



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

Product Name : Wireless Module
Model No. : Q2698
FCC ID : N7NQ2698
IC : 2417C-Q2698

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 : 16/05/2012
Test Date : 16/05/2012~08/06/2012
Issued Date : 24/07/2012
Report No. : 125S043R-HP-US-P07V01
Report Version : V 2.2

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. : 125S043R-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. : Q2698

FCC ID : N7NQ2698

IC : 2417C-Q2698

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 Part 22.913(a)&22.917(b), FCC Part 24.232(b)&24.238(b)
Industry Canada RSS-132, Issue 2: 2005 Clause 4.4&4.5&4.6
Industry Canada RSS-133, Issue 5: 2009 Clause 6.4&6.5&6.6

Test Result : Complied

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Laboratory Information

We, **QuietTek 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 QuietTek Corporation's Web Site :<http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of QuietTek 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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1. General Information

1.1. EUT Description

Product Name	Wireless Module
Model No.	Q2698
Hardware Version	1.0
Device Category	Portable
RF Exposure Environment	Uncontrolled
2G	
Support Band	GSM850/PCS1900
GPRS Type	Class B
GPRS Class	Class 12
Uplink	GSM 850: 824~849MHz PCS 1900: 1850~1910MHz
Downlink	GSM 850: 869~894MHz PCS 1900: 1930~1990MHz
Release Version	R99
Type of modulation	GMSK for GSM/GPRS 8PSK for EDGE
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
Release Version	Rel-6
Type of modulation	QPSK

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

Note:

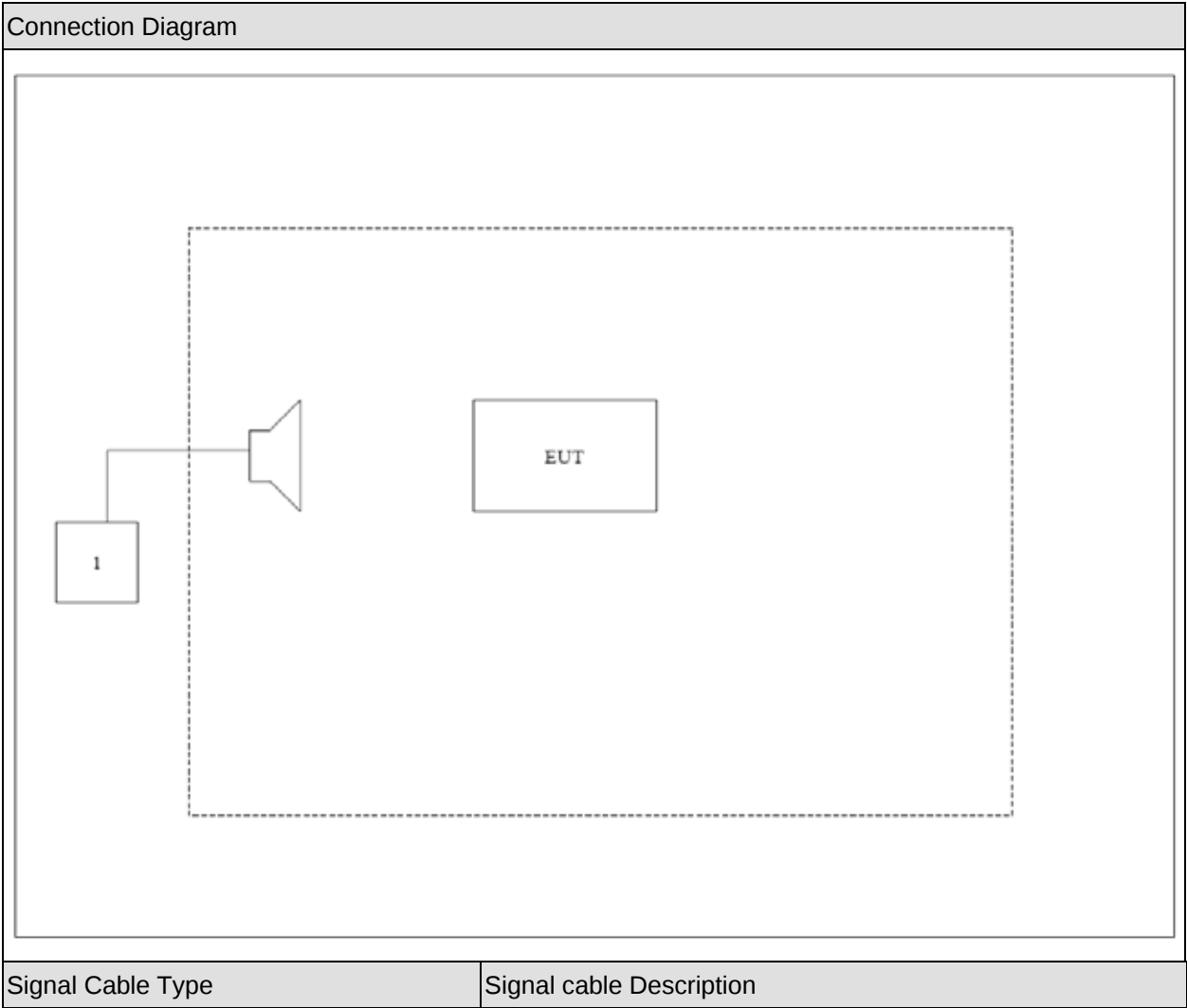
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. Radiated power output working at GPRS link was higher than that working at GSM link, so all of test items were done working at GPRS mode. Refer to peak power output for more details.

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

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 (FCC Part 22H & Part 2)

Performed Item	Section in CFR 47	Section in RSS GEN or RSS-132	Test Performed	Deviation
Peak Output Power	FCC Part 22.913(a)(2) and Part 2.1046	4.4	Yes	No
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 (FCC Part 24E & Part 2)

Performed Item	Section in CFR 47	Section in RSS GEN or RSS-133	Test Performed	Deviation
Peak Output Power	FCC Part 24.232(b) and Part 2.1046	6.4	Yes	No
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

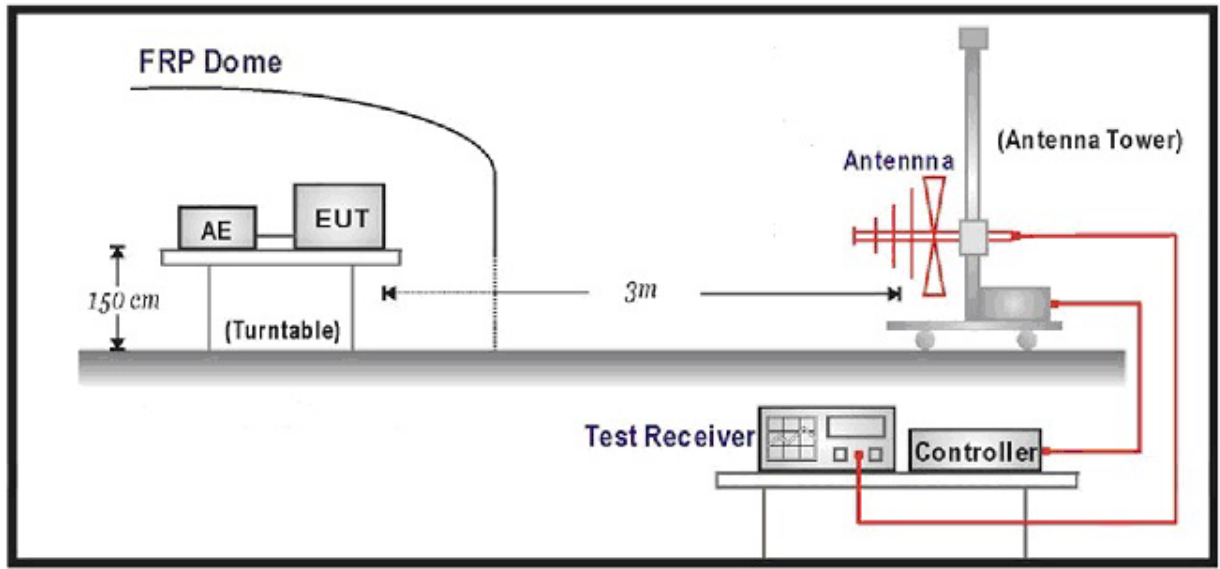
3.1. Test Equipment

Spurious Emission / AC-5

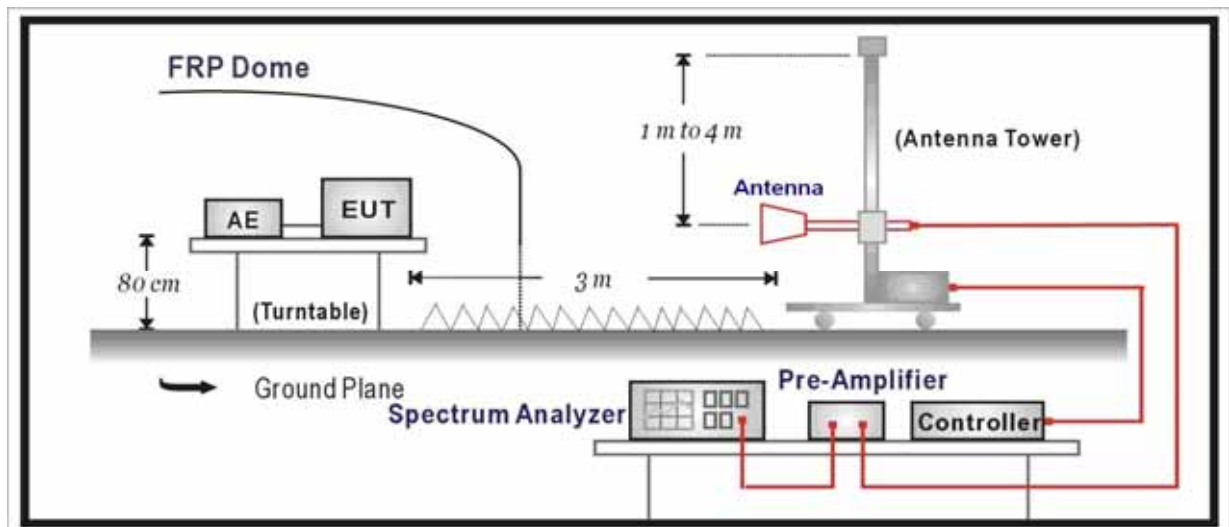
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2013.04.10
Radio Communication Tester	R&S	CMU 200	117088	2013.04.18
Dual Directional Coupler	Agilent	778D	20160	2013.04.18
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2013.04.18
PSG Analog 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	2012.06.11
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2013.01.10

