



# FCC RF Test Report

APPLICANT : Motorola Mobility, Inc.  
EQUIPMENT : Mobile Phone  
BRAND NAME : MOTOROLA  
MODEL NAME : XT531  
GPPD NUMBER : 3060  
FCC ID : IHDT56MY3  
STANDARD : FCC Part 15 Subpart C §15.247  
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Apr. 21, 2011 and completely tested on May 14, 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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SPORTON INTERNATIONAL INC.

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FCC ID : IHDT56MY3

Page Number : 1 of 72

Report Issued Date : July 23, 2011

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### REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR142113B	Rev. 01	Initial issue of report	May 17, 2011
FR142113B	Rev. 02	Add entire WiFi data rate	Jun. 10, 2011



### 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	-
3.2	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 16.8 dB at 1.55 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 11.23 dB at 30.54 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-



# 1 General Description

## 1.1 Applicant

Motorola Mobility, Inc.

8F., No. 9, Songgao Rd., Taipei 110, Taiwan, R.O.C.

## 1.2 Manufacturer

Chi Mei Communication Systems, Inc.

No. 4, Mingsheng Street, Tucheng District, New Taipei City, 23678, Taiwan

## 1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Mobile Phone
Brand Name	MOTOROLA
Model Name	XT531
FCC ID	IHDT56MY3
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 : 16.90 dBm (0.05 W) 802.11g : 20.71 dBm (0.12 W) 802.11n (BW 20MHz) : 19.39 dBm (0.09 W)
Antenna Type	PIFA Antenna with gain 0.723 dBi
HW Version	V3.0
SW Version	V4.130
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.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	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	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	16.9	16.88	16.6	16.64
CH 06	2437 MHz	16.68	16.63	16.58	16.36
CH 11	2462 MHz	16.81	16.79	16.51	16.7

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	20.01	19.97	19.98	20.01	19.95	20.06	20.12	20.14
CH 06	2437 MHz	20.05	20.08	20.1	20.06	20.03	20.02	20	20.11
CH 11	2462 MHz	20.46	20.34	20.42	20.44	20.64	20.46	20.34	20.71

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412 MHz	19	18.85	18.67	18.58	18.74	18.97	18.63	18.52
CH 06	2437 MHz	19.15	19.14	19.11	18.87	18.92	18.99	18.86	18.78
CH 11	2462 MHz	19.39	19.27	19.33	19.28	19.34	19.3	19.17	19.38

**Remark:**

1. 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).

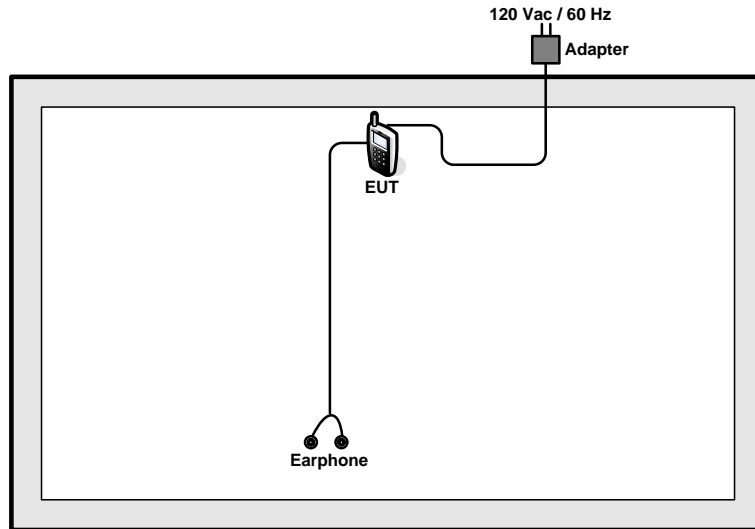
Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

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

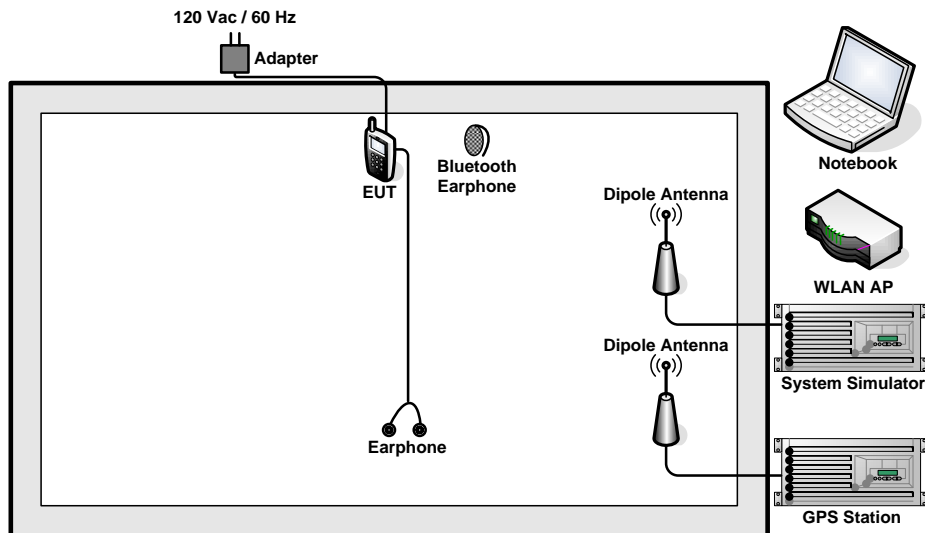
Test Cases		
Test Item	802.11b (Modulation : DSSS)	802.11g/n (Modulation : OFDM)
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 MHz Mode 8: 802.11n (BW 20M)_CH06_2437 MHz Mode 9: 802.11n (BW 20M)_CH11_2462 MHz
Radiated TCs	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
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link + Adapter + Earphone + GPS Rx	

## 2.3 Connection Diagram of Test System

### <WLAN Tx Mode>



### <AC Conducted Emission Mode>



## 2.4 RF Utility

The programmed RF utility “adb.exe” 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 Bandwidth Measurement

##### 3.1.1 Limit of 6dB Bandwidth

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

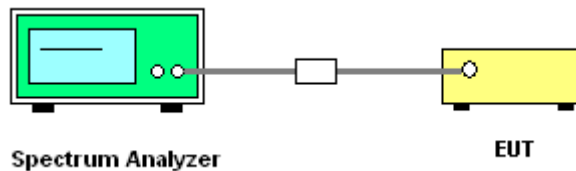
##### 3.1.2 Measuring Instruments

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



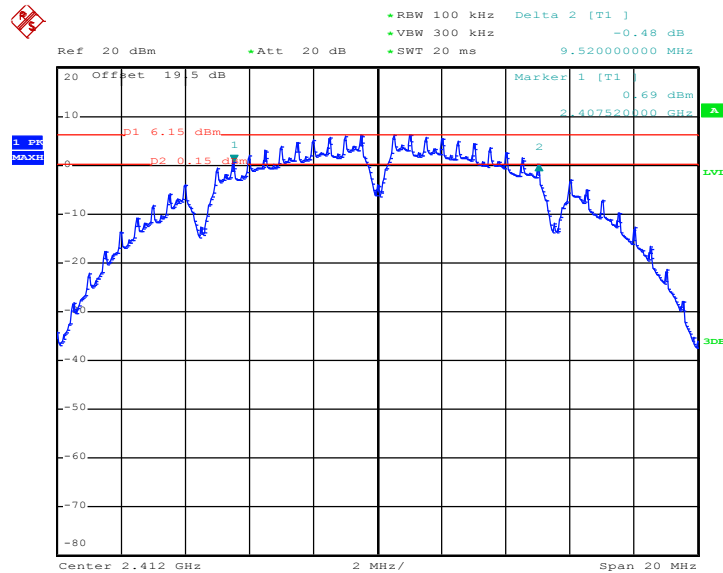


3.1.5 Test Result of 6dB Bandwidth

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

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	9.52	0.5	Pass
06	2437	9.04	0.5	Pass
11	2462	9.04	0.5	Pass

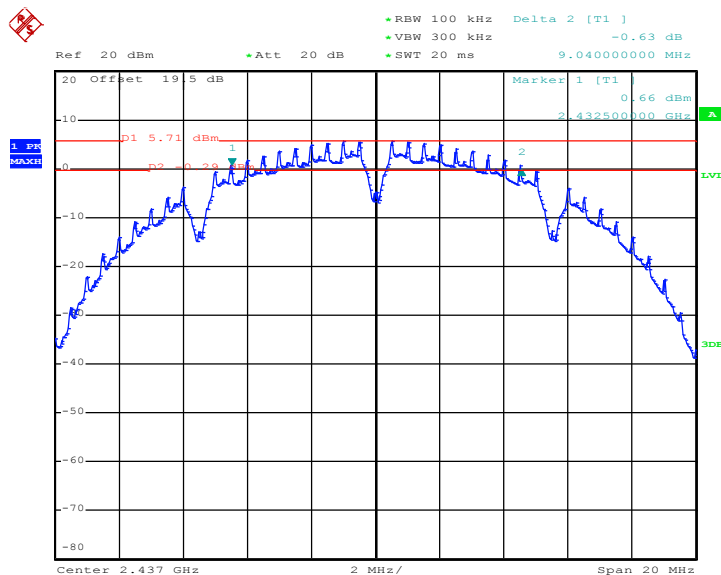
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 13.MAY.2011 08:51:10

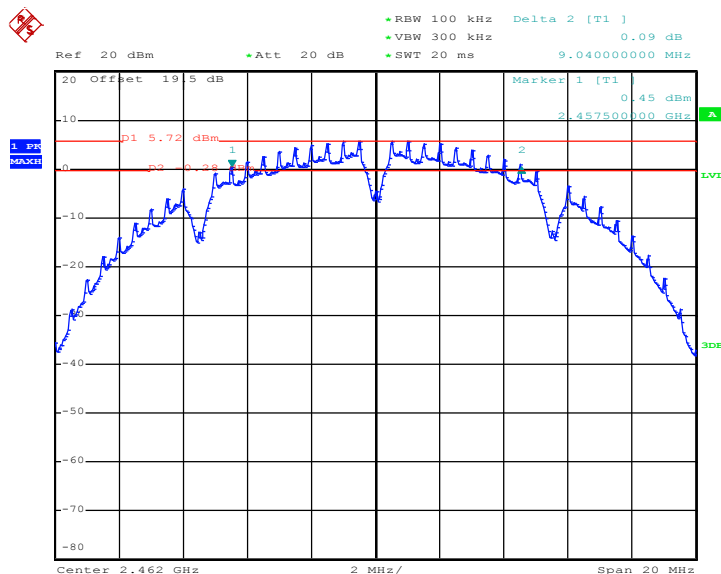


### Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



Date: 14.MAY.2011 09:48:13

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



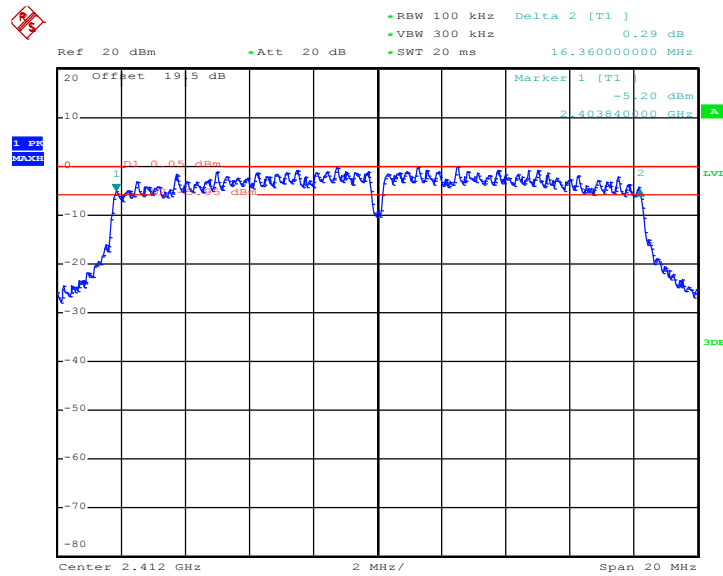
Date: 14.MAY.2011 10:00:55



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

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.36	0.5	Pass
06	2437	16.40	0.5	Pass
11	2462	16.36	0.5	Pass

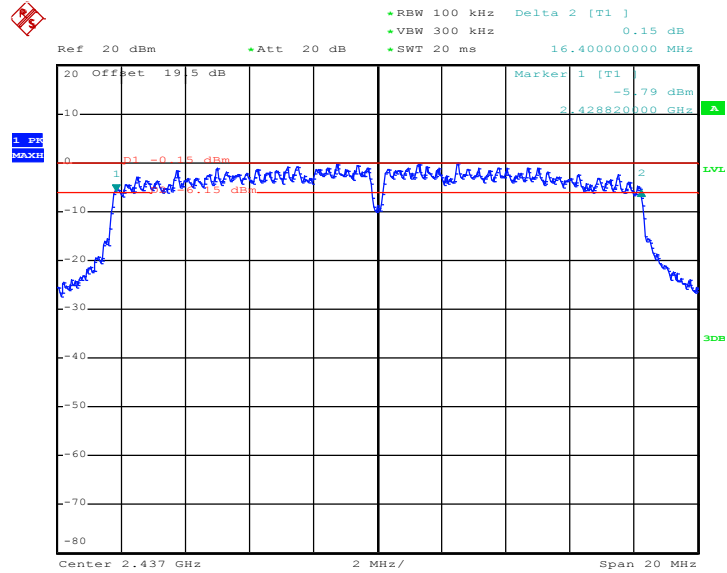
Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



