

PNP 4 GHz wideband transistor

BFQ32M

N AMER PHILIPS/DISCRETE

69E D

DESCRIPTION

PNP transistor in a TO-72 metal envelope with insulated electrodes and a shield lead connected to the case. It is primarily intended for use in UHF and microwave amplifiers such as aerial amplifiers, radar systems, oscilloscopes, spectrum analyzers etc.

The transistor features high power gain, high transition frequency and low noise up to high frequencies.

NPN complement is BFQ63.

PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	collector
4	shield lead (connected to case)

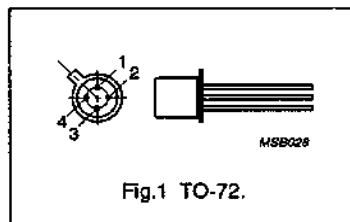


Fig.1 TO-72.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CB0}	collector-base voltage	open emitter	—	-20	V
V_{CE0}	collector-emitter voltage	open base	—	-15	V
I_C	DC collector current		—	-100	mA
P_{tot}	total power dissipation	up to $T_s = 50^\circ\text{C}$ (note 1)	—	250	mW
f_T	transition frequency	$I_C = -50\text{ mA}$; $V_{CE} = -5\text{ V}$; $f = 500\text{ MHz}$; $T_j = 25^\circ\text{C}$	4.5	—	GHz
C_{re}	feedback capacitance	$I_C = -10\text{ mA}$; $V_{CE} = -10\text{ V}$; $f = 1\text{ MHz}$	1.4	—	pF
F	noise figure	$I_C = -10\text{ mA}$; $V_{CE} = -5\text{ V}$; $Z_s = \text{opt.}$; $f = 500\text{ MHz}$; $T_{amb} = 25^\circ\text{C}$	2.3	—	dB
G_{UM}	maximum unilateral power gain	$I_C = -20\text{ mA}$; $V_{CE} = -5\text{ V}$; $f = 500\text{ MHz}$; $T_{amb} = 25^\circ\text{C}$	11	—	dB

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CB0}	collector-base voltage	open emitter	—	-20	V
V_{CE0}	collector-emitter voltage	open base	—	-15	V
V_{EB0}	emitter-base voltage	open collector	—	-3	V
I_C	DC collector current		—	-100	mA
I_{CM}	peak collector current	$f > 1\text{ MHz}$	—	-150	mA
P_{tot}	total power dissipation	up to $T_s = 50^\circ\text{C}$ (note 1)	—	250	mW
T_{stg}	storage temperature		-65	200	$^\circ\text{C}$
T_j	junction temperature		—	200	$^\circ\text{C}$

Note

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

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THERMAL RESISTANCE

SYMBOL	PARAMETER	CONDITIONS	THERMAL RESISTANCE
$R_{th\ j-a}$	thermal resistance from junction to soldering point	up to $T_s = 50\text{ °C}$ (note 1)	600 K/W

Note

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

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = -10\text{ V}$	—	—	-100	nA
h_{FE}	DC current gain	$I_C = -50\text{ mA}; V_{CE} = -5\text{ V}$	20	50	—	
C_c	collector capacitance	$I_E = I_s = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$	—	1.8	—	pF
C_e	emitter capacitance	$I_C = I_c = 0; V_{EB} = -0.5\text{ V}; f = 1\text{ MHz}$	—	0.4	—	pF
C_{re}	feedback capacitance	$I_C = -10\text{ mA}; V_{CE} = -10\text{ V}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$	—	1.4	—	pF
f_T	transition frequency	$I_C = -50\text{ mA}; V_{CE} = -5\text{ V}; f = 500\text{ MHz}$	—	4.5	—	GHz
F	noise figure	$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; Z_S = \text{opt.}; f = 500\text{ MHz}; T_{amb} = 25\text{ °C}$	—	2.3	—	dB
G_{UM}	maximum unilateral power gain (note 1)	$I_C = -50\text{ mA}; V_{CE} = -5\text{ V}; f = 500\text{ MHz}; T_{amb} = 25\text{ °C}$	—	11	—	dB

Note

1. G_{UM} is the maximum unilateral power gain, assuming S_{12} is zero and $G_{UM} = 10 \log \frac{|S_{21}|^2}{(1 - |S_{11}|^2)(1 - |S_{22}|^2)}$ dB.

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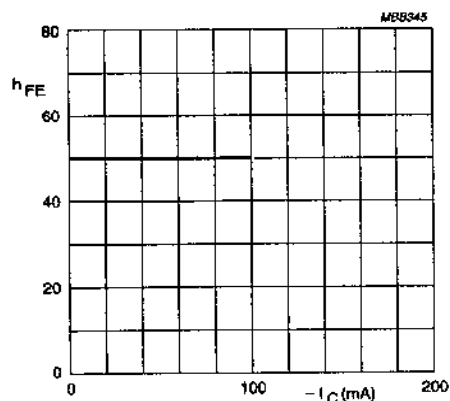
 $V_{CE} = -5$ V; $T_J = 25$ °C.

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

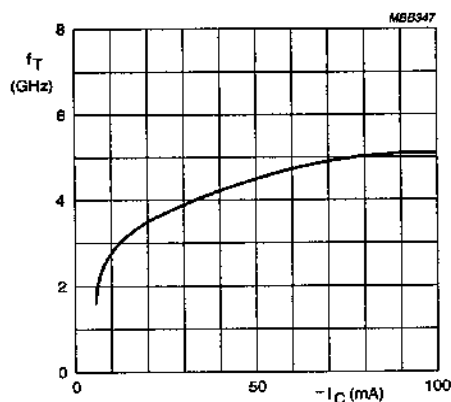
 $V_{CE} = -5$ V; $T_J = 25$ °C.

Fig.3 Transition frequency as a function of collector current.