FCC RF Test Report

APPLICANT	**:**	**Enda Gormley Sile LLC**
EQUIPMENT	**:**	**HDMI Digital Media Receiver**
MODEL NAME	**:**	**W87CUN**
FCC ID	**:**	**2ABDU-0509**
STANDARD	**:**	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	**:**	**(DTS) Digital Transmission System**

The product was received on Jun. 10, 2014 and testing was completed on Jul. 16, 2014. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

SPORTON INTERNATIONAL INC.

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

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR441920-02B	Rev. 01	Initial issue of report	Aug. 06, 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 0.51 dB at 2484.610 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 3.20 dB at 0.518 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Enda Gormley Sile LLC
Debbie Maynerich
11670 Fountains Drive
Suite 200
Maple Grove, Minnesota, 55369

1.2 Product Feature of Equipment Under Test

Product Feature	
Equipment	HDMI Digital Media Receiver
Model Name	W87CUN
FCC ID	2ABDU-0509
EUT supports Radios application	WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 Bluetooth v3.0 BR/EDR

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

1.3 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><Ant 1>
802.11b : 20.44 dBm (0.1107 W)
802.11g : 25.86 dBm (0.3855 W)
<Ant 2>
802.11b : 20.24 dBm (0.1057 W)
802.11g : 26.02 dBm (0.3999 W)
<Ant 1 + 2>
802.11n HT20 : 28.06 dBm (0.6397 W)</td></tr>
<tr><td>Antenna Type</td><td><Ant 1>
802.11b/g/n: PCB Printing Antenna type with gain 3.90 dBi
<Ant 2>
802.11b/g/n: PCB Printing Antenna type with gain -0.20 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
Ant. 1</th><th>Chain
Port 1
Ant. 2</th></tr>
<tr><td>802.11b</td><td>V</td><td>V</td></tr>
<tr><td>802.11g</td><td>V</td><td>V</td></tr>
<tr><td>802.11n
MIMO</td><td>V</td><td>V</td></tr>
</table>
</td></tr>
</table>

1.4 Modification of EUT

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

1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	**Sporton Site No.**		
	TH02-HY	CO05-HY	03CH07-HY

1.6 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.

<Ant. 1>

802.11b				
Data Rate (MHz)	**1M bps**	**2M bps**	**5.5M bps**	**11M bps**
Peak Power (dBm)	**20.44**	20.43	20.40	20.35

802.11g								
Data Rate (MHz)	**6M bps**	**9M bps**	**12M bps**	**18M bps**	**24M bps**	**36M bps**	**48M bps**	**54M bps**
Peak Power (dBm)	**25.86**	25.85	25.79	25.79	25.73	25.85	25.83	25.80

<Ant. 2>

802.11b				
Data Rate (MHz)	**1M bps**	**2M bps**	**5.5M bps**	**11M bps**
Peak Power (dBm)	**20.24**	20.21	20.20	20.20

802.11g								
Data Rate (MHz)	**6M bps**	**9M bps**	**12M bps**	**18M bps**	**24M bps**	**36M bps**	**48M bps**	**54M bps**
Peak Power (dBm)	**26.02**	26.00	25.98	25.93	25.91	25.90	25.92	26.00

MIMO <Ant. 1+2>

2.4GHz 802.11n HT20								
Data Rate (MHz)	**MCS 0**	**MCS 1**	**MCS2**	**MCS 3**	**MCS 4**	**MCS 5**	**MCS 6**	**MCS 7**
Peak Power (dBm)	**28.06**	27.98	28.04	28.02	28.02	28.04	28.05	28.04
Data Rate (MHz)	**MCS8**	**MCS9**	**MCS10**	**MCS11**	**MCS12**	**MCS13**	**MCS14**	**MCS15**
Peak Power (dBm)	28.05	28.04	27.98	28.06	28.05	28.03	28.05	28.05

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

2.3 Test Mode

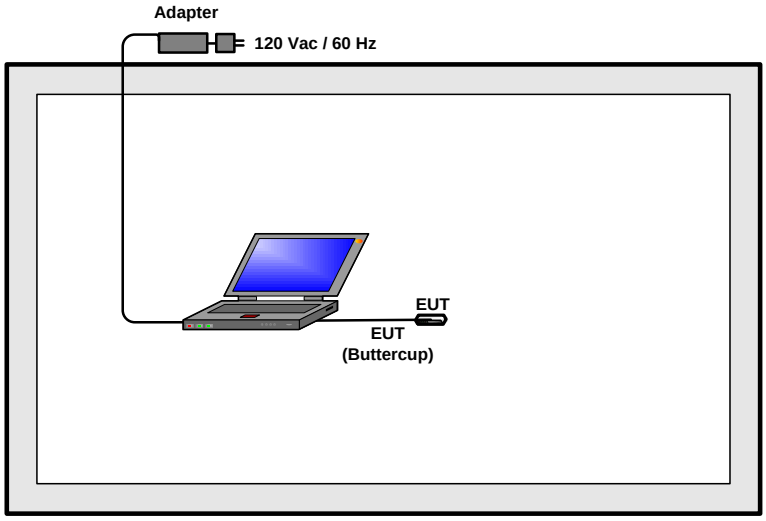
Final results of test modes, data rates and test channels are shown as following table.

Test Cases				
	Test Items	**Mode**	**Data Rate**	**Test Channel**
Conducted TCs	**6dB and 99% BW Power Spectral Density**	**802.11b**	**1 Mbps**	**L/M/H**
		802.11g	**6 Mbps**	**L/M/H**
		802.11n HT20	**6.5 Mbps**	**L/M/H**
	Output Power	**802.11b**	**1 Mbps**	**L/M/H**
		802.11g	**6 Mbps**	**L/M/H**
		802.11n HT20	**6.5 Mbps**	**L/M/H**
	Conducted Band Edge	**802.11b**	**1 Mbps**	**L/H**
		802.11g	**6 Mbps**	**L/H**
		802.11n HT20	**6.5 Mbps**	**L/H**
	Conducted Spurious Emission	**802.11b**	**1 Mbps**	**L/M/H**
		802.11g	**6 Mbps**	**L/M/H**
		802.11n HT20	**6.5 Mbps**	**L/M/H**
Radiated TCs	**Radiated Band Edge**	**802.11b**	**1 Mbps**	**L/H**
		802.11g	**6 Mbps**	**L/H**
		802.11n HT20	**6.5 Mbps**	**L/H**
	Radiated Spurious Emission	**802.11b**	**1 Mbps**	**L/M/H**
		802.11g	**6 Mbps**	**L/M/H**
		802.11n HT20	**6.5 Mbps**	**L/M/H**

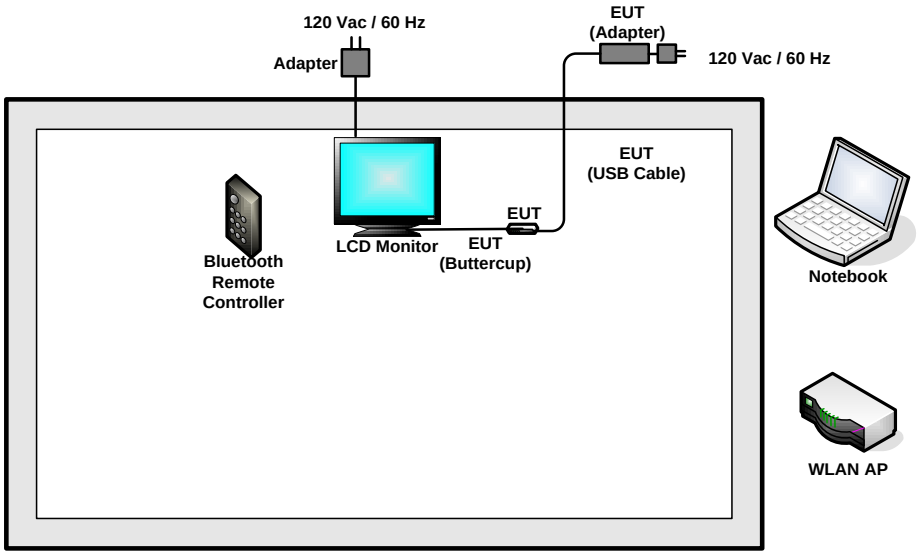
Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN (2.4GHz) Link + MPEG4 + Buttercup + USB Cable (Charging from Adapter) <Fig. 1> Mode 2 WLAN (2.4GHz) Link + MPEG4 + Buttercup + USB Cable (Charging from Adapter) <Fig. 2>
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.	

2.4 Connection Diagram of Test System

<WLAN Tx Mode>

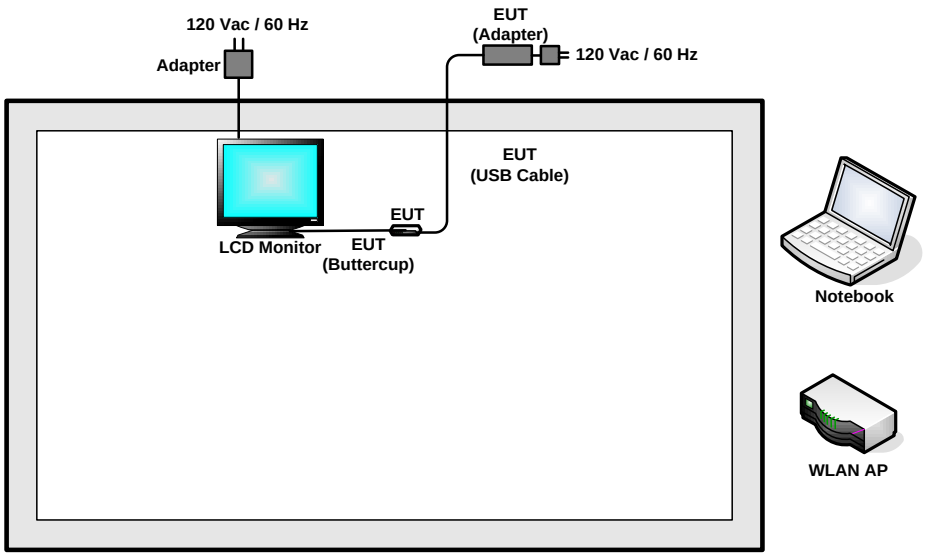


<AC Conducted Emission with Bluetooth Remote Controller Mode>



<Fig. 1>

< AC Conducted Emission Mode>



<Fig. 2>

2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
3.	Bluetooth Remote Controller	N/A	CV98LM	2ABDV-0929	N/A	N/A
4.	Notebook	DELL	Vostro 1510	FCC DoC/ Contains FCC ID: E2K4965AGNM	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.6 EUT Operation Test Setup

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

2.7 Measurement Results Explanation Example

For all conducted test items:

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

Example:
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF cable loss + attenuator factor.
Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).
= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

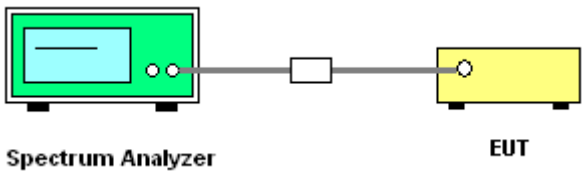
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

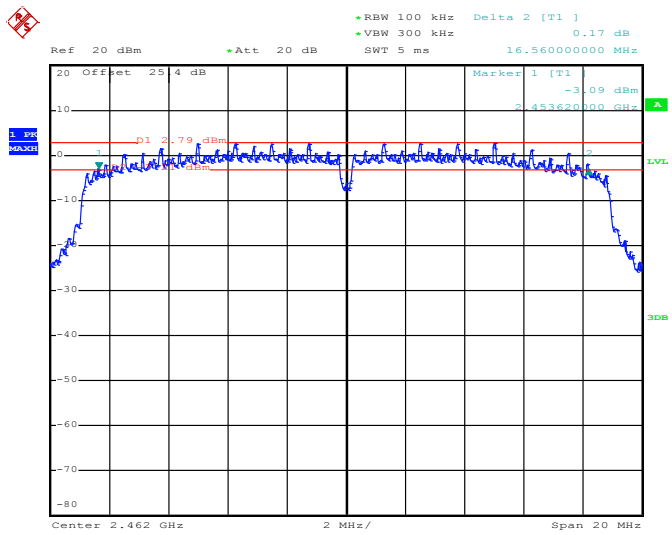


3.1.5 Test Result of 6dB Bandwidth

Test Band :	2.4GHz	Temperature :	21~26℃
Test Engineer :	Bill Kuo and Stuart Lin	Relative Humidity :	45~54%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant. 1	Ant. 2		
11b	1Mbps	1	1	2412	8.54	-	0.5	Pass
11b	1Mbps	1	6	2437	8.08		0.5	Pass
11b	1Mbps	1	11	2462	8.08		0.5	Pass
11g	6Mbps	1	1	2412	15.76		0.5	Pass
11g	6Mbps	1	6	2437	15.76		0.5	Pass
11g	6Mbps	1	11	2462	15.80		0.5	Pass
HT20	MCS0	2	1	2412	15.64	16.32	0.5	Pass
HT20	MCS0	2	6	2437	15.44	16.30	0.5	Pass
HT20	MCS0	2	11	2462	15.76	16.56	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.