Date: 14.MAY.2011 10:16:47

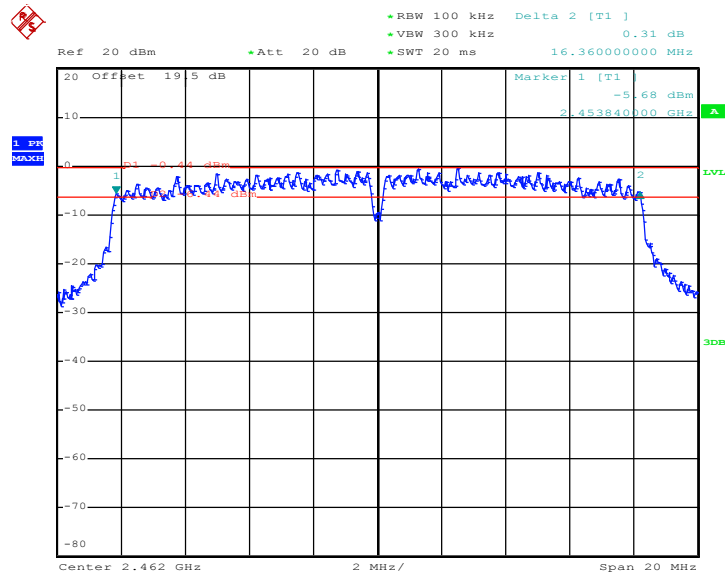


Mode 5 : 6 dB Bandwidth Plot on 802.11g Channel 06



Date: 14.MAY.2011 10:31:03

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



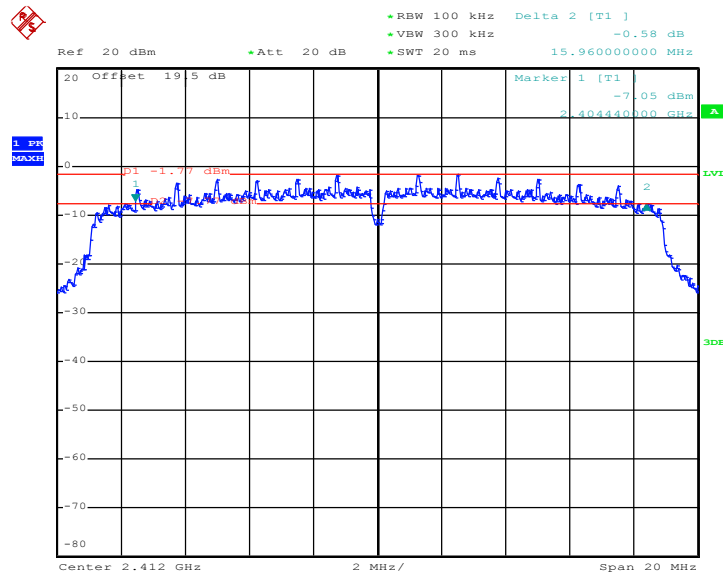
Date: 14.MAY.2011 10:45:02



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

Channel	Frequency (MHz)	802.11n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.96	0.5	Pass
06	2437	16.26	0.5	Pass
11	2462	16.42	0.5	Pass

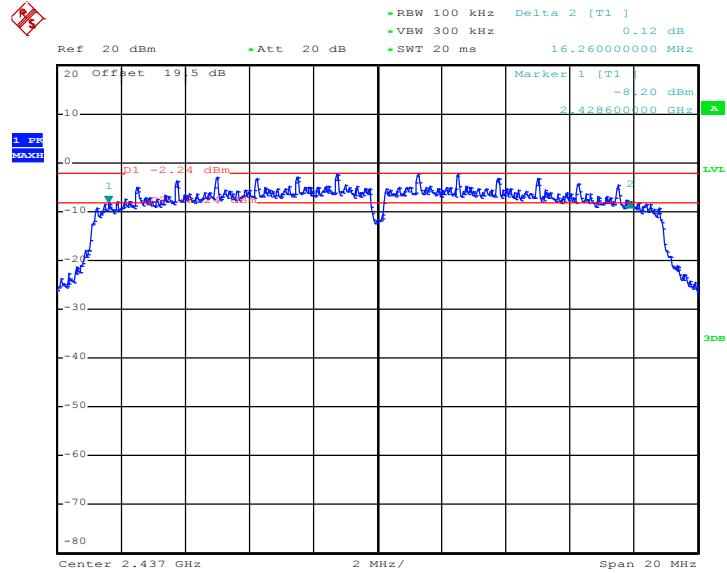
Mode 7 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 01



Date: 14.MAY.2011 11:05:04

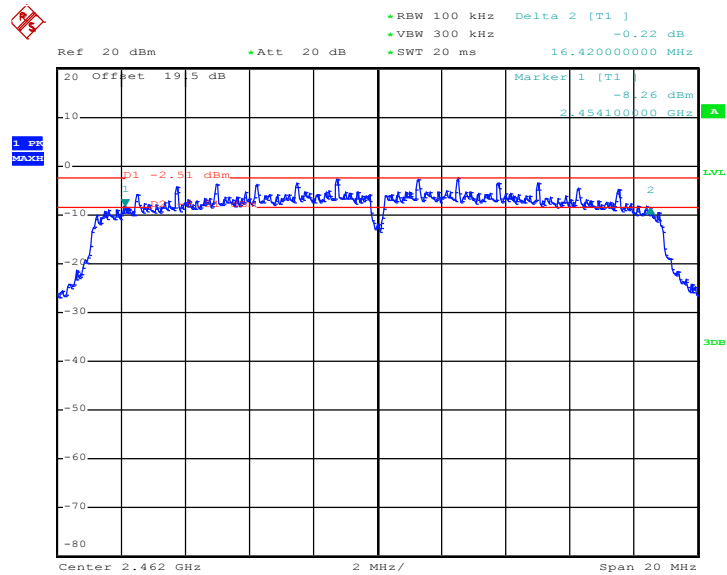


Mode 8 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 06



Date: 14.MAY.2011 11:21:19

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



Date: 14.MAY.2011 11:34:35

## 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.

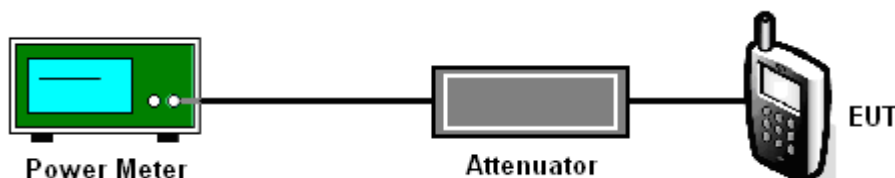
### 3.2.2 Measuring Instruments

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

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

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	16.90	30	Pass
06	2437	16.68	30	Pass
11	2462	16.81	30	Pass

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

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.14	30	Pass
06	2437	20.12	30	Pass
11	2462	20.71	30	Pass

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

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.00	30	Pass
06	2437	19.15	30	Pass
11	2462	19.39	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**

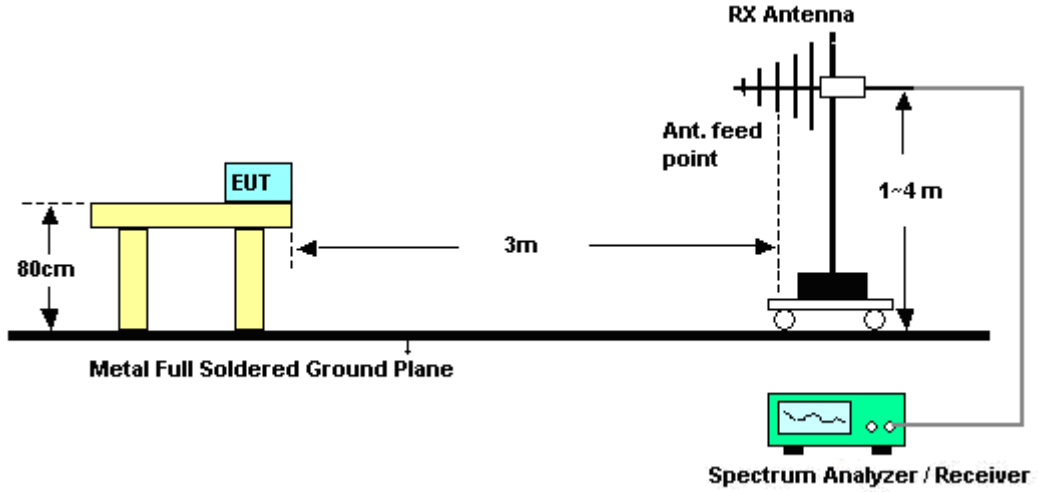
See list of measuring instruments of this test report.

#### **3.3.3 Test Procedures**

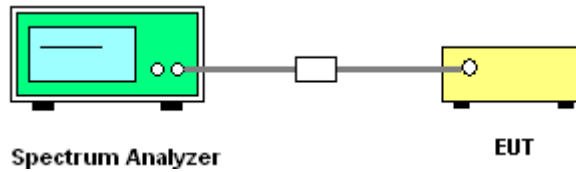
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW)  $\geq$  RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized 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 :	23~26°C
Test Band :	802.11b	Relative Humidity :	54~60%
Test Channel :	01	Test Engineer :	Wii Chang

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
2388.09	49.66	-24.34	74	45.3	32.18	6.03	33.85	126	354	Peak
2388.09	38.14	-15.86	54	33.78	32.18	6.03	33.85	126	354	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
2388.85	49.37	-24.63	74	45.01	32.18	6.03	33.85	102	296	Peak
2388.85	37.81	-16.19	54	33.45	32.18	6.03	33.85	102	296	Average

Test Mode :	Mode 3	Temperature :	23~26°C
Test Band :	802.11b	Relative Humidity :	54~60%
Test Channel :	11	Test Engineer :	Wii Chang

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
2488.98	47.9	-26.1	74	43.32	32.3	6.18	33.9	101	0	Peak
2488.98	39.69	-14.31	54	35.11	32.3	6.18	33.9	101	0	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
2487.46	50.92	-23.08	74	46.36	32.28	6.18	33.9	100	295	Peak
2487.46	38.29	-15.71	54	33.73	32.28	6.18	33.9	100	295	Average



Test Mode :	Mode 4	Temperature :	23~26°C
Test Band :	802.11g	Relative Humidity :	54~60%
Test Channel :	01	Test Engineer :	Wii Chang

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	55.98	-18.02	74	51.62	32.18	6.03	33.85	132	26	Peak
2390	39.12	-14.88	54	34.76	32.18	6.03	33.85	132	26	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
2389.61	49.79	-24.21	74	45.43	32.18	6.03	33.85	155	304	Peak
2389.61	35.16	-18.84	54	30.8	32.18	6.03	33.85	155	304	Average

Test Mode :	Mode 6	Temperature :	23~26°C
Test Band :	802.11g	Relative Humidity :	54~60%
Test Channel :	11	Test Engineer :	Wii Chang

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	53.72	-20.28	74	49.16	32.28	6.18	33.9	101	358	Peak
2483.5	38.38	-15.62	54	33.82	32.28	6.18	33.9	101	358	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	54.39	-19.61	74	49.83	32.28	6.18	33.9	115	7	Peak
2483.5	38.55	-15.45	54	33.99	32.28	6.18	33.9	115	7	Average



Test Mode :	Mode 7	Temperature :	23~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	54~60%
Test Channel :	01	Test Engineer :	Wii Chang

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
2389.61	52	-22	74	47.64	32.18	6.03	33.85	132	26	Peak
2389.61	37.3	-16.7	54	32.94	32.18	6.03	33.85	132	26	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
2386.38	48.44	-25.56	74	44.08	32.18	6.03	33.85	158	288	Peak
2386.38	34.49	-19.51	54	30.13	32.18	6.03	33.85	158	288	Average

Test Mode :	Mode 9	Temperature :	23~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	54~60%
Test Channel :	11	Test Engineer :	Wii Chang

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
2484.61	53.22	-20.78	74	48.66	32.28	6.18	33.9	129	34	Peak
2484.61	38.09	-15.91	54	33.53	32.28	6.18	33.9	129	34	Average

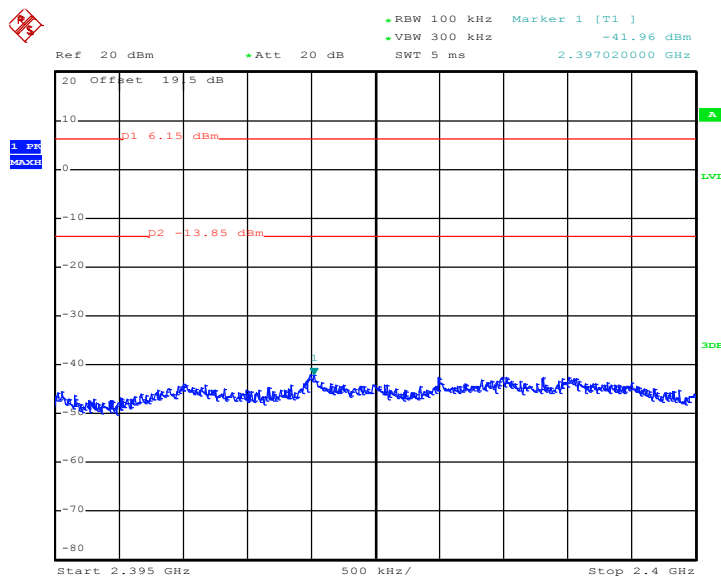
ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2485.18	51.59	-22.41	74	47.03	32.28	6.18	33.9	100	295	Peak
2485.18	37.4	-16.6	54	32.84	32.28	6.18	33.9	100	295	Average



