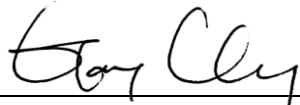


FCC Co-Location Test Report

FCC ID : FDI000000020
Equipment : AirStation
Model No. : WHR-1166D
Brand Name : Buffalo Inc.
Applicant : Buffalo Inc.
Address : Akamon-dori Bldg, 30-20, Ohsu 3-chome,
Naka-ku, Nagoya 460-8315, Japan
Standard : 47 CFR FCC Part 15.247
47 CFR FCC Part 15.407
Received Date : Nov. 02, 2013
Tested Date : Nov. 13, 2013

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:



Gary Chang / Manager



Testing Laboratory
2732

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Release Record

Report No.	Version	Description	Issued Date
FR3N0201	Rev. 01	Initial issue	Dec. 06, 2013

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.247(d) 15.407(b) 15.209	Radiated Emissions	[dBuV/m at 3m]: 500.02MHz 44.64 (Margin -1.36dB) – QP	Pass

1 General Description

1.1 Information

The product has 3 kinds of transformer and DDR. It would be Type A, Type B, and Type C. Please refer to photographs of EUT for more details.

1.1.1 Specification of the Equipment under Test (EUT)

FCC ID	FDI000000020
Operating Frequency	802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz, 5745 MHz ~ 5825 MHz
Modulation Type	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n/ac : OFDM (BPSK / QPSK / 16QAM / 64QAM)
Note: 2.4 and 5GHz can transmit simultaneously	

1.1.2 Antenna Details

Ant. No.	Type	Operating Frequency / Gain (dBi)			Connector
		2400~2483.5 MHz	5150~5250 MHz	5725-5850 MHz	
1	PCB	2.6	2.07	3.27	AYU
2	PCB	3.4	2.99	3.40	AYU

1.2 The Equipment List

Test Item	Radiated Emission above 1GHz				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
3m semi-anechoic chamber	CHAMPRO	SAC-03	03CH01-WS	Jan. 04, 2013	Jan. 03, 2014
Spectrum Analyzer	R&S	FSV40	101498	Jan. 24, 2013	Jan. 23, 2014
Receiver	R&S	ESR3	101658	Jan. 28, 2013	Jan. 27, 2014
Spectrum Analyzer	R&S	FSV 40	101063	Feb. 18, 2013	Feb. 17, 2014
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jan. 11, 2013	Jan. 10, 2014
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Feb. 18, 2013	Feb. 17, 2014
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014
Amplifier	Burgeon	BPA-530	100219	Nov. 28, 2012	Nov. 27, 2013
Amplifier	Agilent	83017A	MY39501308	Dec. 18, 2012	Dec. 17, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-001	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-002	Dec. 25, 2012	Dec. 24, 2013
control	EM Electronics	EM1000	60612	N/A	N/A
Note: Calibration Interval of instruments listed above is one year.					

Loop Antenna	R&S	HFH2-Z2	100330	Nov. 15, 2012	Nov. 14, 2014
Amplifier	MITEQ	AMF-6F-260400	9121372	Apr. 19, 2013	Apr. 18, 2015
Note: Calibration Interval of instruments listed above is two year.					

1.3 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247

47 CFR FCC Part 15.407

ANSI C63.10-2009

FCC KDB 789033 D01 General UNII Test procedures v01r03

FCC KDB 558074 D01 DTS Meas Guidance v03r01

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Uncertainty	
Parameters	Uncertainty
Radiated emission	±2.49 dB
Conducted emission	±2.946 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
Radiated Emissions	03CH01-WS	24°C / 63%	Haru Yang

- FCC site registration No.: 657002
- IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Data rate (Mbps) / MCS	Test Configuration
Radiated Emissions	2.4G 11n20 CH06 + 5G 11ac VHT20 CH157	MCS 0 + MCS 0	---

