

FCC RF Test Report

APPLICANT : HTC Corporation
EQUIPMENT : Smartphone
MODEL NAME : PK76130
FCC ID : NM8PK76130
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Jan. 21, 2012 and completely tested on Feb. 24, 2012. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR212120-01B	Rev. 01	Initial issue of report	Mar. 05, 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	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	A8.4	Power Output	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(d)	A8.5	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.4	15.247(d)	A8.5	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 4.90 dB at 0.422 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.14 dB at 4824.000 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

HTC Corporation

No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan

1.2 Manufacturer

HTC Corporation

No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Smartphone
Model Name	PK76130
FCC ID	NM8PK76130
Sample 1	EUT with LCM 1, Camera 1, and Battery 1
Sample 2	EUT with LCM 2, Camera 2, and Battery 2
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	11
Carrier Frequency of Each Channel	$2412+(n-1)*5$ MHz; $n=1\sim11$
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 20.64 dBm (0.116 W) 802.11g : 19.30 dBm (0.085 W) 802.11g/n (BW 20MHz) : 19.23 dBm (0.084 W)
Duty Cycle	802.11b : 100.00% 802.11g : 94.93% 802.11g/n (BW 20MHz) : 94.58%
Antenna Type	PIFA Antenna with gain 0.30 dBi
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : 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 INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO05-HY	03CH05-HY	722060/4086B-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.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Sony Ericsson	MW600	PY70DA2029	N/A	N/A

2 Test Configuration of Equipment Under Test

2.1 Pre-Scanned RF Power

Preliminary tests were performed in different data rate as below table and the highest power data rates (11b, 11g, 11g/n (BW 20MHz) 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)	20.64	20.56	20.47	19.64

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)	19.30	19.08	19.23	18.95	19.25	18.86	18.42	18.35

2.4GHz 802.11g/n (BW 20MHz) mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	19.23	19.14	18.98	18.97	18.66	18.46	18.35	18.25

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	19.92	20.17	20.64	18.85	19.04	19.30

Band	2.4GHz 802.11g/n (BW 20MHz) RF Peak Power (dBm)		
Channel	1	6	11
Frequency (MHz)	2412	2437	2462
Peak Power	18.54	18.82	19.23

Remark:

The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, and MCS0 for 802.11g/n (BW 20MHz) 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	17.36	17.66	18.12	12.70	12.96	13.16

Band	2.4GHz 802.11g/n (BW 20MHz) RF Peak Power (dBm)		
Channel	1	6	11
Frequency (MHz)	2412	2437	2462
Average Power	12.57	12.91	13.17

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).

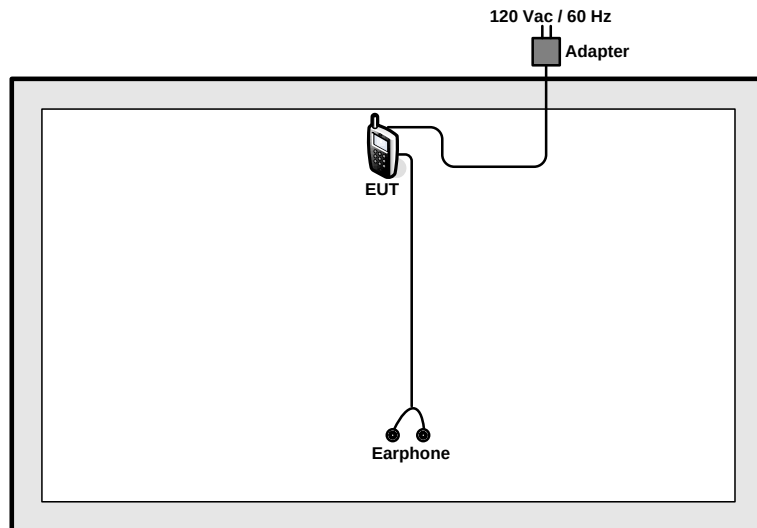
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

The following tables are showing the test modes as the worst cases (X Plane for Sample 1 and Z Plane for Sample 2) and recorded in this report.

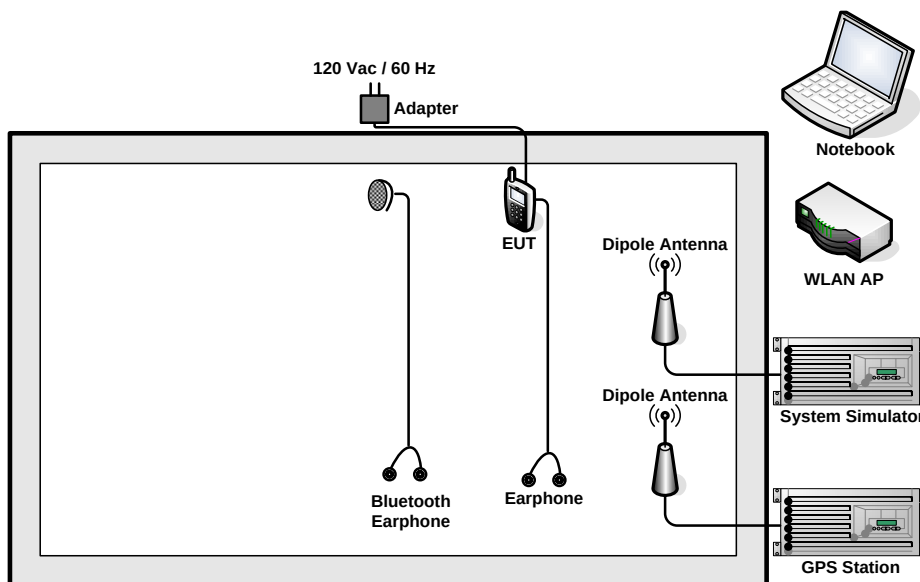
Test Cases		
Test Item	802.11b (Modulation : DSSS)	802.11g/n (Modulation : OFDM)
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11g/n (BW 20M)_CH01_2412 MHz Mode 8: 802.11g/n (BW 20M)_CH06_2437 MHz Mode 9: 802.11g/n (BW 20M)_CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz for Sample 1 Mode 2 : 802.11b CH06_2437 MHz for Sample 1 Mode 3 : 802.11b CH11_2462 MHz for Sample 1 Mode 4: 802.11b CH01_2412 MHz for Sample 2	Mode 5: 802.11g_CH01_2412 MHz for Sample 1 Mode 6: 802.11g_CH06_2437 MHz for Sample 1 Mode 7: 802.11g_CH11_2462 MHz for Sample 1 Mode 8: 802.11g_CH11_2462 MHz for Sample 2 Mode 9: 802.11g/n (BW 20M)_CH01_2412 MHz for Sample 1 Mode 10: 802.11g/n (BW 20M)_CH06_2437 MHz for Sample 1 Mode 11: 802.11g/n (BW 20M)_CH11_2462 MHz for Sample 1
AC Conducted Emission	Mode 1 : GSM1900 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 2 + USB Cable 3 (Charging from Adapter 3) for Sample 1 Mode 2 : GSM1900 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 2 + USB Cable 3 (Charging from Adapter 3) for Sample 2	
Remark:		
1. The worst case of conducted emission is mode 1; only the test data of it was reported.		
2. For Radiated TCs, the test was performance with Earphone2, USB Cable 1, and Adapter 1.		

2.5 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.6 RF Utility

The programmed RF utility “Remote 432X controller (P1.63)” 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 Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

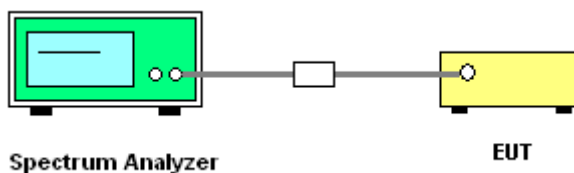
3.1.2 Measuring Instruments

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) $\geq 3 * \text{RBW}$. 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



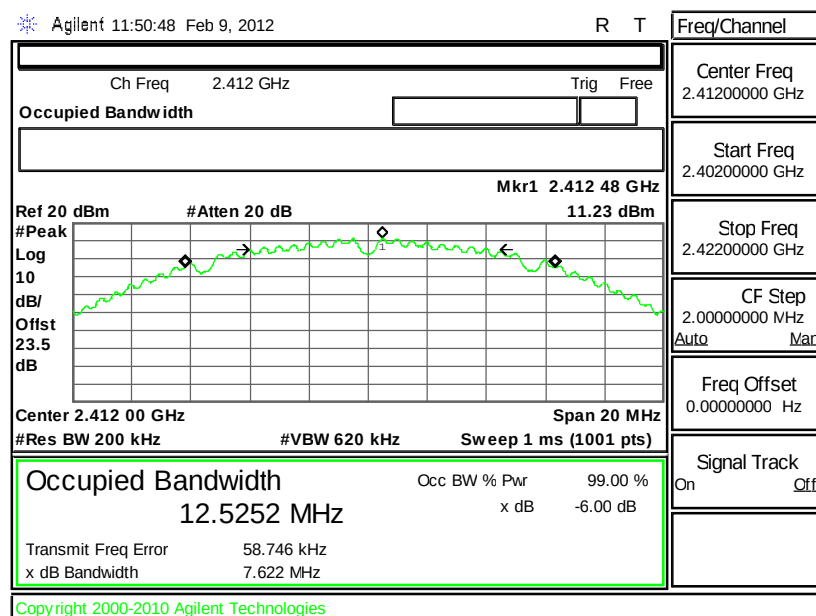


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	23~26°C
Test Engineer :	Rover Lee	Relative Humidity :	50~54%

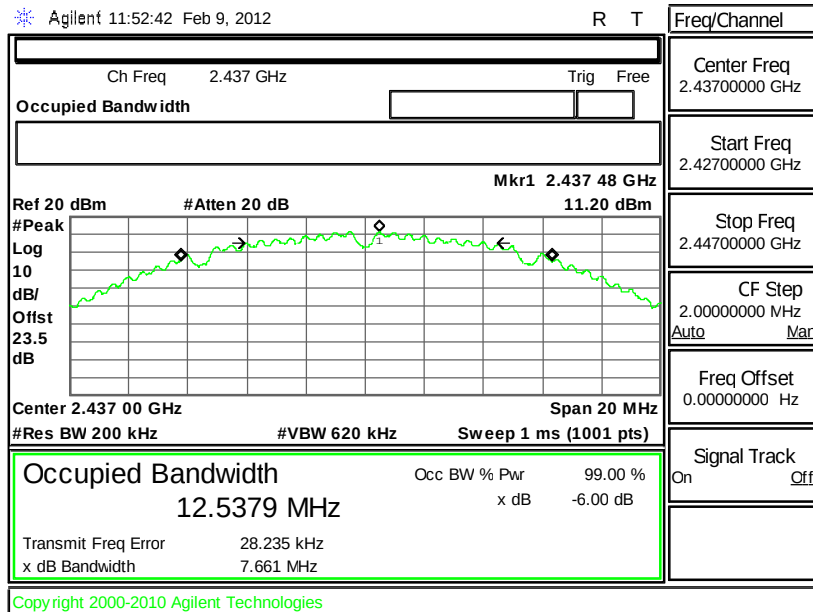
Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	7.622	0.5	Pass
06	2437	7.661	0.5	Pass
11	2462	7.594	0.5	Pass

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

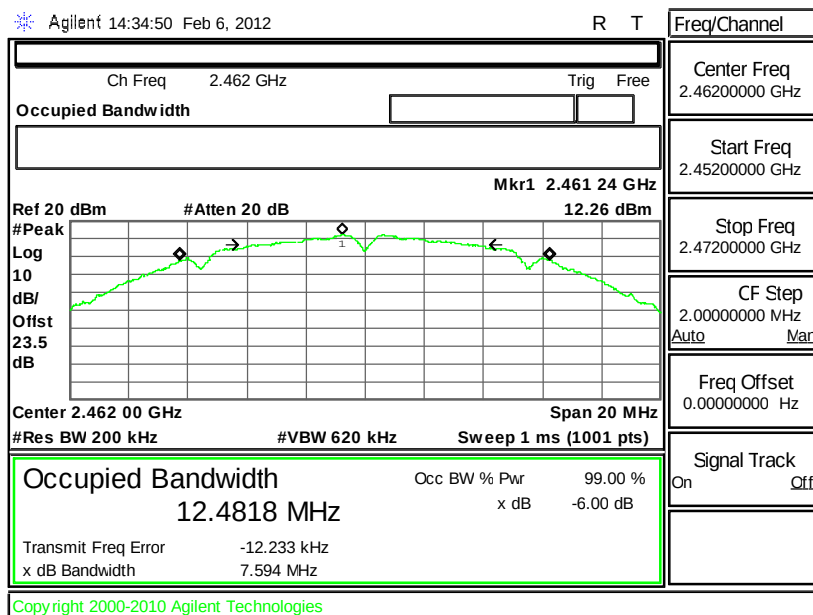




Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



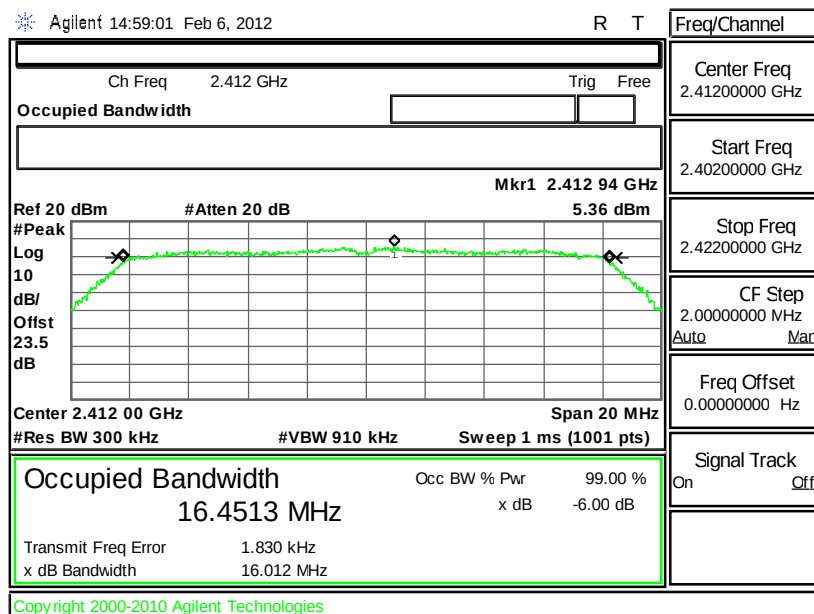
Mode 3 : 6 dB Bandwidth Plot on 802.11b Channel 11





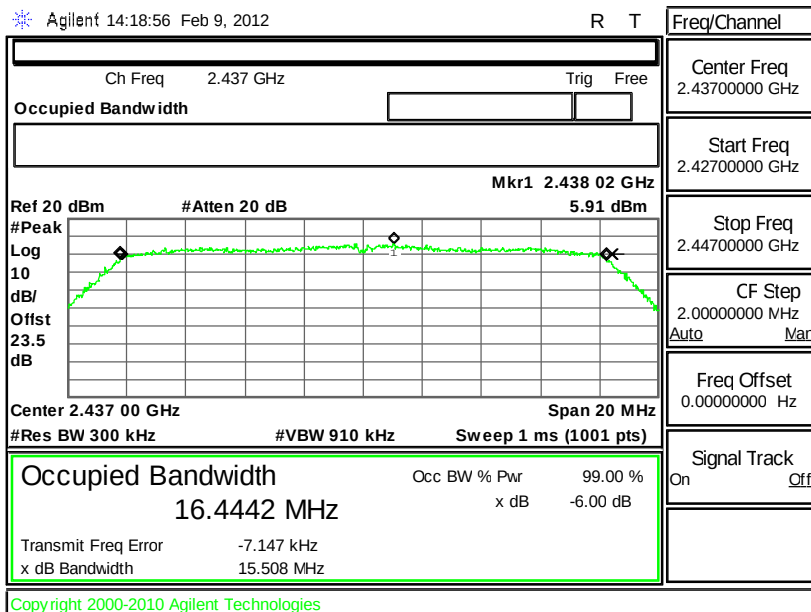
Test Mode :	Mode 4, 5, 6	Temperature :	23~26°C
Test Engineer :	Rover Lee	Relative Humidity :	50~54%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.012	0.5	Pass
06	2437	15.508	0.5	Pass
11	2462	16.076	0.5	Pass

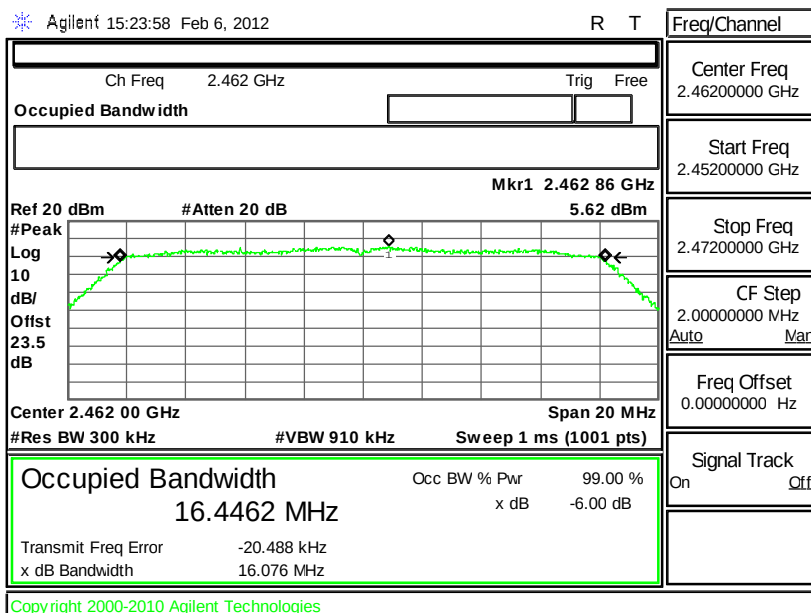
Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



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



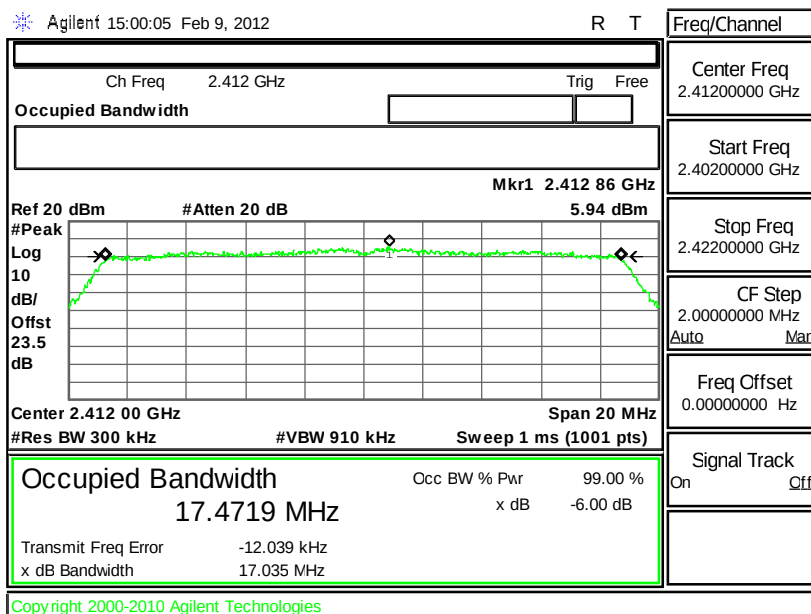
Mode 6 : 6 dB Bandwidth Plot on 802.11g Channel 11