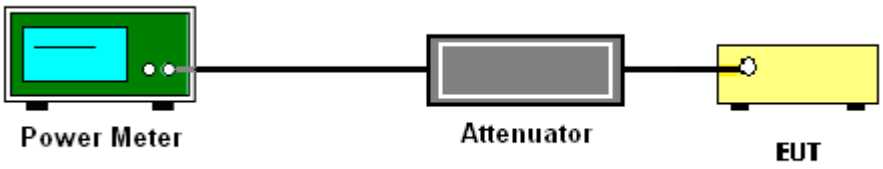
3.2.2 Measuring Instruments

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 :	21~26℃
Test Engineer :	Bill Kuo and Stuart Lin	Relative Humidity :	45~54%

Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Max. Limit (dBm)		DG (dBi)		Pass/Fail
					Ant. 1	Ant. 2	SUM	Ant. 1	Ant. 2	Ant. 1	Ant. 2	
11b	1Mbps	1	1	2412	20.44	20.24	-	30.00	30.00	3.90	-0.20	Pass
11b	1Mbps	1	6	2437	20.43	20.15		30.00	30.00	3.90	-0.20	Pass
11b	1Mbps	1	11	2462	19.49	19.96		30.00	30.00	3.90	-0.20	Pass
11g	6Mbps	1	1	2412	24.18	24.91		30.00	30.00	3.90	-0.20	Pass
11g	6Mbps	1	2	2417	24.30	25.86		30.00	30.00	3.90	-0.20	Pass
11g	6Mbps	1	3	2422	25.70	-		30.00	30.00	3.90	-0.20	Pass
11g	6Mbps	1	6	2437	25.86	26.02		30.00	30.00	3.90	-0.20	Pass
11g	6Mbps	1	9	2452	24.80	-		30.00	30.00	3.90	-0.20	Pass
11g	6Mbps	1	10	2457	24.00	25.74		30.00	30.00	3.90	-0.20	Pass
11g	6Mbps	1	11	2462	22.92	24.01		30.00	30.00	3.90	-0.20	Pass
HT20	MCS0	2	1	2412	22.75	23.16	25.97	30.00		5.10		Pass
HT20	MCS0	2	2	2417	24.38	24.61	27.51	30.00		5.10		Pass
HT20	MCS0	2	6	2437	24.90	25.20	28.06	30.00		5.10		Pass
HT20	MCS0	2	10	2457	23.85	24.21	27.04	30.00		5.10		Pass
HT20	MCS0	2	11	2462	22.90	23.35	26.14	30.00		5.10		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 :	21~26℃
Test Engineer :	Bill Kuo and Stuart Lin	Relative Humidity :	45~54%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)		
					Ant. 1	Ant. 2	Ant. 1	Ant. 2	Sum Power
11b	1Mbps	1	1	2412	0.20	0.21	17.33	17.16	-
11b	1Mbps	1	6	2437	0.20	0.21	17.26	17.15	
11b	1Mbps	1	11	2462	0.20	0.21	16.33	16.94	
11g	6Mbps	1	1	2412	0.22	0.23	14.37	16.21	
11g	6Mbps	1	2	2417	0.22	0.23	14.89	18.75	
11g	6Mbps	1	3	2422	0.22	0.23	18.68	-	
11g	6Mbps	1	6	2437	0.22	0.23	18.94	19.45	
11g	6Mbps	1	9	2452	0.22	0.23	15.97	-	
11g	6Mbps	1	10	2457	0.22	0.23	14.46	19.05	
11g	6Mbps	1	11	2462	0.22	0.23	12.26	14.30	
HT20	MCS0	2	1	2412	0.21	0.22	12.67	13.54	16.14
HT20	MCS0	2	2	2417	0.21	0.22	15.51	16.54	19.07
HT20	MCS0	2	6	2437	0.21	0.22	17.44	18.39	20.95
HT20	MCS0	2	10	2457	0.21	0.22	15.22	15.80	18.53
HT20	MCS0	2	11	2462	0.21	0.22	13.13	14.04	16.62

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.

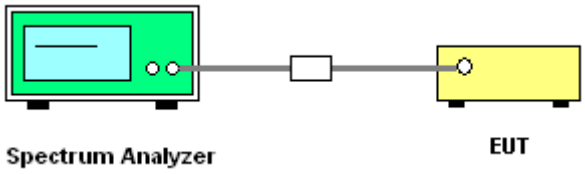
   If measurements performed using method (2) plus 10 log (N) exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

   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



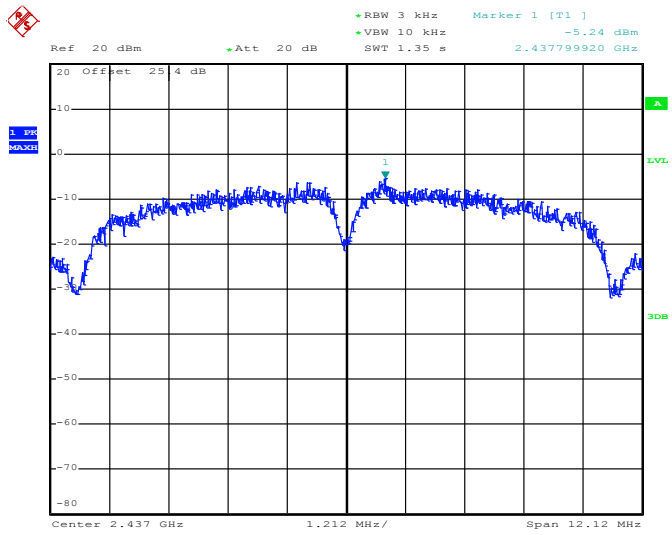
3.3.5 Test Result of Power Spectral Density

Test Band :	2.4GHz	Temperature :	21~26℃
Test Engineer :	Bill Kuo and Stuart Lin	Relative Humidity :	45~54%

Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Peak Power Density (dBm/3kHz)			Max. Limit (dBm/3kHz)		DG (dBi)		Pass/Fail
					Ant. 1	Ant. 2	Worst +10log(2)	Ant. 1	Ant. 2	Ant. 1	Ant. 2	
11b	1Mbps	1	1	2412	-5.89	-	-	3.90	-0.20	8.00	8.00	Pass
11b	1Mbps	1	6	2437	-5.24			3.90	-0.20	8.00	8.00	Pass
11b	1Mbps	1	11	2462	-6.31			3.90	-0.20	8.00	8.00	Pass
11g	6Mbps	1	1	2412	-10.70			3.90	-0.20	8.00	8.00	Pass
11g	6Mbps	1	6	2437	-6.69			3.90	-0.20	8.00	8.00	Pass
11g	6Mbps	1	11	2462	-13.61			3.90	-0.20	8.00	8.00	Pass
HT20	MCS0	2	1	2412	-12.34	-10.73	-7.72	5.10		8.00		Pass
HT20	MCS0	2	6	2437	-7.08	-6.51	-3.50	5.10		8.00		Pass
HT20	MCS0	2	11	2462	-10.32	-11.45	-7.31	5.10		8.00		Pass

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

Worst Case Power Density (dBm/3kHz)



Date: 13.JUL.2014 10:47:17

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).

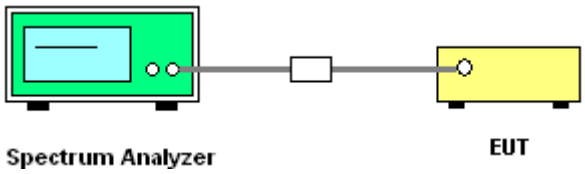
3.4.2 Measuring Instruments

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



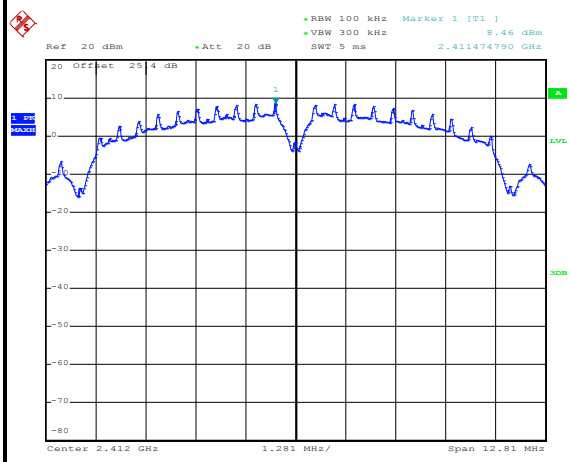
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Number of TX = 1, Ant. 1 (Measured)

Number of TX	1	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	45~54%
Test Channel :	01	**Test Engineer :**	Bill Kuo and Stuart Lin

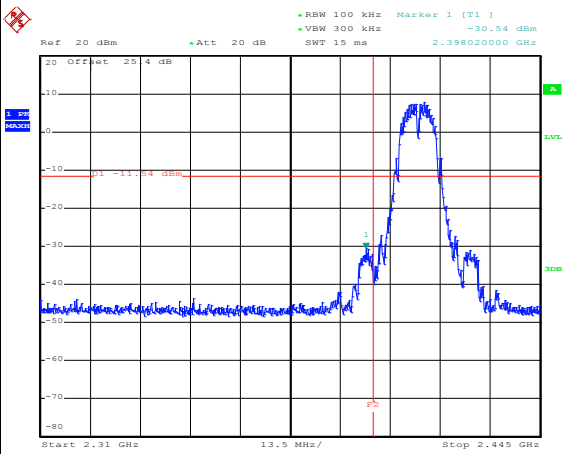
WLAN 802.11b Channel 01

100kHz PSD reference Level



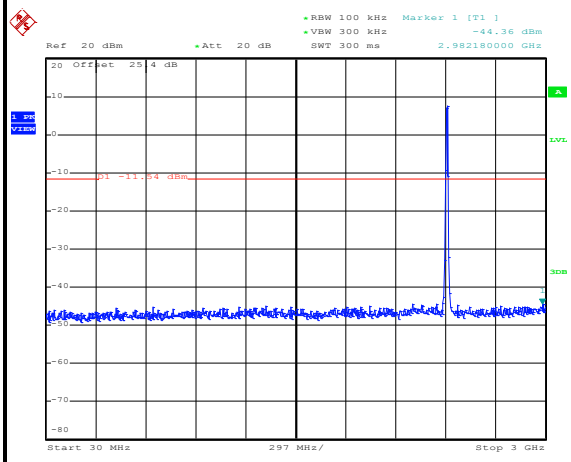
Date: 13.JUL.2014 10:39:44

Low Channel Plot



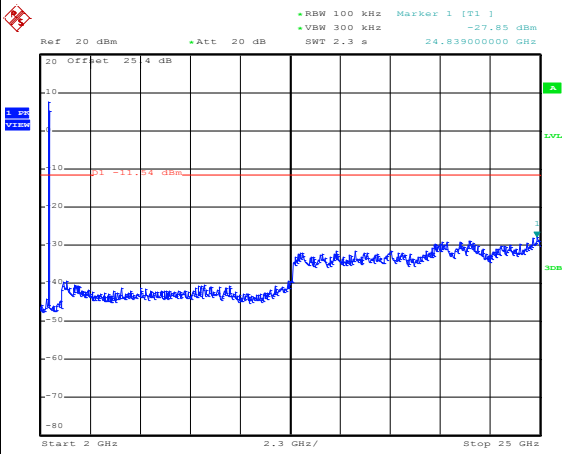
Date: 13.JUL.2014 10:40:01

Spurious Emission 30MHz~3GHz



Date: 13.JUL.2014 10:42:30

Spurious Emission 2GHz~25GHz

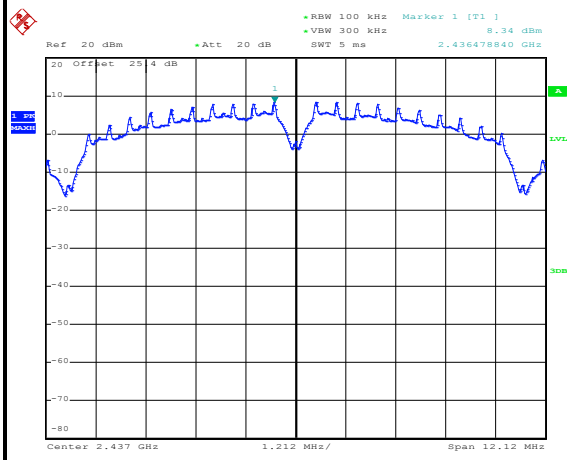


Date: 13.JUL.2014 10:42:48

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	45~54%
Test Channel :	06	**Test Engineer :**	Bill Kuo and Stuart Lin

WLAN 802.11b Channel 06

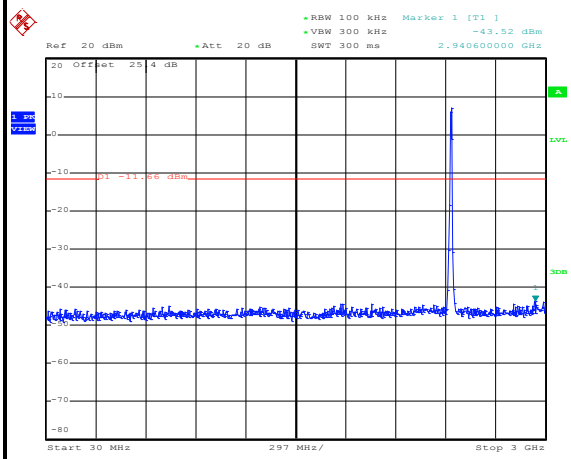
100kHz PSD reference Level



Date: 13.JUL.2014 10:47:43

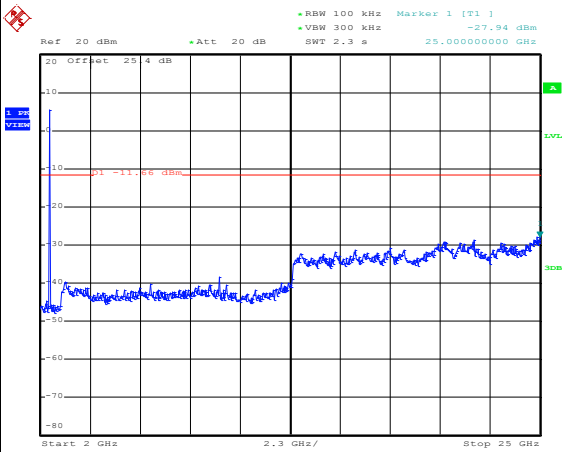
Mid Channel Plot

Spurious Emission 30MHz~3GHz



Date: 13.JUL.2014 10:48:08

Spurious Emission 2GHz~25GHz

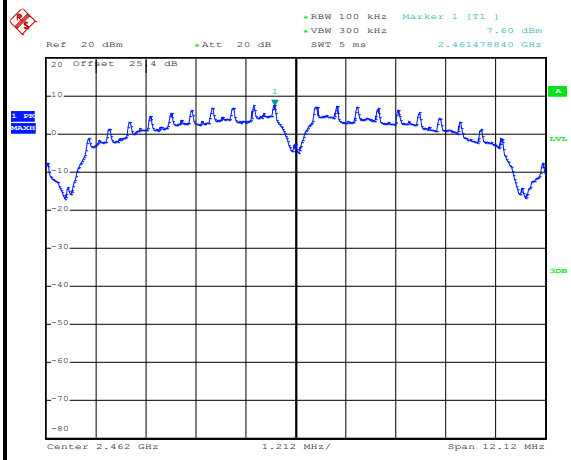


Date: 13.JUL.2014 10:48:26

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11b	**Temperature :**	21~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	45~54%
Test Channel :	11	**Test Engineer :**	Bill Kuo and Stuart Lin

