



FCC Part22H&24E Test Report Industry Canada RSS-132/RSS-133

Product Name : Wireless Module
Model No. : SL9090
FCC ID : N7NSL9090
IC : 2417C-SL9090

Applicant : Sierra Wireless Hong Kong Limited
Address : Unit 201-207, 2nd Floor, Bio-Informatics Center,
No. 2 Science Park West Avenue Hong Kong
Science Park, Shatin, New Territories, Hong
Kong, People's Republic of China

Date of Receipt : 12/06/2012
Test Date : 12/06/2012~ 05/07/2012
Issued Date : 24/07/2012
Report No. : 126S034R-HP-US-P07V01
Report Version : V 2.1

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report Certification

Issued Date : 24/07/2012

Report No. : 126S034R-HP-US-P07V01



Product Name : Wireless Module

Applicant : Sierra Wireless Hong Kong Limited

Address : Unit 201-207, 2nd Floor, Bio-Informatics Center, No. 2 Science Park
West Avenue Hong Kong Science Park, Shatin, New Territories,
Hong Kong, People's Republic of China

Manufacturer : Sierra Wireless Hong Kong Limited

Address : Unit 201-207, 2nd Floor, Bio-Informatics Center, No. 2 Science Park
West Avenue Hong Kong Science Park, Shatin, New Territories,
Hong Kong, People's Republic of China

Model No. : SL9090

FCC ID : N7NSL9090

IC : 2417C-SL9090

EUT Voltage : 3.4V/3.8V/4.2V

Brand Name : Sierra Wireless

Applicable Standard : FCC CFR Title 47 Part 2,TIA/EIA 603-C
FCC Part22.917(b), FCC Part24.238(b)
Industry Canada RSS-132, Issue 2: 2005 Clause 4.5
Industry Canada RSS-133, Issue 5: 2009 Clause 6.5

Test Result : Complied

Performed Location : Suzhou EMC Laboratory
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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
China	:	CNAS

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/>

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1. General Information

1.1. EUT Description

Product Name	Wireless Module
Model No.	SL9090
Device Category	Portable
Hardware Version	1.0
Device Category	Portable
RF Exposure Environment	Uncontrolled
2G	
Support Band	GSM850/PCS1900
GPRS Type	Class B
GPRS Class	Class 10
Uplink	GSM 850: 824~849MHz PCS 1900: 1850~1910MHz
Downlink	GSM 850: 869~894MHz PCS 1900: 1930~1990MHz
3G	
Support Band	WCDMA Band II/WCDMA Band V
Uplink	WCDMA Band II: 1850 ~ 1910 MHz WCDMA Band V: 824 ~ 849 MHz
Downlink	WCDMA Band II: 1930 ~ 1990 MHz WCDMA Band V: 869 ~ 894 MHz
CDMA	
Support Band	CDMA2000 1X EVDO BC0/BC1
Uplink	BC0: 824~849MHz BC1: 1850~1910MHz
Downlink	BC0: 869~894MHz BC1: 1930~1990MHz

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
Mode 9: HSUPA Band II Link
Mode 10: HSUPA Band V Link
Mode 11: HSPA+ Band II Link
Mode 12: HSPA+ Band V Link
Mode 13: CDMA 2000 1X BC0 Link
Mode 14: CDMA 2000 1X BC1 Link
Mode 15: CDMA 2000 1X EVDO BC0 Link
Mode 16: CDMA 2000 1X EVDO BC1 Link

Note:

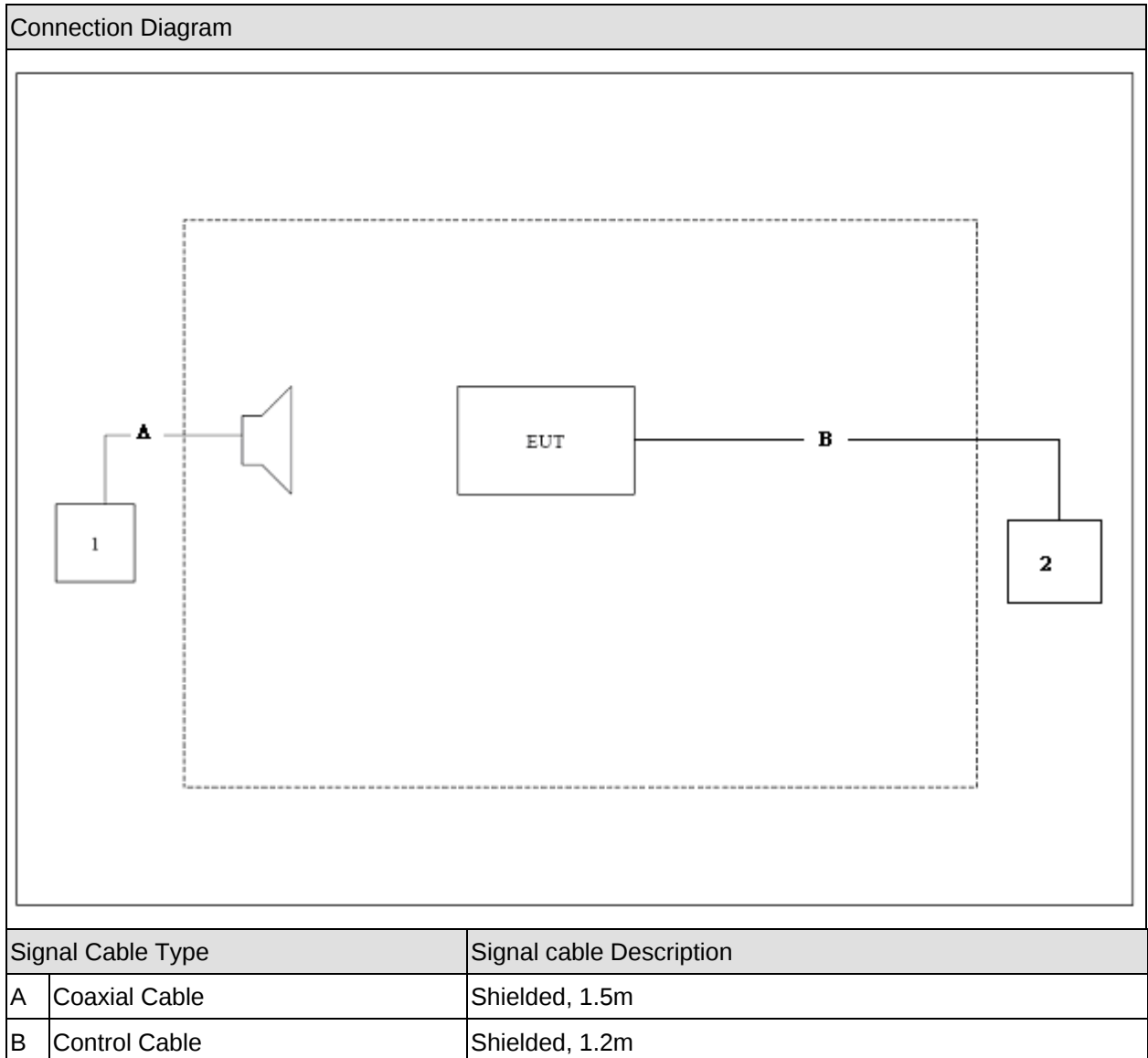
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