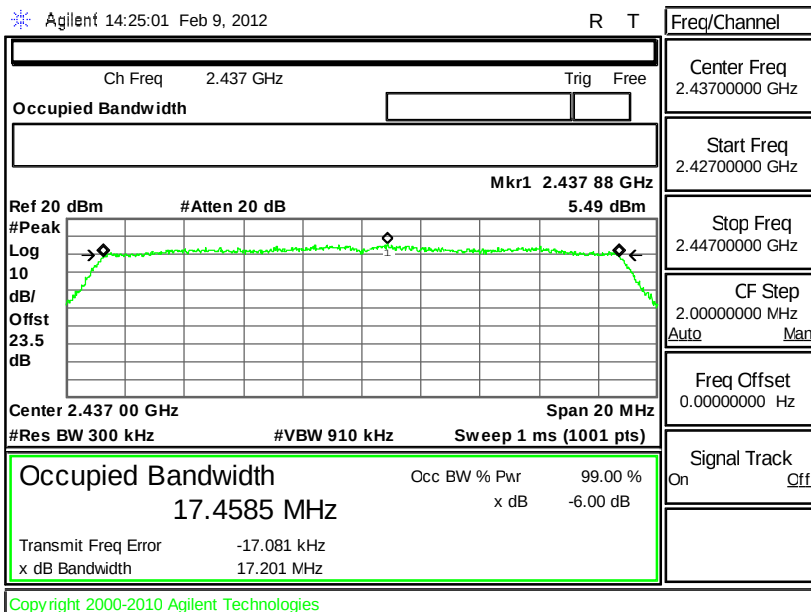
Test Mode :	Mode 7, 8, 9	Temperature :	23~26°C
Test Engineer :	Rover Lee	Relative Humidity :	50~54%

Channel	Frequency (MHz)	802.11g/n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.035	0.5	Pass
06	2437	17.201	0.5	Pass
11	2462	17.375	0.5	Pass

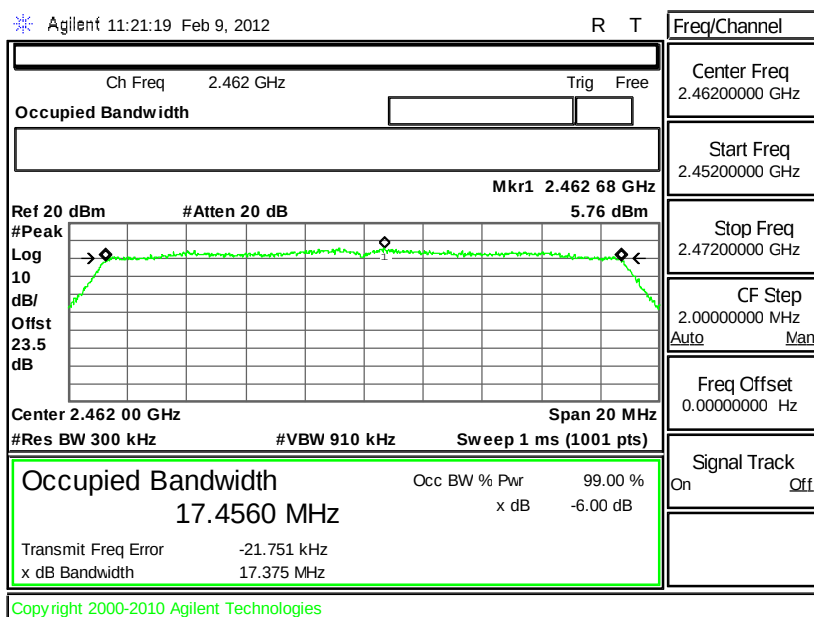
Mode 7 : 6 dB Bandwidth Plot on 802.11g/n(BW 20MHz) Channel 01



Mode 8 : 6 dB Bandwidth Plot on 802.11g/n(BW 20MHz) Channel 06



Mode 9 : 6 dB Bandwidth Plot on 802.11g/n(BW 20MHz) Channel 11



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.

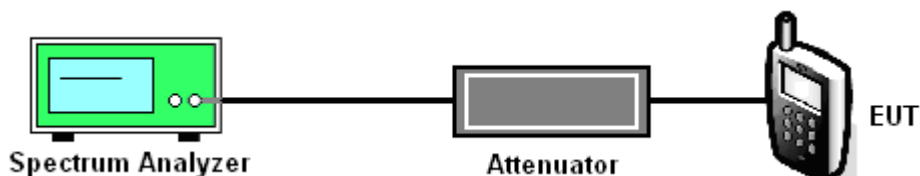
3.2.2 Measuring Instruments

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 spectrum analyzer 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

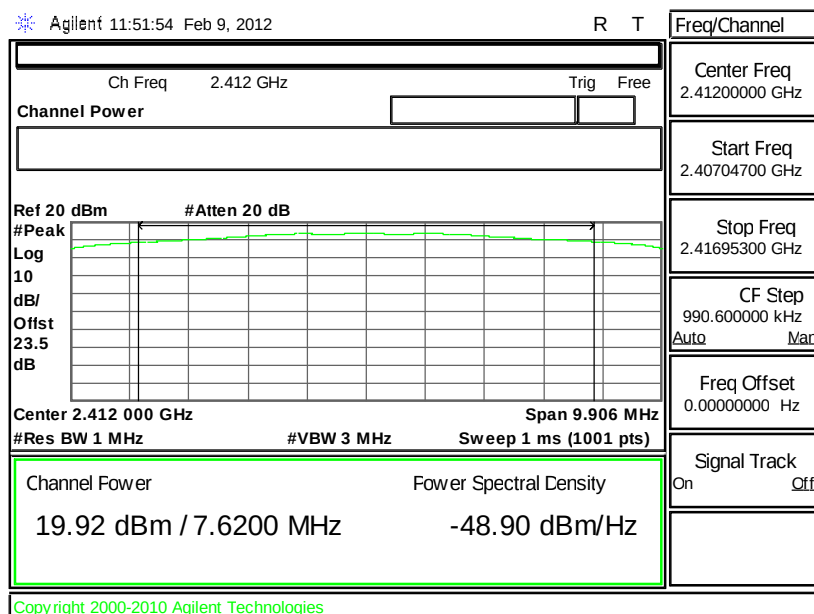


3.2.5 Test Result of Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	23~26°C
Test Engineer :	Rover Lee	Relative Humidity :	50~54%

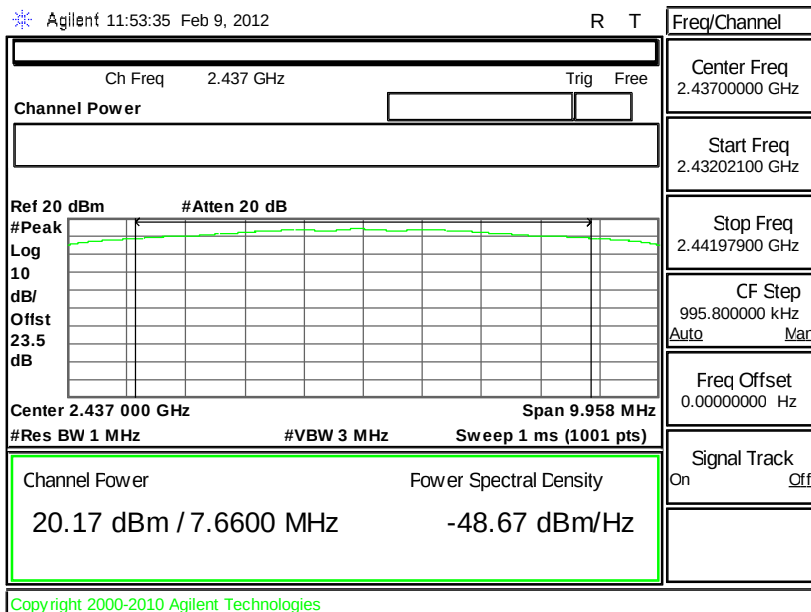
Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.92	30	Pass
06	2437	20.17	30	Pass
11	2462	20.64	30	Pass

Mode 1 : Output Power Plot on 802.11b Channel 01

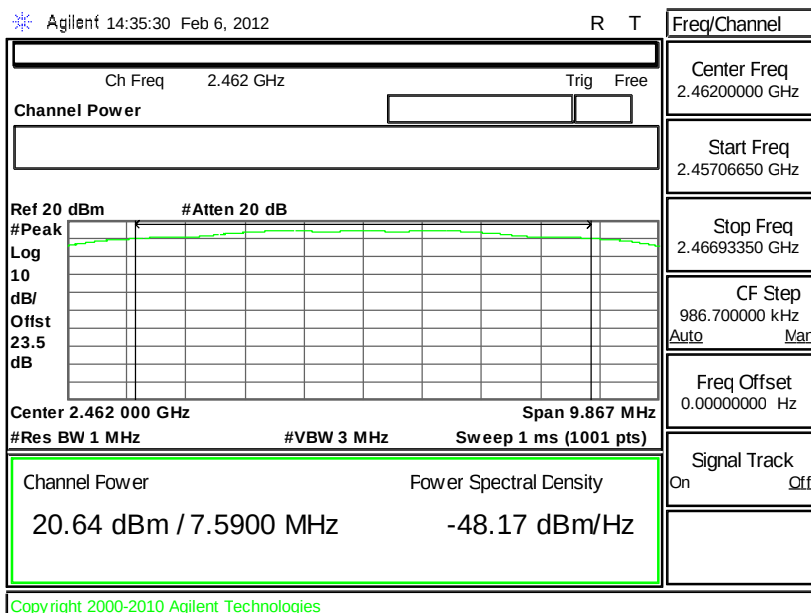




Mode 2 : Output Power Plot on 802.11b Channel 06



Mode 3 : Output Power Plot on 802.11b Channel 11

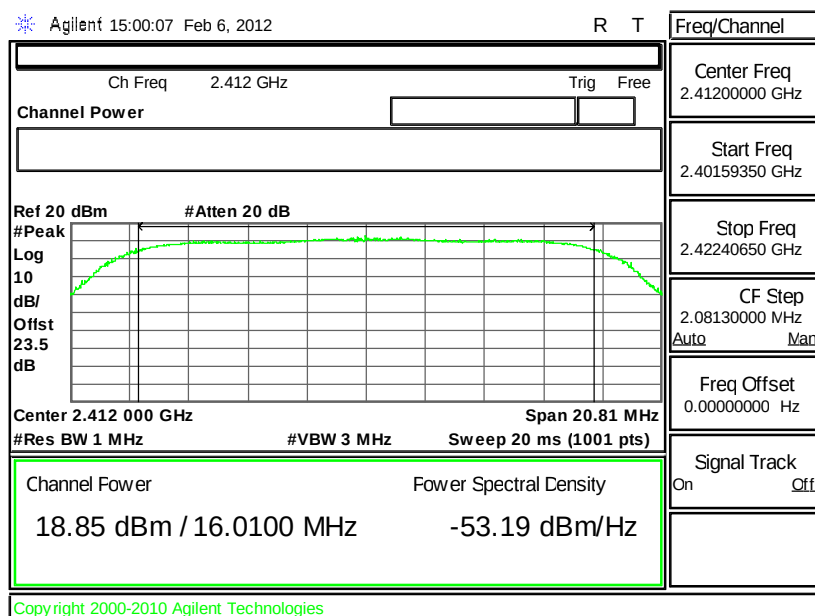




Test Mode :	Mode 4, 5, 6	Temperature :	23~26°C
Test Engineer :	Rover Lee	Relative Humidity :	50~54%

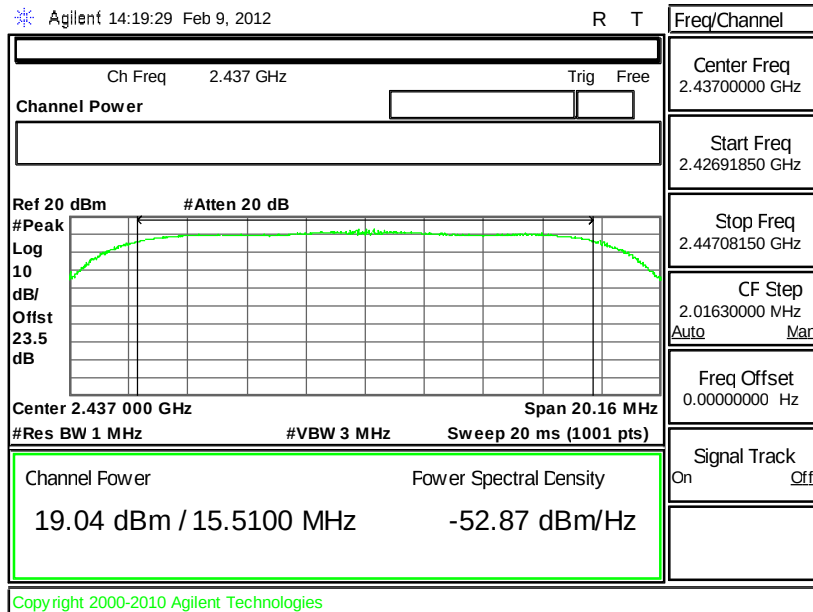
Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.85	30	Pass
06	2437	19.04	30	Pass
11	2462	19.30	30	Pass

Mode 4 : Output Power Plot on 802.11g Channel 01

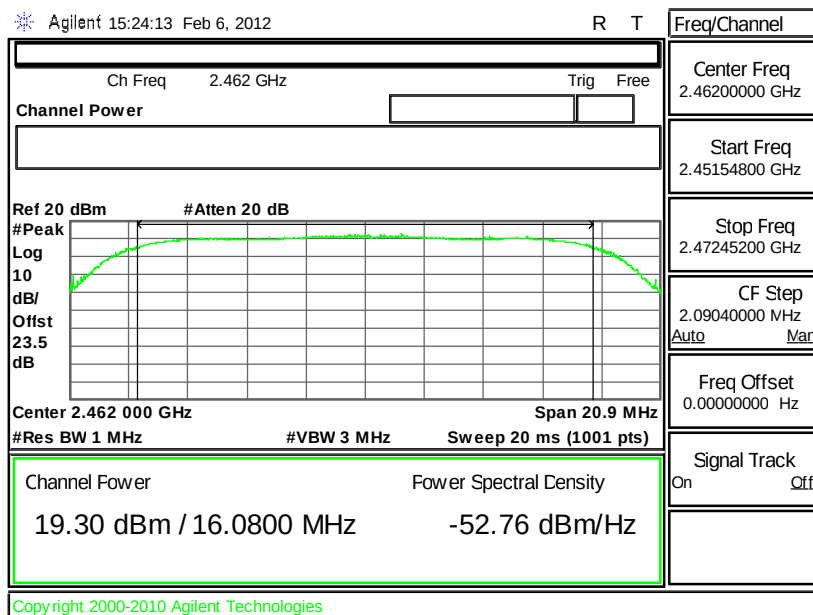




Mode 5 : Output Power Plot on 802.11g Channel 06



Mode 6 : Output Power Plot on 802.11g Channel 11

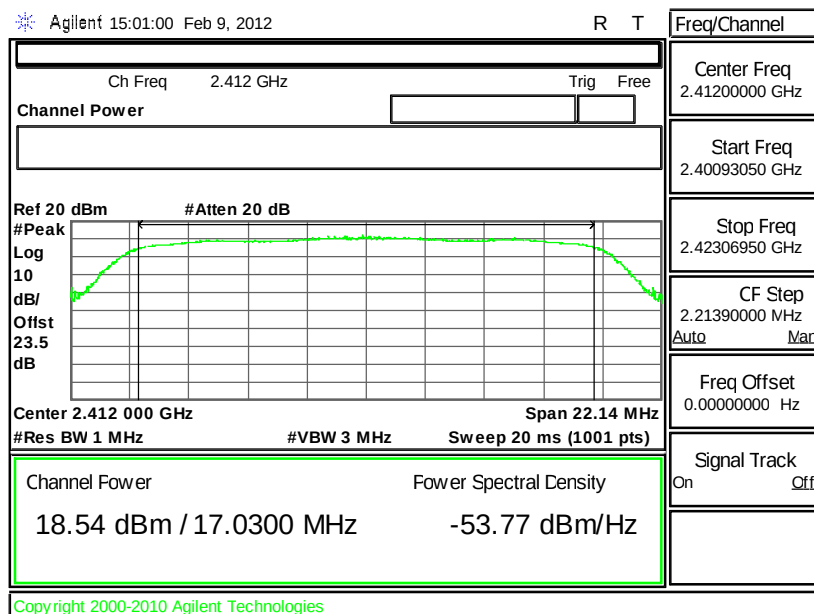




Test Mode :	Mode 7, 8, 9	Temperature :	23~26°C
Test Engineer :	Rover Lee	Relative Humidity :	50~54%

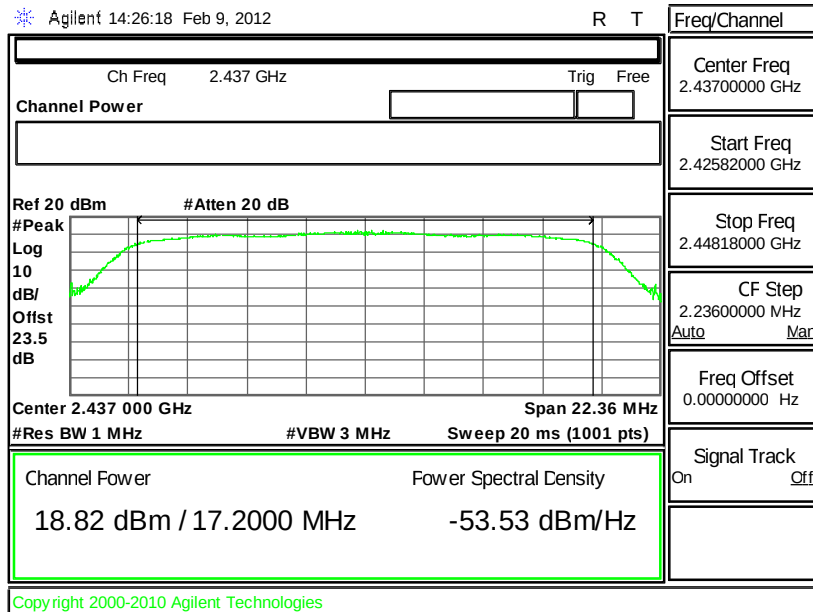
Channel	Frequency (MHz)	802.11g/n (BW 20MHz) Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.54	30	Pass
06	2437	18.82	30	Pass
11	2462	19.23	30	Pass

Mode 7: Output Power Plot on 802.11g/n (BW 20MHz) channel 01

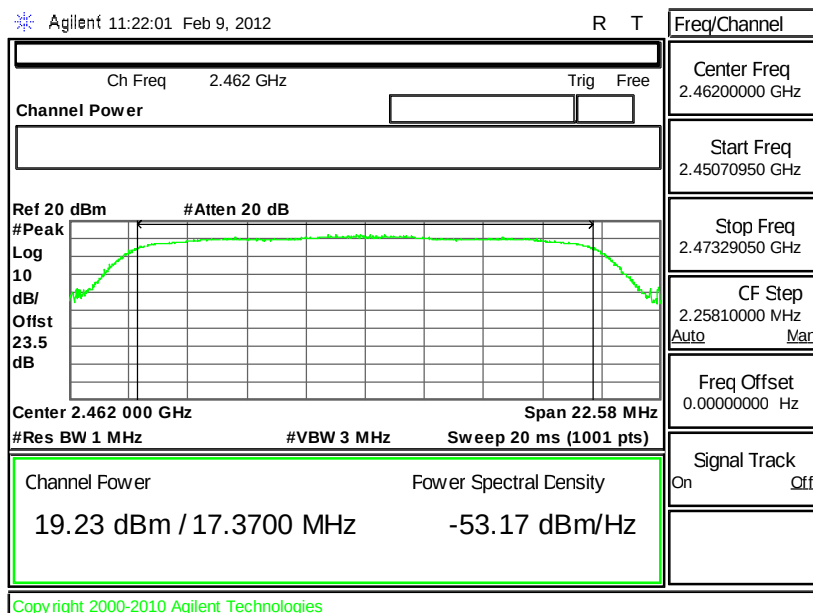




Mode 8 : Output Power Plot on 802.11g/n (BW 20MHz) Channel 06



Mode 9 : Output Power Plot on 802.11g/n (BW 20MHz) Channel 11



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

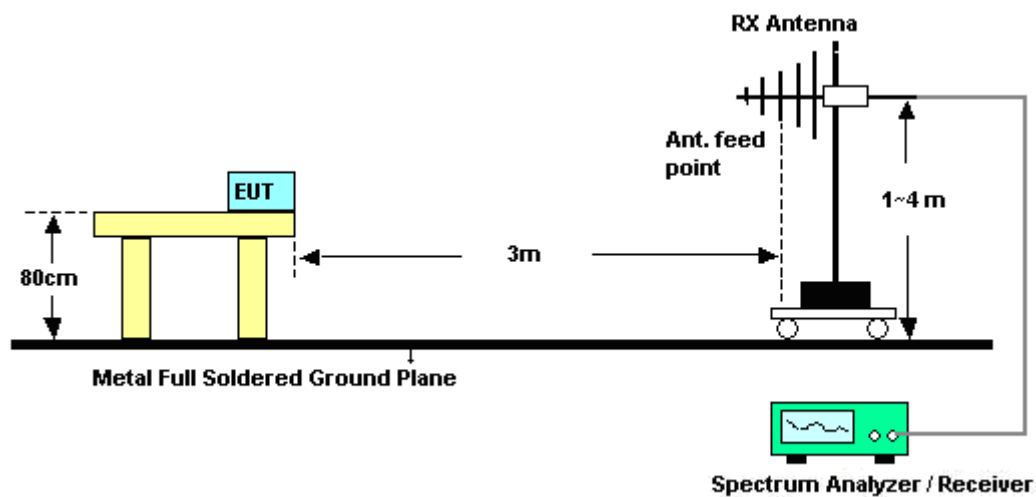
See list of measuring instruments of this test report.

