



# 2PC4081R-Q

NPN general-purpose transistor

22 July 2025

Product data sheet

## 1. General description

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

PNP complement: 2PA1576R-Q

## 2. Features and benefits

- Low current (max. 150 mA)
- Low voltage (max. 50 V)
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- General-purpose switching
- Small signal 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         |                                                                        | -   | -   | 150 | mA   |
| $h_{FE}$  | DC current gain           | $V_{CE} = 6\text{ V}$ ; $I_C = 1\text{ mA}$ ; $T_{amb} = 25\text{ °C}$ | 180 | -   | 390 |      |

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------|--------------------|----------------|
| 1   | B      | base        | <br>SC-70 (SOT323) | <br>aaa-027673 |
| 2   | E      | emitter     |                    |                |
| 3   | C      | collector   |                    |                |

6. Ordering information

Table 3. Ordering information

| Type number | Package |                                                                                        |         |
|-------------|---------|----------------------------------------------------------------------------------------|---------|
|             | Name    | Description                                                                            | Version |
| 2PC4081R-Q  | SC-70   | plastic, surface-mounted package; 3 leads; 1.3 mm pitch; 2 mm x 1.25 mm x 0.95 mm body | SOT323  |

7. Marking

Table 4. Marking codes

| Type number | Marking code[1] |
|-------------|-----------------|
| 2PC4081R-Q  | Z%R             |

[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           |     | -   | 7   | V    |
| I <sub>C</sub>   | collector current         |                          |     | -   | 150 | mA   |
| I <sub>CM</sub>  | peak collector current    |                          |     | -   | 200 | mA   |
| I <sub>BM</sub>  | peak base current         |                          |     | -   | 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] Transistor mounted on an FR4 printed-circuit board, single-sided copper, tin-plated and standard footprint.

9. Thermal characteristics

Table 6. Thermal characteristics

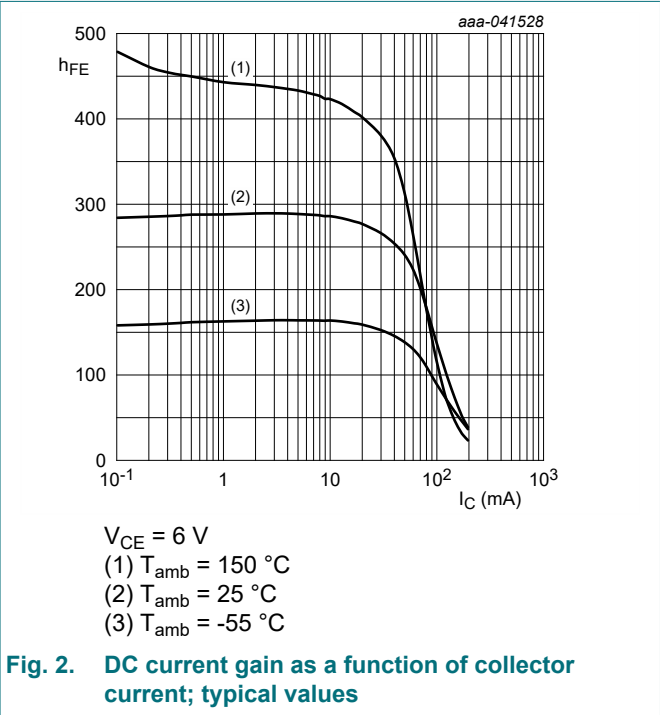
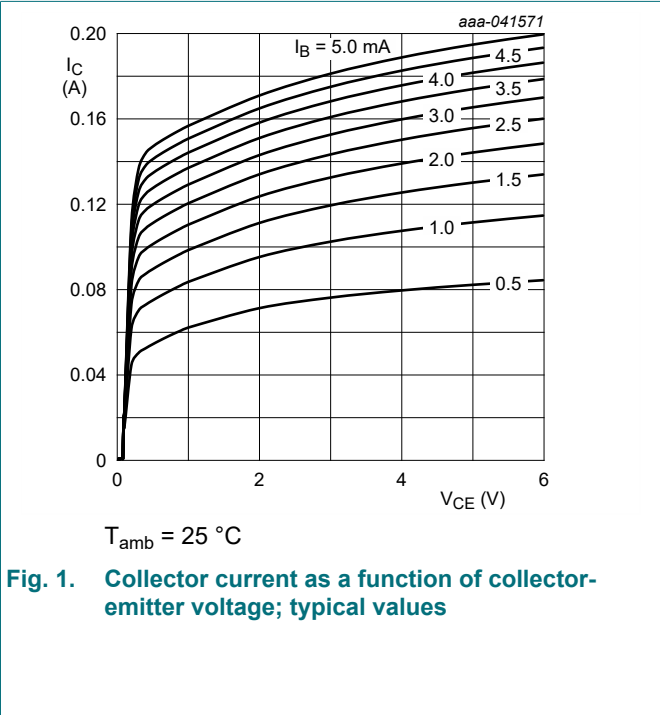
| Symbol               | Parameter                                   | Conditions  |     | Min | Typ | Max | Unit |
|----------------------|---------------------------------------------|-------------|-----|-----|-----|-----|------|
| R <sub>th(j-a)</sub> | thermal resistance from junction to ambient | in free air | [1] | -   | -   | 625 | K/W  |

