



PMEG3010BEA-Q

1 A low VF MEGA Schottky barrier rectifier

25 October 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 Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Forward current: $I_F \leq 1$ A
- Reverse voltage: $V_R \leq 30$ V
- Very low forward voltage
- Very small SMD plastic package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- High efficiency DC-to-DC conversion
- Voltage clamping
- Protection circuits
- Low voltage rectification
- Blocking diodes
- Low power consumption applications

4. Quick reference data

Table 1. Quick reference data

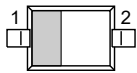

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|--------|-----------------|-------------------------------------|-----|-----|-----|-----|---------|
| I_F | forward current | $T_{sp} \leq 55$ °C | [1] | - | - | 1 | A |
| V_R | reverse voltage | $T_j = 25$ °C | | - | - | 30 | V |
| V_F | forward voltage | $I_F = 1$ A; pulsed; $T_j = 25$ °C | [2] | - | 450 | 560 | mV |
| I_R | reverse current | $V_R = 30$ V; pulsed; $T_j = 25$ °C | [2] | - | 40 | 150 | μ A |

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

[2] Pulsed test: $t_p \leq 300$ μ s; $\delta \leq 0.02$

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------|---|---|
| 1 | K | cathode |  SOD323 |  sym001 |
| 2 | A | anode | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|---------------|---------|--|---------|
| | Name | Description | Version |
| PMEG3010BEA-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 |
|---------------|--------------|
| PMEG3010BEA-Q | V2 |

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 | $T_{sp} \leq 55\text{ °C}$ | [1] | - | 1 | 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 | | [2] | - | 150 | °C |
| T_{amb} | ambient temperature | | [2] | -65 | 150 | °C |
| T_{stg} | storage temperature | | | -65 | 150 | °C |

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

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 | | [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.

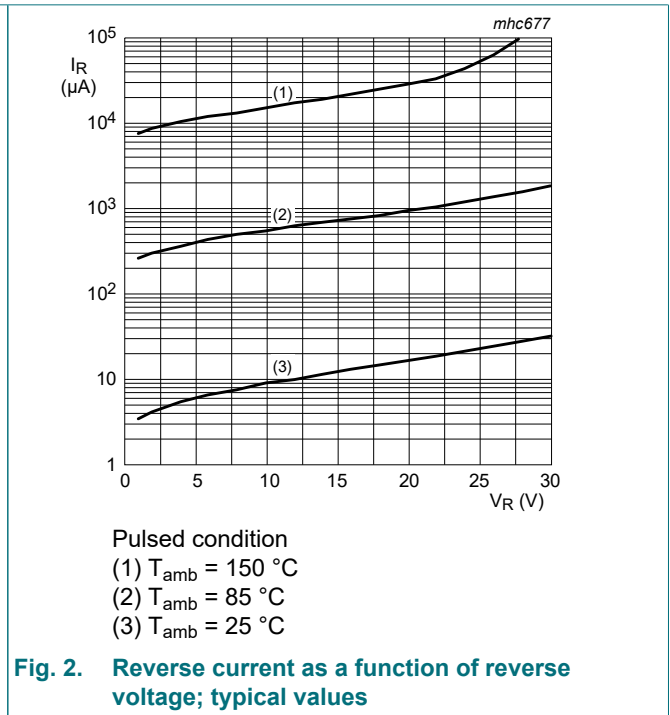
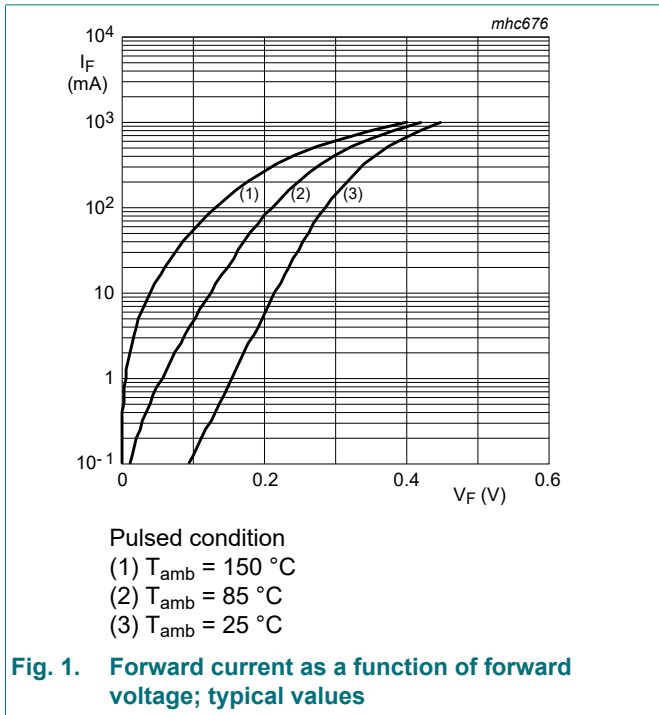
10. Characteristics

