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## Product Reference Information

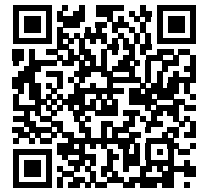
**Part Number:** PMEG4002EJ,115  
**Manufacturer:** Nexperia USA Inc.  
**Package:** SC-90, SOD-323F  
**Availability:** Please confirm with sales

### Product Page:

<https://antrexco.com/product/details/nexperia-usa-inc/pmeg4002ej-115.html>

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### Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

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# PMEG4002EJ

40 V, 200 mA low VF Schottky barrier rectifier

2 October 2025

Product data sheet

## 1. General description

Planar Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a SOD323F (SC-90) small and flat lead Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Average forward current:  $I_{F(AV)} \leq 0.2$  A
- Reverse voltage:  $V_R \leq 40$  V
- 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 (SMPS)
- Reverse polarity protection
- Ultra high-speed switching
- Low power consumption applications

## 4. Quick reference data

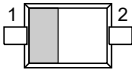
Table 1. Quick reference data

| Symbol      | Parameter               | Conditions                                                        | Min | Typ | Max | Unit |
|-------------|-------------------------|-------------------------------------------------------------------|-----|-----|-----|------|
| $I_{F(AV)}$ | average forward current | $\delta = 0.5$ ; $f = 20$ kHz; square wave; $T_{amb} \leq 130$ °C | -   | -   | 0.2 | A    |
|             |                         | $\delta = 0.5$ ; $f = 20$ kHz; square wave; $T_{sp} \leq 145$ °C  | -   | -   | 0.2 | A    |
| $V_R$       | reverse voltage         | $T_j = 25$ °C                                                     | -   | -   | 40  | V    |
| $V_F$       | forward voltage         | $I_F = 200$ mA; $T_j = 25$ °C                                     | -   | 520 | 600 | mV   |
| $I_R$       | reverse current         | $V_R = 40$ V; $T_j = 25$ °C                                       | -   | 0.7 | 10  | µA   |

[1] Device mounted on a ceramic PCB,  $Al_2O_3$ , standard footprint.

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline                                                                                     | Graphic symbol                                                                                                                                                                               |
|-----|--------|-------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | K      | cathode     | <br>SC-90 (SOD323F) | <br>K  A<br>sym001 |
| 2   | A      | anode       |                                                                                                        |                                                                                                                                                                                              |

6. Ordering information

Table 3. Ordering information

| Type number | Package |                                                                           |         |
|-------------|---------|---------------------------------------------------------------------------|---------|
|             | Name    | Description                                                               | Version |
| PMEG4002EJ  | SC-90   | plastic, surface-mounted package; 2 leads; 1.7 mm x 1.25 mm x 0.7 mm body | SOD323F |

7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| PMEG4002EJ  | 1N           |

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                     | T <sub>j</sub> = 25 °C                                           |         | -   | 40    | V    |
| I <sub>F(AV)</sub> | average forward current             | δ = 0.5; f = 20 kHz; square wave; T <sub>amb</sub> ≤ 130 °C      | [1]     | -   | 0.2   | A    |
|                    |                                     | δ = 0.5; f = 20 kHz; square wave; T <sub>sp</sub> ≤ 145 °C       |         | -   | 0.2   | A    |
| I <sub>FRM</sub>   | repetitive peak forward current     | t <sub>p</sub> ≤ 1 ms; δ ≤ 0.25                                  |         | -   | 2.6   | 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 | [2]     | -   | 2.75  | A    |
| P <sub>tot</sub>   | total power dissipation             | T <sub>amb</sub> ≤ 25 °C                                         | [2] [3] | -   | 385   | mW   |
|                    |                                     |                                                                  | [2] [4] | -   | 695   | mW   |
|                    |                                     |                                                                  | [1] [2] | -   | 1.045 | W    |
| T <sub>j</sub>     | junction temperature                |                                                                  |         | -   | 150   | °C   |
| T <sub>amb</sub>   | ambient temperature                 |                                                                  |         | -55 | 150   | °C   |
| T <sub>stg</sub>   | storage temperature                 |                                                                  |         | -65 | 150   | °C   |

