

# 3GZ1108Q

# 3.0 GHz Gain Block and Power Amplifier

## General Description

The 3GZ1108Q is a low cost, low noise transistor and packaged in M04 package. It can be designed for Low Noise Amplifier, Gain Block and Power Driver. This product can be used in the application which frequency band is during DC to 3GHz.

## Features

- Very Low Noise Figure,  $NF=1.6\text{dB}$  at Frequency=2.4GHz.
- Gain Block 13 dB at 2.4GHz, 16dB at 1.57542GHz, 18dB at 900Mhz
- P1dB point 15dBm at 2.4GHz biased at +3.3V
- AEC-Q101 Qualified and PPAP Capable.

## Applications

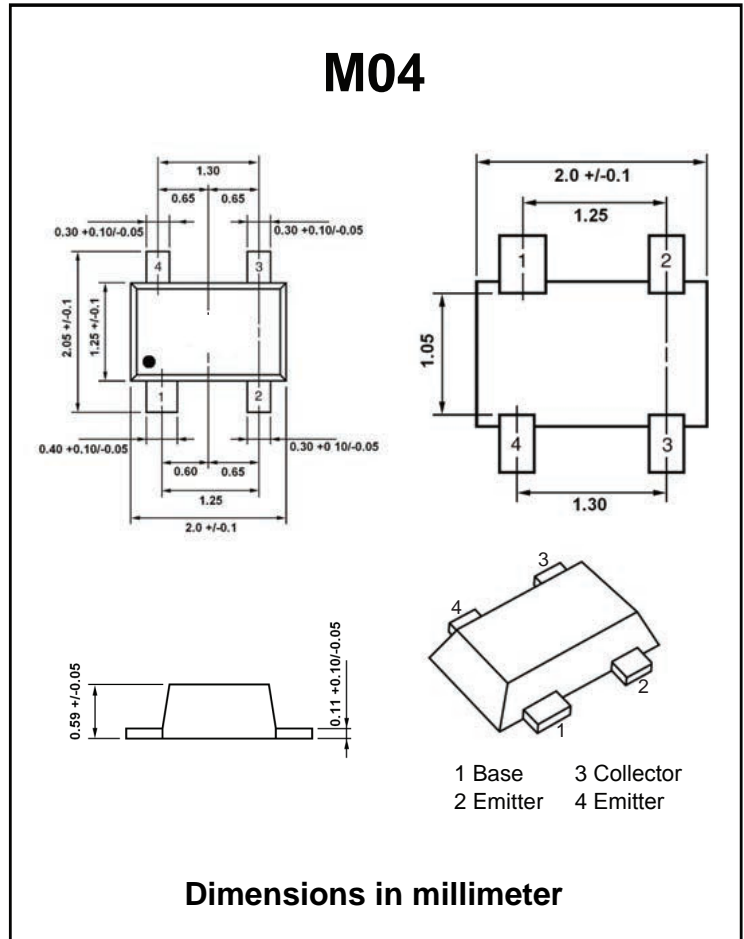
- Wireless application, e.g. analog and digital cellular telephones, Cordless telephones (GPS, DECT, PHS, Bluetooth, WLAN, ZigBee)
- RF front end
- Pagers
- CATV, Cable modem

## Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply Voltage	V <sub>CC</sub>	7	V
Input Current	I <sub>CC</sub>	80	mA
RF Input Power	PRFI	10	dBm
Operating Temperature	T <sub>opr</sub>	-40 to 85	°C
Storage Temperature range	T <sub>stg</sub>	-55 to 150	

Notes:

1. operation of this device in excess of any maximum rating as specified above may cause permanent damage to the device
2. ESD Sensitive Device.





## ■ S-parameter

Test Conditions:  $I_{CC} = 5\text{mA}$ ,  $V_{CE} = 3.3\text{V}$ , and Input power =  $-30\text{dBm}$

