



# FCC RF Test Report

APPLICANT : ASUSTek Computer Inc.  
EQUIPMENT : Eee Pad  
BRAND NAME : ASUS  
MODEL NAME : SL101  
FCC ID : MSQSL101  
STANDARD : FCC Part 15 Subpart C §15.247  
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Jun. 18, 2011 and completely tested on Jul. 07, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai / Manager



## SPORTON INTERNATIONAL INC.

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FCC ID : MSQSL101

Page Number : 1 of 80

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Report Version : Rev. 01



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**APPENDIX A. PHOTOGRAPHS OF EUT**

**APPENDIX B. SETUP PHOTOGRAPHS**



**SUMMARY OF TEST RESULT**

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	Gen 4.4.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)	A8.4	Power Output	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(d)	A8.5	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.4	15.247(d)	A8.5	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 4.4 dB at 1.638 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.02 dB at 2390 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-



# **1 General Description**

## **1.1 Applicant**

**ASUSTek Computer Inc.**

No. 15, Li-Te Rd., Peitou, Taipei 112, Taiwan

## **1.2 Manufacturer**

**1. PEGATRON CORPORATION Taoyuan Mfg.**

No. 5, Shing Yeh St., Kwei Shan Hsiang Taoyuan 333, Taiwan

**2. Protek (Shanghai) Limited.**

No. 3768, Xiu Yan Rd., Nanhui District, Shanghai, China

**3. NorthTec Asis (Shanghai) Limited.**

No. 3768, Xiuyan Rd., Kangqiao Town, Nanhui District, Shanghai, 201319 China

**4. Unihan Maitek Computer**

No. 233, jinfeng Rd., Suzhou New District, Jiangsu Province 215011, China

**5. ASKEY TECHNOLOGY (JIANGSU) LTD.**

No. 1388, JiaoTong Road, WuJiang Economic-Technological Development Area, Jiangsu Province, P.R.C.

### 1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Eee PAD
Brand Name	ASUS
Model Name	SL101
FCC ID	MSQSL101
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	11
Carrier Frequency of Each Channel	2412+(n-1)*5 MHz; n=1~11
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 19.10 dBm (0.08 W) 802.11g : 23.58 dBm (0.22 W) 802.11n (BW 20MHz) : 23.68 dBm (0.23 W)
Antenna Type	PCB Antenna with gain 1.17 dBi
HW Version	1.2G
SW Version	ventana-img-20110121.092845
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

**Remark:**

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Transmission System (DTS).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL INC.		
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	CO05-HY	03CH07-HY	722060/4086B-1

## 1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issue 8

### Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (DoC), recorded in a separate test report.

## 1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	LCD Monitor	Dell	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
5.	iPod Earphone	Apple	A1285	FCC DoC	Unshielded, 1.2 m	N/A
6.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A

## 2 Test Configuration of Equipment Under Test

### 2.1 RF Power

Preliminary tests were performed in different data rate and recorded the RF power output in the following table:

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)	
		DSSS Data Rate	
		1 Mbps	
CH 01	2412 MHz	18.92	
CH 06	2437 MHz	19.10	
CH 11	2462 MHz	13.50	

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)	
		OFDM Data Rate	
		6 Mbps	
CH 01	2412 MHz	23.58	
CH 06	2437 MHz	23.52	
CH 11	2462 MHz	20.47	

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)	
		OFDM Data Rate	
		MCS=0	
		6.5 Mbps	
CH 01	2412 MHz	23.14	
CH 06	2437 MHz	23.68	
CH 11	2462 MHz	19.67	

**Remark:**

1. The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n (BW 20MHz) for all the test cases due to the highest RF output power.
2. The EUT is programmed to transmit signals continuously for all testing.



## 2.2 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

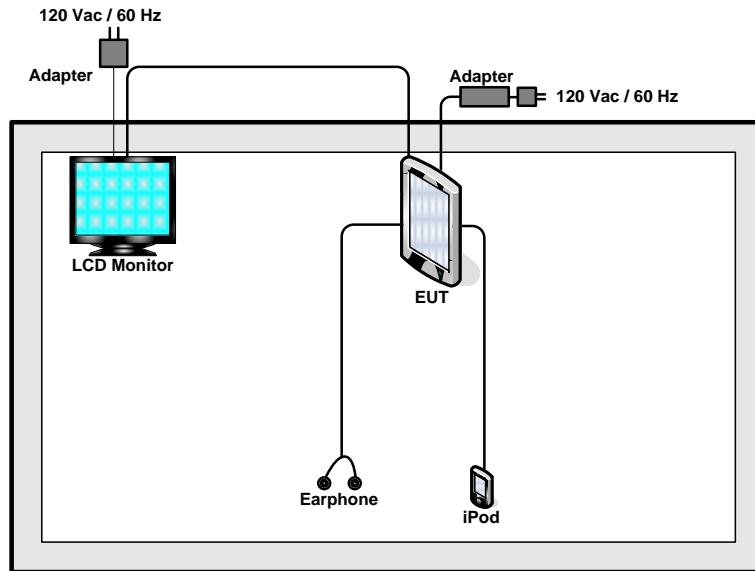
Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

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

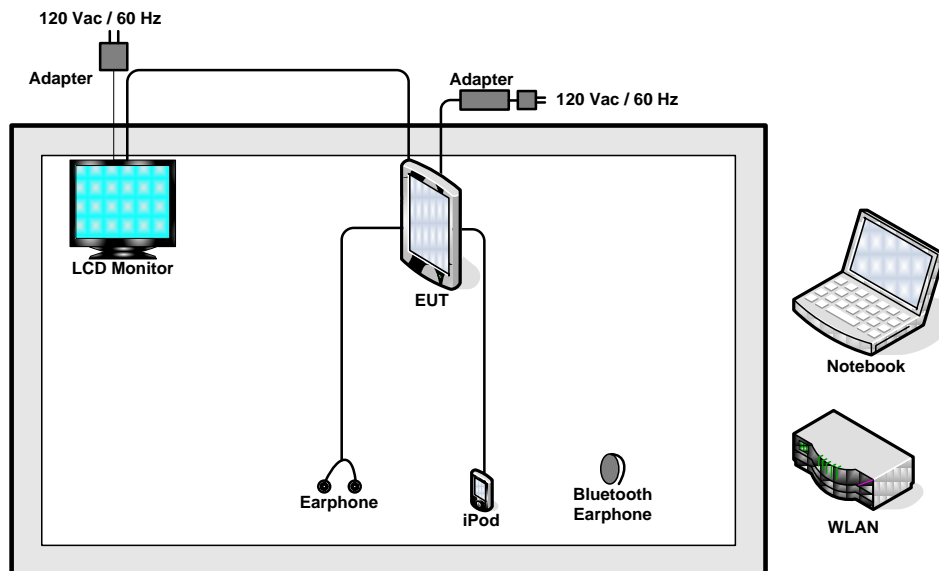
Test Cases		
Test Item	802.11b (Modulation : DSSS)	802.11g/n (Modulation : OFDM)
<b>Conducted TCs</b>	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 MHz Mode 8: 802.11n (BW 20M)_CH06_2437 MHz Mode 9: 802.11n (BW 20M)_CH11_2462 MHz
<b>Radiated TCs</b>	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 MHz Mode 8: 802.11n (BW 20M)_CH06_2437 MHz Mode 9: 802.11n (BW 20M)_CH11_2462 MHz
<b>AC Conducted Emission</b>	Mode 1 : WLAN Link + Bluetooth Link + TC (Charging from Adapter)	
<b>Remark:</b>		
1. TC stands for Test Configuration, and consists of iPod, monitor, earphone.		

## 2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>





## **2.4 RF Utility**

The programmed RF utility "WLAN Test" is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

### 3 Test Result

#### 3.1 6dB and 99% Bandwidth Measurement

##### 3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

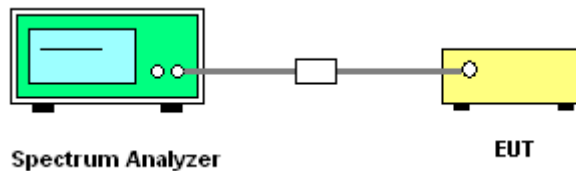
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz.  
In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

##### 3.1.4 Test Setup



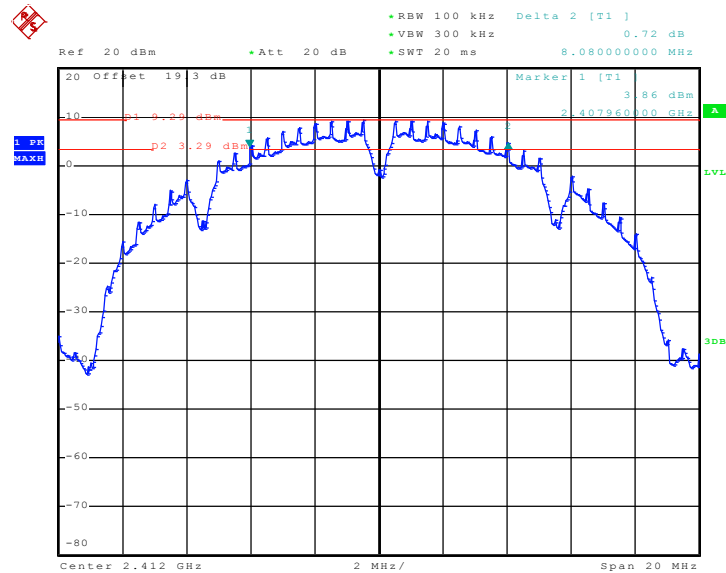


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24~26°C
Test Engineer :	Hank Yu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	8.08	0.5	Pass
06	2437	8.08	0.5	Pass
11	2462	8.08	0.5	Pass

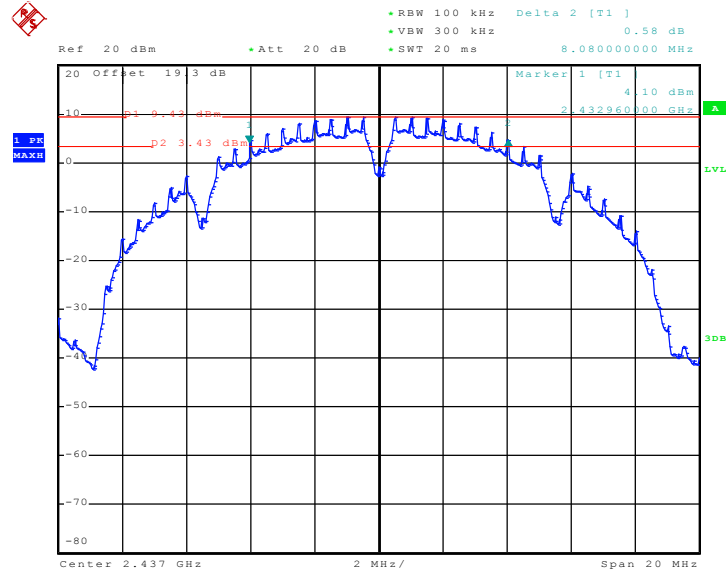
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 29.JUN.2011 19:05:21

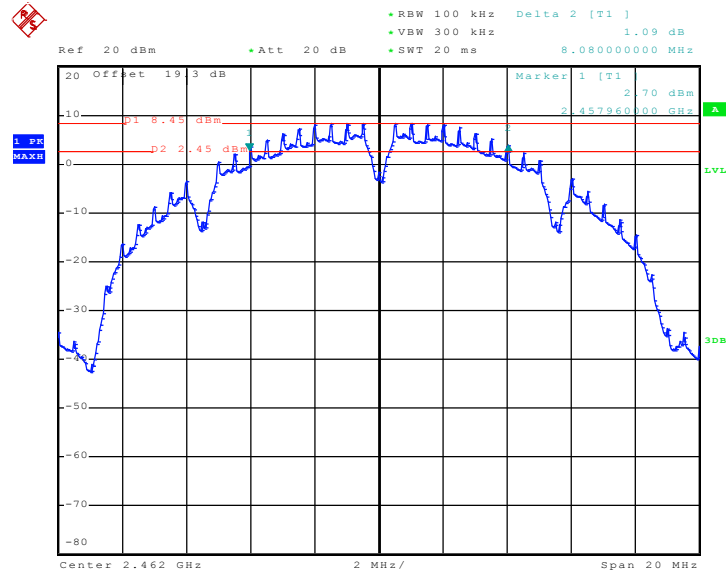


Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



Date: 29.JUN.2011 19:03:02

Mode 3 : 6 dB Bandwidth Plot on 802.11b Channel 11



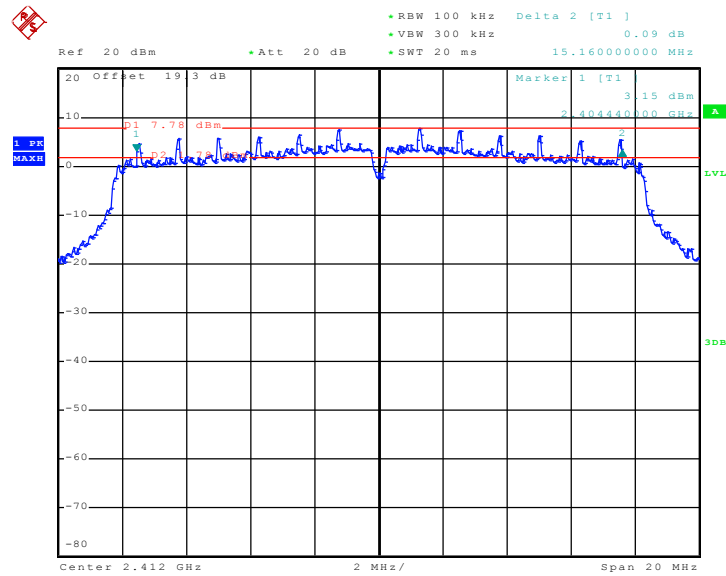
Date: 29.JUN.2011 19:07:24



Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Hank Yu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.16	0.5	Pass
06	2437	15.16	0.5	Pass
11	2462	15.16	0.5	Pass

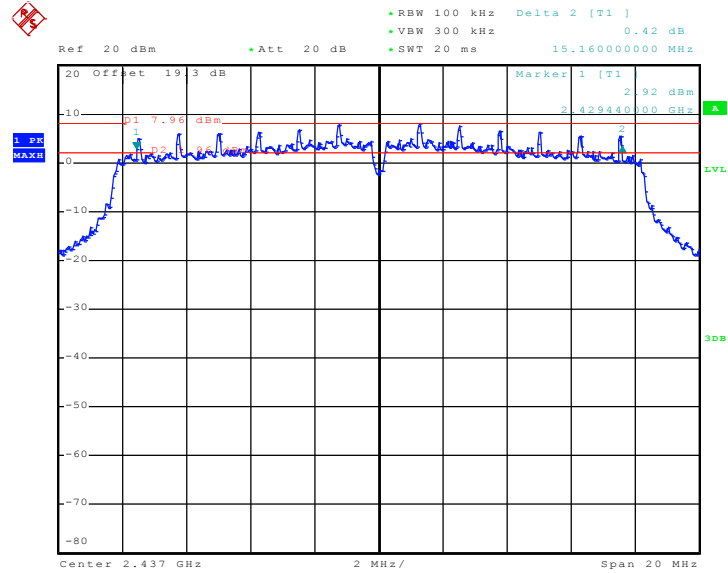
Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



