FCC RF Test Report

APPLICANT	:	Acer Incorporated
EQUIPMENT	:	Smart HandHeld
BRAND NAME	:	Acer
MODEL NAME	:	S510
MARKETING NAME	:	Liquid S1
FCC ID	:	HLZEMS510
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Oct. 28, 2013 and testing was completed on Nov. 07, 2013. 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

Testing Laboratory
1190

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

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APPENDIX A. SETUP PHOTOGRAPHS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3O2801C	Rev. 01	Initial issue of report	Nov. 15, 2013

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	≥ 0.5MHz	Pass	-
3.2	15.247(b)	RSS-210 A8.4	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	RSS-210 A8.2(b)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	RSS-210 A8.5	Conducted Band Edges	≤ 20dBc	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 3.01 dB at 2390.000 MHz
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 9.10 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

Acer Incorporated
8F., No. 88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22181, Taiwan (R.O.C.)

1.2 Manufacturer

Shanghai Sunrise Simcom Limited
No. 888, Shengli Rd., Qingpu, Shanghai, P.R.China 201700

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Smart HandHeld
Brand Name	Acer
Model Name	S510
Marketing Name	Liquid S1
FCC ID	HLZEMS510
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA WLAN 11b/g/n (HT20/HT40) Bluetooth 3.0 + EDR Bluetooth 4.0 + LE
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	802.11b/g/n : 2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to Antenna	802.11b : 17.92 dBm (0.0619 W) 802.11g : 21.94 dBm (0.1563 W) 802.11n HT20 : 15.84 dBm (0.0384 W) 802.11n HT40 : 16.70 dBm (0.0468 W)
Antenna Type	802.11b/g/n : IFA Antenna type with gain 0.03 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 1st 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). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X 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 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)	17.92	17.84	17.71	17.80

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)	21.94	21.92	21.85	21.82	21.81	21.78	21.75	21.91

2.4GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	15.84	15.69	15.80	15.83	15.78	15.81	15.80	15.75

2.4GHz 802.11n HT40 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	16.70	16.61	16.43	16.36	16.42	16.52	16.00	16.15

2.3 Test Mode

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

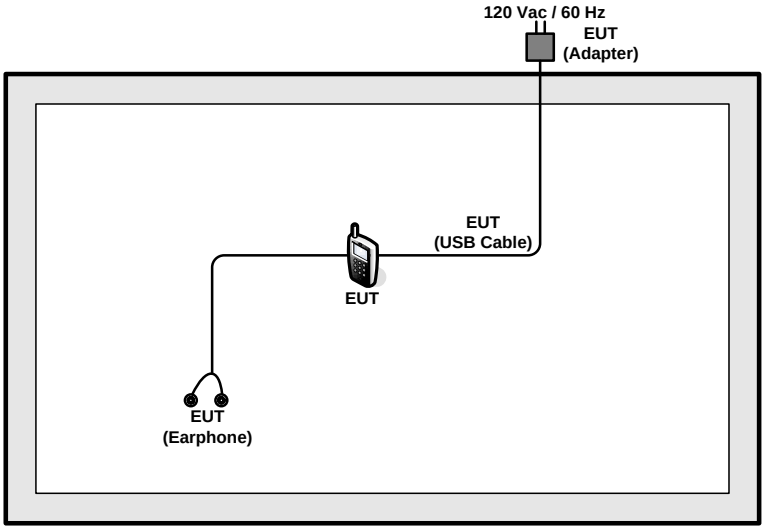
<2.4GHz>

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	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

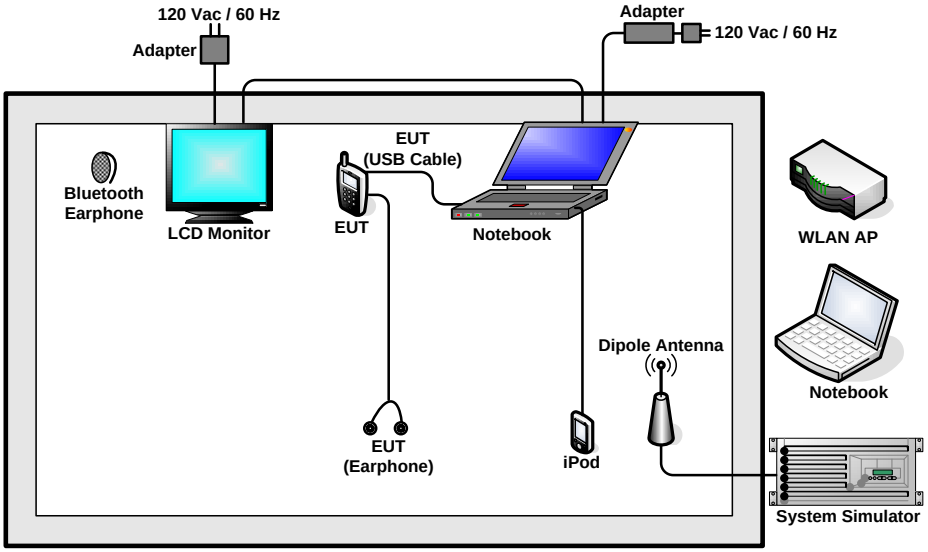
Test Cases	
AC Conducted Emission	Mode 1 : WCDMA Band II Idle + Bluetooth Link + WLAN Link + Camera + Earphone + Battery + USB Cable (Data Link with Notebook) + SIM 2

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.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Latitude E6320	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
5.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
6.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
7.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit/receive.

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.

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

= 4.2 + 10 = 14.2 (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.

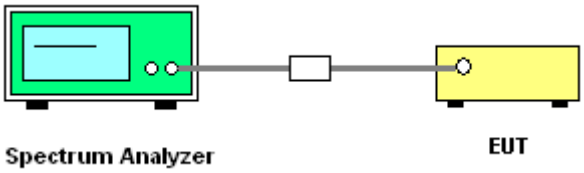
3.1.2 Measuring Instruments

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

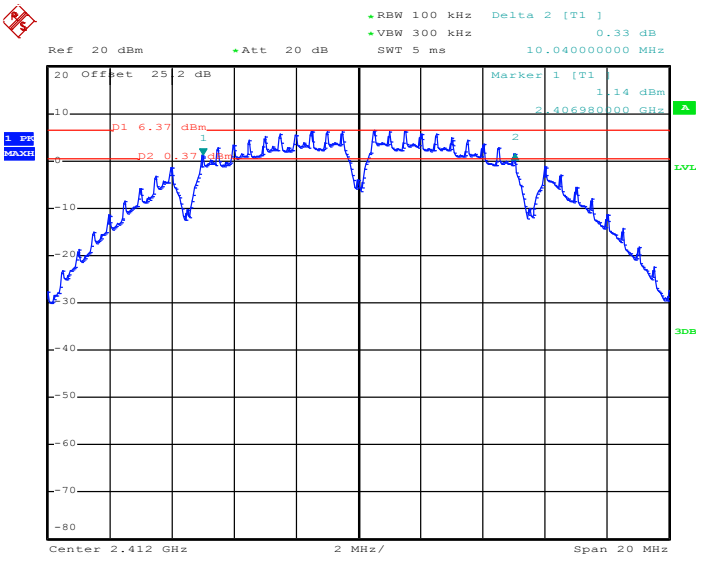


3.1.5 Test Result of 6dB Occupied Bandwidth

Test Band :	2.4GHz	Temperature :	21~25℃
Test Engineer :	Reece Li	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	-	10.04	0.5	Pass
11b	1Mbps	1	6	2437		10.04	0.5	Pass
11b	1Mbps	1	11	2462		10.04	0.5	Pass
11g	6Mbps	1	1	2412		16.32	0.5	Pass
11g	6Mbps	1	6	2437		16.32	0.5	Pass
11g	6Mbps	1	11	2462		16.32	0.5	Pass
HT20	MCS0	1	1	2412		17.60	0.5	Pass
HT20	MCS0	1	6	2437		17.54	0.5	Pass
HT20	MCS0	1	11	2462		17.60	0.5	Pass
HT40	MCS0	1	3	2422		35.92	0.5	Pass
HT40	MCS0	1	6	2437		35.68	0.5	Pass
HT40	MCS0	1	9	2452		36.08	0.5	Pass

Minimum 6dB Bandwidth



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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.

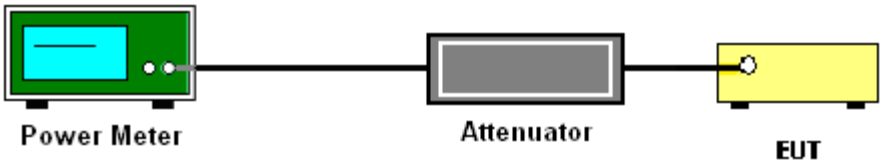
3.2.2 Measuring Instruments

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 :	Reece Li	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	17.61	30	0.03	Pass
11b	1Mbps	1	6	2437	17.92	30	0.03	Pass
11b	1Mbps	1	11	2462	15.08	30	0.03	Pass
11g	6Mbps	1	1	2412	21.24	30	0.03	Pass
11g	6Mbps	1	6	2437	21.94	30	0.03	Pass
11g	6Mbps	1	11	2462	16.05	30	0.03	Pass
HT20	MCS0	1	1	2412	15.64	30	0.03	Pass
HT20	MCS0	1	6	2437	15.84	30	0.03	Pass
HT20	MCS0	1	11	2462	15.71	30	0.03	Pass
HT40	MCS0	1	3	2422	14.74	30	0.03	Pass
HT40	MCS0	1	6	2437	16.70	30	0.03	Pass
HT40	MCS0	1	9	2452	15.18	30	0.03	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℃
Test Engineer :	Reece Li	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	0.05	15.87	30	0.03	Pass
11b	1Mbps	1	6	2437	0.05	15.98	30	0.03	Pass
11b	1Mbps	1	11	2462	0.05	12.91	30	0.03	Pass
11g	6Mbps	1	1	2412	0.34	12.95	30	0.03	Pass
11g	6Mbps	1	6	2437	0.34	13.58	30	0.03	Pass
11g	6Mbps	1	11	2462	0.34	6.27	30	0.03	Pass
HT20	MCS0	1	1	2412	0.33	8.73	30	0.03	Pass
HT20	MCS0	1	6	2437	0.33	10.33	30	0.03	Pass
HT20	MCS0	1	11	2462	0.33	5.25	30	0.03	Pass
HT40	MCS0	1	3	2422	0.69	3.95	30	0.03	Pass
HT40	MCS0	1	6	2437	0.69	10.16	30	0.03	Pass
HT40	MCS0	1	9	2452	0.69	3.84	30	0.03	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.

