



# PDTC115ET

PNP resistor-equipped transistor; R1 = 100 k $\Omega$ , R2 = 100 k $\Omega$

28 March 2024

Product data sheet

## 1. General description

PNP Resistor-Equipped Transistor (RET) in a small SOT23 Surface-Mounted Device (SMD) plastic package.

NPN complement: PDTC115ET

## 2. Features and benefits

- Built-in bias resistors
- Simplifies circuit design
- Reduces component count
- Reduces pick and place costs
- AEC-Q101 qualified

## 3. Applications

- General purpose switching and amplification
- Inverter and interface circuits
- Circuit driver

## 4. Quick reference data

Table 1. Quick reference data

| Symbol           | Parameter                 | Conditions               | Min | Typ | Max | Unit       |
|------------------|---------------------------|--------------------------|-----|-----|-----|------------|
| V <sub>CEO</sub> | collector-emitter voltage | open base                | -   | -   | -50 | V          |
| I <sub>O</sub>   | output current            |                          | -   | -   | -20 | mA         |
| R1               | bias resistor 1 (input)   | T <sub>amb</sub> = 25 °C | 70  | 100 | 130 | k $\Omega$ |
| R2/R1            | bias resistor ratio       |                          | 0.8 | 1   | 1.2 |            |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description        | Simplified outline | Graphic symbol |
|-----|--------|--------------------|--------------------|----------------|
| 1   | I      | input (base)       | <br>SOT23          | <br>sym003     |
| 2   | G      | GND (emitter)      |                    |                |
| 3   | O      | output (collector) |                    |                |

6. Ordering information

Table 3. Ordering information

| Type number | Package |                                                                                          |         |
|-------------|---------|------------------------------------------------------------------------------------------|---------|
|             | Name    | Description                                                                              | Version |
| PDTA115ET   | 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] |
|-------------|-----------------|
| PDTA115ET   | %AB             |

[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 <sub>CBO</sub> | collector-base voltage    | open emitter             |     | -   | -50  | V    |
| V <sub>CEO</sub> | collector-emitter voltage | open base                |     | -   | -50  | V    |
| V <sub>EBO</sub> | emitter-base voltage      | open collector           |     | -   | -10  | V    |
| V <sub>I</sub>   | input voltage             |                          |     | -40 | 10   | V    |
| I <sub>O</sub>   | output current            |                          |     | -   | -20  | mA   |
| I <sub>CM</sub>  | peak collector current    |                          |     | -   | -100 | mA   |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 25 °C | [1] | -   | 250  | mW   |
| T <sub>j</sub>   | junction temperature      |                          |     | -   | 150  | °C   |
| T <sub>amb</sub> | ambient temperature       |                          |     | -65 | 150  | °C   |
| T <sub>stg</sub> | storage temperature       |                          |     | -65 | 150  | °C   |

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

9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol               | Parameter                                   | Conditions               |     | Min | Typ | Max | Unit |
|----------------------|---------------------------------------------|--------------------------|-----|-----|-----|-----|------|
| R <sub>th(j-a)</sub> | thermal resistance from junction to ambient | T <sub>amb</sub> ≤ 25 °C | [1] | -   | -   | 500 | K/W  |

