



# 2PD601ASW-Q

50 V, 100 mA NPN general purpose transistor

7 September 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
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- General purpose switching and amplification.

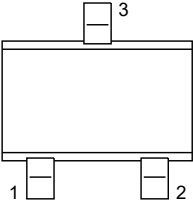
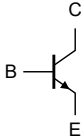
## 4. Quick reference data

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-Q</a> | SC-70   | plastic, surface-mounted package; 3 leads; 1.3 mm pitch; 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-Q | %6F             |

[1] % = placeholder for manufacturing site code

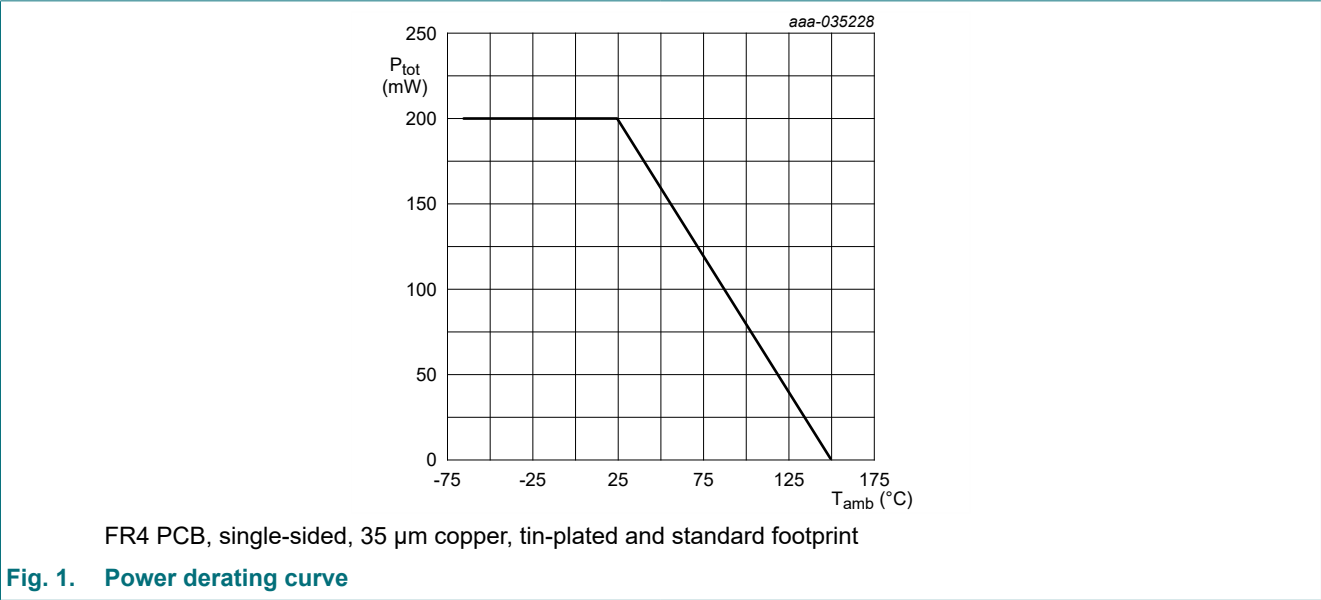
8. Limiting values

Table 5. Limiting values

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

| Symbol           | Parameter                 | Conditions                          |     | Min | Max | Unit |
|------------------|---------------------------|-------------------------------------|-----|-----|-----|------|
| V <sub>CBO</sub> | collector-base voltage    | open emitter                        |     | -   | 60  | V    |
| V <sub>CEO</sub> | collector-emitter voltage | open base                           |     | -   | 50  | V    |
| V <sub>EBO</sub> | emitter-base voltage      | open collector                      |     | -   | 6   | V    |
| I <sub>C</sub>   | collector current         |                                     |     | -   | 100 | mA   |
| I <sub>CM</sub>  | peak collector current    | single pulse; t <sub>p</sub> ≤ 1 ms |     | -   | 200 | mA   |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 25 °C            | [1] | -   | 200 | 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, 35 µm copper, tin-plated and standard footprint.

