

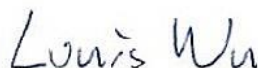


FCC RADIO TEST REPORT

FCC ID : 2AFZZ116AG
Equipment : Mobile Phone
Brand Name : POCO
Model Name : 21091116AG
Applicant : Xiaomi Communications Co., Ltd.
#019, 9th Floor, Building 6, 33 Xi'erqi Middle
Road, Haidian District, Beijing, China, 100085
Manufacturer : Xiaomi Communications Co., Ltd.
#019, 9th Floor, Building 6, 33 Xi'erqi Middle
Road, Haidian District, Beijing, China, 100085
Standard : FCC Part 15 Subpart E §15.407

The product was received on Aug. 19, 2021 and testing was started from Aug. 23, 2021 and completed on Sep. 17, 2021. 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 of Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.



Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FR181632F	01	Initial issue of report	Sep. 24, 2021

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	Under limit 7.48 dB at 17978.000 MHz
3.5	15.207	AC Conducted Emission	Pass	Under limit 21.31 dB at 0.152 MHz
3.6	15.203 15.407(a)	Antenna Requirement	Pass	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Danny Lee

Report Producer: Ruby Zou



1 General Description

1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE/5G NR, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, NFC, FM Receiver, and GNSS.

Product Specification subjective to this standard	
Sample 1	6G+128GB with Battery 1
Sample 2	4G+64GB with Battery 2
Antenna Type	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna GPS / Glonass / BDS / Galileo: PIFA Antenna NFC: FPC Antenna FM: Using earphone as antenna

Antenna information		
5745 MHz ~ 5825 MHz	Peak Gain (dBi)	-2.60

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

1.2 Modification of EUT

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

1.3 Testing Location

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, CO07-HY

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

FCC designation No.: TW3786



1.4 Applicable Standards

According to the specifications of 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.
- ♦ 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. The TAF code is not including all the FCC KDB listed without accreditation.



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 find X plane as worst plane.
- 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 in "*" were 802.11n HT40 and 802.11ac VHT40.
2. The above Frequency and Channel in "[#]" were 802.11ac VHT80.

2.2 Test Mode

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

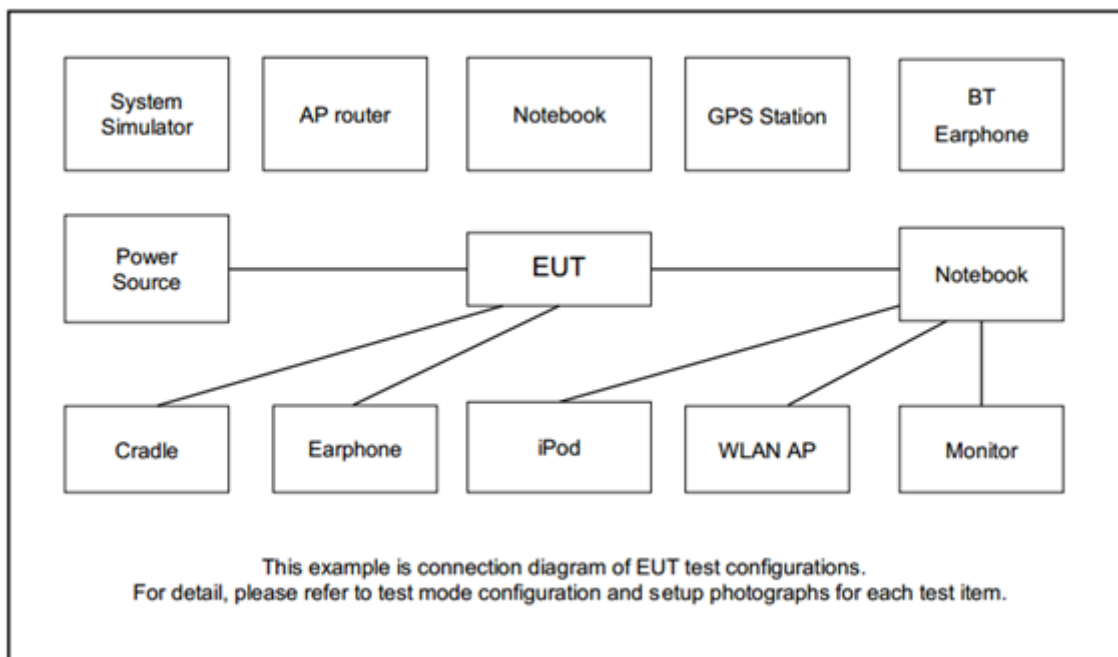
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20 (Covered by HT20)	MCS0
802.11ac VHT40 (Covered by HT40)	MCS0
802.11ac VHT80	MCS0

Test Cases	
AC Conducted Emission	Mode 1: GSM850 (Middle Channel) Idle + Bluetooth Link + WLAN (5GHz) Link + GNSS Rx + Earphone + USB Cable 1 (Data Link with Notebook) for Sample 1
Remark: 1. For Radiated Test Cases, the tests were performed with USB Cable 2 and Sample 1. 2. Data Link with Notebook means data application transferred mode between EUT and Notebook.	

Ch. #		Band IV : 5725-5850 MHz		
		802.11a	802.11n HT40	802.11ac VHT80
L	Low	149	151	-
M	Middle	157	-	155
H	High	165	159	-

Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8m
2.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
4.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
5.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
6.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
7.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A
8.	Earphone	MI	EM023	N/A	Unshielded, 1.0m	N/A

2.5 EUT Operation Test Setup

The RF test items, make the EUT (SW: MIUI 12.5 Global 0.0.0) 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.

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\
 &= 4.2 + 10 = 14.2 \text{ (dB)}
 \end{aligned}$$

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.

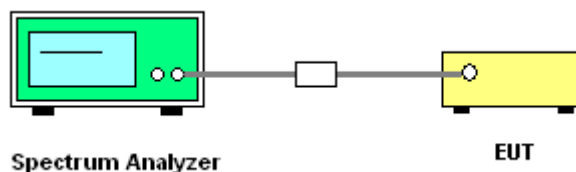
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

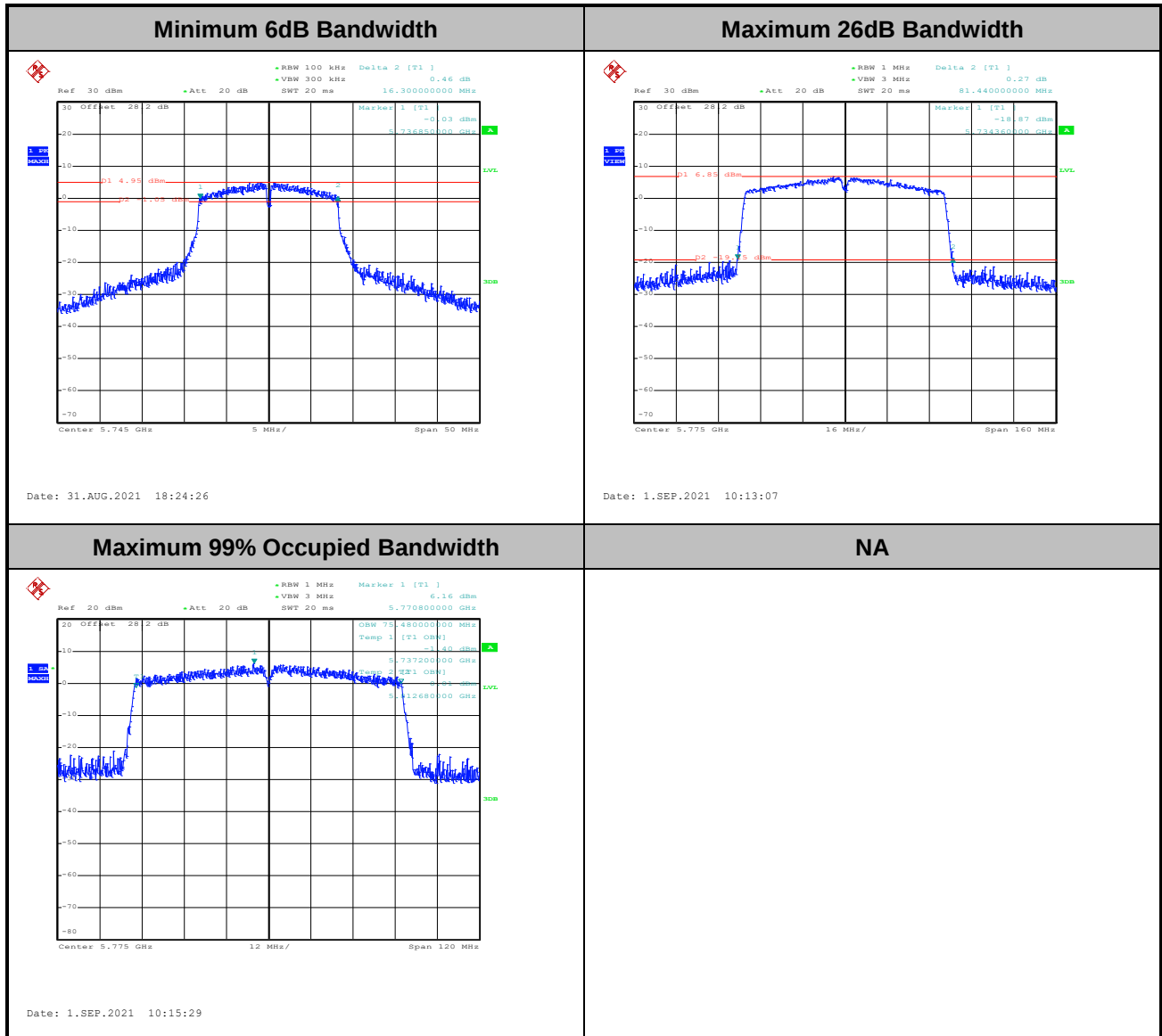
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section C) Emission bandwidth for the band 5.725-5.85 GHz
2. Set RBW = 100 kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 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.



