FCC RADIO TEST REPORT

According to

47 CFR FCC Part 15 Subpart C § 15.225

Equipment	:	**Penta Band WCMDA/HSPA+**
Brand Name	:	**LG**
Model No.	:	**LG-E960**
Marketing Name	:	**LG-E960**
Applicant	:	**LG ELECTRONICS MOBILECOMM U.S.A., INC.**
Manufacturer		1000 SYLVAN AVENU ENGLEWOOD CLIFFS, NEW JERSEY 07632
FCC ID	:	**ZNFE960**
Received Date	:	Nov. 12, 2012
Final Test Date	:	Nov. 21, 2012

Statement

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

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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History of This Test Report

Original Issue Date: Sep. 26, 2012
Report No.: FR291007-01
□ No additional attachment.
■ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description
FR291007-01	Sep. 26, 2012	Original.
FR291007-02	Nov. 21, 2012	PCB layout change for NFC function

CERTIFICATE OF COMPLIANCE

According to

47 CFR FCC Part 15 Subpart C § 15.225

Equipment	:	**Penta Band WCMDA/HSPA+**
Brand Name	:	**LG**
Model No.	:	**LG-E960**
Applicant	:	**LG ELECTRONICS MOBILECOMM U.S.A., INC.**
		1000 SYLVAN AVENU ENGLEWOOD CLIFFS, NEW JERSEY 07632

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Nov. 12, 2012 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Wayne Hsu / Assistant Manager

SPORTON International Inc.

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

1. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
3.1	15.207	AC Power Line Conducted Emissions	Complies	11.31 dB
3.2	15.225(a)	Field Strength of Fundamental Emissions	Complies	76.74 dB
3.3	15.215(c)	20dB Spectrum Bandwidth	Complies	-
3.4	15.225(d)	Radiated Emissions	Complies	1.03 dB
3.5	15.225(e)	Frequency Stability	Complies	-
3.6	15.203	Antenna Requirements	Complies	-

Remark: The “N/A” is means not applicable.

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Field Strength of Fundamental Emissions	±0.8dB	Confidence levels of 95%
20dB Spectrum Bandwidth / Frequency Stability	$\pm 8.5\times10^{-8}$	Confidence levels of 95%
Radiated / Band Edge Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

2. GENERAL INFORMATION

2.1 Product Details

Items	Description
Power Type	5Vdc from AC Adapter ; 3.7Vdc from Li-ion battery
Modulation	ASK
Channel Number	1
Max. Field Strength	47.25 dBuV/m at 3m (QP)
Test Freq. Range	13.553 ~ 13.567MHz
Carrier Frequencies	13.56 MHz
Antenna	Integrate Antenna (Without any antenna connector)

2.2 Accessories

Accessories Information				
AC Adapter 1	Brand Name	SUNLIN	Model Name	MCS-01WR
	Power Rating	I/P: 100-240V~50/60Hz, 0.2A ; O/P: 5.0V, 1.2A		
AC Adapter 2	Brand Name	TENPAO	Model Name	MCS-01WT
	Power Rating	I/P: 100-240~50/60Hz, 0.2A ; O/P: 5.0Vdc, 1.2A		
AC Adapter 3	Brand Name	DONG DO	Model Name	MCS-01WD
	Power Rating	I/P: 100-240~50/60Hz, 0.2A ; O/P: 5.0Vdc, 1.2A		
USB Cable 1	Brand Name	INTERFACESAMIL	Model Name	EAD62330101
	Signal Line	1.1meter shielded cable without ferrite core		
USB Cable 2	Brand Name	NINGBO	Model Name	EAD62330102
	Signal Line	1.1meter shielded cable without ferrite core		
Cradle	Brand Name	N/A	Model Name	WCP-500
	Power Rating	I/P: 5.2V, 2A ; O/P: 5.0V, 1A		
Battery	Brand Name	LG	Model Name	BL-T5
	Power Rating	3.8 Vdc, 2100 mAh	Type	Li-ion
Wireless Charging Pad	Brand Name	LG	Model Name	WCP-400
	Power Rating	IP: 5.25V, 1.8A OP: 5.1V, 1A	FCC ID	BJWCP400

Note: Regarding to more detail and other information, please refer to user manual.

2.3 Table for Test Modes

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Channel
Radiated Emissions 30MHz~1GHz	Transmitting mode	1
Field Strength of Fundamental Emissions	CTX	1
20dB Spectrum Bandwidth	CTX	1
Radiated Emissions 9kHz~30MHz	CTX	1
Band Edge Emissions	CTX	1
Frequency Stability	Un-modulation	1

Remark: CTX=continuously transmitting.

1.1 Table for Testing Locations

Test Site No.	Site Category	Location
CO04-HY	Conduction	Hwa Ya
TH01-HY	OVEN Room	Hwa Ya
10CH02-HY	SAC	Hwa Ya
03CH02-HY	SAC	Hwa Ya

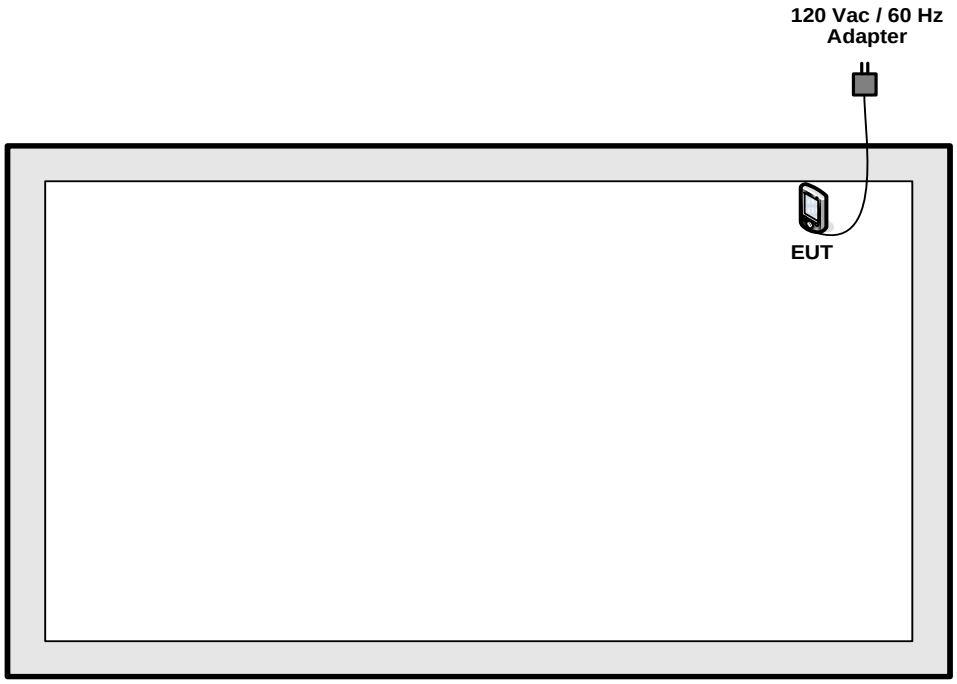
Semi Anechoic Chamber (SAC).

1.2 Table for Supporting Units

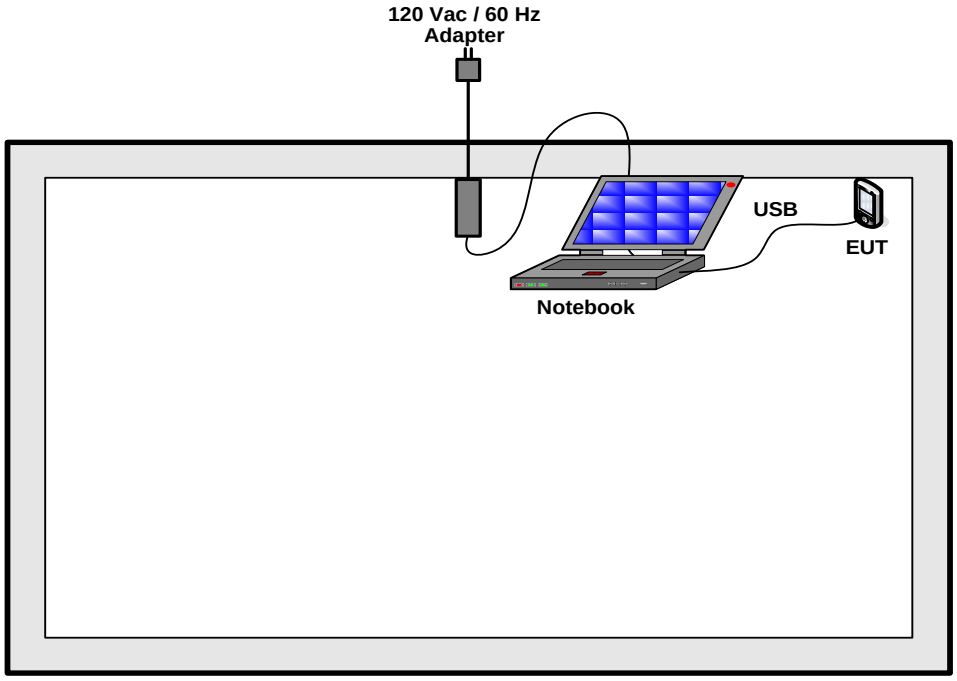
Support Unit	Brand	Model	FCC ID
Notebook	DELL	E5520	DoC
Wireless Charging (Client Provide)	LG	WCP-400	DoC
USB cable (Client Provide)	-	-	-
Earphone (Client Provide)	-	-	-

