

# PMEG3005EB; PMEG3005EL

0.5 A very low  $V_F$  MEGA Schottky barrier rectifiers

Rev. 01 — 29 November 2006

Product data sheet

## 1. Product profile

### 1.1 General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifiers with an integrated guard ring for stress protection, encapsulated in ultra small Surface-Mounted Device (SMD) plastic packages.

Table 1. Product overview

| Type number | Package |       | Configuration |
|-------------|---------|-------|---------------|
|             | NXP     | JEITA |               |
| PMEG3005EB  | SOD523  | SC-79 | single        |
| PMEG3005EL  | SOD882  | -     | single        |

### 1.2 Features

- Forward current:  $I_F \leq 0.5$  A
- Reverse voltage:  $V_R \leq 30$  V
- Very low forward voltage
- Ultra small SMD plastic packages

### 1.3 Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Reverse polarity protection
- Low power consumption applications

### 1.4 Quick reference data





Table 2. Quick reference data

| Symbol | Parameter       | Conditions          | Min   | Typ | Max | Unit |
|--------|-----------------|---------------------|-------|-----|-----|------|
| $I_F$  | forward current | $T_{sp} \leq 55$ °C | -     | -   | 0.5 | A    |
| $V_R$  | reverse voltage |                     | -     | -   | 30  | V    |
| $V_F$  | forward voltage | $I_F = 500$ mA      | [1] - | 430 | 500 | mV   |

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

## 2. Pinning information

**Table 3. Pinning**

| Pin           | Description |     | Simplified outline  | Symbol   |
|---------------|-------------|-----|---|--|
| <b>SOD523</b> |             |     |   |  |
| 1             | cathode     | [1] |                              | <br><i>sym001</i> |
| 2             | anode       |     |   |  |
| <b>SOD882</b> |             |     |   |  |
| 1             | cathode     | [1] |  <p>Transparent top view</p> | <br><i>sym001</i> |
| 2             | anode       |     |   |  |

[1] The marking bar indicates the cathode.

## 3. Ordering information

**Table 4. Ordering information**

| Type number | Package |  |         |
|-------------|---------|--|---------|
|             | Name    | Description  | Version |
| PMEG3005EB  | SC-79   | plastic surface-mounted package; 2 leads                                   | SOD523  |
| PMEG3005EL  | -       | leadless ultra small plastic package; 2 terminals; body 1.0 × 0.6 × 0.5 mm | SOD882  |

## 4. Marking

**Table 5. Marking codes**

| Type number | Marking code |
|-------------|--------------|
| PMEG3005EB  | KB           |
| PMEG3005EL  | AM           |

## 5. Limiting values

**Table 6. Limiting values**

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

| Symbol    | Parameter                           | Conditions                                    | Min | Max  | Unit |
|-----------|-------------------------------------|---|-----|------|------|
| $V_R$     | reverse voltage                     |   | -   | 30   | V    |
| $I_F$     | forward current                     | $T_{sp} \leq 55\text{ °C}$                    | -   | 0.5  | A    |
| $I_{FRM}$ | repetitive peak forward current     | $t_p \leq 1\text{ ms};$<br>$\delta \leq 0.25$ | -   | 1    | A    |
| $I_{FSM}$ | non-repetitive peak forward current | square wave;<br>$t_p = 8\text{ ms}$           | -   | 3    | A    |
| $P_{tot}$ | total power dissipation             | $T_{amb} \leq 25\text{ °C}$                   | [1] |      |      |
|           | PMEG3005EB                          |   | -   | 310  | mW   |
|           | PMEG3005EL                          |   | -   | 250  | mW   |
| $T_j$     | junction temperature                |   | -   | 150  | °C   |
| $T_{amb}$ | ambient temperature                 |   | -65 | +150 | °C   |
| $T_{stg}$ | storage temperature                 |   | -65 | +150 | °C   |

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

| Symbol         | Parameter  | Conditions  | Min    | Typ | Max | Unit |
|----------------|--|-------------|--------|-----|-----|------|
| $R_{th(j-a)}$  | thermal resistance from junction to ambient      | in free air | [1][2] |     |     |      |
|                | PMEG3005EB                                       |             | -      | -   | 400 | K/W  |
|                | PMEG3005EL                                       |             | -      | -   | 500 | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             | [3]    |     |     |      |
|                | PMEG3005EB                                       |             | -      | -   | 75  | K/W  |