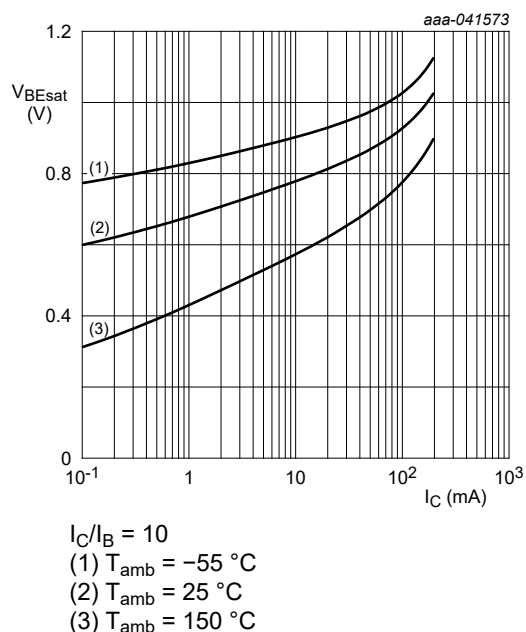
[1] Transistor mounted on an FR4 printed-circuit board, single-sided copper, tin-plated and standard footprint.

10. Characteristics

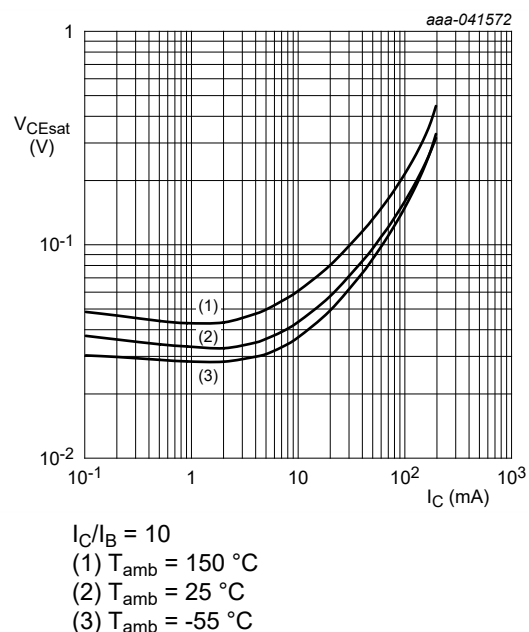
Table 7. Characteristics

| Symbol      | Parameter                            | Conditions                                                                                                                       | Min | Typ | Max | Unit          |
|-------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|---------------|
| $I_{CBO}$   | collector-base cut-off current       | $V_{CB} = 30\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$                                                   | -   | -   | 100 | nA            |
|             |                                      | $V_{CB} = 30\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ }^{\circ}\text{C}$                                                      | -   | -   | 5   | $\mu\text{A}$ |
| $I_{EBO}$   | emitter-base cut-off current         | $V_{EB} = 4\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$                                                    | -   | -   | 100 | nA            |
| $h_{FE}$    | DC current gain                      | $V_{CE} = 6\text{ V}; I_C = 1\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$                                                   | 180 | -   | 390 |               |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = 50\text{ mA}; I_B = 5\text{ mA}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02; T_{amb} = 25\text{ }^{\circ}\text{C}$ | -   | -   | 400 | mV            |
| $C_c$       | collector capacitance                | $V_{CB} = 12\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^{\circ}\text{C}$               | -   | 2   | 3.5 | pF            |
| $f_T$       | transition frequency                 | $V_{CE} = 12\text{ V}; I_C = 2\text{ mA}; f = 100\text{ MHz}; T_{amb} = 25\text{ }^{\circ}\text{C}$                              | 100 | -   | -   | MHz           |





**Fig. 3. Base-emitter saturation voltage as a function of collector current; typical values**



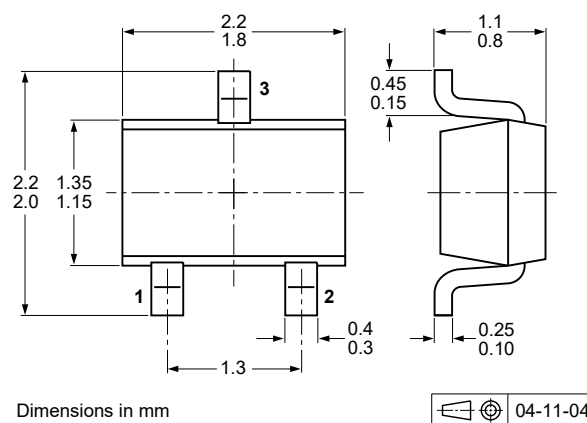
**Fig. 4. Collector-emitter saturation voltage as a function of collector current; typical values**

