

# FCC RF Test Report

APPLICANT : Ubiquiti Networks  
EQUIPMENT : mFi Inwall Outlet  
BRAND NAME : Ubiquiti Networks  
MODEL NAME : mFi-MPW  
FCC ID : SWX-MFIMPW  
STANDARD : FCC Part 15 Subpart C §15.247  
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on May 28, 2013 and completely tested on Jun. 22, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the 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.

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FCC ID : SWX-MFIMPW

Page Number : 1 of 66

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**APPENDIX A. SETUP PHOTOGRAPHS**



### SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	RSS-210 A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	RSS-Gen 4.6.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)	RSS-210 A8.4	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	RSS-210 A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	RSS-210 A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	RSS-210 A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 6.82 dB at 2389.920 MHz
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 7.20 dB at 3.750 MHz
3.7	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-



# 1 General Description

## 1.1 Applicant

Ubiquiti Networks

2580 Orchard Parkway San Jose, CA 95131

## 1.2 Manufacturer

Nanning FuGui Precision Industrial Co., LTD.

No. 18, Zhongbu Road, Nanning New& High-Tech Industrial Development Zone, Guangxi

## 1.3 Feature of Equipment Under Test

Product Feature	
Equipment	mFi Inwall Outlet
Brand Name	Ubiquiti Networks
Model Name	mFi-MPW
FCC ID	SWX-MFIMPW
EUT supports Radios application	WLAN 11bgn
EUT Stage	Production Unit

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



### 1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
<b>Tx/Rx Channel Frequency Range</b>	802.11b/g/n : 2412 MHz ~ 2462 MHz
<b>Maximum Output Power to Antenna</b>	802.11b : 20.56 dBm (0.1138 W) 802.11g : 21.91 dBm (0.1552 W) 802.11n HT20 : 22.78 dBm (0.1897 W) 802.11n HT40 : 21.84 dBm (0.1528 W)
<b>99% Occupied Bandwidth</b>	802.11b : 14.35MHz 802.11g : 18.65MHz 802.11n HT20 : 19.30MHz 802.11n HT40 : 37.60MHz
<b>Antenna Type</b>	802.11b/g/n : PCB Antenna type with gain 2.22 dBi
<b>Type of Modulation</b>	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

### 1.5 Modification of EUT

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

## 1.6 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL INC.			
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978			
<b>Test Site No.</b>	<b>Sporton Site No.</b>			<b>FCC/IC Registration No.</b>
	TH02-HY	CO05-HY	03CH06-HY	722060/4086B-1

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

## 1.7 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
- ♦ ANSI C63.10-2009

**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).

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

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

### 2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		



## 2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and the highest data rates of peak power were chosen for full test shown in the following tables.

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	20.56	20.54	20.49	20.48

2.4GHz 802.11g mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	21.91	21.83	21.86	21.83	21.90	21.86	21.89	21.87

2.4GHz 802.11n HT20 mode									
Data Rate (MHz)		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	400GI	21.33	21.23	21.27	21.31	21.25	22.62	22.65	22.69
	800GI	21.42	21.32	21.36	21.40	21.34	22.71	22.74	22.78

2.4GHz 802.11n HT40 mode									
Data Rate (MHz)		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	400GI	20.66	20.48	20.63	20.56	20.64	21.59	21.66	21.71
	800GI	20.79	20.61	20.76	20.69	20.77	21.72	21.79	21.84



### 2.3 Test Mode

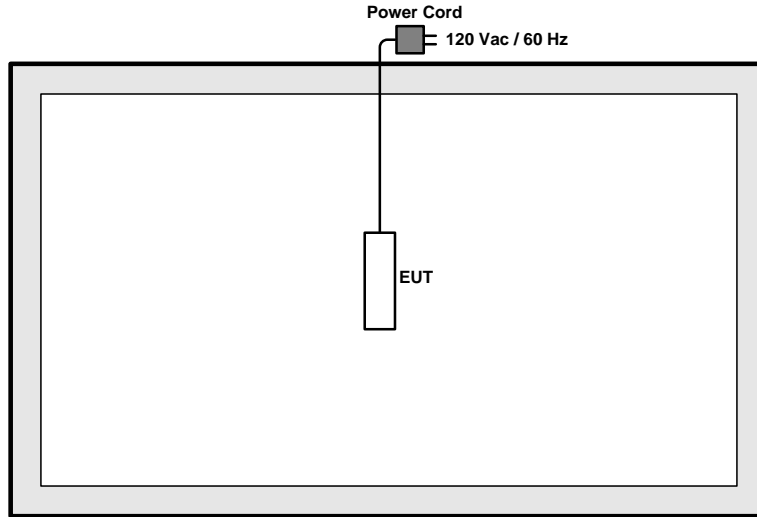
Final results of test modes, data rates and test channels are shown as following table.

<2.4GHz>

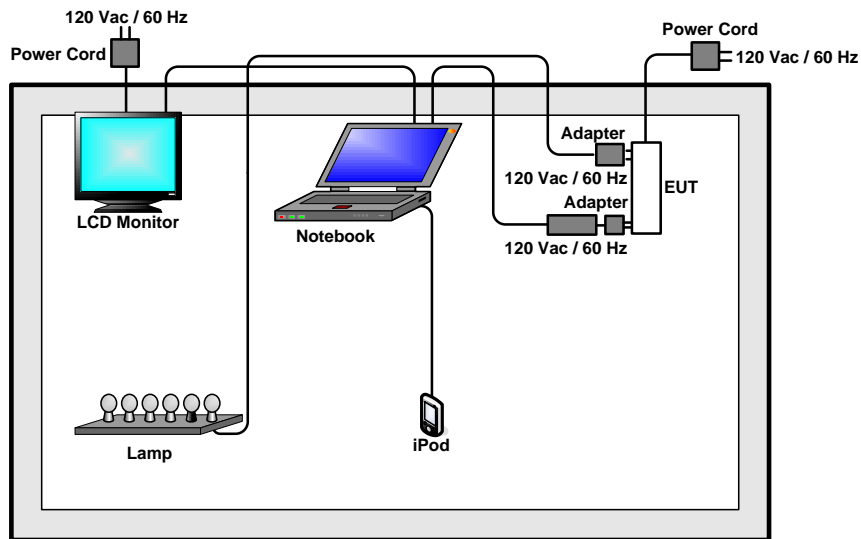
Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB and 99% BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
		802.11n HT40	13.5 Mbps	3/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
Radiated TCs	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
		802.11n HT40	13.5 Mbps	3/9
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
AC Conducted Emission	Mode 1 : WLAN Link + Notebook + Lamp			

## 2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



## 2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
2.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
3.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A
4.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Lamp	N/A	N/A	N/A	N/A	Unshielded, 1.8 m

## 2.6 Description of RF Function Operation Test Setup

For WLAN function, programmed RF utility, "ADB" installed in the notebook make the EUT provides 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.

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

### 3 Test Result

#### 3.1 6dB and 99% Bandwidth Measurement

##### 3.1.1 Limit of 6dB and 99% Bandwidth

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

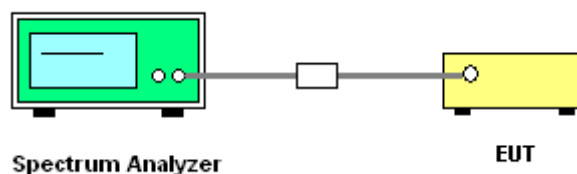
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

##### 3.1.4 Test Setup

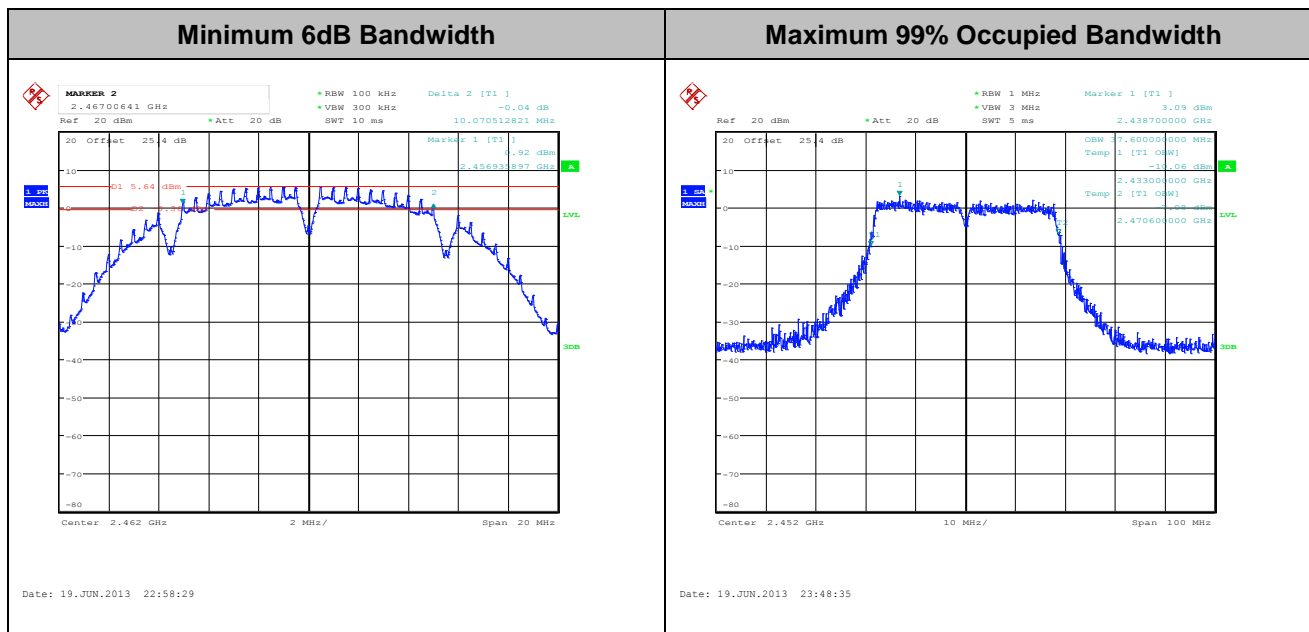




3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Test Band :	2.4GHz	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	99% Bandwidth (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	14.35	10.09	0.5	Pass
11b	1Mbps	1	6	2437	14.35	10.09	0.5	Pass
11b	1Mbps	1	11	2462	14.35	10.07	0.5	Pass
11g	6Mbps	1	1	2412	18.50	16.33	0.5	Pass
11g	6Mbps	1	6	2437	18.65	16.33	0.5	Pass
11g	6Mbps	1	11	2462	18.50	16.33	0.5	Pass
HT20	MCS7	1	1	2412	19.10	17.67	0.5	Pass
HT20	MCS7	1	6	2437	19.30	17.76	0.5	Pass
HT20	MCS7	1	11	2462	19.15	17.72	0.5	Pass
HT40	MCS7	1	3	2422	37.50	36.45	0.5	Pass
HT40	MCS7	1	6	2437	37.50	36.45	0.5	Pass
HT40	MCS7	1	9	2452	37.60	36.47	0.5	Pass



## 3.2 Output Power Measurement

### 3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting Antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the Antenna exceeds 6dBi.

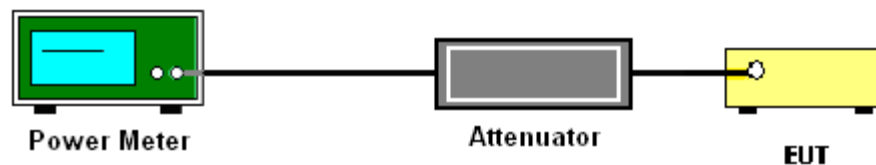
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r01.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

### 3.2.4 Test Setup







3.2.5 Test Result of Peak Output Power

Test Mode :	2.4GHz	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	RF Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	20.03	30	3.06	Pass
11b	1Mbps	1	6	2437	20.12	30	3.06	Pass
11b	1Mbps	1	11	2462	20.56	30	3.06	Pass
11g	6Mbps	1	1	2412	21.88	30	3.06	Pass
11g	6Mbps	1	6	2437	21.91	30	3.06	Pass
11g	6Mbps	1	11	2462	21.33	30	3.06	Pass
HT20	MCS7	1	1	2412	22.78	30	3.06	Pass
HT20	MCS7	1	6	2437	22.01	30	3.06	Pass
HT20	MCS7	1	11	2462	20.03	30	3.06	Pass
HT40	MCS7	1	3	2422	21.74	30	3.06	Pass
HT40	MCS7	1	6	2437	21.84	30	3.06	Pass
HT40	MCS7	1	9	2452	21.28	30	3.06	Pass