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

See list of measuring equipment of this test report.

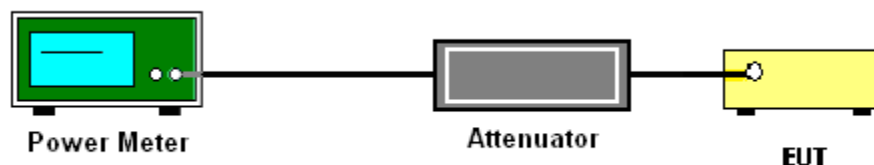
3.2.3 Test Procedures

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.

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

See list of measuring equipment of this test report.

3.3.3 Test Procedures

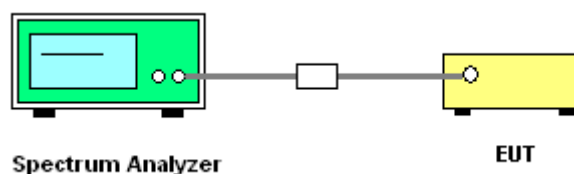
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section F) Maximum power spectral density.

Method SA-3

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

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW $\geq$ 3 MHz.
 - Number of points in sweep $\geq$ 2 Span / RBW.
 - Sweep time $\leq$ (number of points in sweep) $\times$ 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 was connected to the spectrum analyzer by a low loss cable.
 2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

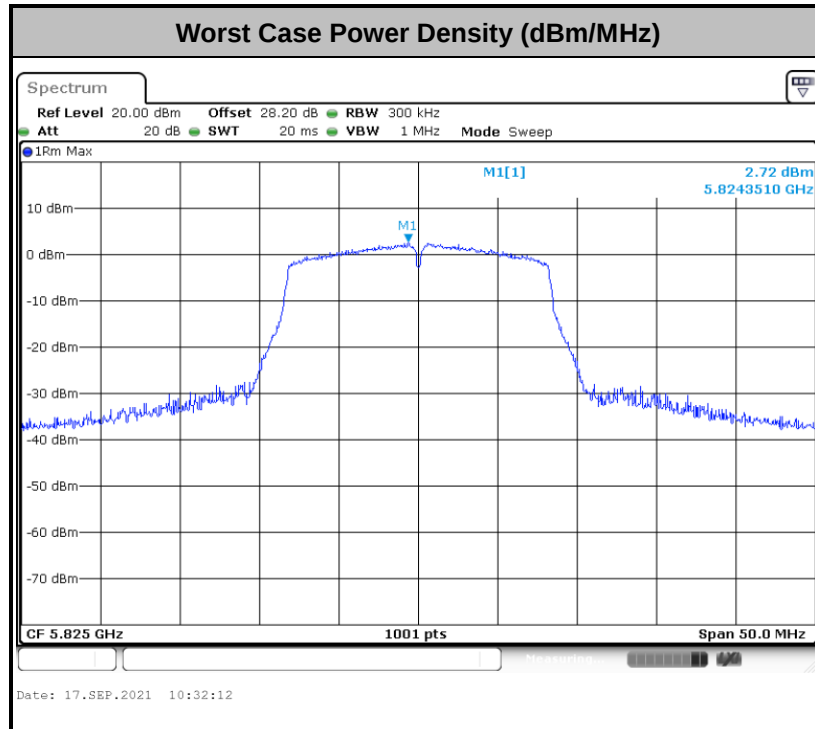
3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



3.4 Unwanted Emissions Measurement

This section and the band unwanted emissions are measured through radiated measurement for band edge spurious

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

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

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

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

See list of measuring equipment 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 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 $\geq$ 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 $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2. The EUT was 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 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. Radiated testing below 1GHz was performed by adjusting the antenna tower from 1m to 4m and by rotating the turn table from 0degree to 360 degree to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6dB margin against QP limit line, the position is marked as “-“.

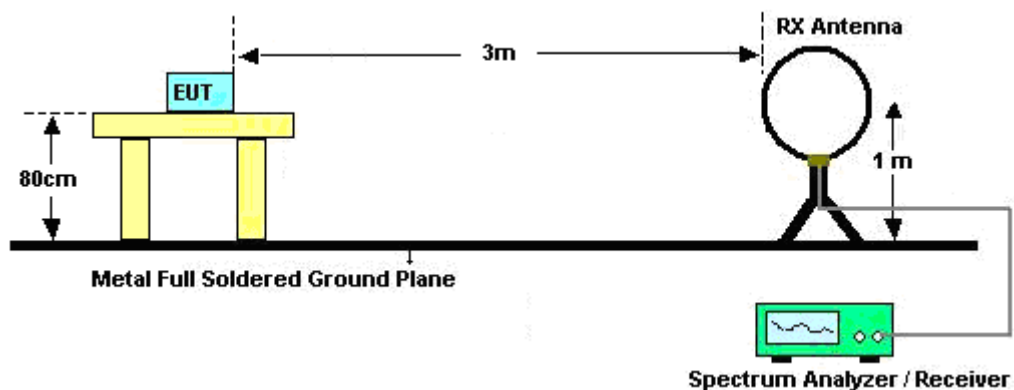
7. Radiated testing above 1GHz was performed by adjusting the antenna tower from 1m to 4m and by rotating the turn table from 0degree to 360 degree to find the peak maximum hold reading for scanning all frequencies.

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

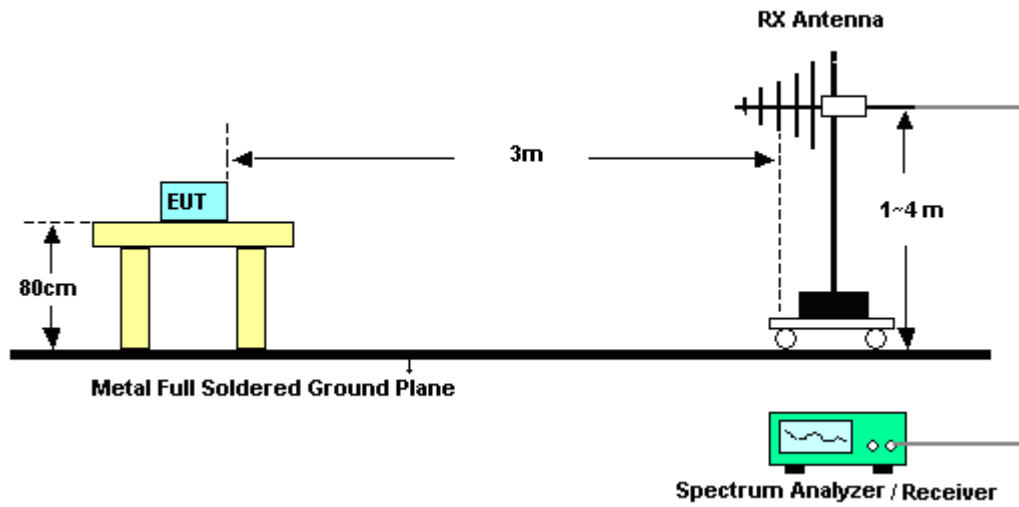
* The ANSI C63.10, Section 6.6.4.3, NOTE 1— where limits are specified by regulations for both average and peak detection, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

