FCC RF Test Report

APPLICANT	:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd.
EQUIPMENT	:	cdma2000/LTE dual-mode Mobile Phone
BRAND NAME	:	Coolpad
MODEL NAME	:	Coolpad 5860E
FCC ID	:	R38YL5860E
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Mar. 09, 2012 and completely tested on May 05, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory 1190

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR230902B	Rev. 01	Initial issue of report	May 14, 2012
FR230902B	Rev. 02	Update report for revising the model name	May 24, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	Gen 4.6.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)	A8.4	Power Output	≤ 30dBm	Pass	-
3.3	15.247(d)	A8.5	Frequency Band Edges	≤ 20dBc	Pass	-
3.4	15.247(d)	A8.5	Spurious Emission	< 20 dBc	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	≤ 8dBm	Pass	-
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 12.57 dB at 2.160 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 5.96 dB at 389.870 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd.
Hi-Tech Industry Park(North), Nanshan District, Shenzhen City, Guangdong Province, P.R.C.

1.2 Manufacturer

Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd.
Hi-Tech Industry Park(North), Nanshan District, Shenzhen City, Guangdong Province, P.R.C.

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	cdma2000/LTE dual-mode Mobile Phone
Brand Name	Coolpad
Model Name	Coolpad 5860E
FCC ID	R38YL5860E
Tx/Rx Frequency Range	2412 MHz ~ 2462 MHz
Number of Channels	11
Carrier Frequency of Each Channel	2412+(n-1)*5 MHz; n=1~11
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 17.18 dBm (0.0522 W) 802.11g : 17.92 dBm (0.0619 W)
Duty Cycle	802.11b : 86.47% 802.11g : 87.01%
Antenna Type	PIFA Antenna with gain 0 dBi
HW Version	P4
SW Version	CP5860E-user 2.3.7 GWK74 2.3.027.P3.120220.5860E release-keys
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH01-KS	CO01-KS	03CH01-KS	149928/4086E-1

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01
- ANSI C63.4-2003
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
3.	Notebook	Dell	VOSTRO1450	PPD-AR5B195	N/A	Shielded Cable DC O/P 1.8m, Unshielded AC I/P Cable 1.8m
4.	DC Power Supply	GW	GPS-30300	N/A	N/A	Unshielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	N/A	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Power

Preliminary tests were performed in different data rate as below table and the highest power data rates (11b, 11g modes) were chosen for full test in the following sections to demonstrate compliance to the FCC limit line.

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	17.18	17.16	16.89	16.88

2.4GHz 802.11g mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	17.92	17.89	17.50	17.91	17.12	17.85	17.80	17.75

2.2 Maximum Peak Conducted Output Power:

Band	2.4GHz 802.11b RF Power (dBm)			2.4GHz 802.11g RF Power (dBm)		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Peak Power	17.18	17.02	16.76	17.68	17.92	17.65

Remark:

The data rates of WLAN 802.11b/g were set in 1Mbps for 802.11b and 6Mbps for 802.11g for all the test cases due to the highest RF output power.

2.3 Maximum Average Conducted Output Power:

Band	2.4GHz 802.11b RF Power (dBm)			2.4GHz 802.11g RF Power (dBm)		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Average Power	15.41	15.28	14.77	7.87	7.52	6.72

Remark:

1. The average power, which is used by the test method, AVG2, in DTS Meas. Guidance v01, is reporting only.
2. The EUT is programmed to transmit signals continuously.

2.4 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 KHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

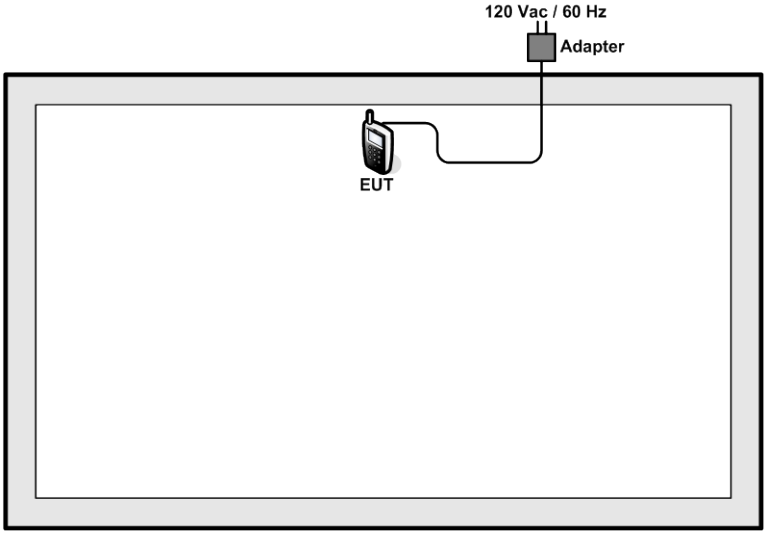
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

The following tables are showing the test modes as the worst cases (Z plane) and recorded in this report.

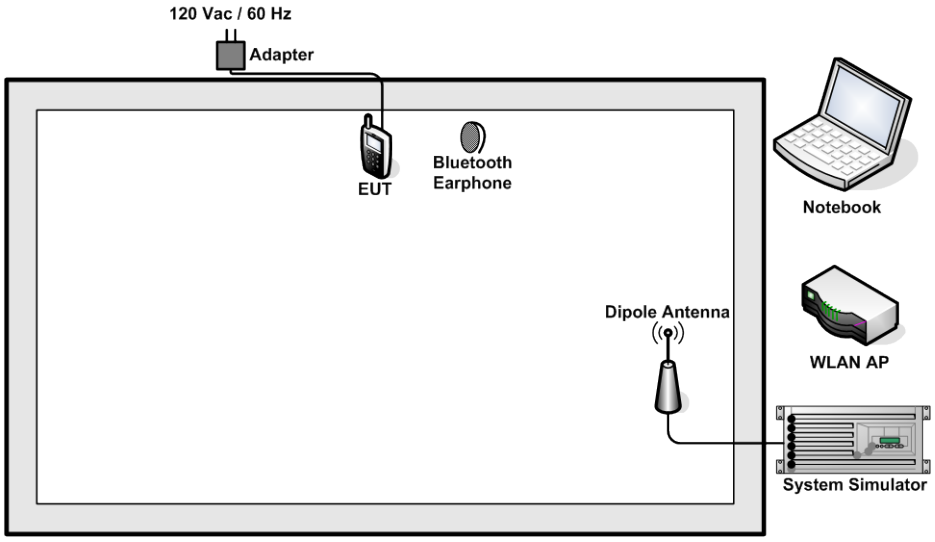
Test Cases		
Test Item	**802.11b**	**802.11g**
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4 : 802.11g CH01_2412 MHz Mode 5 : 802.11g CH06_2437 MHz Mode 6 : 802.11g CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4 : 802.11g CH01_2412 MHz Mode 5 : 802.11g CH06_2437 MHz Mode 6 : 802.11g CH11_2462 MHz
AC Conducted Emission	Mode 1 :GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Camera	

2.5 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.6 RF Utility

The programmed RF utility, “CMD” is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 KHz.

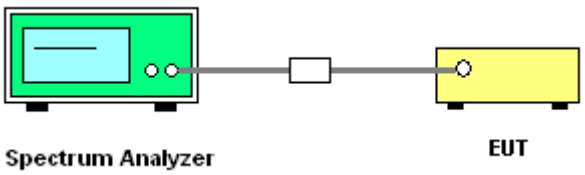
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1-5% of the emission bandwidth (EBW).Set the Video bandwidth (VBW) ≥ 3 * RBW. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

3.1.4 Test Setup

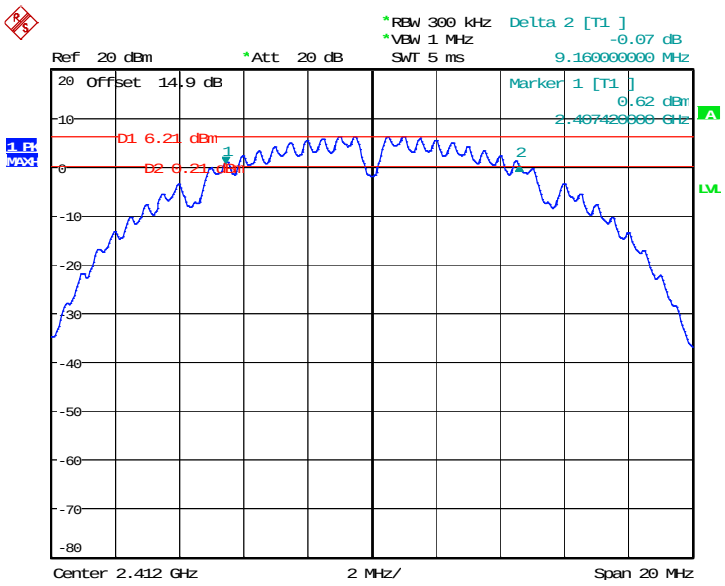


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24-26℃
Test Engineer :	Lizy Yuan	Relative Humidity :	50-53%

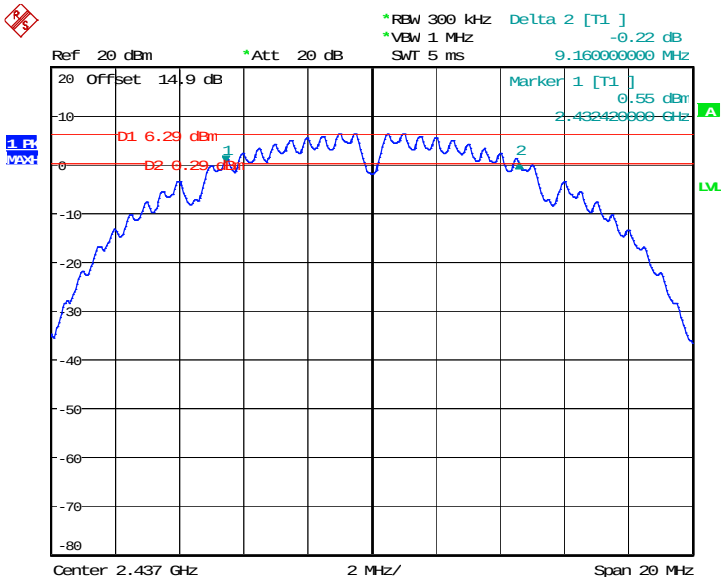
Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	9.16	0.5	Pass
06	2437	9.16	0.5	Pass
11	2462	9.16	0.5	Pass

Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 2.MAY.2012 21:23:06

Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



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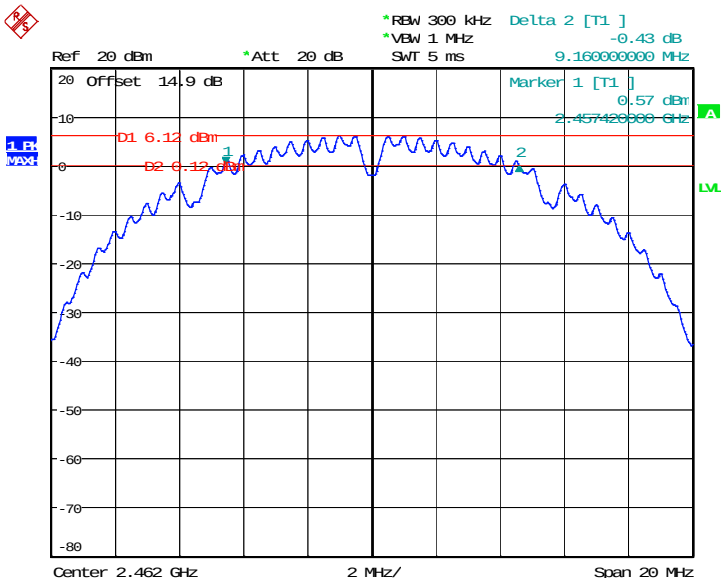
Mode 3 : 6 dB Bandwidth Plot on 802.11b Channel 11

