

DATA SHEET

BFS17

NPN 1 GHz wideband transistor

Product specification
File under Discrete Semiconductors, SC14

September 1995

NPN 1 GHz wideband transistor

BFS17

DESCRIPTION

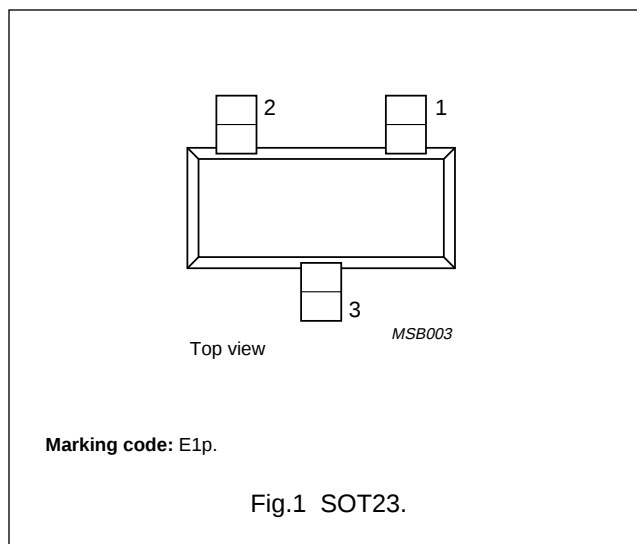
NPN transistor in a plastic SOT23 package.

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
I_C	DC collector current		–	25	mA
P_{tot}	total power dissipation	up to $T_s = 70\text{ °C}$; note 1	–	300	mW
f_T	transition frequency	$I_C = 25\text{ mA}$; $V_{CE} = 5\text{ V}$; $f = 500\text{ MHz}$; $T_j = 25\text{ °C}$	1	–	GHz
F	noise figure	$I_C = 2\text{ mA}$; $V_{CE} = 5\text{ V}$; $R_S = 50\text{ }\Omega$; $f = 500\text{ MHz}$; $T_j = 25\text{ °C}$	4.5	–	dB

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
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 $T_s = 70\text{ °C}$; note 1	–	300	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	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.

NPN 1 GHz wideband transistor

BFS17

THERMAL CHARACTERISTICS

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

Note

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

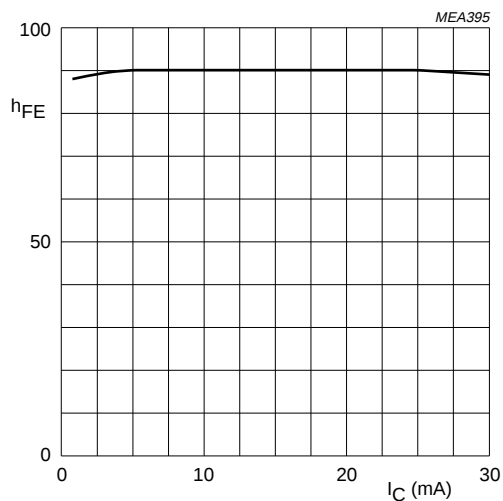
CHARACTERISTICS

$T_j = 25\text{ °C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0$; $V_{CB} = 10\text{ V}$	–	–	10	nA
h_{FE}	DC current gain	$I_C = 2\text{ mA}$; $V_{CE} = 1\text{ V}$	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	$I_E = I_C = 0$; $V_{CB} = 10\text{ V}$; $f = 1\text{ MHz}$	–	0.8	1.5	pF
C_e	emitter capacitance	$I_C = I_E = 0$; $V_{EB} = 0.5\text{ V}$; $f = 1\text{ MHz}$	–	–	2	pF
C_{re}	feedback capacitance	$I_C = 1\text{ mA}$; $V_{CE} = 5\text{ V}$; $f = 1\text{ MHz}$	–	0.65	–	pF
F	noise figure	$I_C = 2\text{ mA}$; $V_{CE} = 5\text{ V}$; $R_S = 50\text{ }\Omega$; $f = 500\text{ MHz}$	–	4.5	–	dB

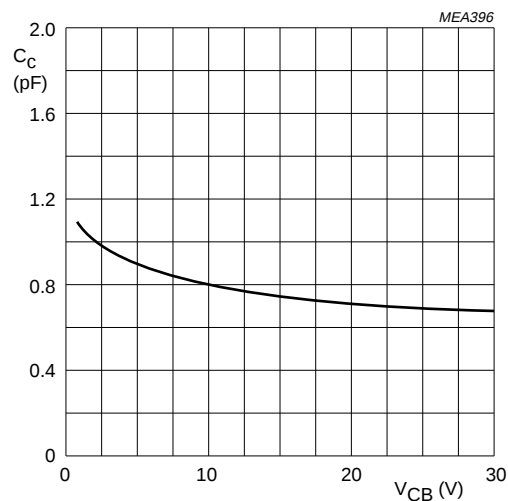
NPN 1 GHz wideband transistor

BFS17



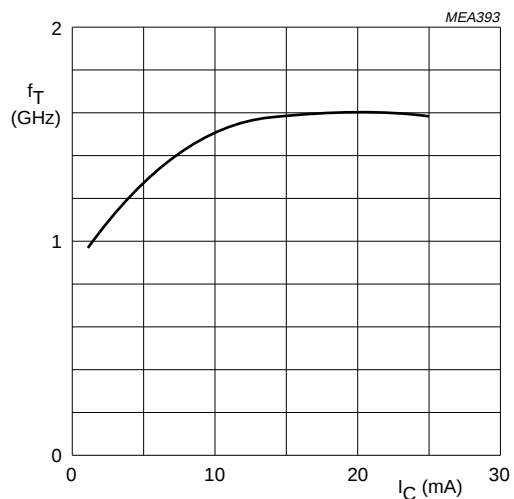
$V_{CE} = 1$ V; $T_j = 25$ °C.

