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Kind regards,

Team Nexperia
1. Product profile

1.1 General description
Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a leadless ultra small SOD1608 (DFN1608D-2) Surface-Mounted Device (SMD) plastic package with visible and solderable side pads.

1.2 Features and benefits
- Average forward current: $I_{F(AV)} \leq 1.5 \, A$
- Reverse voltage: $V_R \leq 20 \, V$
- Low forward voltage $V_F \leq 420 \, mV$
- Low reverse current
- AEC-Q101 qualified
- Solderable side pads
- Package height typ. 0.37 mm
- Ultra small and leadless SMD plastic package

1.3 Applications
- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- LED backlight for mobile application
- Low power consumption applications
- Ultra high-speed switching
- Reverse polarity protection

1.4 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>$\delta &lt; 0.5$; $f = 20 , kHz$; $T_{amb} \leq 100 , ^\circ C$; square wave</td>
<td>-</td>
<td>-</td>
<td>1.5</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$\delta &lt; 0.5$; $f = 20 , kHz$; $T_{sp} \leq 140 , ^\circ C$; square wave</td>
<td>-</td>
<td>-</td>
<td>1.5</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>$I_F = 1.5 , A$; pulsed; $t_p \leq 300 , \mu s$; $\delta \leq 0.02$; $T_j = 25 , ^\circ C$</td>
<td>-</td>
<td>375</td>
<td>420</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 10 , V$; $T_j = 25 , ^\circ C$</td>
<td>-</td>
<td>70</td>
<td>350</td>
<td>$\mu A$</td>
</tr>
<tr>
<td>$t_{fr}$</td>
<td>reverse recovery time</td>
<td>$I_{R} = 0.5 , A$; $I_F = 0.5 , A$; $I_{R(meas)} = 0.1 , A$; $T_j = 25 , ^\circ C$</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>ns</td>
</tr>
</tbody>
</table>

2. Pinning information

Table 2. Pinning information

<table>
<thead>
<tr>
<th>Pin</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>K</td>
<td>cathode[1]</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>anode</td>
</tr>
</tbody>
</table>

[1] The marking bar indicates the cathode.

3. Ordering information

Table 3. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package Name</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMEG2015EPK</td>
<td>DFN1608D-2</td>
<td>Leadless ultra small plastic package; 2 terminals</td>
<td>SOD1608</td>
</tr>
</tbody>
</table>

4. Marking

Table 4. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMEG2015EPK</td>
<td>1100 0000</td>
</tr>
</tbody>
</table>

Fig 1. SOD1608 binary marking code description
5. Limiting values

<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>$T_{sp} \leq 135 , ^\circ \text{C}$</td>
<td>-</td>
<td>2.1</td>
<td>A</td>
</tr>
<tr>
<td>$I_{F(AV)}$</td>
<td>average forward current</td>
<td>$\delta &lt; 0.5; f = 20 , \text{kHz}; \text{square wave}$; $T_{amb} \leq 100 , ^\circ \text{C}$</td>
<td>-</td>
<td>1.5</td>
<td>A</td>
</tr>
<tr>
<td>$I_{FRM}$</td>
<td>repetitive peak forward current</td>
<td>$t_p = 1 , \text{ms}; \delta = 0.25$</td>
<td>-</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>$I_{FSM}$</td>
<td>non-repetitive peak forward current</td>
<td>$t_p = 8 , \text{ms}; T_{j(init)} = 25 , ^\circ \text{C}; \text{square wave}$</td>
<td>-</td>
<td>5</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</td>
<td>415</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>-65</td>
<td>150</td>
<td>°C</td>
</tr>
</tbody>
</table>

[3] Reflow soldering is the only recommended soldering method.

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>300</td>
<td>140</td>
<td>80</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>20</td>
<td>K/W</td>
<td></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] Reflow soldering is the only recommended soldering method.
FR4 PCB, standard footprint

