FCC RADIO TEST REPORT

FCC ID	:	**O57FLEX5G14X05**
Equipment	:	**Notebook Computer**
Brand Name	:	**Lenovo**
Model Name	:	**Lenovo Flex 5G 14Q8CX05********, 82AK********, Yoga 5G 14Q8CX05********, 81XE******** (* = 0~9, A~Z, a~z, "-" or blank, for marketing use only, with no impact on RF compliance of the product)**
Applicant	:	**Lenovo (Shanghai) Electronics Technology Co., Ltd. Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone, Shanghai**
Manufacturer	:	**Lenovo PC HK Limited 23/F, Lincoln House, Taikoo Place, 979 King's Road, Quarry Bay, Hong Kong**
Standard	:	**FCC Part 15 Subpart C §15.247**

Equipment: Murata LBDD5WV1US-575 and HON LIN T99W175 tested inside of Lenovo Notebook Computer.

The product was received on Nov. 27, 2019 and testing was started from Nov. 27, 2019 and completed on Dec. 19, 2019. We, SPORTON INTERNATIONAL INC., EMC & Wireless Communications Laboratory, 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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E-mail : Alex@sporton.com.tw

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FR9N2705C	01	Initial issue of report	Feb. 18, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)	Power Output Measurement	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges	Pass	-
		Conducted Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 0.46 dB at 2484.460 MHz
3.6	15.207	AC Conducted Emission	Pass	Under limit 12.29 dB at 0.209 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

Report Producer: Ching Chen

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Notebook Computer
Brand Name	Lenovo
Model Name	Lenovo Flex 5G 14Q8CX05********, 82AK********, Yoga 5G 14Q8CX05********, 81XE******** (* = 0~9, A~Z, a~z, "-" or blank, for marketing use only, with no impact on RF compliance of the product)
FCC ID	O57FLEX5G14X05
EUT supports Radios application	WCDMA/HSPA/LTE/5G NR/RFID/GNSS WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer.
2. Equipment: Murata LBDD5WV1US-575 and HON LIN T99W175 tested inside of Lenovo Notebook Computer.

Antenna Information			
Notebook Mode	**Antenna Type**	Main: PIFA Antenna	Aux: PIFA Antenna
	Part number	AML6Y-100089 (AM2RC000600)	AML6Y-100090 (AM2RC000700)
	Peak gain (dbi)	Main Antenna :	Aux. Antenna :
		WLAN (2.4GHz): -1.34 Bluetooth: -1.34	WLAN (2.4GHz): -1.89
Tablet Mode	**Antenna Type**	Main: PIFA Antenna	Aux: PIFA Antenna
	Part number	AML6Y-100089 (AM2RC000600)	AML6Y-100090 (AM2RC000700)
	Peak gain (dbi)	Main Antenna :	Aux. Antenna :
		WLAN (2.4GHz): -1.73 Bluetooth: -1.73	WLAN (2.4GHz): -0.52

1.2 Product Specification of Equipment Under Test

<table>
<tr><th colspan="2">Standards-related Product Specification</th></tr>
<tr><td>Tx/Rx Channel Frequency Range</td><td>2412 MHz ~ 2472 MHz</td></tr>
<tr><td>Maximum (Average) Output Power to antenna</td><td><Chain 1>
802.11b : 14.60 dBm (0.0288 W)
802.11g : 14.60 dBm (0.0288 W)
802.11n HT20 : 14.60 dBm (0.0288 W)
802.11n HT40 : 14.60 dBm (0.0288 W)
<Chain 2>
802.11b : 14.90 dBm (0.0309 W)
802.11g : 14.90 dBm (0.0309 W)
802.11n HT20 : 14.80 dBm (0.0302 W)
802.11n HT40 : 14.90 dBm (0.0309 W)
<MIMO Chain 1 + 2>
802.11b : 17.86 dBm (0.0611 W)
802.11g : 17.86 dBm (0.0611 W)
802.11n HT20 : 17.86 dBm (0.0611 W)
802.11n HT40 : 17.86 dBm (0.0611 W)</td></tr>
<tr><td>Type of Modulation</td><td>802.11b : DSSS (DBPSK / DQPSK / CCK)
802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)</td></tr>
<tr><td>Antenna Function Description</td><td>
<table>
<tr><td></td><td>Chain 1</td><td>Chain 2</td></tr>
<tr><td>802.11 b/g/n</td><td>V</td><td>V</td></tr>
<tr><td>802.11 b/g/n MIMO</td><td>V</td><td>V</td></tr>
</table>
</td></tr>
</table>

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

1.3 Modification of EUT

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

1.4 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
Test Site Location	No.52 , Huaya 1st Rd., Guishan Dist.,Taoyuan City, Taiwan	
Test Site No.	**Sporton Site No.**	
	TH05-HY	CO05-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan
Test Site No.	**Sporton Site No.**
	03CH13-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190 and TW0007

1.5 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 v05r02
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

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 notebook type and three orthogonal panels (X, Y, and Z). The worst cases (X plane with tablet mode) 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		

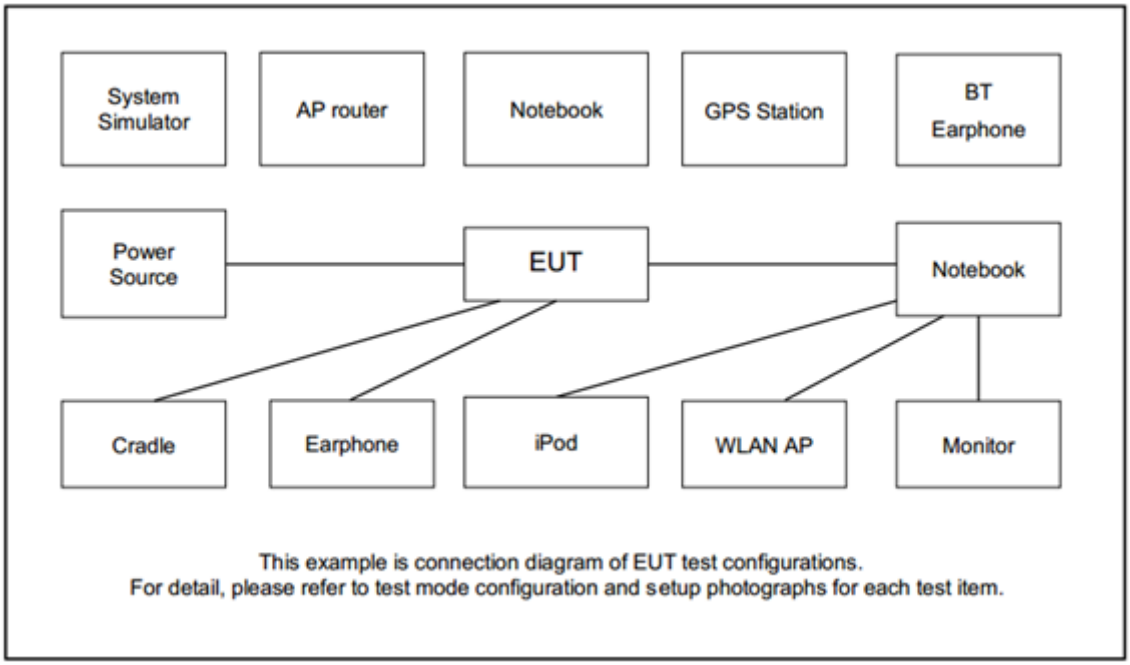
2.2 Test Mode

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

Test Cases	
AC Conducted Emission	Mode 1 :Bluetooth Tx + WLAN 2.4 (GHz) + Adapter + Type-Cx1 + Earphone

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.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
2.	Hard Disk	Lenovo	F310S	FCC DoC	Shielded, 0.5m	N/A
3.	Earphone	Zyia	N/A	FCC DoC	Shielded, 1.0 m	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT_V 4.0-00142” was installed in EUT which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

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 4.2 dB and 10dB attenuator.

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

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

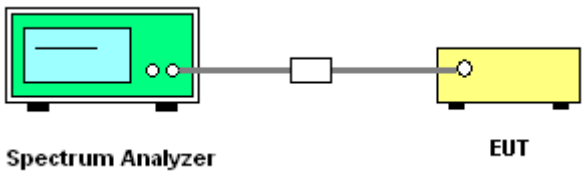
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

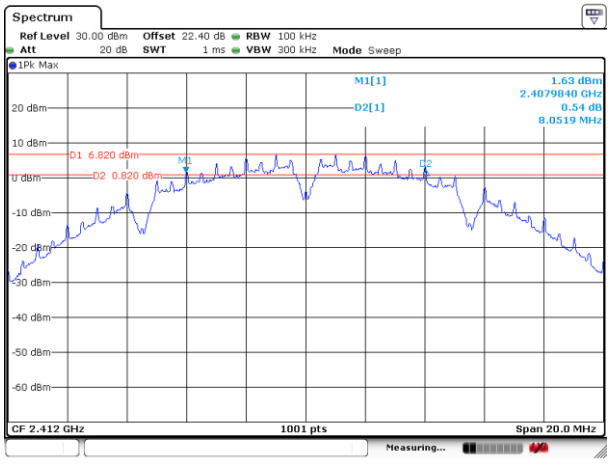
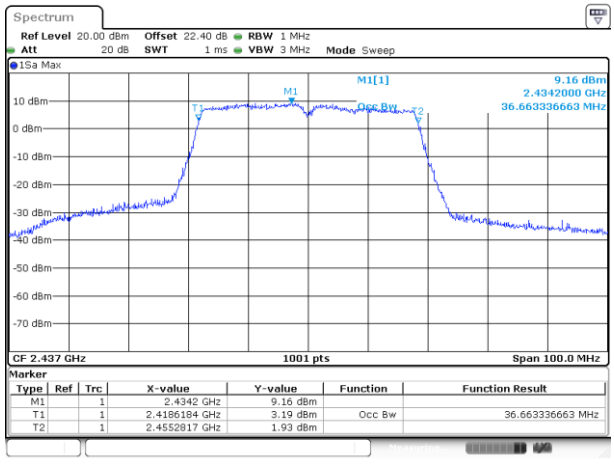
1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

Minimum 6dB Bandwidth	Maximum 99% Occupied Bandwidth
	

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 average output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the average output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

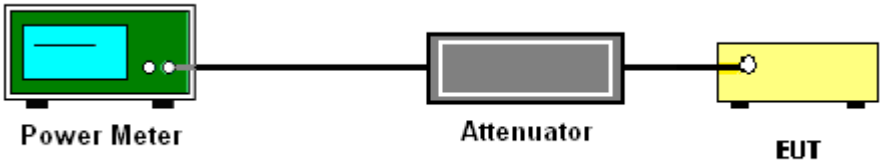
3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

3.2.4 Test Setup



3.2.5 Test Result of Average Output Power

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

See list of measuring equipment of this test report.

3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

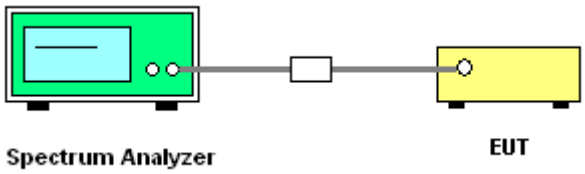
   If measurements performed using method (2) plus 10 log (N) exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

   Method (1): Measure and sum the spectra across the outputs.

   The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

   Method (2): Measure and add 10 log (N) dB, where N is the number of outputs. (N=2)

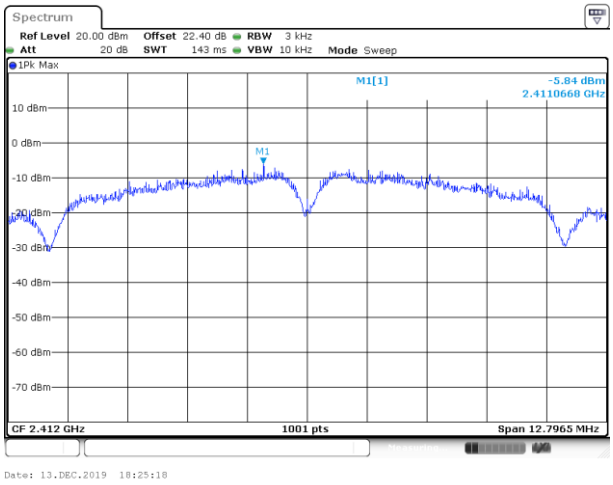
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/3kHz) for MIMO Ant. 2



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.

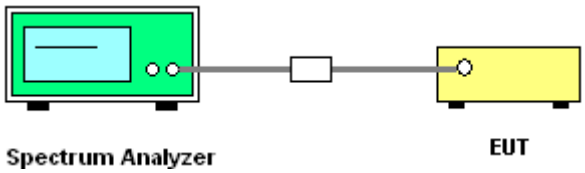
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement.
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 30 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

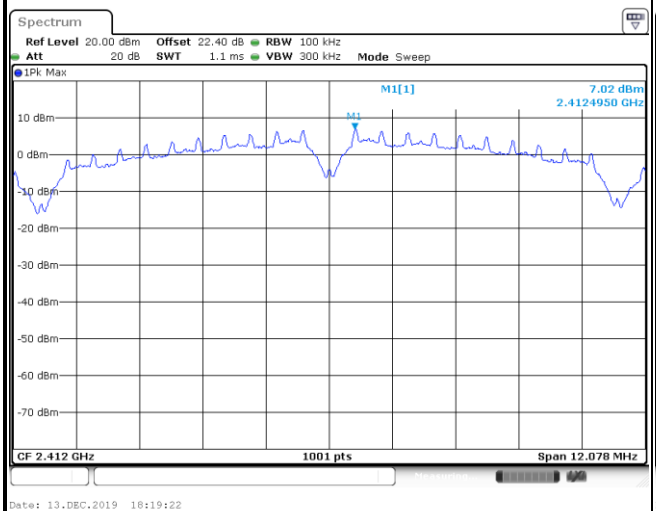
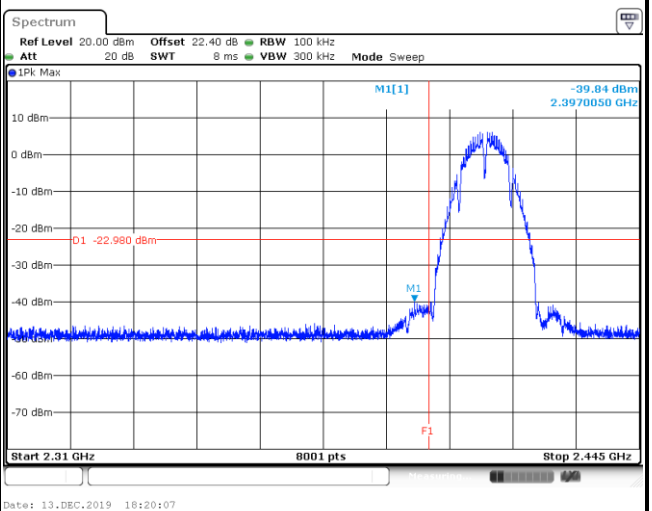
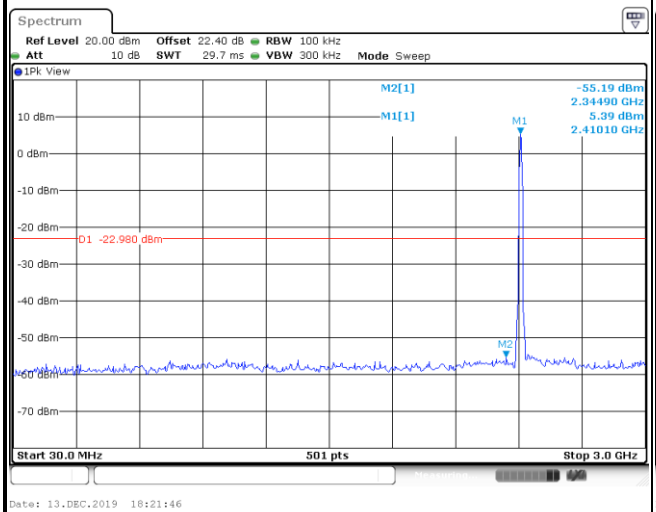
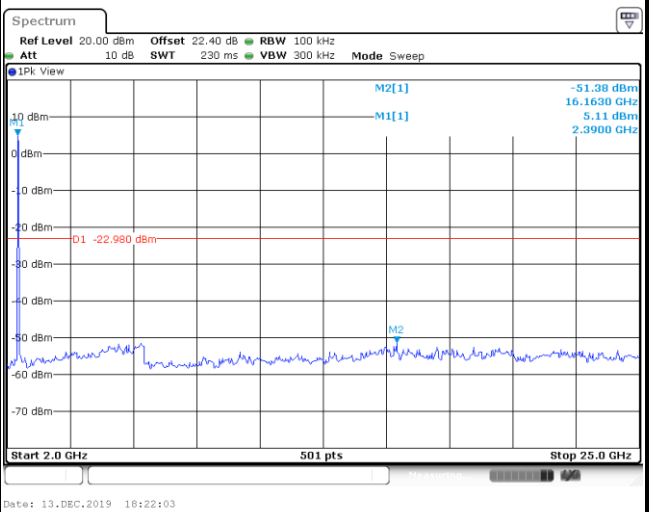


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

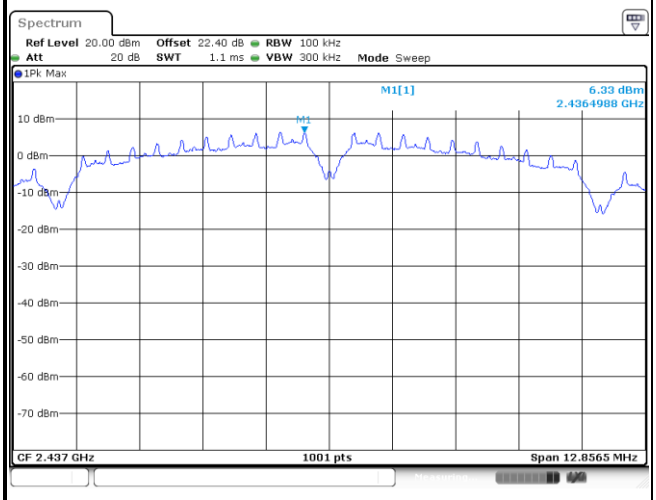
Test Engineer :	Shiming Liu and Eason Huang	**Temperature :**	21~25℃
		Relative Humidity :	51~54%

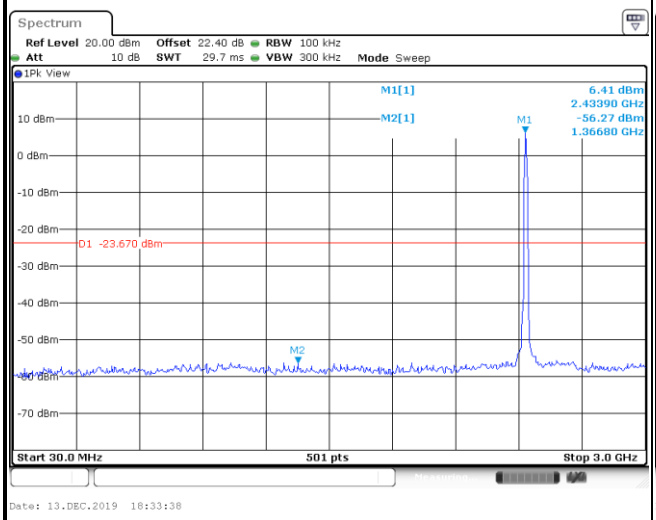
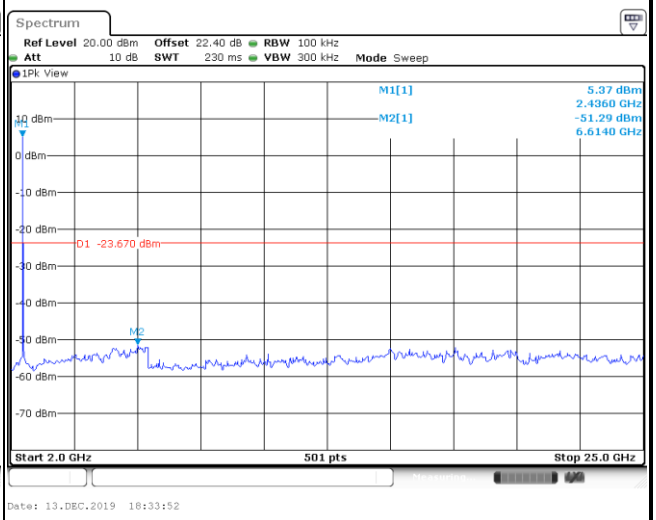
Number of TX = 2, Ant. 1 (Measured)

