



BSR19A-Q

NPN high voltage transistors

25 October 2021

Product data sheet

1. General description

NPN high-voltage transistor in a small SOT23 plastic package.

PNP complements: BSR20A-Q.

2. Features and benefits

- Low current (max. 300 mA)
- High voltage (max. 160 V)
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

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

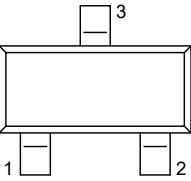
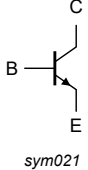
4. Quick reference data

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	 <p style="text-align: center;">SOT23</p>	 <p style="text-align: center;">sym021</p>
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BSR19A-Q	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-Q	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	$V_{CB} = 120\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	50	nA
		$V_{CB} = 120\text{ V}; I_E = 0\text{ A}; T_{amb} = 100\text{ }^\circ\text{C}$	-	-	50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 4\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	50	nA
h_{FE}	DC current gain	$V_{CE} = 5\text{ V}; I_C = 1\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$	80	-	-	
		$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$	80	-	250	
		$V_{CE} = 5\text{ V}; I_C = 50\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$	30	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 1\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	150	mV
		$I_C = 50\text{ mA}; I_B = 5\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	200	mV
C_c	collector capacitance	$V_{CB} = 10\text{ V}; I_E = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	6	pF
f_T	transition frequency	$V_{CE} = 10\text{ V}; I_C = 10\text{ mA}; f = 100\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$	100	300	-	MHz

