



# PMEG6010CEH

60 V, 1 A very low VF Schottky barrier rectifier

1 July 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:  $I_F \leq 1$  A
- Reverse voltage:  $V_R \leq 60$  V
- Very low forward voltage
- Small and flat lead SMD plastic 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 | $T_{sp} \leq 55$ °C                                                             | -   | -   | 1   | A       |
| $V_F$  | forward voltage | $I_F = 1$ A; pulsed; $t_p \leq 300$ $\mu$ s; $\delta \leq 0.02$ ; $T_j = 25$ °C | -   | 570 | 660 | mV      |
| $V_R$  | reverse voltage |                                                                                 | -   | -   | 60  | V       |
| $I_R$  | reverse current | $V_R = 60$ V; $T_j = 25$ °C                                                     | -   | 11  | 50  | $\mu$ A |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline                                                                             | Graphic symbol                                                                                      |
|-----|--------|-------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1   | K      | cathode[1]  | <br>SOD123F | <br>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 |
| PMEG6010CEH | 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 |
|-------------|--------------|
| PMEG6010CEH | CA           |

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol           | Parameter                           | Conditions                                                       |     | Min | Max | Unit |
|------------------|-------------------------------------|------------------------------------------------------------------|-----|-----|-----|------|
| V <sub>R</sub>   | reverse voltage                     |                                                                  |     | -   | 60  | V    |
| I <sub>F</sub>   | forward current                     | T <sub>sp</sub> ≤ 55 °C                                          |     | -   | 1   | A    |
| I <sub>FRM</sub> | repetitive peak forward current     | t <sub>p</sub> ≤ 1 ms; δ ≤ 0.25                                  |     | -   | 7   | A    |
| I <sub>FSM</sub> | non-repetitive peak forward current | t <sub>p</sub> = 8 ms; square wave; T <sub>j(init)</sub> = 25 °C |     | -   | 9   | A    |
| P <sub>tot</sub> | total power dissipation             | T <sub>amb</sub> ≤ 25 °C                                         | [1] | -   | 375 | mW   |
|                  |                                     |                                                                  | [2] | -   | 830 | mW   |
| T <sub>j</sub>   | junction temperature                |                                                                  |     | -   | 150 | °C   |
| T <sub>amb</sub> | ambient temperature                 |                                                                  |     | -65 | 150 | °C   |
| T <sub>stg</sub> | 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

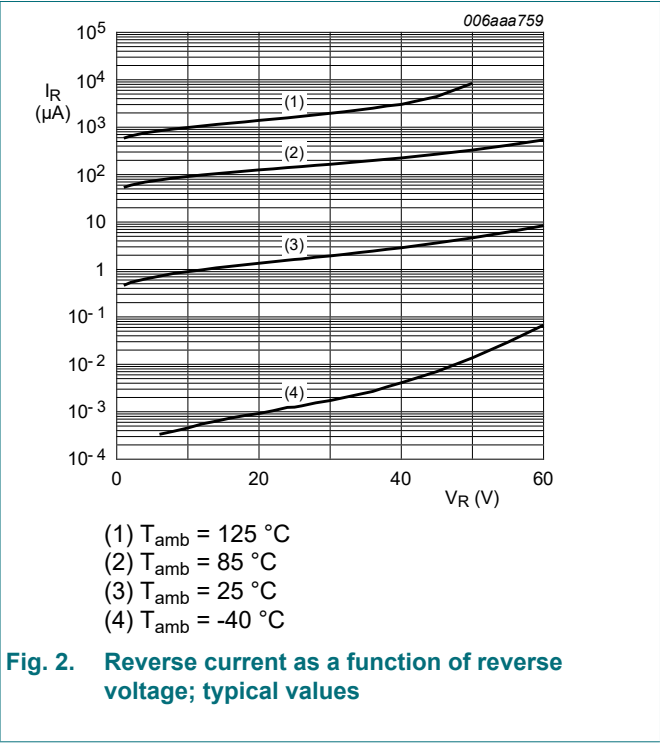
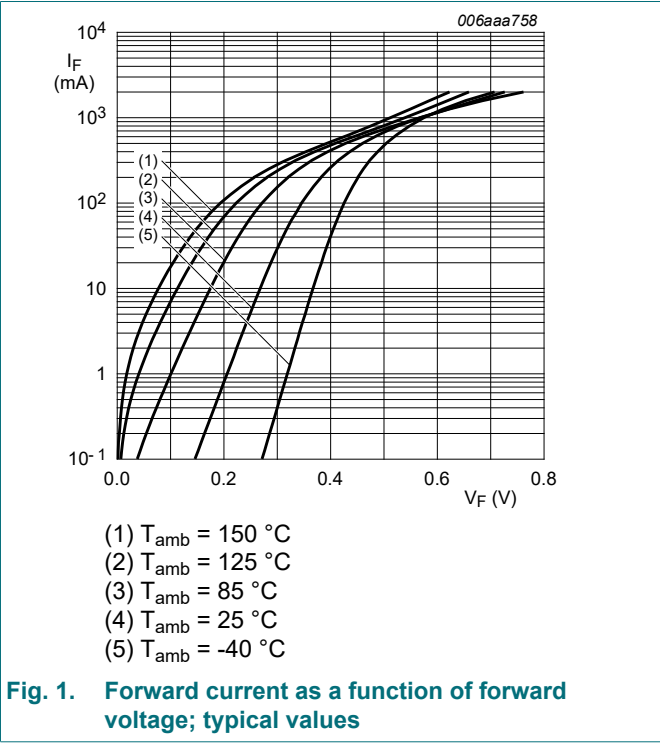
| Symbol                | Parameter                                        | Conditions  |         | Min | Typ | Max | Unit |
|-----------------------|--------------------------------------------------|-------------|---------|-----|-----|-----|------|
| R <sub>th(j-a)</sub>  | thermal resistance from junction to ambient      | in free air | [1] [2] | -   | -   | 330 | K/W  |
|                       |                                                  |             | [1] [3] | -   | -   | 150 | K/W  |
| R <sub>th(j-sp)</sub> | thermal resistance from junction to solder point |             | [4]     | -   | -   | 60  | K/W  |

