FCC RF Test Report

APPLICANT	:	Kodiak Networks Inc
EQUIPMENT	:	Carbonado – Wifi Device
BRAND NAME	:	Carbonado
MODEL NAME	:	UA400
MARKETING NAME	:	Carbonado
FCC ID	:	RTKU400
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Feb. 21, 2013 and completely tested on Mar. 13, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory 1190

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

TABLE OF CONTENTS

REVISION HISTORY **3**

SUMMARY OF TEST RESULT **4**

1 GENERAL DESCRIPTION **5**

1.1 Applicant 5
1.2 Manufacturer 5
1.3 Feature of Equipment Under Test 5
1.4 Product Specification of Equipment Under Test 5
1.5 Testing Site 6
1.6 Applied Standards 6

2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST **7**

2.1 Carrier Frequency Channel 7
2.2 Pre-Scanned RF Power 8
2.3 Test Mode 9
2.4 Connection Diagram of Test System 10
2.5 Support Unit used in test configuration and system 11
2.6 RF Utility 11
2.7 Measurement Results Explanation Example 11

3 TEST RESULT **12**

3.1 6dB Bandwidth Measurement 12
3.2 Output Power Measurement 21
3.3 Power Spectral Density Measurement 24
3.4 Conducted Band Edges and Spurious Emission Measurement 43
3.5 Radiated Emission Measurement 60
3.6 AC Conducted Emission Measurement 92
3.7 Antenna Requirements 98

4 LIST OF MEASURING EQUIPMENT **99**

5 UNCERTAINTY OF EVALUATION **100**

APPENDIX A. PHOTOGRAPHS OF EUT

APPENDIX B. SETUP PHOTOGRAPHS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR322101B	Rev. 01	Initial issue of report	Mar. 15, 2013

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	≥ 0.5MHz	Pass	-
3.2	15.247(b)	A8.4	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	A8.2(b)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges	≤ 20dBc	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	A8.5	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	Under limit 9.87 dB at 83.350 MHz
			Radiated Spurious Emission			
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 3.64 dB at 0.500 MHz
3.7	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Kodiak Networks Inc
1501 10th St #130 Plano, TX 75074, United States

1.2 Manufacturer

Shenzhen Power Idea Technology Limited
1401A, Section B, Bin hai zhi Chuang tower, Wen xin 5 Road, Nan Shan, Shen Zhen city, PRC

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Carbonado – Wifi Device
Brand Name	Carbonado
Model Name	UA400
Marketing Name	Carbonado
FCC ID	RTKU400
EUT supports Radios application	WLAN 11bgn / Bluetooth
HW Version	P920_MB_V0.3
SW Version	Android 2.3.7
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2412 MHz ~ 2462 MHz
Number of Channels	11
Carrier Frequency of Each Channel	2412+(n-1)*5 MHz; n=1~11
Maximum Output Power to Antenna	802.11b : 10.07 dBm (0.0102 W) 802.11g : 15.84 dBm (0.0384 W) 802.11n HT20 : 13.28 dBm (0.0213 W) 802.11n HT40 : 14.05 dBm (0.0254 W)
Antenna Type	Monopole Antenna type with gain -0.5 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH01-KS	CO01-KS	03CH01-KS	149928/4086E-1

1.6 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 D01 DTS Meas. Guidance v02
- ANSI C63.4-2003 and ANSI C63.10-2009

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, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals 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) and radiated emission (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and antenna configurations as following table and the highest power data rates were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

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	10.07	10.05	9.50	10.02
CH 06	2437 MHz	9.60	9.85	9.86	9.87
CH 11	2462 MHz	9.44	9.43	9.38	9.36

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	14.85	14.45	14.62	14.37	14.87	14.72	14.6	14.61
CH 06	2437 MHz	15.03	14.42	14.75	14.35	15.07	14.88	14.67	14.83
CH 11	2462 MHz	15.84	14.83	15.44	14.75	15.84	15.58	15.25	15.46

Channel	Frequency	2.4GHz 802.11n HT20 RF Power (dBm)							
		OFDM Data Rate							
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412 MHz	13.28	13.26	13.27	13.25	13.26	13.23	13.26	13.24
CH 06	2437 MHz	12.58	12.52	12.56	12.62	12.6	12.58	12.61	12.59
CH 11	2462 MHz	12.78	12.7	12.75	12.72	12.67	12.65	12.72	12.71

Channel	Frequency	2.4GHz 802.11n HT40 RF Power (dBm)							
		OFDM Data Rate							
		13.5 Mbps	27 Mbps	40.5 Mbps	54 Mbps	81 Mbps	108 Mbps	121.5 Mbps	135 Mbps
CH 03	2422 MHz	14.05	13.92	13.81	14.03	13.84	13.96	13.87	13.79
CH 06	2437 MHz	13.22	13.01	13.23	14.02	13.92	14.05	13.57	13.09
CH 09	2452 MHz	12.49	12.12	12.71	13.87	13.57	13.77	13.04	12.78

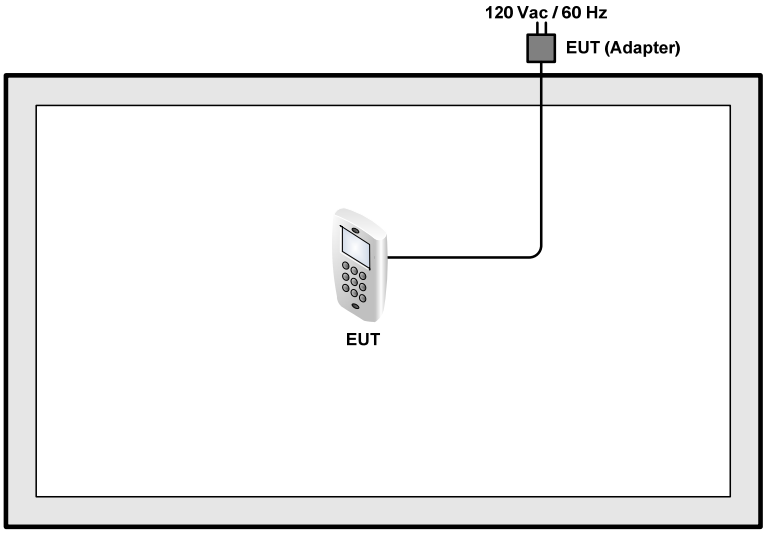
2.3 Test Mode

Final results of test modes, data rates and test channels are shown as following table.

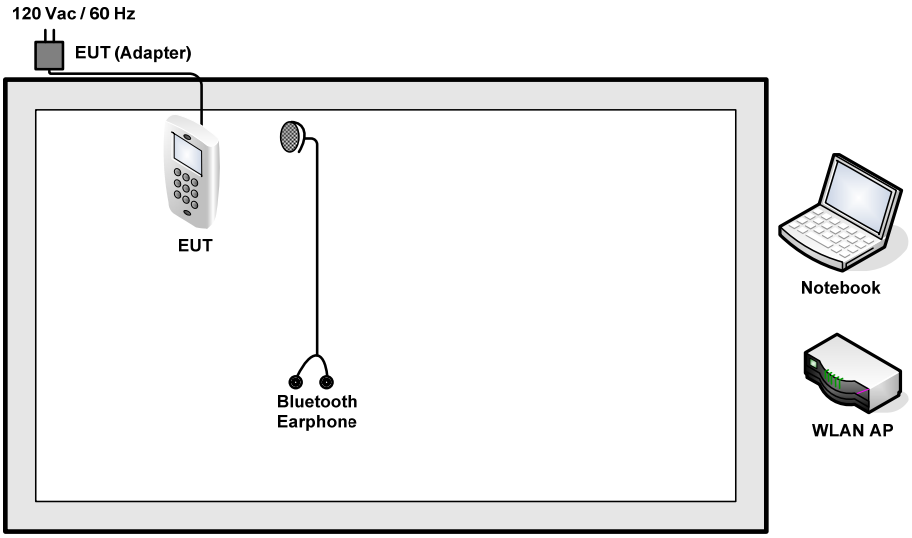
Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
		802.11n HT40	13.5 Mbps	3/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
Radiated TCs	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
		802.11n HT40	13.5 Mbps	3/9
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN Link + Adapter			

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	P08S	QDS-BRCM1030	N/A	AC I/P: Unshielded, 0.9 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	N/A	N/A

2.6 RF Utility

For WLAN function, programmed RF utility, “ADB” installed in the PC make the EUT provides functions like channel selection and power level for continuous transmitting and receiving signals.

2.7 Measurement Results Explanation Example

For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and 10dB attenuator between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and 10dB attenuator factor.

Offset = RF cable loss + attenuator factor.

Following table shows an offset computation example with cable loss 7.5 dB.

Example :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 7.5 + 10 = 7.5 (dB)

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.

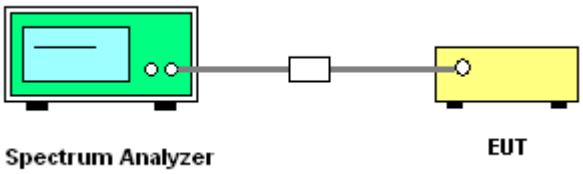
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.
5. Measure and record the results in the test report.

3.1.4 Test Setup

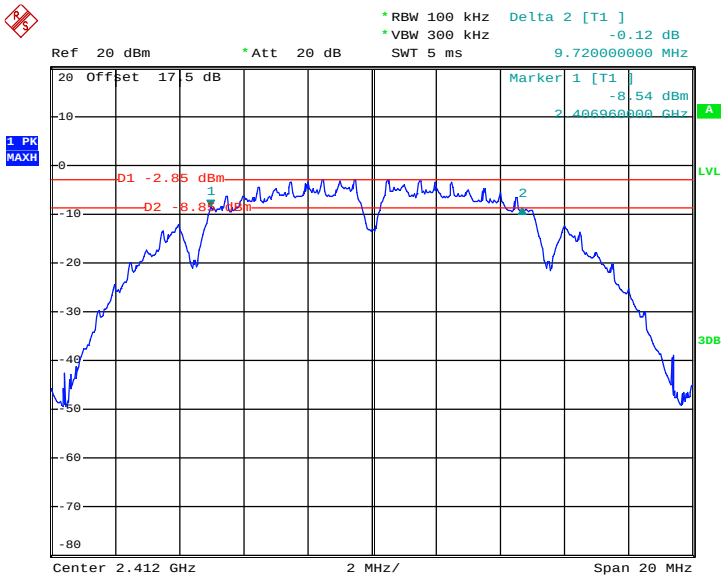


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	802.11b	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%

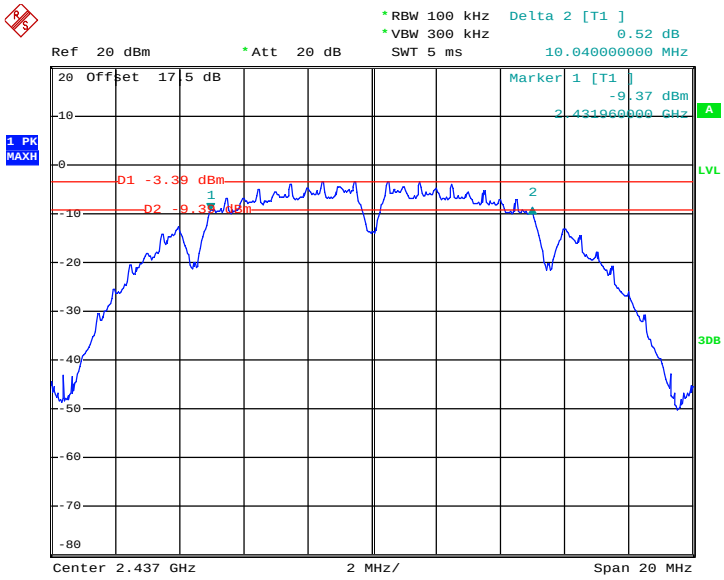
Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	9.72	0.5	Pass
06	2437	10.04	0.5	Pass
11	2462	10.00	0.5	Pass

6 dB Bandwidth Plot on 802.11b Channel 01



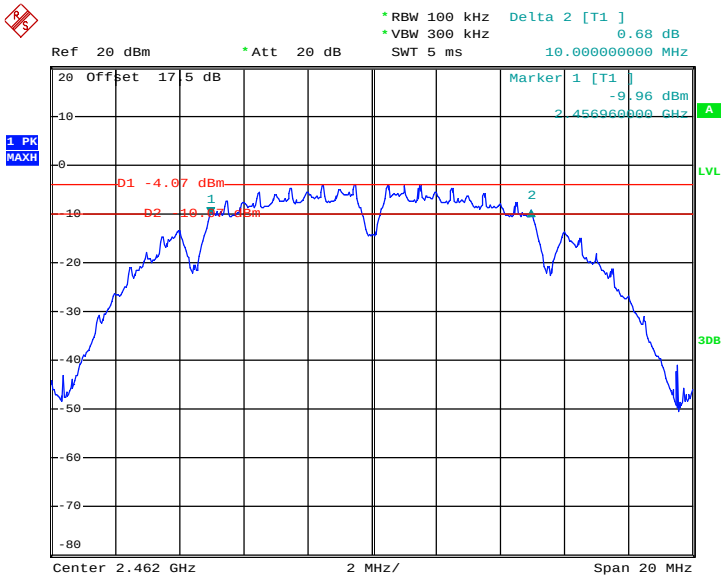
Date: 28.FEB.2013 20:58:36

6 dB Bandwidth Plot on 802.11b Channel 06



Date: 28.FEB.2013 21:11:18

6 dB Bandwidth Plot on 802.11b Channel 11

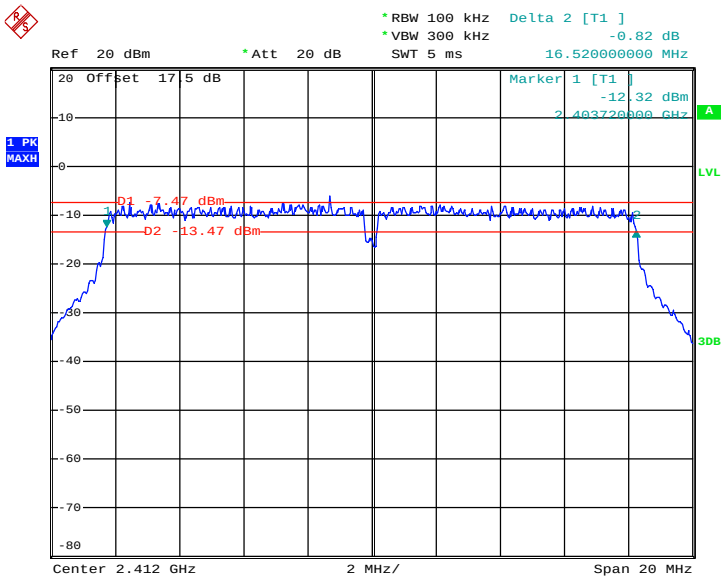


Date: 28.FEB.2013 21:16:30

Test Mode :	802.11g	Temperature :	20~21℃
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%

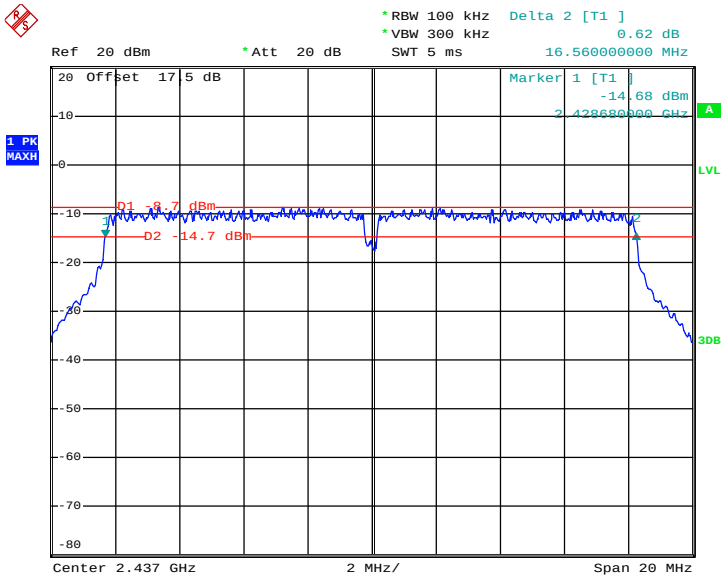
Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.52	0.5	Pass
06	2437	16.56	0.5	Pass
11	2462	16.54	0.5	Pass

6 dB Bandwidth Plot on 802.11g Channel 01



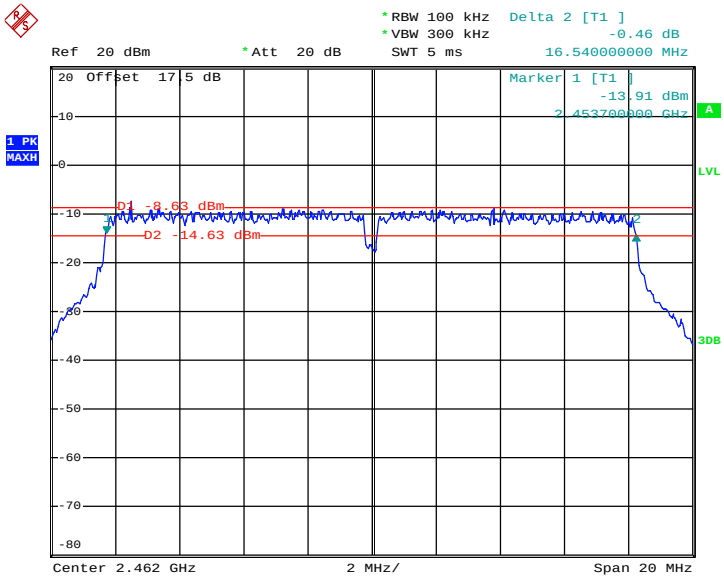
Date: 28.FEB.2013 20:31:19

6 dB Bandwidth Plot on 802.11g Channel 06



Date: 28.FEB.2013 20:39:53

6 dB Bandwidth Plot on 802.11g Channel 11

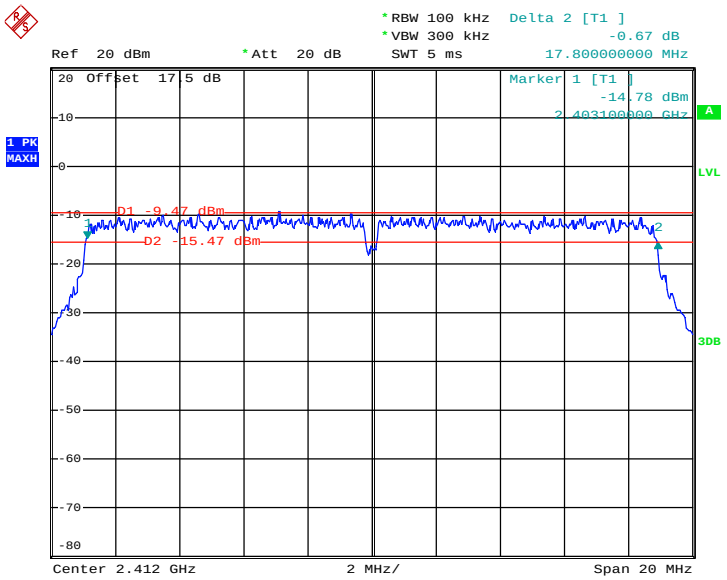


Date: 28.FEB.2013 20:47:33

Test Mode :	802.11n HT20	Temperature :	20~21℃
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%

