BFP420F

Low Noise Silicon Bipolar RF Transistor

Data Sheet

Revision 1.1, 2012-11-07

RF & Protection Devices

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BFP420F, Low Noise Silicon Bipolar RF Transistor

Revision History: 2012-11-07, Revision 1.1

Previous Revision: Rev. 1.0	
Page	**Subjects (major changes since last revision)**
	This datasheet replaces the revision from 2012-01-30. The product itself has not been changed and the device characteristics remain unchanged. Only the product description and information available in the datasheet has been expanded and updated.

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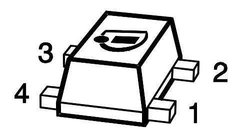
1 Product Brief

The BFP420F is a low noise wideband NPN bipolar RF transistor. The collector design supports voltages up to V_{CEO} = 4.5 V and currents up to I_C = 60 mA. The device is especially suited for mobile applications in which low power consumption is a key requirement. The typical transition frequency is approximately 25 GHz, hence the device offers high power gain at frequencies up to 4.5 GHz in amplifier applications. The device is housed in a thin small flat plastic package with visible leads.

2 Features

- General purpose low noise NPN bipolar RF transistor
- Based on Infineon´s reliable very high volume 25 GHz silicon bipolar technology
- 0.95 dB minimum noise figure typical at 900 MHz, 3 V, 4 mA
- 16.5 dB maximum gain (G_{ma}) typical at 2.4 GHz, 3 V, 15 mA
- 28 dBm OIP_3 typical at 2.4 GHz, 4 V, 40 mA
- 16.5 dBm OP_{1dB} typical at 2.4 GHz, 4 V, 40 mA
- Popular in discrete oscillators
- Thin, small, flat, Pb-free (RoHS compliant) and Halogen-free package with visible leads
- Qualification report according to AEC-Q101 available



RoHS

Applications

As Low Noise Amplifier (LNA) in

- Satellite communication systems: Navigation systems (GPS, Glonass), satellite radio (SDARs, DAB)
- Multimedia applications such as mobile/portable TV, CATV, FM Radio
- ISM applications like RKE, AMR and Zigbee, as well as for emerging wireless applications

As discrete active mixer in RF Frontends

As active device in discrete oscillators

Attention: ESD (Electrostatic discharge) sensitive device, observe handling precautions

Product Name	Package	Pin Configuration				Marking
BFP420F	TSFP-4-1	1 = B	2 = E	3 = C	4 = E	AMs

3 Maximum Ratings

Table 3-1 Maximum Ratings at T_A = 25 °C (unless otherwise specified)

Parameter	Symbol	Values		Unit	Note / Test Condition
		Min.	Max.		
Collector emitter voltage	V_{CEO}	 – –	 4.5 4.1	V	Open base T_A = 25 °C T_A = -55 °C
Collector base voltage	V_{CBO}	–	15	V	Open emitter
Collector emitter voltage	V_{CES}	–	15	V	E-B short circuited
Emitter base voltage	V_{EBO}	–	1.5	V	Open collector
Base current	I_B	–	9	mA	–
Collector current	I_C	–	60	mA	–
Total power dissipation[1)]	P_{tot}	–	210	mW	$T_S \leq$ 100 °C
Junction temperature	T_J	–	150	°C	–
Storage temperature	T_{Stg}	-55	150	°C	–

1) T_S is the soldering point temperature. T_S is measured on the emitter lead at the soldering point of the pcb.

Attention: ***Stresses above the max. values listed here may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. Maximum ratings are absolute ratings; exceeding only one of these values may cause irreversible damage to the integrated circuit.***

4 Thermal Characteristics

Table 4-1 Thermal Resistance

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Junction - soldering point[1)]	R_{thJS}	–	240	–	K/W	–

1)For the definition of R_{thJS} please refer to Application Note AN077 (Thermal Resistance Calculation)

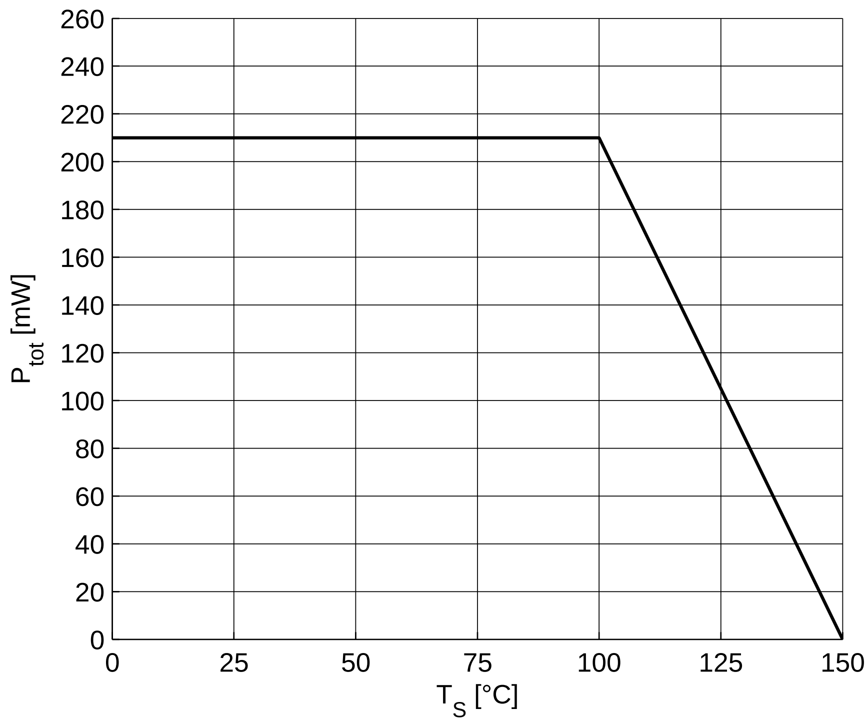


Figure 4-1 Total Power Dissipation $P_{tot} = f(T_s)$

5 Electrical Characteristics

5.1 DC Characteristics

Table 5-1 DC Characteristics at T_A = 25 °C

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Collector emitter breakdown voltage	$V_{(BR)CEO}$	4.5	5.5	–	V	I_C = 1 mA, I_B = 0 Open base
Collector emitter leakage current	I_{CES}	– –	– 1	10 30	µA nA	V_{CE} = 15 V, V_{BE} = 0 V_{CE} = 3 V, V_{BE} = 0 E-B short circuited
Collector base leakage current	I_{CBO}	–	1	30	nA	V_{CB} = 3 V, I_E = 0 Open emitter
Emitter base leakage current	I_{EBO}	–	10	100	nA	V_{EB} = 0.5 V, I_C = 0 Open collector
DC current gain	h_{FE}	60	95	130		V_{CE} = 4 V, I_C = 5 mA Pulse measured

5.2 General AC Characteristics

Table 5-2 General AC Characteristics at T_A = 25 °C

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Transition frequency	f_T	18	25	–	GHz	V_{CE} = 3 V, I_C = 30 mA f = 2 GHz
Collector base capacitance	C_{CB}	–	0.15	0.3	pF	V_{CB} = 2 V, V_{BE} = 0 f = 1 MHz Emitter grounded
Collector emitter capacitance	C_{CE}	–	0.46	–	pF	V_{CE} = 2 V, V_{BE} = 0 f = 1 MHz Base grounded
Emitter base capacitance	C_{EB}	–	0.55	–	pF	V_{EB} = 0.5 V, V_{CB} = 0 f = 1 MHz Collector grounded