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	CMU200	R&S	CMU200	N/A	N/A
2	DC Power Supply	INSTEK	GPS-3030D	EK855344	N/A

1.4. Configuration of Tested System



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/ CDMA 2000 1X BC0 (FCC Part 22H & Part 2)

Performed Item	Section in CFR 47	Section in RSS GEN or RSS-132	Test Performed	Deviation
Spurious Emission	FCC Part 22.917(b) and Part 2.1051, 2.1053	4.5, 4.6	Yes	No

For PCS 1900/WCDMA Band II/ CDMA 2000 1X BC1 (FCC Part 24E & Part 2)

Performed Item	Section in CFR 47	Section in RSS GEN or RSS-133	Test Performed	Deviation
Spurious Emission	FCC Part 24.238(b) and Part 2.1051, 2.1053	6.5, 6.6	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. Spurious Emission

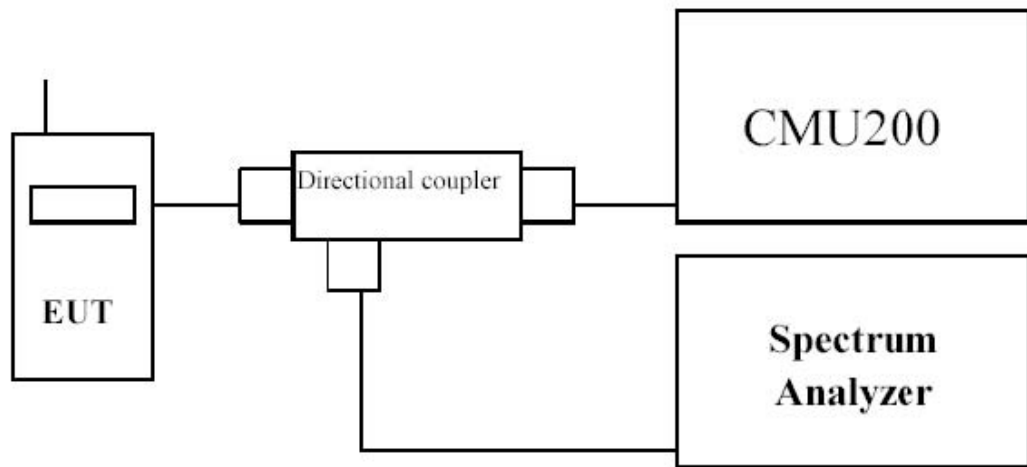
3.1. Test Equipment

Spurious Emission / AC-5

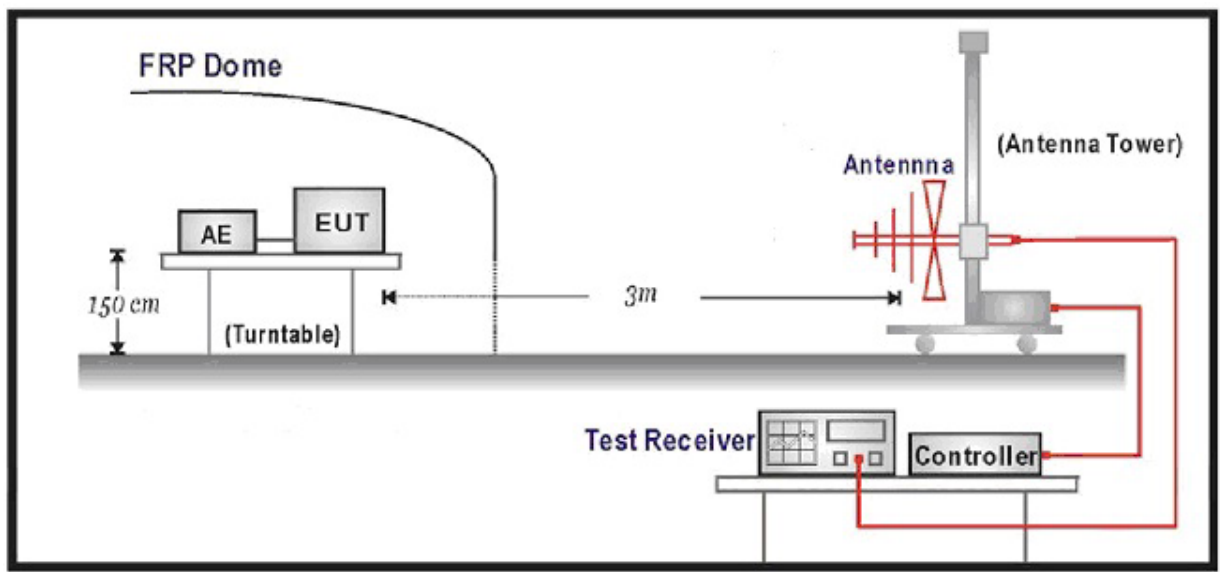
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2013.04.10
Radio Communication Tester	R&S	CMU 200	117088	2013.04.18
Dual Directional Coupler	Agilent	778D	20160	2013.04.18
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2013.04.18
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2013.04.18
Preamplifier	Quietek	AP-025C	CHM-0503006	2013.05.04
Preamplifier	Miteq	NSP1800-25	1364185	2013.05.04
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2012.10.18
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2014.06.08
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2013.01.10