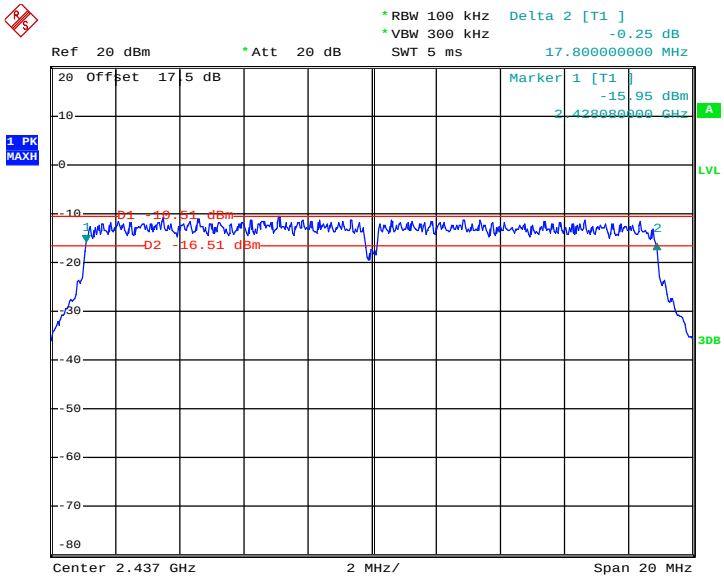
Channel	Frequency (MHz)	2.4GHz 802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.80	0.5	Pass
06	2437	17.80	0.5	Pass
11	2462	17.66	0.5	Pass

6 dB Bandwidth Plot on 802.11n HT20 Channel 01



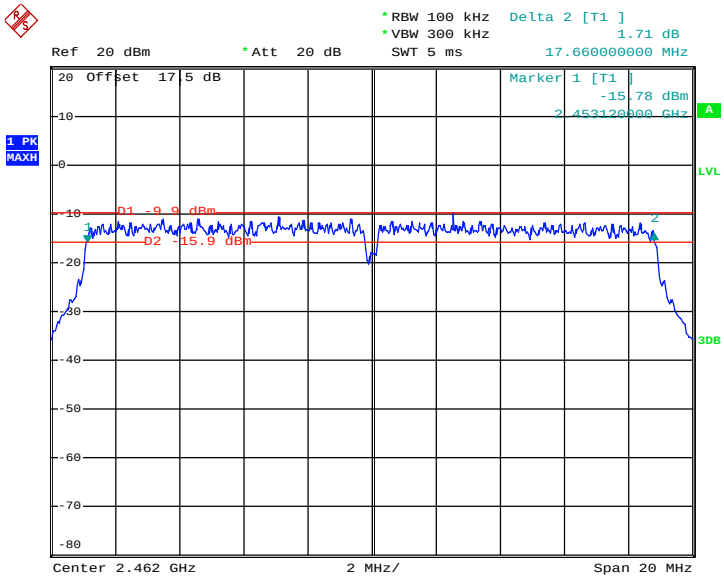
Date: 28.FEB.2013 22:35:55

6 dB Bandwidth Plot on 802.11n HT20 Channel 06



Date: 28.FEB.2013 22:43:03

6 dB Bandwidth Plot on 802.11n HT20 Channel 11

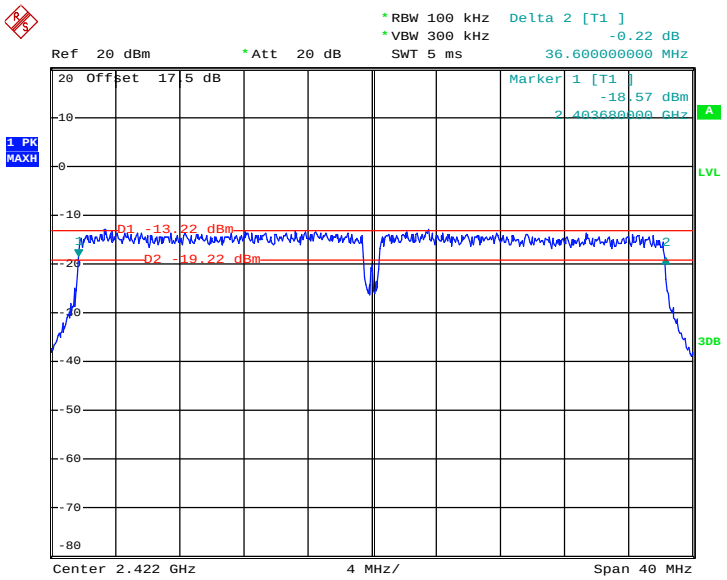


Date: 28.FEB.2013 22:51:20

Test Mode :	802.11n HT40	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%

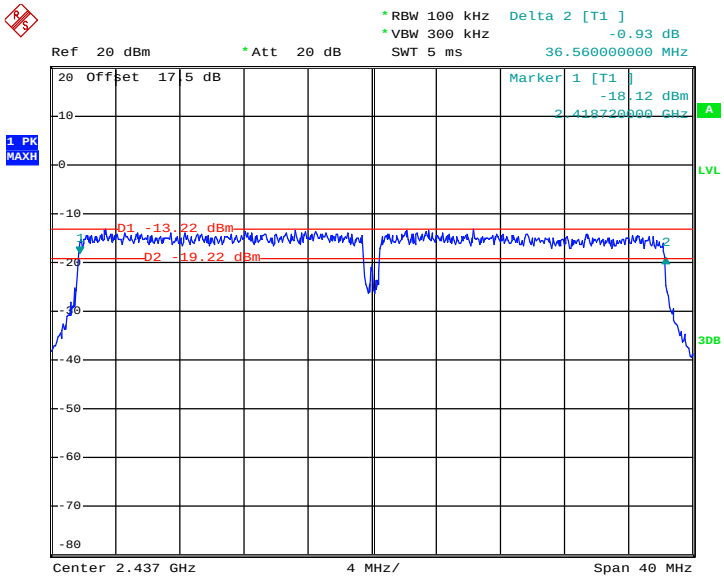
Channel	Frequency (MHz)	802.11n HT40 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
03	2422	36.60	0.5	Pass
06	2437	36.56	0.5	Pass
09	2452	36.32	0.5	Pass

6 dB Bandwidth Plot on 802.11n HT40 Channel 03



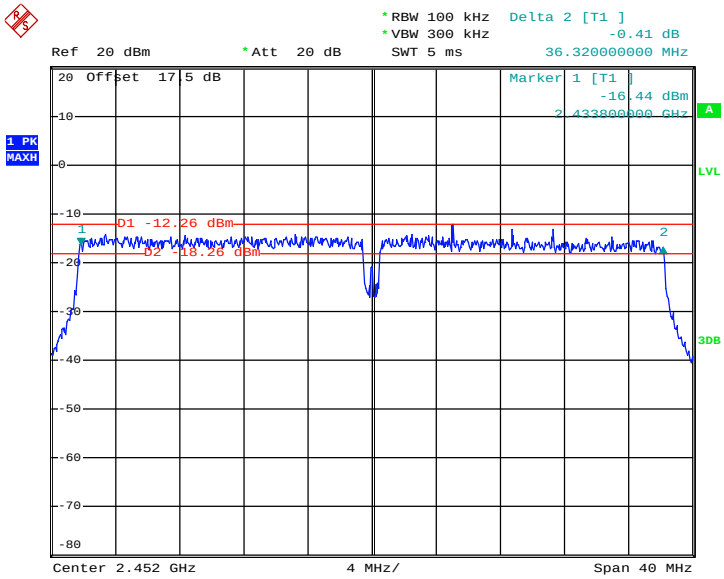
Date: 28.FEB.2013 21:55:25

6 dB Bandwidth Plot on 802.11n HT40 Channel 06



Date: 28.FEB.2013 22:02:30

6 dB Bandwidth Plot on 802.11n HT40Channel 09



Date: 28.FEB.2013 23:08:29

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.

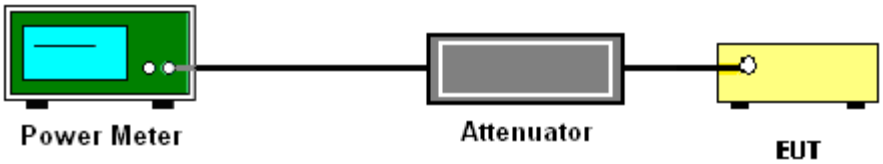
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test Mode :	802.11b	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	10.07	30	Pass
06	2437	9.60	30	Pass
11	2462	9.44	30	Pass

Test Mode :	802.11g	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	14.85	30	Pass
06	2437	15.03	30	Pass
11	2462	15.84	30	Pass

Test Mode :	802.11n HT20	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	13.28	30	Pass
06	2437	12.58	30	Pass
11	2462	12.78	30	Pass

Test Mode :	2.4GHz 802.11n HT40	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%

Channel	Frequency (MHz)	2.4GHz 802.11n HT40 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	14.05	30	Pass
06	2437	13.22	30	Pass
09	2452	12.49	30	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%
Duty Cycle:	100%	**Duty Factor:**	0dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	7.90
06	2437	6.86
11	2462	6.82

Test Mode :	802.11g	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%
Duty Cycle:	100%	**Duty Factor:**	0dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	6.08
06	2437	4.98
11	2462	5.03

Test Mode :	802.11n HT20	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%
Duty Cycle:	100%	**Duty Factor:**	0dB

Channel	Frequency (MHz)	802.11n HT20 Average Output Power (dBm)
01	2412	4.10
06	2437	2.93
11	2462	3.06

Test Mode :	802.11n HT40	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%
Duty Cycle:	100%	**Duty Factor:**	0dB

Channel	Frequency (MHz)	802.11n HT40 Average Output Power (dBm)
03	2422	4.08
06	2437	3.45
09	2452	2.61

3.3 Power Spectral Density Measurement

3.3.1 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.

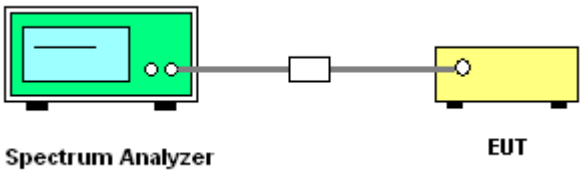
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 9.1 Option 1 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Test Mode :	802.11b	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-2.98	-20.97	8	Pass
06	2437	-3.45	-19.49	8	Pass
11	2462	-4.16	-22.27	8	Pass

Test Mode :	802.11g	**Temperature :**	20~21℃
Test Engineer :	Zhi Lu	**Relative Humidity :**	40~41%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-8.00	-22.05	8	Pass
06	2437	-8.89	-23.17	8	Pass
11	2462	-9.15	-23.01	8	Pass

Test Mode :	802.11n HT20	Temperature :	20~21℃
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%

Channel	Frequency (MHz)	802.11n HT20 Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-9.71	-22.89	8	Pass
06	2437	-10.93	-24.47	8	Pass
11	2462	-11.10	-25.05	8	Pass

Test Mode :	802.11n HT40	Temperature :	20~21℃
Test Engineer :	Zhi Lu	Relative Humidity :	40~41%

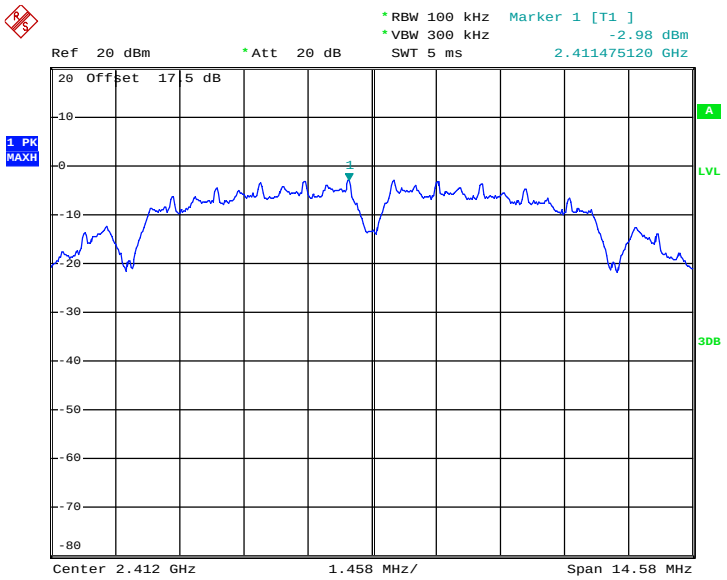
Channel	Frequency (MHz)	802.11n HT40 Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
03	2422	-13.34	-25.74	8	Pass
06	2437	-12.20	-24.54	8	Pass
09	2452	-15.08	-26.73	8	Pass

Note:

1. *Measured power density (dBm) has offset with cable loss.*
2. *The Measured power density (dBm)/ 100KHz is reference level and used as 20dBc down for Conducted Band Edges and Conducted Spurious Emission limit line.*

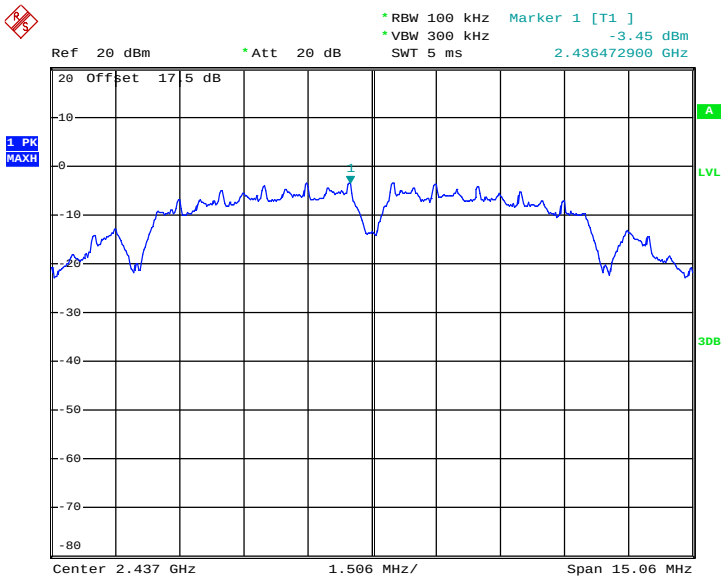
3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on 802.11b Channel 01