5.3 Frequency Dependent AC Characteristics

Measurement setup is a test fixture with Bias T's in a 50 Ω system, T_A = 25 °C

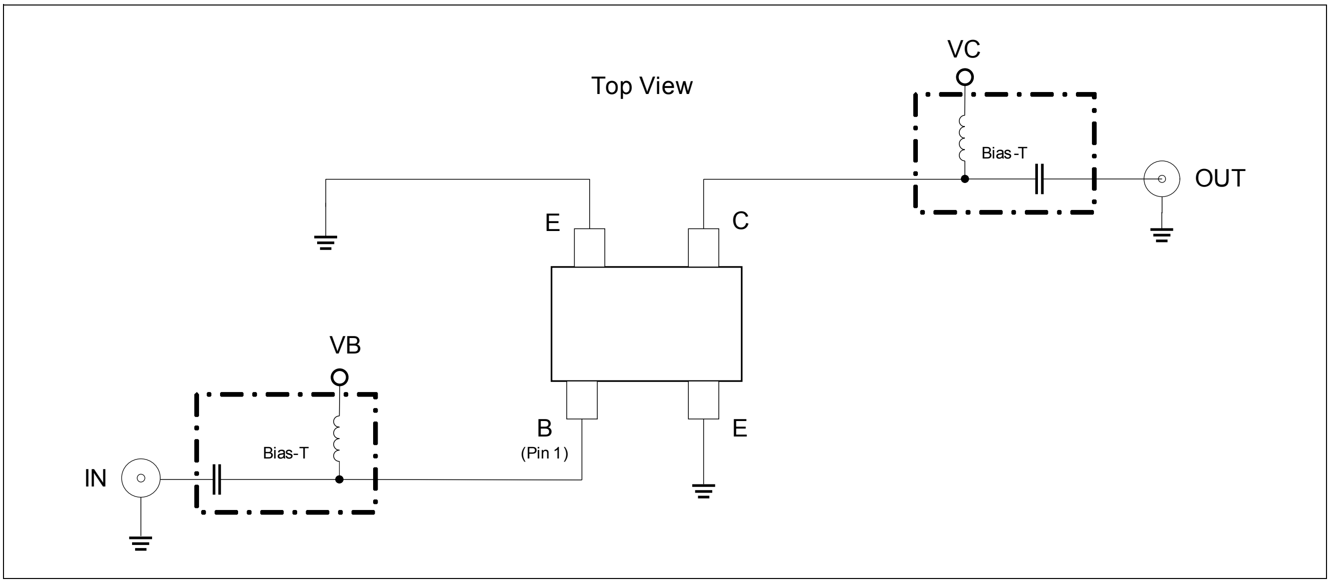


Figure 5-1 BFP420F Testing Circuit

Table 5-3 AC Characteristics, *f* = 150 MHz

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Maximum Power Gain					dB	$Z_S = Z_{SoptG}$, $Z_L = Z_{LoptG}$
@ low noise operating point	G_{ms}	–	30	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	G_{ms}	–	34.5	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	G_{ms}	–	37	–		V_{CE} = 4 V, I_C = 40 mA
Transducer Gain					dB	$Z_S = Z_L$ = 50 Ω
@ low noise operating point	S_{21}	–	22	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	S_{21}	–	30	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	S_{21}	–	33	–		V_{CE} = 4 V, I_C = 40 mA
Noise Figure					dB	$Z_S = Z_{SoptN}$
@ low noise operating point						V_{CE} = 3 V, I_C = 4 mA
Minimum noise figure	NF_{min}	–	0.9	–		
Associated gain	G_{ass}	–	24	–		
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
Minimum noise figure	NF_{min}	–	1.4	–		
Associated gain	G_{ass}	–	29	–		
Linearity					dB	$Z_S = Z_L$ = 50 Ω
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
3rd order intercept point at output	OIP_3	–	21	–		
1 dB gain compression point at output	OP_{1dB}	–	7	–		
@ max. linearity operating point						V_{CE} = 4 V, I_C = 40 mA
3rd order intercept point at output	OIP_3	–	25	–		
1 dB gain compression point at output	OP_{1dB}	–	15.5	–		

Table 5-4 AC Characteristics, f = 450 MHz

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Maximum Power Gain					dB	$Z_S = Z_{SoptG}$, $Z_L = Z_{LoptG}$
@ low noise operating point	G_{ms}	–	25	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	G_{ms}	–	29	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	G_{ms}	–	31	–		V_{CE} = 4 V, I_C = 40 mA
Transducer Gain					dB	$Z_S = Z_L$ = 50 Ω
@ low noise operating point	S_{21}	–	21	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	S_{21}	–	27	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	S_{21}	–	28.5	–		V_{CE} = 4 V, I_C = 40 mA
Noise Figure					dB	$Z_S = Z_{SoptN}$
@ low noise operating point						V_{CE} = 3 V, I_C = 4 mA
Minimum noise figure	NF_{min}	–	0.9	–		
Associated gain	G_{ass}	–	22.5	–		
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
Minimum noise figure	NF_{min}	–	1.4	–		
Associated gain	G_{ass}	–	27	–		
Linearity					dB	$Z_S = Z_L$ = 50 Ω
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
3rd order intercept point at output	OIP_3	–	21.5	–		
1 dB gain compression point at output	OP_{1dB}	–	8	–		
@ max. linearity operating point						V_{CE} = 4 V, I_C = 40 mA
3rd order intercept point at output	OIP_3	–	26.5	–		
1 dB gain compression point at output	OP_{1dB}		16.5	–		

Table 5-5 AC Characteristics, f = 900 MHz

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Maximum Power Gain					dB	$Z_S = Z_{SoptG}$, $Z_L = Z_{LoptG}$
@ low noise operating point	G_{ms}	–	22	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	G_{ms}	–	25	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	G_{ms}	–	26.5	–		V_{CE} = 4 V, I_C = 40 mA
Transducer Gain					dB	$Z_S = Z_L$ = 50 Ω
@ low noise operating point	S_{21}	–	19	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	S_{21}	–	23	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	S_{21}	–	24	–		V_{CE} = 4 V, I_C = 40 mA

Table 5-5 AC Characteristics, f = 900 MHz (cont'd)

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Noise Figure					dB	$Z_S = Z_{SoptN}$
@ low noise operating point						V_{CE} = 3 V, I_C = 4 mA
Minimum noise figure	NF_{min}	–	0.95	–		
Associated gain	G_{ass}	–	20	–		
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
Minimum noise figure	NF_{min}	–	1.4	–		
Associated gain	G_{ass}	–	23	–		
Linearity					dB	$Z_S = Z_L$ = 50 Ω
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
3rd order intercept point at output	OIP_3	–	23.5	–		
1 dB gain compression point at output	OP_{1dB}	–	8	–		
@ max. linearity operating point						V_{CE} = 4 V, I_C = 40 mA
3rd order intercept point at output	OIP_3	–	27.5	–		
1 dB gain compression point at output	OP_{1dB}	–	17	–		

Table 5-6 AC Characteristics, f = 1500 MHz

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Maximum Power Gain					dB	$Z_S = Z_{SoptG}$, $Z_L = Z_{LoptG}$
@ low noise operating point	G_{ms}	–	19	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	G_{ms}	–	22	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	G_{ma}	–	22	–		V_{CE} = 4 V, I_C = 40 mA
Transducer Gain					dB	$Z_S = Z_L$ = 50 Ω
@ low noise operating point	S_{21}	–	16	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	S_{21}	–	19	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	S_{21}	–	19,5	–		V_{CE} = 4 V, I_C = 40 mA
Noise Figure					dB	$Z_S = Z_{SoptN}$
@ low noise operating point						V_{CE} = 3 V, I_C = 4 mA
Minimum noise figure	NF_{min}	–	1	–		
Associated gain	G_{ass}	–	16.5	–		
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
Minimum noise figure	NF_{min}	–	1.5	–		
Associated gain	G_{ass}	–	19	–		
Linearity					dB	$Z_S = Z_L$ = 50 Ω
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
3rd order intercept point at output	OIP_3	–	22.5	–		
1 dB gain compression point at output	OP_{1dB}	–	7	–		
@ max. linearity operating point						V_{CE} = 4 V, I_C = 40 mA
3rd order intercept point at output	OIP_3	–	27.5	–		
1 dB gain compression point at output	OP_{1dB}	–	16	–		

Table 5-7 AC Characteristics, f = 1900 MHz

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Maximum Power Gain					dB	$Z_S = Z_{SoptG}$, $Z_L = Z_{LoptG}$
@ low noise operating point	G_{ms}	–	18	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	G_{ma}	–	19.5	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	G_{ma}	–	19	–		V_{CE} = 4 V, I_C = 40 mA
Transducer Gain					dB	$Z_S = Z_L = 50\ \Omega$
@ low noise operating point	S_{21}	–	14	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	S_{21}	–	16.5	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	S_{21}	–	17	–		V_{CE} = 4 V, I_C = 40 mA
Noise Figure					dB	$Z_S = Z_{SoptN}$
@ low noise operating point						V_{CE} = 3 V, I_C = 4 mA
Minimum noise figure	NF_{min}	–	1.1	–		
Associated gain	G_{ass}	–	15	–		
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
Minimum noise figure	NF_{min}	–	1.5	–		
Associated gain	G_{ass}	–	17	–		
Linearity					dB	$Z_S = Z_L = 50\ \Omega$
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
3rd order intercept point at output	OIP_3	–	24	–		
1 dB gain compression point at output	OP_{1dB}	–	9	–		
@ max. linearity operating point						V_{CE} = 4 V, I_C = 40 mA
3rd order intercept point at output	OIP_3	–	28	–		
1 dB gain compression point at output	OP_{1dB}	–	17	–		

