

# PMEG6002EB; PMEG6002TV

0.2 A very low  $V_F$  MEGA Schottky barrier rectifiers

Rev. 01 — 24 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 and flat lead Surface-Mounted Device (SMD) plastic packages.

Table 1. Product overview

| Type number | Package  |       | Configuration |
|-------------|----------|-------|---------------|
|             | Nexperia | JEITA |               |
| PMEG6002EB  | SOD523   | SC-79 | single        |
| PMEG6002TV  | SOT666   | -     | dual isolated |

### 1.2 Features

- Forward current:  $I_F \leq 0.2$  A
- Reverse voltage:  $V_R \leq 60$  V
- Very low forward voltage
- Ultra small and flat lead 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


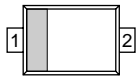
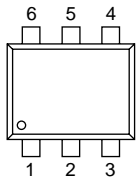
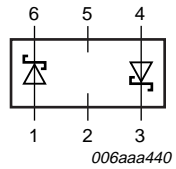
Table 2. Quick reference data

| Symbol           | Parameter       | Conditions           | Min                   | Typ | Max | Unit |
|------------------|-----------------|----------------------|-----------------------|-----|-----|------|
| <b>Per diode</b> |                 |                      |                       |     |     |      |
| $I_F$            | forward current | $T_{amb} \leq 25$ °C | -                     | -   | 0.2 | A    |
| $V_R$            | reverse voltage |                      | -                     | -   | 60  | V    |
| $V_F$            | forward voltage | $I_F = 200$ mA       | <a href="#">[1]</a> - | 540 | 600 | 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>sym001    |
| 2             | anode             |  |  |
| <b>SOT666</b> |                   |   |  |
| 1             | anode (diode 1)   |  | <br>006aaa440 |
| 2             | not connected     |   |  |
| 3             | cathode (diode 2) |   |  |
| 4             | anode (diode 2)   |   |  |
| 5             | not connected     |   |  |
| 6             | cathode (diode 1) |   |  |

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 4. Ordering information

| Type number | Package |  |         |
|-------------|---------|--|---------|
|             | Name    | Description                              | Version |
| PMEG6002EB  | SC-79   | plastic surface-mounted package; 2 leads | SOD523  |
| PMEG6002TV  | -       | plastic surface-mounted package; 6 leads | SOT666  |

## 4. Marking

Table 5. Marking codes

| Type number | Marking code |
|-------------|--------------|
| PMEG6002EB  | B2           |
| PMEG6002TV  | 1B           |

## 5. Limiting values

**Table 6. Limiting values**

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

| Symbol            | Parameter                           | Conditions                                    | Min   | Max  | Unit |
|-------------------|-------------------------------------|---|-------|------|------|
| <b>Per diode</b>  |                                     |   |       |      |      |
| $V_R$             | reverse voltage                     |   | -     | 60   | V    |
| $I_F$             | forward current                     | $T_{amb} \leq 25\text{ °C}$                   | -     | 0.2  | A    |
| $I_{FRM}$         | repetitive peak forward current     | $t_p \leq 1\text{ ms};$<br>$\delta \leq 0.25$ | -     | 2    | A    |
| $I_{FSM}$         | non-repetitive peak forward current | square wave;<br>$t_p = 8\text{ ms}$           | [1] - | 2.5  | A    |
| $P_{tot}$         | total power dissipation             | $T_{amb} \leq 25\text{ °C}$                   | [1] - | 300  | mW   |
|                   |                                     |   | [1] - | 200  | mW   |
|                   |                                     |   | [2] - | 300  | mW   |
| <b>Per device</b> |                                     |   |       |      |      |
| $P_{tot}$         | total power dissipation             | $T_{amb} \leq 25\text{ °C}$                   | [1] - | 300  | mW   |
|                   |                                     |   | [2] - | 400  | 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.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

| Symbol            | Parameter  | Conditions  | Min        | Typ    | Max | Unit |     |     |
|-------------------|--|-------------|------------|--------|-----|------|-----|-----|
| <b>Per device</b> |  |             |            |        |     |      |     |     |
| $R_{th(j-a)}$     | thermal resistance from junction to ambient      | in free air |            |        |     |      |     |     |
|                   |  |             | PMEG6002EB | [1][2] | -   | -    | 400 | K/W |
|                   |  |             | PMEG6002TV | [1][2] | -   | -    | 416 | K/W |
|                   |  |             | [1][3]     | -      | -   | 318  | K/W |     |
| $R_{th(j-sp)}$    | thermal resistance from junction to solder point |             | [4]        |        |     |      |     |     |
|                   |  | PMEG6002EB  |            | -      | -   | 75   | K/W |     |
|                   |  | PMEG6002TV  |            | -      | -   | 195  | 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] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

[4] Soldering point of cathode tab.

