



# BCV71

## NPN general purpose transistor

1 July 2023

Product data sheet

## 1. General description

NPN transistor in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Low current (max. 100 mA)
- Low voltage (max. 60 V)

## 3. Applications

- General purpose switching and amplification.

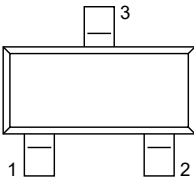
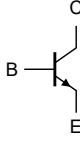
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CE0}$	collector-emitter voltage	open base	-	-	60	V
$I_C$	collector current		-	-	100	mA
$h_{FE}$	DC current gain	$V_{CE} = 5 \text{ V}; I_C = 10 \mu\text{A}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	90	-	
		$V_{CE} = 5 \text{ V}; I_C = 2 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	110	-	220	

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SOT23	 sym021
2	E	emitter		
3	C	collector		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">BCV71</a>	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	<a href="#">SOT23</a>

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7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BCV71	K7%

[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		-	80	V
V <sub>CEO</sub>	collector-emitter voltage	open base		-	60	V
V <sub>EBO</sub>	emitter-base voltage	open collector		-	5	V
I <sub>C</sub>	collector current			-	100	mA
I <sub>CM</sub>	peak collector current	single pulse; t <sub>p</sub> ≤ 1 ms		-	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]	-	250	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] 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
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient		[1]	-	-	500	K/W

[1] Transistor mounted on an FR4 printed-circuit board.

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 20\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	-	100	nA
		$V_{CB} = 20\text{ V}; I_E = 0\text{ A}; T_J = 100\text{ }^{\circ}\text{C}$	-	-	10	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	-	100	nA
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}; I_C = 10\text{ }\mu\text{A}; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	90	-	
		$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$	110	-	220	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	120	250	mV
		$I_C = 50\text{ mA}; I_B = 2.5\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	210	-	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	750	-	mV
		$I_C = 50\text{ mA}; I_B = 2.5\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	850	-	mV
$V_{BE}$	base-emitter voltage	$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$	550	-	700	mV
$C_c$	collector capacitance	$V_{CB} = 10\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	2.5	-	pF
$f_T$	transition frequency	$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}; f = 100\text{ MHz}; T_{amb} = 25\text{ }^{\circ}\text{C}$	100	-	-	MHz
NF	noise figure	$V_{CE} = 5\text{ V}; I_C = 200\text{ }\mu\text{A}; R_S = 2\text{ k}\Omega; f = 1\text{ MHz}; B = 200\text{ Hz}; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	-	10	dB