3 Transmitter Test Results

3.1 Unwanted Emissions into Restricted Frequency Bands

3.1.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.1.2 Test Procedures

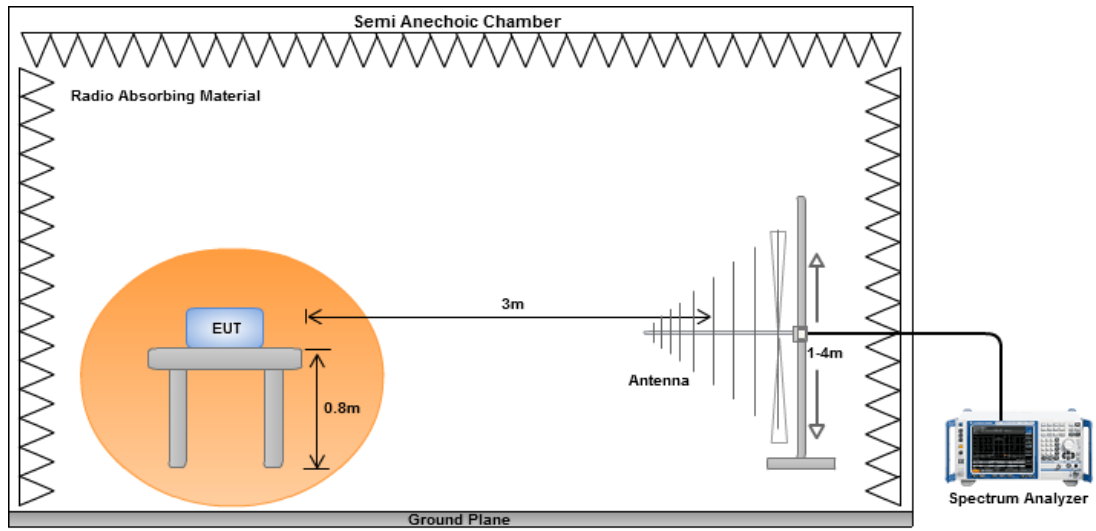
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

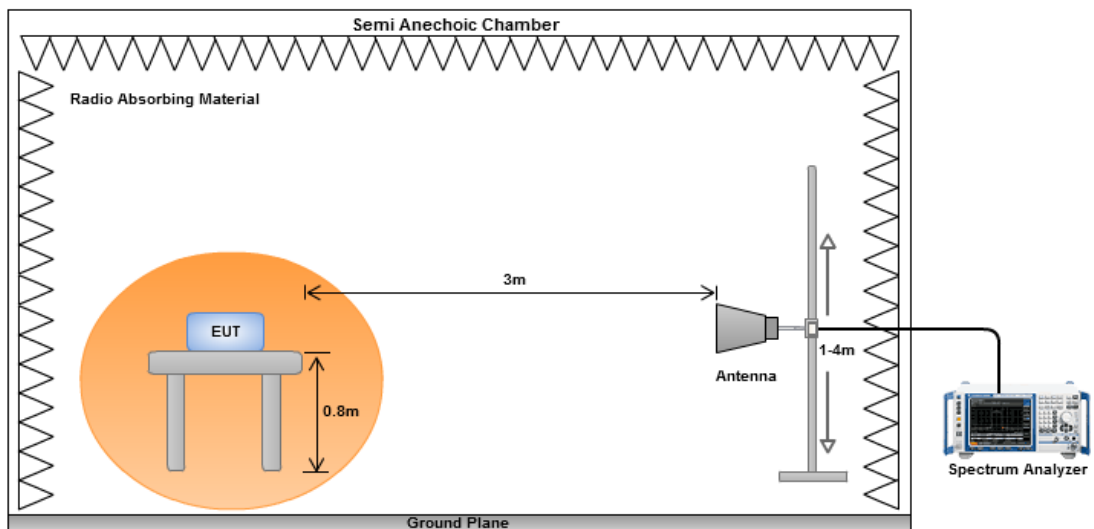
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.1.3 Test Setup

