1. General description

Maximum Efficiency General Application (MEGA) Schottky barrier rectifier, encapsulated in a CFP15 (SOT1289) power and flat lead Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Average forward current: $I_{F(AV)} \leq 6 \, \text{A}$
- Reverse voltage: $V_R \leq 100 \, \text{V}$
- Low leakage current due to high Schottky barrier technology
- Low forward voltage
- High power capability due to clip-bonding technology and heat sink
- High temperature $T_j \leq 175 \, ^\circ\text{C}$
- Small and thin SMD power plastic package, typical height 0.78 mm
- AEC-Q101 qualified

3. Applications

- Low voltage rectification
- Automotive LED lighting
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Reverse polarity protection
- Low power consumption 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>$\delta = 0.5 , ; , f = 20 , \text{kHz}; , T_{amb} \leq 155 , ^\circ\text{C}; , \text{square wave}$</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>$V_R$</td>
<td>reverse voltage</td>
<td>$T_j = 25 , ^\circ\text{C}$</td>
<td>-</td>
<td>-</td>
<td>100</td>
<td>V</td>
</tr>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 6 , \text{A}; , t_p \leq 300 , \mu\text{s}; , \delta \leq 0.02 , ; , T_j = 25 , ^\circ\text{C}$</td>
<td>-</td>
<td>770</td>
<td>840</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 100 , \text{V}; , t_p \leq 3 , \text{ms}; , \delta \leq 0.03 , ; , T_j = 25 , ^\circ\text{C}$</td>
<td>-</td>
<td>0.11</td>
<td>0.45</td>
<td>μA</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>
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<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>anode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>anode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>K</td>
<td>cathode</td>
<td></td>
<td></td>
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</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>
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</thead>
<tbody>
<tr>
<td>PMEG100V060ELPD</td>
<td>CFP15</td>
<td>plastic, thermal enhanced ultra thin SMD package; 3 leads; body: 5.8 x 4.3 x 0.78 mm</td>
<td>SOT1289</td>
<td></td>
</tr>
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</table>

7. Marking

Table 4. Marking codes

<table>
<thead>
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<th>Type number</th>
<th>Marking code</th>
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<tbody>
<tr>
<td>PMEG100V060ELPD</td>
<td>100V L06E</td>
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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>100</td>
<td>V</td>
</tr>
<tr>
<td>$I_F$</td>
<td>forward current</td>
<td>$T_{sp} \leq 150 , ^{\circ}C; \delta = 1$</td>
<td>-</td>
<td>8.4</td>
<td>A</td>
</tr>
<tr>
<td>$I_{F(AV)}$</td>
<td>average forward current</td>
<td>$\delta = 0.5 ; f = 20 , kHz; T_{amb} \leq 155 , ^{\circ}C; square wave$</td>
<td>-</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>$I_{FSM}$</td>
<td>non-repetitive peak forward current</td>
<td>$t_p = 8 , ms; T_{j(init)} = 25 , ^{\circ}C; square wave$</td>
<td>-</td>
<td>130</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>1.66</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[2]</td>
<td>2.15</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[3]</td>
<td>3.75</td>
<td>W</td>
</tr>
<tr>
<td>$T_j$</td>
<td>junction temperature</td>
<td></td>
<td>-</td>
<td>175</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{amb}$</td>
<td>ambient temperature</td>
<td></td>
<td>-55</td>
<td>175</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{stg}$</td>
<td>storage temperature</td>
<td></td>
<td>-65</td>
<td>175</td>
<td>°C</td>
</tr>
</tbody>
</table>


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]</td>
<td>-</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1][3]</td>
<td>-</td>
<td>-</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1][4]</td>
<td>-</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td>$R_{th(j-sp)}$</td>
<td>thermal resistance from junction to solder point</td>
<td></td>
<td>[5]</td>
<td>-</td>
<td>-</td>
<td>3</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.
100 V, 6 A low leakage current Schottky barrier rectifier

