



# PMEG3005AEA

Very low VF MEGA Schottky barrier rectifier

14 June 2019

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 SOD323 (SC-76) very small SMD plastic package.

## 2. Features and benefits

- Very low forward voltage
- High surge current
- Very small plastic SMD package
- AEC-Q101 qualified

## 3. Applications

- Low voltage rectification
- High efficiency DC/DC conversion
- Voltage clamping
- Inverse polarity protection
- Low power consumption applications

## 4. Quick reference data



Table 1. Quick reference data

| Symbol | Parameter       | Conditions                       |     | Min | Typ | Max | Unit          |
|--------|-----------------|----------------------------------|-----|-----|-----|-----|---------------|
| $V_R$  | reverse voltage | $T_j = 25\text{ }^\circ\text{C}$ |     | -   | -   | 30  | V             |
| $V_F$  | forward voltage | $I_F = 500\text{ mA}$            | [1] | -   | 380 | 430 | mV            |
| $I_R$  | reverse current | $V_R = 30\text{ V}$              | [1] | -   | 40  | 150 | $\mu\text{A}$ |

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

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline  | Graphic symbol  |
|-----|--------|-------------|---|---|
| 1   | K      | cathode[1]  | <br>SOD323 | <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 |
| PMEG3005AEA | SOD323  | plastic, surface-mounted package; 2 leads; 1.3 mm pitch; 1.7 mm x 1.25 mm x 0.95 mm body | SOD323  |

## 7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| PMEG3005AEA | E4           |

## 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                     | $T_j = 25\text{ °C}$   | -   | 30  | V    |
| $I_F$            | forward current                     |  | -   | 0.5 | A    |
| $I_{FRM}$        | repetitive peak forward current     | $t_p \leq 1\text{ ms}$ ; $\delta \leq 0.5$                             | -   | 3.5 | A    |
| $I_{FSM}$        | non-repetitive peak forward current | $t_p = 8\text{ ms}$ ; square wave; $T_{j(\text{init})} = 25\text{ °C}$ | -   | 10  | A    |
| $T_j$            | junction temperature                |  | -   | 150 | °C   |
| $T_{\text{amb}}$ | ambient temperature                 |  | -65 | 150 | °C   |
| $T_{\text{stg}}$ | storage temperature                 |  | -65 | 150 | °C   |

## 9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol                | Parameter  | Conditions  | Min     | Typ | Max | Unit |     |
|-----------------------|--|-------------|---------|-----|-----|------|-----|
| $R_{\text{th}(j-a)}$  | thermal resistance from junction to ambient      | in free air | [1] [2] | -   | -   | 450  | K/W |
|                       |  |             | [1] [3] | -   | -   | 210  | K/W |
| $R_{\text{th}(j-sp)}$ | thermal resistance from junction to solder point |             | [1] [4] | -   | -   | 90   | 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 determination of the reverse power losses  $P_R$  and  $I_{F(AV)}$  rating will be 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.

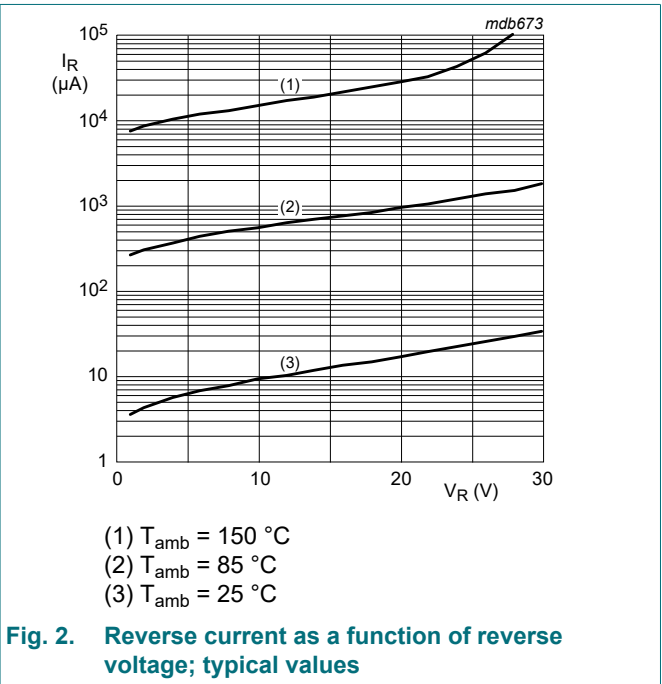
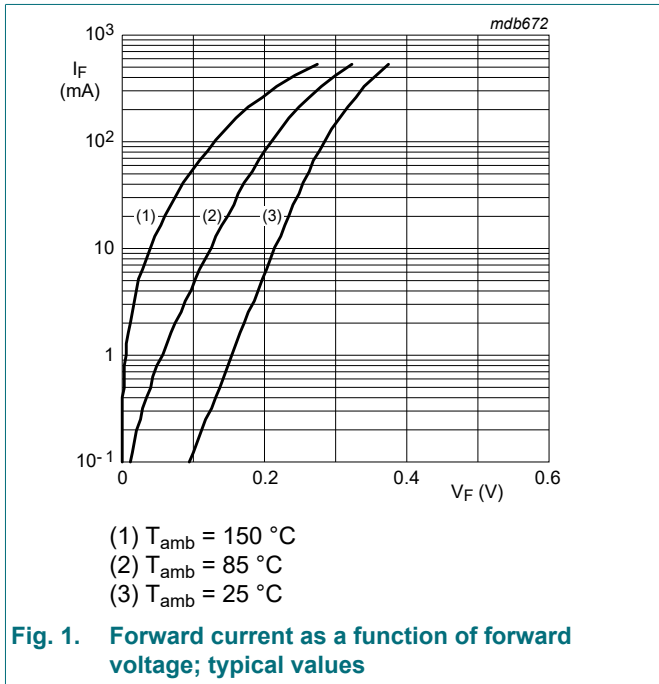
## 10. Characteristics