Table 5-8 AC Characteristics, f = 2400 MHz

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Maximum Power Gain					dB	$Z_S = Z_{SoptG}$, $Z_L = Z_{LoptG}$
@ low noise operating point	G_{ms}	–	16.5	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	G_{ma}	–	16.5	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	G_{ma}	–	16.5	–		V_{CE} = 4 V, I_C = 40 mA
Transducer Gain					dB	$Z_S = Z_L = 50\ \Omega$
@ low noise operating point	S_{21}	–	12	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	S_{21}	–	14.5	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	S_{21}	–	15	–		V_{CE} = 4 V, I_C = 40 mA

Table 5-8 AC Characteristics, f = 2400 MHz (cont'd)

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Noise Figure					dB	$Z_S = Z_{SoptN}$
@ low noise operating point						V_{CE} = 3 V, I_C = 4 mA
Minimum noise figure	NF_{min}	–	1.2	–		
Associated gain	G_{ass}	–	12.5	–		
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
Minimum noise figure	NF_{min}	–	1.6	–		
Associated gain	G_{ass}	–	15	–		
Linearity					dB	$Z_S = Z_L$ = 50 Ω
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
3rd order intercept point at output	OIP_3	–	24.5	–		
1 dB gain compression point at output	OP_{1dB}	–	8.5	–		
@ max. linearity operating point						V_{CE} = 4 V, I_C = 40 mA
3rd order intercept point at output	OIP_3	–	28	–		
1 dB gain compression point at output	OP_{1dB}		16.5	–		

Table 5-9 AC Characteristics, f = 3500 MHz

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Maximum Power Gain					dB	$Z_S = Z_{SoptG}$, $Z_L = Z_{LoptG}$
@ low noise operating point	G_{ma}	–	11.5	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	G_{ma}	–	12.5	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	G_{ma}	–	13	–		V_{CE} = 4 V, I_C = 40 mA
Transducer Gain					dB	$Z_S = Z_L$ = 50 Ω
@ low noise operating point	S_{21}	–	9	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	S_{21}	–	11	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	S_{21}	–	11.5	–		V_{CE} = 4 V, I_C = 40 mA
Noise Figure					dB	$Z_S = Z_{SoptN}$
@ low noise operating point						V_{CE} = 3 V, I_C = 4 mA
Minimum noise figure	NF_{min}	–	1.6	–		
Associated gain	G_{ass}	–	10	–		
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
Minimum noise figure	NF_{min}	–	1.8	–		
Associated gain	G_{ass}	–	11.5	–		
Linearity					dB	$Z_S = Z_L$ = 50 Ω
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
3rd order intercept point at output	OIP_3	–	22	–		
1 dB gain compression point at output	OP_{1dB}	–	8	–		
@ max. linearity operating point						V_{CE} = 4 V, I_C = 40 mA
3rd order intercept point at output	OIP_3	–	26	–		
1 dB gain compression point at output	OP_{1dB}		17	–		

Table 5-10 AC Characteristics, f = 5500 MHz

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Maximum Power Gain					dB	$Z_S = Z_{SoptG}$, $Z_L = Z_{LoptG}$
@ low noise operating point	G_{ma}	–	7.5	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	G_{ma}	–	8.5	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	G_{ma}	–	9	–		V_{CE} = 4 V, I_C = 40 mA
Transducer Gain					dB	$Z_S = Z_L$ = 50 Ω
@ low noise operating point	S_{21}	–	5.5	–		V_{CE} = 3 V, I_C = 4 mA
@ recommended trade off oper. point	S_{21}	–	7	–		V_{CE} = 3 V, I_C = 15 mA
@ max. linearity operating point	S_{21}	–	8	–		V_{CE} = 4 V, I_C = 40 mA
Noise Figure					dB	$Z_S = Z_{SoptN}$
@ low noise operating point						V_{CE} = 3 V, I_C = 4 mA
Minimum noise figure	NF_{min}	–	2.2	–		
Associated gain	G_{ass}	–	5	–		
@ recommended trade off oper. point						V_{CE} = 3 V, I_C = 15 mA
Minimum noise figure	NF_{min}	–	2.3	–		
Associated gain	G_{ass}	–	8	–		
Linearity					dB	$Z_S = Z_L$ = 50 Ω
@ recommended trade off oper. point		–				V_{CE} = 3 V, I_C = 15 mA
3rd order intercept point at output	OIP_3	–	22	–		
1 dB gain compression point at output	OP_{1dB}		8.5	–		
@ max. linearity operating point		–				V_{CE} = 4 V, I_C = 40 mA
3rd order intercept point at output	OIP_3		26	–		
1 dB gain compression point at output	OP_{1dB}		17	–		

Notes

1. *$G_{ms} = |S_{21} / S_{12}|$ for k < 1; $G_{ma} = |S_{21} / S_{12}|(k-(k^2-1)^{1/2})$ for k > 1*
2. *In order to get the NF_{min} values stated in this chapter the test fixture losses have been subtracted from all measured results.*
3. *OIP_3 value depends on termination of all intermodulation frequency components. Termination used for this measurement is 50 Ω from 0.2 MHz to 12 GHz.*

5.4 Characteristic DC Diagrams

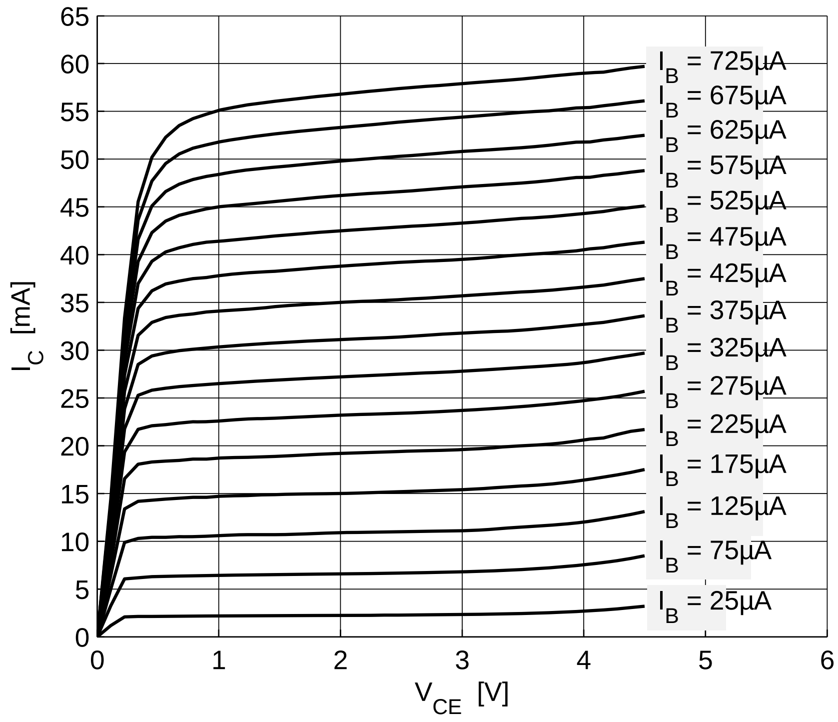


Figure 5-2 Collector Current vs. Collector Emitter Voltage $IC = f(V_{CE})$, I_B = Parameter in µA

