FCC RF Test Report

APPLICANT	:	Amazon.com Services LLC
EQUIPMENT	:	Electronic Display Device
MODEL NAME	:	C2V2L3
FCC ID	:	2A4DH-4832
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure
TEST DATE(S)	:	Jan. 26, 2022 ~ Mar. 02, 2022

We, Sporton International Inc. (ShenZhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (ShenZhen), the test report shall not be reproduced except in full.

Reviewed by: Derreck Chen / Supervisor

Approved by: Eric Shih / Manager

ACCREDITED Cert #5145.01

Sporton International Inc. (ShenZhen)
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People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR1O2129-01E	Rev. 01	Initial issue of report	Mar. 18, 2022

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB, 26dB and 99% Occupied Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b)(4)(i) &15.209(a)	Pass	Under limit 5.33 dB at 32.910 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 14.95 dB at 0.56589 MHz
3.6	15.203 & 15.407(a)	Antenna Requirement	15.203 & 15.407(a)	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.

1 General Description

1.1 Applicant

Amazon.com Services LLC
410 Terry Avenue N, Seattle, WA 98109-5210, United States

1.2 Product Feature of Equipment Under Test

Product Feature	
Equipment	Electronic Display Device
Model Name	C2V2L3
FCC ID	2A4DH-4832

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

1.3 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power	**<5745 MHz ~ 5825 MHz>** 802.11a : 14.56 dBm / 0.0286 W 802.11n HT20 : 14.46 dBm / 0.0279 W 802.11n HT40 : 13.90 dBm / 0.0245 W 802.11ac VHT20: 14.39 dBm / 0.0275 W 802.11ac VHT40: 13.85 dBm / 0.0243 W 802.11ac VHT80: 13.66 dBm / 0.0232 W
99% Occupied Bandwidth	802.11a : 16.83 MHz 802.11n HT20 : 17.78 MHz 802.11n HT40 : 36.66 MHz 802.11ac VHT80 : 75.04 MHz
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Antenna Type / Gain	Monopole Antenna with gain 4.96 dBi

Note: For 802.11n HT20 / ac VHT20 and 802.11n HT40 / ac VHT40 mode, the whole testing have assessed only 802.11n HT20/ HT40 by referring to their maximum conducted power.

1.4 Modification of EUT

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

1.5 Testing Location

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CO01-SZ TH01-SZ	CN1256	421272

Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City Guangdong Province China 518103 TEL: +86-755-33202398		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH02-SZ	CN1256	421272

1.6 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH02-SZ	AUDIX	E3	6.2009-8-24a
2.	CO01-SZ	Rohde&Schwarz	EMC32	10.60.0.0

1.7 Applicable Standards

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

- 47 CFR Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5745-5825 MHz U-NII-3	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155#	5775	165	5825

Note:

1. The above Frequency and Channel in "*" were 802.11n HT40 and 802.11ac VHT40.
2. The above Frequency and Channel in "#" were 802.11ac VHT80.

2.2 Test Mode

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

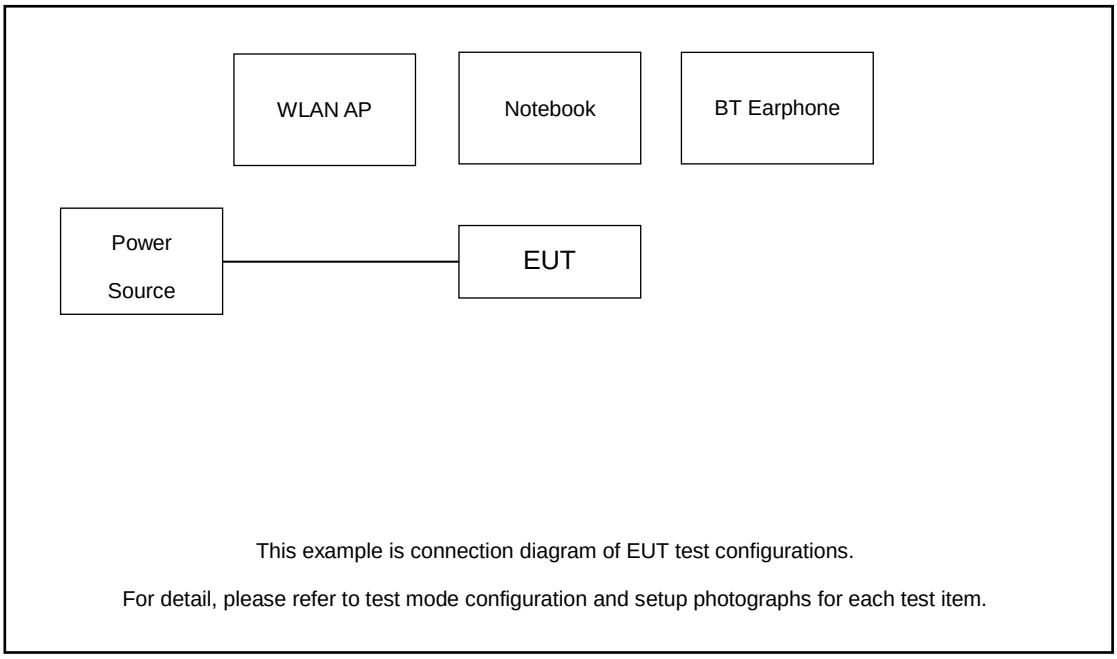
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT80	MCS0

AC Conducted Emission	Mode 1 : All Stress (CPU/Display/EMMC/Display Page Turn/Front Light) + Bluetooth Link + WLAN Link(5G) + Charging from Adapter via USB-C + Battery
Remark: For Radiated Test Cases, The tests were performance with Adapter, Battery and USB Cable.	

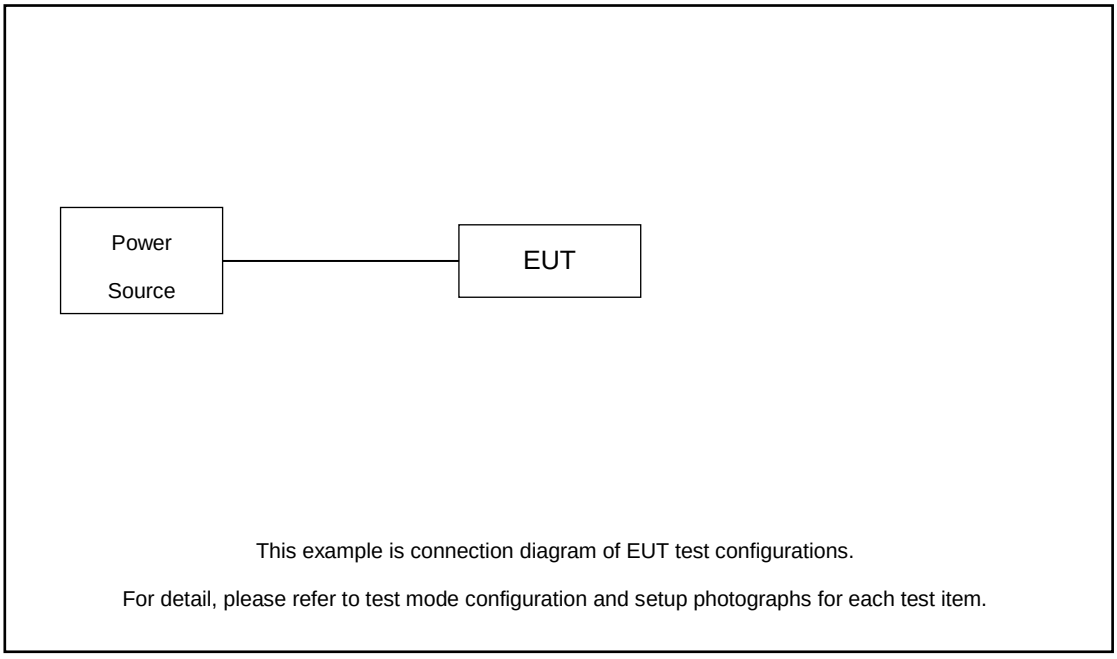
Ch. #		U-NII-3：5745-5825 MHz			
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

2.3 Connection Diagram of Test System

For Conducted Emission:



For Radiated Emission:



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Router	ASUSTek	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded,1.8m
2.	Notebook	DELL	Inspiron 15-7570	Fcc DoC	N/A	shielded cable DC O/P 1.8m Unshielded AC I/P cable 1.8m
3.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
4.	BT Base station	R&S	CBT	N/A	N/A	Unshielded,1.8m
5.	AC Adapter	N/A	PS57CP	N/A	N/A	N/A

2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions, the EUT was set to connect with the router under large package sizes transmission.

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 2.8 dB and 10dB attenuator.

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

= 2.8 + 10 = 12.8 (dB)

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

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

26dB and 99% Occupied bandwidth are reporting only.

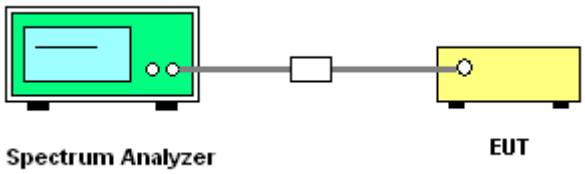
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth for the band 5.725-5.85GHz
2. For 6dB BW, Set RBW = 100kHz.
   For 26dB BW, Set RBW = approximately 1% of the emission bandwidth.
   For 99% OBW, Set RBW = 1% to 5% of the OBW.
3. For 26dB BW, Set the VBW > RBW.
   For 6dB BW & 99% OBW, Set the VBW ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

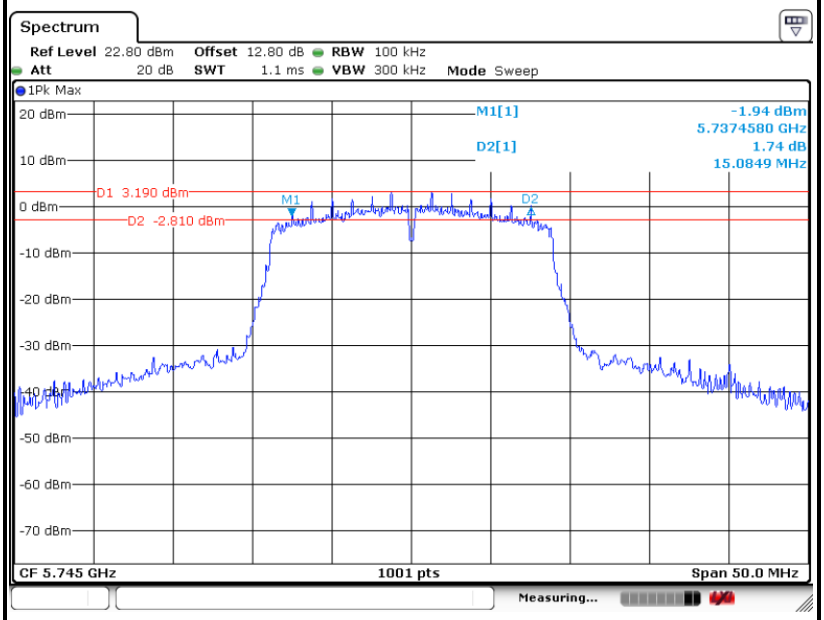
3.1.4 Test Setup



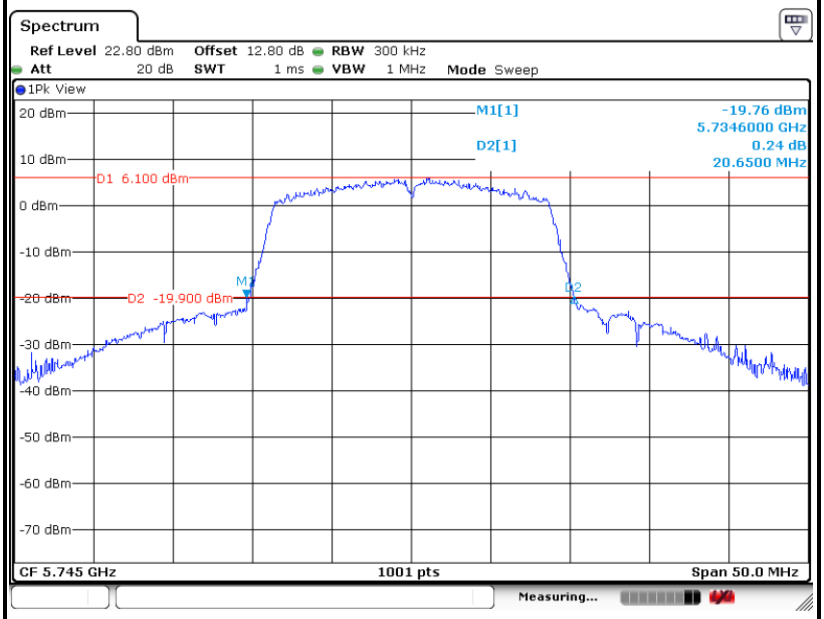
3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