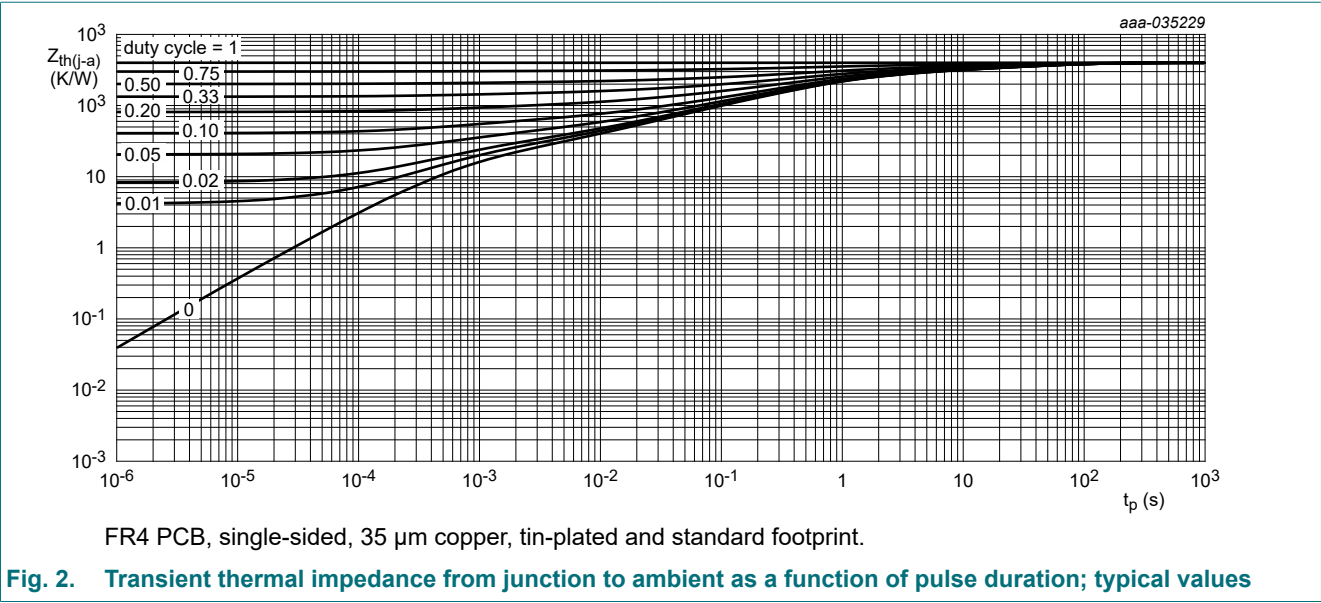


9. Thermal characteristics

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  |

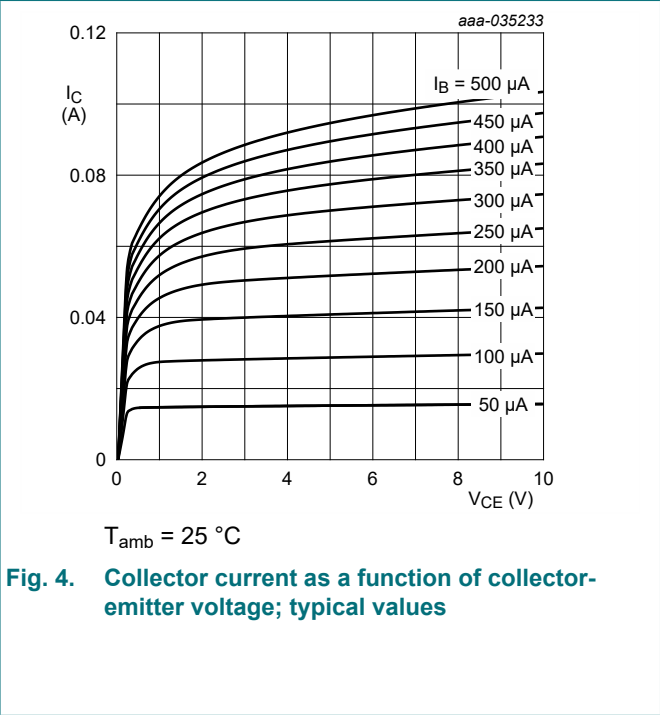
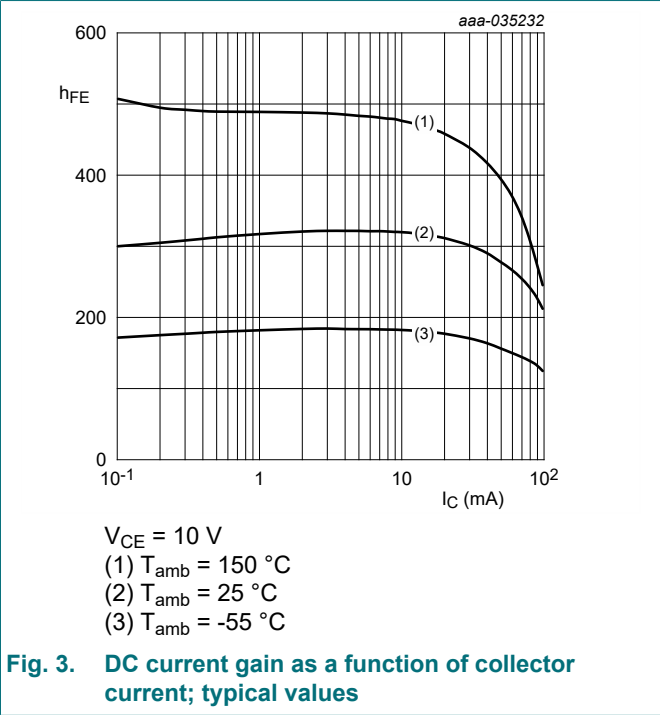
