



FCC RF Test Report

APPLICANT : Compal Electronics, Inc.
EQUIPMENT : Smart phone
BRAND NAME : SDBG
MODEL NAME : i4900
FCC ID : GKR-SD4900
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Nov. 12, 2013 and testing was completed on Jan. 31, 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.

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FCC ID : GKR-SD4900

Page Number : 1 of 63

Report Issued Date : Jun. 04, 2014

Report Version : Rev. 01



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3N1233C	Rev. 01	Initial issue of report	Jun. 04, 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	-
3.1	-	RSS-Gen 4.6.1	99% Bandwidth	-	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 3.01 dB at 2388.750 MHz
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 9.50 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

Compal Electronics, Inc.

No.581, Ruiguang Rd., Neihu District, Taipei City 11492, Taiwan (R.O.C.)

1.2 Manufacturer

Compal Electronics, Inc.

No.581, Ruiguang Rd., Neihu District, Taipei City 11492, Taiwan (R.O.C.)

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Smart phone
Brand Name	SDBG
Model Name	i4900
FCC ID	GKR-SD4900
Sample 1	EUT with 512M Memory
Sample 2	EUT with 1G Memory
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA WLAN 11b/g/n (HT20/HT40) Bluetooth v3.0 + EDR/ v4.0 - LE
HW Version	0D
SW Version	LF11.0.022.00
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 : 19.74 dBm (0.0942 W) 802.11g : 22.92 dBm (0.1959 W) 802.11n HT20 : 22.55 dBm (0.1799 W) 802.11n HT40 : 22.87 dBm (0.1936 W)
99% Occupied Bandwidth	802.11b : 12.70MHz 802.11g : 17.45MHz 802.11n HT20 : 18.50MHz 802.11n HT40 : 36.30MHz
Antenna Type	Loop Antenna with gain 1.07 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: All test items were verified and recorded according to the standards and without any deviation during the test.



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 (Z 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)	19.74	19.62	19.56	19.57

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)	22.92	22.82	22.81	22.75	22.77	22.65	22.71	22.85

2.4GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	22.55	22.32	22.41	22.33	22.28	22.21	22.28	22.27

2.4GHz 802.11n HT40 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	22.87	22.81	22.78	22.71	22.72	22.62	22.68	22.70



2.3 Test Mode

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

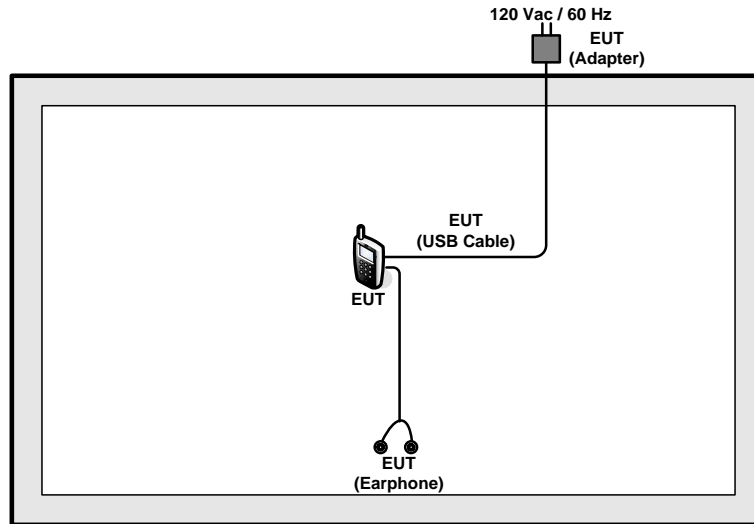
Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB and 99% BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n 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

Remark: All the tests were performed with sample 1.

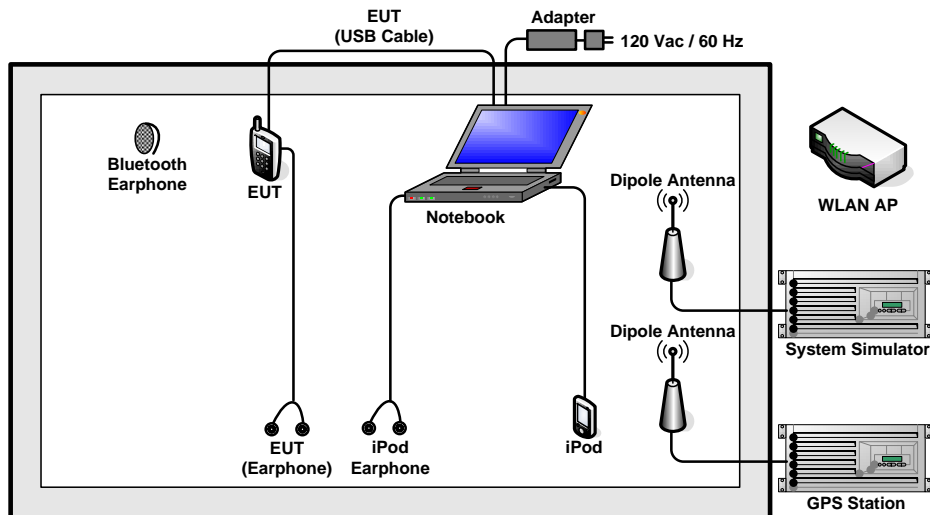
Test Cases	
AC Conducted Emission	Mode 1 : GSM1900 Idle + Bluetooth Link + WLAN Link + GPS Rx + USB Cable (Data Link with Notebook) + Battery + Earphone + SIM 1
Remark: All the tests were performed with sample 1.	

2.4 Connection Diagram of Test System

<Bluetooth 4.0 – LE 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.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Sony Ericsson	MW600	PY700A2029	N/A	N/A
6.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
7.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
8.	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 (SW: LF11.0.019.00) 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.

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

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

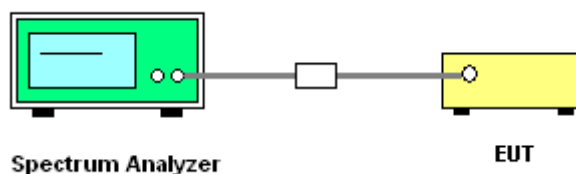
3.1.2 Measuring Instruments

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. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

3.1.4 Test Setup

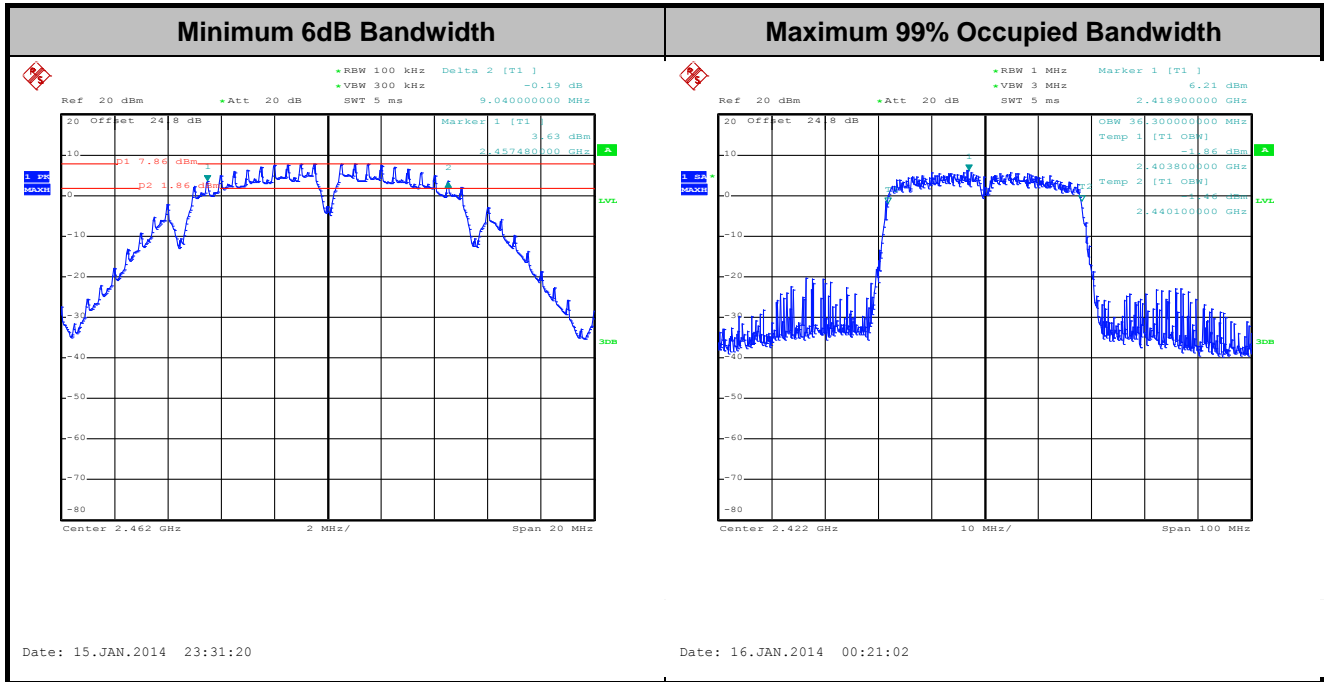




3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Test Band :	2.4GHz	Temperature :	21~26°C
Test Engineer :	Osolemio Chang	Relative Humidity :	45~54%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	99% Bandwidth (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	12.60	9.52	0.5	Pass
11b	1Mbps	1	6	2437	12.60	10.00	0.5	Pass
11b	1Mbps	1	11	2462	12.70	9.04	0.5	Pass
11g	6Mbps	1	1	2412	17.45	15.64	0.5	Pass
11g	6Mbps	1	6	2437	17.40	15.44	0.5	Pass
11g	6Mbps	1	11	2462	17.40	15.32	0.5	Pass
HT20	MCS0	1	1	2412	18.50	17.58	0.5	Pass
HT20	MCS0	1	6	2437	18.45	17.56	0.5	Pass
HT20	MCS0	1	11	2462	18.50	17.60	0.5	Pass
HT40	MCS0	1	3	2422	36.30	35.20	0.5	Pass
HT40	MCS0	1	6	2437	36.30	35.16	0.5	Pass
HT40	MCS0	1	9	2452	36.30	35.20	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.

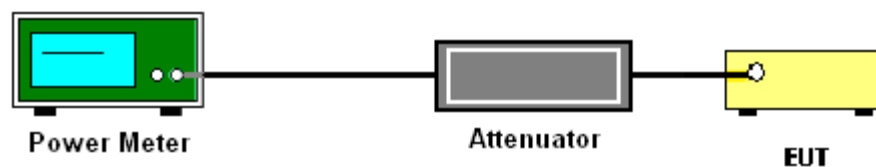
3.2.2 Measuring Instruments

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 :	21~26°C
Test Engineer :	Osolemio Chang	Relative Humidity :	45~54%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	19.38	30	1.07	Pass
11b	1Mbps	1	6	2437	19.54	30	1.07	Pass
11b	1Mbps	1	11	2462	19.74	30	1.07	Pass
11g	6Mbps	1	1	2412	22.92	30	1.07	Pass
11g	6Mbps	1	6	2437	22.76	30	1.07	Pass
11g	6Mbps	1	11	2462	21.85	30	1.07	Pass
HT20	MCS0	1	1	2412	22.55	30	1.07	Pass
HT20	MCS0	1	6	2437	22.49	30	1.07	Pass
HT20	MCS0	1	11	2462	22.04	30	1.07	Pass
HT40	MCS0	1	3	2422	22.09	30	1.07	Pass
HT40	MCS0	1	6	2437	22.87	30	1.07	Pass
HT40	MCS0	1	9	2452	22.13	30	1.07	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 :	21~26°C
Test Engineer :	Osolemio Chang	Relative Humidity :	45~54%

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	0.09	16.65	30	1.07	Pass
11b	1Mbps	1	6	2437	0.09	16.80	30	1.07	Pass
11b	1Mbps	1	11	2462	0.09	16.98	30	1.07	Pass
11g	6Mbps	1	1	2412	0.52	14.84	30	1.07	Pass
11g	6Mbps	1	6	2437	0.52	14.67	30	1.07	Pass
11g	6Mbps	1	11	2462	0.52	11.58	30	1.07	Pass
HT20	MCS0	1	1	2412	0.55	12.82	30	1.07	Pass
HT20	MCS0	1	6	2437	0.55	12.60	30	1.07	Pass
HT20	MCS0	1	11	2462	0.55	11.56	30	1.07	Pass
HT40	MCS0	1	3	2422	1.03	11.09	30	1.07	Pass
HT40	MCS0	1	6	2437	1.03	12.61	30	1.07	Pass
HT40	MCS0	1	9	2452	1.03	11.40	30	1.07	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.

