

FCC RF Test Report

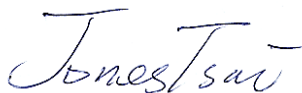
APPLICANT : D-Link Corporation
EQUIPMENT : DC-HSPA+ Le Petit Router
BRAND NAME : D-Link
MODEL NAME : DWR-810
STANDARD : FCC Part 15 Subpart C §15.247
FCC ID : KA2WR810A1
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Dec. 16, 2013 and testing was completed on Jan. 13, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant 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: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : KA2WR810A1

Page Number : 1 of 65

Report Issued Date : Jan. 20, 2014

Report Version : Rev. 01



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 Modification of EUT	6
1.6 Testing Site	6
1.7 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 EUT Operation Test Setup	11
2.7 Measurement Results Explanation Example	11
3 TEST RESULT	12
3.1 6dB Bandwidth Measurement	12
3.2 Output Power Measurement	15
3.3 Power Spectral Density Measurement	18
3.4 Conducted Band Edges and Spurious Emission Measurement	21
3.5 Radiated Band Edges and Spurious Emission Measurement	34
3.6 AC Conducted Emission Measurement	59
3.7 Antenna Requirements	63
4 LIST OF MEASURING EQUIPMENT	64
5 UNCERTAINTY OF EVALUATION	65
APPENDIX A. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3D1605-02	Rev. 01	Initial issue of report	Jan. 20, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	RSS-210 A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	RSS-210 A8.4	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	RSS-210 A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	RSS-210 A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	RSS-210 A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.12 dB at 2389.920 MHz
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 9.90 dB at 0.190 MHz
3.7	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

D-Link Corporation

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

1.2 Manufacturer

D-Link Corporation

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

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	DC-HSPA+ Le Petit Router
Brand Name	D-Link
Model Name	DWR-810
FCC ID	KA2WR810A1
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA WLAN 11bgn
HW Version	A1
SW Version	1.0.0b01
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 Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to Antenna	802.11b : 19.81 dBm (0.0957 W) 802.11g : 23.95 dBm (0.2483 W) 802.11n HT20 : 23.72 dBm (0.2355 W) 802.11n HT40 : 23.51 dBm (0.2244 W)
Antenna Type	PIFA Antenna type with gain -3.46 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 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.
	TH02-HY	CO05-HY	03CH06-HY	722060/4086B-1

Note: The test site complies with ANSI C63.4 2003 requirement.

1.7 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 v03r01
- ANSI C63.4-2003

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).

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 data rate associated with the highest power were chosen for full test shown in the following tables.

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	19.81	19.79	19.69	19.51

2.4GHz 802.11g mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	23.95	23.83	23.90	23.79	23.89	23.91	23.89	23.90

2.4GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	23.72	23.60	23.50	23.60	23.58	23.57	23.60	23.58

2.4GHz 802.11n HT40 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	23.51	23.41	23.31	23.49	23.02	23.22	23.47	23.23

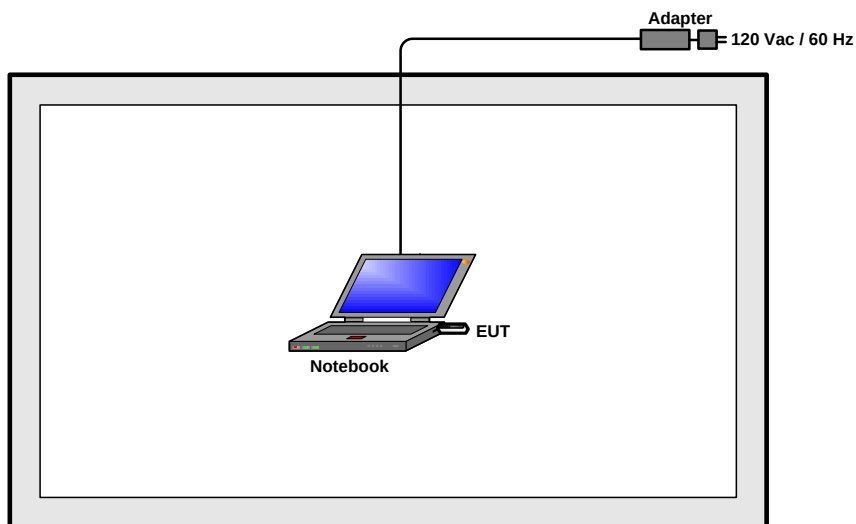
2.3 Test Mode

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

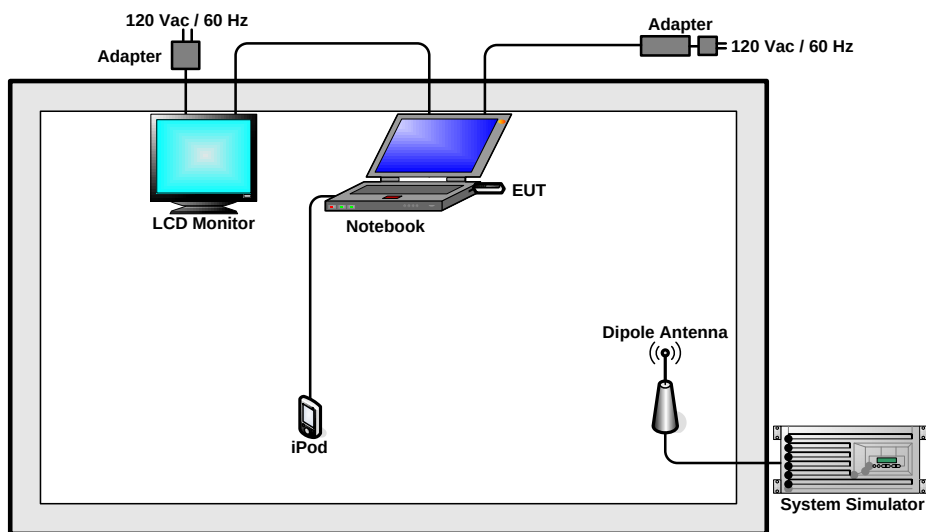
Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
		802.11n HT40	MCS0	3/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
Radiated TCs	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
		802.11n HT40	MCS0	3/9
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
Test Cases				
AC Conducted Emission	Mode 1: WCDMA Band II Idle + WLAN Link + USB Cable (Data Link with Notebook)			

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.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
3.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Notebook	DELL	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.6 EUT Operation Test Setup

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

2.7 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\
 &= 4.2 + 10 = 14.2 \text{ (dB)}
 \end{aligned}$$

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.

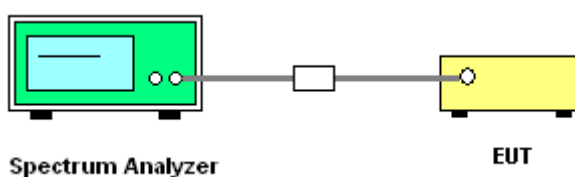
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r01.
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.

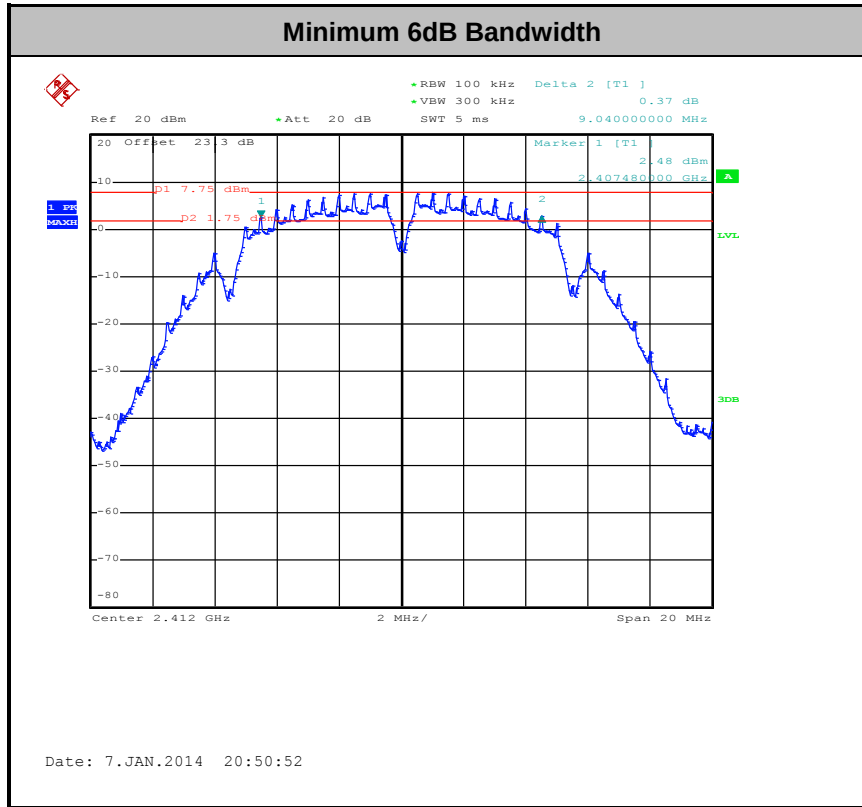
3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Test Band :	2.4GHz	Temperature :	21~25°C
Test Engineer :	Bill Kuo	Relative Humidity :	51~54%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	9.04	0.5	Pass
11b	1Mbps	1	6	2437	9.04	0.5	Pass
11b	1Mbps	1	11	2462	9.08	0.5	Pass
11g	6Mbps	1	1	2412	16.32	0.5	Pass
11g	6Mbps	1	6	2437	16.40	0.5	Pass
11g	6Mbps	1	11	2462	16.36	0.5	Pass
HT20	MCS0	1	1	2412	17.30	0.5	Pass
HT20	MCS0	1	6	2437	17.60	0.5	Pass
HT20	MCS0	1	11	2462	17.56	0.5	Pass
HT40	MCS0	1	3	2422	35.48	0.5	Pass
HT40	MCS0	1	6	2437	36.28	0.5	Pass
HT40	MCS0	1	9	2452	35.40	0.5	Pass



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.

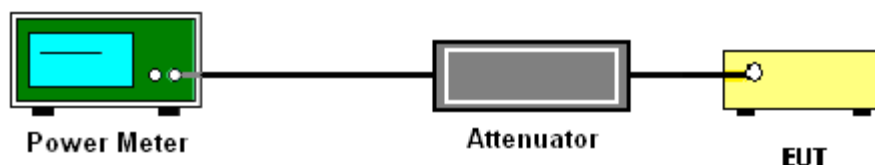
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 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 v03r01.
2. The RF output of EUT was connected to the power meter 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 :	2.4GHz	Temperature :	21~25℃
Test Engineer :	Bill Kuo	Relative Humidity :	51~54%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	19.81	30	-3.46	Pass
11b	1Mbps	1	6	2437	19.32	30	-3.46	Pass
11b	1Mbps	1	11	2462	18.85	30	-3.46	Pass
11g	6Mbps	1	1	2412	23.95	30	-3.46	Pass
11g	6Mbps	1	6	2437	23.64	30	-3.46	Pass
11g	6Mbps	1	11	2462	23.52	30	-3.46	Pass
HT20	MCS0	1	1	2412	19.23	30	-3.46	Pass
HT20	MCS0	1	6	2437	23.72	30	-3.46	Pass
HT20	MCS0	1	11	2462	23.33	30	-3.46	Pass
HT40	MCS0	1	3	2422	20.04	30	-3.46	Pass
HT40	MCS0	1	6	2437	23.51	30	-3.46	Pass
HT40	MCS0	1	9	2452	20.03	30	-3.46	Pass

Note: Measured power (dBm) has offset with cable loss.

