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## Product Reference Information

**Part Number:** PMEG45A10EPDAZ  
**Manufacturer:** Nexperia USA Inc.  
**Package:** TO-277, 3-PowerDFN  
**Availability:** Please confirm with sales

### Product Page:

<https://antrexco.com/product/details/nexperia-usa-inc/pmeg45a10epdaz.html>

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This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

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# PMEG45A10EPD

45 V, 10 A low VF MEGA Schottky barrier rectifier

16 December 2014

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 SOT1289 (CFP15) power and flat lead Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Average forward current:  $I_{F(AV)} \leq 10$  A
- Reverse voltage:  $V_R \leq 45$  V
- Low forward voltage
- High power capability due to clip-bonding technology and heat sink
- Small and thin SMD power plastic package, typical height 0.78 mm

## 3. Applications

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

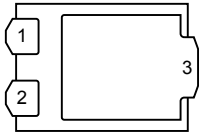
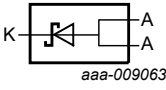
## 4. Quick reference data

Table 1. Quick reference data

| Symbol      | Parameter               | Conditions                                                                       | Min | Typ | Max | Unit    |
|-------------|-------------------------|----------------------------------------------------------------------------------|-----|-----|-----|---------|
| $I_{F(AV)}$ | average forward current | $\delta = 0.5$ ; $f = 20$ kHz; $T_{sp} \leq 130$ °C; square wave                 | -   | -   | 10  | A       |
| $V_R$       | reverse voltage         | $T_J = 25$ °C                                                                    | -   | -   | 45  | V       |
| $V_F$       | forward voltage         | $I_F = 10$ A; $t_p \leq 300$ $\mu$ s; $\delta \leq 0.02$ ; $T_J = 25$ °C; pulsed | -   | 473 | 540 | mV      |
| $I_R$       | reverse current         | $V_R = 10$ V; $t_p \leq 3$ ms; $\delta = 0.3$ ; $T_J = 25$ °C; pulsed            | -   | 13  | 30  | $\mu$ A |
|             |                         | $V_R = 45$ V; $t_p \leq 3$ ms; $\delta = 0.3$ ; $T_J = 25$ °C; pulsed            | -   | 150 | 500 | $\mu$ A |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline                                                                                   | Graphic symbol                                                                                    |
|-----|--------|-------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 1   | A      | anode       | <br>CFP15 (SOT1289) | <br>aaa-009063 |
| 2   | A      | anode       |                                                                                                      |                                                                                                   |
| 3   | K      | cathode     |                                                                                                      |                                                                                                   |

## 6. Ordering information

Table 3. Ordering information

| Type number  | Package |                                                                                         |         |
|--------------|---------|-----------------------------------------------------------------------------------------|---------|
|              | Name    | Description                                                                             | Version |
| PMEG45A10EPD | CFP15   | plastic, thermal enhanced ultra thin SMD package; 3 leads;<br>body: 5.8 x 4.3 x 0.78 mm | SOT1289 |

## 7. Marking

Table 4. Marking codes

| Type number  | Marking code |
|--------------|--------------|
| PMEG45A10EPD | 4510 AAAA    |

