



# PMEG3005EJ

30 V, 0.5 A very low VF MEGA Schottky barrier rectifier

1 October 2022

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 small SOD323F (SC-90) Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Very low forward voltage
- Flat lead SMD package

## 3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Reverse polarity protection
- Low power consumption applications

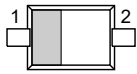

## 4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter       | Conditions  | Min | Typ | Max | Unit |
|--------|-----------------|---|-----|-----|-----|------|
| $I_F$  | forward current | $T_{sp} \leq 55\text{ °C}$  | -   | -   | 0.5 | A    |
| $V_R$  | reverse voltage | $T_{amb} = 25\text{ °C}$  | -   | -   | 30  | V    |
| $V_F$  | forward voltage | $I_F = 500\text{ mA}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{amb} = 25\text{ °C}$ | -   | 380 | 430 | mV   |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline   | Graphic symbol   |
|-----|--------|-------------|--|--|
| 1   | K      | cathode[1]  | <br>SC-90 (SOD323F) | <br><i>sym001</i> |
| 2   | A      | anode       |  |  |

[1] The marking bar indicates the cathode.

## 6. Ordering information

Table 3. Ordering information

| Type number                | Package |   |                         |
|----------------------------|---------|---|-------------------------|
|                            | Name    | Description   | Version                 |
| <a href="#">PMEG3005EJ</a> | SC-90   | plastic, surface-mounted package; 2 leads; 1.7 mm x 1.25 mm x 0.7 mm body | <a href="#">SOD323F</a> |

## 7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| PMEG3005EJ  | CD           |

## 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                     | $T_{amb} = 25\text{ °C}$   |     | -   | 30  | V    |
| $I_F$     | forward current                     | $T_{sp} \leq 55\text{ °C}$   |     | -   | 0.5 | 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; $T_{j(\text{init})} = 25\text{ °C}$ |     | -   | 10  | A    |
| $P_{tot}$ | total power dissipation             | $T_{amb} \leq 25\text{ °C}$  | [1] | -   | 360 | mW   |
|           |                                     |  | [2] | -   | 830 | mW   |
| $T_j$     | junction temperature                |  |     | -   | 150 | °C   |
| $T_{amb}$ | ambient temperature                 |  |     | -65 | 150 | °C   |
| $T_{stg}$ | storage temperature                 |  |     | -65 | 150 | °C   |

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

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

## 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] | -   | -   | 350 | K/W  |
|                |  |             | [1] [3] | -   | -   | 150 | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             |         | -   | -   | 55  | 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.