### 3.3.6 Test Plots of Conducted Band Edges

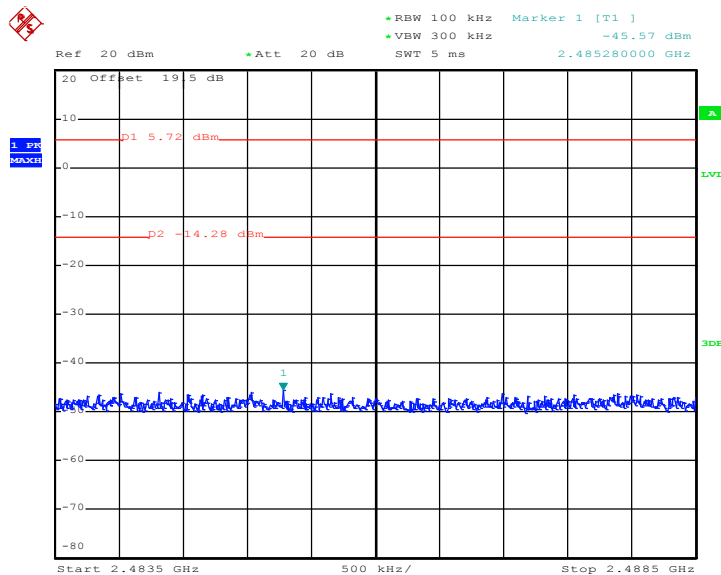
Test Mode :	Mode 1 and 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11b Channel 01



Date: 13.MAY.2011 08:52:18

High Band Edge Plot on 802.11b Channel 11

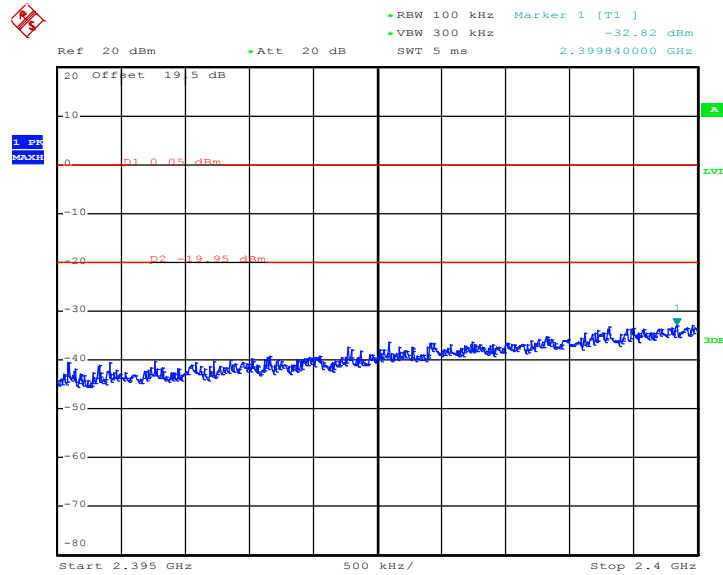


Date: 14.MAY.2011 10:02:23



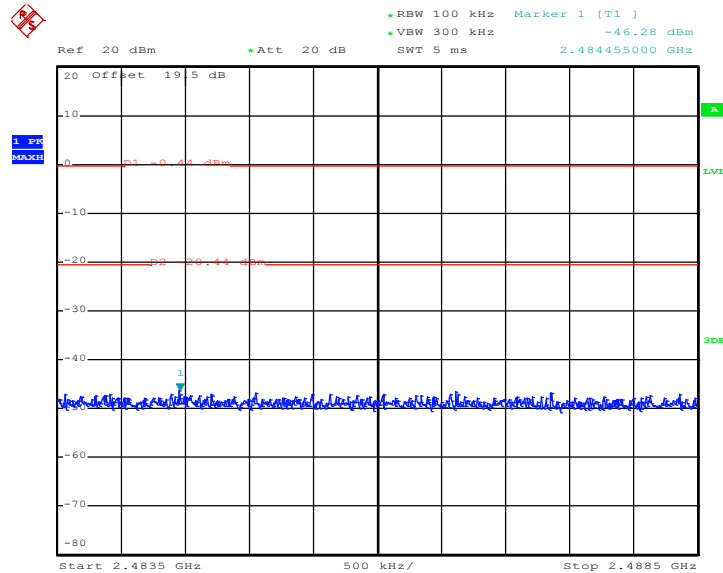
Test Mode :	Mode 4 and 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11g Channel 01



Date: 14.MAY.2011 10:17:55

High Band Edge Plot on 802.11g Channel 11

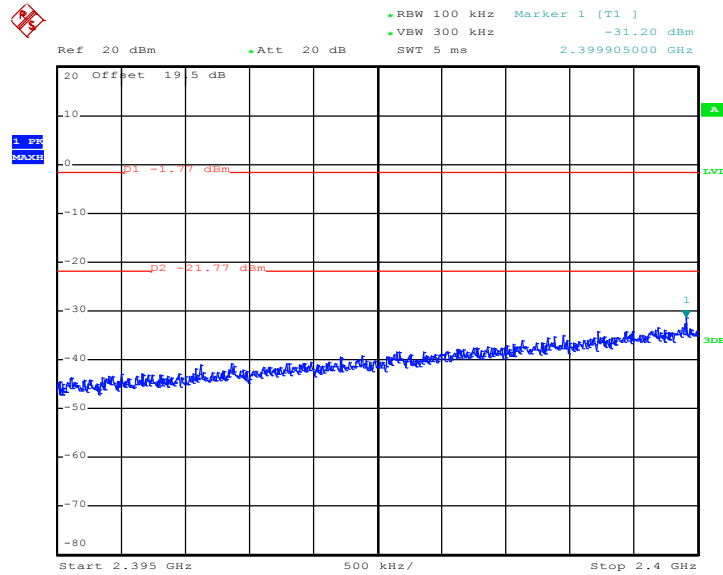


Date: 14.MAY.2011 10:45:47



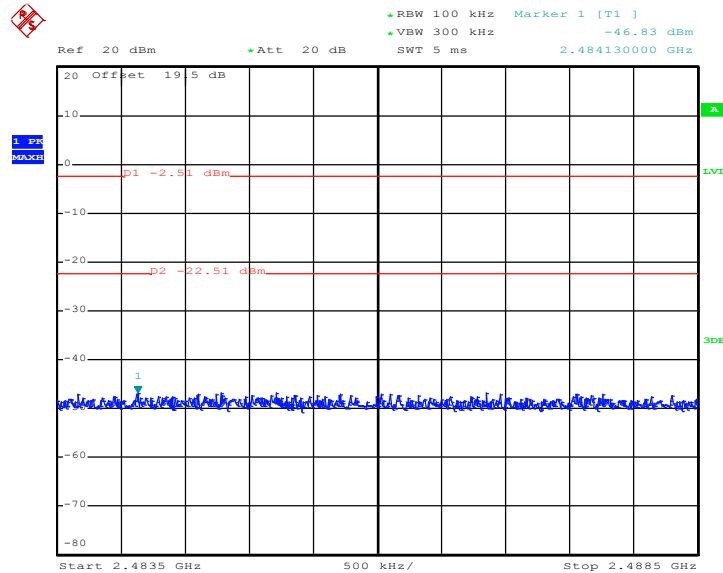
Test Mode :	Mode 7 and 9	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

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



Date: 14.MAY.2011 11:06:30

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



Date: 14.MAY.2011 11:35:33

## 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.

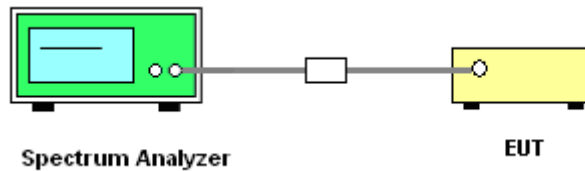
### 3.4.2 Measuring Instruments

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

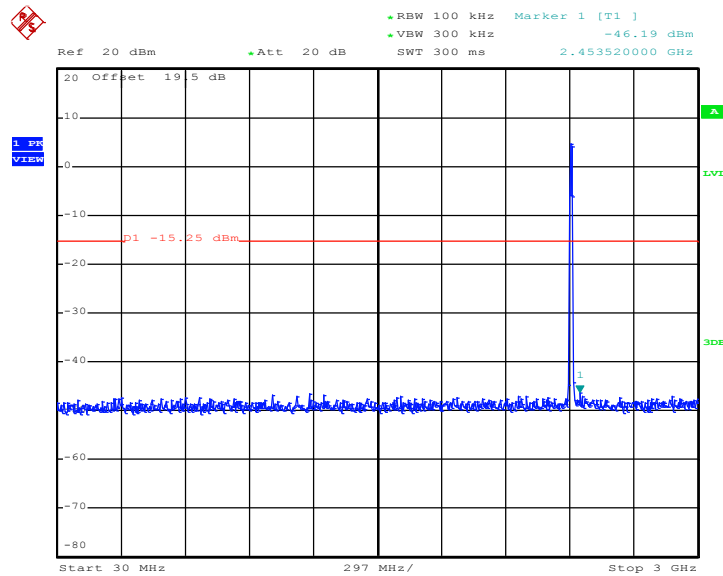




### 3.4.5 Test Plots of Spurious Emission

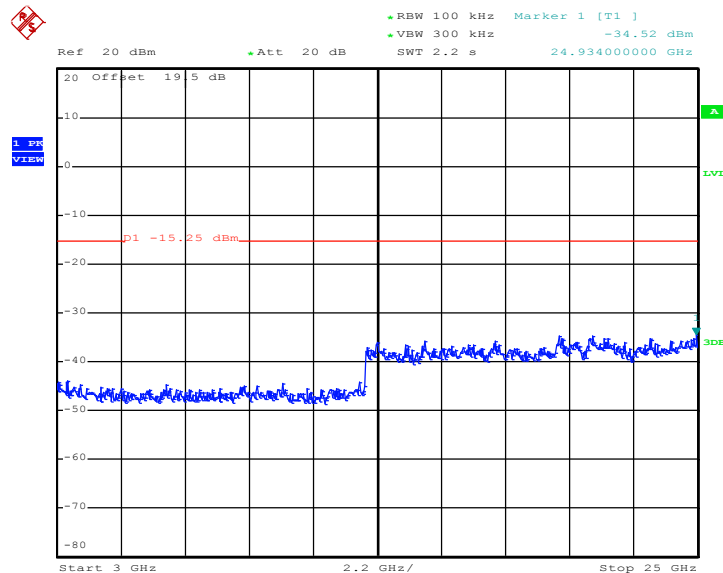
Test Mode :	Mode 1	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 13.MAY.2011 09:03:12

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

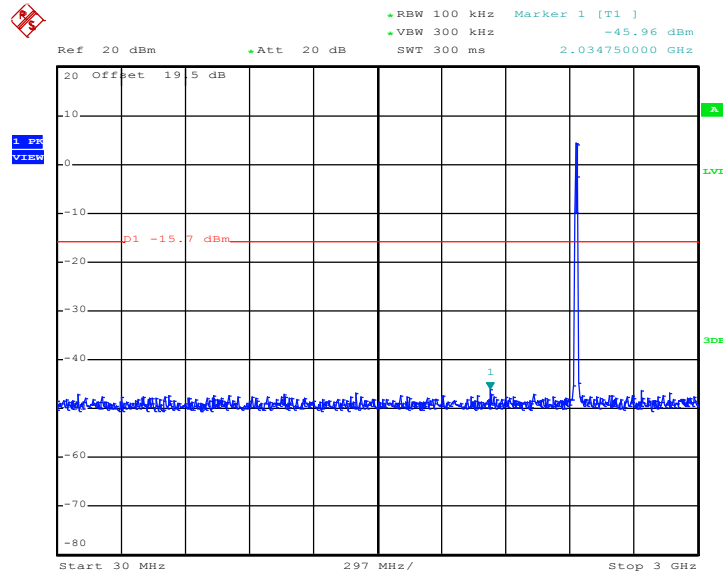


Date: 13.MAY.2011 09:03:29



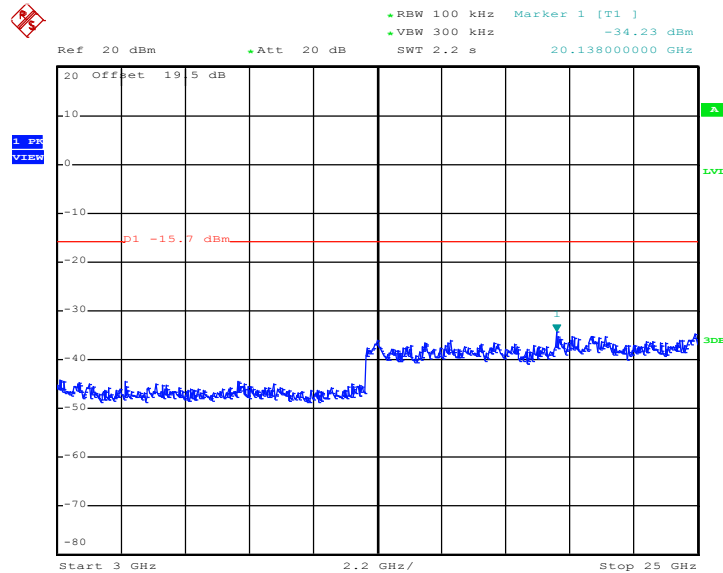
Test Mode :	Mode 2	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAY.2011 09:50:02

