



# FCC RF Test Report

**APPLICANT** : Maestro Wireless Solutions Limited  
**EQUIPMENT** : E210 Series Cellular Router  
**BRAND NAME** : Maestro  
**MODEL NAME** : E214G#01  
**FCC ID** : 2AJF3-E214G-2  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : (DTS) Digital Transmission System

The product was received on Jun. 01, 2018 and testing was completed on Aug. 22, 2018. We, Sporton International (Shenzhen) 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 (Shenzhen) Inc., the test report shall not be reproduced except in full.



Approved by: Eric Shih / Manager

**Sporton International (Shenzhen) Inc.**

**1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen City  
Guangdong Province 518055 China**



# TABLE OF CONTENTS

**REVISION HISTORY..... 3**

**SUMMARY OF TEST RESULT ..... 4**

**1 GENERAL DESCRIPTION ..... 5**

    1.1 Applicant ..... 5

    1.2 Manufacturer ..... 5

    1.3 Product Feature of Equipment Under Test..... 5

    1.4 Product Specification of Equipment Under Test..... 6

    1.5 Modification of EUT ..... 6

    1.6 Testing Location ..... 7

    1.7 Applicable Standards..... 7

**2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST ..... 8**

    2.1 Carrier Frequency and Channel ..... 8

    2.2 Test Mode ..... 8

    2.3 Connection Diagram of Test System..... 9

    2.4 Support Unit used in test configuration and system ..... 9

    2.5 EUT Operation Test Setup ..... 10

    2.6 Measurement Results Explanation Example..... 10

**3 TEST RESULT ..... 11**

    3.1 6dB Bandwidth Measurement ..... 11

    3.2 Output Power Measurement..... 13

    3.3 Power Spectral Density Measurement ..... 14

    3.4 Conducted Band Edges and Spurious Emission Measurement ..... 16

    3.5 Radiated Band Edges and Spurious Emission Measurement ..... 29

    3.6 Antenna Requirements ..... 33

**4 LIST OF MEASURING EQUIPMENT ..... 34**

**5 UNCERTAINTY OF EVALUATION ..... 35**

**APPENDIX A. CONDUCTED TEST RESULTS**

**APPENDIX B. RADIATED SPURIOUS EMISSION**

**APPENDIX C. DUTY CYCLE PLOTS**

**APPENDIX D. SETUP PHOTOGRAPHS**





### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.37 dB at 2483.76 MHz
-	15.207	AC Conducted Emission	15.207(a)	Not Required	-
3.6	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



# 1 General Description

## 1.1 Applicant

**Maestro Wireless Solutions Limited**

Units A & B, 9th Floor, Wing Cheong Factory Building 121 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong

## 1.2 Manufacturer

**Maestro Wireless Solutions Limited**

Units A & B, 9th Floor, Wing Cheong Factory Building 121 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	E210 Series Cellular Router
Brand Name	Maestro
Model Name	E214G#01
FCC ID	2AJF3-E214G-2
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n HT20/HT40
HW Version	V05
SW Version	maestro-e210-v230
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

Standards-related Product Specification	
<b>Tx/Rx Channel Frequency Range</b>	2412 MHz ~ 2462 MHz
<b>Maximum (Peak) Output Power to antenna</b>	802.11b : 18.73 dBm (0.0746 W) 802.11g : 22.46 dBm (0.1762 W) 802.11n HT20 : 22.06 dBm (0.1607 W) 802.11n HT40 : 21.63 dBm (0.1455 W)
<b>Antenna Type / Gain</b>	Dipole Antenna with gain 3.80 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 Location

Sporton International (Shenzhen) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600156-0) and the FCC designation No. are CN5018 / CN5019.

<b>Test Site</b>	Sporton International (Shenzhen) Inc.	
<b>Test Site Location</b>	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen City Guangdong Province 518055 China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Test Firm Registration No.</b>
	TH01-SZ	251365

<b>Test Site</b>	Sporton International (Shenzhen) Inc.	
<b>Test Site Location</b>	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan District Shenzhen City Guangdong Province 518055 China TEL: +86-755-3320-2398	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Test Firm Registration No.</b>
	03CH04-SZ	577730

### 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 v04
- 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. 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

- a. 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: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

### 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		

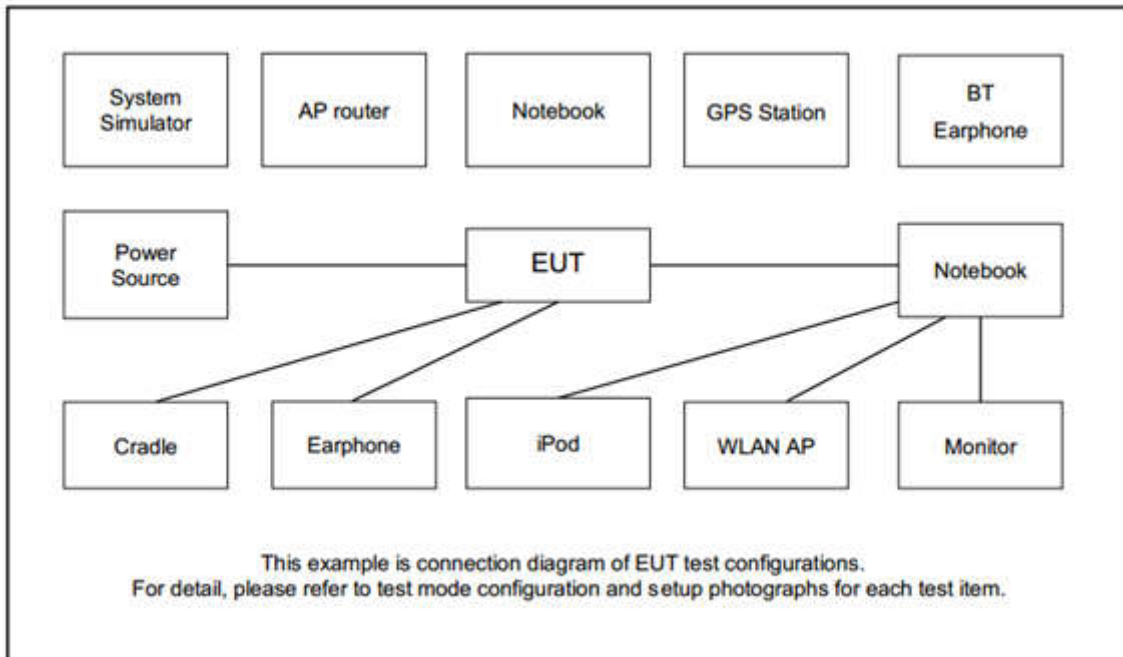
### 2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

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



## 2.3 Connection Diagram of Test System



## 2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	BT Base Station	R&S	CBT	N/A	N/A	Unshielded,1.8m
2.	DC Power	Supply Topward	3303DR	N/A	N/A	Unshielded,1.8m



## 2.5 EUT Operation Test Setup

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

## 2.6 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 5.0 dB and 10dB attenuator.

*Offset(dB) = RF cable loss(dB) + attenuator factor(dB).*

*= 5.0 + 10 = 15.0 (dB)*

### 3 Test Result

#### 3.1 6dB Bandwidth Measurement

##### 3.1.1 Limit of 6dB Bandwidth

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

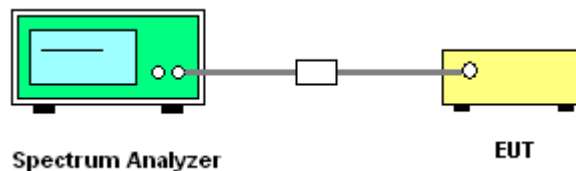
##### 3.1.2 Measuring Instruments

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

##### 3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. Measure and record the results in the test report.

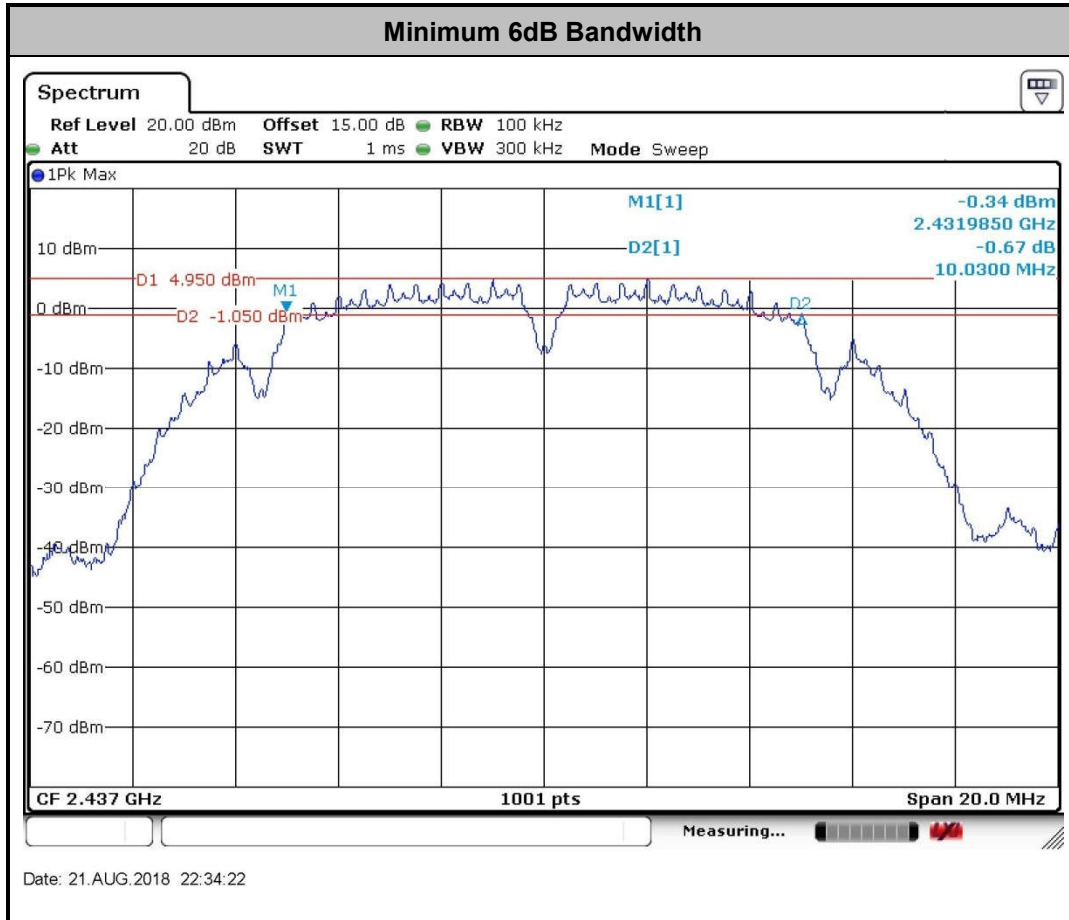
##### 3.1.4 Test Setup





### 3.1.5 Test Result of 6dB Occupied Bandwidth

Please refer to Appendix A.



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

## 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 with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

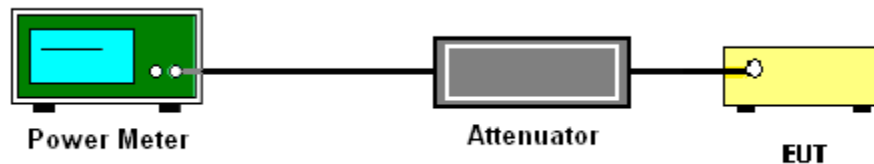
### 3.2.2 Measuring Instruments

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

### 3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.1.3 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.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

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

Please refer to Appendix A.



### **3.3 Power Spectral Density Measurement**

#### **3.3.1 Limit of Power Spectral Density**

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

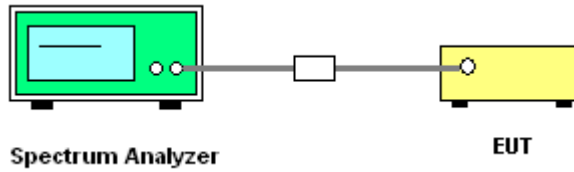
#### **3.3.2 Measuring Instruments**

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

#### **3.3.3 Test Procedures**

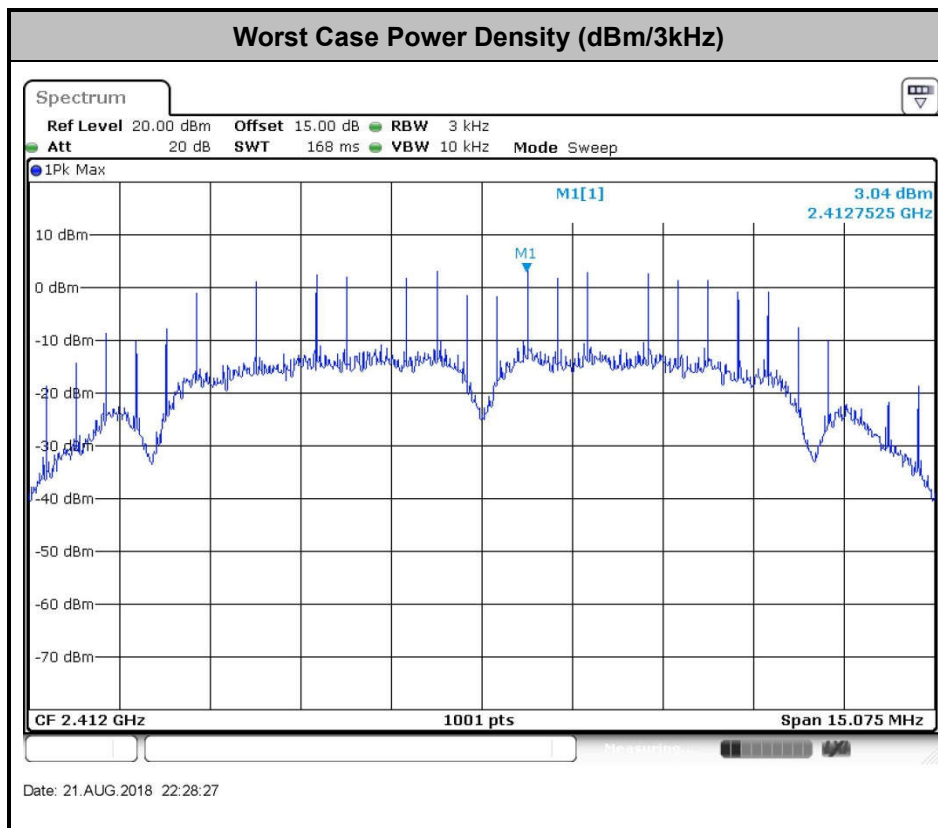
1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum 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

Please refer to Appendix A.



