

# Variant IC RF Test Report

APPLICANT : Texas Instruments Incorporated  
EQUIPMENT : WiFi and Bluetooth Module  
BRAND NAME : Texas Instruments  
MODEL NAME : WL18MODGB  
IC : 451I-WL18SBMOD  
STANDARD : IC RSS-247 ISSUE 1

The product was received on Oct. 23, 2014 and testing was completed on Aug. 14, 2015. 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.



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Reviewed by: Joseph Lin / Supervisor



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Approved by: Jones Tsai / Manager



**SPORTON INTERNATIONAL INC.**

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## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
CR4O2349C	Rev. 01	This is a variant report by adding 6 new antennas. All the test cases were performed on original report which can be referred to Sporton Report Number CR3N2752-01CTX. Based on the original report, only the peak output power and conducted spurious emission and cabinet radiation were performed.	Aug. 28, 2015



## SUMMARY OF TEST RESULT

Report Section	IC Rule	Description	Limit	Result	Remark
3.1	RSS-247 A5.4(4)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.2	RSS-247 5.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.02 dB at 51.330 MHz
3.3	N/A	Antenna Requirement	N/A	Pass	-



# 1 General Description

## 1.1 Applicant

**Texas Instruments Incorporated**

12500 TI Boulevard, M/S 8751, Dallas, TX 75243, USA

## 1.2 Manufacturer

**Jorjin Technologies Inc**

17F, No.239, Sec. 1, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	WiFi and Bluetooth Module
Brand Name	Texas Instruments
Model Name	WL18MODGB
IC	451I-WL18SBMOD
EUT supports Radios application	WLAN 11b/g/n HT20/HT40 Bluetooth v4.0 EDR/LE
EUT Stage	Identical Prototype

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

## 1.4 Product Specification subjective to this standard

Product Specification subjective to this standard			
Tx/Rx Channel Frequency Range		802.11b/g/n : 2412 MHz ~ 2462 MHz	
Maximum Output Power to antenna		<b>&lt;Ant. 1&gt;</b> 802.11b : 17.93 dBm (0.0607 W) 802.11g : 20.58 dBm (0.1143 W) 802.11n HT40 : 20.18 dBm (0.1042 W) <b>SISO&lt;Ant. 1&gt;</b> 802.11n HT20 : 20.55 dBm (0.1135 W) <b>MIMO&lt;Ant. 1 + 2&gt;</b> 802.11n HT20 : 23.52 dBm (0.2249 W)	
Type of Modulation		802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)	
Antenna Function for Transmitter			
		Chain Port 0 Ant. 1	Chain Port 1 Ant. 2
		802.11 b	-
		802.11 g	-
		802.11 n SISO	-
802.11 n MIMO		V	V

Antenna Information		
Antenna Type	Brand	2.4GHz~2.5GHz
PCB	Ethertronics	-0.6
Dipole	LSR	2
PCB	Laird	2
Chip	Pulse	3.2
PIFA	LSR	2

## 1.5 Modification of EUT

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

## 1.6 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.

<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 District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	
	TH05-HY	

<b>Test Site</b>	SPORTON INTERNATIONAL INC.	
<b>Test Site Location</b>	No. 58 , Aly. 75, Ln. 564, Wenhua 3rd Rd., Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-0855	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>IC Registration No.</b>
	03CH10	4086H-1

**Note:** The test site complies with ANSI C63.4 2009 requirement.

## 1.7 Applicable Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

### Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. FCC permits the use of the 1.5 meter table for frequency above 1GHz as an alternative in C63.10-2013 through inquiry tracking number 961829.
3. 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: 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 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		
Channel	CH 01	CH 06	CH 11
Peak Power (dBm)	17.93	17.73	17.51

802.11g			
Data Rate (MHz)	6Mbps		
Channel	CH 01	CH 06	CH 11
Peak Power (dBm)	20.17	20.58	19.82

2.4GHz 802.11n HT40			
Data Rate (MHz)	MCS0		
Channel	CH 03	CH 06	CH 09
Peak Power (dBm)	19.21	20.18	18.91

SISO<Ant. 1>

2.4GHz 802.11n HT20			
Data Rate (MHz)	MCS0		
Channel	CH 01	CH 06	CH 11
Peak Power (dBm)	20.15	20.55	19.66

MIMO<Ant. 1 + 2>

2.4GHz 802.11n HT20			
Data Rate (MHz)	MCS12		
Channel	CH 01	CH 06	CH 11
Peak Power (dBm)	23.33	23.52	23.14

**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 test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

### Single Antenna

<2.4GHz>

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

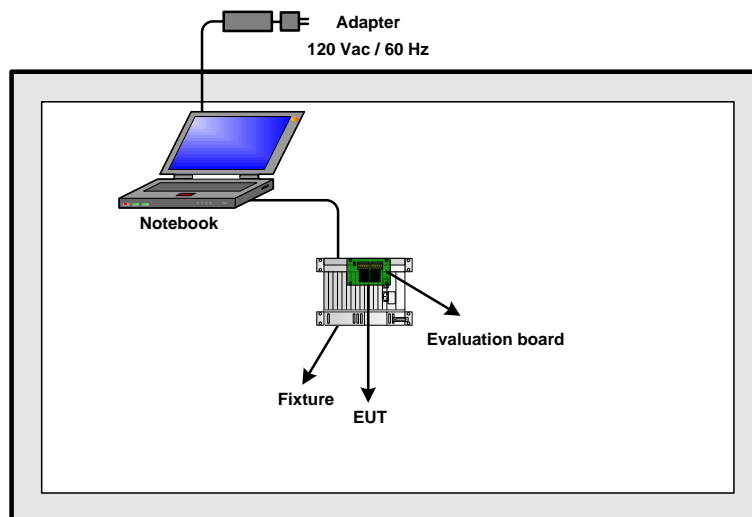
### MIMO Antenna

<2.4GHz>

Modulation	Data Rate
802.11n HT20	MCS12

## 2.4 Connection Diagram of Test System

<WLAN Tx Mode>



## 2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	Lenovo	E335 (with WiFi module TP00034A)	FCC DoC/ Contains FCC ID:QDS-BRCM1058	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, "Rttt" installed in the EUT 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.

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

### 3 Test Result

#### 3.1 Peak Output Power Measurement

##### 3.1.1 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.

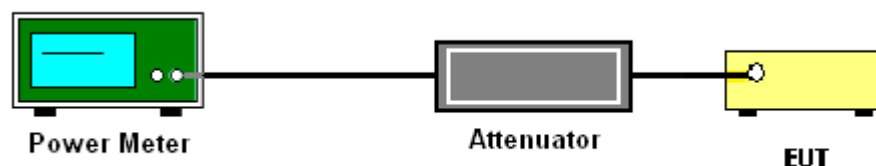
##### 3.1.2 Measuring Instruments

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

##### 3.1.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r03 section 9.1.2 PKPM1 Peak power meter method.
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.

##### 3.1.4 Test Setup





### **3.1.5 Test Result of Peak Output Power**

Please refer to Appendix A.

### **3.1.6 Test Result of Average output Power (Reporting Only)**

Please refer to Appendix A.



## **3.2 Radiated Band Edges and Spurious Emission Measurement**

### **3.2.1 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.

<b>Frequency (MHz)</b>	<b>Field Strength (microvolts/meter)</b>	<b>Measurement Distance (meters)</b>
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

### **3.2.2 Measuring Instruments**

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

### 3.2.3 Test Procedure

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
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 for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively 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:

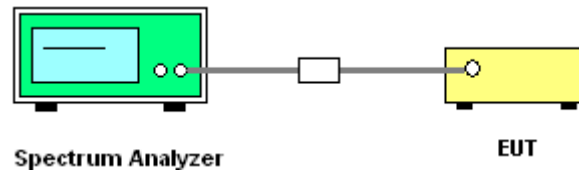
  - VBW = 10 Hz, when duty cycle is no less than 98 percent.
  - VBW  $\geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1	802.11b	40.76	640	1.5625	3kHz
1	802.11g	32.69	340	2.94	3kHz
1	2.4GHz 802.11n HT20	33.02	350	2.86	3kHz
1	2.4GHz 802.11n HT40	30.39	310	3.23	10kHz
1+2	2.4GHz 802.11n HT20 for Ant 1	30.88	210	4.76	10kHz
1+2	2.4GHz 802.11n HT20 for Ant 2	30.88	210	4.76	10kHz

