FCC RADIO TEST REPORT

FCC ID	:	**PKRISGM3000B**
Equipment	:	**M3000B**
Brand Name	:	**Inseego**
Model Name	:	**M3000B**
Marketing Name	:	**M3000**
Applicant	:	**Inseego Corp.** **9710 Scranton Road Suite 200, San Diego,, CA 92121**
Manufacturer	:	**Inseego Corp.** **9710 Scranton Road Suite 200, San Diego,, CA 92121**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Aug. 10, 2022 and testing was performed from Aug. 19, 2022 to Sep. 27, 2022. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

Louis Wu

Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory
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History of this test report

Report No.	Version	Description	Issue Date
FR1D2409C	01	Initial issue of report	Sep. 29, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.403(i)	6dB & 26dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.407(a)	Maximum Conducted Output Power	Pass	-
3.3	15.407(a)	Power Spectral Density	Pass	-
3.4	15.407(b)	Unwanted Emissions	Pass	6.22 dB under the limit at 73.650 MHz
3.5	15.207	AC Conducted Emission	Pass	9.45 dB under the limit at 10.907 MHz
3.6	15.203	Antenna Requirement	Pass	-

Declaration of Conformity:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
   It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to report "Uncertainty of Evaluation".

Comments and Explanations:

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Avis Chuang

Report Producer: Ming Chen

1 General Description

1.1 Product Feature of Equipment Under Test

3G-WCDMA, 4G-LTE, 5G-FR1, Wi-Fi 2.4GHz 802.11b/g/n/ax, Wi-Fi 5GHz 802.11a/n/ac/ax and GNSS.

Product Feature	
Antenna Type	WWAN: Internal Antenna WLAN <Ant. 0>: Internal Antenna <Ant. 1>: Internal Antenna GPS / Glonass / BDS / Galileo: Internal Antenna

Antenna information		
5725 MHz ~ 5850 MHz	Peak Gain (dBi)	Ant. 0: 3.9 Ant. 1: 6.4

Remark: The EUT's information above is declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.1.1 Antenna Gain

<For CDD Mode>

Follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)ii)

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows:

For power measurements on IEEE 802.11 devices,

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

G_{ANT} is set equal to the gain of the antenna having the highest gain.

For PSD measurements, the directional gain calculation.

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k / 20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

As minimum N_{SS}=1 is supported by EUT, the formula can be simplified as:

Directional gain = $10*\log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}]$ dBi

Where G1, G2….GN denote single antenna gain.

The directional gain “DG” is calculated as following table.

			DG for Power	DG for PSD	Power Limit Reduction	PSD Limit Reduction
	Ant 0 (dBi)	Ant 1 (dBi)	(dBi)	(dBi)	(dB)	(dB)
Band IV	3.90	6.40	6.40	8.25	0.40	2.25

Calculation example:

If a device has two antenna, G_{ANT1}= 3.9dBi; G_{ANT2}=6.4dBi

Directional gain of power measurement = max(3.9, 6.4) + 0 = 6.4 dBi

Directional gain of PSD derived from formula which is

10 x log { { [10^ (3.90 dBi / 20) + 10^ (6.40 dBi / 20)] ^ 2 } / 2 }

= 8.25 dBi

Power and PSD limit reduction = Composite gain – 6dBi, (min = 0)

1.2 Modification of EUT

No modifications made to the EUT during the testing.

1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	CO05-HY (TAF Code: 1190)
Remark	The Conducted Emission test item subcontracted to Sporton International Inc. EMC & Wireless Communications Laboratory.

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	TH05-HY, 03CH13-HY

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

FCC designation No.: TW1190 and TW3786

1.4 Applicable Standards

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

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

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, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and only the worst case emissions were reported 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)
5725-5850 MHz Band 4 (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 with "*" are 802.11n HT40 and 802.11ac VHT40 and 802.11ax HE40.
2. The above Frequency and Channel with "#" are 802.11ac VHT80 and 802.11ax HE80.

2.2 Test Mode

This device support 26/52/106/242/484/996-tone RU but does not support 2x996-tone RU on 160MHz channel.

The PSD of partial RU is reduced to be smaller than full RU according to TCB workshop interim guidance Oct. 2018.

The 802.11ax mode is investigated among different tones, full resource units (RU), partial resource units. The partial RU has no higher power than full RU's, thus the full RU is chosen as main test configuration.

The SISO mode conducted power is covered by MIMO mode per chain, so only the MIMO mode is tested.

The power for 802.11n and 802.11ac mode is smaller than 802.11ax mode, so all other conducted and radiated test is covered by 802.11ax mode.

The final test modes include the worst data rates for each modulation shown in the table below.

MIMO Mode

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20 (Covered by HE20)	MCS0
802.11n HT40 (Covered by HE40)	MCS0
802.11ac VHT20 (Covered by HE20)	MCS0
802.11ac VHT40 (Covered by HE40)	MCS0
802.11ac VHT80 (Covered by HE80)	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0
802.11ax HE80	MCS0

Remark: The conducted power level of each chain in MIMO mode is equal or higher than SISO mode.

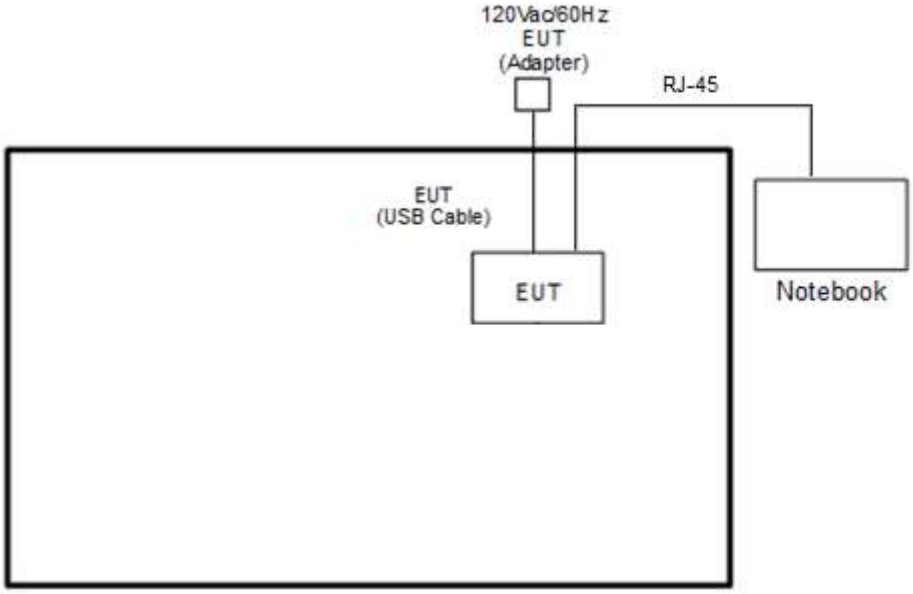
Test Cases	
AC Conducted Emission	Mode 1 : WLAN (5GHz) Link + LAN Link + USB Cable (Charging from Adapter)

Ch. #		Band IV：5725-5850 MHz			
		802.11a	802.11ax HE20	802.11ax HE40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

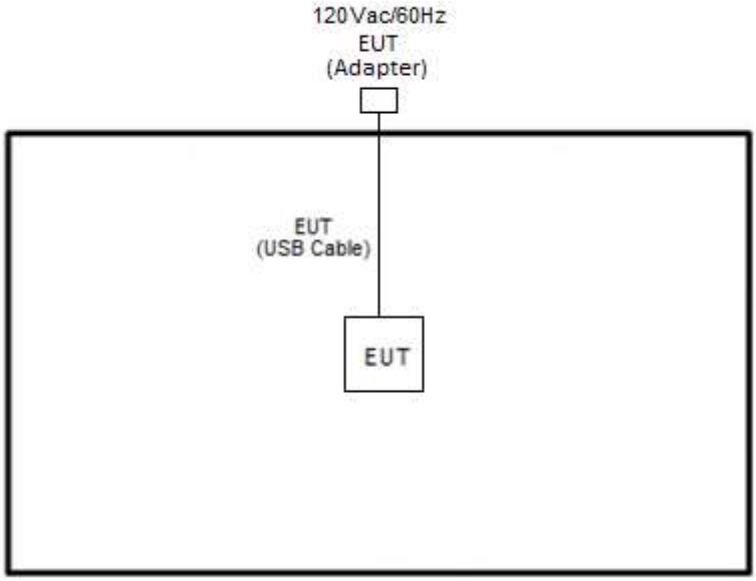
Remark: For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.

2.3 Connection Diagram of Test System

<AC Conducted Emission Mode>



<WLAN Tx Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
2.	Notebook	Acer	N18Q13	PD9AX201NG	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT 4.0.00195.0” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10 dB attenuator.

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

= 4.2 + 10 = 14.2 (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.

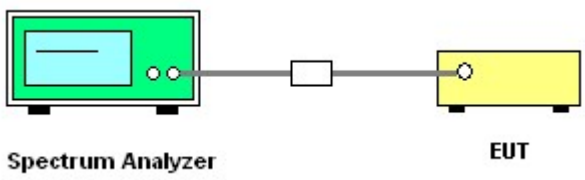
3.1.2 Measuring Instruments

Please refer to the measuring equipment list in 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 5.725-5.85 GHz
2. Set RBW = 100 kHz.
3. 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

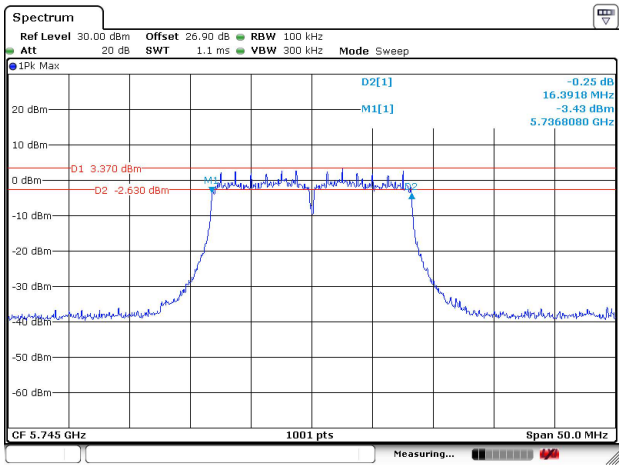
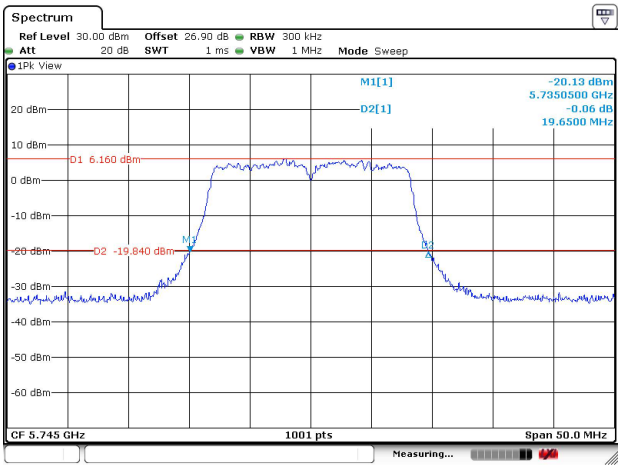
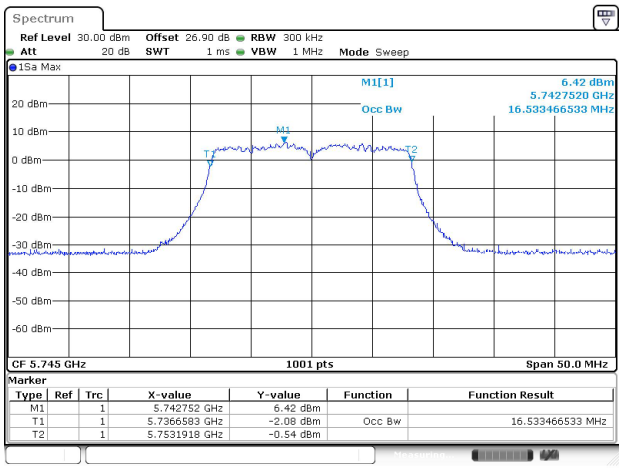


3.1.5 Test Result of 6dB and 26dB and 99% Occupied Bandwidth

Please refer to Appendix A.