3.4.4 Test Setup

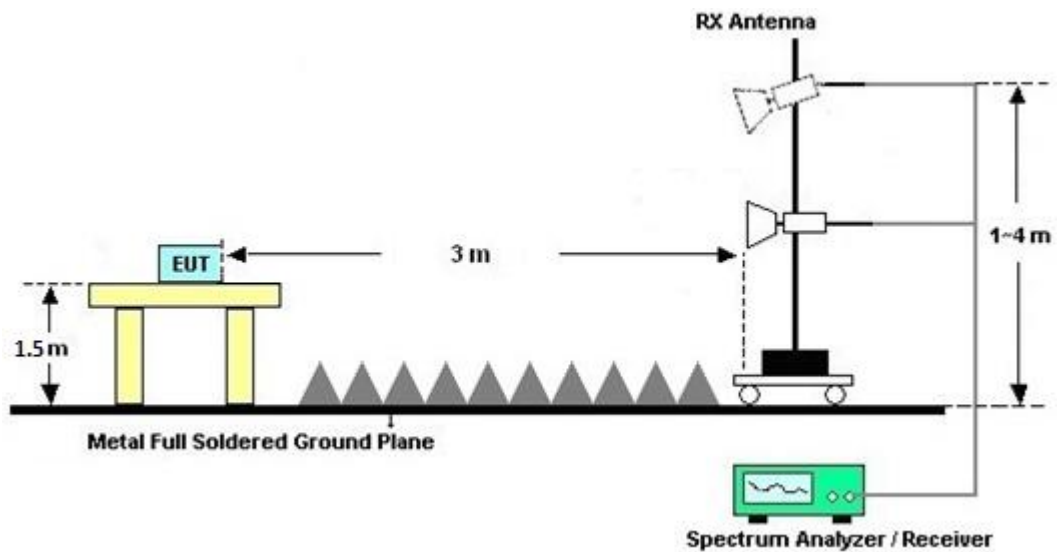
For radiated emissions below 30MHz



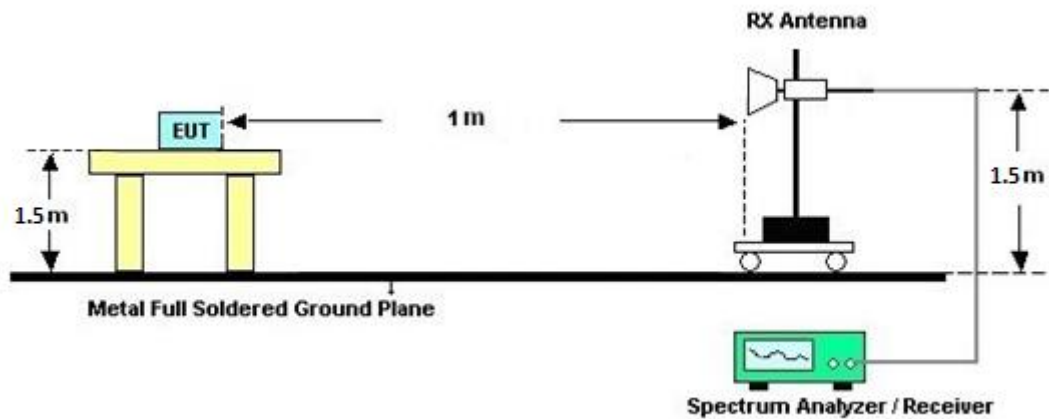
For radiated emissions from 30MHz to 1GHz



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 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 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 (dB μ V)	
	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.

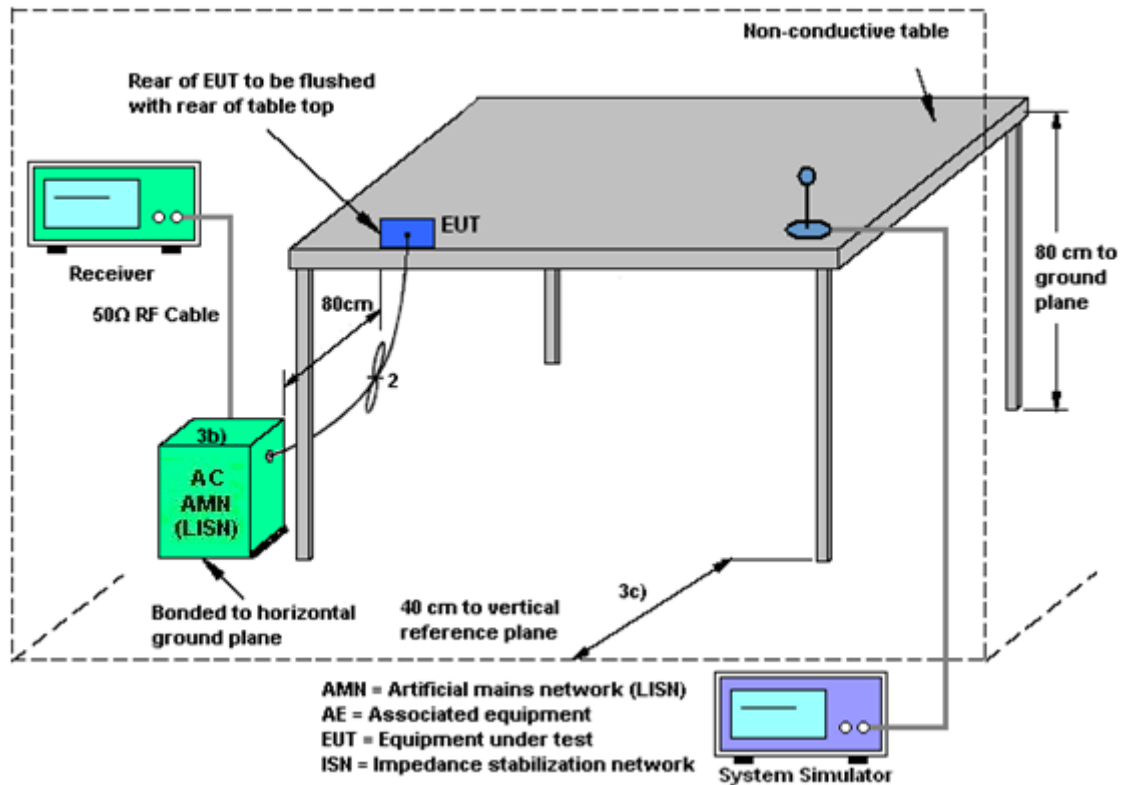
3.5.2 Measuring Instruments

See list of measuring equipment 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 shall be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.6 Antenna Requirements

3.6.1 Standard Applicable

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

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

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



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Aug. 23, 2021~ Aug. 27, 2021	Jan. 03, 2022	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	Jul. 13, 2021	Aug. 23, 2021~ Aug. 27, 2021	Jul. 12, 2022	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02294	1GHz ~ 18GHz	Jun. 23, 2021	Aug. 23, 2021~ Aug. 27, 2021	Jun. 22, 2022	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Dec. 11, 2020	Aug. 23, 2021~ Aug. 27, 2021	Dec. 10, 2021	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Dec. 16, 2020	Aug. 23, 2021~ Aug. 27, 2021	Dec. 15, 2021	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz~18GHz	May 18, 2021	Aug. 23, 2021~ Aug. 27, 2021	May 17, 2022	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Oct. 28, 2020	Aug. 23, 2021~ Aug. 27, 2021	Oct. 27, 2021	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 11, 2020	Aug. 23, 2021~ Aug. 27, 2021	Dec. 10, 2021	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 18, 2021	Aug. 23, 2021~ Aug. 27, 2021	Mar. 17, 2022	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Aug. 23, 2021~ Aug. 27, 2021	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Aug. 23, 2021~ Aug. 27, 2021	N/A	Radiation (03CH13-HY)
Software	Audix	E3 6.2009-8-24	RK-000992	N/A	N/A	Aug. 23, 2021~ Aug. 27, 2021	N/A	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30M-18G	Feb. 10, 2021	Aug. 23, 2021~ Aug. 27, 2021	Feb. 09, 2022	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	804793/4	30M-18G	Feb. 10, 2021	Aug. 23, 2021~ Aug. 27, 2021	Feb. 09, 2022	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Feb. 22, 2021	Aug. 23, 2021~ Aug. 27, 2021	Feb. 21, 2022	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz~40GHz	Mar. 11, 2021	Aug. 23, 2021~ Aug. 27, 2021	Mar. 10, 2022	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24961/4	30M-18G	Feb. 10, 2021	Aug. 23, 2021~ Aug. 27, 2021	Feb. 09, 2022	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 11, 2021	Aug. 23, 2021~ Aug. 27, 2021	Mar. 10, 2022	Radiation (03CH13-HY)
Filter	Wainwright	WLK4-1000-15 30-8000-40SS	SN12	1.53GHz Low Pass Filter	Sep. 15, 2020	Aug. 23, 2021~ Aug. 27, 2021	Sep. 14, 2021	Radiation (03CH13-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40ST	SN5	6.75GHz High Pass Filter	Mar. 11, 2021	Aug. 23, 2021~ Aug. 27, 2021	Mar. 10, 2022	Radiation (03CH13-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Sensor	DARE	RPR3006W	16I00054SNO12	10MHz~6GHz	Dec. 16, 2020	Aug. 25, 2021~ Sep. 17, 2021	Dec. 15, 2021	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Jan. 21, 2021	Aug. 25, 2021~ Sep. 17, 2021	Jan. 20, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101565	10Hz ~ 40GHz	Nov. 13, 2020	Aug. 25, 2021~ Sep. 17, 2021	Nov. 12, 2021	Conducted (TH05-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2021	Aug. 25, 2021~ Sep. 17, 2021	Mar. 16, 2022	Conducted (TH05-HY)
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	Sep. 07, 2021	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Sep. 07, 2021	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	9561-F N00373	9kHz-200MHz	Nov. 02, 2020	Sep. 07, 2021	Nov. 01, 2021	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	N/A	Sep. 07, 2021	N/A	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Feb. 01, 2021	Sep. 07, 2021	Jan. 31, 2022	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 52	36122	N/A	Feb. 01, 2021	Sep. 07, 2021	Jan. 31, 2022	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 11, 2020	Sep. 07, 2021	Sep. 10, 2021	Conduction (CO07-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.2 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.3 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.8 dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.9 dB
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Benny Ku	Temperature:	23~25	°C
Test Date:	2021/8/25~2021/9/17	Relative Humidity:	53~55	%

