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## Product Reference Information

**Part Number:** 2PD601ASW,115  
**Manufacturer:** Nexperia USA Inc.  
**Package:** SC-70, SOT-323  
**Availability:** Please confirm with sales

### Product Page:

<https://antrexco.com/product/details/nexperia-usa-inc/2pd601asw-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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# 2PD601ASW

50 V, 100 mA NPN general purpose transistor

1 October 2022

Product data sheet

## 1. General description

NPN general purpose transistor in a very small SOT323 (SC-70) Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- General-purpose transistor
- Small SMD plastic package

## 3. Applications

- General purpose switching and amplification.

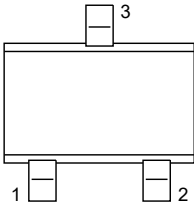
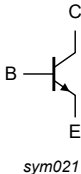
## 4. Quick reference data

Table 1. Quick reference data

| Symbol    | Parameter                 | Conditions                                                              | Min | Typ | Max | Unit |
|-----------|---------------------------|-------------------------------------------------------------------------|-----|-----|-----|------|
| $V_{CE0}$ | collector-emitter voltage | open base                                                               | -   | -   | 50  | V    |
| $I_C$     | collector current         |                                                                         | -   | -   | 100 | mA   |
| $h_{FE}$  | DC current gain           | $V_{CE} = 10\text{ V}$ ; $I_C = 2\text{ mA}$ ; $T_{amb} = 25\text{ °C}$ | 290 | -   | 460 |      |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline                                                                                    | Graphic symbol                                                                                  |
|-----|--------|-------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| 1   | B      | base        | <br>SC-70 (SOT323) | <br>sym021 |
| 2   | E      | emitter     |                                                                                                       |                                                                                                 |
| 3   | C      | collector   |                                                                                                       |                                                                                                 |

## 6. Ordering information

Table 3. Ordering information

| Type number               | Package |                                                                                           |                        |
|---------------------------|---------|-------------------------------------------------------------------------------------------|------------------------|
|                           | Name    | Description                                                                               | Version                |
| <a href="#">2PD601ASW</a> | SC-70   | plastic, surface-mounted package; 3 leads; 1.3 mm pitch;<br>2 mm x 1.25 mm x 0.95 mm body | <a href="#">SOT323</a> |

## 7. Marking

Table 4. Marking codes

| Type number | Marking code[1] |
|-------------|-----------------|
| 2PD601ASW   | %6F             |

[1] % = placeholder for manufacturing site code

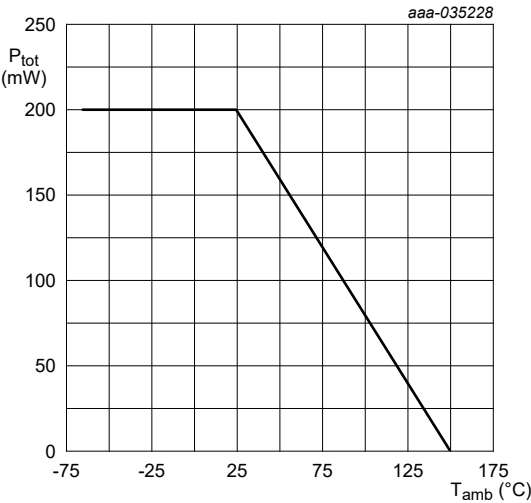
## 8. Limiting values

Table 5. Limiting values

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

| Symbol    | Parameter                 | Conditions                    |     | Min | Max | Unit |
|-----------|---------------------------|-------------------------------|-----|-----|-----|------|
| $V_{CBO}$ | collector-base voltage    | open emitter                  |     | -   | 60  | V    |
| $V_{CEO}$ | collector-emitter voltage | open base                     |     | -   | 50  | V    |
| $V_{EBO}$ | emitter-base voltage      | open collector                |     | -   | 6   | V    |
| $I_C$     | collector current         |                               |     | -   | 100 | mA   |
| $I_{CM}$  | peak collector current    | single pulse; $t_p \leq 1$ ms |     | -   | 200 | mA   |
| $P_{tot}$ | total power dissipation   | $T_{amb} \leq 25$ °C          | [1] | -   | 200 | 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, 35 µm copper, tin-plated and standard footprint.



