

FCC RF Test Report

APPLICANT : HTC Corporation
EQUIPMENT : Smartphone
MODEL NAME : PG05100
FCC ID : NM8PG05100
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Oct. 15, 2010 and completely tested on Nov. 03, 2010. 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:



Anderson Chiu / Deputy Manager



SPORTON INTERNATIONAL INC.

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



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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	-
0	15.247(d)	A8.5	Spurious Emission	$< 20\text{ dBc}$	Pass	-
0	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 3.2 dB at 0.254 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.29 dB at 258.15 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

HTC Corporation
 No. 23, Xinghua Rd., Taoyuan City, Taiwan

1.2 Manufacturer

HTC Corporation
 No. 23, Xinghua Rd., Taoyuan City, Taiwan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Smartphone
Model Name	PG05100
FCC ID	NM8PG05100
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 : 20.88 dBm (0.122 W) 802.11g : 22.81 dBm (0.191 W) 802.11n (BW 20MHz) : 22.75 dBm (0.188 W)
Antenna Type	PCB Antenna with gain -3 dBi
Type of Antenna Connector	N/A
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

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO05-HY	03CH05-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 7

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	CMW 500	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
6.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
7.	Earphone	Merry	RC E160	N/A	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)			
		At DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	20.14	-	-	-
CH 06	2437 MHz	20.51	-	-	-
CH 11	2462 MHz	20.88	20.81	20.83	20.87

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		At OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	22.53	-	-	-	-	-	-	-
CH 06	2437 MHz	22.76	-	-	-	-	-	-	-
CH 11	2462 MHz	22.81	22.61	22.56	22.42	22.4	22.2	22.18	22.05

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		At OFDM Data Rate							
		MCS=0 6.5 Mbps	MCS=1 13 Mbps	MCS=2 19.5 Mbps	MCS=3 26 Mbps	MCS=4 39 Mbps	MCS=5 52 Mbps	MCS=6 58.5 Mbps	MCS=7 65 Mbps
CH 01	2412 MHz	22.43	-	-	-	-	-	-	-
CH 06	2437 MHz	22.71	-	-	-	-	-	-	-
CH 11	2462 MHz	22.75	22.36	22.35	22.41	22.22	22.09	22.11	22.14

Remark:

1. The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, and 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

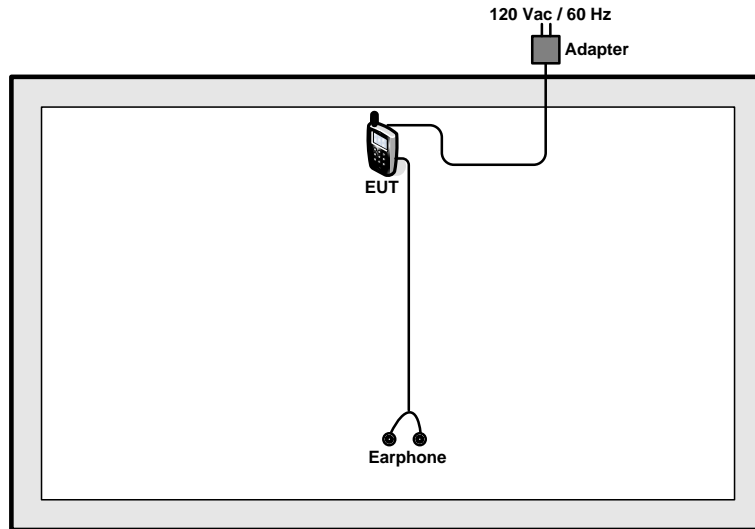
The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic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

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

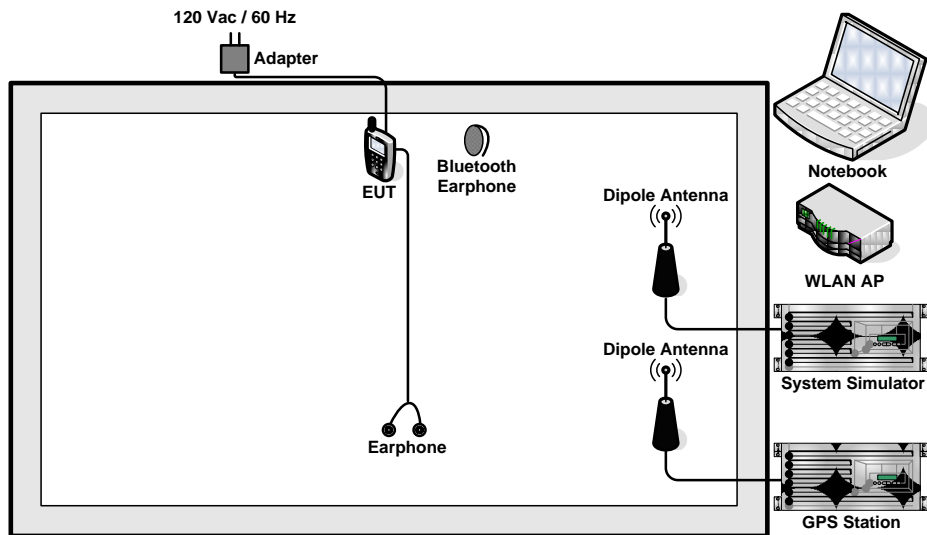
Test Cases		
Test Item	802.11b (Modulation : DSSS)	802.11g/n (Modulation : OFDM)
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 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 + TC Mode 2 : 802.11b CH06_2437 MHz + TC Mode 3 : 802.11b CH11_2462 MHz + TC	Mode 4: 802.11g_CH01_2412 MHz + TC Mode 5: 802.11g_CH06_2437 MHz + TC Mode 6: 802.11g_CH11_2462 MHz + TC Mode 7: 802.11n (BW 20M)_CH01_2412 MHz + TC Mode 8: 802.11n (BW 20M)_CH06_2437 MHz + TC Mode 9: 802.11n (BW 20M)_CH11_2462 MHz + TC
AC Conducted Emission	Mode 1 : CDMA BC0 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone + Battery 4 + USB Cable 2 (Charging from Adapter 2) Mode 2 : CDMA BC0 1xRTT Idle + Bluetooth Link + WLAN Link+ GPS Rx + Earphone + Battery 4 + USB Cable 2 (Charging from Adapter 2)	
Remark: 1. TC stands for Test Configuration are consists of Earphone, USB Cable1, Battery3, and Adapter1. 2. The worst case of conducted emission is mode 1; only the test data of it was reported.		

2.3 Connection Diagram of Test System

<Radiation Test>



<Conduction Test>





2.4 RF Utility

The programmed RF utility “432X controller” 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.

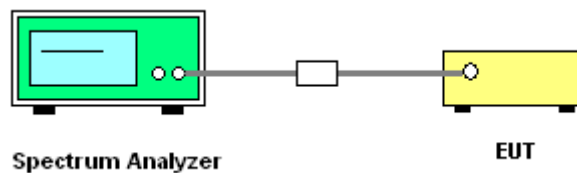
3.1.2 Measuring Instruments

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



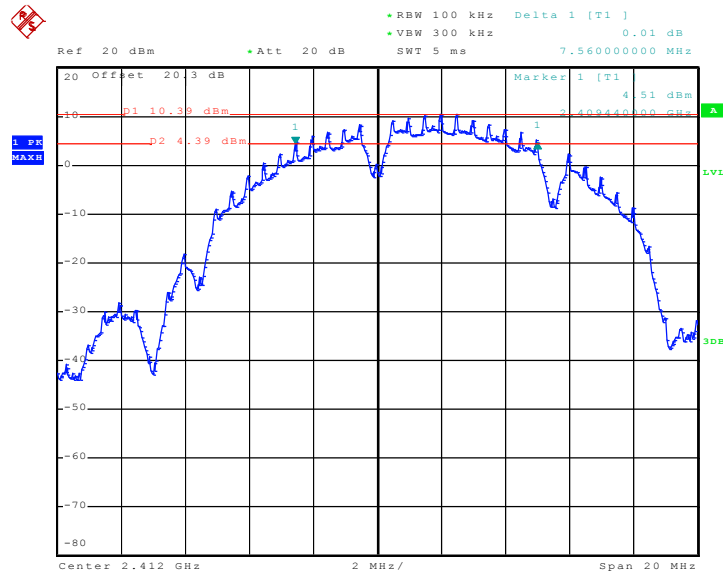


3.1.5 Test Result of 6dB Bandwidth

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

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	7.56	0.5	Pass
06	2437	7.50	0.5	Pass
11	2462	7.54	0.5	Pass

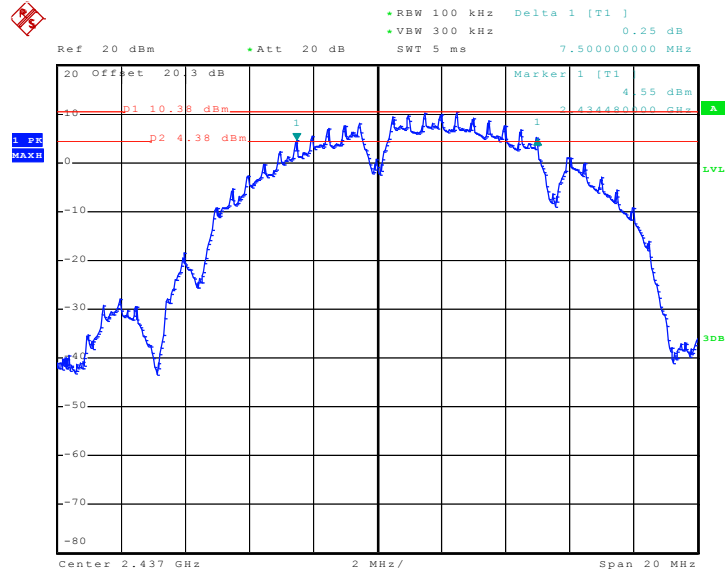
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 27.OCT.2010 06:49:54

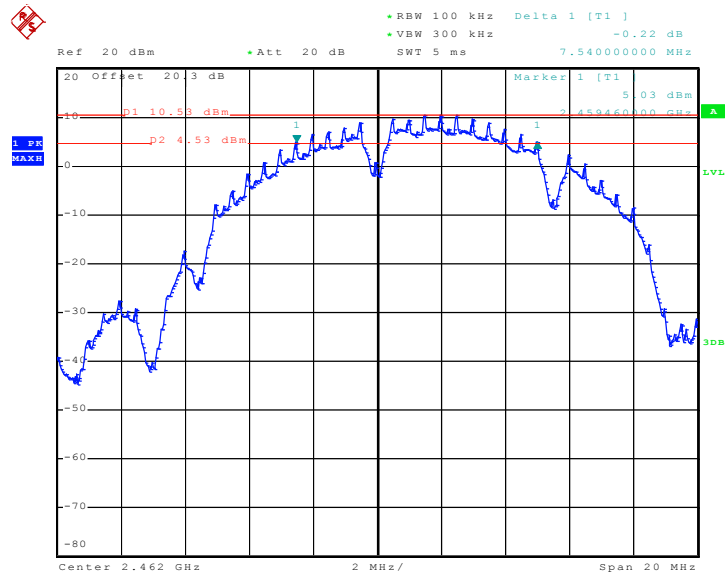


Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



Date: 27.OCT.2010 06:53:13

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



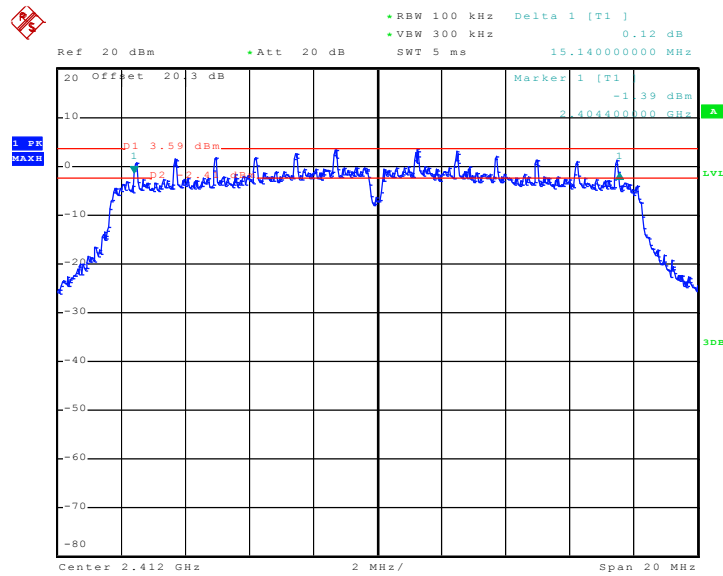
Date: 27.OCT.2010 06:55:35



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	15.14	0.5	Pass
06	2437	15.32	0.5	Pass
11	2462	15.12	0.5	Pass

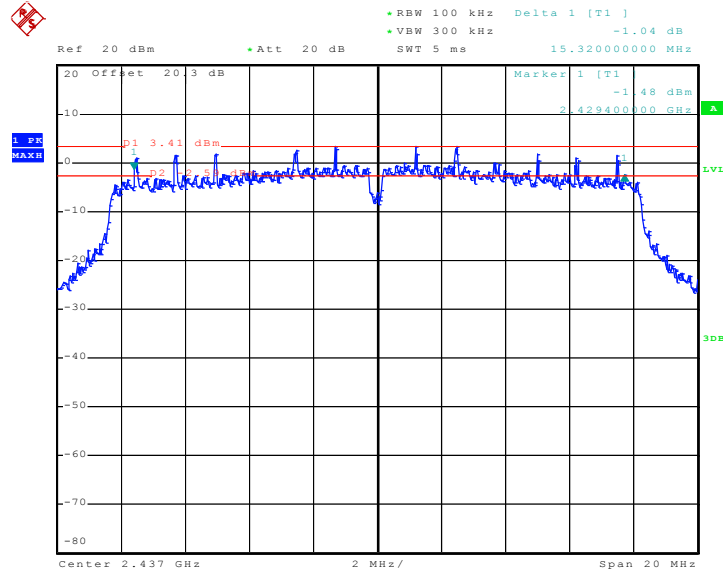
Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



