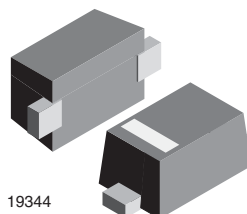
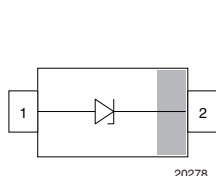


## Single ESD Protection Diode in SOD-523



### FEATURES

- Single-line ESD protection
- Low leakage current
- ESD immunity acc. IEC 61000-4-2  
± 8 kV contact discharge  
± 15 kV air discharge
- e3 - Sn
- Material categorization:  
for definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### MARKING (example only)



Bar = cathode marking

X = date code

Y = type code (see table below)

### DESIGN SUPPORT TOOLS

[click logo to get started](#)

**3D**  
Models  
Available

### ORDERING INFORMATION

| DEVICE NAME | ORDERING CODE   | TAPED UNITS PER REEL<br>(8 mm TAPE ON 7" REEL) | MINIMUM ORDER QUANTITY |
|-------------|-----------------|------------------------------------------------|------------------------|
| VESD01-02V  | VESD01-02V-G-08 | 3000                                           | 3000                   |
| VESD03-02V  | VESD03-02V-G-08 | 3000                                           | 3000                   |
| VESD05-02V  | VESD05-02V-G-08 | 3000                                           | 3000                   |
| VESD08-02V  | VESD08-02V-G-08 | 3000                                           | 3000                   |
| VESD12-02V  | VESD12-02V-G-08 | 3000                                           | 3000                   |

### PACKAGE DATA

| DEVICE NAME | PACKAGE NAME | TYPE CODE | WEIGHT | MOLDING COMPOUND<br>FLAMMABILITY RATING | MOISTURE<br>SENSITIVITY LEVEL        | SOLDERING CONDITIONS         |
|-------------|--------------|-----------|--------|-----------------------------------------|--------------------------------------|------------------------------|
| VESD01-02V  | SOD-523      | . V       | 1.4 mg | UL 94 V-0                               | MSL level 1<br>(according J-STD-020) | Peak temperature max. 260 °C |
| VESD03-02V  | SOD-523      | . B       | 1.4 mg | UL 94 V-0                               | MSL level 1<br>(according J-STD-020) | Peak temperature max. 260 °C |
| VESD05-02V  | SOD-523      | . C       | 1.4 mg | UL 94 V-0                               | MSL level 1<br>(according J-STD-020) | Peak temperature max. 260 °C |
| VESD08-02V  | SOD-523      | . D       | 1.4 mg | UL 94 V-0                               | MSL level 1<br>(according J-STD-020) | Peak temperature max. 260 °C |
| VESD12-02V  | SOD-523      | . E       | 1.4 mg | UL 94 V-0                               | MSL level 1<br>(according J-STD-020) | Peak temperature max. 260 °C |

**ABSOLUTE MAXIMUM RATINGS VESD01-02V**

| PARAMETER             | TEST CONDITIONS                                 | SYMBOL           | VALUE       | UNIT |
|-----------------------|-------------------------------------------------|------------------|-------------|------|
| Peak pulse current    | Acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot    | I <sub>PPM</sub> | 7           | A    |
| Peak pulse power      | Acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot    | P <sub>PP</sub>  | 63          | W    |
| ESD immunity          | Contact discharge acc. IEC 61000-4-2; 10 pulses | V <sub>ESD</sub> | $\pm 8$     | kV   |
|                       | Air discharge acc. IEC 61000-4-2; 10 pulses     |                  | $\pm 15$    | kV   |
| Operating temperature | Junction temperature                            | T <sub>J</sub>   | -40 to +125 | °C   |
| Storage temperature   |                                                 | T <sub>stg</sub> | -55 to +150 | °C   |

**ABSOLUTE MAXIMUM RATINGS VESD03-02V**

| PARAMETER             | TEST CONDITIONS                                 | SYMBOL           | VALUE       | UNIT |
|-----------------------|-------------------------------------------------|------------------|-------------|------|
| Peak pulse current    | Acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot    | I <sub>PPM</sub> | 9           | A    |
| Peak pulse power      | Acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot    | P <sub>PP</sub>  | 108         | W    |
| ESD immunity          | Contact discharge acc. IEC 61000-4-2; 10 pulses | V <sub>ESD</sub> | $\pm 8$     | kV   |
|                       | Air discharge acc. IEC 61000-4-2; 10 pulses     |                  | $\pm 15$    | kV   |
| Operating temperature | Junction temperature                            | T <sub>J</sub>   | -40 to +125 | °C   |
| Storage temperature   |                                                 | T <sub>stg</sub> | -55 to +150 | °C   |

