



# SPORTON International Inc.

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## FCC RADIO TEST REPORT

Applicant's company	Cradlepoint, Inc
Applicant Address	805W. Franklin Street, Boise, ID 83702
FCC ID	UXX-IBR600E

Product Name	Industrial Broadband Router
Brand Name	CradlePoint
Model No.	IBR600LPE / IBR600LPE- PWD
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	May 16, 2013
Final Test Date	Jul. 11, 2014
Submission Type	Class II Change

### Statement

**Test result included in this report is for the IEEE 802.11n and IEEE 802.11b/g of the product.**

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 C63.10-2009, 47 CFR FCC Part 15 Subpart C, KDB 558074 D01 v03r02 and KDB 662911 D01 v02r01.**

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



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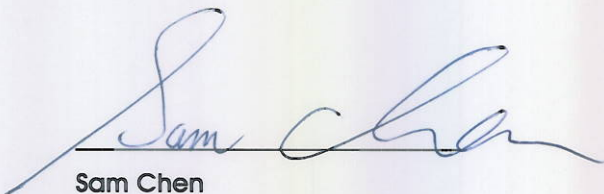
## History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR171915-19	Rev. 01	Initial issue of report	Aug. 06, 2014

## 1. CERTIFICATE OF COMPLIANCE

Product Name : Industrial Broadband Router  
Brand Name : CradlePoint  
Model No. : IBR600LPE / IBR600LPE- PWD  
Applicant : Cradlepoint, Inc  
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on May 16, 2013 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.



Sam Chen

SPORTON INTERNATIONAL INC.

## 2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.207	AC Power Line Conducted Emissions	Complies	7.95 dB
4.2	15.247(d)	Radiated Emissions	Complies	2.21 dB

### 3. GENERAL INFORMATION

#### 3.1. Product Details

##### IEEE 802.11n

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	see the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11 for 20MHz bandwidth ; 7 for 40MHz bandwidth
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

##### IEEE 802.11b/g

Items	Description
Product Type	WLAN (1TX, 1RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

### Antenna and Band width

Antenna	Single (TX)		Two (TX)	
Band width Mode	20 MHz	40 MHz	20 MHz	40 MHz
IEEE 802.11b	V	X	X	X
IEEE 802.11g	V	X	X	X
IEEE 802.11n	X	X	V	V

### IEEE 11n Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2	MCS 0-15
802.11n (HT40)	2	MCS 0-15
<p>Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40.</p> <p>Note 2: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n</p>		

## 3.2. Accessories

Power	Brand	Model	Rating
Adapter 1	TenPao	S024WM1200150	Input:100-240V~50/60Hz, 600mA Max Output: 12V, 1500mA
Adapter 2	HON-KWANG	HK-AB-120A150-US	Input: 100-240V~50/60Hz 0.8A Output: 12V, 1.5A
Others			
Bracket*1			

### 3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
1	Joymax	IWX-1511RSXX-711	Dipole Antenna	Reversed-SMA	5	TX/RX

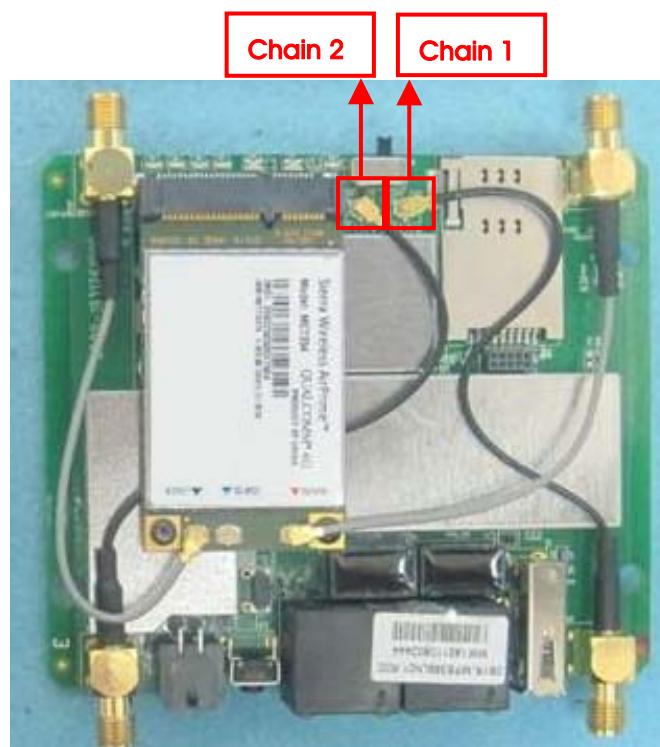
Note: The EUT has a antenna for WLAN function.

