

FCC RF Test Report

APPLICANT : D-Link Co.
EQUIPMENT : 3G WiFi Router
BRAND NAME : D-Link
MODEL NAME : DWR-113
FCC ID : KA2WR113A1
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Dec. 03, 2010 and completely tested on Jan. 05, 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:



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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR000724-01	Rev. 01	Initial issue of report	Jan. 19, 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 9.7 dB at 4.44 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.41 dB at 4874 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

D-Link Co.

No. 289, Sinhu 3rd Rd., Neihu District, Taipei City 114, Taiwan

1.2 Manufacturer

Advance Multimedia Internet Technology Inc.

No. 28, Lane 31, Sec. 1, Huandong Rd., Sinshih Township, Tainan County 74146, Taiwan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	3G WiFi Router
Brand Name	D-Link
Model Name	DWR-113
FCC ID	KA2WR113A1
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 : 18.02 dBm (0.063 W) 802.11g : 21.25 dBm (0.133 W) 802.11n (BW 20MHz) : 20.15 dBm (0.104 W) 802.11n (BW 40MHz) : 20.40 dBm (0.110 W)
Antenna Type	Dipole Antenna with gain 2 dBi
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

Remark:

1. This test report recorded only product characteristics and test results of Digital Transmission System (DTS).
2. 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	03CH06-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.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

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	18.02	18.01	17.44	17.41
CH 06	2437 MHz	17.82	-	-	-
CH 11	2462 MHz	17.56	-	-	-

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	21.25	20.72	20.76	19.96	20.04	19.57	19.80	19.58
CH 06	2437 MHz	21.01	-	-	-	-	-	-	-
CH 11	2462 MHz	20.70	-	-	-	-	-	-	-

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		M0	M1	M2	M3	M4	M5	M6	M7
CH 01	2412 MHz	20.15	20.14	19.90	20.13	19.09	18.79	18.62	18.44
CH 06	2437 MHz	19.79	-	-	-	-	-	-	-
CH 11	2462 MHz	19.56	-	-	-	-	-	-	-
Channel	Frequency	M8	M9	M10	M11	M12	M13	M14	M15
CH 01	2412 MHz	17.34	17.29	17.43	17.27	17.31	17.32	17.31	17.31
CH 06	2437 MHz	-	-	-	-	-	-	-	-
CH 11	2462 MHz	-	-	-	-	-	-	-	-

Channel	Frequency	2.4GHz 802.11n (BW 40MHz) RF Power (dBm)							
		OFDM Data Rate							
		M0	M1	M2	M3	M4	M5	M6	M7
CH 03	2422 MHz	20.40	20.34	19.98	20.06	19.26	19.50	19.25	18.37
CH 06	2437 MHz	20.17	-	-	-	-	-	-	-
CH 09	2452 MHz	19.92	-	-	-	-	-	-	-
Channel	Frequency	M8	M9	M10	M11	M12	M13	M14	M15
CH 03	2422 MHz	17.47	17.48	17.43	17.41	17.43	17.44	17.44	17.43
CH 06	2437 MHz	-	-	-	-	-	-	-	-
CH 09	2452 MHz	-	-	-	-	-	-	-	-

Remark:

1. The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, M0 for 802.11n (BW 20MHz), and for 802.11n (BW 40MHz) for all the test cases due to the highest RF output power.
2. The EUT is programmed to transmit signals continuously for all testing.

2.2 Test Mode

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

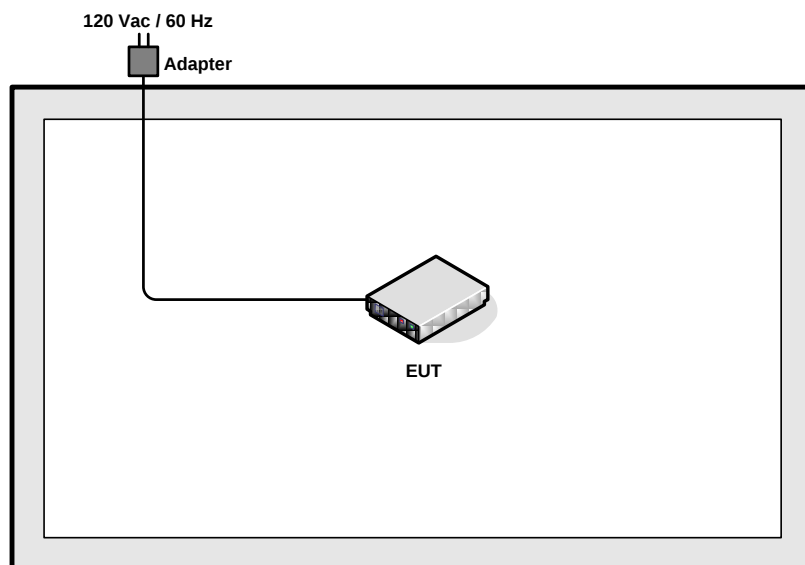
Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

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

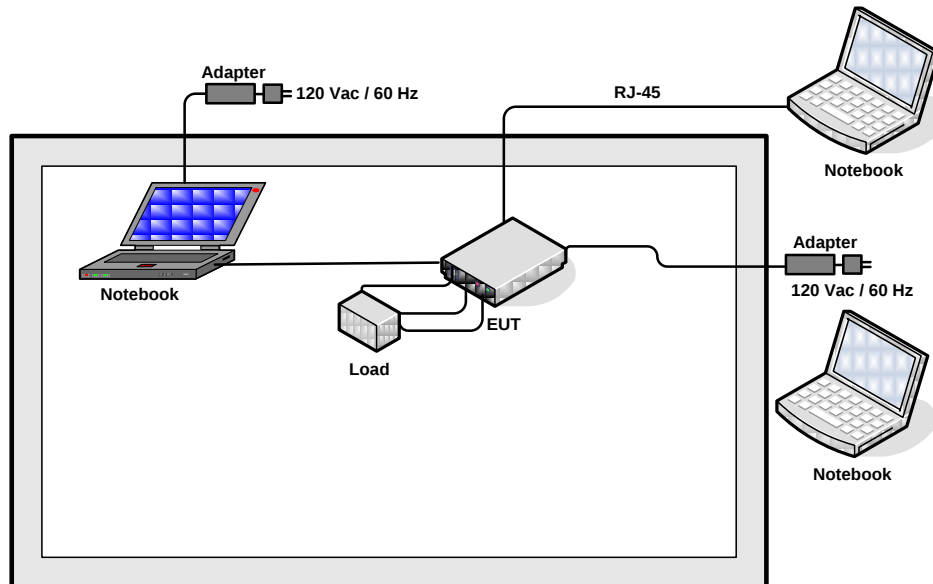
Test Cases		
Test Item	802.11b (Modulation : DSSS)	802.11g/n (Modulation : OFDM)
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 MHz Mode 8: 802.11n (BW 20M)_CH06_2437 MHz Mode 9: 802.11n (BW 20M)_CH11_2462 MHz Mode 10: 802.11n (BW 40M)_CH03_2422 MHz Mode 11: 802.11n (BW 40M)_CH06_2437 MHz Mode 12: 802.11n (BW 40M)_CH09_2452 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 Mode 10: 802.11n (BW 40M)_CH03_2422 MHz Mode 11: 802.11n (BW 40M)_CH09_2452 MHz
AC Conducted Emission	Mode 1 :WLAN Link + LAN Link + WAN Link + Adapter	
Remark: Mode 7 ~ 11 of radiation test only performed Band Edges.		

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<EUT with Adapter Mode>





2.4 RF Utility

The programmed RF utility is installed in notebook 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.

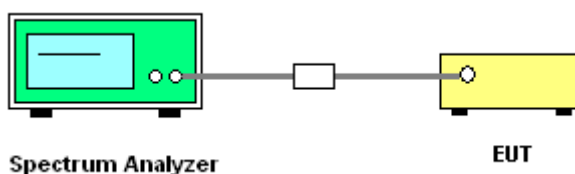
3.1.2 Measuring Instruments

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

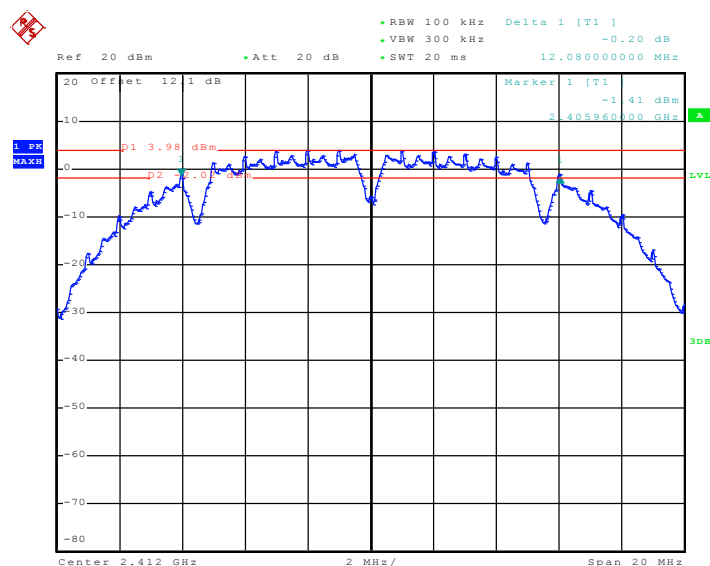


3.1.5 Test Result of 6dB Bandwidth

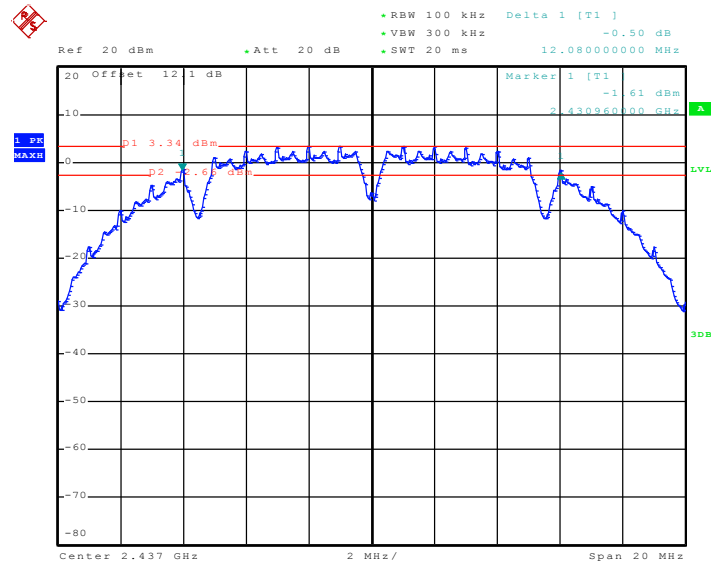
Test Mode :	Mode 1, 2, 3	Temperature :	22~24℃
Test Engineer :	Alan Liu	Relative Humidity :	46~50%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	12.08	0.5	Pass
06	2437	12.08	0.5	Pass
11	2462	12.08	0.5	Pass

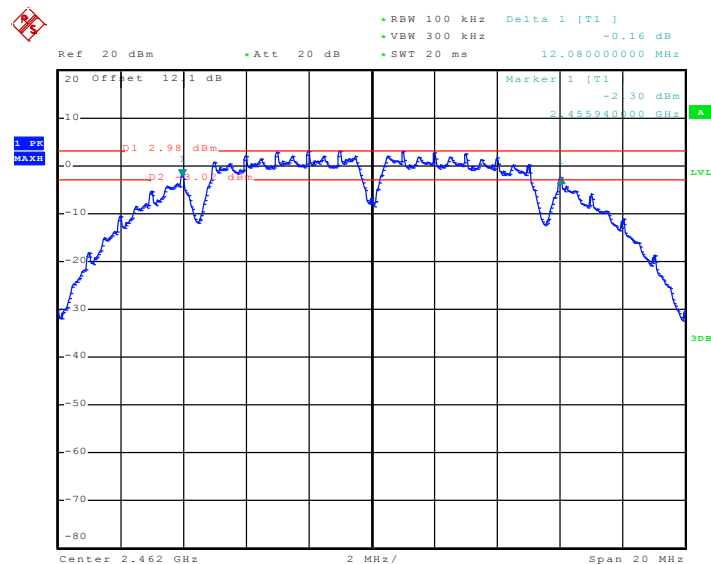
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 26.DEC.2010 15:42:38

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


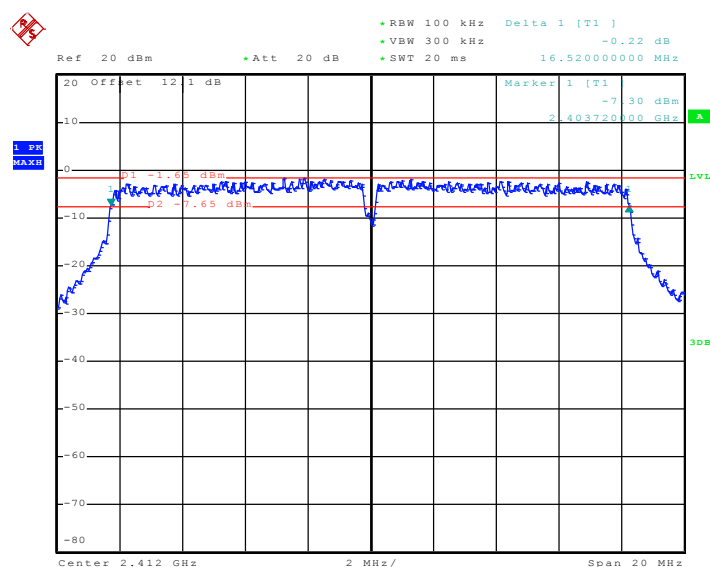
Date: 26.DEC.2010 15:57:02

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


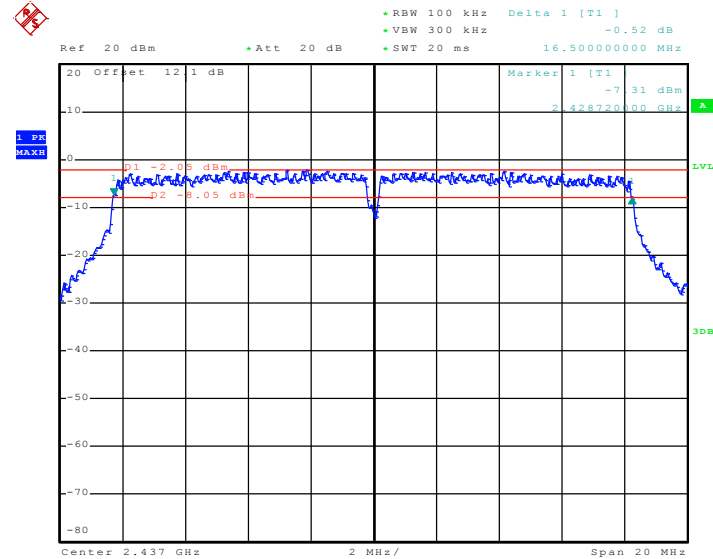
Date: 26.DEC.2010 16:09:00

Test Mode :	Mode 4, 5, 6	Temperature :	22~24°C
Test Engineer :	Alan Liu	Relative Humidity :	46~50%

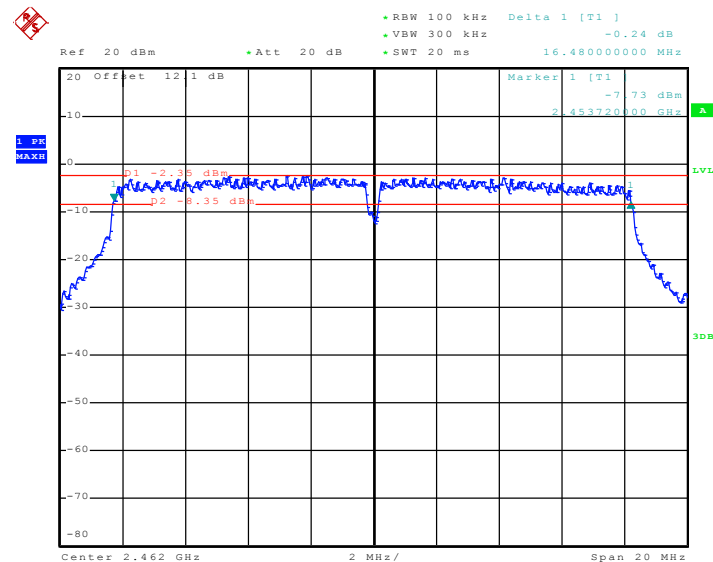
Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.52	0.5	Pass
06	2437	16.50	0.5	Pass
11	2462	16.48	0.5	Pass

