

FCC RF Test Report

APPLICANT : Lenovo (Shanghai) Electronics Technology Co., Ltd.
EQUIPMENT : Portable Tablet Computer
BRAND NAME : lenovo
MODEL NAME : YOGA Tablet 2 Pro-1380F
FCC ID : O57YT2PRO1380F
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Jul. 10, 2014 and testing was completed on Aug. 27, 2014. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



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



TABLE OF CONTENTS

REVISION HISTORY.....	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant.....	5
1.2 Manufacturer.....	5
1.3 Factory.....	5
1.4 Product Feature of Equipment Under Test.....	5
1.5 Product Specification subjective to this standard	6
1.6 Modification of EUT	7
1.7 Testing Location	7
1.8 Applicable Standards.....	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 Carrier Frequency and Channel	8
2.2 Pre-Scanned RF Power.....	9
2.3 Test Mode.....	11
2.4 Connection Diagram of Test System.....	13
2.5 Support Unit used in test configuration and system	14
2.6 EUT Operation Test Setup	14
2.7 Measurement Results Explanation Example.....	14
3 TEST RESULT.....	15
3.1 6dB and 99% Bandwidth Measurement	15
3.2 Peak Output Power Measurement	18
3.3 Power Spectral Density Measurement	21
3.4 Conducted Band Edges and Spurious Emission Measurement	24
3.5 Radiated Band Edges and Spurious Emission Measurement	49
3.6 AC Conducted Emission Measurement.....	82
3.7 Antenna Requirements.....	86
4 LIST OF MEASURING EQUIPMENT	88
5 UNCERTAINTY OF EVALUATION	89
APPENDIX A. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR471003C	Rev. 01	Initial issue of report	Sep. 03, 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 2.78 dB at 4924.000 MHz
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 8.55 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

Lenovo (Shanghai) Electronics Technology Co., Ltd.

No. 68 Building, 199 Fenju Road, Wai Gao Qiao FTZ, Shanghai, China

1.2 Manufacturer

Lenovo PC HK Limited

23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong

1.3 Factory

LENOVO MOBILE COMMUNICATION TECHNOLOGY CO., LTD

NO.999 QISHAN NORTH 2ND ROAD, INFORMATION & OPTOELECTRONICS PARK, TORCH HIGH TECH, XIAMEN FUJIAN 361009, CHINA

LENOVO MOBILE COMMUNICATION (WUHAN) CO., LTD

19 GAOXIN 4TH RD EAST LAKE HIGH-TECH, ZONE WUHAN HUBEI 430205, CHINA

1.4 Product Feature of Equipment Under Test

Product Feature	
Equipment	Portable Tablet Computer
Brand Name	lenovo
Model Name	YOGA Tablet 2 Pro-1380F
FCC ID	O57YT2PRO1380F
EUT supports Radios application	WLAN2.4GHz 802.11b/g/n HT20/HT40 WLAN5GHz 802.11a/n HT20/HT40 Bluetooth v3.0+EDR/Bluetooth v4.0 LE
HW Version	H001
SW Version	S100
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are two types of EUT sample 1 and sample 2, the differences between two samples are only different supplier for Battery/EMMC/Panel/Touch panel/front and back camera.

1.5 Product Specification subjective to this standard

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	<2412 MHz ~ 2462 MHz > 802.11b : 18.37 dBm (0.0687 W) 802.11g : 23.71 dBm (0.2350 W) 802.11n HT20 : 23.02 dBm (0.2004 W) 802.11n HT40 : 20.65 dBm (0.1161 W)		
99% Occupied Bandwidth	<2412 MHz ~ 2462 MHz> 802.11b : 11.30MHz 802.11g : 17.25MHz 802.11n HT20 : 17.95MHz 802.11n HT40 : 36.80MHz		
Antenna Type	< Chain Port 0> 802.11b/g/n : IFA Antenna with gain 0.90 dBi < Chain Port 1> 802.11b/g/n : IFA Antenna with gain 0.80 dBi		
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)		
Antenna Function for Transmitter			
		Chain Port 0	Chain Port 1
	802.11 b	V	V
	802.11 g	V	V
	802.11 n SISO	V	V
	802.11 n MIMO	V	V

1.6 Modification of EUT

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

1.7 Testing Location

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

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

1.8 Applicable 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 v03r02
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.4-2003
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3
- NOTICE 2012-DRS0126

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.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, "Receivers Excluded from Industry Canada Requirements", only radiocommunication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

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 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 and 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.

Channel	Frequency (MHz)	Chain Port	2.4GHz 802.11b RF Power (dBm)				
			Data Rate	Power vs. Data Rate			
			1Mbps	Channel	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412	0	17.29	CH 11	17.26	17.21	17.23
CH 06	2437	0	17.13				
CH 11	2462	0	17.40				
CH 01	2412	1	18.37	CH 01	18.12	18.31	18.13
CH 06	2437	1	17.98				
CH 11	2462	1	17.76				

Channel	Frequency (MHz)	Chain Port	2.4GHz 802.11g RF Power (dBm)								
			Data Rate	Power vs. Data Rate							
			6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 01	2412	0	23.64	CH 11	23.69	23.13	23.31	23.22	23.63	23.68	23.58
CH 06	2437	0	23.46								
CH 11	2462	0	23.71								
CH 01	2412	1	20.89	CH 01	20.36	19.86	20.12	20.35	19.74	20.36	19.99
CH 06	2437	1	20.39								
CH 11	2462	1	20.15								



Channel	Frequency (MHz)	Chain Port	2.4GHz 802.11n HT-20 RF Power (dBm)								
			MCS Index	Power vs. MCS Index							
			MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	0	21.34	CH 06	21.86	21.66	21.31	21.39	20.80	21.27	21.46
CH 06	2437	0	22.16								
CH 11	2462	0	21.74								
CH 01	2412	1	22.12	CH 01	21.73	21.63	21.68	21.55	21.98	21.71	21.79
CH 06	2437	1	21.24								
CH 11	2462	1	21.71								
Channel	Frequency (MHz)	Chain Port	MCS Index MCS8	Channel	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
CH 01	2412	0+1(0)	19.34	CH 11	19.24	19.65	19.18	19.41	19.42	19.45	18.88
CH 06	2437	0+1(0)	19.32								
CH 11	2462	0+1(0)	19.91								
CH 01	2412	0+1(1)	19.04	CH 11	19.25	19.86	19.05	18.69	18.74	19.42	18.51
CH 06	2437	0+1(1)	19.49								
CH 11	2462	0+1(1)	20.11								
CH 01	2412	0+1	22.20	CH 11	22.26	22.77	22.13	22.08	22.10	22.45	21.71
CH 06	2437	0+1	22.42								
CH 11	2462	0+1	23.02								

Channel	Frequency (MHz)	Chain Port	2.4GHz 802.11n HT-40 RF Power (dBm)								
			MCS Index	Power vs. MCS Index							
			MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	0	19.56	CH 03	19.12	19.49	19.34	18.83	19.25	18.83	18.74
CH 06	2437	0	19.26								
CH 09	2452	0	19.05								
CH 03	2422	1	19.44	CH 03	19.28	19.21	19.38	18.55	18.38	18.92	19.22
CH 06	2437	1	19.11								
CH 09	2452	1	19.20								
Channel	Frequency (MHz)	Chain Port	MCS Index MCS8	Channel	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
CH 03	2422	0+1(0)	17.63	CH 03	17.23	17.14	17.35	17.34	17.43	17.31	17.58
CH 06	2437	0+1(0)	17.02								
CH 09	2452	0+1(0)	17.06								
CH 03	2422	0+1(1)	17.64	CH 03	17.18	17.45	17.36	17.38	17.58	17.32	17.15
CH 06	2437	0+1(1)	17.23								
CH 09	2452	0+1(1)	17.34								
CH 03	2422	0+1	20.65	CH 03	20.22	20.31	20.37	20.37	20.52	20.33	20.38
CH 06	2437	0+1	20.14								
CH 09	2452	0+1	20.21								

Note: Chain Port 0+1 is a calculated result from sum of the power Chain Port 0+1(0) and Chain Port 0+1(1).



2.3 Test Mode

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

<2.4GHz>

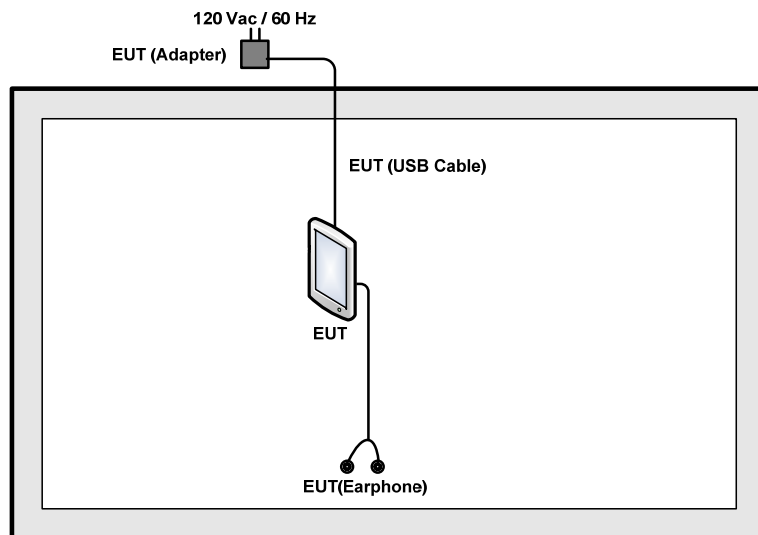
Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB and 99% BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0/ MCS8	1/6/11
		802.11n HT40	MCS0/ MCS8	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0/ MCS8	1/6/11
		802.11n HT40	MCS0/ MCS8	3/6/9
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0/ MCS8	1/11
		802.11n HT40	MCS0/ MCS8	3/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0/ MCS8	1/6/11
		802.11n HT40	MCS0/ MCS8	3/6/9
Radiated TCs	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS8	1/11
		802.11n HT40	MCS8	3/9
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS8	1/6/11
		802.11n HT40	MCS8	3/6/9



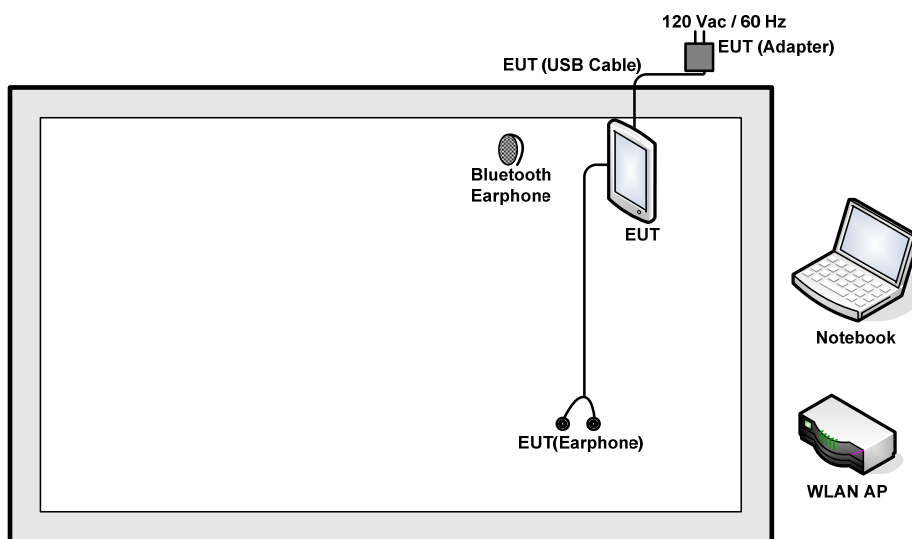
Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN (2.4G) Link + USB Cable 1 (Charging from Adapter) + Battery 1 + Earphone for Sample 1
	Mode 2 : Bluetooth Link + WLAN (2.4G) Link + USB Cable 2 (Charging from Adapter) + Battery 2 + Earphone for Sample 2
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.	

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.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
2.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Bluetooth Earphone	Lenovo	LBH505	N/A	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

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 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.

Offset = RF cable loss

Following shows an offset computation example with cable loss 6dB.

Offset(dB) = RF cable loss(dB) = 6 (dB)

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.

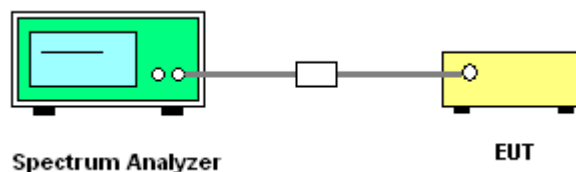
3.1.2 Measuring Instruments

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 v03r02.
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

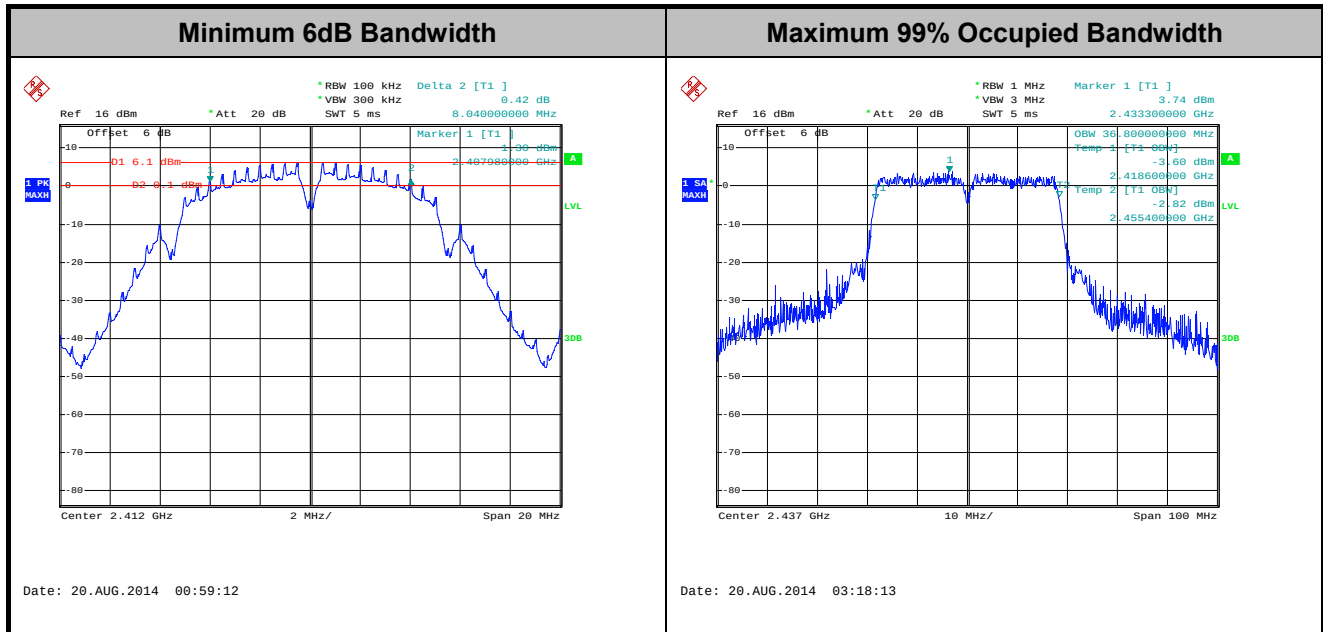




3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Test Band :	2.4GHz	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	99% Bandwidth (MHz)		6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1		
11b	1Mbps	1	1	2412	-	11.25	-	8.04	0.5	Pass
11b	1Mbps	1	6	2437	-	11.30	-	8.04	0.5	Pass
11b	1Mbps	1	11	2462	-	11.25	-	8.04	0.5	Pass
11g	6Mbps	1	1	2412	17.10	-	15.66	-	0.5	Pass
11g	6Mbps	1	6	2437	17.25	-	15.66	-	0.5	Pass
11g	6Mbps	1	11	2462	17.15	-	15.54	-	0.5	Pass
HT20	MCS0	1	1	2412	17.90	-	15.42	-	0.5	Pass
HT20	MCS0	1	6	2437	17.95	-	15.64	-	0.5	Pass
HT20	MCS0	1	11	2462	17.95	-	15.80	-	0.5	Pass
HT40	MCS0	1	3	2422	36.70	-	36.32	-	0.5	Pass
HT40	MCS0	1	6	2437	36.80	-	36.24	-	0.5	Pass
HT40	MCS0	1	9	2452	36.70	-	36.36	-	0.5	Pass
HT20	MCS8	2	1	2412	17.95	17.95	15.66	16.28	0.5	Pass
HT20	MCS8	2	6	2437	17.95	17.95	15.64	16.32	0.5	Pass
HT20	MCS8	2	11	2462	17.90	17.95	15.80	16.30	0.5	Pass
HT40	MCS8	2	3	2422	36.70	36.70	36.28	36.28	0.5	Pass
HT40	MCS8	2	6	2437	36.70	36.70	36.28	36.28	0.5	Pass
HT40	MCS8	2	9	2452	36.70	36.60	36.28	36.28	0.5	Pass



Note : The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Peak Output Power Measurement

3.2.1 Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz and 5725-5850MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is 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.