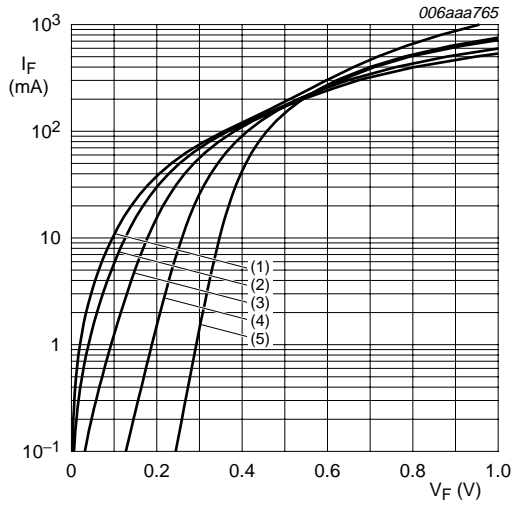
## 7. Characteristics

**Table 8. Characteristics**

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

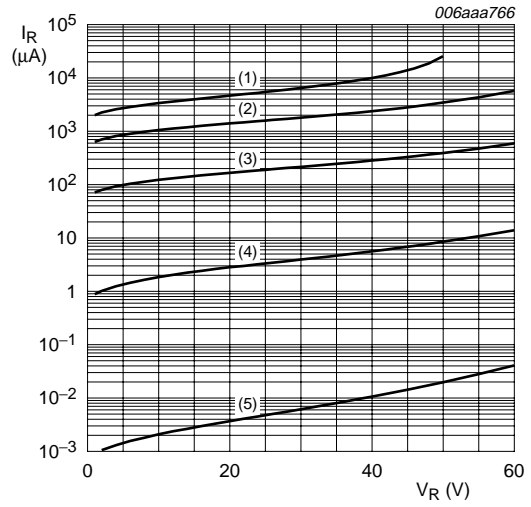
| Symbol           | Parameter         | Conditions   | Min | Typ | Max | Unit |               |
|------------------|-------------------|--|-----|-----|-----|------|---------------|
| <b>Per diode</b> |                   |  |     |     |     |      |               |
| $V_F$            | forward voltage   |  | [1] |     |     |      |               |
|                  |                   | $I_F = 0.1\text{ mA}$                                    |     | -   | 130 | 170  | mV            |
|                  |                   | $I_F = 1\text{ mA}$                                      |     | -   | 190 | 230  | mV            |
|                  |                   | $I_F = 10\text{ mA}$                                     |     | -   | 260 | 300  | mV            |
|                  |                   | $I_F = 100\text{ mA}$                                    |     | -   | 420 | 470  | mV            |
|                  |                   | $I_F = 200\text{ mA}$                                    |     | -   | 540 | 600  | mV            |
| $I_R$            | reverse current   | $V_R = 10\text{ V}$                                      |     | -   | 2   | 10   | $\mu\text{A}$ |
|                  |                   | $V_R = 60\text{ V}$                                      |     | -   | 20  | 100  | $\mu\text{A}$ |
|                  |                   | $V_R = 10\text{ V}; T_{amb} = 100\text{ }^\circ\text{C}$ |     | -   | 310 | -    | $\mu\text{A}$ |
| $C_d$            | diode capacitance | $V_R = 1\text{ V}; f = 1\text{ MHz}$                     |     | -   | 14  | 20   | pF            |

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



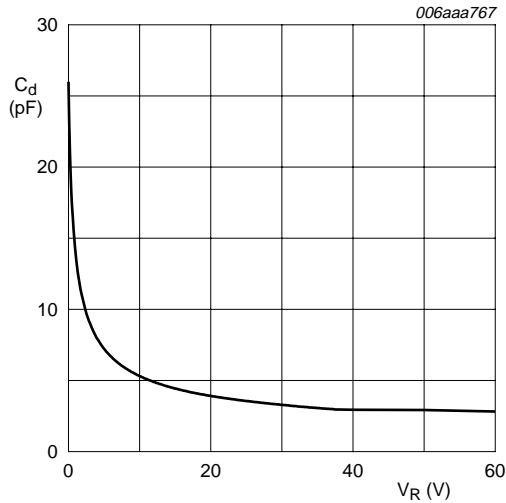
- (1)  $T_{amb} = 150\text{ °C}$
- (2)  $T_{amb} = 125\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