FR4 PCB, single-sided, 35  $\mu m$  copper, tin-plated and standard footprint

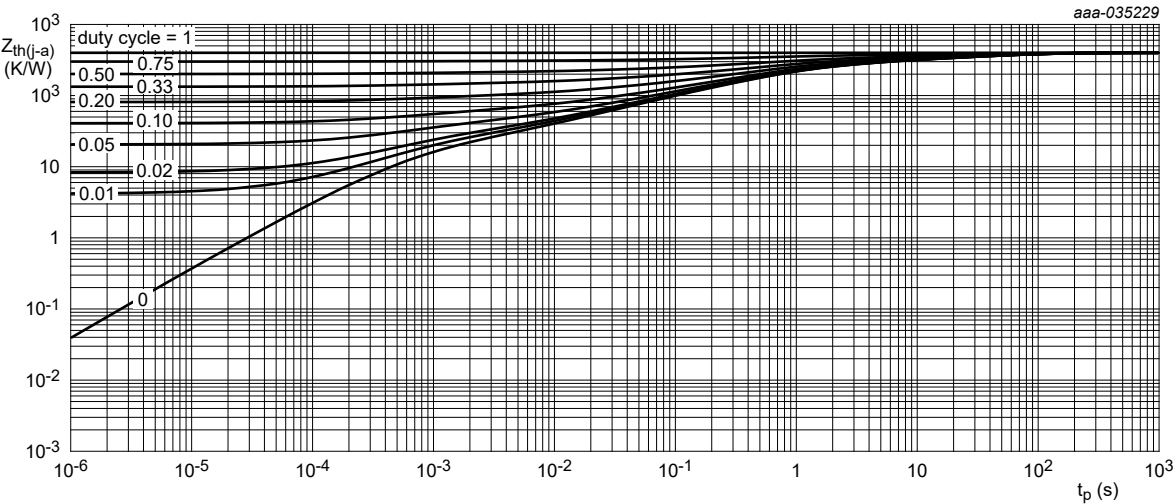
Fig. 1. Power derating curve

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] | -   | -   | 625 | K/W  |

[1] Device mounted on an FR4 PCB, single-sided copper, 35  $\mu m$  copper, tin-plated and standard footprint.