2.4 Test Configurations

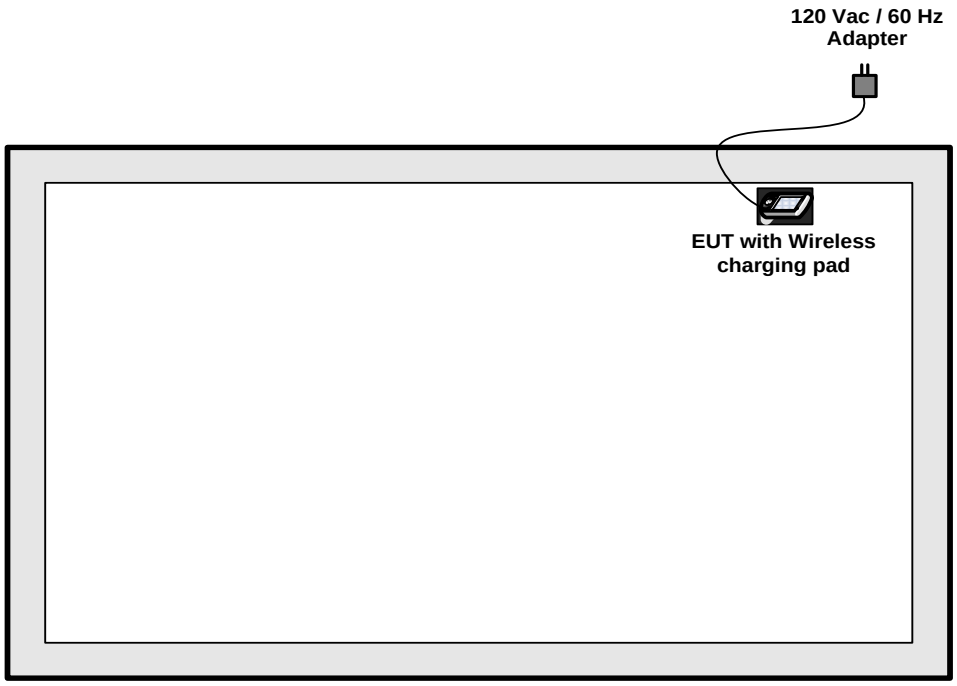
For conducted emissions
Adapter Mode



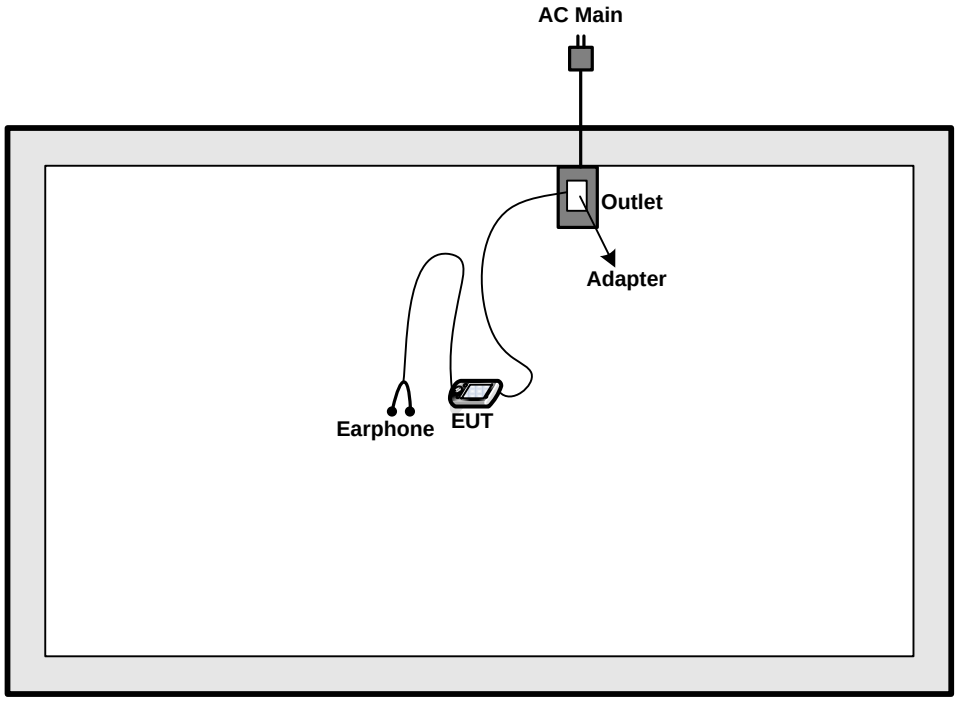
USB Mode



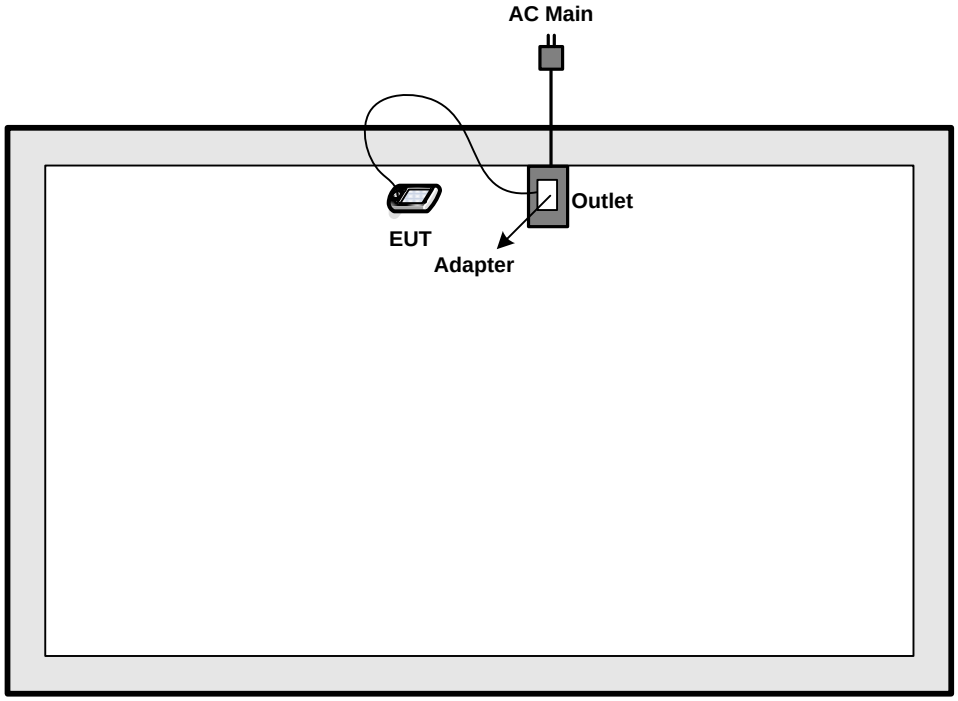
Wireless charging pad



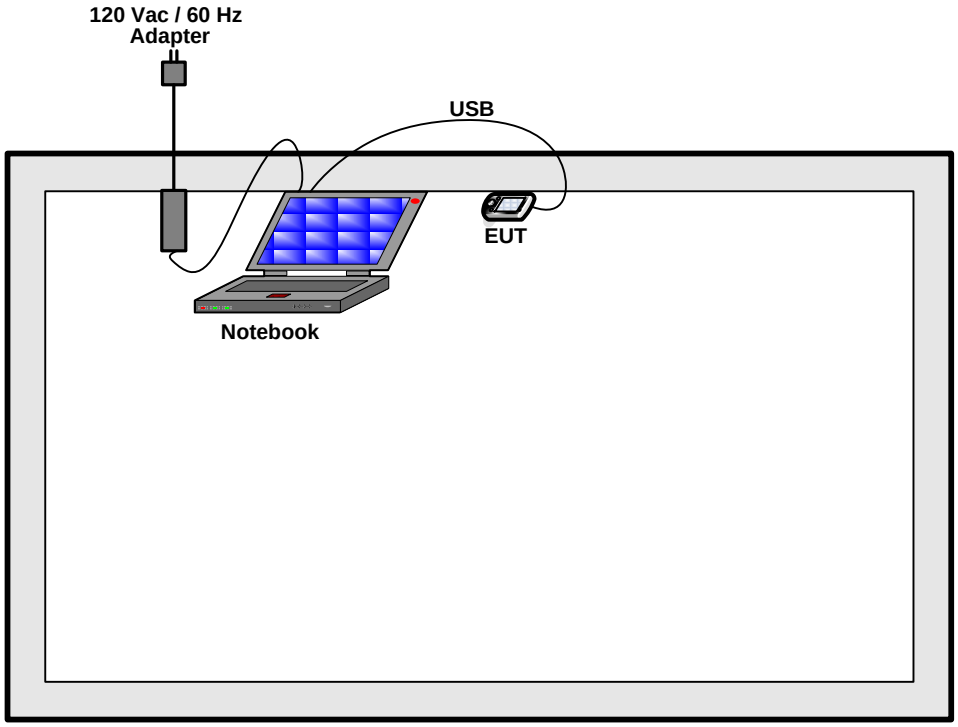
For radiated emissions 9kHz~30MHz



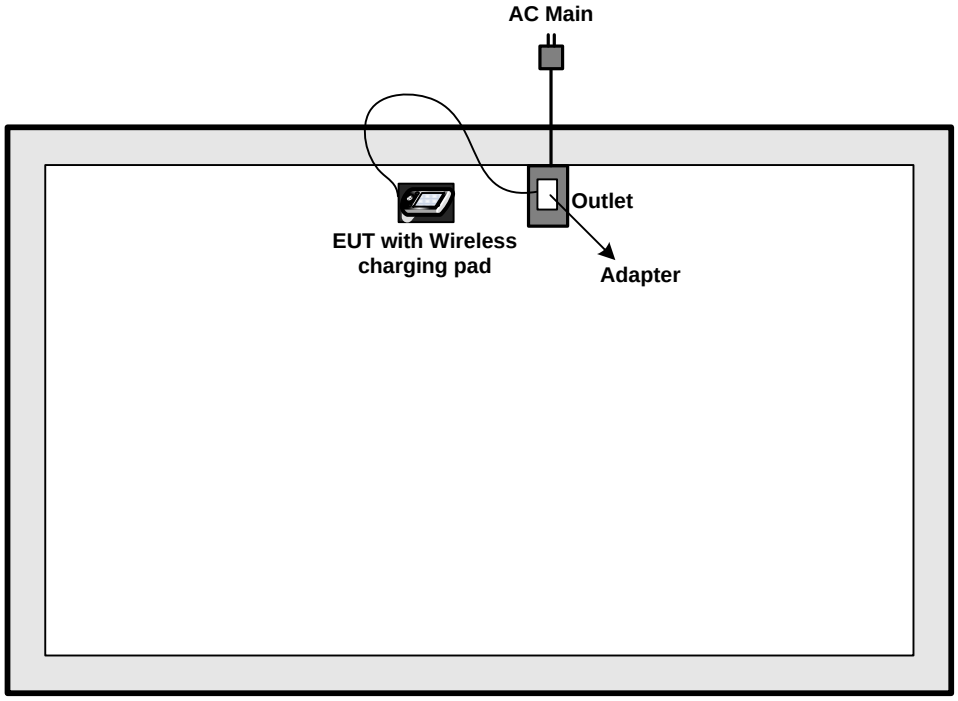
For radiated emissions 30MHz~1GHz
Adapter Mode



USB Mode



Wireless charging pad



3. TEST RESULT

3.1 AC Power Line Conducted Emissions Measurement

3.1.1 Limit

For this product which is designed to be connected to the 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 below limits table.

Class B

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

3.1.2 Measuring Instruments and Setting

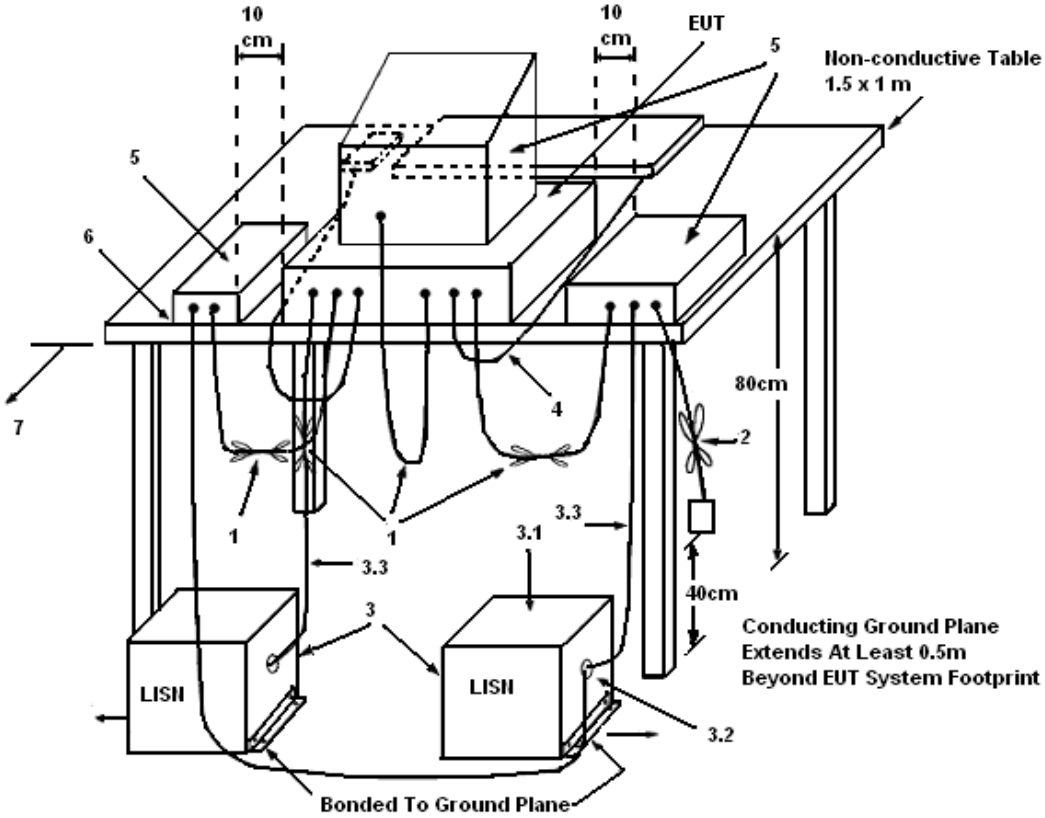
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.3 Test Procedures

1. The EUT was warmed up for 15 minutes before testing started.
2. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters 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 connect to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The CISPR 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.

3.1.4 Test Setup Layout



LEGEND:
(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.
(3.1) All other equipment powered from additional LISN(s).
(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
(3.3) LISN at least 80 cm from nearest part of EUT chassis.
(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
(5) Non-EUT components of EUT system being tested.
(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

3.1.5 Test Deviation

There is no deviation with the original standard.

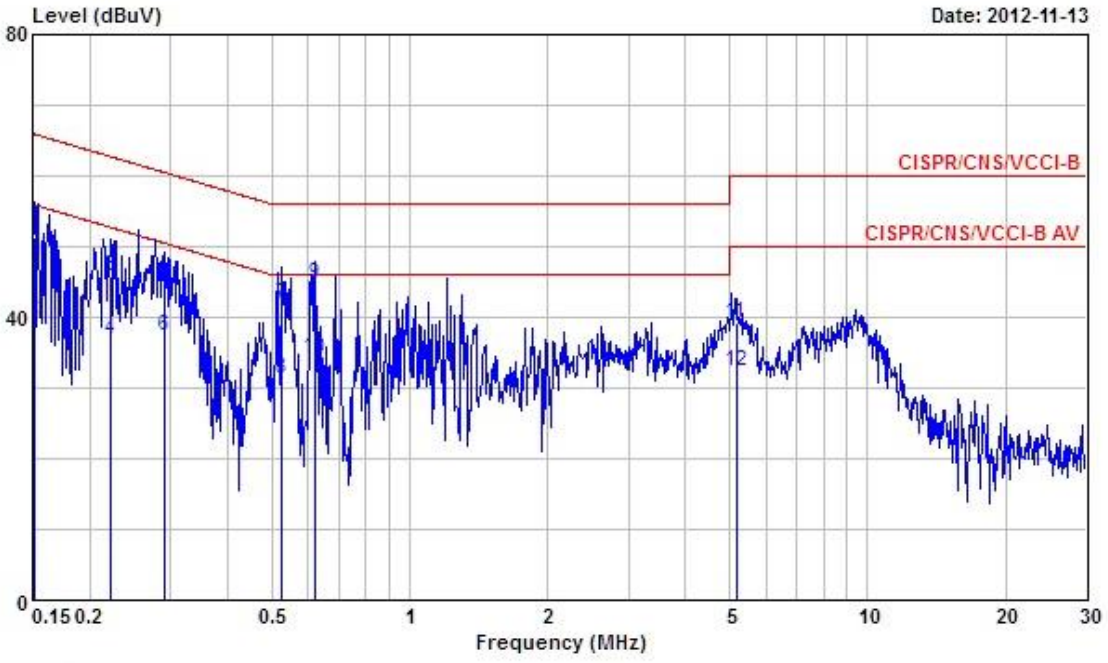
3.1.6 EUT Operation during Test

The EUT was placed on the test table and programmed in transmitting function.

3.1.7 Results of AC Power Line Conducted Emissions Measurement

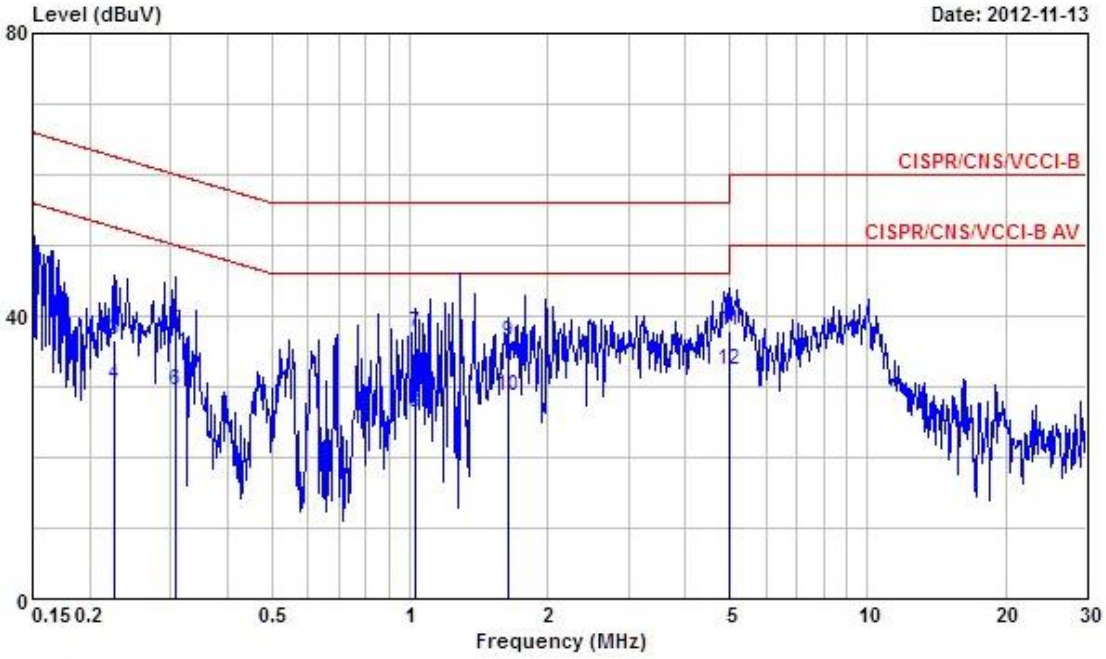
Final Test Date	Nov. 13, 2012	Test Site No.	CO04-HY
Temperature	25.3℃	Humidity	53%
Test Engineer	Bill	Configuration	Transmitting Mode (Adapter Mode)

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1515980	51.37	-14.54	65.91	50.91	0.24	0.22	QP
2	0.1515980	39.66	-16.25	55.91	39.20	0.24	0.22	Average
3	0.2220070	45.83	-16.91	62.74	45.28	0.23	0.32	QP
4	0.2220070	36.72	-16.02	52.74	36.17	0.23	0.32	Average
5	0.2908840	44.51	-15.99	60.50	43.94	0.22	0.35	QP
6	@0.2908840	37.49	-13.01	50.50	36.92	0.22	0.35	Average
7	@0.5261620	41.75	-14.25	56.00	41.16	0.22	0.37	QP
8	0.5261620	31.37	-14.63	46.00	30.78	0.22	0.37	Average
9	@0.6197370	44.69	-11.31	56.00	44.12	0.22	0.35	QP
10	@0.6197370	34.13	-11.87	46.00	33.56	0.22	0.35	Average
11	5.170	39.09	-20.91	60.00	38.36	0.33	0.40	QP
12	5.170	32.27	-17.73	50.00	31.54	0.33	0.40	Average