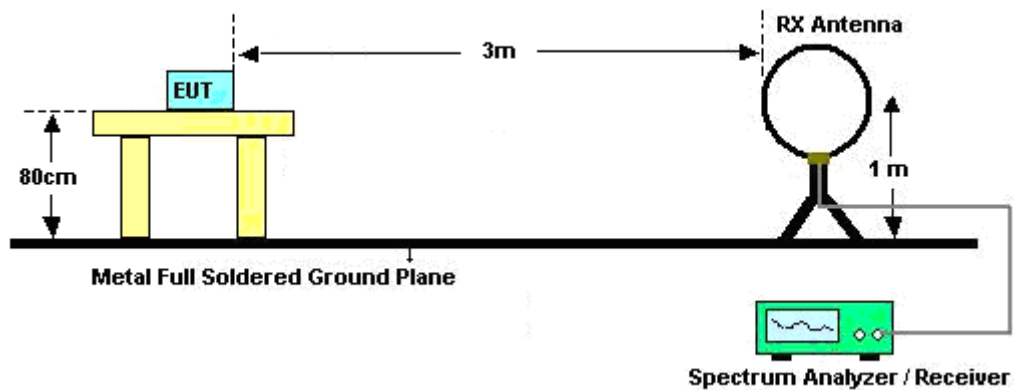


### 3.2.4 Test Setup

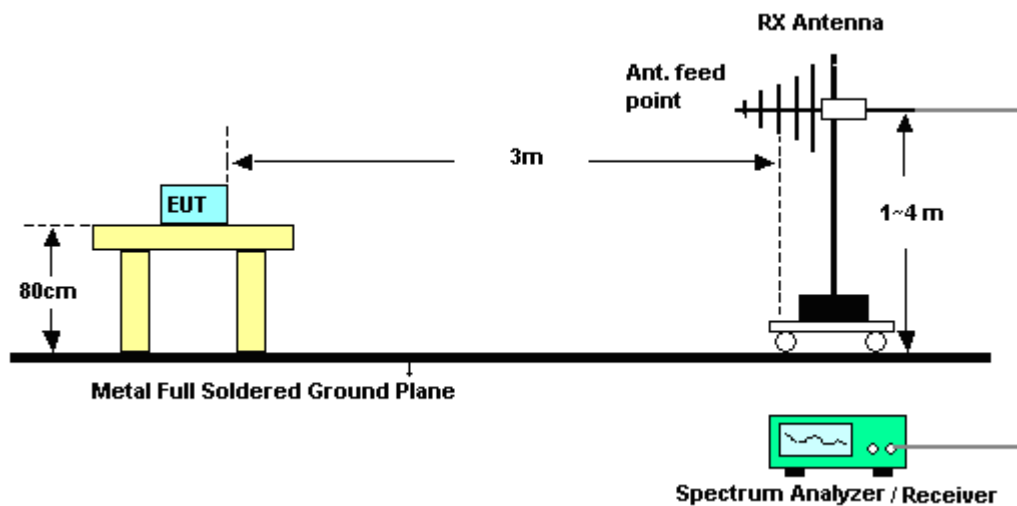
For Conducted Measurement Setup:



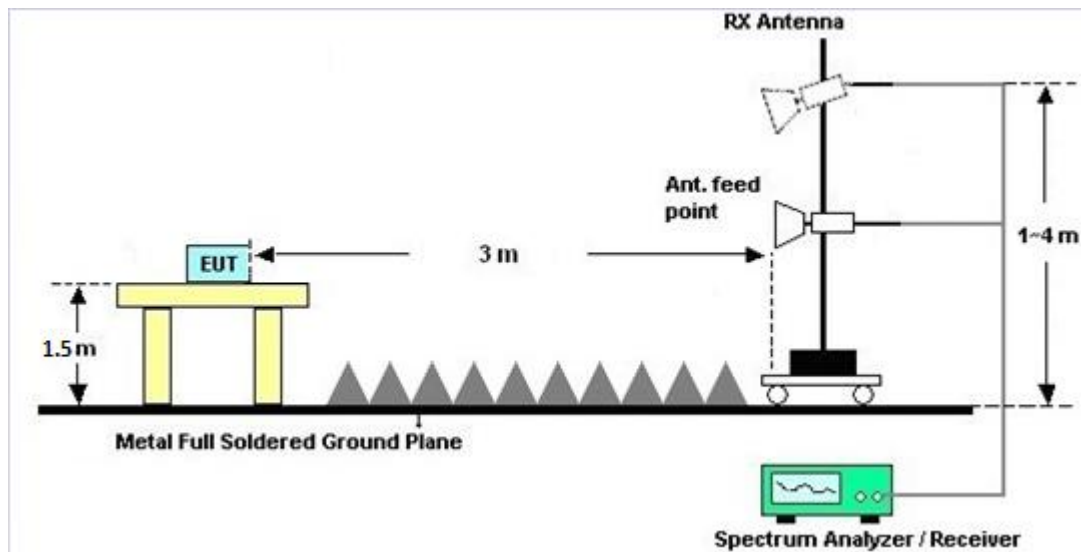
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.2.5 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.

### 3.2.6 Test Result of Conducted Spurious at Band Edges in the Restricted Band

Please refer to Appendix B.

### 3.2.7 Test Result of Conducted Spurious Emission in the Restricted Band

Please refer to Appendix B.

### 3.2.8 Test Result of Cabinet Radiated Spurious at Band Edges

Please refer to Appendix C.

### 3.2.9 Test Result of Cabinet Radiated Spurious Emission (30MHz ~ 10<sup>th</sup> Harmonic)

Please refer to Appendix C.

### 3.3 Antenna Requirements

#### 3.3.1 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.

#### 3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

#### 3.3.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

For CDD transmissions, directional gain is calculated as

Directional gain =  $G_{ANT} + \text{Array Gain}$ , where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain =  $10 \log(N_{ANT}/N_{SS}=1)$  dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$ .

The EUT supports only MCS 12-15 for MIMO mode, hence  $N_{ss}=2$ .

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

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

			DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Ant. 1 (dBi)	Ant. 2 (dBi)				
2.4 GHz	3.20	3.20	3.20	3.20	0.00	0.00

$\text{Power Limit Reduction} = DG(\text{Power}) - 6\text{dBi}, (\text{min} = 0)$

$\text{PSD Limit Reduction} = DG(\text{PSD}) - 6\text{dBi}, (\text{min} = 0)$



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1218006	300MHz~40GHz	Oct. 18, 2014	Aug. 07, 2015~ Aug. 13, 2015	Oct. 17, 2015	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1126017	300MHz~40GHz	Oct. 18, 2014	Aug. 07, 2015~ Aug. 13, 2015	Oct. 17, 2015	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Jun. 18, 2015	Aug. 07, 2015~ Aug. 13, 2015	Jun. 17, 2016	Conducted (TH05-HY)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Nov. 03, 2014	Aug. 13, 2015~ Aug. 14, 2015	Nov. 02, 2015	Radiation (03CH10-HY)
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	Feb. 02, 2015	Aug. 13, 2015~ Aug. 14, 2015	Feb. 01, 2016	Radiation (03CH10-HY)
Amplifier	SONOMA	310N	187311	9kHz~1GHz	Nov. 24, 2014	Aug. 13, 2015~ Aug. 14, 2015	Nov. 23, 2015	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D	35413	30MHz~1GHz	Oct. 24, 2014	Aug. 13, 2015~ Aug. 14, 2015	Oct. 23, 2015	Radiation (03CH10-HY)
EMI Test Receiver	Keysight	N9038A	MY541300 85	20Hz ~ 8.4GHz	Nov. 05, 2014	Aug. 13, 2015~ Aug. 14, 2015	Nov. 04, 2015	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-132 5	1GHz ~ 18GHz	Oct. 03, 2014	Aug. 13, 2015~ Aug. 14, 2015	Oct. 02, 2015	Radiation (03CH10-HY)
Preamplifier	Keysight	83017A	MY532700 78	1GHz~26.5GHz	Nov. 20, 2014	Aug. 13, 2015~ Aug. 14, 2015	Nov. 19, 2015	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 85	10Hz ~ 44GHZ	Oct. 14, 2014	Aug. 13, 2015~ Aug. 14, 2015	Oct. 13, 2015	Radiation (03CH10-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Aug. 13, 2015~ Aug. 14, 2015	N/A	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Aug. 13, 2015~ Aug. 14, 2015	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0-360 degree	N/A	Aug. 13, 2015~ Aug. 14, 2015	N/A	Radiation (03CH10-HY)
Preamplifier	MITEQ	JS44-180040 00-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	Aug. 13, 2015~ Aug. 14, 2015	Jun. 01, 2016	Radiation (03CH10-HY)



