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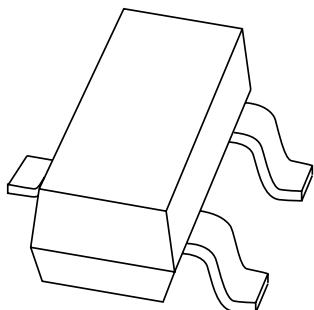
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Kind regards,

Team Nexperia

DATA SHEET



BSR19; BSR19A NPN high voltage transistors

Product data sheet
Supersedes data of 2004 Jan 13

2004 Mar 15

NPN high voltage transistors**BSR19; BSR19A****FEATURES**

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

APPLICATIONS

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

DESCRIPTION

NPN high-voltage transistor in a SOT23 plastic package.
PNP complements: BSR20 and BSR20A.

MARKING

TYPE NUMBER	MARKING CODE ⁽¹⁾
BSR19	56* or U35
BSR19A	57* or U36

Note

1. * = p : Made in Hong Kong.
- * = t : Made in Malaysia.
- * = W : Made in China.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BSR19	–	plastic surface mounted package; 3 leads	SOT23
BSR19A	–	plastic surface mounted package; 3 leads	SOT23

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

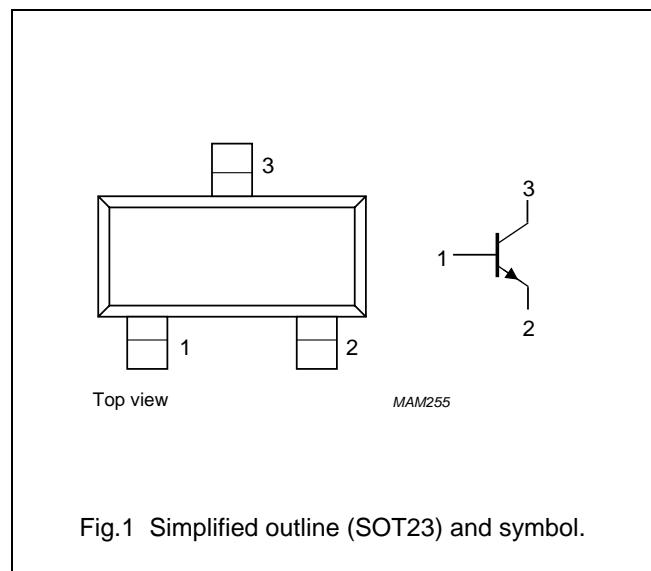


Fig.1 Simplified outline (SOT23) and symbol.

NPN high voltage transistors

BSR19; BSR19A

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage BSR19 BSR19A	open emitter	–	160	V
			–	180	V
V_{CEO}	collector-emitter voltage BSR19 BSR19A	open base	–	140	V
			–	160	V
I_{CM}	peak collector current		–	600	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25^\circ\text{C}$	–	250	mW
h_{FE}	DC current gain BSR19 BSR19A	$I_C = 10 \text{ mA}; V_{CE} = 5 \text{ V}$	60	–	
			80	–	
f_T	transition frequency	$I_C = 10 \text{ mA}; V_{CE} = 10 \text{ V}; f = 100 \text{ MHz}$	100	300	MHz

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage BSR19 BSR19A	open emitter	–	160	V
			–	180	V
V_{CEO}	collector-emitter voltage BSR19 BSR19A	open base	–	140	V
			–	160	V
V_{EBO}	emitter-base voltage	open collector	–	6	V
I_C	collector current (DC)		–	300	mA
I_{CM}	peak collector current		–	600	mA
I_B	base current (DC)		–	100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25^\circ\text{C}$	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

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

NPN high voltage transistors

BSR19; BSR19A

CHARACTERISTICS

 $T_{amb} = 25^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current BSR19	$I_E = 0 \text{ A}; V_{CB} = 100 \text{ V}$	—	100	nA
		$I_E = 0 \text{ A}; V_{CB} = 100 \text{ V}; T_{amb} = 100^\circ\text{C}$	—	100	μA
I_{CBO}	collector cut-off current BSR19A	$I_E = 0 \text{ A}; V_{CB} = 120 \text{ V}$	—	50	nA
		$I_E = 0 \text{ A}; V_{CB} = 120 \text{ V}; T_{amb} = 100^\circ\text{C}$	—	50	μA
I_{EBO}	emitter cut-off current	$I_C = 0 \text{ A}; V_{EB} = 4 \text{ V}$	—	50	nA
h_{FE}	DC current gain BSR19 BSR19A	$I_C = 1 \text{ mA}; V_{CE} = 5 \text{ V}$	60	—	
			80	—	
	DC current gain BSR19 BSR19A	$I_C = 10 \text{ mA}; V_{CE} = 5 \text{ V}$	60	250	
			80	250	
	DC current gain BSR19 BSR19A	$I_C = 50 \text{ mA}; V_{CE} = 5 \text{ V}$	20	—	
			30	—	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10 \text{ mA}; I_B = 1 \text{ mA}$	—	150	mV
V_{CEsat}	collector-emitter saturation voltage BSR19 BSR19A	$I_C = 50 \text{ mA}; I_B = 5 \text{ mA}$	—	250	mV
			—	200	mV
C_c	collector capacitance	$I_E = 0 \text{ A}; V_{CB} = 10 \text{ V}; f = 1 \text{ MHz}$	—	6	pF
f_T	transition frequency	$I_C = 10 \text{ mA}; V_{CE} = 10 \text{ V}; f = 100 \text{ MHz}$	100	300	MHz

