FCC/IC Test Report

APPLICANT	:	Hon Hai Precision Industry Co., Ltd.
EQUIPMENT	:	802.11a/b/g/n/ac 2T2R WLAN Module
BRAND NAME	:	Foxconn
MODEL NAME	:	WFUR6
FCC ID	:	RX3-WFUR6
IC	:	2878F-WFUR6
STANDARD	:	FCC 47 CFR FCC Part 15 Subpart B ICES-003 Issue 5
CLASSIFICATION	:	Certification

The product was received on Feb. 06, 2014 and testing was completed on Feb. 26, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2009 and shown to be compliant 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.

Louis Wu

Reviewed by: Louis Wu / Manager

Jones Tsai

Approved by: Jones Tsai / Manager

Testing Laboratory 1190

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
FC420682	Rev. 01	Initial issue of report	Mar. 28, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.107	ICES003 Section 6.1	AC Conducted Emission	< 15.107 limits < ICES003 6.1 limits	PASS	Under limit 10.80 dB at 0.174 MHz
3.2	15.109	ICES003 Section 6.2	Radiated Emission	< 15.109 limits < ICES003 6.2 limits	PASS	Under limit 14.65 dB at 909.000 MHz

1. General Description

1.1. Applicant

Hon Hai Precision Industry Co., Ltd.
No. 151, Sec. 1, Nankan Rd., Lujhu Township, Taoyuan County 33859, Taiwan (R.O.C.)

1.2. Manufacturer

Hon Hai Precision Industry Co., Ltd.
No. 151, Sec. 1, Nankan Rd., Lujhu Township, Taoyuan County 33859, Taiwan (R.O.C.)

1.3. Feature of Equipment Under Test

Product Feature	
Equipment	802.11a/b/g/n/ac 2T2R WLAN Module
Brand Name	Foxconn
Model Name	WFUR6
FCC ID	RX3-WFUR6
IC	2878F-WFUR6
EUT supports Radios application	WLAN 11abgn (HT20/HT40) WLAN 11ac (VHT20/VHT40/VHT80)
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. Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz ; 5745 MHz ~ 5825 MHz
Rx Frequency	802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz ; 5745 MHz ~ 5825 MHz
Type of Modulation	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

Antenna Information			
Antenna 1 (Vizio_P60)	**Manufacturer**	Hon Hai Precision Industry Co., Ltd.	
	Antenna Type	Main : PIFA Antenna	Aux. : PIFA Antenna
	Peak Gain	Main : WLAN (2.4GHz): 3.42dBi WLAN (5GHz Band1): 1.5dBi WLAN (5GHz Band2): 1.5dBi WLAN (5GHz Band3): 1.19dBi WLAN (5GHz Band4): 3.86dBi	Aux. : WLAN (2.4GHz): 2.62dBi WLAN (5GHz Band1): 2.48dBi WLAN (5GHz Band2): 2.48dBi WLAN (5GHz Band3): 2.75dBi WLAN (5GHz Band4): 1.91dBi
	Antenna No.	Main : FX5526-11-001-C-TB00	Aux. : FX5526-11-002-C-TB00
Antenna 2 (Vizio_P70)	**Manufacturer**	Hon Hai Precision Industry Co., Ltd.	
	Antenna Type	Main : PIFA Antenna	Aux. : PIFA Antenna
	Peak Gain	Main : WLAN (2.4GHz): 3.33dBi WLAN (5GHz Band1): 2.42dBi WLAN (5GHz Band2): 2.42dBi WLAN (5GHz Band3): 2.31dBi WLAN (5GHz Band4): -0.7dBi	Aux. : WLAN (2.4GHz): 3.47dBi WLAN (5GHz Band1): 4.66dBi WLAN (5GHz Band2): 4.66dBi WLAN (5GHz Band3): 3.57dBi WLAN (5GHz Band4): 3.34dBi
	Antenna No.	Main : FX5541-11-001-C-TB00	Aux. : FX5541-11-002-C-TB00

1.5. Modification of EUT

No modifications are made to the EUT during all test items.