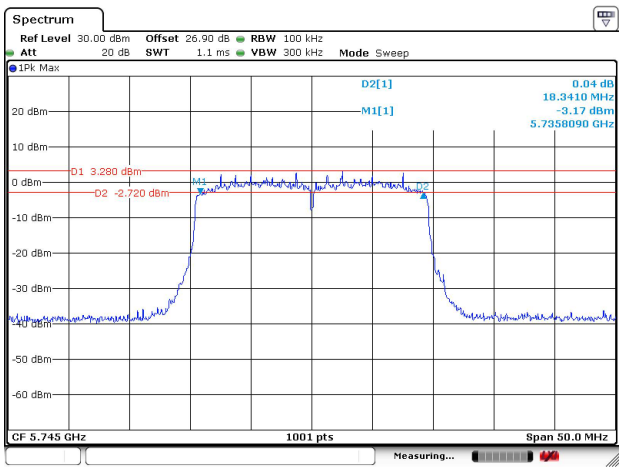
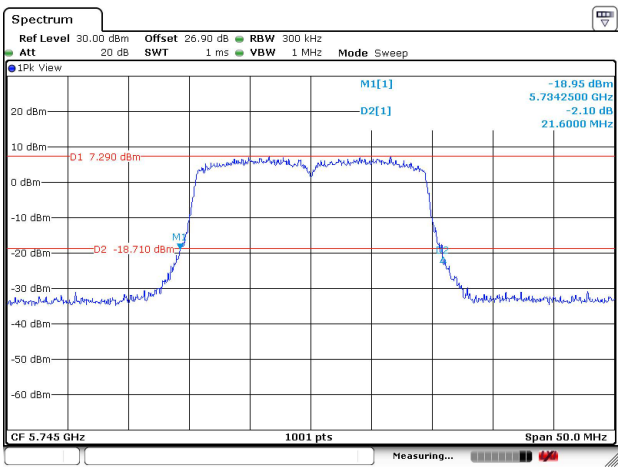
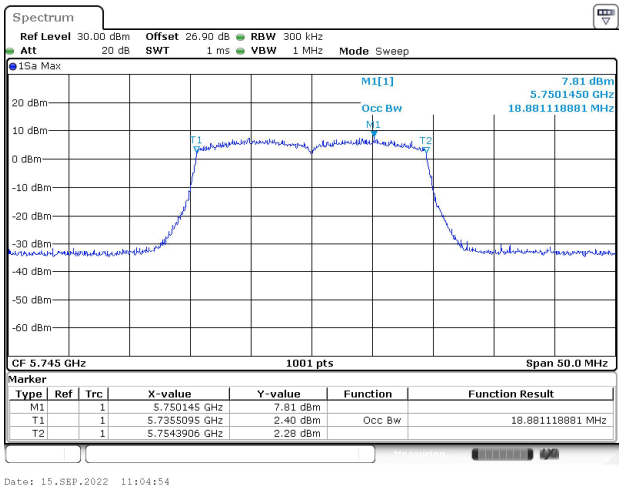
MIMO <Ant. 0+1>

<802.11a>

6dB Bandwidth	26dB Bandwidth
	
99% Occupied Bandwidth	**NA**
	

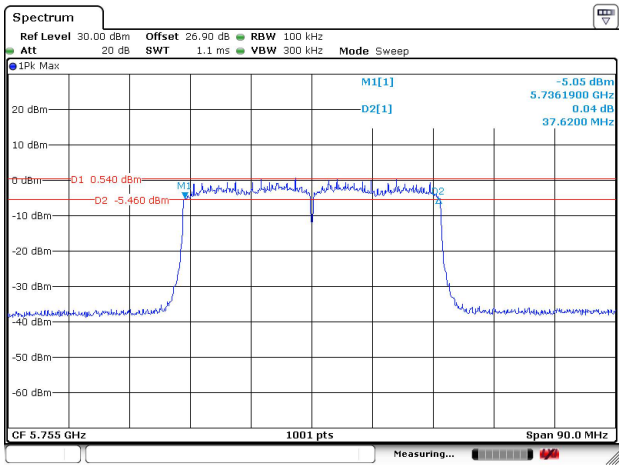
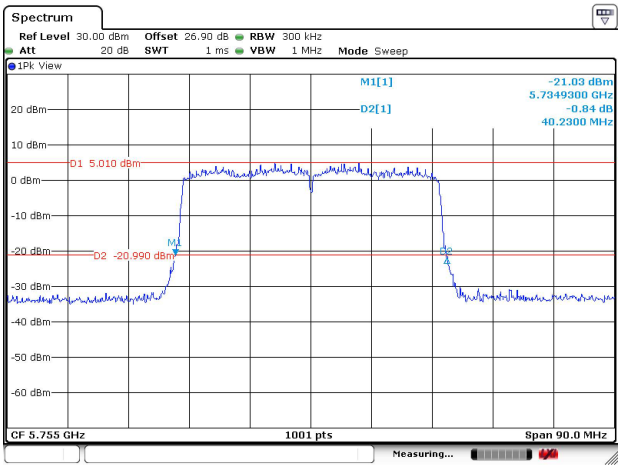
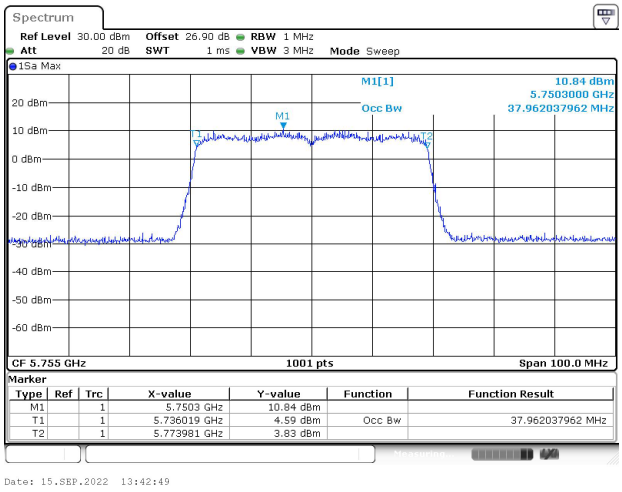
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<802.11ax HE20>

6dB Bandwidth	26dB Bandwidth
	
99% Occupied Bandwidth	**NA**
	

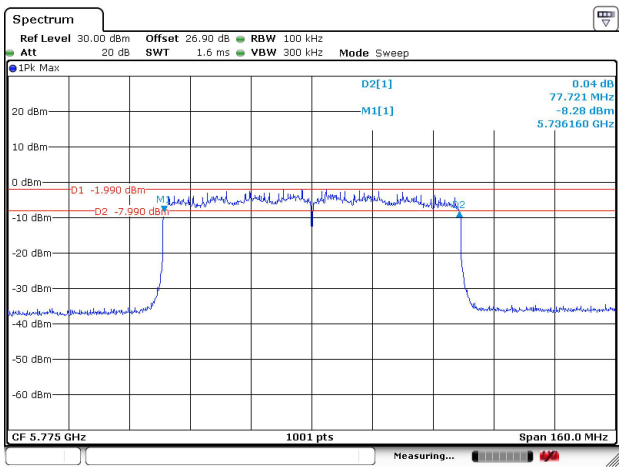
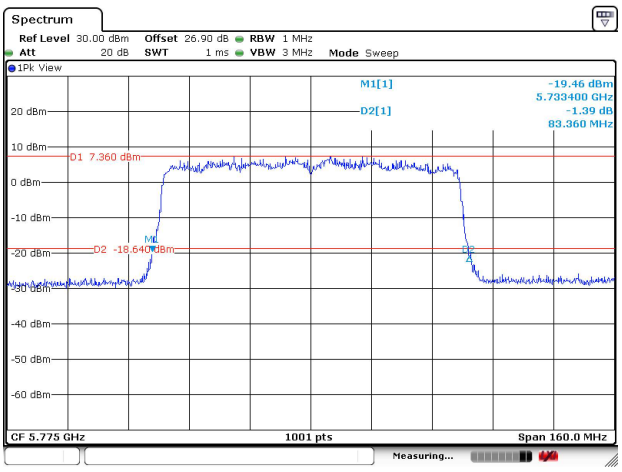
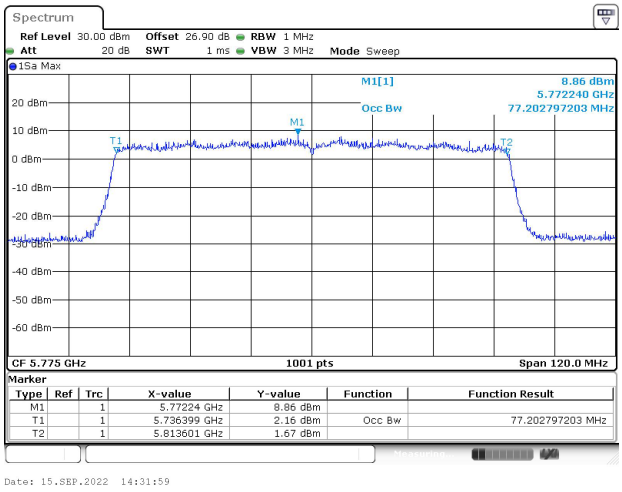
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<802.11ax HE40>

6dB Bandwidth	26dB Bandwidth
	
99% Occupied Bandwidth	**NA**
	

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

<802.11ax HE80>

6dB Bandwidth	26dB Bandwidth
	
99% Occupied Bandwidth	**NA**
	

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.

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

Please refer to the measuring equipment list in this test report.

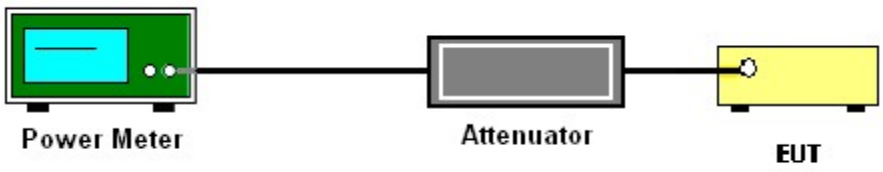
3.2.3 Test Procedures

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

Method PM-G (Measurement using a gated RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter.
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01

3.2.4 Test Setup



3.2.5 Test Result of 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.

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

Please refer to the measuring equipment list in 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.

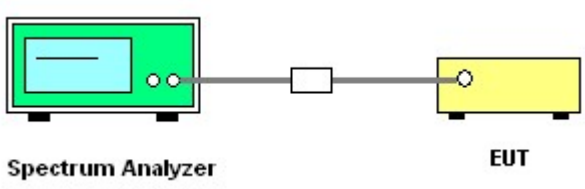
 # Method SA-3 #

(power averaging (rms) detection with max hold):

- 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.
- Add 10 log (500 kHz/RBW) to the measured result, whereas RBW (<500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement
- Sweep time ≤ (number of points in sweep) × 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.
  Detector = power averaging (rms).
- Trace mode = max hold.
- Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

1. The RF output of EUT is 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.

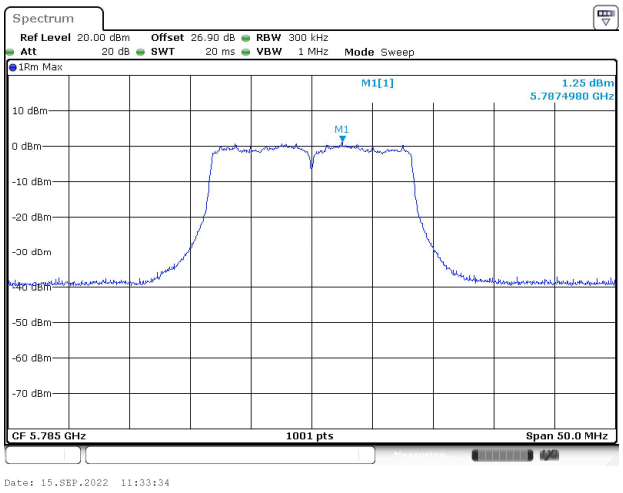
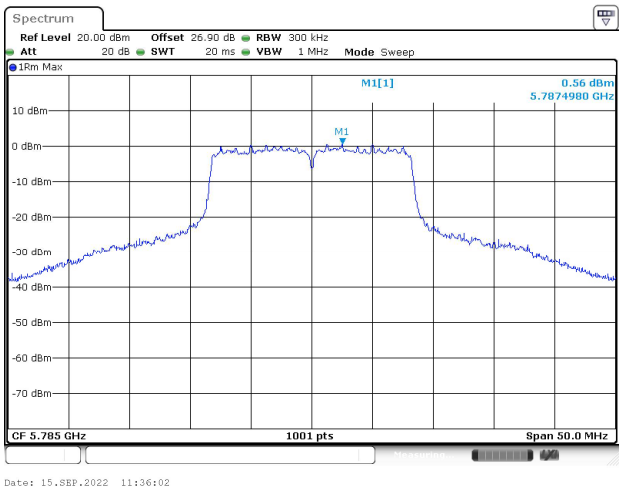
3.3.4 Test Setup