Neutral

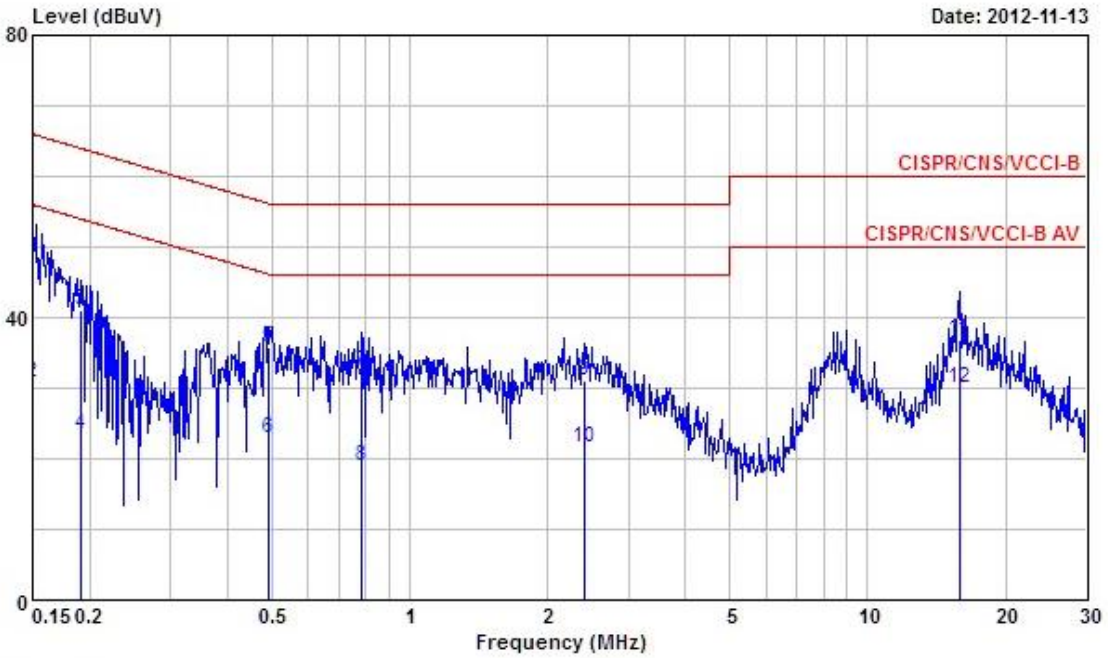


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1500000	48.25	-17.75	66.00	47.92	0.11	0.22	QP
2	0.1500000	36.93	-19.07	56.00	36.60	0.11	0.22	Average
3	0.2267630	36.63	-25.94	62.57	36.20	0.11	0.32	QP
4	0.2267630	30.26	-22.31	52.57	29.83	0.11	0.32	Average
5	0.3067120	37.91	-22.15	60.06	37.45	0.10	0.36	QP
6	0.3067120	29.37	-20.69	50.06	28.91	0.10	0.36	Average
7	1.030	37.58	-18.42	56.00	37.17	0.11	0.30	QP
8	1.030	26.41	-19.59	46.00	26.00	0.11	0.30	Average
9	1.640	36.26	-19.74	56.00	35.77	0.12	0.37	QP
10	1.640	28.79	-17.21	46.00	28.30	0.12	0.37	Average
11	5.000	38.02	-17.98	56.00	37.45	0.17	0.40	QP
12	@ 5.000	32.27	-13.73	46.00	31.70	0.17	0.40	Average

Note:
Level = Read Level + LISN Factor + Cable Loss.

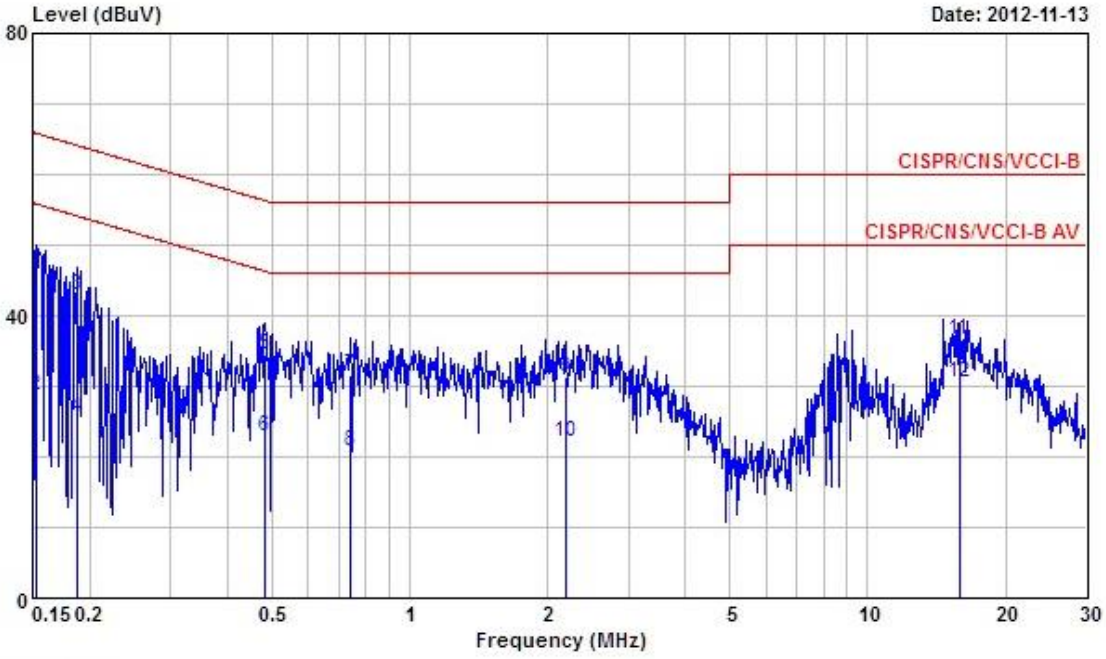
Final Test Date	Nov. 13, 2012	Test Site No.	CO04-HY
Temperature	25.3℃	Humidity	53%
Test Engineer	Bill	Configuration	Transmitting Mode (USB Mode)

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1500000	47.72	-18.28	66.00	47.26	0.24	0.22	QP
2	0.1500000	30.85	-25.15	56.00	30.39	0.24	0.22	Average
3	0.1903870	41.08	-22.94	64.02	40.56	0.23	0.29	QP
4	0.1903870	23.50	-30.52	54.02	22.98	0.23	0.29	Average
5	0.4914980	35.86	-20.28	56.14	35.26	0.22	0.38	QP
6	0.4914980	22.82	-23.32	46.14	22.22	0.22	0.38	Average
7	0.7876140	32.47	-23.53	56.00	31.91	0.23	0.33	QP
8	0.7876140	19.04	-26.96	46.00	18.48	0.23	0.33	Average
9	2.400	30.99	-25.01	56.00	30.33	0.26	0.40	QP
10	2.400	21.64	-24.36	46.00	20.98	0.26	0.40	Average
11	15.890	36.77	-23.23	60.00	35.64	0.51	0.62	QP
12	15.890	29.93	-20.07	50.00	28.80	0.51	0.62	Average

Neutral

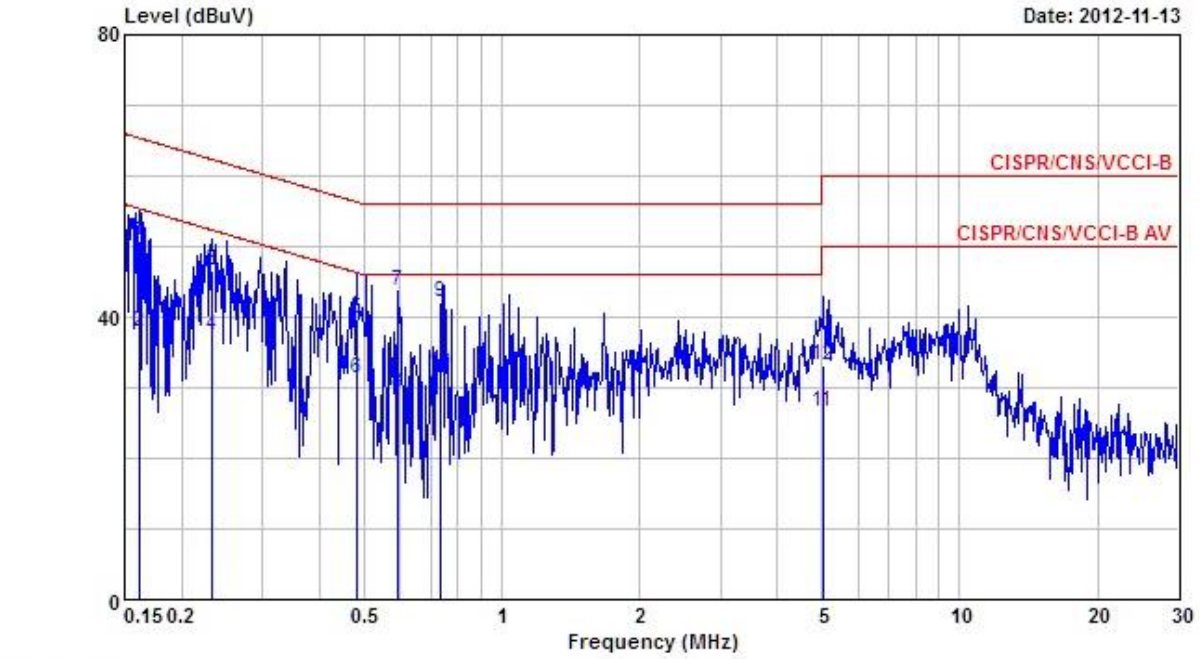


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1532130	46.01	-19.81	65.82	45.68	0.11	0.22	QP
2	0.1532130	28.64	-27.18	55.82	28.31	0.11	0.22	Average
3	0.1883800	42.95	-21.16	64.11	42.56	0.11	0.28	QP
4	0.1883800	25.57	-28.54	54.11	25.18	0.11	0.28	Average
5	0.4811910	34.47	-21.85	56.32	33.99	0.10	0.38	QP
6	0.4811910	22.95	-23.37	46.32	22.47	0.10	0.38	Average
7	0.7430230	31.58	-24.42	56.00	31.14	0.11	0.33	QP
8	0.7430230	20.73	-25.27	46.00	20.29	0.11	0.33	Average
9	2.190	31.24	-24.76	56.00	30.71	0.13	0.40	QP
10	2.190	22.23	-23.77	46.00	21.70	0.13	0.40	Average
11	15.890	36.53	-23.47	60.00	35.62	0.29	0.62	QP
12	15.890	30.56	-19.44	50.00	29.65	0.29	0.62	Average

Note:
Level = Read Level + LISN Factor + Cable Loss.

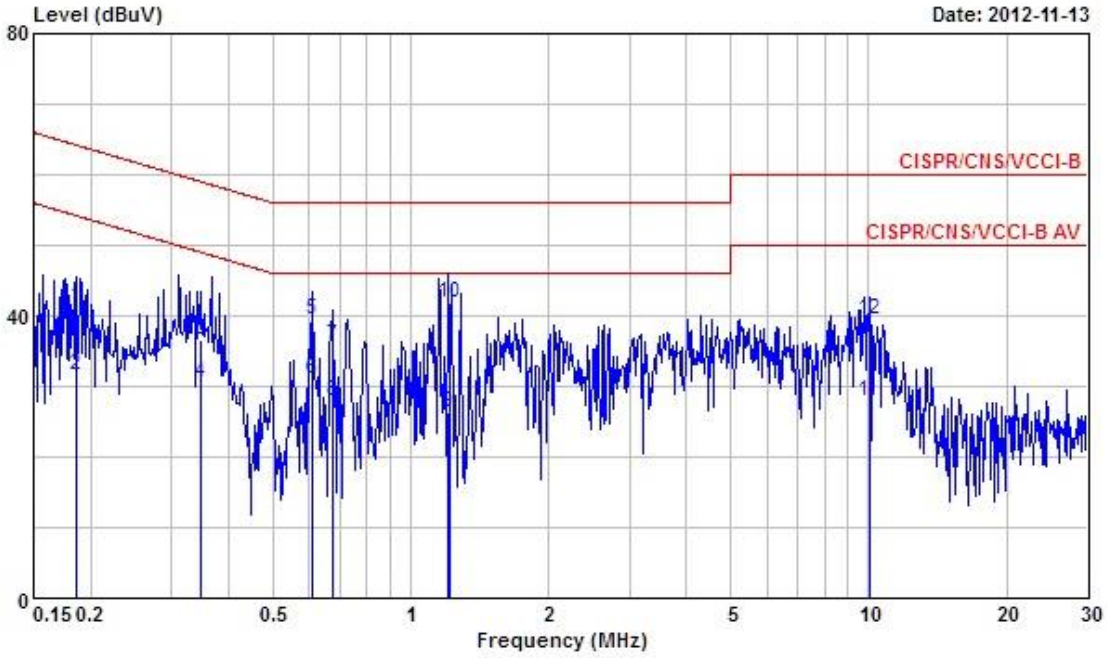
Final Test Date	Nov. 13, 2012	Test Site No.	CO04-HY
Temperature	25.3℃	Humidity	53%
Test Engineer	Bill	Configuration	Transmitting Mode (Wireless charging pad)

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1615500	50.86	-14.52	65.38	50.38	0.24	0.24	QP
2	0.1615500	37.77	-17.61	55.38	37.29	0.24	0.24	Average
3	0.2328500	46.46	-15.89	62.35	45.91	0.23	0.32	QP
4	0.2328500	37.36	-14.99	52.35	36.81	0.23	0.32	Average
5	0.4843910	39.72	-16.54	56.26	39.12	0.22	0.38	QP
6	0.4843910	31.40	-14.86	46.26	30.80	0.22	0.38	Average
7	@0.5897840	43.72	-12.28	56.00	43.14	0.22	0.36	QP
8	0.5897840	29.28	-16.72	46.00	28.70	0.22	0.36	Average
9	@0.7332730	42.14	-13.86	56.00	41.58	0.23	0.33	QP
10	@0.7332730	32.06	-13.94	46.00	31.50	0.23	0.33	Average
11	5.030	26.47	-23.53	50.00	25.75	0.32	0.40	Average
12	5.032	33.24	-26.76	60.00	32.52	0.32	0.40	QP

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1854100	41.44	-22.80	64.24	41.05	0.11	0.28	QP
2	0.1854100	31.49	-22.75	54.24	31.10	0.11	0.28	Average
3	0.3464610	36.68	-22.37	59.05	36.20	0.10	0.38	QP
4	0.3464610	30.59	-18.46	49.05	30.11	0.10	0.38	Average
5	0.6107510	39.60	-16.40	56.00	39.15	0.10	0.35	QP
6	0.6107510	31.15	-14.85	46.00	30.70	0.10	0.35	Average
7	0.6722350	35.77	-20.23	56.00	35.32	0.11	0.34	QP
8	0.6722350	27.77	-18.23	46.00	27.32	0.11	0.34	Average
9	1.210	26.27	-19.73	46.00	25.82	0.12	0.33	Average
10	1.212	41.73	-14.27	56.00	41.28	0.12	0.33	QP
11	10.045	27.98	-22.02	50.00	27.34	0.24	0.40	Average
12	10.045	39.44	-20.56	60.00	38.80	0.24	0.40	QP

Note:
Level = Read Level + LISN Factor + Cable Loss.

