

## FCC RADIO TEST REPORT

Applicant's company	Philips Electronics Singapore Pte. Ltd.
Applicant Address	Home Control, Test & Validation, Philips Consumer Lifestyle, 620A Lorong 1 Toa Payoh, Building TP1, Level 2 Singapore 319762
FCC ID	RCSKWR112401A
Manufacturer's company	PT HonFoong Plastics Industries
Manufacturer Address	Jalan Beringin Lot Jalan Gaharu Lot 232, 233, 247 Batamindo Industrial park Mukakuning P.Batam, Indonesia

Product Name	xfinity RF Remote Control
Brand Name	xfinity
Model Name	KWR112401/01B
Serial Number(12NC)	3139 228 10531
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.249
Test Freq. Range	2425 ~ 2475MHz
Received Date	Sep. 08, 2011
Final Test Date	Nov. 07, 2011
Submission Type	Original Equipment



### 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 C63.10-2009** and **47 CFR FCC Part 15 Subpart C**.

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

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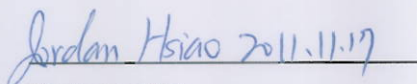
## History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR190845-01	Rev. 01	Initial issue of report	Nov. 17, 2011

## 1. CERTIFICATE OF COMPLIANCE

Product Name : xfinity RF Remote Control  
Brand Name : xfinity  
Model Name : KWR112401/01B  
Serial Number(12NC) : 3139 228 10531  
Applicant : Philips Electronics Singapore Pte. Ltd.  
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.249

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Sep. 08, 2011 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.



Reviewed By:

Jordan Hsiao

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
-	15.207	AC Power Line Conducted Emissions	Not Applicable	-
4.1	15.249(a)	Field Strength of Fundamental Emissions	Complies	1.20 dB
4.2	15.215(c)	20dB Spectrum Bandwidth	Complies	-
4.3	15.249(a)/(d)	Radiated Emissions	Complies	1.88 dB
4.4	15.249(d)	Band Edge Emissions	Complies	9.51 dB
4.5	15.203	Antenna Requirements	Complies	-

Note Due to the EUT is a DC-powered (Coin Cell Battery) equipment; it's not necessary to apply for AC Power Line Conducted Emissions test.

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	$\pm 2.3\text{dB}$	Confidence levels of 95%
Field Strength of Fundamental Emissions	$\pm 0.8\text{dB}$	Confidence levels of 95%
20dB Spectrum Bandwidth	$\pm 8.5 \times 10^{-8}$	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	$\pm 0.8\text{dB}$	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	$\pm 1.9\text{dB}$	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	$\pm 1.9\text{dB}$	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	$\pm 1.9\text{dB}$	Confidence levels of 95%
Temperature	$\pm 0.7^{\circ}\text{C}$	Confidence levels of 95%
Humidity	$\pm 3.2\%$	Confidence levels of 95%
DC / AC Power Source	$\pm 1.4\%$	Confidence levels of 95%

### 3. GENERAL INFORMATION

#### 3.1. Product Details

Items	Description
Power Type	Coin Cell Battery (MANGANESE DIOXIDE LITHIUM BATTERY)
Modulation	O-QPSK (Offset - Quadrature Phase Shift Keying)
Frequency Range	2425 ~ 2475MHz
Channel Number	3
Channel Band Width (99%)	EUT 1 : 2.44 MHz EUT 2 : 2.52 MHz
Max. Field Strength	EUT 1 : 92.80 dBuV/m at 3m (Average) EUT 2 : 87.80 dBuV/m at 3m (Average)
Carrier Frequencies	Please refer to section 3.3
Antenna	Internal Antenna (Without any antenna connector)

#### 3.2. Accessories

N/A

#### 3.3. Table for Carrier Frequencies

Frequency Band	Channel No.	Frequency
2425 ~ 2475MHz	15	2425 MHz
	20	2450 MHz
	25	2475 MHz

### 3.4. 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	Antenna
AC Power Line Conducted Emissions	-	-	-
Field Strength of Fundamental Emissions 20dB Spectrum Bandwidth	CTX	15/20/25	1
Radiated Emissions 30MHz ~ 1GHz	Normal Link	-	-
Radiated Emissions 1GHz~10 <sup>th</sup> Harmonic	CTX	15/20/25	1
Band Edge Emissions	CTX	15/20/25	1

Note: CTX=continuously transmitting

ETU1: Without EEPROM

EUT2: With EEPROM

The following test modes were performed for all tests:

Test Mode 1: EUT put vertically

Test Mode 2: EUT put horizontally

**For Radiated Emission test below 1GHz:**

The EUT was operated at normal link (Mode 2), so it was recorded in this report.

**For Radiated Emission test above 1GHz:**

Due to Mode 1 generated the worst test result, so it was recorded in this report.

### 3.5. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

Please refer section 6 for Test Site Address.