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

Band IV single antenna												
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	1	149	5745	16.80	-	26.50	-	16.30	-	0.5	Pass
11a	6Mbps	1	157	5785	16.80	-	33.45	-	16.30	-	0.5	Pass
11a	6Mbps	1	165	5825	16.80	-	29.00	-	16.30	-	0.5	Pass
HT20	MCS0	1	149	5745	17.80	-	26.90	-	17.60	-	0.5	Pass
HT20	MCS0	1	157	5785	17.80	-	26.45	-	17.60	-	0.5	Pass
HT20	MCS0	1	165	5825	17.75	-	25.20	-	17.40	-	0.5	Pass
HT40	MCS0	1	151	5755	36.30	-	40.41	-	36.09	-	0.5	Pass
HT40	MCS0	1	159	5795	36.30	-	40.14	-	35.46	-	0.5	Pass
VHT80	MCS0	1	155	5775	75.48	-	81.44	-	75.68	-	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV single antenna											
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)		FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	15.30	-	30.00	-	-2.60	-	Pass
11a	6Mbps	1	157	5785	15.60	-	30.00	-	-2.60	-	Pass
11a	6Mbps	1	165	5825	15.70	-	30.00	-	-2.60	-	Pass
HT20	MCS0	1	149	5745	15.20	-	30.00	-	-2.60	-	Pass
HT20	MCS0	1	157	5785	15.40	-	30.00	-	-2.60	-	Pass
HT20	MCS0	1	165	5825	15.50	-	30.00	-	-2.60	-	Pass
HT40	MCS0	1	151	5755	15.40	-	30.00	-	-2.60	-	Pass
HT40	MCS0	1	159	5795	15.40	-	30.00	-	-2.60	-	Pass
VHT20	MCS0	1	149	5745	15.10	-	30.00	-	-2.60	-	Pass
VHT20	MCS0	1	157	5785	15.30	-	30.00	-	-2.60	-	Pass
VHT20	MCS0	1	165	5825	15.40	-	30.00	-	-2.60	-	Pass
VHT40	MCS0	1	151	5755	15.30	-	30.00	-	-2.60	-	Pass
VHT40	MCS0	1	159	5795	15.30	-	30.00	-	-2.60	-	Pass
VHT80	MCS0	1	155	5775	15.50	-	30.00	-	-2.60	-	Pass

TEST RESULTS DATA
Power Spectral Density

Band IV single antenna													
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	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	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	2.22	-	4.42	-	30.00	-	-2.60	-	Pass
11a	6Mbps	1	157	5785	2.22	-	4.82	-	30.00	-	-2.60	-	Pass
11a	6Mbps	1	165	5825	2.22	-	4.94	-	30.00	-	-2.60	-	Pass
HT20	MCS0	1	149	5745	2.22	-	3.83	-	30.00	-	-2.60	-	Pass
HT20	MCS0	1	157	5785	2.22	-	4.45	-	30.00	-	-2.60	-	Pass
HT20	MCS0	1	165	5825	2.22	-	4.84	-	30.00	-	-2.60	-	Pass
HT40	MCS0	1	151	5755	2.22	-	1.53	-	30.00	-	-2.60	-	Pass
HT40	MCS0	1	159	5795	2.22	-	1.46	-	30.00	-	-2.60	-	Pass
VHT80	MCS0	1	155	5775	2.22	-	-2.10	-	30.00	-	-2.60	-	Pass



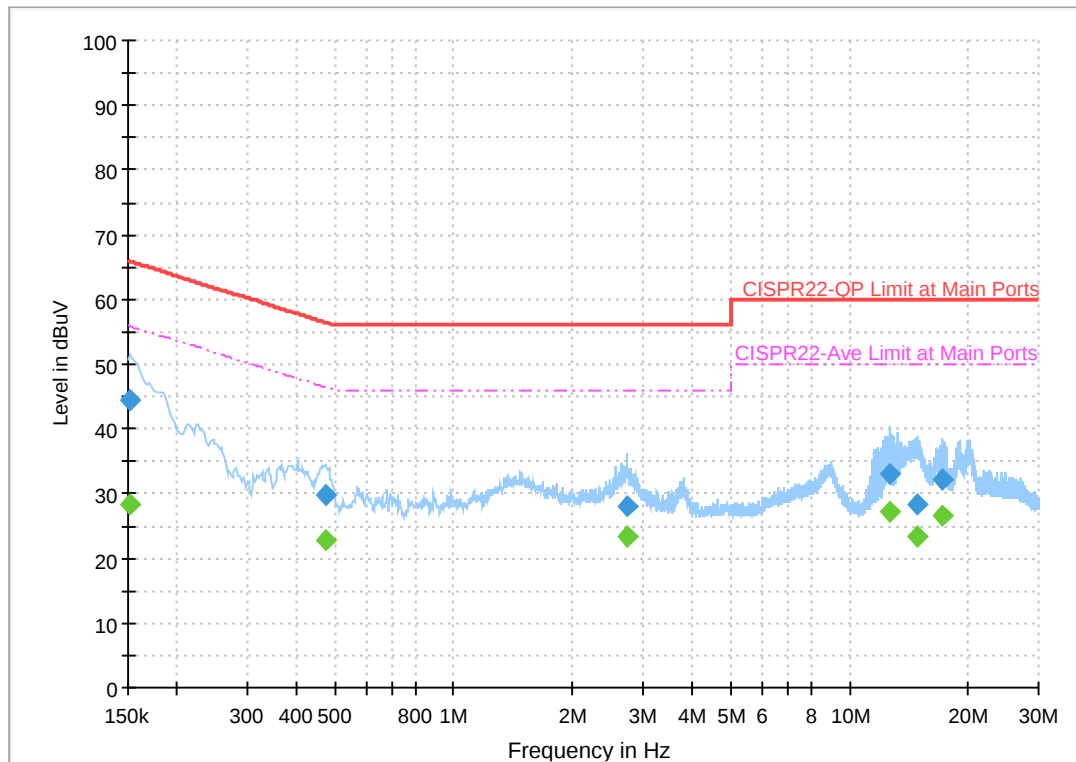
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Tom Lee	Temperature :	23~26℃
		Relative Humidity :	40~50%

EUT Information

Report NO : 181632
Test Mode : Mode 1
Test Voltage : Power From System
Phase : Line

Full Spectrum



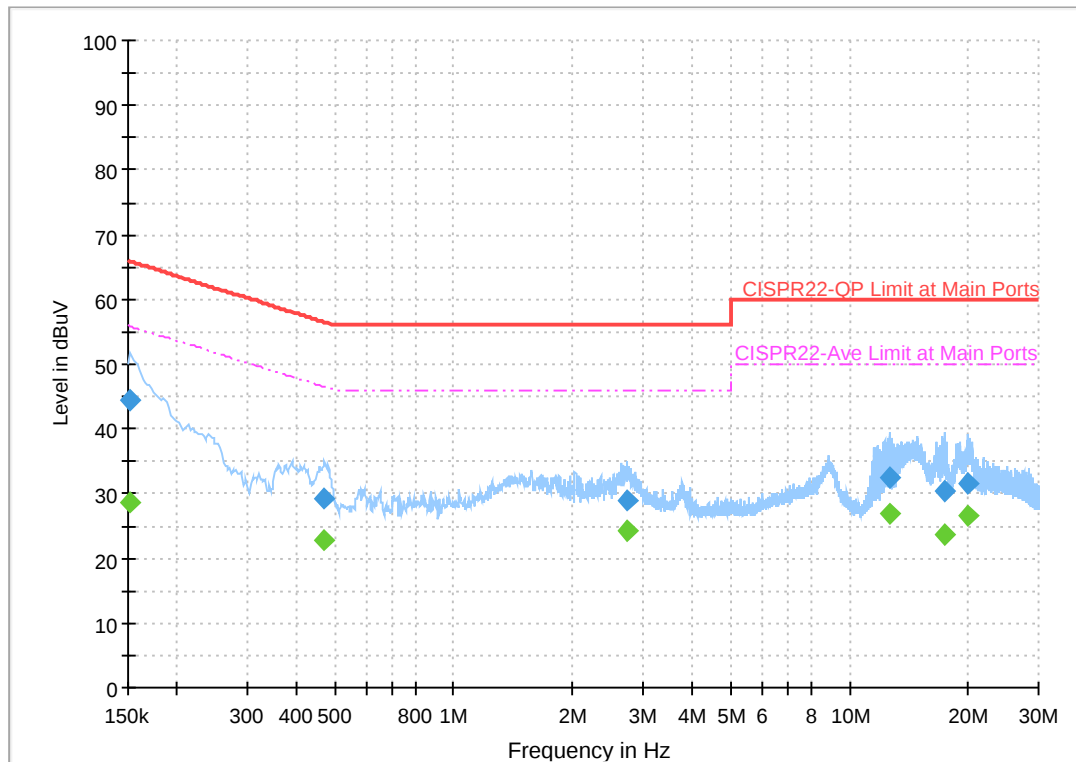
Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	28.48	55.88	27.39	L1	OFF	20.0
0.152250	44.45	---	65.88	21.42	L1	OFF	20.0
0.471750	---	22.81	46.48	23.67	L1	OFF	20.0
0.471750	29.78	---	56.48	26.70	L1	OFF	20.0
2.748750	---	23.49	46.00	22.51	L1	OFF	20.1
2.748750	28.20	---	56.00	27.80	L1	OFF	20.1
12.671250	---	27.08	50.00	22.92	L1	OFF	20.2
12.671250	33.08	---	60.00	26.92	L1	OFF	20.2
14.876250	---	23.25	50.00	26.75	L1	OFF	20.2
14.876250	28.38	---	60.00	31.62	L1	OFF	20.2
17.259000	---	26.54	50.00	23.46	L1	OFF	20.2
17.259000	32.29	---	60.00	27.71	L1	OFF	20.2