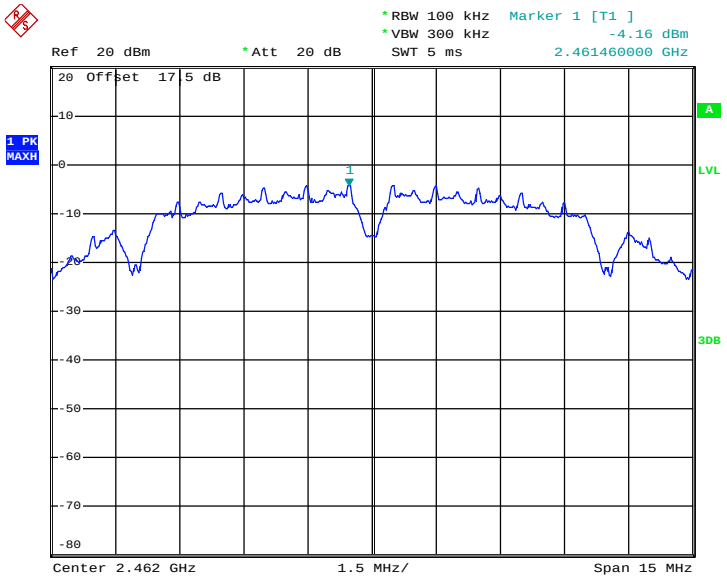
Date: 28.FEB.2013 21:00:48

PSD 100kHz Plot on 802.11b Channel 06



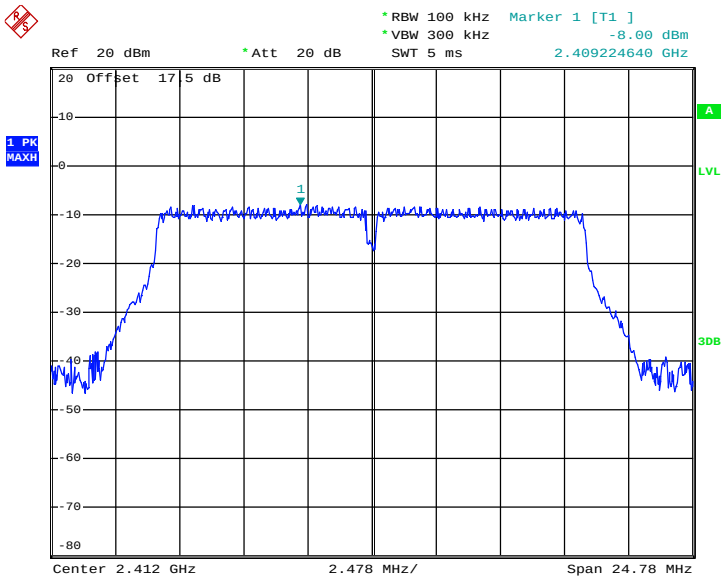
Date: 28.FEB.2013 21:12:04

PSD 100kHz Plot on 802.11b Channel 11



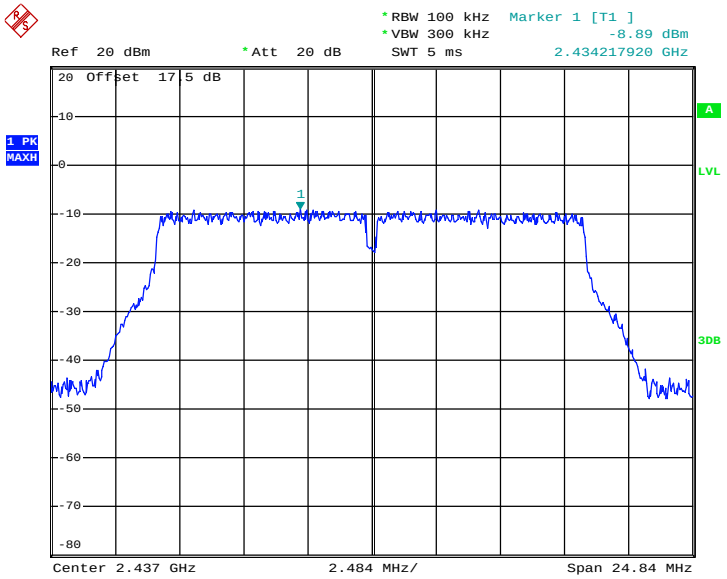
Date: 28.FEB.2013 21:17:40

PSD 100kHz Plot on 802.11g Channel 01



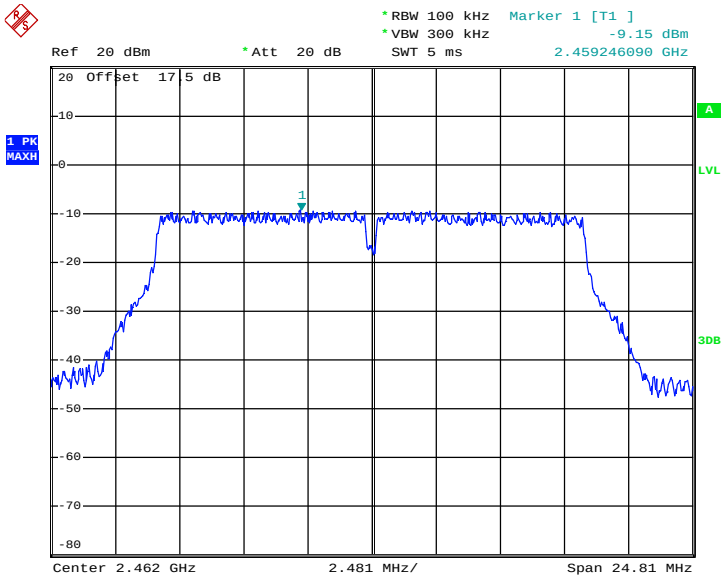
Date: 28.FEB.2013 20:32:35

PSD 100kHz Plot on 802.11g Channel 06



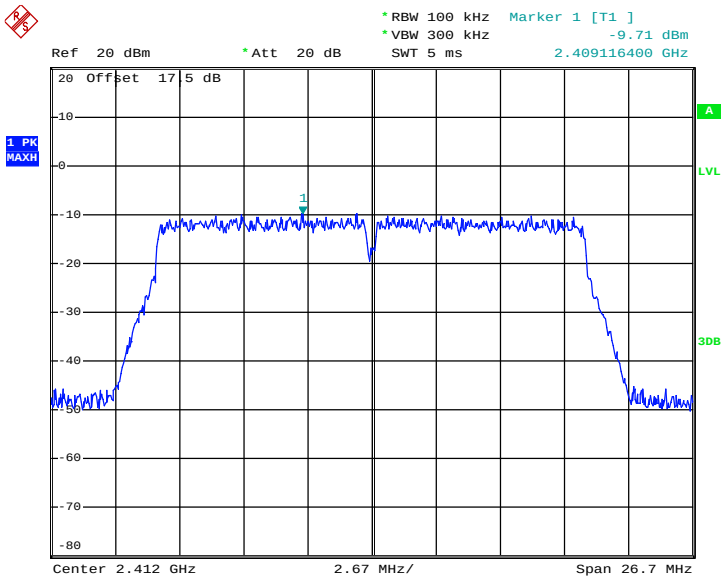
Date: 28.FEB.2013 20:41:18

PSD 100kHz Plot on 802.11g Channel 11



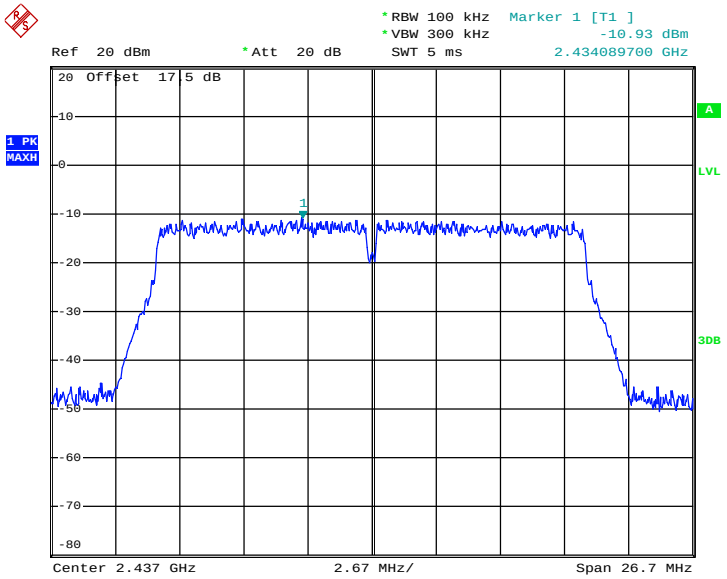
Date: 28.FEB.2013 20:48:35

PSD 100kHz Plot on 802.11n HT20 Channel 01



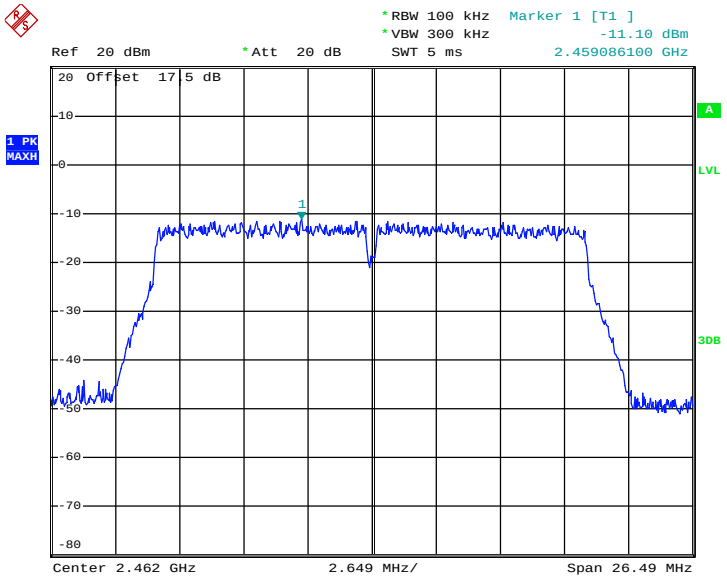
Date: 28.FEB.2013 22:36:56

PSD 100kHz Plot on 802.11n HT20 Channel 06



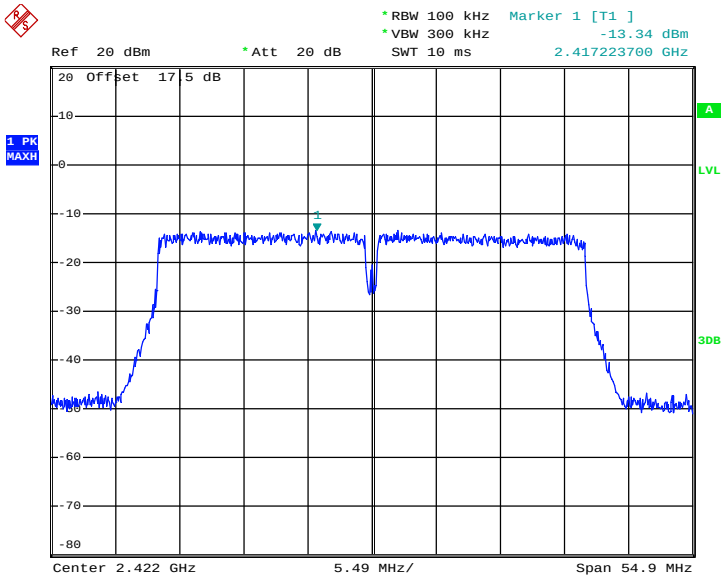
Date: 28.FEB.2013 22:44:37

PSD 100kHz Plot on 802.11n HT20 Channel 11



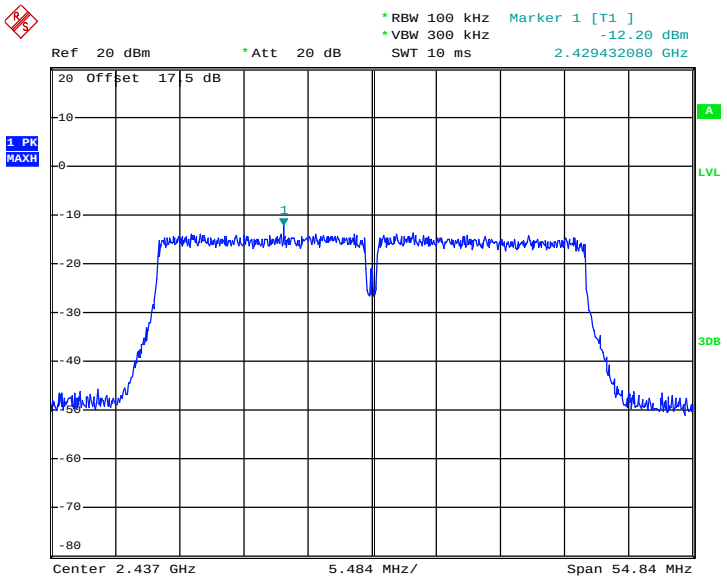
Date: 28.FEB.2013 22:52:37

PSD 100kHz Plot on 802.11n HT40 Channel 03



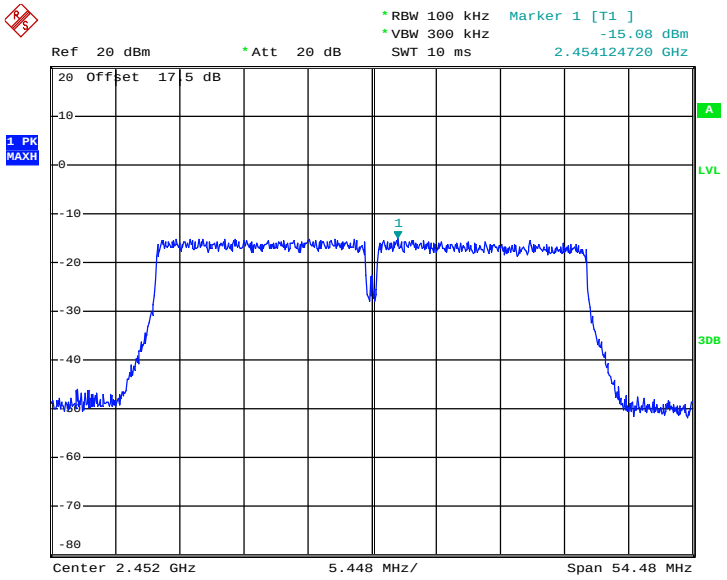
Date: 28.FEB.2013 21:56:27

PSD 100kHz Plot on 802.11n HT40 Channel 06



Date: 28.FEB.2013 22:03:24

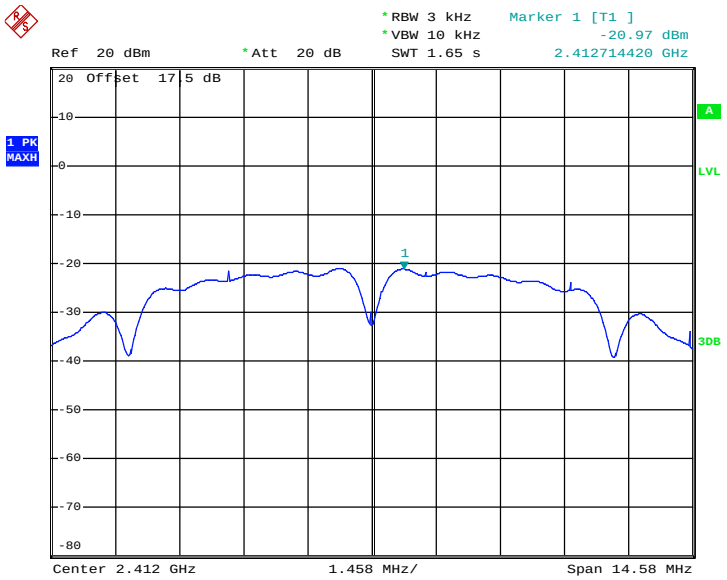
PSD 100kHz Plot on 802.11n HT40 Channel 09



Date: 28.FEB.2013 23:09:54

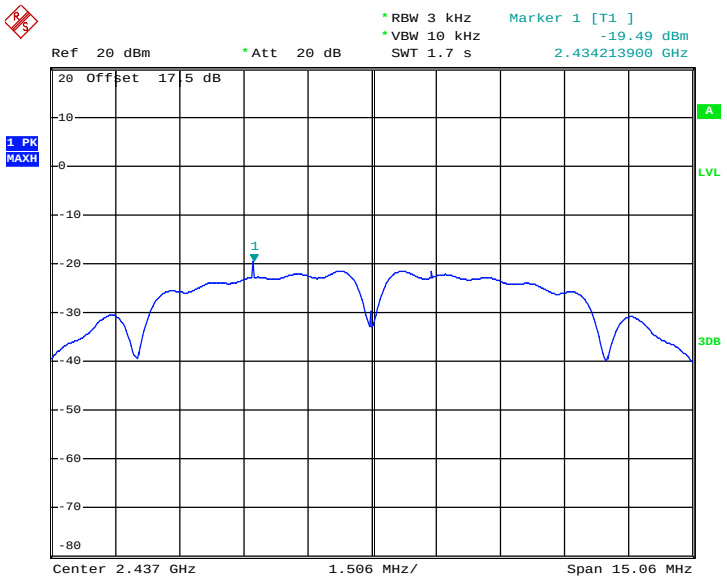
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on 802.11b Channel 01



