1. General description


2. Features and benefits

- Average forward current $I_{F(AV)} \leq 0.2$ A
- Reverse voltage $V_R \leq 20$ V
- Low forward voltage
- Low leakage current
- Ultra small and leadless SMD package
- Package height typ. 0.2 mm

3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Low power consumption applications
- Ultra high-speed switching
- LED backlight for mobile application
- Smartcard-embedded applications

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>$I_{F(AV)}$</td>
<td>average forward current</td>
<td>$\delta = 0.5 , ; f = 20$ kHz; $T_{sp} \leq 125$ °C; square wave</td>
<td>-</td>
<td>-</td>
<td>0.2</td>
<td>A</td>
</tr>
<tr>
<td>$V_R$</td>
<td>reverse voltage</td>
<td>$T_j = 25$ °C</td>
<td>-</td>
<td>-</td>
<td>20</td>
<td>V</td>
</tr>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 200$ mA; $T_j = 25$ °C; pulsed</td>
<td>[1]</td>
<td>375</td>
<td>420</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 10$ V; $T_j = 25$ °C; pulsed</td>
<td>[1]</td>
<td>5</td>
<td>25</td>
<td>µA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 20$ V; $T_j = 25$ °C; pulsed</td>
<td>[1]</td>
<td>10</td>
<td>45</td>
<td>µA</td>
</tr>
</tbody>
</table>

[1] Very short pulse, in order to maintain a stable junction temperature.
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[1]</td>
<td><img src="image" alt="Simplified outline" /></td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>anode</td>
<td><img src="image" alt="Transparent top view" /></td>
<td>2</td>
</tr>
</tbody>
</table>

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

<table>
<thead>
<tr>
<th>Package Name</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSN0603B-2</td>
<td>silicon, leadless ultra small package; 2 terminals; 0.4 mm pitch; 0.6 x 0.3 x 0.2 mm body</td>
<td>SOD962B</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>PMEG2002AESFB</td>
<td>A</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>VR</td>
<td>reverse voltage</td>
<td>$T_j = 25 , ^\circ C$</td>
<td>-</td>
<td>20</td>
<td>V</td>
</tr>
<tr>
<td>IF</td>
<td>forward current</td>
<td>$T_{sp} \leq 120 , ^\circ C; \delta = 1$</td>
<td>-</td>
<td>0.28</td>
<td>A</td>
</tr>
<tr>
<td>IF(AV)</td>
<td>average forward current</td>
<td>$\delta = 0.5; f = 20 , kHz; T_{amb} \leq 115 , ^\circ C;$ square wave</td>
<td>-</td>
<td>0.2</td>
<td>A</td>
</tr>
<tr>
<td>IF(AV)</td>
<td>average forward current</td>
<td>$\delta = 0.5; f = 20 , kHz; T_{sp} \leq 125 , ^\circ C;$ square wave</td>
<td>-</td>
<td>0.2</td>
<td>A</td>
</tr>
<tr>
<td>IFRM</td>
<td>repetitive peak forward current</td>
<td>$t_p \leq 1 , ms; \delta \leq 0.25$</td>
<td>-</td>
<td>1.7</td>
<td>A</td>
</tr>
<tr>
<td>IFSM</td>
<td>non-repetitive peak forward current</td>
<td>$t_p = 8 , ms; T_{j(init)} = 25 , ^\circ C;$ square wave</td>
<td>-</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>Ptot</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25 , ^\circ C$</td>
<td>[1]</td>
<td>325</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[2]</td>
<td>525</td>
<td>mW</td>
</tr>
<tr>
<td>TJ</td>
<td>junction temperature</td>
<td>-</td>
<td>125</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Tamb</td>
<td>ambient temperature</td>
<td>-40</td>
<td>125</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Tstg</td>
<td>storage temperature</td>
<td>-40</td>
<td>125</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for anode and cathode 1 cm² each.

9. Thermal characteristics

Table 6. Thermal 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>Rth(j-a)</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>[1] [2]</td>
<td>-</td>
<td>-</td>
<td>310 K/W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] [3]</td>
<td>-</td>
<td>-</td>
<td>190 K/W</td>
</tr>
<tr>
<td>Rth(j-sp)</td>
<td>thermal resistance from junction to solder point</td>
<td></td>
<td>[4]</td>
<td>-</td>
<td>-</td>
<td>40 K/W</td>
</tr>
</tbody>
</table>

[1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses $P_R$ are a significant part of the total power losses.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for anode and cathode 1 cm² each.
Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values
10. Characteristics

