



PMEG3005ET-Q

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

14 February 2022

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 SOT23 small Surface Mounted Device (SMD) plastic package.

2. Features and benefits

- Forward current: 0.5 A
- Very low forward voltage
- Small SMD plastic 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
- Inverse polarity protection
- Low power consumption applications

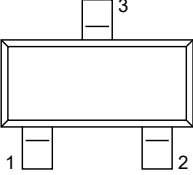
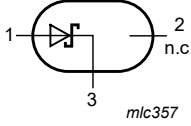
4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-----------------|---|-----|-----|-----|------|
| I_F | forward current | | - | - | 0.5 | A |
| V_R | reverse voltage | | - | - | 30 | V |
| V_F | forward voltage | $I_F = 500 \text{ mA}$; $t_p \leq 300 \text{ } \mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{amb} = 25 \text{ } ^\circ\text{C}$ | - | 380 | 430 | mV |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|---------------|--|--|
| 1 | A | anode |  <p style="text-align: center;">SOT23</p> |  <p style="text-align: center;"><i>mlc357</i></p> |
| 2 | n.c. | not connected | | |
| 3 | K | cathode | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|--------------|---------|--|---------|
| | Name | Description | Version |
| PMEG3005ET-Q | 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] |
|--------------|-----------------------------|
| PMEG3005ET-Q | P4% |

[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 | | | - | 30 | V |
| I_F | forward current | | | - | 0.5 | A |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1 \text{ ms}$; $\delta \leq 0.5$ | | - | 3.9 | A |
| I_{FSM} | non-repetitive peak forward current | $t_p = 8 \text{ ms}$; square wave | [1] | - | 10 | A |
| P_{tot} | total power dissipation | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [1] | - | 280 | mW |
| | | | [2] | - | 420 | 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 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] | - | - | 440 | K/W |
| | | | [3] [1] | - | - | 300 | 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.

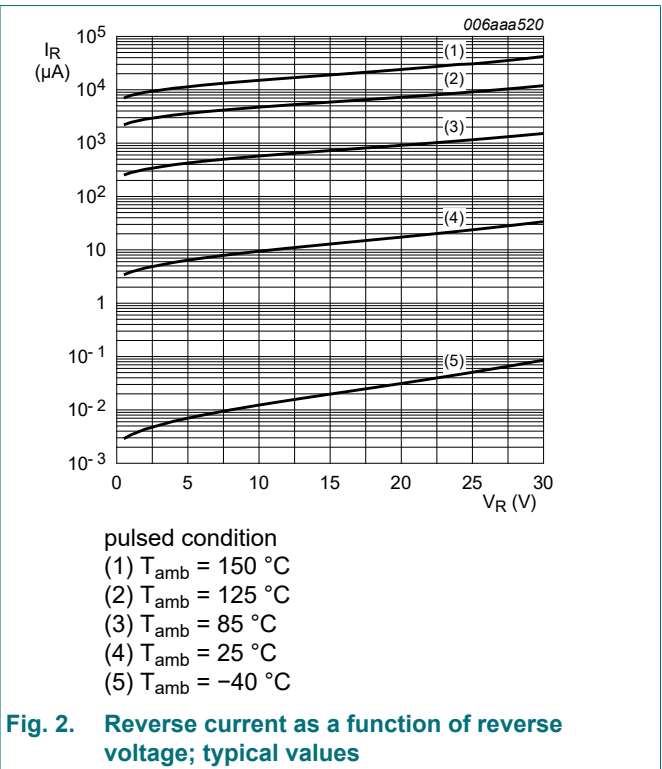
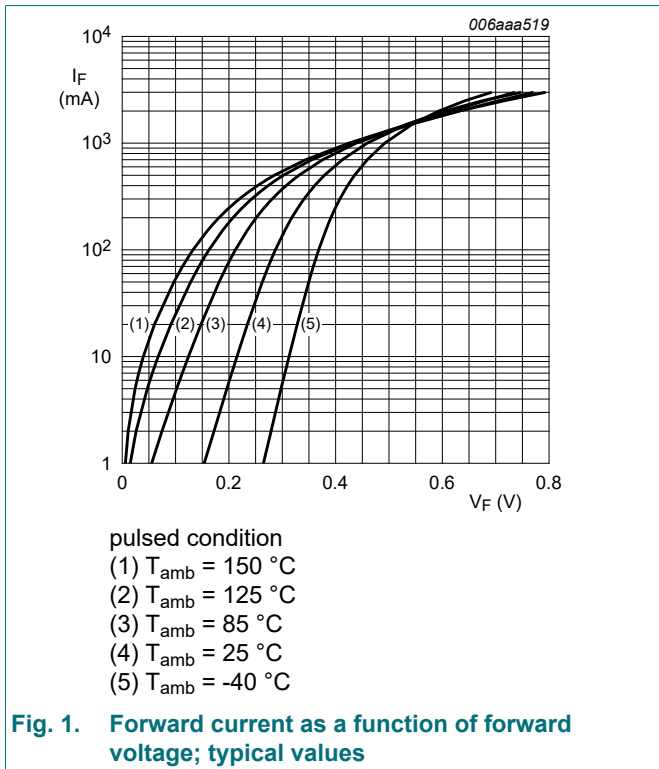
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