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



## 3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	2.4GHz	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	Duty Factor (dB)	Average Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	0	17.86	30	3.06	Pass
11b	1Mbps	1	6	2437	0	17.86	30	3.06	Pass
11b	1Mbps	1	11	2462	0	17.91	30	3.06	Pass
11g	6Mbps	1	1	2412	0.04	13.93	30	3.06	Pass
11g	6Mbps	1	6	2437	0.04	14.20	30	3.06	Pass
11g	6Mbps	1	11	2462	0.04	13.99	30	3.06	Pass
HT20	MCS7	1	1	2412	0.37	13.02	30	3.06	Pass
HT20	MCS7	1	6	2437	0.37	12.81	30	3.06	Pass
HT20	MCS7	1	11	2462	0.37	12.76	30	3.06	Pass
HT40	MCS7	1	3	2422	0.56	11.69	30	3.06	Pass
HT40	MCS7	1	6	2437	0.56	12.08	30	3.06	Pass
HT40	MCS7	1	9	2452	0.56	11.79	30	3.06	Pass

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

### 3.3 Power Spectral Density Measurement

#### 3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

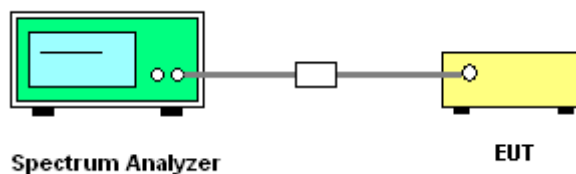
#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

#### 3.3.4 Test Setup



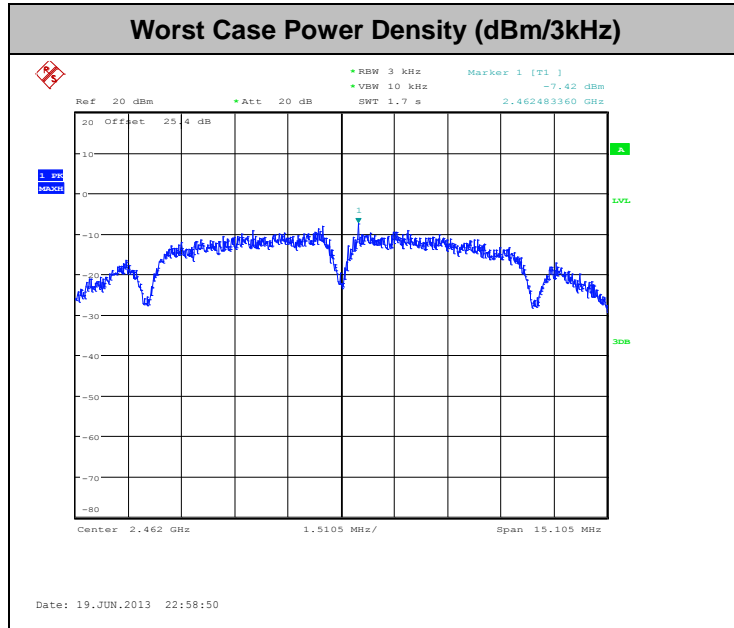


3.3.5 Test Result of Power Spectral Density

Test Mode :	2.4GHz	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)	Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	-8.38	8	3.06	Pass
11b	1Mbps	1	6	2437	-7.76	8	3.06	Pass
11b	1Mbps	1	11	2462	-7.42	8	3.06	Pass
11g	6Mbps	1	1	2412	-15.44	8	3.06	Pass
11g	6Mbps	1	6	2437	-13.94	8	3.06	Pass
11g	6Mbps	1	11	2462	-14.95	8	3.06	Pass
HT20	MCS7	1	1	2412	-16.97	8	3.06	Pass
HT20	MCS7	1	6	2437	-15.58	8	3.06	Pass
HT20	MCS7	1	11	2462	-17.53	8	3.06	Pass
HT40	MCS7	1	3	2422	-21.61	8	3.06	Pass
HT40	MCS7	1	6	2437	-20.17	8	3.06	Pass
HT40	MCS7	1	9	2452	-20.63	8	3.06	Pass

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



## 3.4 Conducted Band Edges and Spurious Emission Measurement

### 3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

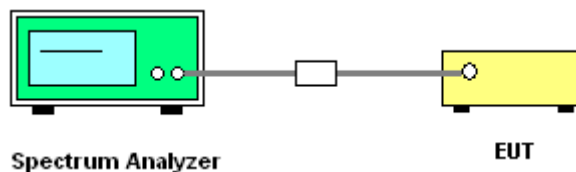
### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

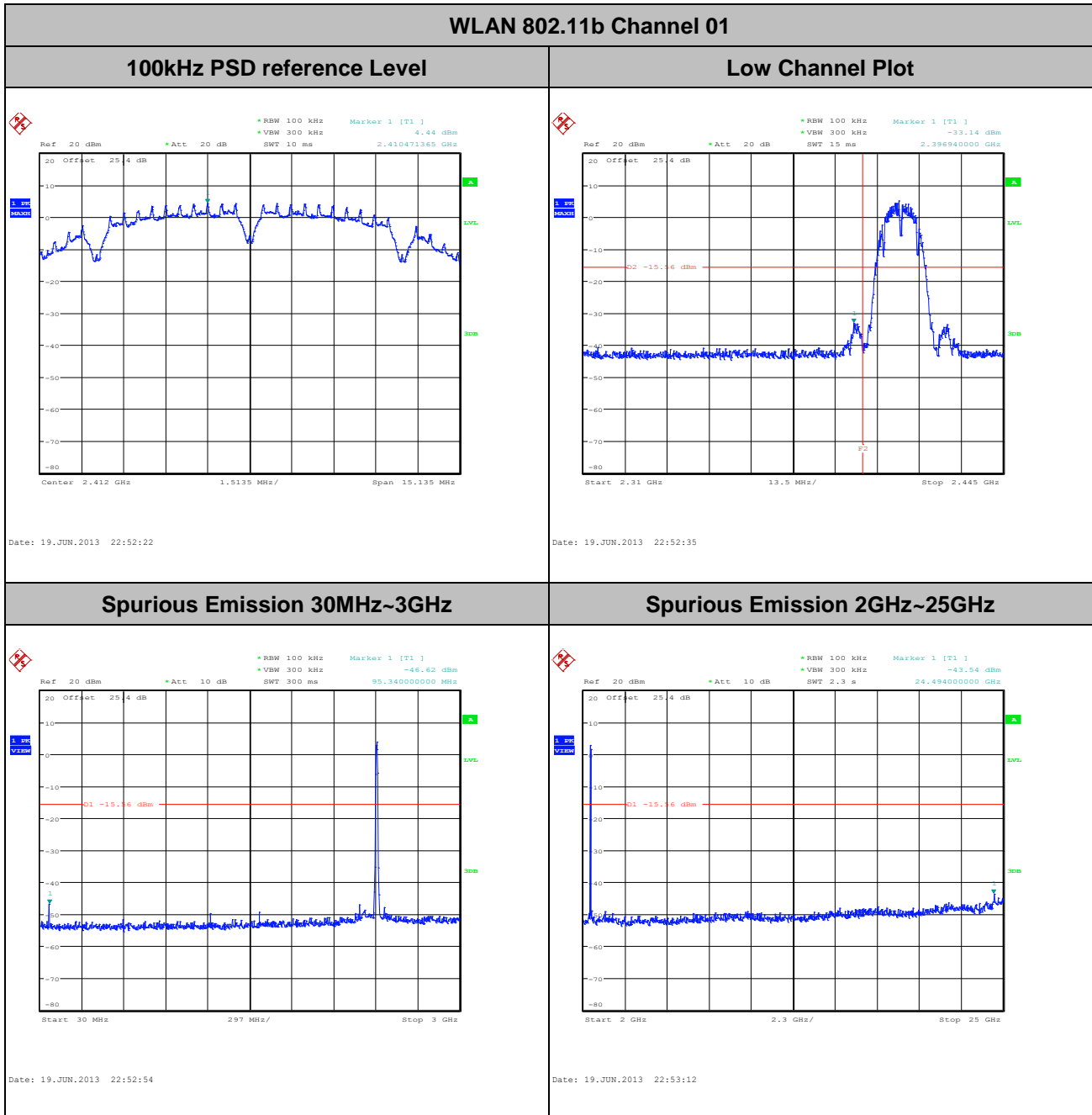
### 3.4.4 Test Setup





### 3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Bill Kuo

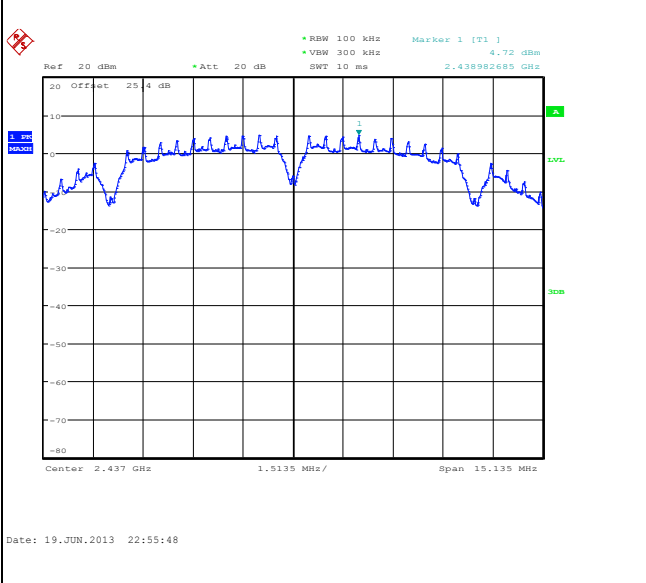




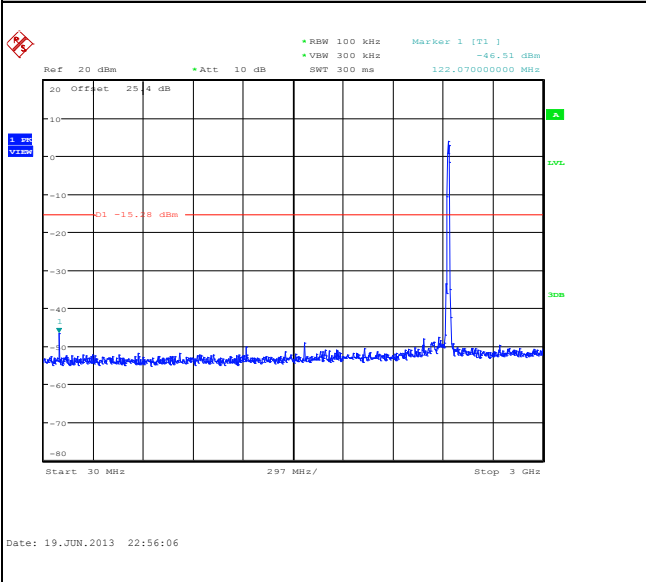
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Bill Kuo

WLAN 802.11b Channel 06

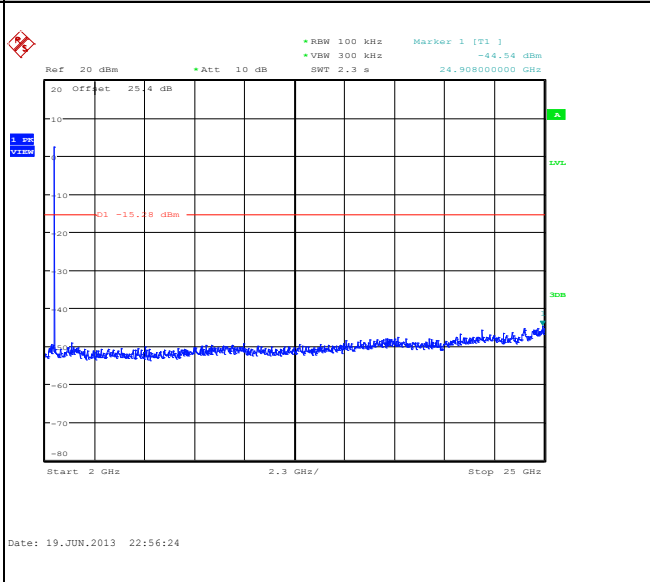
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz



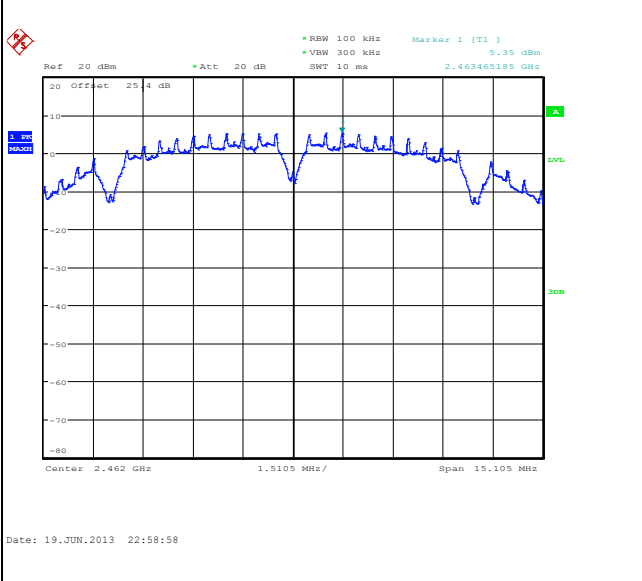




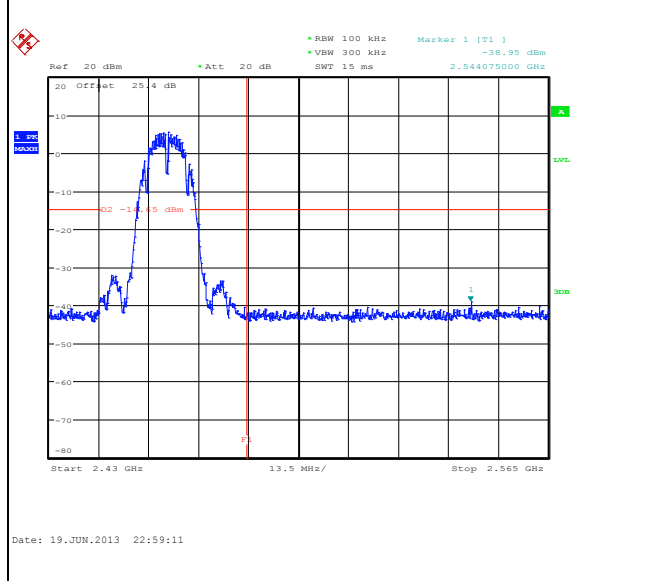
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Bill Kuo

