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
- Low leakage current
- Ultra small and leadless SMD package
- Package height typ. 0.25 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>$I_F(AV)$</td>
<td>average forward current</td>
<td>$\delta = 0.5$; $f = 20$ kHz; $T_{sp} \leq 134$ °C; square wave</td>
<td>-</td>
<td>-</td>
<td>0.5</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>$I_F = 500$ mA; $T_J = 25$ °C; pulsed</td>
<td>-</td>
<td>560</td>
<td>670</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>[1]</td>
<td>2.1</td>
<td>15</td>
<td>µA</td>
</tr>
</tbody>
</table>

[1] Very short pulse, 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</td>
<td></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>PMEG3005EEF</td>
<td>DFN0603-2</td>
<td>plastic, ultra small and leadless full encapsulated package; 2 terminals; 0.4 mm pitch; 0.63 mm x 0.33 mm x 0.25 mm body</td>
<td>SOD972E</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>PMEG3005EEF</td>
<td>M</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>$T_J = 25 , ^\circ C$</td>
<td>-</td>
<td>30</td>
<td>V</td>
</tr>
<tr>
<td>$I_F$</td>
<td>forward current</td>
<td>$\delta = 1$; $T_{sp} \leq 132 , ^\circ C$; $f = 20 , kHz$; square wave</td>
<td>-</td>
<td>0.71</td>
<td>A</td>
</tr>
<tr>
<td>$I_{F(AV)}$</td>
<td>average forward current $\delta = 0.5$; $f = 20 , kHz$; $T_{amb} \leq 60 , ^\circ C$; square wave</td>
<td>-</td>
<td>0.5</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$\delta = 0.5$; $f = 20 , kHz$; $T_{sp} \leq 134 , ^\circ C$; 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>$t_p \leq 1 , ms$; $\delta \leq 0.25$</td>
<td>-</td>
<td>2.5</td>
<td>A</td>
</tr>
<tr>
<td>$I_{FSM}$</td>
<td>non-repetitive peak forward current</td>
<td>$t_p = 8.3 , ms$; square wave; $T_{j(init)} = 25 , ^\circ C$</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>[1]</td>
<td>370</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[2]</td>
<td>570</td>
<td>mW</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>-55</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{stg}$</td>
<td>storage temperature</td>
<td></td>
<td>-55</td>
<td>150</td>
<td>°C</td>
</tr>
</tbody>
</table>

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for anode and cathode 1 cm$^2$ 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>$R_{th(j-a)}$</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>[1]</td>
<td>-</td>
<td>340</td>
<td>K/W</td>
</tr>
<tr>
<td>$R_{th(j-sp)}$</td>
<td>thermal resistance from junction to solder point</td>
<td></td>
<td>[4]</td>
<td>-</td>
<td>35</td>
<td>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 cm$^2$ each.
FR4 PCB, standard footprint

Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

FR4 PCB, mounting pad for anode and cathode 1 cm² each

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>30</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 1 \ mA; T_j = 25 \ ^\circ\ C;\ pulsed$</td>
<td>-</td>
<td>250</td>
<td>290</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 10 \ mA; T_j = 25 \ ^\circ\ C;\ pulsed$</td>
<td>-</td>
<td>310</td>
<td>360</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 100 \ mA; T_j = 25 \ ^\circ\ C;\ pulsed$</td>
<td>-</td>
<td>400</td>
<td>470</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 200 \ mA; T_j = 25 \ ^\circ\ C;\ pulsed$</td>
<td>-</td>
<td>450</td>
<td>520</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 500 \ mA; T_j = 25 \ ^\circ\ C;\ pulsed$</td>
<td>-</td>
<td>560</td>
<td>670</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 10 \ V; T_j = 25 \ ^\circ\ C;\ pulsed$</td>
<td>[1]</td>
<td>-</td>
<td>0.3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 30 \ V; T_j = 25 \ ^\circ\ C;\ pulsed$</td>
<td>[1]</td>
<td>-</td>
<td>2.1</td>
<td>15</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>17</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>7</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>$t_{rr}$</td>
<td>reverse recovery time</td>
<td>$I_F = 500 \ mA; I_R = 500 \ mA; I_{R(meas)} = 100 \ mA; T_j = 25 \ ^\circ\ C$</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>ns</td>
</tr>
</tbody>
</table>

[1] Very short pulse, to maintain a stable junction temperature.

Fig. 3. Forward current as a function of forward voltage; typical values

Fig. 4. Reverse current as a function of reverse voltage; typical values
30 V, 0.5 A low VF MEGA Schottky barrier rectifier

**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

\[ T_J = 150 \ ^{\circ}\text{C} \]

(1) \( \delta = 0.1 \)

(2) \( \delta = 0.2 \)

(3) \( \delta = 0.5 \)

(4) \( \delta = 1 \)

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

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

(1) \( \delta = 1 \)

(2) \( \delta = 0.9 \)

(3) \( \delta = 0.8 \)

(4) \( \delta = 0.5 \)

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

FR4 PCB, standard footprint

\[ T_J = 150 \ ^{\circ}\text{C} \]

(1) \( \delta = 1; \ f = 20 \text{ kHz} \)

(2) \( \delta = 0.5; \ f = 20 \text{ kHz} \)

(3) \( \delta = 0.2; \ f = 20 \text{ kHz} \)

(4) \( \delta = 0.1; \ f = 20 \text{ kHz} \)
Nexperia

PMEG3005EEF

30 V, 0.5 A low VF MEGA Schottky barrier rectifier

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

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 solder point 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
11. Test information

![Reverse recovery definition](image1)

*Fig. 11. Reverse recovery definition*

![Duty cycle definition](image2)

*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

DFN0603-2, ultra small and leadless encapsulated package; 2 terminals; body 0.63 x 0.33 x 0.25 mm

Dimensions (mm are the original dimensions)

<table>
<thead>
<tr>
<th>Unit</th>
<th>A</th>
<th>A_1</th>
<th>b</th>
<th>D</th>
<th>E</th>
<th>e</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm max</td>
<td>0.275</td>
<td>0.03</td>
<td>0.25</td>
<td>0.355</td>
<td>0.655</td>
<td>0.4</td>
<td>0.15</td>
</tr>
<tr>
<td>mm min</td>
<td>0.225</td>
<td>0.23</td>
<td>0.305</td>
<td>0.605</td>
<td>0.4</td>
<td>0.13</td>
<td></td>
</tr>
</tbody>
</table>

Note
1. The marking bar indicates the cathode.

Fig. 13. Package outline DFN0603-2 (SOD972E)
13. Soldering

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

SOD972E

Fig. 14. Reflow soldering footprint for DFN0603-2 (SOD972E)
# 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>
</tr>
</thead>
<tbody>
<tr>
<td>PMEG3005EEF v.1</td>
<td>20181206</td>
<td>Product data sheet</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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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>Objective [short] data sheet</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<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>
</tr>
</tbody>
</table>

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term "short data sheet" is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

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