FCC RF Test Report

APPLICANT	:	ZTE CORPORATION
EQUIPMENT	:	LTE uFi
BRAND NAME	:	ZTE
MODEL NAME	:	303ZT, 304ZT, 305ZT
FCC ID	:	SRQ-MF975
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on May 26, 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

Testing Laboratory
2627

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

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APPENDIX A. SETUP PHOTOGRAPHS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR452602	Rev. 01	Initial issue of report	Aug. 28, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.35 dB at 2389.830 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 11.81 dB at 1.500 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

ZTE CORPORATION
ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.2 Manufacturer

ZTE CORPORATION
ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	LTE uFi
Brand Name	ZTE
Model Name	303ZT, 304ZT, 305ZT
FCC ID	SRQ-MF975
EUT supports Radios application	WCDMA/HSPA/HSPA+(Downlink Only) WLAN2.4GHz 802.11b/g/n HT20/HT40
HW Version	xw3B
SW Version	SBM_JP_MF975V0.0.0B01
EUT Stage	Identical Prototype

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

1.4 Product Specification subjective to this standard

<table>
<tr><th colspan="2">Product Specification subjective to this standard</th></tr>
<tr><td>Tx/Rx Channel Frequency Range</td><td>802.11b/g/n : 2412 MHz ~ 2462 MHz</td></tr>
<tr><td>Maximum (Peak) Output Power to antenna</td><td>802.11b : 17.76 dBm (0.0597 W)
802.11g : 24.37 dBm (0.2735 W)
802.11n HT20 : 25.86 dBm (0.3855 W)
802.11n HT40 : 24.17 dBm (0.2612 W)</td></tr>
<tr><td>Antenna Type</td><td>WLAN for Chain Port 0: Monopole Antenna with gain 2.50 dBi
WLAN for Chain Port 1: Monopole Antenna with gain 2.20 dBi</td></tr>
<tr><td>Type of Modulation</td><td>802.11b : DSSS (DBPSK / DQPSK / CCK)
802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)</td></tr>
<tr><td>Antenna Function for Transmitter</td><td>
<table>
<tr><th></th><th>Chain Port 0</th><th>Chain Port 1</th></tr>
<tr><td>802.11 b</td><td>V</td><td>V</td></tr>
<tr><td>802.11 g</td><td>V</td><td>V</td></tr>
<tr><td>802.11 n SISO</td><td>V</td><td>V</td></tr>
<tr><td>802.11 n MIMO</td><td>V</td><td>V</td></tr>
</table>
</td></tr>
</table>

1.5 Modification of EUT

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

1.6 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 Registration No.**
	TH01-KS	03CH01-KS	CO01-KS	149928

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

1.7 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

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.

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

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

2.1 Carrier Frequency 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.

2.4GHz 802.11b Peak Power (dBm)				
Chain Port	Power vs. Data Rate			
	1M bps	2M bps	5.5M bps	11M bps
Chain Port 0	17.76	17.61	17.59	17.58
Chain Port 1	17.56	17.53	17.54	17.55

2.4GHz 802.11g Peak Power (dBm)								
Chain Port	Power vs. Data Rate							
	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Chain Port 0	21.62	21.92	21.78	22.63	24.32	24.15	24.07	24.37
Chain Port 1	21.73	21.97	21.91	22.43	24.06	24.14	24.06	24.16

2.4GHz 802.11n HT20 Peak Power (dBm)								
Chain Port	Power vs. MCS Index							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Chain Port 0	21.27	21.26	21.34	23.86	24.04	23.82	24.08	24.12
Chain Port 1	21.25	21.36	21.23	23.31	23.16	23.33	23.37	23.38
Chain Port	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Chain Port 0+1(0)	18.11	18.23	18.32	19.12	20.63	21.14	22.67	22.71
Chain Port 0+1(1)	18.33	18.42	18.53	19.26	20.62	21.25	21.95	22.98
Chain Port 0+1	21.23	21.34	21.44	22.20	23.64	24.21	25.34	25.86

2.4GHz 802.11n HT40 Peak Power (dBm)								
Power vs. MCS Index								
Chain Port	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Chain Port 0	21.28	21.01	21.11	24.00	24.09	24.08	23.94	24.17
Chain Port 1	21.16	21.12	21.57	22.74	22.51	23.14	23.12	23.26
Chain Port	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Chain Port 0+1(0)	18.70	18.61	18.62	19.32	20.36	20.31	19.95	20.92
Chain Port 0+1(1)	17.18	18.12	16.73	19.14	20.03	20.12	19.32	21.12
Chain Port 0+1	21.02	21.38	20.79	22.24	23.21	23.23	22.66	24.03

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).

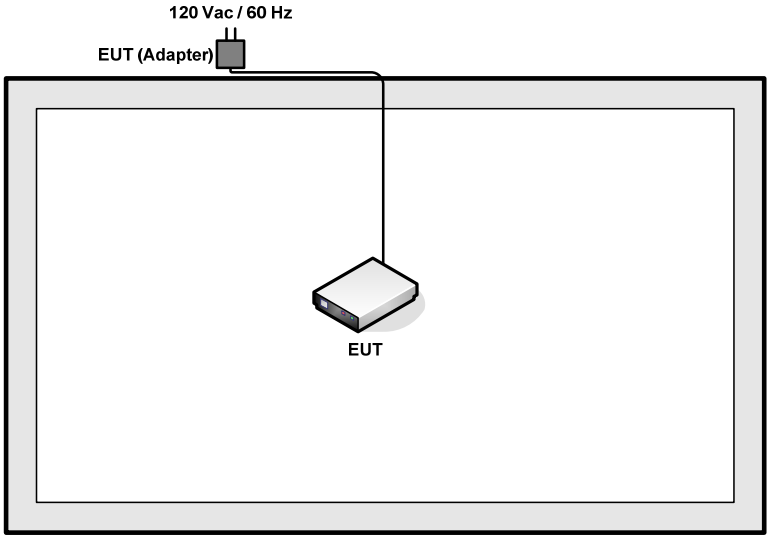
2.3 Test Mode

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

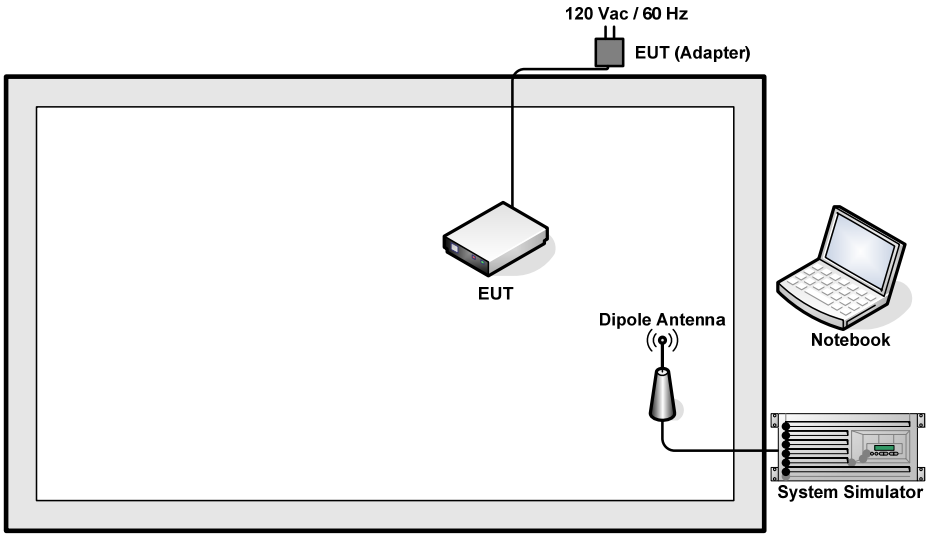
Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	54 Mbps	1/6/11
		802.11n HT20	MCS7/ MCS15	1/6/11
		802.11n HT40	MCS7/ MCS15	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	54 Mbps	1/6/11
		802.11n HT20	MCS7/ MCS15	1/6/11
		802.11n HT40	MCS7/ MCS15	3/6/9
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	54 Mbps	1/11
		802.11n HT20	MCS7/ MCS15	1/11
		802.11n HT40	MCS7/ MCS15	3/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	54 Mbps	1/6/11
		802.11n HT20	MCS7/ MCS15	1/6/11
		802.11n HT40	MCS7/ MCS15	3/6/9
Radiated TCs	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	54 Mbps	1/11
		802.11n HT20	MCS15	1/11
		802.11n HT40	MCS7/ MCS15	3/9
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	54 Mbps	1/6/11
		802.11n HT20	MCS15	1/6/11
		802.11n HT40	MCS7/ MCS15	3/6/9
AC Conducted Emission	Mode 1 : WCDMA Band V Idle + WLAN (2.4G) Link + Adapter			

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Notebook	Lenovo	G480	PRC4	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m

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 Notebook 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 and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF cable loss + attenuator factor.
Following shows an offset computation example with cable loss 6 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).
= 6 + 10 = 16 (dB)

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

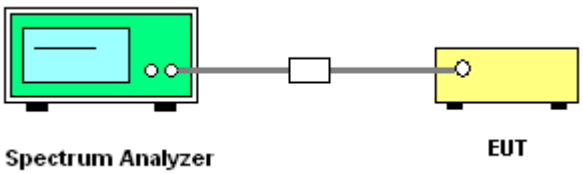
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance 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. Measure and record the results in the test report.

3.1.4 Test Setup

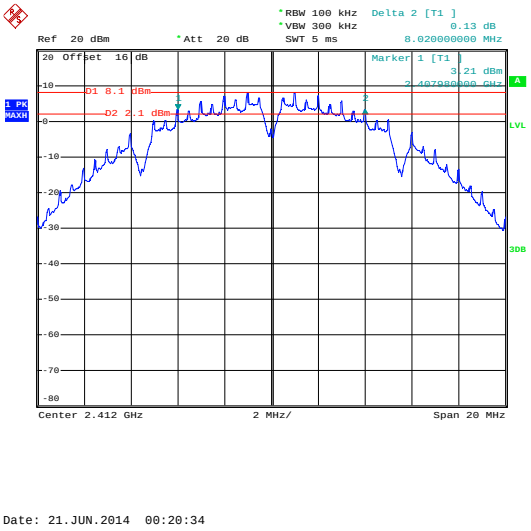


3.1.5 Test Result of 6dB Bandwidth

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

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Chain Port 0	Chain Port 1		
11b	1Mbps	1	1	2412	8.02	-	0.5	Pass
11b	1Mbps	1	6	2437	8.04	-	0.5	Pass
11b	1Mbps	1	11	2462	8.04	-	0.5	Pass
11g	54Mbps	1	1	2412	15.12	-	0.5	Pass
11g	54Mbps	1	6	2437	15.32	-	0.5	Pass
11g	54Mbps	1	11	2462	15.30	-	0.5	Pass
HT20	MCS7	1	1	2412	15.10	-	0.5	Pass
HT20	MCS7	1	6	2437	15.44	-	0.5	Pass
HT20	MCS7	1	11	2462	15.44	-	0.5	Pass
HT40	MCS7	1	3	2422	35.04	-	0.5	Pass
HT40	MCS7	1	6	2437	33.84	-	0.5	Pass
HT40	MCS7	1	9	2452	35.04	-	0.5	Pass
HT20	MCS15	2	1	2412	16.26	15.08	0.5	Pass
HT20	MCS15	2	6	2437	15.94	15.70	0.5	Pass
HT20	MCS15	2	11	2462	15.44	15.44	0.5	Pass
HT40	MCS15	2	3	2422	32.52	35.04	0.5	Pass
HT40	MCS15	2	6	2437	35.08	35.08	0.5	Pass
HT40	MCS15	2	9	2452	35.04	35.04	0.5	Pass

Minimum 6dB Bandwidth



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, 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.

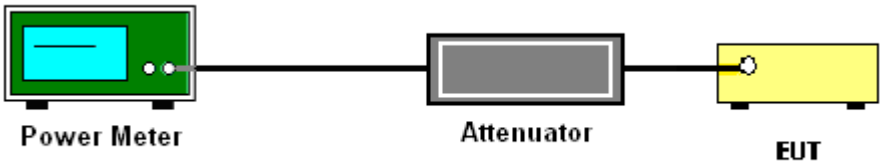
3.2.2 Measuring Instruments

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	17.76	17.56	-	30.00	30.00	2.50	2.20	Pass
11b	1Mbps	1	6	2437	17.54	17.28		30.00	30.00	2.50	2.20	Pass
11b	1Mbps	1	11	2462	17.05	16.42		30.00	30.00	2.50	2.20	Pass
11g	54Mbps	1	1	2412	24.37	24.16		30.00	30.00	2.50	2.20	Pass
11g	54Mbps	1	6	2437	24.16	24.05		30.00	30.00	2.50	2.20	Pass
11g	54Mbps	1	11	2462	24.20	24.12		30.00	30.00	2.50	2.20	Pass
HT20	MCS7	1	1	2412	24.12	23.38		30.00	30.00	2.50	2.20	Pass
HT20	MCS7	1	6	2437	24.05	22.96		30.00	30.00	2.50	2.20	Pass
HT20	MCS7	1	11	2462	23.98	23.10		30.00	30.00	2.50	2.20	Pass
HT40	MCS7	1	3	2422	23.95	23.26		30.00	30.00	2.50	2.20	Pass
HT40	MCS7	1	6	2437	24.02	23.13		30.00	30.00	2.50	2.20	Pass
HT40	MCS7	1	9	2452	24.17	23.11		30.00	30.00	2.50	2.20	Pass
HT20	MCS15	2	1	2412	22.71	22.98	25.86	30.00		5.36		Pass
HT20	MCS15	2	6	2437	22.56	22.77	25.68	30.00		5.36		Pass
HT20	MCS15	2	11	2462	22.11	22.80	25.48	30.00		5.36		Pass
HT40	MCS15	2	3	2422	20.92	21.12	24.03	30.00		5.36		Pass
HT40	MCS15	2	6	2437	20.80	21.03	23.93	30.00		5.36		Pass
HT40	MCS15	2	9	2452	20.79	21.08	23.95	30.00		5.36		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	15.19	15.05	-
11b	1Mbps	1	6	2437	0.00	0.00	14.96	14.80	
11b	1Mbps	1	11	2462	0.00	0.00	14.57	14.08	
11g	54Mbps	1	1	2412	0.21	0.20	15.17	15.18	
11g	54Mbps	1	6	2437	0.21	0.20	14.73	14.86	
11g	54Mbps	1	11	2462	0.21	0.20	14.49	14.07	
HT20	MCS7	1	1	2412	0.23	0.23	14.26	14.41	
HT20	MCS7	1	6	2437	0.23	0.23	13.96	13.78	
HT20	MCS7	1	11	2462	0.23	0.23	13.43	12.95	
HT40	MCS7	1	3	2422	0.41	0.36	13.32	13.68	
HT40	MCS7	1	6	2437	0.41	0.36	13.62	13.39	
HT40	MCS7	1	9	2452	0.41	0.36	13.67	12.89	
HT20	MCS15	2	1	2412	0.23	0.23	11.15	11.22	14.20
HT20	MCS15	2	6	2437	0.23	0.23	11.00	10.94	13.98
HT20	MCS15	2	11	2462	0.23	0.23	10.49	10.12	13.32
HT40	MCS15	2	3	2422	0.45	0.42	10.87	9.51	13.25
HT40	MCS15	2	6	2437	0.45	0.42	10.78	9.50	13.20
HT40	MCS15	2	9	2452	0.45	0.42	10.86	8.03	12.68

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.