3.2. Test Setup

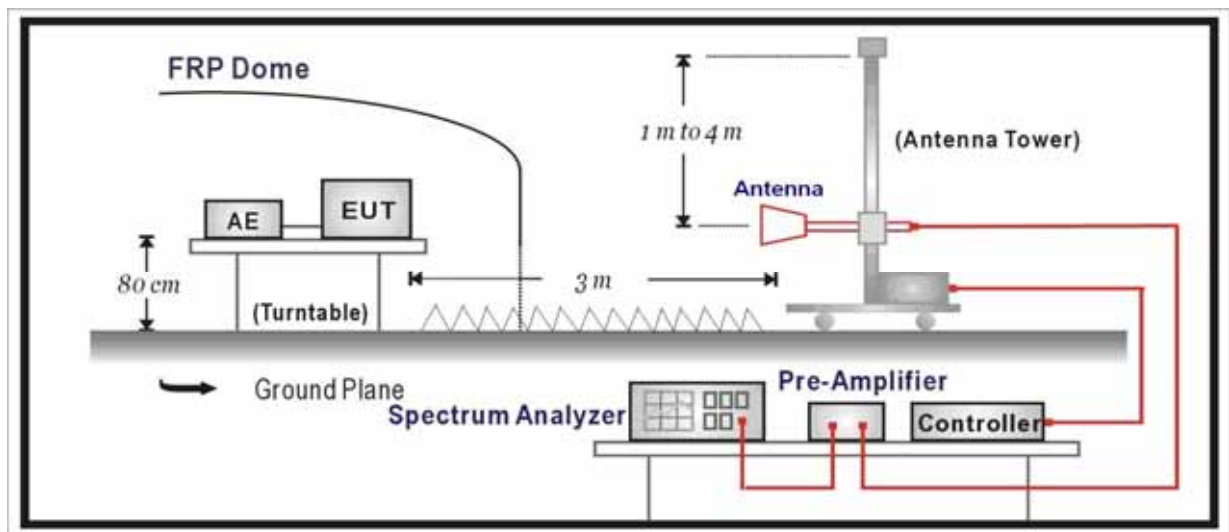
Conducted Spurious Emission Measurement:



Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



3.3. 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 $43 + 10\log(P)$ dB.

3.4. Test Procedure

Conducted Spurious Measurement:

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

- The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- The output of the test antenna shall be connected to the measuring receiver.
- 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.
- a) 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

3.5. Uncertainty

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

3.6. Test Result

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: GPRS 850 Link		
Date of Test	2012/07/04	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)								
1646.00	-54.20	V	-58.76	2.50	9.75	-51.51	-13.00	-38.51
2470.50	-62.75	V	-63.81	3.12	10.48	-56.45	-13.00	-43.45
1646.00	-45.72	H	-50.53	2.50	9.75	-43.28	-13.00	-30.28
2470.50	-61.22	H	-59.96	3.12	10.48	-52.60	-13.00	-39.60
Middle Channel 189 (836.40MHz)								
1671.50	-51.93	V	-56.75	2.52	9.95	-49.32	-13.00	-36.32
2513.00	-55.80	V	-57.27	3.18	10.62	-49.83	-13.00	-36.83
1671.50	-47.28	H	-51.85	2.52	9.95	-44.42	-13.00	-31.42
2513.00	-62.92	H	-64.06	3.18	10.62	-56.62	-13.00	-43.62
High Channel 251 (848.80MHz)								
1697.00	-50.99	V	-55.88	2.54	10.06	-48.36	-13.00	-35.36
2547.00	-54.54	V	-55.12	3.14	10.68	-47.58	-13.00	-34.58
1697.00	-47.30	H	-51.45	2.54	10.06	-43.93	-13.00	-30.93
2547.00	-63.56	H	-63.91	3.14	10.68	-56.37	-13.00	-43.37

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 2: GPRS1900 Link		
Date of Test	2012/07/04	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)								
3700.00	-62.51	V	-61.20	3.84	12.69	-52.35	-13.00	-39.35
5550.00	-61.68	V	-55.33	4.82	13.15	-47.00	-13.00	-34.00
3700.00	-60.23	H	-59.01	3.84	12.69	-50.16	-13.00	-37.16
5550.00	-64.93	H	-58.71	4.82	13.15	-50.38	-13.00	-37.38
Middle Channel 661 (1880.00MHz)								
3760.00	-58.09	V	-57.02	3.73	12.72	-48.03	-13.00	-35.03
5640.00	-62.16	V	-56.38	4.93	13.14	-48.17	-13.00	-35.17
3760.00	-57.03	H	-55.88	3.73	12.72	-46.89	-13.00	-33.89
5640.00	-65.76	H	-60.28	4.93	13.14	-52.07	-13.00	-39.07
High Channel 810 (1909.80MHz)								
3818.00	-61.00	V	-59.43	4.02	12.73	-50.72	-13.00	-37.72
5727.00	-62.56	V	-56.09	4.87	13.11	-47.85	-13.00	-34.85
3818.00	-58.11	H	-56.39	4.02	12.73	-47.68	-13.00	-34.68
5727.00	-65.92	H	-59.81	4.87	13.11	-51.57	-13.00	-38.57

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 3: EDGES850 Link		
Date of Test	2012/07/04	Test Site	AC5