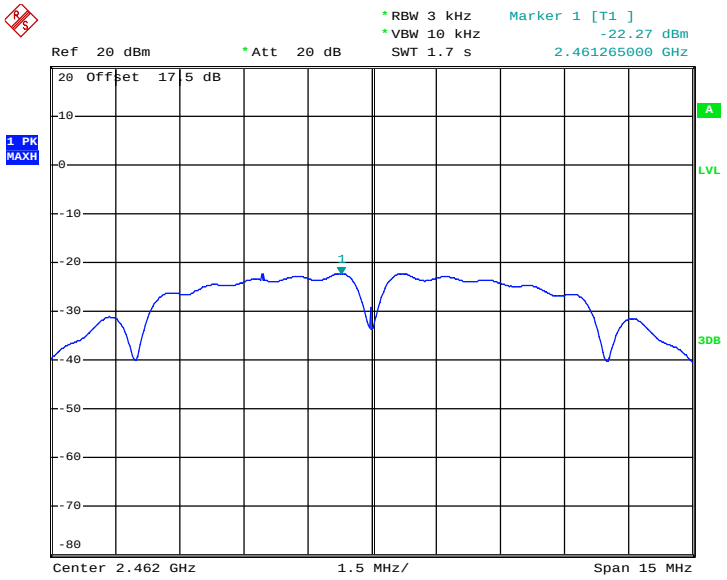
Date: 28.FEB.2013 21:00:26

PSD 3kHz Plot on 802.11b Channel 06



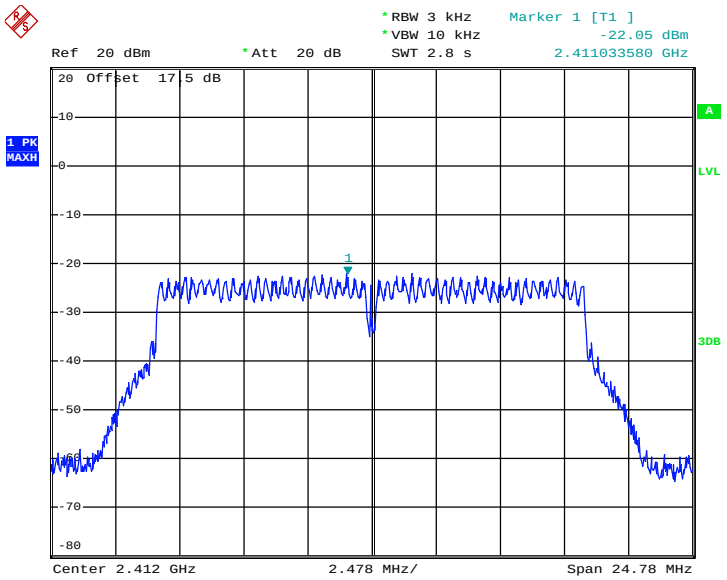
Date: 28.FEB.2013 21:11:49

PSD 3kHz Plot on 802.11b Channel 11



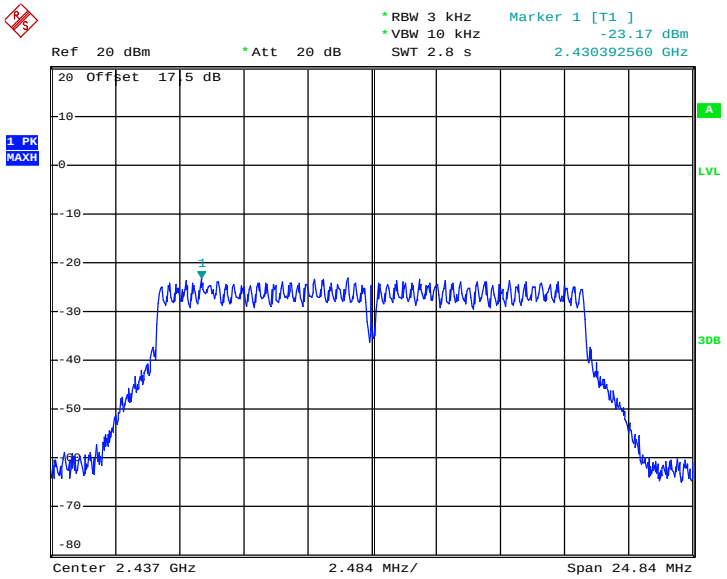
Date: 28.FEB.2013 21:16:56

PSD 3kHz Plot on 802.11g Channel 01



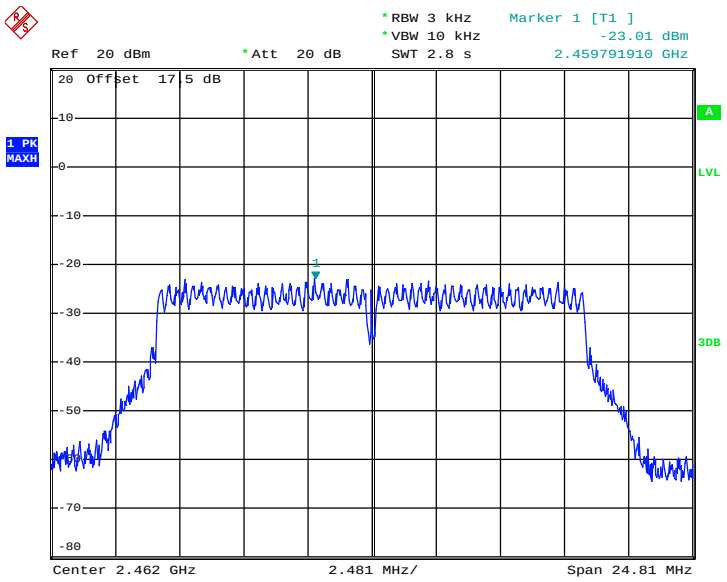
Date: 28.FEB.2013 20:31:53

PSD 3kHz Plot on 802.11g Channel 06



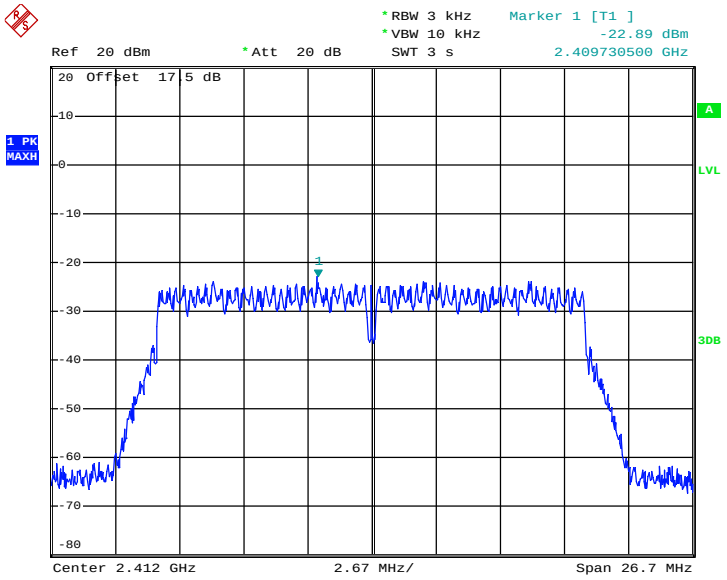
Date: 28.FEB.2013 20:40:23

PSD 3kHz Plot on 802.11g Channel 11



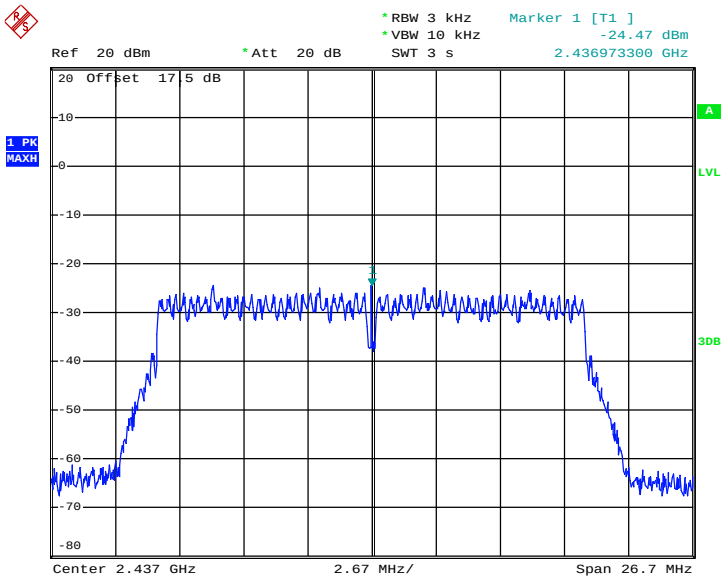
Date: 28.FEB.2013 20:48:05

PSD 3kHz Plot on 802.11n HT20 Channel 01



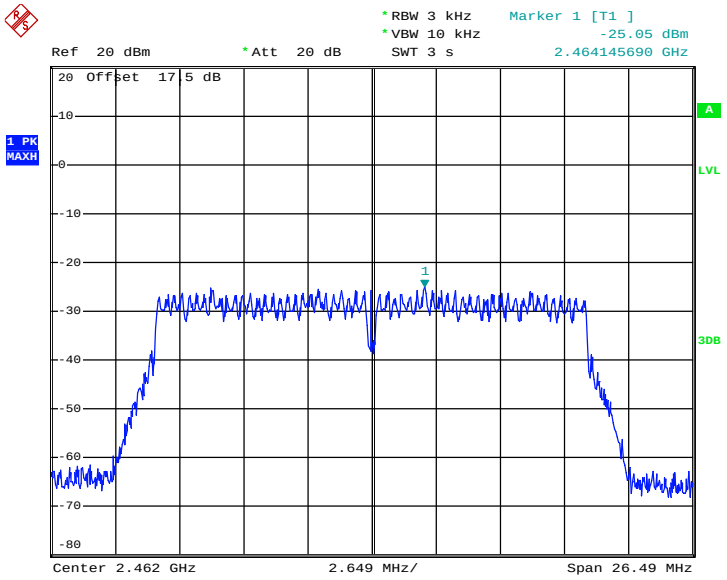
Date: 28.FEB.2013 22:36:27

PSD 3kHz Plot on 802.11n HT20 Channel 06



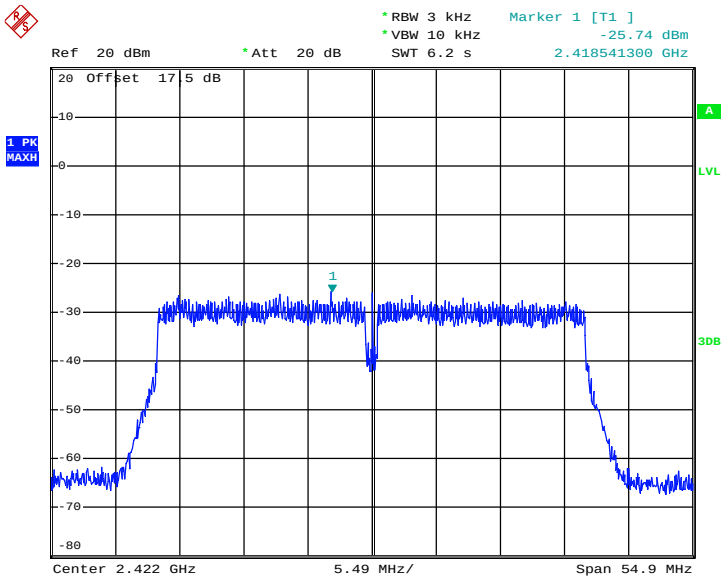
Date: 28.FEB.2013 22:43:31

PSD 3kHz Plot on 802.11n HT20 Channel 11



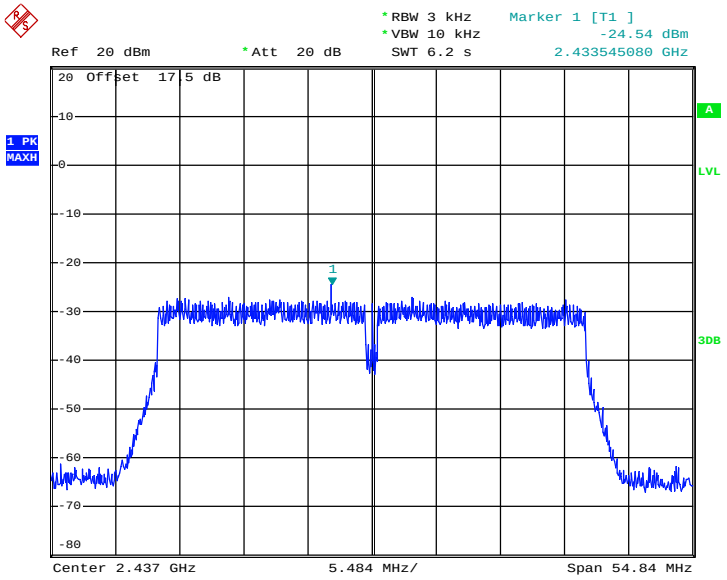
Date: 28.FEB.2013 22:52:25

PSD 3kHz Plot on 802.11n HT40 Channel 03



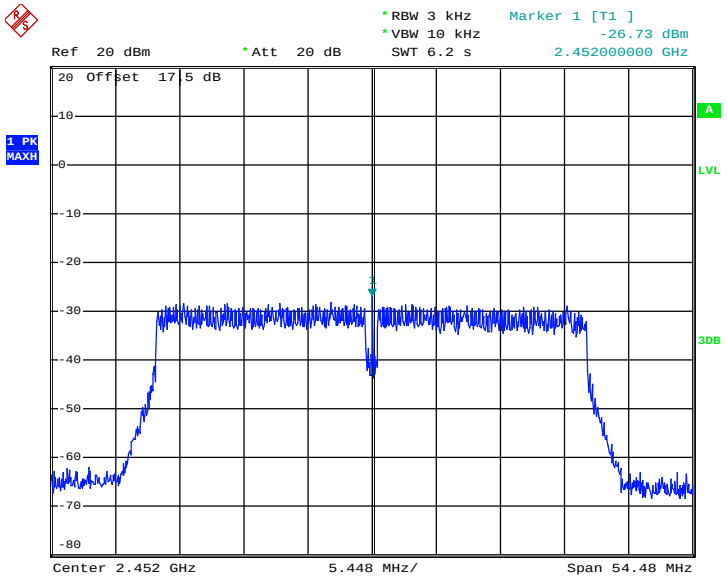
Date: 28.FEB.2013 21:56:08

PSD 3kHz Plot on 802.11n HT40 Channel 06



Date: 28.FEB.2013 22:03:05

PSD 3kHz Plot on 802.11n HT40 Channel 09



Date: 28.FEB.2013 23:09:37

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

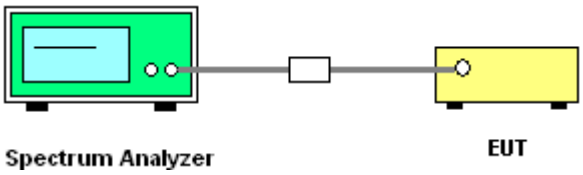
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz, when maximum peak conducted output power procedure is used. The attenuation is set to 30dB, when maximum conducted output power procedure is used.
5. Measure and record the results in the test report.

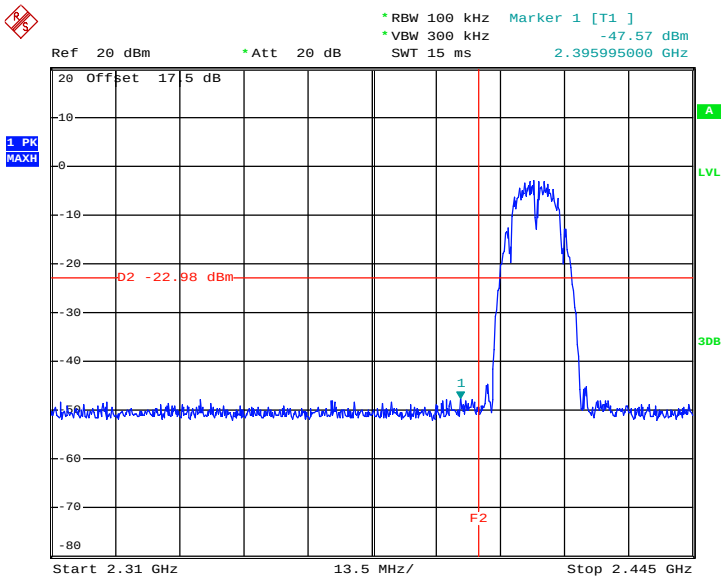
3.4.4 Test Setup



3.4.5 Test Plots of Conducted Band Edges

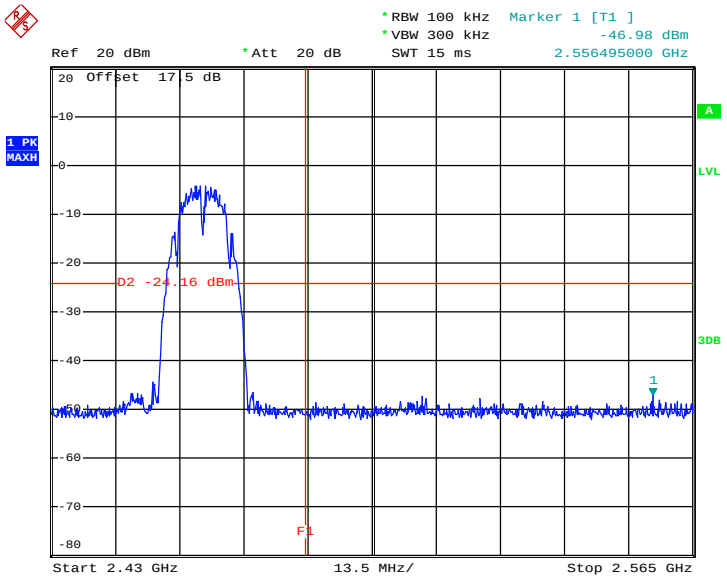
Test Mode :	802.11b	**Temperature :**	20~21℃
Test Band :	Low and High	**Relative Humidity :**	40~41%
Test Channel :	01 and 11	**Test Engineer :**	Zhi Lu

Low Band Edge Plot on 802.11b Channel 01



Date: 28.FEB.2013 21:02:10

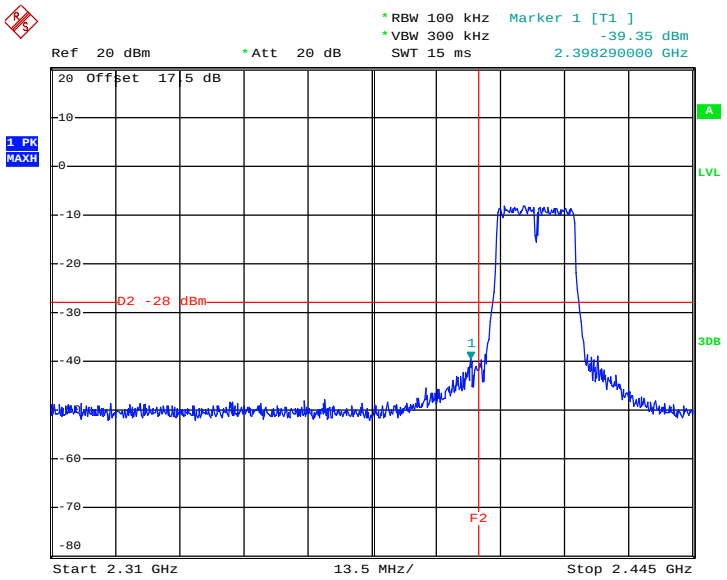
High Band Edge Plot on 802.11b Channel 11



Date: 28.FEB.2013 21:18:02

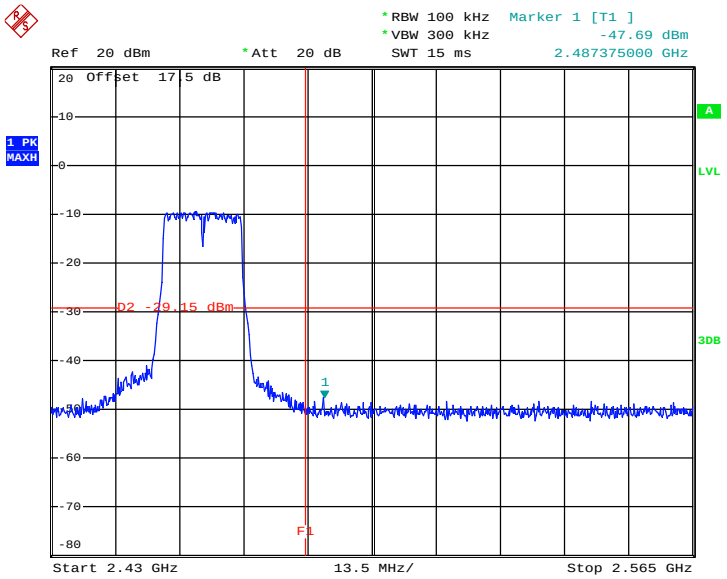
Test Mode :	802.11g	**Temperature :**	20~21℃
Test Band :	Low and High	**Relative Humidity :**	40~41%
Test Channel :	01 and 11	**Test Engineer :**	Zhi Lu

Low Band Edge Plot on 802.11g Channel 01



Date: 28.FEB.2013 20:33:22

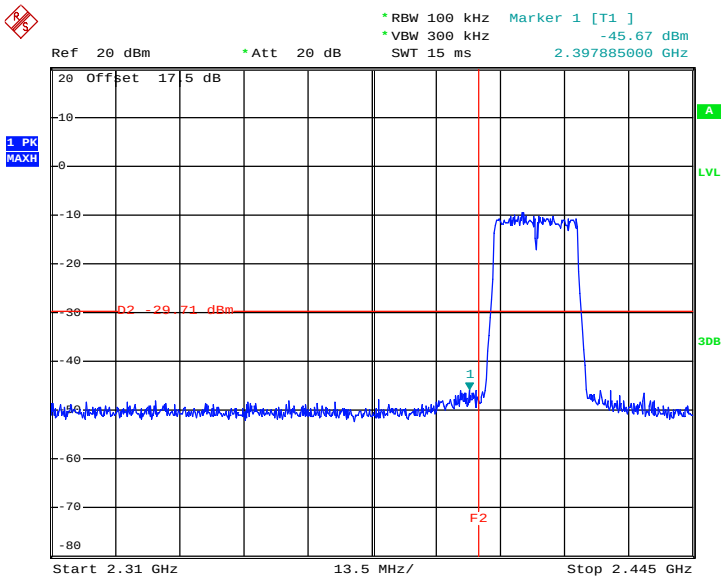
High Band Edge Plot on 802.11g Channel 11



Date: 28.FEB.2013 20:49:10

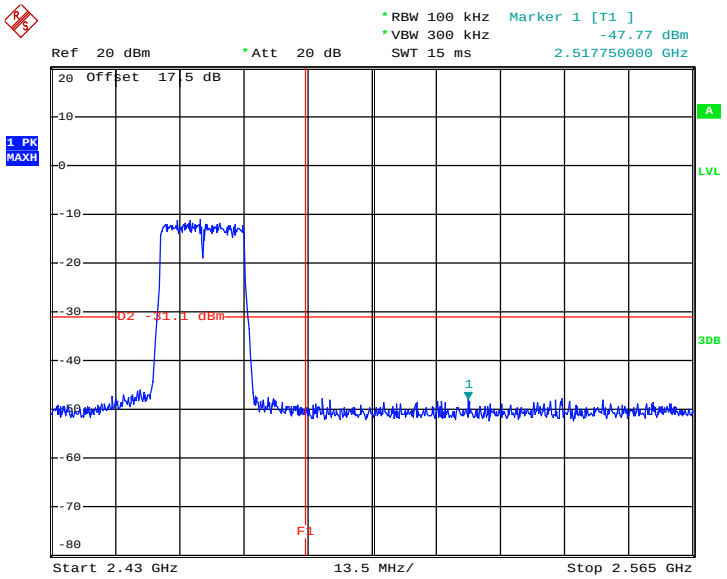
Test Mode :	802.11n HT20	Temperature :	20~21℃
Test Band :	Low and High	Relative Humidity :	40~41%
Test Channel :	01 and 11	Test Engineer :	Zhi Lu

Low Band Edge Plot on 802.11n HT20 Channel 01



Date: 28.FEB.2013 22:37:36

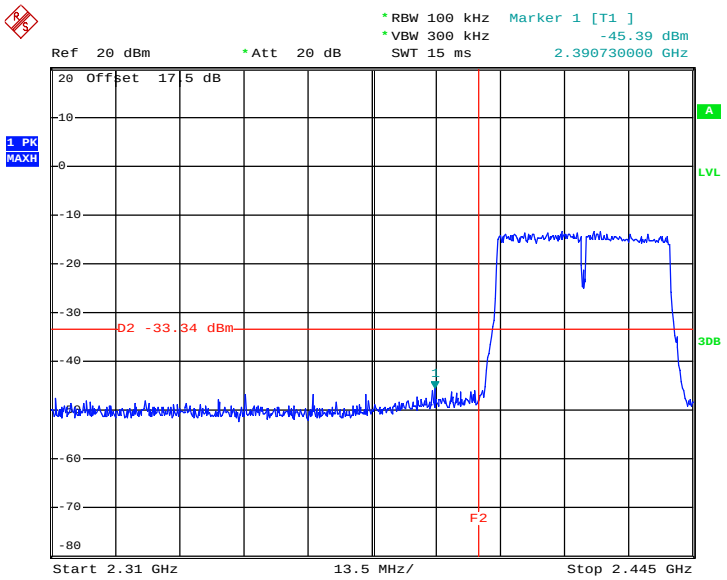
High Band Edge Plot on 802.11n HT20 Channel 11



Date: 28.FEB.2013 22:53:09

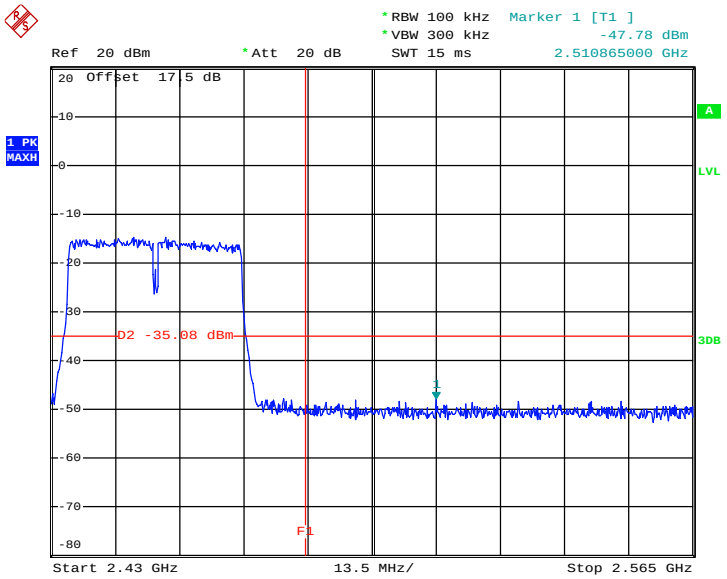
Test Mode :	802.11n HT40	Temperature :	20~21℃
Test Band :	Low and High	Relative Humidity :	40~41%
Test Channel :	03 and 09	Test Engineer :	Zhi Lu

Low Band Edge Plot on 802.11n HT40 Channel 03



Date: 28.FEB.2013 21:57:09

High Band Edge Plot on 802.11n HT40 Channel 09



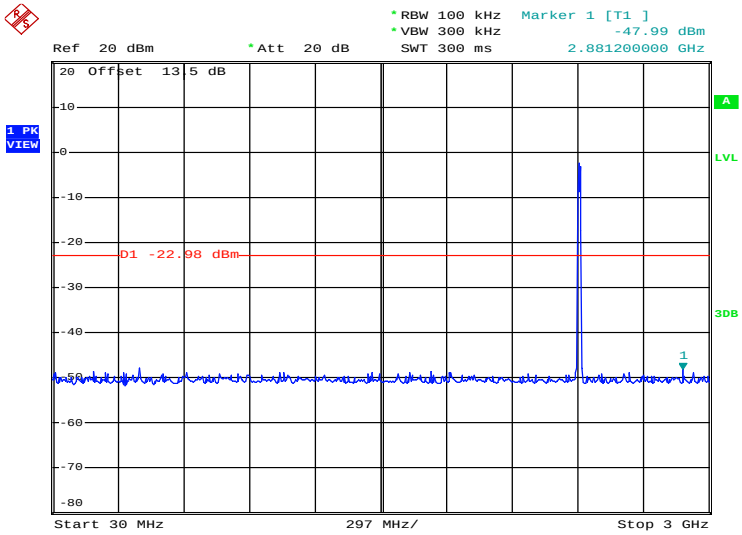
Date: 28.FEB.2013 23:10:45

3.4.6 Test Plots of Spurious Emission

Test Mode :	802.11b	**Temperature :**	20~21℃
Test Band :	30MHz-3GHz and 2G-25GHz	**Relative Humidity :**	40~41%
Test Channel :	01, 06, 11	**Test Engineer :**	Zhi Lu