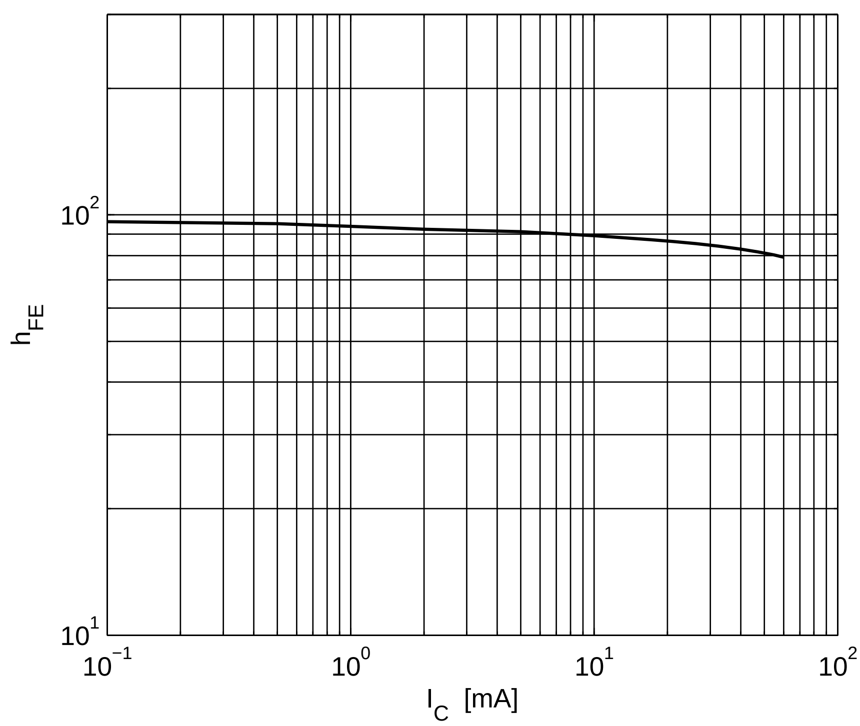


Figure 5-3 DC Current Gain $h_{FE} = f(I_C)$, V_{CE} = 3 V

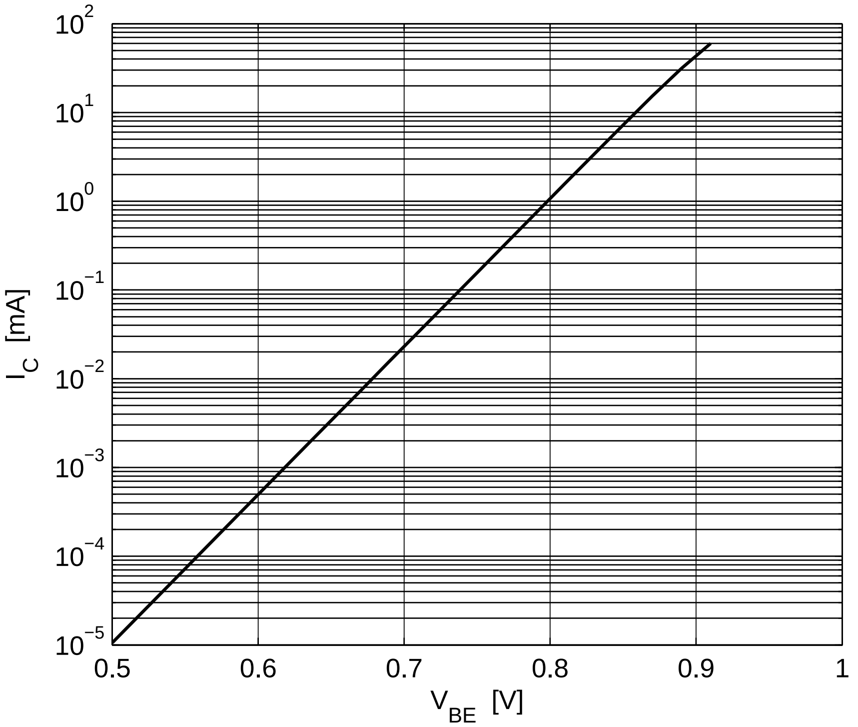


Figure 5-4 Collector Current vs. Base Emitter Voltage $I_C = f(V_{BE})$, V_{CE} = 3 V

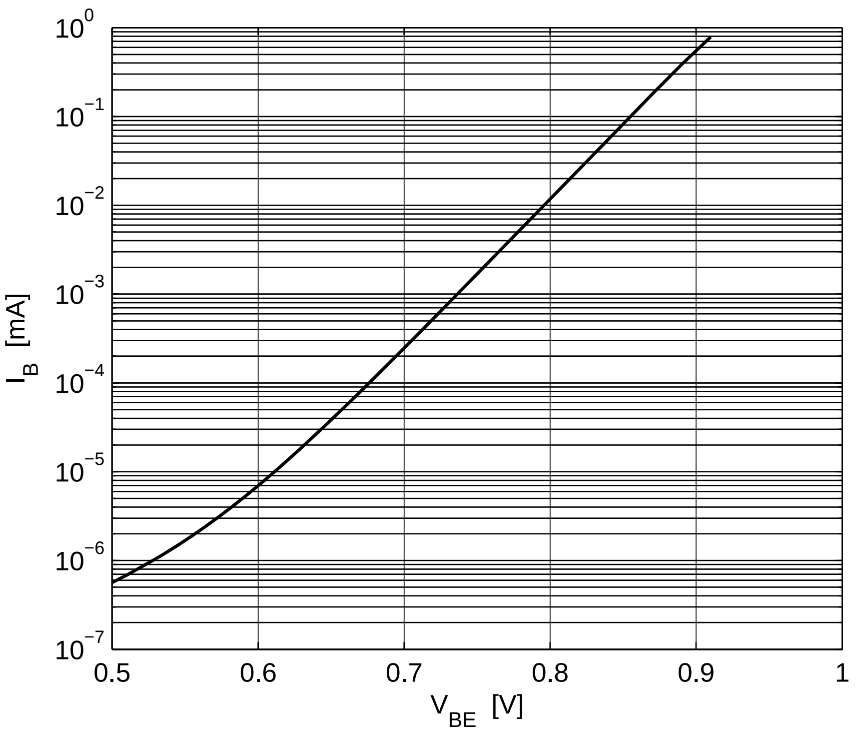


Figure 5-5 Base Current vs. Base Emitter Forward Voltage $I_B = f(V_{BE})$, V_{CE} = 3 V

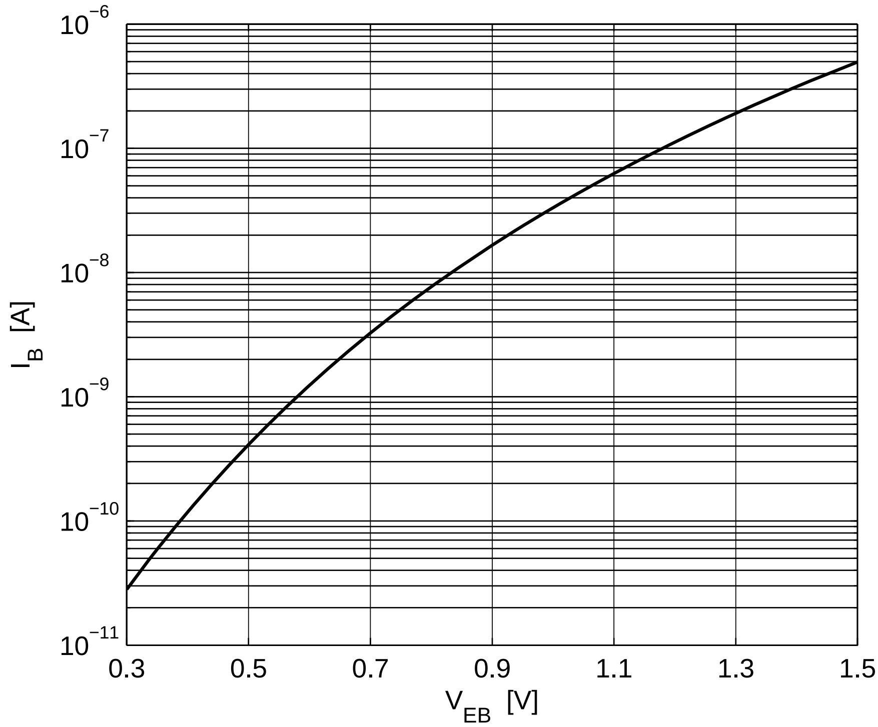


Figure 5-6 Base Current vs. Base Emitter Reverse Voltage $I_B = f(V_{EB})$, V_{CE} = 3 V

