FCC RF Test Report

APPLICANT	:	MTRLC LLC
EQUIPMENT	:	AX3000 Dual-band Mesh WiFi
BRAND NAME	:	Motorola
MODEL NAME	:	Q11
FCC ID	:	2AF5PQ11
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure
TEST DATE(S)	:	Dec. 20, 2021 ~ Jan. 05, 2022

We, Sporton International Inc. (Kunshan), 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. (Kunshan), the test report shall not be reproduced except in full.

Reviewed by: Jason Jia / Supervisor

Approved by: Alex Wang / Manager

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR1D0112C	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 0.62 dB at 5648.00 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 5.25 dB at 0.608 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

MTRLC LLC
275 Turnpike Street Suite 101 Canton, MA 02021

1.2 Manufacturer

MTRLC LLC
275 Turnpike Street Suite 101 Canton, MA 02021

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	AX3000 Dual-band Mesh WiFi
Brand Name	Motorola
Model Name	Q11
FCC ID	2AF5PQ11
HW Version	REV1.0
SW Version	REV1.0
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power	**<CDD Mode>** **<5745 MHz ~ 5825 MHz>** 802.11a : 29.70 dBm / 0.9333 W 802.11n HT20 : 29.69 dBm / 0.9311 W 802.11n HT40 : 28.88 dBm / 0.7727 W 802.11ac VHT20: 29.72 dBm / 0.9376 W 802.11ac VHT40: 28.90 dBm / 0.7762 W 802.11ac VHT80: 24.72 dBm / 0.2965 W 802.11ax HE20: 29.77 dBm / 0.9484 W 802.11ax HE40: 28.97 dBm / 0.7889 W 802.11ax HE80: 25.02 dBm / 0.3177 W
99% Occupied Bandwidth	802.11a : 30.87 MHz 802.11ax HE20 : 27.12 MHz 802.11ax HE40 : 49.15 MHz 802.11ax HE80 : 76.84 MHz
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac/ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)

<table>
<tr><td>Antenna Type / Gain</td><td><Ant. 1>: Dipole Antenna with gain 4.10 dBi
<Ant. 2>: Dipole Antenna with gain 4.80 dBi</td></tr>
<tr><td>Antenna Function Description</td><td>
<table>
<tr><td></td><td>Ant. 1</td><td>Ant. 2</td></tr>
<tr><td>802.11 a/n/ac/ax SISO</td><td>V</td><td>V</td></tr>
<tr><td>802.11 a/n/ac/ax CDD/Beamforming</td><td colspan="2">V</td></tr>
</table>
</td></tr>
</table>

Note:

1. For SISO&MIMO mode, the whole testing has assessed only MIMO mode by referring to their higher conducted power.
2. For 802.11n HT20 / ac VHT20 / ax HE20 and 802.11n HT40 / ac VHT40 / ax HE40 and 802.11ac VHT80 / ax HE80 mode, the whole testing have assessed only 802.11ax HE20 / ax HE40 / ax HE80 by referring to the higher output power.
3. The TxBF Power/EIRP of EUT will less than CDD mode power/EIRP when Beamforming mode is active. So we only evaluate CDD mode by referring to their maximum conducted power/EIRP.
4. The device does not support partial RU for 802.11ax mode

1.5 Modification of EUT

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

1.6 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

<table>
<tr><td>Test Firm</td><td colspan="3">Sporton International Inc. (Kunshan)</td></tr>
<tr><td>Test Site Location</td><td colspan="3">No. 1098, Pengxi North Road, Kunshan Economic Development Zone
Jiangsu Province 215300 People’s Republic of China
TEL : +86-512-57900158
FAX : +86-512-57900958</td></tr>
<tr><td rowspan="2">Test Site No.</td><td>Sporton Site No.</td><td>FCC Designation No.</td><td>FCC Test Firm Registration No.</td></tr>
<tr><td>CO01-KS
03CH05-KS
TH01-KS</td><td>CN1257</td><td>314309</td></tr>
</table>

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH05-KS	AUDIX	E3	6.2009-8-24al
2.	CO01-KS	AUDIX	E3	6.2009-8-24

1.8 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.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. 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).

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)
5725-5850 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 and 802.11ax HE40.
2. The above Frequency and Channel in "#" were 802.11ac VHT80 and 802.11ax HE80.

2.2 Test Mode

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

CDD Mode

Modulation	Data Rate
802.11a	**6 Mbps**
802.11ax HE20	**MCS0**
802.11ax HE40	**MCS0**
802.11ax HE80	**MCS0**

Test Modes: Radiated Spurious Emission	
802.11a	**802.11ax HE20**
CH149 (5745MHz) CH157 (5785MHz) CH165 (5825MHz)	CH149 (5745MHz) CH157 (5785MHz) **CH165 (5825MHz)**
802.11ax HE40	**802.11ax HE80**
CH151 (5755MHz) CH159 (5795MHz)	**CH155 (5775MHz)**

Remark:

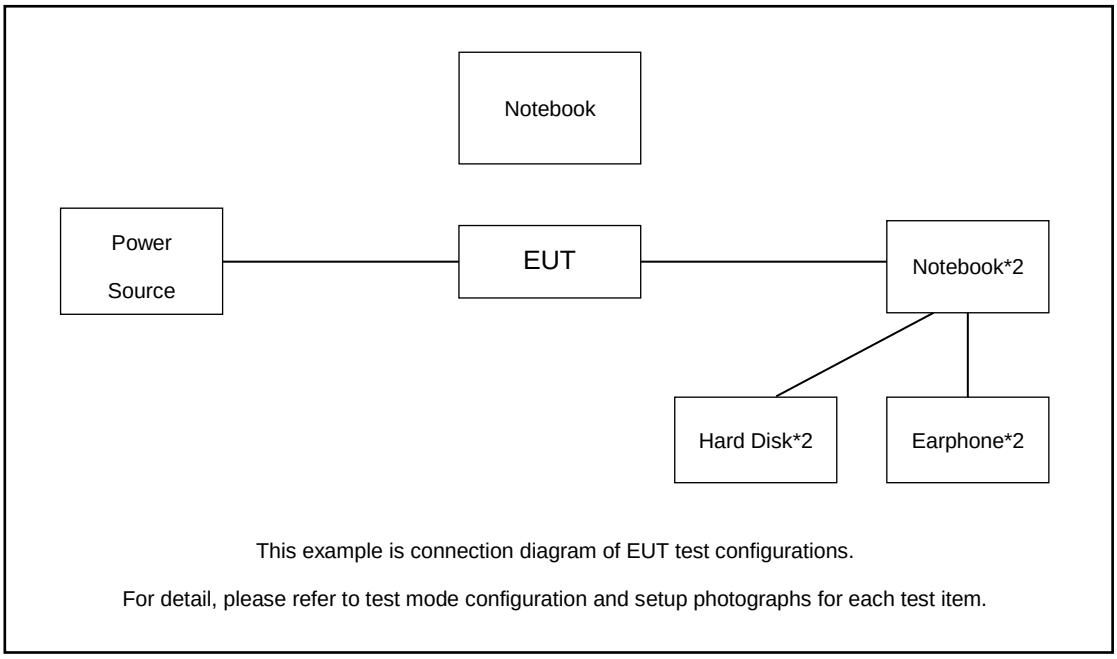
1. For Radiated Test Cases, The tests were performance with Adapter.

2. All test modes of the Radiated Spurious Emission (RSE) were tested; only the worse data in each bandwidth shown in bold for these modes is reported.

Test Modes: AC Conducted Emission
Mode 1 : WLAN (5G) Link+LAN Link+WAN Link+Power from Adapter

2.3 Connection Diagram of Test System

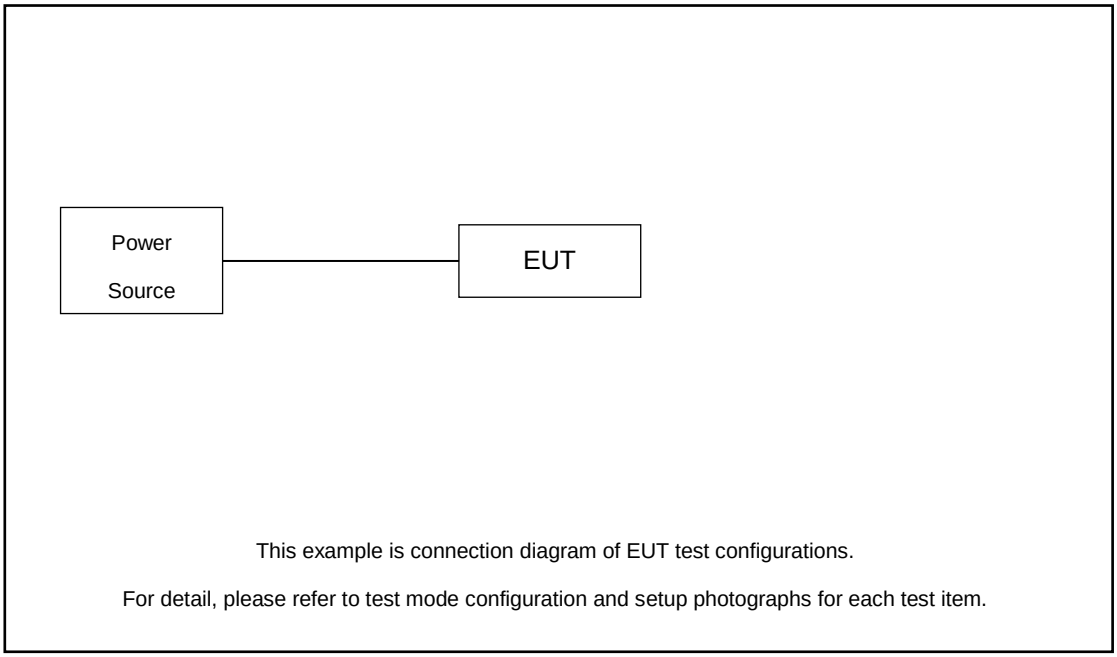
For Conducted Emission:



This example is connection diagram of EUT test configurations.