WLAN 802.11b Channel 11

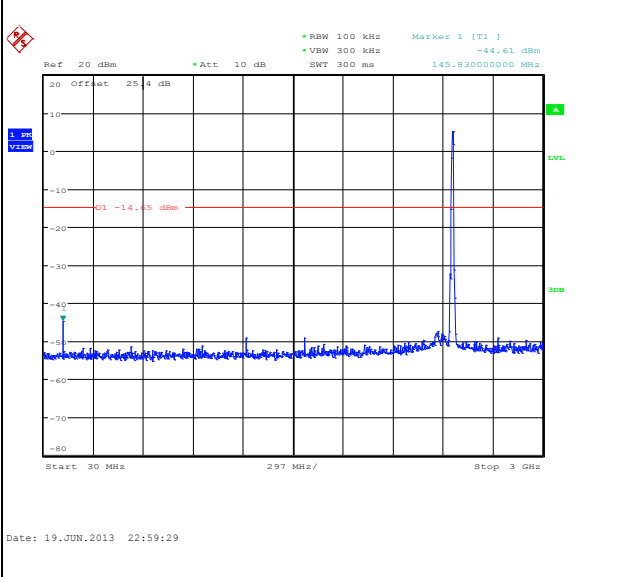
100kHz PSD reference Level



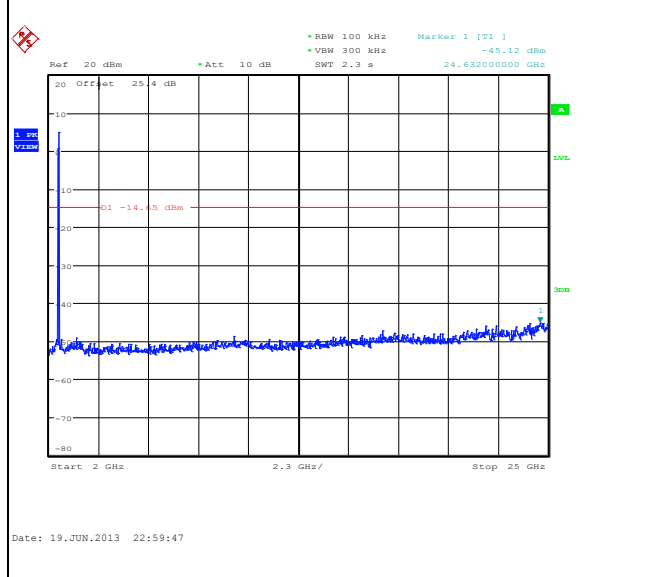
High Channel Plot



Spurious Emission 30MHz~3GHz

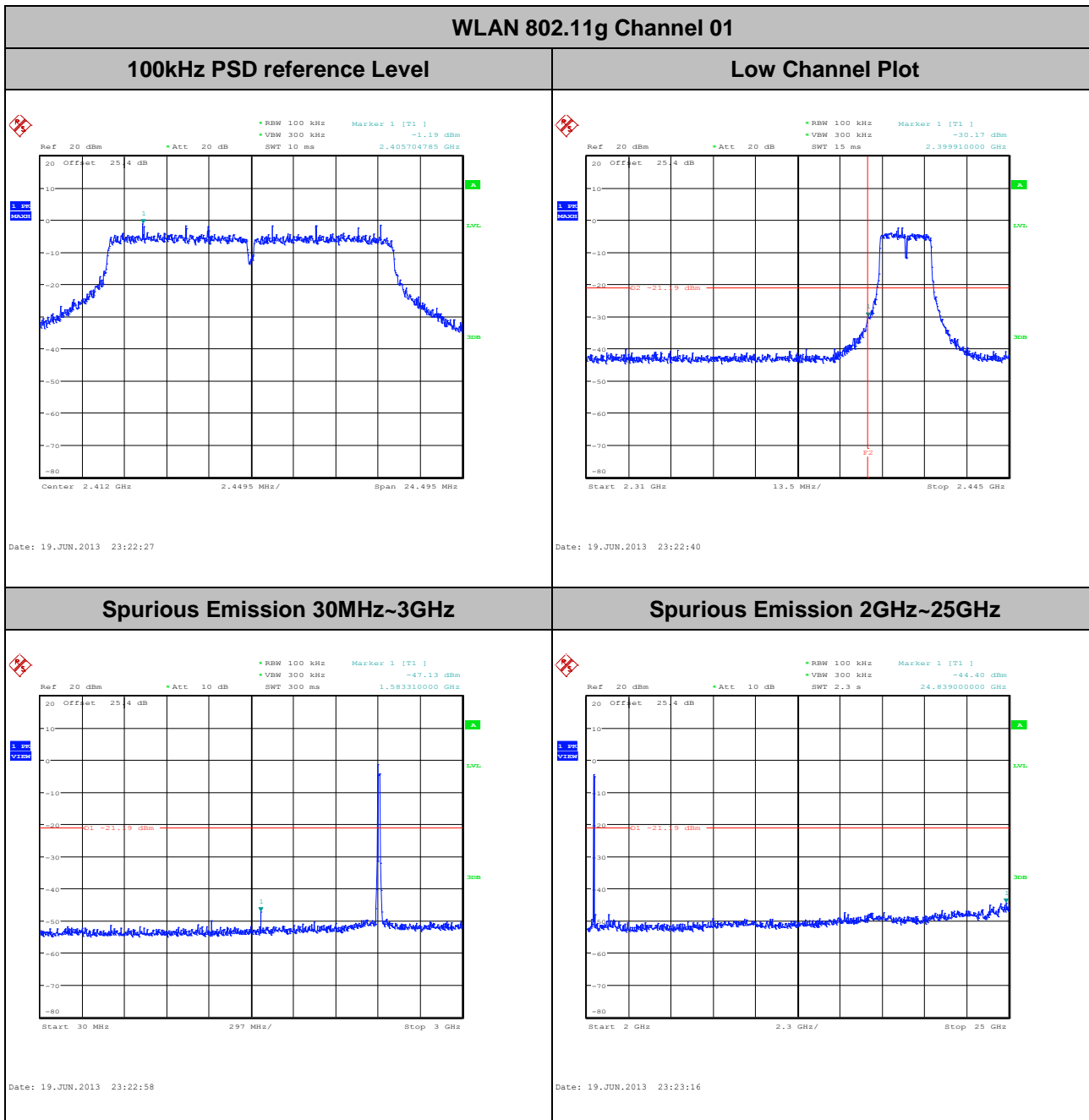


Spurious Emission 2GHz~25GHz





Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Bill Kuo

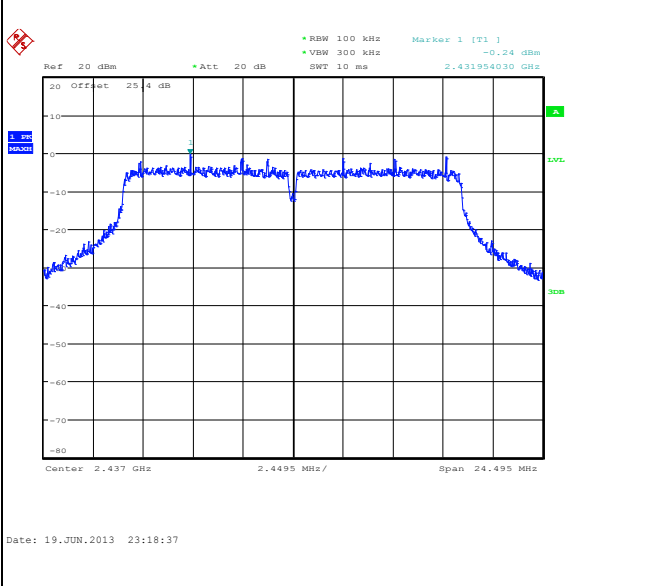




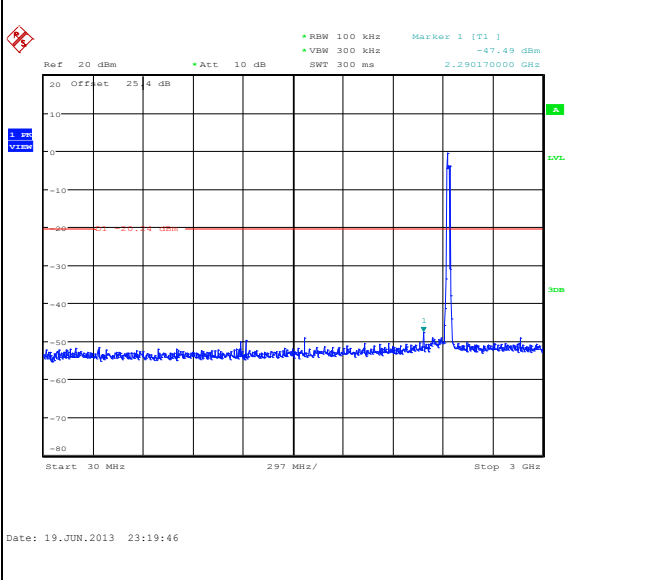
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Bill Kuo

WLAN 802.11g Channel 06

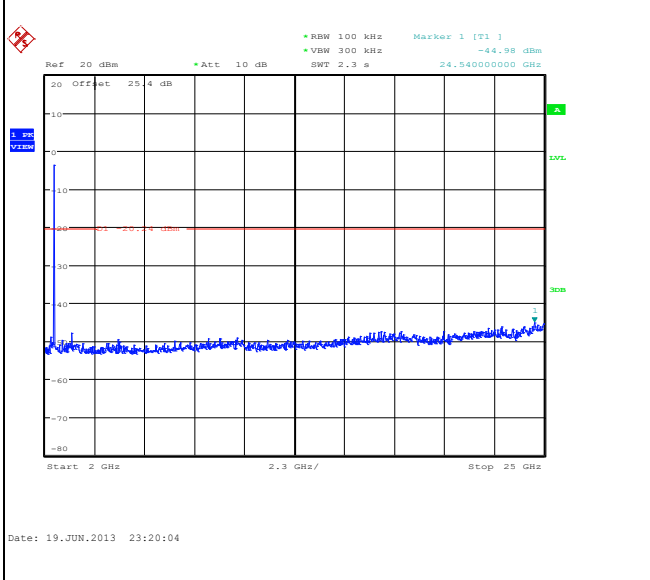
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

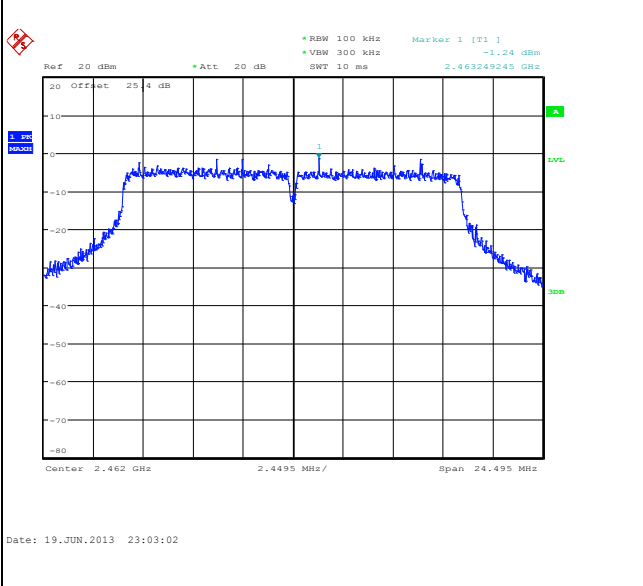




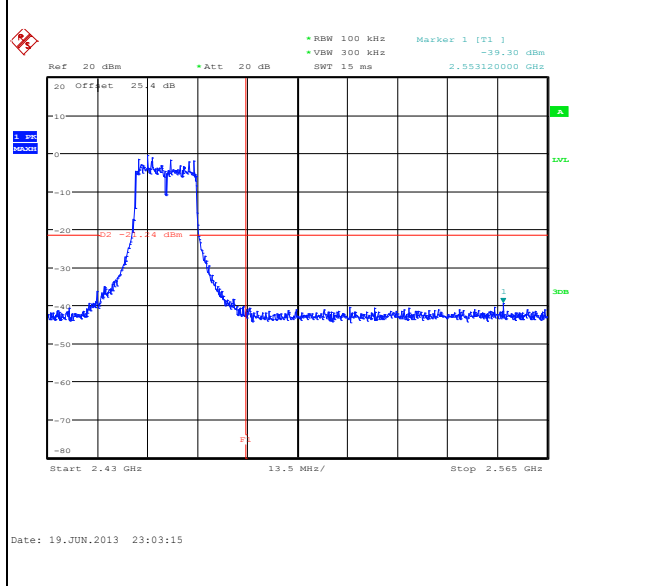
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Bill Kuo