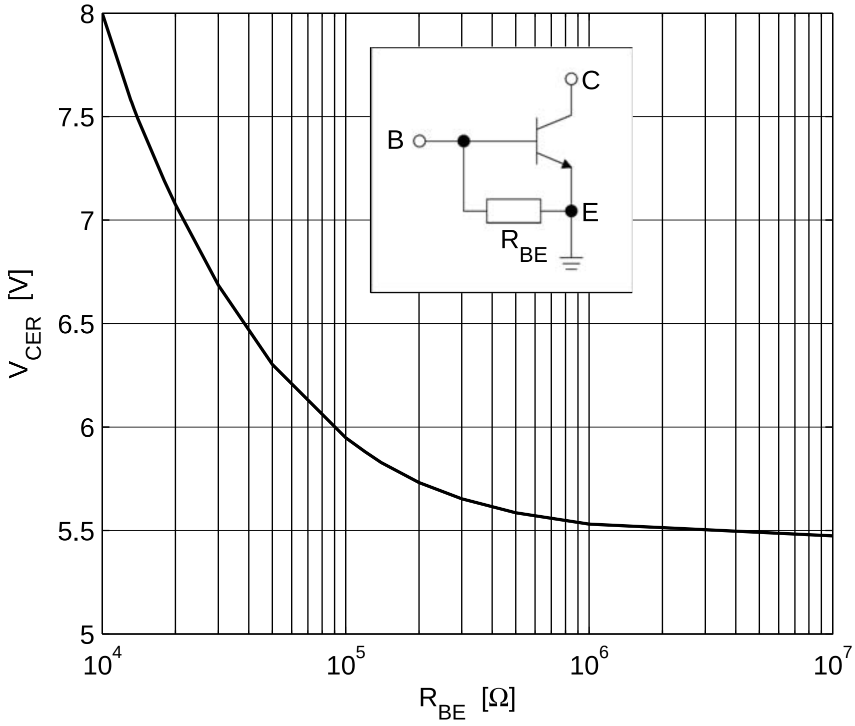


Figure 5-7 Collector Emitter Breakdown Voltage $V_{CER} = f(R_{BE})$, I_C = 1 mA

5.5 Characteristic AC Diagrams

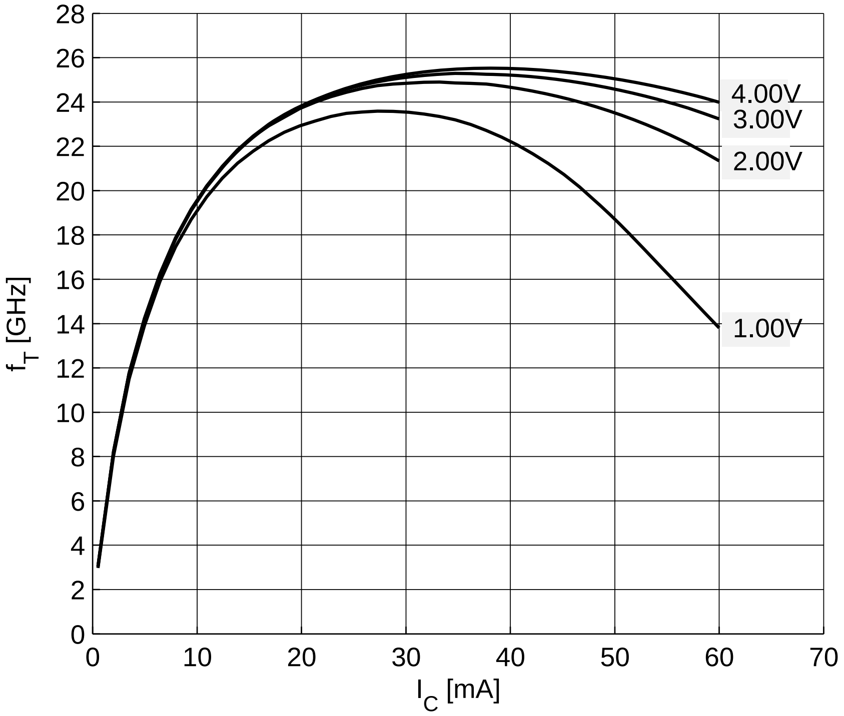


Figure 5-8 Transition Frequency $f_T = f(I_C)$, f = 2 GHz, V_{CE} = Parameter in V

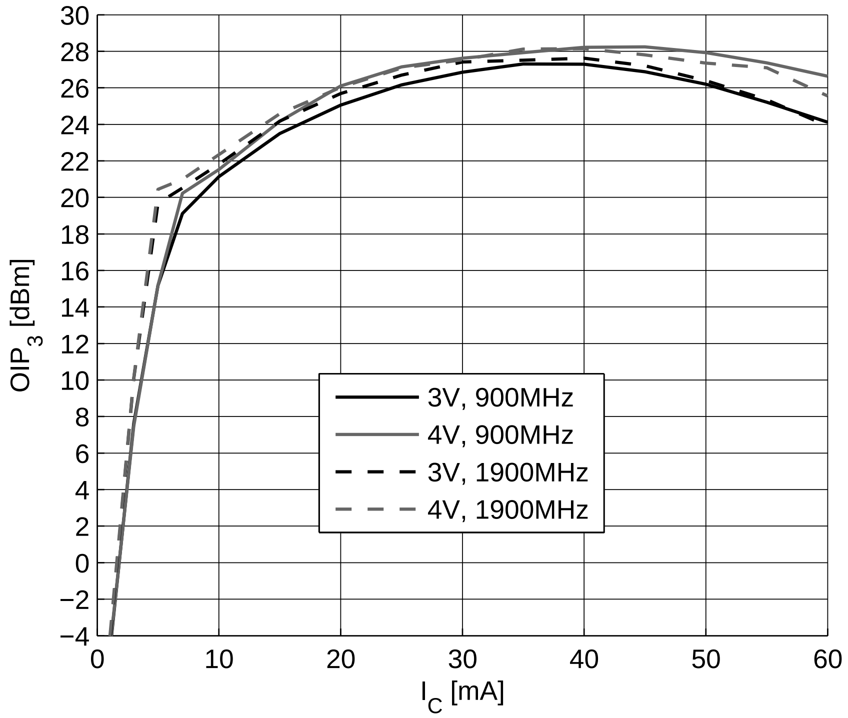


Figure 5-9 3rd Order Intercept Point $OIP_3 = f(I_C)$, $Z_S = Z_L$ = 50 Ω, V_{CE}, f = Parameters

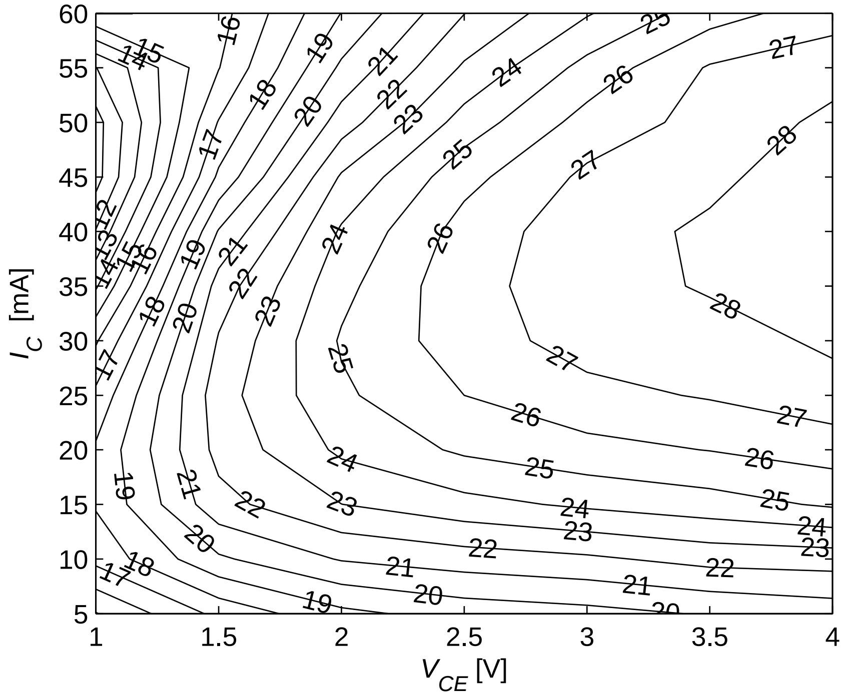


Figure 5-10 3rd Order Intercept Point at output OIP_3 [dBm]= f (I_C, V_{CE}), Z_S = Z_L= 50 Ω, f = 1900 MHz