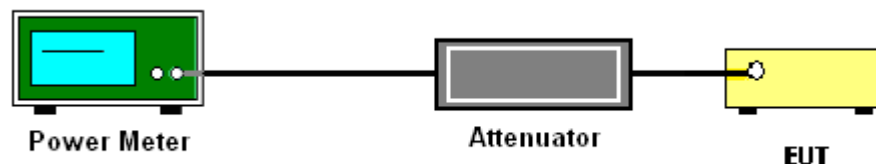
3.2.2 Measuring Instruments

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 v03r02.
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.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

3.2.4 Test Setup





3.2.5 Test Result of Peak Output Power

Test Band :	2.4GHz	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Max. Limit (dBm)		DG (dBi)		Pass/Fail
					Chain Port 0	Chain Port 1	SUM	Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	
11b	1Mbps	1	1	2412	17.29	18.37	-	30.00	30.00	0.90	0.80	Pass
11b	1Mbps	1	6	2437	17.13	17.98		30.00	30.00	0.90	0.80	Pass
11b	1Mbps	1	11	2462	17.40	17.76		30.00	30.00	0.90	0.80	Pass
11g	6Mbps	1	1	2412	23.64	20.89		30.00	30.00	0.90	0.80	Pass
11g	6Mbps	1	6	2437	23.46	20.39		30.00	30.00	0.90	0.80	Pass
11g	6Mbps	1	11	2462	23.71	20.15		30.00	30.00	0.90	0.80	Pass
HT20	MCS0	1	1	2412	21.34	22.12		30.00	30.00	0.90	0.80	Pass
HT20	MCS0	1	6	2437	22.16	21.24		30.00	30.00	0.90	0.80	Pass
HT20	MCS0	1	11	2462	21.74	21.71		30.00	30.00	0.90	0.80	Pass
HT40	MCS0	1	3	2422	19.56	19.44		30.00	30.00	0.90	0.80	Pass
HT40	MCS0	1	6	2437	19.26	19.11		30.00	30.00	0.90	0.80	Pass
HT40	MCS0	1	9	2452	19.05	19.20		30.00	30.00	0.90	0.80	Pass
HT20	MCS8	2	1	2412	19.34	19.04	22.20	30.00		3.86		Pass
HT20	MCS8	2	6	2437	19.32	19.49	22.42	30.00		3.86		Pass
HT20	MCS8	2	11	2462	19.91	20.11	23.02	30.00		3.86		Pass
HT40	MCS8	2	3	2422	17.63	17.64	20.65	30.00		3.86		Pass
HT40	MCS8	2	6	2437	17.02	17.23	20.14	30.00		3.86		Pass
HT40	MCS8	2	9	2452	17.06	17.34	20.21	30.00		3.86		Pass

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



3.2.6 Test Result of Average output Power (Reporting Only)

Test Band :	2.4GHz	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)		
					Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	Sum Power
11b	1Mbps	1	1	2412	0.00	0.00	13.32	14.67	-
11b	1Mbps	1	6	2437	0.00	0.00	13.42	14.47	
11b	1Mbps	1	11	2462	0.00	0.00	13.58	14.21	
11g	6Mbps	1	1	2412	0.21	0.20	14.17	10.45	
11g	6Mbps	1	6	2437	0.21	0.20	14.13	10.24	
11g	6Mbps	1	11	2462	0.21	0.20	14.36	10.02	
HT20	MCS0	1	1	2412	0.23	0.22	11.60	12.25	
HT20	MCS0	1	6	2437	0.23	0.22	12.05	12.07	
HT20	MCS0	1	11	2462	0.23	0.22	11.85	11.67	
HT40	MCS0	1	3	2422	0.47	0.43	9.98	10.09	
HT40	MCS0	1	6	2437	0.47	0.43	9.75	9.30	
HT40	MCS0	1	9	2452	0.47	0.43	9.76	9.48	
HT20	MCS8	2	1	2412	0.42	0.42	9.23	9.19	12.22
HT20	MCS8	2	6	2437	0.42	0.42	9.24	9.40	12.33
HT20	MCS8	2	11	2462	0.42	0.42	9.39	9.53	12.47
HT40	MCS8	2	3	2422	0.78	0.76	8.20	8.32	11.27
HT40	MCS8	2	6	2437	0.78	0.76	7.90	7.62	10.77
HT40	MCS8	2	9	2452	0.78	0.76	7.26	7.97	10.64

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 v03r02
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.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

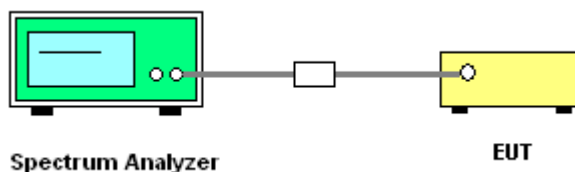
If measurements performed using method (2) plus $10 \log(N)$ exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

Method (1): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

Method (2): Measure and add $10 \log(N)$ dB, where N is the number of outputs. (N=2)

3.3.4 Test Setup

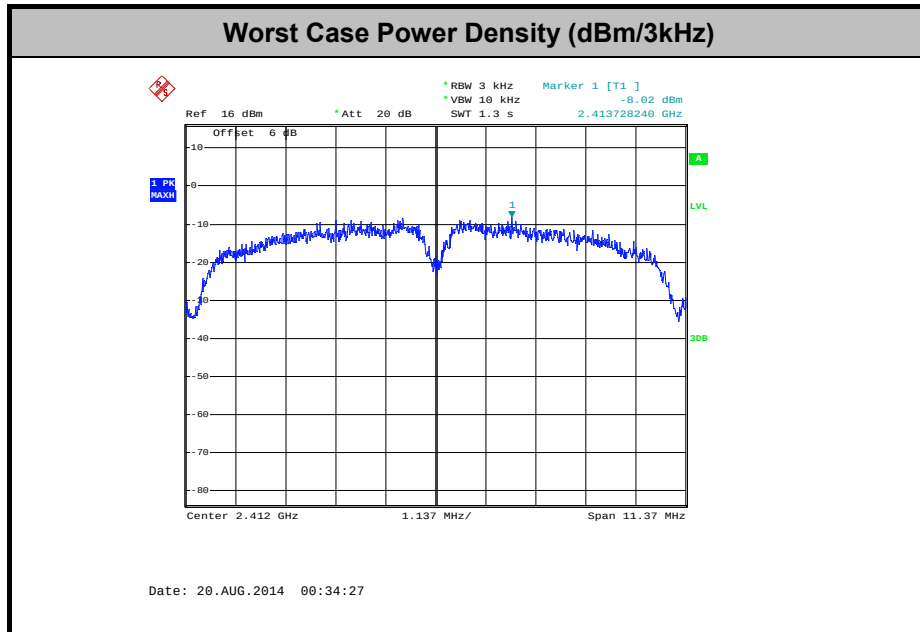


3.3.5 Test Result of Power Spectral Density

Test Band :	2.4GHz	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Peak Power Density (dBm/3kHz)			Max. Limit (dBm/3kHz)		DG (dBi)		Pass/Fail
					Chain Port 0	Chain Port 1	Worst +10log(2)	Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	
11b	1Mbps	1	1	2412	-	-8.02	-	8.00	8.00	0.90	0.80	Pass
11b	1Mbps	1	6	2437	-	-8.30		8.00	8.00	0.90	0.80	Pass
11b	1Mbps	1	11	2462	-	-8.40		8.00	8.00	0.90	0.80	Pass
11g	6Mbps	1	1	2412	-10.78	-		8.00	8.00	0.90	0.80	Pass
11g	6Mbps	1	6	2437	-10.46	-		8.00	8.00	0.90	0.80	Pass
11g	6Mbps	1	11	2462	-9.98	-		8.00	8.00	0.90	0.80	Pass
HT20	MCS0	1	1	2412	-12.89	-		8.00	8.00	0.90	0.80	Pass
HT20	MCS0	1	6	2437	-12.77	-		8.00	8.00	0.90	0.80	Pass
HT20	MCS0	1	11	2462	-13.35	-		8.00	8.00	0.90	0.80	Pass
HT40	MCS0	1	3	2422	-18.52	-		8.00	8.00	0.90	0.80	Pass
HT40	MCS0	1	6	2437	-18.39	-		8.00	8.00	0.90	0.80	Pass
HT40	MCS0	1	9	2452	-18.70	-		8.00	8.00	0.90	0.80	Pass
HT20	MCS8	2	1	2412	-13.23	-14.54	-10.22	8.00		3.86		Pass
HT20	MCS8	2	6	2437	-15.77	-15.50	-12.49	8.00		3.86		Pass
HT20	MCS8	2	11	2462	-14.50	-15.06	-11.49	8.00		3.86		Pass
HT40	MCS8	2	3	2422	-20.37	-19.44	-16.43	8.00		3.86		Pass
HT40	MCS8	2	6	2437	-20.07	-20.37	-17.06	8.00		3.86		Pass
HT40	MCS8	2	9	2452	-20.29	-20.34	-17.28	8.00		3.86		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).

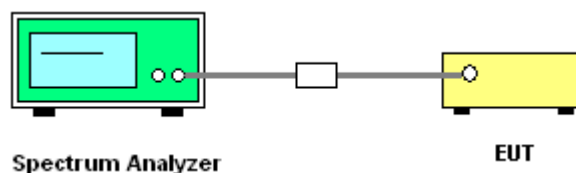
3.4.2 Measuring Instruments

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 v03r02.
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





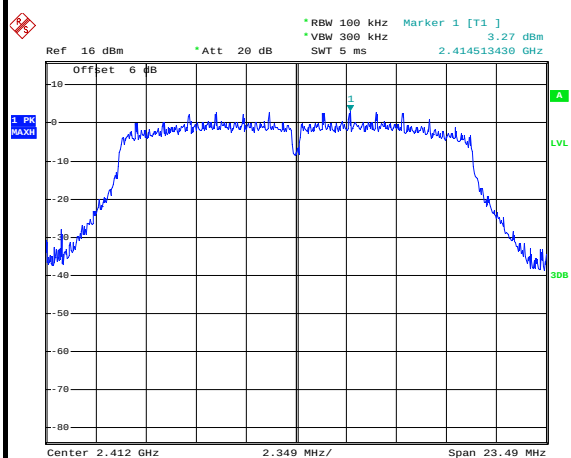
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Number of TX = 1, Chain Port 0 (Measured)

Number of TX :	1	Chain Port :	0
Test Mode :	802.11g	Temperature :	23~24℃
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Adonis Li

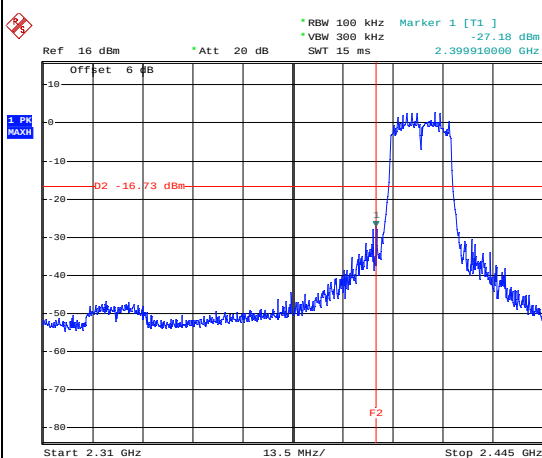
WLAN 802.11g Channel 01

100kHz PSD reference Level



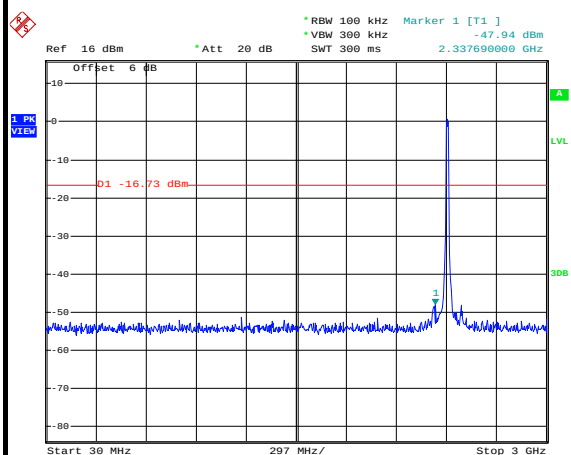
Date: 20.AUG.2014 01:08:00

Low Channel Plot



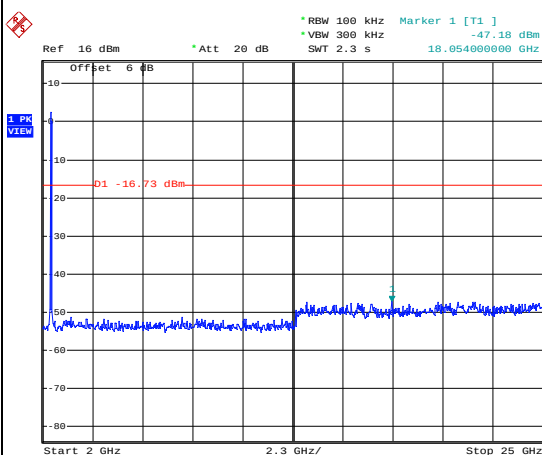
Date: 20.AUG.2014 01:08:14

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 01:08:34

Spurious Emission 2GHz~25GHz



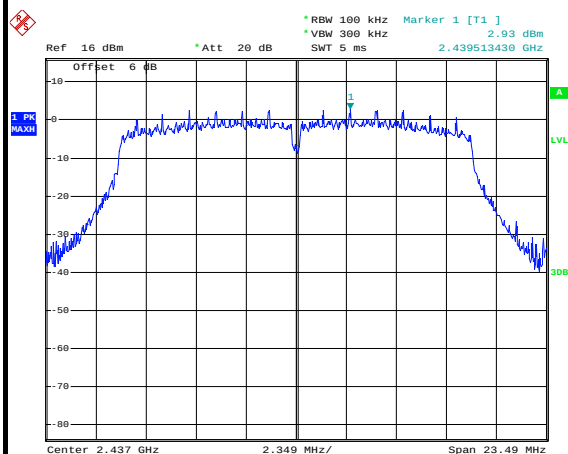
Date: 20.AUG.2014 01:08:52



Number of TX :	1	Chain Port :	0
Test Mode :	802.11g	Temperature :	23~24°C
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

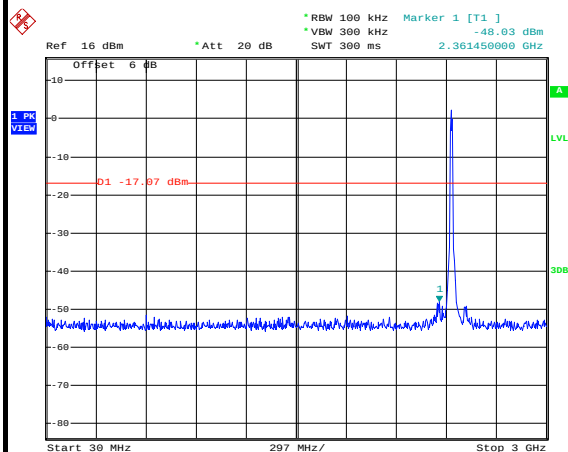
WLAN 802.11g Channel 06

100kHz PSD reference Level



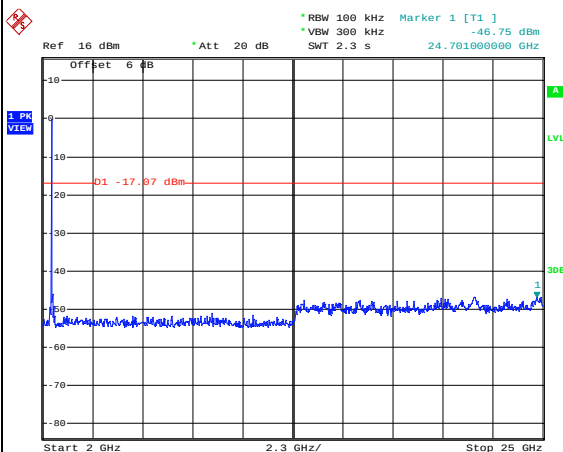
Date: 20.AUG.2014 01:12:34

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 01:12:54

Spurious Emission 2GHz~25GHz



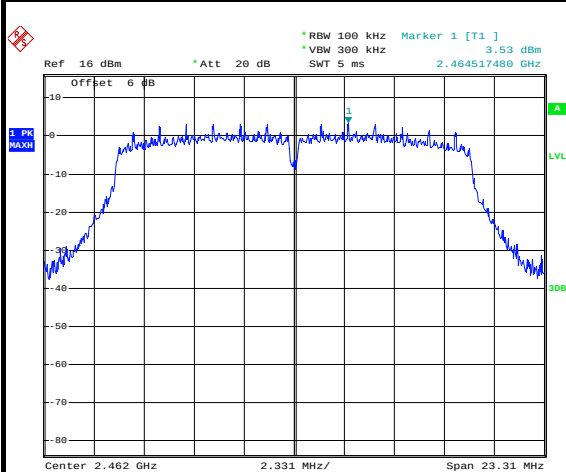
Date: 20.AUG.2014 01:13:13



Number of TX :	1	Chain Port :	0
Test Mode :	802.11g	Temperature :	23~24°C
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Adonis Li

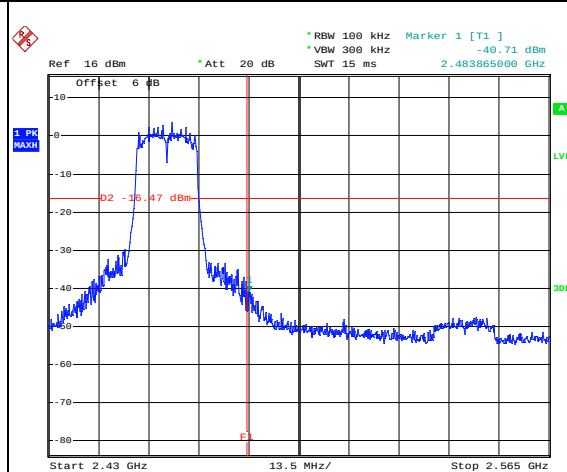
WLAN 802.11g Channel 11

100kHz PSD reference Level



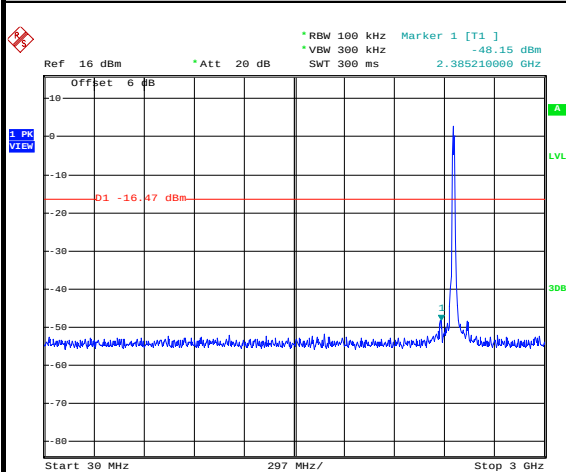
Date: 21.AUG.2014 05:44:50

High Channel Plot



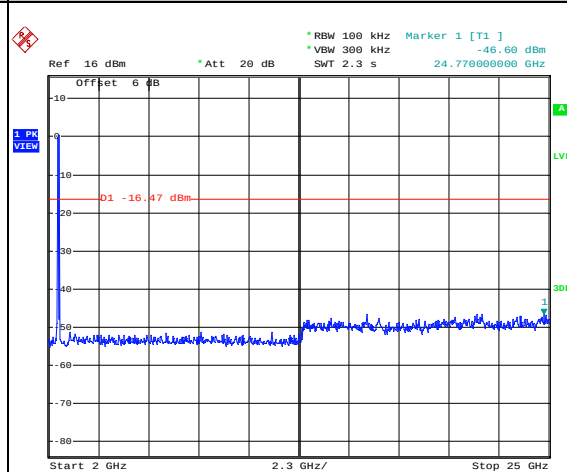
Date: 21.AUG.2014 05:45:04

Spurious Emission 30MHz~3GHz



Date: 21.AUG.2014 05:45:24

Spurious Emission 2GHz~25GHz



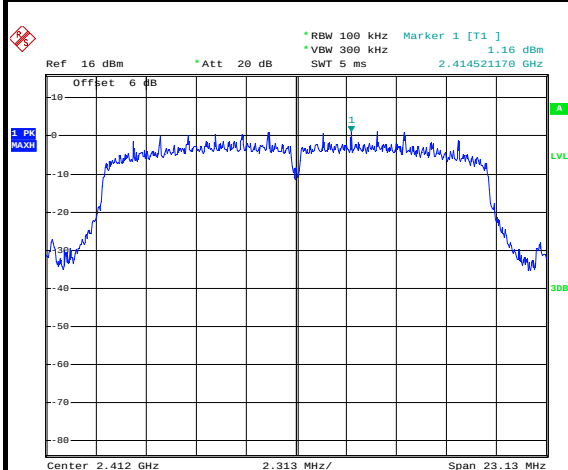
Date: 21.AUG.2014 05:45:42



Number of TX :	1	Chain Port :	0
Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Adonis Li

