



# PMEG4002EB-Q

200 mA very low VF MEGA Schottky barrier rectifier

30 September 2021

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
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 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]  | <br>SC-79 (SOD523) | <br>sym001 |
| 2   | A      | anode       |                                                                                                     |                                                                                               |

[1] The marking bar indicates the cathode.

## 6. Ordering information

Table 3. Ordering information

| Type number  | Package |                                                                          |         |
|--------------|---------|--------------------------------------------------------------------------|---------|
|              | Name    | Description                                                              | Version |
| PMEG4002EB-Q | SC-79   | plastic, surface-mounted package; 2 leads; 1.2 mm x 0.8 mm x 0.6 mm body | SOD523  |

## 7. Marking

Table 4. Marking codes

| Type number  | Marking code |
|--------------|--------------|
| PMEG4002EB-Q | 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; $\delta \leq 0.5$ | -   | 300 | mA   |
| $I_{FSM}$ | non-repetitive peak forward current | $t_p = 8.3$ ms; half sine wave    | -   | 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  |

- [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          |
|--------|-------------------|---------------------------------------------------------------------------------------------------------------|--|-----|-----|-----|---------------|
| $V_F$  | forward voltage   | $I_F = 0.1 \text{ mA}$ ; $T_{amb} = 25^\circ\text{C}$                                                         |  | -   | 190 | 220 | mV            |
|        |                   | $I_F = 1 \text{ mA}$ ; $T_{amb} = 25^\circ\text{C}$                                                           |  | -   | 250 | 290 | mV            |
|        |                   | $I_F = 10 \text{ mA}$ ; $T_{amb} = 25^\circ\text{C}$                                                          |  | -   | 320 | 360 | mV            |
|        |                   | $I_F = 100 \text{ mA}$ ; $T_{amb} = 25^\circ\text{C}$                                                         |  | -   | 440 | 500 | mV            |
|        |                   | $I_F = 200 \text{ mA}$ ; $T_{amb} = 25^\circ\text{C}$                                                         |  | -   | 520 | 600 | mV            |
| $I_R$  | reverse current   | $V_R = 25 \text{ V}$ ; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{amb} = 25^\circ\text{C}$ |  | -   | -   | 0.5 | $\mu\text{A}$ |
| $C_d$  | diode capacitance | $V_R = 1 \text{ V}$ ; $f = 1 \text{ MHz}$ ; $T_{amb} = 25^\circ\text{C}$                                      |  | -   | 20  | -   | pF            |

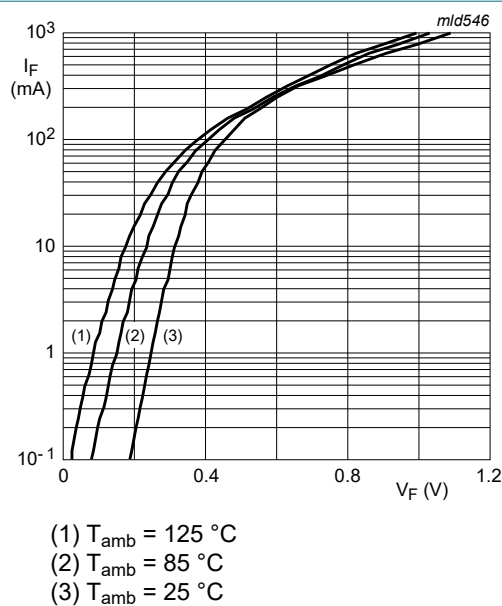


Fig. 1. Forward current as a function of forward voltage; typical values

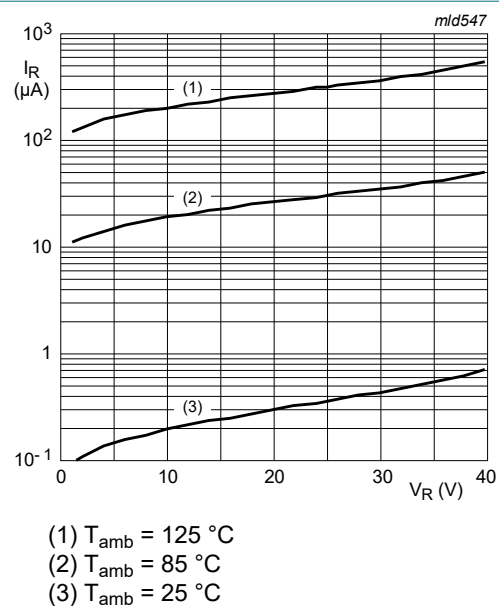
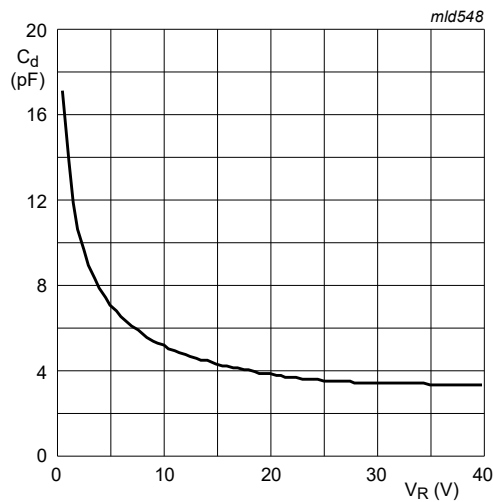