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

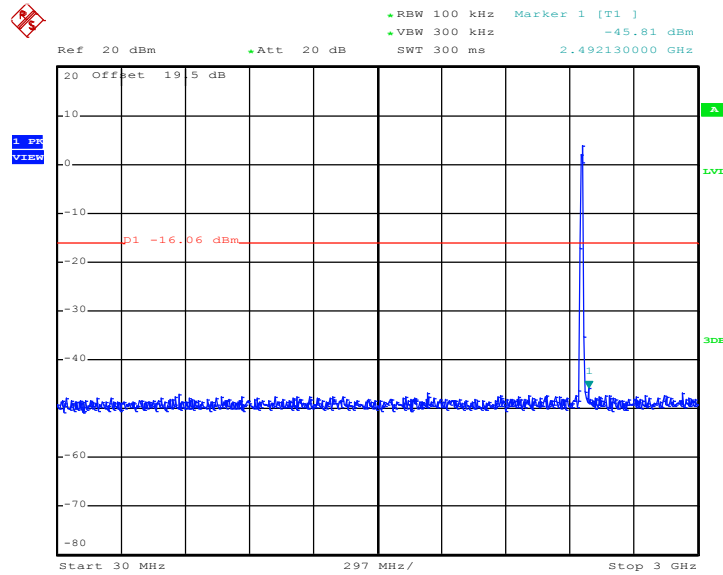


Date: 14.MAY.2011 09:50:19



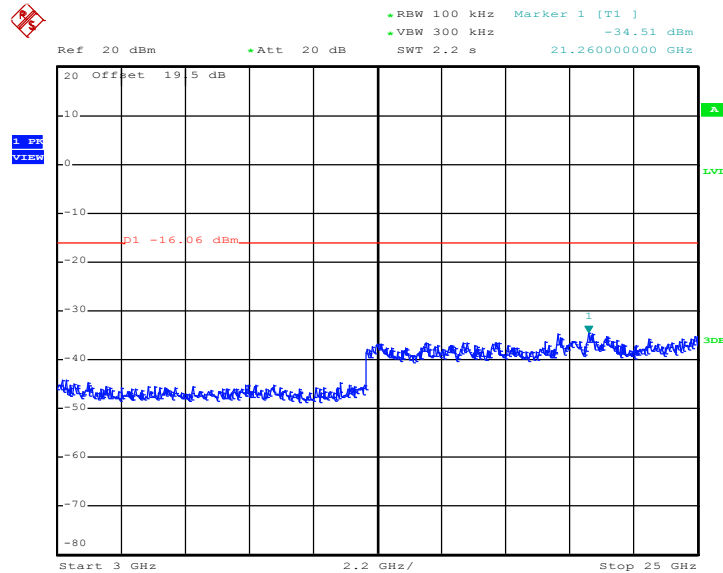
Test Mode :	Mode 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAY.2011 10:03:43

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

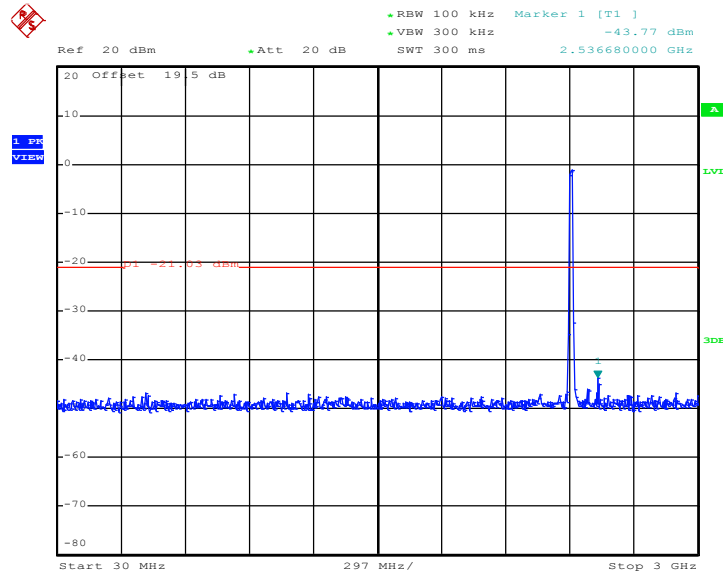


Date: 14.MAY.2011 10:03:59



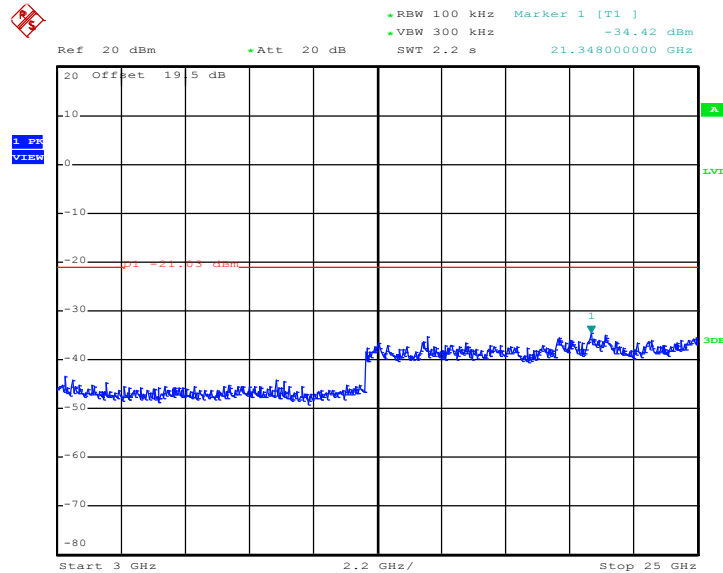
Test Mode :	Mode 4	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAY.2011 10:18:42

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

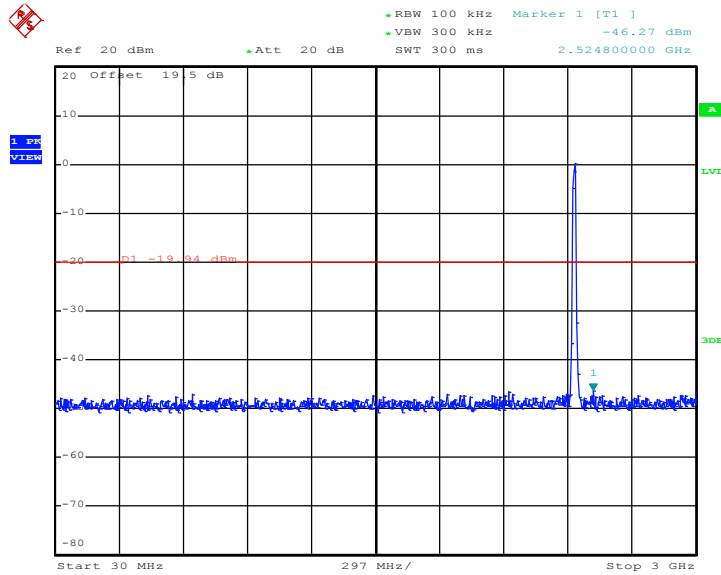


Date: 14.MAY.2011 10:18:58



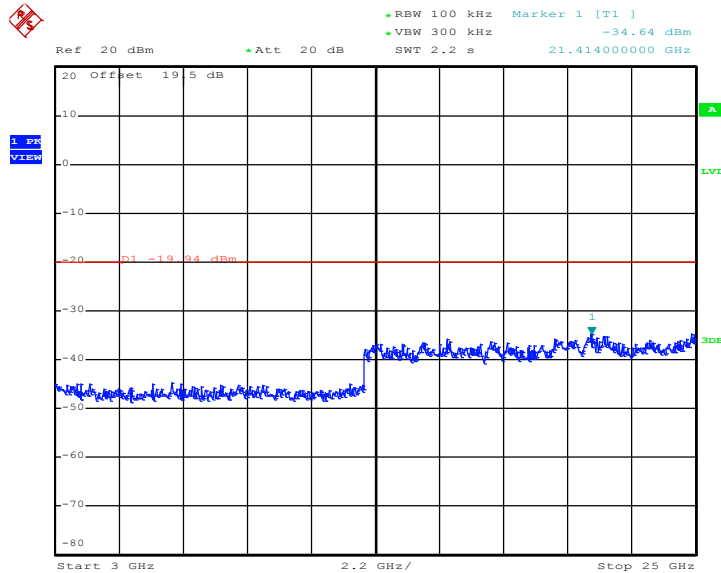
Test Mode :	Mode 5	Temperature :	24~26
Test Band :	802.11g	Relative Humidity :	50~53
Test Channel :	06	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAY.2011 10:32:14

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

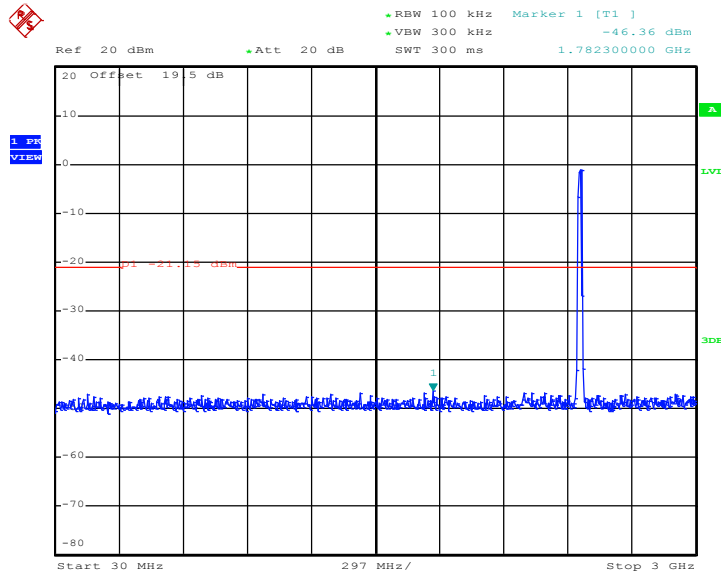


Date: 14.MAY.2011 10:32:31



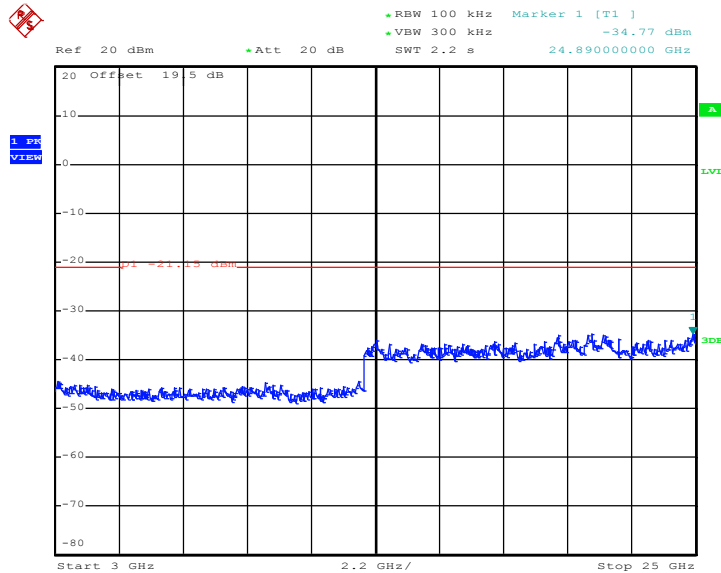
Test Mode :	Mode 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAY.2011 10:47:10

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

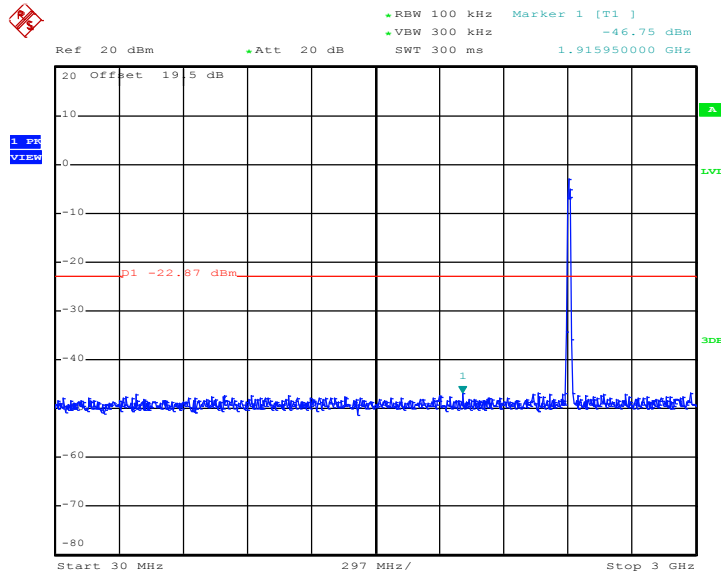


Date: 14.MAY.2011 10:47:27



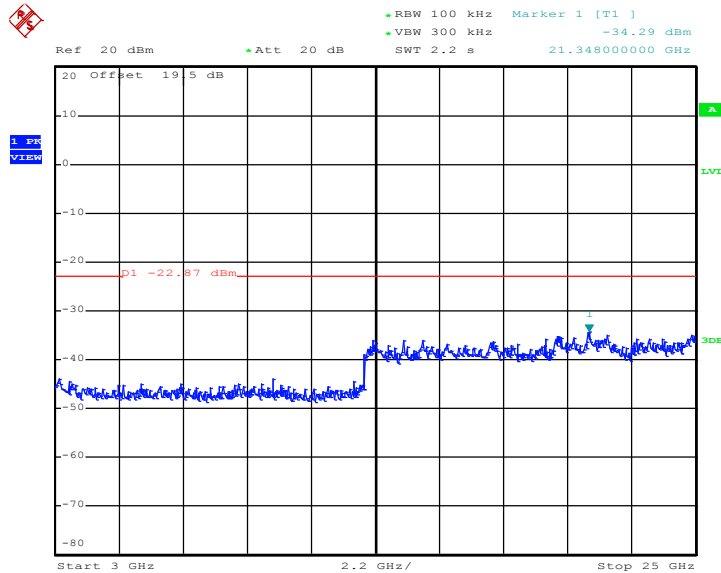
Test Mode :	Mode 7	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAY.2011 11:08:02