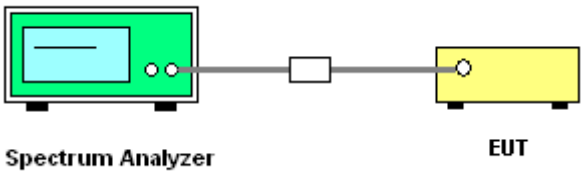
3.3.2 Measuring Instruments

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



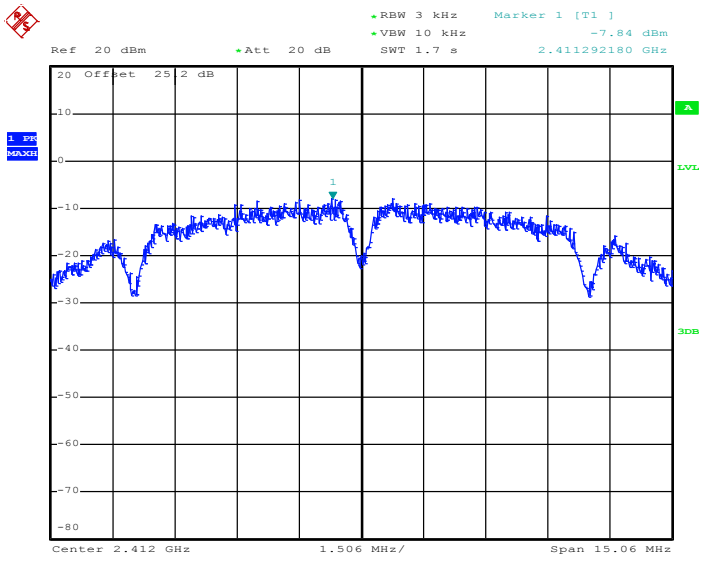
3.3.5 Test Result of Power Spectral Density

Test Mode :	2.4GHz	Temperature :	21~25℃
Test Engineer :	Reece Li	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	-7.84	8	0.03	Pass
11b	1Mbps	1	6	2437	-7.99	8	0.03	Pass
11b	1Mbps	1	11	2462	-9.89	8	0.03	Pass
11g	6Mbps	1	1	2412	-12.14	8	0.03	Pass
11g	6Mbps	1	6	2437	-11.92	8	0.03	Pass
11g	6Mbps	1	11	2462	-17.74	8	0.03	Pass
HT20	MCS0	1	1	2412	-15.63	8	0.03	Pass
HT20	MCS0	1	6	2437	-14.56	8	0.03	Pass
HT20	MCS0	1	11	2462	-20.05	8	0.03	Pass
HT40	MCS0	1	3	2422	-23.67	8	0.03	Pass
HT40	MCS0	1	6	2437	-18.15	8	0.03	Pass
HT40	MCS0	1	9	2452	-23.88	8	0.03	Pass

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

Worst Case Power Density (dBm/3kHz)



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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).