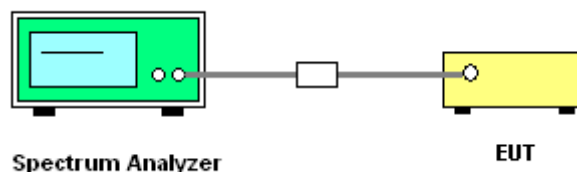
3.3.2 Measuring Instruments

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



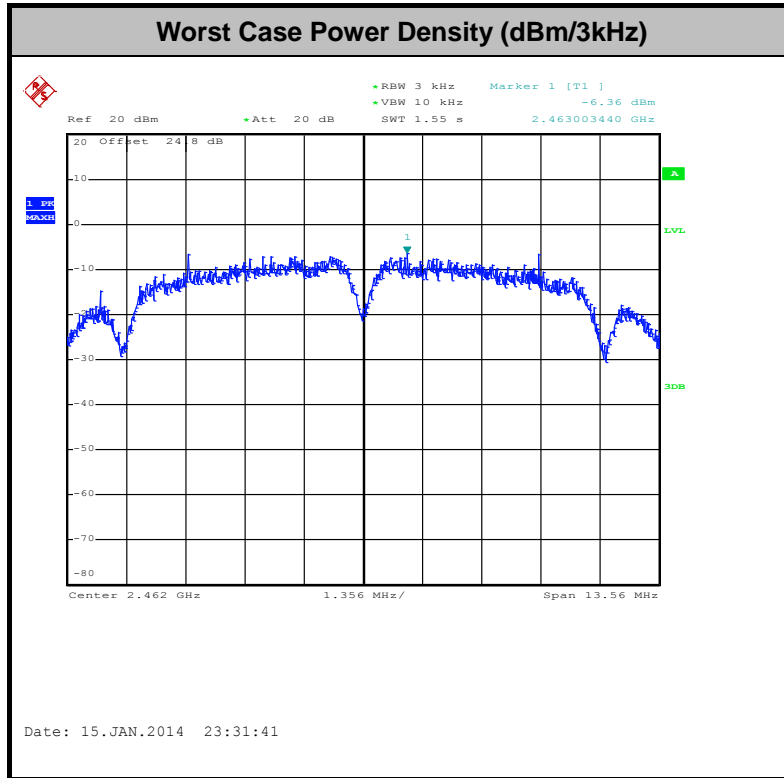


3.3.5 Test Result of Power Spectral Density

Test Mode :	2.4GHz	Temperature :	21~26°C
Test Engineer :	Osolemio Chang	Relative Humidity :	45~54%

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	-6.91	8	1.07	Pass
11b	1Mbps	1	6	2437	-6.63	8	1.07	Pass
11b	1Mbps	1	11	2462	-6.36	8	1.07	Pass
11g	6Mbps	1	1	2412	-10.29	8	1.07	Pass
11g	6Mbps	1	6	2437	-10.61	8	1.07	Pass
11g	6Mbps	1	11	2462	-9.06	8	1.07	Pass
HT20	MCS0	1	1	2412	-12.82	8	1.07	Pass
HT20	MCS0	1	6	2437	-13.16	8	1.07	Pass
HT20	MCS0	1	11	2462	-13.92	8	1.07	Pass
HT40	MCS0	1	3	2422	-15.78	8	1.07	Pass
HT40	MCS0	1	6	2437	-16.00	8	1.07	Pass
HT40	MCS0	1	9	2452	-16.65	8	1.07	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).

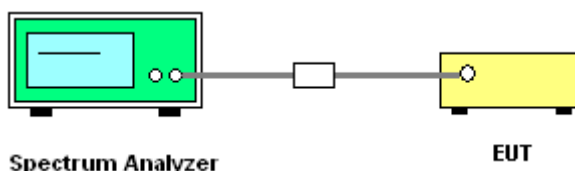
3.4.2 Measuring Instruments

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.

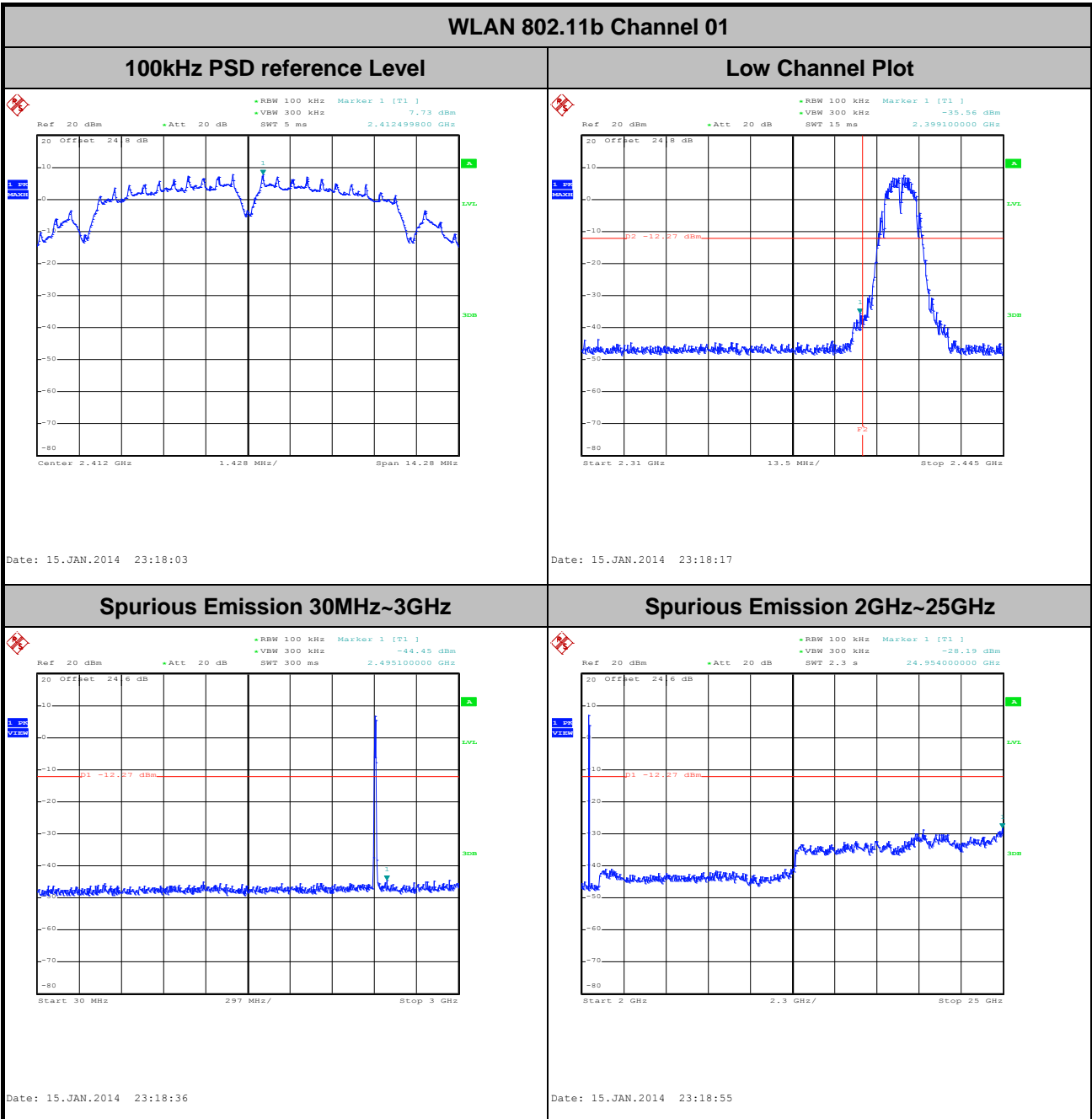
3.4.4 Test Setup





3.4.5 Test Result of Conducted Band Edges and Spurious Emission

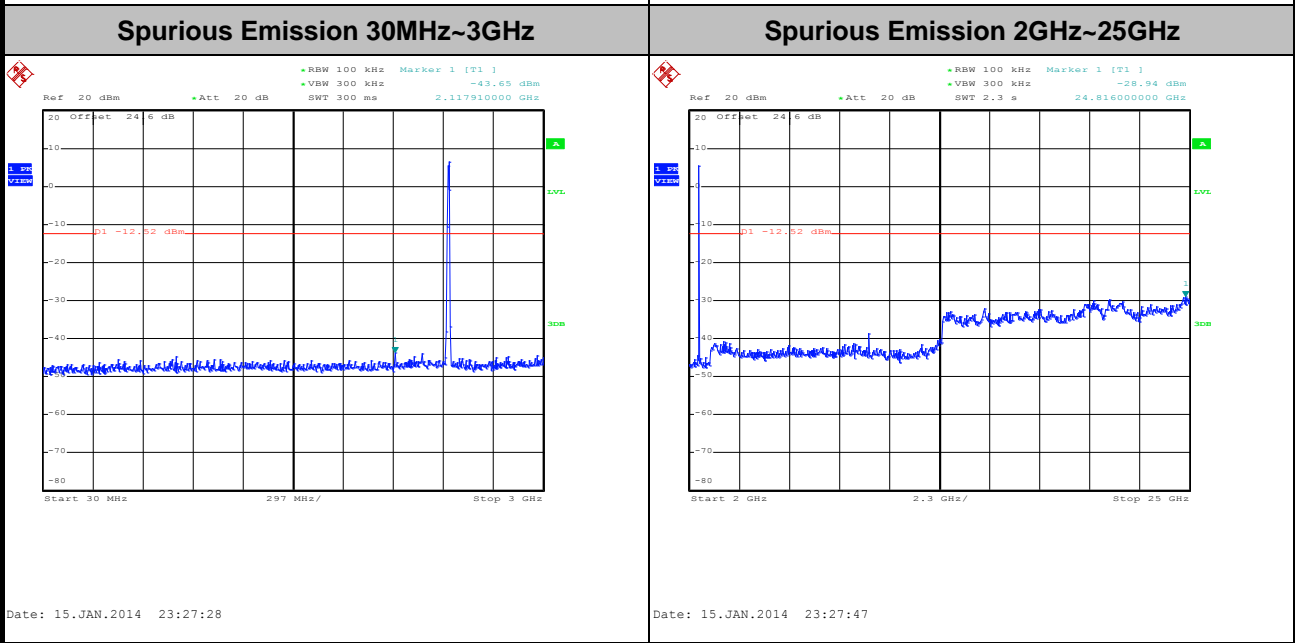
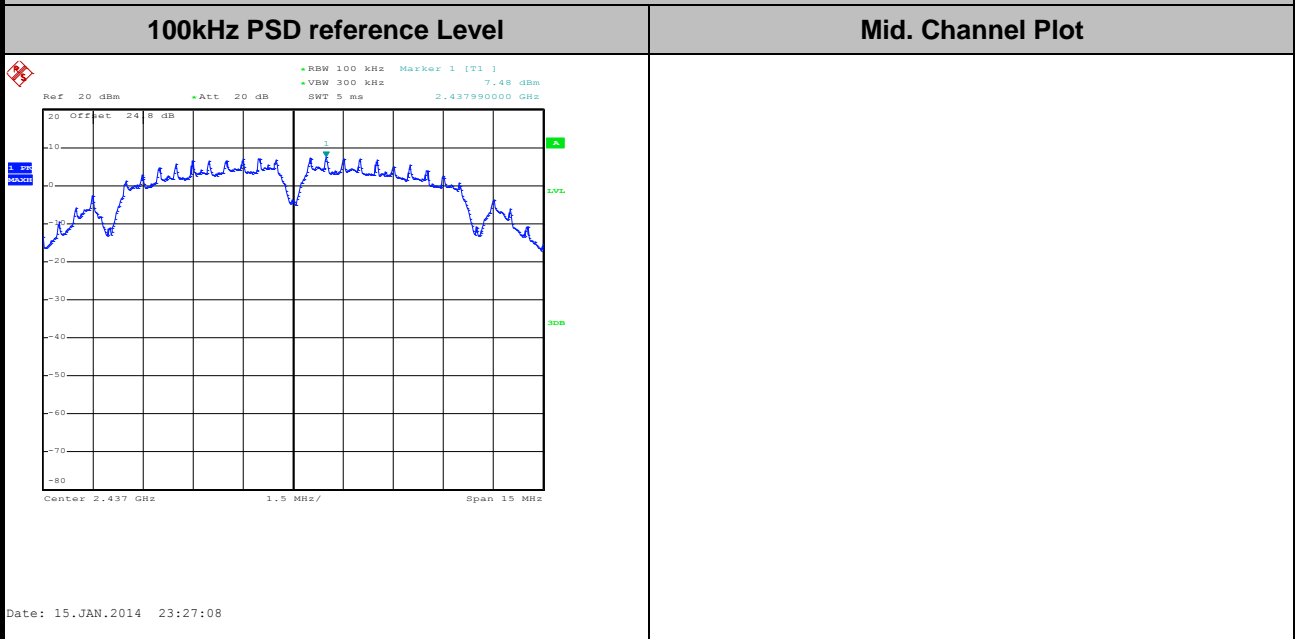
Test Mode :	802.11b	Temperature :	21~26°C
Test Band :	2.4GHz Low	Relative Humidity :	45~54%
Test Channel :	01	Test Engineer :	Osolemio Chang