11. Package outline

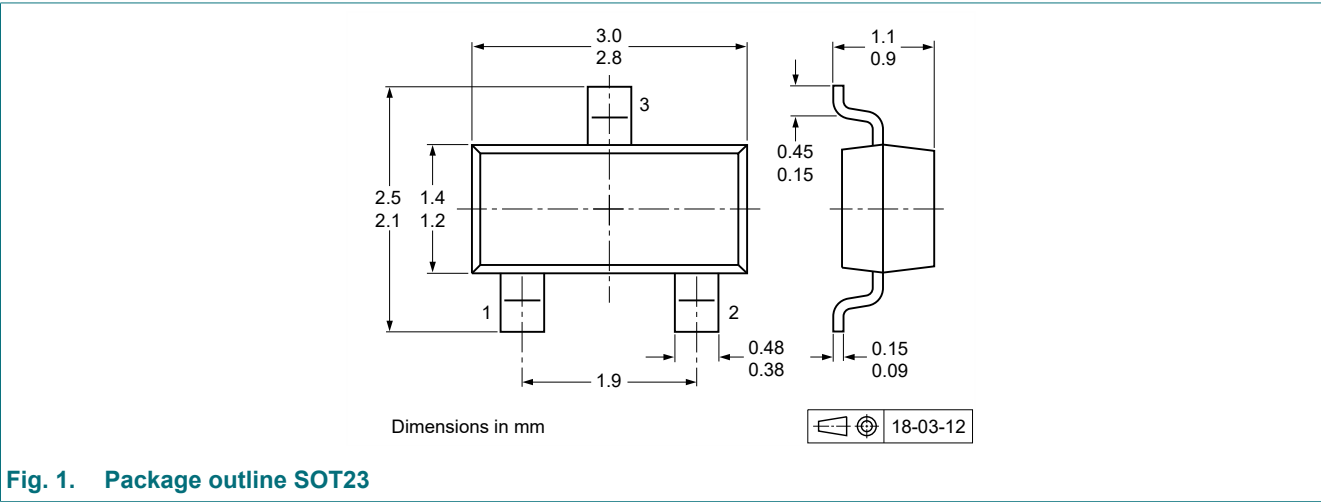


Fig. 1. Package outline SOT23

12. Soldering

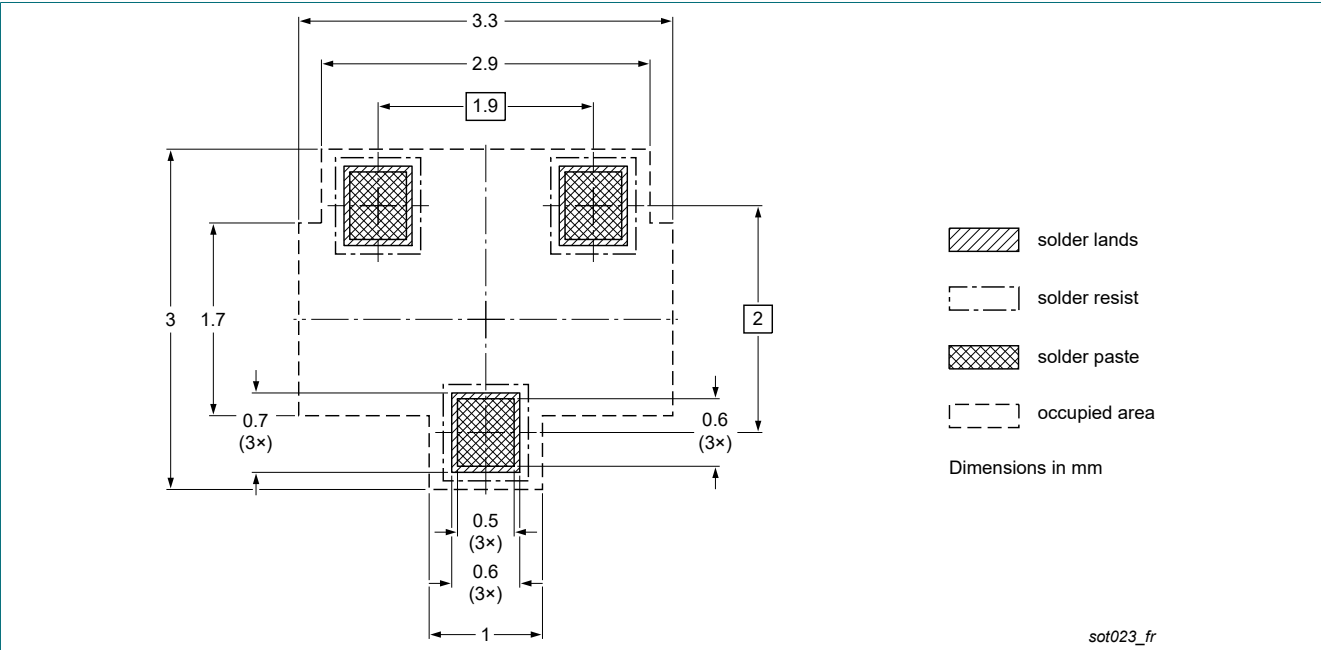


Fig. 2. Reflow soldering footprint for SOT23

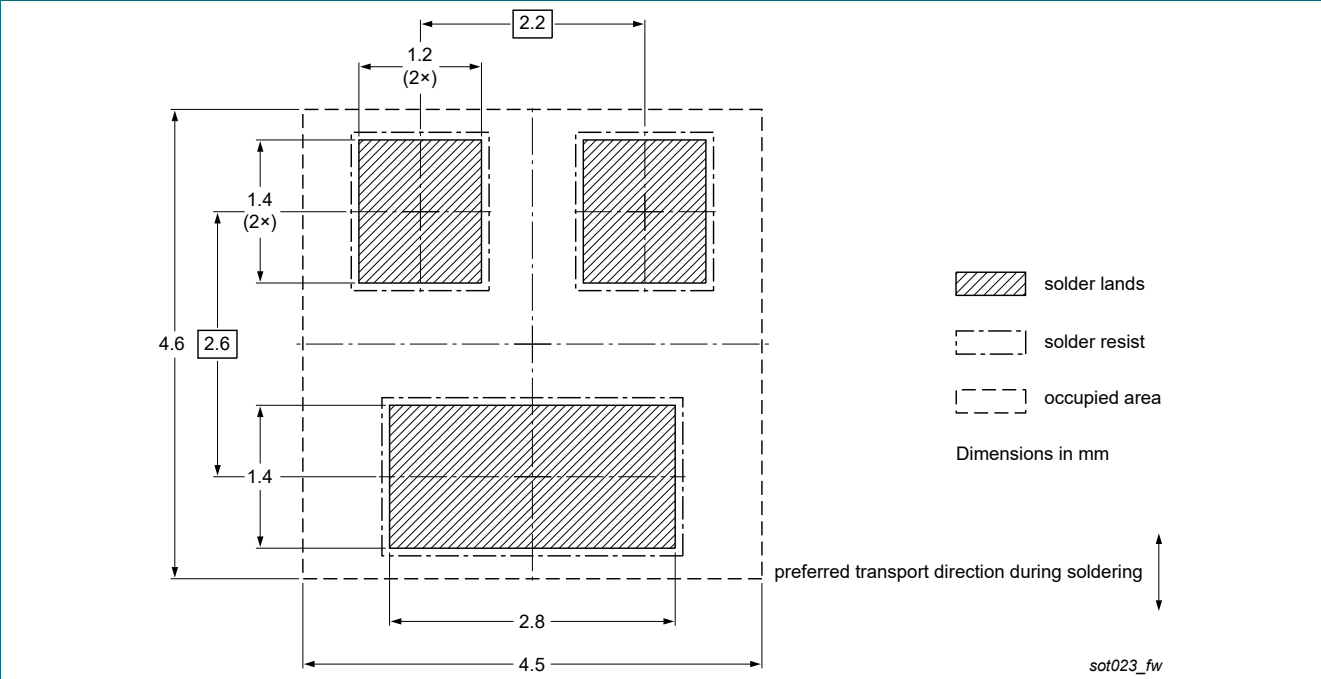


Fig. 3. Wave soldering footprint for SOT23

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BCV71 v.4	20230701	Product data sheet	-	BCV71 v.3
Modifications:	<ul style="list-style-type: none"><li>Product changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).</li></ul>			
BCV71 v.3	20220525	Product data sheet	-	BCV71 v.2
BCV71 v.2	19990408	Product data sheet	-	BCV71 v.1
BCV71 v.1	19970311	Product specification	-	-

# 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".
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