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


Date: 26.DEC.2010 16:34:47

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


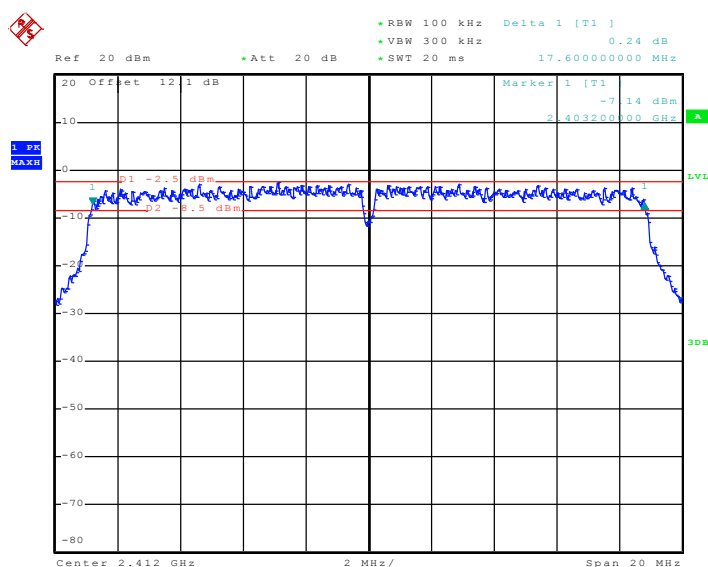
Date: 26.DEC.2010 16:49:04

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


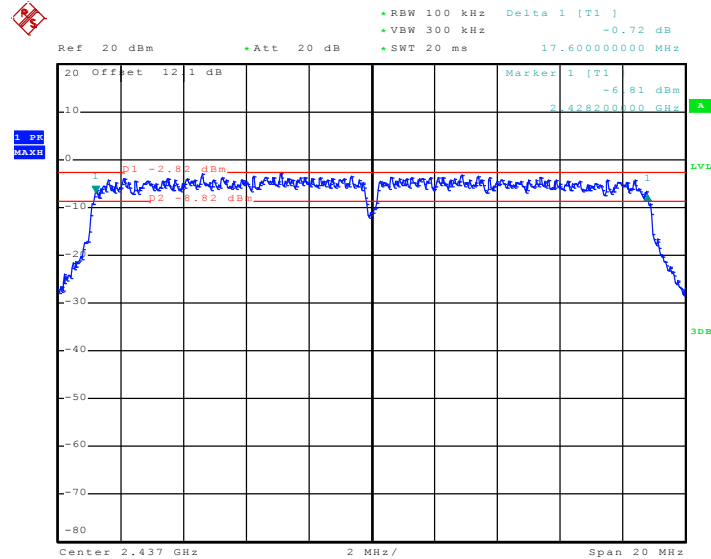
Date: 26.DEC.2010 17:01:12

Test Mode :	Mode 7, 8, 9	Temperature :	22~24°C
Test Engineer :	Alan Liu	Relative Humidity :	46~50%

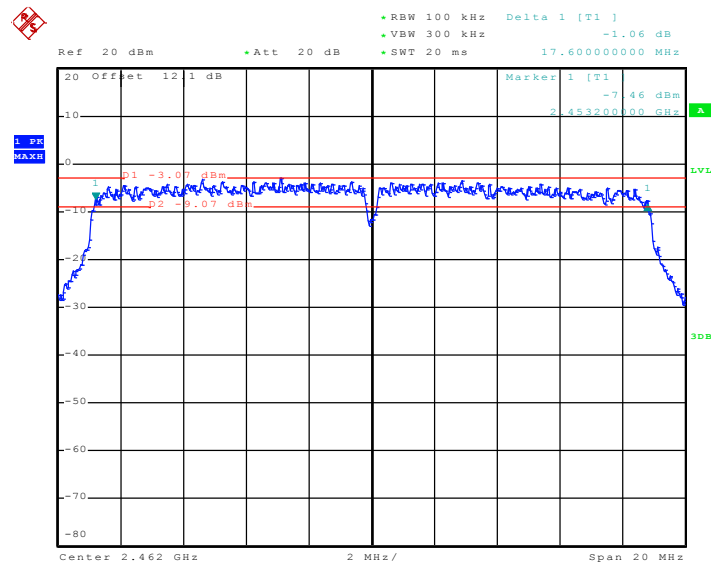
Channel	Frequency (MHz)	802.11n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.60	0.5	Pass
06	2437	17.60	0.5	Pass
11	2462	17.60	0.5	Pass

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


Date: 26.DEC.2010 17:15:06

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


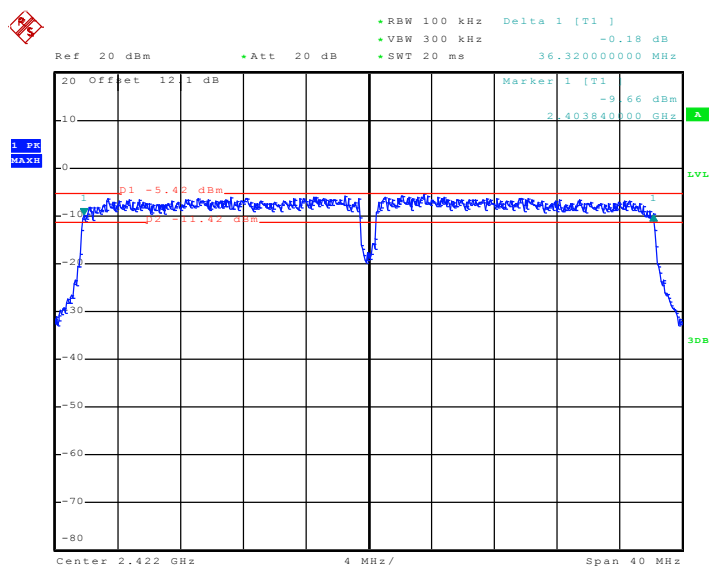
Date: 26.DEC.2010 17:35:48

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


Date: 26.DEC.2010 17:48:51

Test Mode :	Mode 10, 11, 12	Temperature :	22~24°C
Test Engineer :	Alan Liu	Relative Humidity :	46~50%

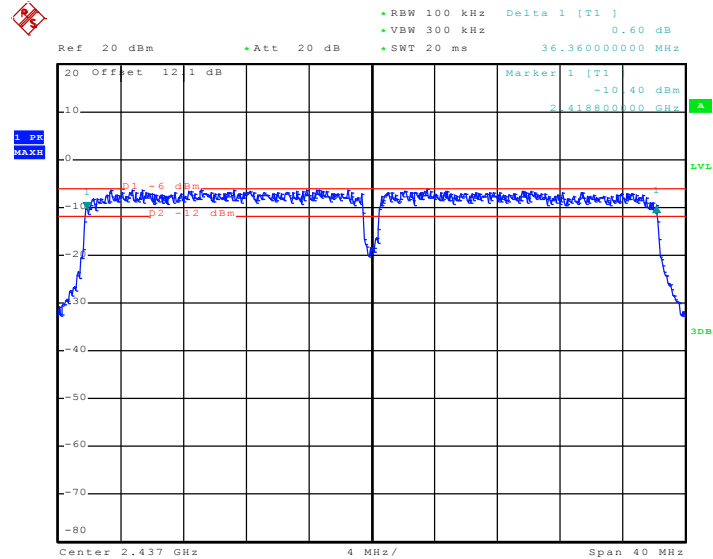
Channel	Frequency (MHz)	802.11n (BW 40MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
03	2422	36.32	0.5	Pass
06	2437	36.36	0.5	Pass
09	2452	36.32	0.5	Pass

Mode 10 : 6 dB Bandwidth Plot on 802.11n(BW 40MHz) Channel 03


Date: 26.DEC.2010 19:01:41

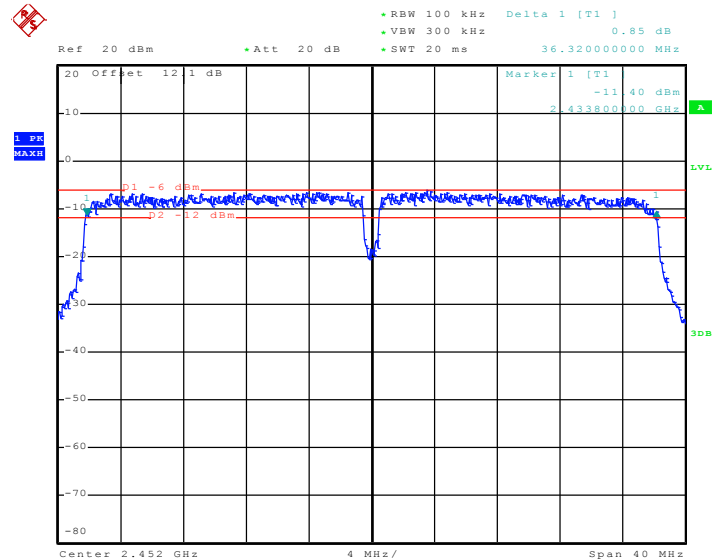


Mode 11 : 6 dB Bandwidth Plot on 802.11n(BW 40MHz) Channel 06



Date: 26.DEC.2010 19:14:33

Mode 12 : 6 dB Bandwidth Plot on 802.11n(BW 40MHz) Channel 09



Date: 26.DEC.2010 19:26:22

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.

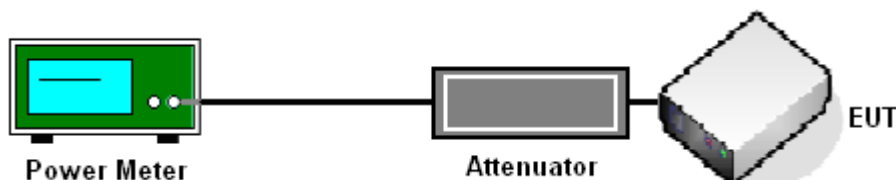
3.2.2 Measuring Instruments

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 :	22~24℃
Test Engineer :	Alan Liu	Relative Humidity :	46~50%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.02	30	Pass
06	2437	17.82	30	Pass
11	2462	17.56	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	22~24℃
Test Engineer :	Alan Liu	Relative Humidity :	46~50%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	21.25	30	Pass
06	2437	21.01	30	Pass
11	2462	20.70	30	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	22~24℃
Test Engineer :	Alan Liu	Relative Humidity :	46~50%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.15	30	Pass
06	2437	19.79	30	Pass
11	2462	19.56	30	Pass

Test Mode :	Mode 10, 11, 12	Temperature :	22~24
Test Engineer :	Alan Liu	Relative Humidity :	46~50

Channel	Frequency (MHz)	802.11n (BW 40MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	20.40	30	Pass
06	2437	20.17	30	Pass
09	2452	19.92	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

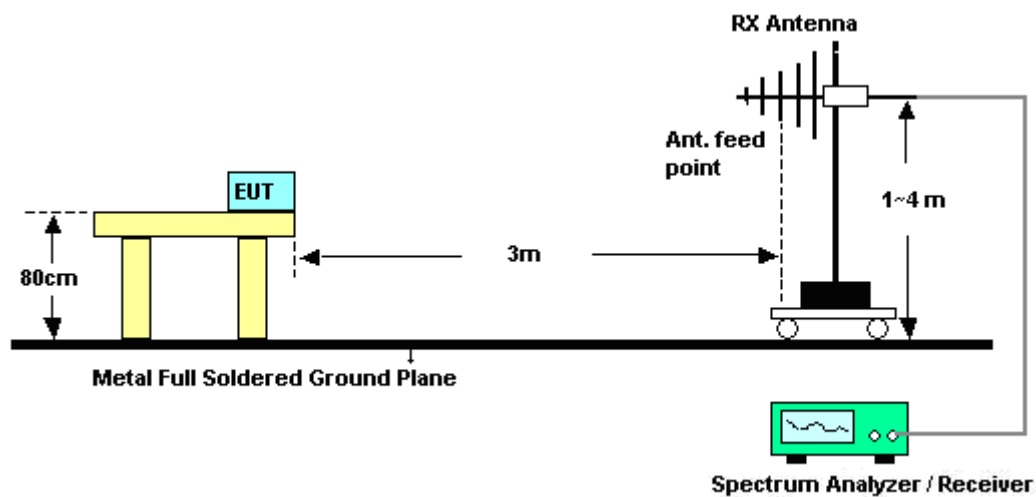
See list of measuring instruments of this test report.

3.3.3 Test Procedures

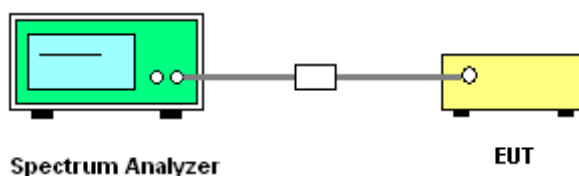
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized 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 :	17~18℃
Test Band :	802.11b	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Kay Wu

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
2389.99	51.51	-22.49	74	49.5	32.48	3.92	34.39	100	139	Peak
2389.99	41.65	-12.35	54	39.64	32.48	3.92	34.39	100	139	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
2384.1	56.89	-17.11	74	54.88	32.48	3.92	34.39	100	34	Peak
2384.1	47.14	-6.86	54	45.15	32.46	3.92	34.39	100	34	Average

Test Mode :	Mode 3	Temperature :	17~18℃
Test Band :	802.11b	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Kay Wu

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
2483.85	48.8	-25.2	74	46.54	32.58	4.05	34.37	101	123	Peak
2483.85	38.38	-15.62	54	36.12	32.58	4.05	34.37	101	123	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
2487.65	55.6	-18.4	74	53.34	32.58	4.05	34.37	100	47	Peak
2487.65	46.03	-7.97	54	43.75	32.6	4.05	34.37	100	47	Average



Test Mode :	Mode 4	Temperature :	17~18℃
Test Band :	802.11g	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Kay Wu

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	55.16	-18.84	74	53.15	32.48	3.92	34.39	100	122	Peak
2390	38.17	-15.83	54	36.16	32.48	3.92	34.39	100	122	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	64.08	-9.92	74	62.07	32.48	3.92	34.39	100	33	Peak
2389.61	45.8	-8.2	54	43.79	32.48	3.92	34.39	100	33	Average

Test Mode :	Mode 6	Temperature :	17~18℃
Test Band :	802.11g	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Kay Wu

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
2483.66	55.25	-18.75	74	52.99	32.58	4.05	34.37	104	125	Peak
2483.66	37.91	-16.09	54	35.65	32.58	4.05	34.37	104	125	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
2483.66	63.41	-10.59	74	61.15	32.58	4.05	34.37	100	47	Peak
2483.66	45.12	-8.88	54	42.86	32.58	4.05	34.37	100	47	Average



Test Mode :	Mode 7	Temperature :	17~18℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Kay Wu

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
2389.99	59.87	-14.13	74	57.86	32.48	3.92	34.39	100	138	Peak
2389.99	38.46	-15.54	54	36.45	32.48	3.92	34.39	100	138	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	67.05	-6.95	74	65.04	32.48	3.92	34.39	100	33	Peak
2389.99	44.99	-9.01	54	42.98	32.48	3.92	34.39	100	33	Average

Test Mode :	Mode 9	Temperature :	17~18℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Kay Wu

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	54.02	-19.98	74	51.76	32.58	4.05	34.37	100	123	Peak
2483.5	35.85	-18.15	54	33.59	32.58	4.05	34.37	100	123	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	63.39	-10.61	74	61.13	32.58	4.05	34.37	100	47	Peak
2483.5	43.21	-10.79	54	40.95	32.58	4.05	34.37	100	47	Average



Test Mode :	Mode 10	Temperature :	17~18℃
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	42~43%
Test Channel :	03	Test Engineer :	Kay Wu

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
2388.66	60.02	-13.98	74	58.01	32.48	3.92	34.39	100	137	Peak
2388.66	44.43	-9.57	54	42.42	32.48	3.92	34.39	100	137	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
2385.81	67.34	-6.66	74	65.33	32.48	3.92	34.39	100	45	Peak
2385.81	50.96	-3.04	54	48.95	32.48	3.92	34.39	100	45	Average

Test Mode :	Mode 11	Temperature :	17~18℃
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	42~43%
Test Channel :	09	Test Engineer :	Kay Wu