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)								
1646.00	-53.86	V	-58.57	2.50	9.75	-51.32	-13.00	-38.32
2470.50	-63.22	V	-64.44	3.12	10.48	-57.08	-13.00	-44.08
1646.00	-49.78	H	-54.59	2.50	9.75	-47.34	-13.00	-34.34
2470.50	-64.18	H	-65.24	3.12	10.48	-57.88	-13.00	-44.88
Middle Channel 189 (836.40MHz)								
1671.50	-54.38	V	-59.20	2.52	9.95	-51.77	-13.00	-38.77
2513.00	-63.73	V	-65.26	3.18	10.62	-57.82	-13.00	-44.82
1671.50	-51.69	H	-56.26	2.52	9.95	-48.83	-13.00	-35.83
2513.00	-64.50	H	-65.65	3.18	10.62	-58.21	-13.00	-45.21
High Channel 251 (848.80MHz)								
1697.00	-56.62	V	-61.50	2.54	10.06	-53.98	-13.00	-40.98
2547.00	-60.74	V	-61.33	3.14	10.68	-53.79	-13.00	-40.79
1697.00	-53.90	H	-58.05	2.54	10.06	-50.53	-13.00	-37.53
2547.00	-63.22	H	-63.57	3.14	10.68	-56.03	-13.00	-43.03

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 4: EDGE1900 Link		
Date of Test	2012/07/04	Test Site	AC5

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)								
3700.00	-57.35	V	-56.04	3.84	12.69	-47.19	-13.00	-34.19
5550.00	-65.63	V	-59.27	4.82	13.15	-50.94	-13.00	-37.94
3700.00	-59.22	H	-57.99	3.84	12.69	-49.14	-13.00	-36.14
5550.00	-66.03	H	-60.29	4.82	13.15	-51.96	-13.00	-38.96
Middle Channel 661 (1880.00MHz)								
3760.00	-62.11	V	-61.04	3.73	12.72	-52.05	-13.00	-39.05
5640.00	-65.91	V	-60.13	4.93	13.14	-51.92	-13.00	-38.92
3760.00	-59.34	H	-58.19	3.73	12.72	-49.20	-13.00	-36.20
5640.00	-66.68	H	-61.21	4.93	13.14	-53.00	-13.00	-40.00
High Channel 810 (1909.80MHz)								
3818.00	-61.26	V	-59.70	4.02	12.73	-50.99	-13.00	-37.99
5727.00	-65.71	V	-59.19	4.87	13.11	-50.95	-13.00	-37.95
3818.00	-61.98	H	-60.26	4.02	12.73	-51.55	-13.00	-38.55
5727.00	-65.82	H	-59.70	4.87	13.11	-51.46	-13.00	-38.46

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 5: WCDMA Band II Link		
Date of Test	2012/07/04	Test Site	AC5

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	-58.44	V	-56.20	4.78	12.69	-48.29	-13.00	-35.29
5557.20	-51.83	V	-45.47	4.82	13.15	-37.14	-13.00	-24.14
3704.80	-58.17	H	-56.01	4.78	12.69	-48.10	-13.00	-35.10
5557.20	-59.02	H	-53.29	4.82	13.15	-44.96	-13.00	-31.96
Middle Channel 9400 (1880.00MHz)								
3760.00	-60.19	V	-57.82	5.03	12.72	-50.13	-13.00	-37.13
5640.00	-56.38	V	-49.59	5.93	13.14	-42.38	-13.00	-29.38
3760.00	-59.08	H	-56.63	5.03	12.72	-48.94	-13.00	-35.94
5640.00	-56.38	H	-49.92	5.93	13.14	-42.71	-13.00	-29.71
High Channel 9538 (1907.60MHz)								
3815.20	-55.29	V	-52.71	5.03	12.73	-45.01	-13.00	-32.01
5722.80	-60.65	V	-54.31	4.87	13.11	-46.07	-13.00	-33.07
3815.20	-54.16	H	-51.40	5.03	12.73	-43.70	-13.00	-30.70
5722.80	-64.57	H	-58.26	4.87	13.11	-50.02	-13.00	-37.02

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 6: WCDMA Band V Traffic		
Date of Test	2012/07/04	Test Site	AC5

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)								
1654.50	-61.20	V	-60.96	3.28	9.75	-54.49	-13.00	-41.49
2479.20	-59.50	V	-57.82	4.10	10.48	-51.44	-13.00	-38.44
1654.50	-60.68	H	-60.12	3.28	9.75	-53.65	-13.00	-40.65
2479.00	-59.32	H	-57.82	4.10	10.48	-51.44	-13.00	-38.44
Middle Channel 4182 (836.40MHz)								
1671.50	-62.45	V	-63.17	3.32	9.95	-56.54	-13.00	-43.54
2513.00	-56.36	V	-54.50	4.31	10.62	-48.19	-13.00	-35.19
1671.50	-60.68	H	-61.02	3.32	9.95	-54.39	-13.00	-41.39
2513.00	-59.71	H	-57.77	4.31	10.62	-51.46	-13.00	-38.46
High Channel 4233 (846.60MHz)								
1697.00	-62.74	V	-63.32	3.35	10.06	-56.61	-13.00	-43.61
2539.80	-58.42	V	-56.41	3.91	10.33	-49.99	-13.00	-36.99
1697.00	-63.23	H	-63.42	4.19	10.68	-56.93	-13.00	-43.93
2538.50	-61.74	H	-59.62	4.33	10.79	-53.16	-13.00	-40.16

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 7: HSDPA Band II Traffic		
Date of Test	2012/07/04	Test Site	AC5

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	-55.71	V	-53.34	4.78	12.69	-45.43	-13.00	-32.43
5557.20	-52.02	V	-45.77	4.82	13.15	-37.44	-13.00	-24.44
3704.80	-54.65	H	-52.11	4.78	12.69	-44.20	-13.00	-31.20
5557.20	-63.81	H	-57.86	4.82	13.15	-49.53	-13.00	-36.53
Middle Channel 9400 (1880.00MHz)								
3760.00	-60.69	V	-58.32	5.03	12.72	-50.63	-13.00	-37.63
5640.00	-55.80	V	-48.96	5.93	13.14	-41.75	-13.00	-28.75
3760.00	-59.34	H	-56.89	5.03	12.72	-49.20	-13.00	-36.20
5640.00	-62.65	H	-56.19	5.93	13.14	-48.98	-13.00	-35.98
High Channel 9538 (1907.60MHz)								
3815.20	-56.18	V	-53.59	5.03	12.73	-45.89	-13.00	-32.89
5722.80	-60.26	V	-53.92	4.87	13.11	-45.68	-13.00	-32.68
3815.20	-53.56	H	-50.80	5.03	12.73	-43.10	-13.00	-30.10
5722.80	-65.50	H	-59.19	4.87	13.11	-50.95	-13.00	-37.95

