1. General description

Unidirectional Transient Voltage Suppressor (TVS) in a very small leadless DSN1608-2 (SOD964) package.

2. Features and benefits

- Rated peak pulse current: $I_{PPM} = 32$ A (8/20 µs pulse)
- Rated peak pulse power: $P_{PPM} = 1850$ W (8/20 µs pulse)
- Dynamic resistance $R_{dy}$n = 0.15 Ω
- Reverse current: $I_{RM} = 0.1$ nA typ.
- Very low package height: 0.29 mm

3. Applications

- Power supply protection
- Industrial application
- Power management

4. Quick reference data

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{PPM}$</td>
<td>peak pulse current</td>
<td>$t_p = 8/20$ µs</td>
<td>[1][2]</td>
<td>-</td>
<td>-</td>
<td>32 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$t_p = 10/1000$ µs</td>
<td>[3][2]</td>
<td>-</td>
<td>-</td>
<td>4.5 A</td>
</tr>
<tr>
<td>$V_{RWM}$</td>
<td>reverse standoff voltage</td>
<td>$T_{amb} = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>26</td>
<td>V</td>
</tr>
</tbody>
</table>

[1] In accordance with IEC 61000-4-5 (8/20 µs current waveform).
5. Pinning information

Table 2. Pinning information

<table>
<thead>
<tr>
<th>Pin</th>
<th>Symbol</th>
<th>Description</th>
<th>Simplified outline</th>
<th>Graphic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>K</td>
<td>cathode</td>
<td><img src="DSN1608-2" alt="Transparent top view" title="SOD964" /></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>anode</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Ordering information

Table 3. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Name</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTVS26VZ1USK</td>
<td>DSN1608-2</td>
<td>leadless very small package; 2 terminals; body 1.6 x 0.8 x 0.29 mm</td>
<td>SOD964</td>
<td></td>
</tr>
</tbody>
</table>

7. Marking

Table 4. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTVS26VZ1USK</td>
<td>Z8</td>
</tr>
</tbody>
</table>
8. Limiting values

Table 5. Limiting values
In accordance with the Absolute Maximum Rating System (IEC 60134).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_{PPM}$</td>
<td>peak pulse power</td>
<td>$t_p = 8/20 \mu s$</td>
<td>[1][2]</td>
<td>-</td>
<td>1850 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$t_p = 10/1000 \mu s$</td>
<td>[3][2]</td>
<td>-</td>
<td>200  W</td>
</tr>
<tr>
<td>$I_{PPM}$</td>
<td>peak pulse current</td>
<td>$t_p = 8/20 \mu s$</td>
<td>[1][2]</td>
<td>-</td>
<td>32   A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$t_p = 10/1000 \mu s$</td>
<td>[3][2]</td>
<td>-</td>
<td>4.5  A</td>
</tr>
<tr>
<td>$T_j$</td>
<td>junction temperature</td>
<td></td>
<td>-</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{amb}$</td>
<td>ambient temperature</td>
<td></td>
<td>-40</td>
<td>125</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{stg}$</td>
<td>storage temperature</td>
<td></td>
<td>-65</td>
<td>150</td>
<td>°C</td>
</tr>
</tbody>
</table>

**ESD maximum ratings**

| $V_{ESD}$ | electrostatic discharge voltage | IEC 61000-4-2; contact discharge | [4][2] | - | 30 kV |
|           |                                   | IEC 61000-4-2; air discharge     | [4][2] | - | 30 kV |

[1] In accordance with IEC 61000-4-5 (8/20 µs current waveform).

---

Fig. 1. 8/20 µs pulse waveform according to IEC 61000-4-5

Fig. 2. ESD pulse waveform according to IEC 61000-4-2
9. Characteristics

### Table 6. Characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{RWM}$</td>
<td>reverse standoff voltage</td>
<td>$T_{amb} = 25 , ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>26</td>
<td>V</td>
</tr>
<tr>
<td>$V_{BR}$</td>
<td>breakdown voltage</td>
<td>$I_R = 10 , mA; T_{amb} = 25 , ^\circ C$</td>
<td>28.9</td>
<td>31.1</td>
<td>33.4</td>
<td>V</td>
</tr>
<tr>
<td>$I_{RM}$</td>
<td>reverse leakage current</td>
<td>$V_{RWM} = 26 , V; T_{amb} = 25 , ^\circ C$</td>
<td>-</td>
<td>0.1</td>
<td>200</td>
<td>nA</td>
</tr>
<tr>
<td>$C_d$</td>
<td>diode capacitance</td>
<td>$f = 1 , MHz; V_R = 0 , V; T_{amb} = 25 , ^\circ C$</td>
<td>-</td>
<td>215</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>$V_{CL}$</td>
<td>clamping voltage</td>
<td>$I_{PPM} = 32 , A; T_{amb} = 25 , ^\circ C; t_p = 8/20 , \mu s$</td>
<td>47.9</td>
<td>57.5</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_{PPM} = 4.5 , A; T_{amb} = 25 , ^\circ C; t_p = 10/1000 , \mu s$</td>
<td>38.4</td>
<td>46</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>$R_{dyn}$</td>
<td>dynamic resistance</td>
<td>$I_R = 10 , A; T_{amb} = 25 , ^\circ C$</td>
<td>0.15</td>
<td>-</td>
<td>-</td>
<td>Ω</td>
</tr>
</tbody>
</table>