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	2.4GHz	Temperature :	21~25°C
Test Engineer :	Bill Kuo	Relative Humidity :	51~54%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	0.03	16.36	30	-3.46	Pass
11b	1Mbps	1	6	2437	0.03	15.90	30	-3.46	Pass
11b	1Mbps	1	11	2462	0.03	15.45	30	-3.46	Pass
11g	6Mbps	1	1	2412	0.19	13.60	30	-3.46	Pass
11g	6Mbps	1	6	2437	0.19	13.14	30	-3.46	Pass
11g	6Mbps	1	11	2462	0.19	12.86	30	-3.46	Pass
HT20	MCS0	1	1	2412	0.21	9.51	30	-3.46	Pass
HT20	MCS0	1	6	2437	0.21	13.18	30	-3.46	Pass
HT20	MCS0	1	11	2462	0.21	12.73	30	-3.46	Pass
HT40	MCS0	1	3	2422	0.39	10.41	30	-3.46	Pass
HT40	MCS0	1	6	2437	0.39	12.95	30	-3.46	Pass
HT40	MCS0	1	9	2452	0.39	9.08	30	-3.46	Pass

Note: Measured power (dBm) has offset with cable loss and duty factor.

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.

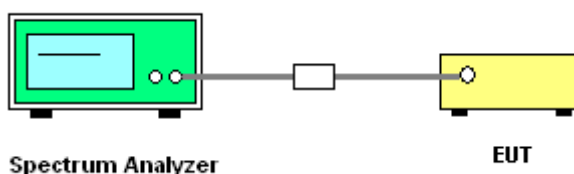
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
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

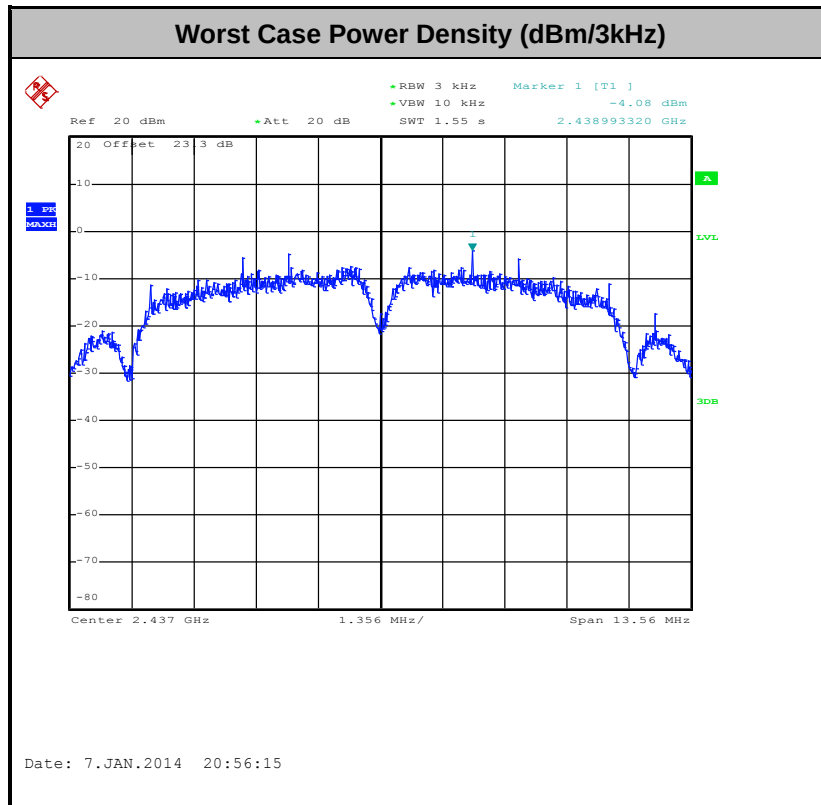


3.3.5 Test Result of Power Spectral Density

Test Mode :	2.4GHz	Temperature :	21~25°C
Test Engineer :	Bill Kuo	Relative Humidity :	51~54%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)	Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	-5.87	8	-3.46	Pass
11b	1Mbps	1	6	2437	-4.08	8	-3.46	Pass
11b	1Mbps	1	11	2462	-6.39	8	-3.46	Pass
11g	6Mbps	1	1	2412	-12.03	8	-3.46	Pass
11g	6Mbps	1	6	2437	-12.52	8	-3.46	Pass
11g	6Mbps	1	11	2462	-12.83	8	-3.46	Pass
HT20	MCS0	1	1	2412	-15.52	8	-3.46	Pass
HT20	MCS0	1	6	2437	-12.02	8	-3.46	Pass
HT20	MCS0	1	11	2462	-12.55	8	-3.46	Pass
HT40	MCS0	1	3	2422	-17.76	8	-3.46	Pass
HT40	MCS0	1	6	2437	-15.76	8	-3.46	Pass
HT40	MCS0	1	9	2452	-18.52	8	-3.46	Pass

Note: Measured power density (dBm) has offset with cable loss.



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).

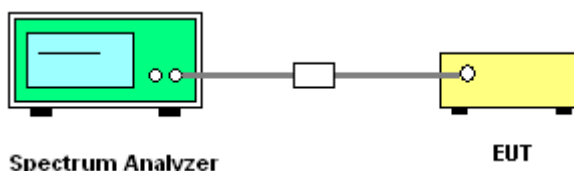
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

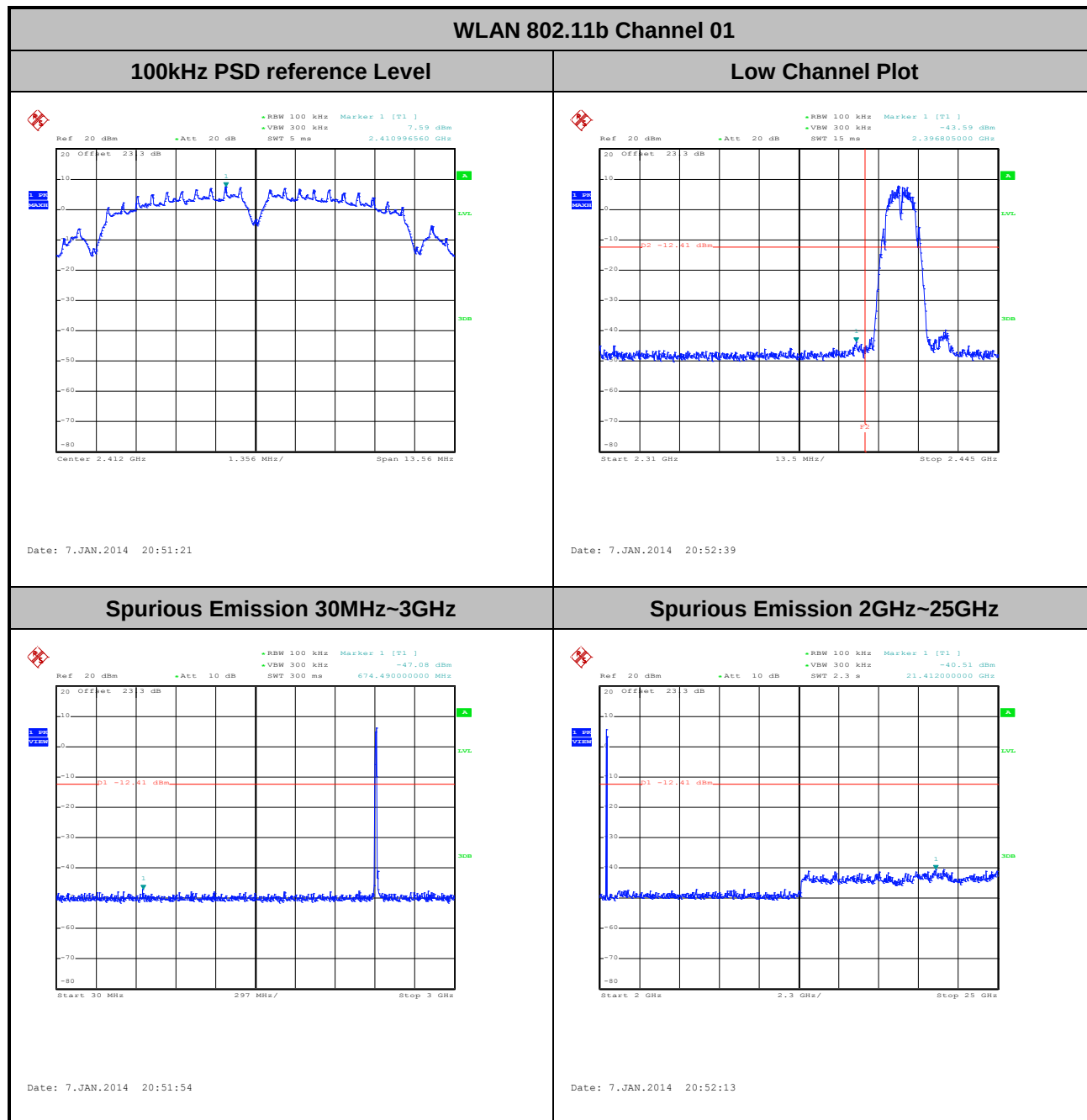
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Bill Kuo

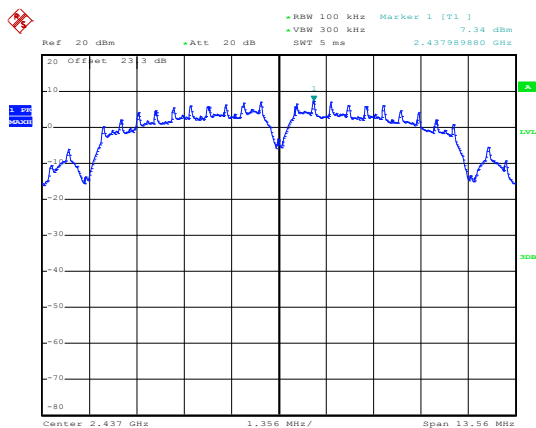




Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz Mid.	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Bill Kuo

