

RF MMIC Innovator

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[CLASSIFICATION] APPLICATION NOTE

[DATE] 2010.05

[REVISION NO.] REV.A

[MEASURING INSTRUMENTS]

- NA\_AGILENT 8753ES

- SA\_AGILENT E4404B

- SG\_AGILENT 4438C

- SG\_IFR 3416

## Wide Band Drive Amp BT05VG

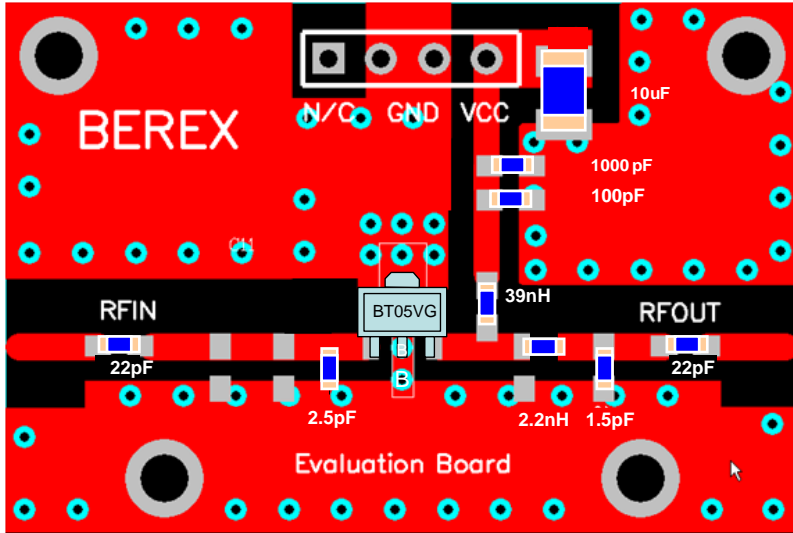
### Application Note



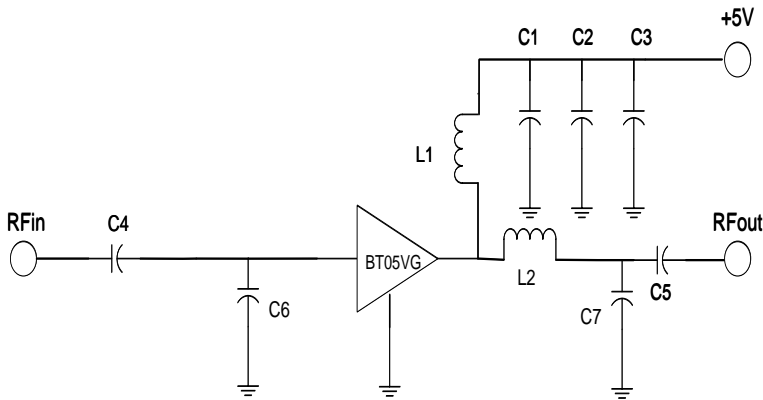
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1. BT05VG\_PCS(1750~1780MHz) Application Note



Ref. Des.	Description/ Part Number	Values	Vendor
C1	0603 CAP	100pF	Samsung
C2	604 CAP	1000pF	Samsung
C3	A3216 CAP	10uF	AVX
C4	0603 CAP	22pF	Samsung
C5	0603 CAP	22pF	Samsung
C6	0603 CAP	2.5pF	Samsung
C7	0603 CAP	1.5pF	Samsung
C8	0603 CAP	NA	
C9	0603 CAP	NA	
C10	0603 CAP	NA	
C11	0603 CAP	NA	
C12	0603 CAP	NA	
L1	0603 IND	39nH	Ceratech
L2	0603 IND	2.2nH	Ceratech
L3	0603 IND	NA	
R1	0603 RES	NA	
U1	SOT89 PKG	BT05VG	BEREX



Note:

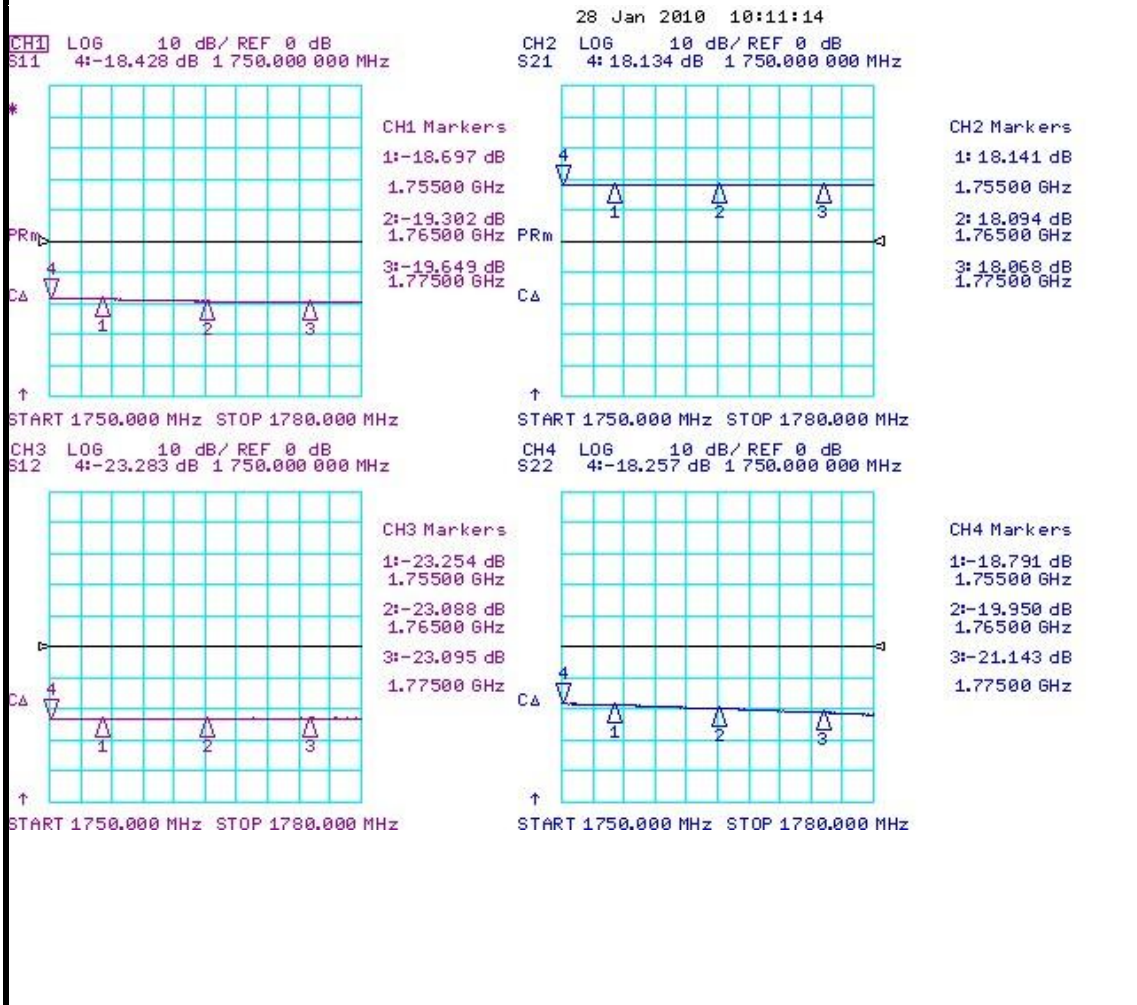
1. PCB: 31mil thick FR4
2. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG is 2.0mm
3. The distance between the center of the shunt cap(C7) and the Output Pin of BT05VG is 6.7mm
4. The distance between the center of the series Inductor(L2) and the Output Pin of BT05VG is 3.0mm