### 3.6. Table for Supporting Units

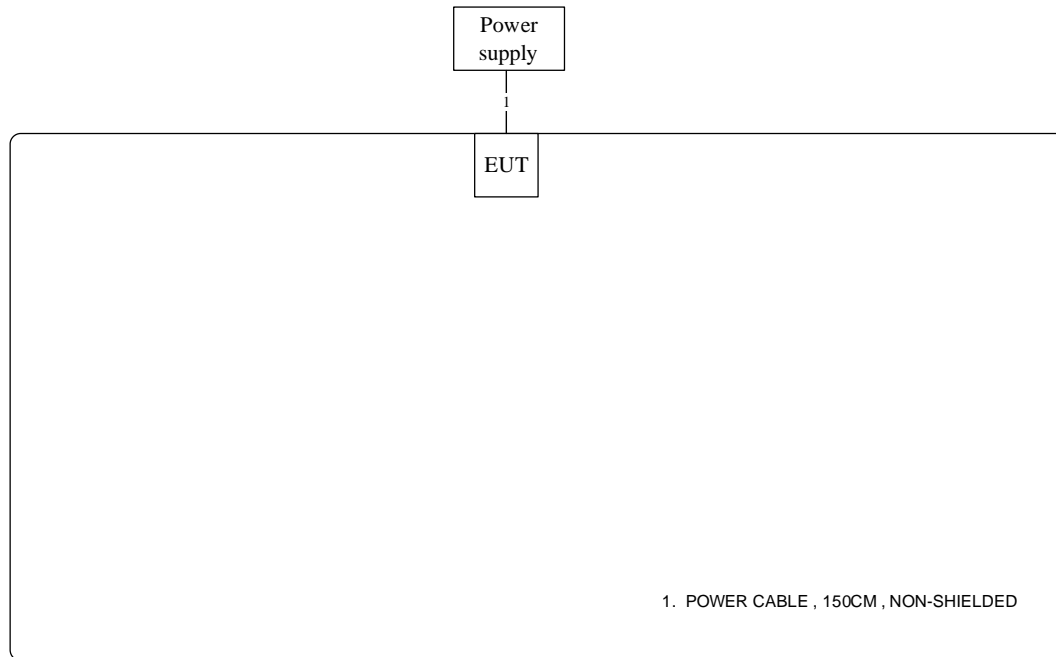
N/A

### 3.7. Test Configurations

#### 3.7.1. Radiation Emissions Test Configuration

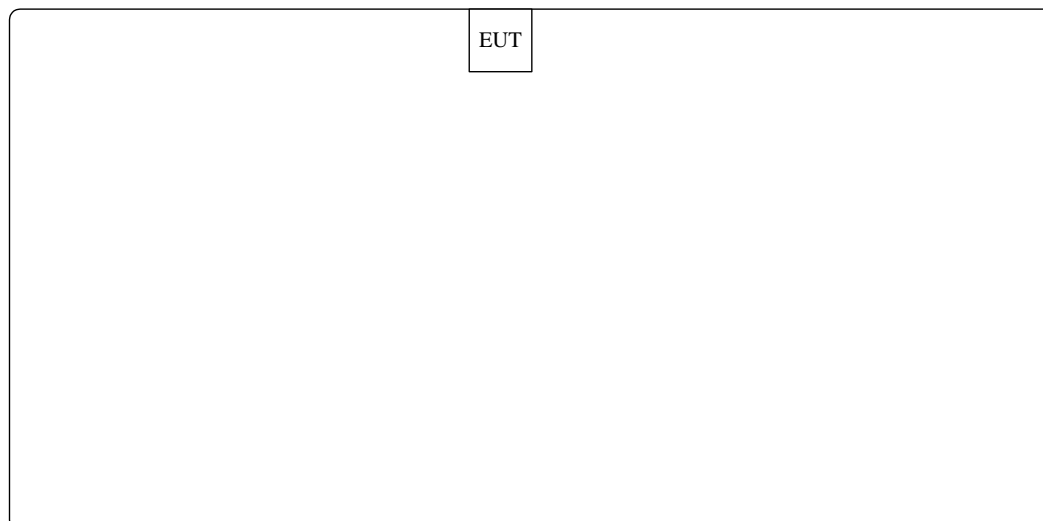
EUT 1

Test Configuration: 30MHz~1GHz



EUT 2

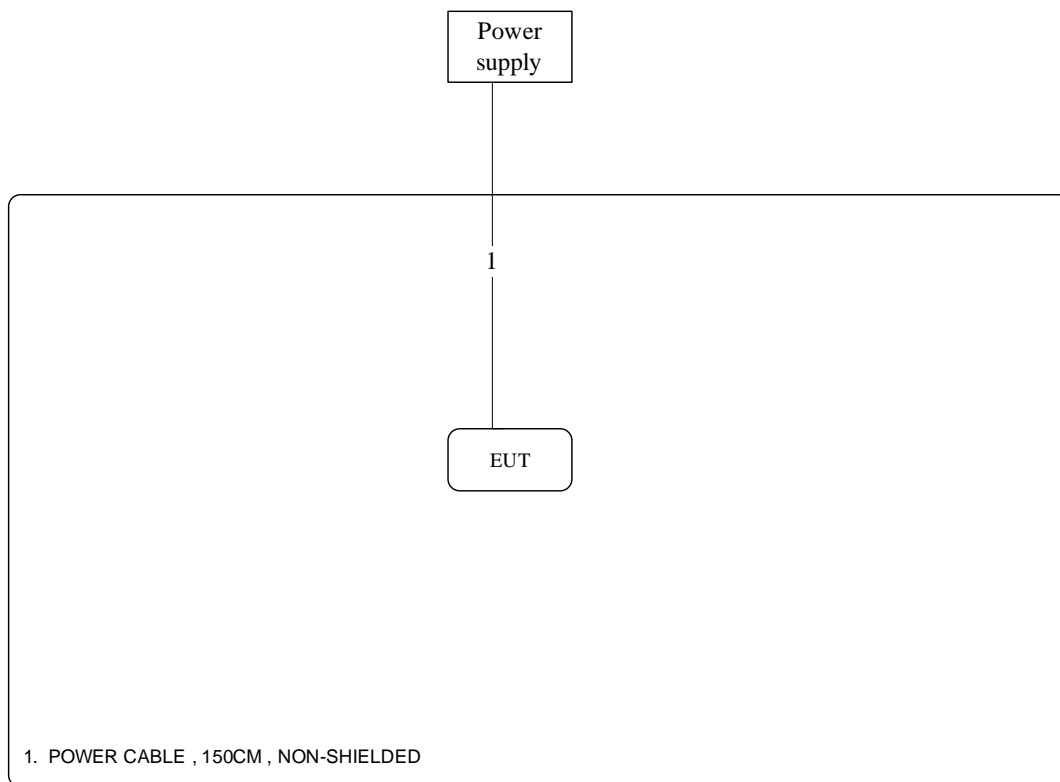
Test Configuration: 30MHz~1GHz





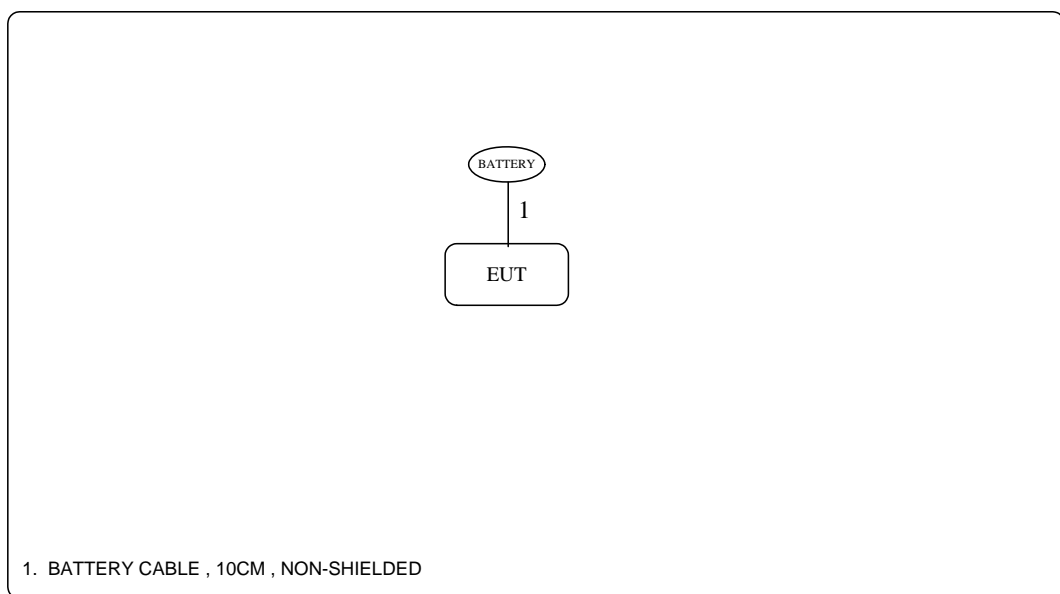
## EUT 1

Test Configuration: Above 1GHz



## EUT 2

Test Configuration: Above 1GHz



## 4. TEST RESULT

### 4.1. Field Strength of Fundamental Emissions Measurement

#### 4.1.1. Limit

The field strength of fundamental emissions within these bands specified at a distance of 3 meters (measurement instrumentation employing an average detector) shall comply with the following table.

Frequency Band (MHz)	Fundamental Emissions Limit (dBuV/m) at 3m	
	Peak	Average
2400-2483.5	114	94

#### 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 spectrum analyzer.

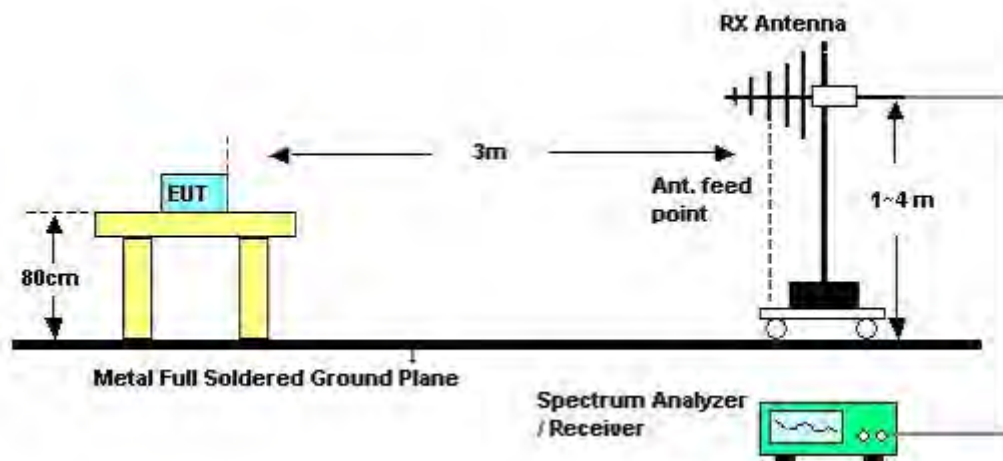
Power Meter Parameter	Setting
RB	1 MHz Peak / 1MHz Average
VB	1 MHz Peak / 10Hz Average
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### 4.1.3. 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. For Fundamental emissions, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
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.

#### 4.1.4. Test Setup Layout



#### 4.1.5. Test Deviation

There is no deviation with the original standard.

#### 4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

#### 4.1.7. Test Result of Field Strength of Fundamental Emissions

##### EUT 1

Temperature	22°C	Humidity	65%
Test Engineer	Robert Chang	Configurations	Channel 15
Test Date	Sep. 28, 2011		

##### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2424.49	85.90	114.00	-28.10	55.42	2.23	28.25	0.00	252	100	Peak	HORIZONTAL
2	2425.02	81.41	94.00	-12.59	50.93	2.23	28.25	0.00	252	100	Average	HORIZONTAL

##### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2424.51	95.96	114.00	-18.04	65.48	2.23	28.25	0.00	26	100	Peak	VERTICAL
2	2425.01	91.55	94.00	-2.45	61.07	2.23	28.25	0.00	26	100	Average	VERTICAL

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Temperature	22°C	Humidity	65%
Test Engineer	Robert Chang	Configurations	Channel 20
Test Date	Sep. 28, 2011		

### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2449.54	86.71	114.00	-27.29	56.18	2.24	28.29	0.00	287	100	Peak	HORIZONTAL
2	2450.03	84.32	94.00	-9.68	53.79	2.24	28.29	0.00	287	100	Average	HORIZONTAL

### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2450.03	92.80	94.00	-1.20	62.27	2.24	28.29	0.00	27	100	Average	VERTICAL
2	2450.54	95.14	114.00	-18.86	64.61	2.24	28.29	0.00	27	100	Peak	VERTICAL

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Temperature	22°C	Humidity	65%
Test Engineer	Robert Chang	Configurations	Channel 25
Test Date	Sep. 28, 2011		

### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2474.52	87.14	114.00	-26.86	56.50	2.26	28.38	0.00	286	100	Peak	HORIZONTAL
2	2475.02	82.84	94.00	-11.16	52.20	2.26	28.38	0.00	286	100	Average	HORIZONTAL

### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2474.50	94.31	114.00	-19.69	63.68	2.26	28.37	0.00	23	100	Peak	VERTICAL
2	2475.02	89.90	94.00	-4.10	59.27	2.26	28.37	0.00	23	100	Average	VERTICAL

### Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

**EUT 2**

<b>Temperature</b>	22°C	<b>Humidity</b>	65%
<b>Test Engineer</b>	Serway Li	<b>Configurations</b>	Channel 15
<b>Test Date</b>	Nov. 05, 2011		

**Horizontal**

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2424.98	76.60	94.00	-17.40	45.58	2.89	28.13	0.00	Average	100	132	HORIZONTAL
2	2425.49	81.13	114.00	-32.87	50.11	2.89	28.13	0.00	Peak	100	132	HORIZONTAL

**Vertical**

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2424.99	87.80	94.00	-6.20	56.78	2.89	28.13	0.00	Average	100	320	VERTICAL
2	2425.49	92.16	114.00	-21.84	61.14	2.89	28.13	0.00	Peak	100	320	VERTICAL

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Temperature	22°C	Humidity	65%
Test Engineer	Serway Li	Configurations	Channel 20
Test Date	Nov. 05, 2011		

#### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2450.00	77.13	94.00	-16.87	46.04	2.91	28.18	0.00	Average	100	141	HORIZONTAL
2	2450.50	81.70	114.00	-32.30	50.61	2.91	28.18	0.00	Peak	100	141	HORIZONTAL

#### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2449.49	91.29	114.00	-22.71	60.20	2.91	28.18	0.00	Peak	100	101	VERTICAL
2	2450.01	86.92	94.00	-7.08	55.83	2.91	28.18	0.00	Average	100	101	VERTICAL

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level



Temperature	22°C	Humidity	65%
Test Engineer	Serway Li	Configurations	Channel 25
Test Date	Nov. 05, 2011		

#### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2475.00	77.21	94.00	-16.79	46.02	2.93	28.26	0.00	Average	100	140	HORIZONTAL
2	2475.48	81.44	114.00	-32.56	50.25	2.93	28.26	0.00	Peak	100	140	HORIZONTAL

#### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2474.48	91.28	114.00	-22.72	60.09	2.93	28.26	0.00	Peak	100	258	VERTICAL
2	2474.99	87.15	94.00	-6.85	55.96	2.93	28.26	0.00	Average	100	258	VERTICAL

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

## 4.2. 20dB Spectrum Bandwidth Measurement

### 4.2.1. Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (2425 ~ 2475MHz).

### 4.2.2. Measuring Instruments and Setting

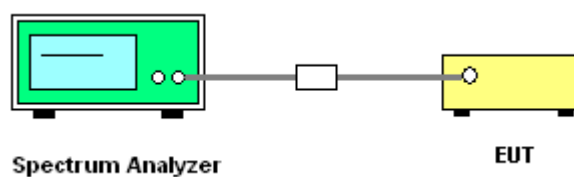
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

### 4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.

### 4.2.4. Test Setup Layout



#### 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. Test Result of 20dB Spectrum Bandwidth

##### EUT 1

<b>Temperature</b>	22°C	<b>Humidity</b>	65%
<b>Test Engineer</b>	Allen Liu	<b>Configurations</b>	Channel 15/20/25

Frequency	20dB BW (MHz)	99% OBW (MHz)	Frequency range (MHz) $f_L > 2400\text{MHz}$	Frequency range (MHz) $f_H < 2483.5\text{MHz}$	Test Result
2425 MHz	2.60	2.40	2423.7200	-	Complies
2450 MHz	2.68	2.44	-	-	Complies
2475 MHz	2.60	2.44	-	2476.3200	Complies

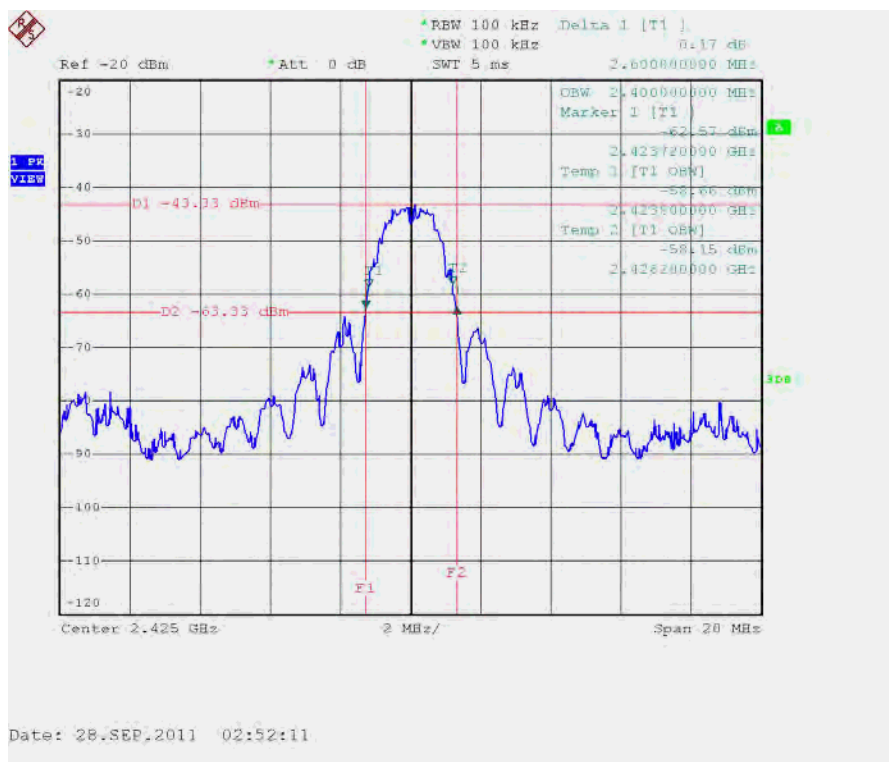
##### EUT 2

<b>Temperature</b>	25°C	<b>Humidity</b>	63%
<b>Test Engineer</b>	Serway Li	<b>Configurations</b>	Channel 15/20/25

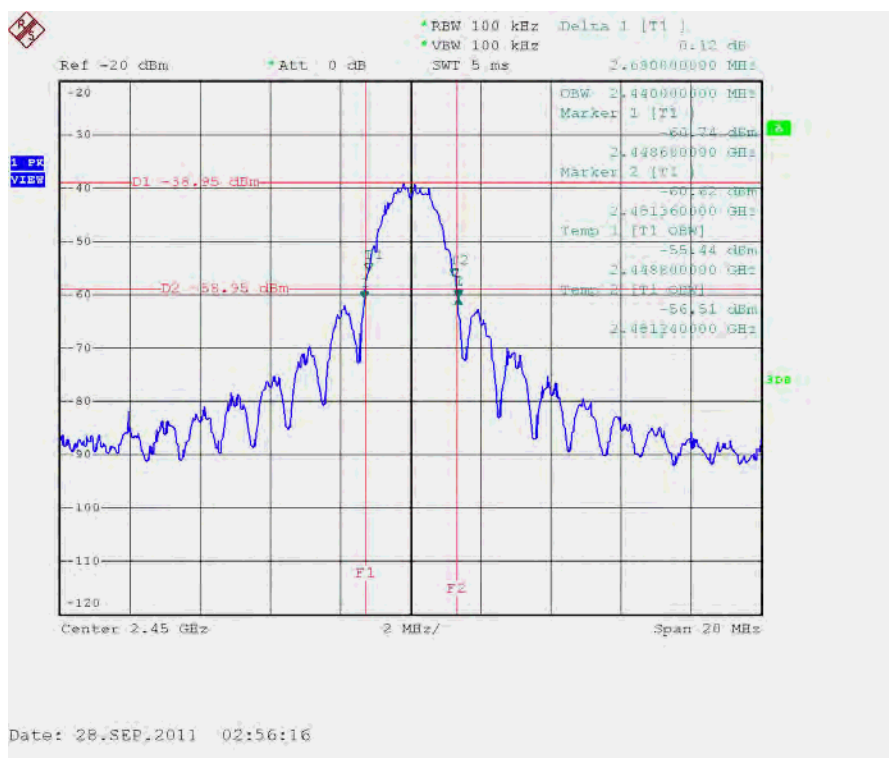
Frequency	20dB BW (MHz)	99% OBW (MHz)	Frequency range (MHz) $f_L > 2400\text{MHz}$	Frequency range (MHz) $f_H < 2483.5\text{MHz}$	Test Result
2425 MHz	2.64	2.48	2423.0000	-	Complies
2450 MHz	2.64	2.48	-	-	Complies
2475 MHz	2.64	2.52	-	2476.3365	Complies

