FCC Part22H&24E Test Report

Product Name	:	Wireless Module
Model No.	:	SIM5320AD
FCC ID	:	UDV-1103022011009

Applicant	:	Shanghai Simcom Ltd.
Address	:	Building A, SIM Technology Building No.633, Jinzhong Road, Shanghai, China

Date of Receipt	:	17/11/2011
Test Date	:	17/11/2011~ 24/11/2011
Issued Date	:	28/11/2011
Report No.	:	11BS053R-HP-US-P07V01
Report Version	:	V 1.1

Test Report Certification

Issued Date : 28/11/2011
Report No. : 11BS053R-HP-US-P07V01

Product Name	:	Wireless Module
Applicant	:	Shanghai Simcom Ltd.
Address	:	Building A, SIM Technology Building No.633, Jinzhong Road, Shanghai, China
Manufacturer	:	Shanghai Simcom Ltd.
Address	:	Building A, SIM Technology Building No.633, Jinzhong Road, Shanghai, China
Model No.	:	SIM5320AD
FCC ID	:	UDV-1103022011009
EUT Voltage	:	DC 3.8V
Brand Name	:	SIMCom
Applicable Standard	:	FCC CFR Title 47 Part 2,TIA/EIA 603-C FCC Part22 Subpart H, FCC Part24 Subpart E
Test Result	:	Complied
Performed Location	:	Suzhou EMC Laboratory No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 FCC Registration Number: 800392

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(Engineering Supervisor: Robin Wu)

Approved By : Marlin Chen
(Engineering Manager: Marlin Chen)

Laboratory Information

We, **QuieTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	**:**	**BSMI, NCC, TAF**
Germany	**:**	**TUV Rheinland**
Norway	**:**	**Nemko, DNV**
USA	**:**	**FCC, NVLAP**
Japan	**:**	**VCCI**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : http://www.quietek.com/tw/ctg/cts/accreditations.htm
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

NVLAP Lab Code : 200347-0

1313

LinKou Testing Laboratory :
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NVLAP Lab Code: 200533-0

0914

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No. 99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou,China.
TEL : +86-512-6251-5088 / FAX : +86-512-6251-5098 E-Mail : service@quietek.com

NVLAP Lab Code : 200743-0

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1. General Information

1.1. EUT Description

Product Name	Wireless Module
Model No.	SIM5320AD
Device Category	Portable
RF Exposure Environment	Uncontrolled
Antenna Type	Internal
GPS	
Operate Frequency	1575.42MHz
Type of modulation	BPSK
2G	
Support Band	GSM850/GSM900/DCS1800/PCS1900
GPRS Type	Class B
GPRS Class	Class 12
Tx Frequency Range	GSM 850: 824 ~ 849MHz EGSM 900: 880 ~ 915 MHz DCS 1800: 1710 ~ 1785 MHz PCS 1900: 1850 ~1910MHz
Rx Frequency Range	GSM 850: 869 ~ 894MHz EGSM 900: 925 ~ 960 MHz DCS 1800: 1805 ~ 1875 MHz PCS 1900: 1930 ~ 1990MHz
Release Version	GSM: R99
Type of modulation	GMSK for GSM/GPRS 8PSK for EDGE
Antenna Gain	-0.98dBi for 824~894MHz band; 2.52dBi for 1850~1990MHz band.
3G	
Support Band	WCDMA Band II/WCDMA Band V
Frequency Range Tx	WCDMA Band V: 824~849MHz WCDMA Band II: 1850~1910MHz
Frequency Range Rx	WCDMA Band V: 869~894MHz WCDMA Band II: 1930~1990MHz
Release Version	UMTS FDD: Rel-5
Type of modulation	QPSK for WCDMA; 16QAM for HSDPA

Antenna Gain	-0.98dBi for 824~894MHz band; 2.52dBi for 1850~1990MHz band.

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: GPRS 850 Link
Mode 2: GPRS 1900 Link
Mode 3: EDGE 850 Link
Mode 4: EDGE 1900 Link
Mode 5: WCDMA Band II Link
Mode 6: WCDMA Band V Link
Mode 7: HSDPA Band II Link
Mode 8: HSDPA Band V Link

Note:

1. Regards to the frequency band operation: the lowest、middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. This device is a composite device in accordance with Part 15 Subpart B regulations. The report number is 11BS053R-HP-US-P01V02.
3. Maximum antenna gain 6.4dBi allowed for GSM850/WCDMA FDD V and maximum antenna gain 3.9dBi for PCS1900/WCDMA FDD II are compliance with the wireless module. A typical antenna is used for report test, antenna gain show in report.

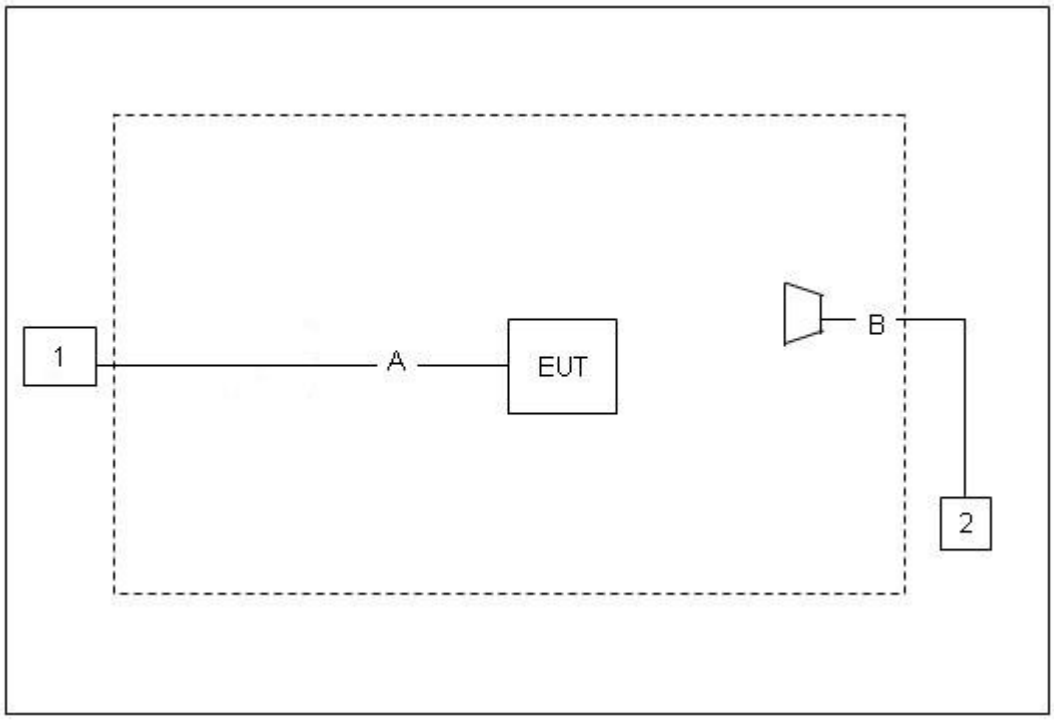
1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	DELL	E520	N/A	Non-Shielded, 1.8m
2	CMU200	R&S	CMU200	N/A	N/A

1.4. Configuration of Tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	USB Extension Cord	Shielded, 1.2m
B	Coaxial Cable	Shielded, 10m

1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	EUT Communicate with CMU200, then select channel to test.

2. Technical Test

2.1. Summary of Test Result

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

For GSM 850/WCDMA Band V (FCC Part 22H & Part 2)

Emission			
Performed Item	Normative References	Test Performed	Deviation
Peak Output Power	FCC Part 22.913(a)(2) and Part 2.1046	Yes	No
Modulation Characteristic	FCC Part 2.1047(d)	Yes	No
Occupied Bandwidth	FCC Part 2.1049	Yes	No
Spurious Emission At Antenna Terminals (+/- 1MHz)	FCC Part 22.917(a) and Part 2.1049	Yes	No
Spurious Emission	FCC Part 22.917(b) and Part 2.1051, 2.1053	Yes	No
Frequency Stability Under Temperature & Voltage Variations	FCC Part 22.355 and 2.1055	Yes	No

For PCS 1900/WCDMA Band II (FCC Part 24E & Part 2)

Emission			
Performed Item	Normative References	Test Performed	Deviation
Peak Output Power	FCC Part 24.232(b) and Part 2.1046	Yes	No
Modulation Characteristic	FCC Part 2.1047(d)	Yes	No
Occupied Bandwidth	FCC Part 24.238(b) and Part 2.1049	Yes	No
Spurious Emission At Antenna Terminals (+/- 1MHz)	FCC Part 24.238(a) and Part 2.1049	Yes	No
Spurious Emission	FCC Part 24.238(b) and Part 2.1051, 2.1053	Yes	No
Frequency Stability Under Temperature & Voltage Variations	FCC Part 24.235 and 2.1055	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	23
Humidity (%RH)	25-75	52
Barometric pressure (mbar)	860-1060	950-1000

3. Peak Output Power

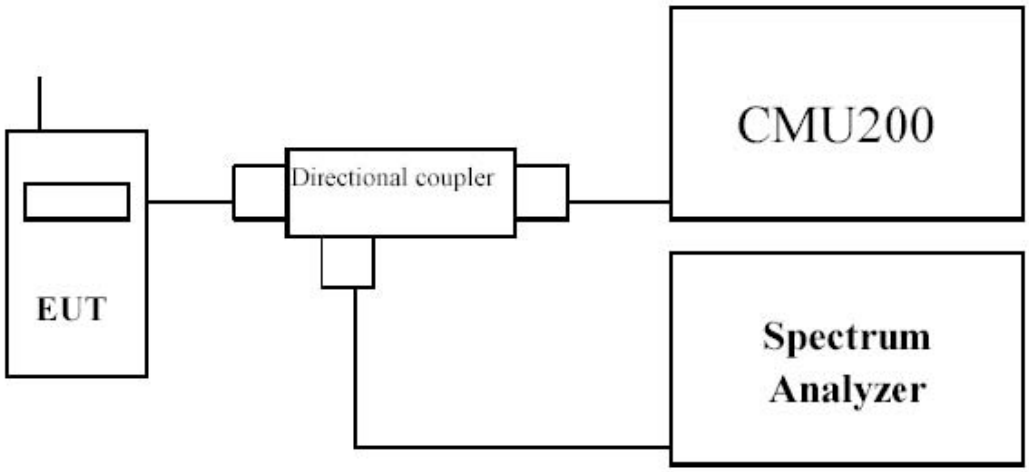
3.1. Test Equipment

Peak Output Power / AC-5

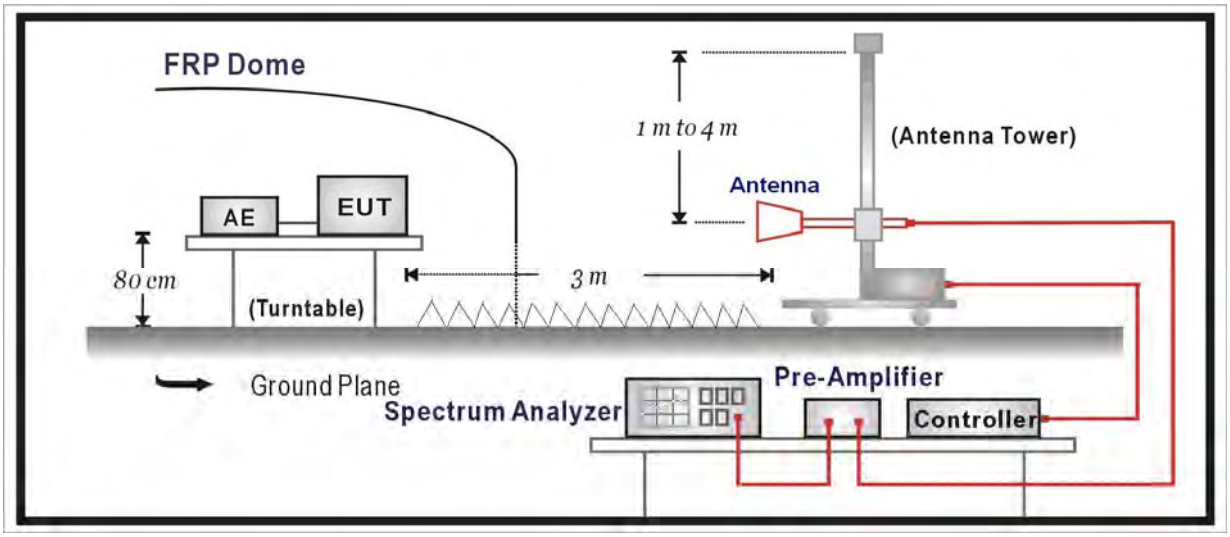
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2012.04.23
Preamplifier	QuieTek	AP-025C	CHM-0503006	2012.05.05
Preamplifier	Miteq	NSP1800-25	1364185	2012.05.05
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2012.10.18
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2011.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2011.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2012.06.11
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2012.01.14

3.2. Test Setup

Conducted Power Measurement:



Radiated Power Measurement:



3.3. Limit

For FCC Part 22.913(a)(2):

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC Part 24.232(b):

The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

3.4. Test Procedure

Conducted Power Measurement:

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMU200 by a Directional Couple.
c) EUT Communicate with CMU200, then selects a channel for testing.
d) Add a correction factor to the display of spectrum, and then test.

Radiated Power Measurement:

e) The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
f) The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
g) The output of the test antenna shall be connected to the measuring receiver.
h) The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
i) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
j) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
k) The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
l) The maximum signal level detected by the measuring receiver shall be noted.
m) The transmitter shall be replaced by a substitution antenna.
n) The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
o) The substitution antenna shall be connected to a calibrated signal generator.
p) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
q) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
r) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
s) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
t) The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if

necessary.

u) Test site anechoic chamber refer to ANSI C63.4: 2009.

Base station simulator settings for each test mode:

1. For GSM/GPRS/EDGE

   Configure R&S CMU200 to support GMSK and 8PSK call respectively, and set one timeslot transmission for GMSK GSM/GPRS and 8PSK EDGE.
   Measure and record power outputs for both modulations.

2. For WCDMA/HSDPA

   Configure the CMU-200 to support all WCDMA tests in respect to the 3GPP 34.121.
   Measure the EUT output power at 826.4MHz, 836.6MHz and 846.6MHz for WCDMA Band V and 1852.4MHz, 1880MHz and 1907.6MHz for WCDMA Band II.

   For Rel 99
   • Set a Test Mode 1 loop back with a 12.2kbps Reference Measurement Channel (RMC)
   • Set and send continuously Up power control commands to the Wireless Module.
   • Measure the power at the Wireless Module antenna connector by using CMU-200.

   For HSDPA Rel 5
   • Establish a Test Mode 1 look back with both 1 12.2kbps RMC channel and a H-Set1 Fixed Reference Channel (FRC). With the CMU-200 this is accomplished by setting the signal Channel Coding to “Fixed Reference Channel” and configuring for HSET-1 QKSP.
   • Set beta values and HSDPA settings for HSDPA Sebtest1 according to Table C.10.1.4
   • Send continuously Up power control commands to the Wireless Module.
   • Measure the power at the Wireless Module antenna connector by using CMU-200 mean power.
   • The mean power shall be averaged over at least one timeslot.
   • Repeat the measurement for the HSDPA Subtest2, 3 and 4 as given in Table C.10.1.4

3GPP HSDPA Sub-test Setting from TS 34 121

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_c/β_d	β_{HS}	CM (dB)	MPR (dB)
1	2/15	15/15	2/15	4/15	0.0	0.0
2	12/15	15/15	12/15	24/15	1.0	0.0
3	15/15	8/15	15/8	30/15	1.5	0.5
4	15/15	4/15	15/4	30/15	1.5	0.5

3.5. Uncertainty

The measurement uncertainty is defined as for Conducted Power Measurement ± 1.2 dB, for Radiated Power Measurement ± 3.2 dB

3.6. Test Result

GPRS 850

Channel No.	Frequency (MHz)	Modulation	Conducted Power (dBm)	ERP (dBm)	Limit (dBm)
128	824.2	GMSK	32.52	30.88	38.50
189	836.4	GMSK	32.65	29.98	38.50
251	848.8	GMSK	32.45	30.29	38.50

GPRS1900

Channel No.	Frequency (MHz)	Modulation	Conducted Power (dBm)	EIRP (dBm)	Limit (dBm)
512	1850.2	GMSK	28.92	26.54	33.00
661	1880.0	GMSK	29.14	25.52	33.00
810	1909.8	GMSK	29.01	27.14	33.00

EDGE 850

Channel No.	Frequency (MHz)	Modulation	Conducted Power (dBm)	ERP (dBm)	Limit (dBm)
128	824.2	8PSK	26.65	24.18	38.50
189	836.4	8PSK	26.82	24.32	38.50
251	848.8	8PSK	26.56	24.58	38.50

EDGE1900

Channel No.	Frequency (MHz)	Modulation	Conducted Power (dBm)	EIRP (dBm)	Limit (dBm)
512	1850.2	8PSK	24.46	24.95	33.00
661	1880.0	8PSK	24.69	24.13	33.00
810	1909.8	8PSK	24.58	25.26	33.00

Note: All conducted measurements are based on a peak detector.

WCDMA/HSDPA

Mode	3GPP Subtest	Band II (1900MHz) Channel						MPR
		Conducted Power (dBm)			EIRP (dBm)			
		9262	9400	9538	9262	9400	9538	
WCDMA R99	1	21.74	21.86	21.82	21.82	21.08	21.01	N/A
Rel5 HSDPA	1	22.31	21.98	22.10	22.16	22.81	22.16	0
	2	22.27	21.95	22.03	---	---	---	0
	3	21.94	21.52	21.76	---	---	---	0.5
	4	21.89	21.51	21.72	---	---	---	0.5

Mode	3GPP Subtest	Band V (850MHz) Channel						MPR
		Conducted Power (dBm)			ERP (dBm)			
		4132	4182	4233	4132	4182	4233	
WCDMA R99	1	22.88	22.83	23.09	22.15	21.80	21.26	N/A
Rel5 HSDPA	1	23.30	22.77	23.04	23.20	23.12	22.19	0
	2	23.21	22.70	22.98	---	---	---	0
	3	22.82	22.45	22.66	---	---	---	0.5
	4	22.78	22.39	22.63	---	---	---	0.5

Note: All conducted measurements are based on an average detector.