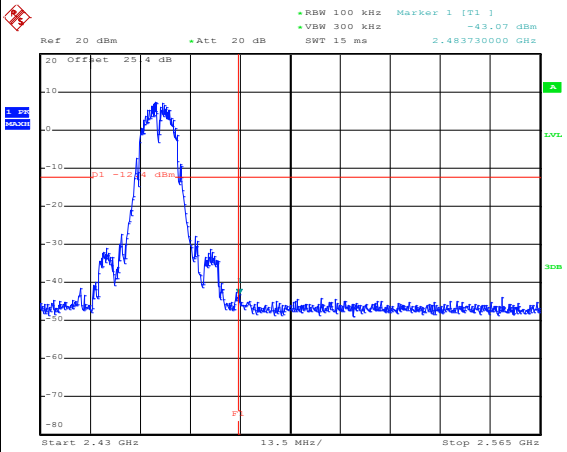
WLAN 802.11b Channel 11

100kHz PSD reference Level



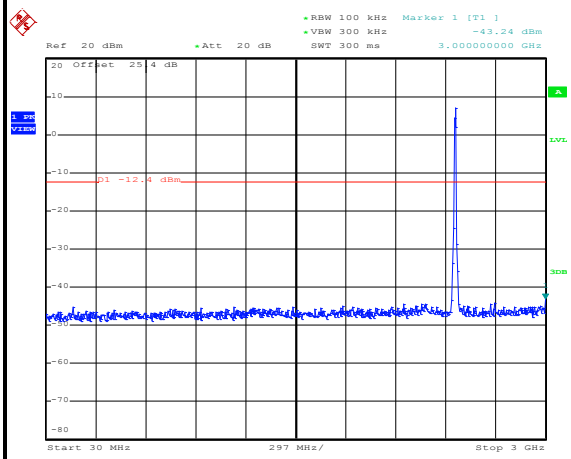
Date: 13.JUL.2014 10:51:18

High Channel Plot



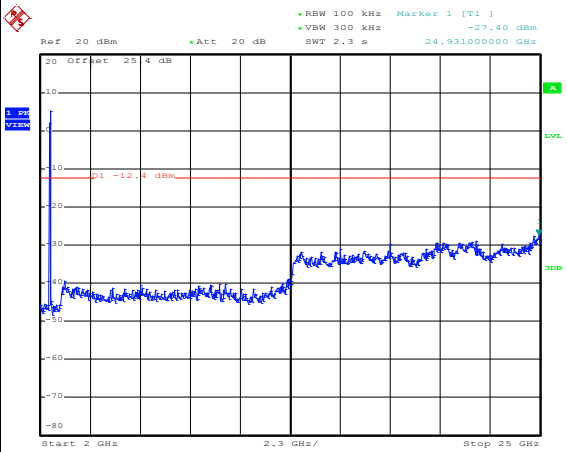
Date: 13.JUL.2014 10:51:37

Spurious Emission 30MHz~3GHz



Date: 13.JUL.2014 10:52:18

Spurious Emission 2GHz~25GHz

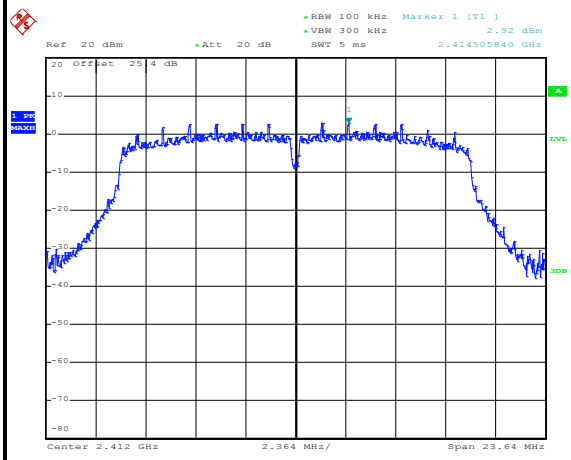


Date: 13.JUL.2014 10:52:36

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	45~54%
Test Channel :	01	**Test Engineer :**	Bill Kuo and Stuart Lin

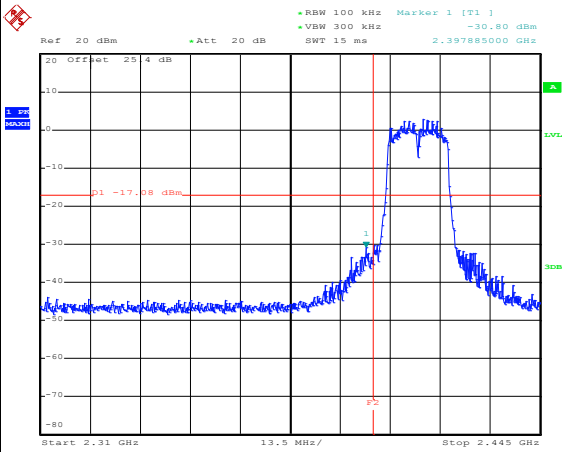
WLAN 802.11g Channel 01

100kHz PSD reference Level



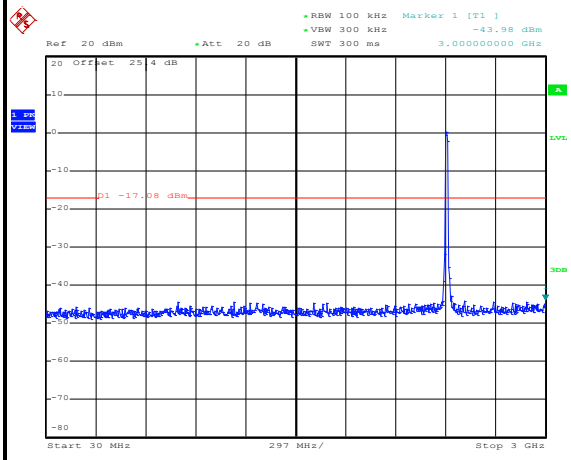
Date: 13.JUL.2014 10:56:48

Low Channel Plot



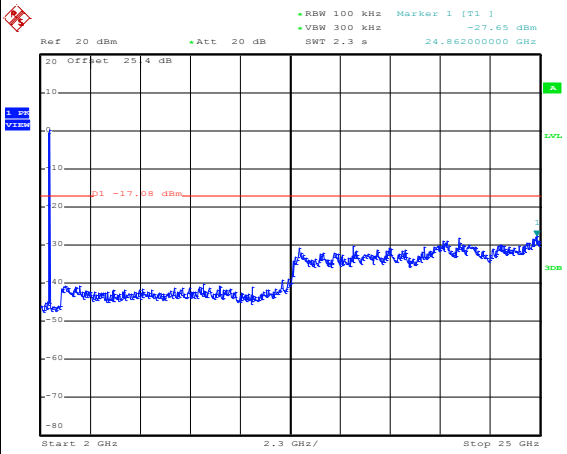
Date: 13.JUL.2014 10:57:08

Spurious Emission 30MHz~3GHz



Date: 13.JUL.2014 10:57:34

Spurious Emission 2GHz~25GHz

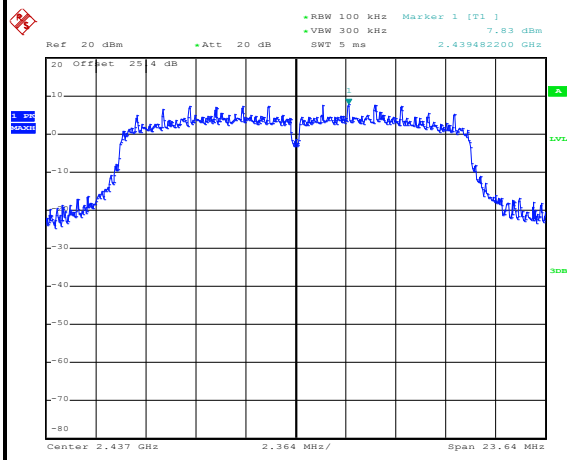


Date: 13.JUL.2014 10:57:52

Number of TX :	1	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	45~54%
Test Channel :	06	**Test Engineer :**	Bill Kuo and Stuart Lin

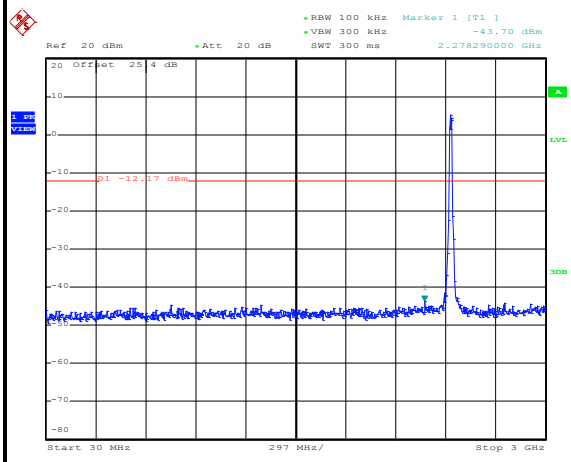
WLAN 802.11g Channel 06

100kHz PSD reference Level

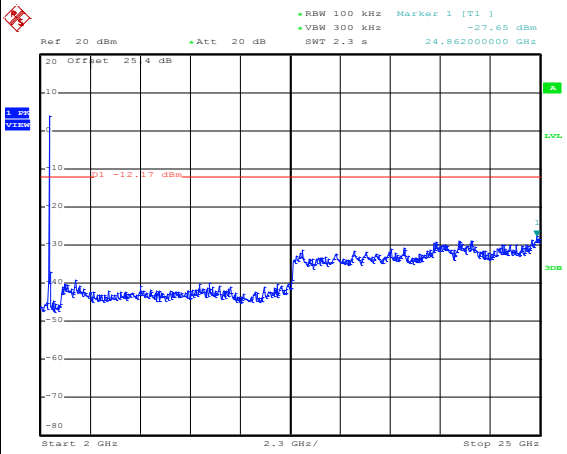


Mid Channel Plot

Spurious Emission 30MHz~3GHz



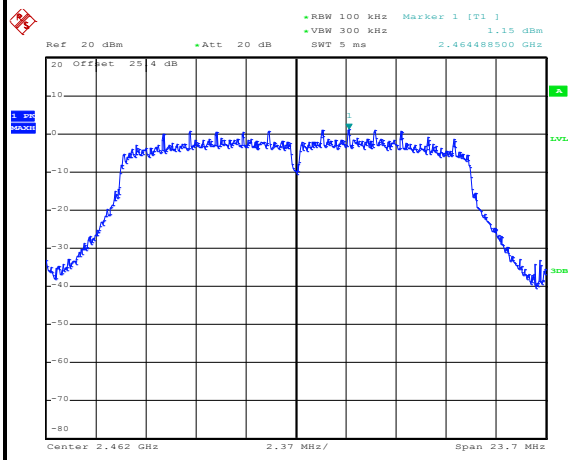
Spurious Emission 2GHz~25GHz



Number of TX :	1	**Ant. :**	1
Test Mode :	802.11g	**Temperature :**	21~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	45~54%
Test Channel :	11	**Test Engineer :**	Bill Kuo and Stuart Lin

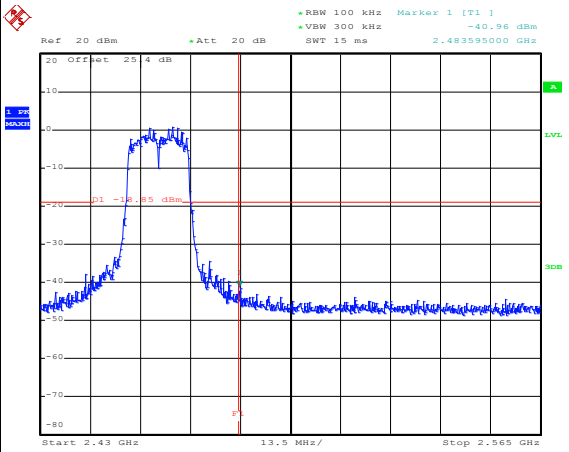
WLAN 802.11g Channel 11

100kHz PSD reference Level



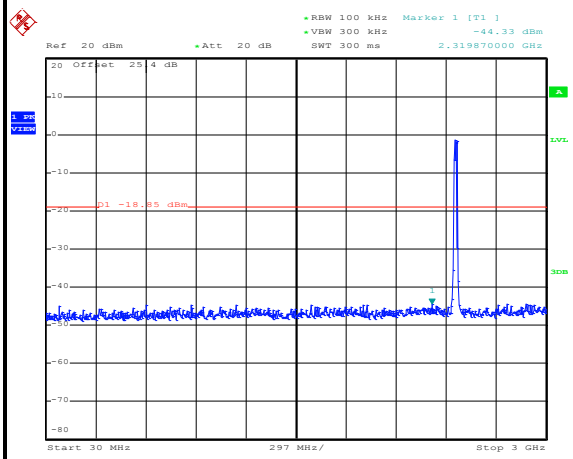
Date: 13.JUL.2014 11:22:19

Mid Channel Plot



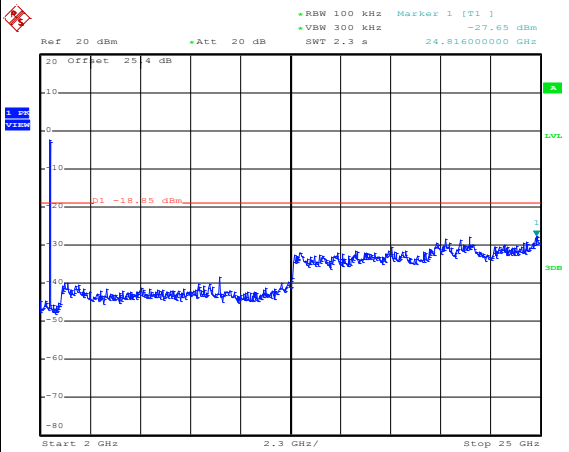
Date: 13.JUL.2014 11:22:53

Spurious Emission 30MHz~3GHz



Date: 13.JUL.2014 11:23:43

Spurious Emission 2GHz~25GHz



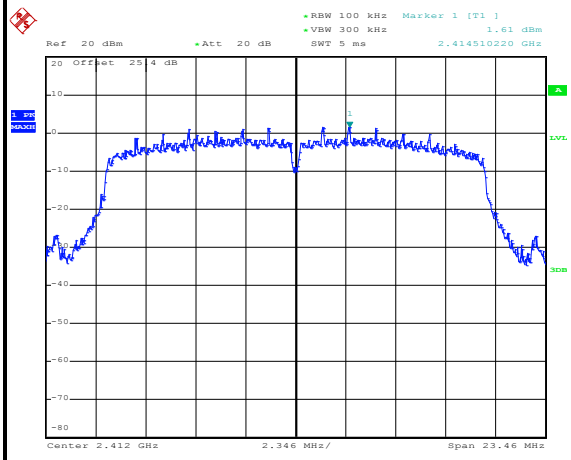
Date: 13.JUL.2014 11:24:01

Number of TX = 2, Ant. 1 (Measured)

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	45~54%
Test Channel :	01	**Test Engineer :**	Bill Kuo and Stuart Lin

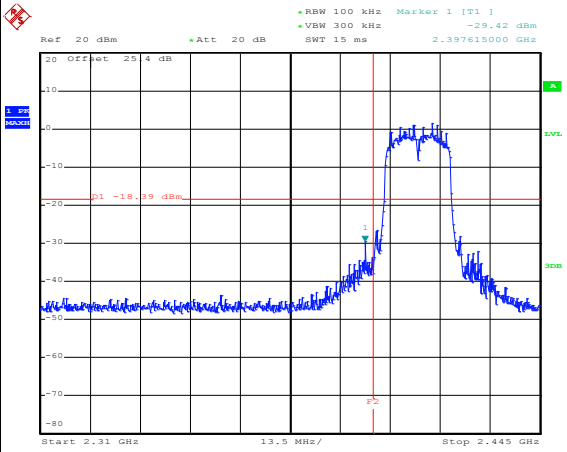
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