1.6. Test Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO05-HY	03CH06-HY	TW1022/4086B-1

1.7. Applied Standards

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

- FCC 47 CFR FCC Part 15 Subpart B
- ANSI C63.4-2009
- IC ICES-003 Issue 5
- IC RSS-Gen Issue 3
- NOTICE 2012-DRS0126

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The test results for FCC compliance, indicating that these results are deemed satisfactory evidence of compliance with Industry Canada Interference-Causing Equipment Standard ICES-003.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, " Receivers Excluded from Industry Canada Requirements", only radiocommunication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

2. Test Configuration of Equipment Under Test

2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2009 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The EUT uses a USB interface and microprocessor operating 40MHz which is the maximum frequency used.

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

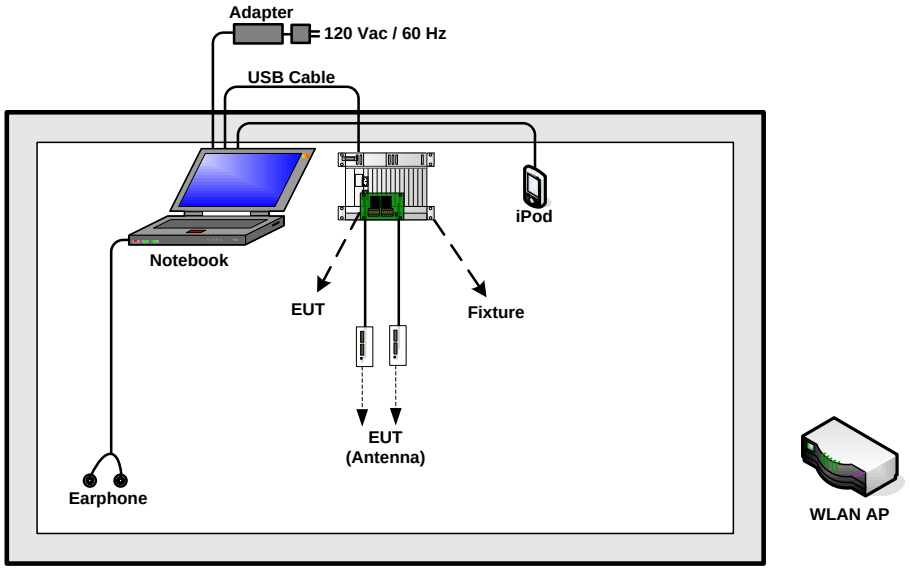
Item	EUT Configuration	Test Condition		
		EMI AC	EMI RE<1G	EMI RE≥1G
1.	Charging Mode (EUT with notebook)	☒	☒	☒

Abbreviations:

- EMI AC: AC conducted emissions
- EMI RE ≥ 1G: EUT radiated emissions ≥ 1GHz
- EMI RE < 1G: EUT radiated emissions < 1GHz

Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1	Mode 1: WLAN (2.4GHz) Idle + USB Cable (Charging by Notebook) Mode 2: WLAN (5GHz) Idle + USB Cable (Charging by Notebook)
Radiated Emissions < 1GHz	1	Mode 1: WLAN (2.4GHz) Idle + USB Cable (Charging by Notebook) Mode 2: WLAN (5GHz) Idle + USB Cable (Charging by Notebook)
Radiated Emissions ≥ 1GHz	1	Mode 1: WLAN (2.4GHz) Idle + USB Cable (Charging by Notebook)

2.2. Connection Diagram of Test System



2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
4.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
5.	Fixture	NA	1P-112BJ00-20SB	NA	NA	NA

2.4. EUT Operation Test Setup

The EUT was attached to the WLAN AP or notebook.