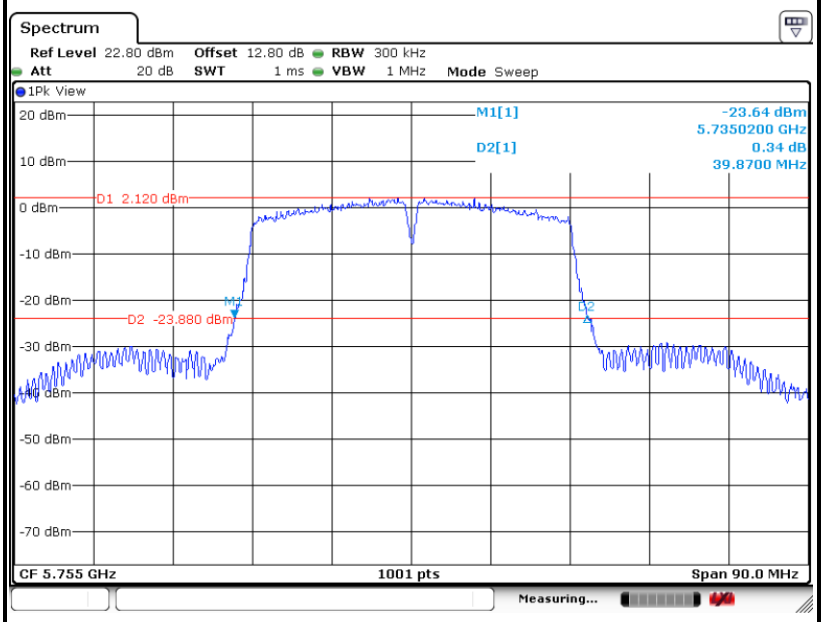
Minimum 6dB Bandwidth



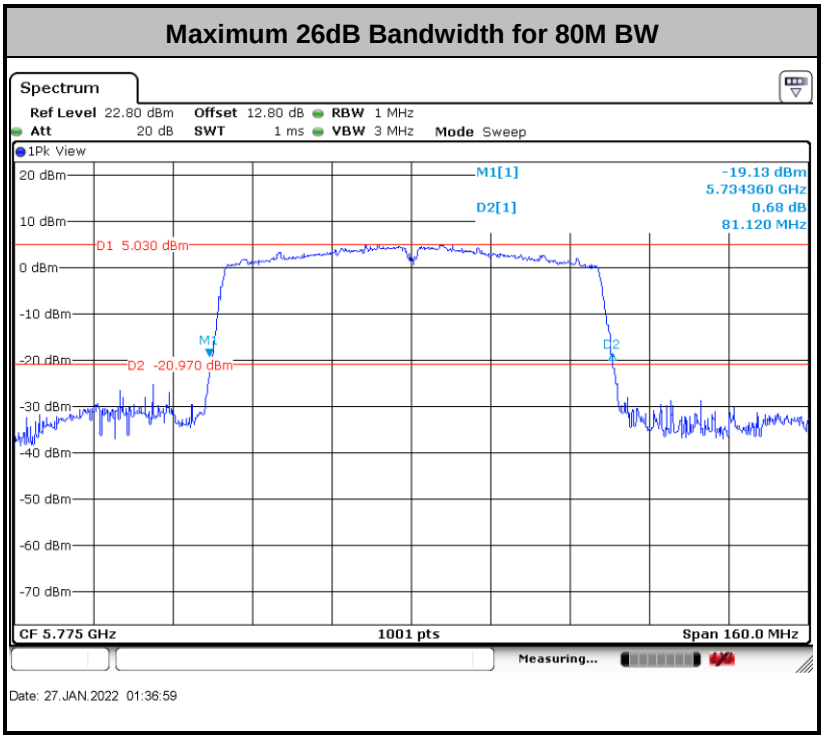
Maximum 26dB Bandwidth for 20M BW



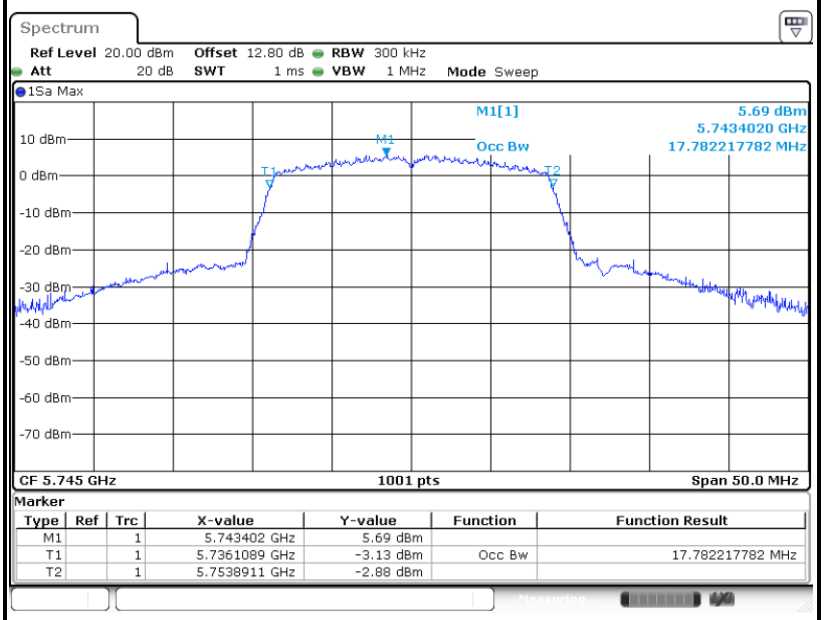
Maximum 26dB Bandwidth for 40M BW



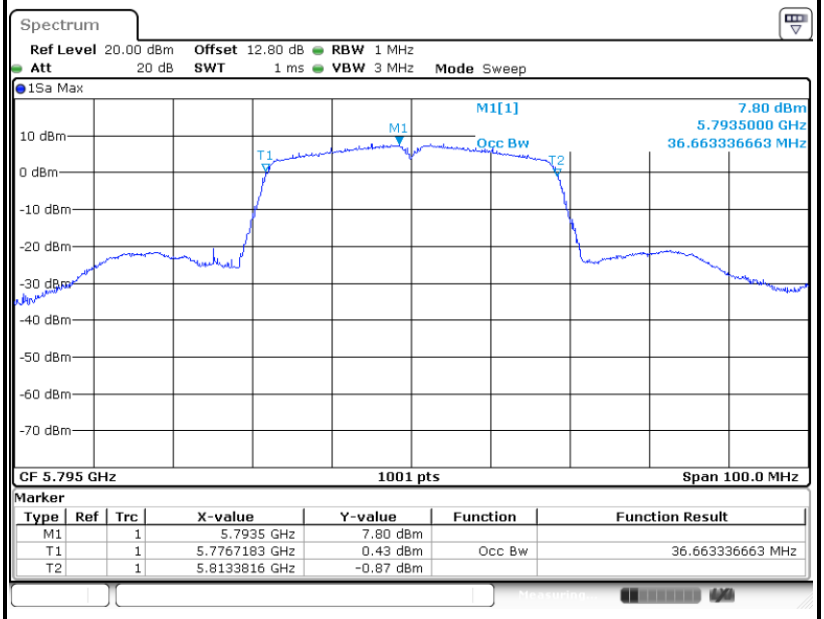
Maximum 26dB Bandwidth for 80M BW



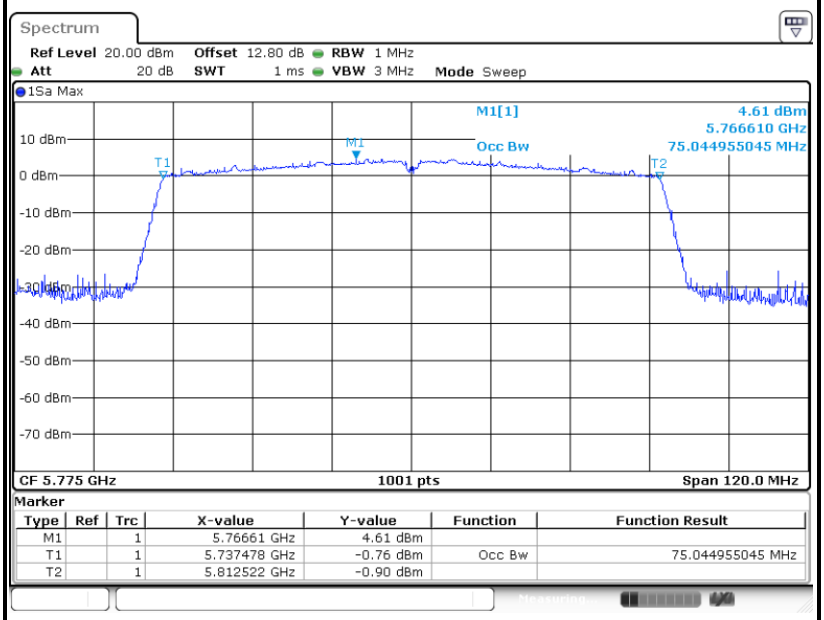
Maximum 99% Occupied Bandwidth for 20M BW



Maximum 99% Occupied Bandwidth for 40M BW



Maximum 99% Occupied Bandwidth for 80M BW



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

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Measuring Instruments

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

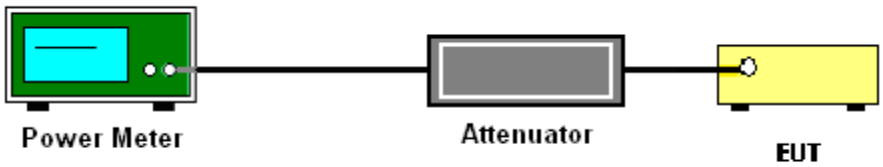
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, 10 log(1/x), where x is the duty cycle.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section F) Maximum power spectral density.

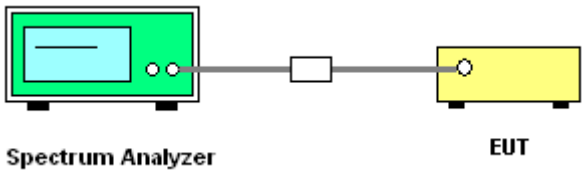
 # Method SA-2 #

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz.
- Set VBW ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(500kHz/RBW) to the test result.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

3.3.4 Test Setup

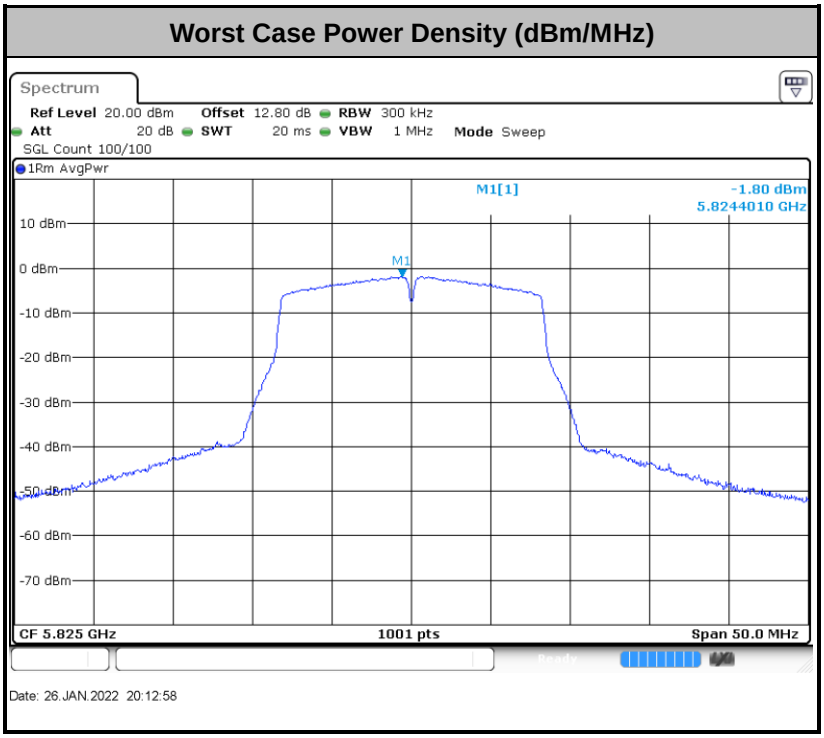


3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

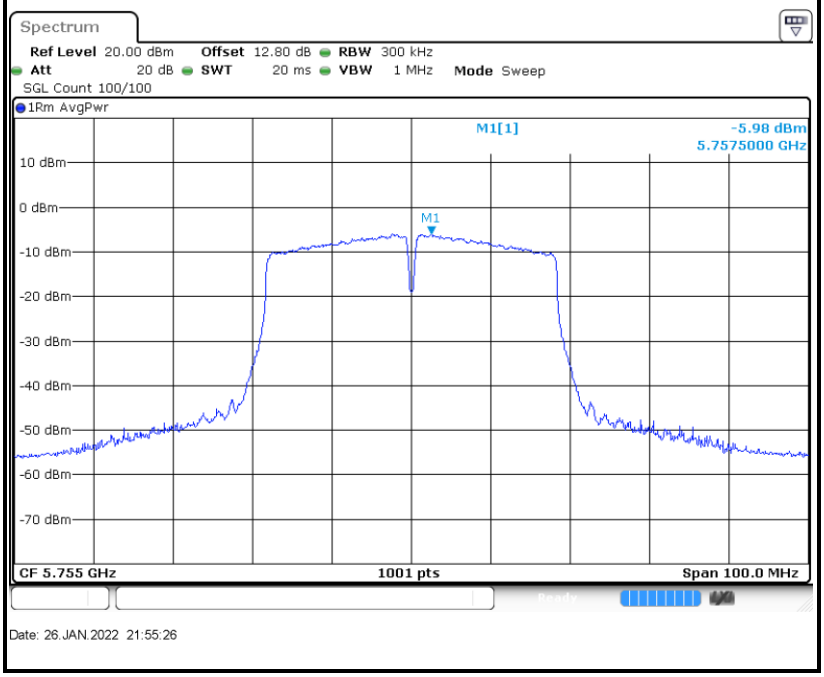
For 20MHz:

Worst Case Power Density (dBm/MHz)



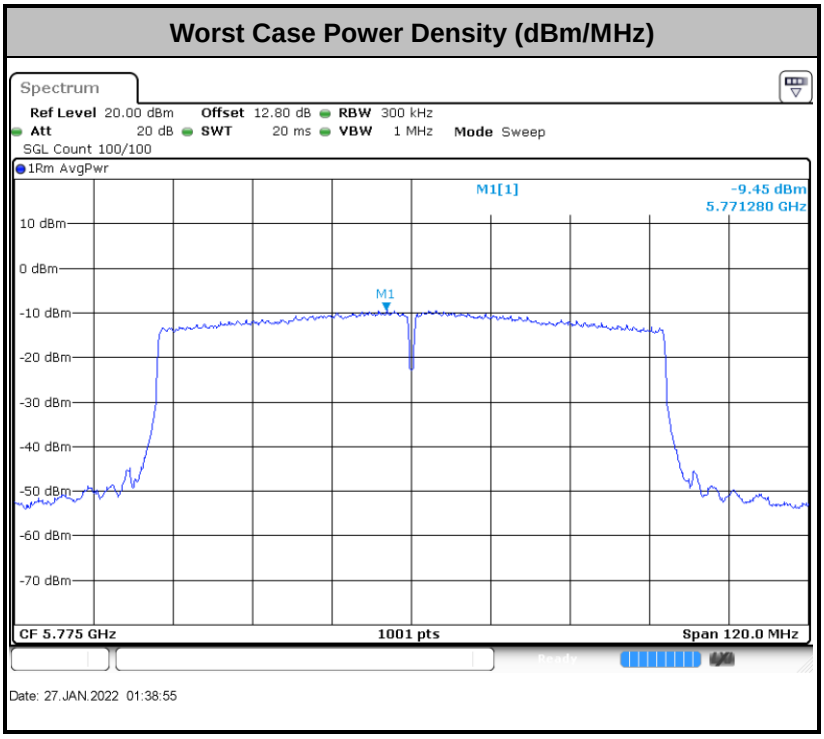
For 40MHz:

Worst Case Power Density (dBm/MHz)



For 80MHz:

Worst Case Power Density (dBm/MHz)



Note: Average Power Density (dB) = Measured value+ Duty Factor

3.4 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5.725-5.85 GHz band:

15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(2) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table,

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

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.3

Note: The following formula is used to convert the EIRP to field strength.

$$EIRP = E_{Meas} + 20\log(d_{Meas}) - 104.7$$

where

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz

   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

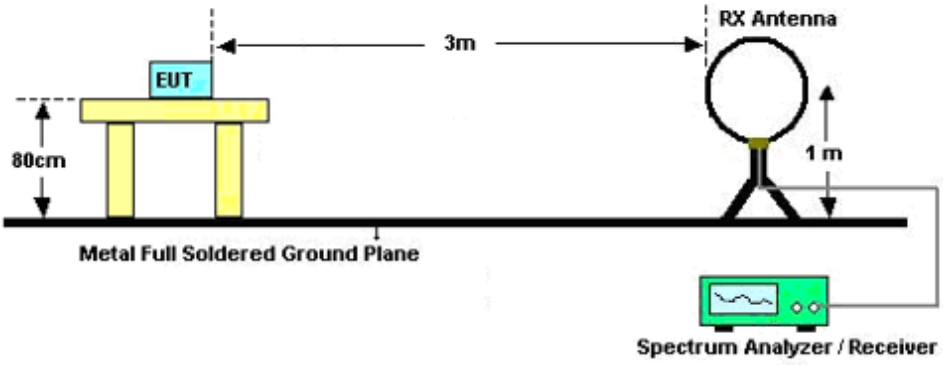
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

2. 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.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
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 peak

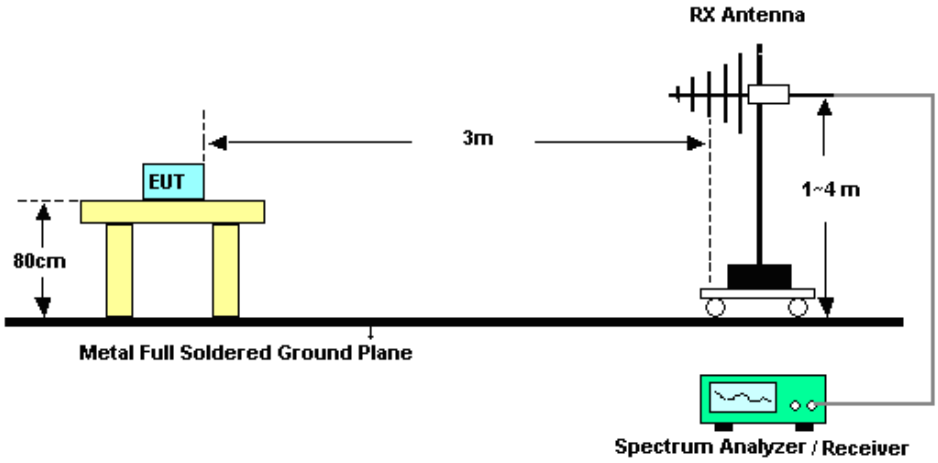
limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

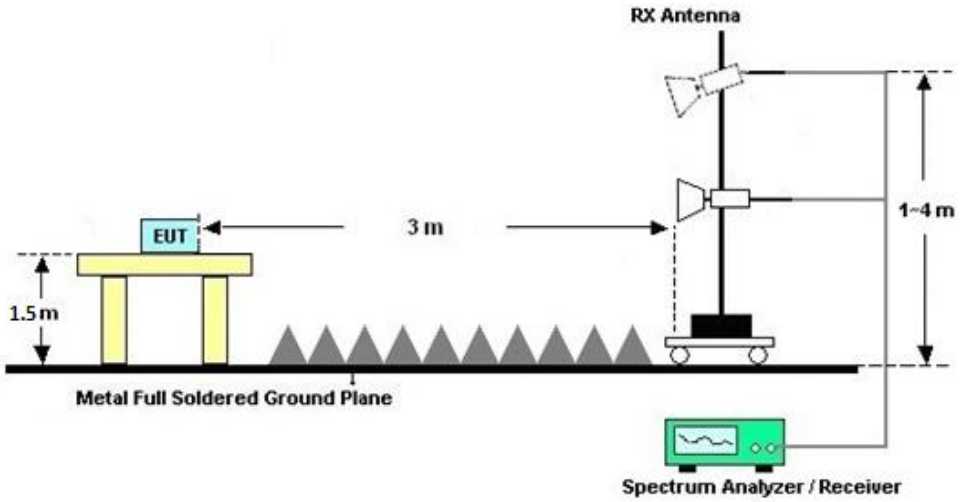
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

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

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

3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix C&D.

3.4.7 Duty Cycle

Please refer to Appendix E.

3.4.8 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix C&D.

3.5 AC Conducted Emission Measurement

3.5.1 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.

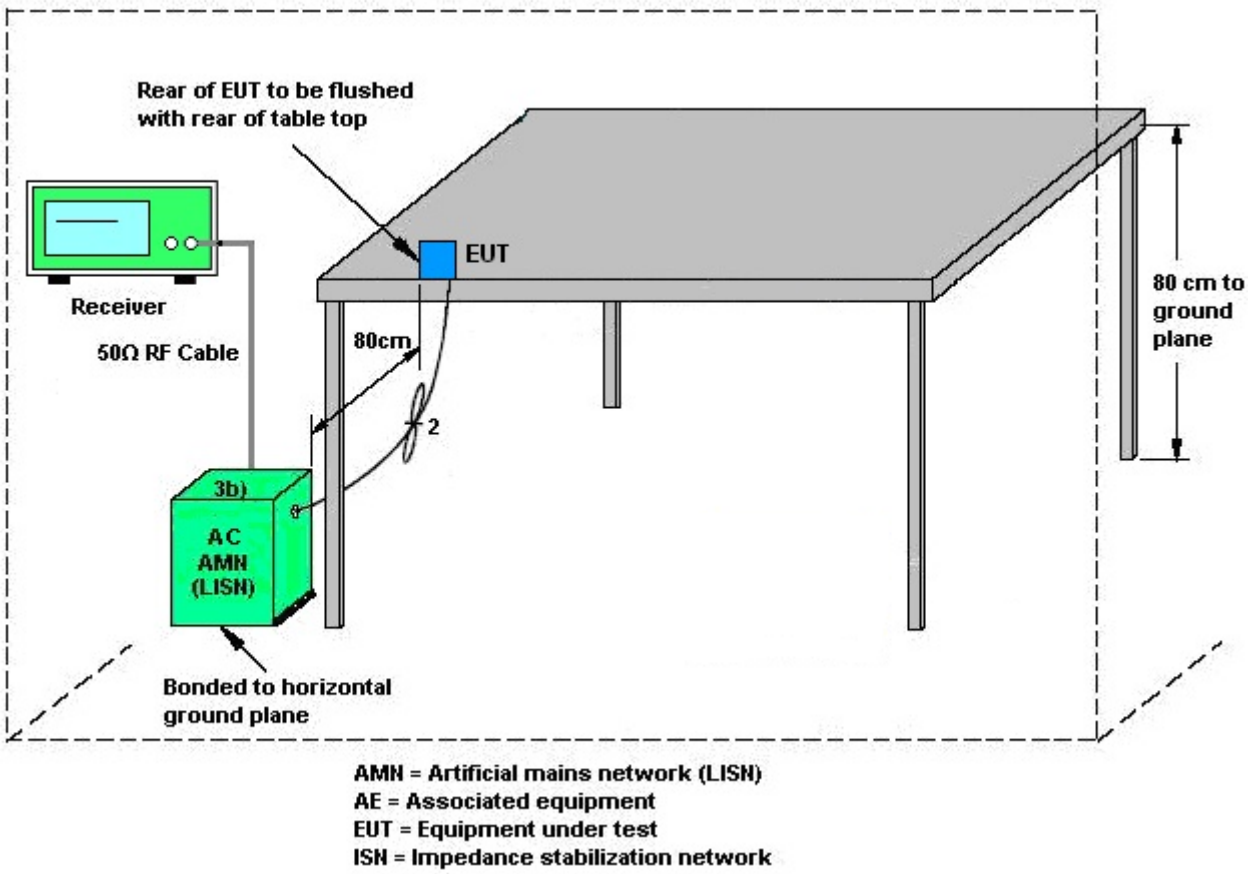
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

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

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Antenna Requirements

3.6.1 Standard Applicable

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 08, 2021	Jan. 26, 2022~ Jan. 27, 2022	Apr. 07, 2022	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1207253	30MHz~40GHz	Dec. 28, 2021	Jan. 26, 2022~ Jan. 27, 2022	Dec. 27, 2022	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Dec. 28, 2021	Jan. 26, 2022~ Jan. 27, 2022	Dec. 27, 2022	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 14, 2021	Jan. 26, 2022~ Jan. 27, 2022	Jul. 13, 2022	Conducted (TH01-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 13, 2021	Jan. 28, 2022	Jul. 13, 2022	Radiation (03CH02-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jun. 22, 2021	Jan. 28, 2022	Jun. 21, 2022	Radiation (03CH02-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz-2GHz	Jul. 15, 2021	Jan. 28, 2022	Jul. 14, 2022	Radiation (03CH02-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Jul. 25, 2021	Jan. 28, 2022	Jul. 24, 2022	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 13, 2021	Jan. 28, 2022	Jul. 13, 2022	Radiation (03CH02-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 11 2021	Jan. 28, 2022	Apr. 10, 2022	Radiation (03CH02-SZ)
LF Amplifier	Burgeon	BPA-530	102211	0.01~3000Mhz	Oct. 22, 2021	Jan. 28, 2022	Oct. 21, 2022	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 22, 2021	Jan. 28, 2022	Oct. 21, 2022	Radiation (03CH02-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270105	0.5GHz~26.5Ghz	Oct. 22, 2021	Jan. 28, 2022	Oct. 21, 2022	Radiation (03CH02-SZ)
AC Power Source	Chroma	61601	616010002470	N/A	NCR	Jan. 28, 2022	NCR	Radiation (03CH02-SZ)
Turn Table	Chaintek	T-200	N/A	0~360 degree	NCR	Jan. 28, 2022	NCR	Radiation (03CH02-SZ)
Antenna Mast	Chaintek	MBS-400	N/A	1 m~4 m	NCR	Jan. 28, 2022	NCR	Radiation (03CH02-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Mar. 08, 2021	Mar. 02, 2022	Mar. 07, 2022	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Sep. 01, 2021	Mar. 02, 2022	Aug. 31, 2022	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 14, 2021	Mar. 02, 2022	Oct. 13, 2022	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 14, 2021	Mar. 02, 2022	Jul. 13, 2022	Conduction (CO01-SZ)

