



PUMX2

NPN/NPN general-purpose double transistor

21 November 2024

Product data sheet

1. General description

NPN/NPN general-purpose double transistors in a small SOT363 (SC-88) Surface Mounted Device (SMD) plastic package.

2. Features and benefits

- Simplifies circuit design
- Reduces component count
- Reduces pick and place costs
- AEC-Q101 qualified

3. Applications

- General-purpose switching and amplification

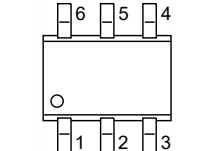
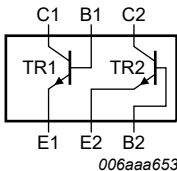
4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------------------|---------------------------|--|-----|-----|-----|------|
| Per transistor | | | | | | |
| V_{CE0} | collector-emitter voltage | open base | - | - | 50 | V |
| I_C | collector current | | - | - | 150 | mA |
| h_{FE} | DC current gain | $V_{CE} = 6\text{ V}$; $I_C = 1\text{ mA}$; $T_{amb} = 25\text{ °C}$ | 120 | 250 | 560 | |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|---------------|--|--|
| 1 | E1 | emitter TR1 |  TSSOP6 (SOT363) |  006aaa653 |
| 2 | E2 | emitter TR2 | | |
| 3 | B2 | base TR2 | | |
| 4 | C2 | collector TR2 | | |
| 5 | B1 | base TR1 | | |
| 6 | C1 | collector TR1 | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|---|------------------------|
| | Name | Description | Version |
| PUMX2 | TSSOP6 | plastic, surface-mounted package; 6 leads; 0.65 mm pitch; 2.1 mm x 1.25 mm x 0.95 mm body | SOT363 |

7. Marking

Table 4. Marking codes

| Type number | Marking code[1] |
|-------------|-----------------|
| PUMX2 | Z1 % |

[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 |
|------------------|---------------------------|-------------------------------------|---------------------|-----|-----|------|
| Per transistor | | | | | | |
| 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 | single pulse; t _p ≤ 1 ms | | - | 200 | mA |
| I _{BM} | peak base current | | | - | 100 | mA |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C | [1] | - | 180 | mW |
| Per device | | | | | | |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C | [1] | - | 300 | 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, tin-plated and standard footprint.

9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|----------------|---|-------------|-----|-----|-----|-----|------|
| Per transistor | | | | | | | |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | - | - | 694 | K/W |
| Per device | | | | | | | |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | - | - | 417 | K/W |

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

10. Characteristics

Table 7. Characteristics

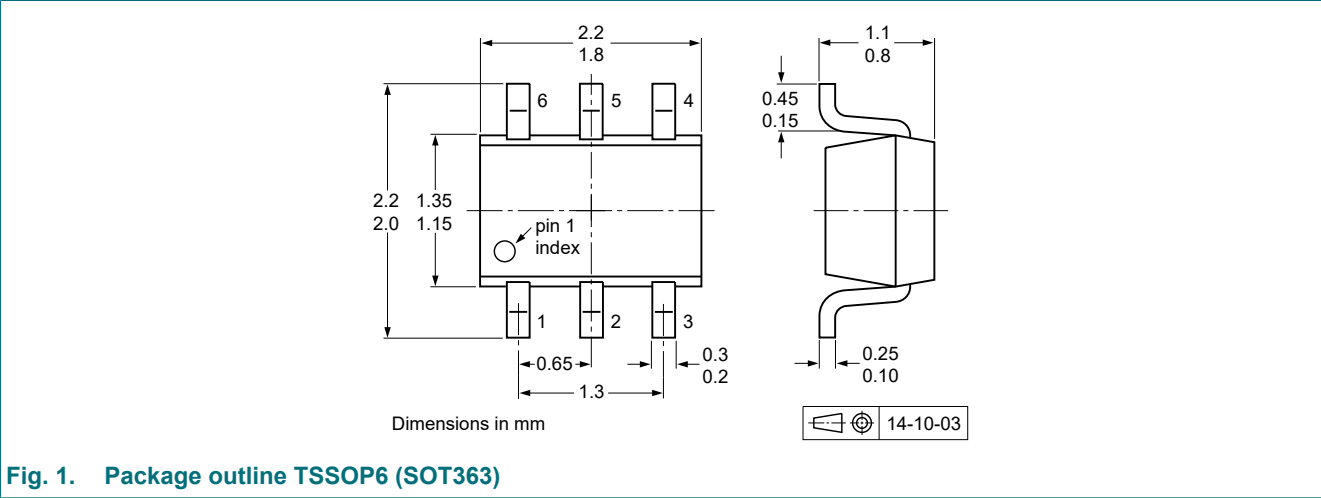
| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|----------------|--------------------------------------|--|--|-----|-----|-----|------|
| Per transistor | | | | | | | |
| I_{CBO} | collector-base cut-off current | $V_{CB} = 60\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ °C}$ | | - | - | 100 | nA |
| | | $V_{CB} = 60\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ °C}$ | | - | - | 50 | μA |
| I_{EBO} | emitter-base cut-off current | $V_{EB} = 7\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ °C}$ | | - | - | 100 | nA |
| h_{FE} | DC current gain | $V_{CE} = 6\text{ V}; I_C = 1\text{ mA}; T_{amb} = 25\text{ °C}$ | | 120 | 250 | 560 | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 50\text{ mA}; I_B = 5\text{ mA}; T_{amb} = 25\text{ °C}$ | | - | - | 250 | mV |
| C_c | collector capacitance | $V_{CB} = 12\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$ | | - | - | 3 | 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

