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Kind regards,

Team Nexperia
1. Product profile

1.1 General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier in common cathode configuration with an integrated guard ring for stress protection, encapsulated in a SOT1061 leadless small Surface-Mounted Device (SMD) plastic package with medium power capability.

1.2 Features and benefits

- Average forward current: $I_{F(AV)} \leq 1\, \text{A}$
- Reverse voltage: $V_R \leq 60\, \text{V}$
- Low forward voltage
- Exposed heat sink (cathode pad) for excellent thermal and electrical conductivity
- Leadless small SMD plastic package with medium power capability
- AEC-Q101 qualified

1.3 Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch Mode Power Supply (SMPS)
- Reverse polarity protection
- Low power consumption applications
- Battery chargers for mobile equipment

1.4 Quick reference data

Table 1. Quick reference data

$T_J = 25\, ^\circ\text{C}$ unless otherwise specified.

<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>square wave; $\delta = 0.5; f = 20, \text{kHz}$ $T_{amb} \leq 110, ^\circ\text{C}$</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$T_{sp} \leq 140, ^\circ\text{C}$</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>$V_R$</td>
<td>reverse voltage</td>
<td>-</td>
<td>-</td>
<td>60</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 1, \text{A}$</td>
<td>-</td>
<td>490</td>
<td>540</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 60, \text{V}$</td>
<td>33</td>
<td>100</td>
<td>-</td>
<td>$\mu\text{A}$</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

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Simplified outline</th>
<th>Graphic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>anode diode 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>anode diode 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>common cathode</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. 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>PMEG6010CPA</td>
<td>HUSON3</td>
<td>plastic thermal enhanced ultra thin small outline package; no leads; three terminals; body 2 × 2 × 0.65 mm</td>
<td>SOT1061</td>
<td></td>
</tr>
</tbody>
</table>

4. Marking

Table 4. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PMEG6010CPA</td>
<td>AP</td>
<td></td>
</tr>
</tbody>
</table>

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></td>
<td>Per diode</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_R$</td>
<td>reverse voltage</td>
<td>$T_J \leq 25 , ^\circ C$</td>
<td>-</td>
<td>60</td>
<td>V</td>
</tr>
<tr>
<td>$I_{F(AV)}$</td>
<td>average forward current</td>
<td>square wave; $\delta = 0.5$; $f = 20$ kHz</td>
<td>$T_{amb} \leq 110 , ^\circ C$</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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>7</td>
<td>A</td>
</tr>
<tr>
<td>$I_{FSM}$</td>
<td>non-repetitive peak forward current</td>
<td>square wave; $t_p = 8$ ms</td>
<td>-</td>
<td>9</td>
<td>A</td>
</tr>
</tbody>
</table>
1 A low VF dual MEGA Schottky barrier rectifier

Table 5. Limiting values ...continued
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>$P_{tot}$</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25 ^\circ C$</td>
<td>[3][4]</td>
<td>500</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[3][5]</td>
<td>960</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1][3]</td>
<td>1800</td>
<td>mW</td>
</tr>
<tr>
<td>$T_J$</td>
<td>junction temperature</td>
<td>-</td>
<td>150</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>$T_{amb}$</td>
<td>ambient temperature</td>
<td>$-55$</td>
<td>+150</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>$T_{stg}$</td>
<td>storage temperature</td>
<td>$-65$</td>
<td>+150</td>
<td></td>
<td>°C</td>
</tr>
</tbody>
</table>

[2] $T_J = 25 ^\circ C$ prior to surge.
[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>$R_{th(j-a)}$</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>[1][2]</td>
<td>-</td>
<td>250</td>
<td>K/W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[3]</td>
<td>-</td>
<td>130</td>
<td>K/W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[5]</td>
<td>-</td>
<td>70</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>[6]</td>
<td>-</td>
<td>12</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.
[2] Reflow soldering is the only recommended soldering method.
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 cathode 1 cm²

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

Table 7. Characteristics
T<sub>j</sub> = 25 °C unless otherwise specified.