## 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. 5. Package outline SC-70 (SOT323)**

13. Soldering

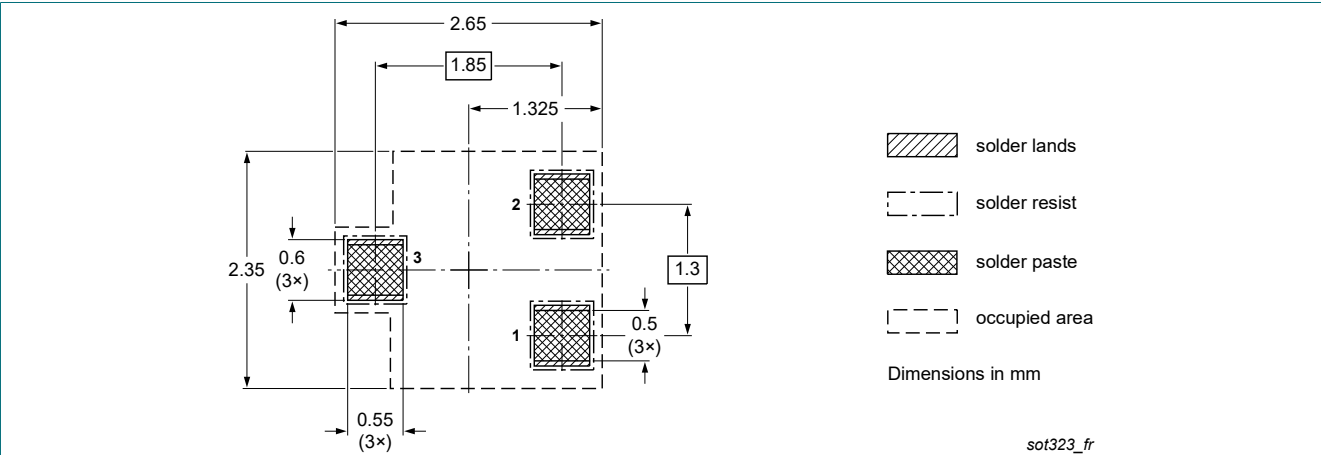


Fig. 6. Reflow soldering footprint for SC-70 (SOT323)

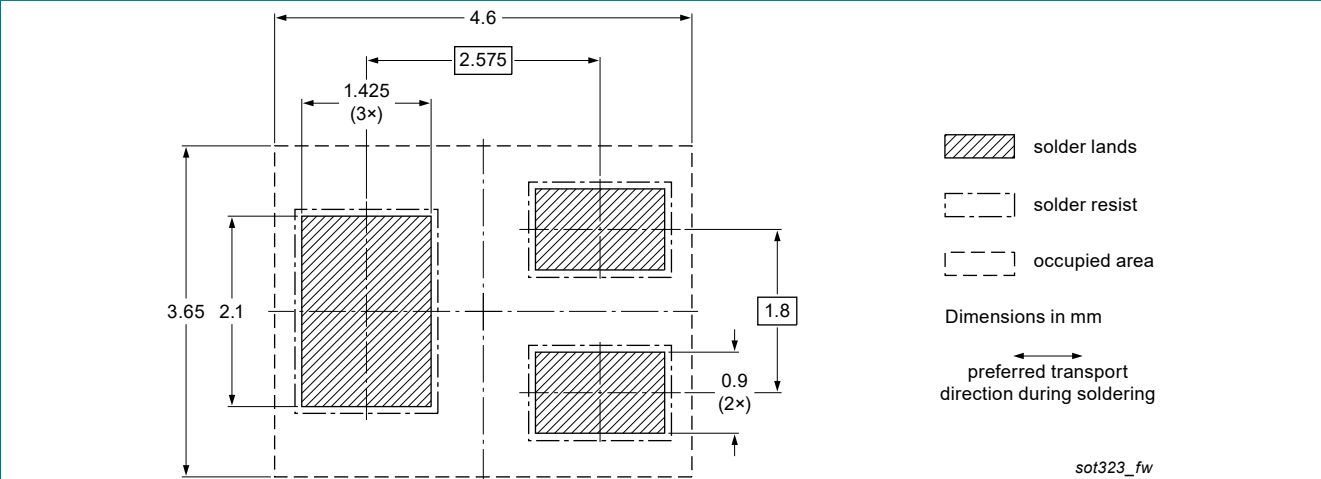


Fig. 7. Wave soldering footprint for SC-70 (SOT323)

## 14. Revision history

Table 8. Revision history

| Data sheet ID  | Release date                           | Data sheet status  | Change notice | Supersedes     |
|----------------|----------------------------------------|--------------------|---------------|----------------|
| 2PC4081R-Q v.2 | 20250722                               | Product data sheet | -             | 2PC4081R-Q v.1 |
| Modifications: | • Characteristics: Figures 1 - 4 added |                    |               |                |
| 2PC4081R-Q v.1 | 20220120                               | 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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Date of release: 22 July 2025