[1] Device mounted on an FR4 PCB, single-sided copper, 35 µm copper, tin-plated and standard footprint.

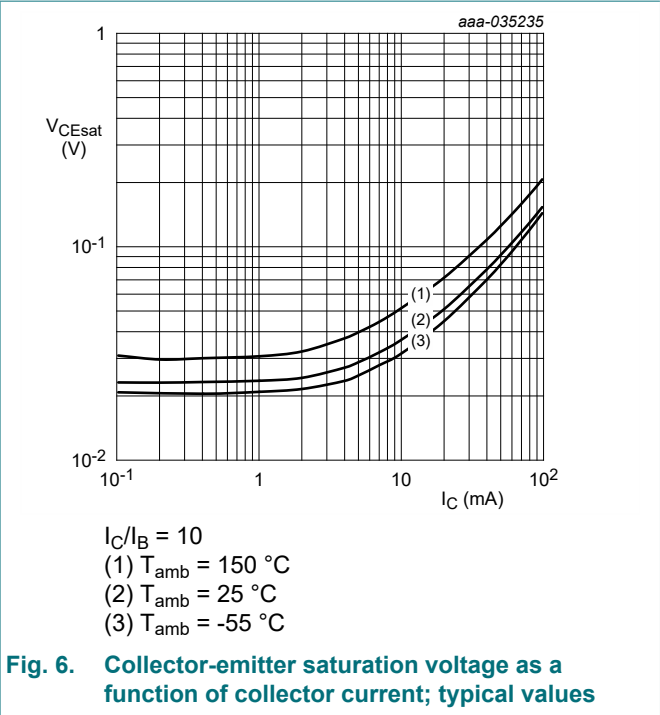
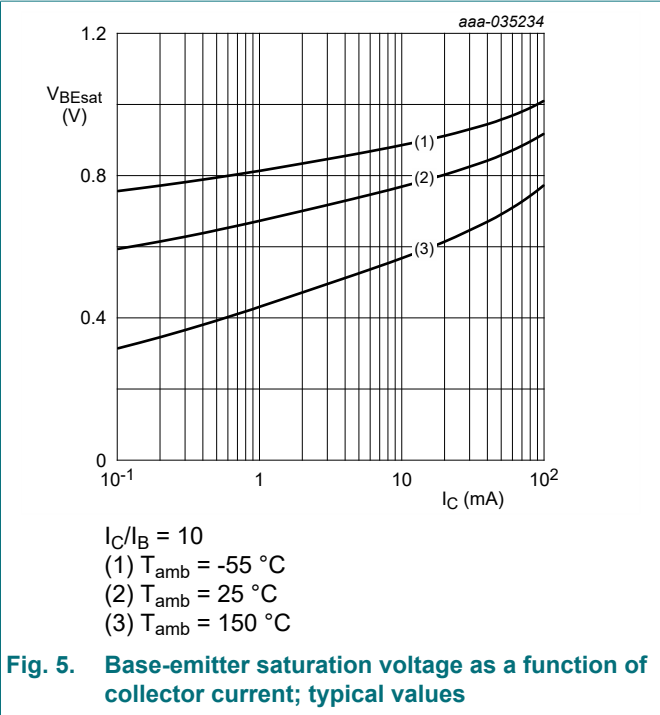