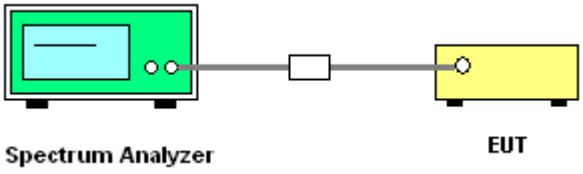
   If measurements performed using method (2) plus 10 log (N) exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

   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



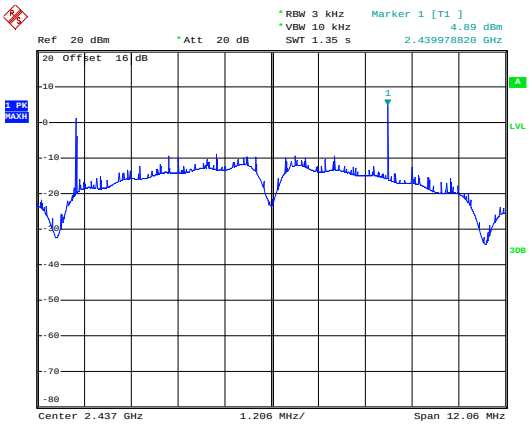
3.3.5 Test Result of Power Spectral Density

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	-8.03	-	-	8.00	8.00	2.50	2.20	Pass
11b	1Mbps	1	6	2437	4.89	-		8.00	8.00	2.50	2.20	Pass
11b	1Mbps	1	11	2462	-8.10	-		8.00	8.00	2.50	2.20	Pass
11g	54Mbps	1	1	2412	-12.95	-		8.00	8.00	2.50	2.20	Pass
11g	54Mbps	1	6	2437	-10.86	-		8.00	8.00	2.50	2.20	Pass
11g	54Mbps	1	11	2462	-11.67	-		8.00	8.00	2.50	2.20	Pass
HT20	MCS7	1	1	2412	-12.25	-		8.00	8.00	2.50	2.20	Pass
HT20	MCS7	1	6	2437	-12.26	-		8.00	8.00	2.50	2.20	Pass
HT20	MCS7	1	11	2462	-12.47	-		8.00	8.00	2.50	2.20	Pass
HT40	MCS7	1	3	2422	-15.01	-		8.00	8.00	2.50	2.20	Pass
HT40	MCS7	1	6	2437	-15.43	-		8.00	8.00	2.50	2.20	Pass
HT40	MCS7	1	9	2452	-13.74	-		8.00	8.00	2.50	2.20	Pass
HT20	MCS15	2	1	2412	-16.17	-15.76	-12.75	8.00		5.36		Pass
HT20	MCS15	2	6	2437	-14.62	-15.26	-11.61	8.00		5.36		Pass
HT20	MCS15	2	11	2462	-15.29	-15.41	-12.28	8.00		5.36		Pass
HT40	MCS15	2	3	2422	-19.40	-17.53	-14.52	8.00		5.36		Pass
HT40	MCS15	2	6	2437	-18.91	-18.36	-15.35	8.00		5.36		Pass
HT40	MCS15	2	9	2452	-18.04	-17.52	-14.51	8.00		5.36		Pass

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

Worst Case Power Density (dBm/3kHz)



Date: 21.JUN.2014 00:30:46

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).

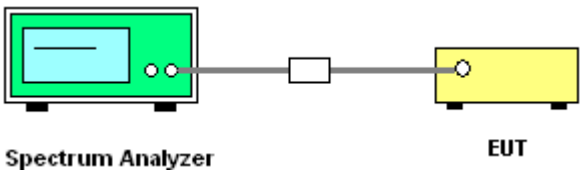
3.4.2 Measuring Instruments

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



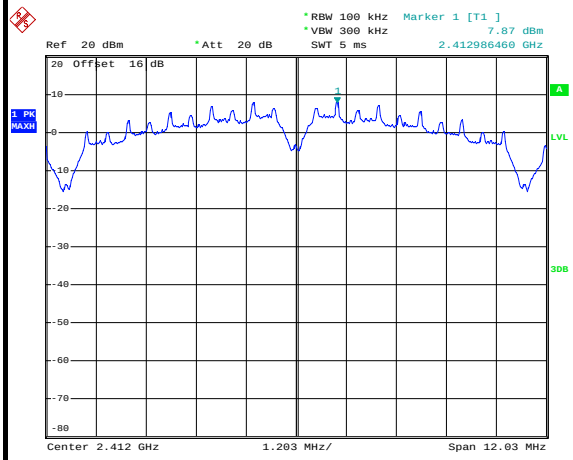
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

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

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

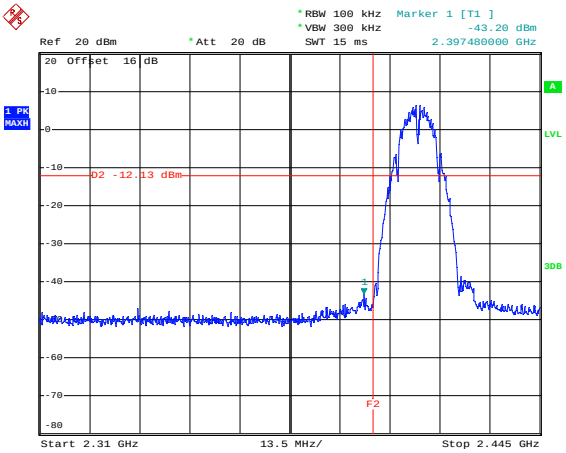
WLAN 802.11b Channel 01

100kHz PSD reference Level



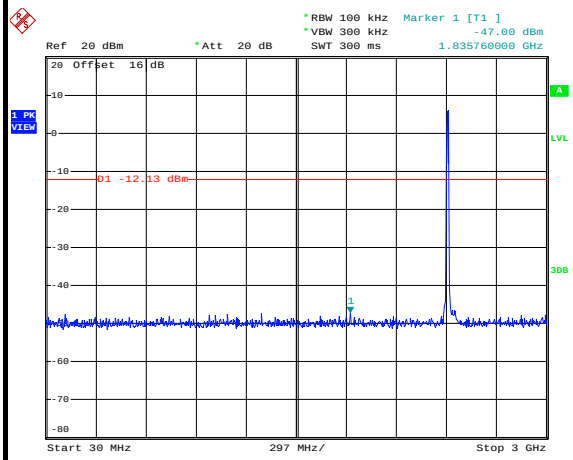
Date: 21.JUN.2014 00:23:41

Low Channel Plot



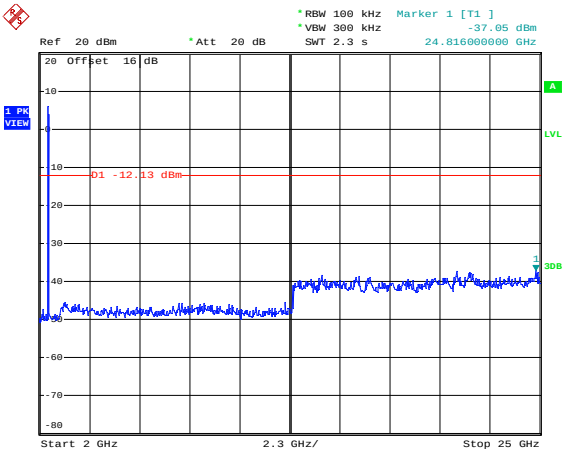
Date: 21.JUN.2014 00:23:55

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 00:24:14

Spurious Emission 2GHz~25GHz

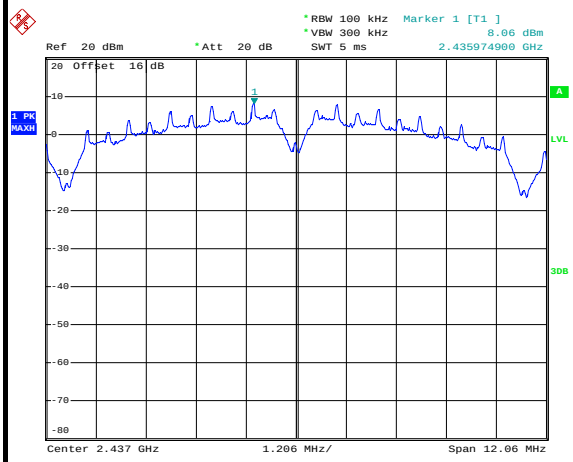


Date: 21.JUN.2014 00:24:32

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

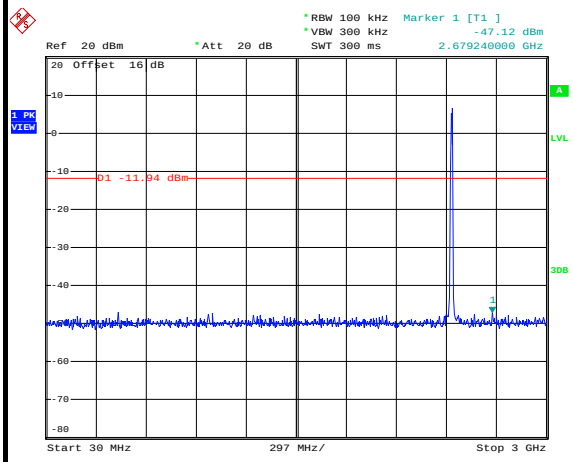
WLAN 802.11b Channel 06

100kHz PSD reference Level



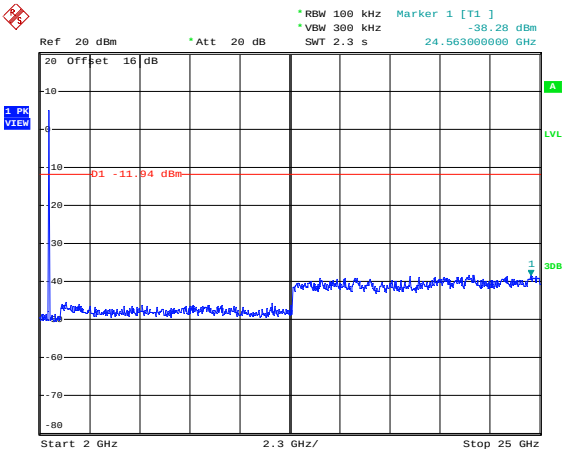
Date: 21.JUN.2014 00:30:54

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 00:31:14

Spurious Emission 2GHz~25GHz

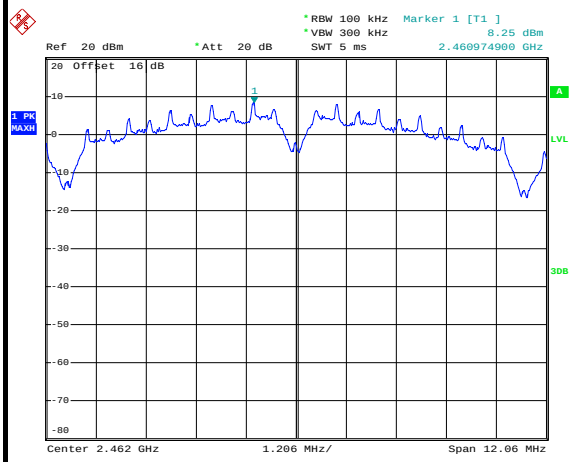


Date: 21.JUN.2014 00:31:33

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

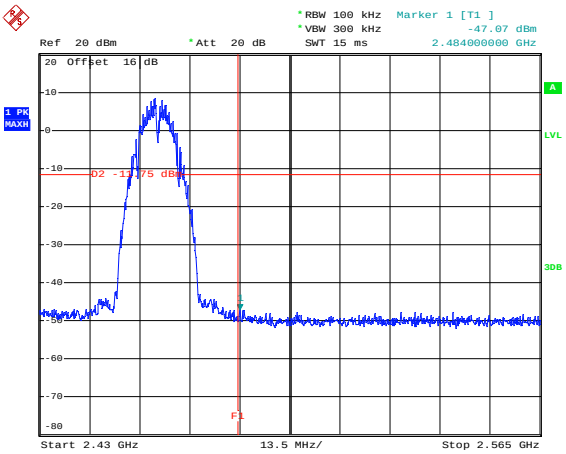
WLAN 802.11b Channel 11

100kHz PSD reference Level



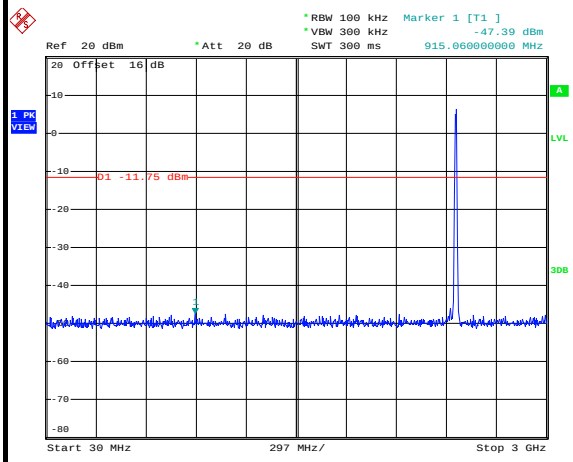
Date: 21.JUN.2014 00:34:47

High Channel Plot



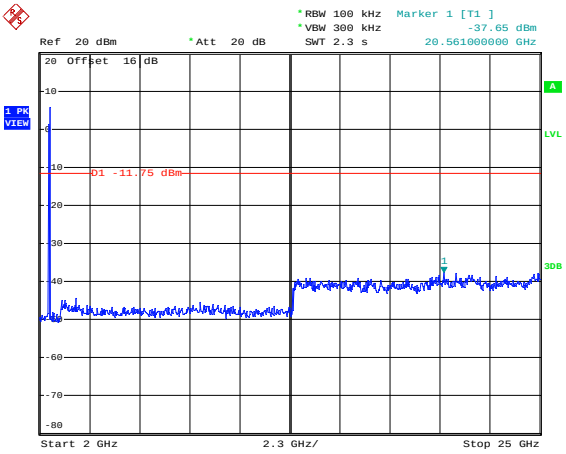
Date: 21.JUN.2014 00:35:01

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 00:35:20

Spurious Emission 2GHz~25GHz

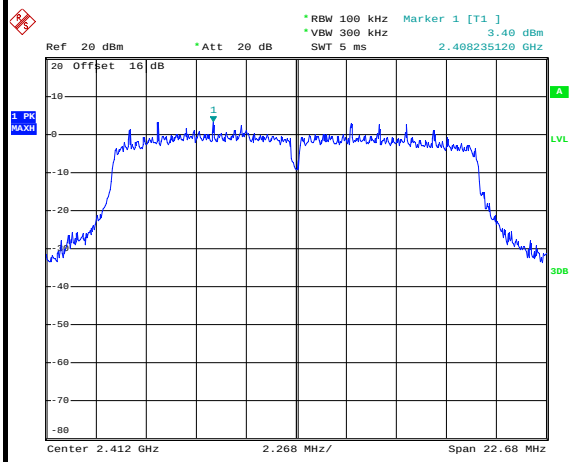


Date: 21.JUN.2014 00:35:38

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

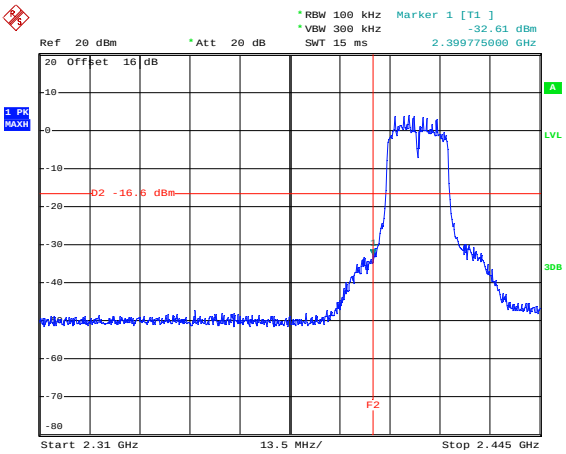
WLAN 802.11g Channel 01

100kHz PSD reference Level



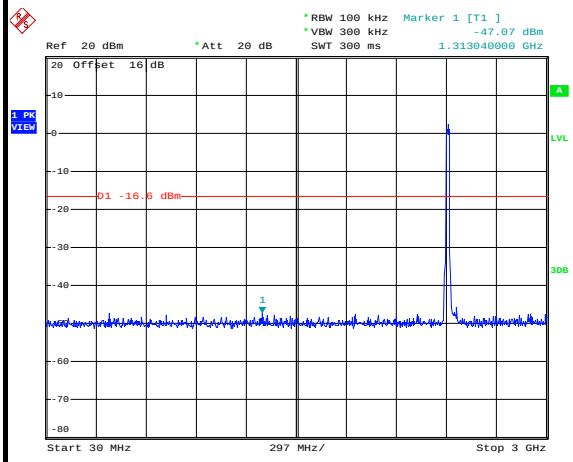
Date: 21.JUN.2014 00:43:16

Low Channel Plot



Date: 21.JUN.2014 00:45:09

Spurious Emission 30MHz~3GHz



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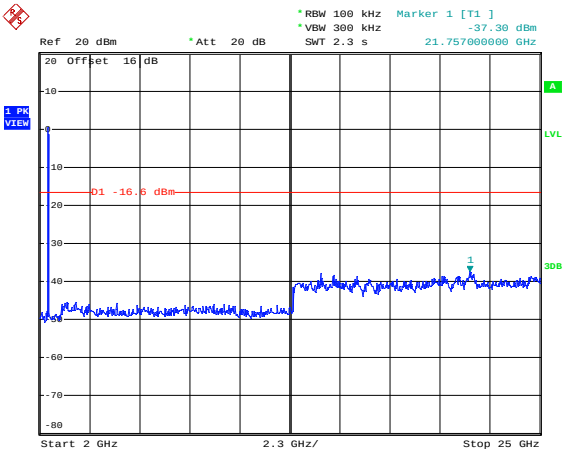
Spurious Emission 2GHz~25GHz