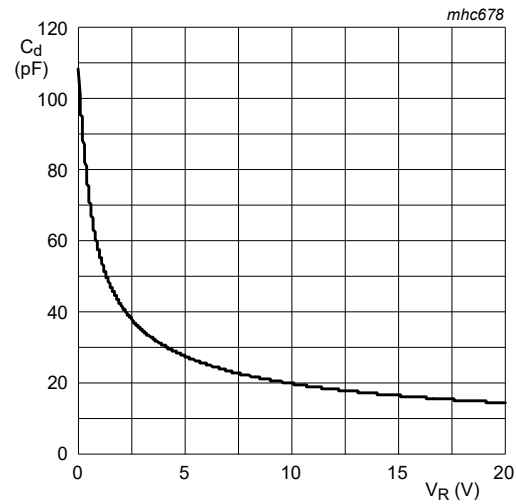
Table 7. Characteristics

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

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|--------|-------------------|--|-----|-----|-----|-----|---------------|
| V_F | forward voltage | $I_F = 0.1\text{ mA}$; pulsed; $T_j = 25\text{ °C}$ | [1] | - | 90 | 130 | mV |
| | | $I_F = 1\text{ mA}$; pulsed; $T_j = 25\text{ °C}$ | [1] | - | 150 | 200 | mV |
| | | $I_F = 10\text{ mA}$; pulsed; $T_j = 25\text{ °C}$ | [1] | - | 215 | 250 | mV |
| | | $I_F = 100\text{ mA}$; pulsed; $T_j = 25\text{ °C}$ | [1] | - | 285 | 340 | mV |
| | | $I_F = 500\text{ mA}$; pulsed; $T_j = 25\text{ °C}$ | [1] | - | 380 | 430 | mV |
| | | $I_F = 1\text{ A}$; pulsed; $T_j = 25\text{ °C}$ | [1] | - | 450 | 560 | mV |
| I_R | reverse current | $V_R = 10\text{ V}$; pulsed; $T_j = 25\text{ °C}$ | [1] | - | 12 | 30 | μA |
| | | $V_R = 30\text{ V}$; pulsed; $T_j = 25\text{ °C}$ | [1] | - | 40 | 150 | μA |
| C_d | diode capacitance | $V_R = 1\text{ V}$; $f = 1\text{ MHz}$ | | - | 55 | 70 | pF |