## 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.

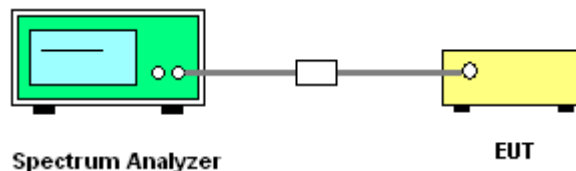
### 3.4.2 Measuring Instruments

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

### 3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
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



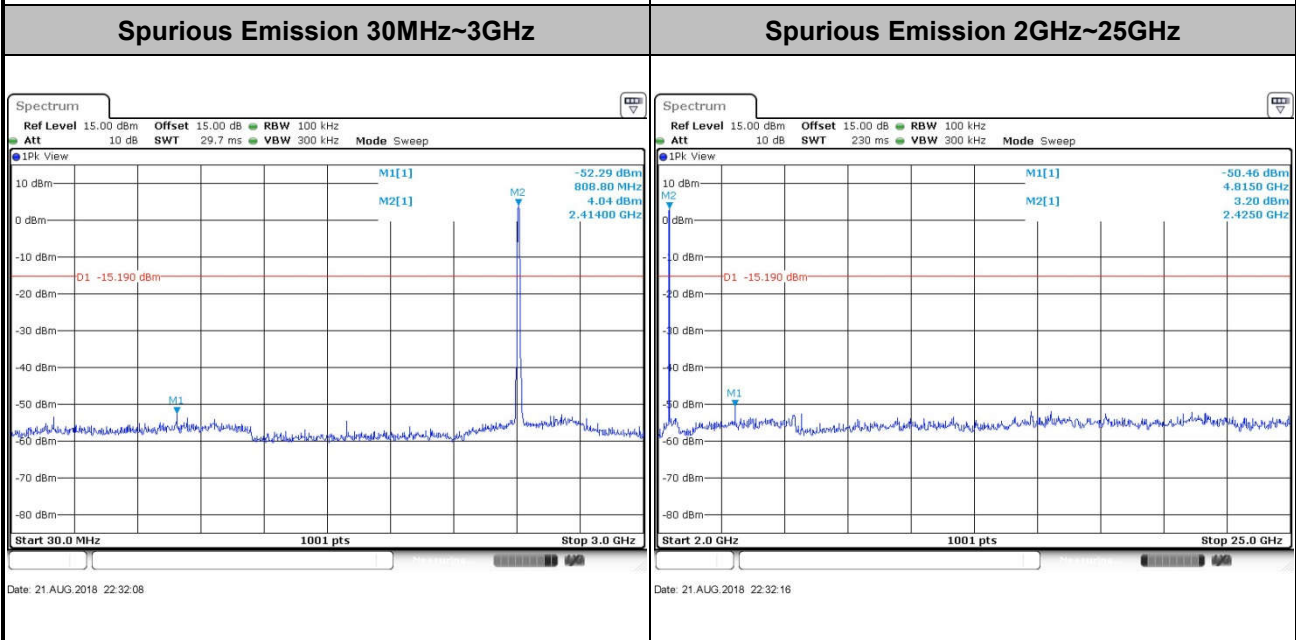
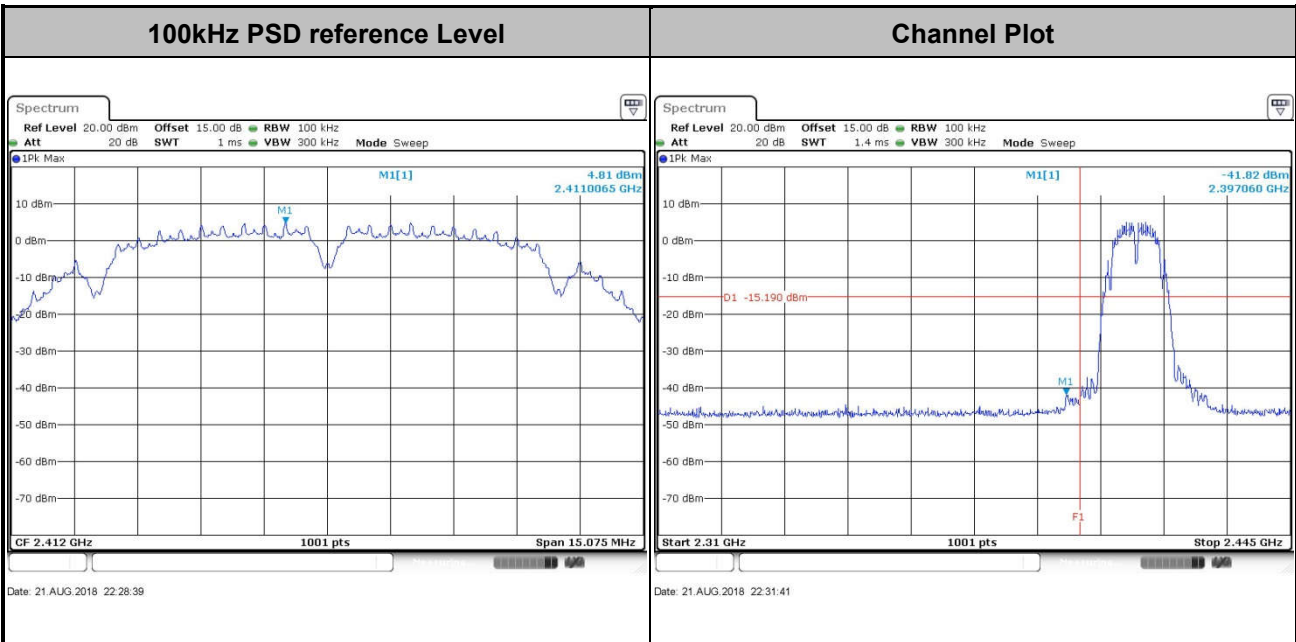




### 3.4.5 Test Result of Conducted Band Edges and Spurious Emission

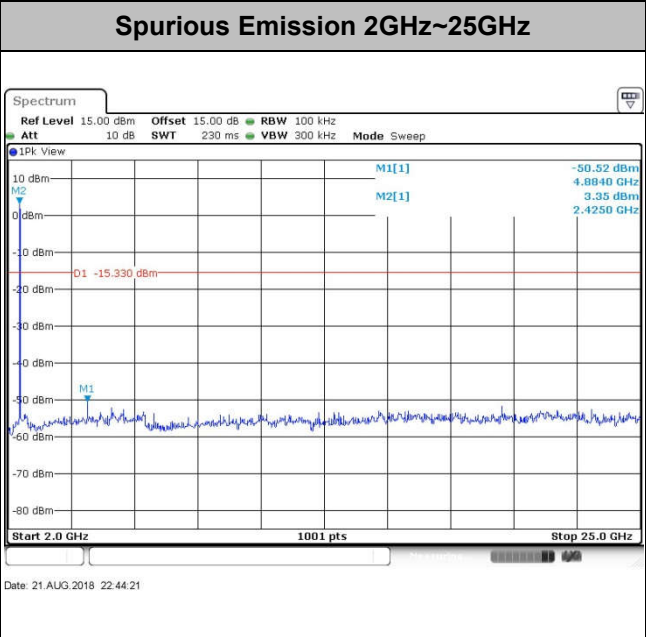
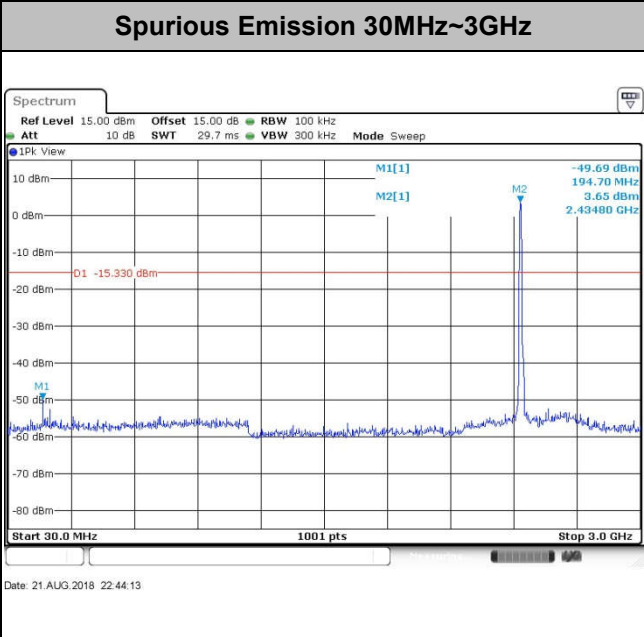
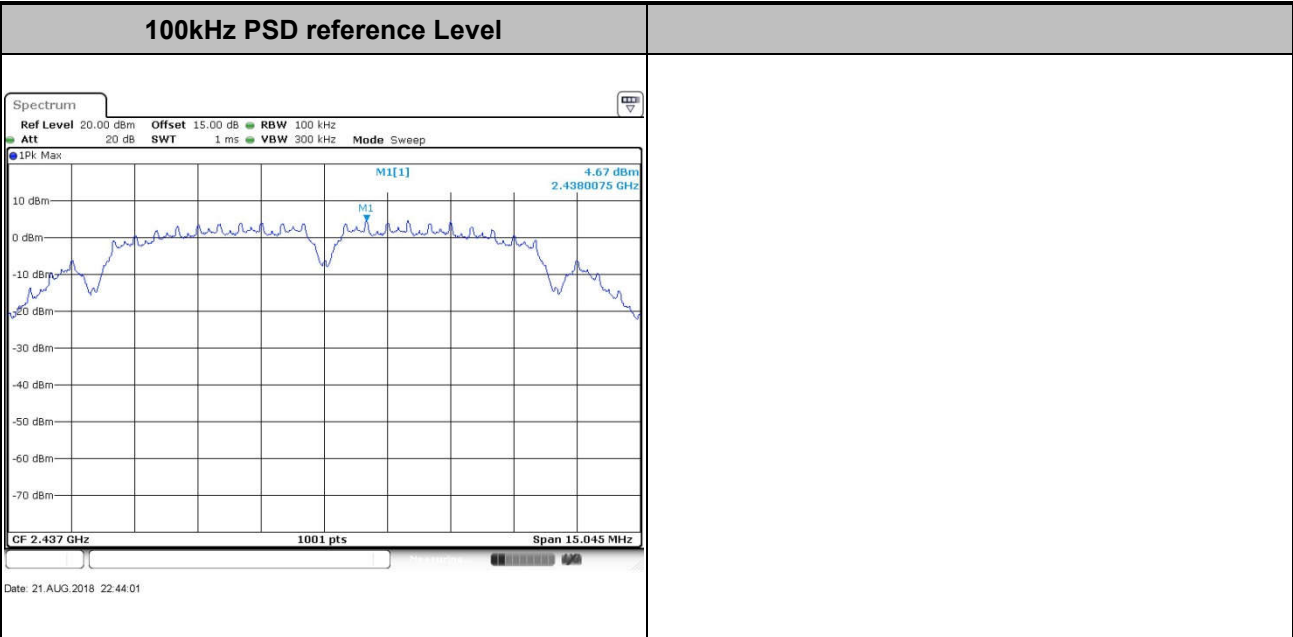
Test Engineer : Wilson chen	Temperature :	24~26°C
	Relative Humidity :	50~53%

Test Mode :	802.11b	Test Channel :	01
-------------	---------	----------------	----