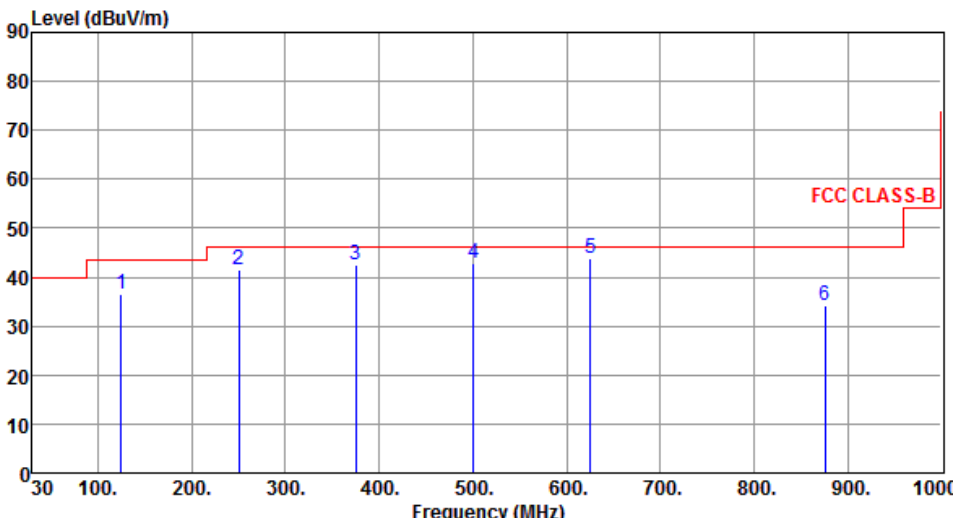
Radiated Emissions below 1 GHz



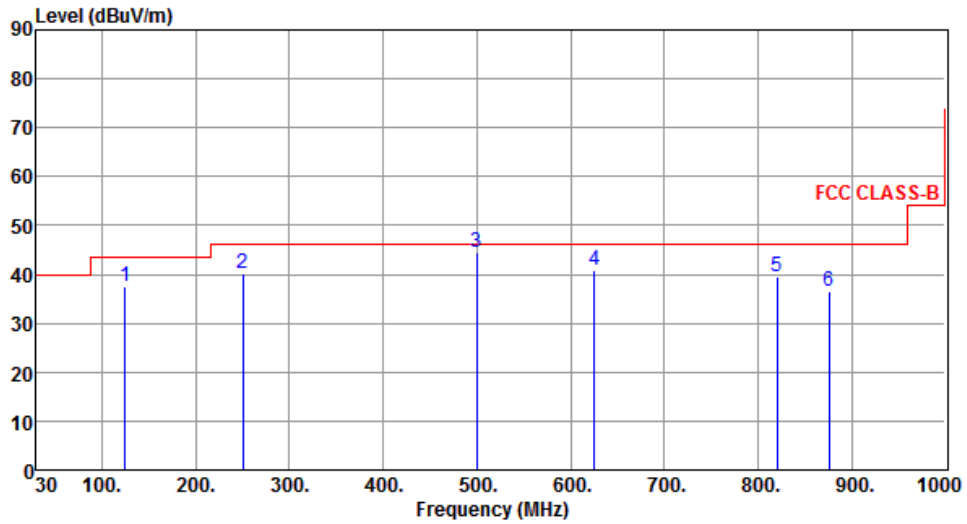
Radiated Emissions above 1 GHz



3.1.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	2.4G 11n20 CH06 + 5G 11ac VHT20 CH157								
Polarization	Horizontal								
 <p>The graph plots Level (dBuV/m) on the y-axis (0 to 90) against Frequency (MHz) on the x-axis (30 to 1000). A red line represents the FCC CLASS-B limit, which is constant at 46 dBuV/m from 30 MHz to 1000 MHz. Six blue vertical lines indicate emission levels at specific frequencies: 1 (125.06 MHz, 36.58 dBuV/m), 2 (250.19 MHz, 41.37 dBuV/m), 3 (375.32 MHz, 42.65 dBuV/m), 4 (500.45 MHz, 42.71 dBuV/m), 5 (625.58 MHz, 43.76 dBuV/m), and 6 (875.84 MHz, 34.28 dBuV/m). All emission levels are below the 46 dBuV/m limit.</p>									
	Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn
	MHz	level	dBuV/m	dB	reading	dB		High	Table
		dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	125.06	36.58	43.50	-6.92	55.20	-18.62	Peak	---	---
2	250.19	41.37	46.00	-4.63	59.24	-17.87	Peak	---	---
3	375.32	42.65	46.00	-3.35	56.87	-14.22	Peak	---	---
4	500.45	42.71	46.00	-3.29	54.27	-11.56	Peak	---	---
5	625.58	43.76	46.00	-2.24	53.13	-9.37	QP	---	---
6	875.84	34.28	46.00	-11.72	40.10	-5.82	Peak	---	---
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).</p>									