**For IEEE 802.11b/g mode (1TX/1RX):**

Only Chain 1 can be used as transmitting/receiving functions.

**For IEEE 802.11n mode (2TX/2RX):**

Chain 1 and Chain 2 could both transmit/receive simultaneously





### 3.4. Table for Carrier Frequencies

There are two bandwidth systems.

For 20MHz bandwidth systems, use Channel 1~Channel 11.

For 40MHz bandwidth systems, use Channel 3~Channel 9.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz	-	-

### 3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. 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	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	-	-	-
Radiated Emissions 9kHz~1GHz	Normal Link	-	-	-

The following test modes were performed for all tests:

Conducted Emission test							
Mode	GSM Link	WCDMA Link	LTE Link	WiFi Link	GPS Link	Adapter 1	Adapter 2
1	●	-	-	●	●	●	-
2	-	●	-	●	●	●	-
3	-	-	●	●	●	●	-
4	●	-	-	●	●	-	●
5	-	●	-	●	●	-	●
6	-	-	●	●	●	-	●
Mode 5 generated the worst test result, so it was recorded in this report.							

Radiated Emissions									
Mode	Stand	Laying	GSM Link	WCDMA Link	LTE Link	WiFi Link	GPS Link	Adapter 1	Adapter 2
1	-	●	●	-	-	●	●	●	-
2 (Note1)	●	-	●	-	-	●	●	●	-
3	●	-	-	●	-	●	●	●	-
4 (Note2)	●	-	-	-	●	●	●	●	-
5	●	-	-	-	●	●	●	-	●
<p>Note1: Mode 2 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3~4 will follow this same test mode.</p> <p>Note2: Mode 4 has been evaluated to be the worst case among Mode 2~4, thus measurement for Mode 5 will follow this same test mode.</p> <p>For Radiated Emission test below 1GHz:</p> <p>Mode 2 generated the worst test result, so it was recorded in this report.</p> <p>For Radiated Emission test above1GHz:</p> <p>Mode 2 generated the worst test result for Radiated emission below 1GHz test, thus the measurement for Radiated emission above 1GHz test will follow this same test configuration.</p>									

#### For Co-location MPE and Radiated Emission Co-location Test:

The EUT could be applied with WiFi function and WWAN function; therefore Co-location Maximum Permissible Exposure (Please refer to Appendix B) and Radiated Emission Co-location (please refer to Appendix C) tests are added for simultaneously transmit among WiFi function and WWAN function.

### 3.6. Table for Testing Locations

Test Site Location				
Address:	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			
Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D
CO01-CB	Conduction	Hsin Chu	262045	IC 4086D

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC).

### 3.7. Table for Multiple Listing and Class II Change

This product is an extension of original one reported under Sporton project number: FR171915-07

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Add 2 Model Name	Conducted emissions measurement Radiated emissions below 1GHz Co-location Maximum Permissible Exposure Radiated Emission Co-location

Model No.	WWAN Module Model No.	Description				
		WIFI	2G	3G	LTE	GPS
IBR600LPE	MC7354	O	O	O	O	X
IBR600LPE-PWD	(FCC ID: N7NMC7355)	O	O	O	O	V

From the above models, model: IBR600LPE-PWD was selected as representative model for the test and its data was recorded in this report.