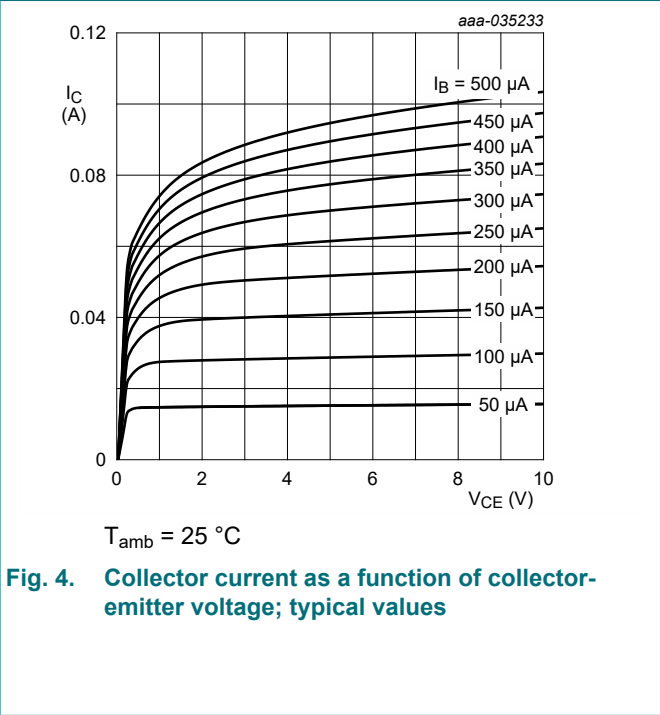
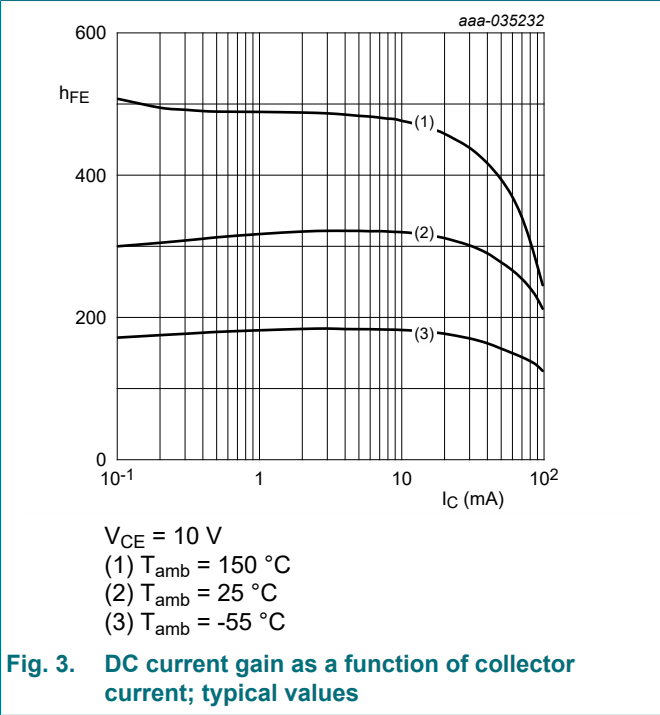
FR4 PCB, single-sided, 35  $\mu m$  copper, tin-plated and standard footprint.

Fig. 2. 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          |
|-------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|---------------|
| $I_{CBO}$   | collector-base cut-off current       | $V_{CB} = 60\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$                                                      | -   | -   | 10  | nA            |
|             |                                      | $V_{CB} = 60\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ }^{\circ}\text{C}$                                                         | -   | -   | 5   | $\mu\text{A}$ |
| $I_{EBO}$   | emitter-base cut-off current         | $V_{EB} = 5\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$                                                       | -   | -   | 10  | nA            |
| $h_{FE}$    | DC current gain                      | $V_{CE} = 2\text{ V}; I_C = 100\text{ mA}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02; T_{amb} = 25\text{ }^{\circ}\text{C}$ | 90  | -   | -   |               |
|             |                                      | $V_{CE} = 10\text{ V}; I_C = 2\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$                                                     | 290 | -   | 460 |               |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = 100\text{ mA}; I_B = 10\text{ mA}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02; T_{amb} = 25\text{ }^{\circ}\text{C}$  | -   | -   | 250 | mV            |
| $C_c$       | collector capacitance                | $V_{CB} = 10\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^{\circ}\text{C}$                  | -   | -   | 3   | pF            |
| $f_T$       | transition frequency                 | $V_{CE} = 10\text{ V}; I_C = 2\text{ mA}; f = 100\text{ MHz}; T_{amb} = 25\text{ }^{\circ}\text{C}$                                 | 100 | -   | -   | MHz           |



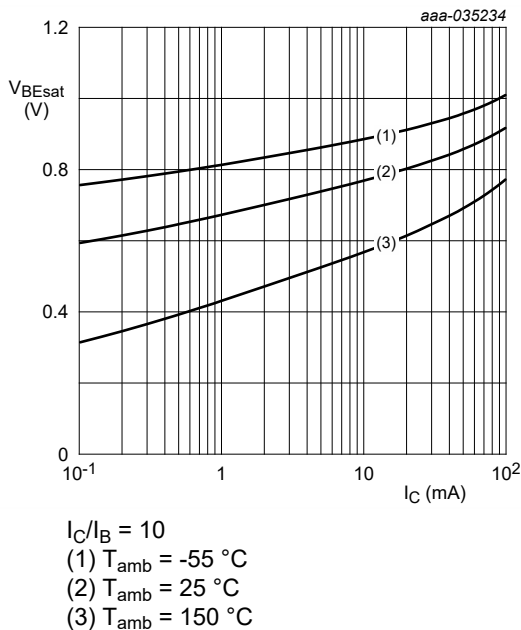


Fig. 5. Base-emitter saturation voltage as a function of collector current; typical values