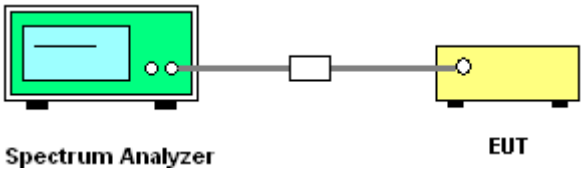
3.4.2 Measuring Instruments

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

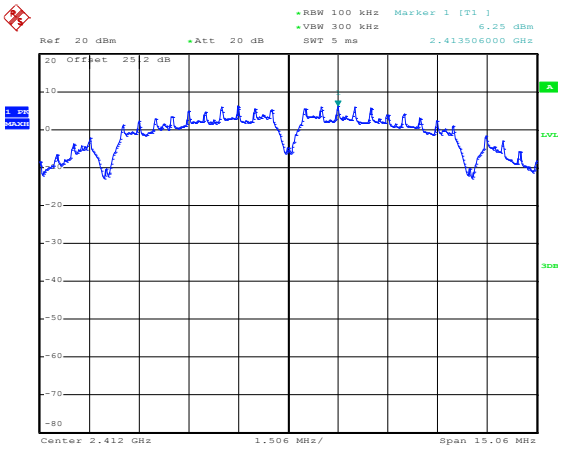


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Reece Li

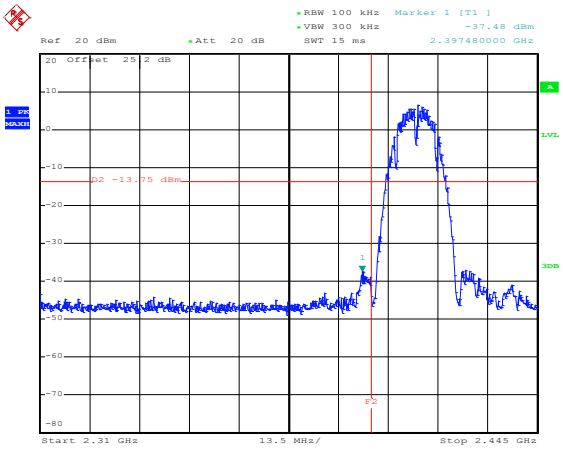
WLAN 802.11b Channel 01

100kHz PSD reference Level



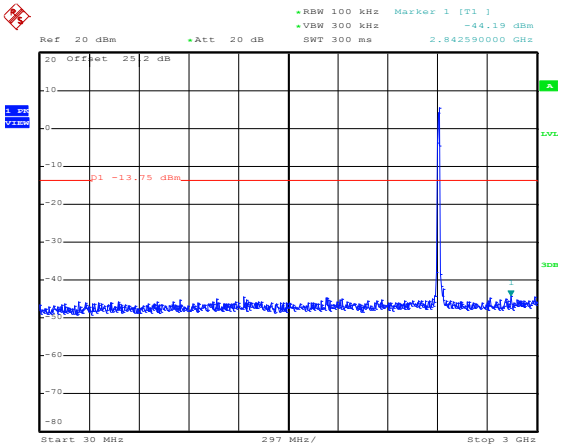
Date: 31.OCT.2013 18:57:16

Low Channel Plot



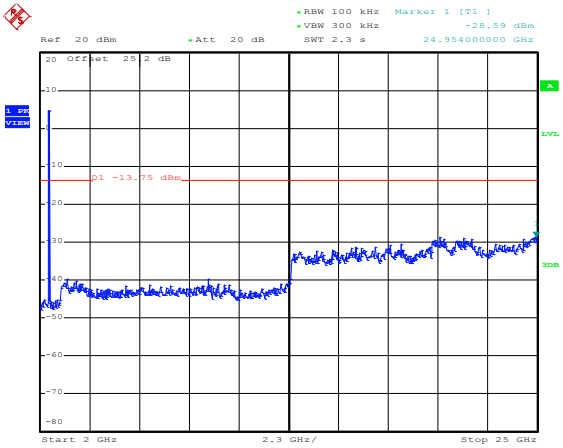
Date: 31.OCT.2013 18:57:31

Spurious Emission 30MHz~3GHz



Date: 31.OCT.2013 18:58:51

Spurious Emission 2GHz~25GHz

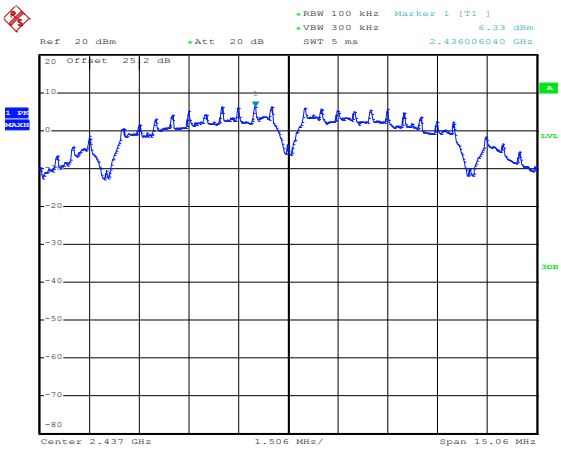


Date: 31.OCT.2013 18:59:10

Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Reece Li

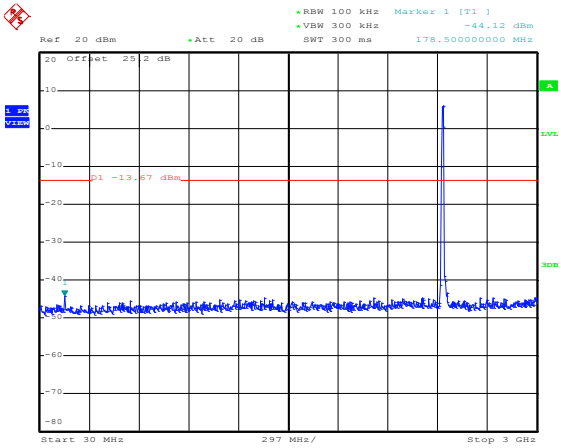
WLAN 802.11b Channel 06

100kHz PSD reference Level



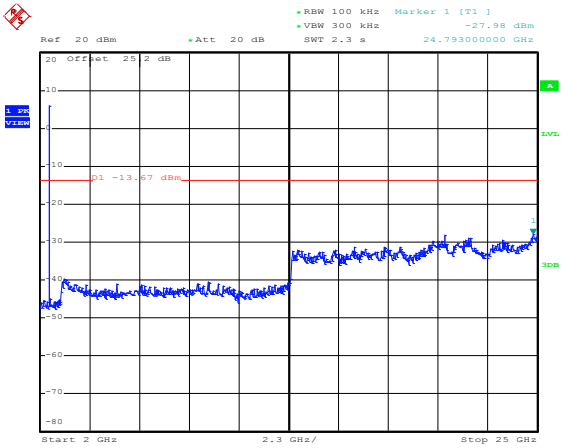
Date: 31.OCT.2013 19:00:54

Spurious Emission 30MHz~3GHz



Date: 31.OCT.2013 19:01:13

Spurious Emission 2GHz~25GHz

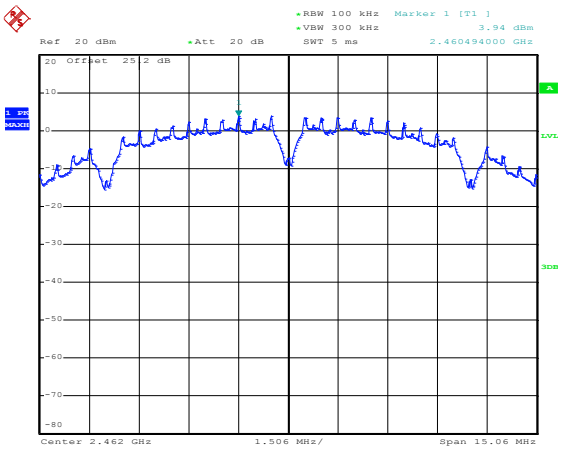


Date: 31.OCT.2013 19:01:32

Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	Reece Li

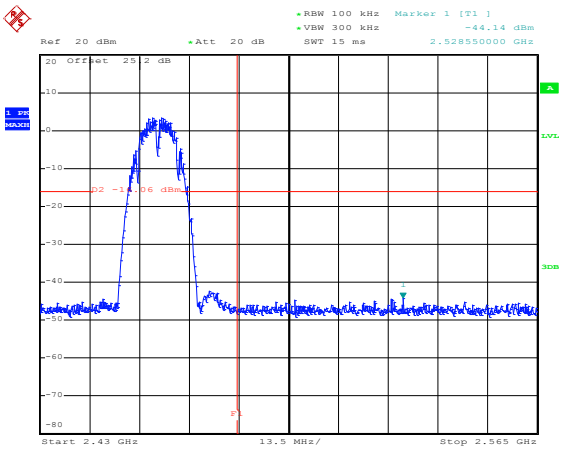
WLAN 802.11b Channel 11

100kHz PSD reference Level



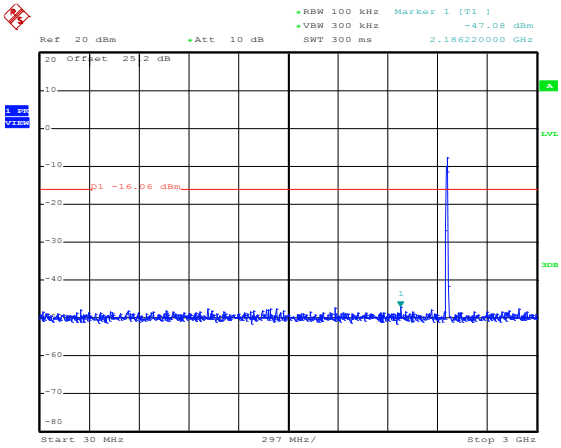
Date: 7.NOV.2013 16:03:38

High Channel Plot



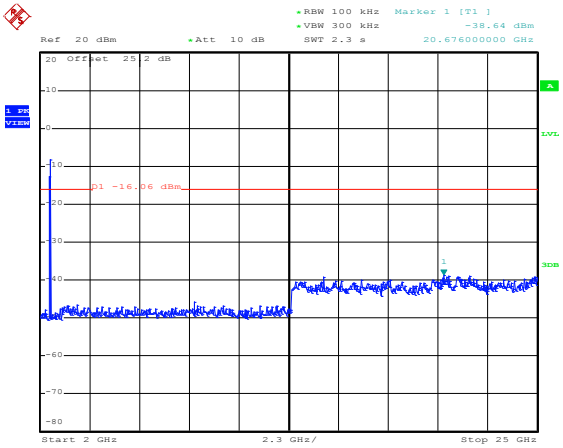
Date: 7.NOV.2013 16:04:17

Spurious Emission 30MHz~3GHz



Date: 7.NOV.2013 16:43:34

Spurious Emission 2GHz~25GHz

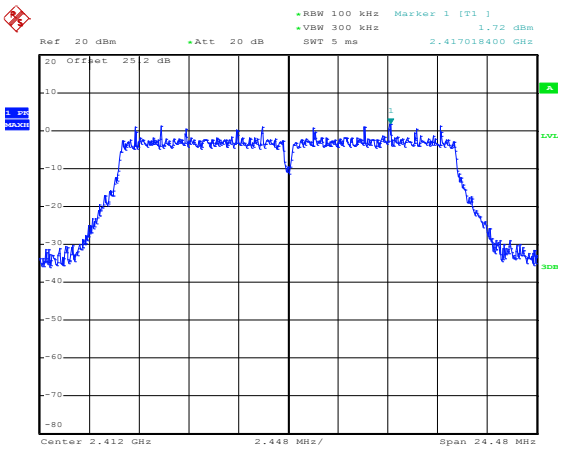


Date: 7.NOV.2013 16:43:52

Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Reece Li

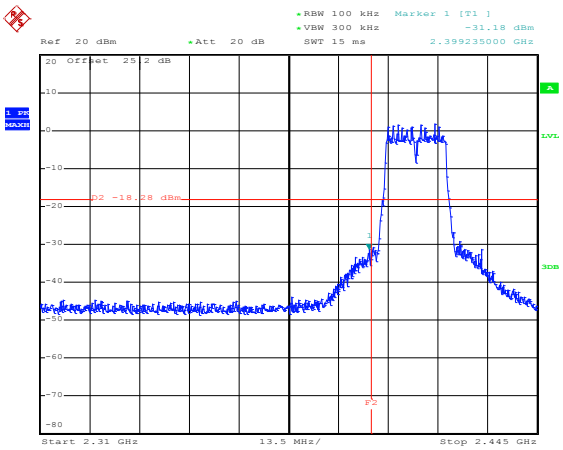
WLAN 802.11g Channel 01

100kHz PSD reference Level



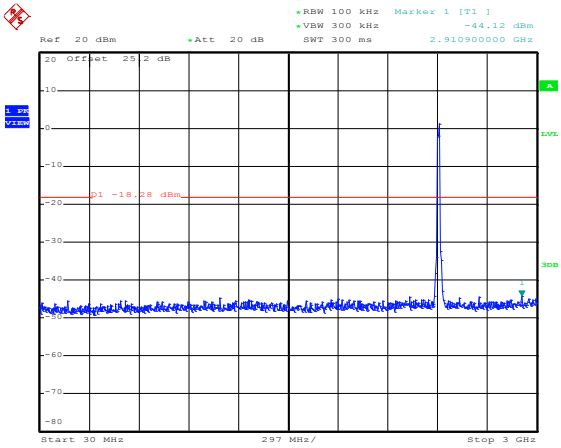
Date: 31.OCT.2013 19:12:30

Low Channel Plot



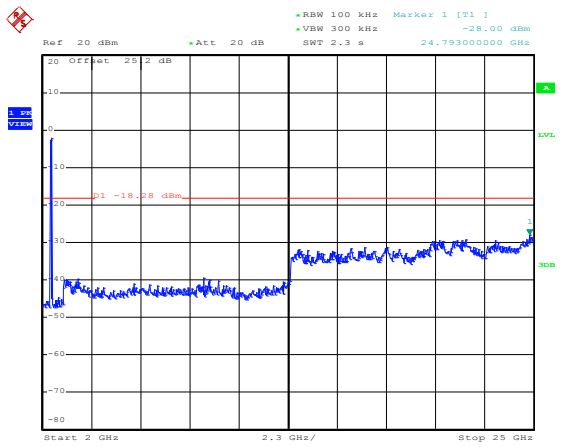
Date: 31.OCT.2013 19:12:46

Spurious Emission 30MHz~3GHz



Date: 31.OCT.2013 19:13:50

Spurious Emission 2GHz~25GHz

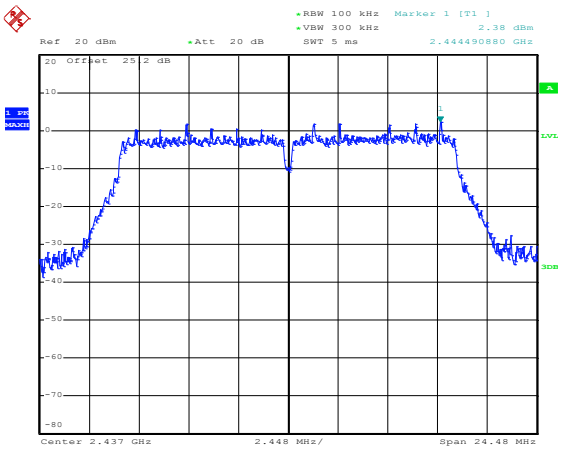


Date: 31.OCT.2013 19:14:08

Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Reece Li

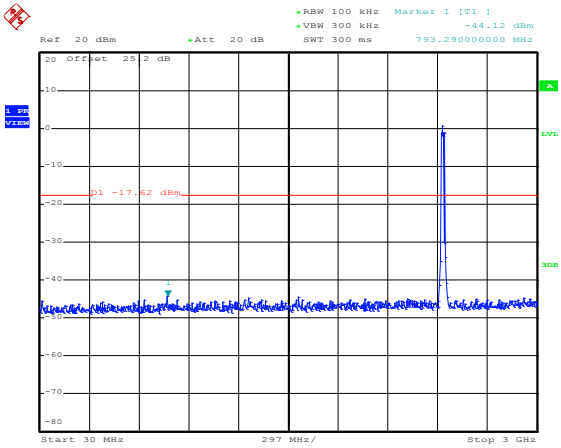
WLAN 802.11g Channel 06

100kHz PSD reference Level