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

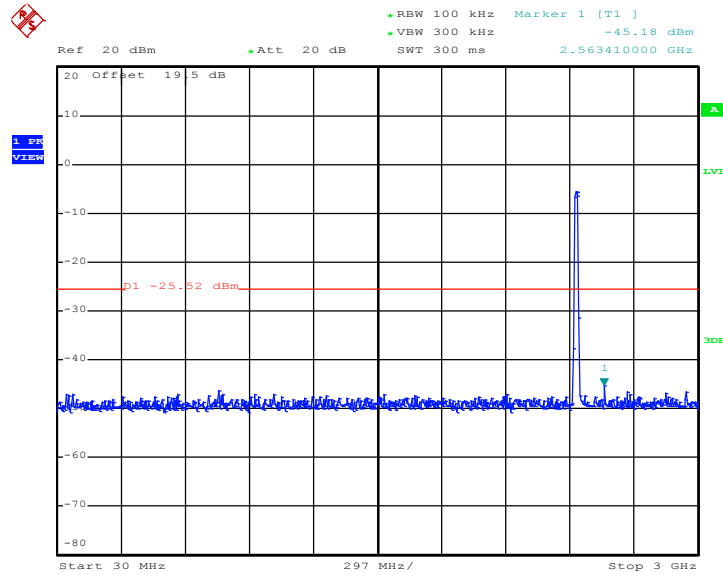


Date: 14.MAY.2011 11:08:19



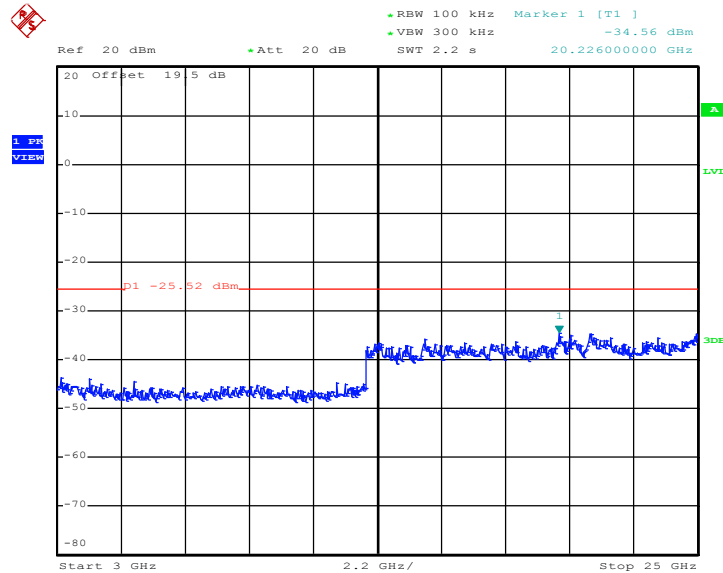
Test Mode :	Mode 8	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAY.2011 11:22:30

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

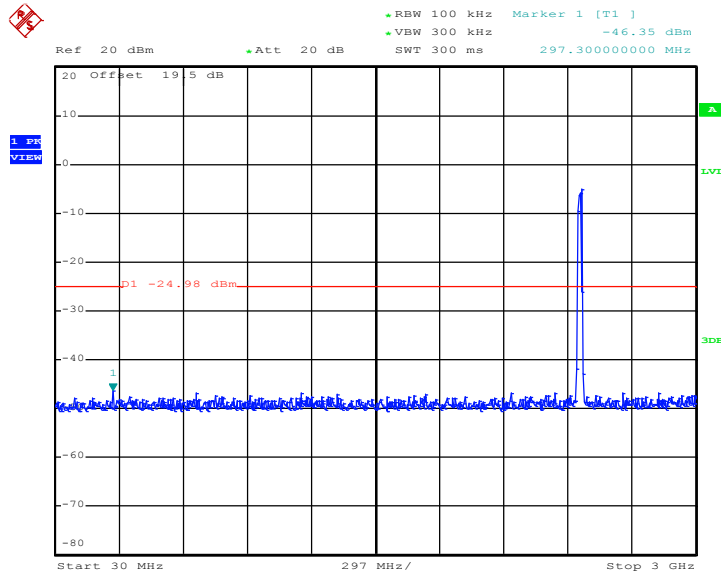


Date: 14.MAY.2011 11:22:47



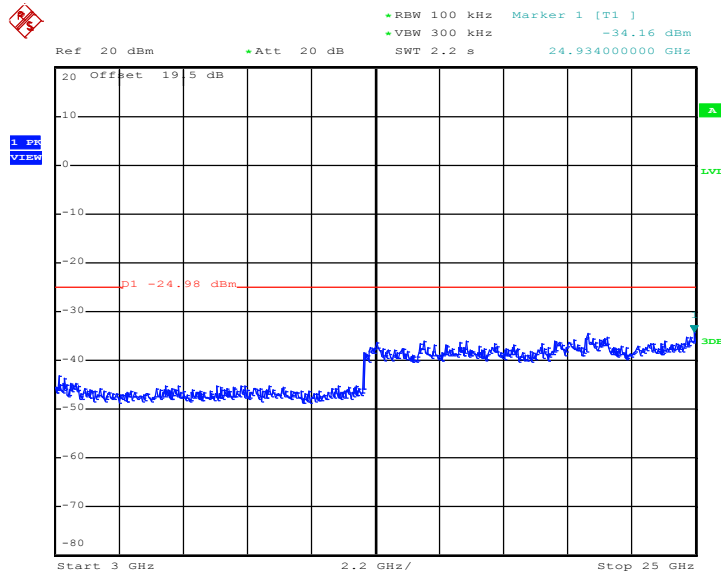
Test Mode :	Mode 9	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 14.MAY.2011 11:36:18

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 14.MAY.2011 11:36:35

## 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.

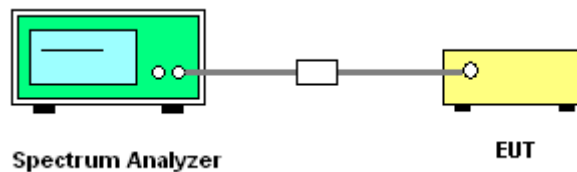
### 3.5.2 Measuring Instruments

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



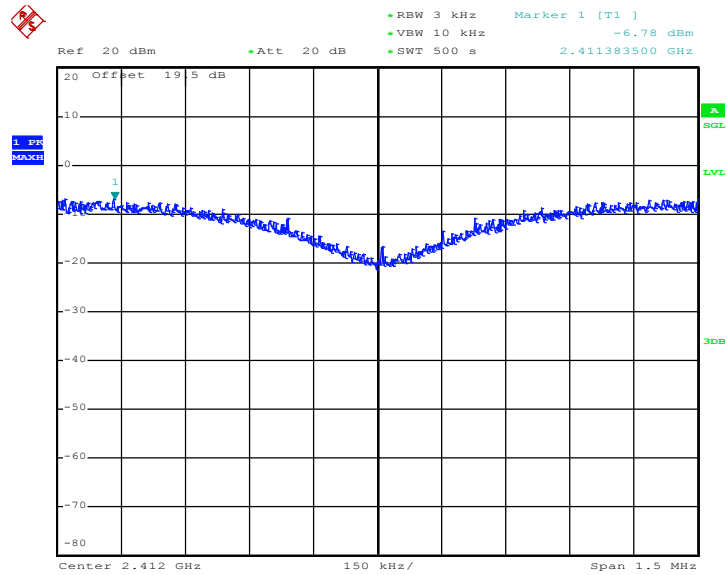


### 3.5.5 Test Result of Power Spectral Density

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

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-6.78	8	Pass
06	2437	-7.20	8	Pass
11	2462	-7.17	8	Pass

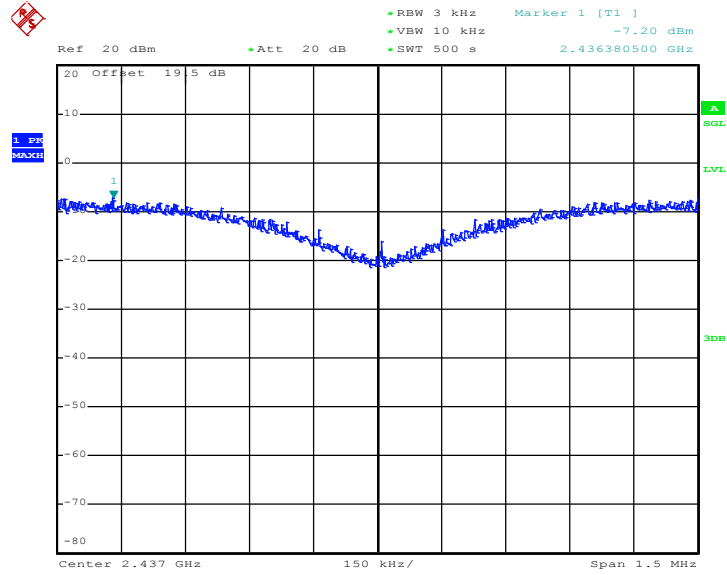
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 13.MAY.2011 09:02:13

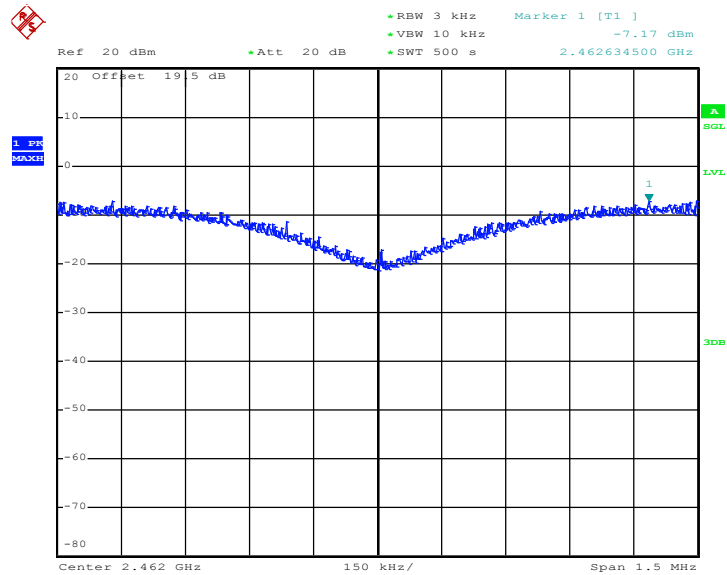


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 14.MAY.2011 09:58:59

Mode 3 : PSD Plot on 802.11b Channel 11



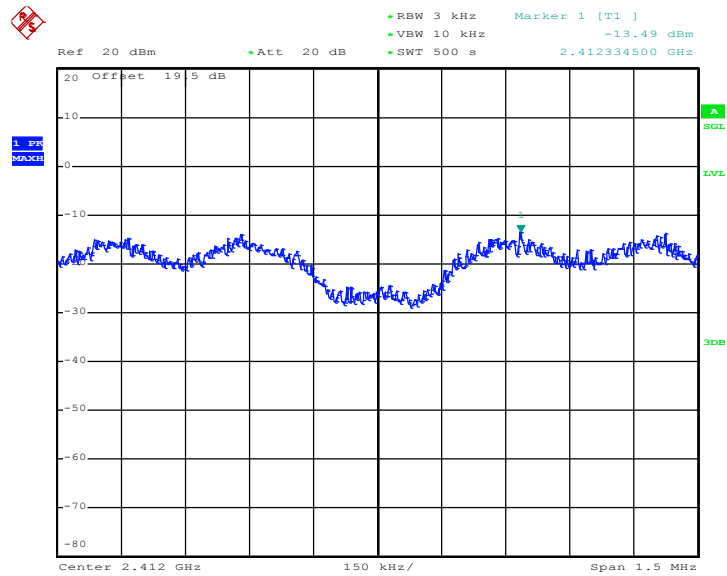
Date: 14.MAY.2011 10:12:40



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

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-13.49	8	Pass
06	2437	-13.61	8	Pass
11	2462	-14.07	8	Pass

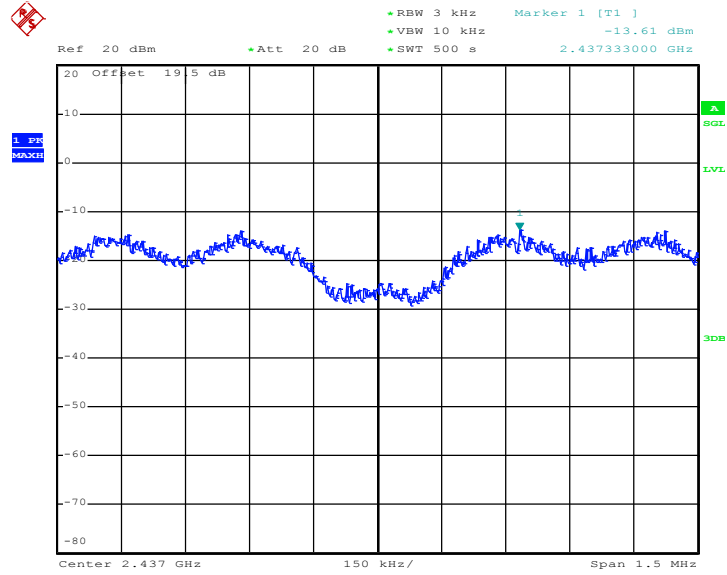
Mode 4 : PSD Plot on 802.11g Channel 01



Date: 14.MAY.2011 10:27:37

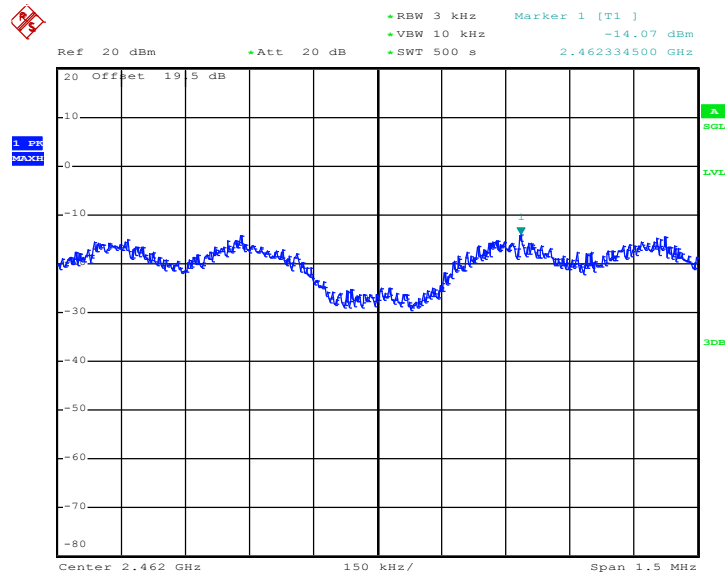


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 14.MAY.2011 10:43:53

Mode 6 : PSD Plot on 802.11g Channel 11



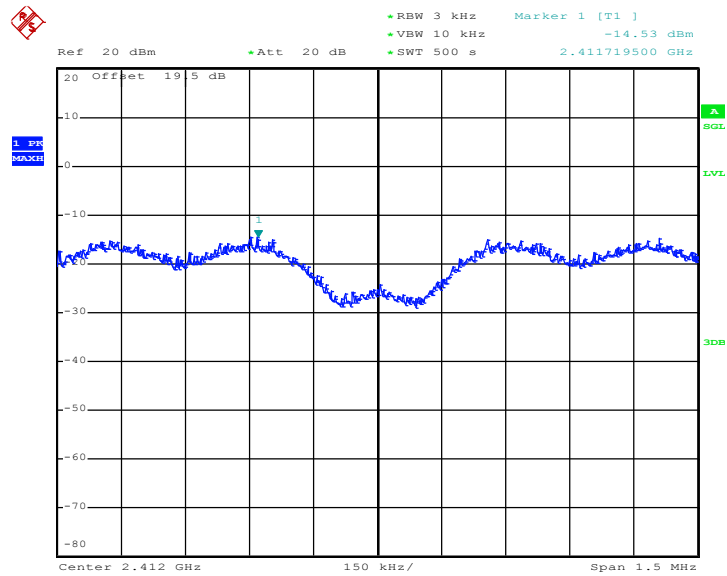
Date: 14.MAY.2011 10:56:21



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

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-14.53	8	Pass
06	2437	-15.11	8	Pass
11	2462	-15.33	8	Pass