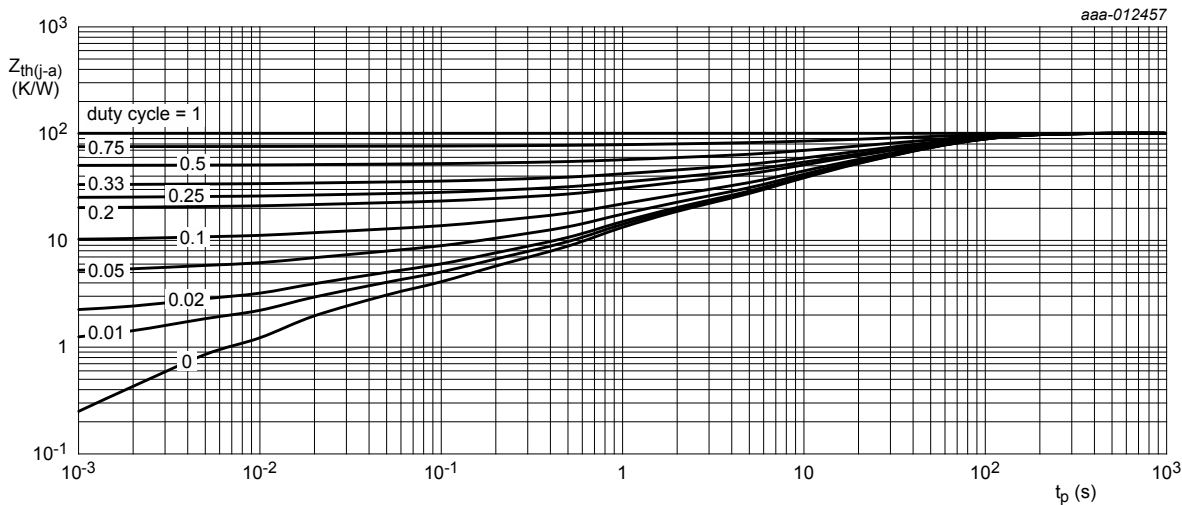
## 8. Limiting values

Table 5. Limiting values

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

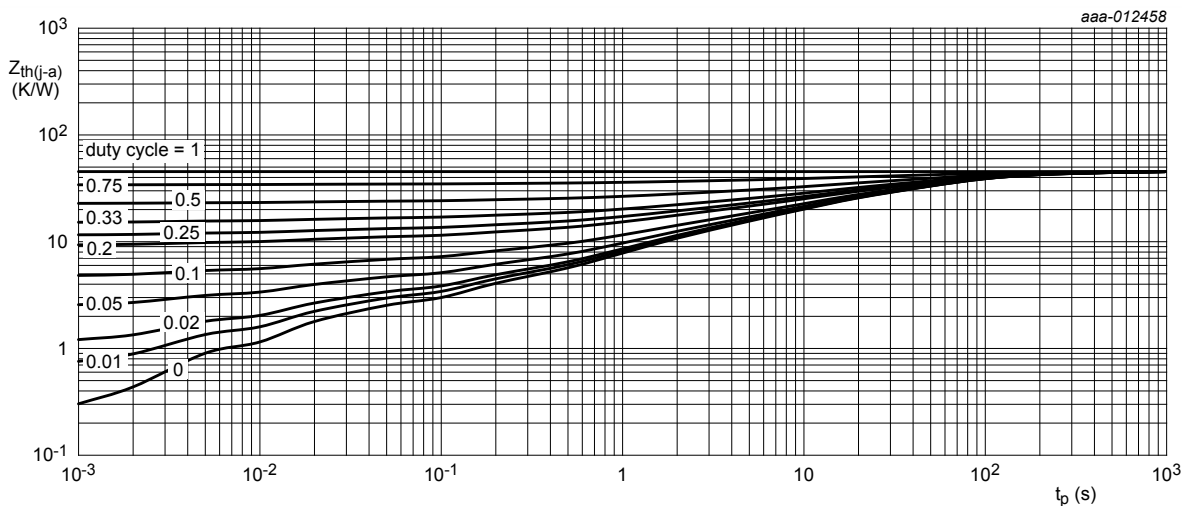
| Symbol      | Parameter                           | Conditions                                                                                        |     | Min | Max | Unit               |
|-------------|-------------------------------------|---------------------------------------------------------------------------------------------------|-----|-----|-----|--------------------|
| $V_R$       | reverse voltage                     | $T_j = 25\text{ }^{\circ}\text{C}$                                                                |     | -   | 45  | V                  |
| $I_F$       | forward current                     | $T_{sp} = 125\text{ }^{\circ}\text{C}$ ; $\delta = 1$                                             |     | -   | 14  | A                  |
| $I_{F(AV)}$ | average forward current             | $\delta = 0.5$ ; $f = 20\text{ kHz}$ ; $T_{sp} \leq 130\text{ }^{\circ}\text{C}$ ;<br>square wave |     | -   | 10  | A                  |
| $I_{FSM}$   | non-repetitive peak forward current | $t_p = 8\text{ ms}$ ; $T_{j(init)} = 25\text{ }^{\circ}\text{C}$ ; square wave                    |     | -   | 170 | A                  |
| $P_{tot}$   | total power dissipation             | $T_{amb} \leq 25\text{ }^{\circ}\text{C}$                                                         | [1] | -   | 0.9 | W                  |
|             |                                     |                                                                                                   | [2] | -   | 1.2 | W                  |
|             |                                     |                                                                                                   | [3] | -   | 3   | W                  |
| $T_j$       | junction temperature                |                                                                                                   |     | -   | 150 | $^{\circ}\text{C}$ |
| $T_{amb}$   | ambient temperature                 |                                                                                                   |     | -55 | 150 | $^{\circ}\text{C}$ |





