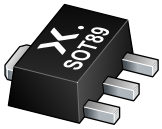



# BCV48

## PNP Darlington transistor

8 October 2024 Product data sheet

## 1. General description

PNP Darlington transistor in a SOT89 (SC-62) flat lead Surface-Mounted Device (SMD) plastic package.

NPN complement: BCV49

## 2. Features and benefits

- Very high DC current gain (min. 10000)
- High current (max. 500 mA)
- Low voltage (max. 60 V)

## 3. Applications

- Applications, where very high amplification is required

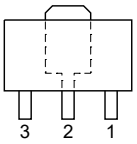
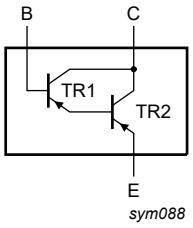
## 4. Quick reference data

**Table 1. Quick reference data**

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $I_C$ | collector current | | | - | - | -500 | mA |
| $h_{FE}$ | DC current gain | $V_{CE}$ = -5 V; $I_C$ = -1 mA; $T_{amb}$ = 25 °C | | 2000 | - | - | |

## 5. Pinning information

**Table 2. Pinning information**

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|---|---|---|---|---|
| 1 | E | emitter |   SOT89 |   sym088 |
| 2 | C | collector | | |
| 3 | B | base | | |

# 6. Ordering information

**Table 3. Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| BCV48 | SOT89 | plastic, surface-mounted package; 3 leads; 1.5 mm pitch; 4.5 mm x 2.5 mm x 1.5 mm body | SOT89 |

# 7. Marking

**Table 4. Marking codes**

| Type number | Marking code |
|---|---|
| BCV48 | EE |

# 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 | | - | -80 | V |
| $V_{CES}$ | collector-emitter voltage | $V_{BE}$ = 0 V | | - | -60 | V |
| $V_{EBO}$ | emitter-base voltage | open collector | | - | -10 | V |
| $I_C$ | collector current | | | - | -500 | mA |
| $I_{CM}$ | peak collector current | | | - | -800 | mA |
| $I_{BM}$ | peak base current | single pulse; $t_p \leq$ 1 ms | | - | -100 | mA |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq$ 25 °C | [1] | - | 1.3 | W |
| $T_j$ | 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, mounting pad for collector 6 $cm^2$.

# 9. Thermal characteristics

**Table 6. Thermal characteristics**

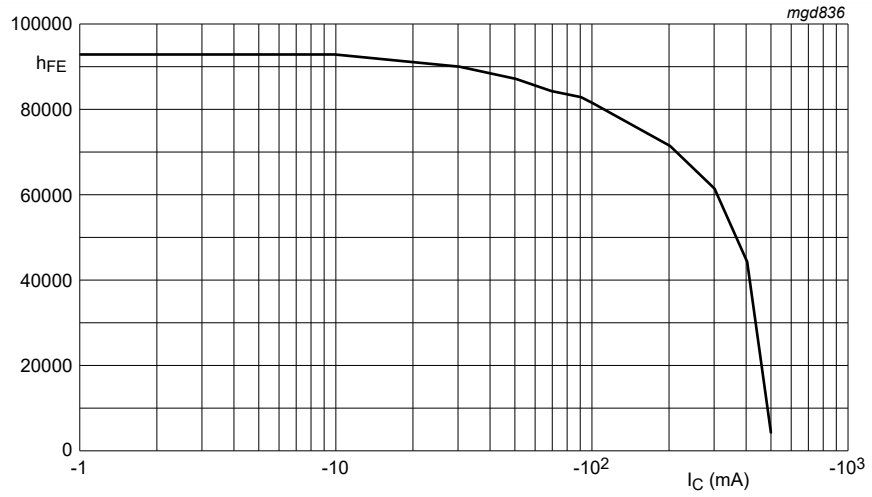
| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | - | - | 96 | K/W |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | | | - | - | 16 | K/W |

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 $cm^2$.

