



2PC4081S-Q

NPN general-purpose transistor

20 January 2022

Product data sheet

1. General description

NPN transistor in a SOT323 (SC-70) plastic package. The PNP complement is 2PA1576.

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

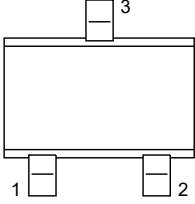
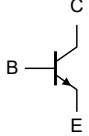
4. Quick reference data

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 | $V_{CE} = 6\text{ V}; I_C = 1\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$ | 270 | - | 560 | |

5. Pinning information

Table 2. Pinning information

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

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| 2PC4081S-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] |
|-------------|-----------------|
| 2PC4081S-Q | Z%S |

[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 | - | 7 | V |
| I_C | collector current | | - | 150 | mA |
| I_{CM} | peak collector current | | - | 200 | mA |
| I_{BM} | peak base current | | - | 200 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$ | [1] | 200 | mW |
| T_j | junction temperature | | - | 150 | °C |
| T_{amb} | ambient temperature | | -65 | 150 | °C |
| T_{stg} | storage temperature | | -65 | 150 | °C |

[1] 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 |
|---------------|---|-------------|-----|-----|-----|------|
| $R_{th(j-a)}$ | 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 | $V_{CB} = 30\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ °C}$ | - | - | 100 | nA |
| | | $V_{CB} = 30\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ °C}$ | - | - | 5 | μA |
| I_{EBO} | emitter-base cut-off current | $V_{EB} = 4\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ °C}$ | - | - | 100 | nA |
| h_{FE} | DC current gain | $V_{CE} = 6\text{ V}; I_C = 1\text{ mA}; T_{amb} = 25\text{ °C}$ | 270 | - | 560 | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 50\text{ mA}; I_B = 5\text{ mA}; t_p \leq 300\text{ μs}; \delta \leq 0.02; T_{amb} = 25\text{ °C}$ | - | - | 400 | mV |
| C_c | collector capacitance | $V_{CB} = 12\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$ | - | 2 | 3.5 | pF |
| f_T | transition frequency | $V_{CE} = 12\text{ V}; I_C = 2\text{ mA}; f = 100\text{ MHz}; T_{amb} = 25\text{ °C}$ | 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

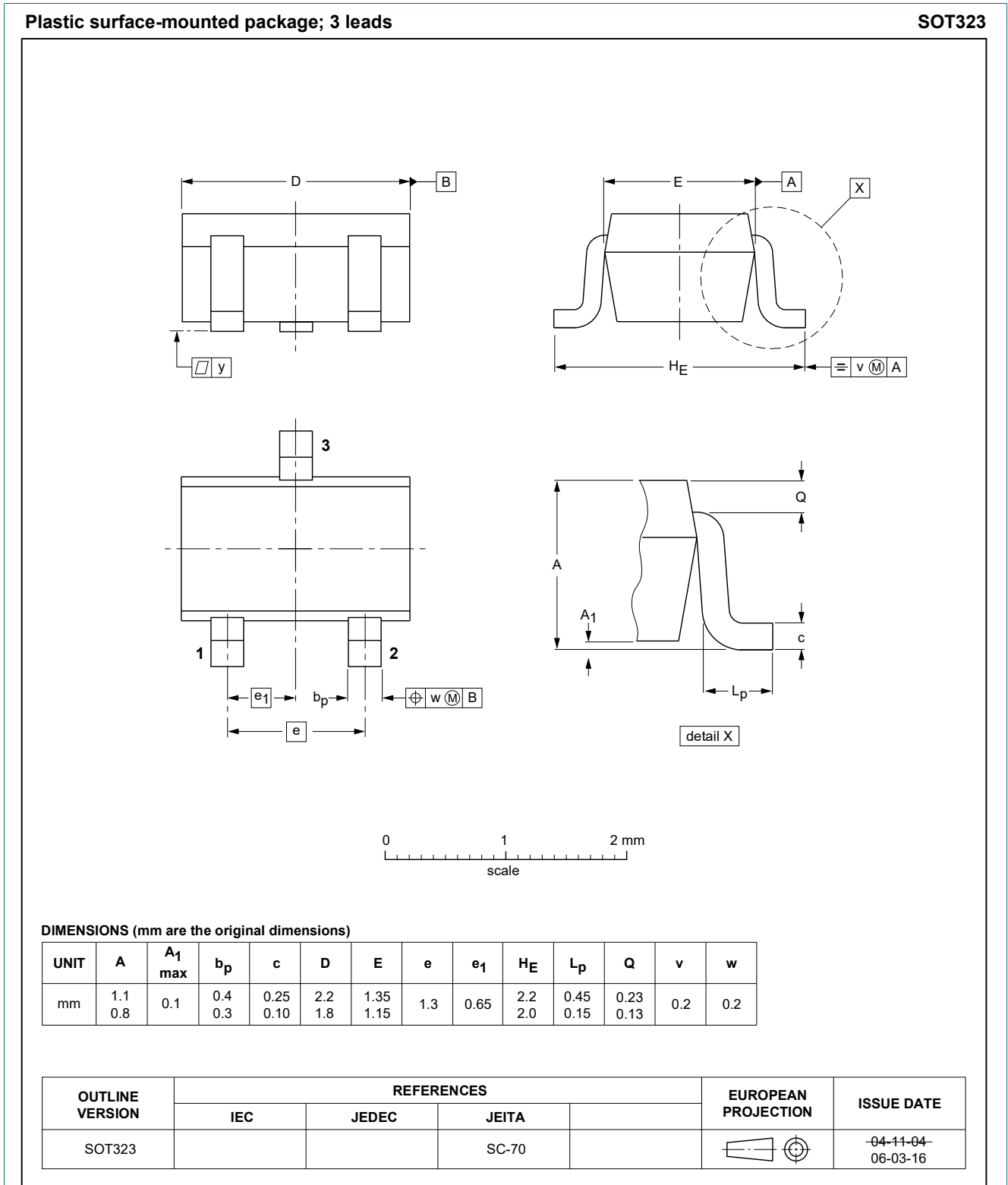


Fig. 1. Package outline SC-70 (SOT323)