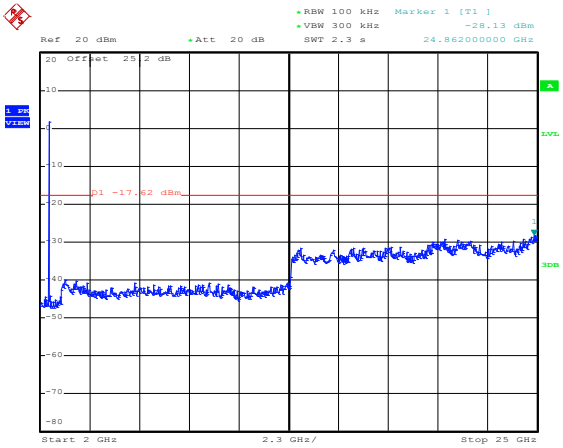
Date: 31.OCT.2013 19:09:34

Spurious Emission 30MHz~3GHz



Date: 31.OCT.2013 19:09:55

Spurious Emission 2GHz~25GHz

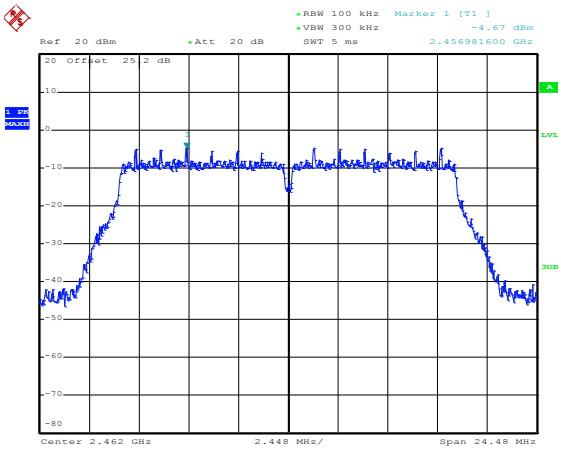


Date: 31.OCT.2013 19:10:14

Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	Reece Li

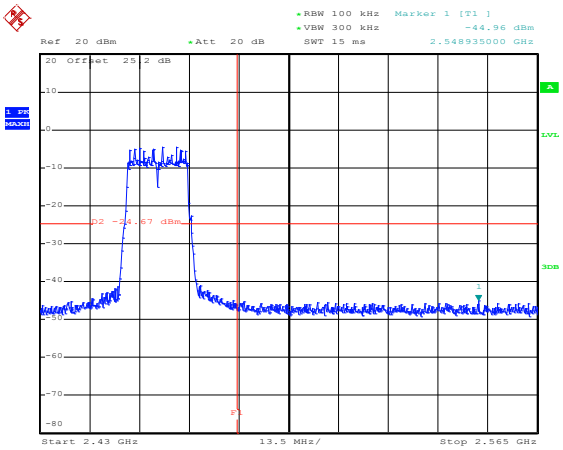
WLAN 802.11g Channel 11

100kHz PSD reference Level



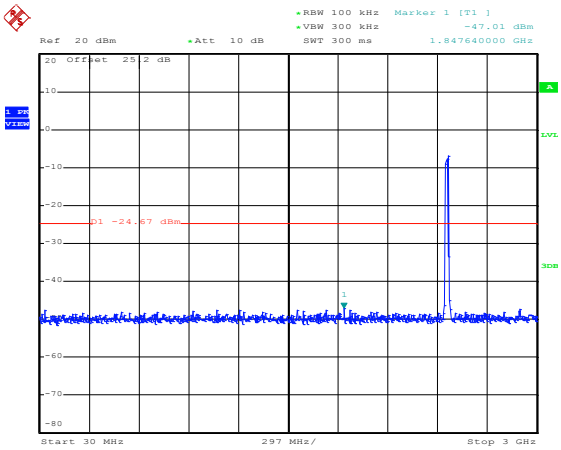
Date: 7.NOV.2013 16:08:28

High Channel Plot



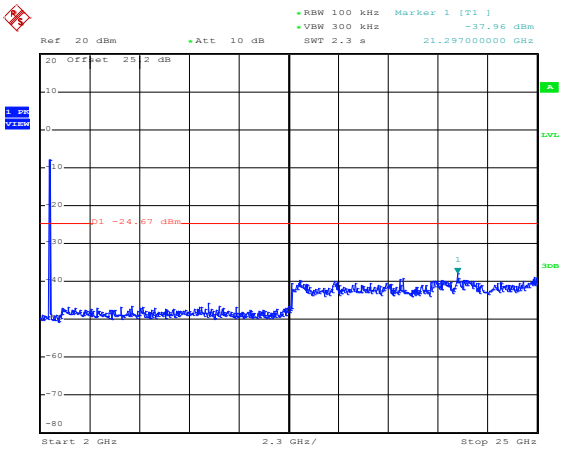
Date: 7.NOV.2013 16:08:53

Spurious Emission 30MHz~3GHz



Date: 7.NOV.2013 16:41:34

Spurious Emission 2GHz~25GHz

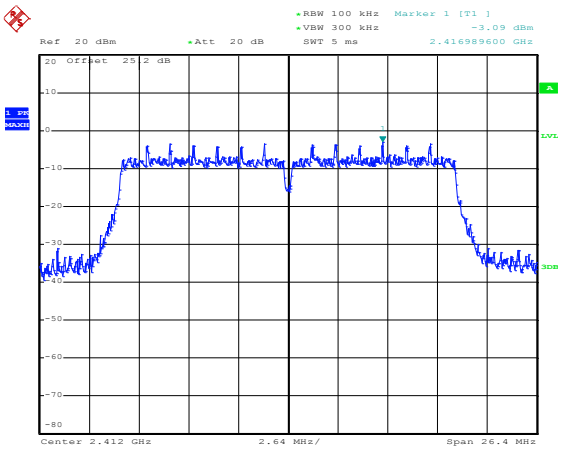


Date: 7.NOV.2013 16:41:53

Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Reece Li

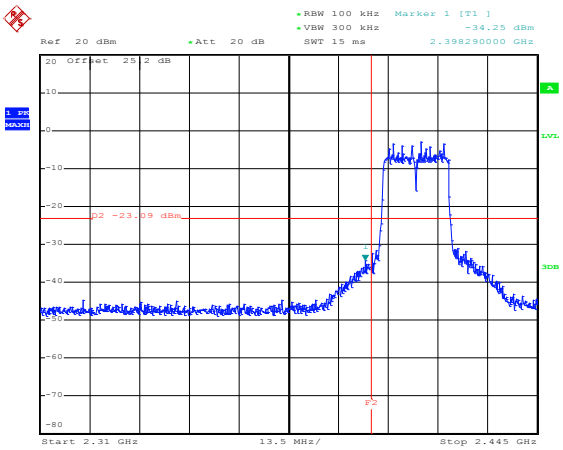
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



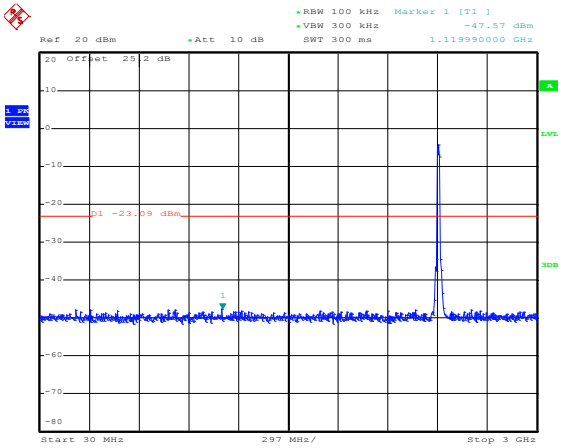
Date: 1.NOV.2013 20:18:39

Low Channel Plot



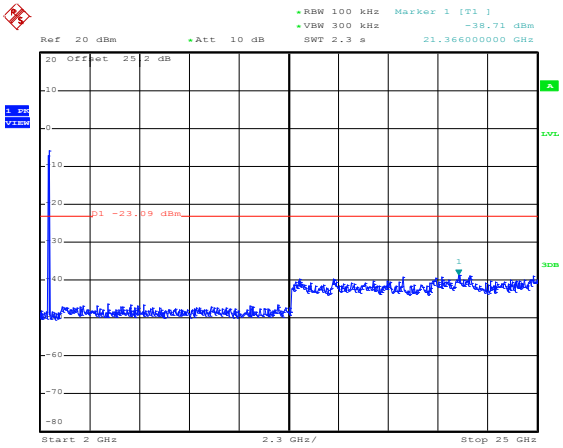
Date: 1.NOV.2013 20:19:17

Spurious Emission 30MHz~3GHz



Date: 1.NOV.2013 20:19:38

Spurious Emission 2GHz~25GHz

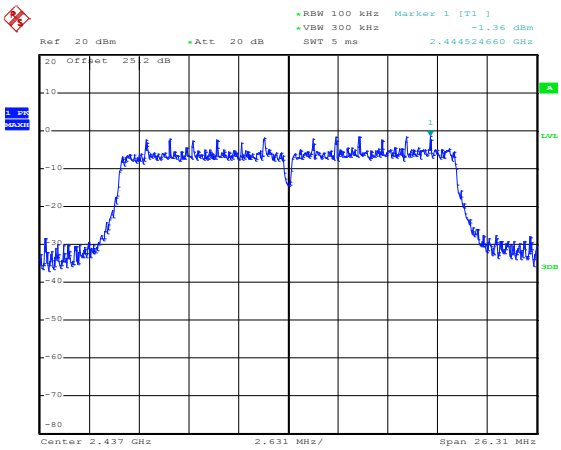


Date: 1.NOV.2013 20:19:57

Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Reece Li

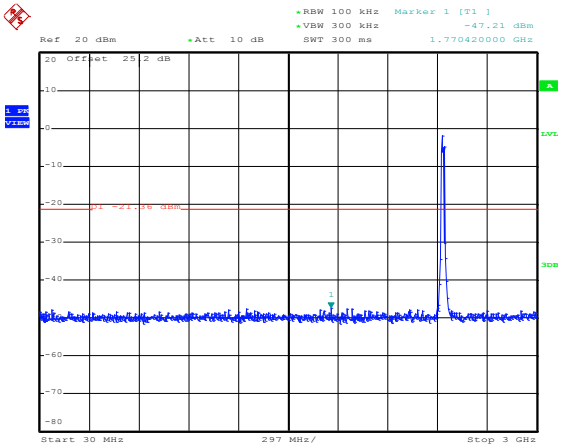
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



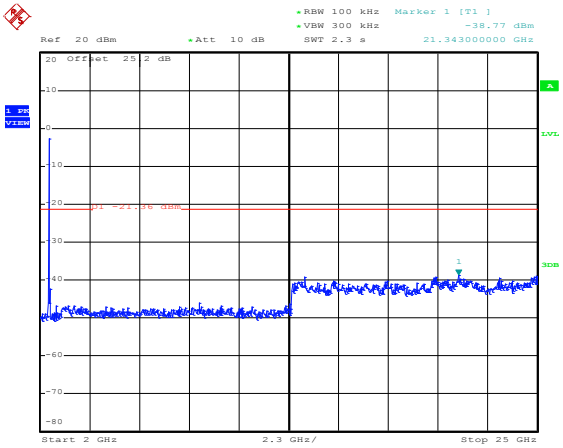
Date: 1.NOV.2013 20:37:21

Spurious Emission 30MHz~3GHz



Date: 1.NOV.2013 20:37:43

Spurious Emission 2GHz~25GHz

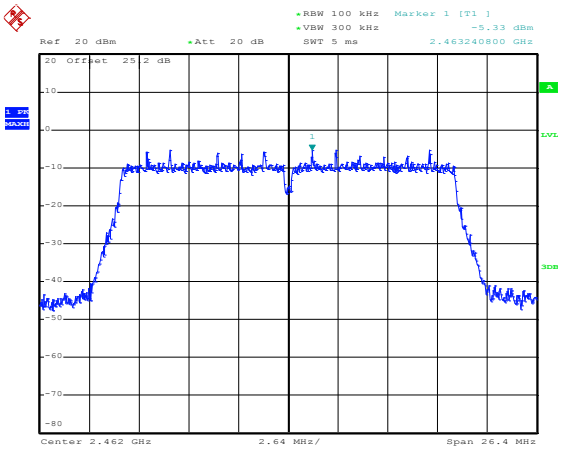


Date: 1.NOV.2013 20:38:02

Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	11	**Test Engineer :**	Reece Li

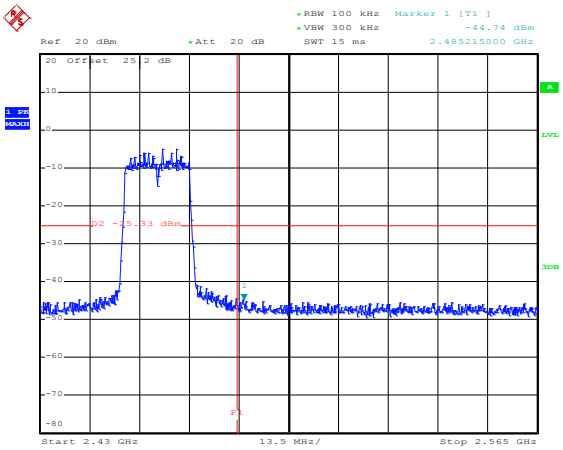
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



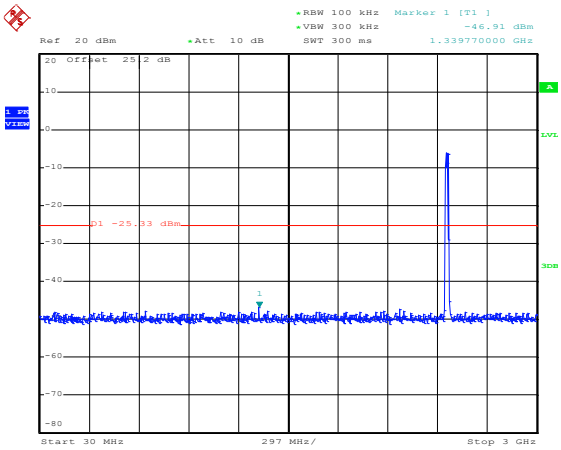
Date: 7.NOV.2013 16:13:49

High Channel Plot



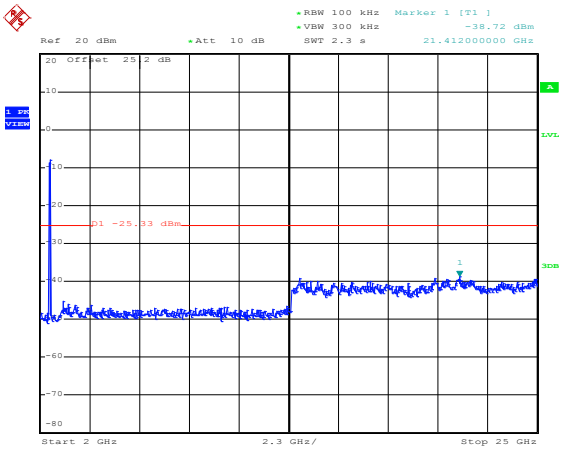
Date: 7.NOV.2013 16:14:26

Spurious Emission 30MHz~3GHz



Date: 7.NOV.2013 16:39:45

Spurious Emission 2GHz~25GHz

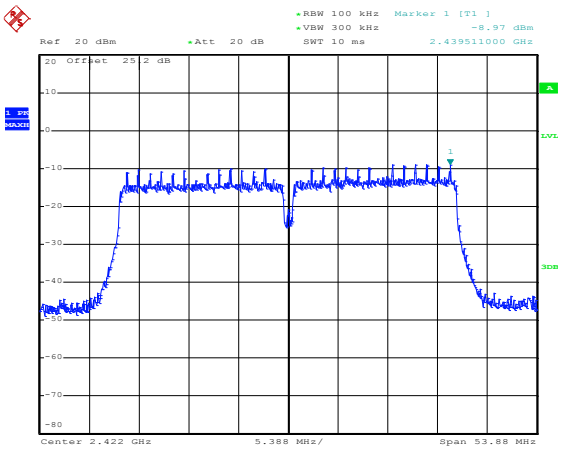


Date: 7.NOV.2013 16:40:04

Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	03	**Test Engineer :**	Reece Li