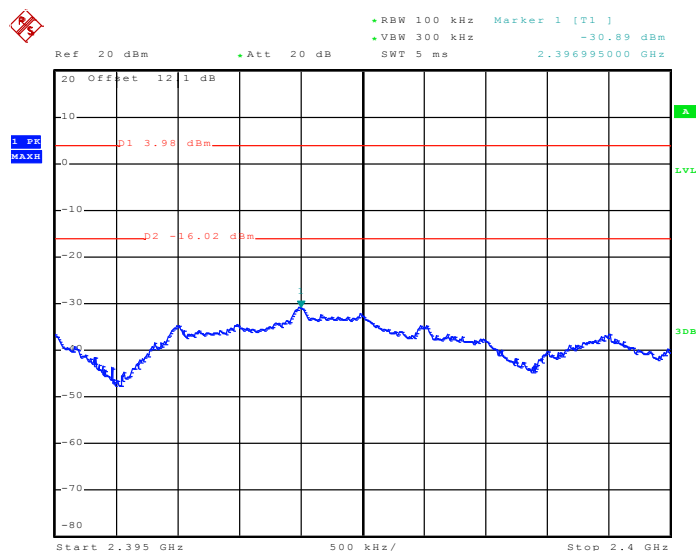
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2487.65	57.51	-16.49	74	55.25	32.58	4.05	34.37	100	124	Peak
2487.65	40.03	-13.97	54	37.75	32.6	4.05	34.37	100	124	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
2487.65	66.18	-7.82	74	63.92	32.58	4.05	34.37	100	39	Peak
2487.65	49.53	-4.47	54	47.25	32.6	4.05	34.37	100	39	Average

3.3.6 Test Plots of Conducted Band Edges

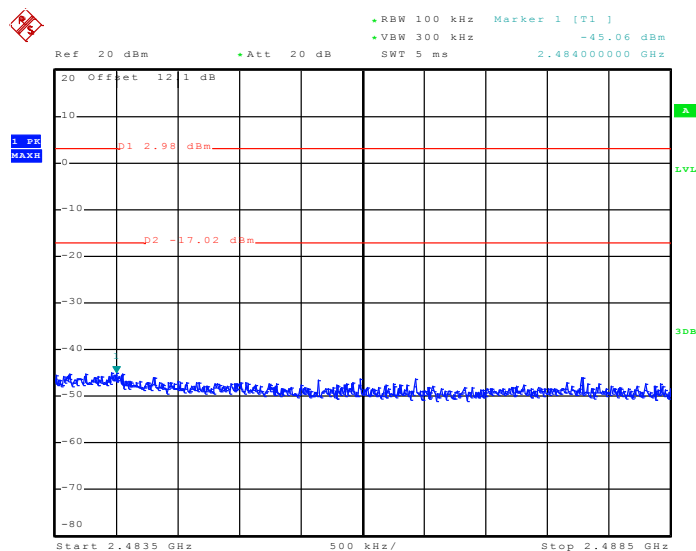
Test Mode :	Mode 1 and 3	Temperature :	22~24°C
Test Band :	802.11b	Relative Humidity :	46~50%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11b Channel 01



Date: 26.DEC.2010 15:43:59

High Band Edge Plot on 802.11b Channel 11

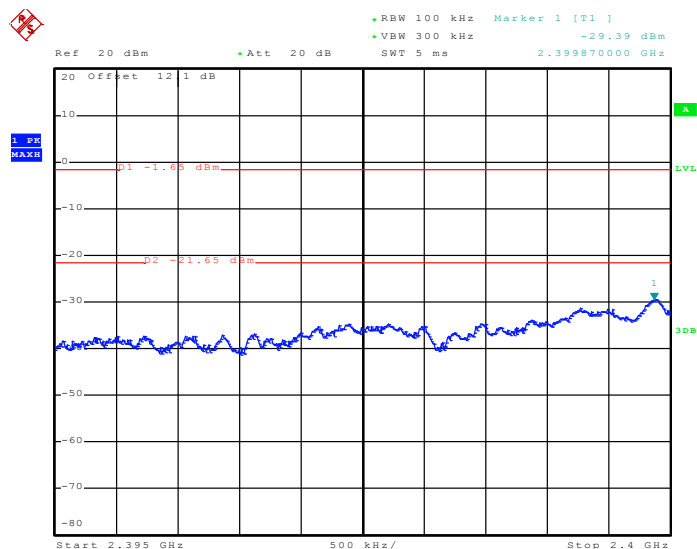


Date: 26.DEC.2010 16:09:47



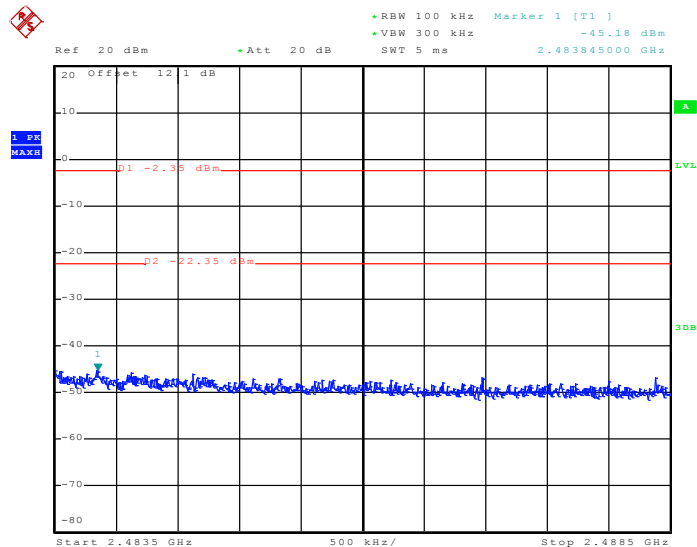
Test Mode :	Mode 4 and 6	Temperature :	22~24℃
Test Band :	802.11g	Relative Humidity :	46~50%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11g Channel 01



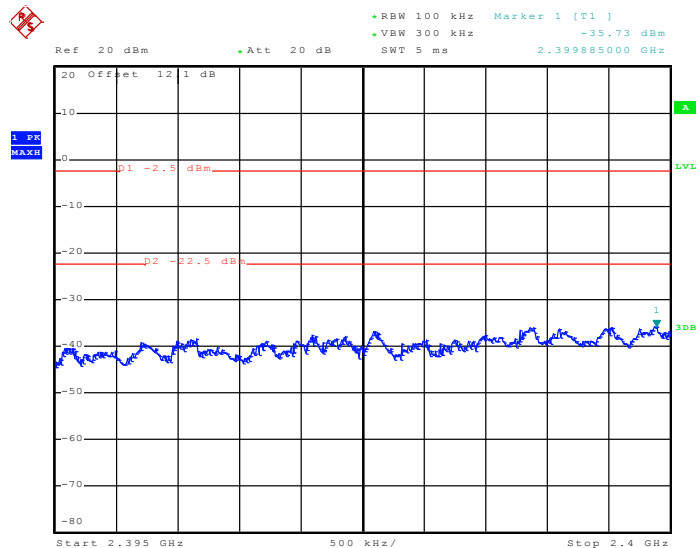
Date: 26.DEC.2010 16:35:56

High Band Edge Plot on 802.11g Channel 11

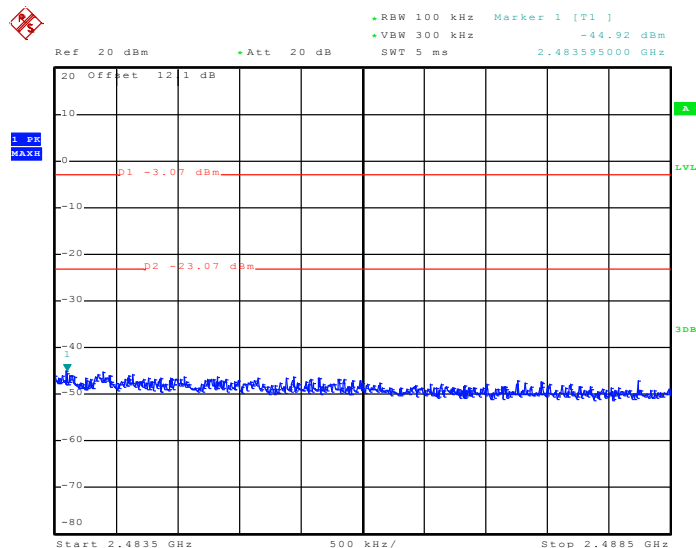


Date: 26.DEC.2010 17:01:58

Test Mode :	Mode 7 and 9	Temperature :	22~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	46~50%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

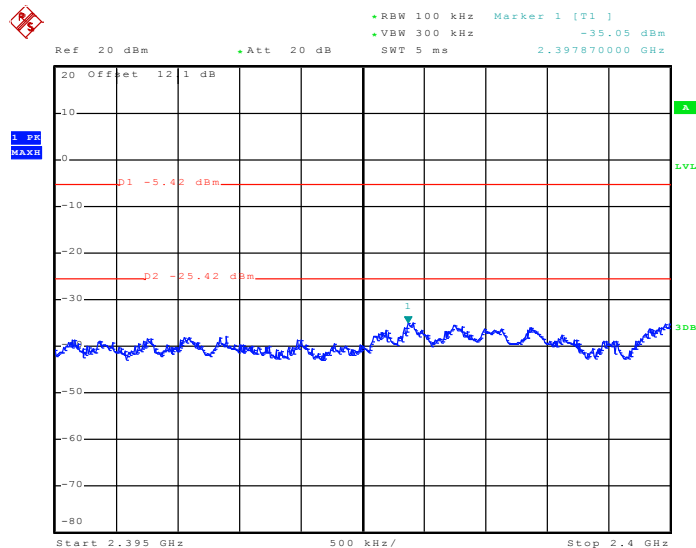
Low Band Edge Plot on 802.11n (BW 20MHz) Channel 01


Date: 26.DEC.2010 17:16:15

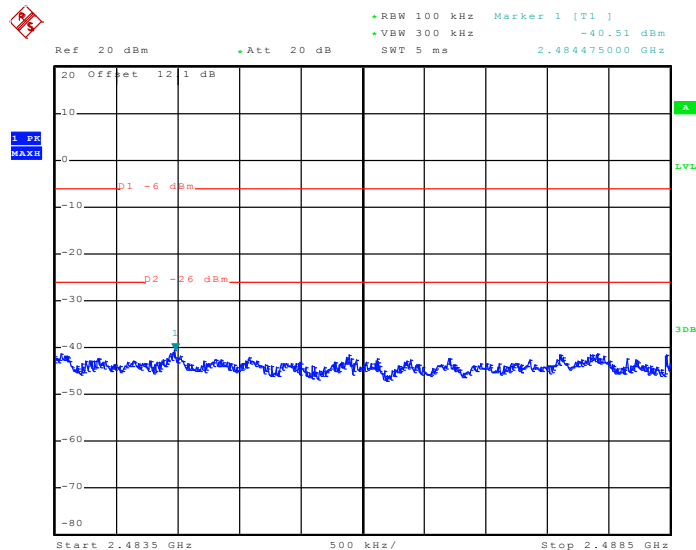
High Band Edge Plot on 802.11n (BW 20MHz) Channel 11


Date: 26.DEC.2010 17:49:38

Test Mode :	Mode 10 and 12	Temperature :	22~24°C
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	46~50%
Test Channel :	03 and 09	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11n (BW 40MHz) Channel 03


Date: 26.DEC.2010 19:02:51

High Band Edge Plot on 802.11n (BW 40MHz) Channel 09


Date: 26.DEC.2010 19:26:48

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.

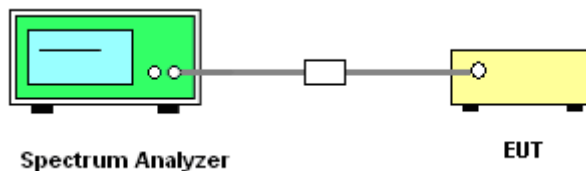
3.4.2 Measuring Instruments

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.

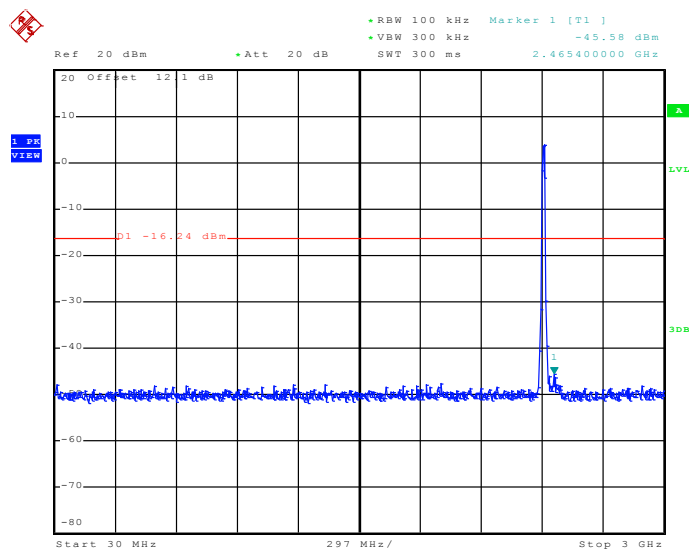
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

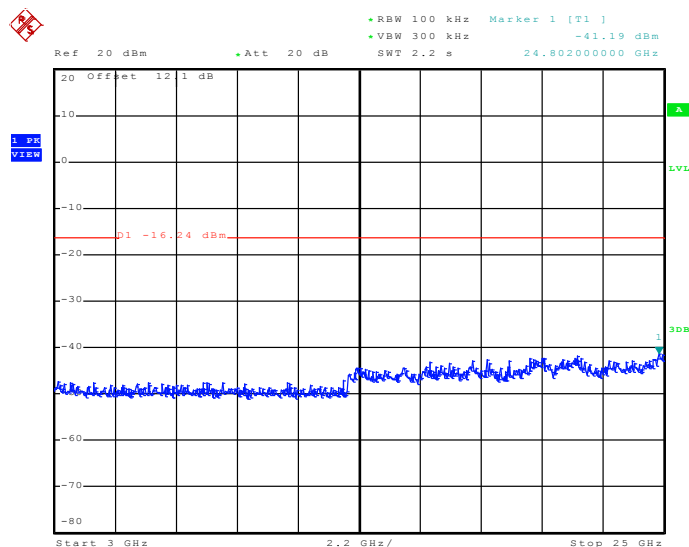
Test Mode :	Mode 1	Temperature :	22~24°C
Test Band :	802.11b	Relative Humidity :	46~50%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



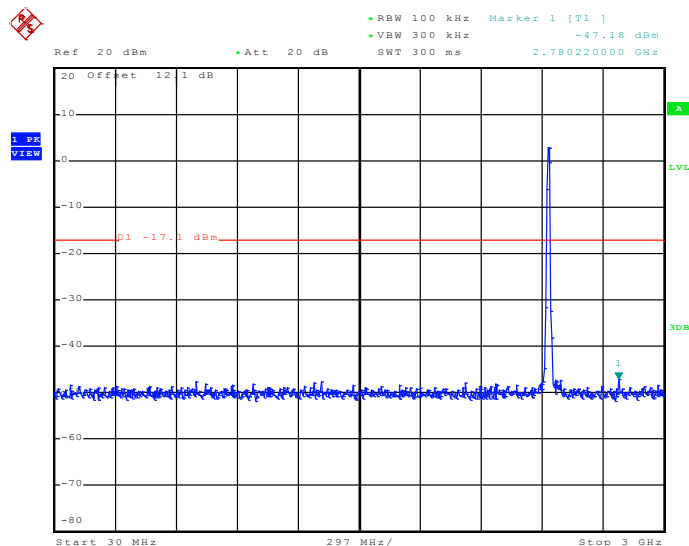
Date: 26.DEC.2010 15:45:34

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

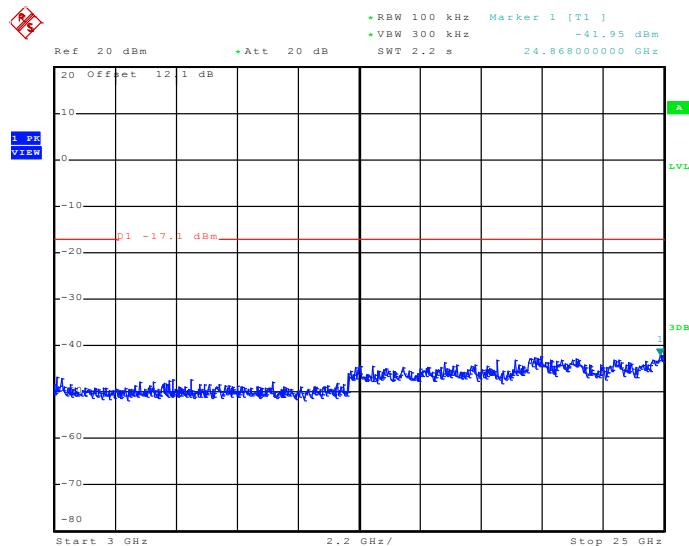


Date: 26.DEC.2010 15:45:51

Test Mode :	Mode 2	Temperature :	22~24℃
Test Band :	802.11b	Relative Humidity :	46~50%
Test Channel :	06	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 26.DEC.2010 16:30:07