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)  $T_{amb} = -40\text{ °C}$

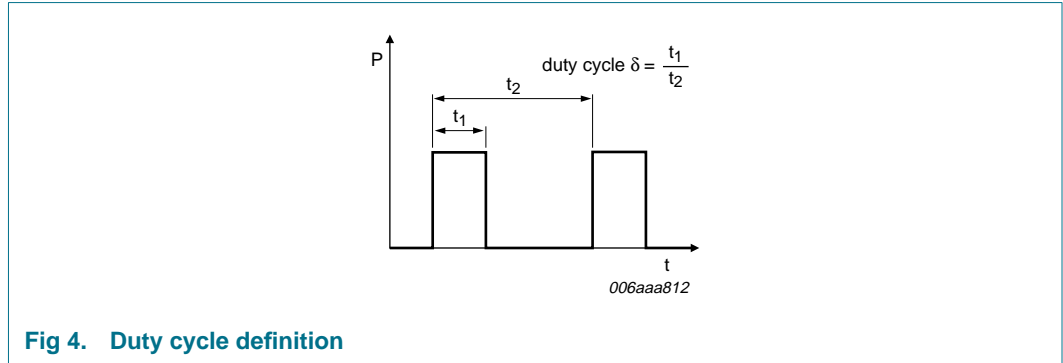
Fig 2. Reverse current as a function of reverse voltage; typical values



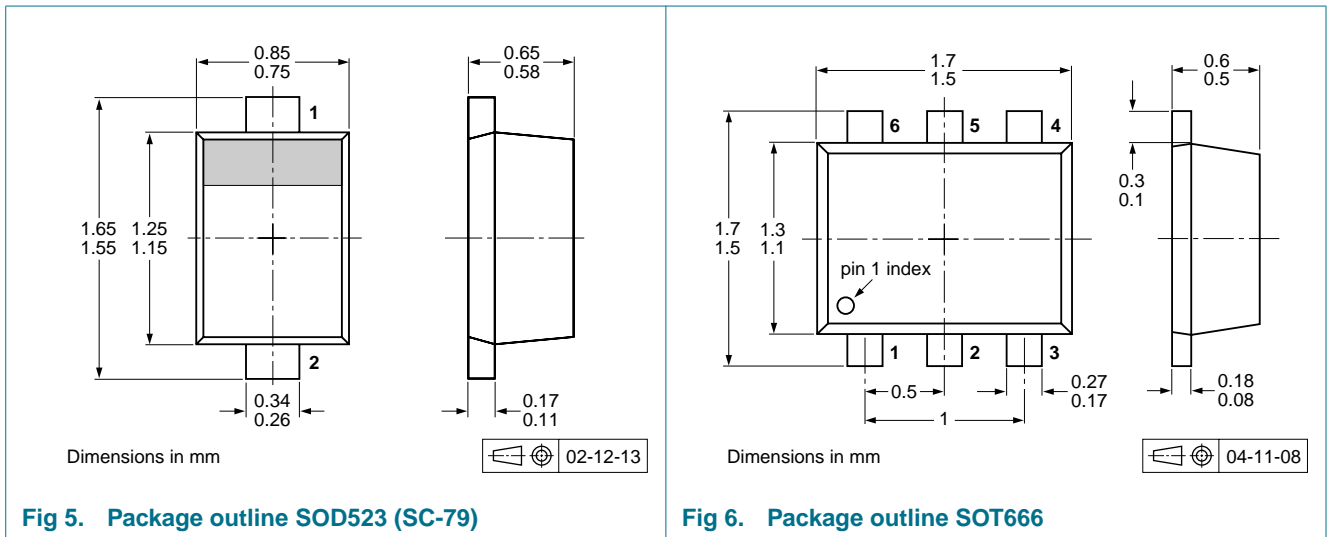
$f = 1\text{ MHz}$ ;  $T_{amb} = 25\text{ °C}$