3.2 Field Strength of Fundamental Emissions and Mask Measurement

3.2.1 Limit

Field strength of fundamental emissions limit:
The field strength of fundamental emissions shall not exceed 15848 micorvolts/meter at 30 meters. The emissions limit in this paragraph is based on measurement instrumentation employing a QP detector.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Field Strength (dBμV/m) at 10m	Field Strength (dBμV/m) at 3m
13.553 ~ 13.567MHz	15848 at 30m	103.08(QP)	124(QP)

Mask limit:

Rules and specifications	RSS-210 A2.6				
Description	Compliance with the spectrum mask is tested using a spectrum analyzer with RB set to a 1kHz for the band 13.553~13.567MHz				
Limit	Freq. of Emission (MHz)	Field Strength (uV/m) at 30m	Field Strength (dBuV/m) at 30m	Field Strength (dBuV/m) at 10m	Field Strength (dBuV/m) at 3m
	1.705~13.110	30	29.5	48.58	69.5
	13.110~13.410	106	40.5	59.58	80.5
	13.410~13.553	334	50.5	69.58	90.5
	13.553~13.567	15848	84.0	103.08	124.0
	13.567~13.710	334	50.5	69.58	90.5
	13.710~14.010	106	40.5	59.58	80.5
	14.010~30.000	30	29.5	48.58	69.5

3.2.2 Measuring Instruments and Setting

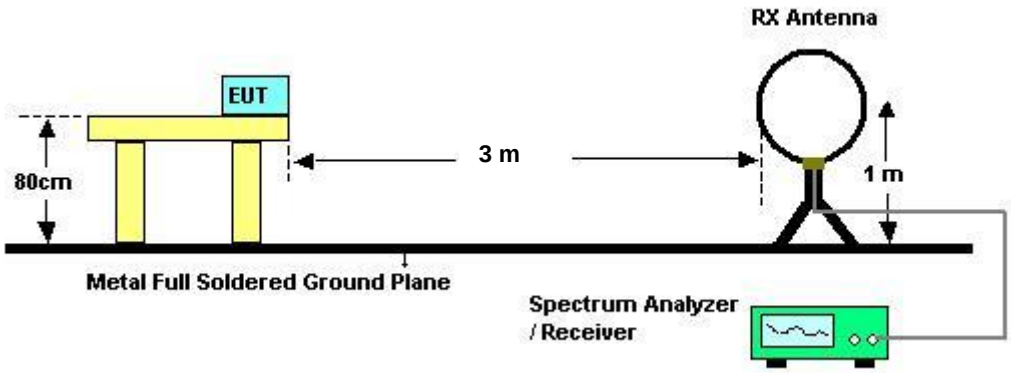
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameter	Setting
Attenuation	Auto
Center Frequency	Fundamental Frequency
RB	10 kHz
Detector	QP

3.2.3 Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength.
4. For Fundamental emissions, use the receiver to measure QP reading.
5. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
6. Compliance with the spectrum mask is tested using a spectrum analyzer with RB set to a 10kHz for the band 13.553~13.567MHz.

3.2.4 Test Setup Layout



3.2.5 Test Deviation

There is no deviation with the original standard.

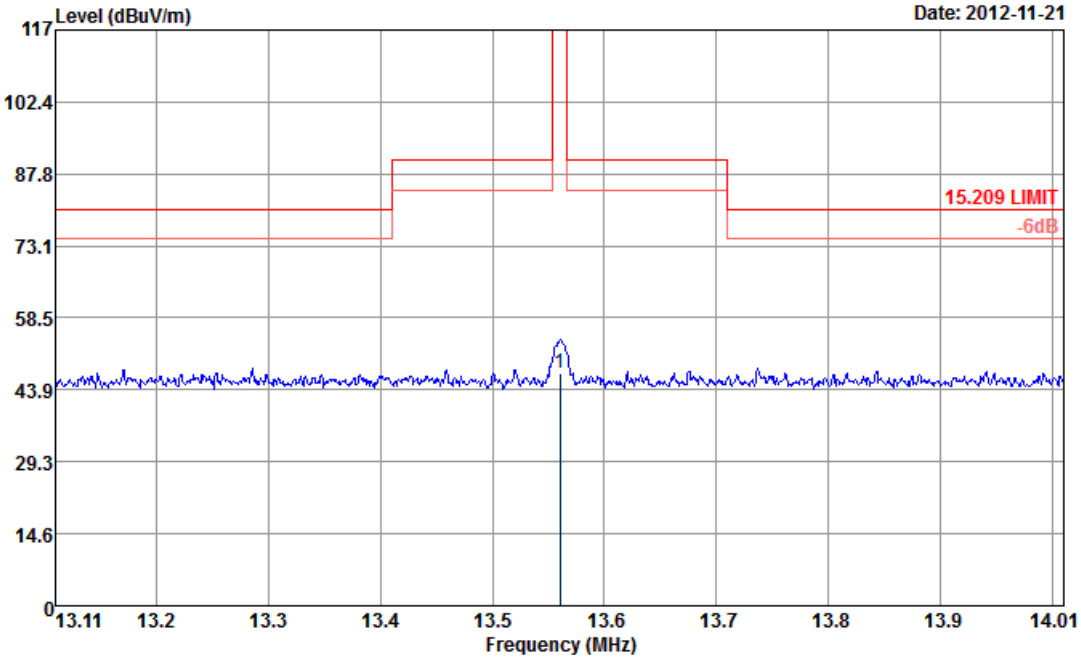
3.2.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.2.7 Test Result of Field Strength of Fundamental Emissions

Final Test Date	Nov. 21, 2012	Test Site No.	03CH07-HY
Temperature	24.4℃	Humidity	57.7%
Test Engineer	Ivan	Configurations	Ch. 1

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m) at 3m	Remark
13.56 MHz	47.25	-76.74	123.99	QP



Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m).

3.3 20dB Spectrum Bandwidth Measurement

3.3.1 Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (13.553 ~ 13.567MHz).

3.3.2 Measuring Instruments and Setting

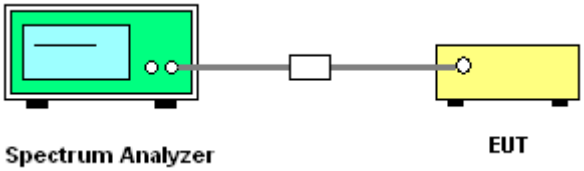
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 20dB Bandwidth
RB	1 kHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.3.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. 20dB Bandwidth the resolution bandwidth of 1 kHz and the video bandwidth of 1 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

3.3.4 Test Setup Layout



3.3.5 Test Deviation

There is no deviation with the original standard.

3.3.6 EUT Operation during Test

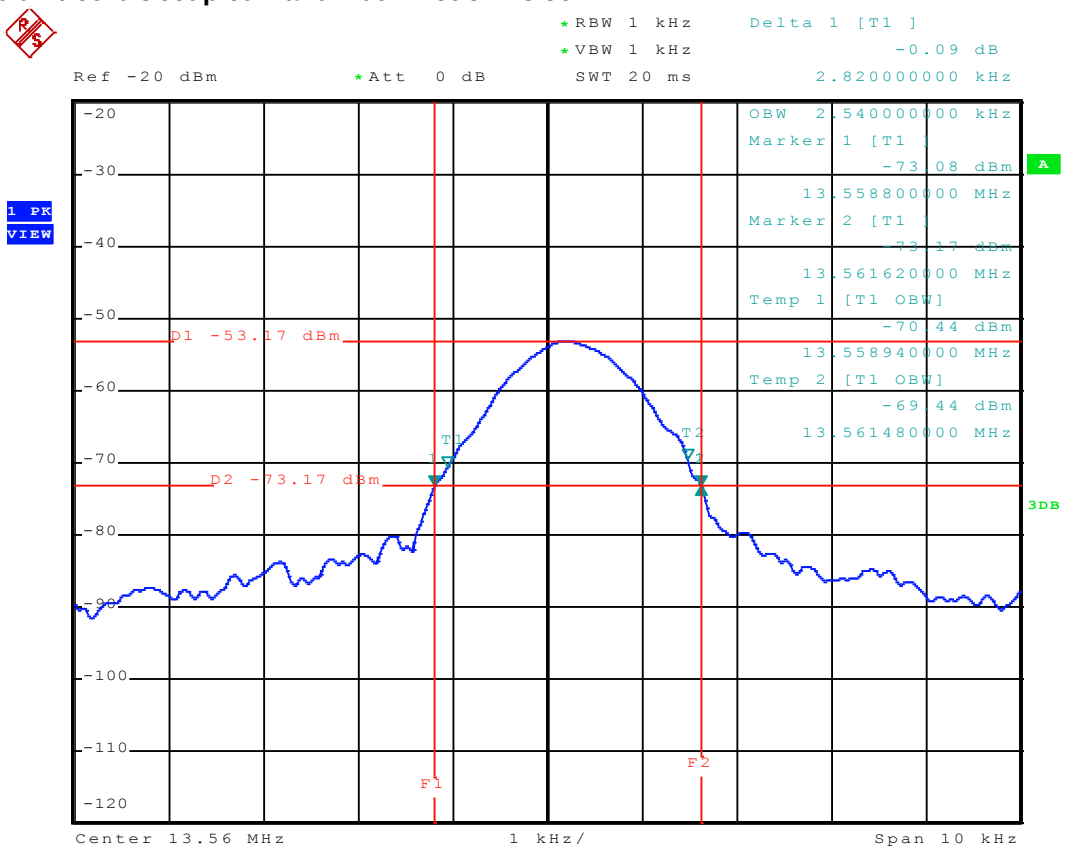
The EUT was programmed to be in continuously transmitting mode.

3.3.7 Test Result of 20dB Spectrum Bandwidth

Final Test Date	Nov. 14, 2012	Test Site No.	TH01-HY
Temperature	25.8℃	Humidity	46%
Test Engineer	Ian	Configurations	Ch.1

Frequency	20dB BW (kHz)	99% OBW (kHz)	Frequency range (MHz) f_L > 13.553MHz	Frequency range (MHz) f_H < 13.567MHz	Test Result
13.56 MHz	2.82	2.54	13.5588	13.5616	**Complies**

20 dB / 99% Occupied Bandwidth Plot on 13.56 MHz



Date: 14.NOV.2012 14:17:24

3.4 Radiated Emissions Measurement

3.4.1 Limit

The field strength of any emissions which appear outside of 13.553 ~ 13.567MHz band shall not exceed the general radiated emissions limits in Section 15.209(a)

Frequencies (MHz)	Field Strength (micorvolts/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

3.4.2 Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of receiver.

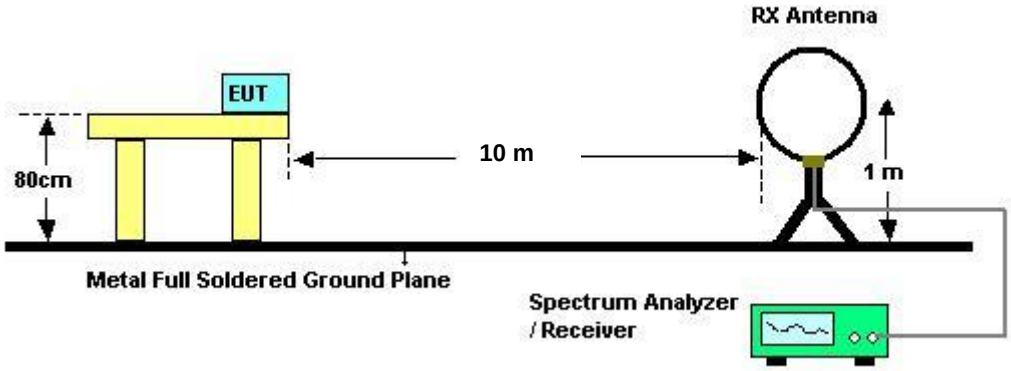
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.4.3 Test Procedures

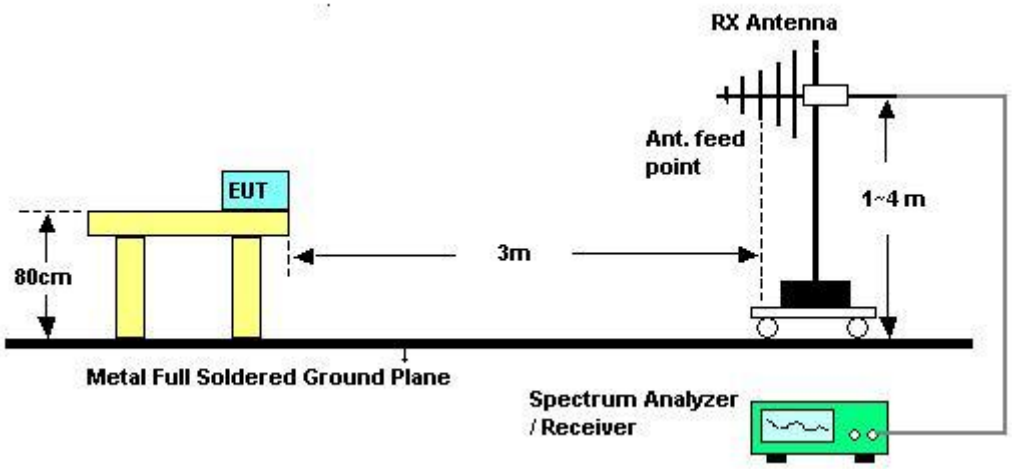
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

3.4.4 Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



3.4.5 Test Deviation

There is no deviation with the original standard.

3.4.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

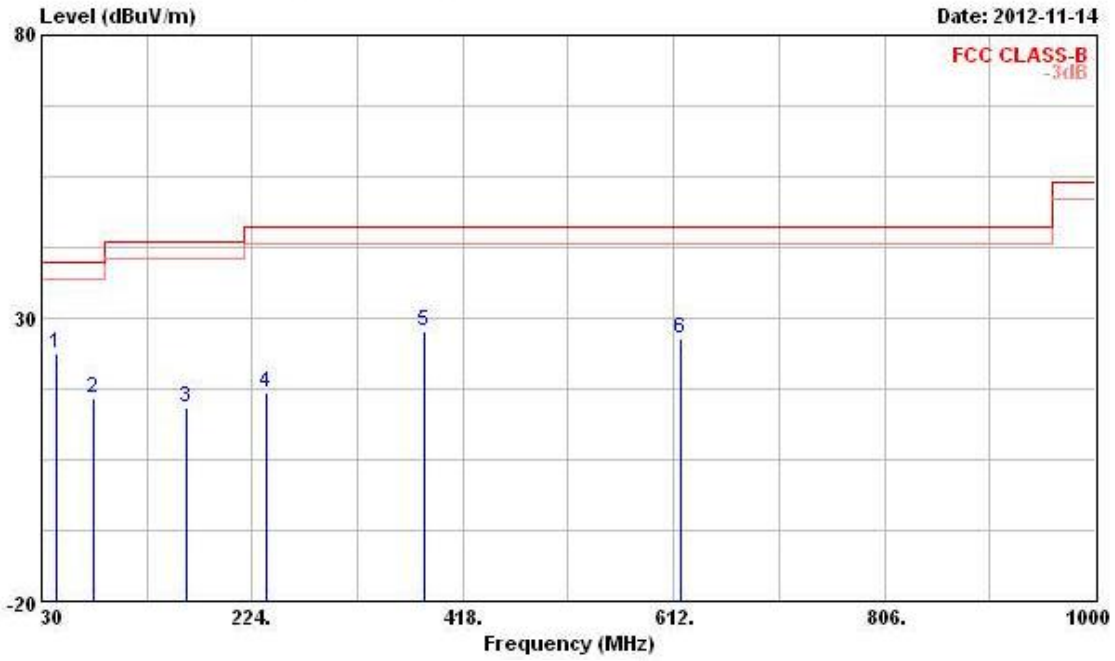
3.4.7 Results of Transmitter Spurious Emissions (9kHz~30MHz)

All spurious emissions (9kHz-30MHz) are below fundamental emissions field strength and the levels exceed the level of 20 dB below the applicable limit.

