BGA416

RF Cascode Amplifier

Small Signal Discretes

Never stop thinking

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BGA416, RF Cascode Amplifier

Revision History: 2008-04-21, Rev. 2.1

Previous Version: 2005-07-26

Page	Subjects (major changes since last revision)
All	Document layout change
4-5	Electrical Characteristics slightly changed
7-8	Figures updated

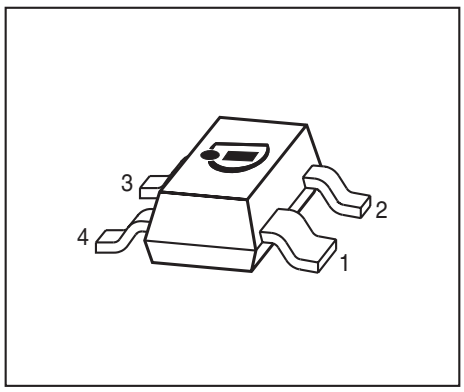
Trademarks

SIEGET® is a registered trademark of Infineon Technologies AG.

1 RF Cascode Amplifier

Feature

- G_{MA} = 23 dB at 900 MHz
- Ultra high reverse isolation, 60 dB at 900 MHz
- Low noise figure, $F_{50\Omega}$ = 1.2 dB at 900 MHz
- On chip bias circuitry, 5.5 mA bias current at V_{CC} = 3 V
- Typical supply voltage: 2.5 to 5.0 V
- SIEGET®-25 technology
- Pb-free (RoHS compliant) package



SOT143

Applications

- Buffer amplifier
- LNAs
- Oscillator active devices

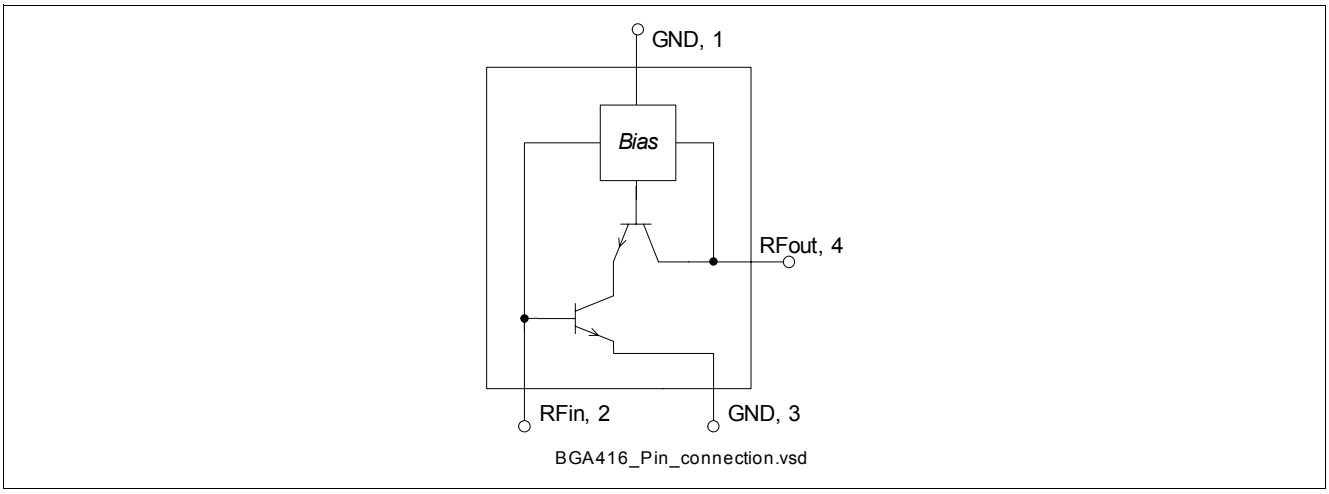


Figure 1 Pin connection

Description

BGA416 is a monolithic silicon cascode amplifier with high reverse isolation. A bias network is integrated for simplified biasing.