[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] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

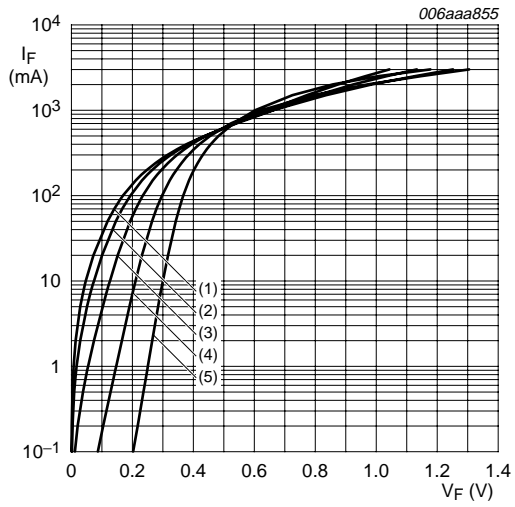
[3] Soldering point of cathode tab.

## 7. Characteristics

**Table 8. Characteristics***T<sub>amb</sub> = 25 °C unless otherwise specified.*

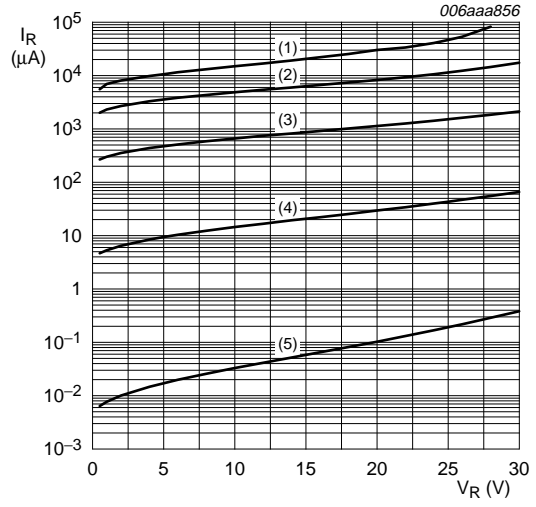
| Symbol | Parameter         | Conditions                             | Min | Typ | Max | Unit          |
|--------|-------------------|--|-----|-----|-----|---------------|
| $V_F$  | forward voltage   |  | [1] |     |     |               |
|        |                   | $I_F = 0.1 \text{ mA}$                 | -   | 90  | 180 | mV            |
|        |                   | $I_F = 1 \text{ mA}$                   | -   | 150 | 200 | mV            |
|        |                   | $I_F = 10 \text{ mA}$                  | -   | 210 | 270 | mV            |
|        |                   | $I_F = 100 \text{ mA}$                 | -   | 295 | 360 | mV            |
| $I_R$  | reverse current   | $V_R = 10 \text{ V}$                   | -   | 15  | 200 | $\mu\text{A}$ |
|        |                   | $V_R = 30 \text{ V}$                   | -   | 70  | 500 | $\mu\text{A}$ |
| $C_d$  | diode capacitance | $V_R = 1 \text{ V}; f = 1 \text{ MHz}$ | -   | 24  | 30  | pF            |

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



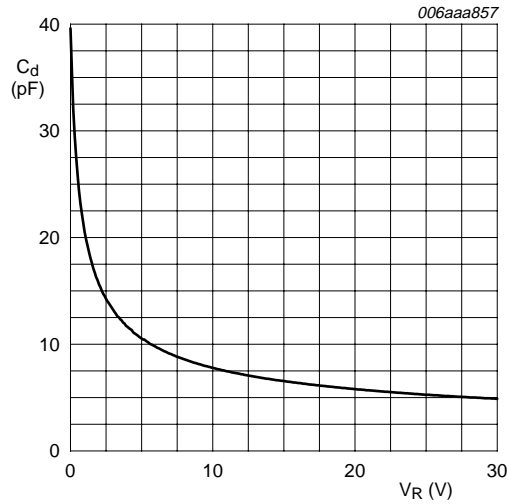
- (1)  $T_{amb} = 150\text{ °C}$
- (2)  $T_{amb} = 125\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