3.3.3 Test Procedures

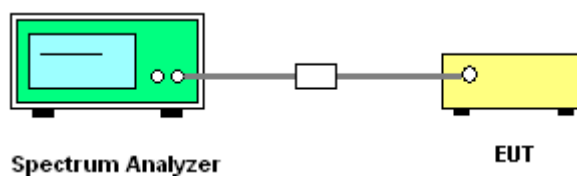
1. The testing follows the guidelines in ANSI C63.4-2003 and the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. Conducted emission test: Set RBW = 100 KHz, Video bandwidth (VBW) $\geq$ RBW. Out of the authorized frequency band emissions must be at least 20 dB lower 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>



<Conducted Band Edges>



3.3.5 Test Result of Radiated Band Edges

<Sample 1>

Test Mode :	Mode 1	Temperature :	22~24℃
Test Band :	802.11b	Relative Humidity :	48~50%
Test Channel :	01	Test Engineer :	David Yang

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
2385.62	53.59	-20.41	74	52.87	32.02	4.58	35.88	100	283	Peak
2385.62	42.15	-11.85	54	41.43	32.02	4.58	35.88	100	283	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
2385.24	53.14	-20.86	74	52.44	32	4.58	35.88	128	33	Peak
2385.24	41.46	-12.54	54	40.76	32	4.58	35.88	128	33	Average

Test Mode :	Mode 3	Temperature :	22~24℃
Test Band :	802.11b	Relative Humidity :	48~50%
Test Channel :	11	Test Engineer :	David Yang

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
2484.61	55.89	-18.11	74	54.97	32.09	4.64	35.81	100	170	Peak
2484.61	46.79	-7.21	54	45.87	32.09	4.64	35.81	100	170	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	56.98	-17.02	74	56.06	32.09	4.64	35.81	104	36	Peak
2484.61	47.16	-6.84	54	46.24	32.09	4.64	35.81	104	36	Average

**<Sample 2>**

Test Mode :	Mode 4	Temperature :	22~24℃
Test Band :	802.11b	Relative Humidity :	48~50%
Test Channel :	01	Test Engineer :	David Yang

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
2378.97	52.95	-21.05	74	52.26	32	4.57	35.88	102	137	Peak
2378.97	40.83	-13.17	54	40.14	32	4.57	35.88	102	137	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
2389.23	51.35	-22.65	74	50.63	32.02	4.58	35.88	100	314	Peak
2389.23	39.16	-14.84	54	38.44	32.02	4.58	35.88	100	314	Average

<Sample 1>

Test Mode :	Mode 5	Temperature :	22~24℃
Test Band :	802.11g	Relative Humidity :	48~50%
Test Channel :	01	Test Engineer :	David Yang

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
2389.99	61.67	-12.33	74	60.93	32.02	4.58	35.86	112	182	Peak
2389.99	43.3	-10.7	54	42.56	32.02	4.58	35.86	112	182	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
2389.8	66.67	-7.33	74	65.93	32.02	4.58	35.86	102	23	Peak
2389.8	47.32	-6.68	54	46.58	32.02	4.58	35.86	102	23	Average

Test Mode :	Mode 7	Temperature :	22~24℃
Test Band :	802.11g	Relative Humidity :	48~50%
Test Channel :	11	Test Engineer :	David Yang

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
2483.66	62.93	-11.07	74	62.01	32.09	4.64	35.81	101	115	Peak
2483.66	44.63	-9.37	54	43.71	32.09	4.64	35.81	101	115	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
2483.66	67.65	-6.35	74	66.73	32.09	4.64	35.81	100	27	Peak
2483.66	49.54	-4.46	54	48.62	32.09	4.64	35.81	100	27	Average

<Sample 2>

Test Mode :	Mode 8	Temperature :	22~24℃
Test Band :	802.11g	Relative Humidity :	48~50%
Test Channel :	11	Test Engineer :	David Yang

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
2488.41	68.13	-5.87	74	67.2	32.1	4.64	35.81	109	26	Peak
2488.41	46.44	-7.56	54	45.51	32.1	4.64	35.81	109	26	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	70.12	-3.88	74	69.2	32.09	4.64	35.81	100	311	Peak
2483.5	48.64	-5.36	54	47.72	32.09	4.64	35.81	100	311	Average

<Sample 1>

Test Mode :	Mode 9	Temperature :	22~24℃
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	48~50%
Test Channel :	01	Test Engineer :	David Yang

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
2387.52	57.22	-16.78	74	56.5	32.02	4.58	35.88	100	278	Peak
2387.52	40.4	-13.6	54	39.68	32.02	4.58	35.88	100	278	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
2389.61	69.15	-4.85	74	68.43	32.02	4.58	35.88	103	21	Peak
2389.61	48.84	-5.16	54	48.12	32.02	4.58	35.88	103	21	Average

Test Mode :	Mode 11	Temperature :	22~24℃
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	48~50%
Test Channel :	11	Test Engineer :	David Yang

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
2484.04	62.32	-11.68	74	61.4	32.09	4.64	35.81	100	127	Peak
2484.04	43.14	-10.86	54	42.22	32.09	4.64	35.81	100	127	Average

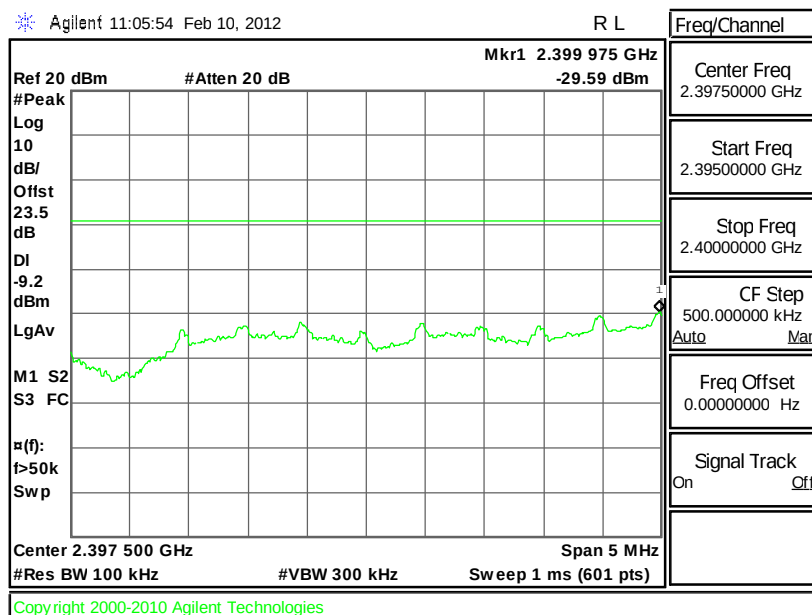
ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.66	69.06	-4.94	74	68.14	32.09	4.64	35.81	100	27	Peak
2483.66	48.77	-5.23	54	47.85	32.09	4.64	35.81	100	27	Average



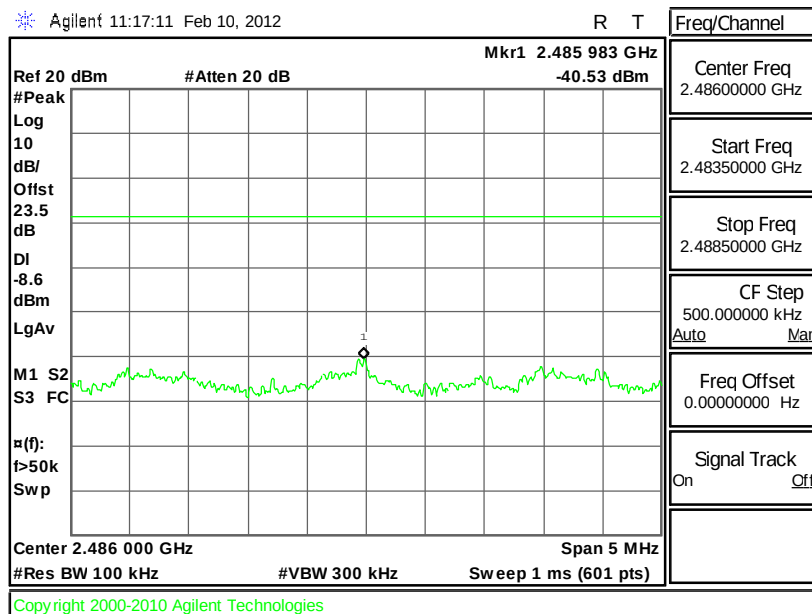
3.3.6 Test Plots of Conducted Band Edges

Test Mode :	Mode 1 and 3	Temperature :	23~26°C
Test Band :	802.11b	Relative Humidity :	50~54%
Test Channel :	01 and 11	Test Engineer :	Rover Lee

Low Band Edge Plot on 802.11b Channel 01



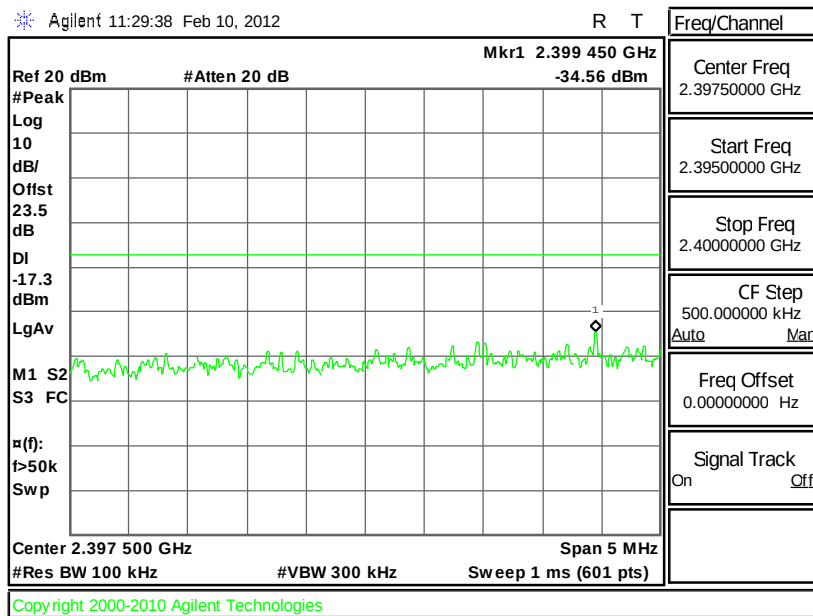
High Band Edge Plot on 802.11b Channel 11



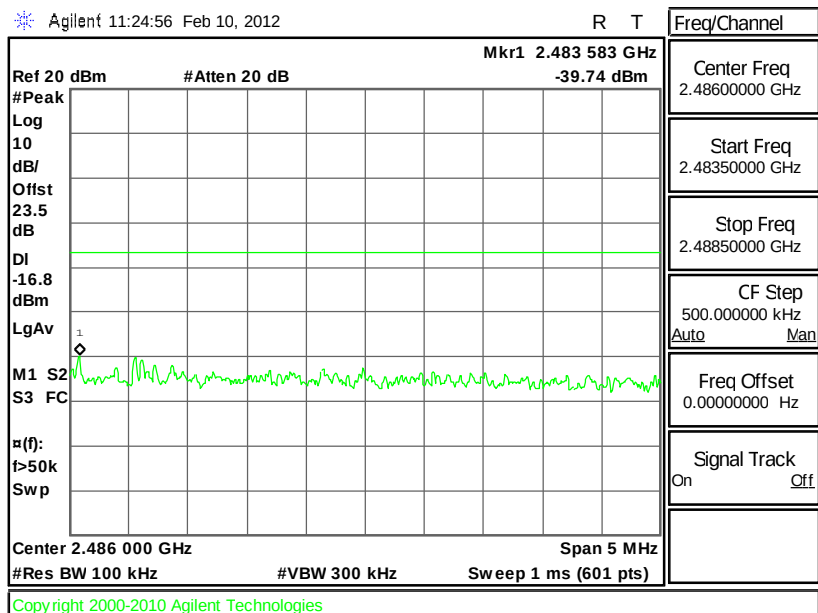


Test Mode :	Mode 4 and 6	Temperature :	23~26°C
Test Band :	802.11g	Relative Humidity :	50~54%
Test Channel :	01 and 11	Test Engineer :	Rover Lee

Low Band Edge Plot on 802.11g Channel 01

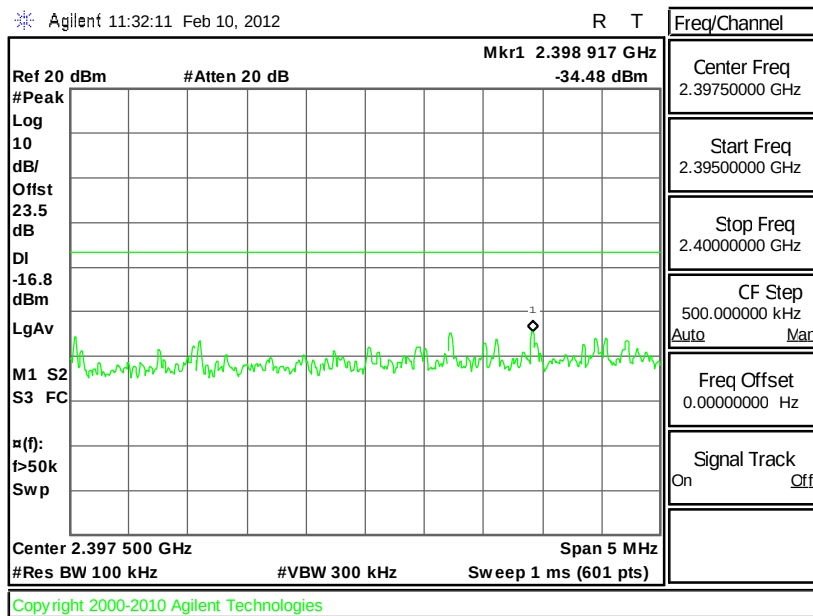
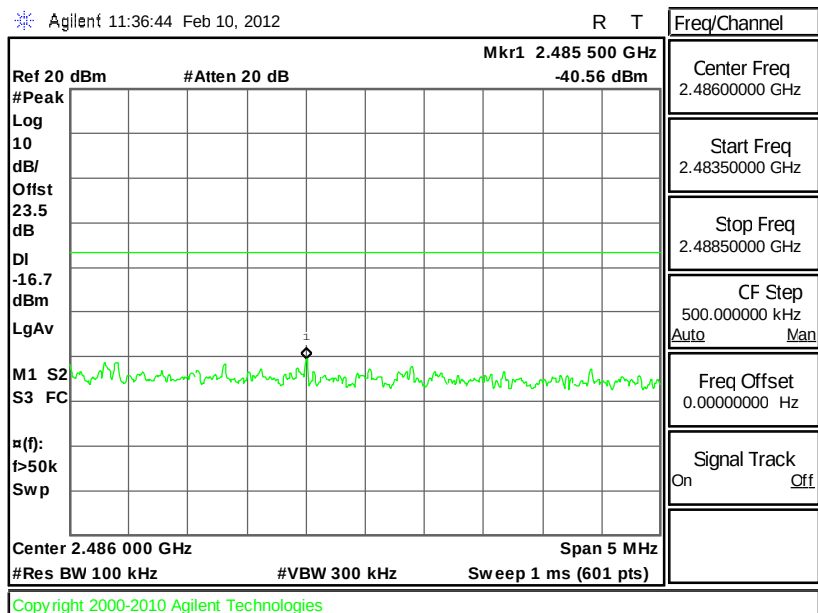


High Band Edge Plot on 802.11g Channel 11





Test Mode :	Mode 7 and 9	Temperature :	23~26°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	50~54%
Test Channel :	01 and 11	Test Engineer :	Rover Lee

Low Band Edge Plot on 802.11g/n (BW 20MHz) Channel 01**High Band Edge Plot on 802.11g/n (BW 20MHz) Channel 11**

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.