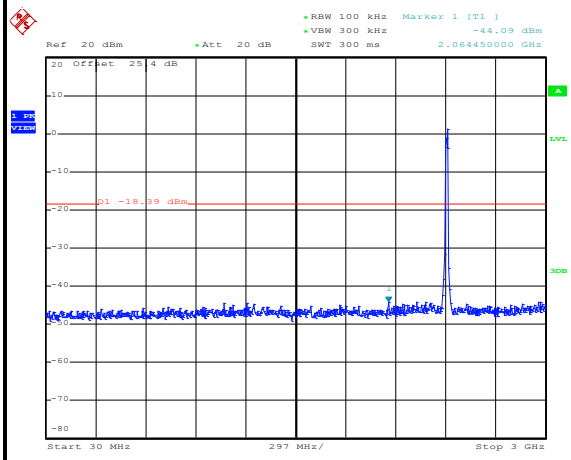
Date: 13.JUL.2014 11:41:21

Low Channel Plot



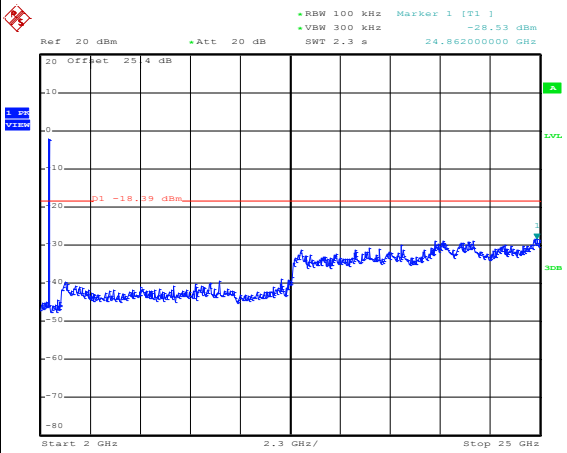
Date: 13.JUL.2014 11:42:03

Spurious Emission 30MHz~3GHz



Date: 13.JUL.2014 11:42:30

Spurious Emission 2GHz~25GHz

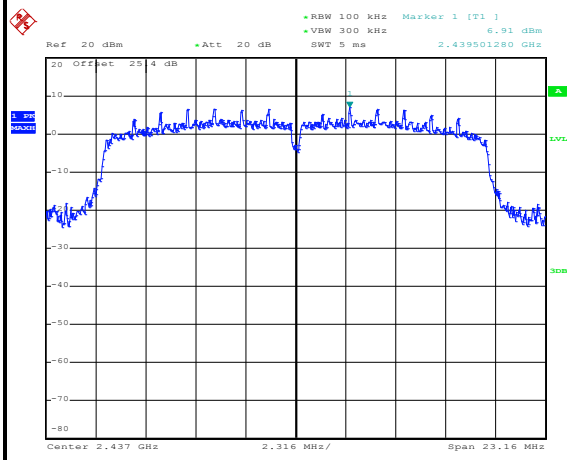


Date: 13.JUL.2014 11:42:48

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	45~54%
Test Channel :	06	**Test Engineer :**	Bill Kuo and Stuart Lin

WLAN 802.11n HT20 Channel 06

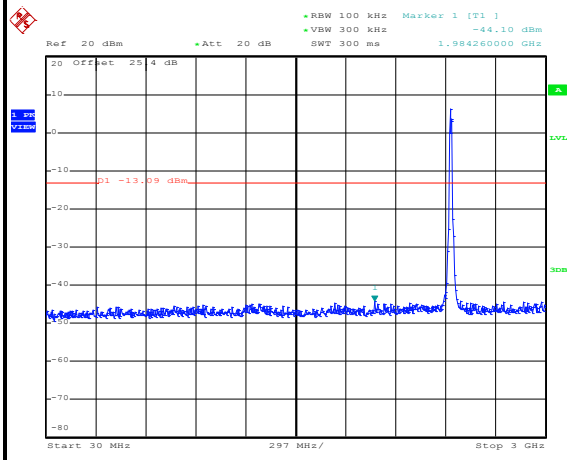
100kHz PSD reference Level



Date: 13.JUL.2014 11:47:05

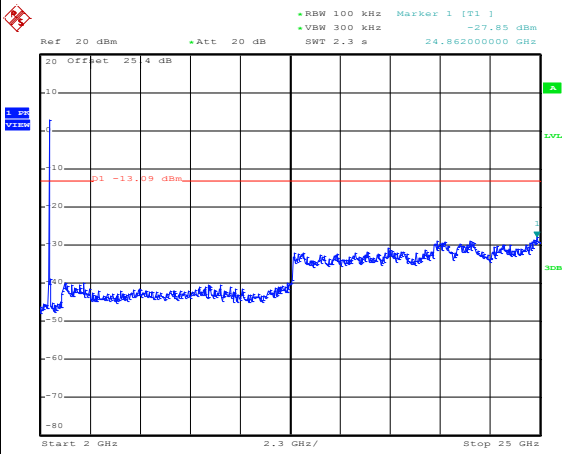
Mid Channel Plot

Spurious Emission 30MHz~3GHz



Date: 13.JUL.2014 12:12:52

Spurious Emission 2GHz~25GHz

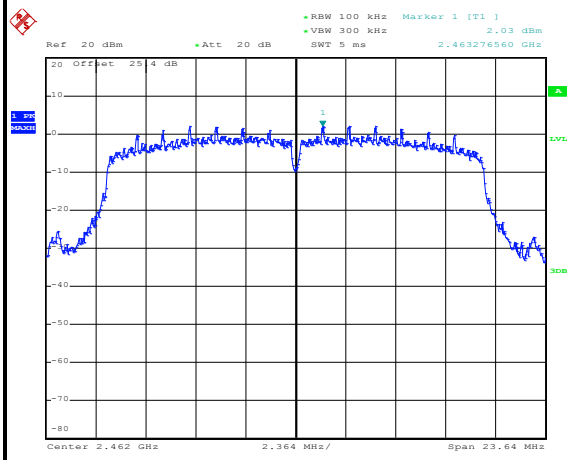


Date: 13.JUL.2014 12:13:10

Number of TX :	2	**Ant. :**	1
Test Mode :	802.11n HT20	**Temperature :**	21~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	45~54%
Test Channel :	11	**Test Engineer :**	Bill Kuo and Stuart Lin

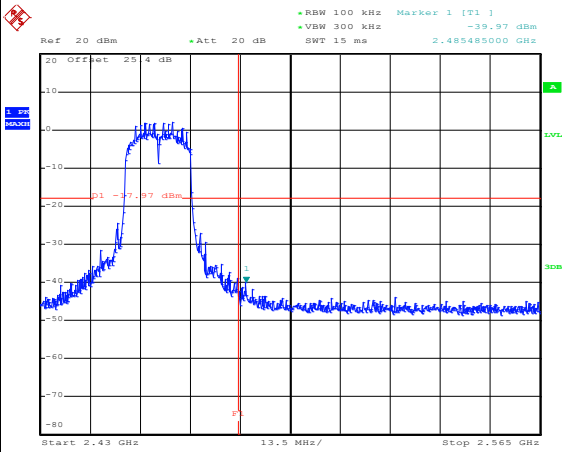
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



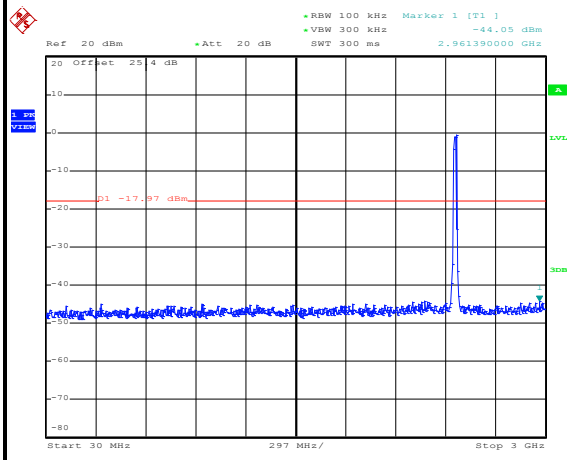
Date: 13.JUL.2014 12:08:22

High Channel Plot



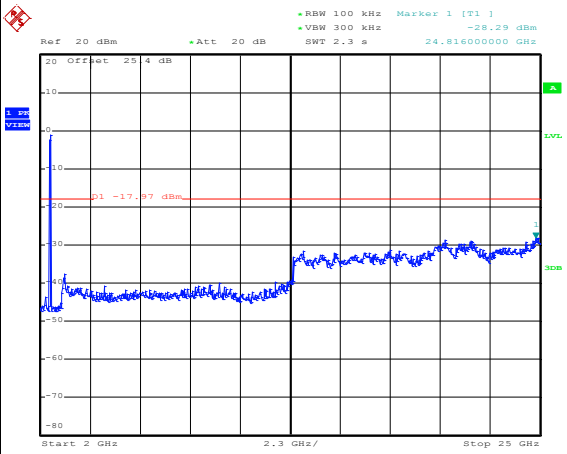
Date: 13.JUL.2014 12:08:57

Spurious Emission 30MHz~3GHz



Date: 13.JUL.2014 12:10:08

Spurious Emission 2GHz~25GHz



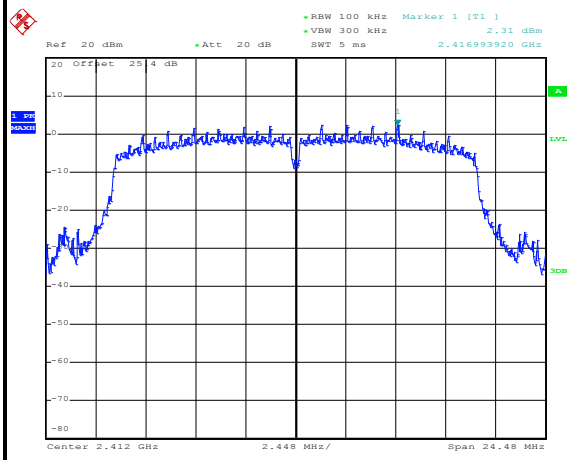
Date: 13.JUL.2014 12:10:26

Number of TX = 2, Ant. 2 (Measured)

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT20	**Temperature :**	21~26℃
Test Band :	2.4GHz Low	**Relative Humidity :**	45~54%
Test Channel :	01	**Test Engineer :**	Bill Kuo and Stuart Lin

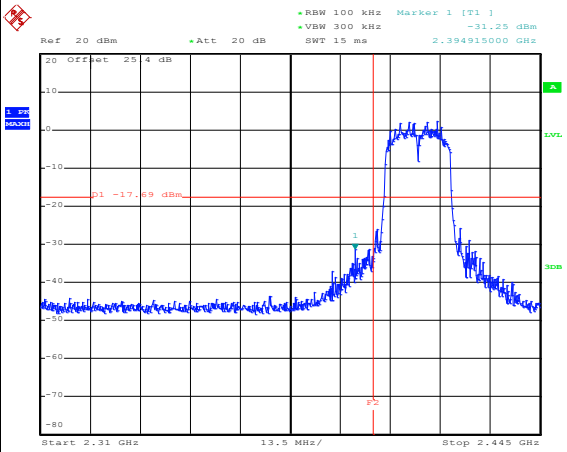
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



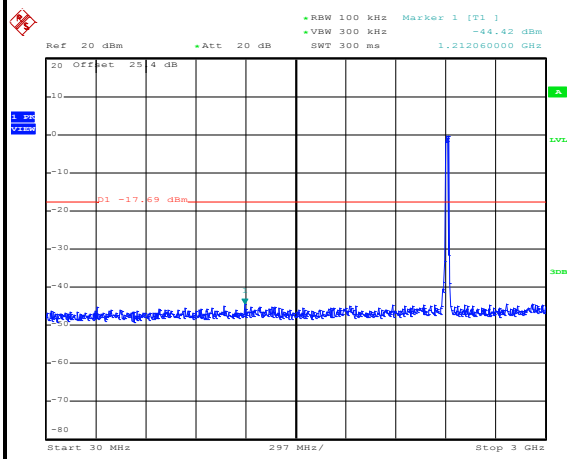
Date: 13.JUL.2014 11:33:29

Low Channel Plot



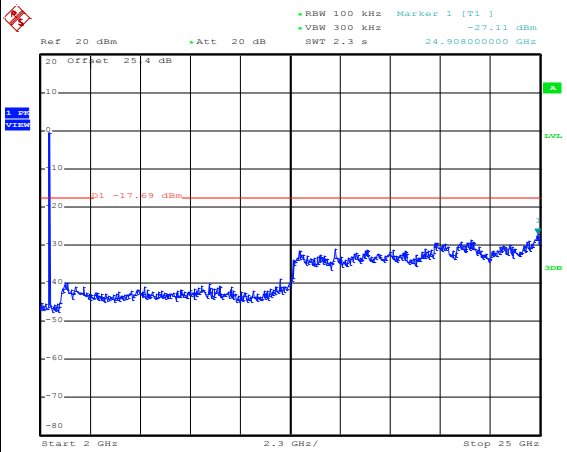
Date: 13.JUL.2014 11:35:59

Spurious Emission 30MHz~3GHz



Date: 13.JUL.2014 11:36:36

Spurious Emission 2GHz~25GHz

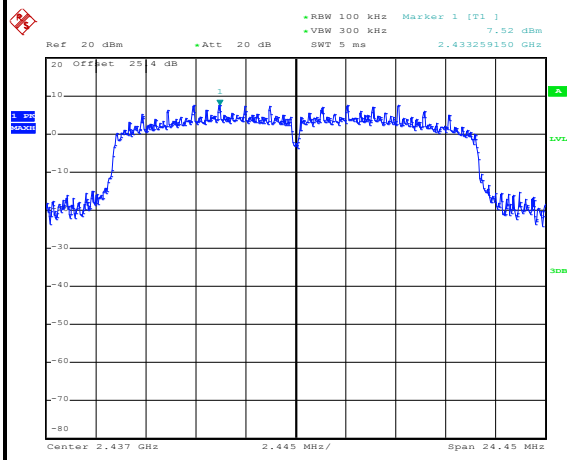


Date: 13.JUL.2014 11:36:54

Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT20	**Temperature :**	21~26℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	45~54%
Test Channel :	06	**Test Engineer :**	Bill Kuo and Stuart Lin

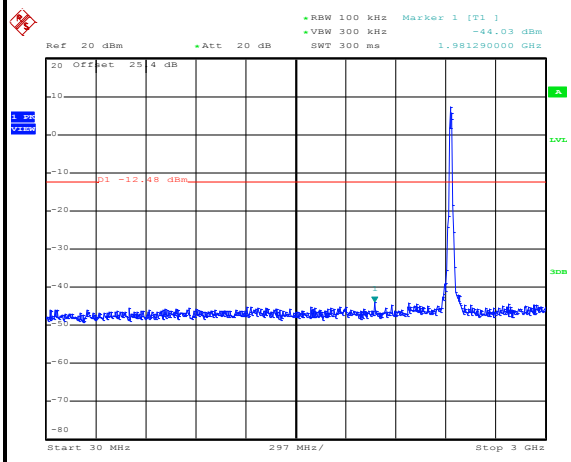
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level