802.11b 30 MHz~3 GHz

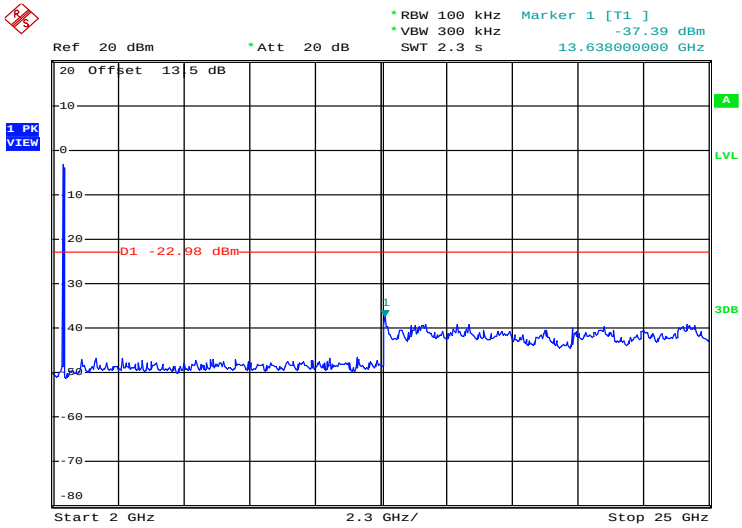
Conducted Spurious Emission Plot on Channel 01



Date: 4.MAR.2013 11:32:09

802.11b 2 GHz~25 GHz

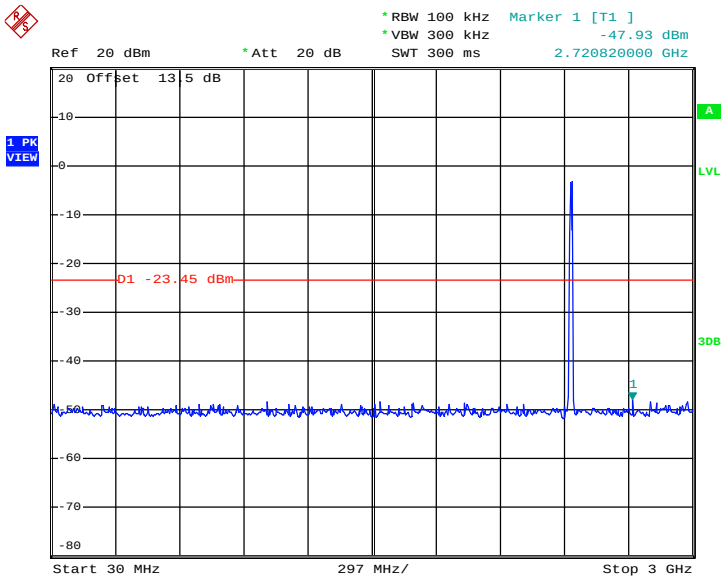
Conducted Spurious Emission Plot on Channel 01



Date: 4.MAR.2013 11:32:35

802.11b 30 MHz~3 GHz

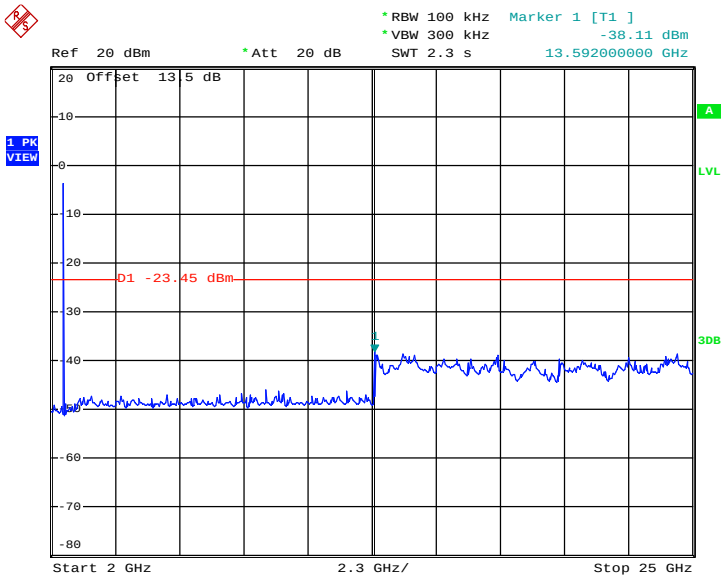
Conducted Spurious Emission Plot on Channel 06



Date: 4.MAR.2013 10:32:06

802.11b 2 GHz~25 GHz

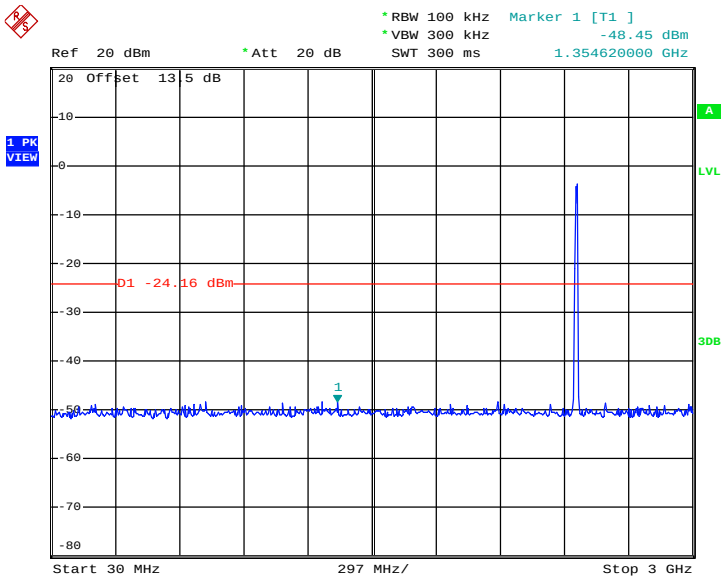
Conducted Spurious Emission Plot on Channel 06



Date: 4.MAR.2013 10:32:36

802.11b 30 MHz~3 GHz

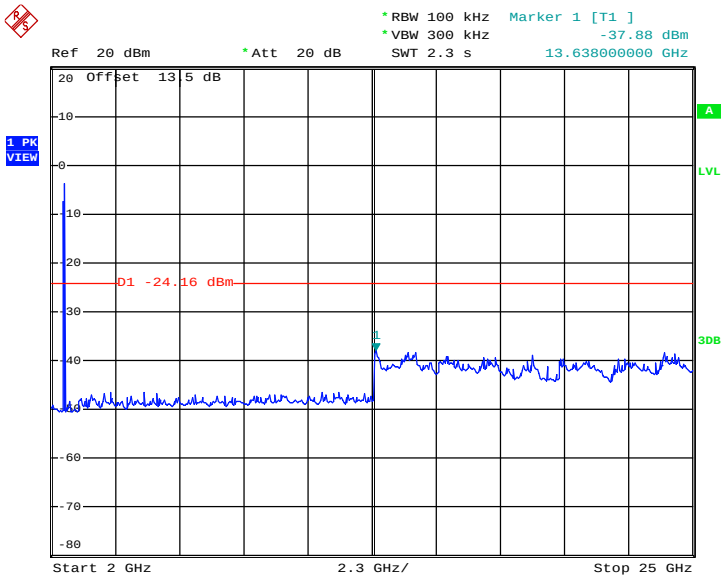
Conducted Spurious Emission Plot on Channel 11



Date: 4.MAR.2013 10:31:14

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

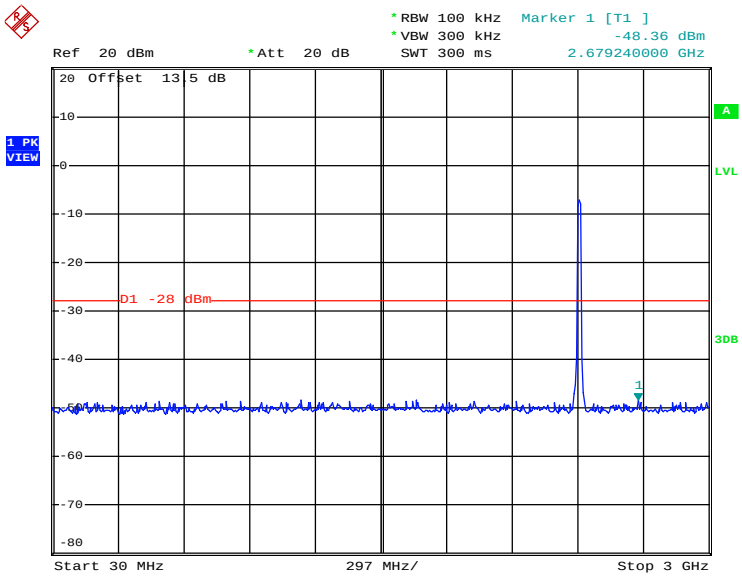


Date: 4.MAR.2013 10:30:37

Test Mode :	802.11g	**Temperature :**	20~21℃
Test Band :	30MHz-3GHz and 2G-25GHz	**Relative Humidity :**	40~41%
Test Channel :	01, 06, 11	**Test Engineer :**	Zhi Lu

802.11g 30 MHz~3 GHz

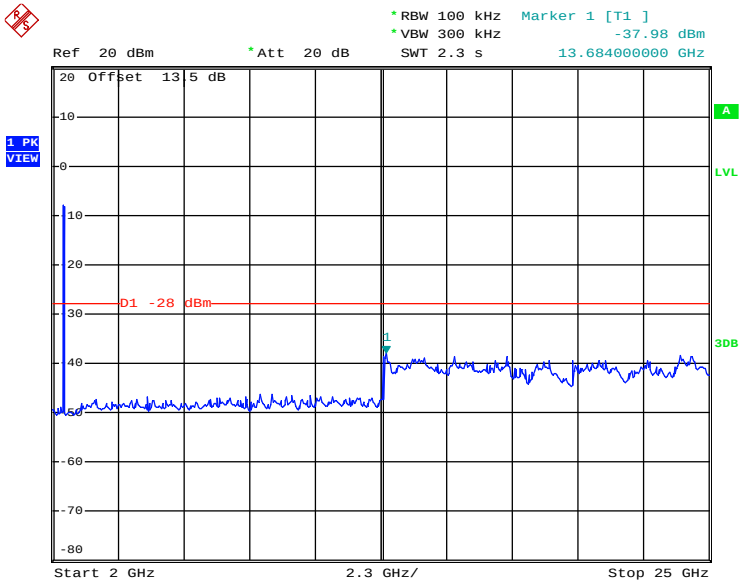
Conducted Spurious Emission Plot on Channel 01



Date: 4.MAR.2013 10:28:24

802.11g 2 GHz~25 GHz

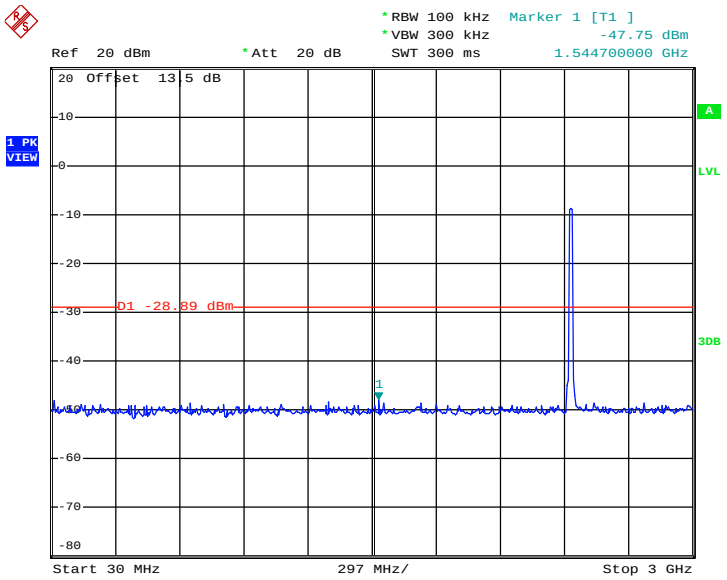
Conducted Spurious Emission Plot on Channel 01



Date: 4.MAR.2013 10:29:06

802.11g 30 MHz~3 GHz

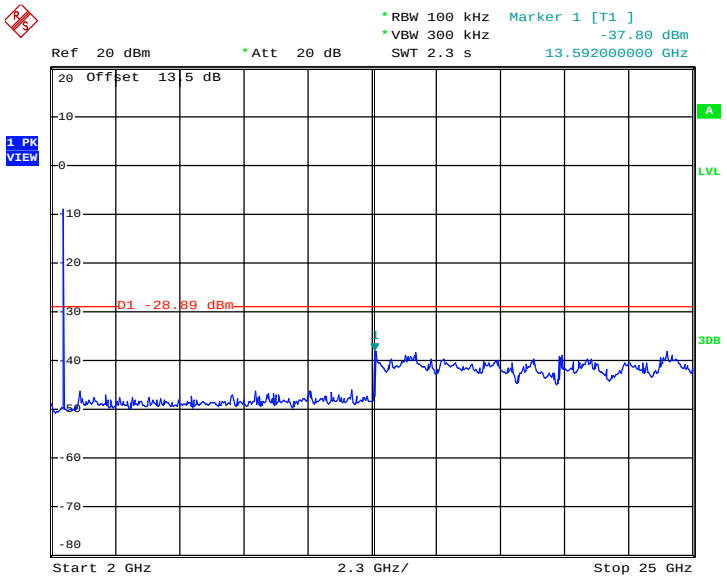
Conducted Spurious Emission Plot on Channel 06



Date: 4.MAR.2013 10:27:26

802.11g 2 GHz~25 GHz

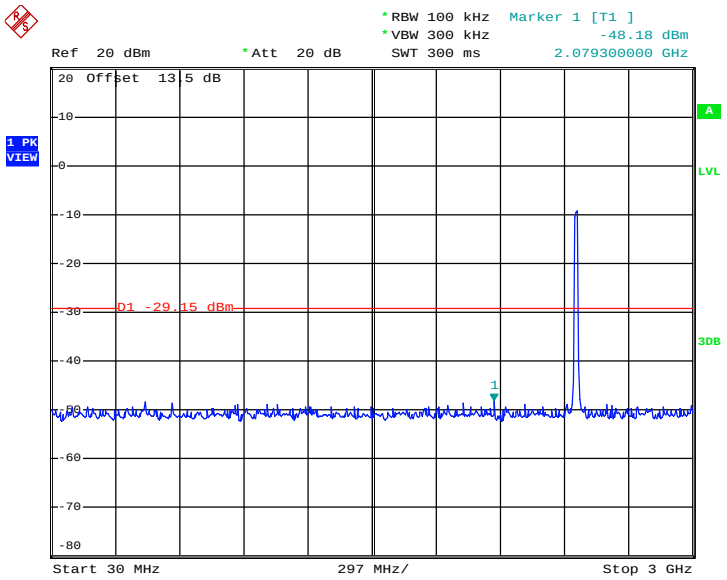
Conducted Spurious Emission Plot on Channel 06



Date: 4.MAR.2013 10:26:40

802.11g 30 MHz~3 GHz

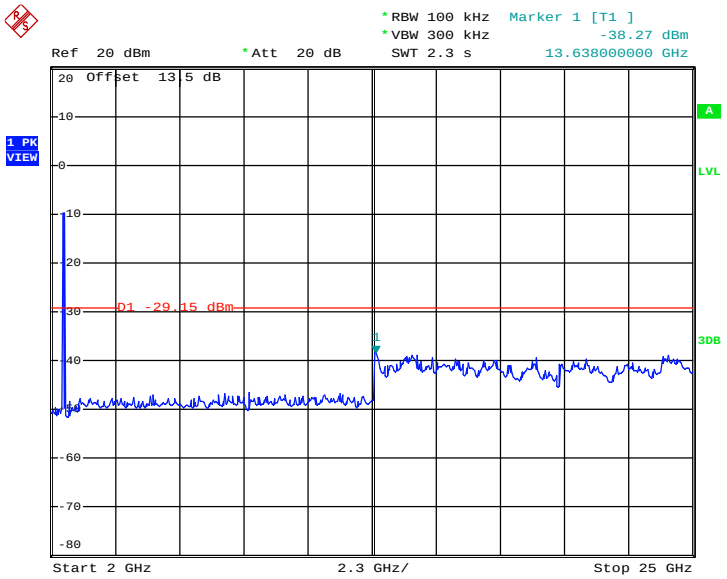
Conducted Spurious Emission Plot on Channel 11



Date: 4.MAR.2013 10:24:39

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

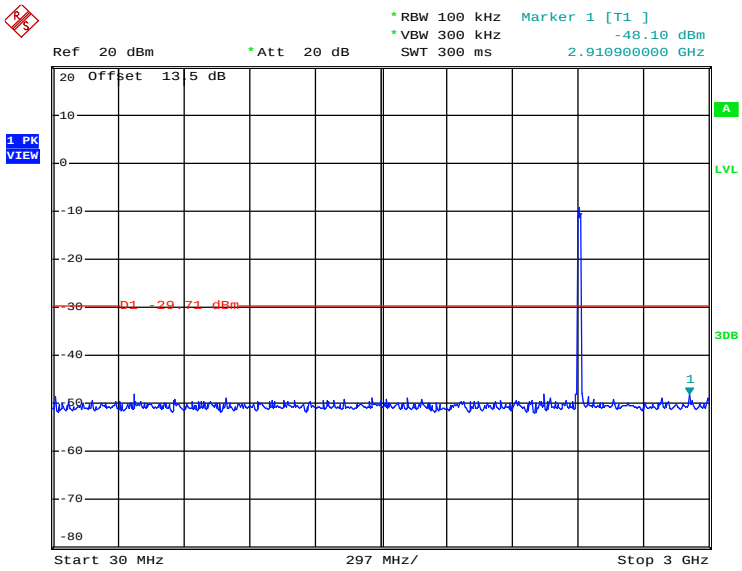


Date: 4.MAR.2013 10:25:35

Test Mode :	802.11n HT20	Temperature :	20~21℃
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	40~41%
Test Channel :	01, 06, 11	Test Engineer :	Zhi Lu

802.11n HT20 30 MHz~3 GHz

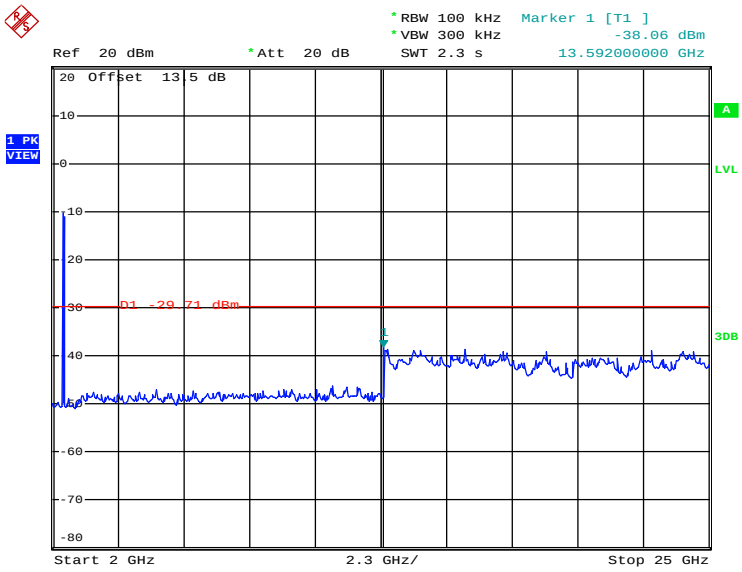
Conducted Spurious Emission Plot on Channel 01



