



# PMEG2020AEA

20 V, 2 A very low VF MEGA Schottky barrier rectifier in SOD323 (SC-76) package

23 September 2020

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

- Forward current: 2 A
- Reverse voltage: 20 V
- Very low forward voltage
- Very small SMD package.
- AEC-Q101 qualified

## 3. Applications

- Low voltage rectification
- High efficiency DC/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 | $T_{sp} \leq 55\text{ °C}$                                                                                    | [1] | -   | -   | 2   | A    |
| $V_R$  | reverse voltage | $T_j = 25\text{ °C}$                                                                                          |     | -   | -   | 20  | V    |
| $V_F$  | forward voltage | $I_F = 2\text{ A}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed;<br>$T_j = 25\text{ °C}$ |     | -   | 450 | 525 | mV   |

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

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol                                 |
|-----|--------|-------------|--------------------|------------------------------------------------|
| 1   | K      | cathode     | <p>SOD323</p>      | <p>K <math>\rightarrow</math> A<br/>sym001</p> |
| 2   | A      | anode       |                    |                                                |

## 6. Ordering information

Table 3. Ordering information

| Type number | Package |                                                                                          |         |
|-------------|---------|------------------------------------------------------------------------------------------|---------|
|             | Name    | Description                                                                              | Version |
| PMEG2020AEA | 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 |
|-------------|--------------|
| PMEG2020AEA | S3           |

## 8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC60134)

| Symbol    | Parameter                           | Conditions                                  |     | Min | Max | Unit               |
|-----------|-------------------------------------|---------------------------------------------|-----|-----|-----|--------------------|
| $V_R$     | reverse voltage                     | $T_j = 25\text{ }^{\circ}\text{C}$          |     | -   | 20  | V                  |
| $I_F$     | forward current                     | $T_{sp} \leq 55\text{ }^{\circ}\text{C}$    | [1] | -   | 2   | A                  |
| $I_{FRM}$ | repetitive peak forward current     | $t_p \leq 1\text{ ms}$ ; $\delta \leq 0.25$ |     | -   | 7   | A                  |
| $I_{FSM}$ | non-repetitive peak forward current | $t_p = 8\text{ ms}$ ; square wave           |     | -   | 9   | A                  |
| $T_j$     | junction temperature                |                                             | [2] | -   | 150 | $^{\circ}\text{C}$ |
| $T_{amb}$ | ambient temperature                 |                                             | [2] | -65 | 150 | $^{\circ}\text{C}$ |
| $T_{stg}$ | storage temperature                 |                                             |     | -65 | 150 | $^{\circ}\text{C}$ |

[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  |
|                |                                                  |             | [3] [4] | -   | -   | 210 | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             | [5]     | -   | -   | 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 determining 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] 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.

[4] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode  $1\text{ cm}^2$ .