3.2. Test Setup

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

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.
- 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: GPRS850 Link		
Date of Test	2012/06/01	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	-48.23	V	-52.95	2.50	9.75	-45.70	-13.00	-32.70
2470.50	-58.39	V	-59.58	3.12	10.48	-52.22	-13.00	-39.22
1646.00	-44.27	H	-49.08	2.50	9.75	-41.83	-13.00	-28.83
2470.50	-49.80	H	-50.84	3.12	10.48	-43.48	-13.00	-30.48
Middle Channel 189 (836.40MHz)								
1671.50	-50.87	V	-55.69	2.52	9.95	-48.26	-13.00	-35.26
2513.00	-58.69	V	-60.16	3.18	10.62	-52.72	-13.00	-39.72
1671.50	-45.39	H	-49.96	2.52	9.95	-42.53	-13.00	-29.53
2513.00	-49.65	H	-50.73	3.18	10.62	-43.29	-13.00	-30.29
High Channel 251 (848.80MHz)								
1697.00	-49.16	V	-54.04	2.54	10.06	-46.52	-13.00	-33.52
2547.00	-57.33	V	-57.92	3.14	10.68	-50.38	-13.00	-37.38
1697.00	-51.19	H	-55.34	2.54	10.06	-47.82	-13.00	-34.82
2547.00	-52.10	H	-52.43	3.14	10.68	-44.89	-13.00	-31.89

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 2:GPRS1900 Link		
Date of Test	2012/06/01	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)								
3703.00	-56.05	V	-54.74	3.84	12.69	-45.89	-13.00	-32.89
5547.50	-63.65	V	-57.30	4.82	13.15	-48.97	-13.00	-35.97
3703.00	-58.59	H	-57.37	3.84	12.69	-48.52	-13.00	-35.52
5547.50	-64.03	H	-58.29	4.82	13.15	-49.96	-13.00	-36.96
Middle Channel 661 (1880.00MHz)								
3762.50	-60.58	V	-59.51	3.73	12.72	-50.52	-13.00	-37.52
5641.00	-65.43	V	-59.64	4.93	13.14	-51.43	-13.00	-38.43
3762.50	-56.26	H	-55.11	3.73	12.72	-46.12	-13.00	-33.12
5641.00	-62.41	H	-56.95	4.93	13.14	-48.74	-13.00	-35.74
High Channel 810 (1909.80MHz)								
3822.00	-62.62	V	-60.85	4.02	12.73	-52.14	-13.00	-39.14
5726.00	-61.01	V	-54.54	4.87	13.11	-46.30	-13.00	-33.30
3822.00	-61.99	H	-60.27	4.02	12.73	-51.56	-13.00	-38.56
5726.00	-61.18	H	-55.09	4.87	13.11	-46.85	-13.00	-33.85

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 3: EDGES850 Link		
Date of Test	2012/06/01	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	-52.55	V	-57.27	2.50	9.75	-50.02	-13.00	-37.02
2470.50	-63.61	V	-64.14	3.12	10.48	-56.78	-13.00	-43.78
1646.00	-49.54	H	-54.35	2.50	9.75	-47.10	-13.00	-34.10
2470.50	-59.94	H	-60.98	3.12	10.48	-53.62	-13.00	-40.62
Middle Channel 189 (836.40MHz)								
1671.50	-52.09	V	-56.91	2.52	9.95	-49.48	-13.00	-36.48
2513.00	-63.18	V	-64.27	3.18	10.62	-56.83	-13.00	-43.83
1671.50	-50.31	H	-54.88	2.52	9.95	-47.45	-13.00	-34.45
2513.00	-64.16	H	-65.30	3.18	10.62	-57.86	-13.00	-44.86
High Channel 251 (848.80MHz)								
1697.00	-57.28	V	-62.19	2.54	10.06	-54.67	-13.00	-41.67
2547.00	-54.34	V	-55.63	3.14	10.68	-48.09	-13.00	-35.09
1697.00	-52.22	H	-56.37	2.54	10.06	-48.85	-13.00	-35.85
2547.00	-60.28	H	-60.61	3.14	10.68	-53.07	-13.00	-40.07

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 4: EDGE1900 Link		
Date of Test	2012/06/01	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)								
3703.00	-56.05	V	-54.74	3.84	12.69	-45.89	-13.00	-32.89
5547.50	-63.65	V	-57.30	4.82	13.15	-48.97	-13.00	-35.97
3703.00	-58.59	H	-57.37	3.84	12.69	-48.52	-13.00	-35.52
5547.50	-64.03	H	-58.29	4.82	13.15	-49.96	-13.00	-36.96
Middle Channel 661 (1880.00MHz)								
3762.50	-60.58	V	-59.51	3.73	12.72	-50.52	-13.00	-37.52
5641.00	-65.43	V	-59.64	4.93	13.14	-51.43	-13.00	-38.43
3762.50	-56.26	H	-55.11	3.73	12.72	-46.12	-13.00	-33.12
5641.00	-62.41	H	-56.95	4.93	13.14	-48.74	-13.00	-35.74
High Channel 810 (1909.80MHz)								
3822.00	-62.62	V	-60.85	4.02	12.73	-52.14	-13.00	-39.14
5726.00	-61.01	V	-54.54	4.87	13.11	-46.30	-13.00	-33.30
3822.00	-61.99	H	-60.27	4.02	12.73	-51.56	-13.00	-38.56
5726.00	-61.18	H	-55.09	4.87	13.11	-46.85	-13.00	-33.85

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 5: WCDMA Band II Link		
Date of Test	2012/06/01	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	-63.84	V	-61.59	4.78	12.69	-53.68	-13.00	-40.68
5557.20	-60.23	V	-53.86	4.82	13.15	-45.53	-13.00	-32.53
3704.80	-57.99	H	-55.82	4.78	12.69	-47.91	-13.00	-34.91
5557.20	-64.17	H	-58.45	4.82	13.15	-50.12	-13.00	-37.12
Middle Channel 9400 (1880.00MHz)								
3760.00	-62.84	V	-60.12	5.03	12.72	-52.43	-13.00	-39.43
5640.00	-64.06	V	-57.23	5.93	13.14	-50.02	-13.00	-37.02
3760.00	-61.21	H	-58.76	5.03	12.72	-51.07	-13.00	-38.07
5640.00	-65.07	H	-58.10	5.93	13.14	-50.89	-13.00	-37.89
High Channel 9538 (1907.60MHz)								
3815.20	-63.23	V	-61.51	5.03	12.73	-53.81	-13.00	-40.81
5722.80	-64.38	V	-57.92	4.87	13.11	-49.68	-13.00	-36.68
3815.20	-56.58	H	-53.83	5.03	12.73	-46.13	-13.00	-33.13
5722.80	-64.55	H	-58.48	4.87	13.11	-50.24	-13.00	-37.24

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 6: WCDMA Band V Traffic		
Date of Test	2012/06/01	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)								
1652.80	-60.95	V	-64.85	3.28	9.75	-58.38	-13.00	-45.38
3312.00	-62.63	V	-63.01	4.10	10.48	-56.63	-13.00	-43.63
1652.80	-56.24	H	-60.14	3.28	9.75	-53.67	-13.00	-40.67
3312.00	-63.14	H	-61.56	4.10	10.48	-55.18	-13.00	-42.18
Middle Channel 4182 (836.40MHz)								
1672.80	-61.81	V	-65.83	3.32	9.95	-59.20	-13.00	-46.20
3346.00	-63.47	V	-63.87	4.31	10.62	-57.56	-13.00	-44.56
1672.80	-57.41	H	-61.18	3.32	9.95	-54.55	-13.00	-41.55
3346.00	-62.47	H	-62.42	4.31	10.62	-56.11	-13.00	-43.11
High Channel 4233 (846.60MHz)								
1693.20	-57.41	V	-61.50	3.35	10.06	-54.79	-13.00	-41.79
2539.80	-63.14	V	-61.83	3.91	10.33	-55.41	-13.00	-42.41
2538.50	-53.91	H	-57.03	4.19	10.68	-50.54	-13.00	-37.54
3388.50	-62.01	H	-61.48	4.33	10.79	-55.02	-13.00	-42.02

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 7: HSDPA Band II Traffic		
Date of Test	2012/06/01	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	-61.78	4.78	12.69	-53.87	-13.00	-40.87
5557.20	-61.16	V	-54.80	4.82	13.15	-46.47	-13.00	-33.47
3704.80	-59.58	H	-57.42	4.78	12.69	-49.51	-13.00	-36.51
5557.20	-64.03	H	-58.31	4.82	13.15	-49.98	-13.00	-36.98
Middle Channel 9400 (1880.00MHz)								
3760.00	-64.65	V	-62.30	5.03	12.72	-54.61	-13.00	-41.61
5640.00	-66.02	V	-59.23	5.93	13.14	-52.02	-13.00	-39.02
3760.00	-63.74	H	-61.32	5.03	12.72	-53.63	-13.00	-40.63
5640.00	-64.79	H	-58.32	5.93	13.14	-51.11	-13.00	-38.11
High Channel 9538 (1907.60MHz)								
3815.20	-65.85	V	-63.26	5.03	12.73	-55.56	-13.00	-42.56
5722.80	-66.06	V	-59.64	4.87	13.11	-51.40	-13.00	-38.40
3815.20	-59.07	H	-56.31	5.03	12.73	-48.61	-13.00	-35.61
5722.80	-65.57	H	-59.50	4.87	13.11	-51.26	-13.00	-38.26