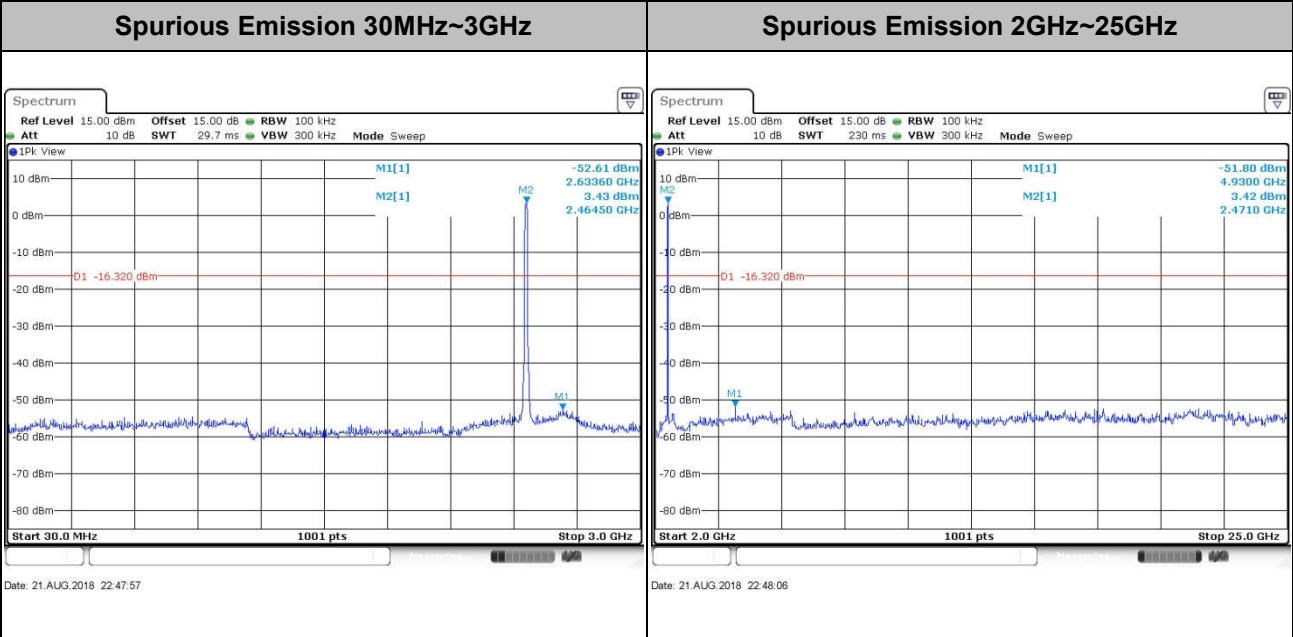
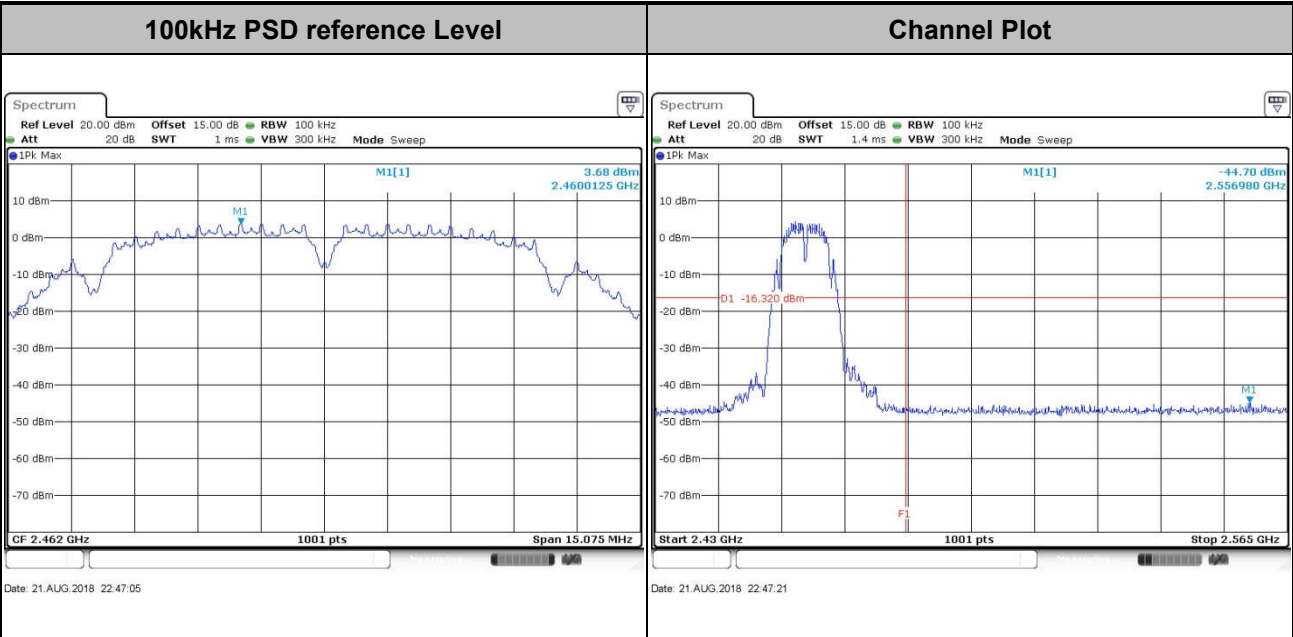


Test Mode :	802.11b	Test Channel :	06
-------------	---------	----------------	----



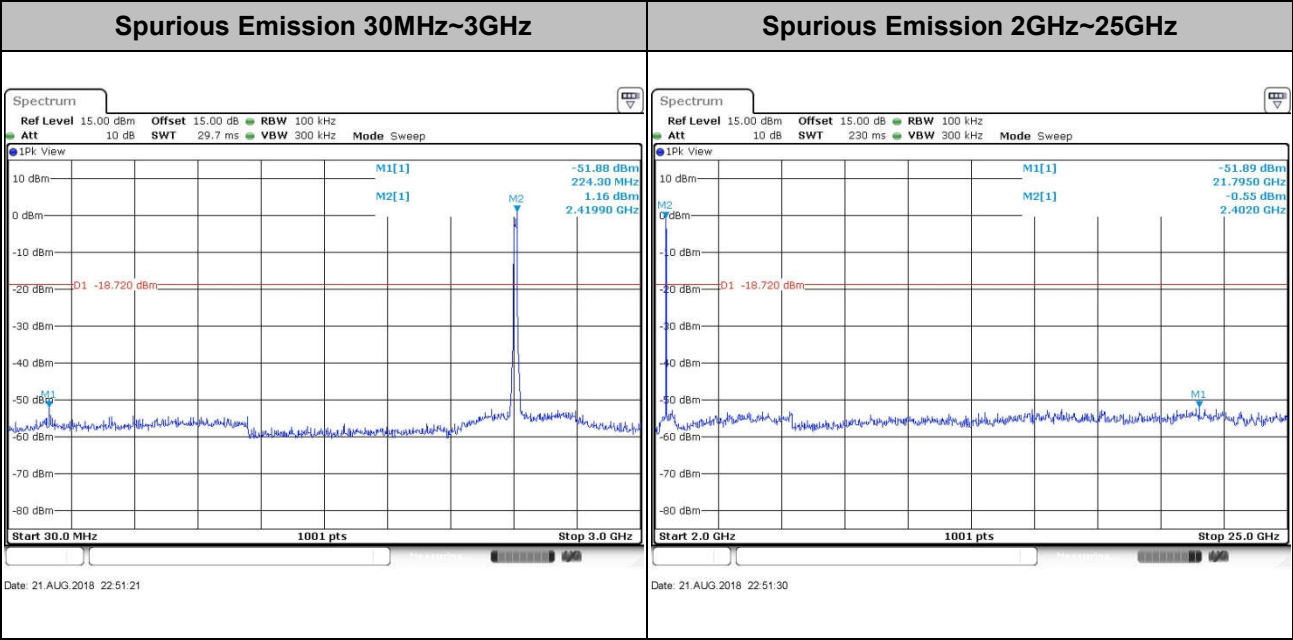
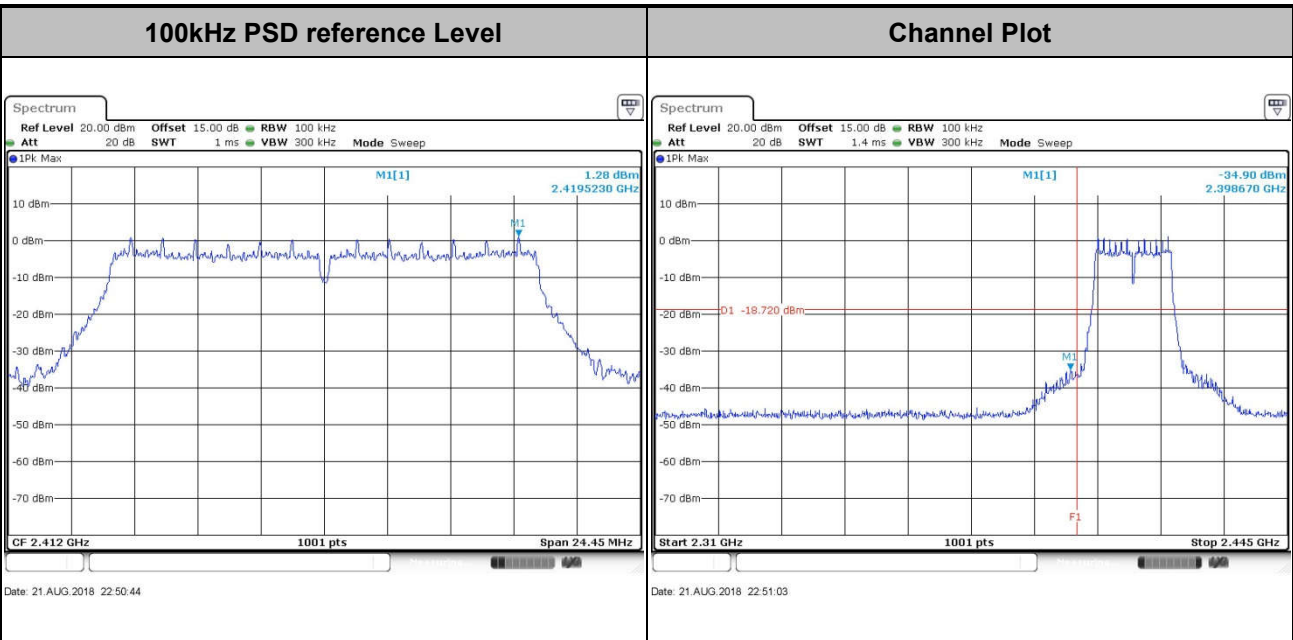


Test Mode :	802.11b	Test Channel :	11
-------------	---------	----------------	----



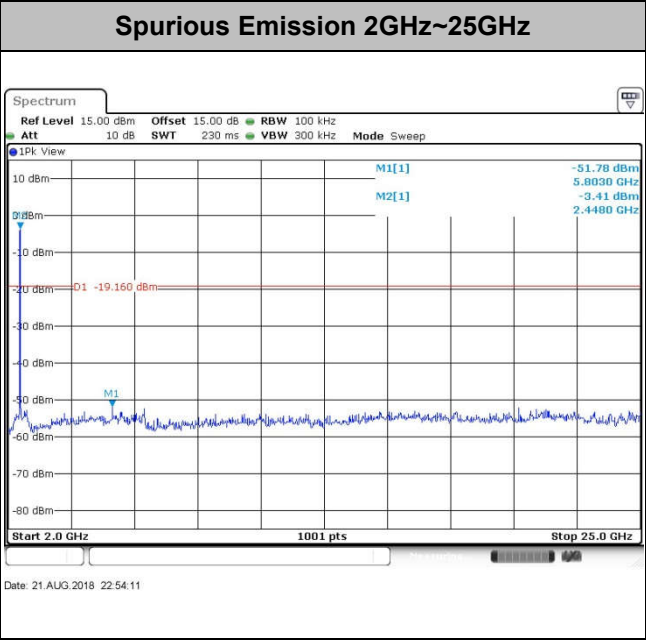
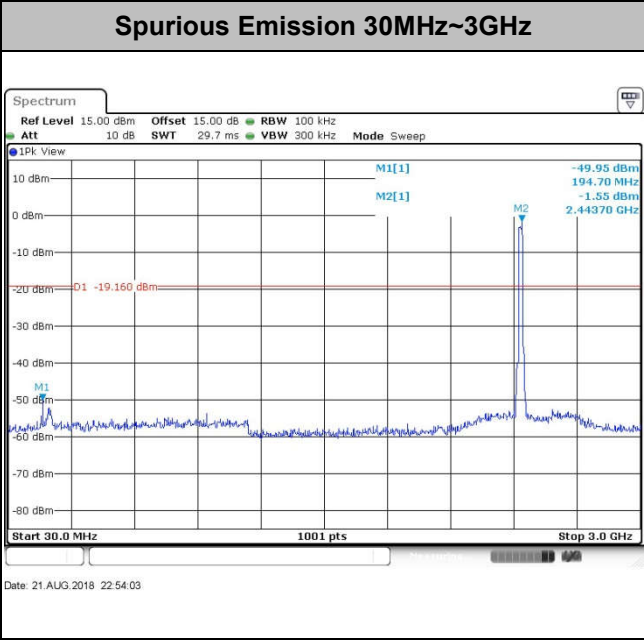
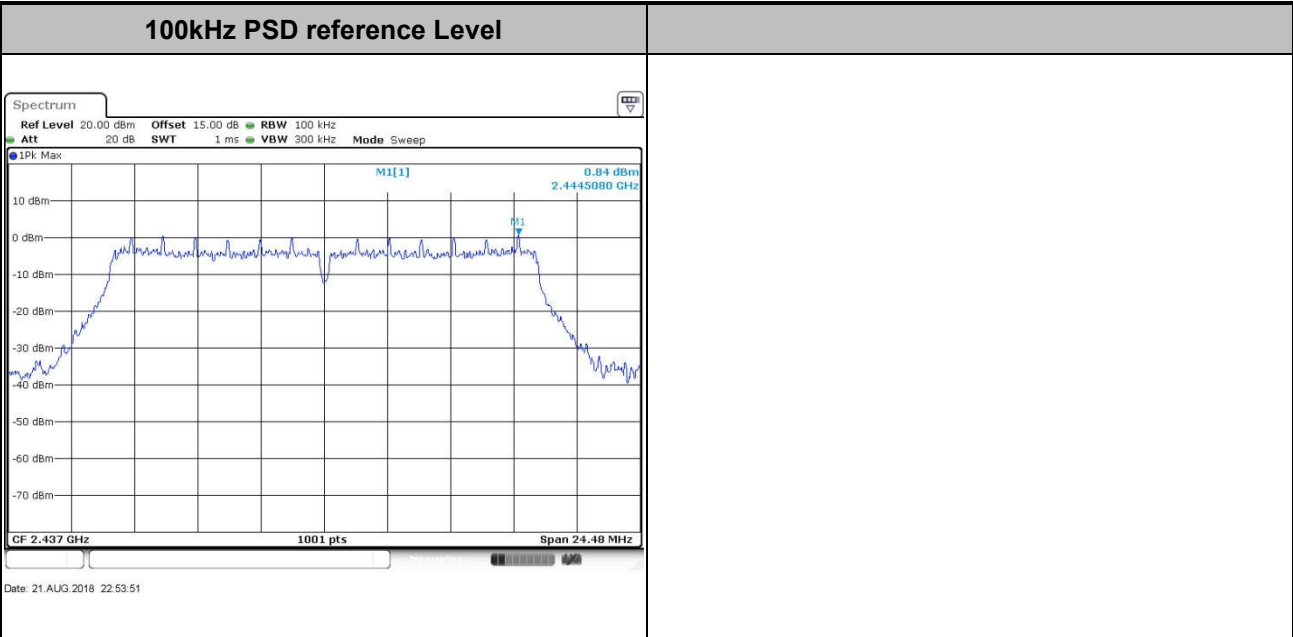