For detail, please refer to test mode configuration and setup photographs for each test item.

For Radiated Emission:



This example is connection diagram of EUT test configurations.

For detail, please refer to test mode configuration and setup photographs for each test item.

2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	Lenovo	V130-15IKB005	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
2.	Hard Disk	WD	C6B	N/A	N/A	N/A
3.	Earphone	Lenovo	P121	N/A	N/A	Unshielded, 1.2m

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 notebook 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 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.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 7.0 dB.

Offset(dB) = RF cable loss(dB).

= 7.0 (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.

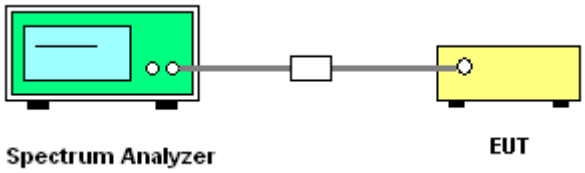
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup

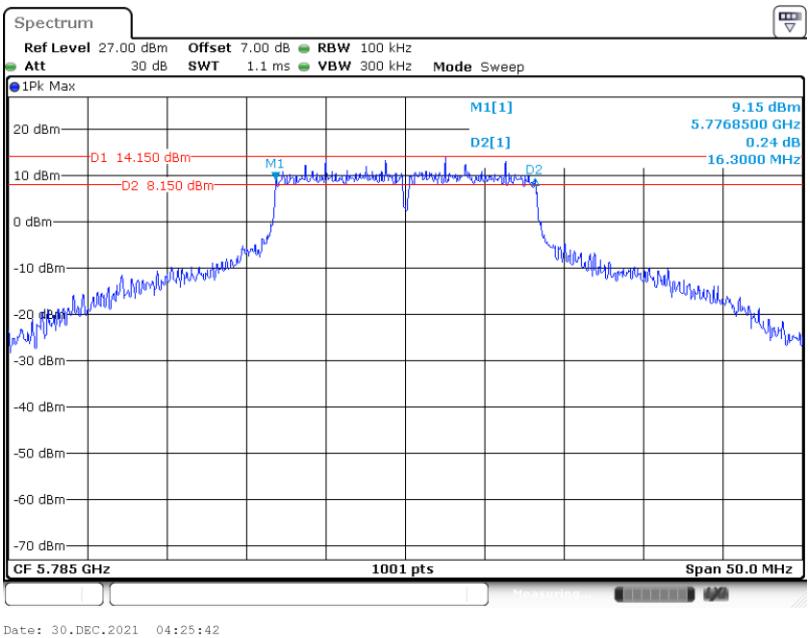


3.1.5 Test Result of 6dB Bandwidth

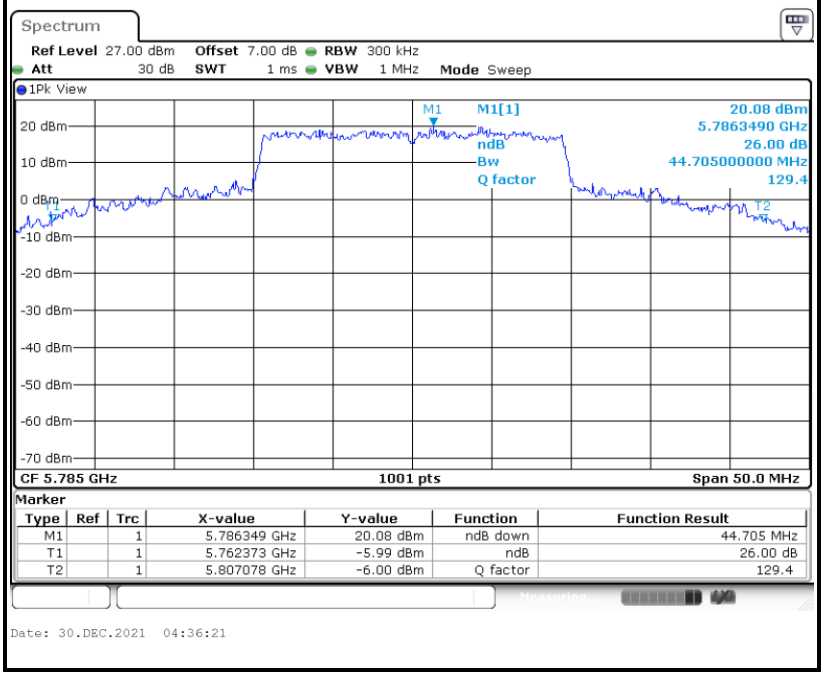
Please refer to Appendix A.

For 20MHz:

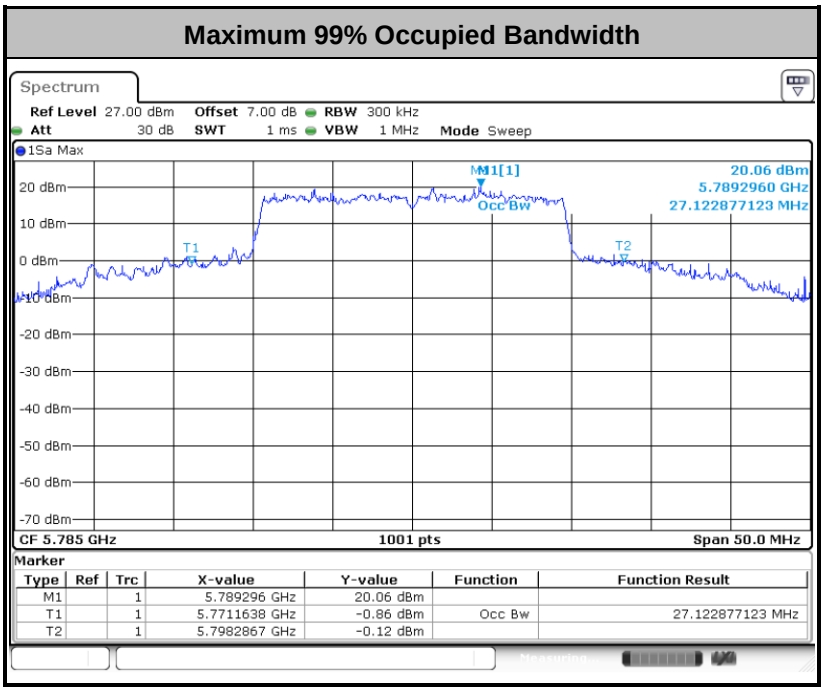
Minimum 6dB Bandwidth



Maximum 26dB Bandwidth

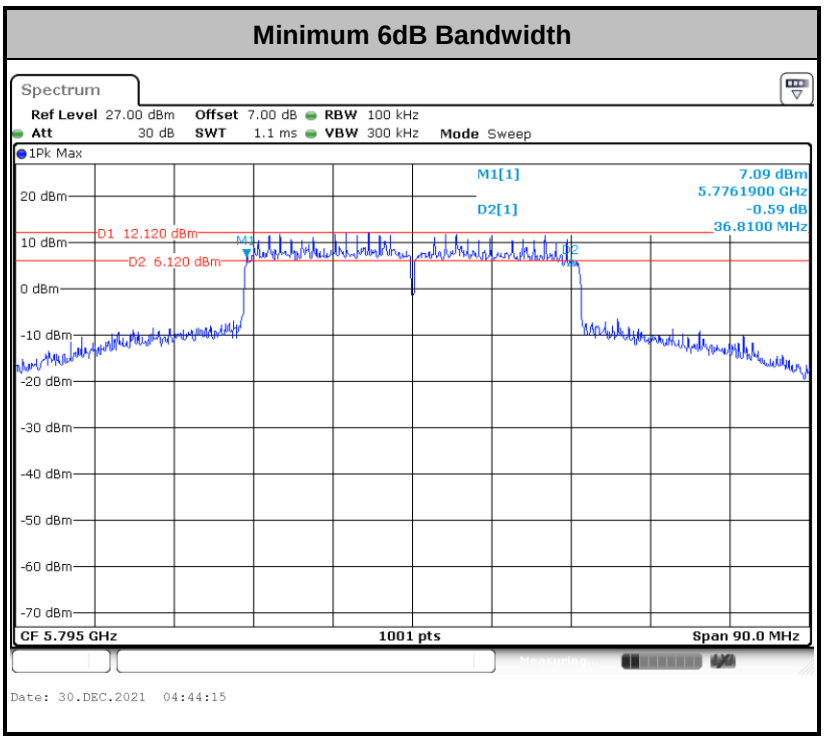


Maximum 99% Occupied Bandwidth

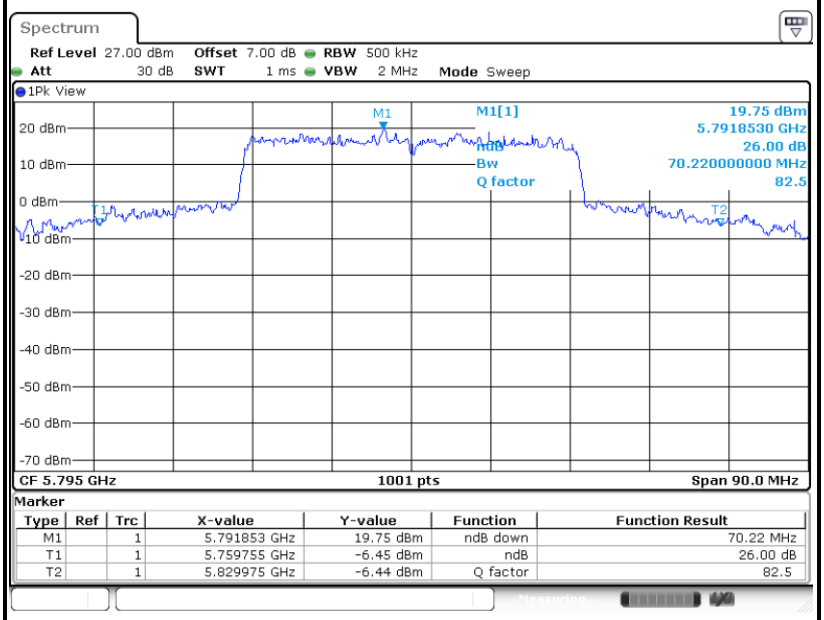


For 40MHz:

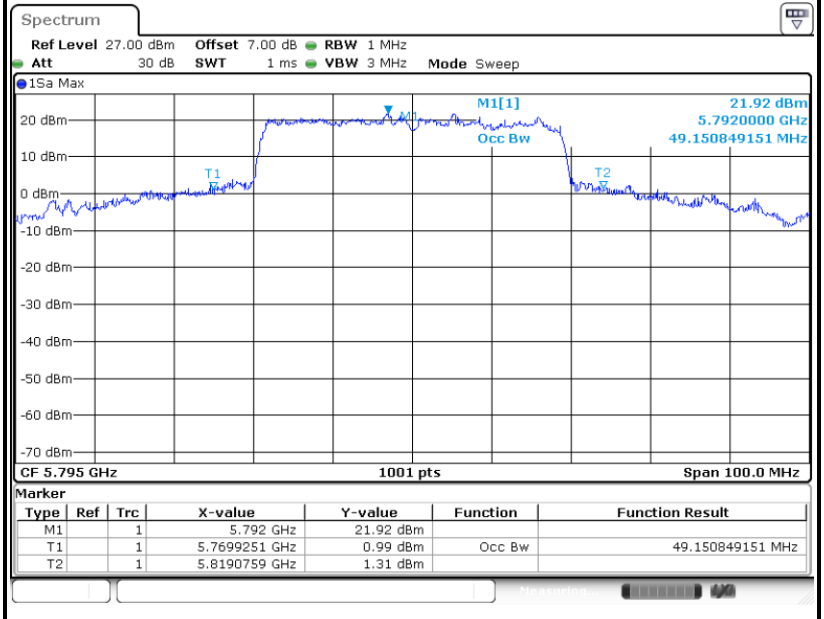
Minimum 6dB Bandwidth



Maximum 26dB Bandwidth

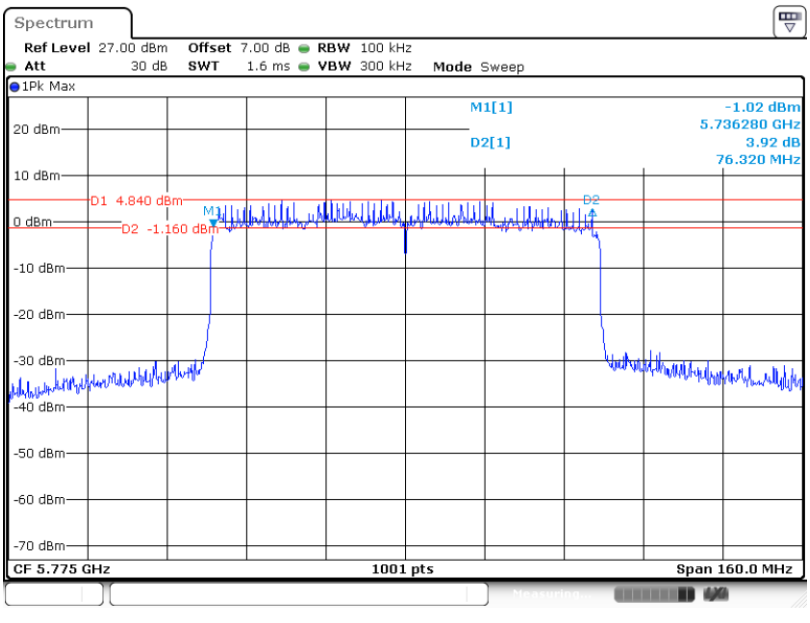


Maximum 99% Occupied Bandwidth

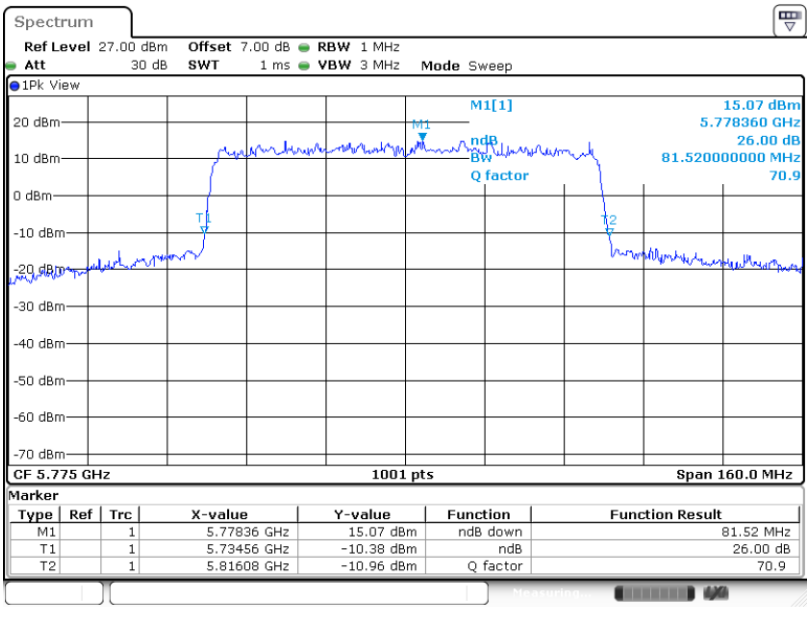


For 80MHz:

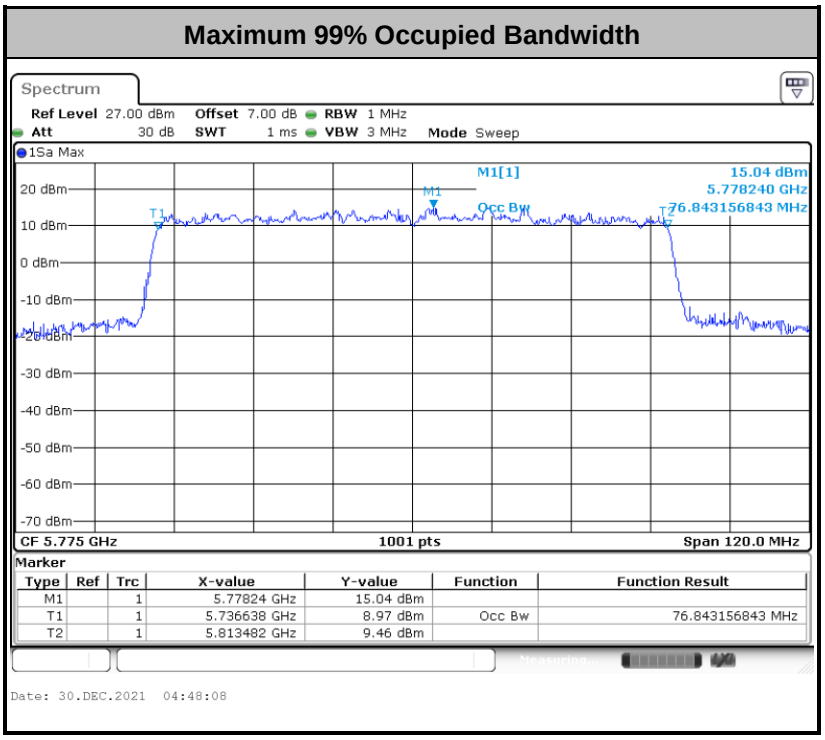
Minimum 6dB Bandwidth



Maximum 26dB Bandwidth



Maximum 99% Occupied Bandwidth



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.

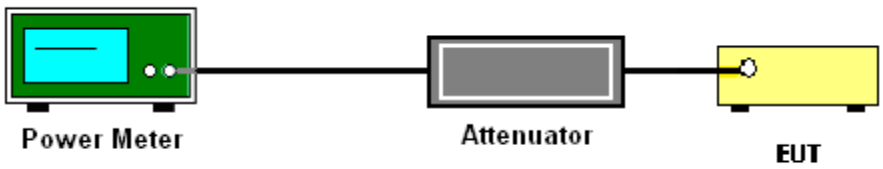
3.2.3 Test Procedures

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.
4. For MIMO mode, the measure-and-sum technique should be used for measuring the in-band transmit power of a device.

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).

