

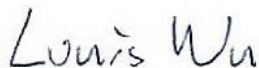
NCC RADIO TEST REPORT

Equipment : “Abbott” i-STAT Alinity Instrument
(“亞培”艾斯特床旁血液監護儀)
Brand Name : Abbott
Model Name : AN-500
Marketing Name : AN-500
Applicant : 美商亞培股份有限公司
台北市中山區民生東路 3 段 51 號 6 樓及 49 號 5 樓、6 樓
Manufacturer : ABBOTT POINT OF CARE INC.
400 College Road East Princeton, NJ 08540, U.S.A
Standard : NCC LP0002 (2018-01-10)

The product was received on Mar. 12, 2020 and testing was started from Apr. 07, 2020 and completed on May 20, 2020. We, SPORTON INTERNATIONAL INC., EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures NCC LP0002 (2018-01-10) and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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



Approved by: Louis Wu

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
TR012109C	01	Initial issue of report	Apr. 28, 2020
TR012109C	02	- Revise accessory list in section 1.1. - Add Frequency and Channel for 802.11n HT40 in section 2.1. - Update test data. - Revise Brand name for AC Adapter	May 22, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	LP0002 4.7.3 4.7.5	6dB & 26dB Bandwidth	Pass	-
3.1	LP0002 4.7.3	99% Occupied Bandwidth	Reporting only	-
3.2	LP0002 4.7.3	Maximum Conducted Output Power	Pass	-
3.3	LP0002 4.7.3	Power Spectral Density	Pass	-
3.4	LP0002 4.7.4	Unwanted Emissions	Pass	Under limit 0.47 dB at 487.840 MHz
-	LP0002 2.3	AC Conducted Emission	Pass	Under limit 4.03 dB at 0.528 MHz
3.6	LP0002 4.7.6	Automatically Discontinue Transmission	Pass	-
3.7	LP0002 2.2 4.7.8	Antenna Requirement	Pass	-
Annex A	LP0002 2.11	Receiver Radiated Emission	Pass	Please refer to Annex A
Annex B	LP0002 2.2 5.20.2	Maximum Power Density	Pass	-

Declaration of Conformity:

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

Comments and Explanations:

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

Reviewed by: Wii Chang

Report Producer: Yimin Ho

1 General Description

1.1 Product Feature of Equipment Under Test

Wi-Fi 2.4GHz 802.11b/g/n and Wi-Fi 5GHz 802.11a/n

Product Specification subjective to this standard	
Antenna Type	WLAN <Ant. 1>: PCB Antenna <Ant. 2>: PCB Antenna

Specification of Accessory		
AC Adapter	Brand Name	Abbott
	Model Name	MENB1060A0551F02
Base Station	Brand Name	Abbott
	Model Name	BST-500
Battery	Brand Name	Abbott
	Model Name	RB-500

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. EMC & Wireless Communications Laboratory	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	TH05-HY	CO05-HY

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

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855	
Test Site No.	Sporton Site No.	
	03CH15-HY	

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

FCC designation No.: TW1190 and TW0007

1.4 Applicable Standards

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

- ♦ NCC LP0002 (2018-01-10)
- ♦ 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, pre-scanned in three orthogonal panels, X, Y, Z and Accessory. The worst cases (Cradle Mode) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	-	-	165	5825

Note: The above Frequency and Channel in "*" were 802.11n HT40.

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

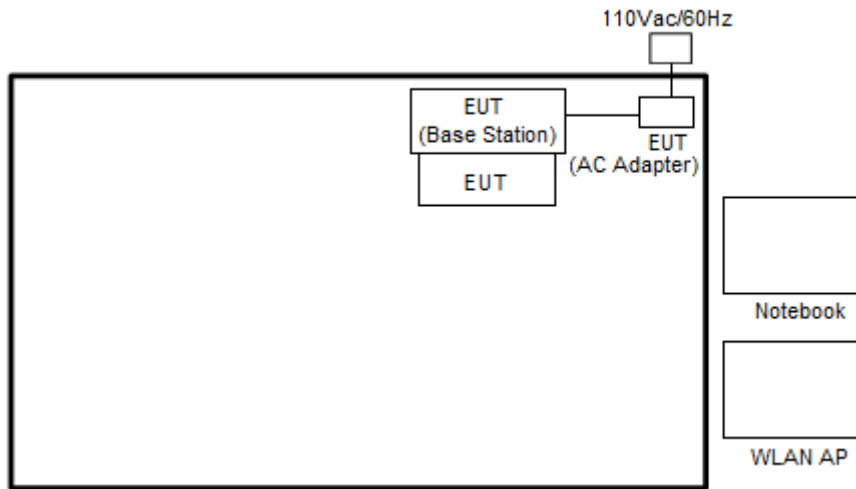
Test Cases	
AC Conducted Emission	Mode 1 : WLAN (5GHz) Link + Base Station + AC Adapter Mode 2 : WLAN (5GHz) Idle + Base Station + AC Adapter
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.	

Ch. #		Band IV : 5725-5850 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
H	High	165	165	159

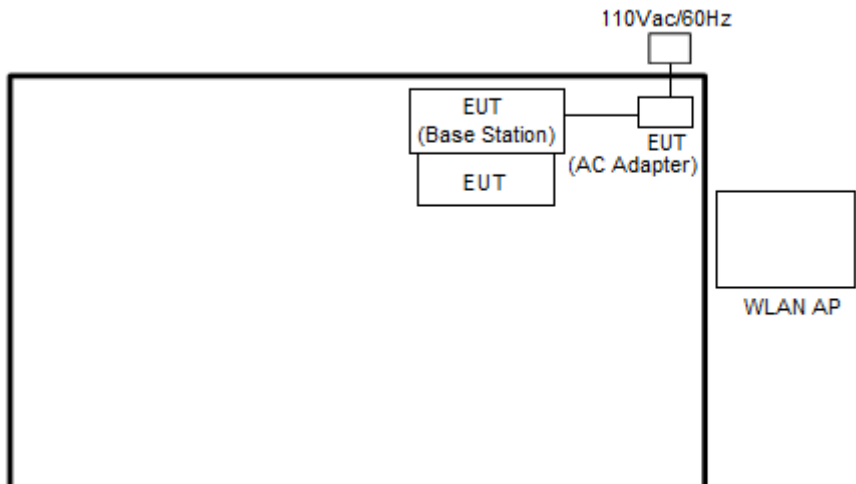
Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System

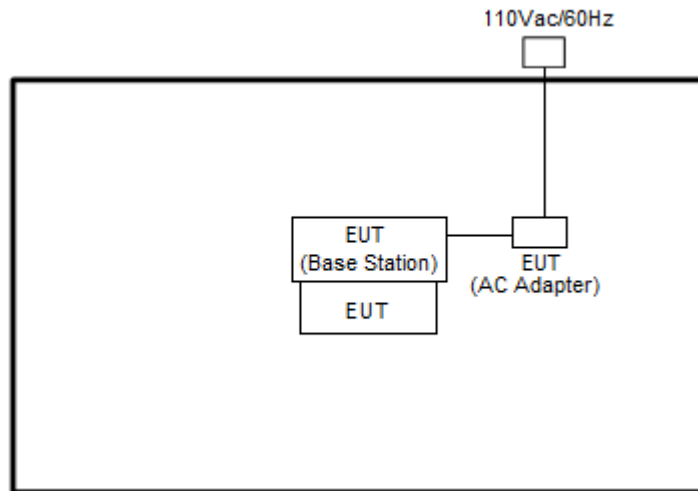
<AC Conducted Emission with Adapter Mode>



<AC Conducted Emission with WLAN Idle Mode>



<WLAN Tx Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded,1.8m
2.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

Remark: Applicant has ensured accessory would not be attached with the product on the market, accessory is provided by lab for testing.

2.5 EUT Operation Test Setup

The RF test items, utility “Tera Term” 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 10dB 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.

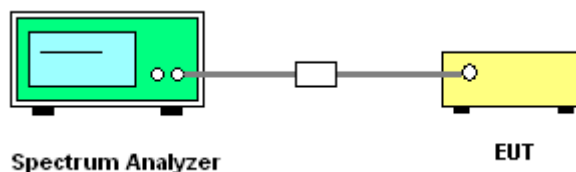
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

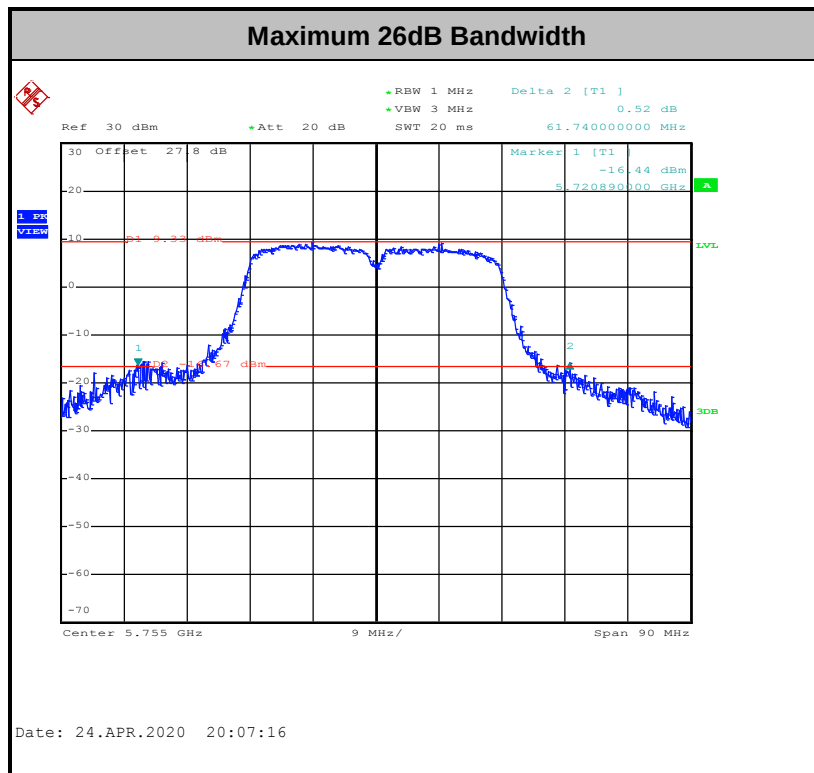
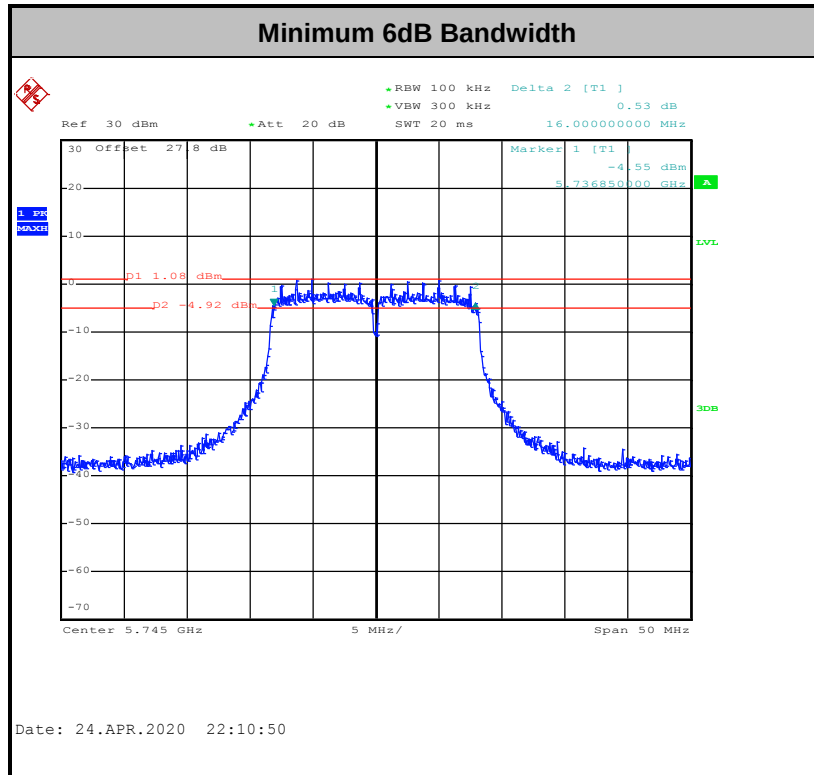
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is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