3. Test Result

3.1. Test of AC Conducted Emission Measurement

3.1.1 Limits 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.

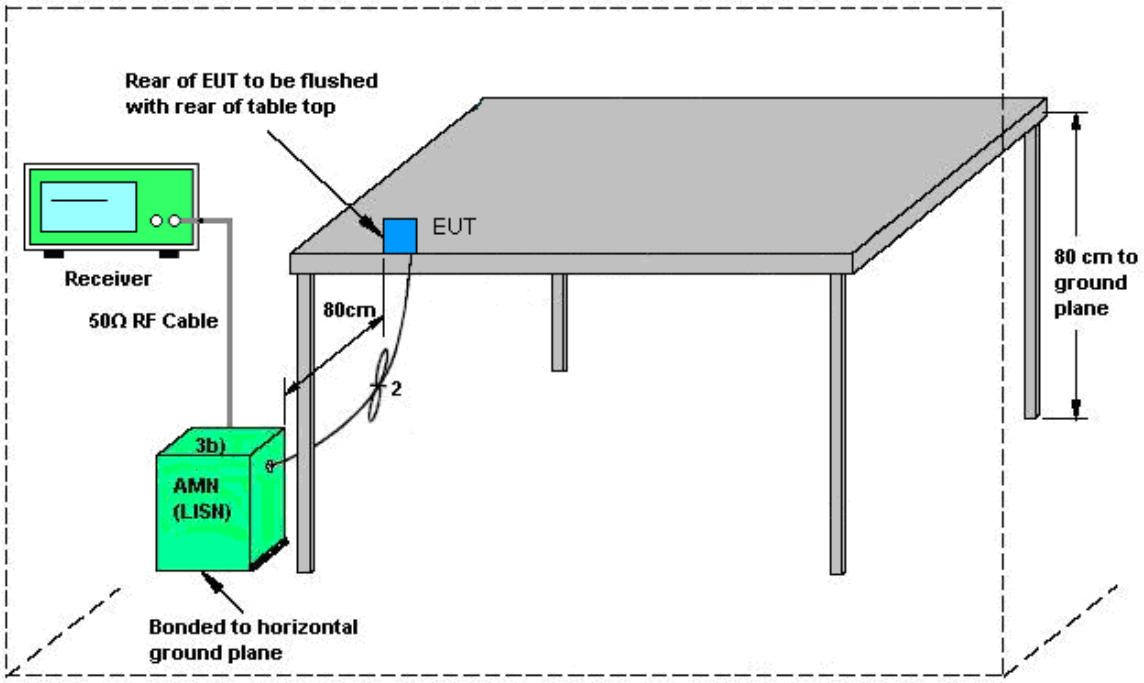
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedure

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

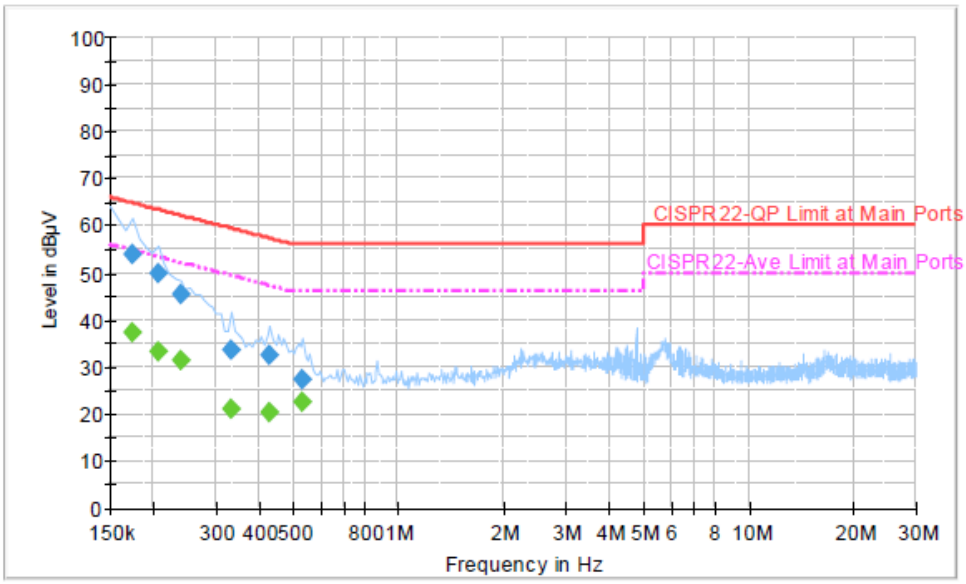
3.1.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.1.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	20~22℃
Test Engineer :	Cosmo Xu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (5GHz) Idle + USB Cable (Charging by Notebook)		