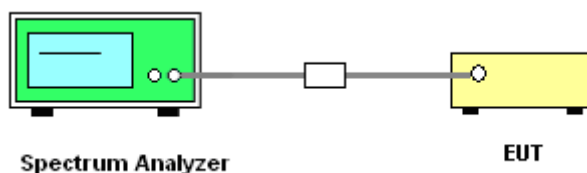
3.4.2 Measuring Instruments

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) $\geq$ 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

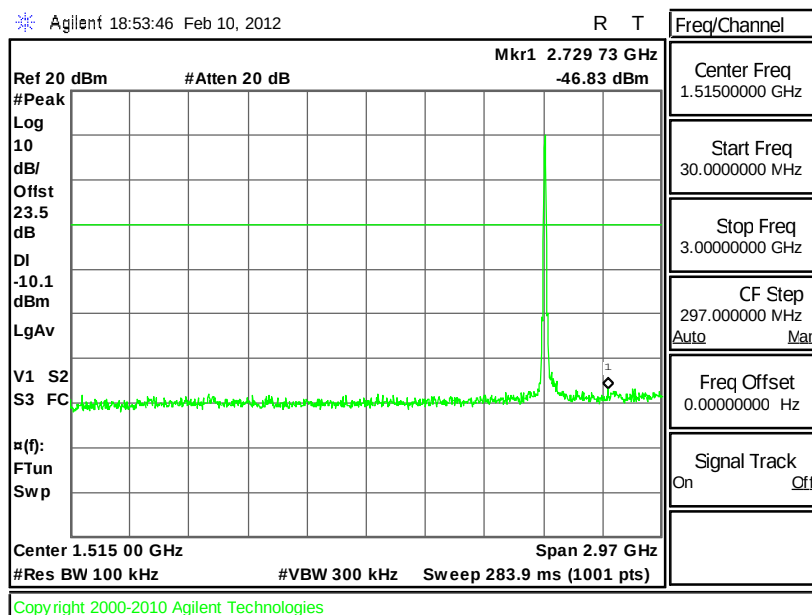




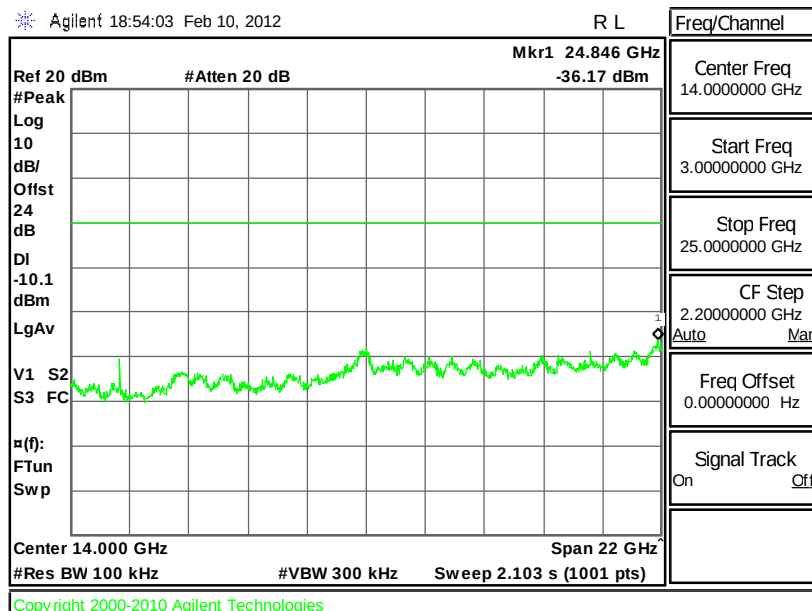
3.4.5 Test Plots of Spurious Emission

Test Mode :	Mode 1	Temperature :	23~26°C
Test Band :	802.11b	Relative Humidity :	50~54%
Test Channel :	01	Test Engineer :	Rover Lee

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

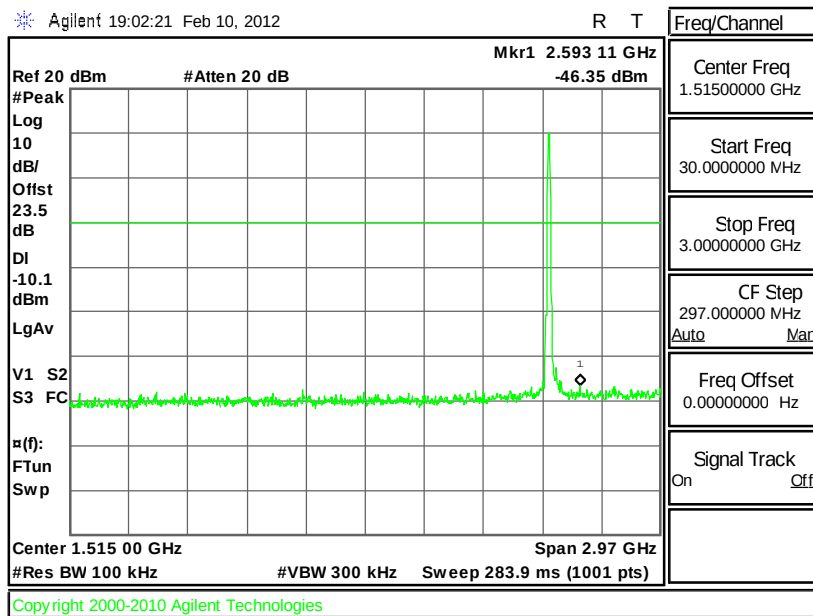
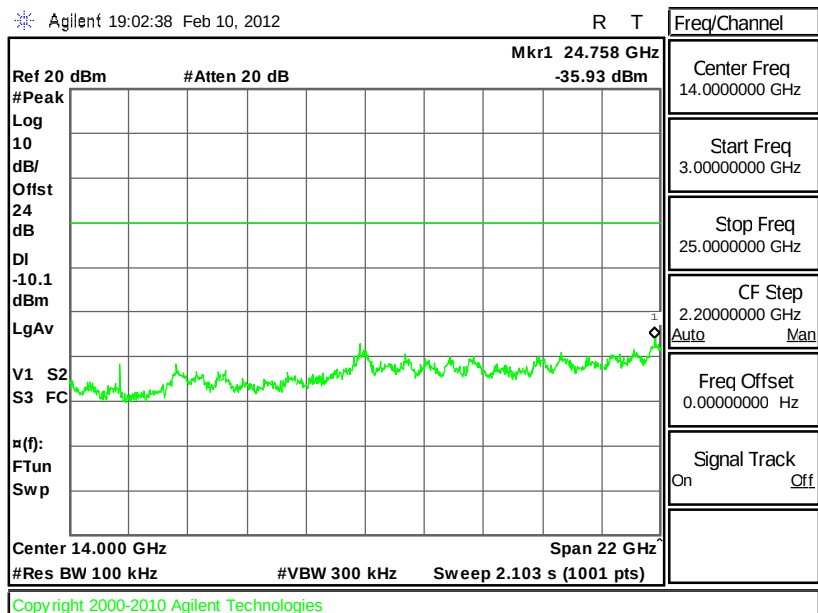


Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



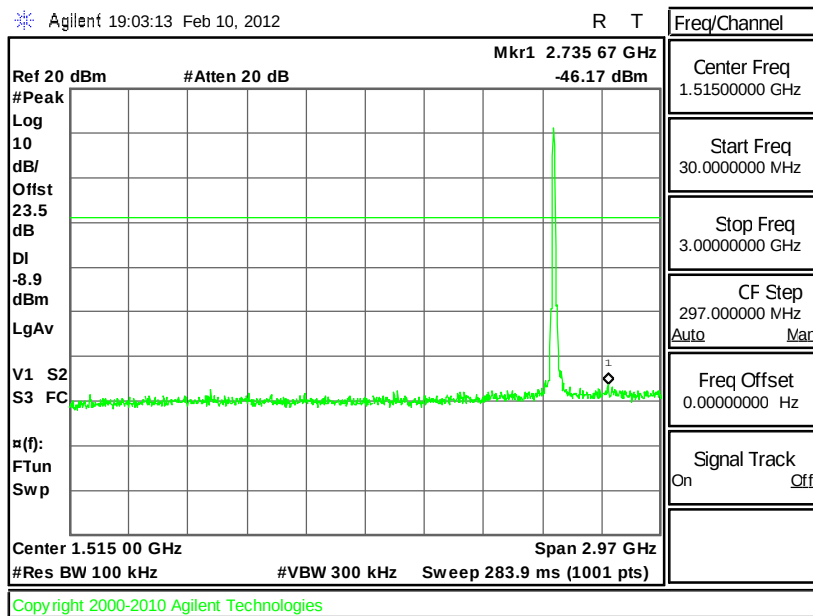
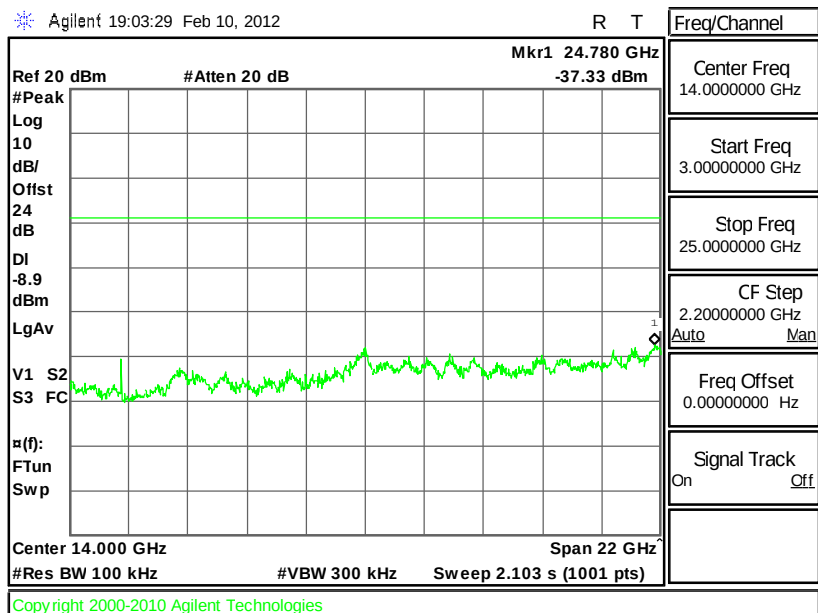


Test Mode :	Mode 2	Temperature :	23~26°C
Test Band :	802.11b	Relative Humidity :	50~54%
Test Channel :	06	Test Engineer :	Rover Lee

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz**Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz**

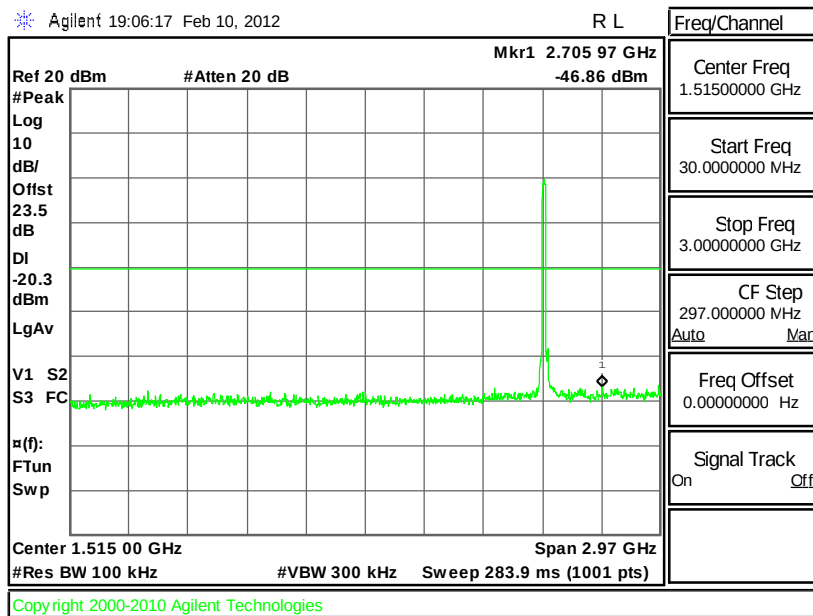
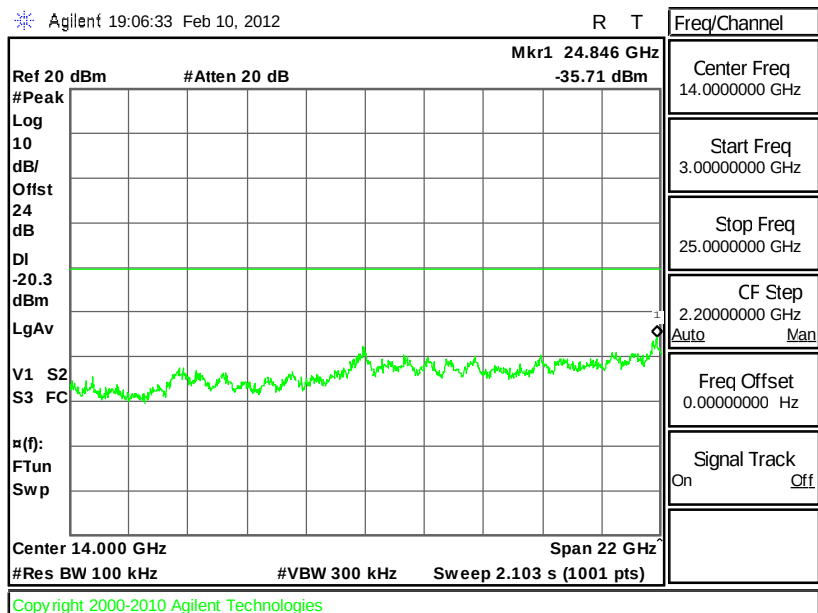


Test Mode :	Mode 3	Temperature :	23~26°C
Test Band :	802.11b	Relative Humidity :	50~54%
Test Channel :	11	Test Engineer :	Rover Lee

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz**Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz**

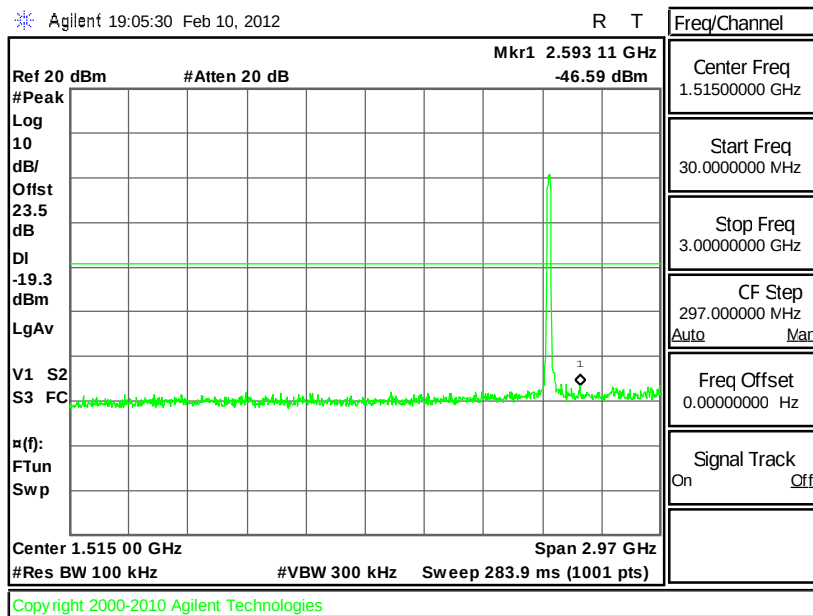
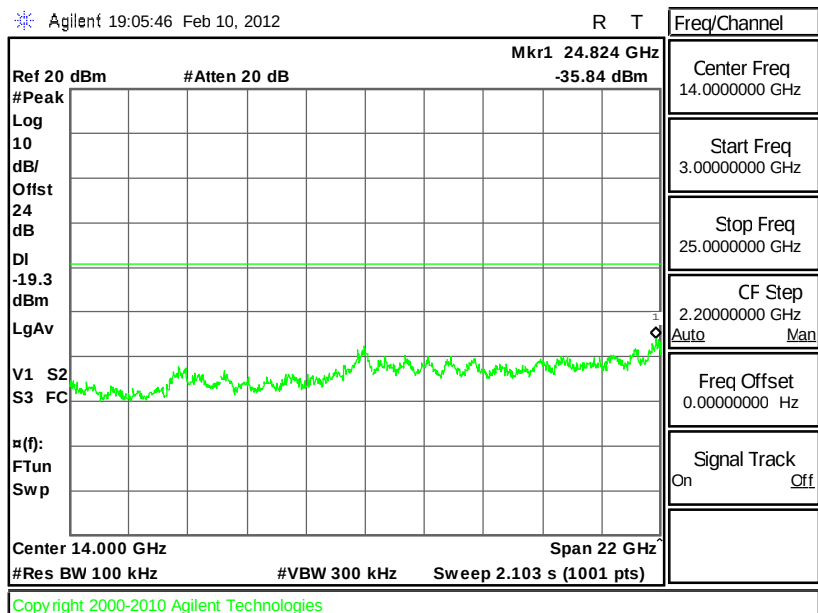


Test Mode :	Mode 4	Temperature :	23~26°C
Test Band :	802.11g	Relative Humidity :	50~54%
Test Channel :	01	Test Engineer :	Rover Lee

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz**Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz**

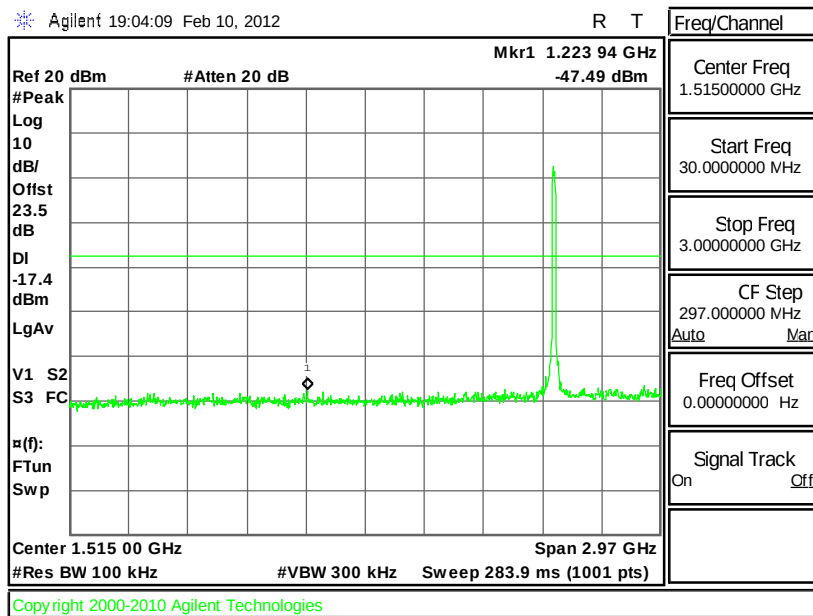
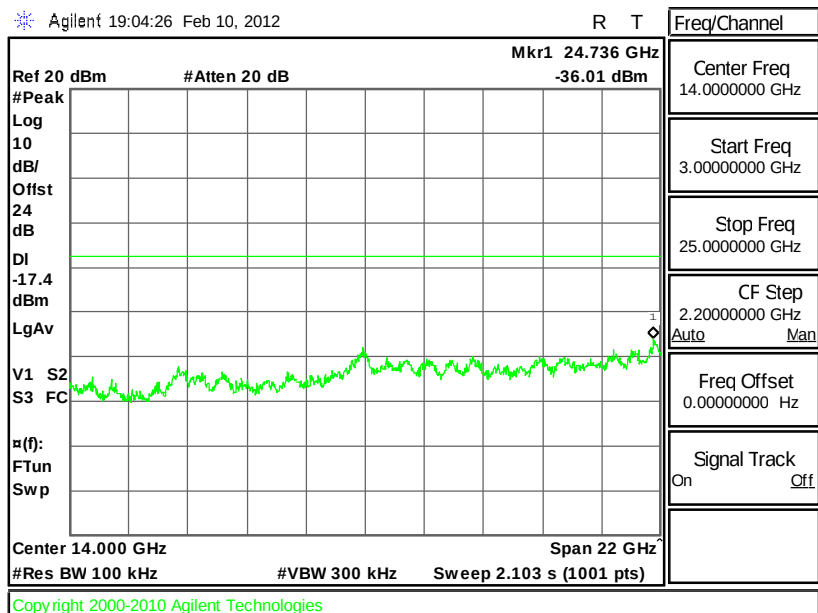