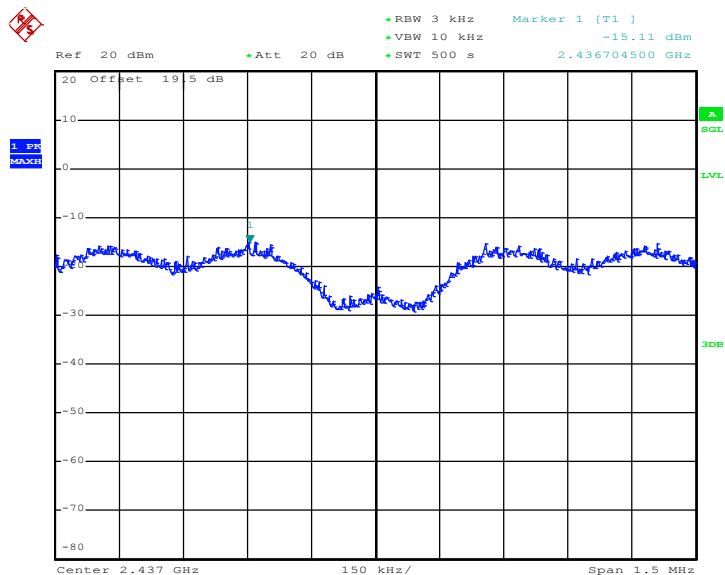
Mode 7 : PSD Plot on 802.11n (BW 20MHz) Channel 01



Date: 14.MAY.2011 11:18:34

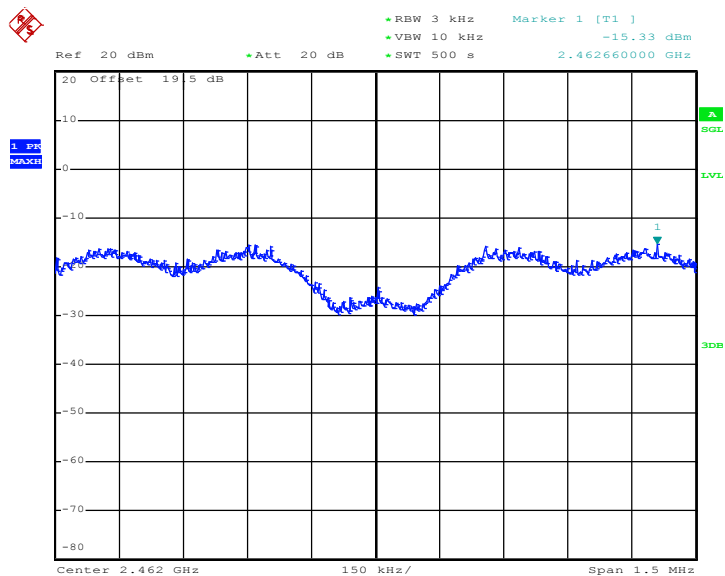


Mode 8 : PSD Plot on 802.11n (BW 20MHz) Channel 06



Date: 14.MAY.2011 11:32:20

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



Date: 14.MAY.2011 11:45:10

## 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.

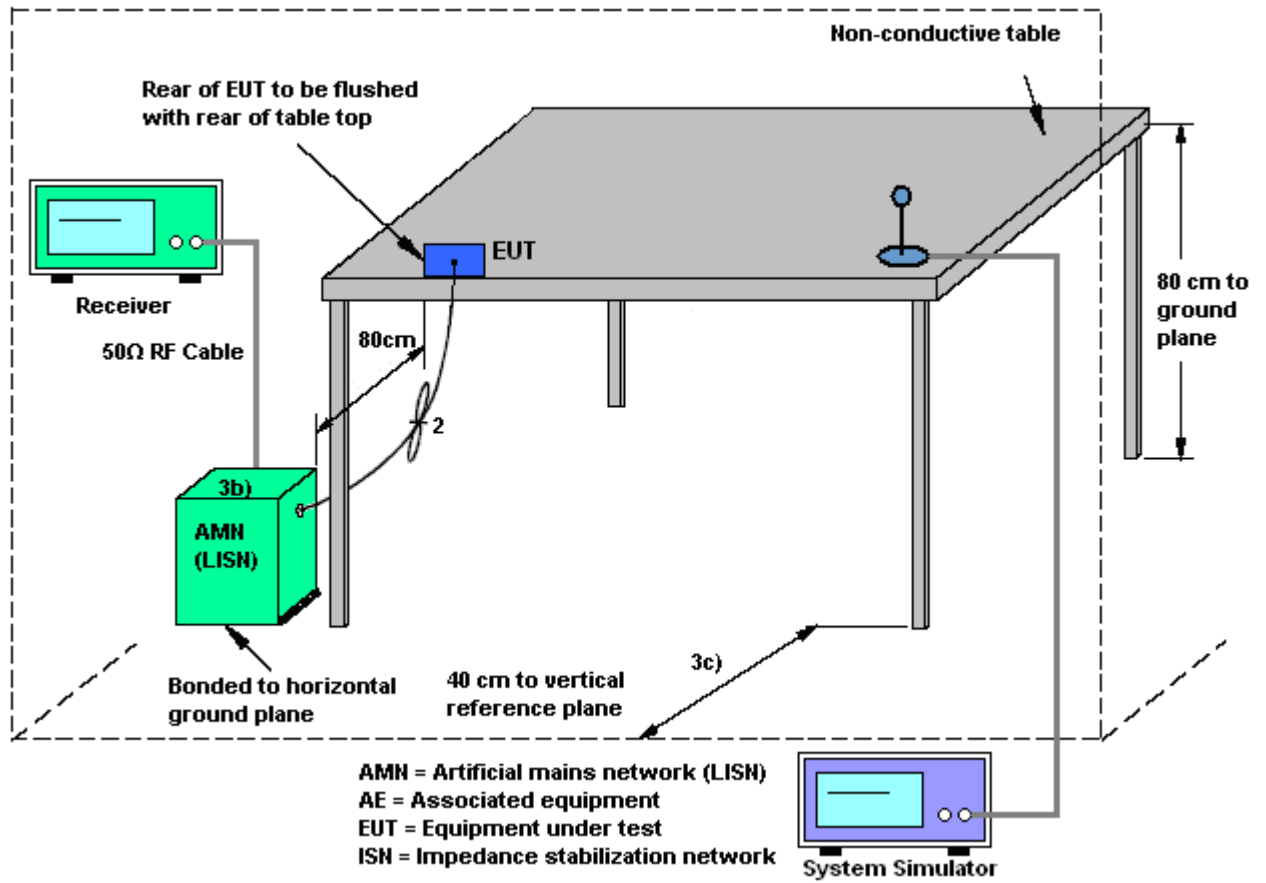
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

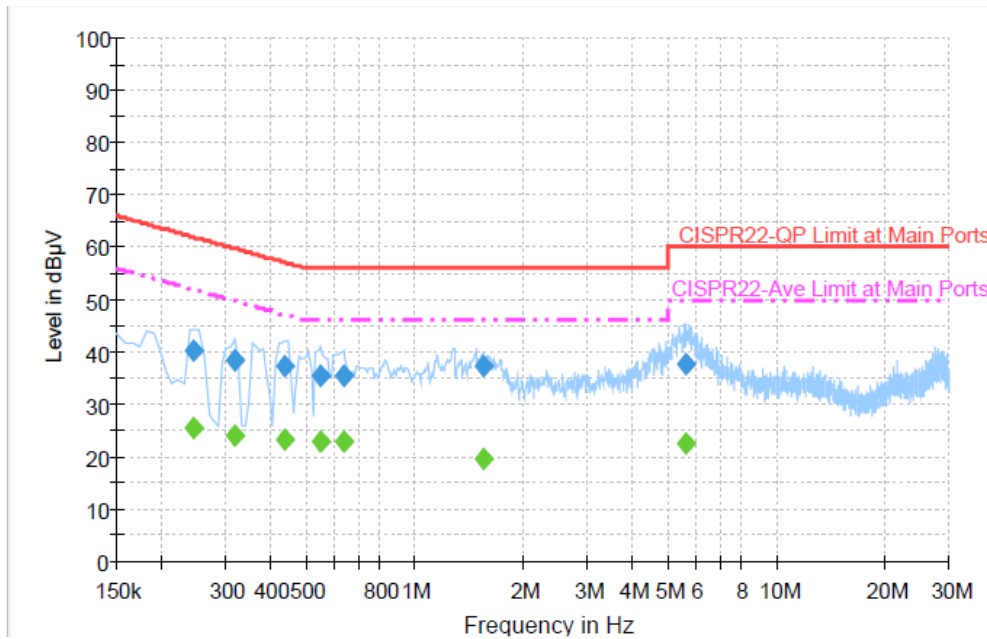
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 :	20~22°C
Test Engineer :	Novic Chiang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + Adapter + Earphone + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

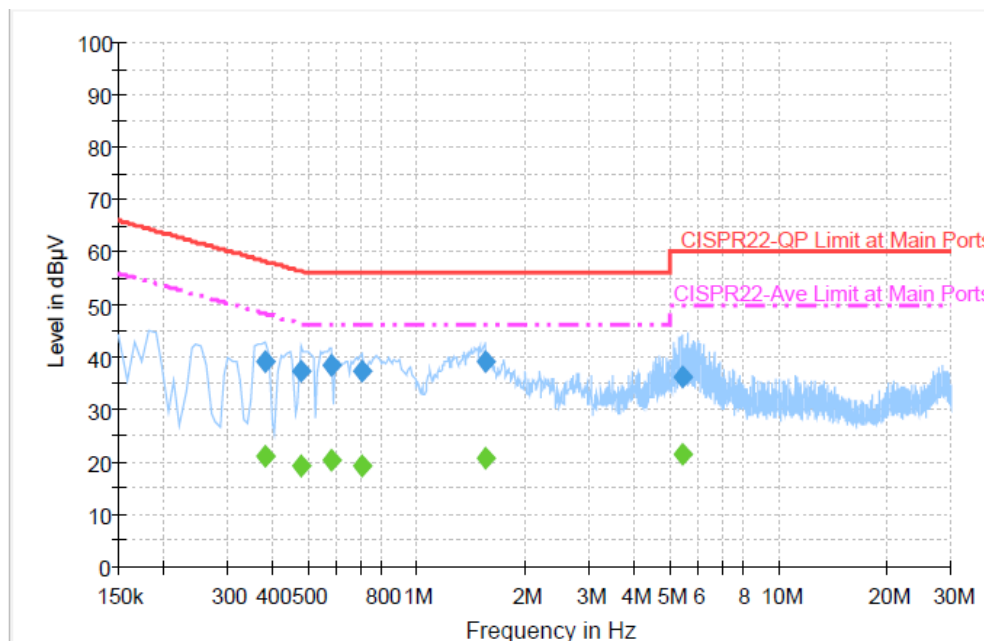
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.246000	40.3	Off	L1	19.4	21.6	61.9
0.318000	38.3	Off	L1	19.4	21.5	59.8
0.438000	37.2	Off	L1	19.5	19.9	57.1
0.550000	35.4	Off	L1	19.4	20.6	56.0
0.638000	35.3	Off	L1	19.4	20.7	56.0
1.542000	37.3	Off	L1	19.4	18.7	56.0
5.590000	37.6	Off	L1	19.5	22.4	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.246000	25.4	Off	L1	19.4	26.5	51.9
0.318000	23.9	Off	L1	19.4	25.9	49.8
0.438000	23.4	Off	L1	19.5	23.7	47.1
0.550000	22.7	Off	L1	19.4	23.3	46.0
0.638000	22.7	Off	L1	19.4	23.3	46.0
1.542000	19.7	Off	L1	19.4	26.3	46.0
5.590000	22.5	Off	L1	19.5	27.5	50.0



Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Novic Chiang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + Adapter + Earphone + GPS Rx		
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)
0.382000	39.0	Off	N	19.4	19.2	58.2
0.478000	37.2	Off	N	19.4	19.2	56.4
0.582000	38.3	Off	N	19.4	17.7	56.0
0.710000	37.3	Off	N	19.5	18.7	56.0
1.550000	39.2	Off	N	19.5	16.8	56.0
5.406000	36.3	Off	N	19.5	23.7	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.382000	21.0	Off	N	19.4	27.2	48.2
0.478000	19.2	Off	N	19.4	27.2	46.4
0.582000	20.3	Off	N	19.4	25.7	46.0
0.710000	19.3	Off	N	19.5	26.7	46.0
1.550000	20.6	Off	N	19.5	25.4	46.0
5.406000	21.5	Off	N	19.5	28.5	50.0

### 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

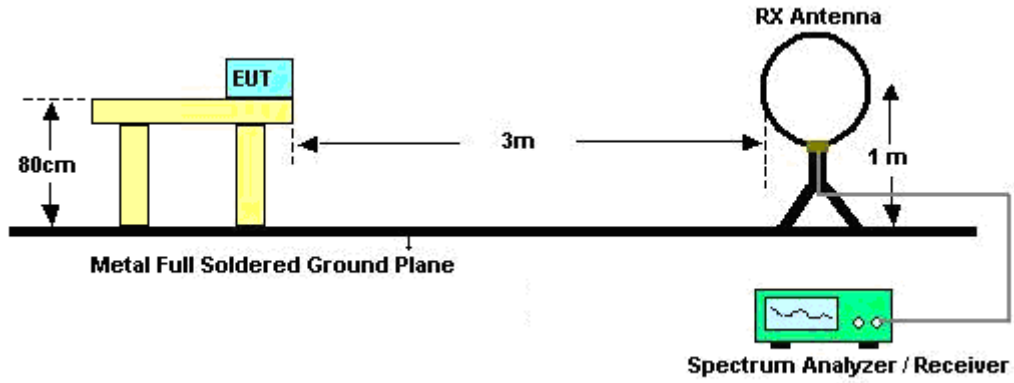
See list of measuring instruments of this test report.