Date: 29.JUN.2011 19:11:19

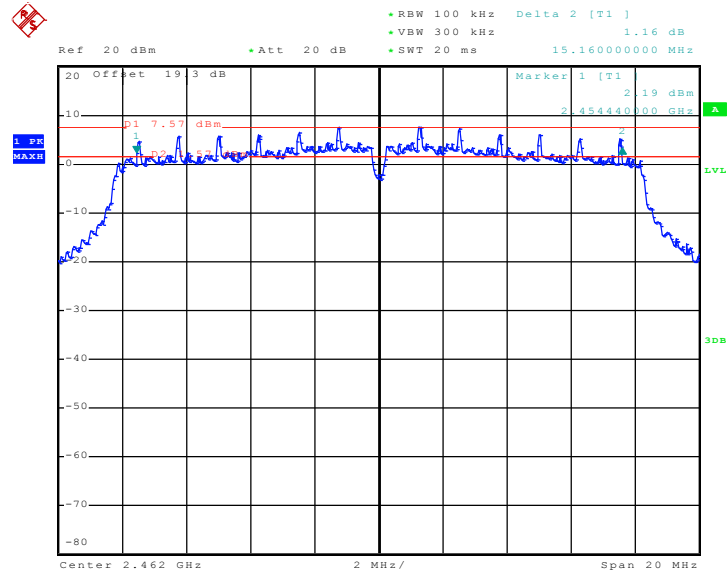


Mode 5 : 6 dB Bandwidth Plot on 802.11g Channel 06



Date: 29.JUN.2011 19:13:14

Mode 6 : 6 dB Bandwidth Plot on 802.11g Channel 11



Date: 29.JUN.2011 19:09:01

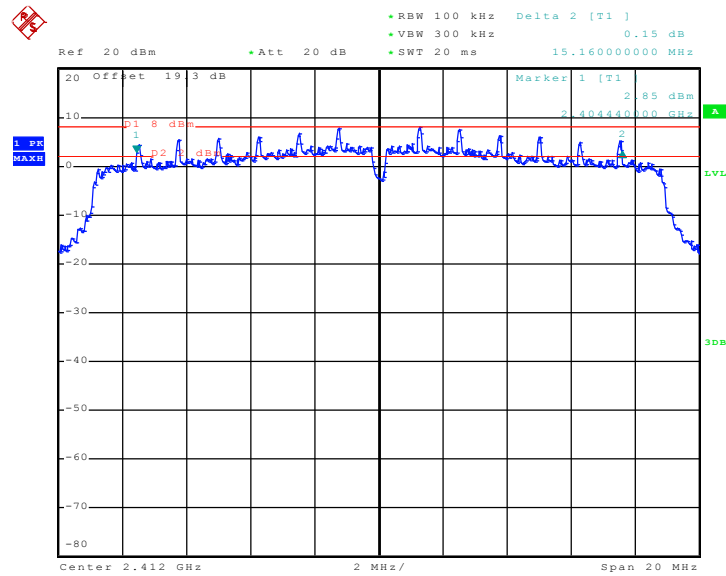




Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Hank Yu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.16	0.5	Pass
06	2437	15.16	0.5	Pass
11	2462	15.16	0.5	Pass

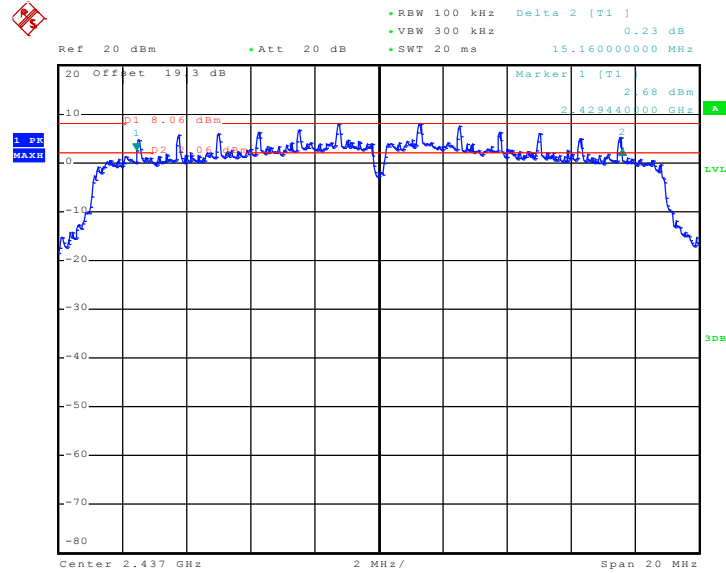
Mode 7 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 01



Date: 29.JUN.2011 19:18:01

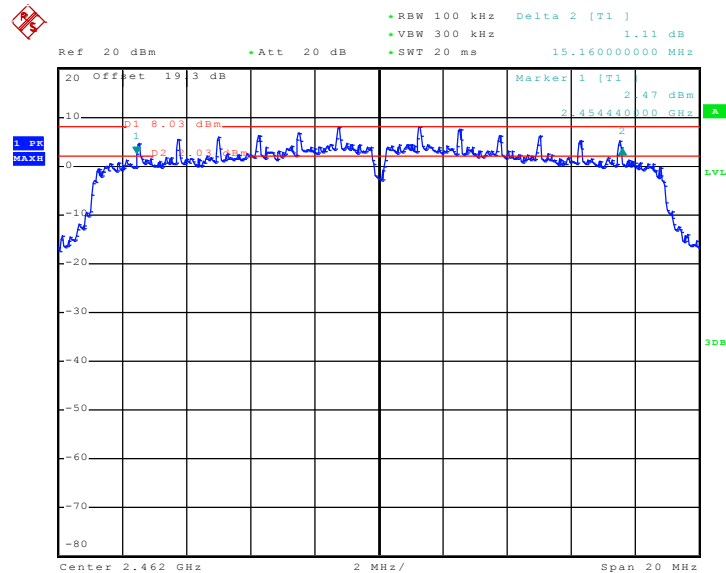


Mode 8 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 06



Date: 29.JUN.2011 19:14:28

Mode 9 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 11



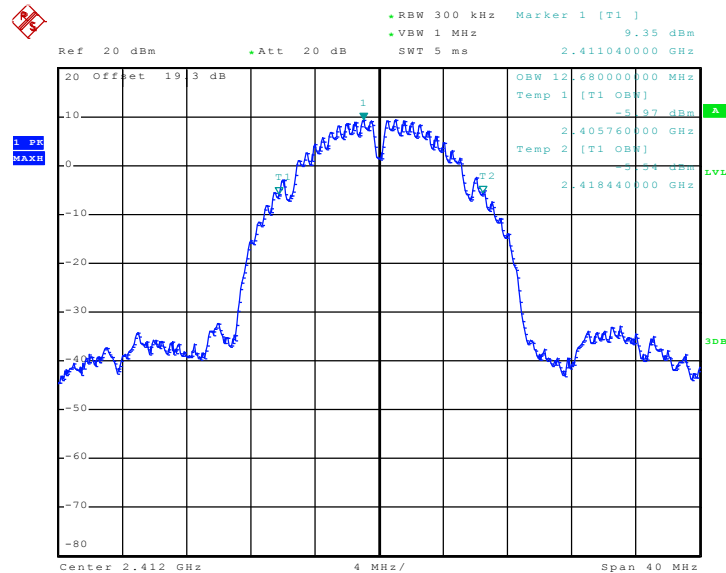
Date: 29.JUN.2011 19:16:51

3.1.6 Test Result of 99% Occupied Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24~26°C
Test Engineer :	Hank Yu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	12.68	Pass
06	2437	12.64	Pass
11	2462	12.76	Pass

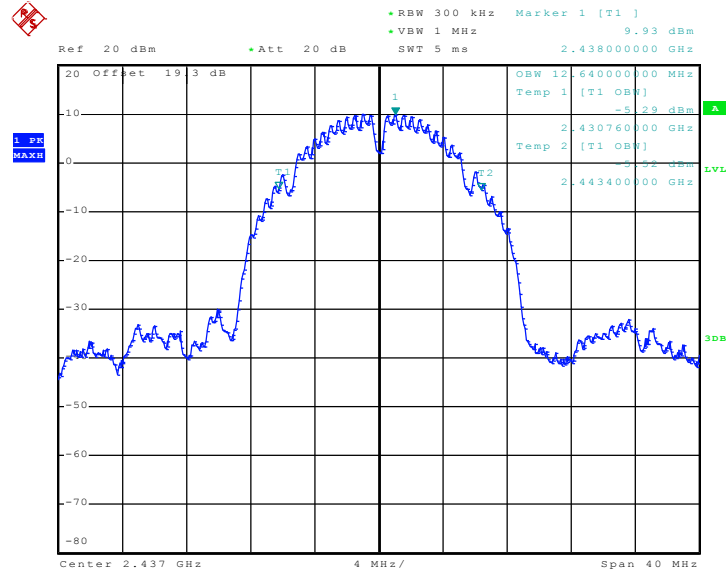
Mode 1 : 99% Occupied Bandwidth Plot on 802.11b Channel 01



Date: 29.JUN.2011 20:54:01

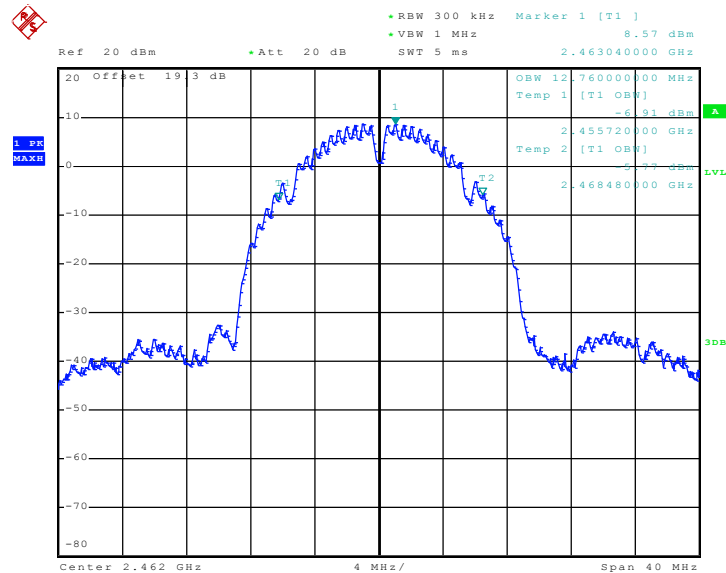


Mode 2 : 99% Occupied Bandwidth Plot on 802.11b Channel 06



Date: 29.JUN.2011 21:20:01

Mode 3 : 99% Occupied Bandwidth Plot on 802.11b Channel 11



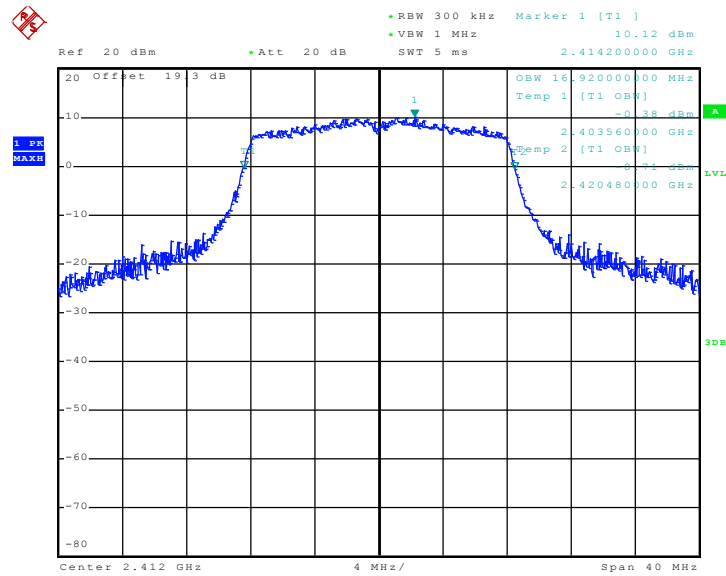
Date: 29.JUN.2011 20:51:52



Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Hank Yu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	16.92	Pass
06	2437	16.96	Pass
11	2462	17.04	Pass

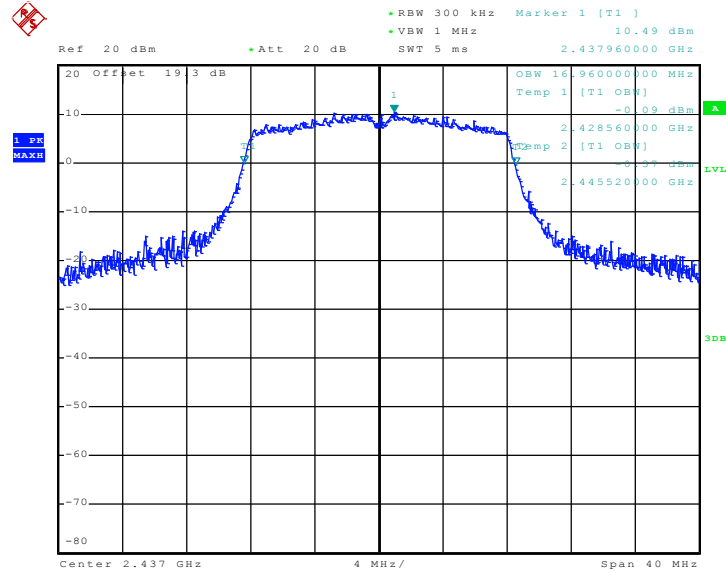
Mode 4 : 99% Occupied Bandwidth Plot on 802.11g Channel 01



Date: 29.JUN.2011 21:22:27

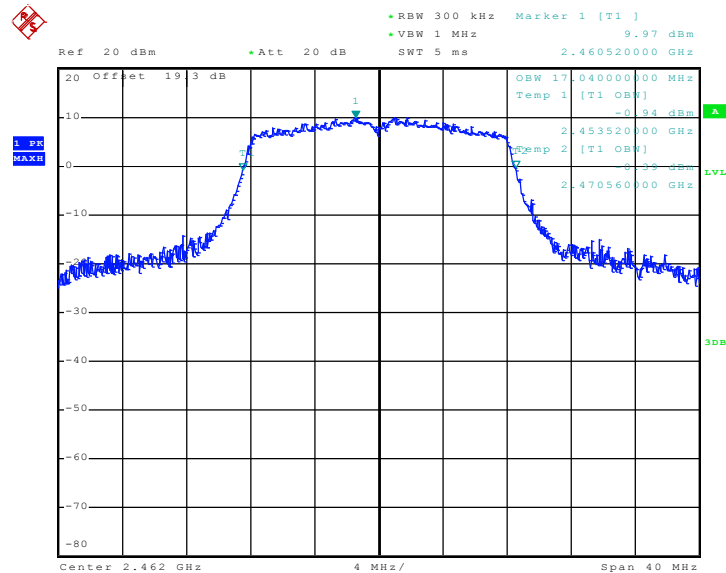


Mode 5 : 99% Occupied Bandwidth Plot on 802.11g Channel 06



Date: 29.JUN.2011 21:20:50

Mode 6 : 99% Occupied Bandwidth Plot on 802.11g Channel 11



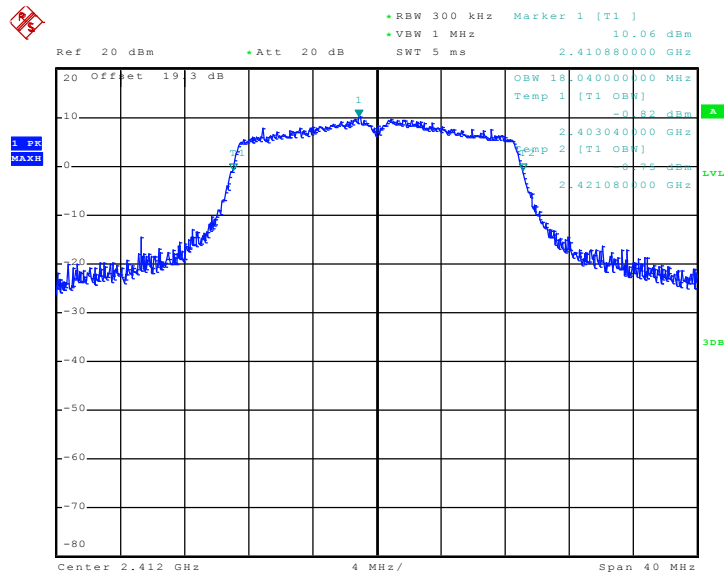
Date: 29.JUN.2011 21:25:03



Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Hank Yu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	18.04	Pass
06	2437	18.04	Pass
11	2462	18.00	Pass