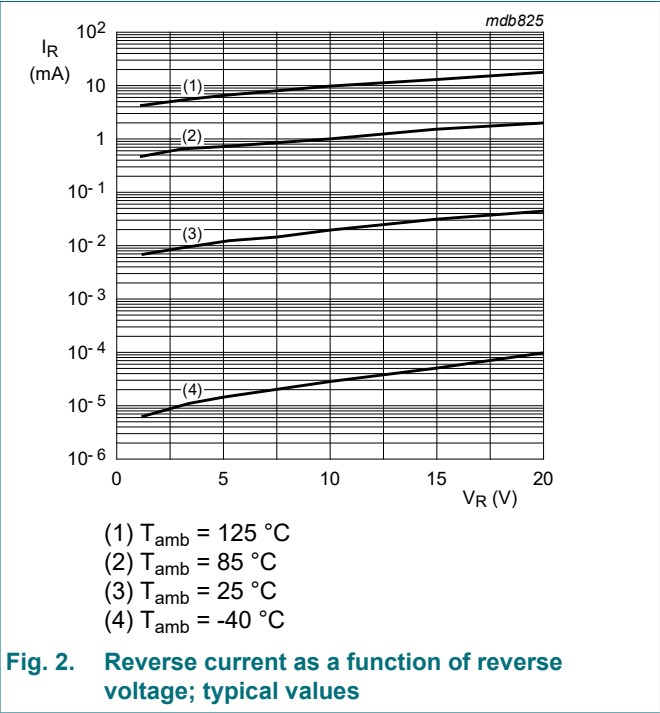
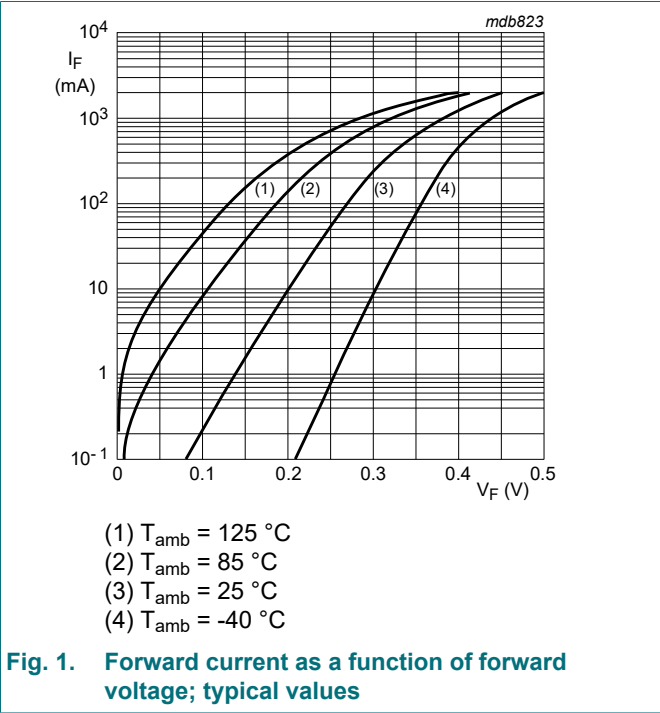
[5] Soldering point of cathode tab.

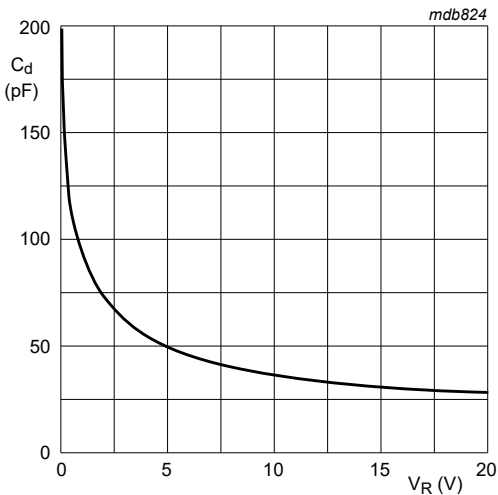
10. Characteristics

Table 7. Characteristics

| Symbol         | Parameter         | Conditions                                                                              | Min | Typ | Max | Unit |
|----------------|-------------------|-----------------------------------------------------------------------------------------|-----|-----|-----|------|
| V <sub>F</sub> | forward voltage   | I <sub>F</sub> = 0.01 A; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C      | -   | 200 | 220 | mV   |
|                |                   | I <sub>F</sub> = 0.1 A; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C       | -   | 265 | 290 | mV   |
|                |                   | I <sub>F</sub> = 1 A; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C         | -   | 380 | 430 | mV   |
|                |                   | I <sub>F</sub> = 2 A; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>j</sub> = 25 °C | -   | 450 | 525 | mV   |
| I <sub>R</sub> | reverse current   | V <sub>R</sub> = 5 V; pulsed; T <sub>j</sub> = 25 °C                                    | -   | 15  | 50  | μA   |
|                |                   | V <sub>R</sub> = 10 V; T <sub>j</sub> = 25 °C [1]                                       | -   | 20  | 80  | μA   |
|                |                   | V <sub>R</sub> = 20 V; T <sub>j</sub> = 25 °C                                           | -   | 50  | 200 | μA   |
| C <sub>d</sub> | diode capacitance | V <sub>R</sub> = 5 V; f = 1 MHz; T <sub>j</sub> = 25 °C                                 | -   | 55  | 70  | pF   |