3.4.8 Results for Radiated Emissions (30MHz~1GHz)

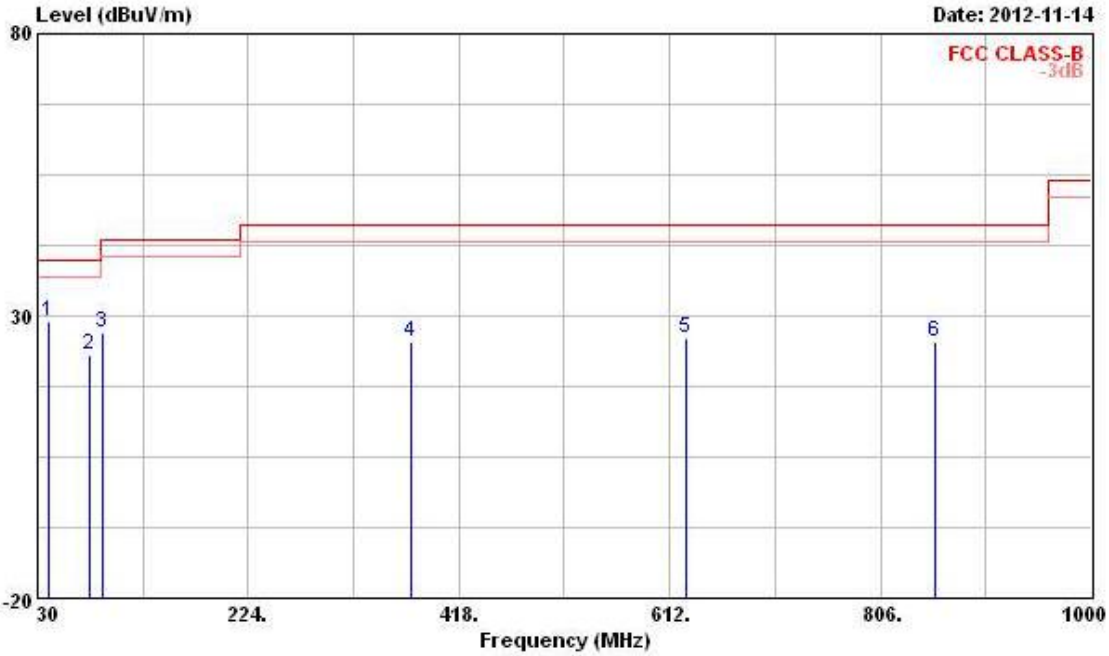
Final Test Date	Nov. 14, 2012	Test Site No.	03CH02-HY
Temperature	23.9℃	Humidity	61%
Test Engineer	Eddie	Configuration	Ch.1 (Adapter Mode)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	43.580	23.73	-16.27	40.00	38.25	12.27	1.09	27.88	Peak	---	---
2	78.500	15.75	-24.25	40.00	34.80	7.30	1.50	27.85	Peak	---	---
3	163.860	14.29	-29.21	43.50	29.36	10.38	2.12	27.57	Peak	---	---
4	237.580	16.85	-29.15	46.00	28.89	12.59	2.69	27.32	Peak	---	---
5	382.110	27.64	-18.36	46.00	37.08	14.98	3.32	27.74	Peak	---	---
6	617.820	26.54	-19.46	46.00	30.73	19.95	4.29	28.43	Peak	---	---

Vertical

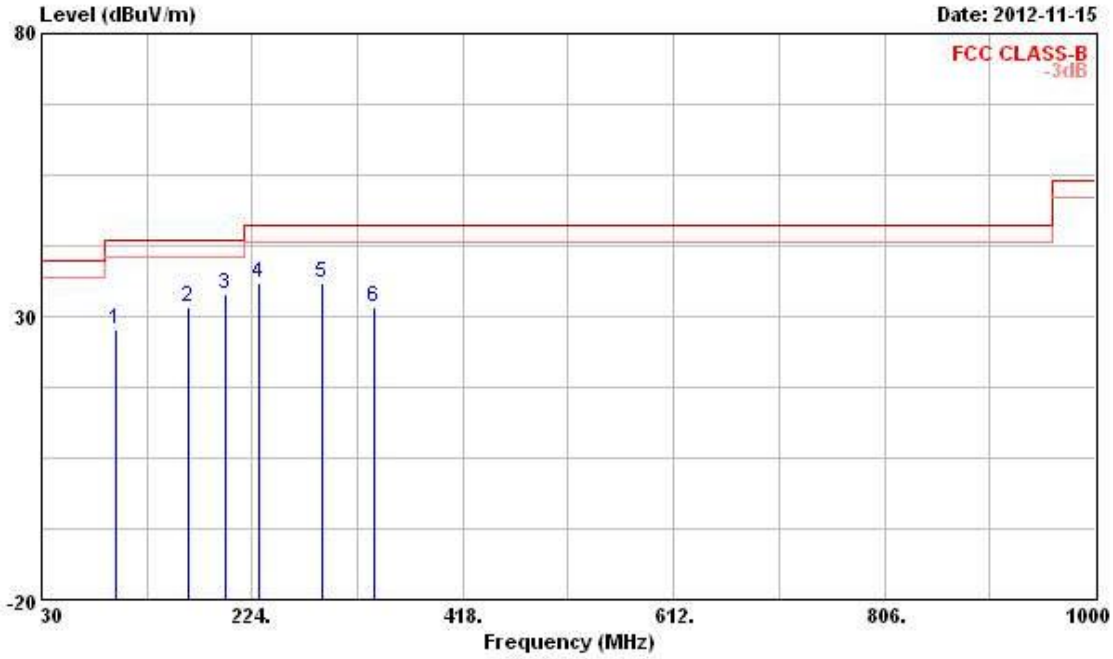


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	40.670	29.15	-10.85	40.00	42.99	13.01	1.05	27.90	Peak	---	---
2	78.500	22.97	-17.03	40.00	42.02	7.30	1.50	27.85	Peak	---	---
3	90.140	26.89	-16.61	43.50	43.66	9.50	1.58	27.85	Peak	---	---
4	374.350	25.54	-20.46	46.00	35.08	14.86	3.29	27.69	Peak	---	---
5	626.550	26.05	-19.95	46.00	30.31	19.83	4.32	28.41	Peak	---	---
6	855.470	25.26	-20.74	46.00	27.80	20.14	5.07	27.75	Peak	---	---

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

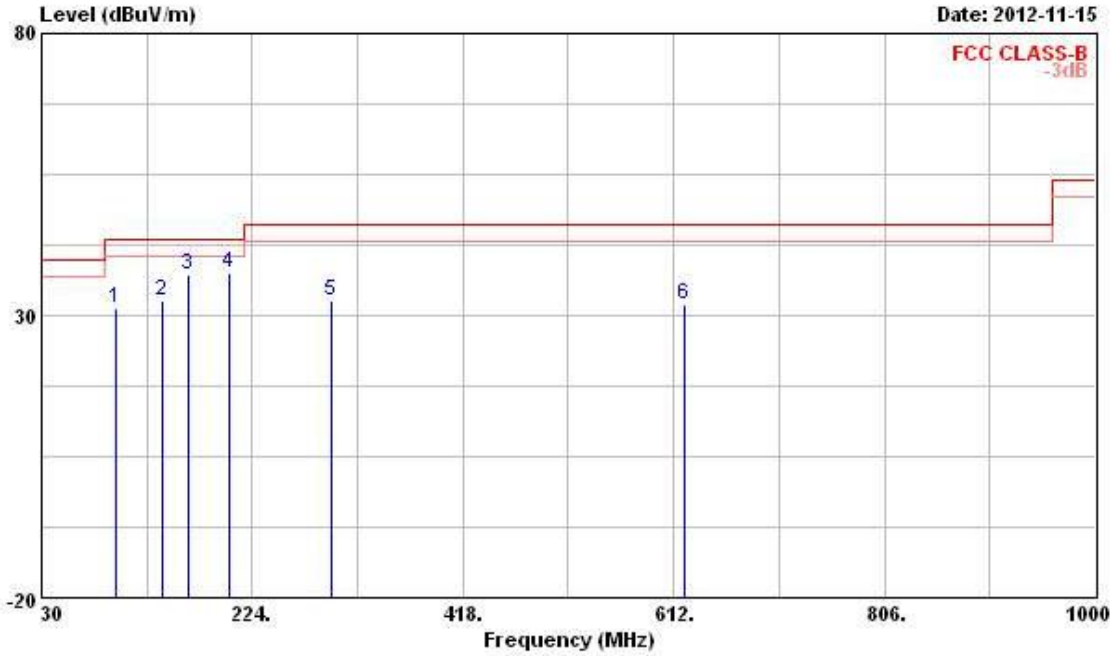
Final Test Date	Nov. 15, 2012	Test Site No.	03CH02-HY
Temperature	23.9℃	Humidity	61%
Test Engineer	Eddie	Configuration	Ch.1 (USB Mode)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	98.870	27.56	-15.94	43.50	42.75	11.01	1.65	27.85	Peak	---	---
2	164.830	31.63	-11.87	43.50	46.71	10.34	2.14	27.56	Peak	---	---
3 @	198.780	33.80	-9.70	43.50	47.52	11.28	2.42	27.42	Peak	---	---
4	230.790	36.01	-9.99	46.00	48.33	12.37	2.64	27.33	Peak	---	---
5	288.990	35.81	-10.19	46.00	46.53	13.55	2.92	27.19	Peak	---	---
6	335.550	31.52	-14.48	46.00	41.55	14.26	3.12	27.41	Peak	---	---

Vertical

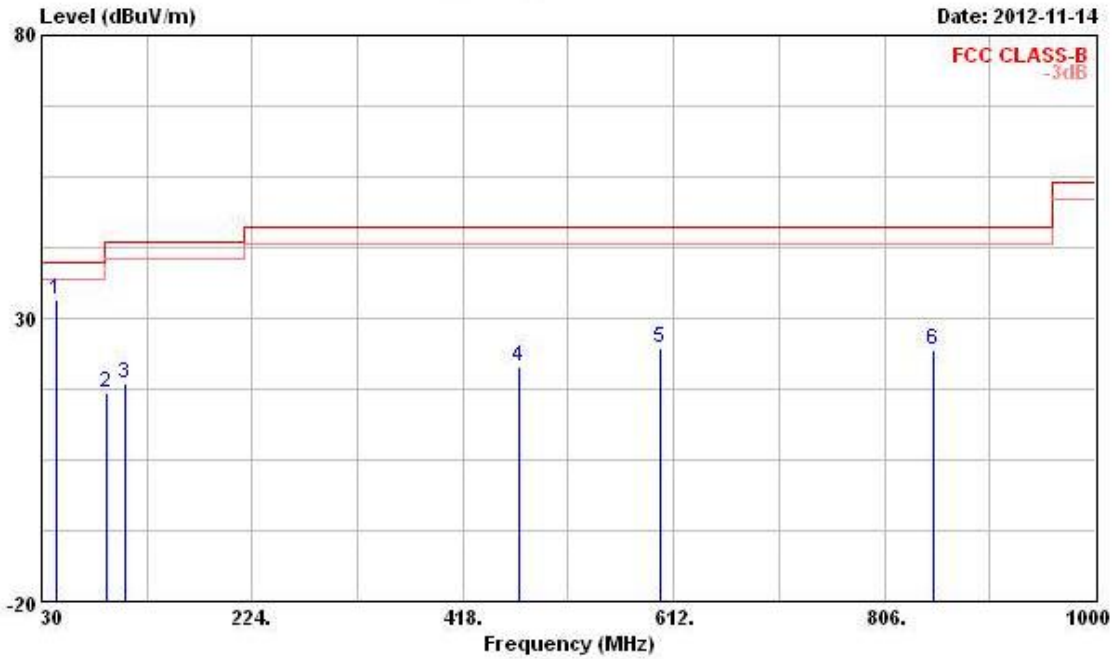


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	98.870	31.39	-12.11	43.50	46.58	11.01	1.65	27.85	Peak	---	---
2	141.550	32.62	-10.88	43.50	46.51	11.78	2.00	27.67	Peak	---	---
3 @	164.830	37.38	-6.12	43.50	52.46	10.34	2.14	27.56	Peak	---	---
4 @	202.660	37.65	-5.85	43.50	51.16	11.45	2.44	27.40	Peak	---	---
5	296.750	32.49	-13.51	46.00	43.05	13.66	2.95	27.17	Peak	---	---
6	622.670	32.04	-13.96	46.00	36.27	19.88	4.31	28.42	Peak	---	---

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

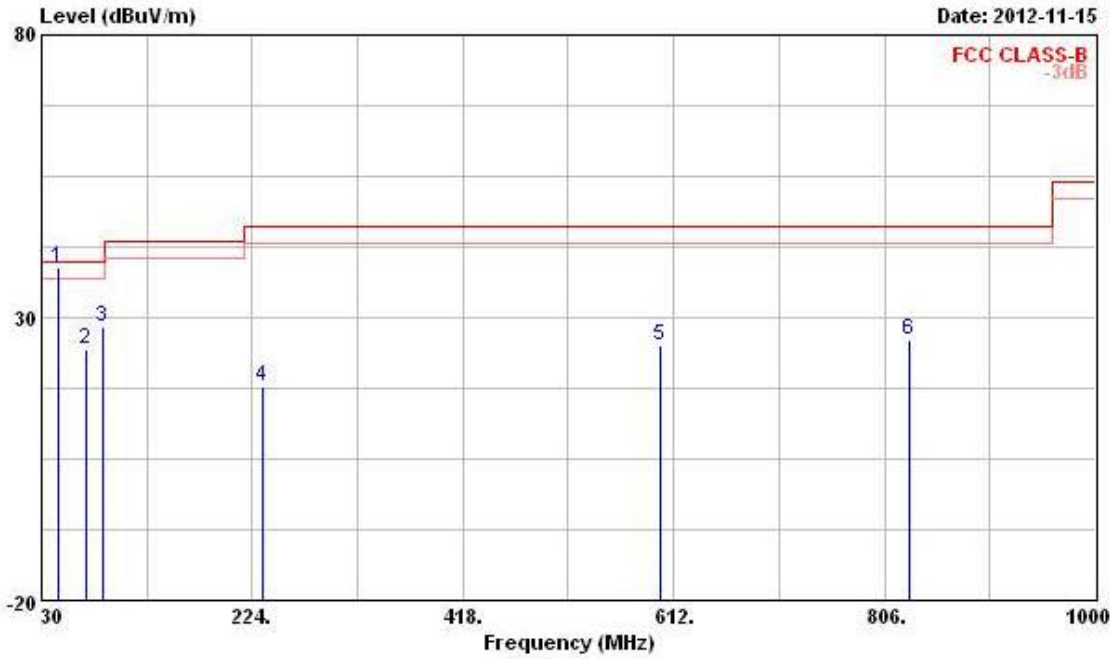
Final Test Date	Nov. 14, 2012	Test Site No.	03CH02-HY
Temperature	23.9℃	Humidity	61%
Test Engineer	Eddie	Configuration	Ch.1 (Wireless charging pad)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	43.580	33.35	-6.65	40.00	47.87	12.27	1.09	27.88	Peak	---	---
2	90.140	16.90	-26.60	43.50	33.67	9.50	1.58	27.85	Peak	---	---
3	106.630	18.48	-25.02	43.50	32.59	11.99	1.72	27.82	Peak	---	---
4	470.380	21.38	-24.62	46.00	29.23	16.69	3.68	28.22	Peak	---	---
5	599.390	24.72	-21.28	46.00	28.79	20.15	4.24	28.46	Peak	---	---
6	851.590	24.55	-21.45	46.00	27.12	20.15	5.05	27.77	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	44.550	38.97	-1.03	40.00	53.73	12.02	1.10	27.88	QP	---	---
2	70.740	24.32	-15.68	40.00	43.97	6.78	1.42	27.85	Peak	---	---
3	86.260	28.22	-11.78	40.00	45.78	8.73	1.56	27.85	Peak	---	---
4	233.700	17.93	-28.07	46.00	30.13	12.46	2.67	27.33	Peak	---	---
5	599.390	24.99	-21.01	46.00	29.06	20.15	4.24	28.46	Peak	---	---
6	828.310	26.10	-19.90	46.00	28.76	20.20	4.98	27.84	Peak	---	---

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.5 Frequency Stability Measurement

3.5.1 Limit

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% (100ppm) of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

3.5.2 Measuring Instruments and Setting

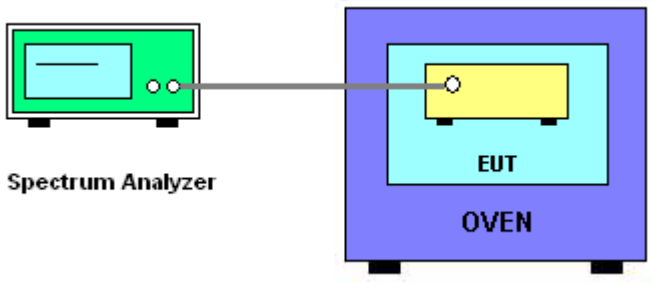
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RB	1 kHz
VB	1 kHz
Sweep Time	Auto

3.5.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 1 kHz, VBW = 1 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±100ppm.
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature rule is -20°C~50°C.