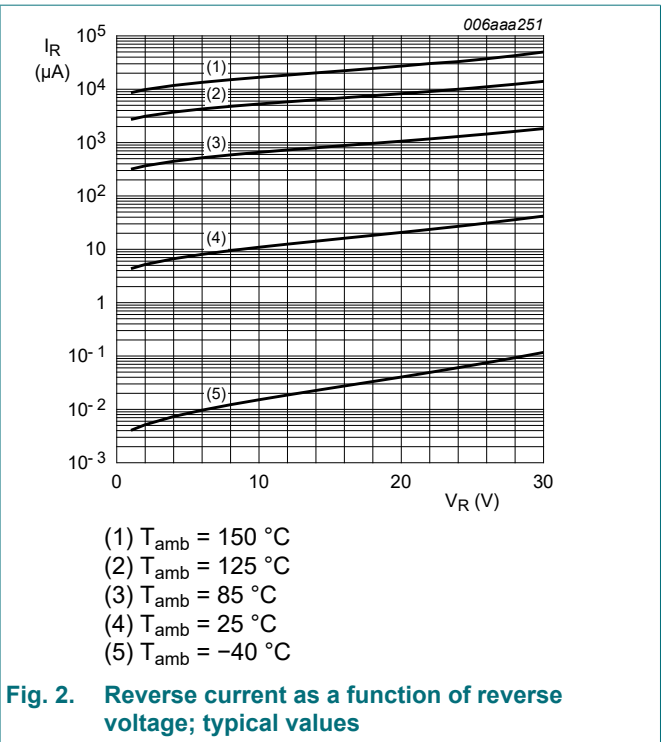
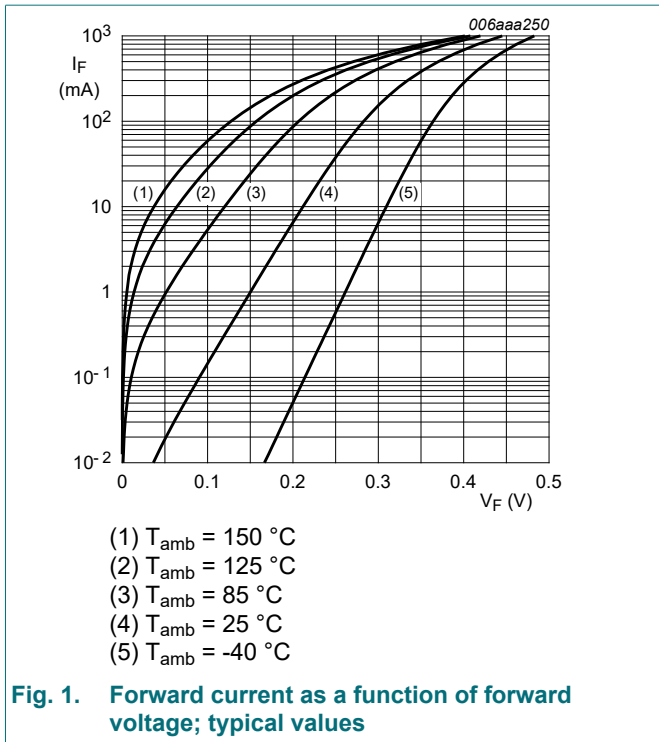
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

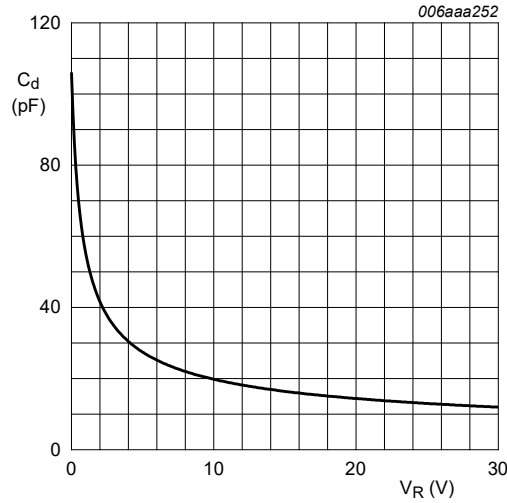
## 10. Characteristics

Table 7. Characteristics

| Symbol         | Parameter         | Conditions   | Min | Typ | Max | Unit |    |
|----------------|-------------------|--|-----|-----|-----|------|----|
| V <sub>F</sub> | forward voltage   | I <sub>F</sub> = 0.1 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C | -   | 90  | 130 | mV   |    |
|                |                   | I <sub>F</sub> = 1 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C   | -   | 150 | 200 | mV   |    |
|                |                   | I <sub>F</sub> = 10 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C  | -   | 215 | 250 | mV   |    |
|                |                   | I <sub>F</sub> = 100 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C | -   | 285 | 340 | mV   |    |
|                |                   | I <sub>F</sub> = 500 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C | -   | 380 | 430 | mV   |    |
| I <sub>R</sub> | reverse current   | V <sub>R</sub> = 10 V; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C   | [1] | -   | 12  | 30   | μA |
|                |                   | V <sub>R</sub> = 30 V; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>amb</sub> = 25 °C   | [1] | -   | 40  | 150  | μA |
| C <sub>d</sub> | diode capacitance | V <sub>R</sub> = 1 V; f = 1 MHz; T <sub>amb</sub> = 25 °C                                    | -   | 55  | 70  | pF   |    |

[1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses P<sub>R</sub> are a significant part of the total power losses. Nomograms for determination of the reverse power losses P<sub>R</sub> and I<sub>F(AV)</sub> rating will be available on request.





