1. General description


2. Features and benefits

- Average forward current $I_{F(AV)} \leq 0.5$ A
- Reverse voltage $V_R \leq 30$ V
- Low forward voltage typ. $V_F = 310$ mV
- Low reverse current typ. $I_R = 0.33$ µA
- Package height typ. 0.3 mm

3. Applications

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

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>$I_F$</td>
<td>forward current</td>
<td>$T_{sp} \leq 140$ °C; $\delta = 1$</td>
<td>-</td>
<td>-</td>
<td>0.71</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>30</td>
<td>V</td>
</tr>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 200$ mA; $t_p \leq 300$ µs; $\delta \leq 0.02$ ; $T_j = 25$ °C</td>
<td>-</td>
<td>460</td>
<td>535</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 30$ V; $T_j = 25$ °C; pulsed</td>
<td>-</td>
<td>1.8</td>
<td>9</td>
<td>µA</td>
</tr>
</tbody>
</table>
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>1 2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>anode</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMEG3005ESF</td>
<td>DSN0603-2</td>
<td>Leadless ultra small package; 2 terminals; body 0.6 x 0.3 x 0.3 mm</td>
<td>SOD962-2</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>PMEG3005ESF</td>
<td>7</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>V_R</td>
<td>reverse voltage</td>
<td>T_j = 25 °C</td>
<td>-</td>
<td>30</td>
<td>V</td>
</tr>
<tr>
<td>I_F</td>
<td>forward current</td>
<td>T_sp ≤ 140 °C; δ = 1</td>
<td>-</td>
<td>0.71</td>
<td>A</td>
</tr>
<tr>
<td>I_F(AV)</td>
<td>average forward current</td>
<td>δ = 0.5; f = 20 kHz; T_amb ≤ 105 °C; square wave</td>
<td>-</td>
<td>0.5</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>δ = 0.5; f = 20 kHz; T_sp ≤ 145 °C; square wave</td>
<td>-</td>
<td>0.5</td>
<td>A</td>
</tr>
<tr>
<td>I_FRM</td>
<td>repetitive peak forward current</td>
<td>t_p = 1 ms; δ ≤ 0.25</td>
<td>-</td>
<td>1.5</td>
<td>A</td>
</tr>
<tr>
<td>I_FSM</td>
<td>non-repetitive peak forward current</td>
<td>t_p = 8 ms; T_j(init) = 25 °C; square wave</td>
<td>-</td>
<td>3.5</td>
<td>A</td>
</tr>
<tr>
<td>P_tot</td>
<td>total power dissipation</td>
<td>T_amb ≤ 25 °C</td>
<td>[2]</td>
<td>405</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[3]</td>
<td>660</td>
<td>mW</td>
</tr>
</tbody>
</table>
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>$R_{th(j-a)}$</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>[1]</td>
<td>-</td>
<td>-</td>
<td>310  K/W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[2]</td>
<td>-</td>
<td>-</td>
<td>190  K/W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1]</td>
<td>-</td>
<td>-</td>
<td>105  K/W</td>
</tr>
<tr>
<td>$R_{th(j-sp)}$</td>
<td>thermal resistance from junction to solder point</td>
<td>[5]</td>
<td>-</td>
<td>-</td>
<td>40   K/W</td>
<td></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
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 reverse breakdown voltage</td>
<td>$I_R = 100 \mu A; \ t_p = 300 \mu s; \ \delta = 0.02 ; \ T_j = 25 ^\circ C$</td>
<td>30</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 0.1 mA; \ t_p \leq 300 \mu s; \ \delta \leq 0.02 ; \ T_j = 25 ^\circ C$</td>
<td>-</td>
<td>185</td>
<td>255</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 1 mA; \ t_p \leq 300 \mu s; \ \delta \leq 0.02 ; \ T_j = 25 ^\circ C$</td>
<td>-</td>
<td>245</td>
<td>320</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 10 mA; \ t_p \leq 300 \mu s; \ \delta \leq 0.02 ; \ T_j = 25 ^\circ C$</td>
<td>-</td>
<td>310</td>
<td>390</td>
<td>mV</td>
</tr>
</tbody>
</table>
### Symbol | Parameter | Conditions | Min | Typ | Max | Unit
--- | --- | --- | --- | --- | --- | ---
\( I_{F} \) | forward current | \( I_{F} = 100 \text{ mA} \); \( t_{p} \leq 300 \mu s \); \( \delta \leq 0.02 \); \( T_{J} = 25 \degree C \) | - | 405 | 480 | mV
\( I_{F} \) | forward current | \( I_{F} = 200 \text{ mA} \); \( t_{p} \leq 300 \mu s \); \( \delta \leq 0.02 \); \( T_{J} = 25 \degree C \) | - | 460 | 535 | mV
\( I_{F} \) | forward current | \( I_{F} = 500 \text{ mA} \); \( t_{p} \leq 300 \mu s \); \( \delta \leq 0.02 \); \( T_{J} = 25 \degree C \) | - | 595 | 720 | mV
\( I_{R} \) | reverse current | \( V_{R} = 10 \text{ V} \); \( T_{J} = 25 \degree C \); pulsed | - | 0.33 | 2 | µA
\( C_{d} \) | diode capacitance | \( V_{R} = 1 \text{ V} \); \( f = 1 \text{ MHz} \); \( T_{J} = 25 \degree C \) | - | 21 | - | pF
\( I_{R} \) | reverse current | \( V_{R} = 30 \text{ V} \); \( T_{J} = 25 \degree C \); pulsed | - | 1.8 | 9 | µA
\( I_{R} \) | reverse current | \( V_{R} = 10 \text{ V} \); \( f = 1 \text{ MHz} \); \( T_{J} = 25 \degree C \) | - | 8 | - | pF
\( t_{rr} \) | reverse recovery time | \( I_{F} = 500 \text{ mA} \); \( I_{R} = 500 \text{ mA} \); \( I_{R(\text{meas})} = 100 \text{ mA} \); \( T_{J} = 25 \degree C \) | - | 1.42 | - | ns