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 8: HSDPA Band V Traffic		
Date of Test	2012/06/01	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)								
1652.80	-60.49	V	-64.39	3.28	9.75	-57.92	-13.00	-44.92
3312.00	-63.15	V	-63.41	4.10	10.48	-57.03	-13.00	-44.03
1652.80	-58.19	H	-62.09	3.28	9.75	-55.62	-13.00	-42.62
3312.00	-63.51	H	-62.41	4.10	10.48	-56.03	-13.00	-43.03
Middle Channel 4182 (836.40MHz)								
1672.80	-61.93	V	-65.94	3.32	9.95	-59.31	-13.00	-46.31
3346.00	-63.83	V	-64.73	3.81	10.62	-57.92	-13.00	-44.92
1672.80	-58.56	H	-62.33	3.32	9.95	-55.70	-13.00	-42.70
3346.00	-63.87	H	-64.39	3.81	10.62	-57.58	-13.00	-44.58
High Channel 4233 (846.60MHz)								
2538.50	-59.78	V	-63.85	3.35	10.06	-57.14	-13.00	-44.14
3380.00	-63.12	V	-62.65	4.19	10.68	-56.16	-13.00	-43.16
2538.50	-54.52	H	-57.86	3.35	10.06	-51.15	-13.00	-38.15
3380.00	-61.55	H	-60.83	4.19	10.68	-54.34	-13.00	-41.34

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 9: HSUPA Band II Traffic		
Date of Test	2012/06/01	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	-64.64	V	-62.40	4.78	12.69	-54.49	-13.00	-41.49
5557.20	-61.25	V	-54.88	4.82	13.15	-46.55	-13.00	-33.55
3704.80	-61.84	H	-59.67	4.78	12.69	-51.76	-13.00	-38.76
5557.20	-65.88	H	-60.15	4.82	13.15	-51.82	-13.00	-38.82
Middle Channel 9400 (1880.00MHz)								
3760.00	-64.99	V	-62.63	5.03	12.72	-54.94	-13.00	-41.94
5640.00	-64.40	V	-57.61	5.93	13.14	-50.40	-13.00	-37.40
3760.00	-64.62	H	-62.19	5.03	12.72	-54.50	-13.00	-41.50
5640.00	-66.18	H	-59.70	5.93	13.14	-52.49	-13.00	-39.49
High Channel 9538 (1907.60MHz)								
3815.20	-65.65	V	-63.07	5.03	12.73	-55.37	-13.00	-42.37
5722.80	-65.72	V	-59.31	4.87	13.11	-51.07	-13.00	-38.07
3815.20	-61.74	H	-58.99	5.03	12.73	-51.29	-13.00	-38.29
5722.80	-66.05	H	-59.97	4.87	13.11	-51.73	-13.00	-38.73

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 10: HSUPA Band V Traffic		
Date of Test	2012/06/01	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)								
1652.80	-61.72	V	-65.22	3.28	9.75	-58.75	-13.00	-45.75
3312.00	-63.03	V	-62.18	4.10	10.48	-55.80	-13.00	-42.80
1652.80	-62.96	H	-66.89	3.28	9.75	-60.42	-13.00	-47.42
3312.00	-64.36	H	-62.96	4.10	10.48	-56.58	-13.00	-43.58
Middle Channel 4182 (836.40MHz)								
1672.80	-63.07	V	-67.09	3.32	9.95	-60.46	-13.00	-47.46
3346.00	-64.68	V	-65.58	3.81	10.62	-58.77	-13.00	-45.77
1672.80	-63.06	H	-66.80	3.32	9.95	-60.17	-13.00	-47.17
3346.00	-64.23	H	-64.74	3.81	10.62	-57.93	-13.00	-44.93
High Channel 4233 (846.60MHz)								
2538.50	-63.32	V	-67.39	3.35	10.06	-60.68	-13.00	-47.68
3380.00	-63.97	V	-63.71	4.19	10.68	-57.22	-13.00	-44.22
2538.50	-63.68	H	-67.09	3.35	10.06	-60.38	-13.00	-47.38
3380.00	-64.59	H	-64.05	4.19	10.68	-57.56	-13.00	-44.56

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 11: HSPA+ Band II Traffic		
Date of Test	2012/06/01	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	-64.36	V	-62.12	4.78	12.69	-54.21	-13.00	-41.21
5557.20	-64.93	V	-58.57	4.82	13.15	-50.24	-13.00	-37.24
3704.80	-61.11	H	-58.95	4.78	12.69	-51.04	-13.00	-38.04
5557.20	-64.27	H	-58.55	4.82	13.15	-50.22	-13.00	-37.22
Middle Channel 9400 (1880.00MHz)								
3760.00	-62.12	V	-59.40	5.03	12.72	-51.71	-13.00	-38.71
5640.00	-65.45	V	-57.57	5.93	13.14	-50.36	-13.00	-37.36
3760.00	-63.43	H	-61.17	5.03	12.72	-53.48	-13.00	-40.48
5640.00	-65.01	H	-58.02	5.93	13.14	-50.81	-13.00	-37.81
High Channel 9538 (1907.60MHz)								
3815.20	-65.97	V	-63.38	5.03	12.73	-55.68	-13.00	-42.68
5722.80	-66.64	V	-60.22	4.87	13.11	-51.98	-13.00	-38.98
3815.20	-65.21	H	-62.46	5.03	12.73	-54.76	-13.00	-41.76
5722.80	-66.95	H	-60.88	4.87	13.11	-52.64	-13.00	-39.64

Product	Wireless Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 12: HSPA+ Band V Traffic		
Date of Test	2012/06/01	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)								
1652.80	-63.57	V	-67.48	3.28	9.75	-61.01	-13.00	-48.01
3312.00	-63.23	V	-63.60	4.10	10.48	-57.22	-13.00	-44.22
1652.80	-62.65	H	-66.58	3.28	9.75	-60.11	-13.00	-47.11
3312.00	-63.13	H	-63.28	4.10	10.48	-56.90	-13.00	-43.90
Middle Channel 4182 (836.40MHz)								
1672.80	-63.18	V	-67.25	3.32	9.95	-60.62	-13.00	-47.62
3346.00	-64.57	V	-65.37	3.81	10.62	-58.56	-13.00	-45.56
1672.80	-63.01	H	-66.75	3.32	9.95	-60.12	-13.00	-47.12
3346.00	-64.49	H	-65.00	3.81	10.62	-58.19	-13.00	-45.19
High Channel 4233 (846.60MHz)								
2538.50	-63.33	V	-67.41	3.35	10.06	-60.70	-13.00	-47.70
3380.00	-63.58	V	-63.32	4.19	10.68	-56.83	-13.00	-43.83
2538.50	-62.80	H	-66.21	3.35	10.06	-59.50	-13.00	-46.50
3380.00	-63.49	H	-62.95	4.19	10.68	-56.46	-13.00	-43.46

4. Receiver Spurious Emission for RSS 132/133

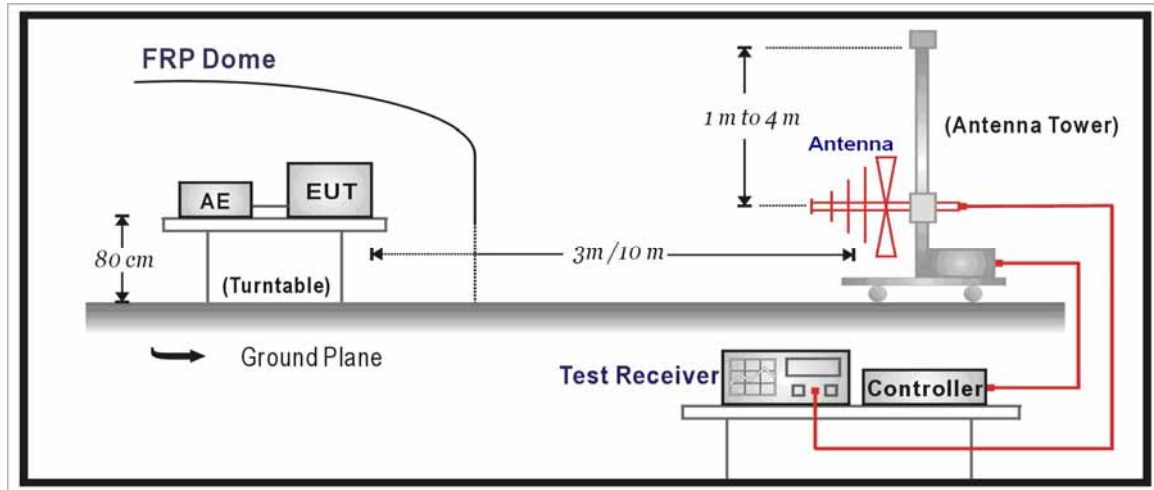
4.1. Test Equipment

Spurious Emission / AC-5

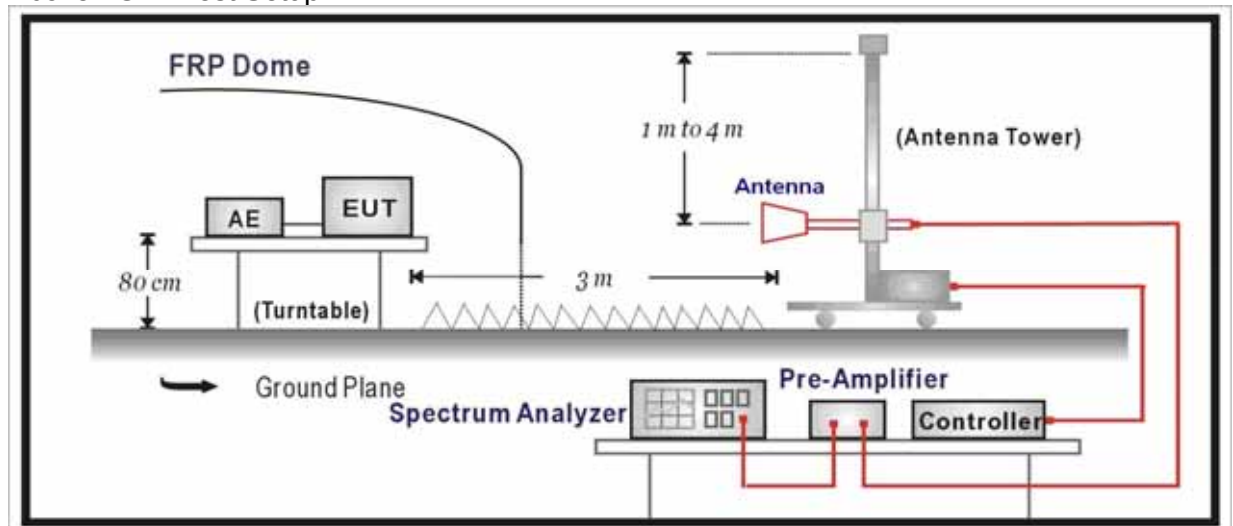
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2013.04.18
Radio Communication Tester	R&S	CMU 200	106388	2012.10.21
Preamplifier	Quietek	AP-025C	CHM-0503006	2013.05.04
Preamplifier	Miteq	NSP1800-25	1364185	2013.05.04
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2012.10.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2013.06.11
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.