Radiated Measurement

GPRS 850

Frequency (MHz)	SA Reading (dBm)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
824.2	-1.03	H	32.66	1.76	-0.02	30.88	38.50	-7.62
824.2	-4.71	V	29.72	1.76	-0.02	27.94	38.50	-10.56
Middle Channel 189 (836.40MHz)								
836.4	-2.16	H	31.63	1.75	0.10	29.98	38.50	-8.52
836.4	-5.96	V	28.70	1.75	0.10	27.05	38.50	-11.45
High Channel 251 (848.80MHz)								
848.8	-2.05	H	31.94	1.78	0.13	30.29	38.50	-8.21
848.8	-4.19	V	30.39	1.78	0.13	28.74	38.50	-9.76

GPRS 1900

Frequency (MHz)	SA Reading (dBm)	Ant .Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 512 (1850.20MHz)								
1850.2	20.75	H	18.82	2.68	10.40	26.54	33.00	-6.46
1850.2	17.48	V	15.36	2.68	10.40	23.08	33.00	-9.92
Middle Channel 661 (1880.00MHz)								
1880.0	19.72	H	17.77	2.68	10.43	25.52	33.00	-7.48
1880.0	18.32	V	16.03	2.68	10.43	23.78	33.00	-9.22
High Channel 810 (1909.80MHz)								
1909.8	21.17	H	19.40	2.70	10.44	27.14	33.00	-5.86
1909.8	20.31	V	18.10	2.70	10.44	25.84	33.00	-7.16

EDGE 850

Frequency (MHz)	SA Reading (dBm)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
824.2	-7.73	H	25.96	1.76	-0.02	24.18	38.50	-14.32
824.2	-10.50	V	23.93	1.76	-0.02	22.15	38.50	-16.35
Middle Channel 189 (836.40MHz)								
836.4	-7.81	H	25.97	1.75	0.10	24.32	38.50	-14.18
836.4	-11.80	V	22.87	1.75	0.10	21.22	38.50	-17.28
High Channel 251 (848.80MHz)								
848.8	-7.76	H	26.23	1.78	0.13	24.58	38.50	-13.92
848.8	-10.01	V	24.57	1.78	0.13	22.92	38.50	-15.58

EDGE1900

Frequency (MHz)	SA Reading (dBm)	Ant .Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 512 (1850.20MHz)								
1850.2	19.16	H	17.23	2.68	10.40	24.95	33.00	-8.05
1850.2	16.50	V	14.38	2.68	10.40	22.10	33.00	-10.90
Middle Channel 661 (1880.00MHz)								
1880.0	18.32	H	16.37	2.68	10.43	24.12	33.00	-8.88
1880.0	14.02	V	11.73	2.68	10.43	19.48	33.00	-13.52
High Channel 810 (1909.80MHz)								
1909.8	19.29	H	17.52	2.70	10.44	25.26	33.00	-7.74
1909.8	19.13	V	16.92	2.70	10.44	24.66	33.00	-8.34

WCDMA Band II

Frequency (MHz)	SA Reading (dBm)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	ERIP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 9262 (1852.40MHz)								
1852.4	16.03	H	14.97	3.55	10.40	21.82	33.00	-11.18
1852.4	12.55	V	11.29	3.55	10.40	18.14	33.00	-14.86
Middle Channel 9400 (1880.00MHz)								
1880.0	15.29	H	14.18	3.53	10.43	21.08	33.00	-11.92
1880.0	14.34	V	12.90	3.53	10.43	19.80	33.00	-13.20
High Channel 9538 (1970.60MHz)								
1970.6	15.09	H	14.13	3.56	10.44	21.01	33.00	-11.99
1970.6	13.94	V	12.54	3.56	10.44	19.42	33.00	-13.58

WCDMA Band V

Frequency (MHz)	SA Reading (dBm)	Ant .Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 4132 (826.40MHz)								
826.4	-9.75	H	24.73	2.56	-0.02	22.15	38.50	-16.35
826.4	-13.82	V	21.43	2.56	-0.02	18.85	38.50	-19.65
Middle Channel 4182 (836.40MHz)								
836.4	-10.27	H	24.29	2.59	0.10	21.80	38.50	-16.70
836.4	-13.91	V	21.55	2.59	0.10	19.06	38.50	-19.44
High Channel 4233 (846.60MHz)								
846.6	-11.00	H	23.67	2.54	0.13	21.26	38.50	-17.24
846.6	-13.53	V	21.82	2.54	0.13	19.41	38.50	-19.09

HSDPA Band II

Frequency (MHz)	SA Reading (dBm)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 9262 (1852.40MHz)								
1852.4	16.37	H	15.31	3.55	10.40	22.16	33.00	-10.84
1852.4	12.91	V	11.66	3.55	10.40	18.51	33.00	-14.49
Middle Channel 9400 (1880.00MHz)								
1880.0	17.01	H	15.91	3.53	10.43	22.81	33.00	-10.19
1880.0	16.09	V	14.66	3.53	10.43	21.56	33.00	-11.44
High Channel 9538 (1970.60MHz)								
1970.6	16.25	H	15.28	3.56	10.44	22.16	33.00	-10.84
1970.6	15.17	V	13.77	3.56	10.44	20.65	33.00	-12.35

HSDPA Band V

Frequency (MHz)	SA Reading (dBm)	Ant .Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 4132 (826.40MHz)								
826.4	-8.70	H	25.78	2.56	-0.02	23.20	38.50	-15.30
826.4	-12.18	V	23.07	2.56	-0.02	20.49	38.50	-18.01
Middle Channel 4182 (836.40MHz)								
836.4	-8.95	H	25.61	2.59	0.10	23.12	38.50	-15.38
836.4	-12.98	V	22.48	2.59	0.10	19.99	38.50	-18.51
High Channel 4233 (846.60MHz)								
846.6	-10.07	H	24.60	2.54	0.13	22.19	38.50	-16.31
846.6	-12.29	V	23.06	2.54	0.13	20.65	38.50	-17.85

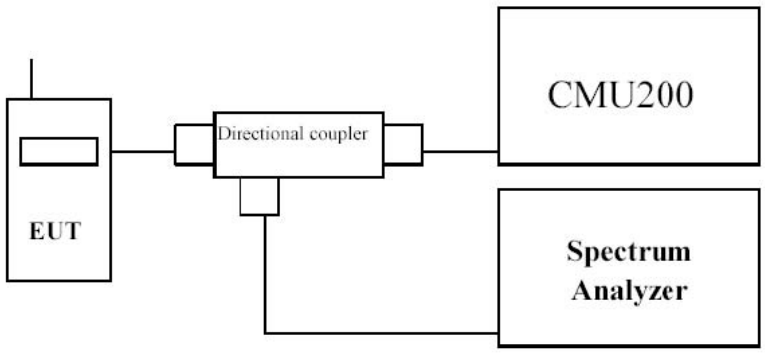
4. Modulation Characteristic

4.1. Test Equipment

Modulation Characteristic / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2012.01.14

4.2. Test Setup



4.3. Limit

N/A

4.4. Uncertainty

The measurement uncertainty is defined as 0.1%

4.5. Test Result

The modulation of GSM/WCDMA were verified and confirmed compliance with requirement.

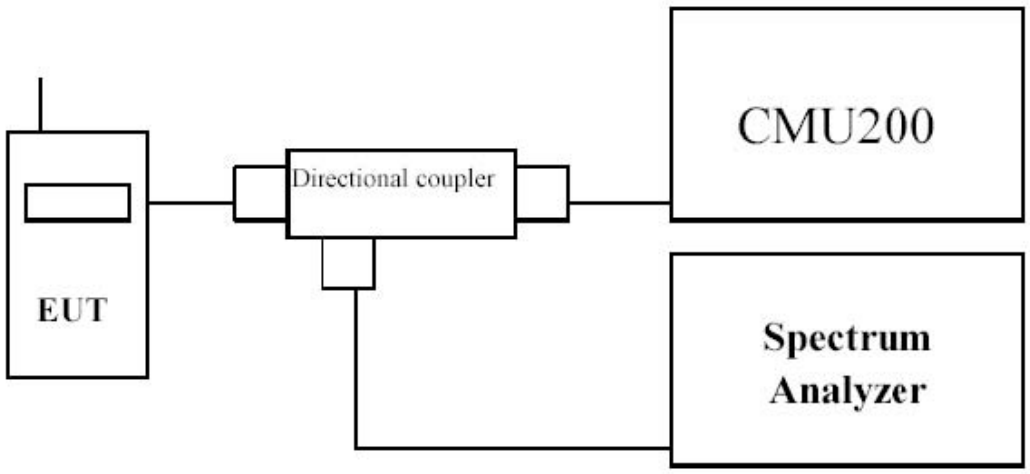
5. Occupied Bandwidth

5.1. Test Equipment

Occupied Bandwidth / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2012.01.14

5.2. Test Setup



5.3. Limit

N/A

5.4. Test Procedure

Using Occupied Bandwidth measurement function of spectrum analyzer, and setting as follows:
For GSM/GPRS/EDGE 850/1900 test --- RBW = 3 kHz and VBW = 10 kHz
For WCDMA/HSDPA FDD Band II/V test --- RBW = 50 kHz and VBW = 200 kHz

5.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz

5.6. Test Result

Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: GPRS850 Link		
Date of Test	2011/11/22	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
128	824.20	318.19	243.53
189	836.40	320.93	241.49
251	848.80	316.53	244.39

Figure Channel 128 (824.20MHz)

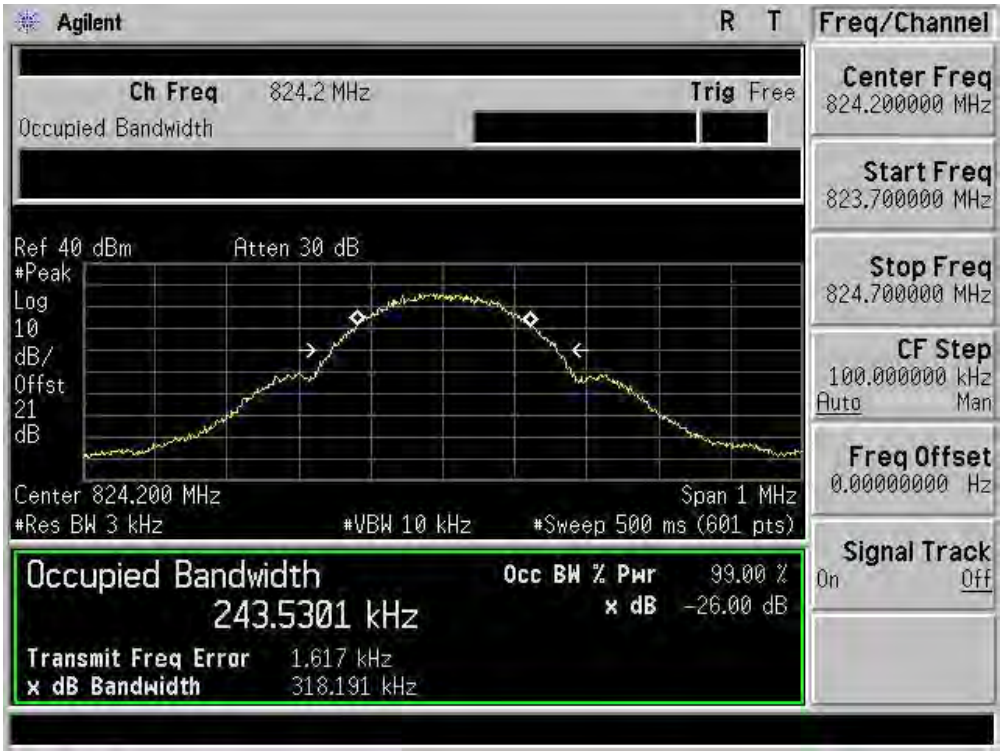


Figure Channel 189 (836.40MHz)

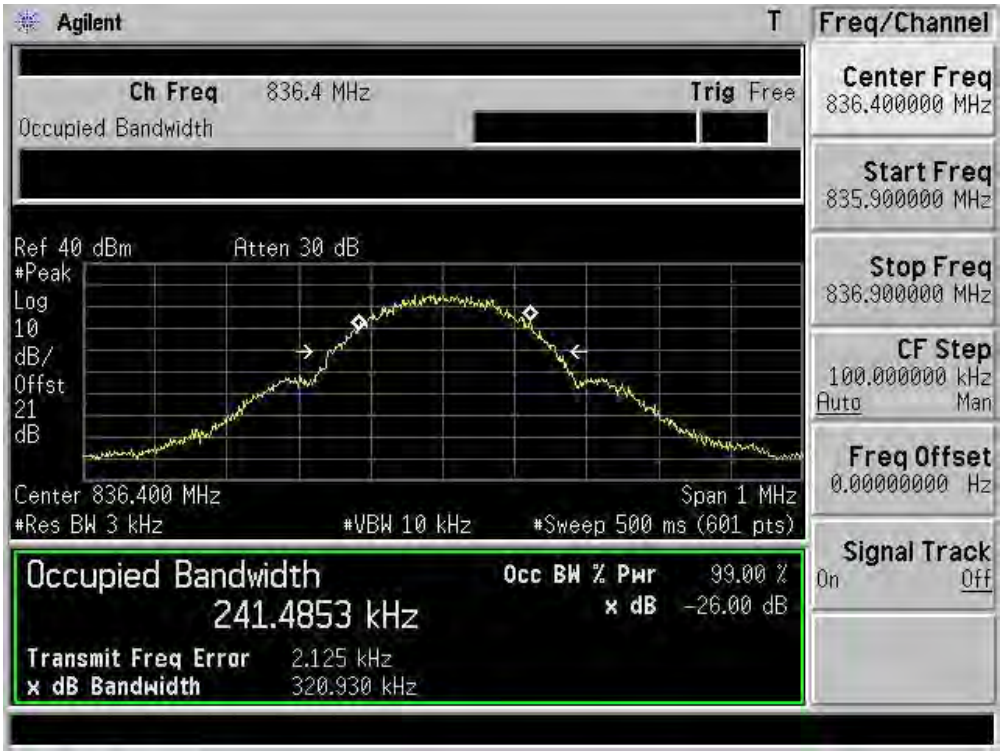
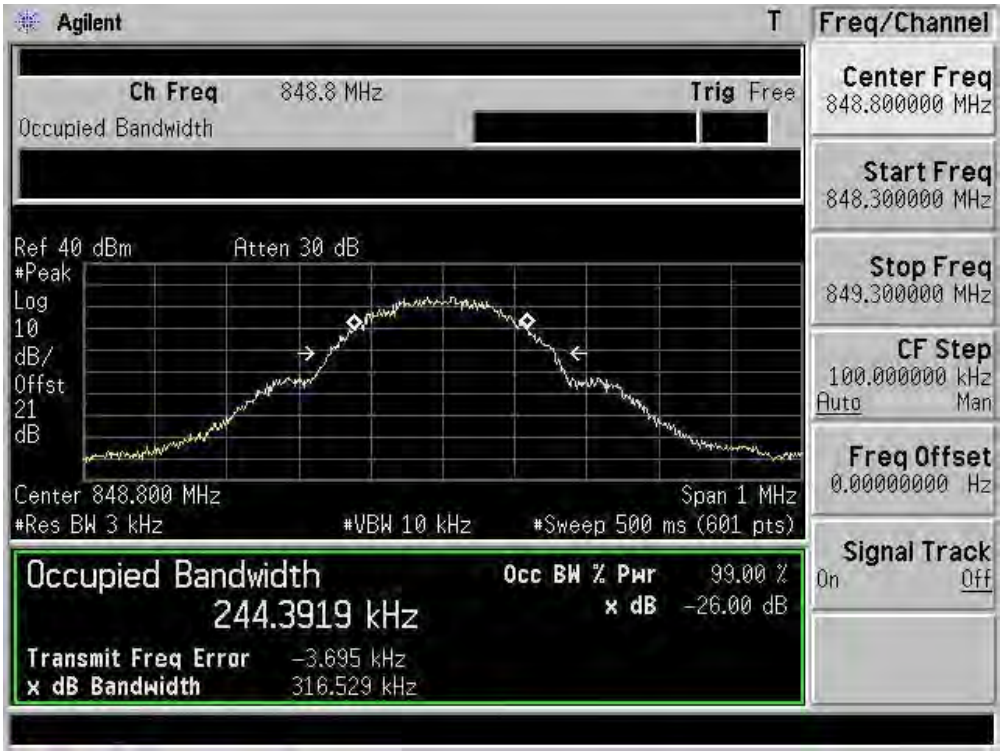


Figure Channel 251 (848.80MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: GPRS 1900 Link		
Date of Test	2011/11/22	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
512	1850.20	319.57	246.01
661	1880.00	314.85	244.00
810	1909.80	313.93	243.93

Figure Channel 512 (1850.20MHz)

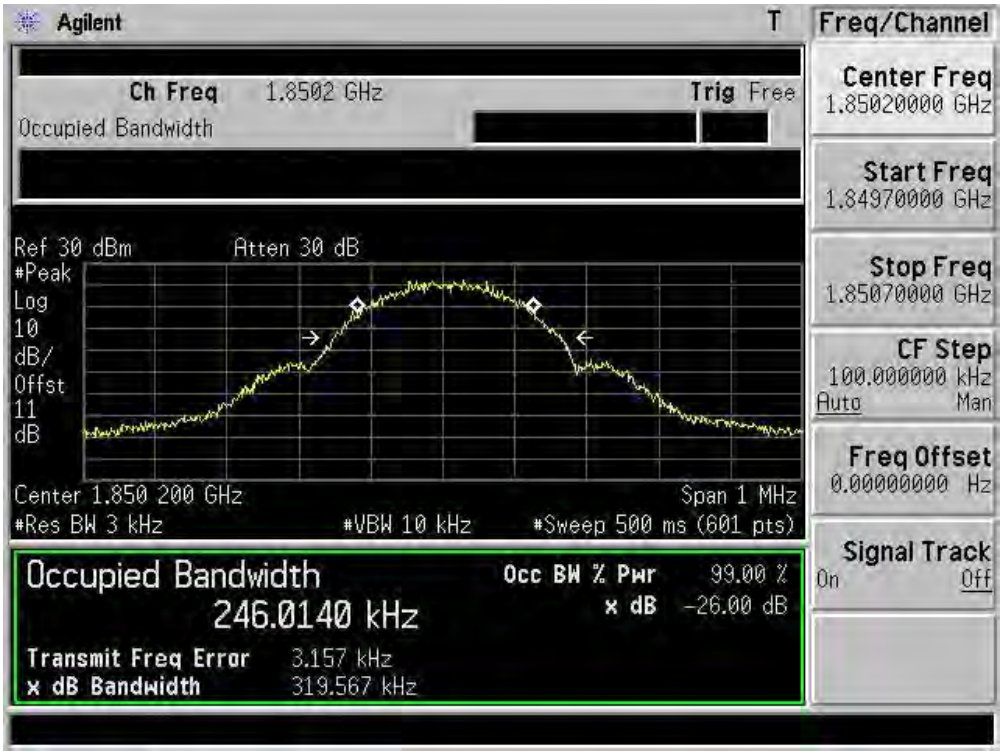


Figure Channel 661 (1880.00MHz)