Frequency	S11	S11	S21	S21	S12	S12	S22	S22
MHZ	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
500.0	-3.0	-54.7	21.5	142.0	-28.7	63.2	-1.3	-22.1
516.5	-2.9	-56.1	21.5	140.9	-28.6	62.2	-1.2	-22.5
533.0	-3.0	-58.7	21.5	139.2	-28.3	60.3	-1.2	-24.0
549.5	-3.1	-61.4	21.4	137.2	-28.1	58.9	-1.3	-25.3
566.0	-3.3	-63.0	21.2	135.7	-27.9	56.9	-1.4	-26.4
582.5	-3.4	-64.7	21.1	134.8	-27.8	56.5	-1.5	-27.0
599.0	-3.5	-65.9	20.9	134.2	-27.9	57.1	-1.6	-27.4
615.5	-3.7	-66.8	20.8	133.4	-27.7	55.2	-1.8	-27.8
632.0	-3.8	-68.3	20.7	132.9	-27.8	55.3	-1.9	-28.4
648.5	-3.7	-68.7	20.7	132.7	-27.6	55.2	-2.0	-27.9
665.0	-3.8	-69.8	20.6	131.9	-27.5	54.5	-2.1	-28.1
681.5	-3.8	-71.2	20.6	131.0	-27.3	54.0	-2.1	-28.3
698.0	-3.8	-72.9	20.6	130.0	-27.1	55.3	-2.1	-28.3
714.5	-3.8	-74.8	20.6	128.8	-26.9	53.6	-2.1	-29.1
731.0	-3.8	-76.6	20.5	127.5	-26.6	53.5	-2.1	-29.7
747.5	-3.9	-78.8	20.4	126.3	-26.5	51.4	-2.2	-30.8
764.0	-4.0	-80.1	20.3	125.3	-26.6	50.4	-2.3	-31.4
780.5	-4.3	-81.5	20.1	124.5	-26.5	49.9	-2.4	-31.8
797.0	-4.3	-82.1	20.0	123.9	-26.5	49.5	-2.5	-32.4
813.5	-4.4	-83.7	20.0	123.3	-26.3	48.5	-2.6	-32.7
830.0	-4.5	-84.6	19.9	122.5	-26.1	49.6	-2.8	-32.6
846.5	-4.5	-85.3	19.8	122.1	-26.3	49.2	-2.8	-32.3
863.0	-4.5	-86.5	19.8	121.6	-26.2	49.2	-2.8	-32.6
879.5	-4.5	-87.8	19.7	120.6	-26.0	49.1	-2.9	-32.7
896.0	-4.4	-89.6	19.7	119.7	-25.8	47.1	-2.9	-33.4
912.5	-4.5	-90.9	19.6	118.7	-25.7	47.7	-2.9	-33.8
929.0	-4.6	-92.8	19.5	117.4	-25.6	46.9	-3.0	-34.3
945.5	-4.7	-94.9	19.4	116.6	-25.8	46.0	-3.1	-34.8
962.0	-4.9	-95.5	19.2	116.0	-25.7	45.9	-3.2	-35.1
978.5	-5.0	-96.8	19.1	115.5	-25.7	44.9	-3.3	-35.6
995.0	-5.1	-96.5	19.0	115.3	-25.7	44.9	-3.4	-35.6
1011.5	-5.0	-97.7	19.0	115.1	-25.6	45.7	-3.5	-35.2
1028.0	-5.1	-98.4	18.9	114.4	-25.5	45.1	-3.5	-35.6
1044.5	-5.1	-99.4	18.9	113.8	-25.4	44.3	-3.6	-35.6
1061.0	-5.1	-101.1	18.9	112.7	-25.3	44.9	-3.6	-35.9
1077.5	-4.9	-103.6	18.9	111.7	-25.1	44.5	-3.6	-36.2
1094.0	-5.1	-104.7	18.7	110.7	-25.0	43.7	-3.7	-36.2
1110.5	-5.2	-106.1	18.6	109.8	-24.9	42.5	-3.6	-36.9
1127.0	-5.3	-107.6	18.5	109.0	-25.0	41.9	-3.7	-37.5