WLAN 802.11g Channel 11

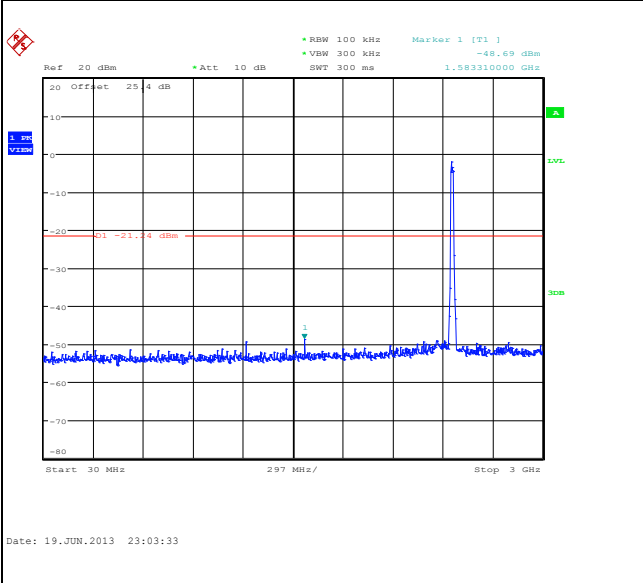
100kHz PSD reference Level



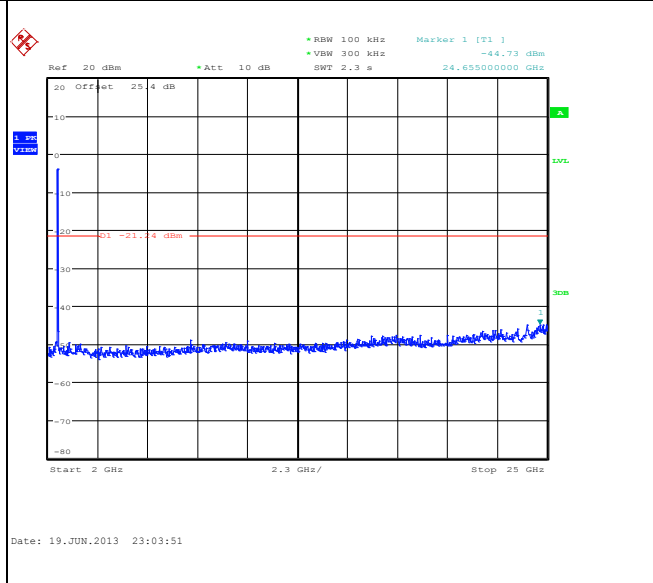
High Channel Plot



Spurious Emission 30MHz~3GHz

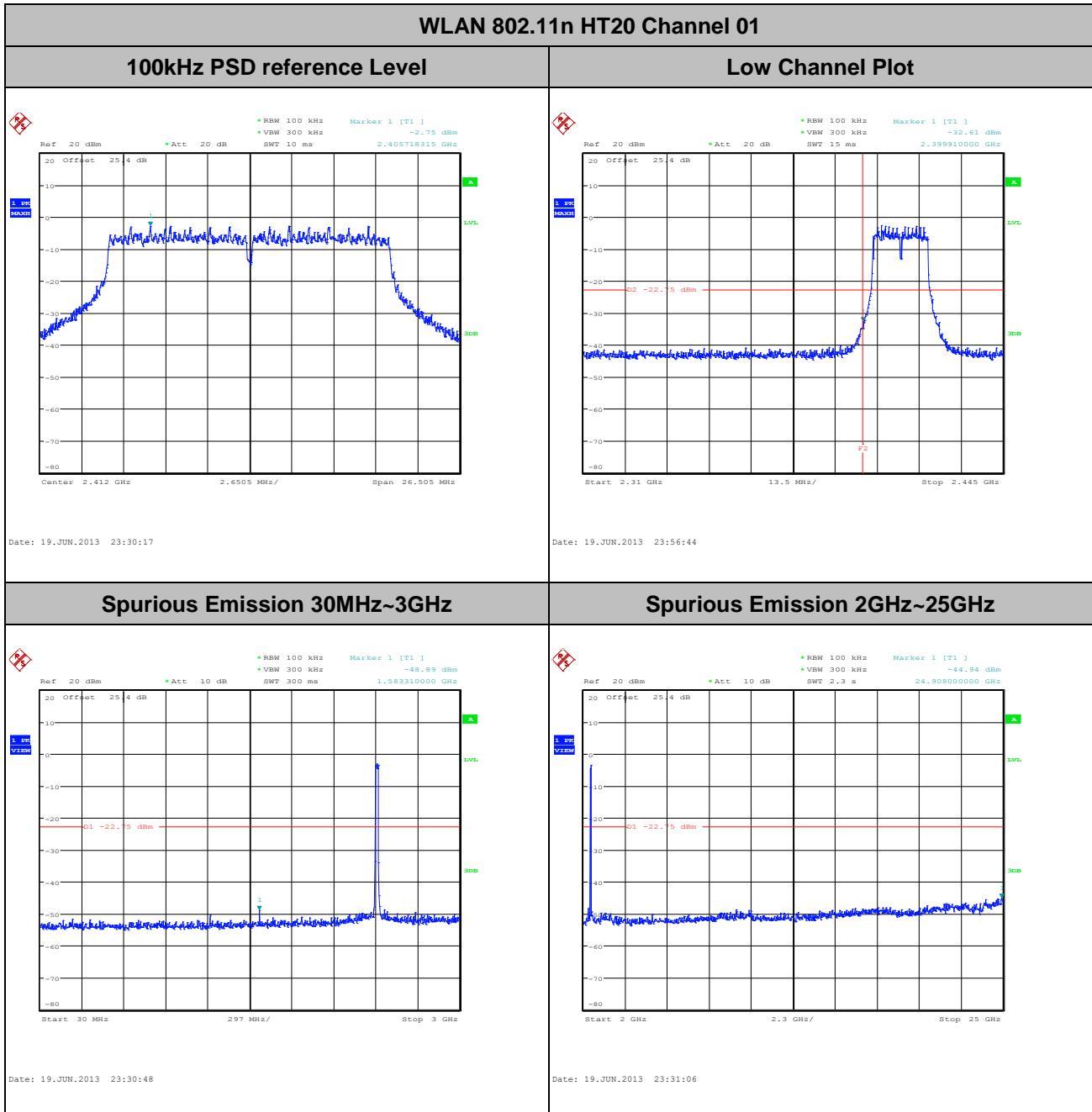


Spurious Emission 2GHz~25GHz



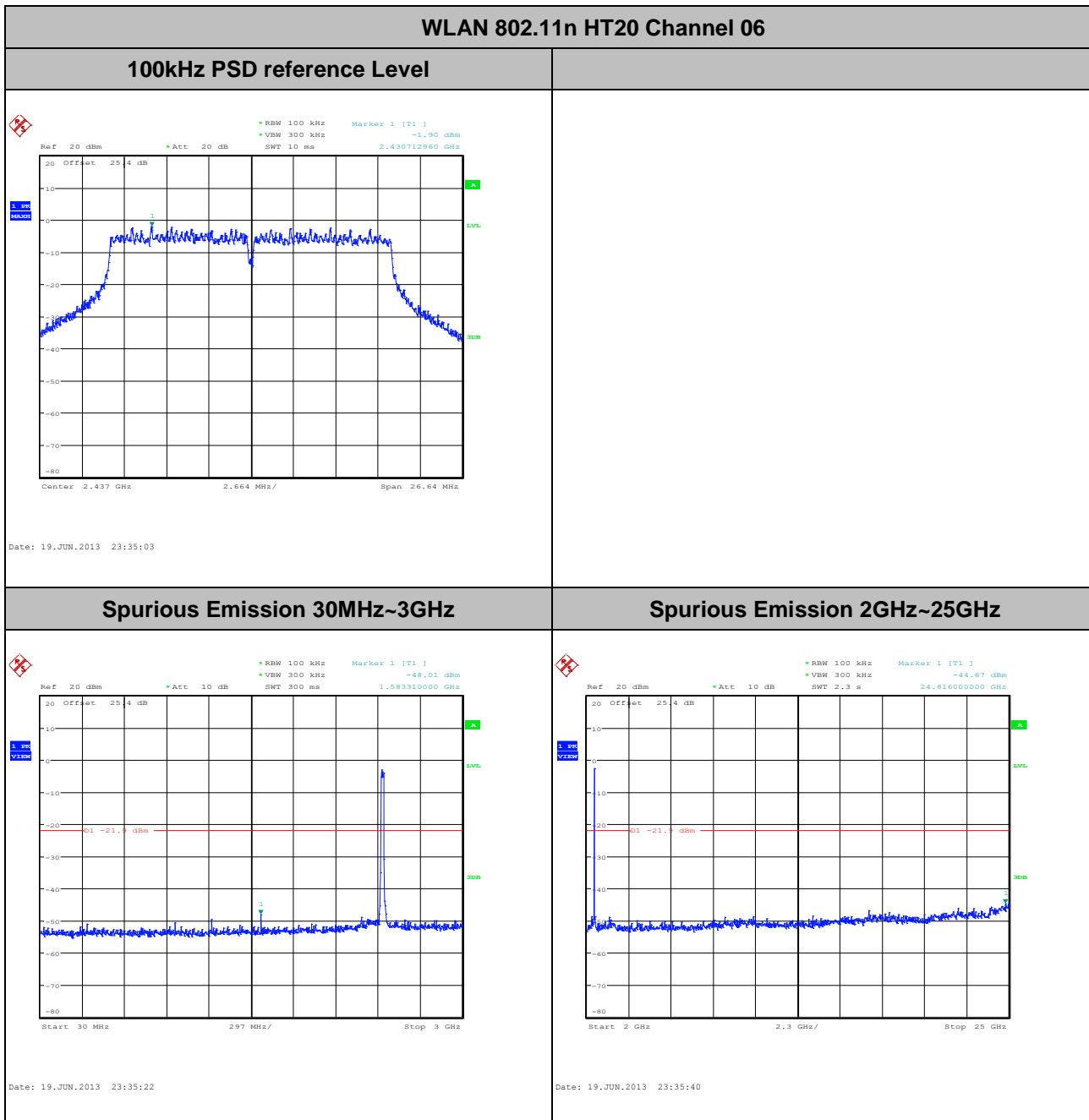


Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Bill Kuo



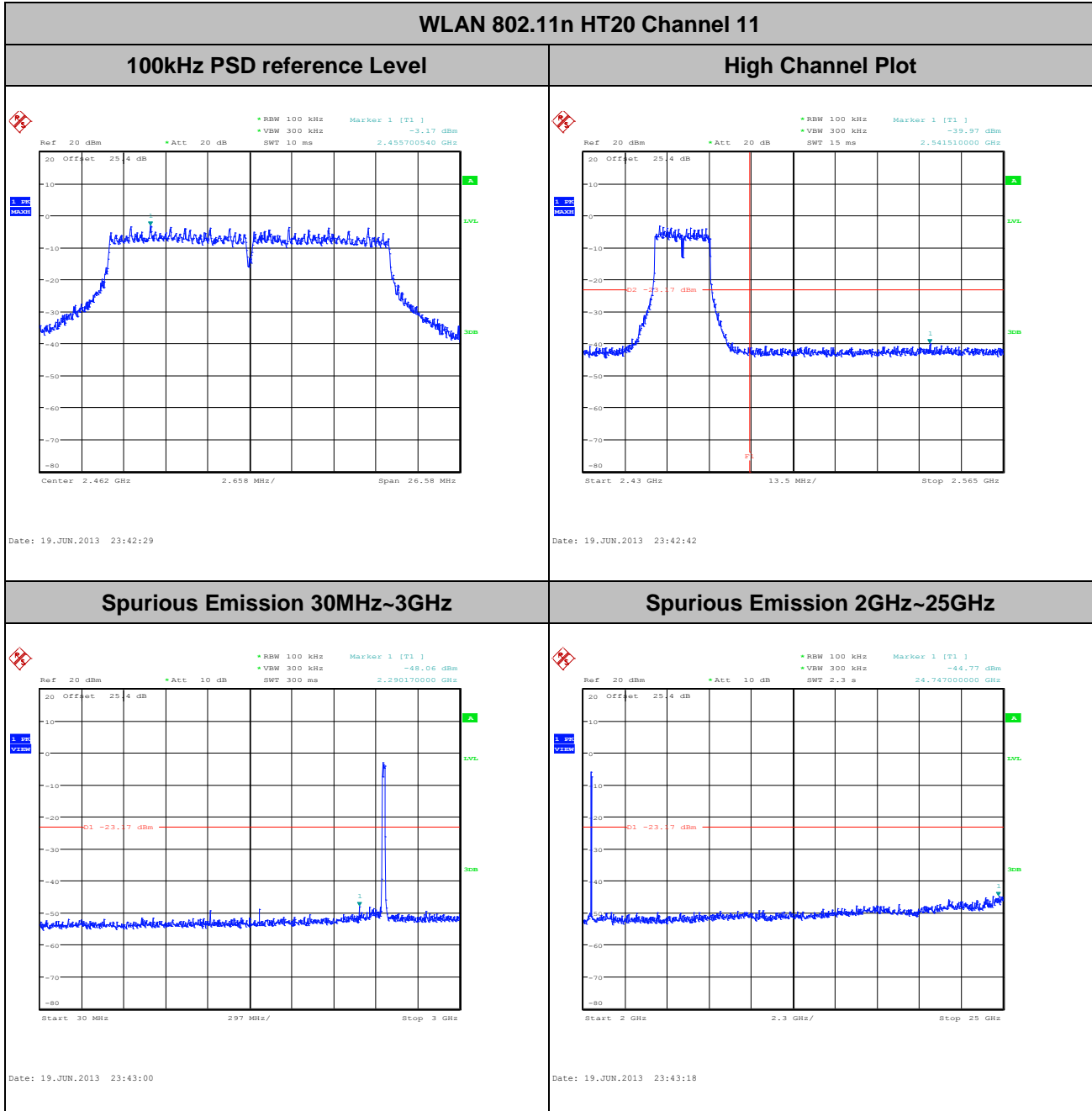


Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Bill Kuo



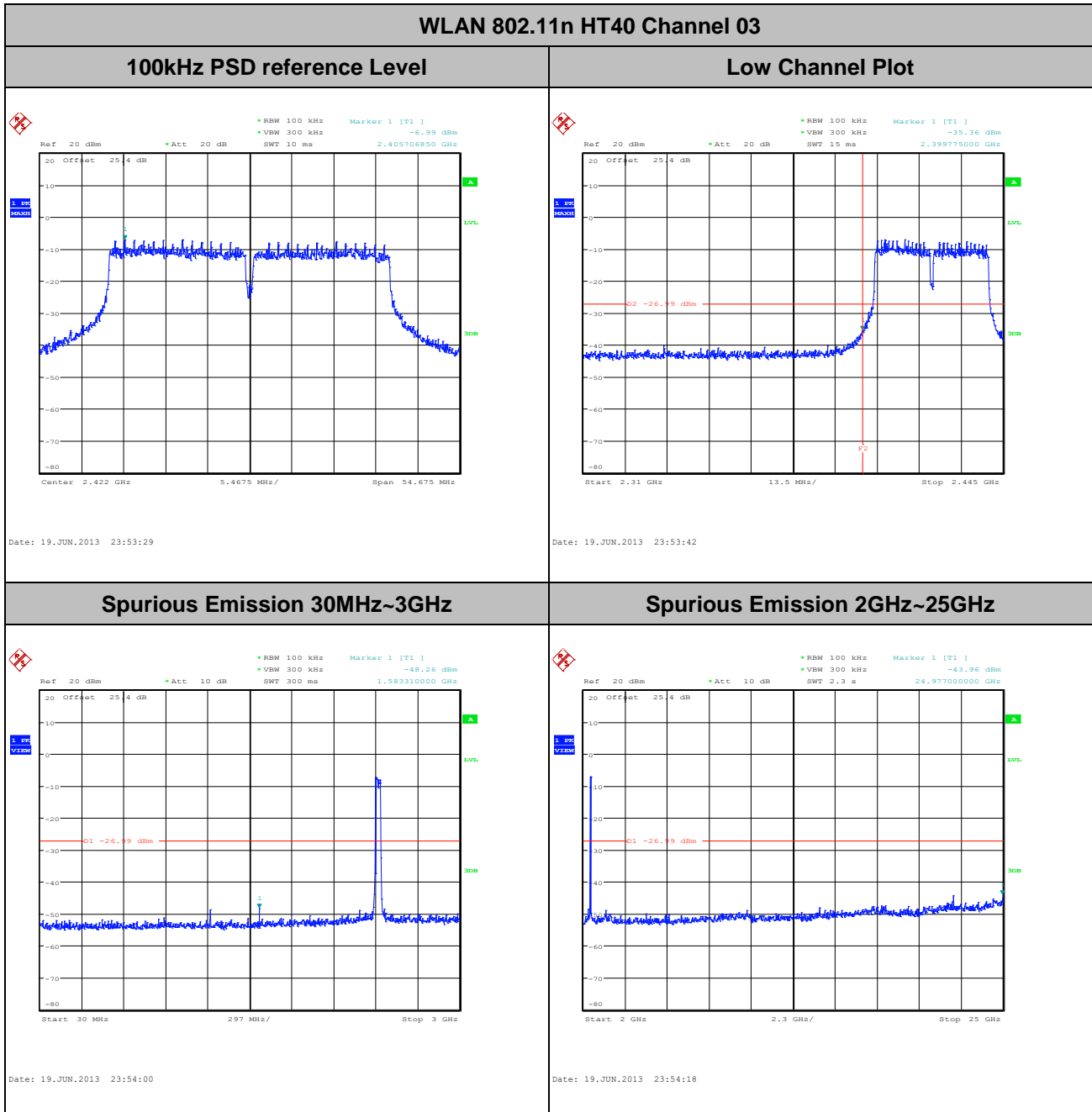


Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Bill Kuo





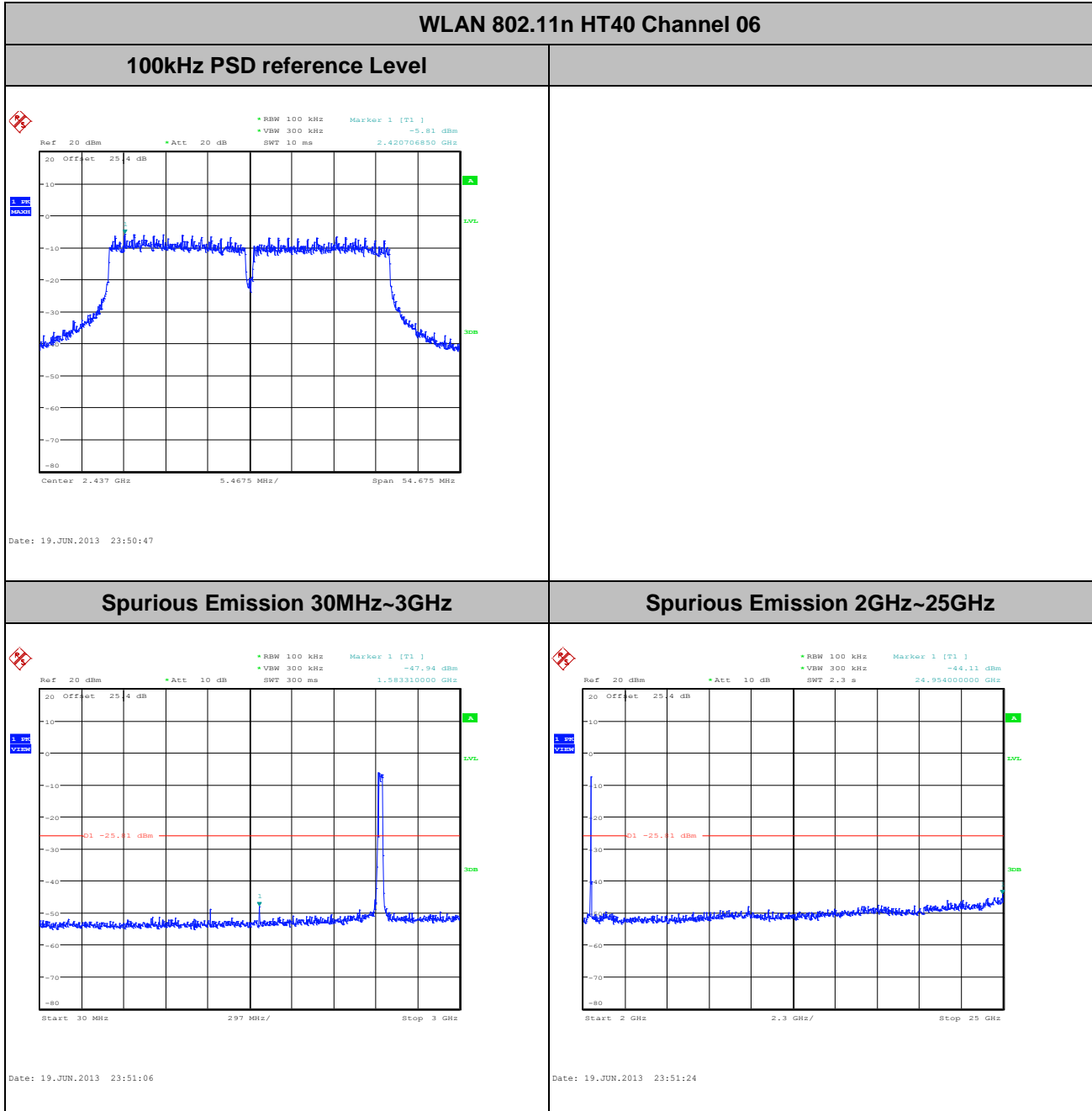
Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	03	Test Engineer :	Bill Kuo





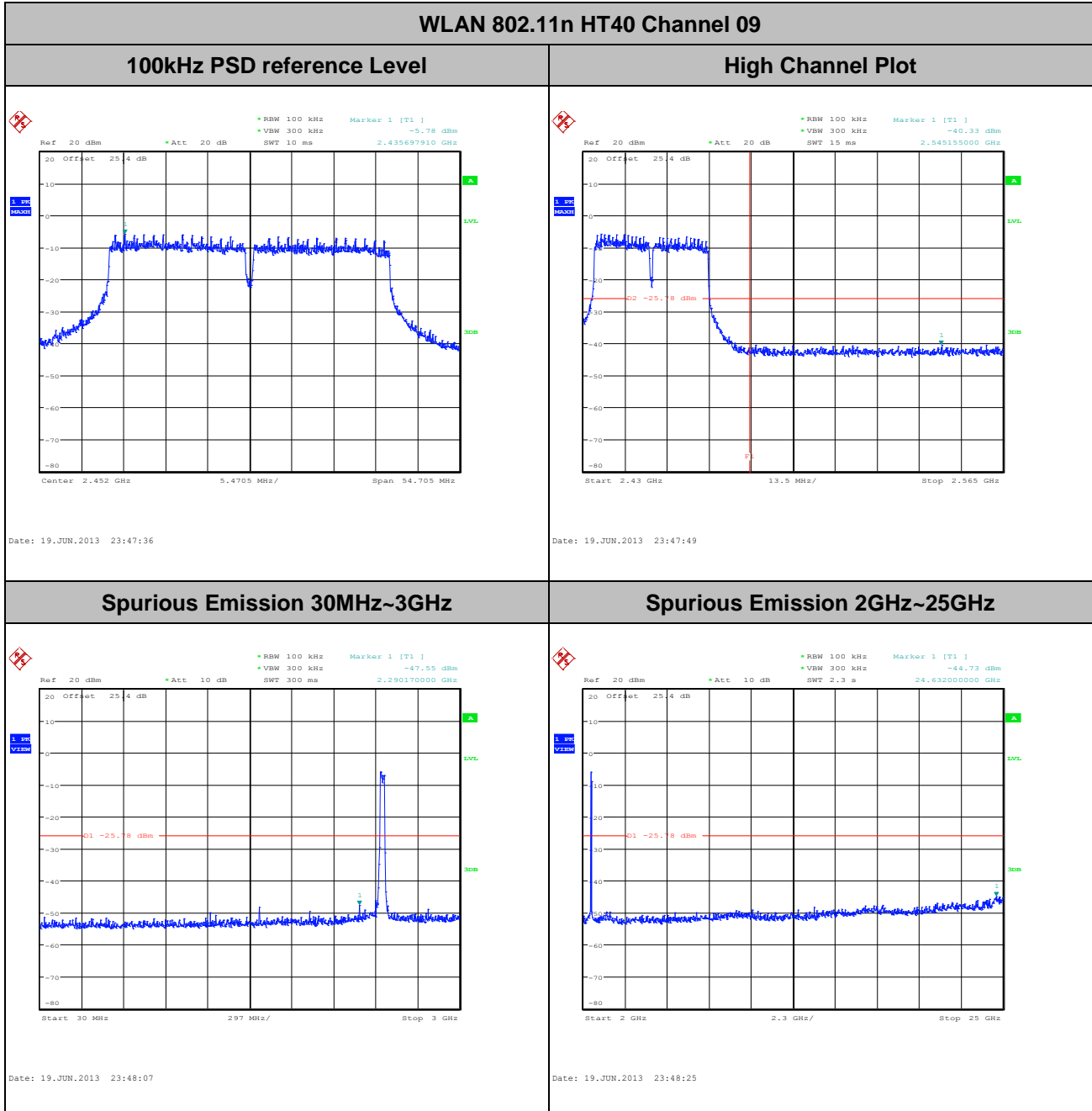


Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Bill Kuo





Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	09	Test Engineer :	Bill Kuo





### 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

See list of measuring instruments of this test report.