## 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.90
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## **APPENDIX A. TEST RESULT OF CONDUCTED POWER**

Test Engineer:	Bill Kuo	Temperature:	21~25	°C
Test Date:	2015/8/12	Relative Humidity:	51~54	%

**TEST RESULTS DATA**  
**Peak Output Power**

2.4GHz Band																
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11b	1Mbps	1	1	2412	17.93			30.00	30.00	3.20	3.20	21.13		36.00	36.00	Pass
11b	1Mbps	1	6	2437	17.73			30.00	30.00	3.20	3.20	20.93		36.00	36.00	Pass
11b	1Mbps	1	11	2462	17.51			30.00	30.00	3.20	3.20	20.71		36.00	36.00	Pass
11g	6Mbps	1	1	2412	20.17			30.00	30.00	3.20	3.20	23.37		36.00	36.00	Pass
11g	6Mbps	1	6	2437	20.58			30.00	30.00	3.20	3.20	23.78		36.00	36.00	Pass
11g	6Mbps	1	11	2462	19.82			30.00	30.00	3.20	3.20	23.02		36.00	36.00	Pass
HT20	MCS0	1	1	2412	20.15			30.00	30.00	3.20	3.20	23.35		36.00	36.00	Pass
HT20	MCS0	1	6	2437	20.55			30.00	30.00	3.20	3.20	23.75		36.00	36.00	Pass
HT20	MCS0	1	11	2462	19.66			30.00	30.00	3.20	3.20	22.86		36.00	36.00	Pass
HT40	MCS0	1	3	2422	19.21			30.00	30.00	3.20	3.20	22.41		36.00	36.00	Pass
HT40	MCS0	1	6	2437	20.18			30.00	30.00	3.20	3.20	23.38		36.00	36.00	Pass
HT40	MCS0	1	9	2452	18.91			30.00	30.00	3.20	3.20	22.11		36.00	36.00	Pass
HT20	MCS12	2	1	2412	19.89	20.71	23.33	30.00		3.20		26.53		36.00		Pass
HT20	MCS12	2	6	2437	20.12	20.87	23.52	30.00		3.20		26.72		36.00		Pass
HT20	MCS12	2	11	2462	19.48	20.69	23.14	30.00		3.20		26.34		36.00		Pass

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



**TEST RESULTS DATA**  
**Average Output Power**

2.4GHz Band									
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)		
					Ant 1	Ant 2	Ant 1	Ant 2	SUM
11b	1Mbps	1	1	2412	3.90		16.01		
11b	1Mbps	1	6	2437	3.90		15.92		
11b	1Mbps	1	11	2462	3.90		15.69		
11g	6Mbps	1	1	2412	4.86		12.01		
11g	6Mbps	1	6	2437	4.86		16.48		
11g	6Mbps	1	11	2462	4.86		11.81		
HT20	MCS0	1	1	2412	4.81		12.22		
HT20	MCS0	1	6	2437	4.81		15.71		
HT20	MCS0	1	11	2462	4.81		11.72		
HT40	MCS0	1	3	2422	5.17		10.22		
HT40	MCS0	1	6	2437	5.17		14.33		
HT40	MCS0	1	9	2452	5.17		9.89		
HT20	MCS12	2	1	2412	5.10	5.10	11.82	12.91	15.41
HT20	MCS12	2	6	2437	5.10	5.10	13.35	13.55	16.46
HT20	MCS12	2	11	2462	5.10	5.10	11.35	12.78	15.14

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



## Appendix B. Test Result of Conducted Spurious

### Test Result of Conducted Spurious at Band Edges in the Restricted Band

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Avg
1		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	( P/A )
802.11b CH 01 2412MHz		2389.94	-44.12	-22.92	-21.2	-48.59	3.2	1.27	0	P
		2389.96	-50.90	-9.7	-41.2	-55.37	3.2	1.27	0	A
	*	2413.277	13.70	-	-	9.23	3.2	1.27	0	P
	*	2411.272	9.73	-	-	5.26	3.2	1.27	0	A
802.11b CH 06 2437MHz		2389.54	-48.47	-27.27	-21.2	-52.94	3.2	1.27	0	P
		2389.66	-55.60	-14.4	-41.2	-60.07	3.2	1.27	0	A
	*	2438.326	13.30	-	-	8.82	3.2	1.28	0	P
	*	2436.323	9.42	-	-	4.94	3.2	1.28	0	A
		2484.60	-47.37	-26.17	-21.2	-51.85	3.2	1.28	0	P
		2484.96	-54.85	-13.65	-41.2	-59.33	3.2	1.28	0	A
802.11b CH 11 2462MHz	*	2460.872	13.3	-	-	8.82	3.2	1.28	0	P
	*	2461.289	9.40	-	-	4.92	3.2	1.28	0	A
		2483.72	-43.01	-21.81	-21.2	-47.49	3.2	1.28	0	P
		2483.84	-50.73	-9.53	-41.2	-55.21	3.2	1.28	0	A

**15C 2.4GHz 2400~2483.5MHz****WIFI 802.11g (Band Edge @ 3m)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Avg
1		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	( P/A )
<b>802.11g</b> <b>CH 01</b> <b>2412MHz</b>		2389.92	-29.96	-8.76	-21.2	-34.43	3.2	1.27	0	P
		2389.66	-48.13	-6.93	-41.2	-52.6	3.2	1.27	0	A
	*	2410.521	15.8	-	-	11.33	3.2	1.27	0	P
	*	2413.611	6.34	-	-	1.87	3.2	1.27	0	A
<b>802.11g</b> <b>CH 06</b> <b>2437MHz</b>		2389.48	-38.28	-17.08	-21.2	-42.75	3.2	1.27	0	P
		2389.38	-51.67	-10.47	-41.2	-56.14	3.2	1.27	0	A
	*	2435.571	20.06	-	-	15.58	3.2	1.28	0	P
	*	2435.154	11.05	-	-	6.57	3.2	1.28	0	A
		2485.28	-40.64	-19.44	-21.2	-45.12	3.2	1.28	0	P
		2483.52	-53.66	-12.46	-41.2	-58.14	3.2	1.28	0	A
<b>802.11g</b> <b>CH 11</b> <b>2462MHz</b>	*	2460.287	15.4	-	-	10.92	3.2	1.28	0	P
	*	2460.872	6.09	-	-	1.61	3.2	1.28	0	A
		2483.56	-33.19	-11.99	-21.2	-37.67	3.2	1.28	0	P
		2483.54	-47.97	-6.77	-41.2	-52.45	3.2	1.28	0	A


**15C 2.4GHz 2400~2483.5MHz**
**WIFI 802.11n HT20 (Band Edge @ 3m)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Avg
1		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	( P/A )
802.11n HT20 CH 01 2412MHz		2390.00	-33.65	-12.45	-21.2	-38.12	3.2	1.27	0	P
		2389.96	-45.96	-4.76	-41.2	-50.43	3.2	1.27	0	A
	*	2413.444	12.64	-	-	8.17	3.2	1.27	0	P
	*	2413.861	3.56	-	-	-0.91	3.2	1.27	0	A
802.11n HT20 CH 06 2437MHz		2389.74	-37.35	-16.15	-21.2	-41.82	3.2	1.27	0	P
		2390.00	-54.28	-13.08	-41.2	-58.75	3.2	1.27	0	A
	*	2438.41	16.06	-	-	11.58	3.2	1.28	0	P
	*	2438.94	7.24	-	-	2.76	3.2	1.28	0	A
		2483.54	-39.78	-18.58	-21.2	-44.26	3.2	1.28	0	P
		2483.52	-53.87	-12.67	-41.2	-58.35	3.2	1.28	0	A
802.11n HT20 CH 11 2462MHz	*	2460.287	13.41	-	-	8.93	3.2	1.28	0	P
	*	2460.872	3.5	-	-	-0.98	3.2	1.28	0	A
		2483.54	-31.24	-10.04	-21.2	-35.72	3.2	1.28	0	P
		2483.50	-47.07	-5.87	-41.2	-51.55	3.2	1.28	0	A


