# PMEG6010CEGW

## 60 V, 1 A Low VF Schottky barrier rectifier

12 October 2023 Product data sheet

## 1. General description

Planar Schottky barrier rectifier with an integrated guard ring for stress protection encapsulated in small SOD123 Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Forward current: $I_F \leq 1$ A
- Reverse voltage $V_R \leq 60$ V
- Low forward voltage, typ. $V_F = 570$ mV
- Low reverse current, typ. $I_R = 11$ µA
- Small 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 |
|---|---|---|---|---|---|---|---|
| $I_{F(AV)}$ | average forward current | δ = 0.5; f = 20 kHz; square wave; $T_{sp} \leq$ 135 °C | | - | - | 1 | A |
| $V_R$ | reverse voltage | $T_j$ = 25 °C | | - | - | 60 | V |
| $V_F$ | forward voltage | $I_F$ = 1 A; $t_p \leq$ 300 µs; δ ≤ 0.02; $T_j$ = 25 °C | | - | 570 | 660 | mV |
| $I_R$ | reverse current | $V_R$ = 60 V; pulsed; $T_j$ = 25 °C | [1] | - | 11 | 50 | µA |

[1] Very short test pulse to prevent junction self-heating.

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# 5. Pinning information

**Table 2. Pinning information**

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|---|---|---|---|---|
| 1 | K | cathode[1] |  SOD123 |  sym001 |
| 2 | A | anode | | |

[1] The marking bar indicates the cathode.

# 6. Ordering information

**Table 3. Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| PMEG6010CEGW | SOD123 | plastic, surface-mounted package; 2 leads; 2.675 mm x 1.6 mm x 1.15 mm body | SOD123 |

# 7. Marking

**Table 4. Marking codes**

| Type number | Marking code |
|---|---|
| PMEG6010CEGW | G7 |

# 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 | $T_j$ = 25 °C | | - | 60 | V |
| $I_F$ | forward current | $T_{sp} \leq$ 55 °C | | - | 1 | A |
| $I_{F(AV)}$ | average forward current | δ = 0.5; f = 20 kHz; square wave; $T_{amb} \leq$ 70 °C | [1] | - | 1 | A |
| | | δ = 0.5; f = 20 kHz; square wave; $T_{sp} \leq$ 135 °C | | - | 1 | A |
| $I_{FRM}$ | repetitive peak forward current | $t_p \leq$ 1 ms; δ ≤ 0.25 | | - | 7 | A |
| $I_{FSM}$ | non-repetitive peak forward current | $t_p$ = 8 ms; square wave; $T_{j(init)}$ = 25 °C | | - | 9 | A |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq$ 25 °C | [2] | - | 410 | mW |
| | | | [1] | - | 675 | mW |
| $T_j$ | junction temperature | | | - | 150 | °C |
| $T_{amb}$ | ambient temperature | | | -55 | 150 | °C |
| $T_{stg}$ | storage temperature | | | -65 | 150 | °C |

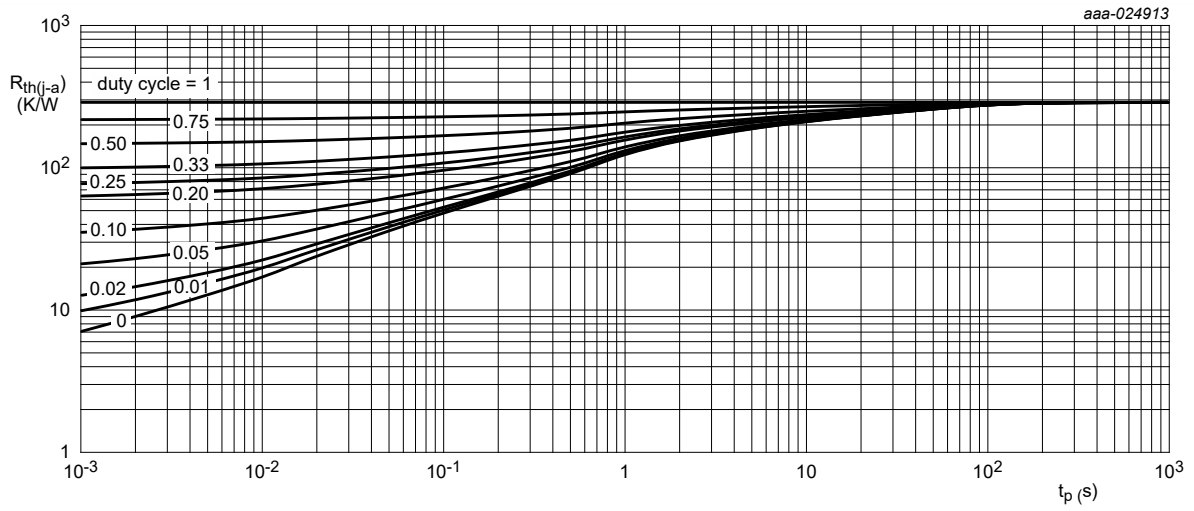
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 $cm^2$.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