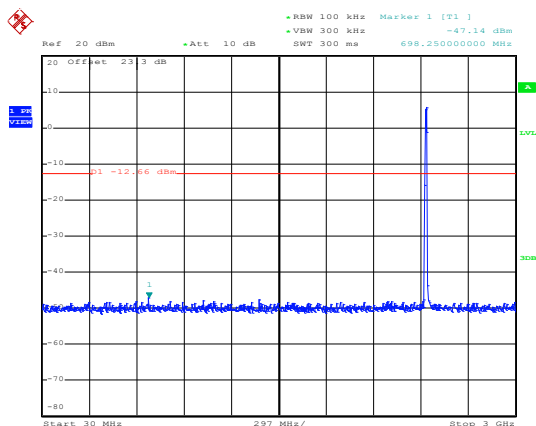
WLAN 802.11b Channel 06

100kHz PSD reference Level



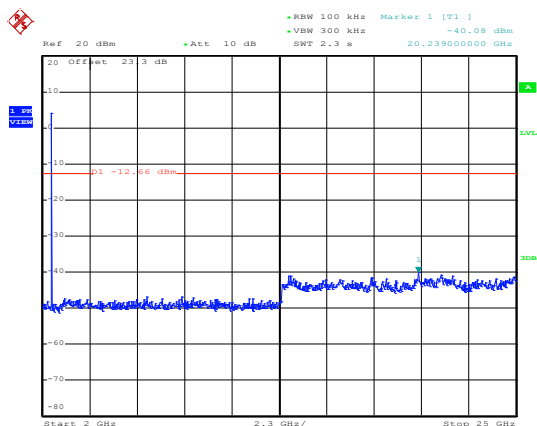
Date: 7.JAN.2014 20:56:24

Spurious Emission 30MHz~3GHz



Date: 7.JAN.2014 20:56:44

Spurious Emission 2GHz~25GHz



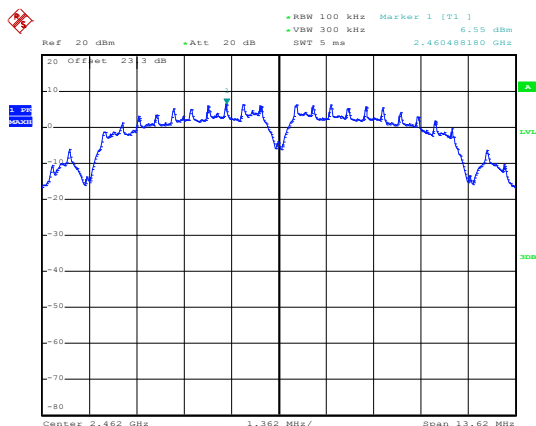
Date: 7.JAN.2014 20:57:02



Test Mode :	802.11b	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Bill Kuo

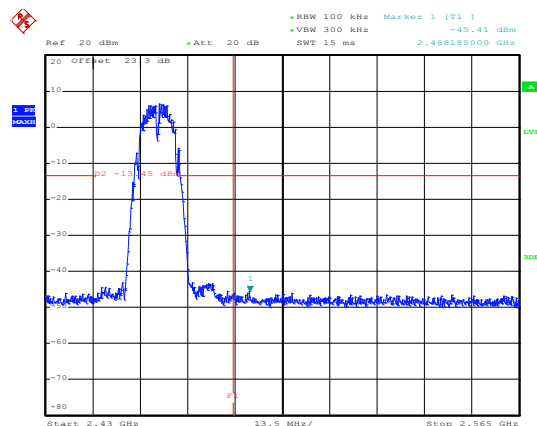
WLAN 802.11b Channel 11

100kHz PSD reference Level



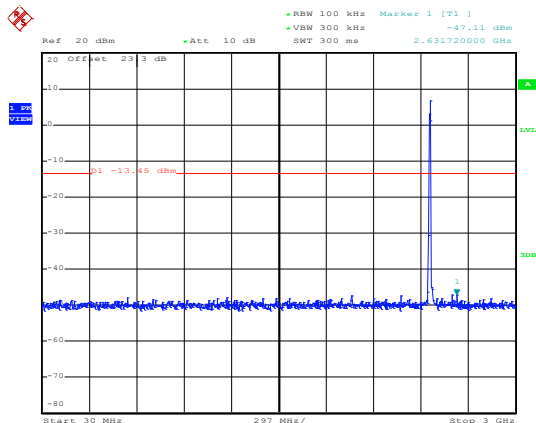
Date: 7.JAN.2014 21:00:41

High Channel Plot



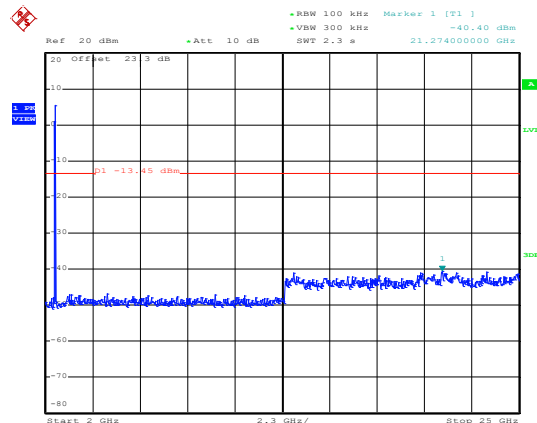
Date: 7.JAN.2014 21:00:55

Spurious Emission 30MHz~3GHz



Date: 7.JAN.2014 21:01:14

Spurious Emission 2GHz~25GHz



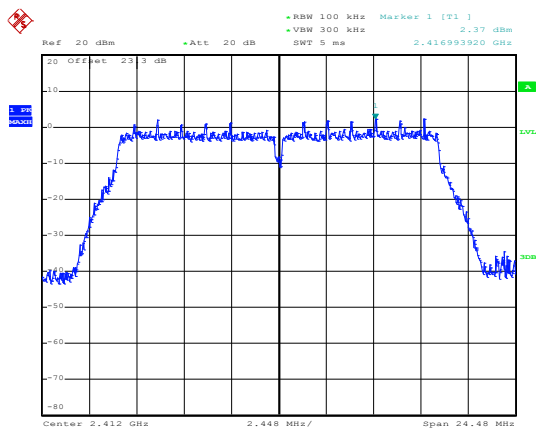
Date: 7.JAN.2014 21:01:33



Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Bill Kuo

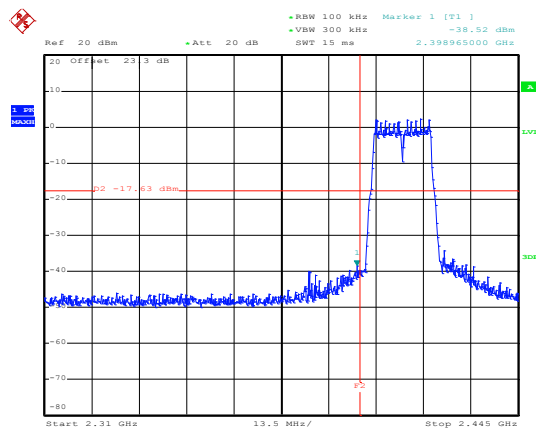
WLAN 802.11g Channel 01

100kHz PSD reference Level



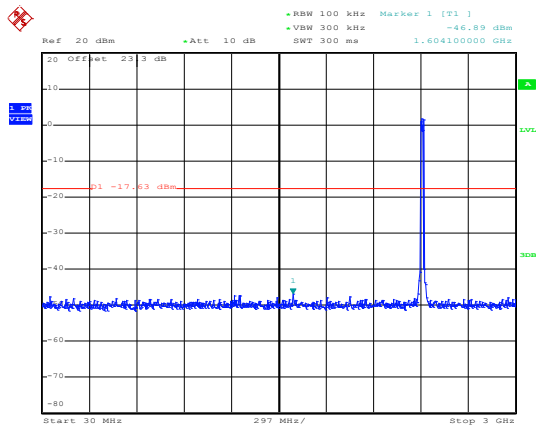
Date: 7.JAN.2014 21:10:46

Low Channel Plot



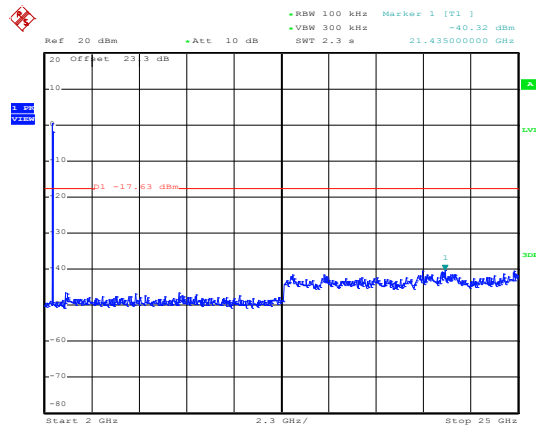
Date: 7.JAN.2014 21:11:00

Spurious Emission 30MHz~3GHz



Date: 7.JAN.2014 21:11:19

Spurious Emission 2GHz~25GHz



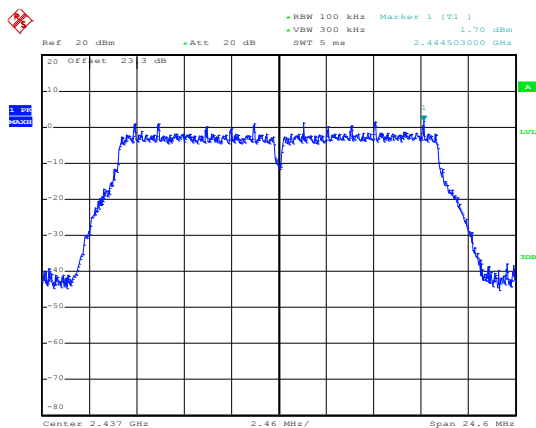
Date: 7.JAN.2014 21:11:38



Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz Mid.	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Bill Kuo

