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Kind regards,

Team Nexperia

# 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 | $T_{sp} \leq 55\ ^\circ C$ | - | - | 0.5 | A |
| $V_R$ | reverse voltage | | - | - | 30 | V |
| $V_F$ | forward voltage | $I_F = 500$ mA [1] | - | 430 | 500 | mV |

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

founded by Philips

## 2. Pinning information

**Table 3.**  **Pinning**

| Pin | Description | Simplified outline | Symbol |
|---|---|---|---|
| **SOD523** | | | |
| 1 | cathode | [1] | |
| 2 | anode | | sym001 |
| **SOD882** | | | |
| 1 | cathode | [1] | |
| 2 | anode | Transparent top view | sym001 |

[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 $1.0 \times 0.6 \times 0.5$ 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$_{sp}$ ≤ 55 °C | - | 0.5 | A |
| I$_{FRM}$ | repetitive peak forward current | t$_p$ ≤ 1 ms; δ ≤ 0.25 | - | 1 | A |
| I$_{FSM}$ | non-repetitive peak forward current | square wave; t$_p$ = 8 ms | - | 3 | A |
| P$_{tot}$ | total power dissipation | T$_{amb}$ ≤ 25 °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**

*$T_{amb} = 25\,°C$ unless otherwise specified.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_F$ | forward voltage | [1] | | | | |
| | | $I_F = 0.1$ mA | - | 90 | 180 | mV |
| | | $I_F = 1$ mA | - | 150 | 200 | mV |
| | | $I_F = 10$ mA | - | 210 | 270 | mV |
| | | $I_F = 100$ mA | - | 295 | 360 | mV |
| | | $I_F = 500$ mA | - | 430 | 500 | mV |
| $I_R$ | reverse current | $V_R = 10$ V | - | 15 | 200 | µA |
| | | $V_R = 30$ V | - | 70 | 500 | µA |
| $C_d$ | diode capacitance | $V_R = 1$ V; $f = 1$ MHz | - | 24 | 30 | pF |

[1]   Pulse test: $t_p \leq 300\,µs$; $\delta \leq 0.02$.
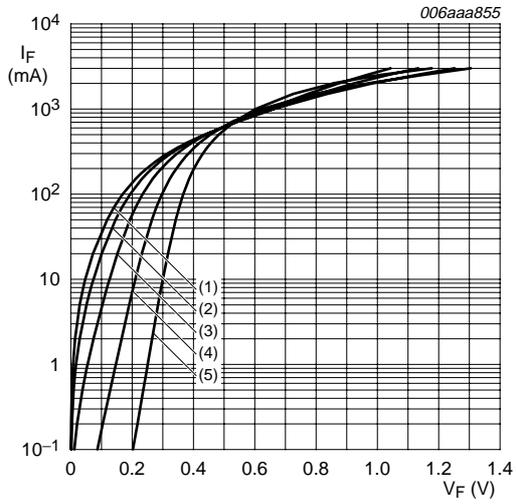
(1)  $T_{amb}$ = 150 °C
(2)  $T_{amb}$ = 125 °C
(3)  $T_{amb}$ = 85 °C
(4)  $T_{amb}$ = 25 °C
(5)  $T_{amb}$ = −40 °C

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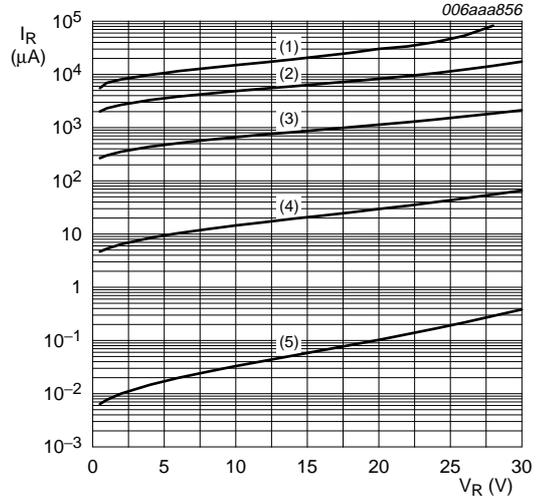