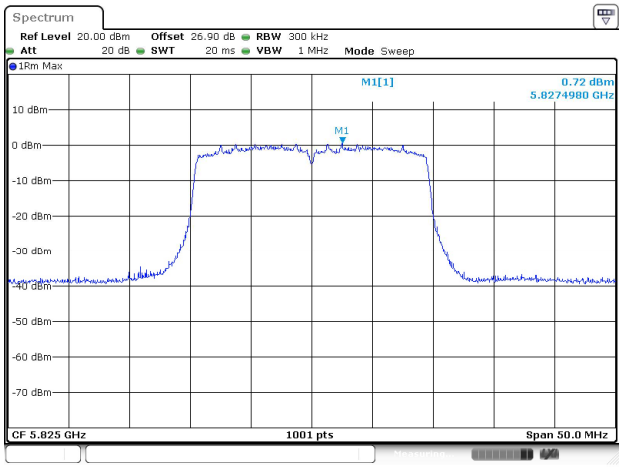
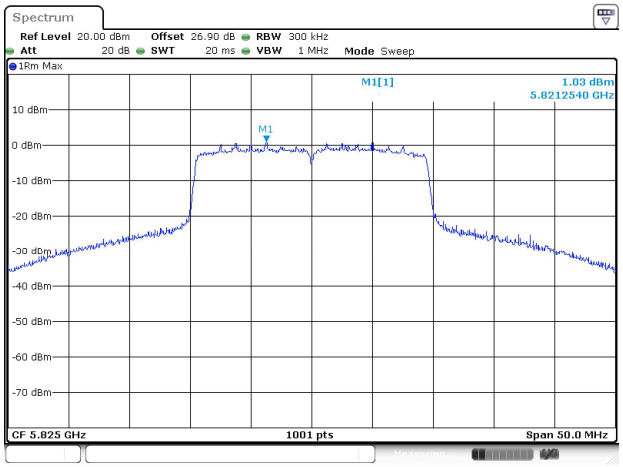
3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

<802.11a>

Maximum Power Density Plot (dBm/300kHz)	
MIMO Ant. 0	**MIMO Ant. 1**
	

<802.11ax HE20>

Maximum Power Density Plot (dBm/300kHz)	
MIMO Ant. 0	**MIMO Ant. 1**
	

<802.11ax HE40>

Maximum Power Density Plot (dBm/300kHz)	
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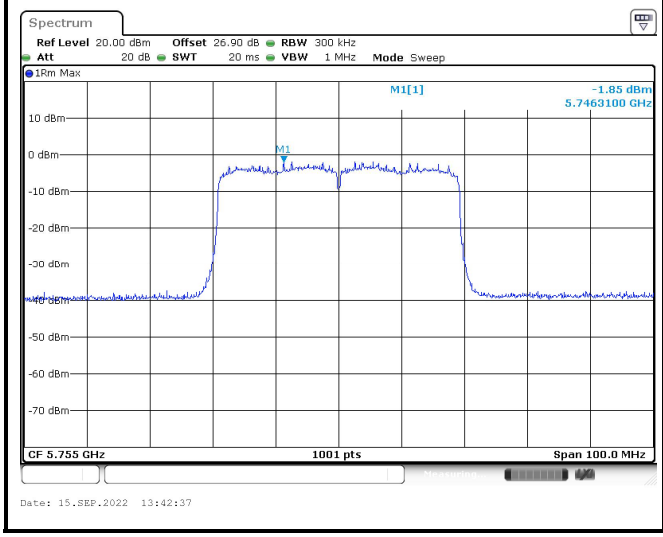
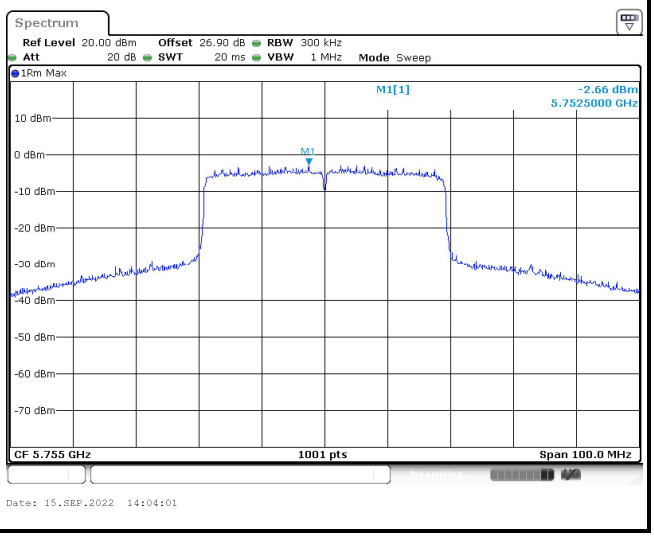
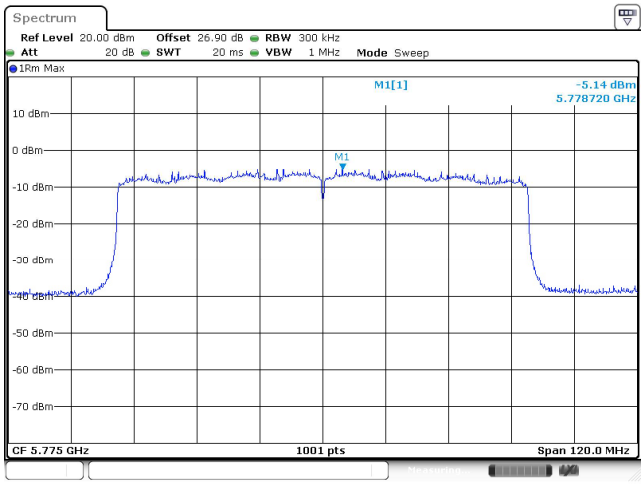
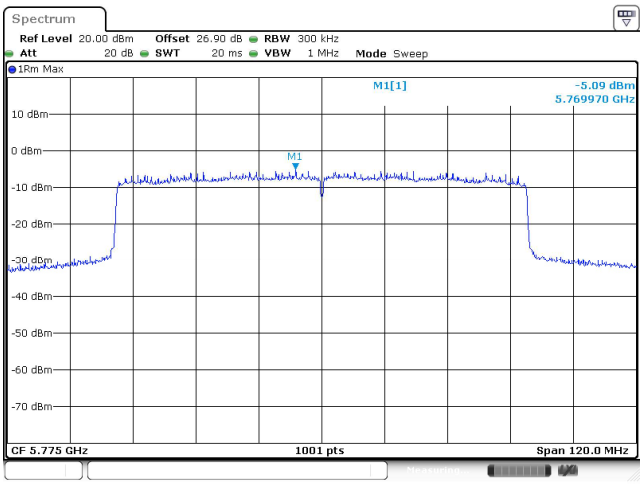
	

<802.11ax HE80>

Maximum Power Density Plot (dBm/300kHz)	
MIMO Ant. 0	**MIMO Ant. 1**
	

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 falls 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

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

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

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

(3) KDB789033 D02 v02r01 G)2)c)

(i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of −27 dBm/MHz.

(ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

3.4.2 Measuring Instruments

Please refer to the measuring equipment list in 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 1000 MHz
   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

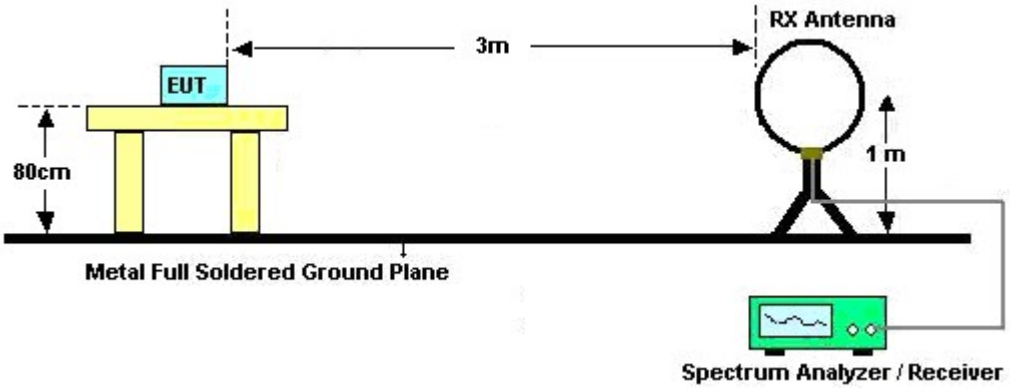
   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

   (3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz
   - 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 is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT is set 3 meters away from the receiving antenna which is 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 is 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. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-“..
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies.

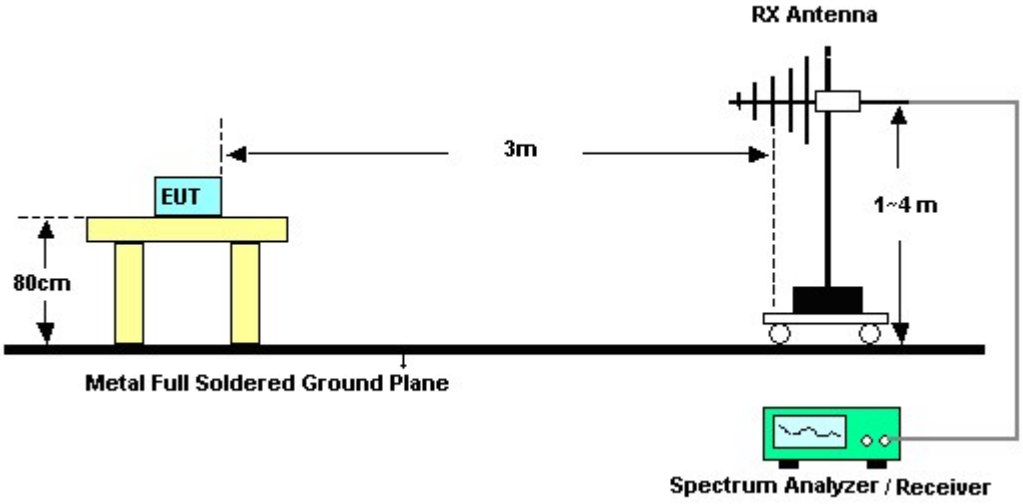
   When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as “-“.

3.4.4 Test Setup

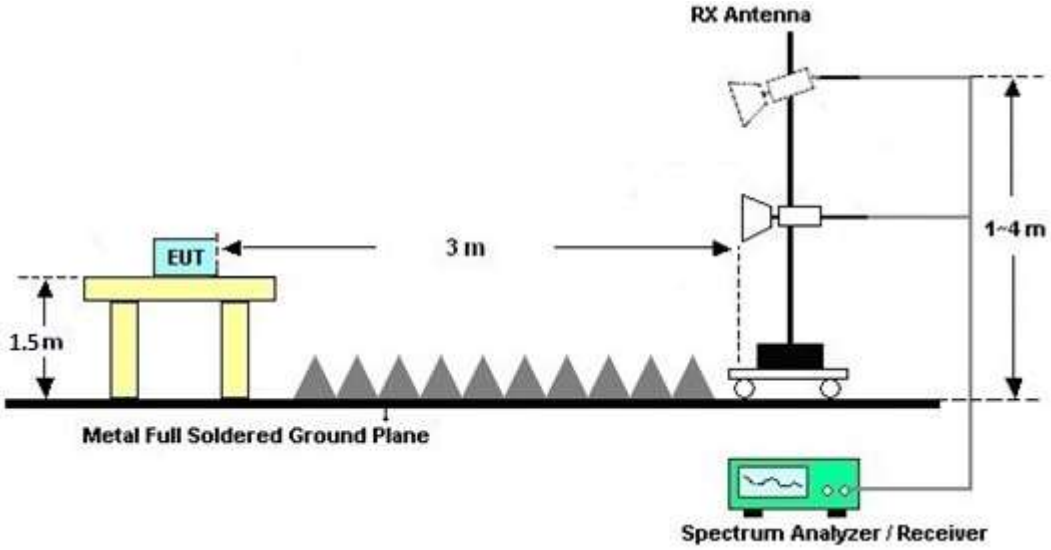
For radiated emissions below 30MHz



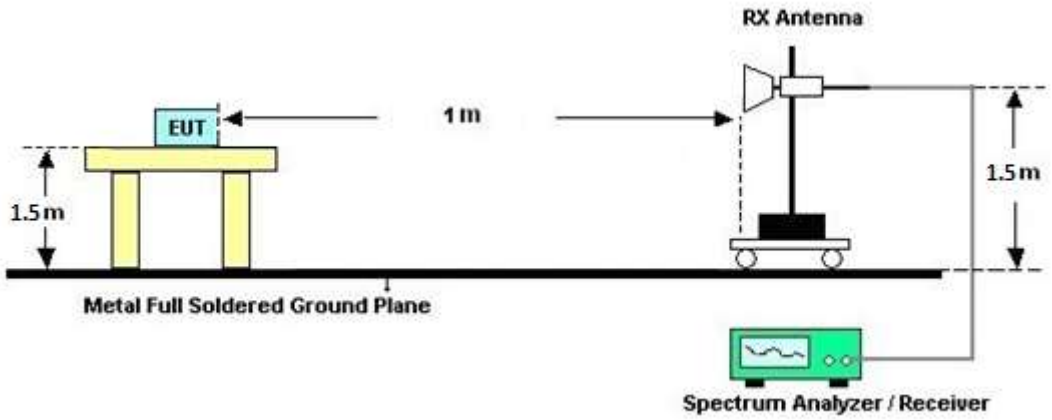
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



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

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

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix C and D.

3.4.7 Duty Cycle

Please refer to Appendix E.

3.4.8 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C and 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.