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

10. Characteristics

Table 7. Characteristics

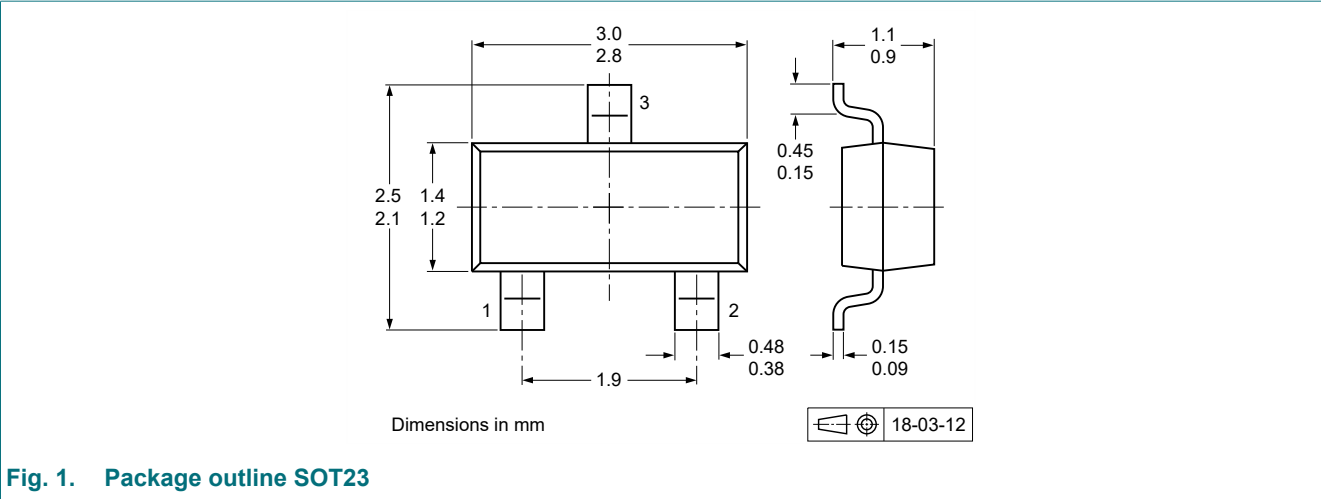
| Symbol              | Parameter                            | Conditions                                                                                               | Min | Typ  | Max  | Unit |
|---------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------|-----|------|------|------|
| I <sub>CBO</sub>    | collector-base cut-off current       | V <sub>CB</sub> = -50 V; I <sub>E</sub> = 0 A; T <sub>amb</sub> = 25 °C                                  | -   | -    | -100 | nA   |
| I <sub>CEO</sub>    | collector-emitter cut-off current    | V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0 A; T <sub>amb</sub> = 25 °C                                  | -   | -    | -100 | nA   |
|                     |                                      | V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0 A; T <sub>j</sub> = 150 °C                                   | -   | -    | -5   | μA   |
| I <sub>EBO</sub>    | emitter-base cut-off current         | V <sub>EB</sub> = -5 V; I <sub>C</sub> = 0 A; T <sub>amb</sub> = 25 °C                                   | -   | -    | -50  | μA   |
| h <sub>FE</sub>     | DC current gain                      | V <sub>CE</sub> = -5 V; I <sub>C</sub> = -5 mA; T <sub>amb</sub> = 25 °C                                 | 80  | -    | -    |      |
| V <sub>CEsat</sub>  | collector-emitter saturation voltage | I <sub>C</sub> = -5 mA; I <sub>B</sub> = -0.25 mA; T <sub>amb</sub> = 25 °C                              | -   | -    | -150 | mV   |
| V <sub>I(off)</sub> | off-state input voltage              | V <sub>CE</sub> = -5 V; I <sub>C</sub> = -100 μA; T <sub>amb</sub> = 25 °C                               | -   | -1.2 | -0.5 | V    |
| V <sub>I(on)</sub>  | on-state input voltage               | V <sub>CE</sub> = -0.3 V; I <sub>C</sub> = -1 mA; T <sub>amb</sub> = 25 °C                               | -3  | -1.6 | -    | V    |
| R1                  | bias resistor 1 (input)              | T <sub>amb</sub> = 25 °C                                                                                 | 70  | 100  | 130  | kΩ   |
| R2/R1               | bias resistor ratio                  |                                                                                                          | 0.8 | 1    | 1.2  |      |
| C <sub>c</sub>      | collector capacitance                | V <sub>CB</sub> = -10 V; I <sub>E</sub> = 0 A; i <sub>e</sub> = 0 A; f = 1 MHz; T <sub>amb</sub> = 25 °C | -   | -    | 3    | pF   |