FR4 PCB, mounting pad for cathode 1 cm<sup>2</sup>

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



Ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint

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          |
|-------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|---------------|
| $V_F$       | forward voltage                          | $I_F = 1\text{ A}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ;<br>$T_J = 25\text{ }^\circ\text{C}$ ; pulsed  | -   | 330 | 380 | mV            |
|             |                                          | $I_F = 2\text{ A}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ;<br>$T_J = 25\text{ }^\circ\text{C}$ ; pulsed  | -   | 357 | -   | mV            |
|             |                                          | $I_F = 3\text{ A}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ;<br>$T_J = 25\text{ }^\circ\text{C}$ ; pulsed  | -   | 377 | -   | mV            |
|             |                                          | $I_F = 5\text{ A}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ;<br>$T_J = 25\text{ }^\circ\text{C}$ ; pulsed  | -   | 409 | 470 | mV            |
|             |                                          | $I_F = 10\text{ A}$ ; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ;<br>$T_J = 25\text{ }^\circ\text{C}$ ; pulsed | -   | 473 | 540 | mV            |
| $I_R$       | reverse current                          | $V_R = 5\text{ V}$ ; $t_p \leq 3\text{ ms}$ ; $\delta = 0.3$ ; $T_J = 25\text{ }^\circ\text{C}$ ;<br>pulsed                 | -   | 10  | -   | $\mu\text{A}$ |
|             |                                          | $V_R = 10\text{ V}$ ; $t_p \leq 3\text{ ms}$ ; $\delta = 0.3$ ;<br>$T_J = 25\text{ }^\circ\text{C}$ ; pulsed                | -   | 13  | 30  | $\mu\text{A}$ |
|             |                                          | $V_R = 30\text{ V}$ ; $t_p \leq 3\text{ ms}$ ; $\delta = 0.3$ ;<br>$T_J = 25\text{ }^\circ\text{C}$ ; pulsed                | -   | 36  | -   | $\mu\text{A}$ |
|             |                                          | $V_R = 45\text{ V}$ ; $t_p \leq 3\text{ ms}$ ; $\delta = 0.3$ ;<br>$T_J = 25\text{ }^\circ\text{C}$ ; pulsed                | -   | 150 | 500 | $\mu\text{A}$ |
|             |                                          | $V_R = 10\text{ V}$ ; $t_p \leq 3\text{ ms}$ ; $\delta = 0.3$ ;<br>$T_J = 125\text{ }^\circ\text{C}$ ; pulsed               | -   | 11  | -   | mA            |
| $C_d$       | diode capacitance                        | $V_R = 1\text{ V}$ ; $f = 1\text{ MHz}$ ; $T_J = 25\text{ }^\circ\text{C}$                                                  | -   | 715 | -   | pF            |
|             |                                          | $V_R = 10\text{ V}$ ; $f = 1\text{ MHz}$ ; $T_J = 25\text{ }^\circ\text{C}$                                                 | -   | 240 | -   | pF            |
| $t_{rr}$    | reverse recovery time ;<br>step recovery | $I_F = 0.5\text{ A}$ ; $I_R = 0.5\text{ A}$ ; $I_{R(\text{meas})} = 0.1\text{ A}$ ;<br>$T_J = 25\text{ }^\circ\text{C}$     | -   | 21  | -   | ns            |
| $t_{rr}$    | reverse recovery time ;<br>ramp recovery | $dI_F/dt = 200\text{ A}/\mu\text{s}$ ; $T_J = 25\text{ }^\circ\text{C}$ ; $I_F = 6\text{ A}$ ;<br>$V_R = 26\text{ V}$       | -   | 13  | -   | ns            |
| $V_{(BR)R}$ | reverse breakdown<br>voltage             | $I_R = 5\text{ mA}$ ; $T_J = 25\text{ }^\circ\text{C}$ ; $t_p \leq 1.2\text{ ms}$ ; $\delta = 0.12$ ; pulsed                | 45  | -   | -   | V             |
| $V_{FRM}$   | peak forward recovery<br>voltage         | $I_F = 0.5\text{ A}$ ; $dI_F/dt = 20\text{ A}/\mu\text{s}$ ; $T_J = 25\text{ }^\circ\text{C}$                               | -   | 317 | -   | mV            |