**15C 2.4GHz 2400~2483.5MHz**
**WIFI 802.11n HT40 (Band Edge @ 3m)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Avg
1		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	( P/A )
802.11n HT40 CH 03 2422MHz		2389.92	-27.55	-6.35	-21.2	-32.02	3.2	1.27	0	P
		2389.72	-43.88	-2.68	-41.2	-48.35	3.2	1.27	0	A
	*	2409.853	8.66	-	-	4.19	3.2	1.27	0	P
	*	2413.945	-1.33	-	-	-5.8	3.2	1.27	0	A
802.11n HT40 CH 06 2437MHz		2389.82	-24.37	-3.17	-21.2	-28.84	3.2	1.27	0	P
		2389.88	-41.4	-0.20	-41.2	-45.87	3.2	1.27	0	A
	*	2424.96	13.08	-	-	8.6	3.2	1.27	0	P
	*	2425.46	2.92	-	-	-1.56	3.2	1.27	0	A
		2483.62	-24.85	-3.65	-21.2	-29.33	3.2	1.28	0	P
		2483.52	-41.96	-0.76	-41.2	-46.44	3.2	1.28	0	A
802.11n HT40 CH 09 2452MHz	*	2444.673	8.69	-	-	4.21	3.2	1.28	0	P
	*	2444.088	-0.93	-	-	-5.41	3.2	1.28	0	A
		2484.16	-29.37	-8.17	-21.2	-33.85	3.2	1.28	0	P
		2483.54	-44.42	-3.22	-41.2	-48.9	3.2	1.28	0	A



## 15C 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT20 MIMO (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	MIMO	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg
1+2(1)		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	(dB)	(P/A)
802.11n		2389.86	-24.03	-2.83	-21.2	-31.51	3.2	1.27	0	3.01	P
HT20		2390.00	-44.11	-2.91	-41.2	-51.59	3.2	1.27	0	3.01	A
CH 01	*	2413.11	16.08	-	-	8.6	3.2	1.27	0	3.01	P
2412MHz	*	2410.68	6.66	-	-	-0.82	3.2	1.27	0	3.01	A
802.11n		2389.78	-24.2	-3	-21.2	-31.68	3.2	1.27	0	3.01	P
HT20		2390.00	-44.19	-2.99	-41.2	-51.67	3.2	1.27	0	3.01	A
CH 06	*	2434.15	17.69	-	-	10.2	3.2	1.27	0	3.01	P
2437MHz	*	2435.82	7.19	-	-	-0.3	3.2	1.27	0	3.01	A
802.11n		2483.56	-41.91	-20.71	-21.2	-49.4	3.2	1.28	0	3.01	P
HT20		2483.56	-53.79	-12.59	-41.2	-61.28	3.2	1.28	0	3.01	A
CH 11	*	2463.126	16.55	-	-	9.06	3.2	1.28	0	3.01	P
2462MHz	*	2461.039	5.52	-	-	-1.97	3.2	1.28	0	3.01	A
802.11n		2483.58	-26.09	-4.89	-21.2	-33.58	3.2	1.28	0	3.01	P
HT20		2483.52	-43.8	-2.6	-41.2	-51.29	3.2	1.28	0	3.01	A
1+2(2)											
802.11n		2389.62	-25.33	-4.13	-21.2	-32.81	3.2	1.27	0	3.01	P
HT20		2389.94	-42.06	-0.86	-41.2	-49.54	3.2	1.27	0	3.01	A
CH 01	*	2412.00	15.98	-	-	8.5	3.2	1.27	0	3.01	P
2412MHz	*	2411.00	5.89	-	-	-1.59	3.2	1.27	0	3.01	A
802.11n		2389.92	-41.96	-20.76	-21.2	-49.44	3.2	1.27	0	3.01	P
HT20		2389.98	-54.32	-13.12	-41.2	-61.8	3.2	1.27	0	3.01	A
CH 06	*	2435.00	18.08	-	-	10.59	3.2	1.27	0	3.01	P
2437MHz	*	2436.00	7.98	-	-	0.49	3.2	1.27	0	3.01	A
802.11n		2483.66	-42.14	-20.94	-21.2	-49.63	3.2	1.28	0	3.01	P
HT20		2483.50	-54.8	-13.6	-41.2	-62.29	3.2	1.28	0	3.01	A
CH 11	*	2463.00	18.46	-	-	10.97	3.2	1.28	0	3.01	P
2462MHz	*	2462.00	5.99	-	-	-1.5	3.2	1.28	0	3.01	A
802.11n		2483.94	-22.38	-1.18	-21.2	-29.87	3.2	1.28	0	3.01	P
HT20		2483.60	-41.6	-0.40	-41.2	-49.09	3.2	1.28	0	3.01	A


**1.1.1 Test Result of Conducted Spurious Emission in the Restricted Band**
**15C 2.4GHz 2400~2483.5MHz**
**WIFI 802.11b (Harmonic @ 3m)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Avg
1		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	(P/A)
<b>802.11b CH 01 2412MHz</b>		105.66	-80.91	-29.21	-51.7	-89.03	3.2	0.22	4.7	P
		213.33	-80.47	-28.77	-51.7	-88.72	3.2	0.35	4.7	P
		281.23	-80.92	-31.72	-49.2	-89.21	3.2	0.39	4.7	P
		396.66	-81.13	-31.93	-49.2	-89.46	3.2	0.43	4.7	P
		631.4	-80.12	-30.92	-49.2	-88.55	3.2	0.53	4.7	P
		846.74	-79.57	-30.37	-49.2	-88.07	3.2	0.6	4.7	P
		4826	-68.5	-47.3	-21.2	-73.37	3.2	1.67	0	P
		7246	-65.41	-44.21	-21.2	-70.66	3.2	2.05	0	P
<b>802.11b CH 06 2437MHz</b>		173.56	-80.47	-28.77	-51.7	-88.67	3.2	0.3	4.7	P
		242.43	-80.95	-31.75	-49.2	-89.23	3.2	0.38	4.7	P
		473.29	-80.3	-31.1	-49.2	-88.67	3.2	0.47	4.7	P
		634.31	-80.76	-31.56	-49.2	-89.19	3.2	0.53	4.7	P
		755.56	-80.34	-31.14	-49.2	-88.83	3.2	0.59	4.7	P
		980.6	-80.77	-39.57	-41.2	-89.33	3.2	0.66	4.7	P
		4892	-67.99	-46.79	-21.2	-72.88	3.2	1.69	0	P
		7312	-66.19	-44.99	-21.2	-71.38	3.2	1.99	0	P
<b>802.11b CH 11 2462MHz</b>		44.55	-80.44	-25.24	-55.2	-88.53	3.2	0.19	4.7	P
		246.31	-80.69	-31.49	-49.2	-88.97	3.2	0.38	4.7	P
		418.97	-80.3	-31.1	-49.2	-88.63	3.2	0.43	4.7	P
		580.96	-80.24	-31.04	-49.2	-88.65	3.2	0.51	4.7	P
		712.88	-80.88	-31.68	-49.2	-89.35	3.2	0.57	4.7	P
		981.57	-80.12	-38.92	-41.2	-88.68	3.2	0.66	4.7	P
		4936	-64.58	-43.38	-21.2	-72.49	3.2	1.7	0	P
		7400	-68.27	-47.07	-21.2	-76.41	3.2	1.93	0	P

**15C 2.4GHz 2400~2483.5MHz****WIFI 802.11g (Harmonic @ 3m)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Avg
1		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	( P/A )
<b>802.11g CH 01 2412MHz</b>		34.85	-80.38	-25.18	-55.2	-88.45	3.2	0.17	4.7	P
		216.24	-80.72	-31.52	-49.2	-88.97	3.2	0.35	4.7	P
		450.98	-80.34	-31.14	-49.2	-88.68	3.2	0.44	4.7	P
		644.01	-80.26	-31.06	-49.2	-88.7	3.2	0.54	4.7	P
		782.72	-81.19	-31.99	-49.2	-89.67	3.2	0.58	4.7	P
		991.27	-79.89	-38.69	-41.2	-88.48	3.2	0.69	4.7	P
		4738	-72.99	-51.79	-21.2	-77.85	3.2	1.66	0	P
		7246	-67.74	-46.54	-21.2	-72.99	3.2	2.05	0	P
<b>802.11g CH 06 2437MHz</b>		74.62	-80.02	-24.82	-55.2	-88.13	3.2	0.21	4.7	P
		217.21	-80.78	-31.58	-49.2	-89.03	3.2	0.35	4.7	P
		409.27	-80.6	-31.4	-49.2	-88.93	3.2	0.43	4.7	P
		529.55	-79.5	-30.3	-49.2	-87.87	3.2	0.47	4.7	P
		787.57	-79.75	-30.55	-49.2	-88.22	3.2	0.57	4.7	P
		925.31	-80.57	-39.37	-41.2	-89.1	3.2	0.63	4.7	P
		4870	-68.01	-46.81	-21.2	-72.89	3.2	1.68	0	P
		7312	-60.76	-39.56	-21.2	-65.95	3.2	1.99	0	P
<b>802.11g CH 11 2462MHz</b>		76.56	-79.68	-24.48	-55.2	-87.79	3.2	0.21	4.7	P
		296.75	-80.44	-31.24	-49.2	-88.73	3.2	0.39	4.7	P
		527.61	-80.67	-31.47	-49.2	-89.04	3.2	0.47	4.7	P
		599.39	-80.31	-31.11	-49.2	-88.74	3.2	0.53	4.7	P
		787.57	-80.42	-31.22	-49.2	-88.89	3.2	0.57	4.7	P
		996.12	-80.79	-39.59	-41.2	-89.38	3.2	0.69	4.7	P
		4936	-70.75	-49.55	-21.2	-75.65	3.2	1.7	0	P
		7400	-72.08	-50.88	-21.2	-77.21	3.2	1.93	0	P




