



# PMEG4002EB

200 mA very low VF MEGA Schottky barrier rectifier

28 June 2016

Product data sheet

## 1. General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a SOD523 (SC-79) ultra small and flat lead Surface Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Forward current: 200 mA
- Reverse voltage: 40 V
- Very low forward voltage
- Ultra small and flat lead SMD plastic package
- AEC-Q101 qualified

## 3. Applications

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

## 4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter       | Conditions                                                     | Min | Typ | Max | Unit |
|--------|-----------------|----------------------------------------------------------------|-----|-----|-----|------|
| $I_F$  | forward current |                                                                | -   | -   | 200 | mA   |
| $V_R$  | reverse voltage |                                                                | -   | -   | 40  | V    |
| $V_F$  | forward voltage | $I_F = 200 \text{ mA}$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$ | -   | 520 | 600 | mV   |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline                                                                                | Graphic symbol                                                                                      |
|-----|--------|-------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1   | K      | cathode[1]  |  <p>SOD523</p> |  <p>sym001</p> |
| 2   | A      | anode       |                                                                                                   |                                                                                                     |

[1] The marking bar indicates the cathode.

## 6. Ordering information

Table 3. Ordering information

| Type number | Package |                                          |         |
|-------------|---------|------------------------------------------|---------|
|             | Name    | Description                              | Version |
| PMEG4002EB  | SOD523  | plastic surface-mounted package; 2 leads | SOD523  |

## 7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| PMEG4002EB  | L9           |

## 8. Limiting values

Table 5. Limiting values

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

| Symbol    | Parameter                           | Conditions                         |  | Min | Max | Unit |
|-----------|-------------------------------------|------------------------------------|--|-----|-----|------|
| $V_R$     | reverse voltage                     |                                    |  | -   | 40  | V    |
| $I_F$     | forward current                     |                                    |  | -   | 200 | mA   |
| $I_{FRM}$ | repetitive peak forward current     | $t_p \leq 1$ s; $\bar{d} \leq 0.5$ |  | -   | 300 | mA   |
| $I_{FSM}$ | non-repetitive peak forward current | half sine wave; $t_p = 8.3$ ms     |  | -   | 1   | A    |
| $T_j$     | junction temperature                |                                    |  | -   | 150 | °C   |
| $T_{amb}$ | ambient temperature                 |                                    |  | -65 | 150 | °C   |
| $T_{stg}$ | storage temperature                 |                                    |  | -65 | 150 | °C   |

## 9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol         | Parameter                                        | Conditions  |        | Min | Typ | Max | Unit |
|----------------|--------------------------------------------------|-------------|--------|-----|-----|-----|------|
| $R_{th(j-a)}$  | thermal resistance from junction to ambient      | in free air | [1][2] | -   | -   | 450 | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             |        | -   | -   | -   |      |