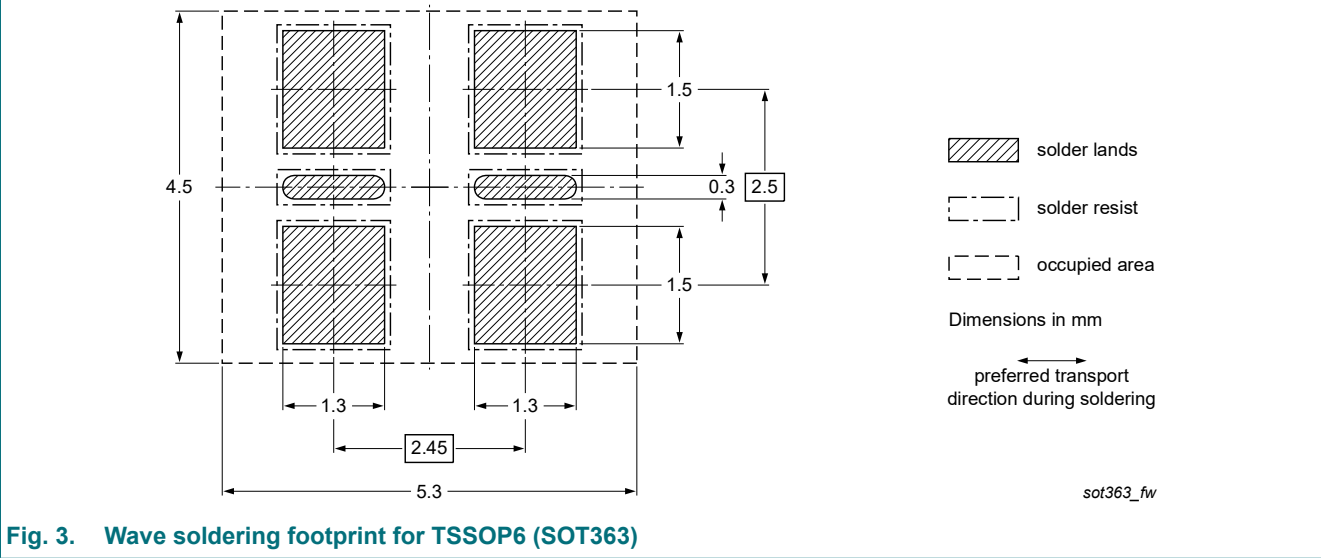
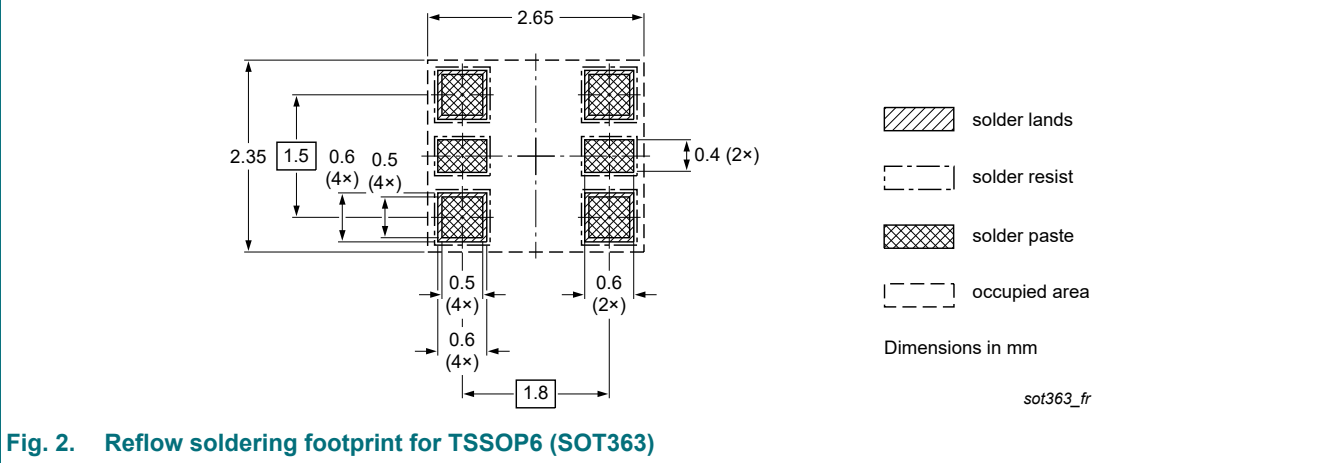
Quality information

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



13. Soldering



14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|---------------|---|--------------------|---------------|------------|
| PUMX2 v.3 | 20241121 | Product data sheet | - | PUMX2_2 |
| Modification: | <ul style="list-style-type: none">Family data sheet reduced to single type data sheet.Section "Packing information" removed. | | | |
| PUMX2_2 | 20091117 | Product data sheet | - | PUMX2_1 |
| PUMX2_1 | 20051110 | 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. |

- [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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