Modulation	2.4G 11n20 CH06 + 5G 11ac VHT20 CH157
Polarization	Vertical



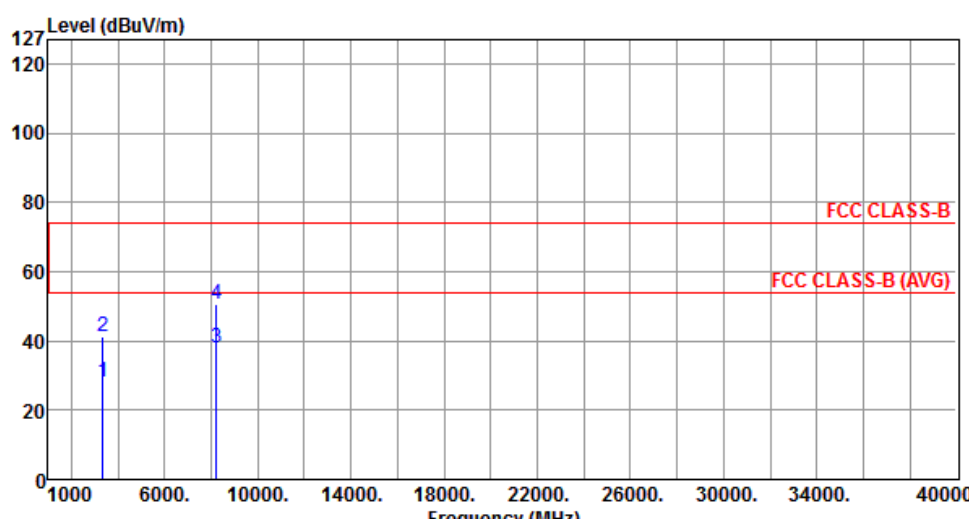
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	125.06	37.38	43.50	-6.12	56.00	-18.62	Peak	---	---
2	250.19	40.33	46.00	-5.67	58.20	-17.87	Peak	---	---
3	500.02	44.64	46.00	-1.36	56.21	-11.57	QP	---	---
4	625.58	40.70	46.00	-5.30	50.07	-9.37	Peak	---	---
5	820.55	39.43	46.00	-6.57	45.93	-6.50	Peak	---	---
6	875.84	36.42	46.00	-9.58	42.24	-5.82	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

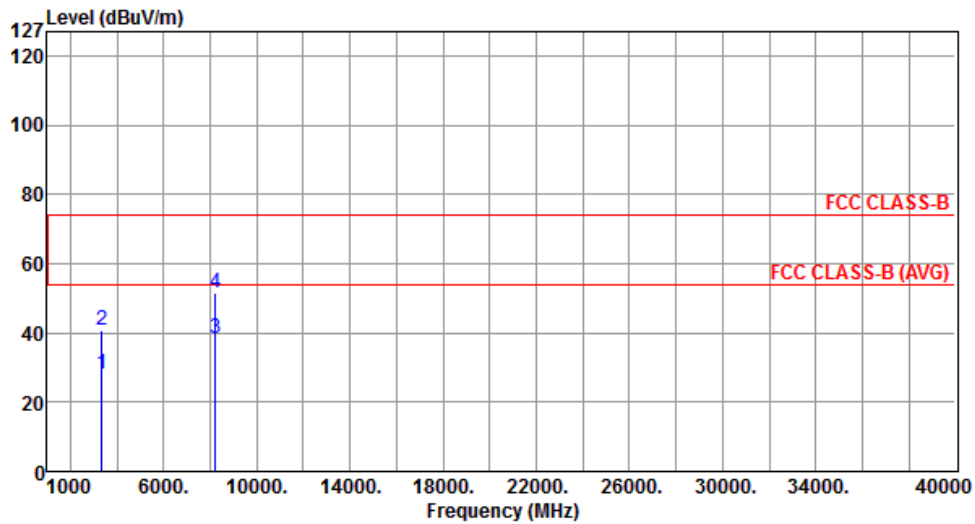
*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.1.5 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation	2.4G 11n20 CH06 + 5G 11ac VHT20 CH157								
Polarization	Horizontal								
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	3348.00	27.98	54.00	-26.02	28.23	-0.25	Average	---	---
2	3348.00	41.12	74.00	-32.88	41.37	-0.25	Peak	---	---
3	8222.00	37.74	54.00	-16.26	27.58	10.16	Average	---	---
4	8222.00	50.83	74.00	-23.17	40.67	10.16	Peak	---	---
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).</p>									