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





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

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

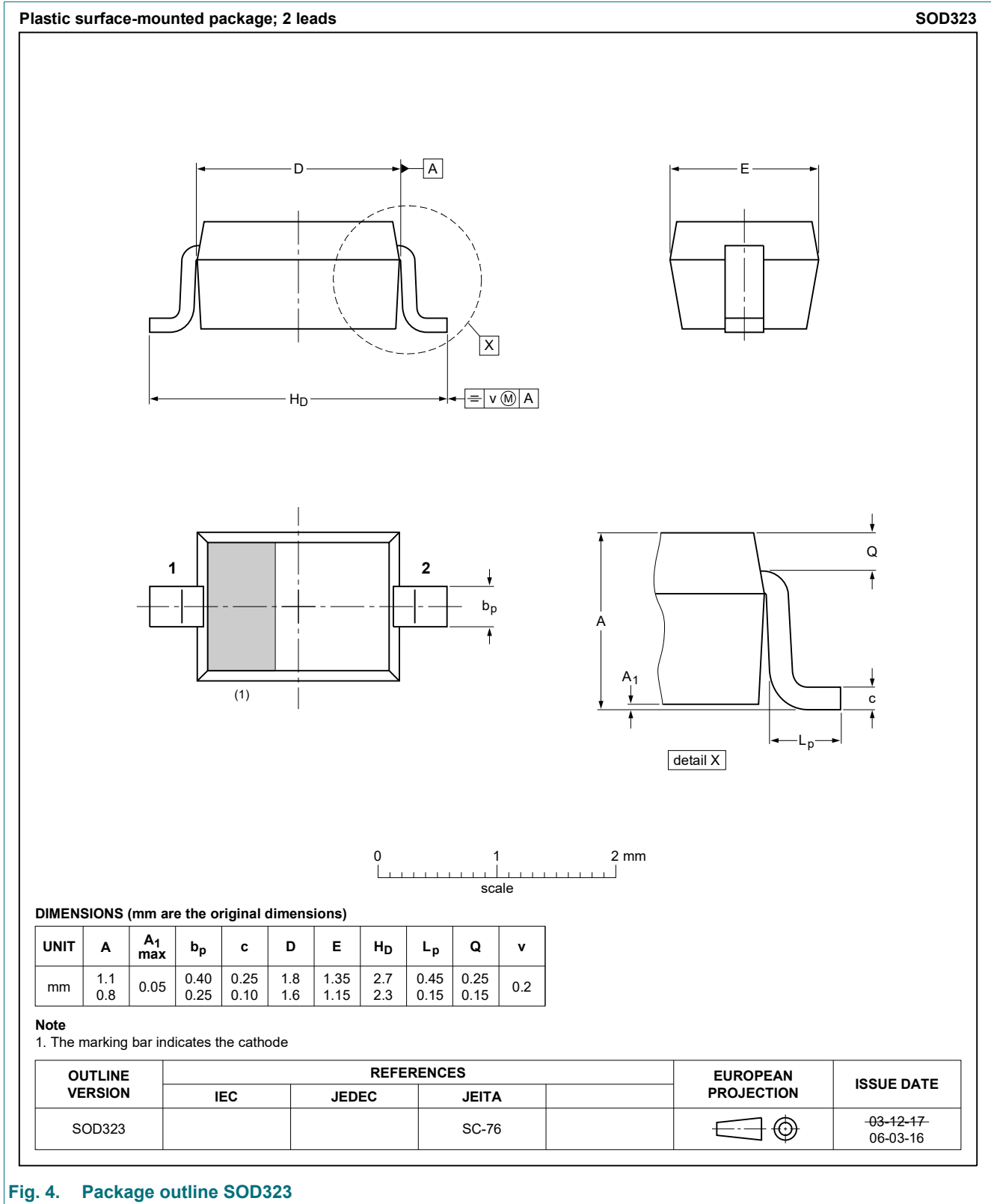


Fig. 4. Package outline SOD323

13. Soldering

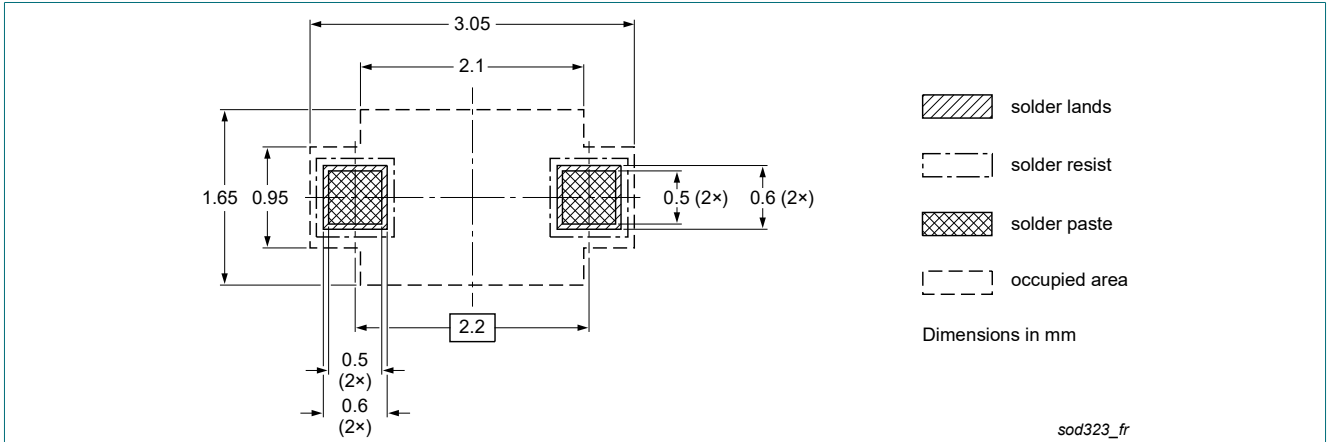


Fig. 5. Reflow soldering footprint for SOD323