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



13. Soldering

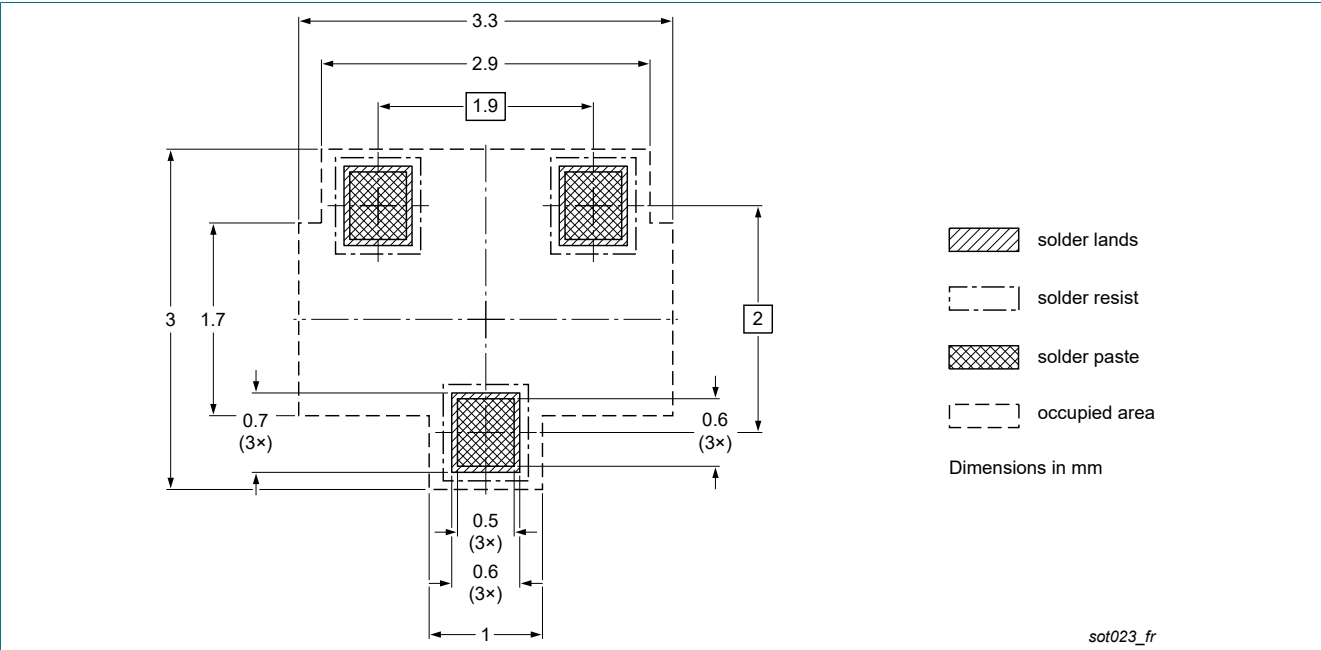


Fig. 2. Reflow soldering footprint for SOT23

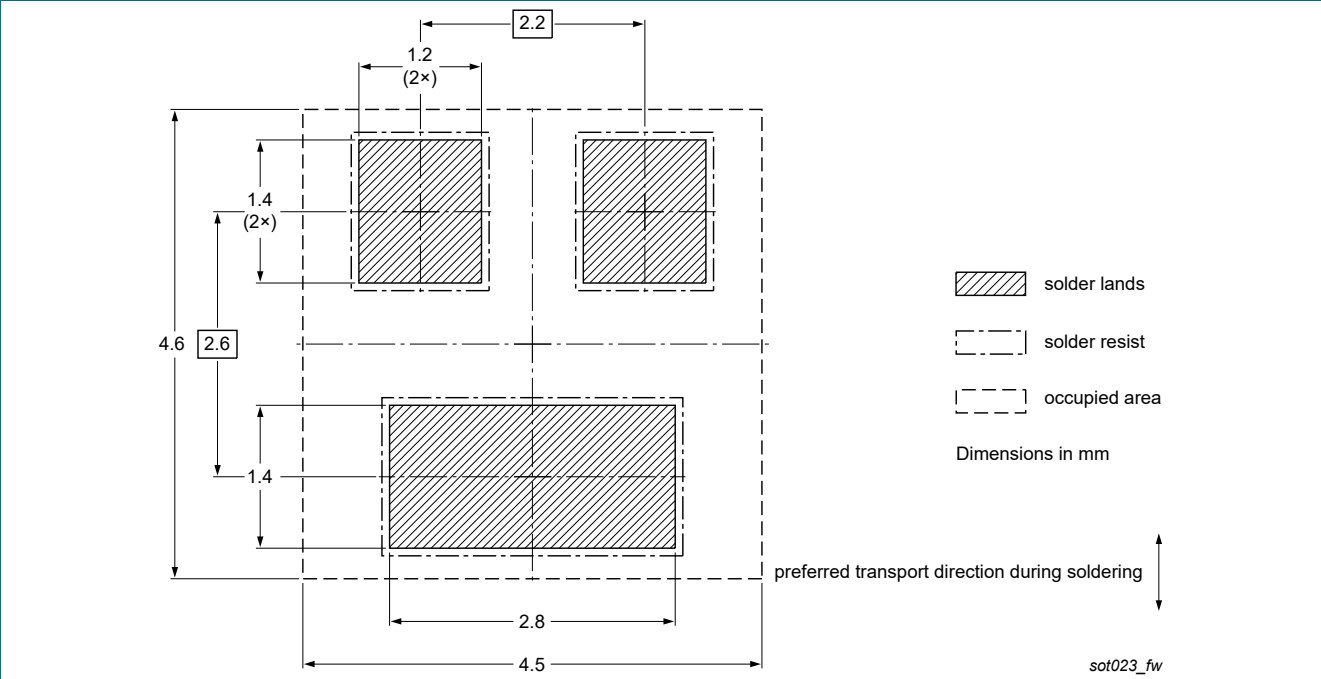


Fig. 3. Wave soldering footprint for SOT23

14. Revision history

Table 8. Revision history

| Data sheet ID       | Release date                                                                                                                                                                                                                                                                                                                             | Data sheet status     | Change notice | Supersedes          |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|---------------------|
| PDTA115ET v.3       | 20240328                                                                                                                                                                                                                                                                                                                                 | Product data sheet    | -             | PDTA115E series v.2 |
| Modification:       | <ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>Legal texts have been adapted to the new company name where appropriate.</li><li>Family data sheet reduced to single type data sheet.</li><li>Packing information removed.</li></ul> |                       |               |                     |
| PDTA115E series v.2 | 20040730                                                                                                                                                                                                                                                                                                                                 | Product data sheet    | -             | PDTA115E series v.1 |
| PDTA115E series v.1 | 20040505                                                                                                                                                                                                                                                                                                                                 | Product specification | -             | -                   |

## 15. Legal information

### Data sheet status

| Document status<br>[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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Contents

1. General description..... 1

2. Features and benefits..... 1

3. Applications..... 1

4. Quick reference data..... 1

5. Pinning information..... 1

6. Ordering information..... 2

7. Marking..... 2

8. Limiting values..... 2

9. Thermal characteristics..... 2

10. Characteristics..... 3

11. Test information..... 3

12. Package outline..... 3

13. Soldering..... 4

14. Revision history..... 5

15. Legal information..... 6

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