### 3.5.3 Test Procedures

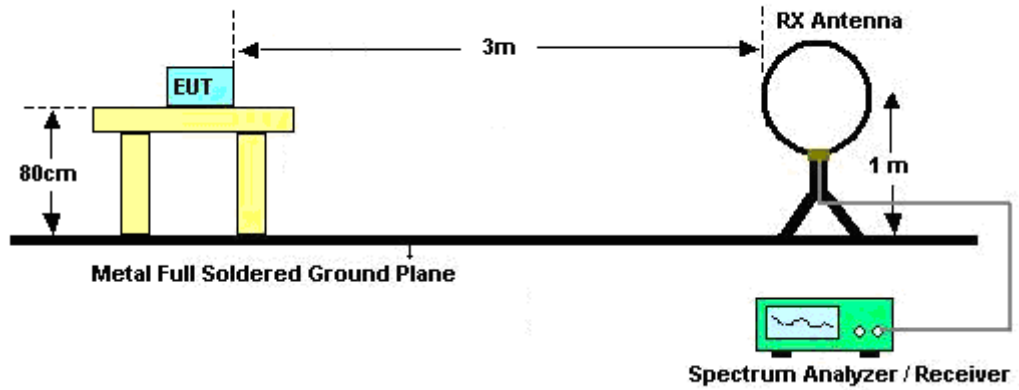
1. The testing follows the guidelines in ANSI C63.10-2009.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 kHz for  $f < 1$  GHz;  $VBW \geq RBW$ ; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW= 3MHz for  $f \geq 1$  GHz for peak measurement.  
For average measurement:
    - $VBW = 10$  Hz, when duty cycle is no less than 98 percent.
    - $VBW \geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle(%)	T( $\mu$ s)	1/T(kHz)	VBW Setting
802.11b	100	-	-	10Hz
802.11g	99.04	-	-	10Hz
2.4GHz 802.11n HT20	91.75	534	1.873	3kHz
2.4GHz 802.11n HT40	87.90	276	3.623	10kHz

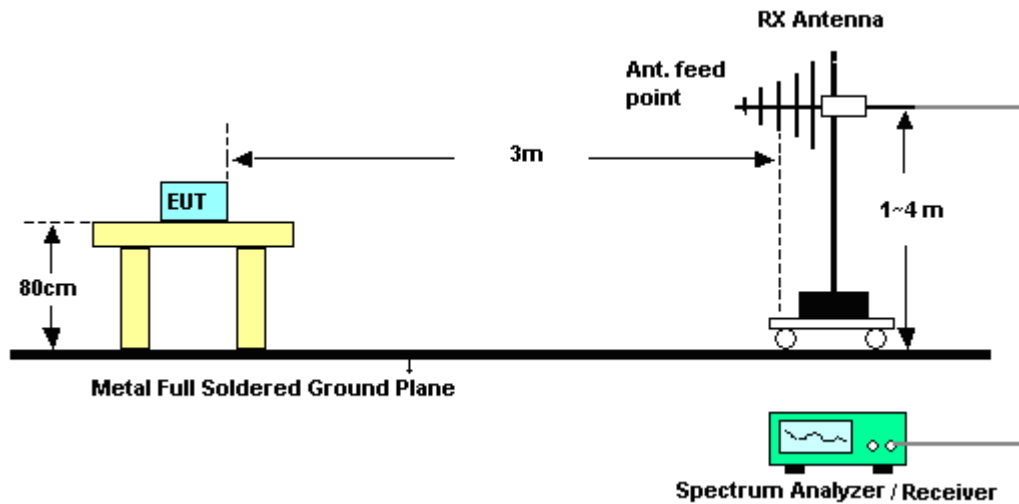
**Note:** For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

### 3.5.4 Test Setup

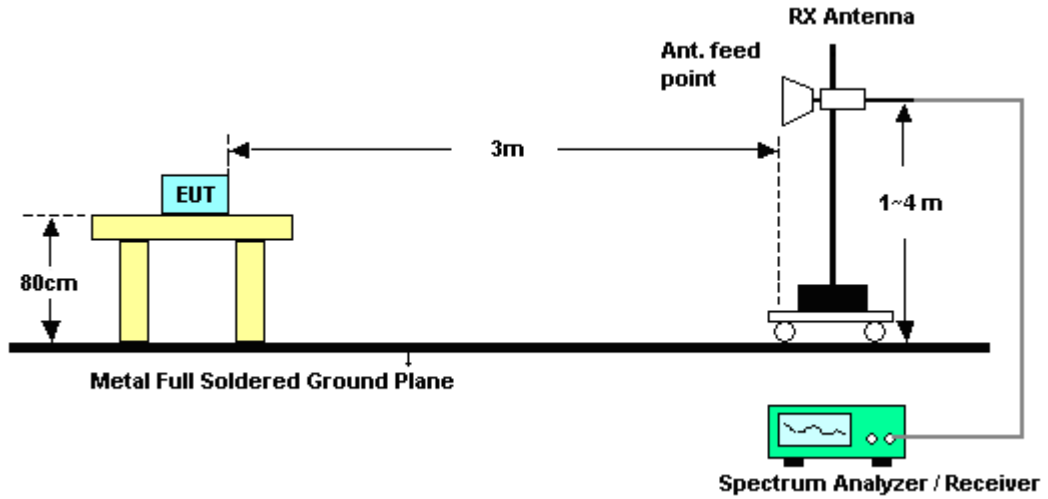
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.



3.5.6 Test Result of Radiated Spurious at Band Edges

Test Mode :	802.11b	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2382.72	53.03	-20.97	74	48.58	32.33	6.45	34.33	107	349	Peak
2390	40.86	-13.14	54	36.38	32.36	6.45	34.33	107	349	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
2324.67	58.11	-15.89	74	53.85	32.26	6.35	34.35	100	235	Peak
2389.47	44.44	-9.56	54	39.96	32.36	6.45	34.33	100	235	Average

Test Mode :	802.11b	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2373	61.91	-12.09	74	57.49	32.33	6.42	34.33	103	293	Peak
2372.37	44.24	-9.76	54	39.82	32.33	6.42	34.33	103	293	Average
2484.73	55.31	-18.69	74	50.54	32.48	6.59	34.3	103	293	Peak
2484.61	42.65	-11.35	54	37.88	32.48	6.59	34.3	103	293	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
2374.35	63.17	-10.83	74	58.75	32.33	6.42	34.33	123	253	Peak
2376.51	45.14	-8.86	54	40.72	32.33	6.42	34.33	123	253	Average
2484.13	53.58	-20.42	74	48.81	32.48	6.59	34.3	123	253	Peak
2484.4	40.97	-13.03	54	36.2	32.48	6.59	34.3	123	253	Average



Test Mode :	802.11g	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2389.47	60.65	-13.35	74	56.17	32.36	6.45	34.33	109	349	Peak
2390	43.68	-10.32	54	39.2	32.36	6.45	34.33	109	349	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2389.92	67.18	-6.82	74	62.7	32.36	6.45	34.33	100	236	Peak
2390	46.72	-7.28	54	42.24	32.36	6.45	34.33	100	236	Average

Test Mode :	802.11g	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.65	66.81	-7.19	74	62.04	32.48	6.59	34.3	102	292	Peak
2483.5	45.62	-8.38	54	40.85	32.48	6.59	34.3	102	292	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
2483.77	64.11	-9.89	74	59.34	32.48	6.59	34.3	180	248	Peak
2483.5	44.58	-9.42	54	39.81	32.48	6.59	34.3	180	248	Average





Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2389.29	59.97	-14.03	74	55.49	32.36	6.45	34.33	107	350	Peak
2390	43.19	-10.81	54	38.71	32.36	6.45	34.33	107	350	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2388.93	61.97	-12.03	74	57.49	32.36	6.45	34.33	100	236	Peak
2390	45.6	-8.4	54	41.12	32.36	6.45	34.33	100	236	Average

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2484.55	66.29	-7.71	74	61.52	32.48	6.59	34.3	102	294	Peak
2483.71	45.54	-8.46	54	40.77	32.48	6.59	34.3	102	294	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
2484.1	64.99	-9.01	74	60.22	32.48	6.59	34.3	121	248	Peak
2483.71	44.42	-9.58	54	39.65	32.48	6.59	34.3	121	248	Average



Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	03	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2389.56	61.29	-12.71	74	56.81	32.36	6.45	34.33	108	349	Peak
2388.93	44.99	-9.01	54	40.51	32.36	6.45	34.33	108	349	Average
2498.44	52.5	-21.5	74	47.7	32.5	6.59	34.29	108	349	Peak
2488.93	41.18	-12.82	54	36.39	32.5	6.59	34.3	108	349	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2389.92	64.23	-9.77	74	59.75	32.36	6.45	34.33	100	213	Peak
2389.83	47.11	-6.89	54	42.63	32.36	6.45	34.33	100	213	Average
2483.77	50.33	-23.67	74	45.56	32.48	6.59	34.3	100	213	Peak
2495.95	39.52	-14.48	54	34.72	32.5	6.59	34.29	100	213	Average



Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	09	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2376.33	54.38	-19.62	74	49.96	32.33	6.42	34.33	103	278	Peak
2375.52	42.78	-11.22	54	38.36	32.33	6.42	34.33	103	278	Average
2483.62	63.98	-10.02	74	59.21	32.48	6.59	34.3	103	278	Peak
2483.56	45.07	-8.93	54	40.3	32.48	6.59	34.3	103	278	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
2375.79	58.1	-15.9	74	53.68	32.33	6.42	34.33	100	237	Peak
2379.75	45.27	-8.73	54	40.85	32.33	6.42	34.33	100	237	Average
2483.74	61.02	-12.98	74	56.25	32.48	6.59	34.3	100	237	Peak
2483.86	43.12	-10.88	54	38.35	32.48	6.59	34.3	100	237	Average



### 3.5.7 Test Result of Radiated Spurious Emission (30MHz ~ 10<sup>th</sup> 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.

<b>Test Mode :</b>	802.11b	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2412 MHz is fundamental signal which can be ignored.</li> <li>2502 MHz and 7236 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 105.07dBμV/m - 20dB = 85.07dBμV/m.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( 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	100.8	-	-	96.26	32.38	6.49	34.33	107	349	Average
2412	105.07	-	-	100.53	32.38	6.49	34.33	107	349	Peak
2502	56.55	-28.52	85.07	51.7	32.5	6.64	34.29	100	0	Peak
4824	48.48	-25.52	74	59.03	34.87	10.17	55.59	100	0	Peak
7236	49.96	-35.11	85.07	59.27	36.15	10.96	56.42	100	0	Peak



<b>Test Mode :</b>	802.11b	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	<ol style="list-style-type: none"> <li>1. 2412 MHz is fundamental signal which can be ignored.</li> <li>2. 2504 MHz and 7236 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>3. Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( 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	103.19	-	-	98.65	32.38	6.49	34.33	100	235	Average
2412	108.25	-	-	103.71	32.38	6.49	34.33	100	235	Peak
2504	54	-34.25	88.25	49.15	32.5	6.64	34.29	100	0	Peak
4824	48.74	-25.26	74	59.29	34.87	10.17	55.59	100	0	Peak
7236	49.93	-38.32	88.25	59.24	36.15	10.96	56.42	100	0	Peak



<b>Test Mode :</b>	802.11b	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	1. 2436 MHz is fundamental signal which can be ignored. 2. 2526 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
140.16	24.44	-19.06	43.5	44.05	10.83	1.31	31.75	-	-	Peak
196.05	23.67	-19.83	43.5	44.76	9.14	1.52	31.75	-	-	Peak
260.04	28.72	-17.28	46	44.96	13.7	1.79	31.73	-	-	Peak
331.5	24.7	-21.3	46	40.82	13.64	1.99	31.75	-	-	Peak
420.4	37.01	-8.99	46	50.11	16.5	2.24	31.84	100	134	Peak
812.4	22.95	-23.05	46	31.82	19.93	3.1	31.9	-	-	Peak
2436	104	-	-	99.4	32.4	6.52	34.32	104	278	Average
2436	108.77	-	-	104.17	32.4	6.52	34.32	104	278	Peak
2526	60.68	-28.09	88.77	55.73	32.54	6.69	34.28	100	0	Peak
4875	51.58	-22.42	74	62.23	34.85	10.18	55.68	100	0	Peak
7311	49.98	-24.02	74	59.18	36.14	10.94	56.28	100	0	Peak