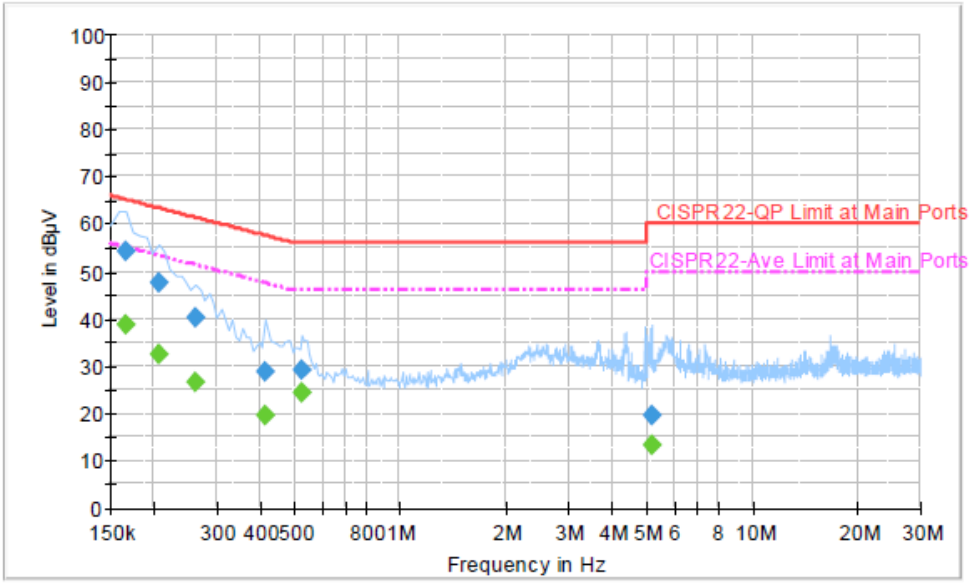
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	54.0	Off	L1	19.3	10.8	64.8
0.206000	49.8	Off	L1	19.3	13.6	63.4
0.238000	45.5	Off	L1	19.3	16.7	62.2
0.334000	33.4	Off	L1	19.4	26.0	59.4
0.430000	32.4	Off	L1	19.6	24.9	57.3
0.534000	27.4	Off	L1	19.5	28.6	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	37.4	Off	L1	19.3	17.4	54.8
0.206000	33.0	Off	L1	19.3	20.4	53.4
0.238000	31.2	Off	L1	19.3	21.0	52.2
0.334000	21.1	Off	L1	19.4	28.3	49.4
0.430000	20.4	Off	L1	19.6	26.9	47.3
0.534000	22.6	Off	L1	19.5	23.4	46.0

Test Mode :	Mode 2	Temperature :	20~22℃
Test Engineer :	Cosmo Xu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (5GHz) Idle + USB Cable (Charging by Notebook)		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	54.3	Off	N	19.3	10.9	65.2
0.206000	47.6	Off	N	19.3	15.8	63.4
0.262000	40.1	Off	N	19.6	21.3	61.4
0.414000	28.9	Off	N	19.6	28.7	57.6
0.526000	29.2	Off	N	19.6	26.8	56.0
5.174000	19.5	Off	N	19.5	40.5	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	38.8	Off	N	19.3	16.4	55.2
0.206000	32.5	Off	N	19.3	20.9	53.4
0.262000	26.6	Off	N	19.6	24.8	51.4
0.414000	19.7	Off	N	19.6	27.9	47.6
0.526000	24.2	Off	N	19.6	21.8	46.0
5.174000	13.2	Off	N	19.5	36.8	50.0

