



PMEG4005AEA-Q

Very low VF MEGA Schottky barrier rectifier

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

2. Features and benefits

- Very low forward voltage
- High surge current
- Very small plastic SMD package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

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 | $T_j = 25\text{ }^\circ\text{C}$ | | - | - | 40 | V |
| V_F | forward voltage | $I_F = 500\text{ mA}$ | [1] | - | 420 | 470 | mV |
| I_R | reverse current | $V_R = 40\text{ V}$ | [1] | - | 30 | 100 | μA |

[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] | SOD323 | K A sym001 |
| 2 | A | anode | | |

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|---------------|---------|--|---------|
| | Name | Description | Version |
| PMEG4005AEA-Q | 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 |
|---------------|--------------|
| PMEG4005AEA-Q | E3 |

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 | $T_j = 25\text{ °C}$ | - | 40 | 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 | - | 10 | 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] [3] | - | - | 210 | K/W |
| $R_{th(j-sp)}$ | 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.
- [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 cm².
- [4] Soldering point of cathode tab.

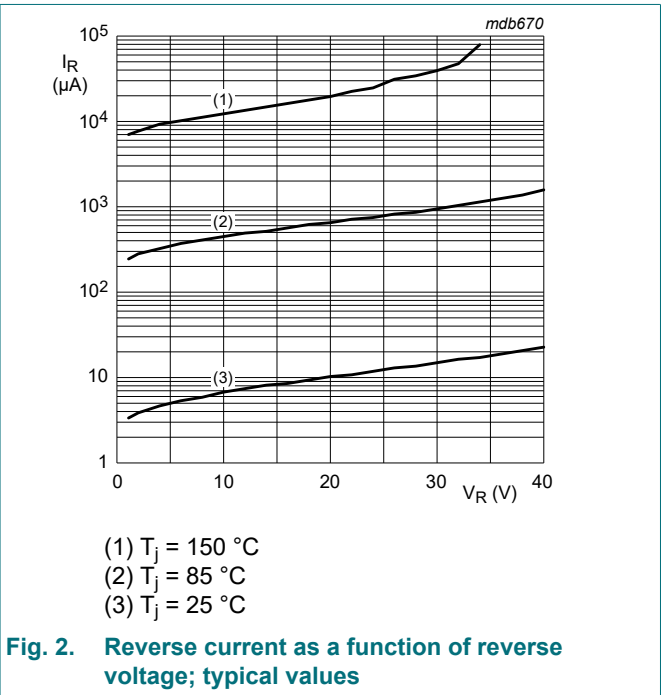
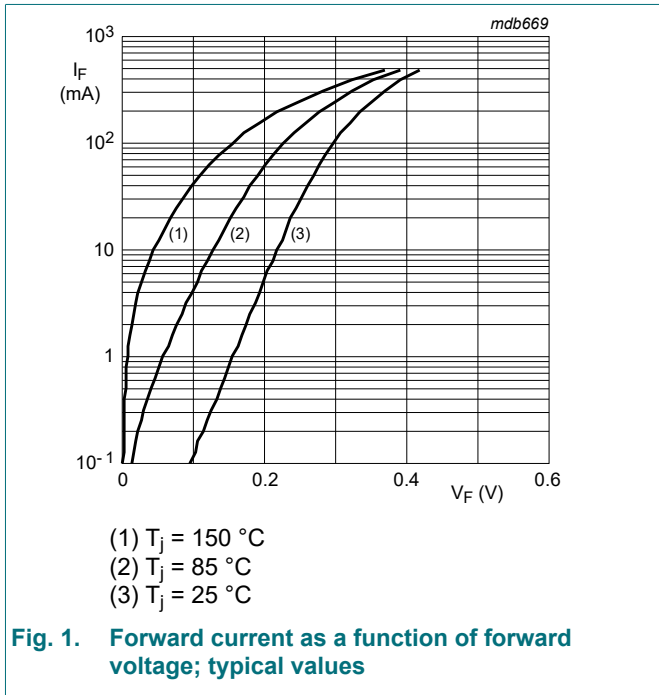
10. Characteristics