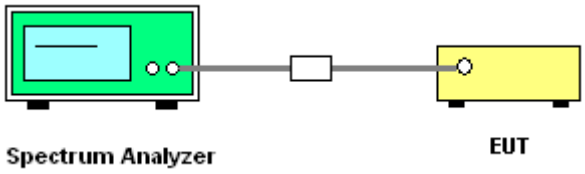
- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz.
- Set VBW ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(500kHz/RBW) 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. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

   Method (c): Measure and add 10 log(N_{ANT}) dB.

   With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity 10 log(N_{ANT}) dB is added to each spectrum value before comparing to the emission limit. The addition of 10 log(N_{ANT}) dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}$ th of the PSD limit.

3.3.4 Test Setup



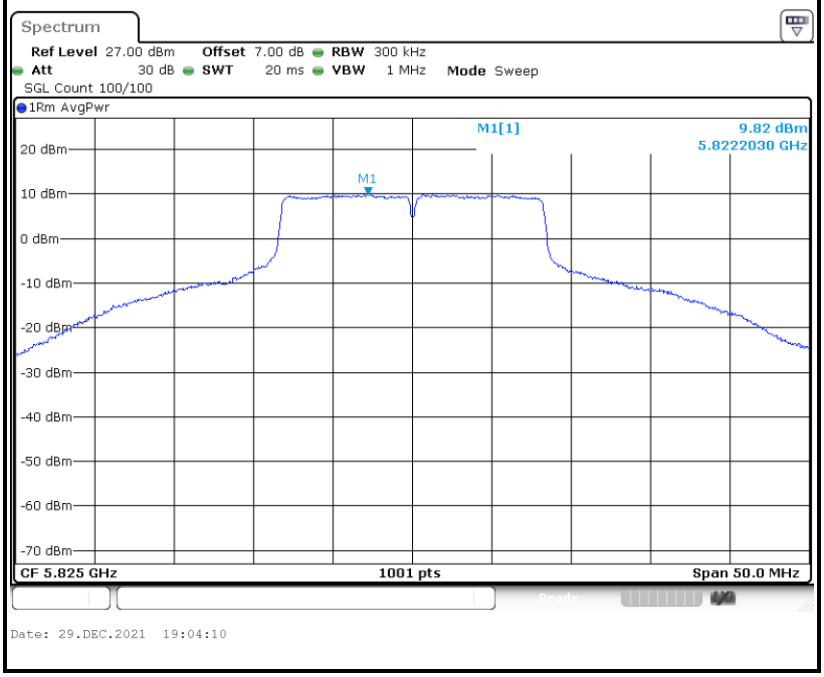
3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

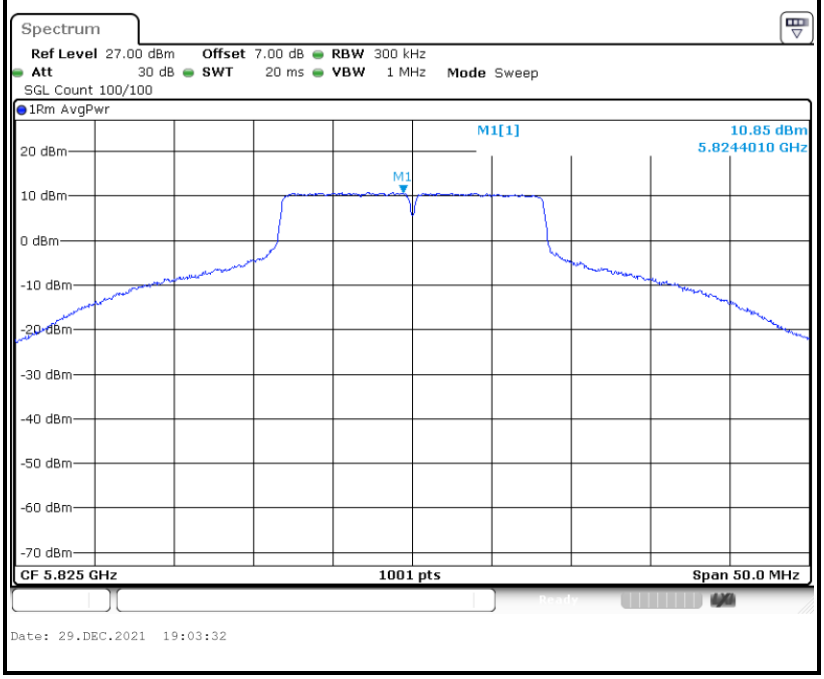
Only the maximum PSD plots of each bandwidth shown in the report.

For 20MHz:

Worst Case Power Density (dBm/MHz) for MIMO Ant. 1



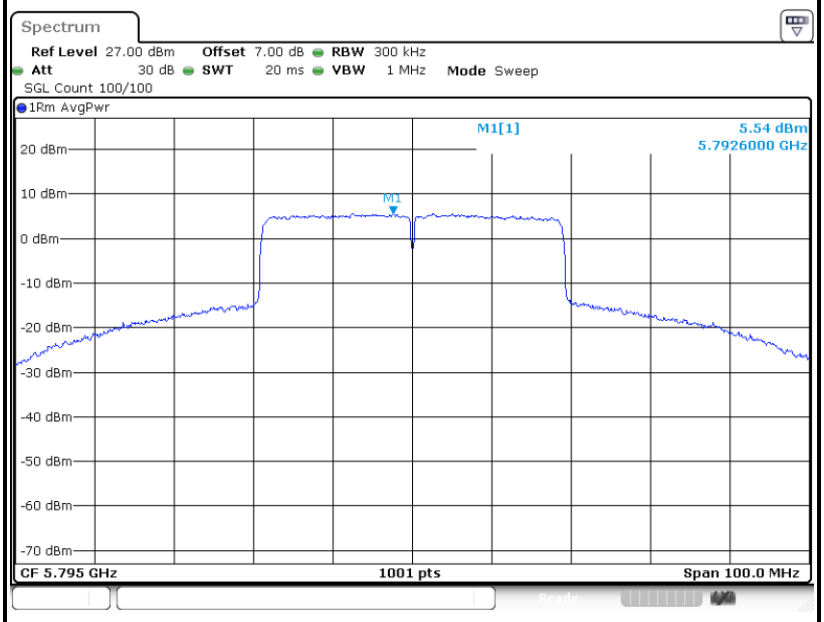
Worst Case Power Density (dBm/MHz) for MIMO Ant. 2



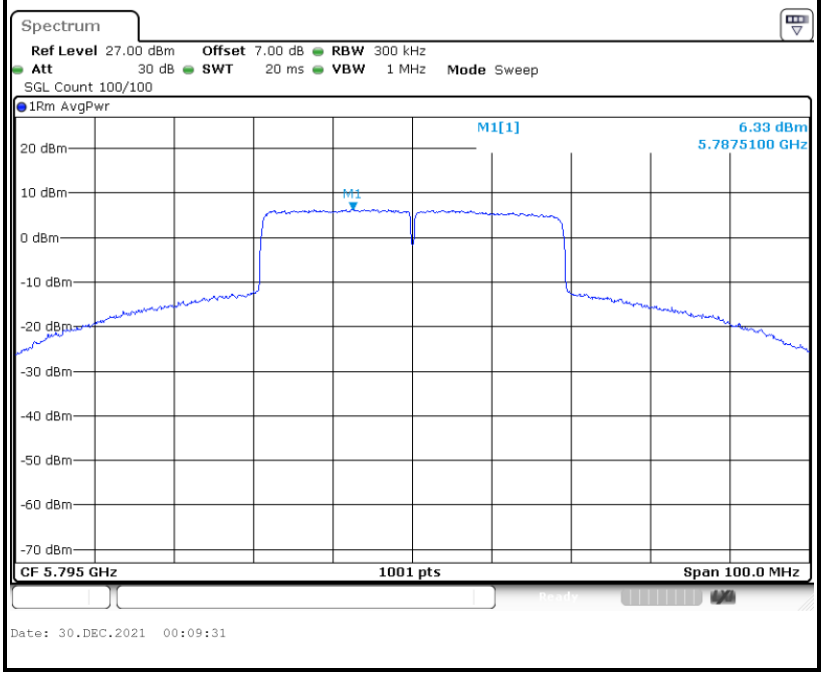
Note: Average Power Density (dB) = Measured value+ Duty Factor

For 40MHz:

Worst Case Power Density (dBm/MHz) for MIMO Ant. 1



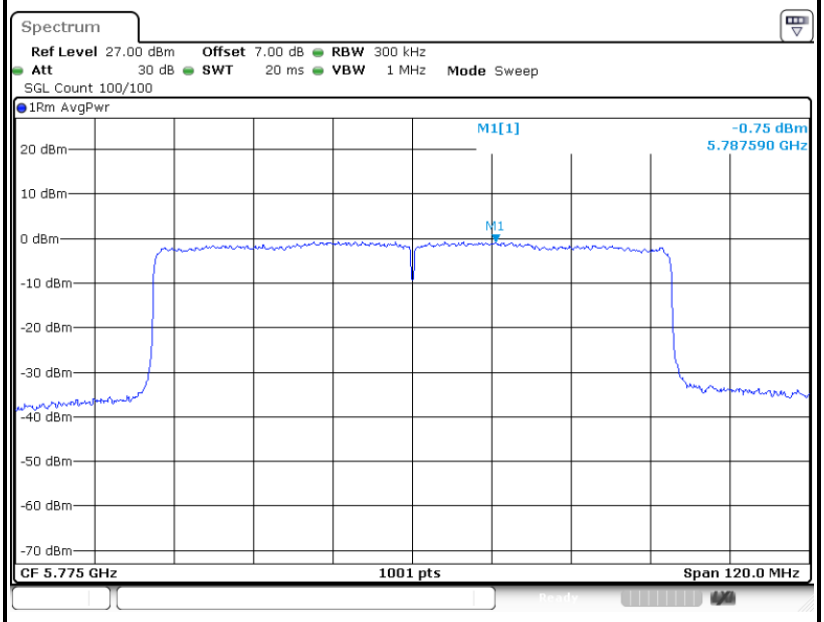
Worst Case Power Density (dBm/MHz) for MIMO Ant. 2