Modulation	2.4G 11n20 CH06 + 5G 11ac VHT20 CH157
Polarization	Vertical



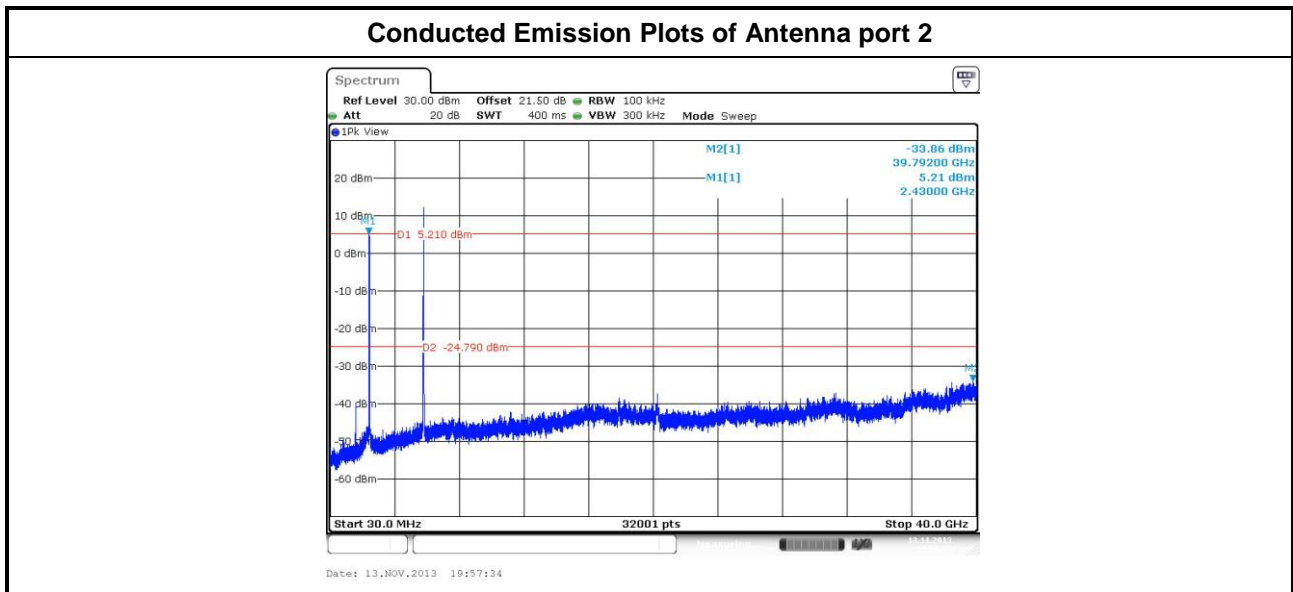
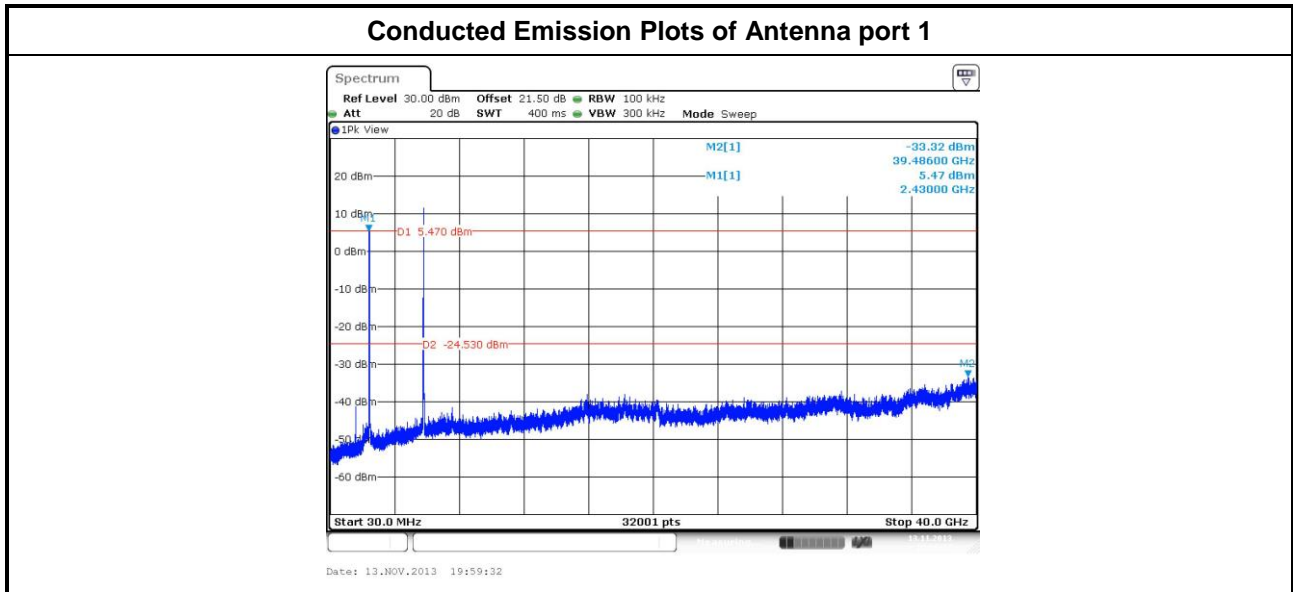
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3348.00	27.93	54.00	-26.07	28.18	-0.25	Average	---	---
2	3348.00	40.96	74.00	-33.04	41.21	-0.25	Peak	---	---
3	8222.00	38.24	54.00	-15.76	28.08	10.16	Average	---	---
4	8222.00	51.70	74.00	-22.30	41.54	10.16	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.1.6 Results for Conducted Emissions (30MHz~40GHz)



4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp, it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

==END==