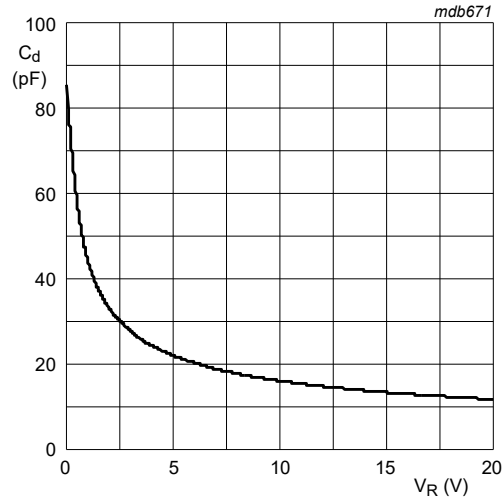
Table 7. Characteristics

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

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|--------|-------------------|--------------------------------------|-----|-----|-----|-----|---------------|
| V_F | forward voltage | $I_F = 0.1\text{ mA}$ | [1] | - | 95 | 130 | mV |
| | | $I_F = 1\text{ mA}$ | [1] | - | 155 | 210 | mV |
| | | $I_F = 10\text{ mA}$ | [1] | - | 220 | 270 | mV |
| | | $I_F = 100\text{ mA}$ | [1] | - | 295 | 350 | mV |
| | | $I_F = 500\text{ mA}$ | [1] | - | 420 | 470 | mV |
| I_R | reverse current | $V_R = 10\text{ V}$ | [1] | - | 7 | 20 | μA |
| | | $V_R = 40\text{ V}$ | [1] | - | 30 | 100 | μA |
| C_d | diode capacitance | $V_R = 1\text{ V}; f = 1\text{ MHz}$ | | - | 43 | 50 | pF |