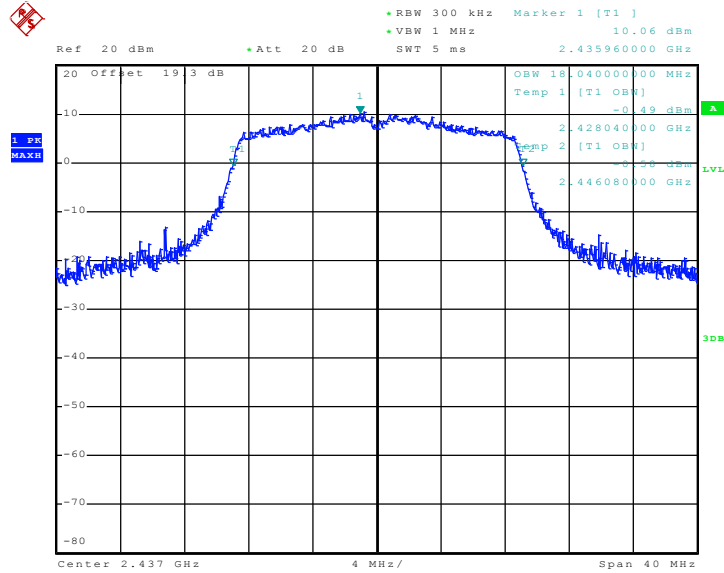
Mode 7 : 99% Occupied Bandwidth Plot on 802.11n(BW 20MHz) Channel 01



Date: 29.JUN.2011 21:46:52

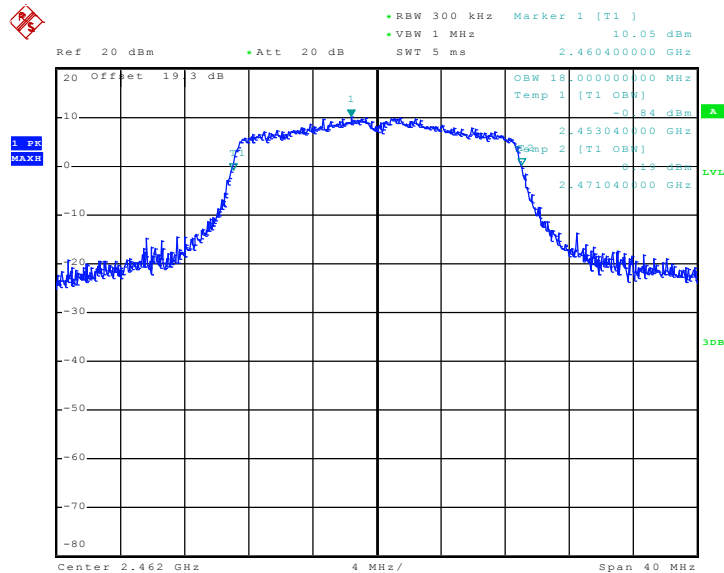


Mode 8 : 99% Occupied Bandwidth Plot on 802.11n(BW 20MHz) Channel 06



Date: 29.JUN.2011 21:48:31

Mode 9 : 99% Occupied Bandwidth Plot on 802.11n(BW 20MHz) Channel 11



Date: 29.JUN.2011 21:26:52



## 3.2 Output Power Measurement

### 3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

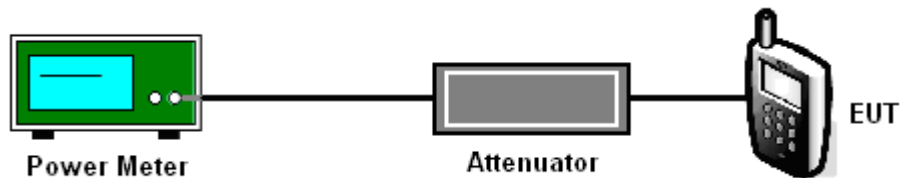
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the power meter by a low loss cable.
3. Measure the power by power meter.

### 3.2.4 Test Setup



**3.2.5 Test Result of Output Power**

<b>Test Mode :</b>	Mode 1, 2, 3	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Hank Yu	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.92	30	Pass
06	2437	19.10	30	Pass
11	2462	13.50	30	Pass

<b>Test Mode :</b>	Mode 4, 5, 6	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Hank Yu	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	23.58	30	Pass
06	2437	23.52	30	Pass
11	2462	20.47	30	Pass

<b>Test Mode :</b>	Mode 7, 8, 9	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Hank Yu	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	23.14	30	Pass
06	2437	23.68	30	Pass
11	2462	19.67	30	Pass



### **3.3 Band Edges Measurement**

#### **3.3.1 Limit of Band Edges**

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

#### **3.3.2 Measuring Instruments**

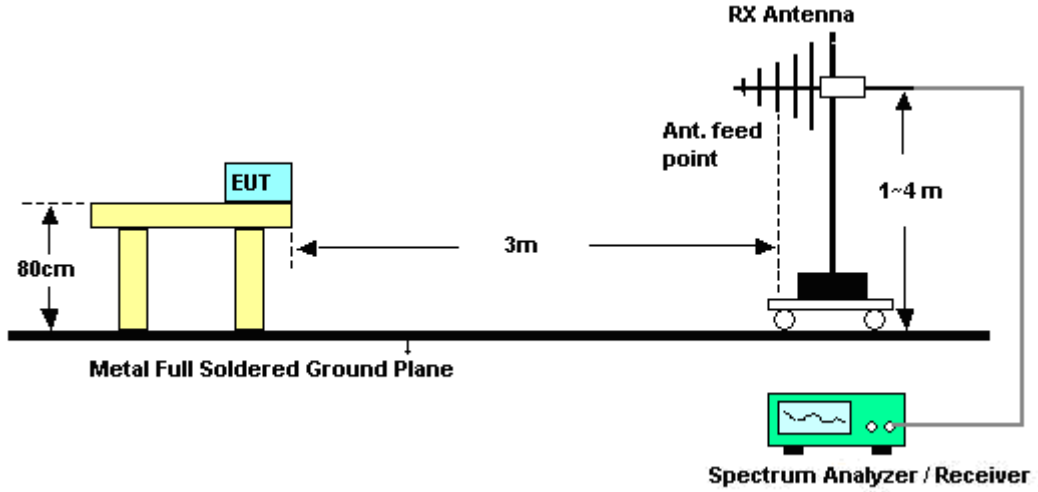
See list of measuring instruments of this test report.

#### **3.3.3 Test Procedures**

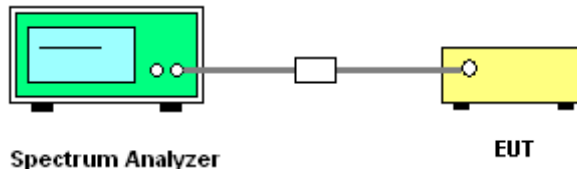
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW)  $\geq$  RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Apply to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep=Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation as in FCC Section 15.35(b) and (c).

### 3.3.4 Test Setup

#### <Radiated Band Edges>



#### <Conducted Band Edges>





3.3.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	46~47%
Test Channel :	01	Test Engineer :	Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	57.75	-16.25	74	55.55	31.7	4.58	34.08	100	276	Peak
2390	46.37	-7.63	54	44.17	31.7	4.58	34.08	100	276	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	52	-22	74	49.8	31.7	4.58	34.08	100	170	Peak
2390	39.95	-14.05	54	37.75	31.7	4.58	34.08	100	170	Average

Test Mode :	Mode 3	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	46~47%
Test Channel :	11	Test Engineer :	Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	55.68	-18.32	74	53.34	31.78	4.64	34.08	100	237	Peak
2483.5	44.28	-9.72	54	41.94	31.78	4.64	34.08	100	237	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	49.73	-24.27	74	47.39	31.78	4.64	34.08	100	24	Peak
2483.5	38.92	-15.08	54	36.58	31.78	4.64	34.08	100	24	Average



Test Mode :	Mode 4	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	46~47%
Test Channel :	01	Test Engineer :	Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	67.58	-6.42	74	65.38	31.7	4.58	34.08	100	276	Peak
2390	50.03	-3.97	54	47.83	31.7	4.58	34.08	100	276	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	63.24	-10.76	74	61.04	31.7	4.58	34.08	100	170	Peak
2390	43.24	-10.76	54	41.04	31.7	4.58	34.08	100	170	Average

Test Mode :	Mode 6	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	46~47%
Test Channel :	11	Test Engineer :	Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	70.56	-3.44	74	68.22	31.78	4.64	34.08	100	239	Peak
2483.5	50.45	-3.55	54	48.11	31.78	4.64	34.08	100	239	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	63.45	-10.55	74	61.11	31.78	4.64	34.08	100	24	Peak
2483.5	43.08	-10.92	54	40.74	31.78	4.64	34.08	100	24	Average



Test Mode :	Mode 7	Temperature :	23~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	46~47%
Test Channel :	01	Test Engineer :	Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	70.87	-3.13	74	68.67	31.7	4.58	34.08	100	275	Peak
2390	50.98	-3.02	54	48.78	31.7	4.58	34.08	100	275	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	63.92	-10.08	74	61.72	31.7	4.58	34.08	100	168	Peak
2390	44.67	-9.33	54	42.47	31.7	4.58	34.08	100	168	Average

Test Mode :	Mode 9	Temperature :	23~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	46~47%
Test Channel :	11	Test Engineer :	Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	70.07	-3.93	74	67.73	31.78	4.64	34.08	100	263	Peak
2483.5	50.33	-3.67	54	47.99	31.78	4.64	34.08	100	263	Average

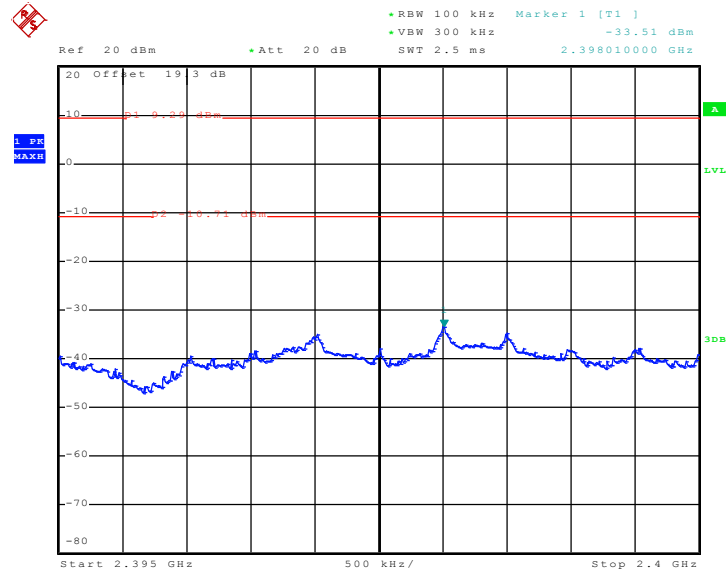
ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	44.06	-9.94	54	41.72	31.78	4.64	34.08	100	175	Average
2483.5	63.3	-10.7	74	60.96	31.78	4.64	34.08	100	175	Peak



### 3.3.6 Test Plots of Conducted Band Edges

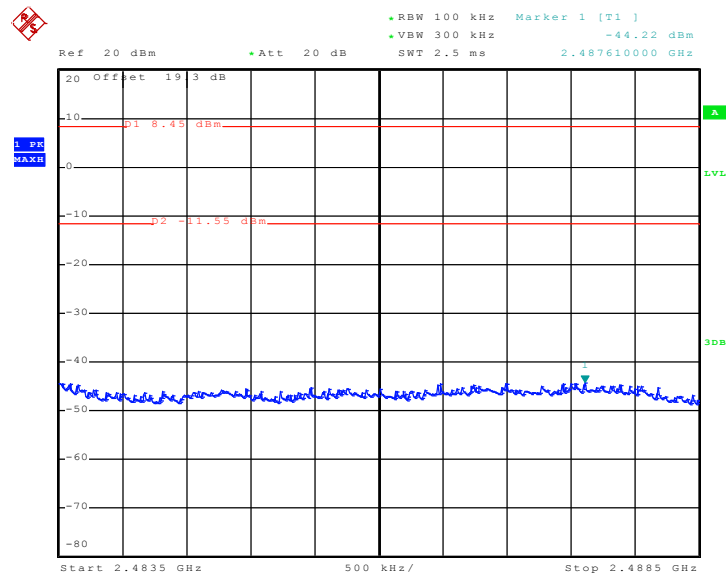
Test Mode :	Mode 1 and 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Hank Yu

Low Band Edge Plot on 802.11b Channel 01



Date: 29.JUN.2011 19:43:21

High Band Edge Plot on 802.11b Channel 11



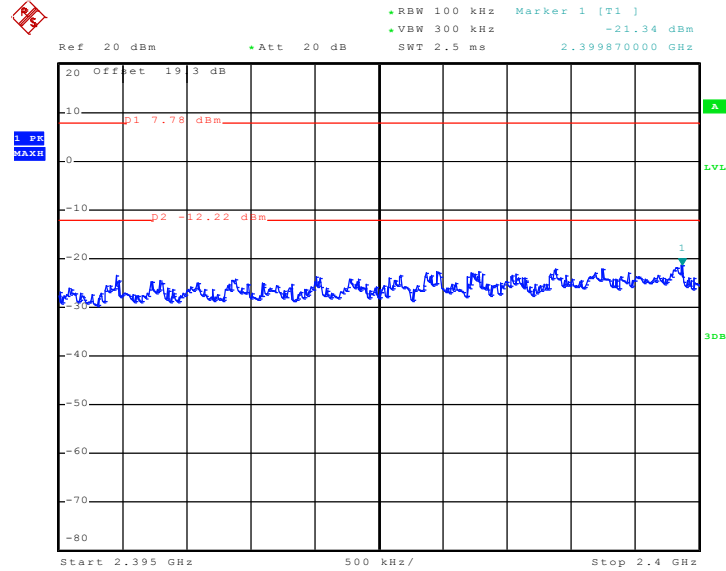
Date: 29.JUN.2011 19:44:40





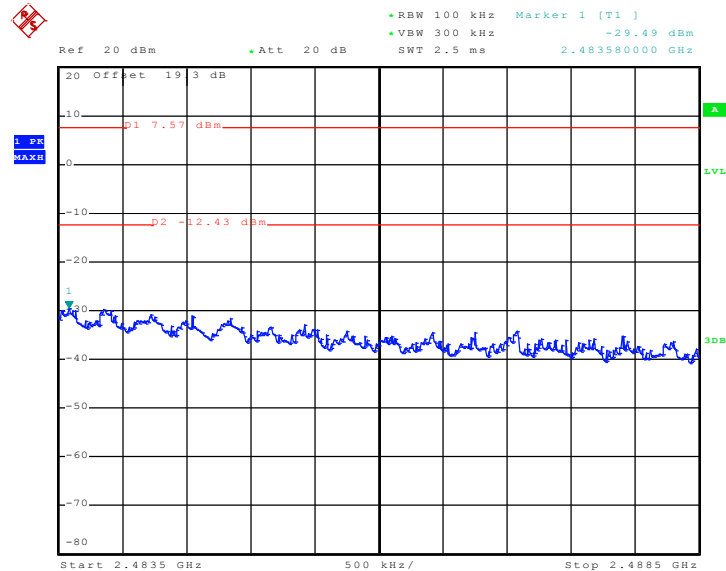
Test Mode :	Mode 4 and 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Hank Yu