<b>Test Mode :</b>	802.11b	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. 2436 MHz is fundamental signal which can be ignored. 2. 2526 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
46.2	20.91	-19.09	40	42.05	9.87	0.77	31.78	-	-	Peak
140.16	24.73	-18.77	43.5	44.34	10.83	1.31	31.75	-	-	Peak
268.14	28.97	-17.03	46	45.91	12.98	1.81	31.73	-	-	Peak
412	39.14	-6.86	46	52.49	16.26	2.22	31.83	100	145	Peak
499.5	23.95	-22.05	46	35.71	17.69	2.48	31.93	-	-	Peak
837.6	22.88	-23.12	46	31.3	20.18	3.19	31.79	-	-	Peak
2436	103.25	-	-	98.65	32.4	6.52	34.32	100	235	Average
2436	108.19	-	-	103.59	32.4	6.52	34.32	100	235	Peak
2526	53.05	-35.14	88.19	48.1	32.54	6.69	34.28	100	0	Peak
4875	49.68	-24.32	74	60.33	34.85	10.18	55.68	100	0	Peak
7311	50.16	-23.84	74	59.36	36.14	10.94	56.28	100	0	Peak



<b>Test Mode :</b>	802.11b	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2462 MHz is fundamental signal which can be ignored.</li> <li>2552 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2462	103.12	-	-	98.42	32.45	6.56	34.31	103	293	Average
2462	107.91	-	-	103.21	32.45	6.56	34.31	103	293	Peak
2552	58.5	-29.41	87.91	53.48	32.56	6.73	34.27	100	0	Peak
4923	49.5	-24.5	74	60.25	34.83	10.2	55.78	100	0	Peak
7386	49.3	-24.7	74	58.37	36.12	10.92	56.11	100	0	Peak

<b>Test Mode :</b>	802.11b	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2462 MHz is fundamental signal which can be ignored.</li> <li>2550 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( 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	102.39	-	-	97.69	32.45	6.56	34.31	123	253	Average
2462	107.76	-	-	103.06	32.45	6.56	34.31	123	253	Peak
2550	55.9	-31.86	87.76	50.88	32.56	6.73	34.27	100	0	Peak
4923	48.48	-25.52	74	59.23	34.83	10.2	55.78	100	0	Peak
7386	51.2	-22.8	74	60.27	36.12	10.92	56.11	100	0	Peak





<b>Test Mode :</b>	802.11g	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2411 MHz is fundamental signal which can be ignored.</li> <li>2504 MHz and 7236 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level (dBμV)	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
140.16	24.52	-18.98	43.5	44.13	10.83	1.31	31.75	-	-	Peak
196.05	22.52	-20.98	43.5	43.61	9.14	1.52	31.75	-	-	Peak
276.24	29.43	-16.57	46	46.49	12.84	1.83	31.73	-	-	Peak
427.4	37.06	-8.94	46	50.15	16.5	2.26	31.85	100	85	Peak
499.5	23.23	-22.77	46	34.99	17.69	2.48	31.93	-	-	Peak
800.5	24.75	-21.25	46	33.84	19.8	3.06	31.95	-	-	Peak
2411	94.32	-	-	89.78	32.38	6.49	34.33	109	349	Average
2411	106.44	-	-	101.9	32.38	6.49	34.33	109	349	Peak
2504	53.9	-32.54	86.44	49.05	32.5	6.64	34.29	100	0	Peak
4824	48.57	-25.43	74	59.12	34.87	10.17	55.59	100	0	Peak
7236	49.15	-37.29	86.44	58.46	36.15	10.96	56.42	100	0	Peak



<b>Test Mode :</b>	802.11g	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. 2411 MHz is fundamental signal which can be ignored. 2. 2502 MHz and 7236 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
100.2	21.64	-21.86	43.5	41.29	11	1.1	31.75	-	-	Peak
140.16	24.88	-18.62	43.5	44.49	10.83	1.31	31.75	-	-	Peak
260.04	28.99	-17.01	46	45.23	13.7	1.79	31.73	-	-	Peak
412	38.92	-7.08	46	52.27	16.26	2.22	31.83	100	46	Peak
751.5	23.34	-22.66	46	32.49	19.78	3.05	31.98	-	-	Peak
905.5	24.99	-21.01	46	32.5	20.6	3.37	31.48	-	-	Peak
2411	95.61	-	-	91.07	32.38	6.49	34.33	100	236	Average
2411	107.07	-	-	102.53	32.38	6.49	34.33	100	236	Peak
2502	52.9	-34.17	87.07	48.05	32.5	6.64	34.29	100	0	Peak
4824	47.28	-26.72	74	57.83	34.87	10.17	55.59	100	0	Peak
7236	49.42	-37.65	87.07	58.73	36.15	10.96	56.42	100	0	Peak



<b>Test Mode :</b>	802.11g	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2436 MHz is fundamental signal which can be ignored.</li> <li>2524 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2436	95.92	-	-	91.32	32.4	6.52	34.32	103	280	Average
2436	107.69	-	-	103.09	32.4	6.52	34.32	103	280	Peak
2524	57.35	-30.34	87.69	52.4	32.54	6.69	34.28	100	0	Peak
4875	48.59	-25.41	74	59.24	34.85	10.18	55.68	100	0	Peak
7311	49.48	-24.52	74	58.68	36.14	10.94	56.28	100	0	Peak

<b>Test Mode :</b>	802.11g	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2436 MHz is fundamental signal which can be ignored.</li> <li>2524 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2436	94.88	-	-	90.28	32.4	6.52	34.32	183	240	Average
2436	106.24	-	-	101.64	32.4	6.52	34.32	183	240	Peak
2524	53.91	-32.33	86.24	48.96	32.54	6.69	34.28	100	0	Peak
4875	48.19	-25.81	74	58.84	34.85	10.18	55.68	100	0	Peak
7311	49.35	-24.65	74	58.55	36.14	10.94	56.28	100	0	Peak



<b>Test Mode :</b>	802.11g	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2461 MHz is fundamental signal which can be ignored.</li> <li>2552 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2461	95.21	-	-	90.51	32.45	6.56	34.31	102	292	Average
2461	106.77	-	-	102.07	32.45	6.56	34.31	102	292	Peak
2552	54.72	-32.05	86.77	49.7	32.56	6.73	34.27	100	0	Peak
4923	48.02	-25.98	74	58.77	34.83	10.2	55.78	100	0	Peak
7386	48.83	-25.17	74	57.9	36.12	10.92	56.11	100	0	Peak

<b>Test Mode :</b>	802.11g	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2461 MHz is fundamental signal which can be ignored.</li> <li>2546 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2461	94.86	-	-	90.16	32.45	6.56	34.31	180	248	Average
2461	106.15	-	-	101.45	32.45	6.56	34.31	180	248	Peak
2546	53.37	-32.78	86.15	48.39	32.56	6.69	34.27	100	0	Peak
4923	47.36	-26.64	74	58.11	34.83	10.2	55.78	100	0	Peak
7386	49.25	-24.75	74	58.32	36.12	10.92	56.11	100	0	Peak



<b>Test Mode :</b>	2.4GHz 802.11n HT20	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2411 MHz is fundamental signal which can be ignored.</li> <li>2506 MHz and 7236 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2411	94.66	-	-	90.12	32.38	6.49	34.33	107	350	Average
2411	105.22	-	-	100.68	32.38	6.49	34.33	107	350	Peak
2506	53.99	-31.23	85.22	49.12	32.52	6.64	34.29	100	0	Peak
4824	47.39	-26.61	74	57.94	34.87	10.17	55.59	100	0	Peak
7236	49.26	-35.96	85.22	58.57	36.15	10.96	56.42	100	0	Peak

<b>Test Mode :</b>	2.4GHz 802.11n HT20	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2411 MHz is fundamental signal which can be ignored.</li> <li>2502 MHz and 7236 MHz are not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2411	95.66	-	-	91.12	32.38	6.49	34.33	100	236	Average
2411	106.44	-	-	101.9	32.38	6.49	34.33	100	236	Peak
2502	51.8	-34.64	86.44	46.95	32.5	6.64	34.29	100	0	Peak
4824	48.22	-25.78	74	58.77	34.87	10.17	55.59	100	0	Peak
7236	49.54	-36.9	86.44	58.85	36.15	10.96	56.42	100	0	Peak



<b>Test Mode :</b>	2.4GHz 802.11n HT20	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	1. 2436 MHz is fundamental signal which can be ignored. 2. 2526 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2436	95.1	-	-	90.5	32.4	6.52	34.32	103	277	Average
2436	105.35	-	-	100.75	32.4	6.52	34.32	103	277	Peak
2526	54.95	-30.4	85.35	50	32.54	6.69	34.28	100	0	Peak
4875	47.88	-26.12	74	58.53	34.85	10.18	55.68	100	0	Peak
7311	48.59	-25.41	74	57.79	36.14	10.94	56.28	100	0	Peak

<b>Test Mode :</b>	2.4GHz 802.11n HT20	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. 2436 MHz is fundamental signal which can be ignored. 2. 2526 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2436	93.92	-	-	89.32	32.4	6.52	34.32	100	237	Average
2436	104.44	-	-	99.84	32.4	6.52	34.32	100	237	Peak
2526	52.21	-32.23	84.44	47.26	32.54	6.69	34.28	100	0	Peak
4875	48.41	-25.59	74	59.06	34.85	10.18	55.68	100	0	Peak
7311	48.81	-25.19	74	58.01	36.14	10.94	56.28	100	0	Peak



<b>Test Mode :</b>	2.4GHz 802.11n HT20	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2461 MHz is fundamental signal which can be ignored.</li> <li>2554 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2461	93.62	-	-	88.92	32.45	6.56	34.31	102	294	Average
2461	103.91	-	-	99.21	32.45	6.56	34.31	102	294	Peak
2554	54.43	-29.48	83.91	49.41	32.56	6.73	34.27	100	0	Peak
4923	47.63	-26.37	74	58.38	34.83	10.2	55.78	100	0	Peak
7386	49.1	-24.9	74	58.17	36.12	10.92	56.11	100	0	Peak

<b>Test Mode :</b>	2.4GHz 802.11n HT20	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	<ol style="list-style-type: none"> <li>2461 MHz is fundamental signal which can be ignored.</li> <li>2546 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.</li> <li>Average measurement was not performed if peak level went lower than the average limit.</li> </ol>		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2461	93.97	-	-	89.27	32.45	6.56	34.31	121	248	Average
2461	104.72	-	-	100.02	32.45	6.56	34.31	121	248	Peak
2546	53.8	-30.92	84.72	48.82	32.56	6.69	34.27	100	0	Peak
4923	47.78	-26.22	74	58.53	34.83	10.2	55.78	100	0	Peak
7386	49.36	-24.64	74	58.43	36.12	10.92	56.11	100	0	Peak



<b>Test Mode :</b>	2.4GHz 802.11n HT40	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	03	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	1. 2420 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
140.16	25.64	-17.86	43.5	45.25	10.83	1.31	31.75	-	-	Peak
196.05	23.19	-20.31	43.5	44.28	9.14	1.52	31.75	-	-	Peak
268.14	29.57	-16.43	46	46.51	12.98	1.81	31.73	-	-	Peak
331.5	25.29	-20.71	46	41.41	13.64	1.99	31.75	-	-	Peak
427.4	40.16	-5.84	46	53.25	16.5	2.26	31.85	100	95	Peak
889.4	24.07	-21.93	46	31.81	20.5	3.34	31.58	-	-	Peak
2420	90.59	-	-	86.02	32.4	6.49	34.32	108	349	Average
2420	100.85	-	-	96.28	32.4	6.49	34.32	108	349	Peak
4845	47.88	-26.12	74	58.47	34.86	10.17	55.62	100	0	Peak
7266	49.64	-24.36	74	58.9	36.14	10.95	56.35	100	0	Peak





<b>Test Mode :</b>	2.4GHz 802.11n HT40	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	03	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. 2420 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
140.16	24.66	-18.84	43.5	44.27	10.83	1.31	31.75	-	-	Peak
196.05	21.47	-22.03	43.5	42.56	9.14	1.52	31.75	-	-	Peak
260.04	30.47	-15.53	46	46.71	13.7	1.79	31.73	-	-	Peak
331.5	20.55	-25.45	46	36.67	13.64	1.99	31.75	-	-	Peak
412	38.88	-7.12	46	52.23	16.26	2.22	31.83	100	145	Peak
888	24.1	-21.9	46	31.84	20.5	3.34	31.58	-	-	Peak
2420	90.38	-	-	85.81	32.4	6.49	34.32	100	213	Average
2420	99.94	-	-	95.37	32.4	6.49	34.32	100	213	Peak
4845	48.1	-25.9	74	58.69	34.86	10.17	55.62	100	0	Peak
7266	48.96	-25.04	74	58.22	36.14	10.95	56.35	100	0	Peak



<b>Test Mode :</b>	2.4GHz 802.11n HT40	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	1. 2435 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2435	91.26	-	-	86.66	32.4	6.52	34.32	103	295	Average
2435	101.12	-	-	96.52	32.4	6.52	34.32	103	295	Peak
4875	48.3	-25.7	74	58.95	34.85	10.18	55.68	100	0	Peak
7311	49.08	-24.92	74	58.28	36.14	10.94	56.28	100	0	Peak