Date: 27.OCT.2010 06:59:07

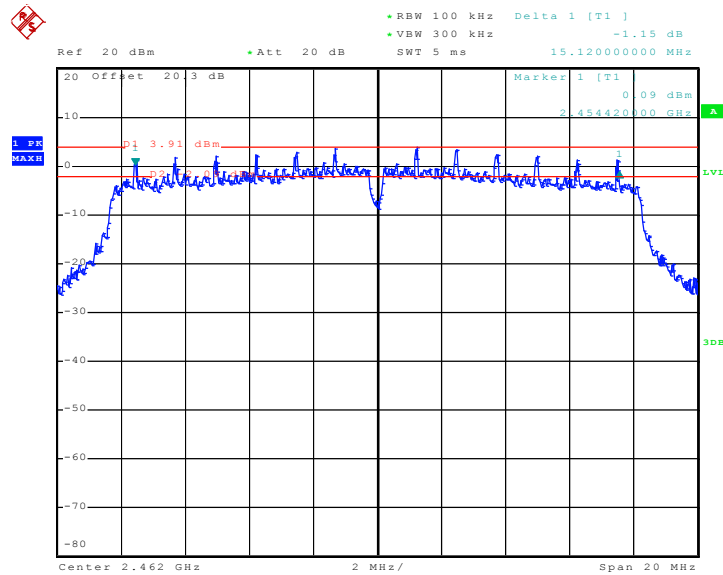


Mode 5 : 6 dB Bandwidth Plot on 802.11g Channel 06



Date: 27.OCT.2010 07:01:59

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



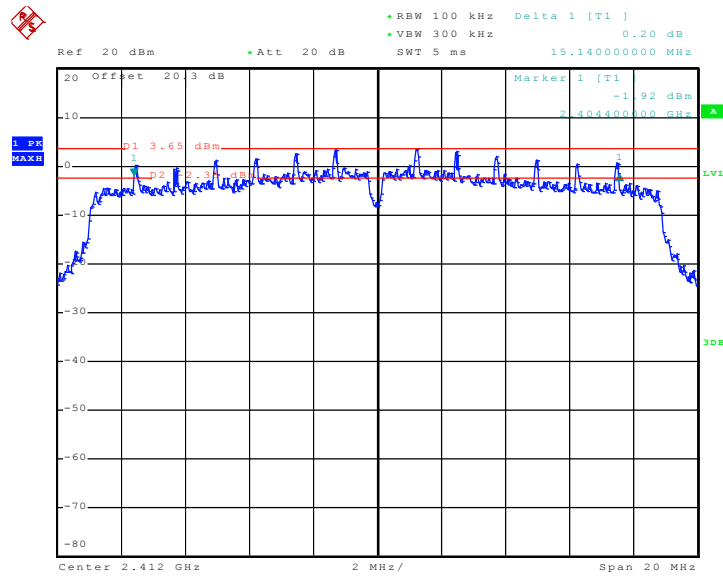
Date: 27.OCT.2010 07:04:35



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	15.14	0.5	Pass
06	2437	15.14	0.5	Pass
11	2462	15.12	0.5	Pass

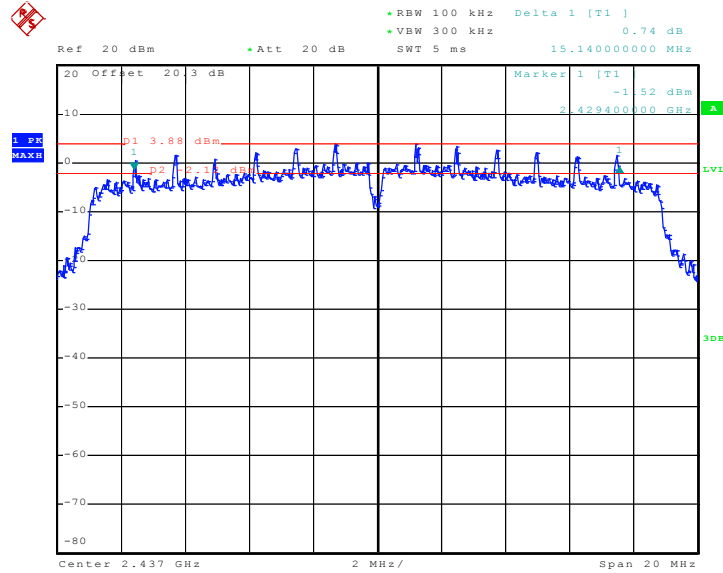
Mode 7 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 01



Date: 27.OCT.2010 07:08:05

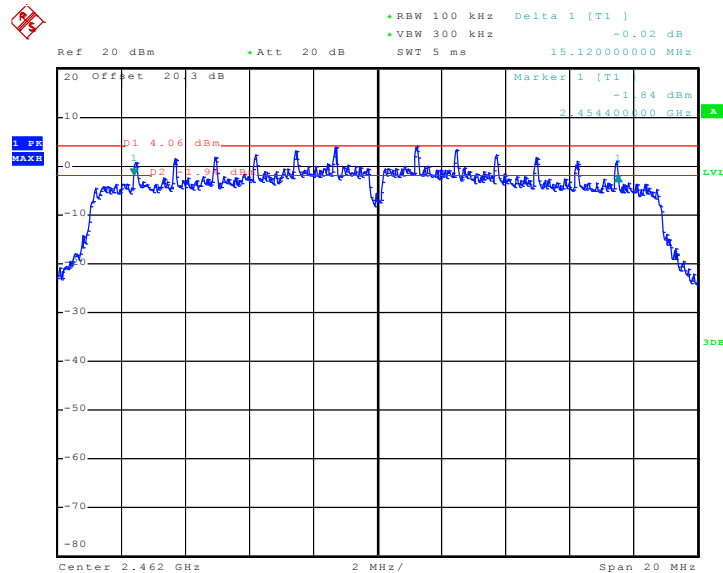


Mode 8 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 06



Date: 27.OCT.2010 07:47:29

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



Date: 27.OCT.2010 07:49:16

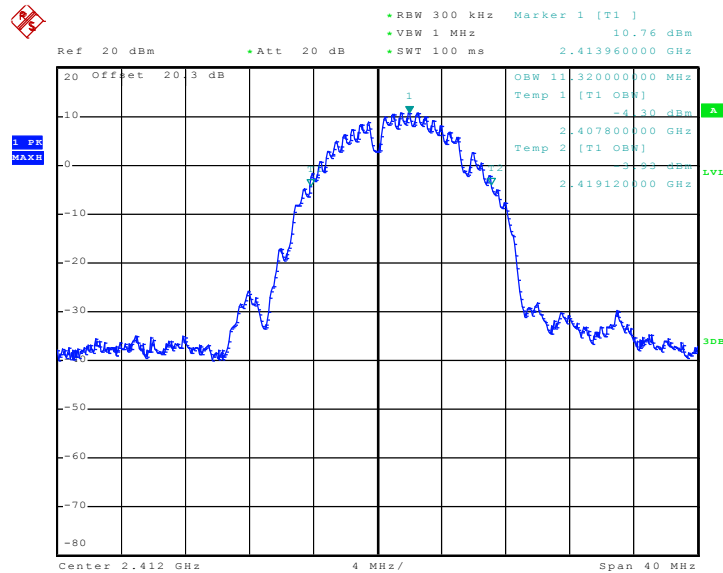


3.1.6 Test Result of 99% Occupied Bandwidth

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

Channel	Frequency (MHz)	802.11b 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	11.32	Pass
06	2437	11.32	Pass
11	2462	11.36	Pass

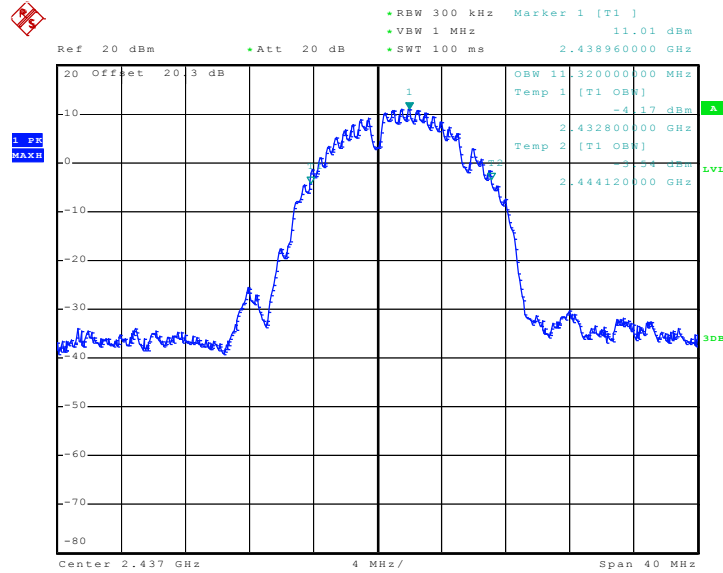
Mode 1 : 99% Occupied Bandwidth Plot on 802.11b Channel 01



Date: 27.OCT.2010 06:50:47

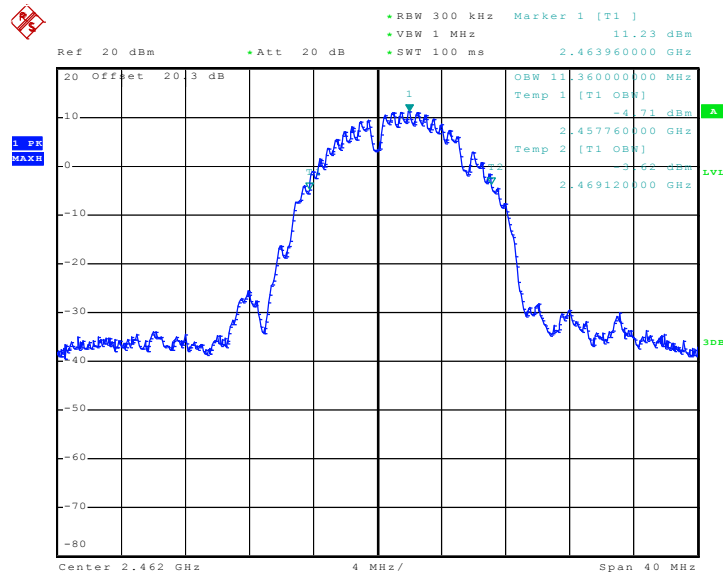


Mode 2 : 99% Occupied Bandwidth Plot on 802.11b Channel 06



Date: 27.OCT.2010 06:53:28

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



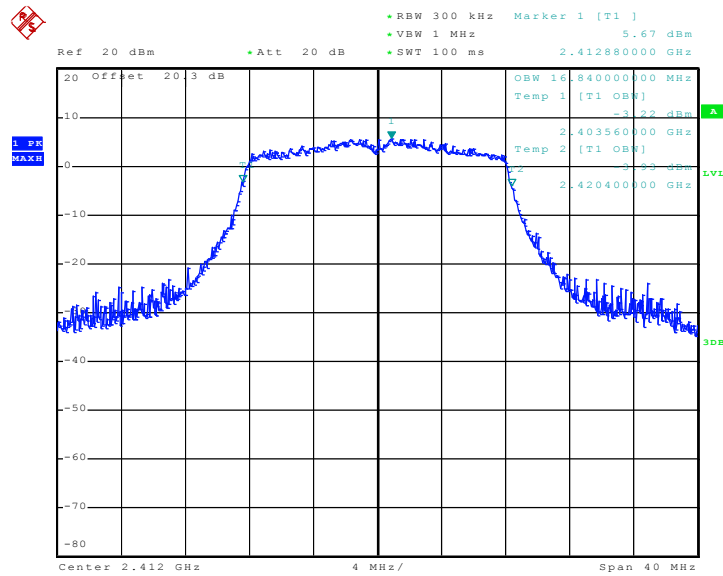
Date: 27.OCT.2010 06:56:07



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

Channel	Frequency (MHz)	802.11g 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	16.84	Pass
06	2437	16.88	Pass
11	2462	16.84	Pass

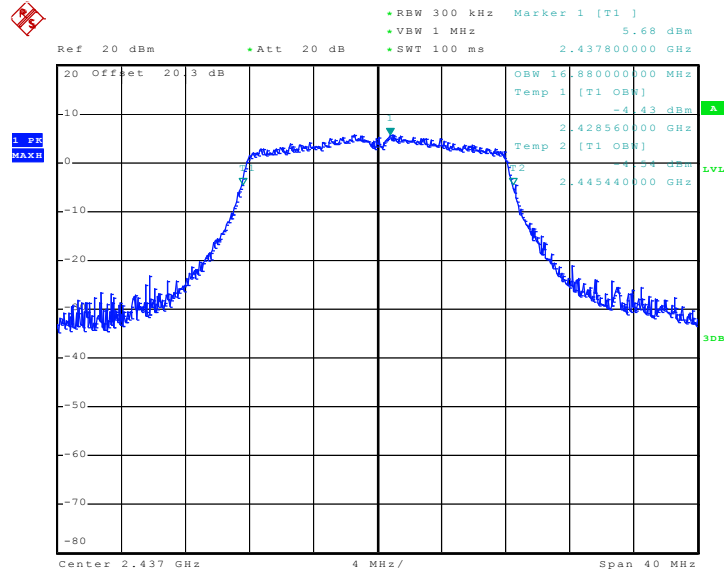
Mode 4 : 99% Occupied Bandwidth Plot on 802.11g Channel 01



Date: 27.OCT.2010 06:59:51

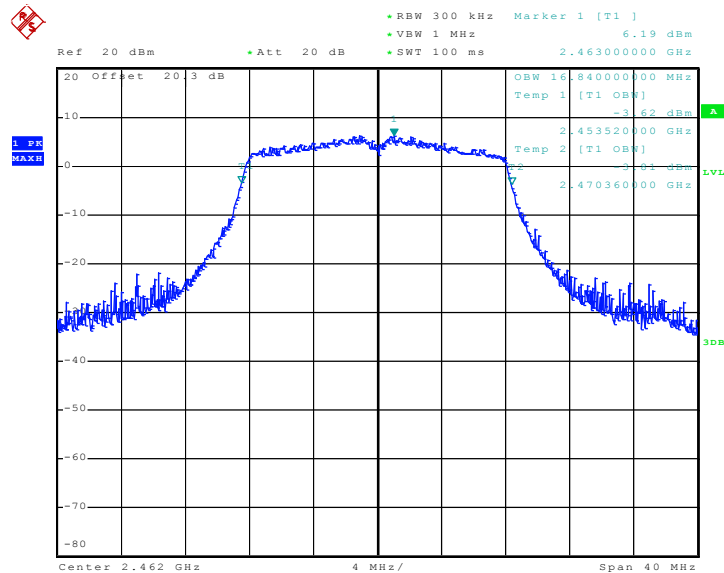


Mode 5 : 99% Occupied Bandwidth Plot on 802.11g Channel 06



Date: 27.OCT.2010 07:02:14

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



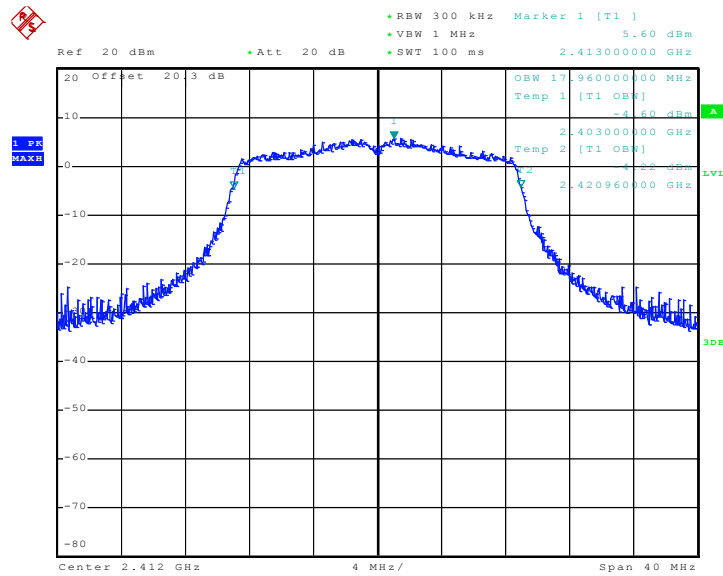
Date: 27.OCT.2010 07:05:46



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) 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	17.96	Pass
06	2437	18.00	Pass
11	2462	17.96	Pass

