

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 BT05VG2

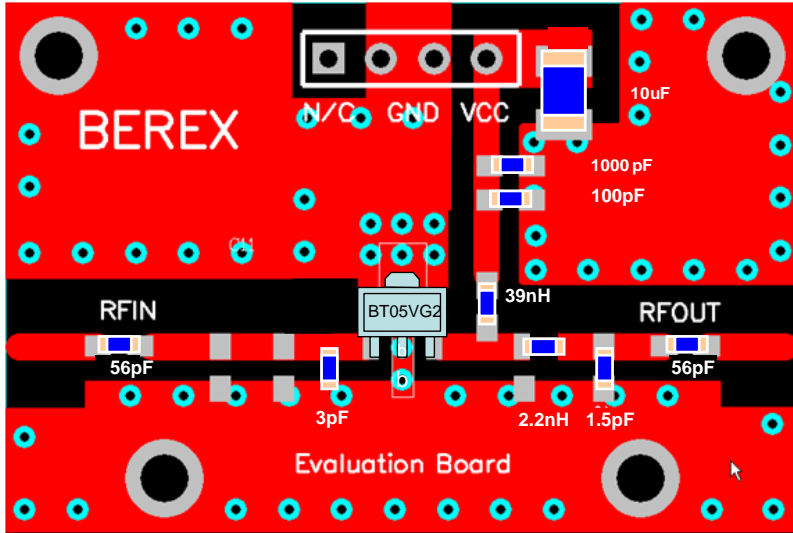
Application Note



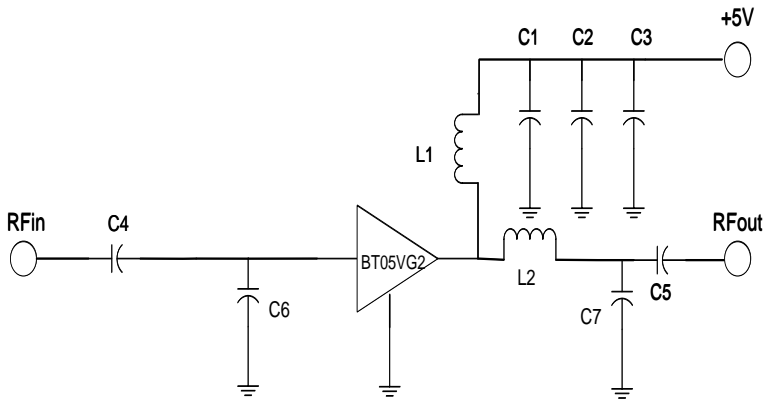
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1. BT05VG2_PCS(1750~1780MHz) Application Note



| 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 | 56pF | Samsung |
| C5 | 0603 CAP | 56pF | Samsung |
| C6 | 0603 CAP | 3pF | 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 | BT05VG2 | BEREX |
| | | | |
| | | | |



Note:

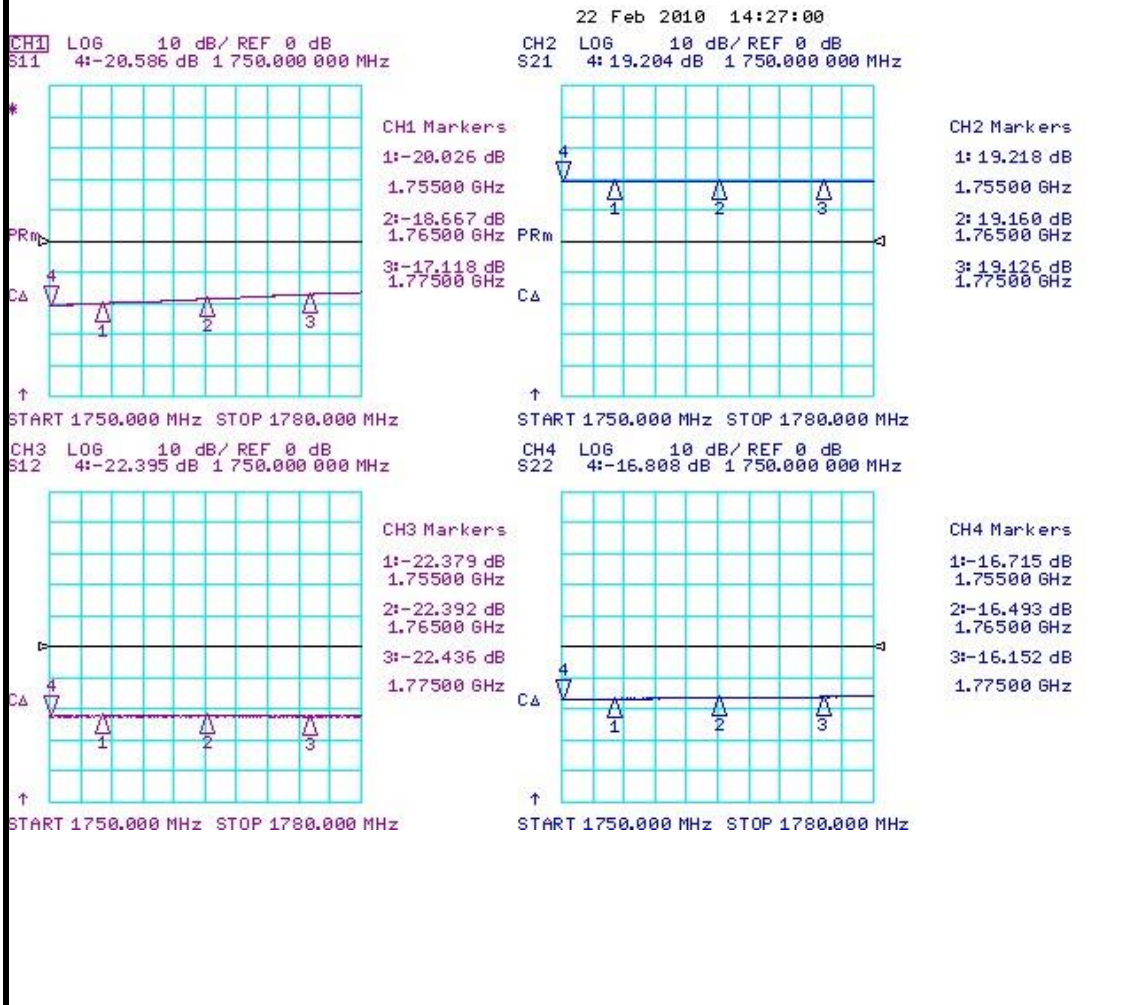
1. PCB: 31mil thick FR4
2. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG2 is 1.5mm
3. The distance between the center of the shunt cap(C7) and the Output Pin of BT05VG2 is 7.7mm
4. The distance between the center of the series Inductor(L2) and the Output Pin of BT05VG2 is 3.3mm

| TITLE | |
|--------------------------|----------|
| BT05VG2 Evaluation Board | |
| (1740~1790 MHz) | |
| Drawing Number | Rev. |
| | |
| Date | Drawn By |
| | |
| FILE NAME | SHEET |
| | |