NCR: No Calibration Required

5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.94dB**

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

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

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

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

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

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

---------- THE END ----------

Appendix A. Conducted Test Results

Report Number : FR1O2129-01E

Test Engineer:	Zhang Xue Yi	Temperature:	21~25	°C
Test Date:	2022/1/26~2022/1/27	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 26dB EBW and 99% OBW

Band IV									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	6 dB Bandwidth (MHz)	6dB Bandwidth min. Limit (MHz)	Pass/Fail
11a	6M bps	1	149	5745	16.78	20.20	15.09	0.5	Pass
11a	6Mbps	1	157	5785	16.83	20.25	15.14	0.5	Pass
11a	6Mbps	1	165	5825	16.78	20.15	15.09	0.5	Pass
HT20	MCS 0	1	149	5745	17.78	20.65	15.08	0.5	Pass
HT20	MCS 0	1	157	5785	17.78	20.40	15.14	0.5	Pass
HT20	MCS 0	1	165	5825	17.78	20.45	15.09	0.5	Pass
HT40	MCS 0	1	151	5755	36.56	39.87	35.08	0.5	Pass
HT40	MCS 0	1	159	5795	36.66	39.87	35.08	0.5	Pass
VHT80	MCS 0	1	155	5775	75.04	81.12	75.16	0.5	Pass

TEST RESULTS DATA
Average Power Table

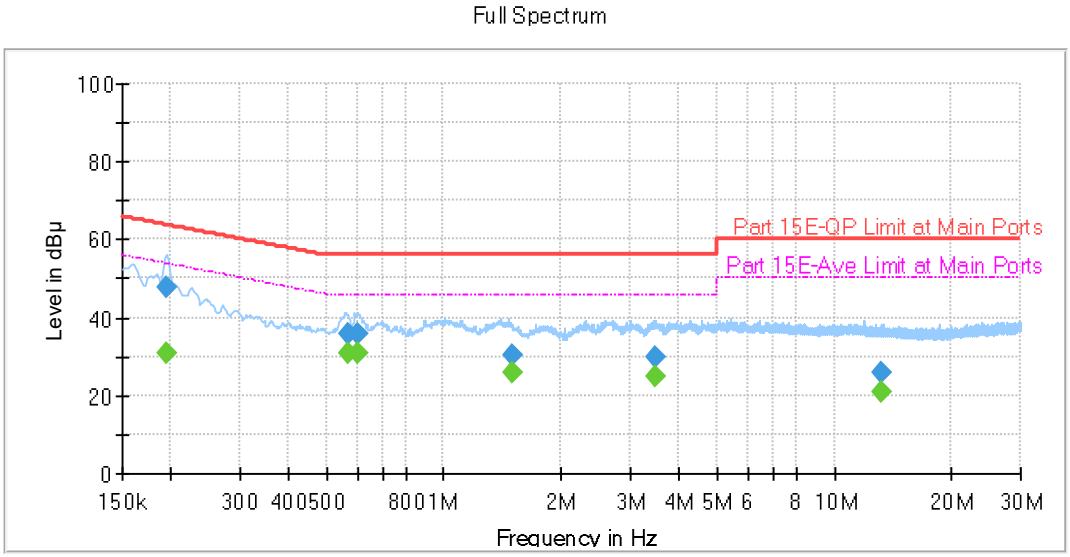
Band IV										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6M bps	1	149	5745	0.13	14.45	30.00	4.96		Pass
11a	6Mbps	1	157	5785	0.13	14.34	30.00	4.96		Pass
11a	6Mbps	1	165	5825	0.13	14.56	30.00	4.96		Pass
HT20	MCS 0	1	149	5745	0.17	14.38	30.00	4.96		Pass
HT20	MCS 0	1	157	5785	0.17	14.35	30.00	4.96		Pass
HT20	MCS 0	1	165	5825	0.17	14.46	30.00	4.96		Pass
HT40	MCS 0	1	151	5755	0.28	13.40	30.00	4.96		Pass
HT40	MCS 0	1	159	5795	0.28	13.90	30.00	4.96		Pass
VHT20	MCS 0	1	149	5745	0.14	14.31	30.00	4.96		Pass
VHT20	MCS 0	1	157	5785	0.14	14.27	30.00	4.96		Pass
VHT20	MCS 0	1	165	5825	0.14	14.39	30.00	4.96		Pass
VHT40	MCS 0	1	151	5755	0.28	13.37	30.00	4.96		Pass
VHT40	MCS 0	1	159	5795	0.28	13.85	30.00	4.96		Pass
VHT80	MCS 0	1	155	5775	0.57	13.66	30.00	4.96		Pass

TEST RESULTS DATA
Power Spectral Density

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	10log (500kHz /RBW) Factor (dB)	Average Power Density (dBm/500kHz)	Average PSD Limit (dBm/500kHz)	DG (dBi)	Pass/Fail
11a	6M bps	1	149	5745	0.13	2.22	0.39	30.00	4.96	Pass
11a	6Mbps	1	157	5785	0.13	2.22	0.40	30.00	4.96	Pass
11a	6Mbps	1	165	5825	0.13	2.22	0.55	30.00	4.96	Pass
HT20	MCS 0	1	149	5745	0.17	2.22	0.03	30.00	4.96	Pass
HT20	MCS 0	1	157	5785	0.17	2.22	0.04	30.00	4.96	Pass
HT20	MCS 0	1	165	5825	0.17	2.22	0.00	30.00	4.96	Pass
HT40	MCS 0	1	151	5755	0.28	2.22	-3.48	30.00	4.96	Pass
HT40	MCS 0	1	159	5795	0.28	2.22	-3.53	30.00	4.96	Pass
VHT80	MCS 0	1	155	5775	0.57	2.22	-6.67	30.00	4.96	Pass

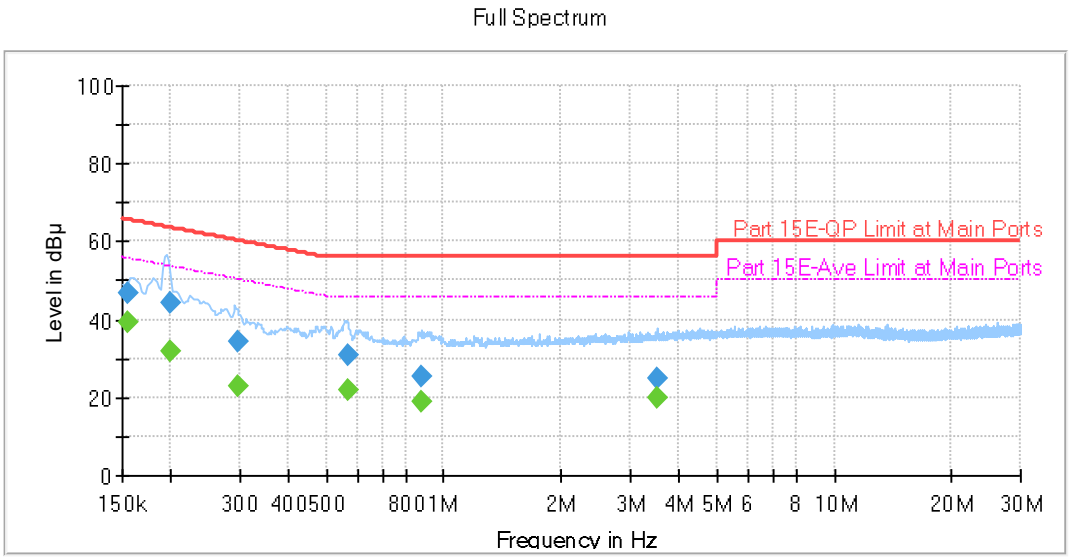
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Zhang Xu	**Temperature :**	22~25℃
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.195540	---	30.73	53.80	23.07	L1	OFF	19.7
0.195540	47.93	---	63.80	15.87	L1	OFF	19.7
0.565890	---	31.05	46.00	14.95	L1	OFF	19.7
0.565890	35.90	---	56.00	20.10	L1	OFF	19.7
0.601080	---	30.70	46.00	15.30	L1	OFF	19.8
0.601080	35.73	---	56.00	20.27	L1	OFF	19.8
1.490190	---	25.68	46.00	20.32	L1	OFF	19.8
1.490190	30.50	---	56.00	25.50	L1	OFF	19.8
3.486390	---	24.67	46.00	21.33	L1	OFF	19.8
3.486390	29.66	---	56.00	26.34	L1	OFF	19.8
13.232040	---	20.82	50.00	29.18	L1	OFF	20.1
13.232040	25.91	---	60.00	34.09	L1	OFF	20.1

Test Engineer :	Zhang Xu	Temperature :	22~25℃
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.155400	---	39.13	55.71	16.58	N	OFF	19.7
0.155400	46.82	---	65.71	18.89	N	OFF	19.7
0.199500	---	31.77	53.63	21.86	N	OFF	19.7
0.199500	44.27	---	63.63	19.36	N	OFF	19.7
0.296250	---	23.07	50.35	27.28	N	OFF	19.7
0.296250	34.47	---	60.35	25.87	N	OFF	19.7
0.566790	---	21.79	46.00	24.21	N	OFF	19.7
0.566790	31.03	---	56.00	24.97	N	OFF	19.7
0.881250	---	19.12	46.00	26.88	N	OFF	19.7
0.881250	25.21	---	56.00	30.79	N	OFF	19.7
3.521310	---	19.87	46.00	26.13	N	OFF	19.8
3.521310	25.05	---	56.00	30.95	N	OFF	19.8

Appendix C. Radiated Spurious Emission

U-NII-3 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5647.4	52.21	-16.09	68.3	37.77	34.3	10.58	30.44	267	55	P	H
		5680	53.97	-36.51	90.48	39.51	34.4	10.59	30.53	267	55	P	H
		5718.6	57.49	-52.92	110.41	42.8	34.57	10.61	30.49	267	55	P	H
		5722.8	57.72	-59.46	117.18	43.03	34.57	10.61	30.49	267	55	P	H
	*	5745	108.3	-	-	93.52	34.6	10.62	30.44	267	55	P	H
		5745	101.01	-	-	86.23	34.6	10.62	30.44	267	55	A	H
		5635.6	52.09	-16.21	68.3	37.65	34.3	10.58	30.44	116	165	P	V
		5699	53.45	-51.02	104.47	38.89	34.5	10.59	30.53	116	165	P	V
		5713.4	56.25	-52.7	108.95	41.6	34.53	10.61	30.49	116	165	P	V
		5721.2	57.51	-56.03	113.54	42.82	34.57	10.61	30.49	116	165	P	V
	*	5745	104.29	-	-	89.51	34.6	10.62	30.44	116	165	P	V
		5745	97.1	-	-	82.32	34.6	10.62	30.44	116	165	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		5649.2	52.55	-15.75	68.3	38.11	34.3	10.58	30.44	263	50	P	H
		5676.2	52.62	-35.06	87.68	38.12	34.4	10.59	30.49	263	50	P	H
		5709.2	53.98	-53.8	107.78	39.33	34.53	10.61	30.49	263	50	P	H
		5724.2	55.37	-65.01	120.38	40.68	34.57	10.61	30.49	263	50	P	H
	*	5785	108	-	-	93.05	34.67	10.64	30.36	263	50	P	H
		5785	101.18	-	-	86.23	34.67	10.64	30.36	263	50	A	H
		5854.6	54.11	-57.6	111.71	38.98	34.93	10.68	30.48	263	50	P	H
		5872.4	53.86	-52.07	105.93	38.71	34.97	10.71	30.53	263	50	P	H
		5899.4	53.05	-34.05	87.1	37.89	35	10.75	30.59	263	50	P	H
		5948	53.52	-14.78	68.3	38.13	35.1	10.78	30.49	263	50	P	H
		5645.6	53.22	-15.08	68.3	38.78	34.3	10.58	30.44	104	165	P	V
		5700	53.79	-51.41	105.2	39.21	34.5	10.61	30.53	104	165	P	V
		5700	53.79	-51.41	105.2	39.21	34.5	10.61	30.53	104	165	P	V
		5720.2	53.14	-58.12	111.26	38.45	34.57	10.61	30.49	104	165	P	V
	*	5785	105.42	-	-	90.47	34.67	10.64	30.36	104	165	P	V
		5785	98.16	-	-	83.21	34.67	10.64	30.36	104	165	A	V
		5850.4	53.95	-67.34	121.29	38.85	34.9	10.68	30.48	104	165	P	V
		5866.8	52.79	-54.7	107.49	37.68	34.93	10.71	30.53	104	165	P	V
		5876	53.32	-51.14	104.46	38.17	34.97	10.71	30.53	104	165	P	V
		5934.6	52.87	-15.43	68.3	37.51	35.07	10.78	30.49	104	165	P	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 165 5825MHz	*	5825	107.81	-	-	92.72	34.83	10.68	30.42	259	53	P	H
		5825	100.35	-	-	85.26	34.83	10.68	30.42	259	53	A	H
		5850.2	60.1	-61.64	121.74	45	34.9	10.68	30.48	259	53	P	H
		5855.2	56.99	-53.75	110.74	41.86	34.93	10.68	30.48	259	53	P	H
		5903.6	54.12	-29.88	84	38.96	35	10.75	30.59	259	53	P	H
		5932.4	52.59	-15.71	68.3	37.31	35.07	10.75	30.54	259	53	P	H
	*	5825	105.48	-	-	90.39	34.83	10.68	30.42	104	165	P	V
		5825	98.21	-	-	83.12	34.83	10.68	30.42	104	165	A	V
		5853.8	54.71	-58.83	113.54	39.58	34.93	10.68	30.48	104	165	P	V
		5855.6	53.78	-56.85	110.63	38.62	34.93	10.71	30.48	104	165	P	V
		5909.8	54.04	-25.38	79.42	38.8	35.03	10.75	30.54	104	165	P	V
		5947.2	52.54	-15.76	68.3	37.15	35.1	10.78	30.49	104	165	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