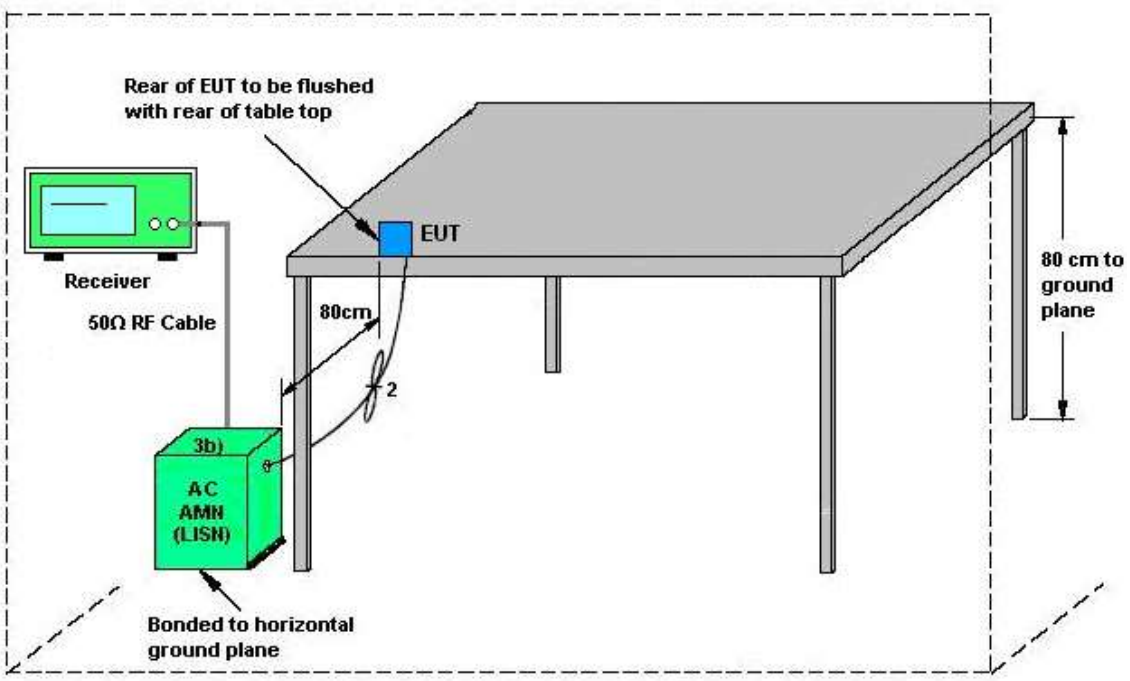
3.5.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.5.3 Test Procedures

1. The EUT is placed 0.4 meter away from the conducting wall of the shielding room, and is 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 shall be used.
6. Both Line and Neutral shall be tested in order to find out the maximum conducted emission.
7. The frequency range from 150 kHz to 30 MHz is scanned.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Antenna Requirements

3.6.1 Standard Applicable

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Aug. 19, 2022~ Sep. 27, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	15I00041SNO 10 (NO:248)	10MHz~6GHz	Dec. 29, 2021	Aug. 19, 2022~ Sep. 27, 2022	Dec. 28, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101905	10Hz - 40GHz (amp)	Aug. 03, 2022	Aug. 19, 2022~ Sep. 27, 2022	Aug. 02, 2023	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	May 13, 2022	Aug. 31, 2022~ Sep. 09, 2022	May 12, 2023	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 24, 2021	Aug. 31, 2022~ Sep. 09, 2022	Dec. 23, 2022	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00993	18GHz-40GHz	Nov. 30, 2021	Aug. 31, 2022~ Sep. 09, 2022	Nov. 29, 2022	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 21, 2022	Aug. 31, 2022~ Sep. 09, 2022	Feb. 20, 2023	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz~40GHz	May 14, 2022	Aug. 31, 2022~ Sep. 09, 2022	May 13, 2023	Radiation (03CH13-HY)
Amplifier	SONOMA	310N	187282	9kHz~1GHz	Dec. 15, 2021	Aug. 31, 2022~ Sep. 09, 2022	Dec. 14, 2022	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	40103 & 07	30MHz~1GHz	Apr. 24, 2022	Aug. 31, 2022~ Sep. 09, 2022	Apr. 23, 2023	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	41912 & 05	30MHz~1GHz	Feb. 06, 2022	Aug. 31, 2022~ Sep. 09, 2022	Feb. 05, 2023	Radiation (03CH13-HY)
Hygrometer	TECPEL	DTM-303B	TP200889	N/A	Sep. 30, 2021	Aug. 31, 2022~ Sep. 09, 2022	Sep. 29, 2022	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz~18GHz	May 17, 2022	Aug. 31, 2022~ Sep. 09, 2022	May 16, 2023	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Oct. 26, 2021	Aug. 31, 2022~ Sep. 09, 2022	Oct. 25, 2022	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 18, 2022	Aug. 31, 2022~ Sep. 09, 2022	Mar. 17, 2023	Radiation (03CH13-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN12	1.53GHz Low Pass Filter	Sep. 14, 2021	Aug. 31, 2022~ Sep. 09, 2022	Sep. 13, 2022	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-1080 -1200-15000-60SS	SN3	1.2GHz High Pass Filter	Jun. 30, 2022	Aug. 31, 2022~ Sep. 09, 2022	Jun. 29, 2023	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-60SS	SN2	3GHz High Pass Filter	Jul. 12, 2022	Aug. 31, 2022~ Sep. 09, 2022	Jul. 11, 2023	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30MHz~18GHz	Feb. 09, 2022	Aug. 31, 2022~ Sep. 09, 2022	Feb. 08, 2023	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	804793/4	30MHz~18GHz	Feb. 09, 2022	Aug. 31, 2022~ Sep. 09, 2022	Feb. 08, 2023	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9 kHz~30 MHz	Mar. 10, 2022	Aug. 31, 2022~ Sep. 09, 2022	Mar. 09, 2023	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24961/4	30MHz~18GHz	Feb. 09, 2022	Aug. 31, 2022~ Sep. 09, 2022	Feb. 08, 2023	Radiation (03CH13-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Aug. 31, 2022~ Sep. 09, 2022	N/A	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Aug. 31, 2022~ Sep. 09, 2022	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Aug. 31, 2022~ Sep. 09, 2022	N/A	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1-18GHz	Jul. 25, 2022	Aug. 31, 2022~ Sep. 09, 2022	Jul. 24, 2023	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1212	1GHz~18GHz	Mar. 10, 2022	Aug. 31, 2022~ Sep. 09, 2022	Mar. 09, 2023	Radiation (03CH13-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Aug. 26, 2022	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 01, 2021	Aug. 26, 2022	Nov. 30, 2022	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 17, 2021	Aug. 26, 2022	Nov. 16, 2022	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 03, 2021	Aug. 26, 2022	Dec. 02, 2022	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	Aug. 26, 2022	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	N/A	Aug. 01, 2022	Aug. 26, 2022	Jul. 31, 2023	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 30, 2021	Aug. 26, 2022	Dec. 29, 2022	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.1 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.0 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.2 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.9 dB**

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Eason Huang	Temperature:	21~25	°C
Test Date:	2022/08/19~2022/09/27	Relative Humidity:	51~54	%

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

Band IV 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 0	Ant 1	Ant 0	Ant 1	Ant 0	Ant 1		
11a	6Mbps	2	149	5745	16.53	16.53	19.65	25.00	16.39	16.39	0.5	Pass
11a	6Mbps	2	157	5785	16.53	16.68	19.55	28.65	16.39	16.39	0.5	Pass
11a	6Mbps	2	165	5825	16.48	16.58	19.80	25.00	16.39	16.39	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1	
11a	6Mbps	2	149	5745	14.40	13.70	17.07	29.60		6.40		Pass
11a	6Mbps	2	157	5785	14.60	14.00	17.32	29.60		6.40		Pass
11a	6Mbps	2	165	5825	13.90	13.80	16.86	29.60		6.40		Pass
HT20	MCS0	2	149	5745	14.10	13.50	16.82	29.60		6.40		Pass
HT20	MCS0	2	157	5785	14.40	13.80	17.12	29.60		6.40		Pass
HT20	MCS0	2	165	5825	14.00	13.90	16.96	29.60		6.40		Pass
HT40	MCS0	2	151	5755	14.10	13.60	16.87	29.60		6.40		Pass
HT40	MCS0	2	159	5795	14.10	13.90	17.01	29.60		6.40		Pass
VHT20	MCS0	2	149	5745	14.10	13.50	16.82	29.60		6.40		Pass
VHT20	MCS0	2	157	5785	14.40	13.80	17.12	29.60		6.40		Pass
VHT20	MCS0	2	165	5825	14.00	13.90	16.96	29.60		6.40		Pass
VHT40	MCS0	2	151	5755	14.10	13.60	16.87	29.60		6.40		Pass
VHT40	MCS0	2	159	5795	14.10	13.90	17.01	29.60		6.40		Pass
VHT80	MCS0	2	155	5775	14.20	13.90	17.06	29.60		6.40		Pass

TEST RESULTS DATA
Power Spectral Density

Band IV MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 0	Ant 1	Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1	
11a	6Mbps	2	149	5745	2.22		3.33	2.68	6.34	27.75		8.25		Pass
11a	6Mbps	2	157	5785	2.22		3.47	2.78	6.48	27.75		8.25		Pass
11a	6Mbps	2	165	5825	2.22		2.87	2.92	5.93	27.75		8.25		Pass

Note: PSD Sum = Max PSD(Ant. 0, Ant. 1) + 10 log (n)

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

Band IV 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 0	Ant 1	Ant 0	Ant 1	Ant 0	Ant 1		
HE20	MCS0	2	149	5745	Full	18.88	19.03	21.60	25.40	18.34	18.84	0.5	Pass
HE20	MCS0	2	157	5785	Full	18.88	19.13	21.40	25.80	18.64	18.84	0.5	Pass
HE20	MCS0	2	165	5825	Full	18.88	19.18	21.60	31.90	18.79	18.74	0.5	Pass
HE40	MCS0	2	151	5755	Full	37.96	38.16	40.23	41.22	37.62	37.96	0.5	Pass
HE40	MCS0	2	159	5795	Full	37.96	38.36	40.32	51.84	37.96	38.14	0.5	Pass
HE80	MCS0	2	155	5775	Full	77.20	77.68	83.36	100.32	77.72	77.72	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
						Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1	
HE20	MCS0	2	149	5745	Full	14.20	13.60	16.92	29.60		6.40		Pass
HE20	MCS0	2	149	5745	26/0	6.70	7.20	9.97	29.60		6.40		Pass
HE20	MCS0	2	149	5745	52/37	8.70	9.10	11.91	29.60		6.40		Pass
HE20	MCS0	2	149	5745	106/53	12.20	11.60	14.92	29.60		6.40		Pass
HE20	MCS0	2	149	5745	242/61	14.50	13.60	17.08	29.60		6.40		Pass
HE20	MCS0	2	157	5785	Full	14.50	13.90	17.22	29.60		6.40		Pass
HE20	MCS0	2	157	5785	26/4	6.60	7.10	9.87	29.60		6.40		Pass
HE20	MCS0	2	157	5785	52/38	9.40	9.60	12.51	29.60		6.40		Pass
HE20	MCS0	2	157	5785	106/53	12.70	12.50	15.61	29.60		6.40		Pass
HE20	MCS0	2	157	5785	242/61	14.60	13.90	17.27	29.60		6.40		Pass
HE20	MCS0	2	165	5825	Full	14.10	14.00	17.06	29.60		6.40		Pass
HE20	MCS0	2	165	5825	26/8	6.80	7.60	10.23	29.60		6.40		Pass
HE20	MCS0	2	165	5825	52/40	9.50	9.50	12.51	29.60		6.40		Pass
HE20	MCS0	2	165	5825	106/54	12.00	12.20	15.11	29.60		6.40		Pass
HE20	MCS0	2	165	5825	242/61	14.20	14.00	17.11	29.60		6.40		Pass
HE40	MCS0	2	151	5755	Full	14.20	13.70	16.97	29.60		6.40		Pass
HE40	MCS0	2	151	5755	484/65	14.50	13.70	17.13	29.60		6.40		Pass
HE40	MCS0	2	159	5795	Full	14.20	14.00	17.11	29.60		6.40		Pass
HE40	MCS0	2	159	5795	484/65	14.40	14.00	17.21	29.60		6.40		Pass
HE80	MCS0	2	155	5775	Full	14.30	14.00	17.16	29.60		6.40		Pass
HE80	MCS0	2	155	5775	996/67	14.50	13.90	17.22	29.60		6.40		Pass