Test Mode :	802.11b	Temperature :	21~26°C
Test Band :	2.4GHz Mid.	Relative Humidity :	45~54%
Test Channel :	06	Test Engineer :	Osolemio Chang

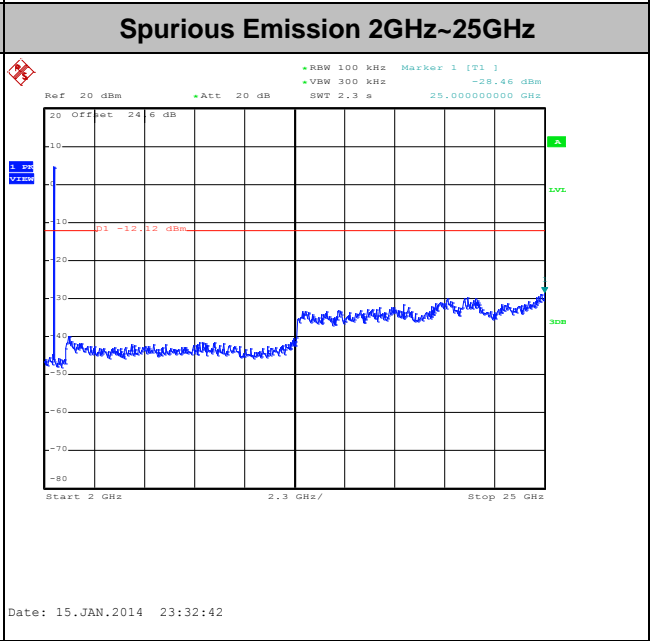
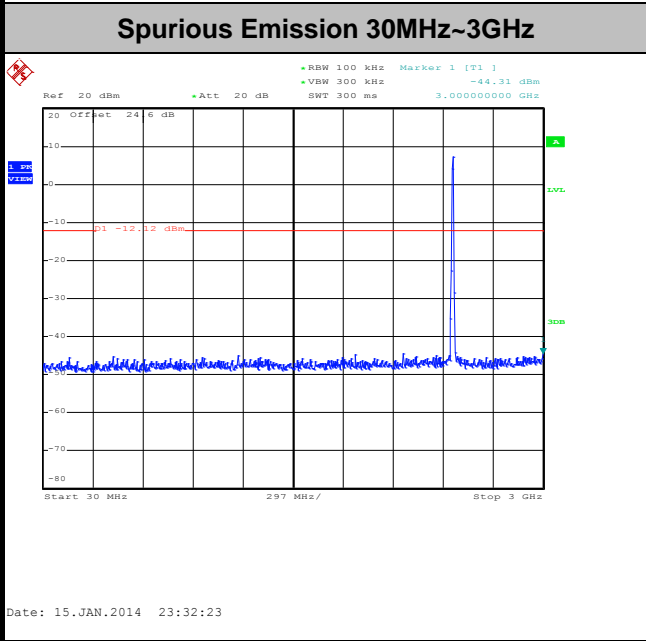
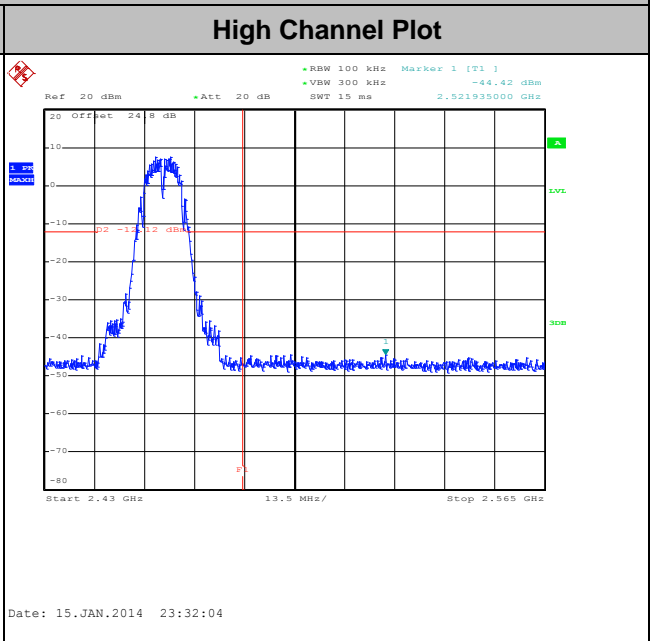
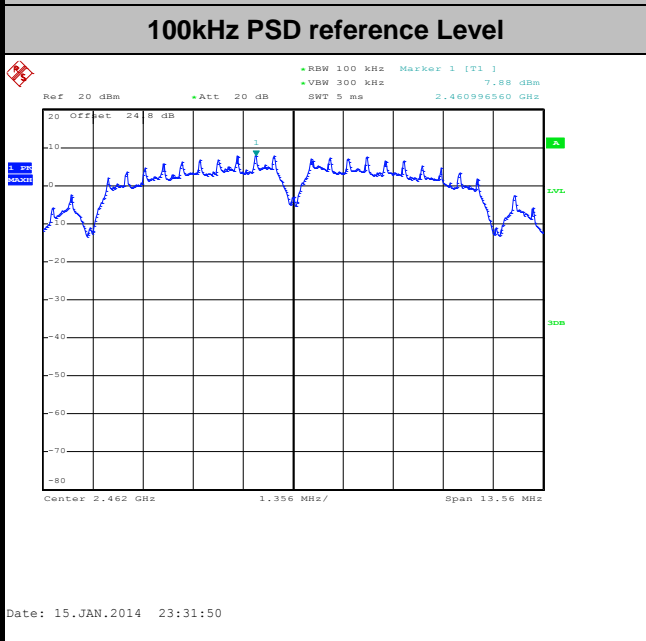
WLAN 802.11b Channel 06





Test Mode :	802.11b	Temperature :	21~26°C
Test Band :	2.4GHz High	Relative Humidity :	45~54%
Test Channel :	11	Test Engineer :	Osolemio Chang

WLAN 802.11b Channel 11

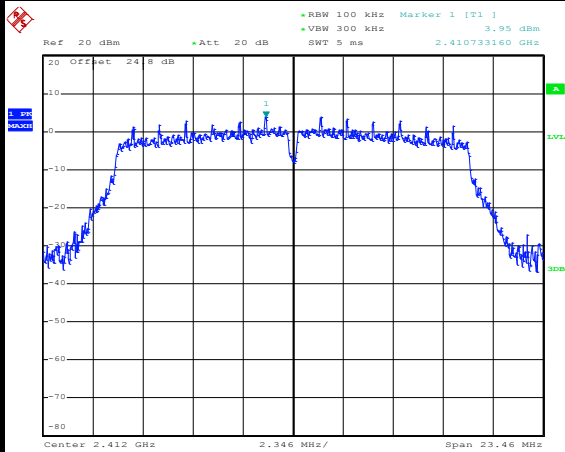




Test Mode :	802.11g	Temperature :	21~26°C
Test Band :	2.4GHz Low	Relative Humidity :	45~54%
Test Channel :	01	Test Engineer :	Osolemio Chang

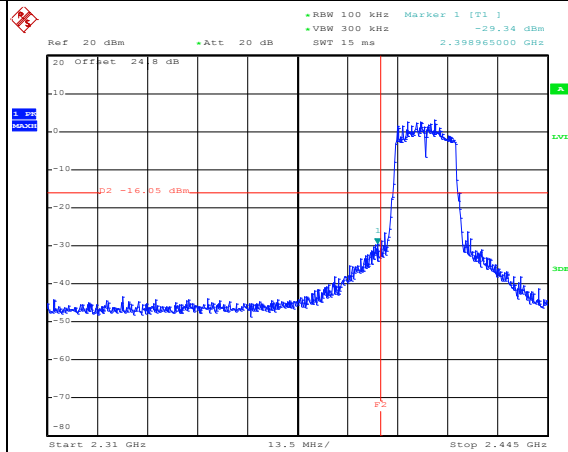
WLAN 802.11g Channel 01

100kHz PSD reference Level



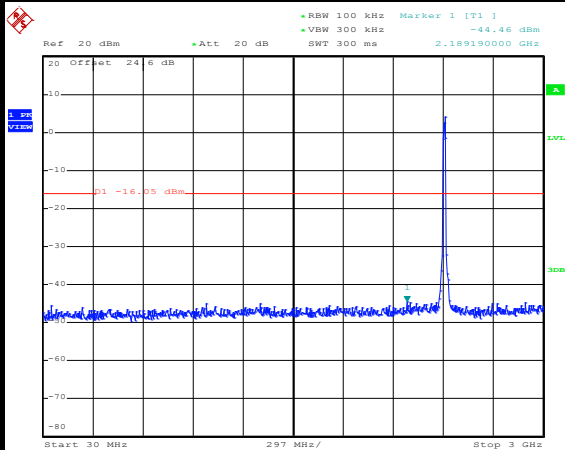
Date: 15.JAN.2014 23:46:08

Low Channel Plot



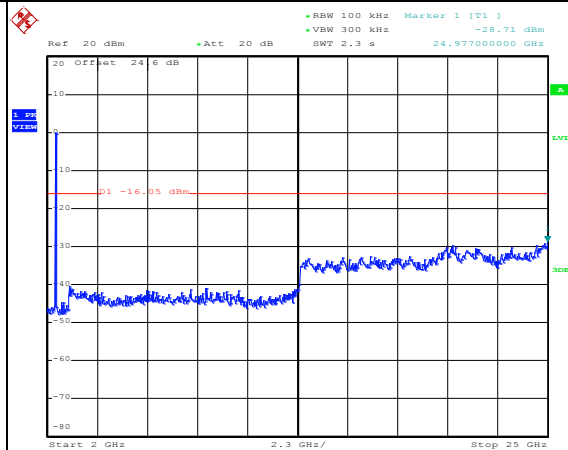
Date: 15.JAN.2014 23:46:22

Spurious Emission 30MHz~3GHz



Date: 15.JAN.2014 23:46:41

Spurious Emission 2GHz~25GHz



Date: 15.JAN.2014 23:47:00

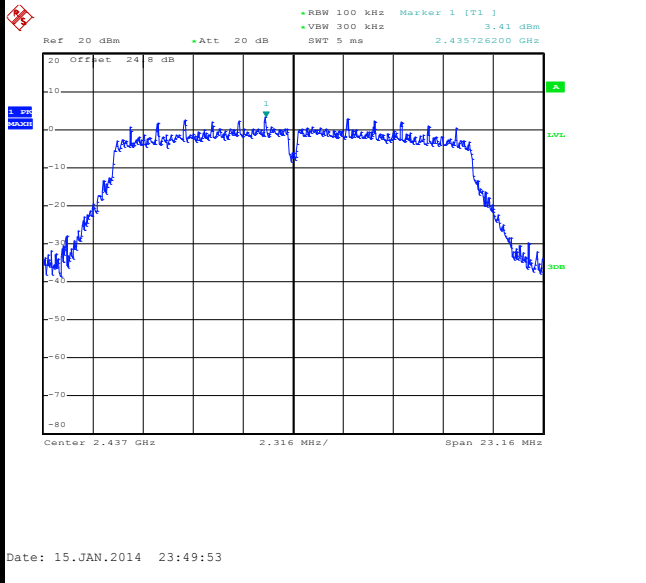


Test Mode :	802.11g	Temperature :	21~26°C
Test Band :	2.4GHz Mid.	Relative Humidity :	45~54%
Test Channel :	06	Test Engineer :	Osolemio Chang