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



- (1)  $T_{amb} = 150\text{ °C}$
- (2)  $T_{amb} = 125\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

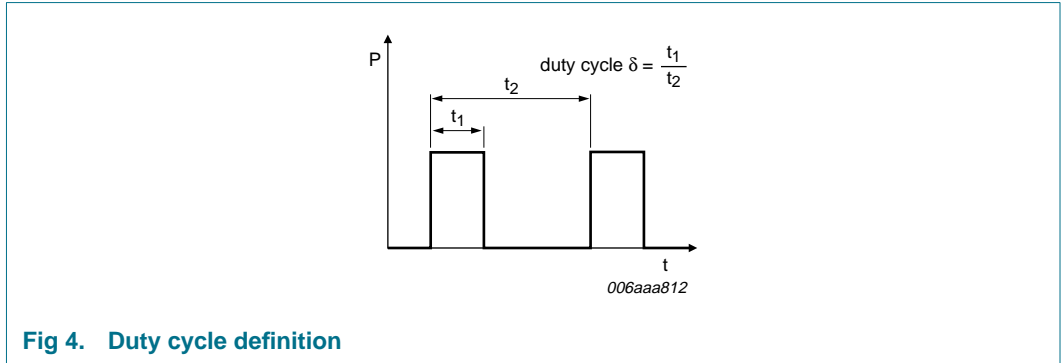
**Fig 2. Reverse current as a function of reverse voltage; typical values**



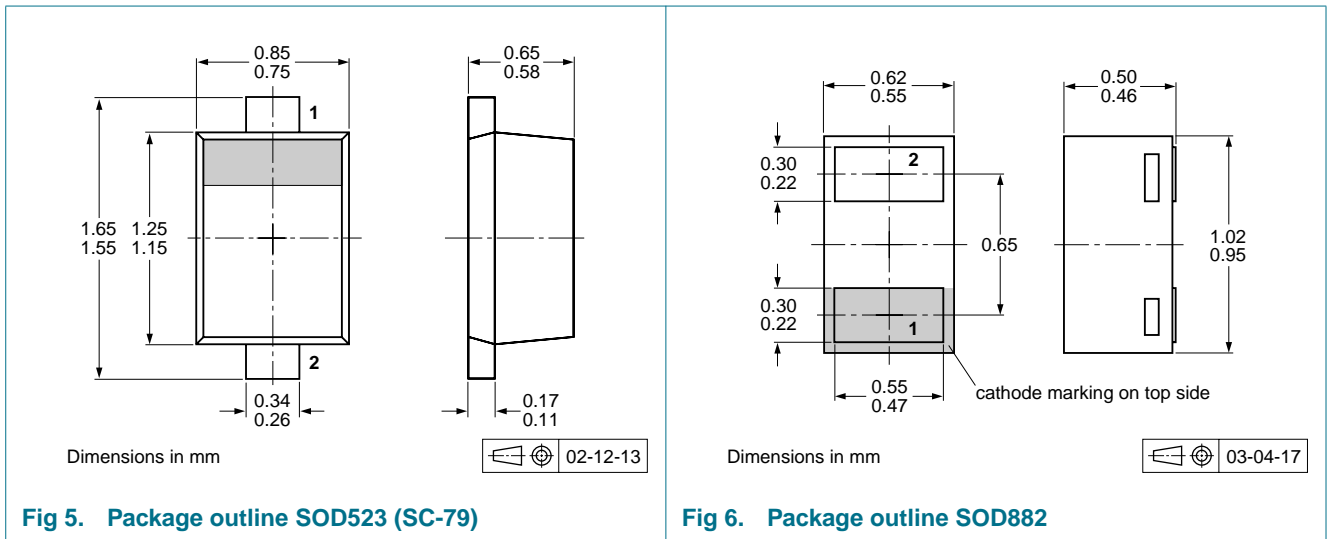
$f = 1\text{ MHz}$ ;  $T_{amb} = 25\text{ °C}$