Low Band Edge Plot on 802.11g Channel 01



Date: 29.JUN.2011 19:39:32

High Band Edge Plot on 802.11g Channel 11

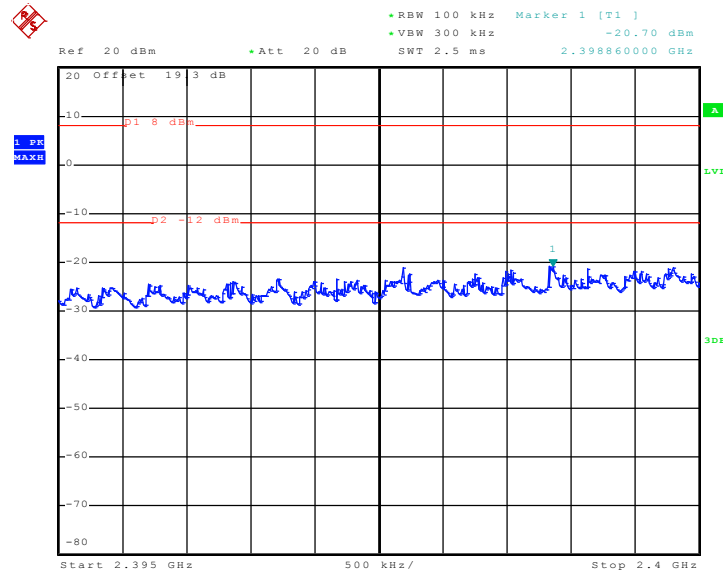


Date: 29.JUN.2011 19:35:19



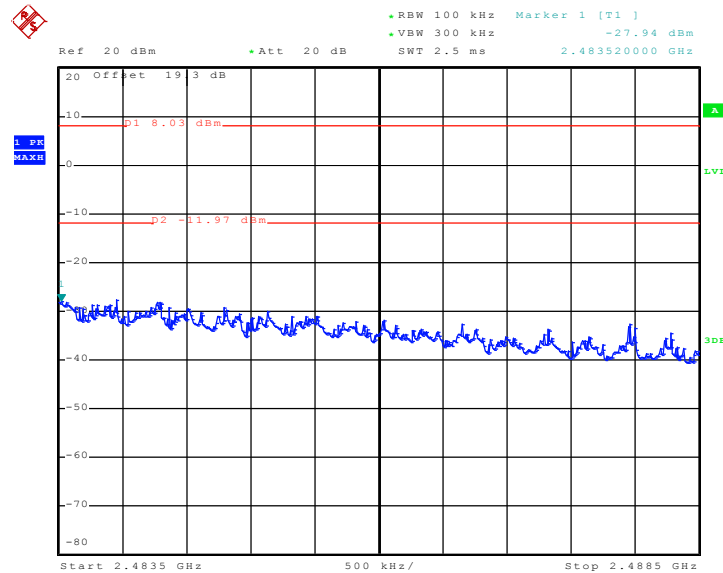
Test Mode :	Mode 7 and 9	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Hank Yu

Low Band Edge Plot on 802.11n (BW 20MHz) Channel 01



Date: 29.JUN.2011 19:26:13

High Band Edge Plot on 802.11n (BW 20MHz) Channel 11



Date: 29.JUN.2011 19:32:54

## 3.4 Spurious Emission Measurement

### 3.4.1 Limit of Spurious Emission Measurement

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

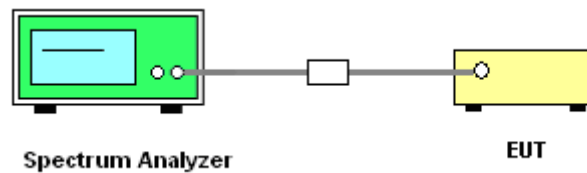
### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.4.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 kHz, Video bandwidth (VBW)  $\geq$  RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

### 3.4.4 Test Setup

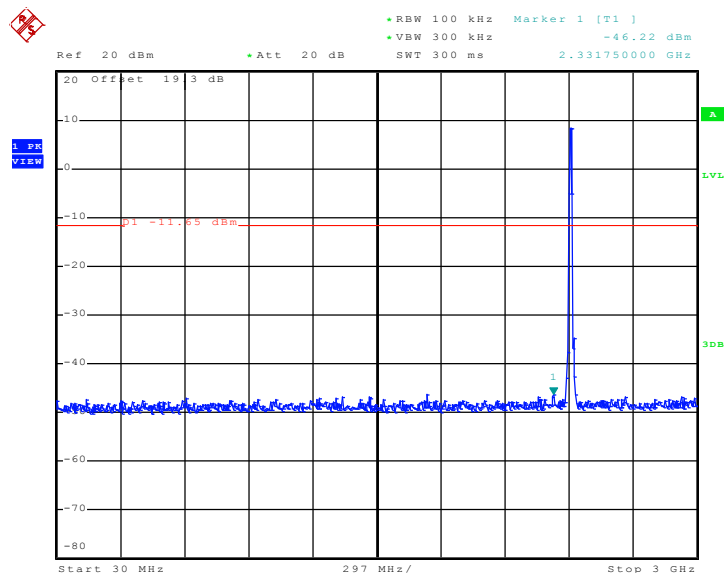




### 3.4.5 Test Plots of Spurious Emission

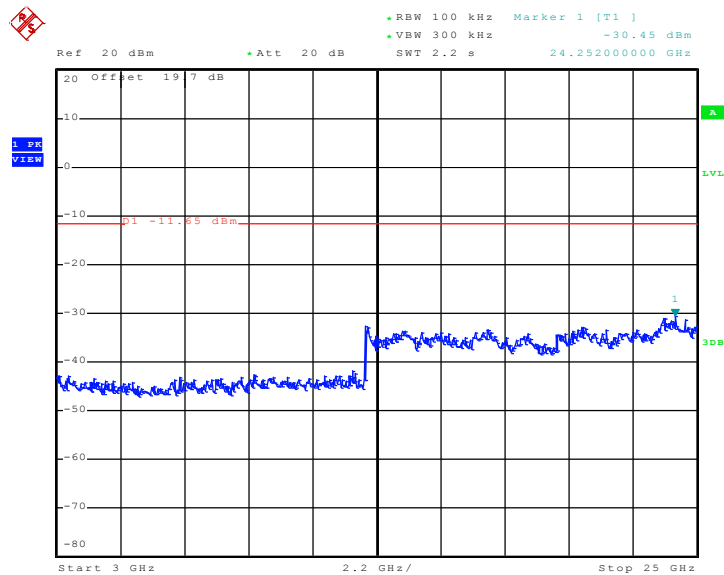
Test Mode :	Mode 1	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.JUN.2011 21:15:03

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

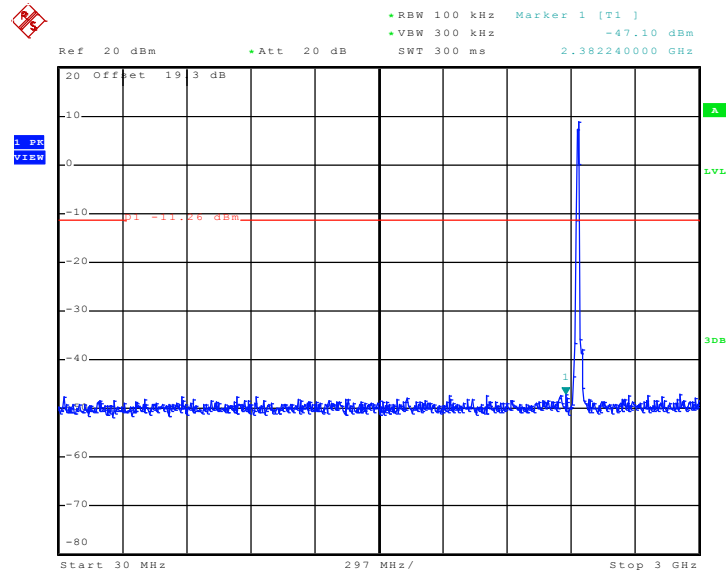


Date: 29.JUN.2011 21:16:01



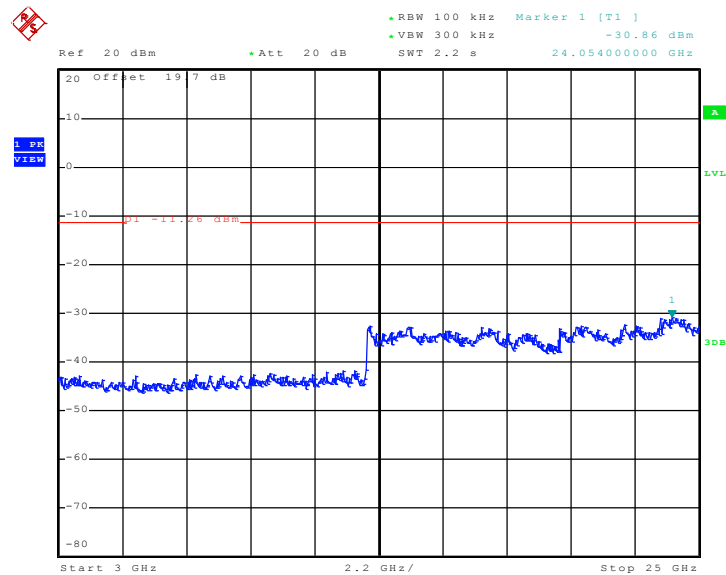
Test Mode :	Mode 2	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.JUN.2011 21:05:28

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

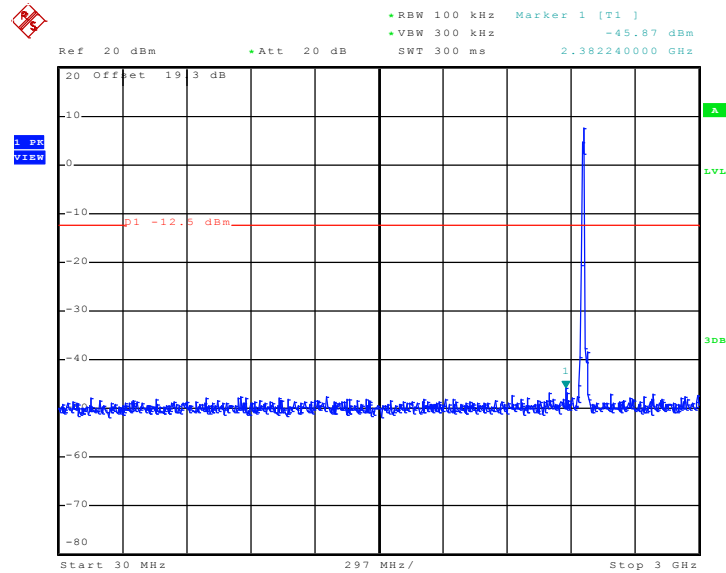


Date: 29.JUN.2011 21:07:40



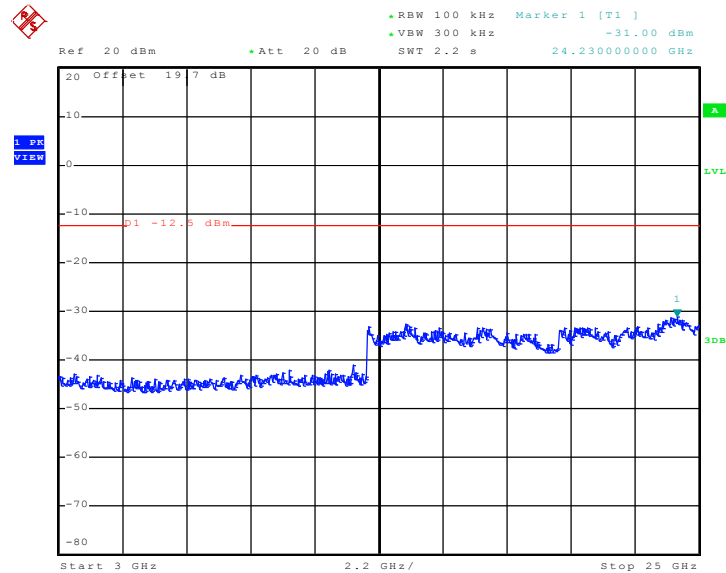
Test Mode :	Mode 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.JUN.2011 21:10:15

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

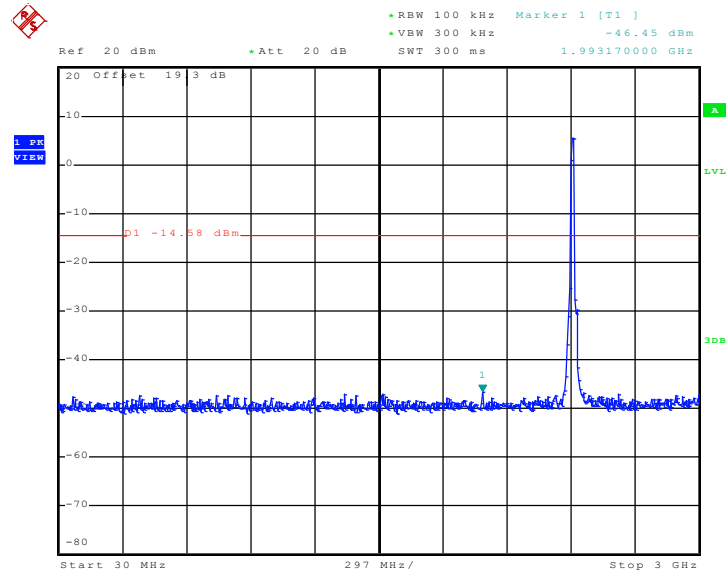


Date: 29.JUN.2011 21:56:32



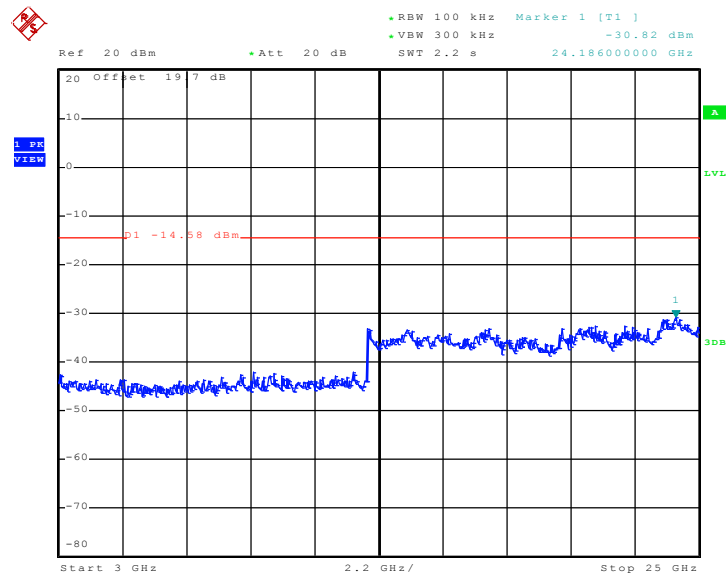
Test Mode :	Mode 4	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.JUN.2011 21:22:50