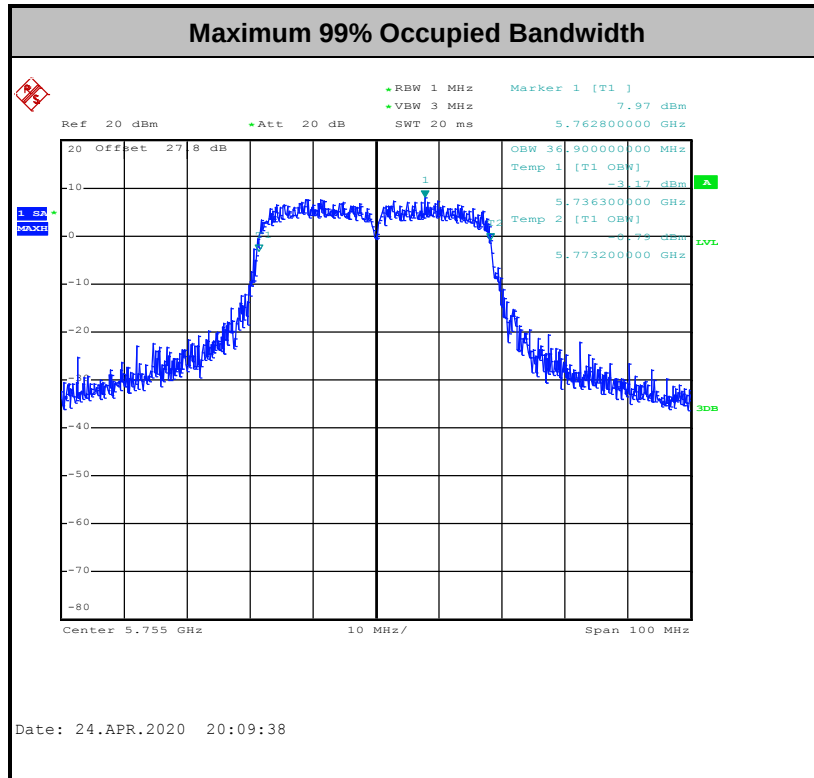
3.1.4 Test Setup



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.

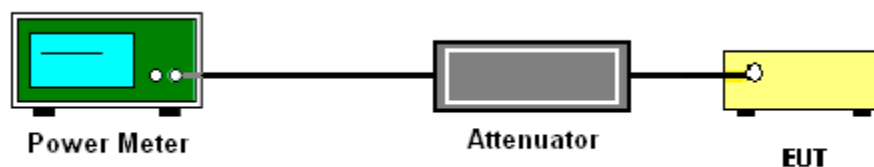
3.2.3 Test Procedures

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

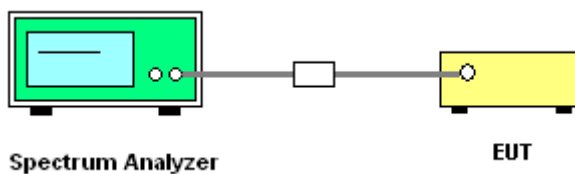
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section F) Maximum power spectral density.

Method SA-3

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

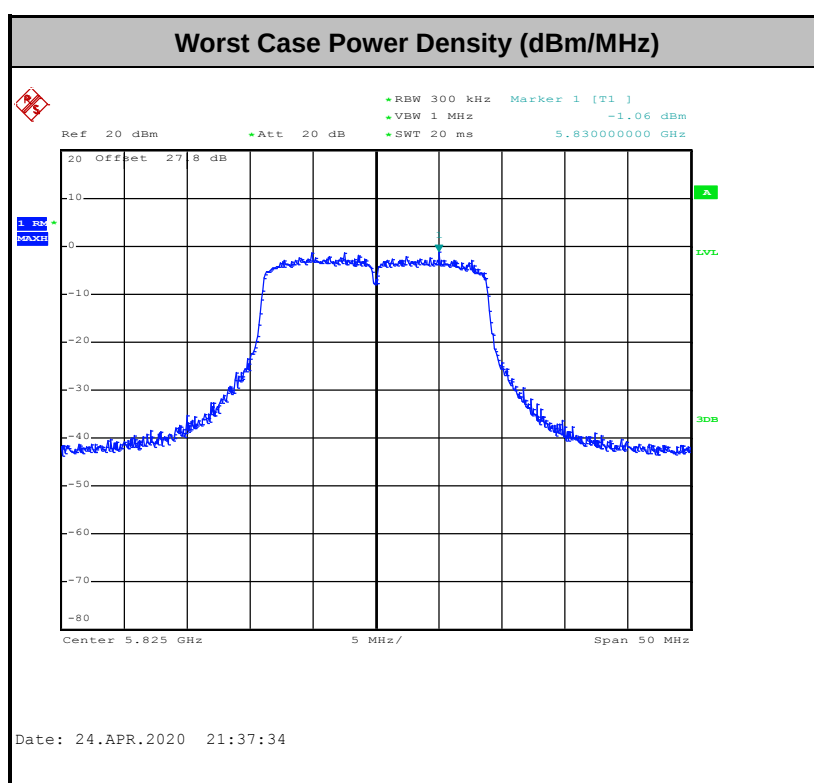
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 300 kHz.
 - Set VBW $\geq$ 1 MHz.
 - Number of points in sweep $\geq$ 2 Span / RBW.
 - Sweep time $\leq$ (number of points in sweep) $\times$ T, when duty cycle is less than 98 percent where T is the minimum transmission 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

3.4.1 Limit of Unwanted Emissions

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

Devices operating in the band 5725-5850 MHz shall have EIRP of unwanted emissions comply with the following:

- a. 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges
- b. 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges
- c. 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges
- d. -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges

- (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.

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

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

- (3) ANSI C63.10-2013 clause 12.7.3 note 97

As specified by regulatory requirements, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit. However, an out-of-band emission that complies with both the average and peak general regulatory limits is not required to satisfy the peak emission limit.

3.4.2 Measuring Instruments

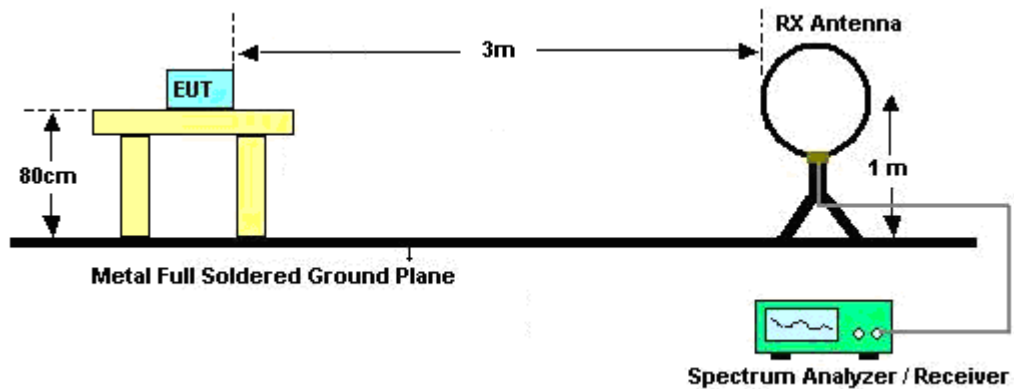
See list of measuring equipment of this test report.