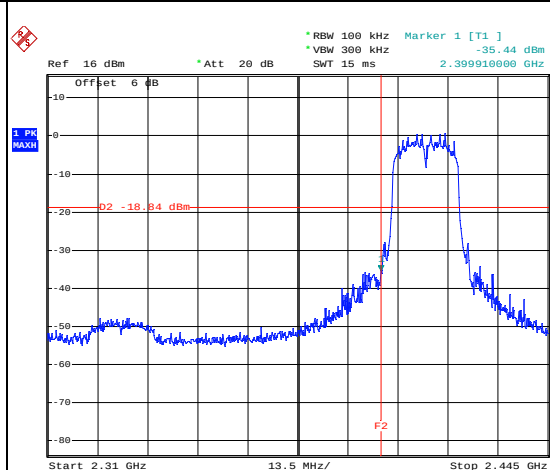
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



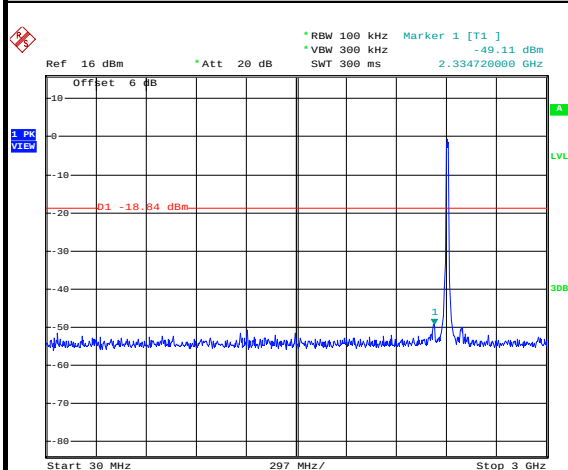
Date: 21.AUG.2014 05:52:13

Low Channel Plot



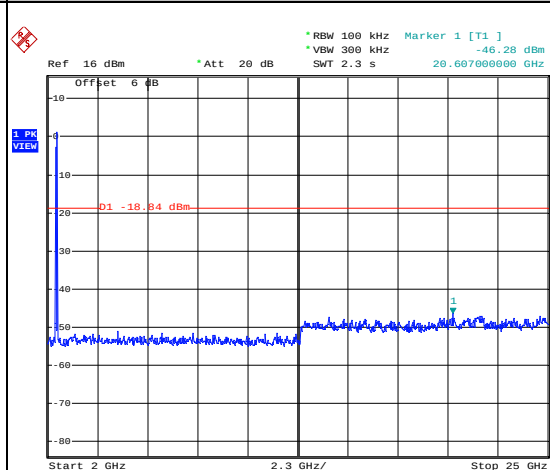
Date: 21.AUG.2014 05:52:27

Spurious Emission 30MHz~3GHz



Date: 21.AUG.2014 05:52:46

Spurious Emission 2GHz~25GHz



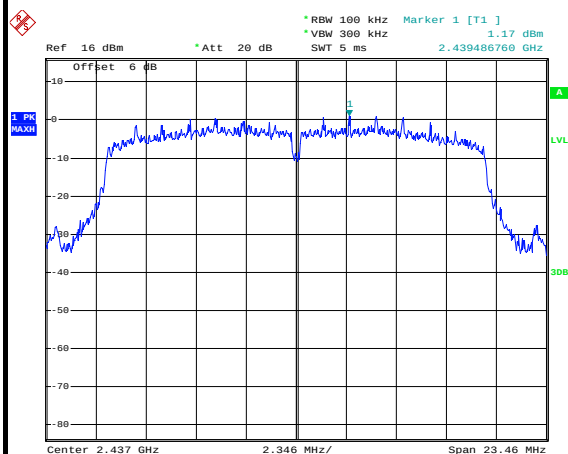
Date: 21.AUG.2014 05:53:05



Number of TX :	1	Chain Port :	0
Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

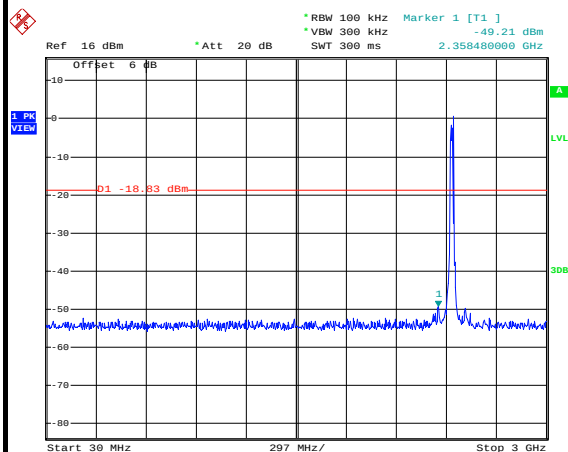
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



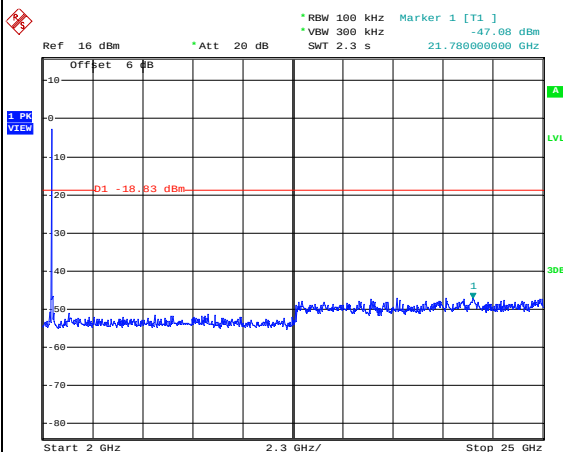
Date: 20.AUG.2014 02:02:24

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 02:02:44

Spurious Emission 2GHz~25GHz



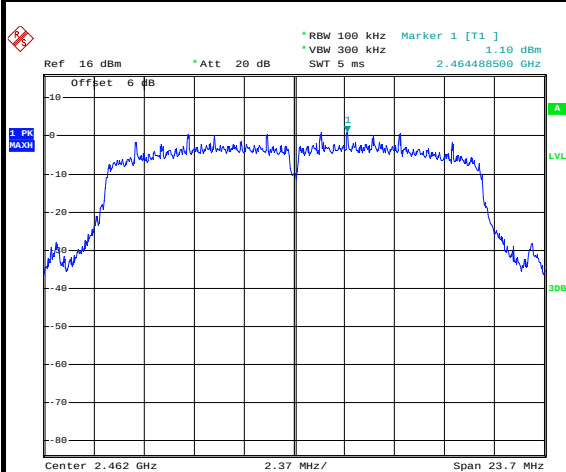
Date: 20.AUG.2014 02:03:03



Number of TX :	1	Chain Port :	0
Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Adonis Li

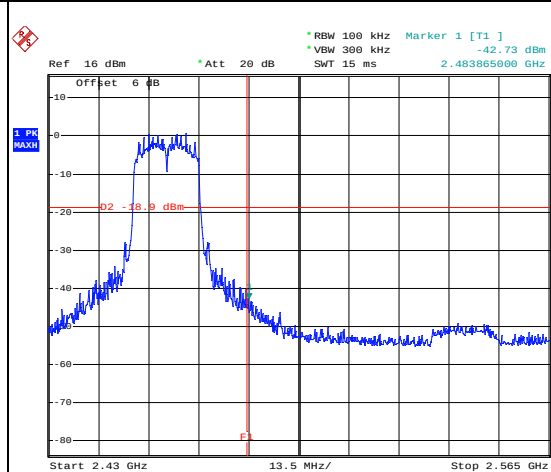
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



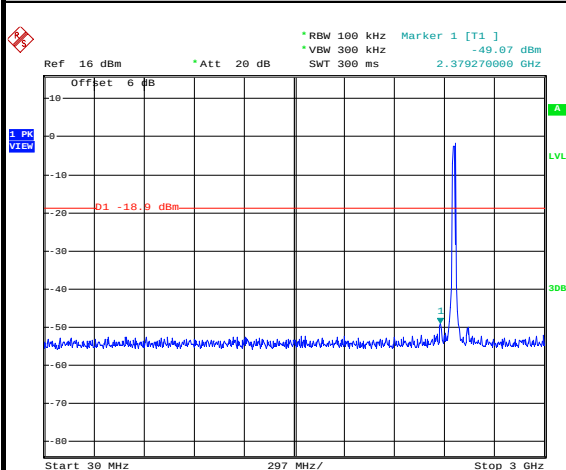
Date: 20.AUG.2014 02:07:26

High Channel Plot



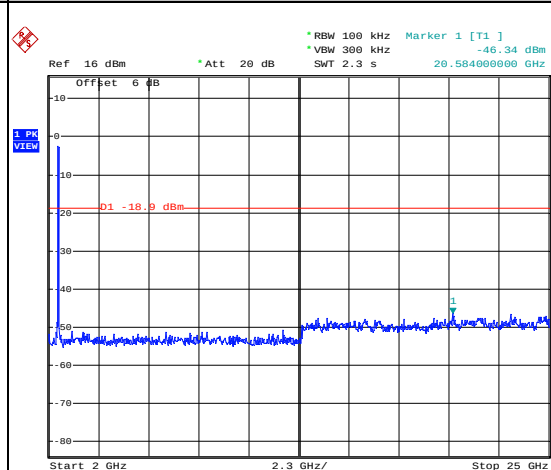
Date: 20.AUG.2014 02:07:40

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 02:08:00

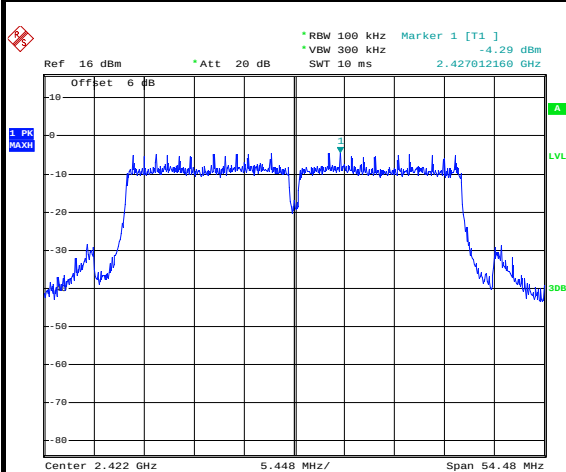
Spurious Emission 2GHz~25GHz



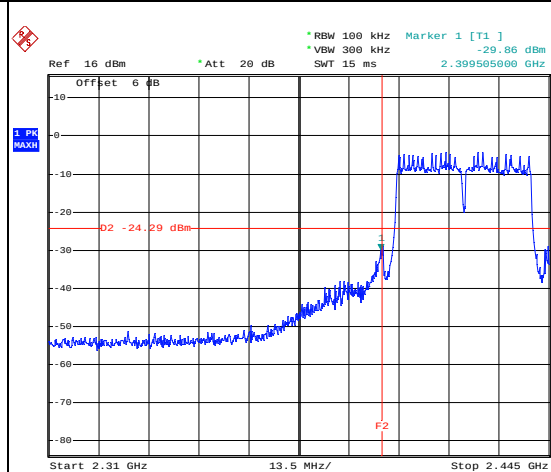
Date: 20.AUG.2014 02:08:18



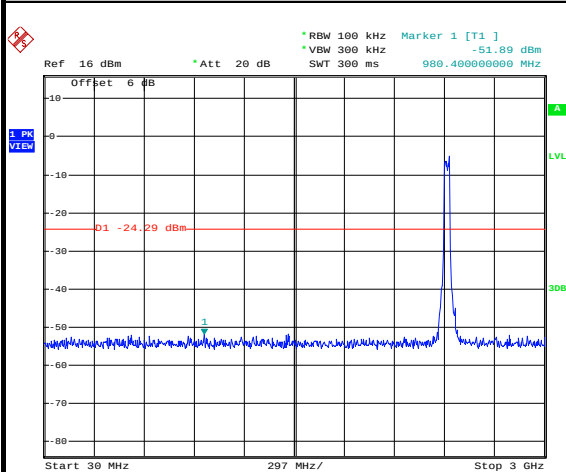
Number of TX :	1	Chain Port :	0
Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	03	Test Engineer :	Adonis Li

WLAN 802.11n HT40 Channel 03**100kHz PSD reference Level**

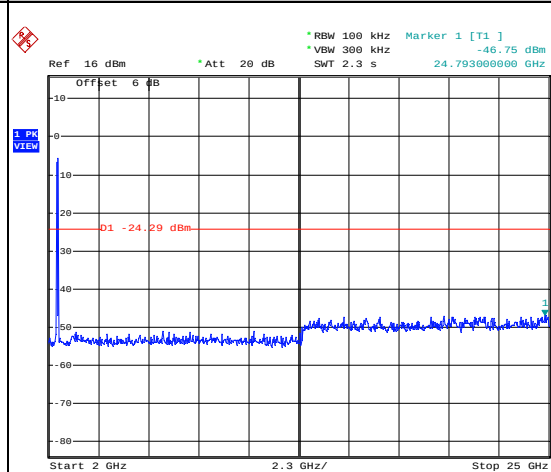
Date: 20.AUG.2014 03:11:58

Low Channel Plot

Date: 20.AUG.2014 03:12:12

Spurious Emission 30MHz~3GHz

Date: 20.AUG.2014 03:13:59

Spurious Emission 2GHz~25GHz

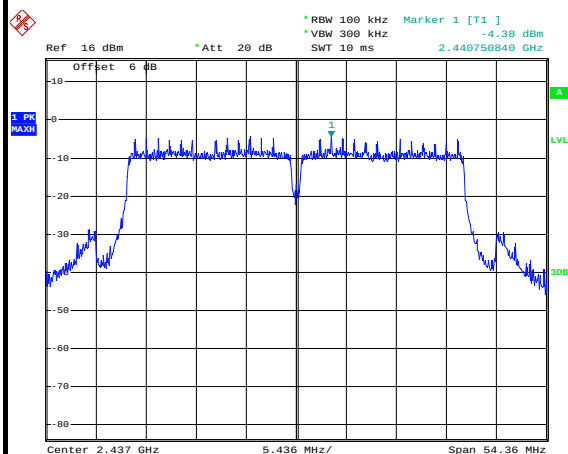
Date: 20.AUG.2014 03:14:18



Number of TX :	1	Chain Port :	0
Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

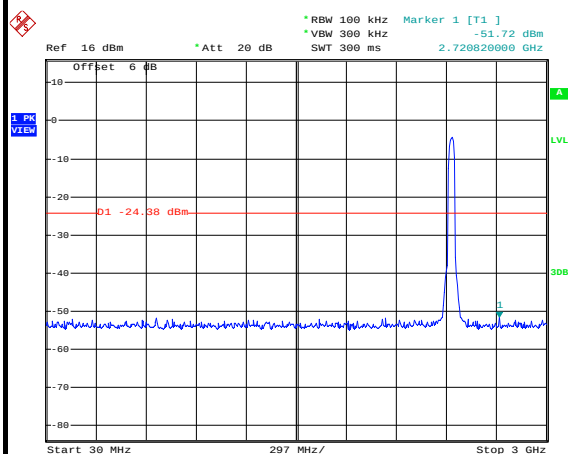
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



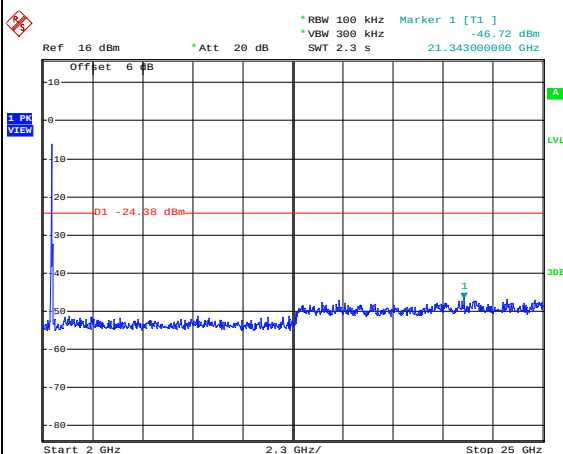
Date: 20.AUG.2014 03:17:24

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2014 01:19:56

Spurious Emission 2GHz~25GHz



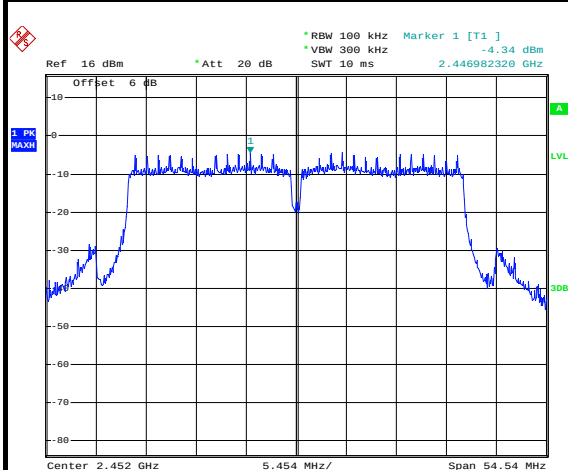
Date: 20.AUG.2014 03:24:38



Number of TX :	1	Chain Port :	0
Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	09	Test Engineer :	Adonis Li

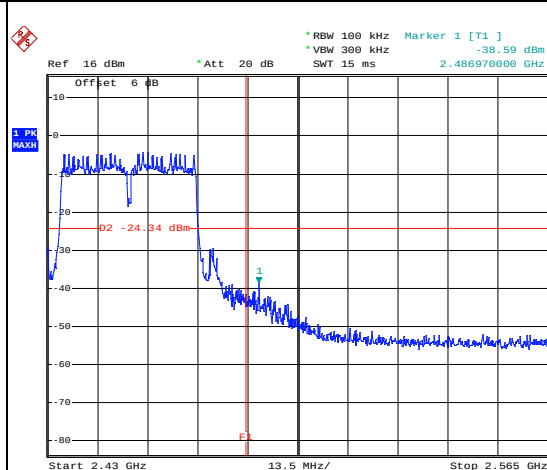
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



