

PMEG4002EL

40 V, 0.2 A low V_F MEGA Schottky barrier rectifier

Rev. 02 — 11 March 2009

Product data sheet

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 SOD882 leadless ultra small Surface-Mounted Device (SMD) plastic package.

1.2 Features

- Forward current: $I_F \leq 0.2$ A
- Reverse voltage: $V_R \leq 40$ V
- Low forward voltage
- Leadless ultra small SMD plastic package
- Power dissipation comparable to SOT23

1.3 Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Low voltage rectification
- Blocking diodes
- Low power consumption applications



1.4 Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-----------------|------------|-----|-----|-----|------|
| I_F | forward current | | - | - | 0.2 | A |
| V_R | reverse voltage | | - | - | 40 | V |

2. Pinning information

Table 2. Pinning

| Pin | Description | Simplified outline | Graphic symbol |
|-----|-------------|---|---|
| 1 | cathode | [1] |  sym001 |
| 2 | anode |  Transparent top view | |

[1] The marking bar indicates the cathode.

3. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| PMEG4002EL | - | leadless ultra small plastic package; 2 terminals; body 1.0 × 0.6 × 0.5 mm | SOD882 |

4. Marking

Table 4. Marking

| Type number | Marking code |
|-------------|--------------|
| PMEG4002EL | F4 |

5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------|-------------------------------------|-------------------------------------|-----|------|------|
| V_R | reverse voltage | | - | 40 | V |
| I_F | forward current | | - | 0.2 | A |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1$ ms; $\delta \leq 0.25$ | - | 1 | A |
| I_{FSM} | non-repetitive peak forward current | square wave; $t_p = 8$ ms | - | 3 | A |
| T_j | junction temperature | [1] | - | 150 | °C |
| T_{amb} | ambient temperature | [1] | -65 | +150 | °C |
| T_{stg} | storage temperature | | -65 | +150 | °C |

[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. Nomograms for determining the reverse power losses P_R and $I_{F(AV)}$ rating are available on request.

6. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------|---|-------------|--------|-----|-----|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1][2] | - | 500 | K/W |

[1] Refer to SOD882 standard mounting conditions (footprint), FR4 Printed-Circuit Board (PCB) with 60 μm copper strip line.

[2] 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. Nomograms for determining the reverse power losses P_R and $I_{F(AV)}$ rating are available on request.

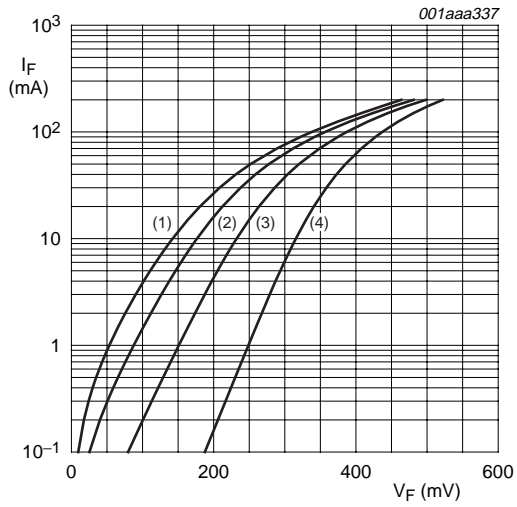
7. Characteristics

Table 7. Characteristics

$T_{amb} = 25^\circ\text{C}$ unless otherwise specified.