Test Mode :	Mode 5	Temperature :	23~26
Test Band :	802.11g	Relative Humidity :	50~54
Test Channel :	06	Test Engineer :	Rover Lee

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz**Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz**



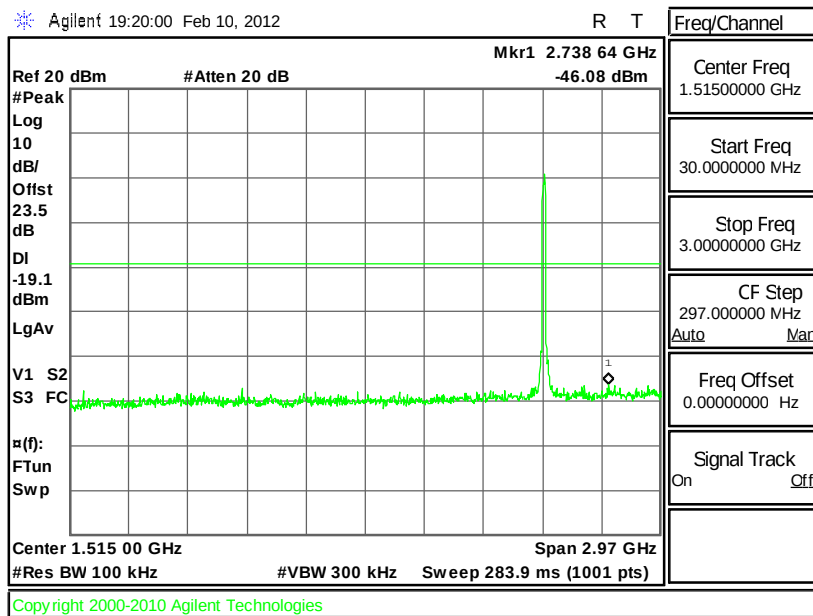
Test Mode :	Mode 6	Temperature :	23~26°C
Test Band :	802.11g	Relative Humidity :	50~54%
Test Channel :	11	Test Engineer :	Rover Lee

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz**Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz**

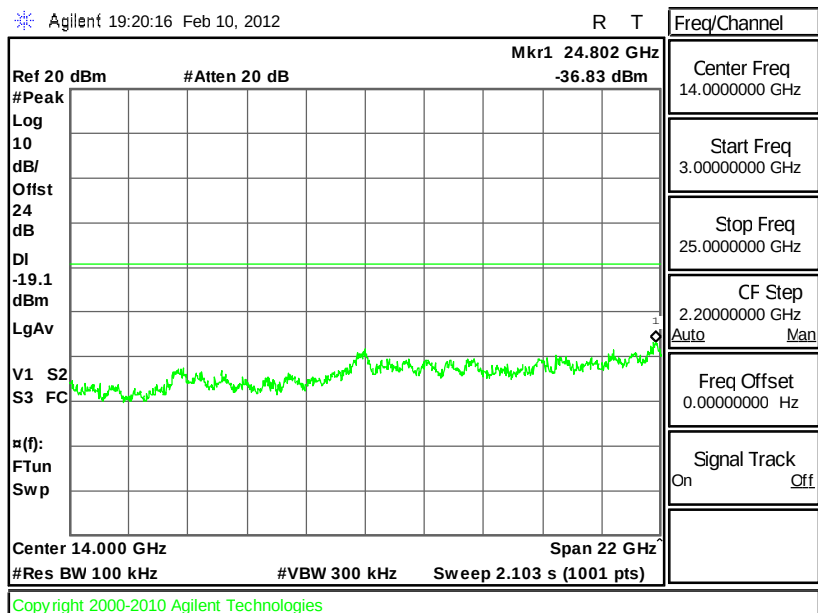


Test Mode :	Mode 7	Temperature :	23~26°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	50~54%
Test Channel :	01	Test Engineer :	Rover Lee

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

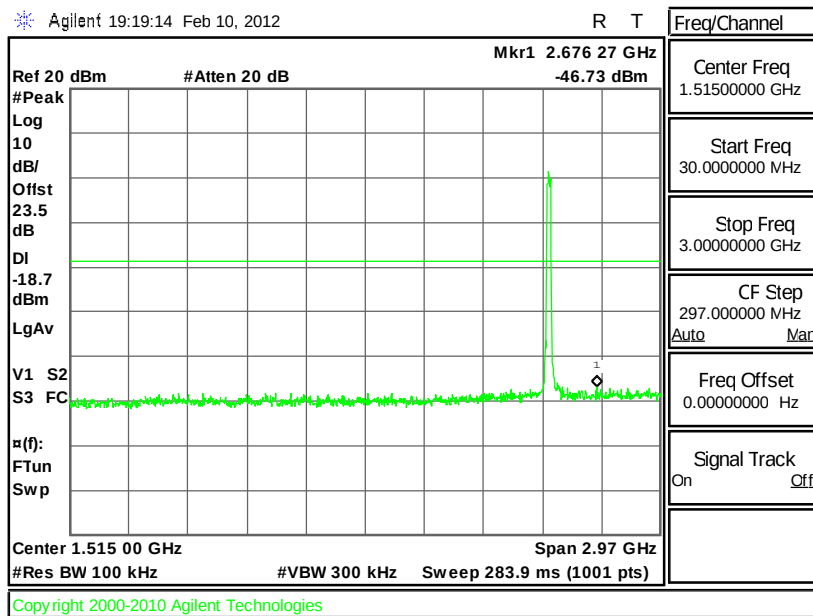
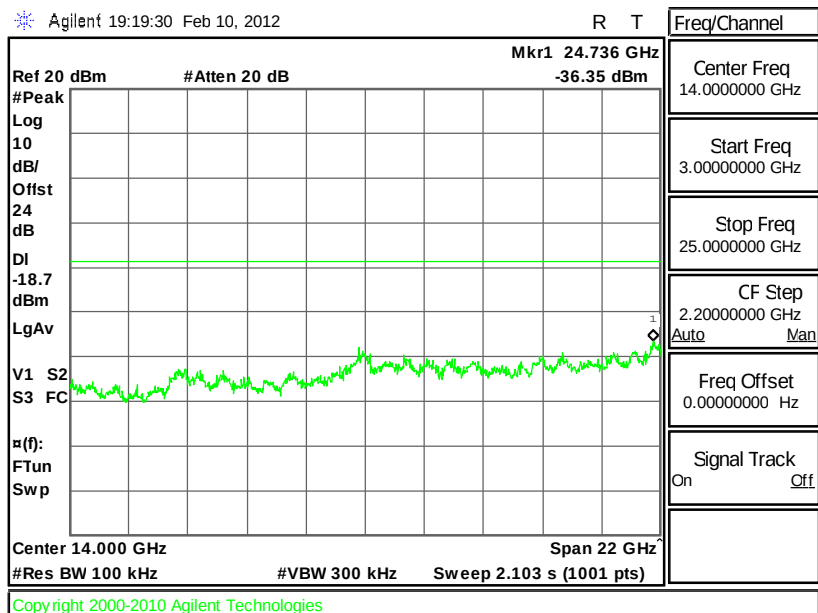


Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



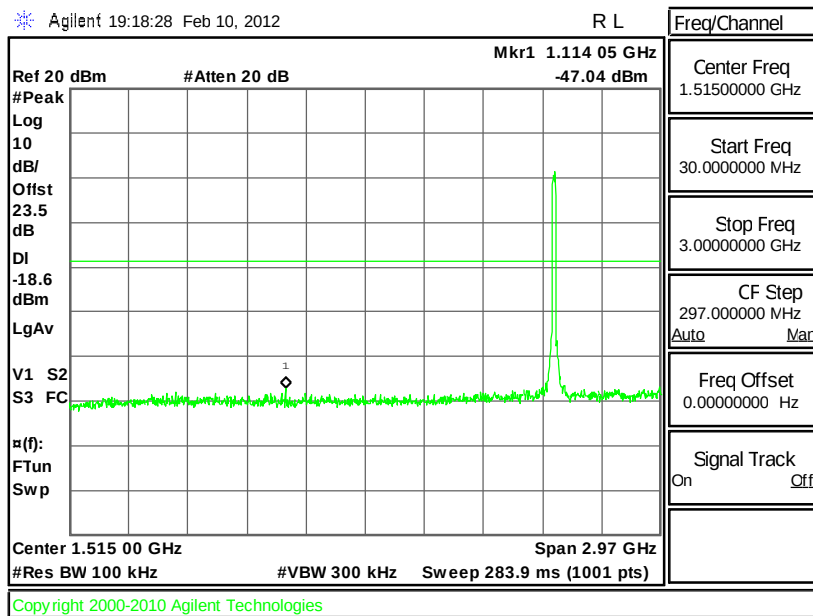
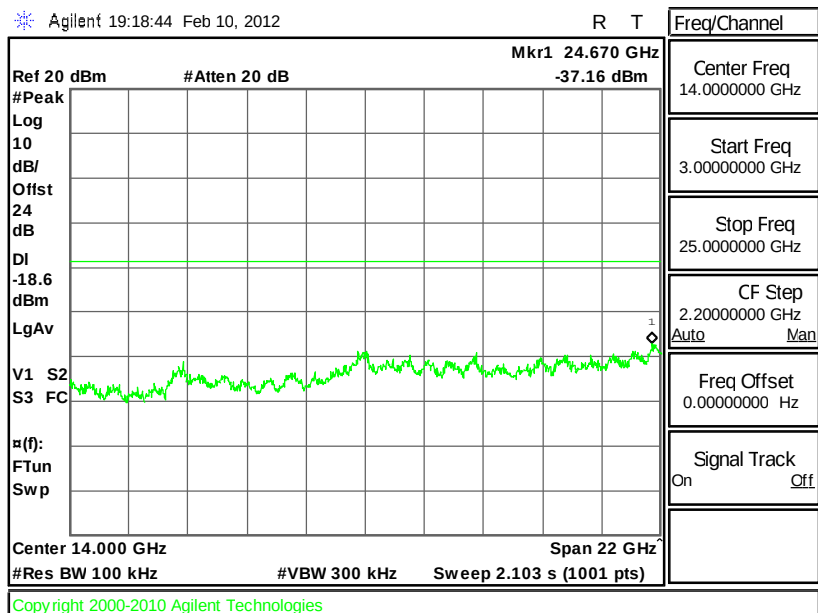


Test Mode :	Mode 8	Temperature :	23~26°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	50~54%
Test Channel :	06	Test Engineer :	Rover Lee

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz**Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz**



Test Mode :	Mode 9	Temperature :	23~26°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	50~54%
Test Channel :	11	Test Engineer :	Rover Lee

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz**Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz**

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.

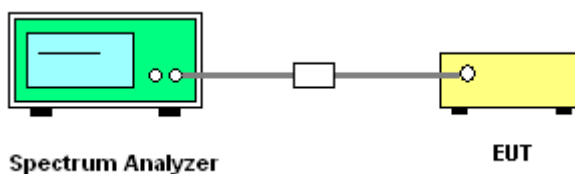
3.5.2 Measuring Instruments

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) $\geq$ 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 $BWCF = 10\log(3\text{ kHz}/100\text{ kHz} = -15.2\text{ dB})$.

3.5.4 Test Setup



3.5.5 Test Result of Power Spectral Density

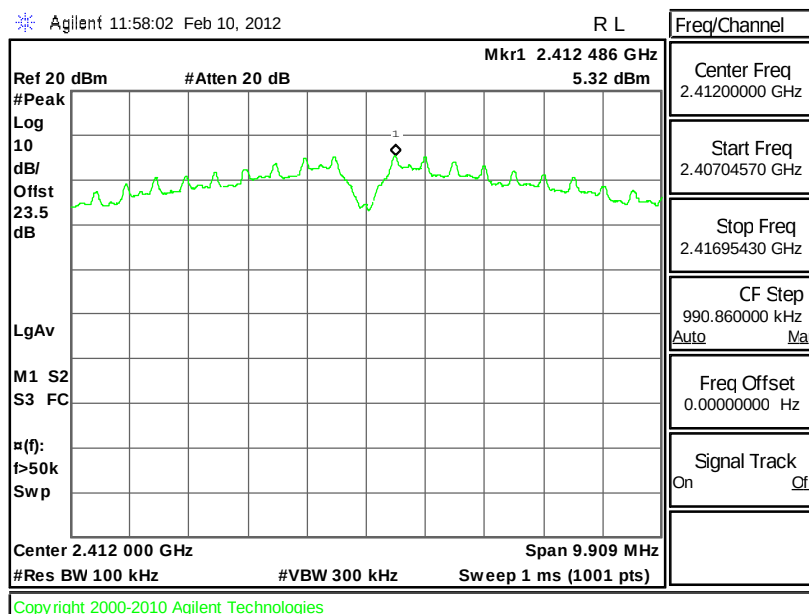
Test Mode :	Mode 1, 2, 3	Temperature :	23~26℃
Test Engineer :	Rover Lee	Relative Humidity :	50~54%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	5.32	-9.88	8	Pass
06	2437	5.57	-9.63	8	Pass
11	2462	6.32	-8.88	8	Pass

Note:

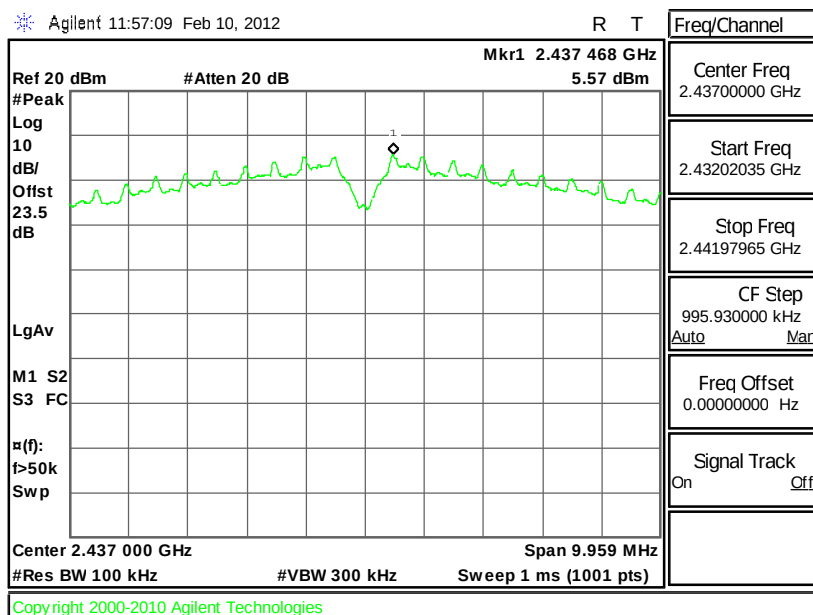
1. Measured power density (dBm) has offset with cable loss.
2. BWCF (dB) = $10 \log (3k/100k) = -15.2 \text{ dB}$
3. Power Density/ 3kHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)

Mode 1 : PSD Plot on 802.11b Channel 01

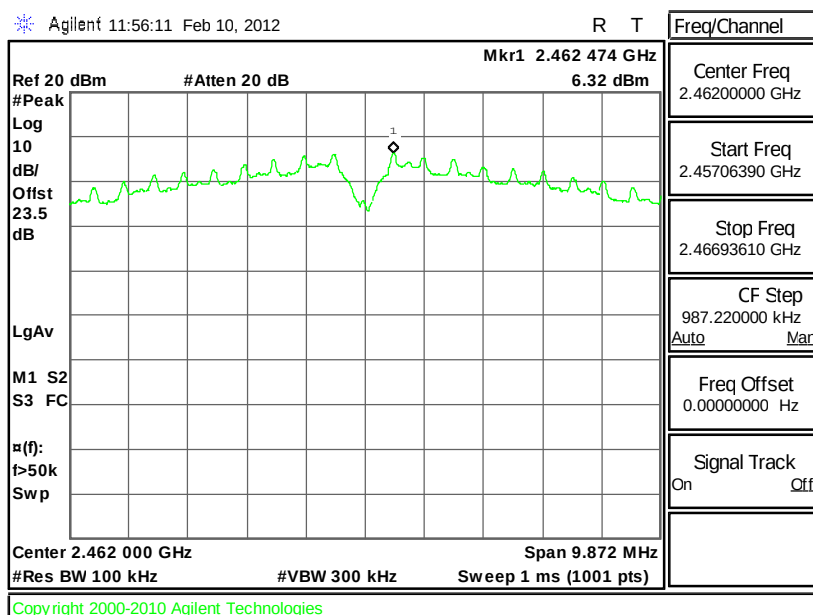




Mode 2 : PSD Plot on 802.11b Channel 06



Mode 3 : PSD Plot on 802.11b Channel 11

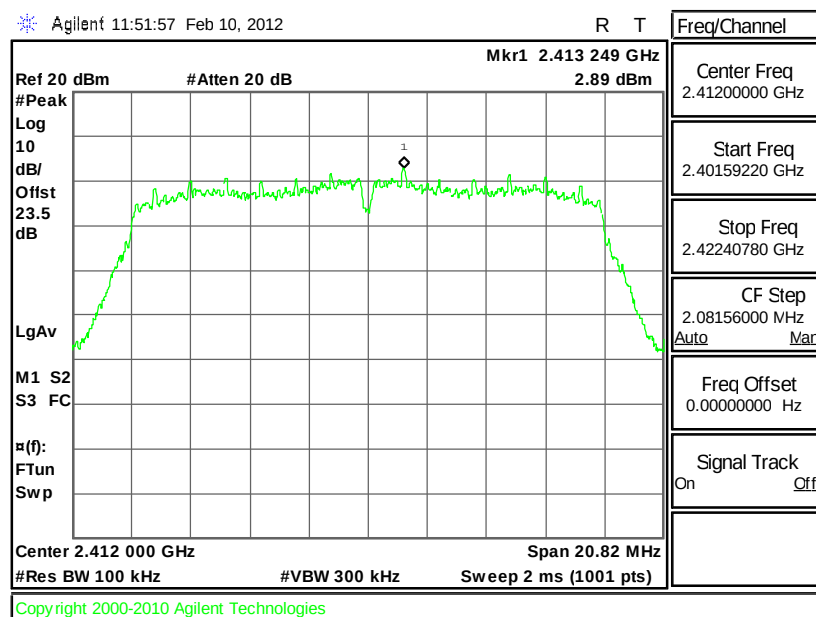


Test Mode :	Mode 4, 5, 6	Temperature :	23~26℃
Test Engineer :	Rover Lee	Relative Humidity :	50~54%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	2.89	-12.31	8	Pass
06	2437	2.33	-12.87	8	Pass
11	2462	3.39	-11.81	8	Pass