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 8: HSDPA Band V Traffic		
Date of Test	2012/07/04	Test Site	AC5

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)								
1654.50	-63.08	V	-63.41	3.28	9.75	-56.94	-13.00	-43.94
2479.20	-59.22	V	-57.17	4.10	10.48	-50.79	-13.00	-37.79
1654.50	-61.04	H	-61.27	3.28	9.75	-54.80	-13.00	-41.80
2479.20	-60.96	H	-58.77	4.10	10.48	-52.39	-13.00	-39.39
Middle Channel 4182 (836.40MHz)								
1671.50	-61.61	V	-62.41	3.32	9.95	-55.78	-13.00	-42.78
2509.20	-54.85	V	-53.43	3.81	10.62	-46.62	-13.00	-33.62
1671.50	-60.38	H	-60.65	3.32	9.95	-54.02	-13.00	-41.02
2509.20	-60.39	H	-58.87	3.81	10.62	-52.06	-13.00	-39.06
High Channel 4233 (846.60MHz)								
1697.00	-62.42	V	-62.38	3.35	10.06	-55.67	-13.00	-42.67
2538.50	-56.99	V	-55.42	4.19	10.68	-48.93	-13.00	-35.93
1697.00	-59.92	H	-59.63	3.35	10.06	-52.92	-13.00	-39.92
2538.50	-59.25	H	-57.86	4.19	10.68	-51.37	-13.00	-38.37

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 9: HSUPA Band II Traffic		
Date of Test	2012/07/04	Test Site	AC5

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	-64.47	V	-62.23	4.78	12.69	-54.32	-13.00	-41.32
5557.20	-66.06	V	-59.71	4.82	13.15	-51.38	-13.00	-38.38
3704.80	-64.41	H	-62.25	4.78	12.69	-54.34	-13.00	-41.34
5557.20	-66.58	H	-60.85	4.82	13.15	-52.52	-13.00	-39.52
Middle Channel 9400 (1880.00MHz)								
3760.00	-63.61	V	-60.84	5.03	12.72	-53.15	-13.00	-40.15
5640.00	-64.98	V	-56.90	5.93	13.14	-49.69	-13.00	-36.69
3760.00	-63.37	H	-61.10	5.03	12.72	-53.41	-13.00	-40.41
5640.00	-65.08	H	-57.82	5.93	13.14	-50.61	-13.00	-37.61
High Channel 9538 (1907.60MHz)								
3815.20	-63.39	V	-60.83	5.03	12.73	-53.13	-13.00	-40.13
5722.80	-65.09	V	-58.30	4.87	13.11	-50.06	-13.00	-37.06
3815.20	-63.14	H	-61.06	5.03	12.73	-53.36	-13.00	-40.36
5722.80	-65.19	H	-58.95	4.87	13.11	-50.71	-13.00	-37.71

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 10: HSUPA Band V Traffic		
Date of Test	2012/07/04	Test Site	AC5

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)								
1654.50	-63.71	V	-64.04	3.28	9.75	-57.57	-13.00	-44.57
2479.20	-59.33	V	-57.28	4.10	10.48	-50.90	-13.00	-37.90
1654.50	-62.40	H	-66.40	3.28	9.75	-59.93	-13.00	-46.93
2479.20	-62.58	H	-62.66	4.10	10.48	-56.28	-13.00	-43.28
Middle Channel 4182 (836.40MHz)								
1671.50	-63.94	V	-64.66	3.32	9.95	-58.03	-13.00	-45.03
2509.20	-57.61	V	-56.24	3.81	10.62	-49.43	-13.00	-36.43
1671.50	-61.71	H	-61.98	3.32	9.95	-55.35	-13.00	-42.35
2509.20	-61.24	H	-59.72	3.81	10.62	-52.91	-13.00	-39.91
High Channel 4233 (846.60MHz)								
1697.00	-62.00	V	-62.00	3.35	10.06	-55.29	-13.00	-42.29
2539.80	-57.34	V	-55.77	4.19	10.68	-49.28	-13.00	-36.28
1697.00	-60.43	H	-60.15	3.35	10.06	-53.44	-13.00	-40.44
2539.80	-59.27	H	-57.89	4.19	10.68	-51.40	-13.00	-38.40

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 11: HSPA+ Band II Traffic		
Date of Test	2012/07/04	Test Site	AC5

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	-64.02	V	-61.61	4.78	12.69	-53.70	-13.00	-40.70
5557.20	-65.42	V	-58.72	4.82	13.15	-50.39	-13.00	-37.39
3704.80	-63.44	H	-60.78	4.78	12.69	-52.87	-13.00	-39.87
5557.20	-64.47	H	-59.38	4.82	13.15	-51.05	-13.00	-38.05
Middle Channel 9400 (1880.00MHz)								
3760.00	-63.41	V	-60.36	5.03	12.72	-52.67	-13.00	-39.67
5640.00	-65.32	V	-57.46	5.93	13.14	-50.25	-13.00	-37.25
3760.00	-63.37	H	-60.99	5.03	12.72	-53.30	-13.00	-40.30
5640.00	-65.63	H	-58.37	5.93	13.14	-51.16	-13.00	-38.16
High Channel 9538 (1907.60MHz)								
3815.20	-64.51	V	-61.80	5.03	12.73	-54.10	-13.00	-41.10
5722.80	-63.90	V	-57.27	4.87	13.11	-49.03	-13.00	-36.03
3815.20	-63.44	H	-60.57	5.03	12.73	-52.87	-13.00	-39.87
5722.80	-64.18	H	-58.18	4.87	13.11	-49.94	-13.00	-36.94

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 12: HSPA+ Band V Traffic		
Date of Test	2012/07/04	Test Site	AC5

