

# PMEG3002TV

0.2 A very low  $V_F$  MEGA Schottky barrier dual rectifier in SOT666 package

Rev. 01 — 21 October 2005

Product data sheet

## 1. Product profile

### 1.1 General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier dual rectifier with an integrated guard ring for stress protection, encapsulated in a SOT666 ultra small and flat lead Surface Mounted Device (SMD) plastic package.

Table 1: Product overview

| Type number | Package |       | Configuration |
|-------------|---------|-------|---------------|
|             | Philips | JEITA |               |
| PMEG3002TV  | SOT666  | -     | dual isolated |

### 1.2 Features

- Forward current:  $\leq 0.2$  A
- Reverse voltage:  $\leq 30$  V
- Very low forward voltage
- Ultra small and flat lead SMD plastic package

### 1.3 Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Inverse 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 | [1] - | -   | 0.2 | A    |
| $V_R$            | reverse voltage |                      | -     | -   | 30  | V    |
| $V_F$            | forward voltage | $I_F = 200$ mA       | [2] - | 420 | 480 | mV   |

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

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

## 2. Pinning information

**Table 3: Pinning**

| Pin | Description       | Simplified outline | Symbol |
|-----|-------------------|--------------------|--------|
| 1   | anode (diode 1)   |                    |        |
| 2   | not connected     |                    |        |
| 3   | cathode (diode 2) |                    |        |
| 4   | anode (diode 2)   |                    |        |
| 5   | not connected     |                    |        |
| 6   | cathode (diode 1) |                    |        |

## 3. Ordering information

**Table 4: Ordering information**

| Type number | Package |  |         |
|-------------|---------|--|---------|
|             | Name    | Description                              | Version |
| PMEG3002TV  | -       | plastic surface mounted package; 6 leads | SOT666  |

## 4. Marking

**Table 5: Marking codes**

| Type number | Marking code |
|-------------|--------------|
| PMEG3002TV  | 2M           |

## 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                     |  | -     | 30   | V    |
| $I_F$             | forward current                     | $T_{amb} \leq 25\text{ °C}$              | [1] - | 0.2  | A    |
| $I_{FRM}$         | repetitive peak forward current     | $t_p \leq 1\text{ ms}; \delta \leq 0.25$ | -     | 1    | 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] - | 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 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 | [1] [2] - | -   | 416 | K/W  |
|                   |  |             | [1] [3] - | -   | 318 | K/W  |
| $R_{th(j-sp)}$    | thermal resistance from junction to solder point |             | [4] -     | -   | 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. Nomograms for determining the reverse power losses  $P_R$  and  $I_{F(AV)}$  rating are available on request.

[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.