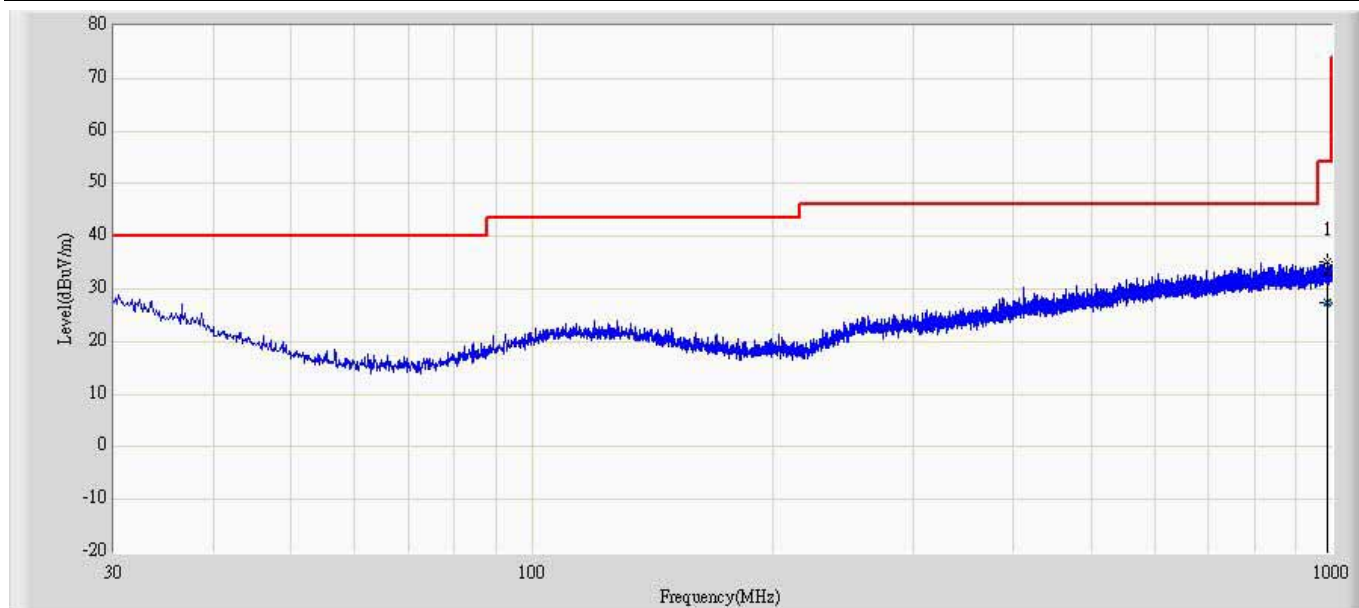
Note: When measurement above 1GHz, the horn antenna will bend down a little (as horn antenna have the narrow beamwidth) in order to find the maximum emission of EUT

4.5. Uncertainty

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

4.6. Test Result

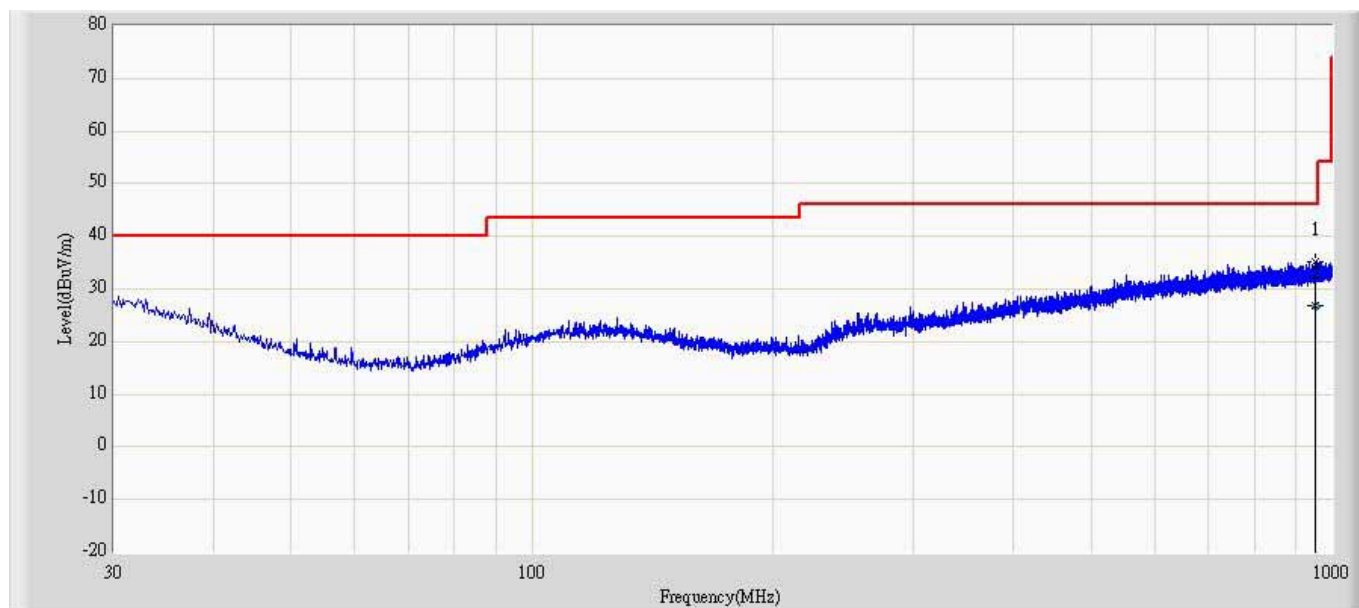
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 15:13
Limit: RSS_GEN_Radiation_03M_QP	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Horizontal
EUT: Wireless Module	Power: DC 3.8V
Note: GSM 850 Idle	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	986.299	35.168	5.220	-18.832	54.000	29.948	PK
2		986.416	27.464	-2.483	-26.536	54.000	29.947	QP

This plot is valid for low, mid & high channels (worst-case plot).

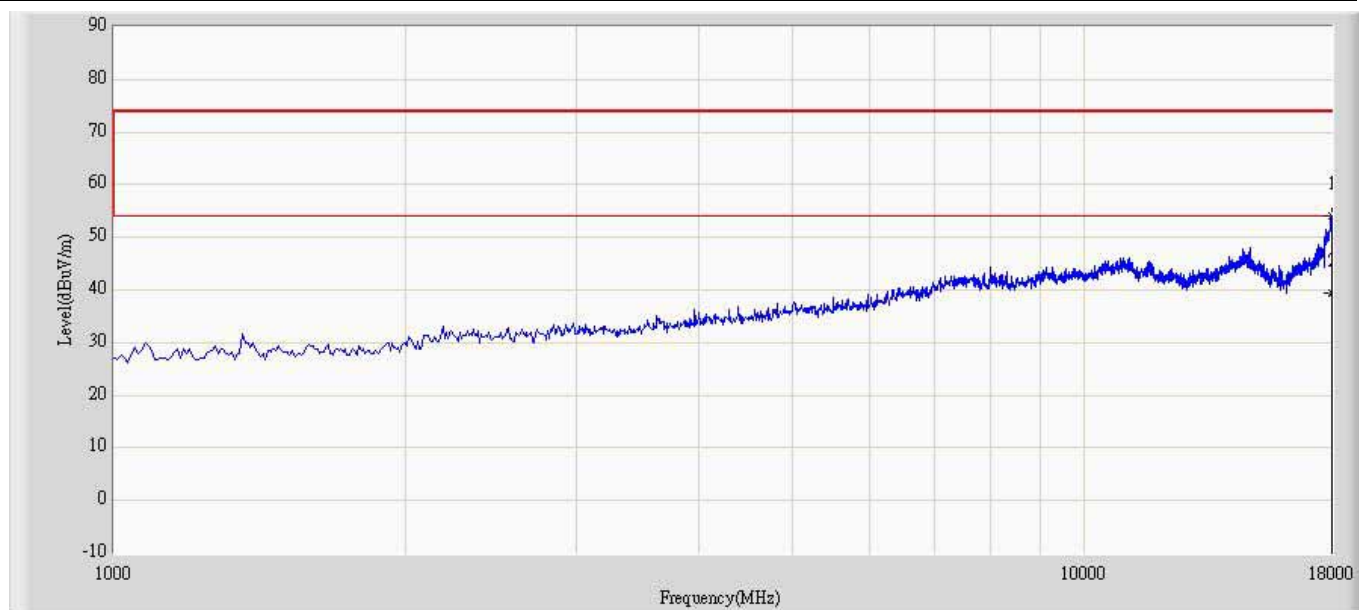
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 15:16
Limit: RSS_GEN_Radiation_03M_QP	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Vertical
EUT: Wireless Module	Power: DC 3.8V
Note: GSM 850 Idle	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	955.016	35.174	5.438	-10.826	46.000	29.735	PK
2		955.320	26.952	-2.789	-19.048	46.000	29.741	QP

This plot is valid for low, mid & high channels (worst-case plot).