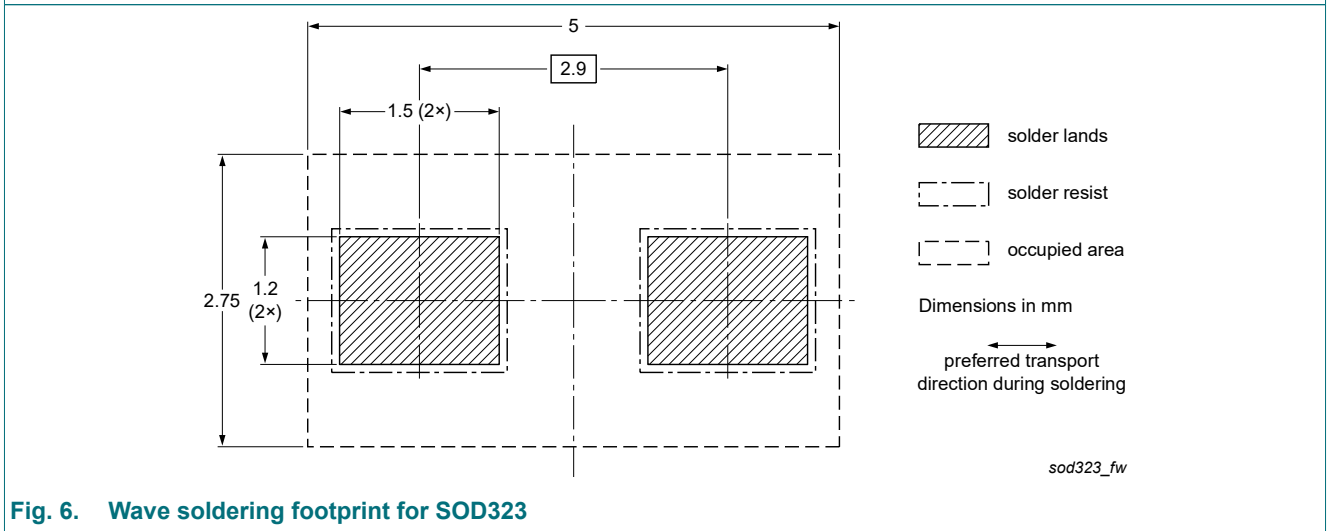


Fig. 6. Wave soldering footprint for SOD323

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|-------------------|--------------|--------------------|---------------|------------|
| PMEG3010BEA-Q v.1 | 20211025 | 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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