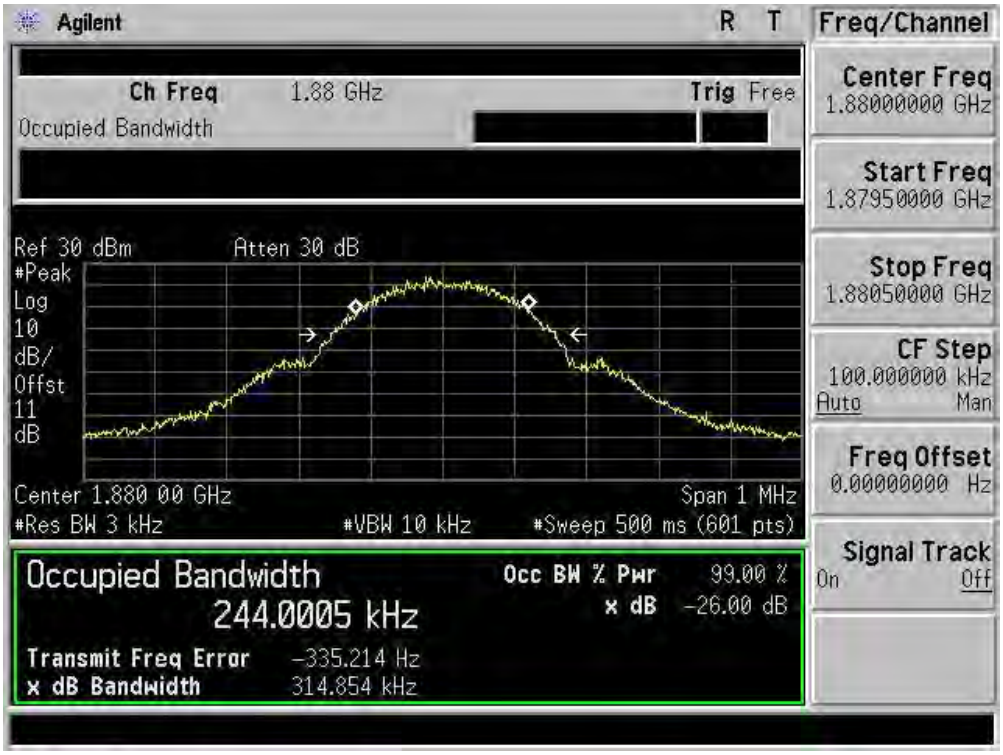
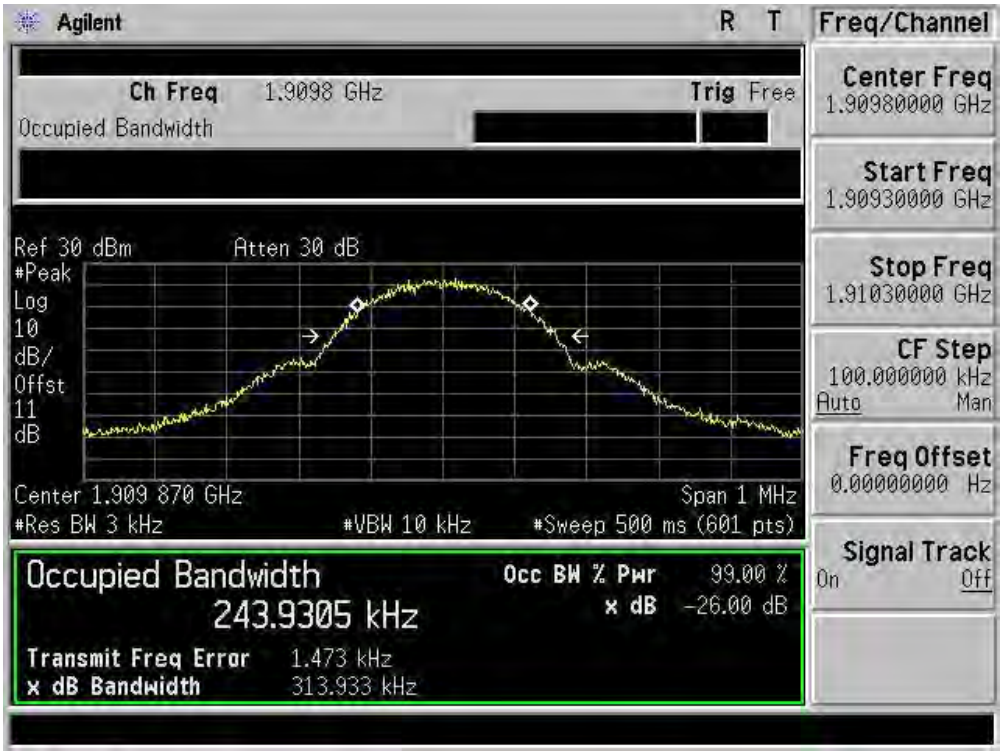


Figure Channel 810 (1909.80MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: EDGE 850 Link		
Date of Test	2011/11/22	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
128	824.20	310.93	245.18
189	836.40	309.10	241.93
251	848.80	305.23	244.26

Figure Channel 128 (824.20MHz)

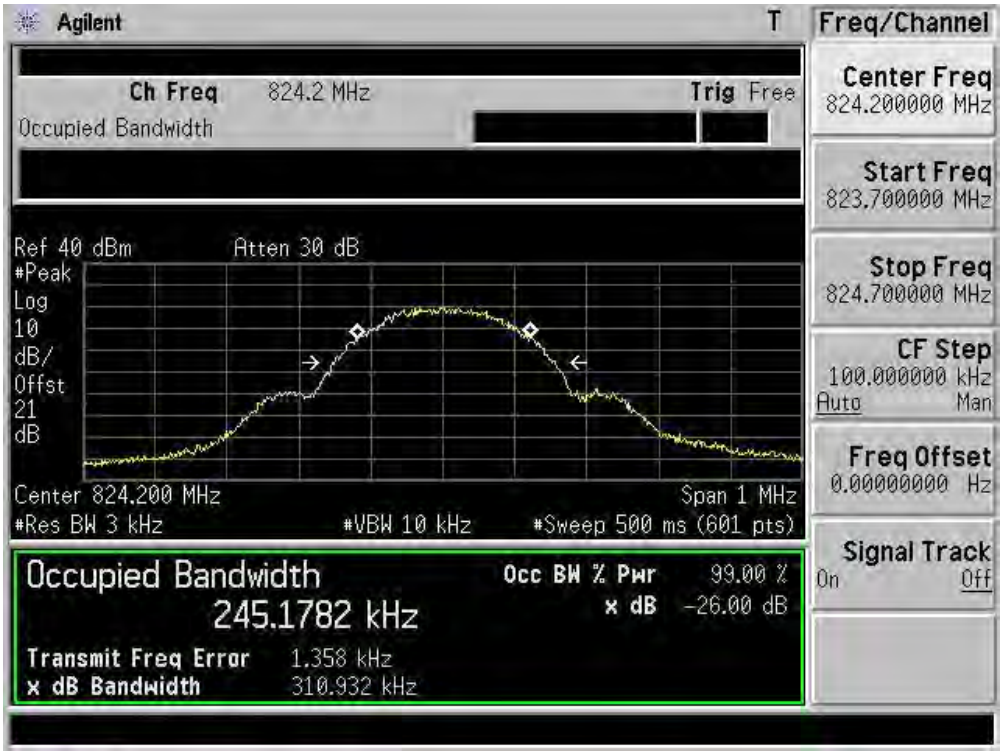


Figure Channel 189 (836.40MHz)

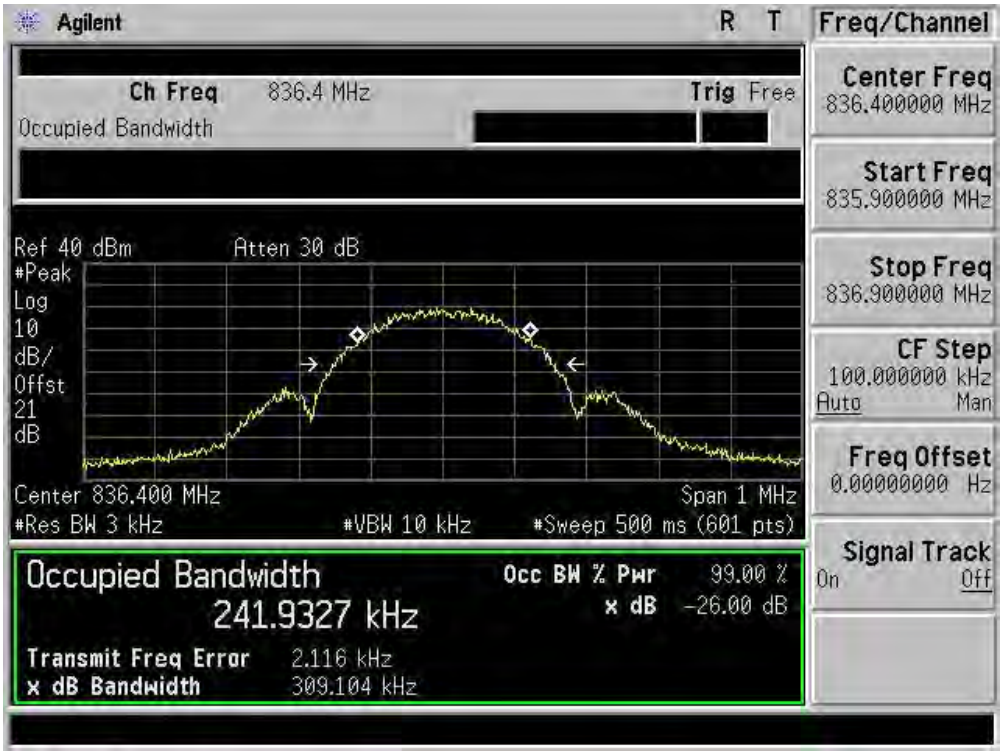
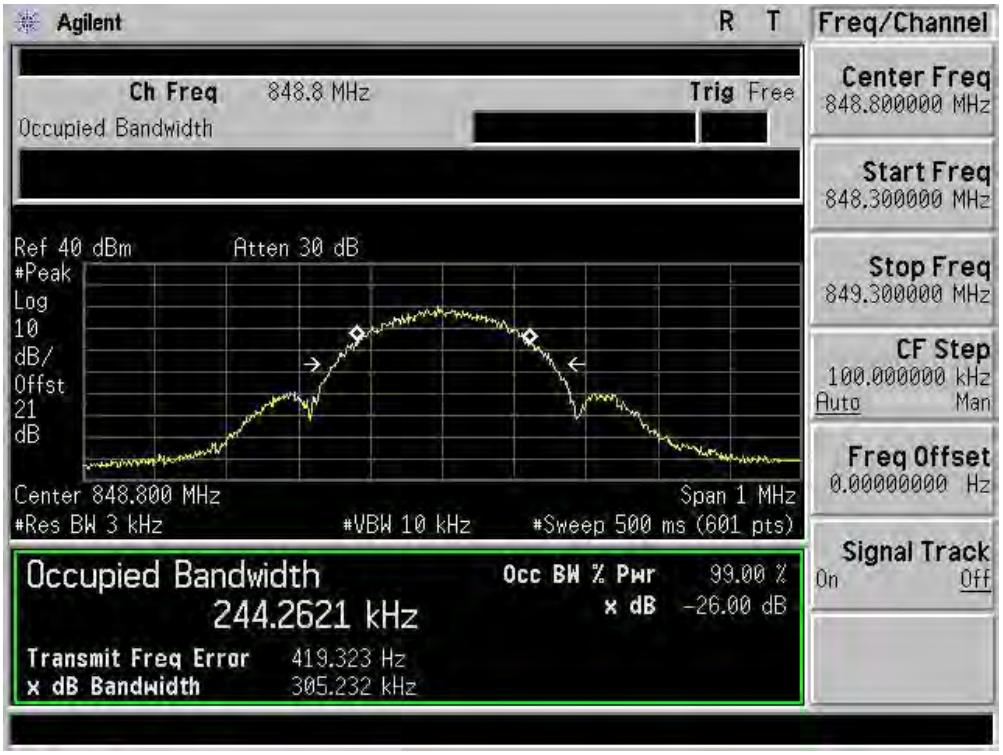


Figure Channel 251 (848.80MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 4: EDGE 1900 Link		
Date of Test	2011/11/22	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
512	1850.20	303.48	247.24
661	1880.00	308.75	236.74
810	1909.80	311.36	240.56

Figure Channel 512 (1850.20MHz)

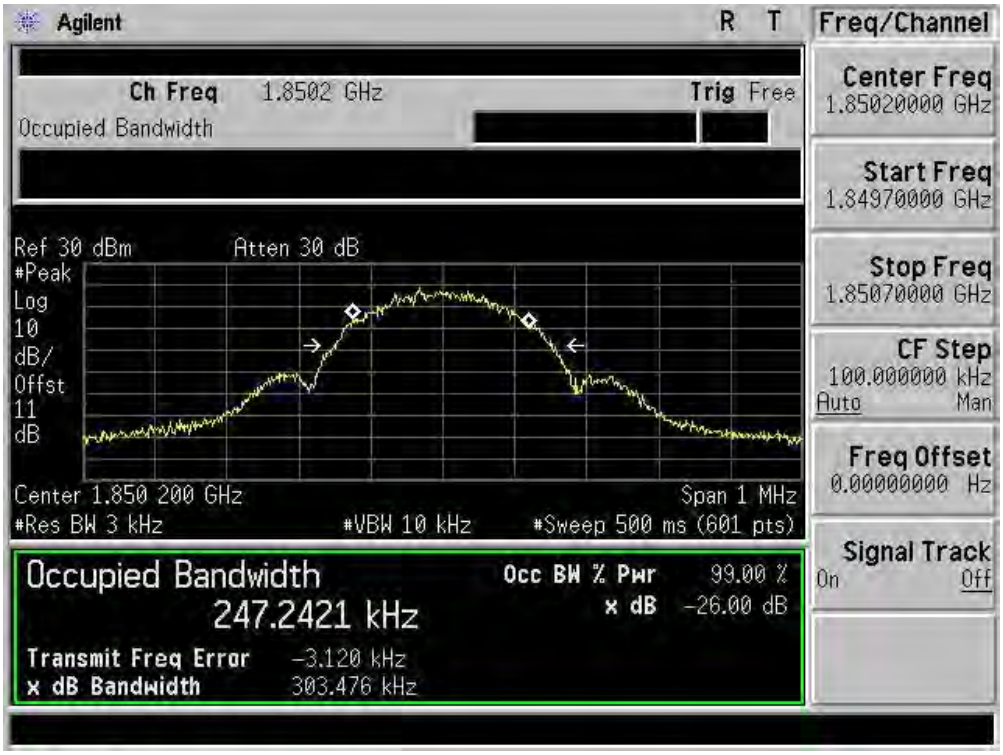


Figure Channel 661 (1880.00MHz)

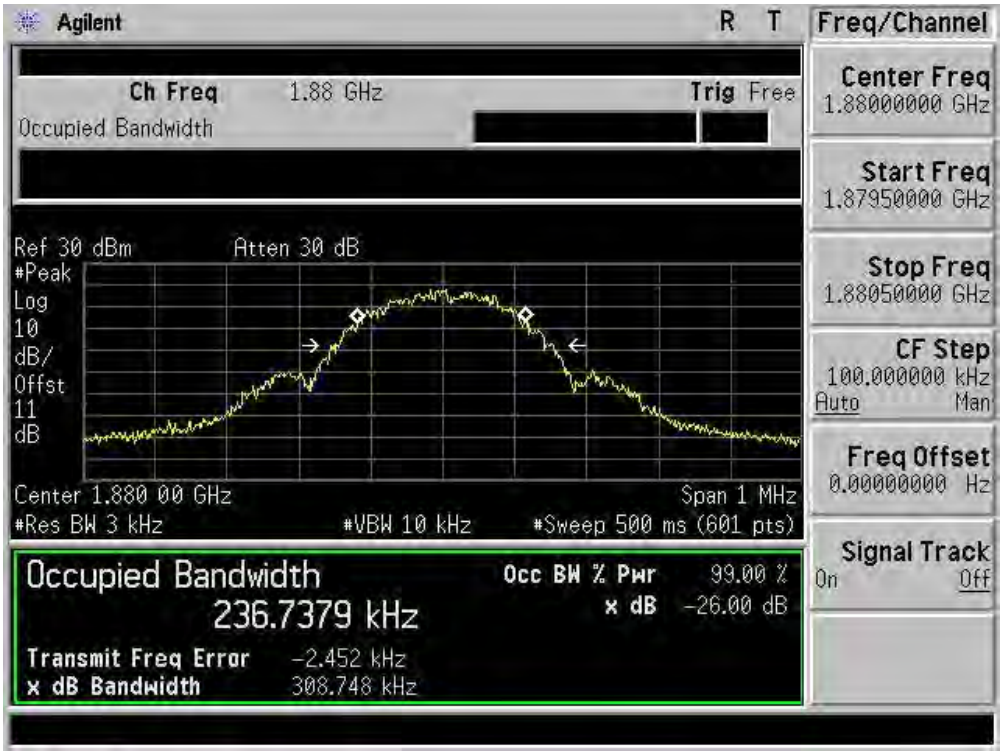
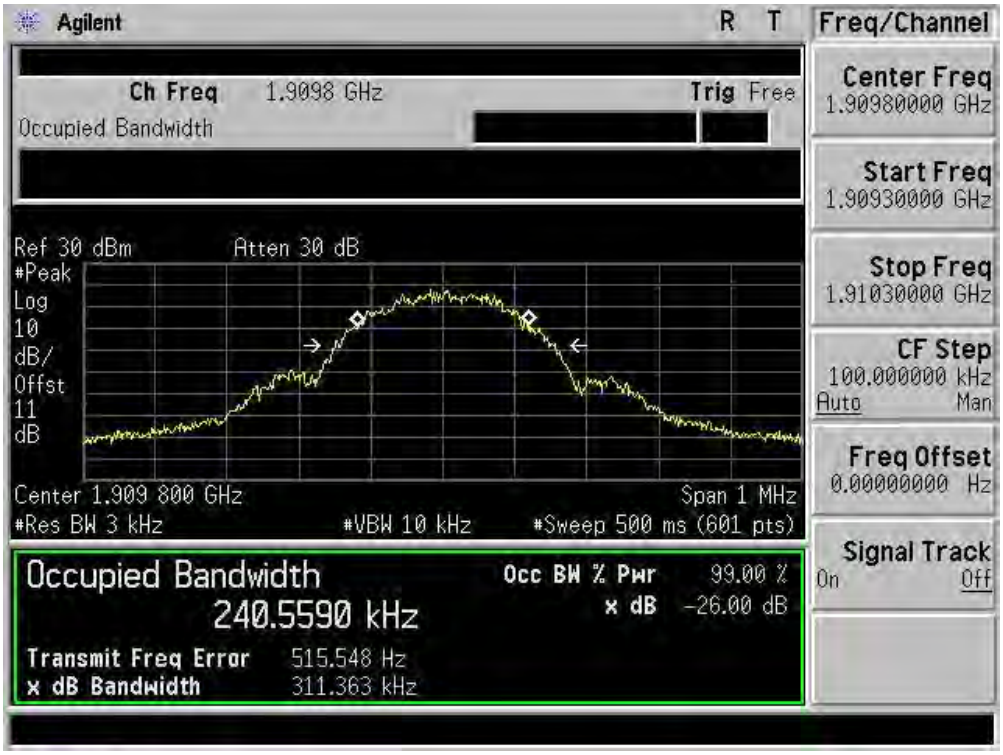