TITLE	
BT05VG Evaluation Board	
(1740~1790 MHz)	
Drawing Number	Rev.
Date	Drawn By
FILE NAME	SHEET

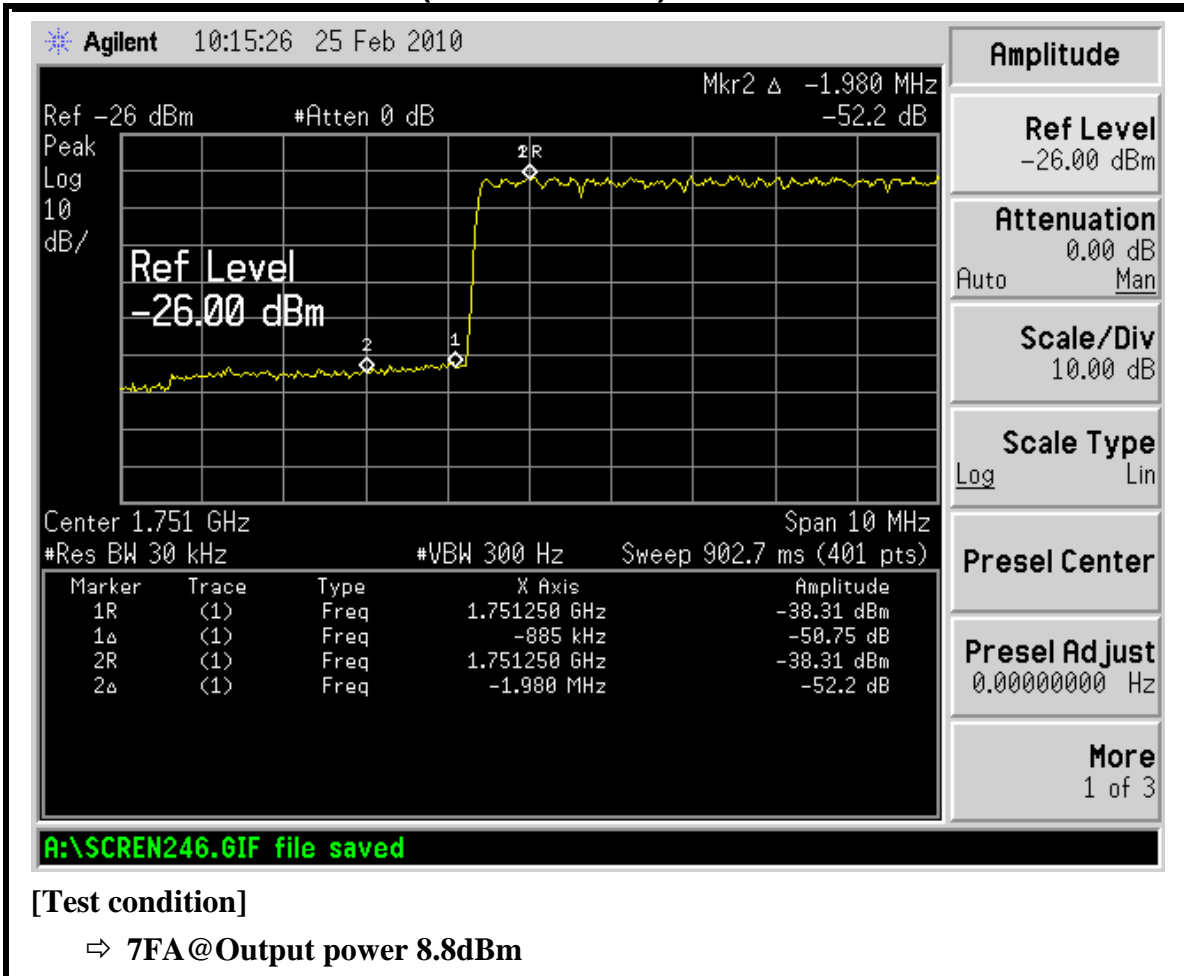
1.1 BT05VG\_PCS(1750~1780MHz) Test Result

SN	Freq [MHz]	Vcc [V]	Icc [mA]	Gain [dB]	OIP3 [dBm] <sup>(1)</sup>	P1dB [dBm]	IRL [dB]	ORL [dB]	NF [dB]
	1765	5	89	18.0	38.5	23.2	-19.3	-21	4.6

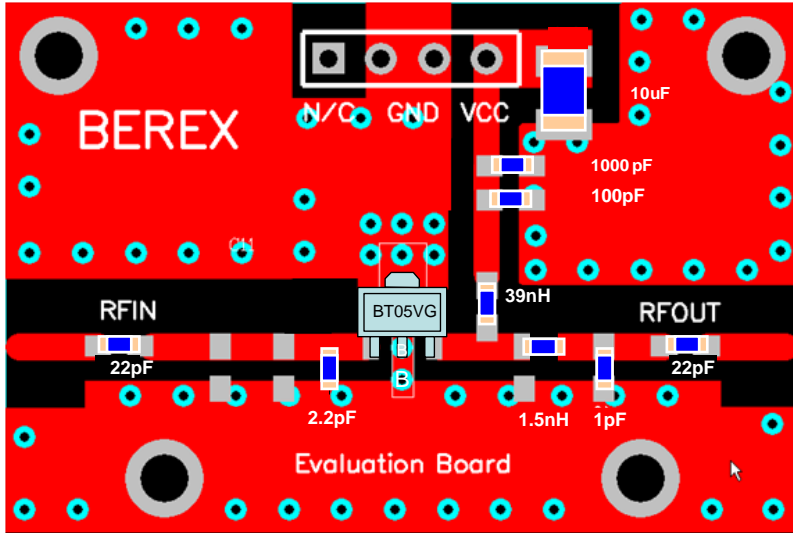
(1) OIP3 was tested @Pout=10dBm/tone 1MHz offset



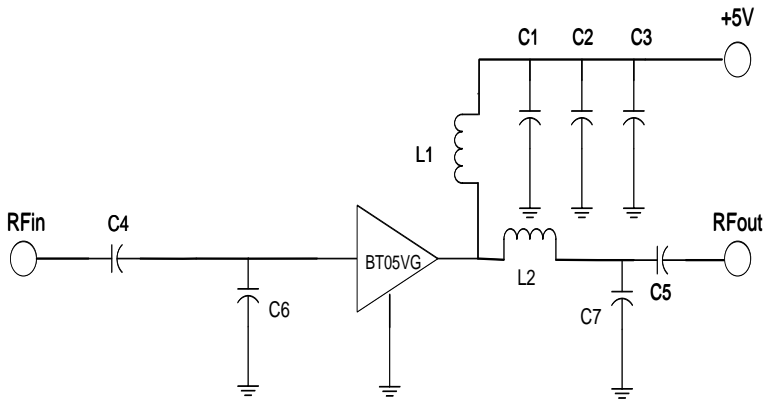
1.2BT05VG\_PCS(1750~1780MHz) SPURIOUS



2. BT05VG\_PCS(1840~1870MHz) Application Note



Ref. Des.	Description/ Part Number	Values	Vendor
C1	0603 CAP	100pF	Samsung
C2	604 CAP	1000pF	Samsung
C3	A3216 CAP	10uF	AVX
C4	0603 CAP	22pF	Samsung
C5	0603 CAP	22pF	Samsung
C6	0603 CAP	2.2pF	Samsung
C7	0603 CAP	1pF	Samsung
C8	0603 CAP	NA	
C9	0603 CAP	NA	
C10	0603 CAP	NA	
C11	0603 CAP	NA	
C12	0603 CAP	NA	
L1	0603 IND	39nH	Ceratech
L2	0603 IND	1.5nH	Ceratech
L3	0603 IND	NA	
R1	0603 RES	NA	
U1	SOT89 PKG	BT05VG	BEREX