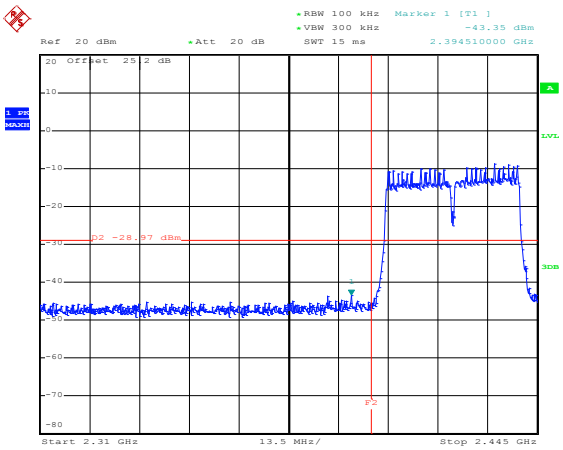
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



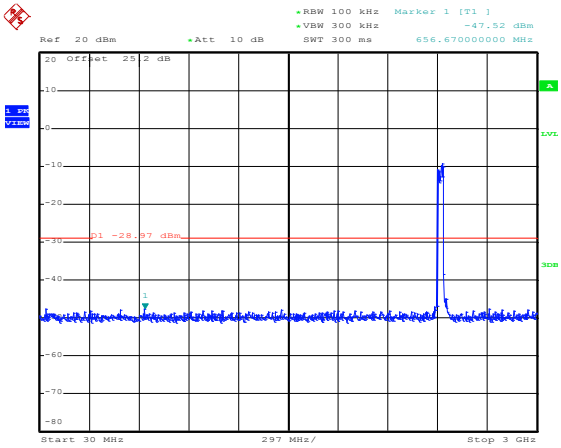
Date: 7.NOV.2013 16:19:18

Low Channel Plot



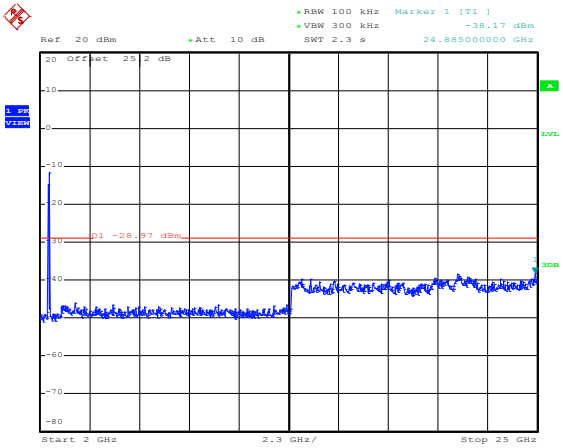
Date: 7.NOV.2013 16:19:39

Spurious Emission 30MHz~3GHz



Date: 7.NOV.2013 16:26:32

Spurious Emission 2GHz~25GHz

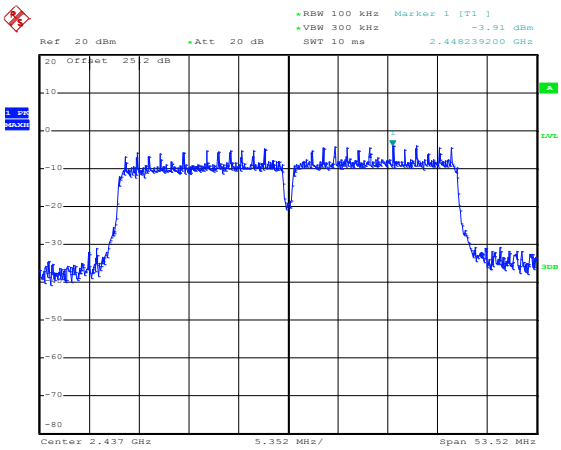


Date: 7.NOV.2013 16:25:33

Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Reece Li

WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



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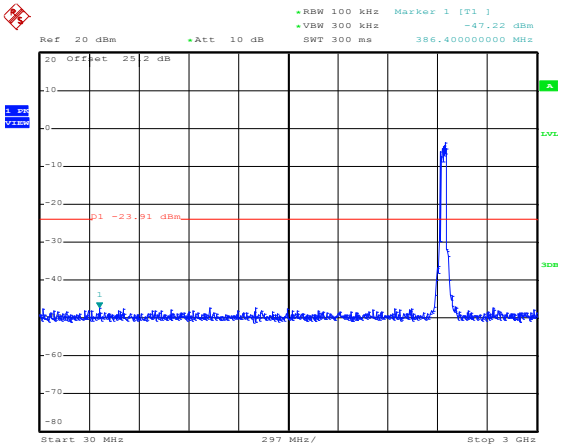
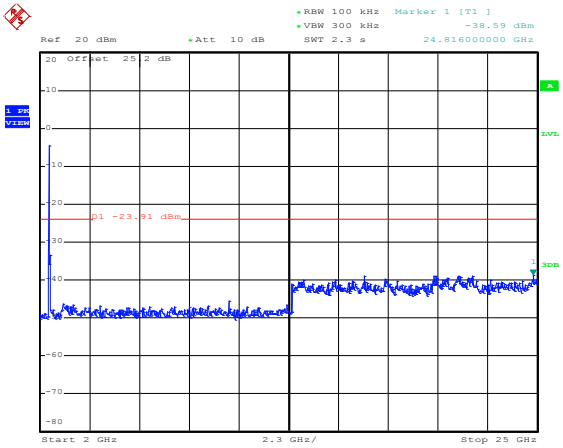
Spurious Emission 30MHz~3GHz



Date: 1.NOV.2013 20:49:00

Spurious Emission 2GHz~25GHz

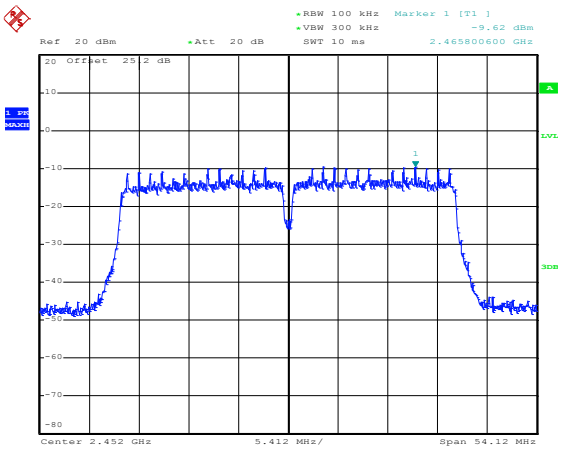


Date: 1.NOV.2013 20:48:08

Test Mode :	802.11n HT40	**Temperature :**	21~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	51~54%
Test Channel :	09	**Test Engineer :**	Reece Li

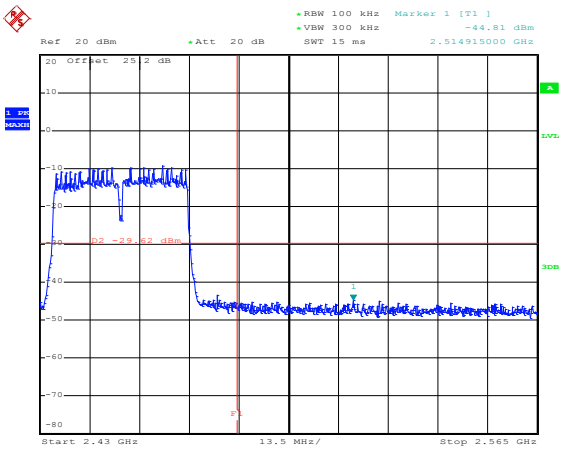
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



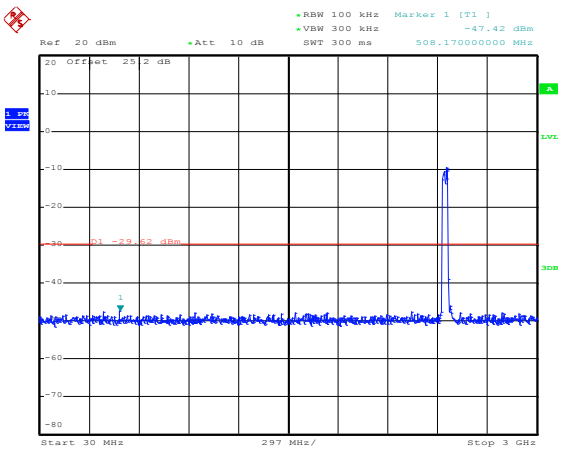
Date: 7.NOV.2013 16:28:45

High Channel Plot



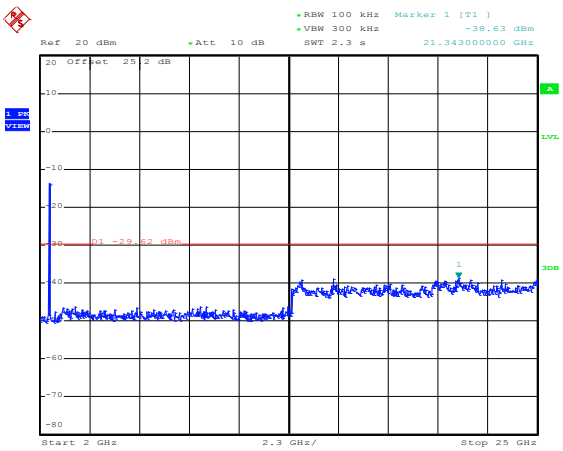
Date: 7.NOV.2013 16:29:10

Spurious Emission 30MHz~3GHz



Date: 7.NOV.2013 16:31:03

Spurious Emission 2GHz~25GHz



Date: 7.NOV.2013 16:30:05

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.

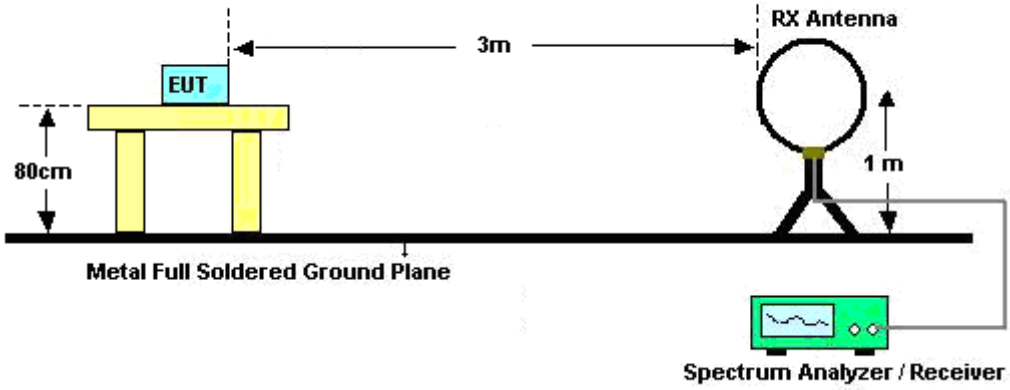
3.5.3 Test Procedures

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 - 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.