13. Soldering

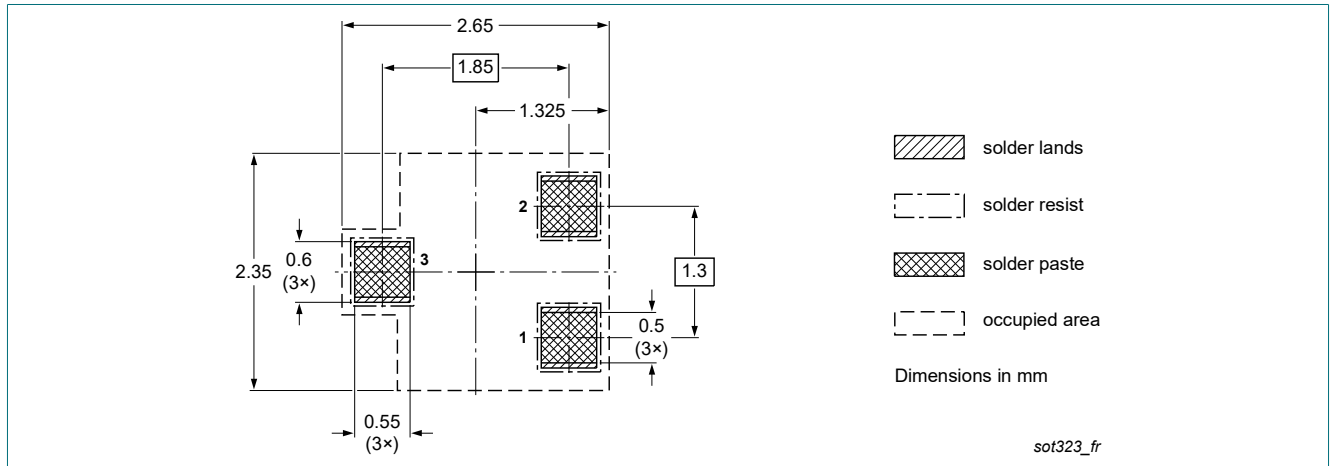


Fig. 2. Reflow soldering footprint for SC-70 (SOT323)

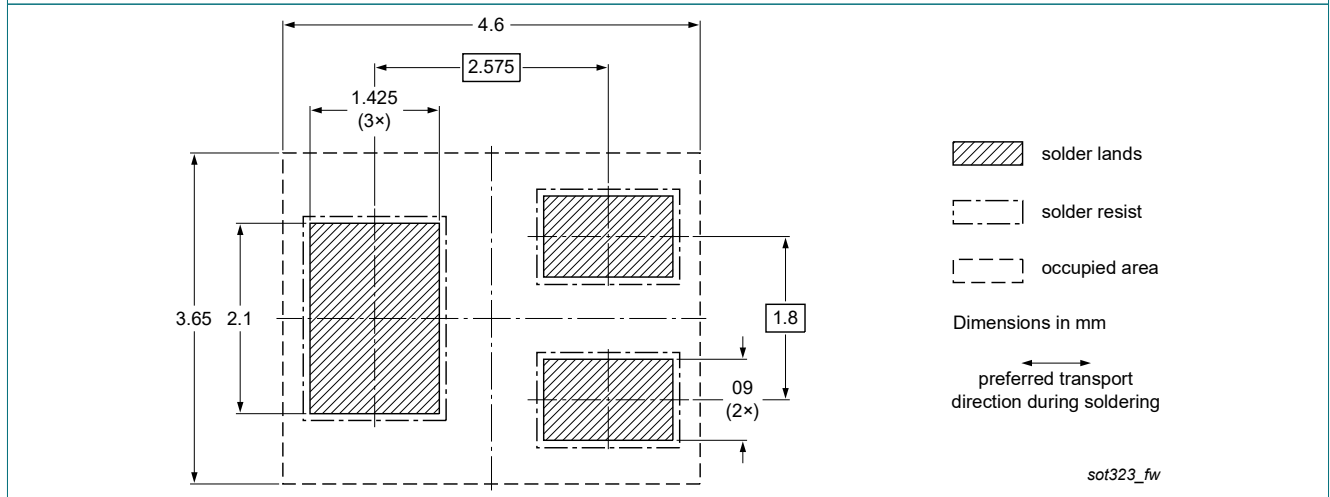


Fig. 3. Wave soldering footprint for SC-70 (SOT323)

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--------------|--------------------|---------------|------------|
| 2PC4081S-Q v.1 | 20220120 | Product data sheet | - | - |

15. Legal information

Data sheet status

| 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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- [2] The term 'short data sheet' is explained in section "Definitions".
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