Test Mode :	802.11b	**Test Channel :**	01

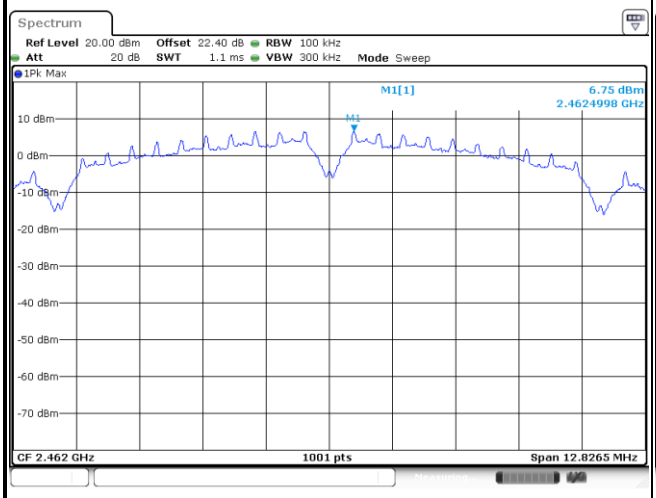
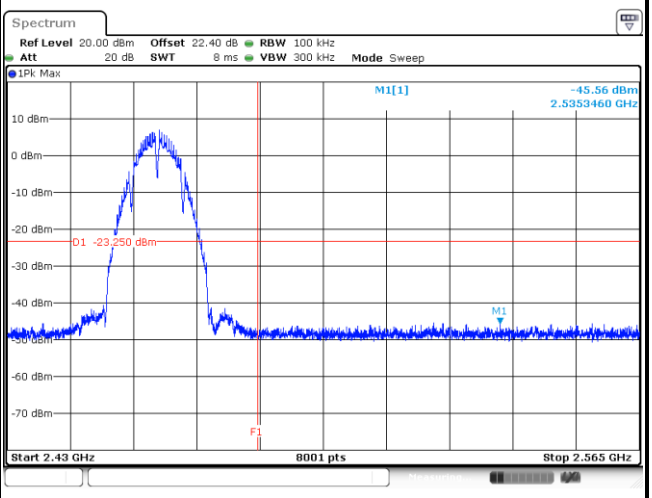
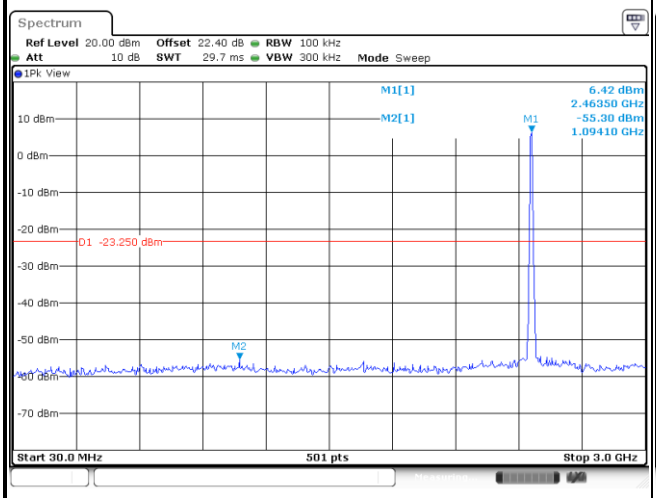
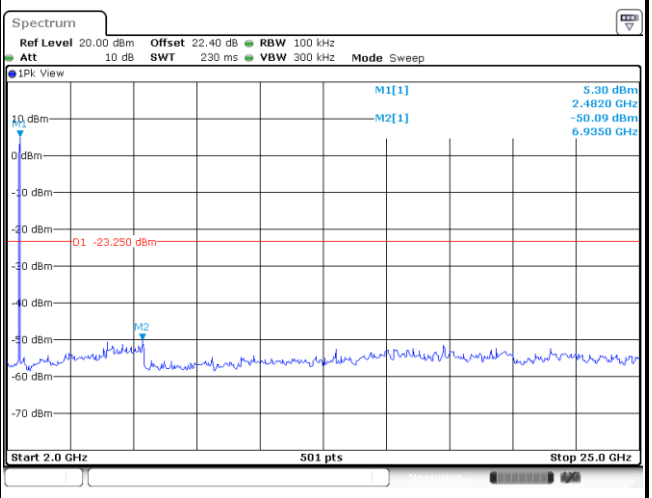
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11b	Test Channel :	06

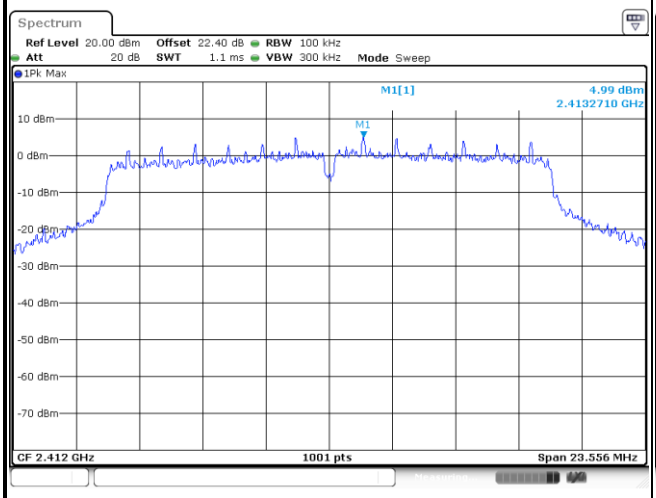
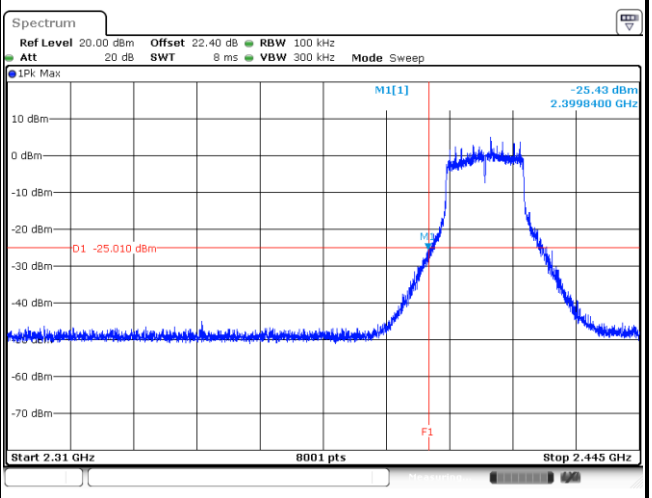
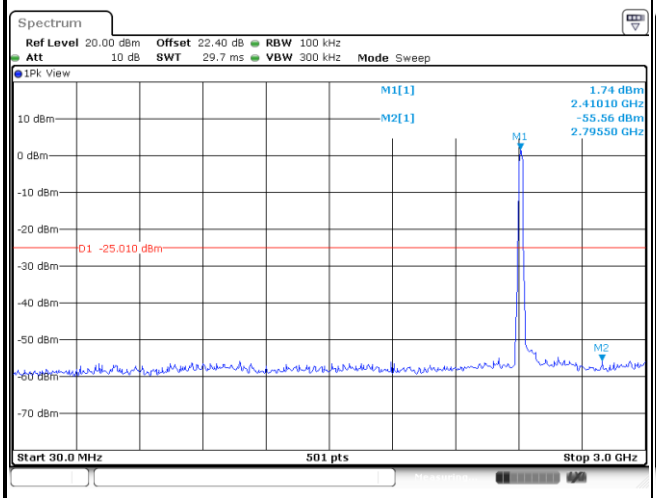
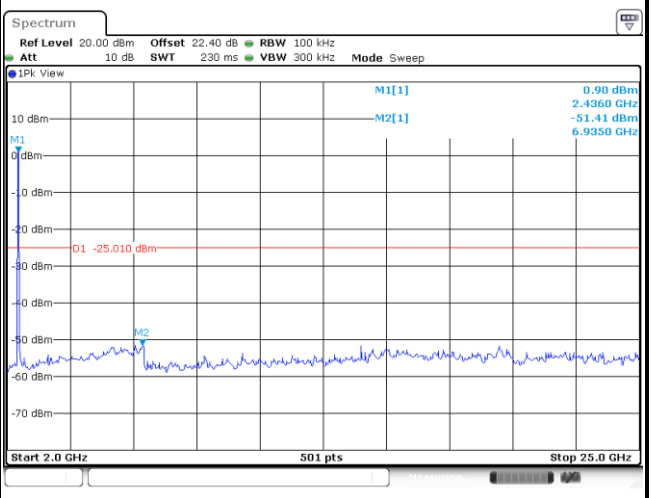
100kHz PSD reference Level	Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

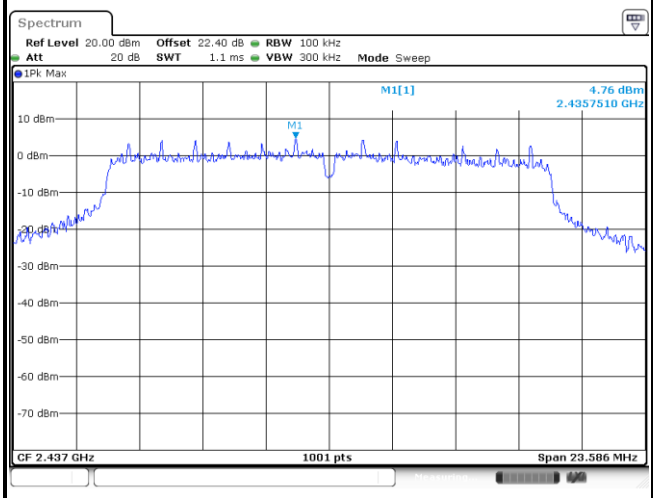
Test Mode :	802.11b	Test Channel :	11

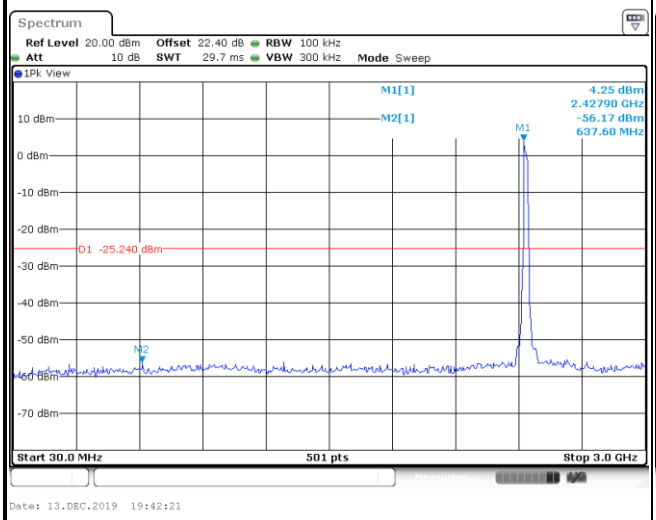
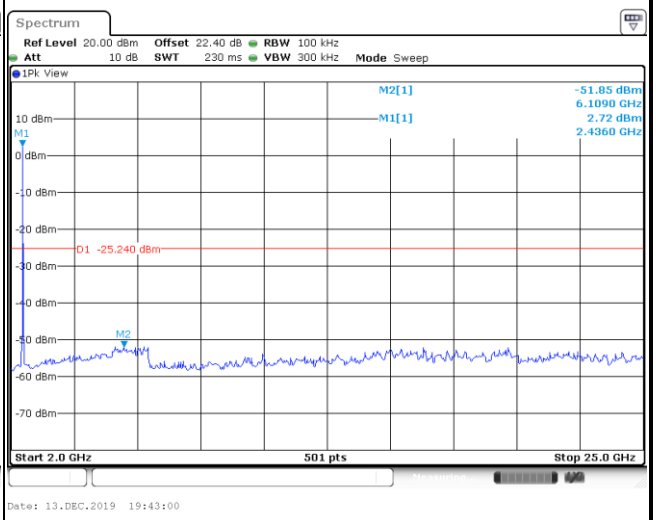
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	01

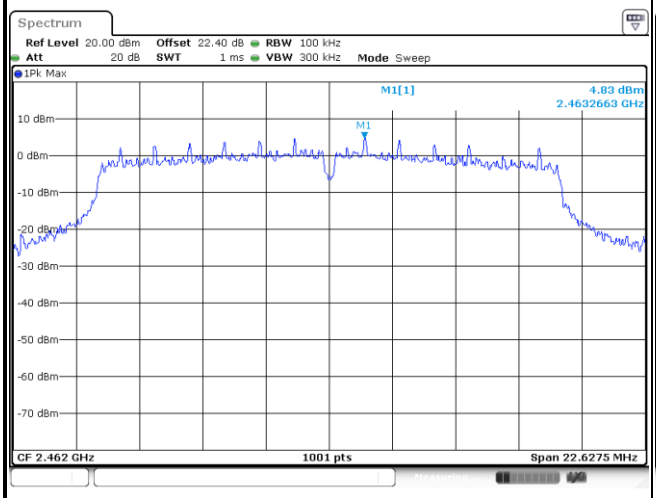
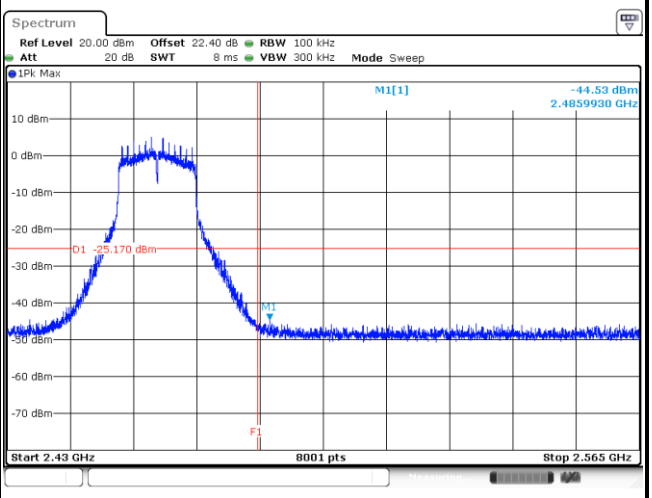
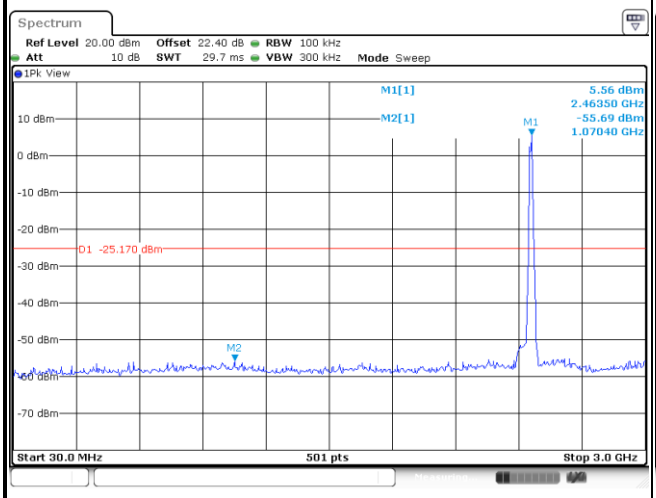
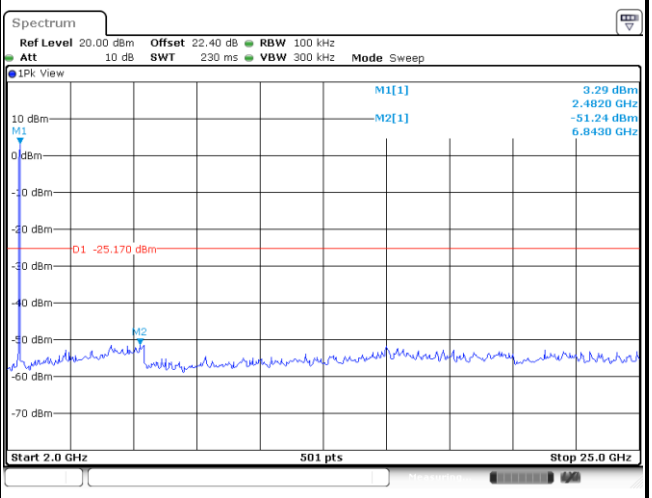
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	06

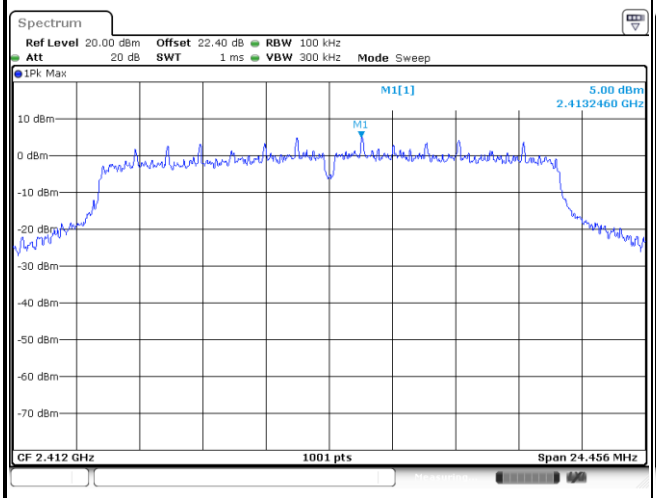
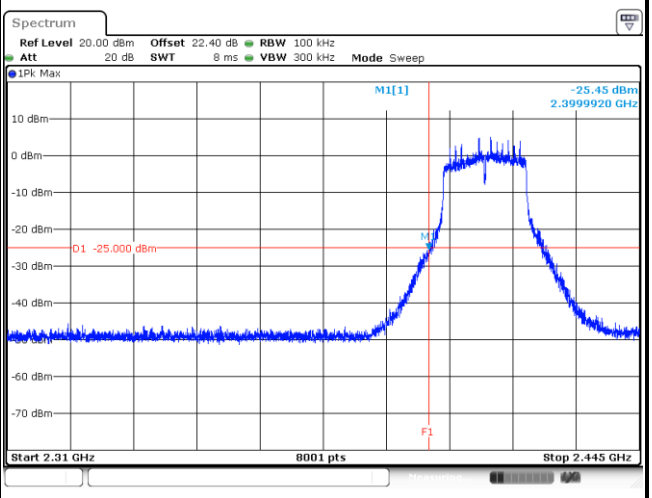
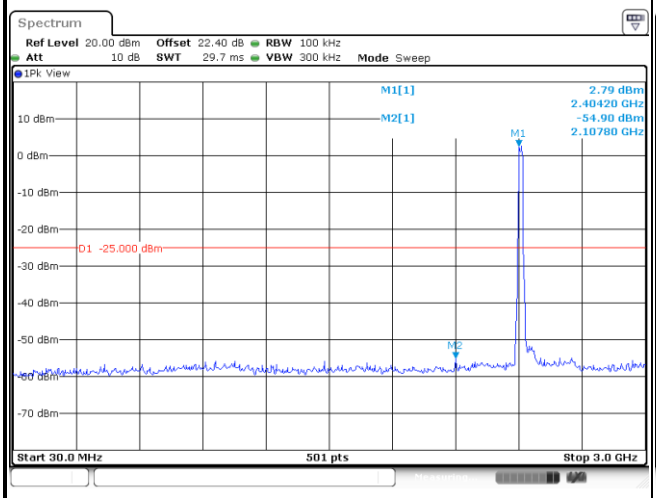
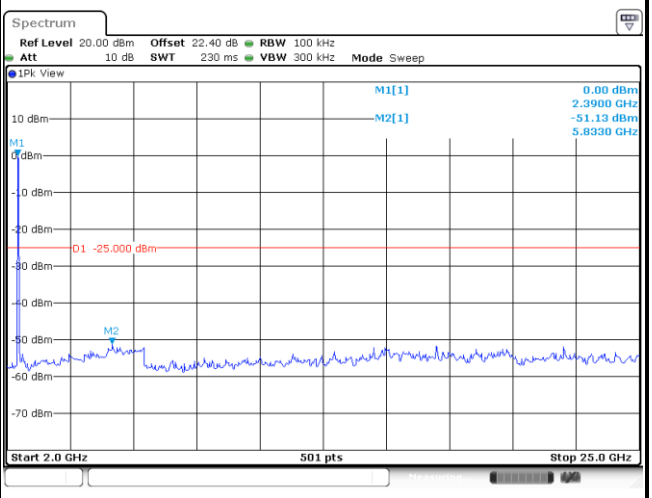
100kHz PSD reference Level	Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