### 3.8. Table for Supporting Units

For Test Site No: 03CH01-CB

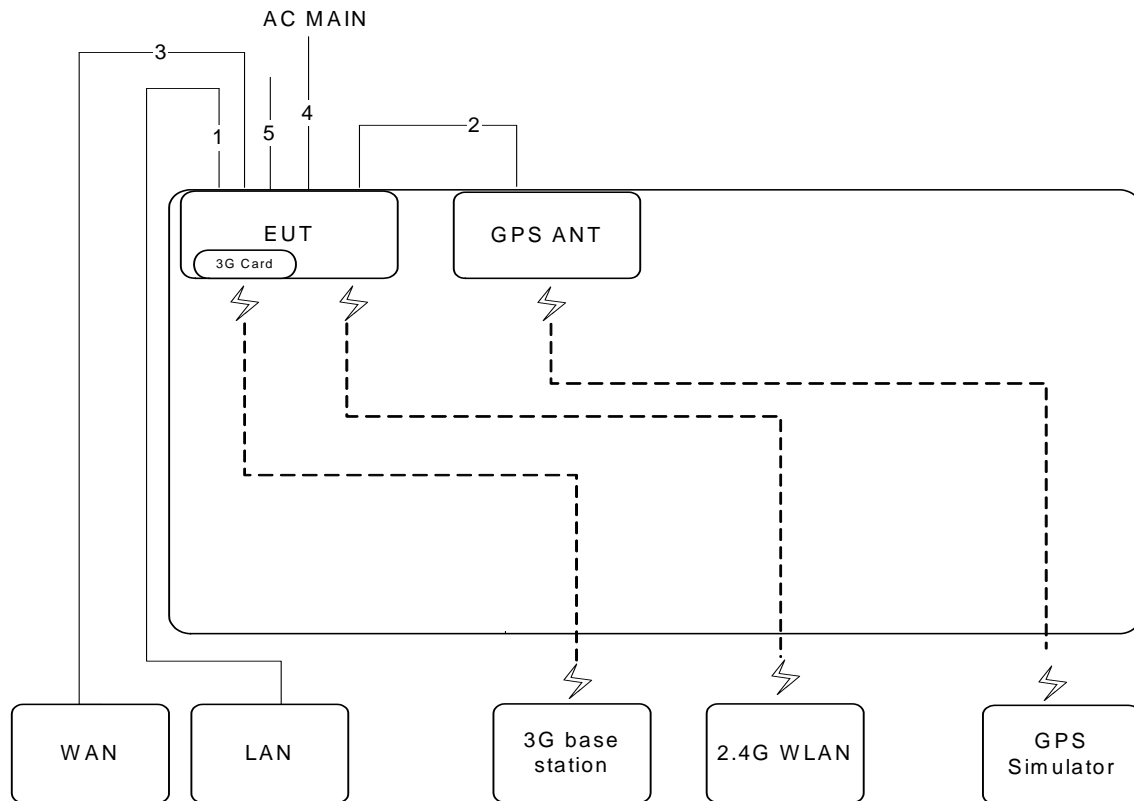
Support Unit	Brand	Model	FCC ID
NB	DELL	M1330	DoC
NB*2	DELL	M1340	DoC
GPS Simulator	WELNAVIGATE	GS-100	N/A
3G base station	R&S	CMU200	N/A
3G Card	N/A	N/A	N/A

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6220	DoC
NB*2	DELL	E6430	DoC
GPS Simulator	WELNAVIGATE	GS-100	N/A
3G base station	R&S	CMU200	N/A
3G Card	N/A	N/A	N/A