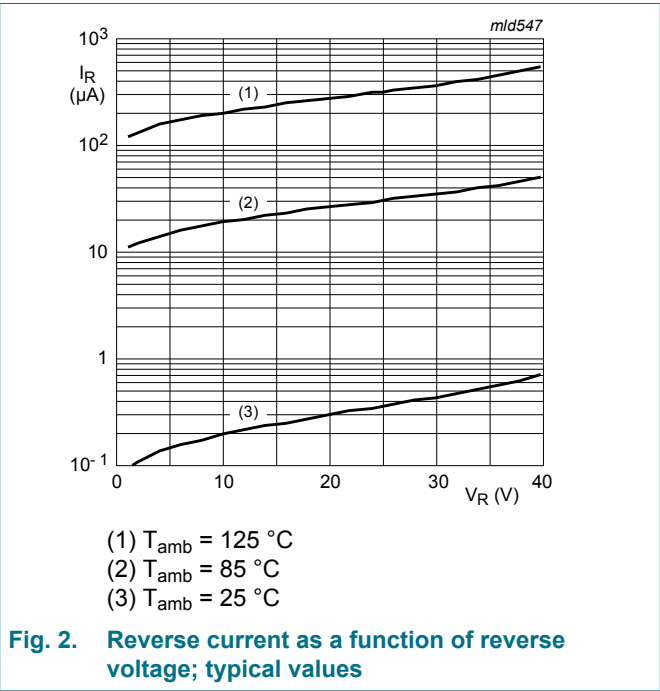
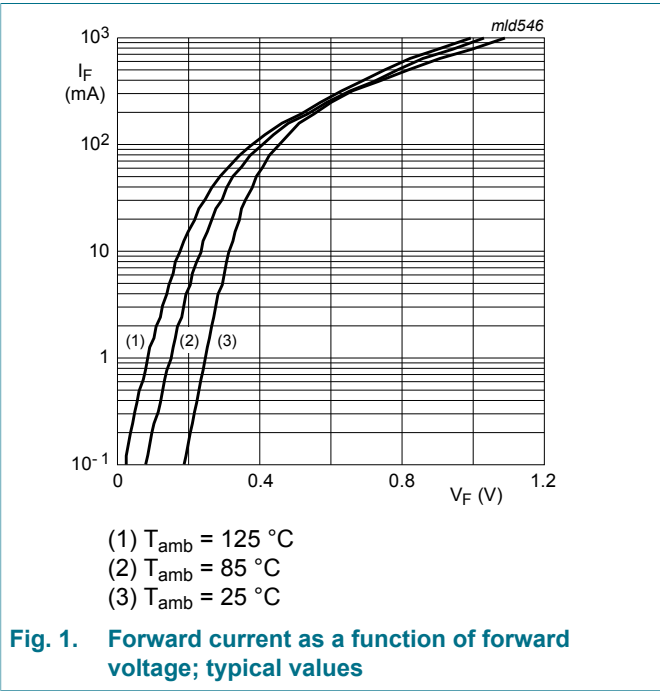
[1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses  $P_R$  are a significant part of the total power losses.

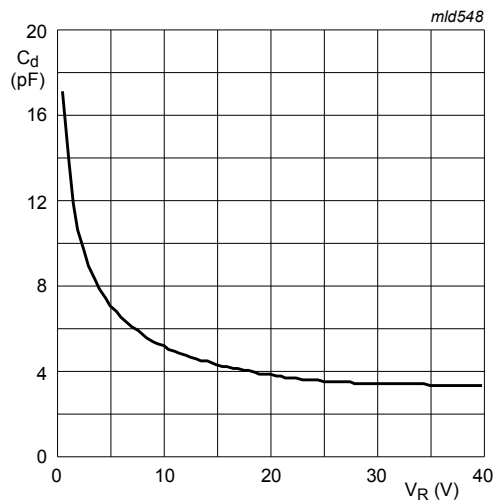
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

| Symbol         | Parameter         | Conditions                                                                                  | Min | Typ | Max | Unit |
|----------------|-------------------|---------------------------------------------------------------------------------------------|-----|-----|-----|------|
| V <sub>F</sub> | forward voltage   | I <sub>F</sub> = 0.1 mA; T <sub>amb</sub> = 25 °C                                           | -   | 190 | 220 | mV   |
|                |                   | I <sub>F</sub> = 1 mA; T <sub>amb</sub> = 25 °C                                             | -   | 250 | 290 | mV   |
|                |                   | I <sub>F</sub> = 10 mA; T <sub>amb</sub> = 25 °C                                            | -   | 320 | 360 | mV   |
|                |                   | I <sub>F</sub> = 100 mA; T <sub>amb</sub> = 25 °C                                           | -   | 440 | 500 | mV   |
|                |                   | I <sub>F</sub> = 200 mA; T <sub>amb</sub> = 25 °C                                           | -   | 520 | 600 | mV   |
| I <sub>R</sub> | reverse current   | V <sub>R</sub> = 25 V; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02 ; pulsed; T <sub>amb</sub> = 25 °C | -   | -   | 0.5 | μA   |
| C <sub>d</sub> | diode capacitance | V <sub>R</sub> = 1 V; f = 1 MHz; T <sub>amb</sub> = 25 °C                                   | -   | 20  | -   | pF   |