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)								
1654.50	-61.64	V	-65.54	3.28	9.75	-59.07	-13.00	-46.07
2479.20	-62.49	V	-61.67	4.10	10.48	-55.29	-13.00	-42.29
1654.50	-62.26	H	-64.99	3.28	9.75	-58.52	-13.00	-45.52
2479.20	-62.72	H	-61.75	4.10	10.48	-55.37	-13.00	-42.37
Middle Channel 4182 (836.40MHz)								
1671.50	-62.27	V	-66.28	3.32	9.95	-59.65	-13.00	-46.65
2509.20	-62.81	V	-63.71	3.81	10.62	-56.90	-13.00	-43.90
1671.50	-60.53	H	-60.95	3.32	9.95	-54.32	-13.00	-41.32
2509.20	-60.04	H	-58.52	3.81	10.62	-51.71	-13.00	-38.71
High Channel 4233 (846.60MHz)								
1697.00	-62.76	V	-62.72	3.35	10.06	-56.01	-13.00	-43.01
2539.80	-57.26	V	-55.70	4.19	10.68	-49.21	-13.00	-36.21
1697.00	-61.32	H	-61.04	3.35	10.06	-54.33	-13.00	-41.33
2539.80	-61.71	H	-60.33	4.19	10.68	-53.84	-13.00	-40.84

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 13: CDMA 2000 1X BC0 Link		
Date of Test	2012/07/04	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 1013 (824.70MHz)								
1649.40	-49.44	V	-48.54	2.50	9.78	-41.26	-13.00	-28.26
2474.10	-58.50	V	-52.51	3.12	10.49	-45.14	-13.00	-32.14
1649.40	-55.13	H	-56.05	2.50	9.78	-48.77	-13.00	-35.77
2474.10	-52.92	H	-51.96	3.12	10.49	-44.59	-13.00	-31.59
Middle Channel 384 (836.52MHz)								
1672.64	-53.95	V	-54.17	2.51	9.94	-46.74	-13.00	-33.74
2508.96	-55.68	V	-55.33	3.18	10.61	-47.90	-13.00	-34.90
1672.64	-51.42	H	-50.79	2.51	9.94	-43.36	-13.00	-30.36
2508.96	-59.82	H	-53.12	3.18	10.61	-45.69	-13.00	-32.69
High Channel 777 (848.31MHz)								
1696.62	-54.57	V	-55.82	2.53	10.10	-48.25	-13.00	-35.25
2544.93	-57.89	V	-56.79	3.15	10.67	-49.27	-13.00	-36.27
1696.62	-59.21	H	-60.61	2.53	10.10	-53.04	-13.00	-40.04
2544.93	-53.71	H	-52.81	3.15	10.67	-45.29	-13.00	-32.29

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 14: CDMA 2000 1X BC1 Link		
Date of Test	2012/07/04	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 25 (1851.25MHz)								
3702.50	-59.03	V	-57.82	3.83	12.69	-48.96	-13.00	-35.96
5553.75	-49.29	V	-43.55	4.82	13.14	-35.23	-13.00	-22.23
3702.50	-55.82	H	-54.52	3.83	12.69	-45.66	-13.00	-32.66
5553.75	-40.45	H	-34.07	4.82	13.14	-25.75	-13.00	-12.75
Middle Channel 600 (1880MHz)								
3760.00	-48.75	V	-47.31	3.73	12.72	-38.32	-13.00	-25.32
5640.00	-57.18	V	-51.05	4.92	13.13	-42.84	-13.00	-29.84
3760.00	-51.12	H	-49.83	3.73	12.72	-40.84	-13.00	-27.84
5640.00	-50.77	H	-44.28	4.92	13.13	-36.07	-13.00	-23.07
High Channel 1175 (1908.75MHz)								
3817.50	-54.01	V	-52.62	3.98	12.73	-43.87	-13.00	-30.87
5726.25	-51.50	V	-46.09	4.86	13.11	-37.84	-13.00	-24.84
3817.50	-55.16	H	-53.85	3.98	12.73	-45.10	-13.00	-32.10
5726.25	-45.02	H	-39.27	4.86	13.11	-31.02	-13.00	-18.02

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 15: CDMA 2000 1X EVDO BC0 Link		
Date of Test	2012/07/04	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 1013 (824.70MHz)								
1649.40	-51.29	V	-50.10	2.50	9.78	-42.82	-13.00	-29.82
2474.10	-58.28	V	-52.67	3.12	10.49	-45.30	-13.00	-32.30
1649.40	-51.92	H	-52.88	2.50	9.78	-45.60	-13.00	-32.60
2474.10	-55.87	H	-54.62	3.12	10.49	-47.25	-13.00	-34.25
Middle Channel 384 (836.52MHz)								
1672.64	-53.34	V	-52.60	2.51	9.94	-45.17	-13.00	-32.17
2508.96	-61.42	V	-55.49	3.18	10.61	-48.06	-13.00	-35.06
1672.64	-47.95	H	-47.20	2.51	9.94	-39.77	-13.00	-26.77
2508.96	-56.41	H	-50.49	3.18	10.61	-43.06	-13.00	-30.06
High Channel 777 (848.31MHz)								
1696.62	-50.07	V	-49.61	2.53	10.10	-42.04	-13.00	-29.04
2544.93	-54.54	V	-47.94	3.15	10.67	-40.42	-13.00	-27.42
1696.62	-54.78	H	-55.14	2.53	10.10	-47.57	-13.00	-34.57
2544.93	-54.61	H	-54.35	3.15	10.67	-46.83	-13.00	-33.83

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 16: CDMA 2000 1X EVDO BC1 Link		
Date of Test	2012/07/04	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 25 (1851.25MHz)								
3702.50	-52.19	V	-50.99	3.83	12.69	-42.13	-13.00	-29.13
5553.75	-42.88	V	-37.20	4.82	13.14	-28.88	-13.00	-15.88
3702.50	-52.42	H	-51.14	3.83	12.69	-42.28	-13.00	-29.28
5553.75	-51.70	H	-46.35	4.82	13.14	-38.03	-13.00	-25.03
Middle Channel 600 (1880MHz)								
3760.00	-52.13	V	-51.06	3.73	12.72	-42.07	-13.00	-29.07
5640.00	-43.02	V	-37.24	4.92	13.13	-29.03	-13.00	-16.03
3760.00	-52.14	H	-50.99	3.73	12.72	-42.00	-13.00	-29.00
5640.00	-51.99	H	-46.53	4.92	13.13	-38.32	-13.00	-25.32
High Channel 1175 (1908.75MHz)								
3817.50	-49.56	V	-48.22	3.98	12.73	-39.47	-13.00	-26.47
5726.25	-45.75	V	-39.48	4.86	13.11	-31.23	-13.00	-18.23
3817.50	-48.49	H	-47.18	3.98	12.73	-38.43	-13.00	-25.43
5726.25	-54.15	H	-48.22	4.86	13.11	-39.97	-13.00	-26.97