### 3.9. Test Configurations

#### 3.9.1. AC Power Line Conduction and Radiation Below 1GHz Emissions Test Configuration



## 4. TEST RESULT

### 4.1. AC Power Line Conducted Emissions Measurement

#### 4.1.1. 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.

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

#### 4.1.2. Measuring Instruments and Setting

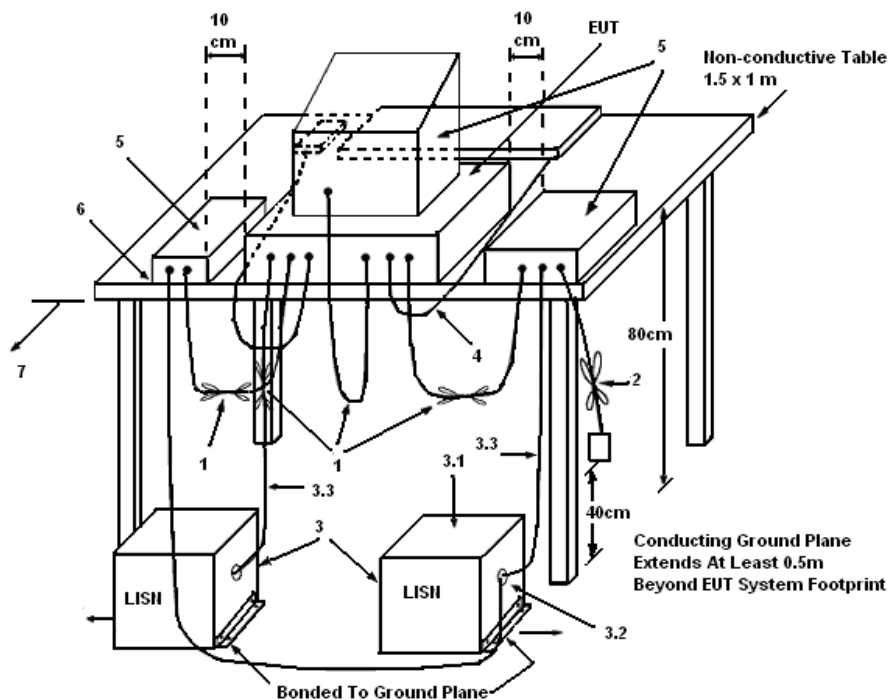
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

#### 4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

#### 4.1.4. 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  $\Omega$ . 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.

#### 4.1.5. Test Deviation

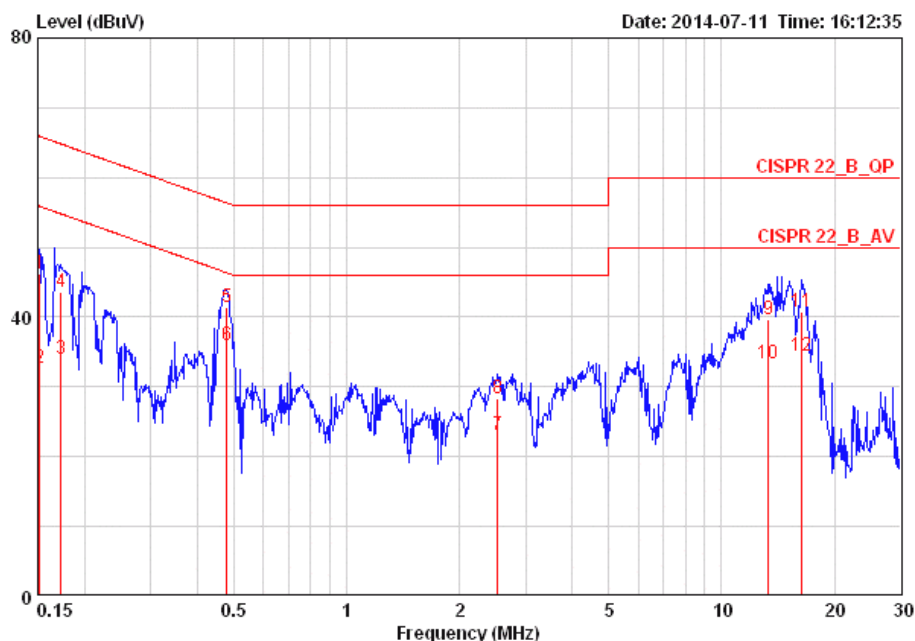
There is no deviation with the original standard.