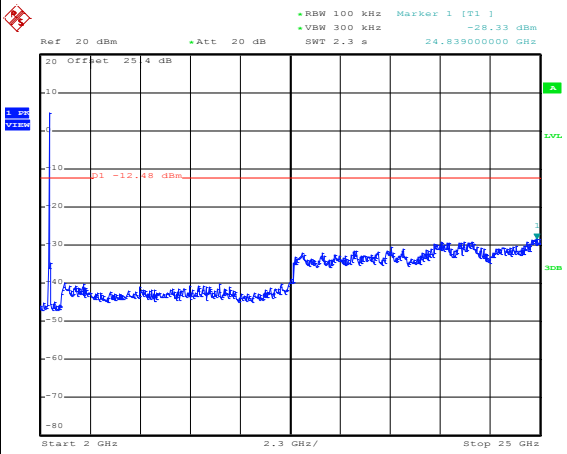


Mid Channel Plot

Spurious Emission 30MHz~3GHz



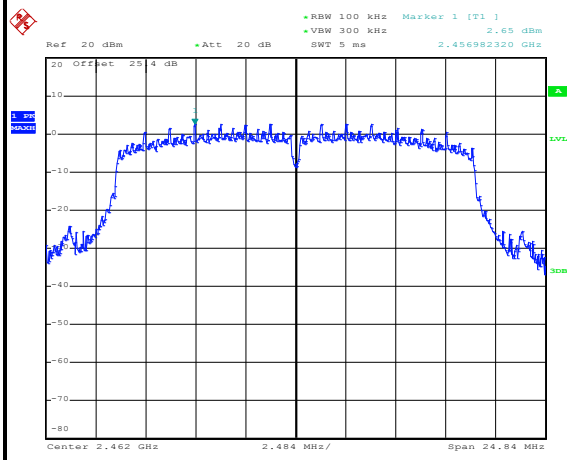
Spurious Emission 2GHz~25GHz



Number of TX :	2	**Ant. :**	2
Test Mode :	802.11n HT20	**Temperature :**	21~26℃
Test Band :	2.4GHz High	**Relative Humidity :**	45~54%
Test Channel :	11	**Test Engineer :**	Bill Kuo and Stuart Lin

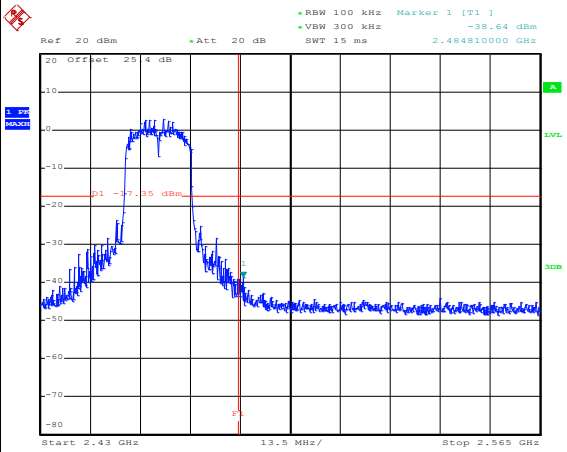
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



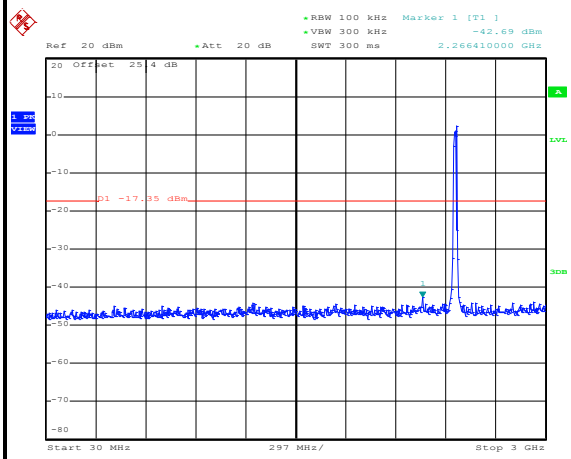
Date: 13.JUL.2014 11:59:21

High Channel Plot



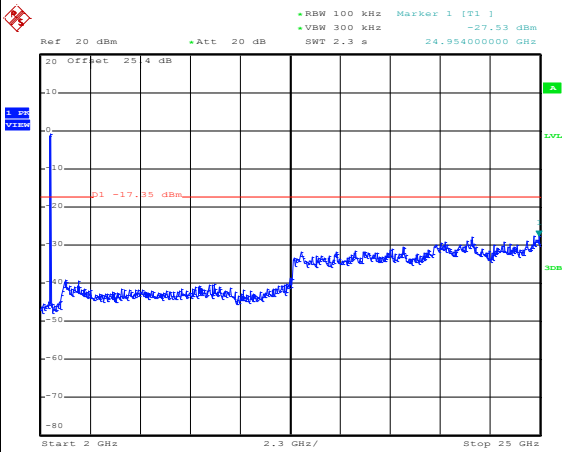
Date: 13.JUL.2014 12:00:25

Spurious Emission 30MHz~3GHz



Date: 13.JUL.2014 12:05:04

Spurious Emission 2GHz~25GHz



Date: 13.JUL.2014 12:03:58

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.

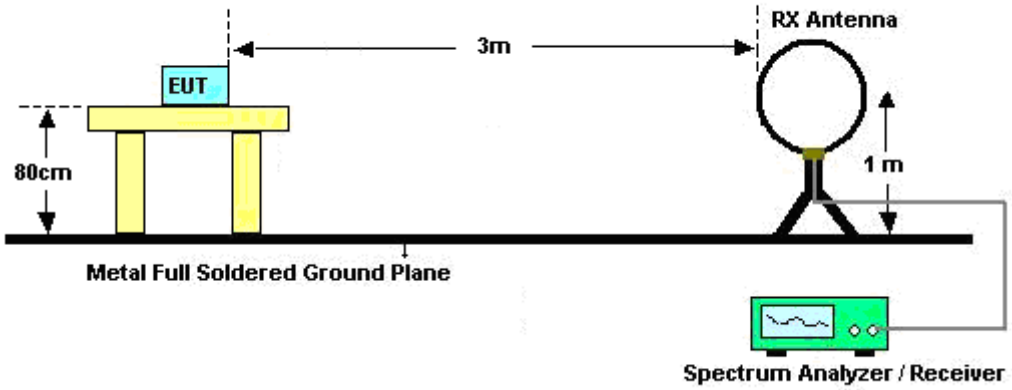
3.5.3 Test Procedure

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.

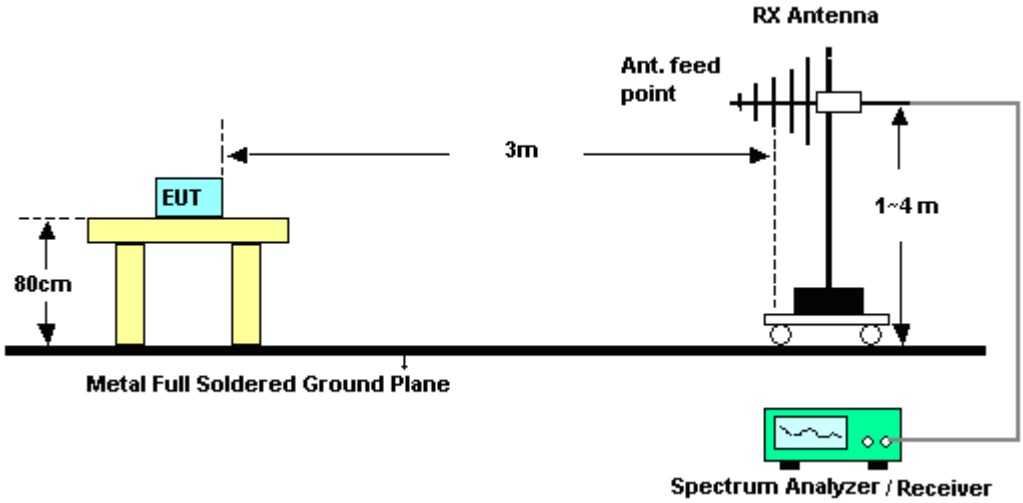
Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1	802.11b	95.41	12480	0.08	100Hz
2	802.11b	95.28	12432	0.08	100Hz
1	802.11g	95.05	2076	0.48	1kHz
2	802.11g	94.95	2070	0.48	1kHz
1+2	2.4GHz 802.11n HT20 for Ant. 1	95.24	1920	0.52	1kHz
1+2	2.4GHz 802.11n HT20 for Ant. 2	95.02	1910	0.52	

3.5.4 Test Setup

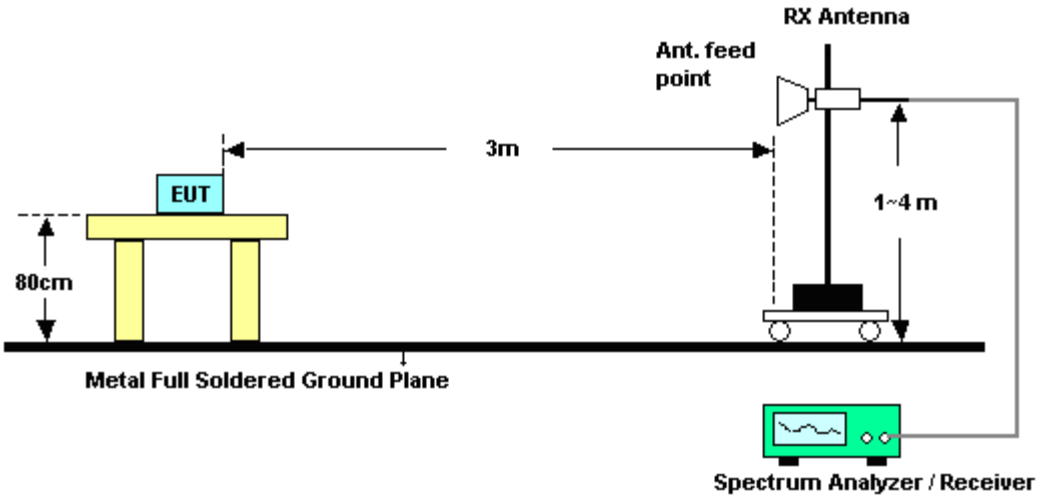
For radiated emissions below 30MHz



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

<Ant. 1>

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Band :	Low	**Relative Humidity :**	49~53%
Test Channel :	01	**Test Engineer :**	Stan Hsieh and Kai Wang

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	63.17	-10.83	74	58.38	32.18	6.91	34.3	200	51	Peak
2390	53.45	-0.55	54	48.66	32.18	6.91	34.3	200	51	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBμV/m)**	**Over Limit (dB)**	**Limit Line (dBμV/m)**	**Read Level (dBμV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2390	61.48	-12.52	74	56.57	32.3	6.91	34.3	109	96	Peak
2390	51.63	-2.37	54	46.72	32.3	6.91	34.3	109	96	Average

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Band :	High	**Relative Humidity :**	49~53%
Test Channel :	11	**Test Engineer :**	Stan Hsieh and Kai Wang

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	61.98	-12.02	74	56.97	32.38	7.06	34.43	211	46	Peak
2483.5	53.2	-0.8	54	48.19	32.38	7.06	34.43	211	46	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBμV/m)**	**Over Limit (dB)**	**Limit Line (dBμV/m)**	**Read Level (dBμV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2483.53	60.94	-13.06	74	55.93	32.38	7.06	34.43	100	99	Peak
2483.5	51.56	-2.44	54	46.55	32.38	7.06	34.43	100	99	Average

Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	Low	Relative Humidity :	49~53%
Test Channel :	01	Test Engineer :	Stan Hsieh and Kai Wang

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
2388.48	73.09	-0.91	74	68.27	32.18	6.91	34.27	200	50	Peak
2390	51.49	-2.51	54	46.7	32.18	6.91	34.3	200	50	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.03	73.04	-0.96	74	68.1	32.3	6.91	34.27	163	99	Peak
2390	49.69	-4.31	54	44.78	32.3	6.91	34.3	163	99	Average

Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	Low	Relative Humidity :	49~53%
Test Channel :	02	Test Engineer :	Stan Hsieh and Kai Wang

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	72.92	-1.08	74	68.13	32.18	6.91	34.3	186	60	Peak
2389.92	50.53	-3.47	54	45.74	32.18	6.91	34.3	186	60	Average
2422	103.06	-	-	98.24	32.22	6.95	34.35	186	60	Average
2422	113.66	-	-	108.84	32.22	6.95	34.35	186	60	Peak

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
2384.52	66.99	-7.01	74	62.07	32.28	6.91	34.27	104	119	Peak
2390.01	48.12	-5.88	54	43.21	32.3	6.91	34.3	104	119	Average
2424	100	-	-	95.18	32.22	6.95	34.35	104	119	Average
2424	109.84	-	-	105.02	32.22	6.95	34.35	104	119	Peak

Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	Low	Relative Humidity :	49~53%
Test Channel :	03	Test Engineer :	Stan Hsieh and Kai Wang

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	72.95	-1.05	74	68.13	32.18	6.91	34.27	154	74	Peak
2389.92	50.71	-3.29	54	45.92	32.18	6.91	34.3	154	74	Average
2424	104.97	-	-	100.15	32.22	6.95	34.35	154	74	Average
2424	114.81	-	-	109.99	32.22	6.95	34.35	154	74	Peak

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
2388.75	72.72	-1.28	74	67.78	32.3	6.91	34.27	102	69	Peak
2390.01	50.78	-3.22	54	45.87	32.3	6.91	34.3	102	69	Average
2418	102.96	-	-	98.16	32.2	6.95	34.35	102	69	Average
2418	113.46	-	-	108.66	32.2	6.95	34.35	102	69	Peak

Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	High	Relative Humidity :	49~53%
Test Channel :	9	Test Engineer :	Stan Hsieh and Kai Wang

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
2450	105.2	-	-	100.36	32.24	6.99	34.39	107	44	Average
2450	115.49	-	-	110.65	32.24	6.99	34.39	107	44	Peak
2484.94	73.38	-0.62	74	68.47	32.28	7.06	34.43	107	44	Peak
2484.76	49.96	-4.04	54	45.05	32.28	7.06	34.43	107	44	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
2452	99.08	-	-	94.24	32.24	6.99	34.39	100	71	Average
2452	109.72	-	-	104.88	32.24	6.99	34.39	100	71	Peak
2484.13	70.5	-3.5	74	65.49	32.38	7.06	34.43	100	71	Peak
2483.71	48.19	-5.81	54	43.18	32.38	7.06	34.43	100	71	Average

Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	High	Relative Humidity :	49~53%
Test Channel :	10	Test Engineer :	Stan Hsieh and Kai Wang