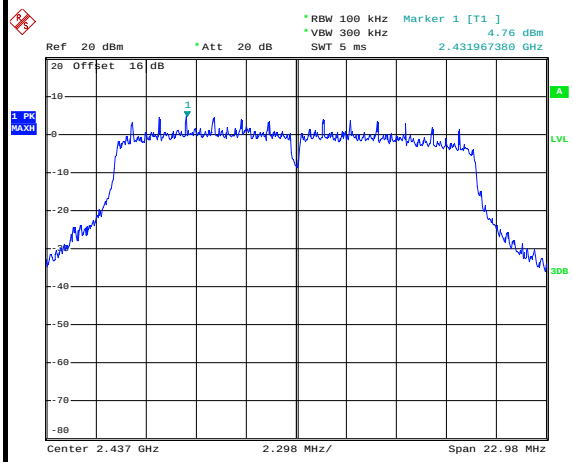


Date: 21.JUN.2014 00:44:08

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

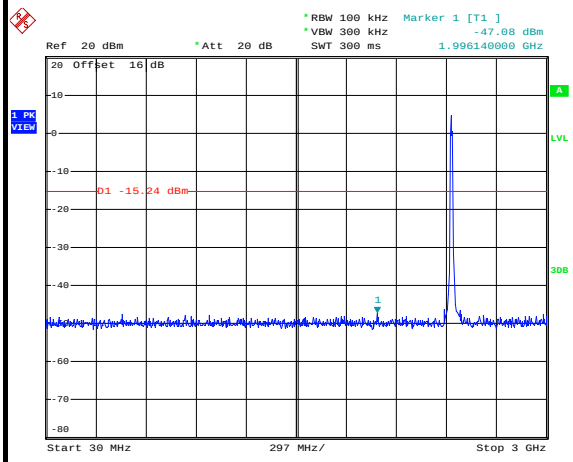
WLAN 802.11g Channel 06

100kHz PSD reference Level



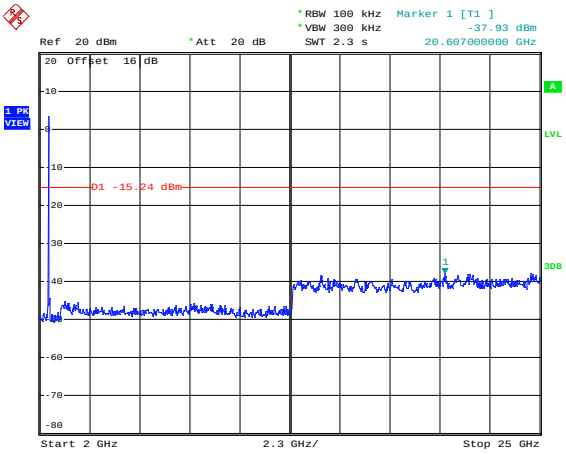
Date: 21.JUN.2014 00:48:13

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 00:48:33

Spurious Emission 2GHz~25GHz

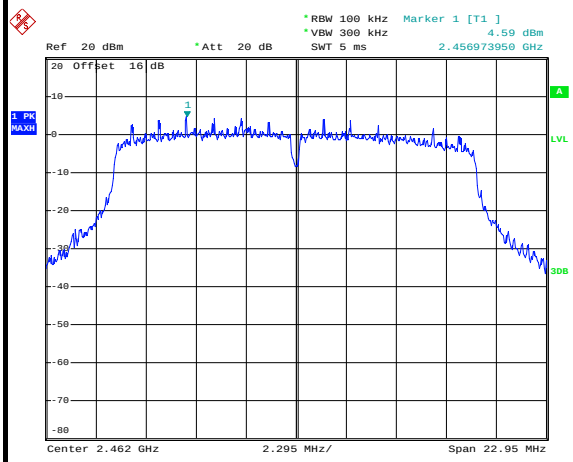


Date: 21.JUN.2014 00:48:52

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

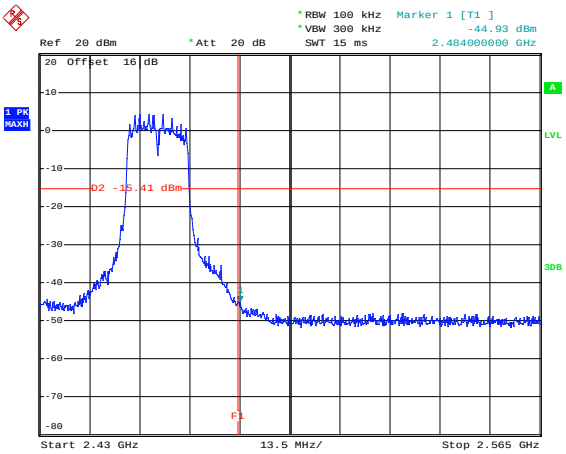
WLAN 802.11g Channel 11

100kHz PSD reference Level



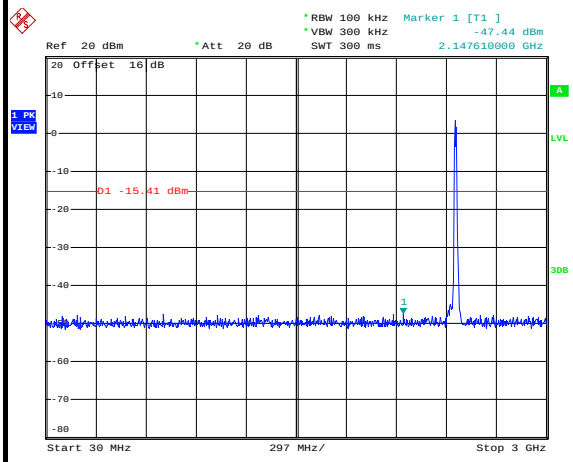
Date: 21.JUN.2014 00:52:22

High Channel Plot



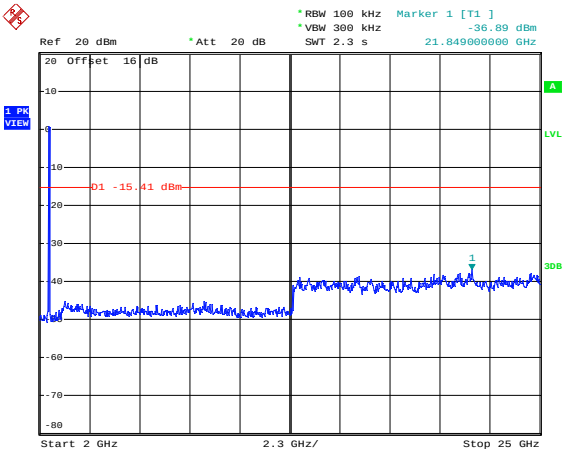
Date: 21.JUN.2014 00:52:36

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 00:52:55

Spurious Emission 2GHz~25GHz

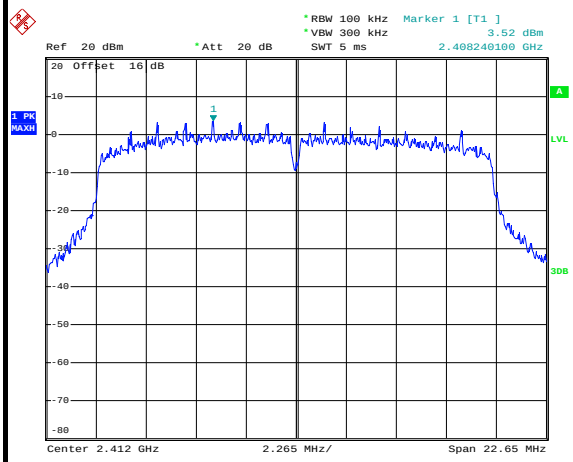


Date: 21.JUN.2014 00:53:13

Number of TX :	1	**Chain Port:**	0
Test Mode :	802.11n HT20	**Temperature :**	23~24℃
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



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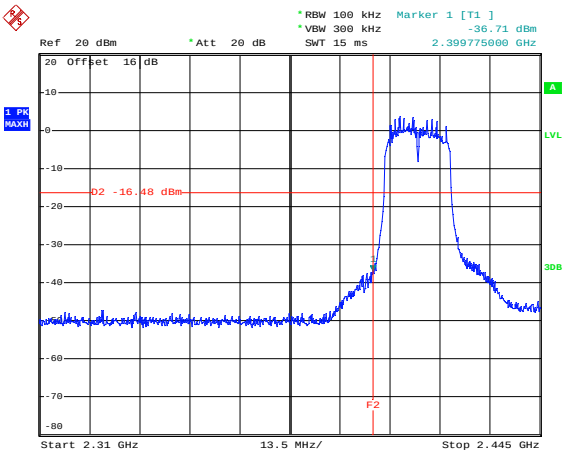
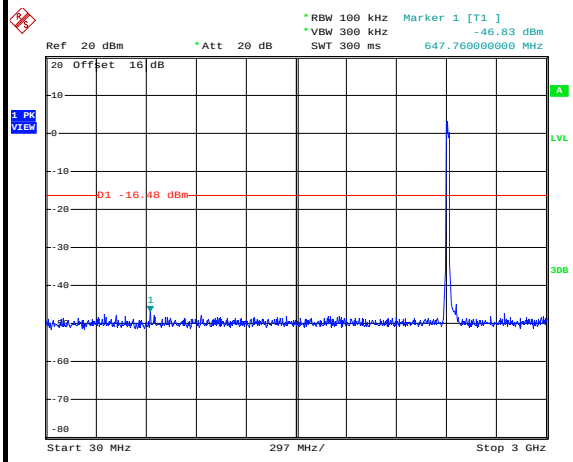
Low Channel Plot



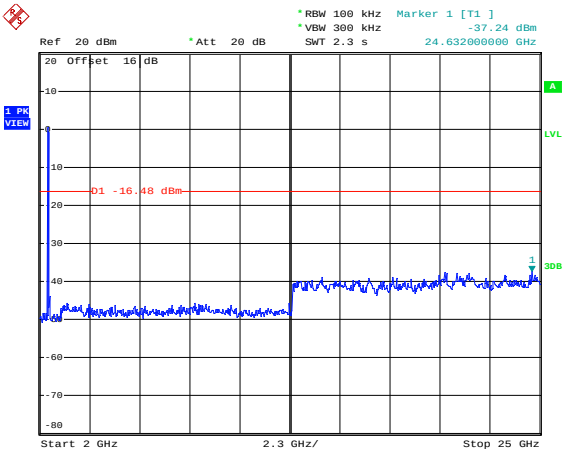
Date: 21.JUN.2014 00:59:26

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 00:59:46

Spurious Emission 2GHz~25GHz

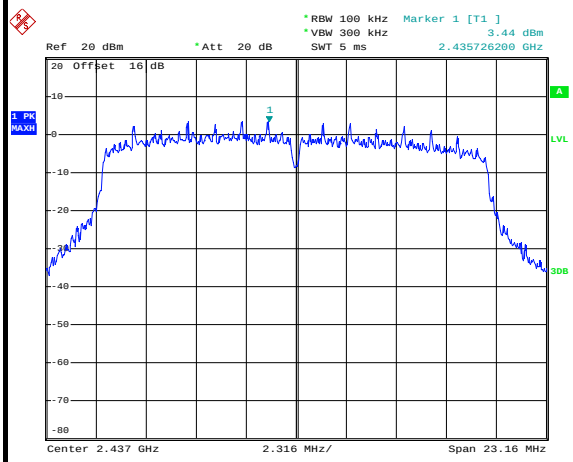


Date: 21.JUN.2014 01:00:04

Number of TX :	1	**Chain Port:**	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

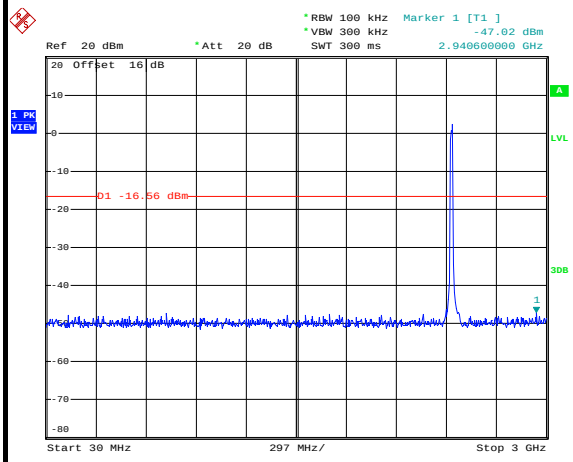
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



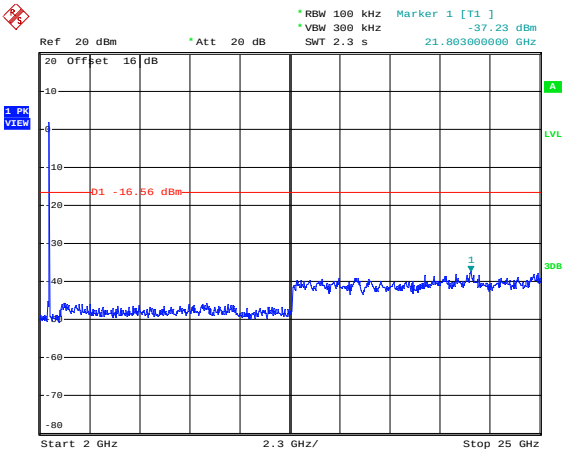
Date: 21.JUN.2014 01:02:48

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 01:03:08

Spurious Emission 2GHz~25GHz

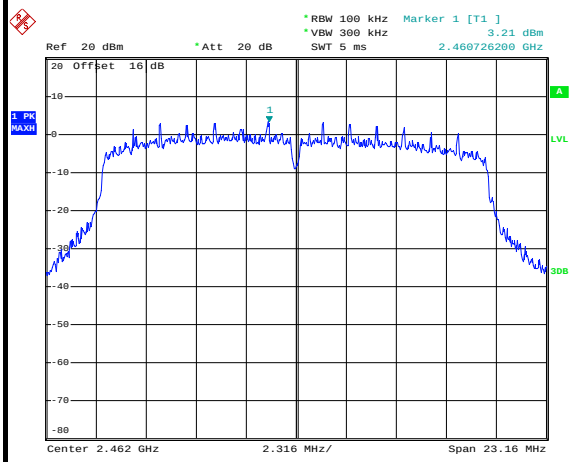


Date: 21.JUN.2014 01:03:26

Number of TX :	1	**Chain Port:**	0
Test Mode :	802.11n HT20	**Temperature :**	23~24℃
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



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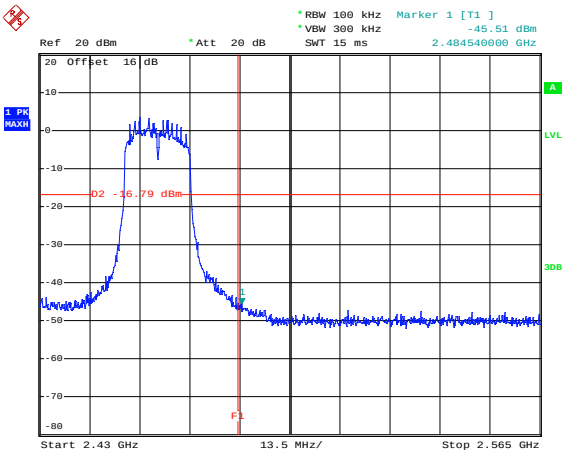
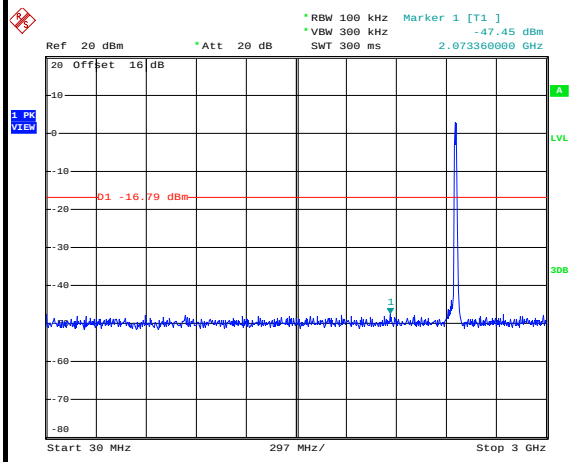
High Channel Plot



