

## Single-Line ESD-Protection Diode in SOD-523



20278



19344

### MARKING (example only)



20279

Bar = cathode marking

X = date code

Y = type code (see table below)

### FEATURES

- Compact SOD-523 package
- Low package height < 0.7 mm
- 1-line unidirectional ESD-protection
- AEC-Q101 qualified available
- Working range 1 V to 33 V
- ESD immunity acc. IEC 61000-4-2  
±15 kV to ±30 kV contact discharge  
±15 kV to ±30 kV air discharge
- Lead plating: Sn (e3)  
- soldering can be checked by standard vision inspection  
- AOI = Automated Optical Inspection
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

 AUTOMOTIVE  
GRADE  
Available

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

### DESIGN SUPPORT TOOLS click logo to get started



| ORDERING INFORMATION     |                       |  |            |                               |                            |
|--------------------------|-----------------------|--|------------|-------------------------------|----------------------------|
| PART NUMBER<br>(EXAMPLE) | AEC-Q101<br>QUALIFIED | ENVIRONMENTAL AND QUALITY CODE                     |            |                               | ORDERING CODE<br>(EXAMPLE) |
|                          |                       | RoHS COMPLIANT +<br>LEAD (Pb)-FREE<br>TERMINATIONS | TIN PLATED | 8K PER 7" REEL<br>(8 mm TAPE) |                            |
|                          |                       | GREEN  |            | MOQ = 8K/BOX                  |                            |
| VESD05C1-02V             | -                     | G  | 3          | -08                           | VESD05C1-02V-G3-08         |
| VESD05C1-02V             | H                     | G  | 3          | -08                           | VESD05C1-02VHG3-08         |

| PACKAGE DATA  |              |           |         |   |                                      |                              |
|---------------|--------------|-----------|---------|---|--------------------------------------|------------------------------|
| DEVICE NAME   | PACKAGE NAME | TYPE CODE | WEIGHT  | MOLDING COMPOUND<br>FLAMMABILITY RATING | MOISTURE<br>SENSITIVITY LEVEL        | SOLDERING CONDITIONS         |
| VESD01C1-02V  | SOD-523      | . V       | 1.32 mg | UL 94 V-0                               | MSL level 1<br>(according J-STD-020) | Peak temperature max. 260 °C |
| VESD03C1-02V  |              | . B       |         |   |                                      |                              |
| VESD05C1-02V  |              | . C       |         |   |                                      |                              |
| VESD08C1-02V  |              | . D       |         |   |                                      |                              |
| VESD012C1-02V |              | . E       |         |   |                                      |                              |
| VESD016C1-02V |              | . G       |         |   |                                      |                              |
| VESD026C1-02V |              | . X       |         |   |                                      |                              |
| VESD033C1-02V |              | A         |         |   |                                      |                              |



| <b>ABSOLUTE MAXIMUM RATINGS VESD01C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |           |             |                    |
|--|---|-----------|-------------|--------------------|
| PARAMETER  | TEST CONDITIONS                                     | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current   | Acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot | $I_{PPM}$ | 14.6        | A                  |
| Peak pulse power   | Acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot | $P_{PP}$  | 100         | 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                                | $T_J$     | -55 to +150 | $^{\circ}\text{C}$ |
| Storage temperature  |   | $T_{stg}$ | -55 to +150 | $^{\circ}\text{C}$ |

| <b>ABSOLUTE MAXIMUM RATINGS VESD03C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |           |             |                    |
|--|---|-----------|-------------|--------------------|
| PARAMETER  | TEST CONDITIONS                                     | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current   | Acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot | $I_{PPM}$ | 11.6        | A                  |
| Peak pulse power   | Acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot | $P_{PP}$  | 100         | 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                                | $T_J$     | -55 to +150 | $^{\circ}\text{C}$ |
| Storage temperature  |   | $T_{stg}$ | -55 to +150 | $^{\circ}\text{C}$ |

| <b>ABSOLUTE MAXIMUM RATINGS VESD05C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |           |             |                    |
|--|---|-----------|-------------|--------------------|
| PARAMETER  | TEST CONDITIONS                                     | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current   | Acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot | $I_{PPM}$ | 8.7         | A                  |
| Peak pulse power   | Acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot | $P_{PP}$  | 100         | 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                                | $T_J$     | -55 to +150 | $^{\circ}\text{C}$ |
| Storage temperature  |   | $T_{stg}$ | -55 to +150 | $^{\circ}\text{C}$ |

