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 typ. $V_F = 310$ mV
- Low reverse current typ. $I_R = 0.88$ µA
- Ultra small and leadless SMD package
- Package height typ. 0.3 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

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>$T_{sp} \leq 120$ °C</td>
<td>-</td>
<td>-</td>
<td>0.28</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; $t_p \leq 300$ µs; $\delta \leq 0.02$; pulsed; $T_j = 25$ °C</td>
<td>-</td>
<td>435</td>
<td>490</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 10$ V; $T_j = 25$ °C</td>
<td>-</td>
<td>0.37</td>
<td>-</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><img src="DSN0603-2.png" alt="Simplified outline" /></td>
<td><img src="DSN0603-2.png" alt="Graphic symbol" /></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>Name</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMEG2002ESF</td>
<td>DSN0603-2</td>
<td>Leadless ultra small</td>
<td>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>
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<tbody>
<tr>
<td>PMEG2002ESF</td>
<td>E</td>
</tr>
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</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>$T_j = 25 , ^\circ C$</td>
<td>-</td>
<td>20</td>
<td>V</td>
</tr>
<tr>
<td>$I_F$</td>
<td>forward current</td>
<td>$T_{sp} \leq 120 , ^\circ C$</td>
<td>-</td>
<td>0.28</td>
<td>A</td>
</tr>
<tr>
<td>$I_{F(AV)}$</td>
<td>average forward current</td>
<td>$\delta = 0.5 , ; , f = 20 , \text{kHz}; , T_{sp} \leq 125 , ^\circ C, \text{; square wave}$</td>
<td>-</td>
<td>0.2</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$\delta = 0.5 , ; , f = 20 , \text{kHz}; , T_{amb} \leq 115 , ^\circ C, \text{; square wave}$</td>
<td>[1]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{FRM}$</td>
<td>repetitive peak forward current</td>
<td>$t_p \leq 1 , \text{ms}; , \delta \leq 0.25$</td>
<td>-</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>$I_{FSM}$</td>
<td>non-repetitive peak forward current</td>
<td>$t_p = 8 , \text{ms}; , T_{j(init)} = 25 , ^\circ C, \text{; square wave}$</td>
<td>-</td>
<td>4.5</td>
<td>A</td>
</tr>
<tr>
<td>$P_{tot}$</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25 , ^\circ C$</td>
<td>[2]</td>
<td>325</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[3]</td>
<td>525</td>
<td>mW</td>
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</table>
9. Thermal characteristics

Table 6. Thermal characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter Description</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] [2]</td>
<td>-</td>
<td>-</td>
<td>310</td>
</tr>
<tr>
<td>$R_{th(j-sp)}$</td>
<td>thermal resistance from junction to solder point</td>
<td></td>
<td>[5]</td>
<td>-</td>
<td>-</td>
<td>40</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_F</td>
<td>forward voltage</td>
<td>I_F = 0.1 mA; t_p ≤ 300 µs; δ ≤ 0.02 ; pulsed; T_J = 25 °C</td>
<td>-</td>
<td>185</td>
<td>250</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_F = 1 mA; t_p ≤ 300 µs; δ ≤ 0.02 ; pulsed; T_J = 25 °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 ≤ 300 µs; δ ≤ 0.02 ; pulsed; T_J = 25 °C</td>
<td>-</td>
<td>310</td>
<td>380</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_F = 100 mA; t_p ≤ 300 µs; δ ≤ 0.02 ; pulsed; T_J = 25 °C</td>
<td>-</td>
<td>390</td>
<td>450</td>
<td>mV</td>
</tr>
</tbody>
</table>
## Symbol | Parameter | Conditions | Min | Typ | Max | Unit

**I_R** | reverse current | $I_F = 200$ mA; $I_R = 200$ mA; $I_{R\text{ (meas)}} = 40$ mA; $T_j = 25$ °C | - | 1.9 | - | ns

| | | $V_R = 6$ V; $T_j = 25$ °C | - | 0.26 | 1.5 | µA
| | | $V_R = 10$ V; $T_j = 25$ °C | - | 0.37 | - | µA
| | | $V_R = 20$ V; $T_j = 25$ °C | - | 0.88 | 3.5 | µA

**C_d** | diode capacitance | $V_R = 1$ V; $f = 1$ MHz; $T_j = 25$ °C | - | 25 | - | pF
| | | $V_R = 10$ V; $f = 1$ MHz; $T_j = 25$ °C | - | 9 | - | pF

**t_{rr}** | reverse recovery time | $I_F = 200$ mA; $I_R = 200$ mA; $I_{R\text{ (meas)}} = 40$ mA; $T_j = 25$ °C | - | 1.9 | - | 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

(1) $T_j = 125$ °C
(2) $T_j = 85$ °C
(3) $T_j = 25$ °C
(4) $T_j = -40$ °C

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

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

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

FR4 PCB, standard footprint

\[ T_J = 125 \ ^\circ \text{C} \]

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

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

PMEG2002ESF

20 V, 0.2 A low VF MEGA Schottky barrier rectifier

FR4 PCB, mounting pad for anode and cathode 1 cm² each
T_j = 125 °C
(1) δ = 1
(2) δ = 0.5
(3) δ = 0.2
(4) δ = 0.1

Fig. 10. Average forward current as a function of ambient temperature; typical values

Ceramic PCB, Al₂O₃, standard footprint
T_j = 125 °C
(1) δ = 1
(2) δ = 0.5
(3) δ = 0.2
(4) δ = 0.1

Fig. 11. Average forward current as a function of ambient temperature; typical values

T_j = 125 °C
(1) δ = 1
(2) δ = 0.5
(3) δ = 0.2
(4) δ = 0.1

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

![Footprint Diagram]

---

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

14. 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>20131008</td>
<td>Product data sheet</td>
<td>-</td>
<td>PMEG2002ESF 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>• Product status changed</td>
<td></td>
<td></td>
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<tr>
<td>PMEG2002ESF v.1</td>
<td>20130301</td>
<td>Objective data sheet</td>
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15. Legal information

Data sheet status

<table>
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<tr>
<th>Document status</th>
<th>Product status</th>
<th>Definition</th>
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<tbody>
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<td>This document contains data from the objective specification for product development.</td>
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<td>Development</td>
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<td>Preliminary [short] data sheet</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Product [short] data sheet</td>
<td>Production</td>
<td>This document contains the product specification.</td>
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16. Contents

1. General description...................................................... 1
2. Features and benefits.................................................. 1
3. Applications................................................................ 1
4. Quick reference data................................................... 1
5. Pinning information..................................................... 2
6. Ordering information................................................... 2
7. Marking...................................................................... 2
8. Limiting values........................................................... 2
9. Thermal characteristics.............................................. 3
10. Characteristics............................................................ 4
11. Test information.......................................................... 8
12. Package outline.......................................................... 9
13. Soldering................................................................. 10
14. Revision history........................................................ 10
15. Legal information....................................................... 11

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