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
2462	100.74	-	-	95.85	32.26	7.02	34.39	200	49	Average
2462	111.46	-	-	106.57	32.26	7.02	34.39	200	49	Peak
2485.06	73.31	-0.69	74	68.4	32.28	7.06	34.43	200	49	Peak
2483.68	49.45	-4.55	54	44.54	32.28	7.06	34.43	200	49	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
2454	97.54	-	-	92.65	32.26	7.02	34.39	100	119	Average
2454	108.18	-	-	103.29	32.26	7.02	34.39	100	119	Peak
2483.92	73.41	-0.59	74	68.4	32.38	7.06	34.43	100	119	Peak
2483.5	49.87	-4.13	54	44.86	32.38	7.06	34.43	100	119	Average

Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	High	Relative Humidity :	49~53%
Test Channel :	11	Test Engineer :	Stan Hsieh and Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.58	73.24	-0.76	74	68.33	32.28	7.06	34.43	200	51	Peak
2483.5	49.77	-4.23	54	44.86	32.28	7.06	34.43	200	51	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2486.05	72.2	-1.8	74	67.19	32.38	7.06	34.43	131	100	Peak
2484.01	47.81	-6.19	54	42.8	32.38	7.06	34.43	131	100	Average

<Ant. 2>

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Band :	Low	**Relative Humidity :**	49~53%
Test Channel :	01	**Test Engineer :**	Stan Hsieh and Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBμV/m)**	**Over Limit (dB)**	**Limit Line (dBμV/m)**	**Read Level (dBμV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2389.11	58.97	-15.03	74	54.15	32.18	6.91	34.27	117	330	Peak
2390	48.87	-5.13	54	44.08	32.18	6.91	34.3	117	330	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**
2380.38	57.31	-16.69	74	52.51	32.16	6.91	34.27	100	144	Peak
2390	46.89	-7.11	54	42.1	32.18	6.91	34.3	100	144	Average

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Band :	High	**Relative Humidity :**	49~53%
Test Channel :	11	**Test Engineer :**	Stan Hsieh and Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBμV/m)**	**Over Limit (dB)**	**Limit Line (dBμV/m)**	**Read Level (dBμV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2488.75	57.5	-16.5	74	52.57	32.3	7.06	34.43	176	88	Peak
2483.89	44.39	-9.61	54	39.48	32.28	7.06	34.43	176	88	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**
2484.43	59.41	-14.59	74	54.5	32.28	7.06	34.43	130	100	Peak
2483.5	49.15	-4.85	54	44.24	32.28	7.06	34.43	130	100	Average

Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	Low	Relative Humidity :	49~53%
Test Channel :	01	Test Engineer :	Stan Hsieh and Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.11	73	-1	74	68.18	32.18	6.91	34.27	146	341	Peak
2390	52.33	-1.67	54	47.54	32.18	6.91	34.3	146	341	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2387.67	70.45	-3.55	74	65.63	32.18	6.91	34.27	103	143	Peak
2389.83	48.9	-5.1	54	44.11	32.18	6.91	34.3	103	143	Average

Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	Low	Relative Humidity :	49~53%
Test Channel :	02	Test Engineer :	Stan Hsieh and Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2387.94	73.17	-0.83	74	68.35	32.18	6.91	34.27	185	0	Peak
2390	51.91	-2.09	54	47.12	32.18	6.91	34.3	185	0	Average
2419	101	-	-	96.2	32.2	6.95	34.35	185	0	Average
2419	110.51	-	-	105.71	32.2	6.95	34.35	185	0	Peak

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	71.93	-2.07	74	67.14	32.18	6.91	34.3	102	138	Peak
2390	51.86	-2.14	54	47.07	32.18	6.91	34.3	102	138	Average
101.35	47.35	-	-	32.2	6.95	34.35	102	138	Average	101.35
110.96	36.96	-	-	32.2	6.95	34.35	102	138	Peak	110.96

Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	High	Relative Humidity :	49~53%
Test Channel :	10	Test Engineer :	Stan Hsieh and Kai Wang

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
2459	102.75	-	-	97.86	32.26	7.02	34.39	112	342	Average
2459	112.17	-	-	107.28	32.26	7.02	34.39	112	342	Peak
2484.61	73.49	-0.51	74	68.58	32.28	7.06	34.43	112	342	Peak
2483.74	52.27	-1.73	54	47.36	32.28	7.06	34.43	112	342	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
2456	103.46	-	-	98.57	32.26	7.02	34.39	102	106	Average
2456	112.96	-	-	108.07	32.26	7.02	34.39	102	106	Peak
2484.04	73.3	-0.7	74	68.39	32.28	7.06	34.43	102	106	Peak
2483.71	52.81	-1.19	54	47.9	32.28	7.06	34.43	102	106	Average

Test Mode :	802.11g	Temperature :	21~25°C
Test Band :	High	Relative Humidity :	49~53%
Test Channel :	11	Test Engineer :	Stan Hsieh and Kai Wang

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
2483.62	72.55	-1.45	74	67.54	32.38	7.06	34.43	141	48	Peak
2483.56	52.67	-1.33	54	47.66	32.38	7.06	34.43	141	48	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.59	72.83	-1.17	74	67.92	32.28	7.06	34.43	129	98	Peak
2483.53	51.96	-2.04	54	47.05	32.28	7.06	34.43	129	98	Average

<MIMO Ant. 1+2>

Test Mode :	802.11n HT20	**Temperature :**	21~25°C
Test Band :	Low	**Relative Humidity :**	49~53%
Test Channel :	01	**Test Engineer :**	Stan Hsieh and Kai Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2386.14	73.03	-0.97	74	68.21	32.18	6.91	34.27	113	47	Peak
2390	51.75	-2.25	54	46.96	32.18	6.91	34.3	113	47	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2389.65	73.01	-0.99	74	68.19	32.18	6.91	34.27	108	99	Peak
2390	52.02	-1.98	54	47.23	32.18	6.91	34.3	108	99	Average

Test Mode :	802.11n HT20	**Temperature :**	21~25°C
Test Band :	Low	**Relative Humidity :**	49~53%
Test Channel :	02	**Test Engineer :**	Stan Hsieh and Kai Wang

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**
2389.38	73.24	-0.76	74	68.42	32.18	6.91	34.27	111	45	Peak
2390	51.06	-2.94	54	46.27	32.18	6.91	34.3	111	45	Average
2419	103.06	-	-	98.26	32.2	6.95	34.35	111	45	Average
2419	112.25	-	-	107.45	32.2	6.95	34.35	111	45	Peak

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2389.56	68.27	-5.73	74	63.45	32.18	6.91	34.27	100	197	Peak
2389.74	47.74	-6.26	54	42.92	32.18	6.91	34.27	100	197	Average
2416	98.47	-	-	93.67	32.2	6.95	34.35	100	197	Average
2416	107.62	-	-	102.82	32.2	6.95	34.35	100	197	Peak

Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	Middle	Relative Humidity :	49~53%
Test Channel :	6	Test Engineer :	Stan Hsieh and Kai Wang

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
2382.18	72.72	-1.28	74	67.92	32.16	6.91	34.27	114	46	Peak
2382.81	53.48	-0.52	54	48.68	32.16	6.91	34.27	114	46	Average
2487.67	72.1	-1.9	74	67.17	32.3	7.06	34.43	114	46	Peak
2484.94	53.01	-0.99	54	48.1	32.28	7.06	34.43	114	46	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
2383.08	70.51	-3.49	74	65.71	32.16	6.91	34.27	108	95	Peak
2390	51.41	-2.59	54	46.62	32.18	6.91	34.3	108	95	Average
2487.82	70.35	-3.65	74	65.42	32.3	7.06	34.43	108	95	Peak
2483.59	52.31	-1.69	54	47.4	32.28	7.06	34.43	108	95	Average

Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	High	Relative Humidity :	49~53%
Test Channel :	10	Test Engineer :	Stan Hsieh and Kai Wang

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
2459	101.85	-	-	96.96	32.26	7.02	34.39	181	93	Average
2459	110.1	-	-	105.21	32.26	7.02	34.39	181	93	Peak
2487.67	73.09	-0.91	74	68.16	32.3	7.06	34.43	181	93	Peak
2483.59	49.87	-4.13	54	44.96	32.28	7.06	34.43	181	93	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
2459	103.78	-	-	98.89	32.26	7.02	34.39	102	119	Average
2462	112.97	-	-	108.08	32.26	7.02	34.39	102	119	Peak
2484.97	72.92	-1.08	74	68.01	32.28	7.06	34.43	102	119	Peak
2483.53	51.07	-2.93	54	46.16	32.28	7.06	34.43	102	119	Average

Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Band :	High	Relative Humidity :	49~53%
Test Channel :	11	Test Engineer :	Stan Hsieh and Kai Wang

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
2483.5	52.09	-1.91	54	47.18	32.28	7.06	34.43	111	27	Peak
2485.18	73.4	-0.6	74	68.49	32.28	7.06	34.43	111	27	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.57	73.37	-0.63	74	68.46	32.28	7.06	34.43	100	99	Peak
2485.24	50.48	-3.52	54	45.57	32.28	7.06	34.43	100	99	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.

<Ant. 1>

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Channel :	01	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**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. 3. No spurious emissions are detected other than listed points as below.		

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
49.98	23.95	-16.05	40	46.05	8.4	0.7	31.2	-	-	Peak
118.02	29.52	-13.98	43.5	48.26	11.29	1.09	31.12	-	-	Peak
238.98	34.89	-11.11	46	53.19	11.18	1.52	31	100	321	Peak
311.9	33.02	-12.98	46	48.91	13.32	1.79	31	-	-	Peak
703.2	27.95	-18.05	46	34.68	20.72	2.95	30.4	-	-	Peak
965	27.52	-26.48	54	29.63	24.75	3.48	30.34	-	-	Peak
2412	106.45	-	-	101.6	32.2	6.95	34.3	200	50	Average
2412	112.49	-	-	107.64	32.2	6.95	34.3	200	50	Peak
4824	45.59	-8.41	54	61.49	34.26	8.77	58.93	100	0	Peak

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Channel :	01	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**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. 3. No spurious emissions are detected other than listed points as below.		

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
60.24	23.23	-16.77	40	47.77	6	0.76	31.3	-	-	Peak
211.44	28.58	-14.92	43.5	49.09	9.21	1.37	31.09	142	225	Peak
280.29	23.08	-22.92	46	39.54	12.8	1.64	30.9	-	-	Peak
308.4	25.87	-20.13	46	41.8	13.28	1.79	31	-	-	Peak
552	23.39	-22.61	46	31.78	19.84	2.56	30.79	-	-	Peak
912.5	26.45	-19.55	46	29.76	23.64	3.37	30.32	-	-	Peak
2412	104.83	-	-	99.98	32.2	6.95	34.3	109	96	Average
2412	110.8	-	-	105.95	32.2	6.95	34.3	109	96	Peak
4824	44.23	-9.77	54	60.13	34.26	8.77	58.93	100	0	Peak

Test Mode :	802.11b	Temperature :	21~25°C
Test Channel :	06	Relative Humidity :	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	Polarization :	Horizontal
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

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
2440	106.53	-	-	101.65	32.24	6.99	34.35	115	138	Average
2440	112.37	-	-	107.49	32.24	6.99	34.35	115	138	Peak
4875	44.85	-9.15	54	60.56	34.3	8.82	58.83	100	0	Peak
7308	47.92	-6.08	54	59.14	35.6	10.91	57.73	100	0	Peak

Test Mode :	802.11b	Temperature :	21~25°C
Test Channel :	06	Relative Humidity :	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	Polarization :	Vertical
Remark :	1. 2438 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2438	104.28	-	-	99.4	32.24	6.99	34.35	132	98	Average
2438	110.37	-	-	105.49	32.24	6.99	34.35	132	98	Peak
4875	44.96	-9.04	54	60.67	34.3	8.82	58.83	100	0	Peak
7311	49.76	-4.24	54	60.98	35.6	10.91	57.73	100	0	Peak

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Channel :	11	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**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. 3. No spurious emissions are detected other than listed points as below.		

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	104.7	-	-	99.81	32.26	7.02	34.39	200	46	Average
2462	110.75	-	-	105.86	32.26	7.02	34.39	200	46	Peak
4926	44.4	-9.6	54	59.89	34.34	8.9	58.73	100	0	Peak
7386	47.16	-6.84	54	58.37	35.6	10.99	57.8	100	0	Peak

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Channel :	11	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**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. 3. No spurious emissions are detected other than listed points as below.		

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	102.64	-	-	97.75	32.26	7.02	34.39	100	99	Average
2462	108.75	-	-	103.86	32.26	7.02	34.39	100	99	Peak
4926	44.98	-9.02	54	60.47	34.34	8.9	58.73	100	0	Peak
7386	48.52	-5.48	54	59.73	35.6	10.99	57.8	100	0	Peak

Test Mode :	802.11g	Temperature :	21~25°C
Test Channel :	01	Relative Humidity :	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	Polarization :	Horizontal
Remark :	1. 2416 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

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
2416	101.72	-	-	96.92	32.2	6.95	34.35	200	50	Average
2416	112.4	-	-	107.6	32.2	6.95	34.35	200	50	Peak
4827	44.95	-9.05	54	60.85	34.26	8.77	58.93	100	0	Peak

Test Mode :	802.11g	Temperature :	21~25°C
Test Channel :	01	Relative Humidity :	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	Polarization :	Vertical
Remark :	1. 2416 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

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
2416	99.77	-	-	94.97	32.2	6.95	34.35	163	99	Average
2416	110.2	-	-	105.4	32.2	6.95	34.35	163	99	Peak
4821	43.49	-10.51	54	59.39	34.26	8.77	58.93	100	0	Peak

Test Mode :	802.11g	**Temperature :**	21~25°C
Test Channel :	06	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Horizontal
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. No spurious emissions are detected other than listed points as below.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	106.35	-	-	101.49	32.22	6.99	34.35	200	49	Average
2436	115.59	-	-	110.73	32.22	6.99	34.35	200	49	Peak
4875	42.92	-11.08	54	58.63	34.3	8.82	58.83	107	142	Average
4875	60.87	-13.13	74	76.58	34.3	8.82	58.83	107	142	Peak
7311	42.53	-11.47	54	53.75	35.6	10.91	57.73	100	4	Average
7311	57.76	-16.24	74	68.98	35.6	10.91	57.73	100	4	Peak
12186	38.04	-15.96	54	39.98	39.05	14.86	55.85	150	38	Average
12186	52.33	-21.67	74	54.27	39.05	14.86	55.85	150	38	Peak

Test Mode :	802.11g	**Temperature :**	21~25°C
Test Channel :	06	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Vertical
Remark :	1. 2438 MHz is fundamental signal which can be ignored. 2. No spurious emissions are detected other than listed points as below.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2438	104.63	-	-	99.75	32.24	6.99	34.35	133	100	Average
2438	114.48	-	-	109.6	32.24	6.99	34.35	133	100	Peak
4878	42.48	-11.52	54	58.16	34.3	8.85	58.83	101	90	Average
4878	60.35	-13.65	74	76.03	34.3	8.85	58.83	101	90	Peak
7311	49.32	-4.68	54	60.54	35.6	10.91	57.73	100	356	Average
7311	64.8	-9.2	74	76.02	35.6	10.91	57.73	100	356	Peak
12186	47.31	-6.69	54	49.25	39.05	14.86	55.85	161	13	Average
12186	64.25	-9.75	74	66.19	39.05	14.86	55.85	161	13	Peak

Test Mode :	802.11g	**Temperature :**	21~25°C
Test Channel :	11	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Horizontal
Remark :	1. 2466 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

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
2466	99.15	-	-	94.26	32.26	7.02	34.39	200	51	Average
2466	108.93	-	-	104.04	32.26	7.02	34.39	200	51	Peak
4923	42.06	-11.94	54	57.58	34.34	8.87	58.73	100	0	Peak
7386	49.07	-4.93	54	60.28	35.6	10.99	57.8	100	0	Peak

Test Mode :	802.11g	**Temperature :**	21~25°C
Test Channel :	11	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Vertical
Remark :	1. 2460 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

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
2460	96.98	-	-	92.09	32.26	7.02	34.39	131	100	Average
2460	107.18	-	-	102.29	32.26	7.02	34.39	131	100	Peak
4923	42.96	-11.04	54	58.48	34.34	8.87	58.73	100	0	Peak
7386	33.2	-20.8	54	44.41	35.6	10.99	57.8	100	356	Average
7386	53.24	-20.76	74	64.45	35.6	10.99	57.8	100	356	Peak

<Ant. 2>

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Channel :	01	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**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. 3. No spurious emissions are detected other than listed points as below.		