U-NII-3 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	55.02	-18.98	74	62.12	38.34	12.32	57.76	104	297	P	H
		11490	45.89	-8.11	54	52.99	38.34	12.32	57.76	104	297	V	H
		17235	50.48	-17.82	68.3	50.6	42.27	15.58	57.97	-	-	P	H
		11490	54.64	-19.36	74	61.74	38.34	12.32	57.76	178	146	P	V
		11490	45.79	-8.21	54	52.89	38.34	12.32	57.76	178	146	V	V
		17235	50.06	-18.24	68.3	50.18	42.27	15.58	57.97	-	-	P	V
802.11a CH 157 5785MHz		11570	55.41	-18.59	74	62.35	38.42	12.31	57.67	238	342	P	H
		11570	45.77	-8.23	54	52.71	38.42	12.31	57.67	238	342	V	H
		17355	58.2	-10.1	68.3	58.25	42.1	15.65	57.8	-	-	P	H
		11570	55.19	-18.81	74	62.13	38.42	12.31	57.67	104	257	P	V
		11570	44.33	-9.67	54	51.27	38.42	12.31	57.67	104	257	V	V
		17355	50.11	-18.19	68.3	50.16	42.1	15.65	57.8	-	-	P	V
802.11a CH 165 5825MHz		11650	52.91	-21.09	74	59.66	38.48	12.36	57.59	229	21	P	H
		11650	43.5	-10.5	54	50.25	38.48	12.36	57.59	229	21	V	H
		17475	58.21	-10.09	68.3	58.12	41.94	15.79	57.64	-	-	P	H
		11650	55.58	-18.42	74	62.33	38.48	12.36	57.59	207	171	P	V
		11650	44.59	-9.41	54	51.34	38.48	12.36	57.59	207	171	V	V
		17475	50.34	-17.96	68.3	50.25	41.94	15.79	57.64	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

U-NII-3 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5642.4	51.91	-16.39	68.3	37.47	34.3	10.58	30.44	296	56	P	H
		5693.8	53.99	-46.65	100.64	39.43	34.5	10.59	30.53	296	56	P	H
		5713.4	60.97	-47.98	108.95	46.32	34.53	10.61	30.49	296	56	P	H
		5721.8	63.72	-51.18	114.9	49.03	34.57	10.61	30.49	296	56	P	H
802.11n	*	5745	106.18	-	-	91.4	34.6	10.62	30.44	296	56	P	H
HT20		5745	99.01	-	-	84.23	34.6	10.62	30.44	296	56	A	H
CH 149		5639.2	51.22	-17.08	68.3	36.78	34.3	10.58	30.44	104	165	P	V
5745MHz		5669.2	52.35	-30.16	82.51	37.85	34.4	10.59	30.49	104	165	P	V
		5714.2	57.55	-51.63	109.18	42.9	34.53	10.61	30.49	104	165	P	V
		5723.2	56.54	-61.56	118.1	41.85	34.57	10.61	30.49	104	165	P	V
	*	5745	104.44	-	-	89.66	34.6	10.62	30.44	104	165	P	V
		5745	96.91	-	-	82.13	34.6	10.62	30.44	104	165	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5622	52.42	-15.88	68.3	37.94	34.3	10.58	30.4	295	49	P	H
		5684.8	52.23	-41.79	94.02	37.67	34.5	10.59	30.53	295	49	P	H
		5704.6	53.17	-53.32	106.49	38.56	34.53	10.61	30.53	295	49	P	H
		5724.2	53.62	-66.76	120.38	38.93	34.57	10.61	30.49	295	49	P	H
	*	5785	107.15	-	-	92.2	34.67	10.64	30.36	295	49	P	H
		5785	100.21	-	-	85.26	34.67	10.64	30.36	295	49	A	H
		5853.4	54.03	-60.42	114.45	38.93	34.9	10.68	30.48	295	49	P	H
		5862	53.87	-54.97	108.84	38.76	34.93	10.71	30.53	295	49	P	H
802.11n		5880.6	54.27	-46.77	101.04	39.12	34.97	10.71	30.53	295	49	P	H
HT20		5941	53.93	-14.37	68.3	38.54	35.1	10.78	30.49	295	49	P	H
CH 157		5618.8	52.04	-16.26	68.3	37.58	34.3	10.56	30.4	104	166	P	V
5785MHz		5671.8	52.52	-31.91	84.43	38.02	34.4	10.59	30.49	104	166	P	V
		5718.6	53.59	-56.82	110.41	38.9	34.57	10.61	30.49	104	166	P	V
		5725	52.77	-69.43	122.2	38.08	34.57	10.61	30.49	104	166	P	V
	*	5785	104.87	-	-	89.92	34.67	10.64	30.36	104	166	P	V
		5785	97.11	-	-	82.16	34.67	10.64	30.36	104	166	A	V
		5852.6	52.9	-63.37	116.27	37.8	34.9	10.68	30.48	104	166	P	V
		5864.8	53.14	-54.91	108.05	38.03	34.93	10.71	30.53	104	166	P	V
		5883.8	53.05	-45.62	98.67	37.96	34.97	10.71	30.59	104	166	P	V
		5930.2	52.28	-16.02	68.3	37	35.07	10.75	30.54	104	166	P	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 165 5825MHz	*	5825	106.52	-	-	91.43	34.83	10.68	30.42	251	51	P	H
		5825	99.32	-	-	84.23	34.83	10.68	30.42	251	51	A	H
		5850.8	61.63	-58.75	120.38	46.53	34.9	10.68	30.48	251	51	P	H
		5858.6	60.04	-49.75	109.79	44.93	34.93	10.71	30.53	251	51	P	H
		5909.8	53.53	-25.89	79.42	38.29	35.03	10.75	30.54	251	51	P	H
		5935.8	52.22	-16.08	68.3	36.86	35.07	10.78	30.49	251	51	P	H
	*	5825	104.75	-	-	89.66	34.83	10.68	30.42	104	163	P	V
		5825	97.32	-	-	82.23	34.83	10.68	30.42	104	163	A	V
		5850.4	54.9	-66.39	121.29	39.8	34.9	10.68	30.48	104	163	P	V
		5855.8	56.56	-54.02	110.58	41.4	34.93	10.71	30.48	104	163	P	V
		5888	52.82	-42.73	95.55	37.7	35	10.71	30.59	104	163	P	V
		5927.6	52.81	-15.49	68.3	37.53	35.07	10.75	30.54	104	163	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

U-NII-3 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11490	53.14	-20.86	74	60.24	38.34	12.32	57.76	104	92	P	H
802.11n		11490	45.14	-8.86	54	52.24	38.34	12.32	57.76	104	92	V	H
HT20		17235	58	-10.3	68.3	58.12	42.27	15.58	57.97	-	-	P	H
CH 149		11490	54.15	-19.85	74	61.25	38.34	12.32	57.76	104	249	P	V
5745MHz		11490	45.26	-8.74	54	52.36	38.34	12.32	57.76	104	249	V	V
		17235	50.33	-17.97	68.3	50.45	42.27	15.58	57.97	-	-	P	V
		11570	53.41	-20.59	74	60.35	38.42	12.31	57.67	104	212	P	H
802.11n		11570	45.13	-8.87	54	52.07	38.42	12.31	57.67	104	247	V	H
HT20		17355	58.09	-10.21	68.3	58.14	42.1	15.65	57.8	-	-	P	H
CH 157		11570	55.19	-18.81	74	62.13	38.42	12.31	57.67	104	247	P	V
5785MHz		11570	45.13	-8.87	54	52.07	38.42	12.31	57.67	104	247	P	V
		17355	50.87	-17.43	68.3	50.92	42.1	15.65	57.8	-	-		V
		11650	54.12	-19.88	74	60.87	38.48	12.36	57.59	307	294	P	H
802.11n		11650	45.21	-8.79	54	51.96	38.48	12.36	57.59	307	294	V	H
HT20		17475	60.56	-7.74	68.3	60.47	41.94	15.79	57.64	-	-	P	H
CH 165		11650	55.73	-18.27	74	62.48	38.48	12.36	57.59	232	18	P	V
5825MHz		11650	47.37	-6.63	54	54.12	38.48	12.36	57.59	232	18	V	V
		17475	50.92	-17.38	68.3	50.83	41.94	15.79	57.64	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

U-NII-3 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5649	53.85	-14.45	68.3	39.66	34.3	10.33	30.44	104	59	P	H
		5698.4	63.02	-41	104.02	48.73	34.5	10.32	30.53	104	59	P	H
		5719.6	72.68	-38.01	110.69	58.16	34.57	10.44	30.49	104	59	P	H
		5723.4	73.41	-45.14	118.55	58.89	34.57	10.44	30.49	104	59	P	H
	*	5755	105.43	-	-	90.69	34.63	10.55	30.44	104	59	P	H
		5755	97.11	-	-	82.37	34.63	10.55	30.44	104	59	A	H
		5850	54.4	-67.8	122.2	39.2	34.9	10.78	30.48	104	59	P	H
		5872.8	55.96	-49.86	105.82	40.67	34.97	10.85	30.53	104	59	P	H
802.11n		5881.2	54.51	-46.08	100.59	39.22	34.97	10.85	30.53	104	59	P	H
HT40		5949	53.41	-14.89	68.3	37.84	35.1	10.96	30.49	104	59	P	H
CH 151		5614.4	53.16	-15.14	68.3	38.93	34.3	10.33	30.4	106	98	P	V
5755MHz		5697.4	59.95	-43.34	103.29	45.66	34.5	10.32	30.53	106	98	P	V
		5717.8	68.7	-41.48	110.18	54.18	34.57	10.44	30.49	106	98	P	V
		5722	69.91	-45.45	115.36	55.39	34.57	10.44	30.49	106	98	P	V
	*	5755	102.44	-	-	87.7	34.63	10.55	30.44	106	98	P	V
		5755	94.67	-	-	79.93	34.63	10.55	30.44	106	98	A	V
		5850.8	55.58	-64.8	120.38	40.38	34.9	10.78	30.48	106	98	P	V
		5864.2	55	-53.22	108.22	39.78	34.93	10.82	30.53	106	98	P	V
		5920.8	53.55	-17.75	71.3	38.15	35.03	10.91	30.54	106	98	P	V
		5947.4	53.77	-14.53	68.3	38.2	35.1	10.96	30.49	106	98	P	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 159 5795MHz		5633.4	53.06	-15.24	68.3	38.87	34.3	10.33	30.44	104	59	P	H
		5695.4	54.82	-47	101.82	40.53	34.5	10.32	30.53	104	59	P	H
		5710	58.23	-49.77	108	43.81	34.53	10.38	30.49	104	59	P	H
		5721.8	54.94	-59.96	114.9	40.42	34.57	10.44	30.49	104	59	P	H
	*	5795	105.68	-	-	90.67	34.7	10.67	30.36	104	59	P	H
		5795	98.41	-	-	83.4	34.7	10.67	30.36	104	59	A	H
		5850	60.49	-61.71	122.2	45.29	34.9	10.78	30.48	104	59	P	H
		5866.4	58.08	-49.53	107.61	42.86	34.93	10.82	30.53	104	59	P	H
		5898.4	55.43	-32.42	87.85	40.13	35	10.89	30.59	104	59	P	H
		5925	54.36	-13.84	68.2	38.89	35.07	10.94	30.54	104	59	P	H
		5621.6	53.03	-15.27	68.3	38.8	34.3	10.33	30.4	104	98	P	V
		5679.8	53.75	-36.58	90.33	39.56	34.4	10.32	30.53	104	98	P	V
		5715.6	53.47	-56.1	109.57	39.05	34.53	10.38	30.49	104	98	P	V
		5720.8	52.87	-59.75	112.62	38.35	34.57	10.44	30.49	104	98	P	V
	*	5795	102.26	-	-	87.25	34.7	10.67	30.36	104	98	P	V
		5795	95.12	-	-	80.11	34.7	10.67	30.36	104	98	A	V
		5852.4	55.13	-61.6	116.73	39.93	34.9	10.78	30.48	104	98	P	V
		5859	54.75	-54.93	109.68	39.53	34.93	10.82	30.53	104	98	P	V
		5909.6	54.01	-25.55	79.56	38.61	35.03	10.91	30.54	104	98	P	V
		5929.6	53.97	-14.33	68.3	38.5	35.07	10.94	30.54	104	98	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