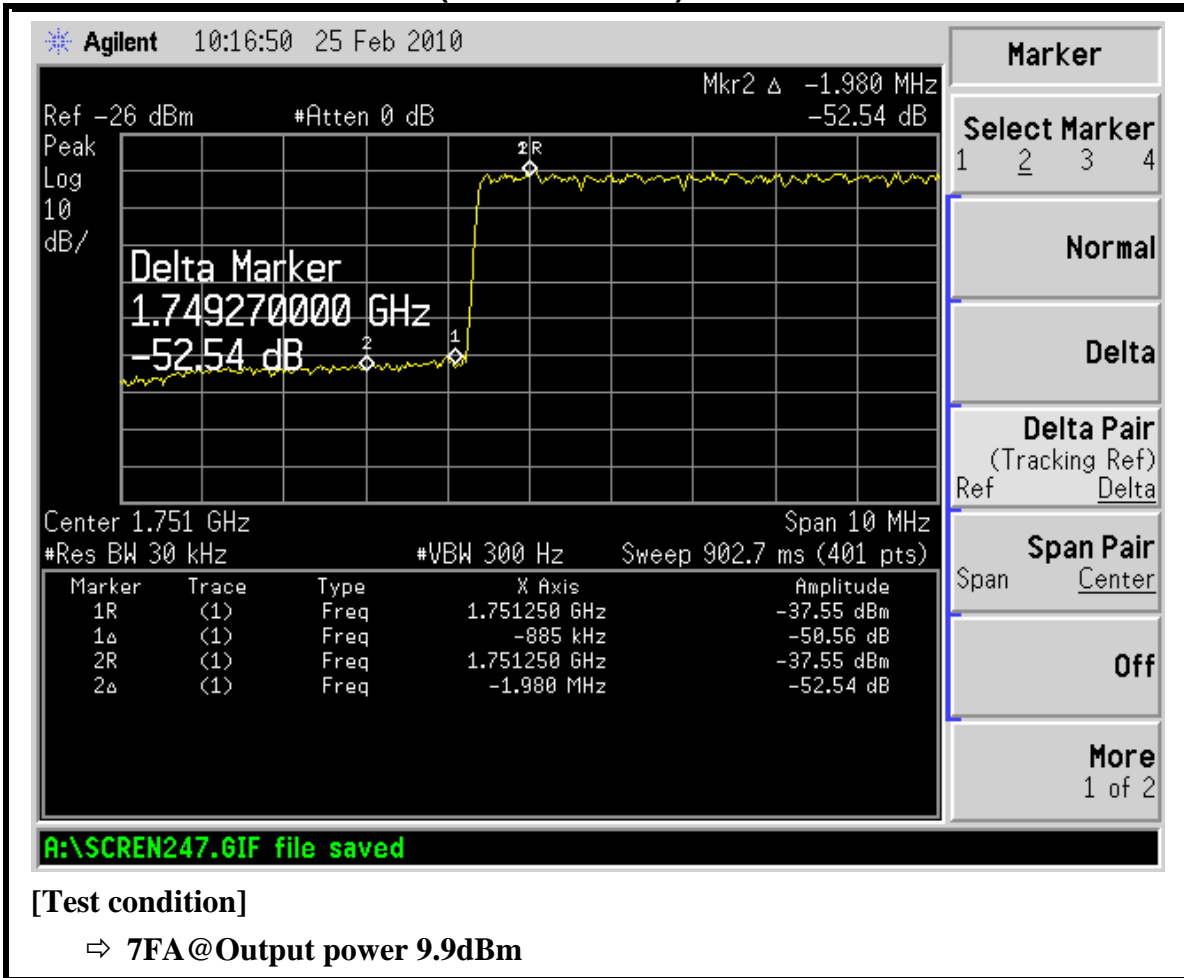
1.1 BT05VG2_PCS(1750~1780MHz) Test Result

| SN | Freq [MHz] | Vcc [V] | Icc [mA] | Gain [dB] | OIP3 [dBm] ⁽¹⁾ | P1dB [dBm] | IRL [dB] | ORL [dB] | NF [dB] |
|----|------------|---------|----------|-----------|---------------------------|------------|----------|----------|---------|
| | 1765 | 5 | 87 | 19.1 | 42.5 | 22.9 | -18 | -16 | 3.9 |

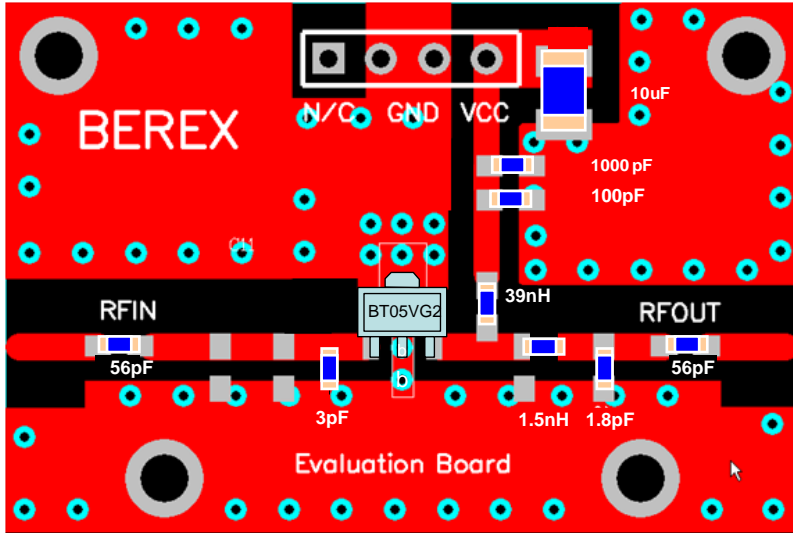
(1) OIP3 was tested @Pout=11dBm/tone 1MHz offset



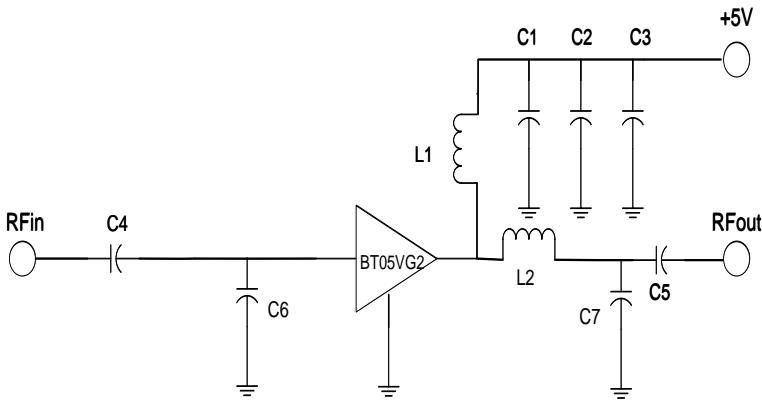
1.2BT05VG2_PCS(1750~1780MHz) SPURIOUS



2. BT05VG2_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 | 56pF | Samsung |
| C5 | 0603 CAP | 56pF | Samsung |
| C6 | 0603 CAP | 3pF | Samsung |
| C7 | 0603 CAP | 1.8pF | Samsung |
| C8 | 0603 CAP | NA | |
| C9 | 0603 CAP | NA | |
| C10 | 0603 CAP | NA | |
| C11 | 0603 CAP | NA | |
| C12 | 0603 CAP | NA | |
| L1 | 0603 IND | 39nH | Ceratech |
| L2 | 0603 IND | 1.5nH | Ceratech |
| L3 | 0603 IND | NA | |
| R1 | 0603 RES | NA | |
| U1 | SOT89 PKG | BT05VG2 | BEREX |
| | | | |
| | | | |



Note:

