NPN 5 GHz wideband transistors BFG25AW; BFG25AW/X

FEATURES

- Low current consumption (100 μA to 1 mA)
- Low noise figure
- Gold metallization ensures excellent reliability.

APPLICATIONS

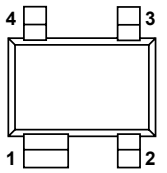
Wideband applications in UHF low power amplifiers, such as pocket telephones and paging systems.

DESCRIPTION

NPN silicon planar epitaxial transistor in a 4-pin dual-emitter SOT343N plastic package.

PINNING

PIN	DESCRIPTION
BFG25AW	
1	collector
2	base
3	emitter
4	emitter
BFG25AW/X	
1	collector
2	emitter
3	base
4	emitter



Top view MBK523

Fig.1 SOT343N.

MARKING

TYPE NUMBER	CODE
BFG25AW	N6
BFG25AW/X	V1

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	–	8	V
V_{CEO}	collector-emitter voltage	open base	–	–	5	V
I_C	collector current (DC)		–	–	6.5	mA
P_{tot}	total power dissipation	$T_s \leq 85$ °C	–	–	500	mW
h_{FE}	DC current gain	I_C = 0.5 mA; V_{CE} = 1 V	50	80	200	
C_{re}	feedback capacitance	I_C = 0; V_{CE} = 1 V; f = 1 MHz	–	0.2	0.3	pF
f_T	transition frequency	I_C = 1 mA; V_{CE} = 1 V; f = 500 MHz; T_{amb} = 25 °C	3.5	5	–	GHz
G_{UM}	maximum unilateral power gain	I_C = 0.5 mA; V_{CE} = 1 V; f = 1 GHz; T_{amb} = 25 °C	–	16	–	dB
F	noise figure	$\Gamma_s = \Gamma_{opt}$; I_C = 1 mA; V_{CE} = 1 V; f = 1 GHz	–	2	–	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	–	8	V
V_{CEO}	collector-emitter voltage	open base	–	5	V
V_{EBO}	emitter-base voltage	open collector	–	2	V
I_C	collector current (DC)		–	6.5	mA
P_{tot}	total power dissipation	$T_s \leq 85$ °C; see Fig.2; note 1	–	500	mW
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 pin.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	$T_s \leq 85$ °C; note 1	180	K/W

Note

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

CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	I_C = 100 μA; I_E = 0	–	–	8	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	I_C = 1 mA; I_B = 0	–	–	5	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	I_E = 100 μA; I_C = 0	–	–	2	V
I_{CBO}	collector leakage current	open emitter; V_{CB} = 5 V; I_E = 0	–	–	50	nA
h_{FE}	DC current gain	I_C = 0.5 mA; V_{CE} = 1 V	50	80	200	
C_{re}	feedback capacitance	I_C = 0; V_{CE} = 1 V; f = 1 MHz	–	0.2	0.3	pF
f_T	transition frequency	I_C = 1 mA; V_{CE} = 1 V; f = 1 GHz; T_{amb} = 25 °C	3.5	5	–	GHz
G_{UM}	maximum unilateral power gain; note 1	I_C = 0.5 mA; V_{CE} = 1 V; f = 1 GHz; T_{amb} = 25 °C	–	16	–	dB
		I_C = 0.5 mA; V_{CE} = 1 V; f = 2 GHz; T_{amb} = 25 °C	–	8	–	dB
F	noise figure	$\Gamma_s = \Gamma_{opt}$; I_C = 0.5 mA; V_{CE} = 1 V; f = 1 GHz	–	1.9	–	dB
		$\Gamma_s = \Gamma_{opt}$; I_C = 1 mA; V_{CE} = 1 V; f = 1 GHz	–	2		dB