**ABSOLUTE MAXIMUM RATINGS VESD05-02V**

| PARAMETER             | TEST CONDITIONS                                 | SYMBOL           | VALUE       | UNIT |
|-----------------------|-------------------------------------------------|------------------|-------------|------|
| Peak pulse current    | Acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot    | I <sub>PPM</sub> | 6           | A    |
| Peak pulse power      | Acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot    | P <sub>PP</sub>  | 120         | W    |
| ESD immunity          | Contact discharge acc. IEC 61000-4-2; 10 pulses | V <sub>ESD</sub> | $\pm 8$     | kV   |
|                       | Air discharge acc. IEC 61000-4-2; 10 pulses     |                  | $\pm 15$    | kV   |
| Operating temperature | Junction temperature                            | T <sub>J</sub>   | -40 to +125 | °C   |
| Storage temperature   |                                                 | T <sub>stg</sub> | -55 to +150 | °C   |

**ABSOLUTE MAXIMUM RATINGS VESD08-02V**

| PARAMETER             | TEST CONDITIONS                                 | SYMBOL           | VALUE       | UNIT |
|-----------------------|-------------------------------------------------|------------------|-------------|------|
| Peak pulse current    | Acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot    | I <sub>PPM</sub> | 4           | A    |
| Peak pulse power      | Acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot    | P <sub>PP</sub>  | 120         | W    |
| ESD immunity          | Contact discharge acc. IEC 61000-4-2; 10 pulses | V <sub>ESD</sub> | $\pm 8$     | kV   |
|                       | Air discharge acc. IEC 61000-4-2; 10 pulses     |                  | $\pm 15$    | kV   |
| Operating temperature | Junction temperature                            | T <sub>J</sub>   | -40 to +125 | °C   |
| Storage temperature   |                                                 | T <sub>stg</sub> | -55 to +150 | °C   |

**ABSOLUTE MAXIMUM RATINGS VESD12-02V**

| PARAMETER             | TEST CONDITIONS                                 | SYMBOL           | VALUE       | UNIT |
|-----------------------|-------------------------------------------------|------------------|-------------|------|
| Peak pulse current    | Acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot    | I <sub>PPM</sub> | 2           | A    |
| Peak pulse power      | Acc. IEC 61000-4-5, 8/20 $\mu$ s/single shot    | P <sub>PP</sub>  | 25          | W    |
| ESD immunity          | Contact discharge acc. IEC 61000-4-2; 10 pulses | V <sub>ESD</sub> | $\pm 8$     | kV   |
|                       | Air discharge acc. IEC 61000-4-2; 10 pulses     |                  | $\pm 15$    | kV   |
| Operating temperature | Junction temperature                            | T <sub>J</sub>   | -40 to +125 | °C   |
| Storage temperature   |                                                 | T <sub>stg</sub> | -55 to +150 | °C   |

**ELECTRICAL CHARACTERISTICS VESD01-02V**(T<sub>amb</sub> = 25 °C, unless otherwise specified)

| PARAMETER                 | TEST CONDITIONS/REMARKS                | SYMBOL               | MIN. | TYP. | MAX. | UNIT  |
|---------------------------|----------------------------------------|----------------------|------|------|------|-------|
| Protection paths          | Number of lines which can be protected | N <sub>channel</sub> | -    | -    | 1    | lines |
| Reverse stand-off voltage | Max. reverse working voltage           | V <sub>RWM</sub>     | -    | -    | 1    | V     |
| Reverse voltage           | at I <sub>R</sub> = 100 µA             | V <sub>R</sub>       | 1    | -    | -    | V     |
| Reverse current           | at V <sub>R</sub> = 1 V                | I <sub>R</sub>       | -    | -    | 100  | µA    |
| Reverse breakdown voltage | at I <sub>R</sub> = 1 mA               | V <sub>BR</sub>      | 1.5  | -    | -    | V     |
| Reverse clamping voltage  | at I <sub>PP</sub> (see fig. 1)        | V <sub>C</sub>       | -    | 9    | -    | V     |
| Capacitance               | at V <sub>R</sub> = 0 V; f = 1 MHz     | C <sub>D</sub>       | -    | 180  | -    | pF    |

**ELECTRICAL CHARACTERISTICS VESD03-02V**(T<sub>amb</sub> = 25 °C, unless otherwise specified)

| PARAMETER                 | TEST CONDITIONS/REMARKS                | SYMBOL               | MIN. | TYP. | MAX. | UNIT  |
|---------------------------|----------------------------------------|----------------------|------|------|------|-------|
| Protection paths          | Number of lines which can be protected | N <sub>channel</sub> | -    | -    | 1    | lines |
| Reverse stand-off voltage | Max. reverse working voltage           | V <sub>RWM</sub>     | -    | -    | 3    | V     |
| Reverse voltage           | at I <sub>R</sub> = 20 µA              | V <sub>R</sub>       | 3    | -    | -    | V     |
| Reverse current           | at V <sub>R</sub> = 3 V                | I <sub>R</sub>       | -    | -    | 20   | µA    |
| Reverse breakdown voltage | at I <sub>R</sub> = 1 mA               | V <sub>BR</sub>      | 4    | -    | -    | V     |
| Reverse clamping voltage  | at I <sub>PP</sub> (see fig. 1)        | V <sub>C</sub>       | -    | 12   | -    | V     |
| Capacitance               | at V <sub>R</sub> = 0 V; f = 1 MHz     | C <sub>D</sub>       | -    | 110  | -    | pF    |