# EUT 1

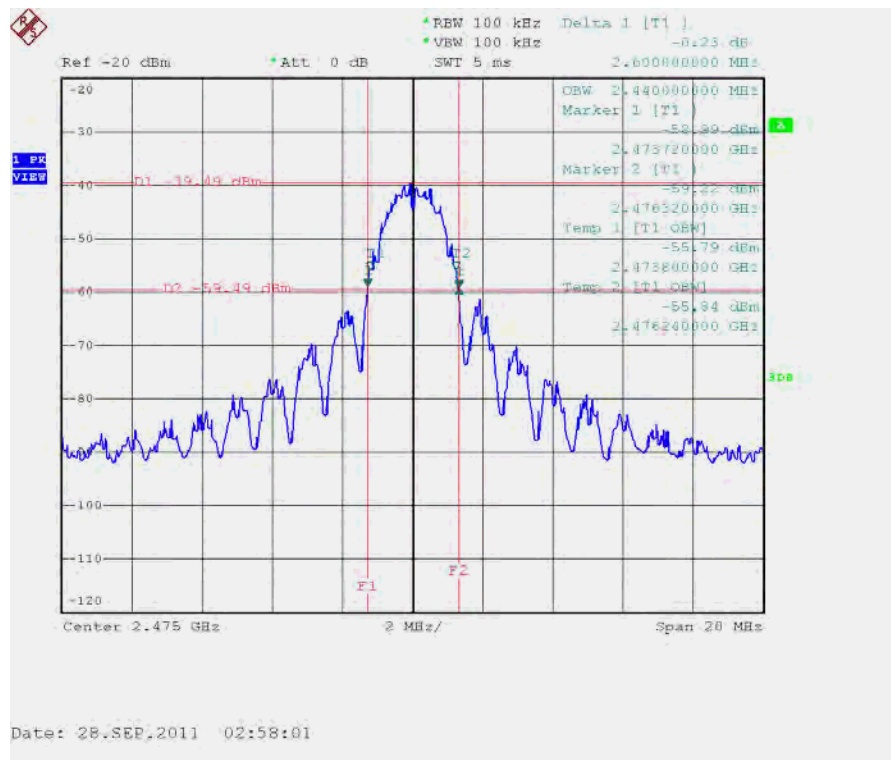
## 20 dB/99% Bandwidth Plot on 2425 MHz



## 20 dB/99% Bandwidth Plot on 2450 MHz

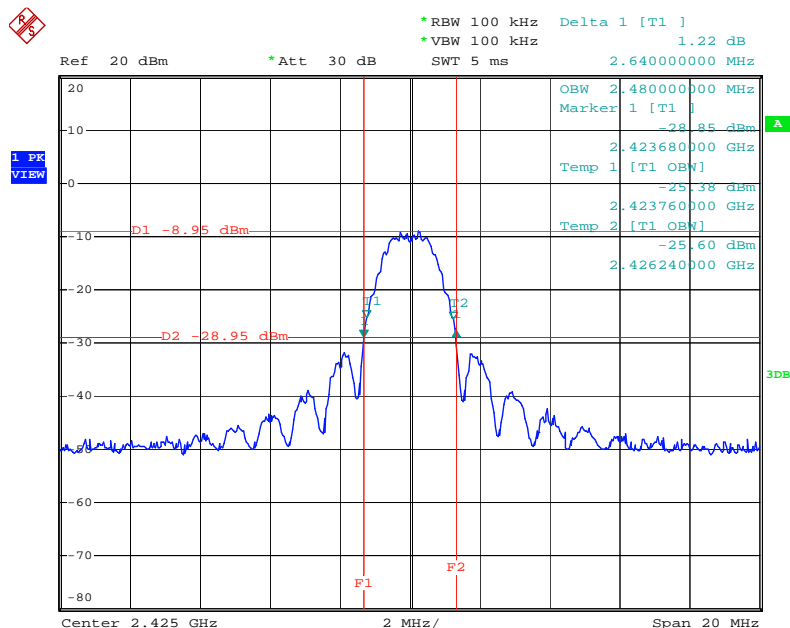


# 20 dB/99% Bandwidth Plot on 2475 MHz



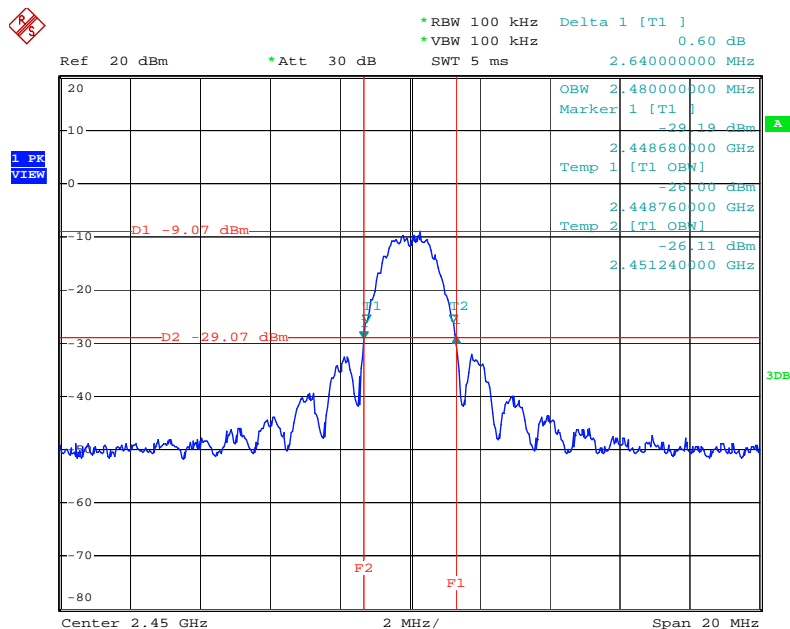
## EUT 2

### 20 dB/99% Bandwidth Plot on 2425 MHz



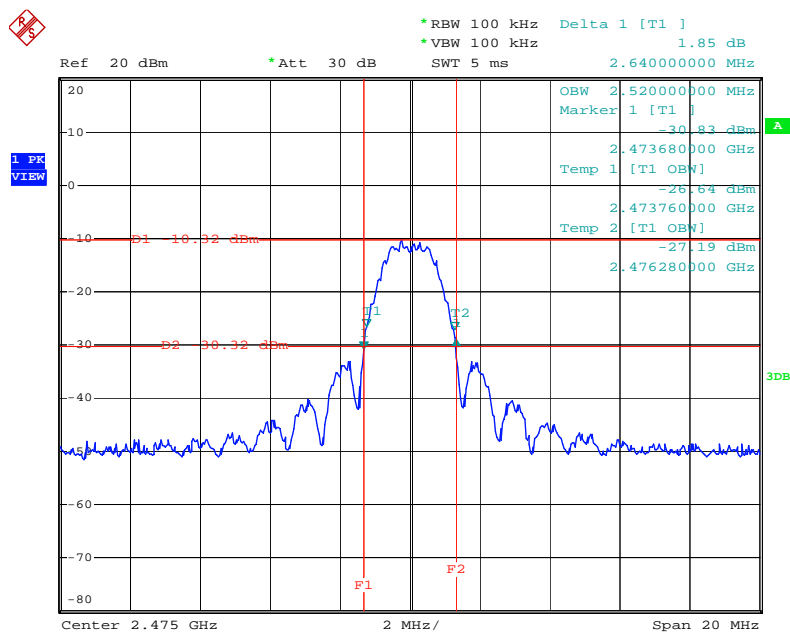
Date: 7.NOV.2011 16:17:11

### 20 dB/99% Bandwidth Plot on 2450 MHz



Date: 7.NOV.2011 16:23:40

## 20 dB/99% Bandwidth Plot on 2475 MHz



Date: 7.NOV.2011 16:36:14

### 4.3. Radiated Emissions Measurement

#### 4.3.1. Limit

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 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