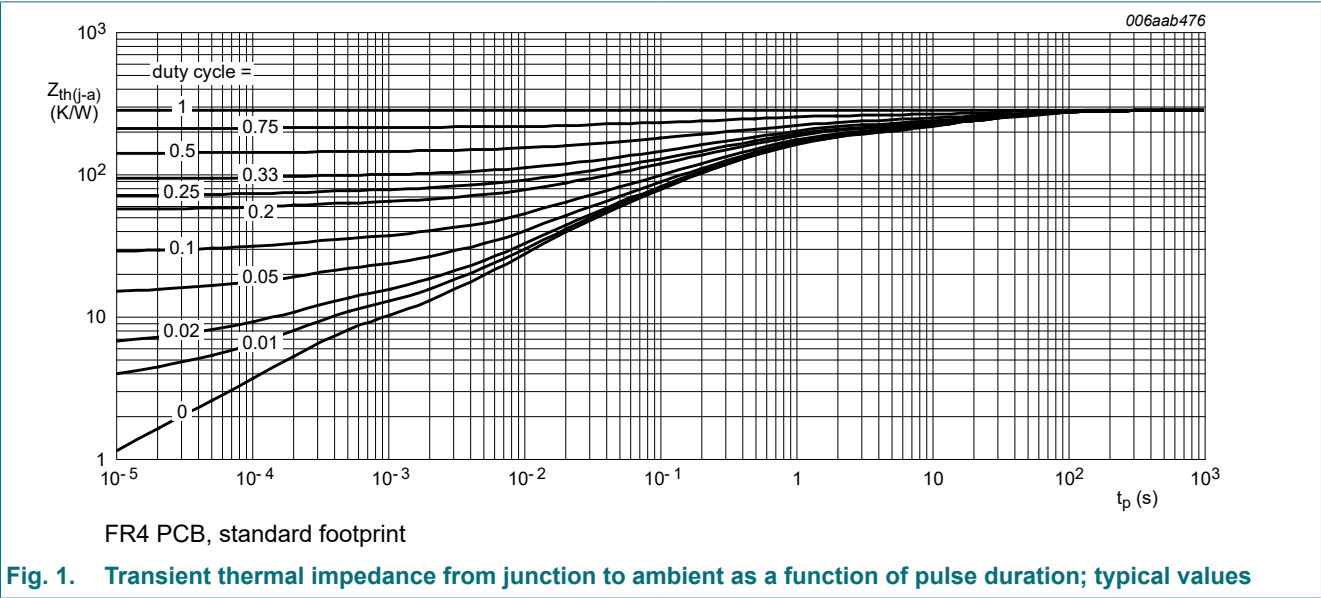
- [1] Device mounted on a ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint.
- [2] Reflow soldering is the only recommended soldering method.
- [3] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
- [4] Device mounted on an FR4 PCB, 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 |
|----------------|--------------------------------------------------|-------------|-------------|-----|-----|-----|------|
| $R_{th(j-a)}$  | thermal resistance from junction to ambient      | in free air | [1] [2] [3] | -   | -   | 325 | K/W  |
|                |                                                  |             | [1] [2] [4] | -   | -   | 180 | K/W  |
|                |                                                  |             | [1] [2] [5] | -   | -   | 120 | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             | [6]         | -   | -   | 25  | 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] Reflow soldering is the only recommended soldering method.
- [3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [4] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.
- [5] Device mounted on a ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint.
- [6] Soldering point of cathode tab.