Figure Channel 810 (1909.80MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 5: WCDMA Band II Link		
Date of Test	2011/11/22	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
9262	1852.4	4643.00	4155.50
9400	1880.0	4645.00	4157.70
9538	1970.6	4650.00	4149.80

Figure Channel 9262 (1852.40MHz)

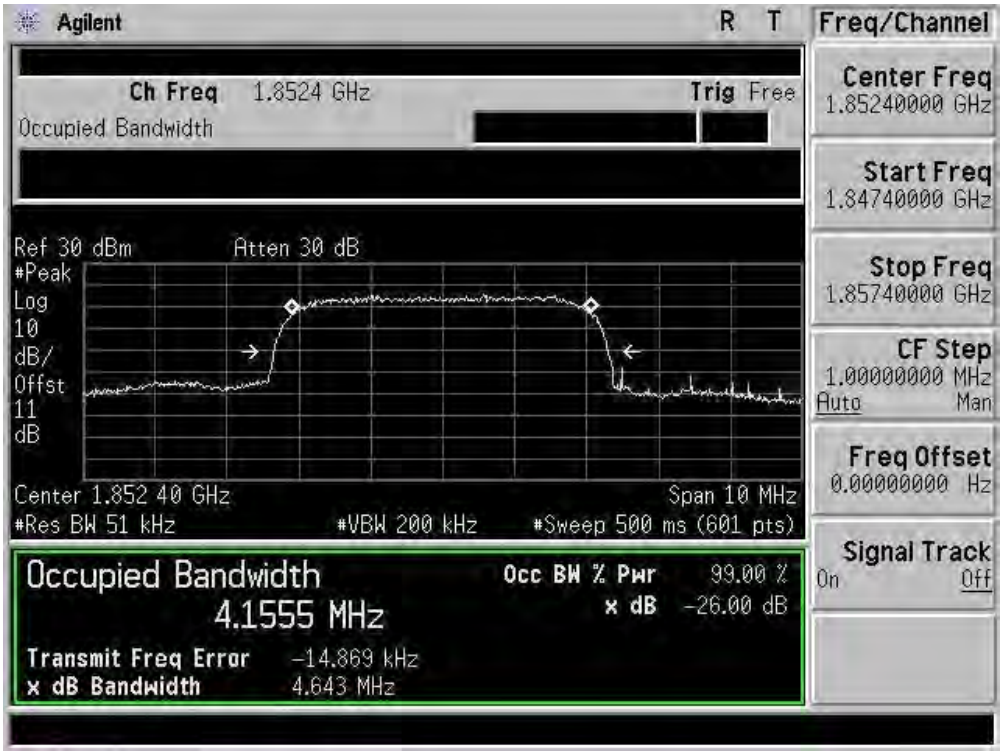


Figure Channel 9400 (1880MHz)

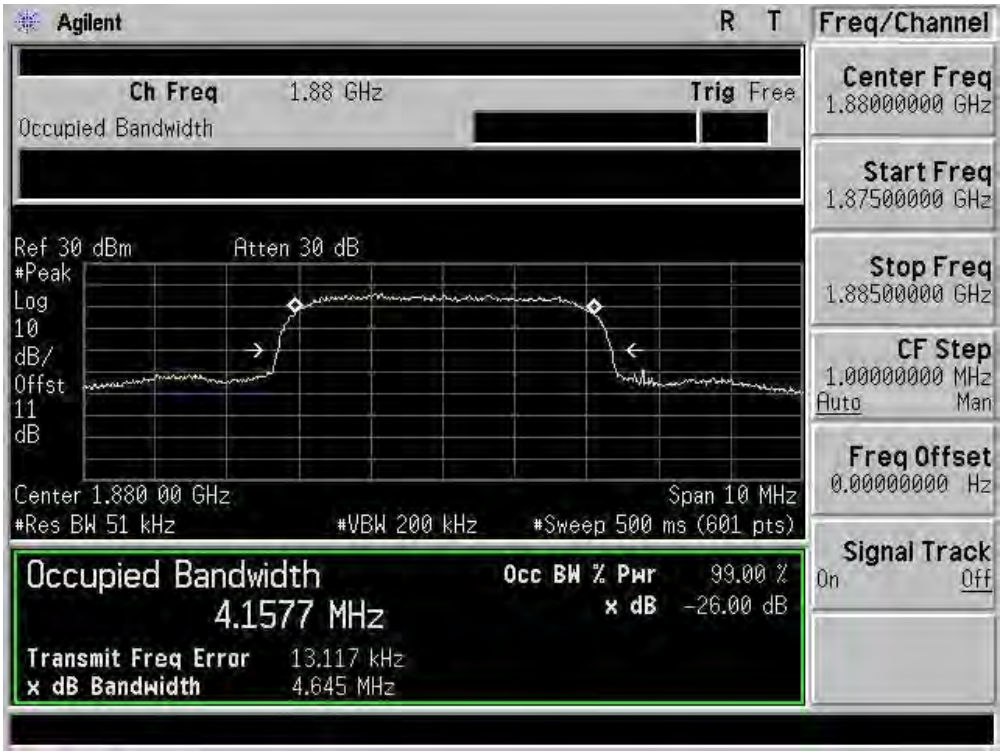
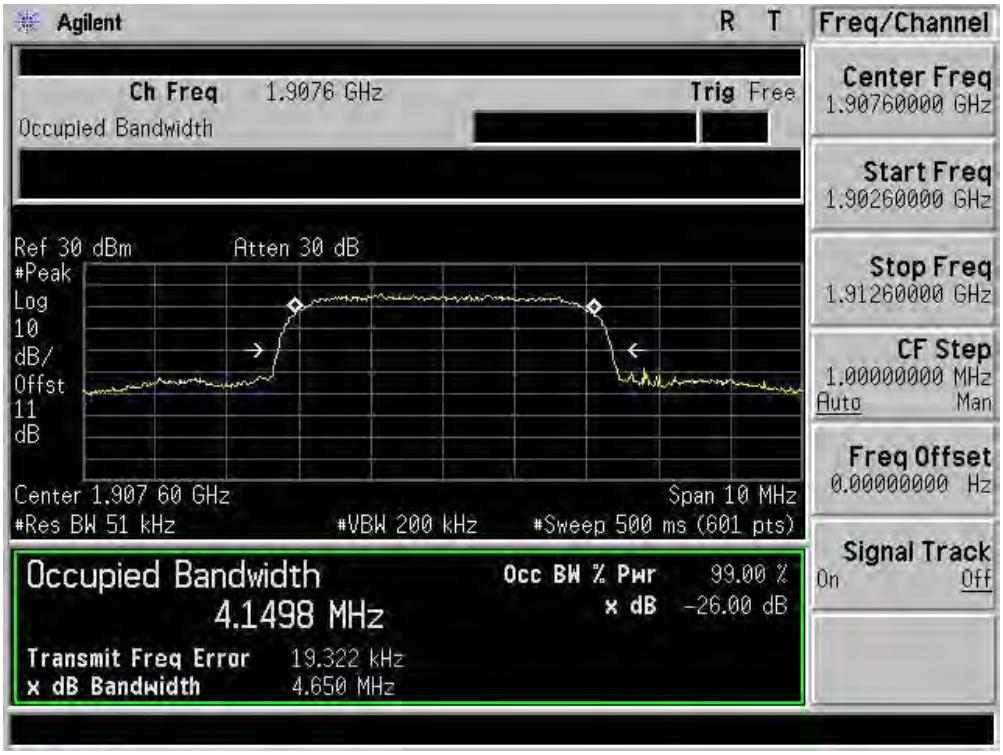


Figure Channel 9538 (1907.6MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 6: WCDMA Band V Link		
Date of Test	2011/11/22	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
4132	826.4	4648.00	4161.20
4182	836.4	4662.00	4168.80
4233	846.6	4162.00	4643.00

Figure Channel 4132 (826.4MHz)

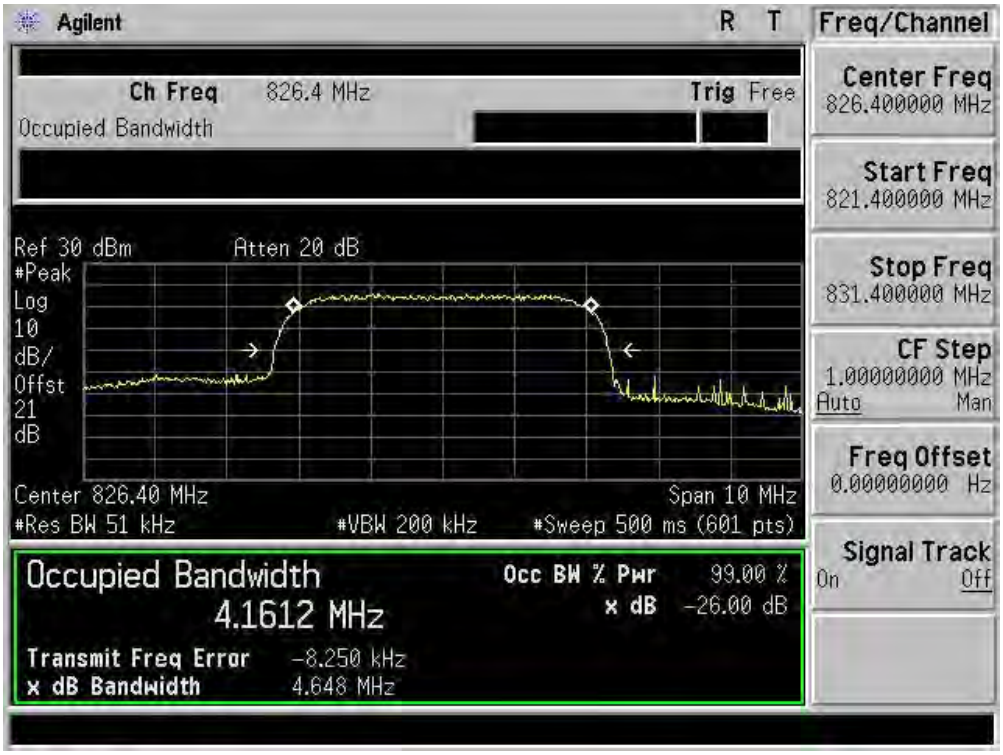


Figure Channel 4182 (836.4.00MHz)

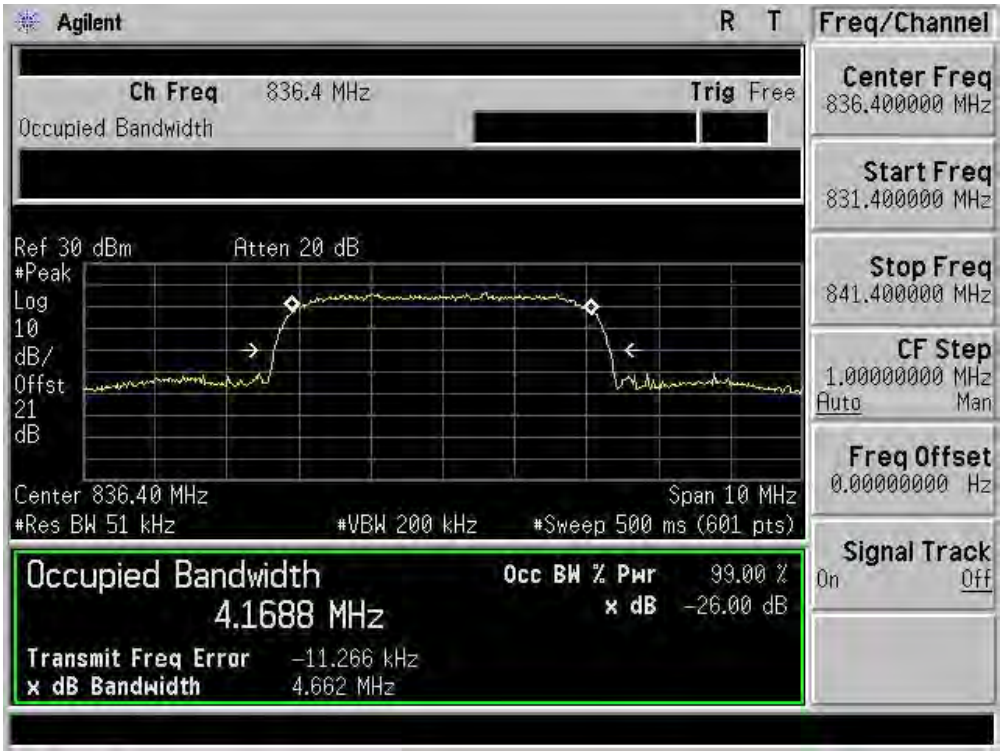
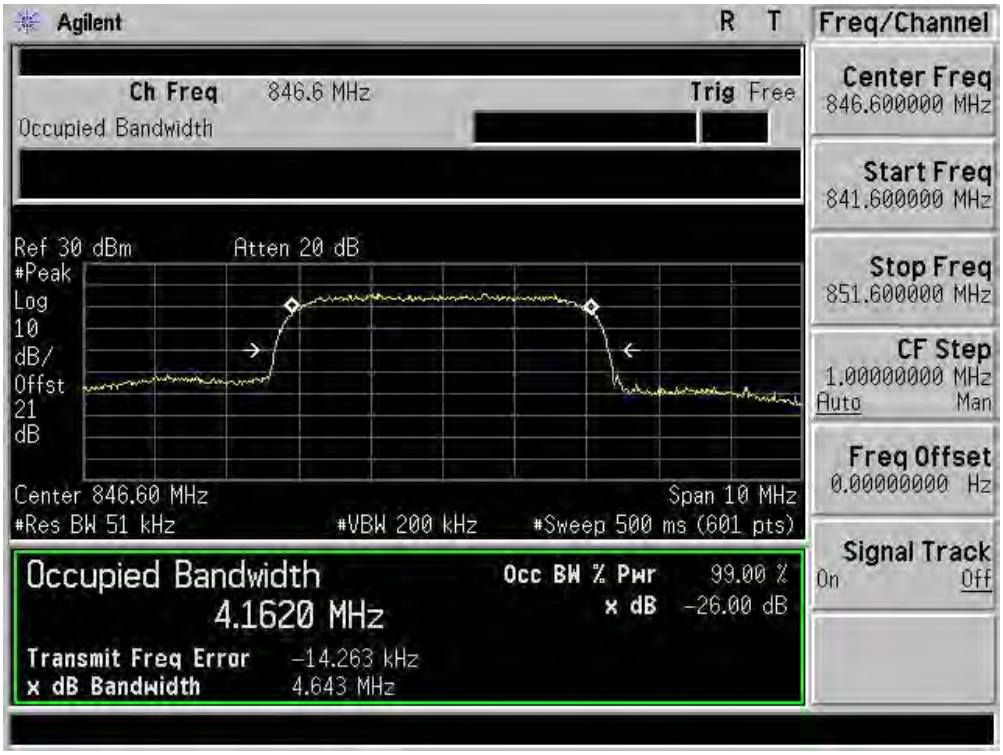


Figure Channel 4233(846.6MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 7: HSDPA Band II Link		
Date of Test	2011/11/22	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
9262	1852.4	4645.00	4161.40
9400	1880.0	4637.00	4154.80
9538	1970.6	4630.00	4160.00

Figure Channel 9262 (1852.4MHz)