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

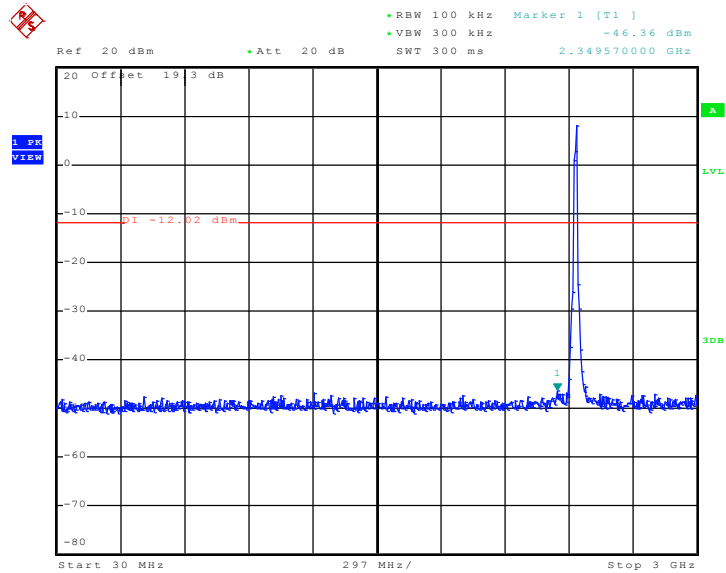


Date: 29.JUN.2011 21:23:31



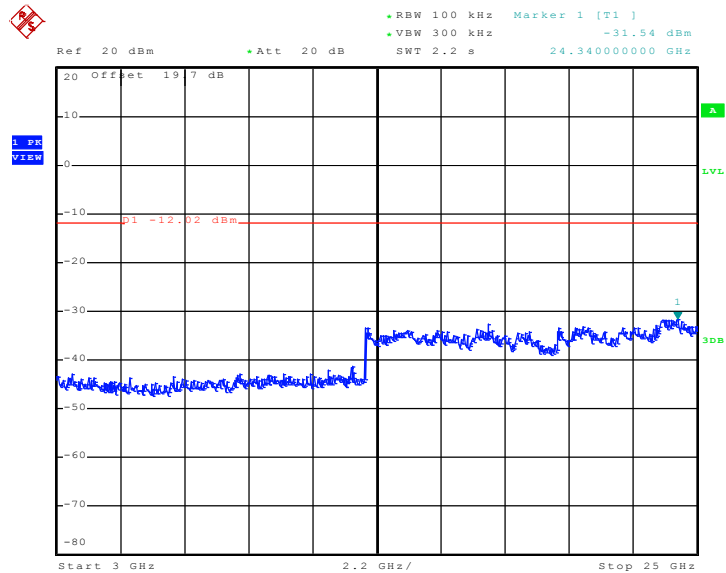
Test Mode :	Mode 5	Temperature :	24~26
Test Band :	802.11g	Relative Humidity :	50~53
Test Channel :	06	Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.JUN.2011 21:21:12

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



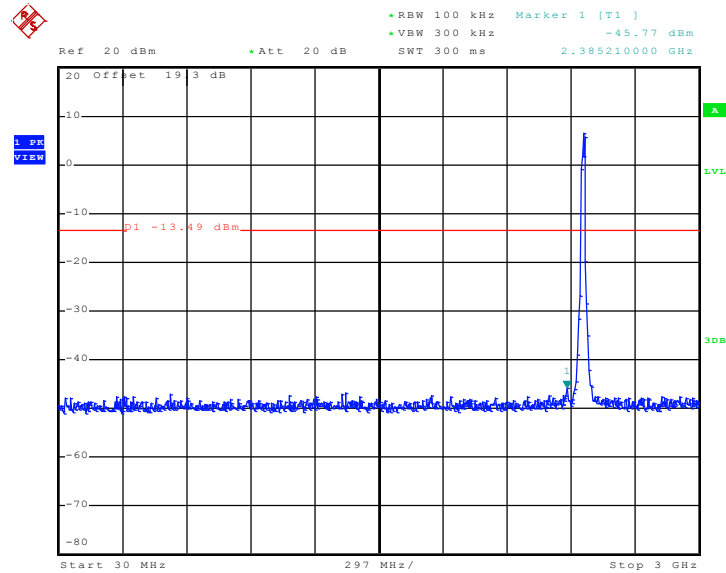
Date: 29.JUN.2011 21:21:45





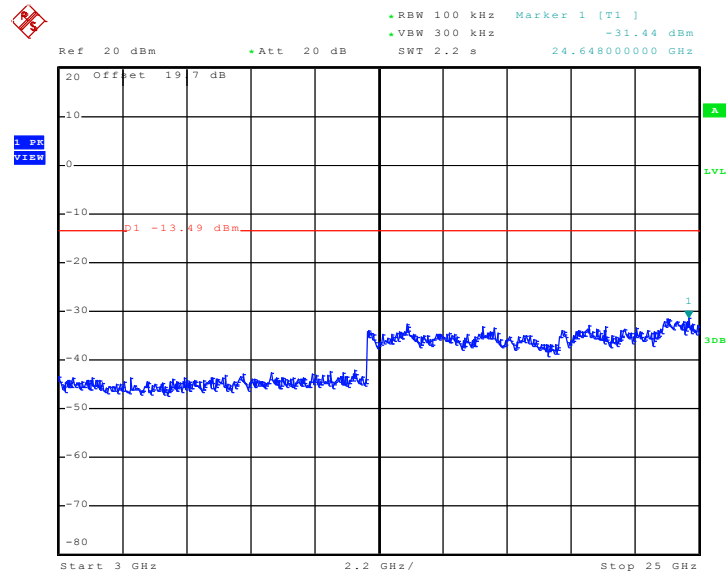
Test Mode :	Mode 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.JUN.2011 21:25:25

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

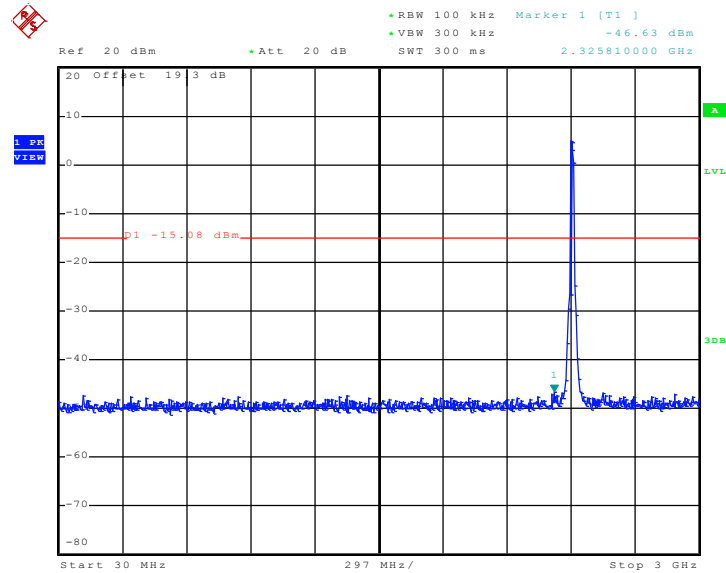


Date: 29.JUN.2011 21:26:04



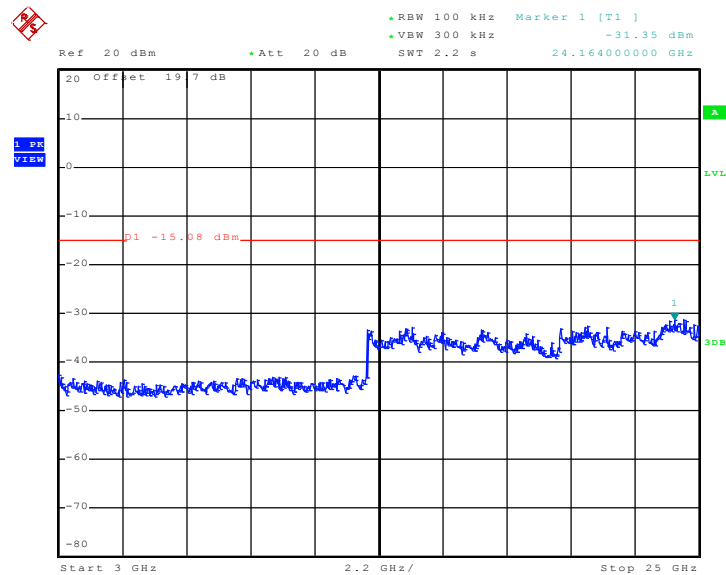
Test Mode :	Mode 7	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.JUN.2011 21:47:15

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

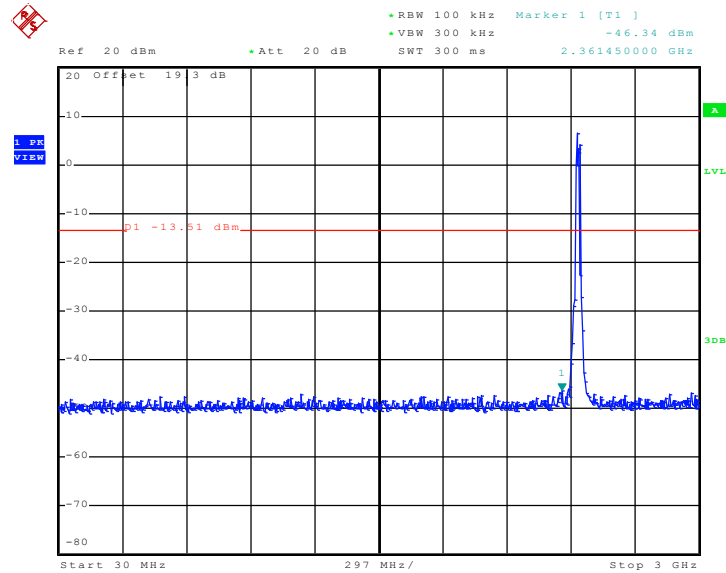


Date: 29.JUN.2011 21:47:46



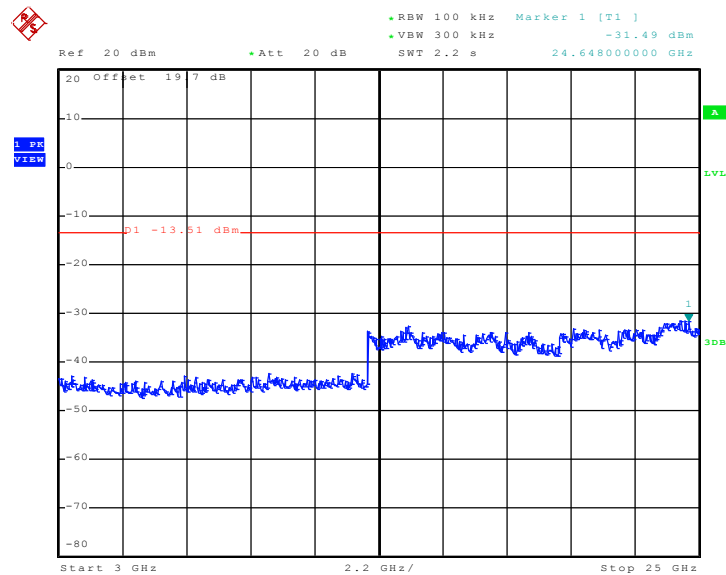
Test Mode :	Mode 8	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.JUN.2011 21:48:53

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

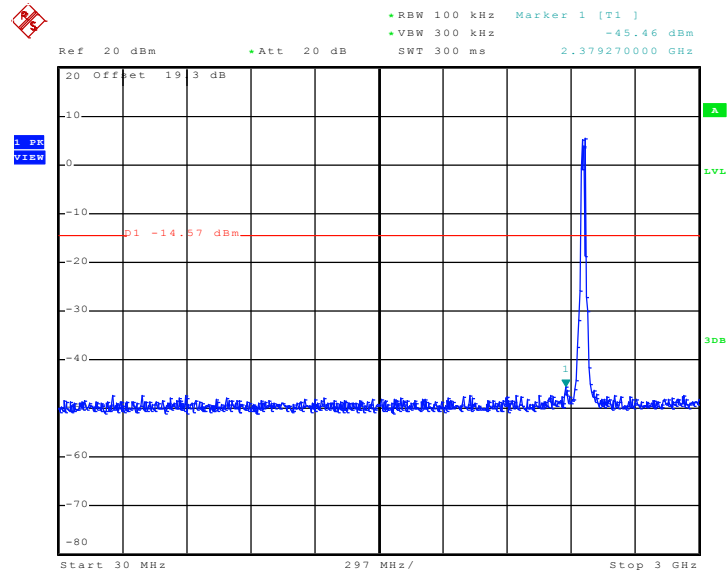


Date: 29.JUN.2011 21:50:19



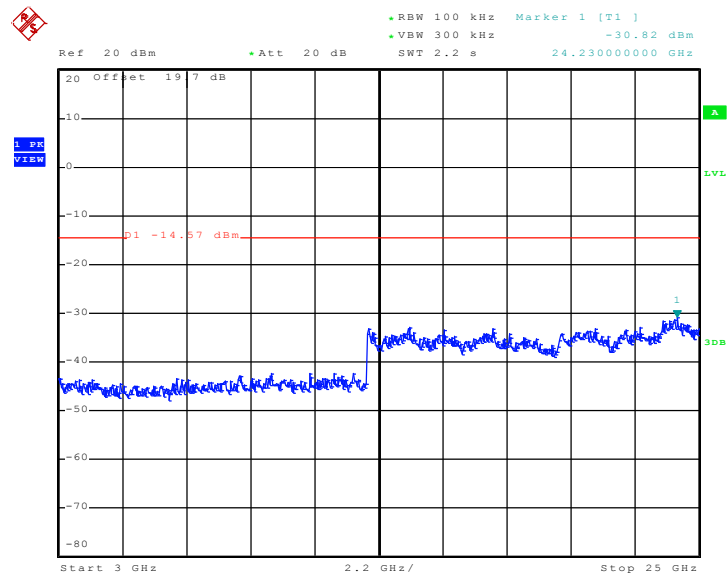
Test Mode :	Mode 9	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 29.JUN.2011 21:42:35