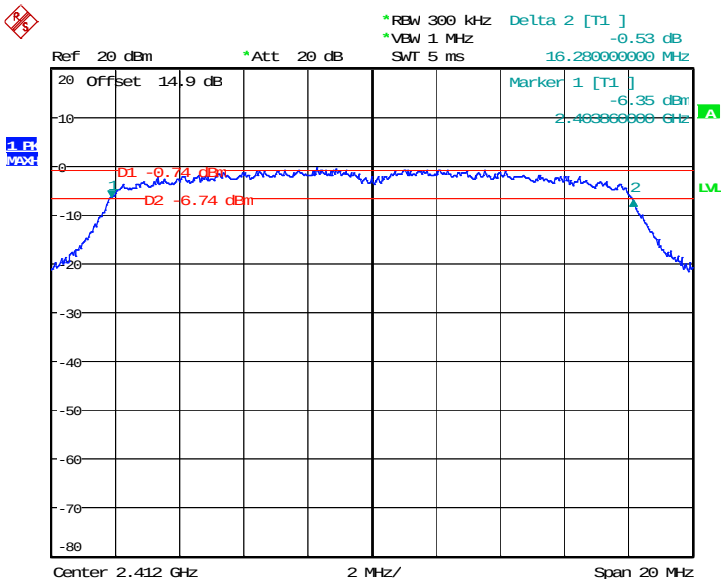


Date: 2.MAY.2012 21:05:16

Test Mode :	Mode 4, 5, 6	Temperature :	24-26℃
Test Engineer :	Lizy Yuan	Relative Humidity :	50-53%

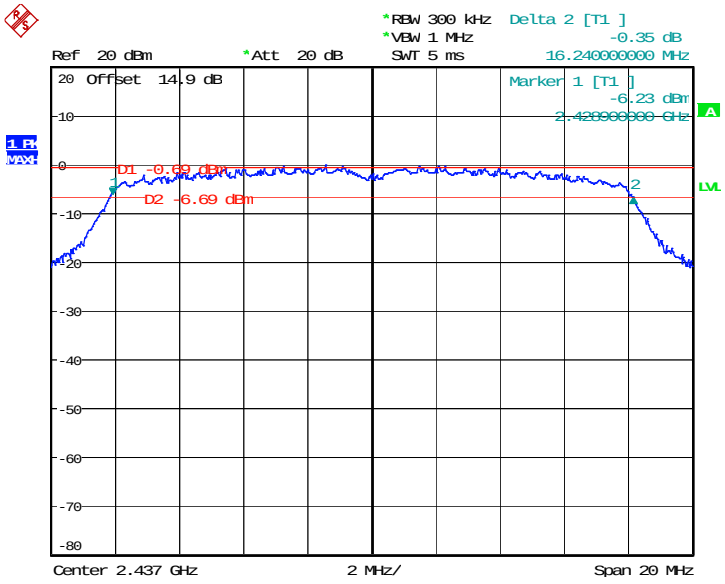
Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.28	0.5	Pass
06	2437	16.24	0.5	Pass
11	2462	16.12	0.5	Pass

Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



Date: 2.MAY.2012 21:10:27

Mode 5 : 6 dB Bandwidth Plot on 802.11g Channel 06



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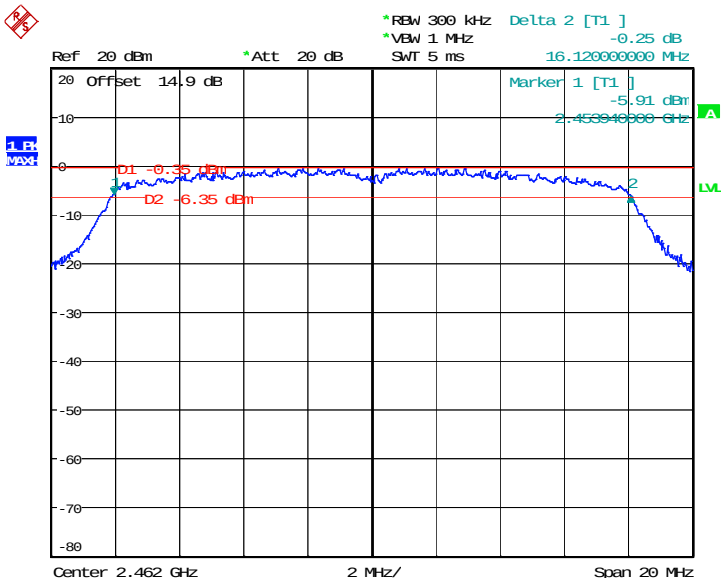
Mode 6 : 6 dB Bandwidth Plot on 802.11g Channel 11



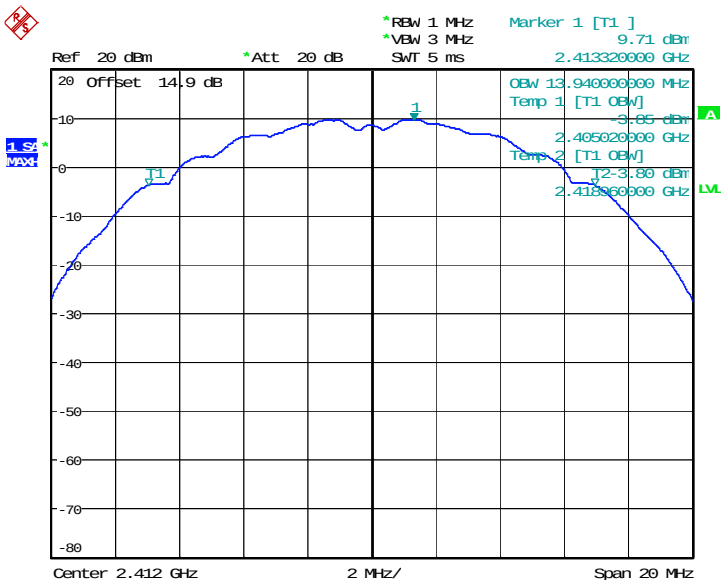
Date: 2.MAY.2012 21:18:53

3.1.6 Test Result of 99% Occupied Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24-26℃
Test Engineer :	Lizy Yuan	Relative Humidity :	50-53%

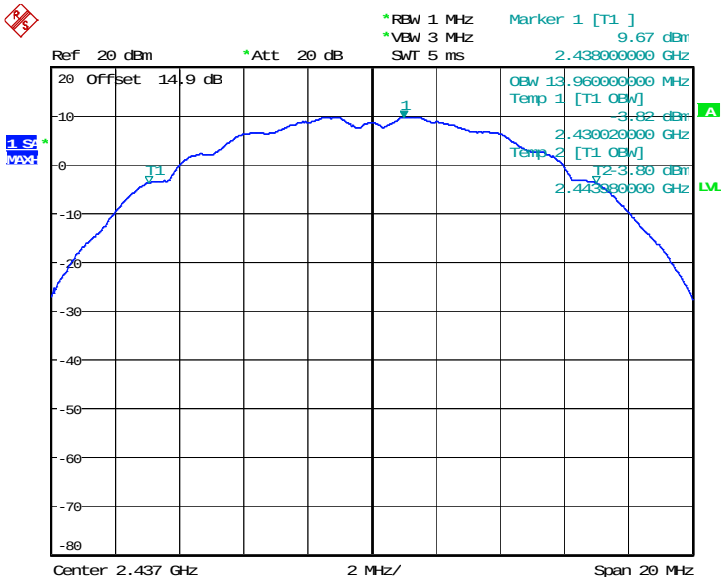
Channel	Frequency (MHz)	802.11b 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	13.94	Pass
06	2437	13.96	Pass
11	2462	13.94	Pass

Mode 1 : 99% Occupied Bandwidth Plot on 802.11b Channel 01



Date: 2.MAY.2012 20:32:34

Mode 2 : 99% Occupied Bandwidth Plot on 802.11b Channel 06



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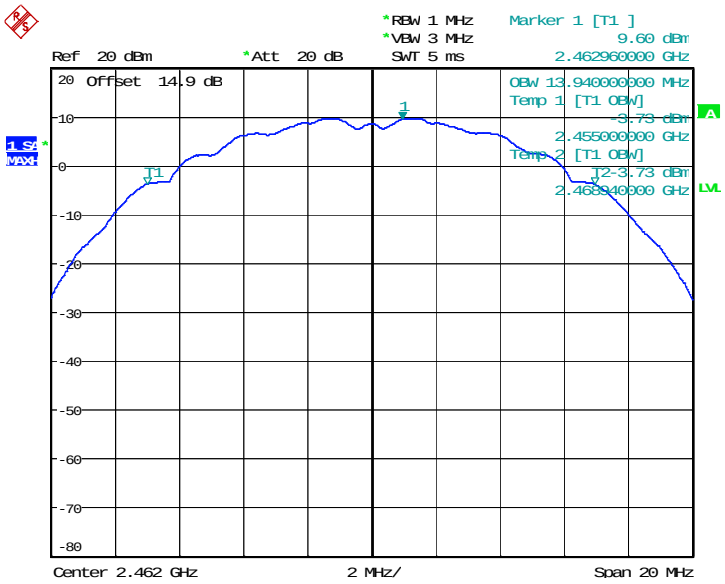
Mode 3 : 99% Occupied Bandwidth Plot on 802.11b Channel 11

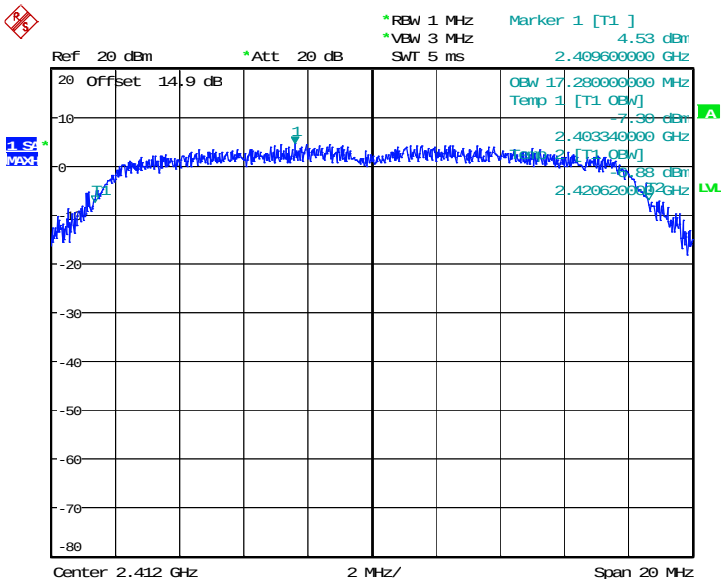


Date: 2.MAY.2012 21:08:34

Test Mode :	Mode 4, 5, 6	Temperature :	24-26℃
Test Engineer :	Lizy Yuan	Relative Humidity :	50-53%

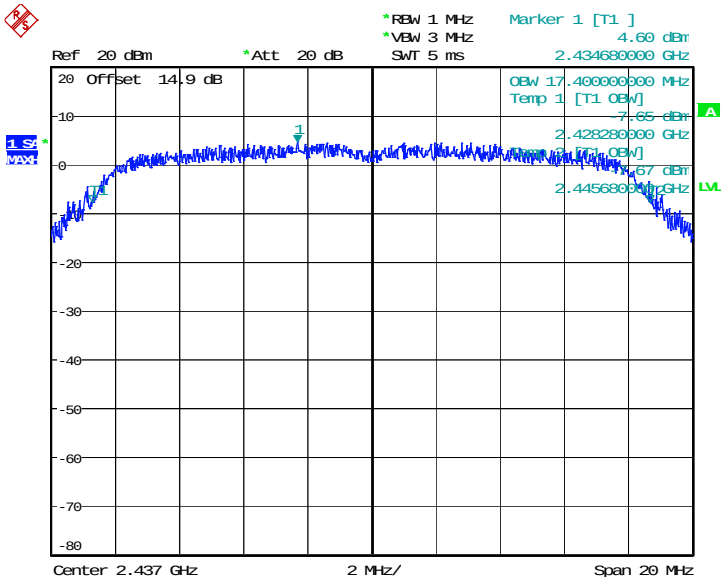
Channel	Frequency (MHz)	802.11g 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	17.28	Pass
06	2437	17.40	Pass
11	2462	17.38	Pass