Type	Package	Marking
BGA416	SOT143	C1s

*Note: **ESD:** Electrostatic discharge sensitive device, observe handling precaution*

Maximum Ratings

Table 1 Maximum ratings

Parameter	Symbol	Limit Value	Unit
Voltage at pin RFout	V_{OUT}	6	V
Device current[1)]	I_D	20	mA
Current into pin RFin	I_{in}	0.5	mA
Input power	P_{in}	8	dBm
Total power dissipation, T_S < 123°C[2)]	P_{tot}	100	mW
Junction temperature	T_J	150	°C
Ambient temperature range	T_A	-65... 150	°C
Storage temperature range	T_{STG}	-65... 150	°C

1) Device current is equal to current into pin RFout

2) T_S is measured on the ground lead at the soldering point

Note: All Voltages refer to GND-Node

Thermal resistance

Table 2 Thermal resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[1)]	R_{thJS}	270	K/W

1) For calculation of R_{thJA} please refer to Application Note Thermal Resistance

2 Electrical Characteristics

Electrical characteristics at T_A = 25 °C (measured in test circuit specified in **Figure 2**)

V_{CC} = 3 V, unless otherwise specified

Table 3 Electrical Characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Maximum available power gain	G_{MA}		23		dB	f = 0.9 GHz
			14		dB	f = 1.8 GHz
Insertion power gain	$\|S_{21}\|^2$		17		dB	f = 0.9 GHz
			11		dB	f = 1.8 GHz
Reverse isolation	$\|S_{12}\|$		60		dB	f = 0.9 GHz
			40		dB	f = 1.8 GHz
Noise figure (Z_S = 50 Ω)	$F_{50\Omega}$		1.2		dB	f = 0.9 GHz
			1.6		dB	f = 1.8 GHz
Output power at 1 dB gain compression (Z_S = Z_L = 50 Ω)	P_{-1dB}		-3		dBm	f = 0.9 GHz
			-3		dBm	f = 1.8 GHz
Output third order intercept point (Z_S = Z_L = 50 Ω)	OIP_3		14		dBm	f = 0.9 GHz
			14		dBm	f = 1.8 GHz
Device current	I_D		5.5		mA	

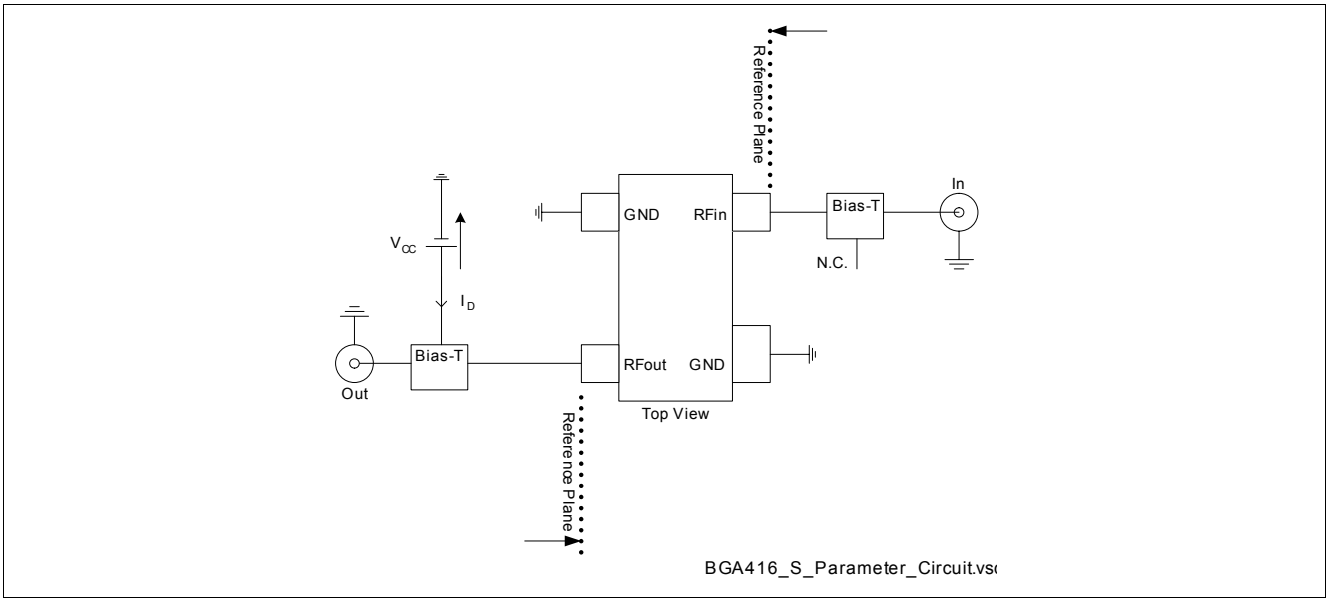
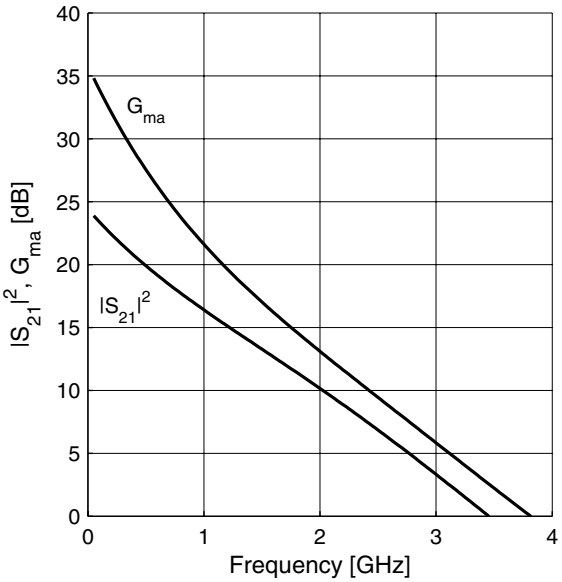