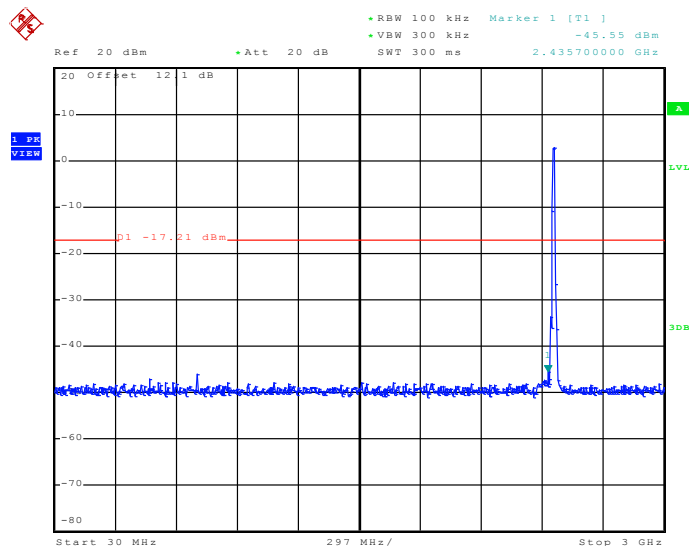
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 26.DEC.2010 16:30:44



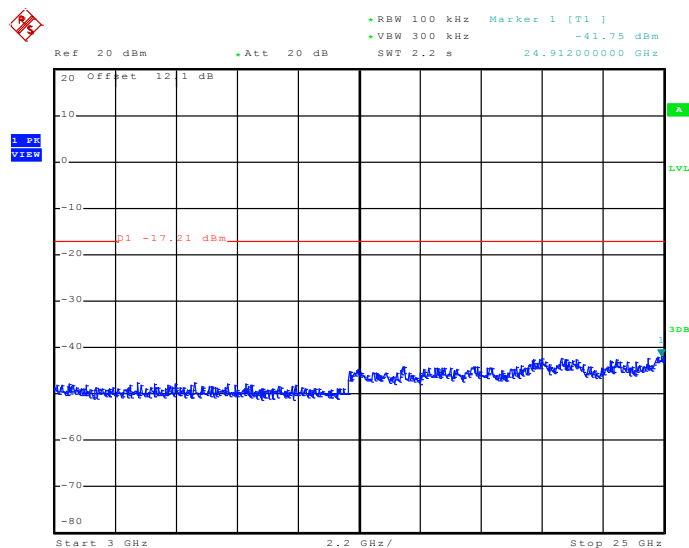
Test Mode :	Mode 3	Temperature :	22~24°C
Test Band :	802.11b	Relative Humidity :	46~50%
Test Channel :	11	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 26.DEC.2010 16:23:26

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

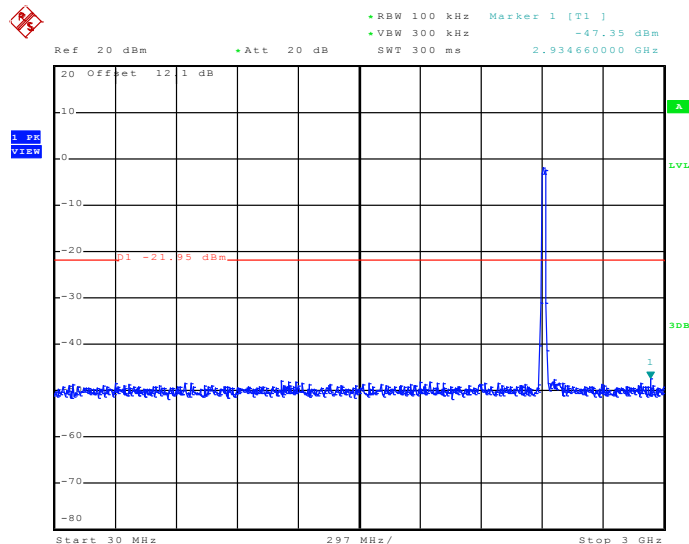


Date: 26.DEC.2010 16:26:40



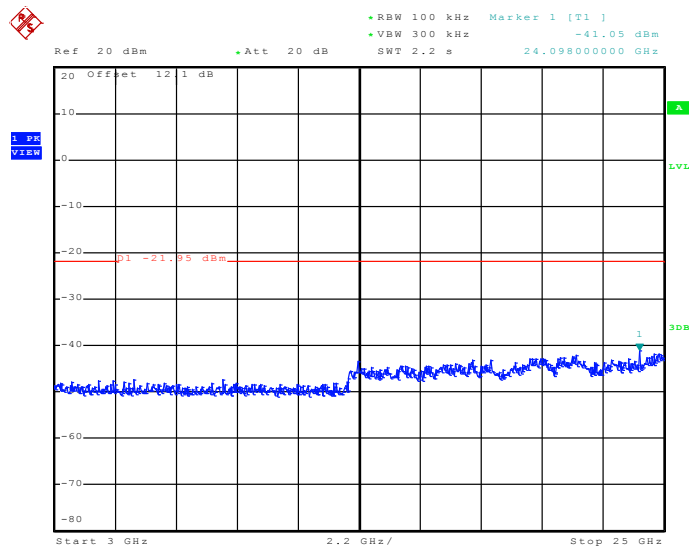
Test Mode :	Mode 4	Temperature :	22~24℃
Test Band :	802.11g	Relative Humidity :	46~50%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



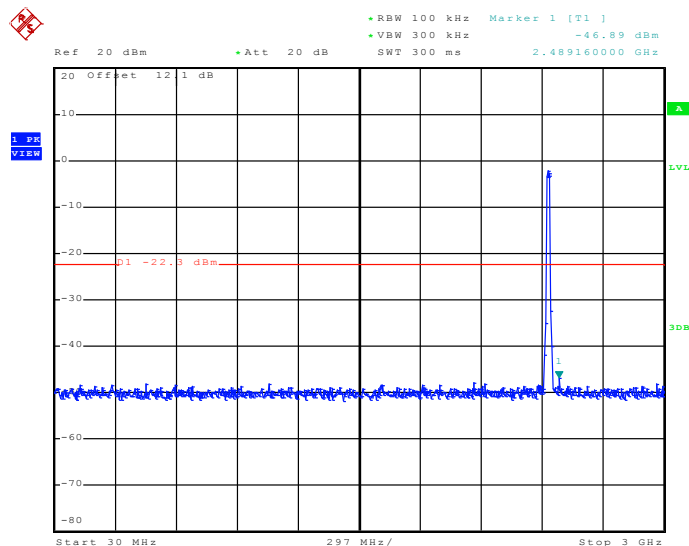
Date: 26.DEC.2010 16:45:20

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

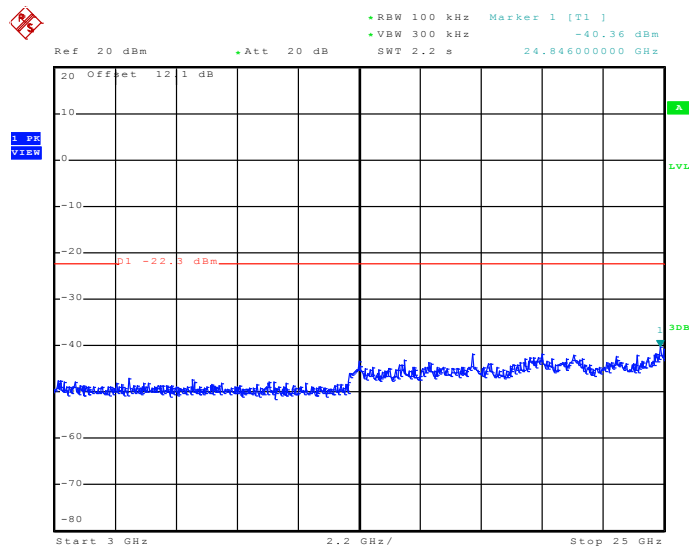


Date: 26.DEC.2010 16:45:37

Test Mode :	Mode 5	Temperature :	22~24
Test Band :	802.11g	Relative Humidity :	46~50
Test Channel :	06	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 26.DEC.2010 16:58:42

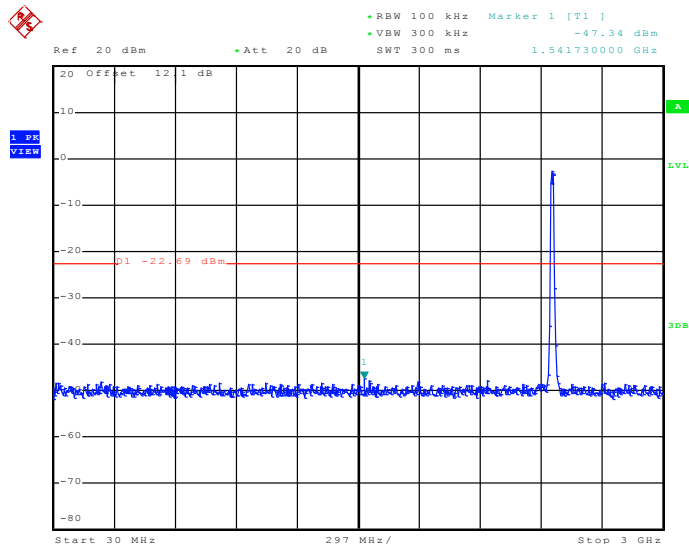
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 26.DEC.2010 16:58:59



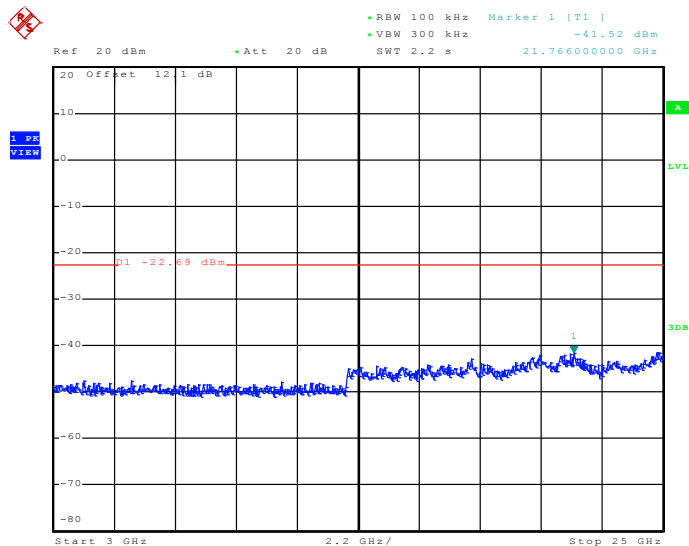
Test Mode :	Mode 6	Temperature :	22~24℃
Test Band :	802.11g	Relative Humidity :	46~50%
Test Channel :	11	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 26.DEC.2010 17:12:59

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

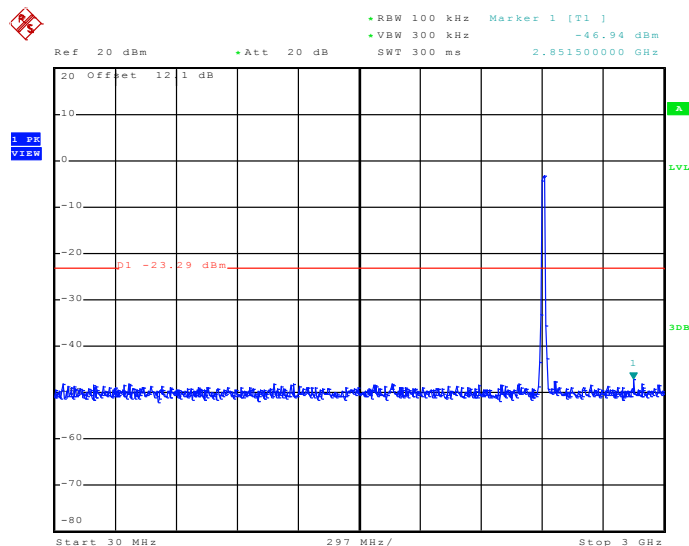


Date: 26.DEC.2010 17:13:16



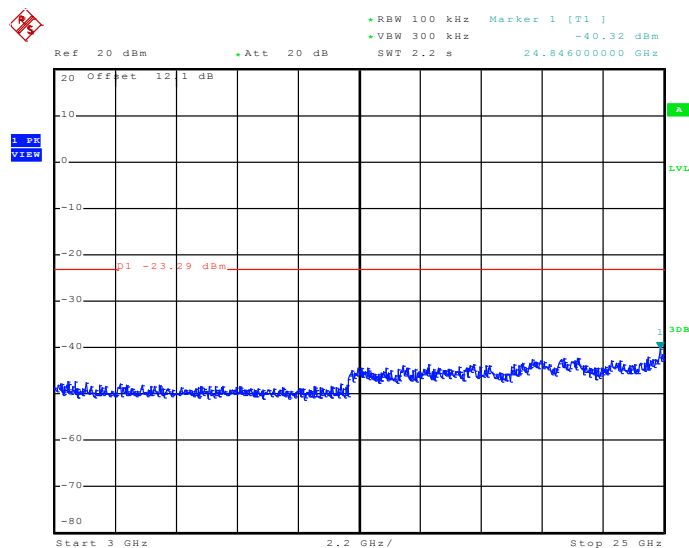
Test Mode :	Mode 7	Temperature :	22~24℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	46~50%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



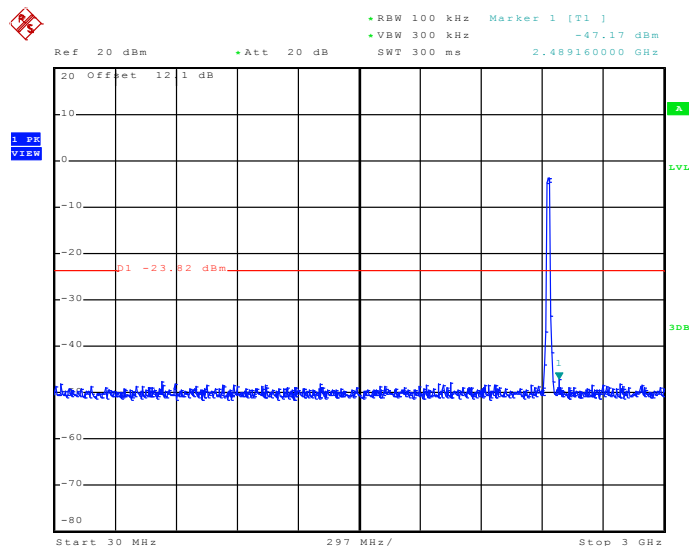
Date: 26.DEC.2010 17:32:33

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

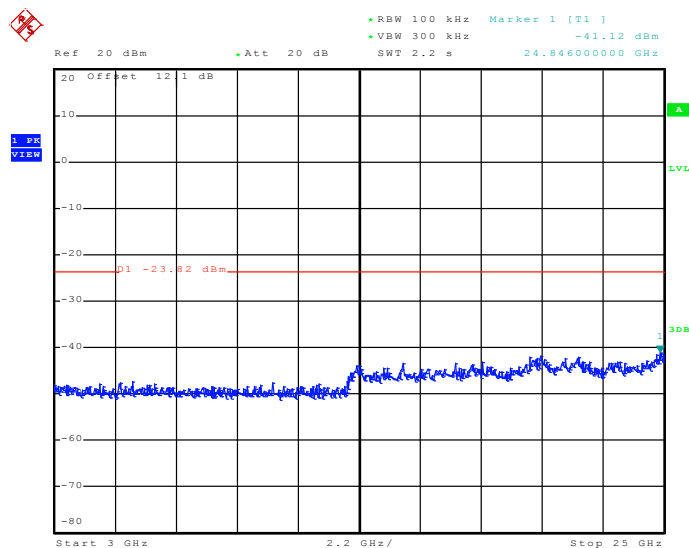


Date: 26.DEC.2010 17:32:50

Test Mode :	Mode 8	Temperature :	22~24℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	46~50%
Test Channel :	06	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 26.DEC.2010 17:45:35