4. Receiver Spurious Emission for RSS 132/133

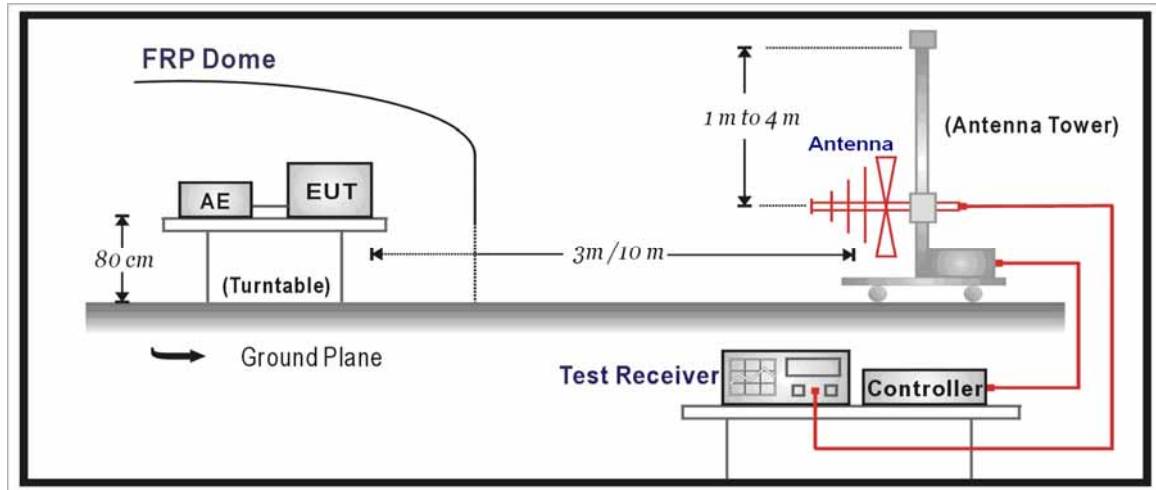
4.1. Test Equipment

Spurious Emission / AC-5

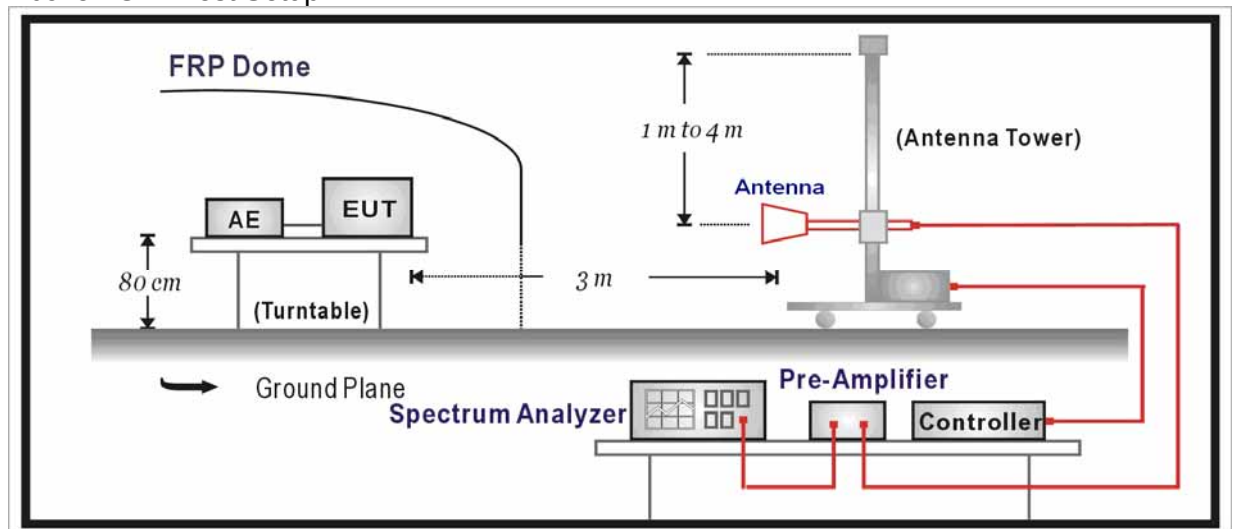
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2013.04.18
Radio Communication Tester	R&S	CMU 200	106388	2012.10.21
Preamplifier	Quietek	AP-025C	CHM-0503006	2013.05.04
Preamplifier	Miteq	NSP1800-25	1364185	2013.05.04
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2012.10.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2014.06.08
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2013.01.10

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

According to Standard RSS132/133 refer to RSS-Gen Issue 2.

Field Strength micro-volts/m at 3 meters		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 10 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

On any frequency or frequencies below or equal to 1000 MHz, the radiated limits shown are based on measuring equipment employing a quasi-peak detector function and above 1000 MHz, the radiated limits shown are based measuring equipment employing an average detector function.

When average radiated emission measurement are included emission measurement Above 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

For class A, the measurement distance between the EUT and antenna is 10 meters for under

1GHz and above 1GHz.

For class B, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and 3 meters for above 1GHz.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCI) is 120 kHz and above 1GHz is 1MHz.

