

# 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

## BFQ18A

## 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

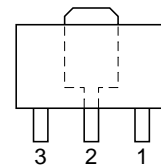


Fig.1 SOT89.

## 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.

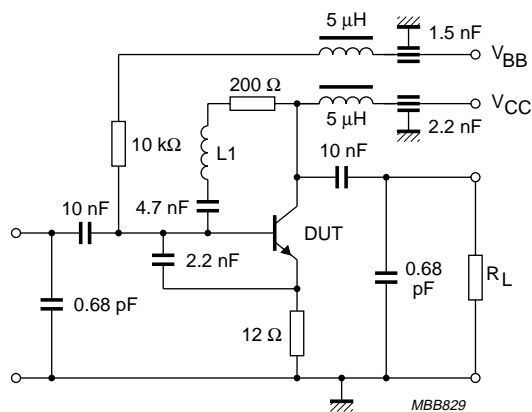
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	UNIT
$h_{FE}$	DC current gain	$I_C = 100\text{ mA}$ ; $V_{CE} = 10\text{ V}$	25	–	
$C_c$	collector capacitance	$I_E = i_e = 0$ ; $V_{CB} = 10\text{ V}$ ; $f = 1\text{ MHz}$	–	2	pF
$C_e$	emitter capacitance	$I_C = i_c = 0$ ; $V_{EB} = 0.5\text{ V}$ ; $f = 1\text{ MHz}$	–	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

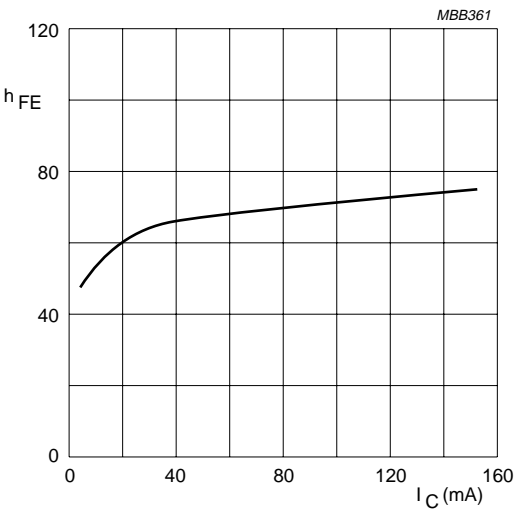
- $I_C = 80\text{ mA}$ ;  $V_{CE} = 10\text{ V}$ ;  $R_L = 75\text{ }\Omega$ ;  
 $V_p = V_o = 700\text{ mV}$ ;  $f_p = 795.25\text{ MHz}$ ;  
 $V_q = V_o - 6\text{ dB}$ ;  $f_q = 803.25\text{ MHz}$ ;  
 $V_r = V_o - 6\text{ dB}$ ;  $f_r = 805.25\text{ MHz}$ ;  
measured at  $f_{(p+q-r)} = 793.25\text{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

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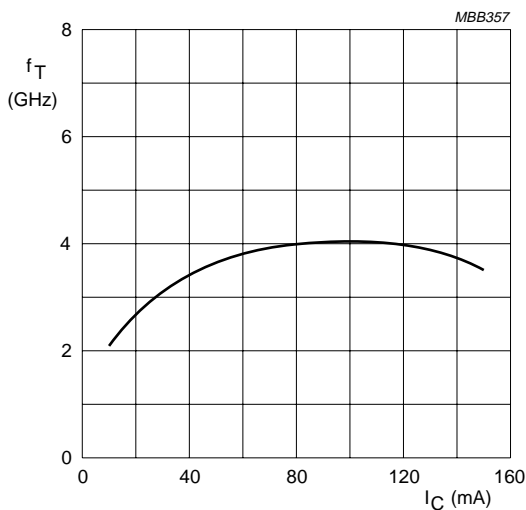


$f = 40 - 860 \text{ MHz}$ .



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

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.

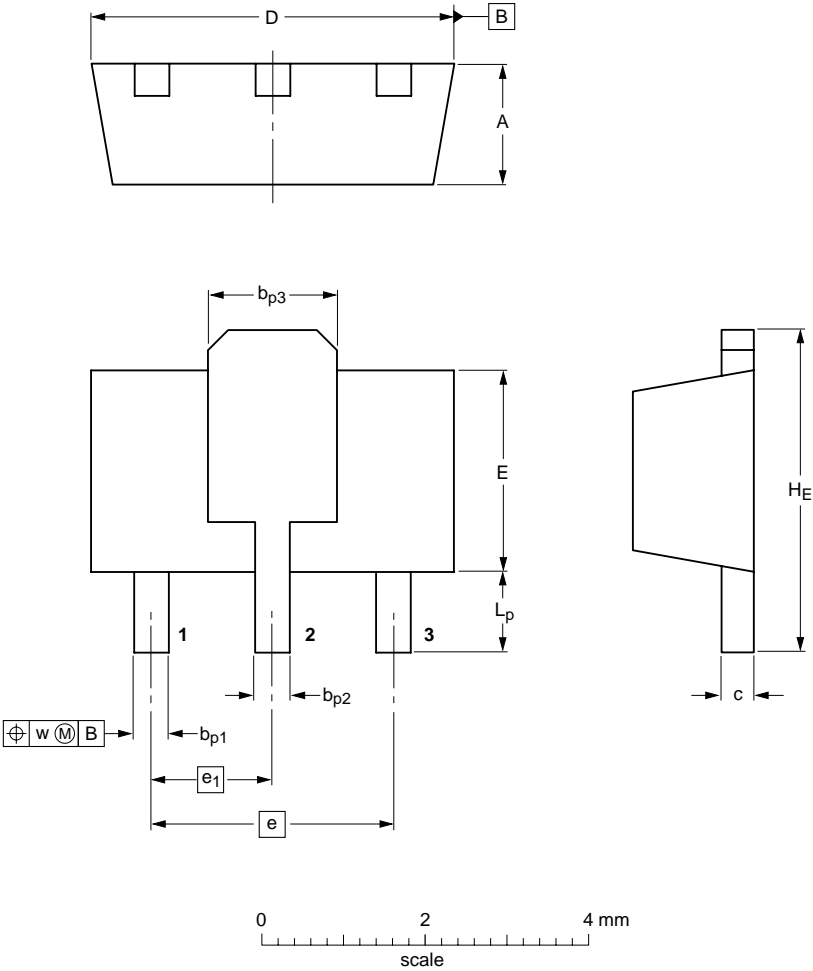
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PACKAGE OUTLINE

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

SOT89



DIMENSIONS (mm are the original dimensions)

UNIT	A	b <sub>p1</sub>	b <sub>p2</sub>	b <sub>p3</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	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 <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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.

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[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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