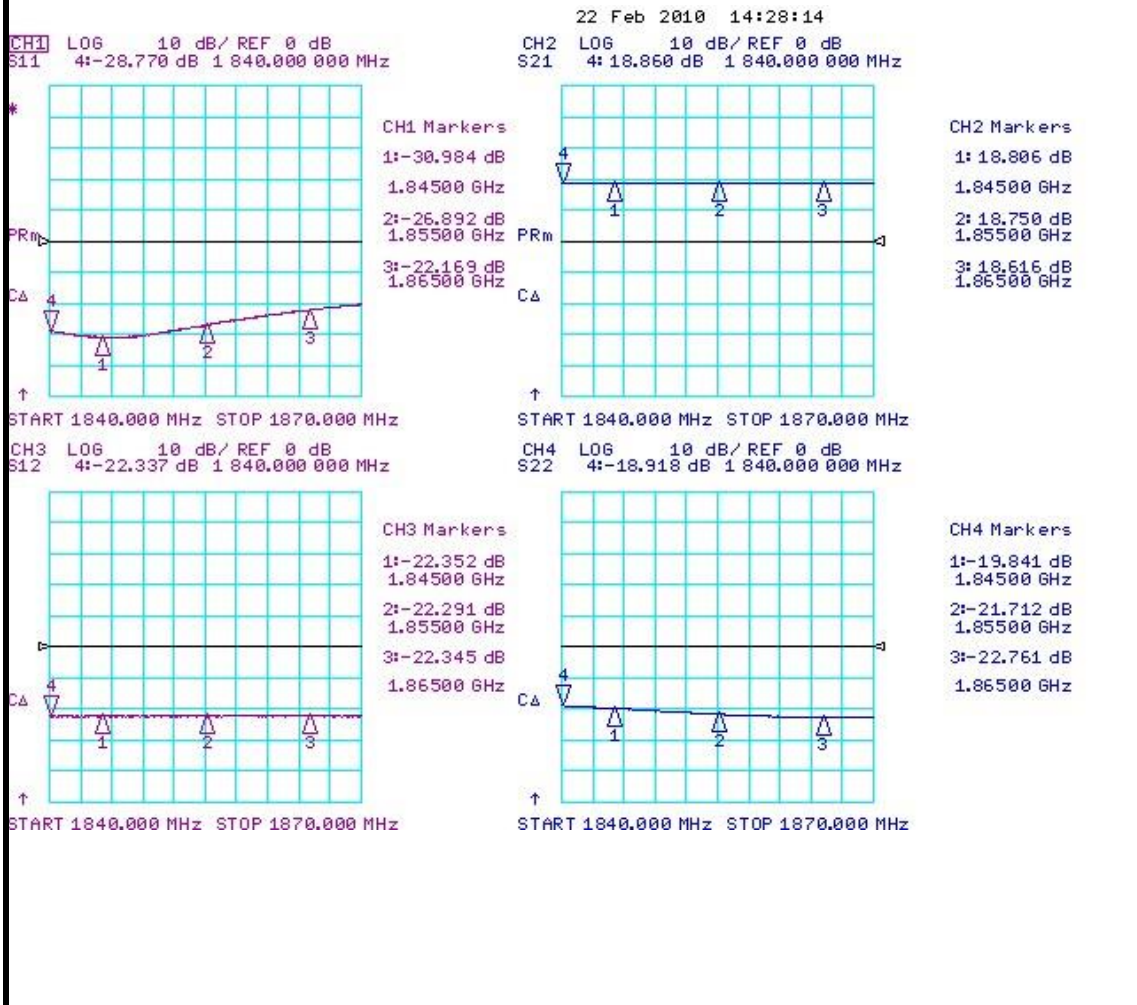
1. PCB: 31mil thick FR4
2. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG2 is 1.0mm
3. The distance between the center of the shunt cap(C7) and the Output Pin of BT05VG2 is 9.5mm
4. The distance between the center of the series Inductor(L2) and the Output Pin of BT05VG2 is 3.3mm

| TITLE | |
|--------------------------|----------|
| BT05VG2 Evaluation Board | |
| (1840~1870 MHz) | |
| Drawing Number | Rev. |
| | |
| Date | Drawn By |
| | |
| FILE NAME | SHEET |
| | |

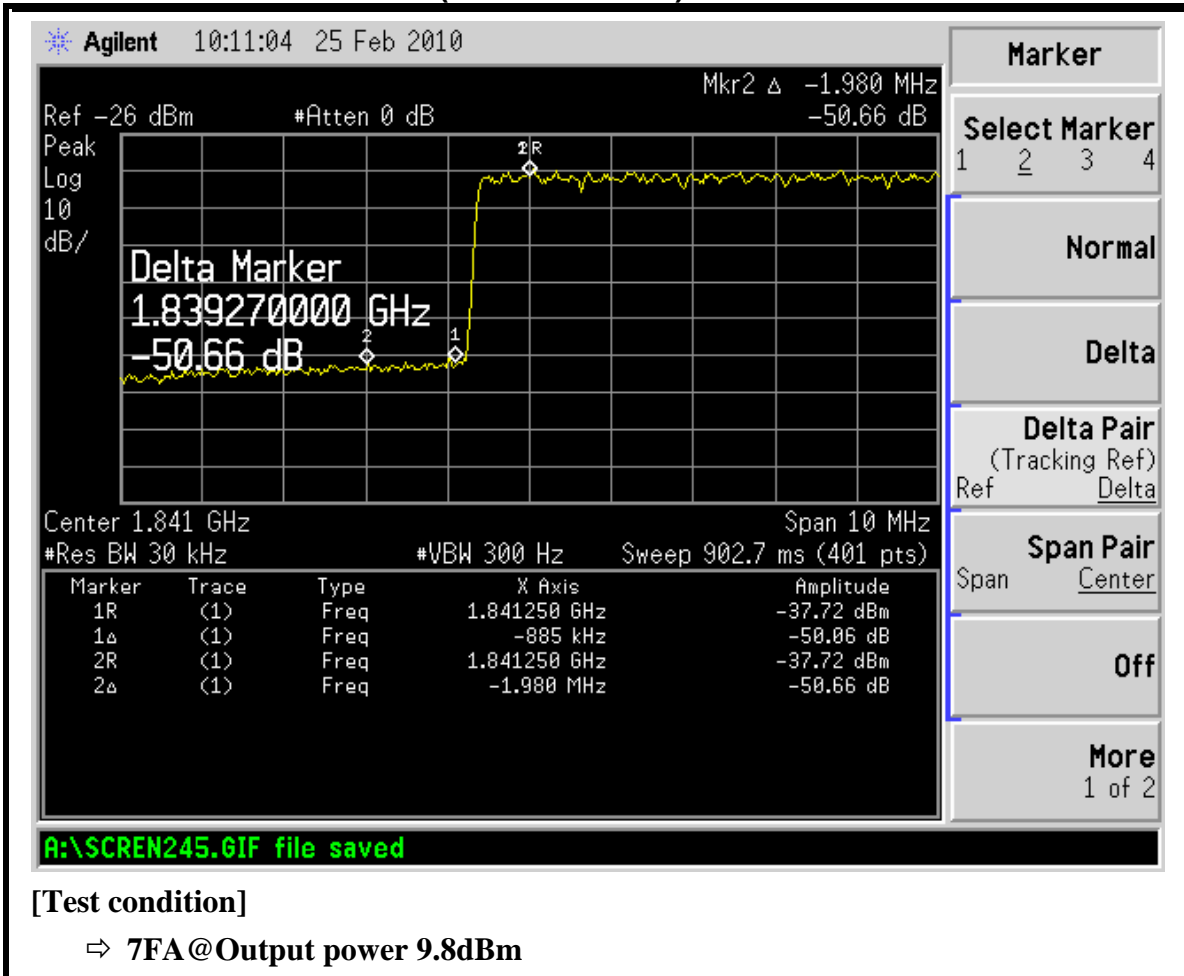
2.1 BT05VG2_PCS(1840~1870MHz)Test Result

| SN | Freq [MHz] | Vcc [V] | Icc [mA] | Gain [dB] | OIP3 [dBm] ⁽¹⁾ | P1dB [dBm] | IRL [dB] | ORL [dB] | NF [dB] |
|----|------------|---------|----------|-----------|---------------------------|------------|----------|----------|---------|
| | 1855 | 5 | 87 | 18.7 | 42 | 22.2 | -26 | -21 | 3.9 |