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

Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values
**Fig. 3.** 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>$V_{(BR)}$</td>
<td>reverse breakdown voltage</td>
<td>$I_R = 1 \text{ mA}; t_p \leq 1.2 \text{ ms}; \delta \leq 0.12$; $T_j = 25 \degree \text{C}$; pulsed</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 0.1 \text{ A}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02$; $T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>455</td>
<td>-</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 1 \text{ A}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02$; $T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>600</td>
<td>-</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 2 \text{ A}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02$; $T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>670</td>
<td>740</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 3 \text{ A}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02$; $T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>710</td>
<td>770</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 4 \text{ A}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02$; $T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>740</td>
<td>810</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 6 \text{ A}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02$; $T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>770</td>
<td>840</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 6 \text{ A}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02$; $T_j = -40 \degree \text{C}$</td>
<td>-</td>
<td>860</td>
<td>970</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 6 \text{ A}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02$; $T_j = 125 \degree \text{C}$</td>
<td>-</td>
<td>630</td>
<td>750</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 60 \text{ V}; t_p \leq 3 \text{ ms}; \delta \leq 0.03$; $T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>0.035</td>
<td>-</td>
<td>μA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 80 \text{ V}; t_p \leq 3 \text{ ms}; \delta \leq 0.03$; $T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>0.055</td>
<td>-</td>
<td>μA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 100 \text{ V}; t_p \leq 3 \text{ ms}; \delta \leq 0.03$; $T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>0.11</td>
<td>0.45</td>
<td>μA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 100 \text{ V}; t_p \leq 3 \text{ ms}; \delta \leq 0.03$; $T_j = 125 \degree \text{C}$</td>
<td>-</td>
<td>0.22</td>
<td>0.8</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 60 \text{ V}; t_p \leq 3 \text{ ms}; \delta \leq 0.03$; $T_j = 150 \degree \text{C}$</td>
<td>-</td>
<td>0.5</td>
<td>2</td>
<td>mA</td>
</tr>
<tr>
<td>$C_d$</td>
<td>diode capacitance</td>
<td>$V_R = 1 \text{ V}; f = 1 \text{ MHz}; T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>200</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 4 \text{ V}; f = 1 \text{ MHz}; T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>120</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 10 \text{ V}; f = 1 \text{ MHz}; T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>80</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>$t_{rr}$</td>
<td>reverse recovery time</td>
<td>$I_F = 0.5 \text{ A}; I_R = 0.5 \text{ A}; I_{R(meas)} = 0.1 \text{ A}; T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>8</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>$V_{FR}$</td>
<td>forward recovery voltage</td>
<td>$I_F = 0.5 \text{ A}; dI_F/dt = 20 \text{ A/µs}; T_j = 25 \degree \text{C}$</td>
<td>-</td>
<td>565</td>
<td>-</td>
<td>mV</td>
</tr>
</tbody>
</table>
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

Fig. 7. Average forward power dissipation as a function of average forward current; typical values
**PMEG100V060ELPD**

100 V, 6 A low leakage current Schottky barrier rectifier

---

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

<table>
<thead>
<tr>
<th>$T_j$ (°C)</th>
<th>$\delta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>0.8</td>
<td>0.5</td>
</tr>
<tr>
<td>0.2</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>$T_j$ (°C)</th>
<th>$\delta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>175</td>
<td>1</td>
</tr>
<tr>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>0.1</td>
<td></td>
</tr>
</tbody>
</table>

---

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

<table>
<thead>
<tr>
<th>$T_j$ (°C)</th>
<th>$\delta$</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>175</td>
<td>1; DC</td>
<td>FR4 PCB, standard footprint</td>
</tr>
<tr>
<td>0.5</td>
<td>f = 20 kHz</td>
<td></td>
</tr>
<tr>
<td>0.2</td>
<td>f = 20 kHz</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>f = 20 kHz</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>$T_j$ (°C)</th>
<th>$\delta$</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>175</td>
<td>1; DC</td>
<td>FR4 PCB, mounting pad for cathode 1 cm$^2$</td>
</tr>
<tr>
<td>0.5</td>
<td>f = 20 kHz</td>
<td></td>
</tr>
<tr>
<td>0.2</td>
<td>f = 20 kHz</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>f = 20 kHz</td>
<td></td>
</tr>
</tbody>
</table>
11. Test information

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

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.

**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 CFP15 (SOT1289)](image)

Fig. 17. Package outline CFP15 (SOT1289)

13. Soldering

![Reflow soldering footprint for CFP15 (SOT1289)](image)

Fig. 18. Reflow soldering footprint for CFP15 (SOT1289)
## 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>PMEG100V060ELPD v.1</td>
<td>20160520</td>
<td>Product data sheet</td>
<td>-</td>
<td>-</td>
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</table>
15. Legal information

Data sheet status

<table>
<thead>
<tr>
<th>Document status</th>
<th>Product status</th>
<th>Definition</th>
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<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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