DISCRETE SEMICONDUCTORS

DATA SHEET

BFS17NPN 1 GHz wideband transistor

Product specification
File under Discrete Semiconductors, SC14

September 1995





NPN 1 GHz wideband transistor

BFS17

DESCRIPTION

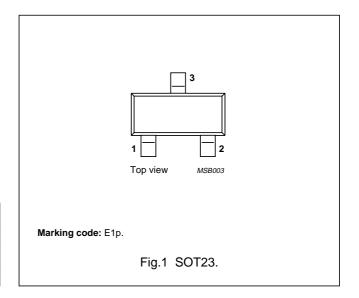
NPN transistor in a plastic SOT23 package.

APPLICATIONS

- A wide range of RF applications such as:
 - Mixers and oscillators in TV tuners
 - RF communications equipment.

PINNING

PIN	DESCRIPTION					
1	base					
2	emitter					
3	collector					



QUICK REFERENCED DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V _{CBO}	collector-base voltage	open emitter	_	25	V
V _{CEO}	collector-emitter voltage	open base	_	15	V
Ic	DC collector current		_	25	mA
P _{tot}	total power dissipation	up to T _s = 70 °C; note 1	_	300	mW
f _T	transition frequency	$I_C = 25 \text{ mA}; V_{CE} = 5 \text{ V}; f = 500 \text{ MHz}; T_j = 25 °C$	1	_	GHz
F	noise figure	I_C = 2 mA; V_{CE} = 5 V; R_S = 50 Ω; f = 500 MHz; T_i = 25 °C	4.5	_	dB

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	PARAMETER CONDITIONS			
V _{CBO}	collector-base voltage	open emitter	_	25	V
V _{CEO}	collector-emitter voltage	open base	_	15	V
V _{EBO}	emitter-base voltage	open collector	_	2.5	V
I _C	DC collector current		_	25	mA
I _{CM}	peak collector current		_	50	mA
P _{tot}	total power dissipation	up to T _s = 70 °C; note 1	_	300	mW
T _{stg}	storage temperature		-65	+150	°C
Tj	junction temperature		_	150	°C

Note to the Quick reference data and the Limiting values

1. T_s is the temperature at the soldering point of the collector pin.

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th j-s}	thermal resistance from junction to soldering point	up to $T_s = 70$ °C; note 1	260	K/W

Note

1. $T_{\mbox{\scriptsize S}}$ is the temperature at the soldering point of the collector pin.

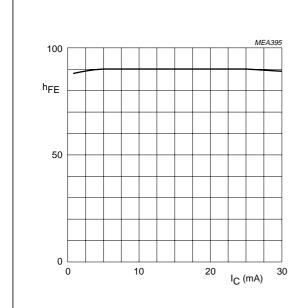
CHARACTERISTICS

 $T_j = 25$ °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CBO}	collector cut-off current	I _E = 0; V _{CB} = 10 V	_	_	10	nA
h _{FE}	DC current gain	I _C = 2 mA; V _{CE} = 1 V	25	90	_	
		$I_C = 25 \text{ mA}; V_{CE} = 1 \text{ V}$	25	90	_	
f _T	transition frequency	$I_C = 2 \text{ mA}; V_{CE} = 5 \text{ V}; f = 500 \text{ MHz}$	_	1	_	GHz
		$I_C = 25 \text{ mA}; V_{CE} = 5 \text{ V}; f = 500 \text{ MHz}$	_	1.6	_	GHz
C _c	collector capacitance	$I_E = i_e = 0$; $V_{CB} = 10 \text{ V}$; $f = 1 \text{ MHz}$	_	0.8	1.5	pF
Ce	emitter capacitance	$I_C = i_c = 0$; $V_{EB} = 0.5 \text{ V}$; $f = 1 \text{ MHz}$	_	_	2	pF
C _{re}	feedback capacitance	I _C = 1 mA; V _{CE} = 5 V; f = 1 MHz	_	0.65	_	pF
F	noise figure	I_C = 2 mA; V_{CE} = 5 V; R_S = 50 Ω ; f = 500 MHz	_	4.5	_	dB

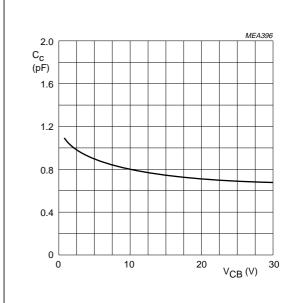
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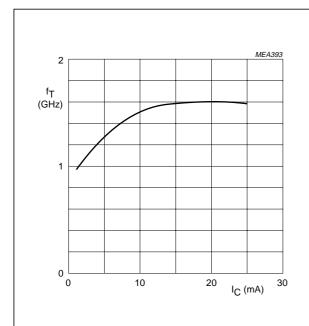
 $V_{CE} = 1 \text{ V}; T_j = 25 \,^{\circ}\text{C}.$

Fig.2 DC current gain as a function of collector current.



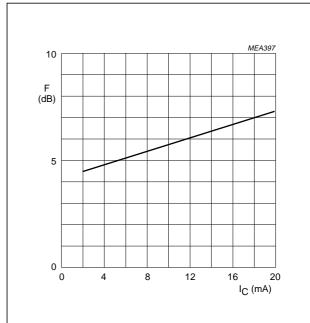
 $I_E = i_e = 0$; f = 1 MHz; $T_j = 25$ °C.

Fig.3 Collector capacitance as a function of collector-base voltage.



 V_{CE} = 5 V; f = 500 MHz; T_j = 25 °C.

Fig.4 Transition frequency as a function of collector current.



 V_{CE} = 5 V; R_S = 50 Ω ; f = 500 MHz; T_j = 25 °C.

Fig.5 Minimum noise figure as a function of collector current.

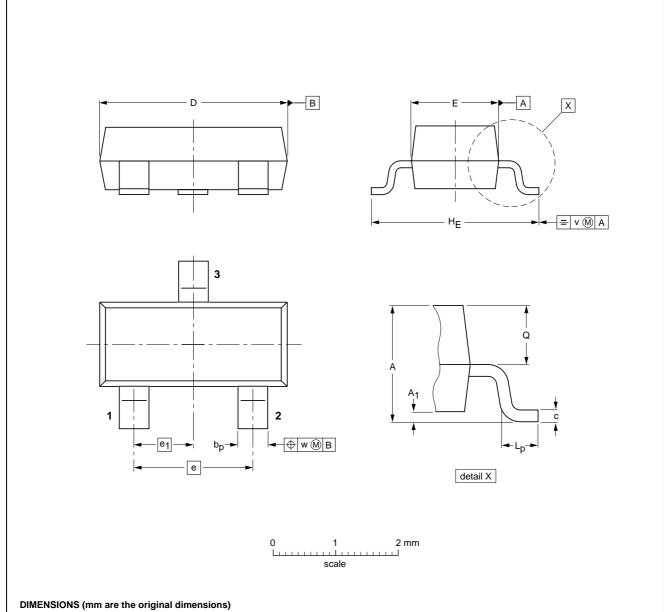
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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



UNIT	Α	A ₁ max.	bp	С	D	E	е	e ₁	HE	Lp	Q	٧	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		REFER	RENCES EUROPEAN ISS			ISSUE DATE
VERSION	IEC	JEDEC	EIAJ		PROJECTION	ISSUE DATE
SOT23						97-02-28

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DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	

Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

Application information

Where application information is given, it is advisory and does not form part of the specification.

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.