Mode 4 : 99% Occupied Bandwidth Plot on 802.11g Channel 01



Date: 2.MAY.2012 21:13:16

Mode 5 : 99% Occupied Bandwidth Plot on 802.11g Channel 06



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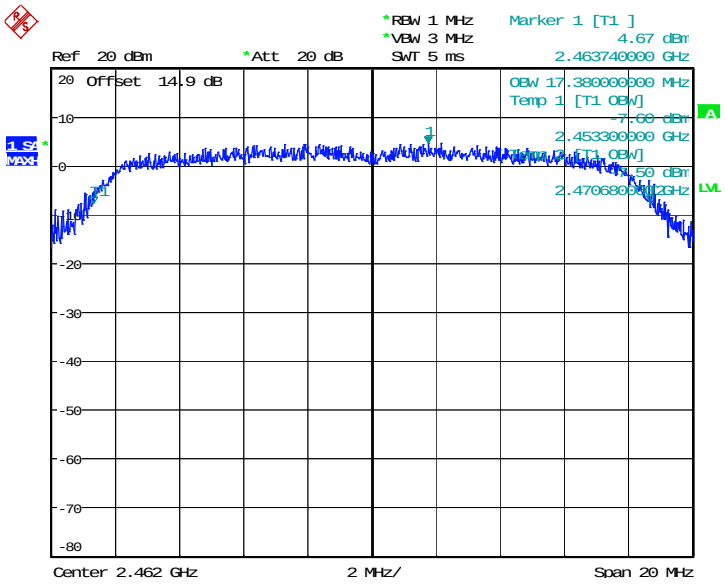
Mode 6 : 99% Occupied Bandwidth Plot on 802.11g Channel 11



Date: 2.MAY.2012 21:20:46

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

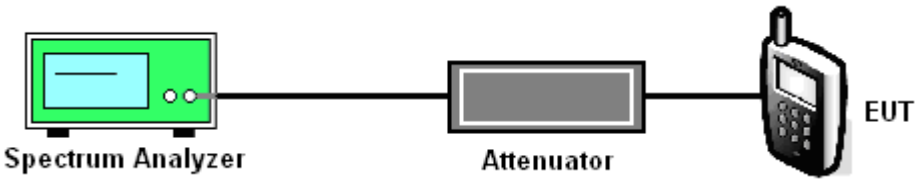
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure PK2 of FCC KDB No. 558074 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the power meter by a low loss cable. The path loss was compensated to the results for each measurement.
3. The spectrum analyzer's settings are Resolution bandwidth (RBW) = 1MHz, Video bandwidth (VBW) = 3MHz, Peak Detector, auto sweep time, and the frequency span to a value that is 5-30 % greater than the EBW.
4. The spectrum analyzer’s integrated band power measurement function is used to measure the peak power and the test results are demonstrated to compliance to the limit line as following plots.

3.2.4 Test Setup



3.2.5 Test Result of Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	24-26℃
Test Engineer :	Lizy Yuan	Relative Humidity :	50-53%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	17.18	30	Pass
06	2437	17.02	30	Pass
11	2462	16.76	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	24-26℃
Test Engineer :	Lizy Yuan	Relative Humidity :	50-53%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	17.68	30	Pass
06	2437	17.92	30	Pass
11	2462	17.65	30	Pass

3.3 Band Edges Measurement

3.3.1 Limit of Band Edges

In any 100 KHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

3.3.2 Measuring Instruments

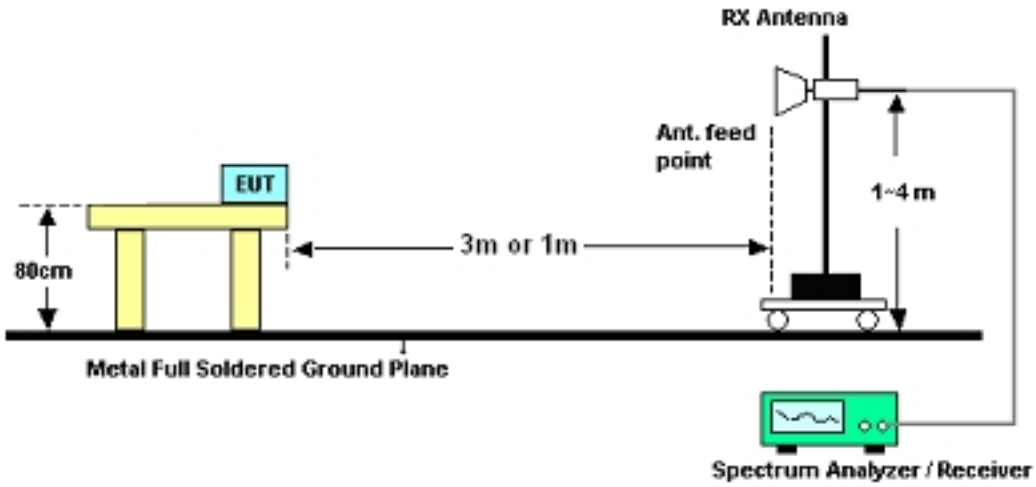
See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows the guidelines in ANSI C63.4-2003 and the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. Conducted emission test: Set RBW = 100 KHz, Video bandwidth (VBW) ≥ RBW. Out of the authorized frequency band emissions must be at least 20 dB lower than the highest emission level within the authorized band as measured with a 100 KHz RBW. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
3. Radiated emission test: Apply to band edge emissions that falling on the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep=Auto. If the emission is pulsed, then modify the unit for continuous operation. Use the settings in this paragraph to correct the reading level by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation per 15.35(b) and (c).

3.3.4 Test Setup

<Radiated Band Edges>



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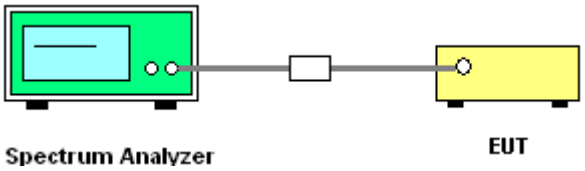


3.3.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	20~21°C
Test Band :	802.11b	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2368.9	50.86	-23.14	74	48.62	32.83	3.42	34.01	152	227	Peak
2368.9	37.51	-16.49	54	35.27	32.83	3.42	34.01	152	227	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2310.19	50.84	-23.16	74	48.75	32.73	3.22	33.86	122	273	Peak
2310.19	37.58	-16.42	54	35.49	32.73	3.22	33.86	122	273	Average

Test Mode :	Mode 3	Temperature :	20~21°C
Test Band :	802.11b	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.42	51.74	-22.26	74	49.25	33.01	3.68	34.2	200	42	Peak
2484.42	39.1	-14.9	54	36.61	33.01	3.68	34.2	200	42	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.61	51.26	-22.74	74	48.77	33.01	3.68	34.2	122	93	Peak
2484.61	38.53	-15.47	54	36.04	33.01	3.68	34.2	122	93	Average

Test Mode :	Mode 4	Temperature :	20~21°C
Test Band :	802.11g	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2372.32	50.09	-23.91	74	47.85	32.83	3.42	34.01	114	266	Peak
2372.32	36.39	-17.61	54	34.15	32.83	3.42	34.01	114	266	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2379.54	50.7	-23.3	74	48.46	32.83	3.42	34.01	142	277	Peak
2379.54	37.4	-16.6	54	35.16	32.83	3.42	34.01	142	277	Average

Test Mode :	Mode 6	Temperature :	20~21°C
Test Band :	802.11g	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Jack Li

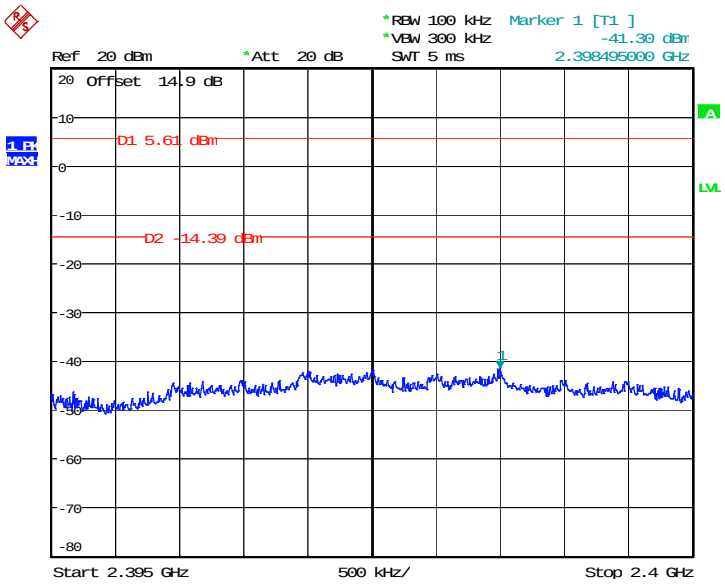
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2490.69	50.67	-23.33	74	48.13	33.05	3.72	34.23	200	155	Peak
2490.69	37.75	-16.25	54	35.21	33.05	3.72	34.23	200	155	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	51.49	-22.51	74	49	33.01	3.68	34.2	122	259	Peak
2483.5	37.95	-16.05	54	35.46	33.01	3.68	34.2	122	259	Average

3.3.6 Test Plots of Conducted Band Edges

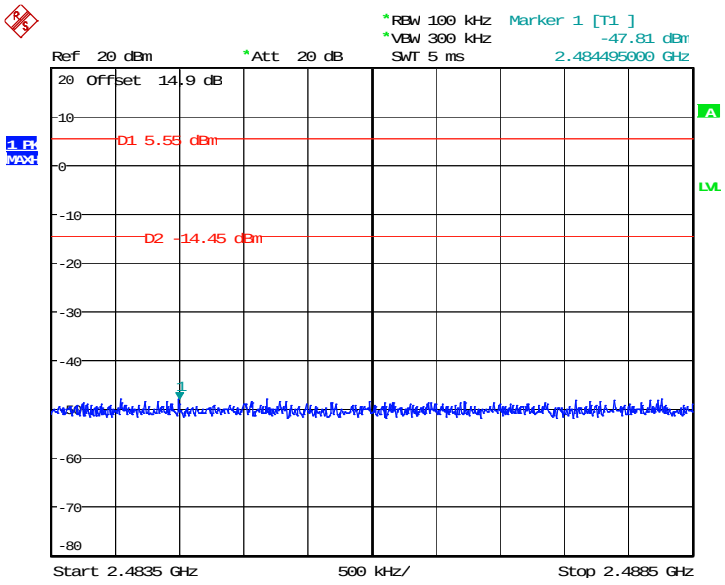
Test Mode :	Mode 1 and 3	Temperature :	24-26℃
Test Band :	802.11b	Relative Humidity :	50-53%
Test Channel :	01 and 11	Test Engineer :	Lizy Yuan

Low Band Edge Plot on 802.11b Channel 01



Date: 2.MAY.2012 20:30:54

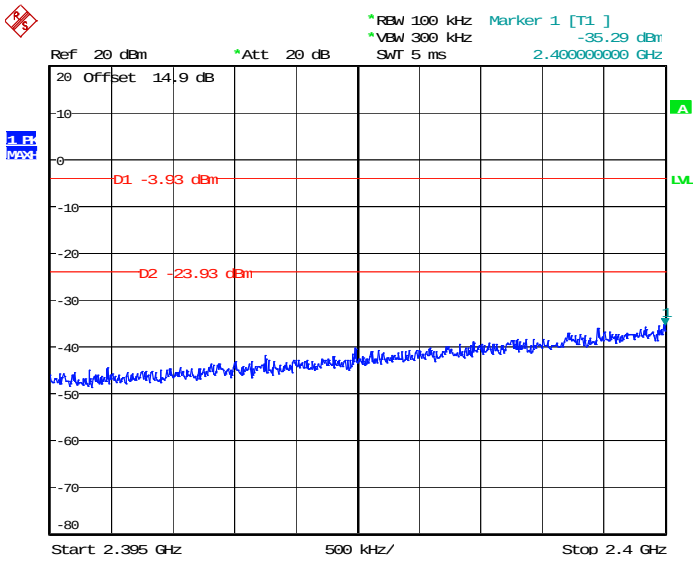
High Band Edge Plot on 802.11b Channel 11