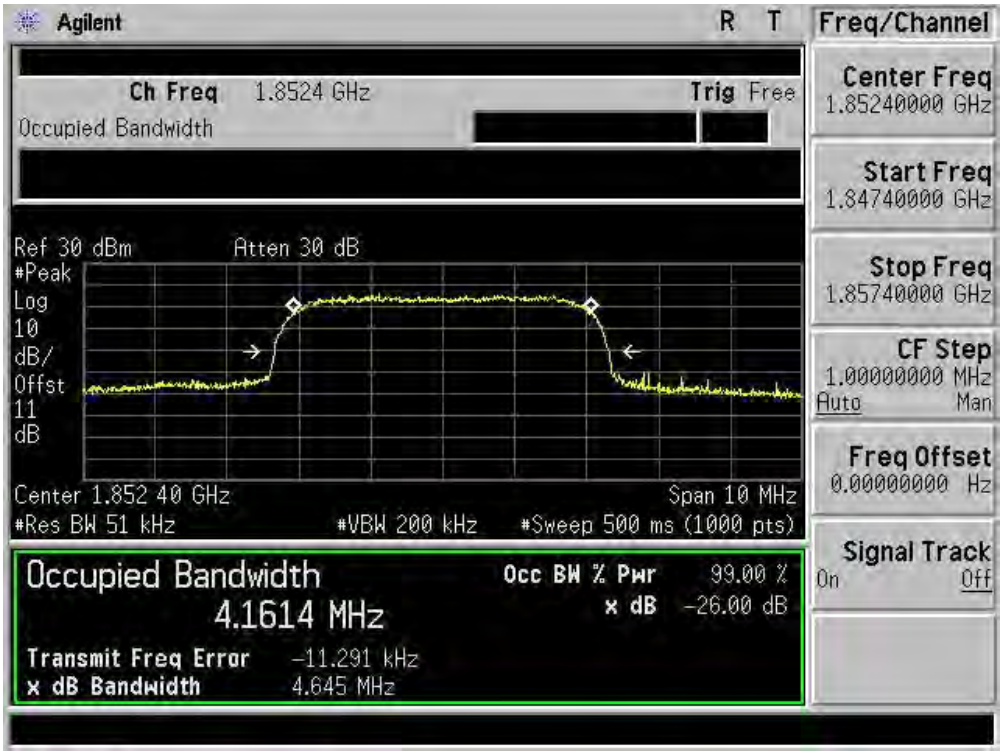


Figure Channel 9400 (1880MHz)

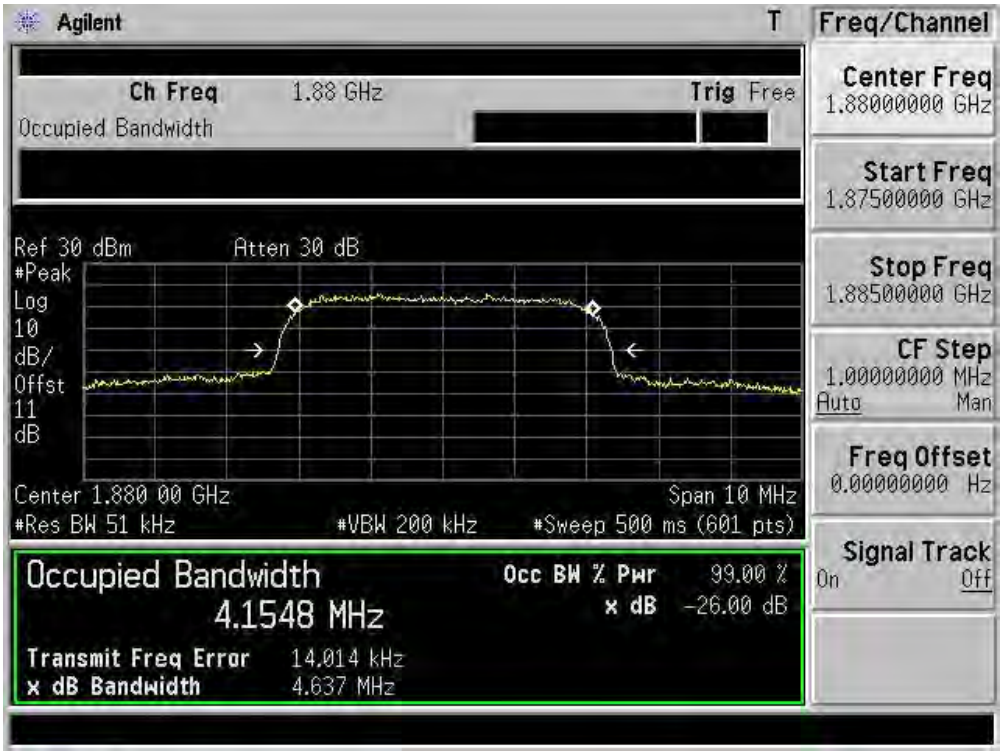
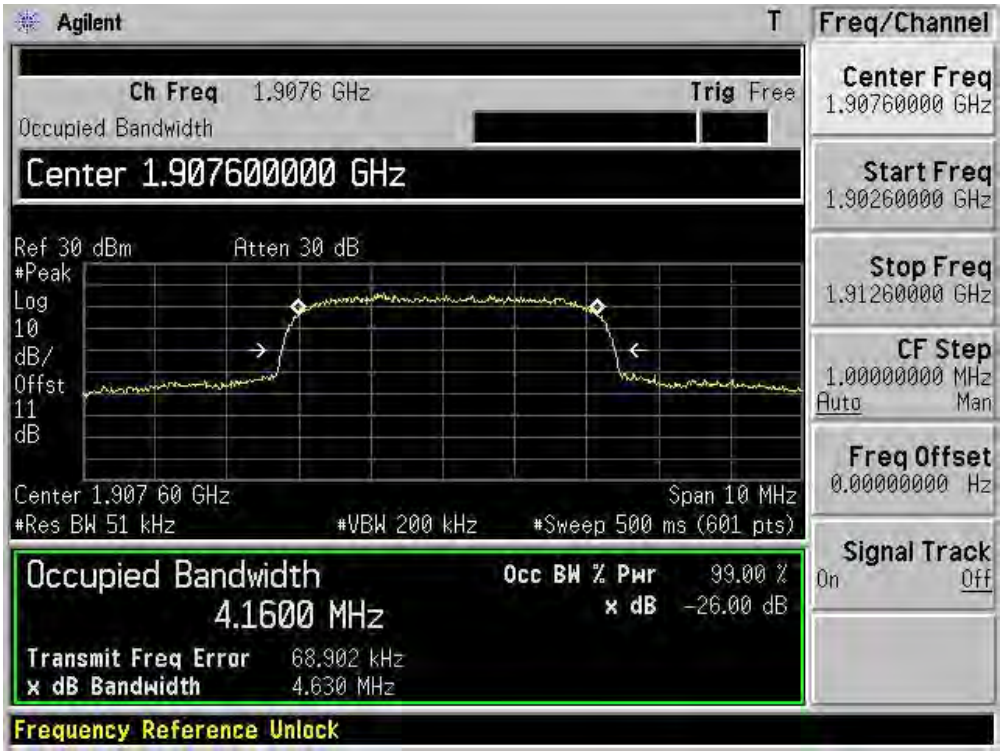


Figure Channel 9538 (1907.6MHz)



Product	Wireless Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 8: HSDPA Band V Link		
Date of Test	2011/11/22	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
4132	826.4	4640.00	4149.90
4182	836.4	4660.00	4170.40
4233	846.6	4641.00	4155.10

Figure Channel 4132 (826.4MHz)

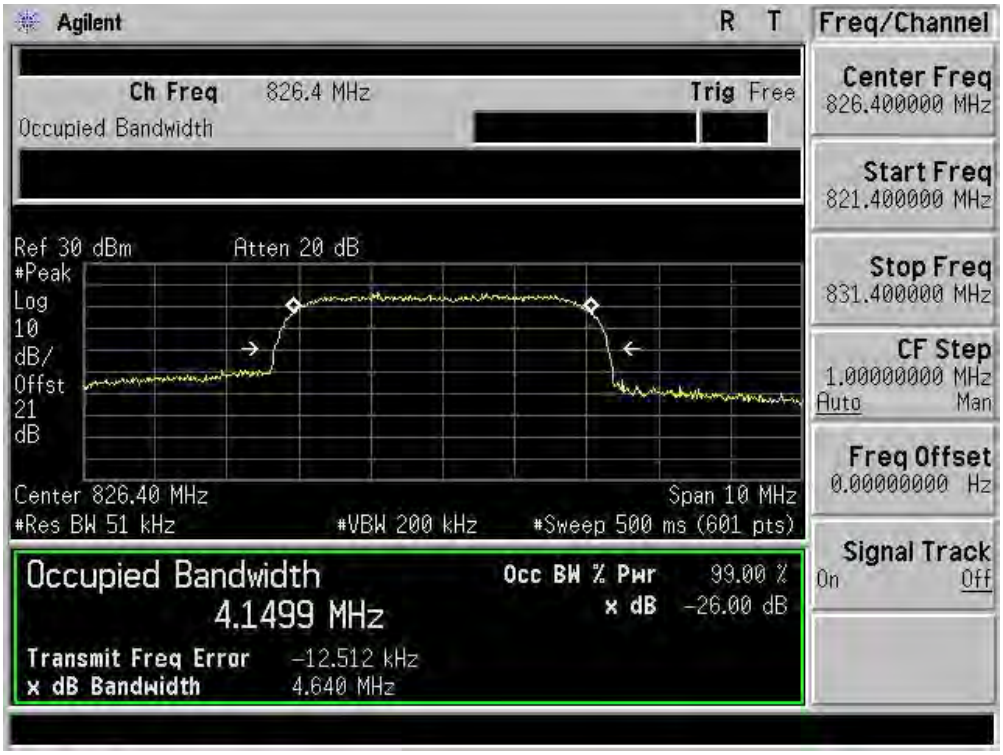


Figure Channel 4182 (836.4MHz)

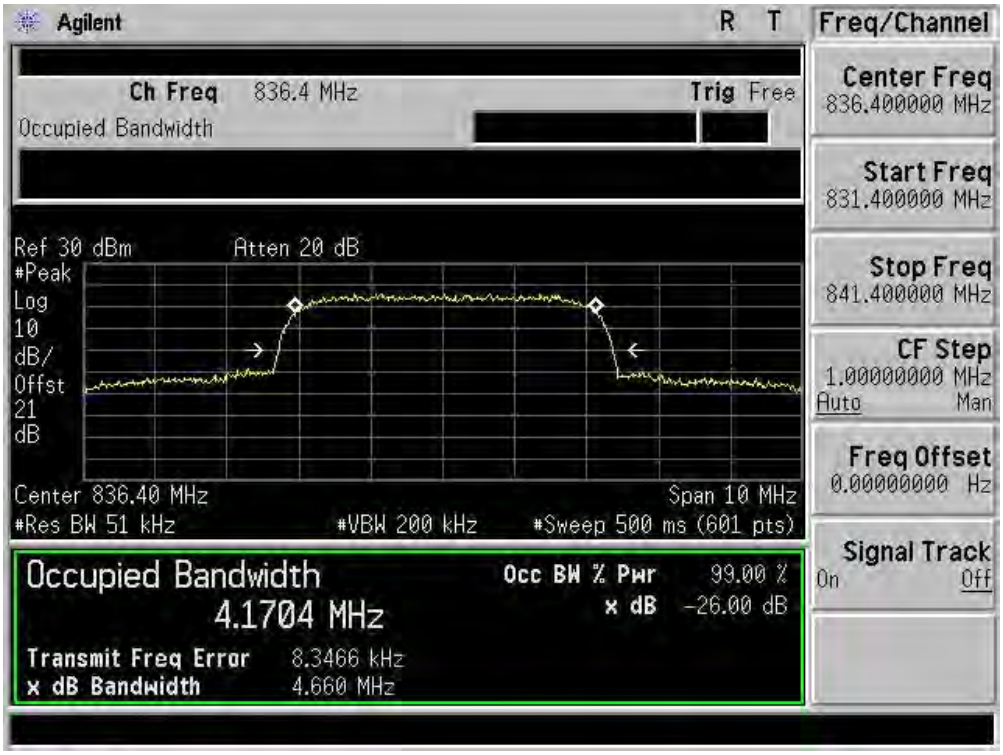
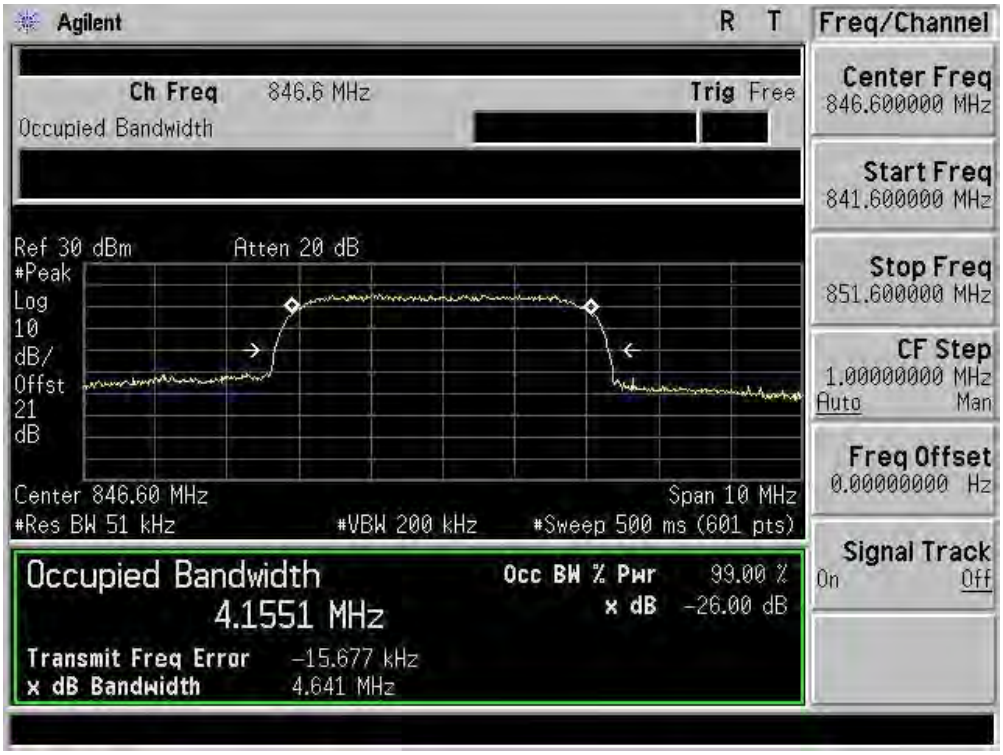


Figure Channel 4233 (846.6MHz)



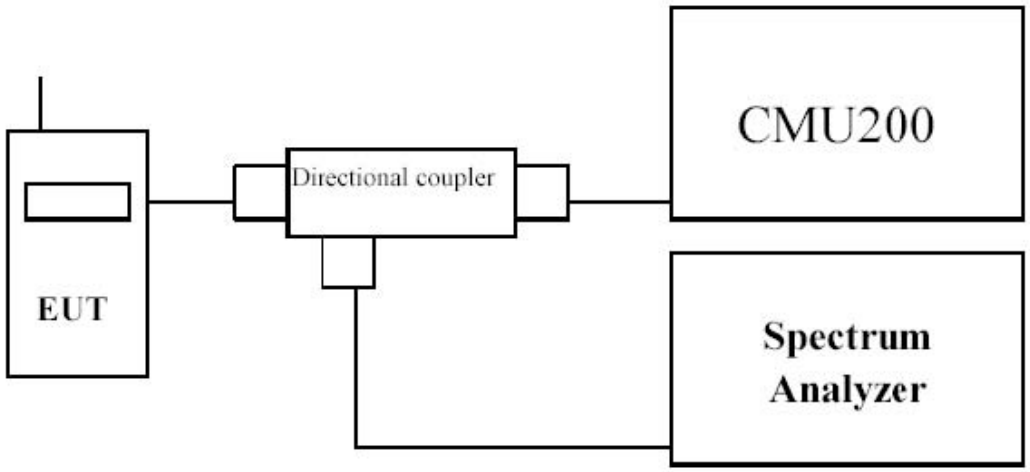
6. Spurious Emission At Antenna Terminals (+/- 1MHz)

6.1. Test Equipment

Spurious Emission At Antenna Terminals (+/- 1MHz) / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2012.01.14

6.2. Test Setup



6.3. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

6.4. Test Procedure

In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

6.5. Uncertainty

The measurement uncertainty is defined as ± 1.2 dB.

6.6. Test Result

Product	Wireless Module		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 1: GPRS 850 Link		
Date of Test	2011/11/22	Test Site	AC-6

Figure Channel 128 (824.20MHz)

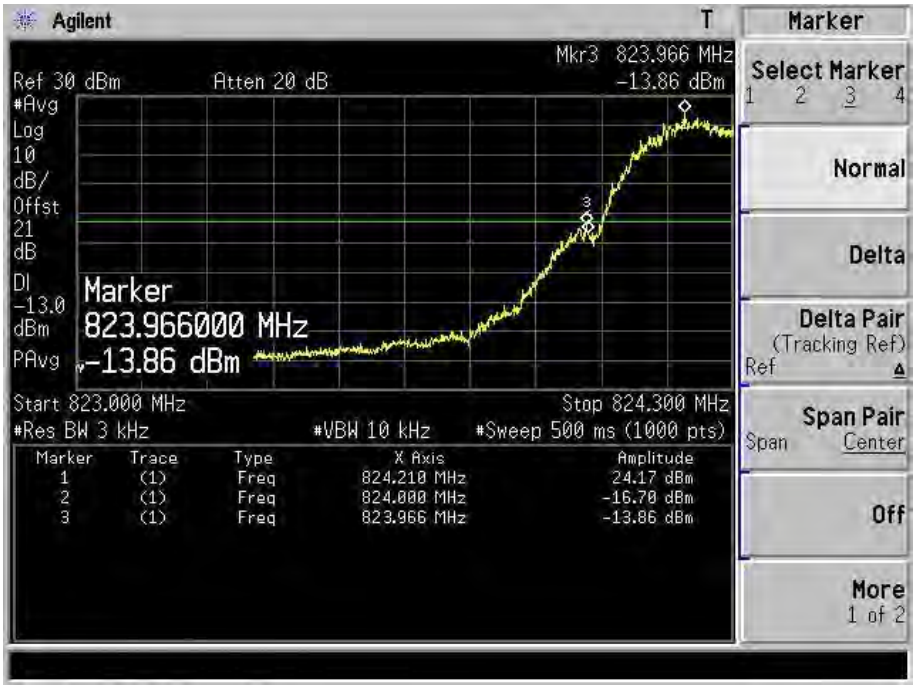
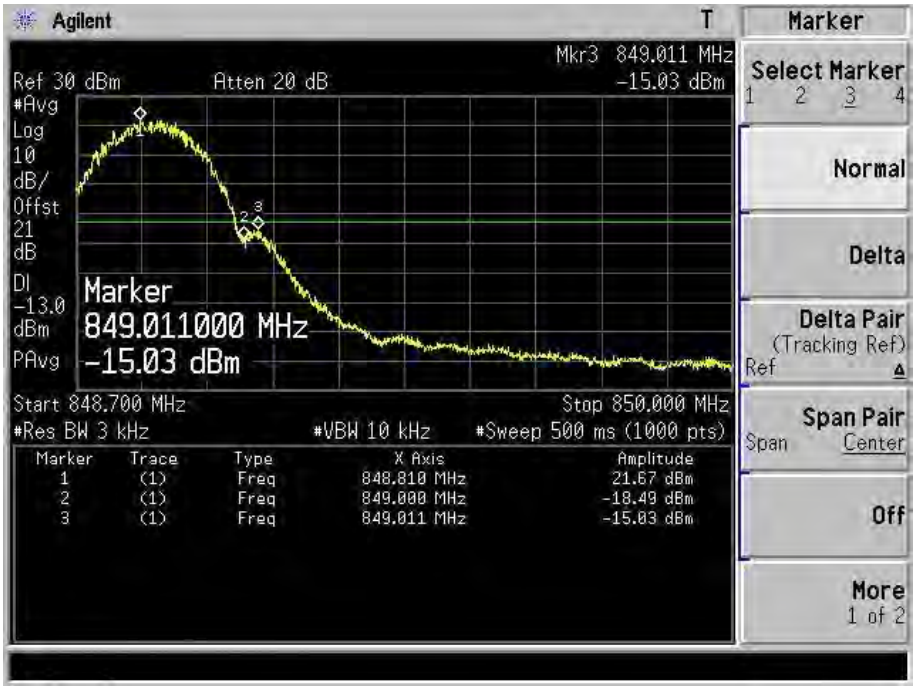