3.5.4 Test Setup Layout



3.5.5 Test Deviation

There is no deviation with the original standard.

3.5.6 EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

3.5.7 Test Result of Frequency Stability

Final Test Date	Nov. 14, 2012	Test Site No.	TH01-HY
Temperature	25.8℃	Humidity	46%
Test Engineer	Ian	Configurations	Ch.1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	**13.56 MHz**
126.5	13.560280
110	13.560180
93.5	13.560240
Max. Deviation (MHz)	**0.000280**
Max. Deviation (ppm)	**20.6490**

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(℃)	**13.56 MHz**
-20	13.560280
-10	13.560360
0	13.560320
10	13.560440
20	13.560280
30	13.560240
40	13.560320
50	13.560360
Max. Deviation (MHz)	**0.000440**
Max. Deviation (ppm)	**32.4484**

3.6 Antenna Requirements

3.6.1 Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

3.6.2 Antenna Connector Construction

Please refer to section 2.1 in this test report; antenna connector complied with the requirements.

4. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz ~ 2.75GHz	Mar. 23, 2012	Conduction (CO04-HY)
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Feb. 08, 2012	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz ~ 30MHz	Apr. 20, 2012	Conduction (CO04-HY)
RF Cable-CON	HUBER+SUHNER	RG213/U	CB049	9kHz ~ 30MHz	Apr. 25, 2012	Conduction (CO04-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP 40	100305	9KHz~40GHz	Feb. 21, 2012	Conducted (TH01-HY)
Spectrum Analyzer	R&S	FSV 40	15195-01-00	9KHz~40GHz	Jan. 06, 2012	Conducted (TH01-HY)
AC Power Source	G.W	APS-9102	EL920581	AC 0V ~ 300V	Jul. 02, 2012	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20 ~ 100℃	Dec. 07, 2011	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100302	10MHz ~ 40GHz	Nov. 22, 2011	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	Jan. 12, 2012	Conducted (TH01-HY)
Power Meter	Anritsu	ML2495A	1124009	300MHz ~ 40GHz	Jan. 12, 2012	Conducted (TH01-HY)
RF Cable-2m	HUBER+SUHNER	SUCOFLEX_104	SN 345672/4	1GHz ~ 26.5GHz	Dec. 03, 2011	Conducted (TH01-HY)
RF Cable-3m	HUBER+SUHNER	SUCOFLEX_104	SN 345668/4	1GHz ~ 26.5GHz	Dec. 03, 2011	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.

For radiated emissions 9kHz~30MHz

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Base Station	Agilent	E5515C	MY47511206	N/A	Apr. 20, 2012	Radiation (03CH07-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 06, 2012	Radiation (03CH07-HY)
BT Base Station	Rohde & Schwarz	CBT32	100522	N/A	Feb. 09, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1GHz ~ 18GHz	Aug. 22, 2012	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 03, 2012	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	860004/0001	9 kHz~30 MhZ	Jul. 03, 2012	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 05, 2011	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10-1000MHz.32dB.GAIN	Feb. 27, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	Radiation (03CH07-HY)

Note: Calibration Interval of instruments listed above is one year.

For radiated emissions 30MHz~1GHz

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100593	9kHz ~ 40GHz	Sep. 14, 2012	Radiation (03CH02-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	May 10, 2012	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100kHz ~ 1.3GHz	Jul. 23, 2012	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz ~ 1GHz	Jan. 18, 2012	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30MHz ~ 2GHz	Oct. 22, 2012	Radiation (03CH02-HY)
Turn Table	HD	DS 420	420/649/00	0~ 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 ~ 4 m	N/A	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is one year.

For radiated emissions 9kHz~30MHz

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9kHz ~ 30MHz	Jul. 03, 2012*	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is two year.

5. TEST LOCATION

SHIJR	ADD	:	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei 221, Taiwan, R.O.C.
	TEL	:	886-2-2696-2468
	FAX	:	886-2-2696-2255
HWA YA	ADD	:	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	:	886-3-327-0973
LINKOU	ADD	:	No. 30-2, Dingfu Vil., Linkou Dist., New Taipei City 244, Taiwan, R.O.C.
	TEL	:	886-2-2601-1640
	FAX	:	886-2-2601-1695
DUNGHU	ADD	:	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2631-4739
	FAX	:	886-2-2631-9740
JUNGHE	ADD	:	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei 235, Taiwan, R.O.C.
	TEL	:	886-2-8227-2020
	FAX	:	886-2-8227-2626
NEIHU	ADD	:	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	:	886-3-656-9065
	FAX	:	886-3-656-9085

6. TAF CERTIFICATE OF ACCREDITATION

Certificate No. : L1190-120405

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2010 to January 09, 2013
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

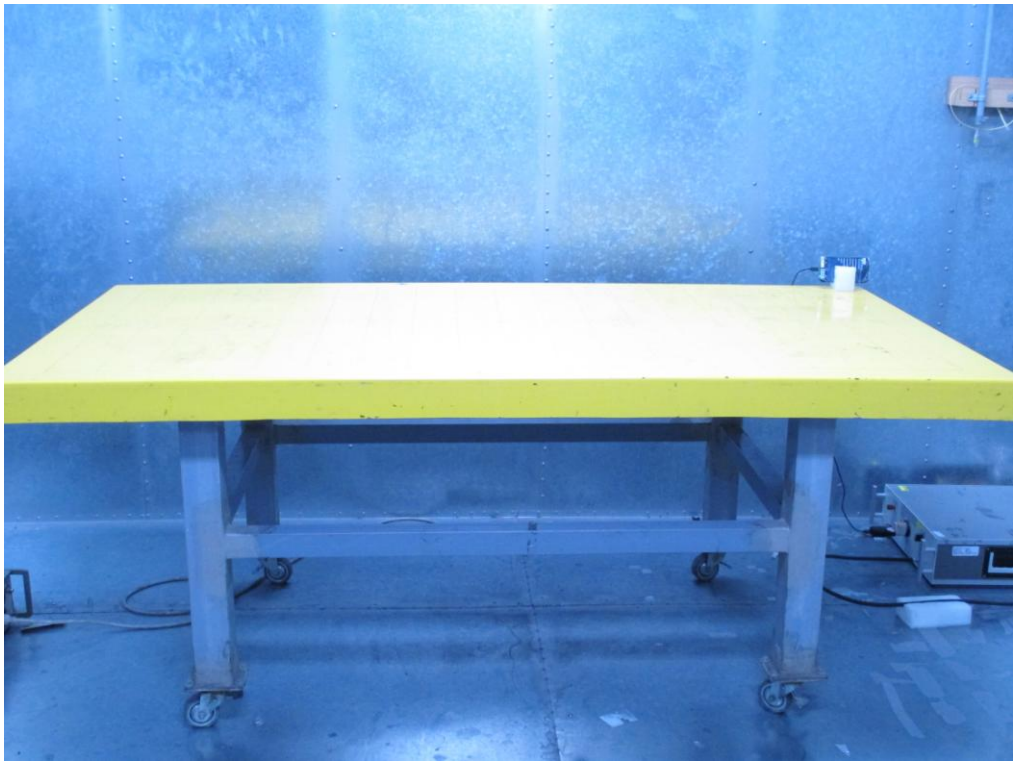
Jay-San Chen
President, Taiwan Accreditation Foundation
Date:April 05, 2012