3.4.3 Test Procedures

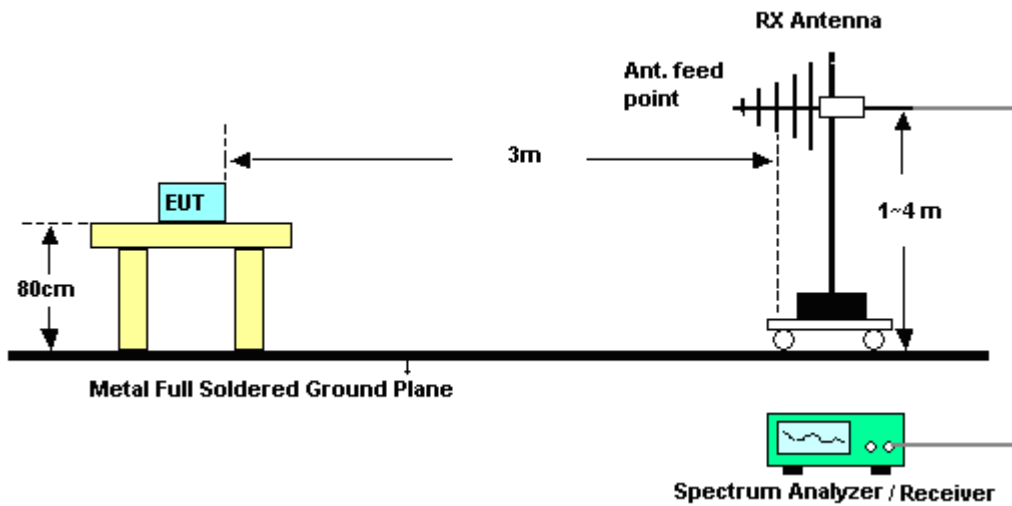
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section G) Unwanted emissions measurement.
(1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
(2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW $\geq$ 3 MHz
 - Detector = Peak
 - Sweep time = auto
 - Trace mode = max hold
(3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
 - RBW = 1 MHz
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq$ 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 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

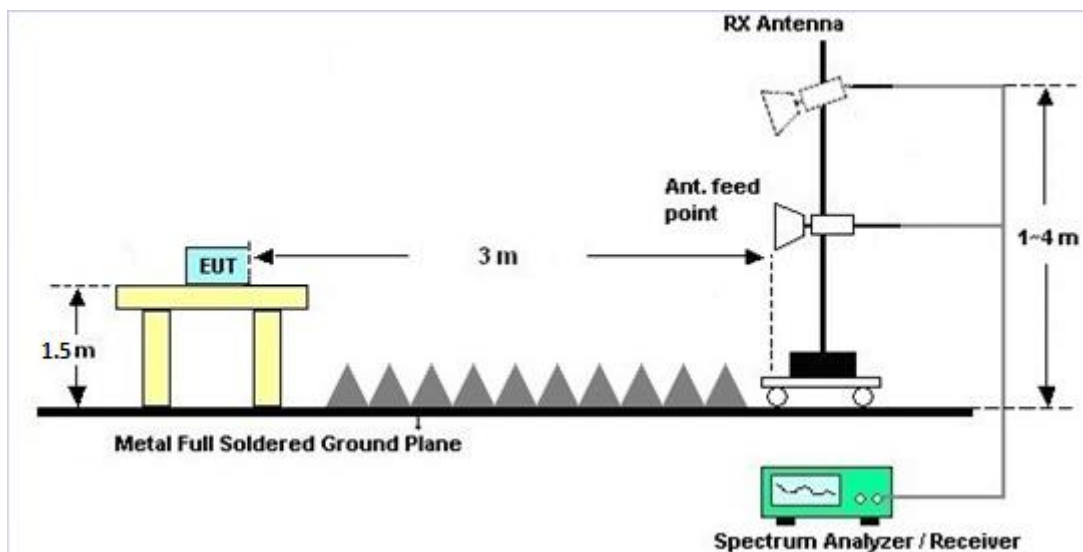
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





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

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per NCC LP0002 section 5.13 was not reported.

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

3.4.6 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.

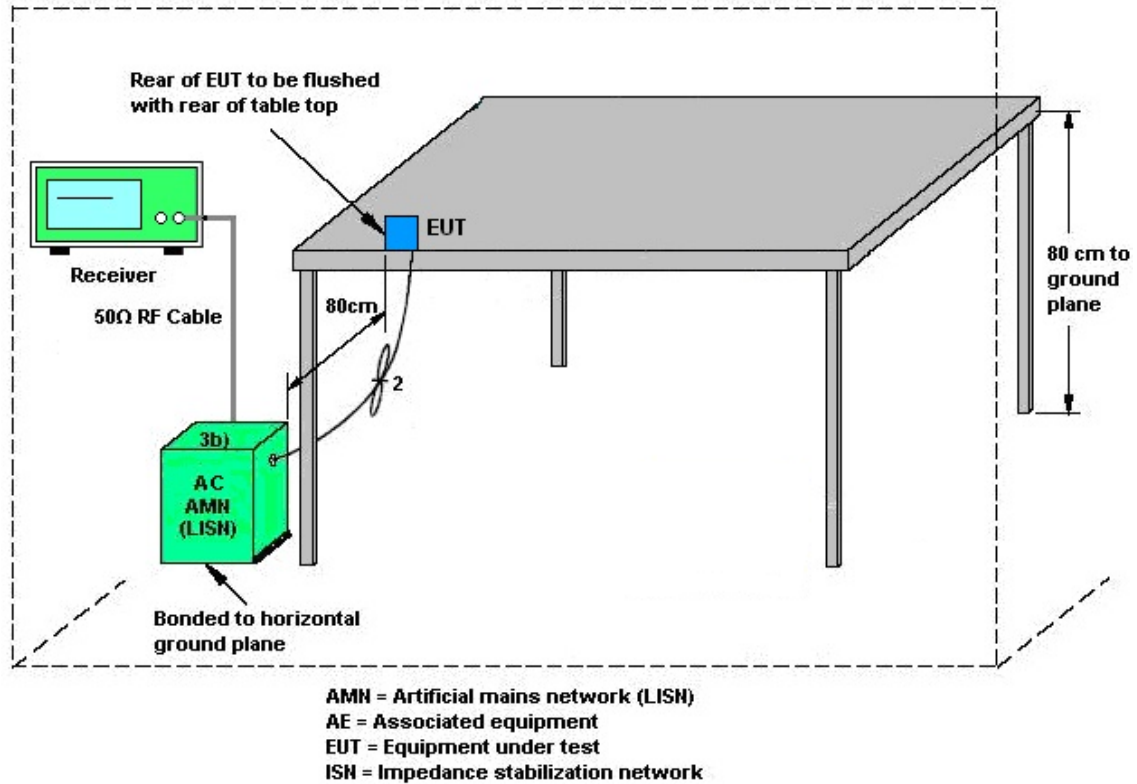
3.5.2 Measuring Instruments

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

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

3.7 Antenna Requirements

3.7.1 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.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

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



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 09, 2020	Apr. 10, 2020~ May 20, 2020	Jan. 08, 2021	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL6111D&008 00N1D01N-06	41912&05	30MHz to 1GHz	Feb. 09, 2020	Apr. 10, 2020~ May 20, 2020	Feb. 08, 2021	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-162 0	1-18GHz	Oct. 28, 2019	Apr. 10, 2020~ May 20, 2020	Oct. 27, 2020	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Dec. 10, 2019	Apr. 10, 2020~ May 20, 2020	Dec. 09, 2020	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 27, 2019	Apr. 10, 2020~ May 20, 2020	Dec. 26, 2020	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-30 3	171000180 0055007	1GHz~18GHz	Mar. 31, 2020	Apr. 10, 2020~ May 20, 2020	Mar. 30, 2021	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY532701 95	1GHz~26.5GHz	Aug. 23, 2019	Apr. 10, 2020~ May 20, 2020	Aug. 22, 2020	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 13, 2019	Apr. 10, 2020~ May 20, 2020	Dec. 12, 2020	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY541300 85	20MHz~8.4GHz	Nov. 01, 2019	Apr. 10, 2020~ May 20, 2020	Oct. 31, 2020	Radiation (03CH15-HY)
Spectrum Analyzer	Agilent	E4446A	MY501801 36	3Hz~44GHz	Apr. 29, 2019	Apr. 10, 2020~ Apr. 27, 2020	Apr. 28, 2020	Radiation (03CH15-HY)
Spectrum Analyzer	Agilent	E4446A	MY501801 36	3Hz~44GHz	May 04, 2020	May 04, 2020~ May 20, 2020	May 03, 2021	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Apr. 10, 2020~ May 20, 2020	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Apr. 10, 2020~ May 20, 2020	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24 (k5)	RK-00045 1	N/A	N/A	Apr. 10, 2020~ May 20, 2020	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY36980/ 4	30M-18G	Apr. 15, 2019	Apr. 10, 2020~ Apr. 13, 2020	Apr. 14, 2020	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY36980/ 4	30M-18G	Apr. 14, 2020	Apr. 14, 2020~ May 20, 2020	Apr. 13, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9838/4 PE	30M-18G	Apr. 15, 2019	Apr. 10, 2020~ Apr. 13, 2020	Apr. 14, 2020	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9838/4 PE	30M-18G	Apr. 14, 2020	Apr. 14, 2020~ May 20, 2020	Apr. 13, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY802430 /4	30M~18GHz	May 13, 2019	Apr. 10, 2020~ Apr. 20, 2020	May 12, 2020	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY802430 /4	30M~18GHz	Apr. 14, 2020	Apr. 20, 2020~ May 20, 2020	Apr. 13, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 25, 2020	Apr. 10, 2020~ May 20, 2020	Feb. 24, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 25, 2020	Apr. 10, 2020~ May 20, 2020	Feb. 24, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WLK4-1000-15 30-8000-40SS	SN4	1.53G Low Pass	Jul. 04, 2019	Apr. 10, 2020~ May 20, 2020	Jul. 03, 2020	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-2700- 3000-18000-60 ST	SN4	3GHz High Pass Filter	Sep. 17, 2019	Apr. 10, 2020~ May 20, 2020	Sep. 16, 2020	Radiation (03CH15-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H2	41410069	N/A	Jun. 17, 2019	Apr. 07, 2020~ Apr. 24, 2020	Jun. 16, 2020	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	17I00015S NO36	10MHz~6GHz	Jan. 22, 2020	Apr. 07, 2020~ Apr. 24, 2020	Jan. 21, 2021	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Aug. 14, 2019	Apr. 07, 2020~ Apr. 24, 2020	Aug. 13, 2020	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-1405-0	EC190015 7	N/A	Aug. 15, 2019	Apr. 07, 2020~ Apr. 24, 2020	Aug. 14, 2020	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	May 14, 2020	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 15, 2019	May 14, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 07, 2019	May 14, 2020	Nov. 06, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 15, 2019	May 14, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	May 14, 2020	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 02, 2020	May 14, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 02, 2020	May 14, 2020	Jan. 01, 2021	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.3
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.0
--	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.4
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.0
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Jacob Yu / Kai Liao	Temperature:	21~25	°C
Test Date:	2020/4/7 ~ 2020/4/24	Relative Humidity:	51~54	%

Maximum Power Density				
Max. Power	Gain	EIRP	20 cm PSD	PSD Limit
13.80	4.80	18.60	0.0144	1.00
dBm	dBi	dBm	mW/cm ²	mW/cm ²