EUT Information

Report NO : 181632
Test Mode : Mode 1
Test Voltage : Power From System
Phase : Neutral

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	28.58	55.88	27.29	N	OFF	20.0
0.152250	44.56	---	65.88	21.31	N	OFF	20.0
0.469500	---	22.70	46.52	23.82	N	OFF	20.0
0.469500	29.27	---	56.52	27.26	N	OFF	20.0
2.733000	---	24.21	46.00	21.79	N	OFF	20.1
2.733000	28.98	---	56.00	27.02	N	OFF	20.1
12.664500	---	26.86	50.00	23.14	N	OFF	20.2
12.664500	32.35	---	60.00	27.65	N	OFF	20.2
17.342250	---	23.72	50.00	26.28	N	OFF	20.3
17.342250	30.34	---	60.00	29.66	N	OFF	20.3
19.952250	---	26.66	50.00	23.34	N	OFF	20.3
19.952250	31.61	---	60.00	28.39	N	OFF	20.3



Appendix C. Radiated Spurious Emission

Test Engineer :	Yuan Lee, Jacky Hong, and Wilson Wu	Temperature :	20~25°C
		Relative Humidity :	50~60%

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preampl Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5638	51.51	-16.69	68.2	40.57	31.92	6.44	27.42	100	260	P	H
		5700	56.52	-48.68	105.2	45.36	32.2	6.42	27.46	100	260	P	H
		5719.6	68.13	-42.56	110.69	56.92	32.28	6.41	27.48	100	260	P	H
		5724.8	71.18	-50.56	121.74	59.95	32.3	6.41	27.48	100	260	P	H
	*	5745	108.83	-	-	97.54	32.38	6.41	27.5	100	260	P	H
	*	5745	100.98	-	-	89.69	32.38	6.41	27.5	100	260	A	H
													H
													H
		5611	51.88	-16.32	68.2	40.85	31.98	6.45	27.4	315	77	P	V
		5697.2	54.91	-48.23	103.14	43.77	32.18	6.42	27.46	315	77	P	V
		5719.4	64.15	-46.48	110.63	52.94	32.28	6.41	27.48	315	77	P	V
		5724	70.28	-49.64	119.92	59.05	32.3	6.41	27.48	315	77	P	V
	*	5745	106.87	-	-	95.58	32.38	6.41	27.5	315	77	P	V
	*	5745	98.82	-	-	87.53	32.38	6.41	27.5	315	77	A	V
													V
													V



WIFI Ant. 1	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)
802.11a CH 157 5785MHz		5603	51.49	-16.71	68.2	40.44	31.99	6.45	27.39	100	251	P	H
		5665.4	51.91	-27.72	79.63	40.93	31.99	6.43	27.44	100	251	P	H
		5719.4	53.42	-57.21	110.63	42.21	32.28	6.41	27.48	100	251	P	H
		5721	50.77	-62.31	113.08	39.56	32.28	6.41	27.48	100	251	P	H
	*	5785	108.14	-	-	96.88	32.4	6.39	27.53	100	251	P	H
	*	5785	100.5	-	-	89.24	32.4	6.39	27.53	100	251	A	H
		5852	50.61	-67.03	117.64	39.24	32.51	6.43	27.57	100	251	P	H
		5861.6	53.37	-55.58	108.95	41.96	32.55	6.44	27.58	100	251	P	H
		5906.2	51.63	-30.45	82.08	40.05	32.71	6.48	27.61	100	251	P	H
		5942.4	51.67	-16.53	68.2	40.02	32.78	6.51	27.64	100	251	P	H
													H
													H
		5620.8	51.51	-16.69	68.2	40.52	31.96	6.44	27.41	326	76	P	V
		5681.6	51.67	-39.95	91.62	40.6	32.09	6.43	27.45	326	76	P	V
		5712.8	51.95	-56.84	108.79	40.75	32.25	6.42	27.47	326	76	P	V
		5722.2	50.26	-65.56	115.82	39.04	32.29	6.41	27.48	326	76	P	V
	*	5785	106.38	-	-	95.12	32.4	6.39	27.53	326	76	P	V
	*	5785	98.27	-	-	87.01	32.4	6.39	27.53	326	76	A	V
		5853.6	50.65	-63.34	113.99	39.27	32.51	6.44	27.57	326	76	P	V
		5861.4	51.79	-57.22	109.01	40.38	32.55	6.44	27.58	326	76	P	V
		5889	52.1	-42.71	94.81	40.57	32.66	6.47	27.6	326	76	P	V
		5935.4	50.21	-17.99	68.2	38.56	32.77	6.51	27.63	326	76	P	V
													V
													V



WIFI Ant. 1	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)
802.11a CH 165 5825MHz	*	5825	108.02	-	-	96.71	32.45	6.41	27.55	100	248	P	H
	*	5825	100.45	-	-	89.14	32.45	6.41	27.55	100	248	A	H
		5850	66.72	-55.48	122.2	55.36	32.5	6.43	27.57	100	248	P	H
		5856	65.42	-45.1	110.52	54.04	32.52	6.44	27.58	100	248	P	H
		5884	54.65	-43.87	98.52	43.15	32.64	6.46	27.6	100	248	P	H
		5940.8	51.16	-17.04	68.2	39.51	32.78	6.51	27.64	100	248	P	H
													H
													H
	*	5825	105.77	-	-	94.46	32.45	6.41	27.55	324	75	P	V
	*	5825	98.1	-	-	86.79	32.45	6.41	27.55	324	75	A	V
		5852.6	65.69	-50.58	116.27	54.32	32.51	6.43	27.57	324	75	P	V
		5856	62.15	-48.37	110.52	50.77	32.52	6.44	27.58	324	75	P	V
		5876.4	52.87	-51.29	104.16	41.4	32.61	6.45	27.59	324	75	P	V
		5932.2	52.17	-16.03	68.2	40.54	32.76	6.5	27.63	324	75	P	V
													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. 1	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)
802.11a CH 149 5745MHz		11490	47.51	-26.49	74	52.44	40.17	10.68	55.78	-	-	P	H
		17235	48.63	-19.57	68.2	51.65	40.57	12.61	56.2	-	-	P	H
		17978	56.1	-17.9	74	51.72	47.91	13.19	56.72	-	-	P	H
		17978	46.18	-7.82	54	41.8	47.91	13.19	56.72	-	-	A	H
		11490	47.78	-26.22	74	52.71	40.17	10.68	55.78	-	-	P	V
		17235	52.52	-15.68	68.2	55.54	40.57	12.61	56.2	-	-	P	V
		17989	55.76	-18.24	74	51.09	48.2	13.19	56.72	-	-	P	V
		17989	46.12	-7.88	54	41.45	48.2	13.19	56.72	-	-	A	V
802.11a CH 157 5785MHz		11570	48	-26	74	52.99	40.06	10.72	55.77	-	-	P	H
		17355	48.92	-19.28	68.2	51.6	41.03	12.71	56.42	-	-	P	H
		18000	55.7	-18.3	74	50.72	48.5	13.2	56.72	-	-	P	H
		18000	46.25	-7.75	54	41.27	48.5	13.2	56.72	-	-	A	H
		11570	47.05	-26.95	74	52.04	40.06	10.72	55.77	-	-	P	V
		17355	51.09	-17.11	68.2	53.77	41.03	12.71	56.42	-	-	P	V
		17978	56.75	-17.25	74	52.37	47.91	13.19	56.72	-	-	P	V
		17978	46.32	-7.68	54	41.94	47.91	13.19	56.72	-	-	A	V
802.11a CH 165 5825MHz		11650	46.97	-27.03	74	52.23	39.75	10.75	55.76	-	-	P	H
		17475	49.86	-18.34	68.2	52.18	41.52	12.8	56.64	-	-	P	H
		17978	55.91	-18.09	74	51.53	47.91	13.19	56.72	-	-	P	H
		17978	46.52	-7.48	54	42.14	47.91	13.19	56.72	-	-	A	H
		11650	47.53	-26.47	74	52.79	39.75	10.75	55.76	-	-	P	V
		17475	49.29	-18.91	68.2	51.61	41.52	12.8	56.64	-	-	P	V
		17989	55.87	-18.13	74	51.2	48.2	13.19	56.72	-	-	P	V
		17989	46.24	-7.76	54	41.57	48.2	13.19	56.72	-	-	A	V
Remark	- No other spurious found. - All results are PASS against Peak and Average limit line. - The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. - The emission level close to 18GHz is checked that the average emission level is noise floor only.												



Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		5629.4	51.89	-16.31	68.2	40.92	31.94	6.44	27.41	100	260	P	H
		5696	57.74	-44.51	102.25	46.6	32.18	6.42	27.46	100	260	P	H
		5719.6	68.77	-41.92	110.69	57.56	32.28	6.41	27.48	100	260	P	H
		5722	72.74	-42.62	115.36	61.52	32.29	6.41	27.48	100	260	P	H
	*	5755	104.18	-	-	92.88	32.4	6.4	27.5	100	260	P	H
	*	5755	96.66	-	-	85.36	32.4	6.4	27.5	100	260	A	H
		5850.4	51.68	-69.61	121.29	40.32	32.5	6.43	27.57	100	260	P	H
		5863	51.66	-56.9	108.56	40.25	32.55	6.44	27.58	100	260	P	H
		5892.8	52.89	-39.1	91.99	41.35	32.67	6.47	27.6	100	260	P	H
		5939.2	52.1	-16.1	68.2	40.45	32.78	6.51	27.64	100	260	P	H
													H
													H
		5641.6	51.75	-16.45	68.2	40.81	31.92	6.44	27.42	314	76	P	V
		5697.8	55.53	-48.05	103.58	44.38	32.19	6.42	27.46	314	76	P	V
		5717.2	67.39	-42.63	110.02	56.19	32.27	6.41	27.48	314	76	P	V
		5723.6	68.92	-50.09	119.01	57.7	32.29	6.41	27.48	314	76	P	V
	*	5755	102.96	-	-	91.66	32.4	6.4	27.5	314	76	P	V
	*	5755	94.51	-	-	83.21	32.4	6.4	27.5	314	76	A	V
		5853.8	50.73	-62.81	113.54	39.34	32.52	6.44	27.57	314	76	P	V
		5855.4	50.98	-59.71	110.69	39.6	32.52	6.44	27.58	314	76	P	V
		5892.8	53.13	-38.86	91.99	41.59	32.67	6.47	27.6	314	76	P	V
		5943.4	50.8	-17.4	68.2	39.14	32.79	6.51	27.64	314	76	P	V
													V
													V



WIFI Ant. 1	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)
802.11n HT40 CH 159 5795MHz		5610.2	52	-16.2	68.2	40.97	31.98	6.45	27.4	100	250	P	H
		5663.6	52.65	-25.65	78.3	41.68	31.98	6.43	27.44	100	250	P	H
		5718	53.32	-56.92	110.24	42.12	32.27	6.41	27.48	100	250	P	H
		5720.4	53.52	-58.19	111.71	42.31	32.28	6.41	27.48	100	250	P	H
	*	5795	104.23	-	-	92.97	32.4	6.39	27.53	100	250	P	H
	*	5795	96.65	-	-	85.39	32.4	6.39	27.53	100	250	A	H
		5851.8	60.52	-57.58	118.1	49.15	32.51	6.43	27.57	100	250	P	H
		5862.6	57.3	-51.37	108.67	45.89	32.55	6.44	27.58	100	250	P	H
		5904.4	52.38	-31.03	83.41	40.8	32.71	6.48	27.61	100	250	P	H
		5943	51.27	-16.93	68.2	39.61	32.79	6.51	27.64	100	250	P	H
													H
													H
		5609.6	51.47	-16.73	68.2	40.44	31.98	6.45	27.4	308	77	P	V
		5668.4	51.94	-29.91	81.85	40.94	32.01	6.43	27.44	308	77	P	V
		5719.6	52.7	-57.99	110.69	41.49	32.28	6.41	27.48	308	77	P	V
		5724.4	53.08	-67.75	120.83	41.85	32.3	6.41	27.48	308	77	P	V
	*	5795	102.1	-	-	90.84	32.4	6.39	27.53	308	77	P	V
	*	5795	94.34	-	-	83.08	32.4	6.39	27.53	308	77	A	V
		5853.8	57.51	-56.03	113.54	46.12	32.52	6.44	27.57	308	77	P	V
		5857.6	55.51	-54.56	110.07	44.12	32.53	6.44	27.58	308	77	P	V
		5922.4	52.77	-17.35	70.12	41.16	32.74	6.49	27.62	308	77	P	V
		5937.2	50.72	-17.48	68.2	39.07	32.77	6.51	27.63	308	77	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 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		11510	47.48	-26.52	74	52.39	40.18	10.69	55.78	-	-	P	H
		17265	48.62	-19.58	68.2	51.61	40.63	12.64	56.26	-	-	P	H
		17989	56.16	-17.84	74	51.49	48.2	13.19	56.72	-	-	P	H
		17989	46.23	-7.77	54	41.56	48.2	13.19	56.72	-	-	A	H
		11510	47.44	-26.56	74	52.35	40.18	10.69	55.78	-	-	P	V
		17265	48	-20.2	68.2	50.99	40.63	12.64	56.26	-	-	P	V
		18000	56.02	-17.98	74	51.04	48.5	13.2	56.72	-	-	P	V
		18000	46.29	-7.71	54	41.31	48.5	13.2	56.72	-	-	A	V
802.11n HT40 CH 159 5795MHz		11590	46.92	-27.08	74	51.94	40.02	10.73	55.77	-	-	P	H
		17385	48.96	-19.24	68.2	51.5	41.21	12.73	56.48	-	-	P	H
		17989	55.59	-18.41	74	50.92	48.2	13.19	56.72	-	-	P	H
		17989	46.36	-7.64	54	41.69	48.2	13.19	56.72	-	-	A	H
		11590	46.91	-27.09	74	51.93	40.02	10.73	55.77	-	-	P	V
		17385	50.09	-18.11	68.2	52.63	41.21	12.73	56.48	-	-	P	V
		17978	55.66	-18.34	74	51.28	47.91	13.19	56.72	-	-	P	V
		17978	46.09	-7.91	54	41.71	47.91	13.19	56.72	-	-	A	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. 4. The emission level close to 18GHz is checked that the average emission level is noise floor only.												



Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz		5645.2	56.14	-12.06	68.2	45.21	31.91	6.44	27.42	102	250	P	H
		5693.8	66.3	-34.33	100.63	55.18	32.16	6.42	27.46	102	250	P	H
		5715.8	70.45	-39.18	109.63	59.25	32.26	6.42	27.48	102	250	P	H
		5720.2	69.55	-41.71	111.26	58.34	32.28	6.41	27.48	102	250	P	H
	*	5775	100.89	-	-	89.61	32.4	6.4	27.52	102	250	P	H
	*	5775	93.16	-	-	81.88	32.4	6.4	27.52	102	250	A	H
		5852.4	63.91	-52.82	116.73	52.54	32.51	6.43	27.57	102	250	P	H
		5855.8	63.34	-47.24	110.58	51.96	32.52	6.44	27.58	102	250	P	H
		5875.4	59.85	-45.05	104.9	48.39	32.6	6.45	27.59	102	250	P	H
		5925.8	53.95	-14.25	68.2	42.33	32.75	6.5	27.63	102	250	P	H
													H
													H
		5619.6	53.72	-14.48	68.2	42.73	31.96	6.44	27.41	311	76	P	V
		5690.6	63.51	-34.76	98.27	52.41	32.14	6.42	27.46	311	76	P	V
		5717	69.2	-40.76	109.96	58	32.27	6.41	27.48	311	76	P	V
		5723.8	71.88	-47.58	119.46	60.65	32.3	6.41	27.48	311	76	P	V
	*	5775	98.13	-	-	86.85	32.4	6.4	27.52	311	76	P	V
	*	5775	90.55	-	-	79.27	32.4	6.4	27.52	311	76	A	V
		5855	60.34	-50.46	110.8	48.96	32.52	6.44	27.58	311	76	P	V
		5860.2	61.01	-48.33	109.34	49.61	32.54	6.44	27.58	311	76	P	V
		5875.8	57.39	-47.22	104.61	45.93	32.6	6.45	27.59	311	76	P	V
		5932.6	51.52	-16.68	68.2	39.88	32.77	6.5	27.63	311	76	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 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz		11550	47.56	-26.44	74	52.52	40.1	10.71	55.77	-	-	P	H
		17325	49.1	-19.1	68.2	51.93	40.85	12.69	56.37	-	-	P	H
		18000	56.78	-17.22	74	51.8	48.5	13.2	56.72	-	-	P	H
		18000	46.1	-7.9	54	41.12	48.5	13.2	56.72	-	-	A	H
		11550	46.39	-27.61	74	51.35	40.1	10.71	55.77	-	-	P	V
		17325	48.69	-19.51	68.2	51.52	40.85	12.69	56.37	-	-	P	V
		18000	55.48	-18.52	74	50.5	48.5	13.2	56.72	-	-	P	V
		18000	46.14	-7.86	54	41.16	48.5	13.2	56.72	-	-	A	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. 4. The emission level close to 18GHz is checked that the average emission level is noise floor only.												