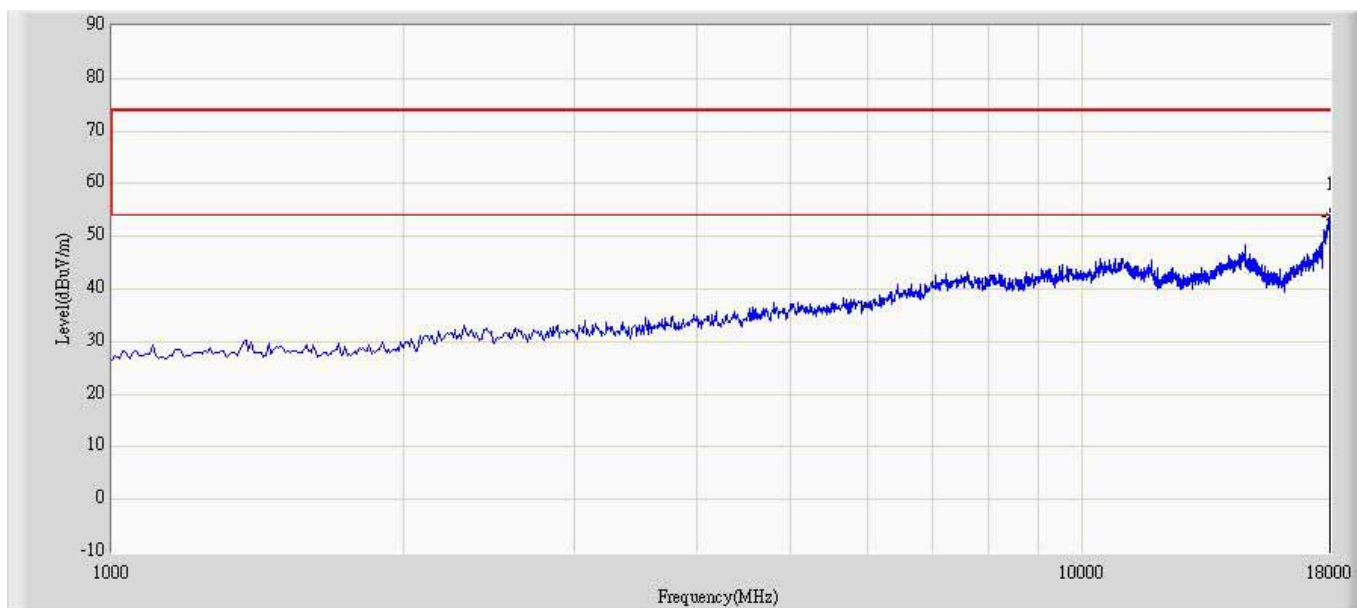
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 14:34
Limit: RSS_GEN_Radiation_03M_PK	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Wireless Module	Power: DC 3.8V
Note: GSM 850 Idle	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			18000.000	54.140	38.524	-19.860	74.000	15.616	PK
2		*	18000.000	39.306	23.690	-14.694	54.000	15.616	AV

This plot is valid for low, mid & high channels (worst-case plot).

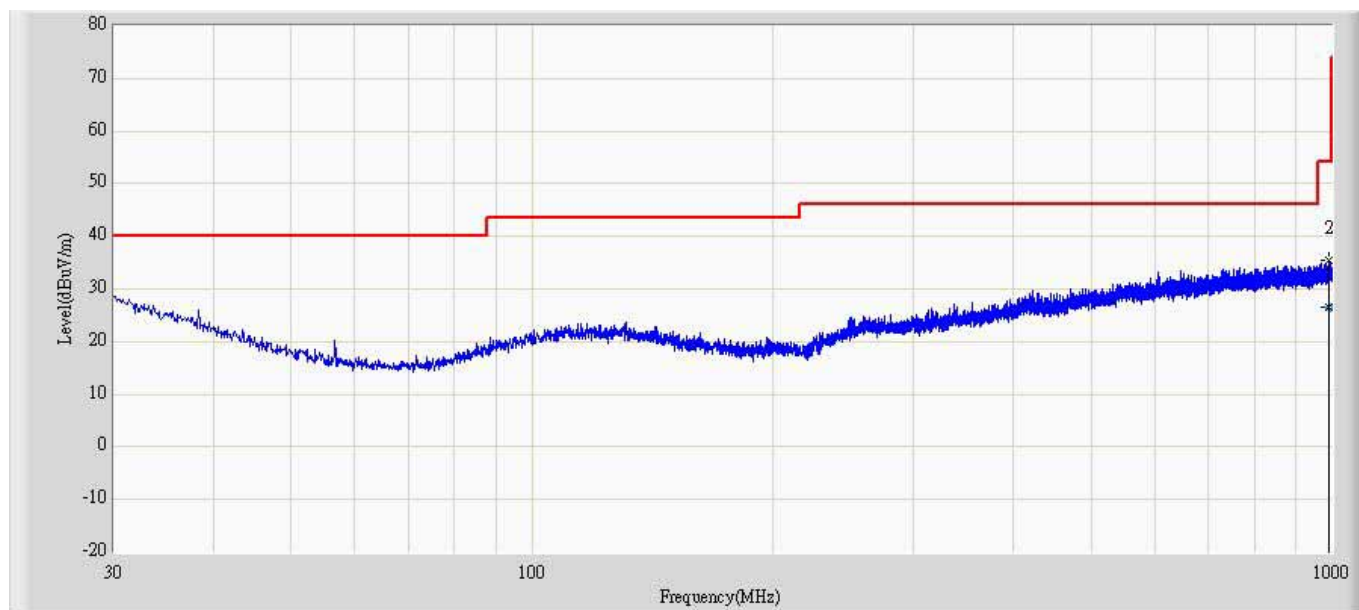
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 14:54
Limit: RSS_GEN_Radiation_03M_PK	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Wireless Module	Power: DC 3.8V
Note: GSM 850 Idle	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	18000.000	53.652	38.036	-20.348	74.000	15.616	PK

This plot is valid for low, mid & high channels (worst-case plot).

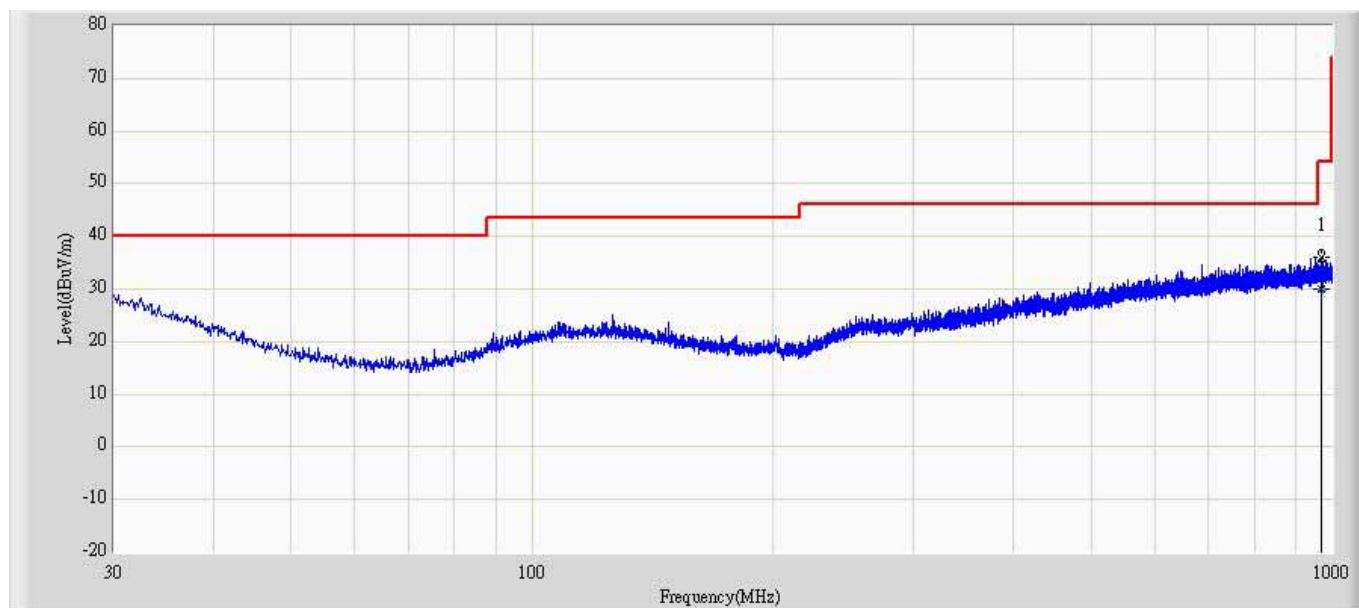
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 15:24
Limit: RSS_GEN_Radiation_03M_QP	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Horizontal
EUT: Wireless Module	Power: DC 3.8V
Note: PCS 1900 Idle	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		989.887	26.495	-3.470	-27.505	54.000	29.965	QP
2	*	989.936	35.531	5.566	-18.469	54.000	29.965	PK

This plot is valid for low, mid & high channels (worst-case plot).