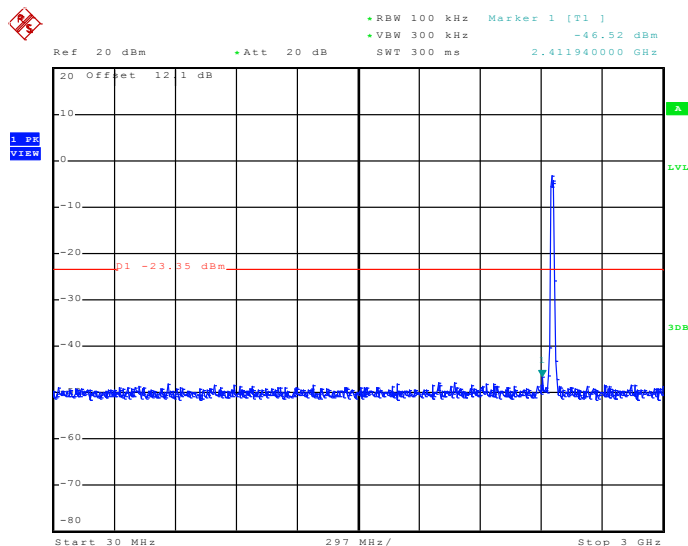
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 26.DEC.2010 17:45:53



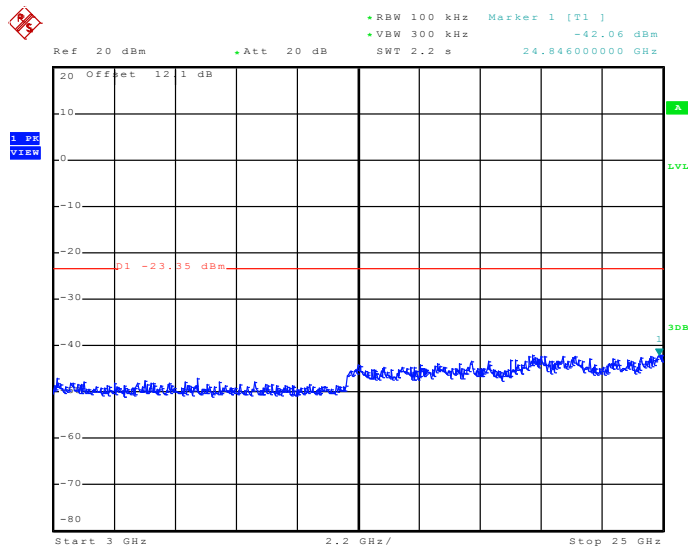
Test Mode :	Mode 9	Temperature :	22~24℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	46~50%
Test Channel :	11	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 26.DEC.2010 17:59:09

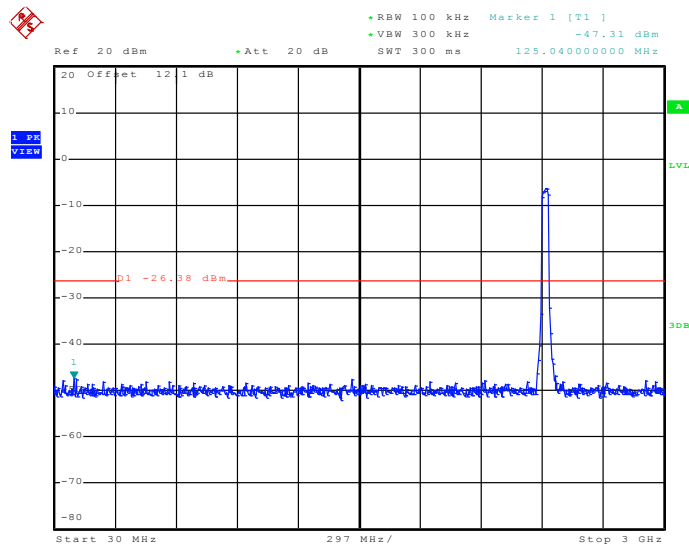
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



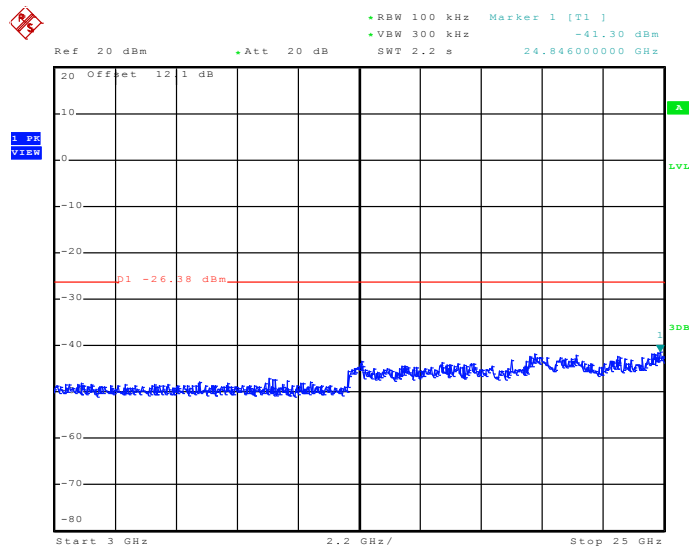
Date: 26.DEC.2010 17:59:26



Test Mode :	Mode 10	Temperature :	22~24℃
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	46~50%
Test Channel :	03	Test Engineer :	Alan Liu

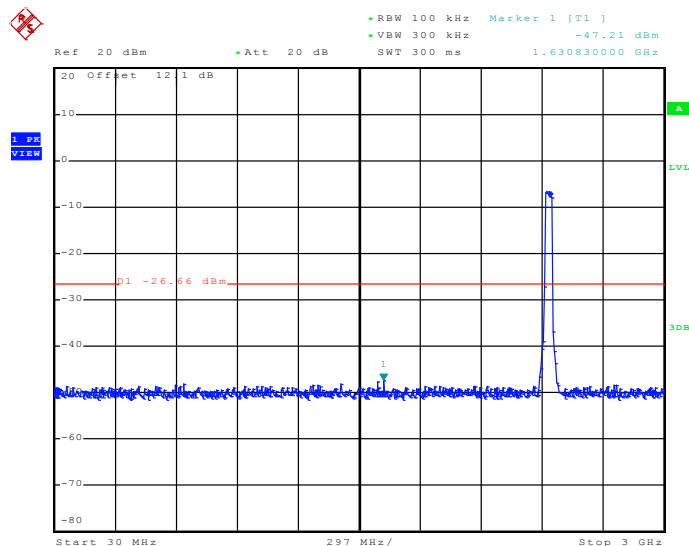
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

Date: 26.DEC.2010 19:12:20

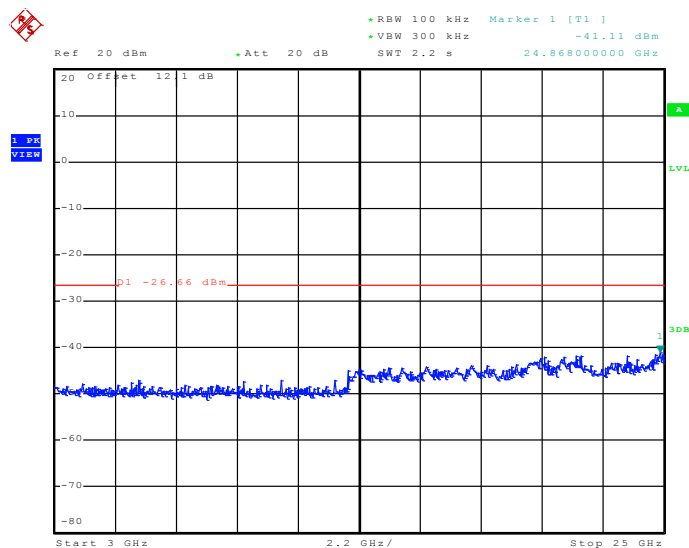
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

Date: 26.DEC.2010 19:12:37

Test Mode :	Mode 11	Temperature :	22~24℃
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	46~50%
Test Channel :	06	Test Engineer :	Alan Liu

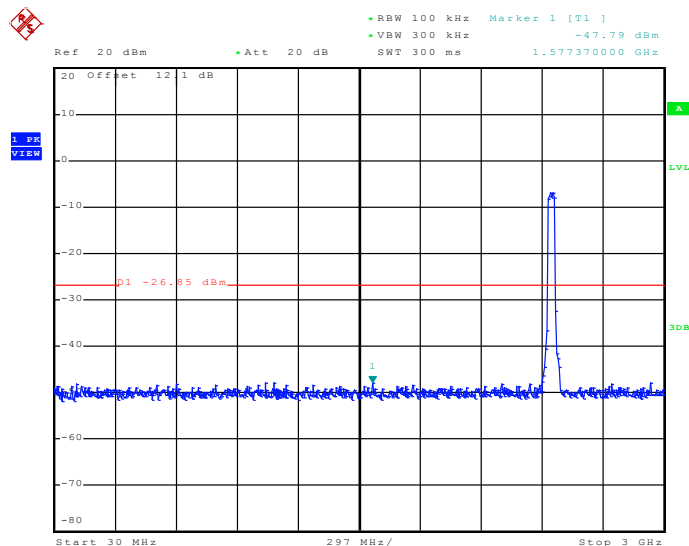
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 26.DEC.2010 19:24:00

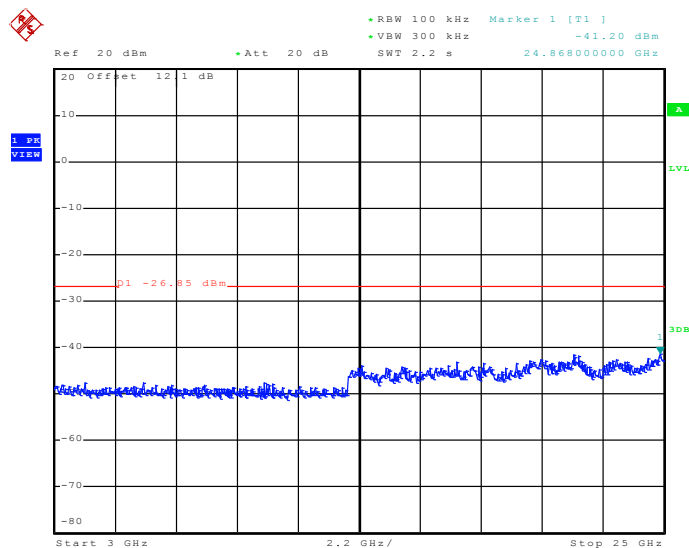
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 26.DEC.2010 19:24:17

Test Mode :	Mode 12	Temperature :	22~24℃
Test Band :	802.11n (BW 40MHz)	Relative Humidity :	46~50%
Test Channel :	09	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 26.DEC.2010 19:37:27

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 26.DEC.2010 19:37:45

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.

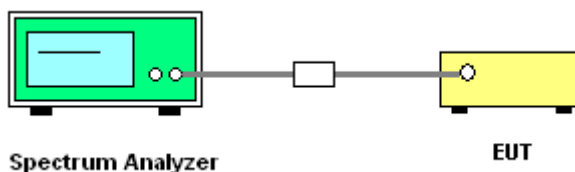
3.5.2 Measuring Instruments

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

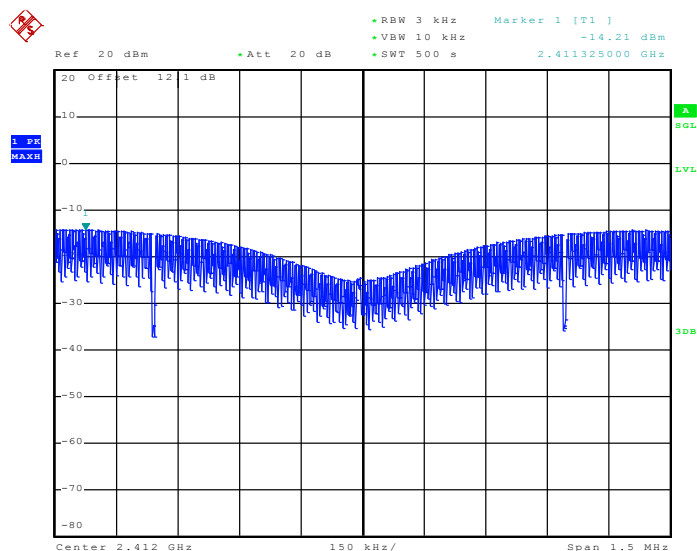


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	22~24℃
Test Engineer :	Alan Liu	Relative Humidity :	46~50%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-14.21	8	Pass
06	2437	-14.86	8	Pass
11	2462	-15.09	8	Pass

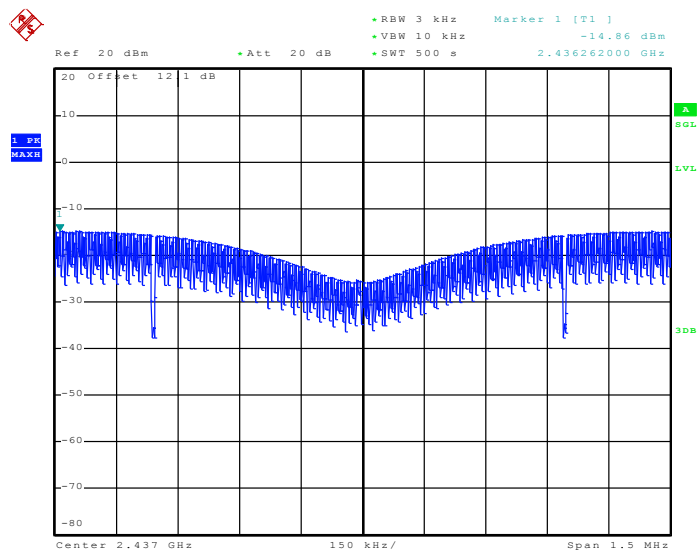
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 26.DEC.2010 15:54:30

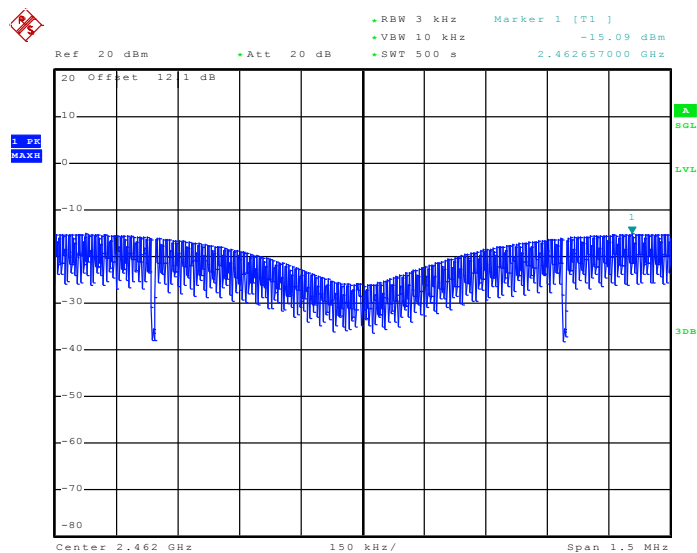


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 26.DEC.2010 16:06:04

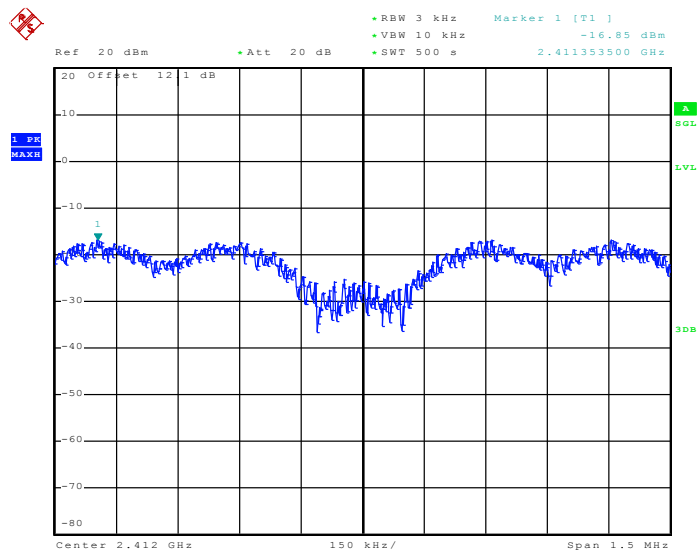
Mode 3 : PSD Plot on 802.11b Channel 11



Date: 26.DEC.2010 16:18:47

Test Mode :	Mode 4, 5, 6	Temperature :	22~24°C
Test Engineer :	Alan Liu	Relative Humidity :	46~50%