Date: 4.MAR.2013 10:17:04

802.11n HT20 2 GHz~25 GHz

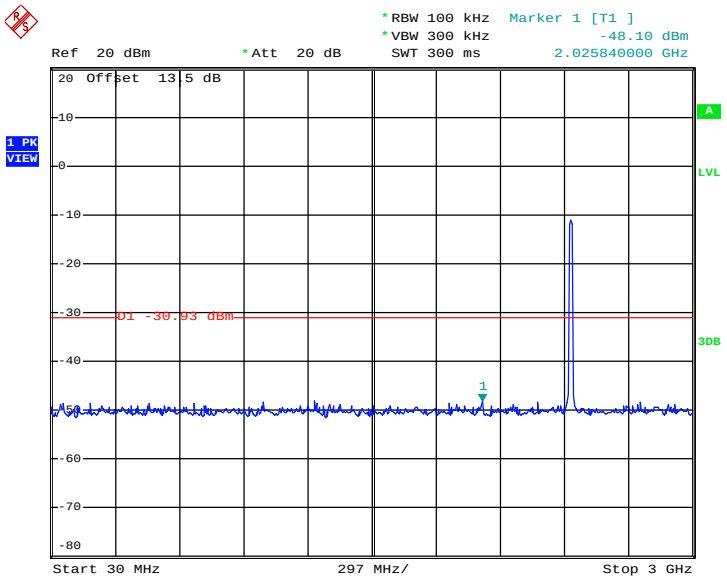
Conducted Spurious Emission Plot on Channel 01



Date: 4.MAR.2013 10:16:27

802.11n HT20 30 MHz~3 GHz

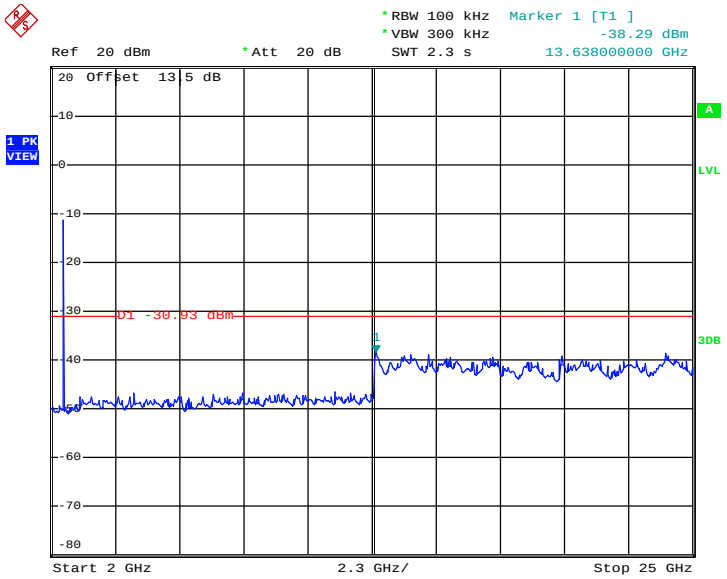
Conducted Spurious Emission Plot on Channel 06



Date: 4.MAR.2013 10:13:49

802.11n HT20 2 GHz~25 GHz

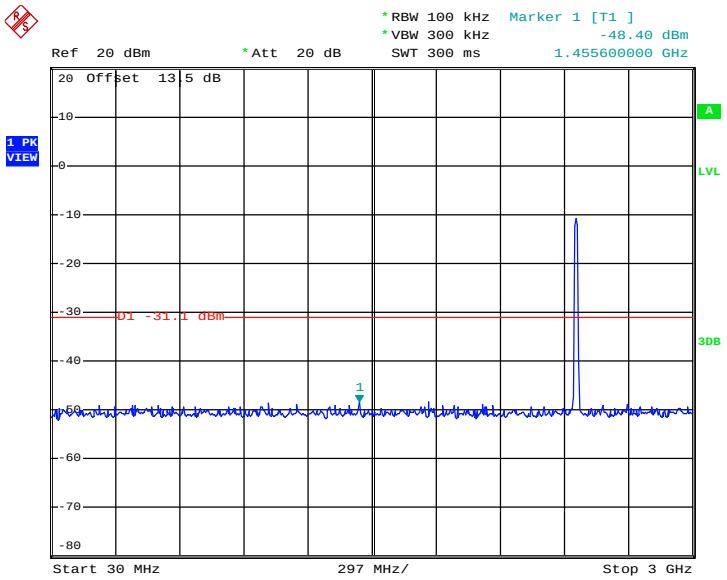
Conducted Spurious Emission Plot on Channel 06



Date: 4.MAR.2013 10:12:57

802.11n HT20 30 MHz~3 GHz

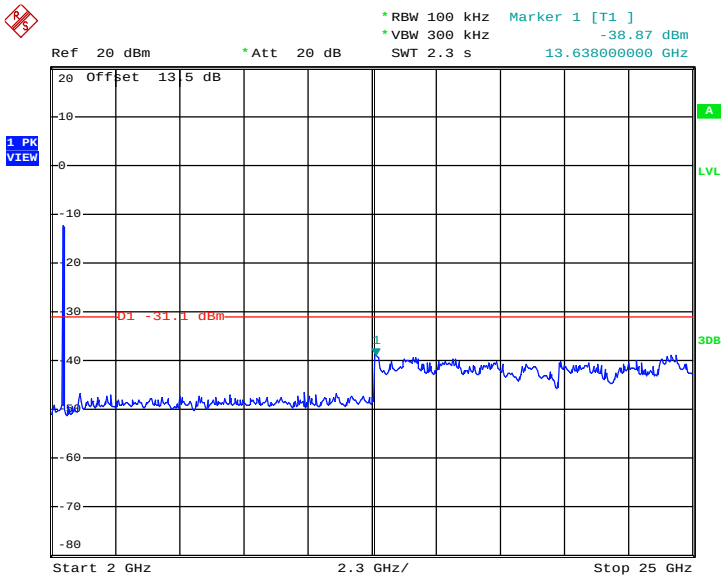
Conducted Spurious Emission Plot on Channel 11



Date: 4.MAR.2013 10:14:50

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

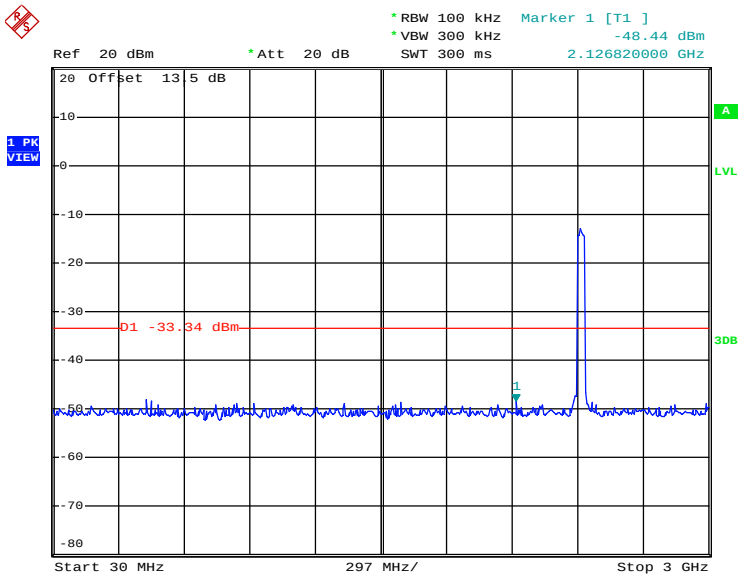


Date: 4.MAR.2013 10:15:15

Test Mode :	802.11n HT40	Temperature :	20~21
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	40~41
Test Channel :	03, 06, 09	Test Engineer :	Zhi Lu

802.11n HT40 30 MHz~3 GHz

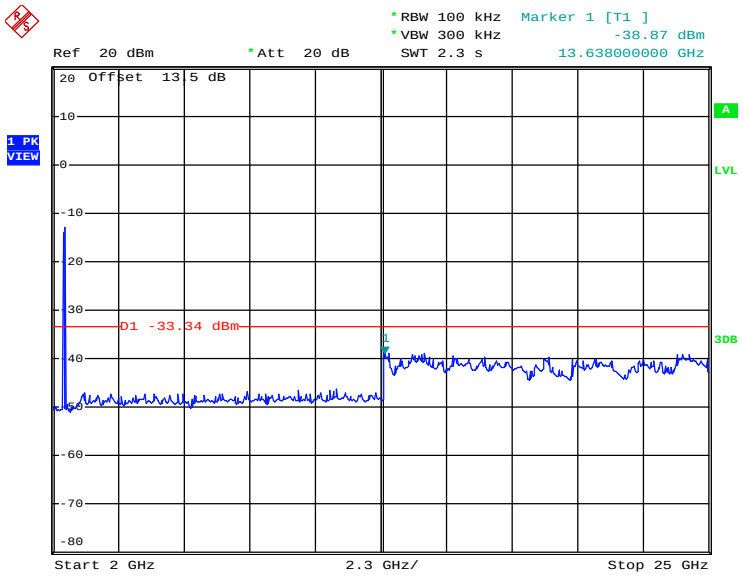
Conducted Spurious Emission Plot on Channel 03



Date: 4.MAR.2013 10:09:08

802.11n HT40 2 GHz~25 GHz

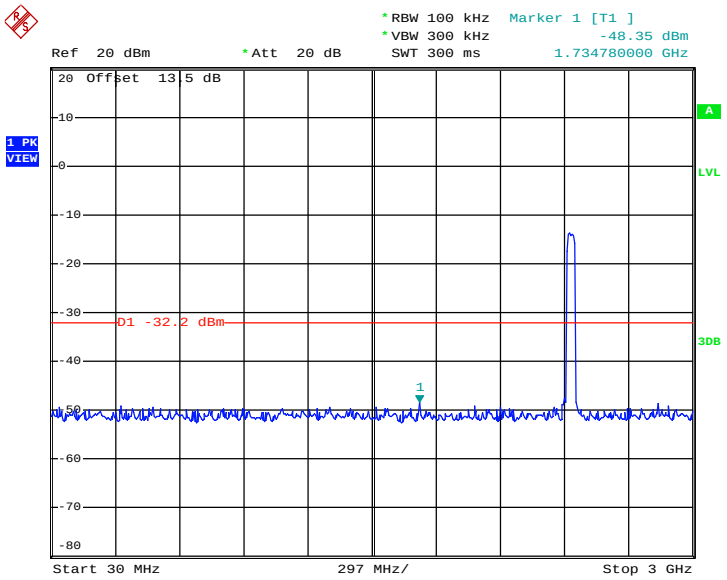
Conducted Spurious Emission Plot on Channel 03



Date: 4.MAR.2013 10:08:28

802.11n HT40 30 MHz~3 GHz

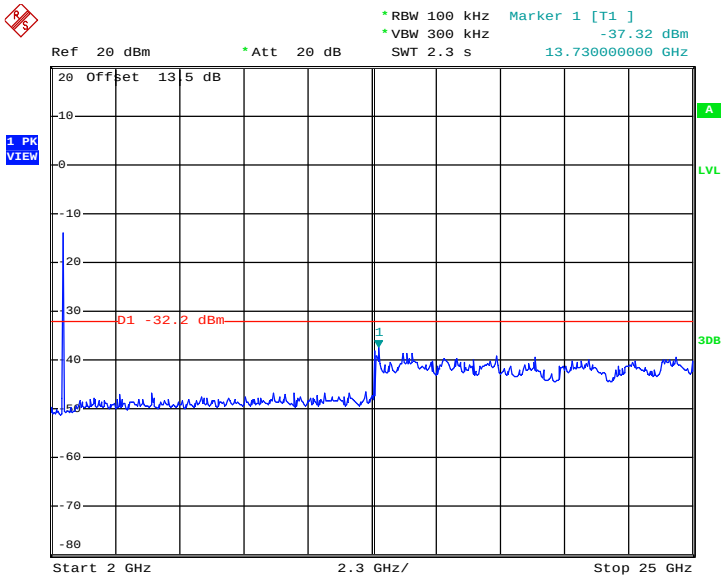
Conducted Spurious Emission Plot on Channel 06



Date: 4.MAR.2013 10:06:41

802.11n HT40 2 GHz~25 GHz

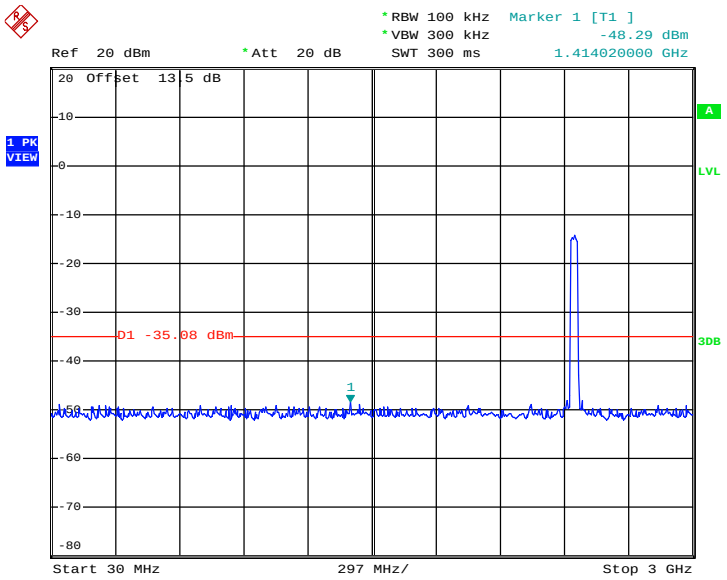
Conducted Spurious Emission Plot on Channel 06



Date: 4.MAR.2013 10:07:10

802.11n HT40 30 MHz~3 GHz

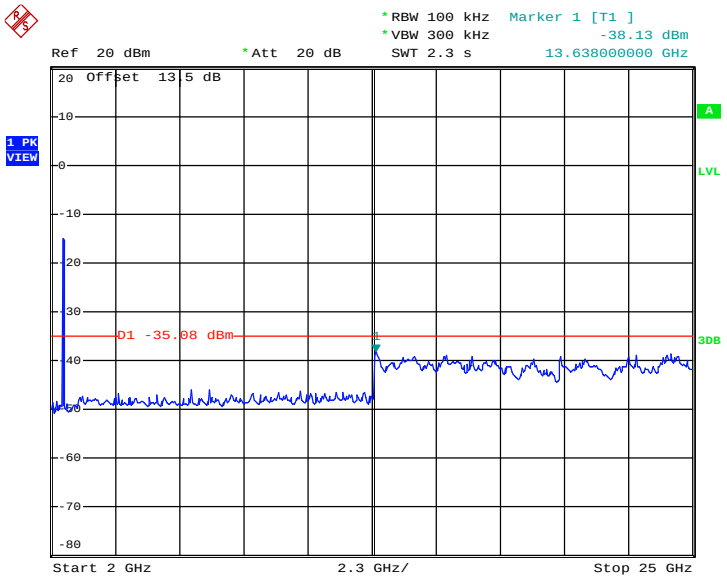
Conducted Spurious Emission Plot on Channel 09



Date: 4.MAR.2013 10:05:07

802.11n HT40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 09



Date: 4.MAR.2013 10:03:55

3.5 Radiated Emission Measurement

3.5.1 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

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

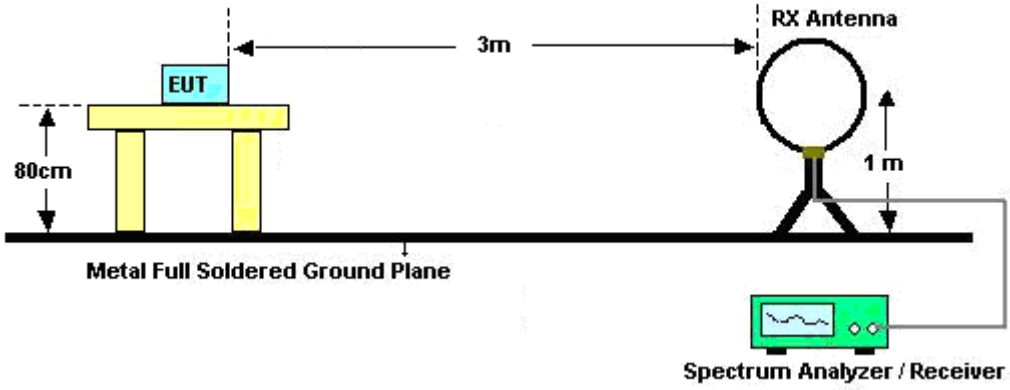
1. The testing follows the guidelines in ANSI C63. 10-2009
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 KHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(us)	1/T(KHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	100.00	-	-	10Hz
802.11n HT20	100.00	-	-	10Hz
802.11n HT40	100.00	-	-	10Hz

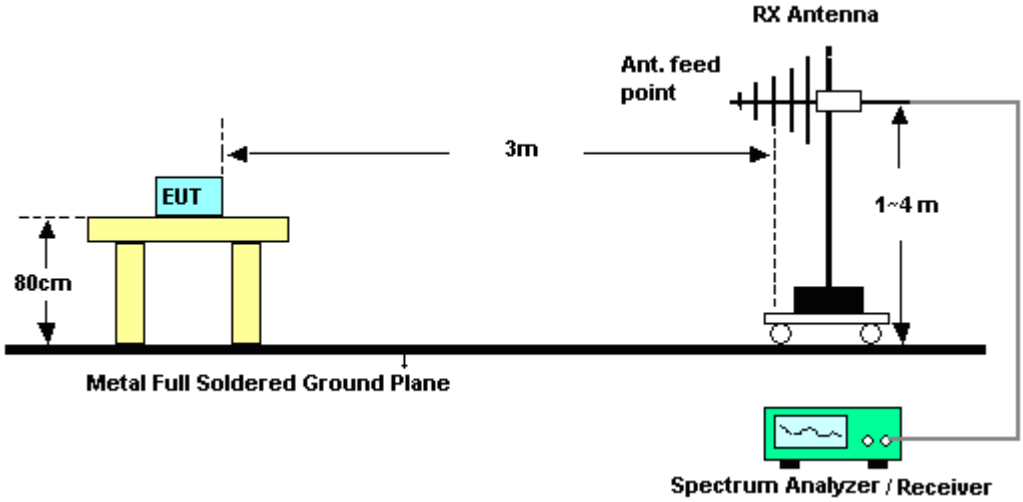
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

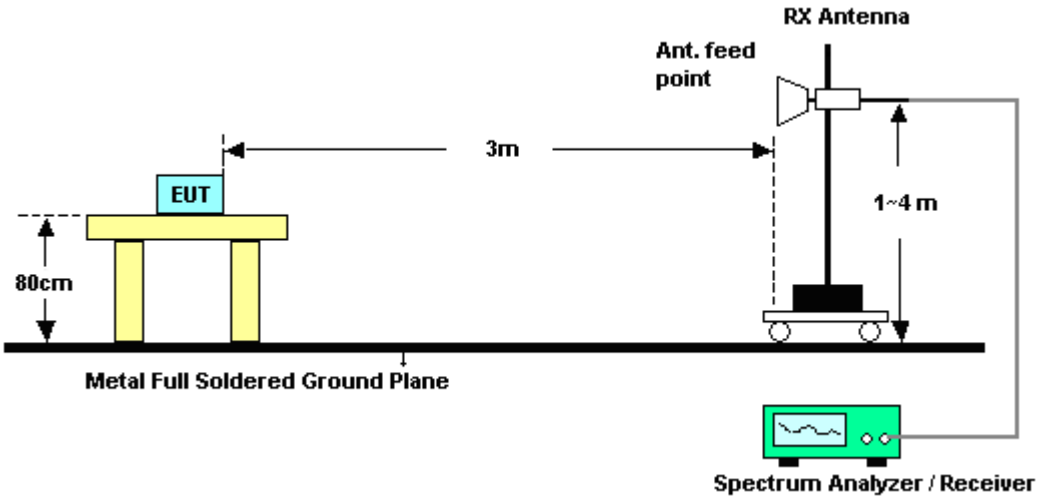
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Band Edges