Frequency	S11	S11	S21	S21	S12	S12	S22	S22
MHZ	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
1143.5	-5.5	-108.1	18.3	108.4	-25.1	41.2	-3.9	-37.6
1160.0	-5.4	-109.8	18.3	108.2	-24.9	40.9	-4.0	-38.4
1176.5	-5.7	-109.7	18.1	107.9	-25.0	41.1	-4.1	-38.3
1193.0	-5.7	-111.0	18.1	107.7	-25.0	40.4	-4.2	-38.8
1209.5	-5.6	-111.1	18.1	107.5	-24.9	41.5	-4.2	-38.2
1226.0	-5.5	-111.1	18.0	107.3	-24.9	42.5	-4.2	-37.8
1242.5	-5.5	-112.7	18.0	106.3	-24.7	42.2	-4.3	-37.8
1259.0	-5.4	-114.6	18.0	105.2	-24.6	41.1	-4.3	-38.3
1275.5	-5.4	-116.9	17.9	104.0	-24.5	41.0	-4.3	-38.8
1292.0	-5.5	-118.2	17.8	103.2	-24.5	39.8	-4.3	-39.2
1308.5	-5.6	-119.2	17.7	102.7	-24.3	39.0	-4.4	-39.9
1325.0	-5.8	-120.4	17.5	102.0	-24.6	38.8	-4.5	-39.8
1341.5	-6.0	-121.1	17.4	101.7	-24.6	37.9	-4.6	-40.3
1358.0	-6.0	-121.4	17.3	101.6	-24.5	37.9	-4.7	-40.3
1374.5	-6.1	-121.9	17.2	101.3	-24.5	38.1	-4.8	-40.4
1391.0	-6.0	-122.3	17.2	101.1	-24.6	38.8	-4.8	-40.4
1407.5	-6.0	-122.9	17.2	100.6	-24.4	39.1	-4.9	-40.3
1424.0	-5.9	-123.4	17.2	99.9	-24.4	39.0	-4.9	-40.2
1440.5	-6.0	-125.6	17.1	99.0	-24.3	38.6	-4.9	-40.3
1457.0	-6.0	-126.7	17.0	98.4	-24.3	38.1	-5.0	-40.4
1473.5	-5.9	-128.6	17.0	97.5	-24.2	37.7	-5.0	-40.8
1490.0	-6.0	-129.3	16.9	97.1	-24.0	38.1	-5.0	-40.7
1506.5	-6.1	-130.6	16.8	96.5	-24.1	36.8	-5.1	-41.1
1523.0	-6.2	-131.7	16.6	95.9	-24.1	36.6	-5.2	-41.3
1539.5	-6.3	-132.1	16.6	95.6	-24.2	36.9	-5.2	-41.6
1556.0	-6.3	-132.4	16.5	95.3	-24.2	36.2	-5.3	-41.7
1572.5	-6.3	-133.4	16.4	95.2	-24.1	36.5	-5.4	-41.9
1589.0	-6.3	-134.1	16.4	94.7	-24.1	37.1	-5.5	-42.1
1605.5	-6.3	-135.1	16.4	94.1	-24.0	36.2	-5.5	-41.8
1622.0	-6.3	-135.7	16.3	93.4	-23.9	37.0	-5.5	-42.4
1638.5	-6.2	-136.9	16.3	92.9	-23.9	36.3	-5.5	-42.3
1655.0	-6.2	-138.3	16.2	92.4	-23.8	36.3	-5.6	-42.3
1671.5	-6.4	-139.5	16.1	91.7	-23.9	36.1	-5.6	-42.8
1688.0	-6.5	-140.2	16.0	91.0	-23.9	35.3	-5.7	-42.5
1704.5	-6.5	-140.6	15.9	90.7	-23.9	35.4	-5.7	-42.7
1721.0	-6.6	-141.8	15.8	90.5	-23.9	35.7	-5.8	-42.7
1737.5	-6.5	-142.1	15.8	90.3	-23.8	35.2	-5.8	-43.0
1754.0	-6.5	-142.3	15.7	90.1	-23.8	34.9	-5.8	-43.0
1770.5	-6.5	-143.4	15.7	89.4	-23.8	34.7	-5.9	-43.3
1787.0	-6.5	-143.7	15.6	89.0	-23.7	35.2	-5.9	-43.0
1803.5	-6.4	-145.3	15.6	88.4	-23.7	35.7	-6.0	-43.4