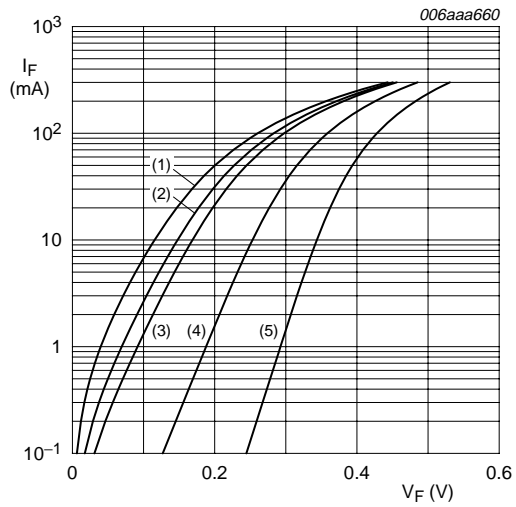
## 7. Characteristics

**Table 8: Characteristics**

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

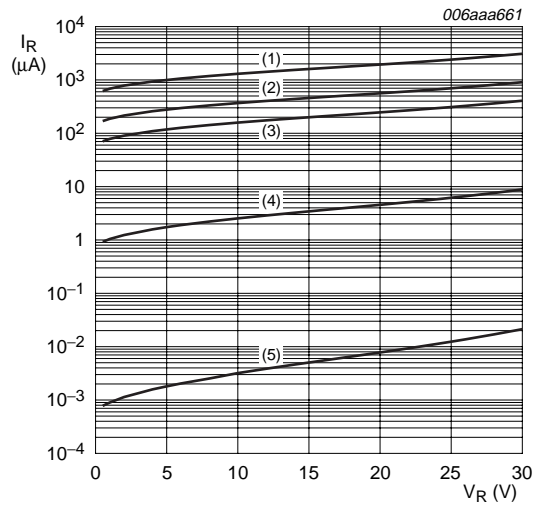
| Symbol           | Parameter         | Conditions   | Min                   | Typ | Max | Unit          |    |
|------------------|-------------------|--|-----------------------|-----|-----|---------------|----|
| <b>Per diode</b> |                   |  |                       |     |     |               |    |
| $V_F$            | forward voltage   |  |                       | [1] |     |               |    |
|                  |                   |  | $I_F = 0.1\text{ mA}$ | -   | 130 | 190           | mV |
|                  |                   |  | $I_F = 1\text{ mA}$   | -   | 190 | 250           | mV |
|                  |                   |  | $I_F = 10\text{ mA}$  | -   | 255 | 300           | mV |
|                  |                   |  | $I_F = 100\text{ mA}$ | -   | 355 | 400           | mV |
|                  |                   |  | $I_F = 200\text{ mA}$ | -   | 420 | 480           | mV |
| $I_R$            | reverse current   | $V_R = 10\text{ V}$                                      | -                     | 3   | 10  | $\mu\text{A}$ |    |
|                  |                   | $V_R = 30\text{ V}$                                      | -                     | 10  | 30  | $\mu\text{A}$ |    |
|                  |                   | $V_R = 10\text{ V}; T_{amb} = 100\text{ }^\circ\text{C}$ | -                     | 400 | -   | $\mu\text{A}$ |    |
| $C_d$            | diode capacitance | $V_R = 1\text{ V}; f = 1\text{ MHz}$                     | -                     | 20  | 25  | pF            |    |

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



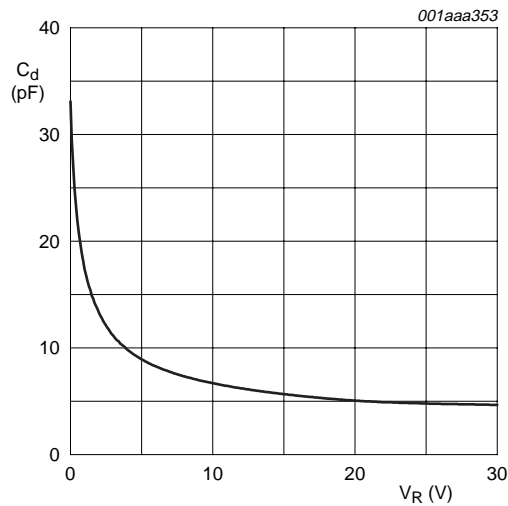
- (1)  $T_{amb} = 125\text{ °C}$
- (2)  $T_{amb} = 100\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

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



- (1)  $T_{amb} = 125\text{ °C}$
- (2)  $T_{amb} = 100\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