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	104.88	-	-	100.03	32.2	6.95	34.3	117	330	Average
2412	108.34	-	-	103.49	32.2	6.95	34.3	117	330	Peak
4824	43.97	-10.03	54	59.87	34.26	8.77	58.93	100	0	Peak

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Channel :	01	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**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. 3. No spurious emissions are detected other than listed points as below.		

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	101.31	-	-	96.46	32.2	6.95	34.3	100	144	Average
2412	104.95	-	-	100.1	32.2	6.95	34.3	100	144	Peak
4824	44.99	-9.01	54	60.89	34.26	8.77	58.93	100	0	Peak

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Channel :	06	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**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. 3. No spurious emissions are detected other than listed points as below.		

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	105.09	-	-	100.21	32.24	6.99	34.35	115	347	Average
2437	108.69	-	-	103.81	32.24	6.99	34.35	115	347	Peak
4875	45.64	-8.36	54	61.35	34.3	8.82	58.83	100	0	Peak
7311	48.94	-5.06	54	60.16	35.6	10.91	57.73	100	0	Peak

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Channel :	06	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Vertical
Remark :	1. 2438 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2438	103.53	-	-	98.65	32.24	6.99	34.35	100	143	Average
2438	106.68	-	-	101.8	32.24	6.99	34.35	100	143	Peak
4875	47.28	-6.72	54	62.99	34.3	8.82	58.83	100	0	Peak
7311	49.97	-4.03	54	61.19	35.6	10.91	57.73	100	356	Average
7311	54.97	-19.03	74	66.19	35.6	10.91	57.73	100	356	Peak

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Channel :	11	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**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. 3. No spurious emissions are detected other than listed points as below.		

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	104.89	-	-	100	32.26	7.02	34.39	176	88	Average
2462	101.18	-	-	96.29	32.26	7.02	34.39	176	88	Peak
4926	45.78	-8.22	54	61.27	34.34	8.9	58.73	100	0	Peak
7383	48.43	-5.57	54	59.63	35.6	10.99	57.79	100	0	Peak

Test Mode :	802.11b	**Temperature :**	21~25°C
Test Channel :	11	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**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. 3. No spurious emissions are detected other than listed points as below.		

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	104.89	-	-	100	32.26	7.02	34.39	130	100	Average
2462	108.75	-	-	103.86	32.26	7.02	34.39	130	100	Peak
4926	48.5	-5.5	54	63.99	34.34	8.9	58.73	100	0	Peak
7386	46.9	-7.1	54	58.11	35.6	10.99	57.8	100	357	Average
7386	52.99	-21.01	74	64.2	35.6	10.99	57.8	100	357	Peak

Test Mode :	802.11g	**Temperature :**	21~25°C
Test Channel :	01	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Horizontal
Remark :	1. 2414 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

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
49.44	24.63	-15.37	40	46.39	8.75	0.69	31.2	-	-	Peak
130.71	32.45	-11.05	43.5	50.5	11.9	1.15	31.1	100	21	Peak
230.61	34.09	-11.91	46	53.38	10.22	1.49	31	-	-	Peak
314.7	32.42	-13.58	46	48.27	13.35	1.8	31	-	-	Peak
703.2	27.81	-18.19	46	34.54	20.72	2.95	30.4	-	-	Peak
995.8	30.43	-23.57	54	32.46	24.68	3.51	30.22	-	-	Peak
2414	100.61	-	-	95.76	32.2	6.95	34.3	146	341	Average
2414	109.99	-	-	105.14	32.2	6.95	34.3	146	341	Peak
4824	41.4	-12.6	54	57.3	34.26	8.77	58.93	100	0	Peak

Test Mode :	802.11g	**Temperature :**	21~25°C
Test Channel :	01	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**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. 3. No spurious emissions are detected other than listed points as below.		

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
49.44	28.41	-11.59	40	50.17	8.75	0.69	31.2	125	89	Peak
209.82	30.07	-13.43	43.5	50.62	9.19	1.36	31.1	-	-	Peak
292.71	26.29	-19.71	46	42.52	13.13	1.71	31.07	-	-	Peak
314	28.96	-17.04	46	44.82	13.34	1.8	31	-	-	Peak
552	24.25	-21.75	46	32.64	19.84	2.56	30.79	-	-	Peak
997.2	33.34	-20.66	54	35.38	24.66	3.51	30.21	-	-	Peak
2412	96.84	-	-	91.99	32.2	6.95	34.3	103	143	Average
2412	107.12	-	-	102.27	32.2	6.95	34.3	103	143	Peak
4824	45.22	-8.78	54	61.12	34.26	8.77	58.93	100	0	Peak

Test Mode :	802.11g	**Temperature :**	21~25°C
Test Channel :	06	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Horizontal
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. No spurious emissions are detected other than listed points as below.		

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
2440	104.03	-	-	99.15	32.24	6.99	34.35	115	346	Average
2440	113.57	-	-	108.69	32.24	6.99	34.35	115	346	Peak
4872	49.17	-24.83	74	64.88	34.3	8.82	58.83	100	0	Peak
7311	42.3	-11.7	54	53.52	35.6	10.91	57.73	129	54	Average
7311	57.68	-16.32	74	68.9	35.6	10.91	57.73	129	54	Peak
12183	37.91	-16.09	54	39.85	39.05	14.86	55.85	100	338	Average
12183	53.07	-20.93	74	55.01	39.05	14.86	55.85	100	338	Peak

Test Mode :	802.11g	**Temperature :**	21~25°C
Test Channel :	06	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Vertical
Remark :	1. 2442 MHz is fundamental signal which can be ignored. 2. No spurious emissions are detected other than listed points as below.		

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
2442	103.08	-	-	98.24	32.24	6.99	34.39	106	96	Average
2442	112.5	-	-	107.66	32.24	6.99	34.39	106	96	Peak
4881	36.77	-17.23	54	52.45	34.3	8.85	58.83	101	111	Average
4881	53.94	-20.06	74	69.62	34.3	8.85	58.83	101	111	Peak
7314	47.09	-6.91	54	58.31	35.6	10.91	57.73	100	42	Average
7314	62.91	-11.09	74	74.13	35.6	10.91	57.73	100	42	Peak
12183	41.78	-12.22	54	43.72	39.05	14.86	55.85	153	47	Average
12183	57.64	-16.36	74	59.58	39.05	14.86	55.85	153	47	Peak

Test Mode :	802.11g	**Temperature :**	21~25°C
Test Channel :	11	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Horizontal
Remark :	1. 2460 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

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
2460	97.1	-	-	92.21	32.26	7.02	34.39	141	48	Average
2460	106.66	-	-	101.77	32.26	7.02	34.39	141	48	Peak
4923	42.55	-11.45	54	58.07	34.34	8.87	58.73	100	0	Peak
7386	43.4	-10.6	54	54.61	35.6	10.99	57.8	100	0	Peak

Test Mode :	802.11g	**Temperature :**	21~25°C
Test Channel :	11	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Vertical
Remark :	1. 2460 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

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
2460	99.46	-	-	94.57	32.26	7.02	34.39	129	98	Average
2460	108.76	-	-	103.87	32.26	7.02	34.39	129	98	Peak
4923	44.13	-9.87	54	59.65	34.34	8.87	58.73	100	0	Peak
7383	38.32	-15.68	54	49.52	35.6	10.99	57.79	100	357	Average
7383	53.68	-20.32	74	64.88	35.6	10.99	57.79	100	357	Peak

<MIMO Ant. 1+2>

Test Mode :	802.11n HT20	**Temperature :**	21~25°C
Test Channel :	01	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Horizontal
Remark :	1. 2410 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2410	101.16	-	-	96.31	32.2	6.95	34.3	113	47	Average
2410	110.15	-	-	105.3	32.2	6.95	34.3	113	47	Peak
4923	43.16	-10.84	54	58.68	34.34	8.87	58.73	100	0	Peak

Test Mode :	802.11n HT20	**Temperature :**	21~25°C
Test Channel :	01	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Vertical
Remark :	1. 2414 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

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
2414	99.65	-	-	94.8	32.2	6.95	34.3	108	99	Average
2414	108.54	-	-	103.69	32.2	6.95	34.3	108	99	Peak
4923	45.17	-8.83	54	60.69	34.34	8.87	58.73	100	0	Peak

Test Mode :	802.11n HT20	**Temperature :**	21~25°C
Test Channel :	06	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Horizontal
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

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
49.98	26.41	-13.59	40	48.51	8.4	0.7	31.2	-	-	Peak
130.44	32.34	-11.16	43.5	50.39	11.9	1.15	31.1	100	99	Peak
138.81	30.95	-12.55	43.5	49.35	11.5	1.2	31.1	-	-	Peak
311.9	33.32	-12.68	46	49.21	13.32	1.79	31	-	-	Peak
421.8	26.66	-19.34	46	38.49	16.74	2.22	30.79	-	-	Peak
666.1	29.89	-16.11	46	37.13	20.36	2.87	30.47	-	-	Peak
2436	107.09	-	-	102.23	32.22	6.99	34.35	114	46	Average
2436	116.56	-	-	111.7	32.22	6.99	34.35	114	46	Peak
4875	45.11	-8.89	54	60.82	34.3	8.82	58.83	100	0	Peak
7311	42.5	-11.5	54	53.72	35.6	10.91	57.73	105	19	Average
7311	55.02	-18.98	74	66.24	35.6	10.91	57.73	105	19	Peak

Test Mode :	802.11n HT20	**Temperature :**	21~25°C
Test Channel :	06	**Relative Humidity :**	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	**Polarization :**	Vertical
Remark :	1. 2439 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.35	27.87	-12.13	40	40.47	18.28	0.54	31.42	-	-	Peak
49.71	30.16	-9.84	40	51.92	8.75	0.69	31.2	166	221	Peak
139.08	29.03	-14.47	43.5	47.43	11.5	1.2	31.1	-	-	Peak
313.3	28.2	-17.8	46	44.07	13.33	1.8	31	-	-	Peak
624.1	24.78	-21.22	46	32.3	20.27	2.76	30.55	-	-	Peak
864.2	28.73	-17.27	46	32.69	23.12	3.29	30.37	-	-	Peak
2439	106.08	-	-	101.2	32.24	6.99	34.35	108	95	Average
2439	114.82	-	-	109.94	32.24	6.99	34.35	108	95	Peak
4881	50.5	-3.5	54	66.18	34.3	8.85	58.83	100	0	Peak
7314	49.39	-4.61	54	60.61	35.6	10.91	57.73	100	357	Average
7314	62.38	-11.62	74	73.6	35.6	10.91	57.73	100	357	Peak

Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Channel :	11	Relative Humidity :	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	Polarization :	Horizontal
Remark :	1. 2464 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit. 3. No spurious emissions are detected other than listed points as below.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2464	101.12	-	-	96.23	32.26	7.02	34.39	111	27	Average
2464	110.26	-	-	105.37	32.26	7.02	34.39	111	27	Peak
4923	43.5	-10.5	54	59.02	34.34	8.87	58.73	100	0	Peak
7386	48.53	-5.47	54	59.74	35.6	10.99	57.8	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	21~25°C
Test Channel :	11	Relative Humidity :	49~53%
Test Engineer :	Stan Hsieh and Kai Wang	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. 3. No spurious emissions are detected other than listed points as below.		

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	100.9	-	-	96.01	32.26	7.02	34.39	100	99	Average
2462	109.74	-	-	104.85	32.26	7.02	34.39	100	99	Peak
4923	44.22	-9.78	54	59.74	34.34	8.87	58.73	100	0	Peak
7386	38.6	-15.4	54	49.81	35.6	10.99	57.8	100	357	Average
7386	53.92	-20.08	74	65.13	35.6	10.99	57.8	100	357	Peak

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

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

*Decreases with the logarithm of the frequency.