(1)  $T_{amb}$ = 150 °C
(2)  $T_{amb}$ = 125 °C
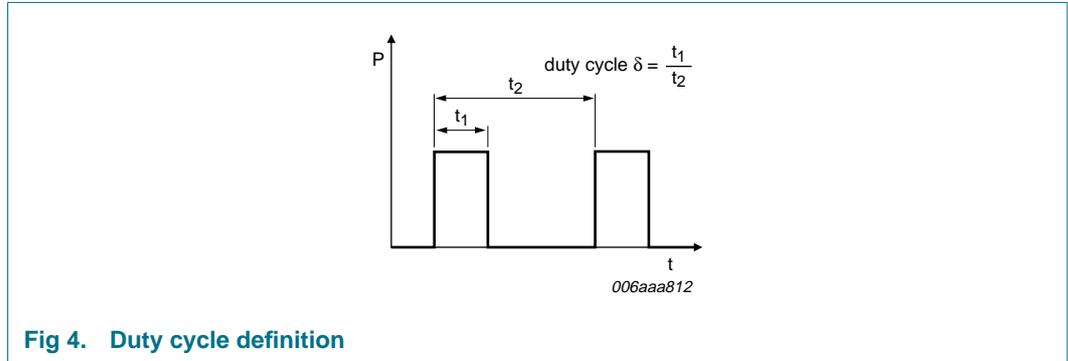(3)  $T_{amb}$ = 85 °C
(4)  $T_{amb}$ = 25 °C
(5)  $T_{amb}$ = −40 °C

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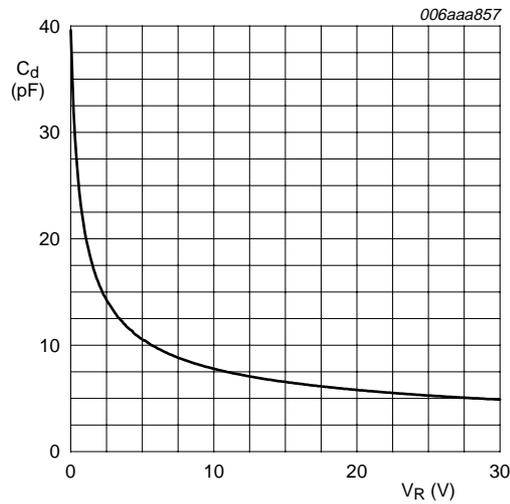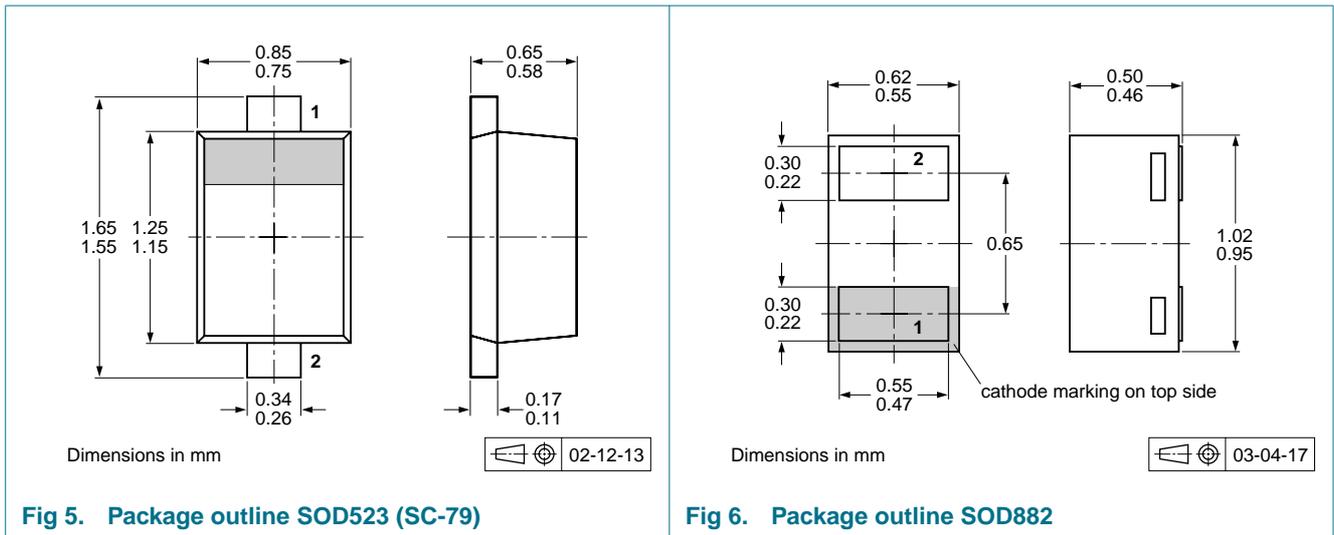