**ELECTRICAL CHARACTERISTICS VESD05-02V**(T<sub>amb</sub> = 25 °C, unless otherwise specified)

| PARAMETER                 | TEST CONDITIONS/REMARKS                | SYMBOL               | MIN. | TYP. | MAX. | UNIT  |
|---------------------------|----------------------------------------|----------------------|------|------|------|-------|
| Protection paths          | Number of lines which can be protected | N <sub>channel</sub> | -    | -    | 1    | lines |
| Reverse stand-off voltage | Max. reverse working voltage           | V <sub>RWM</sub>     | -    | -    | 5    | V     |
| Reverse voltage           | at I <sub>R</sub> = 0.1 µA             | V <sub>R</sub>       | 5    | -    | -    | V     |
| Reverse current           | at V <sub>R</sub> = 5 V                | I <sub>R</sub>       | -    | -    | 0.1  | µA    |
| Reverse breakdown voltage | at I <sub>R</sub> = 1 mA               | V <sub>BR</sub>      | 6.5  | -    | -    | V     |
| Reverse clamping voltage  | at I <sub>PP</sub> (see fig. 1)        | V <sub>C</sub>       | -    | 20   | -    | V     |
| Capacitance               | at V <sub>R</sub> = 0 V; f = 1 MHz     | C <sub>D</sub>       | -    | 55   | -    | pF    |

**ELECTRICAL CHARACTERISTICS VESD08-02V**(T<sub>amb</sub> = 25 °C, unless otherwise specified)

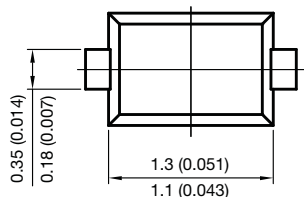
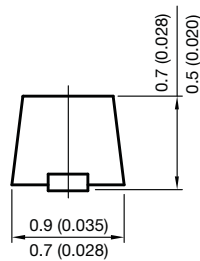
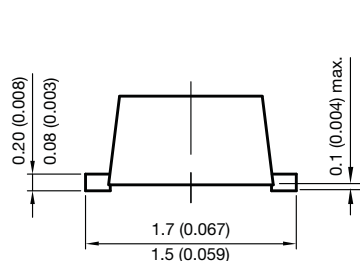
| PARAMETER                 | TEST CONDITIONS/REMARKS                | SYMBOL               | MIN. | TYP. | MAX. | UNIT  |
|---------------------------|----------------------------------------|----------------------|------|------|------|-------|
| Protection paths          | Number of lines which can be protected | N <sub>channel</sub> | -    | -    | 1    | lines |
| Reverse stand-off voltage | Max. reverse working voltage           | V <sub>RWM</sub>     | -    | -    | 8    | V     |
| Reverse voltage           | at I <sub>R</sub> = 0.1 µA             | V <sub>R</sub>       | 8    | -    | -    | V     |
| Reverse current           | at V <sub>R</sub> = 8 V                | I <sub>R</sub>       | -    | -    | 0.1  | µA    |
| Reverse breakdown voltage | at I <sub>R</sub> = 1 mA               | V <sub>BR</sub>      | 9    | -    | -    | V     |
| Reverse clamping voltage  | at I <sub>PP</sub> (see fig. 1)        | V <sub>C</sub>       | -    | 30   | -    | V     |
| Capacitance               | at V <sub>R</sub> = 0 V; f = 1 MHz     | C <sub>D</sub>       | -    | 35   | -    | pF    |

**ELECTRICAL CHARACTERISTICS VESD12-02V**(T<sub>amb</sub> = 25 °C, unless otherwise specified)

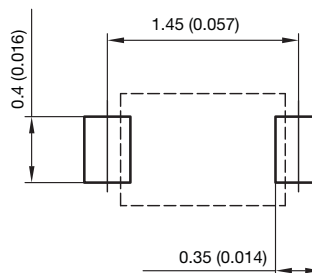
| PARAMETER                 | TEST CONDITIONS/REMARKS                | SYMBOL               | MIN. | TYP. | MAX. | UNIT  |
|---------------------------|----------------------------------------|----------------------|------|------|------|-------|
| Protection paths          | Number of lines which can be protected | N <sub>channel</sub> | -    | -    | 1    | lines |
| Reverse stand-off voltage | Max. reverse working voltage           | V <sub>RWM</sub>     | -    | -    | 12   | V     |
| Reverse voltage           | at I <sub>R</sub> = 0.1 µA             | V <sub>R</sub>       | 12   | -    | -    | V     |
| Reverse current           | at V <sub>R</sub> = 12 V               | I <sub>R</sub>       | -    | -    | 0.1  | µA    |
| Reverse breakdown voltage | at I <sub>R</sub> = 1 mA               | V <sub>BR</sub>      | 14   | -    | -    | V     |
| Reverse clamping voltage  | at I <sub>PP</sub> (see fig. 1)        | V <sub>C</sub>       | -    | 25   | -    | V     |
| Capacitance               | at V <sub>R</sub> = 0 V; f = 1 MHz     | C <sub>D</sub>       | -    | 30   | -    | 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

16864



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