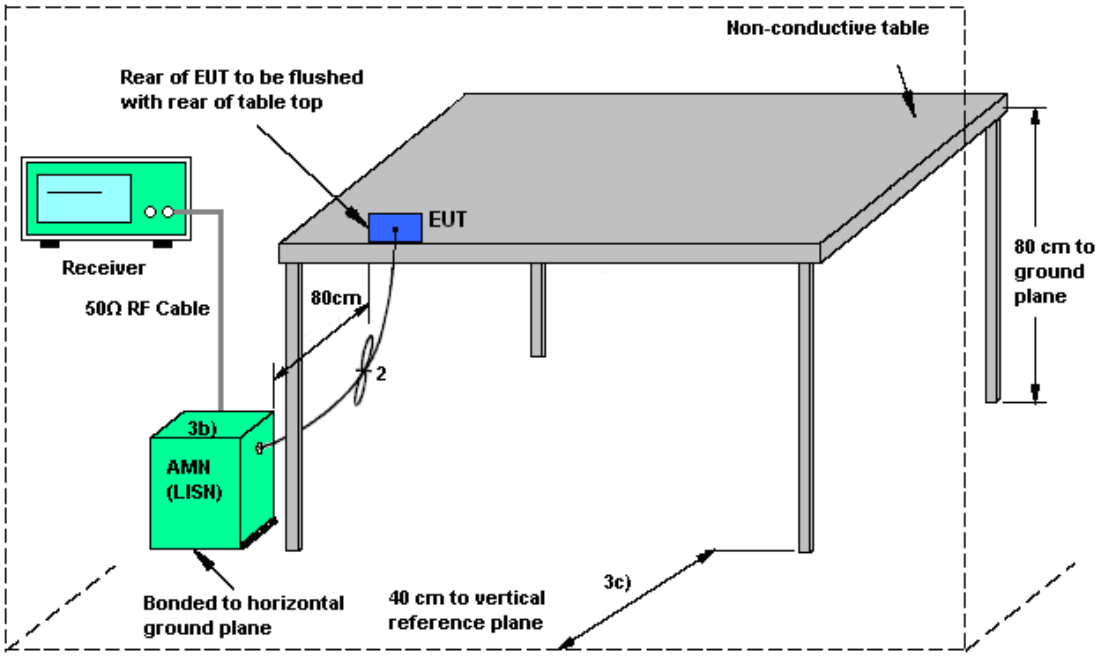
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

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

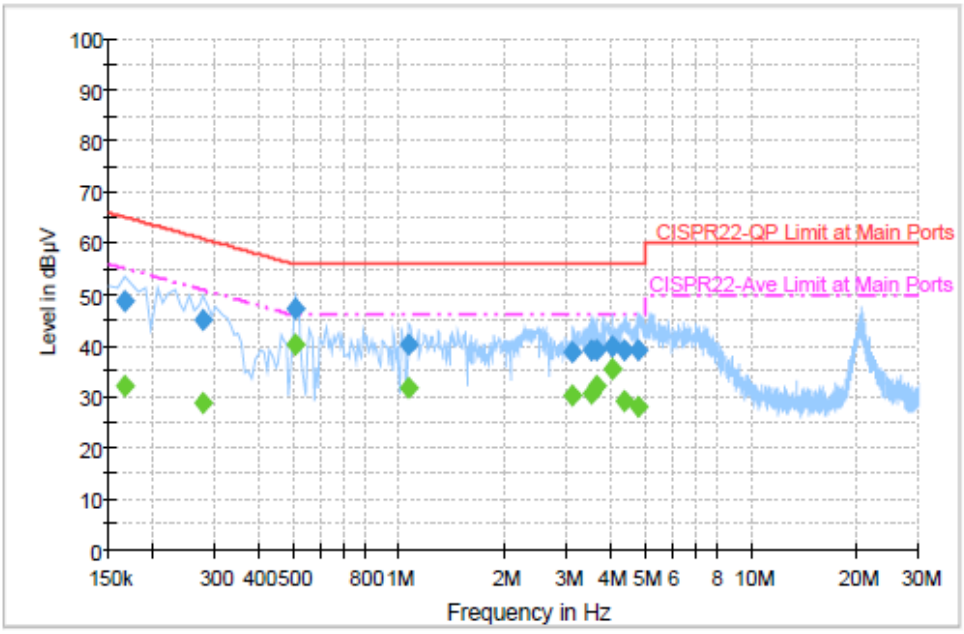
3.6.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

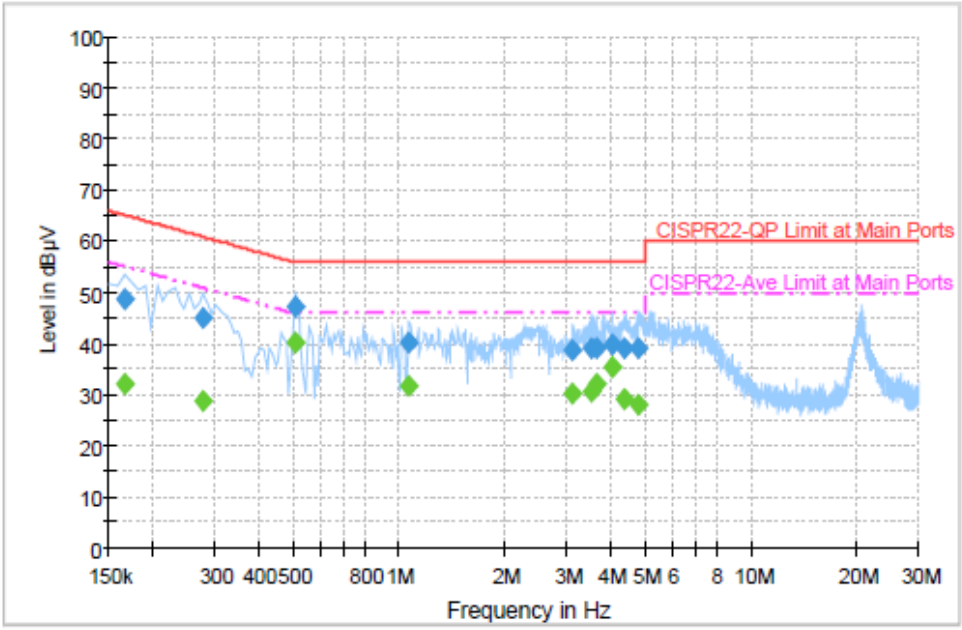
Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Cosmo Xu	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + MPEG4 + Buttercup + USB Cable (Charging from Adapter)		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	48.6	Off	L1	19.3	16.6	65.2
0.278000	44.9	Off	L1	19.4	16.0	60.9
0.510000	47.2	Off	L1	19.4	8.8	56.0
1.070000	40.4	Off	L1	19.5	15.6	56.0
3.118000	38.7	Off	L1	19.6	17.3	56.0
3.510000	39.1	Off	L1	19.6	16.9	56.0
3.638000	38.9	Off	L1	19.5	17.1	56.0
4.030000	39.7	Off	L1	19.6	16.3	56.0
4.350000	39.0	Off	L1	19.6	17.0	56.0
4.814000	39.2	Off	L1	19.6	16.8	56.0

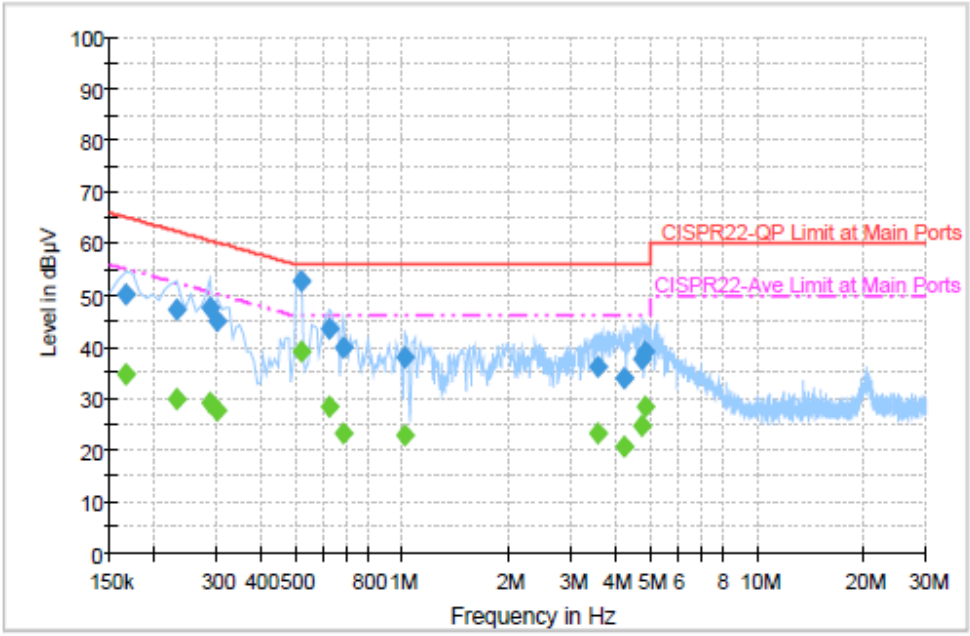
Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Cosmo Xu	**Relative Humidity :**	45~47%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + MPEG4 + Buttercup + USB Cable (Charging from Adapter)		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	32.0	Off	L1	19.3	23.2	55.2
0.278000	28.7	Off	L1	19.4	22.2	50.9
0.510000	40.1	Off	L1	19.4	5.9	46.0
1.070000	31.7	Off	L1	19.5	14.3	46.0
3.118000	30.4	Off	L1	19.6	15.6	46.0
3.510000	30.7	Off	L1	19.6	15.3	46.0
3.638000	32.2	Off	L1	19.5	13.8	46.0
4.030000	35.4	Off	L1	19.6	10.6	46.0
4.350000	29.1	Off	L1	19.6	16.9	46.0
4.814000	28.0	Off	L1	19.6	18.0	46.0

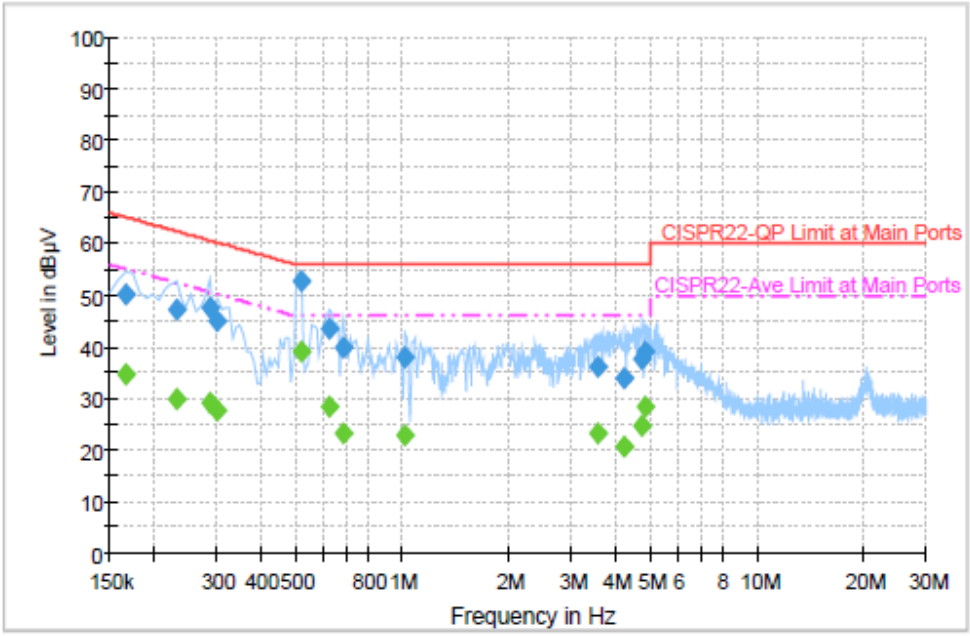
Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Cosmo Xu	**Relative Humidity :**	45~47%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + MPEG4 + Buttercup + USB Cable (Charging from Adapter)		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	50.1	Off	N	19.3	15.1	65.2
0.230000	47.1	Off	N	19.4	15.3	62.4
0.286000	47.8	Off	N	19.3	12.8	60.6
0.302000	45.0	Off	N	19.3	15.2	60.2
0.518000	52.8	Off	N	19.4	3.2	56.0
0.622000	43.5	Off	N	19.4	12.5	56.0
0.686000	39.7	Off	N	19.5	16.3	56.0
1.014000	38.2	Off	N	19.5	17.8	56.0
3.558000	36.2	Off	N	19.6	19.8	56.0
4.246000	33.8	Off	N	19.6	22.2	56.0
4.758000	37.5	Off	N	19.6	18.5	56.0
4.846000	39.0	Off	N	19.6	17.0	56.0

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Cosmo Xu	**Relative Humidity :**	45~47%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	Bluetooth Link + WLAN (2.4GHz) Link + MPEG4 + Buttercup + USB Cable (Charging from Adapter)		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	34.5	Off	N	19.3	20.7	55.2
0.230000	30.0	Off	N	19.4	22.4	52.4
0.286000	29.1	Off	N	19.3	21.5	50.6
0.302000	27.8	Off	N	19.3	22.4	50.2
0.518000	39.2	Off	N	19.4	6.8	46.0
0.622000	28.4	Off	N	19.4	17.6	46.0
0.686000	23.3	Off	N	19.5	22.7	46.0
1.014000	22.9	Off	N	19.5	23.1	46.0
3.558000	23.3	Off	N	19.6	22.7	46.0
4.246000	20.8	Off	N	19.6	25.2	46.0
4.758000	24.6	Off	N	19.6	21.4	46.0
4.846000	28.4	Off	N	19.6	17.6	46.0

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the Antenna exceeds 6 dBi. The use of a permanently attached Antenna or of an Antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

For CDD and beamforming transmissions, directional gain is calculated as

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

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 and beamforming.

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

The directional gain “DG” is calculated as following table.

			DG	DG	Power	PSD
			for	for	Limit	Limit
	Ant. 1	Ant. 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
2.4 GHz	3.90	-0.20	5.10	5.10	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	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 09, 2014	Jul. 12, 2014~ Jul. 13, 2014	Jun. 08, 2015	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Aug. 17, 2013	Jul. 12, 2014~ Jul. 13, 2014	Aug. 16, 2014	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 17, 2013	Jul. 12, 2014~ Jul. 13, 2014	Aug. 16, 2014	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9 kHz~7 GHz	Sep. 06, 2013	Jul. 09, 2014~ Jul. 16, 2014	Sep. 05, 2014	Radiation (03CH07-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV30	101749	10Hz ~ 30GHz	Feb. 10, 2014	Jul. 09, 2014~ Jul. 16, 2014	Feb. 09, 2015	Radiation (03CH07-HY)
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Dec. 02, 2012	Jul. 09, 2014~ Jul. 16, 2014	Dec. 03, 2014	Radiation (03CH07-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30 MHz ~ 1 GHz	Oct. 10, 2013	Jul. 09, 2014~ Jul. 16, 2014	Oct. 09, 2014	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1 GHz~18 GHz	Aug. 22, 2013	Jul. 09, 2014~ Jul. 16, 2014	Aug. 21, 2014	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15 GHz- 40 GHz	Oct. 03, 2013	Jul. 09, 2014~ Jul. 16, 2014	Oct. 02, 2014	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10 MHz ~ 1000MHz 32dB GAIN	Mar. 17, 2014	Jul. 09, 2014~ Jul. 16, 2014	Mar. 16, 2015	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1 GHz~26.5 GHz	Nov. 29, 2013	Jul. 09, 2014~ Jul. 16, 2014	Nov. 28, 2014	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590074	DC~18 G High Gain	Jul. 07, 2014	Jul. 09, 2014~ Jul. 16, 2014	Jul. 06, 2015	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	Jul. 09, 2014~ Jul. 16, 2014	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	ChainTek 3000	N/A	N/A	N/A	Jul. 09, 2014~ Jul. 16, 2014	N/A	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 15, 2013	Jul. 08, 2014	Nov. 14, 2014	Conduction (CO05-HY)
LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2013	Jul. 08, 2014	Dec. 11, 2014	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 04, 2013	Jul. 08, 2014	Dec. 03, 2014	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 08, 2014	N/A	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.26**

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

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