



PMEG1030EH

10 V, 3 A ultra low VF Schottky barrier rectifier

21 April 2023

Product data sheet

1. General description

Planar Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a small and flat lead SOD123F Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Forward current: 3 A
- Reverse voltage: 10 V
- Ultra low forward voltage
- Small and flat lead SMD package
- AEC-Q101 qualified

3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switched-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 | $T_{sp} \leq 55\text{ °C}$ | - | - | 3 | A |
| V_R | reverse voltage | | - | - | 10 | V |
| V_F | forward voltage | $I_F = 3\text{ A}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ °C}$ | - | 390 | 530 | mV |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------|--|---|
| 1 | K | cathode[1] |  SOD123F |  aaa-003679 |
| 2 | A | anode | | |

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|----------------------------|---------|--|-------------------------|
| | Name | Description | Version |
| PMEG1030EH | 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 |
|-------------|--------------|
| PMEG1030EH | AC |

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 | | | - | 10 | V |
| I_F | forward current | $T_{sp} \leq 55 \text{ }^\circ\text{C}$ | | - | 3 | A |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1 \text{ ms}$; $\delta \leq 0.25$ | | - | 5.5 | A |
| I_{FSM} | non-repetitive peak forward current | $t_p = 8 \text{ ms}$; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$ | | - | 9 | A |
| P_{tot} | total power dissipation | $T_{\text{amb}} \leq 25 \text{ }^\circ\text{C}$ | [1] | - | 375 | mW |
| | | | [2] | - | 830 | mW |
| T_j | junction temperature | | | - | 150 | $^\circ\text{C}$ |
| T_{amb} | ambient temperature | | | -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] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2 .

9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|-----------------------|--|-------------|---------|-----|-----|-----|------|
| $R_{\text{th}(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] [2] | - | - | 330 | K/W |
| | | | [1] [3] | - | - | 150 | K/W |
| $R_{\text{th}(j-sp)}$ | 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.

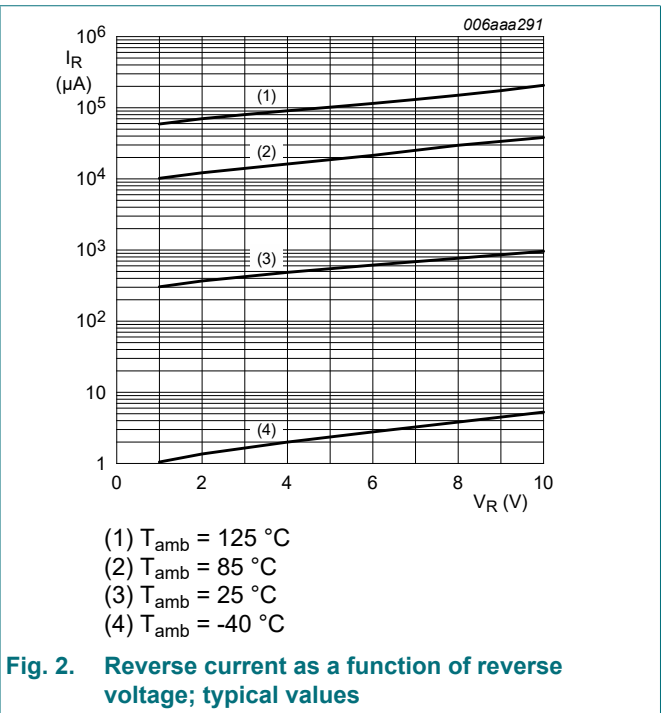
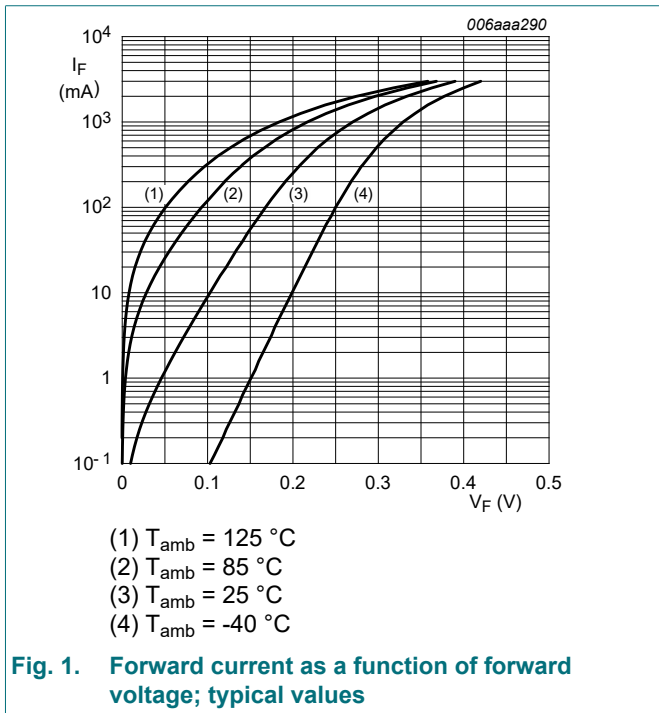
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