# 10. Characteristics

**Table 7. Characteristics**

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $I_{CBO}$ | collector-base cut-off current | $V_{CB}$ = -60 V; $I_E$ = 0 A; $T_{amb}$ = 25 °C | | - | - | -100 | nA |
| $I_{EBO}$ | emitter-base cut-off current | $V_{EB}$ = -10 V; $I_C$ = 0 A; $T_{amb}$ = 25 °C | | - | - | -100 | nA |
| $h_{FE}$ | DC current gain | $V_{CE}$ = -5 V; $I_C$ = -1 mA; $T_{amb}$ = 25 °C | | 2000 | - | - | |
| | | $V_{CE}$ = -5 V; $I_C$ = -10 mA; $T_{amb}$ = 25 °C | | 4000 | - | - | |
| | | $V_{CE}$ = -5 V; $I_C$ = -100 mA; $T_{amb}$ = 25 °C | | 10000 | - | - | |
| | | $V_{CE}$ = -5 V; $I_C$ = -500 mA; $T_{amb}$ = 25 °C | | 2000 | - | - | |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C$ = -100 mA; $I_B$ = -0.1 mA; $T_{amb}$ = 25 °C | | - | - | -1 | V |
| $V_{BEsat}$ | base-emitter saturation voltage | | | - | - | -1.5 | V |
| $V_{BEon}$ | base-emitter turn-on voltage | $I_C$ = -10 mA; $V_{CE}$ = -5 V; $T_{amb}$ = 25 °C | | - | - | -1.4 | V |
| $f_T$ | transition frequency | $V_{CE}$ = -5 V; $I_C$ = -30 mA; f = 100 MHz | | - | 220 | - | MHz |