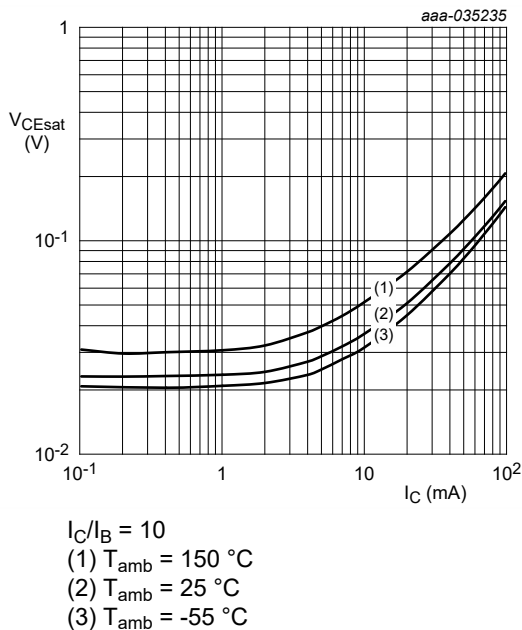


Fig. 6. Collector-emitter saturation voltage as a function of collector current; typical values

11. Package outline

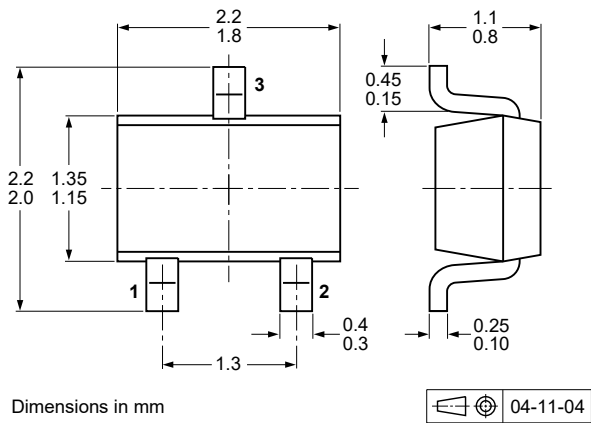


Fig. 7. Package outline SC-70 (SOT323)