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 29.JUN.2011 21:43:19

## 3.5 Power Spectral Density Measurement

### 3.5.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

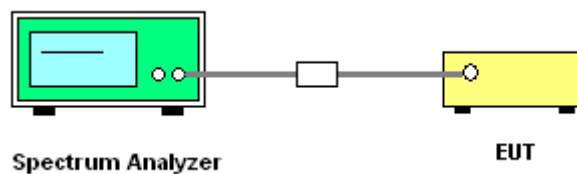
### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.5.3 Test Procedures

1. The test follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Take the measured data from spectrum analyzer.

### 3.5.4 Test Setup



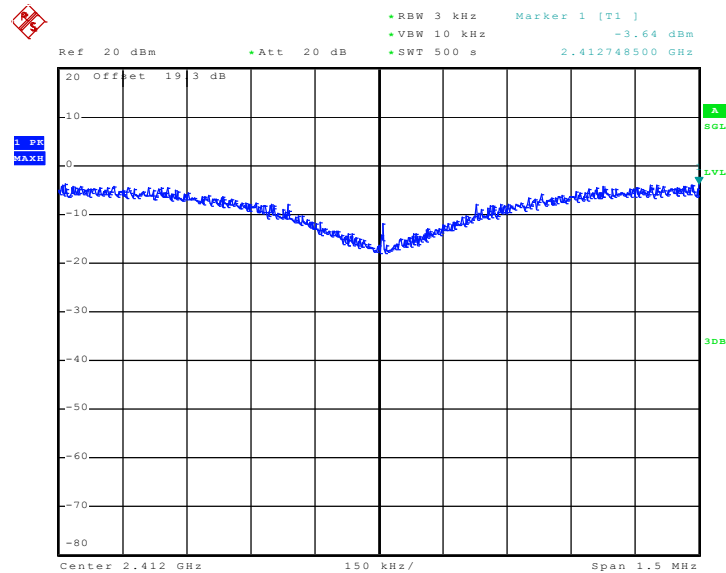


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	24~26°C
Test Engineer :	Hank Yu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-3.64	8	Pass
06	2437	-3.58	8	Pass
11	2462	-4.46	8	Pass

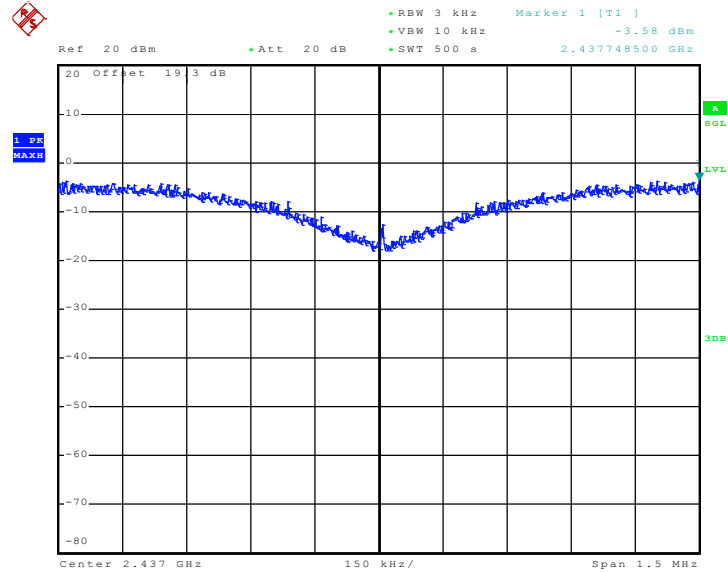
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 29.JUN.2011 22:58:37

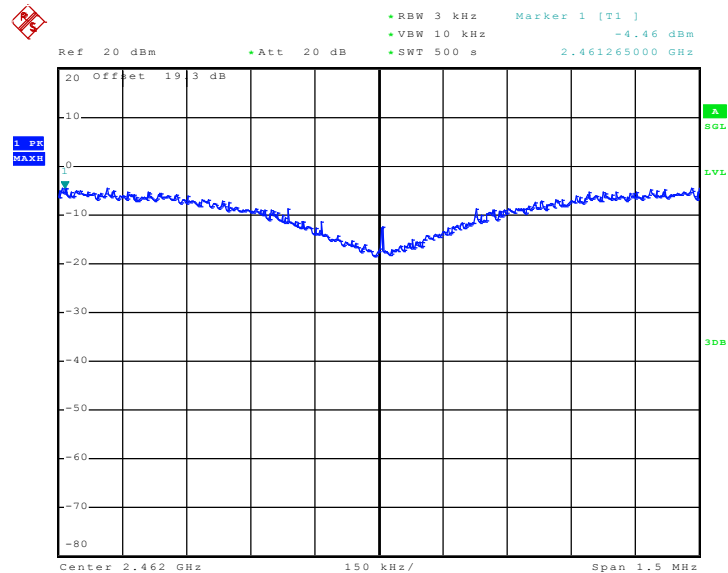


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 29.JUN.2011 22:43:40

Mode 3 : PSD Plot on 802.11b Channel 11



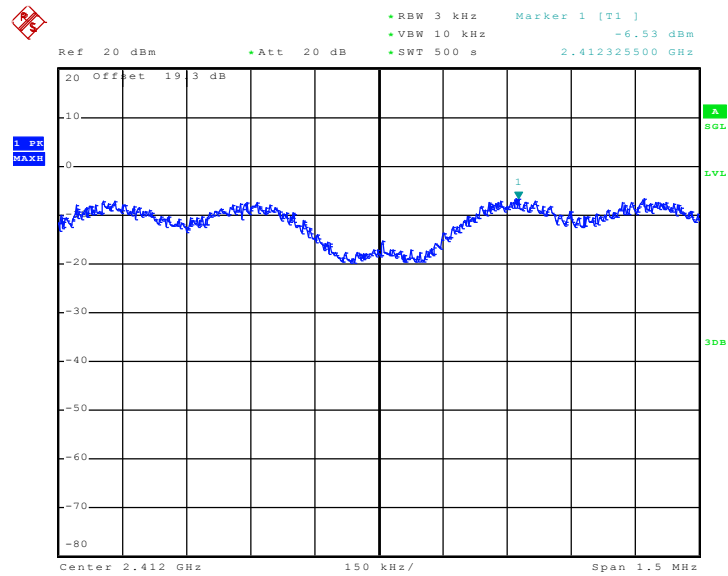
Date: 29.JUN.2011 20:11:04



Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Hank Yu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-6.53	8	Pass
06	2437	-6.64	8	Pass
11	2462	-6.47	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01

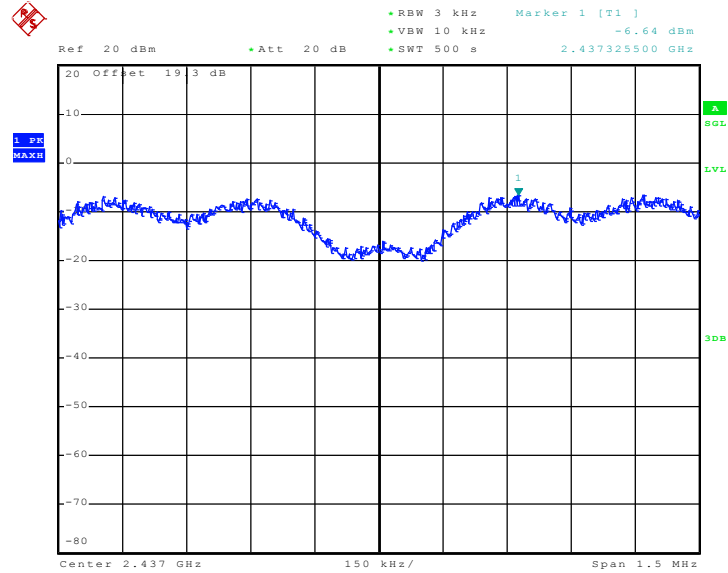


Date: 29.JUN.2011 23:12:45



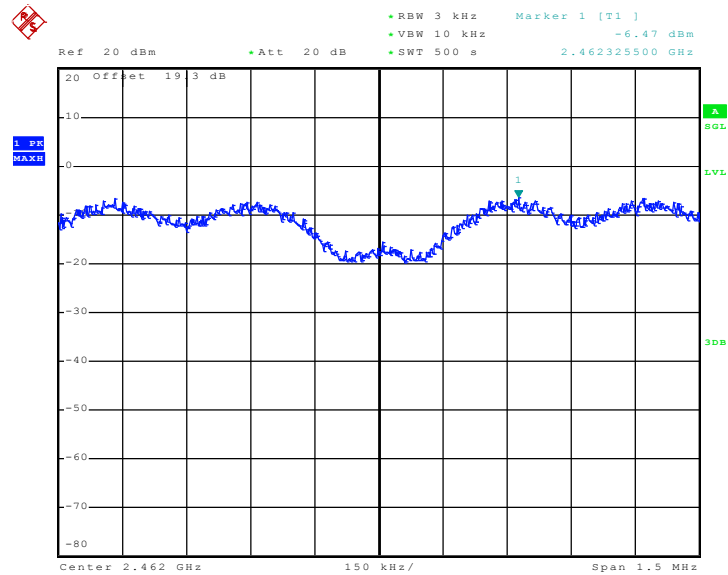


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 29.JUN.2011 22:12:03

Mode 6 : PSD Plot on 802.11g Channel 11



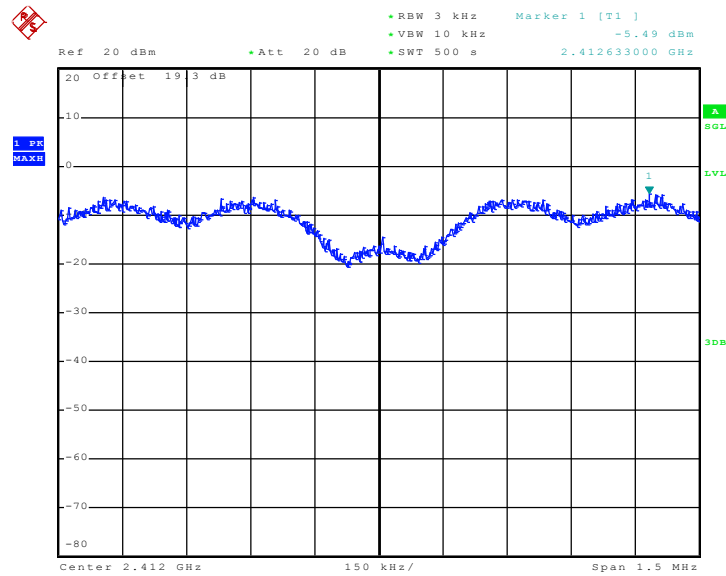
Date: 29.JUN.2011 23:49:18



Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Hank Yu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-5.49	8	Pass
06	2437	-5.32	8	Pass
11	2462	-5.32	8	Pass

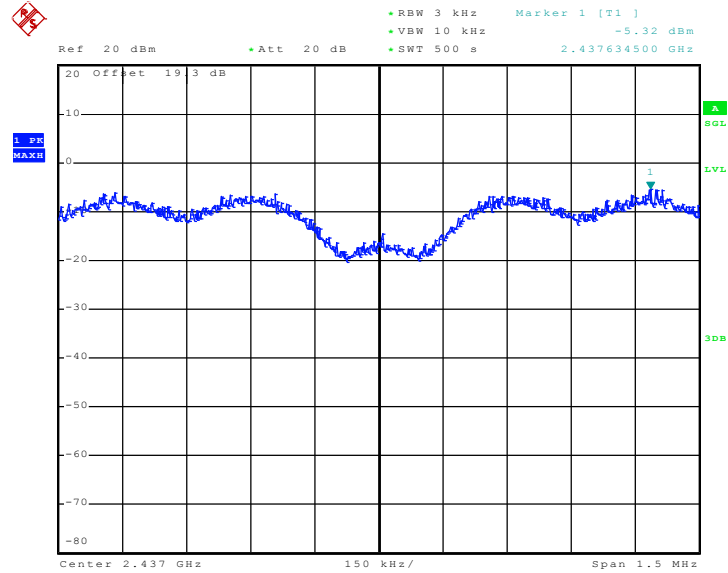
Mode 7 : PSD Plot on 802.11n (BW 20MHz) Channel 01



Date: 29.JUN.2011 23:22:00

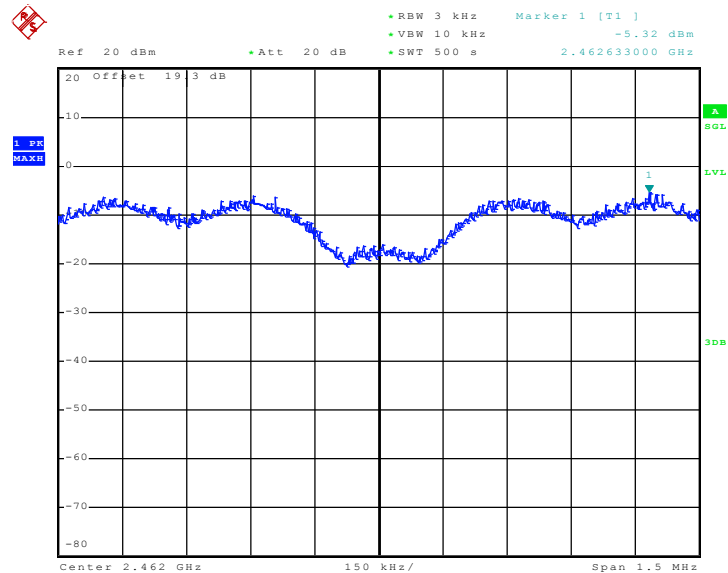


Mode 8 : PSD Plot on 802.11n (BW 20MHz) Channel 06



Date: 29.JUN.2011 23:30:57

Mode 9 : PSD Plot on 802.11n (BW 20MHz) Channel 11



Date: 29.JUN.2011 23:40:25

## 3.6 AC Conducted Emission Measurement

### 3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

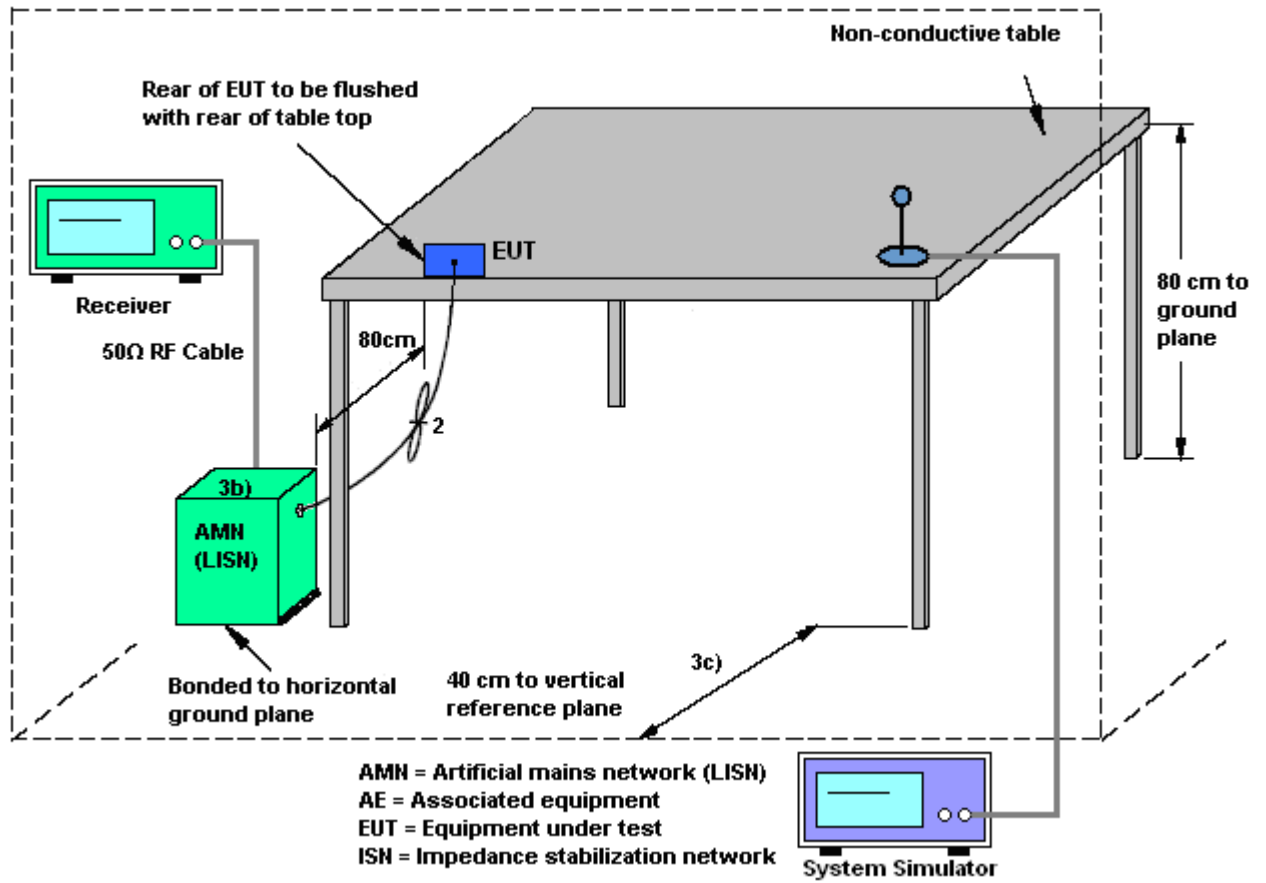
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