[1] Pulsed test: t<sub>p</sub> ≤ 300 μs; δ ≤ 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

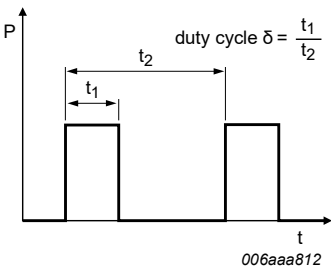
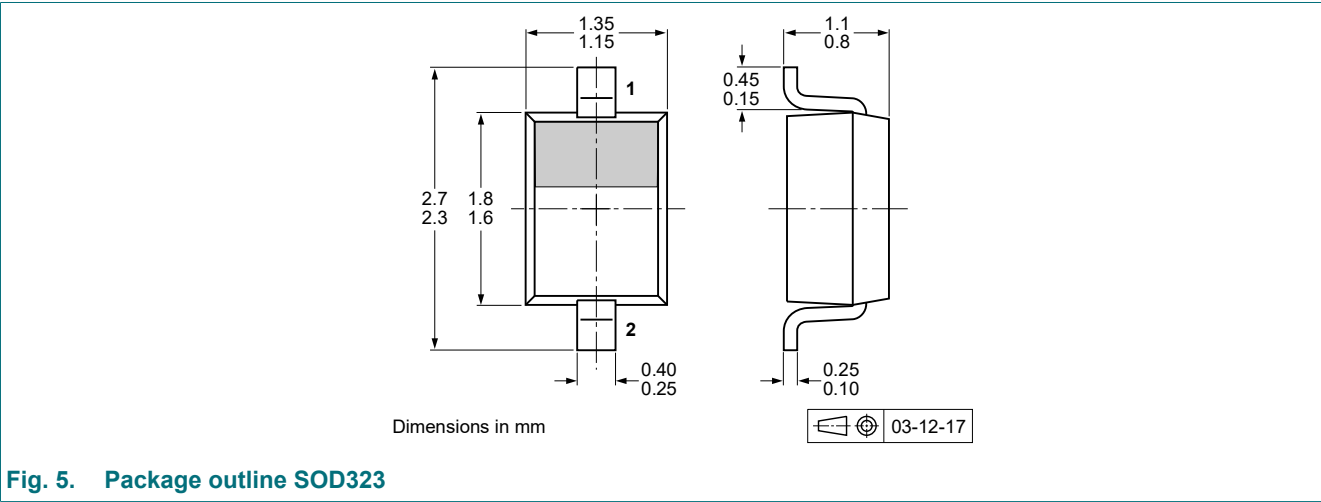


