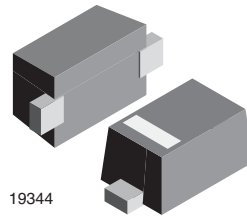


Single ESD-Protection Diode in SOD-523



MARKING (example only)



Bar = cathode marking
 X = date code
 Y = type code (see table below)

FEATURES

- Single-line ESD-protection
- ESD-immunity acc. IEC 61000-4-2
 ± 30 kV contact discharge
 ± 30 kV air discharge
- Typ. capacitance = 130 pF
- Leakage current $I_R < 1 \mu\text{A}$ ($V_R = 5$ V)
- e3 - Sn
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



| ORDERING INFORMATION | | | |
|----------------------|-------------------|--------------------------------|------------------------|
| DEVICE NAME | ORDERING CODE | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
| VESD05A1-02V | VESD05A1-02V-G-08 | 3000 (8 mm tape on 7" reel) | 3000 |
| | VESD05A1-02V-G-18 | 10 000 (8 mm tape on 13" reel) | 10 000 |

| PACKAGE DATA | | | | | | |
|--------------|--------------|-----------|--------|--------------------------------------|-----------------------------------|--------------------------|
| DEVICE NAME | PACKAGE NAME | TYPE CODE | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
| VESD05A1-02V | SOD-523 | . 3 | 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} | 16 | A |
| Peak pulse power | Acc. IEC 61000-4-5, 8/20 μs /single shot | P_{PP} | 192 | W |
| ESD immunity | Contact discharge acc. IEC 61000-4-2; 10 pulses | V_{ESD} | ± 30 | 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 |

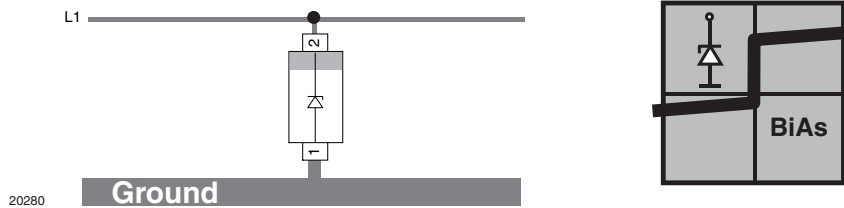
BiAs-MODE (bidirectional asymmetrical protection mode)

With the VESD05A1-02V 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.

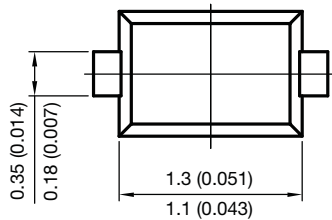
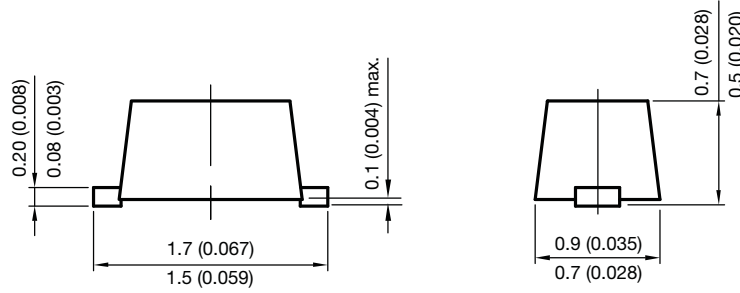
Due to the different clamping levels in forward and reverse direction the VESD05A1-02V clamping behaviour is bidirectional and asymmetrical (BiAs).



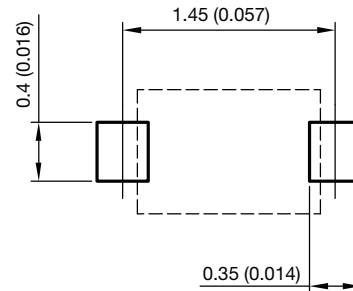
| ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | |
|---|---|---------------|------|-------|------|---------------|
| PARAMETER | TEST CONDITIONS/REMARKS | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Protection paths | Number of lines which can be protected | $N_{channel}$ | - | - | 1 | lines |
| Reverse stand off voltage | Max. reverse working voltage | V_{RWM} | - | - | 5 | V |
| Reverse voltage | at $I_R = 1\text{ }\mu\text{A}$ | V_R | 5 | - | - | V |
| Reverse current | at $V_R = 5\text{ V}$ | I_R | - | < 0.1 | 1 | μA |
| Reverse breakdown voltage | at $I_R = 1\text{ mA}$ | V_{BR} | 6 | 6.8 | 7.5 | V |
| Reverse clamping voltage | at $I_{PP} = 1\text{ A}$; 8/20 μs test pulse | V_C | - | 7.2 | 8.5 | V |
| | at $I_{PP} = I_{PPM} = 16\text{ A}$; 8/20 μs test pulse | V_C | - | 10.5 | 12 | V |
| Forward clamping voltage | at $I_{PP} = 0.2\text{ A}$; 8/20 μs test pulse | V_F | - | 0.88 | 1.1 | V |
| | at $I_{PP} = 1\text{ A}$; 8/20 μs test pulse | V_F | - | 1 | 1.5 | V |
| | at $I_{PP} = I_{PPM} = 16\text{ A}$; 8/20 μs test pulse | V_F | - | 3.2 | 4.5 | V |
| Capacitance | at $V_R = 0\text{ V}$; $f = 1\text{ MHz}$ | C_D | - | 130 | 150 | pF |
| | at $V_R = 2.5\text{ V}$; $f = 1\text{ MHz}$ | C_D | - | 76 | - | pF |



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



foot print recommendation:



Document no.: S8-V-3880.02-001 (4)

Rev. h - Date: 13. Oct. 2010

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- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
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- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
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