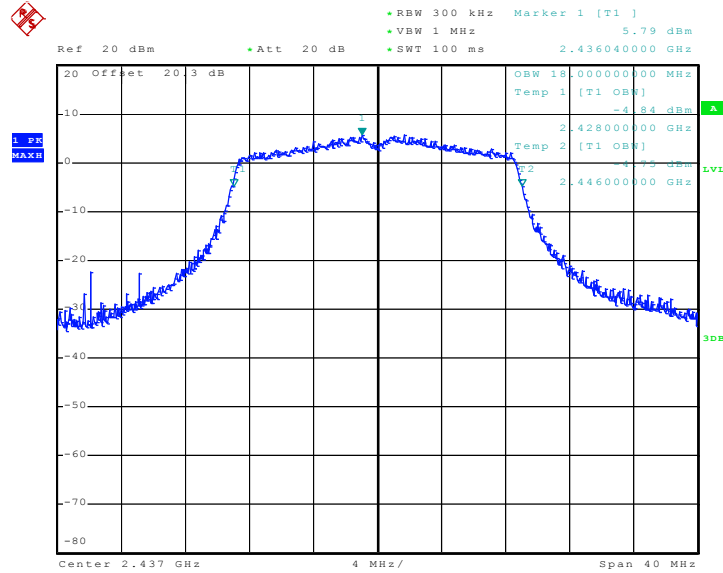
Mode 7 : 99% Occupied Bandwidth Plot on 802.11n(BW 20MHz) Channel 01



Date: 27.OCT.2010 07:08:40

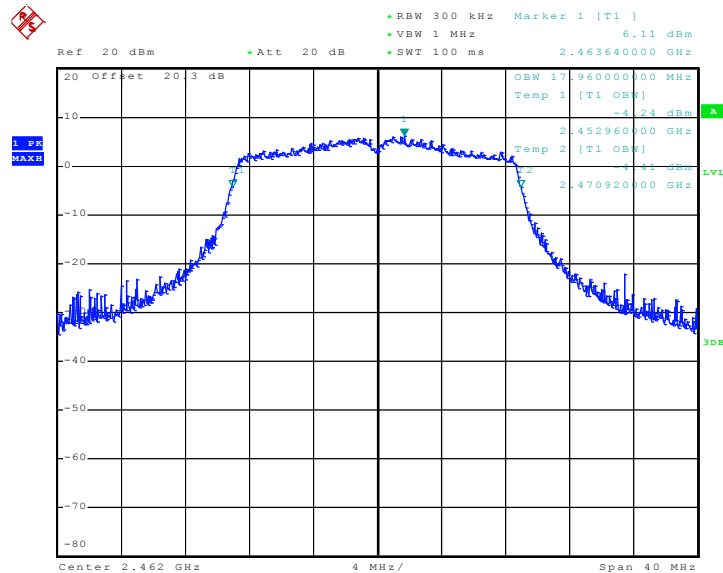


Mode 8 : 99% Occupied Bandwidth Plot on 802.11n(BW 20MHz) Channel 06



Date: 27.OCT.2010 07:10:43

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



Date: 27.OCT.2010 07:12:54

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.

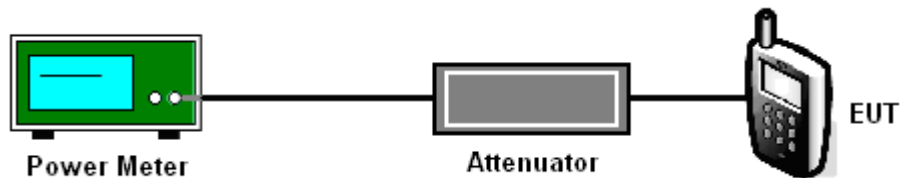
3.2.2 Measuring Instruments

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	20.14	30	Pass
06	2437	20.51	30	Pass
11	2462	20.88	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	22.53	30	Pass
06	2437	22.76	30	Pass
11	2462	22.81	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	22.43	30	Pass
06	2437	22.71	30	Pass
11	2462	22.75	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

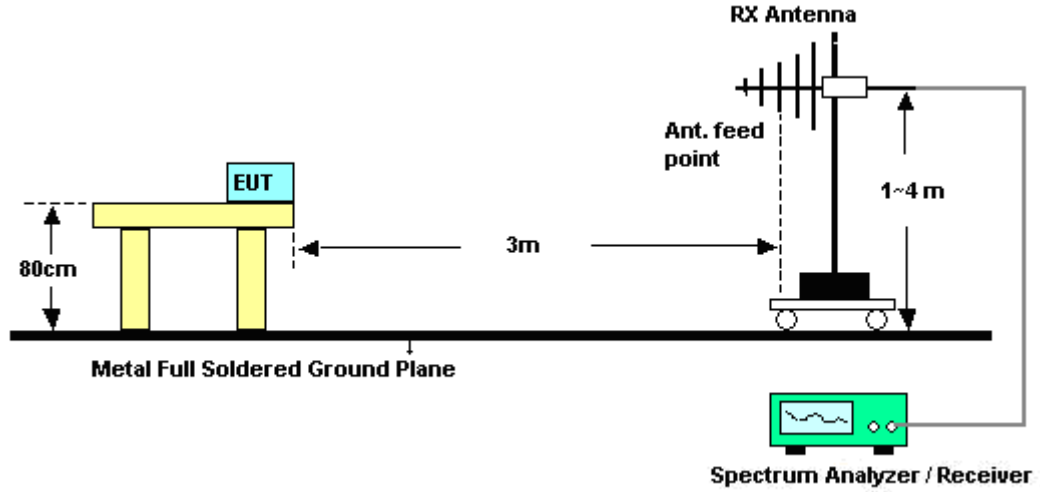
See list of measuring instruments of this test report.

3.3.3 Test Procedures

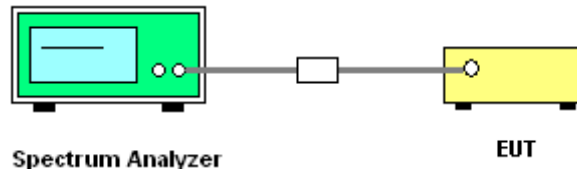
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) \geq RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized 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 :	49~53%
Test Channel :	01	Test Engineer :	Cona Huang

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	53.17	-20.83	74	51.05	31.7	4.5	34.08	200	211	Peak
2390	40.26	-13.74	54	38.14	31.7	4.5	34.08	200	211	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
2389.99	55.23	-18.77	74	52.55	31.7	4.5	33.52	100	169	Peak
2389.99	42.98	-11.02	54	40.3	31.7	4.5	33.52	100	169	Average

Test Mode :	Mode 3	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	49~53%
Test Channel :	11	Test Engineer :	Cona Huang

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	53.99	-20.01	74	51.7	31.78	4.59	34.08	190	224	Peak
2483.5	42.26	-11.74	54	39.97	31.78	4.59	34.08	190	224	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
2498	52.47	-21.53	74	50.13	31.8	4.62	34.08	162	5	Peak
2498	38.07	-15.93	54	35.73	31.8	4.62	34.08	162	5	Average



Test Mode :	Mode 4	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	49~53%
Test Channel :	01	Test Engineer :	Cona Huang

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	53.68	-20.32	74	51.56	31.7	4.5	34.08	196	211	Peak
2390	39.98	-14.02	54	37.86	31.7	4.5	34.08	196	211	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	51.41	-22.59	74	48.76	31.7	4.47	33.52	128	39	Peak
2389.61	39.74	-14.26	54	37.09	31.7	4.47	33.52	128	39	Average

Test Mode :	Mode 6	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	49~53%
Test Channel :	11	Test Engineer :	Cona Huang

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	59.56	-14.44	74	57.27	31.78	4.59	34.08	190	226	Peak
2483.5	43.5	-10.5	54	41.21	31.78	4.59	34.08	190	226	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	55.66	-18.34	74	53.37	31.78	4.59	34.08	100	340	Peak
2483.5	40.38	-13.62	54	38.09	31.78	4.59	34.08	100	340	Average



Test Mode :	Mode 7	Temperature :	23~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	49~53%
Test Channel :	01	Test Engineer :	Cona Huang

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	54.78	-19.22	74	52.66	31.7	4.5	34.08	197	213	Peak
2390	40.55	-13.45	54	38.43	31.7	4.5	34.08	197	213	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
2389.23	61.13	-12.87	74	58.48	31.7	4.47	33.52	125	37	Peak
2389.23	42.73	-11.27	54	40.08	31.7	4.47	33.52	125	37	Average

Test Mode :	Mode 9	Temperature :	23~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	49~53%
Test Channel :	11	Test Engineer :	Cona Huang

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	61.49	-12.51	74	59.2	31.78	4.59	34.08	189	227	Peak
2483.5	44.62	-9.38	54	42.33	31.78	4.59	34.08	189	227	Average

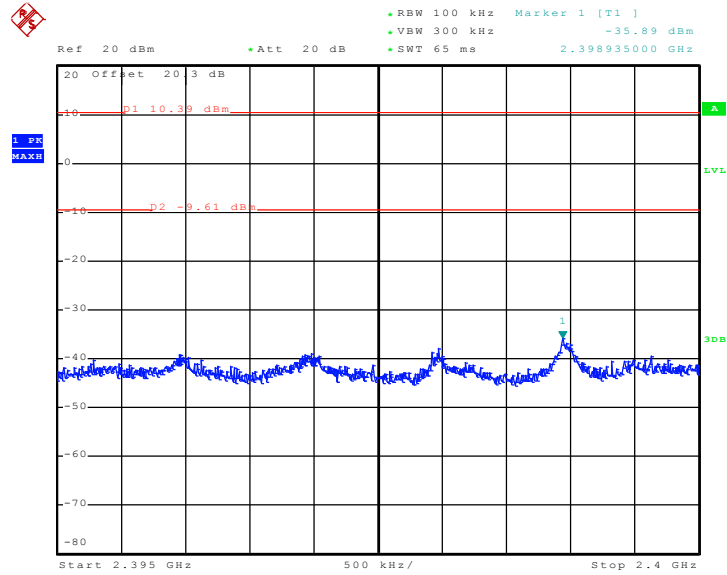
ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	56.63	-17.37	74	54.34	31.78	4.59	34.08	163	7	Peak
2483.5	40.69	-13.31	54	38.4	31.78	4.59	34.08	163	7	Average



3.3.6 Test Plots of Conducted Band Edges

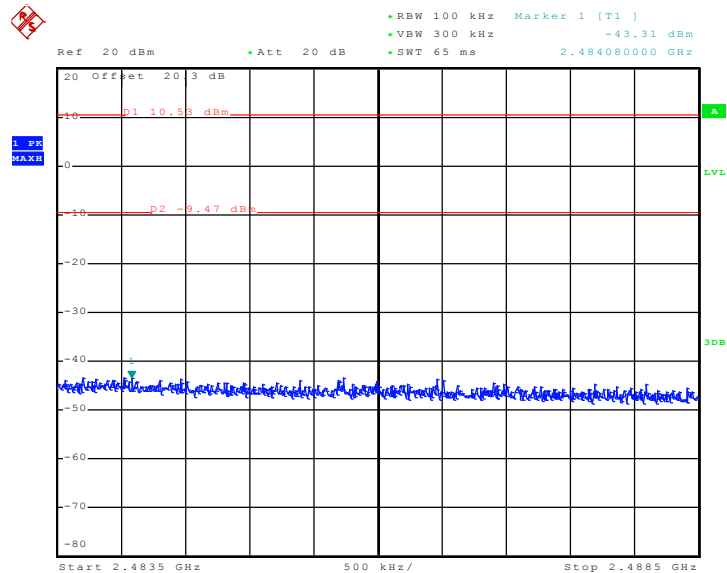
Test Mode :	Mode 1 and 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11b Channel 01



Date: 27.OCT.2010 06:50:12

High Band Edge Plot on 802.11b Channel 11

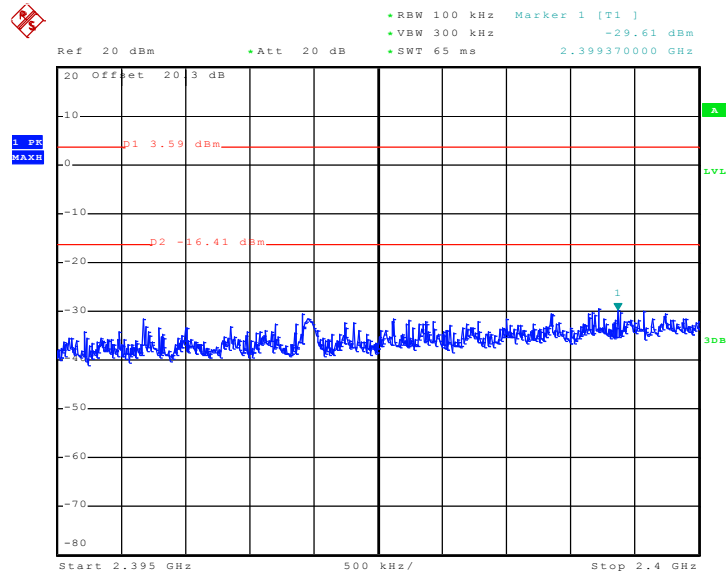


Date: 27.OCT.2010 06:55:54



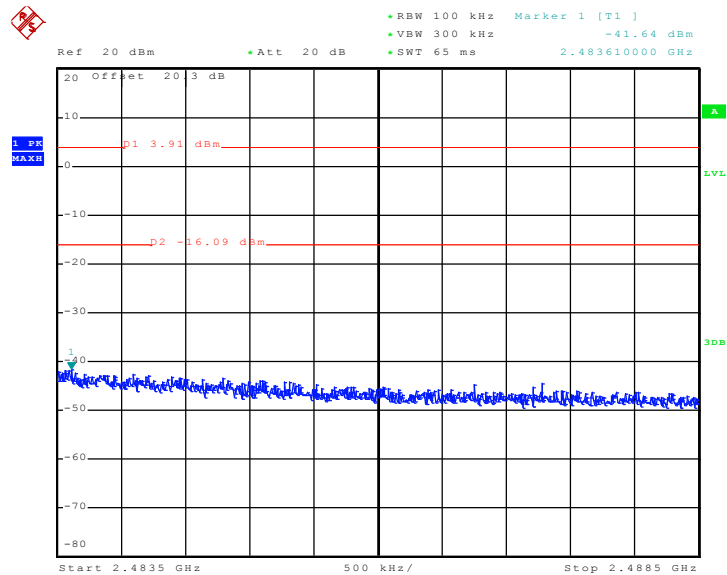
Test Mode :	Mode 4 and 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11g Channel 01



Date: 27.OCT.2010 06:59:28

High Band Edge Plot on 802.11g Channel 11

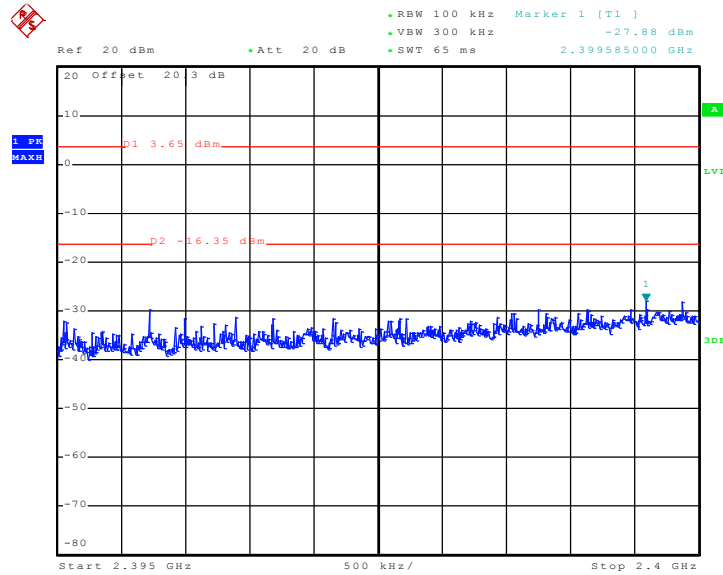


Date: 27.OCT.2010 07:04:59



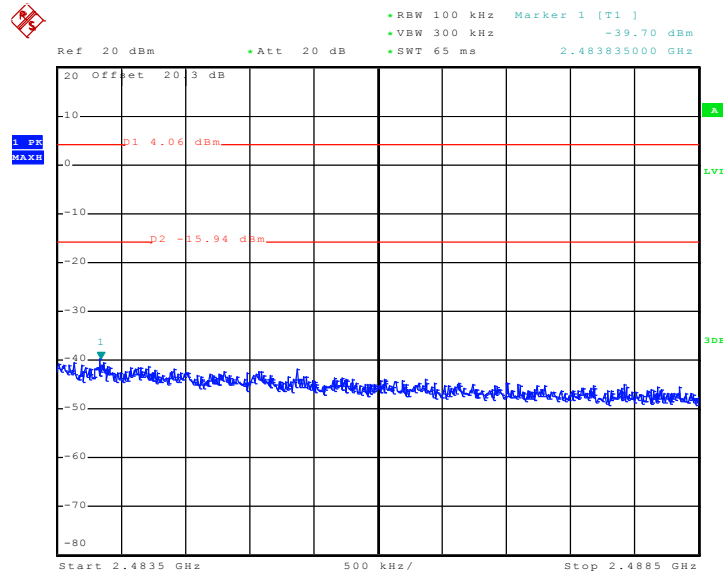
Test Mode :	Mode 7 and 9	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

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



Date: 27.OCT.2010 07:08:27

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



Date: 27.OCT.2010 07:49:37

3.4 Spurious Emission Measurement

3.4.1 Limit of Spurious Emission Measurement

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

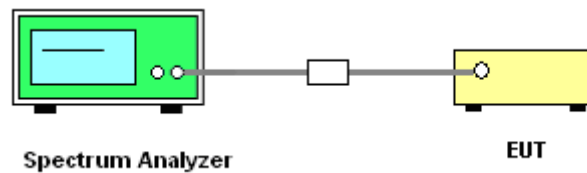
3.4.2 Measuring Instruments

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.