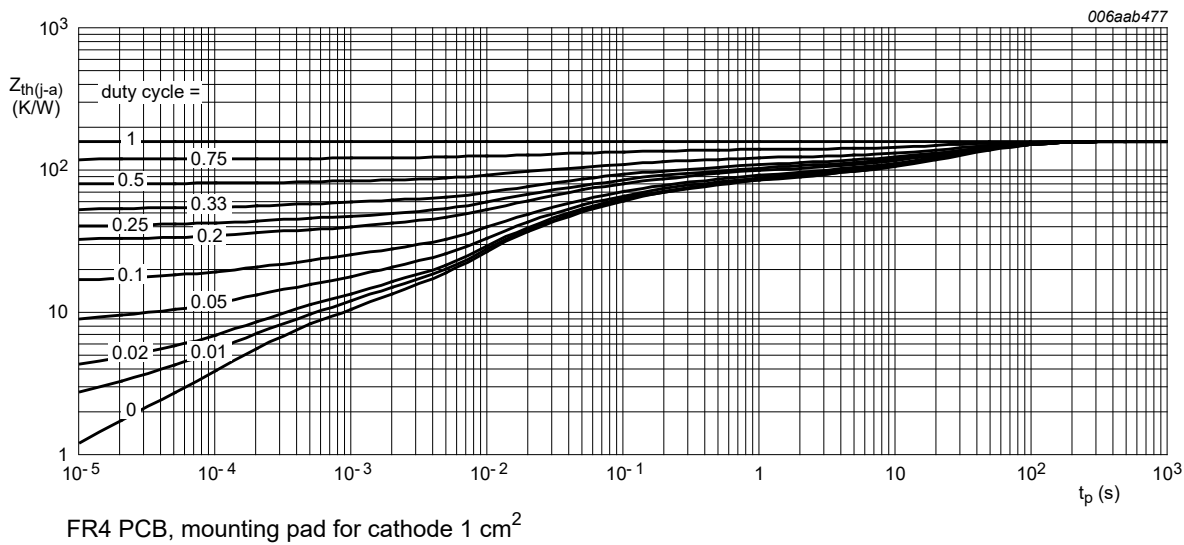


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