Note

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

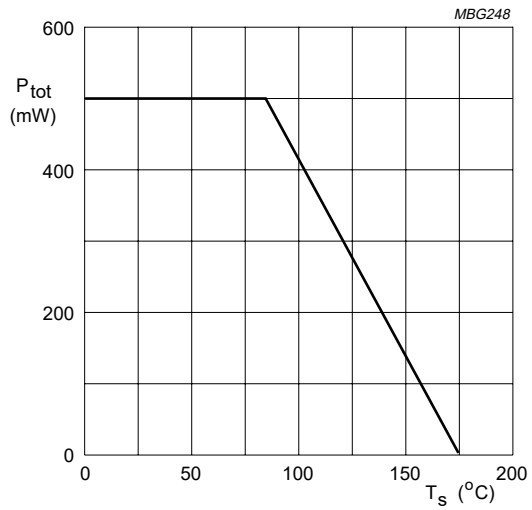
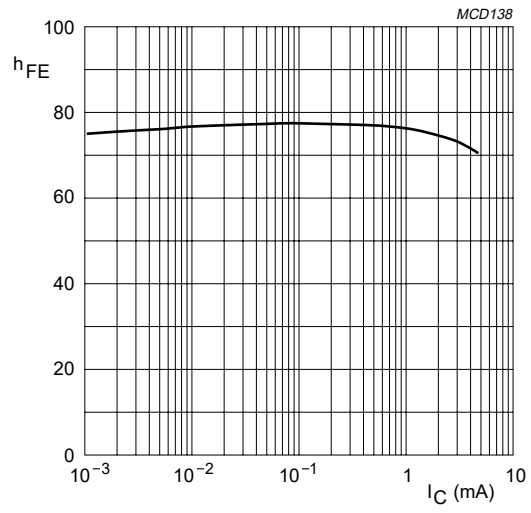
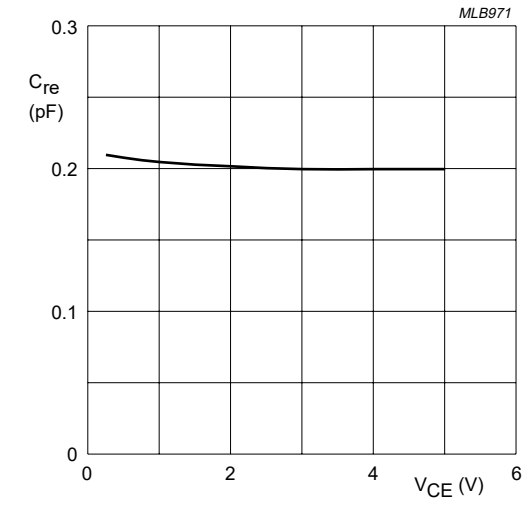


Fig.2 Power derating curve.



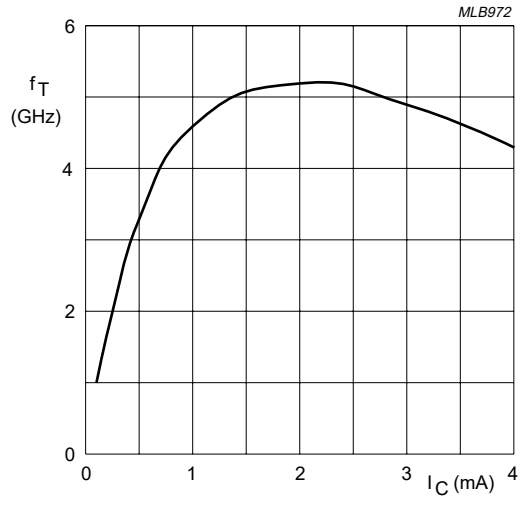
V_{CE} = 1 V.

Fig.3 DC current gain as a function of collector current; typical values.