Frequency	S11	S11	S21	S21	S12	S12	S22	S22
MHZ	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
1820.0	-6.5	-146.3	15.5	88.0	-23.6	34.6	-6.1	-43.9
1836.5	-6.5	-147.2	15.4	87.3	-23.6	33.8	-6.1	-43.4
1853.0	-6.5	-148.4	15.4	86.7	-23.5	34.3	-6.1	-43.4
1869.5	-6.6	-149.7	15.3	86.2	-23.5	33.7	-6.2	-43.8
1886.0	-6.6	-150.5	15.2	85.9	-23.5	32.2	-6.2	-44.4
1902.5	-6.7	-151.1	15.1	85.8	-23.8	33.0	-6.2	-44.6
1919.0	-6.7	-151.0	15.1	85.7	-23.5	33.4	-6.3	-44.9
1935.5	-6.8	-151.2	15.0	85.5	-23.6	34.5	-6.3	-44.5
1952.0	-6.6	-151.3	15.0	85.2	-23.6	34.4	-6.5	-44.8
1968.5	-6.6	-152.8	15.0	84.6	-23.4	33.0	-6.4	-44.9
1985.0	-6.6	-152.9	14.9	84.0	-23.5	33.4	-6.5	-44.8
2001.5	-6.6	-154.2	14.9	83.5	-23.5	34.8	-6.5	-44.8
2018.0	-6.6	-154.7	14.8	82.8	-23.4	33.3	-6.6	-44.7
2034.5	-6.5	-156.3	14.8	82.2	-23.3	33.6	-6.6	-44.8
2051.0	-6.6	-157.6	14.6	81.5	-23.3	32.7	-6.6	-44.9
2067.5	-6.7	-158.3	14.5	81.2	-23.4	32.6	-6.6	-45.2
2084.0	-6.8	-159.1	14.4	81.2	-23.4	32.2	-6.7	-45.1
2100.5	-6.8	-159.1	14.3	81.3	-23.3	31.3	-6.8	-45.5
2117.0	-6.8	-159.3	14.3	80.9	-23.4	31.8	-6.8	-45.7
2133.5	-6.8	-160.1	14.3	80.5	-23.2	31.2	-6.8	-46.0
2150.0	-6.7	-160.3	14.3	80.3	-23.3	32.2	-6.8	-45.8
2166.5	-6.7	-160.8	14.3	80.1	-23.4	31.8	-6.9	-45.9
2183.0	-6.6	-161.3	14.2	79.3	-23.3	32.2	-7.0	-46.3
2199.5	-6.6	-162.3	14.2	78.7	-23.1	33.3	-7.0	-46.2
2216.0	-6.6	-164.1	14.1	78.0	-23.1	32.2	-7.1	-46.1
2232.5	-6.6	-164.8	14.0	77.5	-23.1	32.4	-7.1	-46.0
2249.0	-6.7	-165.1	13.9	77.4	-23.1	32.6	-7.1	-45.7
2265.5	-6.7	-165.6	13.8	77.1	-23.0	31.9	-7.1	-46.4
2282.0	-6.8	-166.0	13.8	76.8	-23.1	32.3	-7.2	-46.3
2298.5	-6.8	-166.9	13.7	76.6	-23.1	31.6	-7.2	-46.6
2315.0	-6.8	-167.2	13.7	76.3	-23.1	31.3	-7.2	-46.8
2331.5	-6.7	-168.2	13.6	75.9	-23.1	32.4	-7.3	-46.9
2348.0	-6.7	-168.0	13.6	75.7	-23.1	32.6	-7.3	-47.0
2364.5	-6.7	-169.0	13.6	75.4	-23.1	31.2	-7.4	-47.1
2381.0	-6.6	-169.5	13.5	74.9	-23.0	32.5	-7.4	-47.4
2397.5	-6.6	-170.2	13.5	74.3	-22.9	31.2	-7.5	-47.3
2414.0	-6.6	-171.1	13.4	73.9	-22.9	31.6	-7.5	-47.4
2430.5	-6.7	-171.7	13.3	73.7	-23.1	32.1	-7.5	-47.3
2447.0	-6.8	-172.1	13.3	73.4	-22.9	30.6	-7.5	-47.3
2463.5	-6.7	-172.7	13.2	73.2	-23.0	31.4	-7.6	-47.8
2480.0	-6.7	-173.9	13.2	72.6	-22.9	31.3	-7.6	-47.8



