BSP19

NPN high voltage transistor

8 October 2024 **Product data sheet**

1. General description

NPN high-voltage transistor in a SOT223 Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Low current (max. 100 mA)
- High voltage (max. 350 V)

3. Applications

- Switching and amplification
- Especially used in telephony and automotive applications

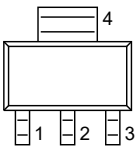
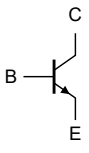
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	350	V
I_C	collector current			-	-	100	mA
h_{FE}	DC current gain	V_{CE} = 10 V; I_C = 20 mA; T_j = 25 °C		40	-	-	

5. Pinning information

Table 2. Pinning information

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

SC-73 (SOT223)

sym123

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BSP19	SC-73	plastic, surface-mounted package with increased heatsink; 4 leads; 2.3 mm pitch; 6.5 mm x 3.5 mm x 1.65 mm body	SOT223

7. Marking

Table 4. Marking codes

Type number	Marking code
BSP19	BSP19

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		-	400	V
V_{CEO}	collector-emitter voltage	open base		-	350	V
V_{EBO}	emitter-base voltage	open collector		-	5	V
I_C	collector current			-	100	mA
I_B	base current			-	100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	1.2	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 a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 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		[1]	-	-	104	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	23	K/W

[1] Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm^2.

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = 300 V; I_E = 0 A; T_j = 25 °C		-	-	20	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0 A; T_j = 25 °C		-	-	100	nA
h_{FE}	DC current gain	V_{CE} = 10 V; I_C = 20 mA; T_j = 25 °C		40	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = 50 mA; I_B = 4 mA; T_j = 25 °C		-	-	0.5	V
C_c	collector capacitance	V_{CB} = 10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_j = 25 °C		-	-	2.5	pF
f_T	transition frequency	V_{CE} = 10 V; I_C = 10 mA; f = 100 MHz; T_j = 25 °C		70	-	-	MHz

11. Package outline

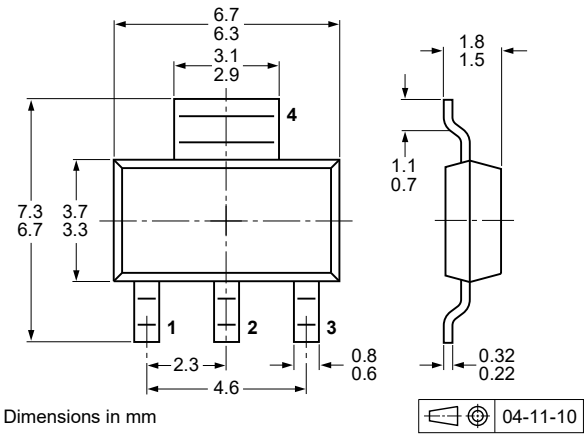


Fig. 1. Package outline SC-73 (SOT223)