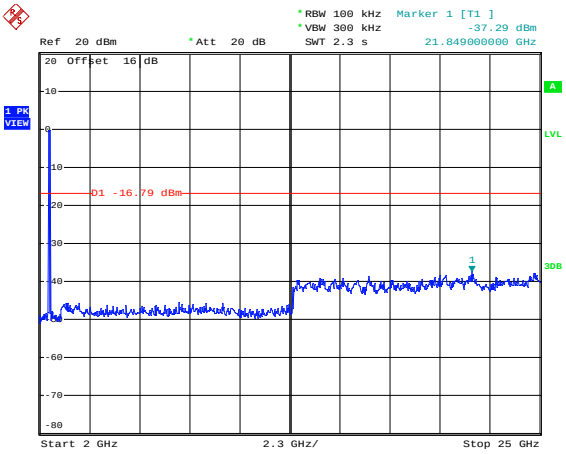
Date: 21.JUN.2014 01:07:09

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 01:07:28

Spurious Emission 2GHz~25GHz

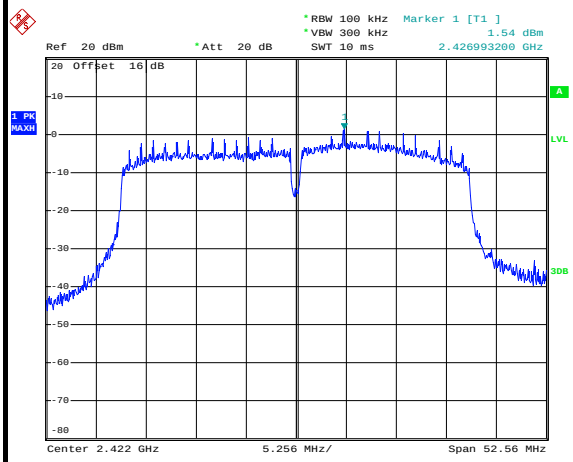


Date: 21.JUN.2014 01:07:47

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

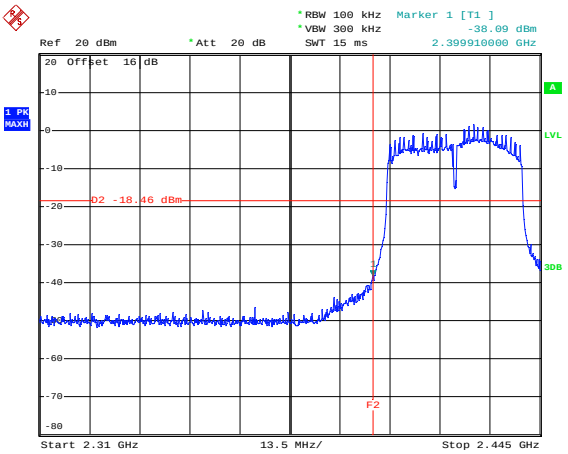
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



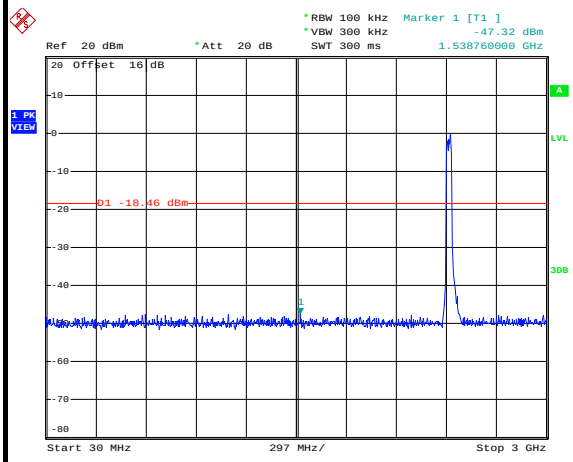
Date: 21.JUN.2014 01:49:04

Low Channel Plot



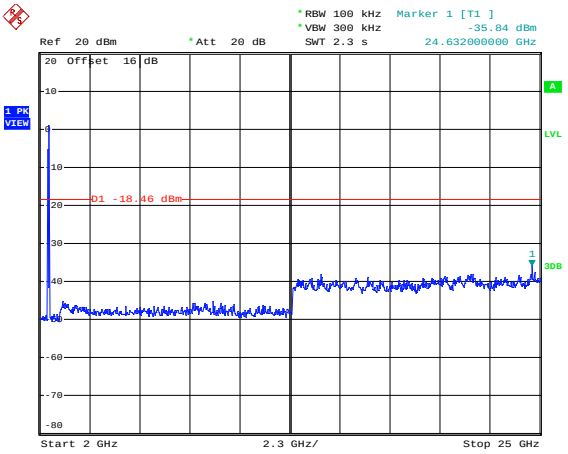
Date: 21.JUN.2014 01:50:40

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 01:51:43

Spurious Emission 2GHz~25GHz

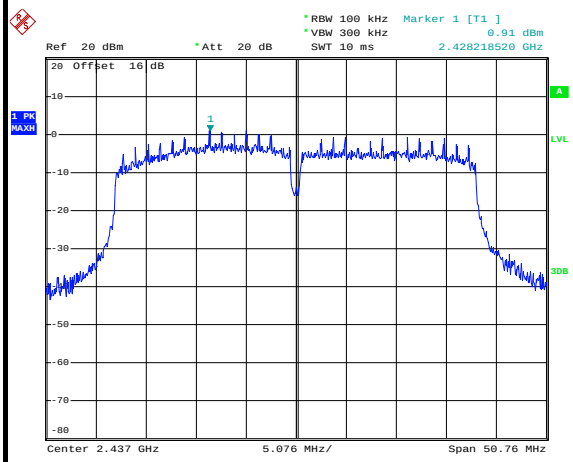


Date: 21.JUN.2014 01:52:01

Number of TX :	1	**Chain Port:**	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

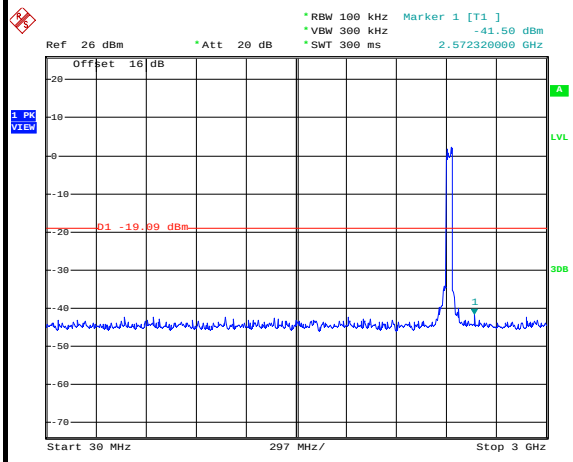
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



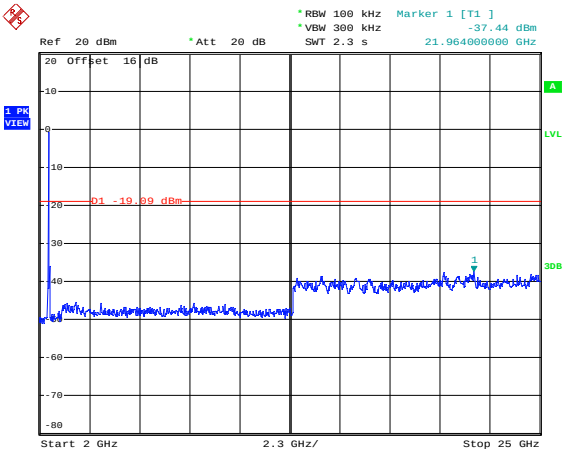
Date: 21.JUN.2014 02:11:16

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2014 15:37:07

Spurious Emission 2GHz~25GHz

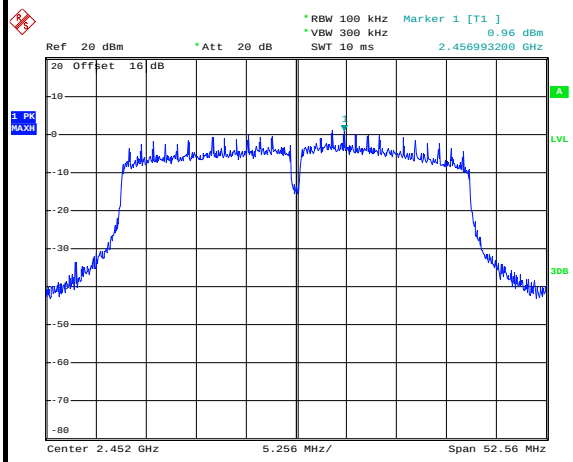


Date: 21.JUN.2014 02:16:35

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

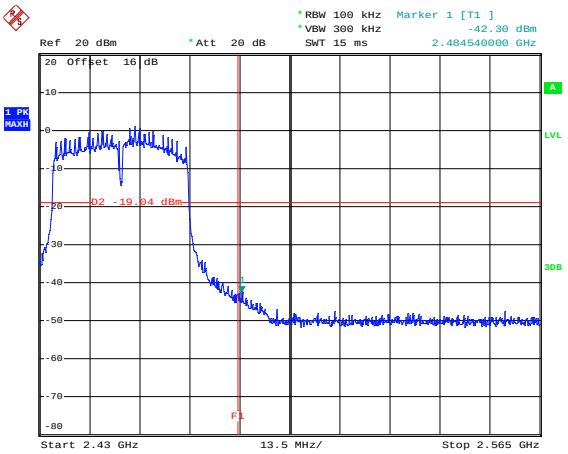
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



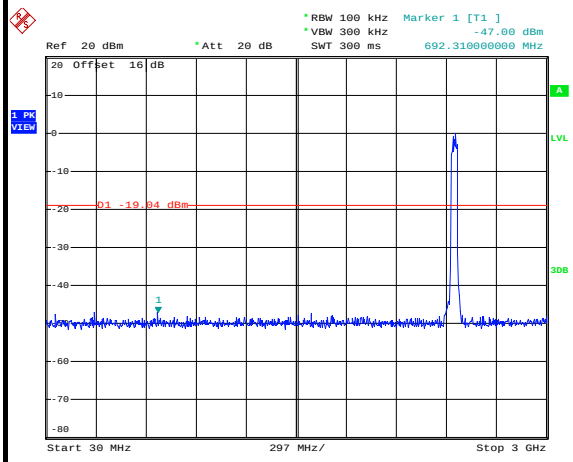
Date: 21.JUN.2014 02:19:52

High Channel Plot



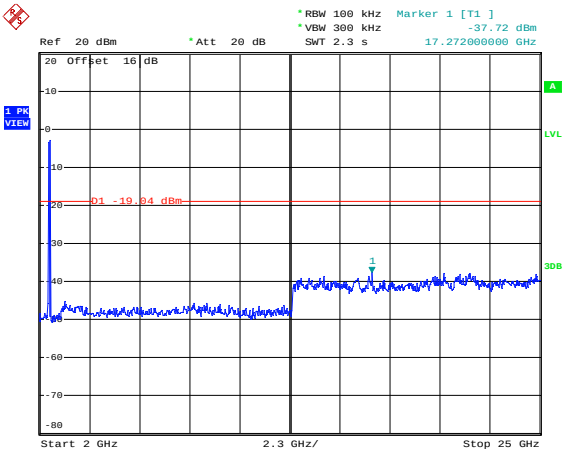
Date: 21.JUN.2014 02:20:06

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 02:20:25

Spurious Emission 2GHz~25GHz



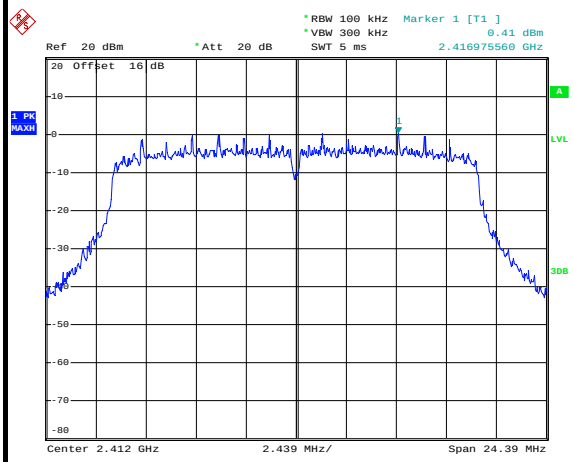
Date: 21.JUN.2014 02:20:44

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℃
Test Band :	2.4GHz Low	**Relative Humidity :**	47~48%
Test Channel :	01	**Test Engineer :**	Adonis Li

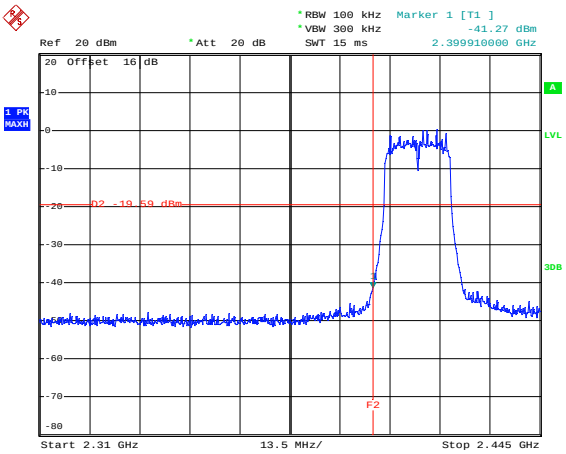
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



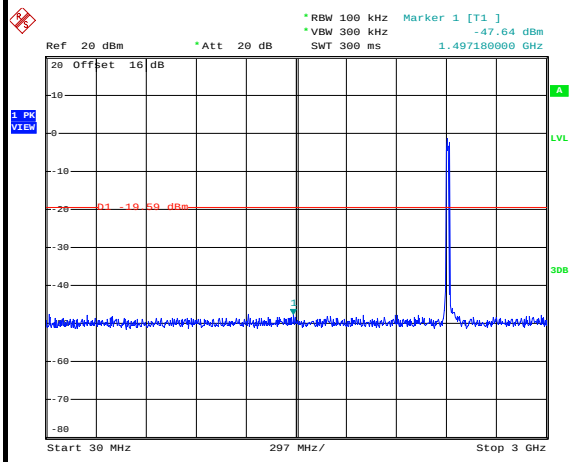
Date: 21.JUN.2014 01:12:16

Low Channel Plot



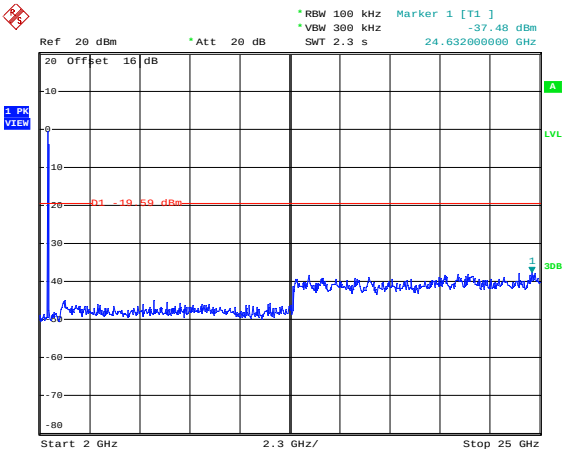
Date: 21.JUN.2014 01:12:29

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 01:12:49

Spurious Emission 2GHz~25GHz

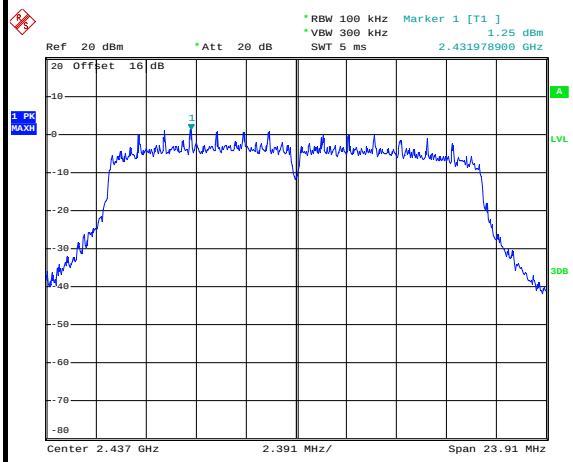


Date: 21.JUN.2014 01:13:07

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

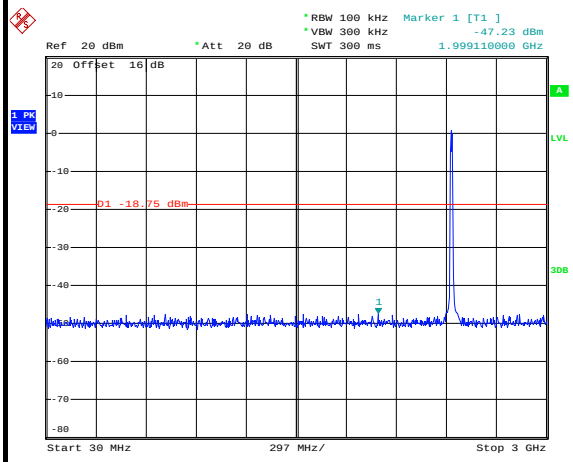
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