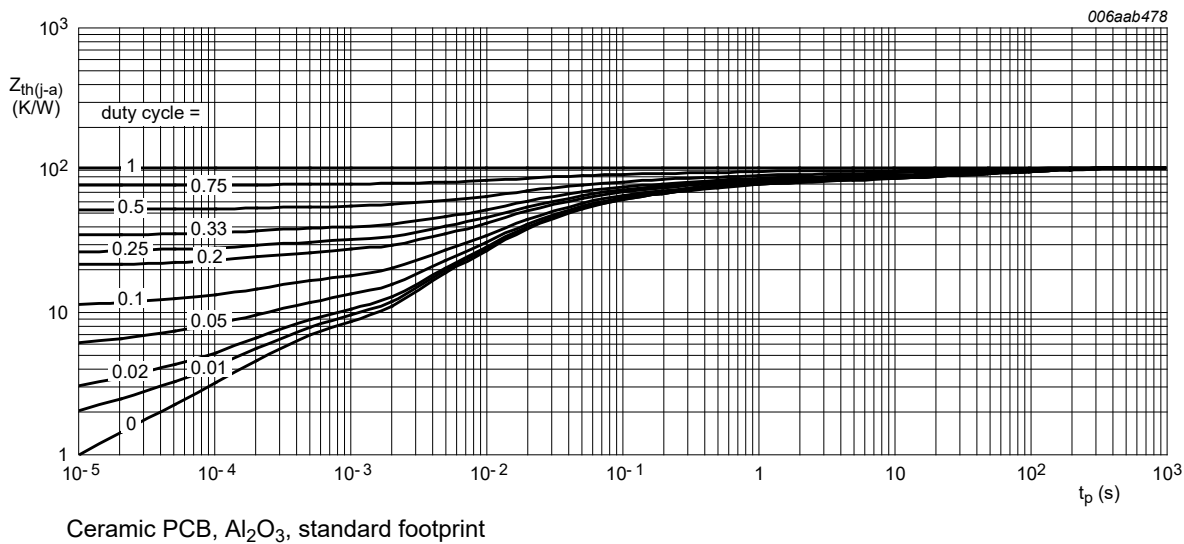


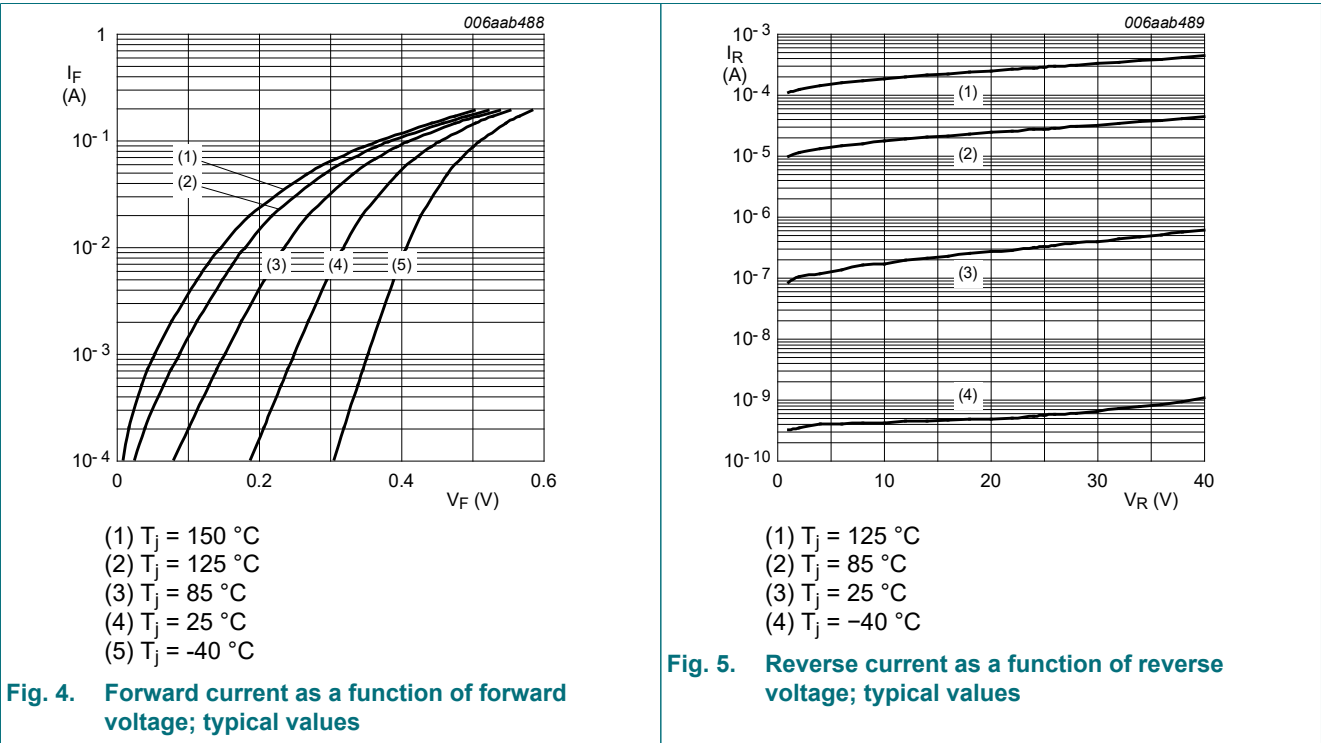
Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