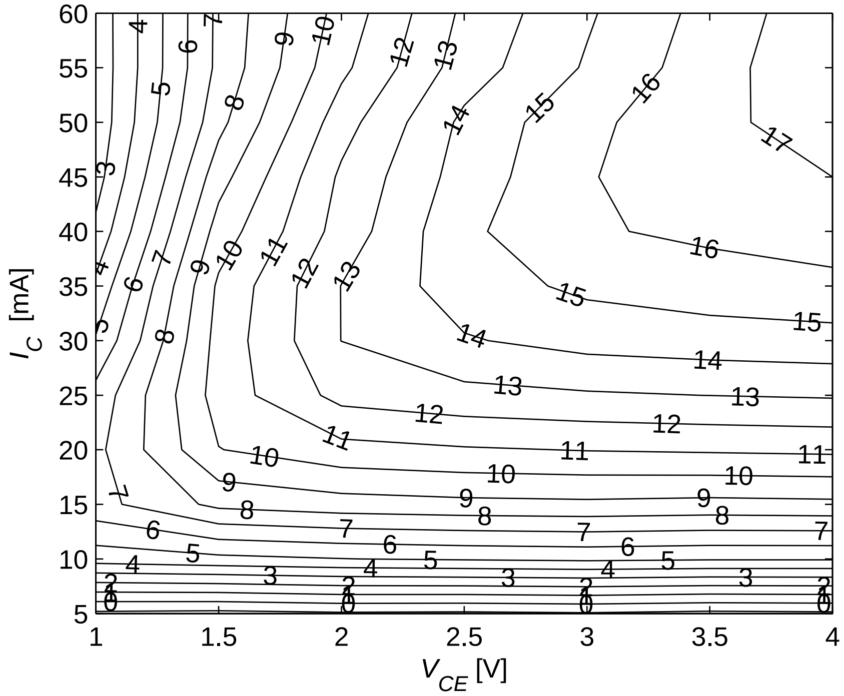


Figure 5-11 Compression Point at output OP_{1dB} [dBm]= f (I_C, V_{CE}), Z_S = Z_L= 50 Ω, f = 1900 MHz

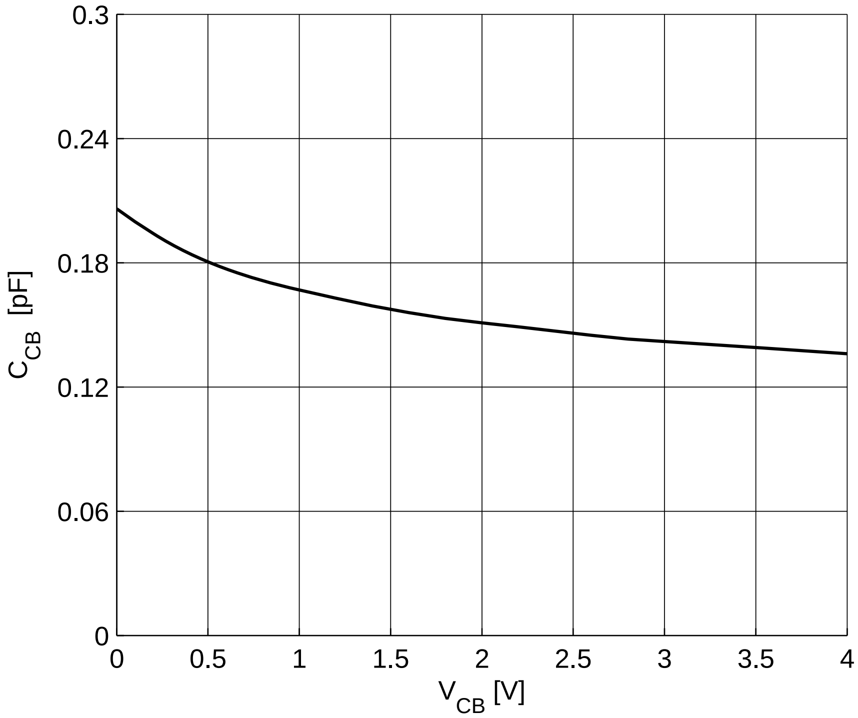


Figure 5-12 Collector Base Capacitance $C_{CB} = f(V_{CB})$, f = 1 MHz

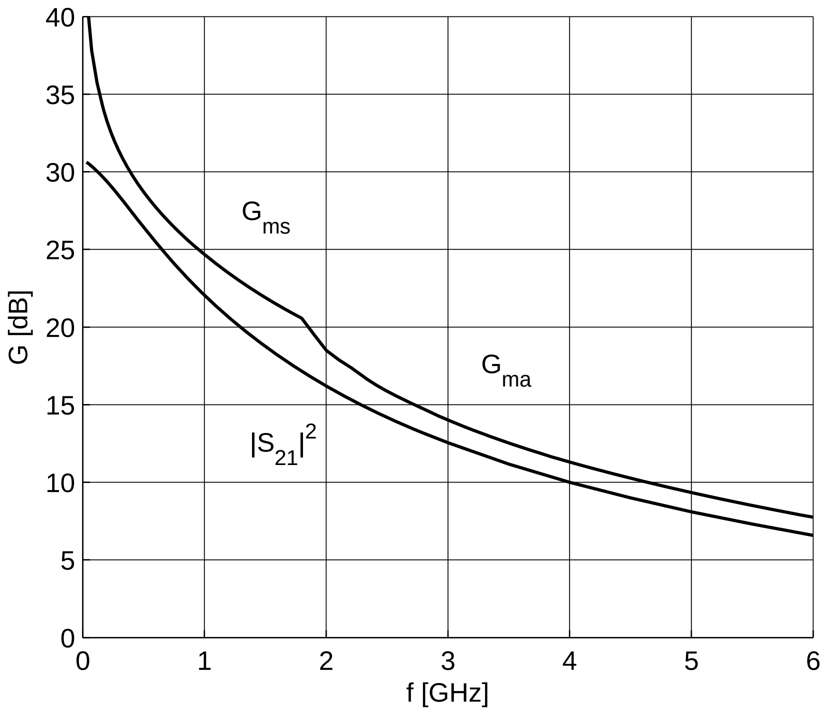


Figure 5-13 Gain G_{ma}, G_{ms}, $|S_{21}|^2 = f(f)$, V_{CE} = 3 V, I_C = 15 mA

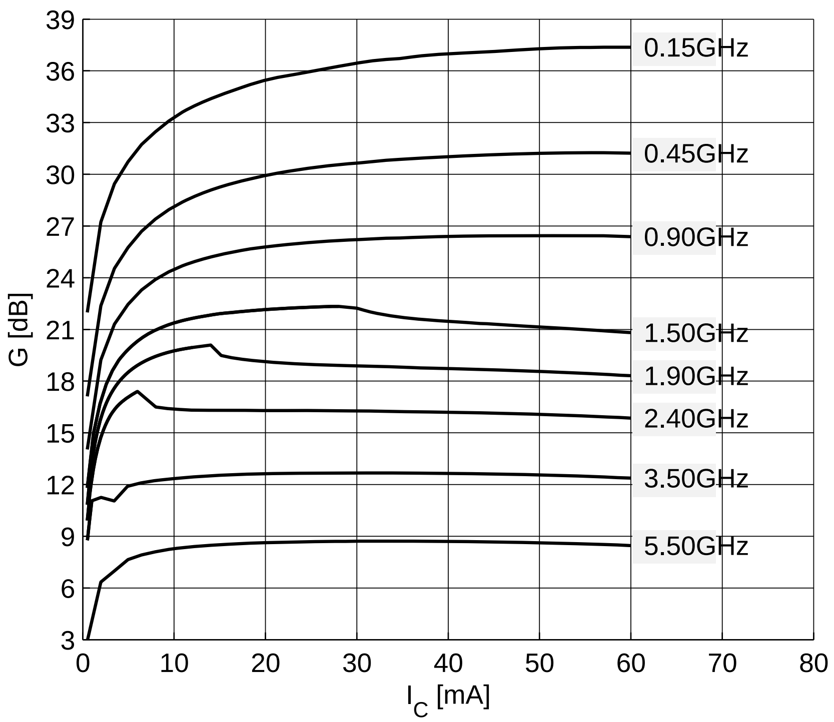


Figure 5-14 Maximum Power Gain $G_{max} = f\,(I_C)$, V_{CE} = 3 V, f = Parameter in GHz