Figure Channel 251 (848.80MHz)



Product	Wireless Module		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 2: GPRS1900 Link		
Date of Test	2011/11/22	Test Site	AC-6

Figure Channel 512 (1850.20MHz)

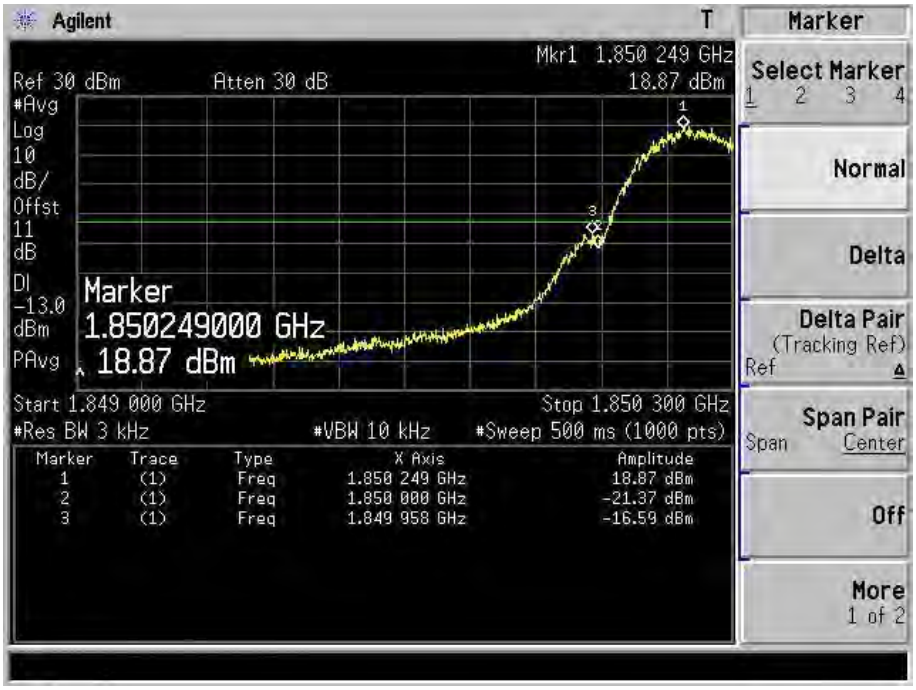
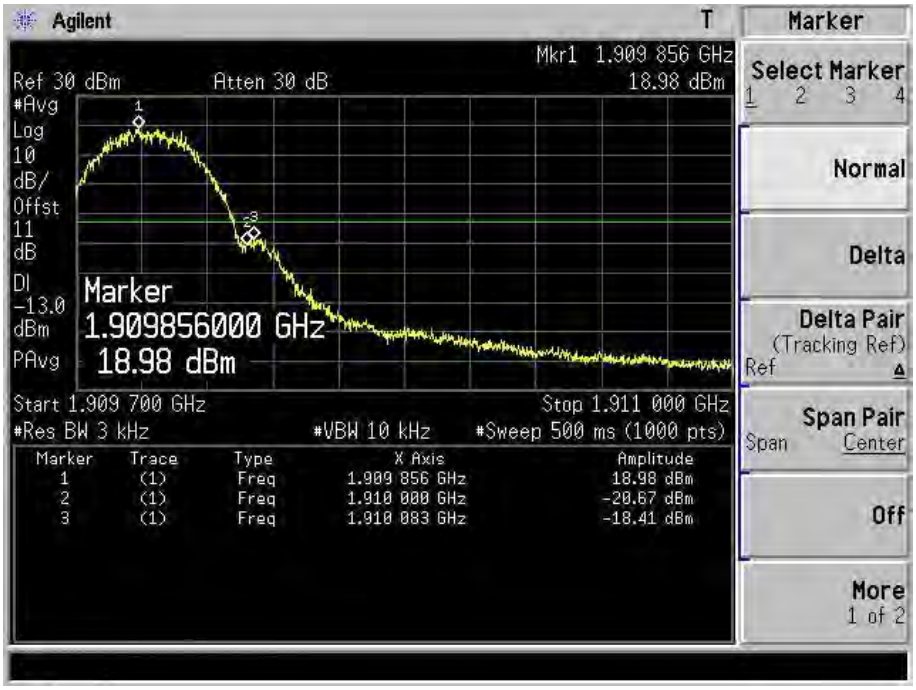


Figure Channel 810 (1909.80MHz)



Product	Wireless Module		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 3: EDGE 850 Link		
Date of Test	2011/11/22	Test Site	AC-6

Figure Channel 128 (824.20MHz)

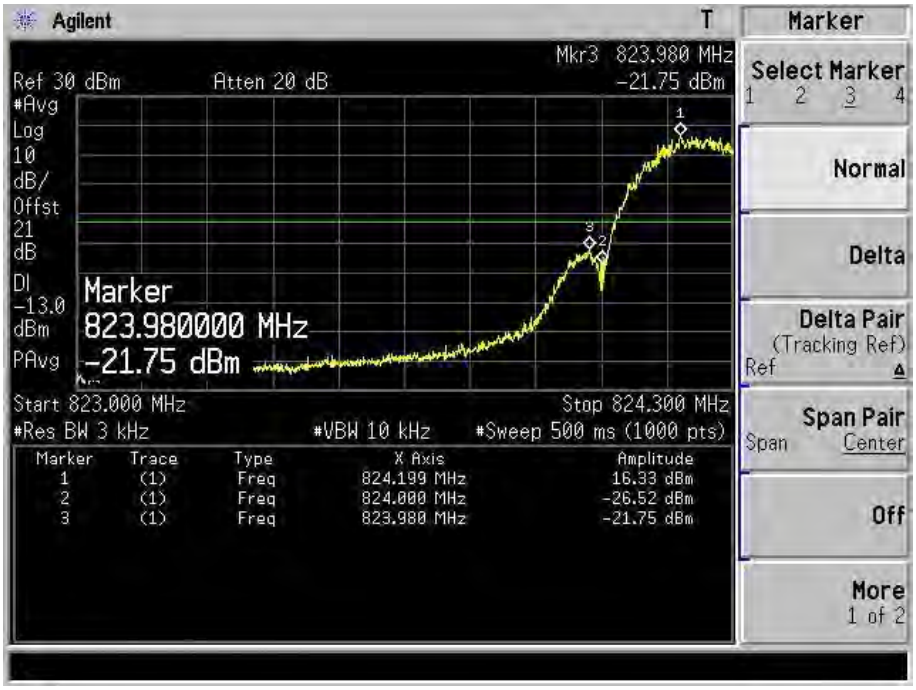
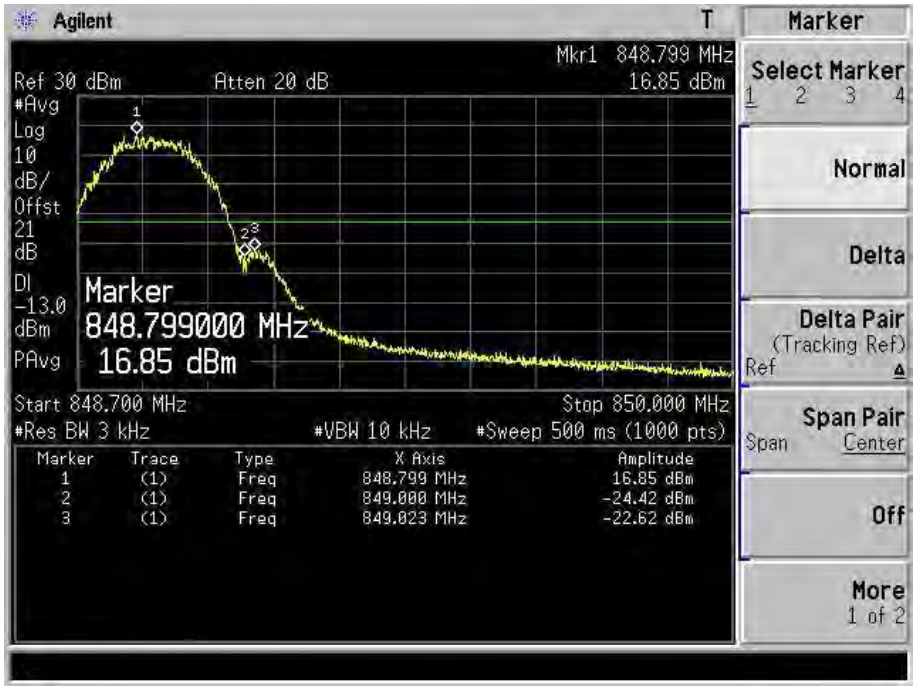


Figure Channel 251 (848.80MHz)



Product	Wireless Module		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 4: EDGE1900 Link		
Date of Test	2011/11/22	Test Site	AC-6

Figure Channel 512 (1850.20MHz)

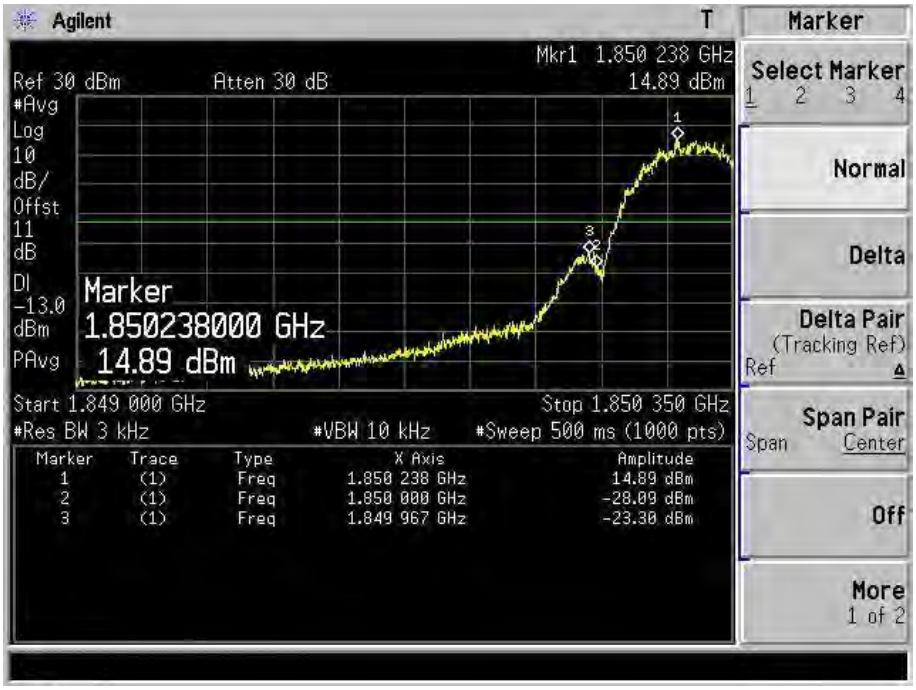
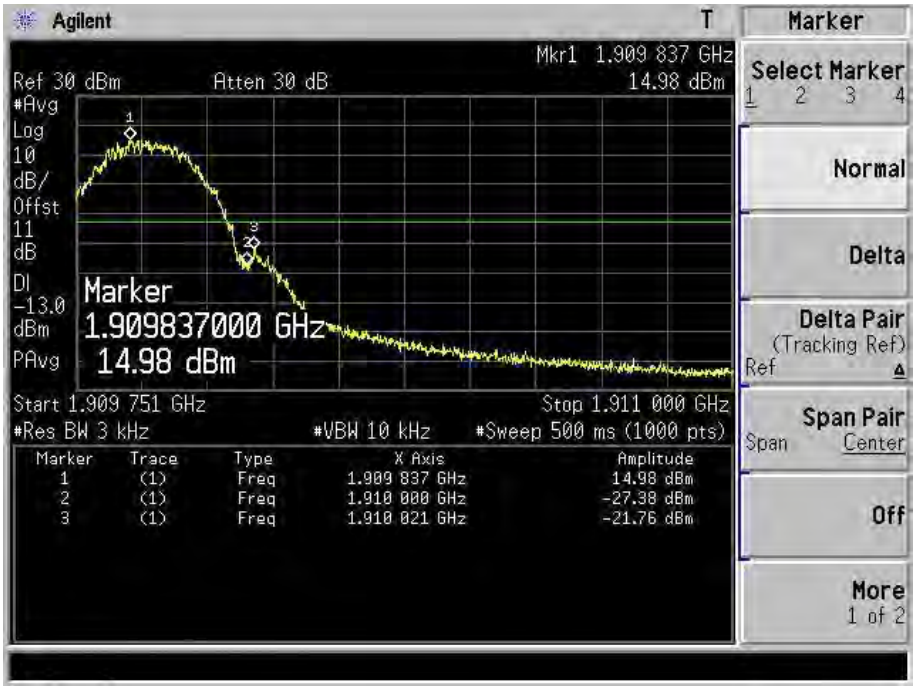


Figure Channel 810 (1909.80MHz)



Product	Wireless Module		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 5: WCDMA Band II Link		
Date of Test	2011/11/22	Test Site	AC-6

Figure Channel 9262 (1852.4MHz)

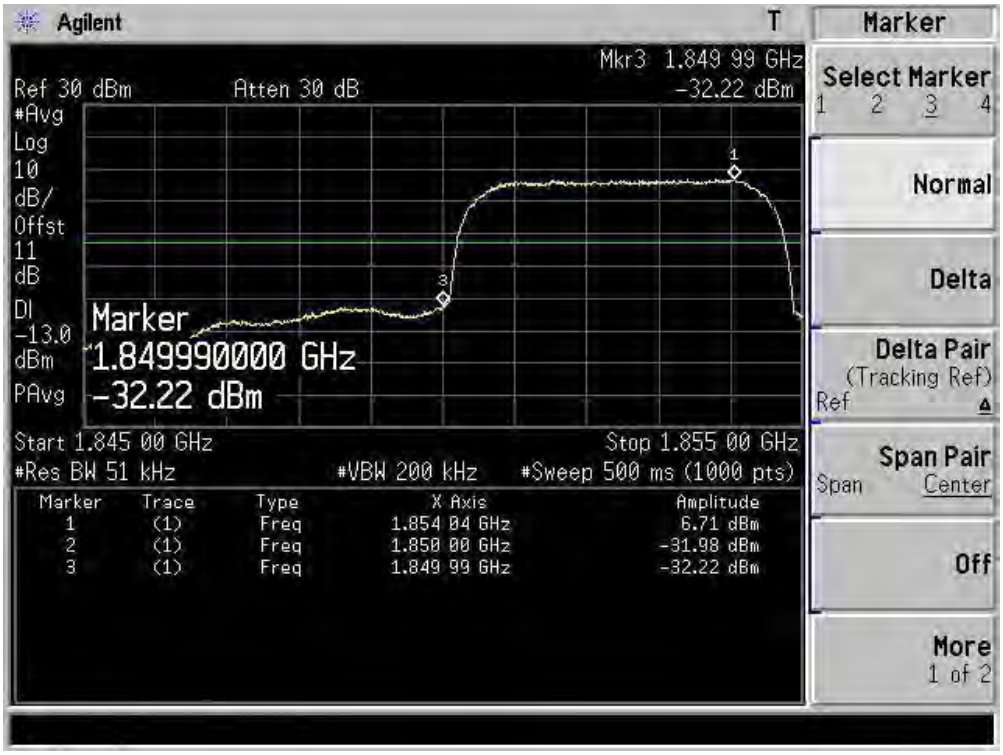
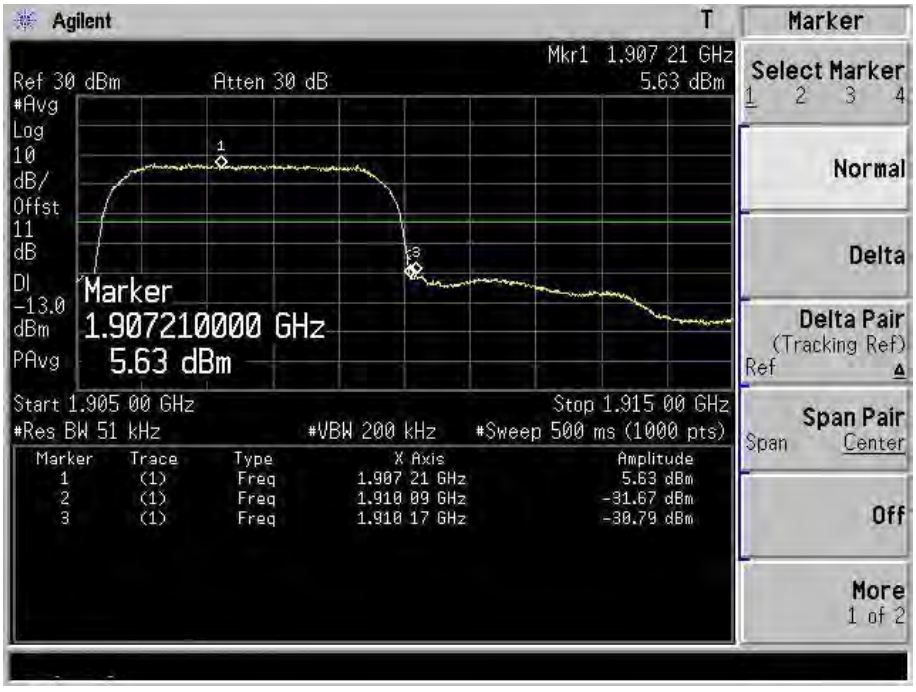


