



PMEG3005EH-Q

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

25 August 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 small SOD123F Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Very low forward voltage
- Flat lead SMD package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

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] |  SOD123F |  sym001 |
| 2 | A | anode | | |

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|--------------|---------|--|---------|
| | Name | Description | Version |
| PMEG3005EH-Q | SOD123F | plastic, surface-mounted package; 2 leads; 2.6 mm x 1.6 mm x 1.1 mm body | SOD123F |

7. Marking

Table 4. Marking codes

| Type number | Marking code |
|--------------|--------------|
| PMEG3005EH-Q | A4 |

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; $T_{j(init)} = 25\text{ °C}$ | | - | 10 | A |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$ | [1] | - | 375 | 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 cm².

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] | - | - | 330 | K/W |
| | | | [1] [3] | - | - | 150 | K/W |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | | | - | - | 60 | 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.

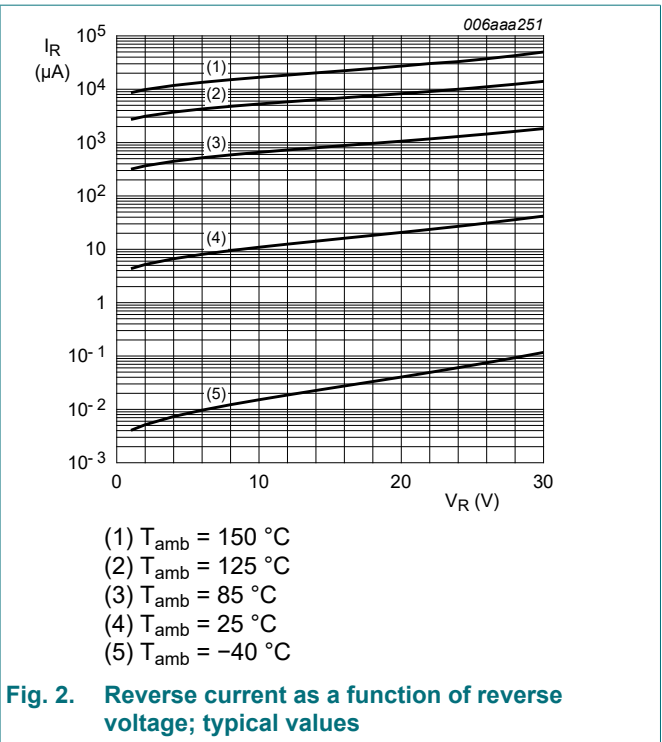
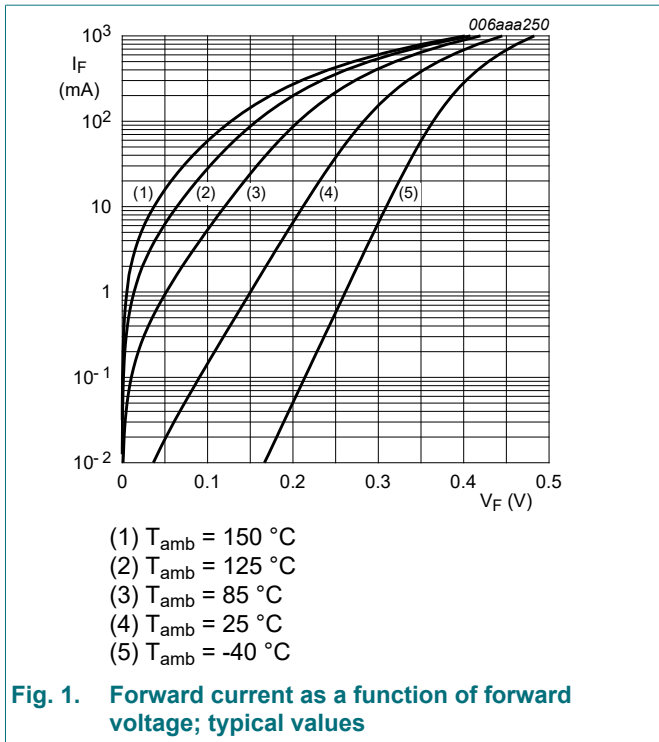
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².