$V_{CE}$ = -5 V

**Fig. 1. DC current gain; typical values**

## 11. Package outline

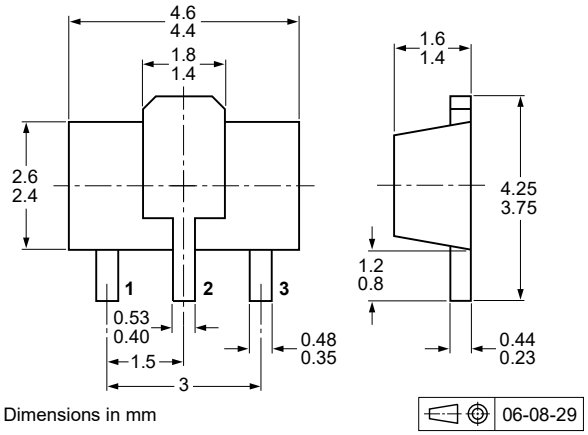



**Fig. 2. Package outline SOT89**

## 12. Soldering

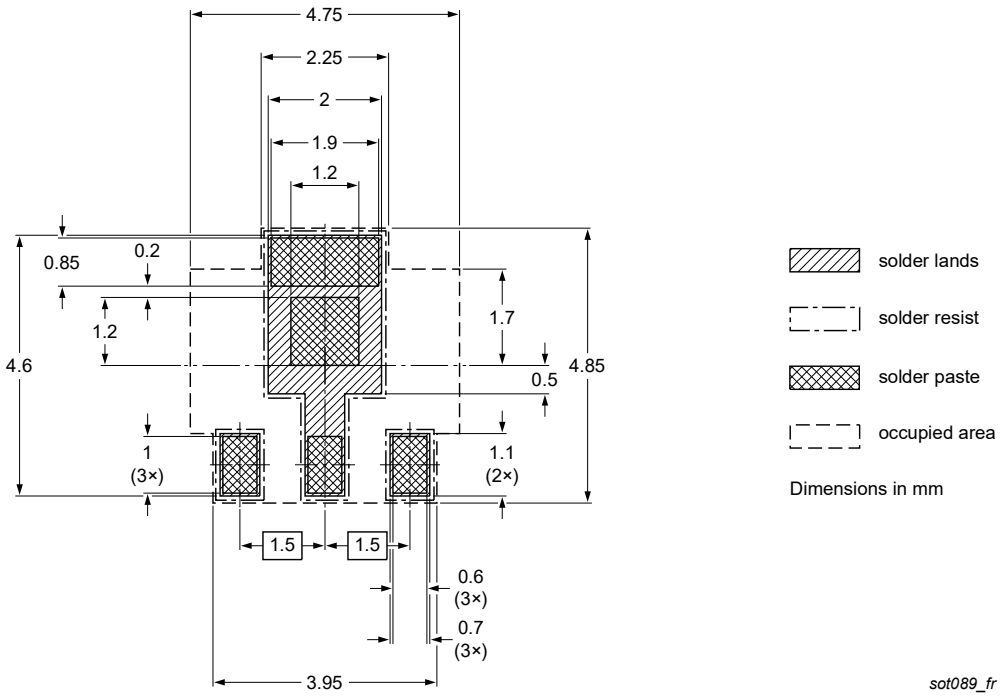



**Fig. 3. Reflow soldering footprint for SOT89**

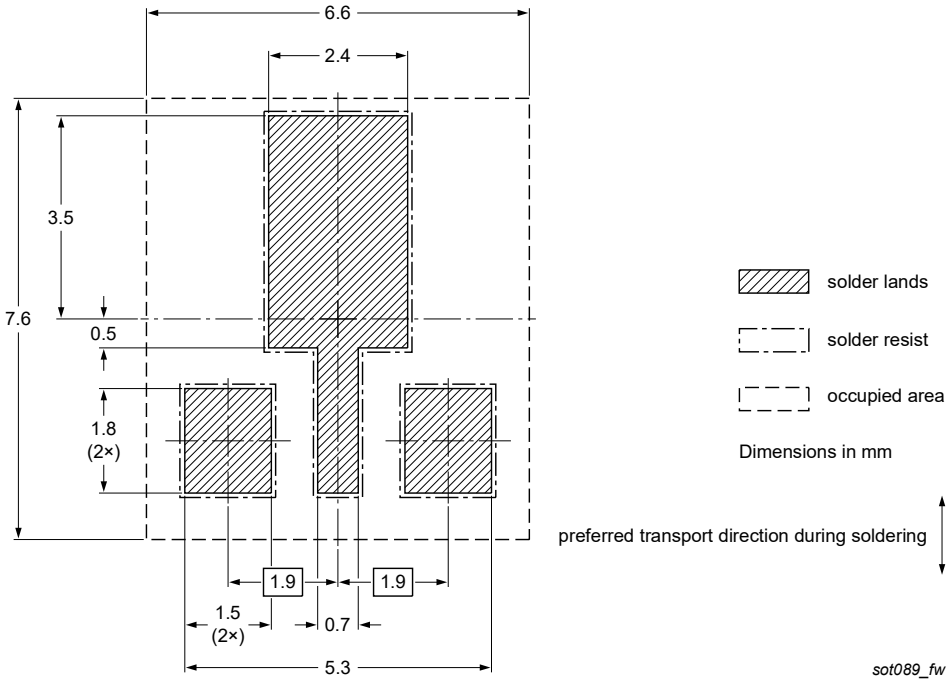



**Fig. 4. Wave soldering footprint for SOT89**

## 13. Revision history

**Table 8. Revision history**

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| BCV48 v.4 | 20241008 | Product data sheet | - | BCV48 v.3 |
| Modifications: | • Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s). | | | |
| BCV48 v.3 | 20230406 | Product data sheet | - | BCV28_48 v.2 |
| BCV28_48 v.2 | 20041206 | Product data sheet | - | BCV28_48 v.1 |
| BCV28_48 v.1 | 19990408 | Product data sheet | - | - |

# 14. 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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**Date of release: 8 October 2024**

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