Note:

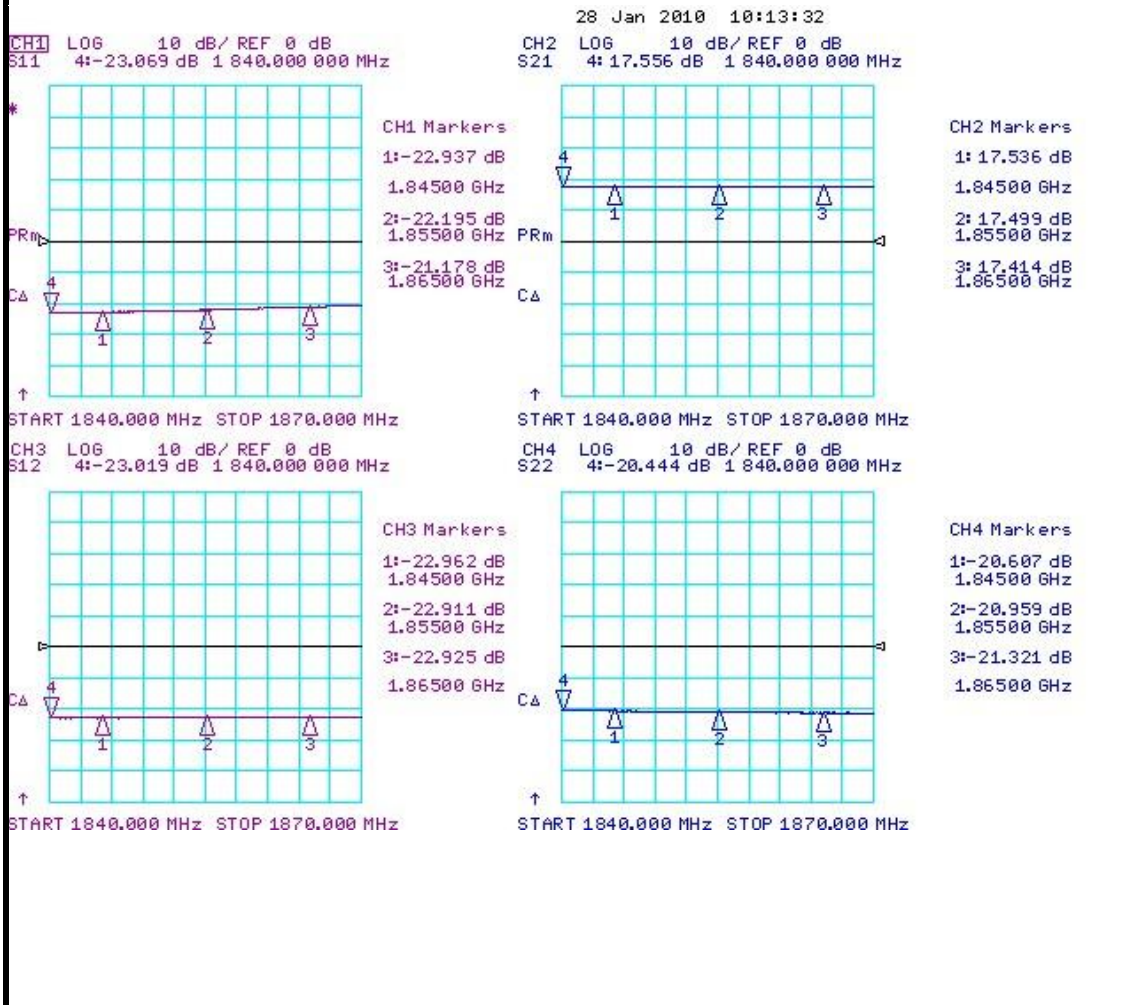
1. PCB: 31mil thick FR4
2. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG is 1.0mm
3. The distance between the center of the shunt cap(C7) and the Output Pin of BT05VG is 9.4mm
4. The distance between the center of the series Inductor(L2) and the Output Pin of BT05VG is 3.0mm

TITLE	
BT05VG Evaluation Board	
(1840~1870 MHz)	
Drawing Number	Rev.
Date	Drawn By
FILE NAME	SHEET

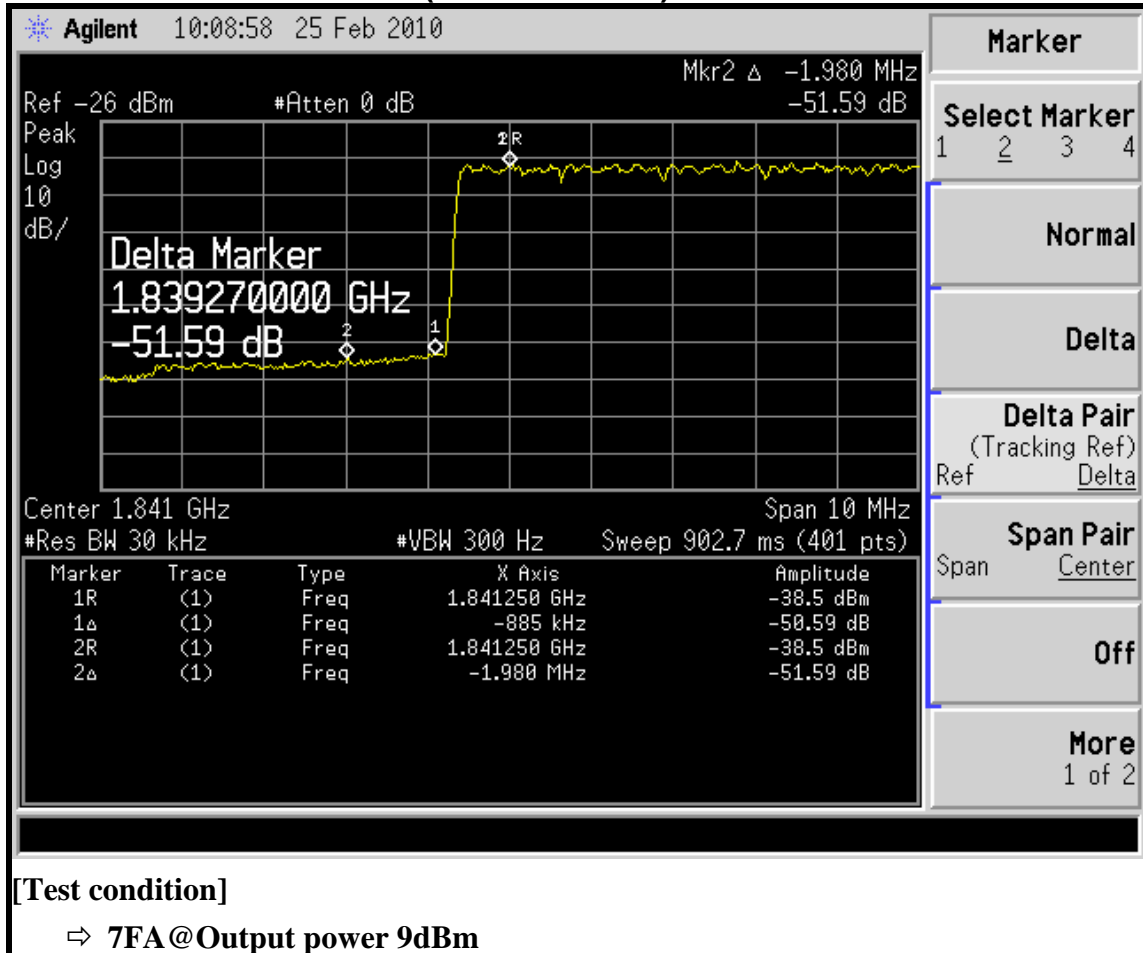
2.1 BT05VG\_PCS(1840~1870MHz)Test Result