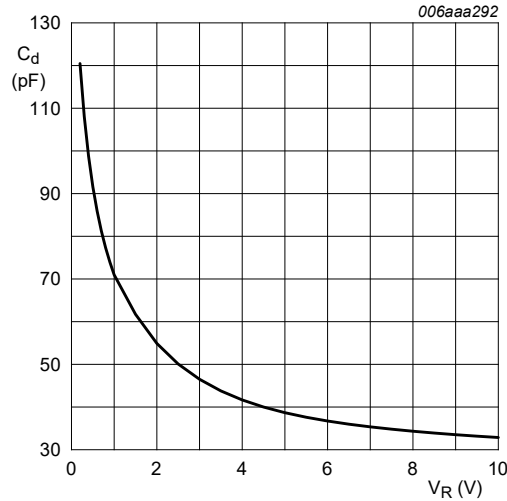
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2 .

10. Characteristics

Table 7. Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-------------------|---|-----|------|-----|------|
| V_F | forward voltage | $I_F = 10 \text{ mA}$; pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 100 | 130 | mV |
| | | $I_F = 100 \text{ mA}$; pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 170 | 200 | mV |
| | | $I_F = 1 \text{ A}$; pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 280 | 350 | mV |
| | | $I_F = 3 \text{ A}$; pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 390 | 530 | mV |
| I_R | reverse current | $V_R = 5 \text{ V}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 0.55 | 2 | mA |
| | | $V_R = 8 \text{ V}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 0.8 | 2.5 | mA |
| | | $V_R = 10 \text{ V}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 1 | 3 | mA |
| C_d | diode capacitance | $V_R = 1 \text{ V}$; $f = 1 \text{ MHz}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 70 | 85 | pF |





f = 1 MHz; T_{amb} = 25 °C

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

11. Test information

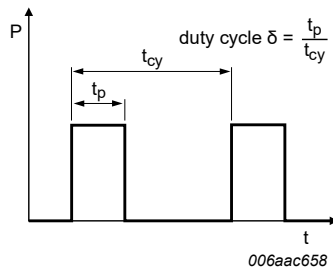


Fig. 4. Duty cycle definition

The current ratings for the typical waveforms are calculated according to the equations:

$$I_{F(AV)} = I_M \times \delta \text{ with } I_M \text{ defined as peak current}$$

$$I_{RMS} = I_{F(AV)} \text{ at DC}$$

$$I_{RMS} = I_M \times \sqrt{\delta} \text{ with } I_{RMS} \text{ defined as RMS current}$$