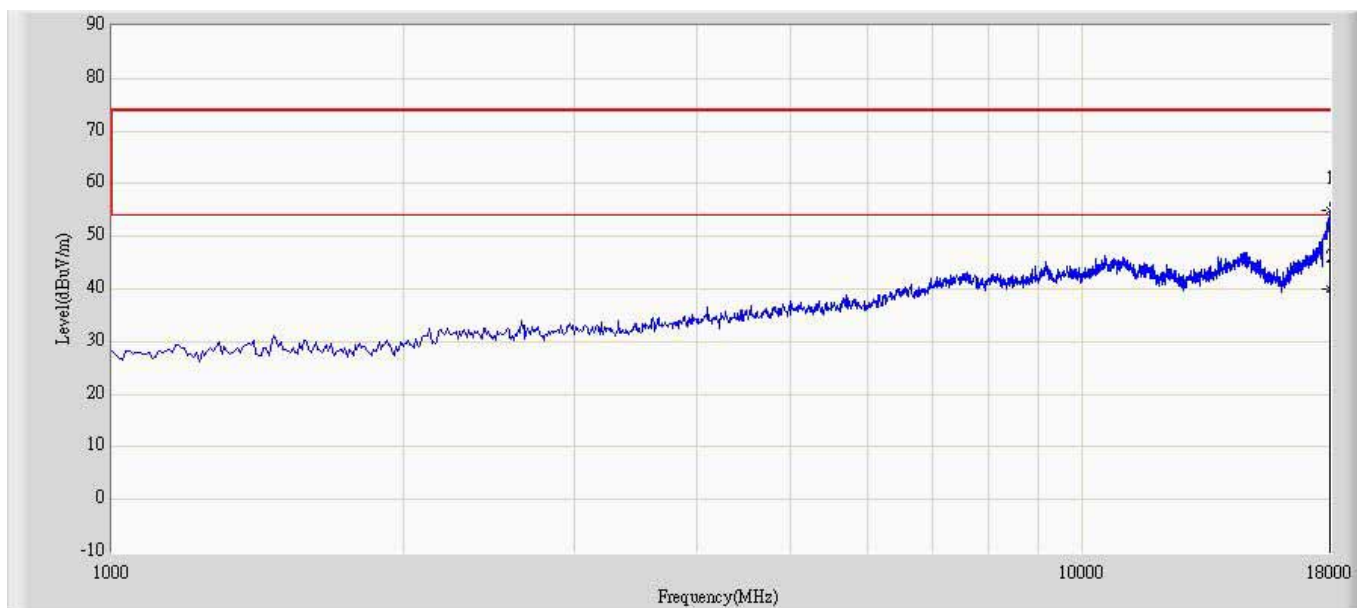
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 15:25
Limit: RSS_GEN_Radiation_03M_QP	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Vertical
EUT: Wireless Module	Power: DC 3.8V
Note: PCS 1900 Idle	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	968.232	36.086	6.312	-17.914	54.000	29.774	PK
2		968.778	30.125	0.354	-23.875	54.000	29.771	QP

This plot is valid for low, mid & high channels (worst-case plot).

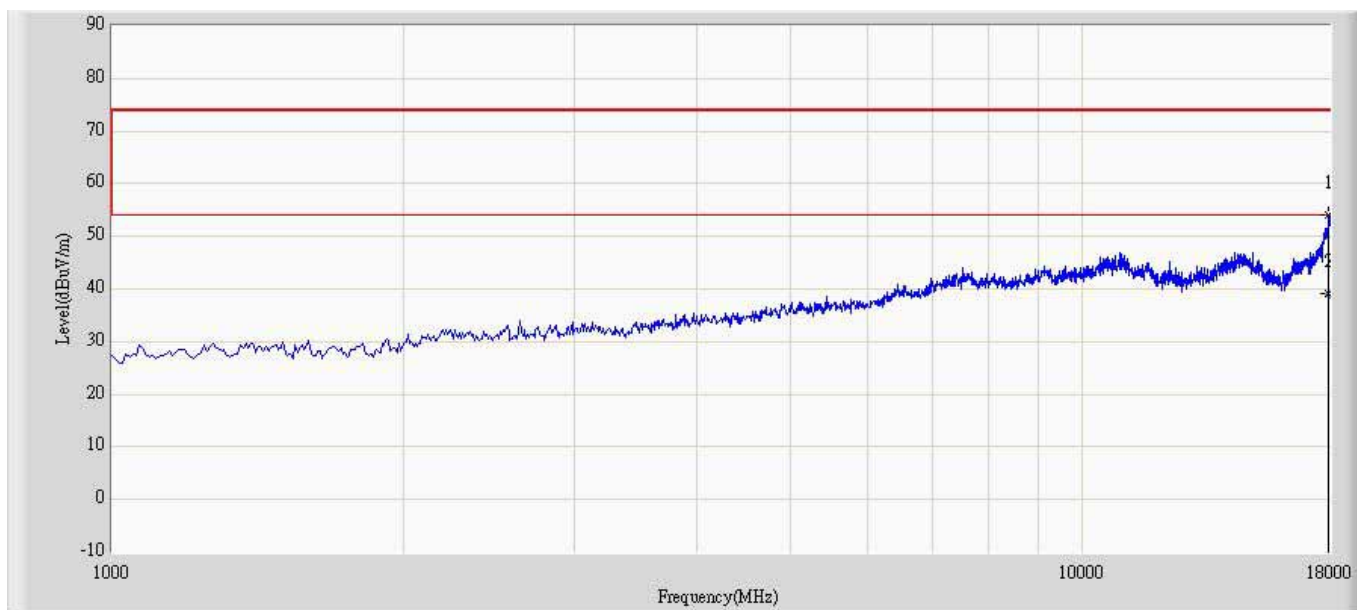
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 14:54
Limit: RSS_GEN_Radiation_03M_PK	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Wireless Module	Power: DC 3.8V
Note: PCS 1900 Idle	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			17991.500	55.000	39.529	-19.000	74.000	15.471	PK
2		*	17991.500	39.968	24.497	-14.032	54.000	15.471	AV

This plot is valid for low, mid & high channels (worst-case plot).

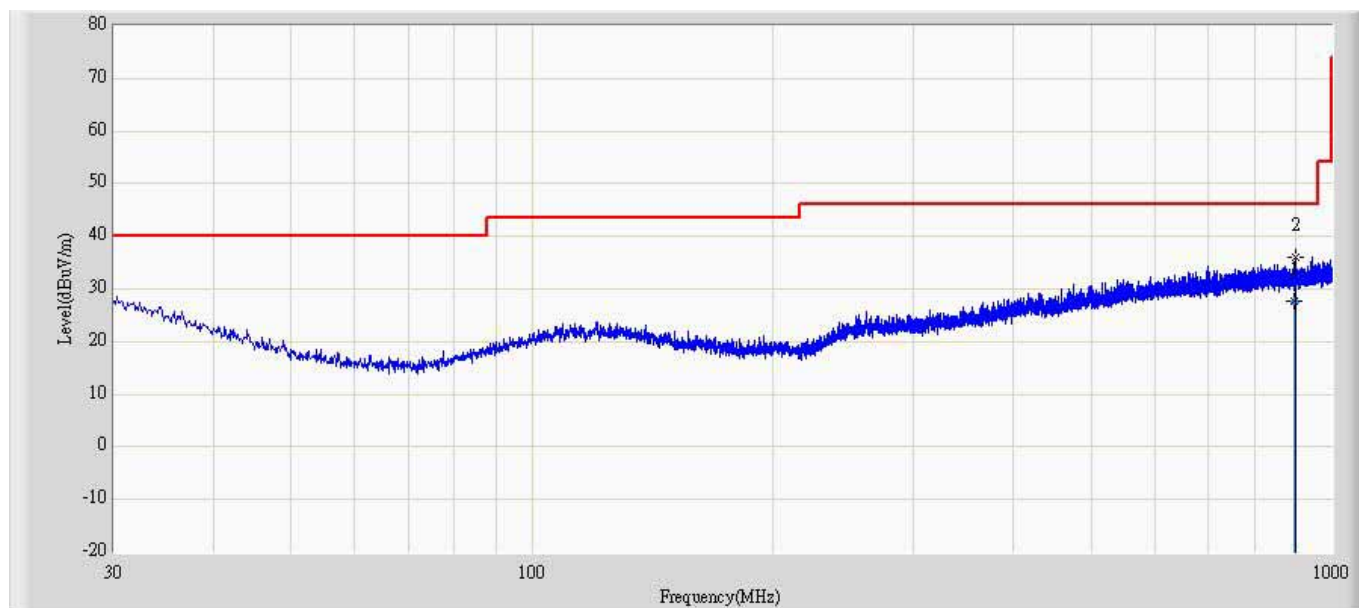
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 14:55
Limit: RSS_GEN_Radiation_03M_PK	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Wireless Module	Power: DC 3.8V
Note: PCS 1900 Idle	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			17966.000	54.154	39.248	-19.846	74.000	14.906	PK
2		*	17966.000	39.275	24.369	-14.725	54.000	14.906	AV

This plot is valid for low, mid & high channels (worst-case plot).

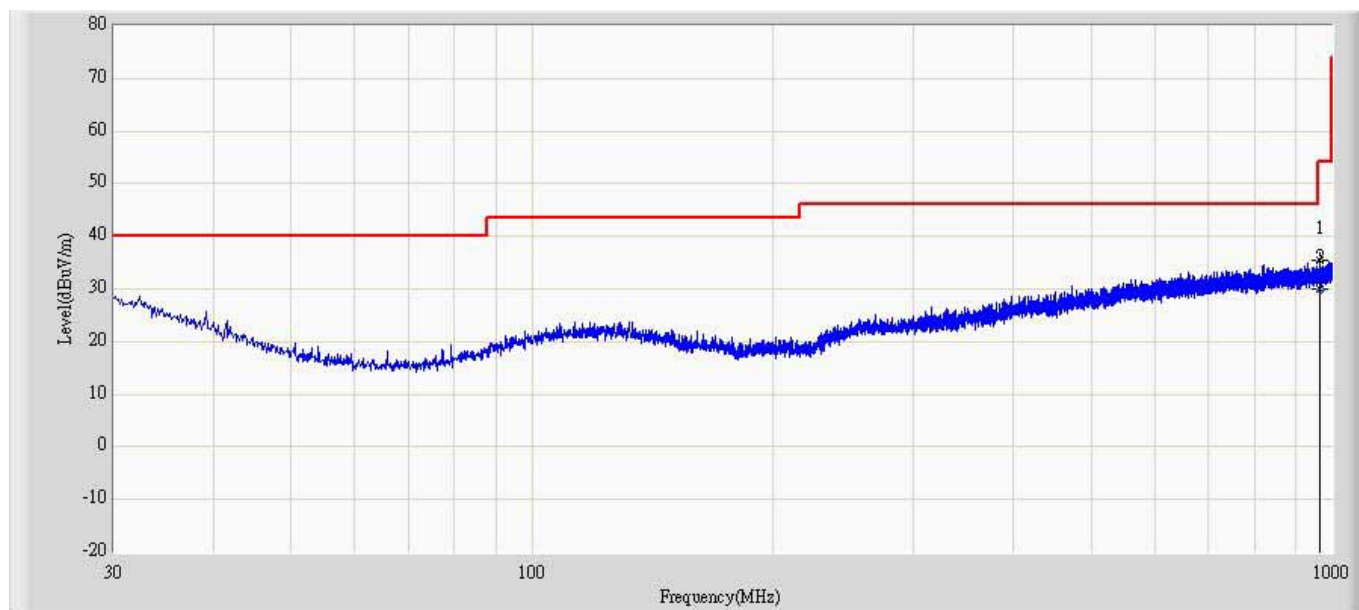
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 15:27
Limit: RSS_GEN_Radiation_03M_QP	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Horizontal
EUT: Wireless Module	Power: DC 3.8V
Note: WCDMA Band II Idle	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		898.778	27.676	-1.541	-18.324	46.000	29.216	QP
2	*	898.999	36.092	6.870	-9.908	46.000	29.222	PK

