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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 ) °C; square wave</td>
<td>[1]</td>
<td>-</td>
<td>1.5</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>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 ) µs; ( \delta \leq 0.02; T_j = 25 ) °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 ) °C</td>
<td>-</td>
<td>70</td>
<td>350</td>
<td>µA</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 ) °C</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>ns</td>
</tr>
</tbody>
</table>

[1] Device mounted on a ceramic Printed-Circuit Board (PCB), \( \text{Al}_2\text{O}_3 \), standard footprint.
2. 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="image" alt="Simplified outline" /></td>
<td><img src="image" 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.

3. 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>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 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>$T_{sp} \leq 135 , ^\circ C$</td>
<td>-</td>
<td>2.1</td>
<td>A</td>
</tr>
<tr>
<td>$I_{F\langle AVG\rangle}$</td>
<td>average forward current</td>
<td>$\delta &lt; 0.5; f = 20 , kHz; , \text{square wave};$</td>
<td>1.5</td>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$T_{\text{amb}} \leq 100 , ^\circ C$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$\delta &lt; 0.5; f = 20 , kHz; , \text{square wave};$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$T_{sp} \leq 140 , ^\circ C$</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>$t_p = 8 , \text{ms}; , T_{j\langle \text{init} \rangle} = 25 , ^\circ C; , \text{square wave}$</td>
<td>-</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>$P_{\text{tot}}$</td>
<td>total power dissipation</td>
<td>$T_{\text{amb}} \leq 25 , ^\circ C$</td>
<td></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>$T_{\text{amb}}$</td>
<td>ambient temperature</td>
<td>-</td>
<td>-55</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{\text{stg}}$</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 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>$R_{\text{th(j-a)}}$</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>$R_{\text{th(j-sp)}}$</td>
<td>thermal resistance from junction to solder point</td>
<td>-</td>
<td>20</td>
<td></td>
<td></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] 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
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 ≤ 300 µs; δ ≤ 0.02; T_j = 25 °C</td>
<td>-</td>
<td>230</td>
<td>260</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_F = 500 mA; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_j = 25 °C</td>
<td>-</td>
<td>290</td>
<td>330</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_F = 1 A; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_j = 25 °C</td>
<td>-</td>
<td>330</td>
<td>380</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_F = 1.5 A; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_j = 25 °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 °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 °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 °C</td>
<td>-</td>
<td>105</td>
<td>120</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_R = 10 V; f = 1 MHz; T_j = 25 °C</td>
<td>-</td>
<td>40</td>
<td>50</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; dI_F/dt = 0.1 A; T_j = 25 °C</td>
<td>-</td>
<td>5</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/µs; T_j = 25 °C</td>
<td>-</td>
<td>320</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

- (1) $T_j = 150 \, ^\circ C$
- (2) $T_j = 125 \, ^\circ C$
- (3) $T_j = 85 \, ^\circ C$
- (4) $T_j = 25 \, ^\circ C$
- (5) $T_j = -40 \, ^\circ C$

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

- (1) $T_j = 125 \, ^\circ C$
- (2) $T_j = 85 \, ^\circ C$
- (3) $T_j = 25 \, ^\circ C$
- (4) $T_j = -40 \, ^\circ C$

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

- $f = 1 \, \text{MHz}$; $T_{	ext{amb}} = 25 \, ^\circ C$

**Fig 8.** Average forward power dissipation as a function of average forward current; typical values

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

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

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

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

![Diagram of reverse recovery definition]

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

Fig 14. Reverse recovery definition

\( T_j = 150 \, ^\circ C \)

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

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

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

\((4) \, \delta = 0.1; \, f = 20 \, kHz \)
The current ratings for the typical waveforms are calculated according to the equations:

\[ I_{F(\text{AV})} = I_M \times \delta \]

with \( I_M \) defined as peak current, \( I_{\text{RMS}} = I_{F(\text{AV})} \) at DC, and \( I_{\text{RMS}} = I_M \times \sqrt{\delta} \) with \( I_{\text{RMS}} \) 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

Fig 17. Package outline SOD1608 (DFN1608D-2)

10. Soldering

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

Table 8. 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>
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<tr>
<td>PMEG2015EPK v.1</td>
<td>20120306</td>
<td>Product data sheet</td>
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12. Legal information

12.1 Data sheet status

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

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

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