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

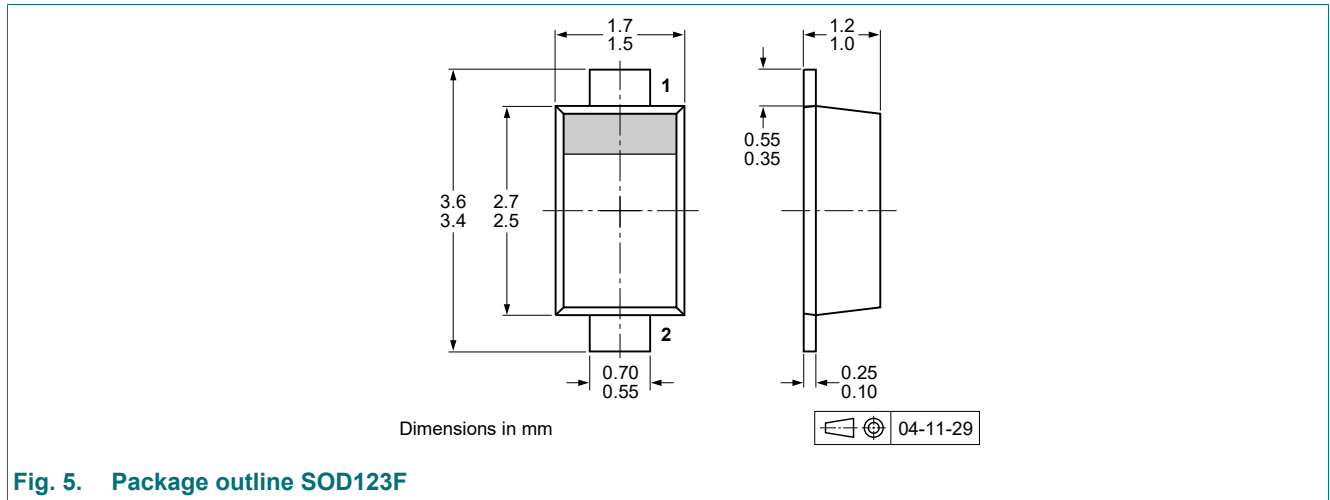


Fig. 5. Package outline SOD123F

13. Soldering

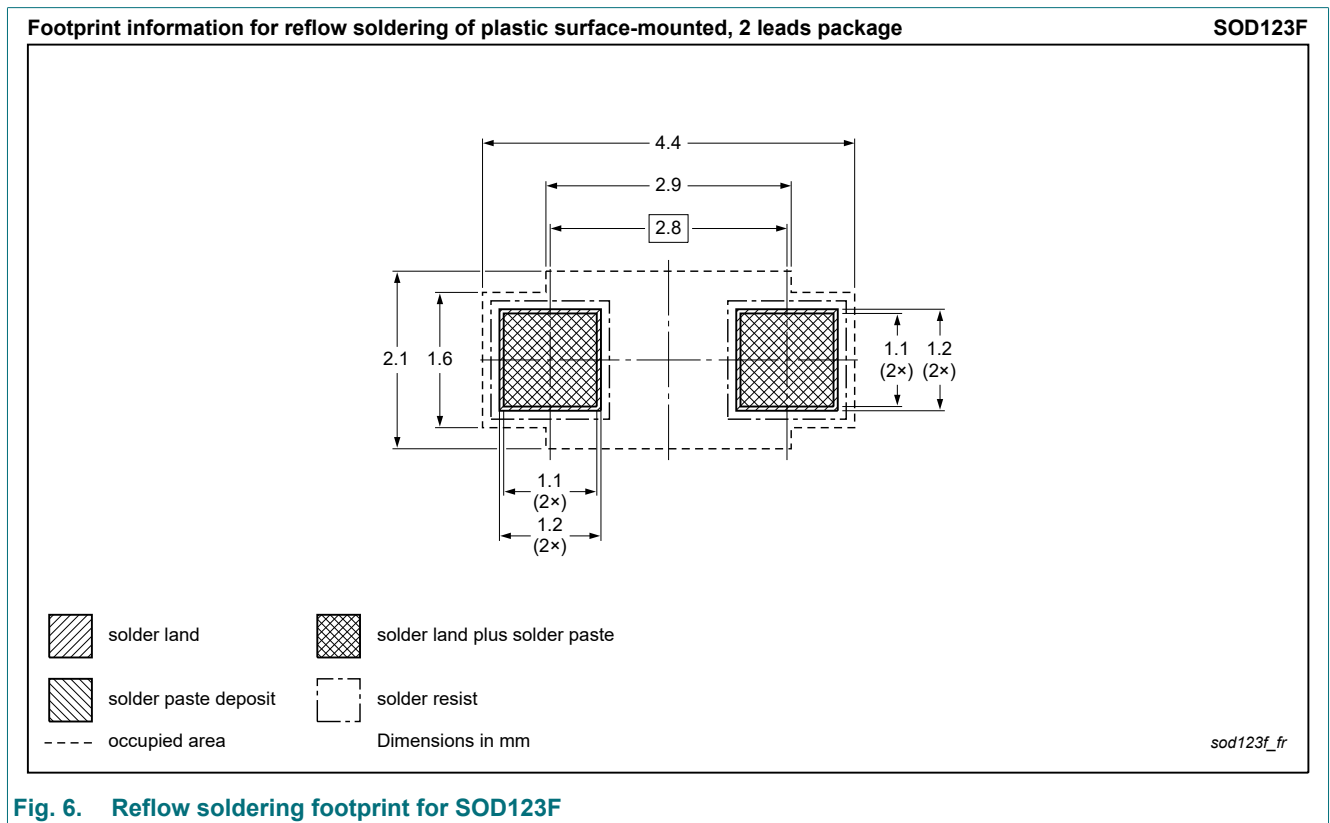


Fig. 6. Reflow soldering footprint for SOD123F

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|-----------------|---|--------------------|---------------|-----------------|
| PMEG1030EH v. 5 | 20230421 | Product data sheet | - | PMEG1030EH_EJ_4 |
| Modifications: | <ul style="list-style-type: none">• Family data sheet splitted to single type data sheets.• Packing information removed. | | | |
| PMEG1030EH_EJ_4 | 20100115 | Product data sheet | - | PMEG1030EH_EJ_3 |
| PMEG1030EH_EJ_3 | 20050602 | Product data sheet | - | PMEG1030EH_EJ_2 |
| PMEG1030EH_EJ_2 | 20050405 | 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. |

- [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".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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