# 9. Thermal characteristics

**Table 6. Thermal characteristics**

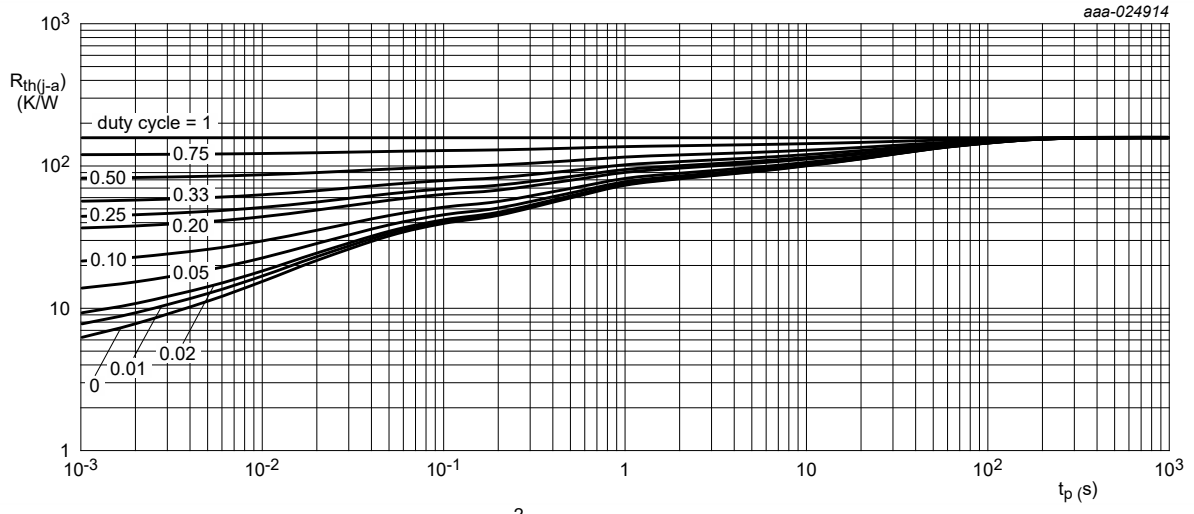
| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] [2] | - | - | 305 | K/W |
| | | | [1] [3] | - | - | 185 | K/W |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | | [4] | - | - | 21 | 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 $cm^2$.
[4] Soldering point of cathode tab.




FR4 PCB, standard footprint

**Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values**




FR4 PCB, mounting pad for cathode 1 $cm^2$

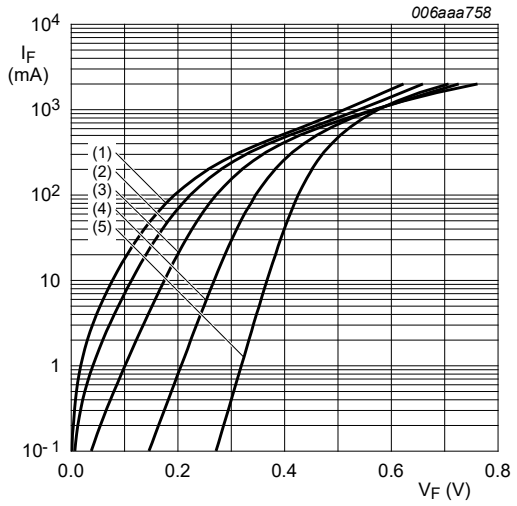
**Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values**