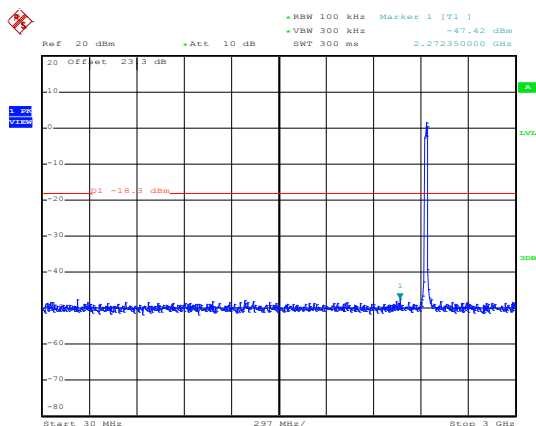
WLAN 802.11g Channel 06

100kHz PSD reference Level



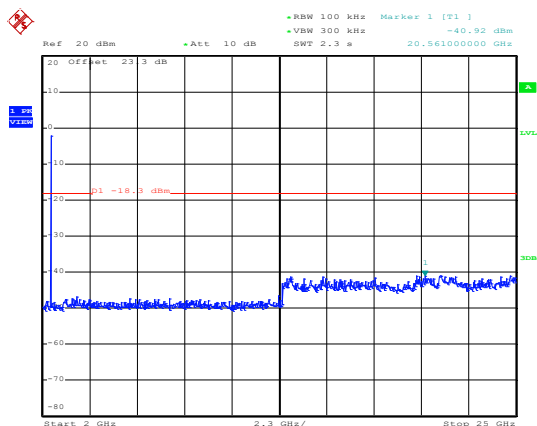
Date: 7.JAN.2014 21:08:27

Spurious Emission 30MHz~3GHz



Date: 7.JAN.2014 21:08:47

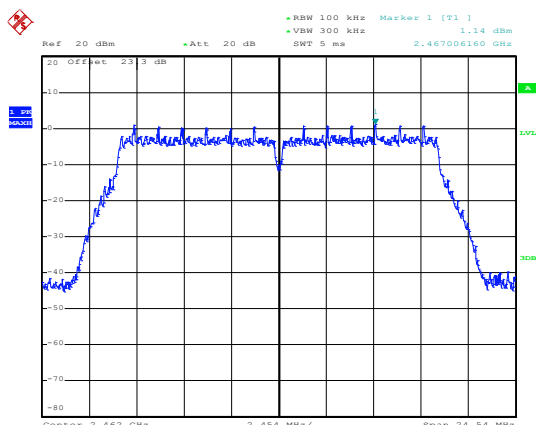
Spurious Emission 2GHz~25GHz



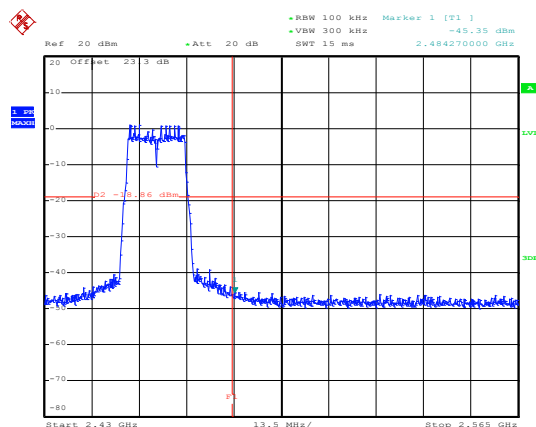
Date: 7.JAN.2014 21:09:05



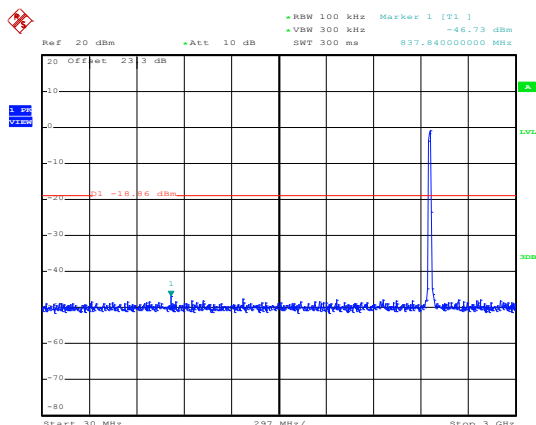
Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Bill Kuo

WLAN 802.11g Channel 11**100kHz PSD reference Level**

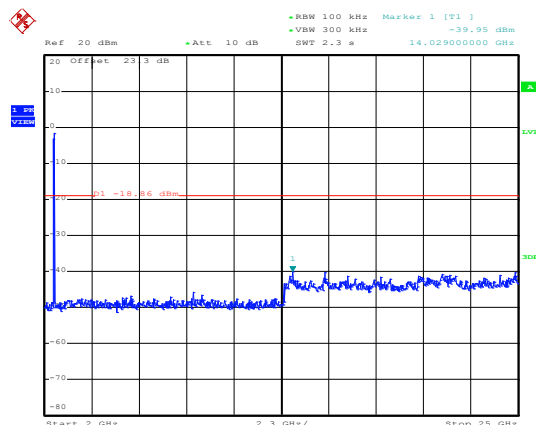
Date: 7.JAN.2014 21:04:31

High Channel Plot

Date: 7.JAN.2014 21:04:45

Spurious Emission 30MHz~3GHz

Date: 7.JAN.2014 21:05:04

Spurious Emission 2GHz~25GHz

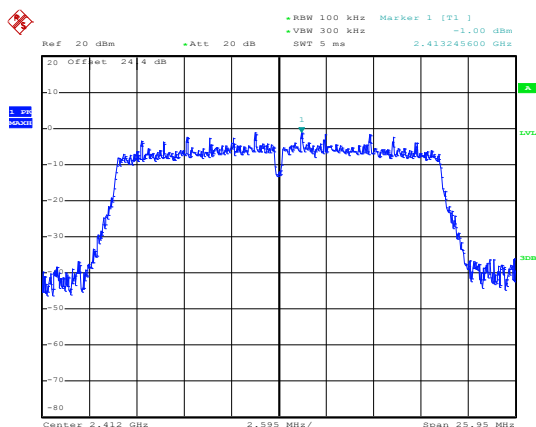
Date: 7.JAN.2014 21:05:23



Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Bill Kuo

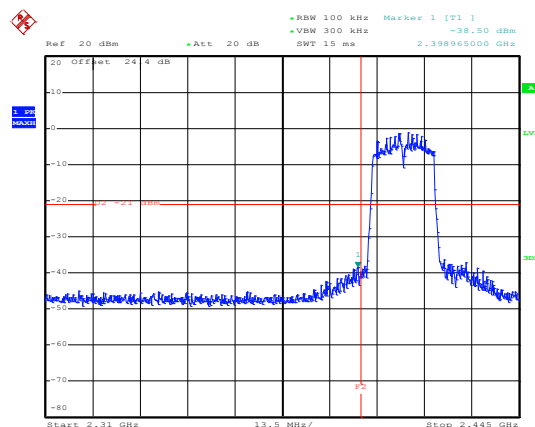
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



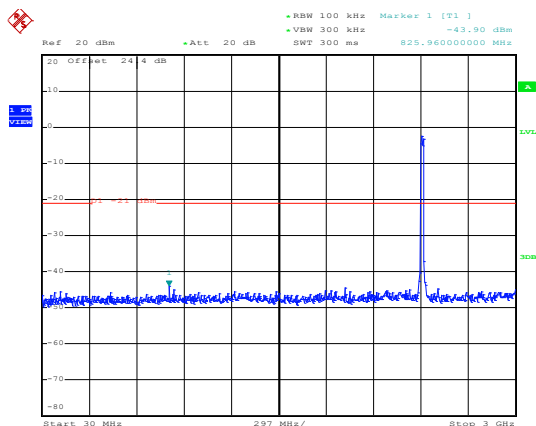
Date: 13.JAN.2014 17:09:29

Low Channel Plot



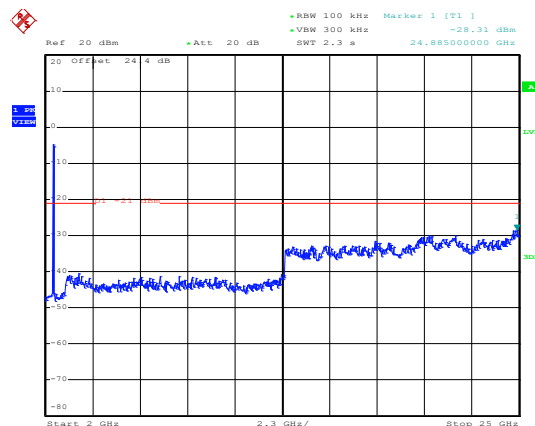
Date: 13.JAN.2014 17:09:43

Spurious Emission 30MHz~3GHz



Date: 13.JAN.2014 17:10:02

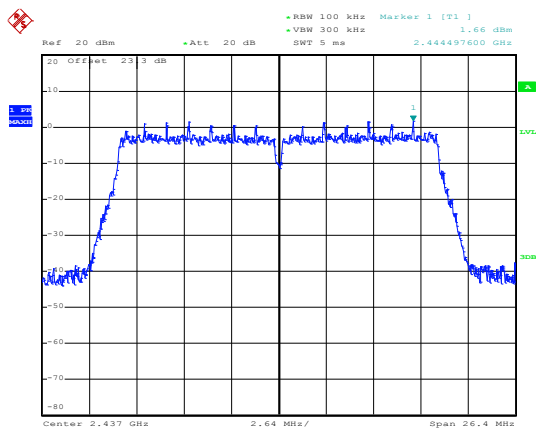
Spurious Emission 2GHz~25GHz



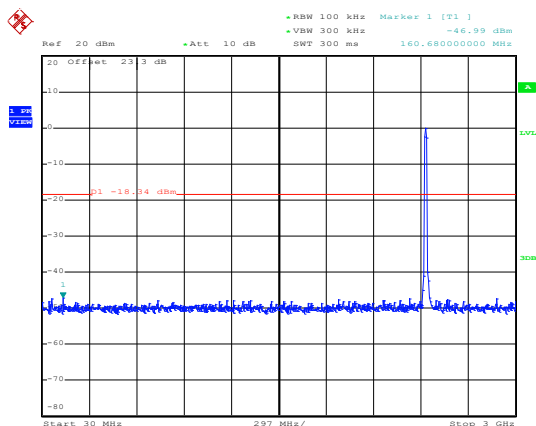
Date: 13.JAN.2014 17:10:21



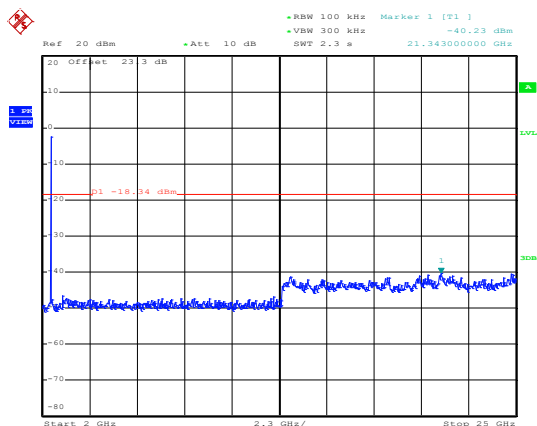
Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz Mid.	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Bill Kuo

