BSR19A

NPN high voltage transistor

1 January 2023 **Product data sheet**

1. General description

NPN high-voltage transistor in a small SOT23 Surface-Mounted Device (SMD) plastic package.

PNP complement: BSR20A

2. Features and benefits

- Low current (max. 300 mA)
- High voltage (max. 160 V)

3. Applications

- General purpose switching and amplification
- Especially used for telephony applications

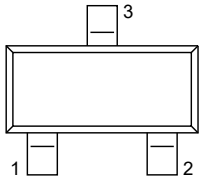
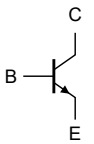
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CBO}	collector-base voltage	open emitter		-	-	180	V
V_{CEO}	collector-emitter voltage	open base		-	-	160	V
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	-	600	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C		-	-	250	mW
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 1 mA; T_{amb} = 25 °C		80	-	-	
f_T	transition frequency	V_{CE} = 10 V; I_C = 10 mA; f = 100 MHz; T_{amb} = 25 °C		100	300	-	MHz

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
BSR19A	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BSR19A	57%

[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_{CBO}	collector-base voltage	open emitter		-	180	V
V_{CEO}	collector-emitter voltage	open base		-	160	V
V_{EBO}	emitter-base voltage	open collector		-	6	V
I_C	collector current			-	300	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	600	mA
I_{Blim}	limiting base current			-	100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C		-	250	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C

9. Thermal characteristics

Table 6. Thermal characteristics

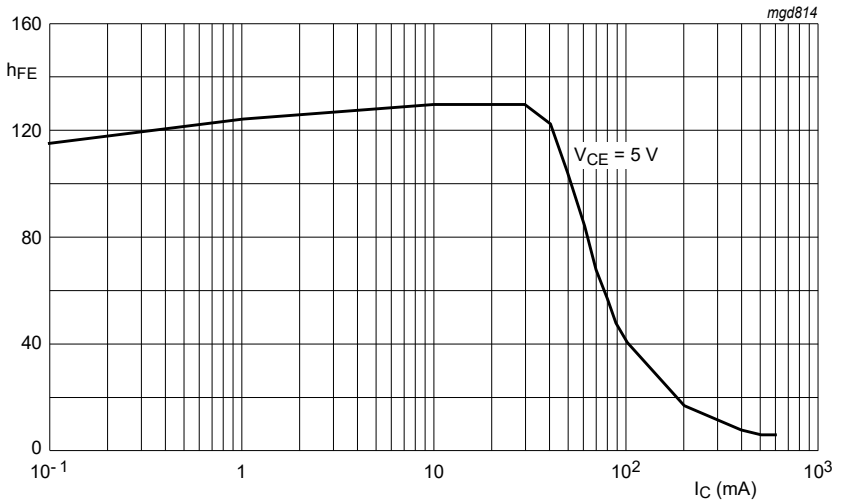
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient		[1]	-	-	500	K/W

[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} = 120 V; I_E = 0 A; T_{amb} = 25 °C		-	-	50	nA
		V_{CB} = 120 V; I_E = 0 A; T_{amb} = 100 °C		-	-	50	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = 4 V; I_C = 0 A; T_{amb} = 25 °C		-	-	50	nA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 1 mA; T_{amb} = 25 °C		80	-	-	
		V_{CE} = 5 V; I_C = 10 mA; T_{amb} = 25 °C		80	-	250	
		V_{CE} = 5 V; I_C = 50 mA; T_{amb} = 25 °C		30	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = 10 mA; I_B = 1 mA; T_{amb} = 25 °C		-	-	150	mV
		I_C = 50 mA; I_B = 5 mA; T_{amb} = 25 °C		-	-	200	mV
C_c	collector capacitance	V_{CB} = 10 V; I_E = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	6	pF
f_T	transition frequency	V_{CE} = 10 V; I_C = 10 mA; f = 100 MHz; T_{amb} = 25 °C		100	300	-	MHz