#### 4.3.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

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

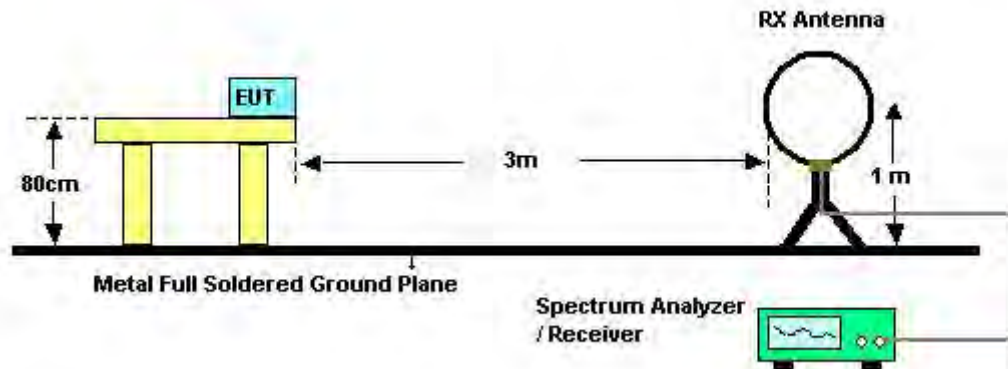


#### 4.3.3. Test Procedures

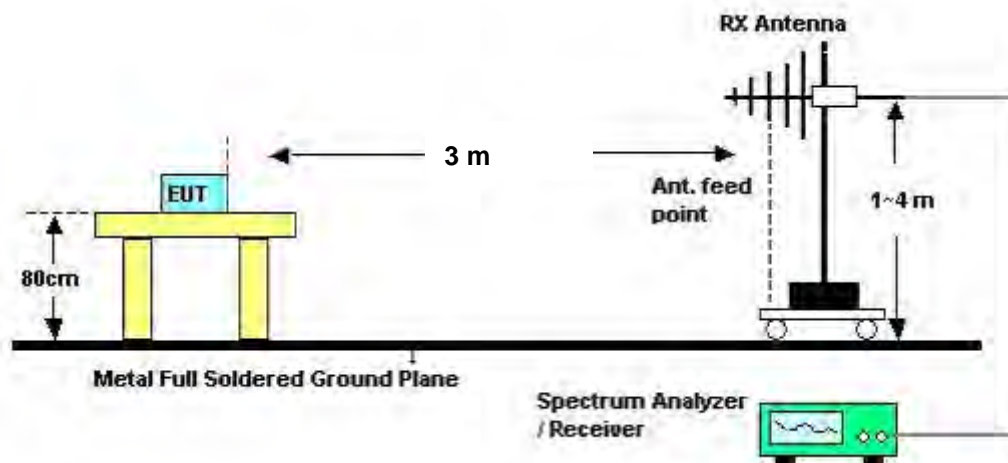
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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 RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. 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.
8. 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.
9. 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.
10. 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.

#### 4.3.4. Test Setup Layout

For radiated emissions below 1GHz



For radiated emissions above 1GHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor =  $20 \log (\text{specific distance [3m]} / \text{test distance [1.5m]})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

#### 4.3.5. Test Deviation

There is no deviation with the original standard.

#### 4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	22°C	Humidity	65%
Test Engineer	Robert Chang	Configurations	Normal Link
Test Date	Sep. 29, 2011	Test Mode	EUT 1 / Mode 2

Temperature	22°C	Humidity	65%
Test Engineer	Serway Li	Configurations	Normal Link
Test Date	Nov. 05, 2011	Test Mode	EUT 2 / 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 20dB below the permissible value has no need to be reported.

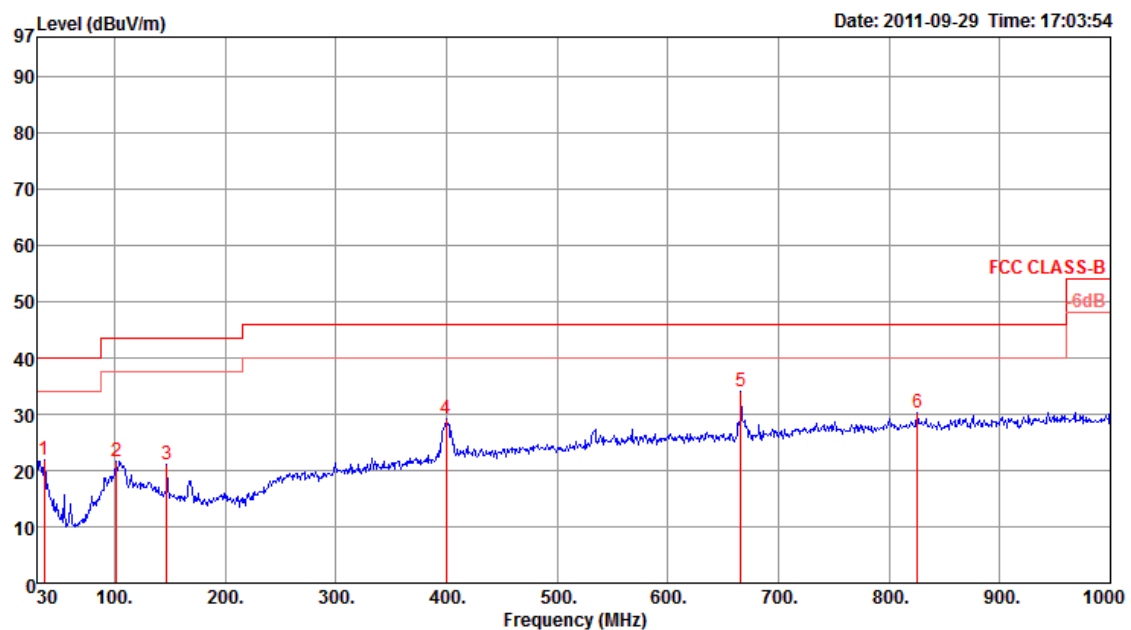
Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB);

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

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

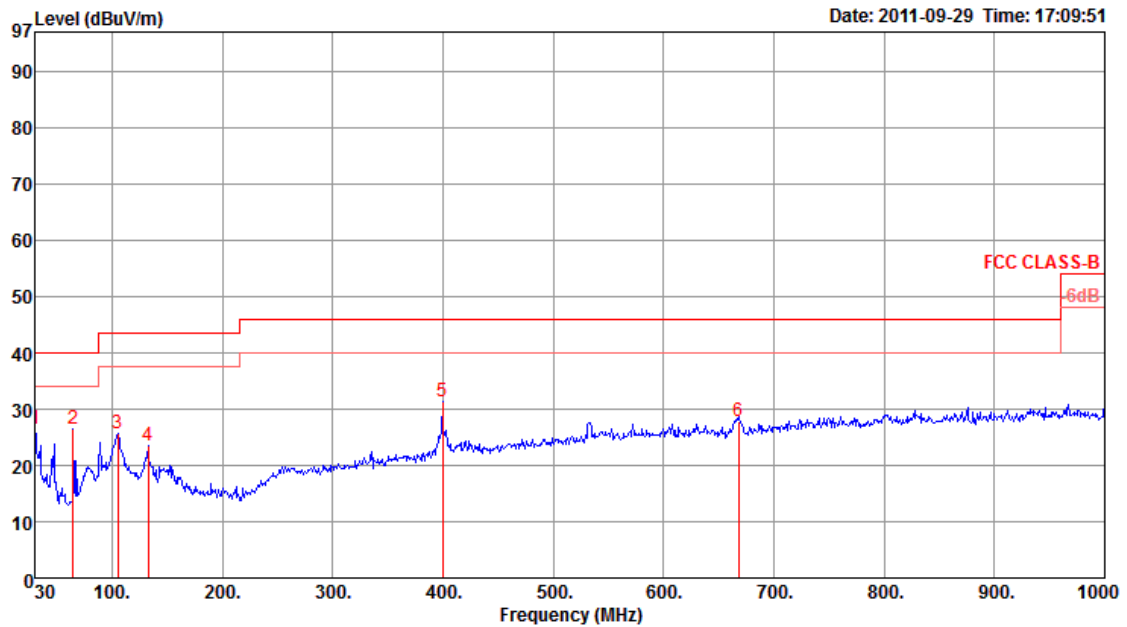
Temperature	22°C	Humidity	65%
Test Engineer	Robert Chang	Configurations	Normal Link
Test Mode	EUT 1 / Mode 2		

##### Horizontal



	Freq	Level	Limit	Over	Read	Cable	Preamp	Antenna	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	36.79	21.88	40.00	-18.12	33.85	0.95	27.80	14.88	0	400	Peak	HORIZONTAL
2	101.78	21.68	43.50	-21.82	36.56	1.51	27.59	11.20	0	400	Peak	HORIZONTAL
3	147.37	21.00	43.50	-22.50	35.96	1.78	27.36	10.62	0	400	Peak	HORIZONTAL
4	399.57	29.19	46.00	-16.81	37.32	2.99	27.60	16.48	0	400	Peak	HORIZONTAL
5 p	666.32	33.94	46.00	-12.06	38.53	3.99	28.03	19.45	0	400	Peak	HORIZONTAL
6	825.40	30.26	46.00	-15.74	32.30	4.40	27.55	21.11	0	400	Peak	HORIZONTAL