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	16.65	16.65	25.25	25.45	16.00	16.10	0.5	Pass
11a	6Mbps	1	157	5785	17.85	17.85	26.25	26.00	16.90	16.90	0.5	Pass
11a	6Mbps	1	165	5825	17.90	17.80	25.60	26.65	16.75	16.80	0.5	Pass
HT20	MCS0	1	149	5745	17.75	17.85	26.25	26.20	17.10	16.60	0.5	Pass
HT20	MCS0	1	157	5785	17.80	17.80	26.35	25.95	16.80	16.25	0.5	Pass
HT20	MCS0	1	165	5825	17.90	17.80	25.70	26.25	16.90	16.65	0.5	Pass
HT40	MCS0	1	151	5755	36.70	36.90	61.74	50.40	35.28	35.10	0.5	Pass
HT40	MCS0	1	159	5795	36.80	36.60	47.70	48.54	35.28	35.28	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	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	11.70	11.00		30.00	30.00	4.80	4.80	Pass
11a	6Mbps	1	157	5785	10.70	10.30		30.00	30.00	4.80	4.80	Pass
11a	6Mbps	1	165	5825	11.20	10.70		30.00	30.00	4.80	4.80	Pass
HT20	MCS0	1	149	5745	11.70	11.10		30.00	30.00	4.80	4.80	Pass
HT20	MCS0	1	157	5785	10.70	10.30		30.00	30.00	4.80	4.80	Pass
HT20	MCS0	1	165	5825	11.40	11.10		30.00	30.00	4.80	4.80	Pass
HT40	MCS0	1	151	5755	13.80	13.60		30.00	30.00	4.80	4.80	Pass
HT40	MCS0	1	159	5795	12.50	12.10		30.00	30.00	4.80	4.80	Pass

TEST RESULTS DATA
Power Spectral Density

Band IV single antenna														
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 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	2.22	2.22	1.11	0.37		30.00	30.00	4.80	4.80	Pass
11a	6Mbps	1	157	5785	2.22	2.22	0.09	0.19		30.00	30.00	4.80	4.80	Pass
11a	6Mbps	1	165	5825	2.22	2.22	0.85	0.11		30.00	30.00	4.80	4.80	Pass
HT20	MCS0	1	149	5745	2.22	2.22	1.11	0.48		30.00	30.00	4.80	4.80	Pass
HT20	MCS0	1	157	5785	2.22	2.22	0.72	0.26		30.00	30.00	4.80	4.80	Pass
HT20	MCS0	1	165	5825	2.22	2.22	1.16	0.32		30.00	30.00	4.80	4.80	Pass
HT40	MCS0	1	151	5755	2.22	2.22	0.52	0.16		30.00	30.00	4.80	4.80	Pass
HT40	MCS0	1	159	5795	2.22	2.22	-0.06	-0.95		30.00	30.00	4.80	4.80	Pass



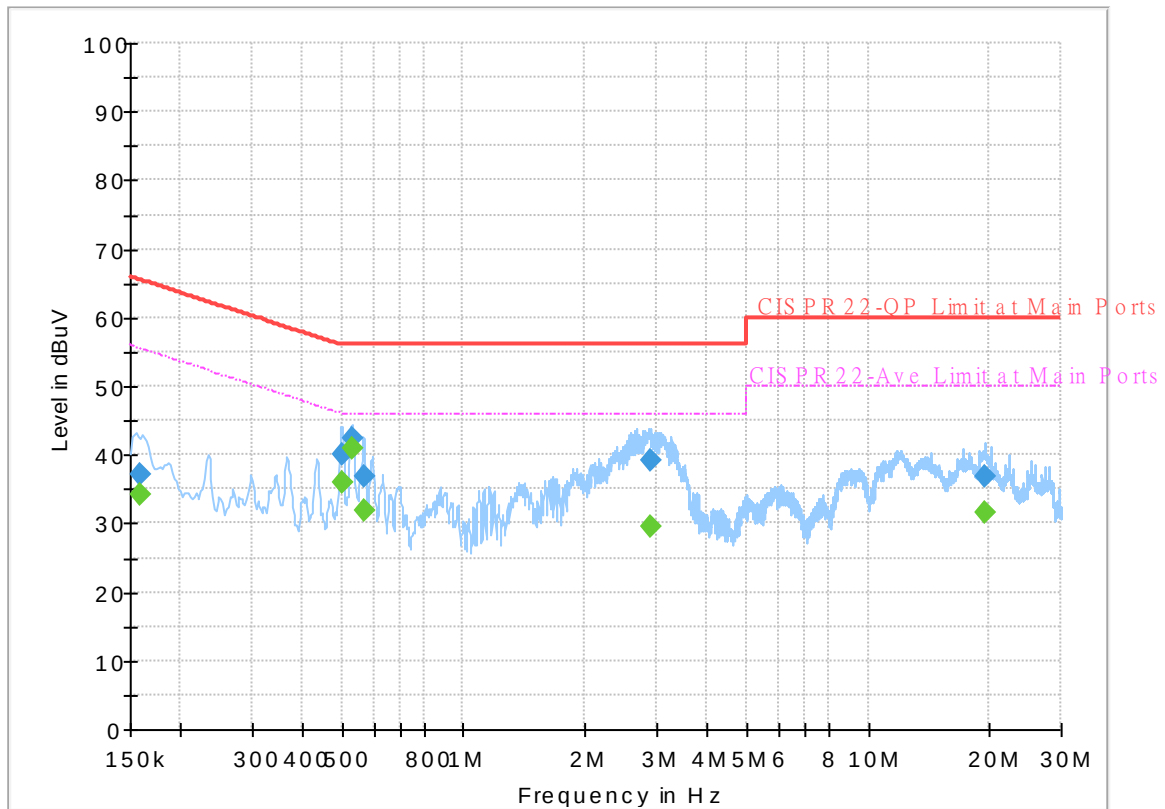
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Tom Lee	Temperature :	21~24℃
		Relative Humidity :	42~50%

EUT Information

Report NO : 012109
Test Mode : Mode 1
Test Voltage : 110Vac/60Hz
Phase : Line

Full Spectrum



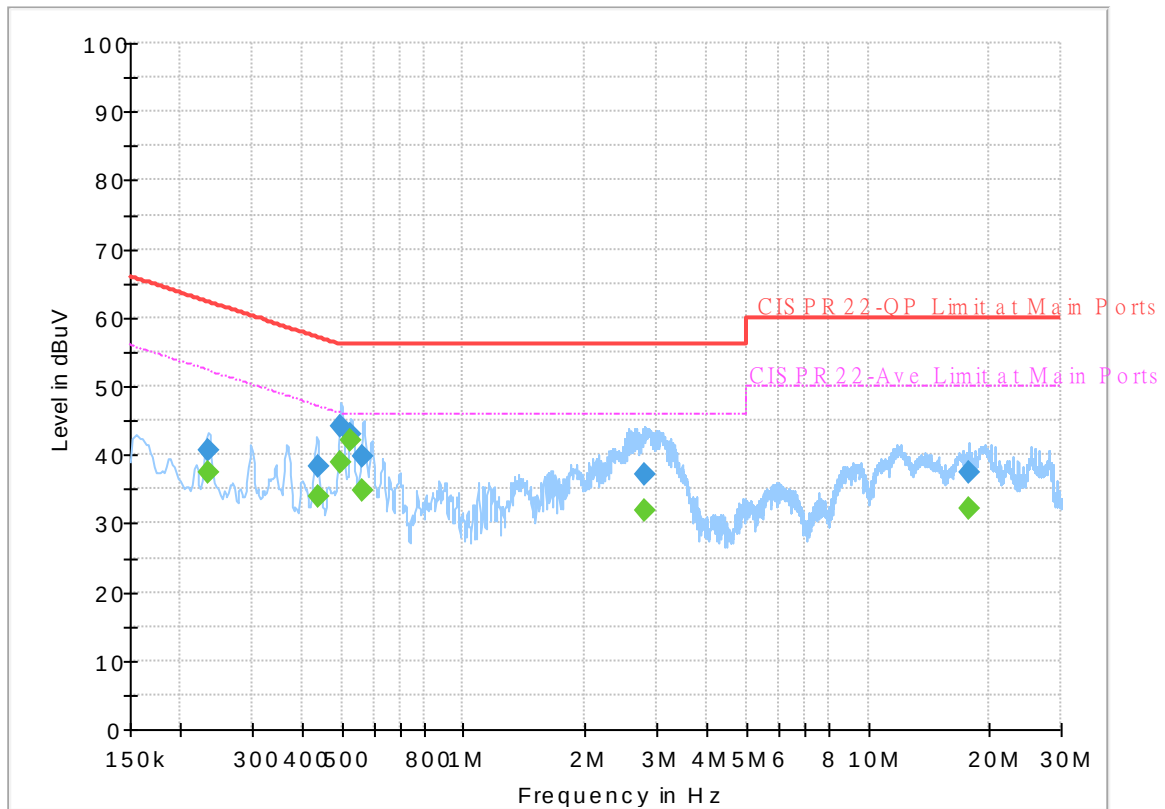
Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.158100	---	34.15	55.56	21.41	L1	OFF	19.5
0.158100	37.23	---	65.56	28.33	L1	OFF	19.5
0.501360	---	36.03	46.00	9.97	L1	OFF	19.5
0.501360	40.09	---	56.00	15.91	L1	OFF	19.5
0.530610	---	40.99	46.00	5.01	L1	OFF	19.5
0.530610	42.31	---	56.00	13.69	L1	OFF	19.5
0.567150	---	31.81	46.00	14.19	L1	OFF	19.5
0.567150	36.92	---	56.00	19.08	L1	OFF	19.5
2.904000	---	29.59	46.00	16.41	L1	OFF	19.6
2.904000	39.04	---	56.00	16.96	L1	OFF	19.6
19.468230	---	31.50	50.00	18.50	L1	OFF	19.8
19.468230	36.73	---	60.00	23.27	L1	OFF	19.8

EUT Information

Report NO : 012109
Test Mode : Mode 1
Test Voltage : 110Vac/60Hz
Phase : Neutral

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.232980	---	37.39	52.34	14.95	N	OFF	19.5
0.232980	40.64	---	62.34	21.70	N	OFF	19.5
0.435480	---	34.03	47.15	13.12	N	OFF	19.5
0.435480	38.31	---	57.15	18.84	N	OFF	19.5
0.498570	---	39.01	46.02	7.01	N	OFF	19.5
0.498570	44.05	---	56.02	11.97	N	OFF	19.5
0.528180	---	41.97	46.00	4.03	N	OFF	19.5
0.528180	43.02	---	56.00	12.98	N	OFF	19.5
0.563460	---	34.92	46.00	11.08	N	OFF	19.5
0.563460	39.70	---	56.00	16.30	N	OFF	19.5
2.800500	---	31.85	46.00	14.15	N	OFF	19.6
2.800500	37.08	---	56.00	18.92	N	OFF	19.6
17.750580	---	32.02	50.00	17.98	N	OFF	19.9
17.750580	37.50	---	60.00	22.50	N	OFF	19.9



Appendix C. Radiated Spurious Emission

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	24.3~24.9°C
		Relative Humidity :	55~60%

