

# PMEG2005AEL

0.5 A ultra low  $V_F$  MEGA Schottky barrier rectifier in leadless ultra small SOD882 package

Rev. 03 — 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
- Ultra 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

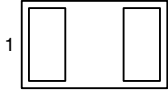
### 1.4 Quick reference data

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 |
| PMEG2005AEL | -       | 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 |
|-------------|--------------|
| PMEG2005AEL | F2           |

## 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     | $t_p \leq 1 \text{ ms}$ ; $\delta \leq 0.25$ | -   | 2.5  | A    |
| $I_{FSM}$ | non-repetitive peak forward current | $t = 8 \text{ ms}$ square wave               | -   | 3    | 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 | <a href="#">[1]</a> <a href="#">[2]</a> 500 | K/W  |

- [1] Refer to SOD882 standard mounting conditions (footprint), FR4 with 60  $\mu$ m 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.

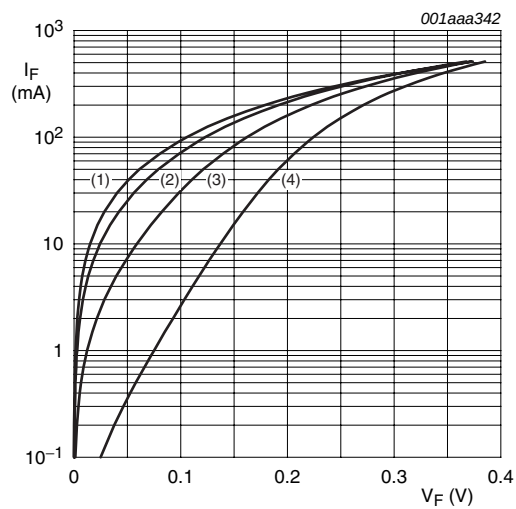
## 7. Characteristics

**Table 7. Characteristics**

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

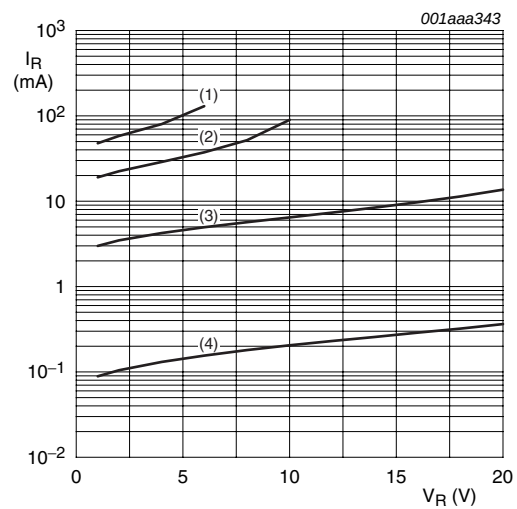
| Symbol | Parameter                  | Conditions                                                                | Typ                 | Max  | Unit    |
|--------|----------------------------|---------------------------------------------------------------------------|---------------------|------|---------|
| $V_F$  | continuous forward voltage | see <a href="#">Figure 1</a> ;                                            |                     |      |         |
|        |                            | $I_F = 0.1\text{ mA}$                                                     | 25                  | 60   | mV      |
|        |                            | $I_F = 1\text{ mA}$                                                       | 75                  | 110  | mV      |
|        |                            | $I_F = 10\text{ mA}$                                                      | 135                 | 190  | mV      |
|        |                            | $I_F = 100\text{ mA}$                                                     | 220                 | 290  | mV      |
|        |                            | $I_F = 500\text{ mA}$                                                     | 375                 | 440  | mV      |
| $I_R$  | continuous reverse current | see <a href="#">Figure 2</a> ;                                            | <a href="#">[1]</a> |      |         |
|        |                            | $V_R = 10\text{ V}$                                                       | 210                 | 600  | $\mu$ A |
|        |                            | $V_R = 20\text{ V}$                                                       | 370                 | 1500 | $\mu$ A |
| $C_d$  | diode capacitance          | $V_R = 1\text{ V}$ ; $f = 1\text{ MHz}$ ;<br>see <a href="#">Figure 3</a> | 19                  | 25   | pF      |

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



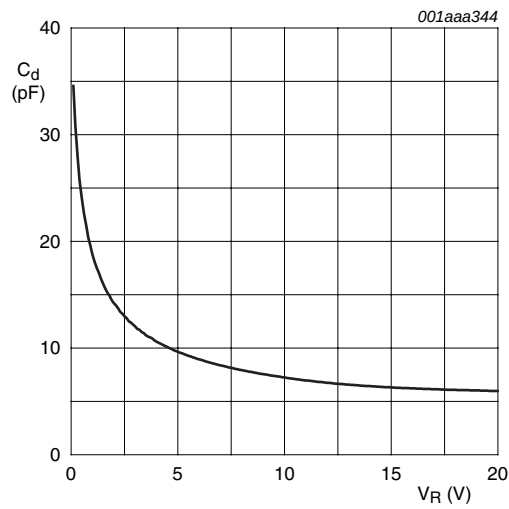
- (1)  $T_j = 150\text{ }^{\circ}\text{C}$
- (2)  $T_j = 125\text{ }^{\circ}\text{C}$
- (3)  $T_j = 85\text{ }^{\circ}\text{C}$
- (4)  $T_j = 25\text{ }^{\circ}\text{C}$