12. Soldering

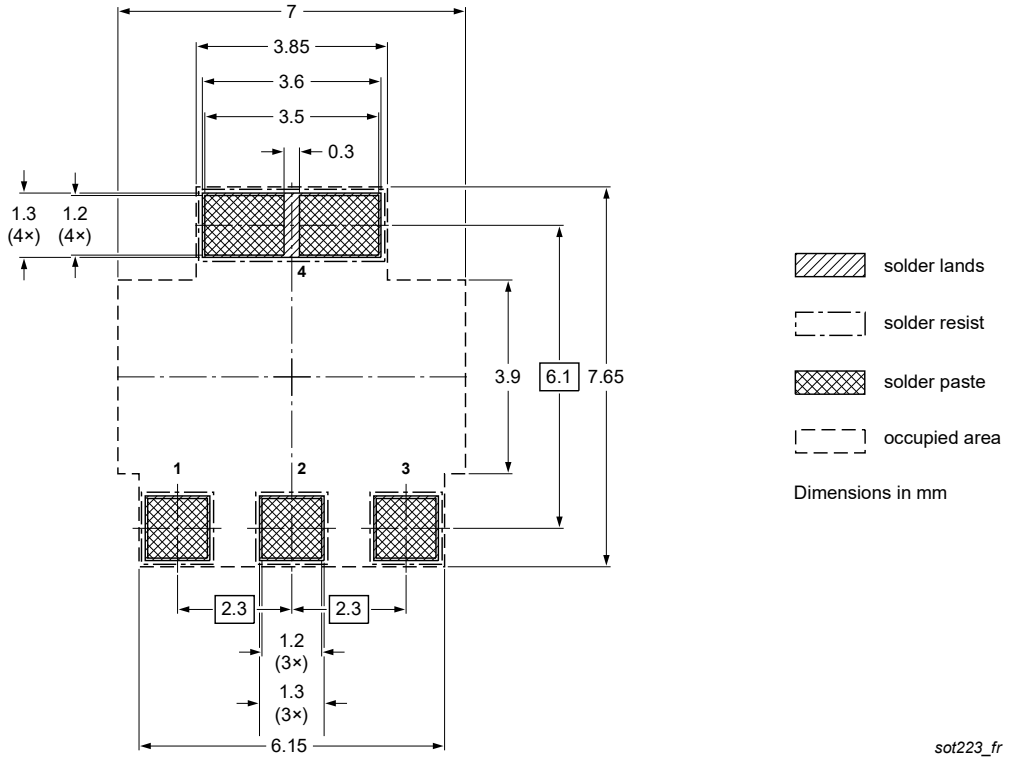


Fig. 2. Reflow soldering footprint for SC-73 (SOT223)

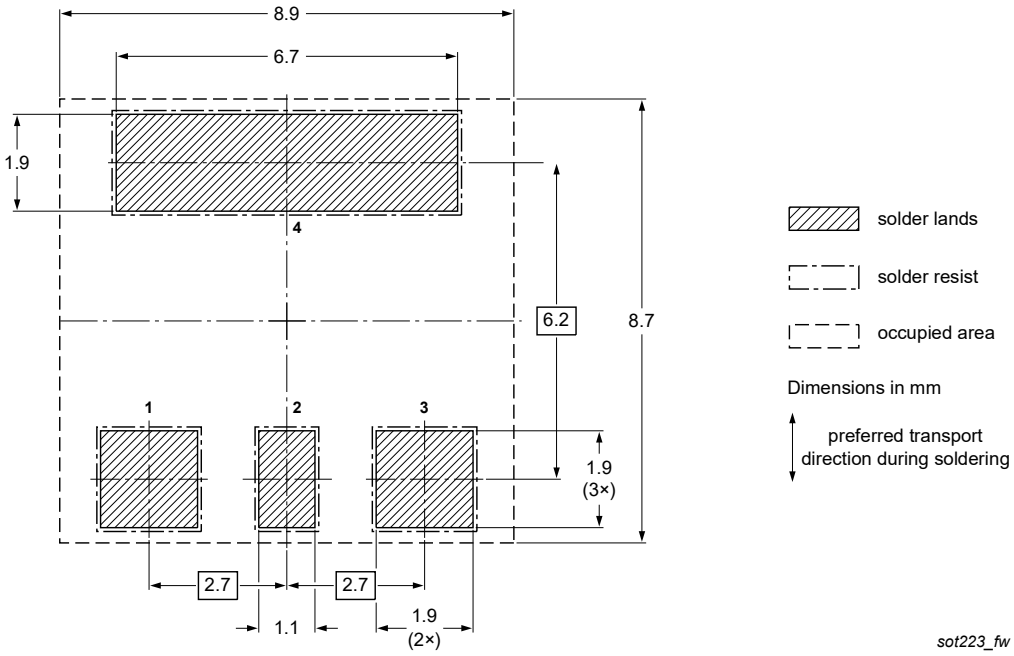


Fig. 3. Wave soldering footprint for SC-73 (SOT223)

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BSP19 v.4	20241008	Product data sheet	-	BSP19 v.3
Modifications:	• Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).			
BSP19 v.3	20230712	Product data sheet	-	BSP19_20 v.2
BSP19_20 v.2	19990601	Product data sheet	-	BSP19_20 v.1
BSP19_20 v.1	19970303	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".
[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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