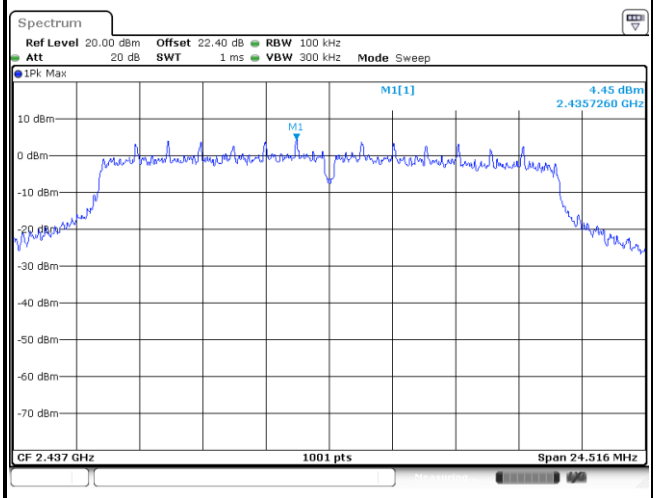
Test Mode :	802.11g	Test Channel :	11

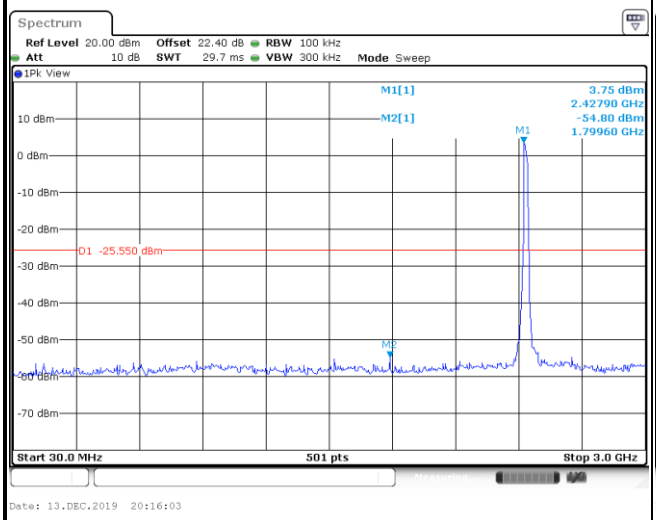
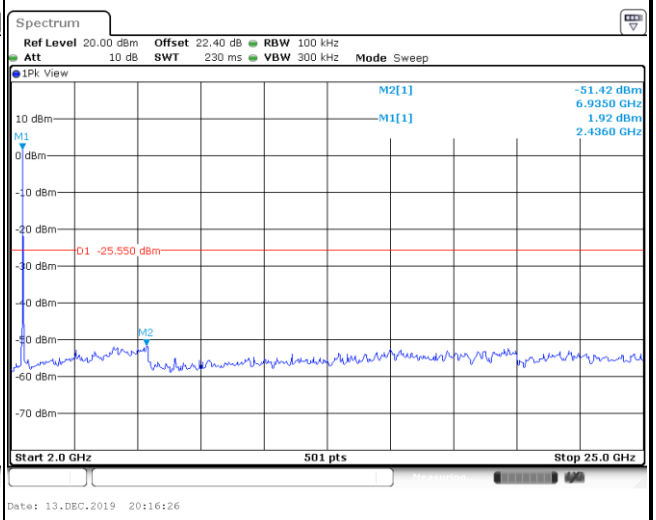
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	01

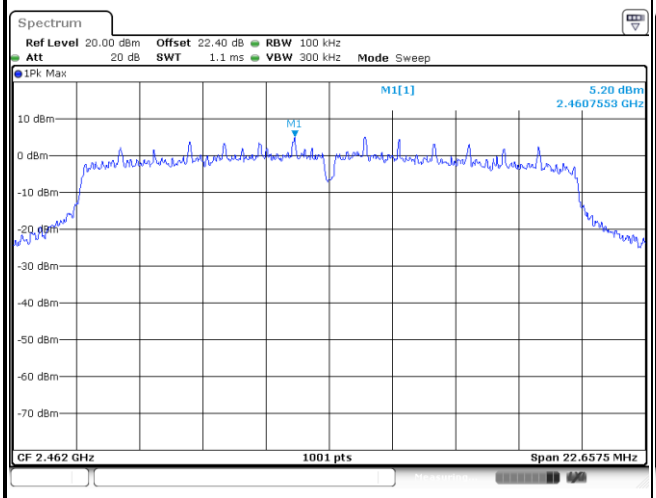
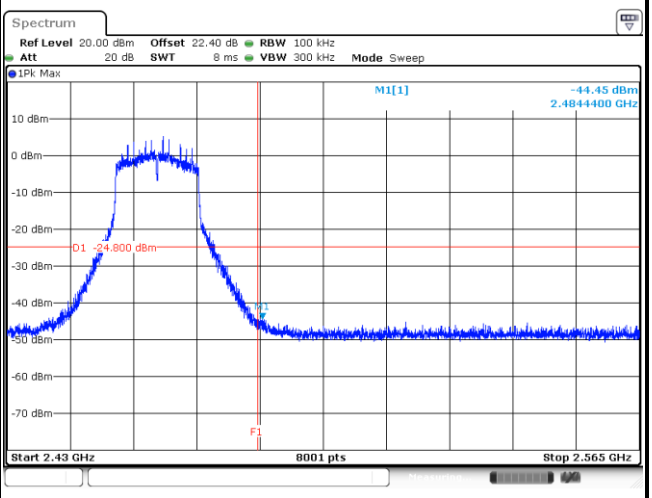
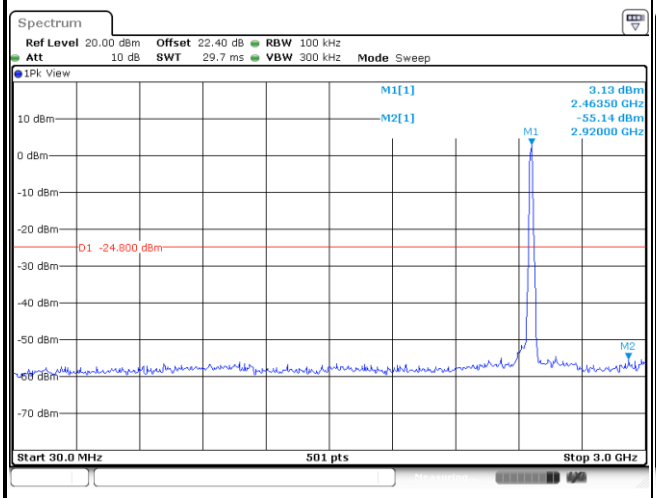
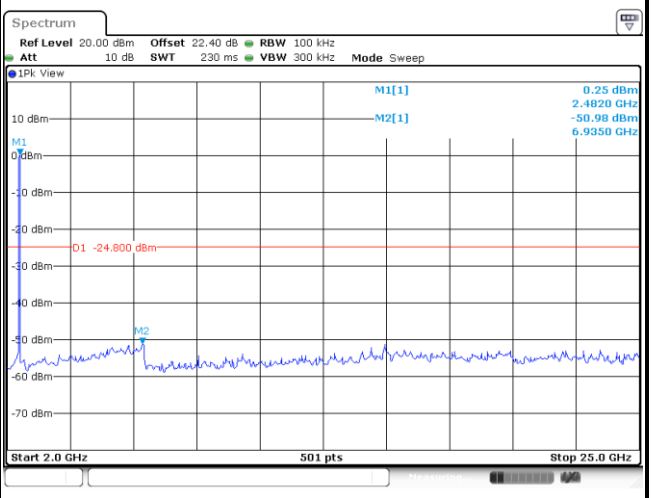
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	06

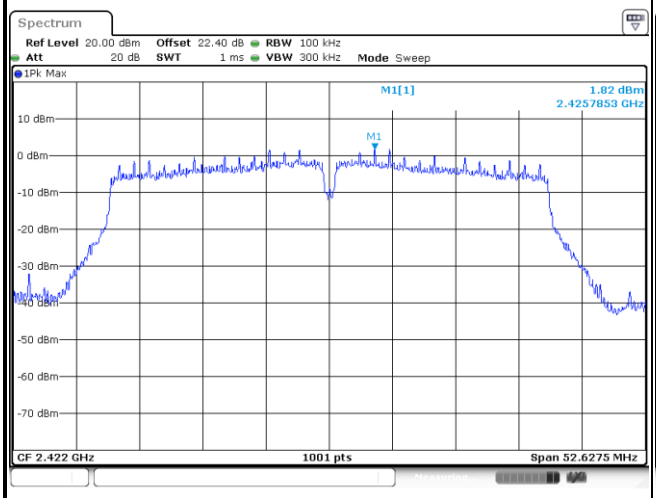
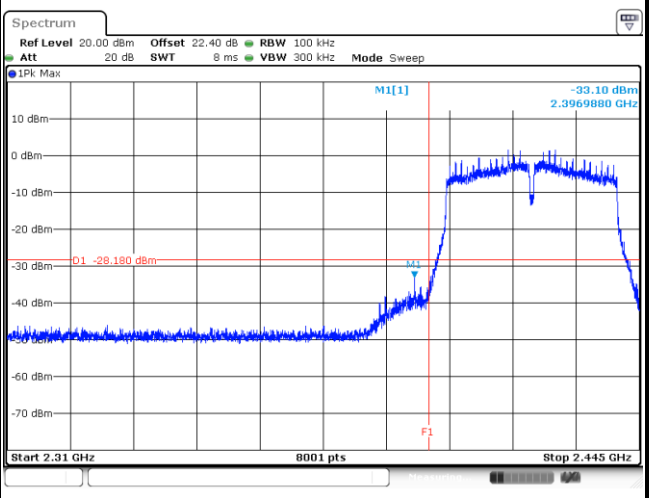
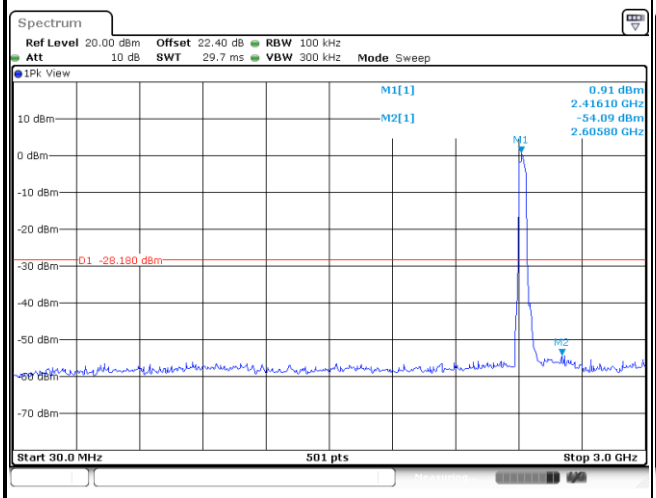
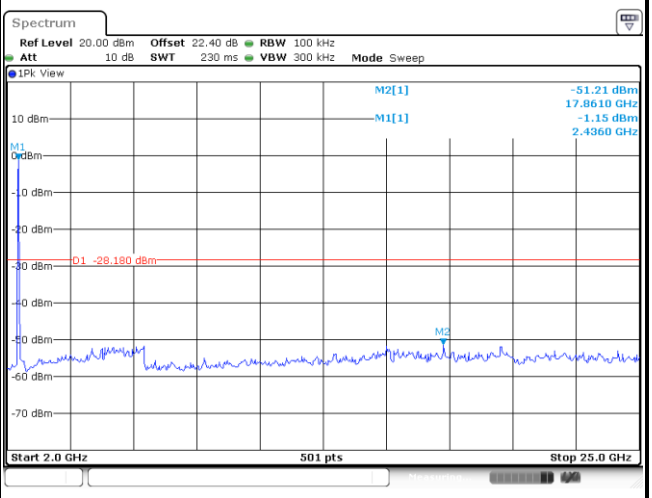
100kHz PSD reference Level	Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

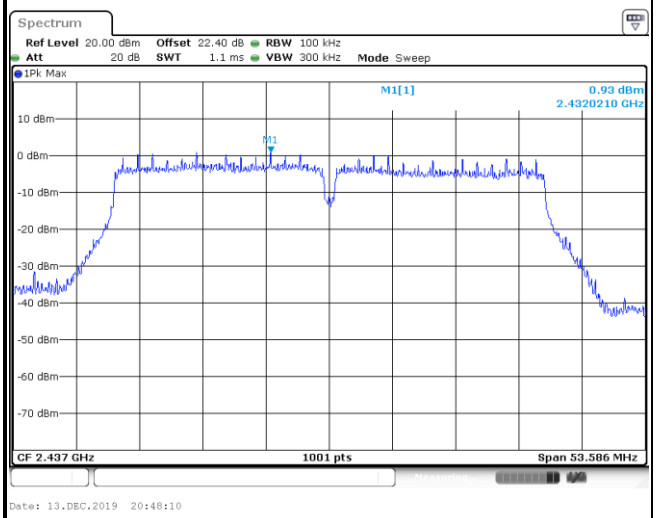
Test Mode :	802.11n HT20	Test Channel :	11

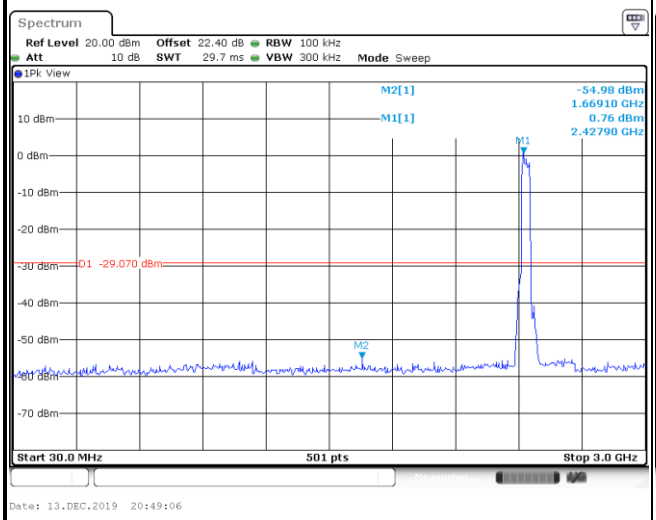
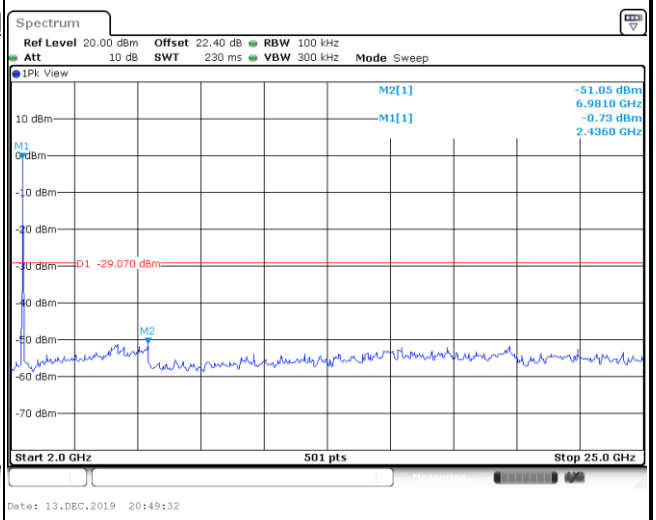
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT40	Test Channel :	03

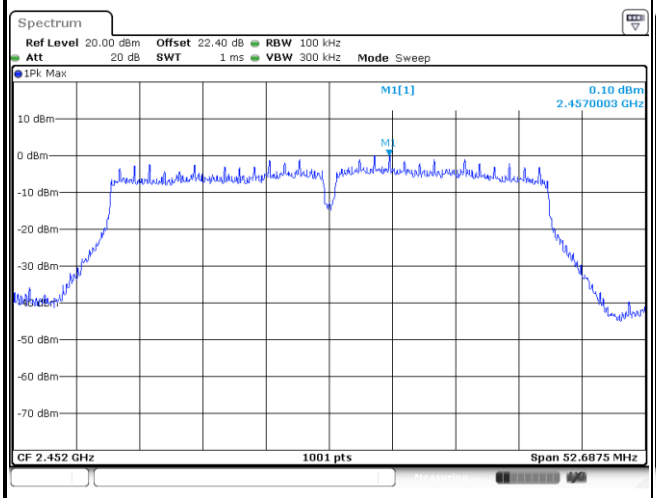
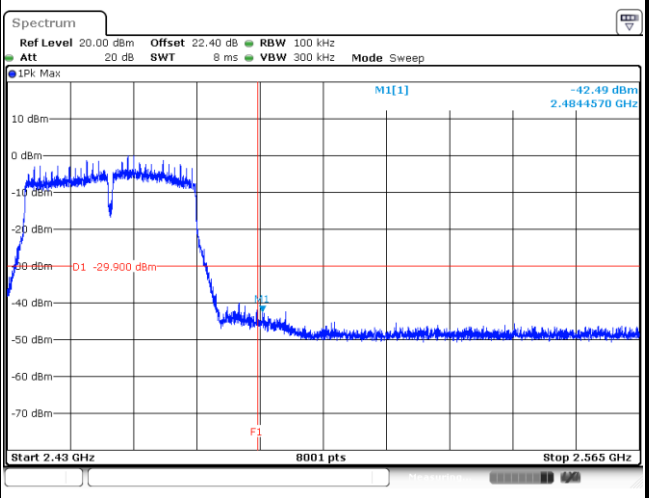
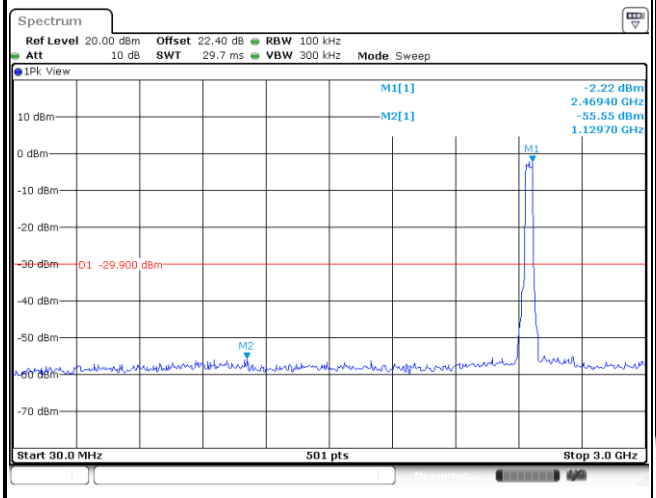
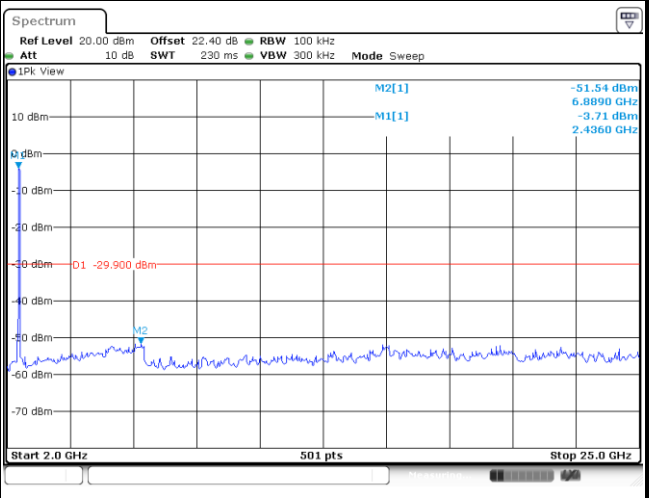
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT40	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	