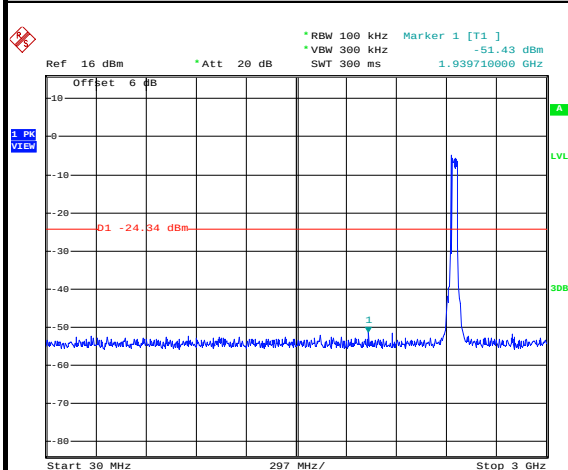
Date: 20.AUG.2014 03:34:02

High Channel Plot



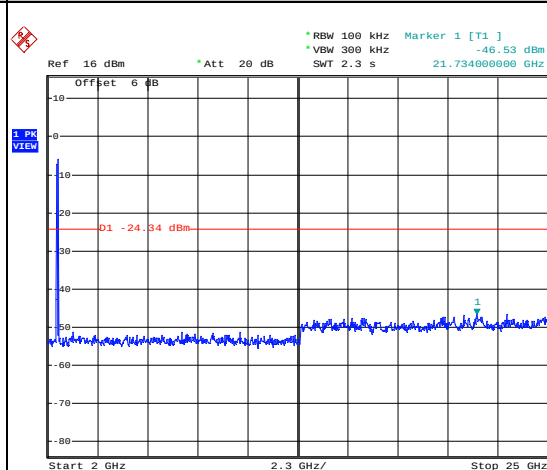
Date: 20.AUG.2014 03:34:16

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 03:34:35

Spurious Emission 2GHz~25GHz



Date: 20.AUG.2014 03:34:54

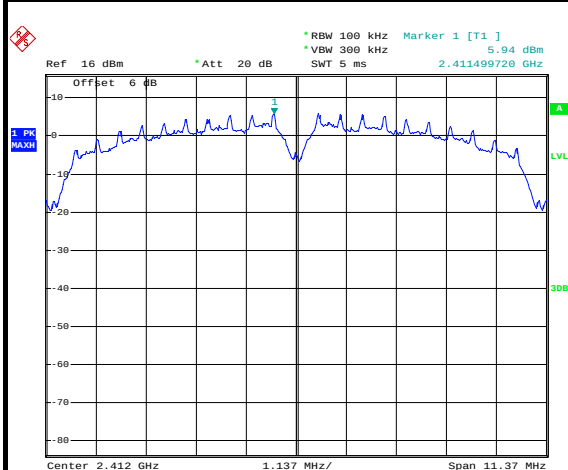


Number of TX = 1, Chain Port 1 (Measured)

Number of TX :	1	Chain Port:	1
Test Mode :	802.11b	Temperature :	23~24°C
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Adonis Li

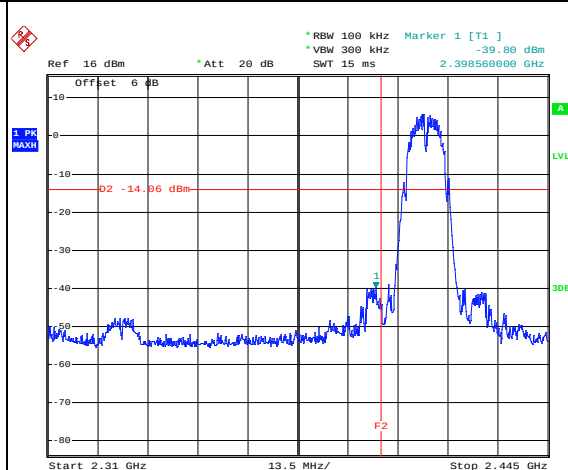
WLAN 802.11b Channel 01

100kHz PSD reference Level



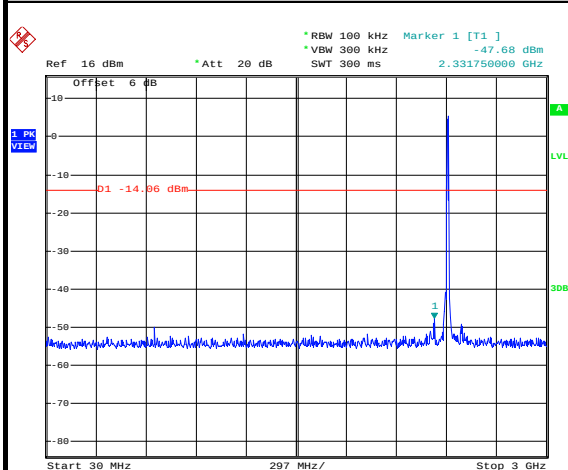
Date: 20.AUG.2014 00:34:36

Low Channel Plot



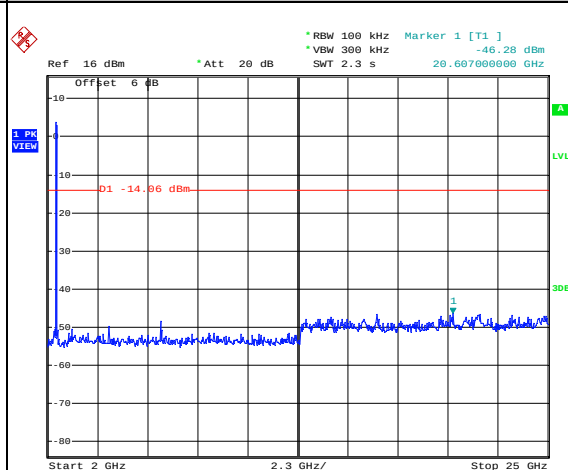
Date: 20.AUG.2014 00:34:50

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 00:35:10

Spurious Emission 2GHz~25GHz



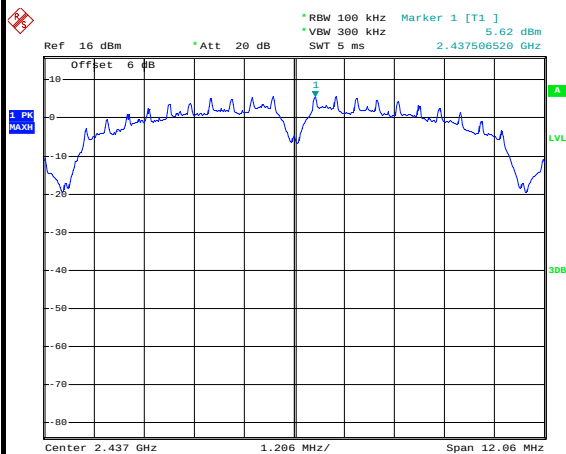
Date: 20.AUG.2014 00:35:28



Number of TX :	1	Chain Port:	1
Test Mode :	802.11b	Temperature :	23~24°C
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

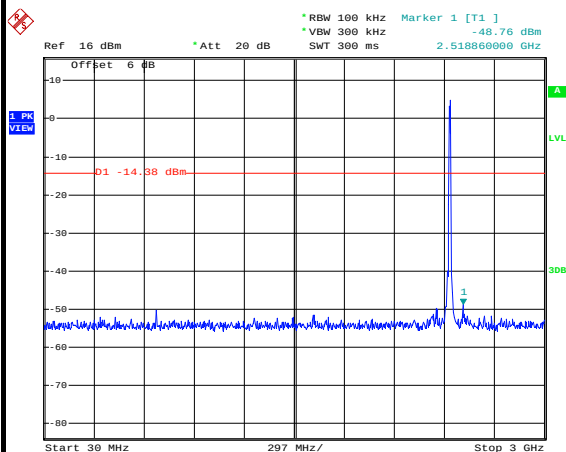
WLAN 802.11b Channel 06

100kHz PSD reference Level



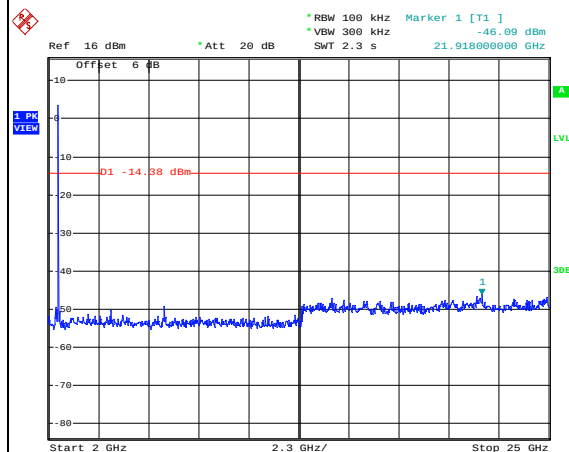
Date: 20.AUG.2014 00:47:06

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 00:47:26

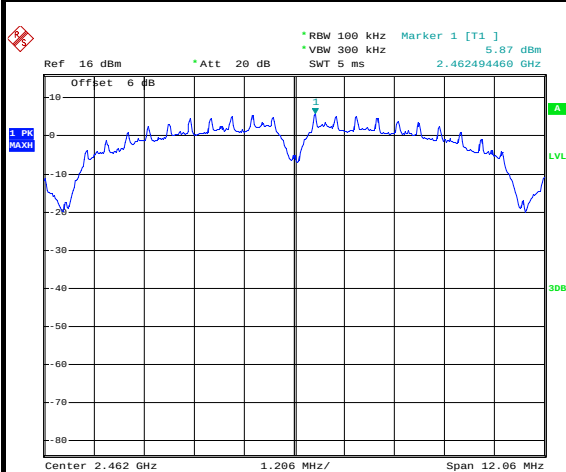
Spurious Emission 2GHz~25GHz



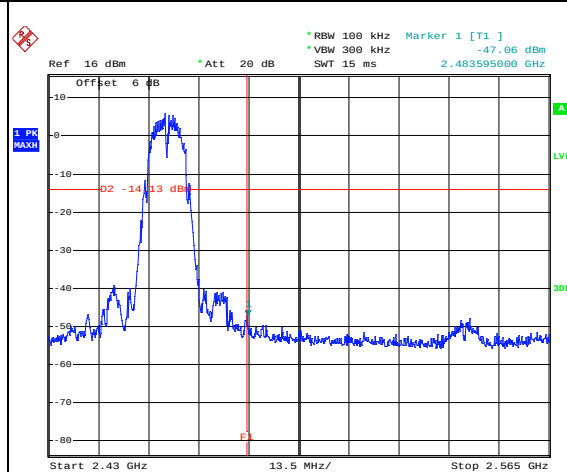
Date: 20.AUG.2014 00:47:45



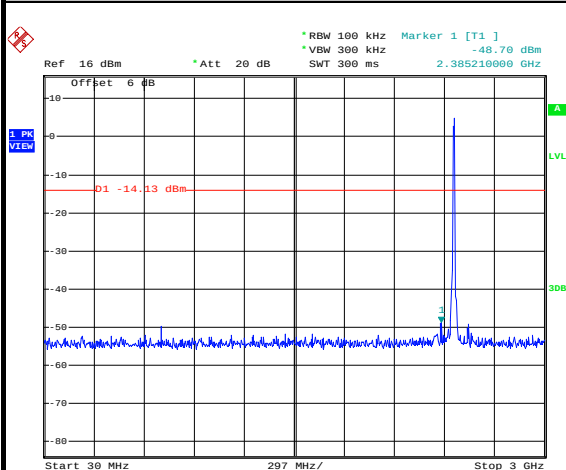
Number of TX :	1	Chain Port:	1
Test Mode :	802.11b	Temperature :	23~24°C
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Adonis Li

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

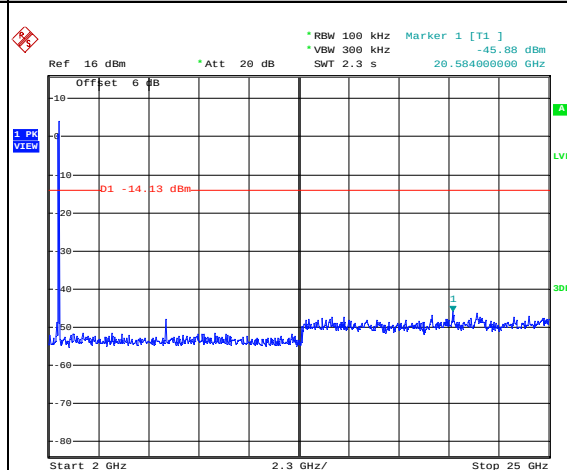
Date: 21.AUG.2014 05:36:56

High Channel Plot

Date: 21.AUG.2014 05:37:10

Spurious Emission 30MHz~3GHz

Date: 21.AUG.2014 05:39:11

Spurious Emission 2GHz~25GHz

Date: 21.AUG.2014 05:39:29

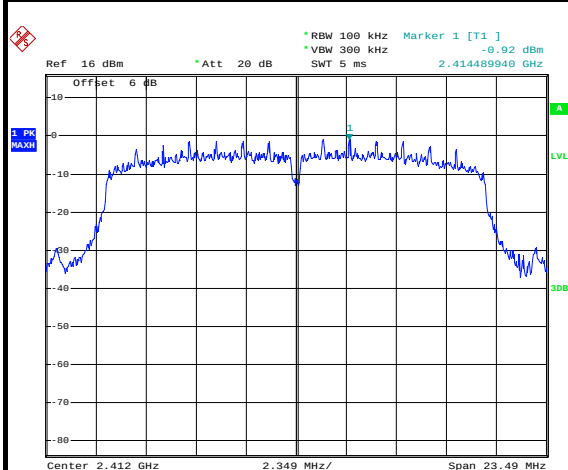


Number of TX = 2, Chain Port 0+1(0) (Measured)

Number of TX :	2	Chain Port:	0+1(0)
Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Adonis Li

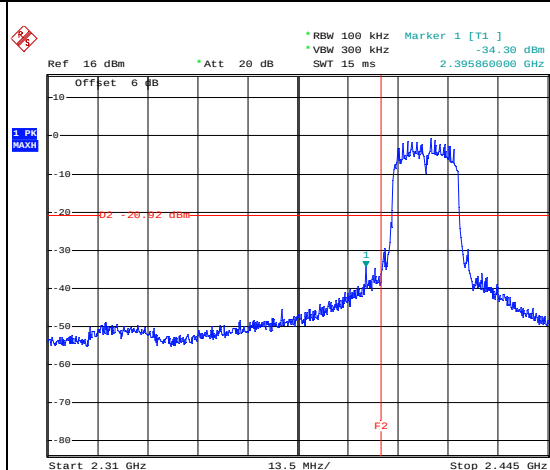
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



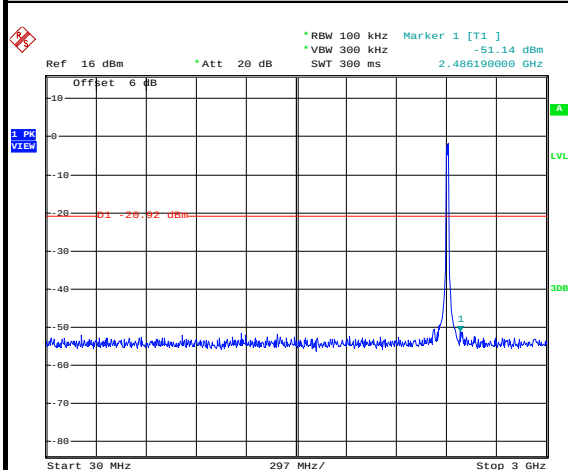
Date: 20.AUG.2014 02:41:14

Low Channel Plot



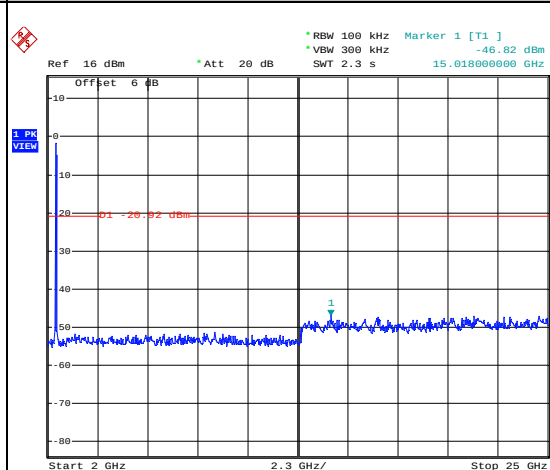
Date: 20.AUG.2014 02:41:28

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 02:41:48

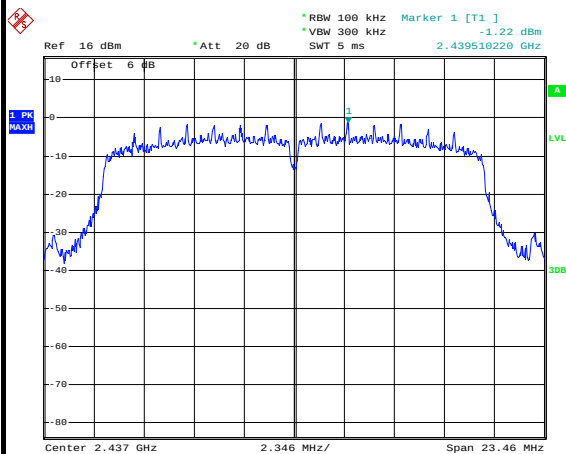
Spurious Emission 2GHz~25GHz



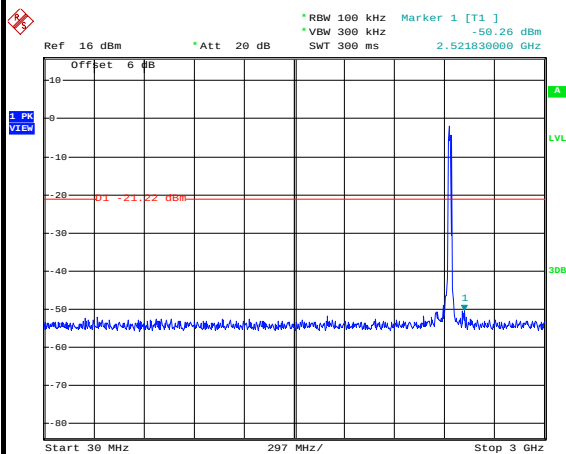
Date: 20.AUG.2014 02:42:06



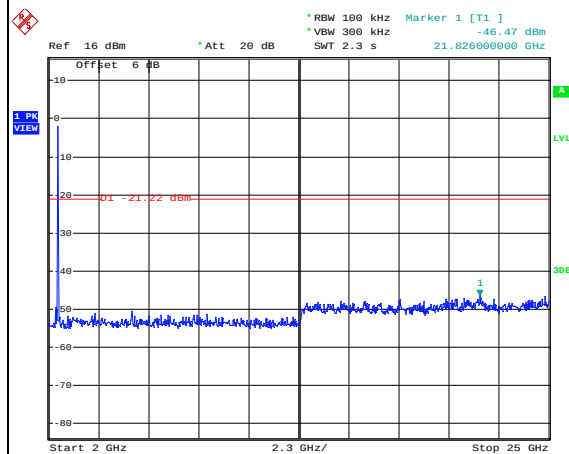
Number of TX :	2	Chain Port:	0+1(0)
Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