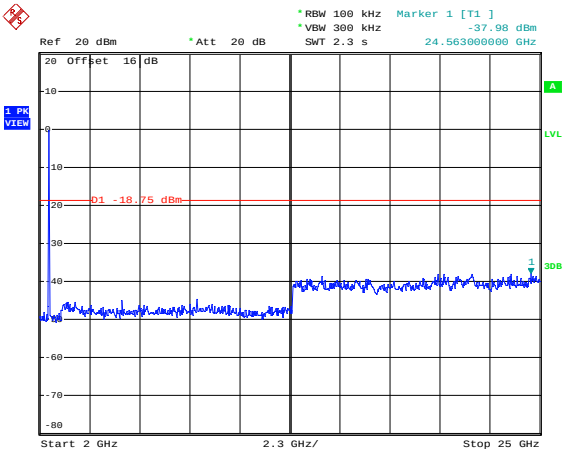
Date: 21.JUN.2014 01:16:57

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 01:17:16

Spurious Emission 2GHz~25GHz

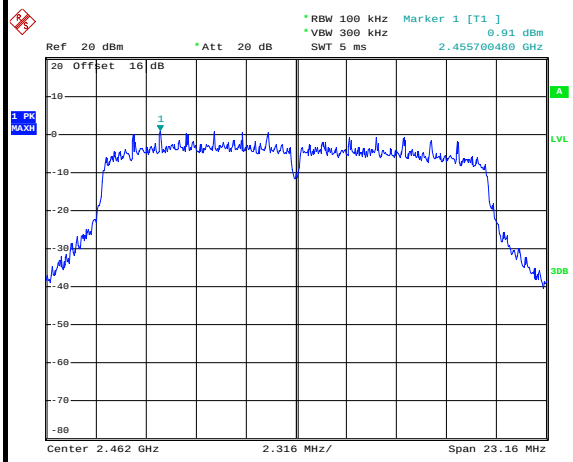


Date: 21.JUN.2014 01:17:35

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

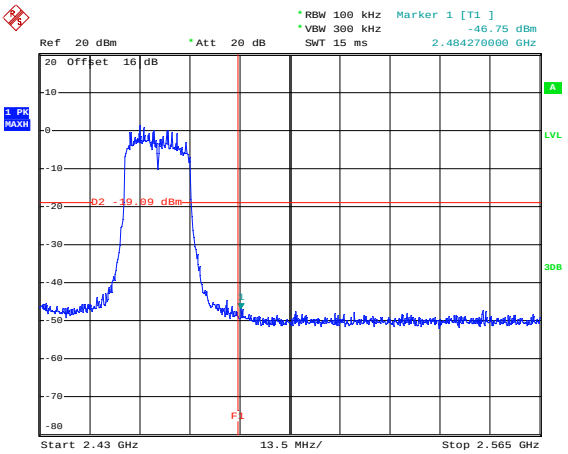
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



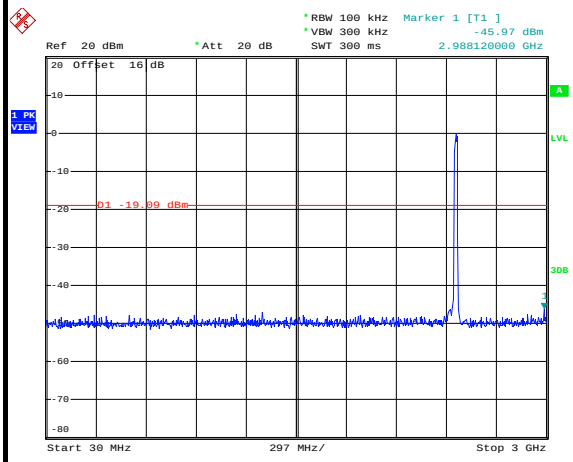
Date: 21.JUN.2014 01:21:51

High Channel Plot



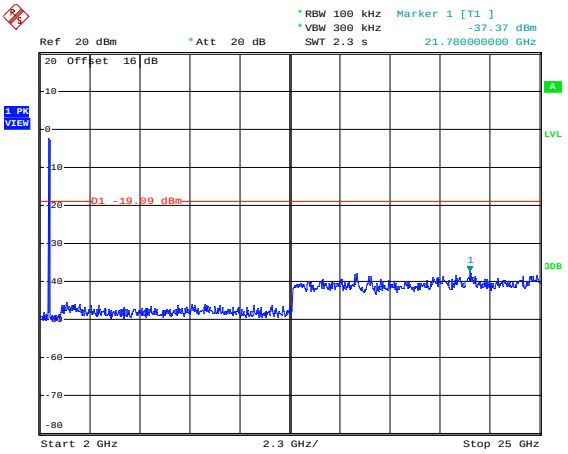
Date: 21.JUN.2014 01:22:05

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 01:22:24

Spurious Emission 2GHz~25GHz

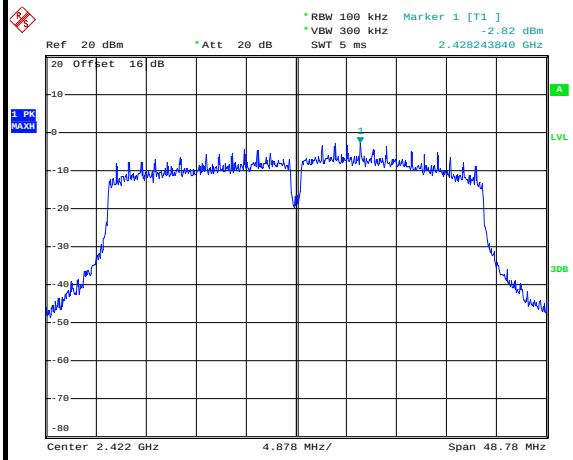


Date: 21.JUN.2014 01:22:43

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

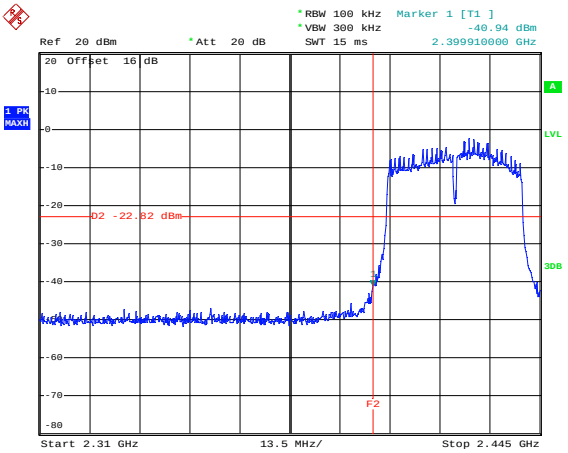
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



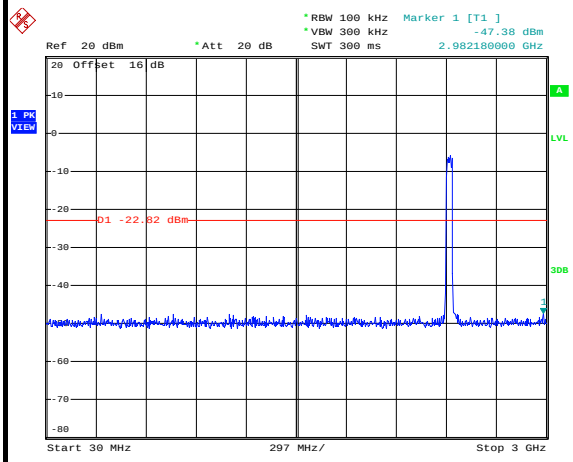
Date: 21.JUN.2014 02:25:07

Low Channel Plot



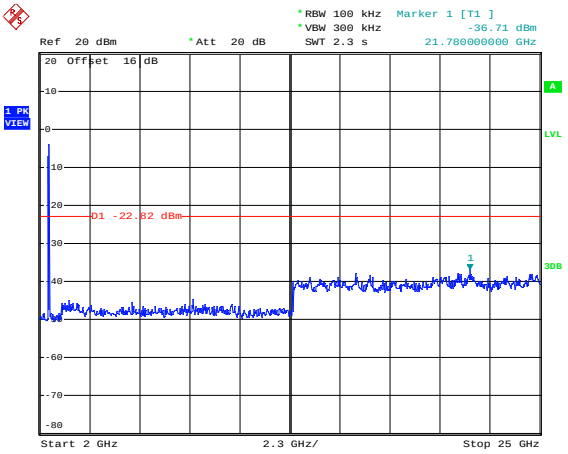
Date: 21.JUN.2014 02:25:21

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 02:25:40

Spurious Emission 2GHz~25GHz

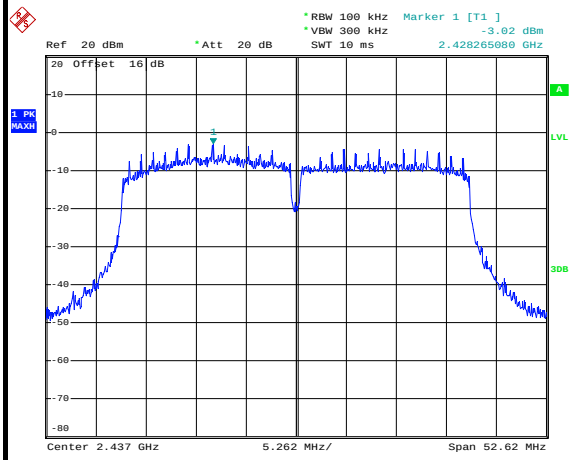


Date: 21.JUN.2014 02:25:59

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

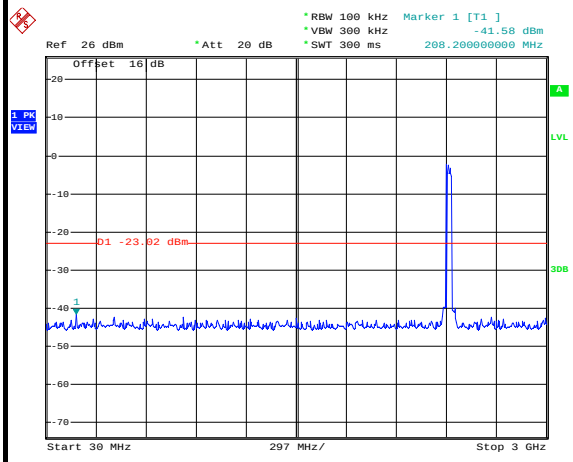
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



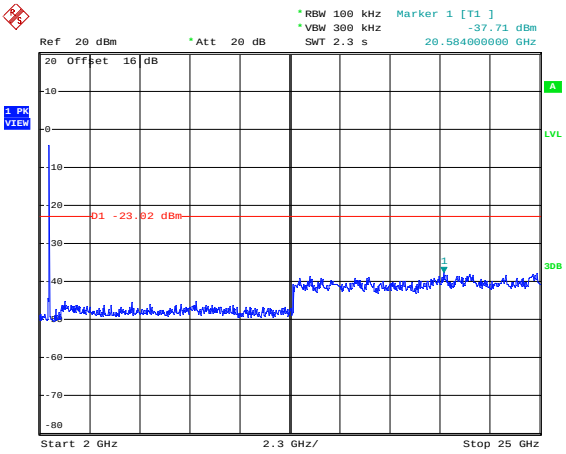
Date: 21.JUN.2014 02:31:07

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2014 15:35:36

Spurious Emission 2GHz~25GHz

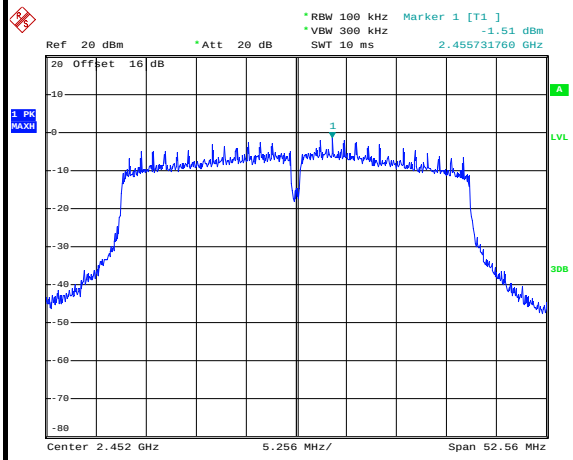


Date: 21.JUN.2014 02:36:25

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

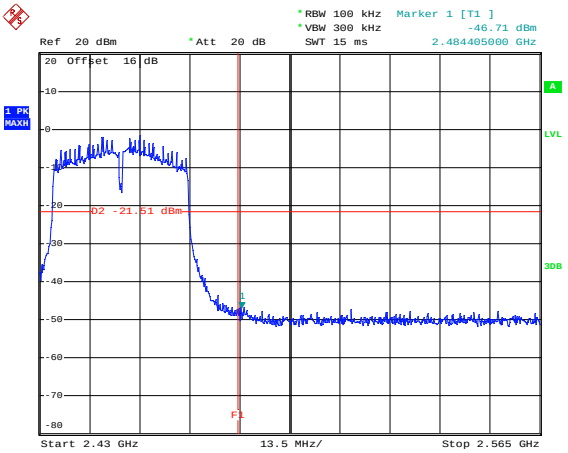
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



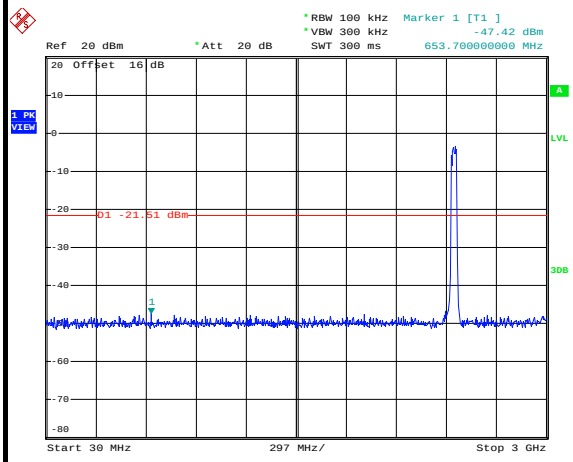
Date: 21.JUN.2014 02:40:29

High Channel Plot



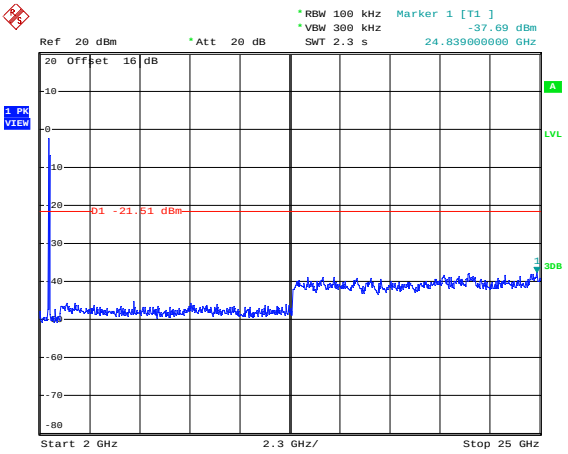
Date: 21.JUN.2014 02:40:43

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 02:42:16

Spurious Emission 2GHz~25GHz



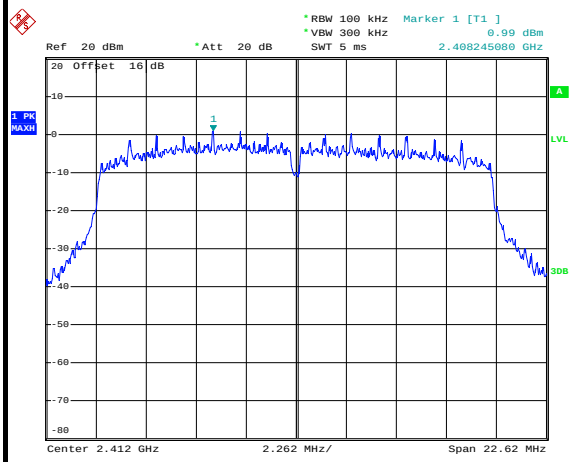
Date: 21.JUN.2014 02:42:35

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℃
Test Band :	2.4GHz Low	**Relative Humidity :**	47~48%
Test Channel :	01	**Test Engineer :**	Adonis Li

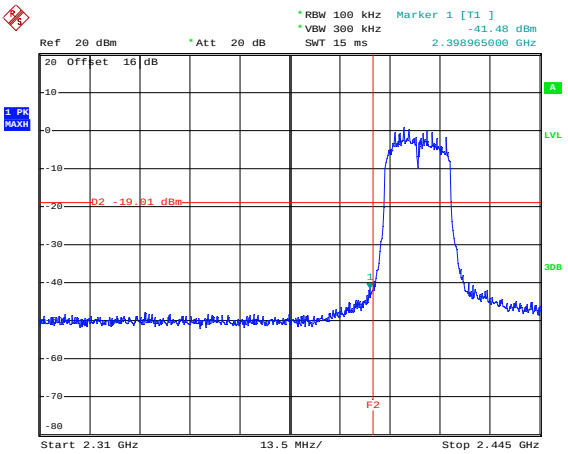
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