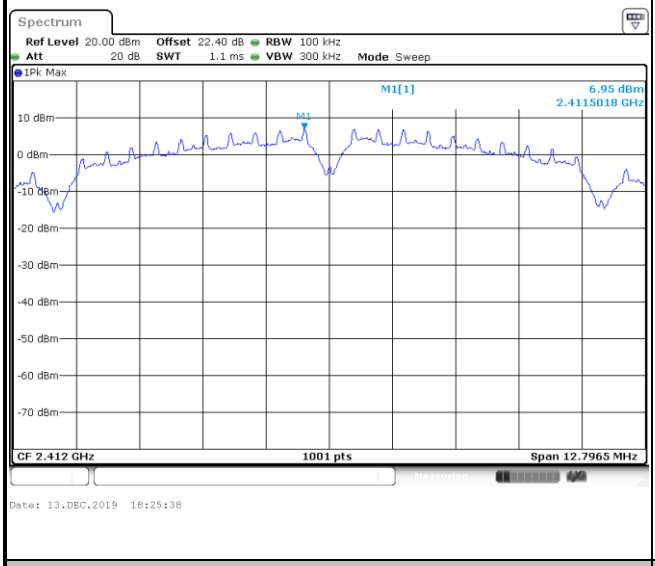
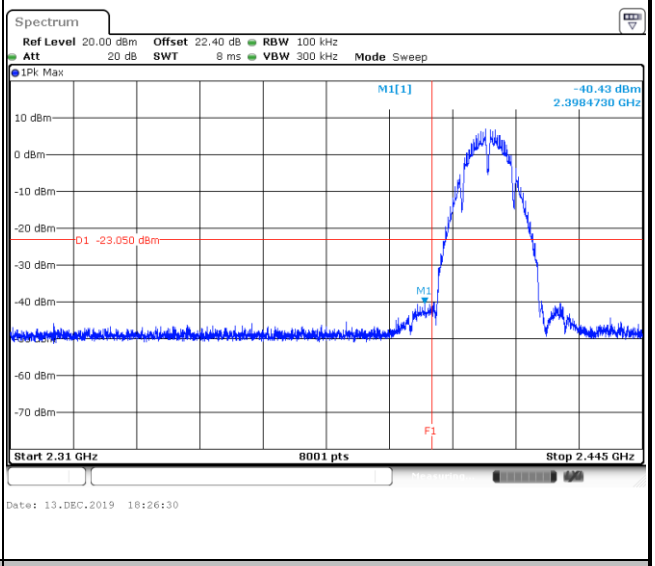
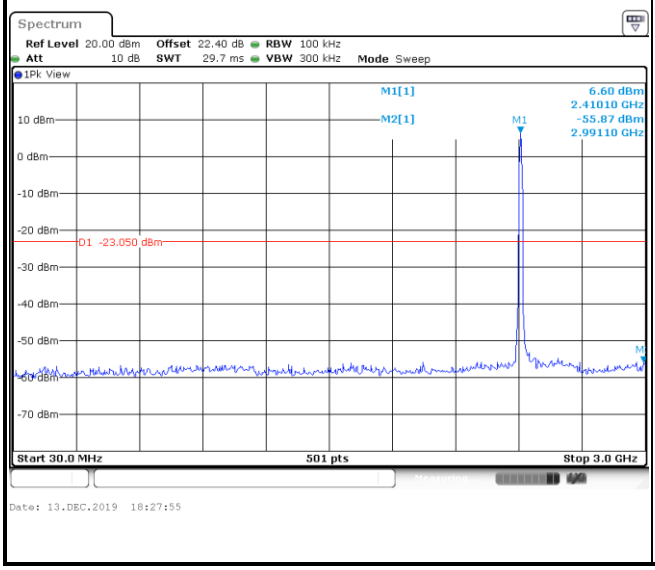
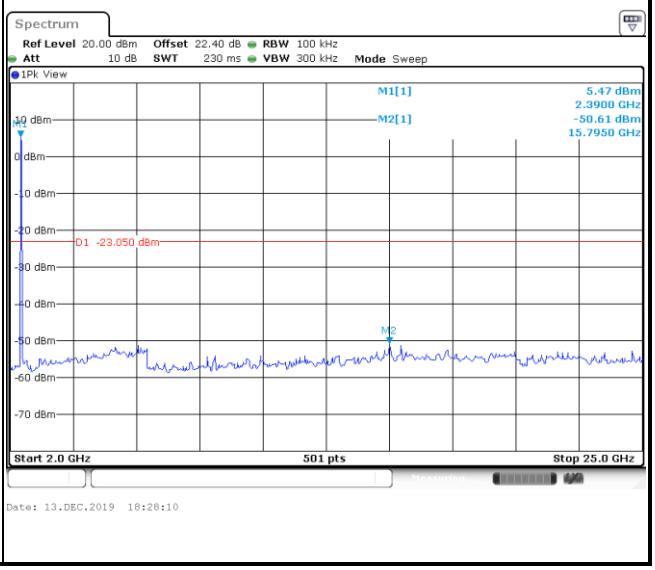
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

Test Mode :	802.11n HT40	Test Channel :	09

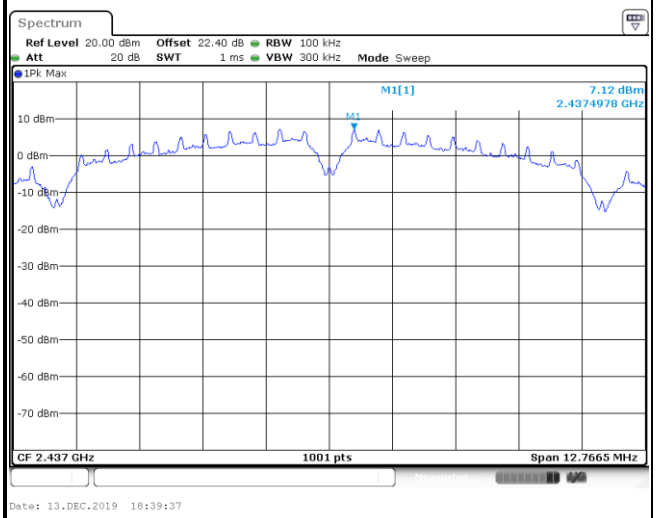
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

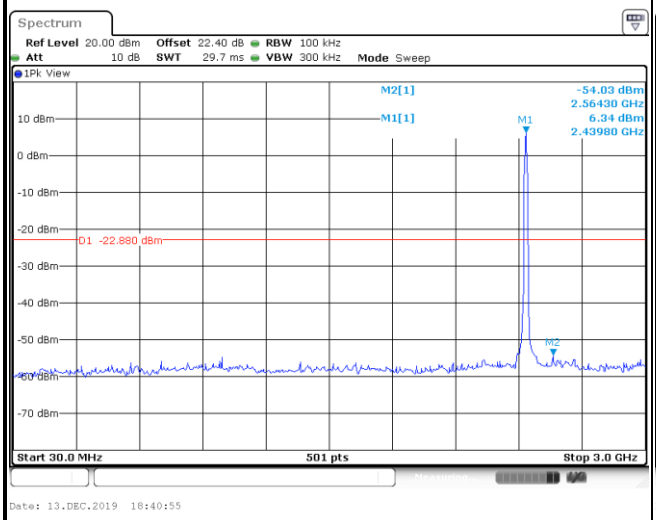
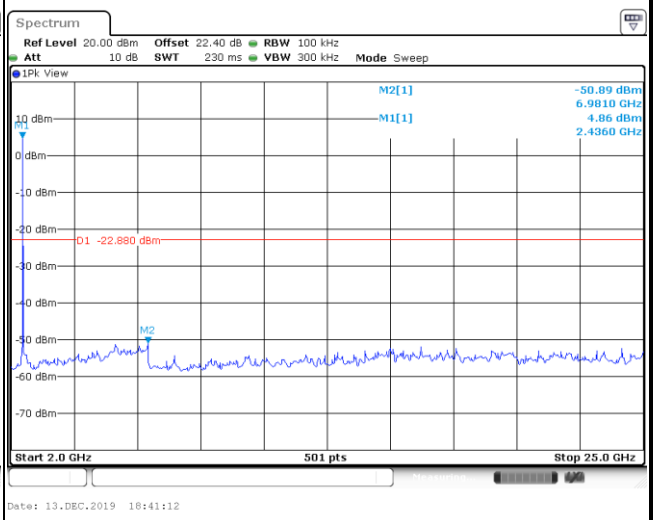
Number of TX = 2, Ant. 2 (Measured)

Test Mode :	802.11b	Test Channel :	01

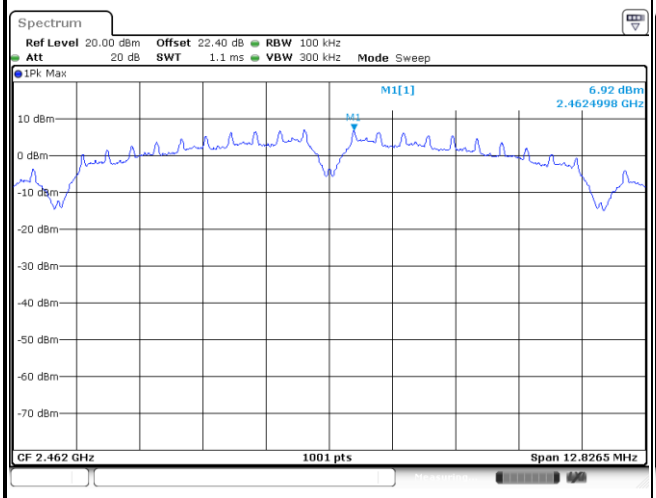
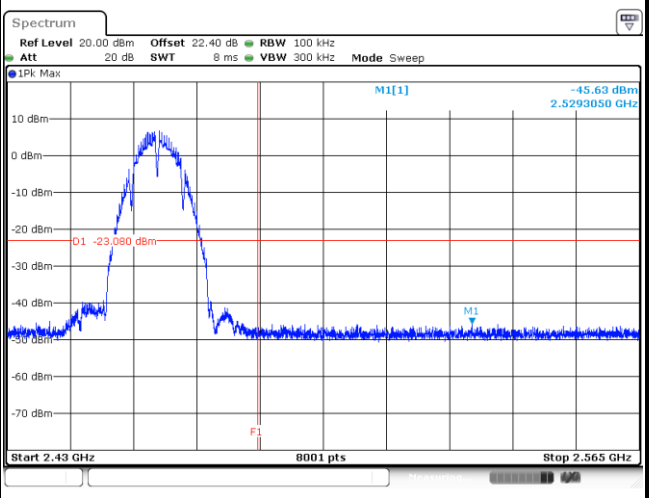
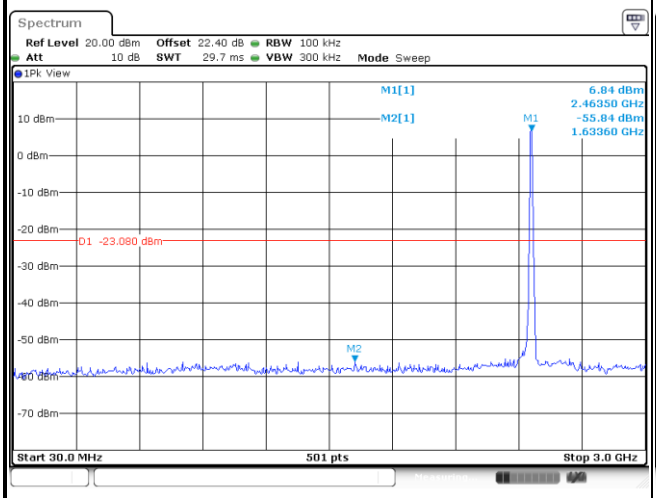
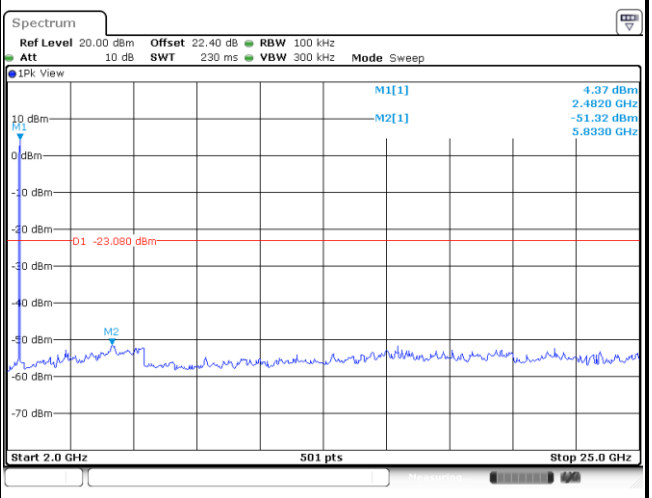
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11b	Test Channel :	06

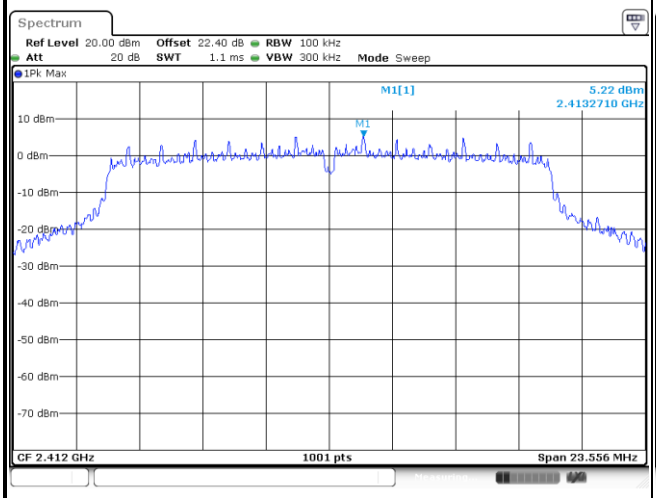
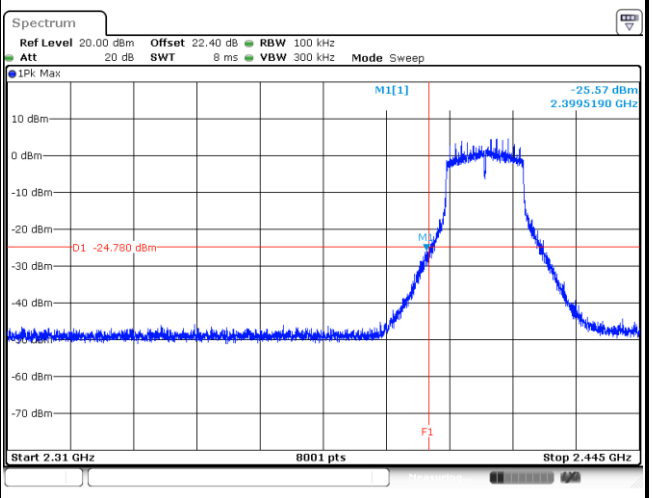
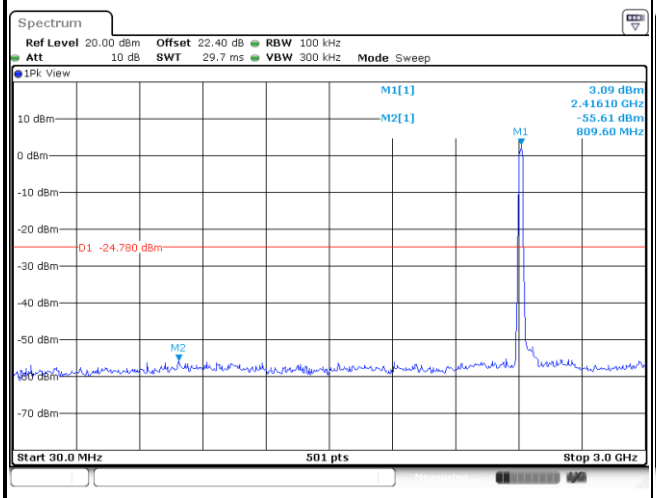
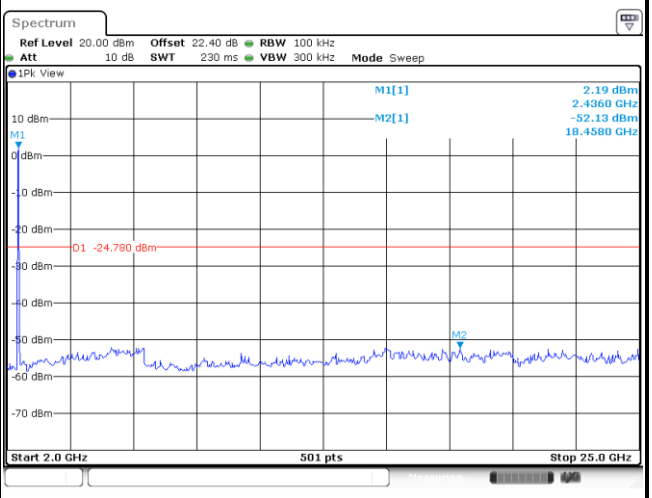
100kHz PSD reference Level	Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

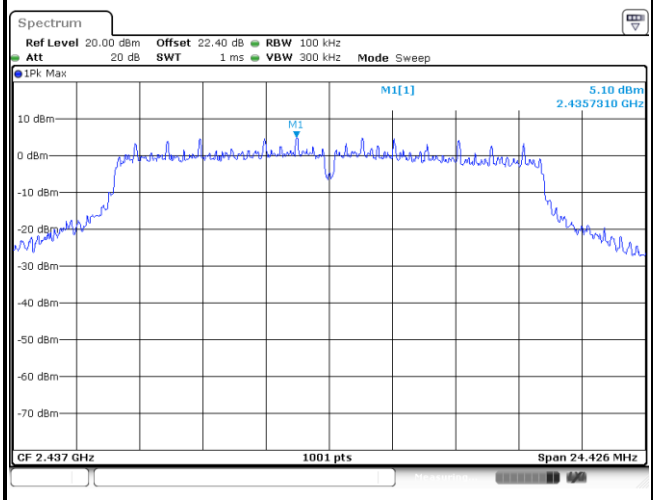
Test Mode :	802.11b	Test Channel :	11

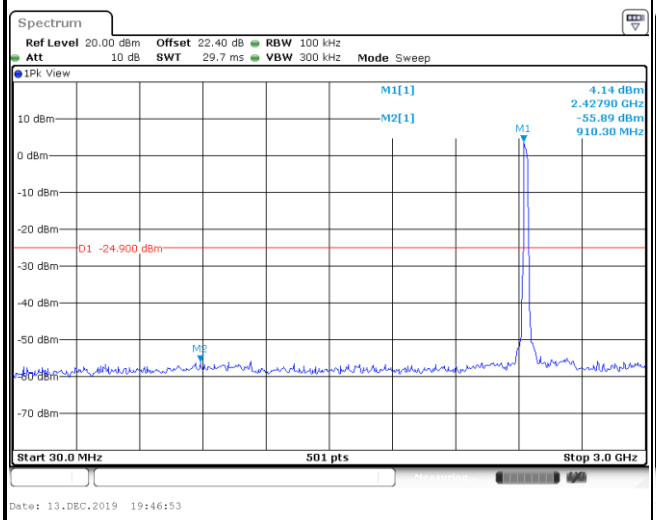
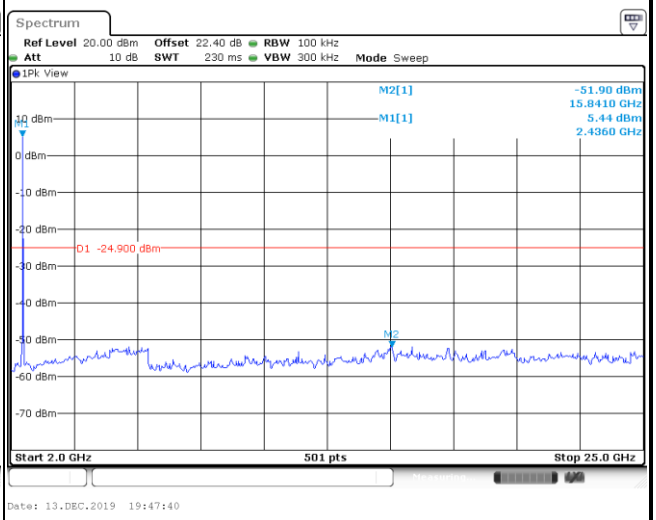
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	01

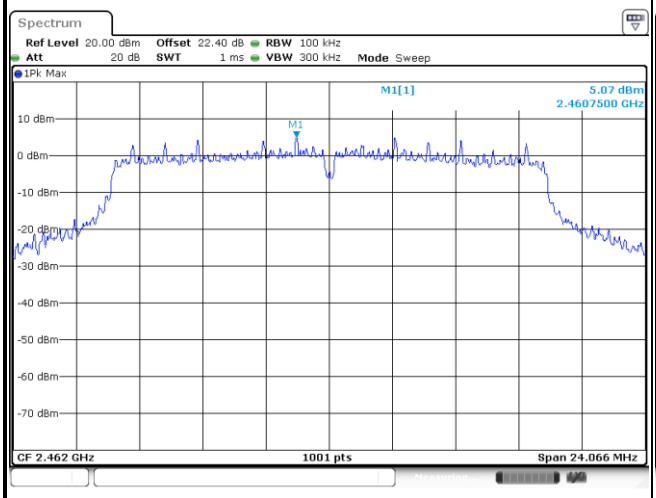
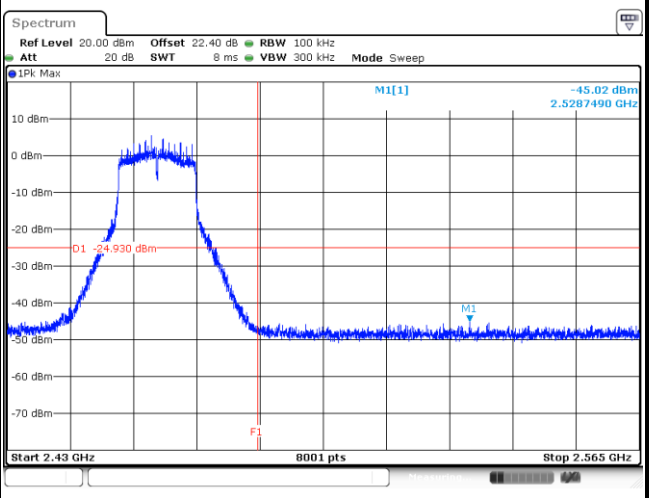
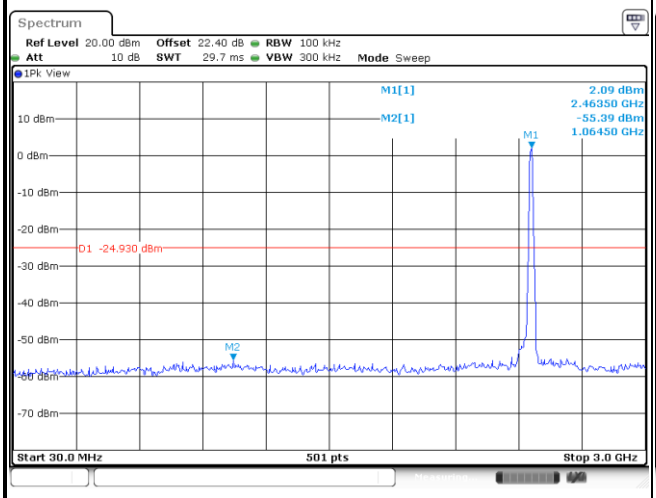
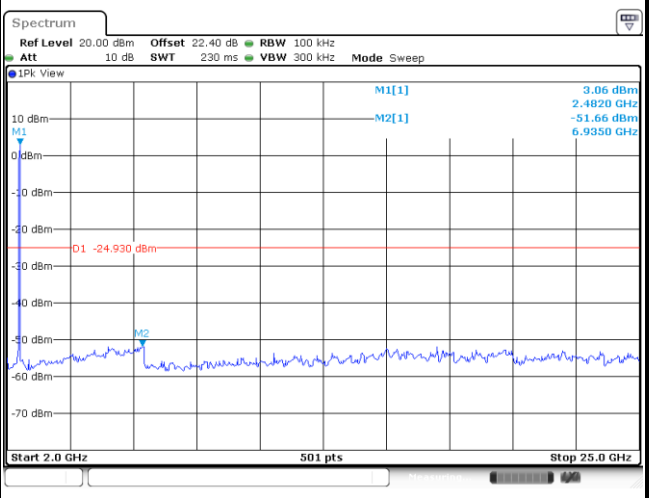
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	06