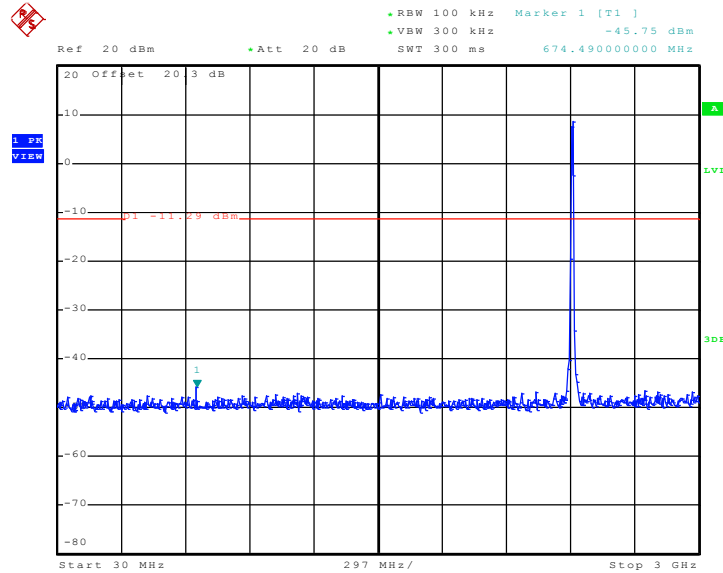
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

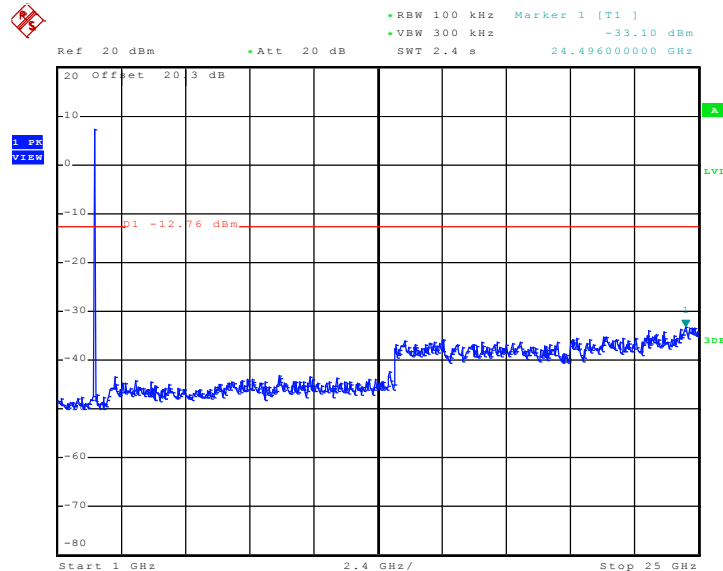
Test Mode :	Mode 1	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.OCT.2010 06:51:10

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

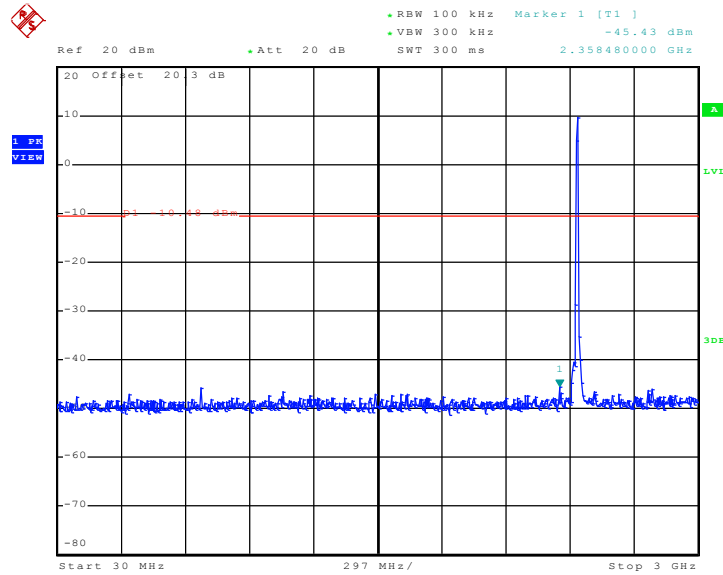


Date: 27.OCT.2010 06:51:26



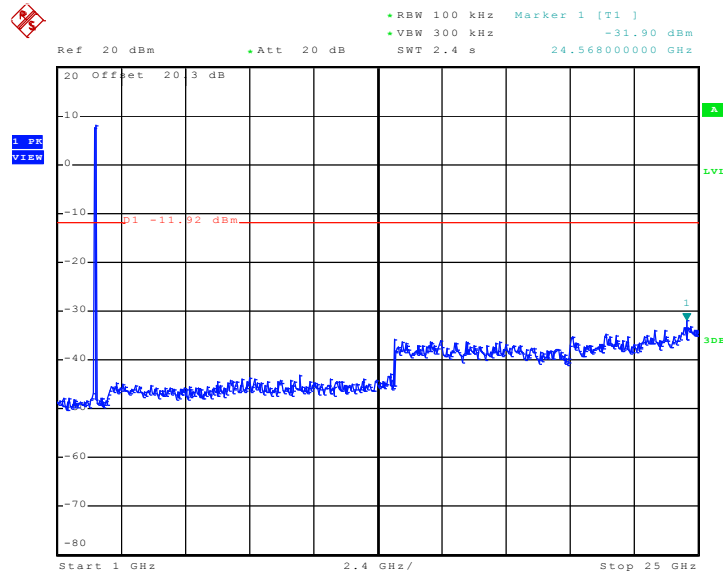
Test Mode :	Mode 2	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.OCT.2010 06:53:49

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

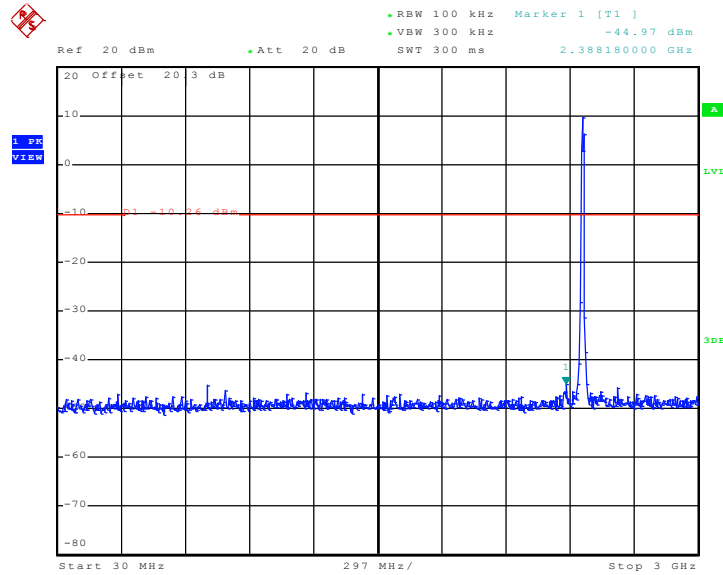


Date: 27.OCT.2010 06:54:06



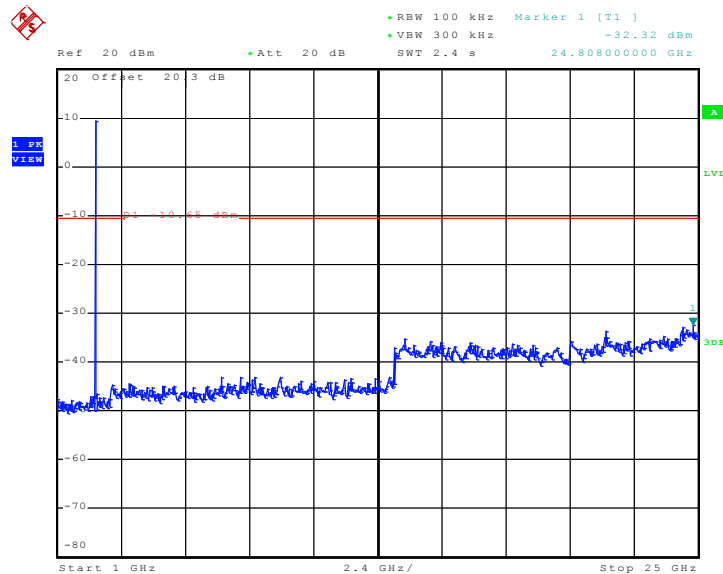
Test Mode :	Mode 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.OCT.2010 06:56:40

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

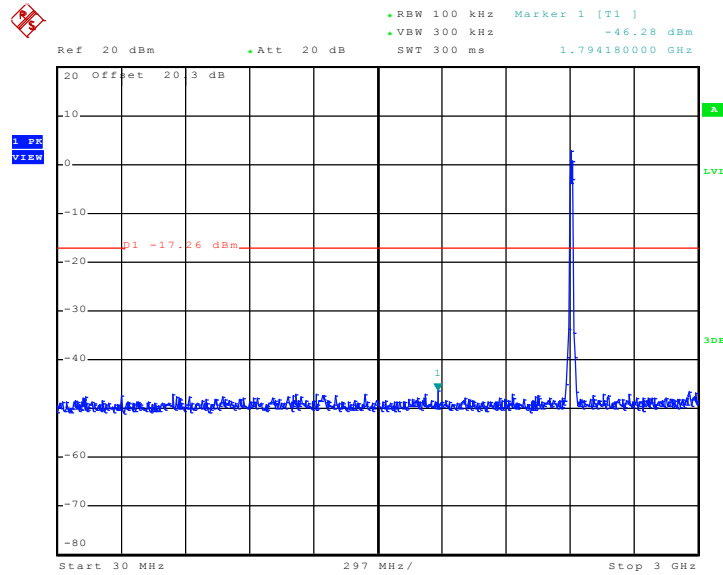


Date: 27.OCT.2010 06:56:57



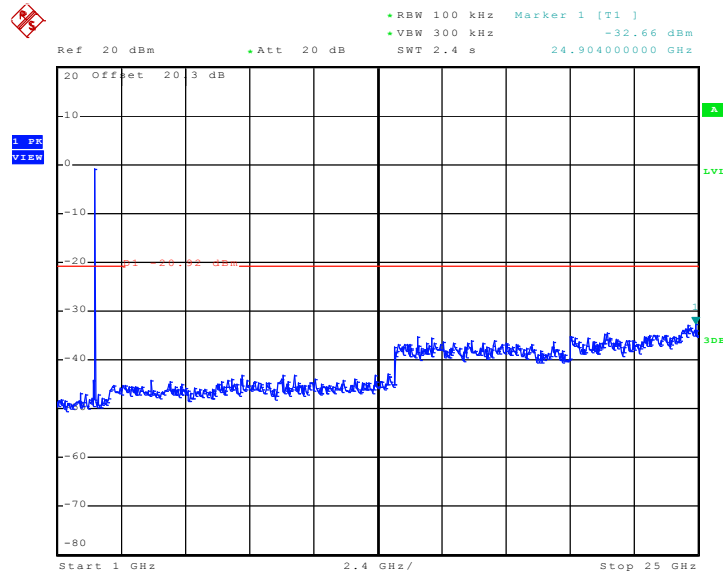
Test Mode :	Mode 4	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.OCT.2010 07:55:46

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

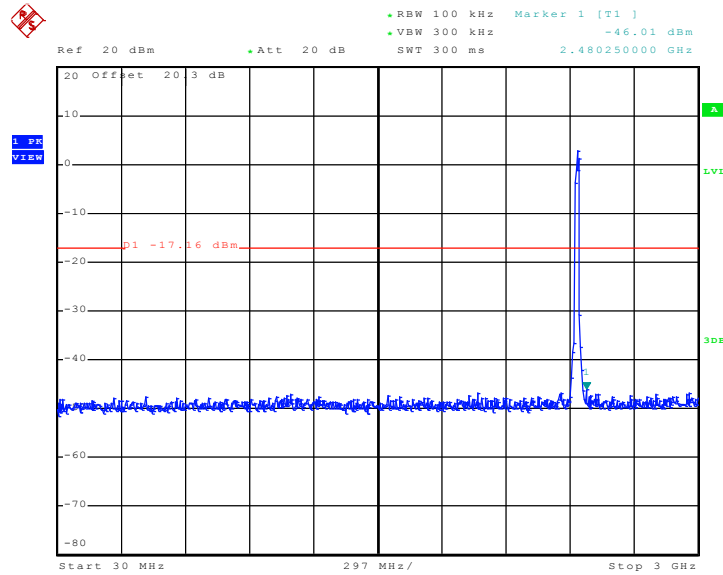


Date: 27.OCT.2010 07:00:29



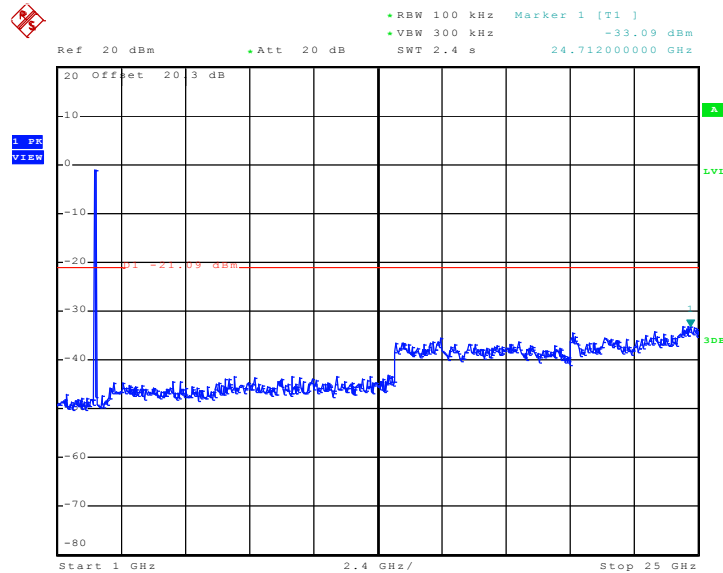
Test Mode :	Mode 5	Temperature :	24~26
Test Band :	802.11g	Relative Humidity :	50~53
Test Channel :	06	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.OCT.2010 07:56:50