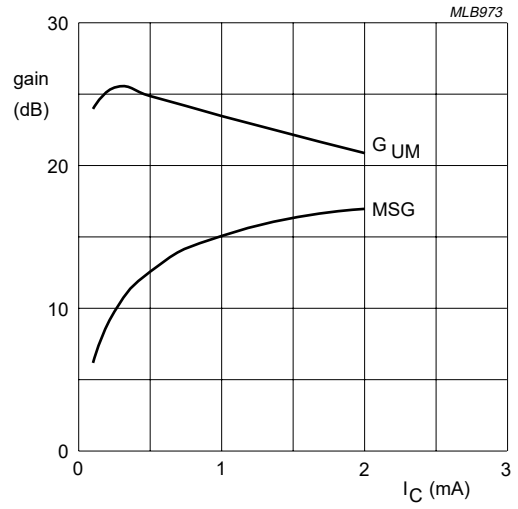
I_C = 0; f = 1 MHz.

Fig.4 Feedback capacitance as a function of collector-base voltage; typical values.



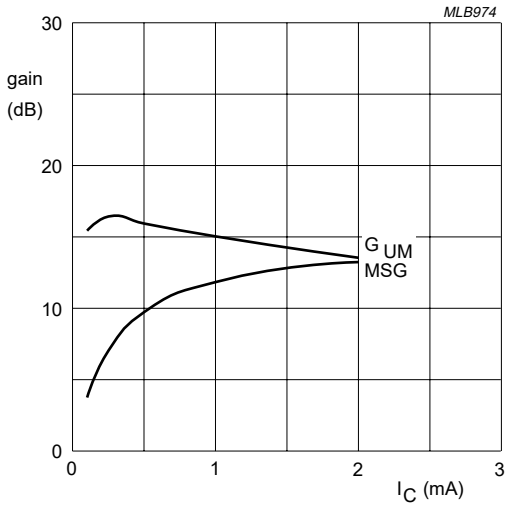
f = 500 MHz; V_{CE} = 1 V; T_{amb} = 25 °C.

Fig.5 Transition frequency as a function of collector current; typical values.



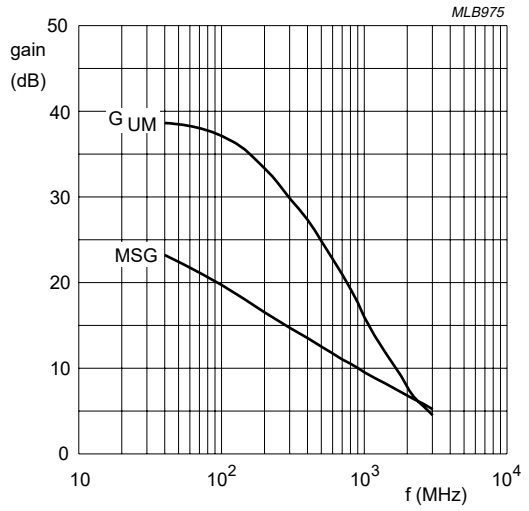
f = 500 MHz; V_{CE} = 1 V.

Fig.6 Gain as a function of collector current; typical values.



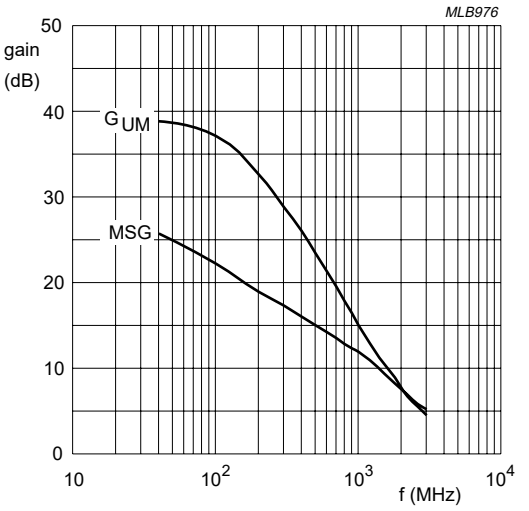
f = 1 GHz; V_{CE} = 1 V.

Fig.7 Gain as a function of collector current; typical values.



I_C = 0.5 mA; V_{CE} = 1 V.

Fig.8 Gain as a function of frequency; typical values.



I_C = 1 mA; V_{CE} = 1 V.

Fig.9 Gain as a function of frequency; typical values.

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