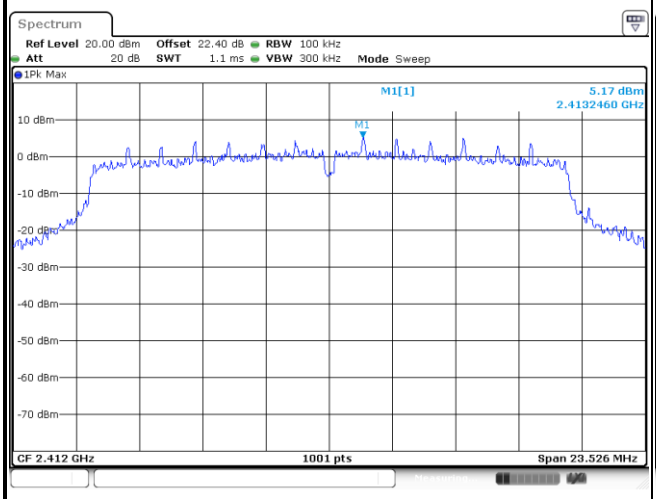
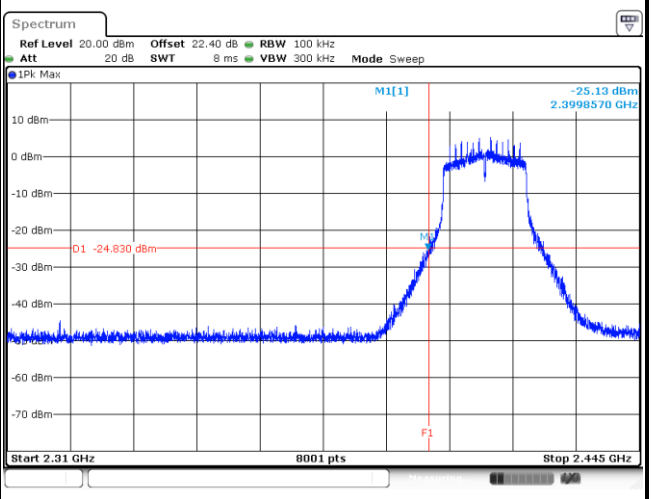
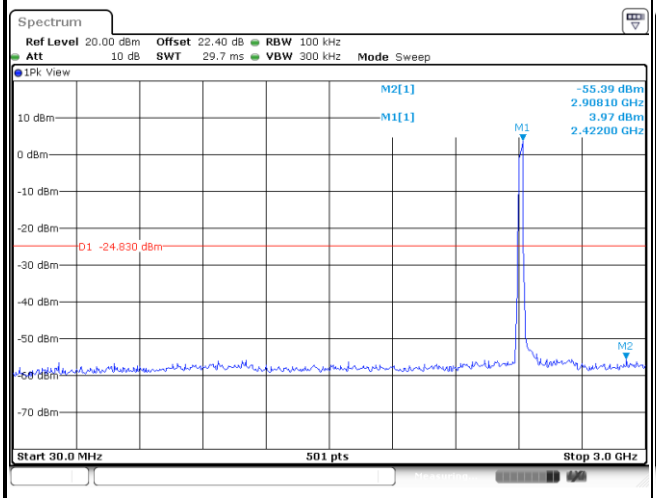
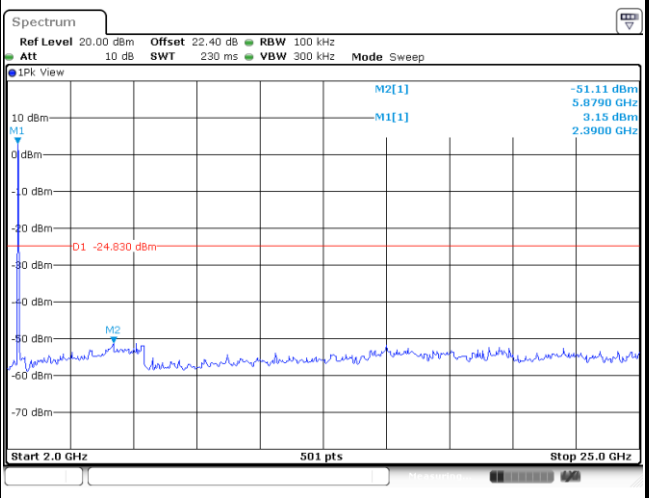
100kHz PSD reference Level	Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

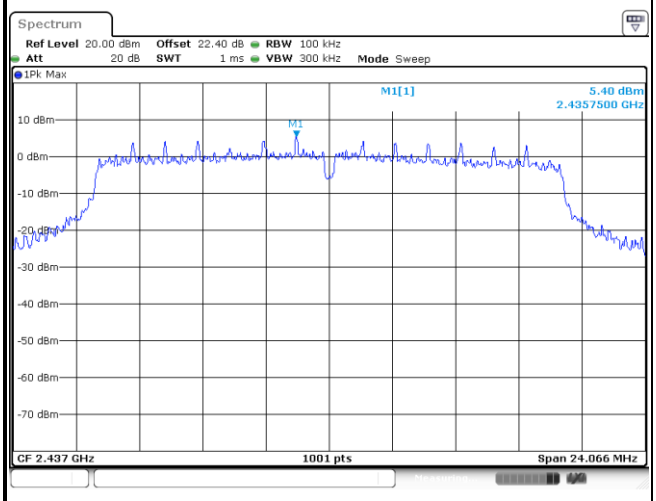
Test Mode :	802.11g	Test Channel :	11

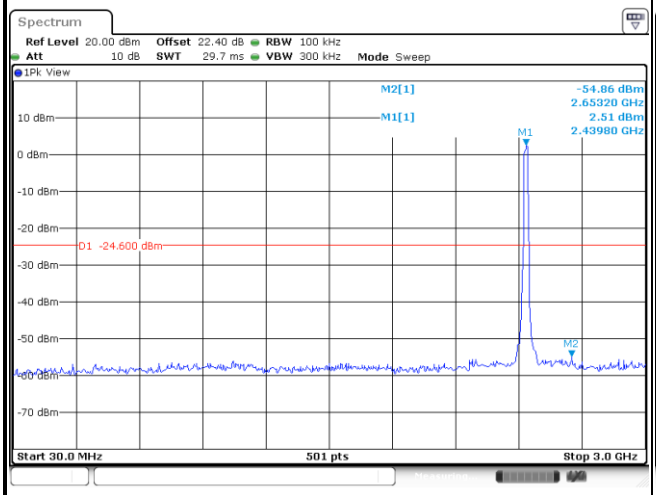
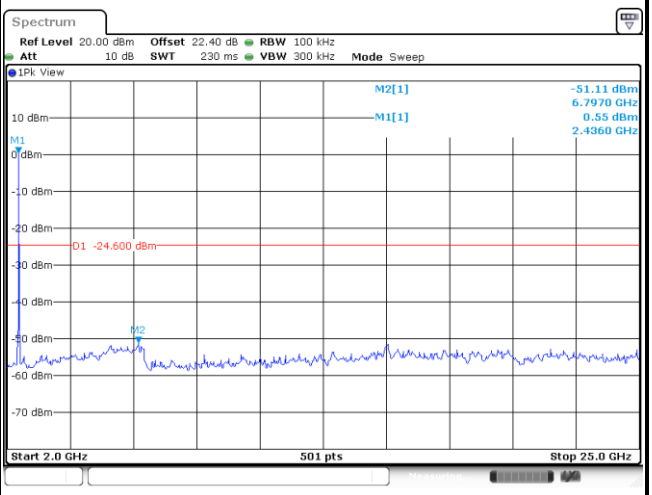
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	01

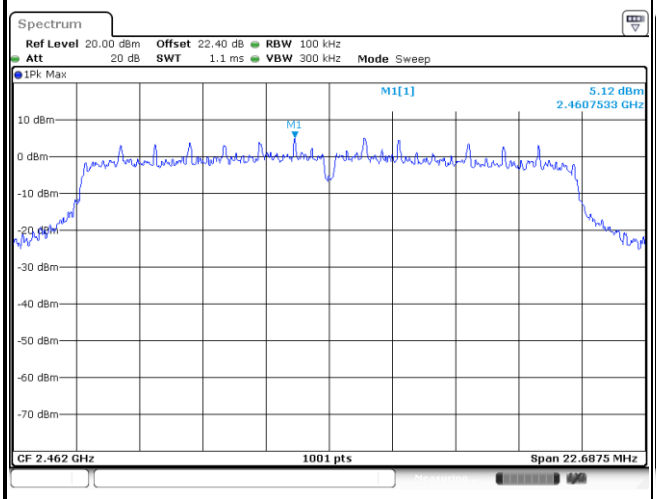
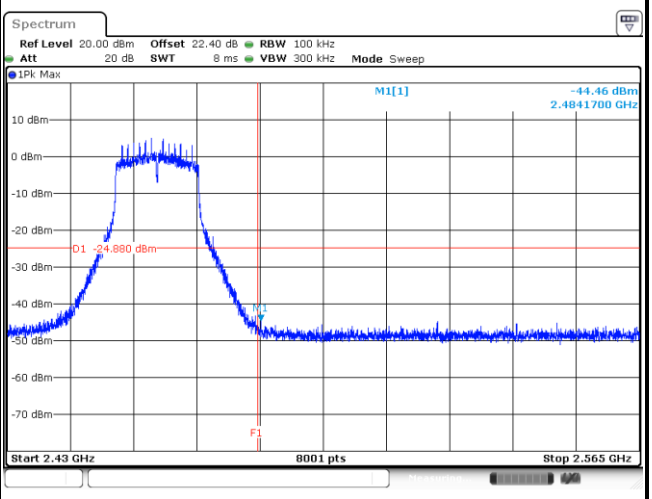
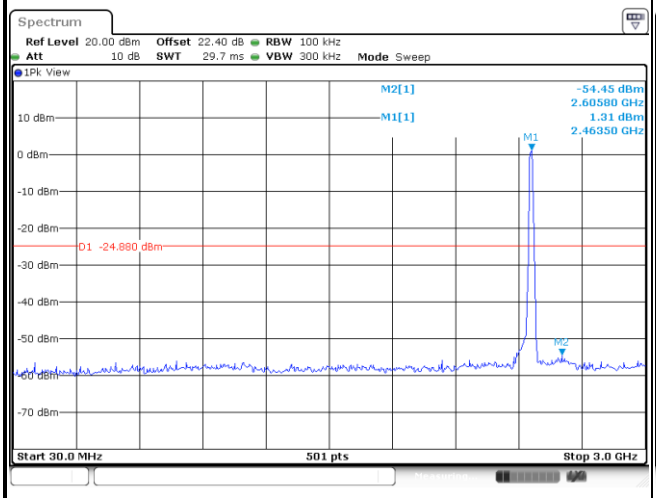
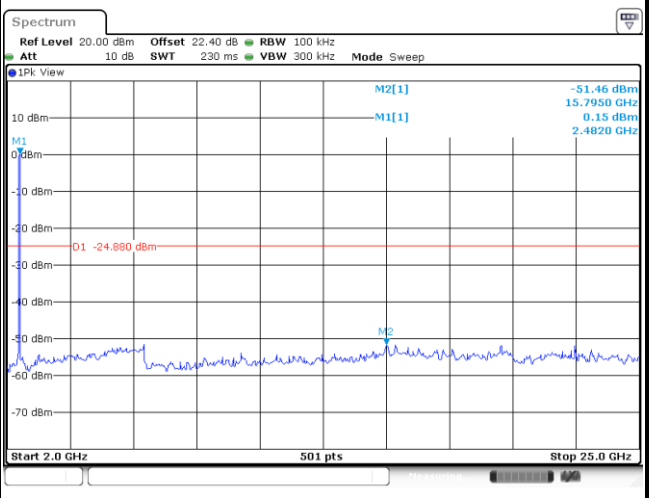
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	06

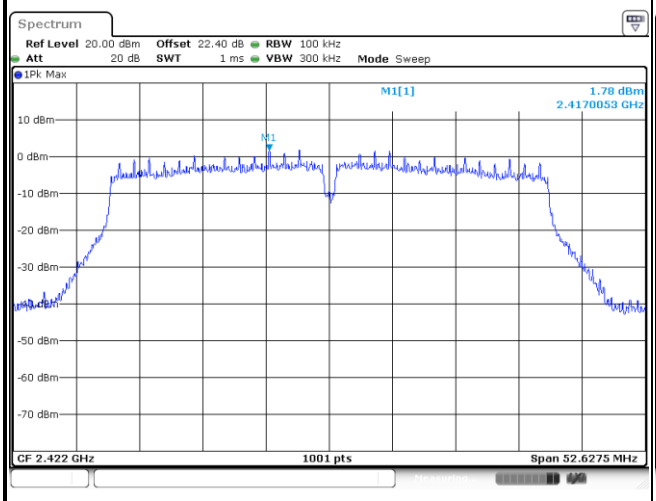
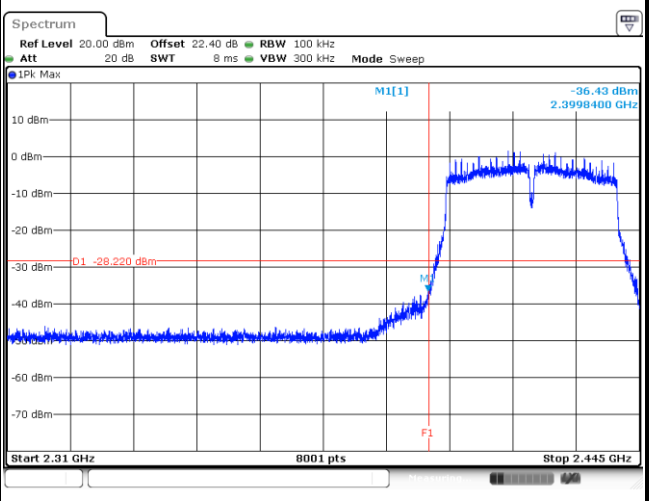
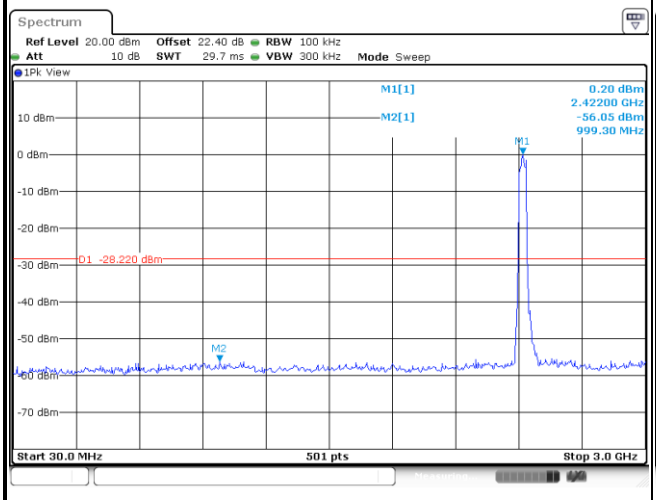
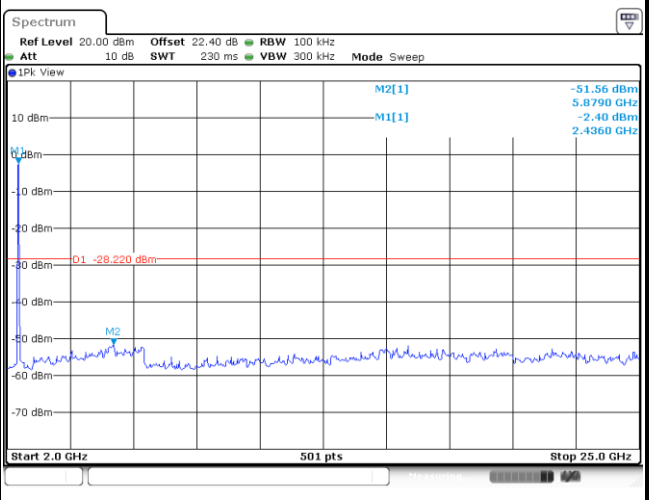
100kHz PSD reference Level	Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

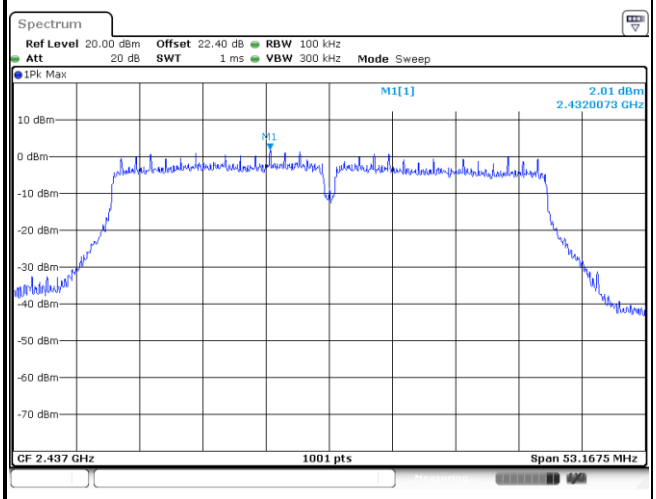
Test Mode :	802.11n HT20	Test Channel :	11

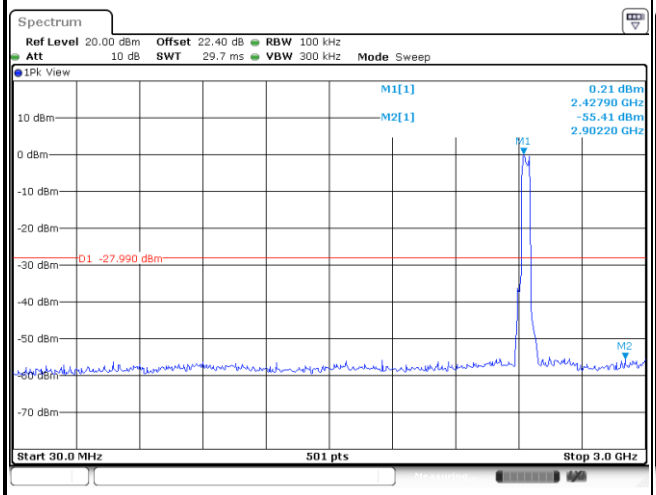
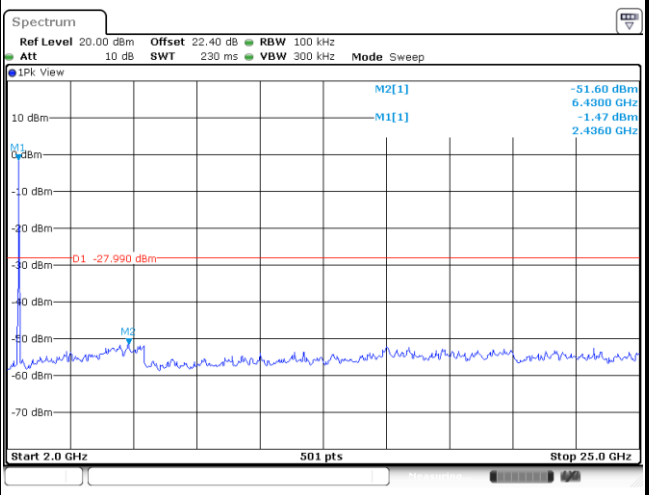
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT40	Test Channel :	03