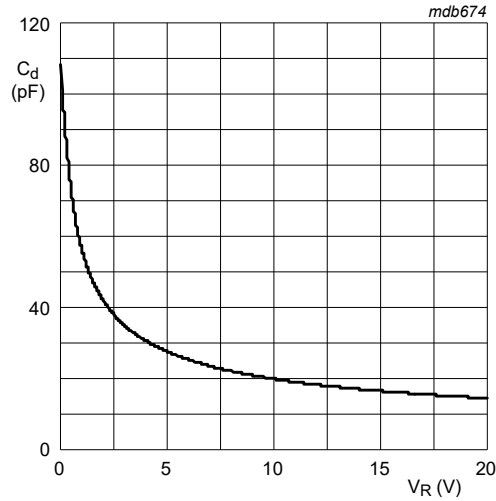
**Table 7. Characteristics**

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

| Symbol | Parameter         | Conditions                           |     | Min | Typ | Max | Unit          |
|--------|-------------------|--------------------------------------|-----|-----|-----|-----|---------------|
| $V_F$  | forward voltage   | $I_F = 0.1\text{ mA}$                | [1] | -   | 90  | 130 | mV            |
|        |                   | $I_F = 1\text{ mA}$                  | [1] | -   | 150 | 200 | mV            |
|        |                   | $I_F = 10\text{ mA}$                 | [1] | -   | 215 | 250 | mV            |
|        |                   | $I_F = 100\text{ mA}$                | [1] | -   | 285 | 340 | mV            |
|        |                   | $I_F = 500\text{ mA}$                | [1] | -   | 380 | 430 | mV            |
| $I_R$  | reverse current   | $V_R = 10\text{ V}$                  | [1] | -   | 12  | 30  | $\mu\text{A}$ |
|        |                   | $V_R = 30\text{ V}$                  | [1] | -   | 40  | 150 | $\mu\text{A}$ |
| $C_d$  | diode capacitance | $V_R = 1\text{ V}; f = 1\text{ MHz}$ |     | -   | 55  | 70  | pF            |

