1. General description


2. Features and benefits

- Average forward current: $I_{F(AV)} \leq 1 \text{ A}$
- Reverse voltage: $V_R \leq 20 \text{ V}$
- Low forward voltage $V_F \leq 490 \text{ mV}$
- AEC-Q101 qualified
- Ultra small and leadless SMD plastic package
- Solderable side pads
- Package height typ. 0.37 mm

3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Reverse polarity protection
- 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>$\delta = 0.5$ ; $f = 20 \text{ kHz}$; $T_{sp} \leq 130 ^\circ C$; square wave</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$\delta = 0.5$ ; $f = 20 \text{ kHz}$; $T_{amb} \leq 80 ^\circ C$; square wave</td>
<td>[1]</td>
<td>-</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>$V_R$</td>
<td>reverse voltage</td>
<td>$T_J = 25 ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>20</td>
<td>V</td>
</tr>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 1 \text{ A}$; pulsed; $t_p \leq 300 \mu s$; $\delta \leq 0.02$ ; $T_J = 25 ^\circ C$</td>
<td>-</td>
<td>428</td>
<td>490</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 10 \text{ V}$; $T_J = 25 ^\circ C$</td>
<td>-</td>
<td>28</td>
<td>50</td>
<td>$\mu$A</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></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>PMEG2010BELD</td>
<td>DFN1006D-2</td>
<td>DFN1006D-2: leadless ultra small plastic package; 2 terminals</td>
<td>SOD882D</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>PMEG2010BELD</td>
<td>0000 1001</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>$T_j = 25 , ^\circ\text{C}$</td>
<td>-</td>
<td>20</td>
<td>V</td>
</tr>
<tr>
<td>$I_F$</td>
<td>forward current</td>
<td>$T_{sp} \leq 130 , ^\circ\text{C}$</td>
<td>-</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>$I_{F(AV)}$</td>
<td>average forward current</td>
<td>$\delta = 0.5 , : f = 20 , \text{kHz}; , T_{sp} \leq 130 , ^\circ\text{C}$; square wave</td>
<td>-</td>
<td>1</td>
<td>A</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>3</td>
<td>A</td>
</tr>
<tr>
<td>$I_{FSM}$</td>
<td>non-repetitive peak forward current</td>
<td>$t_p = 8 , \text{ms}; , T_{j(init)} = 25 , ^\circ\text{C}$; square wave</td>
<td>-</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>$P_{tot}$</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25 , ^\circ\text{C}$</td>
<td>[2][3]</td>
<td>-</td>
<td>370 mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[4][3]</td>
<td>-</td>
<td>735 mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1][3]</td>
<td>-</td>
<td>1135 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>-65</td>
<td>150</td>
<td>°C</td>
</tr>
</tbody>
</table>

[1] Device mounted on a ceramic PCB, $\text{Al}_2\text{O}_3$, standard footprint.
[3] Reflow soldering is the only recommended soldering method.

Fig. 1. SOD882D binary marking code description
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][2][3]</td>
<td>-</td>
<td>-</td>
<td>340 K/W</td>
</tr>
<tr>
<td>(R_{th(j-sp)})</td>
<td>thermal resistance from junction to solder point</td>
<td></td>
<td>[6]</td>
<td>-</td>
<td>-</td>
<td>25 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] Reflow soldering is the only recommended soldering method.


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

FR4 PCB, standard footprint
Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

FR4 PCB, mounting pad for cathode 1 cm²

Ceramic PCB, Al₂O₃, standard footprint

Fig. 4. 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>$I_F = 100$ mA; pulsed; $t_p \leq 300$ µs; $\delta \leq 0.02$; $T_J = 25$ °C</td>
<td>-</td>
<td>266</td>
<td>310</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 500$ mA; pulsed; $t_p \leq 300$ µs; $\delta \leq 0.02$; $T_J = 25$ °C</td>
<td>-</td>
<td>353</td>
<td>390</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 1$ A; pulsed; $t_p \leq 300$ µs; $\delta \leq 0.02$; $T_J = 25$ °C</td>
<td>-</td>
<td>428</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>28</td>
<td>50</td>
<td>µA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 20$ V; $T_J = 25$ °C</td>
<td>-</td>
<td>87</td>
<td>200</td>
<td>µA</td>
</tr>
<tr>
<td>$C_d$</td>
<td>diode capacitance</td>
<td>$V_R = 1$ V; $f = 1$ MHz; $T_J = 25$ °C</td>
<td>-</td>
<td>31</td>
<td>40</td>
<td>pF</td>
</tr>
<tr>
<td>$t_{rr}$</td>
<td>reverse recovery time</td>
<td>$I_F = 0.5$ A; $I_R = 0.5$ A; $I_{R(meas)} = 0.1$ A; $T_J = 25$ °C</td>
<td>-</td>
<td>1.6</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>$V_{FRM}$</td>
<td>peak forward recovery voltage</td>
<td>$I_F = 0.5$ A; $dI_F/dt = 20$ A/µs; $T_J = 25$ °C</td>
<td>-</td>
<td>565</td>
<td>-</td>
<td>mV</td>
</tr>
</tbody>
</table>

Fig. 5. Forward current as a function of forward voltage; typical values

Fig. 6. Reverse current as a function of reverse voltage; typical values
**Fig. 7.** Diode capacitance as a function of reverse voltage; typical values

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

**Fig. 8.** 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. 9.** Average reverse power dissipation as a function of reverse voltage; typical values

\[ T_j = 125 \, ^\circ\text{C} \]

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

FR4 PCB, standard footprint

\[ T_j = 150 \, ^\circ\text{C} \]

(1) \( \delta = 1 \)
(2) \( \delta = 0.5 \)
(3) \( \delta = 0.2 \)
(4) \( \delta = 0.1 \)
FR4 PCB, mounting pad for cathode 1 cm²
$T_j = 150 \, ^\circ C$
(1) $\delta = 1$
(2) $\delta = 0.5$
(3) $\delta = 0.2$
(4) $\delta = 0.1$

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

Ceramic PCB, Al₂O₃, standard footprint
$T_j = 150 \, ^\circ C$
(1) $\delta = 1$
(2) $\delta = 0.5$
(3) $\delta = 0.2$
(4) $\delta = 0.1$

Fig. 12. Average forward current as a function of ambient temperature; typical values

$T_j = 150 \, ^\circ C$
(1) $\delta = 1$
(2) $\delta = 0.5$
(3) $\delta = 0.2$
(4) $\delta = 0.1$

Fig. 13. Average forward current as a function of solder point temperature; typical values
11. Test information

Fig. 14. Reverse recovery definition

Fig. 15. Forward recovery definition

Fig. 16. 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.
11.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

12. Package outline

![Package outline DFN1006D-2 (SOD882D)](image)

Fig. 17. Package outline DFN1006D-2 (SOD882D)

13. Soldering

![Reflow soldering footprint for DFN1006D-2 (SOD882D)](image)

Fig. 18. Reflow soldering footprint for DFN1006D-2 (SOD882D)
### 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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<tr>
<td>PMEG2010BELD v.2</td>
<td>20150804</td>
<td>Product data sheet</td>
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<td>PMEG2010BELD v.1</td>
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<td>Modifications:</td>
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<td>• Section Marking:</td>
<td></td>
<td>updated figure 1.</td>
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<td>PMEG2010BELD v.1</td>
<td>20120418</td>
<td>Product data sheet</td>
<td>-</td>
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15. Legal information

15.1 Data sheet status

<table>
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</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 URL: http://www.nexperia.com.

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