<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&lt;sub&gt;F&lt;/sub&gt;</td>
<td>forward voltage</td>
<td>I&lt;sub&gt;F&lt;/sub&gt; = 100 mA</td>
<td>-</td>
<td>325</td>
<td>-</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I&lt;sub&gt;F&lt;/sub&gt; = 1 A</td>
<td>-</td>
<td>490</td>
<td>540</td>
<td>mV</td>
</tr>
<tr>
<td>I&lt;sub&gt;R&lt;/sub&gt;</td>
<td>reverse current</td>
<td>V&lt;sub&gt;R&lt;/sub&gt; = 10 V</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>μA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V&lt;sub&gt;R&lt;/sub&gt; = 60 V</td>
<td>-</td>
<td>33</td>
<td>100</td>
<td>μA</td>
</tr>
<tr>
<td>C&lt;sub&gt;d&lt;/sub&gt;</td>
<td>diode capacitance</td>
<td>f = 1 MHz</td>
<td>V&lt;sub&gt;R&lt;/sub&gt; = 1 V</td>
<td>-</td>
<td>120</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V&lt;sub&gt;R&lt;/sub&gt; = 10 V</td>
<td>-</td>
<td>40</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>t&lt;sub&gt;tr&lt;/sub&gt;</td>
<td>reverse recovery time</td>
<td>[1]</td>
<td>-</td>
<td>40</td>
<td>-</td>
<td>ns</td>
</tr>
</tbody>
</table>

[1] When switched from I<sub>F</sub> = 10 mA to I<sub>R</sub> = 10 mA; R<sub>L</sub> = 100 Ω; measured at I<sub>R</sub> = 1 mA.
1 A low $V_F$ dual MEGA Schottky barrier rectifier

Fig 4. Forward current as a function of forward voltage; typical values

Fig 5. Reverse current as a function of reverse voltage; typical values

Fig 6. Diode capacitance as a function of reverse voltage; typical values
A low $V_F$ dual MEGA Schottky barrier rectifier

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

- $T_J = 150 \, ^\circ C$
  - $\delta = 0.1$
  - $\delta = 0.2$
  - $\delta = 0.5$
  - $\delta = 1$

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

- $T_J = 125 \, ^\circ C$
  - $\delta = 1$
  - $\delta = 0.9$
  - $\delta = 0.8$
  - $\delta = 0.5$

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

- $T_J = 150 \, ^\circ C$
  - $\delta = 1; \text{DC}$
  - $\delta = 0.5; f = 20 \, \text{kHz}$
  - $\delta = 0.2; f = 20 \, \text{kHz}$
  - $\delta = 0.1; f = 20 \, \text{kHz}$

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

- $T_J = 150 \, ^\circ C$
  - $\delta = 1; \text{DC}$
  - $\delta = 0.5; f = 20 \, \text{kHz}$
  - $\delta = 0.2; f = 20 \, \text{kHz}$
  - $\delta = 0.1; f = 20 \, \text{kHz}$
Ceramic PCB, Al₂O₃, standard footprint

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

Tj = 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 12. Average forward current as a function of solder point temperature; typical values
8. Test information

The current ratings for the typical waveforms as shown in Figure 9, 10, 11 and 12 are calculated according to the equations: $I_{F(AY)} = I_M \cdot \delta$ with $I_M$ defined as peak current, $I_{RMS} = I_{F(AY)}$ at DC, and $I_{RMS} = I_M \cdot \sqrt{\delta}$ 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

Fig 15. Package outline SOT1061

10. Packing information

Table 8. Packing methods

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Description</th>
<th>Packing quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMEG6010CPA</td>
<td>SOT1061</td>
<td>4 mm pitch, 8 mm tape and reel</td>
<td>3000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-115</td>
</tr>
</tbody>
</table>

[1] For further information and the availability of packing methods, see Section 14.
11. Soldering

Reflow soldering is the only recommended soldering method.

Fig 16. Reflow soldering footprint SOT1061
12. 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>
<tr>
<td>PMEG6010CPA v.1</td>
<td>20100825</td>
<td>Product data sheet</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
13. Legal information

13.1 Data sheet status

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></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 URL http://www.nxp.com.

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