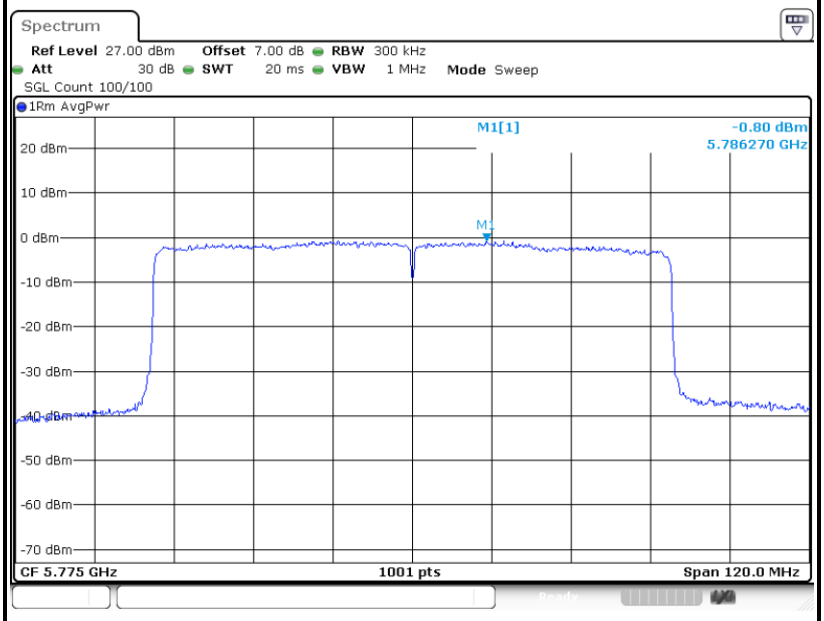
Note: Average Power Density (dB) = Measured value+ Duty Factor

For 80MHz:

Worst Case Power Density (dBm/MHz) for MIMO Ant. 1



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



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.

$$EIRP = E_{Meas} + 20\log(d_{Meas}) - 104.77$$

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

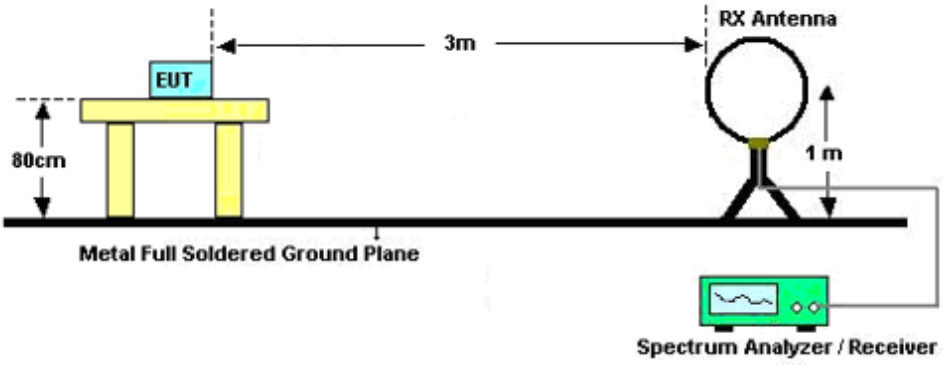
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

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

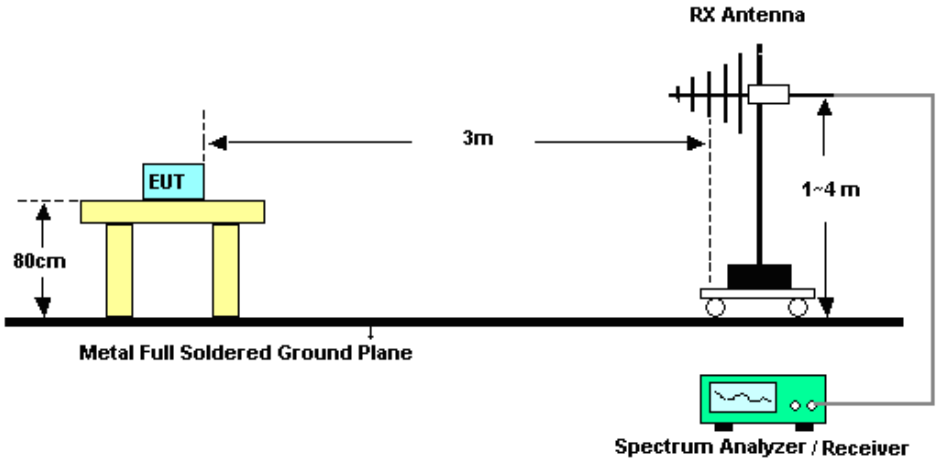
limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

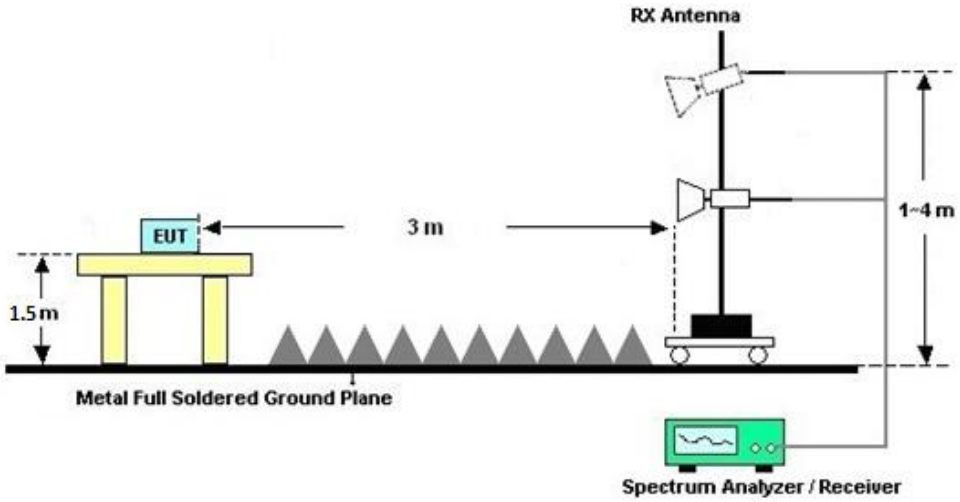
For radiated emissions below 30MHz



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.

3.4.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix C.

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.

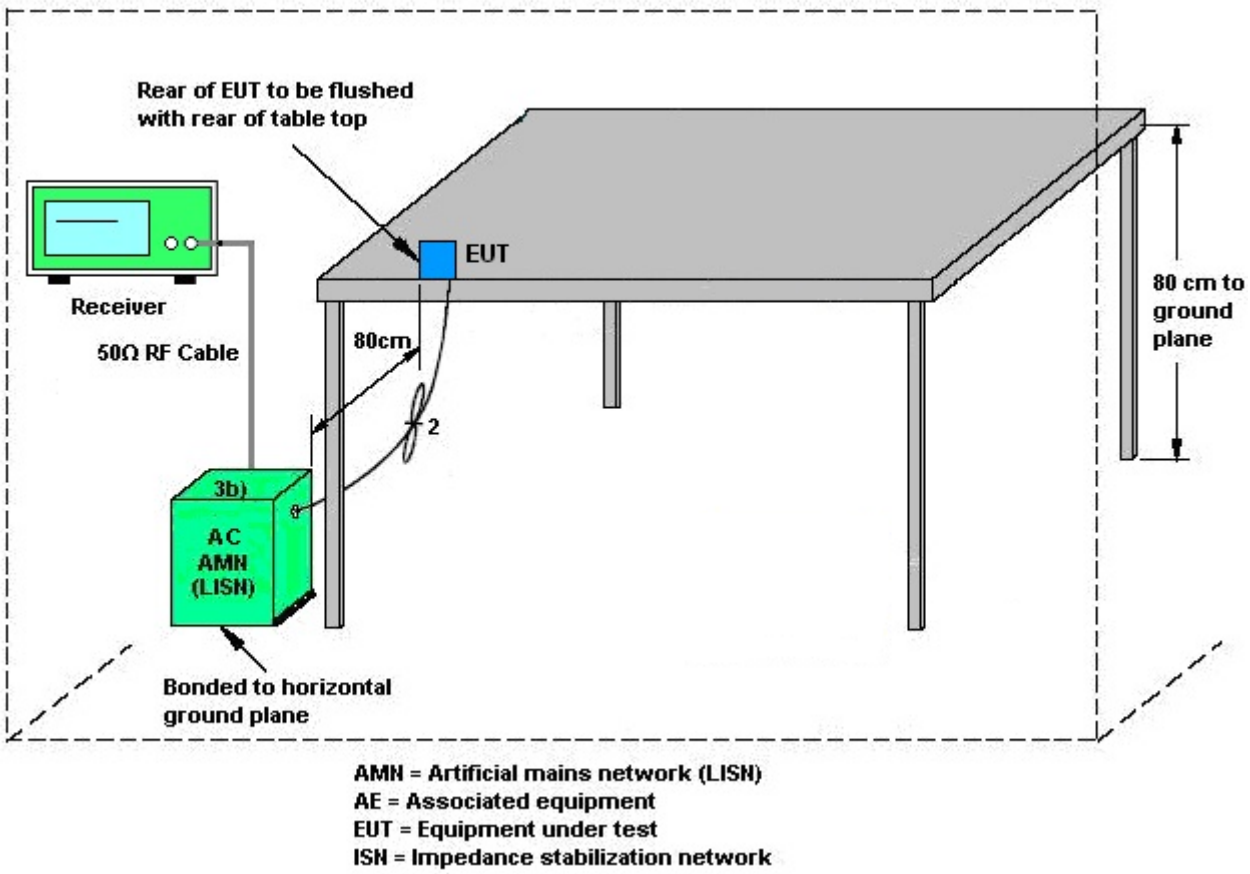
3.5.2 Measuring Instruments

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

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e.,

Directional gain = $G_{ANT\ MAX}$(Ant.1 Gain, Ant.2 Gain,…) + Array Gain, as following table for Power,

where Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

For PSD, the directional gain calculation is following,

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{Gn/20})^2 / N_{ANT}$] dBi, as following table for PSD.