TEST RESULTS DATA
Power Spectral Density

Band IV MIMO														
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	RU Config.	10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
						Ant 0	Ant 1	Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1	
HE20	MCS0	2	149	5745	Full	2.22		3.14	2.72	6.15	27.75		8.25		Pass
HE20	MCS0	2	149	5745	26/0	2.22		3.06	2.49	6.07	27.75		8.25		Pass
HE20	MCS0	2	149	5745	52/37	2.22		2.79	2.43	5.80	27.75		8.25		Pass
HE20	MCS0	2	149	5745	106/53	2.22		2.79	2.61	5.80	27.75		8.25		Pass
HE20	MCS0	2	149	5745	242/61	2.22		2.58	1.80	5.59	27.75		8.25		Pass
HE20	MCS0	2	157	5785	Full	2.22		3.15	2.79	6.16	27.75		8.25		Pass
HE20	MCS0	2	157	5785	26/4	2.22		2.69	2.66	5.70	27.75		8.25		Pass
HE20	MCS0	2	157	5785	52/38	2.22		2.80	2.58	5.81	27.75		8.25		Pass
HE20	MCS0	2	157	5785	106/53	2.22		3.14	2.70	6.15	27.75		8.25		Pass
HE20	MCS0	2	157	5785	242/61	2.22		2.53	2.27	5.54	27.75		8.25		Pass
HE20	MCS0	2	165	5825	Full	2.22		2.94	3.25	6.26	27.75		8.25		Pass
HE20	MCS0	2	165	5825	26/8	2.22		2.93	3.15	6.16	27.75		8.25		Pass
HE20	MCS0	2	165	5825	52/40	2.22		2.53	3.04	6.05	27.75		8.25		Pass
HE20	MCS0	2	165	5825	106/54	2.22		2.73	3.05	6.06	27.75		8.25		Pass
HE20	MCS0	2	165	5825	242/61	2.22		2.44	2.39	5.45	27.75		8.25		Pass
HE40	MCS0	2	151	5755	Full	2.22		0.37	-0.44	3.38	27.75		8.25		Pass
HE40	MCS0	2	151	5755	484/65	2.22		-0.79	-1.75	2.22	27.75		8.25		Pass
HE40	MCS0	2	159	5795	Full	2.22		-0.05	0.02	3.03	27.75		8.25		Pass
HE40	MCS0	2	159	5795	484/65	2.22		-0.67	-0.78	2.34	27.75		8.25		Pass
HE80	MCS0	2	155	5775	Full	2.22		-2.92	-2.87	0.14	27.75		8.25		Pass
HE80	MCS0	2	155	5775	996/67	2.22		-3.27	-4.24	-0.26	27.75		8.25		Pass

Note: PSD Sum = Max PSD(Ant. 0, Ant. 1) + 10 log (n)

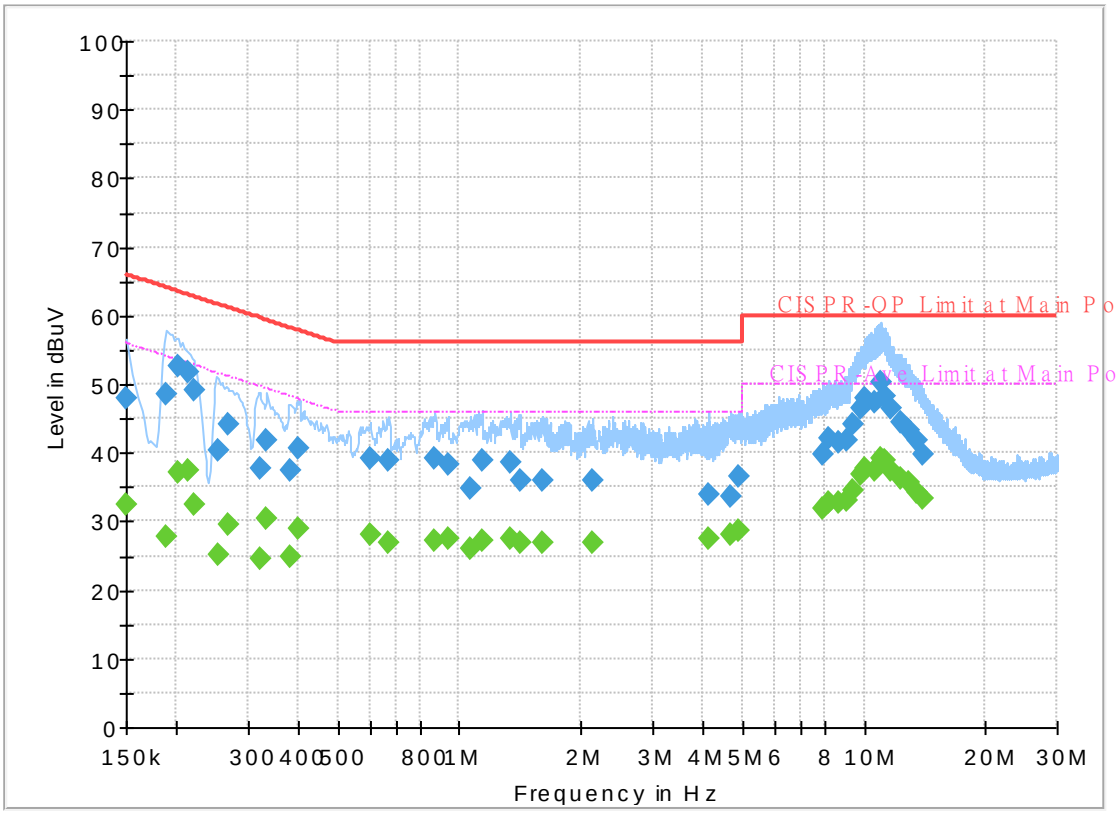
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Calvin Wang	**Temperature :**	23~26℃
		Relative Humidity :	45~55%

EUT Information

Report NO :	1D2409
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

Full Spectrum



Final_Result

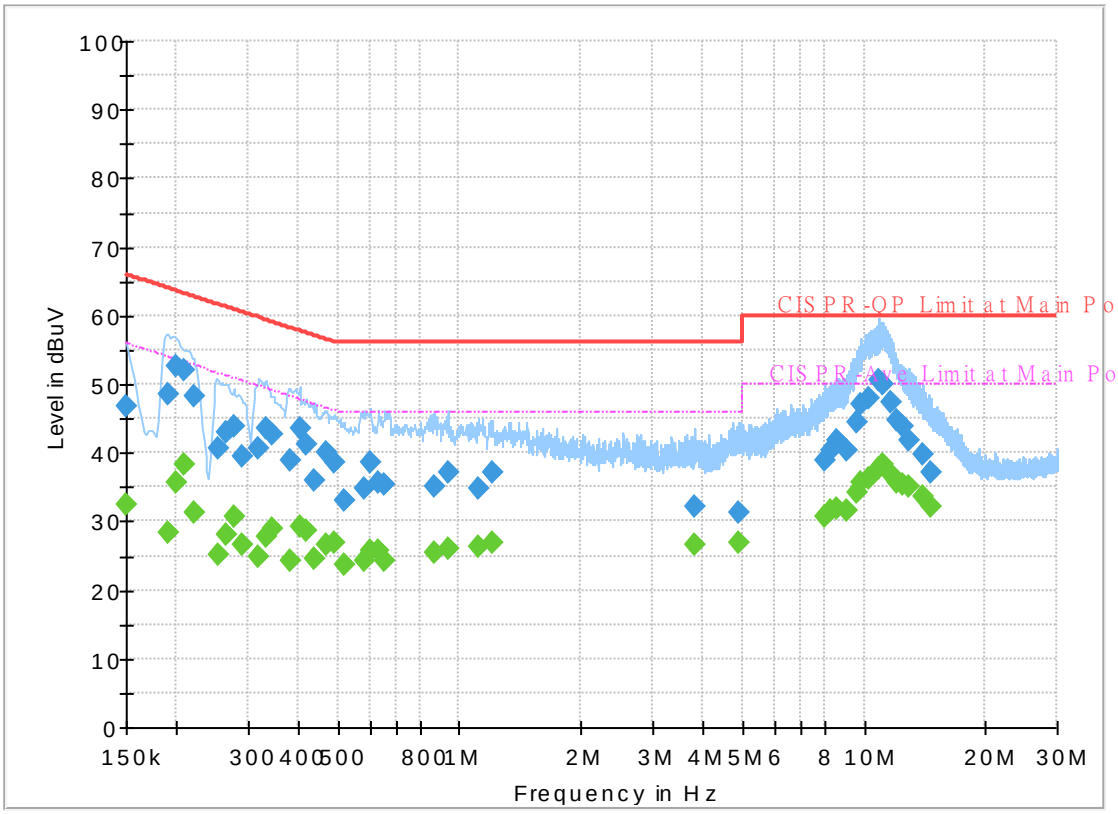
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	32.45	56.00	23.55	L1	OFF	19.8
0.150000	48.07	---	66.00	17.93	L1	OFF	19.8
0.188250	---	27.71	54.11	26.40	L1	OFF	19.8
0.188250	48.53	---	64.11	15.58	L1	OFF	19.8
0.201750	---	37.01	53.54	16.53	L1	OFF	19.8
0.201750	52.57	---	63.54	10.97	L1	OFF	19.8
0.213000	---	37.42	53.09	15.67	L1	OFF	19.8
0.213000	51.63	---	63.09	11.46	L1	OFF	19.8
0.219750	---	32.33	52.83	20.50	L1	OFF	19.8
0.219750	48.99	---	62.83	13.84	L1	OFF	19.8
0.253500	---	25.27	51.64	26.37	L1	OFF	19.8
0.253500	40.24	---	61.64	21.40	L1	OFF	19.8
0.269250	---	29.67	51.14	21.47	L1	OFF	19.8
0.269250	44.12	---	61.14	17.02	L1	OFF	19.8
0.321000	---	24.64	49.68	25.04	L1	OFF	19.8
0.321000	37.80	---	59.68	21.88	L1	OFF	19.8
0.334500	---	30.31	49.34	19.03	L1	OFF	19.8
0.334500	41.67	---	59.34	17.67	L1	OFF	19.8
0.384000	---	24.72	48.19	23.47	L1	OFF	19.8
0.384000	37.42	---	58.19	20.77	L1	OFF	19.8
0.399750	---	28.92	47.86	18.94	L1	OFF	19.8

0.399750	40.59	---	57.86	17.27	L1	OFF	19.8
0.602250	---	27.93	46.00	18.07	L1	OFF	19.9
0.602250	39.11	---	56.00	16.89	L1	OFF	19.9
0.669750	---	26.96	46.00	19.04	L1	OFF	19.9
0.669750	38.79	---	56.00	17.21	L1	OFF	19.9
0.870000	---	27.18	46.00	18.82	L1	OFF	19.9
0.870000	39.06	---	56.00	16.94	L1	OFF	19.9
0.937500	---	27.52	46.00	18.48	L1	OFF	19.9
0.937500	38.21	---	56.00	17.79	L1	OFF	19.9
1.061250	---	26.07	46.00	19.93	L1	OFF	19.9
1.061250	34.79	---	56.00	21.21	L1	OFF	19.9
1.137750	---	27.27	46.00	18.73	L1	OFF	19.9
1.137750	38.95	---	56.00	17.05	L1	OFF	19.9
1.338000	---	27.45	46.00	18.55	L1	OFF	19.9
1.338000	38.51	---	56.00	17.49	L1	OFF	19.9
1.407750	---	27.03	46.00	18.97	L1	OFF	19.9
1.407750	35.85	---	56.00	20.15	L1	OFF	19.9
1.601250	---	26.89	46.00	19.11	L1	OFF	19.9
1.601250	36.11	---	56.00	19.89	L1	OFF	19.9
2.141250	---	27.01	46.00	18.99	L1	OFF	19.9
2.141250	35.98	---	56.00	20.02	L1	OFF	19.9
4.146000	---	27.45	46.00	18.55	L1	OFF	20.0
4.146000	34.01	---	56.00	21.99	L1	OFF	20.0
4.679250	---	28.14	46.00	17.86	L1	OFF	20.0
4.679250	33.71	---	56.00	22.29	L1	OFF	20.0
4.881750	---	28.60	46.00	17.40	L1	OFF	20.0
4.881750	36.52	---	56.00	19.48	L1	OFF	20.0
7.903500	---	31.82	50.00	18.18	L1	OFF	20.2
7.903500	39.71	---	60.00	20.29	L1	OFF	20.2
8.162250	---	32.86	50.00	17.14	L1	OFF	20.2
8.162250	42.21	---	60.00	17.79	L1	OFF	20.2
8.702250	---	32.84	50.00	17.16	L1	OFF	20.2
8.702250	41.58	---	60.00	18.42	L1	OFF	20.2
9.096000	---	32.96	50.00	17.04	L1	OFF	20.2
9.096000	41.72	---	60.00	18.28	L1	OFF	20.2
9.368250	---	34.62	50.00	15.38	L1	OFF	20.2
9.368250	44.09	---	60.00	15.91	L1	OFF	20.2
9.771000	---	36.78	50.00	13.22	L1	OFF	20.3
9.771000	46.48	---	60.00	13.52	L1	OFF	20.3
10.038750	---	37.74	50.00	12.26	L1	OFF	20.3
10.038750	47.93	---	60.00	12.07	L1	OFF	20.3
10.637250	---	37.31	50.00	12.69	L1	OFF	20.3
10.637250	47.47	---	60.00	12.53	L1	OFF	20.3
10.974750	---	39.08	50.00	10.92	L1	OFF	20.3
10.974750	50.18	---	60.00	9.82	L1	OFF	20.3
11.296500	---	38.82	50.00	11.18	L1	OFF	20.3
11.296500	48.30	---	60.00	11.70	L1	OFF	20.3
11.703750	---	37.45	50.00	12.55	L1	OFF	20.3
11.703750	46.59	---	60.00	13.41	L1	OFF	20.3
12.288750	---	36.34	50.00	13.66	L1	OFF	20.4
12.288750	44.37	---	60.00	15.63	L1	OFF	20.4
12.860250	---	35.70	50.00	14.30	L1	OFF	20.4
12.860250	43.24	---	60.00	16.76	L1	OFF	20.4
13.508250	---	34.24	50.00	15.76	L1	OFF	20.4
13.508250	41.72	---	60.00	18.28	L1	OFF	20.4
14.019000	---	33.26	50.00	16.74	L1	OFF	20.4
14.019000	39.90	---	60.00	20.10	L1	OFF	20.4