WLAN 802.11n HT20 Channel 06**100kHz PSD reference Level**

Date: 7.JAN.2014 21:16:11

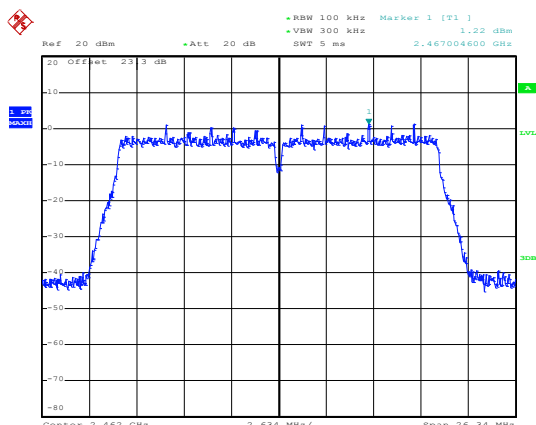
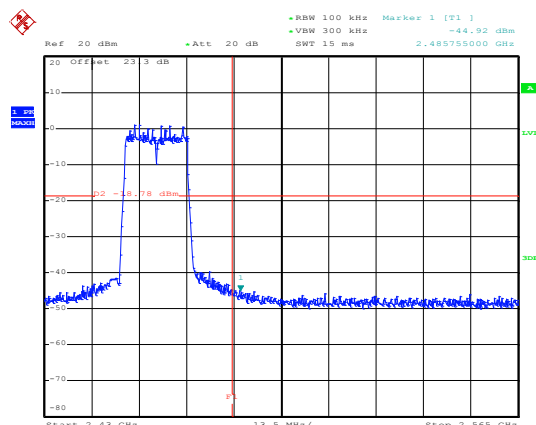
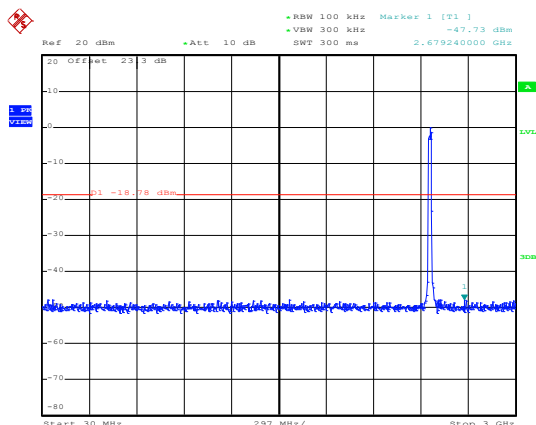
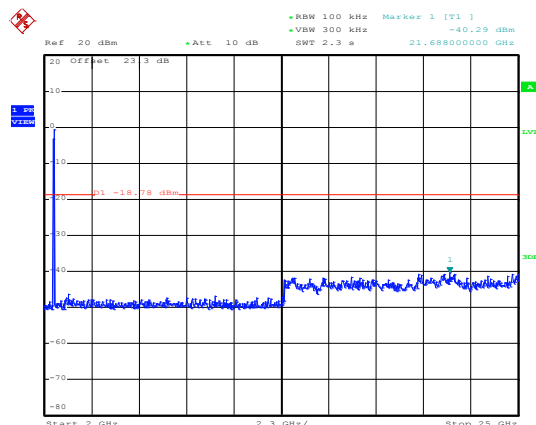
Spurious Emission 30MHz~3GHz

Date: 7.JAN.2014 21:18:06

Spurious Emission 2GHz~25GHz

Date: 7.JAN.2014 21:18:25

Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Bill Kuo

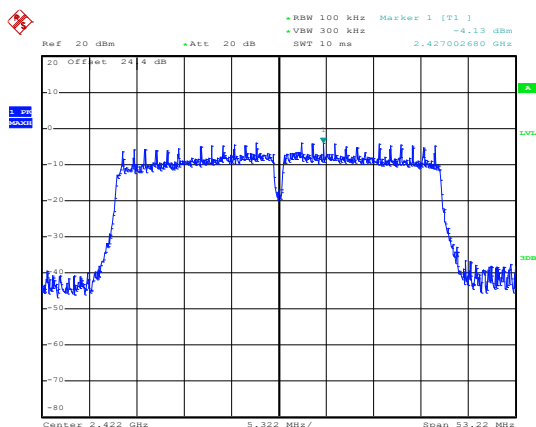
WLAN 802.11n HT20 Channel 11
100kHz PSD reference Level

High Channel Plot

Spurious Emission 30MHz~3GHz

Spurious Emission 2GHz~25GHz




Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	03	Test Engineer :	Bill Kuo

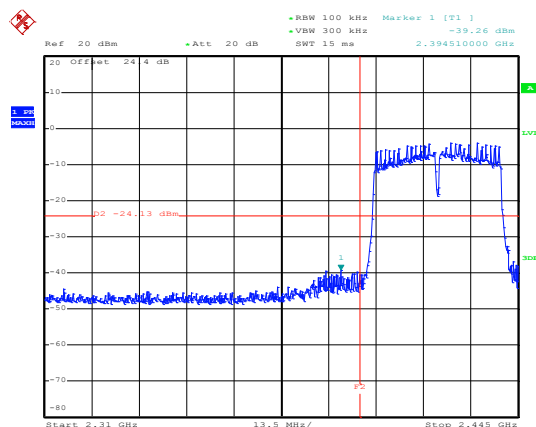
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



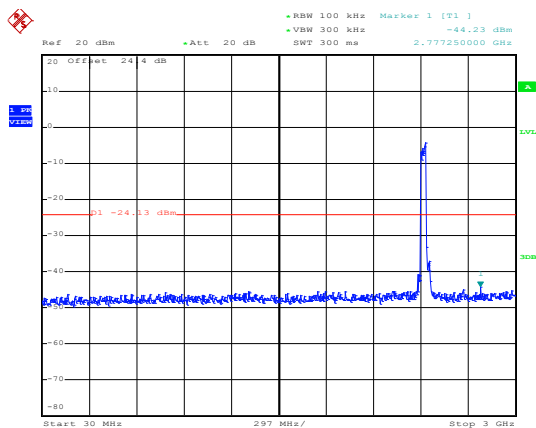
Date: 13.JAN.2014 17:04:05

Low Channel Plot



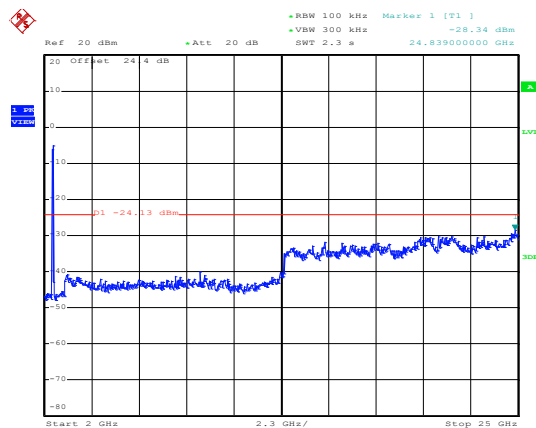
Date: 13.JAN.2014 17:04:18

Spurious Emission 30MHz~3GHz



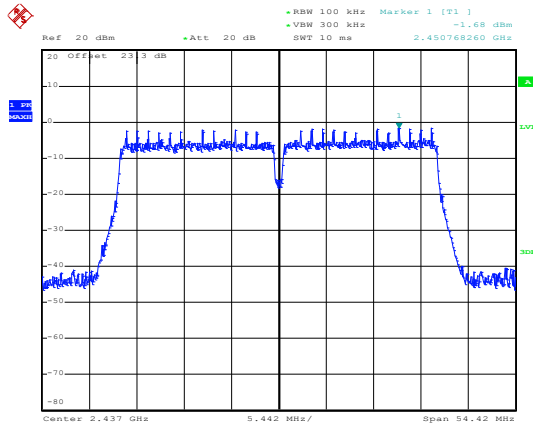
Date: 13.JAN.2014 17:04:36

Spurious Emission 2GHz~25GHz

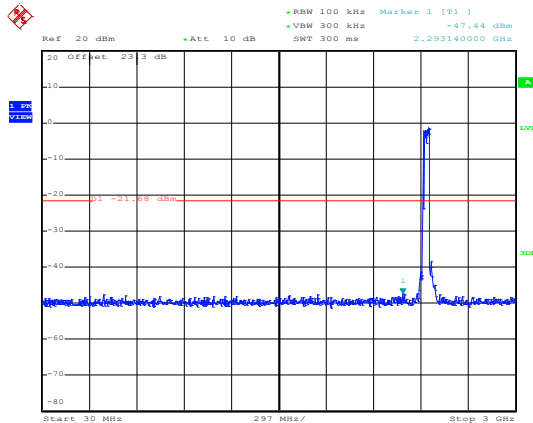


Date: 13.JAN.2014 17:04:54

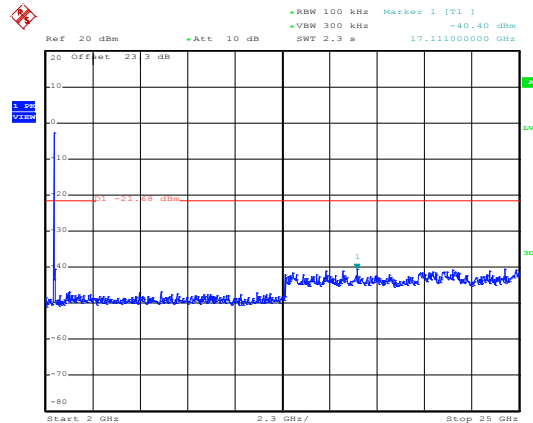
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz Mid.	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Bill Kuo

WLAN 802.11n HT40 Channel 06
100kHz PSD reference Level


Date: 7.JAN.2014 21:37:23

Spurious Emission 30MHz~3GHz


Date: 7.JAN.2014 21:56:57

Spurious Emission 2GHz~25GHz


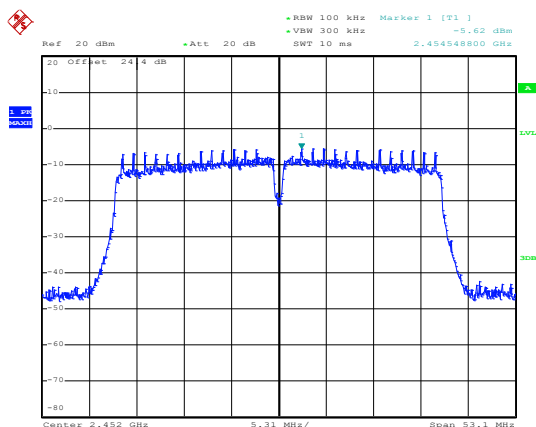
Date: 7.JAN.2014 21:55:50



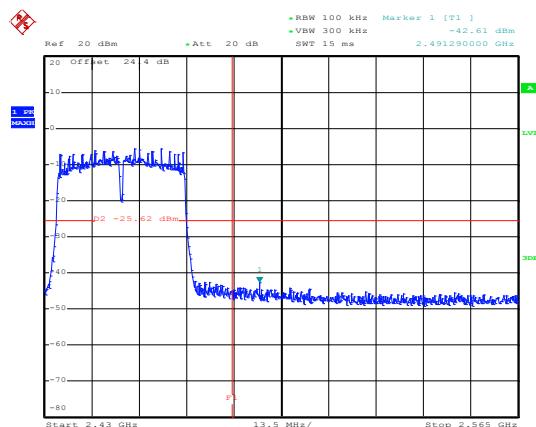
Test Mode :	802.11n HT40	Temperature :	21~25°C
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	09	Test Engineer :	Bill Kuo