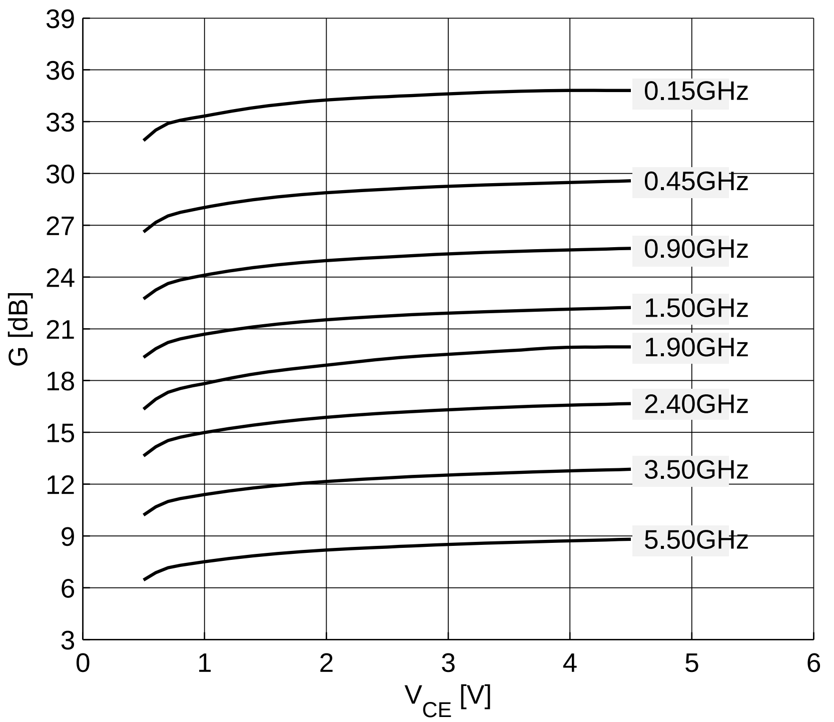


Figure 5-15 Maximum Power Gain $G_{max} = f\,(V_{CE})$, I_C = 15 mA, f = Parameter in GHz

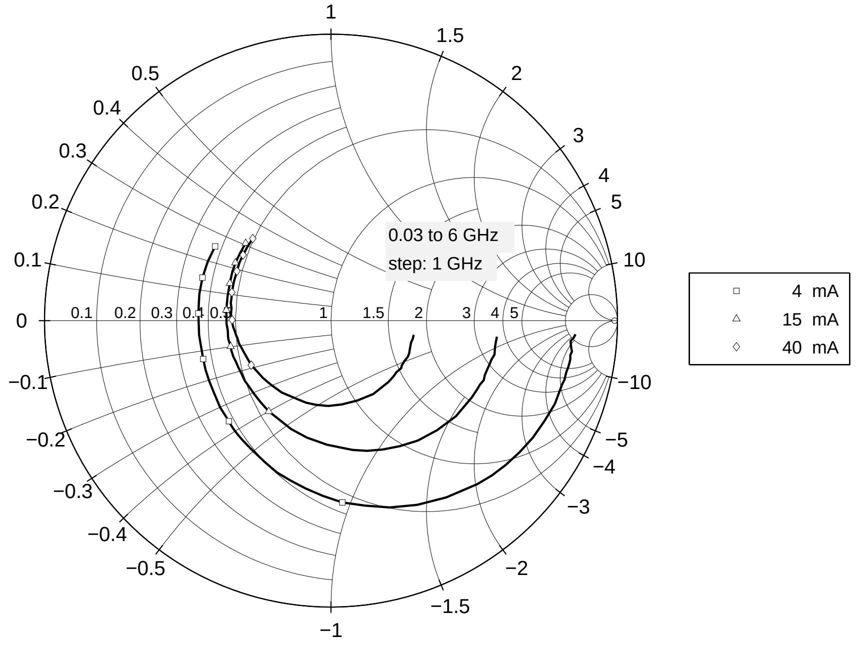


Figure 5-16 Input Matching $S_{11} = f(f)$, V_{CE} = 3 V, I_C = 4 / 15 / 40 mA

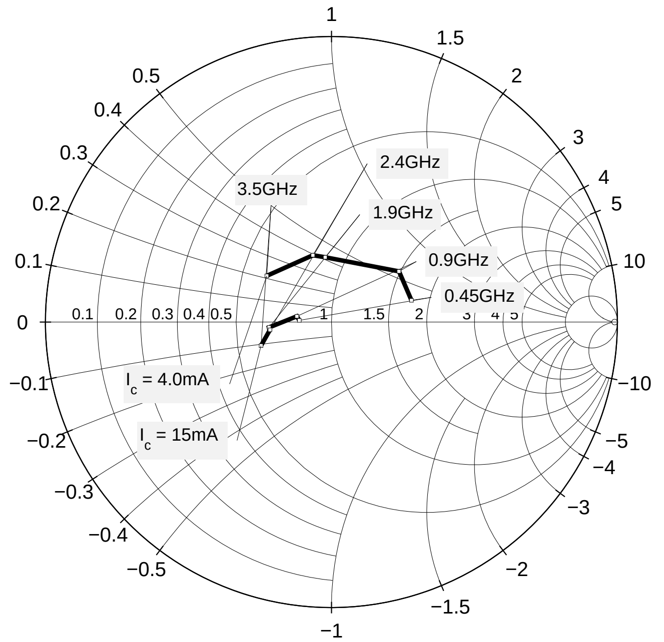


Figure 5-17 Source Impedance for Minimum Noise Figure $Z_{opt} = f(f)$, V_{CE} = 3 V, I_C = 4 / 15 mA

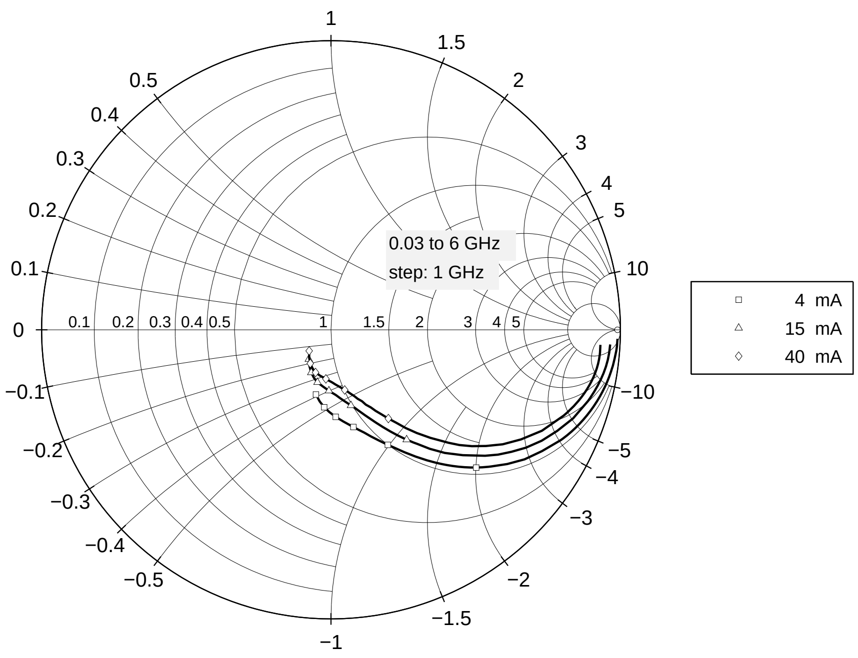


Figure 5-18 Output Matching $S_{22} = f(f)$, V_{CE} = 3 V, I_C = 4 / 15 / 40 mA

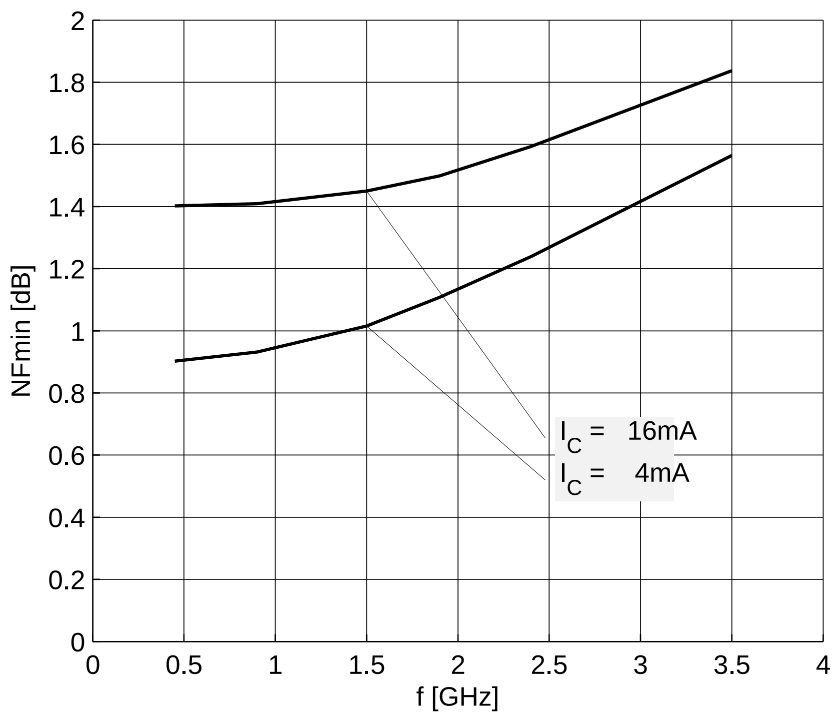


Figure 5-19 Noise Figure $NF_{min} = f(f)$, V_{CE} = 3 V, I_C = 4 / 16 mA, $Z_S = Z_{opt}$