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

**8. Test information**



**9. Package outline**



**10. Packing information**

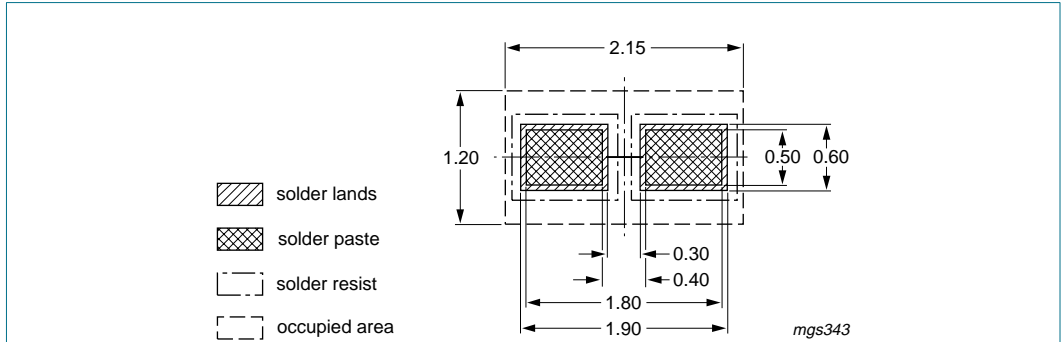
**Table 9. Packing methods**

The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

| Type number | Package | Description                    | Packing quantity |      |       |
|-------------|---------|--------------------------------|------------------|------|-------|
|             |         |                                | 3000             | 8000 | 10000 |
| PMEG3005EB  | SOD523  | 2 mm pitch, 8 mm tape and reel | -                | -315 | -     |
|             |         | 4 mm pitch, 8 mm tape and reel | -115             | -    | -135  |
| PMEG3005EL  | SOD882  | 2 mm pitch, 8 mm tape and reel | -                | -    | -315  |

[1] For further information and the availability of packing methods, see [Section 14](#).

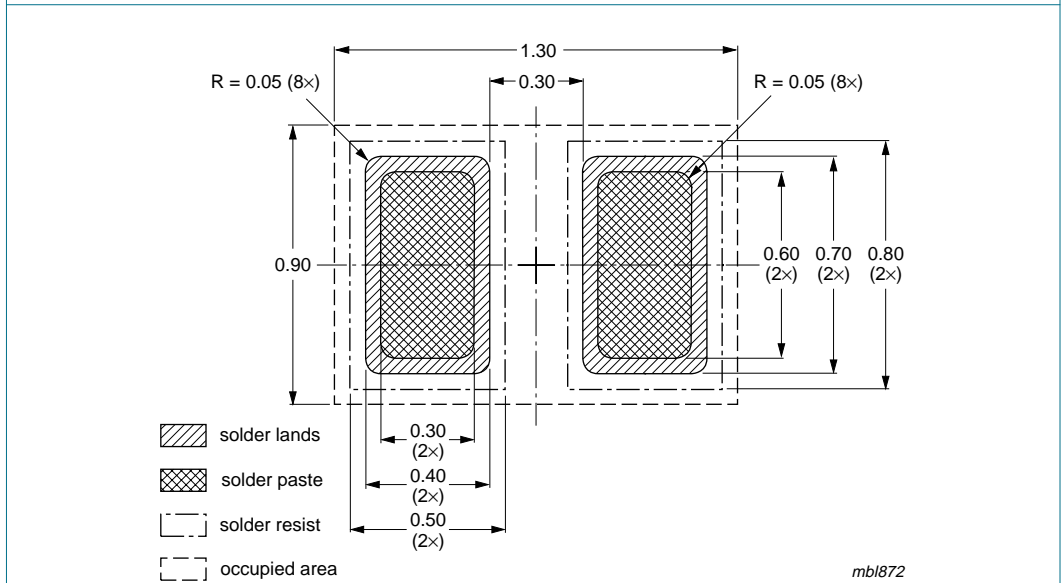
**11. Soldering**



Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 7. Reflow soldering footprint SOD523 (SC-79)**



Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 8. Reflow soldering footprint SOD882**

## 12. Revision history

**Table 10. Revision history**

| Document ID             | Release date | Data sheet status  | Change notice | Supersedes |
|-------------------------|--------------|--------------------|---------------|------------|
| PMEG3005EB_PMEG3005EL_1 | 20061129     | Product data sheet | -             | -          |



## 13. Legal information

### 13.1 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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