U-NII-3 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		11510	51.55	-22.45	74	58.59	38.36	12.34	57.74	104	82	P	H
		11510	43.06	-10.94	54	50.1	38.36	12.34	57.74	104	82	V	H
		17265	50.82	-17.48	68.3	51.01	42.22	15.51	57.92	-	-	P	H
		11510	51.9	-22.1	74	58.94	38.36	12.34	57.74	104	238	P	V
		11510	43.28	-10.72	54	50.32	38.36	12.34	57.74	104	238	V	V
		17265	50.24	-18.06	68.3	50.43	42.22	15.51	57.92	-	-	P	V
802.11n HT40 CH 159 5795MHz		11590	50.33	-23.67	74	57.24	38.43	12.31	57.65	-	-	P	H
		17385	50.04	-18.26	68.3	49.95	42.05	15.79	57.75	-	-	P	H
		11590	56.31	-17.69	74	63.22	38.43	12.31	57.65	212	21	P	V
		11590	44.98	-9.02	54	51.89	38.43	12.31	57.65	212	21	V	V
		17385	50.96	-17.34	68.3	50.87	42.05	15.79	57.75	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

U-NII-3 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5646.2	55.97	-12.33	68.3	41.78	34.3	10.33	30.44	104	59	P	H
		5688.2	62.47	-34.05	96.52	48.18	34.5	10.32	30.53	104	59	P	H
		5717	66.3	-43.66	109.96	51.88	34.53	10.38	30.49	104	59	P	H
		5723.4	67.54	-51.01	118.55	53.02	34.57	10.44	30.49	104	59	P	H
	*	5775	102.99	-	-	88.11	34.67	10.61	30.4	104	59	P	H
		5775	95.11	-	-	80.23	34.67	10.61	30.4	104	59	A	H
		5853.2	64.21	-50.69	114.9	49.01	34.9	10.78	30.48	104	59	P	H
		5869	66.66	-40.22	106.88	51.44	34.93	10.82	30.53	104	59	P	H
802.11ac		5875.8	59.35	-45.26	104.61	44.06	34.97	10.85	30.53	104	59	P	H
VHT80		5935.4	54.31	-13.99	68.3	38.79	35.07	10.94	30.49	104	59	P	H
CH 155		5647.8	53.81	-14.49	68.3	39.62	34.3	10.33	30.44	104	100	P	V
5775MHz		5689.8	64.11	-33.59	97.7	49.82	34.5	10.32	30.53	104	100	P	V
		5716.6	63.52	-46.33	109.85	49.1	34.53	10.38	30.49	104	100	P	V
		5723.2	63.08	-55.02	118.1	48.56	34.57	10.44	30.49	104	100	P	V
	*	5775	100.51	-	-	85.63	34.67	10.61	30.4	104	100	P	V
		5775	92.79	-	-	77.91	34.67	10.61	30.4	104	100	A	V
		5850.4	62	-59.29	121.29	46.8	34.9	10.78	30.48	104	100	P	V
		5862	62.23	-46.61	108.84	47.01	34.93	10.82	30.53	104	100	P	V
		5876.4	56.32	-47.84	104.16	41.03	34.97	10.85	30.53	104	100	P	V
		5937.2	54.95	-13.35	68.3	39.43	35.07	10.94	30.49	104	100	P	V

Remark

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

U-NII-3 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz		11550	49.4	-24.6	74	56.38	38.4	12.32	57.7	-	-	P	H
		17325	50.8	-17.5	68.3	50.98	42.15	15.52	57.85	-	-	P	H
		11550	49.77	-24.23	74	56.75	38.4	12.32	57.7	-	-	P	V
		17325	50.2	-18.1	68.3	50.38	42.15	15.52	57.85	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

U-NII-3 5725~5850MHz

Emission below 1GHz

5GHz WIFI 802.11a (LF @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
5GHz 802.11a LF		91.11	25.49	-18.01	43.5	41.63	15	0.96	32.1	-	-	P	H
		288.99	23.85	-22.15	46	34.74	19.06	1.77	31.72	-	-	P	H
		451.95	24.51	-21.49	46	30.46	23.14	2.2	31.29	-	-	P	H
		571.26	27.85	-18.15	46	29.99	26.18	2.5	30.82	-	-	P	H
		734.22	31.03	-14.97	46	31.28	27.94	2.82	31.01	-	-	P	H
		982.54	32.85	-21.15	54	29.85	30.9	3.28	31.18	-	-	P	H
		32.91	34.67	-5.33	40	42.92	23.6	0.55	32.4	-	-	P	V
		157.07	24.33	-19.17	43.5	38.53	16.7	1.28	32.18	-	-	P	V
		292.87	23.41	-22.59	46	34.18	19.16	1.78	31.71	-	-	P	V
		560.59	27.69	-18.31	46	29.56	26.5	2.48	30.85	-	-	P	V
		846.74	30.14	-15.86	46	29.41	29.08	3.04	31.39	-	-	P	V
		988.36	33.02	-20.98	54	30.23	30.62	3.29	31.12	-	-	P	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	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		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. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

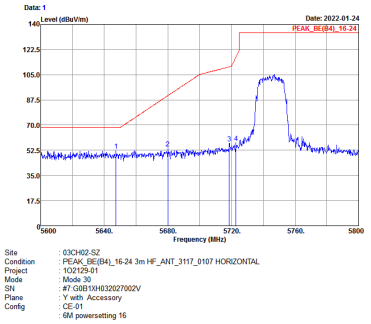
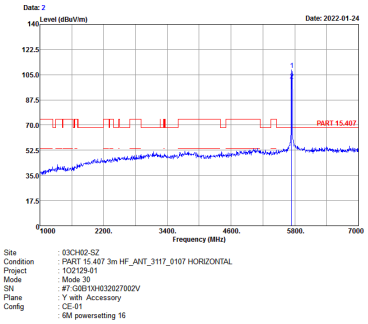
Appendix D. Radiated Spurious Emission Plots

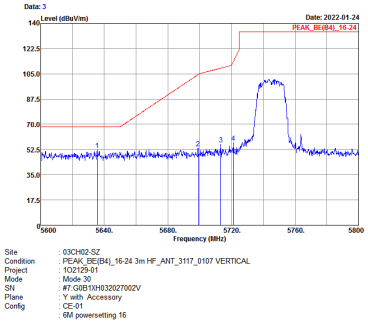
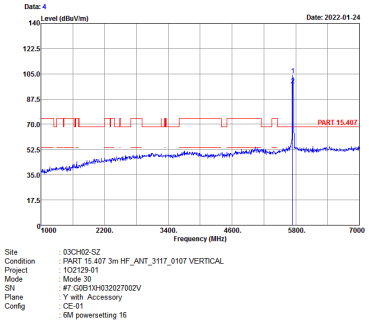
Note symbol

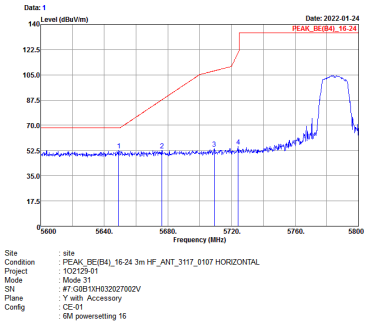
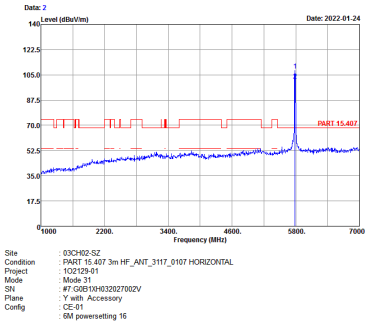
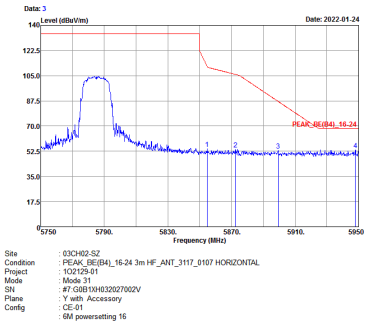
-L	**Low channel location**
-R	**High channel location**

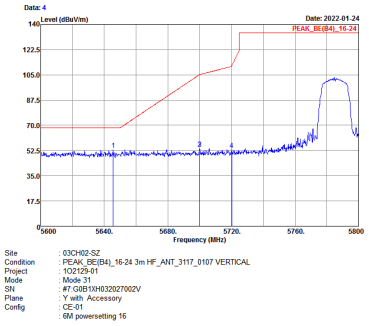
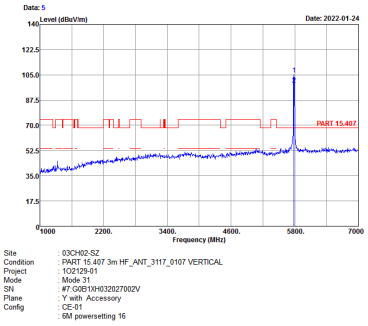
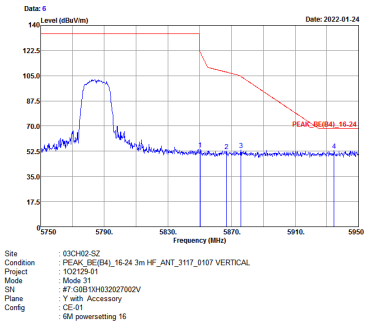
UNII-3 - 5725~5850MHz

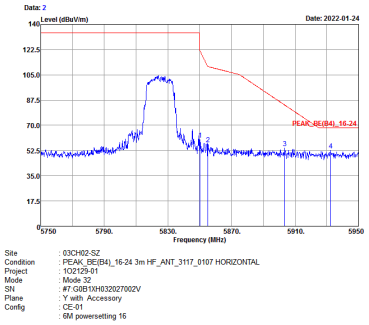
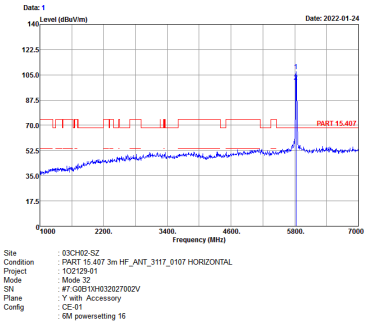
WIFI 802.11a (Band Edge @ 3m)

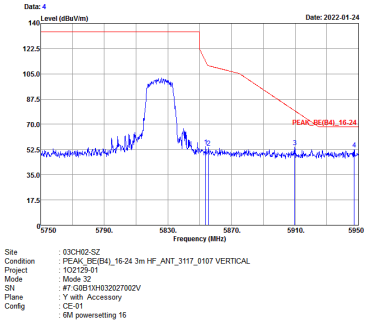
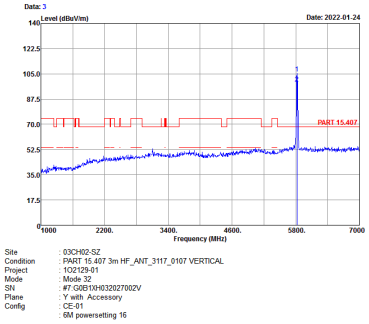
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Fundamental
Peak		

WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Vertical	Fundamental
Peak		

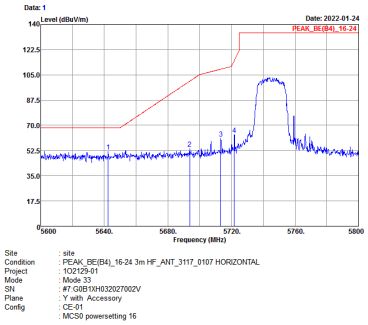
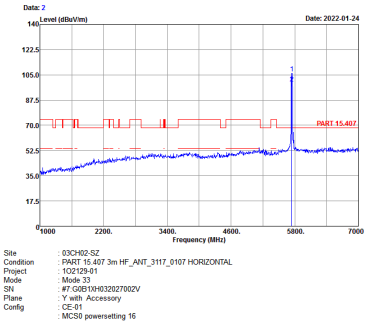
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

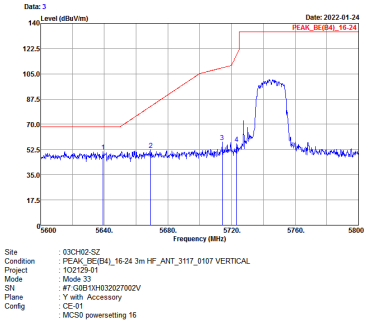
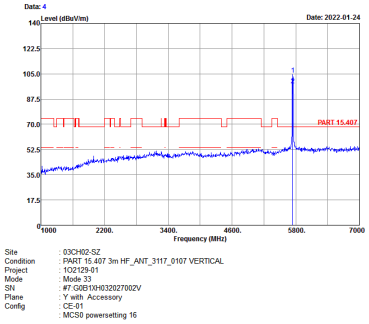
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