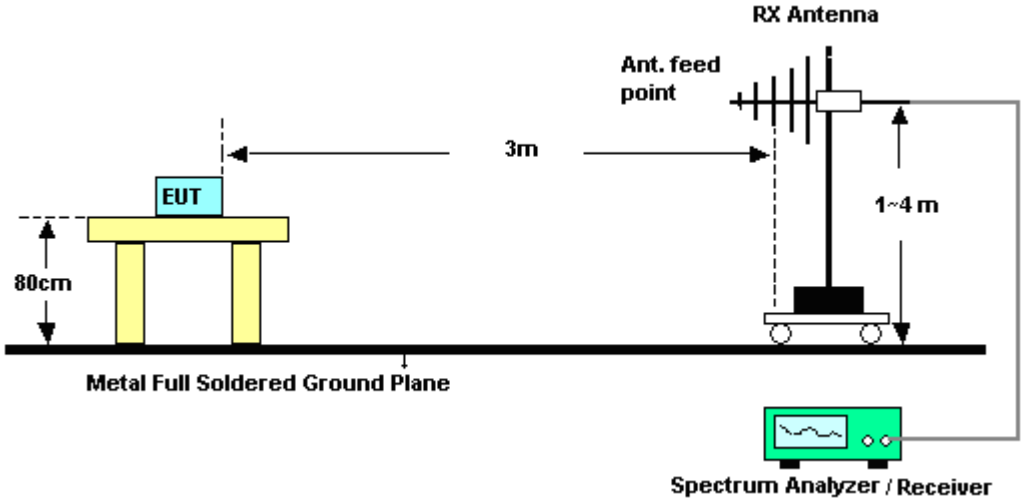
Band	Duty Cycle(%)	T(μs)	1/T(kHz)	VBW Setting
802.11b	98.87	-	-	10Hz
802.11g	92.55	1394.23	0.717	1kHz
2.4GHz 802.11n HT20	92.61	1306.09	0.766	1kHz
2.4GHz 802.11n HT40	85.23	647.43	1.545	3kHz

3.5.4 Test Setup

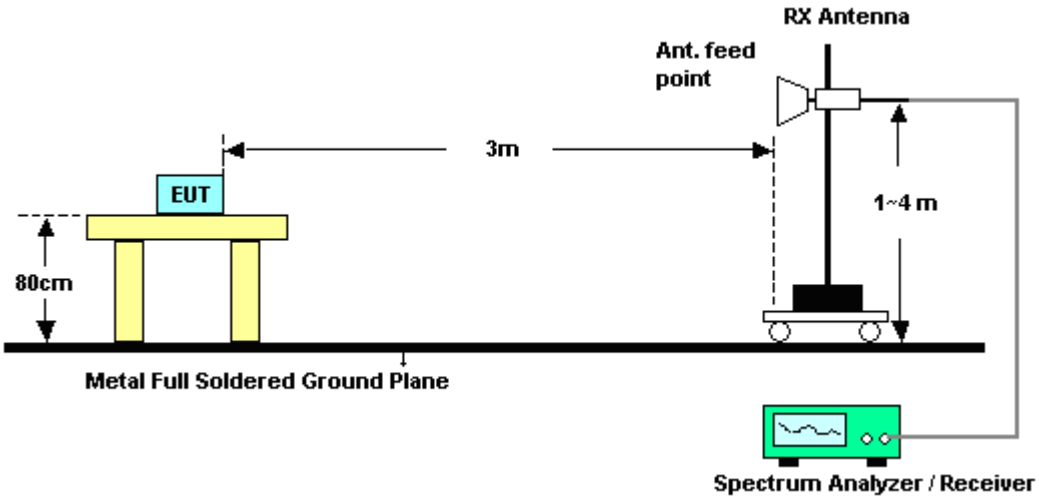
For radiated emissions below 30MHz



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
2386.68	53.54	-20.46	74	49.5	31.92	6.45	34.33	107	78	Peak
2386.5	42.95	-11.05	54	38.91	31.92	6.45	34.33	107	78	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
2387.67	47.96	-26.04	74	43.92	31.92	6.45	34.33	101	144	Peak
2386.23	35.3	-18.7	54	31.26	31.92	6.45	34.33	101	144	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
2488	54.33	-19.67	74	50.04	32	6.59	34.3	104	84	Peak
2487.61	42.1	-11.9	54	37.81	32	6.59	34.3	104	84	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
2488.57	49.03	-24.97	74	44.74	32	6.59	34.3	121	160	Peak
2487.64	34.9	-19.1	54	30.61	32	6.59	34.3	121	160	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
2389.56	63.45	-10.55	74	59.41	31.92	6.45	34.33	107	75	Peak
2390	45.05	-8.95	54	41.01	31.92	6.45	34.33	107	75	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
2390	51.45	-22.55	74	47.41	31.92	6.45	34.33	146	132	Peak
2389.92	38.47	-15.53	54	34.43	31.92	6.45	34.33	146	132	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
2484.01	69.78	-4.22	74	65.5	31.99	6.59	34.3	103	85	Peak
2483.56	50.91	-3.09	54	46.63	31.99	6.59	34.3	103	85	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
2484.04	57.27	-16.73	74	52.99	31.99	6.59	34.3	111	108	Peak
2483.56	40.78	-13.22	54	36.5	31.99	6.59	34.3	111	108	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
2389.11	67.46	-6.54	74	63.42	31.92	6.45	34.33	107	75	Peak
2390	46.22	-7.78	54	42.18	31.92	6.45	34.33	107	75	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
2389.38	55.55	-18.45	74	51.51	31.92	6.45	34.33	138	130	Peak
2390	38.66	-15.34	54	34.62	31.92	6.45	34.33	138	130	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
2483.65	70.23	-3.77	74	65.95	31.99	6.59	34.3	103	87	Peak
2483.59	48.63	-5.37	54	44.35	31.99	6.59	34.3	103	87	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
2485.69	61.14	-12.86	74	56.86	31.99	6.59	34.3	169	125	Peak
2483.56	40.61	-13.39	54	36.33	31.99	6.59	34.3	169	125	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
2390	70.99	-3.01	74	66.95	31.92	6.45	34.33	108	87	Peak
2389.29	47.03	-6.97	54	42.99	31.92	6.45	34.33	108	87	Average
2484.19	59.49	-14.51	74	55.21	31.99	6.59	34.3	108	87	Peak
2483.5	42.67	-11.33	54	38.39	31.99	6.59	34.3	108	87	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
2389.56	56.66	-17.34	74	52.62	31.92	6.45	34.33	136	129	Peak
2389.65	38.43	-15.57	54	34.39	31.92	6.45	34.33	136	129	Average
2484.07	52.17	-21.83	74	47.89	31.99	6.59	34.3	136	129	Peak
2483.53	38.53	-15.47	54	34.25	31.99	6.59	34.3	136	129	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
2389.56	52.21	-21.79	74	48.17	31.92	6.45	34.33	105	87	Peak
2390	39.3	-14.7	54	35.26	31.92	6.45	34.33	105	87	Average
2486.92	70.39	-3.61	74	66.11	31.99	6.59	34.3	105	87	Peak
2483.59	49.58	-4.42	54	45.3	31.99	6.59	34.3	105	87	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
2337	48.46	-25.54	74	44.55	31.88	6.38	34.35	141	147	Peak
2387.4	37.74	-16.26	54	33.7	31.92	6.45	34.33	141	147	Average
2486.29	61.22	-12.78	74	56.94	31.99	6.59	34.3	141	147	Peak
2484.1	41.37	-12.63	54	37.09	31.99	6.59	34.3	141	147	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 :	2411 MHz is fundamental signal which can be ignored.		

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
115.05	29.51	-13.99	43.5	48.07	12	1.19	31.75	-	-	Peak
169.86	29.61	-13.89	43.5	49.93	9.8	1.63	31.75	100	152	Peak
220.35	26.49	-19.51	46	47.4	9.2	1.63	31.74	-	-	Peak
429.5	25.59	-20.41	46	38.38	16.8	2.26	31.85	-	-	Peak
471.5	24.63	-21.37	46	36.8	17.42	2.31	31.9	-	-	Peak
847.4	23.69	-22.31	46	31.44	20.78	3.22	31.75	-	-	Peak
2411	103.62	-	-	99.53	31.93	6.49	34.33	107	78	Average
2411	109.21	-	-	105.12	31.93	6.49	34.33	107	78	Peak
4824	50.97	-3.03	54	61.99	34.4	10.17	55.59	101	306	Average
4824	52.13	-21.87	74	63.15	34.4	10.17	55.59	101	306	Peak