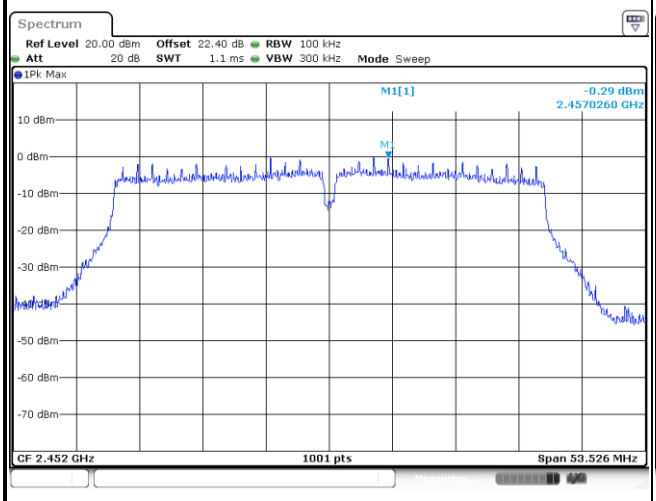
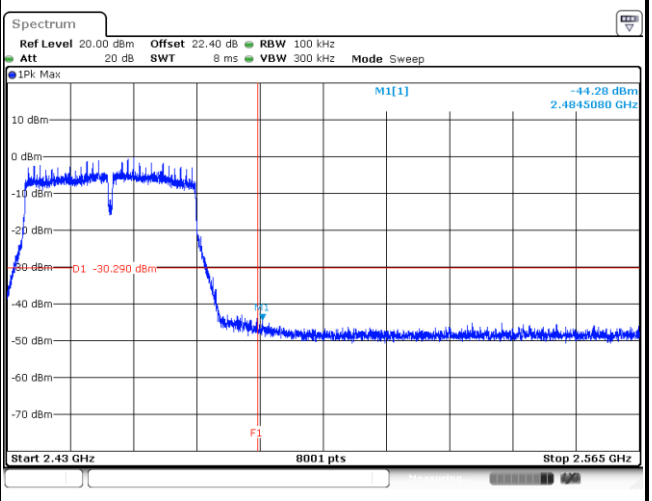
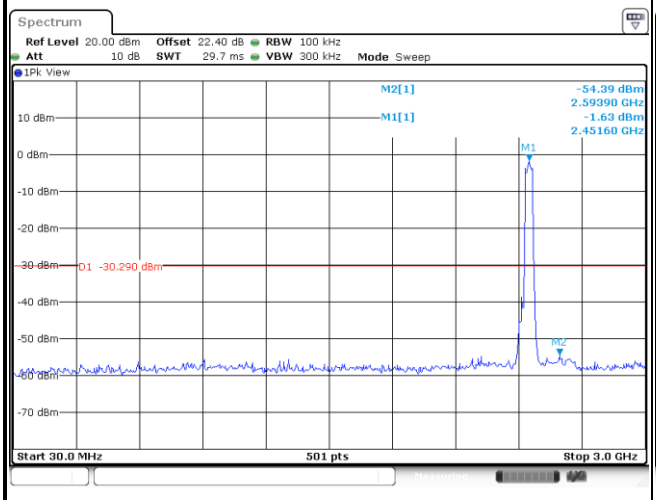
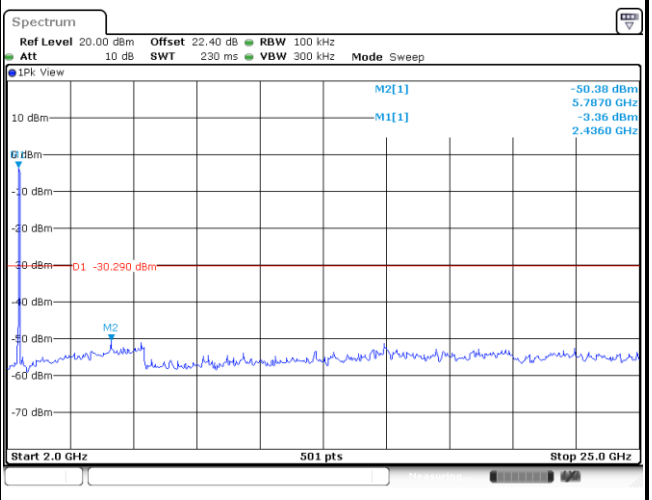
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT40	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

Test Mode :	802.11n HT40	Test Channel :	09

100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

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

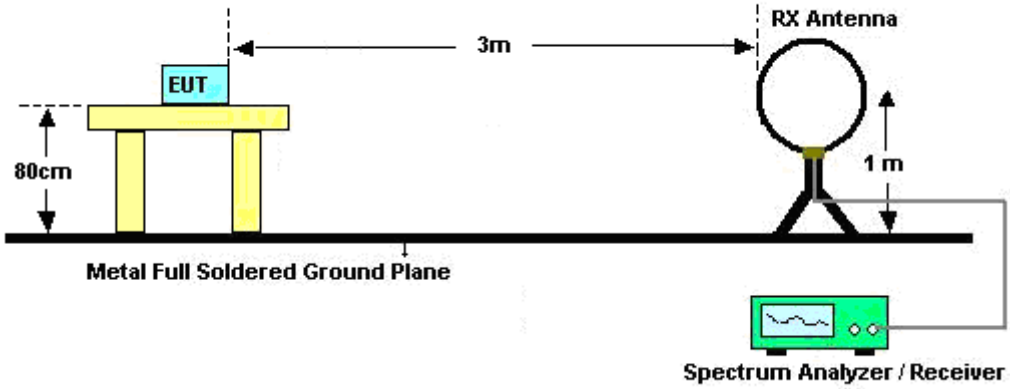
See list of measuring equipment of this test report.

3.5.3 Test Procedures

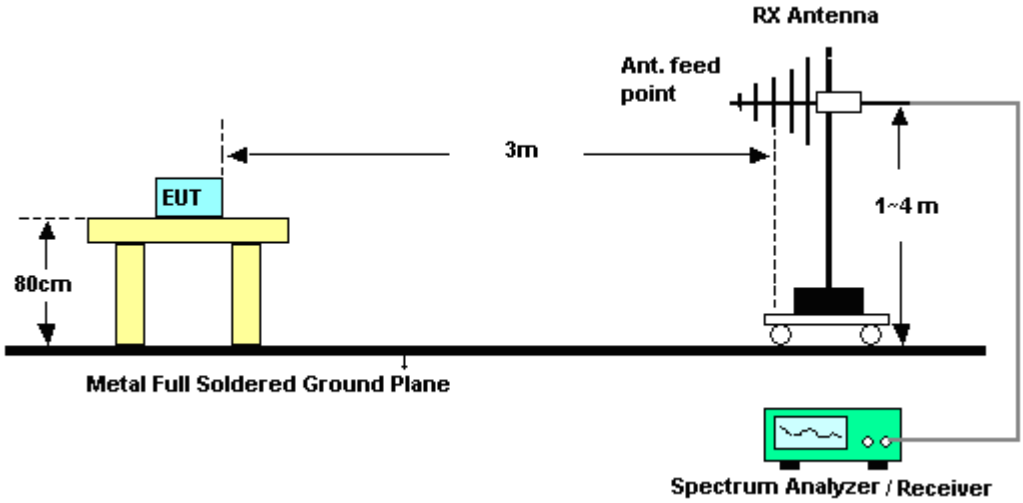
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the 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 RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

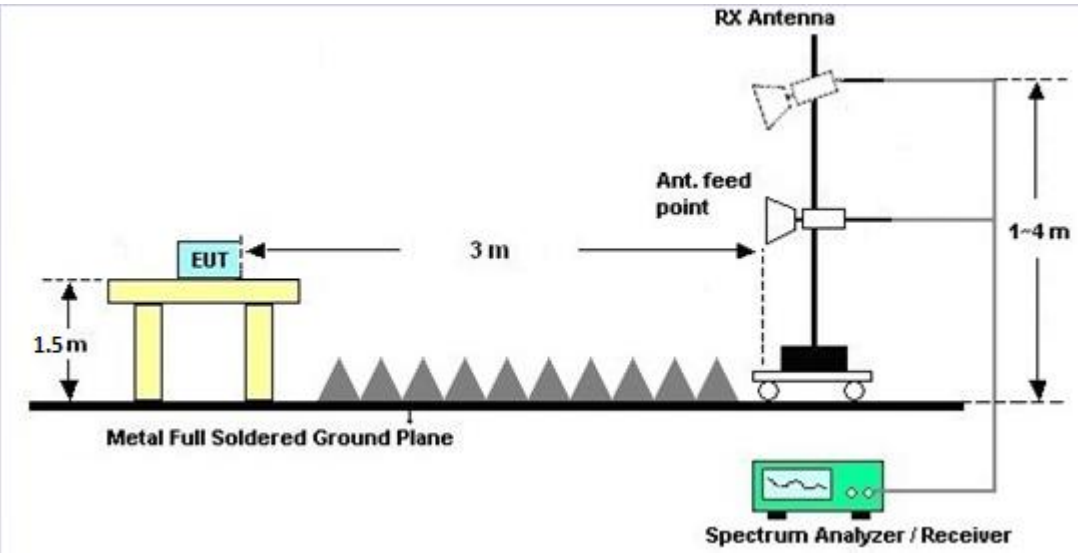
For radiated emissions below 30MHz



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 alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C and D.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

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

*Decreases with the logarithm of the frequency.

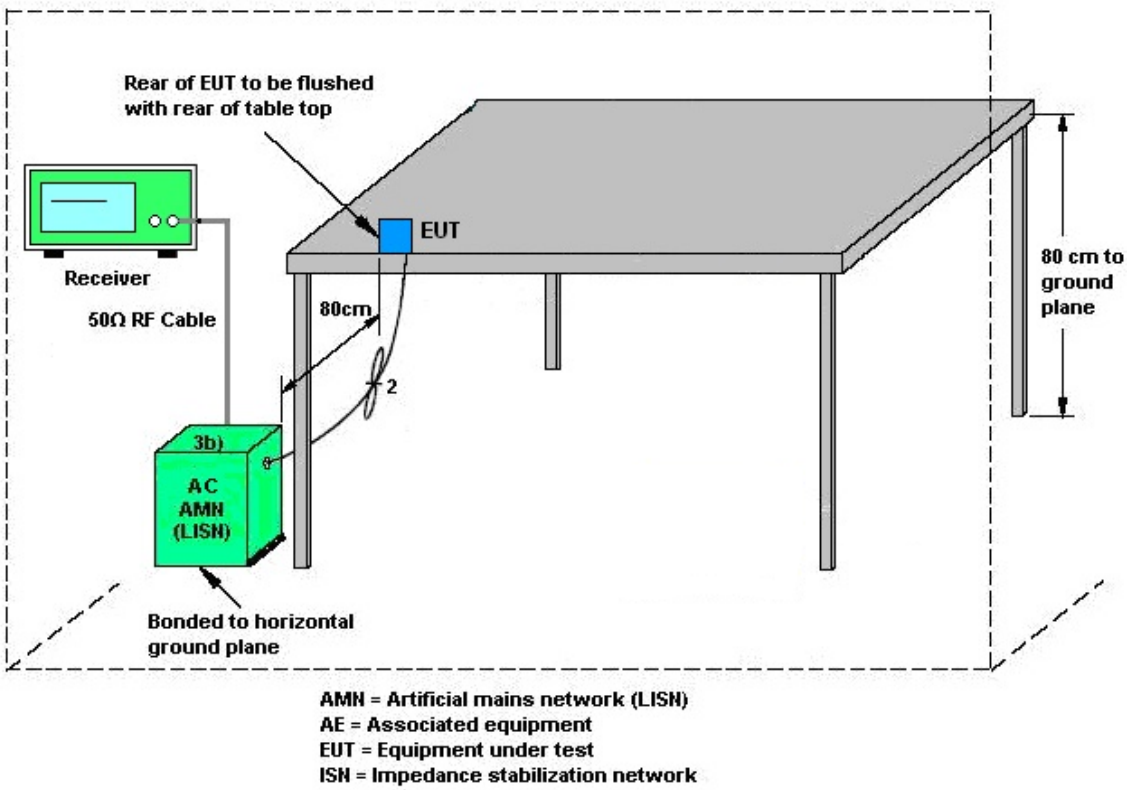
3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

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

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. 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.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = G_{ANT} + 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 $N_{ANT} \leq 4$.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain G_{ANT} is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

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.

<CDD Modes>

	Ant. 1 (dBi)	Ant. 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
2.4 GHz	0.53	1.70	1.70	4.15	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 07, 2019	Dec. 01, 2019~ Dec. 04, 2019	Jan. 06, 2020	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	Jul. 02, 2019	Dec. 01, 2019~ Dec. 04, 2019	Jul. 01, 2020	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800N1D01N-06	40103 & 07	30MHz~1GHz	Apr. 30, 2019	Dec. 01, 2019~ Dec. 04, 2019	Apr. 29, 2020	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz- 40GHz	May 14, 2019	Dec. 01, 2019~ Dec. 04, 2019	May 13, 2020	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Mar. 15, 2019	Dec. 01, 2019~ Dec. 04, 2019	Mar. 14, 2020	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590074	1GHz~18GHz	May 20, 2019	Dec. 01, 2019~ Dec. 04, 2019	May 19, 2020	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Dec. 18, 2018	Dec. 01, 2019~ Dec. 04, 2019	Dec. 17, 2019	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 06, 2018	Dec. 01, 2019~ Dec. 04, 2019	Dec. 05, 2019	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30M-18G	Feb. 13, 2019	Dec. 01, 2019~ Dec. 04, 2019	Feb. 12, 2020	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	804793/4	30M-18G	Feb. 13, 2019	Dec. 01, 2019~ Dec. 04, 2019	Feb. 12, 2020	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24961/4	30M-18G	Feb. 13, 2019	Dec. 01, 2019~ Dec. 04, 2019	Feb. 12, 2020	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30M~40GHz	Mar. 13, 2019	Dec. 01, 2019~ Dec. 04, 2019	Mar. 12, 2020	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30M~40GHz	Mar. 13, 2019	Dec. 01, 2019~ Dec. 04, 2019	Mar. 12, 2020	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 19, 2019	Dec. 01, 2019~ Dec. 04, 2019	Mar. 18, 2020	Radiation (03CH13-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Dec. 01, 2019~ Dec. 04, 2019	N/A	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Dec. 01, 2019~ Dec. 04, 2019	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Dec. 01, 2019~ Dec. 04, 2019	N/A	Radiation (03CH13-HY)
Software	AUDIX	E3 6.2009-8-24c	RK-001124	N/A	N/A	Dec. 01, 2019~ Dec. 04, 2019	N/A	Radiation (03CH13-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20Hz ~ 8.4GHz	Nov. 01, 2019	Dec. 01, 2019~ Dec. 04, 2019	Oct. 31, 2020	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60SS	SN2	3GHz High Pass Filter	Jul. 14, 2019	Dec. 01, 2019~ Dec. 04, 2019	Jul. 13, 2020	Radiation (03CH13-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN12	1.53GHz Low Pass Filter	Sep. 16, 2019	Dec. 01, 2019~ Dec. 04, 2019	Sep. 15, 2020	Radiation (03CH13-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H2	41410069	N/A	Jun. 17, 2019	Nov. 27, 2019~ Dec. 13, 2019	Jun. 16, 2020	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054S NO10	10MHz~6GHz	Dec. 19, 2018	Nov. 27, 2019~ Dec. 13, 2019	Dec. 18 2019	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Jul. 15, 2019	Nov. 27, 2019~ Dec. 13, 2019	Jul. 14, 2020	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC120838 2	N/A	Mar. 27, 2019	Nov. 27, 2019~ Dec. 13, 2019	Mar. 26, 2020	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Dec. 19, 2019	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 15, 2019	Dec. 19, 2019	Nov. 14, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 15, 2019	Dec. 19, 2019	Nov. 14, 2020	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Dec. 19, 2019	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Dec. 31, 2018	Dec. 19, 2019	Dec. 30, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Dec. 31, 2018	Dec. 19, 2019	Dec. 30, 2019	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.0**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.4**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.5**

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

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

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Shiming Liu/Eason Huang	Temperature:	21~25	°C
Test Date:	2019/11/27~2019/12/13	Relative Humidity:	51~54	%

Report Number : FR9N2705C

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant1	Ant2	Ant1	Ant2		
11b	1Mbps	2	1	2412	13.84	13.59	8.05	8.53	0.50	Pass
11b	1Mbps	2	6	2437	13.99	13.84	8.57	8.51	0.50	Pass
11b	1Mbps	2	11	2462	13.59	13.84	8.55	8.55	0.50	Pass
11g	6Mbps	2	1	2412	16.88	16.68	15.70	15.70	0.50	Pass
11g	6Mbps	2	6	2437	16.98	16.73	15.72	16.28	0.50	Pass
11g	6Mbps	2	11	2462	16.68	16.68	15.08	16.04	0.50	Pass
HT20	MCS0	2	1	2412	17.98	17.88	16.30	15.68	0.50	Pass
HT20	MCS0	2	6	2437	18.03	17.93	16.34	16.04	0.50	Pass
HT20	MCS0	2	11	2462	17.83	17.83	15.10	15.12	0.50	Pass
HT40	MCS0	2	3	2422	36.16	36.36	35.08	35.08	0.50	Pass
HT40	MCS0	2	6	2437	36.66	36.66	35.72	35.44	0.50	Pass
HT40	MCS0	2	9	2452	36.46	36.56	35.12	35.68	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band																
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	14.60	14.90		30.00	30.00	0.53	1.70	15.13	16.60	36.00	36.00	Pass
11b	1Mbps	1	6	2437	14.60	14.90		30.00	30.00	0.53	1.70	15.13	16.60	36.00	36.00	Pass
11b	1Mbps	1	11	2462	14.60	14.90		30.00	30.00	0.53	1.70	15.13	16.60	36.00	36.00	Pass
11g	6Mbps	1	1	2412	14.60	14.90		30.00	30.00	0.53	1.70	15.13	16.60	36.00	36.00	Pass
11g	6Mbps	1	6	2437	14.60	14.90		30.00	30.00	0.53	1.70	15.13	16.60	36.00	36.00	Pass
11g	6Mbps	1	11	2462	14.60	14.90		30.00	30.00	0.53	1.70	15.13	16.60	36.00	36.00	Pass
HT20	MCS0	1	1	2412	14.60	14.70	-	30.00	30.00	0.53	1.70	15.13	16.40	36.00	36.00	Pass
HT20	MCS0	1	6	2437	14.60	14.80		30.00	30.00	0.53	1.70	15.13	16.50	36.00	36.00	Pass
HT20	MCS0	1	11	2462	14.60	14.70		30.00	30.00	0.53	1.70	15.13	16.40	36.00	36.00	Pass
HT40	MCS0	1	3	2422	14.10	14.40		30.00	30.00	0.53	1.70	14.63	16.10	36.00	36.00	Pass
HT40	MCS0	1	6	2437	14.60	14.90		30.00	30.00	0.53	1.70	15.13	16.60	36.00	36.00	Pass
HT40	MCS0	1	9	2452	12.60	12.80		30.00	30.00	0.53	1.70	13.13	14.50	36.00	36.00	Pass
11b	1Mbps	2	1	2412	14.70	15.00	17.86	30.00		1.70		19.57		36.00		Pass
11b	1Mbps	2	6	2437	14.70	15.00	17.86	30.00		1.70		19.57		36.00		Pass
11b	1Mbps	2	11	2462	14.70	15.00	17.86	30.00		1.70		19.57		36.00		Pass
11g	6Mbps	2	1	2412	14.70	15.00	17.86	30.00		1.70		19.57		36.00		Pass
11g	6Mbps	2	6	2437	14.70	15.00	17.86	30.00		1.70		19.57		36.00		Pass
11g	6Mbps	2	11	2462	14.70	15.00	17.86	30.00		1.70		19.57		36.00		Pass
HT20	MCS0	2	1	2412	14.70	15.00	17.86	30.00		1.70		19.57		36.00		Pass
HT20	MCS0	2	6	2437	14.70	15.00	17.86	30.00		1.70		19.57		36.00		Pass
HT20	MCS0	2	11	2462	14.70	15.00	17.86	30.00		1.70		19.57		36.00		Pass
HT40	MCS0	2	3	2422	14.20	14.70	17.47	30.00		1.70		19.17		36.00		Pass
HT40	MCS0	2	6	2437	14.70	15.00	17.86	30.00		1.70		19.57		36.00		Pass
HT40	MCS0	2	9	2452	12.70	13.00	15.86	30.00		1.70		17.57		36.00		Pass

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

TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band												
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant1	Ant2	Worse + 3.01	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	2	1	2412	-7.41	-5.84	-2.83	4.15		8.00		Pass
11b	1Mbps	2	6	2437	-7.22	-5.87	-2.86	4.15		8.00		Pass
11b	1Mbps	2	11	2462	-7.14	-6.45	-3.44	4.15		8.00		Pass
11g	6Mbps	2	1	2412	-9.53	-9.51	-6.50	4.15		8.00		Pass
11g	6Mbps	2	6	2437	-9.35	-8.93	-5.92	4.15		8.00		Pass
11g	6Mbps	2	11	2462	-9.78	-9.64	-6.63	4.15		8.00		Pass
HT20	MCS0	2	1	2412	-10.83	-10.03	-7.02	4.15		8.00		Pass
HT20	MCS0	2	6	2437	-11.63	-9.54	-6.53	4.15		8.00		Pass
HT20	MCS0	2	11	2462	-10.86	-9.47	-6.46	4.15		8.00		Pass
HT40	MCS0	2	3	2422	-13.22	-13.20	-10.19	4.15		8.00		Pass
HT40	MCS0	2	6	2437	-13.60	-13.60	-10.59	4.15		8.00		Pass
HT40	MCS0	2	9	2452	-15.82	-15.72	-12.71	4.15		8.00		Pass