| <b>ABSOLUTE MAXIMUM RATINGS VESD08C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |           |             |                    |
|--|---|-----------|-------------|--------------------|
| PARAMETER  | TEST CONDITIONS                                     | SYMBOL    | VALUE       | UNIT               |
| Peak pulse current   | Acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot | $I_{PPM}$ | 6.60        | A                  |
| Peak pulse power   | Acc. IEC 61000-4-5, 8/20 $\mu\text{s}$ /single shot | $P_{PP}$  | 100         | 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                                | $T_J$     | -55 to +150 | $^{\circ}\text{C}$ |
| Storage temperature  |   | $T_{stg}$ | -55 to +150 | $^{\circ}\text{C}$ |



| <b>ABSOLUTE MAXIMUM RATINGS VESD12C1-02V</b><br>(T <sub>amb</sub> = 25 °C, unless otherwise specified) |   |                  |             |      |
|--|---|------------------|-------------|------|
| PARAMETER  | TEST CONDITIONS                                 | SYMBOL           | VALUE       | UNIT |
| Peak pulse current   | Acc. IEC 61000-4-5, 8/20 µs/single shot         | I <sub>PPM</sub> | 4.4         | A    |
| Peak pulse power   | Acc. IEC 61000-4-5, 8/20 µs/single shot         | P <sub>PP</sub>  | 100         | W    |
| ESD immunity   | Contact discharge acc. IEC 61000-4-2; 10 pulses | V <sub>ESD</sub> | 30          | kV   |
|  | Air discharge acc. IEC 61000-4-2; 10 pulses     |                  | 30          | kV   |
| Operating temperature  | Junction temperature                            | T <sub>J</sub>   | -55 to +150 | °C   |
| Storage temperature  |   | T <sub>stg</sub> | -55 to +150 | °C   |

| <b>ABSOLUTE MAXIMUM RATINGS VESD16C1-02V</b><br>(T <sub>amb</sub> = 25 °C, unless otherwise specified) |   |                  |             |      |
|--|---|------------------|-------------|------|
| PARAMETER  | TEST CONDITIONS                                 | SYMBOL           | VALUE       | UNIT |
| Peak pulse current   | Acc. IEC 61000-4-5, 8/20 µs/single shot         | I <sub>PPM</sub> | 3.6         | A    |
| Peak pulse power   | Acc. IEC 61000-4-5, 8/20 µs/single shot         | P <sub>PP</sub>  | 100         | W    |
| ESD immunity   | Contact discharge acc. IEC 61000-4-2; 10 pulses | V <sub>ESD</sub> | 30          | kV   |
|  | Air discharge acc. IEC 61000-4-2; 10 pulses     |                  | 30          | kV   |
| Operating temperature  | Junction temperature                            | T <sub>J</sub>   | -55 to +150 | °C   |
| Storage temperature  |   | T <sub>stg</sub> | -55 to +150 | °C   |

| <b>ABSOLUTE MAXIMUM RATINGS VESD26C1-02V</b><br>(T <sub>amb</sub> = 25 °C, unless otherwise specified) |   |                  |             |      |
|--|---|------------------|-------------|------|
| PARAMETER  | TEST CONDITIONS                                 | SYMBOL           | VALUE       | UNIT |
| Peak pulse current   | Acc. IEC 61000-4-5, 8/20 µs/single shot         | I <sub>PPM</sub> | 2.1         | A    |
| Peak pulse power   | Acc. IEC 61000-4-5, 8/20 µs/single shot         | P <sub>PP</sub>  | 100         | W    |
| ESD immunity   | Contact discharge acc. IEC 61000-4-2; 10 pulses | V <sub>ESD</sub> | 20          | kV   |
|  | Air discharge acc. IEC 61000-4-2; 10 pulses     |                  | 20          | kV   |
| Operating temperature  | Junction temperature                            | T <sub>J</sub>   | -55 to +150 | °C   |
| Storage temperature  |   | T <sub>stg</sub> | -55 to +150 | °C   |

| <b>ABSOLUTE MAXIMUM RATINGS VESD33C1-02V</b><br>(T <sub>amb</sub> = 25 °C, unless otherwise specified) |   |                  |             |      |
|--|---|------------------|-------------|------|
| PARAMETER  | TEST CONDITIONS                                 | SYMBOL           | VALUE       | UNIT |
| Peak pulse current   | Acc. IEC 61000-4-5, 8/20 µs/single shot         | I <sub>PPM</sub> | 1.6         | A    |
| Peak pulse power   | Acc. IEC 61000-4-5, 8/20 µs/single shot         | P <sub>PP</sub>  | 100         | W    |
| ESD immunity   | Contact discharge acc. IEC 61000-4-2; 10 pulses | V <sub>ESD</sub> | 15          | kV   |
|  | Air discharge acc. IEC 61000-4-2; 10 pulses     |                  | 15          | kV   |
| Operating temperature  | Junction temperature                            | T <sub>J</sub>   | -55 to +150 | °C   |
| Storage temperature  |   | T <sub>stg</sub> | -55 to +150 | °C   |