This plot is valid for low, mid & high channels (worst-case plot).

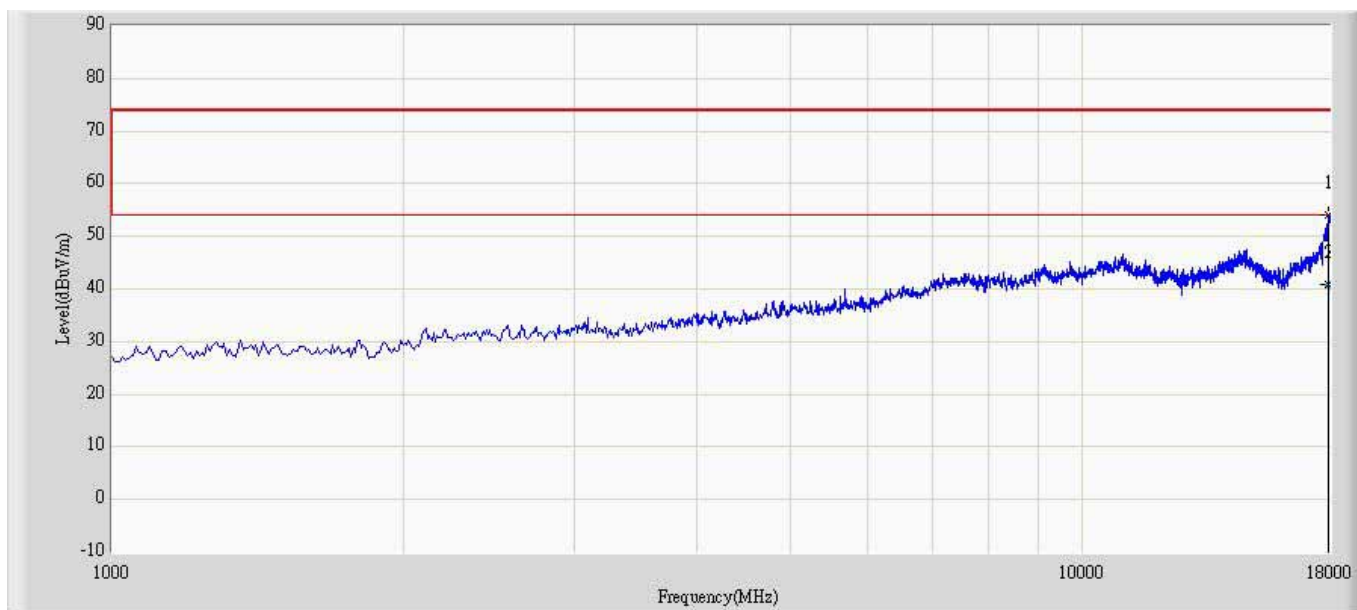
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 15:28
Limit: RSS_GEN_Radiation_03M_QP	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Vertical
EUT: Wireless Module	Power: DC 3.8V
Note: WCDMA Band II Idle	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	967.384	35.517	5.746	-18.483	54.000	29.771	PK
2		967.498	29.884	0.112	-24.116	54.000	29.772	QP

This plot is valid for low, mid & high channels (worst-case plot).

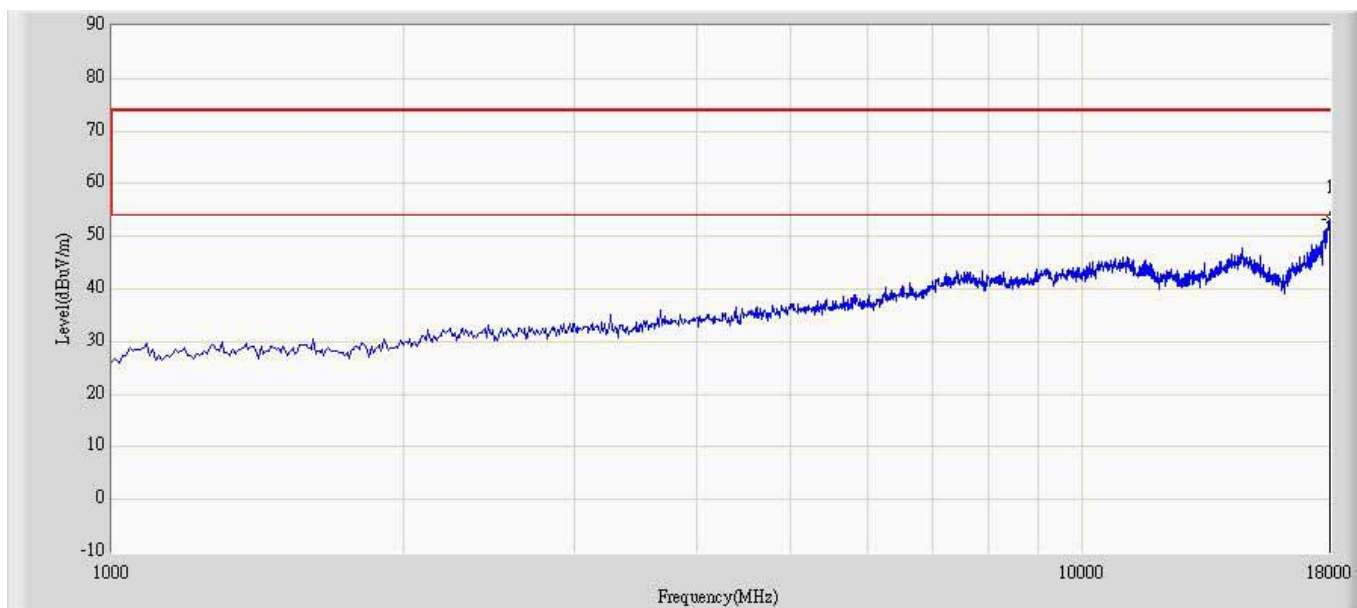
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 14:56
Limit: RSS_GEN_Radiation_03M_PK	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Wireless Module	Power: DC 3.8V
Note: WCDMA Band II Idle	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			17966.000	53.997	39.091	-20.003	74.000	14.906	PK
2		*	17966.000	40.770	25.864	-13.230	54.000	14.906	AV

This plot is valid for low, mid & high channels (worst-case plot).

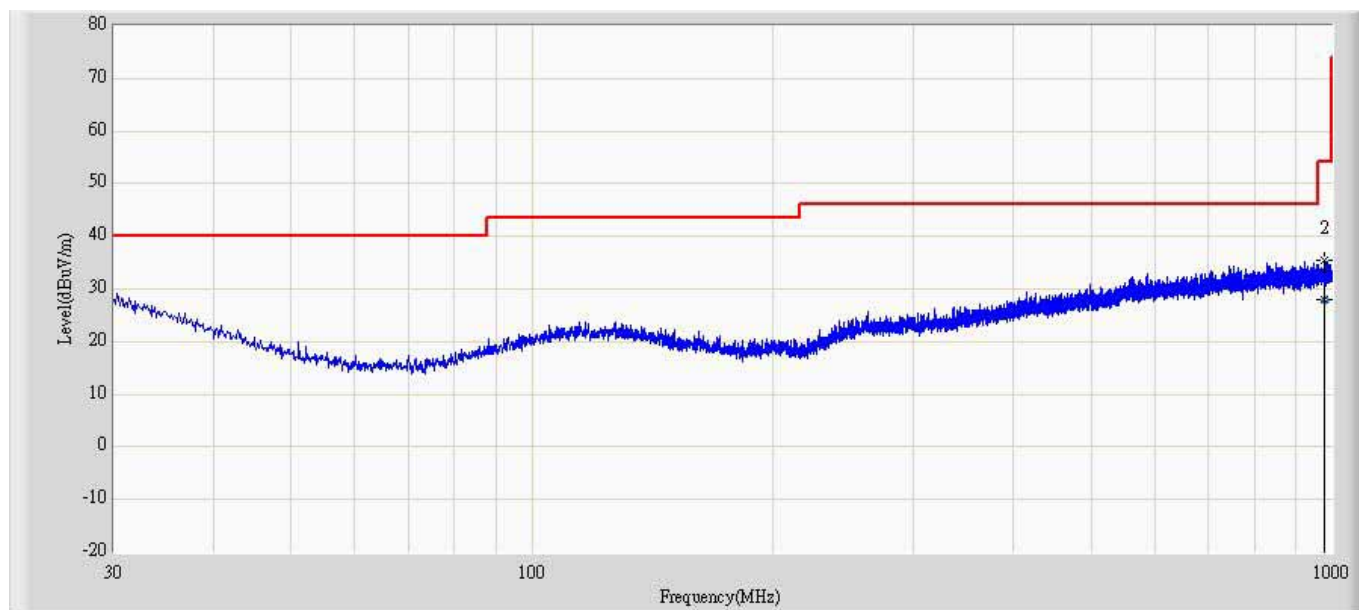
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 14:57
Limit: RSS_GEN_Radiation_03M_PK	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Wireless Module	Power: DC 3.8V
Note: WCDMA Band I Idle	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	17991.500	53.143	37.672	-20.857	74.000	15.471	PK

This plot is valid for low, mid & high channels (worst-case plot).