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

Date: 20.AUG.2014 02:45:09

Spurious Emission 30MHz~3GHz

Date: 20.AUG.2014 02:45:29

Spurious Emission 2GHz~25GHz

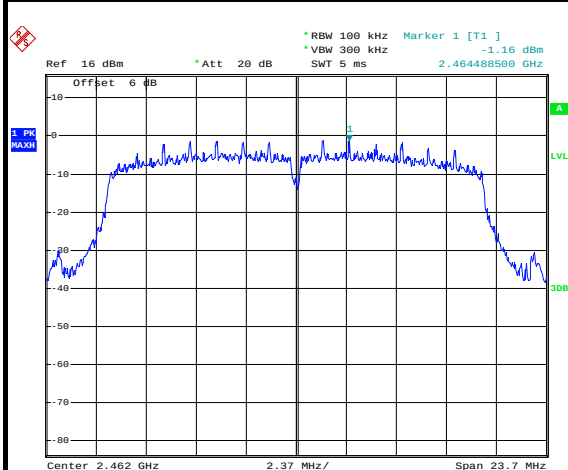
Date: 20.AUG.2014 02:45:48



Number of TX :	2	Chain Port:	0+1(0)
Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Adonis Li

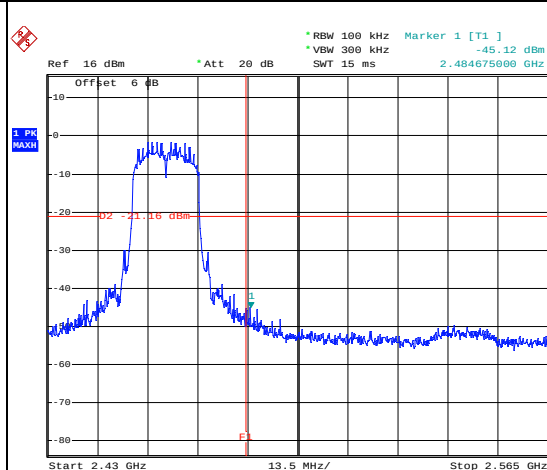
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



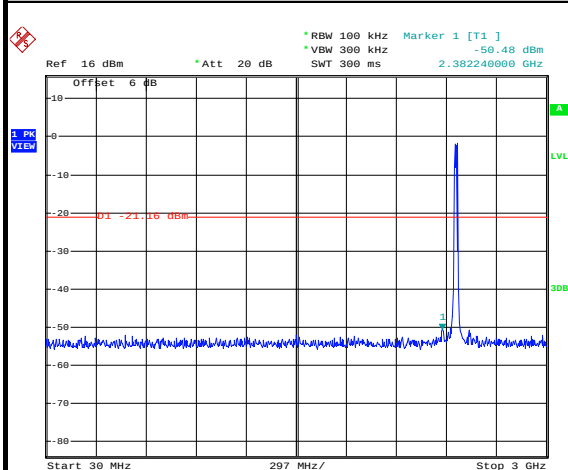
Date: 20.AUG.2014 02:48:25

High Channel Plot



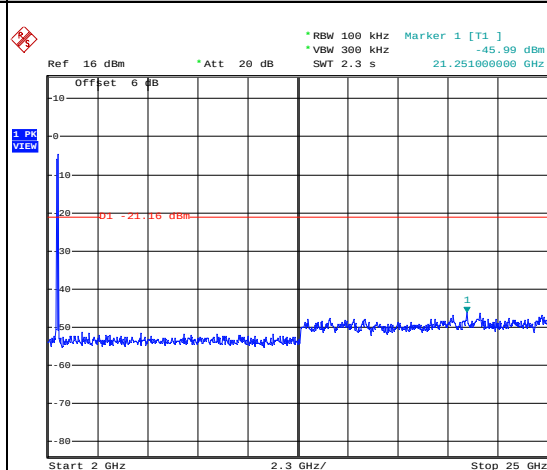
Date: 20.AUG.2014 02:48:39

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 02:48:59

Spurious Emission 2GHz~25GHz



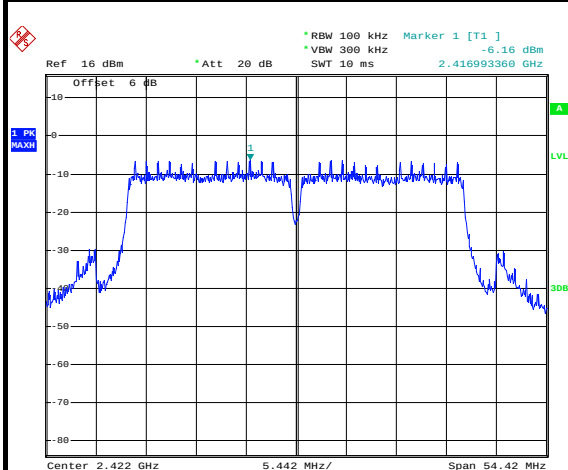
Date: 20.AUG.2014 02:49:17



Number of TX :	2	Chain Port:	0+1(0)
Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	03	Test Engineer :	Adonis Li

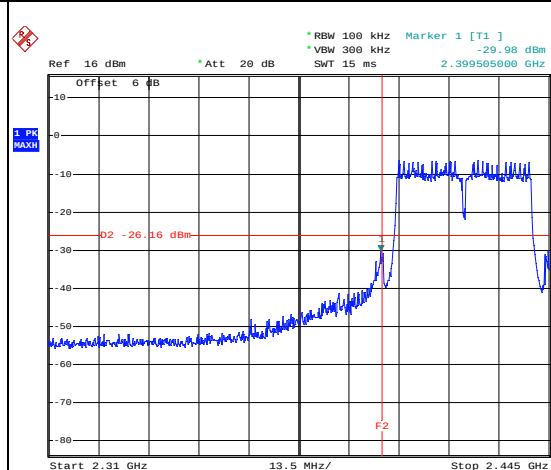
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



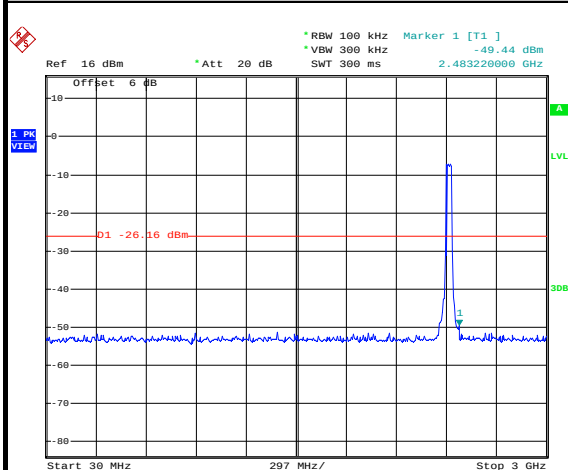
Date: 20.AUG.2014 04:08:21

Low Channel Plot



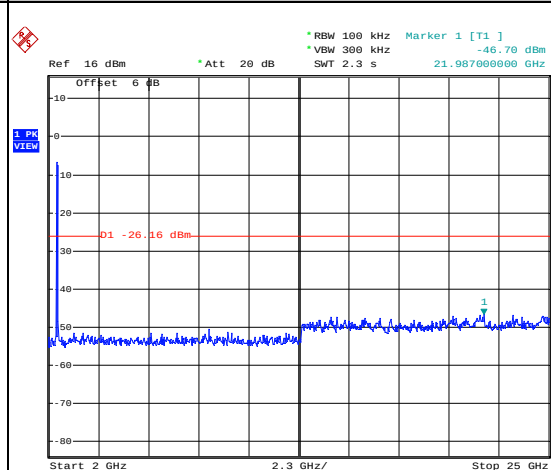
Date: 20.AUG.2014 04:08:35

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2014 01:56:46

Spurious Emission 2GHz~25GHz



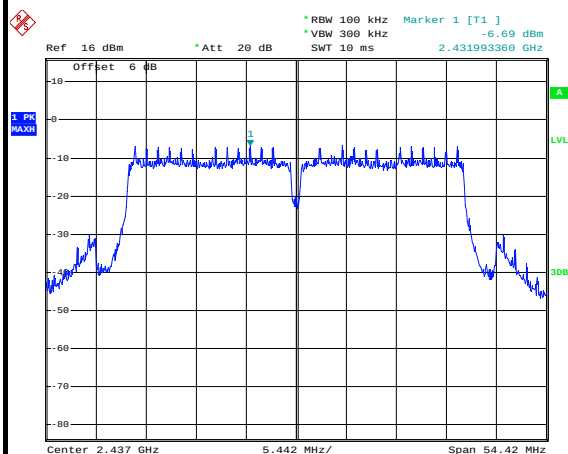
Date: 20.AUG.2014 04:10:37



Number of TX :	2	Chain Port:	0+1(0)
Test Mode :	802.11n HT40	Temperature :	23~24℃
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

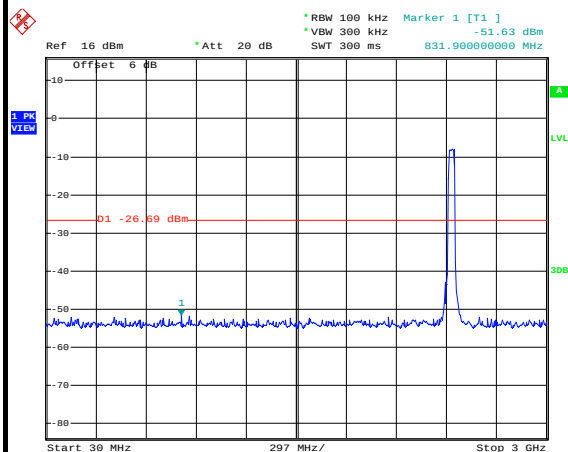
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



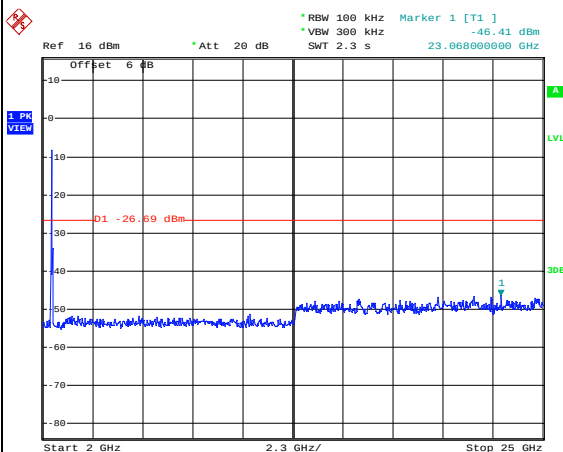
Date: 20.AUG.2014 04:18:21

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2014 02:01:25

Spurious Emission 2GHz~25GHz



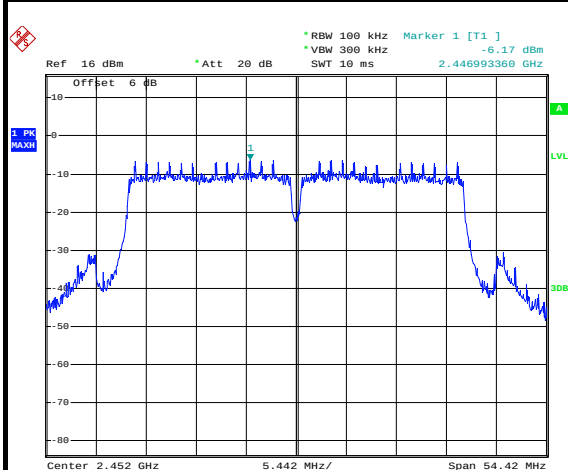
Date: 20.AUG.2014 04:23:25



Number of TX :	2	Chain Port:	0+1(0)
Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	09	Test Engineer :	Adonis Li

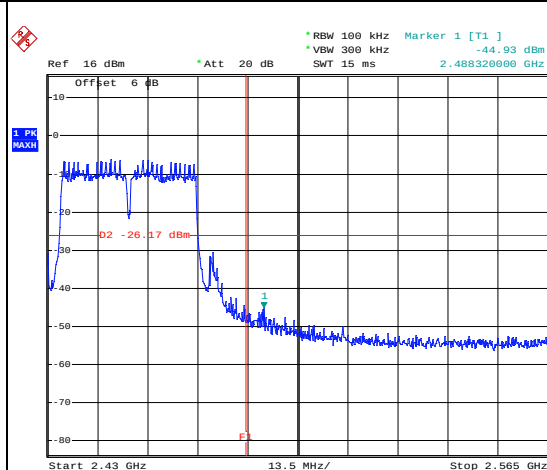
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



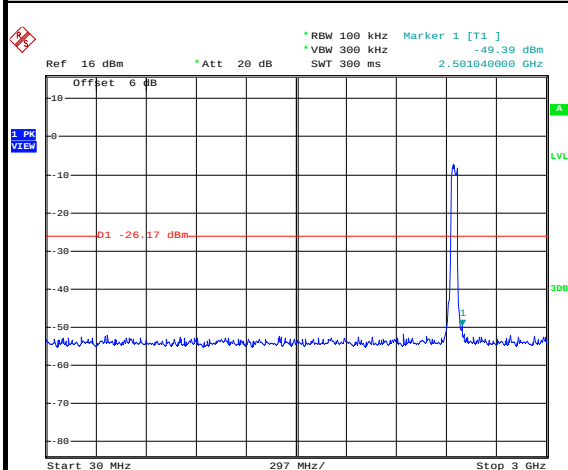
Date: 20.AUG.2014 04:31:27

High Channel Plot



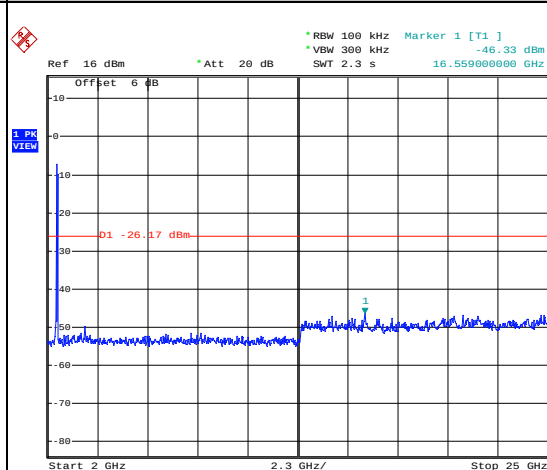
Date: 20.AUG.2014 04:31:41

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2014 02:05:41

Spurious Emission 2GHz~25GHz



Date: 20.AUG.2014 04:33:46

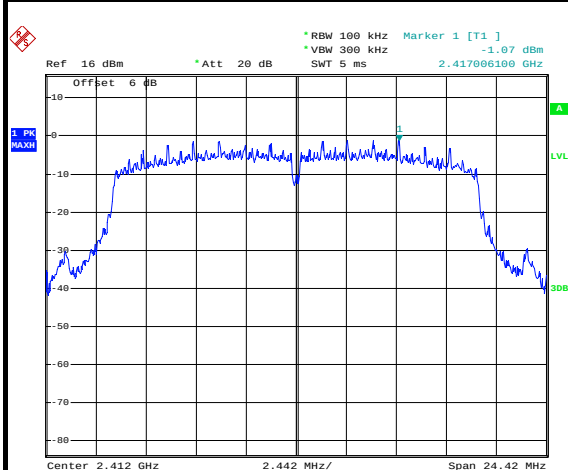


Number of TX = 2, Chain Port 0+1(1) (Measured)

Number of TX :	2	Chain Port:	0+1(1)
Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Adonis Li

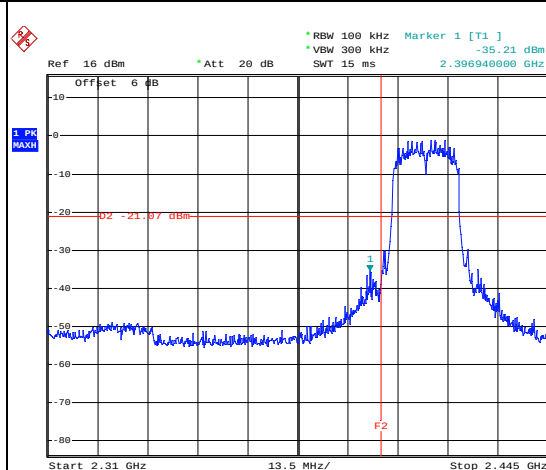
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



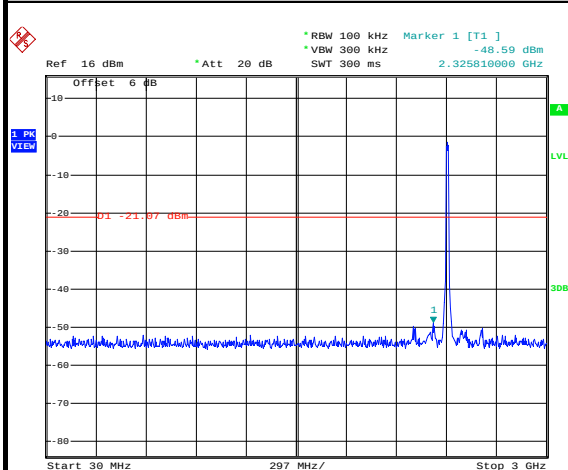
Date: 20.AUG.2014 02:20:46

Low Channel Plot



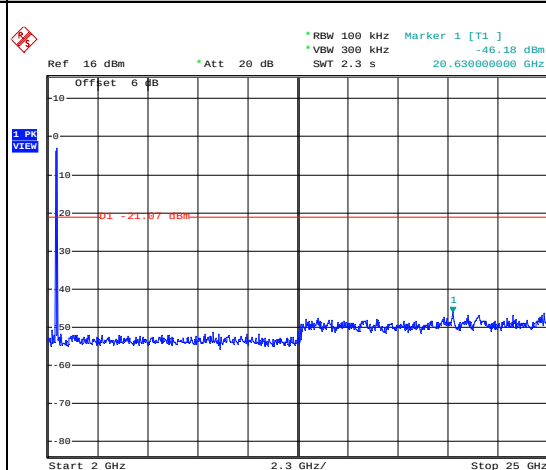
Date: 20.AUG.2014 02:21:00

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 02:21:20

Spurious Emission 2GHz~25GHz

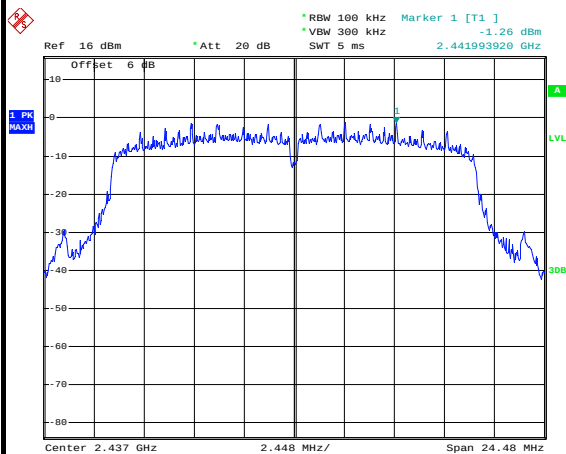


Date: 20.AUG.2014 02:21:38

Number of TX :	2	Chain Port:	0+1(1)
Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