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

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

11. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

12. Package outline

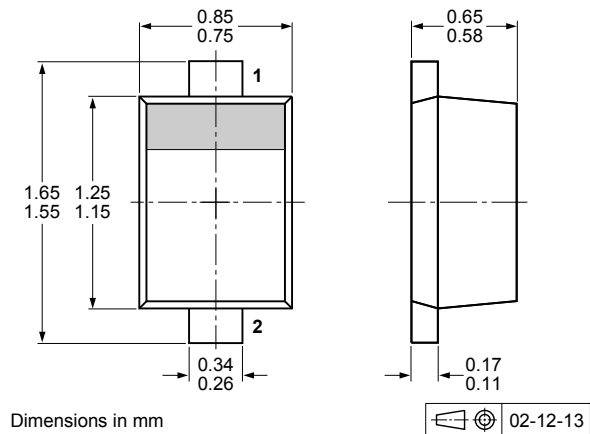


Fig. 4. Package outline SOD523

13. Soldering

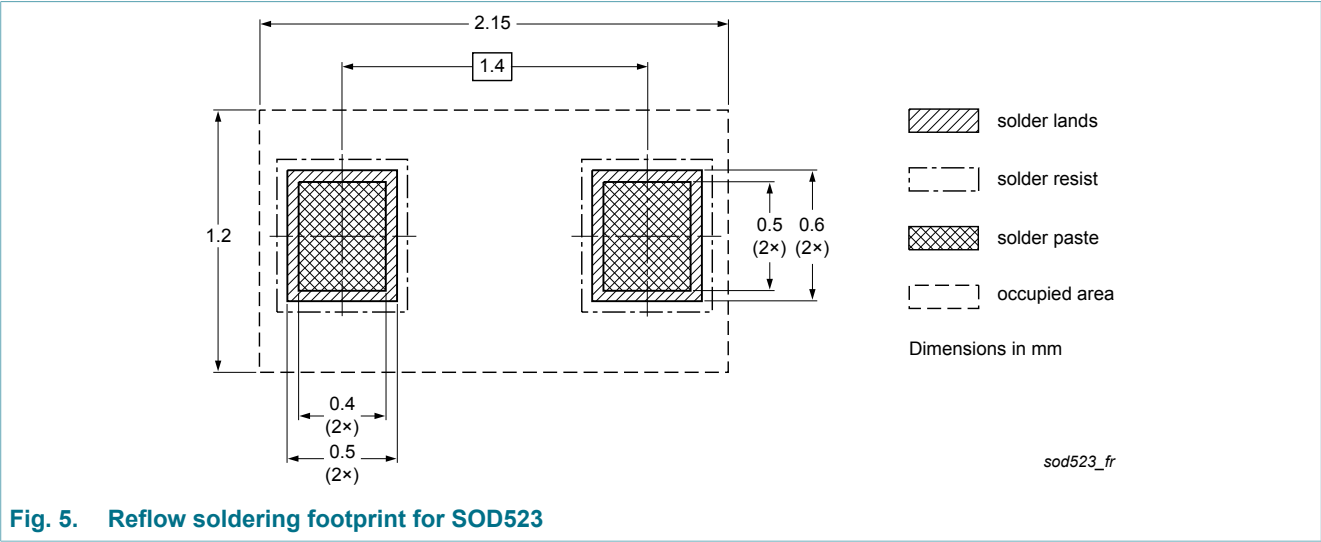


Fig. 5. Reflow soldering footprint for SOD523

14. Revision history

Table 8. Revision history

| Data sheet ID  | Release date                                                                                                                                            | Data sheet status  | Change notice | Supersedes     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|----------------|
| PMEG4002EB v.3 | 20160628                                                                                                                                                | Product data sheet | -             | PMEG4002EB v.2 |
| Modifications: | <ul style="list-style-type: none"><li>• Section "Features and benefits": added AEC-Q101 qualified</li><li>• Section "Test information": added</li></ul> |                    |               |                |
| PMEG4002EB v.2 | 20100113                                                                                                                                                | Product data sheet | -             | PMEG4002EB v.1 |
| PMEG4002EB v.1 | 20050712                                                                                                                                                | Product data sheet | -             | -              |

## 15. Legal information

### 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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