Date: 2.MAY.2012 21:07:07

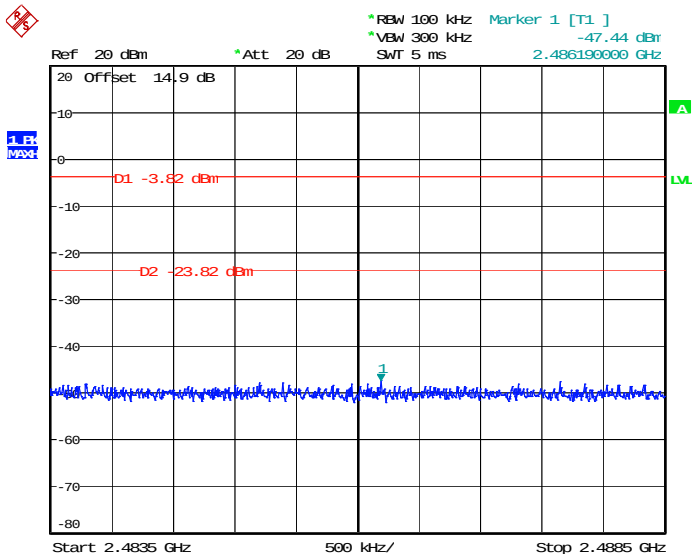
Test Mode :	Mode 4 and 6	Temperature :	24-26℃
Test Band :	802.11g	Relative Humidity :	50-53%
Test Channel :	01 and 11	Test Engineer :	Lizy Yuan

Low Band Edge Plot on 802.11g Channel 01



Date: 2.MAY.2012 21:11:35

High Band Edge Plot on 802.11g Channel 11



Date: 2.MAY.2012 21:19:50

3.4 Spurious Emission Measurement

3.4.1 Limit of Spurious Emission Measurement

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

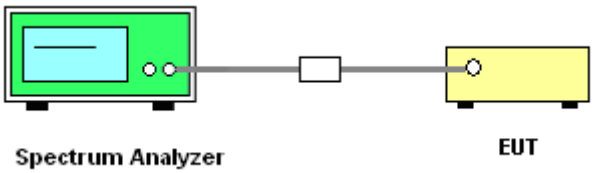
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable. The path loss was compensated to the results for each measurement.
2. Set RBW = 100 KHz, Video bandwidth (VBW) ≥ RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 KHz RBW.

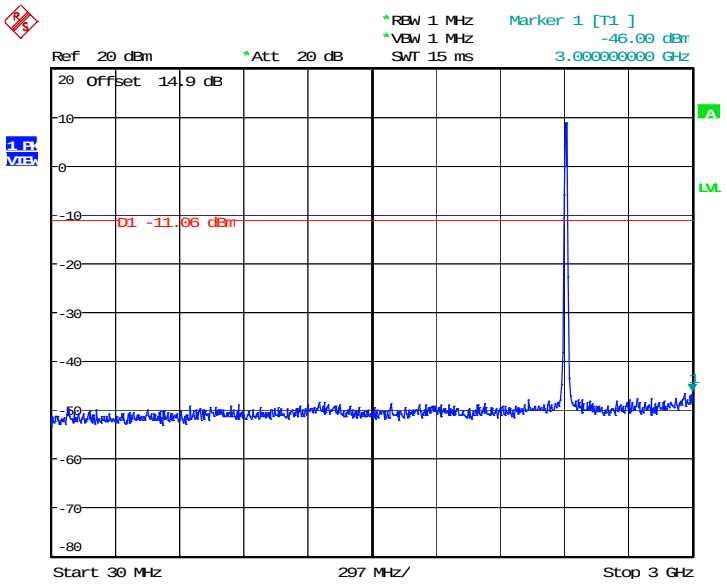
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

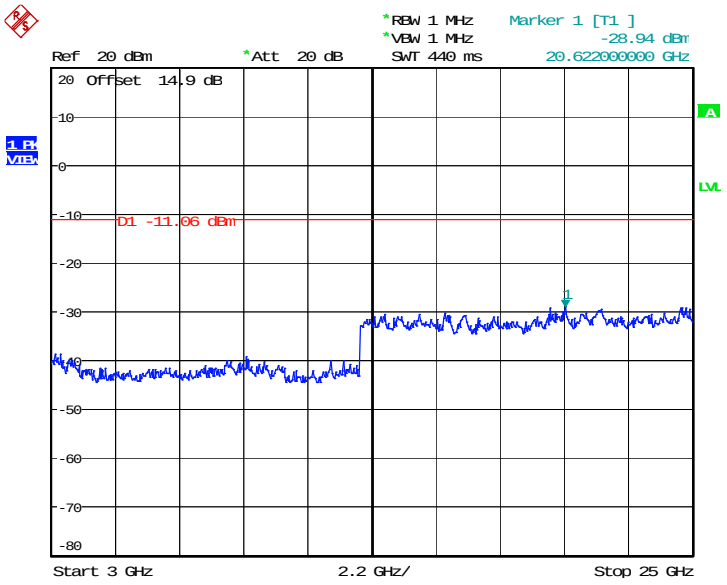
Test Mode :	Mode 1	Temperature :	24-26℃
Test Band :	802.11b	Relative Humidity :	50-53%
Test Channel :	01	Test Engineer :	Lizy Yuan

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 2.MAY.2012 21:35:28

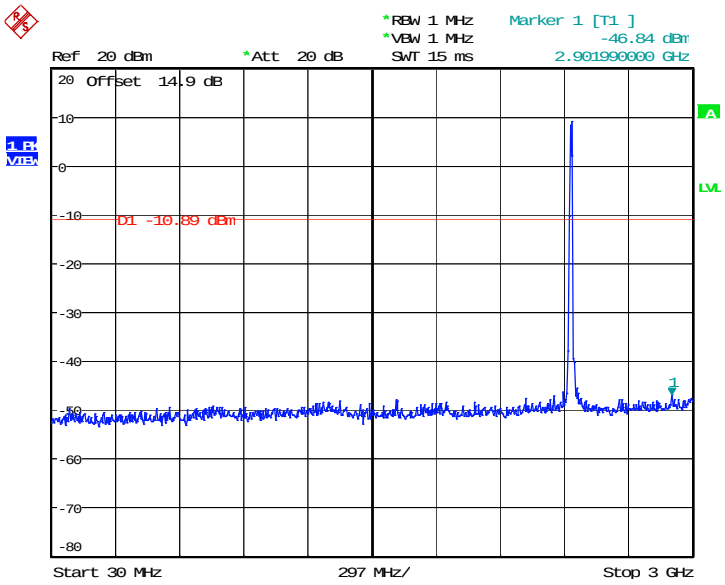
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 2.MAY.2012 21:35:46

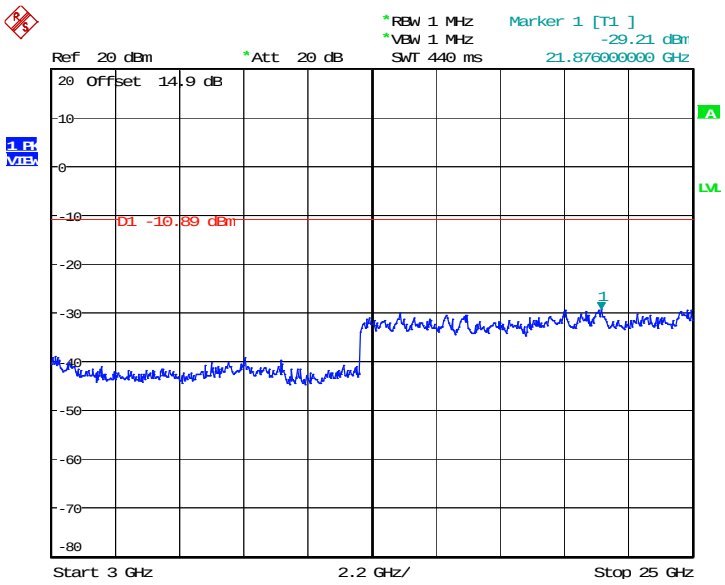
Test Mode :	Mode 2	Temperature :	24-26℃
Test Band :	802.11b	Relative Humidity :	50-53%
Test Channel :	06	Test Engineer :	Lizy Yuan

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 2.MAY.2012 21:36:33

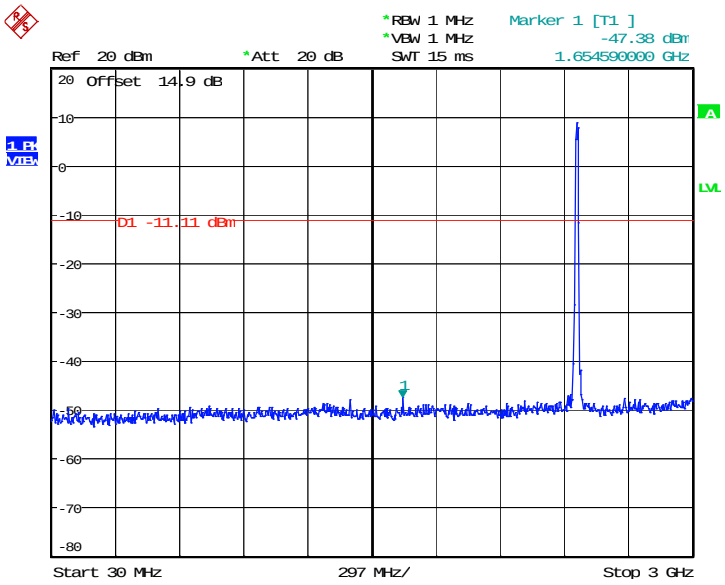
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 2.MAY.2012 21:36:51

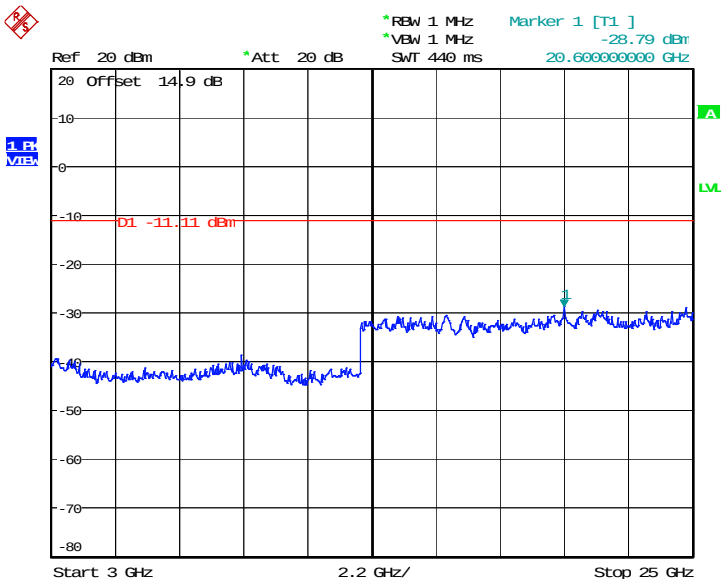
Test Mode :	Mode 3	Temperature :	24-26℃
Test Band :	802.11b	Relative Humidity :	50-53%
Test Channel :	11	Test Engineer :	Lizy Yuan

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 2.MAY.2012 21:37:42

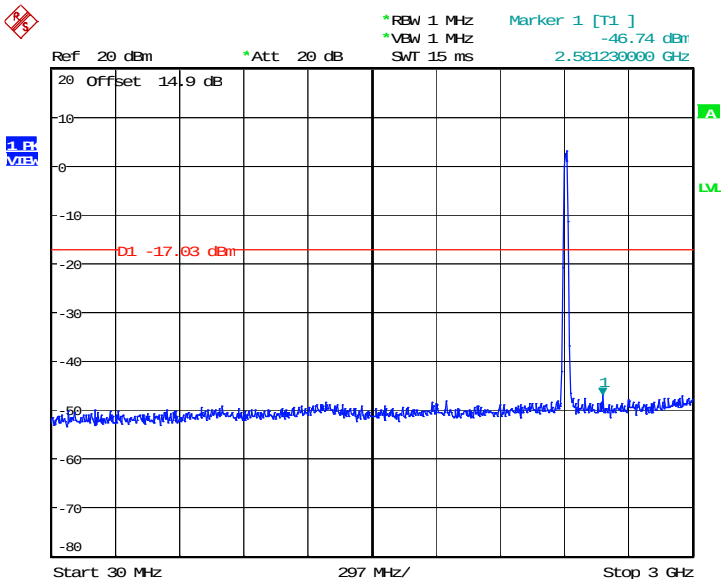
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 2.MAY.2012 21:38:01