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	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5642.6	51.77	-16.43	68.2	39.45	31.81	11.03	30.52	232	292	P	H
		5675.6	51.94	-35.24	87.18	39.57	31.9	11.01	30.54	232	292	P	H
		5719.6	55.08	-55.61	110.69	42.66	32	10.99	30.57	232	292	P	H
		5724	62.43	-57.49	119.92	50.01	32	10.99	30.57	232	292	P	H
	*	5745	105.6	-	-	93.2	32	10.98	30.58	232	292	P	H
	*	5745	97.66	-	-	85.26	32	10.98	30.58	232	292	A	H
													H
													H
		5600.6	52.15	-16.05	68.2	39.69	31.9	11.05	30.49	253	165	P	V
		5658.4	51.25	-23.19	74.44	38.93	31.83	11.02	30.53	253	165	P	V
		5717.2	52.47	-57.55	110.02	40.04	32	10.99	30.56	253	165	P	V
		5724.2	61.35	-59.03	120.38	48.93	32	10.99	30.57	253	165	P	V
	*	5745	101.69	-	-	89.29	32	10.98	30.58	253	165	P	V
	*	5745	93.67	-	-	81.27	32	10.98	30.58	253	165	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		5636.8	53.11	-15.09	68.2	40.76	31.83	11.03	30.51	238	289	P	H
		5681	51.75	-39.43	91.18	39.36	31.92	11.01	30.54	238	289	P	H
		5709.8	51.93	-56.02	107.95	39.49	32	11	30.56	238	289	P	H
		5722.8	51.2	-65.98	117.18	38.78	32	10.99	30.57	238	289	P	H
	*	5785	106.49	-	-	94	32.14	10.96	30.61	238	289	P	H
	*	5785	97.88	-	-	85.39	32.14	10.96	30.61	238	289	A	H
		5850.4	51.25	-70.04	121.29	38.62	32.2	11.08	30.65	238	289	P	H
		5870.6	52.08	-54.35	106.43	39.33	32.28	11.13	30.66	238	289	P	H
		5891.4	52.41	-40.62	93.03	39.53	32.37	11.18	30.67	238	289	P	H
		5931.2	52.8	-15.4	68.2	39.76	32.46	11.28	30.7	238	289	P	H
													H
													H
		5601.2	52.33	-15.87	68.2	39.87	31.9	11.05	30.49	228	161	P	V
		5689.4	51.77	-45.61	97.38	39.35	31.96	11.01	30.55	228	161	P	V
		5710.8	50.84	-57.39	108.23	38.41	32	10.99	30.56	228	161	P	V
		5724.4	50.95	-69.88	120.83	38.53	32	10.99	30.57	228	161	P	V
	*	5785	101.54	-	-	89.08	32.1	10.96	30.6	228	161	P	V
	*	5785	92.67	-	-	80.21	32.1	10.96	30.6	228	161	A	V
		5854.8	51.73	-59.53	111.26	39.07	32.22	11.09	30.65	228	161	P	V
		5864.8	51.19	-56.86	108.05	38.47	32.26	11.12	30.66	228	161	P	V
		5924.6	51.91	-16.58	68.49	38.88	32.45	11.27	30.69	228	161	P	V
		5926.4	52.48	-15.72	68.2	39.55	32.45	11.17	30.69	228	161	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	107.56	-	-	94.98	32.2	11.01	30.63	234	290	P	H
	*	5825	98.6	-	-	86.02	32.2	11.01	30.63	234	290	A	H
		5854.2	54.16	-58.46	112.62	41.5	32.22	11.09	30.65	234	290	P	H
		5855.2	54.44	-56.3	110.74	41.78	32.22	11.09	30.65	234	290	P	H
		5914	52.42	-23.89	76.31	39.44	32.43	11.24	30.69	234	290	P	H
		5932.4	52.68	-15.52	68.2	39.63	32.46	11.29	30.7	234	290	P	H
													H
													H
	*	5825	100.06	-	-	87.48	32.2	11.01	30.63	222	160	P	V
	*	5825	100.01	-	-	87.43	32.2	11.01	30.63	222	160	A	V
		5852.8	51.97	-63.85	115.82	39.33	32.21	11.08	30.65	222	160	P	V
		5866.6	51.68	-55.87	107.55	38.95	32.27	11.12	30.66	222	160	P	V
		5878.2	51.89	-50.93	102.82	39.09	32.31	11.15	30.66	222	160	P	V
		5945.8	52.05	-16.15	68.2	38.95	32.49	11.32	30.71	222	160	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	49.94	-24.06	74	56.14	40.48	14.91	61.59	100	0	P	H
		17235	56.29	-11.91	68.2	55.41	40.94	18.76	58.82	100	0	P	H
													H
													H
		11490	53.91	-20.09	74	60.11	40.48	14.91	61.59	209	324	P	V
		11490	42.67	-11.33	54	48.87	40.48	14.91	61.59	209	324	A	V
		17235	62.65	-5.55	68.2	61.77	40.94	18.76	58.82	400	82	P	V
													V
802.11a CH 157 5785MHz		11570	47.82	-26.18	74	54.2	40.29	14.95	61.62	100	0	P	H
		17355	55.8	-12.4	68.2	53.67	41.75	18.91	58.53	100	0	P	H
													H
													H
		11570	48.72	-25.28	74	55.1	40.29	14.95	61.62	100	0	P	V
		17355	63.49	-4.71	68.2	61.36	41.75	18.91	58.53	184	263	P	V
													V
													V
802.11a CH 165 5825MHz		11650	55.66	-18.34	74	62.45	39.85	14.99	61.63	100	229	P	H
		11650	44.11	-9.89	54	50.9	39.85	14.99	61.63	100	229	A	H
		17475	56.95	-11.25	68.2	53.65	42.5	19.03	58.23	100	0	P	H
													H
		11650	54.97	-19.03	74	61.76	39.85	14.99	61.63	100	129	P	V
		11650	43.68	-10.32	54	50.47	39.85	14.99	61.63	100	129	A	V
		17475	63.31	-4.89	68.2	60.01	42.5	19.03	58.23	200	263	P	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 HT20 (Band Edge @ 3m)**