Figure Channel 9538 (1907.6MHz)



Product	Wireless Module		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 6: WCDMA Band V Link		
Date of Test	2011/11/22	Test Site	AC-6

Figure Channel 4132 (826.4MHz)

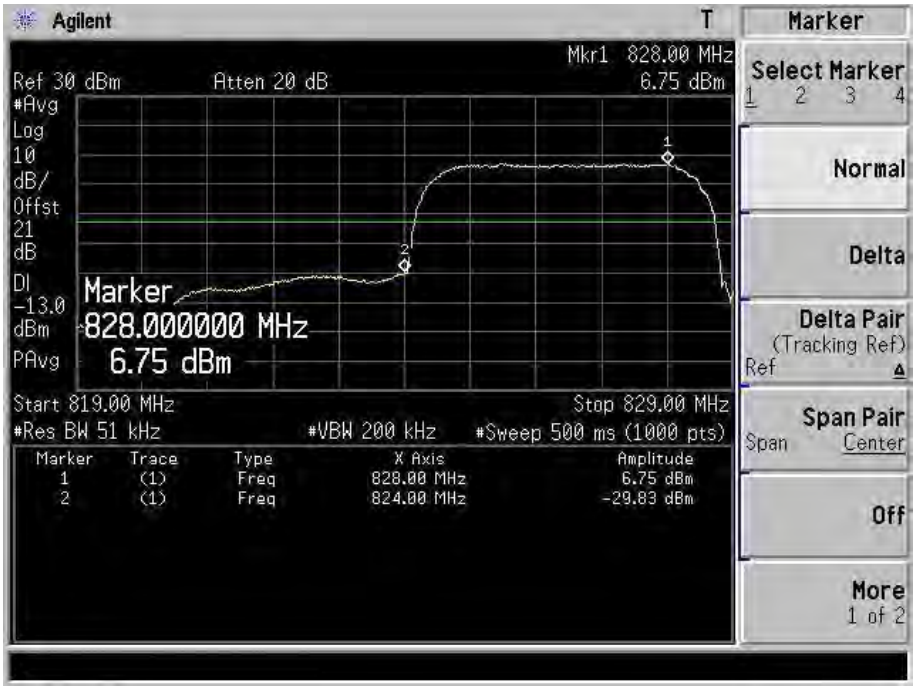
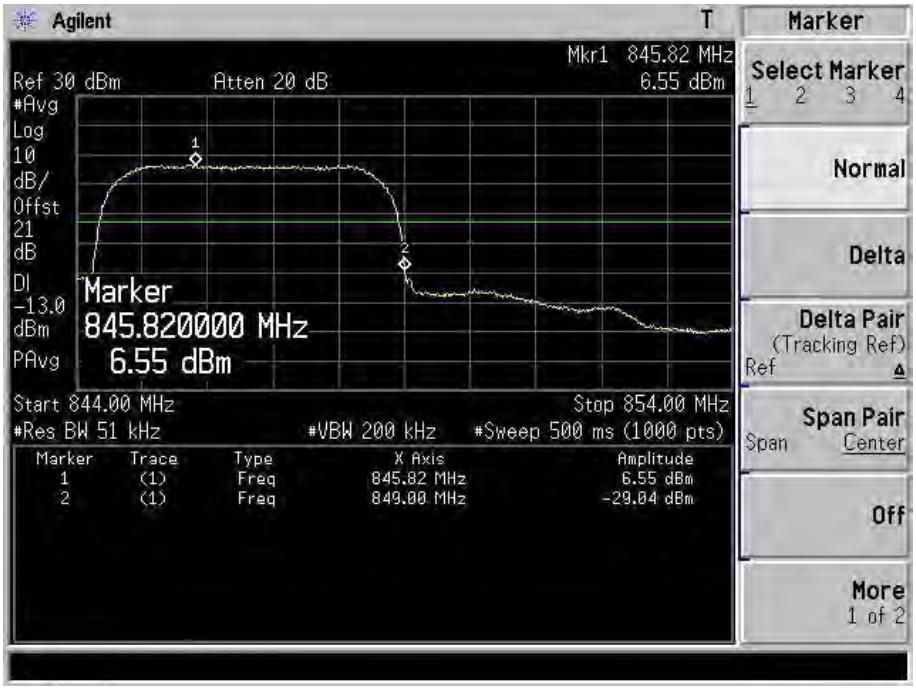


Figure Channel 4233 (846.6MHz)



Product	Wireless Module		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 7: HSDPA Band II Link		
Date of Test	2011/11/22	Test Site	AC-6

Figure Channel 9262 (1852.4MHz)

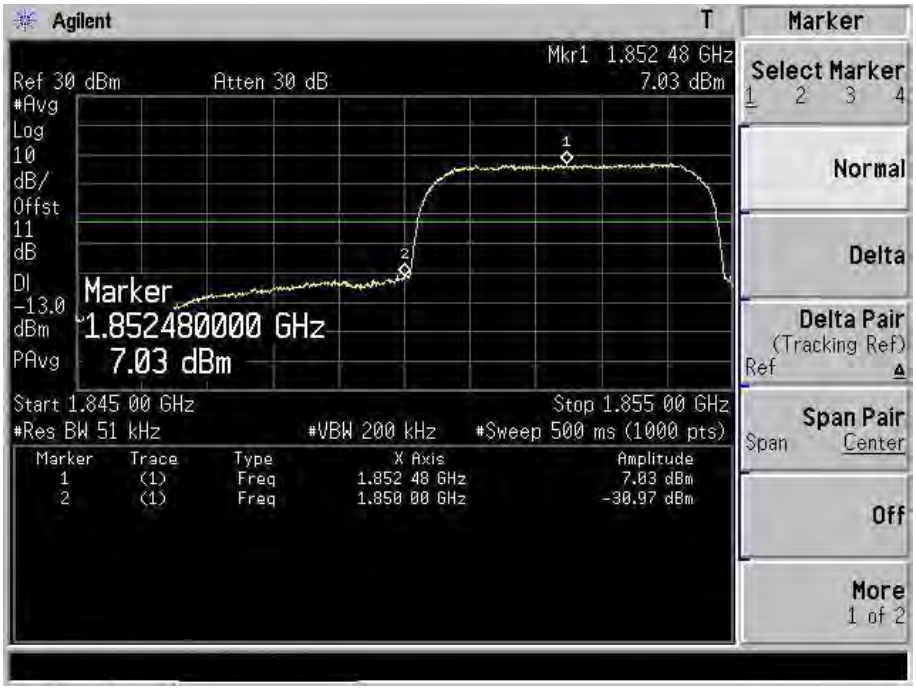
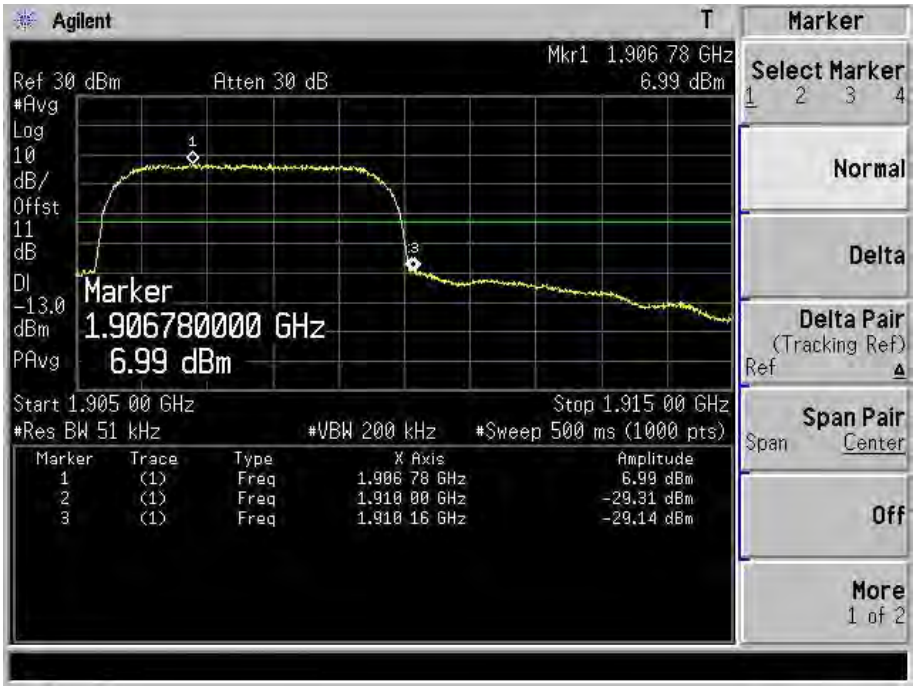


Figure Channel 9538 (1907.6MHz)



Product	Wireless Module		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 8: HSDPA Band V Link		
Date of Test	2011/11/22	Test Site	AC-6

Figure Channel 4132 (826.4MHz)

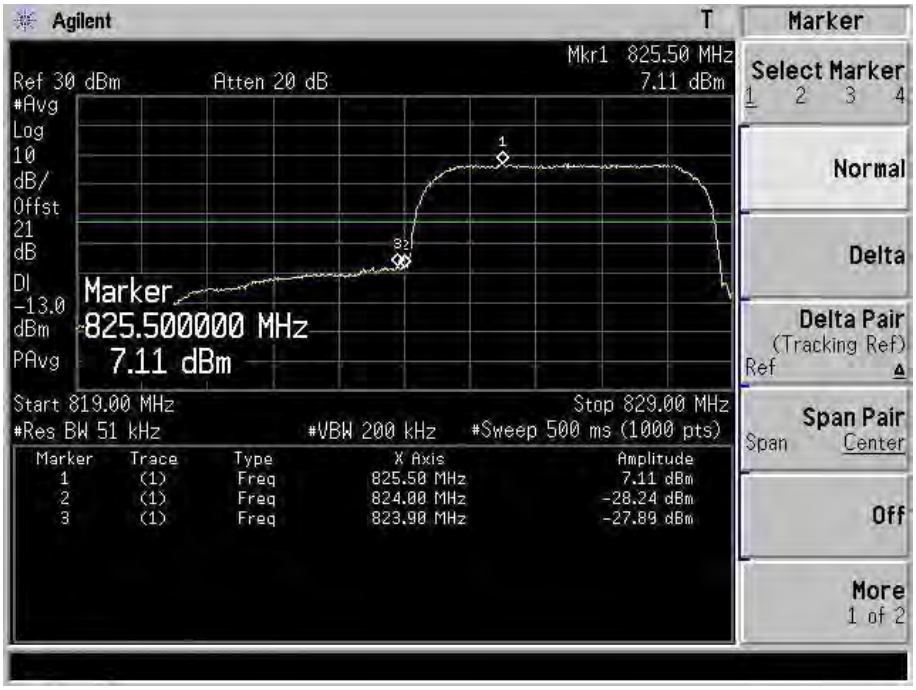
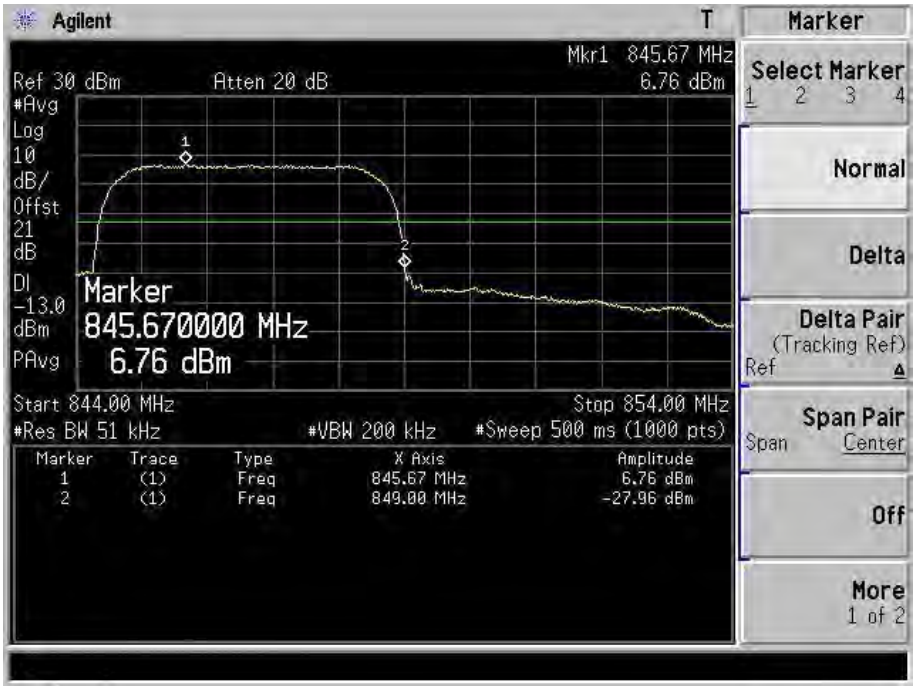


Figure Channel 4233 (846.6MHz)



7. Spurious Emission

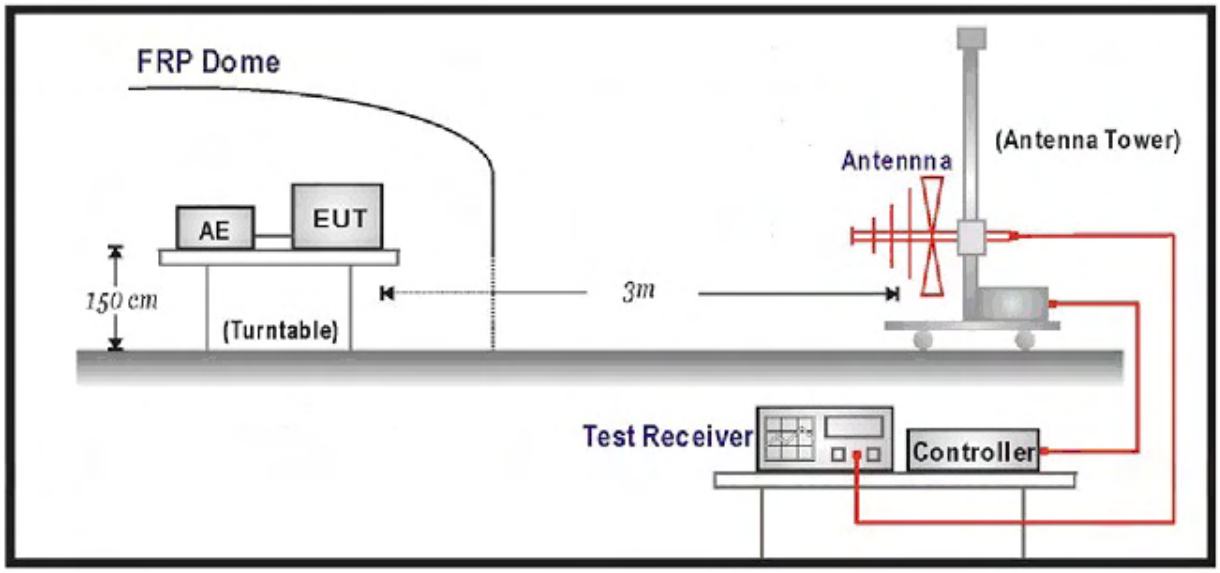
7.1. Test Equipment

Spurious Emission / AC-5

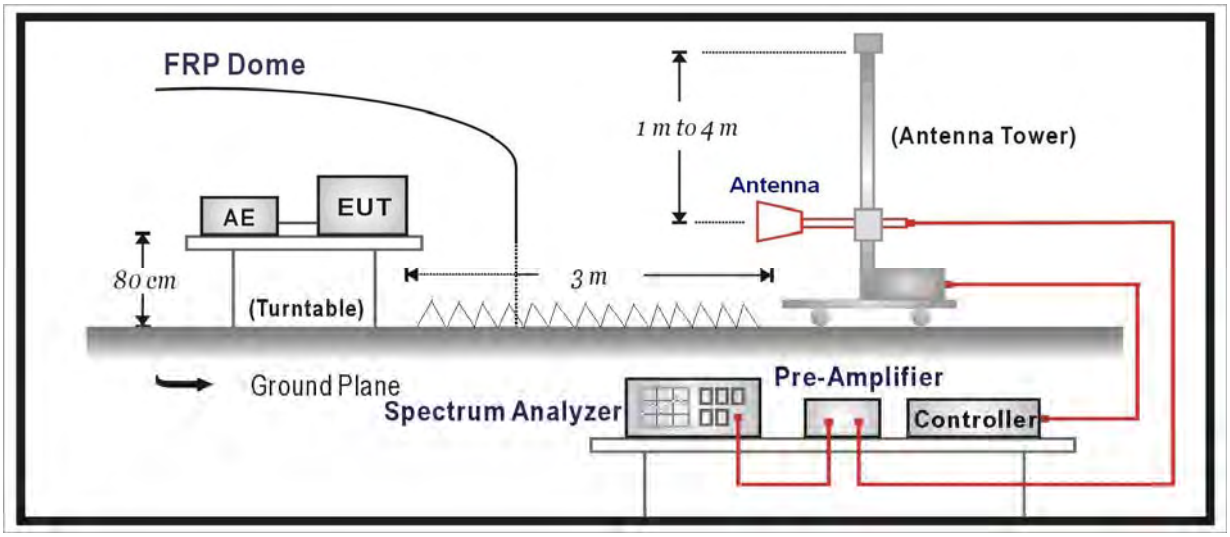
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2012.04.23
Preamplifier	QuieTek	AP-025C	CHM-0503006	2012.05.05
Preamplifier	Miteq	NSP1800-25	1364185	2012.05.05
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2012.10.18
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2011.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2011.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2012.06.11
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2012.01.14

7.2. Test Setup

Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



7.3. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

7.4. Test Procedure

Conducted Spurious Measurement:

a) Place the EUT on a bench and set it in transmitting mode.
b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMU200 by a Directional Couple.
c) EUT Communicate with CMU200, then select a channel for testing.
d) Add a correction factor to the display of spectrum, and then test.
e) The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

Radiated Spurious Measurement:

a) The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
b) The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
c) The output of the test antenna shall be connected to the measuring receiver.
d) The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
e) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
f) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
g) The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
v) The maximum signal level detected by the measuring receiver shall be noted.
h) The transmitter shall be replaced by a substitution antenna.
i) The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
j) The substitution antenna shall be connected to a calibrated signal generator.
k) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
l) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
m) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.

n) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
o) The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
p) The frequency range was checked up to 10th harmonic.
q) Test site anechoic chamber refer to ANSI C63.4: 2009

7.5. Uncertainty

The measurement uncertainty is defined as 3.2 dB for Radiated Power Measurement.