EUT Information

Report NO :	1D2409
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	32.32	56.00	23.68	N	OFF	19.8
0.150000	46.73	---	66.00	19.27	N	OFF	19.8
0.190500	---	28.28	54.02	25.74	N	OFF	19.8
0.190500	48.51	---	64.02	15.51	N	OFF	19.8
0.199500	---	35.67	53.63	17.96	N	OFF	19.8
0.199500	52.55	---	63.63	11.08	N	OFF	19.8
0.208500	---	38.25	53.27	15.02	N	OFF	19.8
0.208500	52.12	---	63.27	11.15	N	OFF	19.8
0.219750	---	31.36	52.83	21.47	N	OFF	19.8
0.219750	48.11	---	62.83	14.72	N	OFF	19.8
0.253500	---	25.21	51.64	26.43	N	OFF	19.8
0.253500	40.54	---	61.64	21.10	N	OFF	19.8
0.264750	---	28.09	51.28	23.19	N	OFF	19.8
0.264750	42.95	---	61.28	18.33	N	OFF	19.8
0.276000	---	30.67	50.94	20.27	N	OFF	19.8
0.276000	43.95	---	60.94	16.99	N	OFF	19.8
0.291750	---	26.50	50.47	23.97	N	OFF	19.8
0.291750	39.52	---	60.47	20.95	N	OFF	19.8
0.318750	---	24.85	49.74	24.89	N	OFF	19.8
0.318750	40.57	---	59.74	19.17	N	OFF	19.8
0.332250	---	27.89	49.40	21.51	N	OFF	19.8

0.332250	43.57	---	59.40	15.83	N	OFF	19.8
0.345750	---	29.07	49.06	19.99	N	OFF	19.8
0.345750	42.58	---	59.06	16.48	N	OFF	19.8
0.381750	---	24.24	48.24	24.00	N	OFF	19.8
0.381750	38.77	---	58.24	19.47	N	OFF	19.8
0.402000	---	29.15	47.81	18.66	N	OFF	19.8
0.402000	43.62	---	57.81	14.19	N	OFF	19.8
0.417750	---	28.65	47.49	18.84	N	OFF	19.8
0.417750	41.36	---	57.49	16.13	N	OFF	19.8
0.440250	---	24.52	47.06	22.54	N	OFF	19.8
0.440250	36.02	---	57.06	21.04	N	OFF	19.8
0.467250	---	26.62	46.56	19.94	N	OFF	19.8
0.467250	40.07	---	56.56	16.49	N	OFF	19.8
0.492000	---	26.84	46.13	19.29	N	OFF	19.8
0.492000	38.60	---	56.13	17.53	N	OFF	19.8
0.519000	---	23.80	46.00	22.20	N	OFF	19.8
0.519000	33.01	---	56.00	22.99	N	OFF	19.8
0.584250	---	24.19	46.00	21.81	N	OFF	19.8
0.584250	34.89	---	56.00	21.11	N	OFF	19.8
0.602250	---	25.62	46.00	20.38	N	OFF	19.8
0.602250	38.54	---	56.00	17.46	N	OFF	19.8
0.629250	---	25.70	46.00	20.30	N	OFF	19.8
0.629250	35.60	---	56.00	20.40	N	OFF	19.8
0.654000	---	24.33	46.00	21.67	N	OFF	19.8
0.654000	35.25	---	56.00	20.75	N	OFF	19.8
0.863250	---	25.48	46.00	20.52	N	OFF	19.9
0.863250	35.16	---	56.00	20.84	N	OFF	19.9
0.935250	---	26.01	46.00	19.99	N	OFF	19.9
0.935250	37.10	---	56.00	18.90	N	OFF	19.9
1.110750	---	26.30	46.00	19.70	N	OFF	19.9
1.110750	34.85	---	56.00	21.15	N	OFF	19.9
1.203000	---	26.90	46.00	19.10	N	OFF	19.9
1.203000	37.08	---	56.00	18.92	N	OFF	19.9
3.815250	---	26.49	46.00	19.51	N	OFF	20.0
3.815250	32.20	---	56.00	23.80	N	OFF	20.0
4.906500	---	26.81	46.00	19.19	N	OFF	20.0
4.906500	31.23	---	56.00	24.77	N	OFF	20.0
7.962000	---	30.59	50.00	19.41	N	OFF	20.2
7.962000	38.91	---	60.00	21.09	N	OFF	20.2
8.297250	---	31.43	50.00	18.57	N	OFF	20.2
8.297250	40.34	---	60.00	19.66	N	OFF	20.2
8.565000	---	31.89	50.00	18.11	N	OFF	20.2
8.565000	41.71	---	60.00	18.29	N	OFF	20.2
9.087000	---	31.50	50.00	18.50	N	OFF	20.2
9.087000	40.27	---	60.00	19.73	N	OFF	20.2
9.566250	---	34.28	50.00	15.72	N	OFF	20.2
9.566250	44.52	---	60.00	15.48	N	OFF	20.2
9.836250	---	35.73	50.00	14.27	N	OFF	20.3
9.836250	46.94	---	60.00	13.06	N	OFF	20.3
10.304250	---	36.30	50.00	13.70	N	OFF	20.3
10.304250	47.93	---	60.00	12.07	N	OFF	20.3
10.907250	---	37.70	50.00	12.30	N	OFF	20.3
10.907250	50.55	---	60.00	9.45	N	OFF	20.3
11.175000	---	38.31	50.00	11.69	N	OFF	20.3
11.175000	50.00	---	60.00	10.00	N	OFF	20.3
11.649750	---	36.84	50.00	13.16	N	OFF	20.3
11.649750	47.31	---	60.00	12.69	N	OFF	20.3
12.108750	---	35.55	50.00	14.45	N	OFF	20.4
12.108750	44.73	---	60.00	15.27	N	OFF	20.4
12.513750	---	35.47	50.00	14.53	N	OFF	20.4
12.513750	43.74	---	60.00	16.26	N	OFF	20.4
12.891750	---	35.06	50.00	14.94	N	OFF	20.4
12.891750	41.88	---	60.00	18.12	N	OFF	20.4
13.913250	---	33.61	50.00	16.39	N	OFF	20.4
13.913250	39.85	---	60.00	20.15	N	OFF	20.4
14.597250	---	32.22	50.00	17.78	N	OFF	20.5
14.597250	37.19	---	60.00	22.81	N	OFF	20.5

Appendix C. Radiated Spurious Emission

Test Engineer :	Mancy Chou, Jacky Hong and Rain Lee	Temperature :	20~25°C
		Relative Humidity :	50~60%

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0+1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		5641.4	52.48	-15.72	68.2	40.62	32	6.48	26.62	100	120	P	H
		5663.4	52.33	-25.82	78.15	40.39	32.08	6.49	26.63	100	120	P	H
		5719.6	54.24	-56.45	110.69	42.01	32.34	6.54	26.65	100	120	P	H
		5723.6	57.91	-61.1	119.01	45.66	32.35	6.55	26.65	100	120	P	H
	*	5745	108.94	-	-	96.65	32.39	6.56	26.66	100	120	P	H
	*	5745	102.37	-	-	90.08	32.39	6.56	26.66	100	120	A	H
													H
802.11a													H
CH 149		5611.2	52.04	-16.16	68.2	40.19	32	6.45	26.6	115	7	P	V
5745MHz		5686	54.63	-40.24	94.87	42.53	32.22	6.51	26.63	115	7	P	V
		5717.4	56.86	-53.21	110.07	44.64	32.33	6.54	26.65	115	7	P	V
		5724.6	64.28	-57.01	121.29	52.03	32.35	6.55	26.65	115	7	P	V
	*	5745	110.83	-	-	98.54	32.39	6.56	26.66	115	7	P	V
	*	5745	104.41	-	-	92.12	32.39	6.56	26.66	115	7	A	V
													V
													V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		5620.8	52.28	-15.92	68.2	40.43	32	6.46	26.61	100	122	P	H
		5655.4	54.28	-17.93	72.21	42.38	32.03	6.49	26.62	100	122	P	H
		5713.4	52.75	-56.2	108.95	40.53	32.33	6.54	26.65	100	122	P	H
		5721.4	51.67	-62.32	113.99	39.44	32.34	6.54	26.65	100	122	P	H
	*	5785	109.69	-	-	97.29	32.47	6.6	26.67	100	122	P	H
	*	5785	102.86	-	-	90.46	32.47	6.6	26.67	100	122	A	H
		5851.4	52.93	-66.08	119.01	40.48	32.51	6.64	26.7	100	122	P	H
		5869.8	52.74	-53.91	106.65	40.17	32.62	6.66	26.71	100	122	P	H
		5909.6	53.68	-25.88	79.56	40.9	32.82	6.68	26.72	100	122	P	H
		5932.2	52.09	-16.11	68.2	39.26	32.86	6.7	26.73	100	122	P	H
													H
802.11a CH 157 5785MHz													H
		5607.4	52.89	-15.31	68.2	41.04	32	6.45	26.6	120	10	P	V
		5686.4	52.49	-42.68	95.17	40.39	32.22	6.51	26.63	120	10	P	V
		5716.2	53.59	-56.15	109.74	41.37	32.33	6.54	26.65	120	10	P	V
		5722.4	51.95	-64.32	116.27	39.72	32.34	6.54	26.65	120	10	P	V
	*	5785	112.25	-	-	99.85	32.47	6.6	26.67	120	10	P	V
	*	5785	104.91	-	-	92.51	32.47	6.6	26.67	120	10	A	V
		5853.6	53.82	-60.17	113.99	41.36	32.52	6.64	26.7	120	10	P	V
		5871.4	53.42	-52.79	106.21	40.84	32.63	6.66	26.71	120	10	P	V
		5909.6	53.43	-26.13	79.56	40.65	32.82	6.68	26.72	120	10	P	V
		5925.6	53.25	-14.95	68.2	40.44	32.85	6.69	26.73	120	10	P	V
													V
													V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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)
	*	5825	111.06	-	-	98.62	32.5	6.63	26.69	100	230	P	H
	*	5825	103	-	-	90.56	32.5	6.63	26.69	100	230	A	H
		5852.6	58.37	-57.9	116.27	45.91	32.52	6.64	26.7	100	230	P	H
		5855.4	56.13	-54.56	110.69	43.65	32.53	6.65	26.7	100	230	P	H
		5877	54.22	-49.49	103.71	41.61	32.66	6.66	26.71	100	230	P	H
		5939.2	53.26	-14.94	68.2	40.42	32.88	6.7	26.74	100	230	P	H
													H
802.11a													H
CH 165	*	5825	111.41	-	-	98.97	32.5	6.63	26.69	120	8	P	V
5825MHz	*	5825	105.1	-	-	92.66	32.5	6.63	26.69	120	8	A	V
		5850.2	59.91	-61.83	121.74	47.47	32.5	6.64	26.7	120	8	P	V
		5856.6	56.33	-54.02	110.35	43.84	32.54	6.65	26.7	120	8	P	V
		5910.6	53.36	-25.46	78.82	40.58	32.82	6.68	26.72	120	8	P	V
		5935.6	53	-15.2	68.2	40.16	32.87	6.7	26.73	120	8	P	V
													V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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)
802.11a CH 149 5745MHz		11490	45.53	-28.47	74	51.05	40.18	10.38	56.08	-	-	P	H
		17235	45.96	-22.24	68.2	49.47	40.2	12.86	56.57	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		11490	45.37	-28.63	74	50.89	40.18	10.38	56.08	-	-	P	V
		17235	46.5	-21.7	68.2	50.01	40.2	12.86	56.57	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		11570	45.44	-28.56	74	51.04	40.06	10.41	56.07	-	-	P	H
		17355	47.71	-20.49	68.2	50.87	40.64	12.99	56.79	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11a CH 157 5785MHz													H
		11570	44.88	-29.12	74	50.48	40.06	10.41	56.07	-	-	P	V
		17355	47.63	-20.57	68.2	50.79	40.64	12.99	56.79	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		11650	46.04	-27.96	74	51.86	39.8	10.45	56.07	-	-	P	H
		17475	48.64	-19.56	68.2	51.23	41.3	13.12	57.01	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11a CH 165 5825MHz													H
		11650	45.6	-28.4	74	51.42	39.8	10.45	56.07	-	-	P	V
		17475	47.68	-20.52	68.2	50.27	41.3	13.12	57.01	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