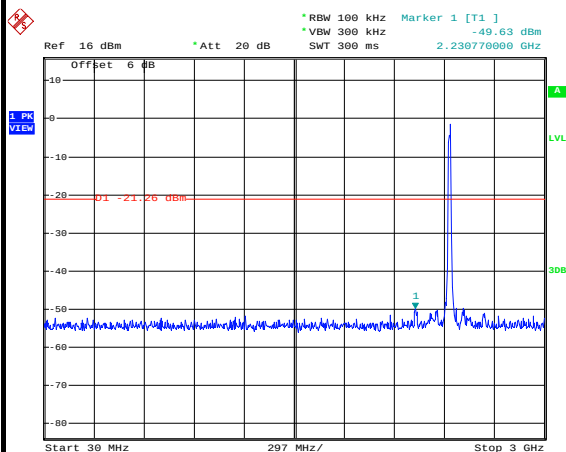
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



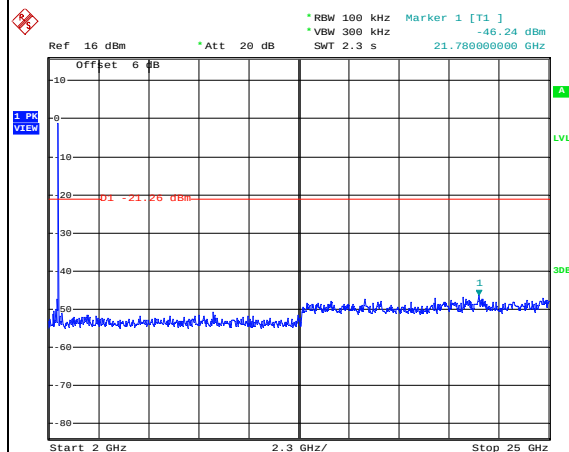
Date: 20.AUG.2014 02:25:54

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 02:26:14

Spurious Emission 2GHz~25GHz



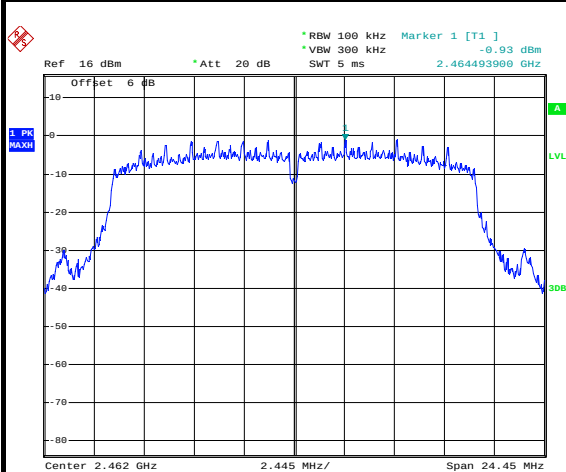
Date: 20.AUG.2014 02:26:33



Number of TX :	2	Chain Port:	0+1(1)
Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Adonis Li

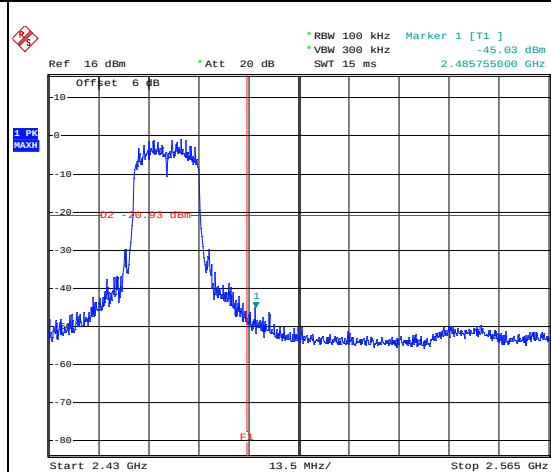
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



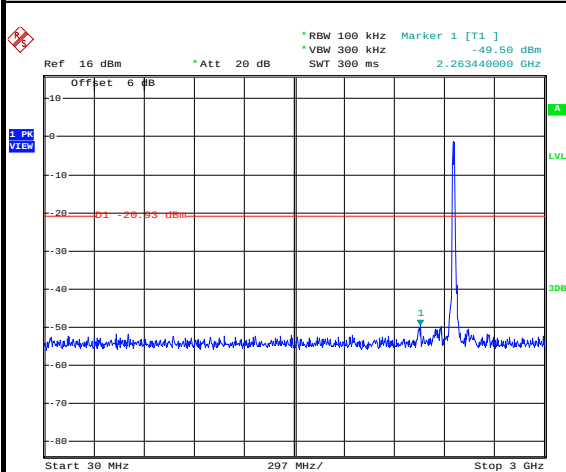
Date: 20.AUG.2014 02:30:50

High Channel Plot



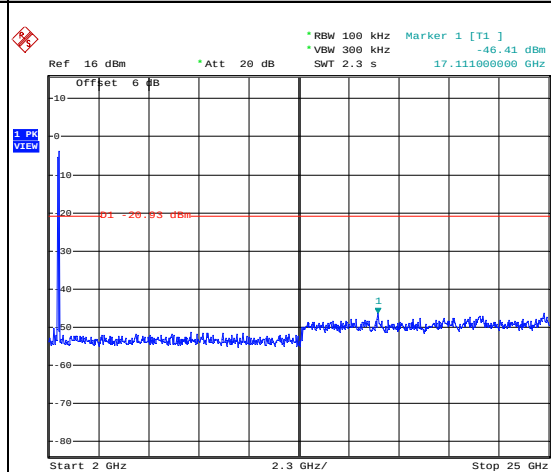
Date: 20.AUG.2014 02:31:04

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 02:31:23

Spurious Emission 2GHz~25GHz



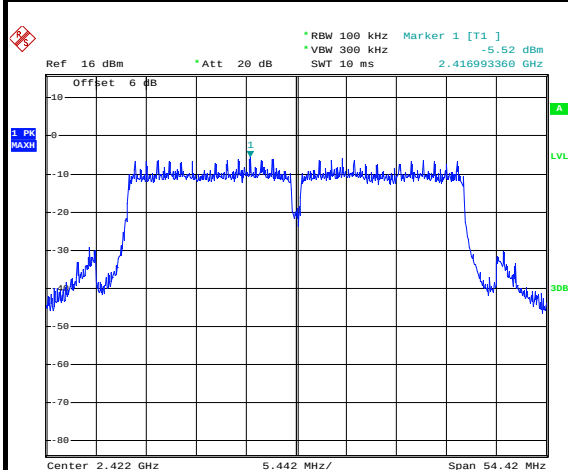
Date: 20.AUG.2014 02:31:42



Number of TX :	2	Chain Port:	0+1(1)
Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	03	Test Engineer :	Adonis Li

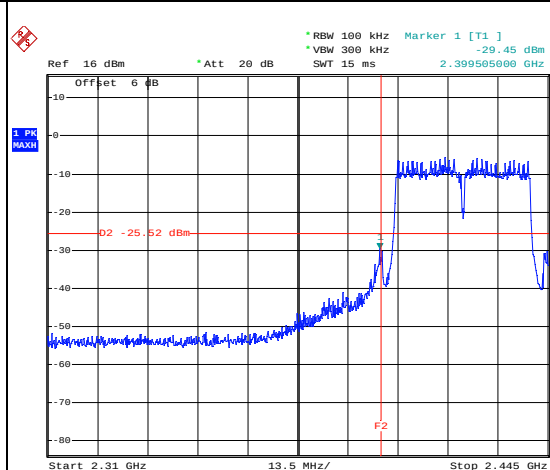
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



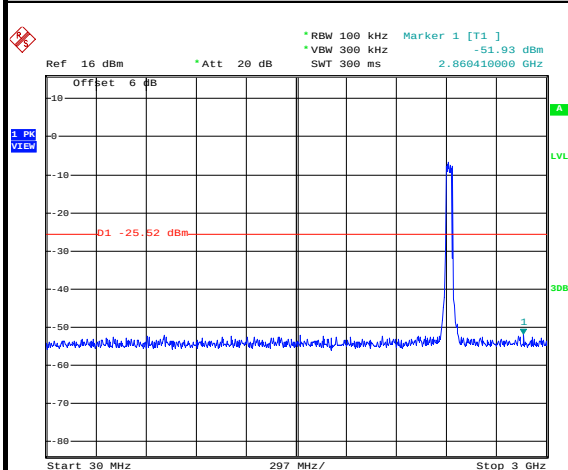
Date: 20.AUG.2014 03:41:45

Low Channel Plot



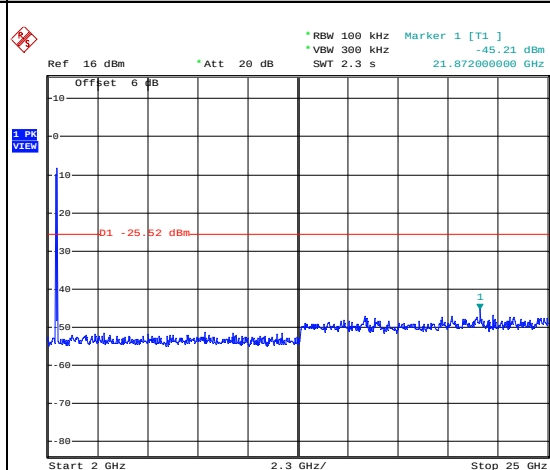
Date: 20.AUG.2014 03:41:59

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 03:46:37

Spurious Emission 2GHz~25GHz



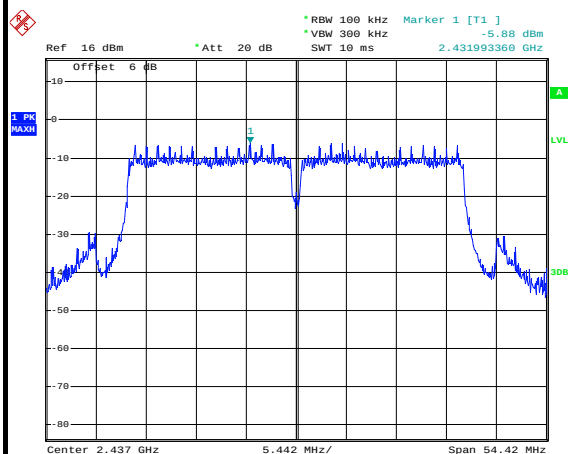
Date: 20.AUG.2014 03:46:56



Number of TX :	2	Chain Port:	0+1(1)
Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

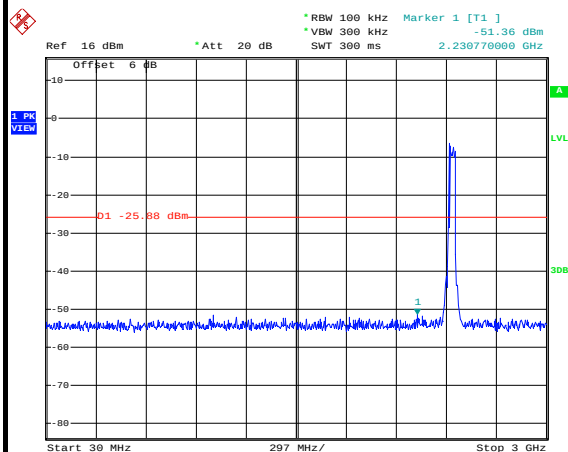
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



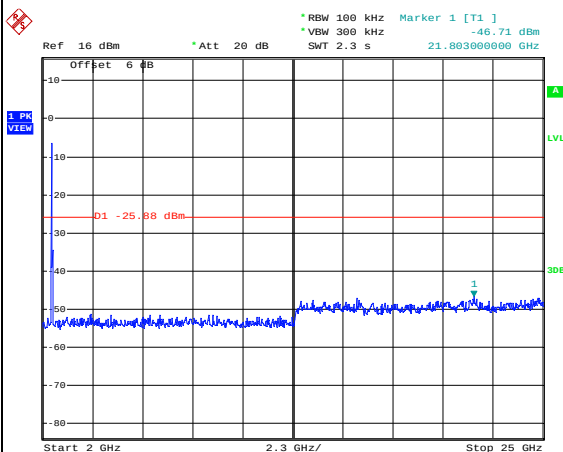
Date: 20.AUG.2014 03:51:31

Spurious Emission 30MHz~3GHz



Date: 20.AUG.2014 03:51:51

Spurious Emission 2GHz~25GHz



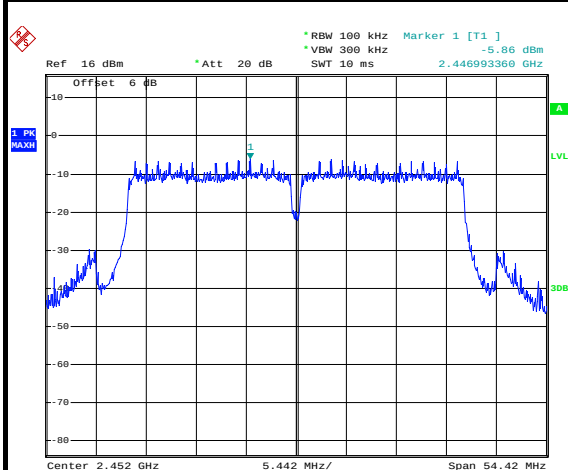
Date: 20.AUG.2014 03:52:10



Number of TX :	2	Chain Port:	0+1(1)
Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	09	Test Engineer :	Adonis Li

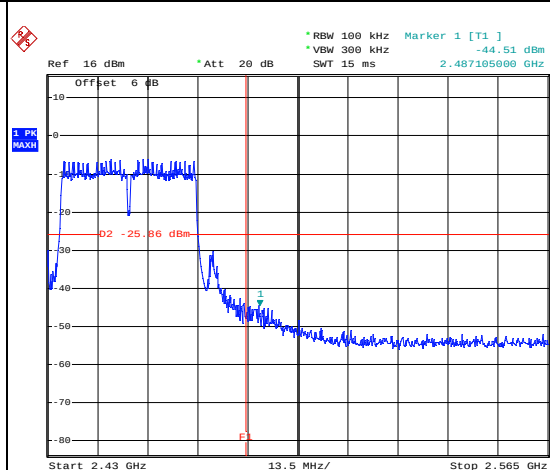
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



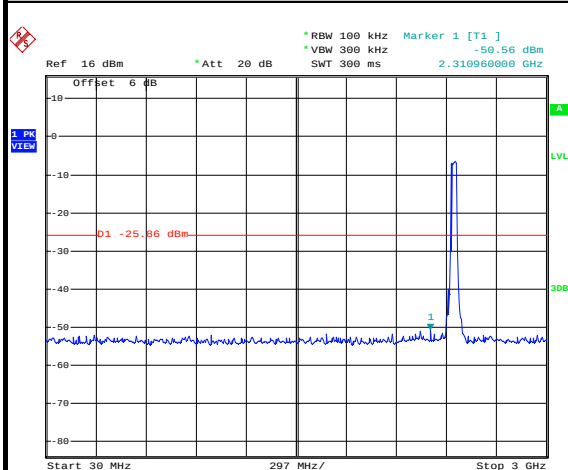
Date: 20.AUG.2014 03:56:08

High Channel Plot



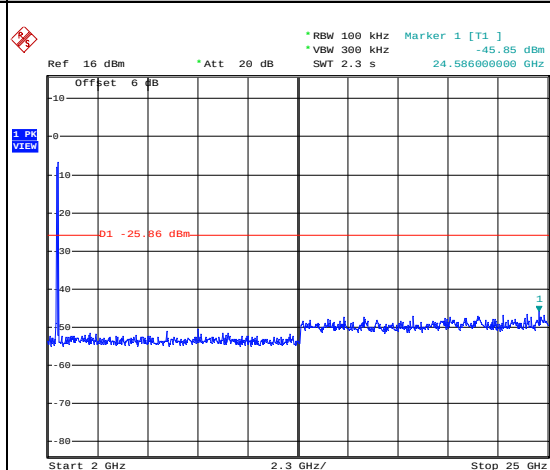
Date: 20.AUG.2014 03:56:22

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2014 02:07:58

Spurious Emission 2GHz~25GHz



Date: 20.AUG.2014 03:58:02

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 Procedure

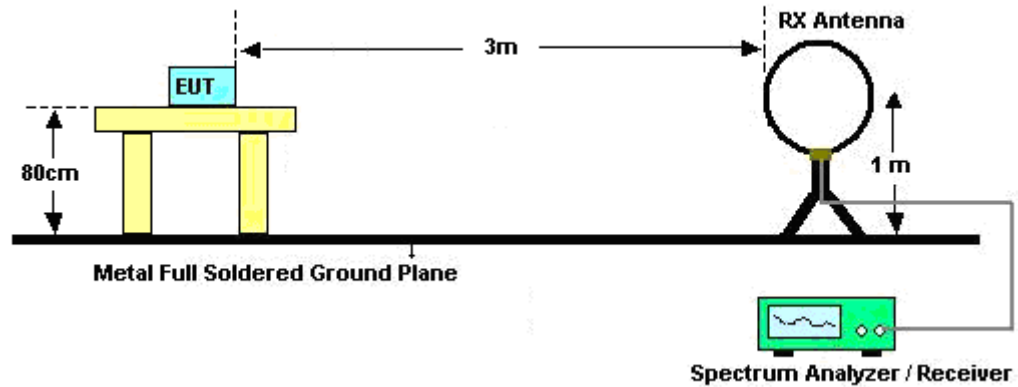
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the 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; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.