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

FR4 PCB, mounting pad for cathode 1 cm²

Fig 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values
7. 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 , \mu s; ) ( \delta \leq 0.02; T_j = 25 , ^\circ C )</td>
<td>230</td>
<td>260</td>
<td></td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( I_F = 500 , mA; ) pulsed; ( t_p \leq 300 , \mu s; ) ( \delta \leq 0.02; T_j = 25 , ^\circ C )</td>
<td>290</td>
<td>330</td>
<td></td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( I_F = 1 , A; ) pulsed; ( t_p \leq 300 , \mu s; ) ( \delta \leq 0.02; T_j = 25 , ^\circ C )</td>
<td>330</td>
<td>380</td>
<td></td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( I_F = 1.5 , A; ) pulsed; ( t_p \leq 300 , \mu s; ) ( \delta \leq 0.02; T_j = 25 , ^\circ C )</td>
<td>375</td>
<td>420</td>
<td></td>
<td>mV</td>
</tr>
<tr>
<td>I_R</td>
<td>reverse current</td>
<td>( V_R = 10 , V; T_j = 25 , ^\circ C )</td>
<td>-</td>
<td>70</td>
<td>350</td>
<td>µA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_R = 20 , V; T_j = 25 , ^\circ C )</td>
<td>-</td>
<td>220</td>
<td>900</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 , ^\circ C )</td>
<td>105</td>
<td>120</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>40</td>
<td>50</td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td>t_r</td>
<td>reverse recovery time</td>
<td>( I_F = 0.5 , A; I_R = 0.5 , A; I_{dF(meas)} = 0.1 , A; T_j = 25 , ^\circ C )</td>
<td>5</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>V_FRM</td>
<td>peak forward recovery</td>
<td>( I_F = 0.5 , A; dI_F/dt = 20 , A/\mu s; T_j = 25 , ^\circ C )</td>
<td>320</td>
<td></td>
<td></td>
<td>mV</td>
</tr>
</tbody>
</table>
20 V, 1.5 A low VF MEGA Schottky barrier rectifier

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

Fig 8. Average forward power dissipation as a function of average forward current; typical values
20 V, 1.5 A low VF MEGA Schottky barrier rectifier

**Fig 9.** 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 10.** Average forward current as a function of ambient temperature; typical values

- FR4 PCB, standard footprint
  - $T_J = 150 \, ^\circ\text{C}$
    - (1) $\delta = 1$ (DC)
    - (2) $\delta = 0.5$; $f = 20 \, \text{kHz}$
    - (3) $\delta = 0.2$; $f = 20 \, \text{kHz}$
    - (4) $\delta = 0.1$; $f = 20 \, \text{kHz}$

- Ceramic PCB, Al$_2$O$_3$, standard footprint
  - $T_J = 150 \, ^\circ\text{C}$
    - (1) $\delta = 1$ (DC)
    - (2) $\delta = 0.5$; $f = 20 \, \text{kHz}$
    - (3) $\delta = 0.2$; $f = 20 \, \text{kHz}$
    - (4) $\delta = 0.1$; $f = 20 \, \text{kHz}$
8. Test information

\[ I_F = 150 \, ^\circ C \]

(1) \( \delta = 1 \) (DC)

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

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

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

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

Fig 14. Reverse recovery 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.

### 8.1 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.
9. Package outline

![Package outline](image1.png)

**Fig 17. Package outline SOD1608 (DFN1608D-2)**

10. Soldering

![Footprint information](image2.png)

**Footprint information for reflow soldering of SOD1608 package**

**Fig 18. Reflow soldering footprint for SOD1608 (DFN1608D-2)**
11. Revision history

<table>
<thead>
<tr>
<th>Document ID</th>
<th>Release date</th>
<th>Data sheet status</th>
<th>Change notice</th>
<th>Supersedes</th>
</tr>
</thead>
<tbody>
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<td>PMEG2015EPK v.1</td>
<td>20120306</td>
<td>Product data sheet</td>
<td>-</td>
<td>-</td>
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</table>
12. Legal information

12.1 Data sheet status

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

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14. Contents

1  Product profile . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1
  1.1  General description . . . . . . . . . . . . . . . . . . . . . . . . 1
  1.2  Features and benefits . . . . . . . . . . . . . . . . . . . . . . . 1
  1.3  Applications . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1
  1.4  Quick reference data . . . . . . . . . . . . . . . . . . . . . . . 1
2  Pinning information . . . . . . . . . . . . . . . . . . . . . . . . . 2
3  Ordering information . . . . . . . . . . . . . . . . . . . . . . . . . 2
4  Marking . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2
5  Limiting values . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
6  Thermal characteristics . . . . . . . . . . . . . . . . . . . . . . . 3
7  Characteristics . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 5
8  Test information . . . . . . . . . . . . . . . . . . . . . . . . . . . . 8
  8.1  Quality information . . . . . . . . . . . . . . . . . . . . . . . . . 9
9  Package outline . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10
10  Soldering . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10
11  Revision history . . . . . . . . . . . . . . . . . . . . . . . . . . . 11
12  Legal information . . . . . . . . . . . . . . . . . . . . . . . . . . . 12
  12.1  Data sheet status . . . . . . . . . . . . . . . . . . . . . . . . . . 12
  12.2  Definitions . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12
  12.3  Disclaimers . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12
  12.4  Trademarks . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 13
13  Contact information . . . . . . . . . . . . . . . . . . . . . . . . . 13