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





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

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

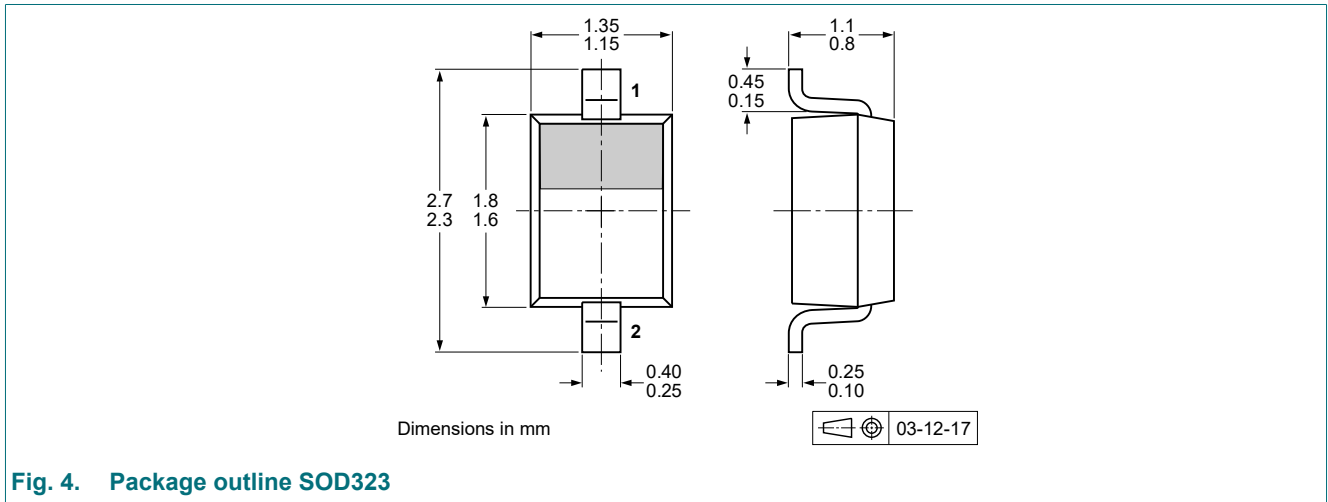


Fig. 4. Package outline SOD323

13. Soldering

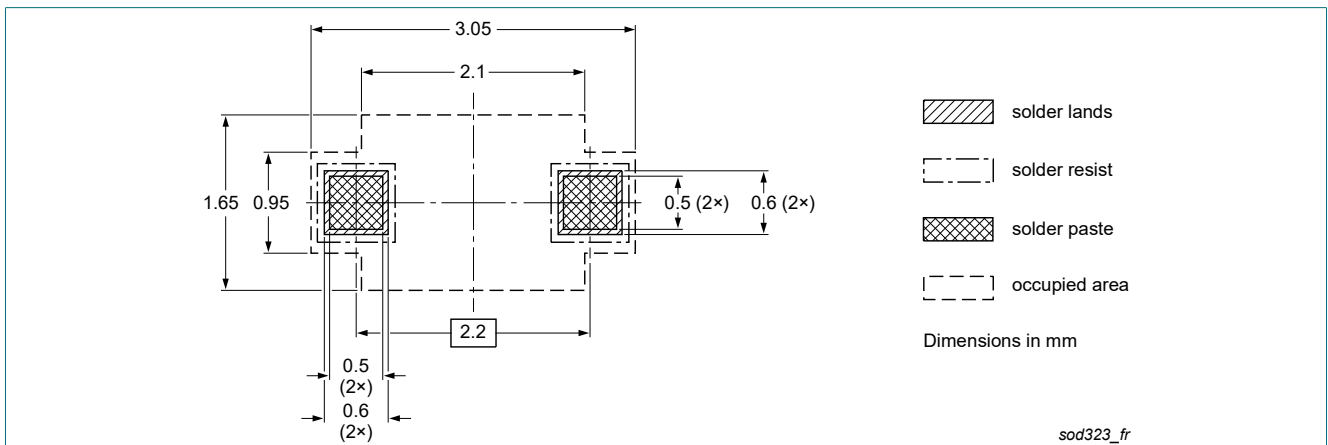


Fig. 5. Reflow soldering footprint for SOD323

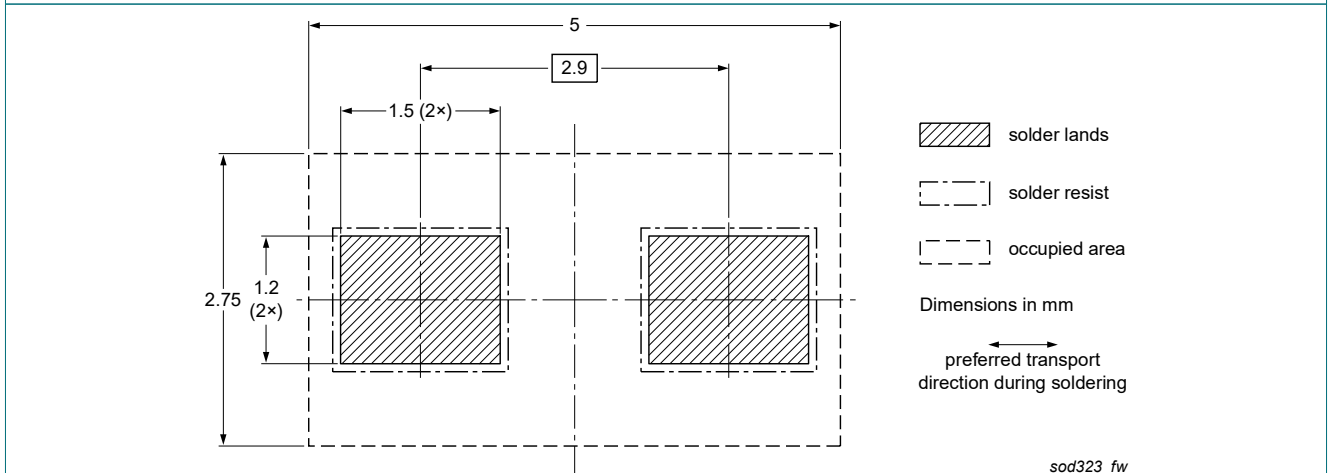


Fig. 6. Wave soldering footprint for SOD323

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|-------------------|--------------|--------------------|---------------|------------|
| PMEG4005AEA-Q v.1 | 20210915 | 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. |

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