



PMEG4010ET

40 V, 1 A very low VF Schottky barrier rectifier

1 October 2022

Product data sheet

1. General description

Planar Schottky barrier rectifiers with an integrated guard ring for stress protection, encapsulated in a SOT23 (TO-236AB) small Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Forward current: $I_F \leq 1$ A
- Reverse voltage: $V_R \leq 40$ V
- Very low forward voltage

3. Applications

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

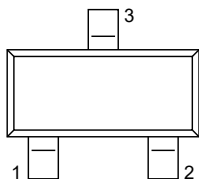
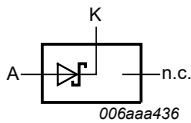
4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-----------------|--|-----|-----|-----|---------|
| I_F | forward current | $T_{sp} \leq 55$ °C | - | - | 1 | A |
| V_R | reverse voltage | | - | - | 40 | V |
| V_F | forward voltage | $I_F = 1$ A; $t_p \leq 300$ μ s; $\delta \leq 0.02$; $T_{amb} = 25$ °C | - | 540 | 640 | mV |
| I_R | reverse current | $V_R = 40$ V; $T_{amb} = 25$ °C | - | 30 | 100 | μ A |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|---------------|--|--|
| 1 | A | anode |  SOT23 |  006aaa436 |
| 2 | n.c. | not connected | | |
| 3 | K | cathode | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|----------------------------|---------|--|-----------------------|
| | Name | Description | Version |
| PMEG4010ET | SOT23 | plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body | SOT23 |

7. Marking

Table 4. Marking codes

| Type number | Marking code[1] |
|-------------|-----------------|
| PMEG4010ET | %AW |

[1] % = placeholder for manufacturing site code

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 | | | - | 40 | V |
| I_F | forward current | $T_{sp} \leq 55\text{ °C}$ | | - | 1 | A |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1\text{ ms}$; $\delta \leq 0.25$ | | - | 5 | A |
| I_{FSM} | non-repetitive peak forward current | $t_p = 8\text{ ms}$; square wave | | - | 9 | A |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$ | [1] | - | 280 | mW |
| | | | [2] | - | 420 | 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 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 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 | | [1] [2] | - | - | 440 | K/W |
| | | | [3] [2] | - | - | 300 | K/W |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | | [4] | - | - | 120 | K/W |

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

[2] 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.