| <b>ELECTRICAL CHARACTERISTICS VESD01C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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  | $V_{RWM}$     | -    | -    | 1    | V             |
| Reverse voltage  | at $I_R = 100\text{ }\mu\text{A}$                                       | $V_R$         | 1    | 1.2  | -    | V             |
| Reverse current  | at $V_R = 1\text{ V}$   | $I_R$         | -    | 20   | 100  | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 20\text{ mA}$   | $V_{BR}$      | 2.5  | 2.65 | 2.8  | V             |
| Reverse clamping voltage   | at $I_{PP} = I_{PPM} = 14.6\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_C$         | -    | 6.2  | 6.9  | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$ , $t_p = 300\text{ }\mu\text{s}$               | $V_F$         | 0.9  | 1.1  | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 14.6\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_F$         | -    | 3    | 3.92 | V             |
| Dynamic resistance   | $t_p = 100\text{ ns}$ (TLP; pin 2-1)                                    | $r_{dyn}$     | -    | 0.13 | -    | $\Omega$      |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$                              | $C_D$         | 153  | 192  | 230  | pF            |

| <b>ELECTRICAL CHARACTERISTICS VESD03C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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  | $V_{RWM}$     | -    | -    | 3    | V             |
| Reverse voltage  | at $I_R = 20\text{ }\mu\text{A}$  | $V_R$         | 3    | -    | -    | V             |
| Reverse current  | at $V_R = 3\text{ V}$   | $I_R$         | -    | 8    | 20   | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$  | $V_{BR}$      | 4.4  | 4.65 | 4.9  | V             |
| Reverse clamping voltage   | at $I_{PP} = I_{PPM} = 11.6\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_C$         | -    | 7.8  | 8.70 | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$ , $t_p = 300\text{ }\mu\text{s}$               | $V_F$         | 0.9  | 1.1  | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 11.6\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_F$         | -    | 2.6  | 3.32 | V             |
| Dynamic resistance   | $t_p = 100\text{ ns}$ (TLP; pin 2-1)                                    | $r_{dyn}$     | -    | 0.19 | -    | $\Omega$      |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$                              | $C_D$         | 89   | 112  | 135  | pF            |

| <b>ELECTRICAL CHARACTERISTICS VESD05C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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 $V_R = 5\text{ V}$  | $I_R$         | -    | 0.01 | 0.1  | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$   | $V_{BR}$      | 6.85 | 7.26 | 7.65 | V             |
| Reverse clamping voltage   | at $I_{PP} = I_{PPM} = 8.7\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_C$         | -    | 10.3 | 11.5 | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$ , $t_p = 300\text{ }\mu\text{s}$              | $V_F$         | 0.9  | 1.1  | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 8.7\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_F$         | -    | 2.2  | 2.74 | V             |
| Dynamic resistance   | $t_p = 100\text{ ns}$ (TLP; pin 2-1)                                   | $r_{dyn}$     | -    | 0.2  | -    | $\Omega$      |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$                             | $C_D$         | 53   | 67   | 81   | pF            |



| <b>ELECTRICAL CHARACTERISTICS VESD08C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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   | $V_{RWM}$     | -    | -    | 8    | V             |
| Reverse voltage  | at $I_R = 0.1\text{ }\mu\text{A}$                                      | $V_R$         | 8    | -    | -    | V             |
| Reverse current  | at $V_R = 8\text{ V}$  | $I_R$         | -    | 0.01 | 0.1  | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$   | $V_{BR}$      | 9.5  | 10   | 10.5 | V             |
| Reverse clamping voltage   | at $I_{PP} = I_{PPM} = 6.6\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_C$         | -    | 13.7 | 15.3 | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$ , $t_p = 300\text{ }\mu\text{s}$              | $V_F$         | 0.9  | 1.1  | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 6.6\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_F$         | -    | 1.9  | 2.32 | V             |
| Dynamic resistance   | $t_p = 100\text{ ns}$ (TLP; pin 2-1)                                   | $r_{dyn}$     | -    | 0.23 | -    | $\Omega$      |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$                             | $C_D$         | 37   | 47   | 57   | pF            |

| <b>ELECTRICAL CHARACTERISTICS VESD12C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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   | $V_{RWM}$     | -    | -    | 12   | V             |
| Reverse voltage  | at $I_R = 0.1\text{ }\mu\text{A}$                                      | $V_R$         | 12   | -    | -    | V             |
| Reverse current  | at $V_R = 12\text{ V}$   | $I_R$         | -    | 0.01 | 0.1  | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$   | $V_{BR}$      | 13.9 | 14.7 | 15.5 | V             |
| Reverse clamping voltage   | at $I_{PP} = I_{PPM} = 4.4\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_C$         | -    | 20.5 | 22.7 | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$ , $t_p = 300\text{ }\mu\text{s}$              | $V_F$         | 0.9  | 1.1  | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 4.4\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_F$         | -    | 1.6  | 1.88 | V             |
| Dynamic resistance   | $t_p = 100\text{ ns}$ (TLP; pin 2-1)                                   | $r_{dyn}$     | -    | 0.4  | -    | $\Omega$      |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$                             | $C_D$         | 26   | 33   | 40   | pF            |