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		5627.8	51.79	-16.41	68.2	39.42	31.84	11.04	30.51	233	289	P	H
		5679.2	52.08	-37.77	89.85	39.69	31.92	11.01	30.54	233	289	P	H
		5719.4	55.83	-54.8	110.63	43.41	32	10.99	30.57	233	289	P	H
		5725	64.41	-57.79	122.2	51.99	32	10.99	30.57	233	289	P	H
	*	5745	106.08	-	-	93.68	32	10.98	30.58	233	289	P	H
	*	5745	97.57	-	-	85.17	32	10.98	30.58	233	289	A	H
													H
													H
		5611.2	52.29	-15.91	68.2	39.87	31.88	11.04	30.5	251	165	P	V
		5698	51.57	-52.16	103.73	39.13	31.99	11	30.55	251	165	P	V
		5720	52.11	-58.69	110.8	39.69	32	10.99	30.57	251	165	P	V
		5722.4	63.95	-52.32	116.27	51.53	32	10.99	30.57	251	165	P	V
	*	5745	101.34	-	-	88.94	32	10.98	30.58	251	165	P	V
	*	5745	93.23	-	-	80.83	32	10.98	30.58	251	165	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)
802.11n HT20 CH 157 5785MHz		5613.2	52.24	-15.96	68.2	39.83	31.87	11.04	30.5	240	291	P	H
		5668.4	52.16	-29.69	81.85	39.8	31.87	11.02	30.53	240	291	P	H
		5701.6	51.46	-54.19	105.65	39.01	32	11	30.55	240	291	P	H
		5721.6	51.01	-63.44	114.45	38.59	32	10.99	30.57	240	291	P	H
	*	5785	105.69	-	-	93.2	32.14	10.96	30.61	240	291	P	H
	*	5785	97.83	-	-	85.34	32.14	10.96	30.61	240	291	A	H
		5850.6	50.82	-70.01	120.83	38.19	32.2	11.08	30.65	240	291	P	H
		5870.6	51.45	-54.98	106.43	38.7	32.28	11.13	30.66	240	291	P	H
		5910	52.19	-27.08	79.27	39.22	32.42	11.23	30.68	240	291	P	H
		5928.2	52.21	-15.99	68.2	39.17	32.46	11.28	30.7	240	291	P	H
													H
													H
		5636.6	52.44	-15.76	68.2	40.09	31.83	11.03	30.51	243	158	P	V
		5687.8	51.91	-44.29	96.2	39.5	31.95	11.01	30.55	243	158	P	V
		5719	52.11	-58.41	110.52	39.69	32	10.99	30.57	243	158	P	V
		5724.2	50.82	-69.56	120.38	38.4	32	10.99	30.57	243	158	P	V
	*	5785	100.48	-	-	87.99	32.14	10.96	30.61	243	158	P	V
	*	5785	92.13	-	-	79.64	32.14	10.96	30.61	243	158	A	V
		5854	51.18	-61.9	113.08	38.52	32.22	11.09	30.65	243	158	P	V
		5858.8	52.12	-57.61	109.73	39.43	32.24	11.1	30.65	243	158	P	V
		5897	51.94	-36.94	88.88	39.03	32.39	11.2	30.68	243	158	P	V
		5939.8	52.19	-16.01	68.2	39.1	32.48	11.31	30.7	243	158	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 HT20 CH 165 5825MHz	*	5825	106.56	-	-	93.98	32.2	11.01	30.63	246	289	P	H
	*	5825	98.23	-	-	85.65	32.2	11.01	30.63	246	289	A	H
		5850.6	56.7	-64.13	120.83	44.07	32.2	11.08	30.65	246	289	P	H
		5857.2	53.65	-56.53	110.18	40.97	32.23	11.1	30.65	246	289	P	H
		5910.2	53.69	-25.43	79.12	40.72	32.42	11.23	30.68	246	289	P	H
		5943.4	53.32	-14.88	68.2	40.21	32.49	11.32	30.7	246	289	P	H
													H
													H
	*	5825	100.21	-	-	87.63	32.2	11.01	30.63	248	161	P	V
	*	5825	92.22	-	-	79.64	32.2	11.01	30.63	248	161	A	V
		5852	52.12	-65.52	117.64	39.48	32.21	11.08	30.65	248	161	P	V
		5859	51.7	-57.98	109.68	39.01	32.24	11.1	30.65	248	161	P	V
		5875.6	53.37	-51.38	104.75	40.59	32.3	11.14	30.66	248	161	P	V
		5927.6	51.86	-16.34	68.2	38.82	32.46	11.28	30.7	248	161	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 HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		11490	49.3	-24.7	74	55.5	40.48	14.91	61.59	100	0	P	H
		17235	57.75	-10.45	68.2	56.87	40.94	18.76	58.82	100	0	P	H
													H
													H
		11490	49.78	-24.22	74	55.98	40.48	14.91	61.59	100	0	P	V
		17235	63.56	-4.64	68.2	62.68	40.94	18.76	58.82	198	229	P	V
													V
													V
802.11n HT20 CH 157 5785MHz		11570	49.9	-24.1	74	56.28	40.29	14.95	61.62	100	0	P	H
		17355	57.17	-11.03	68.2	55.04	41.75	18.91	58.53	100	0	P	H
													H
													H
		11570	49.52	-24.48	74	55.9	40.29	14.95	61.62	100	0	P	V
		17355	62.26	-5.94	68.2	60.13	41.75	18.91	58.53	192	264	P	V
													V
													V
802.11n HT20 CH 165 5825MHz		11650	54.88	-19.12	74	61.67	39.85	14.99	61.63	100	229	P	H
		11650	42.83	-11.17	54	49.62	39.85	14.99	61.63	100	229	A	H
		17475	64.49	-3.71	68.2	61.19	42.5	19.03	58.23	196	228	P	H
													H
		11650	49.88	-24.12	74	56.67	39.85	14.99	61.63	100	0	P	V
		17475	57.16	-11.04	68.2	53.86	42.5	19.03	58.23	100	0	P	V
		11650	49.88	-24.12	74	56.67	39.85	14.99	61.63	100	0	P	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 (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		5641.2	52.46	-15.74	68.2	41.31	31.82	9.85	30.52	239	293	P	H
		5697.8	53.79	-49.79	103.58	42.49	31.99	9.86	30.55	239	293	P	H
		5719.8	72.5	-38.24	110.74	61.21	32	9.86	30.57	239	293	P	H
		5722.2	75.37	-40.45	115.82	64.08	32	9.86	30.57	239	293	P	H
	*	5755	103.42	-	-	92.12	32.02	9.87	30.59	239	293	P	H
	*	5755	95.2	-	-	83.9	32.02	9.87	30.59	239	293	A	H
		5852.2	49.63	-67.55	117.18	38.13	32.21	9.94	30.65	239	293	P	H
		5870.4	50.65	-55.84	106.49	39.07	32.28	9.96	30.66	239	293	P	H
		5881.6	51.03	-49.27	100.3	39.4	32.33	9.97	30.67	239	293	P	H
		5935.2	51.32	-16.88	68.2	39.51	32.47	10.04	30.7	239	293	P	H
													H
													H
		5607.2	50.66	-17.54	68.2	39.42	31.89	9.85	30.5	252	164	P	V
		5699.6	52.38	-52.53	104.91	41.07	32	9.86	30.55	252	164	P	V
		5717	65.8	-44.16	109.96	54.5	32	9.86	30.56	252	164	P	V
		5724.2	67.97	-52.41	120.38	56.68	32	9.86	30.57	252	164	P	V
	*	5755	98.45	-	-	87.15	32.02	9.87	30.59	252	164	P	V
	*	5755	91.23	-	-	79.93	32.02	9.87	30.59	252	164	A	V
		5851	48.96	-70.96	119.92	37.48	32.2	9.93	30.65	252	164	P	V
		5863.2	49.53	-58.97	108.5	37.99	32.25	9.95	30.66	252	164	P	V
		5899.2	50.38	-36.87	87.25	38.67	32.4	9.99	30.68	252	164	P	V
		5945.4	50.17	-18.03	68.2	38.34	32.49	10.05	30.71	252	164	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		5633.6	51.72	-16.48	68.2	40.55	31.83	9.85	30.51	231	287	P	H
		5687.8	51.64	-44.56	96.2	40.38	31.95	9.86	30.55	231	287	P	H
		5700.2	51.57	-53.69	105.26	40.26	32	9.86	30.55	231	287	P	H
		5722.4	53.07	-63.2	116.27	41.78	32	9.86	30.57	231	287	P	H
	*	5795	104.32	-	-	92.88	32.18	9.87	30.61	231	287	P	H
	*	5795	96.03	-	-	84.59	32.18	9.87	30.61	231	287	A	H
		5851.8	53.41	-64.69	118.1	41.92	32.21	9.93	30.65	231	287	P	H
		5855.6	52.94	-57.69	110.63	41.43	32.22	9.94	30.65	231	287	P	H
		5916.8	51.59	-22.66	74.25	39.83	32.43	10.02	30.69	231	287	P	H
		5932.4	50.9	-17.3	68.2	39.1	32.46	10.04	30.7	231	287	P	H
													H
													H
		5622.4	51.28	-16.92	68.2	40.08	31.86	9.85	30.51	236	161	P	V
		5674.8	51.21	-35.38	86.59	39.99	31.9	9.86	30.54	236	161	P	V
		5710.6	50.18	-57.99	108.17	38.88	32	9.86	30.56	236	161	P	V
		5723.8	49.67	-69.79	119.46	38.38	32	9.86	30.57	236	161	P	V
	*	5795	99.61	-	-	88.17	32.18	9.87	30.61	236	161	P	V
	*	5795	91.24	-	-	79.8	32.18	9.87	30.61	236	161	A	V
		5854.4	49.56	-62.61	112.17	38.05	32.22	9.94	30.65	236	161	P	V
		5855.6	50.34	-60.29	110.63	38.83	32.22	9.94	30.65	236	161	P	V
		5884.8	50.5	-47.42	97.92	38.85	32.34	9.98	30.67	236	161	P	V
		5933	50.74	-17.46	68.2	38.93	32.47	10.04	30.7	236	161	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	49.91	-24.09	74	56.13	40.47	14.91	61.6	100	0	P	H
		17265	54.61	-13.59	68.2	53.5	41.06	18.8	58.75	100	0	P	H
													H
													H
		11510	49.44	-24.56	74	55.66	40.47	14.91	61.6	100	0	P	V
		17265	54.92	-13.28	68.2	53.81	41.06	18.8	58.75	100	0	P	V
													V
													V
802.11n HT40 CH 159 5795MHz		11590	49.65	-24.35	74	56.08	40.23	14.96	61.62	100	0	P	H
		17385	56.61	-11.59	68.2	54.08	42.05	18.93	58.45	100	0	P	H
													H
													H
		11590	49.93	-24.07	74	56.36	40.23	14.96	61.62	100	0	P	V
		17385	57.62	-10.58	68.2	55.09	42.05	18.93	58.45	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

WIFI 802.11n HT20 (LF @ 3m)

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)
802.11n HT20 LF		133.79	37.13	-6.37	43.5	50.47	17.62	1.44	32.49	-	-	P	H
		230.79	42.07	-3.93	46	56.33	16.03	1.94	32.4	-	-	P	H
		288.02	43.02	-2.98	46	54.37	18.82	2.18	32.49	-	-	P	H
		416.06	42.5	-3.5	46	49.56	22.46	2.68	32.28	-	-	P	H
		473.29	45.28	-0.72	46	51.49	23.35	2.86	32.52	-	-	P	H
		487.84	45.53	-0.47	46	51.41	23.57	2.91	32.47	100	0	P	H
													H
													H
													H
													H
													H
													H
													H
		250.19	37.21	-8.79	46	49.2	18.21	2.04	32.41	-	-	P	V
		288.02	37.09	-8.91	46	48.44	18.82	2.18	32.49	-	-	P	V
		431.58	38.78	-7.22	46	45.71	22.68	2.72	32.42	-	-	P	V
		465.53	40.88	-5.12	46	47.24	23.25	2.83	32.54	100	0	P	V
		535.37	40.72	-5.28	46	46	23.84	3.04	32.33	-	-	P	V
		729.37	38.45	-7.55	46	39.88	27.26	3.62	32.44	-	-	P	V
													V
													V
													V
													V
													V
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Band 4 - 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 165 5825MHz	*	5825	108.45	-	-	95.87	32.2	11.01	30.63	244	214	P	H
	*	5825	100.75	-	-	88.17	32.2	11.01	30.63	244	214	A	H
		5851	55.08	-64.84	119.92	42.45	32.2	11.08	30.65	244	214	P	H
		5855.2	56.84	-53.9	110.74	44.18	32.22	11.09	30.65	244	214	P	H
		5904.6	55.64	-27.62	83.26	42.69	32.41	11.22	30.68	244	214	P	H
		5935.6	53.63	-14.57	68.2	40.56	32.47	11.3	30.7	244	214	P	H
													H
													H
	*	5825	101.93	-	-	89.35	32.2	11.01	30.63	101	191	P	V
	*	5825	94.28	-	-	81.7	32.2	11.01	30.63	101	191	A	V
		5851.6	51.41	-67.14	118.55	38.77	32.21	11.08	30.65	101	191	P	V
		5856.4	53.68	-56.73	110.41	41.01	32.23	11.09	30.65	101	191	P	V
		5880.8	53.94	-46.95	100.89	41.13	32.32	11.16	30.67	101	191	P	V
		5931.4	52.46	-15.74	68.2	39.41	32.46	11.29	30.7	101	191	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 HT20 (Harmonic @ 3m)**

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 165 5825MHz		11650	61.62	-12.38	74	68.41	39.85	14.99	61.63	100	128	P	H
		11650	49.51	-4.49	54	56.3	39.85	14.99	61.63	100	128	A	H
		17475	54.22	-13.98	68.2	50.92	42.5	19.03	58.23	100	0	P	H
													H
		11650	61.91	-12.09	74	68.7	39.85	14.99	61.63	100	130	P	V
		11650	49.57	-4.43	54	56.36	39.85	14.99	61.63	100	130	A	V
		17475	54.63	-13.57	68.2	51.33	42.5	19.03	58.23	100	0	P	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Note symbol

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

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.	
2		(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”.