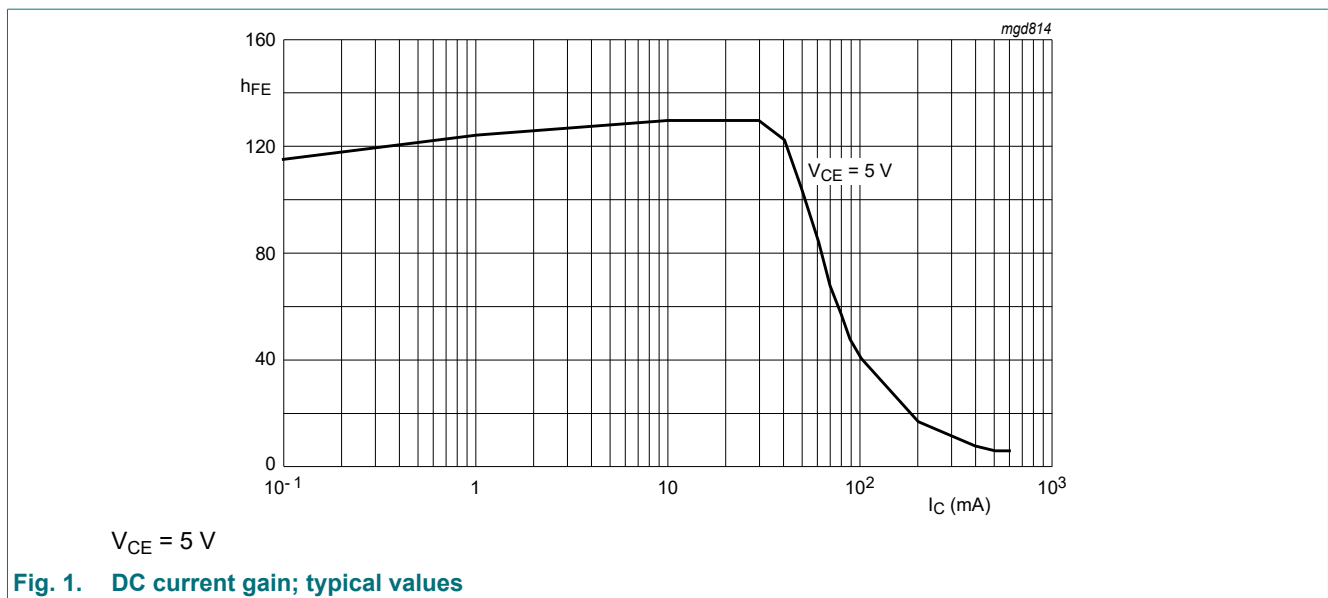


Fig. 1. DC current gain; typical values

11. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

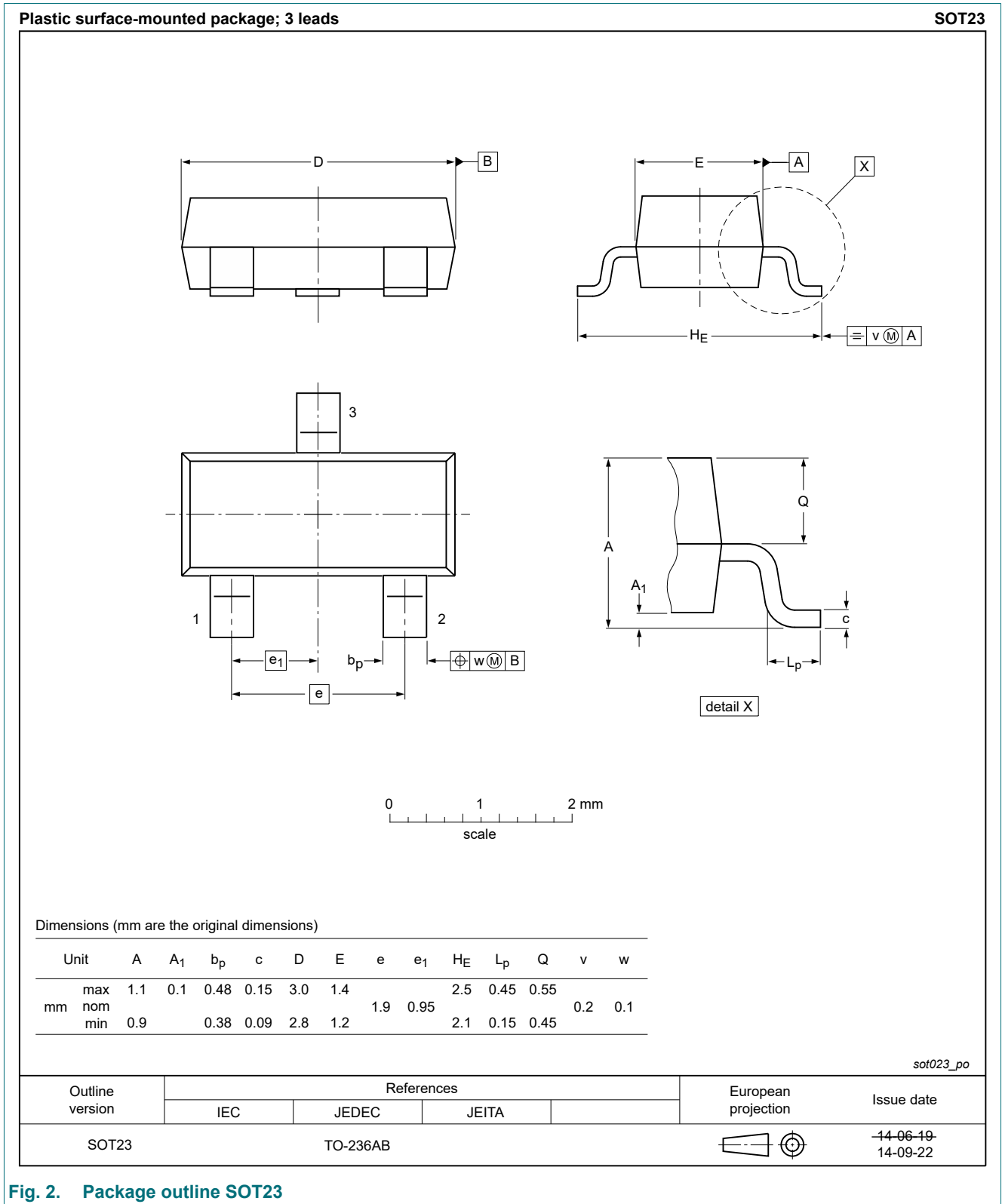


Fig. 2. Package outline SOT23

13. Soldering

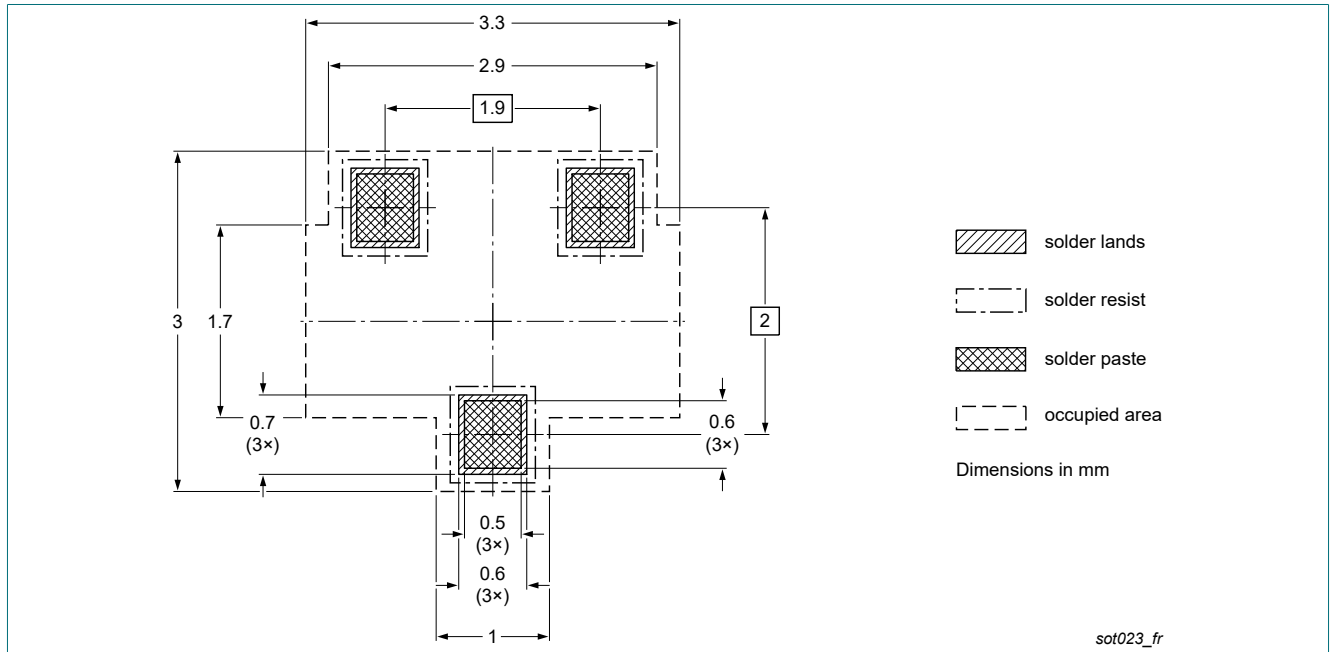


Fig. 3. Reflow soldering footprint for SOT23