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

**8. Test information**



**9. Package outline**



**10. Packing information**

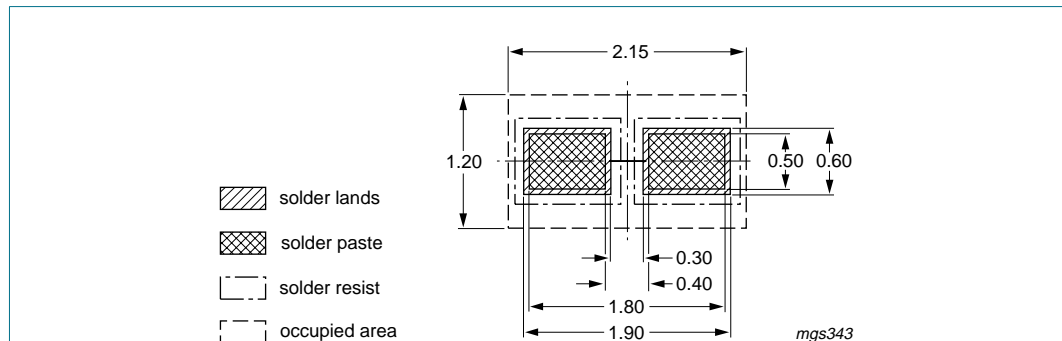
**Table 9. Packing methods**

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

| Type number | Package | Description                    | Packing quantity |      |      |       |
|-------------|---------|--------------------------------|------------------|------|------|-------|
|             |         |                                | 3000             | 4000 | 8000 | 10000 |
| PMEG6002EB  | SOD523  | 2 mm pitch, 8 mm tape and reel | -                | -    | -315 | -     |
|             |         | 4 mm pitch, 8 mm tape and reel | -115             | -    | -    | -135  |
| PMEG6002TV  | SOT666  | 2 mm pitch, 8 mm tape and reel | -                | -    | -315 | -     |
|             |         | 4 mm pitch, 8 mm tape and reel | -                | -115 | -    | -     |

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

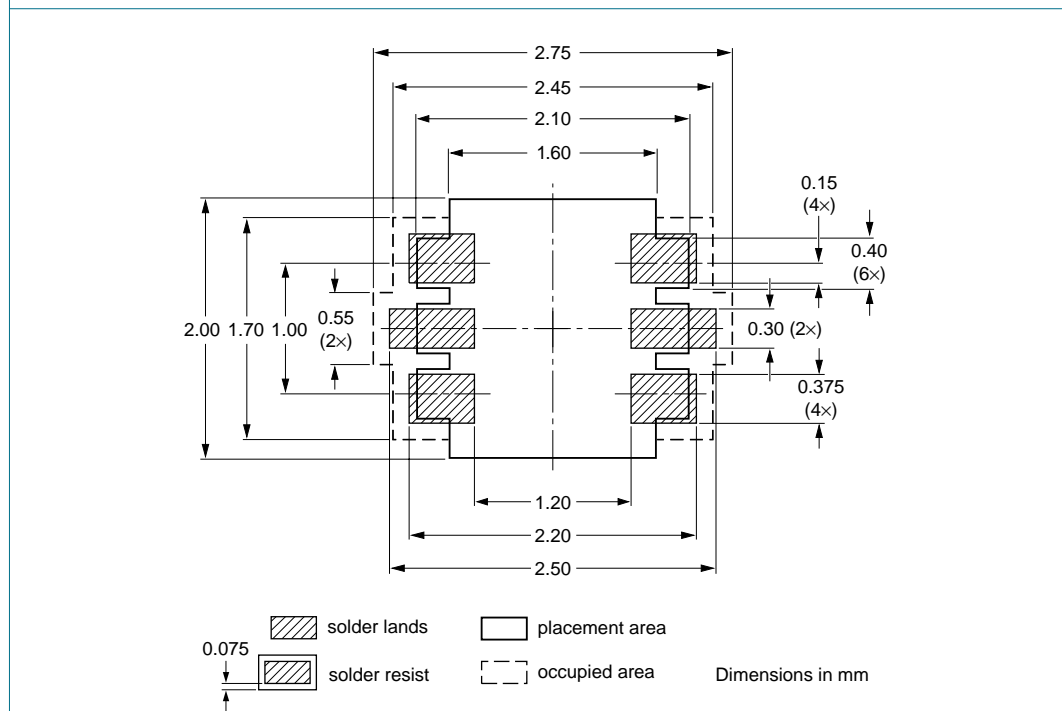
## 11. Soldering



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.

**Fig 8. Reflow soldering footprint SOT666**

## 12. Revision history

**Table 10. Revision history**

| Document ID             | Release date | Data sheet status  | Change notice | Supersedes |
|-------------------------|--------------|--------------------|---------------|------------|
| PMEG6002EB_PMEG6002TV_1 | 20061124     | 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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## 15. Contents

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