P1, total 24 pages

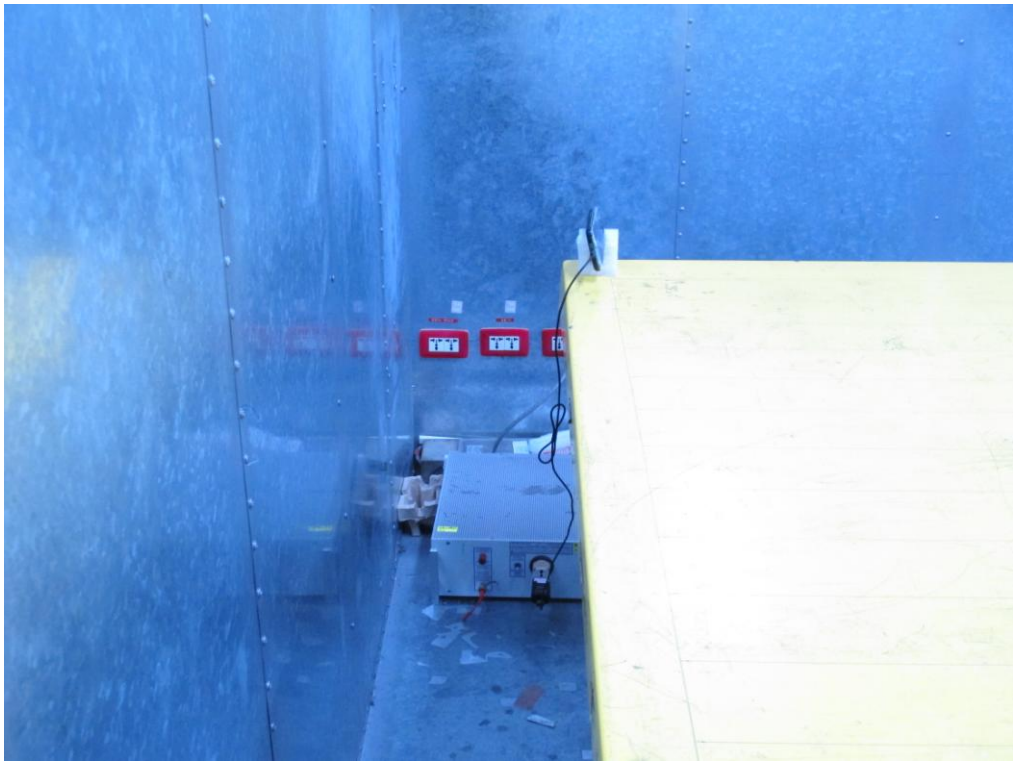
Appendix A. Test Photos

1 Photographs of Conducted Emissions Test Configuration

Adapter Mode

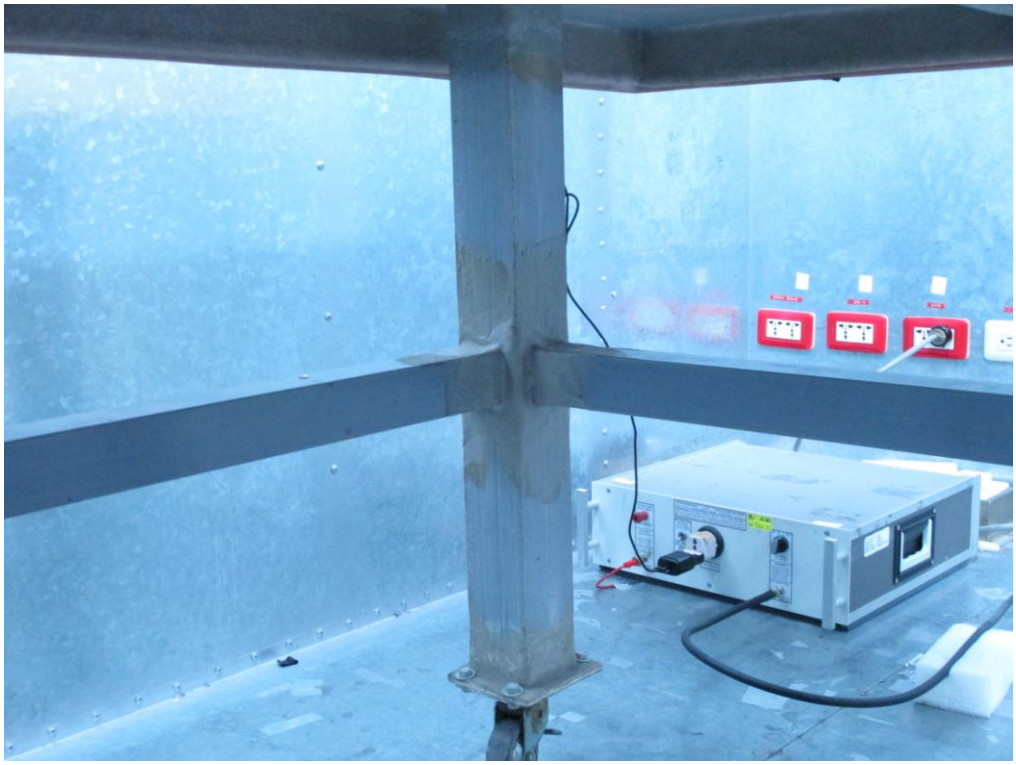


FRONT VIEW



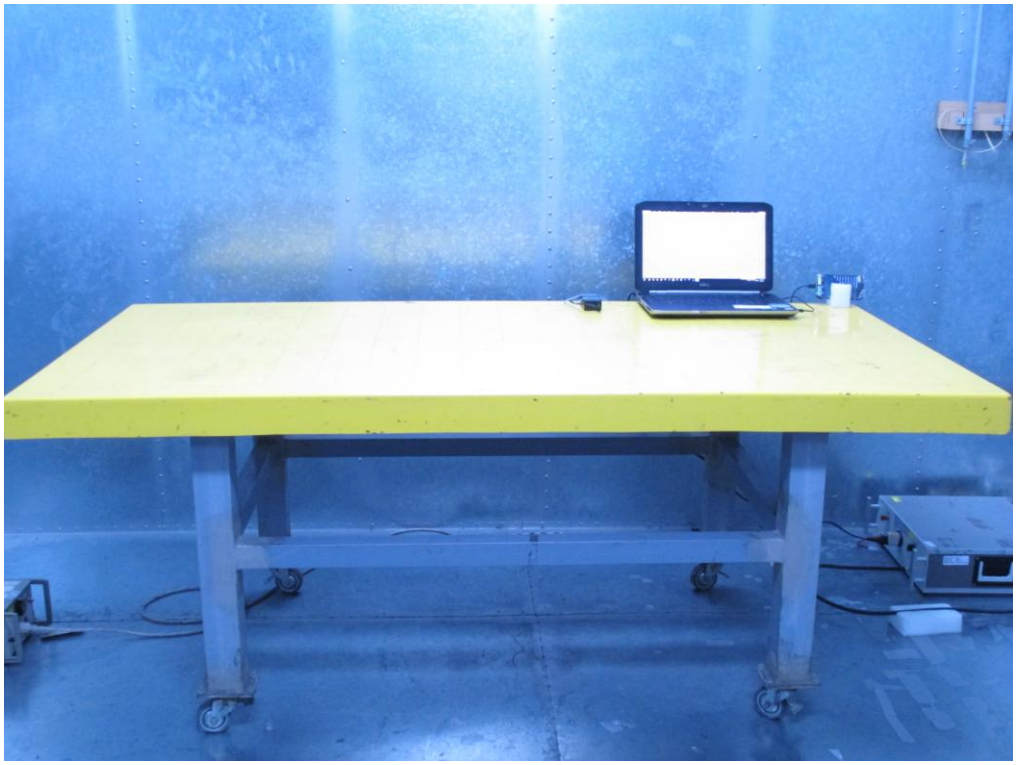
REAR VIEW

SIDE VIEW

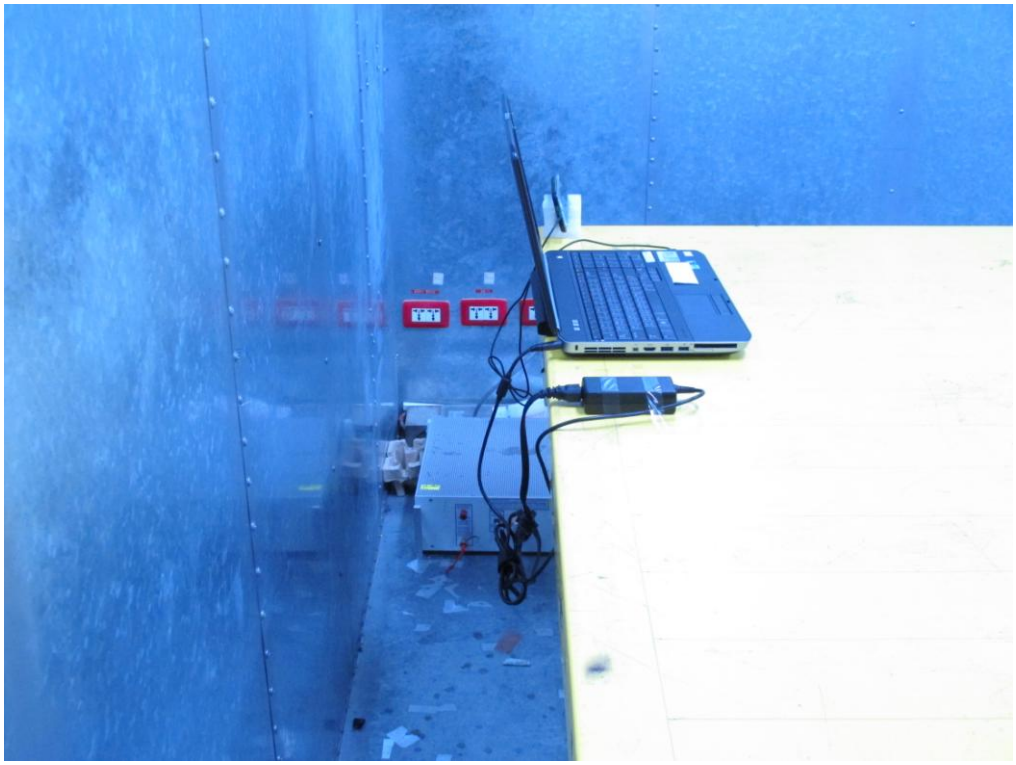


USB Mode

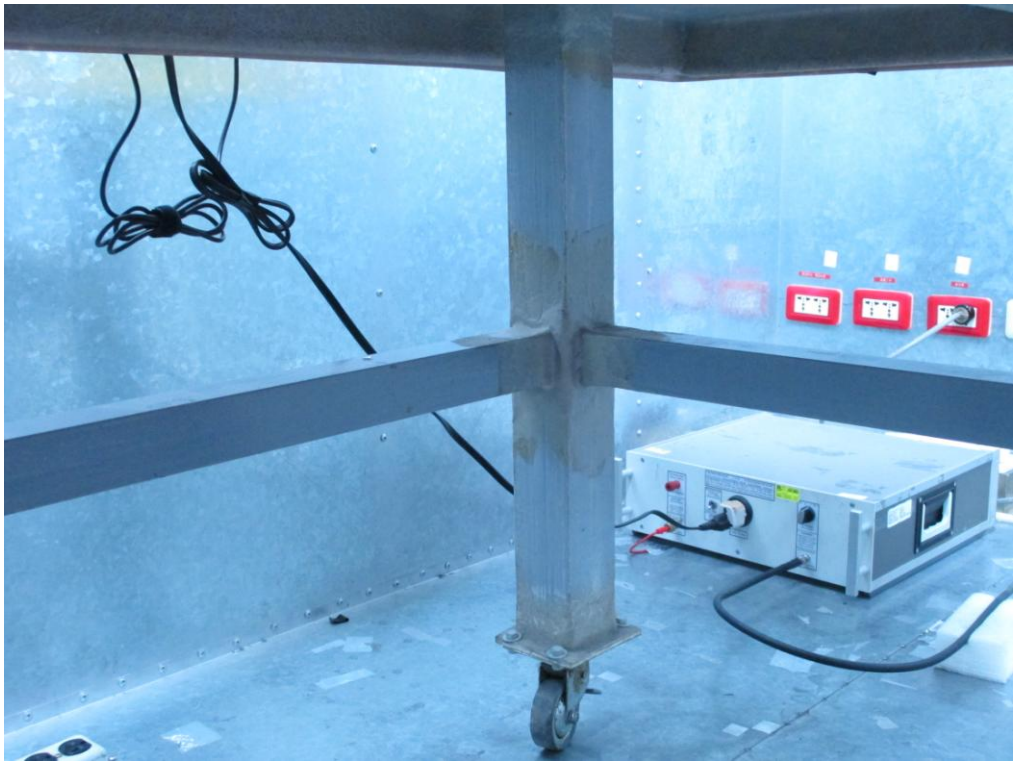
FRONT VIEW



REAR VIEW

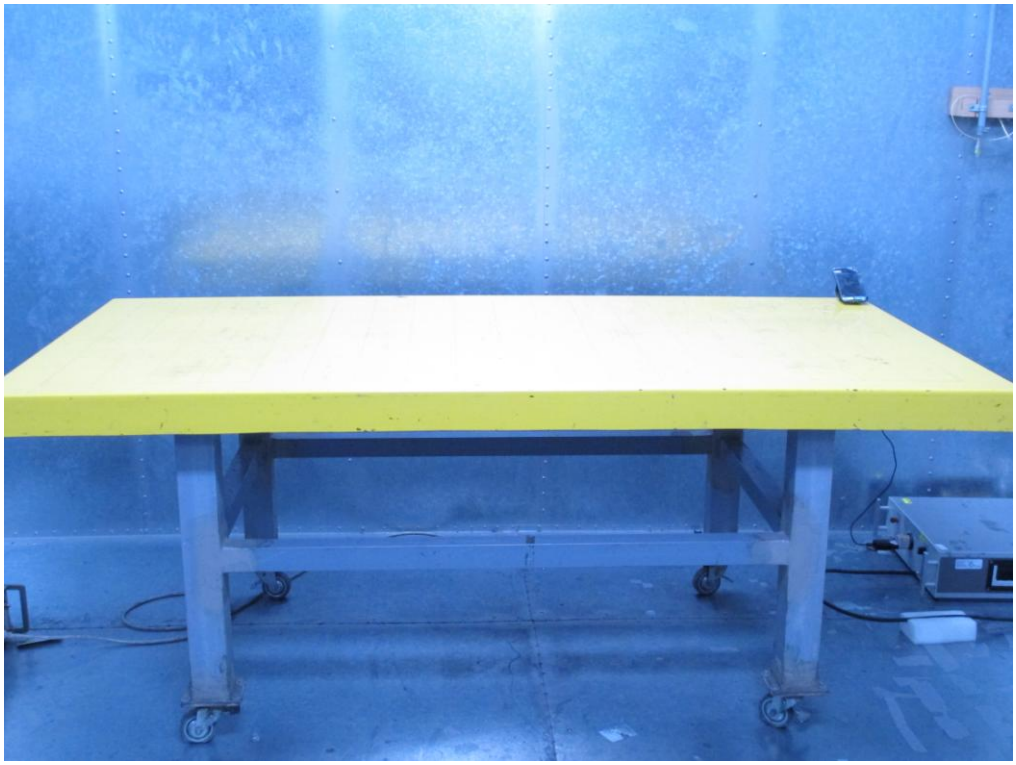


SIDE VIEW

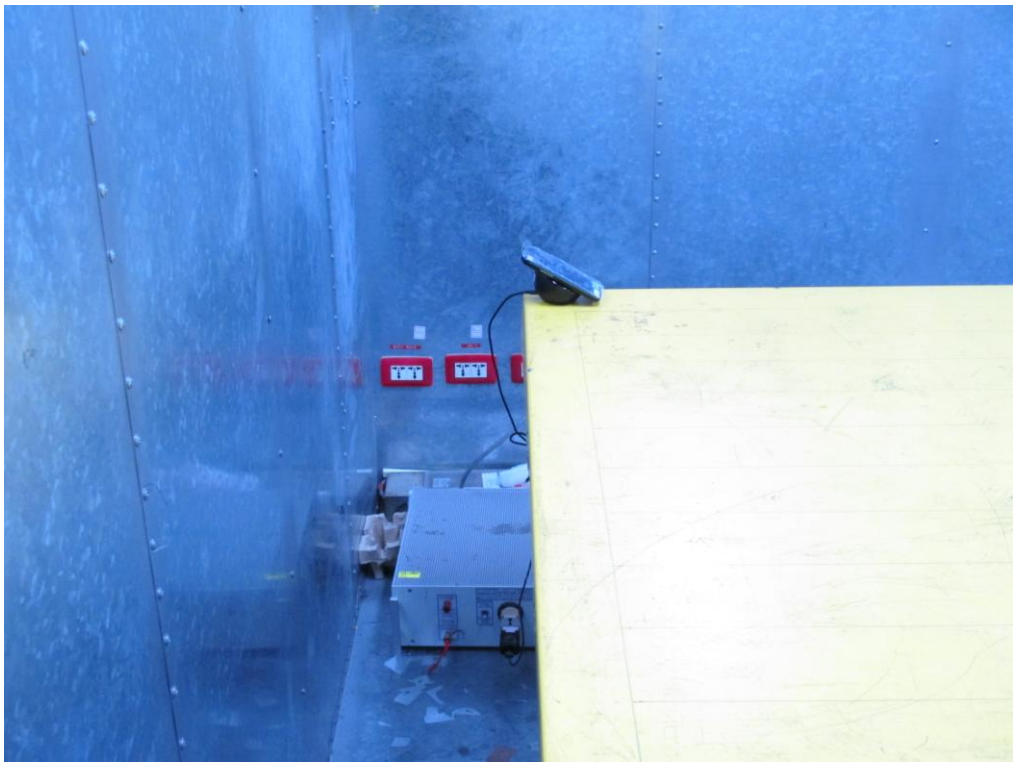


Wireless charging pad

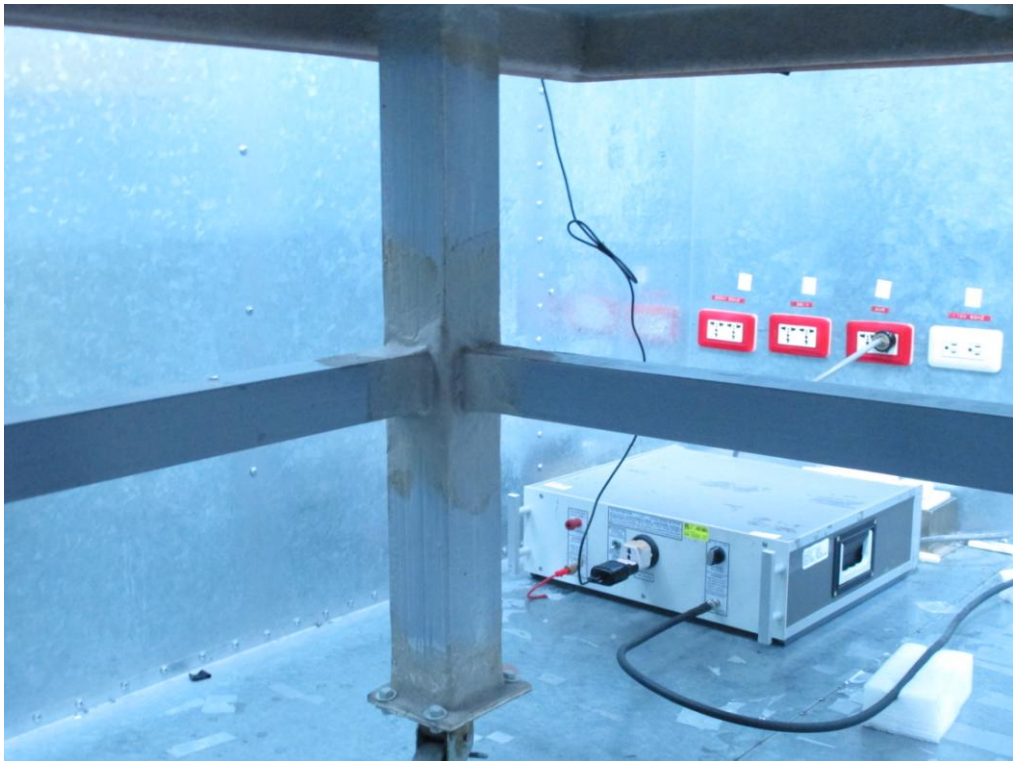
FRONT VIEW



REAR VIEW



