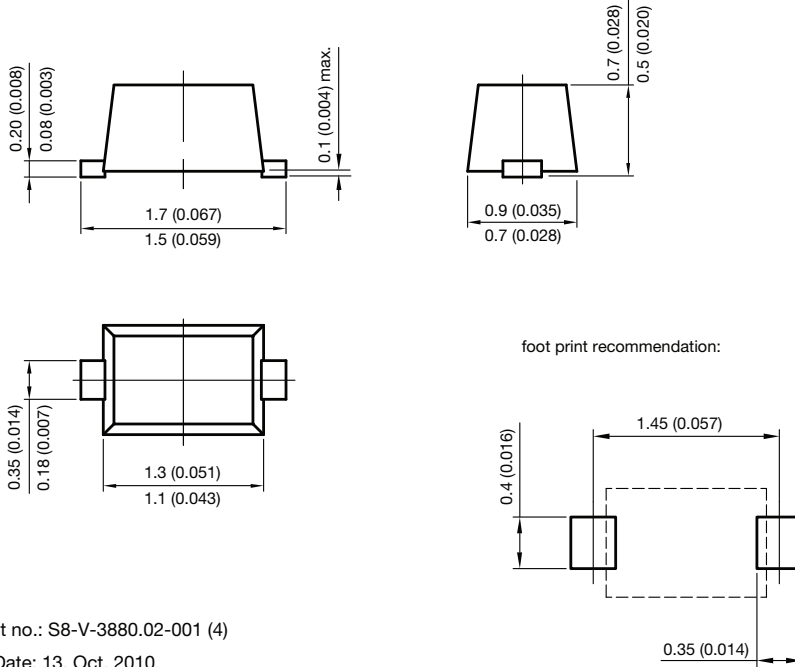


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SOD-523

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PACKAGE DIMENSIONS in millimeters (inches): **SOD-523**



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