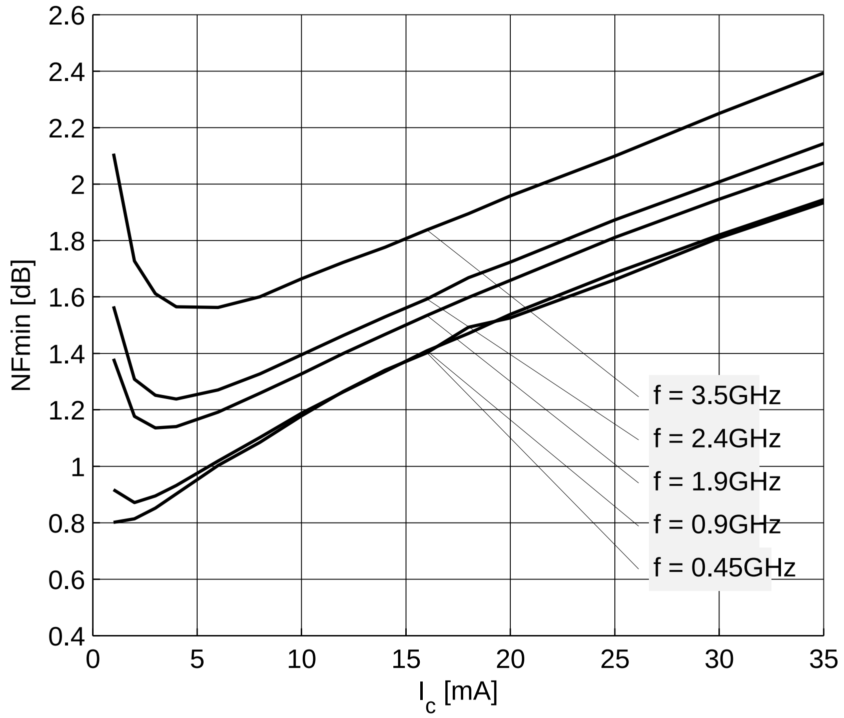


Figure 5-20 Noise Figure $NF_{min} = f(I_C)$, V_{CE} = 3 V, $Z_S = Z_{opt}$, f = Parameter in GHz

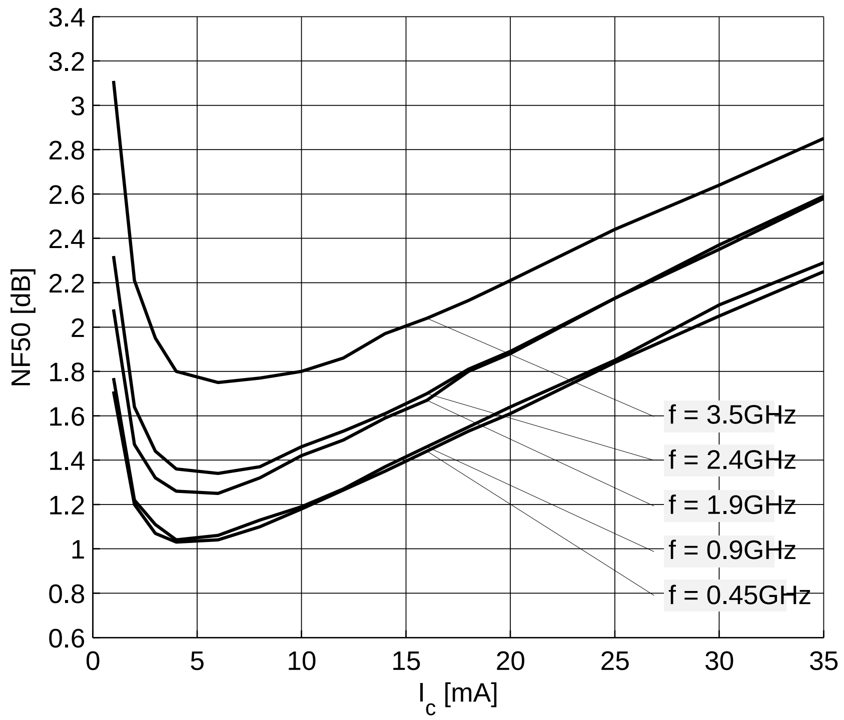


Figure 5-21 Noise Figure $NF_{50} = f(I_C)$, V_{CE} = 3 V, Z_S = 50 Ω, f = Parameter in GHz

Note: The curves shown in this chapter have been generated using typical devices but shall not be considered as a guarantee that all devices have identical characteristic curves. T_A = 25 °C.

6 Simulation Data

For the SPICE Gummel Poon (GP) model as well as for the S-parameters (including noise parameters) please consult our website and download the latest versions before actually starting your design.
You find the BFP420F SPICE GP model on the official homepage of Infineon RF transistors in MWO- and ADS-format, which you can import into these circuit simulation tools very quickly and conveniently. The model already contains the package parasitics and is ready to use for DC- and high frequency simulations. The terminals of the model circuit correspond to the pin configuration of the device.
The model parameters have been extracted and verified up to 10 GHz using typical devices. The BFP420F SPICE GP model reflects the typical DC- and RF-performance within the limitations which are given by the SPICE GP model itself. Besides the DC characteristics all S-parameters in magnitude and phase, as well as noise figure (including optimum source impedance, equivalent noise resistance and flicker noise) and intermodulation have been extracted.

7 Package Information TSFP-4-1

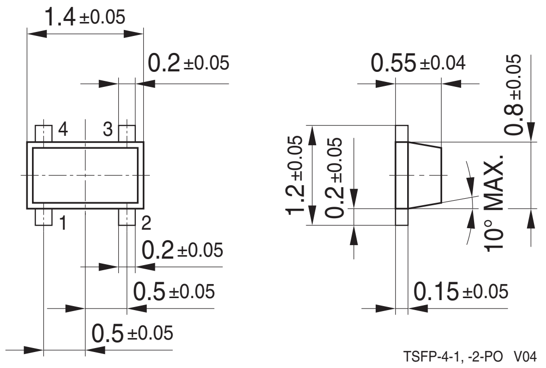


Figure 7-1 Package Outline

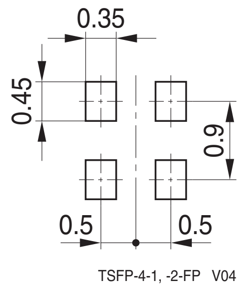


Figure 7-2 Package Footprint

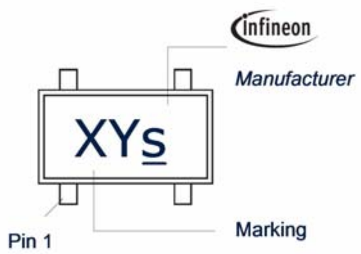


Figure 7-3 Marking Description (Marking BFP420F: AMs)

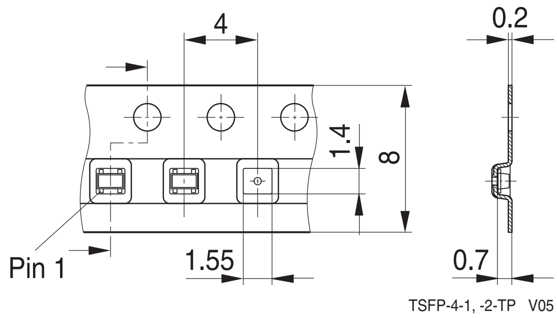


Figure 7-4 Tape Dimensions

w w w . i n f i n e o n . c o m

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