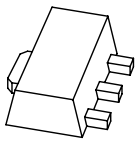

# BFQ18A

## NPN 4 GHz wideband transistor

Rev. 03 — 28 September 2007 Product data sheet

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# 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 |

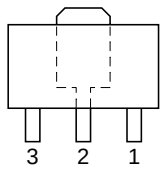



Fig.1 SOT89.

## 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 °C (note 1) | – | 1 | W |
| $f_T$ | transition frequency | $I_C$ = 100 mA; $V_{CE}$ = 10 V; f = 500 MHz; $T_j$ = 25 °C | 4 | – | GHz |
| $C_{re}$ | feedback capacitance | $I_C$ = 0; $V_{CE}$ = 10 V; f = 10.7 MHz | 1.2 | – | pF |
| $d_{im}$ | intermodulation distortion | $I_C$ = 80 mA; $V_{CE}$ = 10 V; $R_L$ = 75 Ω; $V_o$ = 700 mV; measured at $f_{(p+q-r)}$ = 793.25 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 °C (note 1) | – | 1 | W |
| $T_{stg}$ | storage temperature | | –65 | 150 | °C |
| $T_j$ | junction temperature | | – | 175 | °C |

**Note**

1. $T_s$ is the temperature at the soldering point of the collector tab.

## THERMAL RESISTANCE

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

**Note**

1. $T_s$ is the temperature at the soldering point of the collector tab.

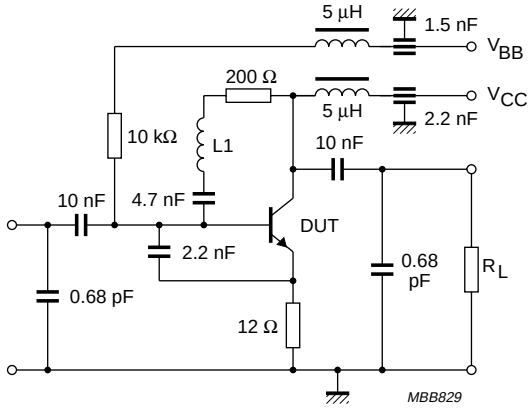
## CHARACTERISTICS

$T_j$ = 25 °C unless otherwise specified.

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

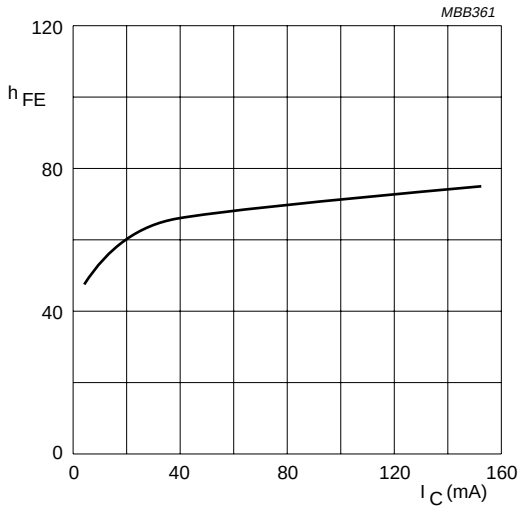
**Note**

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



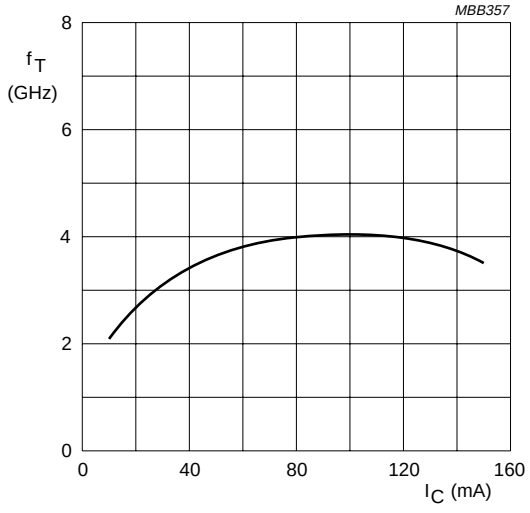

f = 40 – 860 MHz.

Fig.2 Intermodulation distortion MATV test circuit.




$V_{CE}$ = 10 V; $T_j$ = 25 °C.

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

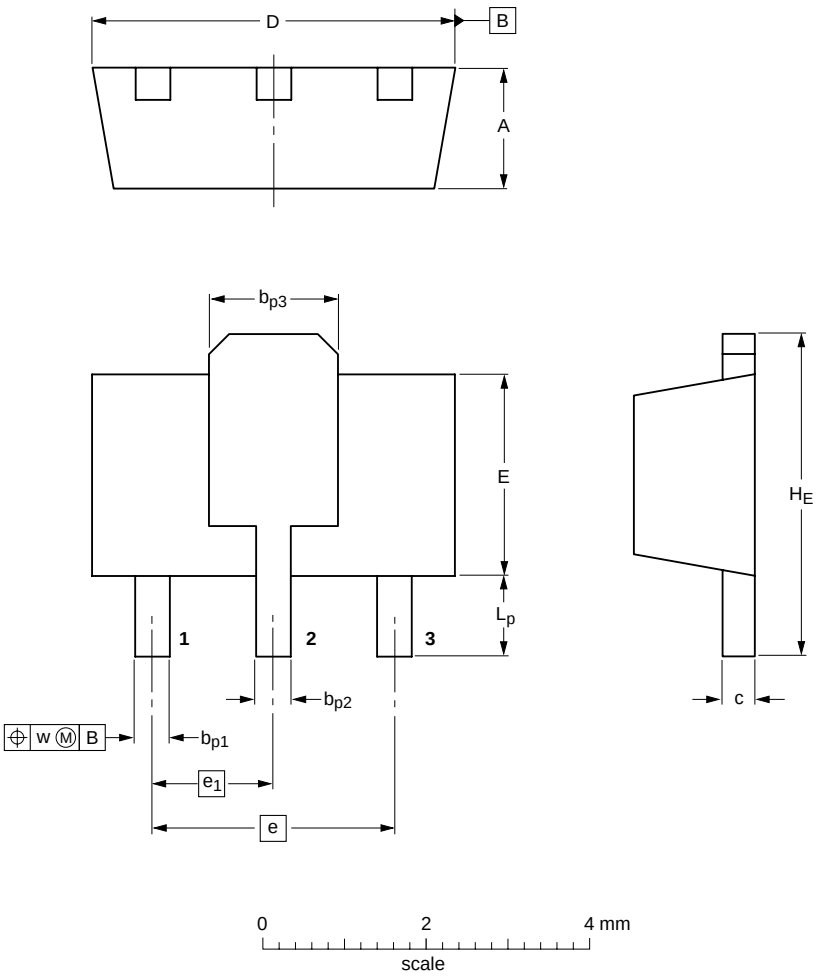



$V_{CE}$ = 10 V; f = 500 MHz; $T_j$ = 25 °C.

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

## 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<br>1.4 | 0.48<br>0.35 | 0.53<br>0.40 | 1.8<br>1.4 | 0.44<br>0.23 | 4.6<br>4.4 | 2.6<br>2.4 | 3.0 | 1.5 | 4.25<br>3.75 | 1.2<br>0.8 | 0.13 |

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

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| Document status[1][2] | Product status[3] | Definition |
|---|---|---|
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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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Date of release: 28 September 2007
Document identifier: BFQ18A_N_3