Test Mode : 802.11g Test Channel : 01



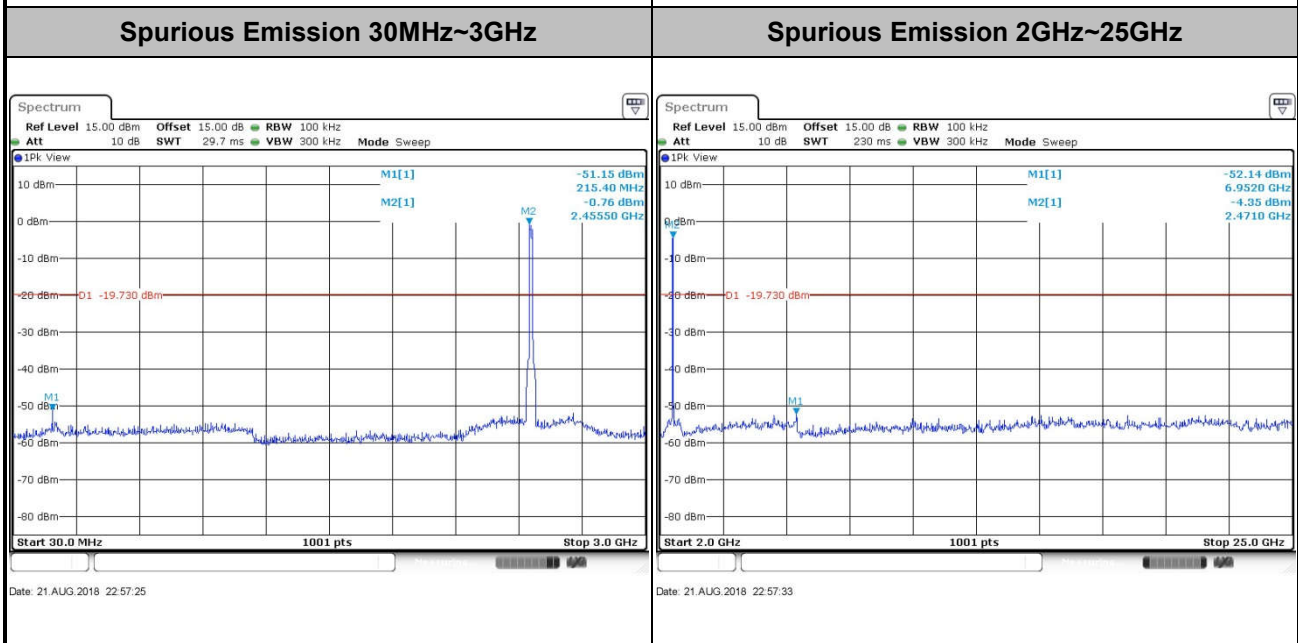
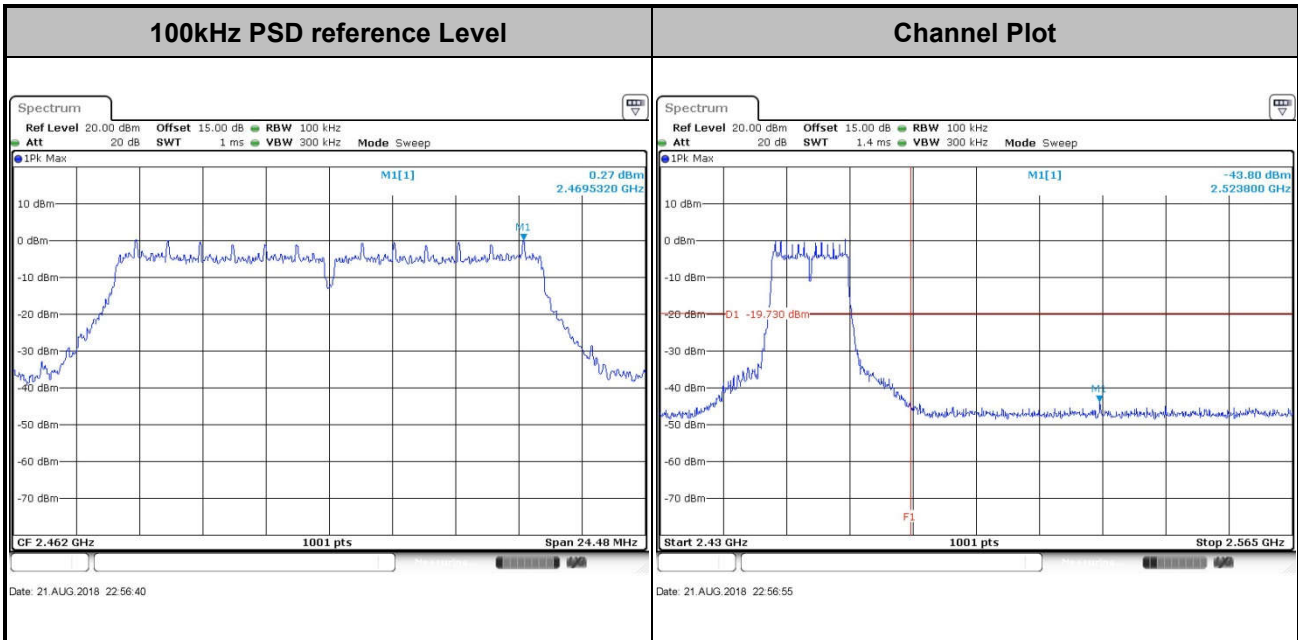


Test Mode :	802.11g	Test Channel :	06
-------------	---------	----------------	----



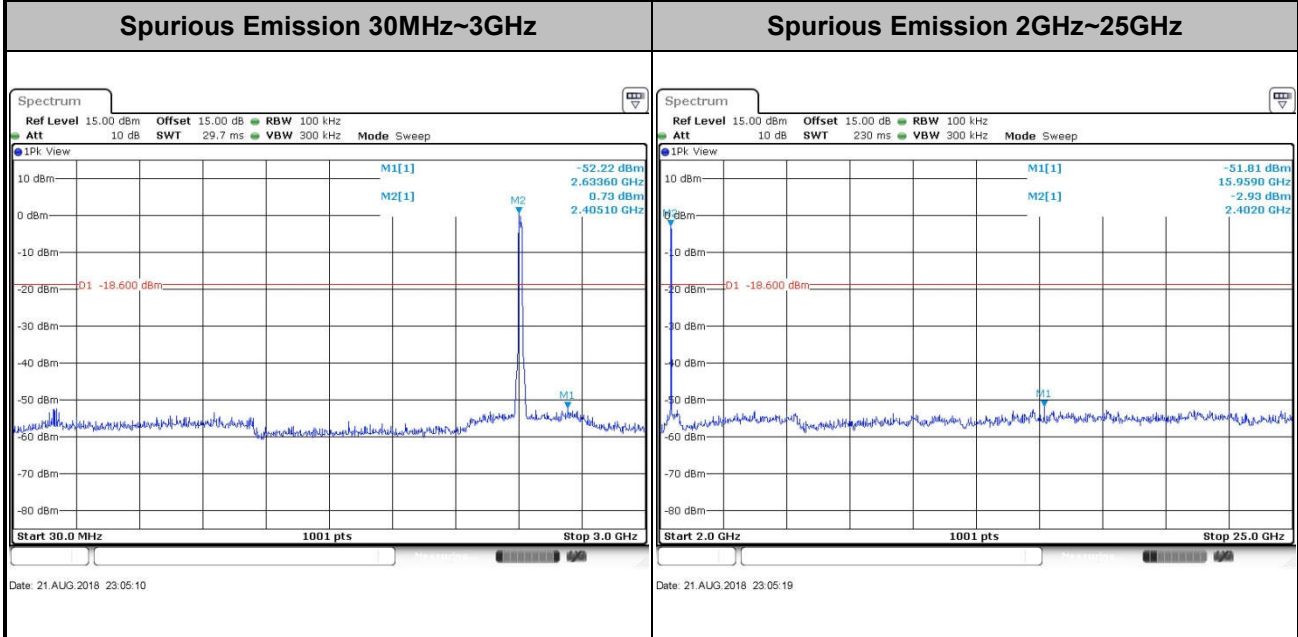
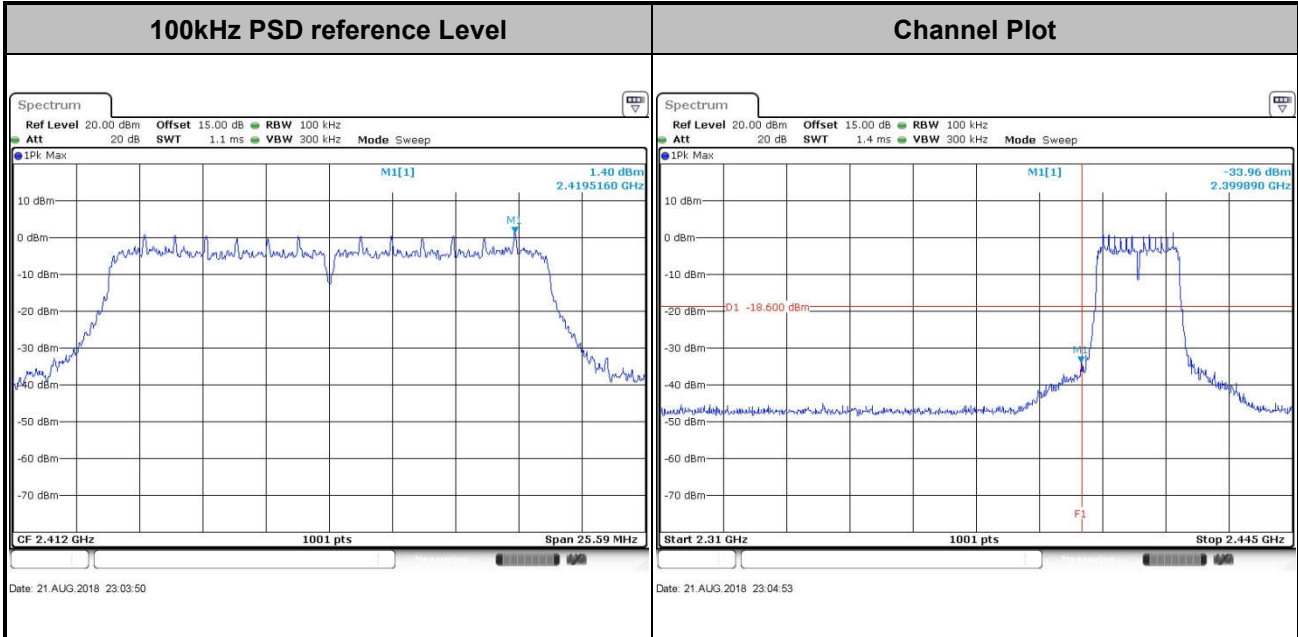


Test Mode :	802.11g	Test Channel :	11
-------------	---------	----------------	----



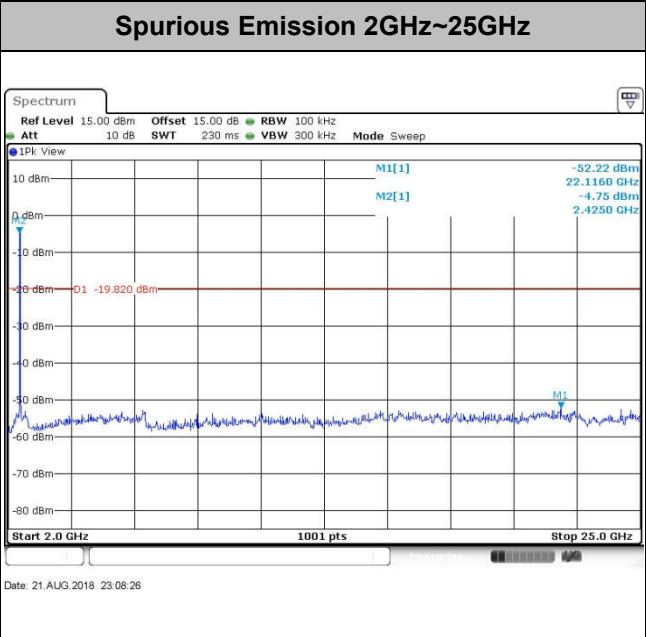
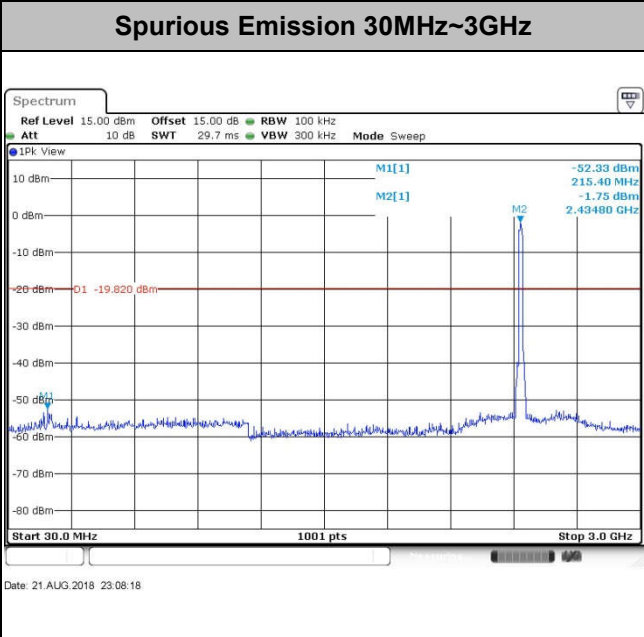
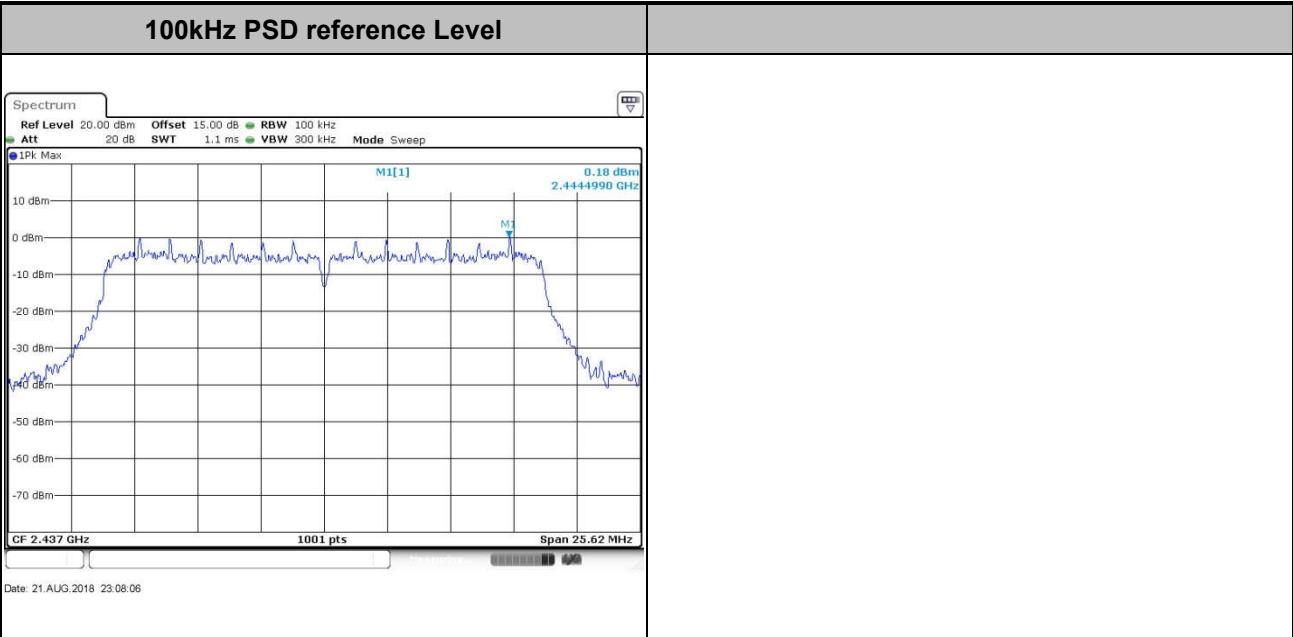