Fig. 4. Duty cycle definition

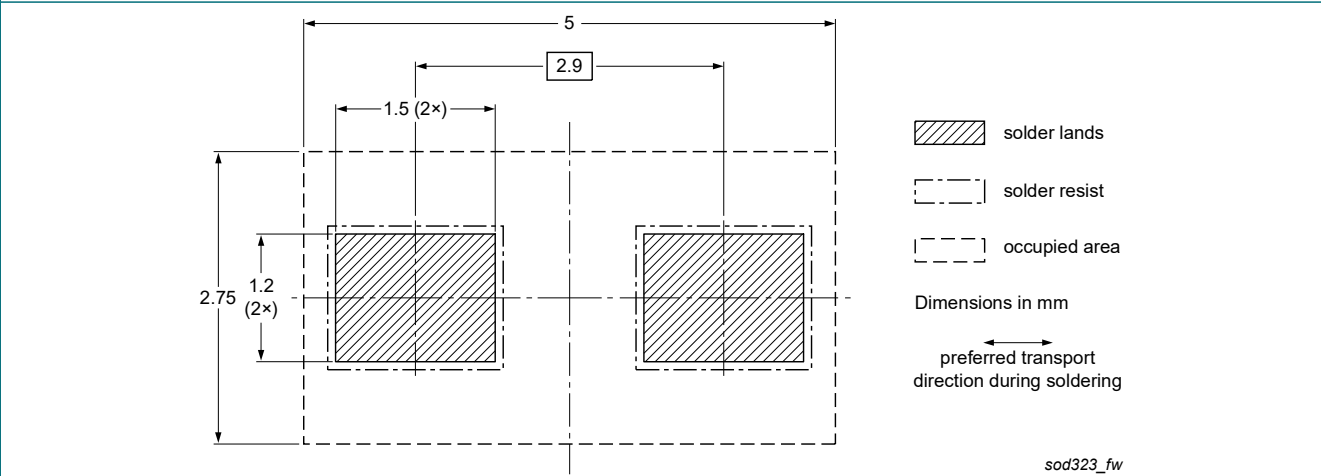
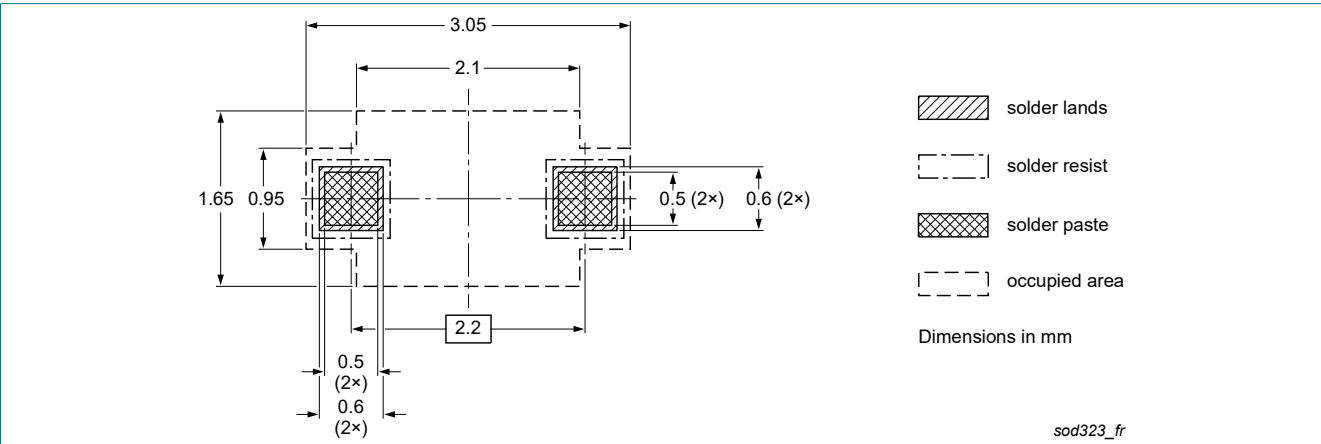
Quality information

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



13. Soldering



## 14. Revision history

**Table 8. Revision history**

| Data sheet ID   | Release date                                                                                                                                                                                                                                                                                                                                                   | Data sheet status  | Change notice | Supersedes      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|-----------------|
| PMEG2020AEA v.2 | 20200923                                                                                                                                                                                                                                                                                                                                                       | Product data sheet | -             | PMEG2010BEA v.1 |
| Modifications:  | <ul style="list-style-type: none"><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><li>• Automotive qualification added in sections: Features and benefits, Test information and Legal information</li></ul> |                    |               |                 |
| PMEG2020AEA v.2 | 20040226                                                                                                                                                                                                                                                                                                                                                       | 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.                                     |

- [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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