# 10. Characteristics

**Table 7. Characteristics**

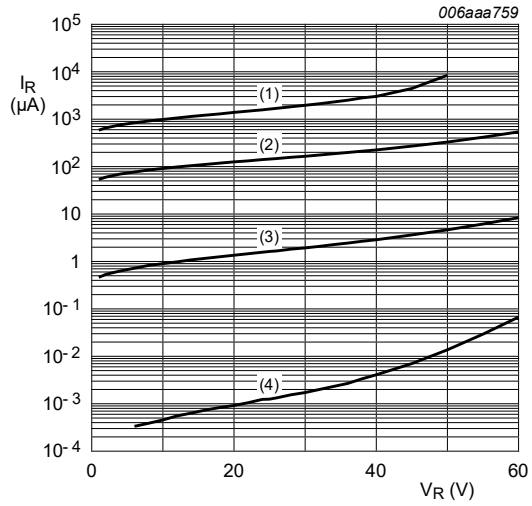
| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $V_{(BR)R}$ | reverse breakdown voltage | $I_R$ = 1 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; $T_j$ = 25 °C | | 60 | - | - | V |
| $V_F$ | forward voltage | $I_F$ = 1 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; $T_j$ = 25 °C | | - | 210 | 250 | mV |
| | | $I_F$ = 10 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; $T_j$ = 25 °C | | - | 270 | 310 | mV |
| | | $I_F$ = 100 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; $T_j$ = 25 °C | | - | 350 | 400 | mV |
| | | $I_F$ = 500 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; $T_j$ = 25 °C | | - | 460 | 530 | mV |
| | | $I_F$ = 700 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; $T_j$ = 25 °C | | - | 510 | 580 | mV |
| | | $I_F$ = 1 A; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; $T_j$ = 25 °C | | - | 570 | 660 | mV |
| $I_R$ | reverse current | $V_R$ = 5 V; pulsed; $T_j$ = 25 °C | [1] | - | 0.8 | - | µA |
| | | $V_R$ = 10 V; pulsed; $T_j$ = 25 °C | [1] | - | 1.1 | - | µA |
| | | $V_R$ = 60 V; pulsed; $T_j$ = 25 °C | [1] | - | 11 | 50 | µA |
| $C_d$ | diode capacitance | $V_R$ = 1 V; f = 1 MHz; $T_j$ = 25 °C | | - | 60 | 68 | pF |

[1] Very short test pulse to prevent junction self-heating.



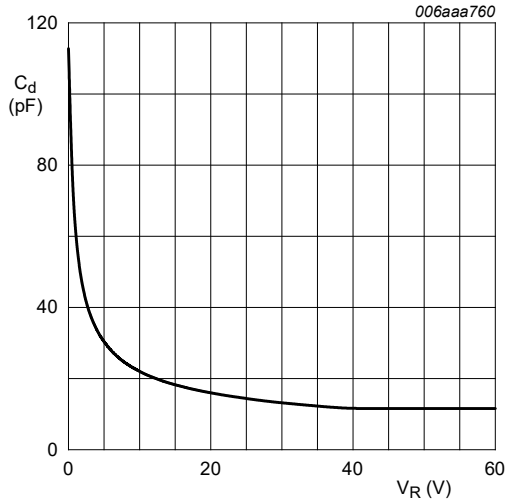

(1) $T_{amb}$ = 150 °C
(2) $T_{amb}$ = 125 °C
(3) $T_{amb}$ = 85 °C
(4) $T_{amb}$ = 25 °C
(5) $T_{amb}$ = -40 °C

**Fig. 3. Forward current as a function of forward voltage; typical values**




(1) $T_{amb}$ = 125 °C
(2) $T_{amb}$ = 85 °C
(3) $T_{amb}$ = 25 °C
(4) $T_{amb}$ = -40 °C