f = 1 MHz; T<sub>amb</sub> = 25 °C

Fig. 3. Diode capacitance as a function of reverse voltage; typical values

## 11. Package outline

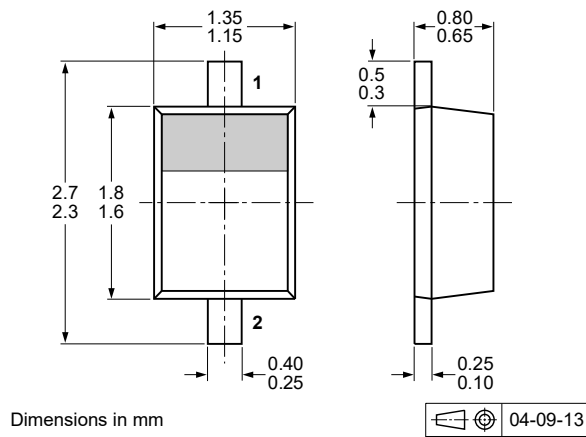


Fig. 4. Package outline SC-90 (SOD323F)

## 12. Soldering

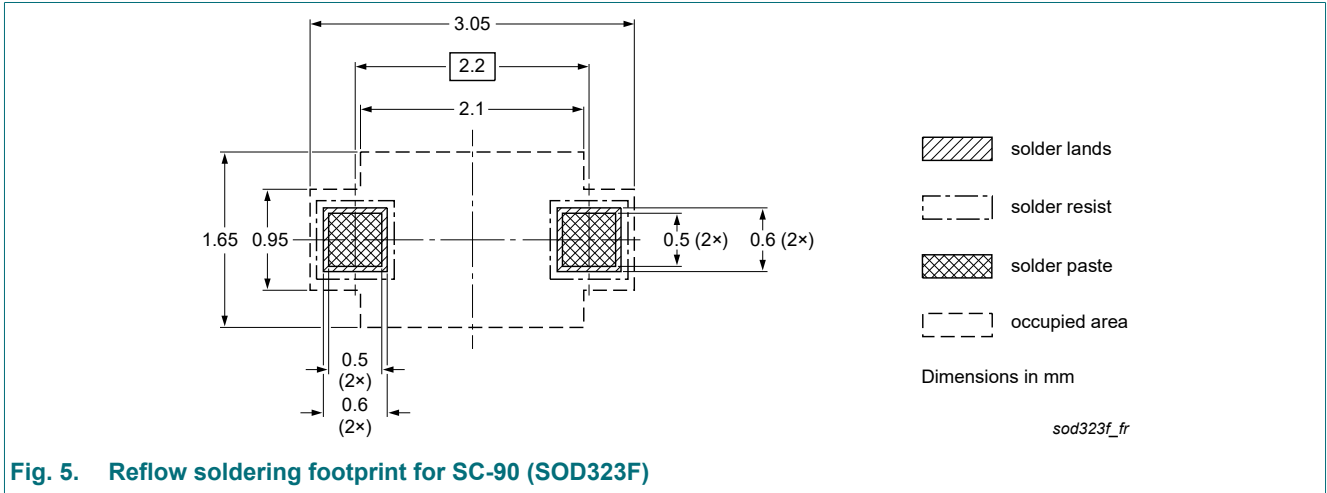


Fig. 5. Reflow soldering footprint for SC-90 (SOD323F)

## 13. Revision history

Table 8. Revision history

| Data sheet ID        | Release date  | Data sheet status  | Change notice | Supersedes           |
|----------------------|---|--------------------|---------------|----------------------|
| PMEG3005EJ v.3       | 20221001  | Product data sheet | -             | PMEGXX05EH_EJ_SE R_2 |
| Modifications:       | <ul style="list-style-type: none"> <li>Family data sheet reduced to single type data sheet.</li> <li>Product changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).</li> <li>Packing information removed.</li> </ul> |                    |               |                      |
| PMEGXX05EH_EJ_SE R_2 | 20100113  | Product data sheet | -             | PMEGXX05EH_EJ_SE R_1 |
| PMEGXX05EH_EJ_SE R_1 | 20050412  | Product data sheet | -             | -                    |

## 14. 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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