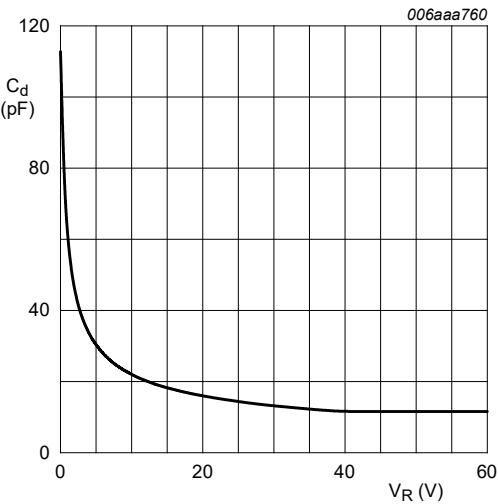
- [1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses P<sub>R</sub> are a significant part of the total power losses.
- [2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.
- [4] 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> = 1 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C   | -   | 210 | 250 | mV   |
|                |                   | I <sub>F</sub> = 10 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C  | -   | 270 | 310 | mV   |
|                |                   | I <sub>F</sub> = 100 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C | -   | 350 | 400 | mV   |
|                |                   | I <sub>F</sub> = 500 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02                         | -   | 460 | 530 | mV   |
|                |                   | I <sub>F</sub> = 700 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02                         | -   | 510 | 580 | mV   |
|                |                   | I <sub>F</sub> = 1 A; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C    | -   | 570 | 660 | mV   |
| I <sub>R</sub> | reverse current   | V <sub>R</sub> = 5 V; T <sub>j</sub> = 25 °C                                               | -   | 0.8 | -   | μA   |
|                |                   | V <sub>R</sub> = 10 V; T <sub>j</sub> = 25 °C                                              | -   | 1.1 | -   | μA   |
|                |                   | V <sub>R</sub> = 60 V; T <sub>j</sub> = 25 °C                                              | -   | 11  | 50  | μA   |
| C <sub>d</sub> | diode capacitance | V <sub>R</sub> = 1 V; f = 1 MHz; T <sub>j</sub> = 25 °C                                    | -   | 60  | 68  | pF   |





f = 1 MHz; T<sub>amb</sub> = 25 °C

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

11. Test information

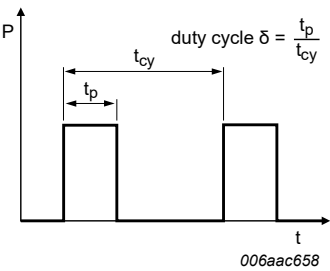


Fig. 4. Duty cycle definition

The current ratings for the typical waveforms are calculated according to the equations:  
 $I_{F(AV)} = I_M \times \delta$  with  $I_M$  defined as peak current,  $I_{RMS} = I_{F(AV)}$  at DC, and  $I_{RMS} = I_M \times \sqrt{\delta}$  with  $I_{RMS}$  defined as RMS current.