**Fig. 4. Reverse current as a function of reverse voltage; typical values**




f = 1 MHz; $T_{amb}$ = 25 °C

**Fig. 5. Diode capacitance as a function of reverse voltage; typical values**

## 11. Test information

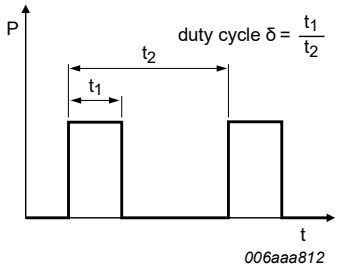



**Fig. 6. Duty cycle definition**

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

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

## 12. Package outline

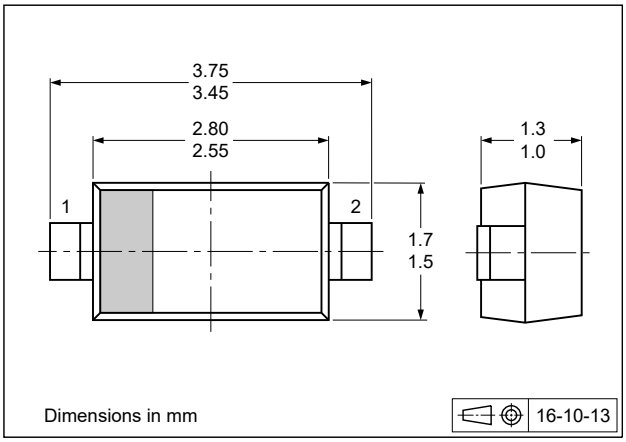



**Fig. 7. Package outline SOD123**

## 13. Soldering

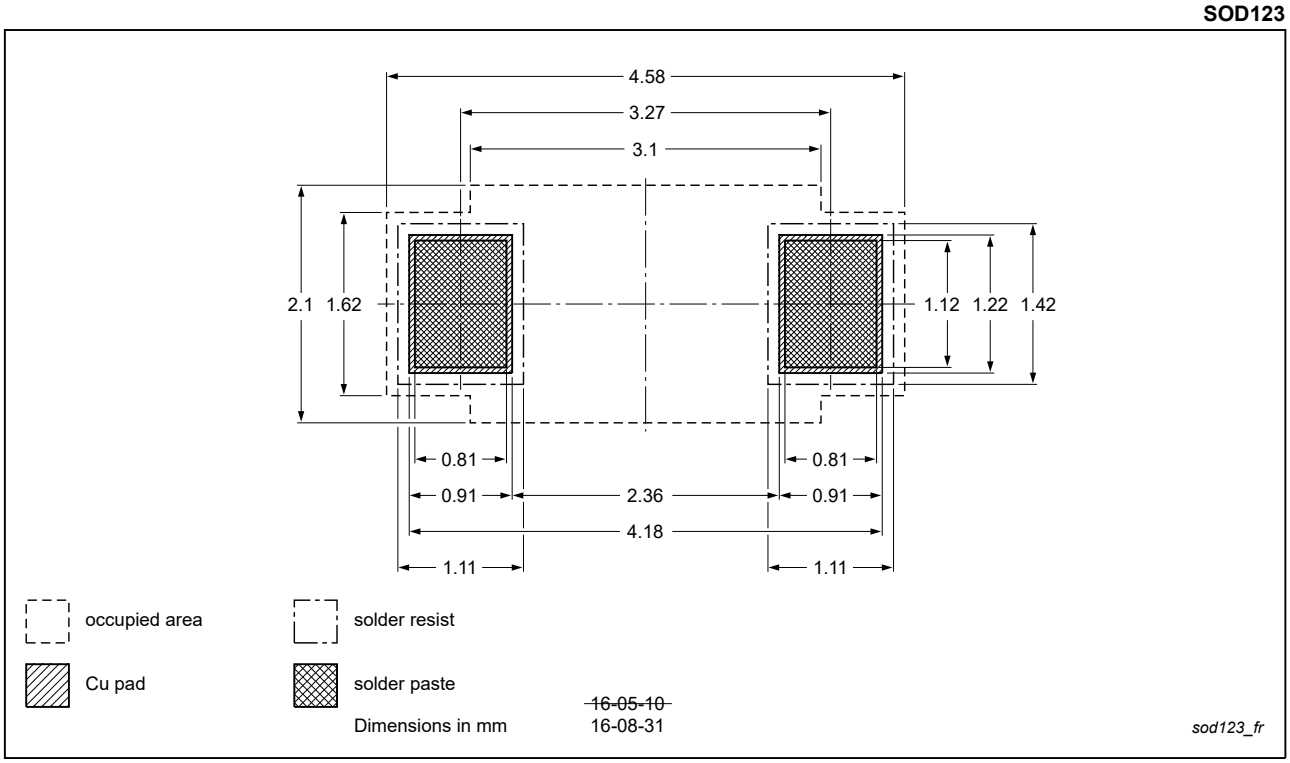