Test Mode :	802.11n HT20	Test Channel :	01
-------------	--------------	----------------	----





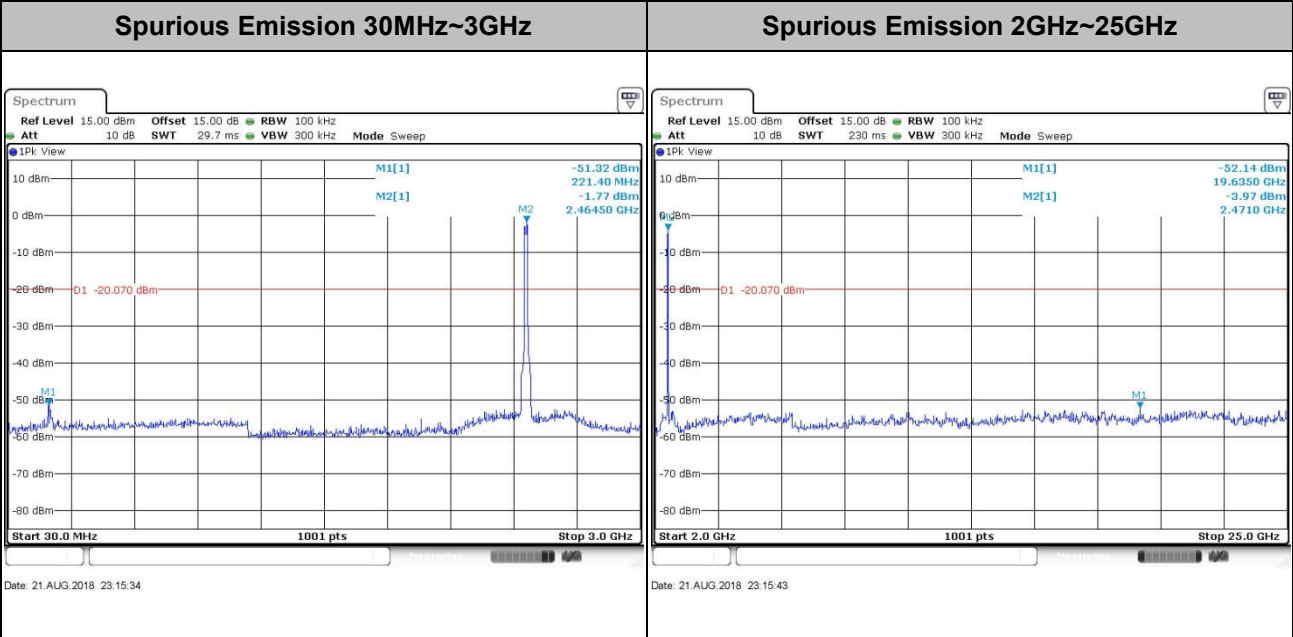
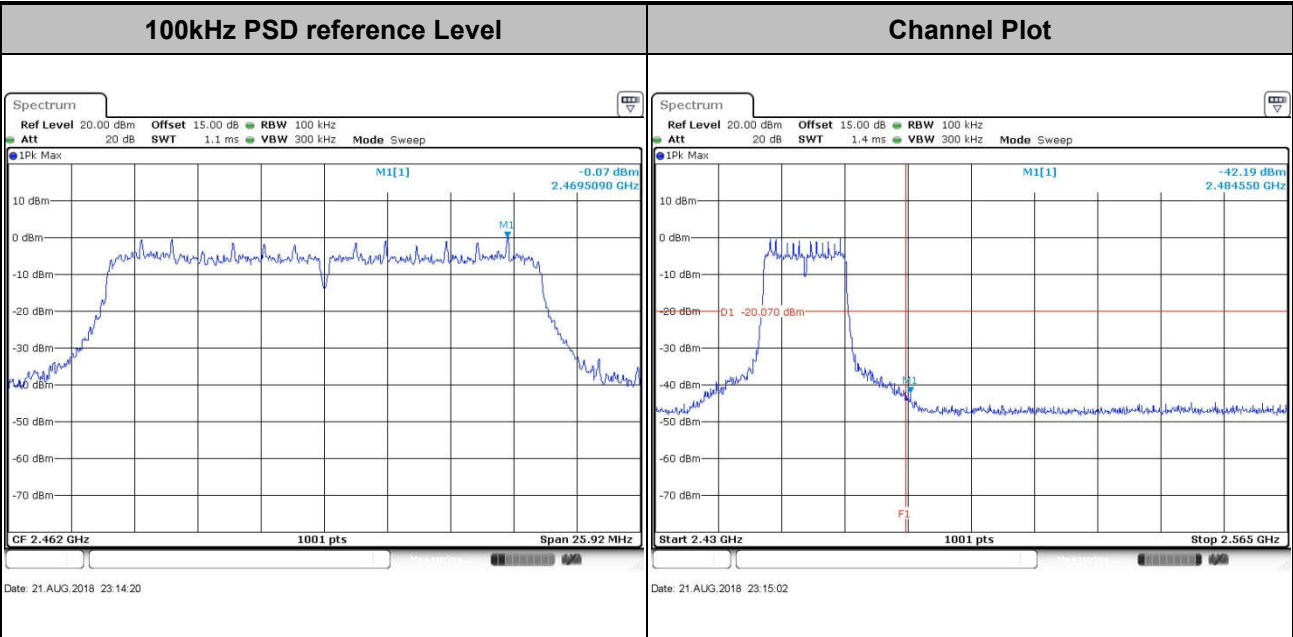
Test Mode :	802.11n HT20	Test Channel :	06
-------------	--------------	----------------	----





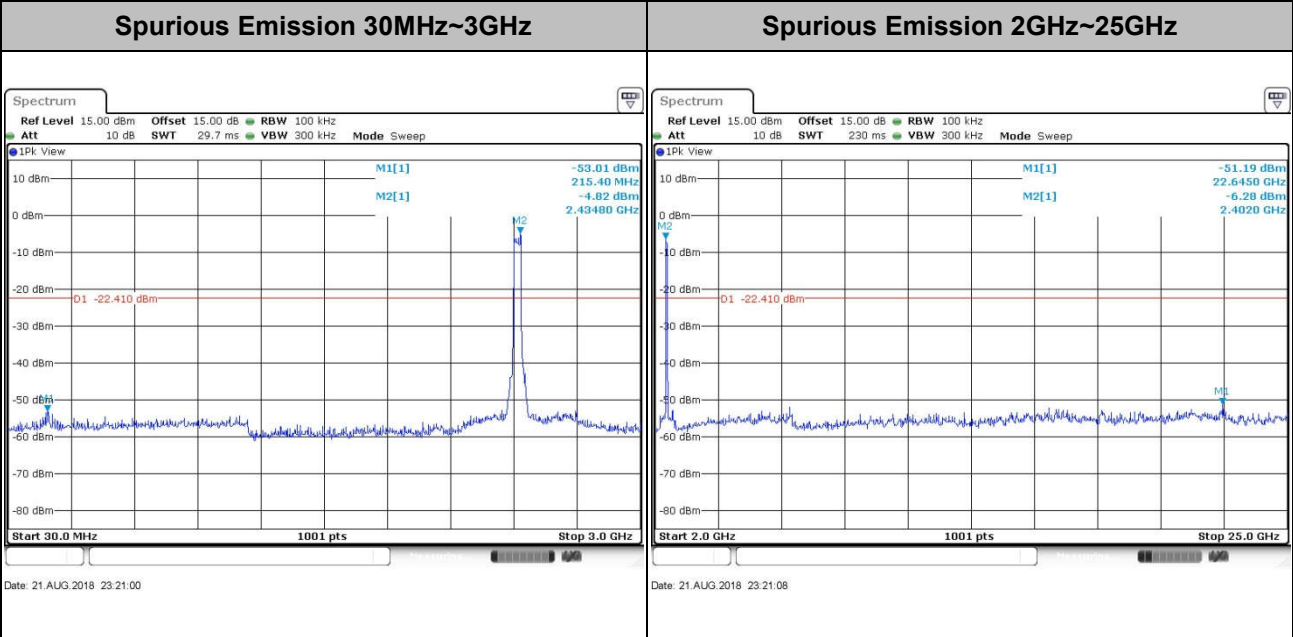
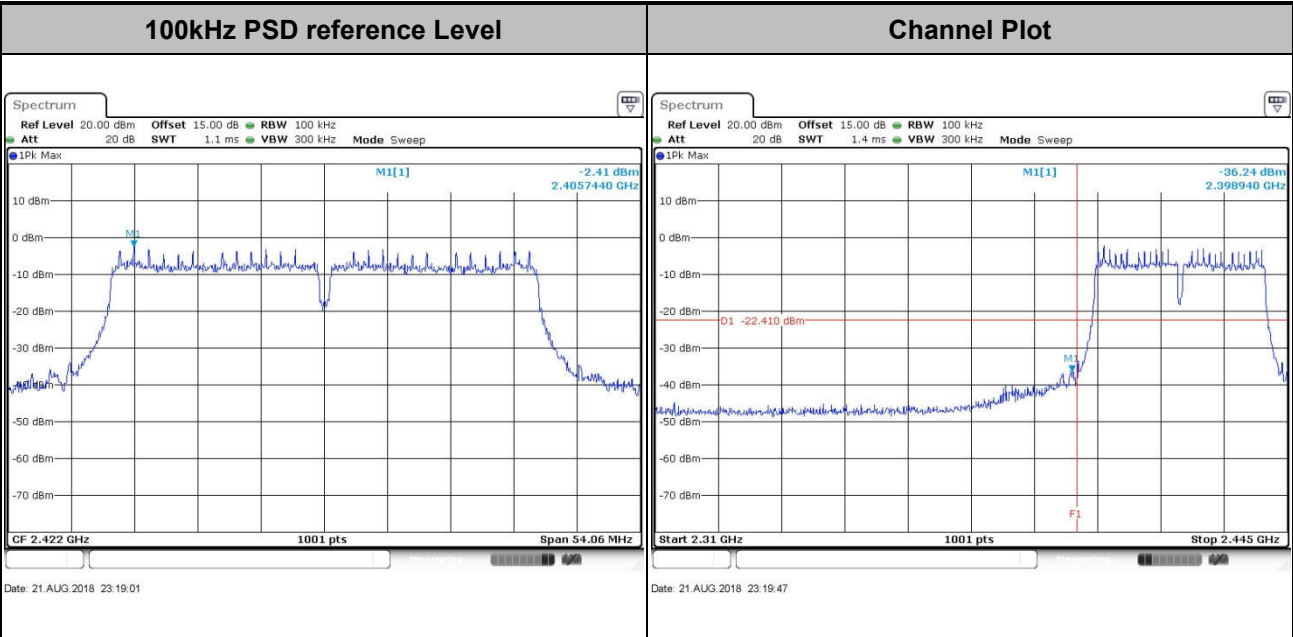


Test Mode :	802.11n HT20	Test Channel :	11
-------------	--------------	----------------	----