V_{CE} = 5 V

Fig. 1. DC current gain; typical values

11. Package outline

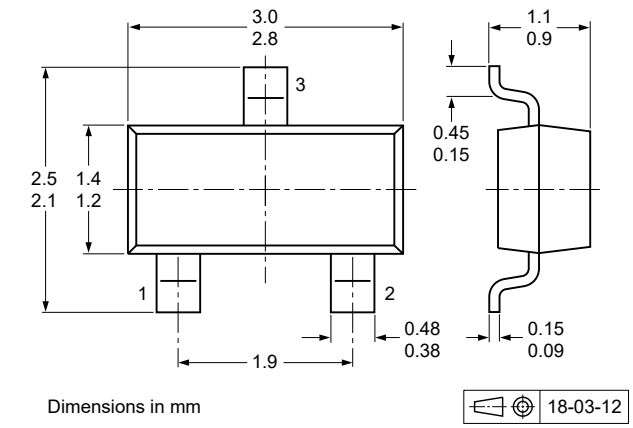


Fig. 2. Package outline SOT23

12. Soldering

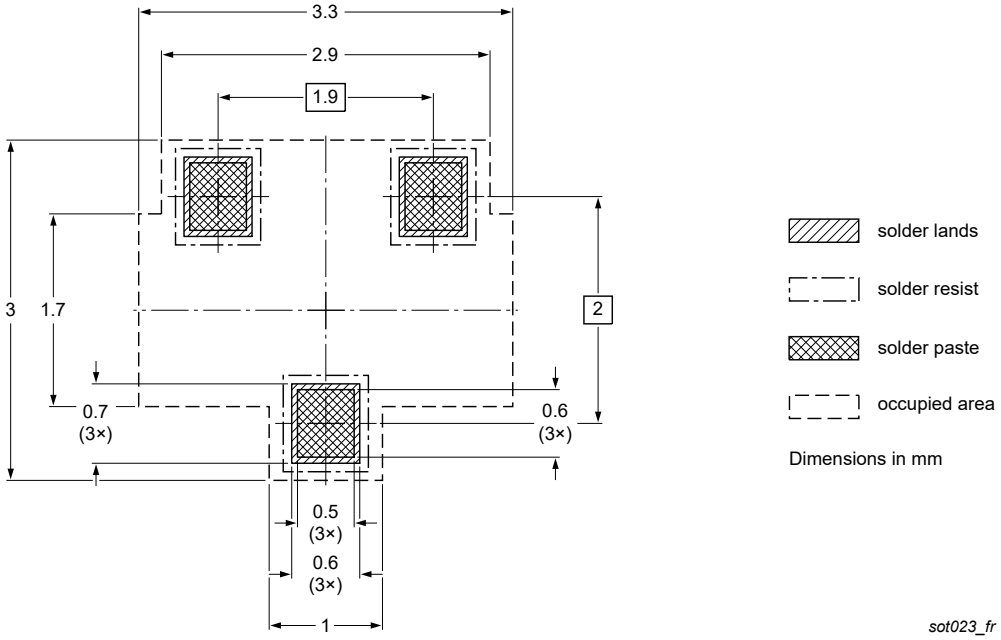


Fig. 3. Reflow soldering footprint for SOT23

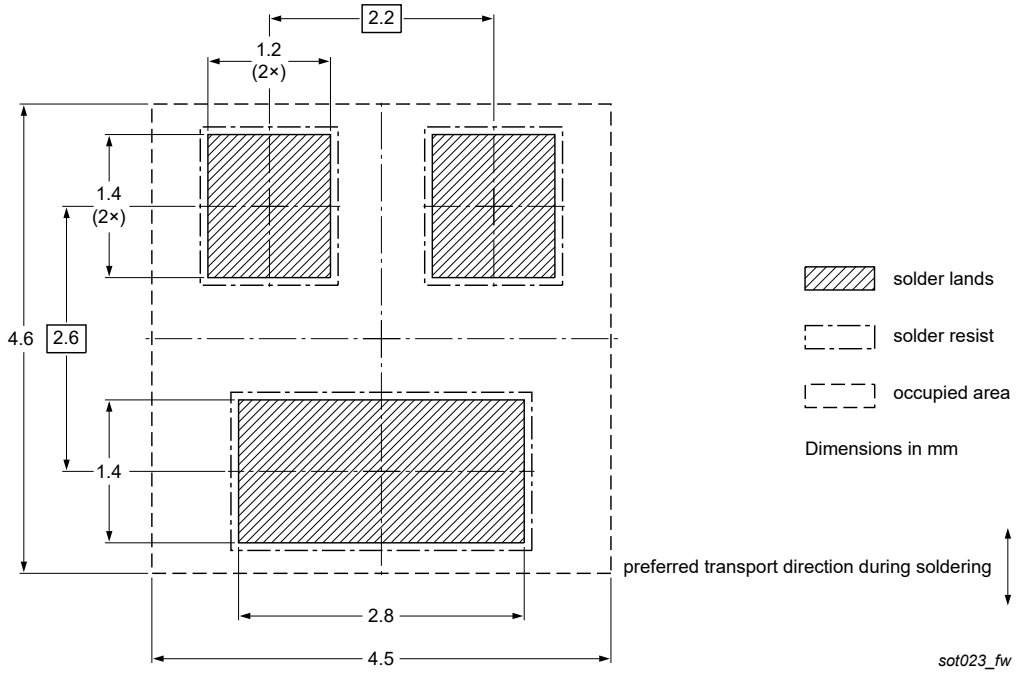


Fig. 4. Wave soldering footprint for SOT23

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BSR19A v.3	20230101	Product data sheet	-	BSR19A v.2
Modifications:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • Product changed to non automotive. Please refer to the automotive product(s) with -Q.			
BSR19A v.2	20040315	Product data sheet	-	BSR19A v.1
BSR19A v.1	20040113	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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