SN	Freq [MHz]	Vcc [V]	Icc [mA]	Gain [dB]	OIP3 [dBm] <sup>(1)</sup>	P1dB [dBm]	IRL [dB]	ORL [dB]	NF [dB]
	1855	5	88	17.4	38.5	23.6	-22	-21	4.6

(1) OIP3 was tested @Pout=10dBm/tone 1MHz offset

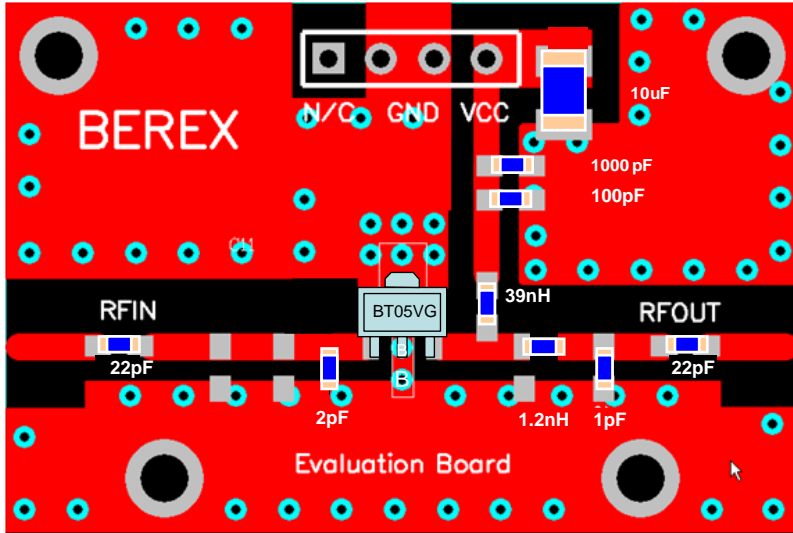


2.2BT05VG\_PCS(1840~1870MHz) SPURIOUS

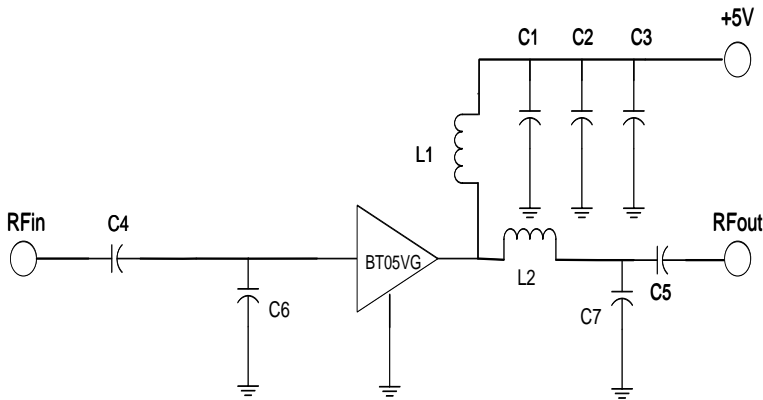




3. BT05VG\_WCDMA(1940~1980MHz) Application Note



Ref. Des.	Description/ Part Number	Values	Vendor
C1	0603 CAP	100pF	Samsung
C2	604 CAP	1000pF	Samsung
C3	A3216 CAP	10uF	AVX
C4	0603 CAP	22pF	Samsung
C5	0603 CAP	22pF	Samsung
C6	0603 CAP	2pF	Samsung
C7	0603 CAP	1pF	Samsung
C8	0603 CAP	NA	
C9	0603 CAP	NA	
C10	0603 CAP	NA	
C11	0603 CAP	NA	
C12	0603 CAP	NA	
L1	0603 IND	39nH	Ceratech
L2	0603 IND	1.2nH	Ceratech
L3	0603 IND	NA	
R1	0603 RES	NA	
U1	SOT89 PKG	BT05VG	BEREX



Note:

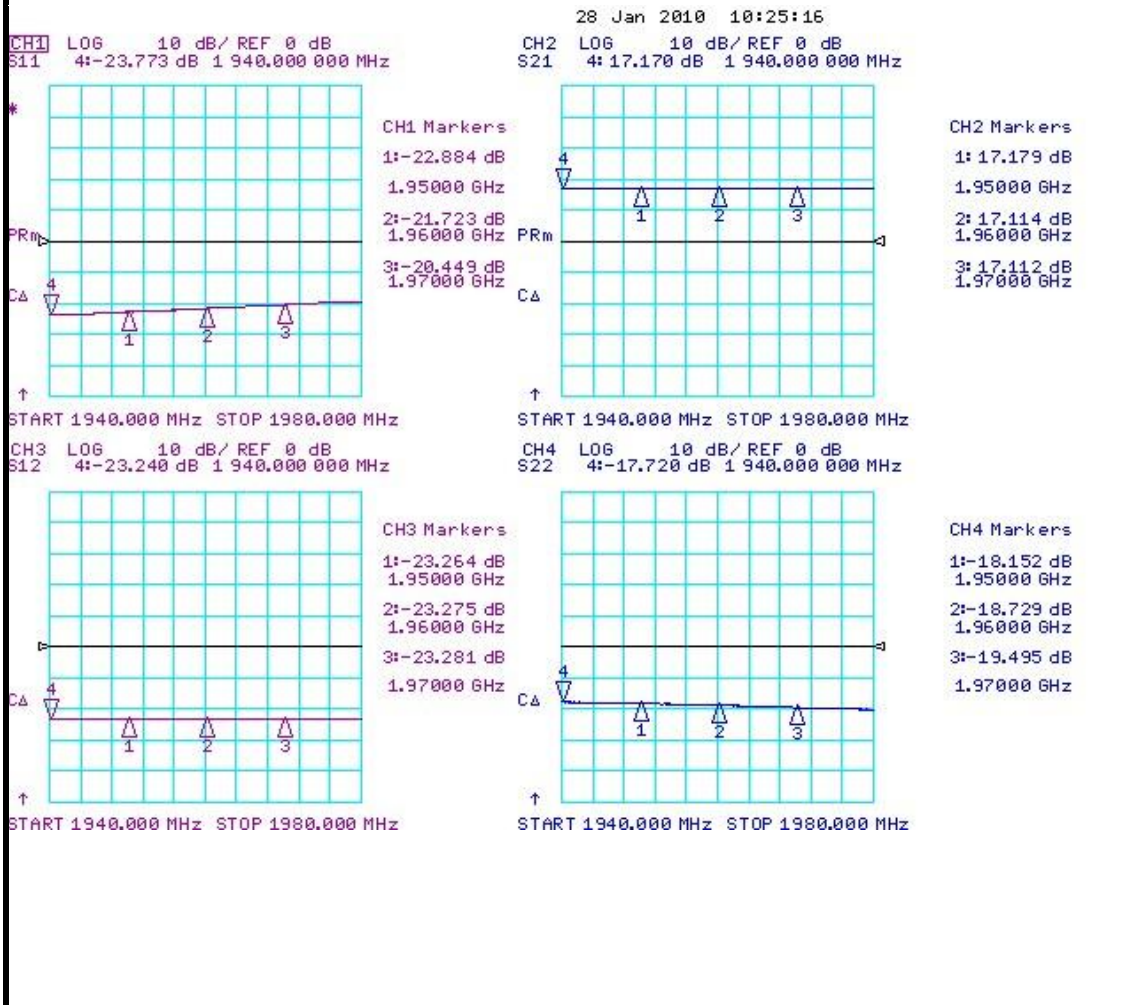
1. PCB: 31mil thick FR4
2. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG is 1.0mm
3. The distance between the center of the shunt cap(C7) and the Output Pin of BT05VG is 9.0mm
4. The distance between the center of the series Inductor(L2) and the Output Pin of BT05VG is 3.0mm

