

BFQ18A

NPN 4 GHz wideband transistor

Rev. 03 — 28 September 2007

Product data sheet

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NXP Semiconductors

NPN 4 GHz wideband transistor

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DESCRIPTION

NPN transistor in a plastic SOT89 envelope intended for application in thick and thin-film circuits. It is primarily intended for MATV purposes.

PINNING

PIN	DESCRIPTION
Code: FF	
1	emitter
2	collector
3	base

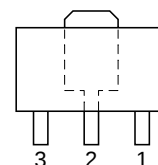


Fig.1 SOT89.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	—	25	V
V_{CEO}	collector-emitter voltage	open base	—	18	V
I_C	DC collector current		—	150	mA
P_{tot}	total power dissipation	up to $T_s = 155\text{ °C}$ (note 1)	—	1	W
f_T	transition frequency	$I_C = 100\text{ mA}$; $V_{CE} = 10\text{ V}$; $f = 500\text{ MHz}$; $T_j = 25\text{ °C}$	4	—	GHz
C_{re}	feedback capacitance	$I_C = 0$; $V_{CE} = 10\text{ V}$; $f = 10.7\text{ MHz}$	1.2	—	pF
d_{im}	intermodulation distortion	$I_C = 80\text{ mA}$; $V_{CE} = 10\text{ V}$; $R_L = 75\text{ }\Omega$; $V_o = 700\text{ mV}$; measured at $f_{(p+q-r)} = 793.25\text{ MHz}$	—	−60	dB

LIMITING VALUES

In accordance with the Absolute Maximum 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	—	18	V
V_{EBO}	emitter-base voltage	open collector	—	2	V
I_C	DC collector current		—	150	mA
P_{tot}	total power dissipation	up to $T_s = 155\text{ °C}$ (note 1)	—	1	W
T_{stg}	storage temperature		−65	150	°C
T_j	junction temperature		—	175	°C

Note

- T_s is the temperature at the soldering point of the collector tab.

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THERMAL RESISTANCE

SYMBOL	PARAMETER	CONDITIONS	THERMAL RESISTANCE
$R_{th\ j-s}$	thermal resistance from junction to soldering point	up to $T_s = 155\text{ °C}$ (note 1)	20 K/W

Note

- T_s is the temperature at the soldering point of the collector tab.

CHARACTERISTICS

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

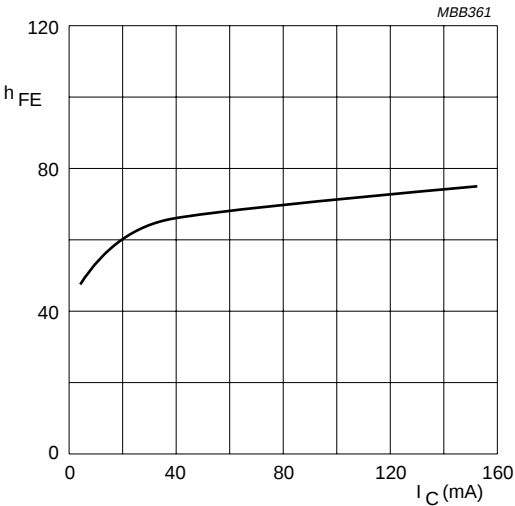
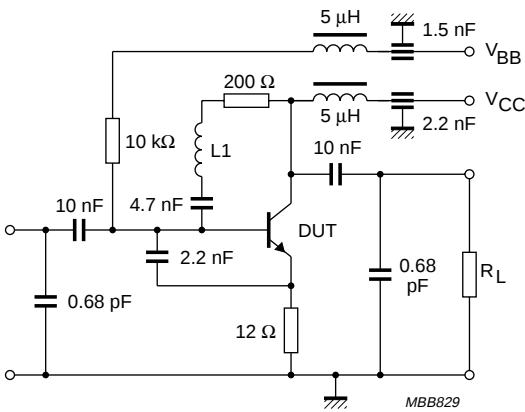
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	UNIT
h_{FE}	DC current gain	$I_C = 100\text{ mA}$; $V_{CE} = 10\text{ V}$	25	–	
C_c	collector capacitance	$I_E = i_e = 0$; $V_{CB} = 10\text{ V}$; $f = 1\text{ MHz}$	–	2	pF
C_e	emitter capacitance	$I_C = i_c = 0$; $V_{EB} = 0.5\text{ V}$; $f = 1\text{ MHz}$	–	11	pF
C_{re}	feedback capacitance	$I_C = 0$; $V_{CE} = 10\text{ V}$; $f = 10.7\text{ MHz}$	–	1.2	pF
f_T	transition frequency	$I_C = 100\text{ mA}$; $V_{CE} = 10\text{ V}$; $f = 500\text{ MHz}$	–	4	GHz
d_{im}	intermodulation distortion (see Fig.2)	note 1	–	–60	dB

Note

- $I_C = 80\text{ mA}$; $V_{CE} = 10\text{ V}$; $R_L = 75\text{ }\Omega$;
 $V_p = V_o = 700\text{ mV}$; $f_p = 795.25\text{ MHz}$;
 $V_q = V_o - 6\text{ dB}$; $f_q = 803.25\text{ MHz}$;
 $V_r = V_o - 6\text{ dB}$; $f_r = 805.25\text{ MHz}$;
measured at $f_{(p+q-r)} = 793.25\text{ MHz}$.