N_{ANT} = number of transmit antennas

N_{SS} = number of spatial streams. (The worst case directional gain will occur when NSS = 1)

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)
Band IV	4.10	4.80	4.80	7.47	0.00	1.47

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
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 14, 2021	Dec. 29, 2021~ Dec. 30, 2021	Oct. 13, 2022	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 07, 2021	Dec. 29, 2021~ Dec. 30, 2021	Jan. 06, 2022	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 07, 2021	Dec. 29, 2021~ Dec. 30, 2021	Jan. 06, 2022	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 16, 2021	Jan. 05, 2022	Oct. 15, 2022	Radiation (03CH05-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr.13, 2021	Jan. 05, 2022	Apr. 12, 2022	Radiation (03CH05-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 30, 2021	Jan. 05, 2022	Oct. 29, 2022	Radiation (03CH05-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jun. 04 ,2021	Jan. 05, 2022	Jun. 03, 2022	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218652	1GHz~18GHz	Apr. 24, 2021	Jan. 05, 2022	Apr. 23, 2022	Radiation (03CH05-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 06, 2021	Jan. 05, 2022	Jan. 05, 2022	Radiation (03CH05-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Apr. 12, 2021	Jan. 05, 2022	Apr. 11, 2022	Radiation (03CH05-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 07, 2021	Jan. 05, 2022	Jan. 06, 2022	Radiation (03CH05-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2012228	1Ghz-18Ghz	Oct. 16, 2021	Jan. 05, 2022	Oct. 15, 2022	Radiation (03CH05-KS)
Amplifier	Keysight	83017A	MY53270316	500MHz~26.5GHz	Oct. 16, 2021	Jan. 05, 2022	Oct. 15, 2022	Radiation (03CH05-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jan. 05, 2022	NCR	Radiation (03CH05-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jan. 05, 2022	NCR	Radiation (03CH05-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jan. 05, 2022	NCR	Radiation (03CH05-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 21, 2021	Dec. 20, 2021	Apr. 20, 2022	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 14, 2021	Dec. 20, 2021	Oct. 13, 2022	Conduction (CO01-KS)
AC LISN	R&S	ENV216	100334	9kHz~30MHz	Oct. 14, 2021	Dec. 20, 2021	Oct. 13, 2022	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 14, 2021	Dec. 20, 2021	Oct. 13, 2022	Conduction (CO01-KS)

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))	**5.0dB**

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

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

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

Appendix A. Conducted Test Results

Report Number : FR1D0112C

Test Engineer:	Jiang Jun	Temperature:	21~25	°C
Test Date:	2021/12/29~2021/12/30	Relative Humidity:	51~54	%

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

U-NII-3 MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	149	5745	20.93	23.98	36.31	39.61	16.35	16.35	0.5	Pass
11a	6Mbps	2	157	5785	21.73	24.53	36.76	40.06	16.30	16.35	0.5	Pass
11a	6Mbps	2	165	5825	27.22	30.87	41.21	42.61	16.35	16.35	0.5	Pass

TEST RESULTS DATA
Average Power Table

U-NII-3 MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	0.21	0.21	25.80	26.37	29.11	30.00		4.80		Pass
11a	6Mbps	2	157	5785	0.21	0.21	25.58	26.26	28.94	30.00		4.80		Pass
11a	6Mbps	2	165	5825	0.21	0.21	26.66	26.72	29.70	30.00		4.80		Pass
HT20	MCS0	2	149	5745	0.21	0.21	26.22	26.93	29.60	30.00		4.80		Pass
HT20	MCS0	2	157	5785	0.21	0.21	26.26	26.99	29.65	30.00		4.80		Pass
HT20	MCS0	2	165	5825	0.21	0.21	26.33	27.01	29.69	30.00		4.80		Pass
HT40	MCS0	2	151	5755	0.46	0.42	25.17	25.66	28.43	30.00		4.80		Pass
HT40	MCS0	2	159	5795	0.46	0.42	25.51	26.20	28.88	30.00		4.80		Pass
VHT20	MCS0	2	149	5745	0.07	0.07	26.28	26.92	29.62	30.00		4.80		Pass
VHT20	MCS0	2	157	5785	0.07	0.07	26.29	27.01	29.67	30.00		4.80		Pass
VHT20	MCS0	2	165	5825	0.07	0.07	26.33	27.06	29.72	30.00		4.80		Pass
VHT40	MCS0	2	151	5755	0.13	0.13	25.15	25.75	28.47	30.00		4.80		Pass
VHT40	MCS0	2	159	5795	0.13	0.13	25.47	26.28	28.90	30.00		4.80		Pass
VHT80	MCS0	2	155	5775	0.29	0.29	21.72	21.71	24.72	30.00		4.80		Pass

TEST RESULTS DATA
Power Spectral Density

U-NII-3 single antenna																
U-NII-3 MIMO																
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
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	0.21	0.21	2.22		11.23	11.88	14.89	28.53		7.47		Pass
11a	6Mbps	2	157	5785	0.21	0.21	2.22		11.02	11.88	14.89	28.53		7.47		Pass
11a	6Mbps	2	165	5825	0.21	0.21	2.22		12.04	13.07	16.08	28.53		7.47		Pass

Note: PSD Sum = Max PSD(Ant. 1, Ant. 2) + 10 log (n)

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

U-NII-3 MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
						Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2		
HE20	MCS0	2	149	5745	Full	24.53	27.12	41.61	42.96	18.30	18.45	0.5	Pass
HE20	MCS0	2	157	5785	Full	27.47	27.12	41.91	44.71	18.60	18.70	0.5	Pass
HE20	MCS0	2	165	5825	Full	25.67	26.47	40.46	41.96	18.90	18.60	0.5	Pass
HE40	MCS0	2	151	5755	Full	39.36	41.26	57.81	57.72	37.62	37.35	0.5	Pass
HE40	MCS0	2	159	5795	Full	43.86	49.15	68.69	70.22	37.62	36.81	0.5	Pass
HE80	MCS0	2	155	5775	Full	76.84	76.72	81.52	81.36	77.12	76.32	0.5	Pass

TEST RESULTS DATA
Average Power Table

U-NII-3 MIMO															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)		Average Conducted Power with duty factor (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
						Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
HE20	MCS0	2	149	5745	Full	0.07	0.09	26.32	27.00	29.69	30.00		4.80		Pass
HE20	MCS0	2	157	5785	Full	0.07	0.09	26.30	27.04	29.70	30.00		4.80		Pass
HE20	MCS0	2	165	5825	Full	0.07	0.09	26.38	27.11	29.77	30.00		4.80		Pass
HE40	MCS0	2	151	5755	Full	0.17	0.17	25.23	25.79	28.53	30.00		4.80		Pass
HE40	MCS0	2	159	5795	Full	0.17	0.17	25.56	26.32	28.97	30.00		4.80		Pass
HE80	MCS0	2	155	5775	Full	0.35	0.35	22.13	21.89	25.02	30.00		4.80		Pass

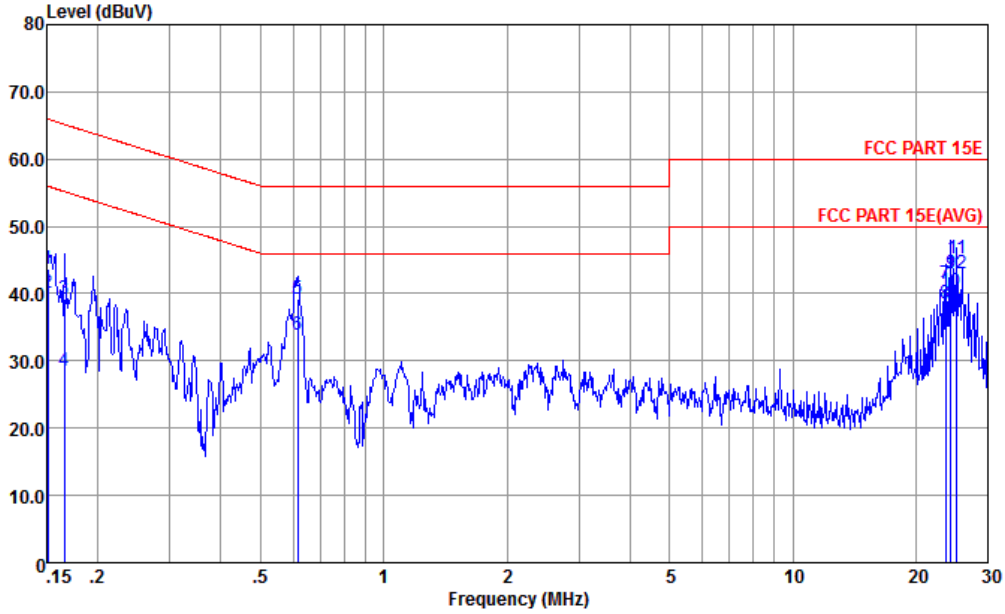
TEST RESULTS DATA
Power Spectral Density