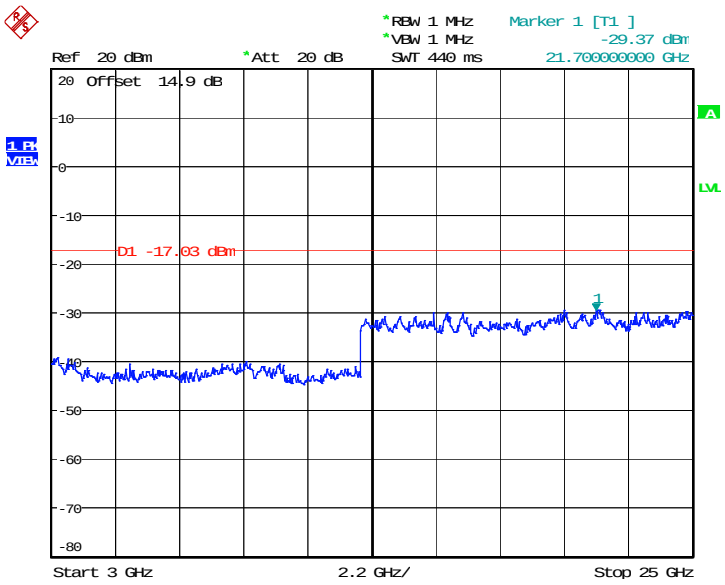
Test Mode :	Mode 4	Temperature :	24-26℃
Test Band :	802.11g	Relative Humidity :	50-53%
Test Channel :	01	Test Engineer :	Lizy Yuan

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 2.MAY.2012 21:43:35

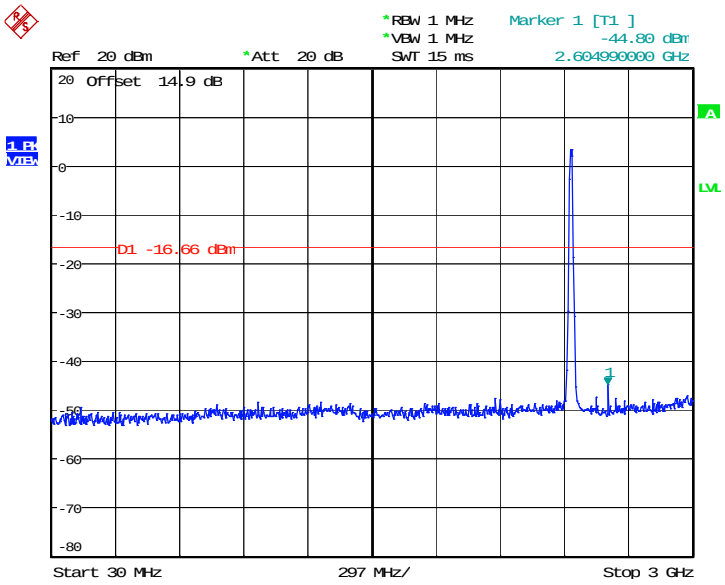
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 2.MAY.2012 21:43:53

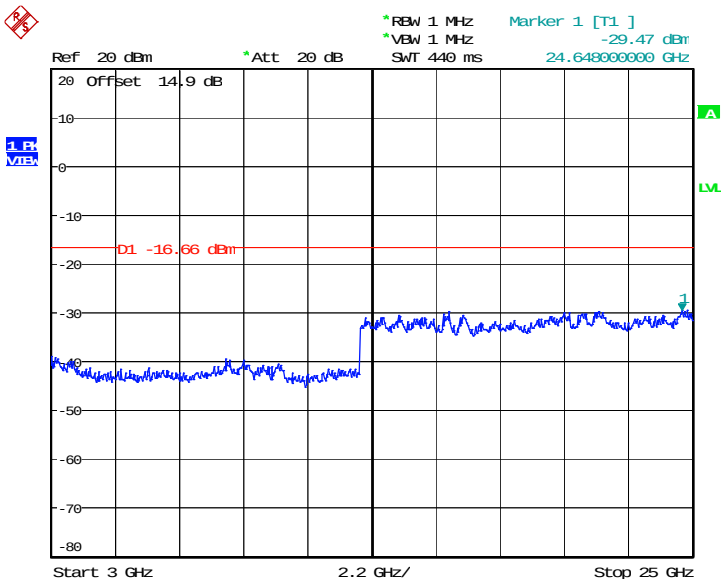
Test Mode :	Mode 5	Temperature :	24-26℃
Test Band :	802.11g	Relative Humidity :	50-53%
Test Channel :	06	Test Engineer :	Lizy Yuan

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 2.MAY.2012 21:44:54

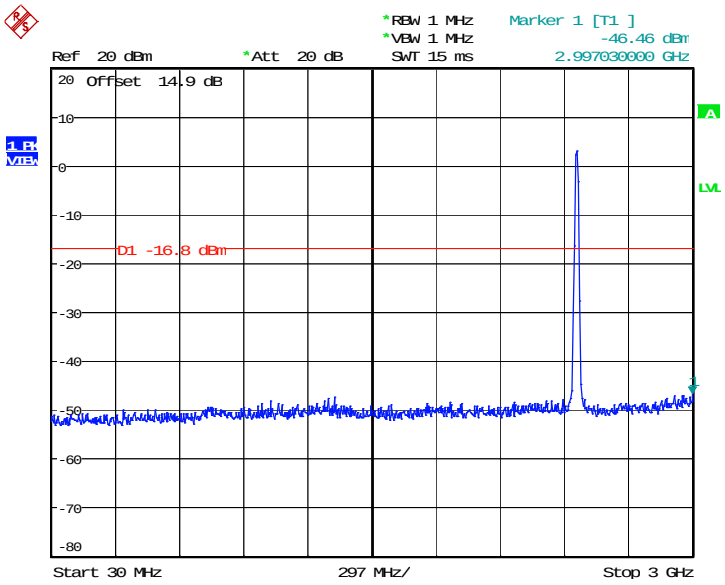
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 2.MAY.2012 21:45:12

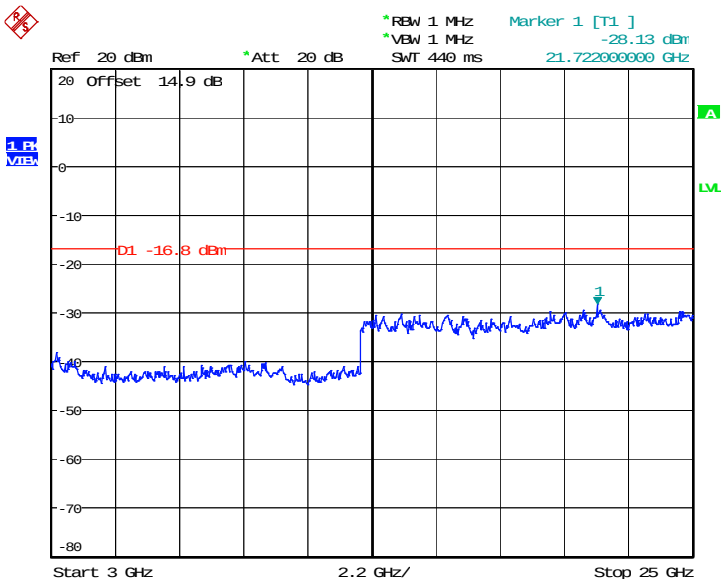
Test Mode :	Mode 6	Temperature :	24-26℃
Test Band :	802.11g	Relative Humidity :	50-53%
Test Channel :	11	Test Engineer :	Lizy Yuan

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 2.MAY.2012 21:46:26

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 2.MAY.2012 21:46:45

3.5 Power Spectral Density Measurement

3.5.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3KHz band at any time interval of continuous transmission.

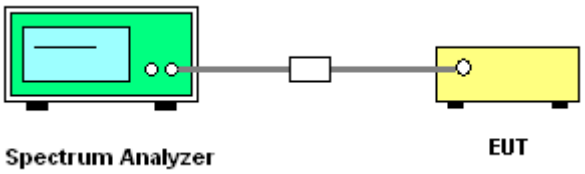
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The testing follows Measurement Procedure PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Record the measurement data derived from spectrum analyzer.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 KHz. Video bandwidth (VBW) >= 300 KHz In order to make an accurate measurement, set the span to 5-30% greater than Emission Bandwidth (EBW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log (3 kHz/100 kHz = -15.2 dB).

3.5.4 Test Setup



3.5.5 Test Result of Power Spectral Density

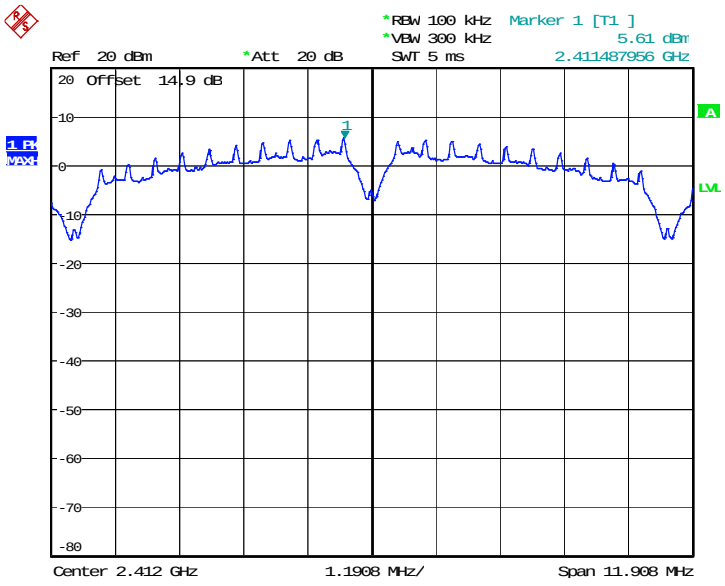
Test Mode :	Mode 1, 2, 3	Temperature :	24-26℃
Test Engineer :	Lizy Yuan	Relative Humidity :	50-53%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	5.61	-9.59	8	Pass
06	2437	5.56	-9.64	8	Pass
11	2462	5.55	-9.65	8	Pass

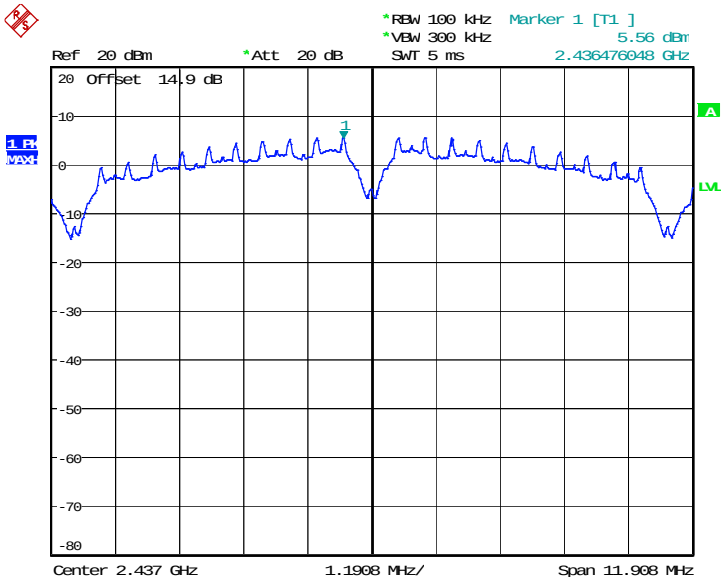
Note:

1. *Measured power density (dBm) has offset with cable loss.*
2. *BWCF (dB) = 10 log (3k/100k) = -15.2 dB*
3. *Power Density/ 3kHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)*