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



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

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

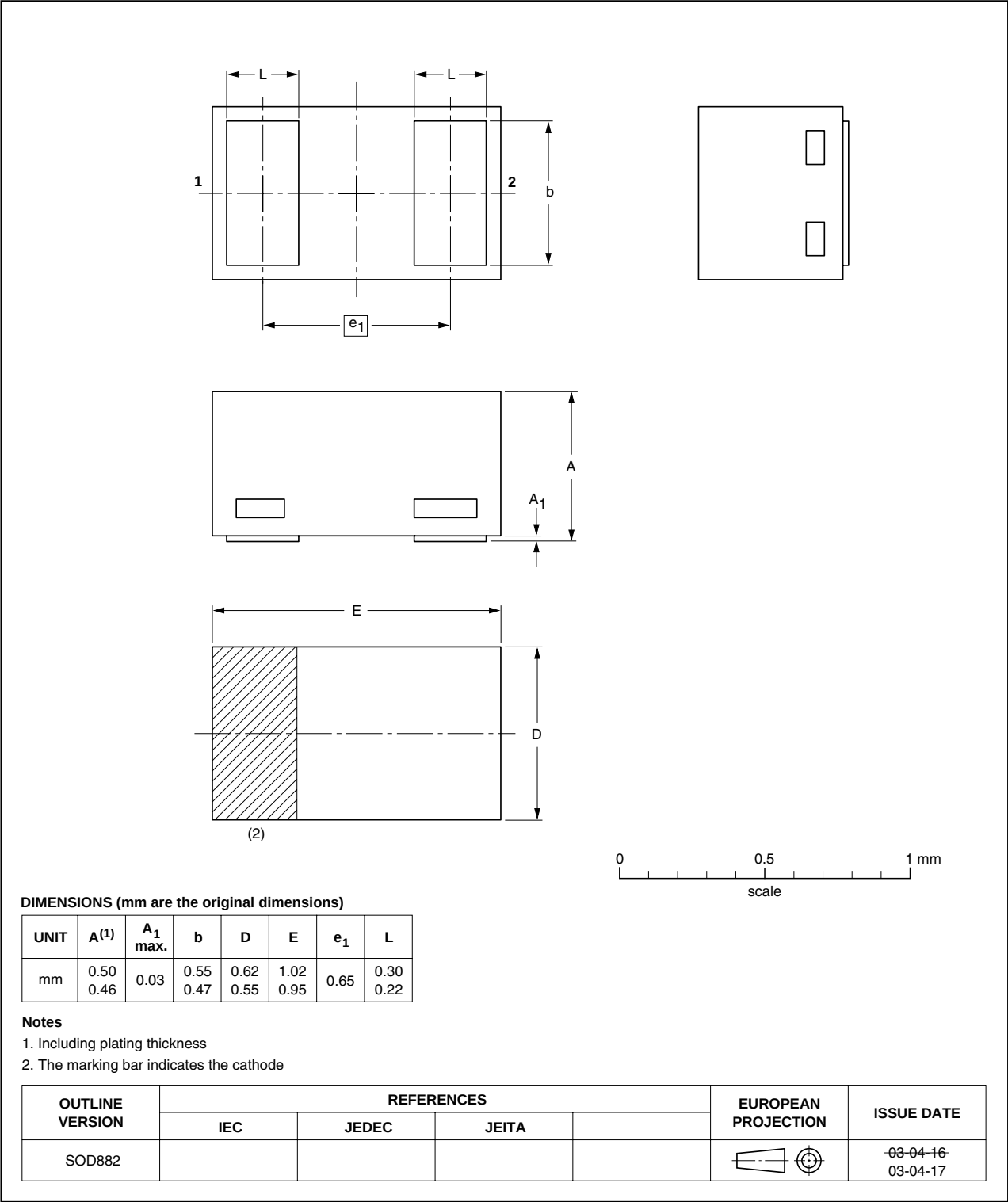


Fig 4. Package outline

## 9. Revision history

Table 8. Revision history

| Document ID    | Release date                                                                                                                                                                                                                    | Data sheet status | Change notice | Supersedes    |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------|---------------|
| PMEG2005AEL_3  | 20100115                                                                                                                                                                                                                        | Product data      | -             | PMEG2005AEL_2 |
| Modifications: | <ul style="list-style-type: none"><li>This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content.</li></ul> |                   |               |               |
| PMEG2005AEL_2  | 20040427                                                                                                                                                                                                                        | Product data      | -             | PMEG2005AEL_1 |
| PMEG2005AEL_1  | 20040419                                                                                                                                                                                                                        | Product data      | -             | -             |

## 10. Legal information

### 10.1 Data sheet status

| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | 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".

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