U-NII-3 MIMO																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)		10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
						Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
HE20	MCS0	2	149	5745	Full	0.07	0.09	2.22		11.26	11.81	14.82	28.53		7.47		Pass
HE20	MCS0	2	157	5785	Full	0.07	0.09	2.22		11.34	11.98	14.99	28.53		7.47		Pass
HE20	MCS0	2	165	5825	Full	0.07	0.09	2.22		11.26	11.93	14.94	28.53		7.47		Pass
HE40	MCS0	2	151	5755	Full	0.17	0.17	2.22		7.43	7.95	10.96	28.53		7.47		Pass
HE40	MCS0	2	159	5795	Full	0.17	0.17	2.22		7.76	8.55	11.56	28.53		7.47		Pass
HE80	MCS0	2	155	5775	Full	0.35	0.35	2.22		1.47	1.42	4.48	28.53		7.47		Pass

Note: PSD Sum = Max PSD(Ant. 1, Ant. 2) + 10 log (n)

Appendix B. AC Conducted Emission Test Results

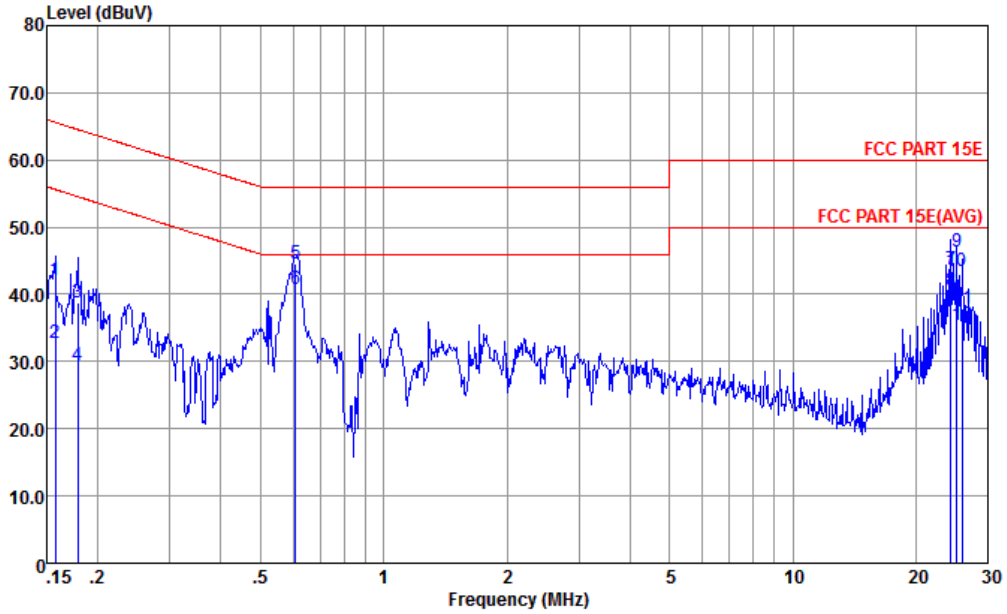
Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC PART 15E LISN-060105-L LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.151	43.70	-22.26	65.96	33.20	0.02	10.48	QP
2		0.151	40.20	-15.76	55.96	29.70	0.02	10.48	Average
3		0.166	39.27	-25.89	65.16	28.80	0.03	10.44	QP
4		0.166	28.57	-26.59	55.16	18.10	0.03	10.44	Average
5		0.617	39.24	-16.76	56.00	28.89	0.11	10.24	QP
6		0.617	33.84	-12.16	46.00	23.49	0.11	10.24	Average
7		23.636	41.37	-18.63	60.00	30.20	0.62	10.55	QP
8		23.636	38.47	-11.53	50.00	27.30	0.62	10.55	Average
9		24.400	43.11	-16.89	60.00	31.91	0.64	10.56	QP
10		24.400	40.31	-9.69	50.00	29.11	0.64	10.56	Average
11		25.188	45.33	-14.67	60.00	34.10	0.66	10.57	QP
12	*	25.188	43.03	-6.97	50.00	31.80	0.66	10.57	Average

Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC PART 15E LISN-060105-N NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.157	42.07	-23.53	65.60	31.50	0.11	10.46	QP
2		0.157	32.77	-22.83	55.60	22.20	0.11	10.46	Average
3		0.179	38.71	-25.84	64.55	28.20	0.10	10.41	QP
4		0.179	29.31	-25.24	54.55	18.80	0.10	10.41	Average
5		0.608	44.55	-11.45	56.00	34.20	0.11	10.24	QP
6	*	0.608	40.75	-5.25	46.00	30.40	0.11	10.24	Average
7		24.400	43.74	-16.26	60.00	32.51	0.67	10.56	QP
8		24.400	40.54	-9.46	50.00	29.31	0.67	10.56	Average
9		25.188	46.36	-13.64	60.00	35.10	0.69	10.57	QP
10		25.188	43.36	-6.64	50.00	32.10	0.69	10.57	Average
11		26.001	37.90	-22.10	60.00	26.60	0.72	10.58	QP
12		26.001	35.40	-14.60	50.00	24.10	0.72	10.58	Average

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)

Appendix C. Radiated Spurious Emission

UNII-3 - 5725~5850MHz

WIFI 802.11ax HE20_Full (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.
CDD 2*2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE20 Full CH 165 5825MHz		5850	92.11	-30.19	122.3	81.63	35.87	11.33	36.72	242	277	P	H
		5856	84.67	-25.95	110.62	74.17	35.9	11.34	36.74	242	277	P	H
		5879.2	74.61	-27.57	102.18	64.12	35.89	11.36	36.76	242	277	P	H
		5934.4	59.64	-8.66	68.3	49.16	35.87	11.42	36.81	242	277	P	H
		5818	116.58	-	-	106.15	35.81	11.31	36.69	242	277	P	H
		5818	107.91	-	-	97.48	35.81	11.31	36.69	242	277	A	H
		5851.2	95.67	-23.89	119.56	85.19	35.87	11.33	36.72	100	59	P	V
		5855.2	91.86	-18.98	110.84	81.36	35.9	11.34	36.74	100	59	P	V
		5875.3	80.43	-24.65	105.08	69.94	35.89	11.36	36.76	100	59	P	V
		5928.4	63.54	-4.76	68.3	53.08	35.87	11.4	36.81	100	59	P	V
		5818	120.45	-	-	110.02	35.81	11.31	36.69	100	59	P	V
		5818	113.1	-	-	102.67	35.81	11.31	36.69	100	59	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

UNII-3 5725~5850MHz

WIFI 802.11ax HE20_Full (Harmonic @ 3m)

WIFI Ant. CDD 2*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)
802.11ax HE20 Full CH 165 5825MHz		11653	49.21	-24.79	74	60.3	38.79	16.46	66.34	300	0	P	H
		17483	58.64	-9.66	68.3	60.59	42.54	20.33	64.82	300	0	P	H
		11653	56.7	-17.3	74	67.79	38.79	16.46	66.34	100	60	P	V
		11653	48.54	-5.46	54	59.63	38.79	16.46	66.34	100	60	A	V
		17483	67.53	-0.77	68.3	69.48	42.54	20.33	64.82	100	282	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

UNII-3 5725~5850MHz

WIFI 802.11ax HE40_Full (Band Edge @ 3m)

WIFI Ant. CDD 2*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)
		5647.2	63.31	-4.99	68.3	53.24	35.5	11.08	36.51	264	305	P	H
		5691.2	75.11	-23.7	98.81	64.95	35.59	11.13	36.56	264	305	P	H
		5719.2	90.62	-20.06	110.68	80.41	35.65	11.16	36.6	264	305	P	H
		5720.8	93.52	-19.2	112.72	83.31	35.65	11.16	36.6	264	305	P	H
		5850.4	67.29	-54.1	121.39	56.81	35.87	11.33	36.72	264	305	P	H
		5855.8	66.91	-43.77	110.68	56.41	35.9	11.34	36.74	264	305	P	H
		5875.2	61.95	-43.2	105.15	51.46	35.89	11.36	36.76	264	305	P	H
		5928.8	55.28	-13.02	68.3	44.82	35.87	11.4	36.81	264	305	P	H
802.11ax		5758	114.39	-	-	104.09	35.72	11.21	36.63	264	305	P	H
HE40 Full		5758	105.7	-	-	95.4	35.72	11.21	36.63	264	305	A	H
CH 151		5648	67.68	-0.62	68.3	57.61	35.5	11.08	36.51	102	59	P	V
5755MHz		5700	78.97	-26.33	105.3	68.81	35.59	11.13	36.56	102	59	P	V
		5719.2	95.11	-15.57	110.68	84.9	35.65	11.16	36.6	102	59	P	V
		5723.2	95.34	-22.86	118.2	85.11	35.65	11.18	36.6	102	59	P	V
		5852.8	74.28	-41.64	115.92	63.8	35.87	11.33	36.72	102	59	P	V
		5855.6	73.35	-37.38	110.73	62.85	35.9	11.34	36.74	102	59	P	V
		5875.2	67.77	-37.38	105.15	57.28	35.89	11.36	36.76	102	59	P	V
		5925.8	59.27	-9.03	68.3	48.81	35.87	11.4	36.81	102	59	P	V
		5764	118.26	-	-	107.93	35.72	11.24	36.63	102	59	P	V
		5764	109.4	-	-	99.07	35.72	11.24	36.63	102	59	A	V