Test Mode :	802.11b	**Temperature :**	22~24℃
Test Band :	Low	**Relative Humidity :**	41~43%
Test Channel :	01	**Test Engineer :**	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2335.29	50.24	-23.76	74	46.92	32.77	2.06	31.51	120	10	Peak
2386.68	36.94	-17.06	54	33.5	32.85	2.1	31.51	120	10	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.86	52.23	-21.77	74	48.79	32.85	2.1	31.51	110	100	Peak
2324.4	36.85	-17.15	54	33.56	32.75	2.05	31.51	110	100	Average

Test Mode :	802.11b	**Temperature :**	22~24℃
Test Band :	High	**Relative Humidity :**	41~43%
Test Channel :	11	**Test Engineer :**	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.43	50.01	-23.99	74	46.36	33.01	2.15	31.51	100	258	Peak
2496.22	36.81	-17.19	54	33.12	33.04	2.16	31.51	108	340	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2499.43	50.2	-23.8	74	46.51	33.04	2.16	31.51	120	200	Peak
2493.73	36.79	-17.21	54	33.1	33.04	2.16	31.51	120	300	Average

Test Mode :	802.11g	**Temperature :**	22~24℃
Test Band :	Low	**Relative Humidity :**	41~43%
Test Channel :	01	**Test Engineer :**	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	56.84	-17.16	74	53.4	32.85	2.1	31.51	105	350	Peak
2390	35.9	-18.1	54	32.46	32.85	2.1	31.51	105	350	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.93	52.05	-21.95	74	48.61	32.85	2.1	31.51	130	140	Peak
2390	37.31	-16.69	54	33.87	32.85	2.1	31.51	130	140	Average

Test Mode :	802.11g	**Temperature :**	22~24℃
Test Band :	High	**Relative Humidity :**	41~43%
Test Channel :	11	**Test Engineer :**	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	50.7	-23.3	74	47.05	33.01	2.15	31.51	119	18	Peak
2483.5	37.37	-16.63	54	33.72	33.01	2.15	31.51	119	18	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.82	49.74	-24.26	74	46.09	33.01	2.15	31.51	183	104	Peak
2483.5	36.9	-17.1	54	33.25	33.01	2.15	31.51	183	104	Average

Test Mode :	802.11n HT20	**Temperature :**	22~24℃
Test Band :	Low	**Relative Humidity :**	41~43%
Test Channel :	01	**Test Engineer :**	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.32	52.58	-21.42	74	49.14	32.85	2.1	31.51	110	20	Peak
2390	37.68	-16.32	54	34.24	32.85	2.1	31.51	110	20	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	52.83	-21.17	74	49.39	32.85	2.1	31.51	110	270	Peak
2390	37.45	-16.55	54	34.01	32.85	2.1	31.51	110	270	Average

Test Mode :	802.11n HT20	**Temperature :**	22~24℃
Test Band :	High	**Relative Humidity :**	41~43%
Test Channel :	11	**Test Engineer :**	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.94	50.48	-23.52	74	46.83	33.01	2.15	31.51	120	20	Peak
2483.71	37.1	-16.9	54	33.45	33.01	2.15	31.51	120	20	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2488.09	50.64	-23.36	74	46.95	33.04	2.16	31.51	120	25	Peak
2493.85	36.84	-17.16	54	33.15	33.04	2.16	31.51	130	140	Average

Test Mode :	802.11n HT40	**Temperature :**	22~24℃
Test Band :	Low	**Relative Humidity :**	41~43%
Test Channel :	03	**Test Engineer :**	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.93	55.53	-18.47	74	52.09	32.85	2.1	31.51	100	360	Peak
2390	40.99	-13.01	54	37.55	32.85	2.1	31.51	100	360	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.84	50.49	-23.51	74	47.05	32.85	2.1	31.51	135	300	Peak
2390	37.79	-16.21	54	34.35	32.85	2.1	31.51	135	300	Average

Test Mode :	802.11n HT40	**Temperature :**	22~24℃
Test Band :	High	**Relative Humidity :**	41~43%
Test Channel :	09	**Test Engineer :**	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.03	51.41	-22.59	74	47.76	33.01	2.15	31.51	115	5	Peak
2484.31	38.05	-15.95	54	34.4	33.01	2.15	31.51	115	5	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2486.53	50.31	-23.69	74	46.66	33.01	2.15	31.51	115	26	Peak
2483.74	37.4	-16.6	54	33.75	33.01	2.15	31.51	112	36	Average

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

Note: Below 1GHz for radiated emission measurement, pre-scanned all test modes and only choose the worst case mode was recorded in the report.

Test Mode :	802.11b	**Temperature :**	22~24℃
Test Channel :	01	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 20dB below the highest emission level. For example, 98.33 dBuV/m - 20dB = 78.33 dBuV/m. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2399	50.86	-27.47	78.33	47.42	32.85	2.1	31.51	123	16	Peak
2412	98.33	-	-	94.85	32.88	2.11	31.51	123	16	Peak
2412	93.61	-	-	90.13	32.88	2.11	31.51	123	16	Average
4824	47.53	-26.47	74	40.83	35.16	3.08	31.54	100	225	Peak
7236	43.15	-35.18	78.33	34.72	36.16	3.22	30.95	128	345	Peak

Test Mode :	802.11b	**Temperature :**	22~24℃
Test Channel :	01	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2399	49.47	-25.43	74.9	46.03	32.85	2.1	31.51	107	101	Peak
2412	94.9	-	-	91.42	32.88	2.11	31.51	107	101	Peak
2412	90.04	-	-	86.56	32.88	2.11	31.51	107	101	Average
4824	47.33	-26.67	74	40.63	35.16	3.08	31.54	115	89	Peak
7236	44.01	-30.89	74.9	35.58	36.16	3.22	30.95	138	112	Peak

Test Mode :	802.11b	**Temperature :**	22~24℃
Test Channel :	06	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	92.62	-	-	89.06	32.94	2.13	31.51	121	18	Average
2437	97.18	-	-	93.62	32.94	2.13	31.51	121	18	Peak
4874	47.5	-26.5	74	40.73	35.18	3.11	31.52	120	278	Peak
7311	45.73	-28.27	74	37.28	36.19	3.2	30.94	109	52	Peak

Test Mode :	802.11b	**Temperature :**	22~24℃
Test Channel :	06	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	93.77	-	-	90.21	32.94	2.13	31.51	100	278	Peak
2437	88.75	-	-	85.19	32.94	2.13	31.51	100	278	Average
4874	47.08	-26.92	74	40.31	35.18	3.11	31.52	110	245	Peak
7311	46.18	-27.82	74	37.73	36.19	3.2	30.94	125	89	Peak

Test Mode :	802.11b	**Temperature :**	22~24℃
Test Channel :	11	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
40.67	25.88	-14.12	40	47.5	11.63	0.38	33.63	-	-	Peak
55.22	27.11	-12.89	40	54.04	6.19	0.45	33.57	100	225	Peak
83.35	26.05	-13.95	40	51.78	7.33	0.54	33.6	-	-	Peak
103.72	30.21	-13.29	43.5	52.23	11.01	0.58	33.61	-	-	Peak
121.18	25.89	-17.61	43.5	47.07	11.78	0.63	33.59	-	-	Peak
262.8	20.98	-25.02	46	41.27	12.2	0.93	33.42	-	-	Peak
2462	90.06	-	-	86.45	32.98	2.14	31.51	100	355	Average
2462	96.22	-	-	92.61	32.98	2.14	31.51	100	355	Peak
4924	48.44	-25.56	74	41.63	35.18	3.14	31.51	108	96	Peak
7386	45.22	-28.78	74	36.74	36.23	3.18	30.93	125	80	Peak

Test Mode :	802.11b	**Temperature :**	22~24℃
Test Channel :	11	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
41.64	28.38	-11.62	40	50.68	10.94	0.39	33.63	-	-	Peak
59.1	26.71	-13.29	40	54.38	5.43	0.47	33.57	-	-	Peak
63.95	27.29	-12.71	40	55.17	5.21	0.49	33.58	-	-	Peak
83.35	30.13	-9.87	40	55.86	7.33	0.54	33.6	100	120	Peak
92.08	29.63	-13.87	43.5	53.35	9.34	0.55	33.61	-	-	Peak
151.25	27.19	-16.31	43.5	50.09	9.95	0.72	33.57	-	-	Peak
2462	88.36	-	-	84.75	32.98	2.14	31.51	129	293	Average
2462	92.89	-	-	89.28	32.98	2.14	31.51	129	293	Peak
4924	48.73	-25.27	74	41.92	35.18	3.14	31.51	115	320	Peak
7386	47.63	-26.37	74	39.15	36.23	3.18	30.93	148	85	Peak

Test Mode :	802.11g	**Temperature :**	22~24℃
Test Channel :	01	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2399	59.77	-16	75.77	56.33	32.85	2.1	31.51	100	360	Peak
2412	95.77	-	-	92.29	32.88	2.11	31.51	100	360	Peak
2412	84.27	-	-	80.79	32.88	2.11	31.51	100	360	Average
4824	48.36	-25.64	74	41.66	35.16	3.08	31.54	112	320	Peak
7236	47.33	-28.44	75.77	38.9	36.16	3.22	30.95	127	85	Peak

Test Mode :	802.11g	**Temperature :**	22~24℃
Test Channel :	01	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2399	61.97	-12.2	74.17	58.53	32.85	2.1	31.51	132	138	Peak
2412	94.17	-	-	90.69	32.88	2.11	31.51	132	138	Peak
2412	83.67	-	-	80.19	32.88	2.11	31.51	132	138	Average
4824	48.89	-25.11	74	42.19	35.16	3.08	31.54	152	324	Peak
7236	44.77	-29.4	74.17	36.34	36.16	3.22	30.95	115	78	Peak

Test Mode :	802.11g	**Temperature :**	22~24℃
Test Channel :	06	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	97.41	-	-	93.85	32.94	2.13	31.51	146	24	Peak
2437	86.72	-	-	83.16	32.94	2.13	31.51	146	24	Average
4874	46.98	-27.02	74	40.21	35.18	3.11	31.52	100	252	Peak
7311	48.93	-25.07	74	40.48	36.19	3.2	30.94	125	36	Peak

Test Mode :	802.11g	**Temperature :**	22~24℃
Test Channel :	06	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	92.96	-	-	89.4	32.94	2.13	31.51	128	133	Peak
2437	82.57	-	-	79.01	32.94	2.13	31.51	128	133	Average
4874	48.82	-25.18	74	42.05	35.18	3.11	31.52	125	38	Peak
7311	48.93	-25.07	74	40.48	36.19	3.2	30.94	100	258	Peak

Test Mode :	802.11g	**Temperature :**	22~24℃
Test Channel :	11	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	98.84	-	-	95.23	32.98	2.14	31.51	119	18	Peak
2462	87.88	-	-	84.27	32.98	2.14	31.51	119	18	Average
4924	48.79	-25.21	74	41.98	35.18	3.14	31.51	125	34	Peak
7386	54.46	-19.54	74	45.98	36.23	3.18	30.93	100	258	Peak
7386	44.05	-9.95	54	35.57	36.23	3.18	30.93	100	258	Average

Test Mode :	802.11g	**Temperature :**	22~24℃
Test Channel :	11	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	3. 2462 MHz is fundamental signal which can be ignored. 4. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	93.3	-	-	89.69	32.98	2.14	31.51	183	104	Peak
2462	80.87	-	-	77.26	32.98	2.14	31.51	183	104	Average
4924	48.58	-25.42	74	41.77	35.18	3.14	31.51	100	52	Peak
7386	54.97	-19.03	74	46.49	36.23	3.18	30.93	100	225	Peak
7386	35.87	-18.13	54	27.39	36.23	3.18	30.93	100	225	Average

Test Mode :	802.11n HT20	**Temperature :**	22~24℃
Test Channel :	01	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2399	55.34	-20.24	75.58	51.9	32.85	2.1	31.51	120	0	Peak
2412	95.58	-	-	92.1	32.88	2.11	31.51	120	0	Peak
2412	83.61	-	-	80.13	32.88	2.11	31.51	120	0	Average
4824	47.7	-26.3	74	41	35.16	3.08	31.54	112	321	Peak
7236	45.57	-30.01	75.58	37.14	36.16	3.22	30.95	118	96	Peak

Test Mode :	802.11n HT20	**Temperature :**	22~24℃
Test Channel :	01	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2399	53.5	-19.7	73.2	50.06	32.85	2.1	31.51	107	261	Peak
2412	93.2	-	-	89.72	32.88	2.11	31.51	107	261	Peak
2412	81.29	-	-	77.81	32.88	2.11	31.51	107	261	Average
4824	48.27	-25.73	74	41.57	35.16	3.08	31.54	108	48	Peak
7236	45.74	-27.46	73.2	37.31	36.16	3.22	30.95	128	246	Peak

Test Mode :	802.11n HT20	**Temperature :**	22~24℃
Test Channel :	06	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	96.06	-	-	92.5	32.94	2.13	31.51	100	360	Peak
2437	85.12	-	-	81.56	32.94	2.13	31.51	100	360	Average
4874	47.67	-26.33	74	40.9	35.18	3.11	31.52	152	324	Peak
7311	46.19	-27.81	74	37.74	36.19	3.2	30.94	107	69	Peak

Test Mode :	802.11n HT20	**Temperature :**	22~24℃
Test Channel :	06	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	92.54	-	-	88.98	32.94	2.13	31.51	129	122	Peak
2437	81.71	-	-	78.15	32.94	2.13	31.51	129	122	Average
4874	47.98	-26.02	74	41.21	35.18	3.11	31.52	128	96	Peak
7311	46.63	-27.37	74	38.18	36.19	3.2	30.94	148	275	Peak

Test Mode :	802.11n HT20	**Temperature :**	22~24℃
Test Channel :	11	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	94.16	-	-	90.55	32.98	2.14	31.51	118	13	Peak
2462	83.28	-	-	79.67	32.98	2.14	31.51	118	13	Average
4924	48.7	-25.3	74	41.89	35.18	3.14	31.51	106	55	Peak
7386	48.2	-25.8	74	39.72	36.23	3.18	30.93	172	64	Peak

Test Mode :	802.11n HT20	**Temperature :**	22~24℃
Test Channel :	11	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	89.99	-	-	86.38	32.98	2.14	31.51	130	143	Peak
2462	78.33	-	-	74.72	32.98	2.14	31.51	130	143	Average
4924	49.2	-24.8	74	42.39	35.18	3.14	31.51	129	214	Peak
7386	44.7	-29.3	74	36.22	36.23	3.18	30.93	147	325	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~24℃
Test Channel :	03	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 2399 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2399	54.69	-18.73	73.42	51.25	32.85	2.1	31.51	129	320	Peak
2422	93.42	-	-	89.9	32.91	2.12	31.51	129	320	Peak
2422	81.28	-	-	77.76	32.91	2.12	31.51	129	320	Average
4844	49.59	-24.41	74	42.86	35.17	3.09	31.53	129	82	Peak
7266	43.32	-30.68	74	34.88	36.18	3.21	30.95	125	34	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~24℃
Test Channel :	03	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 2399 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2399	51.51	-15.9	67.41	48.07	32.85	2.1	31.51	130	278	Peak
2422	87.41	-	-	83.89	32.91	2.12	31.51	130	278	Peak
2422	76.6	-	-	73.08	32.91	2.12	31.51	130	278	Average
4844	49.05	-24.95	74	42.32	35.17	3.09	31.53	112	85	Peak
7266	42.72	-31.28	74	34.28	36.18	3.21	30.95	125	86	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~24℃
Test Channel :	06	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	93.14	-	-	89.58	32.94	2.13	31.51	123	34	Peak
2437	81.54	-	-	77.98	32.94	2.13	31.51	123	34	Average
4874	48.38	-25.62	74	41.61	35.18	3.11	31.52	115	86	Peak
7311	45.99	-28.01	74	37.54	36.19	3.2	30.94	162	85	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~24℃
Test Channel :	06	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	88.61	-	-	85.05	32.94	2.13	31.51	100	123	Peak
2437	78.16	-	-	74.6	32.94	2.13	31.51	100	123	Average
4874	48.03	-25.97	74	41.26	35.18	3.11	31.52	124	89	Peak
7311	45.49	-28.51	74	37.04	36.19	3.2	30.94	117	52	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~24℃
Test Channel :	09	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2452	91.52	-	-	87.96	32.94	2.13	31.51	117	0	Peak
2452	80.35	-	-	76.79	32.94	2.13	31.51	117	0	Average
4904	48.93	-25.07	74	42.14	35.18	3.13	31.52	114	325	Peak
7356	44.48	-29.52	74	36.01	36.21	3.19	30.93	112	289	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~24℃
Test Channel :	09	**Relative Humidity :**	41~43%
Test Engineer :	Steven Hao	**Polarization :**	Vertical
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2452	86.97	-	-	83.41	32.94	2.13	31.51	100	285	Peak
2452	76.35	-	-	72.79	32.94	2.13	31.51	100	285	Average
4904	48.51	-25.49	74	41.72	35.18	3.13	31.52	109	65	Peak
7356	45.67	-28.33	74	37.2	36.21	3.19	30.93	118	25	Peak

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.

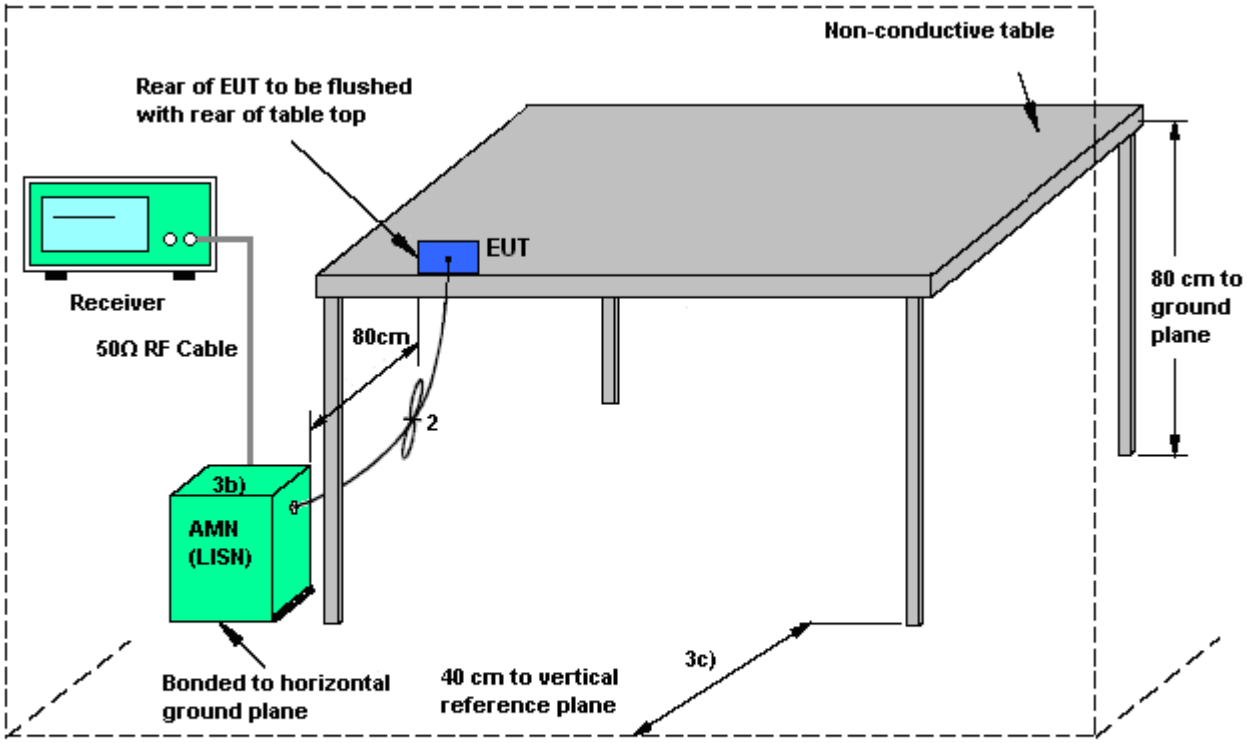
3.6.2 Measuring Instruments

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 and ANSI C63.10-2009.
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.