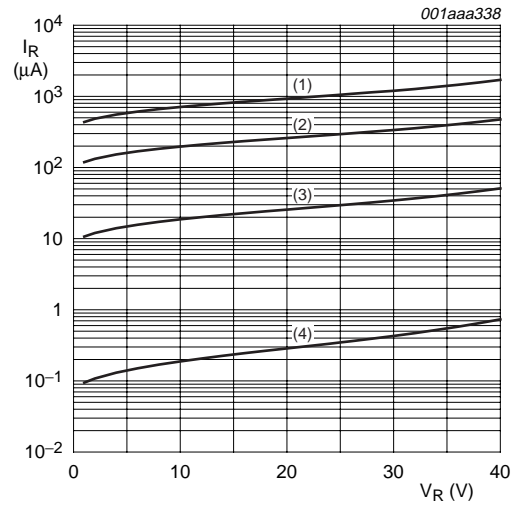
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-------------------|--------------------------------------|-----|-----|-----|---------------|
| V_F | forward voltage | $I_F = 0.1\text{ mA}$ | | 190 | 220 | mV |
| | | $I_F = 1\text{ mA}$ | | 250 | 290 | mV |
| | | $I_F = 10\text{ mA}$ | | 320 | 360 | mV |
| | | $I_F = 100\text{ mA}$ | | 440 | 500 | mV |
| | | $I_F = 200\text{ mA}$ | | 520 | 600 | mV |
| I_R | reverse current | | [1] | | | |
| | | $V_R = 25\text{ V}$ | | 0.3 | 0.5 | μA |
| | | $V_R = 40\text{ V}$ | | 0.7 | 10 | μA |
| C_d | diode capacitance | $V_R = 1\text{ V}; f = 1\text{ MHz}$ | | 14 | 20 | pF |

[1] Pulse test: $t_p \leq 300\ \mu\text{s}$; $\delta \leq 0.02$.



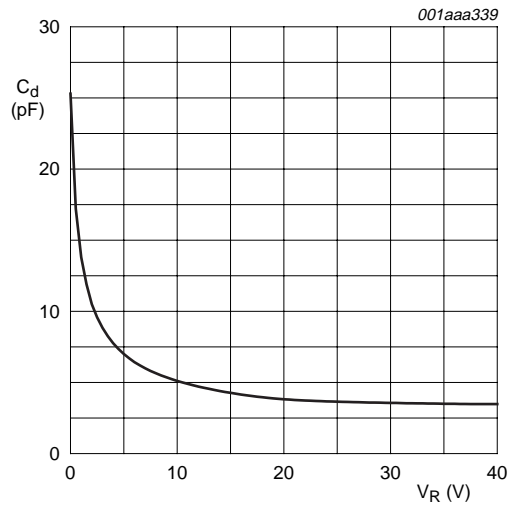
- (1) $T_j = 150\text{ }^\circ\text{C}$
- (2) $T_j = 125\text{ }^\circ\text{C}$
- (3) $T_j = 85\text{ }^\circ\text{C}$
- (4) $T_j = 25\text{ }^\circ\text{C}$

Fig 1. Forward current as a function of forward voltage; typical values



- (1) $T_j = 150\text{ }^\circ\text{C}$
- (2) $T_j = 125\text{ }^\circ\text{C}$
- (3) $T_j = 85\text{ }^\circ\text{C}$
- (4) $T_j = 25\text{ }^\circ\text{C}$

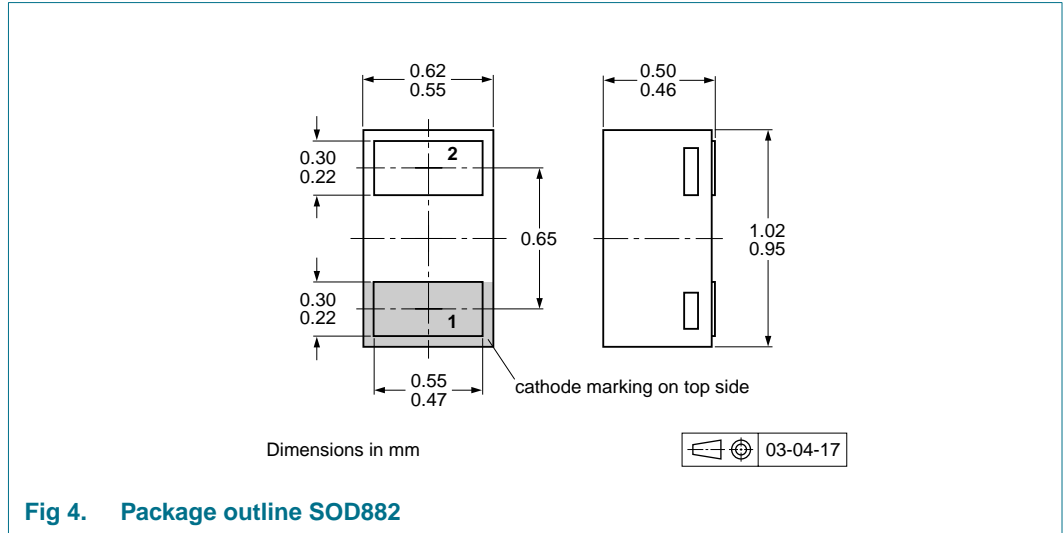
Fig 2. Reverse current as a function of reverse voltage; typical values