WLAN 802.11g Channel 06

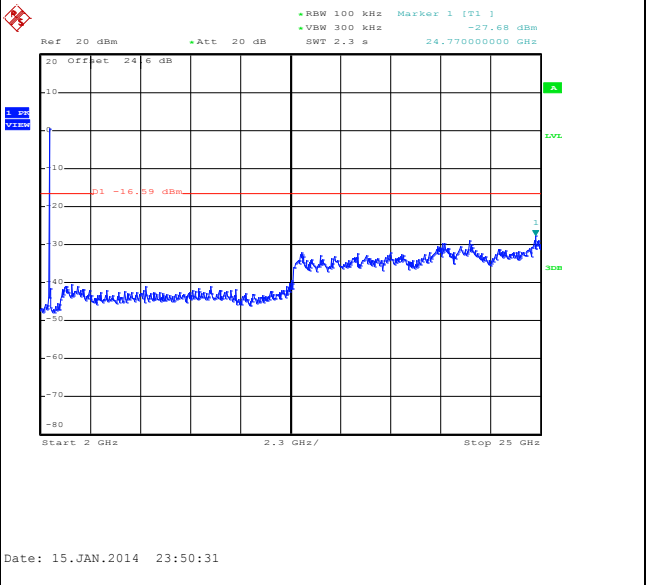
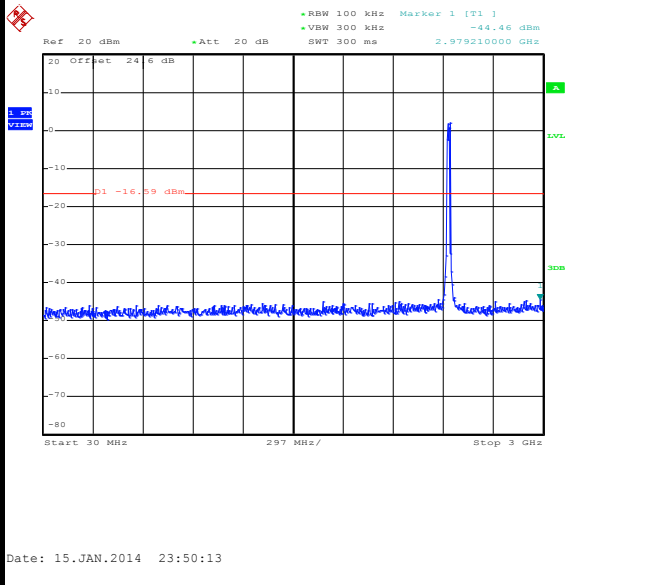
100kHz PSD reference Level

Mid. Channel Plot



Spurious Emission 30MHz~3GHz

Spurious Emission 2GHz~25GHz

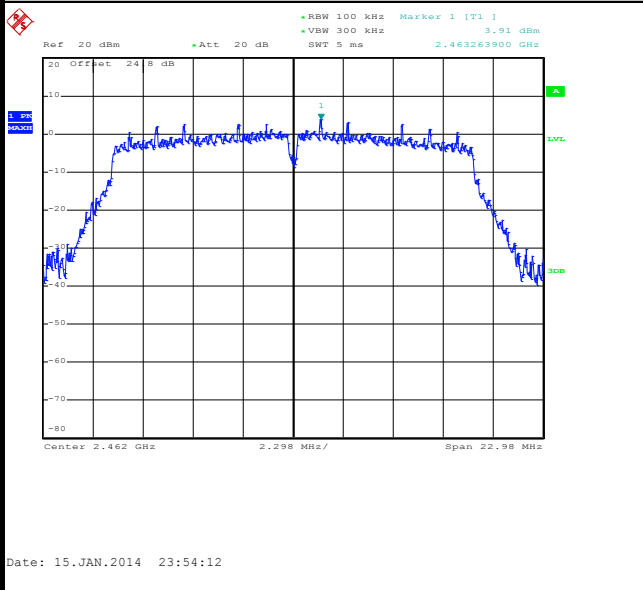




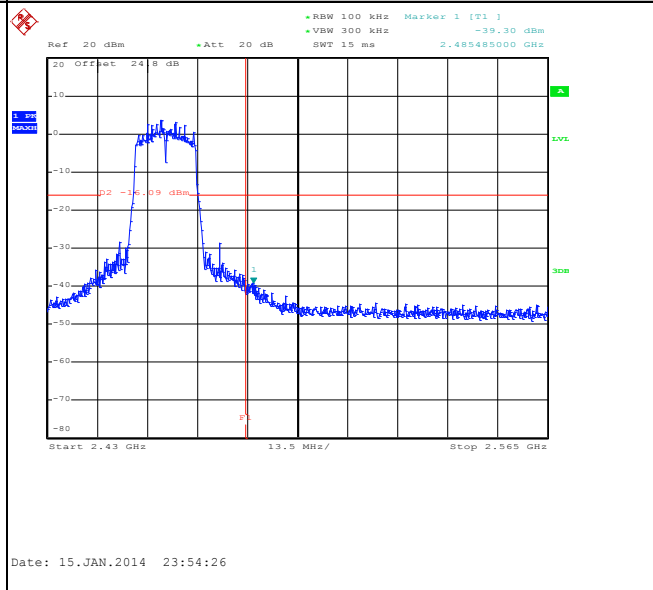
Test Mode :	802.11g	Temperature :	21~26°C
Test Band :	2.4GHz High	Relative Humidity :	45~54%
Test Channel :	11	Test Engineer :	Osolemio Chang

WLAN 802.11g Channel 11

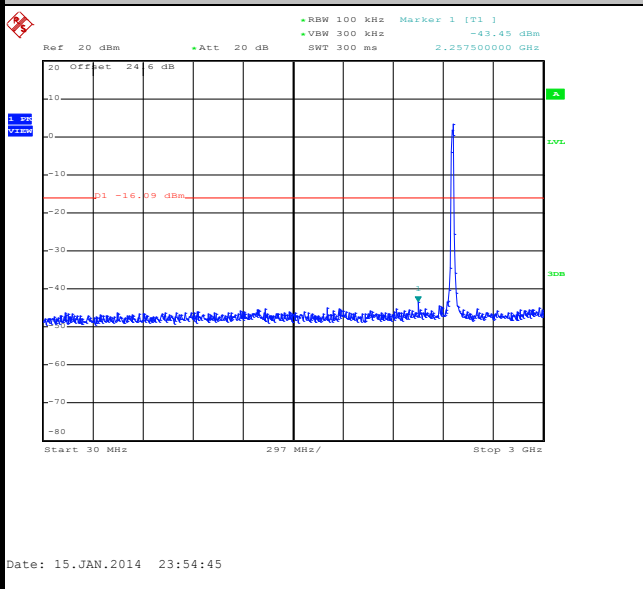
100kHz PSD reference Level



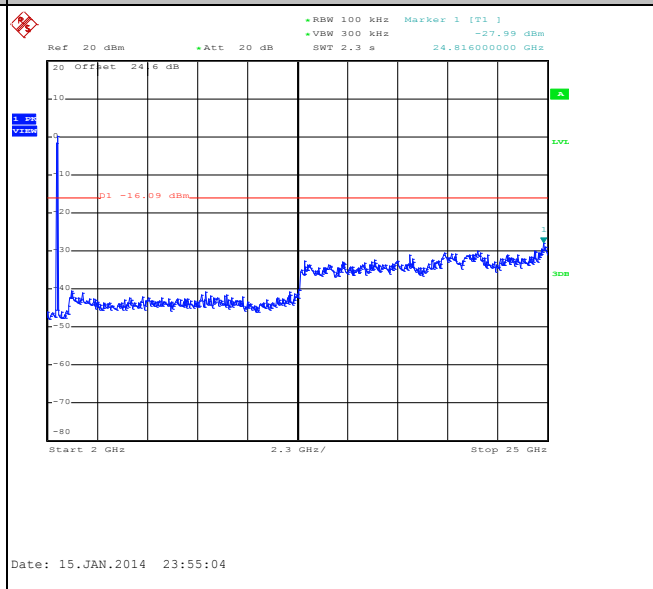
High Channel Plot



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

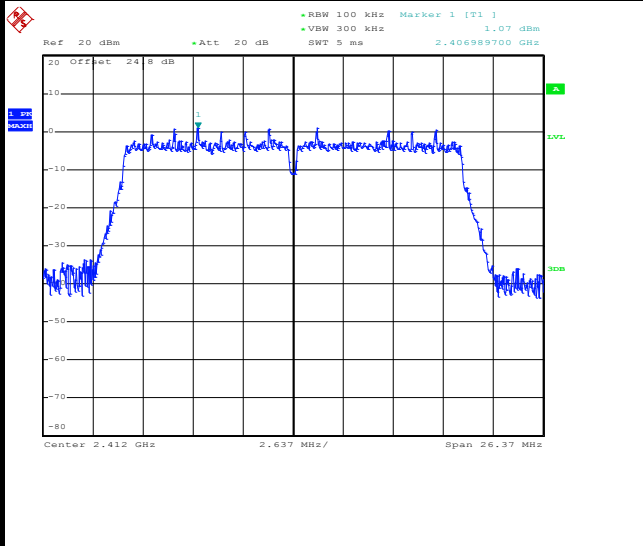




Test Mode :	802.11n HT20	Temperature :	21~26°C
Test Band :	2.4GHz Low	Relative Humidity :	45~54%
Test Channel :	01	Test Engineer :	Osolemio Chang

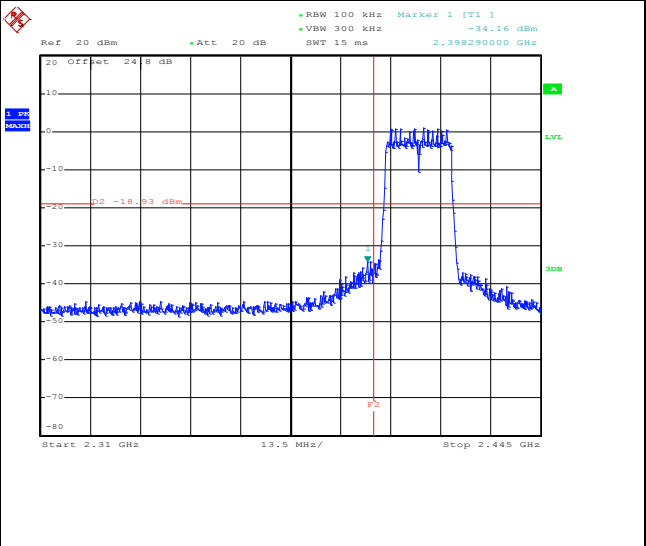
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



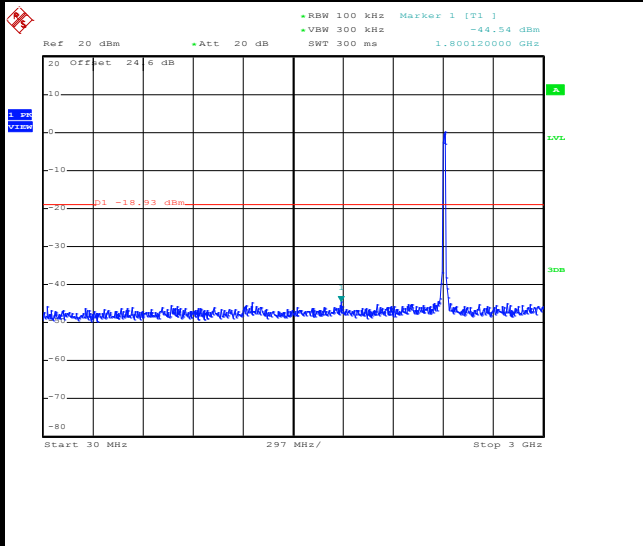
Date: 16.JAN.2014 01:10:51

Low Channel Plot



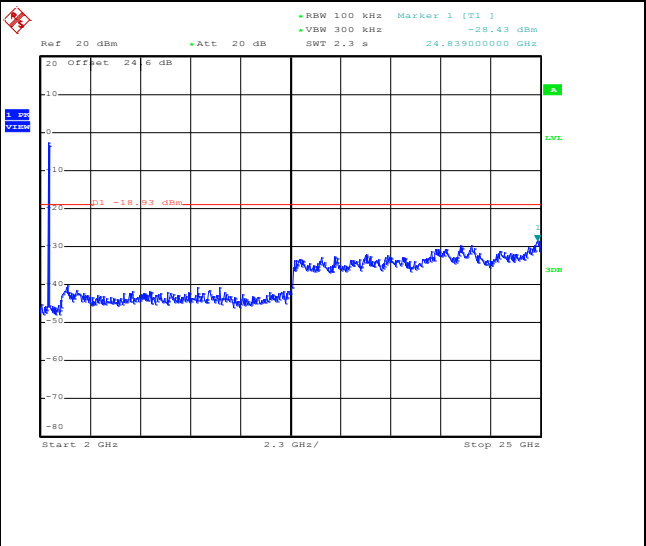
Date: 16.JAN.2014 01:12:50

Spurious Emission 30MHz~3GHz



Date: 16.JAN.2014 01:11:24

Spurious Emission 2GHz~25GHz



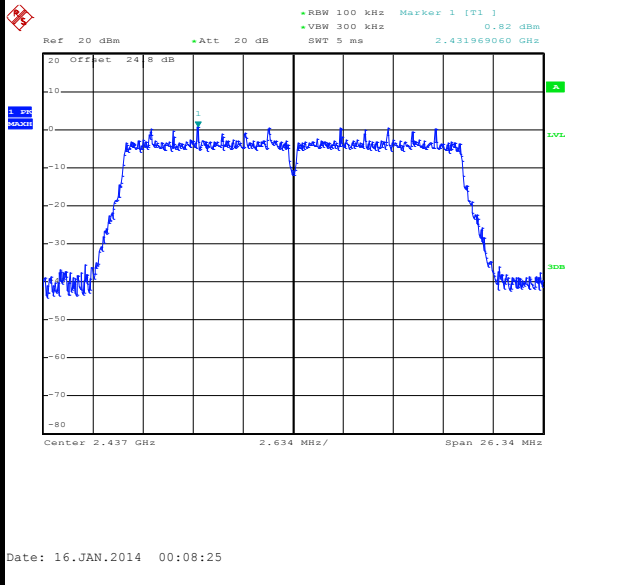
Date: 16.JAN.2014 01:11:43



Test Mode :	802.11n HT20	Temperature :	21~26°C
Test Band :	2.4GHz Mid.	Relative Humidity :	45~54%
Test Channel :	06	Test Engineer :	Osolemio Chang