TITLE	
BT05VG Evaluation Board	
(1940~1980 MHz)	
Drawing Number	Rev.
Date	Drawn By
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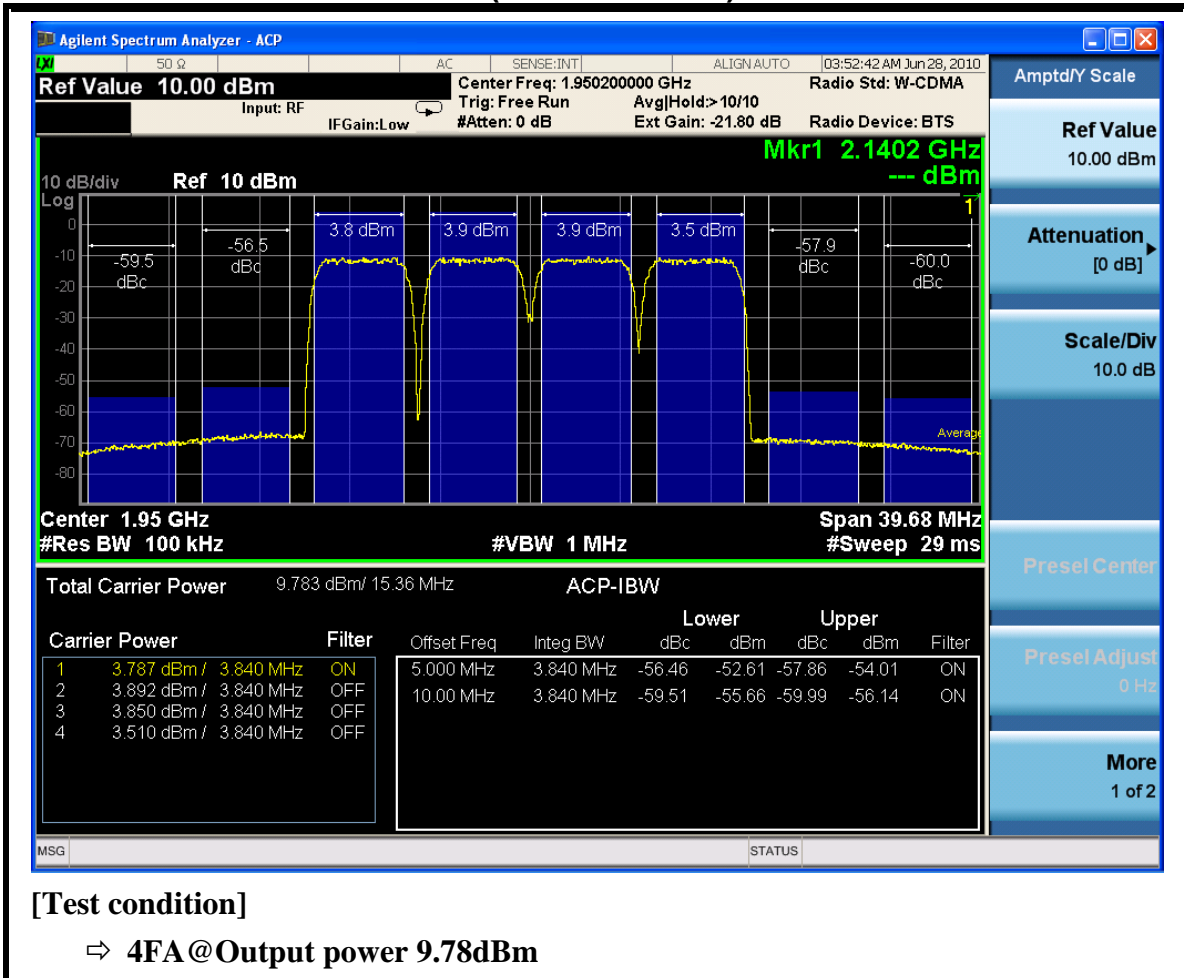
3.1 BT05VG\_WCDMA(1940~1980MHz)TestResult

SN	Freq [MHz]	Vcc [V]	Icc [mA]	Gain [dB]	OIP3 [dBm] <sup>(1)</sup>	P1dB [dBm]	IRL [dB]	ORL [dB]	NF [dB]
	1960	5	90	17.1	38.3	23.6	-21	-19	4.7

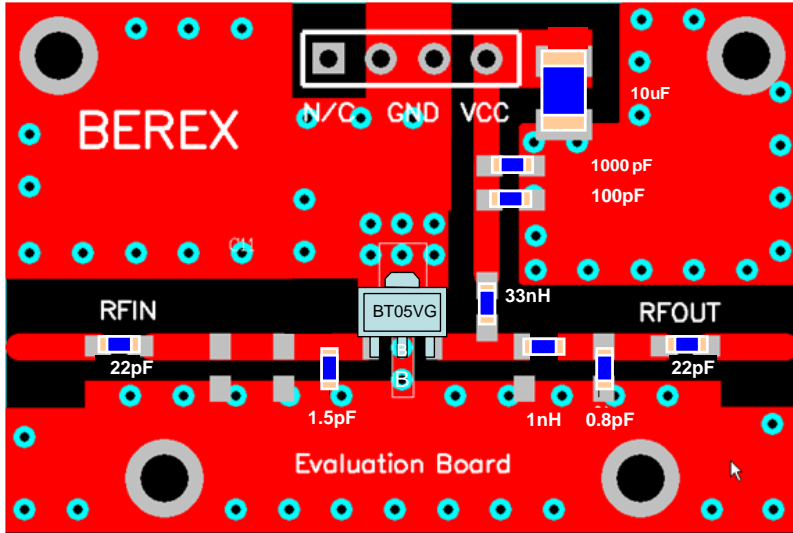
(1) OIP3 was tested @Pout=10dBm/tone 1MHz offset