#### 3.7.3 Test Procedures

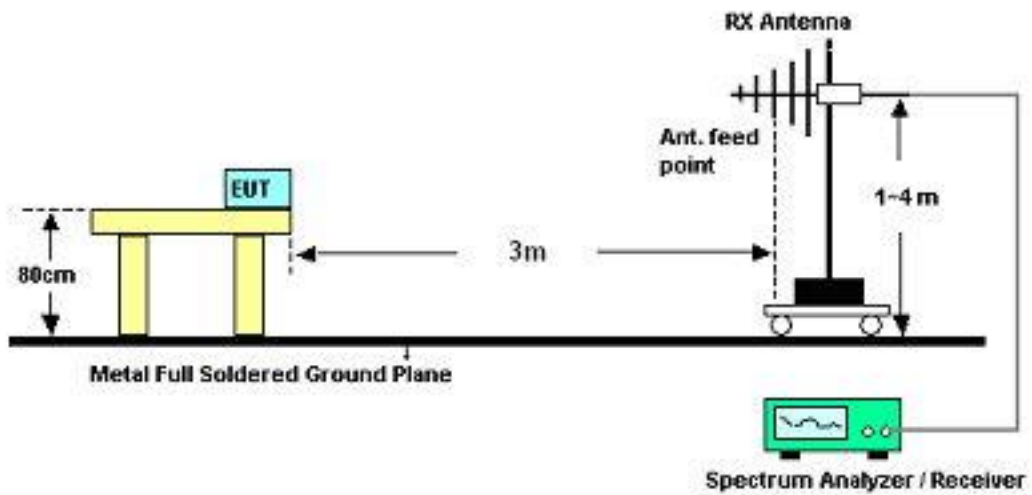
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
  - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
  - 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)
- 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

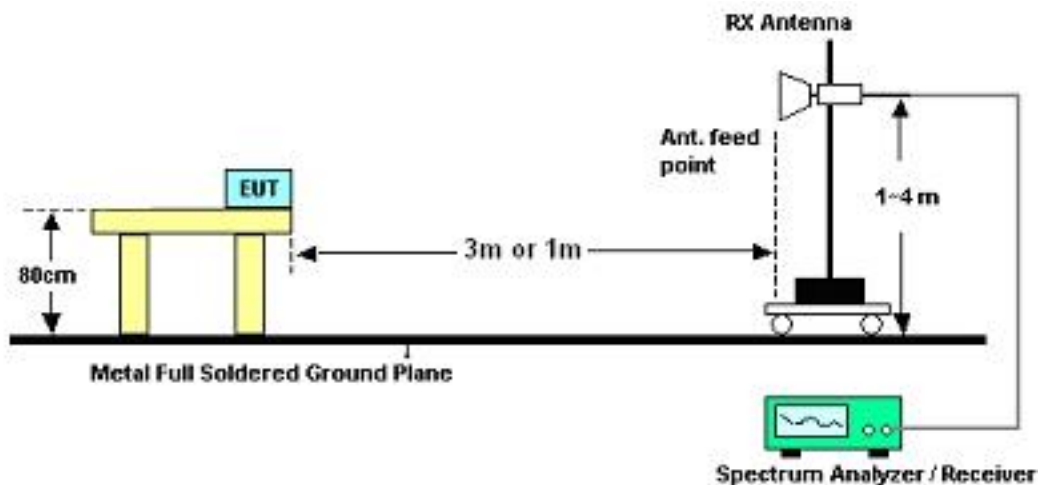
For radiated emissions below 30MHz



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 :	Wii Chang	Temperature :	23~26°C	
		Relative Humidity :	54~60%	
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 :	23~26°C
Test Channel :	01	Relative Humidity :	54~60%
Test Engineer :	Wii Chang	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
32.97	24.38	-15.62	40	39.49	15.8	0.56	31.47	100	132	Peak
86.97	16.86	-23.14	40	39.23	8.24	0.92	31.53	-	-	Peak
254.1	19.56	-26.44	46	36.69	12.73	1.55	31.41	-	-	Peak
310.5	14.92	-31.08	46	30.66	13.79	1.79	31.32	-	-	Peak
416.2	18.98	-27.02	46	31.11	16.83	2.2	31.16	-	-	Peak
484.1	20.11	-25.89	46	30.82	17.96	2.39	31.06	-	-	Peak
2388.09	38.14	-15.86	54	33.78	32.18	6.03	33.85	126	354	Average
2388.09	49.66	-24.34	74	45.3	32.18	6.03	33.85	126	354	Peak
2412	105.48	-	-	101.08	32.2	6.07	33.87	126	354	Peak
2412	101.63	-	-	97.23	32.2	6.07	33.87	126	354	Average
2484	35.27	-18.73	54	30.71	32.28	6.18	33.9	126	354	Average
2484	45.57	-28.43	74	41.01	32.28	6.18	33.9	126	354	Peak



<b>Test Mode :</b>	Mode 1	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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
31.62	28.23	-11.77	40	43.1	16.04	0.55	31.46	100	121	Peak
91.02	21.73	-21.77	43.5	43.51	8.79	0.95	31.52	-	-	Peak
263.82	22.13	-23.87	46	39.03	12.89	1.61	31.4	-	-	Peak
309.8	23.51	-22.49	46	39.29	13.76	1.79	31.33	-	-	Peak
399.4	17.82	-28.18	46	30.3	16.56	2.14	31.18	-	-	Peak
461	19.3	-26.7	46	30.49	17.57	2.32	31.08	-	-	Peak
2388.85	37.81	-16.19	54	33.45	32.18	6.03	33.85	102	296	Average
2388.85	49.37	-24.63	74	45.01	32.18	6.03	33.85	102	296	Peak
2412	105.82	-	-	101.42	32.2	6.07	33.87	102	296	Peak
2412	101.79	-	-	97.39	32.2	6.07	33.87	102	296	Average
2484	35.64	-18.36	54	31.08	32.28	6.18	33.9	102	296	Average
2484	48.3	-25.7	74	43.74	32.28	6.18	33.9	102	296	Peak



<b>Test Mode :</b>	Mode 2	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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
32.97	25.08	-14.92	40	40.19	15.8	0.56	31.47	100	177	Peak
86.97	17.54	-22.46	40	39.91	8.24	0.92	31.53	-	-	Peak
242.49	20.21	-25.79	46	37.98	12.12	1.53	31.42	-	-	Peak
377.7	16.74	-29.26	46	30.02	15.87	2.09	31.24	-	-	Peak
489	18.74	-27.26	46	29.35	18.04	2.41	31.06	-	-	Peak
554.1	19.99	-26.01	46	29.35	19.05	2.56	30.97	-	-	Peak
2388	46.73	-27.27	74	42.37	32.18	6.03	33.85	128	30	Peak
2388	35.8	-18.2	54	31.44	32.18	6.03	33.85	128	30	Average
2437	106.92	-	-	102.45	32.24	6.11	33.88	128	30	Peak
2437	102.15	-	-	97.68	32.24	6.11	33.88	128	30	Average
2492	49.4	-24.6	74	44.82	32.3	6.18	33.9	128	30	Peak
2492	38.25	-15.75	54	33.67	32.3	6.18	33.9	128	30	Average



Test Mode :	Mode 2	Temperature :	23~26°C
Test Channel :	06	Relative Humidity :	54~60%
Test Engineer :	Wii Chang	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
30.54	28.48	-11.52	40	43.13	16.27	0.54	31.46	100	116	Peak
91.02	20.89	-22.61	43.5	42.67	8.79	0.95	31.52	-	-	Peak
128.82	11.88	-31.62	43.5	30.74	11.57	1.14	31.57	-	-	Peak
304.2	18.34	-27.66	46	34.28	13.61	1.78	31.33	-	-	Peak
419.7	17.7	-28.3	46	29.74	16.9	2.21	31.15	-	-	Peak
522.6	19.54	-26.46	46	29.5	18.57	2.5	31.03	-	-	Peak
2380	45.04	-28.96	74	40.7	32.16	6.03	33.85	100	302	Peak
2380	34.65	-19.35	54	30.31	32.16	6.03	33.85	100	302	Average
2437	105.73	-	-	101.26	32.24	6.11	33.88	100	302	Peak
2437	102.15	-	-	97.68	32.24	6.11	33.88	100	302	Average
2494	47.04	-26.96	74	42.46	32.3	6.18	33.9	100	302	Peak
2494	35.93	-18.07	54	31.35	32.3	6.18	33.9	100	302	Average
7311	49.74	-24.26	74	62.36	35.45	10.06	58.13	100	0	Peak



Test Mode :	Mode 3	Temperature :	23~26°C
Test Channel :	11	Relative Humidity :	54~60%
Test Engineer :	Wii Chang	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
32.97	26.42	-13.58	40	41.53	15.8	0.56	31.47	100	136	Peak
86.97	17.27	-22.73	40	39.64	8.24	0.92	31.53	-	-	Peak
245.73	18.86	-27.14	46	36.42	12.33	1.53	31.42	-	-	Peak
360.2	15.97	-30.03	46	29.85	15.33	2.06	31.27	-	-	Peak
456.1	18.19	-27.81	46	29.48	17.49	2.31	31.09	-	-	Peak
562.5	20.77	-25.23	46	29.96	19.19	2.59	30.97	-	-	Peak
2366	38.34	-15.66	54	34.06	32.13	5.99	33.84	101	0	Average
2366	44.51	-29.49	74	40.23	32.13	5.99	33.84	101	0	Peak
2462	101.55	-	-	97.04	32.26	6.14	33.89	101	0	Average
2462	105.36	-	-	100.85	32.26	6.14	33.89	101	0	Peak
2488.98	39.69	-14.31	54	35.11	32.3	6.18	33.9	101	0	Average
2488.98	47.9	-26.1	74	43.32	32.3	6.18	33.9	101	0	Peak



<b>Test Mode :</b>	Mode 3	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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
32.7	28.58	-11.42	40	43.69	15.8	0.56	31.47	100	31	Peak
91.02	22.36	-21.14	43.5	44.14	8.79	0.95	31.52	-	-	Peak
123.42	19.03	-24.47	43.5	37.92	11.55	1.12	31.56	-	-	Peak
354.6	15.87	-30.13	46	29.95	15.18	2.02	31.28	-	-	Peak
461	18.72	-27.28	46	29.91	17.57	2.32	31.08	-	-	Peak
559.7	20.35	-25.65	46	29.6	19.14	2.58	30.97	-	-	Peak
2388	33.48	-20.52	54	29.12	32.18	6.03	33.85	100	295	Average
2388	45.93	-28.07	74	41.57	32.18	6.03	33.85	100	295	Peak
2462	101.91	-	-	97.4	32.26	6.14	33.89	100	295	Average
2462	105.79	-	-	101.28	32.26	6.14	33.89	100	295	Peak
2487.46	38.29	-15.71	54	33.73	32.28	6.18	33.9	100	295	Average
2487.46	50.92	-23.08	74	46.36	32.28	6.18	33.9	100	295	Peak



<b>Test Mode :</b>	Mode 4	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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
32.97	25.33	-14.67	40	40.44	15.8	0.56	31.47	100	31	Peak
145.02	27.62	-15.88	43.5	46.64	11.33	1.21	31.56	-	-	Peak
240.33	16.43	-29.57	46	34.34	11.98	1.53	31.42	-	-	Peak
363.7	16.4	-29.6	46	30.15	15.45	2.07	31.27	-	-	Peak
472.2	18.51	-27.49	46	29.46	17.76	2.36	31.07	-	-	Peak
582.1	20.99	-25.01	46	29.8	19.49	2.64	30.94	-	-	Peak
2390	55.98	-18.02	74	51.62	32.18	6.03	33.85	132	26	Peak
2390	39.12	-14.88	54	34.76	32.18	6.03	33.85	132	26	Average
2412	105.12	-	-	100.72	32.2	6.07	33.87	132	26	Peak
2412	95.34	-	-	90.94	32.2	6.07	33.87	132	26	Average
2494	33.8	-20.2	54	29.22	32.3	6.18	33.9	132	26	Average
2494	55.59	-18.41	74	51.01	32.3	6.18	33.9	132	26	Peak