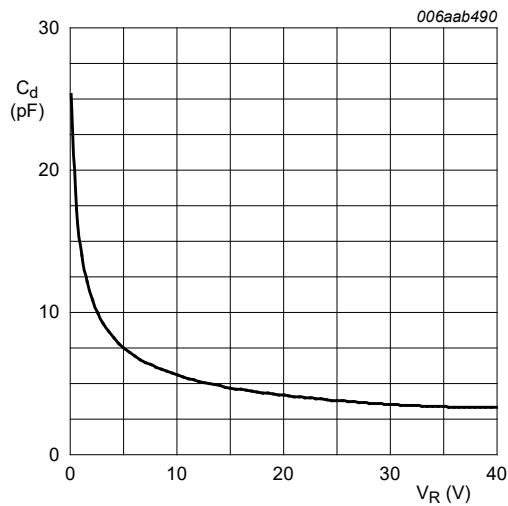
10. Characteristics

Table 7. Characteristics

| Symbol          | Parameter             | Conditions                                                                                                                                                     |     | Min | Typ | Max | Unit |
|-----------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|------|
| V <sub>F</sub>  | forward voltage       | I <sub>F</sub> = 0.1 mA; T <sub>j</sub> = 25 °C                                                                                                                | [1] | -   | 190 | 220 | mV   |
|                 |                       | I <sub>F</sub> = 1 mA; T <sub>j</sub> = 25 °C                                                                                                                  |     | -   | 250 | 290 | mV   |
|                 |                       | I <sub>F</sub> = 10 mA; T <sub>j</sub> = 25 °C                                                                                                                 |     | -   | 320 | 360 | mV   |
|                 |                       | I <sub>F</sub> = 100 mA; T <sub>j</sub> = 25 °C                                                                                                                |     | -   | 440 | 500 | mV   |
|                 |                       | I <sub>F</sub> = 200 mA; T <sub>j</sub> = 25 °C                                                                                                                |     | -   | 520 | 600 | mV   |
| I <sub>R</sub>  | reverse current       | V <sub>R</sub> = 10 V; T <sub>j</sub> = 25 °C                                                                                                                  |     | -   | 0.2 | 0.3 | μA   |
|                 |                       | V <sub>R</sub> = 25 V; T <sub>j</sub> = 25 °C                                                                                                                  |     | -   | 0.3 | 0.5 | μA   |
|                 |                       | V <sub>R</sub> = 40 V; T <sub>j</sub> = 25 °C                                                                                                                  |     | -   | 0.7 | 10  | μA   |
| C <sub>d</sub>  | diode capacitance     | V <sub>R</sub> = 1 V; f = 1 MHz; T <sub>j</sub> = 25 °C                                                                                                        |     | -   | 14  | -   | pF   |
|                 |                       | V <sub>R</sub> = 10 V; f = 1 MHz; T <sub>j</sub> = 25 °C                                                                                                       |     | -   | 6   | -   | pF   |
| t <sub>rr</sub> | reverse recovery time | when switched from I <sub>asub&gt;F</sub> = 10 mA to I <sub>R</sub> = 10 mA; R <sub>L</sub> = 100 W; measured at I <sub>R</sub> = 1 mA; T <sub>j</sub> = 25 °C |     | -   | 5   | -   | ns   |

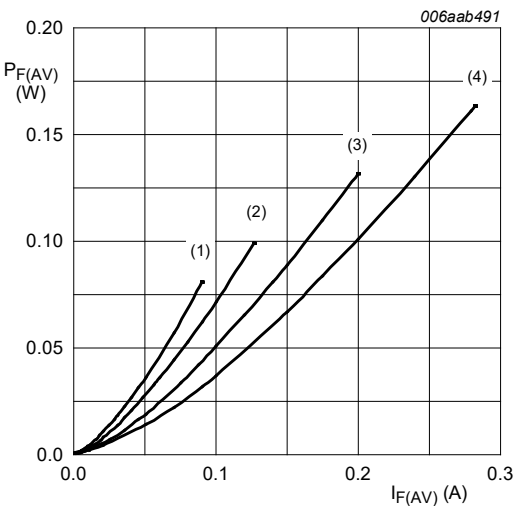
[1]





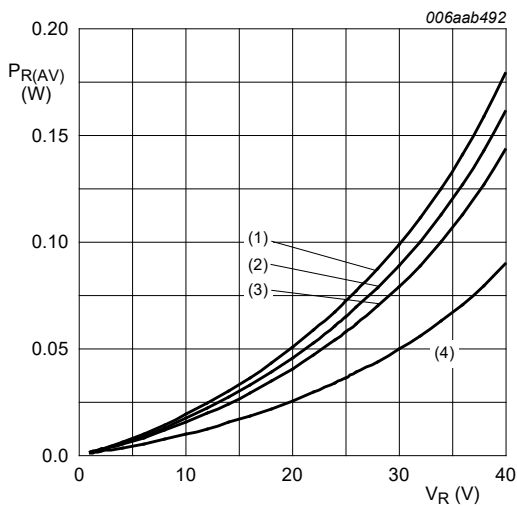
$f = 1 \text{ MHz}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$