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

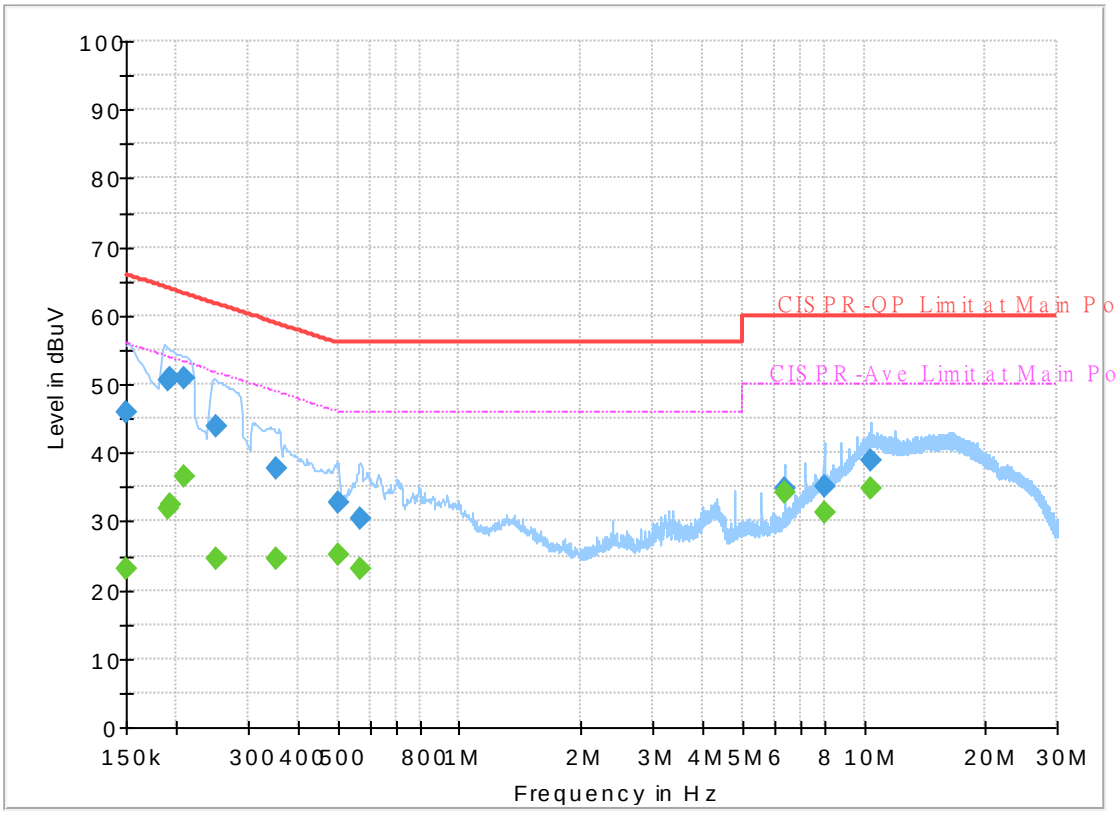
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Tom Lee	**Temperature :**	22~25℃
		Relative Humidity :	43~51%

EUT Information

Report NO :	9N2705
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

Full Spectrum



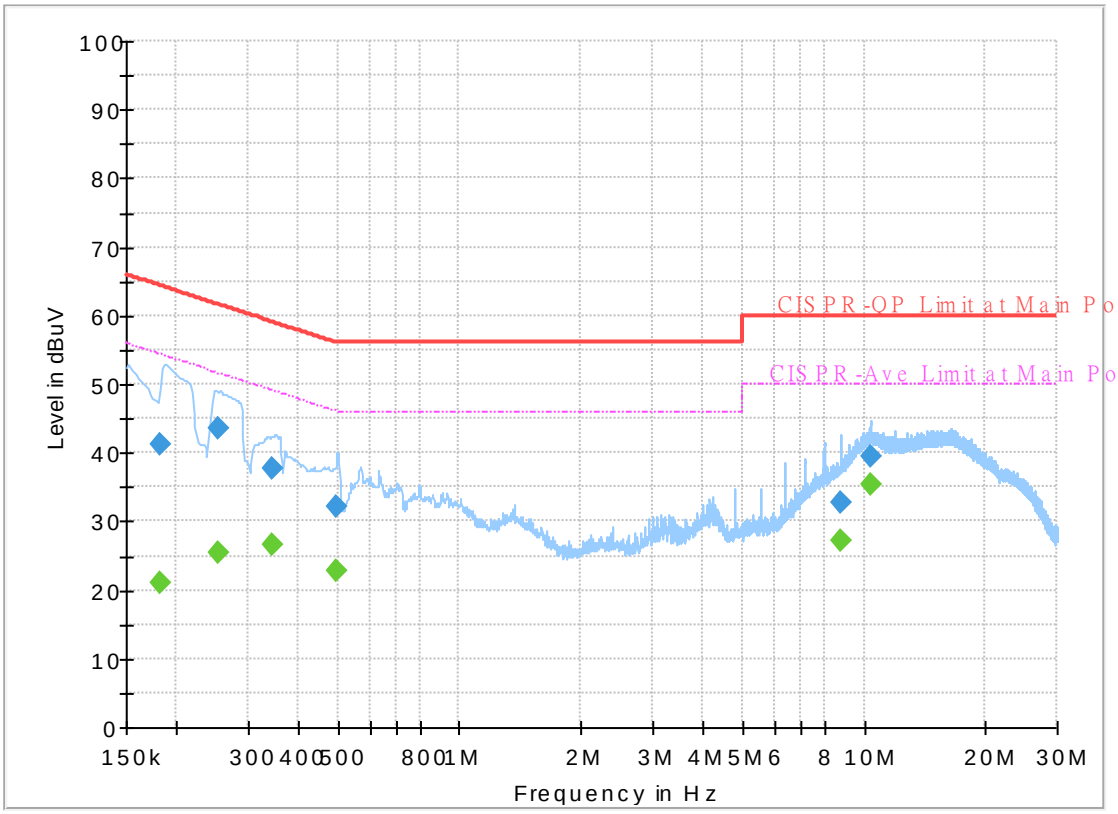
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	45.91	---	66.00	20.09	L1	OFF	19.5
0.150000	---	23.08	56.00	32.92	L1	OFF	19.5
0.190500	50.60	---	64.02	13.42	L1	OFF	19.5
0.190500	---	31.85	54.02	22.17	L1	OFF	19.5
0.192750	50.81	---	63.92	13.11	L1	OFF	19.5
0.192750	---	32.60	53.92	21.32	L1	OFF	19.5
0.208500	50.98	---	63.27	12.29	L1	OFF	19.5
0.208500	---	36.49	53.27	16.78	L1	OFF	19.5
0.250530	44.00	---	61.74	17.74	L1	OFF	19.5
0.250530	---	24.68	51.74	27.06	L1	OFF	19.5
0.353760	37.73	---	58.87	21.14	L1	OFF	19.5
0.353760	---	24.54	48.87	24.33	L1	OFF	19.5
0.500010	32.61	---	56.00	23.39	L1	OFF	19.5
0.500010	---	25.28	46.00	20.72	L1	OFF	19.5
0.566250	30.48	---	56.00	25.52	L1	OFF	19.5
0.566250	---	23.18	46.00	22.82	L1	OFF	19.5
6.369000	34.93	---	60.00	25.07	L1	OFF	19.6
6.369000	---	34.29	50.00	15.71	L1	OFF	19.6
7.965600	35.21	---	60.00	24.79	L1	OFF	19.6
7.965600	---	31.27	50.00	18.73	L1	OFF	19.6
10.349250	39.03	---	60.00	20.97	L1	OFF	19.7
10.349250	---	34.70	50.00	15.30	L1	OFF	19.7

EUT Information

Report NO :	9N2705
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.181500	---	21.07	54.42	33.35	N	OFF	19.5
0.181500	41.18	---	64.42	23.24	N	OFF	19.5
0.253500	---	25.43	51.64	26.21	N	OFF	19.5
0.253500	43.53	---	61.64	18.11	N	OFF	19.5
0.345750	---	26.56	49.06	22.50	N	OFF	19.5
0.345750	37.86	---	59.06	21.20	N	OFF	19.5
0.494250	---	22.69	46.10	23.41	N	OFF	19.5
0.494250	32.04	---	56.10	24.06	N	OFF	19.5
8.748510	---	27.25	50.00	22.75	N	OFF	19.7
8.748510	32.75	---	60.00	27.25	N	OFF	19.7
10.349250	---	35.27	50.00	14.73	N	OFF	19.7
10.349250	39.51	---	60.00	20.49	N	OFF	19.7

Appendix C. Radiated Spurious Emission

Test Engineer :	Jesse Wang, JC Liang, and Wilson Wu	Temperature :	21.5 ~ 23.5°C
		Relative Humidity :	46.5 ~ 49.5%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2315.565	55	-19	74	40.57	27.87	13.86	27.3	125	160	P	H
		2389.38	44.35	-9.65	54	30.08	27.64	13.92	27.29	125	160	A	H
	*	2412	110.83	-	-	96.59	27.58	13.94	27.28	125	160	P	H
	*	2412	107.73	-	-	93.49	27.58	13.94	27.28	125	160	A	H
													H
		2347.59	54.96	-19.04	74	40.56	27.8	13.89	27.29	346	26	P	V
		2390	44.49	-9.51	54	30.22	27.64	13.92	27.29	346	26	A	V
	*	2412	110.69	-	-	96.45	27.58	13.94	27.28	346	26	P	V
	*	2412	107.44	-	-	93.2	27.58	13.94	27.28	346	26	A	V
													V
802.11b CH 06 2437MHz		2374.96	55.74	-18.26	74	41.42	27.7	13.91	27.29	126	180	P	H
		2389.94	44.35	-9.65	54	30.08	27.64	13.92	27.29	126	180	A	H
	*	2437	111.48	-	-	97.27	27.53	13.96	27.28	126	180	P	H
	*	2437	108.45	-	-	94.24	27.53	13.96	27.28	126	180	A	H
		2484.11	55.23	-18.77	74	41	27.5	14	27.27	126	180	P	H
		2484.39	44.54	-9.46	54	30.31	27.5	14	27.27	126	180	A	H
		2337.72	55.71	-18.29	74	41.31	27.82	13.88	27.3	358	20	P	V
		2389.52	44.23	-9.77	54	29.96	27.64	13.92	27.29	358	20	A	V
	*	2436	111.52	-	-	97.31	27.53	13.96	27.28	358	20	P	V
	*	2436	108.41	-	-	94.2	27.53	13.96	27.28	358	20	A	V
		2483.62	55.23	-18.77	74	41	27.5	14	27.27	358	20	P	V
		2483.9	44.49	-9.51	54	30.26	27.5	14	27.27	358	20	A	V

802.11b CH 11 2462MHz	*	2462	111.49	-	-	97.29	27.5	13.98	27.28	175	180	P	H
	*	2462	108.55	-	-	94.35	27.5	13.98	27.28	175	180	A	H
		2487.76	56.61	-17.39	74	42.38	27.5	14	27.27	175	180	P	H
		2487.4	45.61	-8.39	54	31.38	27.5	14	27.27	175	180	A	H
													H
													H
	*	2462	112.2	-	-	98	27.5	13.98	27.28	346	18	P	V
	*	2462	109.12	-	-	94.92	27.5	13.98	27.28	346	18	A	V
		2487.64	56.52	-17.48	74	42.29	27.5	14	27.27	346	18	P	V
		2487.44	46.48	-7.52	54	32.25	27.5	14	27.27	346	18	A	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 802.11b (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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	42.6	-31.4	74	62.56	31.15	6.44	57.55	100	0	P	H
													H
													H
													H
		4824	43.27	-30.73	74	63.23	31.15	6.44	57.55	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	43.29	-30.71	74	62.96	31.2	6.58	57.45	100	0	P	H
		7311	42.93	-31.07	74	55.17	36.78	8.25	57.27	100	0	P	H
													H
													H
		4874	39.44	-34.56	74	59.11	31.2	6.58	57.45	100	0	P	V
		7311	43.47	-30.53	74	55.71	36.78	8.25	57.27	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	43.78	-30.22	74	63.16	31.25	6.72	57.35	100	0	P	H
		7386	43	-31	74	55.57	36.63	8.16	57.36	100	0	P	H
													H
													H
		4920	43.27	-30.73	74	62.68	31.24	6.71	57.36	100	0	P	V
		7386	43.77	-30.23	74	56.34	36.63	8.16	57.36	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+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2390	63.73	-10.27	74	49.46	27.64	13.92	27.29	186	180	P	H
		2390	52.25	-1.75	54	37.98	27.64	13.92	27.29	186	180	A	H
	*	2412	114.31	-	-	100.07	27.58	13.94	27.28	186	180	P	H
	*	2412	106.04	-	-	91.8	27.58	13.94	27.28	186	180	A	H
													H
													H
		2390	63.33	-10.67	74	49.06	27.64	13.92	27.29	370	17	P	V
		2390	52.24	-1.76	54	37.97	27.64	13.92	27.29	370	17	A	V
	*	2412	113.94	-	-	99.7	27.58	13.94	27.28	370	17	P	V
	*	2412	105.62	-	-	91.38	27.58	13.94	27.28	370	17	A	V
													V
													V
802.11g CH 06 2437MHz		2364.32	55.46	-18.54	74	41.11	27.74	13.9	27.29	360	181	P	H
		2389.94	44.93	-9.07	54	30.66	27.64	13.92	27.29	360	181	A	H
	*	2437	113.58	-	-	99.37	27.53	13.96	27.28	360	181	P	H
	*	2437	106.22	-	-	92.01	27.53	13.96	27.28	360	181	A	H
		2483.52	56.89	-17.11	74	42.66	27.5	14	27.27	360	181	P	H
		2483.62	45.83	-8.17	54	31.6	27.5	14	27.27	360	181	A	H
		2372.3	55.45	-18.55	74	41.12	27.71	13.91	27.29	352	13	P	V
		2389.94	44.88	-9.12	54	30.61	27.64	13.92	27.29	352	13	A	V
	*	2437	112.83	-	-	98.62	27.53	13.96	27.28	352	13	P	V
	*	2437	105.2	-	-	90.99	27.53	13.96	27.28	352	13	A	V
		2484.11	55.72	-18.28	74	41.49	27.5	14	27.27	352	13	P	V
		2483.69	45.12	-8.88	54	30.89	27.5	14	27.27	352	13	A	V

802.11g CH 11 2462MHz	*	2462	114.99	-	-	100.79	27.5	13.98	27.28	174	182	P	H
	*	2462	106.95	-	-	92.75	27.5	13.98	27.28	174	182	A	H
		2483.88	62.93	-11.07	74	48.7	27.5	14	27.27	174	182	P	H
		2483.52	52.38	-1.62	54	38.15	27.5	14	27.27	174	182	A	H
													H
													H
	*	2462	114.5	-	-	100.3	27.5	13.98	27.28	353	14	P	V
	*	2462	106.5	-	-	92.3	27.5	13.98	27.28	353	14	A	V
		2483.8	61.85	-12.15	74	47.62	27.5	14	27.27	353	14	P	V
		2483.52	50.28	-3.72	54	36.05	27.5	14	27.27	353	14	A	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 (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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	39.24	-34.76	74	59.2	31.15	6.44	57.55	100	0	P	H
													H
													H
													H
		4824	39.36	-34.64	74	59.32	31.15	6.44	57.55	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	39.29	-34.71	74	58.96	31.2	6.58	57.45	100	0	P	H
		7311	43.39	-30.61	74	55.63	36.78	8.25	57.27	100	0	P	H
													H
													H
		4874	38.09	-35.91	74	57.76	31.2	6.58	57.45	100	0	P	V
		7311	43.52	-30.48	74	55.76	36.78	8.25	57.27	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	39	-35	74	58.38	31.25	6.72	57.35	100	0	P	H
		7386	42.68	-31.32	74	55.25	36.63	8.16	57.36	100	0	P	H
													H
													H
		4924	38.49	-35.51	74	57.87	31.25	6.72	57.35	100	0	P	V
		7386	43.42	-30.58	74	55.99	36.63	8.16	57.36	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+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		2389.905	61.42	-12.58	74	47.15	27.64	13.92	27.29	186	181	P	H
		2390	51.44	-2.56	54	37.17	27.64	13.92	27.29	186	181	A	H
	*	2412	111.01	-	-	96.77	27.58	13.94	27.28	186	181	P	H
	*	2412	102.99	-	-	88.75	27.58	13.94	27.28	186	181	A	H
802.11n													H
HT20													H
CH 01		2389.905	60.28	-13.72	74	46.01	27.64	13.92	27.29	350	23	P	V
2412MHz		2390	50.6	-3.4	54	36.33	27.64	13.92	27.29	350	23	A	V
	*	2412	111.97	-	-	97.73	27.58	13.94	27.28	350	23	P	V
	*	2412	104.22	-	-	89.98	27.58	13.94	27.28	350	23	A	V
													V
													V
		2346.4	56.44	-17.56	74	42.03	27.81	13.89	27.29	253	207	P	H
		2389.8	45.66	-8.34	54	31.39	27.64	13.92	27.29	253	207	A	H
	*	2437	112.13	-	-	97.92	27.53	13.96	27.28	253	207	P	H
	*	2437	104.64	-	-	90.43	27.53	13.96	27.28	253	207	A	H
802.11n		2486.42	55.13	-18.87	74	40.9	27.5	14	27.27	253	207	P	H
HT20		2483.55	46.17	-7.83	54	31.94	27.5	14	27.27	253	207	A	H
CH 06		2338.28	55.88	-18.12	74	41.48	27.82	13.88	27.3	355	19	P	V
2437MHz		2389.8	45.74	-8.26	54	31.47	27.64	13.92	27.29	355	19	A	V
	*	2437	112.98	-	-	98.77	27.53	13.96	27.28	355	19	P	V
	*	2437	105.28	-	-	91.07	27.53	13.96	27.28	355	19	A	V
		2486.42	55.77	-18.23	74	41.54	27.5	14	27.27	355	19	P	V
		2483.52	45.9	-8.1	54	31.67	27.5	14	27.27	355	19	A	V

	*	2462	113.05	-	-	98.85	27.5	13.98	27.28	149	158	P	H
	*	2462	104.9	-	-	90.7	27.5	13.98	27.28	149	158	A	H
		2484	60.94	-13.06	74	46.71	27.5	14	27.27	149	158	P	H
		2483.56	52.14	-1.86	54	37.91	27.5	14	27.27	149	158	A	H
802.11n													H
HT20													H
CH 11	*	2462	113.98	-	-	99.78	27.5	13.98	27.28	356	11	P	V
2462MHz	*	2462	105.53	-	-	91.33	27.5	13.98	27.28	356	11	A	V
		2483.52	60.35	-13.65	74	46.12	27.5	14	27.27	356	11	P	V
		2483.52	51.84	-2.16	54	37.61	27.5	14	27.27	356	11	A	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 (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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4824	41.06	-32.94	74	61.02	31.15	6.44	57.55	100	0	P	H
													H
802.11n													H
HT20													H
CH 01		4824	39.95	-34.05	74	59.91	31.15	6.44	57.55	100	0	P	V
2412MHz													V
													V
													V
		4874	40.48	-33.52	74	60.15	31.2	6.58	57.45	100	0	P	H
		7311	43.61	-30.39	74	55.85	36.78	8.25	57.27	100	0	P	H
802.11n													H
HT20													H
CH 06		4874	38.44	-35.56	74	58.11	31.2	6.58	57.45	100	0	P	V
2437MHz		7311	43.92	-30.08	74	56.16	36.78	8.25	57.27	100	0	P	V
													V
													V
		4924	38.29	-35.71	74	57.67	31.25	6.72	57.35	100	0	P	H
		7386	43.54	-30.46	74	56.11	36.63	8.16	57.36	100	0	P	H
802.11n													H
HT20													H
CH 11		4924	39.45	-34.55	74	58.83	31.25	6.72	57.35	100	0	P	V
2462MHz		7386	43.3	-30.7	74	55.87	36.63	8.16	57.36	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 HT40 (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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		2389.52	60.75	-13.25	74	46.48	27.64	13.92	27.29	186	181	P	H
		2389.94	52.93	-1.07	54	38.66	27.64	13.92	27.29	186	181	A	H
	*	2422	110.8	-	-	96.57	27.56	13.95	27.28	186	181	P	H
	*	2422	102.52	-	-	88.29	27.56	13.95	27.28	186	181	A	H
802.11n		2487.4	56.36	-17.64	74	42.13	27.5	14	27.27	186	181	P	H
HT40		2486.77	46.49	-7.51	54	32.26	27.5	14	27.27	186	181	A	H
CH 03		2389.94	60.33	-13.67	74	46.06	27.64	13.92	27.29	359	14	P	V
2422MHz		2389.94	52.74	-1.26	54	38.47	27.64	13.92	27.29	359	14	A	V
	*	2422	110.6	-	-	96.37	27.56	13.95	27.28	359	14	P	V
	*	2422	102.62	-	-	88.39	27.56	13.95	27.28	359	14	A	V
		2487.05	55.22	-18.78	74	40.99	27.5	14	27.27	359	14	P	V
		2483.69	46.46	-7.54	54	32.23	27.5	14	27.27	359	14	A	V
		2388.82	56.98	-17.02	74	42.71	27.64	13.92	27.29	216	179	P	H
		2389.8	48.2	-5.8	54	33.93	27.64	13.92	27.29	216	179	A	H
	*	2437	109.27	-	-	95.06	27.53	13.96	27.28	216	179	P	H
	*	2437	101.11	-	-	86.9	27.53	13.96	27.28	216	179	A	H
802.11n		2483.62	62.35	-11.65	74	48.12	27.5	14	27.27	216	179	P	H
HT40		2483.52	52.73	-1.27	54	38.5	27.5	14	27.27	216	179	A	H
CH 06		2389.38	58.82	-15.18	74	44.55	27.64	13.92	27.29	363	12	P	V
2437MHz		2389.8	48.9	-5.1	54	34.63	27.64	13.92	27.29	363	12	A	V
	*	2437	108.89	-	-	94.68	27.53	13.96	27.28	363	12	P	V
	*	2437	100.58	-	-	86.37	27.53	13.96	27.28	363	12	A	V
		2483.62	63.93	-10.07	74	49.7	27.5	14	27.27	363	12	P	V
		2483.76	52.59	-1.41	54	38.36	27.5	14	27.27	363	12	A	V