WLAN 802.11n HT40 Channel 09

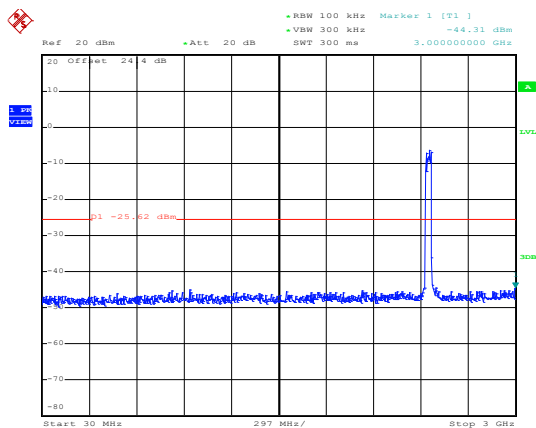
100kHz PSD reference Level



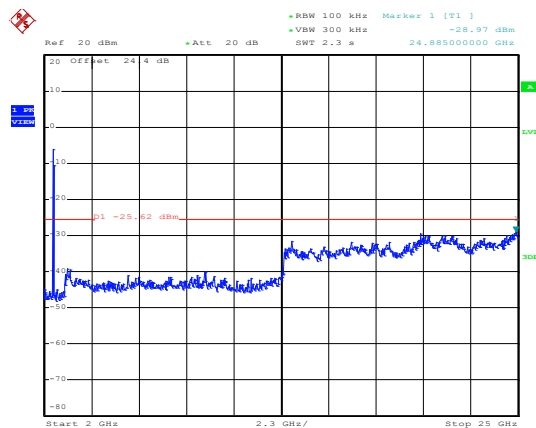
High Channel Plot



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz



3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
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 - Preamplifier 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; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

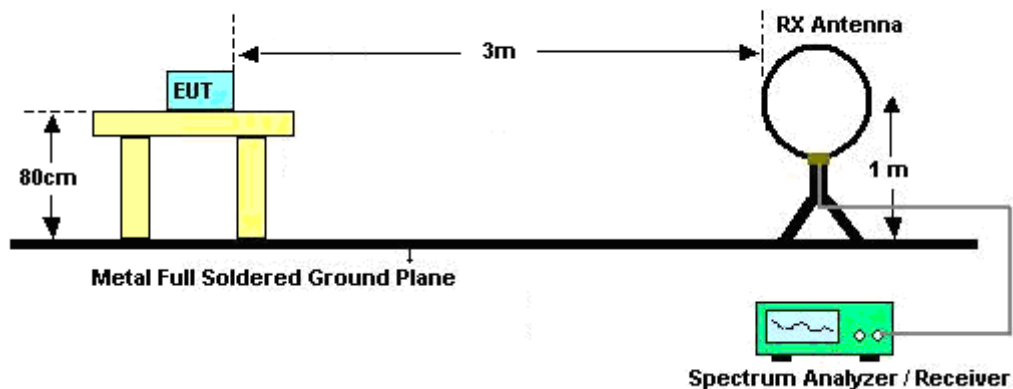
For average measurement:

 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, 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.

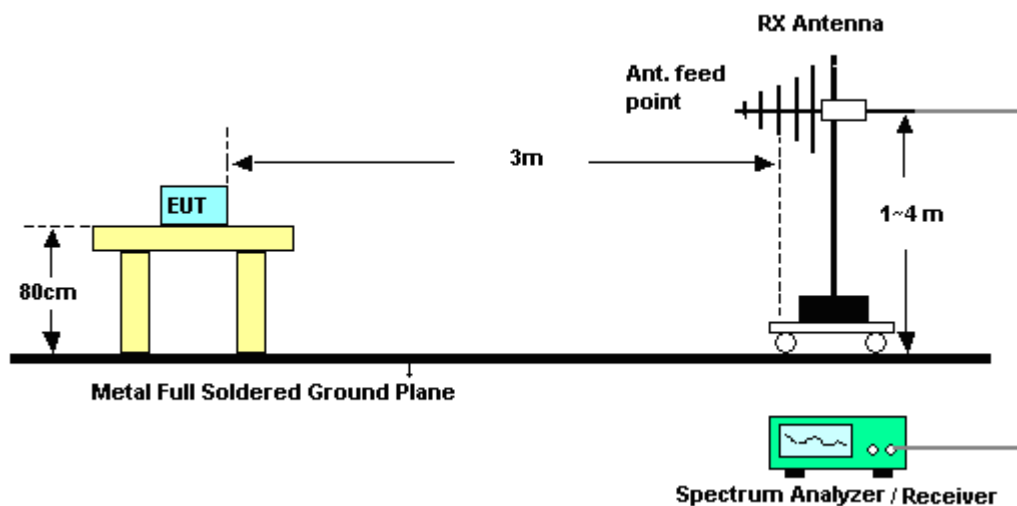
Band	Duty Cycle(%)	T(μ s)	1/T(kHz)	VBW Setting
802.11b	99.32	-	-	10Hz
802.11g	95.72	1399.00	0.715	1kHz
2.4GHz 802.11n HT20	95.25	1292.00	0.774	1kHz
2.4GHz 802.11n HT40	91.33	641.00	1.560	3kHz

3.5.4 Test Setup

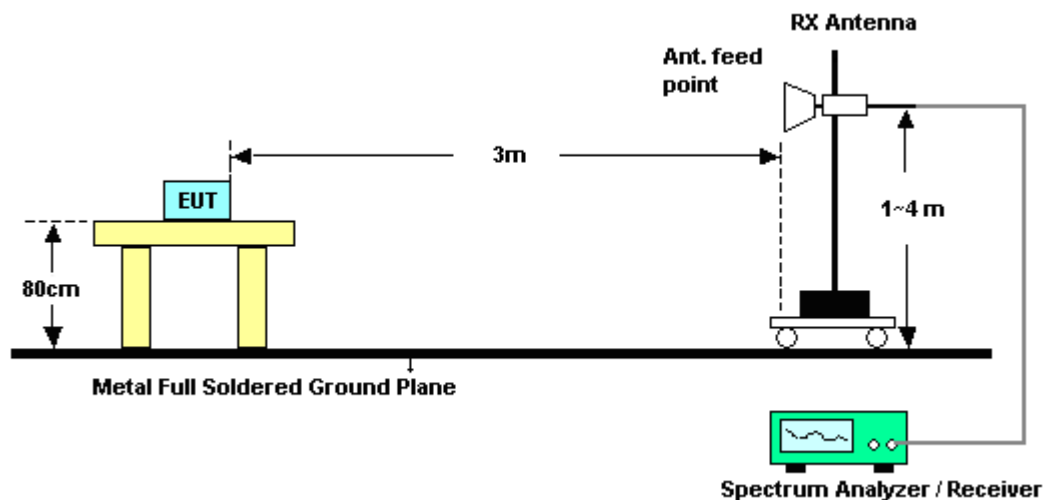
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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 Spurious at Band Edges

Test Mode :	802.11b	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

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
2389.29	54.33	-19.67	74	50.29	31.92	6.45	34.33	120	344	Peak
2390	41.14	-12.86	54	37.1	31.92	6.45	34.33	120	344	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
2389.29	49.54	-24.46	74	45.5	31.92	6.45	34.33	100	8	Peak
2390	35.44	-18.56	54	31.4	31.92	6.45	34.33	100	8	Average

Test Mode :	802.11b	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

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
2486.5	56.58	-17.42	74	52.3	31.99	6.59	34.3	108	306	Peak
2483.53	44.68	-9.32	54	40.4	31.99	6.59	34.3	108	306	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
2483.77	48.84	-25.16	74	44.56	31.99	6.59	34.3	100	9	Peak
2483.5	35.99	-18.01	54	31.71	31.99	6.59	34.3	100	9	Average



Test Mode :	802.11g	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

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
2388.75	67.69	-6.31	74	63.65	31.92	6.45	34.33	120	314	Peak
2390	45.97	-8.03	54	41.93	31.92	6.45	34.33	120	314	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
2382.9	63.22	-10.78	74	59.2	31.9	6.45	34.33	100	50	Peak
2389.83	39.93	-14.07	54	35.89	31.92	6.45	34.33	100	50	Average

Test Mode :	802.11g	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

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
2483.83	66.24	-7.76	74	61.96	31.99	6.59	34.3	109	305	Peak
2483.5	47.85	-6.15	54	43.57	31.99	6.59	34.3	109	305	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
2485.51	52.54	-21.46	74	48.26	31.99	6.59	34.3	100	44	Peak
2483.53	37.31	-16.69	54	33.03	31.99	6.59	34.3	100	44	Average



Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

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	65.7	-8.3	74	61.66	31.92	6.45	34.33	110	304	Peak
2390	47.42	-6.58	54	43.38	31.92	6.45	34.33	110	304	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
2388.66	51.5	-22.5	74	47.46	31.92	6.45	34.33	108	331	Peak
2389.83	36.99	-17.01	54	32.95	31.92	6.45	34.33	108	331	Average

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

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
2483.53	66.84	-7.16	74	62.56	31.99	6.59	34.3	118	313	Peak
2483.74	47.22	-6.78	54	42.94	31.99	6.59	34.3	118	313	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
2485.99	58.34	-15.66	74	54.06	31.99	6.59	34.3	105	331	Peak
2483.71	40.38	-13.62	54	36.1	31.99	6.59	34.3	105	331	Average



Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	03	Test Engineer :	Marlboro Hsu

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
2389.92	70.88	-3.12	74	66.84	31.92	6.45	34.33	120	341	Peak
2388.75	48.98	-5.02	54	44.94	31.92	6.45	34.33	120	341	Average
2484.34	54.61	-19.39	74	50.33	31.99	6.59	34.3	120	341	Peak
2483.77	38.04	-15.96	54	33.76	31.99	6.59	34.3	120	341	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	59.01	-14.99	74	54.97	31.92	6.45	34.33	107	8	Peak
2389.38	39.27	-14.73	54	35.23	31.92	6.45	34.33	107	8	Average
2485.54	48.68	-25.32	74	44.4	31.99	6.59	34.3	107	8	Peak
2483.59	35.47	-18.53	54	31.19	31.99	6.59	34.3	107	8	Average



Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	09	Test Engineer :	Marlboro Hsu

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
2389.92	59.27	-14.73	74	55.23	31.92	6.45	34.33	111	303	Peak
2389.11	41.7	-12.3	54	37.66	31.92	6.45	34.33	111	303	Average
2483.56	65.05	-8.95	74	60.77	31.99	6.59	34.3	111	303	Peak
2483.5	50.64	-3.36	54	46.36	31.99	6.59	34.3	111	303	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
2389.47	49.22	-24.78	74	45.18	31.92	6.45	34.33	108	10	Peak
2389.92	35.65	-18.35	54	31.61	31.92	6.45	34.33	108	10	Average
2488.57	53.1	-20.9	74	48.81	32	6.59	34.3	108	10	Peak
2483.56	38.76	-15.24	54	34.48	31.99	6.59	34.3	108	10	Average

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

Note: Pre-scanned all test modes and only choose the worst case mode recorded in the test report for radiated spurious emission below 1GHz.