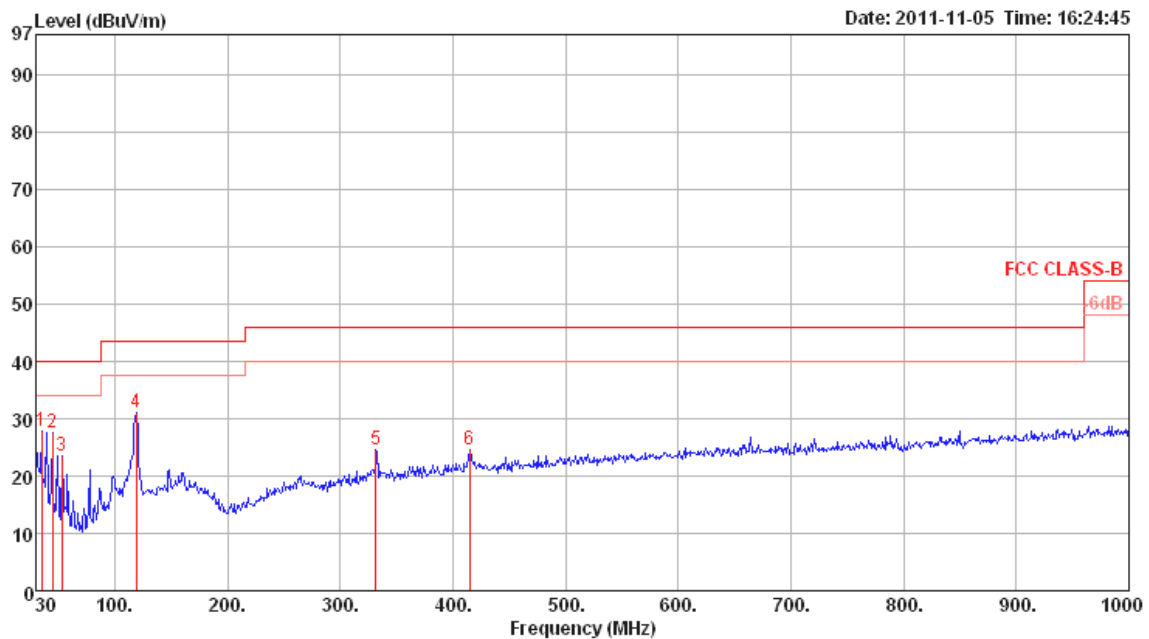
## Vertical



	Freq	Level	Limit	Over	Read	Cable	Preamp	Antenna	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	30.00	26.47	40.00	-13.53	36.19	0.83	27.80	17.25	0	100	Peak	VERTICAL
2 p	64.92	26.55	40.00	-13.45	47.24	1.20	27.74	5.85	0	100	Peak	VERTICAL
3	105.66	25.73	43.50	-17.77	39.86	1.54	27.57	11.90	0	100	Peak	VERTICAL
4	132.82	23.63	43.50	-19.87	37.18	1.68	27.43	12.20	0	100	Peak	VERTICAL
5	399.57	31.35	46.00	-14.65	39.48	2.99	27.60	16.48	0	100	Peak	VERTICAL
6	668.26	27.72	46.00	-18.28	32.20	4.00	28.03	19.55	0	100	Peak	VERTICAL

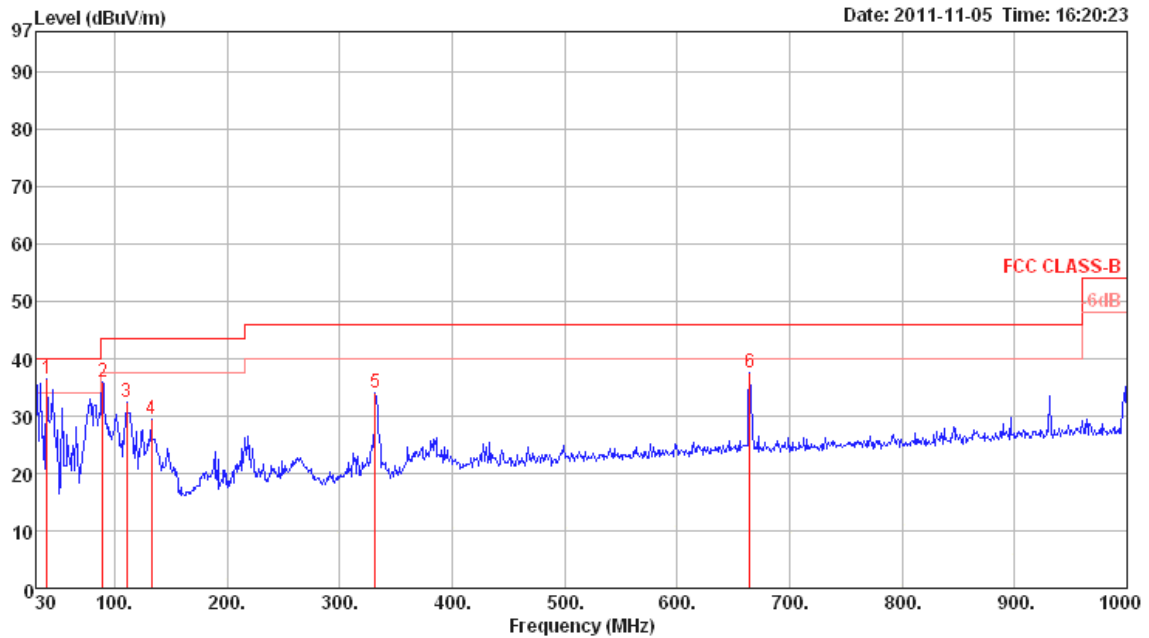
Temperature	22°C	Humidity	65%
Test Engineer	Serway Li	Configurations	Normal Link
Test Mode	EUT 2 / Mode 2		

### Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase	Aux Factor
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg		dB
1	34.85	27.83	40.00	-12.17	39.05	0.50	16.08	27.80	Peak	100	0	HORIZONTAL	0.00
2	44.55	27.58	40.00	-12.42	44.36	0.70	10.32	27.80	Peak	100	0	HORIZONTAL	0.00
3	53.28	23.58	40.00	-16.42	42.61	0.76	8.00	27.79	Peak	100	0	HORIZONTAL	0.00
4	119.24	31.06	43.50	-12.44	44.90	1.20	12.46	27.50	Peak	100	0	HORIZONTAL	0.00
5	331.67	24.61	46.00	-21.39	35.34	2.16	14.23	27.12	Peak	100	0	HORIZONTAL	0.00
6	415.09	24.68	46.00	-21.32	33.67	2.39	16.30	27.68	Peak	100	0	HORIZONTAL	0.00

# Vertical



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	Aux
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	dB
1	39.70	36.46	40.00	-3.54	50.45	0.70	13.11	27.80	400	0 VERTICAL	0.00
2	89.17	36.06	43.50	-7.44	53.81	1.10	8.80	27.65	400	0 VERTICAL	0.00
3	110.51	32.29	43.50	-11.21	46.84	1.20	11.80	27.55	400	0 VERTICAL	0.00
4	132.82	29.53	43.50	-13.97	43.35	1.33	12.28	27.43	400	0 VERTICAL	0.00
5	331.67	34.18	46.00	-11.82	44.91	2.16	14.23	27.12	400	0 VERTICAL	0.00
6	664.38	37.42	46.00	-8.58	43.04	3.44	18.98	28.04	400	0 VERTICAL	0.00

## 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.

#### 4.3.9. Results for Radiated Emissions (1GHz~10<sup>th</sup> Harmonic)

Temperature	22°C	Humidity	65%
Test Engineer	Robert Chang	Configurations	Channel 15
Test Date	Sep. 28, 2011	Test Mode	EUT 1 / Mode 1

##### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	4848.89	57.91	74.00	-16.09	56.53	3.32	33.09	35.03	278	142 Peak	HORIZONTAL
2	4849.00	48.48	54.00	-5.52	47.10	3.32	33.09	35.03	278	142 Average	HORIZONTAL
3	7276.37	47.27	54.00	-6.73	42.72	4.06	35.89	35.40	37	163 Average	HORIZONTAL
4	7276.58	57.28	74.00	-16.72	52.73	4.06	35.89	35.40	37	163 Peak	HORIZONTAL

##### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	4849.02	52.12	54.00	-1.88	50.74	3.32	33.09	35.03	95	163 Average	VERTICAL
2	4851.03	61.46	74.00	-12.54	60.08	3.32	33.09	35.03	95	163 Peak	VERTICAL
3	7276.40	46.51	54.00	-7.49	41.96	4.06	35.89	35.40	94	138 Average	VERTICAL
4	7276.67	56.79	74.00	-17.21	52.24	4.06	35.89	35.40	94	138 Peak	VERTICAL



Temperature	22°C	Humidity	65%
Test Engineer	Robert Chang	Configurations	Channel 20
Test Date	Sep. 28, 2011	Test Mode	EUT 1 / Mode 1

### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	4901.01	47.78	54.00	-6.22	46.27	3.34	33.19	35.02	282	159 Average	HORIZONTAL
2	4901.14	57.17	74.00	-16.83	55.66	3.34	33.19	35.02	282	159 Peak	HORIZONTAL
3	7351.35	46.50	54.00	-7.50	41.82	4.06	36.02	35.40	26	149 Average	HORIZONTAL
4	7351.63	56.43	74.00	-17.57	51.75	4.06	36.02	35.40	26	149 Peak	HORIZONTAL

### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	4899.01	61.00	74.00	-13.00	59.49	3.34	33.19	35.02	64	165 Peak	VERTICAL
2	4901.04	51.64	54.00	-2.36	50.13	3.34	33.19	35.02	64	165 Average	VERTICAL
3	7348.59	55.52	74.00	-18.48	50.84	4.06	36.02	35.40	77	142 Peak	VERTICAL
4	7348.70	44.71	54.00	-9.29	40.03	4.06	36.02	35.40	77	142 Average	VERTICAL