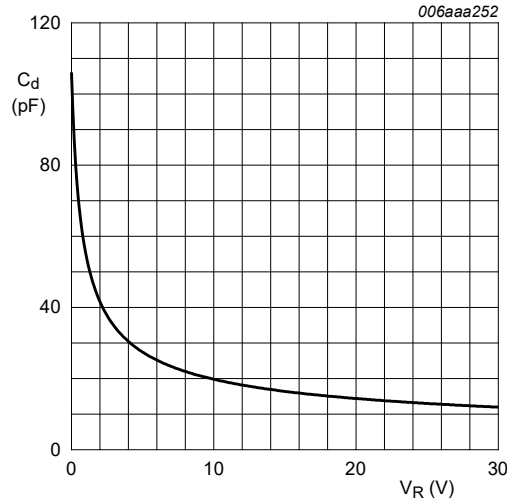
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².

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 _{amb} = 25 °C | - | 12 | 30 | μA |
| | | V _R = 30 V; T _{amb} = 25 °C | - | 40 | 150 | μA |
| C _d | diode capacitance | V _R = 1 V; f = 1 MHz; T _{amb} = 25 °C | - | 55 | 70 | pF |





f = 1 MHz; T_{amb} = 25 °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

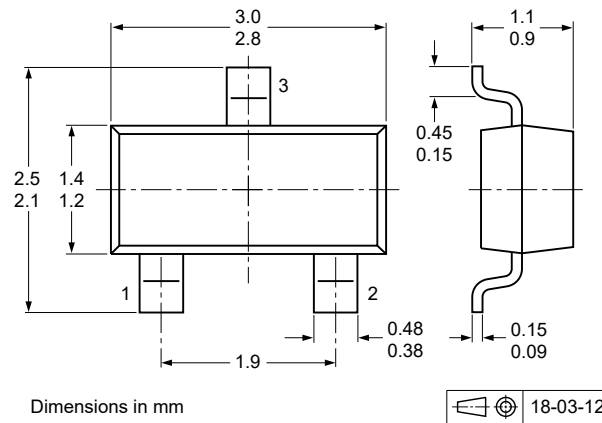


Fig. 4. Package outline SOT23

13. Soldering

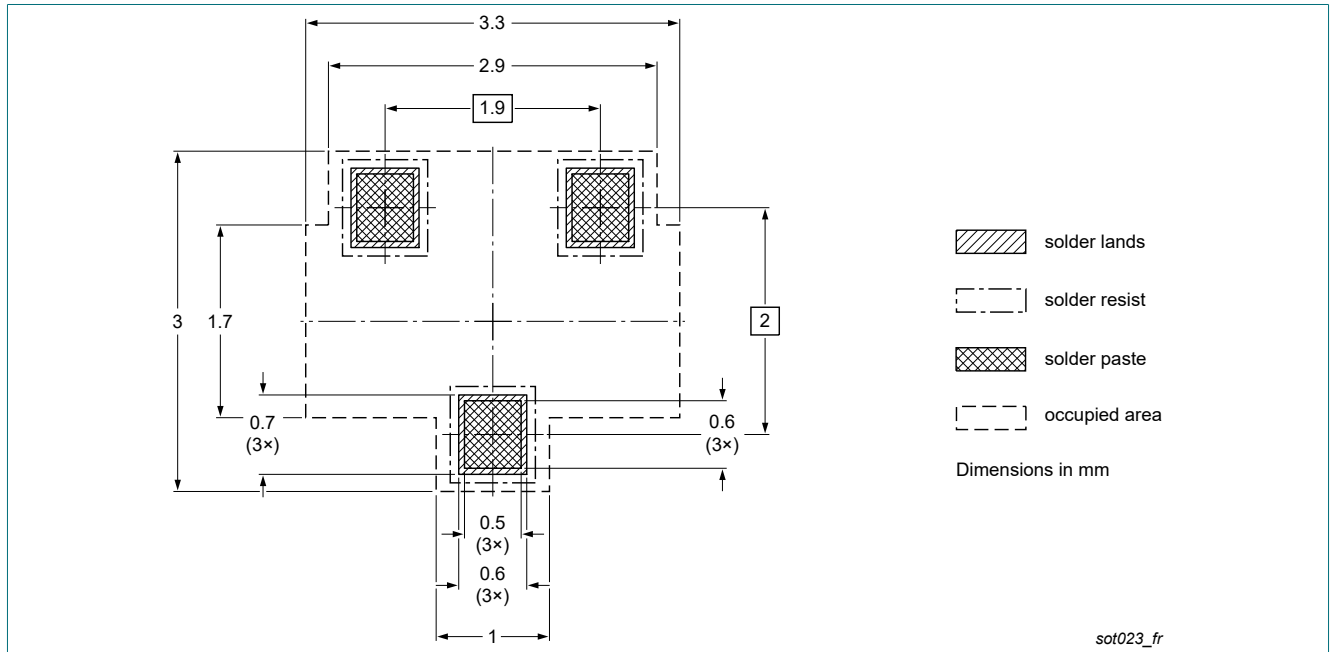


Fig. 5. Reflow soldering footprint for SOT23

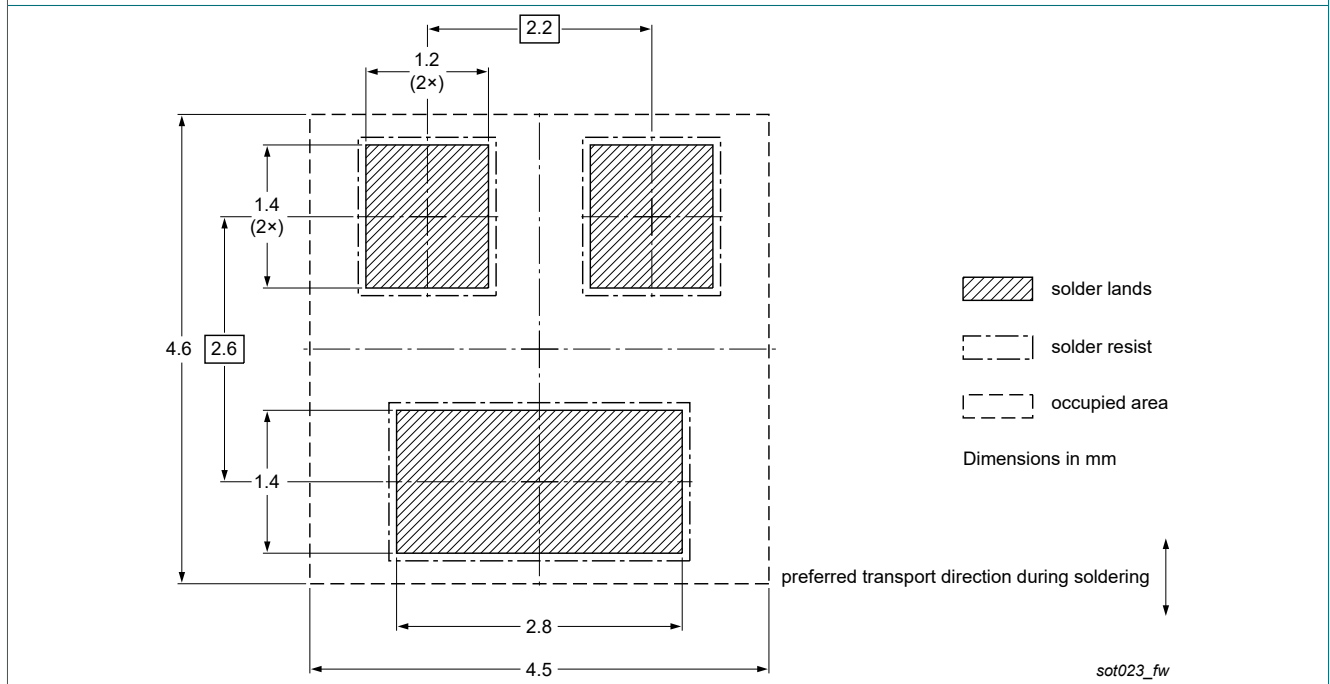


Fig. 6. Wave soldering footprint for SOT23

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|------------------|--------------|--------------------|---------------|------------|
| PMEG3005ET-Q v.1 | 20220214 | 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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- [2] The term 'short data sheet' is explained in section "Definitions".
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Contents

| | |
|---------------------------------|---|
| 1. General description..... | 1 |
| 2. Features and benefits..... | 1 |
| 3. Applications..... | 1 |
| 4. Quick reference data..... | 1 |
| 5. Pinning information..... | 2 |
| 6. Ordering information..... | 2 |
| 7. Marking..... | 2 |
| 8. Limiting values..... | 3 |
| 9. Thermal characteristics..... | 3 |
| 10. Characteristics..... | 4 |
| 11. Test information..... | 5 |
| 12. Package outline..... | 5 |
| 13. Soldering..... | 6 |
| 14. Revision history..... | 7 |
| 15. Legal information..... | 8 |

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