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

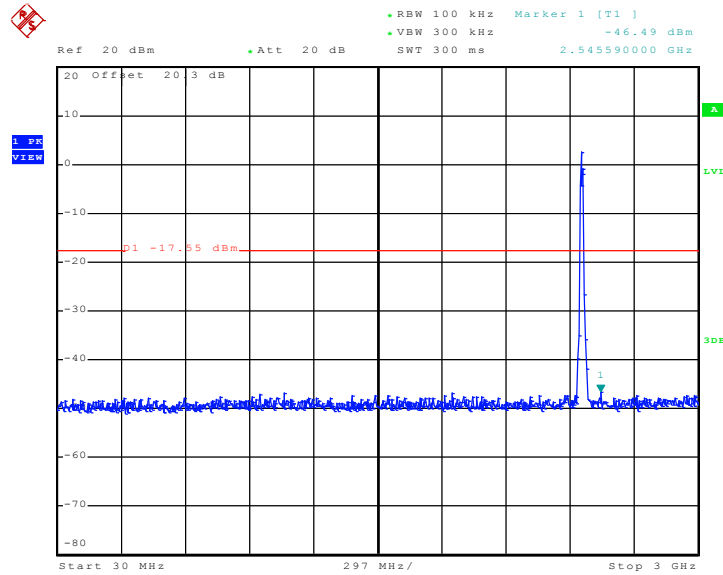


Date: 27.OCT.2010 07:02:51



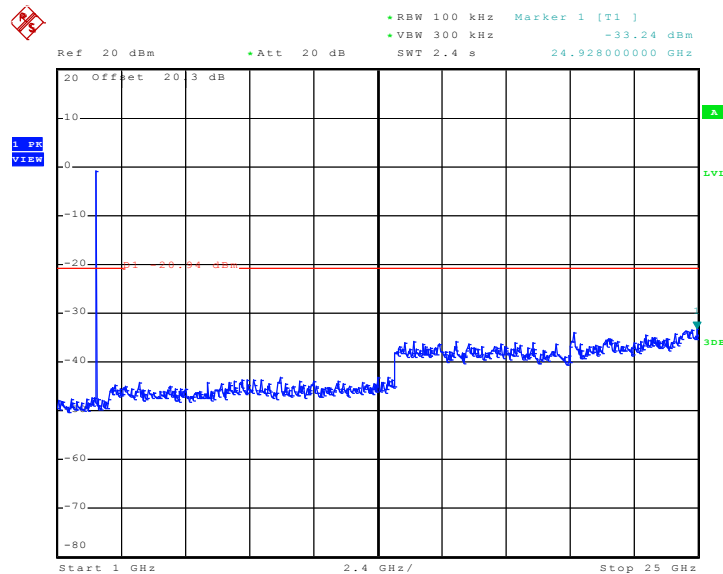
Test Mode :	Mode 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.OCT.2010 07:06:08

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

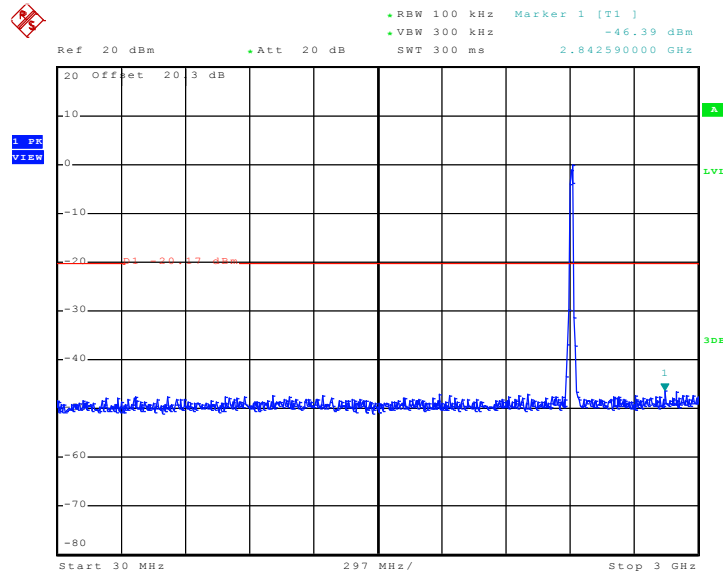


Date: 27.OCT.2010 07:06:24



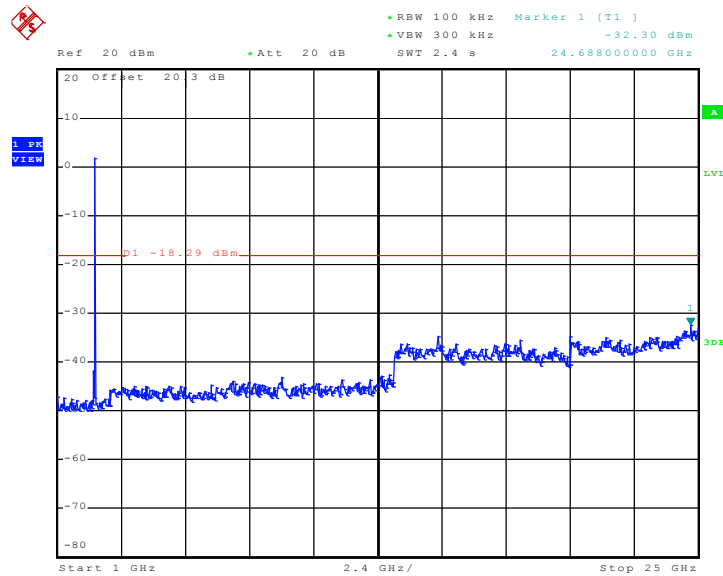
Test Mode :	Mode 7	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.OCT.2010 07:09:01

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

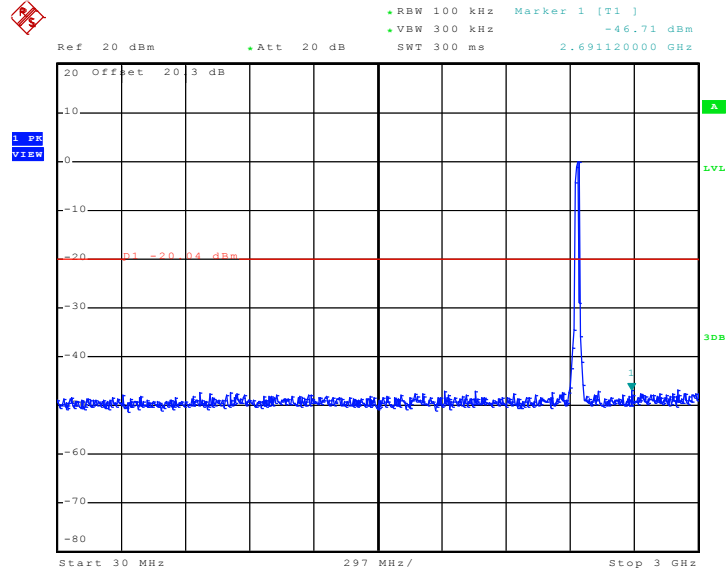


Date: 27.OCT.2010 07:09:18



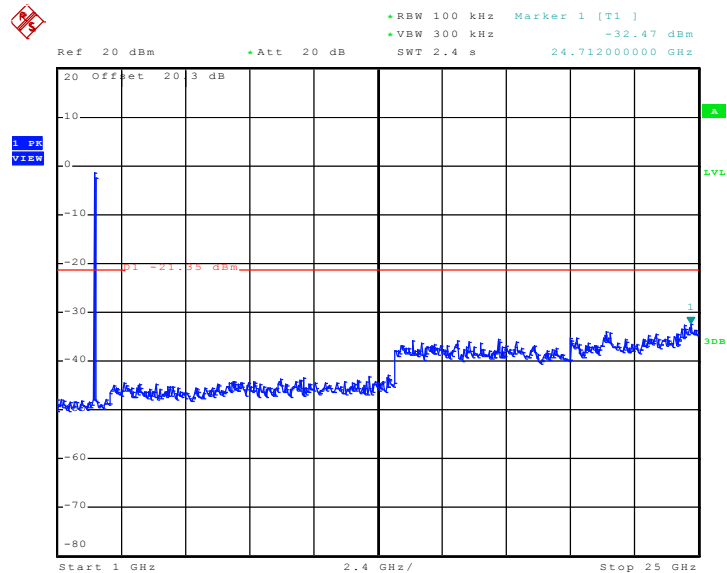
Test Mode :	Mode 8	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.OCT.2010 07:11:07

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

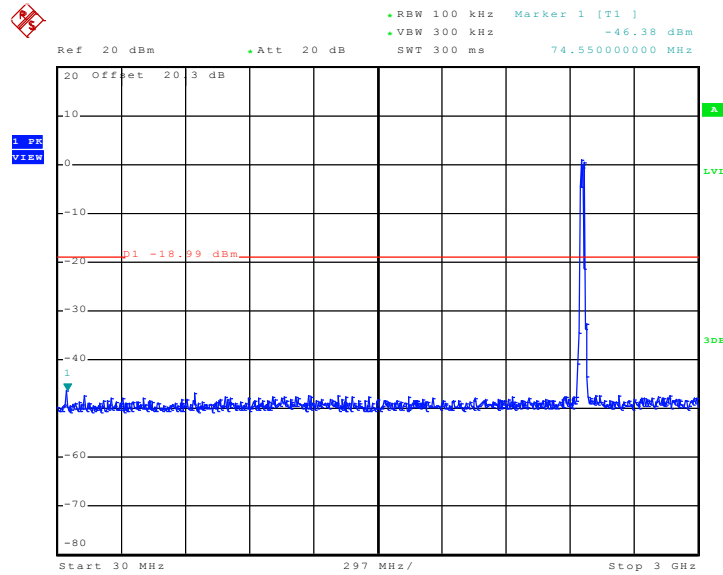


Date: 27.OCT.2010 07:11:24



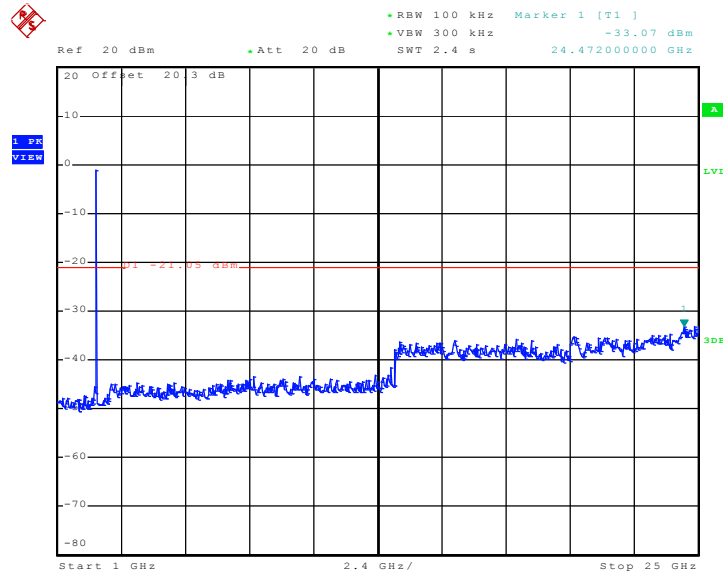
Test Mode :	Mode 9	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 27.OCT.2010 07:52:53

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz



Date: 27.OCT.2010 07:13:32

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.

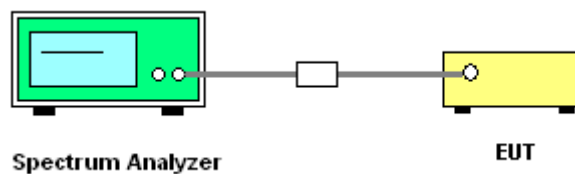
3.5.2 Measuring Instruments

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

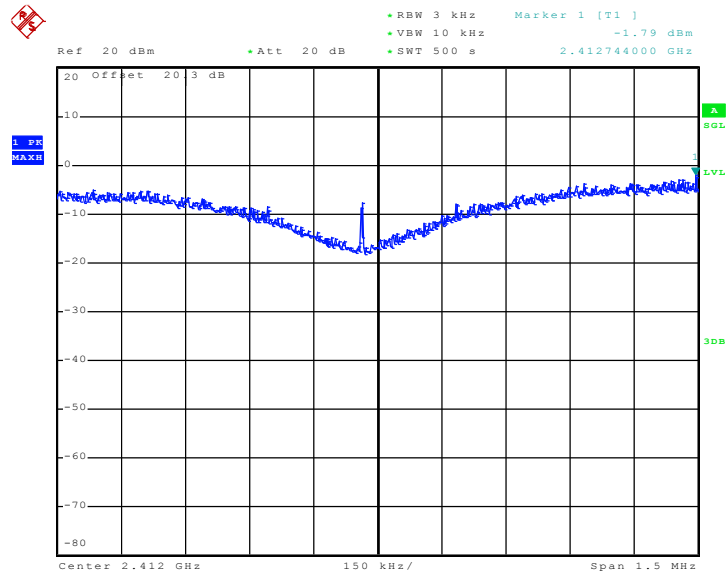


3.5.5 Test Result of Power Spectral Density

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	-1.79	8	Pass
06	2437	-1.68	8	Pass
11	2462	-1.50	8	Pass

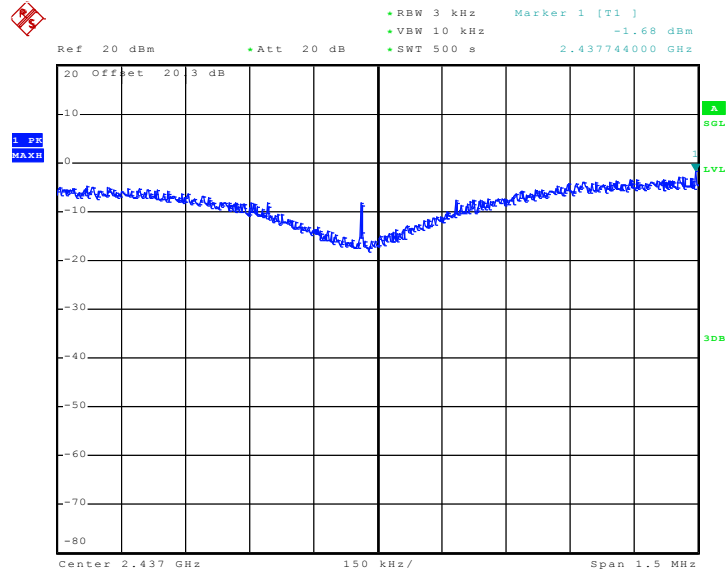
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 27.OCT.2010 07:23:13