7.6. Test Result

Product	Wireless Module		
Test Item	Spurious Emission		
Test Mode	Mode 1: GPRS850 Traffic		
Date of Test	2011/11/24	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
1648.40	-54.41	V	-59.22	2.50	9.75	-51.97	-13.00	-38.97
2472.60	-52.21	V	-53.25	3.12	10.48	-45.89	-13.00	-32.89
1648.40	-47.13	H	-51.77	2.50	9.75	-44.52	-13.00	-31.52
2472.60	-51.11	H	-52.15	3.12	10.48	-44.79	-13.00	-31.79
Middle Channel 189 (836.40MHz)								
1672.80	-54.56	V	-59.38	2.52	9.95	-51.95	-13.00	-38.95
2509.20	-52.92	V	-54.38	3.18	10.62	-46.94	-13.00	-33.94
1672.80	-53.39	H	-57.96	2.52	9.95	-50.53	-13.00	-37.53
2509.20	-54.43	H	-55.51	3.18	10.62	-48.07	-13.00	-35.07
High Channel 251 (848.80MHz)								
1697.60	-55.02	V	-59.90	2.54	10.06	-52.38	-13.00	-39.38
2546.40	-40.78	V	-41.37	3.14	10.68	-33.83	-13.00	-20.83
1697.60	-57.04	H	-61.19	2.54	10.06	-53.67	-13.00	-40.67
2546.40	-55.33	H	-55.66	3.14	10.68	-48.12	-13.00	-35.12

Product	Wireless Module		
Test Item	Spurious Emission		
Test Mode	Mode 2: GPRS1900 Traffic		
Date of Test	2011/11/24	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 512 (1850.20MHz)								
3700.40	-62.35	V	-61.97	3.84	12.69	-53.12	-13.00	-40.12
5550.60	-61.20	V	-54.85	4.82	13.15	-46.52	-13.00	-33.52
3700.40	-61.48	H	-60.26	3.84	12.69	-51.41	-13.00	-38.41
5550.60	-64.97	H	-59.23	4.82	13.15	-50.90	-13.00	-37.90
Middle Channel 661 (1880.00MHz)								
3760.00	-60.58	V	-59.51	3.73	12.72	-50.52	-13.00	-37.52
5640.00	-60.04	V	-54.26	4.93	13.14	-46.05	-13.00	-33.05
3760.00	-63.12	H	-62.35	3.73	12.72	-53.36	-13.00	-40.36
5640.00	-61.62	H	-56.17	4.93	13.14	-47.96	-13.00	-34.96
High Channel 810 (1909.80MHz)								
3819.60	-60.24	V	-58.67	4.02	12.73	-49.96	-13.00	-36.96
5729.40	-59.41	V	-52.94	4.87	13.11	-44.70	-13.00	-31.70
3819.60	-61.83	H	-60.11	4.02	12.73	-51.40	-13.00	-38.40
5729.40	-60.09	H	-54.00	4.87	13.11	-45.76	-13.00	-32.76

Product	Wireless Module		
Test Item	Spurious Emission		
Test Mode	Mode 3: EDGE 850 Link		
Date of Test	2011/11/24	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
1648.40	-57.46	V	-62.18	2.50	9.75	-54.93	-13.00	-41.93
2472.60	-57.20	V	-58.72	3.12	10.48	-51.36	-13.00	-38.36
1648.40	-54.38	H	-59.19	2.50	9.75	-51.94	-13.00	-38.94
2472.60	-57.20	H	-58.41	3.12	10.48	-51.05	-13.00	-38.05
Middle Channel 189 (836.40MHz)								
1672.80	-49.65	V	-55.13	2.52	9.95	-47.70	-13.00	-34.70
2509.20	-56.31	V	-58.07	3.18	10.62	-50.63	-13.00	-37.63
1672.80	-47.78	H	-52.60	2.52	9.95	-45.17	-13.00	-32.17
2509.20	-57.88	H	-58.96	3.18	10.62	-51.52	-13.00	-38.52
High Channel 251 (848.80MHz)								
1697.60	-49.56	V	-55.14	2.54	10.06	-47.62	-13.00	-34.62
2546.40	-57.23	V	-58.93	3.14	10.68	-51.39	-13.00	-38.39
1697.60	-47.18	H	-52.09	2.54	10.06	-44.57	-13.00	-31.57
2546.40	-57.49	H	-58.87	3.14	10.68	-51.33	-13.00	-38.33

Product	Wireless Module		
Test Item	Spurious Emission		
Test Mode	Mode 4: EDGE1900 Link		
Date of Test	2011/11/24	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 512 (1850.20MHz)								
3700.40	-62.75	V	-62.96	3.84	12.69	-54.11	-13.00	-41.11
5550.60	-62.84	V	-56.49	4.82	13.15	-48.16	-13.00	-35.16
3700.40	-62.95	H	-62.11	3.84	12.69	-53.26	-13.00	-40.26
5550.60	-64.14	H	-58.35	4.82	13.15	-50.02	-13.00	-37.02
Middle Channel 661 (1880.00MHz)								
3760.00	-63.56	V	-61.71	3.73	12.72	-52.72	-13.00	-39.72
5640.00	-63.04	V	-57.25	4.93	13.14	-49.04	-13.00	-36.04
3760.00	-64.16	H	-63.10	3.73	12.72	-54.11	-13.00	-41.11
5640.00	-63.13	H	-57.67	4.93	13.14	-49.46	-13.00	-36.46
High Channel 810 (1909.80MHz)								
3819.60	-62.64	V	-62.27	4.02	12.73	-53.56	-13.00	-40.56
5729.40	-62.93	V	-57.18	4.87	13.11	-48.94	-13.00	-35.94
3819.60	-63.63	H	-62.88	4.02	12.73	-54.17	-13.00	-41.17
5729.40	-62.90	H	-57.47	4.87	13.11	-49.23	-13.00	-36.23

Product	Wireless Module		
Test Item	Spurious Emission		
Test Mode	Mode 5: WCDMA Band II Link		
Date of Test	2011/11/24	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 9262 (1852.40MHz)								
3704.80	-48.84	V	-46.60	4.78	12.69	-38.69	-13.00	-25.69
5557.20	-65.06	V	-58.81	4.82	13.15	-50.48	-13.00	-37.48
3704.80	-56.70	H	-54.53	4.78	12.69	-46.62	-13.00	-33.62
5557.20	-64.44	H	-58.29	4.82	13.15	-49.96	-13.00	-36.96
Middle Channel 9400 (1880.00MHz)								
3760.00	-47.63	V	-45.26	5.03	12.72	-37.57	-13.00	-24.57
5640.00	-65.45	V	-57.63	5.93	13.14	-50.42	-13.00	-37.42
3760.00	-54.55	H	-52.10	5.03	12.72	-44.41	-13.00	-31.41
5640.00	-64.51	H	-57.34	5.93	13.14	-50.13	-13.00	-37.13
High Channel 9538 (1907.60MHz)								
3815.20	-48.01	V	-45.42	5.03	12.73	-37.72	-13.00	-24.72
5722.80	-63.81	V	-57.42	4.87	13.11	-49.18	-13.00	-36.18
3815.20	-54.88	H	-52.13	5.03	12.73	-44.43	-13.00	-31.43
5722.80	-64.56	H	-58.40	4.87	13.11	-50.16	-13.00	-37.16

Product	Wireless Module		
Test Item	Spurious Emission		
Test Mode	Mode 6: WCDMA Band V Traffic		
Date of Test	2011/11/24	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 4132 (826.40MHz)								
1652.80	-51.33	V	-55.23	3.28	9.75	-48.76	-13.00	-35.76
2479.20	-56.63	V	-57.17	4.10	10.48	-50.79	-13.00	-37.79
1652.80	-49.62	H	-53.52	3.28	9.75	-47.05	-13.00	-34.05
2479.20	-57.67	H	-57.98	4.10	10.48	-51.60	-13.00	-38.60
Middle Channel 4182 (836.40MHz)								
1672.80	-50.06	V	-54.07	3.32	9.95	-47.44	-13.00	-34.44
2509.20	-56.47	V	-57.43	3.81	10.62	-50.62	-13.00	-37.62
1672.80	-47.69	H	-51.46	3.32	9.95	-44.83	-13.00	-31.83
2509.20	-56.82	H	-57.41	3.81	10.62	-50.60	-13.00	-37.60
High Channel 4233 (846.60MHz)								
1693.20	-46.05	V	-50.13	3.35	10.06	-43.42	-13.00	-30.42
2539.80	-56.06	V	-56.71	4.19	10.68	-50.22	-13.00	-37.22
1693.20	-45.10	H	-48.44	3.35	10.06	-41.73	-13.00	-28.73
2539.80	-57.09	H	-56.37	4.19	10.68	-49.88	-13.00	-36.88

Product	Wireless Module		
Test Item	Spurious Emission		
Test Mode	Mode 7: HSDPA Band II Traffic		
Date of Test	2011/11/24	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 9262 (1852.40MHz)								
3704.80	-46.27	V	-44.02	4.78	12.69	-36.11	-13.00	-23.11
5557.20	-63.75	V	-58.01	4.82	13.15	-49.68	-13.00	-36.68
3704.80	-50.80	H	-48.63	4.78	12.69	-40.72	-13.00	-27.72
5557.20	-64.59	H	-58.73	4.82	13.15	-50.40	-13.00	-37.40
Middle Channel 9400 (1880.00MHz)								
3760.00	-47.53	V	-45.22	5.03	12.72	-37.53	-13.00	-24.53
5640.00	-65.26	V	-57.37	5.93	13.14	-50.16	-13.00	-37.16
3760.00	-54.95	H	-52.50	5.03	12.72	-44.81	-13.00	-31.81
5640.00	-65.04	H	-58.10	5.93	13.14	-50.89	-13.00	-37.89
High Channel 9538 (1907.60MHz)								
3815.20	-48.63	V	-46.05	5.03	12.73	-38.35	-13.00	-25.35
5722.80	-65.50	V	-58.71	4.87	13.11	-50.47	-13.00	-37.47
3815.20	-55.27	H	-52.52	5.03	12.73	-44.82	-13.00	-31.82
5722.80	-65.28	H	-59.36	4.87	13.11	-51.12	-13.00	-38.12

Product	Wireless Module		
Test Item	Spurious Emission		
Test Mode	Mode 8: HSDPA Band V Traffic		
Date of Test	2011/11/24	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 4132 (826.40MHz)								
1652.80	-50.50	V	-54.40	3.28	9.75	-47.93	-13.00	-34.93
2479.20	-52.51	V	-52.87	4.10	10.48	-46.49	-13.00	-33.49
1652.80	-47.41	H	-51.32	3.28	9.75	-44.85	-13.00	-31.85
2479.20	-49.17	H	-49.31	4.10	10.48	-42.93	-13.00	-29.93
Middle Channel 4182 (836.40MHz)								
1672.80	-49.42	V	-53.43	3.32	9.95	-46.80	-13.00	-33.80
2509.20	-51.84	V	-52.82	3.81	10.62	-46.01	-13.00	-33.01
1672.80	-45.74	H	-49.51	3.32	9.95	-42.88	-13.00	-29.88
2509.20	-49.17	H	-49.62	3.81	10.62	-42.81	-13.00	-29.81
High Channel 4233 (846.60MHz)								
1693.20	-46.59	V	-50.66	3.35	10.06	-43.95	-13.00	-30.95
2539.80	-55.24	V	-55.02	4.19	10.68	-48.53	-13.00	-35.53
1693.20	-44.09	H	-47.43	3.35	10.06	-40.72	-13.00	-27.72
2539.80	-48.74	H	-48.02	4.19	10.68	-41.53	-13.00	-28.53

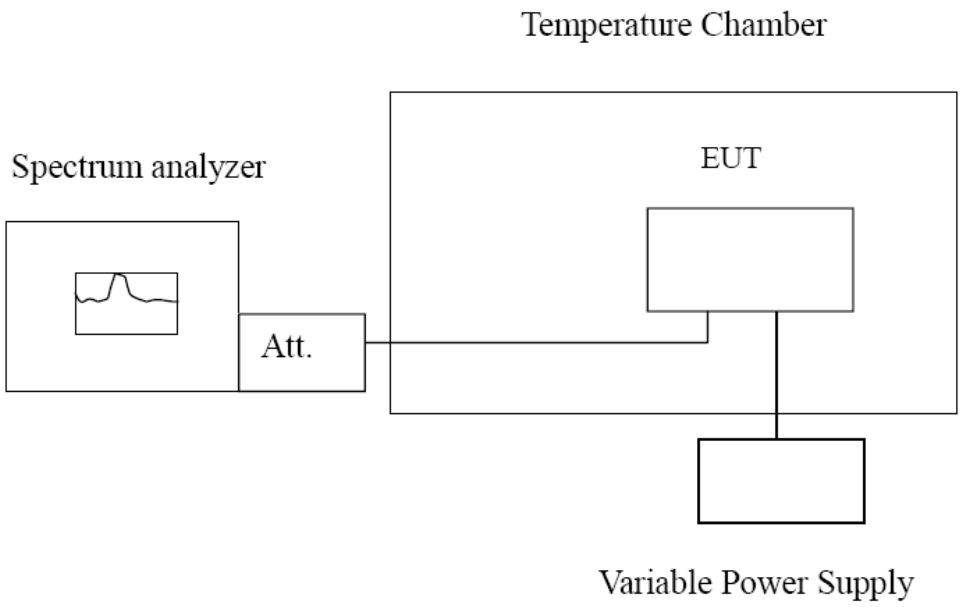
8. Frequency Stability Under Temperature & Voltage Variations

8.1. Test Equipment

Frequency Stability Under Temperature & Voltage Variations / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
DC Power Supply	IDRC	CD-035-020PR	977272	2012.09.22
Temperature & Humidity Chamber	Gaoyu	TH-1P-B	WIT-05121302	2012.01.19
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2012.01.14

8.2. Test Setup



8.3. Limit

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Limit	< ± 2.5 ppm

8.4. Test Procedure

Frequency Stability Under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20℃. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

8.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz.

8.6. Test Result

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: GPRS 850 Link		
Date of Test	2011/11/22	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.40	39	± 2091
-20	836.40	36	± 2091
-10	836.40	44	± 2091
0	836.40	51	± 2091
10	836.40	26	± 2091
20	836.40	34	± 2091
30	836.40	38	± 2091
40	836.40	45	± 2091
50	836.40	33	± 2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	836.40	28	± 2091
3.800	836.40	32	± 2091
3.400	836.40	39	± 2091

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 2: GPRS1900 Link		
Date of Test	2011/11/22	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	1880.00	38	± 4700
-20	1880.00	35	± 4700
-10	1880.00	47	± 4700
0	1880.00	46	± 4700
10	1880.00	33	± 4700
20	1880.00	32	± 4700
30	1880.00	31	± 4700
40	1880.00	29	± 4700
50	1880.00	26	± 4700

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	1880.00	46	± 4700
3.800	1880.00	22	± 4700
3.400	1880.00	43	± 4700

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 3: EDGE 850 Link		
Date of Test	2011/11/22	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.40	46	± 2091
-20	836.40	44	± 2091
-10	836.40	52	± 2091
0	836.40	38	± 2091
10	836.40	41	± 2091
20	836.40	29	± 2091
30	836.40	56	± 2091
40	836.40	44	± 2091
50	836.40	55	± 2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	836.40	35	± 2091
3.800	836.40	45	± 2091
3.400	836.40	48	± 2091

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 4: EDGE 1900 Link		
Date of Test	2011/11/22	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	1880.00	58	± 4700
-20	1880.00	54	± 4700
-10	1880.00	48	± 4700
0	1880.00	46	± 4700
10	1880.00	52	± 4700
20	1880.00	38	± 4700
30	1880.00	39	± 4700
40	1880.00	44	± 4700
50	1880.00	37	± 4700

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	1880.00	44	± 4700
3.800	1880.00	39	± 4700
3.400	1880.00	32	± 4700

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 5: WCDMA Band II Link		
Date of Test	2011/11/22	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	1880.00	39	± 4700
-20	1880.00	44	± 4700
-10	1880.00	46	± 4700
0	1880.00	51	± 4700
10	1880.00	33	± 4700
20	1880.00	41	± 4700
30	1880.00	38	± 4700
40	1880.00	52	± 4700
50	1880.00	45	± 4700

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	1880.00	29	± 4700
3.800	1880.00	56	± 4700
3.400	1880.00	52	± 4700

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 6: WCDMA Band V Link		
Date of Test	2011/11/22	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.40	46	± 2091
-20	836.40	48	± 2091
-10	836.40	56	± 2091
0	836.40	60	± 2091
10	836.40	39	± 2091
20	836.40	45	± 2091
30	836.40	36	± 2091
40	836.40	39	± 2091
50	836.40	55	± 2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	836.40	48	± 2091
3.800	836.40	54	± 2091
3.400	836.40	41	± 2091

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode7: HSDPA Band II Link		
Date of Test	2011/11/22	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	1880.00	66	± 4700
-20	1880.00	63	± 4700
-10	1880.00	54	± 4700
0	1880.00	48	± 4700
10	1880.00	47	± 4700
20	1880.00	51	± 4700
30	1880.00	46	± 4700
40	1880.00	49	± 4700
50	1880.00	38	± 4700

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	1880.00	44	± 4700
3.800	1880.00	53	± 4700
3.400	1880.00	48	± 4700

Product	Wireless Module		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 8: HSDPA Band V Link		
Date of Test	2011/11/22	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.40	56	± 2091
-20	836.40	55	± 2091
-10	836.40	48	± 2091
0	836.40	39	± 2091
10	836.40	62	± 2091
20	836.40	47	± 2091
30	836.40	49	± 2091
40	836.40	39	± 2091
50	836.40	42	± 2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	836.40	32	± 2091
3.800	836.40	39	± 2091
3.400	836.40	41	± 2091

9. Attachment

➢ EUT Photograph

(1) EUT Photo

(2) EUT Photo