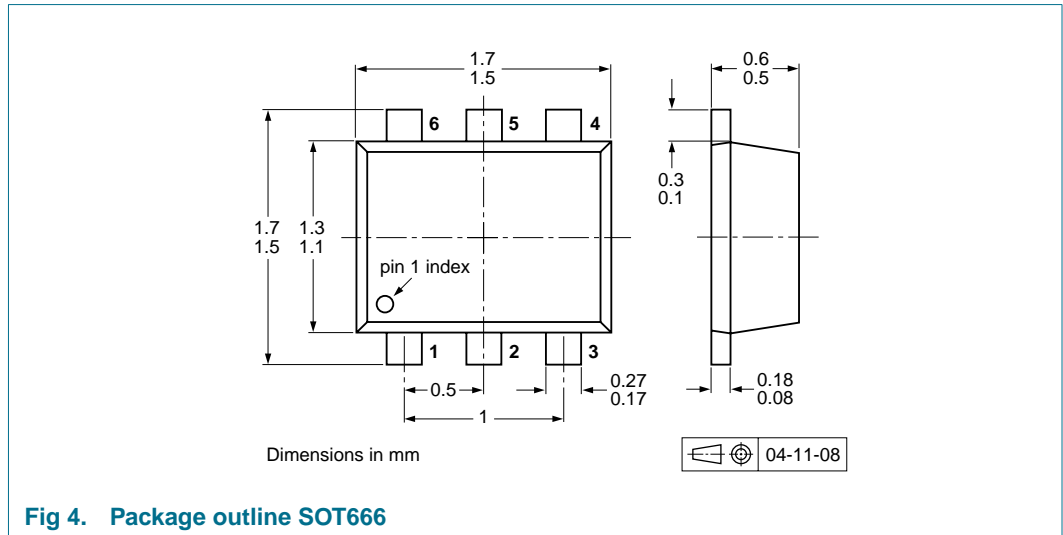
Fig 2. Reverse current as a function of reverse voltage; typical values



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

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

## 8. Package outline



## 9. Packing information

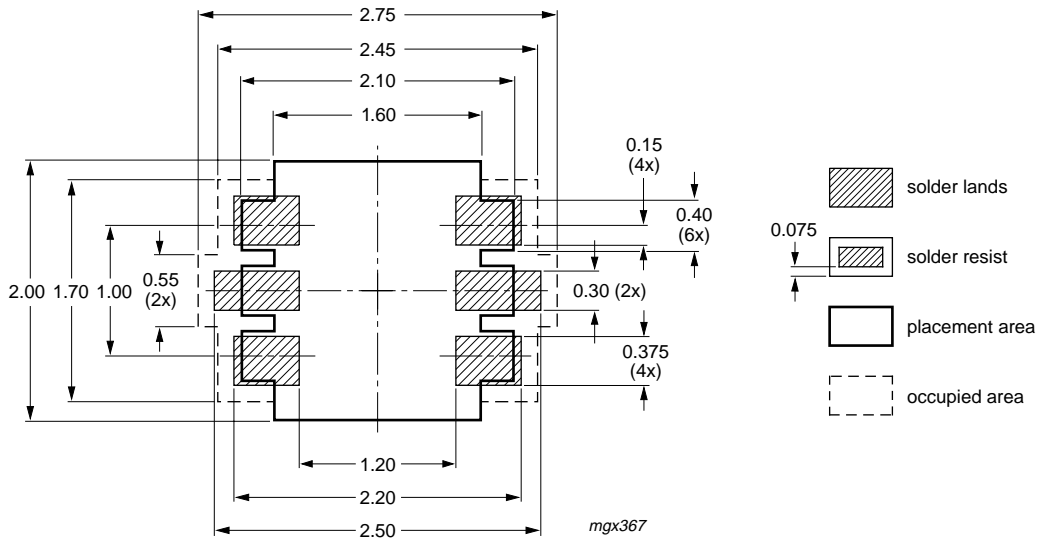
**Table 9: Packing methods**

The indicated -xxx are the last three digits of the 12NC ordering code. [\[1\]](#)

| Type number | Package | Description                    | Packing quantity |      |
|-------------|---------|--------------------------------|------------------|------|
|             |         |                                | 4000             | 8000 |
| PMEG3002TV  | 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 16](#).

## 10. Soldering



Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 5. Reflow soldering footprint SOT666**

## 11. Revision history

Table 10: Revision history

| Document ID  | Release date | Data sheet status  | Change notice | Doc. number | Supersedes |
|--------------|--------------|--------------------|---------------|-------------|------------|
| PMEG3002TV_1 | 20051021     | Product data sheet | -             | -           | -          |



## 12. Data sheet status

| Level | Data sheet status <sup>[1]</sup> | Product status <sup>[2] [3]</sup> | Definition   |
|-------|----------------------------------|-----------------------------------|--|
| I     | Objective data                   | Development                       | This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.  |
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[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

## 13. Definitions

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

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