Band 4 5725~5850MHz

WIFI 802.11ax HE20_Full (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		5640.8	52.5	-15.7	68.2	40.65	32	6.47	26.62	100	120	P	H
		5696.6	52.62	-50.07	102.69	40.46	32.28	6.52	26.64	100	120	P	H
		5720	55.88	-54.92	110.8	43.65	32.34	6.54	26.65	100	120	P	H
		5722.6	59.27	-57.46	116.73	47.03	32.35	6.54	26.65	100	120	P	H
	*	5745	109.95	-	-	97.66	32.39	6.56	26.66	100	120	P	H
	*	5745	101.79	-	-	89.5	32.39	6.56	26.66	100	120	A	H
802.11ax													H
HE20 Full													H
CH 149		5600.2	52.43	-15.77	68.2	40.59	32	6.44	26.6	109	3	P	V
5745MHz		5664.6	53.05	-25.99	79.04	41.1	32.09	6.49	26.63	109	3	P	V
		5719.2	58.13	-52.45	110.58	45.9	32.34	6.54	26.65	109	3	P	V
		5724	65.36	-54.56	119.92	53.11	32.35	6.55	26.65	109	3	P	V
	*	5745	113.24	-	-	100.95	32.39	6.56	26.66	109	3	P	V
	*	5745	104	-	-	91.71	32.39	6.56	26.66	109	3	A	V
													V
													V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		5629	52.49	-15.71	68.2	40.64	32	6.46	26.61	100	119	P	H
		5687.6	53.47	-42.58	96.05	41.37	32.23	6.51	26.64	100	119	P	H
		5701.2	53.03	-52.51	105.54	40.84	32.3	6.53	26.64	100	119	P	H
		5722.4	52.04	-64.23	116.27	39.81	32.34	6.54	26.65	100	119	P	H
	*	5785	109.45	-	-	97.05	32.47	6.6	26.67	100	119	P	H
	*	5785	102.34	-	-	89.94	32.47	6.6	26.67	100	119	A	H
		5852	51.88	-65.76	117.64	39.43	32.51	6.64	26.7	100	119	P	H
		5875	54.24	-50.96	105.2	41.64	32.65	6.66	26.71	100	119	P	H
		5894	53.13	-37.97	91.1	40.42	32.76	6.67	26.72	100	119	P	H
		5934.2	52.63	-15.57	68.2	39.79	32.87	6.7	26.73	100	119	P	H
802.11ax													H
HE20 Full													H
CH 157		5610	52.92	-15.28	68.2	41.07	32	6.45	26.6	100	3	P	V
5785MHz		5666.2	52.33	-27.89	80.22	40.36	32.1	6.5	26.63	100	3	P	V
		5710.8	52.5	-55.73	108.23	40.29	32.32	6.53	26.64	100	3	P	V
		5723	52.31	-65.33	117.64	40.07	32.35	6.54	26.65	100	3	P	V
	*	5785	113.33	-	-	100.93	32.47	6.6	26.67	100	3	P	V
	*	5785	104.72	-	-	92.32	32.47	6.6	26.67	100	3	A	V
		5850	52.4	-69.8	122.2	39.96	32.5	6.64	26.7	100	3	P	V
		5868.4	52.25	-54.8	107.05	39.7	32.61	6.65	26.71	100	3	P	V
		5916.4	53.57	-20.97	74.54	40.78	32.83	6.69	26.73	100	3	P	V
		5945.4	53.57	-14.63	68.2	40.72	32.89	6.7	26.74	100	3	P	V
													V
													V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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)
	*	5825	110.14	-	-	97.7	32.5	6.63	26.69	100	230	P	H
	*	5825	103.07	-	-	90.63	32.5	6.63	26.69	100	230	A	H
		5850.6	61.16	-59.67	120.83	48.72	32.5	6.64	26.7	100	230	P	H
		5856.8	57.95	-52.35	110.3	45.46	32.54	6.65	26.7	100	230	P	H
		5905.4	53.16	-29.51	82.67	40.39	32.81	6.68	26.72	100	230	P	H
		5927.6	52.9	-15.3	68.2	40.08	32.86	6.69	26.73	100	230	P	H
802.11ax													H
HE20 Full													H
CH 165	*	5825	111.96	-	-	99.52	32.5	6.63	26.69	141	6	P	V
5825MHz	*	5825	105.22	-	-	92.78	32.5	6.63	26.69	141	6	A	V
		5850	65.57	-56.63	122.2	53.13	32.5	6.64	26.7	141	6	P	V
		5855.6	58.42	-52.21	110.63	45.94	32.53	6.65	26.7	141	6	P	V
		5902.6	53.2	-31.54	84.74	40.43	32.81	6.68	26.72	141	6	P	V
		5940.8	52.63	-15.57	68.2	39.79	32.88	6.7	26.74	141	6	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11ax HE20 Full (Harmonic @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		11490	45.21	-28.79	74	50.73	40.18	10.38	56.08	-	-	P	H
		17235	47.07	-21.13	68.2	50.58	40.2	12.86	56.57	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ax													H
HE20 Full													H
CH 149		11490	45.78	-28.22	74	51.3	40.18	10.38	56.08	-	-	P	V
5745MHz		17235	47.07	-21.13	68.2	50.58	40.2	12.86	56.57	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		11570	46.1	-27.9	74	51.7	40.06	10.41	56.07	-	-	P	H
		17355	47.37	-20.83	68.2	50.53	40.64	12.99	56.79	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ax													H
HE20 Full													H
CH 157		11570	45.39	-28.61	74	50.99	40.06	10.41	56.07	-	-	P	V
5785MHz		17355	47.37	-20.83	68.2	50.53	40.64	12.99	56.79	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		11650	47.43	-26.57	74	53.25	39.8	10.45	56.07	-	-	P	H
		17475	47.23	-20.97	68.2	49.82	41.3	13.12	57.01	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ax													H
HE20 Full													H
CH 165		11650	45.9	-28.1	74	51.72	39.8	10.45	56.07	-	-	P	V
5825MHz		17475	48.3	-19.9	68.2	50.89	41.3	13.12	57.01	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.

Band 4 5725~5850MHz

WIFI 802.11ax HE20_Partial 242 (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		5621.8	52.32	-15.88	68.2	40.47	32	6.46	26.61	100	37	P	H
		5696.6	52.84	-49.85	102.69	40.68	32.28	6.52	26.64	100	37	P	H
		5719.6	67.81	-42.88	110.69	55.58	32.34	6.54	26.65	100	37	P	H
		5723.4	71.7	-46.85	118.55	59.46	32.35	6.54	26.65	100	37	P	H
	*	5745	109.92	-	-	97.63	32.39	6.56	26.66	100	37	P	H
802.11ax	*	5745	102.49	-	-	90.2	32.39	6.56	26.66	100	37	A	H
HE20													H
Partial													H
242/61		5625.2	52.31	-15.89	68.2	40.46	32	6.46	26.61	100	70	P	V
CH 149		5680.6	52.35	-38.53	90.88	40.29	32.18	6.51	26.63	100	70	P	V
5745MHz		5719	64.47	-46.05	110.52	52.24	32.34	6.54	26.65	100	70	P	V
		5724.4	69.95	-50.88	120.83	57.7	32.35	6.55	26.65	100	70	P	V
	*	5745	110.73	-	-	98.44	32.39	6.56	26.66	100	70	P	V
	*	5745	102.45	-	-	90.16	32.39	6.56	26.66	100	70	A	V
													V
													V

Band 4 5725~5850MHz

WIFI 802.11ax HE40_Full (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		5619.6	52.93	-15.27	68.2	41.08	32	6.46	26.61	100	118	P	H
		5687.2	52.89	-42.87	95.76	40.79	32.22	6.51	26.63	100	118	P	H
		5719.4	61.29	-49.34	110.63	49.06	32.34	6.54	26.65	100	118	P	H
		5722.4	65.79	-50.48	116.27	53.56	32.34	6.54	26.65	100	118	P	H
	*	5755	107.06	-	-	94.74	32.41	6.57	26.66	100	118	P	H
	*	5755	99.16	-	-	86.84	32.41	6.57	26.66	100	118	A	H
		5850	53.19	-69.01	122.2	40.75	32.5	6.64	26.7	100	118	P	H
		5873.2	53.25	-52.45	105.7	40.66	32.64	6.66	26.71	100	118	P	H
		5887.6	52.94	-42.91	95.85	40.26	32.73	6.67	26.72	100	118	P	H
		5930	53.02	-15.18	68.2	40.2	32.86	6.69	26.73	100	118	P	H
802.11ax													H
HE40 Full													H
CH 151		5616.4	53.37	-14.83	68.2	41.53	32	6.45	26.61	130	6	P	V
5755MHz		5699.8	54.61	-50.44	105.05	42.43	32.3	6.52	26.64	130	6	P	V
		5719.6	69.74	-40.95	110.69	57.51	32.34	6.54	26.65	130	6	P	V
		5723.4	69.8	-48.75	118.55	57.56	32.35	6.54	26.65	130	6	P	V
	*	5755	110.1	-	-	97.78	32.41	6.57	26.66	130	6	P	V
	*	5755	101.58	-	-	89.26	32.41	6.57	26.66	130	6	A	V
		5850.6	52.8	-68.03	120.83	40.36	32.5	6.64	26.7	130	6	P	V
		5864	54.08	-54.2	108.28	41.56	32.58	6.65	26.71	130	6	P	V
		5905.2	53.7	-29.11	82.81	40.93	32.81	6.68	26.72	130	6	P	V
		5941.6	53.13	-15.07	68.2	40.29	32.88	6.7	26.74	130	6	P	V
													V
													V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		5641.8	53.13	-15.07	68.2	41.27	32	6.48	26.62	100	120	P	H
		5659.8	52.39	-23.09	75.48	40.46	32.06	6.49	26.62	100	120	P	H
		5714.4	52.01	-57.22	109.23	39.79	32.33	6.54	26.65	100	120	P	H
		5721	52.57	-60.51	113.08	40.34	32.34	6.54	26.65	100	120	P	H
	*	5795	107.87	-	-	95.45	32.49	6.61	26.68	100	120	P	H
	*	5795	99.64	-	-	87.22	32.49	6.61	26.68	100	120	A	H
		5853.8	52.67	-60.87	113.54	40.21	32.52	6.64	26.7	100	120	P	H
		5867.2	53.75	-53.63	107.38	41.21	32.6	6.65	26.71	100	120	P	H
		5893.2	54.21	-37.49	91.7	41.5	32.76	6.67	26.72	100	120	P	H
		5928.2	53.19	-15.01	68.2	40.37	32.86	6.69	26.73	100	120	P	H
802.11ax													H
HE40 Full													H
CH 159		5605	53.12	-15.08	68.2	41.28	32	6.44	26.6	146	8	P	V
5795MHz		5689	53.9	-43.19	97.09	41.79	32.23	6.52	26.64	146	8	P	V
		5718.6	52.88	-57.53	110.41	40.65	32.34	6.54	26.65	146	8	P	V
		5720.4	52.51	-59.2	111.71	40.28	32.34	6.54	26.65	146	8	P	V
	*	5795	110.63	-	-	98.21	32.49	6.61	26.68	146	8	P	V
	*	5795	101.78	-	-	89.36	32.49	6.61	26.68	146	8	A	V
		5850.2	55.29	-66.45	121.74	42.85	32.5	6.64	26.7	146	8	P	V
		5861.6	55.82	-53.13	108.95	43.3	32.57	6.65	26.7	146	8	P	V
		5882.2	53.8	-46.05	99.85	41.16	32.69	6.66	26.71	146	8	P	V
		5930	53.84	-14.36	68.2	41.02	32.86	6.69	26.73	146	8	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11ax HE40_Partial 484 (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		5638.4	52.26	-15.94	68.2	40.41	32	6.47	26.62	251	5	P	H
		5699.2	58.14	-46.47	104.61	45.96	32.3	6.52	26.64	251	5	P	H
		5715.4	70.94	-38.57	109.51	58.72	32.33	6.54	26.65	251	5	P	H
		5721.2	74.3	-39.24	113.54	62.07	32.34	6.54	26.65	251	5	P	H
	*	5755	109.11	-	-	96.79	32.41	6.57	26.66	251	5	P	H
	*	5755	100.45	-	-	88.13	32.41	6.57	26.66	251	5	A	H
		5854.4	53.03	-59.14	112.17	40.55	32.53	6.65	26.7	251	5	P	H
		5866.8	52.7	-54.79	107.49	40.16	32.6	6.65	26.71	251	5	P	H
		5875.2	53.2	-51.85	105.05	40.6	32.65	6.66	26.71	251	5	P	H
802.11ax		5931.4	53.23	-14.97	68.2	40.4	32.86	6.7	26.73	251	5	P	H
HE40													H
Partial													H
484/65		5638	52.46	-15.74	68.2	40.61	32	6.47	26.62	104	219	P	V
CH 151		5698	57.45	-46.28	103.73	45.28	32.29	6.52	26.64	104	219	P	V
5755MHz		5719.2	71.45	-39.13	110.58	59.22	32.34	6.54	26.65	104	219	P	V
		5723.2	74.59	-43.51	118.1	62.35	32.35	6.54	26.65	104	219	P	V
	*	5755	105.55	-	-	93.23	32.41	6.57	26.66	104	219	P	V
	*	5755	98.11	-	-	85.79	32.41	6.57	26.66	104	219	A	V
		5851	52.67	-67.25	119.92	40.22	32.51	6.64	26.7	104	219	P	V
		5864	53.01	-55.27	108.28	40.49	32.58	6.65	26.71	104	219	P	V
		5891.2	53.91	-39.27	93.18	41.21	32.75	6.67	26.72	104	219	P	V
		5928	52.79	-15.41	68.2	39.97	32.86	6.69	26.73	104	219	P	V
													V
													V