Mode 1 : PSD Plot on 802.11b Channel 01

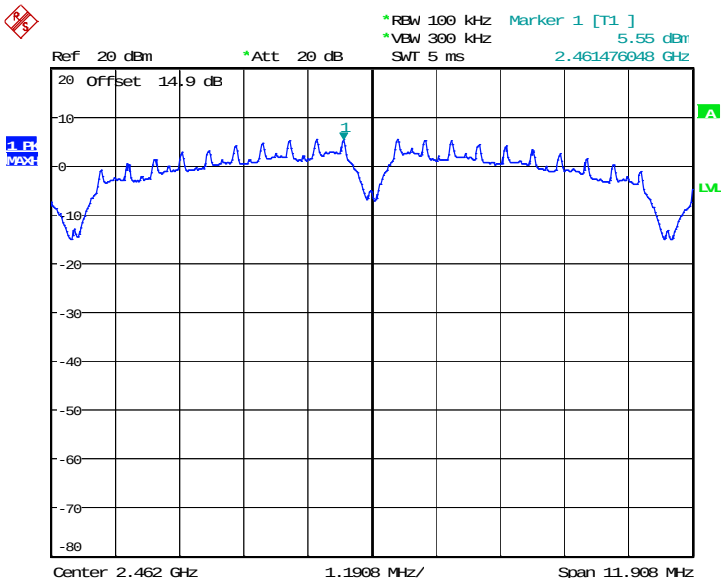


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 2.MAY.2012 20:35:26

Mode 3 : PSD Plot on 802.11b Channel 11



Date: 2.MAY.2012 21:05:36

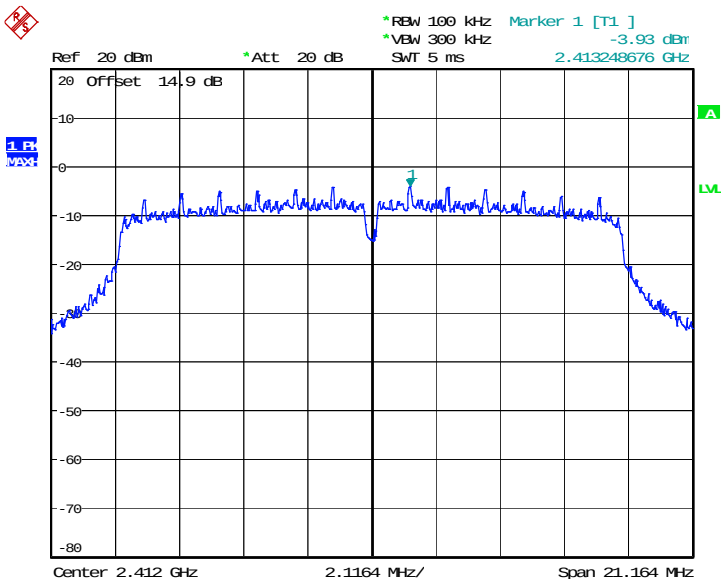
Test Mode :	Mode 4, 5, 6	Temperature :	24-26℃
Test Engineer :	Lizy Yuan	Relative Humidity :	50-53%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-3.93	-19.13	8	Pass
06	2437	-3.63	-18.83	8	Pass
11	2462	-3.82	-19.02	8	Pass

Note:

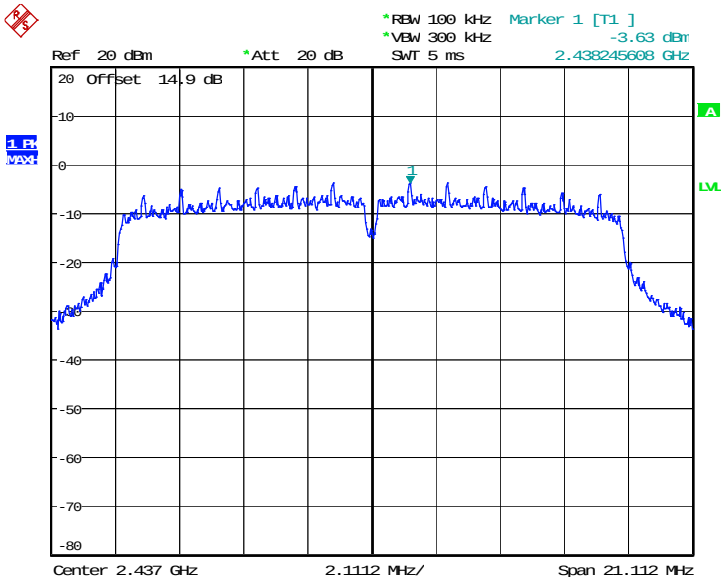
1. *Measured power density (dBm) has offset with cable loss.*
2. *BWCF (dB) = 10 log (3k/100k) = -15.2 dB*
3. *Power Density/ 3KHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)*

Mode 4 : PSD Plot on 802.11g Channel 01



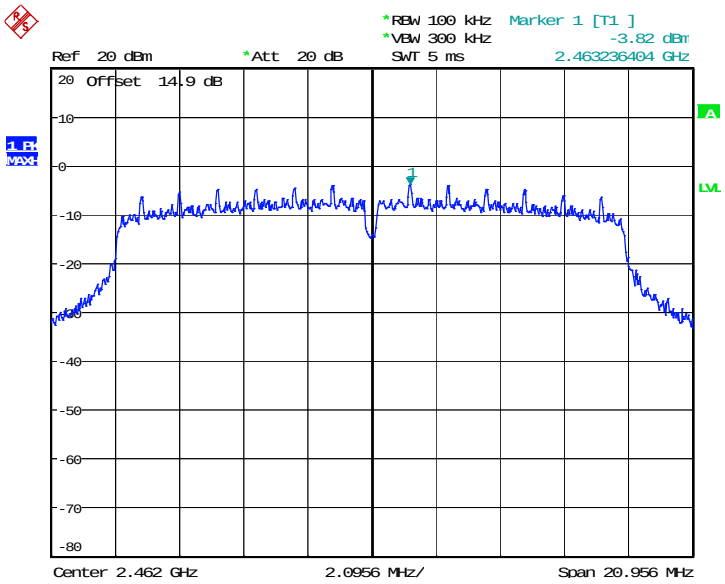
Date: 2.MAY.2012 21:10:54

Mode 5 : PSD Plot on 802.11g Channel 06



Date: 2.MAY.2012 21:16:20

Mode 6 : PSD Plot on 802.11g Channel 11



Date: 2.MAY.2012 21:19:21

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 KHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

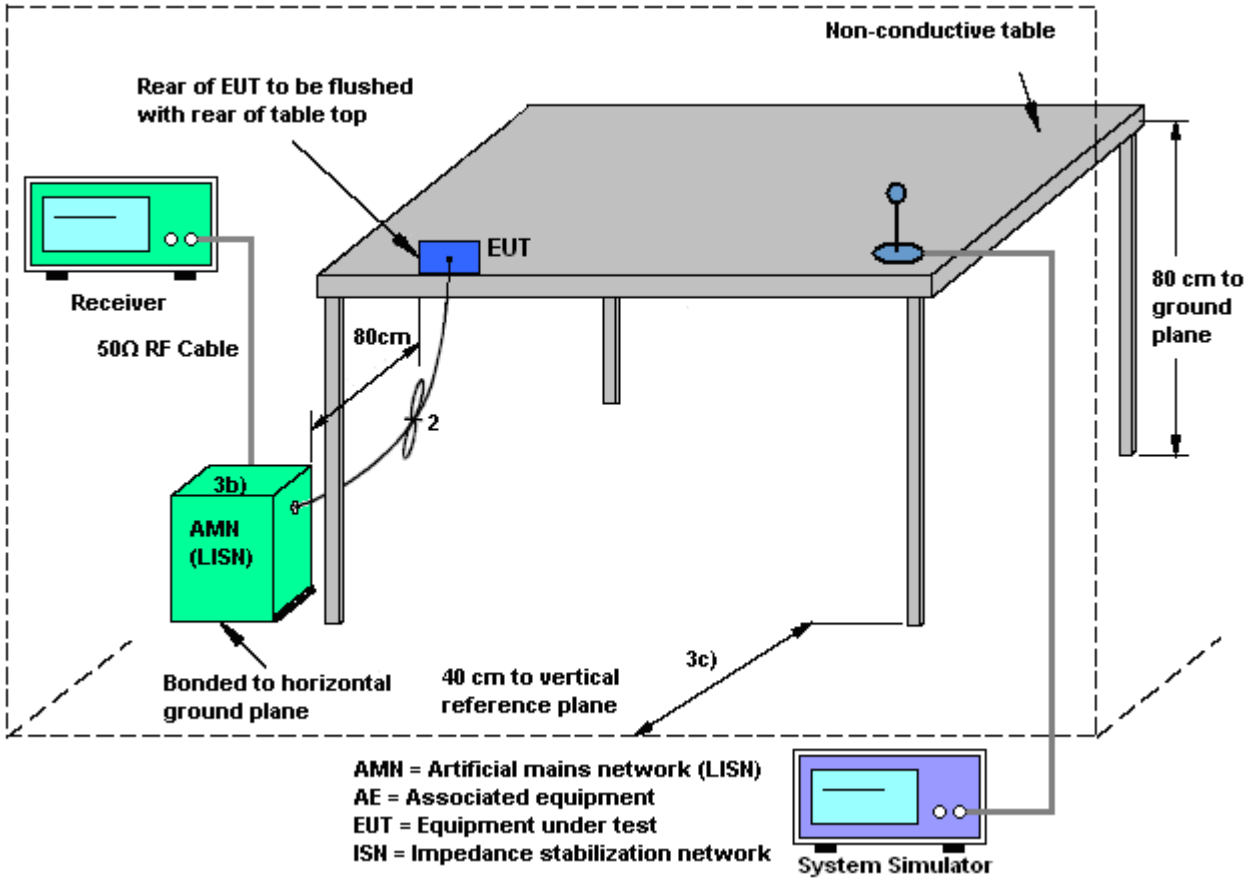
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

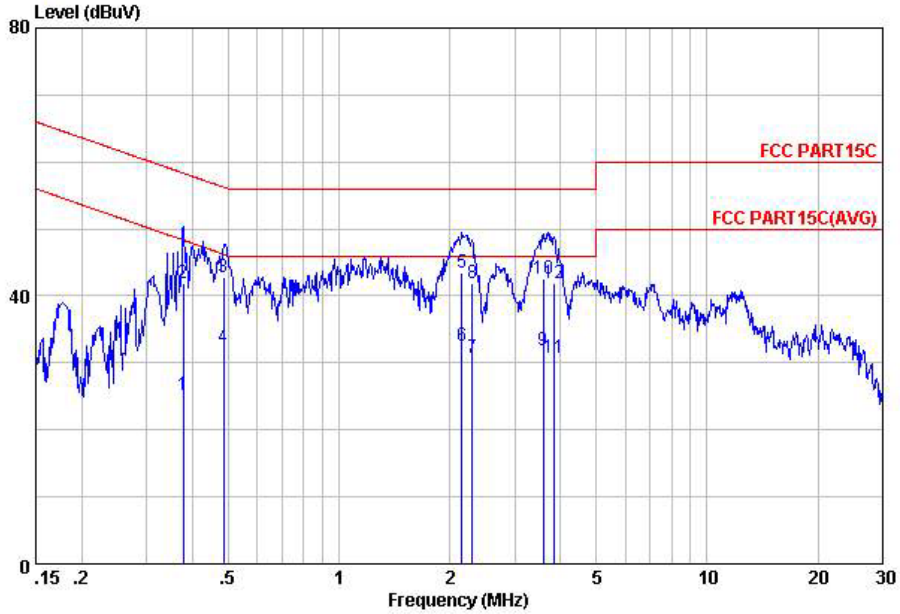
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 KHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	19~20℃
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