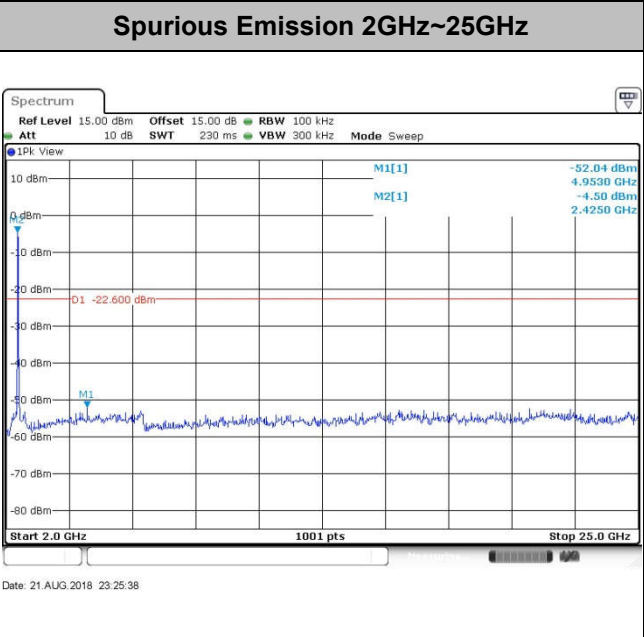
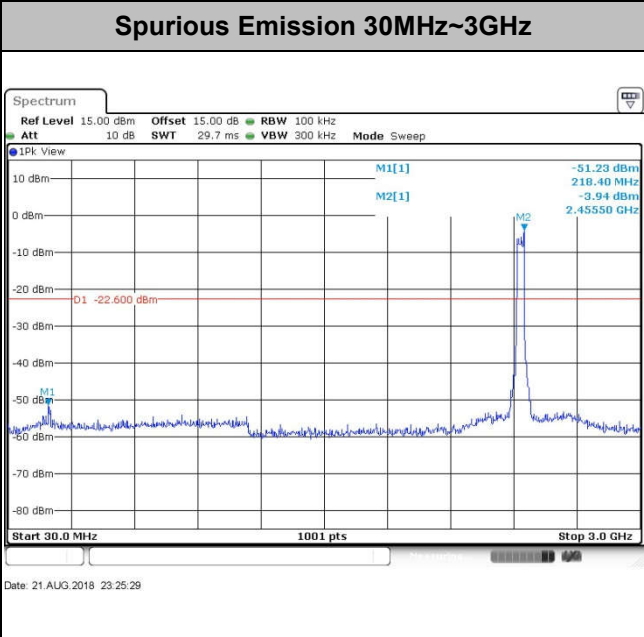
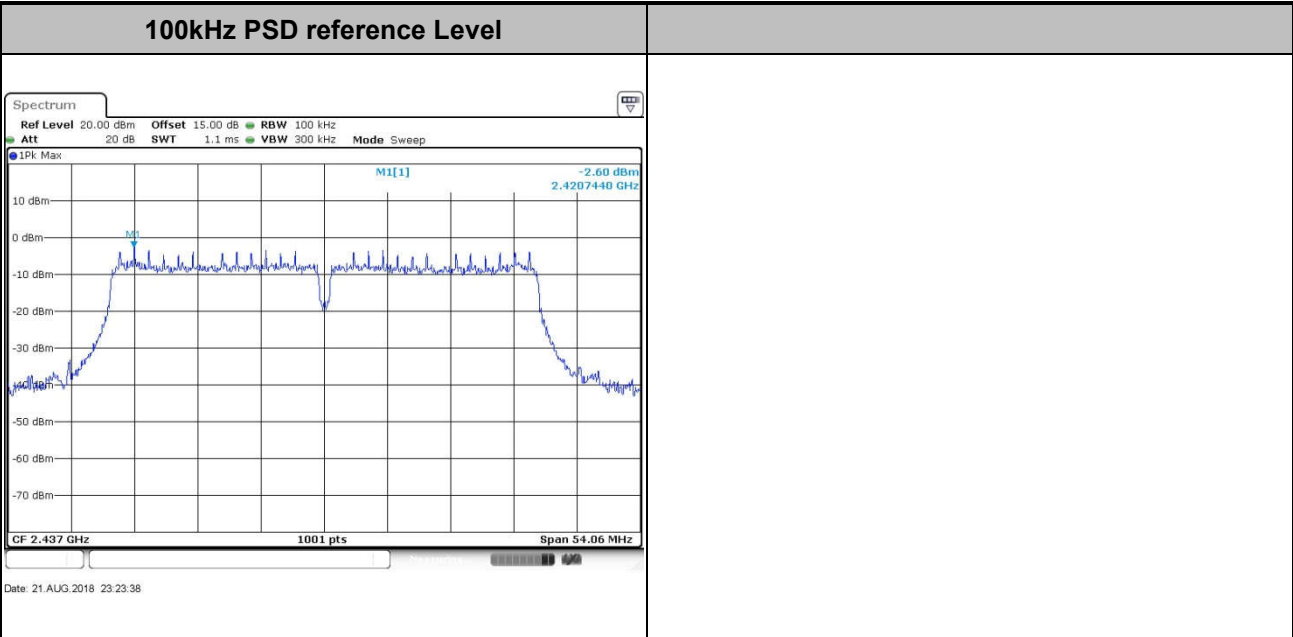


Test Mode : 802.11n HT40      Test Channel : 03



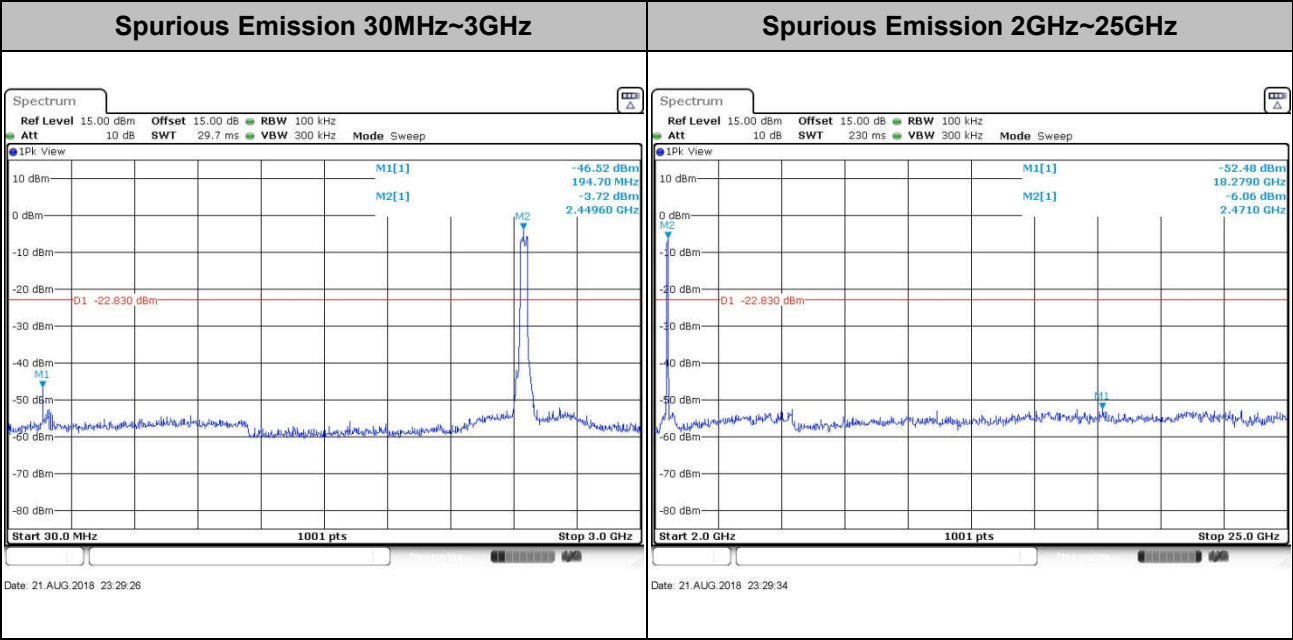
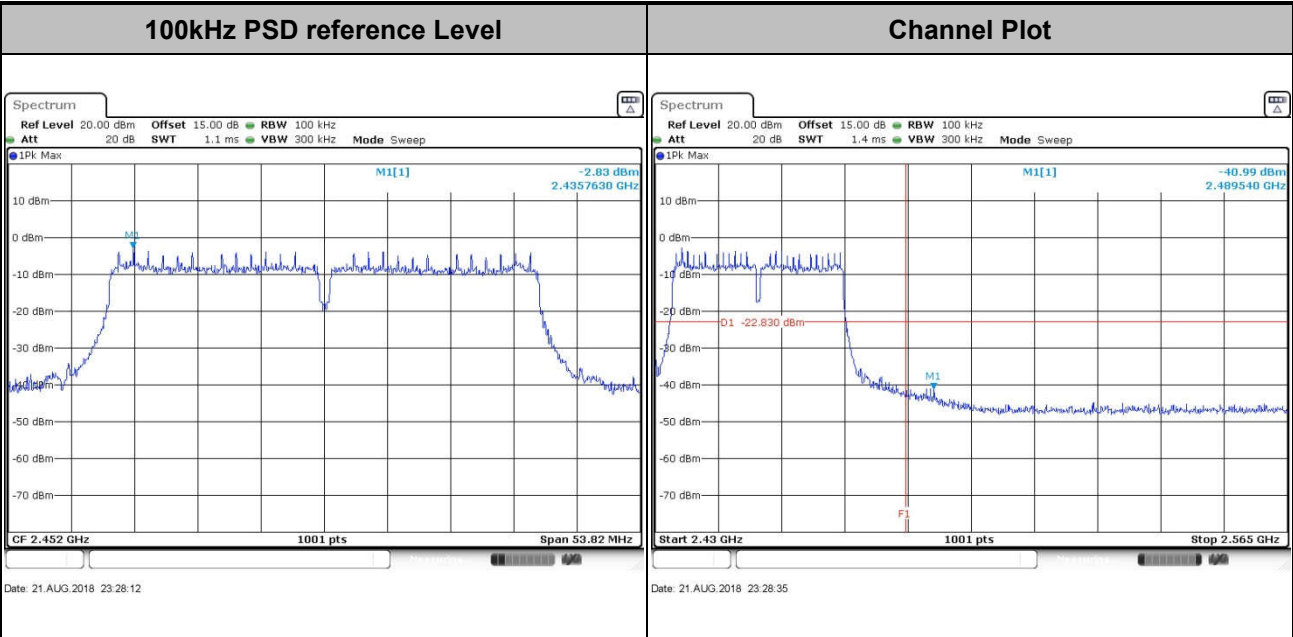


Test Mode :	802.11n HT40	Test Channel :	06
-------------	--------------	----------------	----





Test Mode :	802.11n HT40	Test Channel :	09
-------------	--------------	----------------	----





### 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 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

#### 3.5.2 Measuring Instruments

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

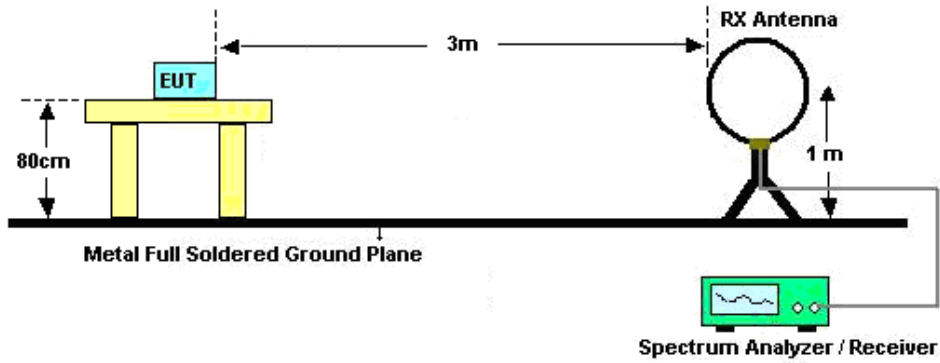


### 3.5.3 Test Procedures

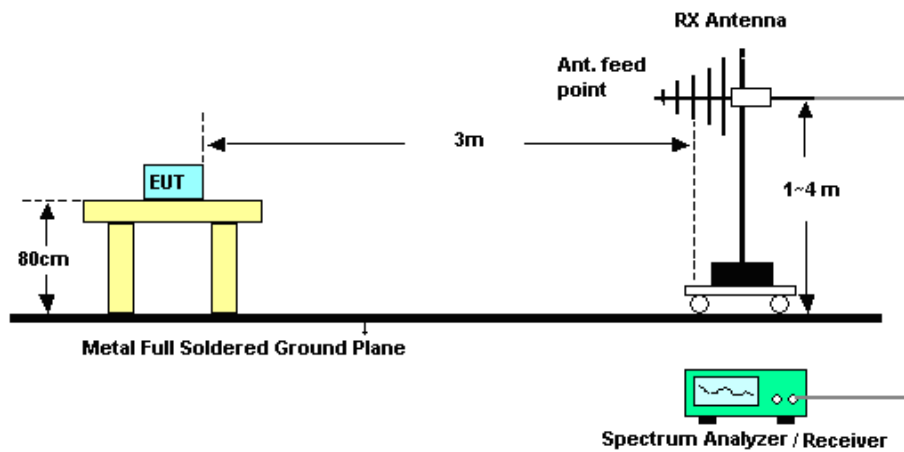
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test 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 testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. 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.

### 3.5.4 Test Setup

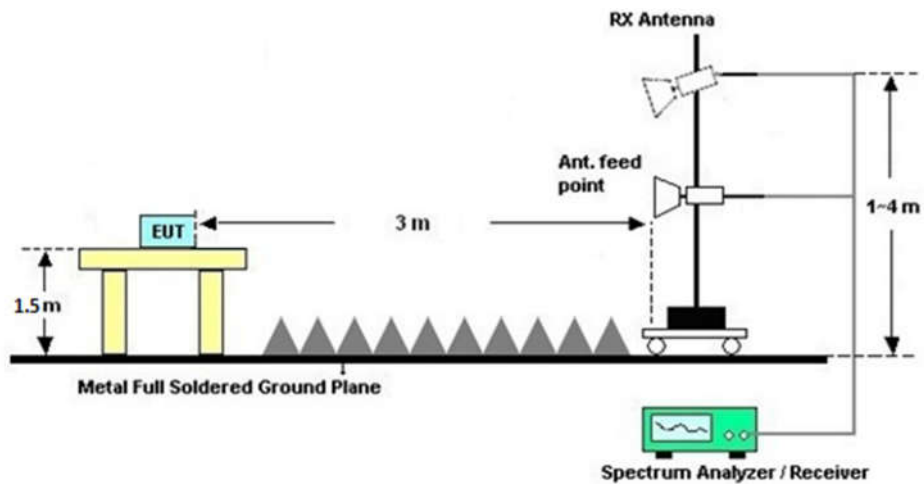
For radiated emissions below 30MHz



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 was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

### **3.5.6 Test Result of Radiated Spurious at Band Edges**

Please refer to Appendix C.

### **3.5.7 Duty Cycle**

Please refer to Appendix D.

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

Please refer to Appendix C.





## **3.6 Antenna Requirements**

### **3.6.1 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. 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 rule.

### **3.6.2 Antenna Anti-Replacement Construction**

Non-standard antenna connector is used.