12. Soldering

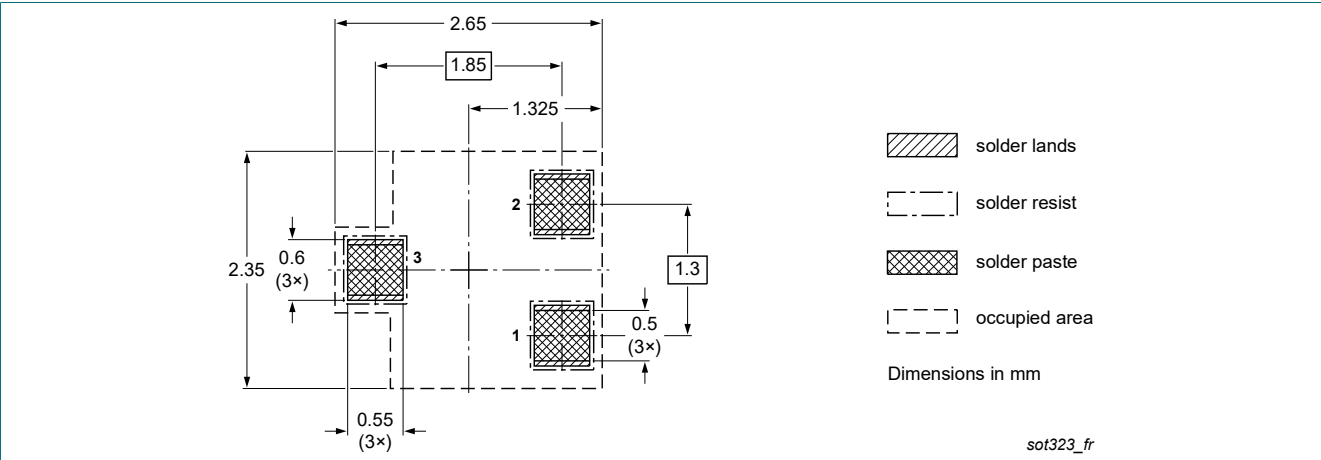


Fig. 8. Reflow soldering footprint for SC-70 (SOT323)

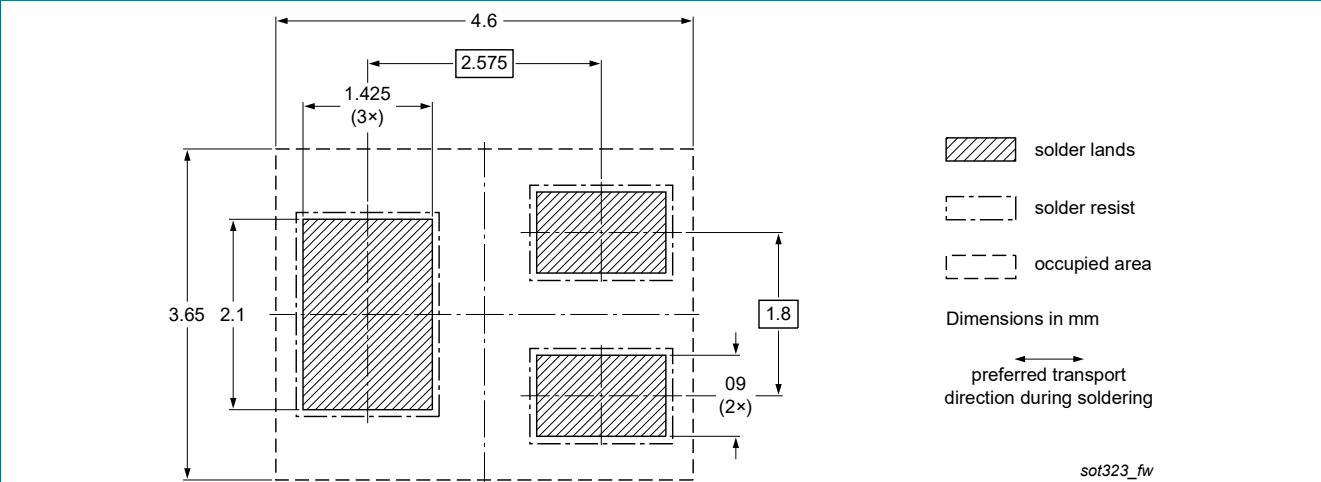


Fig. 9. Wave soldering footprint for SC-70 (SOT323)

## 13. Revision history

**Table 8. Revision history**

| Data sheet ID   | Release date                                                                                                                                                                                                                                                                                                                                                                                                | Data sheet status     | Change notice | Supersedes      |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-----------------|
| 2PD601ASW v.3   | 20221001                                                                                                                                                                                                                                                                                                                                                                                                    | Product data sheet    | -             | 2PD601A_SER v.2 |
| Modifications:  | <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 splitted to single type data sheets.</li><li>• Product changed to non automotive. Please refer to the automotive product(s) with -Q.</li></ul> |                       |               |                 |
| 2PD601A_SER v.2 | 20040212                                                                                                                                                                                                                                                                                                                                                                                                    | Product data sheet    | -             | 2PD601A_SER v.1 |
| 2PD601A_SER v.1 | 20020626                                                                                                                                                                                                                                                                                                                                                                                                    | Product specification | -             | -               |

## 14. 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".
- [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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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..... 3

10. Characteristics..... 4

11. Package outline..... 5

12. Soldering..... 6

13. Revision history..... 7

14. Legal information..... 8

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