



PMEG2005EL

20 V, 0.5 A very low V_F MEGA Schottky barrier rectifier in leadless ultra small SOD882 package

Rev. 02 — 15 January 2010

Product data sheet

1. Product profile

1.1 General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier diode with an integrated guard ring for stress protection encapsulated in a SOD882 leadless ultra small plastic package.

1.2 Features

- Forward current: 0.5 A
- Reverse voltage: 20 V
- Very low forward voltage
- Leadless ultra small plastic package
- Power dissipation comparable to SOT23

1.3 Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Low voltage rectification
- High efficiency DC-to-DC conversion
- Low power consumption applications

1.4 Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Value | Unit |
|--------|-----------------|-------|------|
| I_F | forward current | 0.5 | A |
| V_R | reverse voltage | 20 | V |

2. Pinning information

Table 2. Discrete pinning

| Pin | Description | Simplified outline | Symbol |
|-----|-------------|---|---------------|
| 1 | cathode | <p>Bottom view</p> <p>Top view</p> <p>001aaa332</p> | <p>sym001</p> |
| 2 | anode | | |

[1] The marking bar indicates the cathode.

3. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|---|---------|
| | Name | Description | Version |
| PMEG2005EL | - | 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 |
|-------------|--------------|
| PMEG2005EL | F5 |

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 | continuous reverse voltage | | - | 20 | V |
| I_F | continuous forward current | | - | 0.5 | A |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1$ ms; $\delta \leq 0.25$ | - | 2.5 | A |
| I_{FSM} | non-repetitive peak forward current | $t = 8$ ms square wave | - | 3.0 | A |
| T_j | junction temperature | [1] | - | 150 | °C |
| T_{amb} | operating ambient temperature | [1] | -65 | +150 | °C |
| T_{stg} | storage temperature | | -65 | +150 | °C |

- [1] For Schottky barrier diodes thermal run-away 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 will be available on request.

6. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Value | 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 with 60 μm copper strip line.
- [2] For Schottky barrier diodes thermal run-away 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 will be available on request.

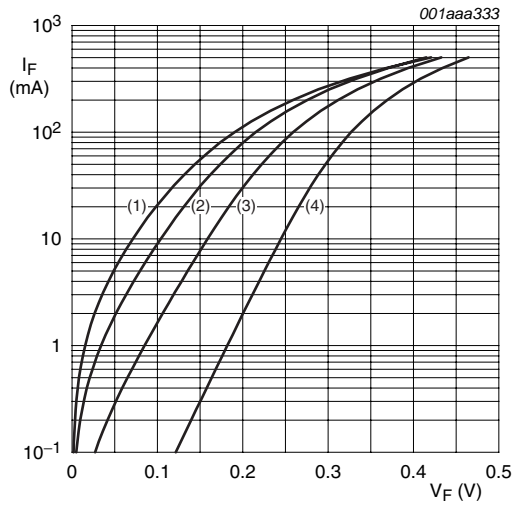
7. Characteristics

Table 7. Characteristics

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

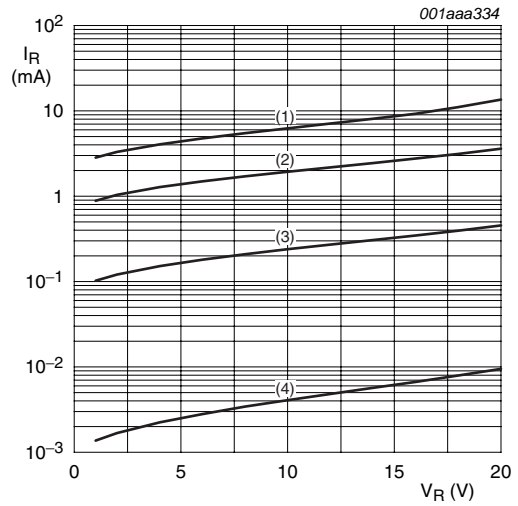
| Symbol | Parameter | Conditions | Typ | Max | Unit |
|--------|----------------------------|--|-----------------------|-----|---------------|
| V_F | continuous forward voltage | see Figure 1 $I_F = 0.1\text{ mA}$ | 125 | 180 | mV |
| | | $I_F = 1\text{ mA}$ | 185 | 240 | mV |
| | | $I_F = 10\text{ mA}$ | 250 | 290 | mV |
| | | $I_F = 100\text{ mA}$ | 325 | 380 | mV |
| | | $I_F = 500\text{ mA}$ | 450 | 500 | mV |
| I_R | continuous reverse current | $V_R = 10\text{ V}$; see Figure 2 | [1] 4 | 30 | μA |
| C_d | diode capacitance | $V_R = 1\text{ V}$; $f = 1\text{ MHz}$; see Figure 3 | 24 | 30 | pF |