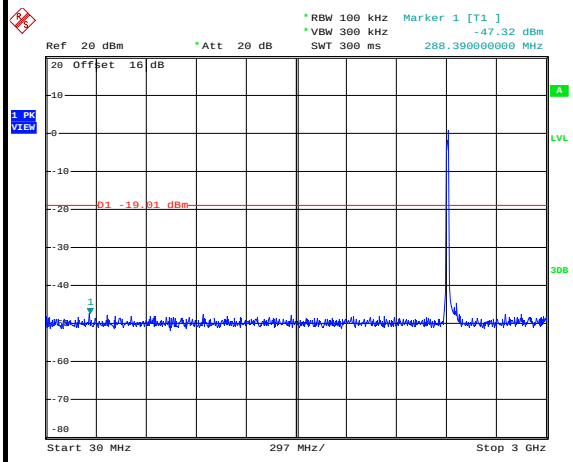
Date: 21.JUN.2014 01:33:27

Low Channel Plot



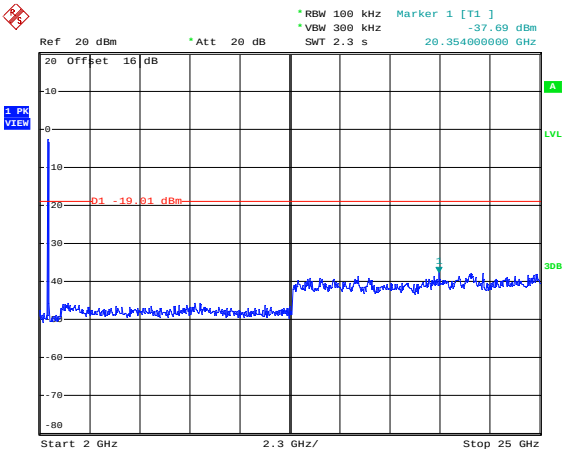
Date: 21.JUN.2014 01:33:41

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 01:34:00

Spurious Emission 2GHz~25GHz

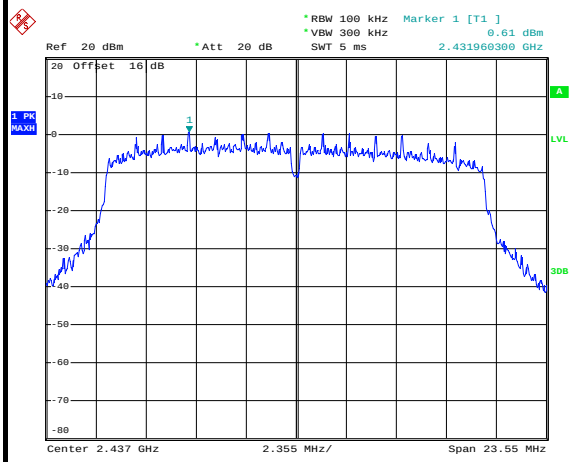


Date: 21.JUN.2014 01:34:19

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

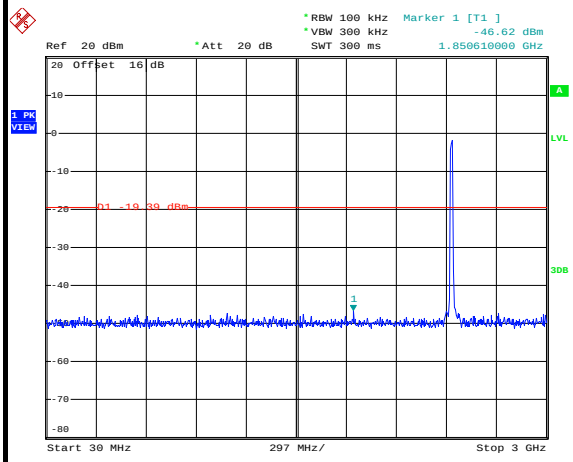
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



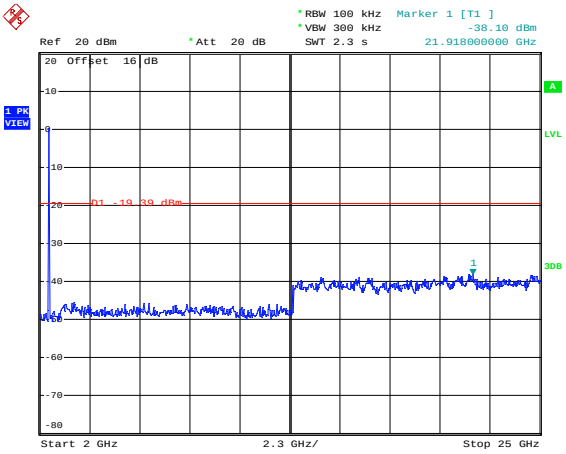
Date: 21.JUN.2014 01:37:11

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 01:38:56

Spurious Emission 2GHz~25GHz

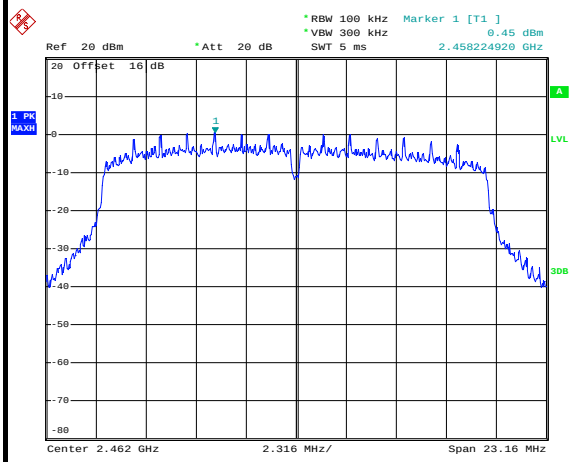


Date: 21.JUN.2014 01:39:14

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

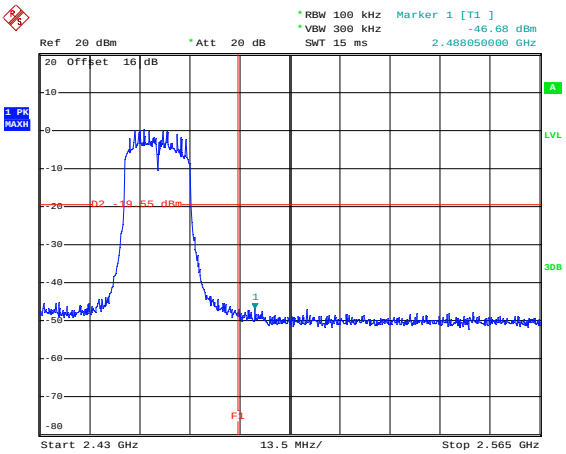
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



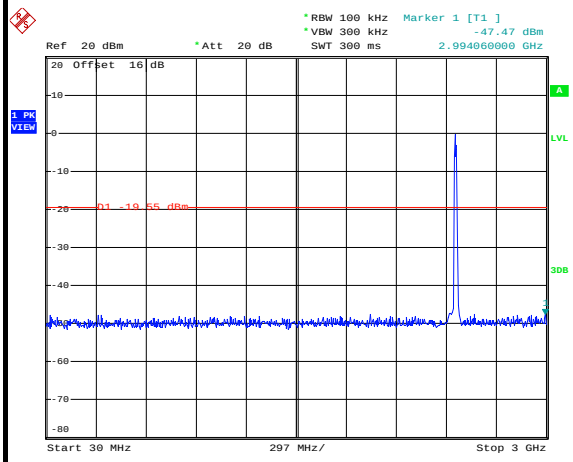
Date: 21.JUN.2014 01:42:23

High Channel Plot



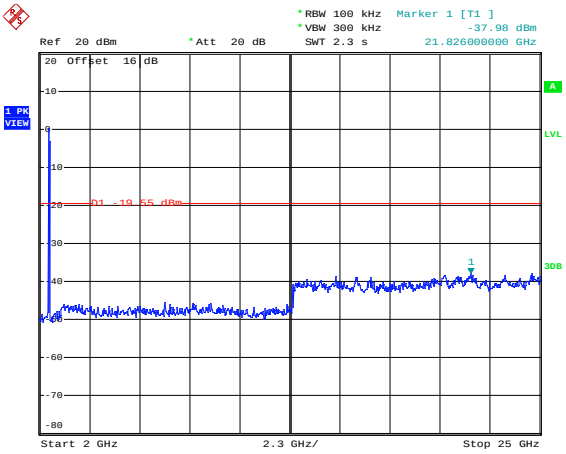
Date: 21.JUN.2014 01:42:37

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 01:42:56

Spurious Emission 2GHz~25GHz

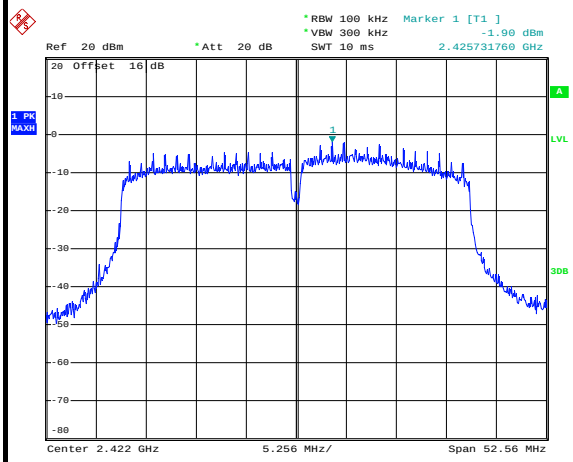


Date: 21.JUN.2014 01:43:15

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

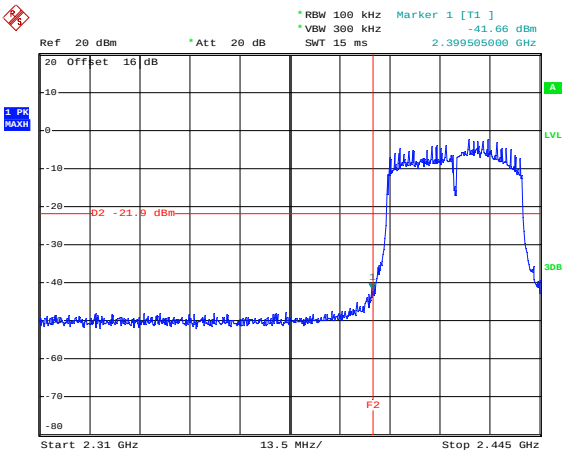
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



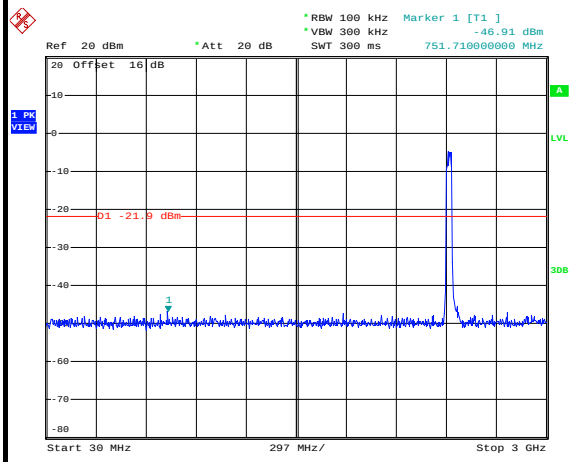
Date: 21.JUN.2014 03:14:50

Low Channel Plot



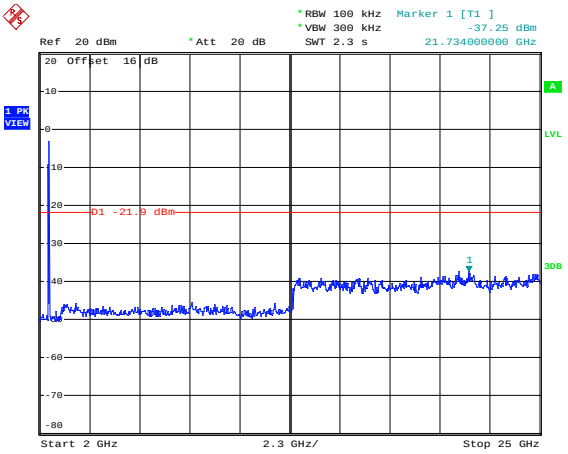
Date: 21.JUN.2014 03:15:04

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 03:15:23

Spurious Emission 2GHz~25GHz

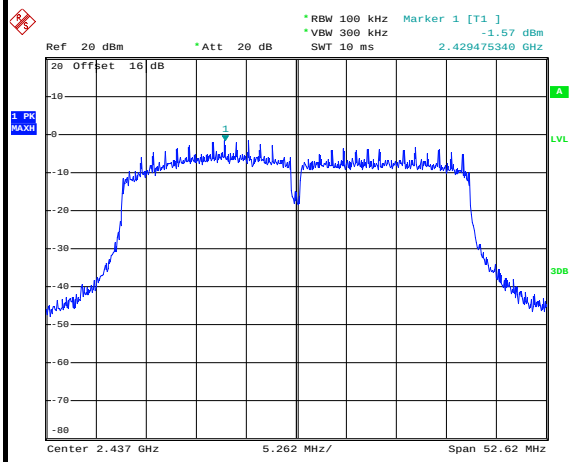


Date: 21.JUN.2014 03:15:42

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

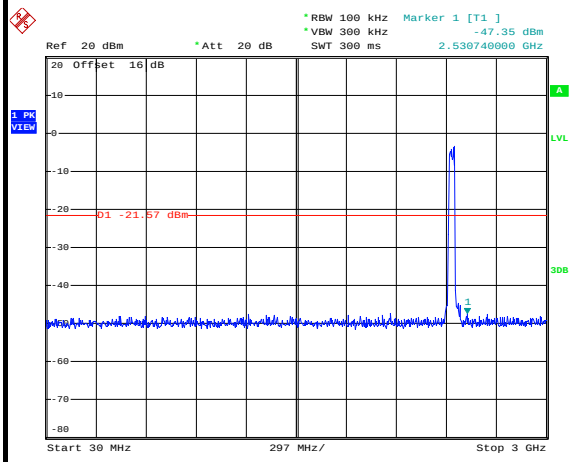
WLAN 802.11n HT40 Channel 06

100kHz PSD reference Level



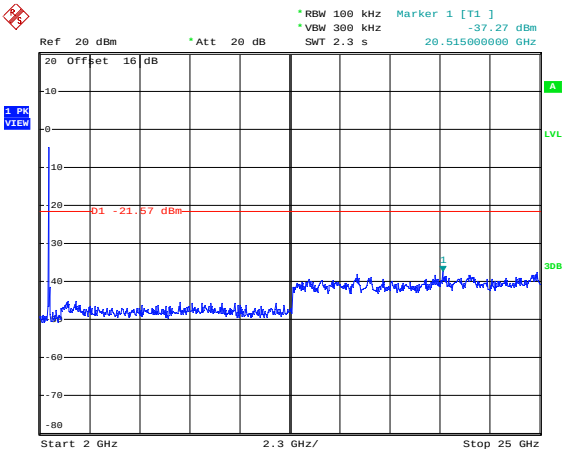
Date: 21.JUN.2014 03:29:12

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 03:29:32

Spurious Emission 2GHz~25GHz

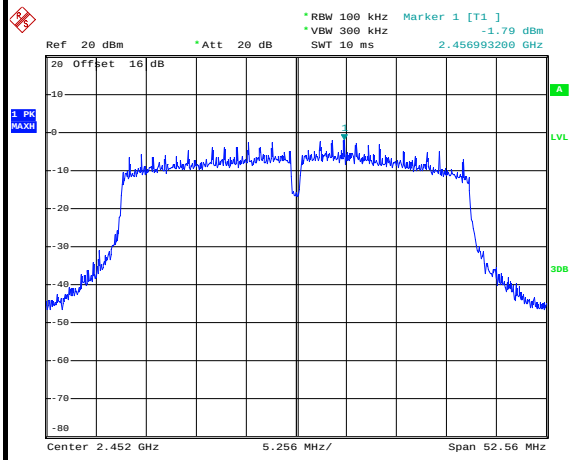


Date: 21.JUN.2014 03:29:51

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

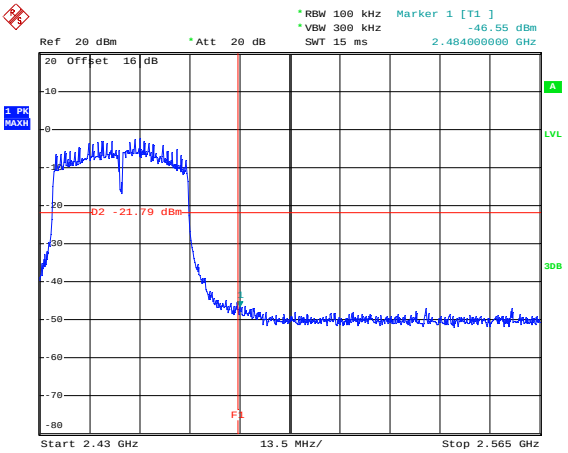
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



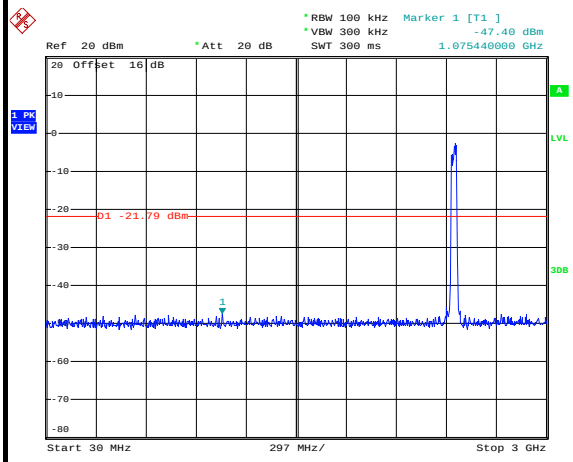
Date: 21.JUN.2014 04:22:26

High Channel Plot



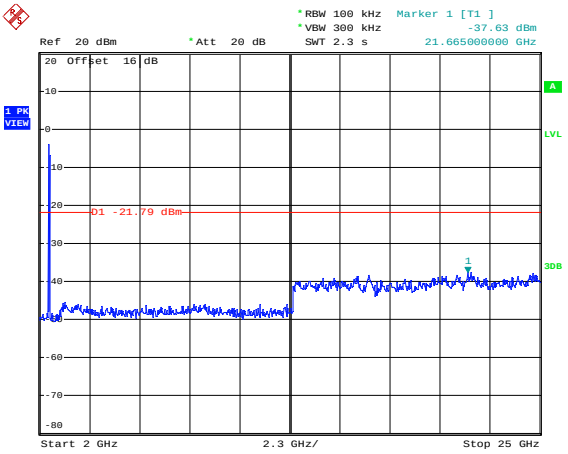
Date: 21.JUN.2014 04:22:40

Spurious Emission 30MHz~3GHz



Date: 21.JUN.2014 04:22:59

Spurious Emission 2GHz~25GHz



Date: 21.JUN.2014 04:23:18

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.