NPN high voltage transistors

BSR19; BSR19A

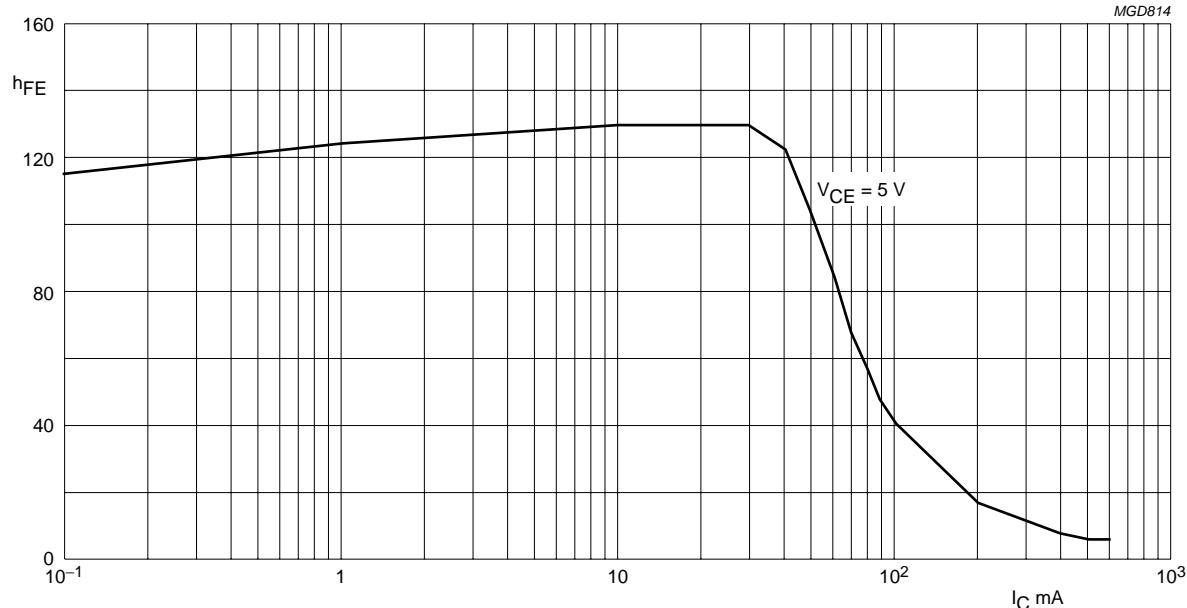


Fig.2 DC current gain; typical values.

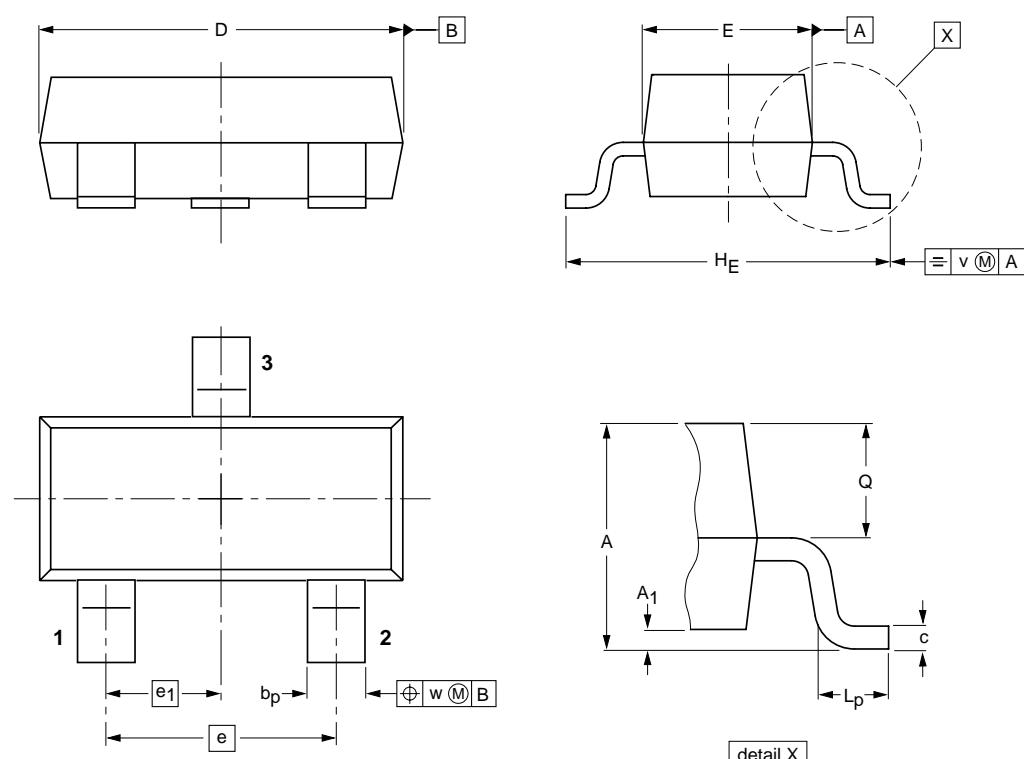
NPN high voltage transistors

BSR19; BSR19A

PACKAGE OUTLINE

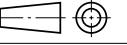
Plastic surface-mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max.	b _p	c	D	E	e	e ₁	H _E	l _p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				-04-11-04- 06-03-16

NPN high voltage transistors

BSR19; BSR19A

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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NXP Semiconductors

Customer notification

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

Contact information

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