Fig. 2. Reverse current as a function of reverse voltage; typical values



f = 1 MHz; T<sub>amb</sub> = 25 °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

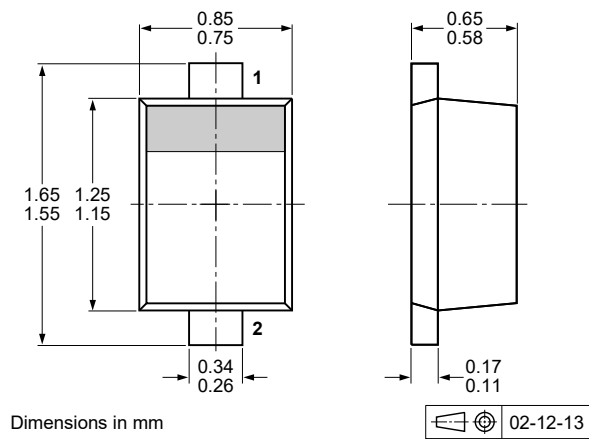


Fig. 4. Package outline SC-79 (SOD523)

13. Soldering

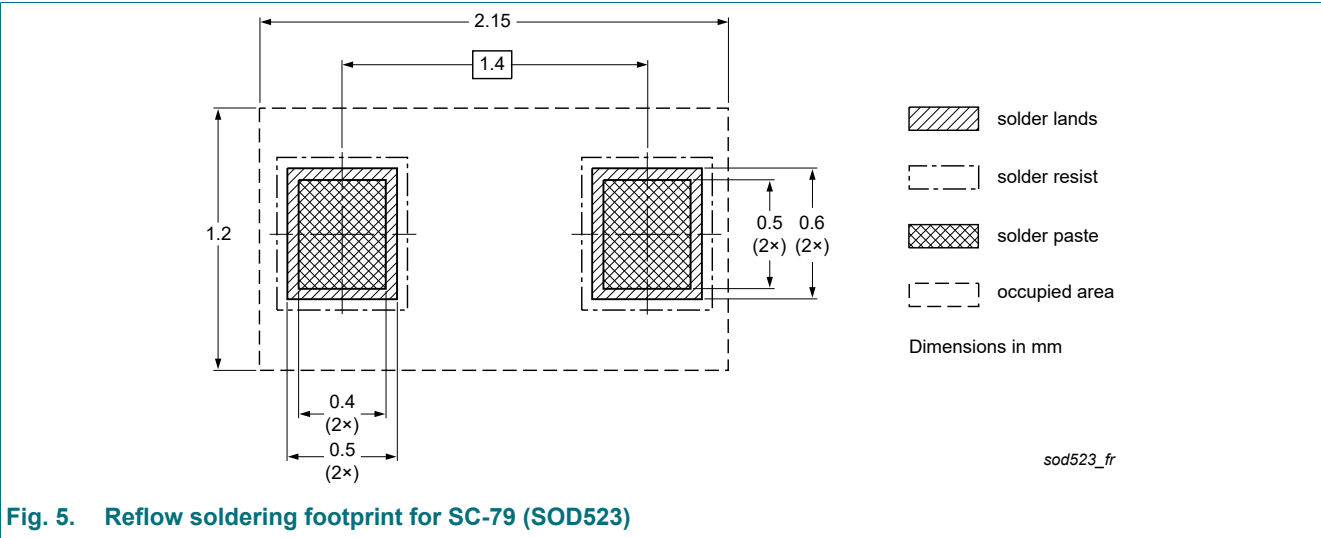


Fig. 5. Reflow soldering footprint for SC-79 (SOD523)

14. Revision history

Table 8. Revision history

| Data sheet ID    | Release date | Data sheet status  | Change notice | Supersedes |
|------------------|--------------|--------------------|---------------|------------|
| PMEG4002EB-Q v.1 | 20210930     | Product data sheet | -             | -          |

## 15. Legal information

### Data sheet status

| Document status<br>[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.                                     |

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- [2] The term 'short data sheet' is explained in section "Definitions".
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