Table 7. 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(BR)R</td>
<td>reverse breakdown voltage</td>
<td>$I_R = 0.1 \ mA; T_J = 25 ^\circ C$; pulsed</td>
<td>[1]</td>
<td>20</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>V_F</td>
<td>forward voltage</td>
<td>$I_F = 0.1 \ mA; T_J = 25 ^\circ C$; pulsed</td>
<td>[1]</td>
<td>-</td>
<td>120</td>
<td>180 mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 1 \ mA; T_J = 25 ^\circ C$; pulsed</td>
<td>[1]</td>
<td>-</td>
<td>180</td>
<td>250 mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 10 \ mA; T_J = 25 ^\circ C$; pulsed</td>
<td>[1]</td>
<td>-</td>
<td>245</td>
<td>310 mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 100 \ mA; T_J = 25 ^\circ C$; pulsed</td>
<td>[1]</td>
<td>-</td>
<td>330</td>
<td>380 mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 200 \ mA; T_J = 25 ^\circ C$; pulsed</td>
<td>[1]</td>
<td>-</td>
<td>375</td>
<td>420 mV</td>
</tr>
<tr>
<td>I_R</td>
<td>reverse current</td>
<td>$V_R = 6 \ V; T_J = 25 ^\circ C$; pulsed</td>
<td>[1]</td>
<td>-</td>
<td>3.2</td>
<td>20 µA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 10 \ V; T_J = 25 ^\circ C$; pulsed</td>
<td>[1]</td>
<td>-</td>
<td>5</td>
<td>25 µA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 20 \ V; T_J = 25 ^\circ C$; pulsed</td>
<td>[1]</td>
<td>-</td>
<td>10</td>
<td>45 µA</td>
</tr>
<tr>
<td>C_d</td>
<td>diode capacitance</td>
<td>$V_R = 1 \ V; f = 1 \ MHz; T_J = 25 ^\circ C$</td>
<td>-</td>
<td>25</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 10 \ V; f = 1 \ MHz; T_J = 25 ^\circ C$</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>t_rr</td>
<td>reverse recovery time</td>
<td>$I_F = 200 \ mA; I_{R(max)} = 200 \ mA; I_{R(meas)} = 40 \ mA; T_J = 25 ^\circ C$</td>
<td>-</td>
<td>1.9</td>
<td>-</td>
<td>ns</td>
</tr>
</tbody>
</table>

[1] Very short pulse, in order to maintain a stable junction temperature.
**Fig. 5.** Diode capacitance as a function of reverse voltage; typical values

- $f = 1 \text{ MHz}; \ T_{\text{amb}} = 25 \, ^\circ\text{C}$

**Fig. 6.** Average forward power dissipation as a function of average forward current; typical values

- $T_J = 125 \, ^\circ\text{C}$
  1. $\delta = 0.1$
  2. $\delta = 0.2$
  3. $\delta = 0.5$
  4. $\delta = 1; \ DC$

**Fig. 7.** Average reverse power dissipation as a function of reverse voltage; typical values

- $T_J = 125 \, ^\circ\text{C}$
  1. $\delta = 1; \ DC$
  2. $\delta = 0.9; \ f = 20 \, \text{kHz}$
  3. $\delta = 0.8; \ f = 20 \, \text{kHz}$
  4. $\delta = 0.5; \ f = 20 \, \text{kHz}$

**Fig. 8.** Average forward current as a function of ambient temperature; typical values

- $T_J = 125 \, ^\circ\text{C}$
  1. $\delta = 1; \ DC$
  2. $\delta = 0.5; \ f = 20 \, \text{kHz}$
  3. $\delta = 0.2; \ f = 20 \, \text{kHz}$
  4. $\delta = 0.1; \ f = 20 \, \text{kHz}$
**FR4 PCB, mounting pad for anode and cathode 1 cm² each**

- **Tj = 125 °C**
  - (1) δ = 1; DC
  - (2) δ = 0.5; f = 20 kHz
  - (3) δ = 0.2; f = 20 kHz
  - (4) δ = 0.1; f = 20 kHz

**Fig. 9. Average forward current as a function of ambient temperature; typical values**

**Fig. 10. Average forward current as a function of solder point temperature; typical values**
11. Test information

Fig. 11. Reverse recovery definition

Fig. 12. Duty cycle definition

The current ratings for the typical waveforms are calculated according to the equations: $I_{F(AV)} = I_M \times \delta$ with $I_M$ defined as peak current, $I_{RMS} = I_{F(AV)}$ at DC, and $I_{RMS} = I_M \times \sqrt{\delta}$ with $I_{RMS}$ defined as RMS current.

12. Package outline

Fig. 13. Package outline DSN0603B-2 (SOD962B)
13. Soldering

Footprint information for reflow soldering of leadless ultra small package; 2 terminals

Fig. 14. Reflow soldering footprint for DSN0603B-2 (SOD962B)
14. Revision history

Table 8. 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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<tr>
<td>PMEG2002AESFB v.1</td>
<td>20170817</td>
<td>Product data sheet</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
15. Legal information

Data sheet status

<table>
<thead>
<tr>
<th>Document status</th>
<th>Product status</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1][2]</td>
<td>[3]</td>
<td>This document contains data from the objective specification for product development.</td>
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</tbody>
</table>

Objective [short] data sheet

Development

This document contains data from the objective specification for product development.

Preliminary [short] data sheet

Qualification

This document contains data from the preliminary specification.

Product [short] data sheet

Production

This document contains the product specification.

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