<b>Test Mode :</b>	2.4GHz 802.11n HT40	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. 2435 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2435	90.75	-	-	86.15	32.4	6.52	34.32	100	237	Average
2435	100.66	-	-	96.06	32.4	6.52	34.32	100	237	Peak
4875	47.95	-26.05	74	58.6	34.85	10.18	55.68	100	0	Peak
7311	49.32	-24.68	74	58.52	36.14	10.94	56.28	100	0	Peak



<b>Test Mode :</b>	2.4GHz 802.11n HT40	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	09	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	1. 2450 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2450	91.42	-	-	86.78	32.43	6.52	34.31	103	278	Average
2450	101.94	-	-	97.3	32.43	6.52	34.31	103	278	Peak
4905	47.47	-26.53	74	58.18	34.83	10.2	55.74	100	0	Peak
7356	48.48	-25.52	74	57.61	36.13	10.92	56.18	100	0	Peak

<b>Test Mode :</b>	2.4GHz 802.11n HT40	<b>Temperature :</b>	22~24°C
<b>Test Channel :</b>	09	<b>Relative Humidity :</b>	47~49%
<b>Test Engineer :</b>	Marlboro Hsu	<b>Polarization :</b>	Vertical
<b>Remark :</b>	1. 2450 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2450	90.89	-	-	86.25	32.43	6.52	34.31	100	237	Average
2450	100.17	-	-	95.53	32.43	6.52	34.31	100	237	Peak
4905	46.97	-27.03	74	57.68	34.83	10.2	55.74	100	0	Peak
7356	49	-25	74	58.13	36.13	10.92	56.18	100	0	Peak

## 3.6 AC Conducted Emission Measurement

### 3.6.1 Limit of AC Conducted Emission

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

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

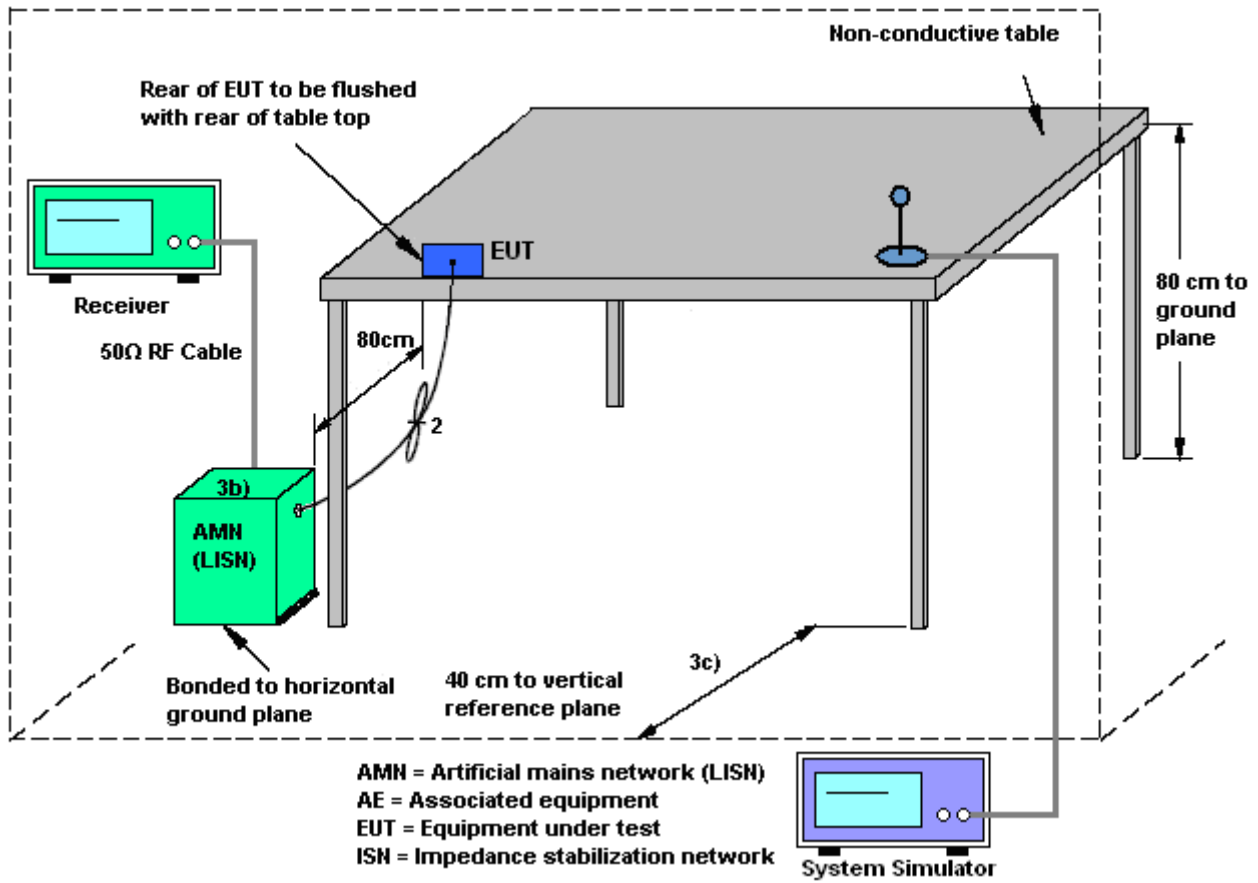
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

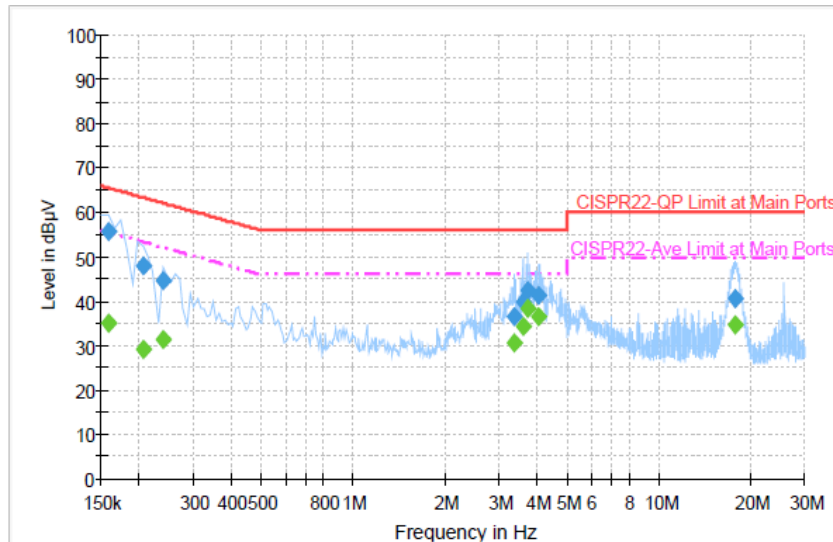
1. The testing follows the guidelines in ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

### 3.6.4 Test Setup



### 3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link + Notebook + Lamp		



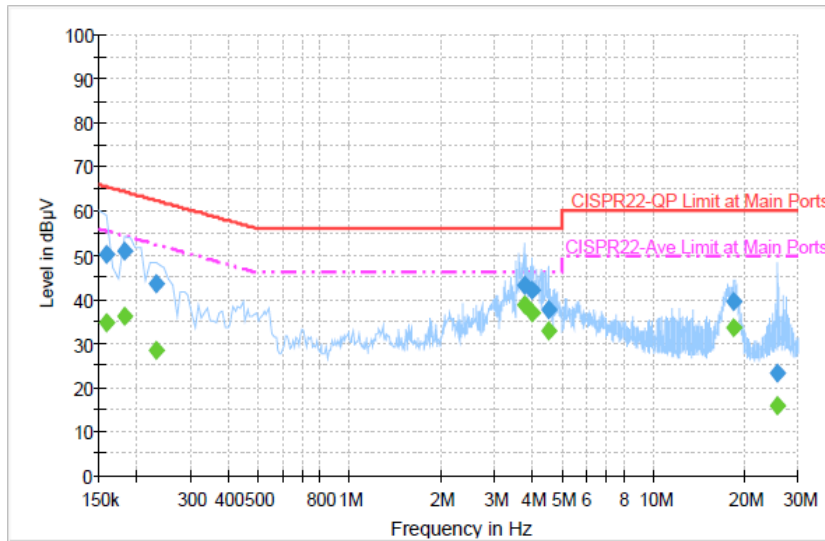
#### Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	55.7	Off	L1	19.3	9.9	65.6
0.206000	48.0	Off	L1	19.4	15.4	63.4
0.238000	44.7	Off	L1	19.5	17.5	62.2
3.374000	36.7	Off	L1	19.6	19.3	56.0
3.590000	39.8	Off	L1	19.6	16.2	56.0
3.718000	42.5	Off	L1	19.6	13.5	56.0
4.030000	41.3	Off	L1	19.6	14.7	56.0
17.710000	40.6	Off	L1	19.9	19.4	60.0

#### Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	35.1	Off	L1	19.3	20.5	55.6
0.206000	29.0	Off	L1	19.4	24.4	53.4
0.238000	31.2	Off	L1	19.5	21.0	52.2
3.374000	30.6	Off	L1	19.6	15.4	46.0
3.590000	34.3	Off	L1	19.6	11.7	46.0
3.718000	38.3	Off	L1	19.6	7.7	46.0
4.030000	36.5	Off	L1	19.6	9.5	46.0
17.710000	34.8	Off	L1	19.9	15.2	50.0

<b>Test Mode :</b>	Mode 1	<b>Temperature :</b>	20~22°C
<b>Test Engineer :</b>	Slash Huang	<b>Relative Humidity :</b>	45~47%
<b>Test Voltage :</b>	120Vac / 60Hz	<b>Phase :</b>	Neutral
<b>Function Type :</b>	WLAN Link + Notebook + Lamp		



**Final Result : Quasi-Peak**

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	50.3	Off	N	19.3	15.3	65.6
0.182000	50.9	Off	N	19.4	13.5	64.4
0.230000	43.6	Off	N	19.4	18.8	62.4
3.750000	43.2	Off	N	19.6	12.8	56.0
3.990000	42.0	Off	N	19.6	14.0	56.0
4.502000	37.5	Off	N	19.6	18.5	56.0
18.478000	39.6	Off	N	20.0	20.4	60.0
25.670000	23.2	Off	N	20.0	36.8	60.0

**Final Result : Average**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	34.8	Off	N	19.3	20.8	55.6
0.182000	36.1	Off	N	19.4	18.3	54.4
0.230000	28.3	Off	N	19.4	24.1	52.4
3.750000	38.8	Off	N	19.6	7.2	46.0
3.990000	36.9	Off	N	19.6	9.1	46.0
4.502000	33.0	Off	N	19.6	13.0	46.0
18.478000	33.5	Off	N	20.0	16.5	50.0
25.670000	16.0	Off	N	20.0	34.0	50.0



## **3.7 Antenna Requirements**

### **3.7.1 Standard Applicable**

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

### **3.7.2 Antenna Connected Construction**

Non-standard connector used.

### **3.7.3 Antenna Gain**

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.





## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 07, 2013	Jun. 13, 2013~ Jun. 19, 2013	Jun. 06, 2014	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Sep. 08, 2012	Jun. 13, 2013~ Jun. 19, 2013	Sep. 07, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Sep. 08, 2012	Jun. 13, 2013~ Jun. 19, 2013	Sep. 07, 2013	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 13, 2012	Jun. 03, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Jun. 03, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Jun. 03, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Jun. 03, 2013	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	FSP30	101352	9kHz~30GHz	Nov. 07, 2012	Jun. 21, 2013~ Jun. 22, 2013	Nov. 06, 2013	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY4421103 0	9kHz ~ 26.5GHz	Nov. 26, 2012	Jun. 21, 2013~ Jun. 22, 2013	Nov. 25, 2013	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2013	Jun. 21, 2013~ Jun. 22, 2013	May 05, 2014	Radiation (03CH06-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	860004/0001	9 kHz~30 MhZ	Jul. 03, 2012	Jun. 21, 2013~ Jun. 22, 2013	Jul. 03, 2014	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz ~ 2GHz	Oct. 06, 2012	Jun. 21, 2013~ Jun. 22, 2013	Oct. 05, 2013	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2012	Jun. 21, 2013~ Jun. 22, 2013	Jul. 31, 2013	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz ~ 1GHz	Apr. 12, 2013	Jun. 21, 2013~ Jun. 22, 2013	Apr. 11, 2014	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 21, 2012	Jun. 21, 2013~ Jun. 22, 2013	Jul. 20, 2013	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA91702 51	15GHz ~ 40GHz	Sep. 28, 2012	Jun. 21, 2013~ Jun. 22, 2013	Sep. 27, 2013	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 12, 2013	Jun. 21, 2013~ Jun. 22, 2013	Apr. 11, 2014	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 - 360 degree	N/A	Jun. 21, 2013~ Jun. 22, 2013	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF7802082 12	1 m ~ 4 m	N/A	Jun. 21, 2013~ Jun. 22, 2013	N/A	Radiation (03CH06-HY)



## 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.26
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### Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.54
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### Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.72
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