f = 1 MHz; $T_{amb}$ = 25 °C

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

## 8. Test information



**Fig 4. Duty cycle definition**

## 9. Package outline



**Fig 5. Package outline SOD523 (SC-79)**



**Fig 6. Package outline SOD882**

## 10. Packing information

**Table 9. Packing methods**
*The indicated -xxx are the last three digits of the 12NC ordering code.*[1]

| 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 |

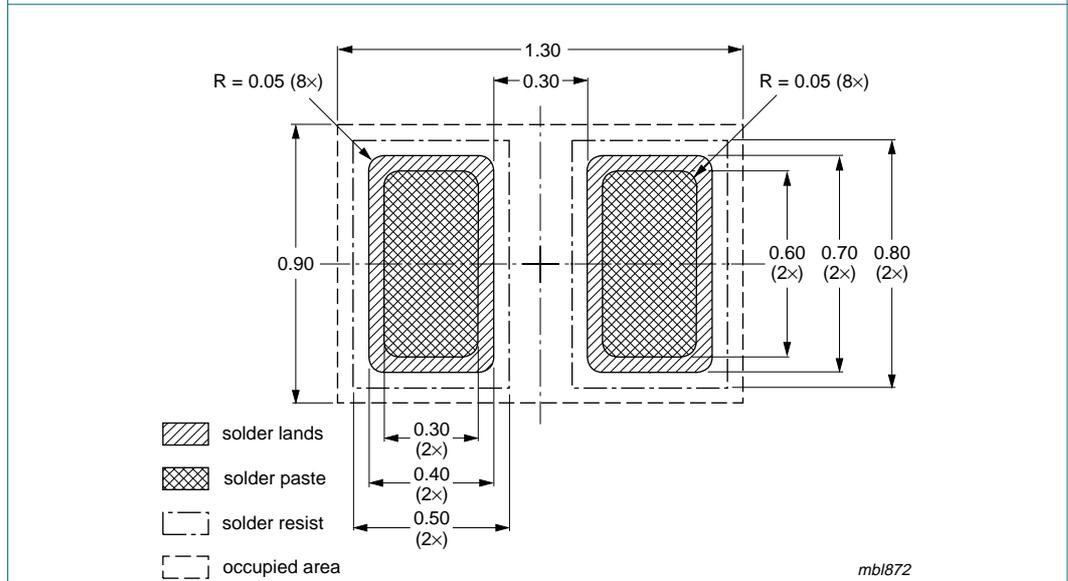[1] For further information and the availability of packing methods, see Section 14.

## 11. Soldering
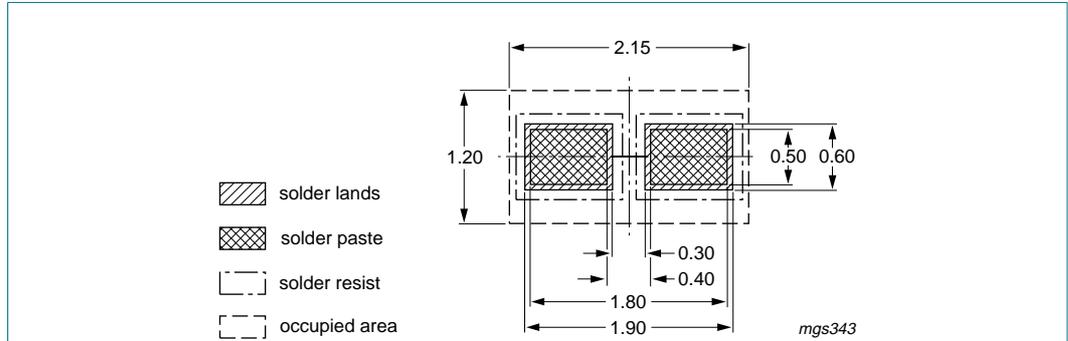
Reflow soldering is the only recommended soldering method.

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[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".

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# 15. Contents