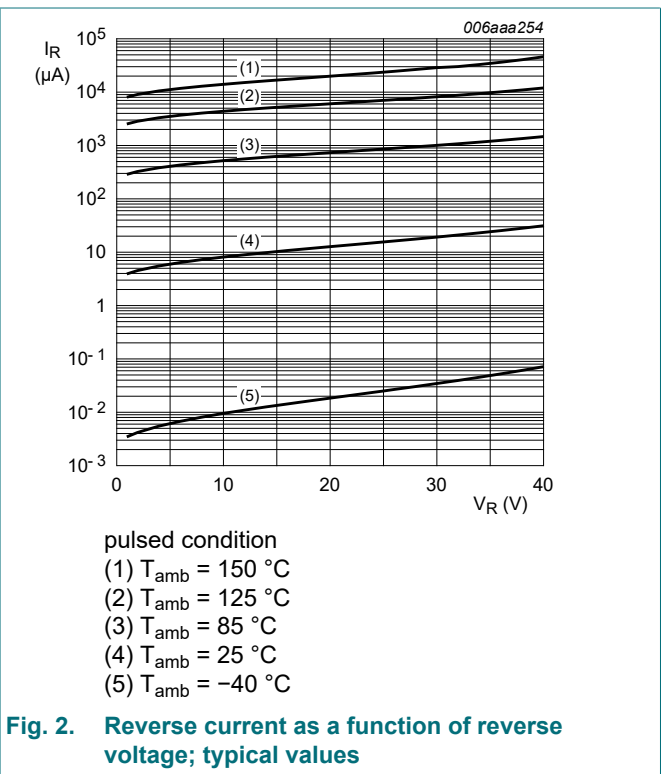
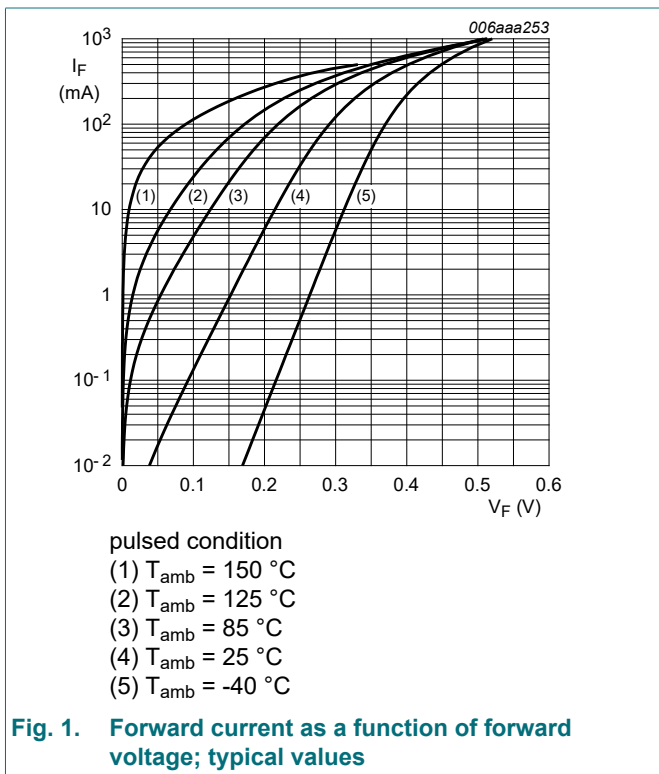
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².

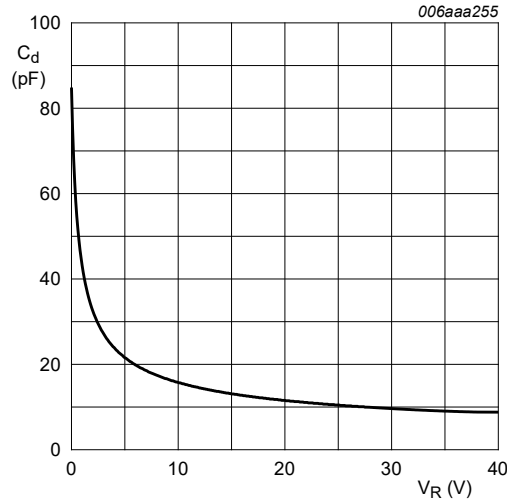
[4] Soldering point of cathode tab.

10. Characteristics

Table 7. Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-------------------|---|-----|-----|-----|---------------|
| V_F | forward voltage | $I_F = 0.1 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 95 | 130 | mV |
| | | $I_F = 1 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 155 | 210 | mV |
| | | $I_F = 10 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 220 | 270 | mV |
| | | $I_F = 100 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 295 | 350 | mV |
| | | $I_F = 500 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 420 | 470 | mV |
| | | $I_F = 1 \text{ A}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 540 | 640 | mV |
| I_R | reverse current | $V_R = 10 \text{ V}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 7 | 20 | μA |
| | | $V_R = 40 \text{ V}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 30 | 100 | μA |
| C_d | diode capacitance | $V_R = 1 \text{ V}; f = 1 \text{ MHz}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | 43 | 50 | pF |