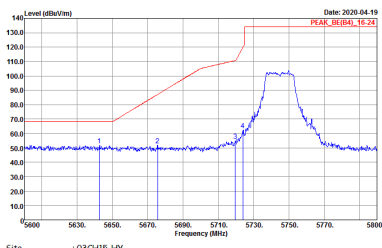
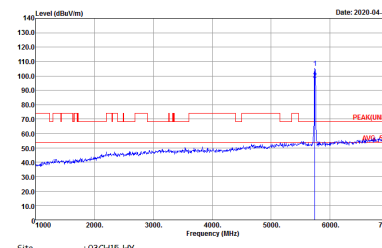


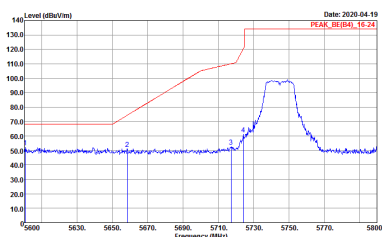
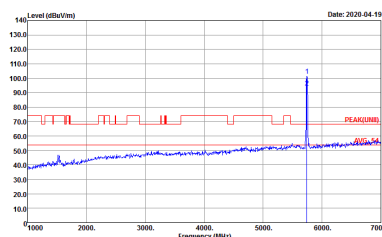
Appendix D. Radiated Spurious Emission Plots

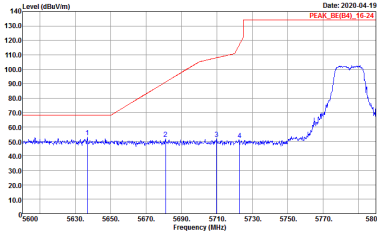
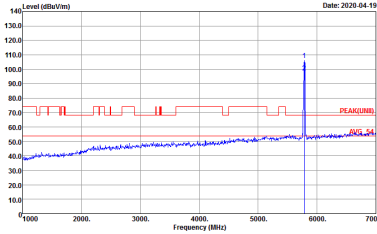
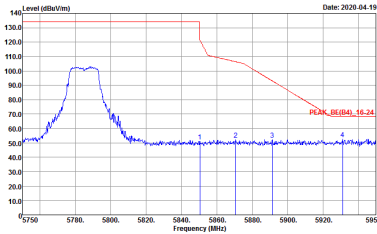
Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	24.3~24.9°C
		Relative Humidity :	55~60%

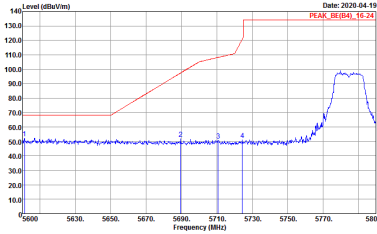
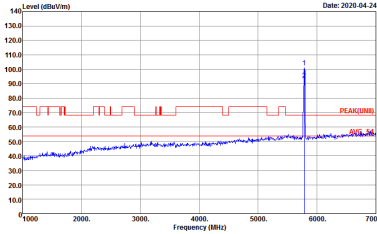
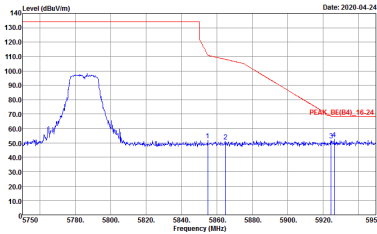
Band 4 - 5725~5850MHz

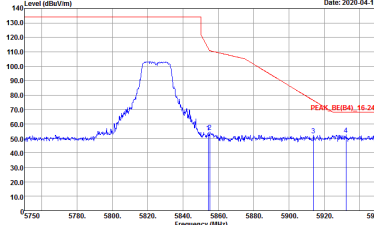
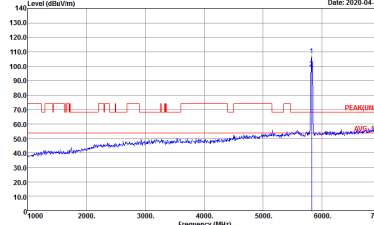
WIFI 802.11a (Band Edge @ 3m)

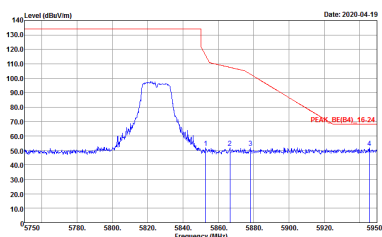
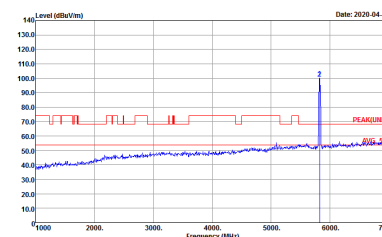
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_B4_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK_FUND 3m 91200_15_1620 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto

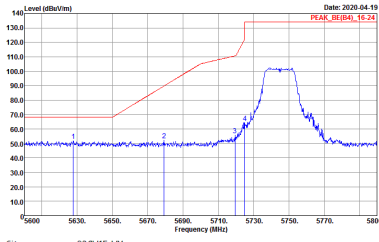
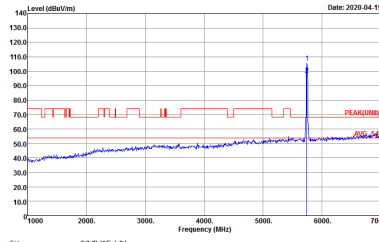
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 HORIZONTAL : RBW:3000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL : RBW:3000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 HORIZONTAL : RBW:3000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

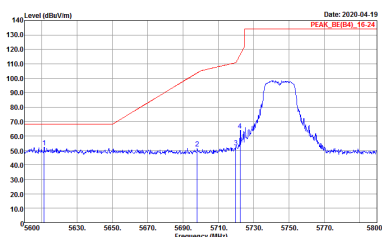
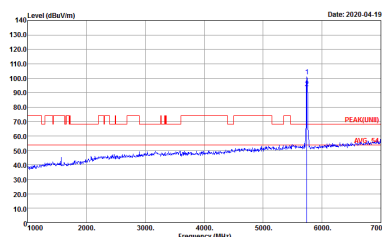
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL : RBW:3000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL : RBW:3000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL : RBW:3000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

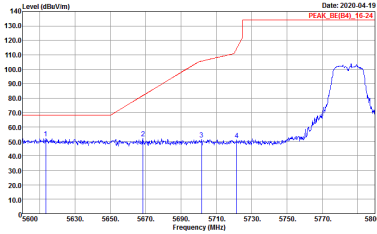
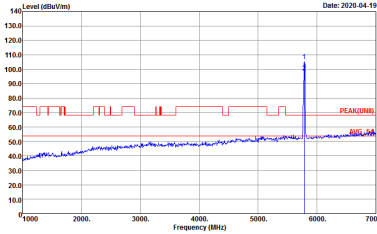
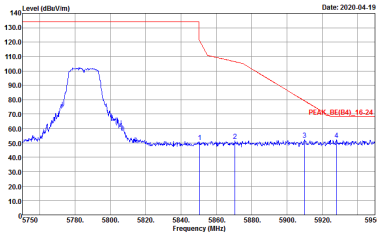
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(FUND) 3m 91200_15_1620 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto

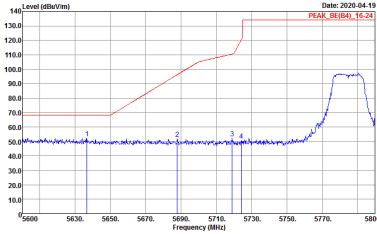
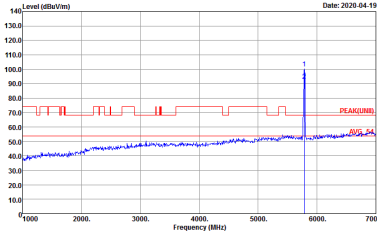
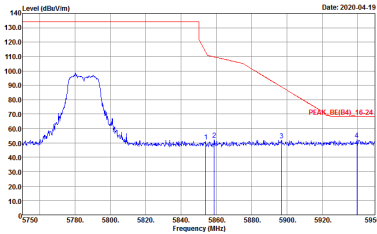
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE[84]_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(FUND) 3m 91200_15_1620 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto

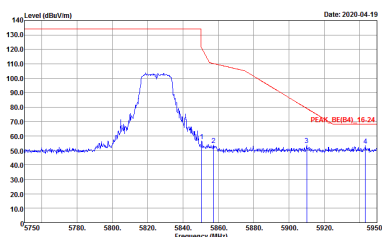
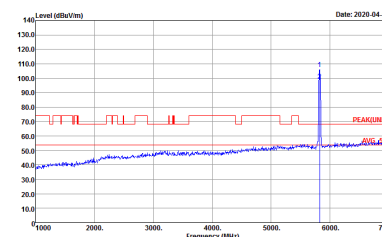
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

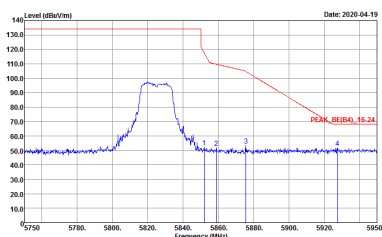
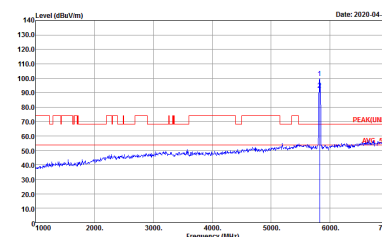
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE[84]_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(FUND) 3m 91200_15_1620 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto

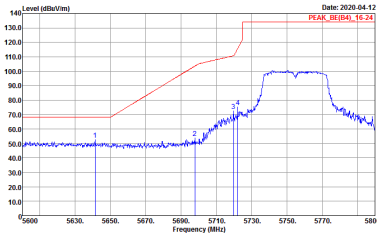
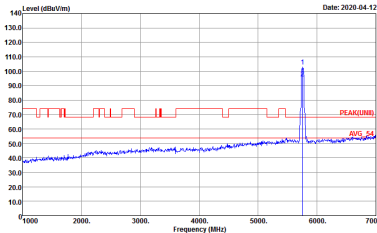
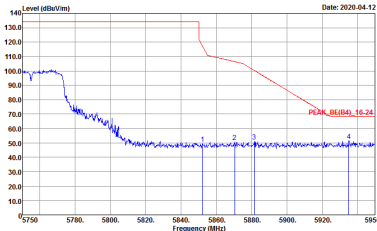
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

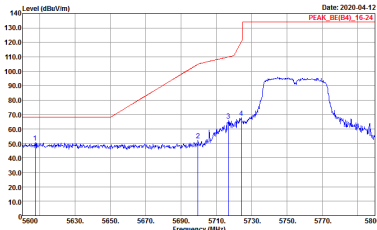
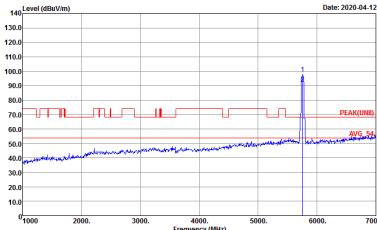
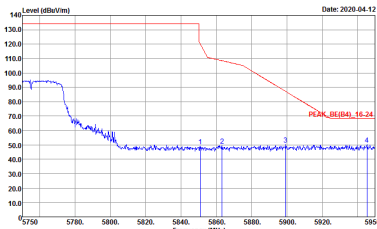
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(FUND)_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