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2411 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
2411	104.79	-	-	100.7	31.93	6.49	34.33	120	344	Average
2411	110.22	-	-	106.13	31.93	6.49	34.33	120	344	Peak
4824	47.58	-26.42	74	58.6	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2413 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
2413	95.38	-	-	91.29	31.93	6.49	34.33	100	8	Average
2413	100.54	-	-	96.45	31.93	6.49	34.33	100	8	Peak
4824	46.92	-27.08	74	57.94	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2436 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
2436	106.12	-	-	101.98	31.94	6.52	34.32	109	305	Average
2436	111.23	-	-	107.09	31.94	6.52	34.32	109	305	Peak
4875	46.48	-27.52	74	57.61	34.37	10.18	55.68	100	0	Peak
7311	48.59	-25.41	74	58.32	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2436 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
2436	96.14	-	-	92	31.94	6.52	34.32	100	6	Average
2436	101.27	-	-	97.13	31.94	6.52	34.32	100	6	Peak
4875	47.77	-26.23	74	58.9	34.37	10.18	55.68	100	0	Peak
7311	48.04	-25.96	74	57.77	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2463 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
175.26	31.61	-11.89	43.5	52.28	9.55	1.53	31.75	-	-	Peak
215.76	31.74	-11.76	43.5	52.72	9.16	1.61	31.75	-	-	Peak
287.85	32.01	-13.99	46	48.91	12.96	1.86	31.72	-	-	Peak
398	30.11	-15.89	46	44.01	15.74	2.18	31.82	-	-	Peak
720	37.73	-8.27	46	46.99	19.8	2.95	32.01	100	81	Peak
898.5	33.32	-12.68	46	40.44	21.06	3.36	31.54	-	-	Peak
2463	106.62	-	-	102.4	31.97	6.56	34.31	108	306	Average
2463	111.84	-	-	107.62	31.97	6.56	34.31	108	306	Peak
4923	47.63	-26.37	74	58.87	34.34	10.2	55.78	100	0	Peak
7386	48	-26	74	57.63	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2463 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
33.24	28.04	-11.96	40	42.46	16.7	0.67	31.79	-	-	Peak
160.14	28.57	-14.93	43.5	48.75	10.1	1.47	31.75	-	-	Peak
214.95	33.1	-10.4	43.5	54.1	9.15	1.6	31.75	-	-	Peak
716.5	30.12	-15.88	46	39.48	19.71	2.94	32.01	-	-	Peak
748	33.41	-12.59	46	42.18	20.18	3.04	31.99	-	-	Peak
797	35.76	-10.24	46	44.62	20.03	3.06	31.95	100	102	Peak
2463	96.05	-	-	91.83	31.97	6.56	34.31	100	9	Average
2463	101.1	-	-	96.88	31.97	6.56	34.31	100	9	Peak
4923	46.06	-27.94	74	57.3	34.34	10.2	55.78	100	0	Peak
7386	48.06	-25.94	74	57.69	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2412 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
2412	98.07	-	-	93.97	31.93	6.49	34.32	120	314	Average
2412	108.27	-	-	104.17	31.93	6.49	34.32	120	314	Peak
4824	46.19	-27.81	74	57.21	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2410 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
2410	88.75	-	-	84.66	31.93	6.49	34.33	100	50	Average
2410	98.8	-	-	94.71	31.93	6.49	34.33	100	50	Peak
4824	47.35	-26.65	74	58.37	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2438 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
2438	100.85	-	-	96.69	31.96	6.52	34.32	110	305	Average
2438	110.84	-	-	106.68	31.96	6.52	34.32	110	305	Peak
4874	47.94	-26.06	74	59.07	34.37	10.18	55.68	100	0	Peak
7311	49.61	-24.39	74	59.34	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2436 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
2436	87.77	-	-	83.63	31.94	6.52	34.32	102	4	Average
2436	97.55	-	-	93.41	31.94	6.52	34.32	102	4	Peak
4874	47.04	-26.96	74	58.17	34.37	10.18	55.68	100	0	Peak
7311	47.51	-26.49	74	57.24	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2460 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
175.8	31.43	-12.07	43.5	52.1	9.55	1.53	31.75	-	-	Peak
215.76	31.11	-12.39	43.5	52.09	9.16	1.61	31.75	-	-	Peak
287.85	33.56	-12.44	46	50.46	12.96	1.86	31.72	-	-	Peak
748	34.87	-11.13	46	43.64	20.18	3.04	31.99	-	-	Peak
797	33.98	-12.02	46	42.84	20.03	3.06	31.95	-	-	Peak
898.5	35.93	-10.07	46	43.05	21.06	3.36	31.54	100	36	Peak
2460	99.1	-	-	94.88	31.97	6.56	34.31	109	305	Average
2460	109.65	-	-	105.43	31.97	6.56	34.31	109	305	Peak
4924	47.02	-26.98	74	58.26	34.34	10.2	55.78	100	0	Peak
7836	48	-26	74	57.25	35.57	10.95	55.77	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2464 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
33.24	27.83	-12.17	40	42.25	16.7	0.67	31.79	-	-	Peak
160.14	28.54	-14.96	43.5	48.72	10.1	1.47	31.75	-	-	Peak
215.76	32.89	-10.61	43.5	53.87	9.16	1.61	31.75	-	-	Peak
716.5	31.52	-14.48	46	40.88	19.71	2.94	32.01	-	-	Peak
748	35.62	-10.38	46	44.39	20.18	3.04	31.99	100	109	Peak
800.5	34.76	-11.24	46	43.65	20	3.06	31.95	-	-	Peak
2464	88.76	-	-	84.54	31.97	6.56	34.31	100	44	Average
2464	99.19	-	-	94.97	31.97	6.56	34.31	100	44	Peak
4924	46.62	-27.38	74	57.86	34.34	10.2	55.78	100	0	Peak
7386	48.48	-25.52	74	58.11	35.56	10.92	56.11	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2410 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
170.4	31.27	-12.23	43.5	51.65	9.76	1.61	31.75	-	-	Peak
215.76	30.11	-13.39	43.5	51.09	9.16	1.61	31.75	-	-	Peak
287.85	33.28	-12.72	46	50.18	12.96	1.86	31.72	-	-	Peak
748	35.25	-10.75	46	44.02	20.18	3.04	31.99	-	-	Peak
797	33.29	-12.71	46	42.15	20.03	3.06	31.95	-	-	Peak
898.5	36.61	-9.39	46	43.73	21.06	3.36	31.54	100	206	Peak
2410	99.89	-	-	95.8	31.93	6.49	34.33	110	304	Average
2410	109.75	-	-	105.66	31.93	6.49	34.33	110	304	Peak
4824	48.53	-25.47	74	59.55	34.4	10.17	55.59	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2414 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
33.24	27.66	-12.34	40	42.08	16.7	0.67	31.79	-	-	Peak
158.25	29.45	-14.05	43.5	49.62	10.14	1.44	31.75	-	-	Peak
215.76	32.52	-10.98	43.5	53.5	9.16	1.61	31.75	100	49	Peak
718.6	33.38	-12.62	46	42.67	19.77	2.95	32.01	-	-	Peak
748	34.97	-11.03	46	43.74	20.18	3.04	31.99	-	-	Peak
798.4	34.43	-11.57	46	43.3	20.02	3.06	31.95	-	-	Peak
2414	86.98	-	-	82.88	31.93	6.49	34.32	108	331	Average
2414	96.78	-	-	92.68	31.93	6.49	34.32	108	331	Peak
4824	48.03	-25.97	74	59.05	34.4	10.17	55.59	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2436 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
2436	99.33	-	-	95.19	31.94	6.52	34.32	110	304	Average
2436	109.49	-	-	105.35	31.94	6.52	34.32	110	304	Peak
4874	47.88	-26.12	74	59.01	34.37	10.18	55.68	100	0	Peak
7311	48.6	-25.4	74	58.33	35.61	10.94	56.28	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2438 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
2438	91.4	-	-	87.23	31.96	6.52	34.31	107	330	Average
2438	101.71	-	-	97.54	31.96	6.52	34.31	107	330	Peak
4874	47.28	-26.72	74	58.41	34.37	10.18	55.68	100	0	Peak
7311	48.23	-25.77	74	57.96	35.61	10.94	56.28	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	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	97.55	-	-	93.33	31.97	6.56	34.31	118	313	Average
2462	106.97	-	-	102.75	31.97	6.56	34.31	118	313	Peak
4924	46.48	-27.52	74	57.72	34.34	10.2	55.78	100	0	Peak
7386	48.48	-25.52	74	58.11	35.56	10.92	56.11	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2464 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
2464	89.84	-	-	85.61	31.97	6.56	34.3	105	331	Average
2464	99.65	-	-	95.42	31.97	6.56	34.3	105	331	Peak
4924	47.07	-26.93	74	58.31	34.34	10.2	55.78	100	0	Peak
7386	49.02	-24.98	74	58.65	35.56	10.92	56.11	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~24°C
Test Channel :	03	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2424 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
169.05	30.63	-12.87	43.5	50.95	9.82	1.61	31.75	-	-	Peak
216.3	30.97	-15.03	46	51.95	9.16	1.61	31.75	-	-	Peak
287.85	33.04	-12.96	46	49.94	12.96	1.86	31.72	-	-	Peak
748	36.19	-9.81	46	44.96	20.18	3.04	31.99	100	209	Peak
800.5	34.01	-11.99	46	42.9	20	3.06	31.95	-	-	Peak
898.5	34.32	-11.68	46	41.44	21.06	3.36	31.54	-	-	Peak
2424	93.52	-	-	89.41	31.94	6.49	34.32	120	341	Average
2424	102.59	-	-	98.48	31.94	6.49	34.32	120	341	Peak
4845	47.88	-26.12	74	58.94	34.39	10.17	55.62	100	0	Peak
7266	48.27	-25.73	74	58.04	35.63	10.95	56.35	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~24°C
Test Channel :	03	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2424 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
143.4	28.13	-15.37	43.5	47.79	10.77	1.32	31.75	-	-	Peak
159.06	28.36	-15.14	43.5	48.53	10.12	1.46	31.75	-	-	Peak
215.76	34.61	-8.89	43.5	55.59	9.16	1.61	31.75	100	125	Peak
720	31.45	-14.55	46	40.71	19.8	2.95	32.01	-	-	Peak
748	34.74	-11.26	46	43.51	20.18	3.04	31.99	-	-	Peak
797	32.61	-13.39	46	41.47	20.03	3.06	31.95	-	-	Peak
2424	85.26	-	-	81.15	31.94	6.49	34.32	107	8	Average
2424	94.34	-	-	90.23	31.94	6.49	34.32	107	8	Peak
4845	47.14	-26.86	74	58.2	34.39	10.17	55.62	100	0	Peak
7266	48.08	-25.92	74	57.85	35.63	10.95	56.35	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2435 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
2435	94.49	-	-	90.35	31.94	6.52	34.32	108	324	Average
2435	103.24	-	-	99.1	31.94	6.52	34.32	108	324	Peak
4875	48.84	-25.16	74	59.97	34.37	10.18	55.68	100	0	Peak
7311	47.78	-26.22	74	57.51	35.61	10.94	56.28	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2436 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
2436	86.55	-	-	82.41	31.94	6.52	34.32	100	7	Average
2436	95.9	-	-	91.76	31.94	6.52	34.32	100	7	Peak
4874	47.34	-26.66	74	58.47	34.37	10.18	55.68	100	0	Peak
7311	48.67	-25.33	74	58.4	35.61	10.94	56.28	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~24°C
Test Channel :	09	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2454 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
2454	94.66	-	-	90.44	31.97	6.56	34.31	111	303	Average
2454	104.07	-	-	99.85	31.97	6.56	34.31	111	303	Peak
4905	48.21	-25.79	74	59.4	34.35	10.2	55.74	100	0	Peak
7356	48.12	-25.88	74	57.8	35.58	10.92	56.18	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~24°C
Test Channel :	09	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2454 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
2454	85.95	-	-	81.73	31.97	6.56	34.31	108	10	Average
2454	94.88	-	-	90.66	31.97	6.56	34.31	108	10	Peak
4905	46.82	-27.18	74	58.01	34.35	10.2	55.74	100	0	Peak
7356	48.58	-25.42	74	58.26	35.58	10.92	56.18	100	0	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 (dB μ V)	
	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.