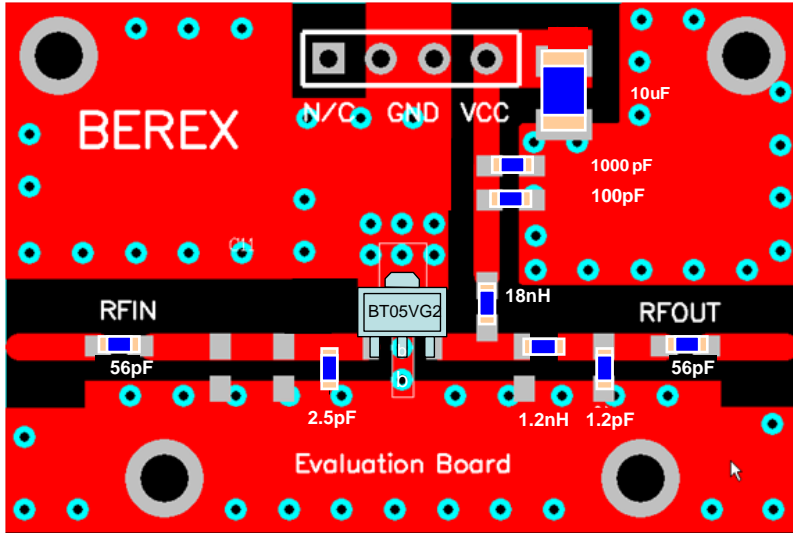
(1) OIP3 was tested @Pout=11dBm/tone 1MHz offset



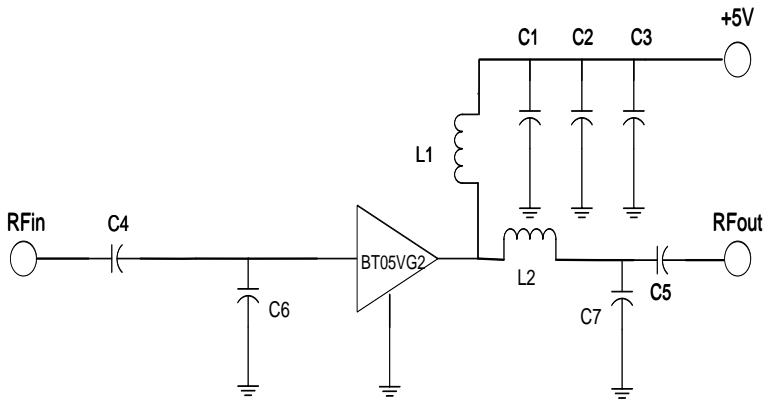
2.2BT05VG2_PCS(1840~1870MHz) SPURIOUS



3. BT05VG2_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 | 56pF | Samsung |
| C5 | 0603 CAP | 56pF | Samsung |
| C6 | 0603 CAP | 2.5pF | Samsung |
| C7 | 0603 CAP | 1.2pF | Samsung |
| C8 | 0603 CAP | NA | |
| C9 | 0603 CAP | NA | |
| C10 | 0603 CAP | NA | |
| C11 | 0603 CAP | NA | |
| C12 | 0603 CAP | NA | |
| L1 | 0603 IND | 18nH | Ceratech |
| L2 | 0603 IND | 1.2nH | Ceratech |
| L3 | 0603 IND | NA | |
| R1 | 0603 RES | NA | |
| U1 | SOT89 PKG | BT05VG2 | BEREX |
| | | | |
| | | | |



Note:

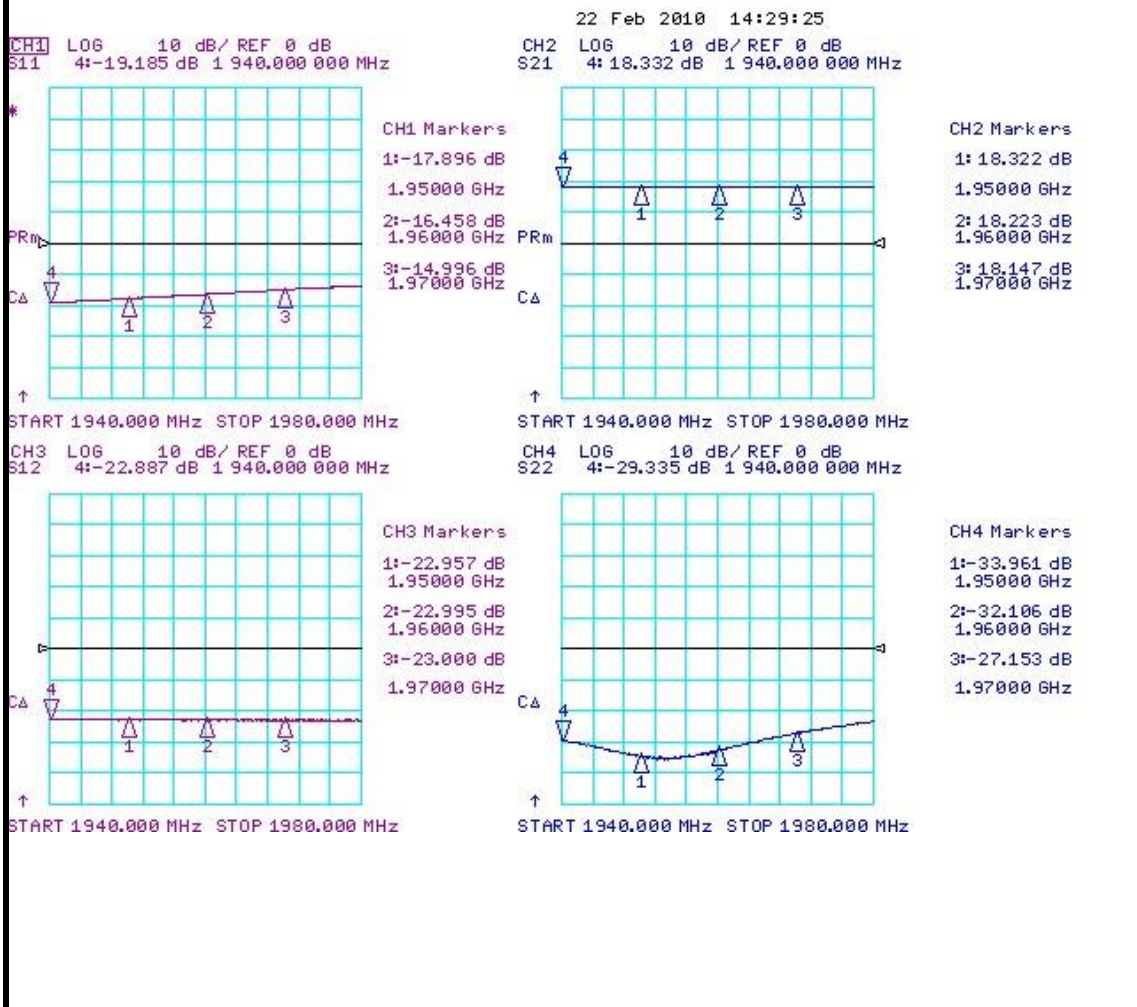
1. PCB: 31mil thick FR4
2. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG2 is 1.0mm
3. The distance between the center of the shunt cap(C7) and the Output Pin of BT05VG2 is 10.3mm
4. The distance between the center of the series Inductor(L2) and the Output Pin of BT05VG2 is 3.3mm