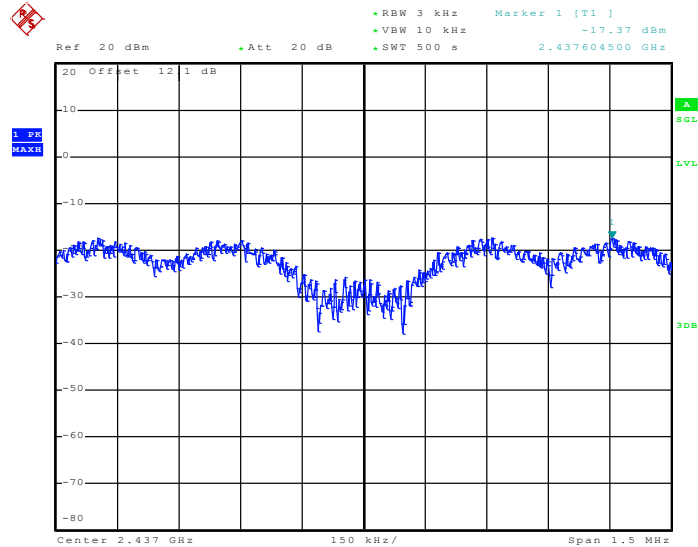
Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-16.85	8	Pass
06	2437	-17.37	8	Pass
11	2462	-17.75	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01


Date: 26.DEC.2010 16:44:59

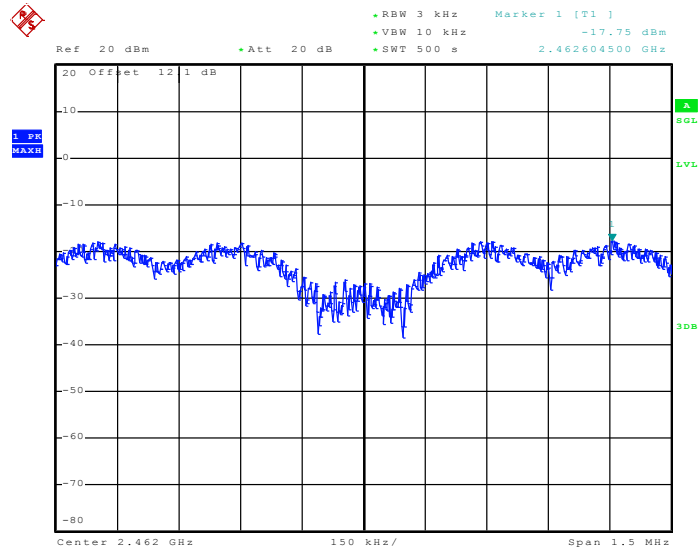


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 26.DEC.2010 16:58:21

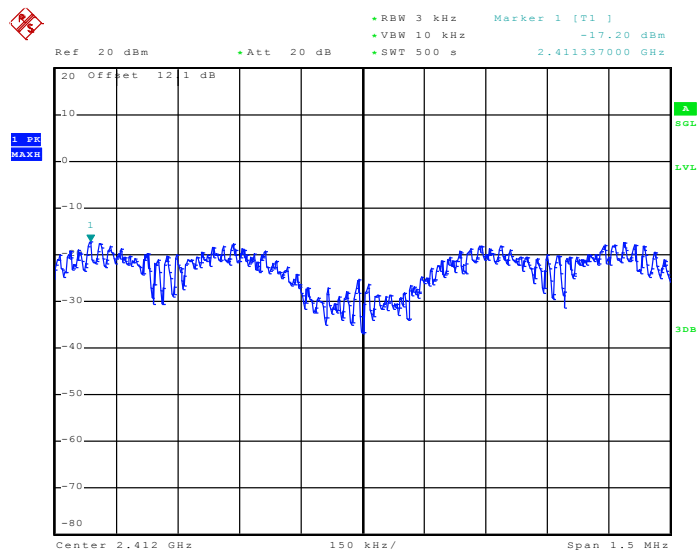
Mode 6 : PSD Plot on 802.11g Channel 11



Date: 26.DEC.2010 17:12:38

Test Mode :	Mode 7, 8, 9	Temperature :	22~24°C
Test Engineer :	Alan Liu	Relative Humidity :	46~50%

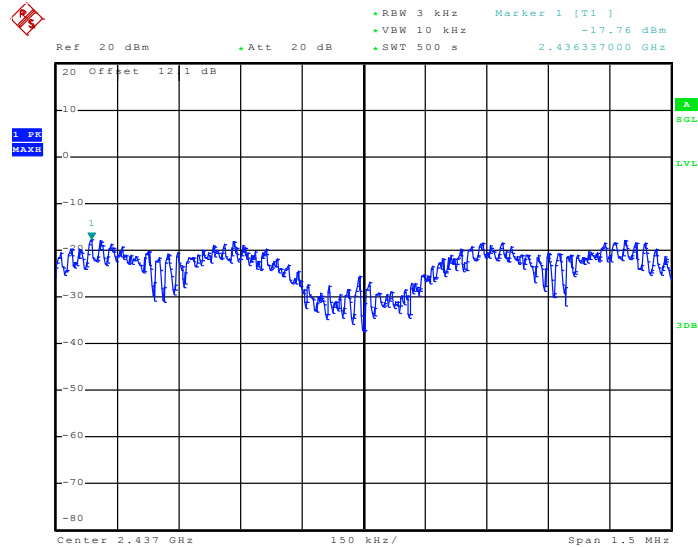
Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-17.20	8	Pass
06	2437	-17.76	8	Pass
11	2462	-18.07	8	Pass

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


Date: 26.DEC.2010 17:32:12

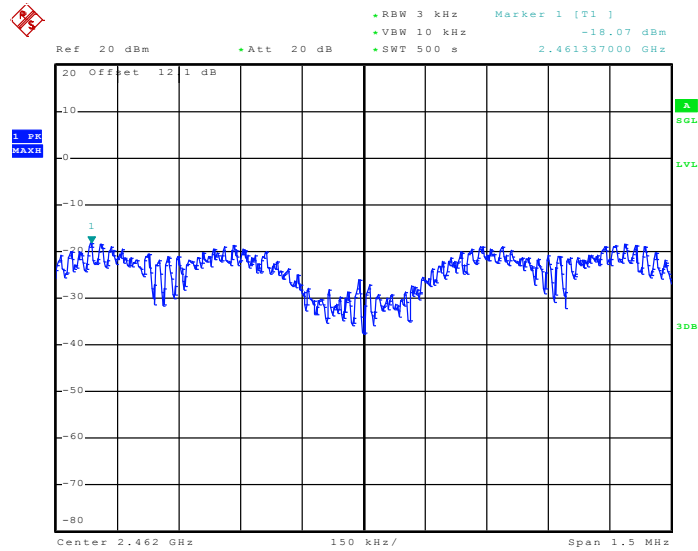


Mode 8 : PSD Plot on 802.11n (BW 20MHz) Channel 06



Date: 26.DEC.2010 17:45:14

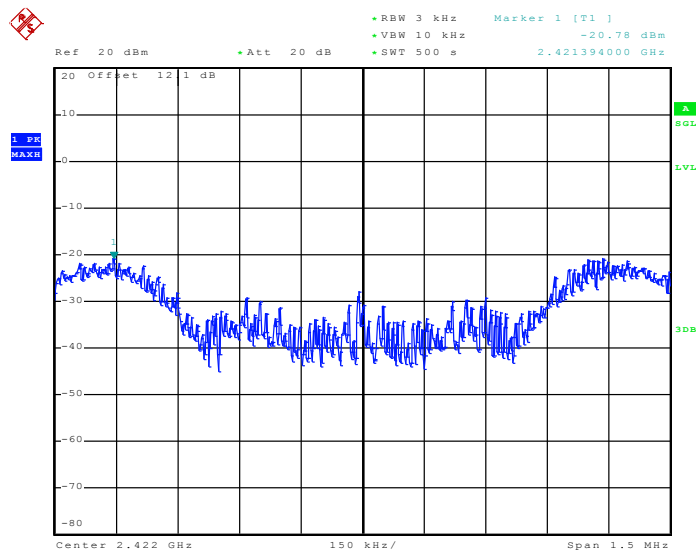
Mode 9 : PSD Plot on 802.11n (BW 20MHz) Channel 11



Date: 26.DEC.2010 17:58:48

Test Mode :	Mode 10, 11, 12	Temperature :	22~24
Test Engineer :	Alan Liu	Relative Humidity :	46~50

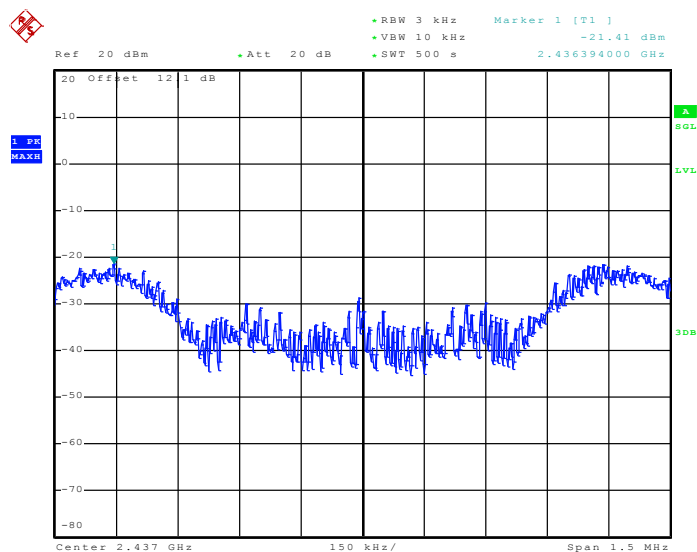
Channel	Frequency (MHz)	802.11n (BW 40MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	-20.78	8	Pass
06	2437	-21.41	8	Pass
09	2452	-21.63	8	Pass

Mode 10 : PSD Plot on 802.11n (BW 40MHz) Channel 03


Date: 26.DEC.2010 19:11:59

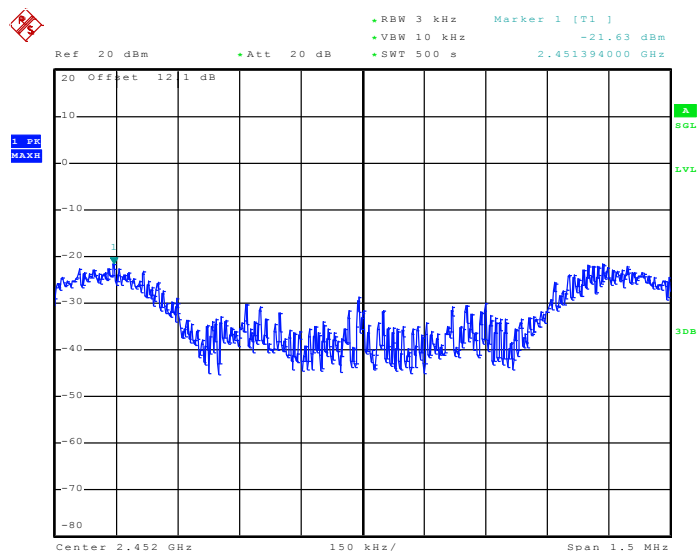


Mode 11 : PSD Plot on 802.11n (BW 40MHz) Channel 06



Date: 26.DEC.2010 19:23:39

Mode 12 : PSD Plot on 802.11n (BW 40MHz) Channel 09



Date: 26.DEC.2010 19:37:06

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.

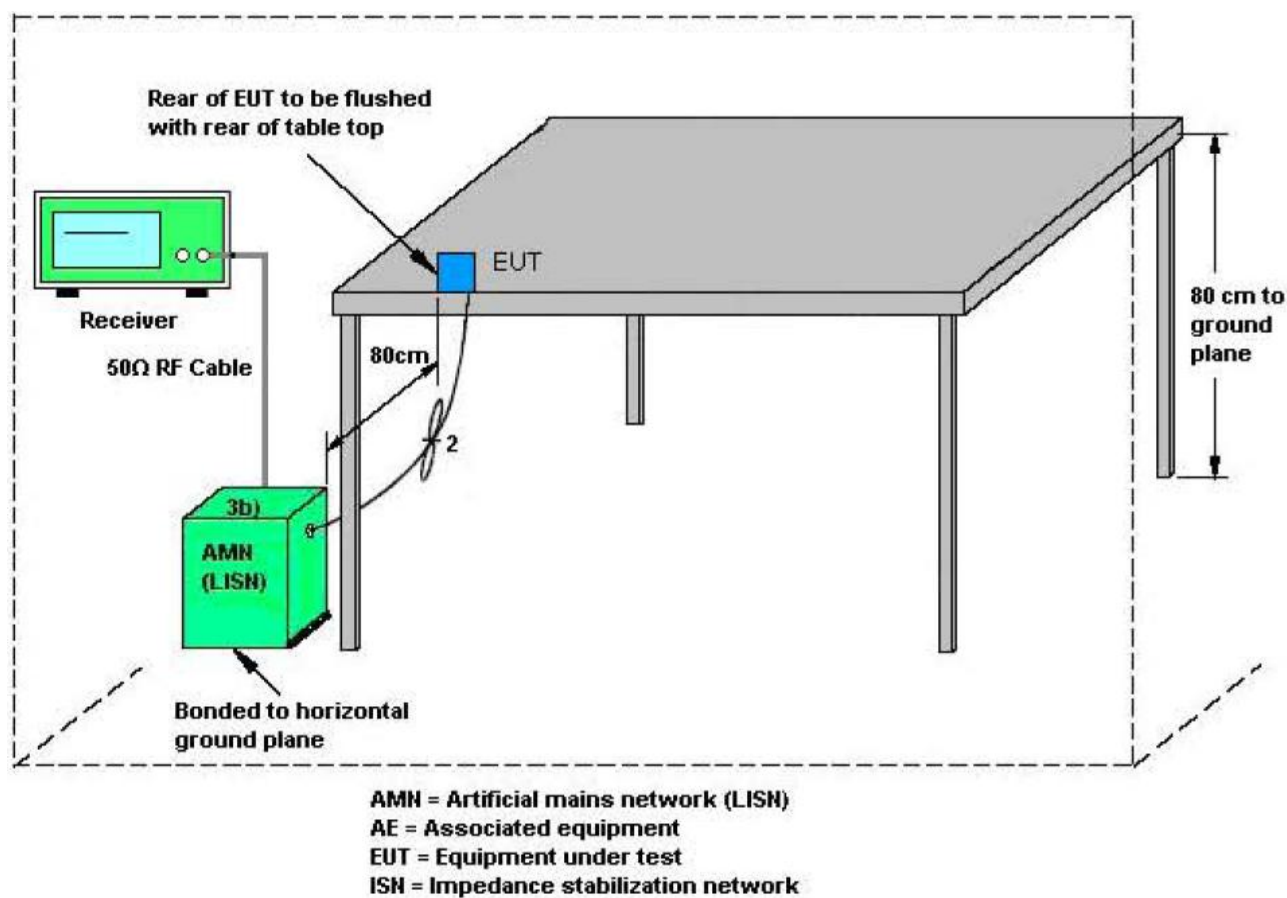
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