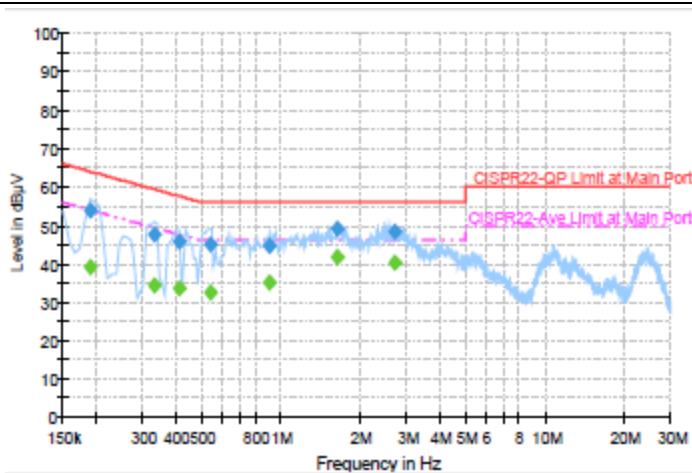
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC 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.

### 3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~23°C
Test Engineer :	Novic Chiang	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link + Bluetooth Link + TC (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

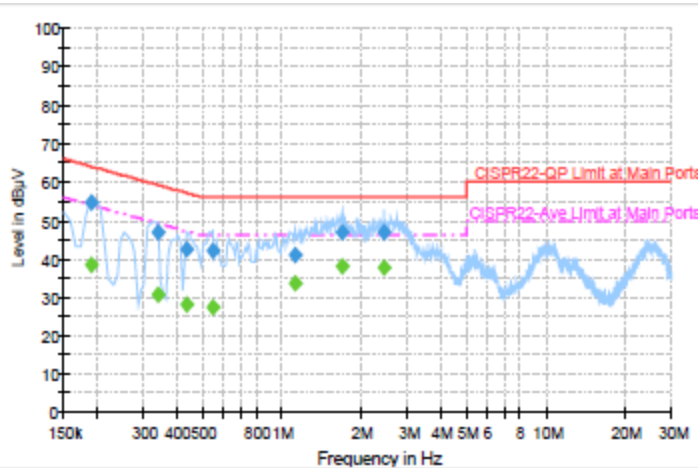
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	53.9	Off	L1	19.4	10.1	64.0
0.334000	47.6	Off	L1	19.3	11.8	59.4
0.414000	45.7	Off	L1	19.4	11.9	57.6
0.542000	45.2	Off	L1	19.3	10.8	56.0
0.910000	44.6	Off	L1	19.4	11.4	56.0
1.638000	48.9	Off	L1	19.4	7.1	56.0
2.702000	48.5	Off	L1	19.5	7.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	39.0	Off	L1	19.4	15.0	54.0
0.334000	34.3	Off	L1	19.3	15.1	49.4
0.414000	33.5	Off	L1	19.4	14.1	47.6
0.542000	32.3	Off	L1	19.3	13.7	46.0
0.910000	35.1	Off	L1	19.4	10.9	46.0
1.638000	41.6	Off	L1	19.4	4.4	46.0
2.702000	40.4	Off	L1	19.5	5.6	46.0



Test Mode :	Mode 1	Temperature :	21~23°C
Test Engineer :	Novic Chiang	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link + Bluetooth Link + TC (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	54.5	Off	N	19.4	9.5	64.0
0.342000	46.9	Off	N	19.3	12.3	59.2
0.438000	42.5	Off	N	19.4	14.6	57.1
0.550000	42.0	Off	N	19.3	14.0	56.0
1.126000	41.1	Off	N	19.4	14.9	56.0
1.694000	46.7	Off	N	19.5	9.3	56.0
2.446000	46.7	Off	N	19.5	9.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	38.5	Off	N	19.4	15.5	54.0
0.342000	30.5	Off	N	19.3	18.7	49.2
0.438000	28.0	Off	N	19.4	19.1	47.1
0.550000	27.3	Off	N	19.3	18.7	46.0
1.126000	33.7	Off	N	19.4	12.3	46.0
1.694000	38.1	Off	N	19.5	7.9	46.0
2.446000	37.8	Off	N	19.5	8.2	46.0

### 3.7 Radiated Emission Measurement

#### 3.7.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/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

#### 3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

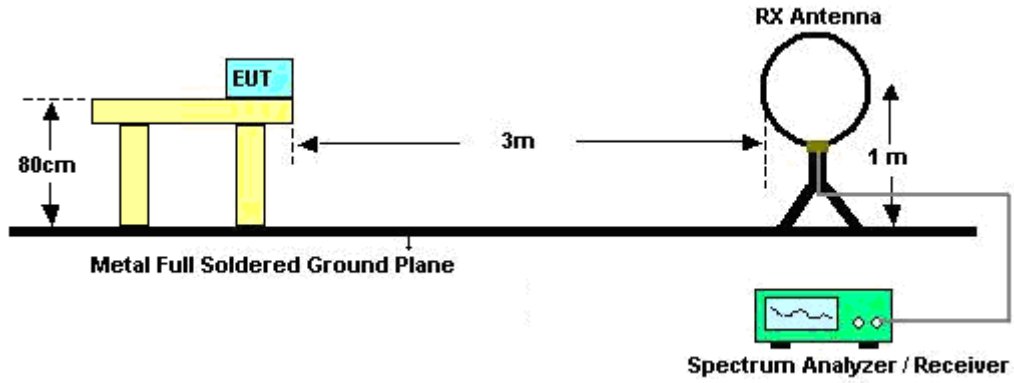
#### 3.7.3 Test Procedures

1. The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:
  - (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
  - (2) Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.  
 Distance extrapolation factor =  $20 \log(\text{specific distance [3m]} / \text{test distance [1m]})$  (dB)
3. Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

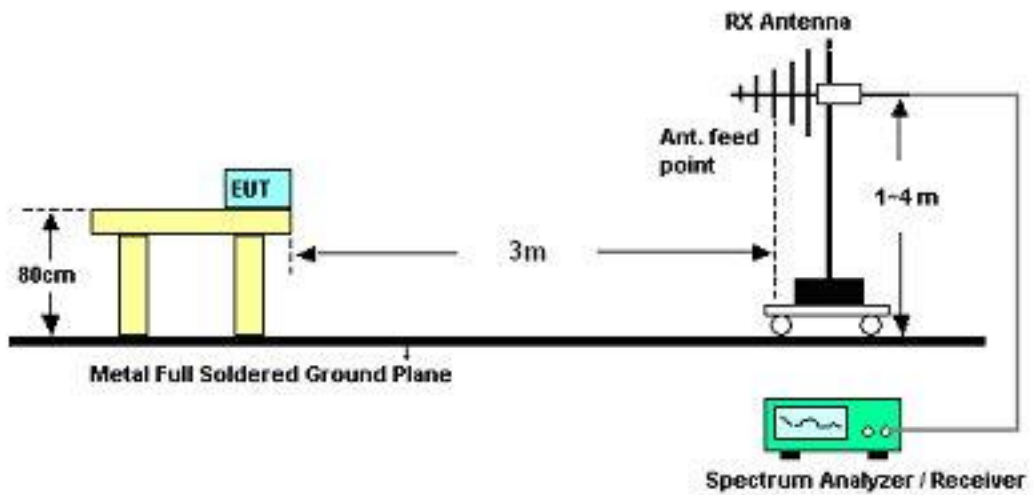


### 3.7.4 Test Setup

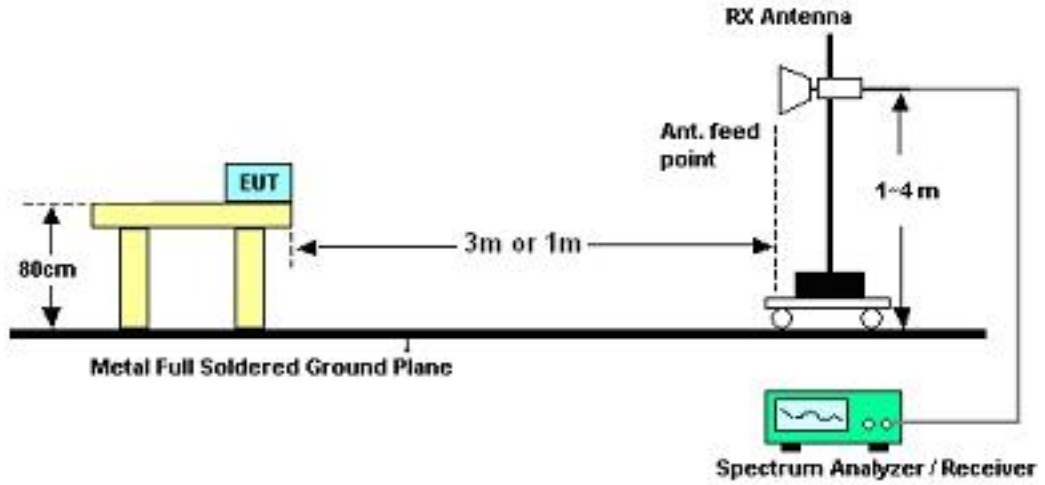
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.7.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

Test Engineer :	Kai Wang	Temperature :	23~24°C	
		Relative Humidity :	46~47%	
Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

**Note:**

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

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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



3.7.6 Test Result of Radiated Emission (30 MHz ~ 10<sup>th</sup> Harmonic)

Test Mode :	Mode 1	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Kai Wang	Polarization :	Horizontal
Remark :	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
98.58	39.59	-3.91	43.5	60.78	9.29	1.09	31.57	100	132	Peak
197.13	36.28	-7.22	43.5	58.08	8.21	1.45	31.46	-	-	Peak
295.95	37.8	-8.2	46	55.2	12.12	1.77	31.29	-	-	Peak
318.2	30.23	-15.77	46	47.05	12.64	1.82	31.28	-	-	Peak
742.4	28.01	-17.99	46	35.93	19.92	2.73	30.57	-	-	Peak
930.7	27.75	-18.25	46	32.64	22.5	3.04	30.43	-	-	Peak
2390	46.37	-7.63	54	44.17	31.7	4.58	34.08	100	276	Average
2390	57.75	-16.25	74	55.55	31.7	4.58	34.08	100	276	Peak
2412	107.29	-	-	105.07	31.71	4.59	34.08	100	276	Average
2412	112.06	-	-	109.84	31.71	4.59	34.08	100	276	Peak
2490	45.72	-8.28	54	43.36	31.8	4.64	34.08	100	276	Average
2490	54.36	-19.64	74	52	31.8	4.64	34.08	100	276	Peak



<b>Test Mode :</b>	Mode 1	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
30	33.1	-6.9	40	45.6	18.36	0.7	31.56	100	33	Peak
97.77	32.58	-10.92	43.5	53.85	9.2	1.09	31.56	-	-	Peak
140.43	34.32	-9.18	43.5	53.9	10.66	1.27	31.51	-	-	Peak
542.9	31.26	-14.74	46	42.13	17.78	2.32	30.97	-	-	Peak
742.4	26.77	-19.23	46	34.69	19.92	2.73	30.57	-	-	Peak
853.7	28.03	-17.97	46	34.17	21.43	2.93	30.5	-	-	Peak
2390	39.95	-14.05	54	37.75	31.7	4.58	34.08	100	170	Average
2390	52	-22	74	49.8	31.7	4.58	34.08	100	170	Peak
2412	99.64	-	-	97.42	31.71	4.59	34.08	100	170	Average
2412	104.49	-	-	102.27	31.71	4.59	34.08	100	170	Peak
2492	41	-13	54	38.64	31.8	4.64	34.08	100	170	Average
2492	51.09	-22.91	74	48.73	31.8	4.64	34.08	100	170	Peak



<b>Test Mode :</b>	Mode 2	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
98.58	38.94	-4.56	43.5	60.13	9.29	1.09	31.57	100	186	Peak
193.89	36.83	-6.67	43.5	58.58	8.27	1.45	31.47	-	-	Peak
294.33	38.1	-7.9	46	55.52	12.11	1.77	31.3	-	-	Peak
318.2	30.08	-15.92	46	46.9	12.64	1.82	31.28	-	-	Peak
478.5	28.63	-17.37	46	40.98	16.57	2.19	31.11	-	-	Peak
931.4	28.06	-17.94	46	32.95	22.5	3.04	30.43	-	-	Peak
2384	40.99	-13.01	54	38.81	31.68	4.58	34.08	126	277	Average
2384	51.99	-22.01	74	49.81	31.68	4.58	34.08	126	277	Peak
2437	106.55	-	-	104.27	31.75	4.61	34.08	126	277	Average
2437	111.75	-	-	109.47	31.75	4.61	34.08	126	277	Peak
2484	40.05	-13.95	54	37.71	31.78	4.64	34.08	126	277	Average
2484	52.58	-21.42	74	50.24	31.78	4.64	34.08	126	277	Peak