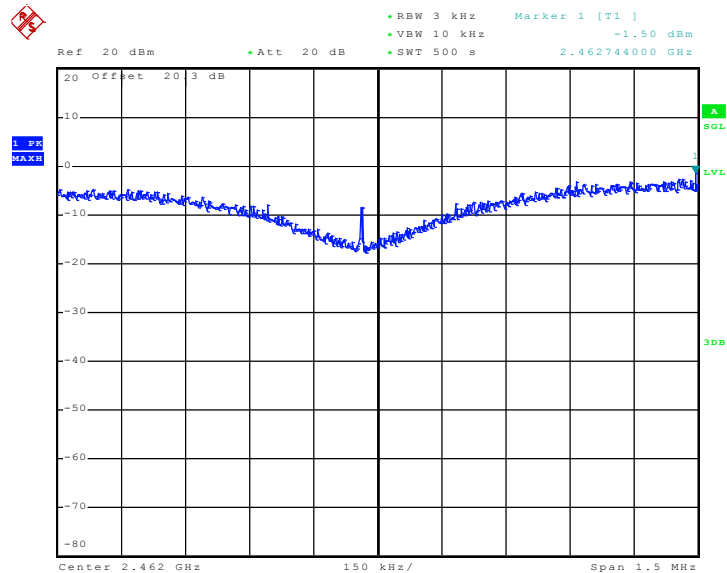


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 27.OCT.2010 07:33:37

Mode 3 : PSD Plot on 802.11b Channel 11



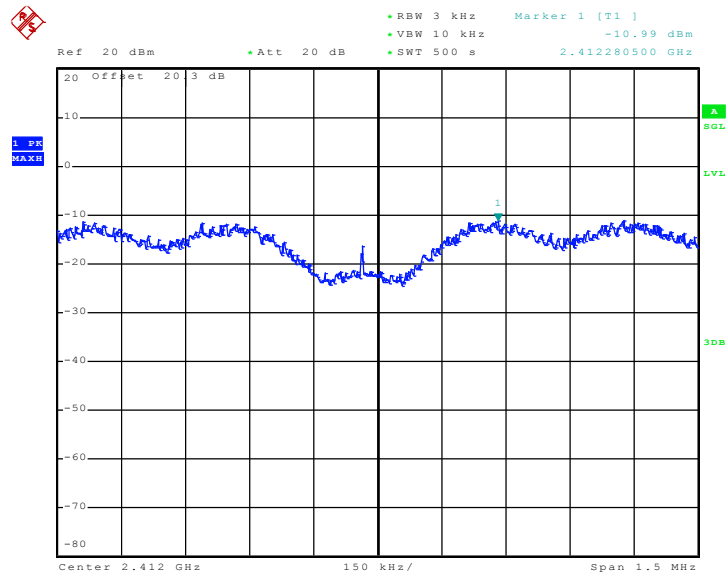
Date: 27.OCT.2010 07:42:35



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	-10.99	8	Pass
06	2437	-11.06	8	Pass
11	2462	-10.71	8	Pass

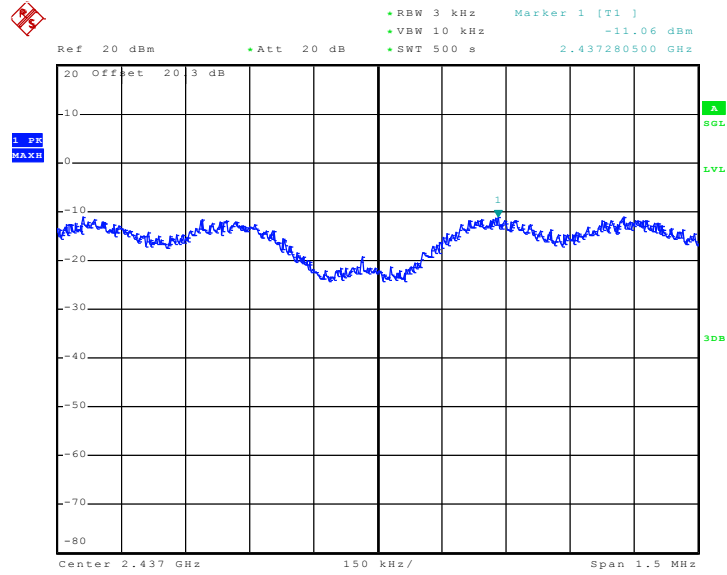
Mode 4 : PSD Plot on 802.11g Channel 01



Date: 27.OCT.2010 08:19:35

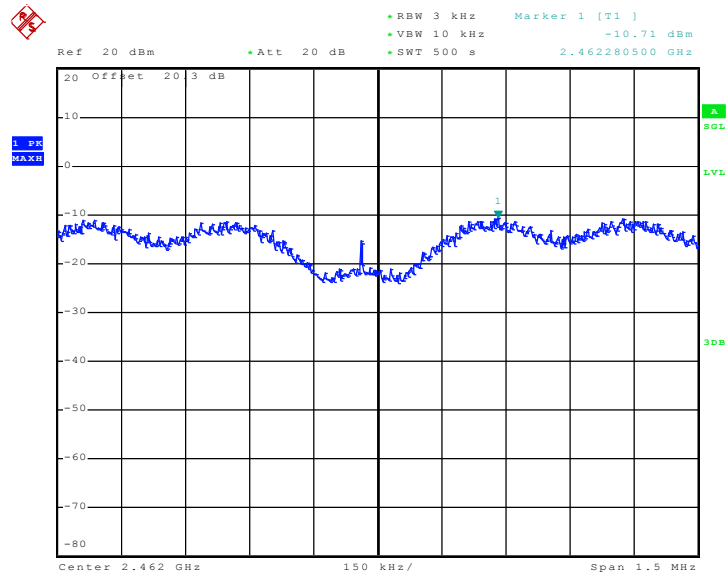


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 27.OCT.2010 08:28:34

Mode 6 : PSD Plot on 802.11g Channel 11



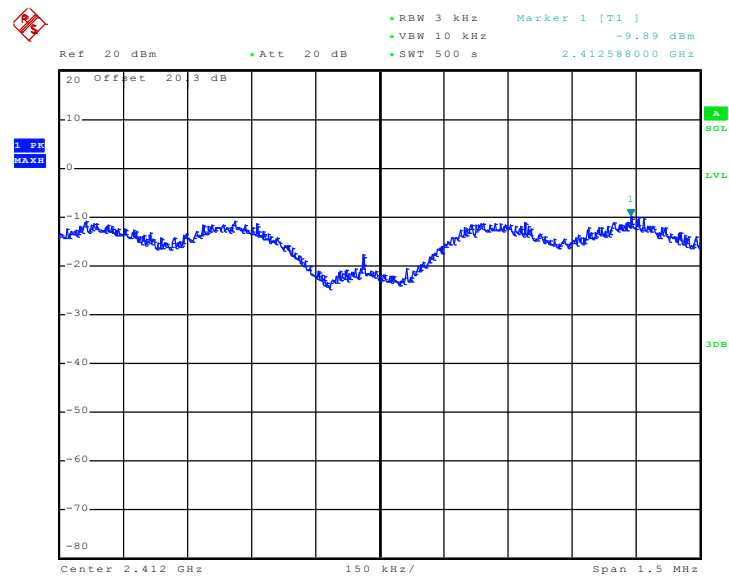
Date: 27.OCT.2010 08:38:14



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	-9.89	8	Pass
06	2437	-9.84	8	Pass
11	2462	-9.50	8	Pass

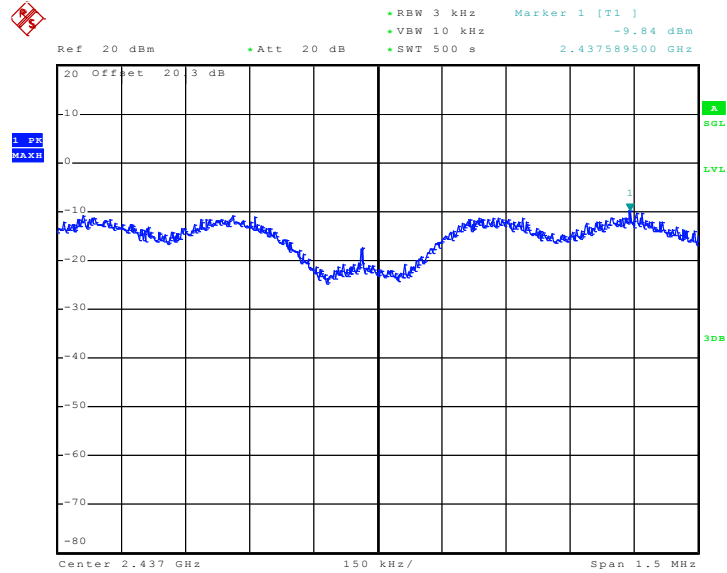
Mode 7 : PSD Plot on 802.11n (BW 20MHz) Channel 01



Date: 27.OCT.2010 08:47:08

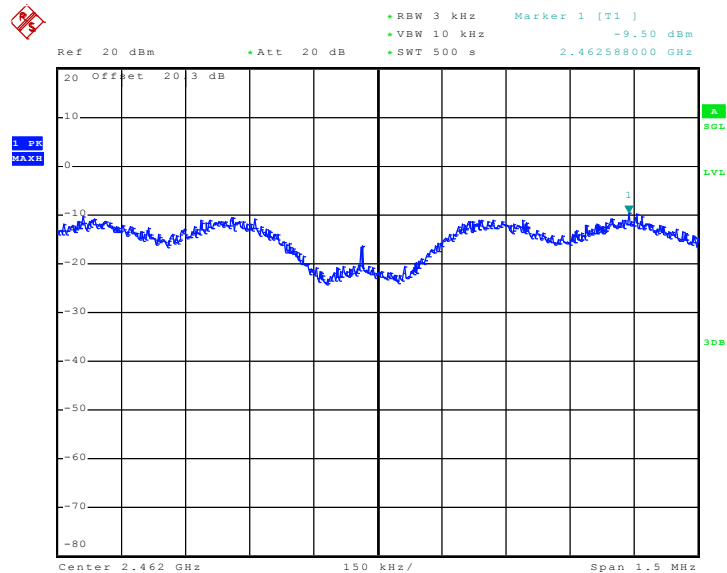


Mode 8 : PSD Plot on 802.11n (BW 20MHz) Channel 06



Date: 27.OCT.2010 08:56:10

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



Date: 27.OCT.2010 09:05:36

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.

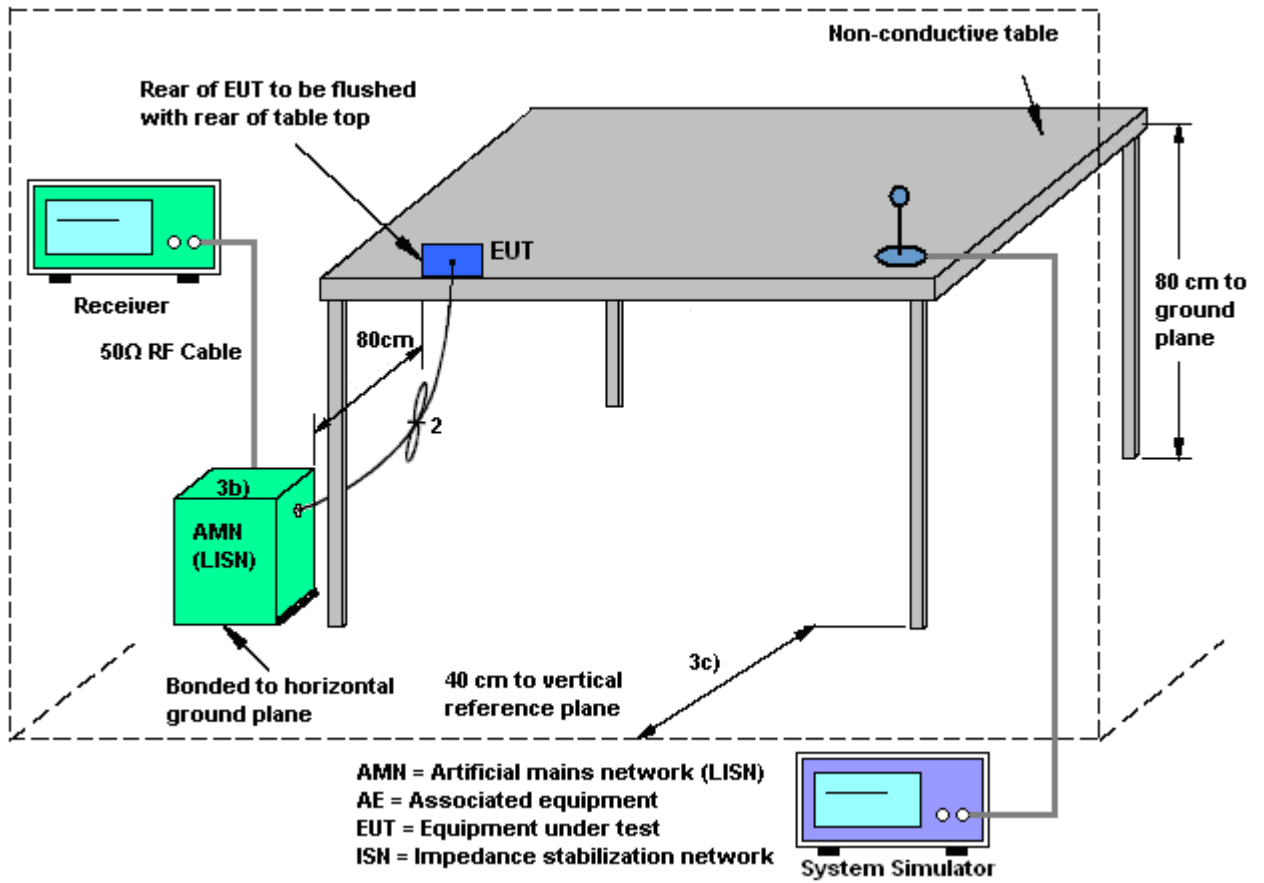
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

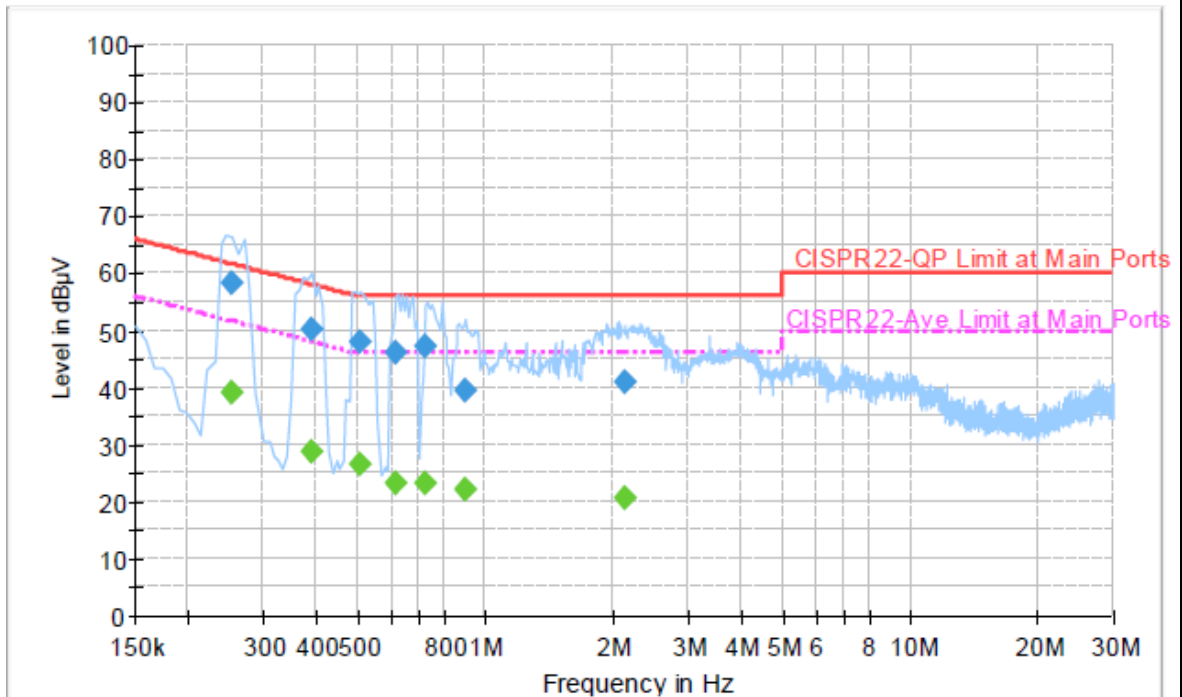
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	CDMA BC0 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone + Battery 4 + USB Cable 2 (Charging from Adapter 2)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