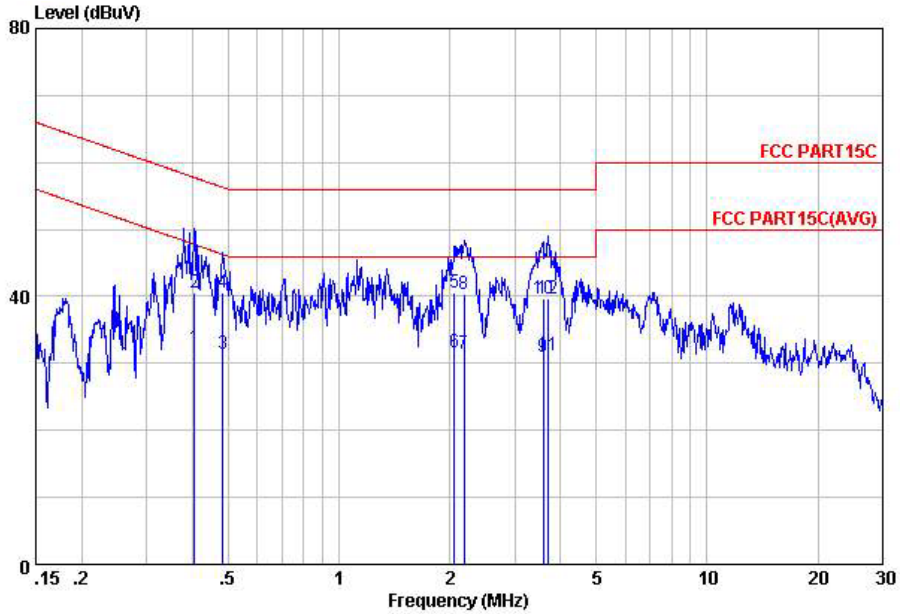


Site : C001-KS
Condition: FCC PART15C LISN-100807 LINE

mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.38	25.11	-23.23	48.34	15.00	-0.08	10.19	Average
2	0.38	41.91	-16.43	58.34	31.80	-0.08	10.19	QP
3	0.49	42.83	-13.40	56.23	32.70	-0.08	10.21	QP
4	0.49	32.23	-14.00	46.23	22.10	-0.08	10.21	Average
5	2.16	43.43	-12.57	56.00	33.20	-0.11	10.34	QP
6	2.16	32.63	-13.37	46.00	22.40	-0.11	10.34	Average
7	2.30	30.73	-15.27	46.00	20.50	-0.11	10.34	Average
8	2.30	41.83	-14.17	56.00	31.60	-0.11	10.34	QP
9	3.58	31.96	-14.04	46.00	21.70	-0.12	10.38	Average
10	3.58	42.56	-13.44	56.00	32.30	-0.12	10.38	QP
11	3.84	30.66	-15.34	46.00	20.40	-0.13	10.39	Average
12	3.84	41.86	-14.14	56.00	31.60	-0.13	10.39	QP

Test Mode :	Mode 1	Temperature :	19~20℃
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-100807 NEUTRAL

mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.40	32.41	-15.36	47.77	22.30	-0.08	10.19	Average
2	0.40	40.51	-17.26	57.77	30.40	-0.08	10.19	QP
3	0.48	31.53	-14.74	46.27	21.40	-0.08	10.21	Average
4	0.48	40.63	-15.64	56.27	30.50	-0.08	10.21	QP
5	2.05	40.52	-15.48	56.00	30.30	-0.11	10.33	QP
6	2.05	31.62	-14.38	46.00	21.40	-0.11	10.33	Average
7	2.19	31.33	-14.67	46.00	21.10	-0.11	10.34	Average
8	2.19	40.23	-15.77	56.00	30.00	-0.11	10.34	QP
9	3.58	31.06	-14.94	46.00	20.80	-0.12	10.38	Average
10	3.58	39.76	-16.24	56.00	29.50	-0.12	10.38	QP
11	3.70	31.26	-14.74	46.00	21.01	-0.13	10.38	Average
12	3.70	39.56	-16.44	56.00	29.31	-0.13	10.38	QP

3.7 Radiated Emission Measurement

3.7.1 Limit of Radiated Emission

In any 100 KHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.7.2 Measuring Instruments

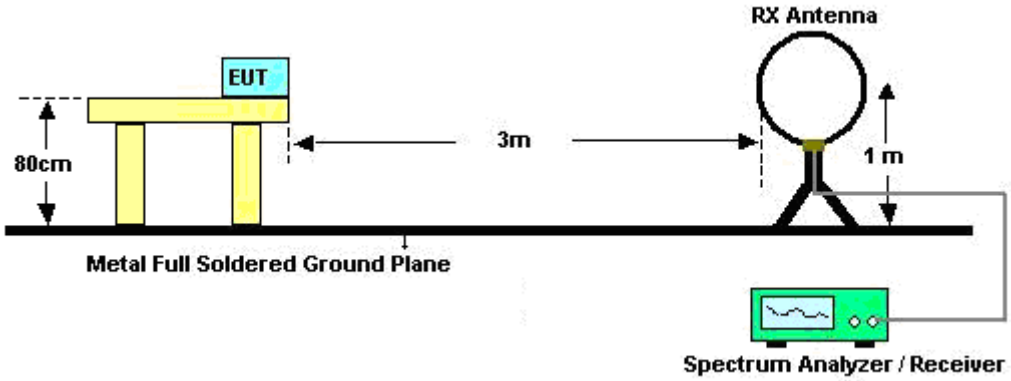
See list of measuring instruments of this test report.

3.7.3 Test Procedures

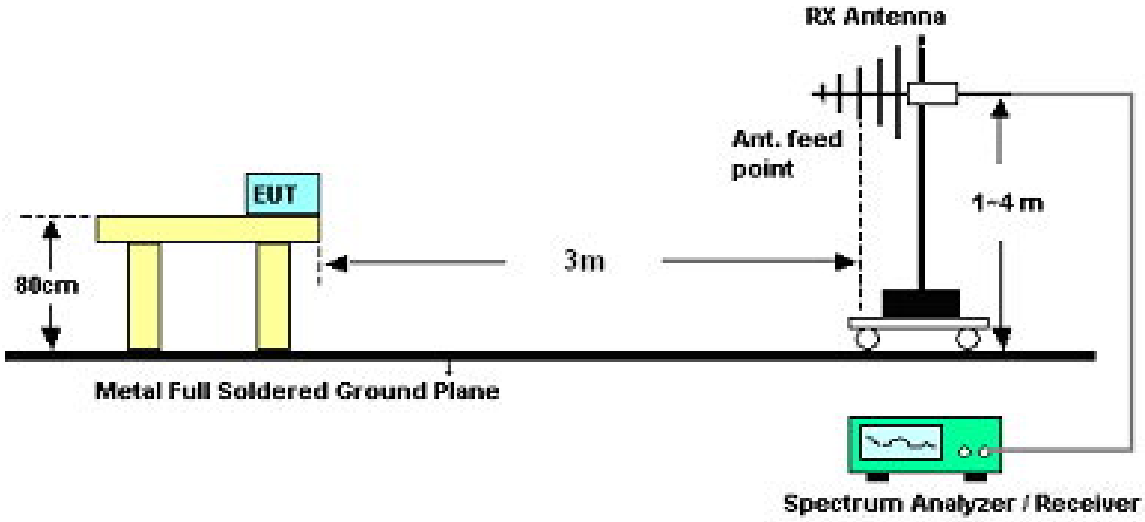
1. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW = 1 MHz for f ≥ 1 GHz, 100 KHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Measurement above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB per decade from 3m to 1m.
   Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB)
2. Maximize the emission by rotating the EUT for three orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines in ANSI C63.4-2003.

3.7.4 Test Setup

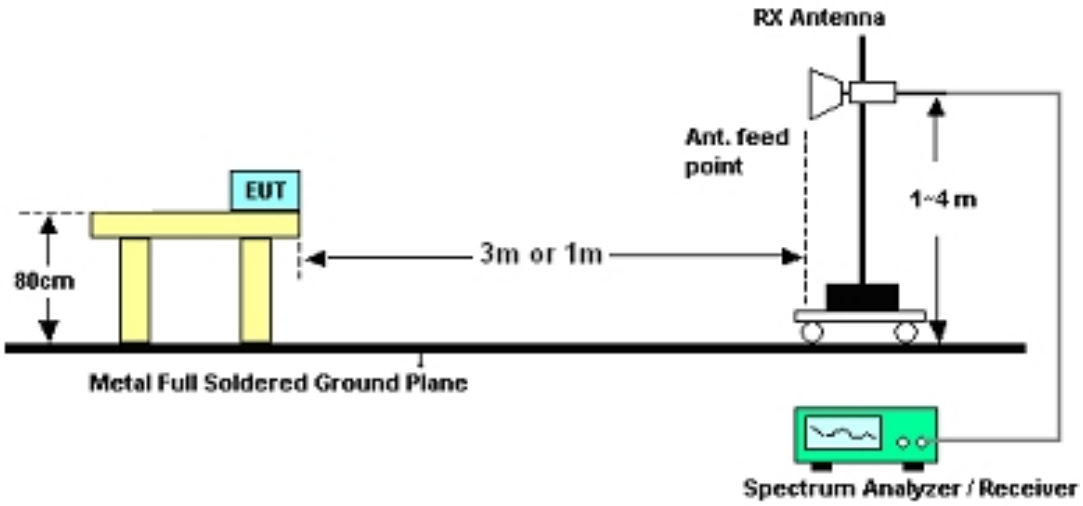
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.7.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.7.6 Test Result of Radiated Emission (30 MHz ~ 10th Harmonic)

Test Mode :	Mode 1	Temperature :	20~21℃
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
181.32	34.85	-8.65	43.5	55.77	8.41	0.56	29.89	-	-	Peak
337.49	37.49	-8.51	46	52.43	14.2	0.8	29.94	-	-	Peak
389.87	40.04	-5.96	46	53.28	15.77	0.84	29.85	122	254	Peak
676.02	36.19	-9.81	46	45.66	19.11	1.11	29.69	-	-	Peak
780.78	36.6	-9.4	46	45.07	19.87	1.23	29.57	-	-	Peak
941.8	37.82	-16.18	54	45.32	20.7	1.33	29.53	-	-	Peak
2368.9	50.86	-23.14	74	48.62	32.83	3.42	34.01	152	227	Peak
2368.9	37.51	-16.49	54	35.27	32.83	3.42	34.01	152	227	Average
2412	103.99	-	-	101.66	32.89	3.52	34.08	100	47	Peak
2412	99.17	-	-	96.84	32.89	3.52	34.08	100	47	Average
2489.93	50.35	-23.65	74	47.81	33.05	3.72	34.23	200	325	Peak
2489.93	37.42	-16.58	54	34.88	33.05	3.72	34.23	200	325	Average

Test Mode :	Mode 1	Temperature :	20~21℃
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
77.53	29.83	-10.17	40	53.33	6.2	0.35	30.05	-	-	Peak
181.32	28.25	-15.25	43.5	49.17	8.41	0.56	29.89	-	-	Peak
389.87	33.42	-12.58	46	46.66	15.77	0.84	29.85	-	-	Peak
676.02	31.48	-14.52	46	40.95	19.11	1.11	29.69	-	-	Peak
780.78	30.8	-15.2	46	39.27	19.87	1.23	29.57	-	-	Peak
939.86	38.27	-7.73	46	45.78	20.69	1.33	29.53	100	12	Peak
2310.19	50.84	-23.16	74	48.75	32.73	3.22	33.86	122	273	Peak
2310.19	37.58	-16.42	54	35.49	32.73	3.22	33.86	122	273	Average
2412	105.76	-	-	103.43	32.89	3.52	34.08	101	263	Peak
2412	100.94	-	-	98.61	32.89	3.52	34.08	101	263	Average
2490.88	55.78	-18.22	74	53.24	33.05	3.72	34.23	143	318	Peak
2490.88	38.16	-15.84	54	35.62	33.05	3.72	34.23	143	318	Average

Test Mode :	Mode 2	Temperature :	20~21℃
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
181.32	34.7	-8.8	43.5	55.62	8.41	0.56	29.89	-	-	Peak
337.49	36.23	-9.77	46	51.17	14.2	0.8	29.94	-	-	Peak
363.68	37.69	-8.31	46	51.96	14.83	0.82	29.92	-	-	Peak
389.87	39.68	-6.32	46	52.92	15.77	0.84	29.85	120	250	Peak
676.02	35.98	-10.02	46	45.45	19.11	1.11	29.69	-	-	Peak
941.8	38.31	-15.69	54	45.81	20.7	1.33	29.53	-	-	Peak
2317.22	51.12	-22.88	74	49.03	32.73	3.22	33.86	114	274	Peak
2317.22	38.73	-15.27	54	36.64	32.73	3.22	33.86	114	274	Average
2437	104.56	-	-	102.16	32.95	3.6	34.15	101	264	Peak
2437	100.17	-	-	97.77	32.95	3.6	34.15	101	264	Average
2494.49	50.03	-23.97	74	47.49	33.05	3.72	34.23	200	325	Peak
2494.49	37.82	-16.18	54	35.28	33.05	3.72	34.23	200	325	Average

