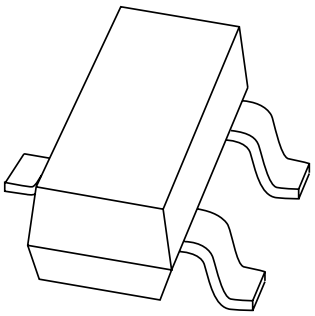
DATA SHEET



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.

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

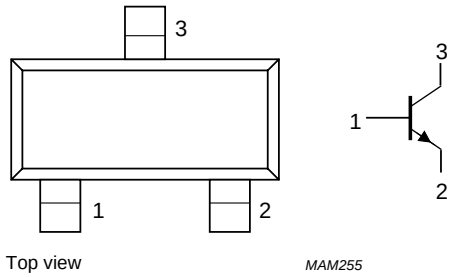


Fig.1 Simplified outline (SOT23) and symbol.

ORDERING INFORMATION

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

QUICK REFERENCE DATA

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

CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

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

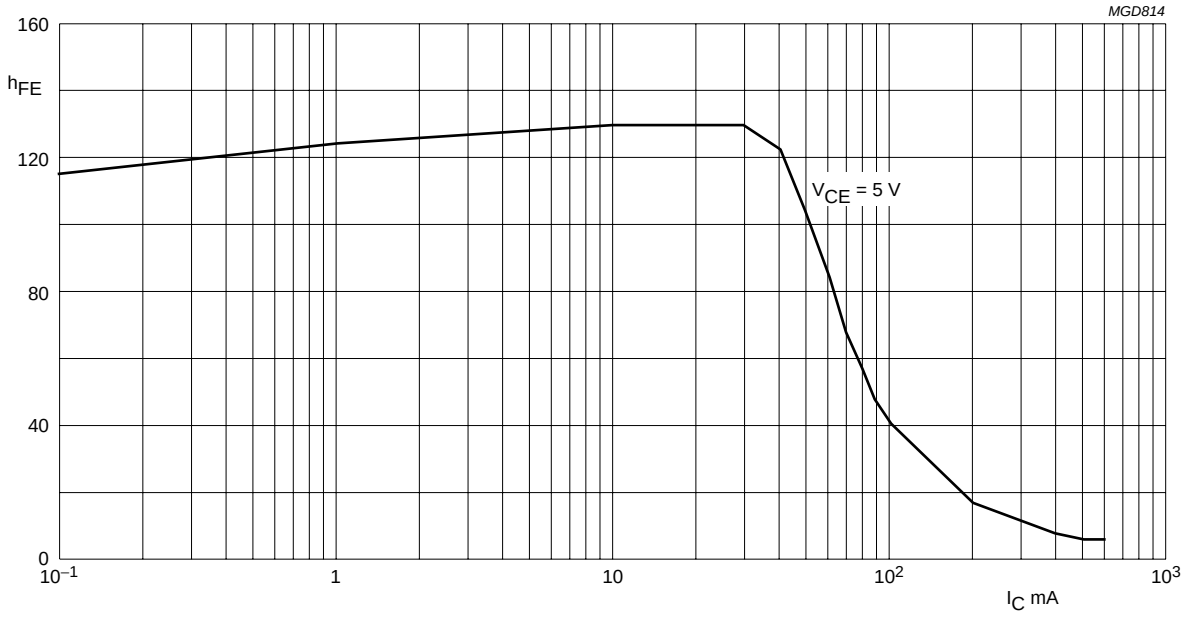
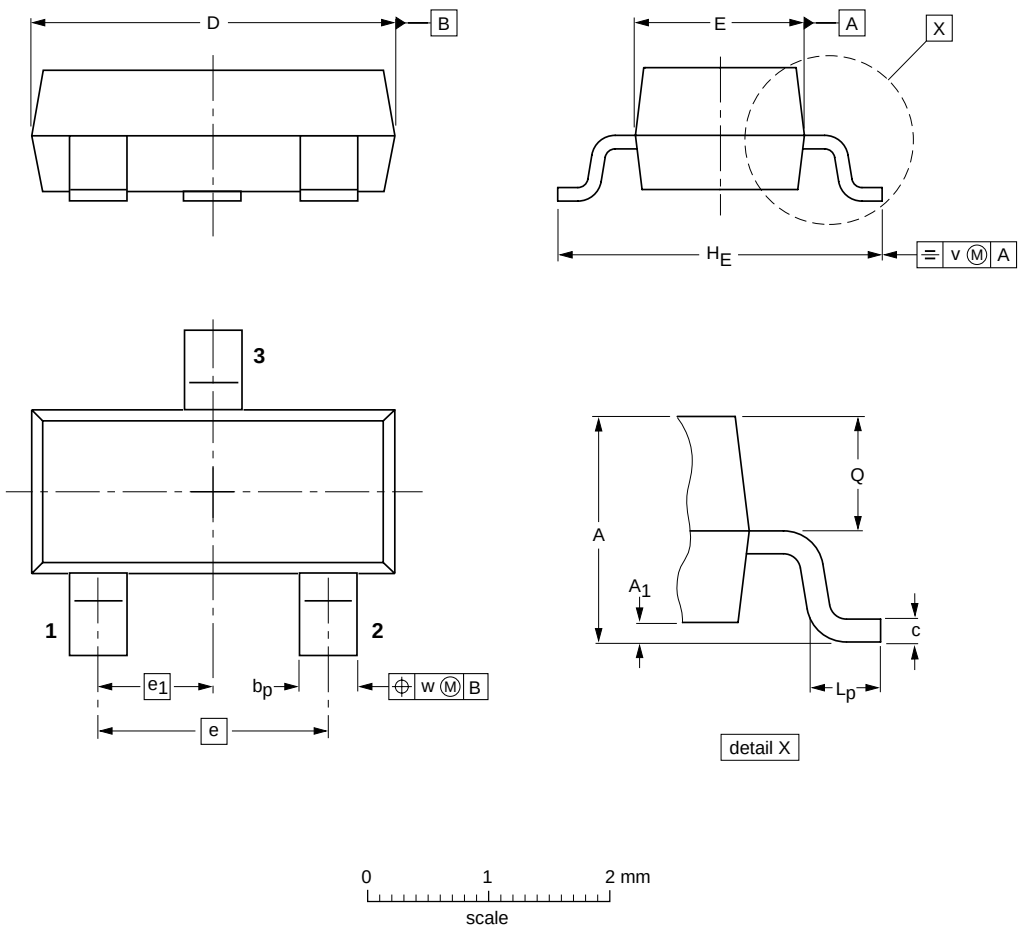


Fig.2 DC current gain; typical values.

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