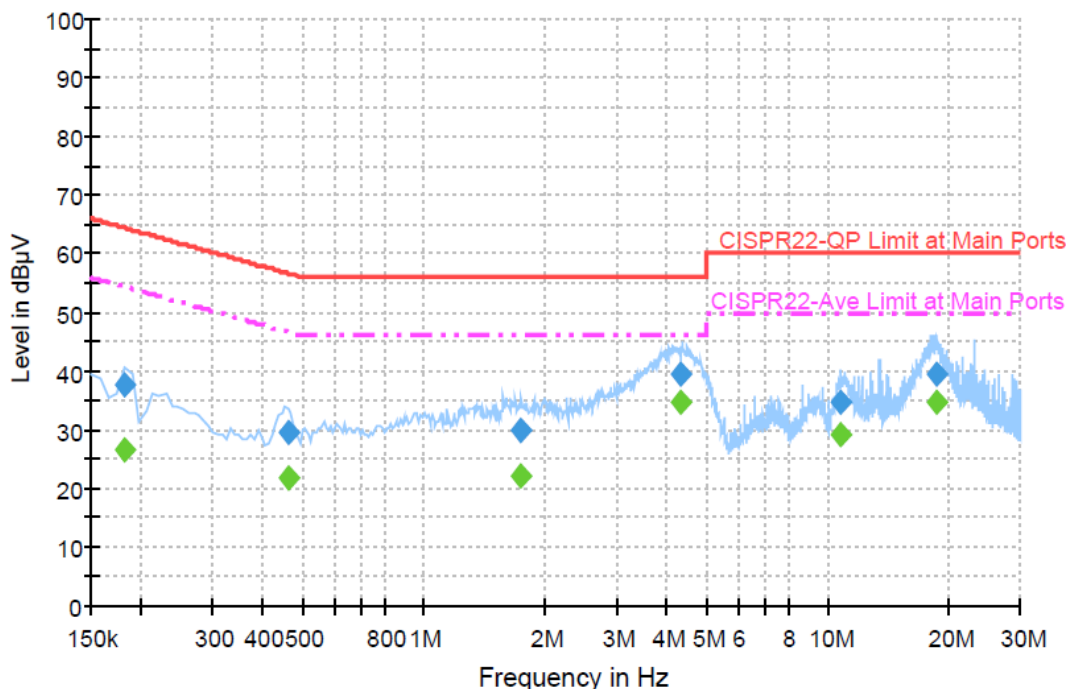
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 :	WLAN Link + LAN Link + WAN Link + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



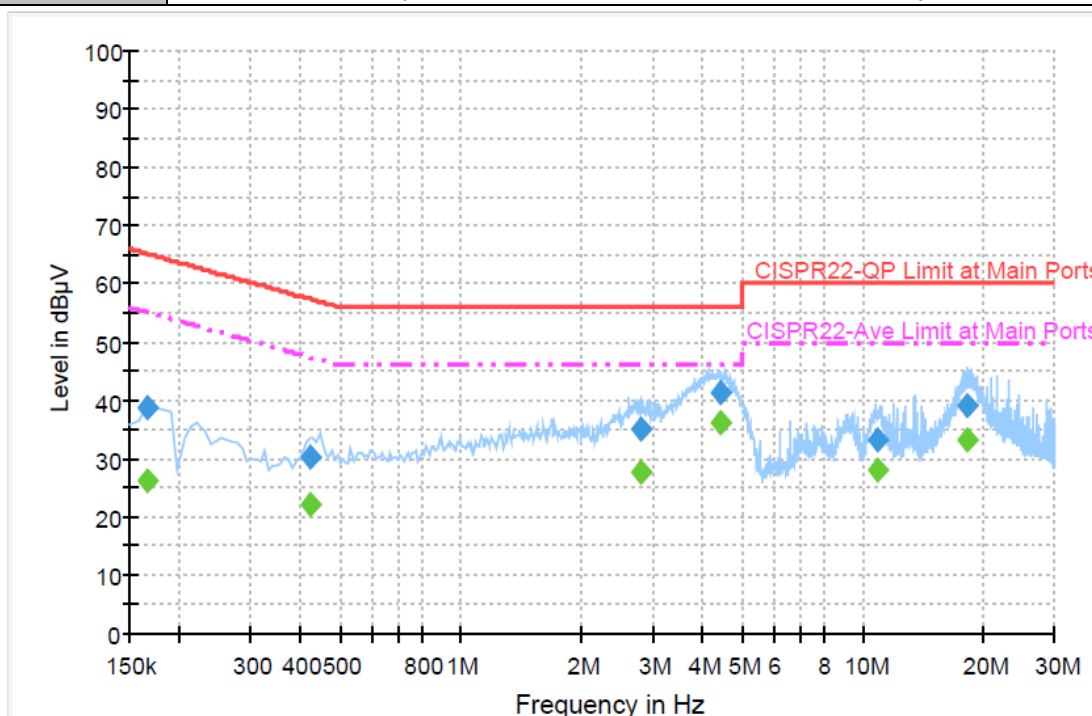
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.182000	37.8	Off	L1	19.4	26.6	64.4
0.462000	29.7	Off	L1	19.3	27.0	56.7
1.742000	29.9	Off	L1	19.4	26.1	56.0
4.326000	39.6	Off	L1	19.5	16.4	56.0
10.790000	34.7	Off	L1	19.6	25.3	60.0
18.590000	39.6	Off	L1	19.8	20.4	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.182000	26.7	Off	L1	19.4	27.7	54.4
0.462000	21.6	Off	L1	19.3	25.1	46.7
1.742000	22.2	Off	L1	19.4	23.8	46.0
4.326000	34.5	Off	L1	19.5	11.5	46.0
10.790000	29.3	Off	L1	19.6	20.7	50.0
18.590000	34.5	Off	L1	19.8	15.5	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 :	WLAN Link + LAN Link + WAN Link + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	38.8	Off	N	19.3	26.4	65.2
0.422000	30.4	Off	N	19.4	27.0	57.4
2.790000	35.0	Off	N	19.6	21.0	56.0
4.446000	41.4	Off	N	19.5	14.6	56.0
10.830000	33.4	Off	N	19.7	26.6	60.0
18.182000	39.1	Off	N	19.8	20.9	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	26.2	Off	N	19.3	29.0	55.2
0.422000	22.0	Off	N	19.4	25.4	47.4
2.790000	27.5	Off	N	19.6	18.5	46.0
4.446000	36.3	Off	N	19.5	9.7	46.0
10.830000	27.9	Off	N	19.7	22.1	50.0
18.182000	33.3	Off	N	19.8	16.7	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

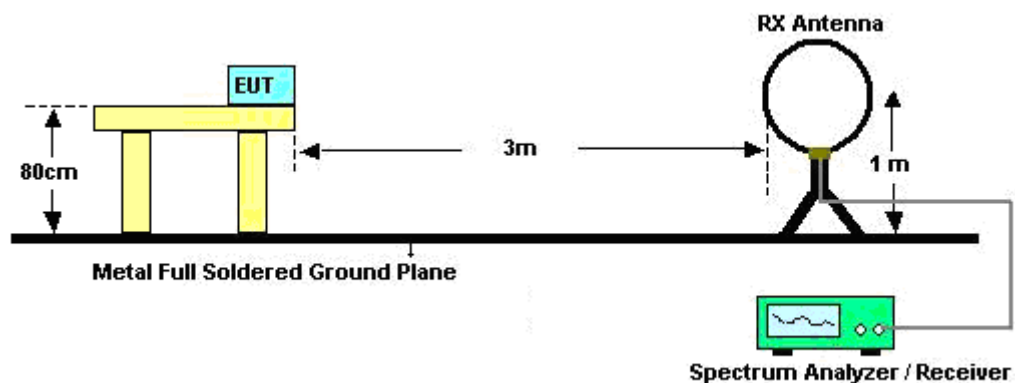
See list of measuring instruments of this test report.

3.7.3 Test Procedures

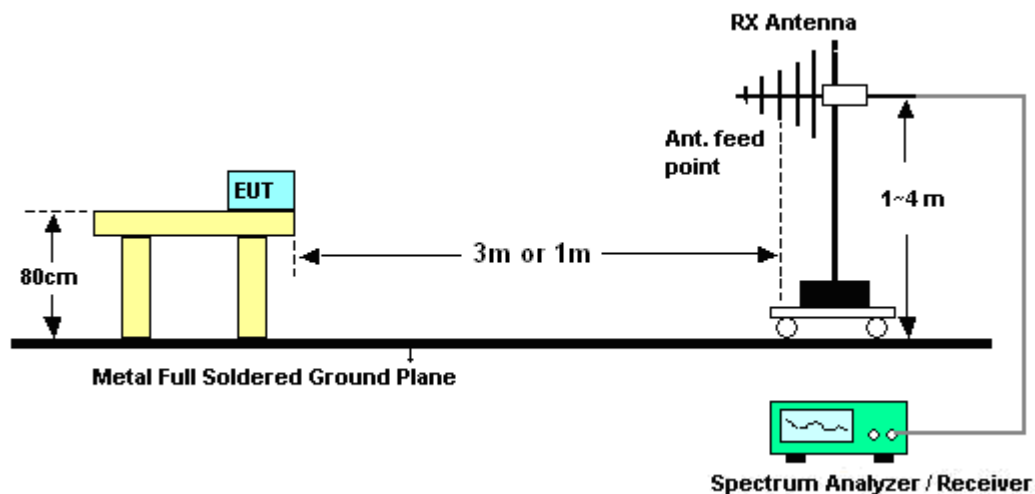
1. The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:
 - (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = 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 :	Kay Wu	Temperature :	17~18℃	
		Relative Humidity :	42~43%	

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 :	17~18℃
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 9648 MHz is not within a restricted band.		

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	25.91	-14.09	40	41.84	14.93	0.74	31.6	-	-	Peak
159.33	30.7	-12.8	43.5	50.51	10.14	1.48	31.43	-	-	Peak
213.33	33.85	-9.65	43.5	53.36	10.24	1.71	31.46	-	-	Peak
320.3	38.03	-7.97	46	53.36	13.93	2.13	31.39	-	-	Peak
745.9	38.09	-7.91	46	46.35	20.02	3.34	31.62	100	152	Peak
904.8	38.04	-7.96	46	43.55	21.65	3.76	30.92	-	-	Peak
2389.99	51.51	-22.49	74	49.5	32.48	3.92	34.39	100	139	Peak
2389.99	41.65	-12.35	54	39.64	32.48	3.92	34.39	100	139	Average
2412	99.77	-	-	97.71	32.5	3.95	34.39	100	139	Peak
2412	96.25	-	-	94.19	32.5	3.95	34.39	100	139	Average
2492	48.33	-25.67	74	46.05	32.6	4.05	34.37	100	139	Peak
2492	36	-18	54	33.72	32.6	4.05	34.37	100	139	Average
4824	50.4	-23.6	74	66.18	34.9	5.77	56.45	100	0	Peak
7236	46.49	-27.51	74	60.12	36.2	7.18	57.01	100	0	Peak
9648	52.89	-26.88	79.77	64.81	36.96	7.94	56.82	100	0	Peak

Test Mode :	Mode 1	Temperature :	17~18°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 9648 MHz is not within a restricted band.		

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
50.79	30.12	-9.88	40	52.8	8.08	0.86	31.62	-	-	Peak
63.48	29.03	-10.97	40	53.23	6.4	0.98	31.58	-	-	Peak
213.33	32.16	-11.34	43.5	51.67	10.24	1.71	31.46	-	-	Peak
532.4	35.22	-10.78	46	45.72	18.26	2.79	31.55	-	-	Peak
745.9	36.56	-9.44	46	44.82	20.02	3.34	31.62	100	291	Peak
959.4	35.05	-10.95	46	39.89	21.9	3.8	30.54	-	-	Peak
2384.1	56.89	-17.11	74	54.88	32.48	3.92	34.39	100	34	Peak
2384.1	47.14	-6.86	54	45.15	32.46	3.92	34.39	100	34	Average
2412	107.83	-	-	105.77	32.5	3.95	34.39	100	34	Peak
2412	104.25	-	-	102.19	32.5	3.95	34.39	100	34	Average
2492	55.01	-18.99	74	52.73	32.6	4.05	34.37	100	34	Peak
2492	42.84	-11.16	54	40.56	32.6	4.05	34.37	100	34	Average
4824	54.47	-19.53	74	70.25	34.9	5.77	56.45	100	231	Peak
4824	52.53	-1.47	54	68.31	34.9	5.77	56.45	100	231	Average
7236	47.09	-26.91	74	60.72	36.21	7.18	57.02	100	0	Peak
9648	54.62	-33.21	87.83	66.54	36.96	7.94	56.82	100	0	Peak



Test Mode :	Mode 2	Temperature :	17~18°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 9748 MHz is not within a restricted band.		

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
157.44	26.12	-17.38	43.5	45.8	10.27	1.47	31.42	-	-	Peak
178.23	24.45	-19.05	43.5	44.93	9.48	1.56	31.52	-	-	Peak
213.33	31.07	-12.43	43.5	50.58	10.24	1.71	31.46	-	-	Peak
320.3	38.29	-7.71	46	53.62	13.93	2.13	31.39	-	-	Peak
745.9	37.77	-8.23	46	46.03	20.02	3.34	31.62	-	-	Peak
906.9	40.79	-5.21	46	46.27	21.66	3.76	30.9	100	144	Peak
2390	48.29	-25.71	74	46.28	32.48	3.92	34.39	100	123	Peak
2390	39.28	-14.72	54	37.27	32.48	3.92	34.39	100	123	Average
2437	99.08	-	-	96.93	32.54	3.99	34.38	100	123	Peak
2437	95.77	-	-	93.62	32.54	3.99	34.38	100	123	Average
2492	47.82	-26.18	74	45.54	32.6	4.05	34.37	100	123	Peak
2492	37.82	-16.18	54	35.54	32.6	4.05	34.37	100	123	Average
4874	51.25	-22.75	74	67.02	34.9	5.82	56.49	128	313	Peak
4874	48.87	-5.13	54	64.66	34.9	5.8	56.49	128	313	Average
7311	45.75	-28.25	74	59.35	36.18	7.2	56.98	100	0	Peak
9748	50.92	-28.16	79.08	62.74	37.04	7.98	56.84	100	0	Peak

Test Mode :	Mode 2	Temperature :	17~18°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 9748 MHz is not within a restricted band.		

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
49.98	29.82	-10.18	40	52.5	8.08	0.86	31.62	-	-	Peak
68.88	28.84	-11.16	40	53.04	6.31	1.04	31.55	-	-	Peak
213.33	30.83	-12.67	43.5	50.34	10.24	1.71	31.46	-	-	Peak
532.4	35.54	-10.46	46	46.04	18.26	2.79	31.55	-	-	Peak
745.9	36.86	-9.14	46	45.12	20.02	3.34	31.62	100	131	Peak
959.4	33.99	-12.01	46	38.83	21.9	3.8	30.54	-	-	Peak
2382	59.66	-14.34	74	57.67	32.46	3.92	34.39	100	45	Peak
2382	44.13	-9.87	54	42.14	32.46	3.92	34.39	100	45	Average
2437	107.64	-	-	105.51	32.52	3.99	34.38	100	45	Peak
2437	104.12	-	-	101.97	32.54	3.99	34.38	100	45	Average
2492	60.56	-13.44	74	58.28	32.6	4.05	34.37	100	45	Peak
2492	46.87	-7.13	54	44.59	32.6	4.05	34.37	100	45	Average
4874	54.92	-19.08	74	70.71	34.9	5.8	56.49	170	312	Peak
4874	52.59	-1.41	54	68.38	34.9	5.8	56.49	170	312	Average
7311	45.97	-28.03	74	59.57	36.18	7.2	56.98	100	0	Peak
9748	54.4	-33.24	87.64	66.22	37.04	7.98	56.84	100	0	Peak

Test Mode :	Mode 3	Temperature :	17~18℃
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 9848 MHz is not within a restricted band.		

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
160.68	27.87	-15.63	43.5	47.78	10.05	1.49	31.45	-	-	Peak
213.33	31.18	-12.32	43.5	50.69	10.24	1.71	31.46	-	-	Peak
241.68	26.67	-19.33	46	44.21	12.1	1.82	31.46	-	-	Peak
320.3	37.81	-8.19	46	53.14	13.93	2.13	31.39	-	-	Peak
745.9	37.92	-8.08	46	46.18	20.02	3.34	31.62	100	148	Peak
959.4	35.57	-10.43	46	40.41	21.9	3.8	30.54	-	-	Peak
2390	48.83	-25.17	74	46.82	32.48	3.92	34.39	101	123	Peak
2390	37.88	-16.12	54	35.87	32.48	3.92	34.39	101	123	Average
2462	96.9	-	-	94.7	32.56	4.02	34.38	101	123	Peak
2462	93.69	-	-	91.49	32.56	4.02	34.38	101	123	Average
2483.85	48.8	-25.2	74	46.54	32.58	4.05	34.37	101	123	Peak
2483.85	38.38	-15.62	54	36.12	32.58	4.05	34.37	101	123	Average
4924	50.97	-23.03	74	66.74	34.9	5.85	56.52	100	0	Peak
9848	47.74	-29.16	76.9	59.42	37.14	8.04	56.86	100	0	Peak

Test Mode :	Mode 3	Temperature :	17~18℃
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 9848 MHz is not within a restricted band.		