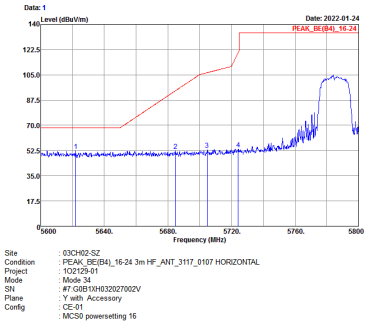
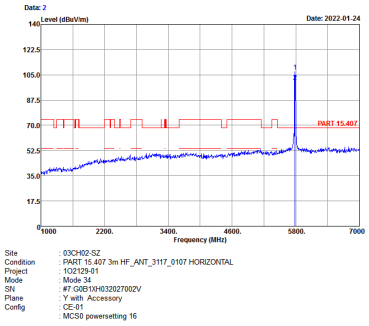
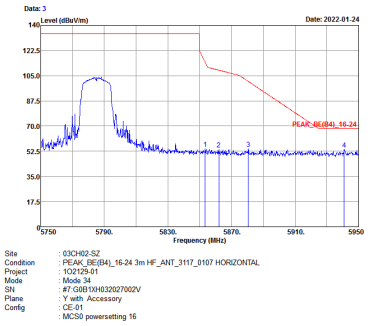
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Fundamental
Peak		

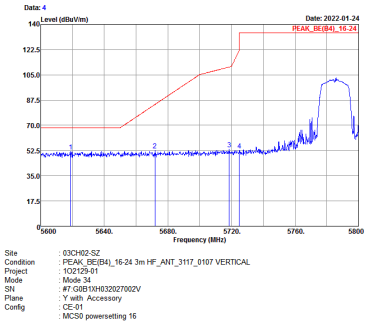
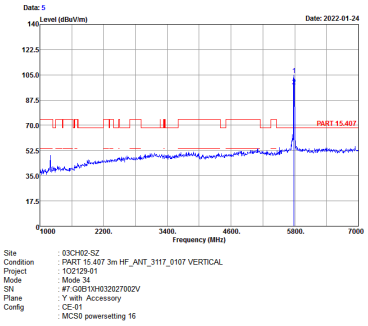
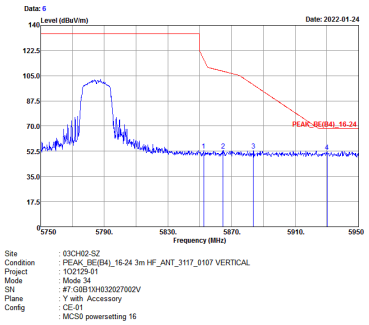
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Vertical	Fundamental
Peak		

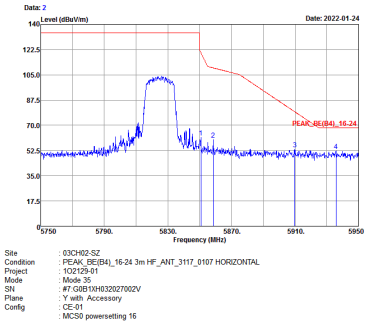
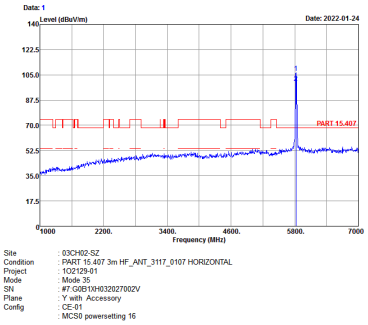
UNII-3 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

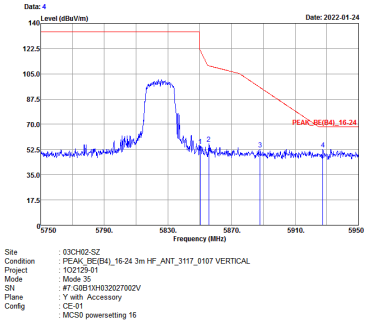
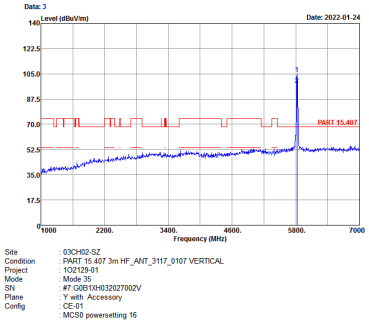
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Fundamental
Peak		

WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Vertical	Fundamental
Peak		

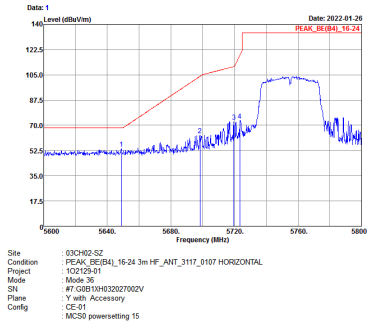
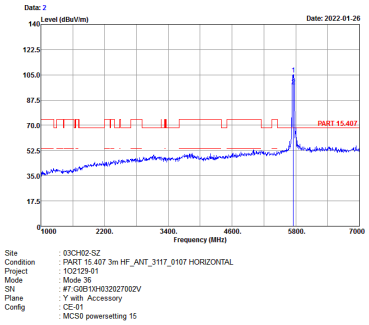
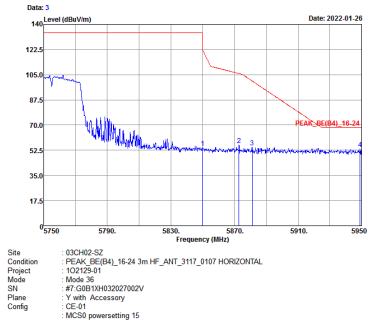
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

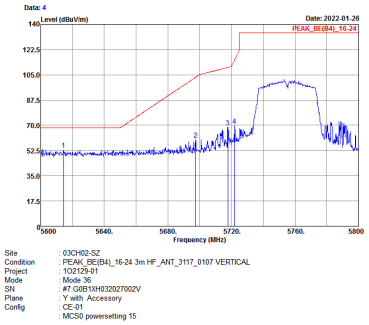
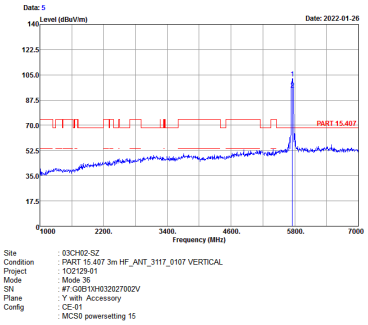
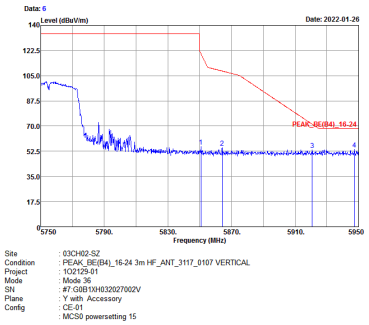
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

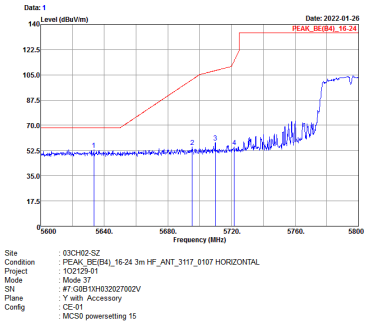
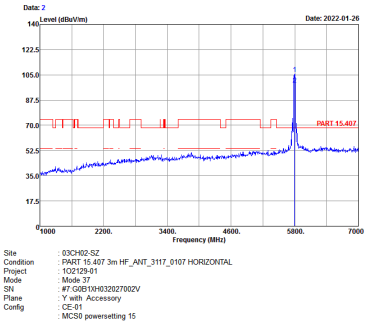
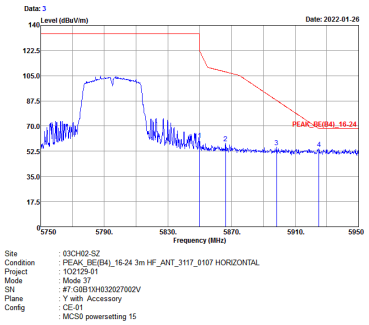
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Fundamental
Peak		

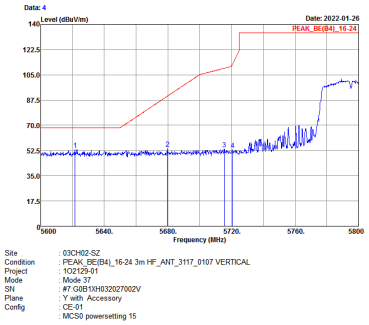
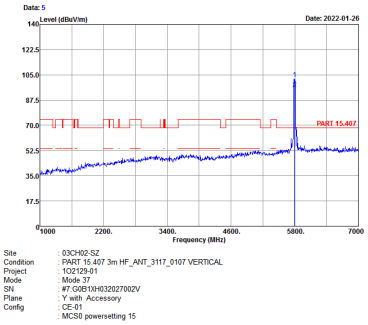
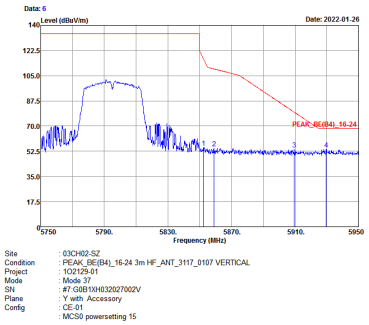
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Vertical	Fundamental
Peak		

UNII-3 5725~5850MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

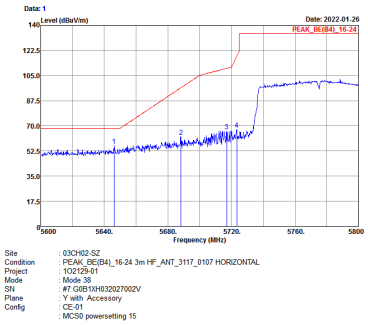
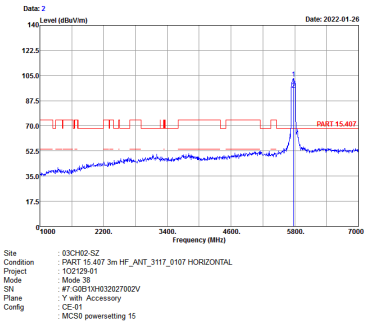
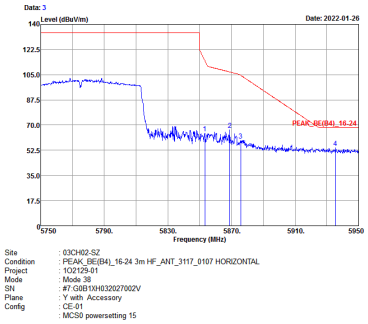
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

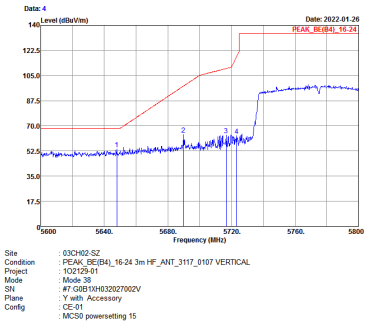
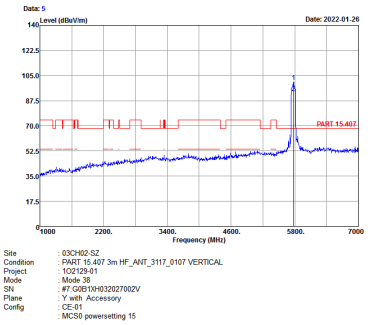
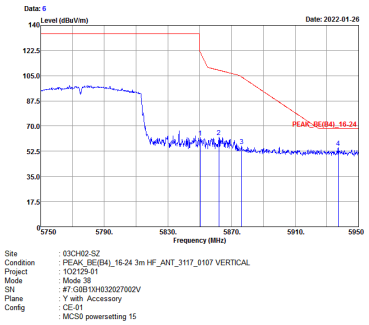
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

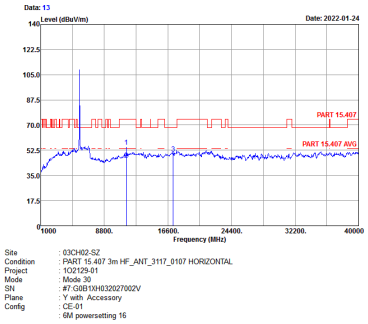
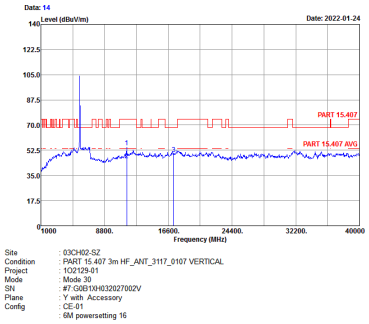
UNII-3 5725~5850MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