#### 4.1.6. EUT Operation during Test

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

#### 4.1.7. Results of AC Power Line Conducted Emissions Measurement

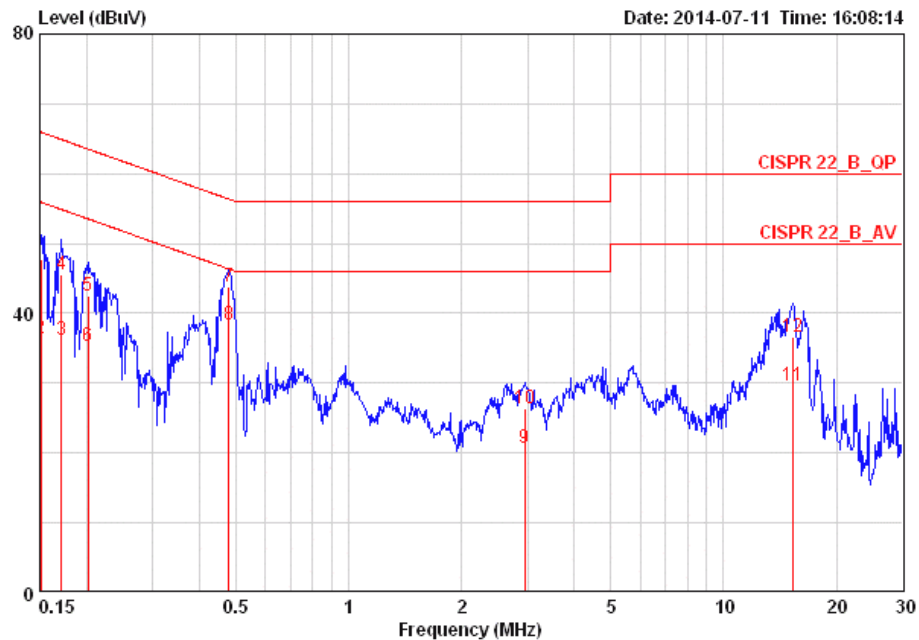
Temperature	25°C	Humidity	53%
Test Engineer	Parody Lin	Phase	Line
Configuration	Normal Link	Test Mode	Mode 5



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1	0.15160	46.15	-19.76	65.91	0.10	45.89	0.16	LINE	QP
2	0.15160	32.78	-23.13	55.91	0.10	32.52	0.16	LINE	AVERAGE
3	0.17307	34.03	-20.78	54.81	0.10	33.77	0.16	LINE	AVERAGE
4	0.17307	43.59	-21.22	64.81	0.10	43.33	0.16	LINE	QP
5	0.47865	41.40	-14.96	56.36	0.11	41.11	0.18	LINE	QP
6	0.47865	36.01	-10.35	46.36	0.11	35.72	0.18	LINE	AVERAGE
7	2.527	23.06	-22.94	46.00	0.18	22.62	0.27	LINE	AVERAGE
8	2.527	28.23	-27.77	56.00	0.18	27.79	0.27	LINE	QP
9	13.337	39.64	-20.36	60.00	0.40	38.82	0.42	LINE	QP
10	13.337	33.43	-16.57	50.00	0.40	32.61	0.42	LINE	AVERAGE
11	16.398	40.77	-19.23	60.00	0.44	39.86	0.47	LINE	QP
12	16.398	34.35	-15.65	50.00	0.44	33.44	0.47	LINE	AVERAGE



Temperature	25°C	Humidity	53%
Test Engineer	Parody Lin	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 5



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1	0.15080	47.80	-18.16	65.96	0.09	47.55	0.16	NEUTRAL	QP
2	0.15080	36.35	-19.61	55.96	0.09	36.10	0.16	NEUTRAL	AVERAGE
3	0.17125	36.12	-18.78	54.90	0.09	35.87	0.16	NEUTRAL	AVERAGE
4	0.17125	45.47	-19.43	64.90	0.09	45.22	0.16	NEUTRAL	QP
5	0.20181	42.49	-21.05	63.54	0.09	42.23	0.17	NEUTRAL	QP
6	0.20181	35.38	-18.16	53.54	0.09	35.12	0.17	NEUTRAL	AVERAGE
7 B	0.47865	43.73	-12.63	56.36	0.10	43.45	0.18	NEUTRAL	QP
8 B	0.47865	38.41	-7.95	46.36	0.10	38.13	0.18	NEUTRAL	AVERAGE
9	2.946	20.63	-25.37	46.00	0.17	20.18	0.28	NEUTRAL	AVERAGE
10	2.946	26.33	-29.67	56.00	0.17	25.88	0.28	NEUTRAL	QP
11	15.307	29.56	-20.44	50.00	0.39	28.71	0.45	NEUTRAL	AVERAGE
12	15.307	36.57	-23.43	60.00	0.39	35.72	0.45	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