[2] In accordance with IEC 61000-4-5 (8/20 μs current waveform).
**Fig. 4.** V-I characteristics for a unidirectional TVS protection diode

**Fig. 5.** Rated peak pulse power as a function of square pulse duration; typical values

**Fig. 6.** Relative variation of rated peak pulse power as a function of junction temperature; typical values

**Fig. 7.** Relative variation of reverse leakage current as a function of ambient temperature; typical values

\[ V_{RWM} = 26 \text{ V} \]
PTVS26VZ1USK

Transient voltage suppressor in DSN1608-2 for mobile applications

---

**Fig. 8. Positive clamping voltage (TLP); typical values**

\[ R_{\text{fot}} = 0.15 \Omega \]

**Fig. 9. Negative clamping voltage (TLP); typical values**

\[ R_{\text{fot}} = 0.07 \Omega \]

**Fig. 10. Positive clamping voltage (8/20 μs pulse); typical values**

\[ t_p = 8/20 \, \mu \text{s} \]

**Fig. 11. Negative clamping voltage (8/20 μs pulse); typical values**

\[ t_p = 8/20 \, \mu \text{s} \]
**ESD tester**

IEC 61000-4-2 ed.2

- $C_s = 150 \, \text{pF}$
- $R_d = 330 \, \Omega$

**DUT (Device Under Test)**

**RG 223/U 50 Ω coax**

**4 GHz Digital Oscilloscope**

**40 dB attenuator**

**50 Ω**

**Fig. 12. ESD clamping test setup and waveforms**

**Fig. 13. Clamped +8 kV pulse waveform (IEC 61000-4-2 network)**

**Fig. 14. Clamped -8 kV pulse waveform (IEC 61000-4-2 network)**
10. Application information

Fig. 15. Application diagram
11. Package outline

DSN1608-2, leadless very small package; 2 terminals; body 1.6 x 0.8 x 0.29 mm

Dimensions (mm are the original dimensions)

<table>
<thead>
<tr>
<th>Unit</th>
<th>A</th>
<th>A1</th>
<th>b</th>
<th>b1</th>
<th>b2</th>
<th>D</th>
<th>E1</th>
<th>E2</th>
<th>L</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>max</td>
<td>0.31</td>
<td>0.3</td>
<td>0.71</td>
<td>0.645</td>
<td>0.46</td>
<td>0.85</td>
<td>1.65</td>
<td>0.6</td>
<td>0.285</td>
<td>0.31</td>
<td>0.94</td>
</tr>
<tr>
<td>nom</td>
<td>0.27</td>
<td>0.03</td>
<td>0.69</td>
<td>0.625</td>
<td>0.44</td>
<td>0.75</td>
<td>1.55</td>
<td>0.29</td>
<td>0.92</td>
<td>0.34</td>
<td></td>
</tr>
</tbody>
</table>

Note
1. The marking bar indicates the cathode.

Fig. 16. Package outline DSN1608-2 (SOD964)
12. Soldering

![Reflow soldering footprint for DSN1608-2 (SOD964)](sod964_fr)

Fig. 17. Reflow soldering footprint for DSN1608-2 (SOD964)
## 13. Revision history

<table>
<thead>
<tr>
<th>Data sheet ID</th>
<th>Release date</th>
<th>Data sheet status</th>
<th>Change notice</th>
<th>Supersedes</th>
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<td>PTVS26VZ1USK v.2</td>
<td>20160822</td>
<td>Product data sheet</td>
<td>-</td>
<td>PTVS26VZ1USK v.1</td>
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<tr>
<td>Modifications:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Updated document according to the latest measurements.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTVS26VZ1USK v.1</td>
<td>20160212</td>
<td>Preliminary data sheet</td>
<td>-</td>
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</table>
14. Legal information

Data sheet status

<table>
<thead>
<tr>
<th>Document status</th>
<th>Product status</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Preliminary</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Objective</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<td>Preliminary</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
<tr>
<td>Preliminary</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
</tbody>
</table>

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