Test Mode :	Mode 2	Temperature :	20~21℃
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
77.53	29.78	-10.22	40	53.28	6.2	0.35	30.05	-	-	Peak
181.32	28.28	-15.22	43.5	49.2	8.41	0.56	29.89	-	-	Peak
337.49	30.62	-15.38	46	45.56	14.2	0.8	29.94	-	-	Peak
389.87	33.43	-12.57	46	46.67	15.77	0.84	29.85	-	-	Peak
676.02	31.22	-14.78	46	40.69	19.11	1.11	29.69	-	-	Peak
939.86	37.81	-8.19	46	45.32	20.69	1.33	29.53	100	10	Peak
2389.49	51.56	-22.44	74	49.28	32.86	3.47	34.05	120	115	Peak
2389.49	38.76	-15.24	54	36.48	32.86	3.47	34.05	120	115	Average
2437	105.7	-	-	103.3	32.95	3.6	34.15	102	93	Peak
2437	101.34	-	-	98.94	32.95	3.6	34.15	102	93	Average
2488.41	50.26	-23.74	74	47.72	33.05	3.72	34.23	169	337	Peak
2488.41	37.88	-16.12	54	35.34	33.05	3.72	34.23	169	337	Average

Test Mode :	Mode 3	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
181.32	34.16	-9.34	43.5	55.08	8.41	0.56	29.89	-	-	Peak
337.49	36.34	-9.66	46	51.28	14.2	0.8	29.94	-	-	Peak
363.68	37.61	-8.39	46	51.88	14.83	0.82	29.92	-	-	Peak
389.87	39.86	-6.14	46	53.1	15.77	0.84	29.85	121	261	Peak
780.78	34.51	-11.49	46	42.98	19.87	1.23	29.57	-	-	Peak
939.86	37.24	-8.76	46	44.75	20.69	1.33	29.53	-	-	Peak
2384.48	50.45	-23.55	74	48.21	32.83	3.42	34.01	112	324	Peak
2384.48	37.51	-16.49	54	35.27	32.83	3.42	34.01	112	324	Average
2462	104.45	-	-	102	32.98	3.64	34.17	101	264	Peak
2462	99.9	-	-	97.45	32.98	3.64	34.17	101	264	Average
2484.42	51.74	-22.26	74	49.25	33.01	3.68	34.2	200	42	Peak
2484.42	39.1	-14.9	54	36.61	33.01	3.68	34.2	200	42	Average

Test Mode :	Mode 3	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
77.53	28.94	-11.06	40	52.44	6.2	0.35	30.05	179	341	Peak
181.32	28.5	-15	43.5	49.42	8.41	0.56	29.89	-	-	Peak
337.49	30.43	-15.57	46	45.37	14.2	0.8	29.94	-	-	Peak
389.87	33.1	-12.9	46	46.34	15.77	0.84	29.85	-	-	Peak
676.02	30.53	-15.47	46	40	19.11	1.11	29.69	-	-	Peak
941.8	37.32	-16.68	54	44.82	20.7	1.33	29.53	-	-	Peak
2380.68	50.9	-23.1	74	48.66	32.83	3.42	34.01	134	346	Peak
2380.68	37.93	-16.07	54	35.69	32.83	3.42	34.01	134	346	Average
2462	106.03	-	-	103.58	32.98	3.64	34.17	100	267	Peak
2462	100.91	-	-	98.46	32.98	3.64	34.17	100	267	Average
2484.61	51.26	-22.74	74	48.77	33.01	3.68	34.2	122	93	Peak
2484.61	38.53	-15.47	54	36.04	33.01	3.68	34.2	122	93	Average

Test Mode :	Mode 4	Temperature :	20~21℃
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
181.32	34.44	-9.06	43.5	55.36	8.41	0.56	29.89	-	-	Peak
337.49	37.68	-8.32	46	52.62	14.2	0.8	29.94	-	-	Peak
363.68	37.19	-8.81	46	51.46	14.83	0.82	29.92	-	-	Peak
389.87	39.83	-6.17	46	53.07	15.77	0.84	29.85	123	258	Peak
676.02	35.44	-10.56	46	44.91	19.11	1.11	29.69	-	-	Peak
939.86	37.5	-8.5	46	45.01	20.69	1.33	29.53	-	-	Peak
2372.32	50.09	-23.91	74	47.85	32.83	3.42	34.01	114	266	Peak
2372.32	36.39	-17.61	54	34.15	32.83	3.42	34.01	114	266	Average
2412	96.86	-	-	94.53	32.89	3.52	34.08	101	64	Peak
2412	81.3	-	-	78.97	32.89	3.52	34.08	101	64	Average
2483.5	49.41	-24.59	74	46.92	33.01	3.68	34.2	200	311	Peak
2483.5	36.21	-17.79	54	33.72	33.01	3.68	34.2	200	311	Average

Test Mode :	Mode 4	Temperature :	20~21℃
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
77.53	29.74	-10.26	40	53.24	6.2	0.35	30.05	-	-	Peak
181.32	28.73	-14.77	43.5	49.65	8.41	0.56	29.89	-	-	Peak
337.49	30.67	-15.33	46	45.61	14.2	0.8	29.94	-	-	Peak
389.87	33.21	-12.79	46	46.45	15.77	0.84	29.85	-	-	Peak
676.02	31.11	-14.89	46	40.58	19.11	1.11	29.69	-	-	Peak
939.86	37.01	-8.99	46	44.52	20.69	1.33	29.53	103	41	Peak
2379.54	50.7	-23.3	74	48.46	32.83	3.42	34.01	142	277	Peak
2379.54	37.4	-16.6	54	35.16	32.83	3.42	34.01	142	277	Average
2412	99.95	-	-	97.62	32.89	3.52	34.08	101	265	Peak
2412	84	-	-	81.67	32.89	3.52	34.08	101	265	Average
2486.13	50.02	-23.98	74	47.53	33.01	3.68	34.2	200	67	Peak
2486.13	36.8	-17.2	54	34.31	33.01	3.68	34.2	200	67	Average

Test Mode :	Mode 5	Temperature :	20~21℃
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
181.32	35.54	-7.96	43.5	56.46	8.41	0.56	29.89	-	-	Peak
337.49	37.65	-8.35	46	52.59	14.2	0.8	29.94	-	-	Peak
363.68	37.17	-8.83	46	51.44	14.83	0.82	29.92	-	-	Peak
389.87	39.95	-6.05	46	53.19	15.77	0.84	29.85	120	247	Peak
676.02	35.14	-10.86	46	44.61	19.11	1.11	29.69	-	-	Peak
939.86	37.1	-8.9	46	44.61	20.69	1.33	29.53	-	-	Peak
2331.66	50.45	-23.55	74	48.32	32.76	3.27	33.9	155	304	Peak
2331.66	37.15	-16.85	54	35.02	32.76	3.27	33.9	155	304	Average
2437	96.35	-	-	93.95	32.95	3.6	34.15	127	58	Peak
2437	81.57	-	-	79.17	32.95	3.6	34.15	127	58	Average
2490.69	50.39	-23.61	74	47.85	33.05	3.72	34.23	102	265	Peak
2490.69	37.92	-16.08	54	35.38	33.05	3.72	34.23	102	265	Average

Test Mode :	Mode 5	Temperature :	20~21℃
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
77.53	28.88	-11.12	40	52.38	6.2	0.35	30.05	200	0	Peak
181.32	28.42	-15.08	43.5	49.34	8.41	0.56	29.89	-	-	Peak
389.87	33.46	-12.54	46	46.7	15.77	0.84	29.85	-	-	Peak
676.02	30.26	-15.74	46	39.73	19.11	1.11	29.69	-	-	Peak
780.78	30.82	-15.18	46	39.29	19.87	1.23	29.57	-	-	Peak
941.8	36.91	-17.09	54	44.41	20.7	1.33	29.53	-	-	Peak
2361.3	50.47	-23.53	74	48.26	32.81	3.38	33.98	120	115	Peak
2361.3	37.67	-16.33	54	35.46	32.81	3.38	33.98	120	115	Average
2437	99.17	-	-	96.77	32.95	3.6	34.15	101	92	Peak
2437	83.34	-	-	80.94	32.95	3.6	34.15	101	92	Average
2488.79	50.13	-23.87	74	47.59	33.05	3.72	34.23	176	324	Peak
2488.79	37.23	-16.77	54	34.69	33.05	3.72	34.23	176	324	Average

Test Mode :	Mode 6	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
181.32	34.09	-9.41	43.5	55.01	8.41	0.56	29.89	-	-	Peak
337.49	37.4	-8.6	46	52.34	14.2	0.8	29.94	-	-	Peak
389.87	39.18	-6.82	46	52.42	15.77	0.84	29.85	134	251	Peak
676.02	35.21	-10.79	46	44.68	19.11	1.11	29.69	-	-	Peak
780.78	34.81	-11.19	46	43.28	19.87	1.23	29.57	-	-	Peak
941.8	38.66	-15.34	54	46.16	20.7	1.33	29.53	-	-	Peak
2337.17	50.28	-23.72	74	48.11	32.78	3.33	33.94	173	325	Peak
2337.17	37.36	-16.64	54	35.19	32.78	3.33	33.94	173	325	Average
2462	97.87	-	-	95.42	32.98	3.64	34.17	100	66	Peak
2462	82.29	-	-	79.84	32.98	3.64	34.17	100	66	Average
2490.69	50.67	-23.33	74	48.13	33.05	3.72	34.23	200	155	Peak
2490.69	37.75	-16.25	54	35.21	33.05	3.72	34.23	200	155	Average

Test Mode :	Mode 6	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
77.53	29.15	-10.85	40	52.65	6.2	0.35	30.05	-	-	Peak
181.32	28.23	-15.27	43.5	49.15	8.41	0.56	29.89	-	-	Peak
389.87	32.42	-13.58	46	45.66	15.77	0.84	29.85	-	-	Peak
676.02	30.5	-15.5	46	39.97	19.11	1.11	29.69	-	-	Peak
780.78	31.01	-14.99	46	39.48	19.87	1.23	29.57	-	-	Peak
939.86	38.74	-7.26	46	46.25	20.69	1.33	29.53	102	0	Peak
2370.23	50.67	-23.33	74	48.43	32.83	3.42	34.01	143	212	Peak
2370.23	37.36	-16.64	54	35.12	32.83	3.42	34.01	143	212	Average
2462	100.39	-	-	97.94	32.98	3.64	34.17	100	266	Peak
2462	83.47	-	-	81.02	32.98	3.64	34.17	100	266	Average
2483.5	51.49	-22.51	74	49	33.01	3.68	34.2	122	259	Peak
2483.5	37.95	-16.05	54	35.46	33.01	3.68	34.2	122	259	Average

3.8 Antenna Requirements

3.8.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.8.2 Antenna Connected Construction

The antennas type used in this product is PIFA Antenna without connector and it is considered to meet antenna requirement.

3.8.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	May 02, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 23, 2011	May 02, 2012	Aug. 22, 2012	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 23, 2011	May 02, 2012	Aug. 22, 2012	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	May 02, 2012	Dec. 29, 2012	Conducted (TH01-KS)
DC Power Supply	TOPWARD	GPS-30300	E1884515	N/A	Aug. 23, 2011	May 02, 2012	Aug. 22, 2012	Conducted (TH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 02, 2011	Apr. 25, 2012	Jun. 01, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 30, 2011	Apr. 25, 2012	Dec. 29, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 30, 2011	Apr. 25, 2012	Dec. 29, 2012	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 16, 2011	Apr. 25, 2012	Nov. 15, 2012	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 30, 2011	Apr. 25, 2012	Dec. 29, 2012	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	May 05, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	May 05, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	May 05, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/00	9 kHz~30 MHz	Jul. 28, 2011	May 05, 2012	Jul. 27, 2012	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	May 05, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 30, 2011	May 05, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	May 05, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2011	May 05, 2012	Nov. 06, 2012	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Oct. 11, 2011	May 05, 2012	Oct.10, 2012	Radiation (03CH01-KS)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 KHz ~ 30 MHz)

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty Uc(y)	**1.13**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.26**		

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty Uc(y)	**1.27**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**		

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	±0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	±1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	±0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site Imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1 = 0.197 Antenna VSWR Γ2 = 0.194 Uncertainty = 20Log(1-Γ1*Γ2)	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty Uc(y)	**2.36**				
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**				

Appendix A. Photographs of EUT

Please refer to Sporton report number EP230902 as below.