| TITLE | |
|--------------------------|----------|
| BT05VG2 Evaluation Board | |
| (1940~1980 MHz) | |
| Drawing Number | Rev. |
| | |
| Date | Drawn By |
| | |
| FILE NAME | SHEET |
| | |

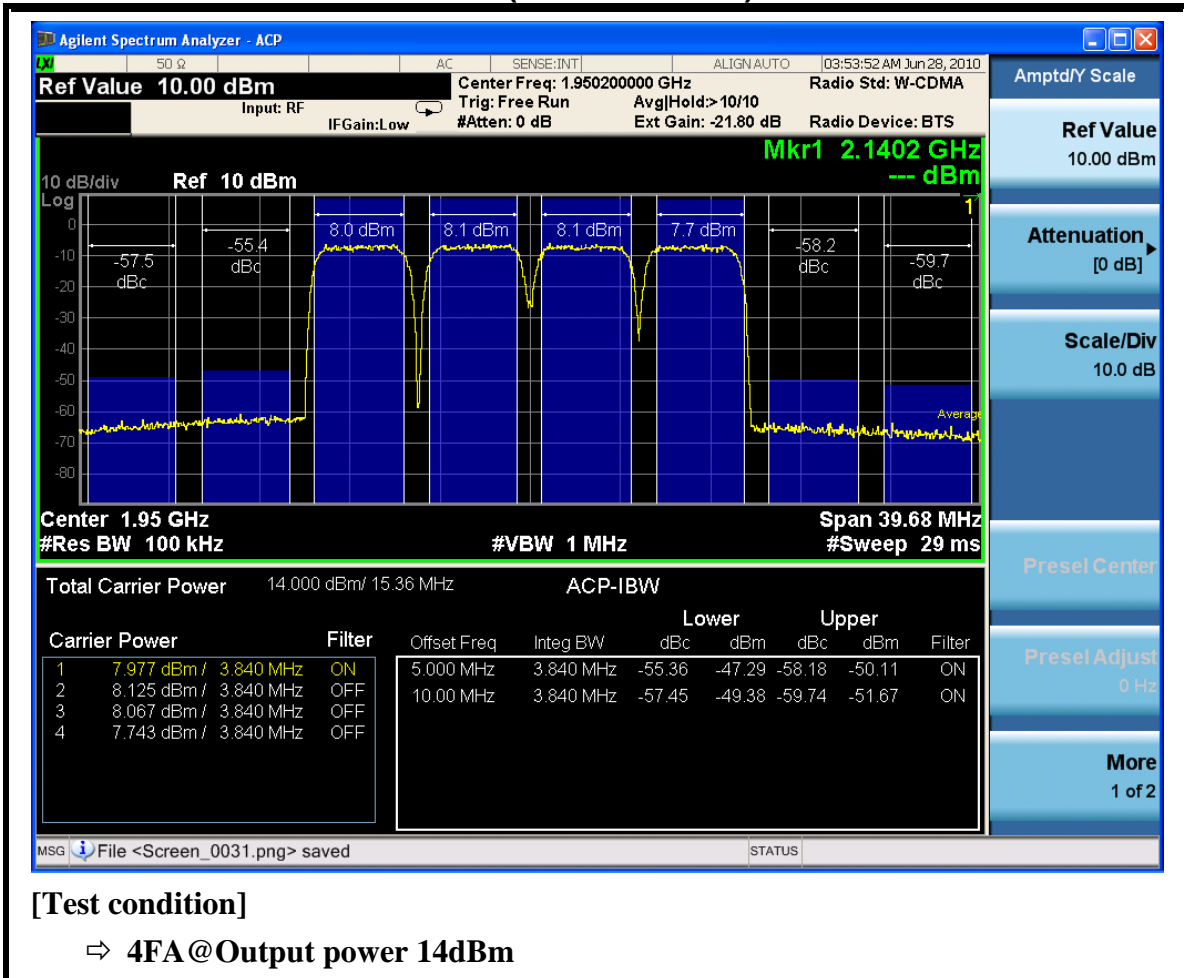
3.1 BT05VG2_WCDMA(1940~1980MHz)TestResult

| SN | Freq [MHz] | Vcc [V] | Icc [mA] | Gain [dB] | OIP3 [dBm] ⁽¹⁾ | P1dB [dBm] | IRL [dB] | ORL [dB] | NF [dB] |
|----|------------|---------|----------|-----------|---------------------------|------------|----------|----------|---------|
| | 1960 | 5 | 93 | 18.2 | 41.5 | 22.9 | -16 | -32 | 4.0 |

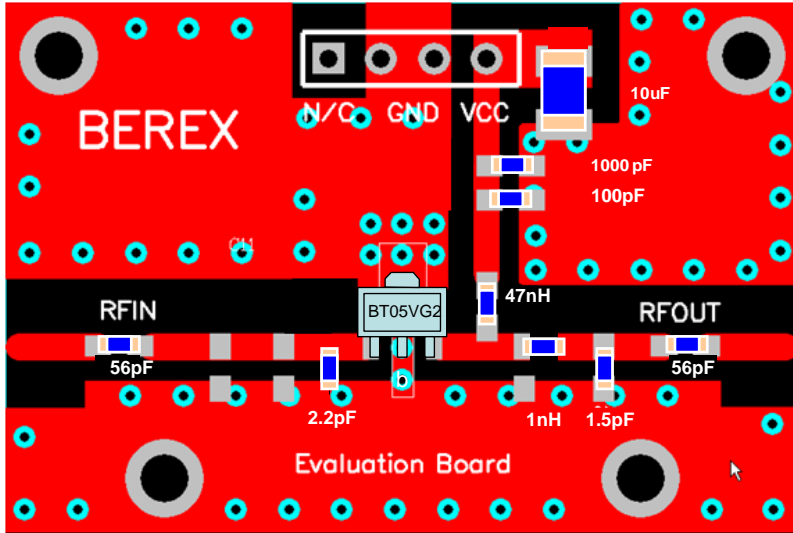
(1) OIP3 was tested @Pout=11dBm/tone 1MHz offset