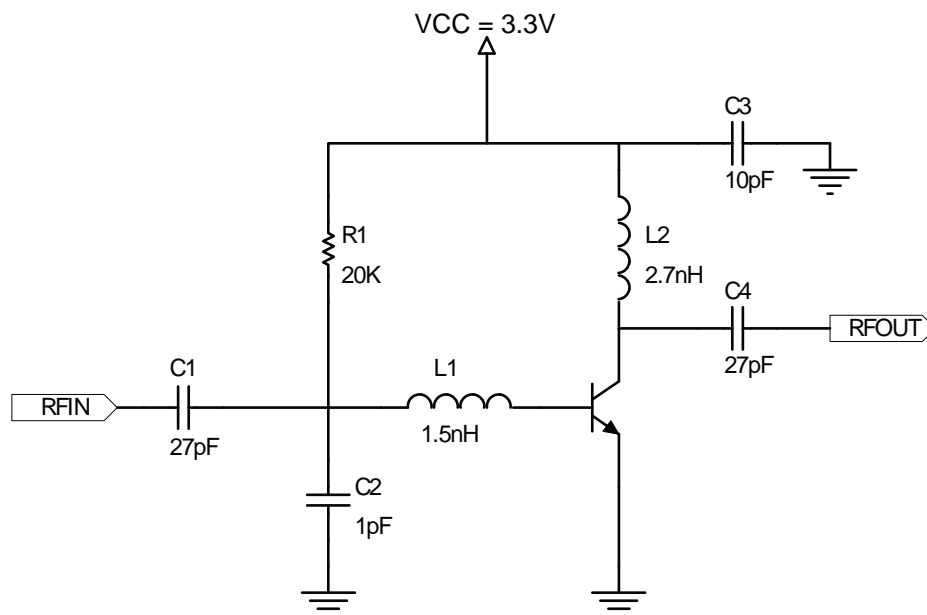
Frequency	S11	S11	S21	S21	S12	S12	S22	S22
MHZ	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
2496.5	-6.7	-173.8	13.1	72.3	-23.0	31.2	-7.7	-47.9
2513.0	-6.7	-174.0	13.1	72.2	-22.9	31.3	-7.7	-48.2
2529.5	-6.8	-174.6	13.1	71.9	-22.8	32.1	-7.7	-48.6
2546.0	-6.7	-174.9	13.0	71.4	-22.7	31.4	-7.7	-48.6
2562.5	-6.6	-176.1	13.0	70.7	-22.9	31.2	-7.8	-48.6
2579.0	-6.6	110.8	13.0	70.2	-22.8	31.5	-7.8	-48.7
2595.5	-6.6	110.0	12.8	69.7	-22.7	32.0	-7.9	-49.0
2612.0	-6.7	109.9	12.7	69.7	-22.7	31.0	-7.9	-48.5
2628.5	-6.7	108.9	12.7	69.2	-22.7	30.9	-7.9	-49.2
2645.0	-6.7	108.2	12.7	69.2	-22.8	30.5	-8.0	-48.9
2661.5	-6.7	108.0	12.6	68.9	-22.8	30.2	-8.0	-48.9
2678.0	-6.7	107.5	12.5	68.7	-22.7	30.8	-8.0	-49.1
2694.5	-6.8	108.2	12.5	68.7	-22.7	30.2	-8.0	-49.3
2711.0	-6.6	107.7	12.5	68.4	-22.6	30.4	-8.1	-49.6
2727.5	-6.6	106.7	12.5	67.9	-22.7	31.2	-8.1	-49.7
2744.0	-6.5	106.5	12.5	67.3	-22.6	31.3	-8.1	-50.2
2760.5	-6.5	105.2	12.4	66.7	-22.7	30.7	-8.2	-50.0
2777.0	-6.5	104.6	12.4	66.3	-22.6	30.1	-8.2	-50.1
2793.5	-6.6	104.1	12.3	66.0	-22.4	30.4	-8.4	-50.3
2810.0	-6.6	102.9	12.2	65.4	-22.5	30.0	-8.3	-50.2
2826.5	-6.5	102.4	12.1	65.3	-22.5	29.8	-8.3	-50.5
2843.0	-6.6	101.8	12.0	65.1	-22.3	30.0	-8.3	-50.0
2859.5	-6.7	102.0	12.0	65.1	-22.5	29.4	-8.3	-50.6
2876.0	-6.7	102.3	12.0	65.0	-22.5	30.8	-8.4	-51.1
2892.5	-6.6	101.8	12.0	64.5	-22.6	30.4	-8.4	-51.7
2909.0	-6.5	102.1	12.0	64.2	-22.5	30.1	-8.4	-51.3
2925.5	-6.5	100.3	11.9	63.7	-22.4	29.8	-8.5	-51.2
2942.0	-6.5	99.9	11.9	63.4	-22.4	29.6	-8.5	-51.4
2958.5	-6.5	99.6	11.8	63.2	-22.4	31.7	-8.6	-51.5
2975.0	-6.5	98.9	11.8	62.6	-22.3	30.2	-8.6	-51.8
2991.5	-6.3	98.5	11.7	62.2	-22.4	30.9	-8.6	-51.9
3008.0	-6.4	97.5	11.7	62.0	-22.3	29.7	-8.6	-51.4
3024.5	-6.5	96.6	11.6	61.8	-22.3	29.7	-8.6	-51.5
3041.0	-6.6	96.7	11.5	61.6	-22.4	30.2	-8.7	-52.0
3057.5	-6.6	97.2	11.5	61.7	-22.3	29.2	-8.7	-51.8
3074.0	-6.5	96.7	11.5	61.1	-22.4	29.0	-8.7	-52.9
3090.5	-6.4	96.1	11.5	60.6	-22.2	30.9	-8.8	-52.6
3107.0	-6.4	167.6	11.4	60.4	-22.3	29.7	-8.9	-52.5
3123.5	-6.4	167.4	11.4	60.1	-22.3	28.9	-8.9	-53.0
3140.0	-6.4	166.4	11.3	59.8	-22.3	29.2	-8.8	-53.1
3156.5	-6.4	166.4	11.3	59.4	-22.1	29.3	-8.9	-53.6