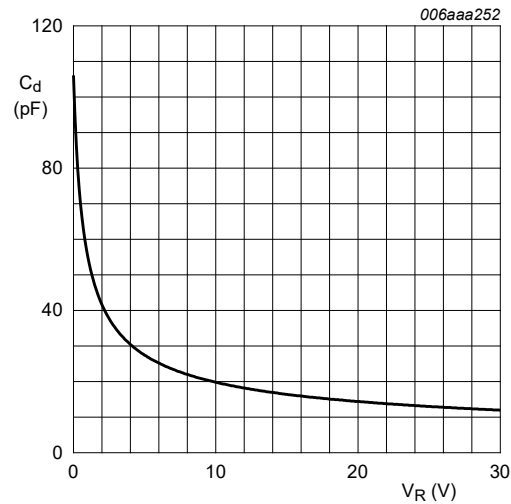
10. Characteristics

Table 7. Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit | |
|----------------|-------------------|--|-----|-----|-----|------|----|
| V _F | forward voltage | I _F = 0.1 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C | - | 90 | 130 | mV | |
| | | I _F = 1 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C | - | 150 | 200 | mV | |
| | | I _F = 10 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C | - | 215 | 250 | mV | |
| | | I _F = 100 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C | - | 285 | 340 | mV | |
| | | I _F = 500 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C | - | 380 | 430 | mV | |
| I _R | reverse current | V _R = 10 V; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C | [1] | - | 12 | 30 | μA |
| | | V _R = 30 V; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C | [1] | - | 40 | 150 | μA |
| C _d | diode capacitance | V _R = 1 V; f = 1 MHz; T _{amb} = 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_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.