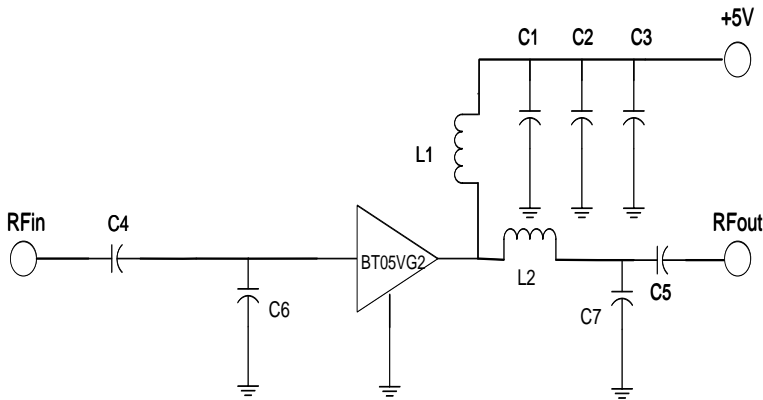
3.2BT05VG2_WCDMA(1940~1980MHz) ACLR



4. BT05VG2_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 | 56pF | Samsung |
| C5 | 0603 CAP | 56pF | Samsung |
| C6 | 0603 CAP | 2.2pF | 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 | 47nH | Ceratech |
| L2 | 0603 IND | 1nH | Ceratech |
| L3 | 0603 IND | NA | |
| R1 | 0603 RES | NA | |
| U1 | SOT89 PKG | BT05VG2 | BEREX |
| | | | |
| | | | |



Note:

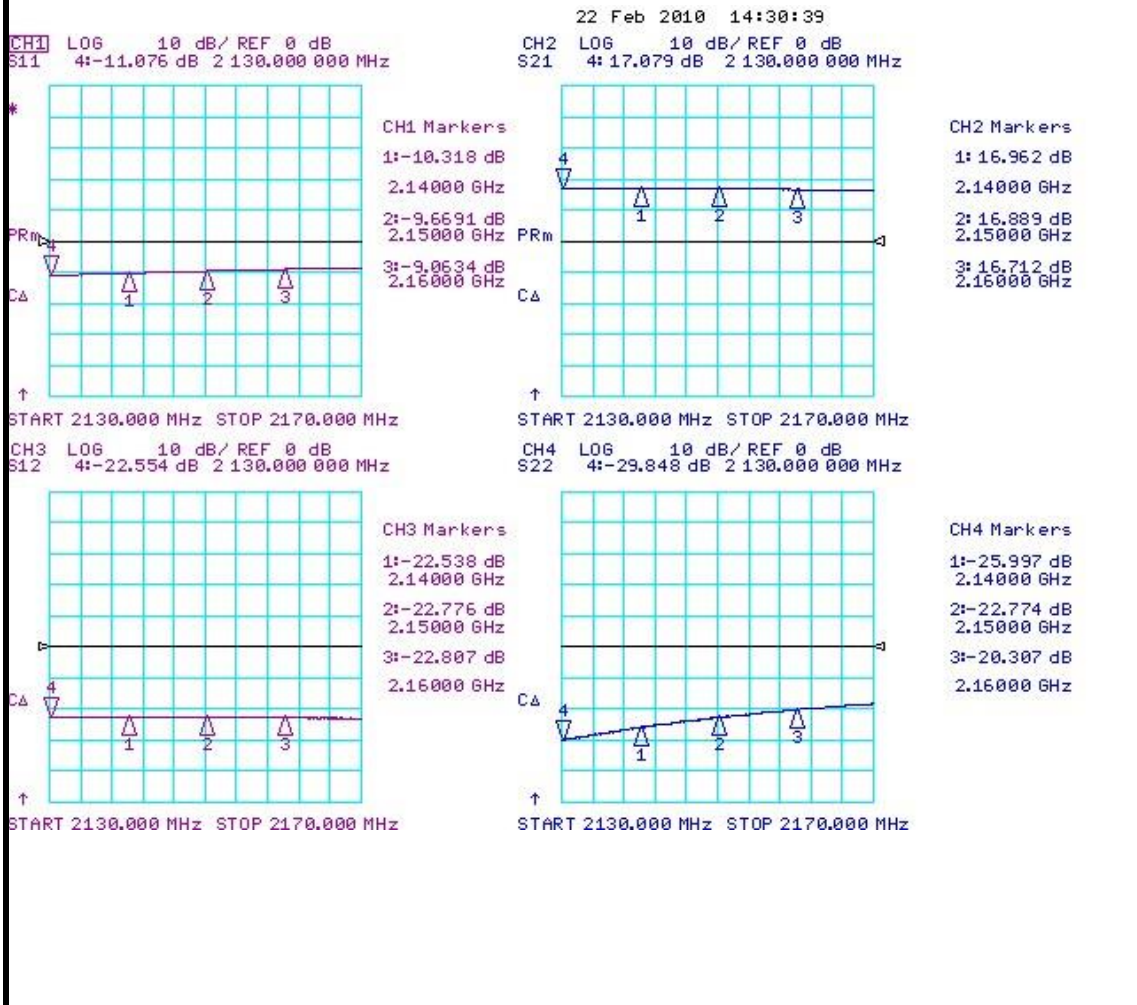
1. PCB: 31mil thick FR4
2. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG2 is 1.0mm
3. The distance between the center of the shunt cap(C7) and the Output Pin of BT05VG2 is 7.6mm
4. The distance between the center of the series Inductor(L2) and the Output Pin of BT05VG2 is 3.3mm

| | |
|--------------------------|----------|
| TITLE | |
| BT05VG2 Evaluation Board | |
| (2130~2170 MHz) | |
| Drawing Number | Rev. |
| Date | Drawn By |
| FILE NAME | SHEET |
| | |