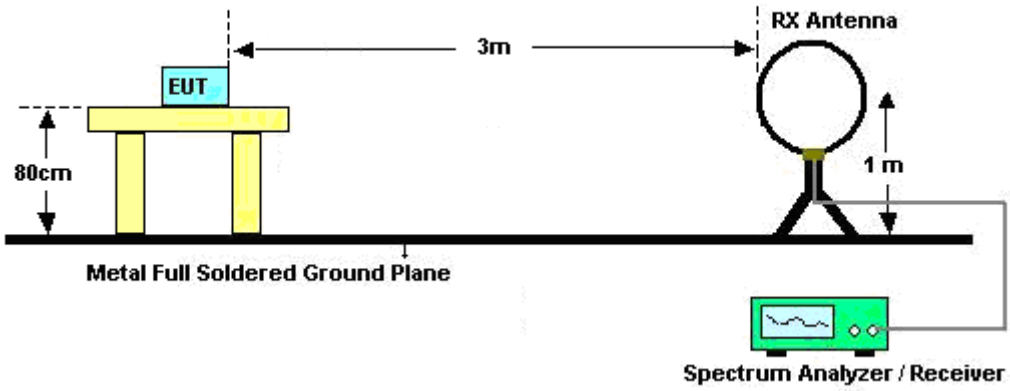
3.5.3 Test Procedure

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 ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

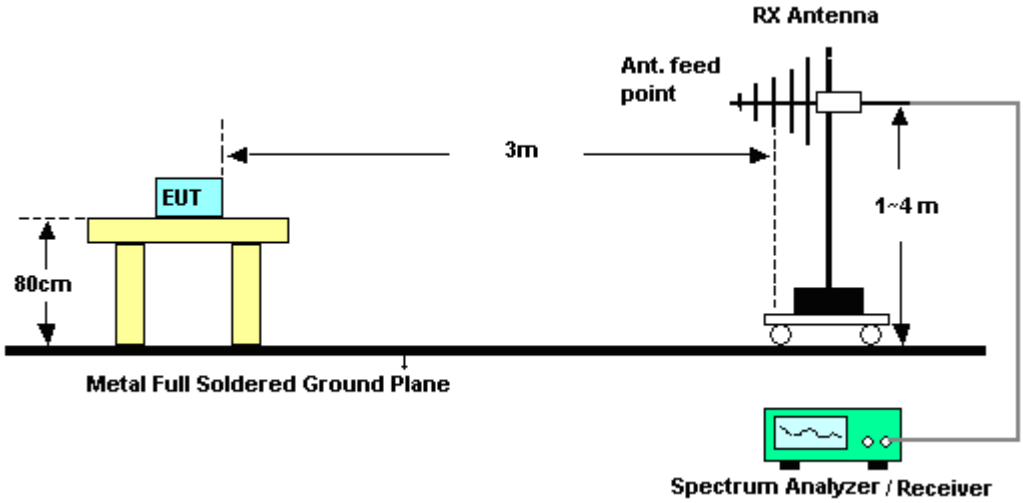
Chain Port	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
0	802.11b	100	-	-	10Hz
0	802.11g	73.08	0.25	4.04	10kHz
0+1	2.4GHz 802.11n HT20	70.72	0.23	4.39	10kHz
0	2.4GHz 802.11n HT40	58.67	0.13	7.84	10kHz
0+1	2.4GHz 802.11n HT40	57.42	0.13	7.75	10kHz

3.5.4 Test Setup

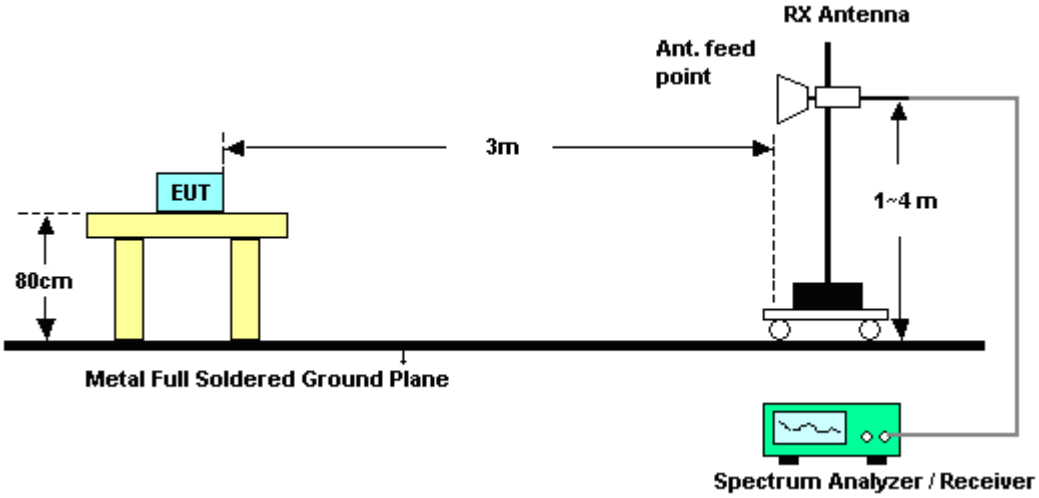
For radiated emissions below 30MHz



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

< 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
2388.30	53.25	-20.75	74	54.68	32.01	2.64	36.08	108	229	Peak
2387.31	39.35	-14.65	54	40.78	32.01	2.64	36.08	108	229	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.39	52.28	-21.72	74	53.71	32.01	2.64	36.08	123	109	Peak
2389.56	37.88	-16.12	54	39.31	32.01	2.64	36.08	123	109	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
2483.77	52.79	-21.21	74	53.56	32.34	2.68	35.79	102	232	Peak
2484.01	38.88	-15.12	54	39.65	32.34	2.68	35.79	102	323	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.04	52	-22.00	74	52.77	32.34	2.68	35.79	113	105	Peak
2484.16	37.79	-16.21	54	38.56	32.34	2.68	35.79	113	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
2390	67.36	-6.64	74	68.79	32.01	2.64	36.08	103	232	Peak
2390	46.08	-7.92	54	47.51	32.01	2.64	36.08	103	232	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
2389.83	69.65	-4.35	74	71.08	32.01	2.64	36.08	115	283	Peak
2390	48.37	-5.63	54	49.8	32.01	2.64	36.08	115	283	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
2483.65	67.26	-6.74	74	68.03	32.34	2.68	35.79	101	236	Peak
2483.5	45.7	-8.30	54	46.47	32.34	2.68	35.79	101	236	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
2483.86	67.8	-6.20	74	68.57	32.34	2.68	35.79	109	91	Peak
2483.5	47.48	-6.52	54	48.25	32.34	2.68	35.79	109	91	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	58.07	-15.93	74	59.5	32.01	2.64	36.08	103	13	Peak
2388.12	47.64	-6.36	54	49.07	32.01	2.64	36.08	103	13	Average
2486.02	51.24	-22.76	74	52.01	32.34	2.68	35.79	103	13	Peak
2484.25	39.28	-14.72	54	40.05	32.34	2.68	35.79	103	13	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.93	56.35	-17.65	74	57.78	32.01	2.64	36.08	118	99	Peak
2388.12	44.2	-9.80	54	45.63	32.01	2.64	36.08	118	99	Average
2484.91	49.74	-24.26	74	50.51	32.34	2.68	35.79	118	99	Peak
2486.68	37.88	-16.12	54	38.65	32.34	2.68	35.79	118	99	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
2389.74	52.32	-21.68	74	53.75	32.01	2.64	36.08	102	18	Peak
2387.58	39.47	-14.53	54	40.9	32.01	2.64	36.08	102	18	Average
2483.83	65.71	-8.29	74	66.48	32.34	2.68	35.79	102	18	Peak
2483.5	48.29	-5.71	54	49.06	32.34	2.68	35.79	102	18	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2333.13	49.31	-24.69	74	51.39	31.76	2.59	36.43	101	9	Peak
2384.79	37.39	-16.61	54	38.96	31.95	2.64	36.16	101	9	Average
2483.62	59.36	-14.64	74	60.13	32.34	2.68	35.79	101	9	Peak
2484.13	43.04	-10.96	54	43.81	32.34	2.68	35.79	101	9	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
2389.92	59.08	-14.92	74	60.51	32.01	2.64	36.08	163	19	Peak
2390	42.95	-11.05	54	44.38	32.01	2.64	36.08	163	19	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	59.61	-14.39	74	61.04	32.01	2.64	36.08	113	24	Peak
2390	42.09	-11.91	54	43.52	32.01	2.64	36.08	113	24	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
2483.86	62.65	-11.35	74	63.42	32.34	2.68	35.79	107	32	Peak
2483.71	44.92	-9.08	54	45.69	32.34	2.68	35.79	107	32	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
2483.56	58.26	-15.74	74	59.03	32.34	2.68	35.79	100	124	Peak
2483.71	42.38	-11.62	54	43.15	32.34	2.68	35.79	100	124	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
2389.29	53.16	-20.84	74	54.59	32.01	2.64	36.08	104	126	Peak
2387.13	41.69	-12.31	54	43.12	32.01	2.64	36.08	104	126	Average
2486.11	51.11	-22.89	74	51.88	32.34	2.68	35.79	105	126	Peak
2484.22	39.16	-14.84	54	39.93	32.34	2.68	35.79	105	126	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
2389.65	52.72	-21.28	74	54.15	32.01	2.64	36.08	100	255	Peak
2388.93	39.27	-14.73	54	40.7	32.01	2.64	36.08	100	255	Average
2486.62	49.67	-24.33	74	50.44	32.34	2.68	35.79	100	255	Peak
2483.68	37.8	-16.20	54	38.57	32.34	2.68	35.79	100	255	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
2389.65	51.73	-22.27	74	53.16	32.01	2.64	36.08	109	54	Peak
2389.74	39.46	-14.54	54	40.89	32.01	2.64	36.08	109	54	Average
2483.77	56.37	-17.63	74	57.14	32.34	2.68	35.79	100	121	Peak
2484.73	41.44	-12.56	54	42.21	32.34	2.68	35.79	100	121	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	49.62	-24.38	74	51.05	32.01	2.64	36.08	107	114	Peak
2389.92	38.44	-15.56	54	39.87	32.01	2.64	36.08	107	114	Average
2483.98	55.86	-18.14	74	56.63	32.34	2.68	35.79	107	120	Peak
2485.33	40.46	-13.54	54	41.23	32.34	2.68	35.79	107	120	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.

< 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 :	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	105.78	-	-	107.06	32.08	2.66	36.02	108	229	Peak
2412	101.11	-	-	102.39	32.08	2.66	36.02	108	229	Average
4824	47.74	-26.26	74	46.41	34.2	3.78	36.65	100	2	Peak

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	105.86	-	-	107.14	32.08	2.66	36.02	123	109	Peak
2412	100.64	-	-	101.92	32.08	2.66	36.02	123	109	Average
4824	49.95	-24.05	74	48.62	34.2	3.78	36.65	100	25	Peak

Test Mode :	802.11b	**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	104.57	-	-	105.61	32.21	2.66	35.91	104	230	Peak
2437	100.61	-	-	101.65	32.21	2.66	35.91	104	230	Average
4874	46.46	-27.54	74	45.32	34.2	3.78	36.84	100	35	Peak
7312	46.74	-27.26	74	45.15	35.72	4.73	38.86	154	100	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	104.19	-	-	105.23	32.21	2.66	35.91	117	100	Peak
2437	99.86	-	-	100.9	32.21	2.66	35.91	117	100	Average
4874	44.78	-29.22	74	43.64	34.2	3.78	36.84	200	101	Peak
7312	45.29	-28.71	74	43.7	35.72	4.73	38.86	101	24	Peak

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	105.45	-	-	106.36	32.27	2.67	35.85	102	232	Peak
2462	100.88	-	-	101.79	32.27	2.67	35.85	102	232	Average
4924	45.33	-28.67	74	44.38	34.2	3.78	37.03	106	14	Peak
7386	45.76	-28.24	74	44.42	35.76	4.77	39.19	100	59	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	104.96	-	-	105.87	32.27	2.67	35.85	113	105	Peak
2462	100.2	-	-	101.11	32.27	2.67	35.85	113	105	Average
4924	45.02	-28.98	74	44.07	34.2	3.78	37.03	110	322	Peak
7386	44.4	-29.60	74	43.06	35.76	4.77	39.19	100	0	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
30.97	27.84	-12.16	40	42.91	17.4	0.19	32.66	-	-	Peak
44.55	24.27	-15.73	40	46.43	10.2	0.31	32.67	-	-	Peak
120.21	32.17	-11.33	43.5	52.33	11.9	0.58	32.64	112	27	Peak
240.49	30.53	-15.47	46	51.17	11	0.84	32.48	-	-	Peak
724.52	31.26	-14.74	46	42.18	19.67	1.41	32	-	-	Peak
960.23	31.12	-22.88	54	40.35	20.76	1.72	31.71	-	-	Peak
2412	105.98	-	-	107.26	32.08	2.66	36.02	103	232	Peak
2412	94.78	-	-	96.06	32.08	2.66	36.02	103	232	Average
4824	46.16	-27.84	74	44.83	34.2	3.78	36.65	100	211	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
33.88	32.71	-7.29	40	49.4	15.75	0.19	32.63	-	-	Peak
71.71	29.23	-10.77	40	56.01	5.4	0.47	32.65	-	-	Peak
119.24	36.52	-6.98	43.5	56.7	11.88	0.58	32.64	200	315	Peak
179.38	29.18	-14.32	43.5	52.32	8.5	0.83	32.47	-	-	Peak
339.43	27.2	-18.8	46	44.61	14.08	0.87	32.36	-	-	Peak
895.24	34.32	-11.68	46	43.87	20.38	1.8	31.73	-	-	Peak
2412	107.04	-	-	108.32	32.08	2.66	36.02	115	283	Peak
2412	97.08	-	-	98.36	32.08	2.66	36.02	115	283	Average
4824	45.94	-28.06	74	44.61	34.2	3.78	36.65	100	323	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	105.8	-	-	106.84	32.21	2.66	35.91	104	229	Peak
2437	95.22	-	-	96.26	32.21	2.66	35.91	104	229	Average
4874	44.45	-29.55	74	43.31	34.2	3.78	36.84	110	341	Peak
7312	44.77	-29.23	74	43.18	35.72	4.73	38.86	102	45	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	102.74	-	-	103.78	32.21	2.66	35.91	176	228	Peak
2437	91.83	-	-	92.87	32.21	2.66	35.91	176	228	Average
4874	44.9	-29.10	74	43.76	34.2	3.78	36.84	100	39	Peak
7312	44.25	-29.75	74	42.66	35.72	4.73	38.86	100	22	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	107.16	-	-	108.07	32.27	2.67	35.85	100	236	Peak
2462	97.07	-	-	97.98	32.27	2.67	35.85	100	236	Average
4924	43.54	-30.46	74	42.59	34.2	3.78	37.03	100	67	Peak
7386	44.59	-29.41	74	43.25	35.76	4.77	39.19	100	311	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	107.86	-	-	108.77	32.27	2.67	35.85	109	91	Peak
2462	98.04	-	-	98.95	32.27	2.67	35.85	109	91	Average
4924	43.14	-30.86	74	42.19	34.2	3.78	37.03	100	85	Peak
7386	44.93	-29.07	74	43.59	35.76	4.77	39.19	100	240	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~23°C
Test Channel :	03	**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	102.99	-	-	104.15	32.14	2.66	35.96	103	13	Peak
2422	93.32	-	-	94.48	32.14	2.66	35.96	103	13	Average
4844	44.75	-29.25	74	43.49	34.2	3.78	36.72	100	36	Peak
7266	43.31	-30.69	74	41.61	35.71	4.72	38.73	100	63	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~23°C
Test Channel :	03	**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	101	-	-	102.16	32.14	2.66	35.96	118	99	Peak
2422	90.87	-	-	92.03	32.14	2.66	35.96	118	99	Average
4844	44.36	-29.64	74	43.1	34.2	3.78	36.72	100	47	Peak
7266	42.58	-31.42	74	40.88	35.71	4.72	38.73	106	41	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	103.38	-	-	104.42	32.21	2.66	35.91	103	15	Peak
2437	94.36	-	-	95.4	32.21	2.66	35.91	103	15	Average
4874	45.12	-28.88	74	43.98	34.2	3.78	36.84	100	91	Peak
7312	42.48	-31.52	74	40.89	35.72	4.73	38.86	113	64	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	103.86	-	-	104.9	32.21	2.66	35.91	120	287	Peak
2437	94.67	-	-	95.71	32.21	2.66	35.91	120	287	Average
4874	43.74	-30.26	74	42.6	34.2	3.78	36.84	100	109	Peak
7312	43.5	-30.50	74	41.91	35.72	4.73	38.86	103	256	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~23°C
Test Channel :	09	**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	103.28	-	-	104.31	32.21	2.67	35.91	102	18	Peak
2452	92.97	-	-	94	32.21	2.67	35.91	102	18	Average
4904	45.39	-28.61	74	44.37	34.2	3.78	36.96	123	210	Peak
7356	44.21	-29.79	74	42.77	35.74	4.76	39.06	154	12	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~23°C
Test Channel :	09	**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	103.21	-	-	104.24	32.21	2.67	35.91	101	9	Peak
2452	93.93	-	-	94.96	32.21	2.67	35.91	101	9	Average
4904	43.59	-30.41	74	42.57	34.2	3.78	36.96	100	46	Peak
7356	44.38	-29.62	74	42.94	35.74	4.76	39.06	100	23	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	107.66	-	-	108.94	32.08	2.66	36.02	163	19	Peak
2412	97.99	-	-	99.27	32.08	2.66	36.02	163	19	Average
4824	45.82	-28.18	74	44.49	34.2	3.78	36.65	100	136	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	109.34	-	-	110.62	32.08	2.66	36.02	113	24	Peak
2412	98.54	-	-	99.82	32.08	2.66	36.02	113	24	Average
4824	45.32	-28.68	74	43.99	34.2	3.78	36.65	100	121	Peak