Note: When measurement above 1GHz, the horn antenna will bend down a little (as horn antenna have the narrow beamwidth) in order to find the maximum emission of EUT

4.5. Uncertainty

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

4.6. Test Result

GPRS 850 Idle

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
128	H	92.7	5.2	16.1	21.3	43.5	-22.2	QP
	V	258.7	4.8	19.9	24.7	46.0	-21.3	QP
	H	1399.5	51.9	-19.5	32.4	54(Note)	-21.6	PK
	V	1382.5	51.2	-19.6	31.6	54(Note)	-22.4	PK
189	H	101.1	5.2	17.4	22.6	43.5	-20.9	QP
	V	283.0	5.1	20.1	25.2	46.0	-20.8	QP
	H	2300.5	51.2	-16.7	34.5	54(Note)	-19.5	PK
	V	1977.5	50.9	-17.6	33.3	54(Note)	-20.7	PK
251	H	110.1	4.9	18.4	23.3	43.5	-20.2	QP
	V	320.0	4.4	21.2	25.6	46.0	-20.4	QP
	H	3635.0	49.9	-12.8	37.1	54(Note)	-16.9	PK
	V	2980.5	49.6	-13.7	35.9	54(Note)	-18.1	PK

GPRS 1900 Idle

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
512	H	119.5	5.3	18.6	23.9	43.5	-19.6	QP
	V	345.4	4.4	21.9	26.3	46.0	-19.7	QP
	H	1391.0	51.9	-19.6	32.3	54(Note)	-21.7	PK
	V	1382.5	51.0	-19.6	31.4	54(Note)	-22.6	PK
661	H	127.6	5.4	18.6	24.0	43.5	-19.5	QP
	V	387.8	5.2	23.1	28.3	46.0	-17.7	QP
	H	1892.5	51.7	-17.8	33.9	54(Note)	-20.1	PK
	V	2113.5	50.3	-17.3	33.0	54(Note)	-21.0	PK
810	H	132.6	5.1	18.3	23.4	43.5	-20.1	QP
	V	411.9	6.1	24.2	30.3	46.0	-15.7	QP
	H	2989.0	49.8	-13.6	36.2	54(Note)	-17.8	PK
	V	3167.5	49.6	-13.4	36.2	54(Note)	-17.8	PK

WCDMA Band II Idle

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
9262	H	92.4	6.1	16.0	22.1	43.5	-21.4	QP
	V	345.5	5.5	21.9	27.4	46.0	-18.6	QP
	H	1272.0	51.9	-20.2	31.7	54(Note)	-22.3	PK
	V	1382.5	51.9	-19.6	32.3	54(Note)	-21.7	PK
9400	H	95.6	5.5	16.6	22.1	43.5	-21.4	QP
	V	363.6	4.5	22.4	26.9	46.0	-19.1	QP
	H	1909.5	50.8	-17.8	33.0	54(Note)	-21.0	PK
	V	2011.5	51.4	-17.5	33.9	54(Note)	-20.1	PK
9538	H	103.5	4.3	17.8	22.1	43.5	-21.4	QP
	V	391.4	4.8	23.2	28.0	46.0	-18.0	QP
	H	3142.0	50.0	-13.4	36.6	54(Note)	-17.4	PK
	V	3439.5	50.0	-13.4	36.6	54(Note)	-17.4	PK

WCDMA Band V Idle

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4132	H	111.2	5.4	18.5	23.9	43.5	-19.6	QP
	V	421.4	4.3	24.4	28.7	46.0	-17.3	QP
	H	1493.0	51.7	-18.9	32.8	54(Note)	-21.2	PK
	V	1374.0	51.0	-19.6	31.4	54(Note)	-22.6	PK
4182	H	121.7	5.3	18.6	23.9	43.5	-19.6	QP
	V	452.9	5.1	24.2	29.3	46.0	-16.7	QP
	H	2139.0	52.1	-17.2	34.9	54(Note)	-19.1	PK
	V	2139.0	50.7	-17.1	33.6	54(Note)	-20.4	PK
4233	H	127.8	5.9	18.6	24.5	43.5	-19.0	QP
	V	499.7	5.3	25.3	30.6	46.0	-15.4	QP
	H	3184.5	49.6	-13.4	36.2	54(Note)	-17.8	PK
	V	3448.0	49.0	-13.4	35.6	54(Note)	-18.4	PK

CDMA 2000 1X BC0 Idle

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
384	H	101.9	4.6	17.6	22.2	43.5	-21.3	QP
	V	314.9	4.8	21.1	25.9	46.0	-20.1	QP
	H	1467.5	50.6	-19.1	31.5	54(Note)	-22.5	PK
	V	1561.0	50.5	-18.7	31.8	54(Note)	-22.2	PK
777	H	109.1	5.0	18.4	23.4	43.5	-20.1	QP
	V	346.6	4.6	22.0	26.6	46.0	-19.4	QP
	H	2844.5	50.1	-14.4	35.7	54(Note)	-18.3	PK
	V	2343.0	50.5	-16.6	33.9	54(Note)	-20.1	PK
1017	H	114.9	4.6	18.5	23.1	43.5	-20.4	QP
	V	365.3	4.9	22.5	27.4	46.0	-18.6	QP
	H	4672.0	49.4	-9.4	40.0	54(Note)	-14.0	PK
	V	3558.5	49.8	-13.1	36.7	54(Note)	-17.3	PK

CDMA 2000 1X BC1 Idle

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
25	H	120.1	5.1	18.6	23.7	43.5	-19.8	QP
	V	394.5	4.7	23.4	28.1	46.0	-17.9	QP
	H	1374.0	50.7	-19.6	31.1	54(Note)	-22.9	PK
	V	1280.5	50.8	-20.2	30.6	54(Note)	-23.4	PK
600	H	125.1	4.8	18.6	23.4	43.5	-20.1	QP
	V	417.6	4.9	24.3	29.2	46.0	-16.8	QP
	H	2139.0	51.6	-17.2	34.4	54(Note)	-19.6	PK
	V	2105.0	50.5	-17.3	33.2	54(Note)	-20.8	PK
1175	H	131.4	4.3	18.4	22.7	43.5	-20.8	QP
	V	459.1	5.5	24.4	29.9	46.0	-16.1	QP
	H	3320.5	48.7	-13.4	35.3	54(Note)	-18.7	PK
	V	3677.5	49.3	-12.7	36.6	54(Note)	-17.4	PK

Note: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.