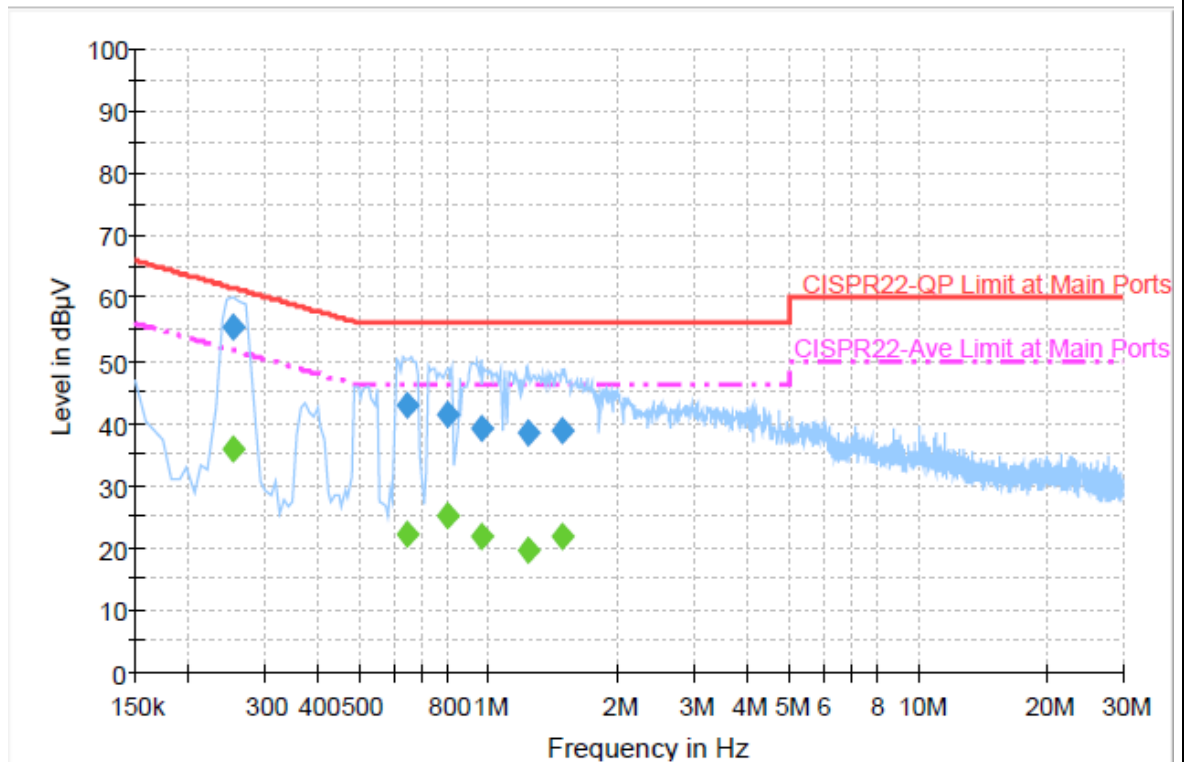
Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.254000	58.4	Off	L1	19.3	3.2	61.6
0.390000	50.2	Off	L1	19.4	7.9	58.1
0.510000	48.0	Off	L1	19.3	8.0	56.0
0.614000	46.2	Off	L1	19.3	9.8	56.0
0.726000	47.1	Off	L1	19.4	8.9	56.0
0.894000	39.6	Off	L1	19.4	16.4	56.0
2.134000	40.8	Off	L1	19.4	15.2	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.254000	39.2	Off	L1	19.3	12.4	51.6
0.390000	29.0	Off	L1	19.4	19.1	48.1
0.510000	26.5	Off	L1	19.3	19.5	46.0
0.614000	23.1	Off	L1	19.3	22.9	46.0
0.726000	23.4	Off	L1	19.4	22.6	46.0
0.894000	22.2	Off	L1	19.4	23.8	46.0
2.134000	20.8	Off	L1	19.4	25.2	46.0



Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Novic Chiang	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	CDMA BC0 Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone + Battery 4 + USB Cable 2 (Charging from Adapter 2)		
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)
0.254000	55.5	Off	N	19.4	6.1	61.6
0.646000	42.9	Off	N	19.3	13.1	56.0
0.798000	41.4	Off	N	19.4	14.6	56.0
0.958000	39.1	Off	N	19.4	16.9	56.0
1.238000	38.3	Off	N	19.5	17.7	56.0
1.478000	38.7	Off	N	19.4	17.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.254000	35.9	Off	N	19.4	15.7	51.6
0.646000	22.3	Off	N	19.3	23.7	46.0
0.798000	24.9	Off	N	19.4	21.1	46.0
0.958000	21.6	Off	N	19.4	24.4	46.0
1.238000	19.7	Off	N	19.5	26.3	46.0
1.478000	21.9	Off	N	19.4	24.1	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

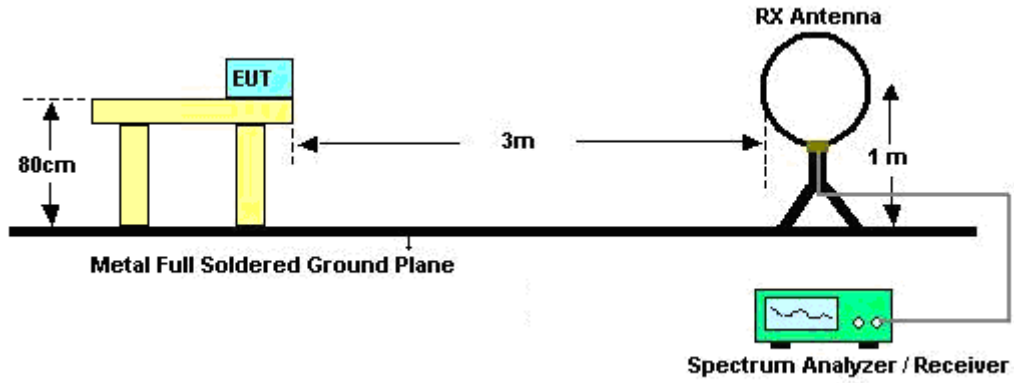
See list of measuring instruments of this test report.

3.7.3 Test Procedures

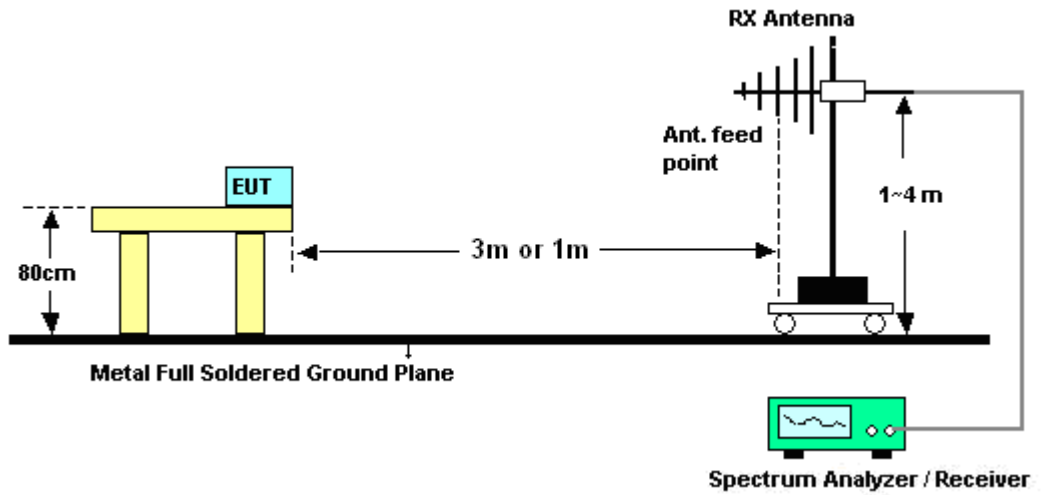
1. The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:
 - (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = 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 above 30MHz





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

Test Engineer :	Cona Huang	Temperature :	23~24°C
		Relative Humidity :	49~53%

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

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



3.7.6 Test Result of Radiated Emission (30 MHz ~ 10th Harmonic)

Test Mode :	Mode 1	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
184.44	33.39	-10.11	43.5	54.55	9.11	1.23	31.5	-	-	Peak
233.58	38.79	-7.21	46	58.11	10.84	1.34	31.5	-	-	Peak
258.15	42.71	-3.29	46	59.3	13.48	1.42	31.49	100	34	Peak
307	25.69	-20.31	46	41.58	13.84	1.55	31.28	-	-	Peak
344.1	27.28	-18.72	46	42.03	14.85	1.71	31.31	-	-	Peak
380.5	27.47	-18.53	46	41.12	15.81	1.77	31.23	-	-	Peak
2390	40.26	-13.74	54	38.14	31.7	4.5	34.08	200	211	Average
2390	53.17	-20.83	74	51.05	31.7	4.5	34.08	200	211	Peak
2412	98.47	-	-	96.34	31.71	4.5	34.08	200	211	Average
2412	101.68	-	-	99.55	31.71	4.5	34.08	200	211	Peak
2484	37.75	-16.25	54	35.46	31.78	4.59	34.08	200	211	Average
2484	48.61	-25.39	74	46.32	31.78	4.59	34.08	200	211	Peak



Test Mode :	Mode 1	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
42.15	35.17	-4.83	40	54.79	11.34	0.58	31.54	100	216	Peak
48.36	32.63	-7.37	40	54.61	8.86	0.73	31.57	-	-	Peak
233.58	36.75	-9.25	46	56.07	10.84	1.34	31.5	-	-	Peak
307	21.82	-24.18	46	37.71	13.84	1.55	31.28	-	-	Peak
393.1	22.71	-23.29	46	35.84	16.25	1.82	31.2	-	-	Peak
599.6	21.55	-24.45	46	30.92	19.3	2.2	30.87	-	-	Peak
2389.99	42.98	-11.02	54	40.3	31.7	4.5	33.52	100	169	Average
2389.99	55.23	-18.77	74	52.55	31.7	4.5	33.52	100	169	Peak
2412	95.17	-	-	92.49	31.71	4.5	33.53	100	169	Average
2412	98.58	-	-	95.9	31.71	4.5	33.53	100	169	Peak
2492	33.71	-20.29	54	30.86	31.8	4.62	33.57	100	169	Average
2492	50.95	-23.05	74	48.1	31.8	4.62	33.57	100	169	Peak



Test Mode :	Mode 2	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
159.87	32.87	-10.63	43.5	53.2	10.03	1.14	31.5	-	-	Peak
233.58	38.09	-7.91	46	57.41	10.84	1.34	31.5	-	-	Peak
258.15	39.98	-6.02	46	56.57	13.48	1.42	31.49	100	31	Peak
307	27.07	-18.93	46	42.96	13.84	1.55	31.28	-	-	Peak
344.1	27.35	-18.65	46	42.1	14.85	1.71	31.31	-	-	Peak
393.1	23.71	-22.29	46	36.84	16.25	1.82	31.2	-	-	Peak
2324	33.22	-20.78	54	30.67	31.63	4.41	33.49	103	16	Average
2324	50.37	-23.63	74	47.82	31.63	4.41	33.49	103	16	Peak
2437	97.55	-	-	94.82	31.75	4.53	33.55	103	16	Average
2437	101.06	-	-	98.33	31.75	4.53	33.55	103	16	Peak
2498	32.52	-21.48	54	29.67	31.8	4.62	33.57	103	16	Average
2498	50.31	-23.69	74	47.46	31.8	4.62	33.57	103	16	Peak



Test Mode :	Mode 2	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
41.88	35.02	-4.98	40	54.22	11.75	0.58	31.53	100	269	Peak
209.01	34.37	-9.13	43.5	55.17	9.41	1.26	31.47	-	-	Peak
233.58	38.24	-7.76	46	57.56	10.84	1.34	31.5	-	-	Peak
356	20.32	-25.68	46	34.77	15.13	1.71	31.29	-	-	Peak
514.2	20.31	-25.69	46	30.86	18.45	2.04	31.04	-	-	Peak
698.3	22.18	-23.82	46	30.55	19.95	2.4	30.72	-	-	Peak
2384	34.11	-19.89	54	31.48	31.68	4.47	33.52	100	298	Average
2384	49.57	-24.43	74	46.94	31.68	4.47	33.52	100	298	Peak
2437	95.15	-	-	92.42	31.75	4.53	33.55	100	298	Average
2437	97.59	-	-	94.86	31.75	4.53	33.55	100	298	Peak
2488	32.4	-21.6	54	29.58	31.8	4.59	33.57	100	298	Average
2488	49.28	-24.72	74	46.46	31.8	4.59	33.57	100	298	Peak



Test Mode :	Mode 3	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
184.44	29.99	-13.51	43.5	51.15	9.11	1.23	31.5	-	-	Peak
233.58	38.08	-7.92	46	57.4	10.84	1.34	31.5	-	-	Peak
258.15	41.68	-4.32	46	58.27	13.48	1.42	31.49	100	25	Peak
307	27.97	-18.03	46	43.86	13.84	1.55	31.28	-	-	Peak
344.1	27.29	-18.71	46	42.04	14.85	1.71	31.31	-	-	Peak
356	27.69	-18.31	46	42.14	15.13	1.71	31.29	-	-	Peak
2388	41.98	-12.02	54	39.89	31.7	4.47	34.08	190	224	Average
2388	51.51	-22.49	74	49.42	31.7	4.47	34.08	190	224	Peak
2462	99.68	-	-	97.43	31.77	4.56	34.08	190	224	Average
2462	101.78	-	-	99.53	31.77	4.56	34.08	190	224	Peak
2483.5	42.26	-11.74	54	39.97	31.78	4.59	34.08	190	224	Average
2483.5	53.99	-20.01	74	51.7	31.78	4.59	34.08	190	224	Peak