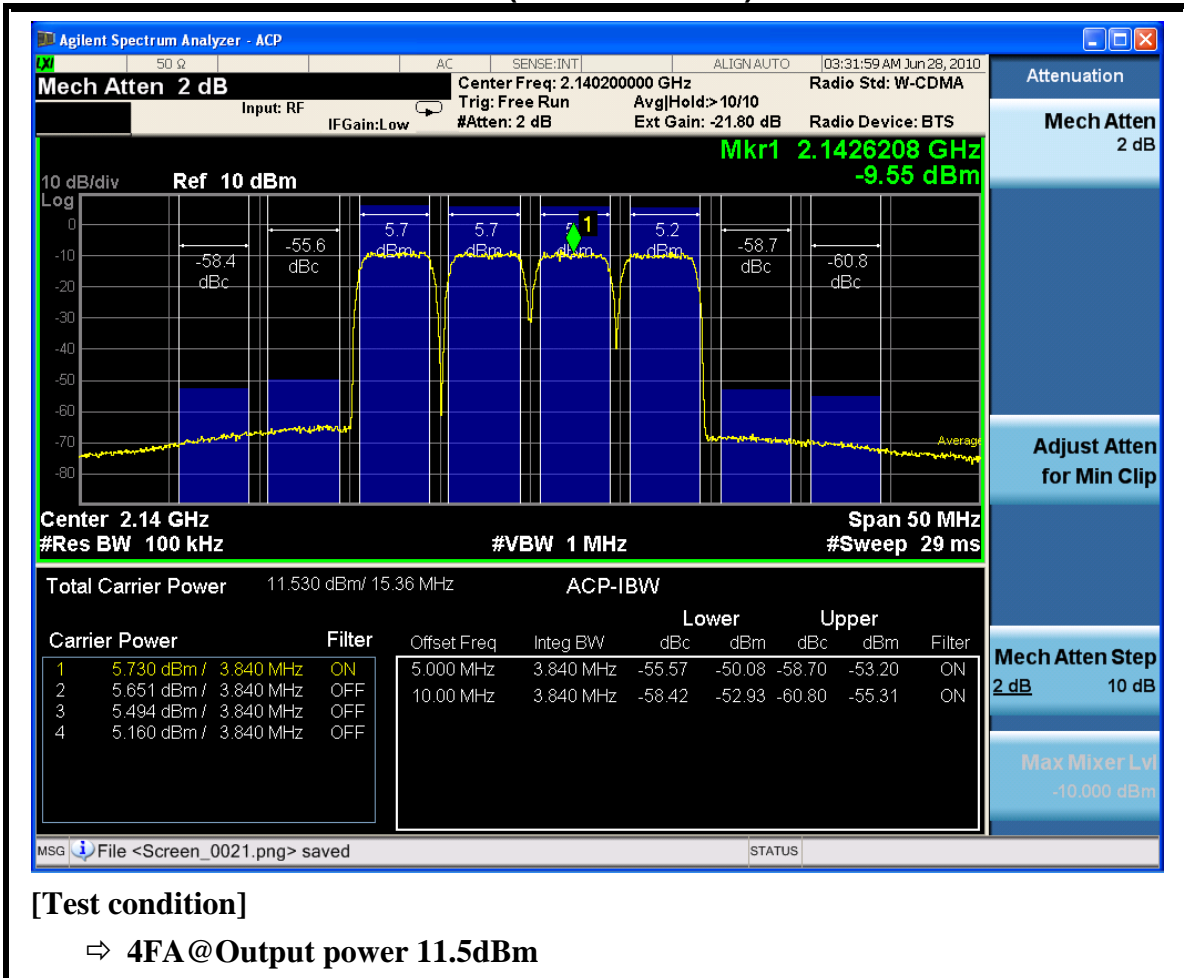
4.1 BT05VG2_WCDMA(2130~2170MHz) Test Result

| SN | Freq [MHz] | Vcc [V] | Icc [mA] | Gain [dB] | OIP3 [dBm] ⁽¹⁾ | P1dB [dBm] | IRL [dB] | ORL [dB] | NF [dB] |
|----|------------|---------|----------|-----------|---------------------------|------------|----------|----------|---------|
| | 2150 | 5 | 82 | 16.8 | 39 | 22.5 | -9.6 | -22.7 | 4.1 |

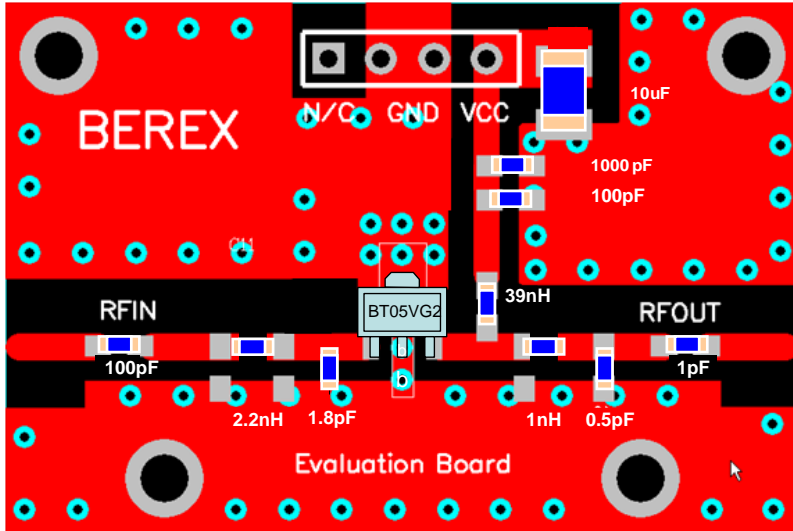
(1) OIP3 was tested @Pout=11dBm/tone 1MHz offset



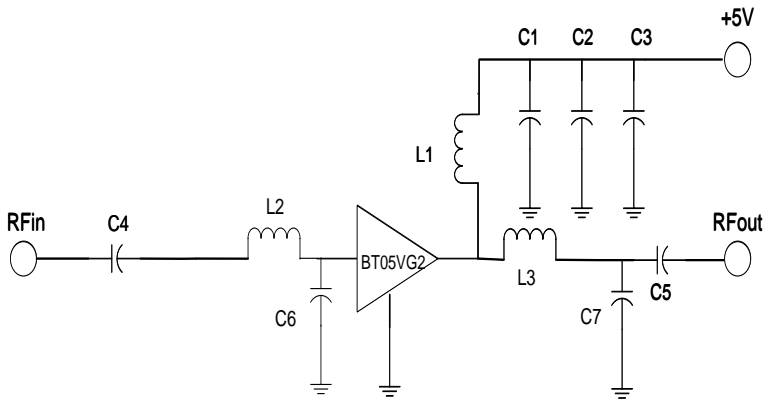
4.2 BT05VG2_WCDMA(2130~2170MHz) ACLR



5. BT05VG2_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 | 100pF | Samsung |
| C5 | 0603 CAP | 1pF | Samsung |
| C6 | 0603 CAP | 1.8pF | Samsung |
| C7 | 0603 CAP | 0.5pF | Samsung |
| C8 | 0603 CAP | NA | Samsung |
| 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 | |
| L3 | 0603 IND | 1nH | |
| R1 | 0603 RES | NA | |
| U1 | SOT89 PKG | BT05VG2 | BEREX |