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



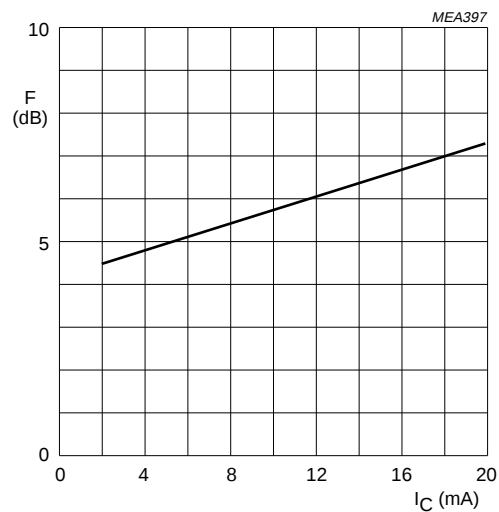
$I_E = I_B = 0$; $f = 1$ MHz; $T_j = 25$ °C.

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.

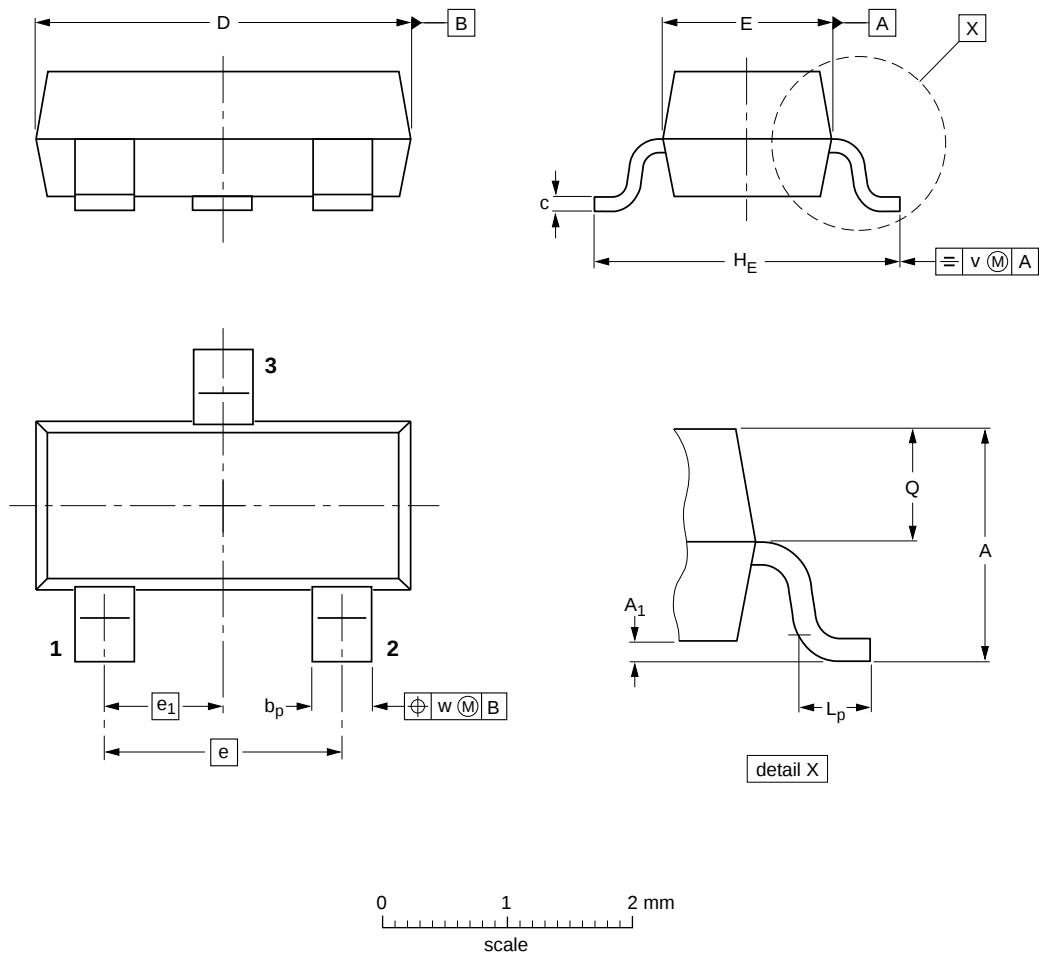
NPN 1 GHz wideband transistor

BFS17

PACKAGE OUTLINE

Package description

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	EIAJ			
SOT23						96-10-18

NPN 1 GHz wideband transistorBFS17

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.