Test Mode :	802.11b	**Temperature :**	22~24°C
Test Channel :	01	**Relative Humidity :**	47~49%
Test Engineer :	Marlboro Hsu	**Polarization :**	Vertical
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
32.16	36.31	-3.69	40	50.14	17.3	0.66	31.79	100	24	Peak
44.04	29.66	-10.34	40	50.42	10.26	0.76	31.78	-	-	Peak
81.84	28.92	-11.08	40	52.44	7.24	1	31.76	-	-	Peak
429.5	23.03	-22.97	46	35.82	16.8	2.26	31.85	-	-	Peak
760.6	22.2	-23.8	46	30.93	20.2	3.05	31.98	-	-	Peak
874	24.03	-21.97	46	31.47	20.9	3.3	31.64	-	-	Peak
2411	93.53	-	-	89.44	31.93	6.49	34.33	101	144	Average
2411	98.98	-	-	94.89	31.93	6.49	34.33	101	144	Peak
4824	50.56	-23.44	74	61.58	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. 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	104.48	-	-	100.32	31.96	6.52	34.32	133	82	Average
2438	109.95	-	-	105.79	31.96	6.52	34.32	133	82	Peak
4874	50.19	-3.81	54	61.32	34.37	10.18	55.68	100	306	Average
4874	52.84	-21.16	74	63.97	34.37	10.18	55.68	100	306	Peak
7311	48.63	-25.37	74	58.36	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. 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	94.39	-	-	90.23	31.96	6.52	34.32	117	158	Average
2438	99.78	-	-	95.62	31.96	6.52	34.32	117	158	Peak
4874	49.08	-4.92	54	60.21	34.37	10.18	55.68	110	224	Average
4874	51.61	-22.39	74	62.74	34.37	10.18	55.68	110	224	Peak
7311	49.55	-24.45	74	59.28	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
2463	100.32	-	-	96.1	31.97	6.56	34.31	104	84	Average
2463	105.71	-	-	101.49	31.97	6.56	34.31	104	84	Peak
4924	50.81	-3.19	54	62.05	34.34	10.2	55.78	100	307	Average
4924	54.22	-19.78	74	65.46	34.34	10.2	55.78	100	307	Peak
7386	48.89	-25.11	74	58.52	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
2463	90.71	-	-	86.49	31.97	6.56	34.31	121	160	Average
2463	95.85	-	-	91.63	31.97	6.56	34.31	121	160	Peak
4924	49.26	-24.74	74	60.49	34.34	10.21	55.78	100	0	Peak
7386	48.11	-25.89	74	57.74	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. 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	98.38	-	-	94.29	31.93	6.49	34.33	107	75	Average
2411	108.62	-	-	104.53	31.93	6.49	34.33	107	75	Peak
4824	46.06	-27.94	74	57.08	34.4	10.17	55.59	200	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. 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	88.58	-	-	84.49	31.93	6.49	34.33	146	132	Average
2413	98.57	-	-	94.48	31.93	6.49	34.33	146	132	Peak
4824	46.93	-27.07	74	57.95	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. 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	98.15	-	-	94.01	31.94	6.52	34.32	104	89	Average
2436	108.94	-	-	104.8	31.94	6.52	34.32	104	89	Peak
4875	48.86	-25.14	74	59.99	34.37	10.18	55.68	100	0	Peak
7311	48.97	-25.03	74	58.7	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. 2430 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
2430	88.88	-	-	84.74	31.94	6.52	34.32	140	128	Average
2430	98.72	-	-	94.58	31.94	6.52	34.32	140	128	Peak
4875	47.61	-26.39	74	58.74	34.37	10.18	55.68	100	0	Peak
7311	48.87	-25.13	74	58.6	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. 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
113.7	28.87	-14.63	43.5	47.37	12.07	1.18	31.75	-	-	Peak
169.05	29.15	-14.35	43.5	49.47	9.82	1.61	31.75	100	127	Peak
214.95	25.76	-17.74	43.5	46.76	9.15	1.6	31.75	-	-	Peak
429.5	24.01	-21.99	46	36.8	16.8	2.26	31.85	-	-	Peak
730.5	22.76	-23.24	46	31.77	20	2.99	32	-	-	Peak
837.6	23.12	-22.88	46	31.04	20.68	3.19	31.79	-	-	Peak
2463	95.63	-	-	91.41	31.97	6.56	34.31	103	85	Average
2463	106.31	-	-	102.09	31.97	6.56	34.31	103	85	Peak
4923	46.21	-27.79	74	57.45	34.34	10.2	55.78	100	0	Peak
7386	49.58	-24.42	74	59.21	35.56	10.92	56.11	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. 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
31.35	35.77	-4.23	40	49.01	17.9	0.65	31.79	100	141	Peak
42.96	29.45	-10.55	40	49.57	10.92	0.75	31.79	-	-	Peak
81.84	29.98	-10.02	40	53.5	7.24	1	31.76	-	-	Peak
429.5	23.15	-22.85	46	35.94	16.8	2.26	31.85	-	-	Peak
637.4	22.52	-23.48	46	32.12	19.66	2.79	32.05	-	-	Peak
837.6	23.95	-22.05	46	31.87	20.68	3.19	31.79	-	-	Peak
2463	86.15	-	-	81.93	31.97	6.56	34.31	111	108	Average
2463	96.14	-	-	91.92	31.97	6.56	34.31	111	108	Peak
4924	45.31	-28.69	74	56.54	34.34	10.21	55.78	100	0	Peak
7386	48.14	-25.86	74	57.77	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
2410	94.37	-	-	90.28	31.93	6.49	34.33	107	75	Average
2410	104.67	-	-	100.58	31.93	6.49	34.33	107	75	Peak
4824	46.79	-27.21	74	57.81	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. 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	84.02	-	-	79.93	31.93	6.49	34.33	138	130	Average
2413	94.54	-	-	90.45	31.93	6.49	34.33	138	130	Peak
4824	46.02	-27.98	74	57.04	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	95.27	-	-	91.13	31.94	6.52	34.32	103	89	Average
2436	105.52	-	-	101.38	31.94	6.52	34.32	103	89	Peak
4875	47.55	-26.45	74	58.68	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 :	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	84.98	-	-	80.84	31.94	6.52	34.32	136	129	Average
2436	95.37	-	-	91.23	31.94	6.52	34.32	136	129	Peak
4875	46.67	-27.33	74	57.8	34.37	10.18	55.68	100	0	Peak
7311	48.13	-25.87	74	57.86	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. 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
115.05	28.68	-14.82	43.5	47.24	12	1.19	31.75	-	-	Peak
169.05	30.49	-13.01	43.5	50.81	9.82	1.61	31.75	100	77	Peak
217.65	26.42	-19.58	46	47.38	9.17	1.61	31.74	-	-	Peak
429.5	24.52	-21.48	46	37.31	16.8	2.26	31.85	-	-	Peak
471.5	23.29	-22.71	46	35.46	17.42	2.31	31.9	-	-	Peak
776	23.28	-22.72	46	32.03	20.16	3.06	31.97	-	-	Peak
2463	93.97	-	-	89.75	31.97	6.56	34.31	103	87	Average
2463	104.59	-	-	100.37	31.97	6.56	34.31	103	87	Peak
4924	45.98	-28.02	74	57.22	34.34	10.2	55.78	100	0	Peak
7386	49.41	-24.59	74	59.04	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. 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
31.35	35.84	-4.16	40	49.08	17.9	0.65	31.79	100	345	Peak
42.15	30.02	-9.98	40	50.14	10.92	0.75	31.79	-	-	Peak
81.84	30.31	-9.69	40	53.83	7.24	1	31.76	-	-	Peak
429.5	22.49	-23.51	46	35.28	16.8	2.26	31.85	-	-	Peak
608	21.59	-24.41	46	31.4	19.48	2.77	32.06	-	-	Peak
914.6	26.47	-19.53	46	33.45	21.05	3.36	31.39	-	-	Peak
2463	82.72	-	-	78.5	31.97	6.56	34.31	169	125	Average
2463	93.29	-	-	89.07	31.97	6.56	34.31	169	125	Peak
4924	46.27	-27.73	74	57.51	34.34	10.2	55.78	100	0	Peak
7386	49.78	-24.22	74	59.41	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. 2420 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
99.66	20.3	-23.2	43.5	40.15	10.8	1.1	31.75	-	-	Peak
156.36	24.56	-18.94	43.5	44.71	10.18	1.42	31.75	-	-	Peak
213.6	24.81	-18.69	43.5	45.84	9.13	1.59	31.75	100	57	Peak
366.5	17.79	-28.21	46	32.61	14.86	2.11	31.79	-	-	Peak
630.4	21.69	-24.31	46	31.15	19.8	2.79	32.05	-	-	Peak
777.4	23.35	-22.65	46	32.08	20.18	3.06	31.97	-	-	Peak
2420	91.91	-	-	87.8	31.94	6.49	34.32	108	87	Average
2420	102.09	-	-	97.98	31.94	6.49	34.32	108	87	Peak
4844	47.88	-26.12	74	58.94	34.39	10.17	55.62	100	0	Peak
7266	48.02	-25.98	74	57.79	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. 2422 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
48.9	22.25	-17.75	40	44.51	8.73	0.79	31.78	100	14	Peak
114.24	25.22	-18.28	43.5	43.76	12.03	1.18	31.75	-	-	Peak
218.46	20.87	-25.13	46	41.81	9.18	1.62	31.74	-	-	Peak
368.6	16.89	-29.11	46	31.69	14.88	2.11	31.79	-	-	Peak
629	21.45	-24.55	46	30.93	19.78	2.79	32.05	-	-	Peak
788.6	23.36	-22.64	46	32.14	20.12	3.06	31.96	-	-	Peak
2422	82.09	-	-	77.98	31.94	6.49	34.32	136	129	Average
2422	92.3	-	-	88.19	31.94	6.49	34.32	136	129	Peak
4844	46.39	-27.61	74	57.45	34.39	10.17	55.62	100	0	Peak
7266	48.95	-25.05	74	58.72	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	92.29	-	-	88.15	31.94	6.52	34.32	104	88	Average
2435	102.28	-	-	98.14	31.94	6.52	34.32	104	88	Peak
4874	48.4	-25.6	74	59.53	34.37	10.18	55.68	100	0	Peak
7311	48.88	-25.12	74	58.61	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. 2439 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
2439	83.23	-	-	79.07	31.96	6.52	34.32	136	128	Average
2439	93.32	-	-	89.16	31.96	6.52	34.32	136	128	Peak
4874	46.86	-27.14	74	57.99	34.37	10.18	55.68	100	0	Peak
7311	49.35	-24.65	74	59.08	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	89.34	-	-	85.12	31.97	6.56	34.31	105	87	Average
2454	99.59	-	-	95.37	31.97	6.56	34.31	105	87	Peak
4905	46.88	-27.12	74	58.07	34.35	10.2	55.74	100	0	Peak
7356	48.2	-25.8	74	57.88	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. 2450 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
2450	79.24	-	-	75.07	31.96	6.52	34.31	141	147	Average
2450	89.16	-	-	84.99	31.96	6.52	34.31	141	147	Peak
4904	47.13	-26.87	74	58.32	34.35	10.2	55.74	100	0	Peak
7356	47.97	-26.03	74	57.65	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 (dBμV)	
	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.

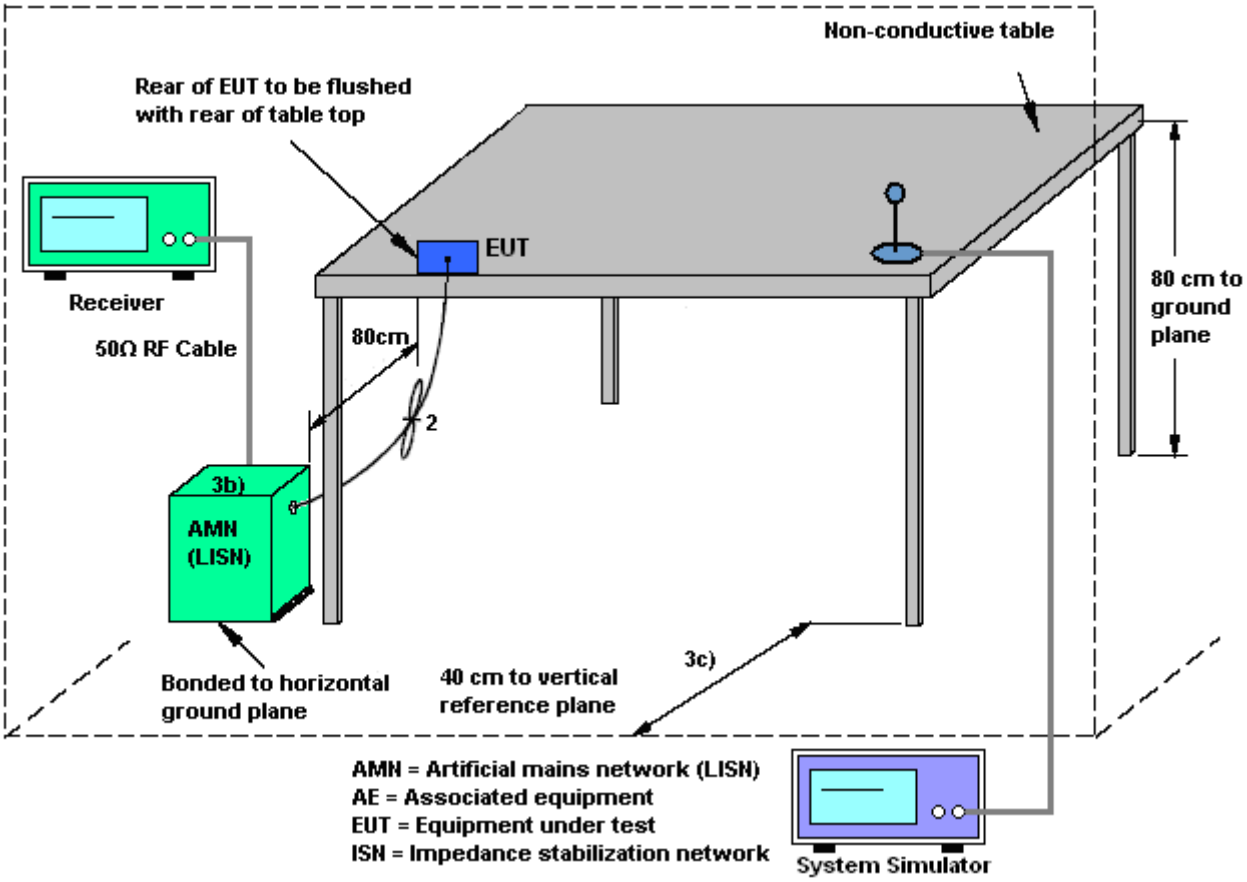
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