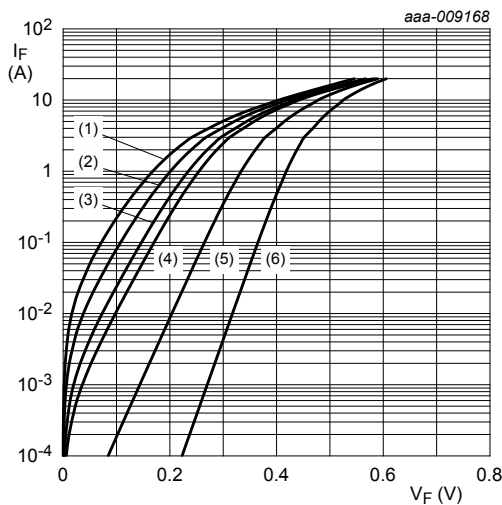


Fig. 4. Forward current as a function of forward voltage; typical values (pulsed condition)

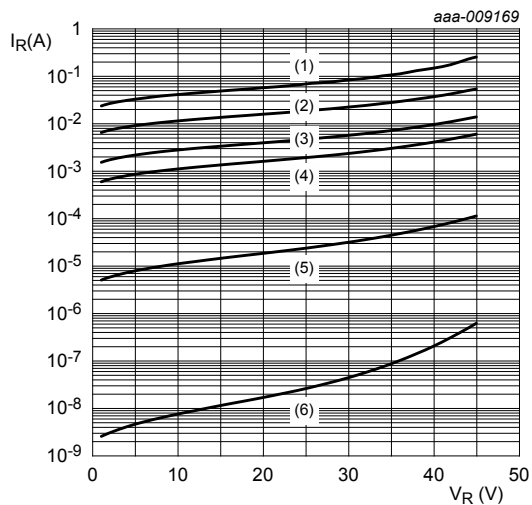


Fig. 5. Reverse current as a function of reverse voltage; typical values (pulsed condition)