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





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

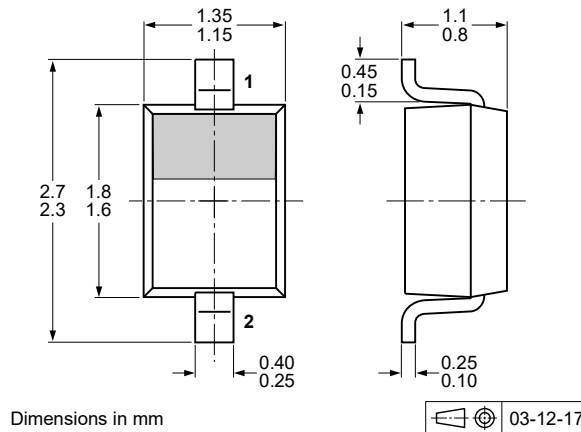


Fig. 4. Package outline SOD323

### 13. Soldering

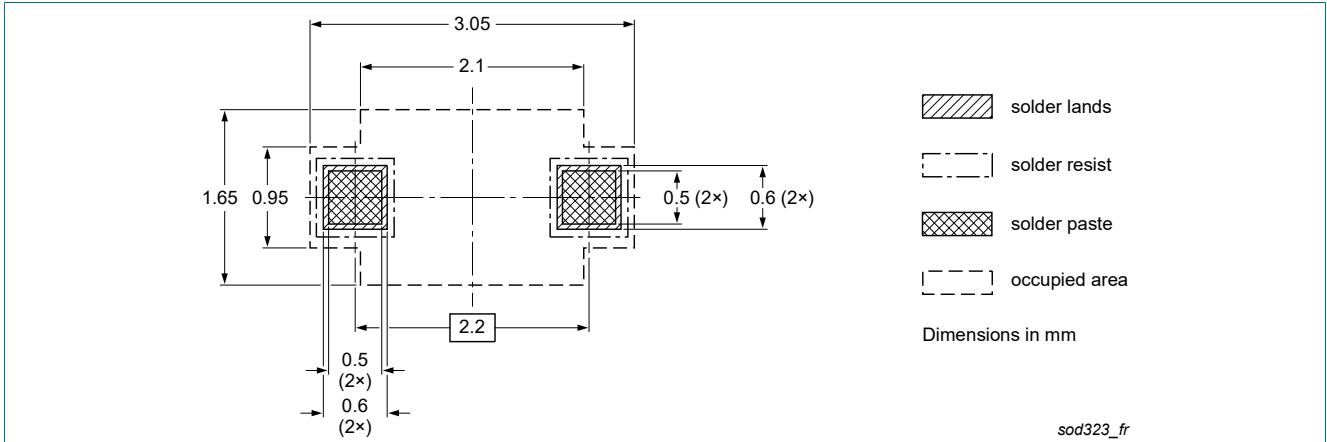


Fig. 5. Reflow soldering footprint for SOD323

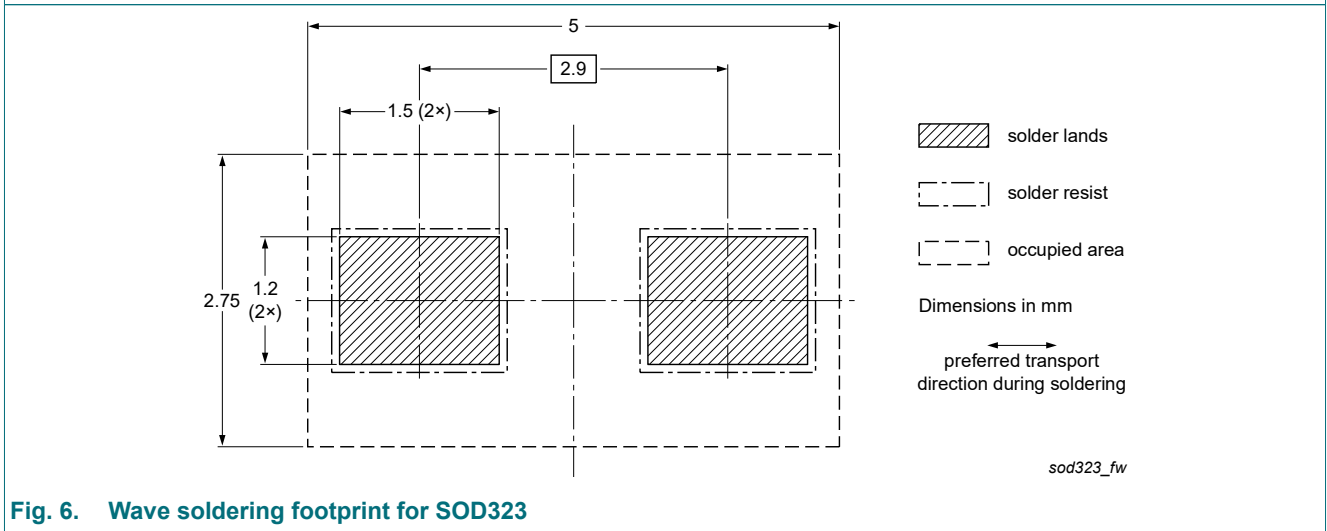


Fig. 6. Wave soldering footprint for SOD323

## 14. Revision history

**Table 8. Revision history**

| Data sheet ID             | Release date  | Data sheet status  | Change notice | Supersedes                |
|---------------------------|---|--------------------|---------------|---------------------------|
| PMEG3005AEA v.2           | 20190614  | Product data sheet | -             | PMEG2005AEA_3005_4005 v.1 |
| Modifications:            | <ul style="list-style-type: none"><li>• Family data sheet separated to single data sheets.</li><li>• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>• Legal texts have been adapted to the new company name where appropriate.</li></ul> |                    |               |                           |
| PMEG2005AEA_3005_4005 v.1 | 20030820  | 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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