3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2. Measuring Instruments

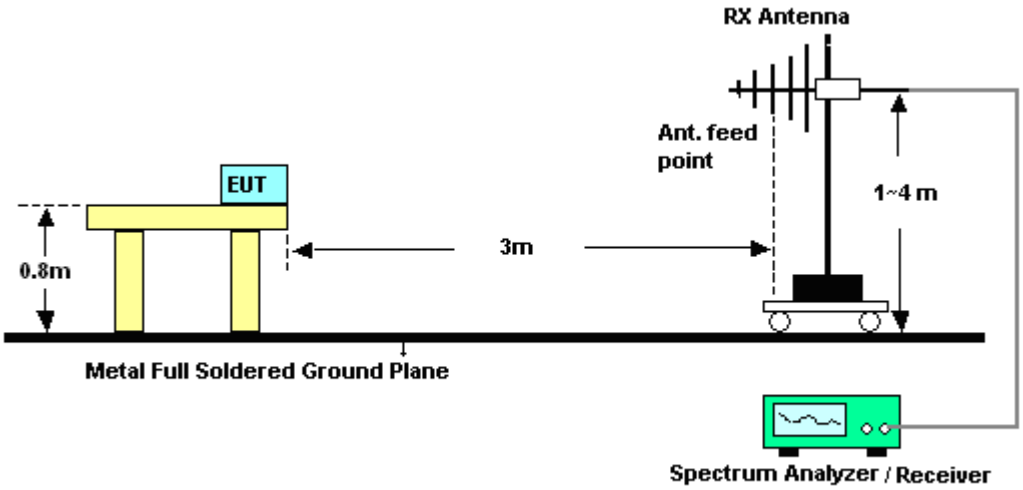
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

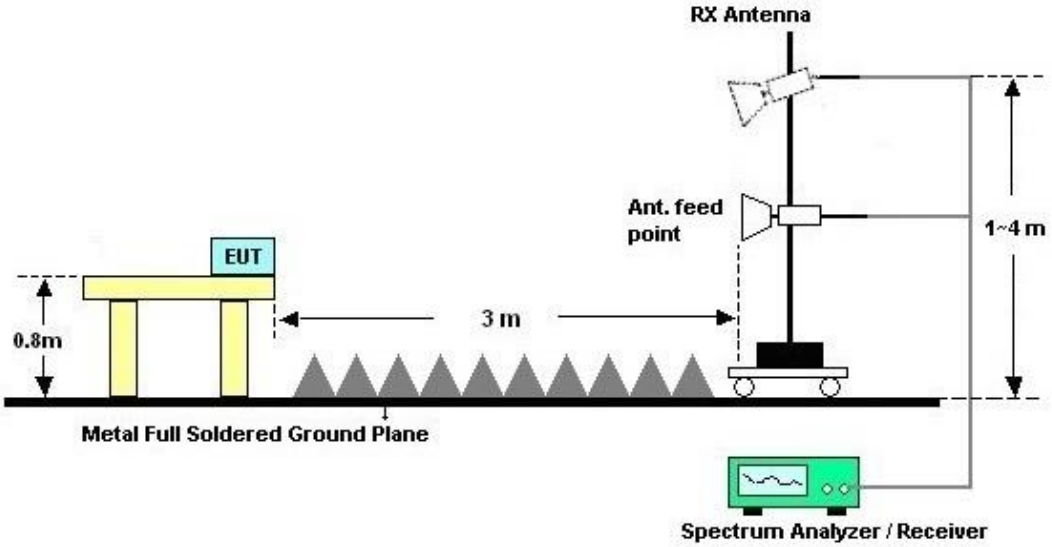
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz

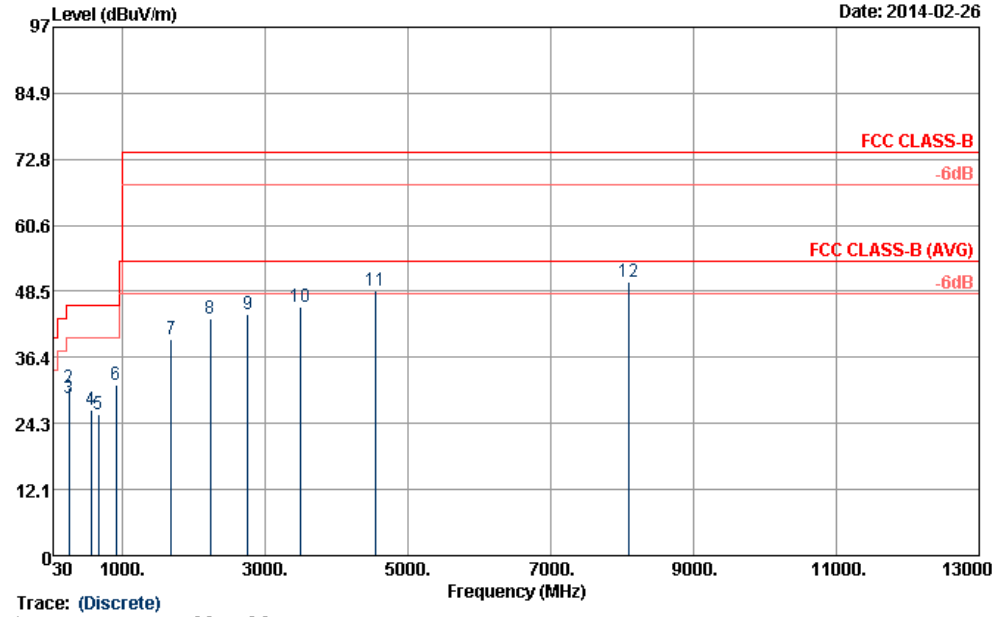


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

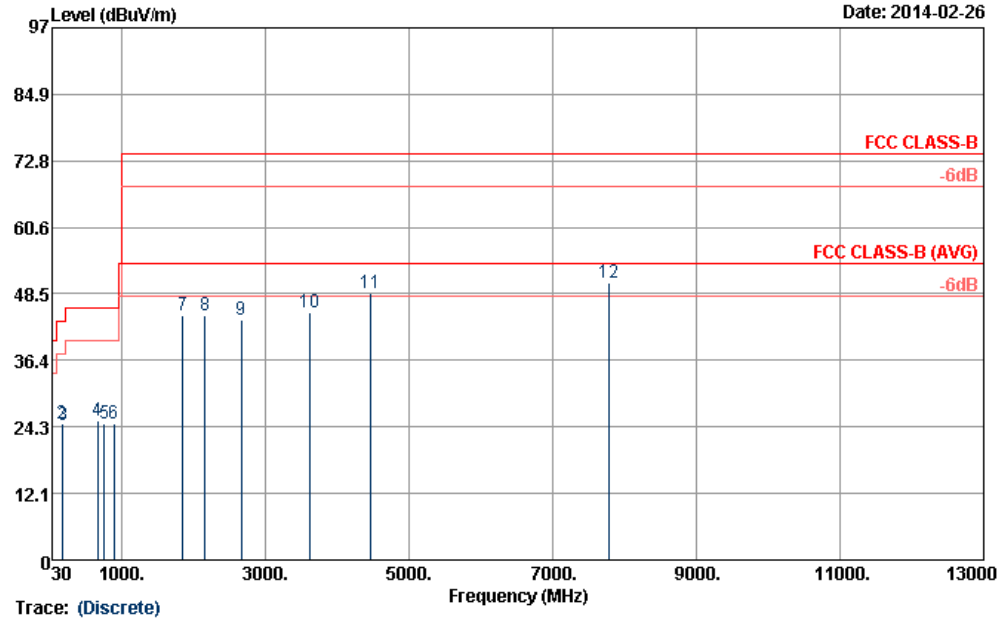
Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Marlboro Hsu	Relative Humidity :	47~49%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	WLAN (2.4GHz) Idle + USB Cable (Charging by Notebook)		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-ANT_583_130802 HORIZONTAL
Project : 420682
Power : Form System
Mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	34.86	20.18	-19.82	40.00	35.78	15.50	0.69	31.79	---	---	Peak
2	247.35	30.90	-15.10	46.00	48.79	12.13	1.72	31.74	---	---	Peak
3	253.56	28.96	-17.04	46.00	46.09	12.85	1.75	31.73	---	---	Peak
4	559.00	26.75	-19.25	46.00	36.86	19.32	2.58	32.01	---	---	Peak
5	664.00	26.00	-20.00	46.00	35.75	19.45	2.83	32.03	---	---	Peak
6	909.00	31.35	-14.65	46.00	38.42	21.01	3.37	31.45	100	87	Peak
7	1680.00	39.65	-34.35	74.00	59.28	29.19	5.12	53.94	---	---	Peak
8	2230.00	43.49	-30.51	74.00	59.46	31.78	6.21	53.96	---	---	Peak
9	2762.00	44.28	-29.72	74.00	58.75	32.37	7.11	53.95	---	---	Peak
10	3488.00	45.58	-28.42	74.00	58.85	32.80	8.03	54.10	---	---	Peak
11	4554.00	48.58	-25.42	74.00	59.02	34.57	10.08	55.09	---	---	Peak
12	8098.00	50.18	-23.82	74.00	59.45	35.60	10.93	55.80	100	17	Peak

Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Marlboro Hsu	Relative Humidity :	47~49%
Test Distance :	3m	Polarization :	Vertical
Function Type :	WLAN (2.4GHz) Idle + USB Cable (Charging by Notebook)		



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-ANT_583_130802 VERTICAL
Project : 420682
Power : Form System
Mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	32.16	24.54	-15.46	40.00	38.37	17.30	0.66	31.79	100	23	Peak
2	169.05	24.84	-18.66	43.50	45.16	9.82	1.61	31.75	---	---	Peak
3	175.26	24.48	-19.02	43.50	45.15	9.55	1.53	31.75	---	---	Peak
4	665.40	25.53	-20.47	46.00	35.28	19.45	2.83	32.03	---	---	Peak
5	756.40	24.80	-21.20	46.00	33.53	20.20	3.05	31.98	---	---	Peak
6	889.40	24.85	-21.15	46.00	32.19	20.90	3.34	31.58	---	---	Peak
7	1846.00	44.46	-29.54	74.00	62.46	30.46	5.51	53.97	---	---	Peak
8	2156.00	44.60	-29.40	74.00	60.74	31.72	6.11	53.97	---	---	Peak
9	2666.00	43.81	-30.19	74.00	58.59	32.23	6.92	53.93	---	---	Peak
10	3608.00	45.20	-28.80	74.00	58.31	32.92	8.24	54.27	---	---	Peak
11	4464.00	48.65	-25.35	74.00	59.17	34.52	9.95	54.99	---	---	Peak
12	7786.00	50.65	-23.35	74.00	59.94	35.56	10.94	55.79	100	241	Peak

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 15, 2013	Feb. 26, 2014	Nov. 14, 2014	Conduction (CO05-HY)
LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2013	Feb. 26, 2014	Dec. 11, 2014	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 04, 2013	Feb. 26, 2014	Dec. 03, 2014	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Feb. 26, 2014	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	FSP30	101067	9kHz ~ 30GHz	Nov. 20, 2013	Feb. 26, 2014	Nov. 19, 2014	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9kHz ~ 26.5GHz	Dec. 02, 2013	Feb. 26, 2014	Dec. 01, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2013	Feb. 26, 2014	May 05, 2014	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL6112B	2885	30MHz ~ 2GHz	Oct. 10, 2013	Feb. 26, 2014	Oct. 09, 2014	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 02, 2013	Feb. 26, 2014	Aug. 01, 2014	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz ~ 1GHz	Apr. 12, 2013	Feb. 26, 2014	Apr. 11, 2014	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2013	Feb. 26, 2014	Jul. 17, 2014	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	Feb. 26, 2014	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Feb. 26, 2014	N/A	Radiation (03CH06-HY)

5. Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.26**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.50**