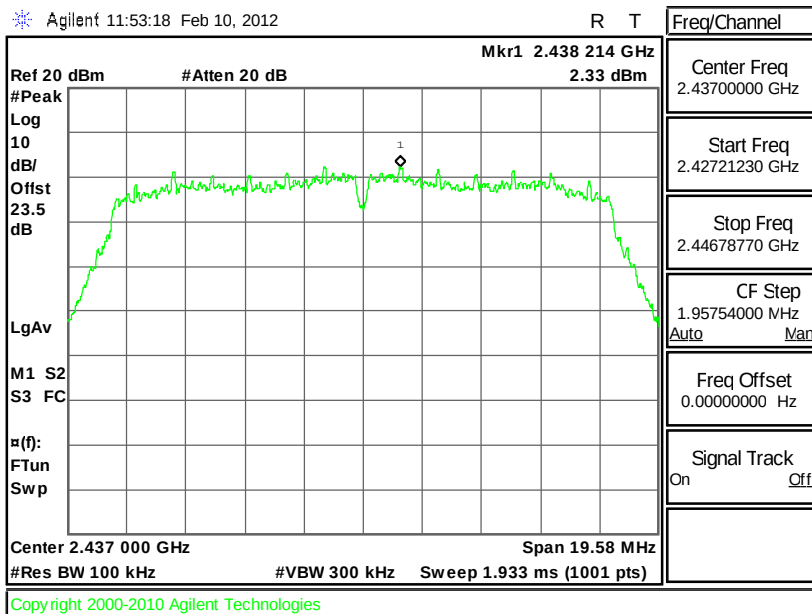
Note:

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

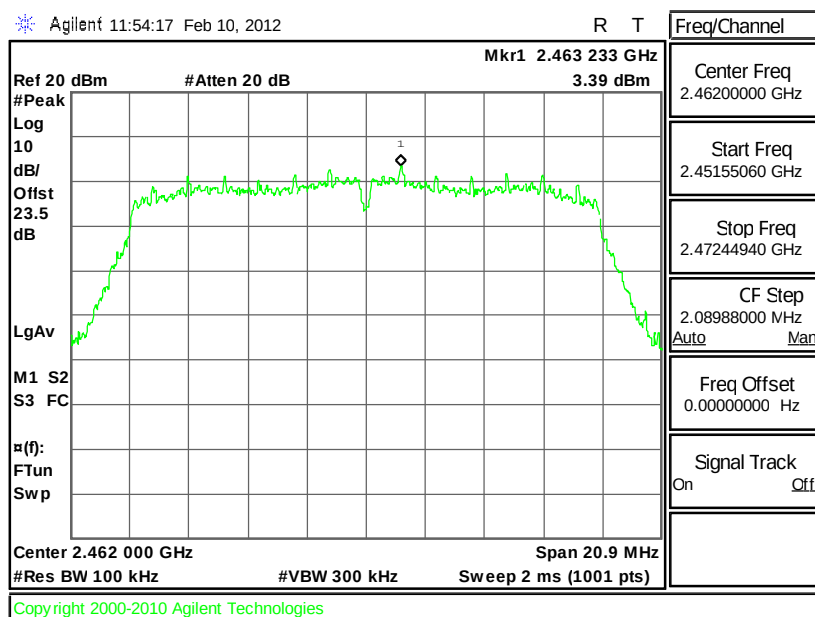
Mode 4 : PSD Plot on 802.11g Channel 01




Mode 5 : PSD Plot on 802.11g Channel 06



Mode 6 : PSD Plot on 802.11g Channel 11

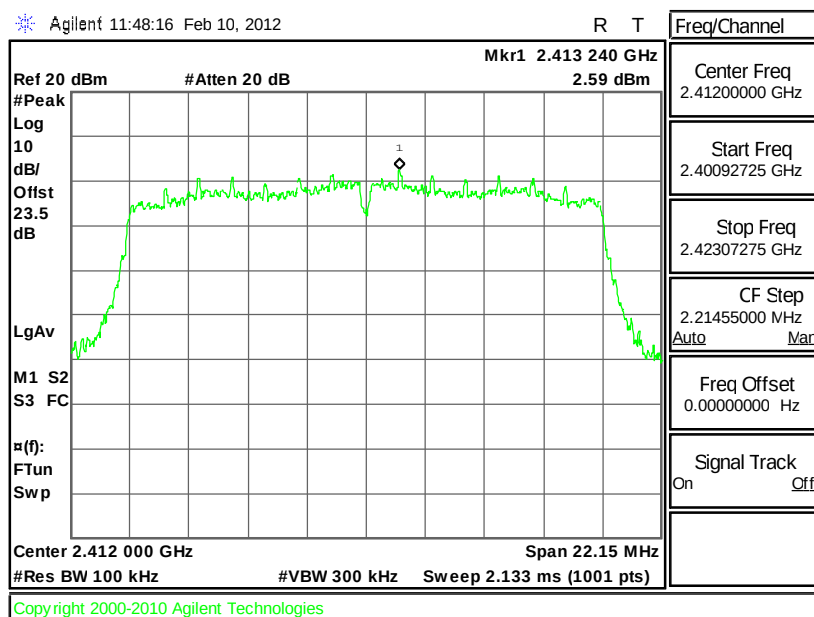


Test Mode :	Mode 7, 8, 9	Temperature :	23~26℃
Test Engineer :	Rover Lee	Relative Humidity :	50~54%

Channel	Frequency (MHz)	802.11g/n (BW 20MHz) Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	2.59	-12.61	8	Pass
06	2437	3.15	-12.05	8	Pass
11	2462	3.46	-11.74	8	Pass

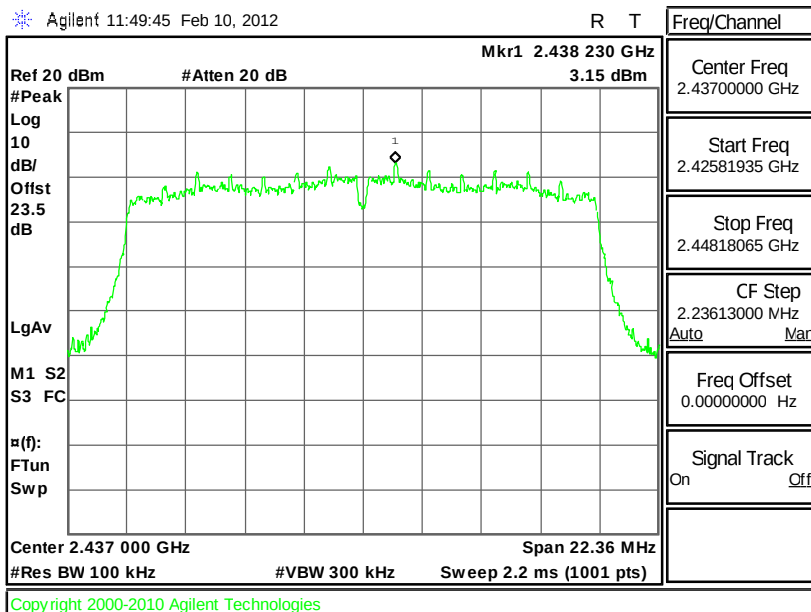
Note:

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

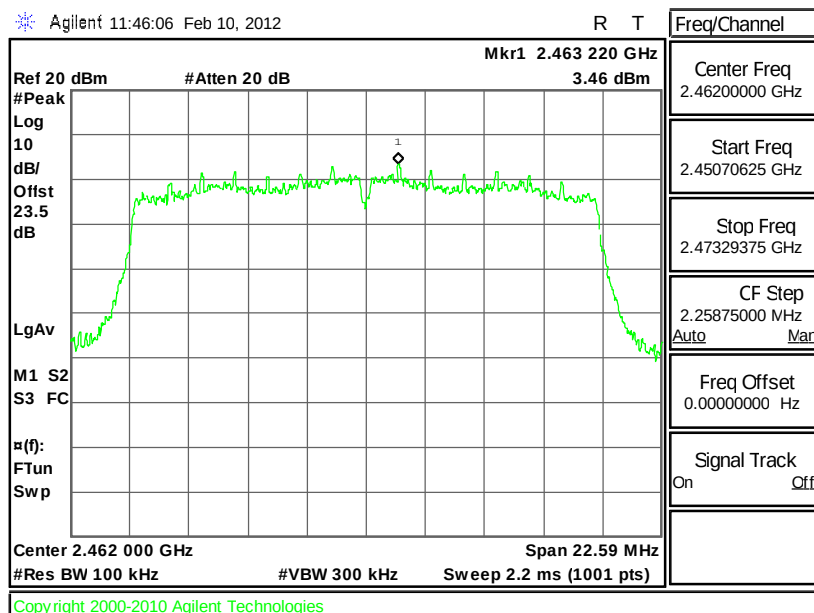
Mode 7 : PSD Plot on 802.11g/n (BW 20MHz) Channel 01




Mode 8 : PSD Plot on 802.11g/n (BW 20MHz) Channel 06



Mode 9 : PSD Plot on 802.11g/n (BW 20MHz) Channel 11



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.

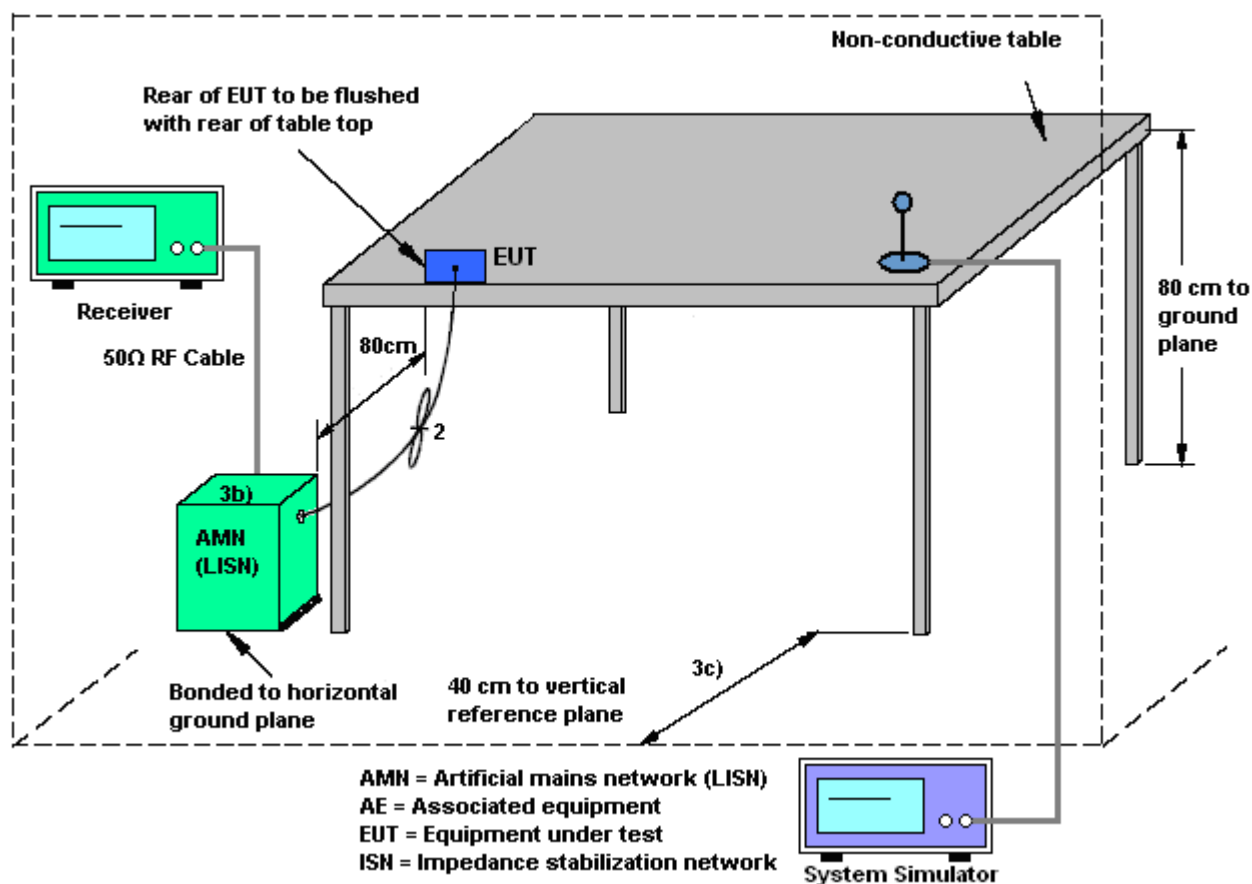
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

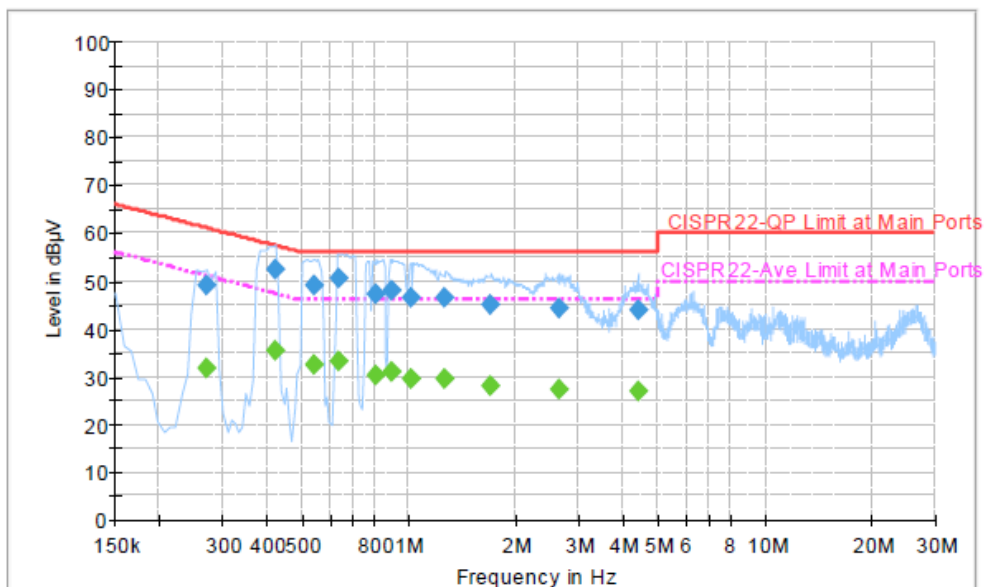
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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

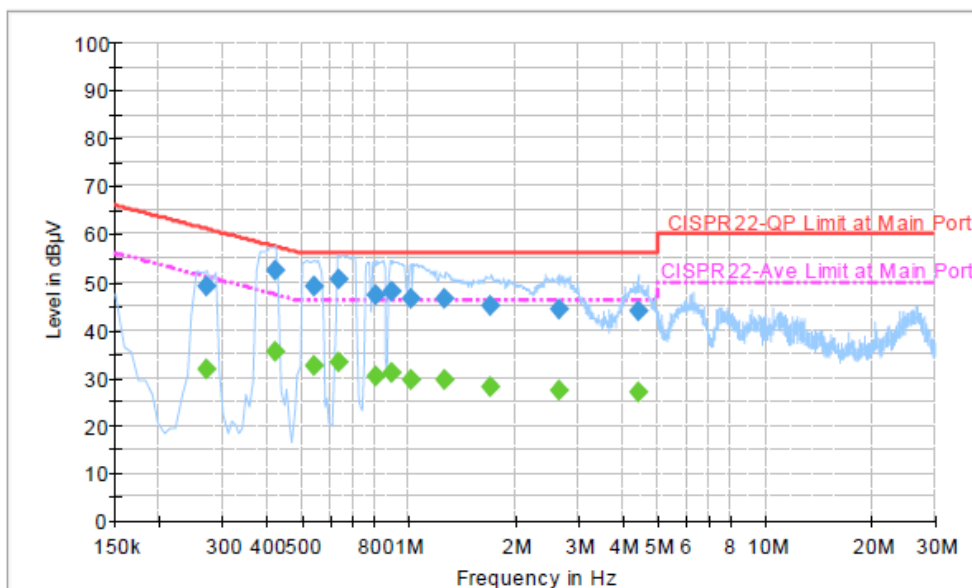
Test Mode :	Mode 1	Temperature :	21~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 2 + USB Cable 3 (Charging from Adapter 3) for Sample 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : QuasiPeak

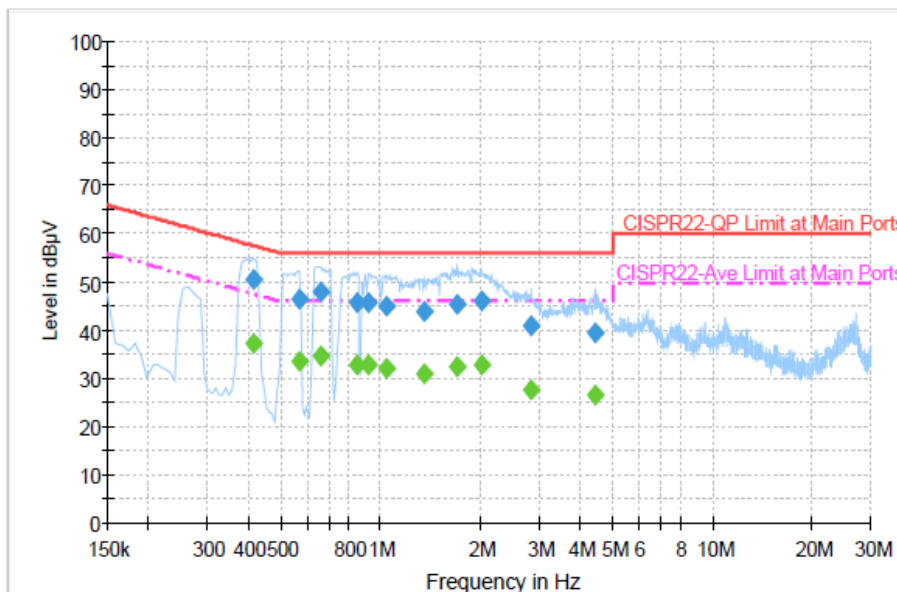
Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.270000	48.9	Off	L1	19.3	12.2	61.1
0.422000	52.5	Off	L1	19.4	4.9	57.4
0.542000	49.2	Off	L1	19.3	6.8	56.0
0.638000	50.4	Off	L1	19.4	5.6	56.0
0.814000	47.2	Off	L1	19.4	8.8	56.0
0.902000	48.0	Off	L1	19.4	8.0	56.0
1.014000	46.5	Off	L1	19.4	9.5	56.0
1.270000	46.4	Off	L1	19.4	9.6	56.0
1.702000	45.0	Off	L1	19.4	11.0	56.0
2.646000	44.3	Off	L1	19.4	11.7	56.0
4.406000	43.9	Off	L1	19.5	12.1	56.0

Test Mode :	Mode 1	Temperature :	21~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 2 + USB Cable 3 (Charging from Adapter 3) for Sample 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Average

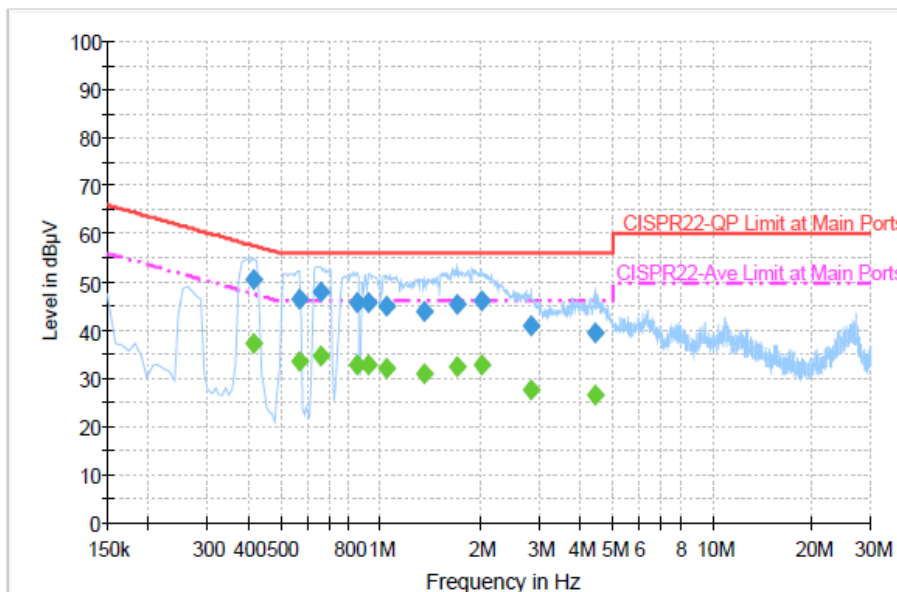
Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.270000	31.8	Off	L1	19.3	19.3	51.1
0.422000	35.4	Off	L1	19.4	12.0	47.4
0.542000	32.4	Off	L1	19.3	13.6	46.0
0.638000	33.3	Off	L1	19.4	12.7	46.0
0.814000	30.3	Off	L1	19.4	15.7	46.0
0.902000	31.0	Off	L1	19.4	15.0	46.0
1.014000	29.4	Off	L1	19.4	16.6	46.0
1.270000	29.5	Off	L1	19.4	16.5	46.0
1.702000	27.9	Off	L1	19.4	18.1	46.0
2.646000	27.2	Off	L1	19.4	18.8	46.0
4.406000	26.8	Off	L1	19.5	19.2	46.0