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

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

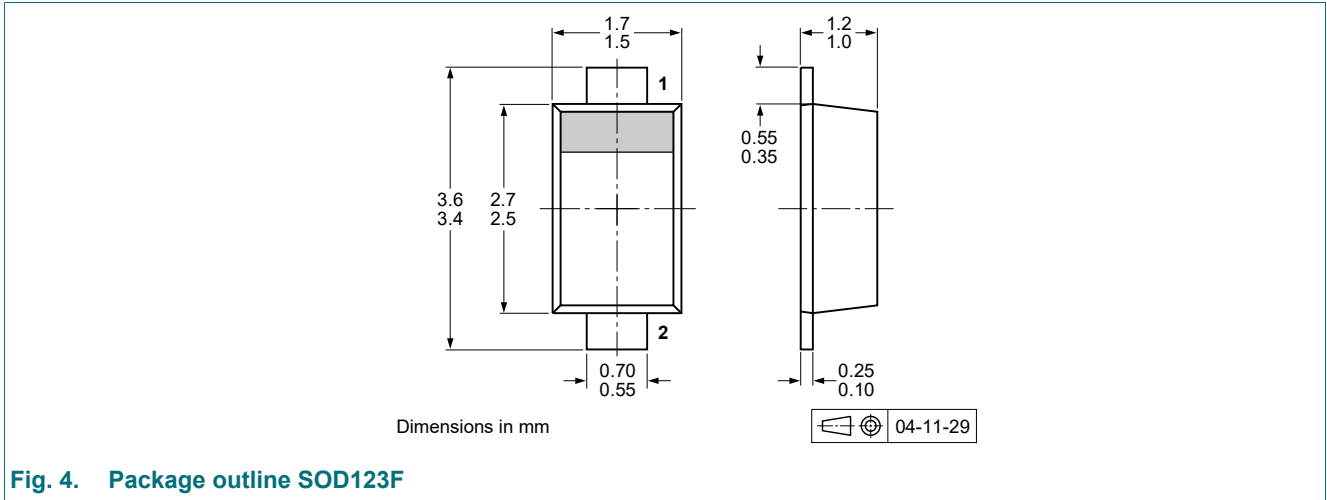
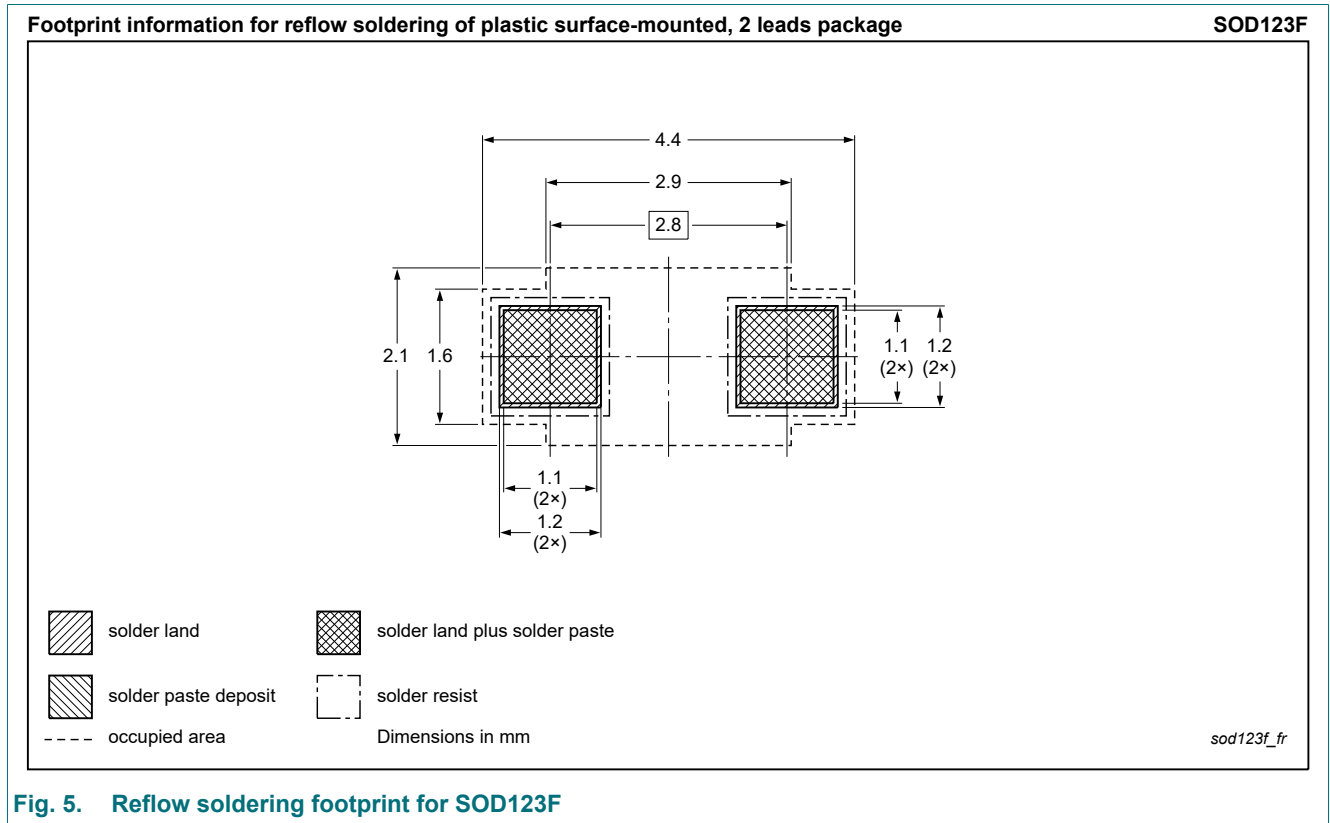


Fig. 4. Package outline SOD123F

13. Soldering



14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|------------------|--------------|--------------------|---------------|------------|
| PMEG3005EH-Q v.1 | 20210825 | 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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For sales office addresses, please send an email to: salesaddresses@nexperia.com
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