**15C 2.4GHz 2400~2483.5MHz**
**WIFI 802.11n HT20 (Harmonic @ 3m)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Avg
1		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	( P/A )
802.11n HT20 CH 01 2412MHz		41.64	-80.01	-24.81	-55.2	-88.1	3.2	0.19	4.7	P
		352.04	-79.77	-30.57	-49.2	-88.06	3.2	0.39	4.7	P
		518.88	-80.35	-31.15	-49.2	-88.72	3.2	0.47	4.7	P
		727.43	-80.55	-31.35	-49.2	-89.02	3.2	0.57	4.7	P
		831.22	-79.69	-30.49	-49.2	-88.18	3.2	0.59	4.7	P
		935.98	-79.8	-38.6	-41.2	-88.33	3.2	0.63	4.7	P
		4298	-72.99	-51.79	-21.2	-77.84	3.2	1.65	0	P
		7246	-70.1	-48.9	-21.2	-75.35	3.2	2.05	0	P
802.11n HT20 CH 06 2437MHz		166.77	-80.14	-28.44	-51.7	-88.34	3.2	0.3	4.7	P
		296.75	-80.85	-31.65	-49.2	-89.14	3.2	0.39	4.7	P
		496.57	-79.69	-30.49	-49.2	-88.03	3.2	0.44	4.7	P
		699.3	-79.77	-30.57	-49.2	-88.22	3.2	0.55	4.7	P
		850.62	-80.53	-31.33	-49.2	-89.03	3.2	0.6	4.7	P
		959.26	-81.05	-39.85	-41.2	-89.58	3.2	0.63	4.7	P
		4892	-70.15	-48.95	-21.2	-75.04	3.2	1.69	0	P
		7312	-63.04	-41.84	-21.2	-68.23	3.2	1.99	0	P
802.11n HT20 CH 11 2462MHz		142.52	-80.64	-28.94	-51.7	-88.81	3.2	0.27	4.7	P
		307.42	-80.2	-31	-49.2	-88.49	3.2	0.39	4.7	P
		438.37	-79.65	-30.45	-49.2	-87.99	3.2	0.44	4.7	P
		648.86	-80.94	-31.74	-49.2	-89.38	3.2	0.54	4.7	P
		741.01	-81.09	-31.89	-49.2	-89.58	3.2	0.59	4.7	P
		988.36	-80.15	-38.95	-41.2	-88.74	3.2	0.69	4.7	P
		4936	-70.93	-49.73	-21.2	-75.83	3.2	1.7	0	P
		7400	-69.56	-48.36	-21.2	-74.69	3.2	1.93	0	P



## 15C 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Avg
1		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	( P/A )
802.11n HT40 CH 03 2422MHz		124.09	-70.51	-18.81	-51.7	-78.67	3.2	0.26	4.7	P
		324.88	-70.36	-21.16	-49.2	-78.64	3.2	0.38	4.7	P
		428.67	-71.39	-22.19	-49.2	-79.72	3.2	0.43	4.7	P
		592.6	-71.75	-22.55	-49.2	-80.18	3.2	0.53	4.7	P
		715.79	-71.83	-22.63	-49.2	-80.3	3.2	0.57	4.7	P
		892.33	-71.33	-22.13	-49.2	-79.86	3.2	0.63	4.7	P
		4826	-72.92	-51.72	-21.2	-77.79	3.2	1.67	0	P
		7026	-70.18	-48.98	-21.2	-75.5	3.2	2.12	0	P
802.11n HT40 CH 06 2437MHz		127.97	-70.8	-19.1	-51.7	-78.96	3.2	0.26	4.7	P
		214.3	-70.84	-21.64	-49.2	-79.09	3.2	0.35	4.7	P
		471.35	-71.15	-21.95	-49.2	-79.52	3.2	0.47	4.7	P
		604.24	-71.87	-22.67	-49.2	-80.3	3.2	0.53	4.7	P
		771.08	-71.17	-21.97	-49.2	-79.65	3.2	0.58	4.7	P
		913.67	-71.35	-22.15	-49.2	-79.88	3.2	0.63	4.7	P
		4870	-73.17	-51.97	-21.2	-78.05	3.2	1.68	0	P
		7290	-66.88	-45.68	-21.2	-72.09	3.2	2.01	0	P
802.11n HT40 CH 09 2452MHz		167.74	-70.89	-19.19	-51.7	-79.09	3.2	0.3	4.7	P
		350.1	-71.08	-21.88	-49.2	-79.37	3.2	0.39	4.7	P
		417.03	-70.83	-21.63	-49.2	-79.16	3.2	0.43	4.7	P
		662.44	-71.4	-22.2	-49.2	-79.85	3.2	0.55	4.7	P
		870.99	-71.31	-22.11	-49.2	-79.83	3.2	0.62	4.7	P
		908.82	-70.94	-21.74	-49.2	-79.47	3.2	0.63	4.7	P
		4826	-72.5	-51.3	-21.2	-77.37	3.2	1.67	0	P
		7312	-71.99	-50.79	-21.2	-77.18	3.2	1.99	0	P



## 15C 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT20 MIMO (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	MIMO	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg
1+2(1)		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	(dB)	(P/A)
802.11n HT20 CH 01 2412MHz		44.85	-58.61	-3.41	-55.2	-65.01	3.2	0.19	4.7	3.01	P
		171.48	-59.28	-7.58	-51.7	-65.88	3.2	0.39	4.7	3.01	P
		226.02	-58.54	-9.34	-49.2	-65.22	3.2	0.47	4.7	3.01	P
		421.1	-58.2	-9	-49.2	-64.98	3.2	0.57	4.7	3.01	P
		741	-56.91	-7.71	-49.2	-63.71	3.2	0.59	4.7	3.01	P
		871.9	-57.48	-8.28	-49.2	-64.32	3.2	0.63	4.7	3.01	P
		4824	-38.88	-17.68	-21.2	-46.74	3.2	1.65	0	3.01	P
		4824	-42.47	-1.27	-41.2	-50.33	3.2	1.65	0	3.01	A
802.11n HT20 CH 06 2437MHz		97.5	-59.61	-7.91	-51.7	-66.12	3.2	0.3	4.7	3.01	P
		152.58	-59.54	-7.84	-51.7	-66.14	3.2	0.39	4.7	3.01	P
		206.31	-59.15	-7.45	-51.7	-65.8	3.2	0.44	4.7	3.01	P
		367.2	-57.89	-8.69	-49.2	-64.65	3.2	0.55	4.7	3.01	P
		627.6	-56.02	-6.82	-49.2	-62.83	3.2	0.6	4.7	3.01	P
		799.8	-56.22	-7.02	-49.2	-63.06	3.2	0.63	4.7	3.01	P
		4875	-39.47	-18.27	-21.2	-47.37	3.2	1.69	0	3.01	P
		4875	-45.12	-3.92	-41.2	-53.02	3.2	1.69	0	3.01	A
		7311	-53.69	-32.49	-21.2	-61.89	3.2	1.99	0	3.01	P
802.11n HT20 CH 11 2462MHz		78.33	-59.49	-4.29	-55.2	-65.97	3.2	0.27	4.7	3.01	P
		118.29	-60.22	-8.52	-51.7	-66.82	3.2	0.39	4.7	3.01	P
		170.94	-59.68	-7.98	-51.7	-66.33	3.2	0.44	4.7	3.01	P
		462.4	-58.42	-9.22	-49.2	-65.17	3.2	0.54	4.7	3.01	P
		618.5	-57.4	-8.2	-49.2	-64.2	3.2	0.59	4.7	3.01	P
		779.5	-57.77	-8.57	-49.2	-64.67	3.2	0.69	4.7	3.01	P
		4926	-42.09	-20.89	-21.2	-50	3.2	1.7	0	3.01	P
		7386	-54.07	-32.87	-21.2	-62.21	3.2	1.93	0	3.01	P