Temperature	22°C	Humidity	65%
Test Engineer	Robert Chang	Configurations	Channel 25
Test Date	Sep. 28, 2011	Test Mode	EUT 1 / Mode 1

#### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	4949.03	47.16	54.00	-6.84	45.50	3.37	33.30	35.01	285	154 Average	HORIZONTAL
2	4951.01	56.54	74.00	-17.46	54.88	3.37	33.30	35.01	285	154 Peak	HORIZONTAL
3	7423.49	55.81	74.00	-18.19	50.98	4.07	36.16	35.40	2	149 Peak	HORIZONTAL
4	7423.68	45.26	54.00	-8.74	40.43	4.07	36.16	35.40	2	149 Average	HORIZONTAL

#### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	4950.98	59.50	74.00	-14.50	57.84	3.37	33.30	35.01	88	166 Peak	VERTICAL
2	4951.10	50.92	54.00	-3.08	49.26	3.37	33.30	35.01	88	166 Average	VERTICAL
3	7423.56	55.85	74.00	-18.15	51.02	4.07	36.16	35.40	100	137 Peak	VERTICAL
4	7423.68	45.31	54.00	-8.69	40.48	4.07	36.16	35.40	100	137 Average	VERTICAL

#### 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.

Temperature	22°C	Humidity	65%
Test Engineer	Serway Li	Configurations	Channel 15
Test Date	Nov. 05, 2011	Test Mode	EUT 2 / Mode 1

### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4850.96	43.81	54.00	-10.19	41.30	4.29	33.42	35.20	Average	181	123	HORIZONTAL
2	4851.02	53.28	74.00	-20.72	50.77	4.29	33.42	35.20	Peak	181	123	HORIZONTAL
3	7266.08	45.95	74.00	-28.05	39.58	5.35	36.43	35.41	Peak	123	312	HORIZONTAL
4	7273.40	32.99	54.00	-21.01	26.60	5.35	36.45	35.41	Average	123	312	HORIZONTAL

### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4849.02	49.06	54.00	-4.94	46.55	4.29	33.42	35.20	Average	100	93	VERTICAL
2	4849.02	57.89	74.00	-16.11	55.38	4.29	33.42	35.20	Peak	100	93	VERTICAL
3	7276.41	35.43	54.00	-18.57	29.04	5.35	36.45	35.41	Average	100	19	VERTICAL
4	7276.63	48.52	74.00	-25.48	42.13	5.35	36.45	35.41	Peak	100	19	VERTICAL

Temperature	22°C	Humidity	65%
Test Engineer	Serway Li	Configurations	Channel 20
Test Date	Nov. 05, 2011	Test Mode	EUT 2 / Mode 1

### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	4898.97	54.32	74.00	-19.68	51.65	4.36	33.51	35.20 Peak	163	97	HORIZONTAL
2	4899.03	44.75	54.00	-9.25	42.08	4.36	33.51	35.20 Average	163	97	HORIZONTAL
3	7349.56	32.05	54.00	-21.95	25.55	5.38	36.56	35.44 Average	100	210	HORIZONTAL
4	7350.18	45.65	74.00	-28.35	39.15	5.38	36.56	35.44 Peak	100	210	HORIZONTAL

### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	4900.97	47.74	54.00	-6.26	45.07	4.36	33.51	35.20 Average	114	92	VERTICAL
2	4901.04	57.16	74.00	-16.84	54.49	4.36	33.51	35.20 Peak	114	92	VERTICAL
3	7348.96	46.98	74.00	-27.02	40.48	5.38	36.56	35.44 Peak	100	21	VERTICAL
4	7351.48	34.97	54.00	-19.03	28.47	5.38	36.56	35.44 Average	100	21	VERTICAL

Temperature	22°C	Humidity	65%
Test Engineer	Serway Li	Configurations	Channel 25
Test Date	Nov. 05, 2011	Test Mode	EUT 2 / Mode 1

### Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4951.00	44.26	54.00	-9.74	41.43	4.42	33.61	35.20	Average	178	102	HORIZONTAL
2	4951.01	53.89	74.00	-20.11	51.06	4.42	33.61	35.20	Peak	178	102	HORIZONTAL
3	7424.57	45.77	74.00	-28.23	39.15	5.42	36.67	35.47	Peak	100	226	HORIZONTAL
4	7425.40	31.97	54.00	-22.03	25.35	5.42	36.67	35.47	Average	100	226	HORIZONTAL

### Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4950.96	47.26	54.00	-6.74	44.43	4.42	33.61	35.20	Average	114	91	VERTICAL
2	4951.00	56.66	74.00	-17.34	53.83	4.42	33.61	35.20	Peak	114	91	VERTICAL
3	7423.24	45.69	74.00	-28.31	39.07	5.42	36.67	35.47	Peak	100	349	VERTICAL
4	7423.64	34.55	54.00	-19.45	27.93	5.42	36.67	35.47	Average	100	349	VERTICAL

### 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.

## 4.4. Band Edge Emissions Measurement

### 4.4.1. Limit

Band edge emissions radiated outside of the specified frequency bands shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 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

### 4.4.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

### 4.4.3. Test Procedures

- The test procedure is the same as section 4.2.3, only the frequency range investigated is limited to 2MHz around bandedges.
- In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

### 4.4.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.2.4.

### 4.4.5. Test Deviation

There is no deviation with the original standard.

### 4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

#### 4.4.7. Test Result of Band Edge and Fundamental Emissions

##### EUT 1

Temperature	22°C	Humidity	65%
Test Engineer	Robert Chang	Configurations	Channel 15, 20, 25
Test Date	Sep. 28, 2011		

##### Channel 15

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.60	53.09	74.00	-20.91	22.71	2.21	28.17	0.00	26	100	Peak	VERTICAL
2	2390.00	42.90	54.00	-11.10	12.51	2.22	28.17	0.00	26	100	Average	VERTICAL
3	2424.60	96.16	74.00			2.23	28.25	0.00	26	100	Peak	VERTICAL
4	2425.00	91.65	54.00			2.23	28.25	0.00	26	100	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2425 MHz.

##### Channel 20

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2450.00	93.15	54.00			2.24	28.29	0.00	27	100	Average	VERTICAL
2	2450.60	95.32	74.00			2.24	28.29	0.00	27	100	Peak	VERTICAL
3	2483.50	44.49	54.00	-9.51	13.86	2.26	28.37	0.00	27	100	Average	VERTICAL
4	2487.30	55.90	74.00	-18.10	25.23	2.26	28.41	0.00	27	100	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 2450MHz.

##### Channel 25

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2474.60	94.43	74.00			2.26	28.37	0.00	23	100	Peak	VERTICAL
2	2475.00	89.92	54.00			2.26	28.37	0.00	23	100	Average	VERTICAL
3	2483.50	43.80	54.00	-10.20	13.17	2.26	28.37	0.00	23	100	Average	VERTICAL
4	2486.30	54.84	74.00	-19.16	24.17	2.26	28.41	0.00	23	100	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 2475 MHz.

Note:

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

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

## EUT 2

Temperature	22°C	Humidity	65%
Test Engineer	Serway Li	Configurations	Channel 15, 20, 25
Test Date	Nov. 05, 2011		

### Channel 15

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	2390.00	42.74	54.00	-11.26	11.81	2.88	28.05	0.00	Average	100	320	VERTICAL
2	2390.00	51.61	74.00	-22.39	20.68	2.88	28.05	0.00	Peak	100	320	VERTICAL
3	2424.60	92.12				2.89	28.13	0.00	Peak	100	320	VERTICAL
4	2425.00	87.69				2.89	28.13	0.00	Average	100	320	VERTICAL

Item 3, 4 are the fundamental frequency at 2425 MHz.

### Channel 20

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	2389.20	52.29	74.00	-21.71	21.38	2.86	28.05	0.00	Peak	100	141	HORIZONTAL
2	2390.00	42.68	54.00	-11.32	11.75	2.88	28.05	0.00	Average	100	141	HORIZONTAL
3	2450.00	77.02				2.91	28.18	0.00	Average	100	141	HORIZONTAL
4	2450.40	81.70				2.91	28.18	0.00	Peak	100	141	HORIZONTAL
5	2483.50	42.91	54.00	-11.09	11.72	2.93	28.26	0.00	Average	100	141	HORIZONTAL
6	2483.50	52.91	74.00	-21.09	21.72	2.93	28.26	0.00	Peak	100	141	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2450MHz.

### Channel 25

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	2474.60	91.32				2.93	28.26	0.00	Peak	100	258	VERTICAL
2	2475.00	87.07				2.93	28.26	0.00	Average	100	258	VERTICAL
3	2483.50	43.23	54.00	-10.77	12.04	2.93	28.26	0.00	Average	100	258	VERTICAL
4	2483.50	51.91	74.00	-22.09	20.72	2.93	28.26	0.00	Peak	100	258	VERTICAL

Item 1, 2 are the fundamental frequency at 2475 MHz.