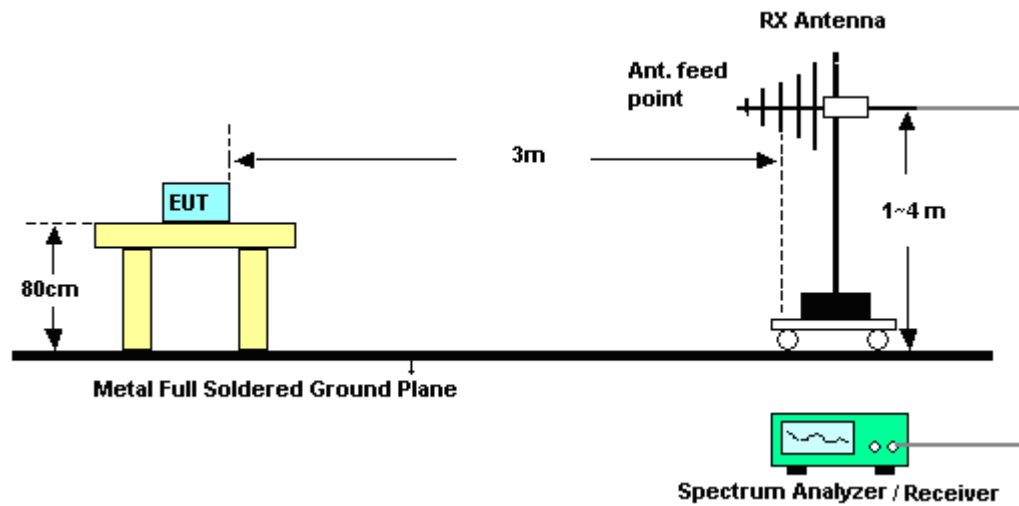
Chain Port	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
0	802.11b	100	-	-	10Hz
1	802.11b	100	-	-	
0	802.11g	95.30	2.07	0.48	1kHz
1	802.11g	95.39	2.07	0.48	
0+1	2.4GHz 802.11n HT20	90.88	0.98	1.02	3KHz
0+1	2.4GHz 802.11n HT40	83.95	0.50	1.99	3KHz

3.5.4 Test Setup

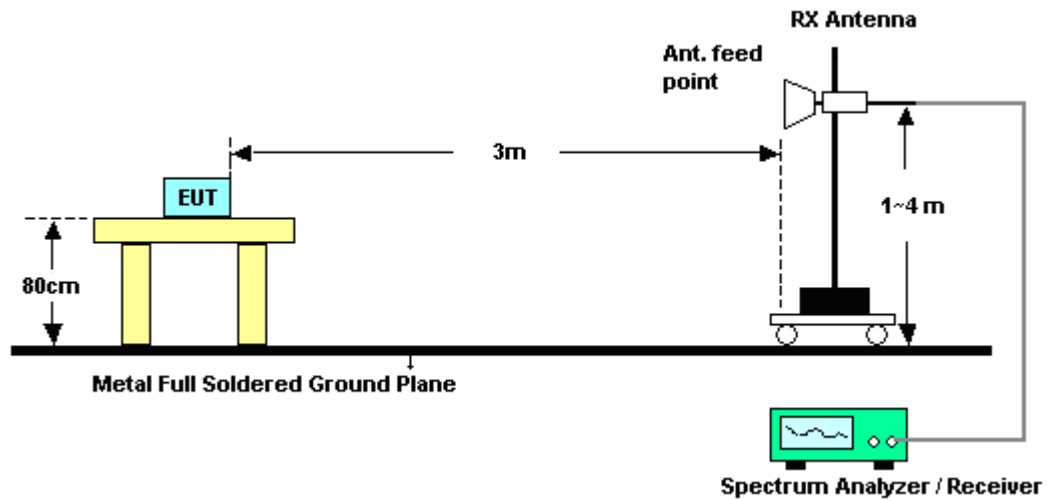
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated 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

For Sample 1

< Chain Port 0>

Test Mode :	802.11b	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Simon Lu

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
2385.42	51.91	-22.09	74	53.5	31.93	2.64	36.16	109	50	Peak
2385.33	41.39	-12.61	54	42.98	31.93	2.64	36.16	109	50	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
2332.14	49.33	-24.67	74	51.31	31.86	2.59	36.43	100	121	Peak
2331.06	36.02	-17.98	54	38	31.86	2.59	36.43	100	121	Average

Test Mode :	802.11b	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Simon Lu

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
2487.82	51.67	-22.33	74	52.63	32.1	2.68	35.74	108	48	Peak
2483.5	39.8	-14.20	54	40.83	32.08	2.68	35.79	108	48	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
2494.48	49.98	-24.02	74	50.94	32.1	2.68	35.74	168	98	Peak
2483.5	36.42	-17.58	54	37.45	32.08	2.68	35.79	168	89	Average



Test Mode :	802.11g	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Simon Lu

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
2389.74	67.39	-6.61	74	68.87	31.96	2.64	36.08	107	47	Peak
2387.04	39.71	-14.29	54	41.19	31.96	2.64	36.08	107	47	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	60.89	-13.11	74	62.37	31.96	2.64	36.08	100	114	Peak
2333.94	36.59	-17.41	54	38.57	31.86	2.59	36.43	100	114	Average

Test Mode :	802.11g	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Simon Lu

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	65.81	-8.19	74	66.84	32.08	2.68	35.79	106	51	Peak
2483.62	40.5	-13.50	54	41.53	32.08	2.68	35.79	106	51	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
2483.53	61.09	-12.91	74	62.12	32.08	2.68	35.79	171	90	Peak
2483.74	37.46	-16.54	54	38.49	32.08	2.68	35.79	171	90	Average



< Chain Port 1 >

Test Mode :	802.11b	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Simon Lu

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
2331.15	55.9	-18.1	74	57.98	31.76	2.59	36.43	171	309	Peak
2330.7	46.2	-7.80	54	48.28	31.76	2.59	36.43	171	309	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
2328.9	58.15	-15.85	74	60.23	31.76	2.59	36.43	100	89	Peak
2329.26	50.95	-3.05	54	53.03	31.76	2.59	36.43	100	89	Average

Test Mode :	802.11b	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Simon Lu

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	54.01	-19.99	74	54.78	32.34	2.68	35.79	103	117	Peak
2483.5	45.96	-8.04	54	46.73	32.34	2.68	35.79	103	117	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
2483.5	54.53	-19.47	74	55.3	32.34	2.68	35.79	119	105	Peak
2483.5	46.19	-7.81	54	46.96	32.34	2.68	35.79	119	105	Average



Test Mode :	802.11g	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Simon Lu

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	69.85	-4.15	74	71.33	31.96	2.64	36.08	167	118	Peak
2390	46.02	-7.98	54	47.5	31.96	2.64	36.08	167	118	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	70.82	-3.18	74	72.3	31.96	2.64	36.08	100	76	Peak
2390	46.63	-7.37	54	48.11	31.96	2.64	36.08	100	76	Average

Test Mode :	802.11g	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Simon Lu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.81	65.3	-8.70	74	66.07	32.34	2.68	35.79	157	300	Peak
2483.5	42.82	-11.18	54	43.59	32.34	2.68	35.79	157	300	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
2485.48	64.53	-9.47	74	65.3	32.34	2.68	35.79	144	68	Peak
2483.5	40.93	-13.07	54	41.7	32.34	2.68	35.79	144	68	Average



< Chain Port 0+1>

Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Simon Lu

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
2387.4	67.55	-6.45	74	68.98	32.01	2.64	36.08	168	135	Peak
2389.74	47.03	-6.97	54	48.46	32.01	2.64	36.08	168	135	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	71.01	-2.99	74	72.44	32.01	2.64	36.08	100	98	Peak
2390	48.17	-5.83	54	49.6	32.01	2.64	36.08	100	98	Average

Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Simon Lu

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
2484.7	69.61	-4.39	74	70.38	32.34	2.68	35.79	105	130	Peak
2483.5	47.21	-6.79	54	47.98	32.34	2.68	35.79	105	130	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
2484.7	67.32	-6.68	74	68.09	32.34	2.68	35.79	124	94	Peak
2483.5	45.39	-8.61	54	46.16	32.34	2.68	35.79	124	94	Average



Test Mode :	802.11n HT40	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	03	Test Engineer :	Simon Lu

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
2389.47	66.5	-7.50	74	67.93	32.01	2.64	36.08	166	134	Peak
2390	44.87	-9.13	54	46.3	32.01	2.64	36.08	166	134	Average
2484.52	50.18	-23.82	74	50.95	32.34	2.68	35.79	166	134	Peak
2489.83	36.1	-17.90	54	36.76	32.4	2.68	35.74	166	134	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
2387.22	69.7	-4.30	74	71.13	32.01	2.64	36.08	100	92	Peak
2389.83	47.04	-6.96	54	48.47	32.01	2.64	36.08	100	92	Average
2484.04	52.59	-21.41	74	53.36	32.34	2.68	35.79	100	92	Peak
2491.3	36.48	-17.52	54	37.14	32.4	2.68	35.74	100	92	Average



Test Mode :	802.11n HT40	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	09	Test Engineer :	Simon Lu

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
2383.17	52.92	-21.08	74	54.49	31.95	2.64	36.16	134	127	Peak
2383.08	37.01	-16.99	54	38.58	31.95	2.64	36.16	134	127	Average
2486.5	65.07	-8.93	74	65.84	32.34	2.68	35.79	134	127	Peak
2483.59	44.24	-9.76	54	45.01	32.34	2.68	35.79	134	127	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.68	55.43	-18.57	74	56.86	32.01	2.64	36.08	100	100	Peak
2384.79	39.66	-14.34	54	41.23	31.95	2.64	36.16	100	100	Average
2486.14	66.83	-7.17	74	67.6	32.34	2.68	35.79	100	100	Peak
2483.62	45.35	-8.65	54	46.12	32.34	2.68	35.79	100	100	Average

**For Sample 2****< Chain Port 0>**

Test Mode :	802.11b	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Simon Lu

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
2487.52	56.9	-17.1	74	57.56	32.4	2.68	35.74	109	58	Peak
2486.77	46.9	-7.10	54	47.67	32.34	2.68	35.79	109	58	Average

ANTENNA POLARITY : VERTICAL

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2486.2	54.66	-19.34	74	55.43	32.34	2.68	35.79	108	256	Peak
2486.77	42.5	-11.50	54	43.27	32.34	2.68	35.79	108	256	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.

For Sample 1

< Chain Port 0>

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2412 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
2412	96.12	-	-	97.5	31.98	2.66	36.02	109	50	Peak
2412	91.77	-	-	93.15	31.98	2.66	36.02	109	50	Average
4824	53.22	-20.78	74	52.02	34.07	3.78	36.65	100	309	Peak
4824	47.9	-6.10	54	46.7	34.07	3.78	36.65	100	309	Average

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	89.57	-	-	90.95	31.98	2.66	36.02	100	121	Peak
2412	85.11	-	-	86.49	31.98	2.66	36.02	100	121	Average
4824	49.66	-24.34	74	48.46	34.07	3.78	36.65	100	52	Peak



Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2437 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
2437	96.11	-	-	97.33	32.03	2.66	35.91	106	50	Peak
2437	91.93	-	-	93.15	32.03	2.66	35.91	106	50	Average
4874	54.87	-19.13	74	53.91	34.02	3.78	36.84	104	336	Peak
4874	51.21	-2.79	54	50.25	34.02	3.78	36.84	104	336	Average
7312	44.57	-29.43	74	42.98	35.72	4.73	38.86	100	35	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	90.63	-	-	91.85	32.03	2.66	35.91	138	95	Peak
2437	86.24	-	-	87.46	32.03	2.66	35.91	138	95	Average
4874	49.89	-24.11	74	48.93	34.02	3.78	36.84	100	34	Peak
7312	44.52	-29.48	74	42.93	35.72	4.73	38.86	122	78	Peak



Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2462 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
95.96	32.48	-11.02	43.5	54.7	9.95	0.43	32.6	-	-	Peak
120.21	35.69	-7.81	43.5	55.85	11.9	0.58	32.64	-	-	Peak
172.59	36.77	-6.73	43.5	59.38	9.06	0.83	32.5	114	235	Peak
191.99	32.54	-10.96	43.5	55.54	8.76	0.71	32.47	-	-	Peak
240.49	35.26	-10.74	46	55.9	11	0.84	32.48	-	-	Peak
481.05	34.96	-11.04	46	48.61	17.3	1.22	32.17	-	-	Peak
2462	96.89	-	-	98.02	32.05	2.67	35.85	108	49	Peak
2462	92.73	-	-	93.86	32.05	2.67	35.85	108	49	Average
4924	54.54	-19.46	74	53.82	33.97	3.78	37.03	101	332	Peak
4924	51.22	-2.78	54	50.5	33.97	3.78	37.03	101	332	Average
7386	46.36	-27.64	74	45.02	35.76	4.77	39.19	124	10	Peak



Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	35.89	-4.11	40	50.36	18	0.19	32.66	126	324	QP
35.82	35.54	-4.46	40	53.47	14.5	0.19	32.62	-	-	Peak
99.84	40.04	-3.46	43.5	61.64	10.6	0.43	32.63	-	-	Peak
120.21	35.99	-7.51	43.5	56.15	11.9	0.58	32.64	-	-	Peak
169.68	34.4	-9.10	43.5	56.77	9.31	0.83	32.51	-	-	Peak
240.49	33.37	-12.63	46	54.01	11	0.84	32.48	-	-	Peak
2462	97.74	-	-	98.87	32.05	2.67	35.85	168	89	Peak
2462	87.42	-	-	88.55	32.05	2.67	35.85	168	89	Average
4924	49.02	-24.98	74	48.3	33.97	3.78	37.03	100	78	Peak
7386	44.62	-29.38	74	43.28	35.76	4.77	39.19	110	45	Peak



Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	97.99	-	-	99.37	31.98	2.66	36.02	107	47	Peak
2412	86.84	-	-	88.22	31.98	2.66	36.02	107	47	Average
4824	46.74	-27.26	74	45.54	34.07	3.78	36.65	114	0	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	91.44	-	-	92.82	31.98	2.66	36.02	100	114	Peak
2412	79.4	-	-	80.78	31.98	2.66	36.02	100	114	Average
4824	44.18	-29.82	74	42.98	34.07	3.78	36.65	100	38	Peak



Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	95.29	-	-	96.51	32.03	2.66	35.91	106	47	Peak
2437	82.05	-	-	83.27	32.03	2.66	35.91	106	47	Average
4874	47.34	-26.66	74	46.38	34.02	3.78	36.84	154	20	Peak
7312	45.46	-28.54	74	43.87	35.72	4.73	38.86	120	78	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	90.36	-	-	91.58	32.03	2.66	35.91	100	132	Peak
2437	77.66	-	-	78.88	32.03	2.66	35.91	100	132	Average
4874	46.57	-27.43	74	45.61	34.02	3.78	36.84	100	0	Peak
7312	45.23	-28.77	74	43.64	35.72	4.73	38.86	147	14	Peak



Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	97.79	-	-	98.92	32.05	2.67	35.85	106	51	Peak
2462	87.24	-	-	88.37	32.05	2.67	35.85	106	51	Average
4924	46.27	-27.73	74	45.55	33.97	3.78	37.03	102	5	Peak
7386	46.23	-27.77	74	44.89	35.76	4.77	39.19	100	15	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	91.87	-	-	93	32.05	2.67	35.85	171	90	Peak
2462	81.24	-	-	82.37	32.05	2.67	35.85	171	90	Average
4924	46.11	-27.89	74	45.39	33.97	3.78	37.03	104	14	Peak
7386	45.38	-28.62	74	44.04	35.76	4.77	39.19	140	24	Peak

**< Chain Port 1>**

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2412 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
2330	56.37	-17.63	74	58.45	31.76	2.59	36.43	171	113	Peak
2330	47.83	-6.17	54	49.91	31.76	2.59	36.43	171	113	Average
2412	103.81	-	-	105.09	32.08	2.66	36.02	171	113	Peak
2412	99.39	-	-	100.67	32.08	2.66	36.02	171	113	Average
4824	44.95	-29.05	74	43.62	34.2	3.78	36.65	102	320	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	2412 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
2330	57.76	-16.24	74	59.84	31.76	2.59	36.43	100	89	Peak
2330	49.86	-4.14	54	51.94	31.76	2.59	36.43	100	89	Average
2412	105.59	-	-	106.87	32.08	2.66	36.02	100	89	Peak
2412	101.27	-	-	102.55	32.08	2.66	36.02	100	89	Average
4824	44.01	-29.99	74	42.68	34.2	3.78	36.65	168	16	Peak



Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2437 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
2358	55.26	-18.74	74	57	31.89	2.62	36.25	170	110	Peak
2358	47.91	-6.09	54	49.65	31.89	2.62	36.25	170	110	Average
2437	104.71	-	-	105.75	32.21	2.66	35.91	165	116	Peak
2437	99.51	-	-	100.55	32.21	2.66	35.91	165	116	Average
4874	44.3	-29.70	74	43.16	34.2	3.78	36.84	126	87	Peak
7312	45.81	-28.19	74	44.22	35.72	4.73	38.86	126	34	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	2437 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
2336	58.31	-15.69	74	60.24	31.82	2.59	36.34	100	240	Peak
2336	47.31	-6.69	54	49.24	31.82	2.59	36.34	100	240	Average
2437	106.24	-	-	107.28	32.21	2.66	35.91	106	223	Peak
2437	94.82	-	-	95.86	32.21	2.66	35.91	106	223	Average
4874	44.78	-29.22	74	43.64	34.2	3.78	36.84	106	162	Peak
7312	46.19	-27.81	74	44.6	35.72	4.73	38.86	175	341	Peak



Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2462 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
2362	58.54	-15.46	74	60.28	31.89	2.62	36.25	103	117	Peak
2362	41.5	-12.50	54	43.24	31.89	2.62	36.25	103	117	Average
2462	103.23	-	-	104.14	32.27	2.67	35.85	103	117	Peak
2462	99.78	-	-	100.69	32.27	2.67	35.85	103	117	Average
4924	45.28	-28.72	74	44.33	34.2	3.78	37.03	123	24	Peak
7386	45.93	-28.07	74	44.59	35.76	4.77	39.19	147	254	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	2462 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
2360	56.53	-17.47	74	58.27	31.89	2.62	36.25	119	105	Peak
2360	39.53	-14.47	54	41.27	31.89	2.62	36.25	119	105	Average
2462	103.33	-	-	104.24	32.27	2.67	35.85	119	105	Peak
2462	99.16	-	-	100.07	32.27	2.67	35.85	119	105	Average
4924	44.53	-29.47	74	43.58	34.2	3.78	37.03	124	301	Peak
7386	45.9	-28.10	74	44.56	35.76	4.77	39.19	187	354	Peak



Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2412 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
2334	59.06	-14.94	74	61.04	31.86	2.59	36.43	167	118	Peak
2334	44.84	-9.16	54	46.82	31.86	2.59	36.43	167	118	Average
2412	104.91	-	-	106.29	31.98	2.66	36.02	167	119	Peak
2412	92.82	-	-	94.2	31.98	2.66	36.02	167	119	Average
2496	53.84	-20.16	74	54.8	32.1	2.68	35.74	167	118	Peak
2496	40.09	-13.91	54	41.05	32.1	2.68	35.74	167	118	Average
4824	45.92	-28.08	74	44.59	34.2	3.78	36.65	123	25	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	2412 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
2334	59.44	-14.56	74	61.42	31.86	2.59	36.43	100	85	Peak
2334	46.51	-7.49	54	48.49	31.86	2.59	36.43	100	85	Average
2412	105.02	-	-	106.4	31.98	2.66	36.02	100	85	Peak
2412	93.02	-	-	94.4	31.98	2.66	36.02	100	85	Average
2492	53.03	-20.97	74	53.99	32.1	2.68	35.74	100	85	Peak
2492	39.12	-14.88	54	40.08	32.1	2.68	35.74	100	85	Average
4824	44.86	-29.14	74	43.53	34.2	3.78	36.65	200	198	Peak



Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2437 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
2360	57.09	-16.91	74	58.83	31.89	2.62	36.25	131	117	Peak
2360	44.3	-9.70	54	46.04	31.89	2.62	36.25	131	117	Average
2437	104.32	-	-	105.36	32.21	2.66	35.91	130	117	Peak
2437	92.12	-	-	93.16	32.21	2.66	35.91	130	117	Average
4874	44.78	-29.22	74	43.64	34.2	3.78	36.84	100	0	Peak
7312	46.25	-27.75	74	44.66	35.72	4.73	38.86	150	180	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	2437 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
2362	61.14	-12.86	74	62.88	31.89	2.62	36.25	100	96	Peak
2362	49.1	-4.90	54	50.84	31.89	2.62	36.25	100	96	Average
2437	105.13	-	-	106.17	32.21	2.66	35.91	100	96	Peak
2437	93	-	-	94.04	32.21	2.66	35.91	100	96	Average
4874	44.85	-29.15	74	43.71	34.2	3.78	36.84	100	0	Peak
7312	46.37	-27.63	74	44.78	35.72	4.73	38.86	180	325	Peak



Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2462 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
2378	53.72	-20.28	74	55.29	31.95	2.64	36.16	157	300	Peak
2378	40.61	-13.39	54	42.18	31.95	2.64	36.16	157	300	Average
2462	101.32	-	-	102.23	32.27	2.67	35.85	157	300	Peak
2462	89.39	-	-	90.3	32.27	2.67	35.85	157	300	Average
4924	44.37	-29.63	74	43.42	34.2	3.78	37.03	160	89	Peak
7386	47.15	-26.85	74	45.81	35.76	4.77	39.19	155	265	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	99.05	-	-	99.96	32.27	2.67	35.85	144	68	Peak
2462	86.87	-	-	87.78	32.27	2.67	35.85	144	68	Average
4924	43.75	-30.25	74	42.8	34.2	3.78	37.03	100	160	Peak
7386	45.52	-28.48	74	44.18	35.76	4.77	39.19	124	0	Peak

< Chain Port 0+1>

Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	105.49	-	-	106.77	32.08	2.66	36.02	168	135	Peak
2412	93.93	-	-	95.21	32.08	2.66	36.02	168	135	Average
4824	44.71	-29.29	74	43.38	34.2	3.78	36.65	145	321	Peak

Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	105.52	-	-	106.8	32.08	2.66	36.02	100	98	Peak
2412	93.94	-	-	95.22	32.08	2.66	36.02	100	98	Average
4824	45.68	-28.32	74	44.35	34.2	3.78	36.65	100	46	Peak



Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2437 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
2360	60.98	-13.02	74	62.72	31.89	2.62	36.25	178	123	Peak
2360	46.77	-7.23	54	48.51	31.89	2.62	36.25	178	123	Average
2437	106.36	-	-	107.4	32.21	2.66	35.91	134	132	Peak
2437	94.64	-	-	95.68	32.21	2.66	35.91	134	132	Average
4874	44.21	-29.79	74	43.07	34.2	3.78	36.84	100	358	Peak
7312	45.5	-28.50	74	43.91	35.72	4.73	38.86	140	258	Peak

Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	2437 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
2356	60	-14.00	74	61.75	31.89	2.61	36.25	131	89	Peak
2356	46.64	-7.36	54	48.39	31.89	2.61	36.25	131	89	Average
2437	104.65	-	-	105.69	32.21	2.66	35.91	117	99	Peak
2437	92.31	-	-	93.35	32.21	2.66	35.91	117	99	Average
4874	44.4	-29.60	74	43.26	34.2	3.78	36.84	100	35	Peak
7312	45.05	-28.95	74	43.46	35.72	4.73	38.86	112	85	Peak



Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	2462 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
2384	60.35	-13.65	74	61.92	31.95	2.64	36.16	105	130	Peak
2384	47.04	-6.96	54	48.61	31.95	2.64	36.16	105	130	Average
2462	105.99	-	-	106.9	32.27	2.67	35.85	105	130	Peak
2462	94.13	-	-	95.04	32.27	2.67	35.85	105	130	Average
4924	43.61	-30.39	74	42.66	34.2	3.78	37.03	135	40	Peak
7386	46.09	-27.91	74	44.75	35.76	4.77	39.19	110	54	Peak

Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	2462 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
2382	60.53	-13.47	74	62.1	31.95	2.64	36.16	124	94	Peak
2382	47.93	-6.07	54	49.5	31.95	2.64	36.16	124	94	Average
2462	104.29	-	-	105.2	32.27	2.67	35.85	122	97	Peak
2462	92.87	-	-	93.78	32.27	2.67	35.85	122	97	Average
4924	44.46	-29.54	74	43.51	34.2	3.78	37.03	124	25	Peak
7386	45.6	-28.40	74	44.26	35.76	4.77	39.19	141	0	Peak



Test Mode :	802.11n HT40	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
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
2422	96.52	-	-	97.68	32.14	2.66	35.96	166	134	Peak
2422	84.27	-	-	85.43	32.14	2.66	35.96	166	134	Average
4844	44.73	-29.27	74	43.47	34.2	3.78	36.72	101	23	Peak
7266	44.15	-29.85	74	42.45	35.71	4.72	38.73	100	348	Peak

Test Mode :	802.11n HT40	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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
2422	97.13	-	-	98.29	32.14	2.66	35.96	100	92	Peak
2422	85.26	-	-	86.42	32.14	2.66	35.96	100	92	Average
4844	44.3	-29.70	74	43.04	34.2	3.78	36.72	111	35	Peak
7266	43.94	-30.06	74	42.24	35.71	4.72	38.73	100	68	Peak



Test Mode :	802.11n HT40	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	97.41	-	-	98.45	32.21	2.66	35.91	169	128	Peak
2437	85.45	-	-	86.49	32.21	2.66	35.91	169	128	Average
4874	45.07	-28.93	74	43.93	34.2	3.78	36.84	148	20	Peak
7312	46.96	-27.04	74	45.37	35.72	4.73	38.86	122	73	Peak

Test Mode :	802.11n HT40	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	96.53	-	-	97.57	32.21	2.66	35.91	100	88	Peak
2437	84.58	-	-	85.62	32.21	2.66	35.91	100	88	Average
4874	44.69	-29.31	74	43.55	34.2	3.78	36.84	120	78	Peak
7312	46.26	-27.74	74	44.67	35.72	4.73	38.86	100	39	Peak



Test Mode :	802.11n HT40	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2452	96.83	-	-	97.86	32.21	2.67	35.91	134	127	Peak
2452	84.54	-	-	85.57	32.21	2.67	35.91	134	127	Average
4904	43.78	-30.22	74	42.76	34.2	3.78	36.96	103	45	Peak
7356	45.8	-28.20	74	44.36	35.74	4.76	39.06	100	152	Peak

Test Mode :	802.11n HT40	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2452	96.64	-	-	97.67	32.21	2.67	35.91	100	100	Peak
2452	85.33	-	-	86.36	32.21	2.67	35.91	100	100	Average
4904	43.53	-30.47	74	42.51	34.2	3.78	36.96	100	54	Peak
7356	45.18	-28.82	74	43.74	35.74	4.76	39.06	100	200	Peak

For Sample 2
< Chain Port 0 >

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	107.26	-	-	108.17	32.27	2.67	35.85	109	58	Peak
2462	103.04	-	-	103.95	32.27	2.67	35.85	109	58	Average
4924	50.23	-23.77	74	49.28	34.2	3.78	37.03	123	254	Peak
7386	45.77	-28.23	74	44.43	35.76	4.77	39.19	100	0	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	103	-	-	103.91	32.27	2.67	35.85	108	256	Peak
2462	98.78	-	-	99.69	32.27	2.67	35.85	108	256	Average
4924	49.37	-24.63	74	48.42	34.2	3.78	37.03	108	234	Peak
7386	46.3	-27.70	74	44.96	35.76	4.77	39.19	115	214	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.

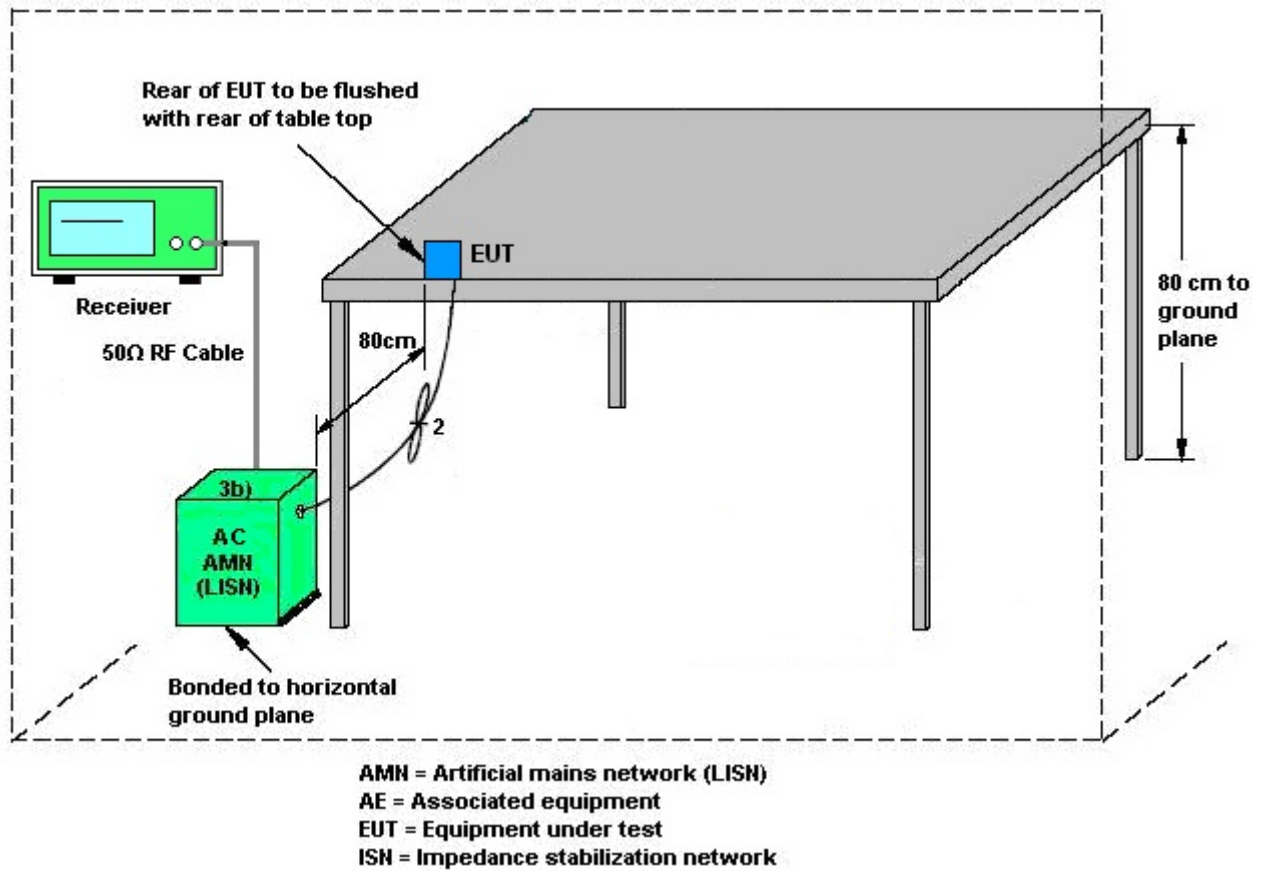
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

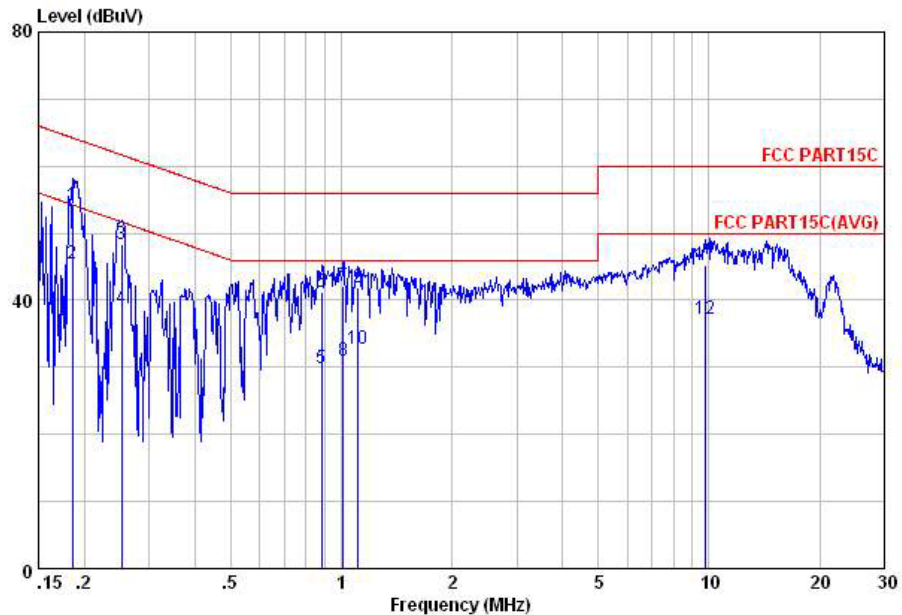
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other 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 (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	22~24℃
Test Engineer :	Eligah Wang	Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN (2.4G) Link + USB Cable 2 (Charging from Adapter) + Battery 2 + Earphone for Sample 2		



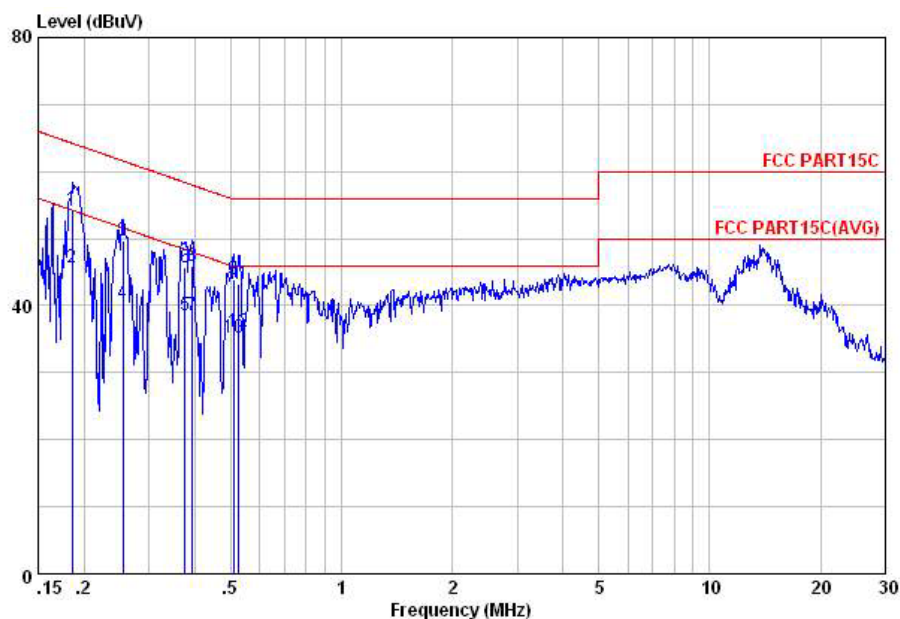
Site : C001-KS
Condition: FCC PART15C LISN-L20130306 LINE

mode : Mode 2

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBμV	dB	dBμV	dBμV	dB	dB	
1	0.19	54.10	-10.14	64.24	42.29	1.20	10.61	QP
2	0.19	45.40	-8.84	54.24	33.59	1.20	10.61	Average
3	0.25	48.27	-13.42	61.69	36.90	0.87	10.50	QP
4	0.25	38.67	-13.02	51.69	27.30	0.87	10.50	Average
5	0.88	29.92	-16.08	46.00	19.60	0.13	10.19	Average
6	0.88	41.22	-14.78	56.00	30.90	0.13	10.19	QP
7	1.01	42.18	-13.82	56.00	31.90	0.10	10.18	QP
8	1.01	30.88	-15.12	46.00	20.60	0.10	10.18	Average
9	1.11	41.88	-14.12	56.00	31.60	0.10	10.18	QP
10	1.11	32.68	-13.32	46.00	22.40	0.10	10.18	Average
11	9.76	45.16	-14.84	60.00	34.60	0.20	10.36	QP
12	9.76	37.16	-12.84	50.00	26.60	0.20	10.36	Average



Test Mode :	Mode 2	Temperature :	22~24℃
Test Engineer :	Eligah Wang	Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN (2.4G) Link + USB Cable 2 (Charging from Adapter) + Battery 2 + Earphone for Sample 2		



Site : C001-KS
Condition: FCC PART15C LISN-N20130306 NEUTRAL

mode : Mode 2

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19	54.39	-9.85	64.24	42.59	1.19	10.61	QP
2	0.19	45.69	-8.55	54.24	33.89	1.19	10.61	Average
3	0.25	49.68	-11.92	61.60	38.30	0.88	10.50	QP
4	0.25	40.28	-11.32	51.60	28.90	0.88	10.50	Average
5	0.38	38.54	-9.85	48.39	27.79	0.45	10.30	Average
6	0.38	45.64	-12.75	58.39	34.89	0.45	10.30	QP
7	0.39	38.50	-9.49	47.99	27.81	0.41	10.28	Average
8	0.39	46.00	-11.99	57.99	35.31	0.41	10.28	QP
9	0.51	43.86	-12.14	56.00	33.30	0.30	10.26	QP
10	0.51	35.16	-10.84	46.00	24.60	0.30	10.26	Average
11	0.53	43.15	-12.85	56.00	32.60	0.29	10.26	QP
12	0.53	36.15	-9.85	46.00	25.60	0.29	10.26	Average

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

FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

For CDD transmissions, directional gain is calculated as

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the k th antenna is being fed by spatial stream j , or zero if it is not;
 G_k is the gain in dBi of the k th antenna.

The EUT supports CDD mode

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain "DG" is calculated as following table.



			DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Chain Port 0 (dBi)	Chain Port 1 (dBi)				
2.4 GHz	0.90	0.80	3.86	3.86	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 28, 2013	Aug. 20, 2014~ Aug. 27, 2014	Dec. 27, 2014	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	30MHz~40GHz	Feb. 27, 2014	Aug. 20, 2014~ Aug. 27, 2014	Feb. 26, 2015	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Feb. 27, 2014	Aug. 20, 2014~ Aug. 27, 2014	Feb. 26, 2015	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 05, 2013	Aug. 12, 2014	Nov. 04, 2014	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 28, 2013	Aug. 12, 2014	Dec. 27, 2014	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 09, 2013	Aug. 12, 2014	Oct. 08, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Jan. 08, 2014	Aug. 12, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 08, 2014	Aug. 12, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 18, 2013	Aug. 12, 2014	Nov. 17, 2014	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA1702 49	15GHz~40GHz	Mar. 10, 2014	Aug. 12, 2014	Mar. 09, 2015	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161073	1MHz~1GHz	May 04, 2014	Aug. 12, 2014	May 03, 2015	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A023 71	1GHz~26.5GHz	Dec. 10, 2013	Aug. 12, 2014	Dec. 09, 2014	Radiation (03CH01-KS)
AC Power Source	Chroma	61601	F1040900 04	N/A	NCR	Aug. 12, 2014	NCR	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Aug. 12, 2014	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Aug. 12, 2014	NCR	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 04, 2014	Jul. 25, 2014	May 03, 2015	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Dec. 10, 2013	Jul. 25, 2014	Dec. 09, 2014	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Dec. 10, 2013	Jul. 25, 2014	Dec. 09, 2014	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	AC 0V~300V, 45Hz~1000Hz	Nov. 12, 2013	Jul. 25, 2014	Nov. 11, 2014	Conduction (CO01-KS)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.3
---	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.5
---	-----