Note:_PCB: 31mil thick FR4

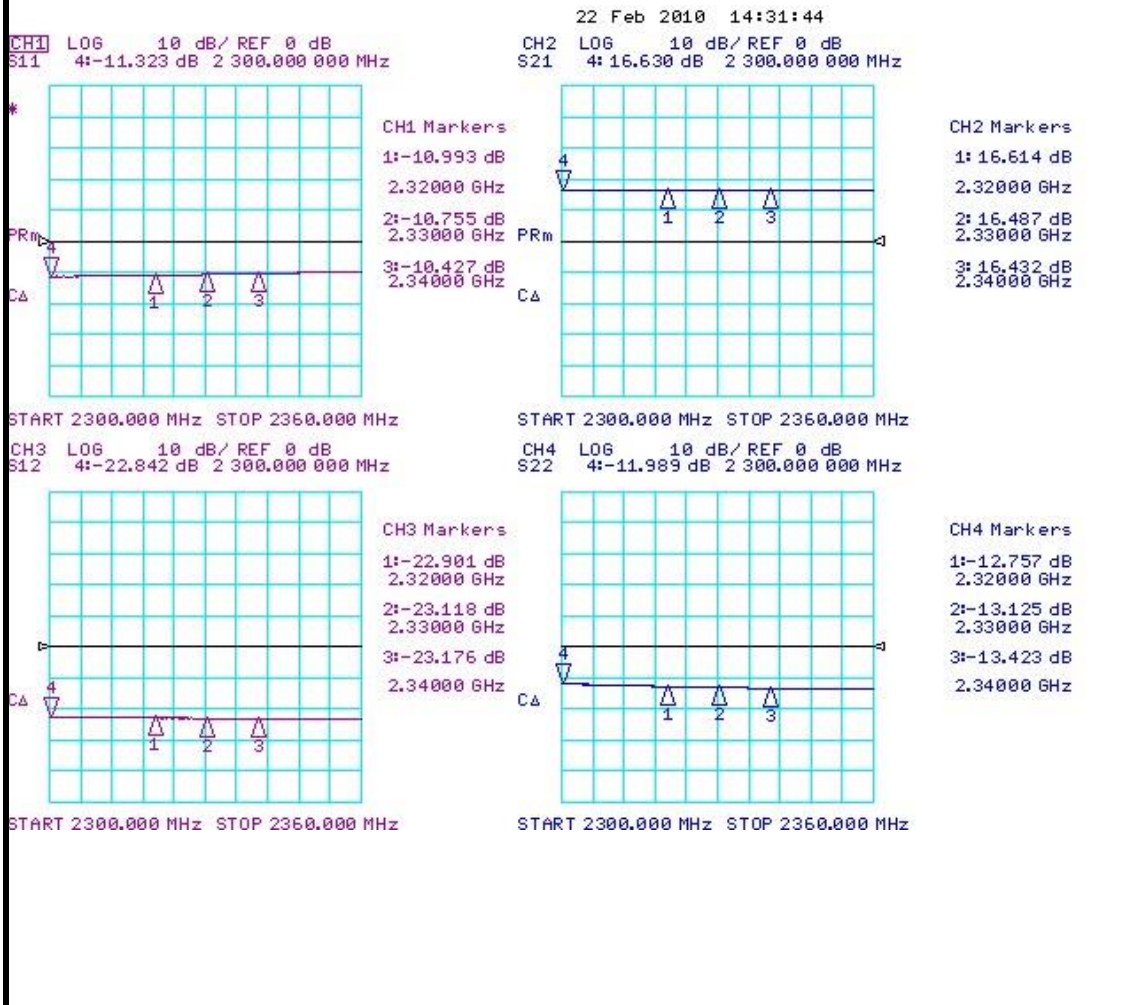
1. The distance between the center of the shunt cap(C6) and the Input Pin of BT05VG2 is 1.0mm
2. The distance between the center of the shunt cap(C7) and the Output Pin of BT05VG2 is 6.1mm
3. The distance between the center of the series Inductor(L2) and the Input Pin of BT05VG2 is 2.5mm
4. The distance between the center of the series Inductor(L3) and the Output Pin of BT05VG2 is 3.3mm

| TITLE | |
|--------------------------|----------|
| BT05VG2 Evaluation Board | |
| (2300~2360 MHz) | |
| Drawing Number | Rev. |
| Date | Drawn By |
| FILE NAME | SHEET |

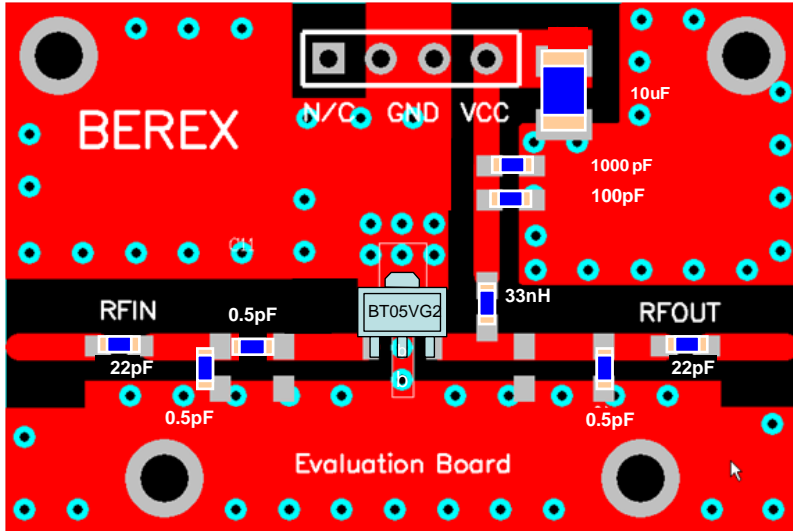
5.1 BT05VG2_WIBRO(2300~2360MHz) Test Result

| SN | Freq [MHz] | Vcc [V] | Icc [mA] | Gain [dB] | OIP3 [dBm] ⁽¹⁾ | P1dB [dBm] | IRL [dB] | ORL [dB] | NF [dB] |
|----|------------|---------|----------|-----------|---------------------------|------------|----------|----------|---------|
| | 2330 | 5 | 88 | 16.4 | 38.5 | 22.3 | -10.7 | -13 | 4.1 |

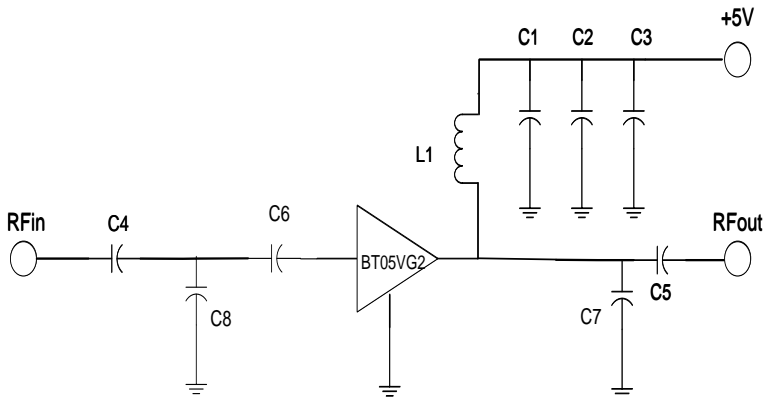
(1) OIP3 was tested @Pout=11dBm/tone 1MHz offset



6. BT05VG2_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 | 56pF | Samsung |
| C5 | 0603 CAP | 56pF | Samsung |
| C6 | 0603 CAP | 0.5pF | Samsung |
| C7 | 0603 CAP | 0.5pF | Samsung |
| C8 | 0603 CAP | 0.5pF | Samsung |
| C9 | 0603 CAP | NA | |
| C10 | 0603 CAP | NA | |
| C11 | 0603 CAP | NA | |
| C12 | 0603 CAP | NA | |
| L1 | 0603 IND | 33nH | Ceratech |
| L2 | 0603 IND | NA | |
| L3 | 0603 IND | NA | |
| R1 | 0603 RES | NA | |
| U1 | SOT89 PKG | BT05VG2 | BEREX |
| | | | |



Note:

1. PCB: 31mil thick FR4
2. The distance between the center of the series cap(C6) and the Input Pin of BT05VG2 is 2.7mm
3. The distance between the center of the shunt cap(C7) and the Output Pin of BT05VG2 is 10.0mm
4. The distance between the center of the shunt cap(C8) and the Input Pin of BT05VG2 is 4.3mm

| TITLE | |
|--------------------------|----------|
| BT05VG2 Evaluation Board | |
| (3500 MHz) | |
| Drawing Number | Rev. |
| Date | Drawn By |
| FILE NAME | SHEET |

6.1 BT05VG2_3500MHz Test Result

| SN | Freq [MHz] | Vcc [V] | Icc [mA] | Gain [dB] | OIP3 [dBm] ⁽¹⁾ | P1dB [dBm] | IRL [dB] | ORL [dB] | NF [dB] |
|----|------------|---------|----------|-----------|---------------------------|------------|----------|----------|---------|
| | 3500 | 5 | 92 | 13.2 | 40.3 | 23.3 | -20 | -16 | 4.2 |

(1) OIP3 was tested @Pout=11dBm/tone 1MHz offset