Test Mode :	Mode 1	Temperature :	21~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 2 + USB Cable 3 (Charging from Adapter 3) for Sample 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.414000	50.4	Off	N	19.4	7.2	57.6
0.566000	46.6	Off	N	19.3	9.4	56.0
0.662000	47.9	Off	N	19.4	8.1	56.0
0.846000	45.8	Off	N	19.5	10.2	56.0
0.918000	45.8	Off	N	19.4	10.2	56.0
1.046000	45.1	Off	N	19.4	10.9	56.0
1.358000	43.8	Off	N	19.5	12.2	56.0
1.702000	45.5	Off	N	19.5	10.5	56.0
2.014000	46.1	Off	N	19.5	9.9	56.0
2.838000	40.8	Off	N	19.5	15.2	56.0
4.406000	39.5	Off	N	19.5	16.5	56.0

Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	51~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 2 + USB Cable 3 (Charging from Adapter 3) for Sample 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.414000	37.3	Off	N	19.4	10.3	47.6
0.566000	33.5	Off	N	19.3	12.5	46.0
0.662000	34.8	Off	N	19.4	11.2	46.0
0.846000	32.7	Off	N	19.5	13.3	46.0
0.918000	32.8	Off	N	19.4	13.2	46.0
1.046000	32.1	Off	N	19.4	13.9	46.0
1.358000	30.9	Off	N	19.5	15.1	46.0
1.702000	32.6	Off	N	19.5	13.4	46.0
2.014000	33.0	Off	N	19.5	13.0	46.0
2.838000	27.7	Off	N	19.5	18.3	46.0
4.406000	26.6	Off	N	19.5	19.4	46.0

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

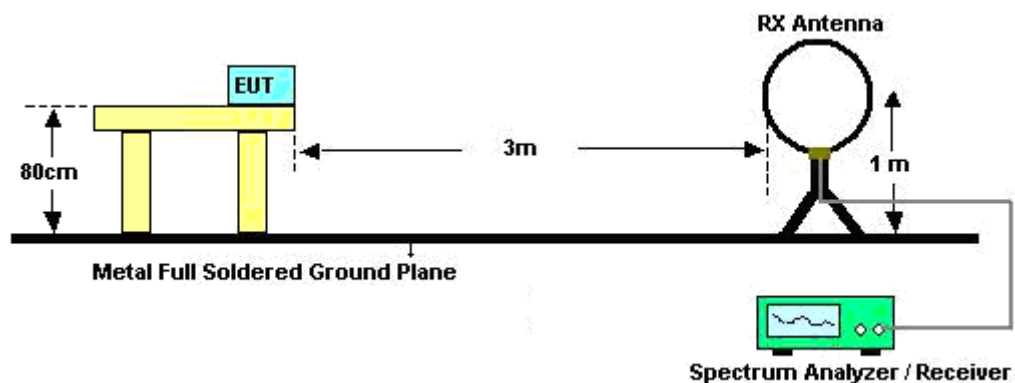
See list of measuring instruments of this test report.

3.7.3 Test Procedures

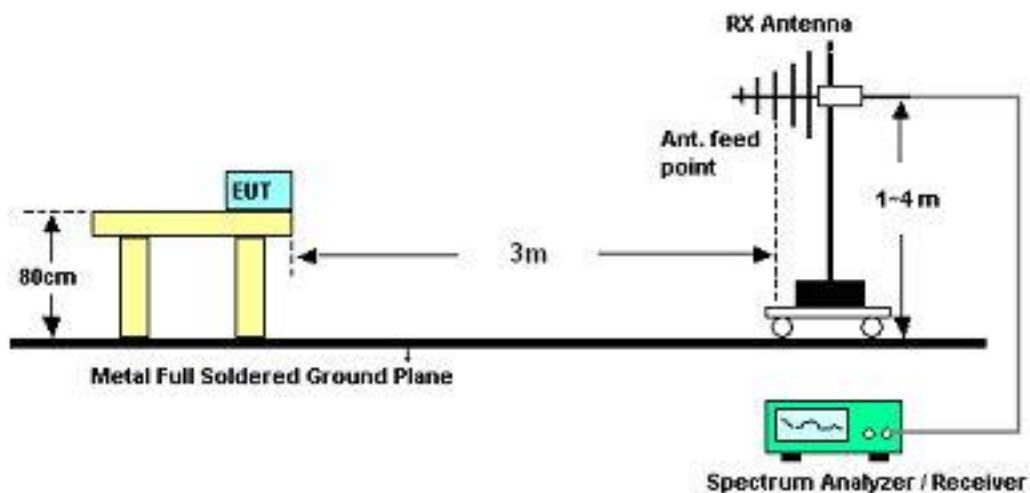
- Use the following spectrum analyzer settings:
 - Span shall wide enough to fully capture the emission being measured;
 - Set RBW = 1 MHz for $f \geq 1$ GHz, 100 KHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - Measurement above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB per decade from 3m to 1m.
Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB)
- 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

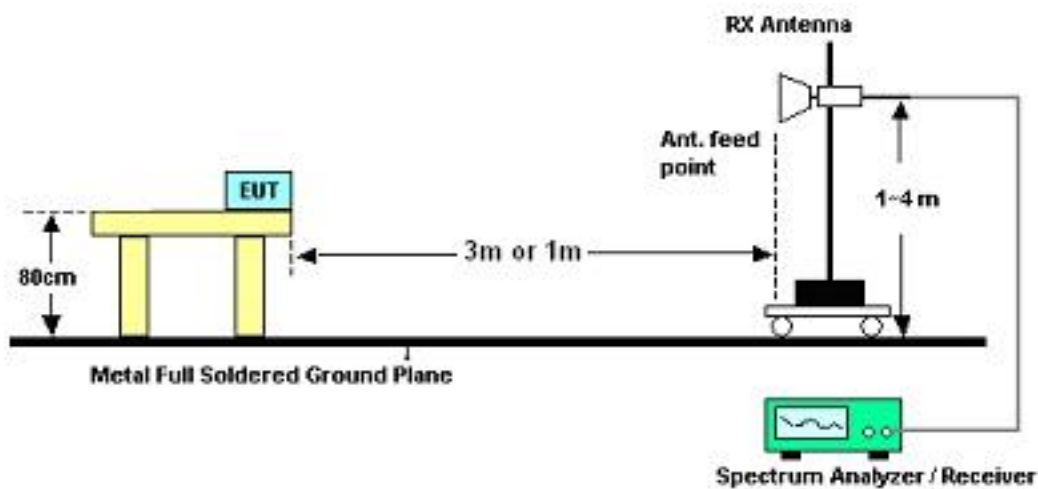
For radiated emissions below 30MHz



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)

<Sample 1>

Test Mode :	Mode 1	Temperature :	22~24℃
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
31.62	20.53	-19.47	40	32.91	18.44	0.72	31.54	122	146	Peak
114.51	23.06	-20.44	43.5	41.71	11.7	1.17	31.52	-	-	Peak
154.2	19.38	-24.12	43.5	38.62	10.96	1.3	31.5	-	-	Peak
388.2	17	-29	46	30.79	15.44	1.98	31.21	-	-	Peak
525.4	19.57	-26.43	46	29.94	18.36	2.28	31.01	-	-	Peak
755	24.06	-21.94	46	29.49	22.35	2.76	30.54	-	-	Peak
2385.62	42.15	-11.85	54	41.43	32.02	4.58	35.88	100	283	Average
2385.62	53.59	-20.41	74	52.87	32.02	4.58	35.88	100	283	Peak
2412	103.36	-	-	102.6	32.03	4.59	35.86	100	283	Average
2412	107.45	-	-	106.69	32.03	4.59	35.86	100	283	Peak
2484	35.46	-18.54	54	34.54	32.09	4.64	35.81	100	283	Average
2484	46.53	-27.47	74	45.61	32.09	4.64	35.81	100	283	Peak
4824	49.84	-24.16	74	67.96	33.83	6.51	58.46	100	0	Peak

Test Mode :	Mode 1	Temperature :	22~24℃
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
39.72	31.93	-8.07	40	49.39	13.3	0.75	31.51	-	-	Peak
47.55	33.34	-6.66	40	54.96	9.15	0.79	31.56	105	57	Peak
136.38	24.89	-18.61	43.5	43.79	11.36	1.25	31.51	-	-	Peak
391.7	16.97	-29.03	46	30.58	15.6	1.99	31.2	-	-	Peak
575.1	20.84	-25.16	46	29.52	19.85	2.38	30.91	-	-	Peak
795.6	23.91	-22.09	46	29.63	22	2.82	30.54	-	-	Peak
2385.24	41.46	-12.54	54	40.76	32	4.58	35.88	128	33	Average
2385.24	53.14	-20.86	74	52.44	32	4.58	35.88	128	33	Peak
2412	105.15	-	-	104.39	32.03	4.59	35.86	128	33	Average
2412	109.11	-	-	108.35	32.03	4.59	35.86	128	33	Peak
2488	36.94	-17.06	54	36.01	32.1	4.64	35.81	128	33	Average
2488	48.3	-25.7	74	47.37	32.1	4.64	35.81	128	33	Peak
4824	52.86	-1.14	54	70.98	33.83	6.51	58.46	132	348	Average
4824	54.02	-19.98	74	72.14	33.83	6.51	58.46	132	348	Peak

Test Mode :	Mode 2	Temperature :	22~24℃
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
30	20.64	-19.36	40	31.7	19.8	0.7	31.56	119	307	Peak
103.71	21.42	-22.08	43.5	41.33	10.54	1.11	31.56	-	-	Peak
133.14	20.55	-22.95	43.5	39.43	11.4	1.24	31.52	-	-	Peak
424.6	17.32	-28.68	46	29.76	16.65	2.08	31.17	-	-	Peak
606.6	21.7	-24.3	46	30.04	20.08	2.44	30.86	-	-	Peak
799.1	24.42	-21.58	46	30.05	22.08	2.83	30.54	-	-	Peak
2390	37.51	-16.49	54	36.77	32.02	4.58	35.86	154	293	Average
2390	47.66	-26.34	74	46.92	32.02	4.58	35.86	154	293	Peak
2437	102.44	-	-	101.61	32.06	4.61	35.84	154	293	Average
2437	106.59	-	-	105.76	32.06	4.61	35.84	154	293	Peak
2486	36.78	-17.22	54	35.86	32.09	4.64	35.81	154	293	Average
2486	47.66	-26.34	74	46.74	32.09	4.64	35.81	154	293	Peak
4874	47.09	-26.91	74	65.1	33.82	6.53	58.36	100	0	Peak

Test Mode :	Mode 2	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
47.55	34.56	-5.44	40	56.18	9.15	0.79	31.56	100	163	Peak
103.71	20.72	-22.78	43.5	40.63	10.54	1.11	31.56	-	-	Peak
135.3	23.55	-19.95	43.5	42.43	11.38	1.25	31.51	-	-	Peak
405	17.7	-28.3	46	30.69	16.16	2.03	31.18	-	-	Peak
559	21.44	-24.56	46	29.78	20.25	2.35	30.94	-	-	Peak
829.2	23.78	-22.22	46	28.37	23.05	2.88	30.52	-	-	Peak
2388	40.29	-13.71	54	39.57	32.02	4.58	35.88	100	31	Average
2388	50.78	-23.22	74	50.06	32.02	4.58	35.88	100	31	Peak
2437	102.44	-	-	101.61	32.06	4.61	35.84	100	31	Average
2437	109.43	-	-	108.6	32.06	4.61	35.84	100	31	Peak
2484	39.45	-14.55	54	38.53	32.09	4.64	35.81	100	31	Average
2484	50.29	-23.71	74	49.37	32.09	4.64	35.81	100	31	Peak
4874	52.72	-1.28	54	70.73	33.82	6.53	58.36	101	322	Average
4874	54.77	-19.23	74	72.78	33.82	6.53	58.36	101	322	Peak



Test Mode :	Mode 3	Temperature :	22~24℃
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
30.54	20.45	-19.55	40	32.17	19.12	0.71	31.55	133	261	Peak
47.28	19.04	-20.96	40	40.66	9.15	0.79	31.56	-	-	Peak
112.89	21.5	-22	43.5	40.36	11.5	1.16	31.52	-	-	Peak
421.1	17.31	-28.69	46	29.8	16.61	2.07	31.17	-	-	Peak
555.5	21.31	-24.69	46	29.81	20.1	2.34	30.94	-	-	Peak
766.2	23.48	-22.52	46	29	22.24	2.78	30.54	-	-	Peak
2390	36.55	-17.45	54	35.81	32.02	4.58	35.86	100	170	Average
2390	47.41	-26.59	74	46.67	32.02	4.58	35.86	100	170	Peak
2462	101.19	-	-	100.33	32.07	4.62	35.83	100	170	Average
2462	105.09	-	-	104.23	32.07	4.62	35.83	100	170	Peak
2484.61	46.79	-7.21	54	45.87	32.09	4.64	35.81	100	170	Average
2484.61	55.89	-18.11	74	54.97	32.09	4.64	35.81	100	170	Peak
4924	48.02	-25.98	74	65.91	33.81	6.56	58.26	100	0	Peak

Test Mode :	Mode 3	Temperature :	22~24℃
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
46.47	34.54	-5.46	40	55.75	9.57	0.78	31.56	111	93	Peak
103.71	19.8	-23.7	43.5	39.71	10.54	1.11	31.56	-	-	Peak
136.11	22.1	-21.4	43.5	40.98	11.38	1.25	31.51	-	-	Peak
396.6	17.05	-28.95	46	30.39	15.85	2	31.19	-	-	Peak
559.7	21.27	-24.73	46	29.55	20.3	2.35	30.93	-	-	Peak
752.2	23.9	-22.1	46	29.32	22.37	2.75	30.54	-	-	Peak
2390	38.92	-15.08	54	38.18	32.02	4.58	35.86	104	36	Average
2390	49.52	-24.48	74	48.78	32.02	4.58	35.86	104	36	Peak
2462	104.65	-	-	103.79	32.07	4.62	35.83	104	36	Average
2462	108.56	-	-	107.7	32.07	4.62	35.83	104	36	Peak
2484.61	47.16	-6.84	54	46.24	32.09	4.64	35.81	104	36	Average
2484.61	56.98	-17.02	74	56.06	32.09	4.64	35.81	104	36	Peak
4924	52.21	-1.79	54	70.1	33.81	6.56	58.26	100	334	Average
4924	54.29	-19.71	74	72.19	33.81	6.55	58.26	100	334	Peak

<Sample 2>

Test Mode :	Mode 4	Temperature :	22~24℃
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
30	20.05	-19.95	40	31.11	19.8	0.7	31.56	144	175	Peak
101.28	21.8	-21.7	43.5	42.21	10.06	1.1	31.57	-	-	Peak
123.42	20.31	-23.19	43.5	38.82	11.8	1.21	31.52	-	-	Peak
326.6	17.6	-28.4	46	33.34	13.71	1.84	31.29	-	-	Peak
568.1	21.05	-24.95	46	29.64	19.97	2.36	30.92	-	-	Peak
725.6	23.97	-22.03	46	30.08	21.82	2.7	30.63	-	-	Peak
2378.97	40.83	-13.17	54	40.14	32	4.57	35.88	102	137	Average
2378.97	52.95	-21.05	74	52.26	32	4.57	35.88	102	137	Peak
2412	102.35	-	-	101.59	32.03	4.59	35.86	102	137	Average
2412	106.34	-	-	105.58	32.03	4.59	35.86	102	137	Peak
2484	36.44	-17.56	54	35.52	32.09	4.64	35.81	102	137	Average
2484	49.72	-24.28	74	48.8	32.09	4.64	35.81	102	137	Peak
4824	49.7	-24.3	74	67.82	33.83	6.51	58.46	100	0	Peak

Test Mode :	Mode 4	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
40.8	35.06	-4.94	40	53.11	12.72	0.75	31.52	103	224	Peak
46.47	33.85	-6.15	40	55.06	9.57	0.78	31.56	-	-	Peak
136.92	22.93	-20.57	43.5	41.83	11.36	1.25	31.51	-	-	Peak
420.4	16.37	-29.63	46	28.88	16.6	2.06	31.17	-	-	Peak
573.7	21.47	-24.53	46	30.15	19.86	2.37	30.91	-	-	Peak
755	23.73	-22.27	46	29.16	22.35	2.76	30.54	-	-	Peak
2389.23	39.16	-14.84	54	38.44	32.02	4.58	35.88	100	314	Average
2389.23	51.35	-22.65	74	50.63	32.02	4.58	35.88	100	314	Peak
2412	100.83	-	-	100.07	32.03	4.59	35.86	100	314	Average
2412	105.84	-	-	105.08	32.03	4.59	35.86	100	314	Peak
2484	38.95	-15.05	54	38.03	32.09	4.64	35.81	100	314	Average
2484	51.47	-22.53	74	50.55	32.09	4.64	35.81	100	314	Peak
4824	49.95	-24.05	74	68.07	33.83	6.51	58.46	100	0	Peak

<Sample 1>

Test Mode :	Mode 5	Temperature :	22~24℃
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
30.81	21.25	-18.75	40	32.97	19.12	0.71	31.55	114	152	Peak
46.47	19.66	-20.34	40	40.87	9.57	0.78	31.56	-	-	Peak
104.25	21.38	-22.12	43.5	41.11	10.7	1.12	31.55	-	-	Peak
392.4	16.36	-29.64	46	29.92	15.65	1.99	31.2	-	-	Peak
547.8	20.63	-25.37	46	29.68	19.58	2.33	30.96	-	-	Peak
741	23.8	-22.2	46	29.33	22.31	2.73	30.57	-	-	Peak
2389.99	43.3	-10.7	54	42.56	32.02	4.58	35.86	112	182	Average
2389.99	61.67	-12.33	74	60.93	32.02	4.58	35.86	112	182	Peak
2412	92.46	-	-	91.7	32.03	4.59	35.86	112	182	Average
2412	106.13	-	-	105.37	32.03	4.59	35.86	112	182	Peak
2488	36.67	-17.33	54	35.74	32.1	4.64	35.81	112	182	Average
2488	49.58	-24.42	74	48.65	32.1	4.64	35.81	112	182	Peak
4824	44.68	-29.32	74	62.8	33.83	6.51	58.46	100	0	Peak