WLAN 802.11n HT20 Channel 06

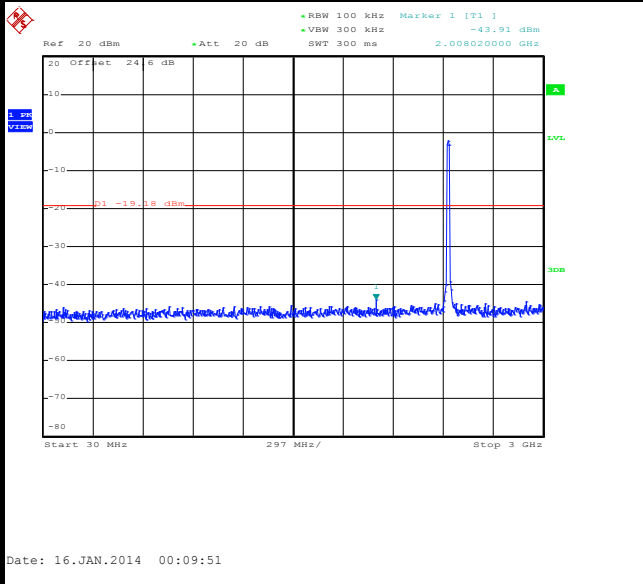
100kHz PSD reference Level



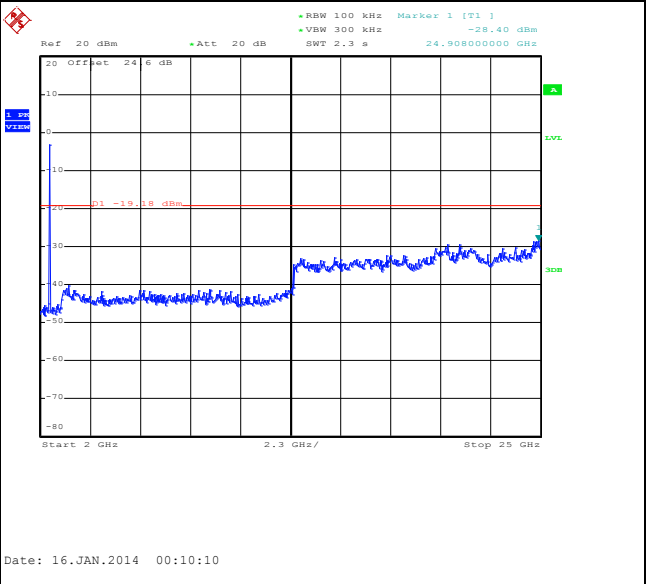
Mid. Channel Plot



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

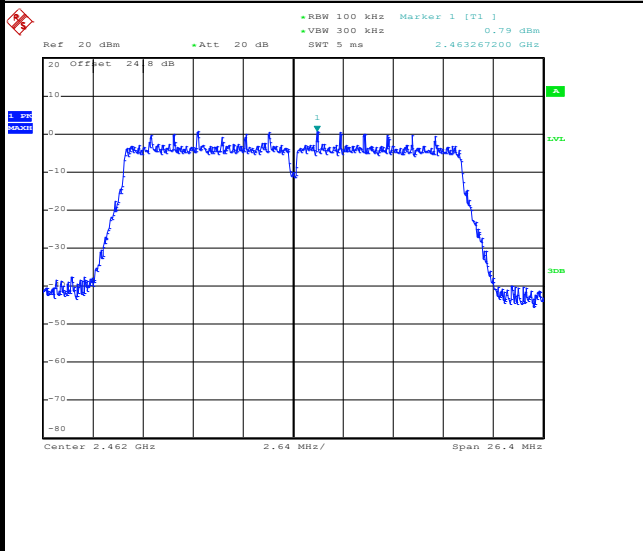




Test Mode :	802.11n HT20	Temperature :	21~26°C
Test Band :	2.4GHz High	Relative Humidity :	45~54%
Test Channel :	11	Test Engineer :	Osolemio Chang

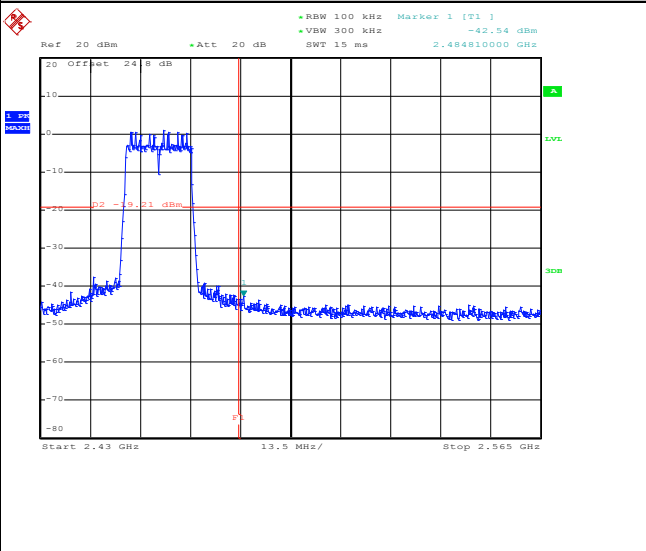
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



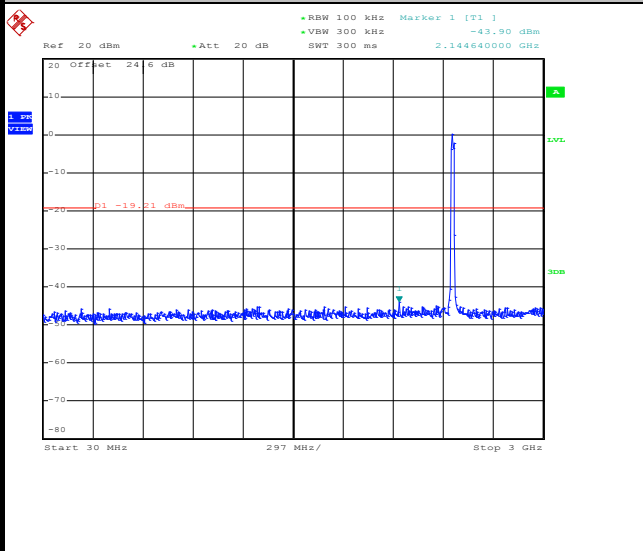
Date: 16.JAN.2014 00:14:12

High Channel Plot



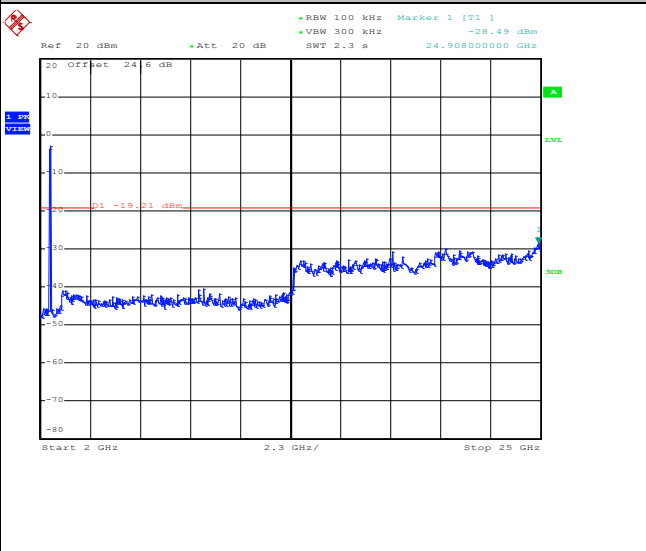
Date: 16.JAN.2014 00:14:26

Spurious Emission 30MHz~3GHz



Date: 16.JAN.2014 00:15:51

Spurious Emission 2GHz~25GHz



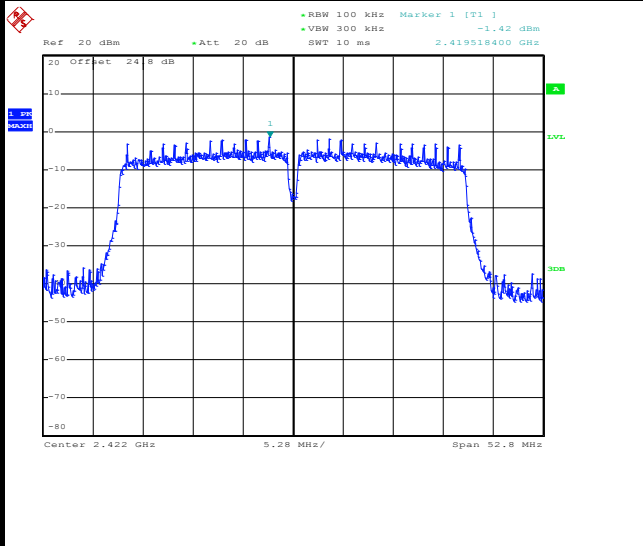
Date: 16.JAN.2014 00:16:10



Test Mode :	802.11n HT40	Temperature :	21~26°C
Test Band :	2.4GHz Low	Relative Humidity :	45~54%
Test Channel :	03	Test Engineer :	Osolemio Chang

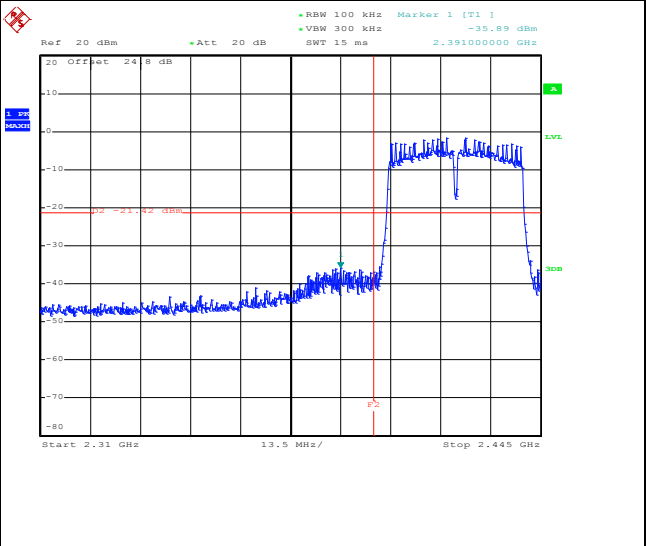
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



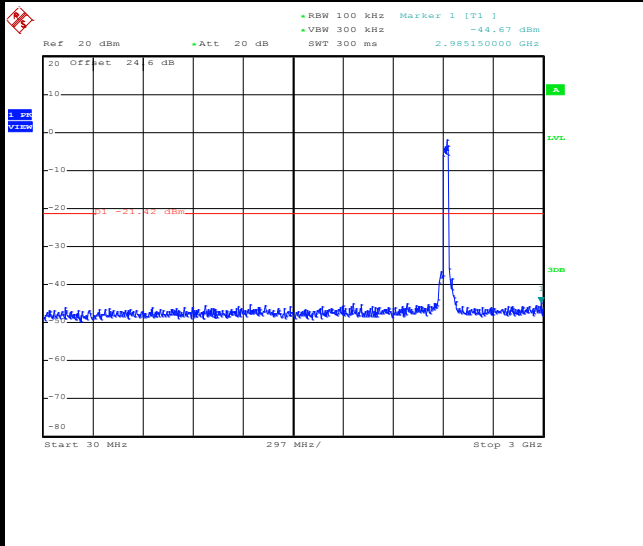
Date: 16.JAN.2014 00:19:59

Low Channel Plot



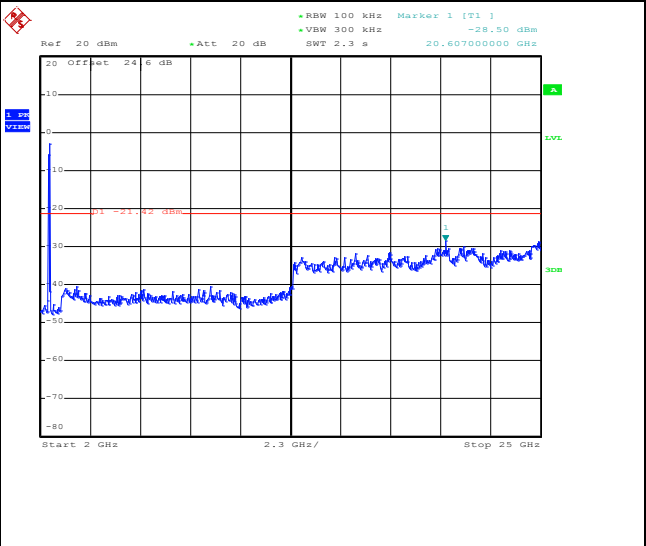
Date: 16.JAN.2014 00:20:13

Spurious Emission 30MHz~3GHz



Date: 16.JAN.2014 00:23:10

Spurious Emission 2GHz~25GHz



Date: 16.JAN.2014 00:23:28

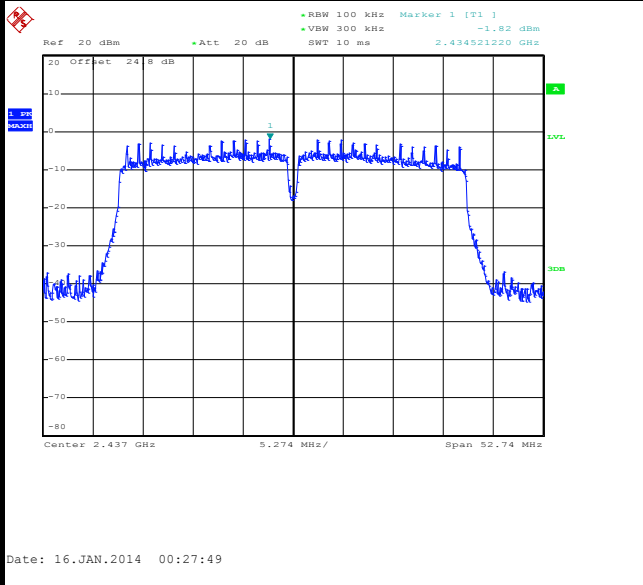


Test Mode :	802.11n HT40	Temperature :	21~26°C
Test Band :	2.4GHz Mid.	Relative Humidity :	45~54%
Test Channel :	06	Test Engineer :	Osolemio Chang

WLAN 802.11n HT40 Channel 06

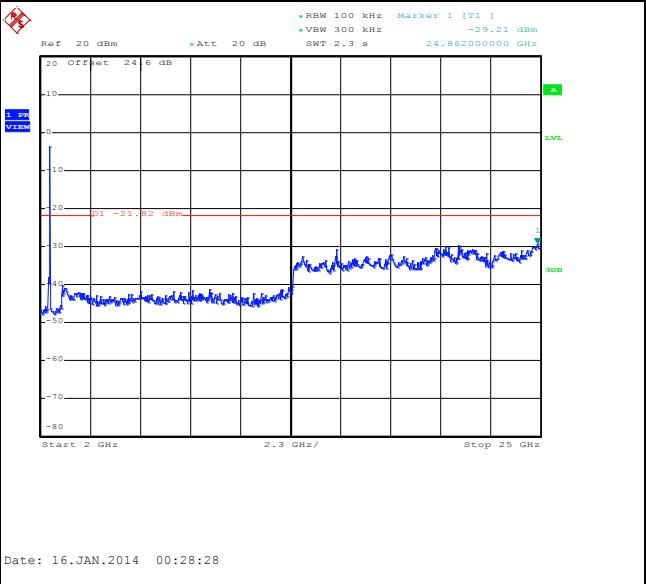
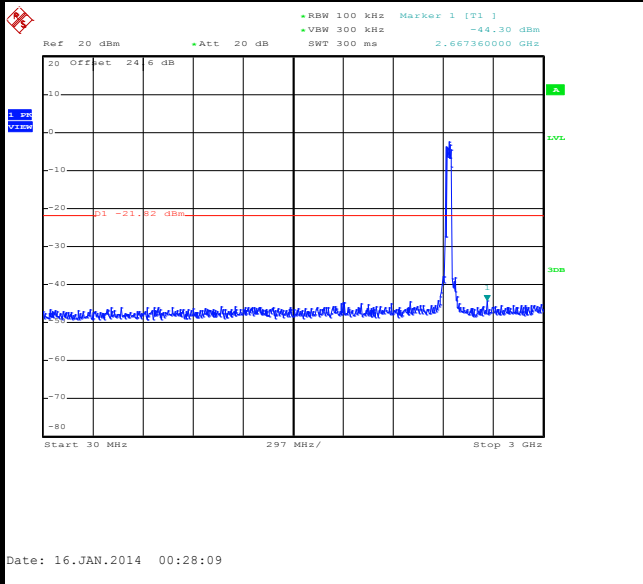
100kHz PSD reference Level

Mid. Channel Plot



Spurious Emission 30MHz~3GHz

Spurious Emission 2GHz~25GHz

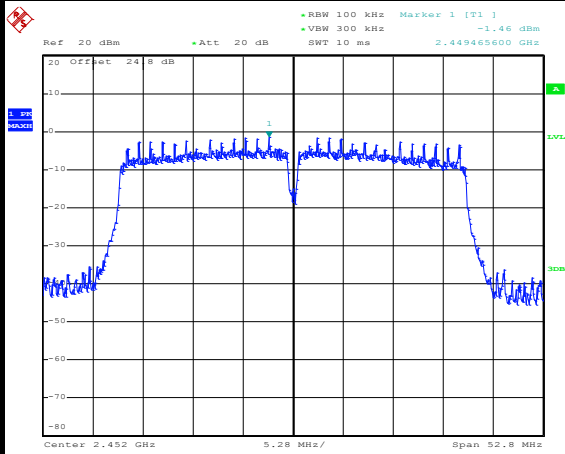




Test Mode :	802.11n HT40	Temperature :	21~26°C
Test Band :	2.4GHz High	Relative Humidity :	45~54%
Test Channel :	09	Test Engineer :	Osolemio Chang

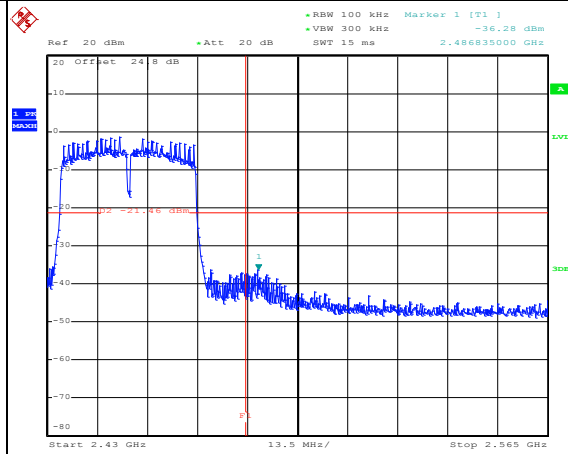
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



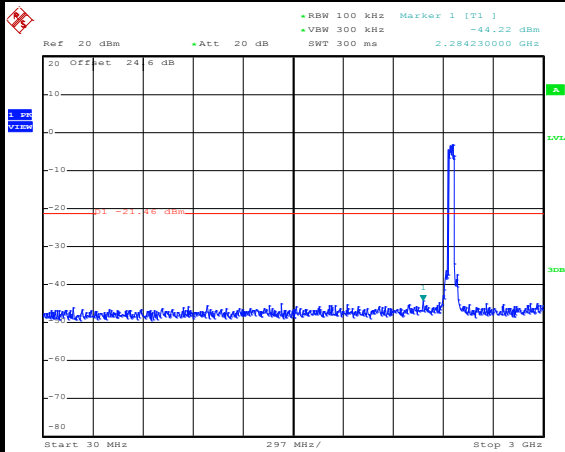
Date: 16.JAN.2014 00:35:29

High Channel Plot



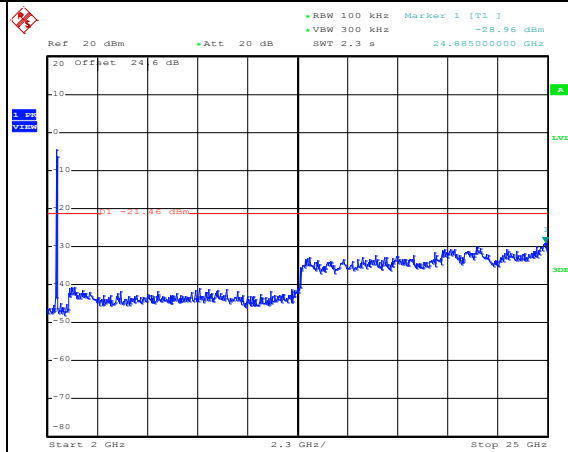
Date: 16.JAN.2014 00:35:43

Spurious Emission 30MHz~3GHz



Date: 16.JAN.2014 00:53:53

Spurious Emission 2GHz~25GHz



Date: 16.JAN.2014 00:54:11



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.

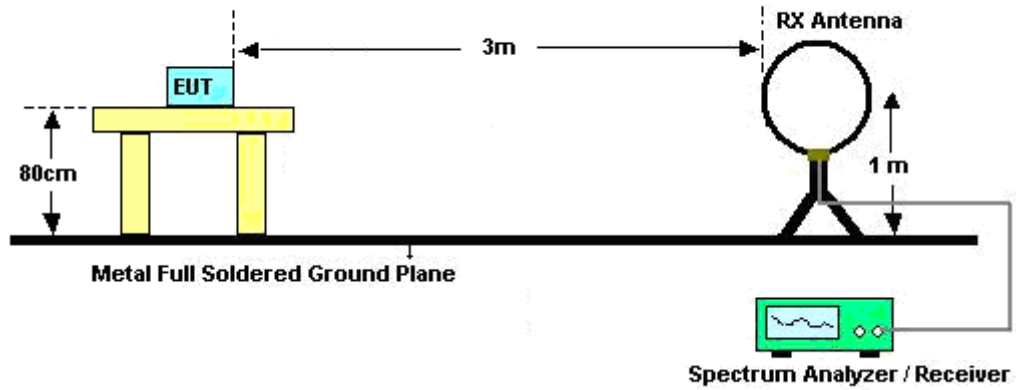
For average measurement:

 - 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.

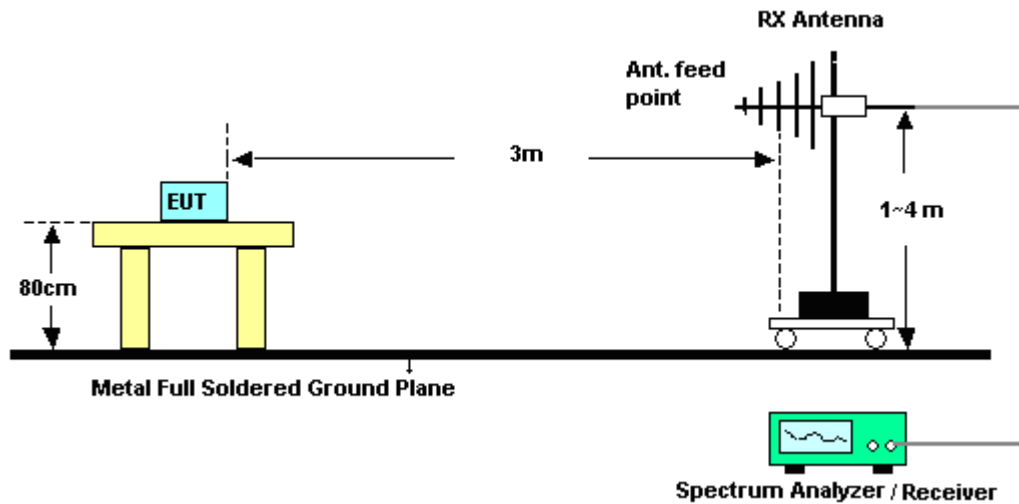
Band	Duty Cycle(%)	T(μs)	1/T(kHz)	VBW Setting
802.11b	98.03	-	-	10Hz
802.11g	88.78	1394.231	0.717	3kz
2.4GHz 802.11n HT20	88.04	1298.077	0.770	3kz
2.4GHz 802.11n HT40	78.95	649.038	1.541	3kz