**Fig. 8. Reflow soldering footprint for SOD123**

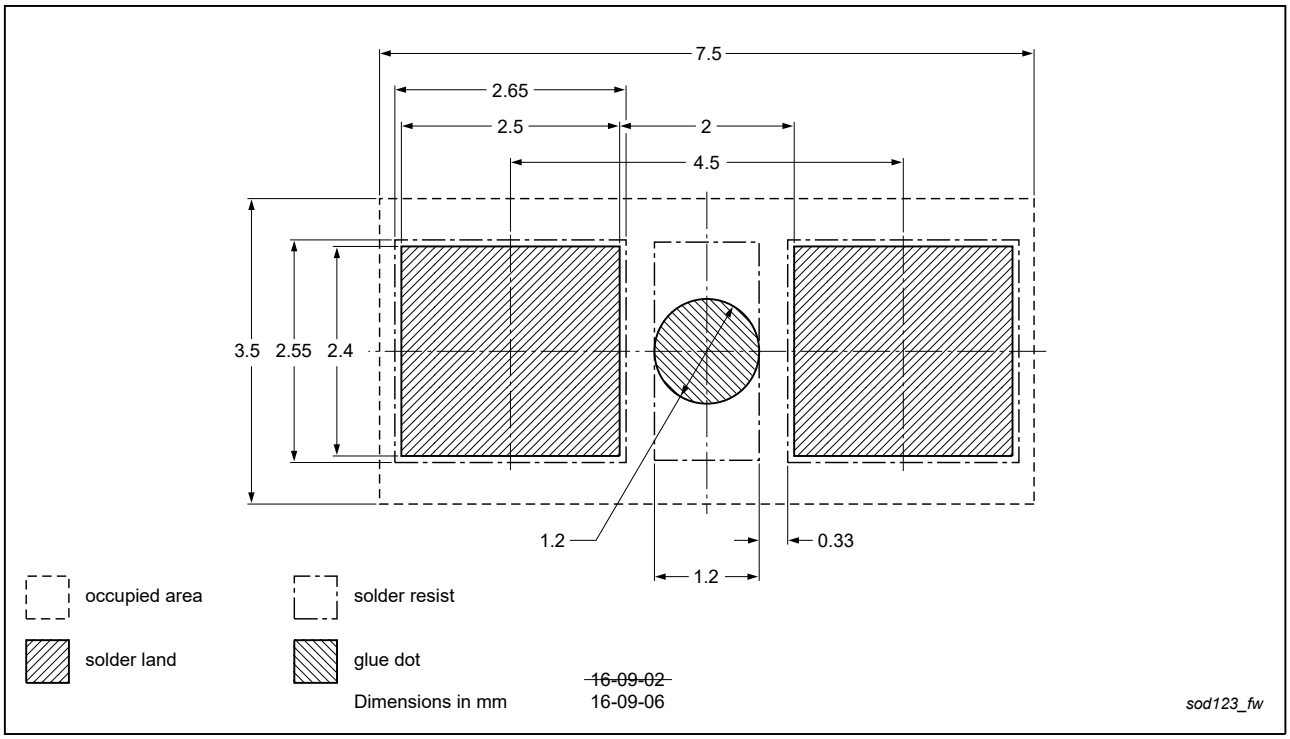



**Fig. 9. Wave soldering footprint for SOD123**

# 14. Revision history

**Table 8. Revision history**

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| PMEG6010CEGW v.2 | 20231012 | Product data sheet | - | PMEG6010CEGW v.1 |
| Modifications: | • Product changed to non automotive. Please refer to the automotive product(s) with -Q. | | | |
| PMEG6010CEGW v.1 | 20161124 | 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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