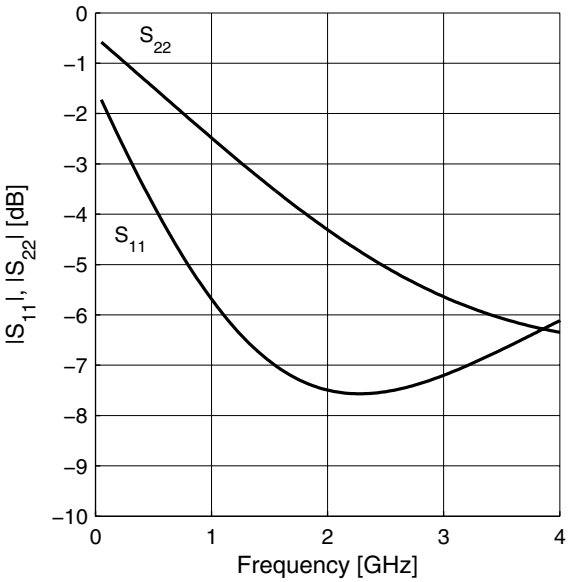
Figure 2 Test Circuit for Electrical Characteristics

3 Measured Parameters

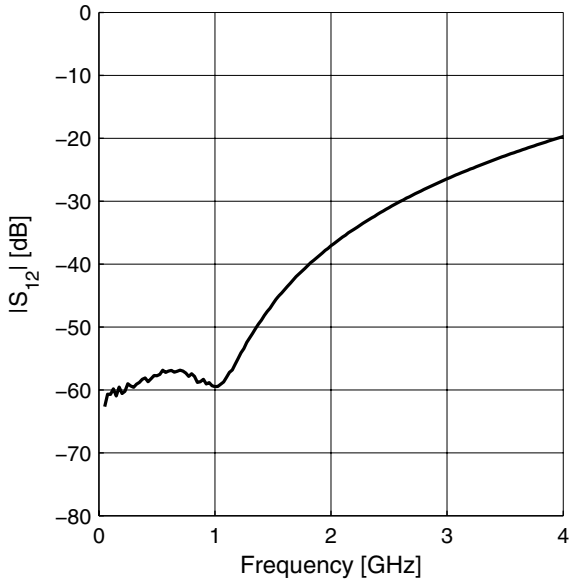
Power Gain $|S_{21}|^2$, G_{ma} = f(f)
V_{CC} = 3V, I_D = 5.5mA



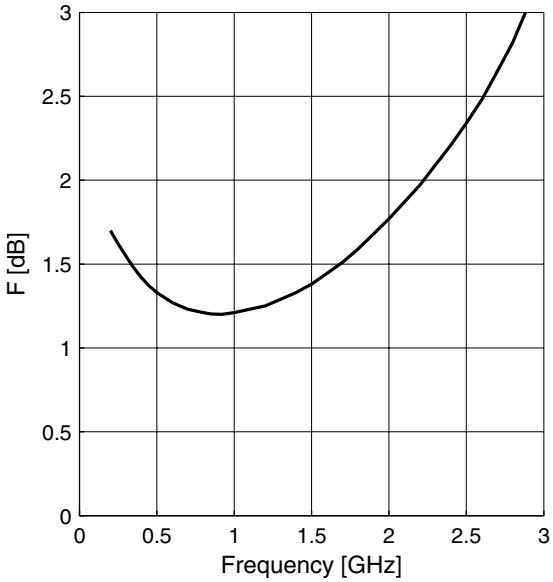
Matching $|S_{11}|$, $|S_{22}|$ = f(f)
V_{CC} = 3V, I_D = 5.5mA



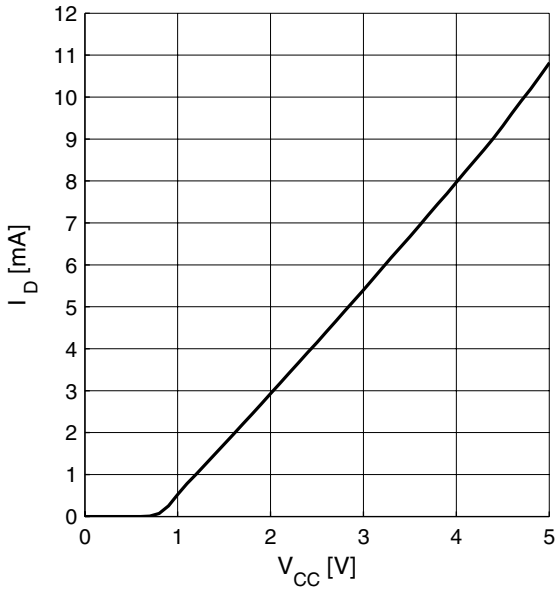
Reverse Isolation $|S_{12}|$ = f(f)
V_{CC} = 3V, I_D = 5.5mA



Noise figure F = f(f)
V_{CC} = 3V, I_D = 5.5mA



Device Current $I_D = f(V_{CC})$



4 Package Information

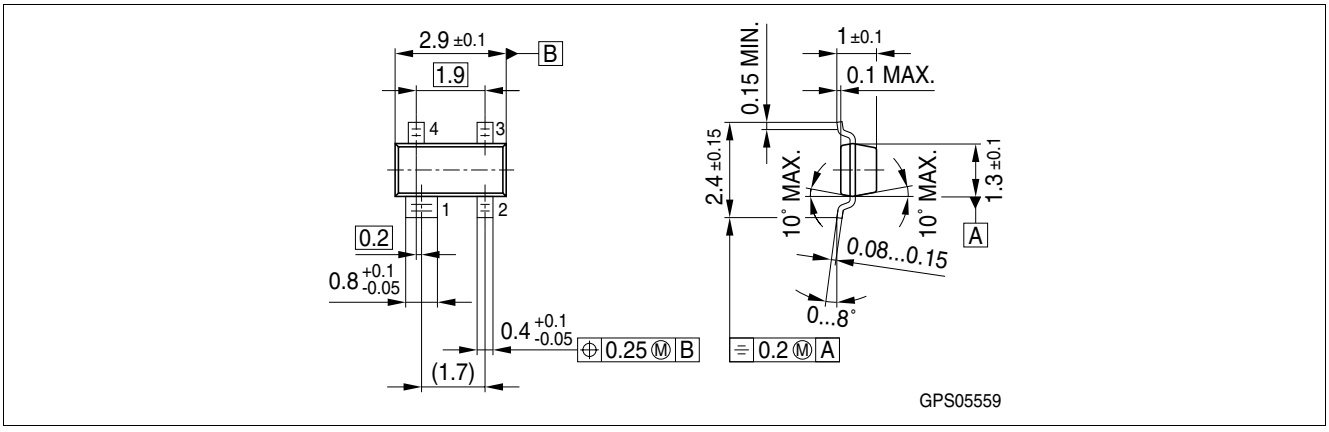


Figure 3 Package Outline SOT143

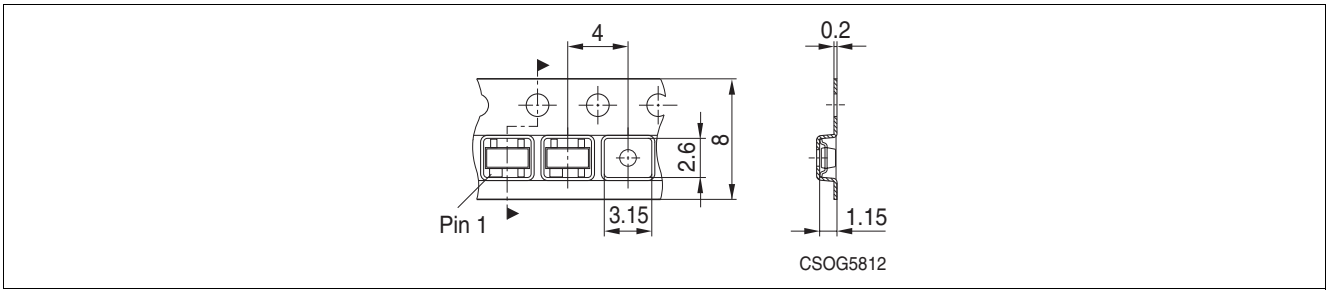


Figure 4 Tape for SOT143