Test Mode :	Mode 3	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
42.15	35.73	-4.27	40	55.35	11.34	0.58	31.54	100	310	Peak
48.63	32.7	-7.3	40	54.68	8.86	0.73	31.57	-	-	Peak
233.58	40.81	-5.19	46	60.13	10.84	1.34	31.5	-	-	Peak
307	20.72	-25.28	46	36.61	13.84	1.55	31.28	-	-	Peak
393.1	21.96	-24.04	46	35.09	16.25	1.82	31.2	-	-	Peak
638.1	22.21	-23.79	46	31.2	19.55	2.25	30.79	-	-	Peak
2386	40.55	-13.45	54	38.46	31.7	4.47	34.08	162	5	Average
2386	51.6	-22.4	74	49.51	31.7	4.47	34.08	162	5	Peak
2462	95.61	-	-	93.36	31.77	4.56	34.08	162	5	Average
2462	98.03	-	-	95.78	31.77	4.56	34.08	162	5	Peak
2498	38.07	-15.93	54	35.73	31.8	4.62	34.08	162	5	Average
2498	52.47	-21.53	74	50.13	31.8	4.62	34.08	162	5	Peak



Test Mode :	Mode 4	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
209.01	32.69	-10.81	43.5	53.49	9.41	1.26	31.47	-	-	Peak
233.58	40.89	-5.11	46	60.21	10.84	1.34	31.5	-	-	Peak
258.15	41.98	-4.02	46	58.57	13.48	1.42	31.49	100	34	Peak
307	26.18	-19.82	46	42.07	13.84	1.55	31.28	-	-	Peak
344.1	26.93	-19.07	46	41.68	14.85	1.71	31.31	-	-	Peak
356	27.39	-18.61	46	41.84	15.13	1.71	31.29	-	-	Peak
2390	39.98	-14.02	54	37.86	31.7	4.5	34.08	196	211	Average
2390	53.68	-20.32	74	51.56	31.7	4.5	34.08	196	211	Peak
2412	92.32	-	-	90.19	31.71	4.5	34.08	196	211	Average
2412	100.95	-	-	98.82	31.71	4.5	34.08	196	211	Peak
2492	37.82	-16.18	54	35.48	31.8	4.62	34.08	196	211	Average
2492	50.19	-23.81	74	47.85	31.8	4.62	34.08	196	211	Peak



Test Mode :	Mode 4	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
42.15	35.92	-4.08	40	55.54	11.34	0.58	31.54	-	-	Peak
47.82	33.95	-6.05	40	55.51	9.27	0.73	31.56	-	-	Peak
233.58	40	-6	46	59.32	10.84	1.34	31.5	100	158	Peak
307	19.69	-26.31	46	35.58	13.84	1.55	31.28	-	-	Peak
393.1	22.28	-23.72	46	35.41	16.25	1.82	31.2	-	-	Peak
549.2	21.81	-24.19	46	31.31	19.3	2.15	30.95	-	-	Peak
2389.61	39.74	-14.26	54	37.09	31.7	4.47	33.52	128	39	Average
2389.61	51.41	-22.59	74	48.76	31.7	4.47	33.52	128	39	Peak
2412	88.62	-	-	85.94	31.71	4.5	33.53	128	39	Average
2412	97.62	-	-	94.94	31.71	4.5	33.53	128	39	Peak
2492	32.02	-21.98	54	29.17	31.8	4.62	33.57	128	39	Average
2492	50.11	-23.89	74	47.26	31.8	4.62	33.57	128	39	Peak



Test Mode :	Mode 5	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
91.29	28.94	-14.56	43.5	49.97	9.67	0.84	31.54	-	-	Peak
233.58	38.48	-7.52	46	57.8	10.84	1.34	31.5	-	-	Peak
258.15	41.44	-4.56	46	58.03	13.48	1.42	31.49	100	245	Peak
307	27.96	-18.04	46	43.85	13.84	1.55	31.28	-	-	Peak
344.1	27.36	-18.64	46	42.11	14.85	1.71	31.31	-	-	Peak
356	26.56	-19.44	46	41.01	15.13	1.71	31.29	-	-	Peak
2360	50.64	-23.36	74	48.05	31.66	4.44	33.51	126	315	Peak
2360	50.64	-23.36	74	48.05	31.66	4.44	33.51	126	315	Peak
2437	91.28	-	-	88.55	31.75	4.53	33.55	126	315	Average
2437	99.09	-	-	96.36	31.75	4.53	33.55	126	315	Peak
2498	32.32	-21.68	54	29.47	31.8	4.62	33.57	126	315	Average
2498	50.29	-23.71	74	47.44	31.8	4.62	33.57	126	315	Peak



Test Mode :	Mode 5	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
42.69	35.61	-4.39	40	55.08	11.34	0.73	31.54	100	126	Peak
47.82	34.23	-5.77	40	55.79	9.27	0.73	31.56	-	-	Peak
226.29	36.62	-9.38	46	56.9	9.87	1.34	31.49	-	-	Peak
356	22.92	-23.08	46	37.37	15.13	1.71	31.29	-	-	Peak
505.8	20.06	-25.94	46	30.84	18.24	2.04	31.06	-	-	Peak
675.9	22.51	-23.49	46	31.1	19.8	2.35	30.74	-	-	Peak
2360	39.89	-14.11	54	37.3	31.66	4.44	33.51	100	35	Average
2360	51.39	-22.61	74	48.8	31.66	4.44	33.51	100	35	Peak
2437	86.89	-	-	84.16	31.75	4.53	33.55	100	35	Average
2437	95.14	-	-	92.41	31.75	4.53	33.55	100	35	Peak
2490	32.17	-21.83	54	29.32	31.8	4.62	33.57	100	35	Average
2490	49.69	-24.31	74	46.84	31.8	4.62	33.57	100	35	Peak



Test Mode :	Mode 6	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
184.44	32.28	-11.22	43.5	53.44	9.11	1.23	31.5	-	-	Peak
233.58	41.81	-4.19	46	61.13	10.84	1.34	31.5	-	-	Peak
258.15	42.17	-3.83	46	58.76	13.48	1.42	31.49	100	36	Peak
307	30.49	-15.51	46	46.38	13.84	1.55	31.28	-	-	Peak
331.5	32.12	-13.88	46	47.22	14.57	1.63	31.3	-	-	Peak
356	24.38	-21.62	46	38.83	15.13	1.71	31.29	-	-	Peak
2390	40.03	-13.97	54	37.91	31.7	4.5	34.08	190	226	Average
2390	51.06	-22.94	74	48.94	31.7	4.5	34.08	190	226	Peak
2462	90.36	-	-	88.11	31.77	4.56	34.08	190	226	Average
2462	100.75	-	-	98.5	31.77	4.56	34.08	190	226	Peak
2483.5	43.5	-10.5	54	41.21	31.78	4.59	34.08	190	226	Average
2483.5	59.56	-14.44	74	57.27	31.78	4.59	34.08	190	226	Peak



Test Mode :	Mode 6	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
42.42	35.27	-4.73	40	54.89	11.34	0.58	31.54	100	154	Peak
47.55	33.71	-6.29	40	55.27	9.27	0.73	31.56	-	-	Peak
233.58	37.65	-8.35	46	56.97	10.84	1.34	31.5	-	-	Peak
307	24.43	-21.57	46	40.32	13.84	1.55	31.28	-	-	Peak
331.5	21.98	-24.02	46	37.08	14.57	1.63	31.3	-	-	Peak
393.1	22.11	-23.89	46	35.24	16.25	1.82	31.2	-	-	Peak
2374	38.1	-15.9	54	36.03	31.68	4.47	34.08	100	340	Average
2374	50.17	-23.83	74	48.1	31.68	4.47	34.08	100	340	Peak
2462	86.91	-	-	84.66	31.77	4.56	34.08	100	340	Average
2462	95.89	-	-	93.64	31.77	4.56	34.08	100	340	Peak
2483.5	40.38	-13.62	54	38.09	31.78	4.59	34.08	100	340	Average
2483.5	55.66	-18.34	74	53.37	31.78	4.59	34.08	100	340	Peak



Test Mode :	Mode 7	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
209.01	33.97	-9.53	43.5	54.77	9.41	1.26	31.47	-	-	Peak
233.58	42.01	-3.99	46	61.33	10.84	1.34	31.5	100	27	Peak
258.15	41.54	-4.46	46	58.13	13.48	1.42	31.49	-	-	Peak
318.9	24.67	-21.33	46	40.05	14.28	1.63	31.29	-	-	Peak
344.1	26.96	-19.04	46	41.71	14.85	1.71	31.31	-	-	Peak
393.1	24.12	-21.88	46	37.25	16.25	1.82	31.2	-	-	Peak
2390	40.55	-13.45	54	38.43	31.7	4.5	34.08	197	213	Average
2390	54.78	-19.22	74	52.66	31.7	4.5	34.08	197	213	Peak
2412	90.11	-	-	87.98	31.71	4.5	34.08	197	213	Average
2412	99.76	-	-	97.63	31.71	4.5	34.08	197	213	Peak
2492	37.8	-16.2	54	35.46	31.8	4.62	34.08	197	213	Average
2492	49.73	-24.27	74	47.39	31.8	4.62	34.08	197	213	Peak



Test Mode :	Mode 7	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
35.4	33.76	-6.24	40	49.76	14.94	0.58	31.52	-	-	Peak
41.88	34.84	-5.16	40	54.04	11.75	0.58	31.53	-	-	Peak
47.82	35	-5	40	56.56	9.27	0.73	31.56	100	241	Peak
307	21.27	-24.73	46	37.16	13.84	1.55	31.28	-	-	Peak
393.1	22.21	-23.79	46	35.34	16.25	1.82	31.2	-	-	Peak
610.1	22.45	-23.55	46	31.74	19.36	2.2	30.85	-	-	Peak
2389.23	42.73	-11.27	54	40.08	31.7	4.47	33.52	125	37	Average
2389.23	61.13	-12.87	74	58.48	31.7	4.47	33.52	125	37	Peak
2412	86.39	-	-	83.71	31.71	4.5	33.53	125	37	Average
2412	95.12	-	-	92.44	31.71	4.5	33.53	125	37	Peak
2488	32.09	-21.91	54	29.27	31.8	4.59	33.57	125	37	Average
2488	49.58	-24.42	74	46.76	31.8	4.59	33.57	125	37	Peak



Test Mode :	Mode 8	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
209.01	33.85	-9.65	43.5	54.65	9.41	1.26	31.47	-	-	Peak
233.58	38.53	-7.47	46	57.85	10.84	1.34	31.5	-	-	Peak
258.15	42.1	-3.9	46	58.69	13.48	1.42	31.49	100	25	Peak
307	34.04	-11.96	46	49.93	13.84	1.55	31.28	-	-	Peak
344.1	26.94	-19.06	46	41.69	14.85	1.71	31.31	-	-	Peak
393.1	23.92	-22.08	46	37.05	16.25	1.82	31.2	-	-	Peak
2358	37.54	-16.46	54	34.17	31.66	4.44	32.73	127	312	Average
2358	52.24	-21.76	74	48.87	31.66	4.44	32.73	127	312	Peak
2437	88.89	-	-	85.35	31.75	4.53	32.74	127	312	Average
2437	97.76	-	-	94.22	31.75	4.53	32.74	127	312	Peak
2488	33.27	-20.73	54	29.63	31.8	4.59	32.75	127	312	Average
2488	50.64	-23.36	74	47	31.8	4.59	32.75	127	312	Peak



Test Mode :	Mode 8	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
34.86	35.01	-4.99	40	50.42	15.53	0.58	31.52	-	-	Peak
42.42	35.95	-4.05	40	55.57	11.34	0.58	31.54	100	264	Peak
48.09	35.9	-4.1	40	57.88	8.86	0.73	31.57	-	-	Peak
331.5	19.84	-26.16	46	34.94	14.57	1.63	31.3	-	-	Peak
393.1	22.1	-23.9	46	35.23	16.25	1.82	31.2	-	-	Peak
466.6	19.46	-26.54	46	31.17	17.5	1.92	31.13	-	-	Peak
2360	32.9	-21.1	54	29.53	31.66	4.44	32.73	100	33	Average
2360	52.77	-21.23	74	49.4	31.66	4.44	32.73	100	33	Peak
2437	85.82	-	-	82.28	31.75	4.53	32.74	100	33	Average
2437	94.79	-	-	91.25	31.75	4.53	32.74	100	33	Peak
2498	40.41	-13.59	54	36.74	31.8	4.62	32.75	100	33	Average
2498	50.7	-23.3	74	47.03	31.8	4.62	32.75	100	33	Peak



Test Mode :	Mode 9	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
90.75	29.87	-13.63	43.5	51.07	9.5	0.84	31.54	-	-	Peak
233.58	40.09	-5.91	46	59.41	10.84	1.34	31.5	-	-	Peak
258.15	41.54	-4.46	46	58.13	13.48	1.42	31.49	100	22	Peak
331.5	26.9	-19.1	46	42	14.57	1.63	31.3	-	-	Peak
344.1	26.63	-19.37	46	41.38	14.85	1.71	31.31	-	-	Peak
393.1	24.25	-21.75	46	37.38	16.25	1.82	31.2	-	-	Peak
2390	40.16	-13.84	54	38.04	31.7	4.5	34.08	189	227	Average
2390	52.11	-21.89	74	49.99	31.7	4.5	34.08	189	227	Peak
2462	89.38	-	-	87.13	31.77	4.56	34.08	189	227	Average
2462	97.64	-	-	95.39	31.77	4.56	34.08	189	227	Peak
2483.5	44.62	-9.38	54	42.33	31.78	4.59	34.08	189	227	Average
2483.5	61.49	-12.51	74	59.2	31.78	4.59	34.08	189	227	Peak



Test Mode :	Mode 9	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	49~53%
Test Engineer :	Cona Huang	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
35.13	34.17	-5.83	40	49.58	15.53	0.58	31.52	-	-	Peak
43.5	34.99	-5.01	40	54.88	10.93	0.73	31.55	100	236	Peak
48.09	34.88	-5.12	40	56.86	8.86	0.73	31.57	-	-	Peak
307	22.31	-23.69	46	38.2	13.84	1.55	31.28	-	-	Peak
393.1	22.43	-23.57	46	35.56	16.25	1.82	31.2	-	-	Peak
521.2	19.97	-26.03	46	30.28	18.62	2.1	31.03	-	-	Peak
2336	38.84	-15.16	54	36.88	31.64	4.41	34.09	163	7	Average
2336	49.93	-24.07	74	47.97	31.64	4.41	34.09	163	7	Peak
2462	85.33	-	-	83.08	31.77	4.56	34.08	163	7	Average
2462	94.26	-	-	92.01	31.77	4.56	34.08	163	7	Peak
2483.5	40.69	-13.31	54	38.4	31.78	4.59	34.08	163	7	Average
2483.5	56.63	-17.37	74	54.34	31.78	4.59	34.08	163	7	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	Mar. 19, 2009	Mar. 18, 2011	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP30	101329	9kHz~30GHz	Apr. 26, 2010	Apr. 25, 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	Nov. 30, 2009	Nov. 29, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Nov. 23, 2009	Nov. 22, 2010	Conduction (CO05-HY)
AC Power Source	APC	APC-1000 W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz-40GHz	Nov. 03, 2010	Nov. 02, 2011	Radiation (03CH05-HY)
Amplifier	COM-POWER	PA-103	161069	1KHz - 1GHz	Mar. 29, 2010	Mar. 28, 2011	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 1GHz	Nov. 06, 2010	Nov. 05, 2011	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Apr. 15, 2010	Apr. 14, 2011	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 - 360 degree	N/A	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m - 4 m	N/A	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	00066584	1GHz ~ 18GHz	Aug. 05, 2010	Aug. 04, 2011	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH05-HY)
System Simulator	R&S	CMU200	117995	N/A	Mar. 19, 2009	Mar. 18, 2011	-

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
Combined Standard Uncertainty $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26		

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
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		



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
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				