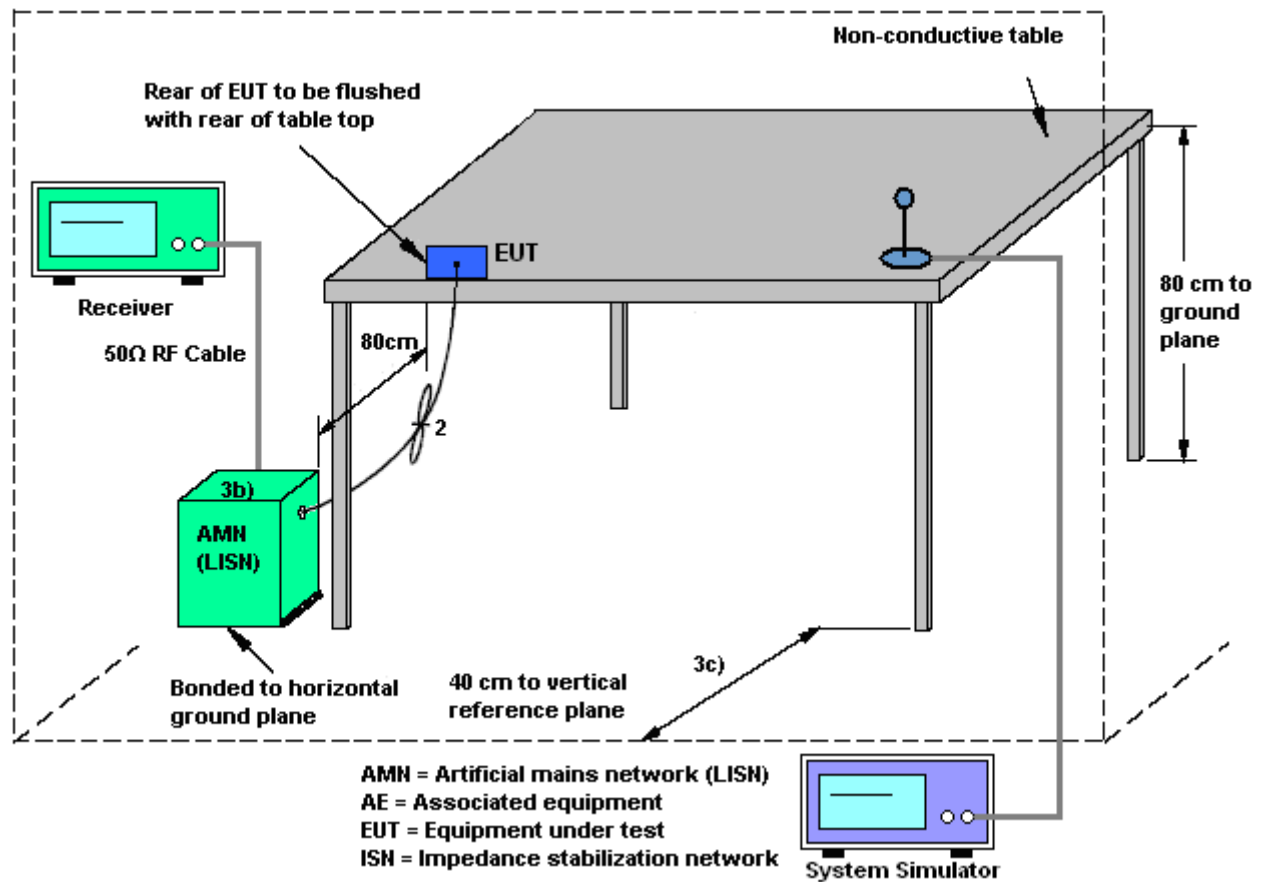
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

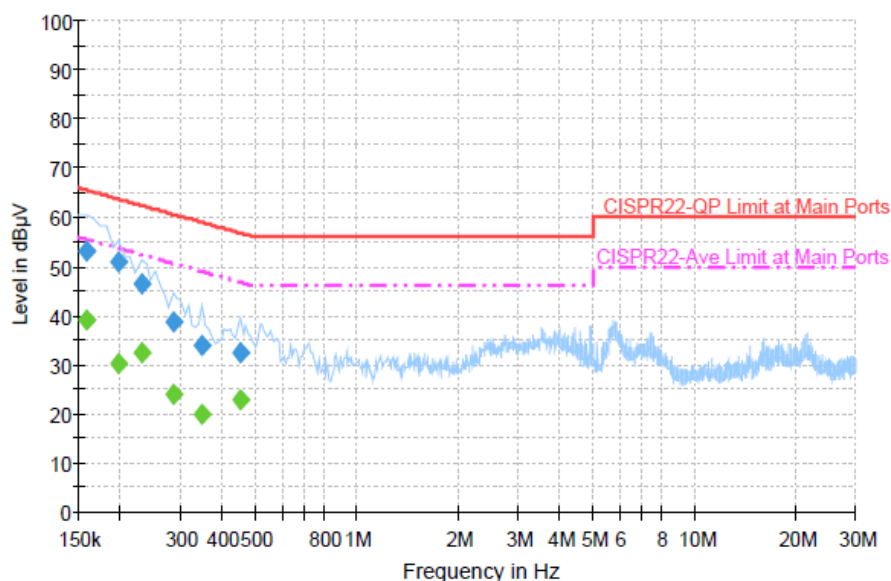
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. 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℃
Test Engineer :	Cosmo Xu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band II Idle + WLAN Link + USB Cable (Data Link with Notebook)		



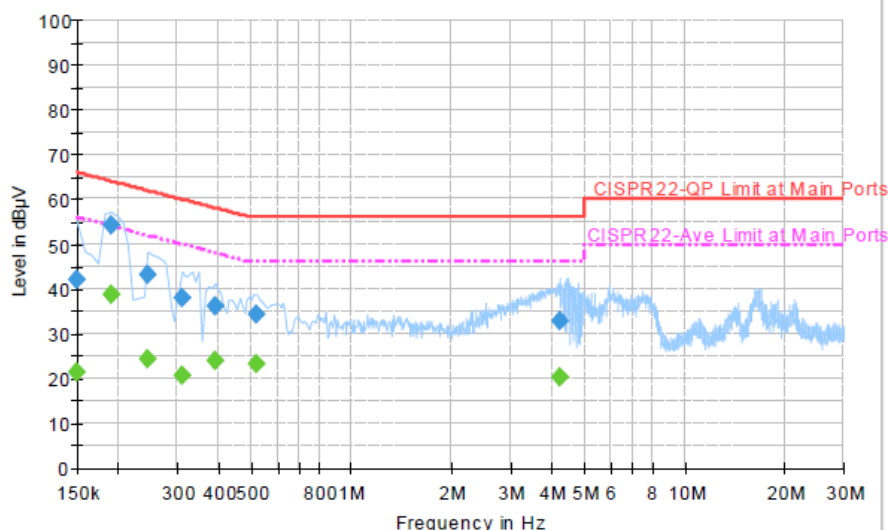
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	53.0	Off	L1	19.3	12.6	65.6
0.198000	51.0	Off	L1	19.3	12.7	63.7
0.230000	46.6	Off	L1	19.4	15.8	62.4
0.286000	38.8	Off	L1	19.4	21.8	60.6
0.350000	34.1	Off	L1	19.4	24.9	59.0
0.454000	32.5	Off	L1	19.3	24.3	56.8

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	39.0	Off	L1	19.3	16.6	55.6
0.198000	30.4	Off	L1	19.3	23.3	53.7
0.230000	32.5	Off	L1	19.4	19.9	52.4
0.286000	23.9	Off	L1	19.4	26.7	50.6
0.350000	20.0	Off	L1	19.4	29.0	49.0
0.454000	22.8	Off	L1	19.3	24.0	46.8

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Cosmo Xu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band II Idle + WLAN Link + USB Cable (Data Link with Notebook)		


Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	42.2	Off	N	19.4	23.8	66.0
0.190000	54.1	Off	N	19.4	9.9	64.0
0.246000	43.3	Off	N	19.4	18.6	61.9
0.310000	38.2	Off	N	19.4	21.8	60.0
0.390000	36.0	Off	N	19.4	22.1	58.1
0.518000	34.4	Off	N	19.4	21.6	56.0
4.214000	32.7	Off	N	19.6	23.3	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	21.5	Off	N	19.4	34.5	56.0
0.190000	38.8	Off	N	19.4	15.2	54.0
0.246000	24.4	Off	N	19.4	27.5	51.9
0.310000	20.7	Off	N	19.4	29.3	50.0
0.390000	24.0	Off	N	19.4	24.1	48.1
0.518000	23.2	Off	N	19.4	22.8	46.0
4.214000	20.4	Off	N	19.6	25.6	46.0



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 Anti-Replacement Construction

Non-standard antenna connector is 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	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 07, 2013	Dec. 24, 2013~ Jan. 13, 2014	Jun. 06, 2014	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Aug. 17, 2013	Dec. 24, 2013~ Jan. 13, 2014	Aug. 16, 2014	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 17, 2013	Dec. 24, 2013~ Jan. 13, 2014	Aug. 16, 2014	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP30	101067	9kHz ~ 30GHz	Nov. 20, 2013	Jan. 11, 2014	Nov. 19, 2014	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9kHz ~ 26.5GHz	Dec. 02, 2013	Jan. 11, 2014	Dec. 01, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2013	Jan. 11, 2014	May 05, 2014	Radiation (03CH06-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	860004/0001	9 kHz~30 MHz	Jul. 03, 2012	Jan. 11, 2014	Jul. 02, 2014	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL6112B	2885	30MHz ~2GHz	Oct. 10, 2013	Jan. 11, 2014	Oct. 09, 2014	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 02, 2013	Jan. 11, 2014	Aug. 01, 2014	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz ~ 1GHz	Apr. 12, 2013	Jan. 11, 2014	Apr. 11, 2014	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2013	Jan. 11, 2014	Jul. 17, 2014	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Oct. 03, 2013	Jan. 11, 2014	Oct. 02, 2014	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 12, 2013	Jan. 11, 2014	Apr. 11, 2014	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 - 360 degree	N/A	Jan. 11, 2014	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Jan. 11, 2014	N/A	Radiation (03CH06-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 15, 2013	Dec. 20, 2013	Nov. 14, 2014	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2013	Dec. 20, 2013	Dec. 11, 2014	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 04, 2013	Dec. 20, 2013	Dec. 03, 2014	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Dec. 20, 2013	N/A	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.50
--	------