f = 1 MHz; T_{amb} = 25 °C

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

11. Test information

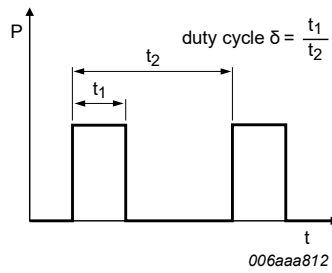


Fig. 4. Duty cycle definition

12. Package outline

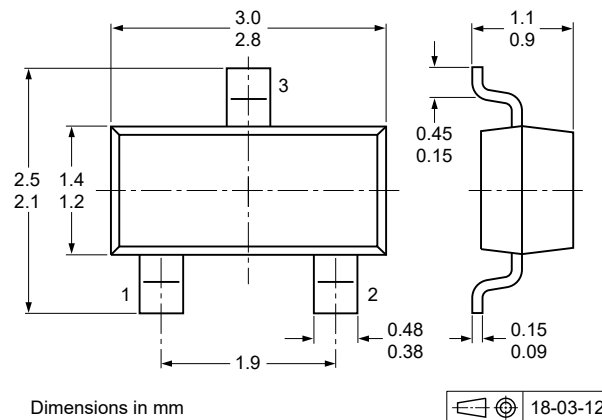


Fig. 5. Package outline SOT23

13. Soldering

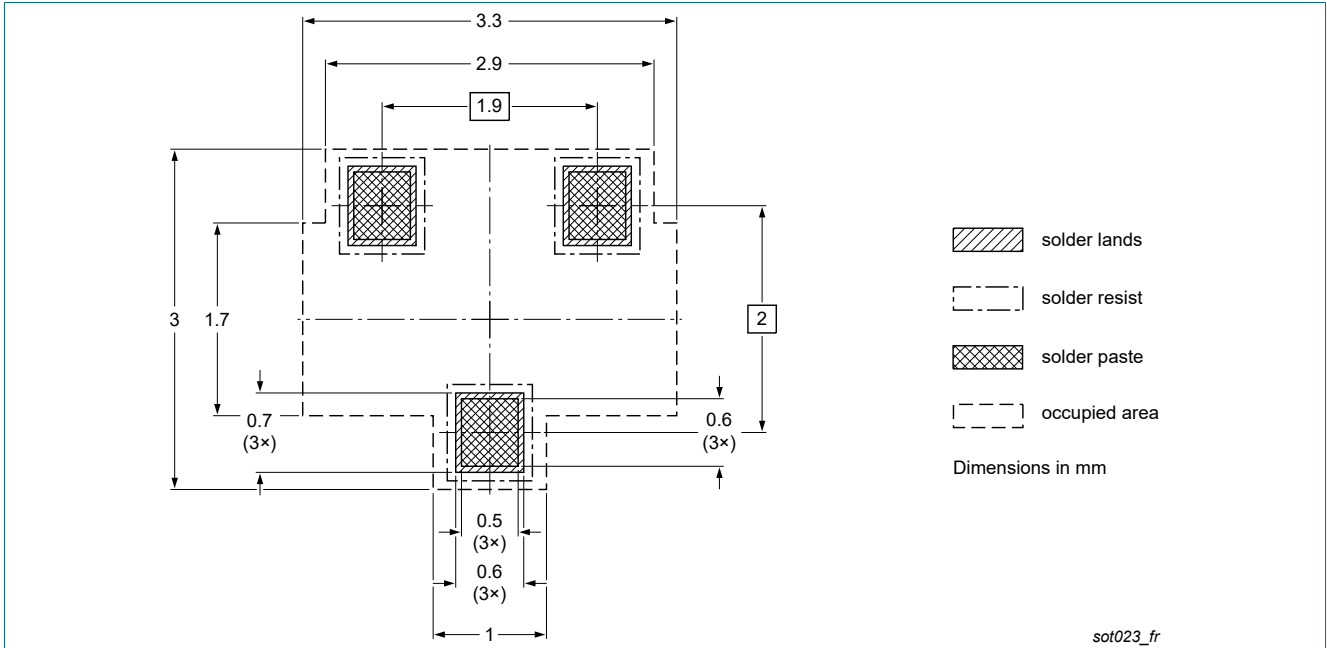


Fig. 6. Reflow soldering footprint for SOT23

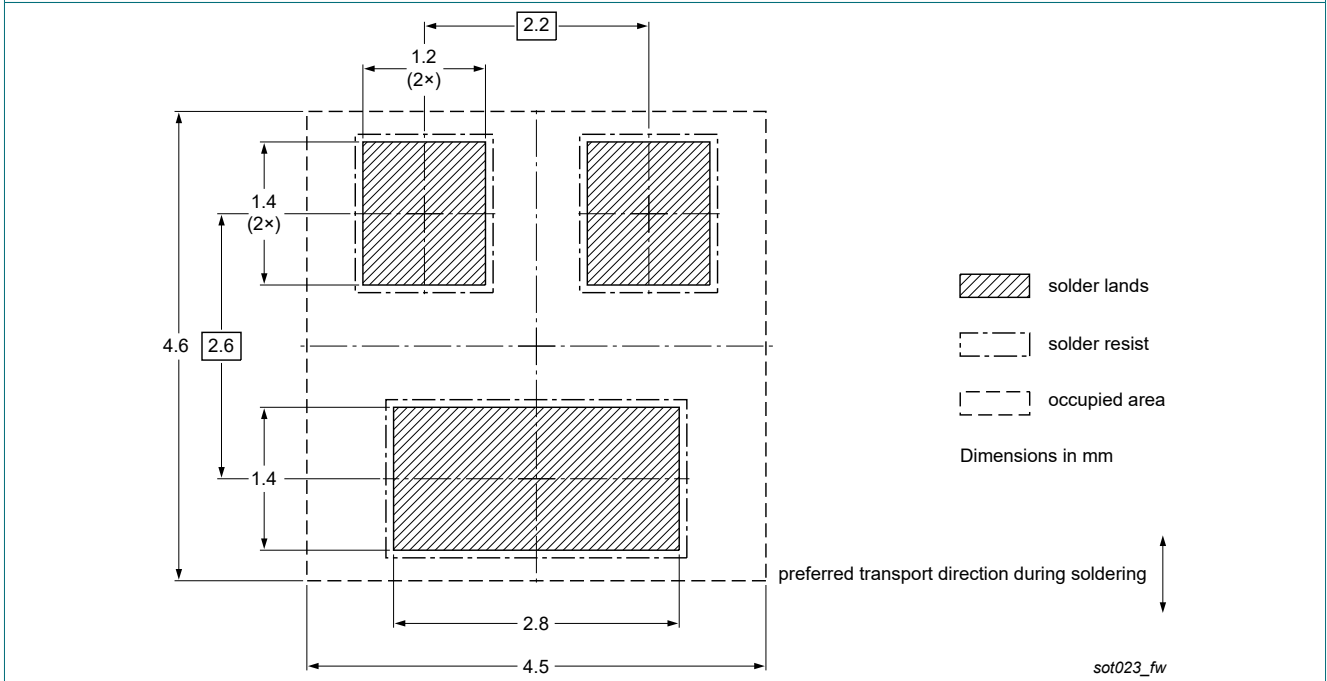


Fig. 7. Wave soldering footprint for SOT23

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|---------------------|--|----------------------|---------------|---------------------|
| PMEG4010ET v.5 | 20221001 | Product data sheet | - | PMEG4010EH_EJ_ET_4 |
| Modifications: | <ul style="list-style-type: none"> Product changed to non-automotive qualification. Please refer to nexperia.com for automotive(-Q) product alternative(s). Family data sheet reduced to single type data sheet. Packing information removed. | | | |
| PMEG4010EH_EJ_ET_4 | 20070321 | Product data sheet | - | PMEGXX10EH_EJ_SER_3 |
| PMEGXX10EH_EJ_SER_3 | 20050411 | Product data sheet | - | PMEGXX10EJ_SER_2 |
| PMEGXX10EJ_SER_2 | 20050131 | Product data sheet | - | PMEGXX10EJ_SER_1 |
| PMEGXX10EJ_SER_1 | 20040907 | Objective 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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