Fig. 6. Diode capacitance as a function of reverse voltage; typical values



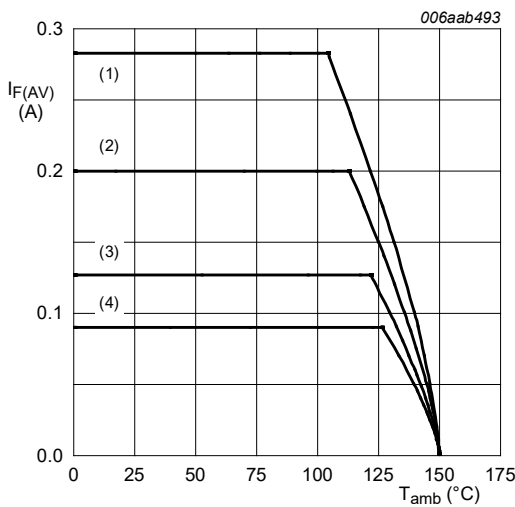
$T_j = 150 \text{ }^\circ\text{C}$   
(1)  $\delta = 0.1$   
(2)  $\delta = 0.2$   
(3)  $\delta = 0.5$   
(4)  $\delta = 0.8$   
(5)  $\delta = 1$

Fig. 7. Average forward power dissipation as a function of average forward current; typical values



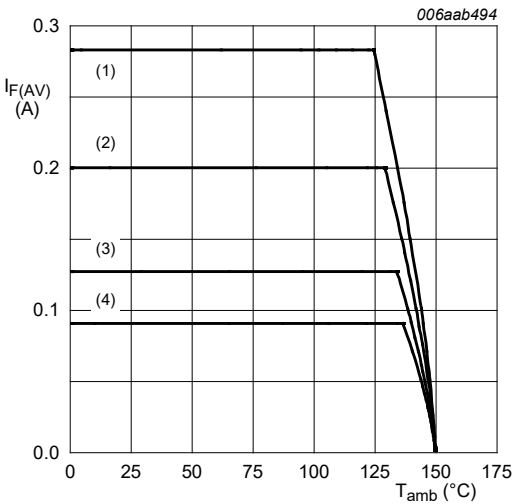
$T_j = 125 \text{ }^\circ\text{C}$   
(1)  $\delta = 1$   
(2)  $\delta = 0.9$   
(3)  $\delta = 0.8$   
(4)  $\delta = 0.5$

Fig. 8. Average reverse power dissipation as a function of reverse voltage; typical values



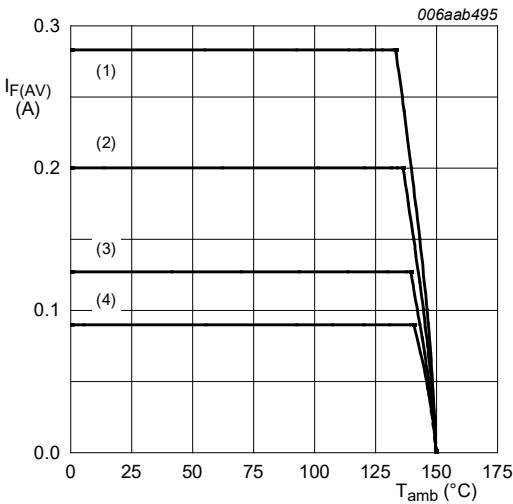
FR4 PCB, standard footprint  
 $T_j = 150 \text{ }^\circ\text{C}$   
(1)  $\delta = 1$ ; DC  
(2)  $\delta = 0.5$ ;  $f = 20 \text{ kHz}$   
(3)  $\delta = 0.2$ ;  $f = 20 \text{ kHz}$   
(4)  $\delta = 0.1$ ;  $f = 20 \text{ kHz}$