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

Fig 3. Diode capacitance as a function of reverse voltage; typical values

8. Package outline



9. Packing information

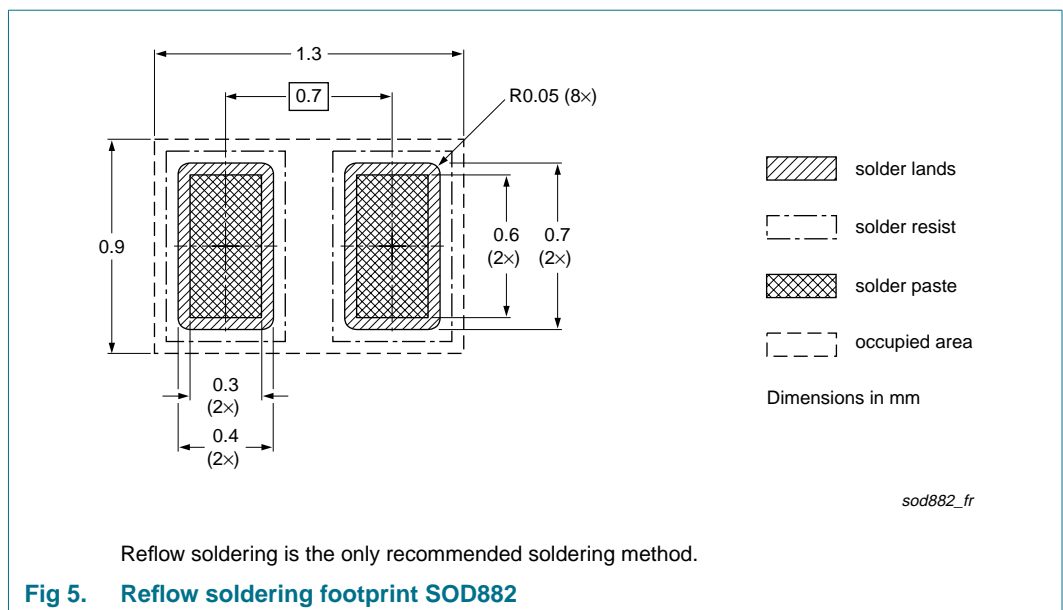
Table 8. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.^[1]

| Type number | Package | Description | Packing quantity |
|-------------|---------|--------------------------------|------------------|
| | | | 10000 |
| PMEG4002EL | SOD882 | 2 mm pitch, 8 mm tape and reel | -315 |

[1] For further information and the availability of packing methods, see [Section 13](#).

10. Soldering



11. Revision history

Table 9. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--------------|---|---------------|--------------|
| PMEG4002EL_2 | 20090311 | Product data sheet | - | PMEG4002EL_1 |
| Modifications: | | <ul style="list-style-type: none">• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.• Legal texts have been adapted to the new company name where appropriate.• Figure 4: superseded by minimized package outline drawing• Section 9 "Packing information": added• Section 10 "Soldering": added• Section 12 "Legal information": updated | | |
| PMEG4002EL_1 | 20040217 | Product data sheet | - | - |

12. Legal information

12.1 Data sheet status

| Document status ^{[1][2]} | Product status ^[3] | Definition |
|-----------------------------------|-------------------------------|---|
| Objective [short] data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

[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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