SIDE VIEW

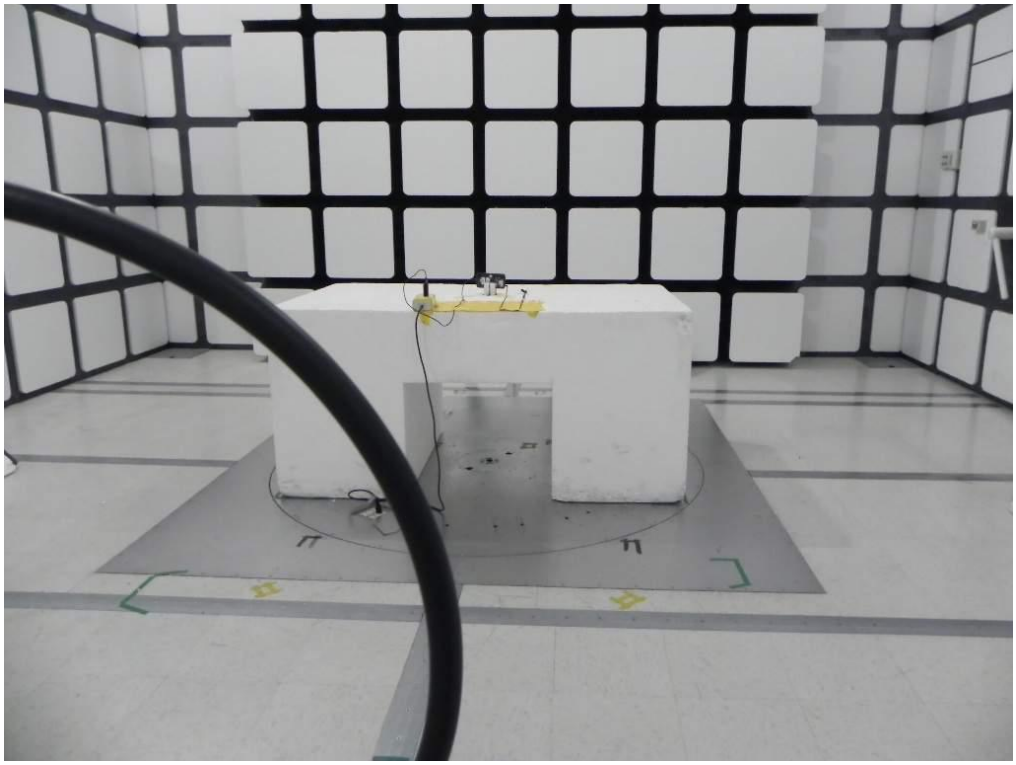


2 Photographs of Radiated Emissions Test Configuration

For radiated emissions 9kHz~30MHz

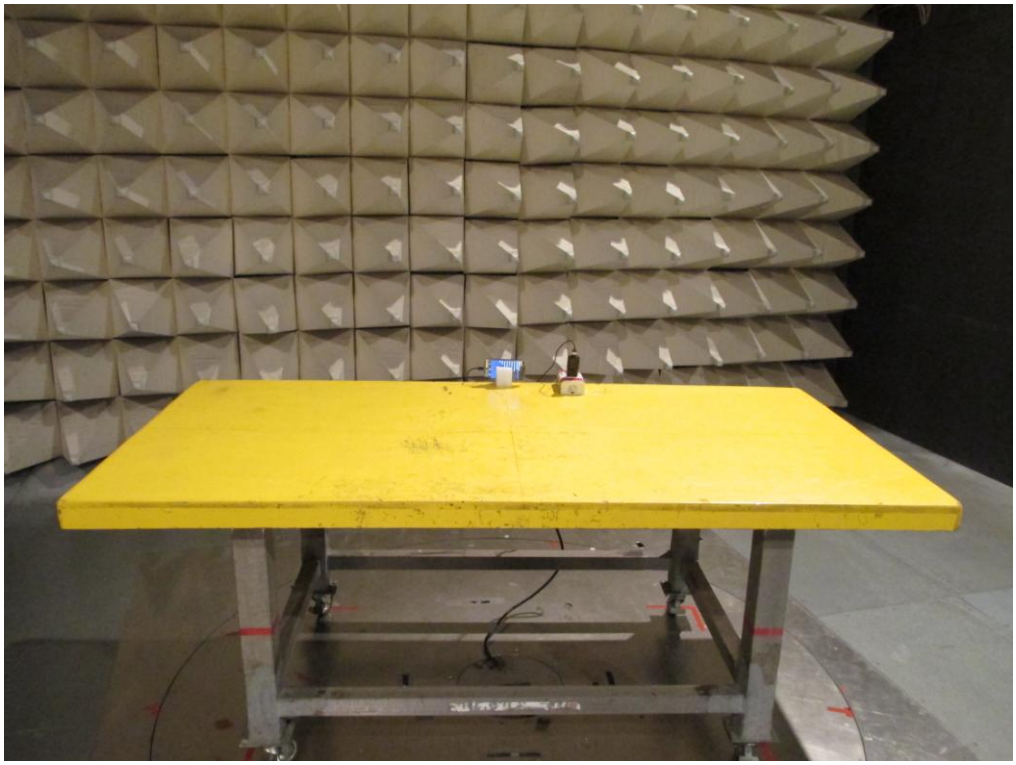
FRONT VIEW

REAR VIEW

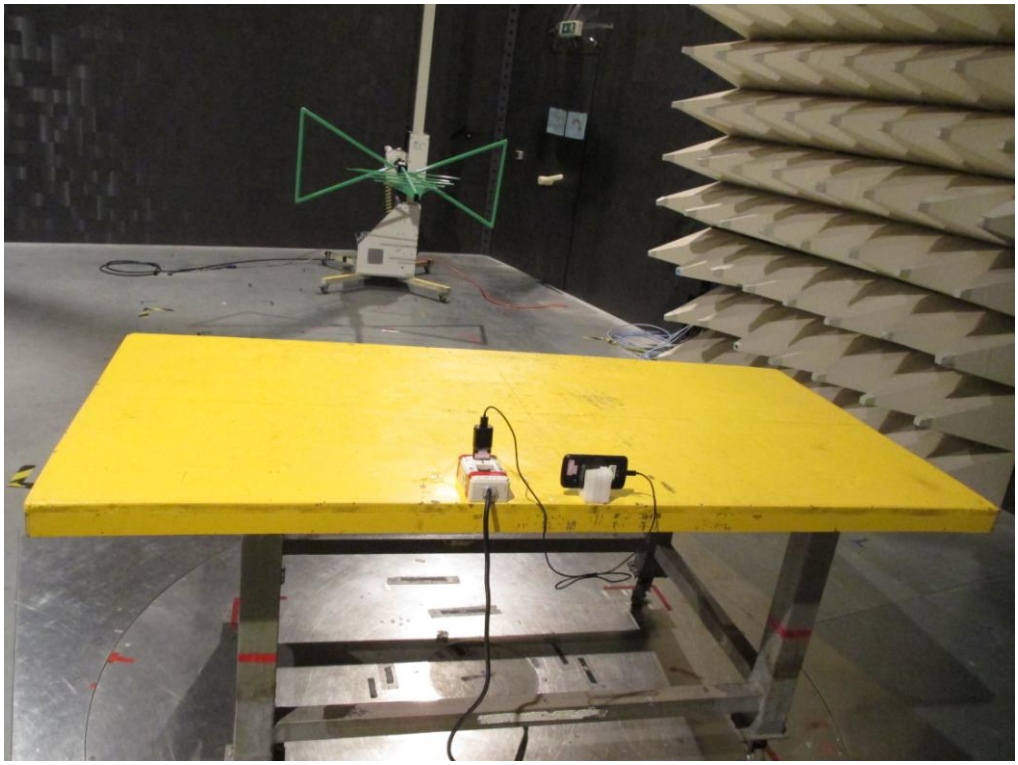


For radiated emissions 30MHz~1GHz
Adapter Mode

FRONT VIEW

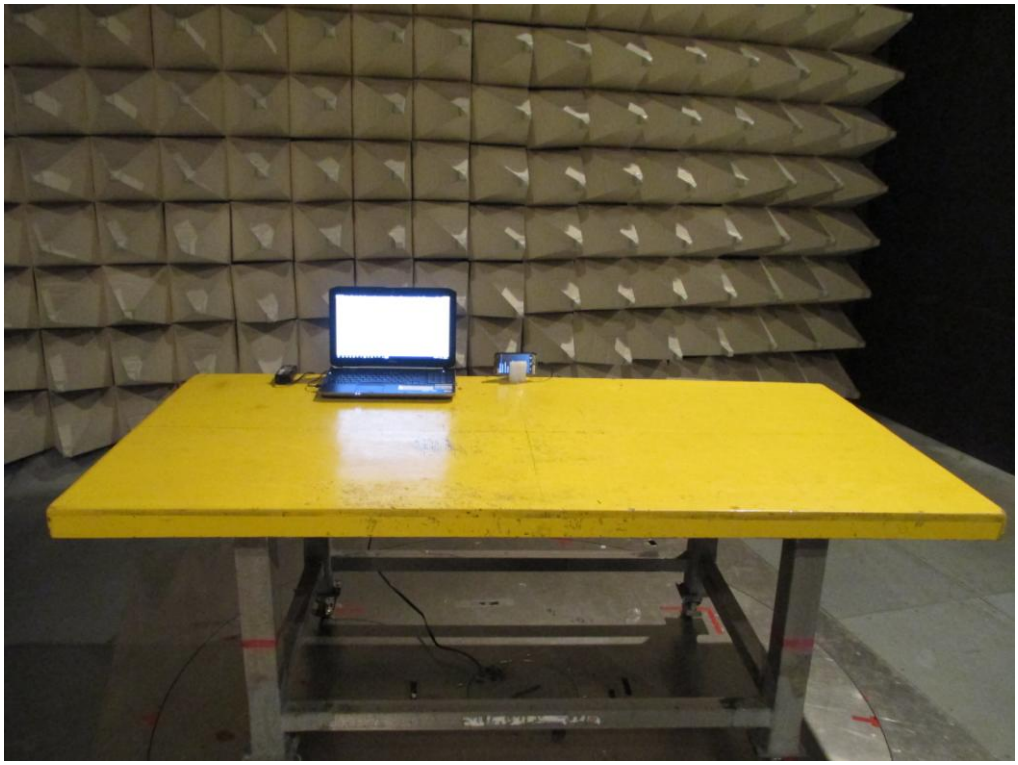


REAR VIEW

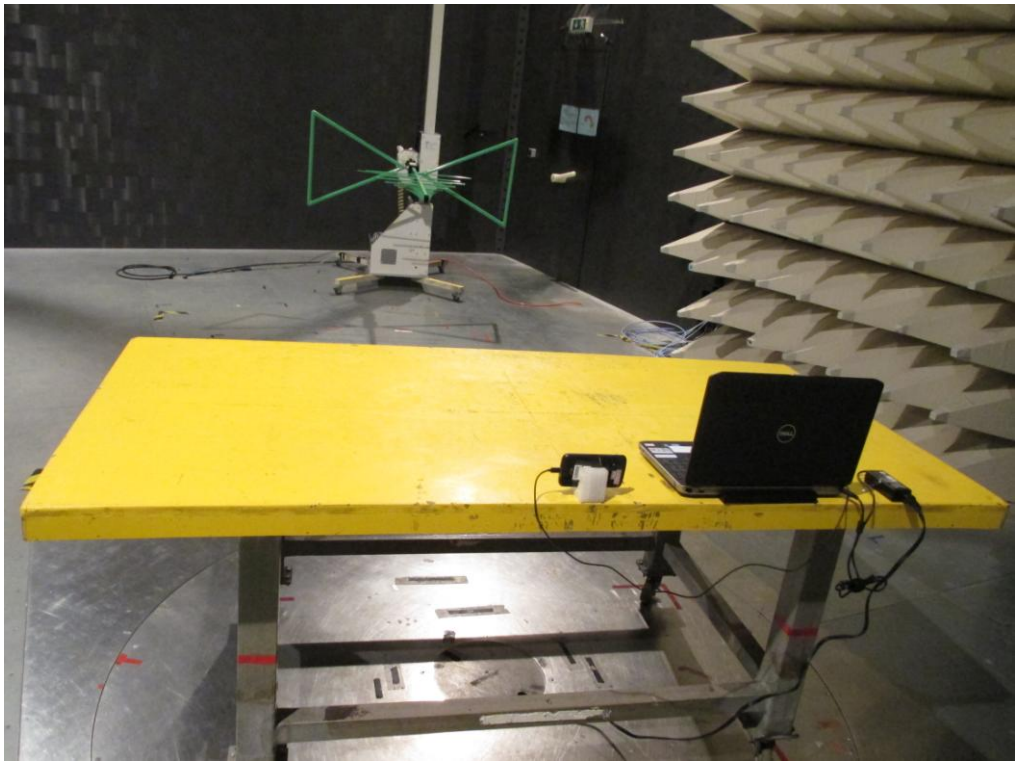


USB Mode

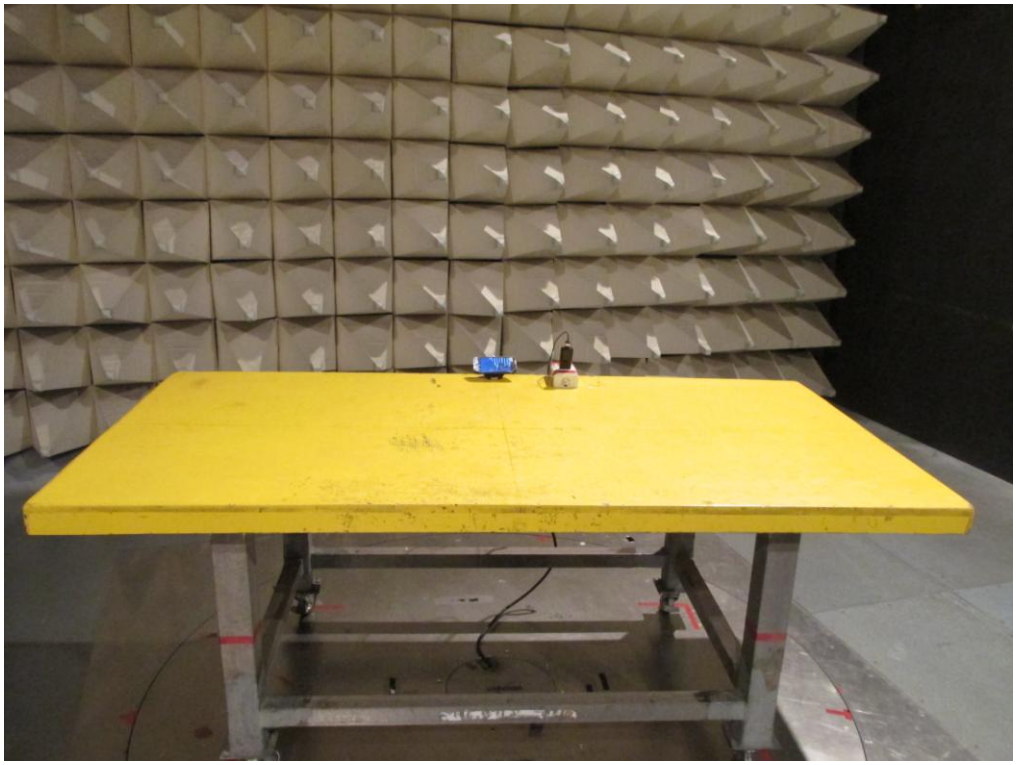
FRONT VIEW



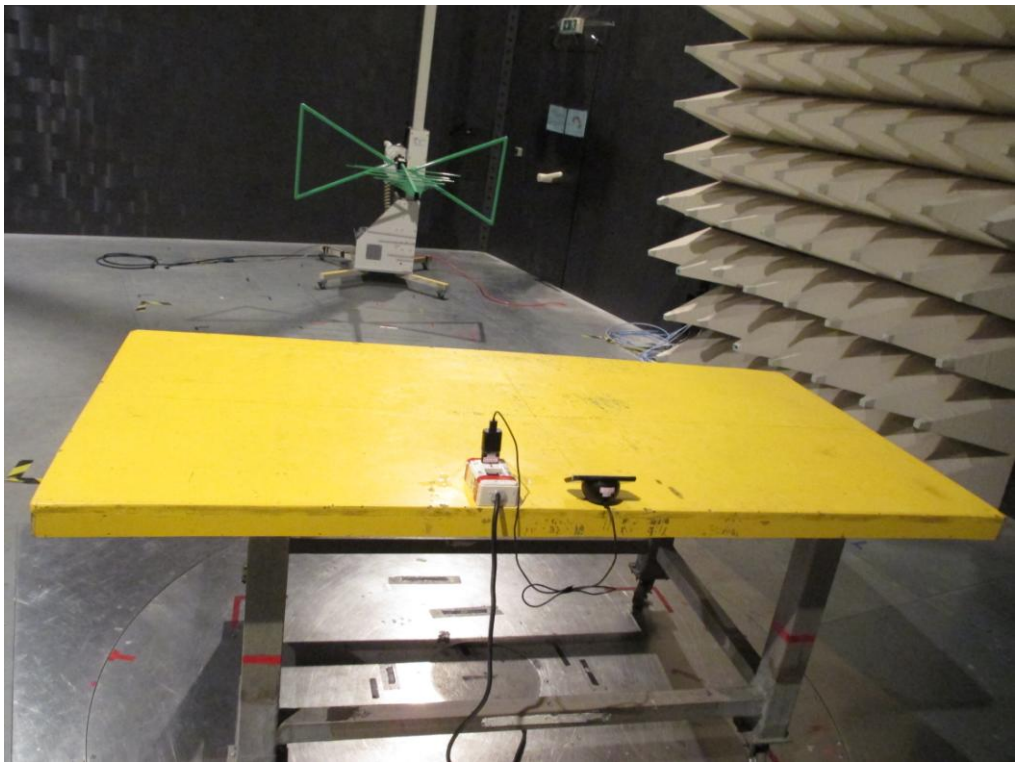
REAR VIEW



Wireless charging pad



FRONT VIEW



REAR VIEW