## 15C 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT20 MIMO (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Grounding	MIMO	Peak
Ant.				Limit	Line	Level	Gain	Loss	Factor	Factor	Avg
1+2(2)		( MHz )	( dBm )	( dB )	( dBm )	( dBm )	( dBi )	( dB )	( dB )	(dB)	(P/A)
802.11n HT20 CH 01 2412MHz		78.6	-61.56	-6.36	-55.2	-68.04	3.2	0.27	4.7	3.01	P
		105.33	-61.16	-9.46	-51.7	-67.73	3.2	0.36	4.7	3.01	P
		291.63	-60.62	-11.42	-49.2	-67.3	3.2	0.47	4.7	3.01	P
		332.9	-58.68	-9.48	-49.2	-65.46	3.2	0.57	4.7	3.01	P
		517.7	-58.25	-9.05	-49.2	-65.05	3.2	0.59	4.7	3.01	P
		643.7	-57.6	-8.4	-49.2	-64.44	3.2	0.63	4.7	3.01	P
		4824	-37.69	-16.49	-21.2	-45.55	3.2	1.65	0	3.01	P
		4824	-41.59	-0.39	-41.2	-49.45	3.2	1.65	0	3.01	A
802.11n HT20 CH 06 2437MHz		47.55	-60.06	-4.86	-55.2	-66.46	3.2	0.19	4.7	3.01	P
		152.58	-59.54	-7.84	-51.7	-66.14	3.2	0.39	4.7	3.01	P
		252.75	-59.09	-9.89	-49.2	-65.77	3.2	0.47	4.7	3.01	P
		472.9	-58.99	-9.79	-49.2	-65.77	3.2	0.57	4.7	3.01	P
		513.5	-58.87	-9.67	-49.2	-65.67	3.2	0.59	4.7	3.01	P
		949.6	-58.74	-9.54	-49.2	-65.68	3.2	0.73	4.7	3.01	P
		4875	-38.01	-16.81	-21.2	-45.91	3.2	1.69	0	3.01	P
		4875	-44.89	-3.69	-41.2	-52.79	3.2	1.69	0	3.01	A
		7311	-52.99	-31.79	-21.2	-61.19	3.2	1.99	0	3.01	P
802.11n HT20 CH 11 2462MHz		46.47	-60.24	-5.04	-55.2	-66.64	3.2	0.19	4.7	3.01	P
		154.74	-59.82	-8.12	-51.7	-66.42	3.2	0.39	4.7	3.01	P
		270.57	-60.28	-11.08	-49.2	-66.93	3.2	0.44	4.7	3.01	P
		345.5	-59.72	-10.52	-49.2	-66.47	3.2	0.54	4.7	3.01	P
		534.5	-58.74	-9.54	-49.2	-65.54	3.2	0.59	4.7	3.01	P
		826.4	-58.17	-8.97	-49.2	-65.07	3.2	0.69	4.7	3.01	P
		4924	-41.85	-20.65	-21.2	-49.76	3.2	1.7	0	3.01	P
		7386	-53.89	-32.69	-21.2	-62.03	3.2	1.93	0	3.01	P



## Appendix C. Radiated Spurious Emission

<For Ant. 1>

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11b CH 01 2412MHz		2334.48	53.45	-20.55	74	54.33	27.05	5.33	33.26	142	229	P	H
		2385.96	43.76	-10.24	54	44.38	27.23	5.39	33.24	142	229	A	H
	*	2410.688	94.5	-	-	95.02	27.28	5.42	33.22	142	229	P	H
	*	2410.855	91.89	-	-	92.41	27.28	5.42	33.22	142	229	A	H
													H
													H
		2344.29	53.09	-20.91	74	53.91	27.1	5.33	33.25	345	360	P	V
		2388.57	43.29	-10.71	54	43.91	27.23	5.39	33.24	345	360	A	V
	*	2413.193	91.79	-	-	92.31	27.28	5.42	33.22	345	360	P	V
	*	2413.277	89.11	-	-	89.63	27.28	5.42	33.22	345	360	A	V
													V
													V
802.11b CH 06 2437MHz		2381.82	53.06	-20.94	74	53.72	27.19	5.39	33.24	117	211	P	H
		2359.05	43.35	-10.65	54	44.13	27.14	5.33	33.25	117	211	A	H
	*	2435.738	90.84	-	-	91.31	27.32	5.42	33.21	117	211	P	H
	*	2435.822	88.31	-	-	88.78	27.32	5.42	33.21	117	211	A	H
		2487.64	53.33	-20.67	74	53.55	27.5	5.46	33.18	117	211	P	H
		2489.8	43.53	-10.47	54	43.75	27.5	5.46	33.18	117	211	A	H
		2389.38	53.52	-20.48	74	54.14	27.23	5.39	33.24	337	331	P	V
		2388.57	43.28	-10.72	54	43.9	27.23	5.39	33.24	337	331	A	V
	*	2435.655	89.23	-	-	89.7	27.32	5.42	33.21	337	331	P	V
	*	2435.905	86.62	-	-	87.09	27.32	5.42	33.21	337	331	A	V
		2491.44	53.69	-20.31	74	53.91	27.5	5.46	33.18	337	331	P	V
		2499.68	43.37	-10.63	54	43.58	27.5	5.46	33.17	337	331	A	V



<b>802.11b CH 11 2462MHz</b>	*	2460.621	89.66	-	-	90.01	27.41	5.44	33.2	144	210	P	H
	*	2460.872	87.06	-	-	87.41	27.41	5.44	33.2	144	210	A	H
		2485.08	53.42	-20.58	74	53.68	27.46	5.46	33.18	144	210	P	H
		2488.4	43.6	-10.4	54	43.82	27.5	5.46	33.18	144	210	A	H
													H
													H
	*	2460.872	86.76	-	-	87.11	27.41	5.44	33.2	369	360	P	V
	*	2460.788	84.19	-	-	84.54	27.41	5.44	33.2	369	360	A	V
		2485.08	53.27	-20.73	74	53.53	27.46	5.46	33.18	369	360	P	V
		2488.64	43.52	-10.48	54	43.74	27.5	5.46	33.18	369	360	A	V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11b CH 01 2412MHz		4824	44.33	-29.67	74	65.9	31.46	7.58	60.61	100	0	P	H
													H
													H
													H
		4824	46.94	-27.06	74	68.51	31.46	7.58	60.61	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4872	42.95	-31.05	74	64.21	31.56	7.7	60.52	100	0	P	H
		7308	45.28	-28.72	74	60.54	36.18	9.49	60.93	100	0	P	H
													H
													H
		4872	46.48	-27.52	74	67.74	31.56	7.7	60.52	100	0	P	V
		7308	44.42	-29.58	74	59.68	36.18	9.49	60.93	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4926	47.24	-26.76	74	68.07	31.66	7.93	60.42	100	0	P	H
		7386	42.7	-31.3	74	57.99	36.37	9.53	61.19	100	0	P	H
													H
													H
		4926	50.07	-23.93	74	70.9	31.66	7.93	60.42	100	0	P	V
		7386	43.87	-30.13	74	59.16	36.37	9.53	61.19	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11g CH 01 2412MHz		2361.57	53.31	-20.69	74	54.09	27.14	5.33	33.25	147	207	P	H
		2365.35	43.32	-10.68	54	44.03	27.14	5.39	33.24	147	207	A	H
	*	2410.35	80.03	-	-	80.55	27.28	5.42	33.22	147	207	P	H
	*	2410.27	72.84	-	-	73.36	27.28	5.42	33.22	147	207	A	H
													H
													H
		2327.28	53.8	-20.2	74	54.68	27.05	5.33	33.26	105	154	P	V
		2359.59	43.29	-10.71	54	44.07	27.14	5.33	33.25	105	154	A	V
	*	2410.1	75.69	-	-	76.21	27.28	5.42	33.22	105	154	P	V
	*	2410.35	67.89	-	-	68.41	27.28	5.42	33.22	105	154	A	V
													V
													V
802.11g CH 06 2437MHz		2372.19	53.92	-20.08	74	54.58	27.19	5.39	33.24	116	228	P	H
		2361.93	43.22	-10.78	54	44	27.14	5.33	33.25	116	228	A	H
	*	2435.4	77.15	-	-	77.62	27.32	5.42	33.21	116	228	P	H
	*	2435.49	69.99	-	-	70.46	27.32	5.42	33.21	116	228	A	H
		2497.4	52.88	-21.12	74	53.09	27.5	5.46	33.17	116	228	P	H
		2484.08	43.58	-10.42	54	43.84	27.46	5.46	33.18	116	228	A	H
		2345.28	52.97	-21.03	74	53.79	27.1	5.33	33.25	100	156	P	V
		2387.76	43.37	-10.63	54	43.99	27.23	5.39	33.24	100	156	A	V
	*	2435.4	72.74	-	-	73.21	27.32	5.42	33.21	100	156	P	V
	*	2435.07	65.49	-	-	65.96	27.32	5.42	33.21	100	156	A	V
		2487.2	53.19	-20.81	74	53.45	27.46	5.46	33.18	100	156	P	V
		2486.84	43.57	-10.43	54	43.83	27.46	5.46	33.18	100	156	A	V