Test Mode :	Mode 5	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
47.01	34.75	-5.25	40	56.37	9.15	0.79	31.56	102	336	Peak
103.98	20.27	-23.23	43.5	40.18	10.54	1.11	31.56	-	-	Peak
137.19	21.33	-22.17	43.5	40.24	11.34	1.26	31.51	-	-	Peak
393.1	17.03	-28.97	46	30.59	15.65	1.99	31.2	-	-	Peak
512.1	20.13	-25.87	46	30.71	18.22	2.25	31.05	-	-	Peak
721.4	22.9	-23.1	46	29.18	21.67	2.69	30.64	-	-	Peak
2389.8	47.32	-6.68	54	46.58	32.02	4.58	35.86	102	23	Average
2389.8	66.67	-7.33	74	65.93	32.02	4.58	35.86	102	23	Peak
2412	95.47	-	-	94.71	32.03	4.59	35.86	102	23	Average
2412	108.53	-	-	107.77	32.03	4.59	35.86	102	23	Peak
2484	36.79	-17.21	54	35.87	32.09	4.64	35.81	102	23	Average
2484	47.65	-26.35	74	46.73	32.09	4.64	35.81	102	23	Peak
4824	38.23	-15.77	54	56.35	33.83	6.51	58.46	100	333	Average
4824	52.11	-21.89	74	70.23	33.83	6.51	58.46	100	333	Peak

Test Mode :	Mode 6	Temperature :	22~24℃
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
30	20.43	-19.57	40	31.49	19.8	0.7	31.56	121	103	Peak
103.17	20.9	-22.6	43.5	40.97	10.38	1.11	31.56	-	-	Peak
153.39	17.2	-26.3	43.5	36.39	11.02	1.29	31.5	-	-	Peak
387.5	15.45	-30.55	46	29.24	15.44	1.98	31.21	-	-	Peak
554.8	20.69	-25.31	46	29.24	20.05	2.34	30.94	-	-	Peak
741	23.48	-22.52	46	29.01	22.31	2.73	30.57	-	-	Peak
2390	38.41	-15.59	54	37.67	32.02	4.58	35.86	112	174	Average
2390	52.62	-21.38	74	51.88	32.02	4.58	35.86	112	174	Peak
2437	92.23	-	-	91.4	32.06	4.61	35.84	112	174	Average
2437	105.64	-	-	104.81	32.06	4.61	35.84	112	174	Peak
2484	37.96	-16.04	54	37.04	32.09	4.64	35.81	112	174	Average
2484	50.76	-23.24	74	49.84	32.09	4.64	35.81	112	174	Peak
4874	44.16	-29.84	74	62.17	33.82	6.53	58.36	100	0	Peak

Test Mode :	Mode 6	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
47.55	34.37	-5.63	40	55.99	9.15	0.79	31.56	100	55	Peak
104.79	20.34	-23.16	43.5	40.07	10.7	1.12	31.55	-	-	Peak
136.11	21.75	-21.75	43.5	40.63	11.38	1.25	31.51	-	-	Peak
447.7	17.3	-28.7	46	29.17	17.14	2.14	31.15	-	-	Peak
619.9	22.05	-23.95	46	29.89	20.5	2.49	30.83	-	-	Peak
747.3	23.41	-22.59	46	28.85	22.37	2.74	30.55	-	-	Peak
2390	40.8	-13.2	54	40.06	32.02	4.58	35.86	100	25	Average
2390	53.89	-20.11	74	53.15	32.02	4.58	35.86	100	25	Peak
2437	96.35	-	-	95.52	32.06	4.61	35.84	100	25	Average
2437	109.07	-	-	108.24	32.06	4.61	35.84	100	25	Peak
2484	39.36	-14.64	54	38.44	32.09	4.64	35.81	100	25	Average
2484	52.43	-21.57	74	51.51	32.09	4.64	35.81	100	25	Peak
4874	39.27	-14.73	54	57.28	33.82	6.53	58.36	100	336	Average
4874	52.12	-21.88	74	70.13	33.82	6.53	58.36	100	336	Peak

Test Mode :	Mode 7	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
30.54	20.48	-19.52	40	32.2	19.12	0.71	31.55	119	200	Peak
47.01	18.53	-21.47	40	40.15	9.15	0.79	31.56	-	-	Peak
104.52	20.4	-23.1	43.5	40.13	10.7	1.12	31.55	-	-	Peak
419	18.47	-27.53	46	31.01	16.57	2.06	31.17	-	-	Peak
568.8	21.45	-24.55	46	30.04	19.97	2.36	30.92	-	-	Peak
743.1	23.43	-22.57	46	28.92	22.33	2.74	30.56	-	-	Peak
2388	35.88	-18.12	54	35.16	32.02	4.58	35.88	101	115	Average
2388	47.86	-26.14	74	47.14	32.02	4.58	35.88	101	115	Peak
2462	90.51	-	-	89.65	32.07	4.62	35.83	101	115	Average
2462	104.31	-	-	103.45	32.07	4.62	35.83	101	115	Peak
2483.66	44.63	-9.37	54	43.71	32.09	4.64	35.81	101	115	Average
2483.66	62.93	-11.07	74	62.01	32.09	4.64	35.81	101	115	Peak
4924	44.1	-29.9	74	61.99	33.81	6.56	58.26	100	0	Peak

Test Mode :	Mode 7	Temperature :	22~24℃
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
46.74	34.77	-5.23	40	55.98	9.57	0.78	31.56	100	174	Peak
103.17	18.64	-24.86	43.5	38.71	10.38	1.11	31.56	-	-	Peak
136.92	21.43	-22.07	43.5	40.33	11.36	1.25	31.51	-	-	Peak
423.2	16.85	-29.15	46	29.32	16.63	2.07	31.17	-	-	Peak
623.4	21.22	-24.78	46	29	20.54	2.5	30.82	-	-	Peak
758.5	24.17	-21.83	46	29.63	22.32	2.76	30.54	-	-	Peak
2390	38.77	-15.23	54	38.03	32.02	4.58	35.86	100	27	Average
2390	52.56	-21.44	74	51.82	32.02	4.58	35.86	100	27	Peak
2462	95.91	-	-	95.05	32.07	4.62	35.83	100	27	Average
2462	109.63	-	-	108.77	32.07	4.62	35.83	100	27	Peak
2483.66	49.54	-4.46	54	48.62	32.09	4.64	35.81	100	27	Average
2483.66	67.65	-6.35	74	66.73	32.09	4.64	35.81	100	27	Peak
4924	38.34	-15.66	54	56.23	33.81	6.56	58.26	100	335	Average
4924	51.26	-22.74	74	69.16	33.81	6.55	58.26	100	335	Peak

<Sample 2>

Test Mode :	Mode 8	Temperature :	22~24℃
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
31.35	21.03	-18.97	40	32.75	19.12	0.71	31.55	175	223	Peak
103.44	20.13	-23.37	43.5	40.04	10.54	1.11	31.56	-	-	Peak
155.82	17.38	-26.12	43.5	36.74	10.82	1.32	31.5	-	-	Peak
338.5	16.79	-29.21	46	32.17	14.05	1.87	31.3	-	-	Peak
553.4	20.53	-25.47	46	29.13	20	2.34	30.94	-	-	Peak
759.9	23.69	-22.31	46	29.15	22.31	2.77	30.54	-	-	Peak
2336	35.43	-18.57	54	34.8	31.98	4.55	35.9	109	26	Average
2336	47.33	-26.67	74	46.7	31.98	4.55	35.9	109	26	Peak
2462	93.19	-	-	92.33	32.07	4.62	35.83	109	26	Average
2462	106.16	-	-	105.3	32.07	4.62	35.83	109	26	Peak
2488.41	46.44	-7.56	54	45.51	32.1	4.64	35.81	109	26	Average
2488.41	68.13	-5.87	74	67.2	32.1	4.64	35.81	109	26	Peak
4924	43.85	-30.15	74	61.74	33.81	6.56	58.26	100	0	Peak

Test Mode :	Mode 8	Temperature :	22~24℃
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
40.53	34.23	-5.77	40	52.28	12.72	0.75	31.52	103	152	Peak
46.47	33.45	-6.55	40	54.66	9.57	0.78	31.56	-	-	Peak
136.92	23.73	-19.77	43.5	42.63	11.36	1.25	31.51	-	-	Peak
440.7	17.35	-28.65	46	29.49	16.9	2.12	31.16	-	-	Peak
593.3	20.93	-25.07	46	29.56	19.84	2.41	30.88	-	-	Peak
749.4	23.78	-22.22	46	29.17	22.4	2.75	30.54	-	-	Peak
2312	35.57	-18.43	54	35.01	31.95	4.53	35.92	100	311	Average
2312	47.18	-26.82	74	46.62	31.95	4.53	35.92	100	311	Peak
2462	93	-	-	92.14	32.07	4.62	35.83	100	311	Average
2462	105.9	-	-	105.04	32.07	4.62	35.83	100	311	Peak
2483.5	48.64	-5.36	54	47.72	32.09	4.64	35.81	100	311	Average
2483.5	70.12	-3.88	74	69.2	32.09	4.64	35.81	100	311	Peak
4924	44.52	-29.48	74	62.41	33.81	6.56	58.26	100	0	Peak

<Sample 1>

Test Mode :	Mode 9	Temperature :	22~24℃
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
30	20.05	-19.95	40	31.11	19.8	0.7	31.56	125	214	Peak
115.32	19.64	-23.86	43.5	38.18	11.8	1.18	31.52	-	-	Peak
217.11	14.13	-31.87	46	34.81	9.27	1.53	31.48	-	-	Peak
414.8	17.02	-28.98	46	29.69	16.45	2.05	31.17	-	-	Peak
560.4	22.15	-23.85	46	30.47	20.26	2.35	30.93	-	-	Peak
783	24.3	-21.7	46	29.99	22.05	2.8	30.54	-	-	Peak
2387.52	40.4	-13.6	54	39.68	32.02	4.58	35.88	100	278	Average
2387.52	57.22	-16.78	74	56.5	32.02	4.58	35.88	100	278	Peak
2412	89.49	-	-	88.73	32.03	4.59	35.86	100	278	Average
2412	102.3	-	-	101.54	32.03	4.59	35.86	100	278	Peak
2498	35.64	-18.36	54	34.7	32.1	4.64	35.8	100	278	Average
2498	47.7	-26.3	74	46.76	32.1	4.64	35.8	100	278	Peak
4824	44.24	-29.76	74	62.36	33.83	6.51	58.46	100	0	Peak

Test Mode :	Mode 9	Temperature :	22~24℃
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
46.47	34.79	-5.21	40	56	9.57	0.78	31.56	103	33	Peak
103.71	18.54	-24.96	43.5	38.45	10.54	1.11	31.56	-	-	Peak
135.84	20.99	-22.51	43.5	39.87	11.38	1.25	31.51	-	-	Peak
421.1	17.04	-28.96	46	29.53	16.61	2.07	31.17	-	-	Peak
559	20.52	-25.48	46	28.86	20.25	2.35	30.94	-	-	Peak
757.8	23.42	-22.58	46	28.87	22.33	2.76	30.54	-	-	Peak
2389.61	48.84	-5.16	54	48.12	32.02	4.58	35.88	103	21	Average
2389.61	69.15	-4.85	74	68.43	32.02	4.58	35.88	103	21	Peak
2412	95.58	-	-	94.82	32.03	4.59	35.86	103	21	Average
2412	108.73	-	-	107.97	32.03	4.59	35.86	103	21	Peak
2494	36.8	-17.2	54	35.86	32.1	4.64	35.8	103	21	Average
2494	48.56	-25.44	74	47.62	32.1	4.64	35.8	103	21	Peak
4824	37.98	-16.02	54	56.1	33.83	6.51	58.46	100	338	Average
4824	53.21	-20.79	74	71.33	33.83	6.51	58.46	100	338	Peak

Test Mode :	Mode 10	Temperature :	22~24℃
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
30	20.03	-19.97	40	31.09	19.8	0.7	31.56	114	308	Peak
47.28	17.72	-22.28	40	39.34	9.15	0.79	31.56	-	-	Peak
116.4	19.48	-24.02	43.5	38.02	11.8	1.18	31.52	-	-	Peak
413.4	16.67	-29.33	46	29.4	16.39	2.05	31.17	-	-	Peak
559.7	20.58	-25.42	46	28.86	20.3	2.35	30.93	-	-	Peak
756.4	23.78	-22.22	46	29.22	22.34	2.76	30.54	-	-	Peak
2382	36.29	-17.71	54	35.59	32	4.58	35.88	102	128	Average
2382	47.44	-26.56	74	46.74	32	4.58	35.88	102	128	Peak
2437	91.25	-	-	90.42	32.06	4.61	35.84	102	128	Average
2437	103.42	-	-	102.59	32.06	4.61	35.84	102	128	Peak
2490	37.08	-16.92	54	36.15	32.1	4.64	35.81	102	128	Average
2490	48.67	-25.33	74	47.74	32.1	4.64	35.81	102	128	Peak
4874	43.84	-30.16	74	61.85	33.82	6.53	58.36	100	0	Peak

Test Mode :	Mode 10	Temperature :	22~24℃
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
41.07	33.4	-6.6	40	51.45	12.72	0.75	31.52	-	-	Peak
45.93	33.55	-6.45	40	54.35	9.98	0.78	31.56	103	152	Peak
136.65	21.52	-21.98	43.5	40.42	11.36	1.25	31.51	-	-	Peak
390.3	17.17	-28.83	46	30.89	15.5	1.99	31.21	-	-	Peak
623.4	22.46	-23.54	46	30.24	20.54	2.5	30.82	-	-	Peak
806.1	24.05	-21.95	46	29.59	22.16	2.84	30.54	-	-	Peak
2390	41.26	-12.74	54	40.52	32.02	4.58	35.86	101	24	Average
2390	56.07	-17.93	74	55.33	32.02	4.58	35.86	101	24	Peak
2437	96.5	-	-	95.67	32.06	4.61	35.84	101	24	Average
2437	109.03	-	-	108.2	32.06	4.61	35.84	101	24	Peak
2484	39.59	-14.41	54	38.67	32.09	4.64	35.81	101	24	Average
2484	51.95	-22.05	74	51.03	32.09	4.64	35.81	101	24	Peak
4874	38.68	-15.32	54	56.69	33.82	6.53	58.36	100	336	Average
4874	52.01	-21.99	74	70.02	33.82	6.53	58.36	100	336	Peak

Test Mode :	Mode 11	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
30.54	20.06	-19.94	40	31.78	19.12	0.71	31.55	124	141	Peak
110.19	19.48	-24.02	43.5	38.55	11.3	1.15	31.52	-	-	Peak
207.39	13.41	-30.09	43.5	34.21	9.17	1.49	31.46	-	-	Peak
397.3	17.15	-28.85	46	30.43	15.9	2.01	31.19	-	-	Peak
570.9	20.67	-25.33	46	29.33	19.89	2.37	30.92	-	-	Peak
752.9	24.14	-21.86	46	29.56	22.37	2.75	30.54	-	-	Peak
2372	35.64	-18.36	54	34.95	32	4.57	35.88	100	127	Average
2372	47.12	-26.88	74	46.43	32	4.57	35.88	100	127	Peak
2462	90.98	-	-	90.12	32.07	4.62	35.83	100	127	Average
2462	103.27	-	-	102.41	32.07	4.62	35.83	100	127	Peak
2484.04	43.14	-10.86	54	42.22	32.09	4.64	35.81	100	127	Average
2484.04	62.32	-11.68	74	61.4	32.09	4.64	35.81	100	127	Peak
4924	44.03	-29.97	74	61.93	33.81	6.55	58.26	100	0	Peak

Test Mode :	Mode 11	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
40.8	33.68	-6.32	40	51.73	12.72	0.75	31.52	109	107	Peak
46.2	33.24	-6.76	40	54.45	9.57	0.78	31.56	-	-	Peak
135.84	21.19	-22.31	43.5	40.07	11.38	1.25	31.51	-	-	Peak
396.6	16.63	-29.37	46	29.97	15.85	2	31.19	-	-	Peak
574.4	20.98	-25.02	46	29.66	19.86	2.37	30.91	-	-	Peak
742.4	24.02	-21.98	46	29.54	22.32	2.73	30.57	-	-	Peak
2390	38.61	-15.39	54	37.87	32.02	4.58	35.86	100	27	Average
2390	52.09	-21.91	74	51.35	32.02	4.58	35.86	100	27	Peak
2462	95.87	-	-	95.01	32.07	4.62	35.83	100	27	Average
2462	109.49	-	-	108.63	32.07	4.62	35.83	100	27	Peak
2483.66	48.77	-5.23	54	47.85	32.09	4.64	35.81	100	27	Average
2483.66	69.06	-4.94	74	68.14	32.09	4.64	35.81	100	27	Peak
4924	37.86	-16.14	54	55.75	33.81	6.56	58.26	100	333	Average
4924	51.17	-22.83	74	69.06	33.81	6.56	58.26	100	333	Peak

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	Agilent	E4446A	MY50180136	3Hz~44GHz	Apr. 03, 2011	Feb. 06, 2012 ~ Feb. 10, 2012	Apr. 02, 2012	Conducted (TH02-HY)
EMI Test Receiver	R&S	ESCI 7	100724	9kHz~7GHz	Aug. 22, 2011	Feb. 18, 2012	Aug. 21, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz~30MHz	Dec. 09, 2011	Feb. 18, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz~30MHz	Dec. 06, 2011	Feb. 18, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000 W	N/A	N/A	N/A	Feb. 18, 2012	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 21, 2011	Feb. 18, 2012	Oct. 20, 2012	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	Feb. 18, 2012	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz~30GHz	Nov. 03, 2011	Feb. 17, 2012 ~ Feb. 24, 2012	Nov. 02, 2012	Radiation (03CH05-HY)
COM-POWER	Double Ridge Horn	AH-118	701030	1GHz~18GHz	N/A	Feb. 17, 2012 ~ Feb. 24, 2012	N/A	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz~1GHz	Oct. 22, 2011	Feb. 17, 2012 ~ Feb. 24, 2012	Oct. 21, 2012	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 - 360 degree	N/A	Feb. 17, 2012 ~ Feb. 24, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m~4 m	N/A	Feb. 17, 2012 ~ Feb. 24, 2012	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz~18GHz	Aug. 04, 2011	Feb. 17, 2012 ~ Feb. 24, 2012	Aug. 03, 2012	Radiation (03CH05-HY)
COM-POWER	COM-POWER	PA-103	161075	1KHz~1GHz	Mar. 29, 2011	Feb. 17, 2012 ~ Feb. 24, 2012	Mar. 28, 2012	Radiation (03CH05-HY)
Pre Amplifier	EMCI	EMC05184 5	SN980048	1GHz~18GHz	Jul. 19, 2011	Feb. 17, 2012 ~ Feb. 24, 2012	Jul. 18, 2012	Radiation (03CH05-HY)
Pre Amplifier	EMCI	EMC05184 5	SN980048	1GHz~18GHz	Jul. 18, 2011	Feb. 17, 2012 ~ Feb. 24, 2012	Jul. 17, 2012	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz~26.5GHz	Apr. 14, 2011	Feb. 17, 2012 ~ Feb. 24, 2012	Apr. 13, 2012	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Feb. 17, 2012 ~ Feb. 24, 2012	Jul. 28, 2012	Radiation (03CH05-HY)

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 $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	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 $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	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 $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				