Test Mode :	802.11n HT20	**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	108.74	-	-	109.78	32.21	2.66	35.91	116	32	Peak
2437	98.59	-	-	99.63	32.21	2.66	35.91	116	32	Average
4874	49.56	-24.44	74	48.42	34.2	3.78	36.84	100	34	Peak
7312	42.92	-31.08	74	41.33	35.72	4.73	38.86	100	321	Peak

Test Mode :	802.11n HT20	**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	107.51	-	-	108.55	32.21	2.66	35.91	100	97	Peak
2437	97.16	-	-	98.2	32.21	2.66	35.91	100	97	Average
4874	44.31	-29.69	74	43.17	34.2	3.78	36.84	154	113	Peak
7312	43.79	-30.21	74	42.2	35.72	4.73	38.86	131	12	Peak

Test Mode :	802.11n HT20	**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	109.56	-	-	110.47	32.27	2.67	35.85	107	32	Peak
2462	99.6	-	-	100.51	32.27	2.67	35.85	107	32	Average
4924	48.9	-25.10	74	47.95	34.2	3.78	37.03	106	45	Peak
7386	43.95	-30.05	74	42.61	35.76	4.77	39.19	100	44	Peak

Test Mode :	802.11n HT20	**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	108.3	-	-	109.21	32.27	2.67	35.85	100	124	Peak
2462	99.02	-	-	99.93	32.27	2.67	35.85	100	124	Average
4924	45.01	-28.99	74	44.06	34.2	3.78	37.03	100	0	Peak
7386	45.19	-28.81	74	43.85	35.76	4.77	39.19	110	350	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~23°C
Test Channel :	03	**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	102.65	-	-	103.81	32.14	2.66	35.96	105	126	Peak
2422	91.56	-	-	92.72	32.14	2.66	35.96	105	126	Average
4844	44.27	-29.73	74	43.01	34.2	3.78	36.72	126	64	Peak
7266	43.7	-30.30	74	42	35.71	4.72	38.73	163	327	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~23°C
Test Channel :	03	**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	100.46	-	-	101.62	32.14	2.66	35.96	100	255	Peak
2422	90.09	-	-	91.25	32.14	2.66	35.96	100	255	Average
4844	44.41	-29.59	74	43.15	34.2	3.78	36.72	147	354	Peak
7266	44.45	-29.55	74	42.75	35.71	4.72	38.73	100	48	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	102.41	-	-	103.45	32.21	2.66	35.91	108	125	Peak
2437	92.29	-	-	93.33	32.21	2.66	35.91	108	125	Average
4874	44.88	-29.12	74	43.74	34.2	3.78	36.84	100	236	Peak
7312	43.79	-30.21	74	42.2	35.72	4.73	38.86	109	147	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	101.6	-	-	102.64	32.21	2.66	35.91	161	103	Peak
2437	92.07	-	-	93.11	32.21	2.66	35.91	161	103	Average
4874	44.34	-29.66	74	43.2	34.2	3.78	36.84	123	324	Peak
7312	44.94	-29.06	74	43.35	35.72	4.73	38.86	165	92	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~23°C
Test Channel :	09	**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	103.79	-	-	104.82	32.21	2.67	35.91	107	36	Peak
2452	93.12	-	-	94.15	32.21	2.67	35.91	107	36	Average
4904	44.05	-29.95	74	43.03	34.2	3.78	36.96	187	14	Peak
7356	45.02	-28.98	74	43.58	35.74	4.76	39.06	148	235	Peak

Test Mode :	802.11n HT40	**Temperature :**	22~23°C
Test Channel :	09	**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	102.31	-	-	103.34	32.21	2.67	35.91	107	114	Peak
2452	91.15	-	-	92.18	32.21	2.67	35.91	107	114	Average
4904	44.38	-29.62	74	43.36	34.2	3.78	36.96	169	95	Peak
7356	44.94	-29.06	74	43.5	35.74	4.76	39.06	142	69	Peak

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

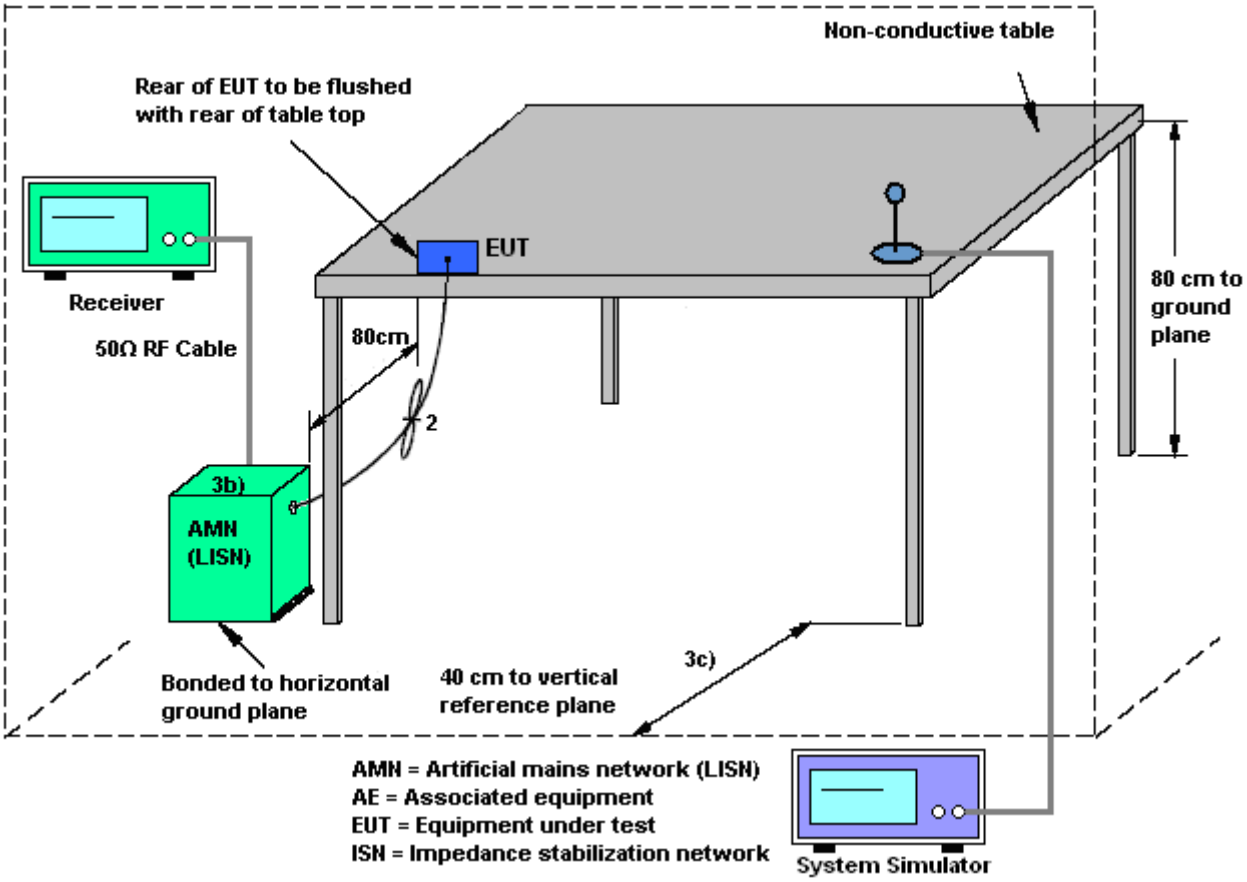
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

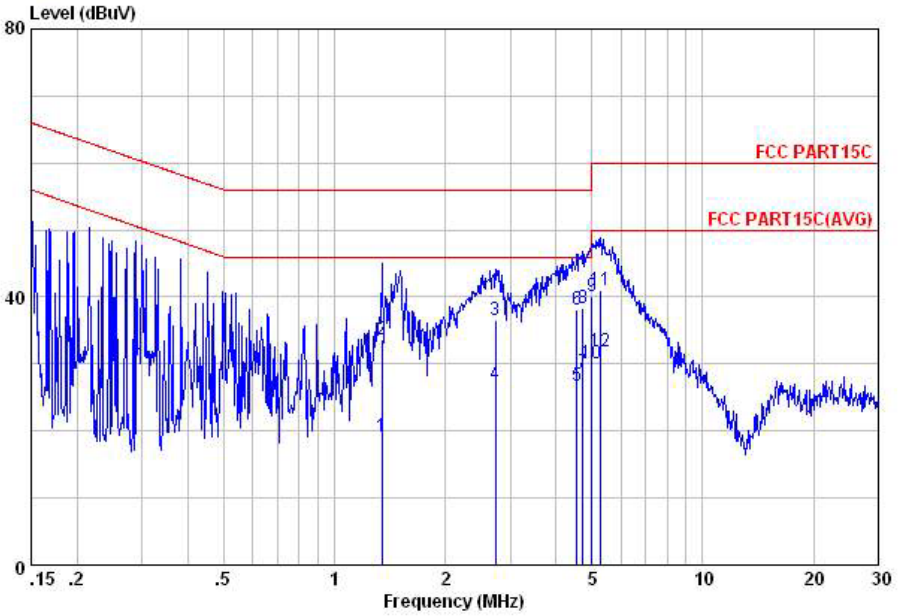
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

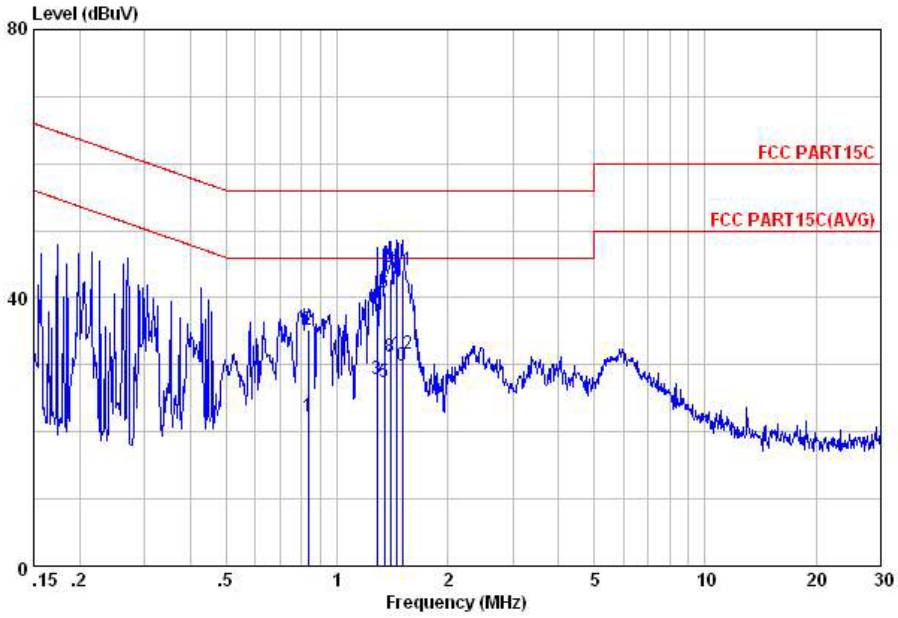
Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Eligah Wang	**Relative Humidity :**	37~39%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WCDMA Band V Idle + WLAN (2.4G) Link + Adapter		



Site : C001-KS
Condition: FCC PART15C LISN-L20130306 LINE
Project : (FR) 452602
mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	1.34	19.18	-26.82	46.00	8.90	0.10	10.18	Average
2	1.34	33.58	-22.42	56.00	23.30	0.10	10.18	QP
3	2.74	36.63	-19.37	56.00	26.30	0.12	10.21	QP
4	2.74	26.93	-19.07	46.00	16.60	0.12	10.21	Average
5	4.55	26.74	-19.26	46.00	16.30	0.19	10.25	Average
6	4.55	38.04	-17.96	56.00	27.60	0.19	10.25	QP
7	4.72	28.75	-17.25	46.00	18.30	0.20	10.25	Average
8	4.72	38.25	-17.75	56.00	27.80	0.20	10.25	QP
9	5.00	40.06	-19.94	60.00	29.60	0.20	10.26	QP
10	5.00	30.06	-19.94	50.00	19.60	0.20	10.26	Average
11	5.28	41.07	-18.93	60.00	30.60	0.20	10.27	QP
12	5.28	31.77	-18.23	50.00	21.30	0.20	10.27	Average

Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Eligah Wang	**Relative Humidity :**	37~39%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	WCDMA Band V Idle + WLAN (2.4G) Link + Adapter		



Site : C001-KS
Condition: FCC PART15C LISN-N20130306 NEUTRAL
Project : (FR) 452602
mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.83	22.34	-23.66	46.00	12.00	0.15	10.19	Average
2	0.83	35.24	-20.76	56.00	24.90	0.15	10.19	QP
3	1.28	27.88	-18.12	46.00	17.60	0.10	10.18	Average
4	1.28	39.18	-16.82	56.00	28.90	0.10	10.18	QP
5	1.34	27.38	-18.62	46.00	17.10	0.10	10.18	Average
6	1.34	40.88	-15.12	56.00	30.60	0.10	10.18	QP
7	1.40	42.68	-13.32	56.00	32.40	0.10	10.18	QP
8	1.40	31.18	-14.82	46.00	20.90	0.10	10.18	Average
9	1.46	42.89	-13.11	56.00	32.60	0.10	10.19	QP
10	1.46	29.89	-16.11	46.00	19.60	0.10	10.19	Average
11	1.50	44.19	-11.81	56.00	33.90	0.10	10.19	QP
12	1.50	31.69	-14.31	46.00	21.40	0.10	10.19	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 kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth 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.

	Ant. 1 (dBi)	Ant. 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
2.4 GHz	2.50	2.20	5.36	5.36	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	Jun. 21, 2014~ Aug. 27, 2014	Dec. 27, 2014	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	30MHz~40GHz	Feb. 27, 2014	Jun. 21, 2014~ Aug. 27, 2014	Feb. 26, 2015	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Feb. 27, 2014	Jun. 21, 2014~ Aug. 27, 2014	Feb. 26, 2015	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 05, 2013	Aug. 27, 2014	Nov. 04, 2014	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 04, 2014	Aug. 27, 2014	May 03, 2015	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 09, 2013	Aug. 27, 2014	Oct. 08, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Jan. 08, 2014	Aug. 27, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 08, 2014	Aug. 27, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 18, 2013	Aug. 27, 2014	Nov. 17, 2014	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Mar. 10, 2014	Aug. 27, 2014	Mar. 09, 2015	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161073	1MHz~1GHz	May 04, 2014	Aug. 27, 2014	May 03, 2015	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02371	1GHz~26.5GHz	Dec. 10, 2013	Aug. 27, 2014	Dec. 09, 2014	Radiation (03CH01-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Aug. 27, 2014	NCR	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Aug. 27, 2014	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Aug. 27, 2014	NCR	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 04, 2014	Jul. 23, 2014	May 03, 2015	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Dec. 10, 2013	Jul. 23, 2014	Dec. 09, 2014	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Dec. 10, 2013	Jul. 23, 2014	Dec. 09, 2014	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Nov. 12, 2013	Jul. 23, 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