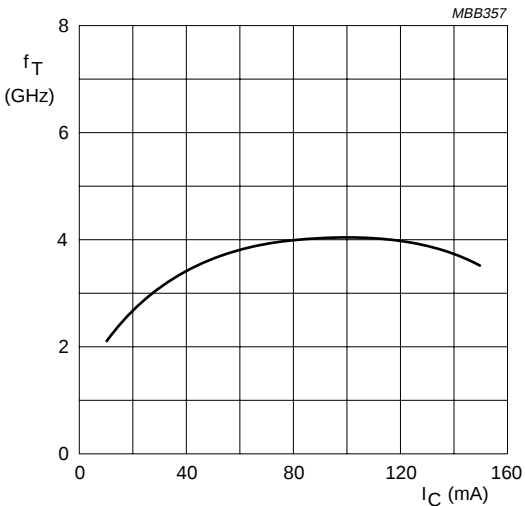
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$V_{CE} = 10\text{ V}$; $T_J = 25\text{ }^\circ\text{C}$.

Fig. 3 DC current gain as a function of collector current.



$V_{CE} = 10\text{ V}$; $f = 500\text{ MHz}$; $T_J = 25\text{ }^\circ\text{C}$.

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

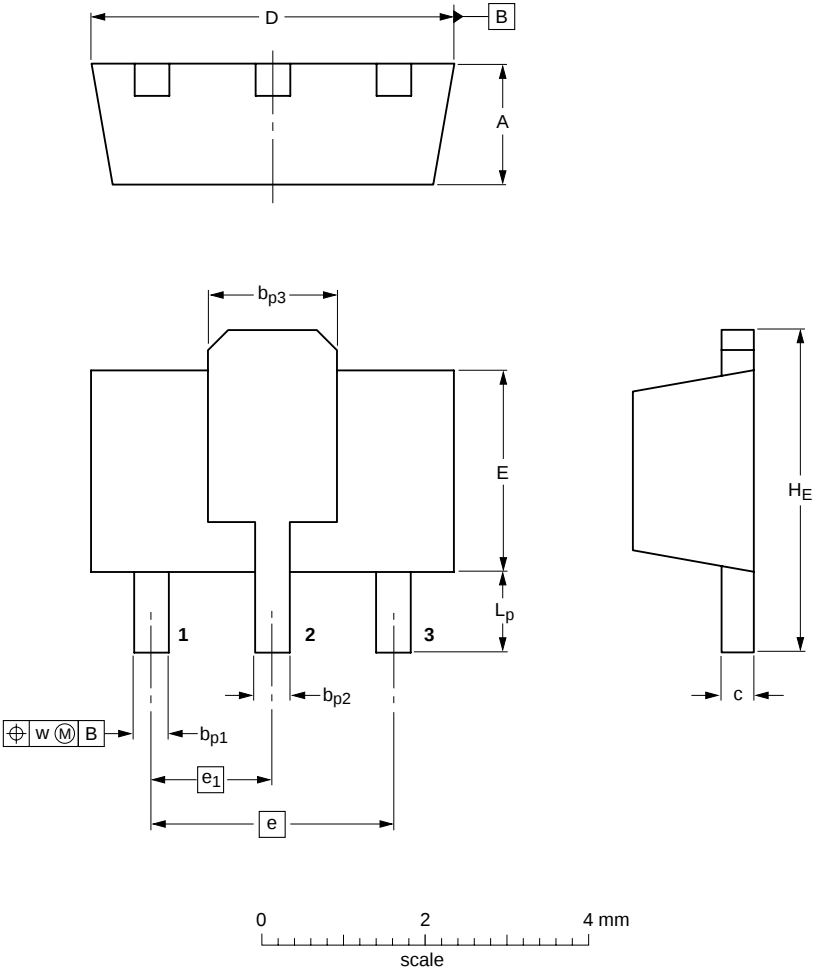
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PACKAGE OUTLINE

Plastic surface-mounted package; collector pad for good heat transfer; 3 leads

SOT89



DIMENSIONS (mm are the original dimensions)

UNIT	A	b _{p1}	b _{p2}	b _{p3}	c	D	E	e	e ₁	H _E	L _p	w
mm	1.6 1.4	0.48 0.35	0.53 0.40	1.8 1.4	0.44 0.23	4.6 4.4	2.6 2.4	3.0	1.5	4.25 3.75	1.2 0.8	0.13

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT89		TO-243	SC-62			06-03-16 06-08-29

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.

[1] Please consult the most recently issued document before initiating or completing a design.

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

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Revision history

Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BFQ18A_N_3	20070928	Product data sheet	-	BFQ18A_CNV_2
Modifications:	• Fig. 1 and package outline updated			
BFQ18A_CNV_2	19950901	Product specification	-	-

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