<b>Test Mode :</b>	Mode 4	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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	28.42	-11.58	40	42.84	16.51	0.53	31.46	100	41	Peak
162.3	24.21	-19.29	43.5	44.25	10.26	1.22	31.52	-	-	Peak
221.7	22.24	-23.76	46	41.59	10.68	1.43	31.46	-	-	Peak
318.9	16.19	-29.81	46	31.64	14.06	1.81	31.32	-	-	Peak
452.6	18.07	-27.93	46	29.41	17.44	2.31	31.09	-	-	Peak
534.5	19.96	-26.04	46	29.7	18.75	2.52	31.01	-	-	Peak
2389.61	49.79	-24.21	74	45.43	32.18	6.03	33.85	155	304	Peak
2389.61	35.16	-18.84	54	30.8	32.18	6.03	33.85	155	304	Average
2412	104.16	-	-	99.76	32.2	6.07	33.87	155	304	Peak
2412	94.2	-	-	89.8	32.2	6.07	33.87	155	304	Average
2492	33.01	-20.99	54	28.43	32.3	6.18	33.9	155	304	Average
2492	51.9	-22.1	74	47.32	32.3	6.18	33.9	155	304	Peak



<b>Test Mode :</b>	Mode 5	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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
32.97	23.26	-16.74	40	38.37	15.8	0.56	31.47	100	116	Peak
116.13	22.43	-21.07	43.5	41.71	11.2	1.08	31.56	-	-	Peak
149.34	26.5	-17	43.5	45.7	11.15	1.21	31.56	-	-	Peak
300	15.86	-30.14	46	31.96	13.46	1.77	31.33	-	-	Peak
386.1	17.47	-28.53	46	30.44	16.14	2.11	31.22	-	-	Peak
456.1	18.69	-27.31	46	29.98	17.49	2.31	31.09	-	-	Peak
2382	46.36	-27.64	74	42.02	32.16	6.03	33.85	103	31	Peak
2382	34.01	-19.99	54	29.67	32.16	6.03	33.85	103	31	Average
2437	105.41	-	-	100.94	32.24	6.11	33.88	103	31	Peak
2437	94.72	-	-	90.25	32.24	6.11	33.88	103	31	Average
2484	35.22	-18.78	54	30.66	32.28	6.18	33.9	103	31	Average
2484	47.84	-26.16	74	43.28	32.28	6.18	33.9	103	31	Peak
2516	57.14	-28.27	85.41	52.55	32.32	6.21	33.94	103	31	Peak



<b>Test Mode :</b>	Mode 5	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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
32.97	28.72	-11.28	40	43.83	15.8	0.56	31.47	100	41	Peak
91.02	25.2	-18.3	43.5	46.98	8.79	0.95	31.52	-	-	Peak
123.69	20.34	-23.16	43.5	39.23	11.55	1.12	31.56	-	-	Peak
377	16.16	-29.84	46	29.44	15.87	2.09	31.24	-	-	Peak
433.7	18.81	-27.19	46	30.56	17.12	2.26	31.13	-	-	Peak
526.1	20.17	-25.83	46	30.07	18.62	2.5	31.02	-	-	Peak
2390	45.46	-28.54	74	41.1	32.18	6.03	33.85	100	284	Peak
2390	33.64	-20.36	54	29.28	32.18	6.03	33.85	100	284	Average
2437	103.65	-	-	99.18	32.24	6.11	33.88	100	284	Peak
2437	93.66	-	-	89.19	32.24	6.11	33.88	100	284	Average
2492	33.78	-20.22	54	29.2	32.3	6.18	33.9	100	284	Average
2492	45.82	-28.18	74	41.24	32.3	6.18	33.9	100	284	Peak
2516	56.12	-27.53	83.65	51.53	32.32	6.21	33.94	100	284	Peak



<b>Test Mode :</b>	Mode 6	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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
32.97	23.24	-16.76	40	38.35	15.8	0.56	31.47	-	-	Peak
151.5	27.88	-15.62	43.5	47.19	11.03	1.21	31.55	100	131	Peak
245.73	17.98	-28.02	46	35.54	12.33	1.53	31.42	-	-	Peak
396.6	17.36	-28.64	46	29.95	16.47	2.13	31.19	-	-	Peak
467.3	18.58	-27.42	46	29.63	17.68	2.34	31.07	-	-	Peak
548.5	19.9	-26.1	46	29.35	18.98	2.55	30.98	-	-	Peak
2388	46.43	-27.57	74	42.07	32.18	6.03	33.85	101	358	Peak
2388	33.78	-20.22	54	29.42	32.18	6.03	33.85	101	358	Average
2462	104.57	-	-	100.06	32.26	6.14	33.89	101	358	Peak
2462	93.68	-	-	89.17	32.26	6.14	33.89	101	358	Average
2483.5	53.72	-20.28	74	49.16	32.28	6.18	33.9	101	358	Peak
2483.5	38.38	-15.62	54	33.82	32.28	6.18	33.9	101	358	Average
2542	52.57	-32	84.57	47.95	32.36	6.23	33.97	101	358	Peak



<b>Test Mode :</b>	Mode 6	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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	26.65	-13.35	40	41.07	16.51	0.53	31.46	100	132	Peak
91.02	25.72	-17.78	43.5	47.5	8.79	0.95	31.52	-	-	Peak
161.49	22.21	-21.29	43.5	42.25	10.26	1.22	31.52	-	-	Peak
307.7	16.24	-29.76	46	32.08	13.7	1.79	31.33	-	-	Peak
355.3	15.99	-30.01	46	30.07	15.18	2.02	31.28	-	-	Peak
407.8	18.78	-27.22	46	31.09	16.69	2.17	31.17	-	-	Peak
2334	45.82	-28.18	74	41.61	32.09	5.95	33.83	115	7	Peak
2334	32.56	-21.44	54	28.35	32.09	5.95	33.83	115	7	Average
2462	103.83	-	-	99.32	32.26	6.14	33.89	115	7	Peak
2462	93.73	-	-	89.22	32.26	6.14	33.89	115	7	Average
2483.5	54.39	-19.61	74	49.83	32.28	6.18	33.9	115	7	Peak
2483.5	38.55	-15.45	54	33.99	32.28	6.18	33.9	115	7	Average
2542	54.29	-29.54	83.83	49.67	32.36	6.23	33.97	115	7	Peak



<b>Test Mode :</b>	Mode 7	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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
32.97	24.08	-15.92	40	39.19	15.8	0.56	31.47	100	41	Peak
86.97	17.84	-22.16	40	40.21	8.24	0.92	31.53	-	-	Peak
245.73	19.74	-26.26	46	37.3	12.33	1.53	31.42	-	-	Peak
343.4	15.7	-30.3	46	30.26	14.81	1.92	31.29	-	-	Peak
393.8	17.47	-28.53	46	30.16	16.38	2.13	31.2	-	-	Peak
489	18.71	-27.29	46	29.32	18.04	2.41	31.06	-	-	Peak
2389.61	52	-22	74	47.64	32.18	6.03	33.85	132	26	Peak
2389.61	37.3	-16.7	54	32.94	32.18	6.03	33.85	132	26	Average
2412	103.87	-	-	99.47	32.2	6.07	33.87	132	26	Peak
2412	92.75	-	-	88.35	32.2	6.07	33.87	132	26	Average
2494	33.29	-20.71	54	28.71	32.3	6.18	33.9	132	26	Average
2494	53.32	-20.68	74	48.74	32.3	6.18	33.9	132	26	Peak



<b>Test Mode :</b>	Mode 7	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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
31.62	24.79	-15.21	40	39.66	16.04	0.55	31.46	100	12	Peak
91.02	26.05	-17.45	43.5	47.83	8.79	0.95	31.52	-	-	Peak
172.02	16.88	-26.62	43.5	37.52	9.65	1.23	31.52	-	-	Peak
393.8	17.24	-28.76	46	29.93	16.38	2.13	31.2	-	-	Peak
495.3	20.22	-25.78	46	30.71	18.15	2.43	31.07	-	-	Peak
596.1	21.34	-24.66	46	29.87	19.71	2.68	30.92	-	-	Peak
2386.38	48.44	-25.56	74	44.08	32.18	6.03	33.85	158	288	Peak
2386.38	34.49	-19.51	54	30.13	32.18	6.03	33.85	158	288	Average
2412	100.6	-	-	96.2	32.2	6.07	33.87	158	288	Peak
2412	89.52	-	-	85.12	32.2	6.07	33.87	158	288	Average
2486	33.64	-20.36	54	29.08	32.28	6.18	33.9	158	288	Average
2486	53.19	-20.81	74	48.63	32.28	6.18	33.9	158	288	Peak



Test Mode :	Mode 8	Temperature :	23~26°C
Test Channel :	06	Relative Humidity :	54~60%
Test Engineer :	Wii Chang	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
32.97	20.8	-19.2	40	35.91	15.8	0.56	31.47	100	169	Peak
86.97	16.61	-23.39	40	38.98	8.24	0.92	31.53	-	-	Peak
261.66	20.65	-25.35	46	37.6	12.86	1.6	31.41	-	-	Peak
310.5	14.66	-31.34	46	30.4	13.79	1.79	31.32	-	-	Peak
377	17.28	-28.72	46	30.56	15.87	2.09	31.24	-	-	Peak
466.6	17.88	-28.12	46	28.94	17.67	2.34	31.07	-	-	Peak
2390	46.04	-27.96	74	41.68	32.18	6.03	33.85	104	32	Peak
2390	34.21	-19.79	54	29.85	32.18	6.03	33.85	104	32	Average
2437	103.83	-	-	99.36	32.24	6.11	33.88	104	32	Peak
2437	92.55	-	-	88.08	32.24	6.11	33.88	104	32	Average
2492	34.67	-19.33	54	30.09	32.3	6.18	33.9	104	32	Average
2492	46.63	-27.37	74	42.05	32.3	6.18	33.9	104	32	Peak
2524	54.06	-29.77	83.83	49.46	32.34	6.23	33.97	104	32	Peak



<b>Test Mode :</b>	Mode 8	<b>Temperature :</b>	23~26°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	54~60%
<b>Test Engineer :</b>	Wii Chang	<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
31.89	25.72	-14.28	40	40.59	16.04	0.55	31.46	100	132	Peak
48.9	21.21	-18.79	40	42.98	9.08	0.68	31.53	-	-	Peak
91.02	27.54	-15.96	43.5	49.32	8.79	0.95	31.52	-	-	Peak
337.8	16.53	-29.47	46	31.32	14.63	1.88	31.3	-	-	Peak
394.5	18	-28	46	30.66	16.41	2.13	31.2	-	-	Peak
458.9	19.34	-26.66	46	30.56	17.54	2.32	31.08	-	-	Peak
2390	33.02	-20.98	54	28.66	32.18	6.03	33.85	100	284	Average
2390	46.45	-27.55	74	42.09	32.18	6.03	33.85	100	284	Peak
2437	100.72	-	-	96.25	32.24	6.11	33.88	100	284	Peak
2437	89.68	-	-	85.21	32.24	6.11	33.88	100	284	Average
2494	45.45	-28.55	74	40.87	32.3	6.18	33.9	100	284	Peak
2494	33.33	-20.67	54	28.75	32.3	6.18	33.9	100	284	Average



Test Mode :	Mode 9	Temperature :	23~26°C
Test Channel :	11	Relative Humidity :	54~60%
Test Engineer :	Wii Chang	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
31.89	19.75	-20.25	40	34.62	16.04	0.55	31.46	-	-	Peak
68.61	26.58	-13.42	40	51.08	6.23	0.83	31.56	100	12	Peak
245.73	16.23	-29.77	46	33.79	12.33	1.53	31.42	-	-	Peak
354.6	15.44	-30.56	46	29.52	15.18	2.02	31.28	-	-	Peak
408.5	18.52	-27.48	46	30.82	16.7	2.17	31.17	-	-	Peak
542.9	20.37	-25.63	46	29.93	18.89	2.54	30.99	-	-	Peak
2382	45.66	-28.34	74	41.32	32.16	6.03	33.85	129	34	Peak
2382	33.46	-20.54	54	29.12	32.16	6.03	33.85	129	34	Average
2462	103.29	-	-	98.78	32.26	6.14	33.89	129	34	Peak
2462	92.64	-	-	88.13	32.26	6.14	33.89	129	34	Average
2484.61	53.22	-20.78	74	48.66	32.28	6.18	33.9	129	34	Peak
2484.61	38.09	-15.91	54	33.53	32.28	6.18	33.9	129	34	Average
2540	52.56	-30.73	83.29	47.94	32.36	6.23	33.97	129	34	Peak



Test Mode :	Mode 9	Temperature :	23~26°C
Test Channel :	11	Relative Humidity :	54~60%
Test Engineer :	Wii Chang	Polarization :	Vertical
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
30.54	28.77	-11.23	40	43.42	16.27	0.54	31.46	100	132	Peak
91.02	26.71	-16.79	43.5	48.49	8.79	0.95	31.52	-	-	Peak
243.3	22.07	-23.93	46	39.77	12.19	1.53	31.42	-	-	Peak
391	17.47	-28.53	46	30.27	16.29	2.12	31.21	-	-	Peak
525.4	19.08	-26.92	46	28.98	18.62	2.5	31.02	-	-	Peak
612.9	21.82	-24.18	46	30.09	19.91	2.73	30.91	-	-	Peak
2366	45.16	-28.84	74	40.88	32.13	5.99	33.84	100	295	Peak
2366	33.04	-20.96	54	28.76	32.13	5.99	33.84	100	295	Average
2462	100.37	-	-	95.86	32.26	6.14	33.89	100	295	Peak
2462	89.81	-	-	85.3	32.26	6.14	33.89	100	295	Average
2485.18	51.59	-22.41	74	47.03	32.28	6.18	33.9	100	295	Peak
2485.18	37.4	-16.6	54	32.84	32.28	6.18	33.9	100	295	Average
2542	50.3	-30.07	80.37	45.68	32.36	6.23	33.97	100	295	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 PIFA 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
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 11, 2010	Jun. 10, 2011	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)
System Simulator	R&S	CMU200	117591	N/A	Oct. 18, 2010	Oct. 17, 2011	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>				