10. Characteristics

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           |





## 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

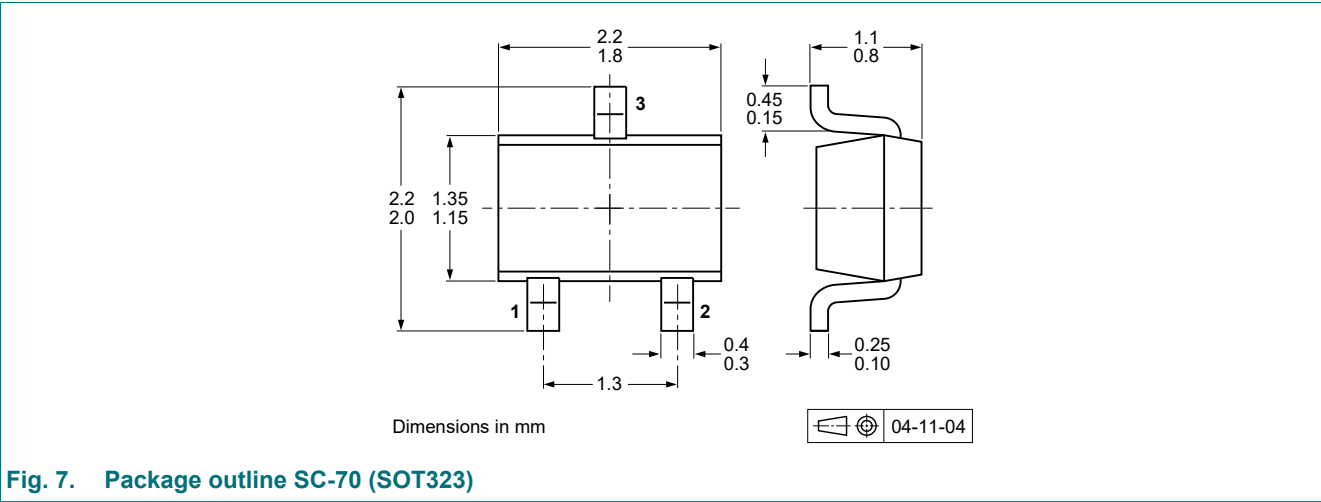


Fig. 7. Package outline SC-70 (SOT323)