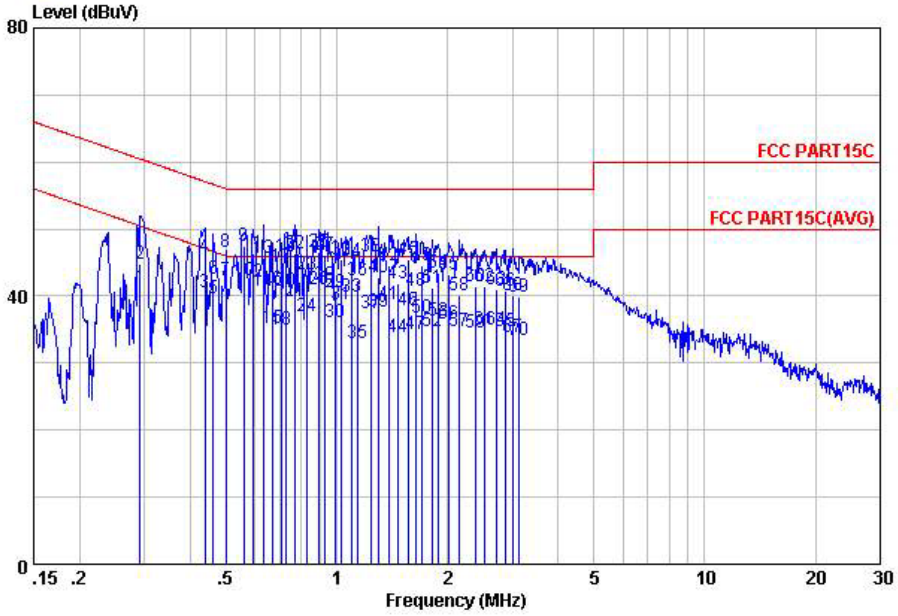
3.6.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

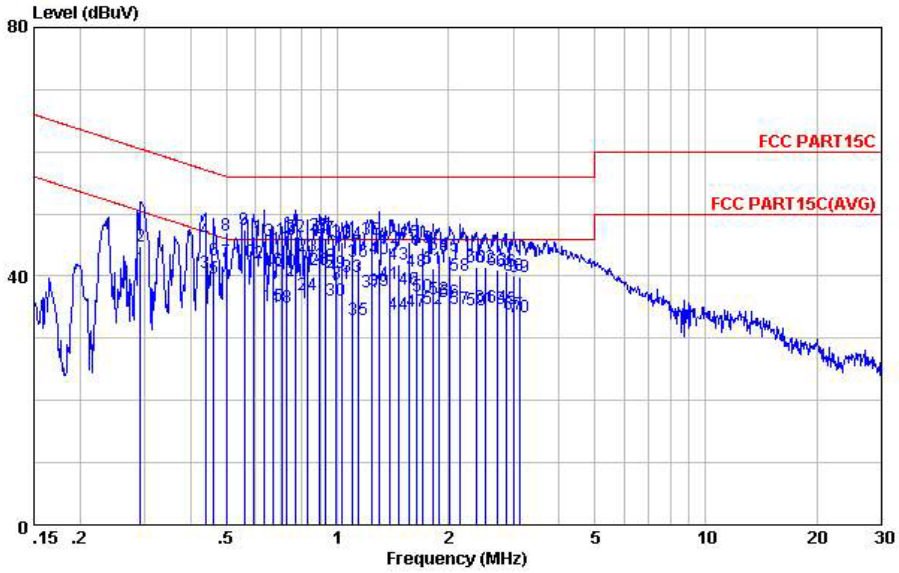
Test Mode :	Mode 1	**Temperature :**	19~20℃
Test Engineer :	Tom Wang	**Relative Humidity :**	39~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	Bluetooth Link + WLAN Link + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-111230 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.29	41.16	-9.30	50.46	30.99	-0.07	10.24	Average
2	0.29	44.76	-15.70	60.46	34.59	-0.07	10.24	QP
3	0.44	40.57	-6.54	47.11	30.40	-0.08	10.25	Average
4	0.44	45.87	-11.24	57.11	35.70	-0.08	10.25	QP
5	0.46	39.57	-7.10	46.67	29.40	-0.08	10.25	Average
6	0.46	42.67	-14.00	56.67	32.50	-0.08	10.25	QP
7	0.50	42.37	-3.64	46.01	32.20	-0.08	10.25	Average
8	0.50	46.47	-9.54	56.01	36.30	-0.08	10.25	QP
9	0.56	47.38	-8.62	56.00	37.20	-0.08	10.26	QP
10	0.56	42.28	-3.72	46.00	32.10	-0.08	10.26	Average
11	0.59	46.28	-9.72	56.00	36.11	-0.09	10.26	QP
12	0.59	42.08	-3.92	46.00	31.91	-0.09	10.26	Average
13	0.63	45.68	-10.32	56.00	35.51	-0.09	10.26	QP
14	0.63	40.88	-5.12	46.00	30.71	-0.09	10.26	Average
15	0.67	35.18	-10.82	46.00	25.00	-0.09	10.27	Average
16	0.67	41.08	-14.92	56.00	30.90	-0.09	10.27	QP
17	0.70	44.38	-11.62	56.00	34.20	-0.09	10.27	QP
18	0.70	34.98	-11.02	46.00	24.80	-0.09	10.27	Average
19	0.73	45.98	-10.02	56.00	35.80	-0.09	10.27	QP
20	0.73	40.78	-5.22	46.00	30.60	-0.09	10.27	Average
21	0.77	39.18	-6.82	46.00	29.00	-0.09	10.27	Average
22	0.77	46.28	-9.72	56.00	36.10	-0.09	10.27	QP
23	0.83	43.18	-12.82	56.00	32.99	-0.09	10.28	QP
24	0.83	36.98	-9.02	46.00	26.79	-0.09	10.28	Average
25	0.89	46.48	-9.52	56.00	36.30	-0.10	10.28	QP
26	0.89	41.08	-4.92	46.00	30.90	-0.10	10.28	Average
27	0.93	46.18	-9.82	56.00	36.00	-0.10	10.28	QP

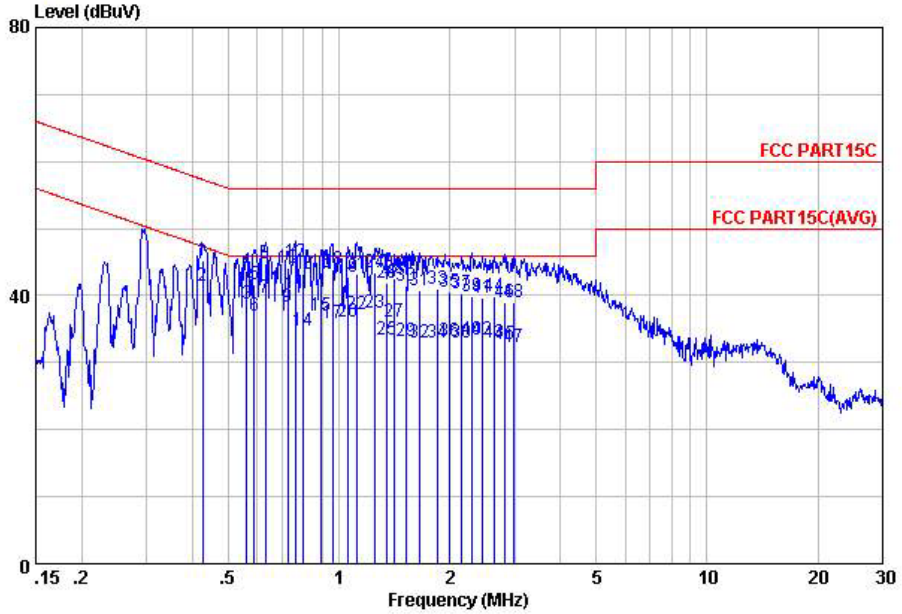
Test Mode :	Mode 1	**Temperature :**	19~20℃
Test Engineer :	Tom Wang	**Relative Humidity :**	39~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	Bluetooth Link + WLAN Link + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-111230 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
28	0.93	41.78	-4.22	46.00	31.60	-0.10	10.28	Average
29	0.99	40.58	-15.42	56.00	30.40	-0.10	10.28	QP
30	0.99	36.08	-9.92	46.00	25.90	-0.10	10.28	Average
31	1.03	38.88	-7.12	46.00	28.70	-0.10	10.28	Average
32	1.03	45.38	-10.62	56.00	35.20	-0.10	10.28	QP
33	1.09	39.88	-6.12	46.00	29.70	-0.10	10.28	Average
34	1.09	45.18	-10.82	56.00	35.00	-0.10	10.28	QP
35	1.14	33.08	-12.92	46.00	22.90	-0.10	10.28	Average
36	1.14	42.38	-13.62	56.00	32.20	-0.10	10.28	QP
37	1.24	37.38	-8.62	46.00	27.20	-0.10	10.28	Average
38	1.24	45.98	-10.02	56.00	35.80	-0.10	10.28	QP
39	1.30	37.58	-8.42	46.00	27.39	-0.10	10.29	Average
40	1.30	42.68	-13.32	56.00	32.49	-0.10	10.29	QP
41	1.39	38.78	-7.22	46.00	28.59	-0.10	10.29	Average
42	1.39	44.48	-11.52	56.00	34.29	-0.10	10.29	QP
43	1.47	41.99	-14.01	56.00	31.81	-0.11	10.29	QP
44	1.47	33.89	-12.11	46.00	23.71	-0.11	10.29	Average
45	1.56	45.39	-10.61	56.00	35.21	-0.11	10.29	QP
46	1.56	37.79	-8.21	46.00	27.61	-0.11	10.29	Average
47	1.64	34.39	-11.61	46.00	24.20	-0.11	10.30	Average
48	1.64	40.89	-15.11	56.00	30.70	-0.11	10.30	QP
49	1.70	44.59	-11.41	56.00	34.40	-0.11	10.30	QP
50	1.70	36.69	-9.31	46.00	26.50	-0.11	10.30	Average
51	1.82	41.29	-14.71	56.00	31.10	-0.11	10.30	QP
52	1.82	34.69	-11.31	46.00	24.50	-0.11	10.30	Average
53	1.89	36.39	-9.61	46.00	26.20	-0.11	10.30	Average
54	1.89	43.49	-12.51	56.00	33.30	-0.11	10.30	QP
55	2.02	43.19	-12.81	56.00	33.00	-0.11	10.30	QP
56	2.02	35.79	-10.21	46.00	25.60	-0.11	10.30	Average
57	2.16	34.69	-11.31	46.00	24.50	-0.11	10.30	Average
58	2.16	40.09	-15.91	56.00	29.90	-0.11	10.30	QP
59	2.38	34.59	-11.41	46.00	24.39	-0.11	10.31	Average
60	2.38	41.39	-14.61	56.00	31.19	-0.11	10.31	QP
61	2.53	34.89	-11.11	46.00	24.69	-0.11	10.31	Average
62	2.53	41.39	-14.61	56.00	31.19	-0.11	10.31	QP
63	2.71	41.10	-14.90	56.00	30.90	-0.11	10.31	QP
64	2.71	34.90	-11.10	46.00	24.70	-0.11	10.31	Average
65	2.87	34.70	-11.30	46.00	24.50	-0.12	10.32	Average
66	2.87	40.80	-15.20	56.00	30.60	-0.12	10.32	QP
67	3.03	33.90	-12.10	46.00	23.70	-0.12	10.32	Average
68	3.03	40.10	-15.90	56.00	29.90	-0.12	10.32	QP
69	3.14	39.80	-16.20	56.00	29.60	-0.12	10.32	QP
70	3.14	33.40	-12.60	46.00	23.20	-0.12	10.32	Average

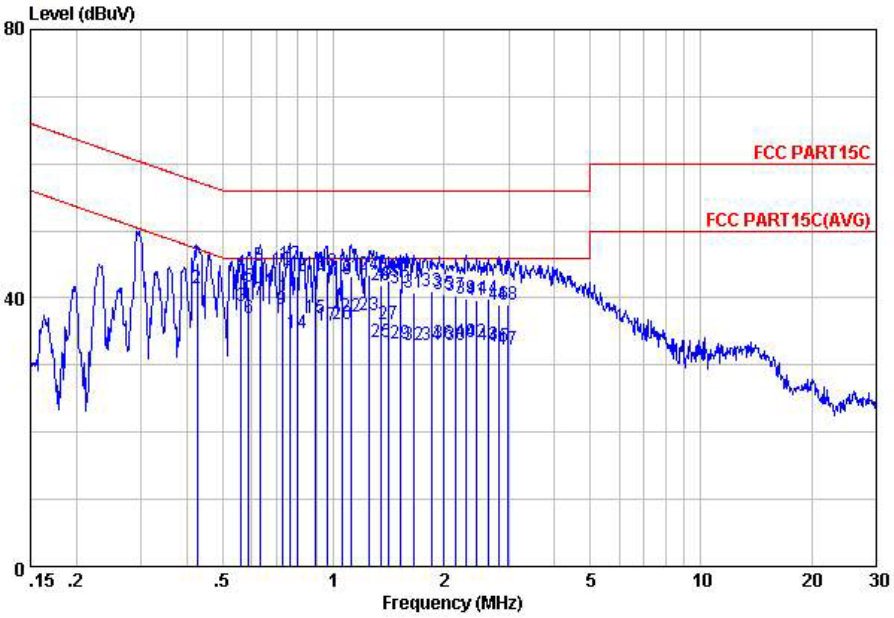
Test Mode :	Mode 1	**Temperature :**	19~20℃
Test Engineer :	Tom Wang	**Relative Humidity :**	39~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	Bluetooth Link + WLAN Link + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-111230 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.43	45.17	-12.16	57.33	35.00	-0.08	10.25	QP
2	0.43	41.37	-5.96	47.33	31.20	-0.08	10.25	Average
3	0.56	38.88	-7.12	46.00	28.70	-0.08	10.26	Average
4	0.56	43.58	-12.42	56.00	33.40	-0.08	10.26	QP
5	0.59	41.58	-14.42	56.00	31.40	-0.08	10.26	QP
6	0.59	36.98	-9.02	46.00	26.80	-0.08	10.26	Average
7	0.63	39.68	-6.32	46.00	29.50	-0.08	10.26	Average
8	0.63	44.78	-11.22	56.00	34.60	-0.08	10.26	QP
9	0.73	38.39	-7.61	46.00	28.20	-0.08	10.27	Average
10	0.73	44.09	-11.91	56.00	33.90	-0.08	10.27	QP
11	0.76	40.29	-5.71	46.00	30.10	-0.08	10.27	Average
12	0.76	45.09	-10.91	56.00	34.90	-0.08	10.27	QP
13	0.80	43.19	-12.81	56.00	32.99	-0.08	10.28	QP
14	0.80	34.69	-11.31	46.00	24.49	-0.08	10.28	Average
15	0.89	36.89	-9.11	46.00	26.70	-0.09	10.28	Average
16	0.89	43.39	-12.61	56.00	33.20	-0.09	10.28	QP
17	0.96	35.89	-10.11	46.00	25.70	-0.09	10.28	Average
18	0.96	43.79	-12.21	56.00	33.60	-0.09	10.28	QP
19	1.05	42.89	-13.11	56.00	32.70	-0.09	10.28	QP
20	1.05	35.99	-10.01	46.00	25.80	-0.09	10.28	Average
21	1.12	43.19	-12.81	56.00	33.00	-0.09	10.28	QP
22	1.12	37.29	-8.71	46.00	27.10	-0.09	10.28	Average
23	1.26	37.49	-8.51	46.00	27.31	-0.10	10.28	Average
24	1.26	43.39	-12.61	56.00	33.21	-0.10	10.28	QP
25	1.35	33.49	-12.51	46.00	23.30	-0.10	10.29	Average
26	1.35	41.89	-14.11	56.00	31.70	-0.10	10.29	QP
27	1.42	36.19	-9.81	46.00	26.00	-0.10	10.29	Average

Test Mode :	Mode 1	**Temperature :**	19~20℃
Test Engineer :	Tom Wang	**Relative Humidity :**	39~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	Bluetooth Link + WLAN Link + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-111230 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
28	1.42	42.49	-13.51	56.00	32.30	-0.10	10.29	QP
29	1.52	33.29	-12.71	46.00	23.10	-0.10	10.29	Average
30	1.52	41.49	-14.51	56.00	31.30	-0.10	10.29	QP
31	1.66	40.79	-15.21	56.00	30.60	-0.11	10.30	QP
32	1.66	32.89	-13.11	46.00	22.70	-0.11	10.30	Average
33	1.85	40.99	-15.01	56.00	30.80	-0.11	10.30	QP
34	1.85	32.99	-13.01	46.00	22.80	-0.11	10.30	Average
35	1.99	40.49	-15.51	56.00	30.30	-0.11	10.30	QP
36	1.99	33.19	-12.81	46.00	23.00	-0.11	10.30	Average
37	2.16	40.29	-15.71	56.00	30.10	-0.11	10.30	QP
38	2.16	33.09	-12.91	46.00	22.90	-0.11	10.30	Average
39	2.30	39.99	-16.01	56.00	29.80	-0.11	10.30	QP
40	2.30	33.39	-12.61	46.00	23.20	-0.11	10.30	Average
41	2.46	39.69	-16.31	56.00	29.49	-0.11	10.31	QP
42	2.46	33.49	-12.51	46.00	23.29	-0.11	10.31	Average
43	2.65	33.00	-13.00	46.00	22.80	-0.11	10.31	Average
44	2.65	39.80	-16.20	56.00	29.60	-0.11	10.31	QP
45	2.81	32.70	-13.30	46.00	22.51	-0.12	10.31	Average
46	2.81	39.10	-16.90	56.00	28.91	-0.12	10.31	QP
47	2.98	32.20	-13.80	46.00	22.00	-0.12	10.32	Average
48	2.98	39.10	-16.90	56.00	28.90	-0.12	10.32	QP

3.7 Antenna Requirements

3.7.1 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.

3.7.2 Antenna Connected Construction

Non-standard connector used.

3.7.3 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	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 29, 2012	Feb. 28, 2013~ Mar. 04, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 22, 2012	Feb. 28, 2013~ Mar. 04, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 22, 2012	Feb. 28, 2013~ Mar. 04, 2013	Aug. 21, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Feb. 28, 2013~ Mar. 04, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	Feb. 28, 2013~ Mar. 04, 2013	Dec. 28, 2013	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 08, 2012	Mar. 13, 2013	Nov. 07, 2013	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	100400	9kHz~30GHz	Jun. 01, 2012	Mar. 13, 2013	May 31, 2013	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2012	Mar. 13, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/ 001	9 kHz~30 MHz	Jul. 03, 2012	Mar. 13, 2013	Jul. 02, 2014	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	1908/7/13	00075957	1GHz~18GHz	Dec. 07, 2012	Mar. 13, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	Jun. 01, 2012	Mar. 13, 2013	May 31, 2013	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 29, 2012	Mar. 13, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2012	Mar. 13, 2013	Nov. 06, 2013	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	9170249	15GHz~40GHz	Nov. 23, 2012	Mar. 13, 2013	Nov. 22, 2013	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 01, 2012	Mar. 13, 2013	May 31, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 29, 2012	Mar. 13, 2013	Dec. 28, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 29, 2012	Mar. 13, 2013	Dec. 28, 2013	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 15, 2012	Mar. 13, 2013	Nov. 14, 2013	Conduction (CO01-KS)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.26

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.54

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.72

Appendix A. Photographs of EUT

Please refer to Sporton report number EP322101 as below.