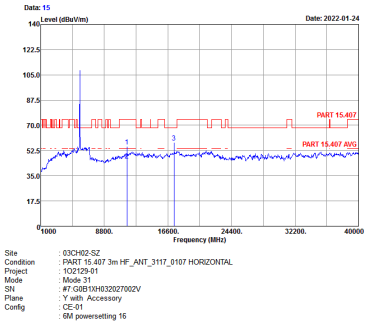
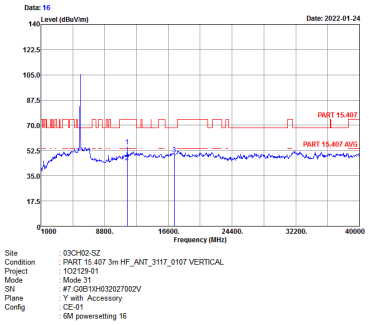
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

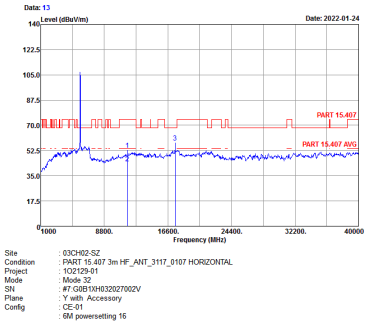
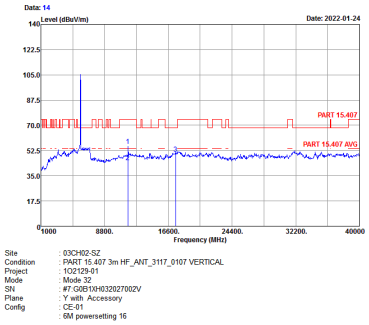
WIFI	UNII-3 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

UNII-3 - 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

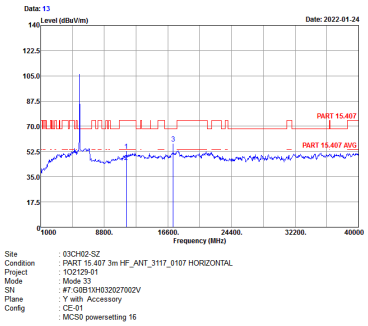
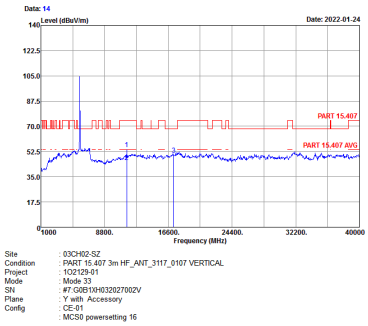
WIFI	UNII-3 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.		

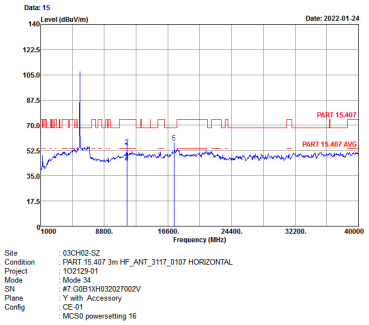
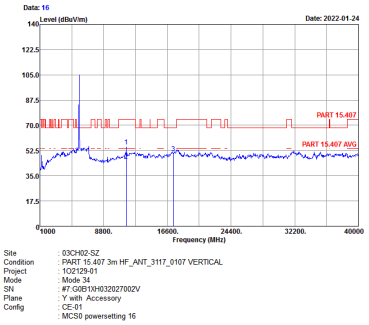
WIFI	UNII-3 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.		

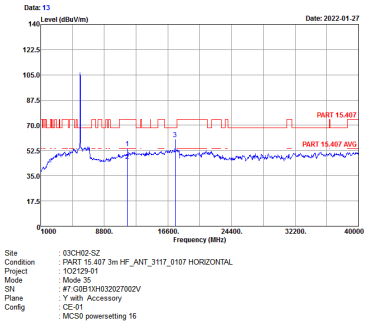
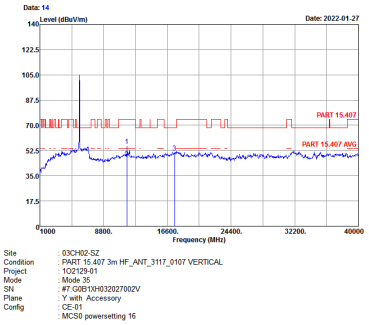
WIFI	UNII-3 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.		

UNII-3 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

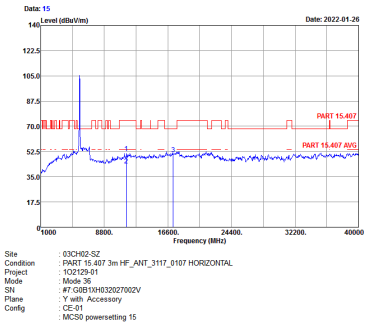
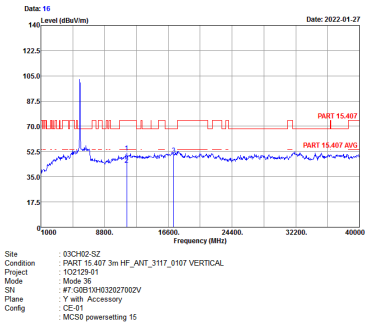
WIFI	UNII-3 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.		

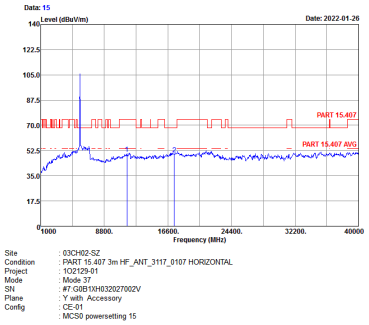
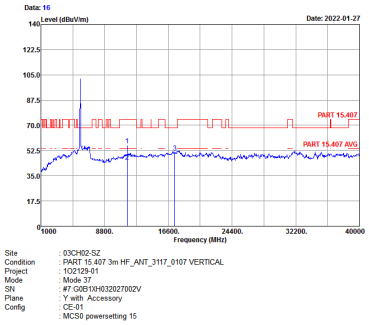
WIFI	UNII-3 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	UNII-3 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.		

UNII-3 5725~5850MHz

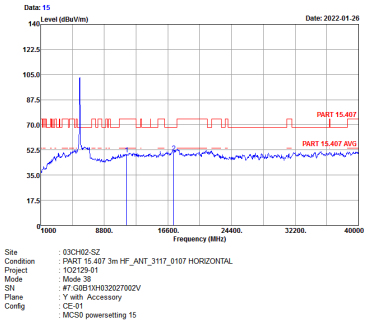
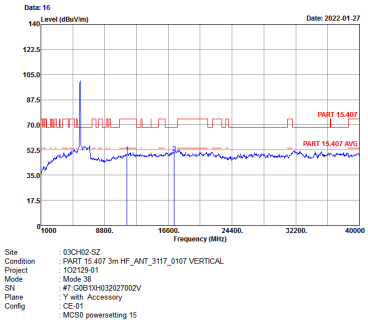
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	UNII-3 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	UNII-3 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Vertical
Peak Avg.		

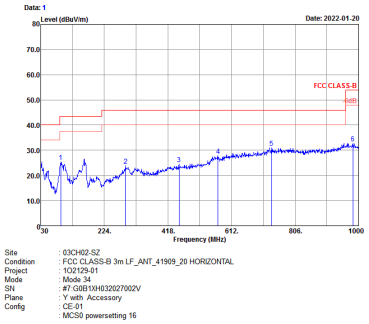
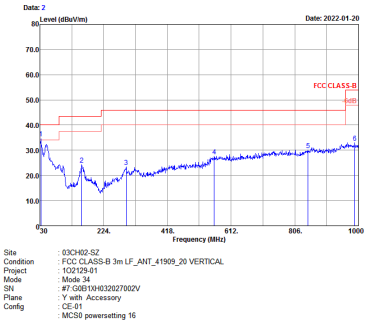
UNII-3 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	UNII-3 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

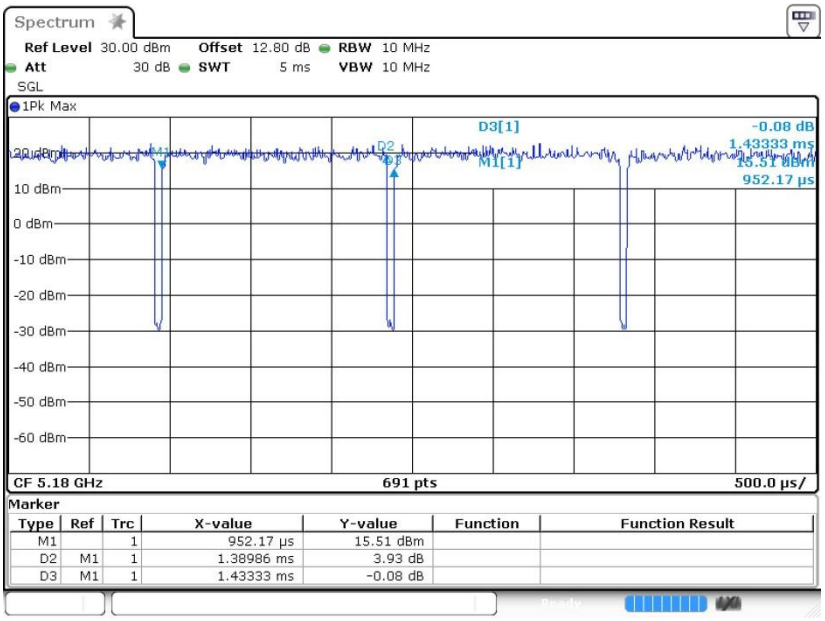
5GHz WIFI 802.11n HT20 (LF)

WIFI	5GHz 5725~5850MHz	
ANT	802.11n HT20 LF	
1	Horizontal	Vertical
QP / Peak		

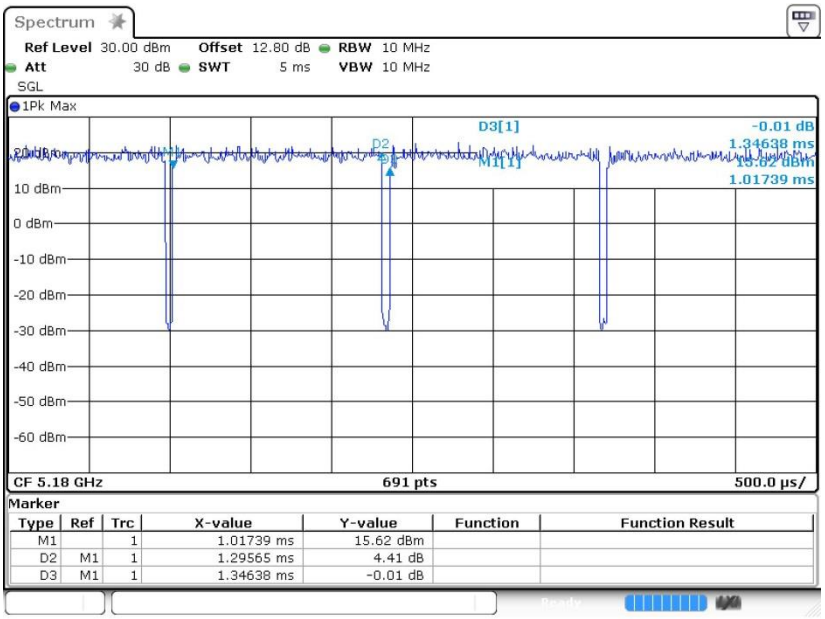
Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	96.97	1.390	0.719	1KHz
802.11n HT20	96.23	1.296	0.772	1KHz
802.11n HT40	93.73	0.649	1.540	3KHz
802.11ac VHT80	87.79	0.323	3.094	10KHZ

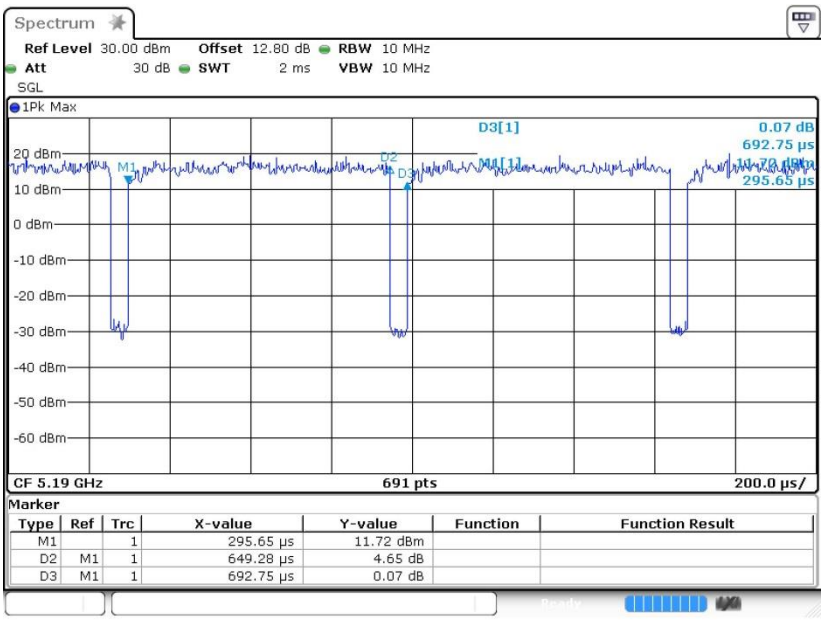
802.11a



802.11n HT20



802.11n HT40



802.11ac VHT80