<b>802.11g CH 11 2462MHz</b>	*	2460.2	77.1	-	-	77.45	27.41	5.44	33.2	164	43	P	H
	*	2460.45	69.86	-	-	70.21	27.41	5.44	33.2	164	43	A	H
		2489.44	53.26	-20.74	74	53.48	27.5	5.46	33.18	164	43	P	H
		2483.72	43.63	-10.37	54	43.89	27.46	5.46	33.18	164	43	A	H
													H
													H
	*	2460.54	73.24	-	-	73.59	27.41	5.44	33.2	227	191	P	V
	*	2460.79	65.13	-	-	65.48	27.41	5.44	33.2	227	191	A	V
		2491.16	52.91	-21.09	74	53.13	27.5	5.46	33.18	227	191	P	V
		2487.2	43.7	-10.3	54	43.96	27.46	5.46	33.18	227	191	A	V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11g CH 01 2412MHz		4824	38.95	-35.05	74	60.52	31.46	7.58	60.61	100	0	P	H
													H
													H
													H
		4824	39.44	-34.56	74	61.01	31.46	7.58	60.61	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	38.08	-35.92	74	59.34	31.56	7.7	60.52	100	0	P	H
		7311	42.32	-31.68	74	57.58	36.18	9.49	60.93	100	0	P	H
													H
													H
		4874	39.69	-34.31	74	60.95	31.56	7.7	60.52	100	0	P	V
		7311	42.61	-31.39	74	57.87	36.18	9.49	60.93	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	38.95	-35.05	74	59.78	31.66	7.93	60.42	100	0	P	H
		7386	41.43	-32.57	74	56.72	36.37	9.53	61.19	100	0	P	H
													H
													H
		4924	41.64	-32.36	74	62.47	31.66	7.93	60.42	100	0	P	V
		7386	41.2	-32.8	74	56.49	36.37	9.53	61.19	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												


**2.4GHz 2400~2483.5MHz**
**WIFI 802.11n HT20 (Band Edge @ 3m)**

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
<b>802.11n HT20 CH 06 2437MHz</b>		2375.97	53.69	-20.31	74	54.35	27.19	5.39	33.24	201	56	P	H
		2385.87	43.79	-10.21	54	44.41	27.23	5.39	33.24	201	56	A	H
	*	2435.404	93.88	-	-	94.35	27.32	5.42	33.21	201	56	P	H
	*	2435.488	86.66	-	-	87.13	27.32	5.42	33.21	201	56	A	H
		2494.52	53.77	-20.23	74	53.98	27.5	5.46	33.17	201	56	P	H
		2483.72	44.04	-9.96	54	44.3	27.46	5.46	33.18	201	56	A	H
		2355.27	53.41	-20.59	74	54.19	27.14	5.33	33.25	375	331	P	V
		2360.49	43.6	-10.4	54	44.38	27.14	5.33	33.25	375	331	A	V
	*	2435.404	91.89	-	-	92.36	27.32	5.42	33.21	375	331	P	V
	*	2435.655	84.72	-	-	85.19	27.32	5.42	33.21	375	331	A	V
		2491.96	54.61	-19.39	74	54.82	27.5	5.46	33.17	375	331	P	V
		2486.52	43.99	-10.01	54	44.25	27.46	5.46	33.18	375	331	A	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**2.4GHz 2400~2483.5MHz****WIFI 802.11n HT20 (Harmonic @ 3m)**

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
<b>802.11n HT20 CH 06 2437MHz</b>		4872	39.38	-34.62	74	60.64	31.56	7.7	60.52	100	0	P	H
		7308	44.44	-29.56	74	59.7	36.18	9.49	60.93	100	0	P	H
													H
													H
		4878	45.35	-28.65	74	66.61	31.56	7.7	60.52	100	0	P	V
		7308	46.34	-27.66	74	61.6	36.18	9.49	60.93	100	0	P	V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11n HT40 CH 03 2422MHz		2327.82	53.04	-20.96	74	53.92	27.05	5.33	33.26	125	228	P	H
		2386.86	43.83	-10.17	54	44.45	27.23	5.39	33.24	125	228	A	H
	*	2419.7	75.18	-	-	75.65	27.32	5.42	33.21	125	228	P	H
	*	2419.62	68.14	-	-	68.61	27.32	5.42	33.21	125	228	A	H
		2489.2	53.81	-20.19	74	54.03	27.5	5.46	33.18	125	228	P	H
		2495.76	44.07	-9.93	54	44.28	27.5	5.46	33.17	125	228	A	H
		2332.41	53.05	-20.95	74	53.93	27.05	5.33	33.26	113	156	P	V
		2364.45	43.8	-10.2	54	44.51	27.14	5.39	33.24	113	156	A	V
	*	2419.12	70.43	-	-	70.94	27.28	5.42	33.21	113	156	P	V
	*	2419.46	63.15	-	-	63.66	27.28	5.42	33.21	113	156	A	V
		2499.72	52.9	-21.1	74	53.11	27.5	5.46	33.17	113	156	P	V
		2488	44.18	-9.82	54	44.4	27.5	5.46	33.18	113	156	A	V
802.11n HT40 CH 06 2437MHz		2386.59	53.33	-20.67	74	53.95	27.23	5.39	33.24	115	227	P	H
		2387.85	43.83	-10.17	54	44.45	27.23	5.39	33.24	115	227	A	H
	*	2434.98	73.78	-	-	74.25	27.32	5.42	33.21	115	227	P	H
	*	2434.57	66.42	-	-	66.89	27.32	5.42	33.21	115	227	A	H
		2496.96	53.51	-20.49	74	53.72	27.5	5.46	33.17	115	227	P	H
		2498.32	44.28	-9.72	54	44.49	27.5	5.46	33.17	115	227	A	H
		2317.47	53.26	-20.74	74	54.24	27.01	5.27	33.26	100	156	P	V
		2389.38	43.61	-10.39	54	44.23	27.23	5.39	33.24	100	156	A	V
	*	2434.15	68.94	-	-	69.41	27.32	5.42	33.21	100	156	P	V
	*	2434.4	61.78	-	-	62.25	27.32	5.42	33.21	100	156	A	V
		2499.96	53.64	-20.36	74	53.85	27.5	5.46	33.17	100	156	P	V
		2483.76	44.01	-9.99	54	44.27	27.46	5.46	33.18	100	156	A	V