<b>Test Mode :</b>	Mode 2	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
30	33.75	-6.25	40	46.25	18.36	0.7	31.56	100	129	Peak
98.04	34.73	-8.77	43.5	56	9.2	1.09	31.56	-	-	Peak
193.89	29.27	-14.23	43.5	51.02	8.27	1.45	31.47	-	-	Peak
479.9	24.73	-21.27	46	37.04	16.61	2.19	31.11	-	-	Peak
542.9	33.98	-12.02	46	44.85	17.78	2.32	30.97	-	-	Peak
853.7	29.31	-16.69	46	35.45	21.43	2.93	30.5	-	-	Peak
2358	40.78	-13.22	54	38.63	31.66	4.57	34.08	100	157	Average
2358	50.16	-23.84	74	48.01	31.66	4.57	34.08	100	157	Peak
2437	99.54	-	-	97.26	31.75	4.61	34.08	100	157	Average
2437	104.24	-	-	101.96	31.75	4.61	34.08	100	157	Peak
2484	37.69	-16.31	54	35.35	31.78	4.64	34.08	100	157	Average
2484	49.61	-24.39	74	47.27	31.78	4.64	34.08	100	157	Peak



<b>Test Mode :</b>	Mode 3	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
98.58	39.57	-3.93	43.5	60.76	9.29	1.09	31.57	100	139	Peak
196.05	36.79	-6.71	43.5	58.57	8.23	1.45	31.46	-	-	Peak
296.22	38.25	-7.75	46	55.65	12.12	1.77	31.29	-	-	Peak
318.2	30.58	-15.42	46	47.4	12.64	1.82	31.28	-	-	Peak
479.2	28.7	-17.3	46	41.03	16.59	2.19	31.11	-	-	Peak
742.4	26.64	-19.36	46	34.56	19.92	2.73	30.57	-	-	Peak
2384	49.62	-4.38	54	47.44	31.68	4.58	34.08	100	237	Average
2384	57.08	-16.92	74	54.9	31.68	4.58	34.08	100	237	Peak
2462	100.55	-	-	98.24	31.77	4.62	34.08	100	237	Average
2462	105.35	-	-	103.04	31.77	4.62	34.08	100	237	Peak
2483.5	44.28	-9.72	54	41.94	31.78	4.64	34.08	100	237	Average
2483.5	55.68	-18.32	74	53.34	31.78	4.64	34.08	100	237	Peak



<b>Test Mode :</b>	Mode 3	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
30	32.45	-7.55	40	44.95	18.36	0.7	31.56	100	215	Peak
97.77	35.2	-8.3	43.5	56.47	9.2	1.09	31.56	-	-	Peak
193.89	33.87	-9.63	43.5	55.62	8.27	1.45	31.47	-	-	Peak
542.9	33.3	-12.7	46	44.17	17.78	2.32	30.97	-	-	Peak
853.7	27.32	-18.68	46	33.46	21.43	2.93	30.5	-	-	Peak
931.4	28.04	-17.96	46	32.93	22.5	3.04	30.43	-	-	Peak
2380	39.78	-14.22	54	37.6	31.68	4.58	34.08	100	24	Average
2380	50.13	-23.87	74	47.95	31.68	4.58	34.08	100	24	Peak
2462	95.24	-	-	92.93	31.77	4.62	34.08	100	24	Average
2462	99.99	-	-	97.68	31.77	4.62	34.08	100	24	Peak
2483.5	38.92	-15.08	54	36.58	31.78	4.64	34.08	100	24	Average
2483.5	49.73	-24.27	74	47.39	31.78	4.64	34.08	100	24	Peak





<b>Test Mode :</b>	Mode 4	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
98.58	39.62	-3.88	43.5	60.81	9.29	1.09	31.57	100	49	Peak
197.67	36.79	-6.71	43.5	58.6	8.19	1.46	31.46	-	-	Peak
295.95	37.99	-8.01	46	55.39	12.12	1.77	31.29	-	-	Peak
318.2	30.83	-15.17	46	47.65	12.64	1.82	31.28	-	-	Peak
478.5	29.11	-16.89	46	41.46	16.57	2.19	31.11	-	-	Peak
742.4	27	-19	46	34.92	19.92	2.73	30.57	-	-	Peak
2390	50.03	-3.97	54	47.83	31.7	4.58	34.08	100	276	Average
2390	67.58	-6.42	74	65.38	31.7	4.58	34.08	100	276	Peak
2412	93.39	-	-	91.17	31.71	4.59	34.08	100	276	Average
2412	110.95	-	-	108.73	31.71	4.59	34.08	100	276	Peak
2490	42.49	-11.51	54	40.13	31.8	4.64	34.08	100	276	Average
2490	54.58	-19.42	74	52.22	31.8	4.64	34.08	100	276	Peak



<b>Test Mode :</b>	Mode 4	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
30.27	33.69	-6.31	40	46.19	18.36	0.7	31.56	100	163	Peak
97.77	34.78	-8.72	43.5	56.05	9.2	1.09	31.56	-	-	Peak
193.89	30.11	-13.39	43.5	51.86	8.27	1.45	31.47	-	-	Peak
542.9	34.43	-11.57	46	45.3	17.78	2.32	30.97	-	-	Peak
742.4	26.77	-19.23	46	34.69	19.92	2.73	30.57	-	-	Peak
853.7	29.39	-16.61	46	35.53	21.43	2.93	30.5	-	-	Peak
2390	43.24	-10.76	54	41.04	31.7	4.58	34.08	100	170	Average
2390	63.24	-10.76	74	61.04	31.7	4.58	34.08	100	170	Peak
2412	86.68	-	-	84.46	31.71	4.59	34.08	100	170	Average
2412	103.69	-	-	101.47	31.71	4.59	34.08	100	170	Peak
2490	39.29	-14.71	54	36.93	31.8	4.64	34.08	100	170	Average
2490	51.93	-22.07	74	49.57	31.8	4.64	34.08	100	170	Peak



<b>Test Mode :</b>	Mode 5	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
98.58	39.47	-4.03	43.5	60.66	9.29	1.09	31.57	100	25	Peak
193.89	38.86	-4.64	43.5	60.61	8.27	1.45	31.47	-	-	Peak
295.68	38.4	-7.6	46	55.8	12.12	1.77	31.29	-	-	Peak
317.5	30.47	-15.53	46	47.32	12.61	1.82	31.28	-	-	Peak
387.5	28.95	-17.05	46	43.72	14.46	1.98	31.21	-	-	Peak
930.7	31.69	-14.31	46	36.58	22.5	3.04	30.43	-	-	Peak
2390	44.95	-9.05	54	42.75	31.7	4.58	34.08	126	273	Average
2390	61.94	-12.06	74	59.74	31.7	4.58	34.08	126	273	Peak
2437	95.71	-	-	93.43	31.75	4.61	34.08	126	273	Average
2437	113.59	-	-	111.31	31.75	4.61	34.08	126	273	Peak
2484	45.28	-8.72	54	42.94	31.78	4.64	34.08	126	273	Average
2484	60.79	-13.21	74	58.45	31.78	4.64	34.08	126	273	Peak



<b>Test Mode :</b>	Mode 5	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
30	33.01	-6.99	40	45.51	18.36	0.7	31.56	100	169	Peak
97.77	34.28	-9.22	43.5	55.55	9.2	1.09	31.56	-	-	Peak
193.89	33.68	-9.82	43.5	55.43	8.27	1.45	31.47	-	-	Peak
479.2	24.54	-21.46	46	36.87	16.59	2.19	31.11	-	-	Peak
542.9	30.22	-15.78	46	41.09	17.78	2.32	30.97	-	-	Peak
853.7	31.06	-14.94	46	37.2	21.43	2.93	30.5	-	-	Peak
2388	37.78	-16.22	54	35.58	31.7	4.58	34.08	100	156	Average
2388	54.19	-19.81	74	51.99	31.7	4.58	34.08	100	156	Peak
2437	89.48	-	-	87.2	31.75	4.61	34.08	100	156	Average
2437	107.05	-	-	104.77	31.75	4.61	34.08	100	156	Peak
2484	40.28	-13.72	54	37.94	31.78	4.64	34.08	100	156	Average
2484	54.7	-19.3	74	52.36	31.78	4.64	34.08	100	156	Peak



<b>Test Mode :</b>	Mode 6	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
97.77	39.55	-3.95	43.5	60.82	9.2	1.09	31.56	100	193	Peak
197.13	37.65	-5.85	43.5	59.45	8.21	1.45	31.46	-	-	Peak
296.22	38.58	-7.42	46	55.98	12.12	1.77	31.29	-	-	Peak
320.3	30	-16	46	46.77	12.69	1.83	31.29	-	-	Peak
479.2	29.95	-16.05	46	42.28	16.59	2.19	31.11	-	-	Peak
960.8	28.28	-25.72	54	32.34	23.19	3.1	30.35	-	-	Peak
2386	48.18	-5.82	54	45.98	31.7	4.58	34.08	100	239	Average
2386	60.36	-13.64	74	58.16	31.7	4.58	34.08	100	239	Peak
2462	90.77	-	-	88.46	31.77	4.62	34.08	100	239	Average
2462	108.14	-	-	105.83	31.77	4.62	34.08	100	239	Peak
2483.5	50.45	-3.55	54	48.11	31.78	4.64	34.08	100	239	Average
2483.5	70.56	-3.44	74	68.22	31.78	4.64	34.08	100	239	Peak



<b>Test Mode :</b>	Mode 6	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
30	32.7	-7.3	40	45.2	18.36	0.7	31.56	100	226	Peak
97.77	34.8	-8.7	43.5	56.07	9.2	1.09	31.56	-	-	Peak
193.89	30.41	-13.09	43.5	52.16	8.27	1.45	31.47	-	-	Peak
349	22.47	-23.53	46	38.43	13.45	1.9	31.31	-	-	Peak
542.9	30.73	-15.27	46	41.6	17.78	2.32	30.97	-	-	Peak
853.7	28.05	-17.95	46	34.19	21.43	2.93	30.5	-	-	Peak
2378	39.09	-14.91	54	36.92	31.68	4.57	34.08	100	24	Average
2378	51.78	-22.22	74	49.61	31.68	4.57	34.08	100	24	Peak
2462	85.56	-	-	83.25	31.77	4.62	34.08	100	24	Average
2462	103.2	-	-	100.89	31.77	4.62	34.08	100	24	Peak
2483.5	43.08	-10.92	54	40.74	31.78	4.64	34.08	100	24	Average
2483.5	63.45	-10.55	74	61.11	31.78	4.64	34.08	100	24	Peak



<b>Test Mode :</b>	Mode 7	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level (dBuV)	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	50.98	-3.02	54	48.78	31.7	4.58	34.08	100	275	Average
2390	70.87	-3.13	74	68.67	31.7	4.58	34.08	100	275	Peak
2412	92.49	-	-	90.27	31.71	4.59	34.08	100	275	Average
2412	111.68	-	-	109.46	31.71	4.59	34.08	100	275	Peak
2490	42.57	-11.43	54	40.21	31.8	4.64	34.08	100	275	Average
2490	54.94	-19.06	74	52.58	31.8	4.64	34.08	100	275	Peak



Test Mode :	Mode 7	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Kai Wang	Polarization :	Vertical
Remark :	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	44.67	-9.33	54	42.47	31.7	4.58	34.08	100	168	Average
2390	63.92	-10.08	74	61.72	31.7	4.58	34.08	100	168	Peak
2412	86.39	-	-	84.17	31.71	4.59	34.08	100	168	Average
2412	103.5	-	-	101.28	31.71	4.59	34.08	100	168	Peak
2492	39.51	-14.49	54	37.15	31.8	4.64	34.08	100	168	Average
2492	51.35	-22.65	74	48.99	31.8	4.64	34.08	100	168	Peak





Test Mode :	Mode 8	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Kai Wang	Polarization :	Horizontal
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	45.42	-8.58	54	43.22	31.7	4.58	34.08	125	276	Average
2390	61.34	-12.66	74	59.14	31.7	4.58	34.08	125	276	Peak
2437	95.57	-	-	93.29	31.75	4.61	34.08	125	276	Average
2437	113.79	-	-	111.51	31.75	4.61	34.08	125	276	Peak
2484	46.01	-7.99	54	43.67	31.78	4.64	34.08	125	276	Average
2484	63.71	-10.29	74	61.37	31.78	4.64	34.08	125	276	Peak



Test Mode :	Mode 8	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Kai Wang	Polarization :	Vertical
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level (dBuV)	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	41.02	-12.98	54	38.82	31.7	4.58	34.08	100	156	Average
2390	55.87	-18.13	74	53.67	31.7	4.58	34.08	100	156	Peak
2437	89.25	-	-	86.99	31.73	4.61	34.08	100	156	Average
2437	106.74	-	-	104.48	31.73	4.61	34.08	100	156	Peak
2484	40.65	-13.35	54	38.31	31.78	4.64	34.08	100	156	Average
2484	56.23	-17.77	74	53.89	31.78	4.64	34.08	100	156	Peak



Test Mode :	Mode 9	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Kai Wang	Polarization :	Horizontal
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2380	48.37	-5.63	54	46.19	31.68	4.58	34.08	100	263	Average
2380	61.05	-12.95	74	58.87	31.68	4.58	34.08	100	263	Peak
2462	90.17	-	-	87.86	31.77	4.62	34.08	100	263	Average
2462	107.56	-	-	105.25	31.77	4.62	34.08	100	263	Peak
2483.5	50.33	-3.67	54	47.99	31.78	4.64	34.08	100	263	Average
2483.5	70.07	-3.93	74	67.73	31.78	4.64	34.08	100	263	Peak



<b>Test Mode :</b>	Mode 9	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	46~47%
<b>Test Engineer :</b>	Kai Wang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level (dBuV)	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2382	42.98	-11.02	54	40.8	31.68	4.58	34.08	100	175	Average
2382	55.73	-18.27	74	53.55	31.68	4.58	34.08	100	175	Peak
2462	85.03	-	-	82.72	31.77	4.62	34.08	100	175	Average
2462	102.21	-	-	99.9	31.77	4.62	34.08	100	175	Peak
2483.5	44.06	-9.94	54	41.72	31.78	4.64	34.08	100	175	Average
2483.5	63.3	-10.7	74	60.96	31.78	4.64	34.08	100	175	Peak



## **3.8 Antenna Requirements**

### **3.8.1 Standard Applicable**

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. 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 FCC rule.

### **3.8.2 Antenna Connected Construction**

The antennas type used in this product is PCB Antenna without connector and it is considered to meet antenna requirement.

### **3.8.3 Antenna Gain**

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Aug. 11, 2010	Aug.10, 2011	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP30	101329	9kHz~30GHz	May. 03, 2011	May. 02, 2012	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 13, 2010	Sep. 12, 2011	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 14, 2010	Sep. 13, 2011	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 30, 2010	Jul. 29, 2011	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 16, 2010	Aug. 15, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz – 30MHz	Dec. 03, 2010	Dec. 02, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz – 30MHz	Dec. 01, 2010	Nov. 30, 2011	Conduction (CO05-HY)
AC Power Source	APC	APC-1000 W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2010	Oct. 30, 2011	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 03, 2010	Dec. 02, 2011	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2010	Aug. 18, 2011	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 06, 2010	Dec. 05, 2011	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Mar. 29, 2011	Mar. 28, 2012	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH07-HY)

## 5 Uncertainty of Evaluation

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

Contribution	Uncertainty of $X_i$		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.13</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.26</b>		

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

Contribution	Uncertainty of $X_i$		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.27</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.54</b>		

**Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)**

Contribution	Uncertainty of $X_i$		$u(X_i)$	$C_i$	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	±0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	±1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	±0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site Imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>2.36</b>				
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>4.72</b>				





## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP131159-02 as below.