Fig. 9. Average forward current as a function of ambient temperature; typical values



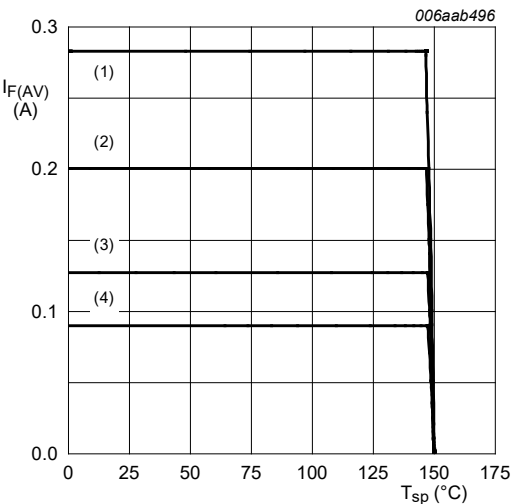
FR4 PCB, mounting pad for cathode 1 cm<sup>2</sup>  
 $T_j = 150$  °C  
(1)  $\delta = 1$ ; DC  
(2)  $\delta = 0.5$ ;  $f = 20$  kHz  
(3)  $\delta = 0.2$ ;  $f = 20$  kHz  
(4)  $\delta = 0.1$ ;  $f = 20$  kHz

Fig. 10. Average forward current as a function of ambient temperature; typical values



Ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint  
 $T_j = 150$  °C  
(1)  $\delta = 1$ ; DC  
(2)  $\delta = 0.5$ ;  $f = 20$  kHz  
(3)  $\delta = 0.2$ ;  $f = 20$  kHz  
(4)  $\delta = 0.1$ ;  $f = 20$  kHz

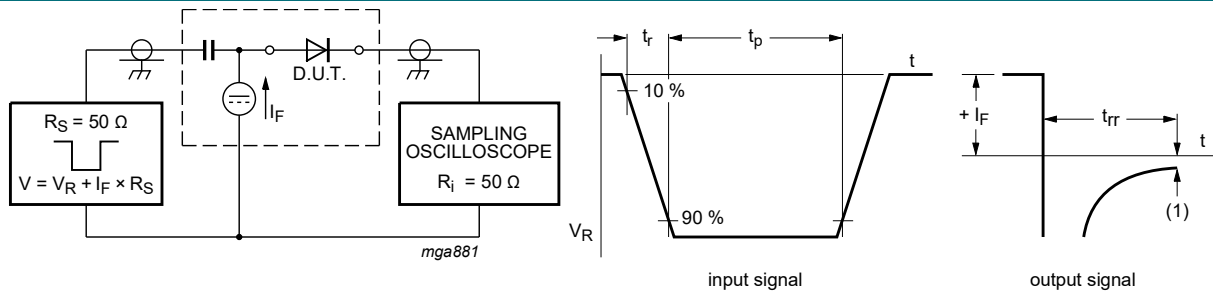
Fig. 11. Average forward current as a function of ambient temperature; typical values



$T_j = 150$  °C  
(1)  $\delta = 1$ ; DC  
(2)  $\delta = 0.5$ ;  $f = 20$  kHz  
(3)  $\delta = 0.2$ ;  $f = 20$  kHz  
(4)  $\delta = 0.1$ ;  $f = 20$  kHz

Fig. 12. Average forward current as a function of solder point temperature; typical values

## 11. Test information



(1)  $I_R = 1 \text{ mA}$

Input signal: reverse pulse rise time  $t_r = 0.6 \text{ ns}$ ; reverse voltage pulse duration  $t_p = 100 \text{ ns}$ ; duty cycle  $\delta = 0.05$

Oscilloscope rise time  $t_r = 0.35 \text{ ns}$

Fig. 13. Reverse recovery time: test circuit and waveforms

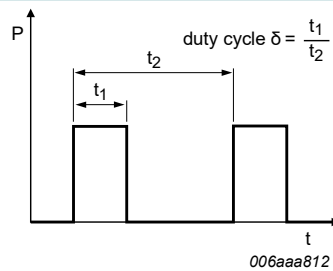


Fig. 14. Duty cycle definition

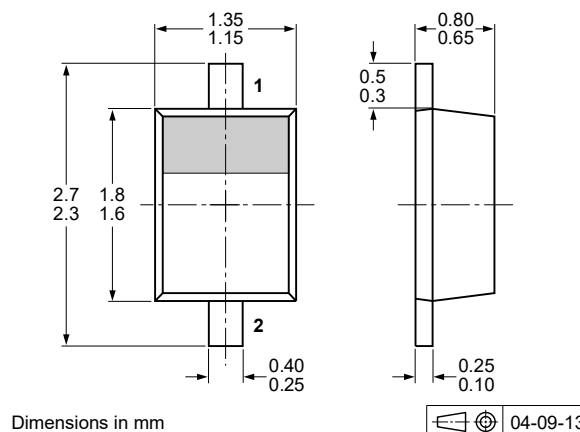
The current ratings for the typical waveforms are calculated according to the equations:

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

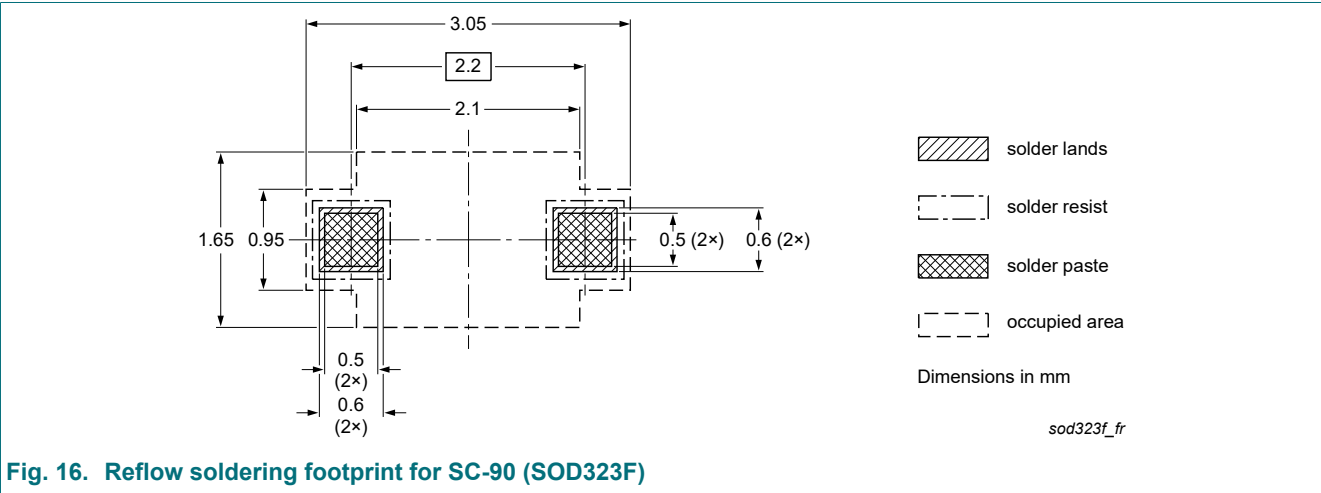
$$I_{RMS} = I_{F(AV)} \text{ at DC}$$

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

## 12. Package outline



13. Soldering



14. Revision history

Table 8. Revision history

| Data sheet ID  | Release date                                                                                                                                                                 | Data sheet status  | Change notice | Supersedes     |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|----------------|
| PMEG4002EJ v.3 | 20251002                                                                                                                                                                     | Product data sheet | -             | PMEG4002EJ v.2 |
| 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> |                    |               |                |
| PMEG4002EJ v.2 | 20230921                                                                                                                                                                     | Product data sheet | -             | PMEG4002EJ_1   |
| PMEG4002EJ_1   | 20090515                                                                                                                                                                     | 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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Date of release: 2 October 2025