## 4.2. Radiated Emissions Measurement

### 4.2.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

### 4.2.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak,
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

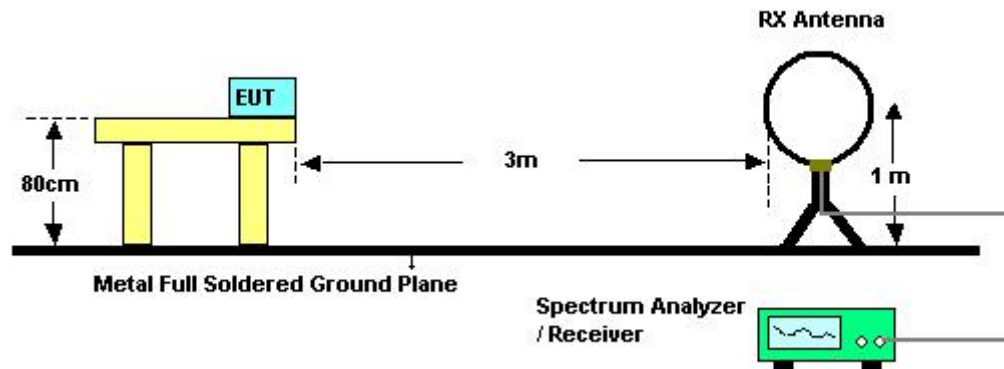
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

#### 4.2.3. Test Procedures

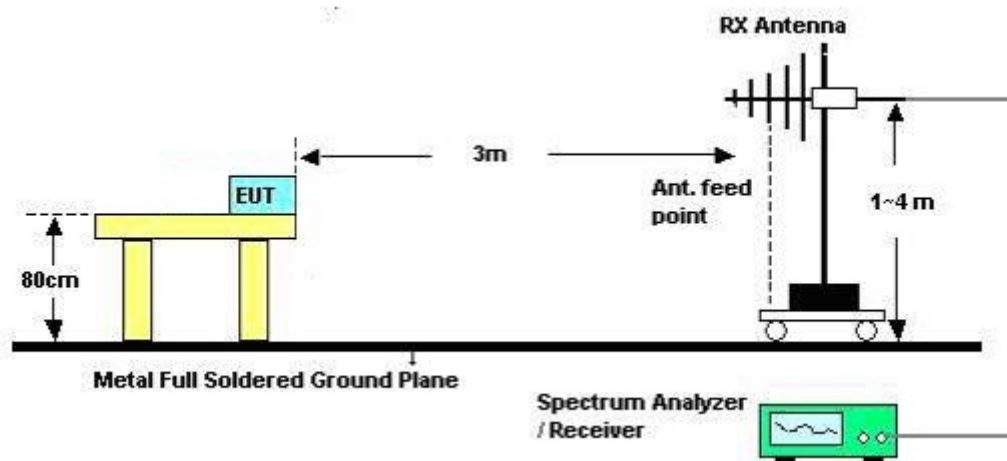
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. 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.

#### 4.2.4. Test Setup Layout

For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



#### 4.2.5. Test Deviation

There is no deviation with the original standard.

#### 4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

#### 4.2.7. Results of Radiated Emissions (9kHz~30MHz)

Temperature	23°C	Humidity	61%
Test Engineer	YC Chen	Configurations	Normal Link
Test Date	Jul. 05, 2014	Test Mode	Mode 2

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

**Note:**

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

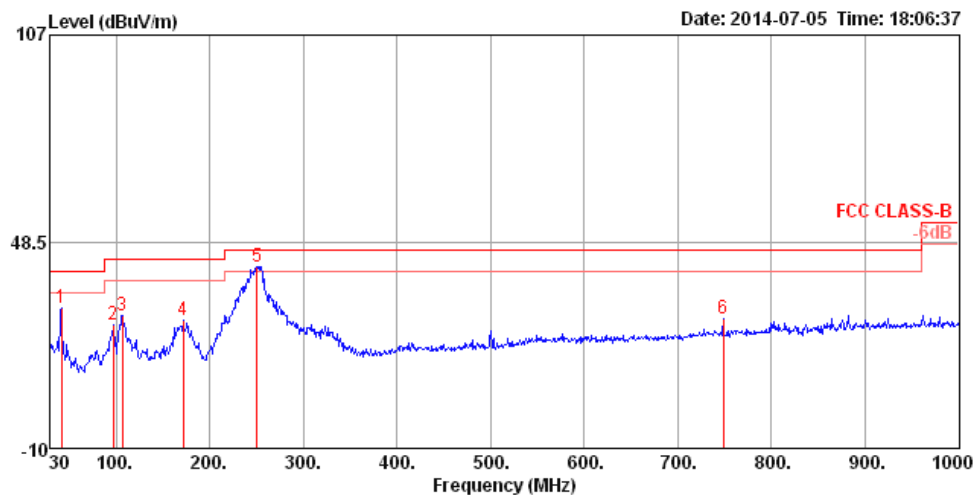
Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