### **3.6.3 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	R&S	FSP30	101400	9kHz~30GHz	Dec. 26, 2017	Aug. 21, 2018	Dec. 25, 2018	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSV40	101078	9kHz~40GHz	Apr. 19, 2018	Aug. 21, 2018	Apr. 18, 2019	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1207253	30MHz~40GHz	Dec. 26, 2017	Aug. 21, 2018	Dec. 25, 2018	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Dec. 26, 2017	Aug. 21, 2018	Dec. 25, 2018	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Apr. 19, 2018	Aug. 18, 2018~ Aug. 22, 2018	Apr. 18, 2019	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY551502 13	10Hz~44GHz	Apr. 19, 2018	Aug. 18, 2018~ Aug. 22, 2018	Apr. 18, 2019	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 14, 2018	Aug. 18, 2018~ Aug. 22, 2018	May 13, 2019	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	Aug 29, 2017	Aug. 18, 2018~ Aug. 22, 2018	Aug. 28, 2018	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-128 5	1GHz~18GHz	Dec. 13, 2017	Aug. 18, 2018~ Aug. 22, 2018	Dec. 12, 2018	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	Apr. 20, 2018	Aug. 18, 2018~ Aug. 22, 2018	Apr. 19, 2019	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz~ ~3000MHz	Oct. 19, 2017	Aug. 18, 2018~ Aug. 22, 2018	Oct. 18, 2018	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P-R	1989346	1GHz~18GHz	Jul. 30, 2018	Aug. 18, 2018~ Aug. 22, 2018	Jul. 29, 2019	Radiation (03CH04-SZ)
Amplifier	Agilent Technologies	83017A	MY532701 56	500MHz~26.5G Hz	Apr. 19, 2018	Aug. 18, 2018~ Aug. 22, 2018	Apr. 18, 2019	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35- HG	1988315	18GHz~40GHz	Jul. 26, 2018	Aug. 18, 2018~ Aug. 22, 2018	Jul. 25, 2019	Radiation (03CH04-SZ)
AC Power Source	Chroma	61601	N/A	N/A	NCR	Aug. 18, 2018~ Aug. 22, 2018	NCR	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Aug. 18, 2018~ Aug. 22, 2018	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Aug. 18, 2018~ Aug. 22, 2018	NCR	Radiation (03CH04-SZ)

NCR: No Calibration Required



## 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.0dB
---	-------

### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.8 dB
---	--------

### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.1 dB
---	--------



## **Appendix A. Conducted Test Results**

**A1 - DTS Part**

Test Engineer:	Wilson Chen	Temperature:	24~26	°C
Test Date:	2018/8/21	Relative Humidity:	50~53	%

**TEST RESULTS DATA**  
**6dB and 99% Occupied Bandwidth**

2.4GHz Band								
Mod.	Data Rate	N <sub>TX</sub>	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	12.34	10.05	0.50	Pass
11b	1Mbps	1	6	2437	12.34	10.03	0.50	Pass
11b	1Mbps	1	11	2462	12.39	10.05	0.50	Pass
11g	6Mbps	1	1	2412	17.78	16.30	0.50	Pass
11g	6Mbps	1	6	2437	17.78	16.32	0.50	Pass
11g	6Mbps	1	11	2462	17.78	16.32	0.50	Pass
HT20	MCS0	1	1	2412	18.38	17.06	0.50	Pass
HT20	MCS0	1	6	2437	18.38	17.08	0.50	Pass
HT20	MCS0	1	11	2462	18.38	17.28	0.50	Pass
HT40	MCS0	1	3	2422	36.66	36.04	0.50	Pass
HT40	MCS0	1	6	2437	36.76	36.04	0.50	Pass
HT40	MCS0	1	9	2452	36.66	35.88	0.50	Pass

**TEST RESULTS DATA**  
**Peak Power Table**

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
11b	1Mbps	1	1	2412	18.63	30.00	3.80	22.43	36.00	Pass
11b	1Mbps	1	6	2437	18.73	30.00	3.80	22.53	36.00	Pass
11b	1Mbps	1	11	2462	18.45	30.00	3.80	22.25	36.00	Pass
11g	6Mbps	1	1	2412	22.46	30.00	3.80	26.26	36.00	Pass
11g	6Mbps	1	6	2437	22.01	30.00	3.80	25.81	36.00	Pass
11g	6Mbps	1	11	2462	21.46	30.00	3.80	25.26	36.00	Pass
HT20	MCS0	1	1	2412	22.06	30.00	3.80	25.86	36.00	Pass
HT20	MCS0	1	6	2437	21.53	30.00	3.80	25.33	36.00	Pass
HT20	MCS0	1	11	2462	20.89	30.00	3.80	24.69	36.00	Pass
HT40	MCS0	1	3	2422	21.63	30.00	3.80	25.43	36.00	Pass
HT40	MCS0	1	6	2437	21.39	30.00	3.80	25.19	36.00	Pass
HT40	MCS0	1	9	2452	20.70	30.00	3.80	24.50	36.00	Pass

**TEST RESULTS DATA**  
**Average Power Table**  
**(Reporting Only)**

2.4GHz Band						
Mod.	Data Rate	N <sub>TX</sub>	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.10	15.16
11b	1Mbps	1	6	2437	0.10	15.28
11b	1Mbps	1	11	2462	0.10	15.03
11g	6Mbps	1	1	2412	0.57	12.69
11g	6Mbps	1	6	2437	0.57	12.50
11g	6Mbps	1	11	2462	0.57	11.95
HT20	MCS0	1	1	2412	0.61	12.73
HT20	MCS0	1	6	2437	0.61	12.42
HT20	MCS0	1	11	2462	0.61	11.89
HT40	MCS0	1	3	2422	1.15	12.30
HT40	MCS0	1	6	2437	1.15	12.06
HT40	MCS0	1	9	2452	1.15	11.56



**TEST RESULTS DATA**  
**Peak Power Density**

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	1Mbps	1	1	2412	3.04	3.80	8.00	Pass
11b	1Mbps	1	6	2437	2.91	3.80	8.00	Pass
11b	1Mbps	1	11	2462	2.50	3.80	8.00	Pass
11g	6Mbps	1	1	2412	-15.34	3.80	8.00	Pass
11g	6Mbps	1	6	2437	-15.45	3.80	8.00	Pass
11g	6Mbps	1	11	2462	-15.72	3.80	8.00	Pass
HT20	MCS0	1	1	2412	-14.19	3.80	8.00	Pass
HT20	MCS0	1	6	2437	-15.50	3.80	8.00	Pass
HT20	MCS0	1	11	2462	-16.20	3.80	8.00	Pass
HT40	MCS0	1	3	2422	-18.93	3.80	8.00	Pass
HT40	MCS0	1	6	2437	-18.16	3.80	8.00	Pass
HT40	MCS0	1	9	2452	-19.11	3.80	8.00	Pass



## Appendix B. Radiated Spurious Emission

Test Engineer :	Feiyan Zhang	Temperature :	22~25°C
		Relative Humidity :	48~52%

### 2.4GHz 2400~2483.5MHz

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

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 CH 01 2412MHz		2388.645	51.36	-22.64	74	53.58	27.7	4.78	34.7	322	301	P	H
		2389.065	38.5	-15.5	54	40.72	27.7	4.78	34.7	322	301	A	H
	*	2412	97.56	-	-	99.77	27.69	4.78	34.68	322	301	P	H
	*	2412	94.4	-	-	96.61	27.69	4.78	34.68	322	301	A	H
		2387.91	56.16	-17.84	74	58.38	27.7	4.78	34.7	235	337	P	V
		2375.835	40.98	-13.02	54	43.24	27.72	4.72	34.7	235	337	A	V
	*	2412	105.41	-	-	107.62	27.69	4.78	34.68	235	337	P	V
	*	2412	102.54	-	-	104.75	27.69	4.78	34.68	235	337	A	V
802.11b CH 06 2437MHz		2379.86	48	-26	74	50.26	27.72	4.72	34.7	162	91	P	H
		2380.14	37.24	-16.76	54	39.5	27.72	4.72	34.7	162	91	A	H
	*	2437	95.33	-	-	97.51	27.66	4.82	34.66	162	91	P	H
	*	2437	92.19	-	-	94.37	27.66	4.82	34.66	162	91	A	H
		2493.14	47.62	-26.38	74	49.76	27.61	4.85	34.6	162	91	P	H
		2493.63	37.64	-16.36	54	39.78	27.61	4.85	34.6	162	91	A	H
		2356.48	51.12	-22.88	74	53.38	27.74	4.72	34.72	177	118	P	V
		2361.1	40.52	-13.48	54	42.78	27.74	4.72	34.72	177	118	A	V
	*	2437	105.33	-	-	107.51	27.66	4.82	34.66	177	118	P	V
	*	2437	102.21	-	-	104.39	27.66	4.82	34.66	177	118	A	V
		2493	50.77	-23.23	74	52.91	27.61	4.85	34.6	177	118	P	V
	2498.39	40.32	-13.68	54	42.46	27.61	4.85	34.6	177	118	A	V	



802.11b CH 11 2462MHz	*	2462	95.63	-	-	97.81	27.64	4.82	34.64	158	94	P	H
	*	2462	92.53	-	-	94.71	27.64	4.82	34.64	158	94	A	H
		2493.68	48.94	-25.06	74	51.08	27.61	4.85	34.6	158	94	P	H
		2496.16	37.64	-16.36	54	39.78	27.61	4.85	34.6	158	94	A	H
	*	2462	105.24	-	-	107.42	27.64	4.82	34.64	149	167	P	V
	*	2462	102.15	-	-	104.33	27.64	4.82	34.64	149	167	A	V
		2485.48	57.5	-16.5	74	59.64	27.63	4.85	34.62	149	167	P	V
		2483.64	41.28	-12.72	54	43.42	27.63	4.85	34.62	149	167	A	V
Remark	<ol style="list-style-type: none"> <li>No other spurious found.</li> <li>All results are PASS against Peak and Average limit line.</li> </ol>												



2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)

Table with 14 columns: 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). Rows include data for CH 01 (2412MHz) and CH 06 (2437MHz) and CH 11 (2462MHz).



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		2389.59	51.24	-22.76	74	53.46	27.7	4.78	34.7	332	303	P	H
		2389.485	40.61	-13.39	54	42.83	27.7	4.78	34.7	332	303	A	H
	*	2412	96.33	-	-	98.54	27.69	4.78	34.68	332	303	P	H
	*	2412	88.86	-	-	91.07	27.69	4.78	34.68	332	303	A	H
		2389.485	60.94	-13.06	74	63.16	27.7	4.78	34.7	320	253	P	V
		2389.8	47.62	-6.38	54	49.82	27.7	4.78	34.68	320	253	A	V
	*	2412	106.05	-	-	108.26	27.69	4.78	34.68	320	253	P	V
	*	2412	98.33	-	-	100.54	27.69	4.78	34.68	320	253	A	V
802.11g CH 06 2437MHz		2328.62	49	-25	74	51.31	27.77	4.66	34.74	360	304	P	H
		2324.28	38.51	-15.49	54	40.82	27.77	4.66	34.74	360	304	A	H
	*	2437	95.32	-	-	97.5	27.66	4.82	34.66	360	304	P	H
	*	2437	87.84	-	-	90.02	27.66	4.82	34.66	360	304	A	H
		2483.9	47.85	-26.15	74	49.99	27.63	4.85	34.62	360	304	P	H
		2491.04	37.93	-16.07	54	40.09	27.61	4.85	34.62	360	304	A	H
		2383.64	53.23	-20.77	74	55.49	27.72	4.72	34.7	324	252	P	V
		2384.76	43.15	-10.85	54	45.35	27.72	4.78	34.7	324	252	A	V
	*	2437	105.17	-	-	107.35	27.66	4.82	34.66	324	252	P	V
	*	2437	97.58	-	-	99.76	27.66	4.82	34.66	324	252	A	V
		2499.86	51.76	-22.24	74	53.9	27.61	4.85	34.6	324	252	P	V
		2490.13	41.99	-12.01	54	44.15	27.61	4.85	34.62	324	252	A	V



802.11g CH 11 2462MHz	*	2462	94.37	-	-	96.55	27.64	4.82	34.64	320	302	P	H
	*	2462	86.88	-	-	89.06	27.64	4.82	34.64	320	302	A	H
		2483.92	51.79	-22.21	74	53.93	27.63	4.85	34.62	320	302	P	H
		2483.52	39.56	-14.44	54	41.7	27.63	4.85	34.62	320	302	A	H
	*	2462	104.43	-	-	106.61	27.64	4.82	34.64	324	241	P	V
	*	2462	96.61	-	-	98.79	27.64	4.82	34.64	324	241	A	V
		2483.96	64.86	-9.14	74	67	27.63	4.85	34.62	324	241	P	V
		2483.52	50	-4	54	52.14	27.63	4.85	34.62	324	241	A	V
Remark	<ol style="list-style-type: none"> <li>No other spurious found.</li> <li>All results are PASS against Peak and Average limit line.</li> </ol>												



**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	39.75	-34.25	74	60.63	31.76	5.55	58.19	150	211	P	H
		4824	40.9	-33.1	74	61.78	31.76	5.55	58.19	141	214	P	V
802.11g CH 06 2437MHz		4874	38.94	-35.06	74	59.51	31.88	5.65	58.1	114	148	P	H
		7311	44.37	-29.63	74	58.15	36.88	7.26	57.92	189	238	P	H
		4874	38.57	-35.43	74	59.14	31.88	5.65	58.1	217	201	P	V
802.11g CH 11 2462MHz		7311	44.87	-29.13	74	58.65	36.88	7.26	57.92	100	140	P	V
		4924	37.25	-36.75	74	57.41	32	5.86	58.02	185	287	P	H
		7386	44.7	-29.3	74	57.94	37.21	7.2	57.65	189	238	P	H
		4924	37.86	-36.14	74	58.02	32	5.86	58.02	150	269	P	V
		7386	45.02	-28.98	74	58.26	37.21	7.2	57.65	183	221	P	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 )
802.11n HT20 CH 01 2412MHz		2389.275	54.99	-19.01	74	57.21	27.7	4.78	34.7	331	304	P	H
		2389.8	42.12	-11.88	54	44.32	27.7	4.78	34.68	331	304	A	H
	*	2412	96.8	-	-	99.01	27.69	4.78	34.68	331	304	P	H
	*	2412	89.36	-	-	91.57	27.69	4.78	34.68	331	304	A	H
		2388.75	63.26	-10.74	74	65.48	27.7	4.78	34.7	309	317	P	V
		2389.8	49.31	-4.69	54	51.51	27.7	4.78	34.68	309	317	A	V
	*	2412	104.92	-	-	107.13	27.69	4.78	34.68	309	317	P	V
	*	2412	97.54	-	-	99.75	27.69	4.78	34.68	309	317	A	V
802.11n HT20 CH 06 2437MHz		2327.78	49.21	-24.79	74	51.52	27.77	4.66	34.74	314	303	P	H
		2311.4	39.11	-14.89	54	41.42	27.79	4.66	34.76	314	303	A	H
	*	2437	96.15	-	-	98.33	27.66	4.82	34.66	314	303	P	H
	*	2437	88.81	-	-	90.99	27.66	4.82	34.66	314	303	A	H
		2491.11	48.7	-25.3	74	50.86	27.61	4.85	34.62	314	303	P	H
		2484.18	38.5	-15.5	54	40.64	27.63	4.85	34.62	314	303	A	H
		2389.52	53.05	-20.95	74	55.27	27.7	4.78	34.7	312	301	P	V
		2380.98	43.27	-10.73	54	45.53	27.72	4.72	34.7	312	301	A	V
	*	2437	105.12	-	-	107.3	27.66	4.82	34.66	312	301	P	V
	*	2437	97.66	-	-	99.84	27.66	4.82	34.66	312	301	A	V
	2492.72	52.24	-21.76	74	54.38	27.61	4.85	34.6	312	301	P	V	
	2489.64	42.36	-11.64	54	44.52	27.61	4.85	34.62	312	301	A	V	