<b>802.11n</b> <b>HT40</b> <b>CH 09</b> <b>2452MHz</b>		2325.12	52.68	-21.32	74	53.56	27.05	5.33	33.26	108	210	P	H
		2371.11	43.76	-10.24	54	44.42	27.19	5.39	33.24	108	210	A	H
	*	2450.02	72.69	-	-	73.08	27.37	5.44	33.2	108	210	P	H
	*	2453.94	65.74	-	-	66.09	27.41	5.44	33.2	108	210	A	H
		2494	52.93	-21.07	74	53.14	27.5	5.46	33.17	108	210	P	H
		2484.32	44.14	-9.86	54	44.4	27.46	5.46	33.18	108	210	A	H
		2334.39	53.01	-20.99	74	53.89	27.05	5.33	33.26	170	190	P	V
		2382.36	43.92	-10.08	54	44.58	27.19	5.39	33.24	170	190	A	V
	*	2449.85	67.54	-	-	67.93	27.37	5.44	33.2	170	190	P	V
	*	2449.01	60.12	-	-	60.51	27.37	5.44	33.2	170	190	A	V
		2498	53.23	-20.77	74	53.44	27.5	5.46	33.17	170	190	P	V
		2491.56	44.08	-9.92	54	44.3	27.5	5.46	33.18	170	190	A	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11n HT40 CH 03 2422MHz		4824	37.88	-36.12	74	59.45	31.46	7.58	60.61	100	0	P	H
													H
													H
													H
		4824	38.23	-35.77	74	59.8	31.46	7.58	60.61	100	0	P	V
													V
													V
													V
802.11n HT40 CH 06 2437MHz		4874	37.96	-36.04	74	59.22	31.56	7.7	60.52	100	0	P	H
		7311	41.87	-32.13	74	57.13	36.18	9.49	60.93	100	0	P	H
													H
													H
		4874	38.51	-35.49	74	59.77	31.56	7.7	60.52	100	0	P	V
		7311	41.6	-32.4	74	56.86	36.18	9.49	60.93	100	0	P	V
													V
													V
802.11n HT40 CH 09 2452MHz		4904	39.12	-34.88	74	60.13	31.63	7.82	60.46	100	0	P	H
		7356	41.75	-32.25	74	57.03	36.3	9.51	61.09	100	0	P	H
													H
													H
		4904	38.98	-35.02	74	59.99	31.63	7.82	60.46	100	0	P	V
		7356	41.15	-32.85	74	56.43	36.3	9.51	61.09	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

### Emission below 1GHz

### 2.4GHz WIFI 802.11b (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
2.4GHz 802.11b LF		108.03	28.53	-14.97	43.5	48.83	11.2	1.14	32.64			P	H
		192.81	37.83	-5.67	43.5	59.46	9.61	1.48	32.72	100	326	P	H
		241.14	32.4	-13.6	46	51.45	12.06	1.62	32.73			P	H
		385.4	31.48	-14.52	46	46.05	16.12	2.13	32.82			P	H
		602.4	34.91	-11.09	46	45.75	19.62	2.57	33.03			P	H
		825	29.88	-16.12	46	37.25	22.3	3.07	32.74			P	H
													H
													H
													H
													H
													H
													H
													H
		51.06	31.71	-8.29	40	54.67	8.89	0.93	32.78	114	2	P	V
		99.66	23.2	-20.3	43.5	44.29	10.4	1.14	32.63			P	V
		192.81	30.39	-13.11	43.5	52.02	9.61	1.48	32.72			P	V
		400.1	25.7	-20.3	46	39.89	16.52	2.13	32.84			P	V
		506.5	28.9	-17.1	46	41.24	18.26	2.33	32.93			P	V
		699	28.53	-17.47	46	38.11	20.59	2.82	32.99			P	V
													V
												V	
												V	
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												





&lt;For MIMO Ant. 1 + 2&gt;

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11n HT20 CH 01 2412MHz		2387.04	53.34	-20.66	74	53.96	27.23	5.39	33.24	115	315	P	H
		2365.35	43.66	-10.34	54	44.37	27.14	5.39	33.24	115	315	A	H
	*	2410.1	87.04	-	-	87.56	27.28	5.42	33.22	115	315	P	H
	*	2413.95	80.09	-	-	80.61	27.28	5.42	33.22	115	315	A	H
													H
													H
		2387.31	52.88	-21.12	74	53.5	27.23	5.39	33.24	361	269	P	V
		2389.92	43.91	-10.09	54	44.51	27.23	5.39	33.22	361	269	A	V
	*	2410.35	86.18	-	-	86.7	27.28	5.42	33.22	361	269	P	V
	*	2413.86	79.17	-	-	79.69	27.28	5.42	33.22	361	269	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2389.47	53.57	-20.43	74	54.19	27.23	5.39	33.24	225	315	P	H
		2379.93	43.65	-10.35	54	44.31	27.19	5.39	33.24	225	315	A	H
	*	2435.15	87.2	-	-	87.67	27.32	5.42	33.21	225	315	P	H
	*	2435.49	79.85	-	-	80.32	27.32	5.42	33.21	225	315	A	H
		2485.56	53.16	-20.84	74	53.42	27.46	5.46	33.18	225	315	P	H
		2489	44	-10	54	44.22	27.5	5.46	33.18	225	315	A	H
		2389.74	52.84	-21.16	74	53.46	27.23	5.39	33.24	370	269	P	V
		2389.56	43.88	-10.12	54	44.5	27.23	5.39	33.24	370	269	A	V
	*	2435.32	87.97	-	-	88.44	27.32	5.42	33.21	370	269	P	V
	*	2435.74	80.65	-	-	81.12	27.32	5.42	33.21	370	269	A	V
		2491.48	53.59	-20.41	74	53.81	27.5	5.46	33.18	370	269	P	V
		2487.32	44.2	-9.8	54	44.46	27.46	5.46	33.18	370	269	A	V



<b>802.11n</b> <b>HT20</b> <b>CH 11</b> <b>2462MHz</b>	*	2463.54	88.07	-	-	88.42	27.41	5.44	33.2	136	312	P	H
	*	2463.54	79.73	-	-	80.08	27.41	5.44	33.2	136	312	A	H
		2499.4	53.01	-20.99	74	53.22	27.5	5.46	33.17	136	312	P	H
		2484.44	44.15	-9.85	54	44.41	27.46	5.46	33.18	136	312	A	H
													H
													H
	*	2460.45	87.48	-	-	87.83	27.41	5.44	33.2	351	266	P	V
	*	2460.87	80.32	-	-	80.67	27.41	5.44	33.2	351	266	A	V
		2485.72	53.37	-20.63	74	53.63	27.46	5.46	33.18	351	266	P	V
		2484.8	44.12	-9.88	54	44.38	27.46	5.46	33.18	351	266	A	V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



## 2.4GHz 2400~2483.5MHz

## WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11n HT20 CH 01 2412MHz		4824	38.81	-35.19	74	60.38	31.46	7.58	60.61	100	0	P	H
													H
													H
													H
		4824	38.42	-35.58	74	59.99	31.46	7.58	60.61	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	38.72	-35.28	74	59.98	31.56	7.7	60.52	100	0	P	H
		7311	43.02	-30.98	74	58.28	36.18	9.49	60.93	100	0	P	H
													H
													H
		4874	38.1	-35.9	74	59.36	31.56	7.7	60.52	100	0	P	V
		7311	42.5	-31.5	74	57.76	36.18	9.49	60.93	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4924	38.69	-35.31	74	59.52	31.66	7.93	60.42	100	0	P	H
		7386	41.16	-32.84	74	56.45	36.37	9.53	61.19	100	0	P	H
													H
													H
		4924	39.08	-34.92	74	59.91	31.66	7.93	60.42	100	0	P	V
		7386	41.79	-32.21	74	57.08	36.37	9.53	61.19	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



## Emission below 1GHz

## 2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
2.4GHz 802.11n HT20 LF		99.66	23.31	-20.19	43.5	44.4	10.4	1.14	32.63			P	H
		192.81	36.15	-7.35	43.5	57.78	9.61	1.48	32.72	163	174	P	H
		216.84	34.25	-11.75	46	55.1	10.26	1.62	32.73			P	H
		433.7	29.15	-16.85	46	42.82	17.04	2.16	32.87			P	H
		626.9	32.14	-13.86	46	42.62	19.92	2.62	33.02			P	H
		795.6	30.92	-15.08	46	38.78	22.05	2.97	32.88			P	H
													H
													H
													H
													H
													H
													H
		51.33	35.98	-4.02	40	58.94	8.89	0.93	32.78	199	221	P	V
		86.43	19.4	-20.6	40	42.21	8.72	1.14	32.67			P	V
		192.81	26.5	-17	43.5	48.13	9.61	1.48	32.72			P	V
		398.7	27.95	-18.05	46	42.19	16.47	2.13	32.84			P	V
		495.3	27.68	-18.32	46	40.16	18.11	2.33	32.92			P	V
		722.8	24.42	-21.58	46	33.51	21.05	2.82	32.96			P	V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



**Note symbol**

*	<b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is <b>over limit</b> line.
P/A	<b>Peak</b> or <b>Average</b>
H/V	<b>Horizontal</b> or <b>Vertical</b>



A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

**Both peak and average measured complies with the limit line, so test result is “PASS”.**

## Appendix D. Setup Photographs

### <Radiated Emission>

#### LF



#### HF