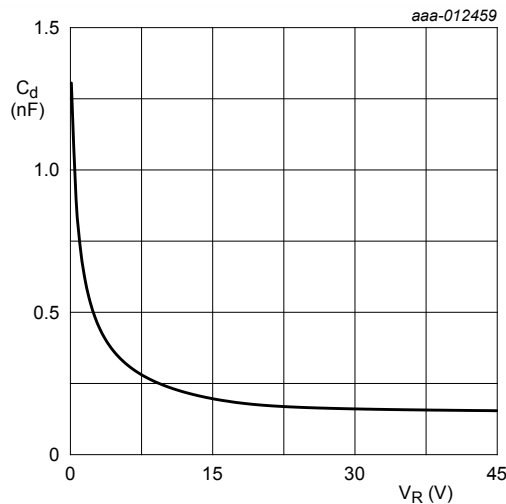


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

11. Test information

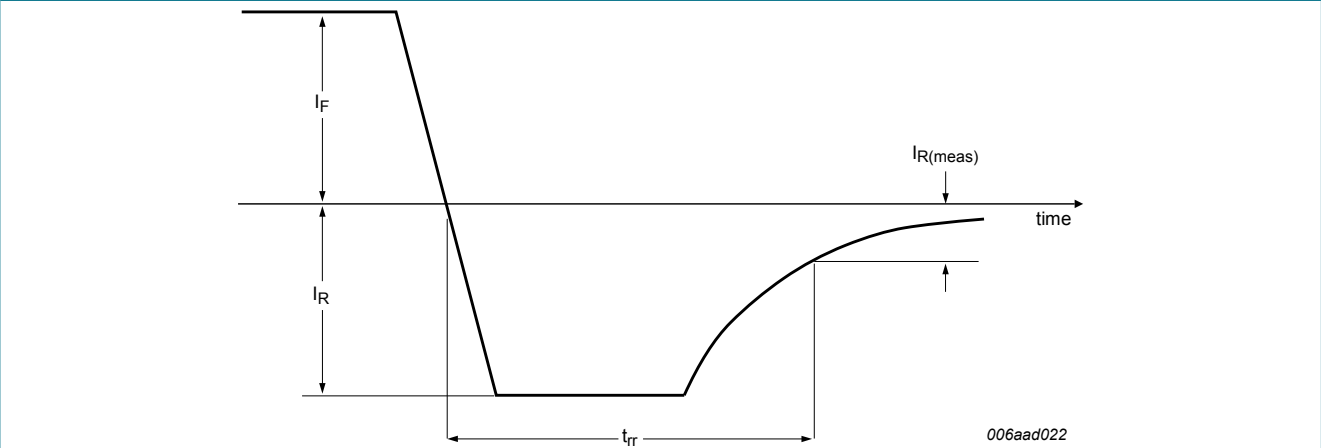


Fig. 7. Reverse recovery definition; step recovery

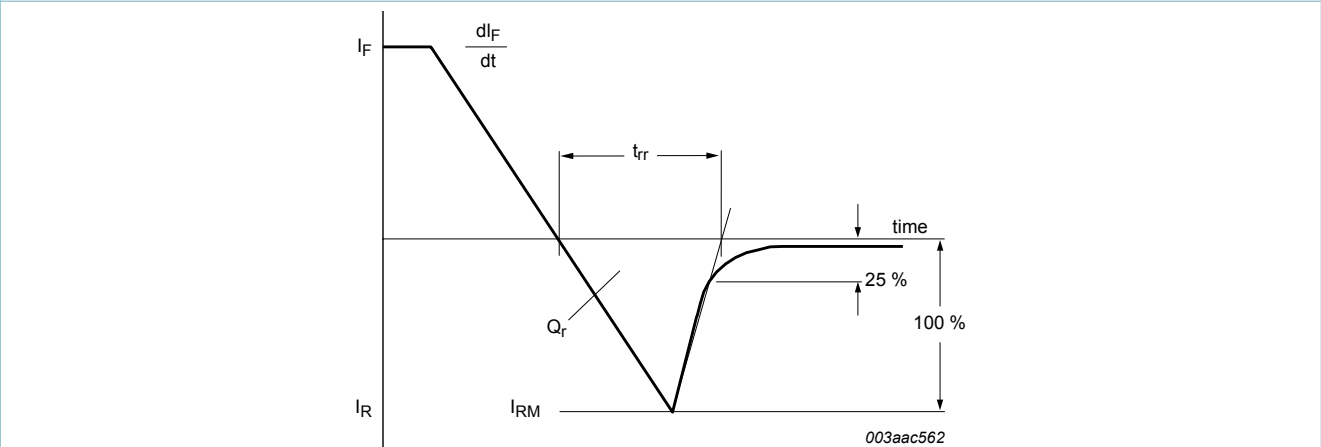


Fig. 8. Reverse recovery definition; ramp recovery

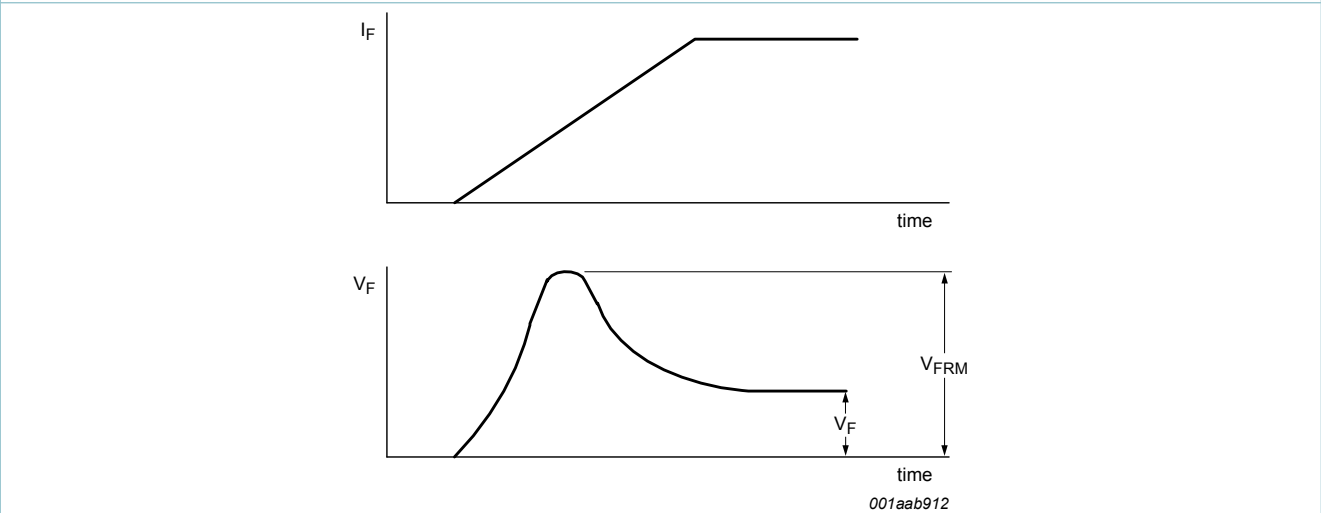


Fig. 9. Forward recovery definition

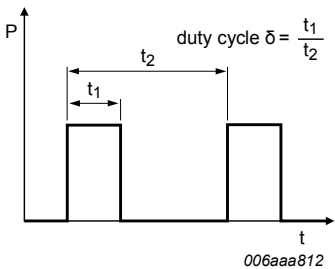


Fig. 10. Duty cycle definition

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

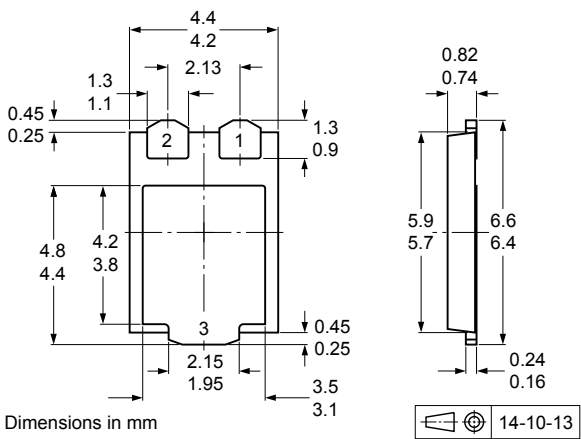
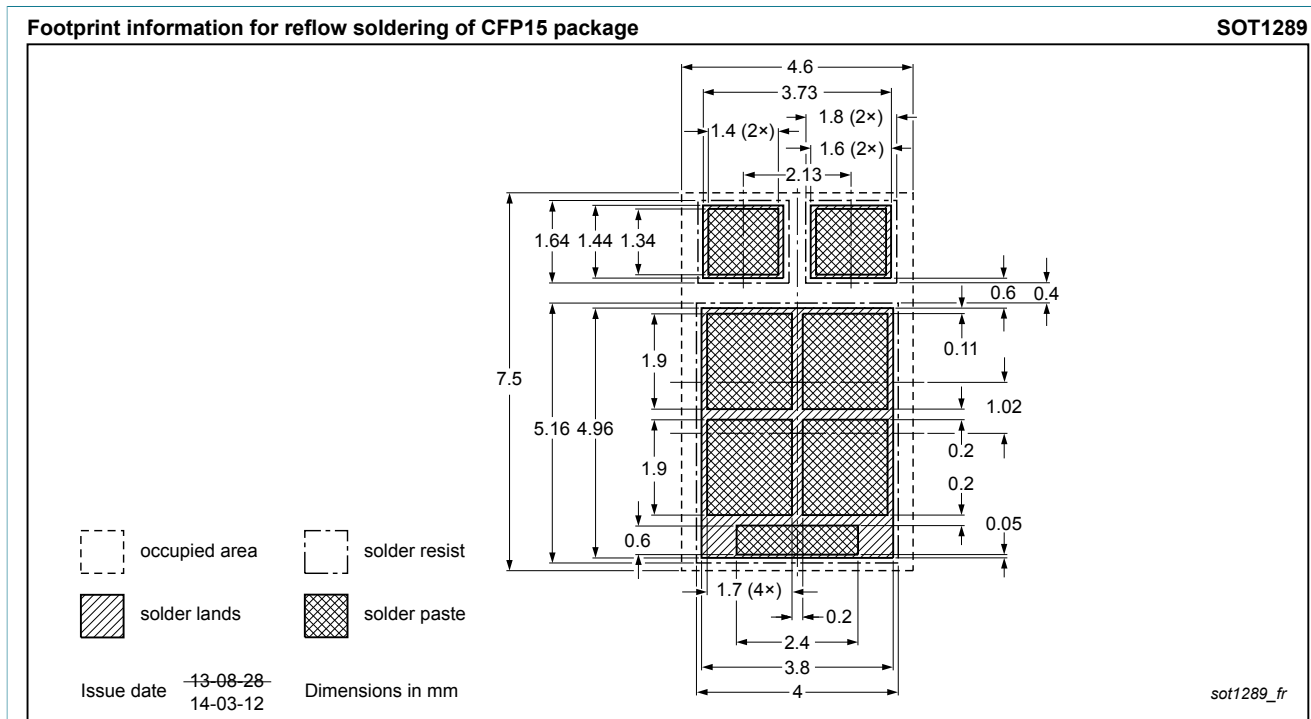


Fig. 11. Package outline CFP15 (SOT1289)

## 13. Soldering



**Fig. 12. Reflow soldering footprint for CFP15 (SOT1289)**

## 14. Revision history

Table 8. Revision history

| Data sheet ID    | Release date                                                                    | Data sheet status    | Change notice | Supersedes       |
|------------------|---------------------------------------------------------------------------------|----------------------|---------------|------------------|
| PMEG45A10EPD v.3 | 20141216                                                                        | Product data sheet   | -             | PMEG45A10EPD v.2 |
| Modifications:   | <ul style="list-style-type: none"><li>Package outline drawing updated</li></ul> |                      |               |                  |
| PMEG45A10EPD v.2 | 20140416                                                                        | Product data sheet   | -             | PMEG45A10EPD v.1 |
| PMEG45A10EPD v.1 | 20140217                                                                        | Objective data sheet | -             | -                |

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| 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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Date of release: 16 December 2014