		2362.92	55.06	-18.94	74	40.7	27.75	13.9	27.29	149	181	P	H
		2311.96	45.95	-8.05	54	31.51	27.88	13.86	27.3	149	181	A	H
	*	2452	106.87	-	-	92.68	27.5	13.97	27.28	149	181	P	H
	*	2452	98.67	-	-	84.48	27.5	13.97	27.28	149	181	A	H
802.11n		2484.39	62.3	-11.7	74	48.07	27.5	14	27.27	149	181	P	H
HT40		2484.46	53.54	-0.46	54	39.31	27.5	14	27.27	149	181	A	H
CH 09		2329.04	55.17	-18.83	74	40.76	27.84	13.87	27.3	322	22	P	V
2452MHz		2389.94	45.91	-8.09	54	31.64	27.64	13.92	27.29	322	22	A	V
	*	2452	107.69	-	-	93.5	27.5	13.97	27.28	322	22	P	V
	*	2452	99.68	-	-	85.49	27.5	13.97	27.28	322	22	A	V
		2483.76	60.95	-13.05	74	46.72	27.5	14	27.27	322	22	P	V
		2483.5	52.42	-1.58	54	38.19	27.5	14	27.27	322	22	A	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 (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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4844	37.68	-36.32	74	57.51	31.19	6.49	57.51	100	0	P	H
		7266	44	-30	74	56.26	36.66	8.3	57.22	100	0	P	H
802.11n													H
HT40													H
CH 03		4844	38.35	-35.65	74	58.18	31.19	6.49	57.51	100	0	P	V
2422MHz		7266	42.89	-31.11	74	55.15	36.66	8.3	57.22	100	0	P	V
													V
													V
		4874	38.06	-35.94	74	57.73	31.2	6.58	57.45	100	0	P	H
		7311	43.28	-30.72	74	55.52	36.78	8.25	57.27	100	0	P	H
802.11n													H
HT40													H
CH 06		4874	38.08	-35.92	74	57.75	31.2	6.58	57.45	100	0	P	V
2437MHz		7311	43.47	-30.53	74	55.71	36.78	8.25	57.27	100	0	P	V
													V
													V
		4904	38.07	-35.93	74	57.59	31.21	6.66	57.39	100	0	P	H
		7356	43.23	-30.77	74	55.67	36.69	8.2	57.33	100	0	P	H
802.11n													H
HT40													H
CH 09		4904	38.01	-35.99	74	57.53	31.21	6.66	57.39	100	0	P	V
2452MHz		7356	43.46	-30.54	74	55.9	36.69	8.2	57.33	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 HT40 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	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)
		124.09	29.87	-13.63	43.5	43.9	17.2	0.96	32.19	-	-	P	H
		222.06	31.26	-14.74	46	47	15.12	1.28	32.14	-	-	P	H
		268.62	31.71	-14.29	46	43.52	18.95	1.39	32.15	-	-	P	H
		289.96	32.43	-13.57	46	44.45	18.7	1.43	32.15	-	-	P	H
		720.64	38.71	-7.29	46	41.64	26.84	2.28	32.05	100	0	P	H
		952.47	33.49	-12.51	46	31.24	30.55	2.66	30.96	-	-	P	H
													H
													H
													H
													H
2.4GHz													H
802.11n													H
HT40		34.85	33.93	-6.07	40	43.36	22.39	0.47	32.29	100	0	P	V
LF		57.16	31	-9	40	50.94	11.77	0.57	32.28	-	-	P	V
		91.11	26.65	-16.85	43.5	43.68	14.43	0.76	32.22	-	-	P	V
		120.21	27.82	-15.68	43.5	41.97	17.1	0.95	32.2	-	-	P	V
		721.61	38.24	-7.76	46	41.1	26.9	2.29	32.05	-	-	P	V
		956.35	33.82	-12.18	46	31.44	30.63	2.68	30.93	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	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)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path 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) + Path 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. Radiated Spurious Emission Plots+

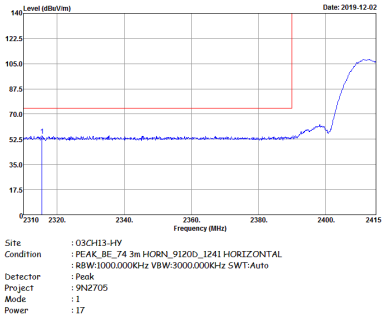
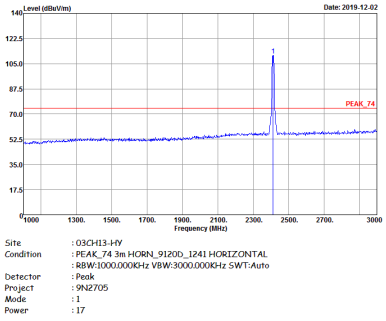
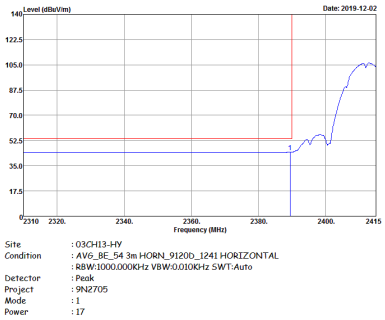
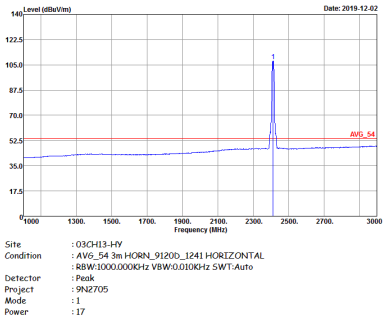
Test Engineer :	Jesse Wang, JC Liang, and Wilson Wu	**Temperature :**	21.5 ~ 23.5°C
		Relative Humidity :	46.5 ~ 49.5%

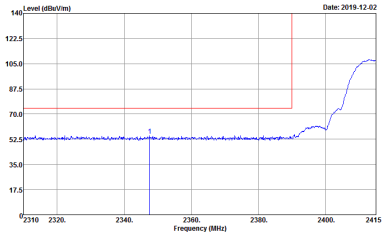
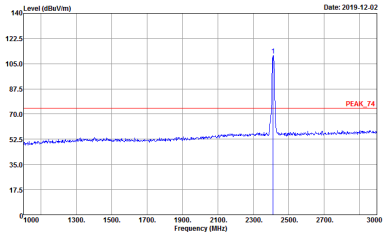
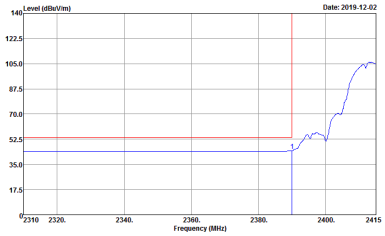
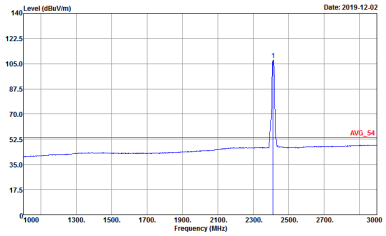
Note symbol

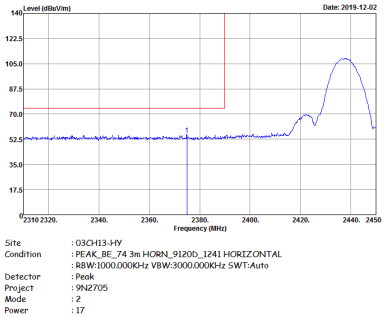
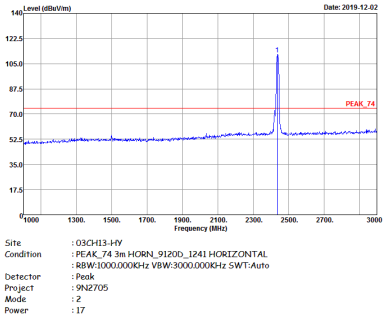
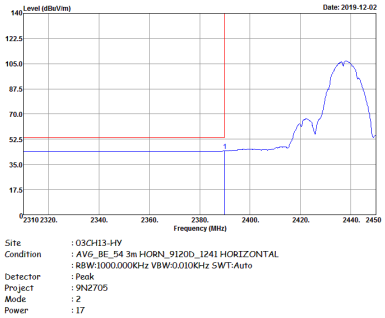
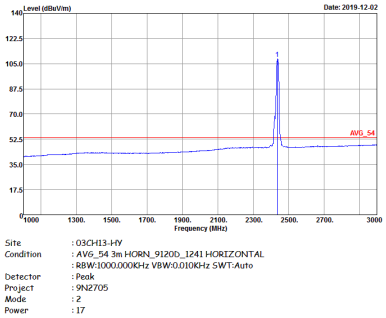
-L	**Low channel location**
-R	**High channel location**

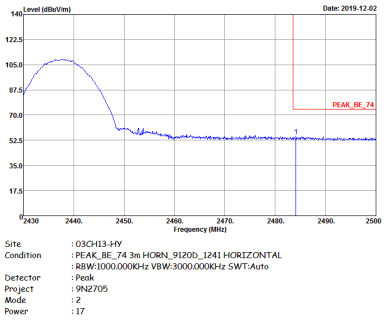
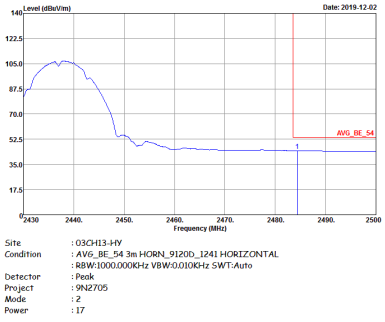
2.4GHz 2400~2483.5MHz

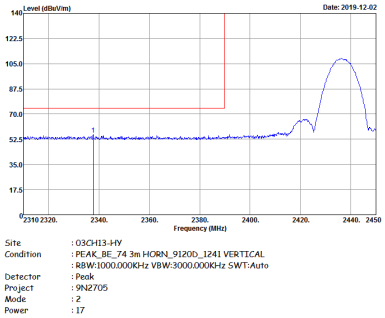
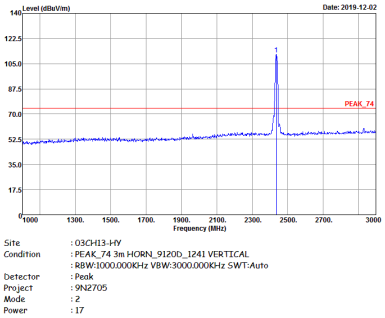
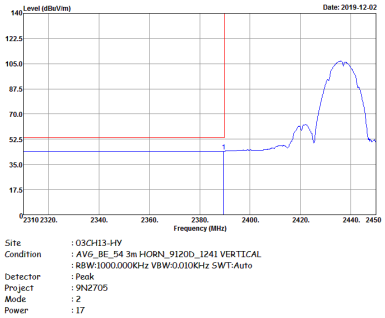
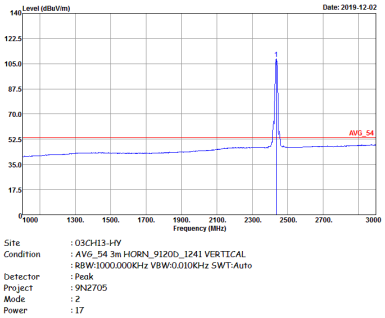
WIFI 802.11b (Band Edge @ 3m)

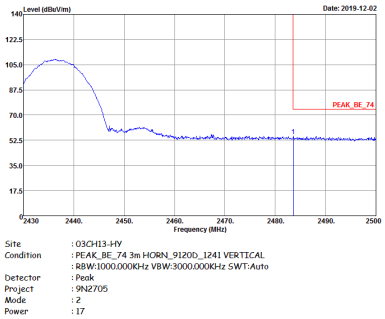
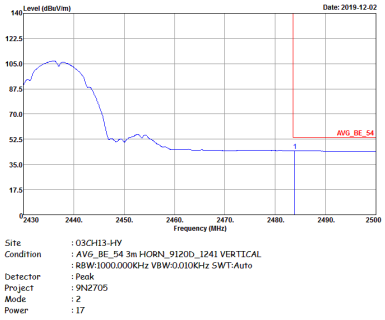
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

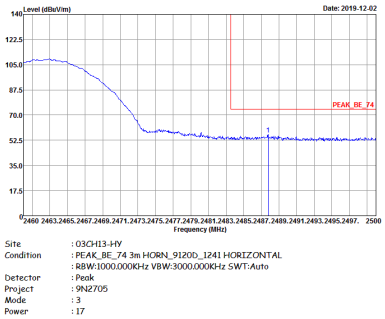
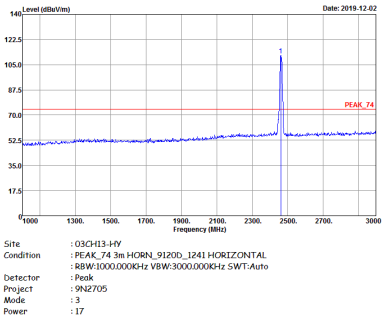
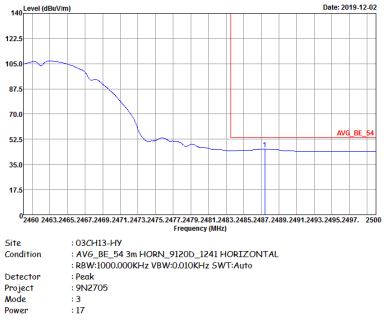
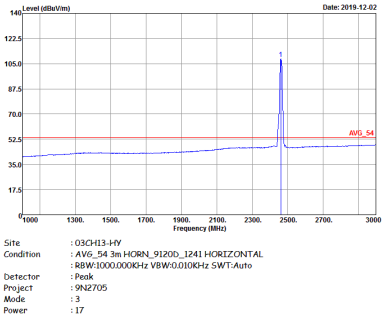
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 1 Power : 17	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 1 Power : 17
Avg.	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 1 Power : 17	 Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 1 Power : 17

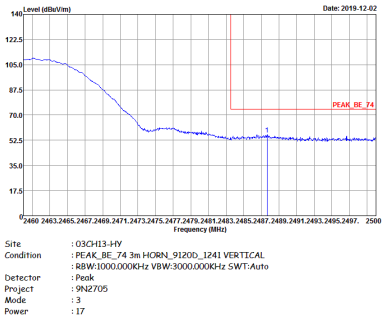
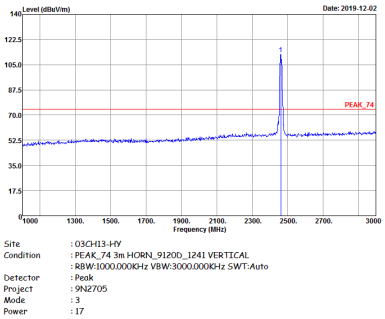
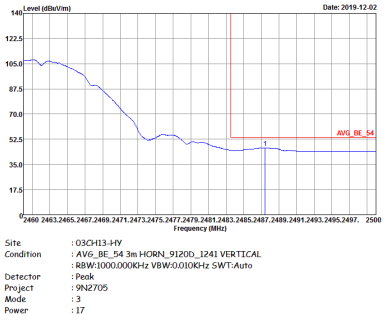
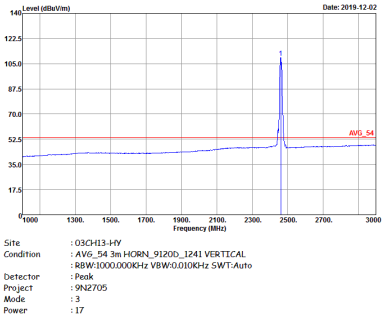
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 2 Power : 17	Left blank
Avg.	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 2 Power : 17	Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 2 Power : 17	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 2 Power : 17
Avg.	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 2 Power : 17	 Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 2 Power : 17

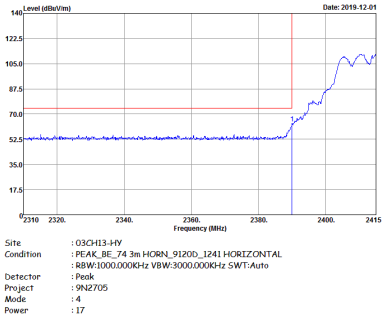
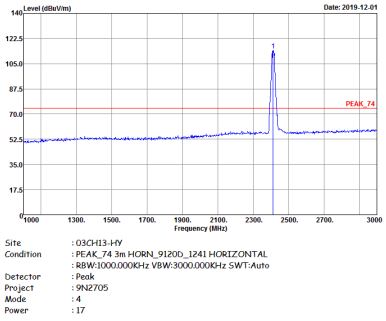
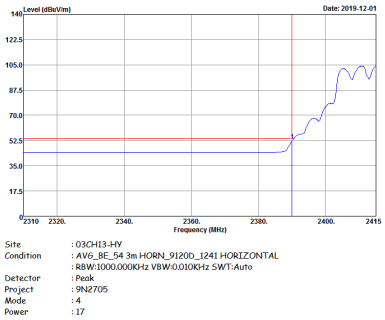
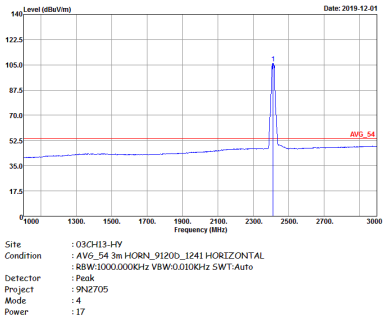
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 2 Power : 17	Left blank
Avg.	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 2 Power : 17	Left blank

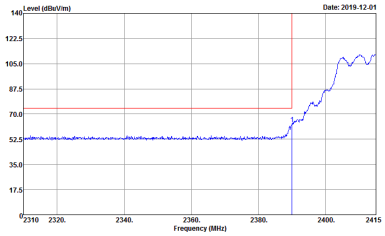
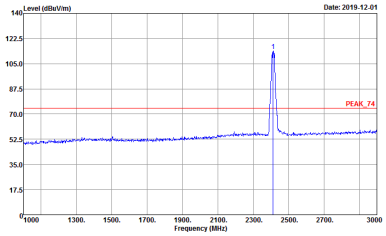
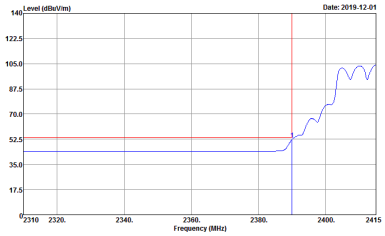
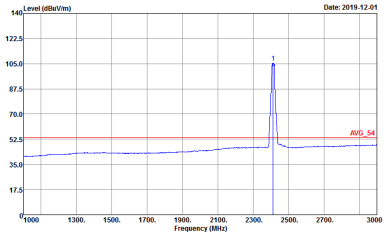
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 3 Power : 17	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 3 Power : 17
Avg.	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 3 Power : 17	 Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 3 Power : 17

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 3 Power : 17	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 3 Power : 17
Avg.	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 3 Power : 17	 Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 3 Power : 17

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 4 Power : 17	 Site : 03CH13-HY Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 4 Power : 17
Avg.	 Site : 03CH13-HY Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 4 Power : 17	 Site : 03CH13-HY Condition : AVG_54 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 9N2705 Mode : 4 Power : 17