<b>802.11n</b>  <b>HT20</b>  <b>CH 11</b>  <b>2462MHz</b>	*	2462	94.2	-	-	96.38	27.64	4.82	34.64	316	321	P	H
	*	2462	86.72	-	-	88.9	27.64	4.82	34.64	316	321	A	H
		2484.16	54.71	-19.29	74	56.85	27.63	4.85	34.62	316	321	P	H
		2483.52	41.48	-12.52	54	43.62	27.63	4.85	34.62	316	321	A	H
	*	2462	104.05	-	-	106.23	27.64	4.82	34.64	301	326	P	V
	*	2462	96.67	-	-	98.85	27.64	4.82	34.64	301	326	A	V
		2485.64	62.78	-11.22	74	64.92	27.63	4.85	34.62	301	326	P	V
		2483.5	49.39	-4.61	54	51.53	27.63	4.85	34.62	301	326	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 )
802.11n HT20 CH 01 2412MHz		4812	39.91	-34.09	74	60.86	31.72	5.55	58.22	251	0	P	H
		4824	39.63	-34.37	74	60.51	31.76	5.55	58.19	190	210	P	V
802.11n HT20 CH 06 2437MHz		4874	38.36	-35.64	74	58.93	31.88	5.65	58.1	122	136	P	H
		7311	44.7	-29.3	74	58.48	36.88	7.26	57.92	112	298	P	H
		4874	38.5	-35.5	74	59.07	31.88	5.65	58.1	233	102	P	V
		7311	45.1	-28.9	74	58.88	36.88	7.26	57.92	185	32	P	V
802.11n HT20 CH 11 2462MHz		4924	36.78	-37.22	74	56.94	32	5.86	58.02	102	203	P	H
		7386	45.47	-28.53	74	58.71	37.21	7.2	57.65	172	214	P	H
		4924	36.94	-37.06	74	57.1	32	5.86	58.02	150	271	P	V
		7386	44.84	-29.16	74	58.08	37.21	7.2	57.65	195	226	P	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 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		2386.58	58.12	-15.88	74	58.64	27.7	4.78	33	118	324	P	H
		2389.94	45.99	-8.01	54	46.51	27.7	4.78	33	118	324	A	H
	*	2422	93.84	-	-	94.39	27.67	4.78	33	118	324	P	H
	*	2422	86.45	-	-	87	27.67	4.78	33	118	324	A	H
		2497.9	48.56	-25.44	74	49.1	27.61	4.85	33	118	324	P	H
		2484.53	39.22	-14.78	54	39.74	27.63	4.85	33	118	324	A	H
		2386.58	63.13	-10.87	74	63.65	27.7	4.78	33	113	190	P	V
		2389.94	50.56	-3.44	54	51.08	27.7	4.78	33	113	190	A	V
	*	2422	100.36	-	-	100.91	27.67	4.78	33	113	190	P	V
	*	2422	93.13	-	-	93.68	27.67	4.78	33	113	190	A	V
		2484.53	51.4	-22.6	74	51.92	27.63	4.85	33	113	190	P	V
		2484.74	42.57	-11.43	54	43.09	27.63	4.85	33	113	190	A	V
802.11n HT40 CH 06 2437MHz		2389.94	51.09	-22.91	74	51.61	27.7	4.78	33	103	320	P	H
		2320.08	41.54	-12.46	54	42.11	27.77	4.66	33	103	320	A	H
	*	2437	92.44	-	-	92.96	27.66	4.82	33	103	320	P	H
	*	2437	85.13	-	-	85.65	27.66	4.82	33	103	320	A	H
		2486	50.72	-23.28	74	51.24	27.63	4.85	33	103	320	P	H
		2483.69	40.51	-13.49	54	41.03	27.63	4.85	33	103	320	A	H
		2389.66	55.24	-18.76	74	55.76	27.7	4.78	33	113	190	P	V
		2389.66	44.97	-9.03	54	45.49	27.7	4.78	33	113	190	A	V
	*	2437	100.21	-	-	100.73	27.66	4.82	33	113	190	P	V
	*	2437	92.76	-	-	93.28	27.66	4.82	33	113	190	A	V
		2483.9	56.36	-17.64	74	56.88	27.63	4.85	33	113	190	P	V
		2483.62	45.39	-8.61	54	45.91	27.63	4.85	33	113	190	A	V



<b>802.11n</b>  <b>HT40</b>  <b>CH 09</b>  <b>2452MHz</b>		2368.38	49.02	-24.98	74	49.56	27.74	4.72	33	118	324	P	H
		2319.66	40.42	-13.58	54	40.99	27.77	4.66	33	118	324	A	H
	*	2452	90.36	-	-	90.88	27.66	4.82	33	118	324	P	H
	*	2452	83.59	-	-	84.11	27.66	4.82	33	118	324	A	H
		2484.46	57.75	-16.25	74	58.27	27.63	4.85	33	118	324	P	H
		2483.5	44.07	-9.93	54	44.59	27.63	4.85	33	118	324	A	H
		2347.66	53.83	-20.17	74	54.36	27.75	4.72	33	109	225	P	V
		2347.94	44.5	-9.5	54	45.03	27.75	4.72	33	109	225	A	V
	*	2452	100.84	-	-	101.36	27.66	4.82	33	109	225	P	V
	*	2452	93.78	-	-	94.3	27.66	4.82	33	109	225	A	V
		2484.6	63.56	-10.44	74	64.08	27.63	4.85	33	109	225	P	V
		2483.76	50.63	-3.37	54	51.15	27.63	4.85	33	109	225	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		4844	37.93	-36.07	74	58.64	31.8	5.65	58.16	114	148	P	H
HT40		7266	45.07	-28.93	74	59.06	36.75	7.29	58.03	189	238	P	H
CH 03		4844	38.34	-35.66	74	59.05	31.8	5.65	58.16	200	210	P	V
2422MHz		7266	45.11	-28.89	74	59.1	36.75	7.29	58.03	105	269	P	V
802.11n		4874	37.95	-36.05	74	58.52	31.88	5.65	58.1	122	136	P	H
HT40		7311	44.56	-29.44	74	58.34	36.88	7.26	57.92	112	298	P	H
CH 06		4874	38.83	-35.17	74	59.4	31.88	5.65	58.1	233	102	P	V
2437MHz		7311	45.04	-28.96	74	58.82	36.88	7.26	57.92	185	32	P	V
802.11n		4904	38.24	-35.76	74	58.56	31.96	5.76	58.04	200	89	P	H
HT40		7356	46.1	-27.9	74	59.55	37.08	7.23	57.76	181	318	P	H
CH 09		4904	37.49	-36.51	74	57.81	31.96	5.76	58.04	152	149	P	V
2452MHz		7356	44.63	-29.37	74	58.08	37.08	7.23	57.76	180	225	P	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 HT40 (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 802.11n HT40 LF		214.3	32.61	-10.89	43.5	46.88	15.39	1.64	31.3	-	-	P	H
		291.9	35.99	-10.01	46	46.3	19.08	1.83	31.22	-	-	P	H
		435.46	37.08	-8.92	46	43.85	22.24	2.26	31.27	-	-	P	H
		586.78	40.27	-5.73	46	44.52	24.35	2.66	31.26	100	142	P	H
		821.52	34.5	-11.5	46	36.21	26.26	3.2	31.17	-	-	P	H
		967.02	38.46	-15.54	54	39.2	27.1	3.5	31.34	-	-	P	H
		112.45	28.79	-14.71	43.5	41.86	17.5	1.11	31.68	-	-	P	V
		192.96	31.69	-11.81	43.5	46.05	15.46	1.54	31.36	-	-	P	V
		482.99	30.13	-15.87	46	35.91	23.09	2.38	31.25	-	-	P	V
		579.99	40.95	-5.05	46	45.29	24.28	2.64	31.26	100	87	P	V
		628.49	36.32	-9.68	46	40.19	24.61	2.77	31.25	-	-	P	V
	870.02	33.81	-12.19	46	35.27	26.41	3.31	31.18	-	-	P	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

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

**For Peak Limit @ 2390MHz:**

- 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)
- Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 55.45(dBμV/m) – 74(dBμV/m)  
= -18.55(dB)

**For Average Limit @ 2390MHz:**

- 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)
- 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”.**

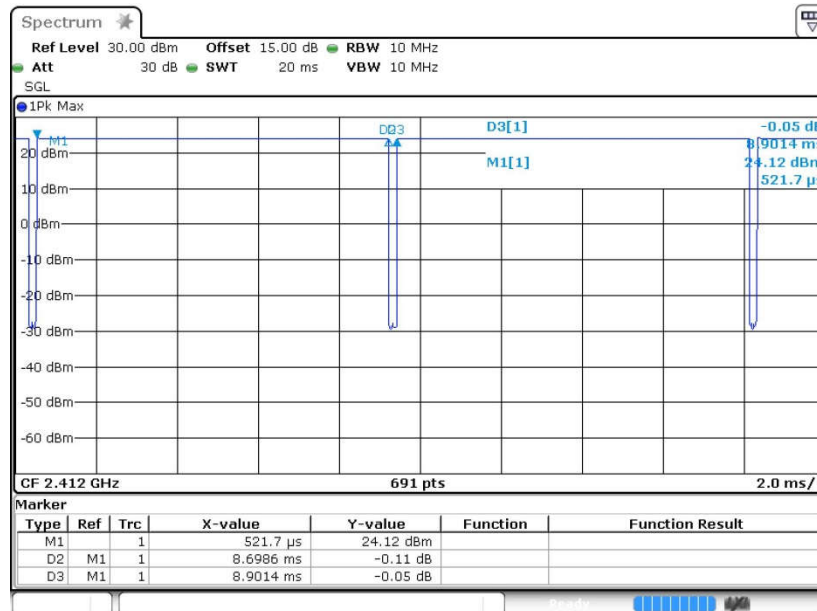




### Appendix C. Duty Cycle Plots

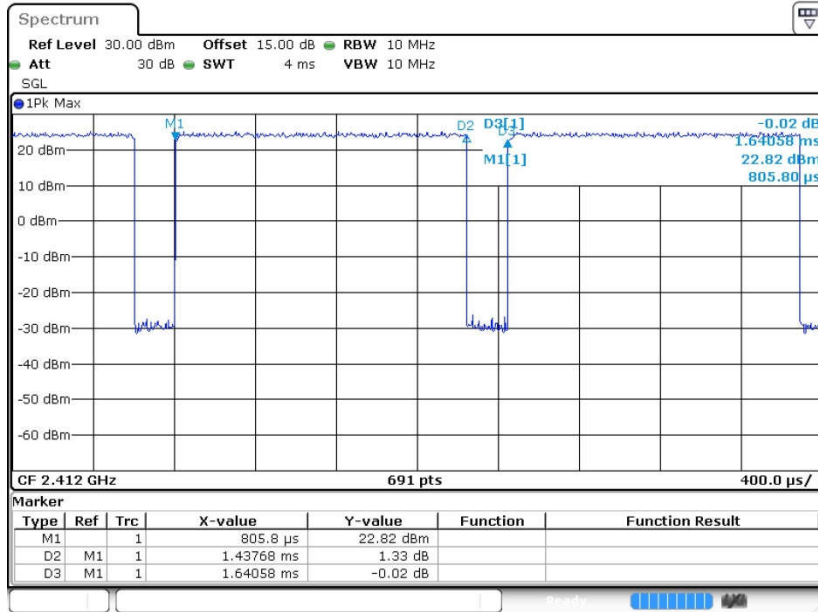
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	97.72	8.699	0.115	300Hz
802.11g	87.63	1.438	0.696	1KHz
802.11n HT20	86.94	1.351	0.740	1KHz
802.11n HT40	76.75	0.670	1.493	3KHz

#### 802.11b

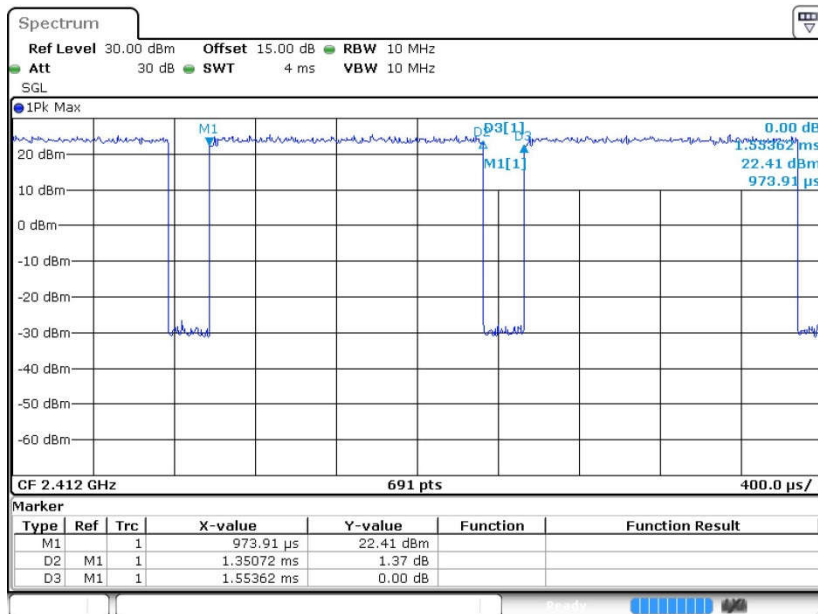




802.11g



802.11n HT20





802.11n HT40

