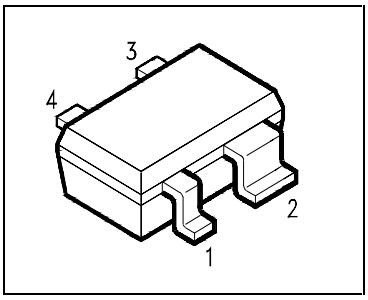
NPN Silicon-Germanium RF Transistor

Preliminary Data



- For high gain low noise amplifier
- Noise Figure F = 0.65 dB at 1.8 GHz
- G_{ms}=21dB at 1.8 GHz
- Gold metalization for high reliability
- 70GHz f_T - Line
- 10dBm Input IP_3 capability @ 1.95 GHz, V_{CE}=2V, I_{CE}=6mA

ESD: **E**lectro**s**tatic **d**ischarge sensitive device,
observe handling precautions!

Type	Marking	Ordering Code (8-mm taped)	Pin Configuration 1	2	3	4	Package
BFP620			B	E	C	E	SOT-343

Maximum Ratings

Parameter	Symbol		Unit
Collector-emitter voltage	V_{CEO}	2.5	V
Collector-base voltage	V_{CBO}	tbd	V
Emitter-base voltage	V_{EBO}	1.5	V
Collector current	I_C	80	mA
Base current	I_B	tbd	mA
Total power dissipation, Ts ≤ tbd. 1)2)	P_{tot}	tbd	mW
Junction temperature	T_j	tbd	°C
Ambient temperature range	T_A	-65...+150°C	°C
Storage temperature range	T_{stg}	-65...+150°C	°C

Thermal Resistance

Junction-soldering point 1)	$R_{th\ JS}$	tbd	K/W

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

2) P_{tot} due to Maximum Ratings.

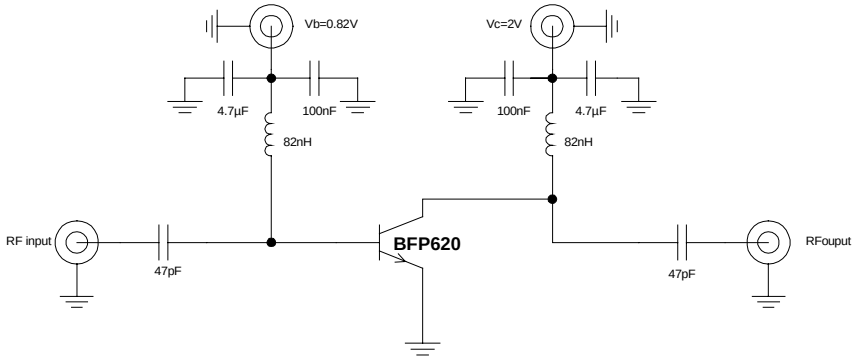
Electrical Characteristics

at T_A = 25 °C, unless otherwise specified.

Parameter	Symbol	Value			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage I_C = 1 mA	$V_{(BR)CEO}$	2.5	2.8		V
Collector-cutoff current V_{CB} = 5 V, I_E = 0 mA	I_{CBO}	-	-	200	nA
Emitter base cutoff current V_{EB} = 1.5 V, I_C = 0 mA	I_{EBO}	-	-	10	µA
DC current gain I_C = 20 mA, V_{CE} = 1.5 V	h_{FE}	150	180	210	
AC Characteristics					
Collector-base capacitance V_{CB} = 2 V, V_{BE} = v_{be} = 0 V, f = 1 MHz	C_{cb}	-	0.11	0.2	pF
Collector-emitter capacitance V_{CE} = 2 V, V_{BE} = v_{be} = 0 V, f = 1 MHz	C_{ce}	-	0.18	-	pF
Emitter-base capacitance V_{EB} = 0.5 V, V_{CB} = v_{cb} = 0 V, f = 1 MHz	C_{eb}	-	0.45	-	pF
Noise figure I_C = 3 mA, V_{CE} = 1.5 V, f = 1.8 GHz, Z_S = Z_{Sopt}	F	-	0.65		dB
Power gain I_C = 20 mA, V_{CE} = 1.5 V, f = 1.8 GHz, Z_S =Z_{Sopt} , Z_L = Z_{Lopt}	G_{ms} 1)	-	21	-	dB
Insertion power gain I_C = 20 mA, V_{CE} = 2 V, f = 1.8 GHz, Z_S = Z_L = 50Ω	$\lvert S_{21}\rvert^2$		19	-	dB
Third order intercept point at output I_C = 20 mA, V_{CE} = 2 V, f = 1.8 GHz, Z_S = Z_{Sopt}, Z_L= Z_{Lopt},	OIP_3	-	22	-	dBm
1dB Compression point I_C = 20 mA, V_{CE} = 2 V, f = 1.8 GHz, Z_S = Z_{Sopt}, Z_L= Z_{Lopt}	P_{-1dB}	-	12	-	dBm

1) $G_{ms} = \left|\frac{S21}{S12}\right|$

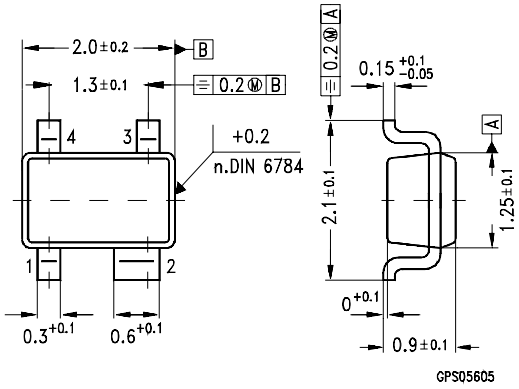
Test Circuit For High IIP_3



SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
$\|S21\|^2$	Insertion Power Gain	tbd	16.5	-	dB
NF	Noise figure (50Ω)	-	1.1	tbd	dB
IIP3	Input Third Order Intercept	tbd	10	-	dBm
RLout	Output Return Loss	-	10	-	dB
RLin	Input Return Loss	-	6	-	dB

Conditions: f=1950MHz, I_{CE}=6mA, $Z_L=Z_S$=50Ω

Package



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