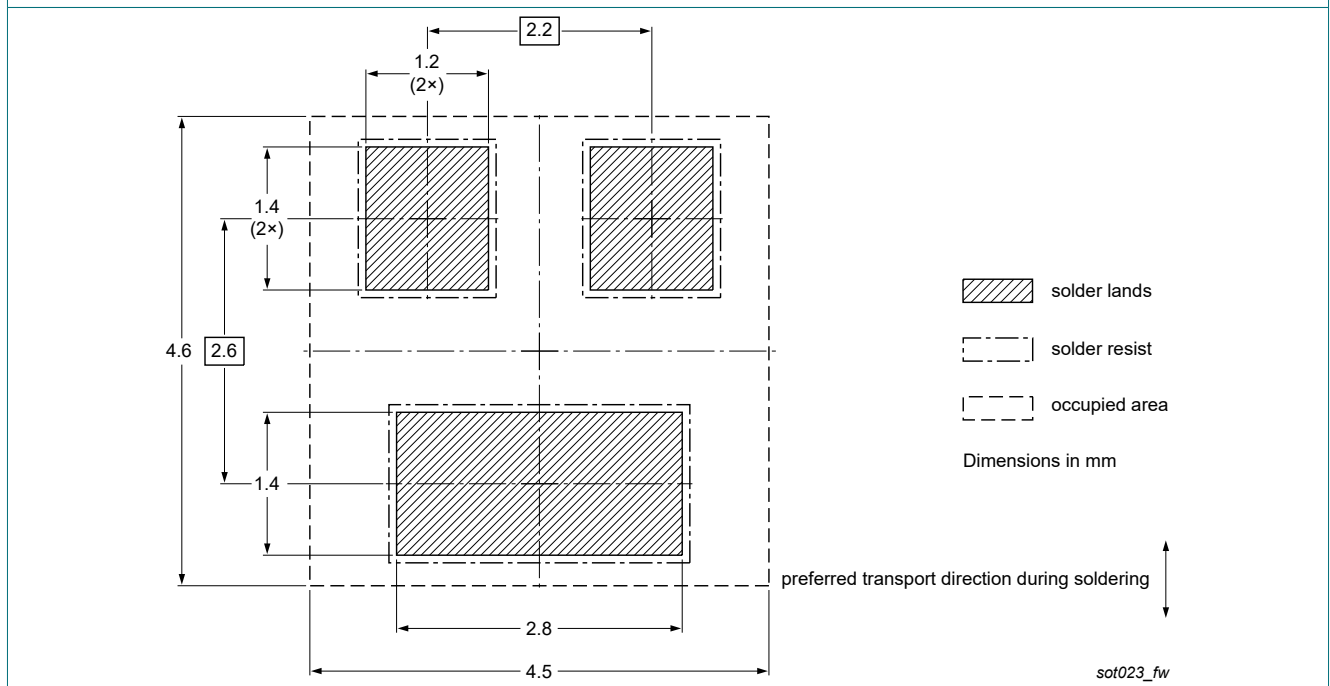


Fig. 4. Wave soldering footprint for SOT23

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BSR19A-Q v.1	20211025	Product data sheet	-	-

15. 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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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