
# PUMX1

## 40 V, 100 mA NPN/NPN general-purpose transistor

Rev. 04 — 20 January 2010 Product data sheet

## 1. Product profile

### 1.1 General description

NPN/NPN general-purpose transistor with two independently operating transistors in a SOT363 (SC-88) very small Surface-Mounted Device (SMD) plastic package.

**Table 1. Product overview**

| Type number | Package | | PNP/PNP complement | NPN/PNP complement |
|---|---|---|---|---|
| | Nexperia | JEITA | | |
| PUMX1 | SOT363 | SC-88 | PUMT1 | PUMZ1 |

### 1.2 Features

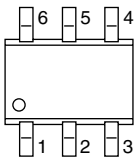
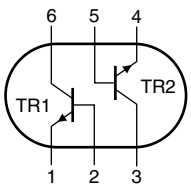
- Double general-purpose transistor
- Board-space reduction
- Very small SMD plastic package

### 1.3 Applications

- General-purpose switching and amplification

## 2. Pinning information

**Table 2. Pinning**

| Pin | Description | Simplified outline | Graphic symbol |
|---|---|---|---|
| 1 | emitter TR1 |  |  |
| 2 | base TR1 | | |
| 3 | collector TR2 | | |
| 4 | emitter TR2 | | |
| 5 | base TR2 | | |
| 6 | collector TR1 | | |





*sym020*

## 3. Ordering information

**Table 3. Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| PUMX1 | SC-88 | plastic surface-mounted package; 6 leads | SOT363 |

## 4. Marking

**Table 4. Marking codes**

| Type number | Marking code[1] |
|---|---|
| PUMX1 | Z*Z |

[1] * = -: made in Hong Kong
* = p: made in Hong Kong
* = t: made in Malaysia
* = W: made in China

## 5. 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 | | - | 50 | V |
| $V_{CEO}$ | collector-emitter voltage | open base | | - | 40 | V |
| $V_{EBO}$ | emitter-base voltage | open collector | | - | 5 | V |
| $I_C$ | collector current | | | - | 100 | mA |
| $I_{CM}$ | peak collector current | | | - | 200 | mA |
| $I_{BM}$ | peak base current | | | - | 200 | mA |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 25$ °C | | - | 200 | mW |
| **Per device** | | | | | | |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 25$ °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.

# 6. Thermal characteristics

**Table 6. Thermal characteristics**

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| **Per device** | | | | | | | |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | - | - | 416 | K/W |

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

# 7. Characteristics

**Table 7. Characteristics**

*$T_{amb}$ = 25 °C unless otherwise specified.*

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| **Per transistor** | | | | | | | |
| $I_{CBO}$ | collector-base cut-off current | $V_{CB}$ = 30 V; $I_E$ = 0 A | | - | - | 100 | nA |
| | | $V_{CB}$ = 30 V; $I_E$ = 0 A; $T_j$ = 150 °C | | - | - | 10 | µA |
| $I_{EBO}$ | emitter-base cut-off current | $V_{EB}$ = 4 V; $I_C$ = 0 A | | - | - | 100 | nA |
| $h_{FE}$ | DC current gain | $V_{CE}$ = 6 V; $I_C$ = 1 mA | | 120 | - | - | |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C$ = 50 mA; $I_B$ = 5 mA | [1] | - | - | 200 | mV |
| $f_T$ | transition frequency | $I_C$ = 2 mA; $V_{CE}$ = 12 V; f = 100 MHz | | 100 | - | - | MHz |
| $C_c$ | collector capacitance | $V_{CB}$ = 12 V; $I_E = i_e$ = 0 A; f = 1 MHz | | - | - | 1.5 | pF |

[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

# 8. Package outline

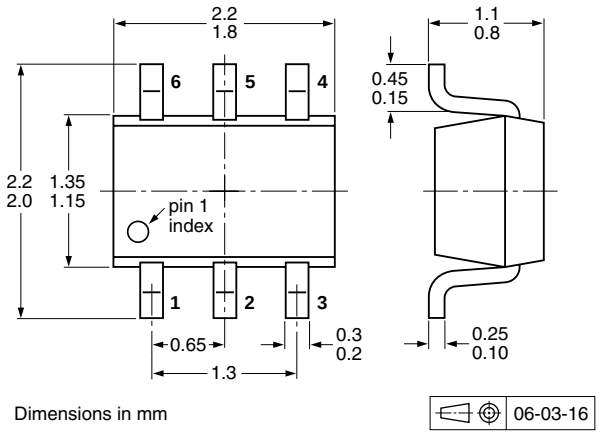



**Fig 1. Package outline PUMX1 (SOT363/SC-88)**

# 9. Packing information

**Table 8. Packing methods**

*The indicated -xxx are the last three digits of the 12NC ordering code.*[1]

| Type number | Package | Description | | Packing quantity | |
|---|---|---|---|---|---|
| | | | | 3000 | 10000 |
| PUMX1 | SOT363 | 4 mm pitch, 8 mm tape and reel; T1 | [2] | -115 | -135 |
| | | 4 mm pitch, 8 mm tape and reel; T2 | [3] | -125 | -165 |

[1] For further information and the availability of packing methods, see Section 12.

[2] T1: normal taping

[3] T2: reverse taping

## 10. Revision history

**Table 9. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| PUMX1_4 | 20100120 | Product data sheet | - | PUMX1_3 |
| Modifications: | • The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.<br>• Legal texts have been adapted to the new company name where appropriate.<br>• Table 1 “Product overview”: added<br>• Section 1.2 “Features”: updated<br>• Section 1.3 “Applications”: amended<br>• Section 2 “Pinning information”: amended<br>• Figure 1: superseded by minimized package outline drawing<br>• Section 9 “Packing information”: added<br>• Section 11 “Legal information”: updated | | | |
| PUMX1_3 | 19990414 | Preliminary specification | - | PUMX1_2 |
| PUMX1_2 | 19970709 | Preliminary specification | - | PUMX1_1 |

# 11. Legal information

## 11.1 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 URL http://www.nexperia.com.

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