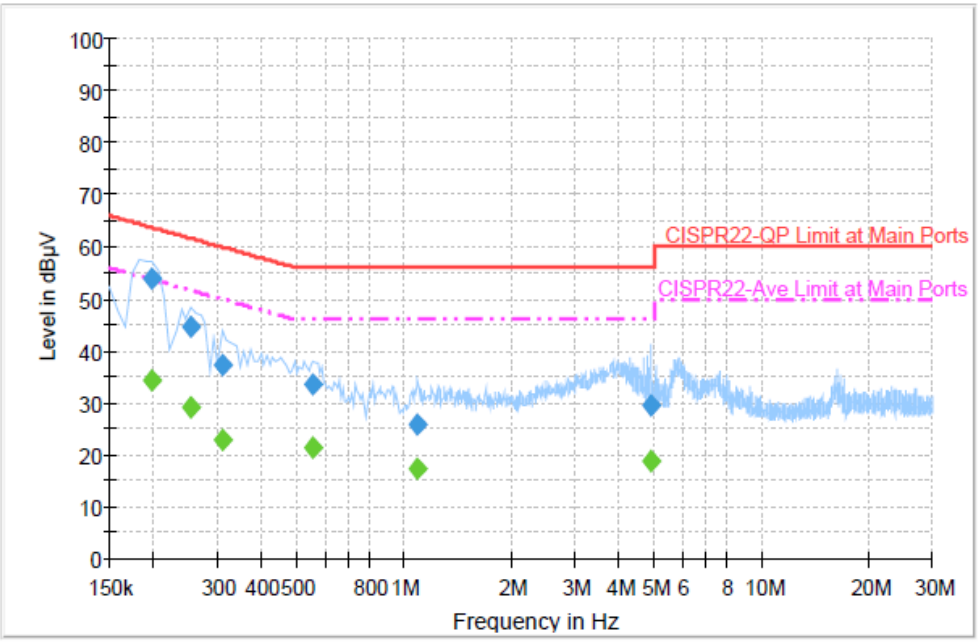
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other 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 + Bluetooth Link + WLAN Link + Camera + Earphone + Battery + USB Cable (Data Link with Notebook) + SIM 2		



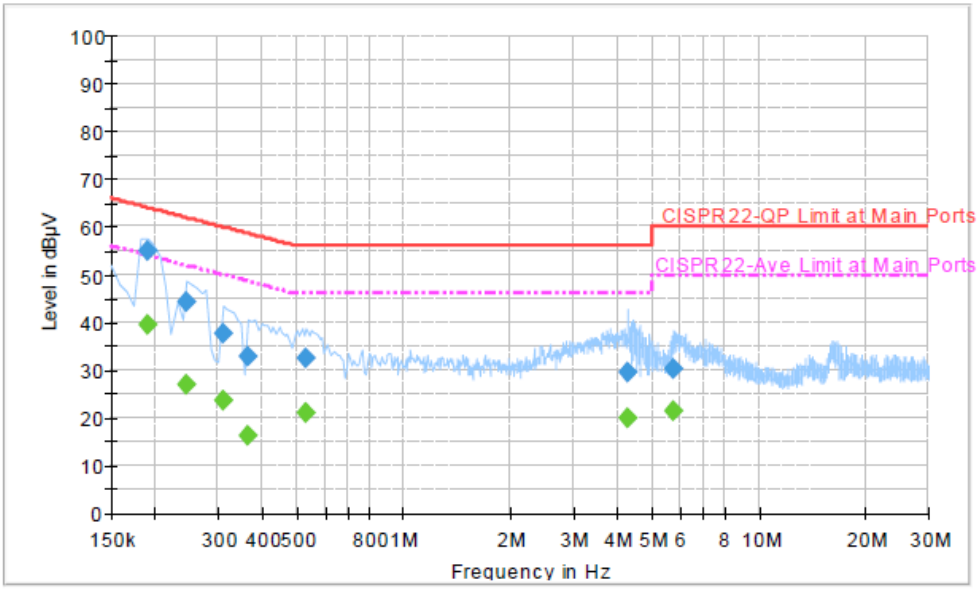
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	54.0	Off	L1	19.3	9.7	63.7
0.254000	44.8	Off	L1	19.5	16.8	61.6
0.310000	37.2	Off	L1	19.4	22.8	60.0
0.558000	33.6	Off	L1	19.4	22.4	56.0
1.094000	25.9	Off	L1	19.5	30.1	56.0
4.918000	29.6	Off	L1	19.6	26.4	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	34.3	Off	L1	19.3	19.4	53.7
0.254000	29.2	Off	L1	19.5	22.4	51.6
0.310000	22.7	Off	L1	19.4	27.3	50.0
0.558000	21.3	Off	L1	19.4	24.7	46.0
1.094000	17.5	Off	L1	19.5	28.5	46.0
4.918000	19.0	Off	L1	19.6	27.0	46.0

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Cosmo Xu	**Relative Humidity :**	45~47%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	WCDMA Band II Idle + Bluetooth Link + WLAN Link + Camera + Earphone + Battery + USB Cable (Data Link with Notebook) + SIM 2		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	54.9	Off	N	19.4	9.1	64.0
0.246000	44.3	Off	N	19.4	17.6	61.9
0.310000	37.5	Off	N	19.4	22.5	60.0
0.366000	32.8	Off	N	19.4	25.8	58.6
0.534000	32.3	Off	N	19.4	23.7	56.0
4.270000	29.5	Off	N	19.6	26.5	56.0
5.774000	30.1	Off	N	19.6	29.9	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	39.6	Off	N	19.4	14.4	54.0
0.246000	27.0	Off	N	19.4	24.9	51.9
0.310000	23.6	Off	N	19.4	26.4	50.0
0.366000	16.1	Off	N	19.4	32.5	48.6
0.534000	20.9	Off	N	19.4	25.1	46.0
4.270000	20.0	Off	N	19.6	26.0	46.0
5.774000	21.3	Off	N	19.6	28.7	50.0

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

An embedded-in antenna design 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	Oct. 31, 2013~ Nov. 07, 2013	Jun. 06, 2014	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Aug. 17, 2013	Oct. 31, 2013~ Nov. 07, 2013	Aug. 16, 2014	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 17, 2013	Oct. 31, 2013~ Nov. 07, 2013	Aug. 16, 2014	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 07, 2013	Nov. 05, 2013~ Nov. 06, 2013	Jun. 06, 2014	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9kHz ~ 26.5GHz	Nov. 26, 2012	Nov. 05, 2013~ Nov. 06, 2013	Nov. 25, 2013	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2013	Nov. 05, 2013~ Nov. 06, 2013	May 05, 2014	Radiation (03CH06-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	860004/0001	9 kHz~30 MhZ	Jul. 03, 2012	Nov. 05, 2013~ Nov. 06, 2013	Jul. 03, 2014	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL6112B	2885	30MHz -2GHz	Oct. 10, 2013	Nov. 05, 2013~ Nov. 06, 2013	Oct. 09, 2014	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 02, 2013	Nov. 05, 2013~ Nov. 06, 2013	Aug. 01, 2014	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz ~ 1GHz	Apr. 12, 2013	Nov. 05, 2013~ Nov. 06, 2013	Apr. 11, 2014	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2013	Nov. 05, 2013~ Nov. 06, 2013	Jul. 17, 2014	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Oct. 03, 2013	Nov. 05, 2013~ Nov. 06, 2013	Oct. 02, 2014	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 12, 2013	Nov. 05, 2013~ Nov. 06, 2013	Apr. 11, 2014	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 - 360 degree	N/A	Nov. 05, 2013~ Nov. 06, 2013	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Nov. 05, 2013~ Nov. 06, 2013	N/A	Radiation (03CH06-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 13, 2012	Nov. 01, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Nov. 01, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Nov. 01, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Nov. 01, 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 = 2Uc(y))	**2.26**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.50**

Appendix A. Setup Photographs

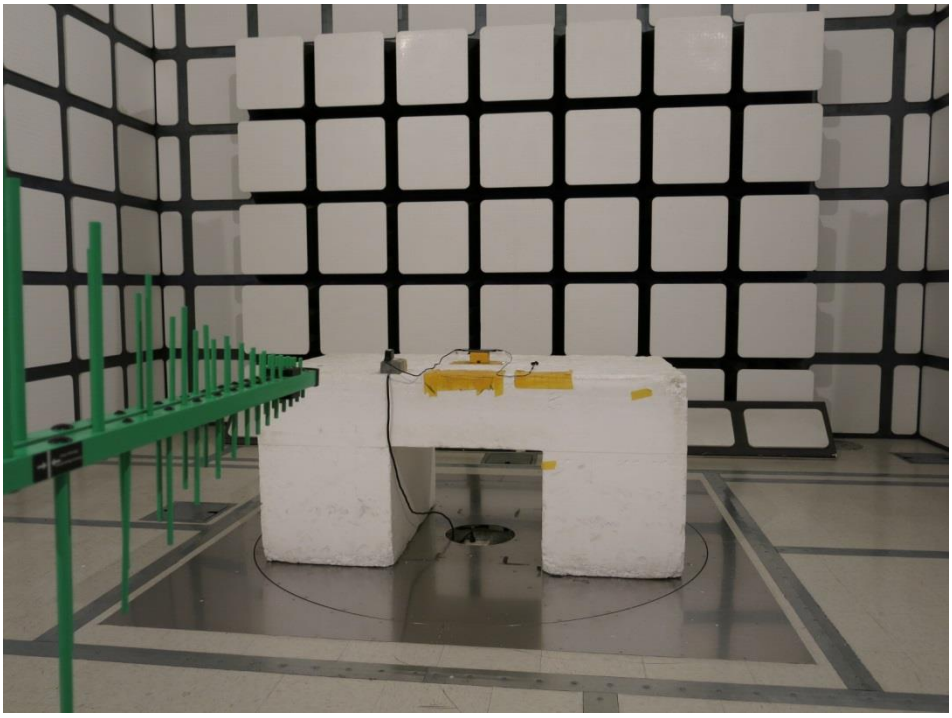
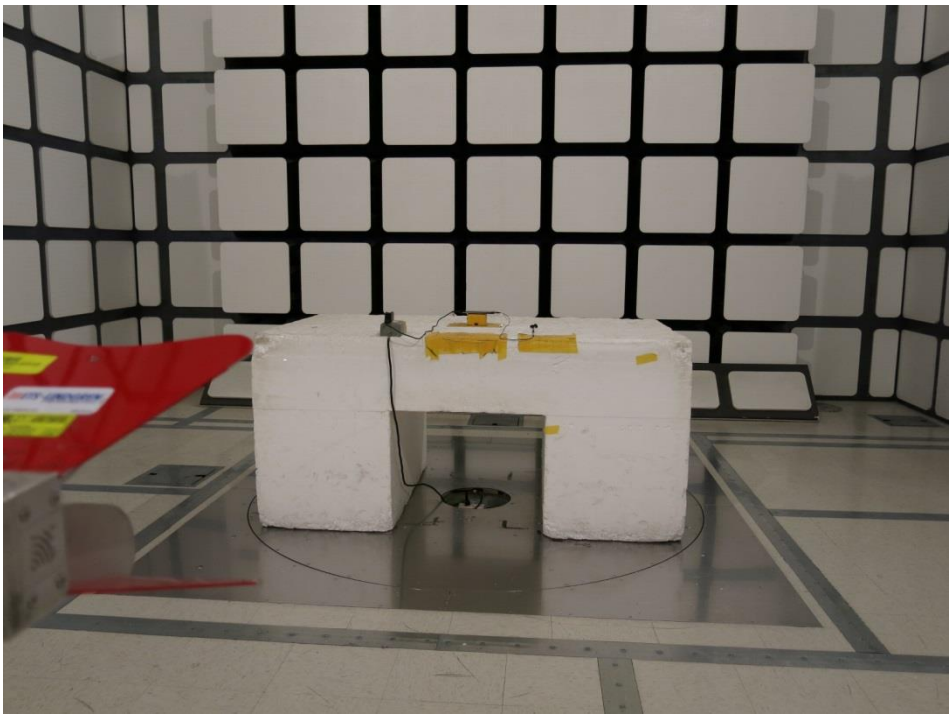
<Conducted Emission>

Mode 1

<Radiated Emission>

X Plane

LF



HF