| <b>ELECTRICAL CHARACTERISTICS VESD16C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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   | $V_{RWM}$     | -    | -    | 16   | V             |
| Reverse voltage  | at $I_R = 0.1\text{ }\mu\text{A}$                                      | $V_R$         | 16   | -    | -    | V             |
| Reverse current  | at $V_R = 16\text{ V}$   | $I_R$         | -    | 0.01 | 0.1  | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$   | $V_{BR}$      | 17   | 17.9 | 18.8 | V             |
| Reverse clamping voltage   | at $I_{PP} = I_{PPM} = 3.6\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_C$         | -    | 25.3 | 28   | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$ , $t_p = 300\text{ }\mu\text{s}$              | $V_F$         | 0.9  | 1.1  | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 3.6\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_F$         | -    | 1.5  | 1.72 | V             |
| Dynamic resistance   | $t_p = 100\text{ ns}$ (TLP; pin 2-1)                                   | $r_{dyn}$     | -    | 0.53 | -    | $\Omega$      |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$                             | $C_D$         | 21   | 27   | 33   | pF            |



| <b>ELECTRICAL CHARACTERISTICS VESD26C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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   | $V_{RWM}$     | -    | -      | 26   | V             |
| Reverse voltage  | at $I_R = 0.1\text{ }\mu\text{A}$                                      | $V_R$         | 26   | -      | -    | V             |
| Reverse current  | at $V_R = 26\text{ V}$   | $I_R$         | -    | < 0.01 | 0.1  | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$   | $V_{BR}$      | 27.6 | 29.1   | 30.6 | V             |
| Reverse clamping voltage   | at $I_{PP} = I_{PPM} = 2.1\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_C$         | -    | 43     | 48   | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$ , $t_p = 300\text{ }\mu\text{s}$              | $V_F$         | 0.9  | 1.1    | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 2.1\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_F$         | -    | 1.3    | 1.42 | V             |
| Dynamic resistance   | $t_p = 100\text{ ns}$ (TLP; pin 2-1)                                   | $r_{dyn}$     | -    | 1.9    | -    | $\Omega$      |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$                             | $C_D$         | 14   | 17.5   | 21   | pF            |

| <b>ELECTRICAL CHARACTERISTICS VESD33C1-02V</b><br>( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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   | $V_{RWM}$     | -    | -      | 33   | V             |
| Reverse voltage  | at $I_R = 0.1\text{ }\mu\text{A}$                                      | $V_R$         | 33   | -      | -    | V             |
| Reverse current  | at $V_R = 33\text{ V}$   | $I_R$         | -    | < 0.01 | 0.1  | $\mu\text{A}$ |
| Reverse breakdown voltage  | at $I_R = 1\text{ mA}$   | $V_{BR}$      | 35.5 | 37.4   | 39.3 | V             |
| Reverse clamping voltage   | at $I_{PP} = I_{PPM} = 1.6\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_C$         | -    | 56     | 62.5 | V             |
| Forward clamping voltage   | at $I_{PP} = 1\text{ A}$ , $t_p = 300\text{ }\mu\text{s}$              | $V_F$         | 0.9  | 1.1    | 1.2  | V             |
|  | at $I_{PP} = I_{PPM} = 1.6\text{ A}$ , $t_p = 8/20\text{ }\mu\text{s}$ | $V_F$         | -    | 1.22   | 1.32 | V             |
| Dynamic resistance   | $t_p = 100\text{ ns}$ (TLP; pin 2-1)                                   | $r_{dyn}$     | -    | 3.6    | -    | $\Omega$      |
| Capacitance  | at $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$                             | $C_D$         | 12   | 15     | 18   | pF            |



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



Fig. 4 - Typical Capacitance vs. Reverse Voltage



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



Fig. 5 - Typical Reverse Voltage vs. Reverse Current



Fig. 3 - Typical Peak Clamping Voltage vs. Peak Pulse Current



Fig. 6 - Typical Clamping Voltage vs. Peak Pulse Current



Fig. 7 - Typical Forward Voltage vs. Forward Current



Fig. 8 - Typical Forward Voltage vs. Forward Current

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



Document no.: S8-V-3880.02-003 (4)  
 Rev.2 - Date: 18. Aug. 2017  
 23093





## CARRIER TAPE SOD-523



S8-V-3717.03-005 (4)  
05.07.2018  
22959

## ORIENTATION IN CARRIER TAPE SOD-523



S8-V-3717.03-006 (4)  
05.07.2018  
22958



## **Disclaimer**

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.