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
50.79	30.89	-9.11	40	53.57	8.08	0.86	31.62	100	118	Peak
184.98	28.81	-14.69	43.5	49.32	9.42	1.58	31.51	-	-	Peak
213.33	31.87	-11.63	43.5	51.38	10.24	1.71	31.46	-	-	Peak
532.4	35.57	-10.43	46	46.07	18.26	2.79	31.55	-	-	Peak
745.9	36.6	-9.4	46	44.86	20.02	3.34	31.62	-	-	Peak
959.4	33.81	-12.19	46	38.65	21.9	3.8	30.54	-	-	Peak
2382	54.58	-19.42	74	52.59	32.46	3.92	34.39	100	47	Peak
2382	43.67	-10.33	54	41.68	32.46	3.92	34.39	100	47	Average
2462	106.87	-	-	104.67	32.56	4.02	34.38	100	47	Peak
2462	103.22	-	-	101.02	32.56	4.02	34.38	100	47	Average
2487.65	55.6	-18.4	74	53.34	32.58	4.05	34.37	100	47	Peak
2487.65	46.03	-7.97	54	43.75	32.6	4.05	34.37	100	47	Average
4924	54.15	-19.85	74	69.92	34.9	5.85	56.52	100	186	Peak
4924	52.38	-1.62	54	68.15	34.9	5.85	56.52	100	186	Average
9848	52.53	-34.34	86.87	64.21	37.14	8.04	56.86	100	0	Peak

Test Mode :	Mode 4	Temperature :	17~18°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 9648 MHz is not within a restricted band.		

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
213.33	33.41	-10.09	43.5	52.92	10.24	1.71	31.46	-	-	Peak
241.68	25.24	-20.76	46	42.78	12.1	1.82	31.46	-	-	Peak
249.78	27.64	-18.36	46	44.59	12.67	1.85	31.47	-	-	Peak
320.3	37.62	-8.38	46	52.95	13.93	2.13	31.39	-	-	Peak
745.9	37.87	-8.13	46	46.13	20.02	3.34	31.62	100	155	Peak
901.3	36.25	-9.75	46	41.8	21.63	3.76	30.94	-	-	Peak
2390	55.16	-18.84	74	53.15	32.48	3.92	34.39	100	122	Peak
2390	38.17	-15.83	54	36.16	32.48	3.92	34.39	100	122	Average
2412	99.34	-	-	97.28	32.5	3.95	34.39	100	122	Peak
2412	90.54	-	-	88.48	32.5	3.95	34.39	100	122	Average
2492	47.18	-26.82	74	44.9	32.6	4.05	34.37	100	122	Peak
2492	34.85	-19.15	54	32.57	32.6	4.05	34.37	100	122	Average
9648	51.3	-28.04	79.34	63.22	36.96	7.94	56.82	100	0	Peak

Test Mode :	Mode 4	Temperature :	17~18°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 9648 MHz is not within a restricted band.		

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
49.98	30.78	-9.22	40	53.46	8.08	0.86	31.62	-	-	Peak
159.33	28.97	-14.53	43.5	48.78	10.14	1.48	31.43	-	-	Peak
213.33	31.18	-12.32	43.5	50.69	10.24	1.71	31.46	-	-	Peak
532.4	35.51	-10.49	46	46.01	18.26	2.79	31.55	-	-	Peak
745.9	37.3	-8.7	46	45.56	20.02	3.34	31.62	100	133	Peak
959.4	33	-13	46	37.84	21.9	3.8	30.54	-	-	Peak
2389.61	64.08	-9.92	74	62.07	32.48	3.92	34.39	100	33	Peak
2389.61	45.8	-8.2	54	43.79	32.48	3.92	34.39	100	33	Average
2412	107.29	-	-	105.23	32.5	3.95	34.39	100	33	Peak
2412	98.71	-	-	96.65	32.5	3.95	34.39	100	33	Average
2486	54.78	-19.22	74	52.52	32.58	4.05	34.37	100	33	Peak
2486	42.31	-11.69	54	40.05	32.58	4.05	34.37	100	33	Average
4824	47.65	-26.35	74	63.42	34.9	5.78	56.45	100	0	Peak
9648	55.53	-31.76	87.29	67.46	36.94	7.94	56.81	100	0	Peak

Test Mode :	Mode 5	Temperature :	17~18℃
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	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
213.33	33.58	-9.92	43.5	53.09	10.24	1.71	31.46	-	-	Peak
241.68	25.99	-20.01	46	43.53	12.1	1.82	31.46	-	-	Peak
249.78	27.47	-18.53	46	44.42	12.67	1.85	31.47	-	-	Peak
320.3	38.99	-7.01	46	54.32	13.93	2.13	31.39	100	169	Peak
532.4	36.61	-9.39	46	47.11	18.26	2.79	31.55	-	-	Peak
745.9	37.8	-8.2	46	46.06	20.02	3.34	31.62	-	-	Peak
2382	49.75	-24.25	74	47.76	32.46	3.92	34.39	100	123	Peak
2382	38.03	-15.97	54	36.04	32.46	3.92	34.39	100	123	Average
2437	99.57	-	-	97.42	32.54	3.99	34.38	100	123	Peak
2437	90.5	-	-	88.35	32.54	3.99	34.38	100	123	Average
2492	50.18	-23.82	74	47.9	32.6	4.05	34.37	100	123	Peak
2492	38.95	-15.05	54	36.67	32.6	4.05	34.37	100	123	Average
4874	48.42	-25.58	74	64.19	34.9	5.82	56.49	100	0	Peak

Test Mode :	Mode 5	Temperature :	17~18°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 9748 MHz is not within a restricted band.		

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
49.98	30.26	-9.74	40	52.94	8.08	0.86	31.62	-	-	Peak
187.68	29.59	-13.91	43.5	50.11	9.4	1.59	31.51	-	-	Peak
213.33	31.78	-11.72	43.5	51.29	10.24	1.71	31.46	-	-	Peak
532.4	35.08	-10.92	46	45.58	18.26	2.79	31.55	-	-	Peak
745.9	36.79	-9.21	46	45.05	20.02	3.34	31.62	100	122	Peak
959.4	33.33	-12.67	46	38.17	21.9	3.8	30.54	-	-	Peak
2382	59.13	-14.87	74	57.14	32.46	3.92	34.39	100	38	Peak
2382	47.43	-6.57	54	45.44	32.46	3.92	34.39	100	38	Average
2437	107.15	-	-	105	32.54	3.99	34.38	100	38	Peak
2437	98.13	-	-	95.98	32.54	3.99	34.38	100	38	Average
2492	55.91	-18.09	74	53.63	32.6	4.05	34.37	100	38	Peak
2492	44.97	-9.03	54	42.69	32.6	4.05	34.37	100	38	Average
4874	48.92	-25.08	74	64.69	34.9	5.82	56.49	100	0	Peak
9748	53.38	-33.77	87.15	65.16	37.06	8	56.84	100	0	Peak

Test Mode :	Mode 6	Temperature :	17~18℃
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	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
213.33	33.68	-9.82	43.5	53.19	10.24	1.71	31.46	-	-	Peak
241.68	26.82	-19.18	46	44.36	12.1	1.82	31.46	-	-	Peak
249.78	26.87	-19.13	46	43.82	12.67	1.85	31.47	-	-	Peak
320.3	37.06	-8.94	46	52.39	13.93	2.13	31.39	-	-	Peak
745.9	38.09	-7.91	46	46.35	20.02	3.34	31.62	100	166	Peak
903.4	36.63	-9.37	46	42.16	21.64	3.76	30.93	-	-	Peak
2388	49.22	-24.78	74	47.21	32.48	3.92	34.39	104	125	Peak
2388	36.73	-17.27	54	34.72	32.48	3.92	34.39	104	125	Average
2462	99.72	-	-	97.52	32.56	4.02	34.38	104	125	Peak
2462	90.82	-	-	88.62	32.56	4.02	34.38	104	125	Average
2483.66	55.25	-18.75	74	52.99	32.58	4.05	34.37	104	125	Peak
2483.66	37.91	-16.09	54	35.65	32.58	4.05	34.37	104	125	Average

Test Mode :	Mode 6	Temperature :	17~18°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 9848 MHz is not within a restricted band.		

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
50.79	30.81	-9.19	40	53.49	8.08	0.86	31.62	-	-	Peak
62.13	28.45	-11.55	40	52.64	6.43	0.97	31.59	-	-	Peak
213.33	32.55	-10.95	43.5	52.06	10.24	1.71	31.46	-	-	Peak
532.4	35.02	-10.98	46	45.52	18.26	2.79	31.55	-	-	Peak
745.9	36.99	-9.01	46	45.25	20.02	3.34	31.62	100	139	Peak
901.3	34.93	-11.07	46	40.48	21.63	3.76	30.94	-	-	Peak
2390	54.68	-19.32	74	52.67	32.48	3.92	34.39	100	47	Peak
2390	40.65	-13.35	54	38.64	32.48	3.92	34.39	100	47	Average
2462	107.01	-	-	104.81	32.56	4.02	34.38	100	47	Peak
2462	98	-	-	95.8	32.56	4.02	34.38	100	47	Average
2483.66	63.41	-10.59	74	61.15	32.58	4.05	34.37	100	47	Peak
2483.66	45.12	-8.88	54	42.86	32.58	4.05	34.37	100	47	Average
4924	49.07	-24.93	74	64.84	34.9	5.85	56.52	100	0	Peak
9848	49.77	-37.24	87.01	61.44	37.16	8.04	56.87	100	0	Peak



Test Mode :	Mode 7	Temperature :	17~18°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	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
2389.99	59.87	-14.13	74	57.86	32.48	3.92	34.39	100	138	Peak
2389.99	38.46	-15.54	54	36.45	32.48	3.92	34.39	100	138	Average
2412	97.52	-	-	95.49	32.5	3.92	34.39	100	138	Peak
2412	88.21	-	-	86.15	32.5	3.95	34.39	100	138	Average
2486	46.97	-27.03	74	44.71	32.58	4.05	34.37	100	138	Peak
2486	33.95	-20.05	54	31.69	32.58	4.05	34.37	100	138	Average



Test Mode :	Mode 7	Temperature :	17~18°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	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
2389.99	67.05	-6.95	74	65.04	32.48	3.92	34.39	100	33	Peak
2389.99	44.99	-9.01	54	42.98	32.48	3.92	34.39	100	33	Average
2412	106.35	-	-	104.29	32.5	3.95	34.39	100	33	Peak
2412	96.98	-	-	94.92	32.5	3.95	34.39	100	33	Average
2486	54.1	-19.9	74	51.84	32.58	4.05	34.37	100	33	Peak
2486	40.22	-13.78	54	37.96	32.58	4.05	34.37	100	33	Average



Test Mode :	Mode 8	Temperature :	17~18°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	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
2388	47.47	-26.53	74	45.46	32.48	3.92	34.39	100	124	Peak
2388	39.57	-14.43	54	37.56	32.48	3.92	34.39	100	124	Average
2437	97.95	-	-	95.8	32.54	3.99	34.38	100	124	Peak
2437	88.59	-	-	86.44	32.54	3.99	34.38	100	124	Average
2486	49.02	-24.98	74	46.76	32.58	4.05	34.37	100	124	Peak
2486	37.71	-16.29	54	35.45	32.58	4.05	34.37	100	124	Average



Test Mode :	Mode 8	Temperature :	17~18°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	56.52	-17.48	74	54.51	32.48	3.92	34.39	100	46	Peak
2390	44.25	-9.75	54	42.24	32.48	3.92	34.39	100	46	Average
2437	106.15	-	-	104.02	32.52	3.99	34.38	100	46	Peak
2437	96.32	-	-	94.17	32.54	3.99	34.38	100	46	Average
2492	56.07	-17.93	74	53.79	32.6	4.05	34.37	100	46	Peak
2492	45.82	-8.18	54	43.54	32.6	4.05	34.37	100	46	Average



Test Mode :	Mode 9	Temperature :	17~18°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	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
2390	45.93	-28.07	74	43.92	32.48	3.92	34.39	100	123	Peak
2390	38.39	-15.61	54	36.38	32.48	3.92	34.39	100	123	Average
2462	96.1	-	-	93.9	32.56	4.02	34.38	100	123	Peak
2462	87	-	-	84.8	32.56	4.02	34.38	100	123	Average
2483.5	54.02	-19.98	74	51.76	32.58	4.05	34.37	100	123	Peak
2483.5	35.85	-18.15	54	33.59	32.58	4.05	34.37	100	123	Average



Test Mode :	Mode 9	Temperature :	17~18°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	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
2390	52.88	-21.12	74	50.87	32.48	3.92	34.39	100	47	Peak
2390	40.35	-13.65	54	38.34	32.48	3.92	34.39	100	47	Average
2462	105.43	-	-	103.23	32.56	4.02	34.38	100	47	Peak
2462	95.68	-	-	93.48	32.56	4.02	34.38	100	47	Average
2483.5	63.39	-10.61	74	61.13	32.58	4.05	34.37	100	47	Peak
2483.5	43.21	-10.79	54	40.95	32.58	4.05	34.37	100	47	Average



Test Mode :	Mode 10	Temperature :	17~18°C
Test Channel :	03	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	2422 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
2388.66	60.02	-13.98	74	58.01	32.48	3.92	34.39	100	137	Peak
2388.66	44.43	-9.57	54	42.42	32.48	3.92	34.39	100	137	Average
2422	95.68	-	-	93.6	32.52	3.95	34.39	100	137	Peak
2422	86.67	-	-	84.59	32.52	3.95	34.39	100	137	Average
2486	46.81	-27.19	74	44.55	32.58	4.05	34.37	100	137	Peak
2486	33.42	-20.58	54	31.16	32.58	4.05	34.37	100	137	Average



Test Mode :	Mode 10	Temperature :	17~18°C
Test Channel :	03	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	2422 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
2385.81	67.34	-6.66	74	65.33	32.48	3.92	34.39	100	45	Peak
2385.81	50.96	-3.04	54	48.95	32.48	3.92	34.39	100	45	Average
2422	103.6	-	-	101.47	32.52	3.99	34.38	100	45	Peak
2422	93.9	-	-	91.82	32.52	3.95	34.39	100	45	Average
2492	55.67	-18.33	74	53.39	32.6	4.05	34.37	100	45	Peak
2492	40.29	-13.71	54	38.01	32.6	4.05	34.37	100	45	Average



Test Mode :	Mode 11	Temperature :	17~18℃
Test Channel :	09	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	2452 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	46.18	-27.82	74	44.17	32.48	3.92	34.39	100	124	Peak
2390	38.27	-15.73	54	36.26	32.48	3.92	34.39	100	124	Average
2452	94.68	-	-	92.53	32.54	3.99	34.38	100	124	Peak
2452	85.75	-	-	83.6	32.54	3.99	34.38	100	124	Average
2487.65	57.51	-16.49	74	55.25	32.58	4.05	34.37	100	124	Peak
2487.65	40.03	-13.97	54	37.75	32.6	4.05	34.37	100	124	Average



Test Mode :	Mode 11	Temperature :	17~18°C
Test Channel :	09	Relative Humidity :	42~43%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	2452 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	54.66	-19.34	74	52.65	32.48	3.92	34.39	100	39	Peak
2390	40.9	-13.1	54	38.89	32.48	3.92	34.39	100	39	Average
2452	102.45	-	-	100.3	32.54	3.99	34.38	100	39	Peak
2452	93.06	-	-	90.91	32.54	3.99	34.38	100	39	Average
2487.65	66.18	-7.82	74	63.92	32.58	4.05	34.37	100	39	Peak
2487.65	49.53	-4.47	54	47.25	32.6	4.05	34.37	100	39	Average

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 Dipole 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	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)
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)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 25, 2010	Oct. 24, 2011	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz-1000MHz	Apr. 28, 2010	Apr. 27, 2011	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Oct. 31, 2010	Oct. 31, 2011	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Aug. 02, 2010	Aug. 01, 2011	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Oct. 20, 2010	Oct.19, 2011	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Apr. 15, 2010	Apr. 14, 2011	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 15, 2010	Apr. 14, 2011	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH06-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
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				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP000724-01 as below.