12. Package outline

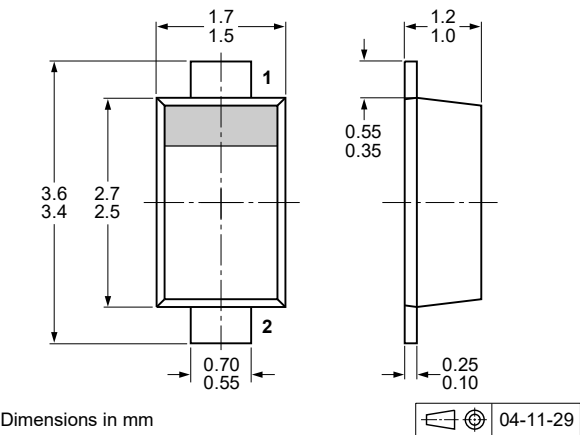


Fig. 5. Package outline SOD123F

13. Soldering

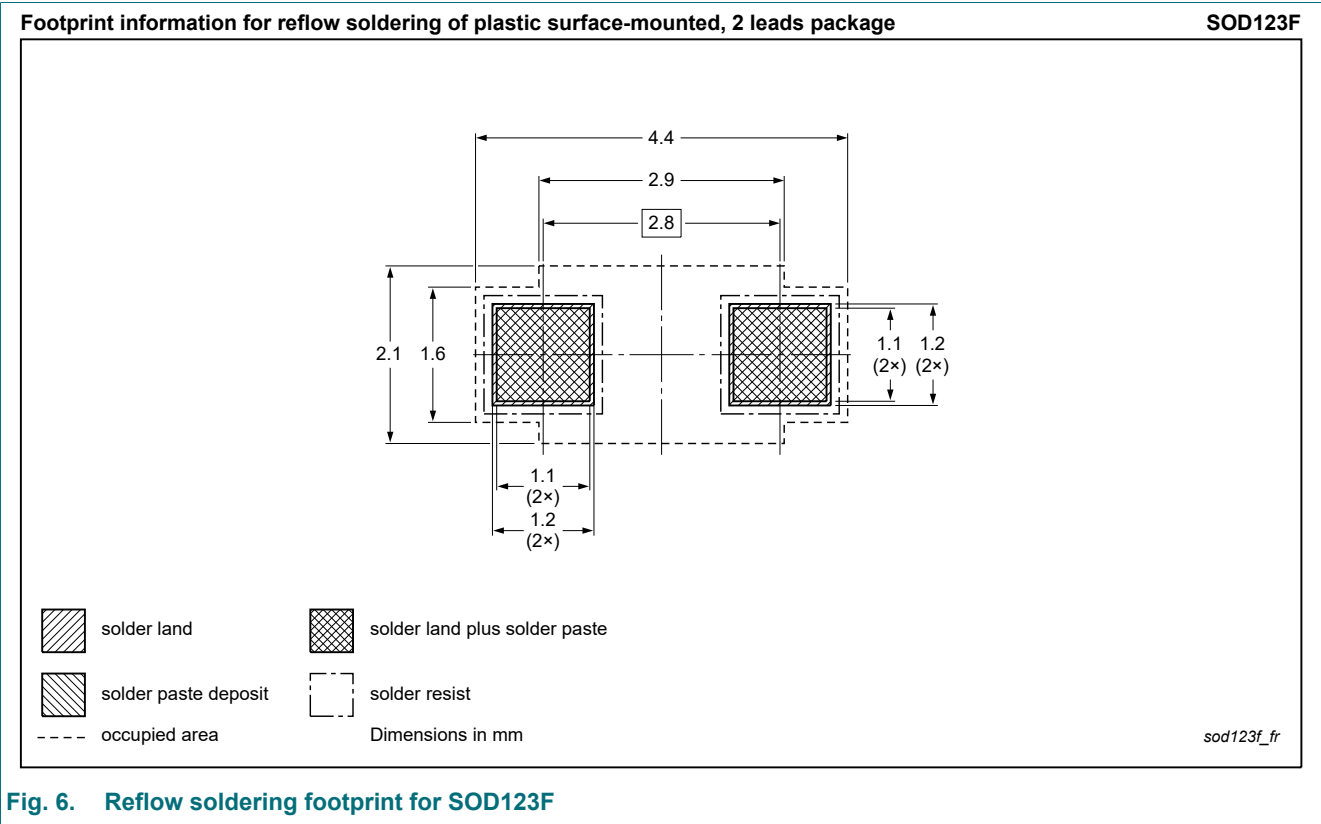


Fig. 6. Reflow soldering footprint for SOD123F

14. Revision history

Table 8. Revision history

| Data sheet ID              | Release date                                                                                                                                                                 | Data sheet status  | Change notice | Supersedes                 |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|----------------------------|
| PMEG6010CEH v.4            | 20230701                                                                                                                                                                     | Product data sheet | -             | PMEG6010CEH v.3            |
| Modifications:             | <ul style="list-style-type: none"><li>Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).</li></ul> |                    |               |                            |
| PMEG6010CEH v.3            | 20230105                                                                                                                                                                     | Product data sheet | -             | PMEG6010CEH_PME G6010CEJ_2 |
| PMEG6010CEH_PME G6010CEJ_2 | 20070327                                                                                                                                                                     | Product data sheet | -             | PMEG6010CEJ_1              |
| PMEG6010CEJ_1              | 20060414                                                                                                                                                                     | 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".
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