13. Soldering

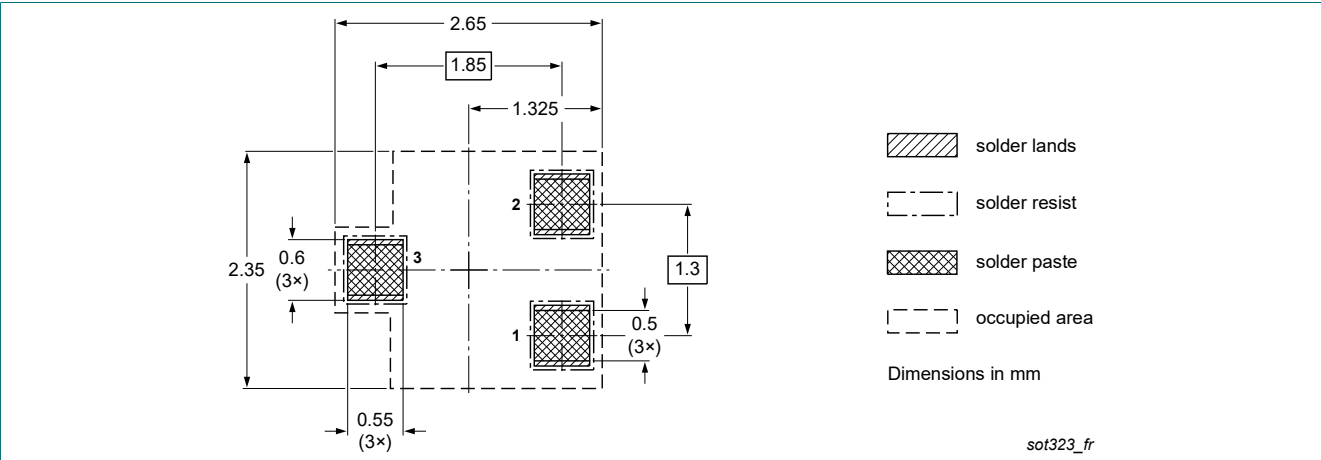


Fig. 8. Reflow soldering footprint for SC-70 (SOT323)

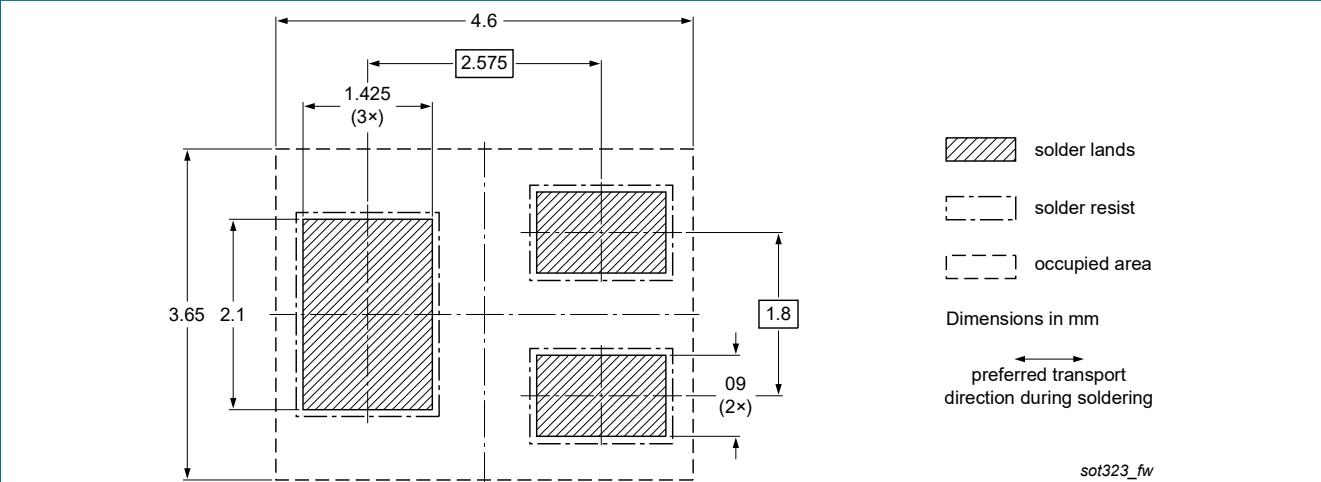


Fig. 9. Wave soldering footprint for SC-70 (SOT323)

## 14. Revision history

Table 8. Revision history

| Data sheet ID   | Release date | Data sheet status  | Change notice | Supersedes |
|-----------------|--------------|--------------------|---------------|------------|
| 2PD601ASW-Q v.1 | 20220907     | Product data sheet | -             | -          |

## 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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