**Fig. 4.** Forward current as a function of forward voltage; typical values

**Fig. 5.** Reverse current as a function of reverse voltage; typical values
Fig. 6. Diode capacitance as a function of reverse voltage; typical values

\[ f = 1 \text{ MHz}; T_{\text{amb}} = 25 \text{ °C} \]

Fig. 7. Average forward power dissipation as a function of average forward current; typical values

\[ T_J = 150 \text{ °C} \]

(1) \( \delta = 0.1 \)
(2) \( \delta = 0.2 \)
(3) \( \delta = 0.5 \)
(4) \( \delta = 1 \)

Fig. 8. Average reverse power dissipation as a function of reverse voltage; typical values

\[ T_J = 125 \text{ °C} \]

(1) \( \delta = 1 \)
(2) \( \delta = 0.9 \)
(3) \( \delta = 0.8 \)
(4) \( \delta = 0.5 \)

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

FR4 PCB, standard footprint

\[ T_J = 150 \text{ °C} \]

(1) \( \delta = 1; \text{ DC} \)
(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
T_{j} = 150 °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. 10. Average forward current as a function of ambient temperature; typical values

Ceramic PCB, Al₂O₃, standard footprint
T_{j} = 150 °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. 11. Average forward current as a function of ambient temperature; typical values

T_{j} = 150 °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. 12. Average forward current as a function of solder point temperature; typical values
11. Test information

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

Leadless ultra small package; 2 terminals; body 0.6 x 0.3 x 0.3 mm

Fig. 15. Package outline DSN0603-2 (SOD962-2)
13. **Soldering**

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

![Soldering footprint diagram]

**Fig. 16.** Reflow soldering footprint for DSN0603-2 (SOD962-2)

14. **Revision history**

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<th>Data sheet status</th>
<th>Change notice</th>
<th>Supersedes</th>
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<td>20150605</td>
<td>Product data sheet</td>
<td>-</td>
<td>-</td>
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15. Legal information

Data sheet status

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<th>Product status</th>
<th>Definition</th>
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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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