Note:

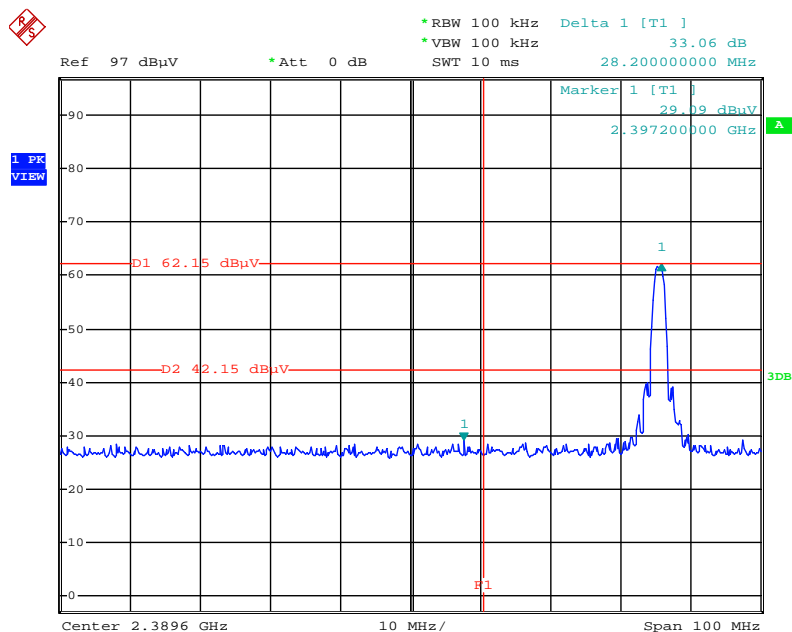
Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.



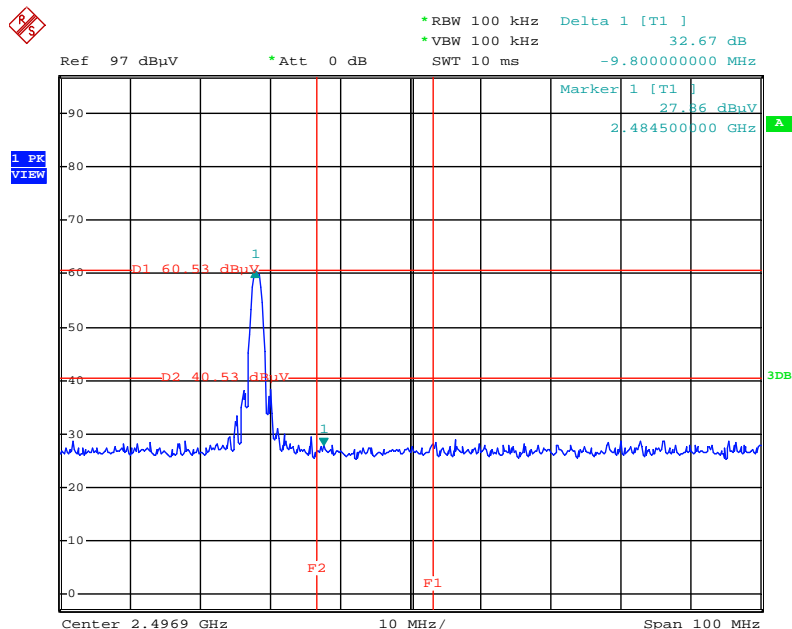
## EUT 1

### Low Band Edge Plot on 2425 MHz



Date: 28.SEP.2011 03:41:09

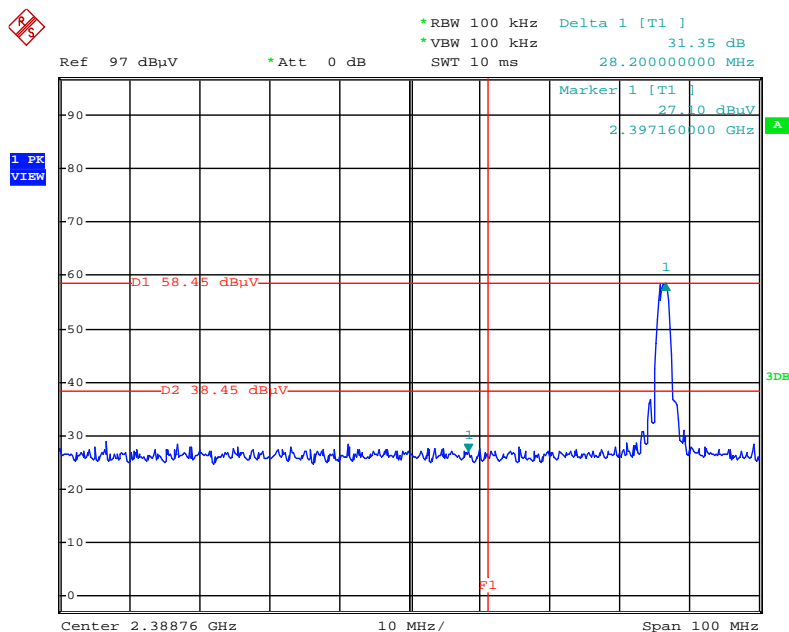
### High Band Edge Plot on 2475 MHz



Date: 28.SEP.2011 04:37:43

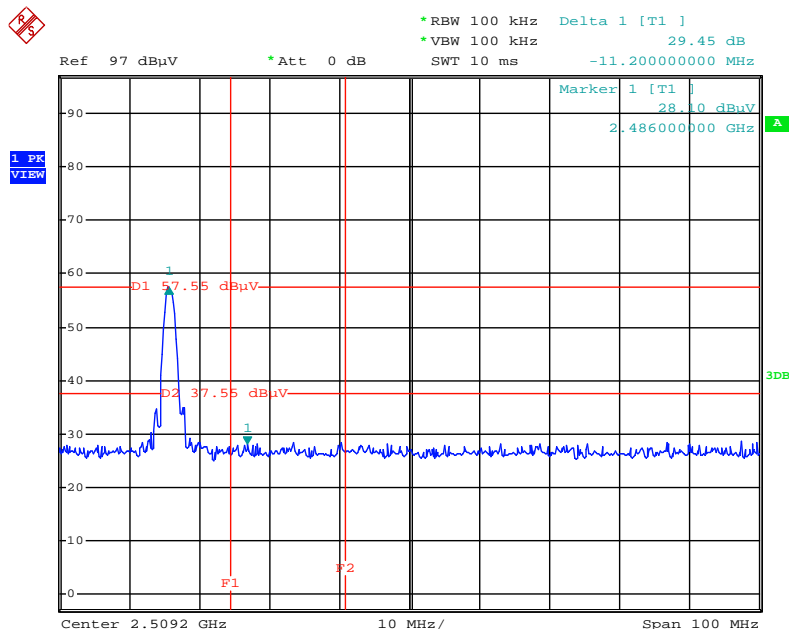
## EUT 2

### Low Band Edge Plot on 2425 MHz



Date: 5.NOV.2011 15:39:59

### High Band Edge Plot on 2475 MHz



Date: 5.NOV.2011 16:17:19

## 4.5. Antenna Requirements

### 4.5.1. 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. Further, this requirement does not apply to intentional radiators that must be professionally installed.

### 4.5.2. Antenna Connector Construction

Please refer to section 3.1 in this test report, antenna connector complied with the requirements.

## 5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Oct. 17, 2010	Radiation (03CH01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Oct. 17, 2011	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 22, 2010	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Oct. 08, 2010	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 17, 2010	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2010	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 29, 2011	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP	100304	9kHz ~ 40GHz	Nov. 22, 2010	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 22, 2011	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Sep. 09, 2010	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N/A	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N/A	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz ~ 26.5 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz ~ 26.5 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV30	101026	9KHz~30GHz	Jul. 27, 2011	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	May 20, 2011	Conducted (TH01-CB)
Thermo-Hygro Meter	N/A	HC 520	#1	15~70 degree	Nov. 02, 2010	Conducted (TH01-CB)
Thermo-Hygro Meter	N/A	HC 520	#1	15~70 degree	Nov. 02, 2011	Conducted (TH01-CB)
RF Power Divider	HP	11636A	00306	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
RF Power Splitter	Anaren	44100	1839	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
RF Power Splitter	Anaren	42100	17930	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
EPM-P Series Power Meter	Agilent	E4416A	GB41291199	50MHz ~ 18GHz	Sep. 09, 2011	Conducted (TH01-CB)
Peak an Avg Power Sensor	Agilent	E9327A	US40442088	50MHz ~ 18GHz	Sep. 09, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz ~ 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz ~ 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz ~ 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz ~ 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz ~ 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-12	-	1 GHz ~ 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	High Cable-13	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Sep. 13, 2011	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 08, 2011	Conducted (TH01-CB)


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

Note: “\*” Calibration Interval of instruments listed above is two years.

## 6. TEST LOCATION

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 <sup>nd</sup> 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

## 7. TAF CERTIFICATE OF ACCREDITATION



Certificate No. : L1190-110702

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 Road, 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 Arrangement with Foreign Authorities



Jay-San Chen  
President, Taiwan Accreditation Foundation  
Date : July 02, 2011

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The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix