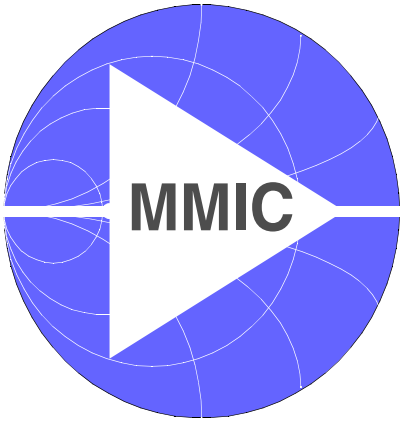
BGA428

BGA428 High Gain, Low Noise Amplifier



Wireless
Silicon Discretes

Infineon technologies

Never stop thinking.

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BGA428
Data sheet
Revision History: 2002-03-26

Previous Version: 2000-11-15

Page	Subjects (major changes since last revision)
4	dot size for pin 1 package marking increased

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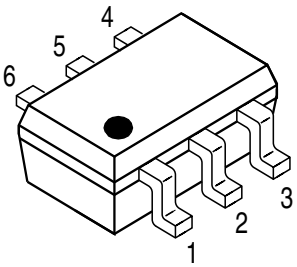
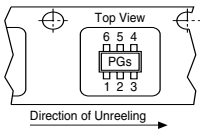
Features

- High gain, G_{MA}=20dB at 1.8GHz
- Low noise figure, NF=1.4dB at 1.8GHz
- Prematched
- Ideal for GSM, DCS1800, PCS1900
- Open collector output
- Typical supply voltage: 2.4-3V
- SIEGET®-45 technology



VPS05604

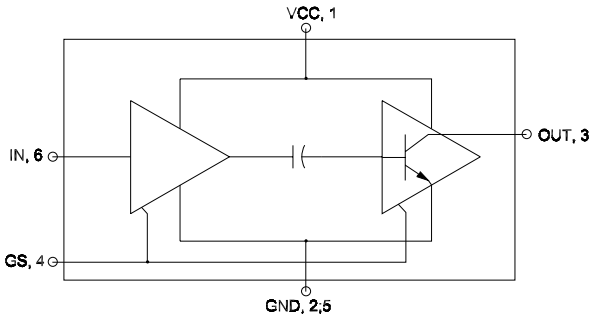
Tape loading orientation



Marking on SOT-363 package (for example PGs) corresponds to pin 1 of device

Position in tape: pin 1 opposite of feed hole side

EHA07193



ESD: Electrostatic discharge sensitive device, observe handling precaution!

Type	Package	Marking	Chip
BGA428	SOT363	PGs	T0527

Maximum Ratings

Parameter	Symbol	Value	Unit
Device voltage	V_{CC}	4	V
Total Device Current[3]	I_{tot}	12	mA
Voltage at pin *Out*	V_{Out}	4	V
Current into pin *In*	I_{IN}	0.5	mA
Voltage at pin *GS*	V_{GS}	3.5	V
Total power dissipation, Ts < 125°C[1]	P_{tot}	50	mW
Junction temperature	T_j	150	°C
Operating temperature range	T_{OP}	-40 ..+85	°C
Storage temperature range	T_{STG}	-65 ... +150	°C
Thermal resistance: junction-soldering point	$R_{th\ JS}$	220	K/W
Input power[2]	P_{IN}	8	dBm

Notes:
All Voltages refer to GND-Node
[1] Ts is measured on the ground lead at the soldering point
[2] Valid for a) Z_L=50Ω and Z_S=50Ω, V_{CC}=2.7V, V_{OUT}=2.7V, V_{GS}=0.0V, GND=0.0V
and b) Z_L=50Ω and Z_S=50Ω, V_{CC}=0.0V, V_{OUT}=0.0V, V_{GS}=2.7V, GND=0.0V
[3] I_{tot}= Current into OUT + Current into VCC

Electrical Characteristics at T_A=25°C (measured in test circuit specified in fig. 1)
V_{CC}=2.7V, Frequency=1.8GHz, unless otherwise specified

Parameter	Symbol	min.	typ.	max.	Unit
Maximum available power gain	G_{MA}		20		dB
Noise figure (Z_S=50Ω)	NF		1.4		dB
Input power at 1dB gain compression	P_{-1dB}		-19		dBm
Input third order intercept point	IIP_3		-9		dBm
Total device current	I_{tot}		8.2		mA
Insertion loss in gain-step-mode Vcc=0.0V, V_{CTRL}=2.7V, R_{CTRL}=3kΩ	L_{GS}		13.5		dB

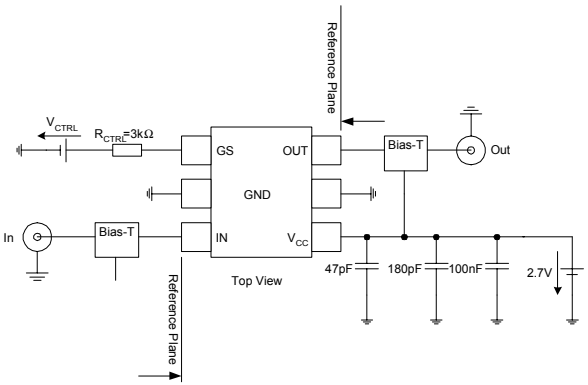


Fig.1: Test Circuit for Electrical Characteristics and S-Parameter

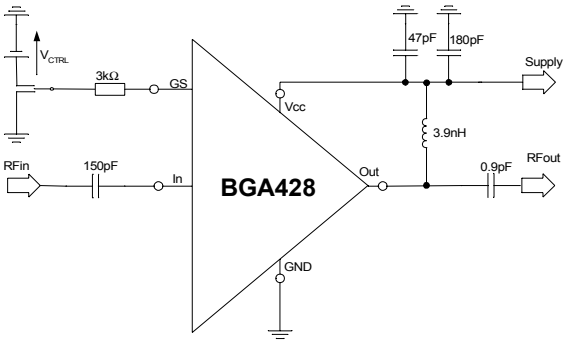


Fig. 2: Application Circuit for 1850MHz

S-Parameter at 2.7V (see Electrical Characteristics for conditions)

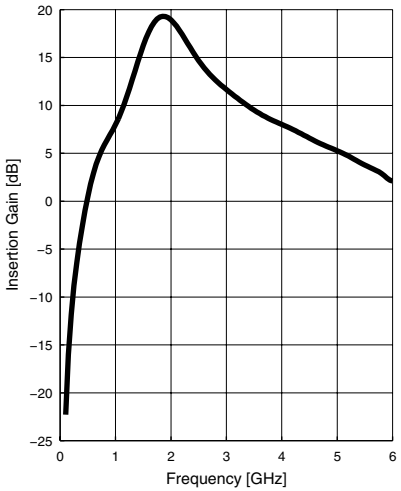
Freq. [GHz]	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
0.100	0.6756	-31.7	58.775	-19.6	0.0005	153.5	0.9491	-3.9
0.200	0.5936	-53.6	47.806	-43.1	0.0014	138.4	0.9327	-6.3
0.300	0.5150	-71.4	39.232	-59.5	0.0021	119.0	0.9174	-8.3
0.400	0.4587	-86.6	32.740	-71.8	0.0028	104.9	0.9035	-10.3
0.600	0.4004	-110.7	23.868	-89.6	0.0042	105.9	0.8807	-14.0
0.800	0.3743	-129.1	18.509	-103.2	0.0063	94.3	0.8593	-17.7
1.000	0.3743	-143.0	14.825	-114.5	0.0082	92.4	0.8352	-21.4
1.200	0.3816	-154.5	12.288	-124.7	0.0093	87.2	0.8116	-25.1
1.400	0.3922	-164.4	10.353	-134.2	0.0110	85.3	0.7865	-28.7
1.600	0.4086	-172.4	8.879	-143.2	0.0132	79.4	0.7597	-32.2
1.800	0.4265	-178.9	7.732	-151.4	0.0141	79.4	0.7309	-36.0
1.900	0.4314	178.8	7.214	-155.2	0.0146	76.1	0.7199	-37.5
2.000	0.4371	176.1	6.771	-159.1	0.0150	77.0	0.7097	-39.1
2.200	0.4505	171.2	5.976	-166.6	0.0169	75.2	0.6791	-42.3
2.400	0.4640	167.2	5.298	-173.5	0.0181	73.2	0.6593	-45.6
3.000	0.4935	155.9	3.935	167.0	0.0217	68.3	0.5925	-53.3
4.000	0.5181	141.2	2.605	139.2	0.0282	65.1	0.5284	-64.9
5.000	0.5202	126.9	1.911	113.6	0.0319	62.2	0.4829	-75.1
6.000	0.5128	110.0	1.479	89.9	0.0489	56.0	0.4323	-81.7

Application Circuit Characteristics (measured in test circuit specified in fig. 2)
TA=25°C, Vcc=2.7V, Frequency=1.85GHz, unless otherwise specified

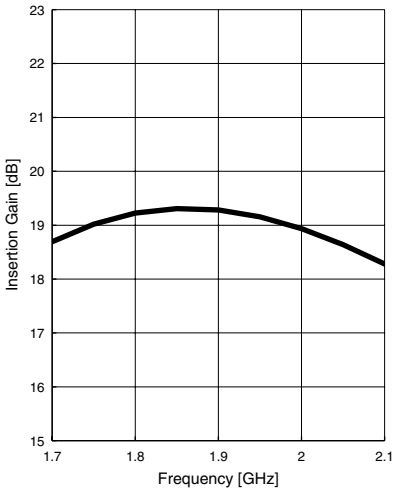
Parameter	Symbol	typ.	Unit
Insertion power gain	$\|S_{21}\|^2$	19	dB
Noise Figure (Z_S=50Ω)	NF	1.4	dB
Input Power at 1dB Gain Compression	P_{-1dB}	-19	dBm
Input Third Order Intercept Point	IIP_3	-9	dBm
Total Device Current	I_{tot}	8.2	mA
Insertion Loss in Gain-Step-Mode Vcc=0.0V, V_{CTRL}=2.7V, R_{CTRL}=3kΩ	L_{GS}	13.5	dB

The following data refers to the application circuit given in fig. 2

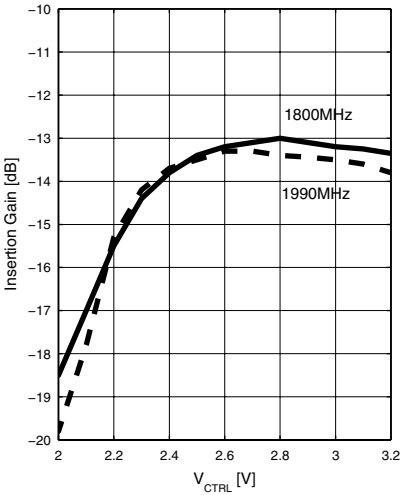
Power Gain $|S21|^2=f(f)$
V_{CC} = 2.7V, V_{Out}=2.7V



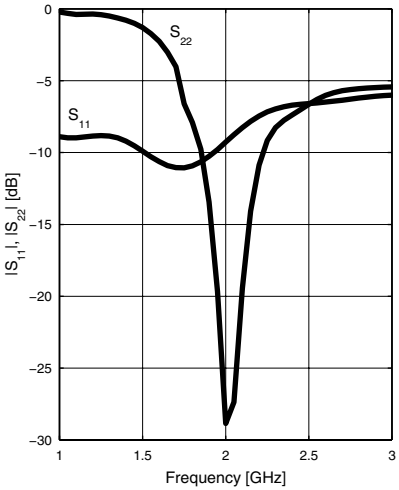
Power Gain $|S21|^2=f(f)$
V_{CC} = 2.7V, V_{Out}=2.7V



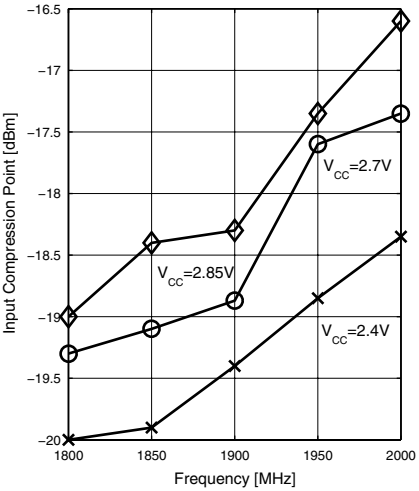
Off–Gain $|S_{21}|^2=f(V_{CTRL})$
V_{CC} = 0.0V, V_{Out}=0.0V,R_{CTRL}=2.7kΩ



Matching $|S_{11}|,|S_{22}|=f(f)$
V_{CC} = 2.7V, V_{Out}=2.7V

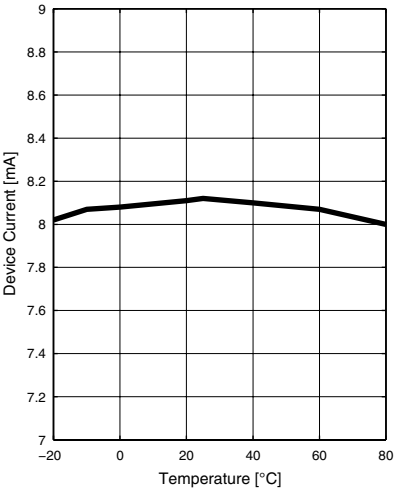


Input Compression Point $P_{-1dB}=f(f)$



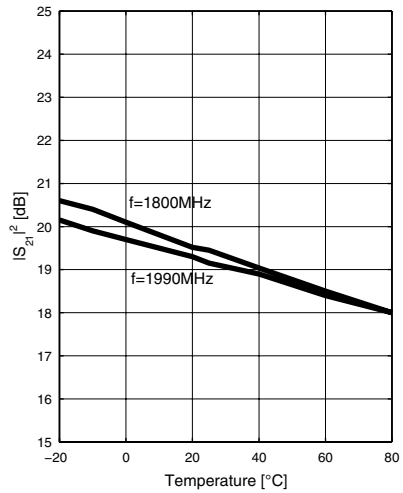
Device Current $I=f(\vartheta)$

V_{CC}=2.7V, V_{Out}=2.7V



Insertion Gain $|S_{21}|^2=f(\vartheta)$

V_{CC}=2.7V, V_{Out}=2.7V



Package Outline