#### 4.2.8. Results of Radiated Emissions (30MHz~1GHz)

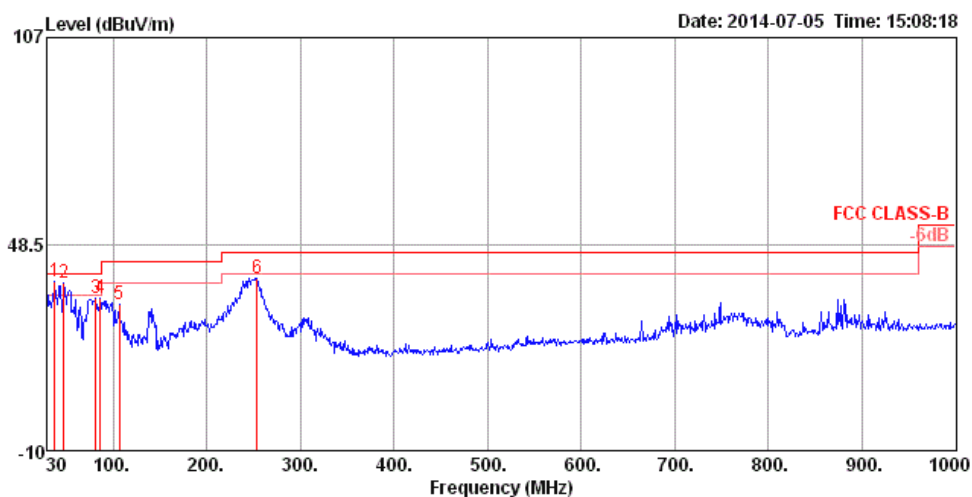
Temperature	23°C	Humidity	61%
Test Engineer	YC Chen	Configurations	Normal Link
Test Mode	Mode 2		

##### Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	41.64	29.81	40.00	-10.19	49.64	0.76	11.27	31.86	100	115	HORIZONTAL	Peak
2	96.93	25.04	43.50	-18.46	45.59	1.17	9.87	31.59	200	182	HORIZONTAL	Peak
3	106.63	27.48	43.50	-16.02	46.70	1.23	11.11	31.56	300	184	HORIZONTAL	Peak
4	171.62	26.05	43.50	-17.45	47.02	1.59	8.96	31.52	200	170	HORIZONTAL	Peak
5	250.19	41.57	46.00	-4.43	59.25	1.90	11.91	31.49	125	192	HORIZONTAL	Peak
6	748.77	26.67	46.00	-19.33	34.83	3.52	19.69	31.37	125	50	HORIZONTAL	Peak

## Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37.76	37.79	40.00	-2.21	55.17	0.72	13.78	31.88	100	224 VERTICAL	QP
2	47.46	37.51	40.00	-2.49	59.88	0.82	8.62	31.81	100	256 VERTICAL	QP
3	81.41	33.28	40.00	-6.72	56.96	1.05	6.98	31.71	125	126 VERTICAL	Peak
4	86.26	33.22	40.00	-6.78	55.84	1.10	7.94	31.66	100	224 VERTICAL	Peak
5	106.63	31.58	43.50	-11.92	50.80	1.23	11.11	31.56	100	92 VERTICAL	Peak
6	254.07	38.63	46.00	-7.37	55.93	1.92	12.29	31.51	100	264 VERTICAL	Peak

### Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB 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.

## 5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100355	9 kHz ~ 2.75 GHz	Apr. 23, 2014	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150 kHz ~ 100 MHz	Nov. 23, 2013	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 11, 2013	Conduction (CO01-CB)
Impulsbegrenzer Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9 kHz ~ 30 MHz	Feb. 25, 2014	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150 kHz ~ 30 MHz	Dec. 04, 2013	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	2888	20MHz ~ 2GHz	Jan. 15, 2014	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 01, 2013	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Dec. 17, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 12, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Dec. 12, 2013	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R.	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO 2000	N/A	1 m - 4 m	N.C.R.	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)

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

\*Calibration Interval of instruments listed above is two year.

N.C.R. means Non-Calibration required.



## 6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%