Band 4 5725~5850MHz

WIFI 802.11ax HE80_Full (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		5639.2	52.56	-15.64	68.2	40.71	32	6.47	26.62	100	118	P	H
		5698.2	57.89	-45.98	103.87	45.72	32.29	6.52	26.64	100	118	P	H
		5716.6	61.08	-48.77	109.85	48.86	32.33	6.54	26.65	100	118	P	H
		5724.8	63.38	-58.36	121.74	51.13	32.35	6.55	26.65	100	118	P	H
	*	5775	105.94	-	-	93.57	32.45	6.59	26.67	100	118	P	H
	*	5775	96.65	-	-	84.28	32.45	6.59	26.67	100	118	A	H
		5853.8	59.65	-53.89	113.54	47.19	32.52	6.64	26.7	100	118	P	H
		5868.8	59.74	-47.19	106.93	47.19	32.61	6.65	26.71	100	118	P	H
		5876.2	54.66	-49.65	104.31	42.05	32.66	6.66	26.71	100	118	P	H
		5944.4	52.87	-15.33	68.2	40.02	32.89	6.7	26.74	100	118	P	H
802.11ax													H
HE80 Full													H
CH 155		5606.4	54.48	-13.72	68.2	42.63	32	6.45	26.6	125	5	P	V
5775MHz		5699.8	64.17	-40.88	105.05	51.99	32.3	6.52	26.64	125	5	P	V
		5719.8	69.57	-41.17	110.74	57.34	32.34	6.54	26.65	125	5	P	V
		5723.4	67.78	-50.77	118.55	55.54	32.35	6.54	26.65	125	5	P	V
	*	5775	107.85	-	-	95.48	32.45	6.59	26.67	125	5	P	V
	*	5775	99.04	-	-	86.67	32.45	6.59	26.67	125	5	A	V
		5855	64.18	-46.62	110.8	51.7	32.53	6.65	26.7	125	5	P	V
		5855.2	65.17	-45.57	110.74	52.69	32.53	6.65	26.7	125	5	P	V
		5875.4	59.14	-45.76	104.9	46.54	32.65	6.66	26.71	125	5	P	V
		5932	53.9	-14.3	68.2	41.07	32.86	6.7	26.73	125	5	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11ax HE80_Partial 484 (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)
		5635.8	53.85	-14.35	68.2	41.99	32	6.47	26.61	267	6	P	H
		5700	67.61	-37.59	105.2	55.42	32.3	6.53	26.64	267	6	P	H
		5713.8	72.64	-36.43	109.07	60.42	32.33	6.54	26.65	267	6	P	H
		5723	74.43	-43.21	117.64	62.19	32.35	6.54	26.65	267	6	P	H
	*	5775	105.26	-	-	92.89	32.45	6.59	26.67	267	6	P	H
	*	5775	97.14	-	-	84.77	32.45	6.59	26.67	267	6	A	H
		5851.6	69.06	-49.49	118.55	56.61	32.51	6.64	26.7	267	6	P	H
		5857.4	68.26	-41.87	110.13	55.77	32.54	6.65	26.7	267	6	P	H
		5875.4	62.86	-42.04	104.9	50.26	32.65	6.66	26.71	267	6	P	H
802.11ax		5928.2	55.2	-13	68.2	42.38	32.86	6.69	26.73	267	6	P	H
HE80													H
Partial													H
484/65		5647.8	55.88	-12.32	68.2	44.02	32	6.48	26.62	229	266	P	V
CH 155		5690.6	70.03	-28.24	98.27	57.91	32.24	6.52	26.64	229	266	P	V
5775MHz		5716	74.93	-34.75	109.68	62.71	32.33	6.54	26.65	229	266	P	V
		5720.4	74.6	-37.11	111.71	62.37	32.34	6.54	26.65	229	266	P	V
	*	5775	104.72	-	-	92.35	32.45	6.59	26.67	229	266	P	V
	*	5775	95.57	-	-	83.2	32.45	6.59	26.67	229	266	A	V
		5854.4	69.49	-42.68	112.17	57.01	32.53	6.65	26.7	229	266	P	V
		5856.2	68.48	-41.98	110.46	55.99	32.54	6.65	26.7	229	266	P	V
		5875	62.7	-42.5	105.2	50.1	32.65	6.66	26.71	229	266	P	V
		5933.4	53.11	-15.09	68.2	40.27	32.87	6.7	26.73	229	266	P	V
													V
													V

Remark

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

Emission above 18GHz

5GHz WIFI 802.11ax HE80 Full (SHF @ 1m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0+1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE80 Full SHF		25983	41.11	-27.09	68.2	58.16	38.71	-2.66	53.1	-	-	P	H
		39244	46.15	-27.85	74	58.68	44.47	-0.5	56.5	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		26415	40.75	-27.45	68.2	56.8	39.36	-2.14	53.27	-	-	P	V
		39703	46.52	-27.48	74	58.38	44.54	-0.3	56.1	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.

Emission below 1GHz

5GHz WIFI 802.11ax HE80 Full (LF @ 3m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0+1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE80 Full LF		73.65	33.78	-6.22	40	52.34	12.83	0.92	32.31	-	-	P	H
		174.53	27.81	-15.69	43.5	43.44	15.4	1.25	32.28	-	-	P	H
		211.39	22.96	-20.54	43.5	38.86	14.97	1.39	32.26	-	-	P	H
		426.73	23.69	-22.31	46	30.96	23	1.91	32.18	-	-	P	H
		562.53	26.05	-19.95	46	30.01	26.17	2.12	32.25	-	-	P	H
		897.18	32.8	-13.2	46	32.79	29.01	2.54	31.54	-	-	P	H
													H
													H
													H
													H
													H
													H
		74.62	32.3	-7.7	40	50.74	12.95	0.92	32.31	-	-	P	V
		103.72	22.11	-21.39	43.5	36.89	16.49	1.06	32.33	-	-	P	V
		167.74	20.39	-23.11	43.5	35.51	15.9	1.26	32.28	-	-	P	V
		267.65	19.59	-26.41	46	30.74	19.56	1.51	32.22	-	-	P	V
		575.14	26.46	-19.54	46	30.79	25.79	2.14	32.26	-	-	P	V
		745.86	29.03	-16.97	46	30.94	27.93	2.32	32.16	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.
3. The emission position marked as “-” means no suspected emission found and emission level has at least 6dB margin against limit or emission is noise floor only.

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	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0+1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5650	55.45	-12.75	68.2	54.51	32.22	4.58	35.86	103	308	P	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) – 68.2(dBμV/m)

= -12.75 (dB)

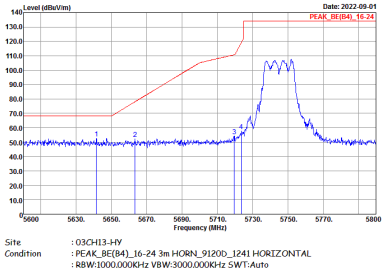
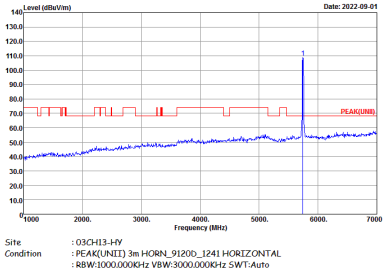
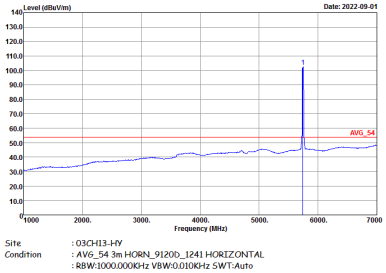
Both peak and average measured complies with the limit line, so test result is “PASS”.

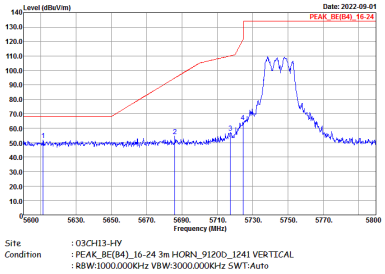
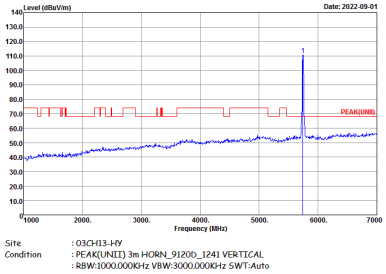
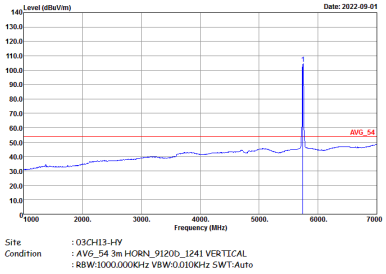
Appendix D. Radiated Spurious Emission Plots

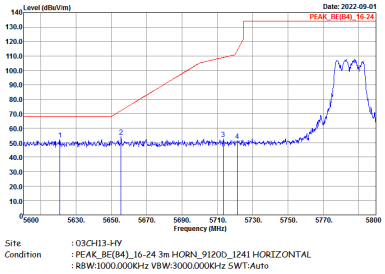
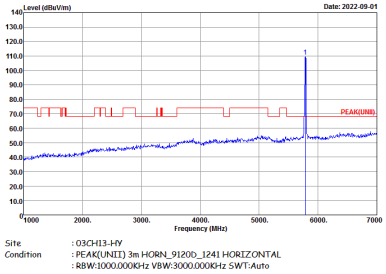
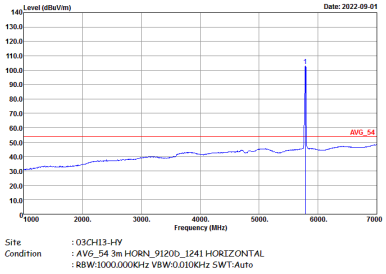
Test Engineer :	Mancy Chou, Jacky Hong and Rain Lee	**Temperature :**	20~25°C
		Relative Humidity :	50~60%

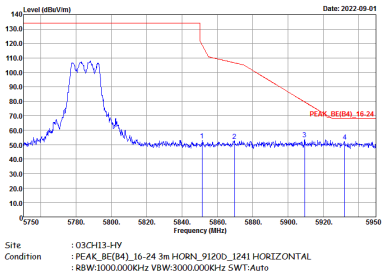
Band 4 - 5725~5850MHz

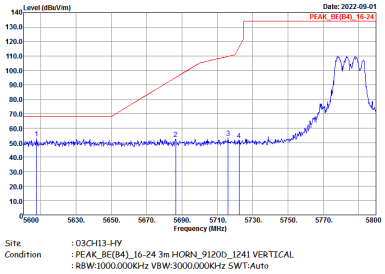
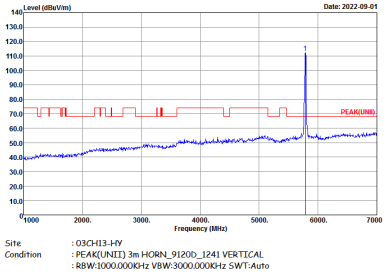
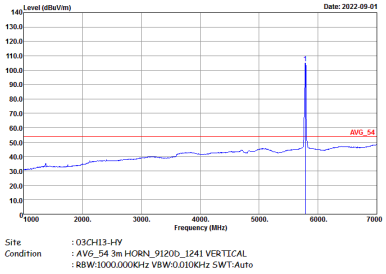
WIFI 802.11a (Band Edge @ 3m)

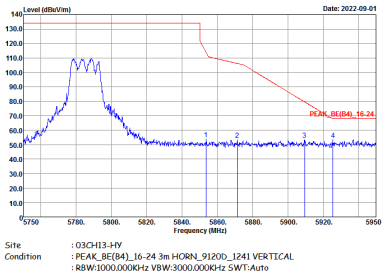
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
0+1	Horizontal	Fundamental
Peak		
Peak	blank	

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
0+1	Vertical	Fundamental
Peak		
AVG	blank	

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
0+1	Horizontal	Fundamental
Peak		
AVG	blank	

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
0+1	Horizontal	Fundamental
Peak		Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
0+1	Vertical	Fundamental
Peak		
Peak	blank	

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
0+1	Horizontal	Fundamental
Peak		Left blank