3.5.4 Test Setup

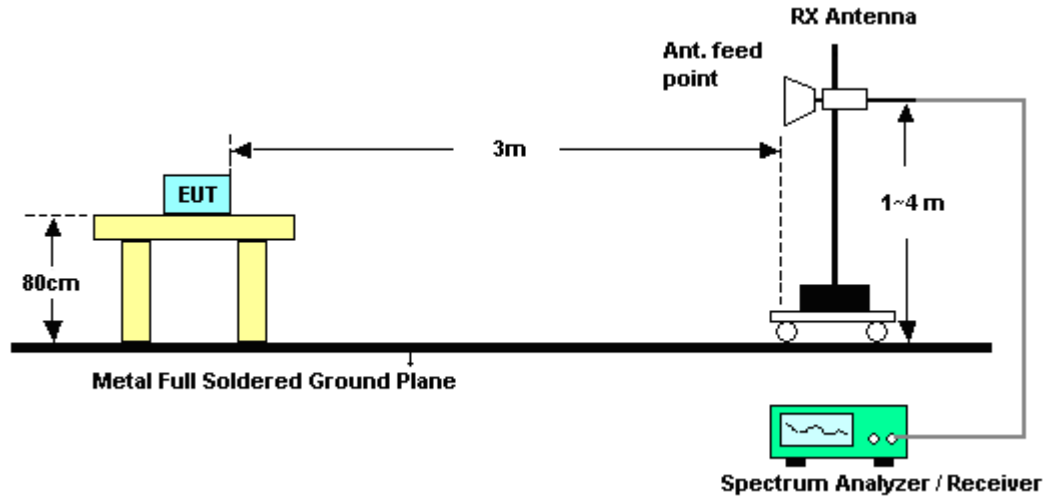
For radiated emissions below 30MHz



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 :	23~24°C
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Gavin Wu

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
2386.59	56.13	-17.87	74	52.09	31.92	6.45	34.33	135	317	Peak
2382.99	41.9	-12.1	54	37.88	31.9	6.45	34.33	135	317	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.84	50.51	-23.49	74	46.47	31.92	6.45	34.33	156	330	Peak
2384.34	37.2	-16.8	54	33.18	31.9	6.45	34.33	156	330	Average

Test Mode :	802.11b	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Gavin Wu

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
2489.11	54.44	-19.56	74	50.15	32	6.59	34.3	100	317	Peak
2483.5	40.91	-13.09	54	36.63	31.99	6.59	34.3	100	317	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
2488.42	51.63	-22.37	74	47.34	32	6.59	34.3	171	262	Peak
2483.5	39.23	-14.77	54	34.95	31.99	6.59	34.3	171	262	Average



Test Mode :	802.11g	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Gavin Wu

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
2388.12	70.55	-3.45	74	66.51	31.92	6.45	34.33	104	28	Peak
2390	49.33	-4.67	54	45.29	31.92	6.45	34.33	104	28	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.84	68.86	-5.14	74	64.82	31.92	6.45	34.33	124	125	Peak
2389.47	47.69	-6.31	54	43.65	31.92	6.45	34.33	124	125	Average

Test Mode :	802.11g	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Gavin Wu

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
2483.74	70.93	-3.07	74	66.65	31.99	6.59	34.3	105	34	Peak
2483.71	45.57	-8.43	54	41.29	31.99	6.59	34.3	105	34	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
2483.95	66.81	-7.19	74	62.53	31.99	6.59	34.3	117	133	Peak
2483.68	41.91	-12.09	54	37.63	31.99	6.59	34.3	117	133	Average



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Gavin Wu

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
2389.02	70.04	-3.96	74	66	31.92	6.45	34.33	104	31	Peak
2389.92	46.34	-7.66	54	42.3	31.92	6.45	34.33	104	31	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	69.07	-4.93	74	65.03	31.92	6.45	34.33	124	123	Peak
2388.93	44.79	-9.21	54	40.75	31.92	6.45	34.33	124	123	Average

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Gavin Wu

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
2483.68	70.41	-3.59	74	66.13	31.99	6.59	34.3	104	34	Peak
2483.8	47.54	-6.46	54	43.26	31.99	6.59	34.3	104	34	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
2483.68	64.58	-9.42	74	60.3	31.99	6.59	34.3	117	134	Peak
2483.65	41.74	-12.26	54	37.46	31.99	6.59	34.3	117	134	Average



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	03	Test Engineer :	Gavin Wu

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
2388.21	69.83	-4.17	74	65.79	31.92	6.45	34.33	194	36	Peak
2388.75	50.99	-3.01	54	46.95	31.92	6.45	34.33	194	36	Average
2487.85	56.38	-17.62	74	52.09	32	6.59	34.3	194	36	Peak
2483.95	39.8	-14.2	54	35.52	31.99	6.59	34.3	194	36	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
2379.48	48.07	-25.93	74	44.08	31.9	6.42	34.33	121	106	Peak
2388.57	35.5	-18.5	54	31.46	31.92	6.45	34.33	121	106	Average
2486.38	47.81	-26.19	74	43.53	31.99	6.59	34.3	121	106	Peak
2487.4	35.44	-18.56	54	31.16	31.99	6.59	34.3	121	106	Average



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	09	Test Engineer :	Gavin Wu

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
2389.83	58.06	-15.94	74	54.02	31.92	6.45	34.33	193	60	Peak
2390	42.23	-11.77	54	38.19	31.92	6.45	34.33	193	60	Average
2483.56	70.91	-3.09	74	66.63	31.99	6.59	34.3	193	60	Peak
2483.62	47.56	-6.44	54	43.28	31.99	6.59	34.3	193	60	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
2385.15	54.31	-19.69	74	50.29	31.9	6.45	34.33	122	123	Peak
2389.29	39.53	-14.47	54	35.49	31.92	6.45	34.33	122	123	Average
2485.72	65.62	-8.38	74	61.34	31.99	6.59	34.3	122	123	Peak
2483.5	42.95	-11.05	54	38.67	31.99	6.59	34.3	122	123	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 :	23~24°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	104.67	-	-	100.58	31.93	6.49	34.33	135	317	Average
2410	110.93	-	-	106.84	31.93	6.49	34.33	135	317	Peak
4824	50.57	-23.43	74	61.59	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	96.23	-	-	92.14	31.93	6.49	34.33	156	330	Average
2410	102.21	-	-	98.12	31.93	6.49	34.33	156	330	Peak
4824	49.36	-24.64	74	60.38	34.4	10.17	55.59	100	0	Peak



Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
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	104.41	-	-	100.25	31.96	6.52	34.32	196	50	Average
2439	109.3	-	-	105.14	31.96	6.52	34.32	196	50	Peak
4875	50.89	-23.11	74	62.02	34.37	10.18	55.68	100	0	Peak
7311	48.86	-25.14	74	58.59	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	100.3	-	-	96.14	31.96	6.52	34.32	122	111	Average
2439	105.18	-	-	101.02	31.96	6.52	34.32	122	111	Peak
4875	48	-26	74	59.13	34.37	10.18	55.68	100	0	Peak
7311	48.89	-25.11	74	58.62	35.61	10.94	56.28	100	0	Peak



Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
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	101.49	-	-	97.27	31.97	6.56	34.31	100	317	Average
2464	107.81	-	-	103.59	31.97	6.56	34.31	100	317	Peak
4923	46.83	-27.17	74	58.07	34.34	10.2	55.78	100	0	Peak
7386	48.87	-25.13	74	58.5	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	98.61	-	-	94.39	31.97	6.56	34.31	171	262	Average
2464	104.65	-	-	100.43	31.97	6.56	34.31	171	262	Peak
4923	47.04	-26.96	74	58.28	34.34	10.2	55.78	100	0	Peak
7386	48.69	-25.31	74	58.32	35.56	10.92	56.11	100	0	Peak



Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	96.71	-	-	92.62	31.93	6.49	34.33	104	28	Average
2411	107.28	-	-	103.19	31.93	6.49	34.33	104	28	Peak
4824	49.5	-24.5	74	60.52	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	93.96	-	-	89.87	31.93	6.49	34.33	124	125	Average
2413	103.43	-	-	99.34	31.93	6.49	34.33	124	125	Peak
4824	47.29	-26.71	74	58.31	34.4	10.17	55.59	100	0	Peak



Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	96.7	-	-	92.54	31.96	6.52	34.32	100	36	Average
2438	106.85	-	-	102.69	31.96	6.52	34.32	100	36	Peak
4875	47.76	-26.24	74	58.89	34.37	10.18	55.68	100	0	Peak
7311	48.18	-25.82	74	57.91	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	93.03	-	-	88.87	31.96	6.52	34.32	121	130	Average
2438	102.99	-	-	98.83	31.96	6.52	34.32	121	130	Peak
4875	48.31	-25.69	74	59.44	34.37	10.18	55.68	100	0	Peak
7311	48.41	-25.59	74	58.14	35.61	10.94	56.28	100	0	Peak



Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	1. 2461 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
42.96	25.36	-14.64	40	45.48	10.92	0.75	31.79	105	332	Peak
44.85	22.84	-17.16	40	44.26	9.6	0.76	31.78	-	-	Peak
113.7	18.51	-24.99	43.5	37.01	12.07	1.18	31.75	-	-	Peak
583.5	21.71	-24.29	46	31.7	19.36	2.69	32.04	-	-	Peak
637.4	22.01	-23.99	46	31.61	19.66	2.79	32.05	-	-	Peak
678	21.35	-24.65	46	31.11	19.42	2.85	32.03	-	-	Peak
2461	96.15	-	-	91.93	31.97	6.56	34.31	105	34	Average
2461	106.44	-	-	102.22	31.97	6.56	34.31	105	34	Peak
4923	47.38	-26.62	74	58.62	34.34	10.2	55.78	100	0	Peak
7386	49.52	-24.48	74	59.15	35.56	10.92	56.11	100	0	Peak



Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	1. 2461 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
30.54	23.18	-16.82	40	36.43	17.9	0.65	31.8	-	-	Peak
52.14	22.34	-17.66	40	45.64	7.66	0.82	31.78	-	-	Peak
60.24	23.5	-16.5	40	47.8	6.6	0.87	31.77	100	258	Peak
721.4	22.42	-23.58	46	31.63	19.84	2.96	32.01	-	-	Peak
746.6	22.95	-23.05	46	31.73	20.17	3.04	31.99	-	-	Peak
823.6	23.53	-22.47	46	31.77	20.47	3.14	31.85	-	-	Peak
2461	92.63	-	-	88.41	31.97	6.56	34.31	117	133	Average
2461	102.83	-	-	98.61	31.97	6.56	34.31	117	133	Peak
4923	47.5	-26.5	74	58.74	34.34	10.2	55.78	100	0	Peak
7386	48.57	-25.43	74	58.2	35.56	10.92	56.11	100	0	Peak



Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	93.96	-	-	89.87	31.93	6.49	34.33	104	31	Average
2411	104.1	-	-	100.01	31.93	6.49	34.33	104	31	Peak
4824	47.83	-26.17	74	58.85	34.4	10.17	55.59	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	91.55	-	-	87.46	31.93	6.49	34.33	124	123	Average
2413	101.18	-	-	97.09	31.93	6.49	34.33	124	123	Peak
4824	47.38	-26.62	74	58.4	34.4	10.17	55.59	100	0	Peak



Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	94.44	-	-	90.3	31.94	6.52	34.32	104	23	Average
2436	105.1	-	-	100.96	31.94	6.52	34.32	104	23	Peak
4875	47.82	-26.18	74	58.95	34.37	10.18	55.68	100	0	Peak
7311	48.53	-25.47	74	58.26	35.61	10.94	56.28	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	91.33	-	-	87.19	31.94	6.52	34.32	123	131	Average
2436	101.42	-	-	97.28	31.94	6.52	34.32	123	131	Peak
4875	48.33	-25.67	74	59.46	34.37	10.18	55.68	100	0	Peak
7311	48.89	-25.11	74	58.62	35.61	10.94	56.28	100	0	Peak



Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	1. 2461 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
2461	95.82	-	-	91.6	31.97	6.56	34.31	104	34	Average
2461	106.09	-	-	101.87	31.97	6.56	34.31	104	34	Peak
4923	47.2	-26.8	74	58.44	34.34	10.2	55.78	100	0	Peak
7386	48.93	-25.07	74	58.56	35.56	10.92	56.11	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	1. 2461 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
2461	91.57	-	-	87.35	31.97	6.56	34.31	117	134	Average
2461	101.7	-	-	97.48	31.97	6.56	34.31	117	134	Peak
4923	46.78	-27.22	74	58.02	34.34	10.2	55.78	100	0	Peak
7386	49.47	-24.53	74	59.1	35.56	10.92	56.11	100	0	Peak



Test Mode :	2.4GHz 802.11n HT40	Temperature :	23~24°C
Test Channel :	03	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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
42.96	25.36	-14.64	40	45.48	10.92	0.75	31.79	102	185	Peak
94.8	17.95	-25.55	43.5	38.52	10.1	1.08	31.75	-	-	Peak
113.7	18.51	-24.99	43.5	37.01	12.07	1.18	31.75	-	-	Peak
637.4	22.01	-23.99	46	31.61	19.66	2.79	32.05	-	-	Peak
707.4	21.83	-24.17	46	31.47	19.47	2.91	32.02	-	-	Peak
739.6	23.62	-22.38	46	32.49	20.1	3.02	31.99	-	-	Peak
2424	91.51	-	-	87.4	31.94	6.49	34.32	194	36	Average
2424	101.35	-	-	97.24	31.94	6.49	34.32	194	36	Peak
4845	46.59	-27.41	74	57.65	34.39	10.17	55.62	100	0	Peak
7266	47.92	-26.08	74	57.69	35.63	10.95	56.35	100	0	Peak