Frequency	S11	S11	S21	S21	S12	S12	S22	S22
MHZ	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.	Mag.	Deg.
3272.0	-6.3	163.1	11.0	57.4	-22.1	29.3	-9.2	-54.2
3288.5	-6.3	162.8	10.9	57.0	-22.2	29.9	-9.1	-54.4
3305.0	-6.4	162.0	10.9	56.6	-22.0	30.8	-9.1	-54.9
3321.5	-6.3	161.5	10.8	56.4	-22.0	29.7	-9.2	-54.4
3338.0	-6.2	161.3	10.9	56.0	-21.8	30.4	-9.2	-55.5
3354.5	-6.3	161.0	10.8	55.6	-22.0	30.0	-9.2	-55.3
3371.0	-6.3	159.9	10.7	55.3	-21.9	29.1	-9.3	-55.3
3387.5	-6.3	159.7	10.6	55.4	-22.0	30.1	-9.3	-54.9
3404.0	-6.4	159.9	10.6	55.2	-21.8	29.4	-9.3	-55.8
3420.5	-6.3	159.5	10.6	54.8	-22.0	29.7	-9.4	-56.1
3437.0	-6.3	159.4	10.6	54.5	-21.9	30.1	-9.4	-55.7
3453.5	-6.2	158.6	10.5	54.0	-21.9	29.9	-9.3	-55.8
3470.0	-6.3	158.5	10.5	54.2	-22.0	29.6	-9.4	-56.0
3486.5	-6.3	158.0	10.5	53.6	-21.9	30.0	-9.5	-56.3
3503.0	-6.2	158.1	10.4	53.2	-21.8	30.1	-9.5	-56.3
3519.5	-6.1	157.2	10.4	52.8	-21.7	29.7	-9.6	-56.6
3536.0	-6.2	156.3	10.3	52.6	-21.8	29.3	-9.6	-56.8
3552.5	-6.3	156.2	10.2	52.3	-21.9	30.3	-9.6	-56.7
3569.0	-6.2	155.9	10.2	52.3	-21.8	29.7	-9.6	-56.7
3585.5	-6.2	156.2	10.2	52.0	-21.7	29.7	-9.6	-56.5
3602.0	-6.2	155.3	10.2	51.7	-21.6	31.4	-9.7	-57.0
3618.5	-6.2	154.7	10.1	51.5	-21.6	29.4	-9.6	-57.3
3635.0	-6.2	154.9	10.1	51.5	-21.8	30.7	-9.7	-57.3
3651.5	-6.2	155.0	10.1	51.2	-21.6	29.1	-9.6	-58.0
3668.0	-6.0	154.9	10.1	50.9	-21.7	30.6	-9.6	-58.9
3684.5	-5.9	154.1	10.1	50.2	-21.4	28.9	-9.7	-58.3
3701.0	-6.0	152.8	10.0	49.7	-21.5	30.3	-9.8	-57.8
3717.5	-6.1	152.0	9.9	49.4	-21.5	29.6	-9.8	-58.2
3734.0	-6.2	152.4	9.9	49.4	-21.5	29.1	-9.8	-59.3
3750.5	-6.1	152.4	9.8	49.2	-21.5	29.7	-9.9	-59.5
3767.0	-6.0	152.0	9.8	48.7	-21.6	29.7	-9.9	-59.9
3783.5	-6.0	151.3	9.7	48.4	-21.4	28.9	-9.9	-59.3
3800.0	-6.0	150.8	9.7	48.2	-21.6	29.0	-10.0	-59.0

## Application Circuits

### 2.4GHz Low Noise Amplifier



### 1.575GHz Low Noise Amplifier