Emission above 18GHz
5GHz WIFI 802.11ac VHT80 (SHF)

[illegible]



Emission below 1GHz

5GHz WIFI 802.11ac VHT80 (LF)

WIFI Ant. 1	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)
5GHz 802.11ac VHT80 LF		30	24.42	-15.58	40	29.45	24.57	0.5	32.22	-	-	P	H
		80.44	19.67	-20.33	40	37.3	13.42	0.79	32.25	-	-	P	H
		97.9	24.69	-18.81	43.5	39.98	15.72	0.87	32.23	-	-	P	H
		567.38	27.35	-18.65	46	31.34	25.88	2.03	32.37	-	-	P	H
		743.92	29.63	-16.37	46	31.28	27.5	2.32	31.75	-	-	P	H
		954.41	32.49	-13.51	46	29.86	30.51	2.6	30.77	-	-	P	H
													H
													H
													H
													H
													H
													H
		30	25.08	-14.92	40	30.11	24.57	0.5	32.22	-	-	P	V
		103.72	19.83	-23.67	43.5	34.44	16.38	0.89	32.23	-	-	P	V
		120.21	20.11	-23.39	43.5	33.46	17.5	0.96	32.24	-	-	P	V
		576.11	26.2	-19.8	46	30.38	25.71	2.05	32.43	-	-	P	V
		788.54	30.26	-15.74	46	31.04	27.81	2.38	31.41	-	-	P	V
		959.26	33.02	-12.98	46	30.08	30.79	2.6	30.74	-	-	P	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.												



Note symbol

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



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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
 = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
 = 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)
 = 55.45 (dBμV/m)
2. Over Limit(dB)
 = Level(dBμV/m) – Limit Line(dBμV/m)
 = 55.45(dBμV/m) – 74(dBμV/m)
 = -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)
 = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
 = 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)
 = 43.54 (dBμV/m)
2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)
 = 43.54(dBμV/m) – 54(dBμV/m)
 = -10.46(dB)

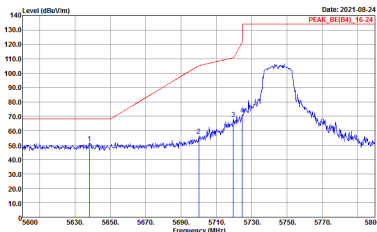
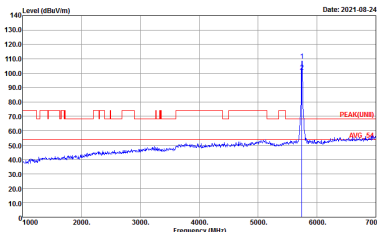
Both peak and average measured complies with the limit line, so test result is “PASS”.



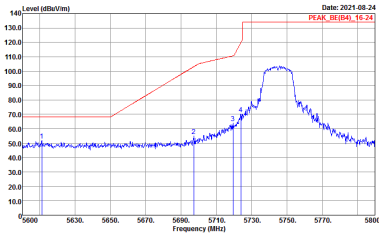
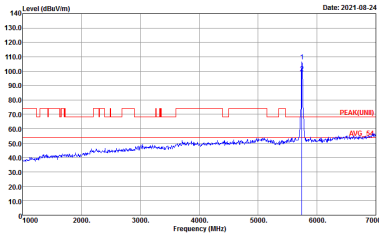
Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Yuan Lee, Jacky Hong, and Wilson Wu	Temperature :	20~25°C
		Relative Humidity :	50~60%

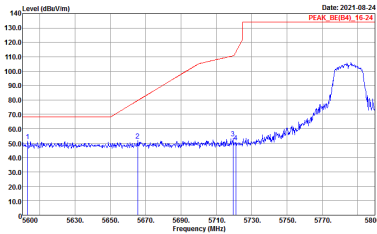
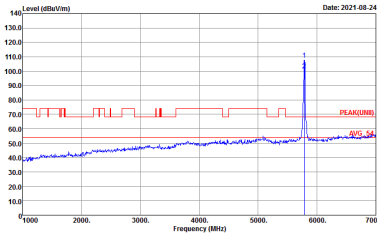
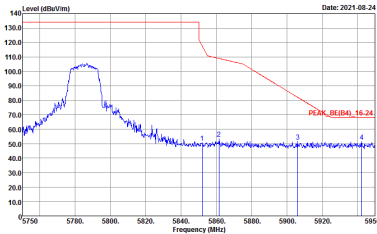
Band 4 - 5725~5850MHz
WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-1V Condition : PEAK_BE(84)_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH13-1V Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

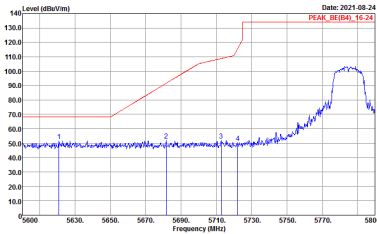
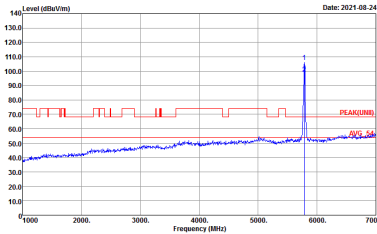
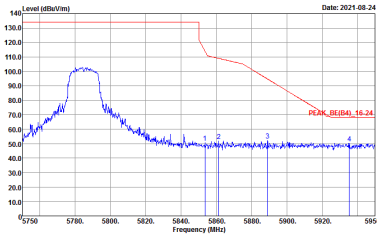


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_15-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH13-HY Condition : PEAK(FUNB)_005-13 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

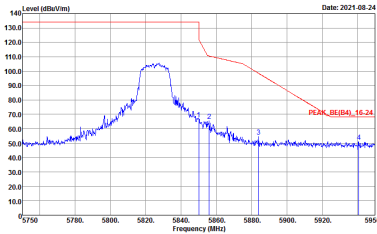
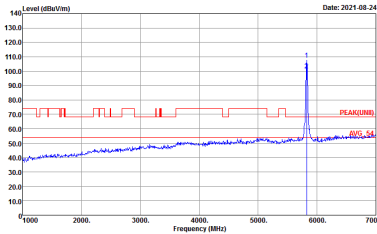


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH13-HY Condition : PEAK(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

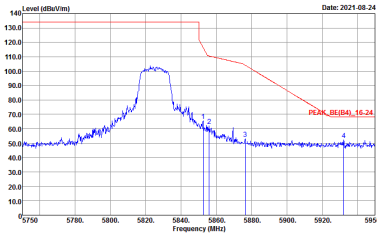
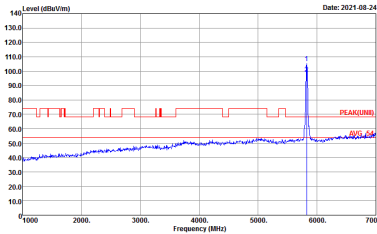


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

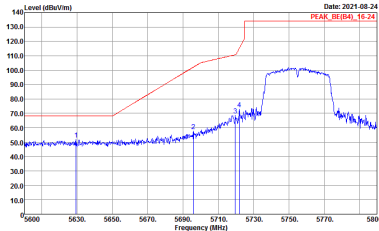
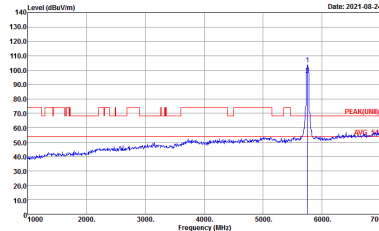
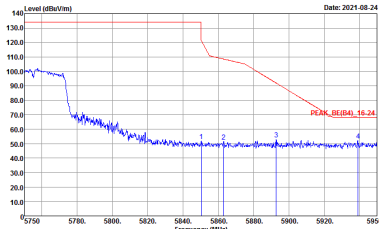


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : : PEAK_802.11a_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH13-HY Condition : : PEAK_802.11a_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

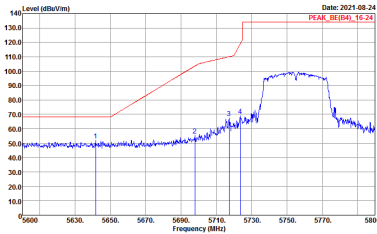
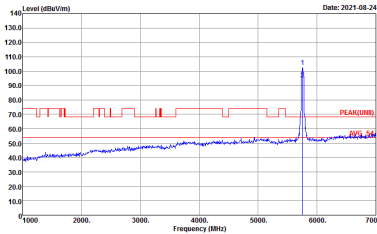
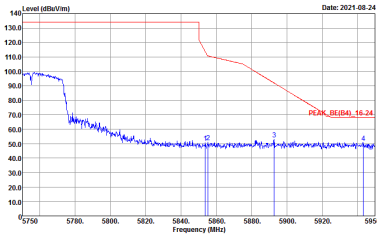


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_B4_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH13-HY Condition : PEAK_FUND 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