Remark

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

UNII-3 5725~5850MHz

WIFI 802.11ax HE40_Full (Harmonic @ 3m)

WIFI Ant. CDD 2*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)
802.11ax		11510	46.41	-27.59	74	57.82	38.7	16.37	66.48	300	0	P	H
HE40 Full		17252	57.54	-10.76	68.3	59.92	42.33	20.16	64.87	300	0	P	H
CH 151		11510	49.66	-24.34	74	61.07	38.7	16.37	66.48	100	0	P	V
5755MHz		17263	62.45	-5.85	68.3	64.8	42.34	20.18	64.87	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

UNII-3 5725~5850MHz

WIFI 802.11ax HE80_Full (Band Edge @ 3m)

WIFI Ant. CDD 2*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)
		5648.8	62.43	-5.87	68.3	52.36	35.5	11.08	36.51	100	285	P	H
		5696.4	72.63	-30.02	102.65	62.47	35.59	11.13	36.56	100	285	P	H
		5714	74.33	-34.89	109.22	64.13	35.62	11.16	36.58	100	285	P	H
		5721.2	76.72	-36.92	113.64	66.51	35.65	11.16	36.6	100	285	P	H
		5850.8	74.54	-45.94	120.48	64.06	35.87	11.33	36.72	100	285	P	H
		5866.4	71.84	-35.87	107.71	61.34	35.9	11.34	36.74	100	285	P	H
		5876.4	67.12	-37.14	104.26	56.63	35.89	11.36	36.76	100	285	P	H
		5925.6	57.56	-10.74	68.3	47.1	35.87	11.4	36.81	100	285	P	H
802.11ax		5758	108.31	-	-	98.01	35.72	11.21	36.63	100	285	P	H
HE80 Full		5758	100.81	-	-	90.51	35.72	11.21	36.63	100	285	A	H
CH 155		5648.4	66.61	-1.69	68.3	56.54	35.5	11.08	36.51	115	25	P	V
5775MHz		5698.4	77.45	-26.67	104.12	67.29	35.59	11.13	36.56	115	25	P	V
		5716.4	82.62	-27.27	109.89	72.42	35.62	11.16	36.58	115	25	P	V
		5721.6	85.07	-29.48	114.55	74.84	35.65	11.18	36.6	115	25	P	V
		5851.6	78.2	-40.45	118.65	67.72	35.87	11.33	36.72	115	25	P	V
		5866	78.15	-29.67	107.82	67.65	35.9	11.34	36.74	115	25	P	V
		5880.8	70.7	-30.29	100.99	60.21	35.89	11.36	36.76	115	25	P	V
		5927.6	62.1	-6.2	68.3	51.64	35.87	11.4	36.81	115	25	P	V
		5758	114.81	-	-	104.51	35.72	11.21	36.63	115	25	P	V
		5758	106.65	-	-	96.35	35.72	11.21	36.63	115	25	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

UNII-3 5725~5850MHz

WIFI 802.11ax HE80_Full (Harmonic @ 3m)

WIFI Ant. CDD 2*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)
802.11ax		11554	47.08	-26.92	74	58.39	38.73	16.39	66.43	300	0	P	H
HE80 Full		17325	56.13	-12.17	68.3	58.39	42.39	20.21	64.86	300	0	P	H
CH 155		11550	48.65	-25.35	74	59.96	38.73	16.39	66.43	100	0	P	V
5775MHz		17329	61.22	-7.08	68.3	63.45	42.41	20.21	64.85	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

U NII-3 5725~5850MHz

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.	
CDD 2*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)

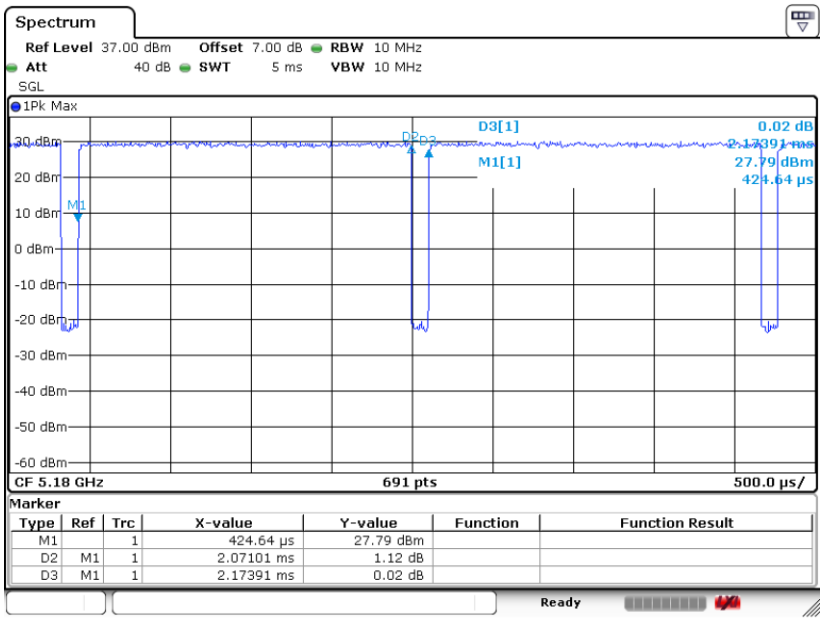
= -10.46(dB)

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

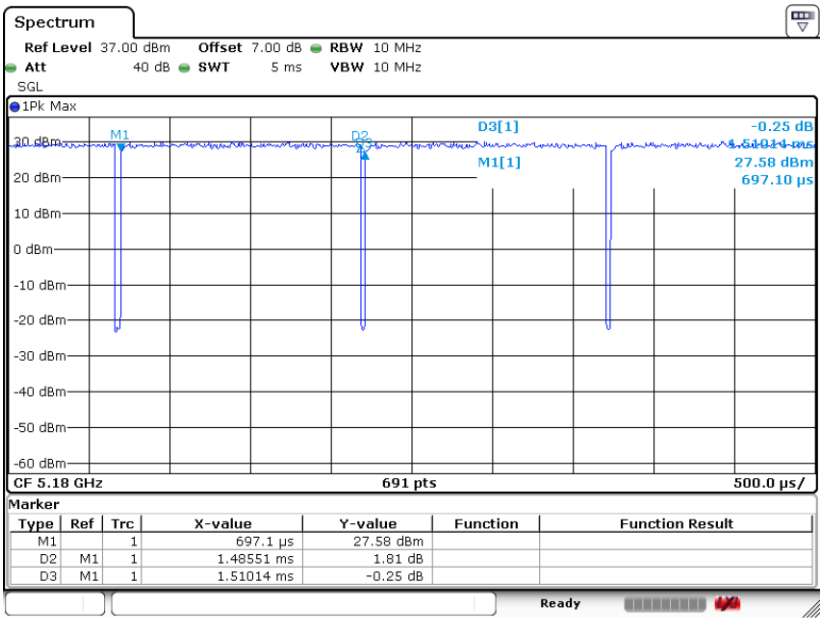
Appendix D. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
1+2	802.11a	95.27	2.071	0.483	0.51kHz
1+2	802.11ax HE20	98.37	-	-	10Hz
1+2	802.11ax HE40	96.07	0.780	1.283	1.3kHz
1+2	802.11ax HE80	92.21	0.412	2.430	2.7kHz

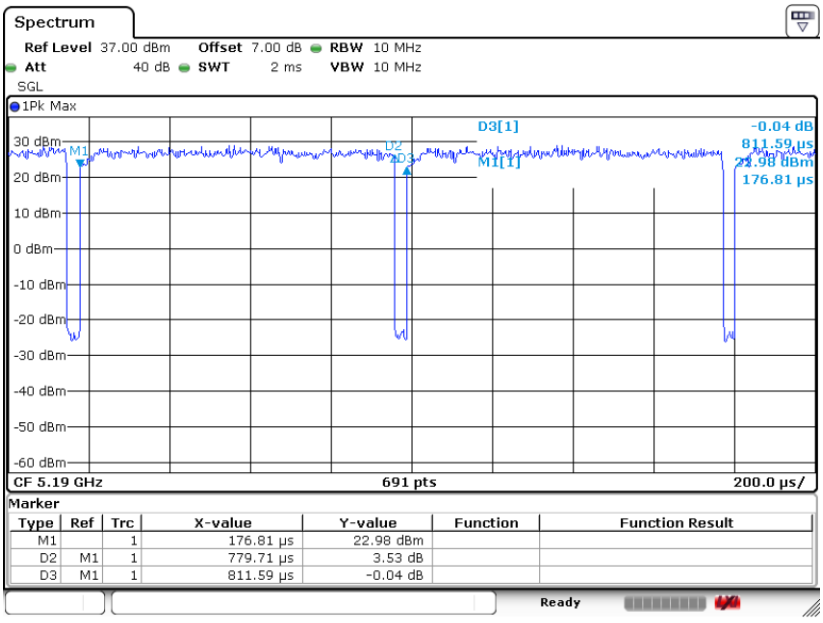
802.11a



802.11ax HE20



802.11ax HE40



802.11ax HE80