Test Mode :	2.4GHz 802.11n HT40	Temperature :	23~24°C
Test Channel :	03	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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
34.05	22.78	-17.22	40	37.79	16.1	0.68	31.79	-	-	Peak
60.24	23.5	-16.5	40	47.8	6.6	0.87	31.77	102	324	Peak
91.56	19.34	-24.16	43.5	41.14	8.9	1.06	31.76	-	-	Peak
583.5	22.2	-23.8	46	32.19	19.36	2.69	32.04	-	-	Peak
704.6	21.59	-24.41	46	31.27	19.44	2.9	32.02	-	-	Peak
746.6	22.95	-23.05	46	31.73	20.17	3.04	31.99	-	-	Peak
2424	86.91	-	-	82.8	31.94	6.49	34.32	121	106	Average
2424	96.87	-	-	92.76	31.94	6.49	34.32	121	106	Peak
4845	46.56	-27.44	74	57.62	34.39	10.17	55.62	100	0	Peak
7266	47.82	-26.18	74	57.59	35.63	10.95	56.35	100	0	Peak



Test Mode :	2.4GHz 802.11n HT40	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
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	95.17	-	-	91.01	31.96	6.52	34.32	198	45	Average
2439	103.94	-	-	99.78	31.96	6.52	34.32	198	45	Peak
4875	47.53	-26.47	74	58.66	34.37	10.18	55.68	100	0	Peak
7311	49.07	-24.93	74	58.8	35.61	10.94	56.28	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	89.73	-	-	85.57	31.96	6.52	34.32	121	118	Average
2439	98.89	-	-	94.73	31.96	6.52	34.32	121	118	Peak
4875	48.55	-25.45	74	59.68	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 :	2.4GHz 802.11n HT40	Temperature :	23~24°C
Test Channel :	09	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	93.88	-	-	89.66	31.97	6.56	34.31	193	60	Average
2454	103.9	-	-	99.68	31.97	6.56	34.31	193	60	Peak
4905	47.64	-26.36	74	58.83	34.35	10.2	55.74	100	0	Peak
7356	48.57	-25.43	74	58.25	35.58	10.92	56.18	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	23~24°C
Test Channel :	09	Relative Humidity :	47~48%
Test Engineer :	Gavin Wu	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	88.53	-	-	84.31	31.97	6.56	34.31	122	123	Average
2454	97.85	-	-	93.63	31.97	6.56	34.31	122	123	Peak
4905	47.31	-26.69	74	58.5	34.35	10.2	55.74	100	0	Peak
7356	50.05	-23.95	74	59.73	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.

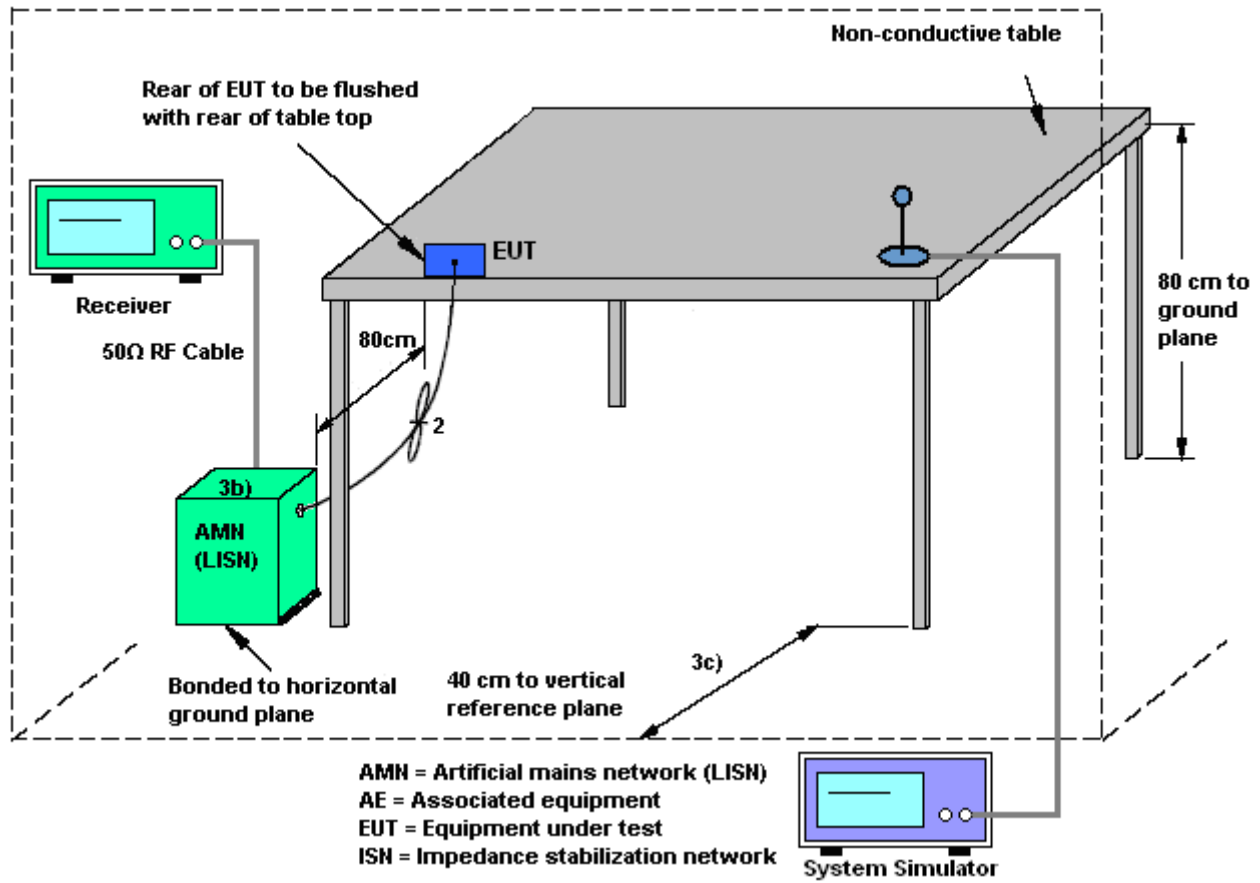
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

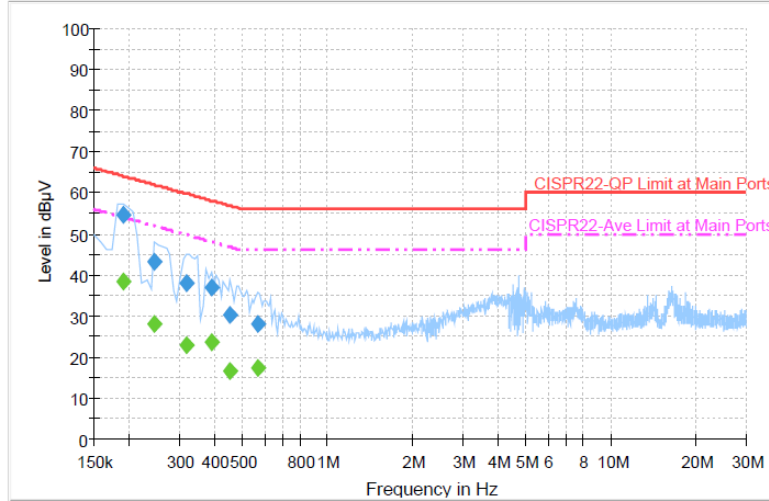
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other 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°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + GPS Rx + USB Cable (Data Link with Notebook) + Battery + Earphone + SIM 1		



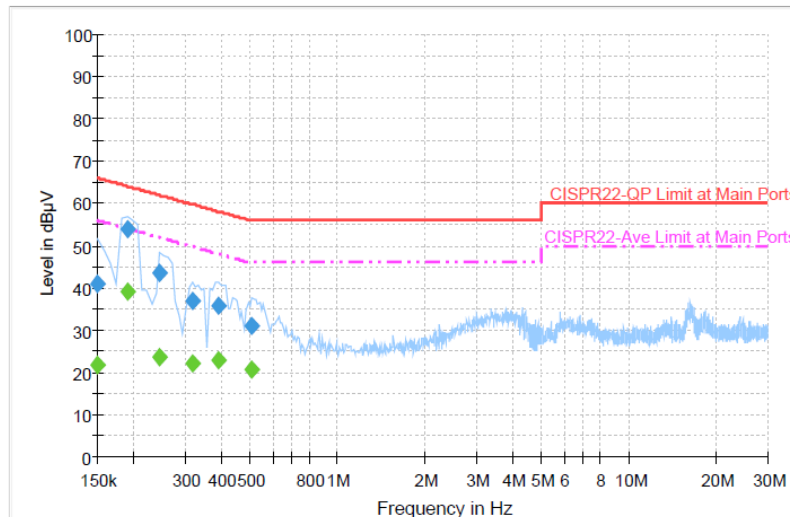
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	54.5	Off	L1	19.4	9.5	64.0
0.246000	43.0	Off	L1	19.4	18.9	61.9
0.318000	38.0	Off	L1	19.4	21.8	59.8
0.390000	36.8	Off	L1	19.4	21.3	58.1
0.454000	30.3	Off	L1	19.3	26.5	56.8
0.566000	28.1	Off	L1	19.4	27.9	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	38.4	Off	L1	19.4	15.6	54.0
0.246000	28.1	Off	L1	19.4	23.8	51.9
0.318000	22.7	Off	L1	19.4	27.1	49.8
0.390000	23.5	Off	L1	19.4	24.6	48.1
0.454000	16.6	Off	L1	19.3	30.2	46.8
0.566000	17.3	Off	L1	19.4	28.7	46.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + GPS Rx + USB Cable (Data Link with Notebook) + Battery + Earphone + SIM 1		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	41.0	Off	N	19.4	25.0	66.0
0.190000	53.7	Off	N	19.4	10.3	64.0
0.246000	43.7	Off	N	19.4	18.2	61.9
0.318000	36.8	Off	N	19.4	23.0	59.8
0.390000	35.8	Off	N	19.4	22.3	58.1
0.510000	31.2	Off	N	19.4	24.8	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	21.7	Off	N	19.4	34.3	56.0
0.190000	38.9	Off	N	19.4	15.1	54.0
0.246000	23.8	Off	N	19.4	28.1	51.9
0.318000	22.1	Off	N	19.4	27.7	49.8
0.390000	23.0	Off	N	19.4	25.1	48.1
0.510000	20.7	Off	N	19.4	25.3	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

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	Jan. 13, 2014~ Jan. 16, 2014	Jun. 06, 2014	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Aug. 17, 2013	Jan. 13, 2014~ Jan. 16, 2014	Aug. 16, 2014	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 17, 2013	Jan. 13, 2014~ Jan. 16, 2014	Aug. 16, 2014	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 15, 2013	Jan. 13, 2014	Nov. 14, 2014	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2013	Jan. 13, 2014	Dec. 11, 2014	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 04, 2013	Jan. 13, 2014	Dec. 03, 2014	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jan. 13, 2014	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	FSP30	101067	9kHz ~ 30GHz	Nov. 20, 2013	Jan. 10, 2014~ Jan. 31, 2014	Nov. 19, 2014	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9kHz ~ 26.5GHz	Dec. 02, 2013	Jan. 10, 2014~ Jan. 31, 2014	Dec. 01, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2013	Jan. 10, 2014~ Jan. 31, 2014	May 05, 2014	Radiation (03CH06-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	860004/0001	9kHz ~ 30MHz	Jul. 03, 2012	Jan. 10, 2014~ Jan. 31, 2014	Jul. 02, 2014	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL6112B	2885	30MHz ~ 2GHz	Oct. 10, 2013	Jan. 10, 2014~ Jan. 31, 2014	Oct. 09, 2014	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 02, 2013	Jan. 10, 2014~ Jan. 31, 2014	Aug. 01, 2014	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz ~ 1GHz	Apr. 12, 2013	Jan. 10, 2014~ Jan. 31, 2014	Apr. 11, 2014	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2013	Jan. 10, 2014~ Jan. 31, 2014	Jul. 17, 2014	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Oct. 03, 2013	Jan. 10, 2014~ Jan. 31, 2014	Oct. 02, 2014	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 12, 2013	Jan. 10, 2014~ Jan. 31, 2014	Apr. 11, 2014	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	Jan. 10, 2014~ Jan. 31, 2014	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Jan. 10, 2014~ Jan. 31, 2014	N/A	Radiation (03CH06-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
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

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