Band 4 5725~5850MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

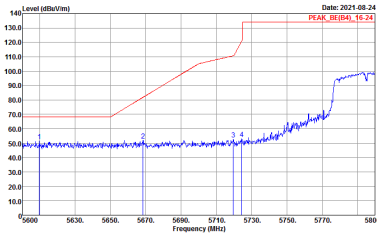
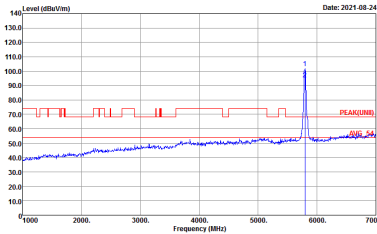
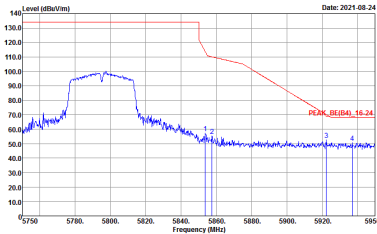


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH13-HY Condition : PEAK(LINE1) 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

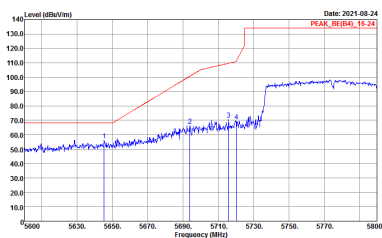
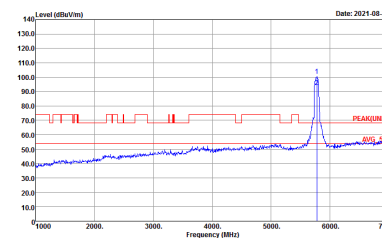
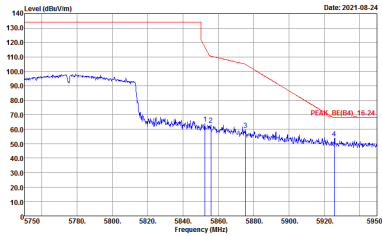


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Fundamental
Peak	Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH13-HY Condition : PEAK_FUND 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

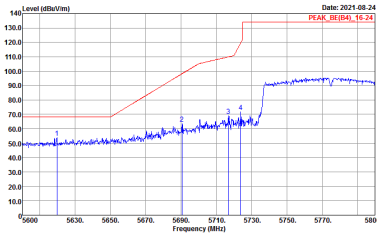
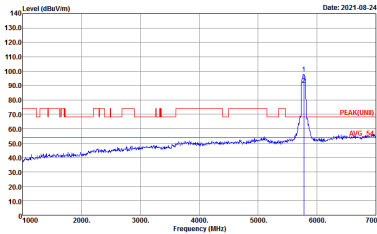
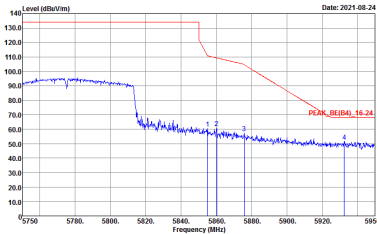


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

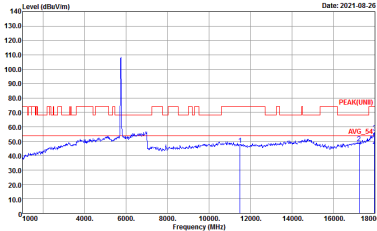
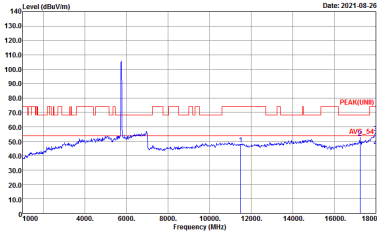
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH13-HY Condition : PEAK(UNB) 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank



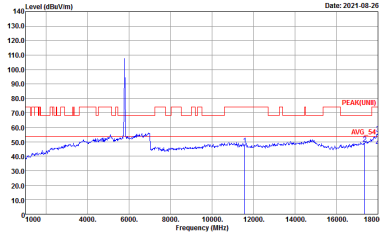
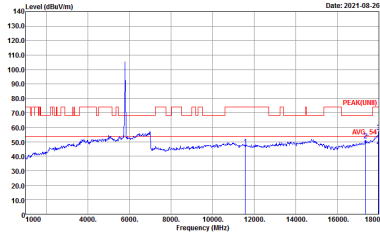
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



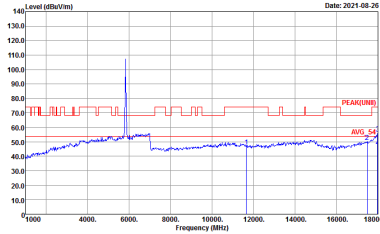
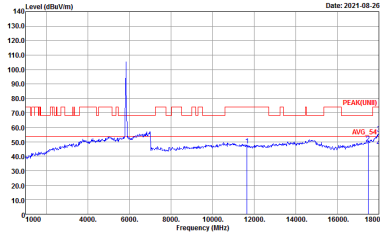
Band 4 - 5725~5850MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL



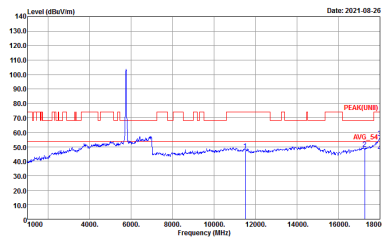
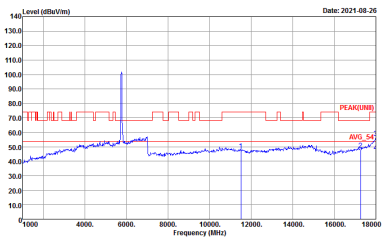
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_9120D_1241 HORIZONTAL	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_9120D_1241 VERTICAL



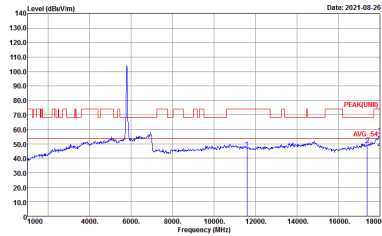
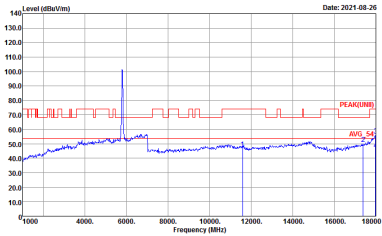
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_9120D_1241 HORIZONTAL	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_9120D_1241 VERTICAL



Band 4 5725~5850MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

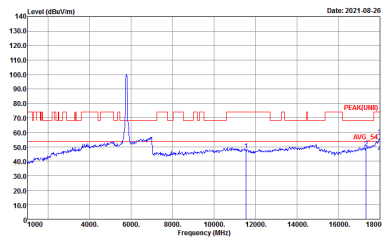
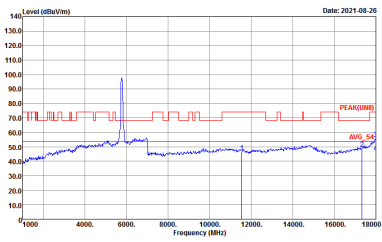
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-14Y Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL	 Site : 03CH13-14Y Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL



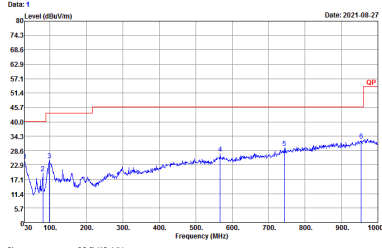
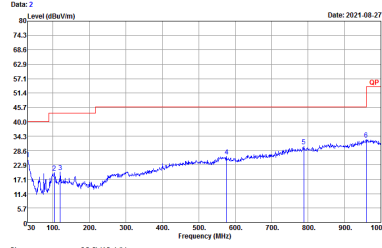
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL



Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Harmonic @ 3m)

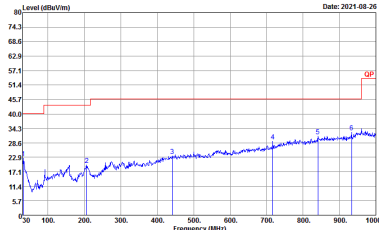
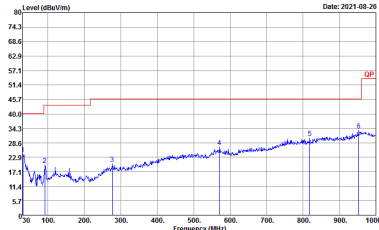
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-14Y Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL	 Site : 03CH13-14Y Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL

Emission above 18GHz
5GHz WIFI 802.11ac VHT80 (SHF)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 SHF	
1	Horizontal	Vertical
Peak / Avg.	Date: 1 Level (dBuV/m) Date: 2021-08-27  Site : 03CH13-HY Condition : QP 3m BIL06_40103 HORIZONTAL Detector : Peak	Date: 2 Level (dBuV/m) Date: 2021-08-27  Site : 03CH13-HY Condition : QP 3m BIL06_40103 VERTICAL Detector : Peak



Emission below 1GHz
5GHz WIFI 802.11ac VHT80 (LF)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH13-HY Condition : QP 3m 81LOG_40103 HORIZONTAL	 Site : 03CH13-HY Condition : QP 3m 81LOG_40103 VERTICAL



Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11a	100.00	-	-	10Hz
5GHz 802.11n HT40	100.00	-	-	10Hz
5GHz 802.11ac VHT80	100.00	-	-	10Hz