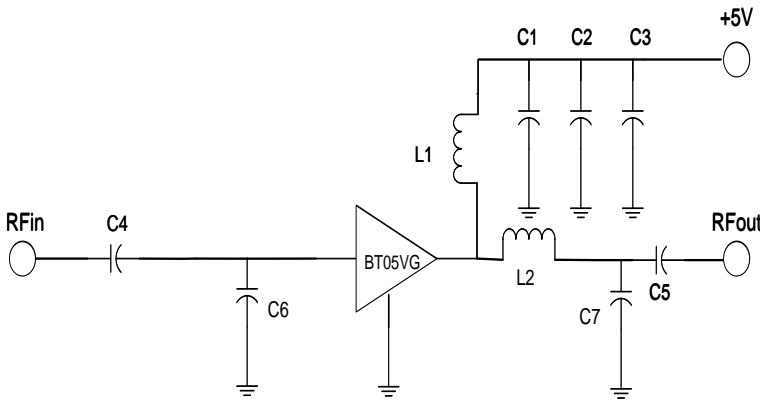
3.2BT05VG\_WCDMA(1940~1980MHz) ACLR



4. BT05VG\_WCDMA(2130~2170MHz) Application Note



Ref. Des.	Description/ Part Number	Values	Vendor
C1	0603 CAP	100pF	Samsung
C2	604 CAP	1000pF	Samsung
C3	A3216 CAP	10uF	AVX
C4	0603 CAP	22pF	Samsung
C5	0603 CAP	22pF	Samsung
C6	0603 CAP	1.5pF	Samsung
C7	0603 CAP	0.8pF	Samsung
C8	0603 CAP	NA	
C9	0603 CAP	NA	
C10	0603 CAP	NA	
C11	0603 CAP	NA	
C12	0603 CAP	NA	
L1	0603 IND	33nH	Ceratech
L2	0603 IND	1nH	Ceratech
L3	0603 IND	NA	
R1	0603 RES	NA	
U1	SOT89 PKG	BT05VG	BEREX



Note:

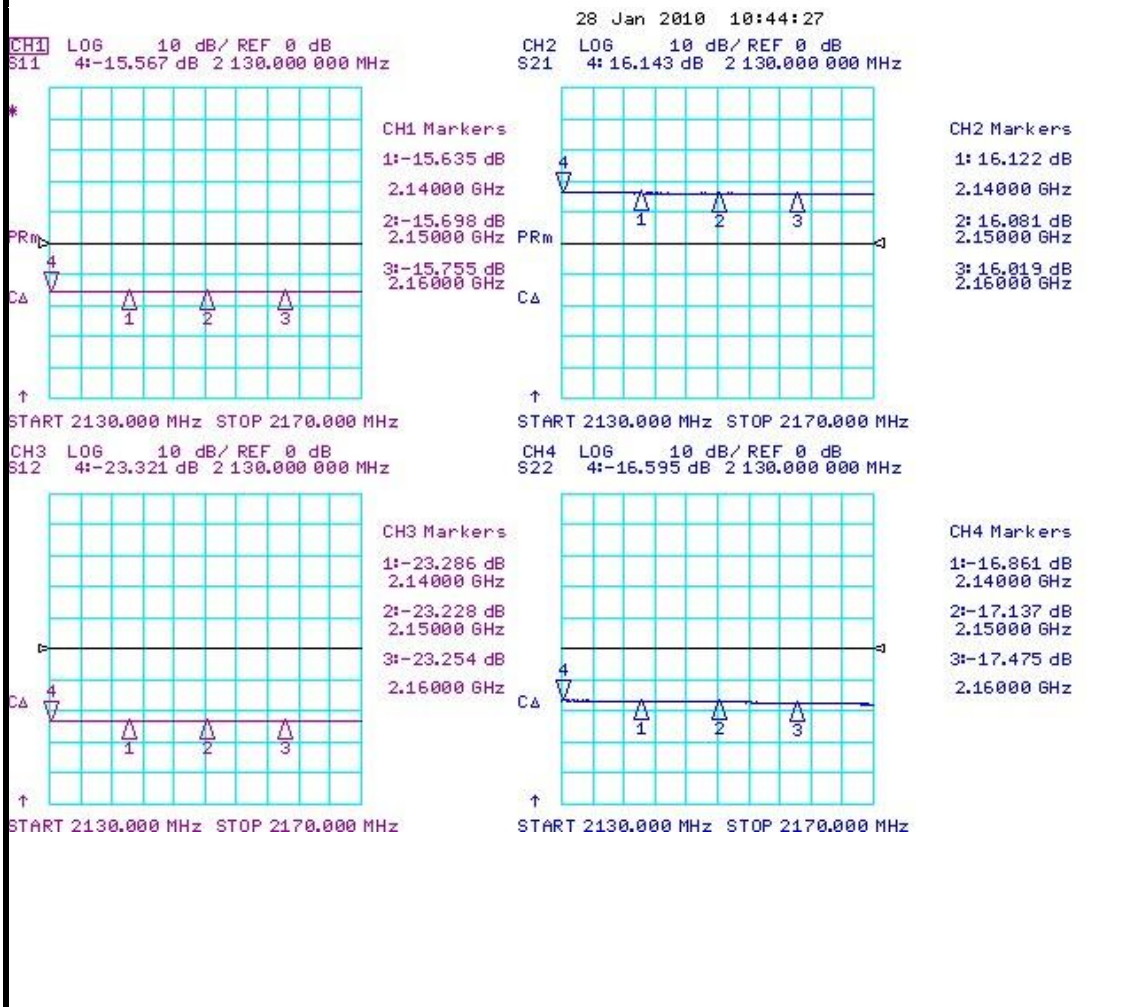
1. PCB: 31mil thick FR4
2. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG is 1.2mm
3. The distance between the center of the shunt cap(C7) and the Output Pin of BT05VG is 5.6mm
4. The distance between the center of the series Inductor(L2) and the Output Pin of BT05VG is 3.0mm

TITLE	
BT05VG Evaluation Board	
(2130~2170 MHz)	
Drawing Number	Rev.
Date	Drawn By
FILE NAME	SHEET