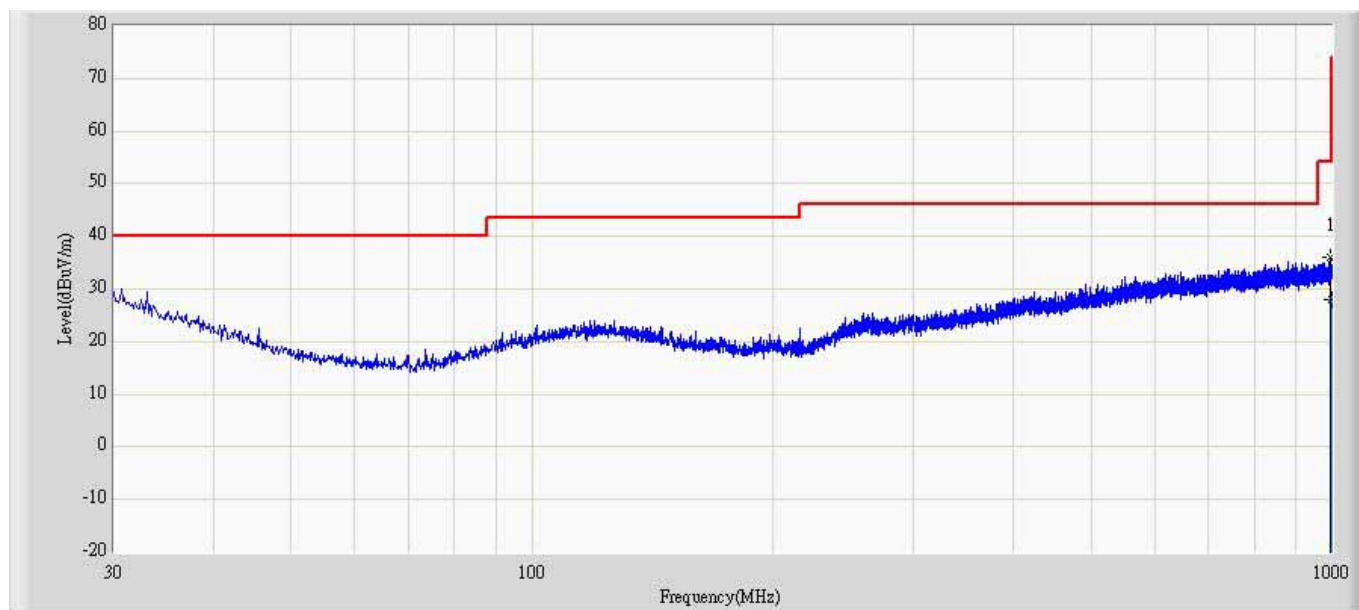
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 15:29
Limit: RSS_GEN_Radiation_03M_QP	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Horizontal
EUT: Wireless Module	Power: DC 3.8V
Note: WCDMA Band V Idle	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		979.413	27.933	-1.979	-26.067	54.000	29.912	QP
2	*	979.509	35.528	5.616	-18.472	54.000	29.912	PK

This plot is valid for low, mid & high channels (worst-case plot).

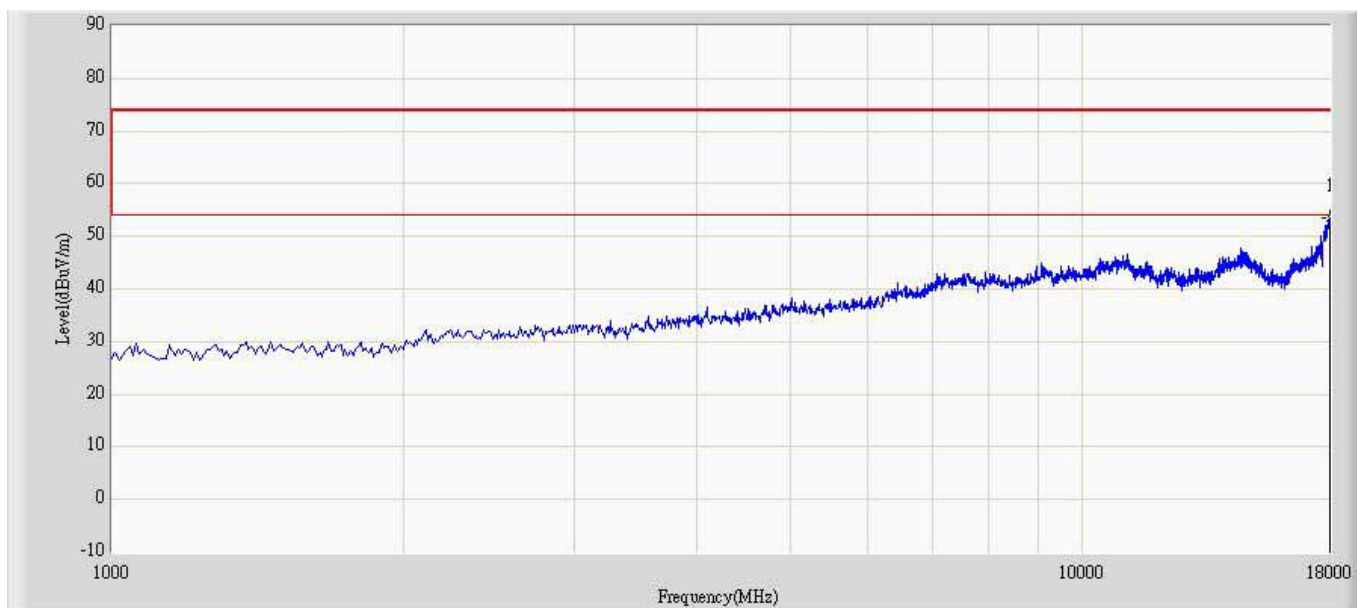
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 15:30
Limit: RSS_GEN_Radiation_03M_QP	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Vertical
EUT: Wireless Module	Power: DC 3.8V
Note: WCDMA Band V Idle	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	997.818	35.901	5.794	-18.099	54.000	30.108	PK
2		998.124	27.962	-2.147	-26.038	54.000	30.109	QP

This plot is valid for low, mid & high channels (worst-case plot).

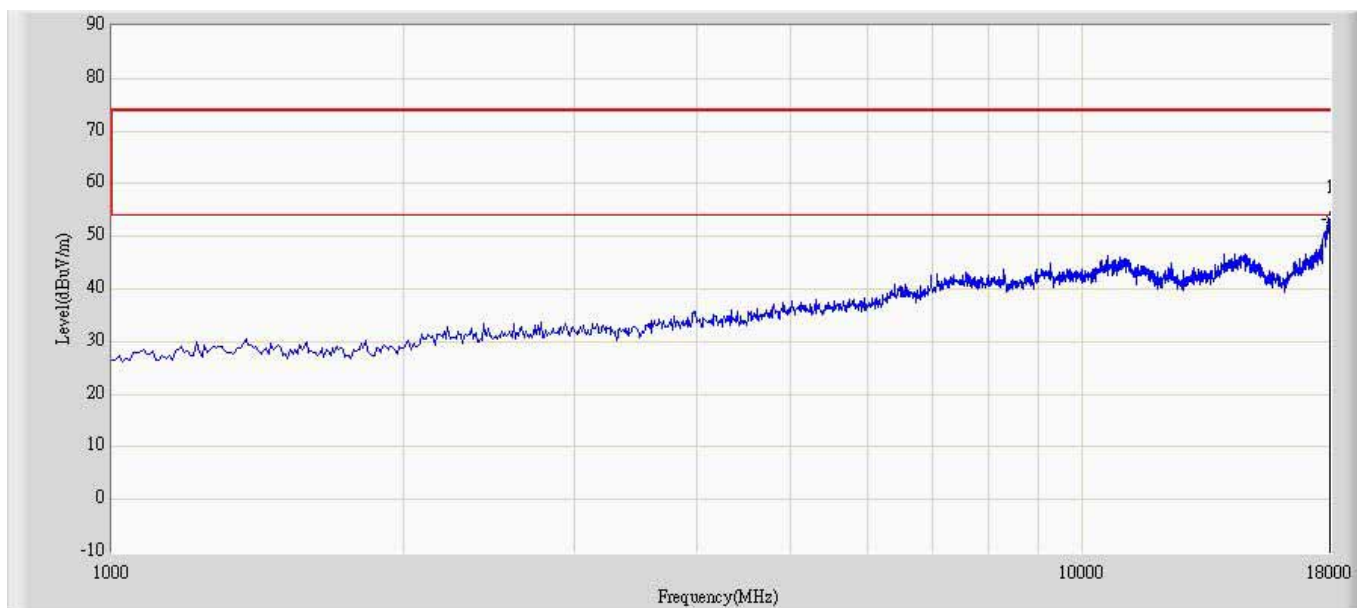
Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 14:57
Limit: RSS_GEN_Radiation_03M_PK	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Wireless Module	Power: DC 3.8V
Note: WCDMA Band V Idle	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	18000.000	53.540	37.924	-20.460	74.000	15.616	PK

This plot is valid for low, mid & high channels (worst-case plot).

Engineer: Jack	
Site: AC5	Time: 2012/06/12 - 14:57
Limit: RSS_GEN_Radiation_03M_PK	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Wireless Module	Power: DC 3.8V
Note: WCDMA Band V Idle	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	17983.000	53.275	37.949	-20.725	74.000	15.326	PK

This plot is valid for low, mid & high channels (worst-case plot).