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



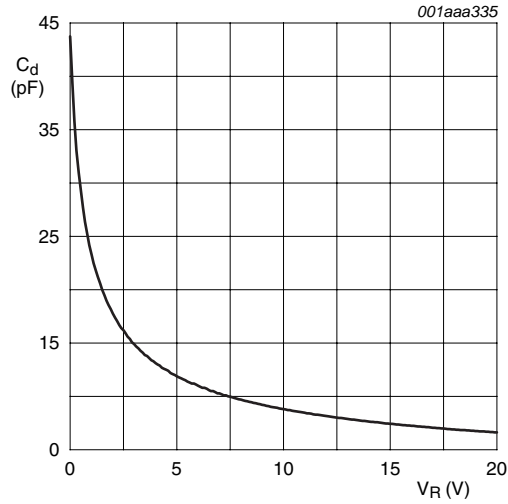
- (1) $T_j = 150\text{ }^\circ\text{C}$
- (2) $T_j = 125\text{ }^\circ\text{C}$
- (3) $T_j = 85\text{ }^\circ\text{C}$
- (4) $T_j = 25\text{ }^\circ\text{C}$

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

Leadless ultra small plastic package; 2 terminals; body 1.0 x 0.6 x 0.5 mm

SOD882

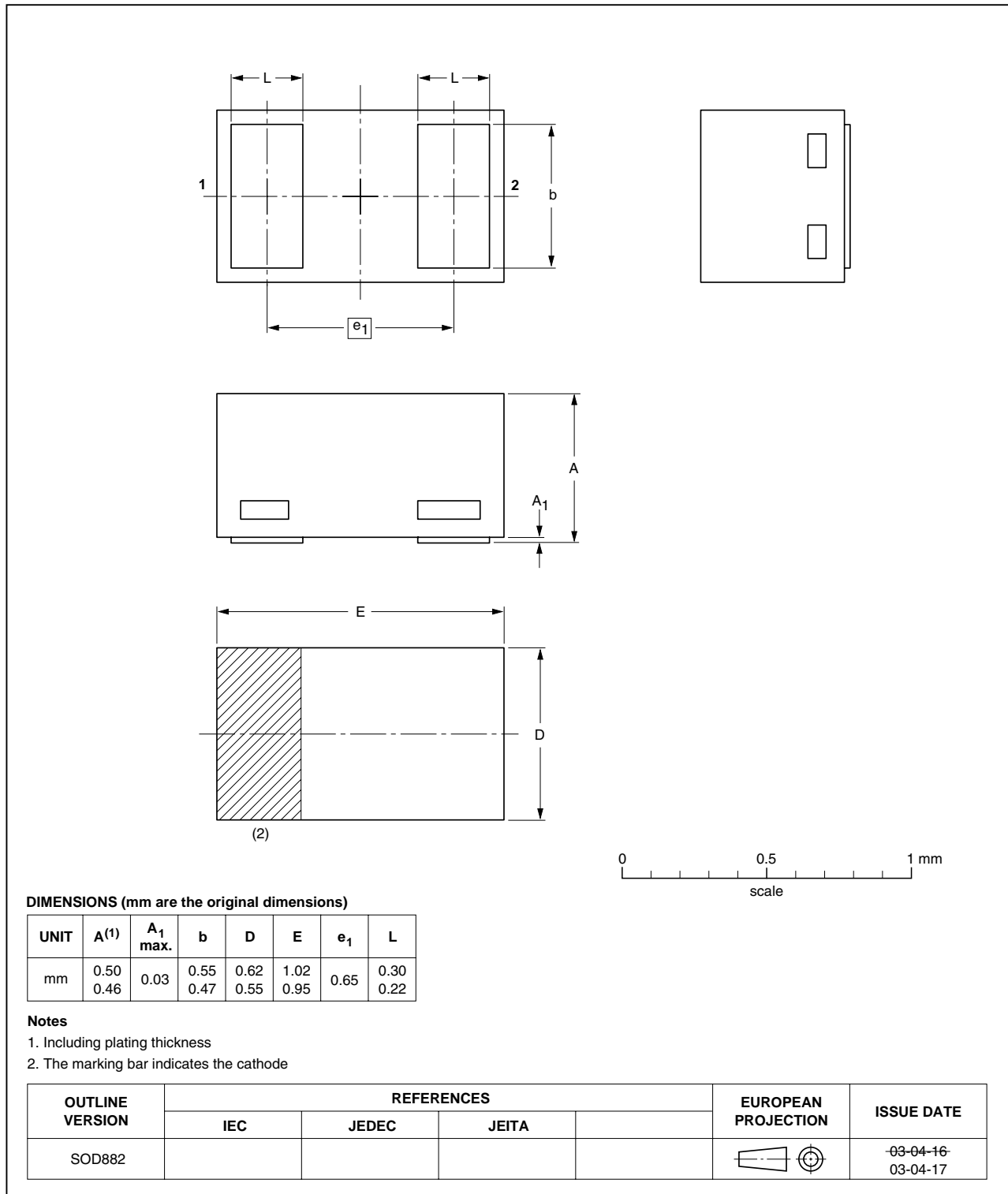


Fig 4. Package outline

9. Revision history

Table 8. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--|-----------------------|---------------|--------------|
| PMEG2005EL_2 | 20100115 | Product specification | - | PMEG2005EL_1 |
| Modifications: | <ul style="list-style-type: none">This data sheet was changed to reflect the new company name NXP, including new legal definitions and disclaimers. No changes were made to the technical content. | | | |
| PMEG2005EL_1 | 20040211 | Product specification | - | - |

10. Legal information

10.1 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.nexperia.com>.

10.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. Nexperia does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local Nexperia sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

10.3 Disclaimers

General — Information in this document is believed to be accurate and reliable. However, Nexperia does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to make changes — Nexperia reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — Nexperia products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of a Nexperia product can reasonably be expected to result in personal injury, death or severe property or environmental

damage. Nexperia accepts no liability for inclusion and/or use of Nexperia products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. Nexperia makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) may cause permanent damage to the device. Limiting values are stress ratings only and operation of the device at these or any other conditions above those given in the Characteristics sections of this document is not implied. Exposure to limiting values for extended periods may affect device reliability.

Terms and conditions of sale — Nexperia products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.nexperia.com/profile/terms>, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by Nexperia. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from national authorities.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

10.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

11. Contact information

For more information, please visit: <http://www.nexperia.com>

For sales office addresses, please send an email to: salesaddresses@nexperia.com

12. Contents

| | | |
|-----------|--|----------|
| 1 | Product profile | 1 |
| 1.1 | General description | 1 |
| 1.2 | Features | 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 | 2 |
| 6 | Thermal characteristics | 3 |
| 7 | Characteristics | 3 |
| 8 | Package outline | 5 |
| 9 | Revision history | 6 |
| 10 | Legal information | 7 |
| 10.1 | Data sheet status | 7 |
| 10.2 | Definitions | 7 |
| 10.3 | Disclaimers | 7 |
| 10.4 | Trademarks | 7 |
| 11 | Contact information | 7 |
| 12 | Contents | 8 |