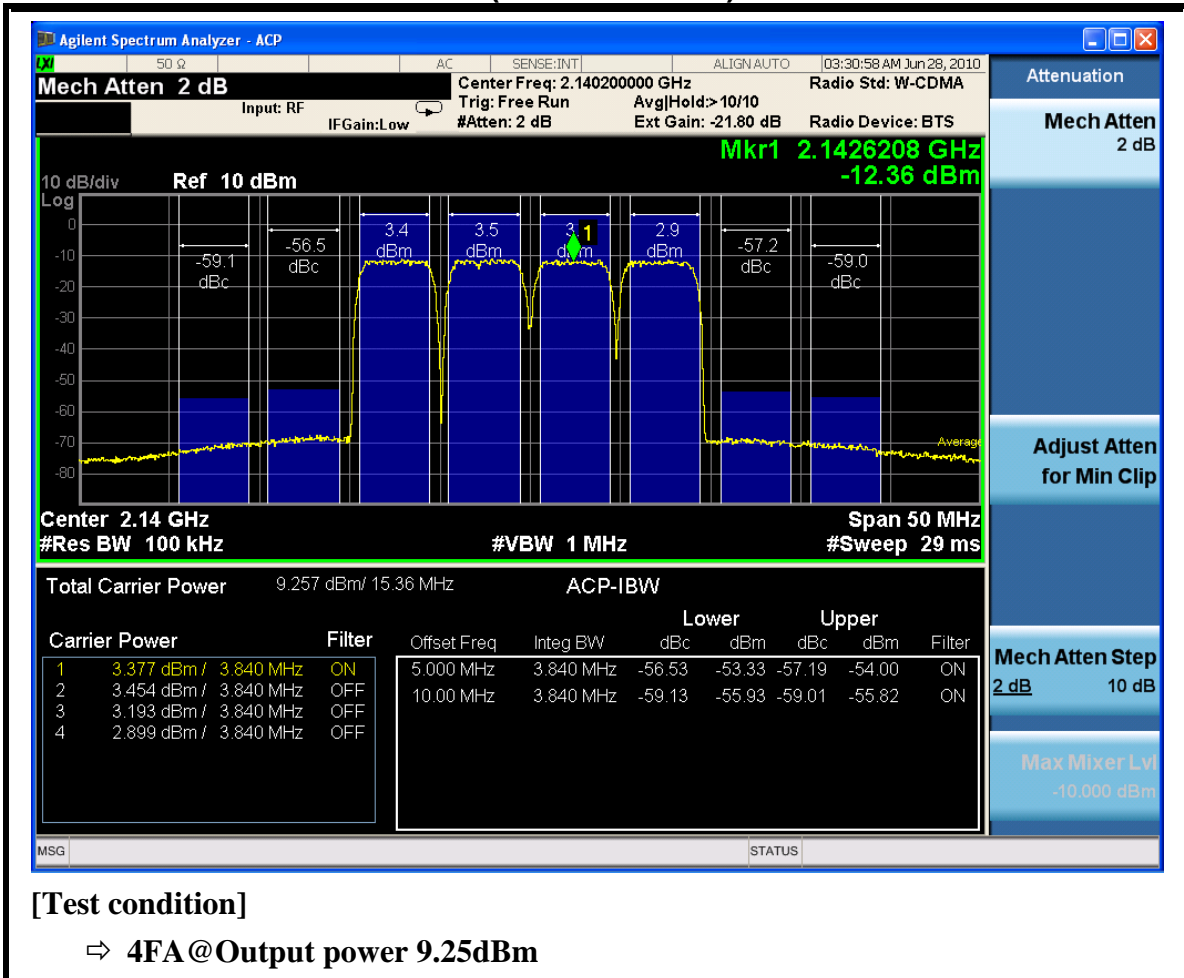
4.1 BT05VG\_WCDMA(2130~2170MHz) Test Result

SN	Freq [MHz]	Vcc [V]	Icc [mA]	Gain [dB]	OIP3 [dBm] <sup>(1)</sup>	P1dB [dBm]	IRL [dB]	ORL [dB]	NF [dB]
	2150	5	87	16	37	23	-15	-17	4.8

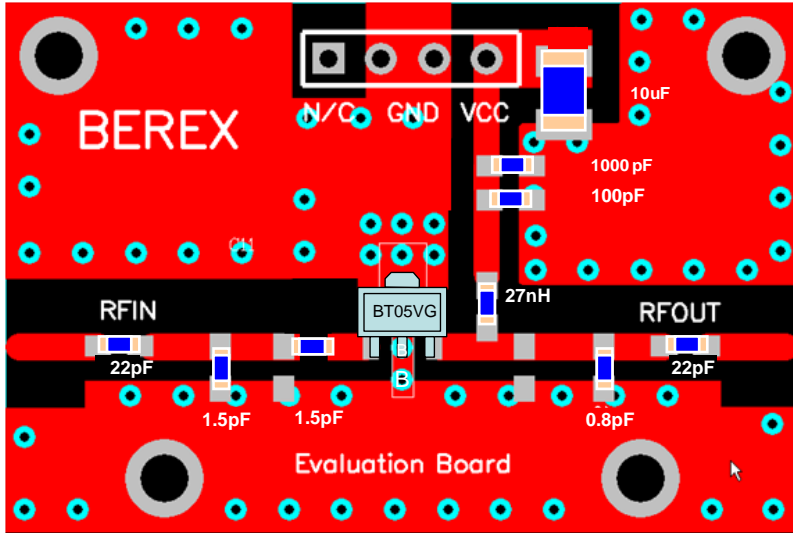
(1) OIP3 was tested @Pout=10dBm/tone 1MHz offset



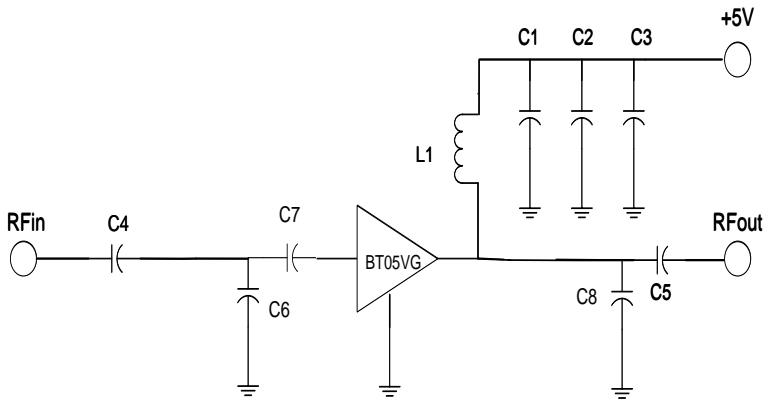
4.2BT05VG\_WCDMA(2130~2170MHz) ACLR



5. BT05VG\_WIBRO(2300~2360MHz) Application Note



Ref. Des.	Description/ Part Number	Values	Vendor
C1	0603 CAP	100pF	Samsung
C2	604 CAP	1000pF	Samsung
C3	A3216 CAP	10uF	AVX
C4	0603 CAP	22pF	Samsung
C5	0603 CAP	22pF	Samsung
C6	0603 CAP	1.5pF	Samsung
C7	0603 CAP	1.5pF	Samsung
C8	0603 CAP	0.8pF	Samsung
C9	0603 CAP	NA	
C10	0603 CAP	NA	
C11	0603 CAP	NA	
C12	0603 CAP	NA	
L1	0603 IND	27nH	Ceratech
L2	0603 IND	NA	
L3	0603 IND	NA	
R1	0603 RES	NA	
U1	SOT89 PKG	BT05VG	BEREX



Note:

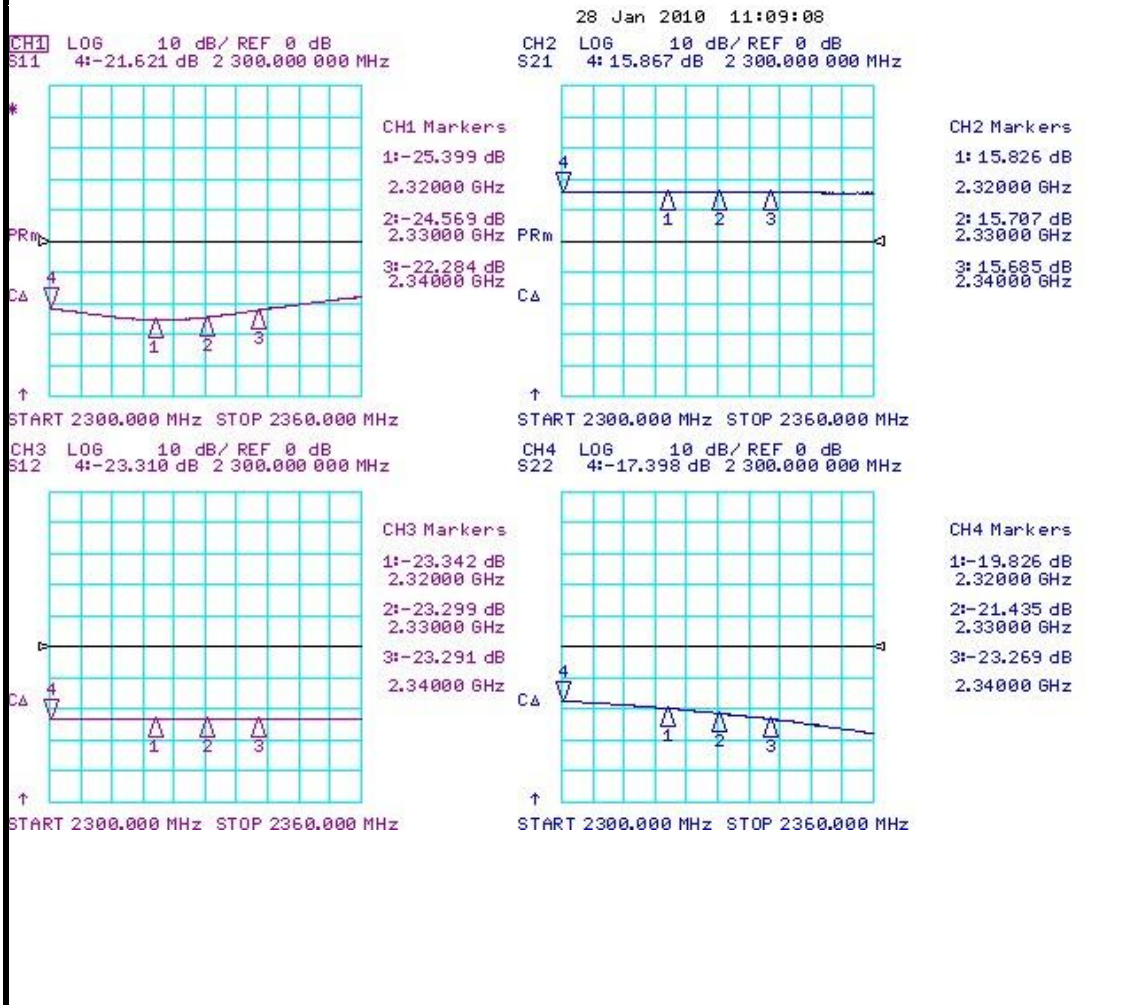
1. PCB: 31mil thick FR4
2. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG is 7.5mm
3. The distance between the center of the series cap(C7) and the Input Pin of BT05VG is 2.2mm
4. The distance between the center of the shunt cap(C8) and the Input Pin of BT05VG is 7.7mm

TITLE	
BT05VG Evaluation Board	
(2300~2360 MHz)	
Drawing Number	Rev.
Date	Drawn By
FILE NAME	SHEET

5.1 BT05VG\_WIBRO(2300~2360MHz) Test Result

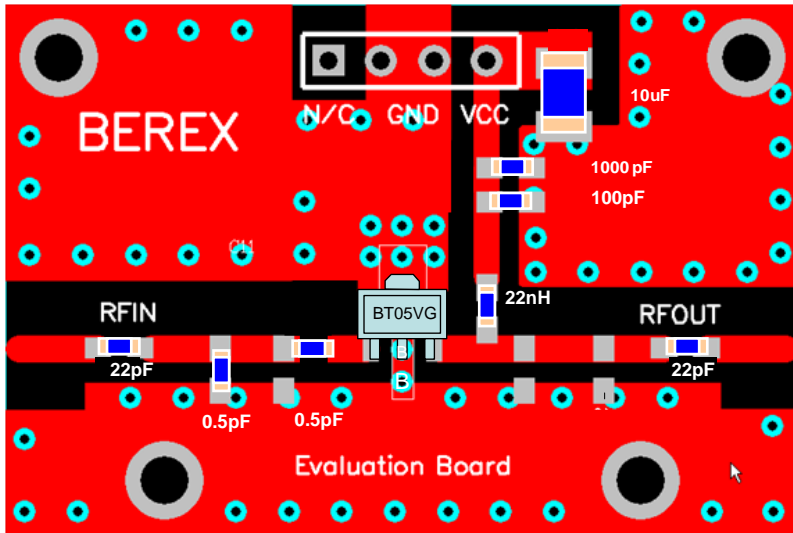
SN	Freq [MHz]	Vcc [V]	Icc [mA]	Gain [dB]	OIP3 [dBm] <sup>(1)</sup>	P1dB [dBm]	IRL [dB]	ORL [dB]	NF [dB]
	2330	5	92	15.7	40.2	23.3	-24	-21	4.9

(1) OIP3 was tested @Pout=10dBm/tone 1MHz offset

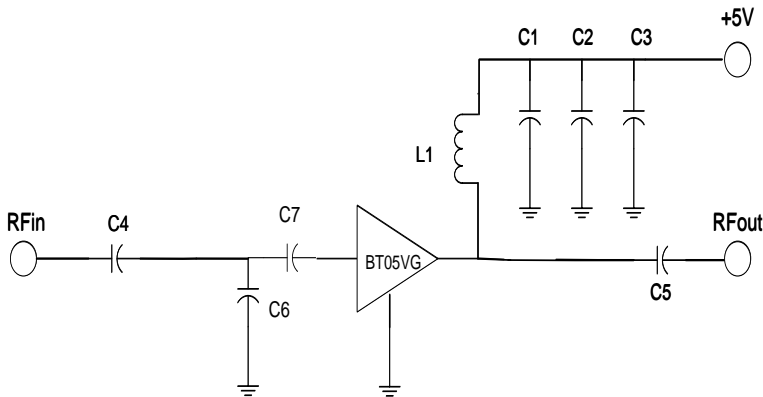




6. BT05VG\_3500MHz Application Note



Ref. Des.	Description/ Part Number	Values	Vendor
C1	0603 CAP	100pF	Samsung
C2	604 CAP	1000pF	Samsung
C3	A3216 CAP	10uF	AVX
C4	0603 CAP	22pF	Samsung
C5	0603 CAP	22pF	Samsung
C6	0603 CAP	0.5pF	Samsung
C7	0603 CAP	0.5pF	Samsung
C8	0603 CAP	NA	
C9	0603 CAP	NA	
C10	0603 CAP	NA	
C11	0603 CAP	NA	
C12	0603 CAP	NA	
L1	0603 IND	22nH	Ceratech
L2	0603 IND	NA	
L3	0603 IND	NA	
R1	0603 RES	NA	
U1	SOT89 PKG	BT05VG	BEREX



Note:

1. PCB: 31mil thick FR4
2. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG is 6.3mm
3. The distance between the center of the series cap(C7) and the Input Pin of BT05VG is 2.1mm

TITLE	
BT05VG Evaluation Board	
(3500 MHz)	
Drawing Number	Rev.
Date	Drawn By
FILE NAME	SHEET

6.1 BT05VG\_3500MHz Test Result

SN	Freq [MHz]	Vcc [V]	Icc [mA]	Gain [dB]	OIP3 [dBm] <sup>(1)</sup>	P1dB [dBm]	IRL [dB]	ORL [dB]	NF [dB]
	3500	5	88	12.2	40.3	23.3	-16.7	-22.9	4.8

(1) OIP3 was tested @Pout=10dBm/tone 1MHz offset