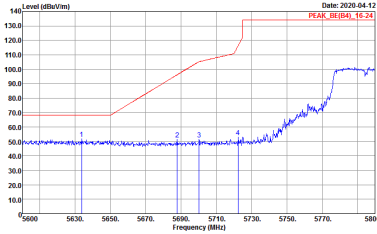
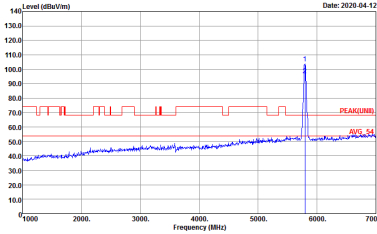
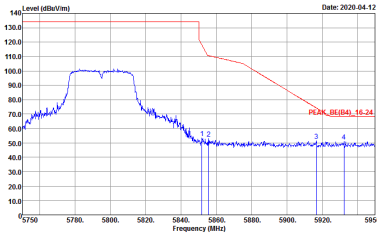
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(FUND) 3m 91200_15_1620 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto

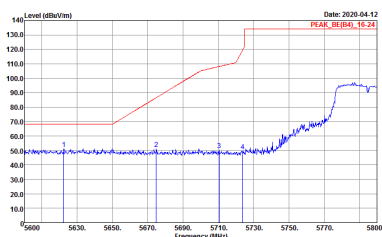
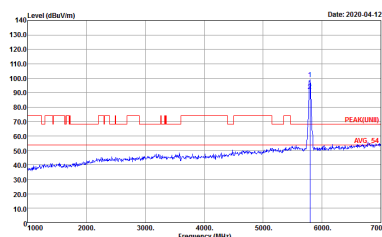
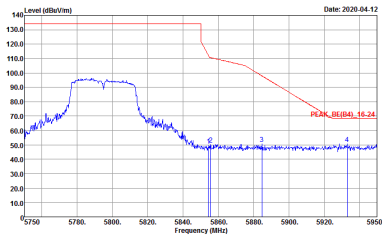
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE[84]_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(FUND) 3m 91200_15_1620 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto

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

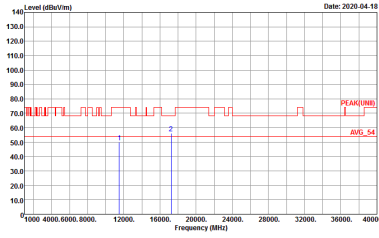
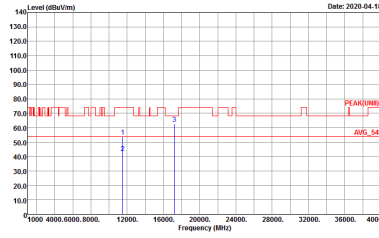
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH15-HV Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HV Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH15-HV Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

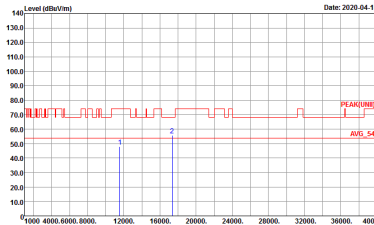
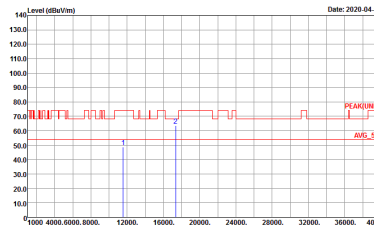
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(FUND)_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 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 : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

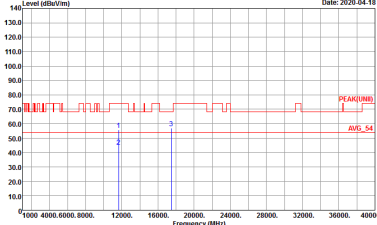
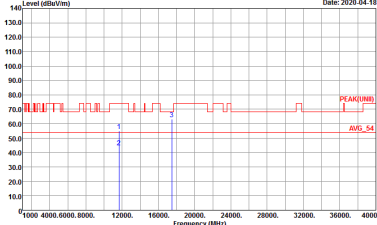
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

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

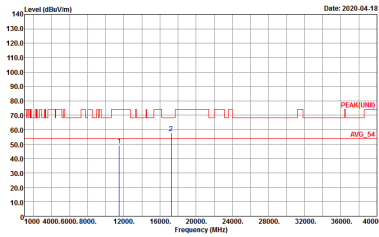
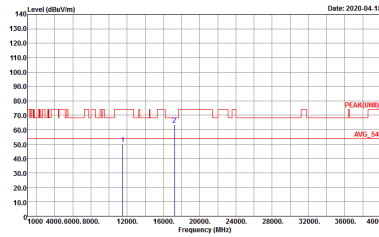
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL

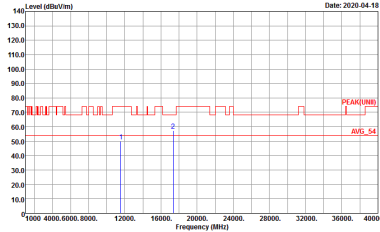
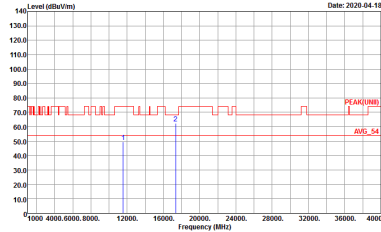
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL

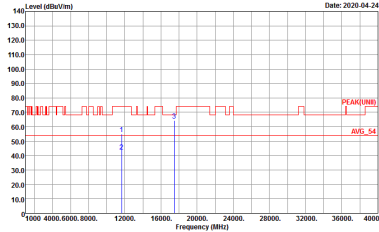
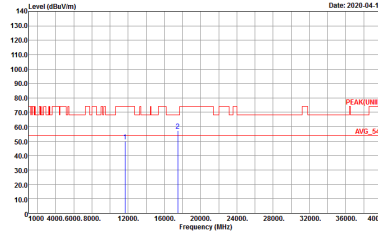


WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL

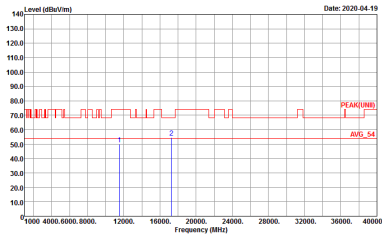
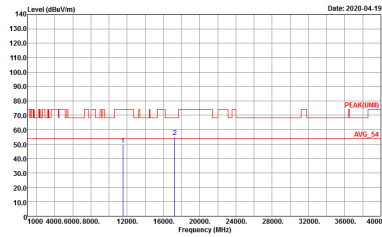
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CHI5-HY Condition : PEAR(UNIT) 3m 91200_15_1620 HORIZONTAL	 Site : 03CHI5-HY Condition : PEAR(UNIT) 3m 91200_15_1620 VERTICAL

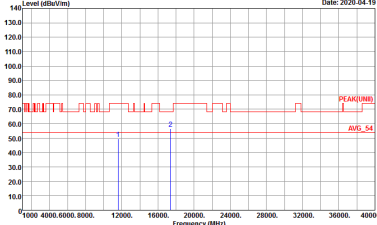
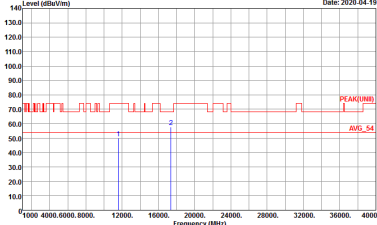
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL

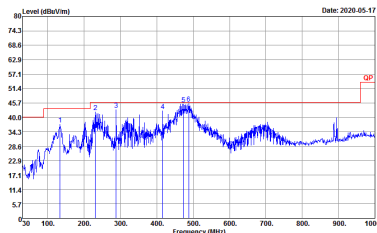
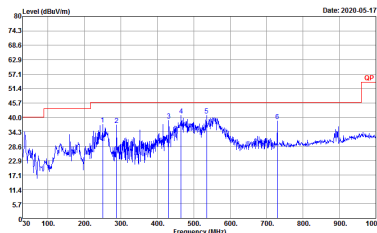
Band 4 5725~5850MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CHI5-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL	 Site : 03CHI5-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL

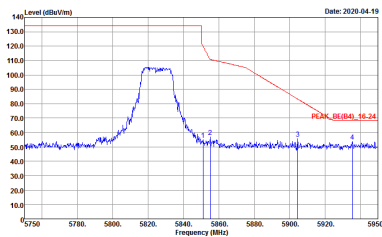
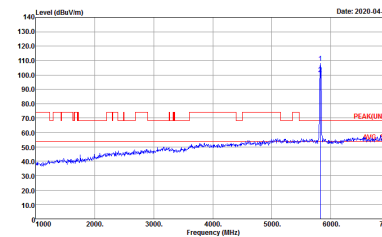


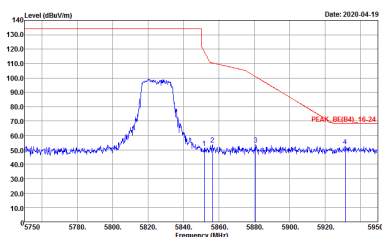
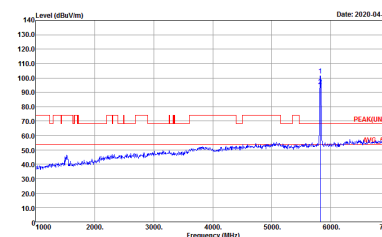
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL

Emission below 1GHz
5GHz WIFI 802.11n HT20 (LF)

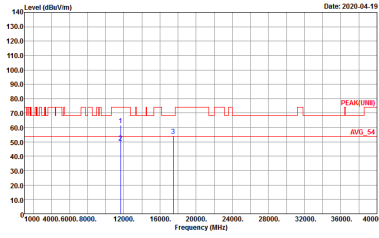
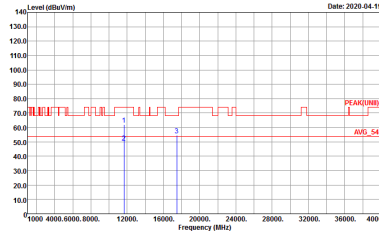
WIFI	5GHz WIFI	
ANT	802.11n HT20 LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH15-HY Condition : QP 3m 81LO6_15_41912 HORIZONTAL	 Site : 03CH15-HY Condition : QP 3m 81LO6_15_41912 VERTICAL

Band 4 - 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5745MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5745MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_95(84)_16-24 3m 91200_15_1620 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

Band 4 - 5725~5850MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5745MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL

Annex. A Receiver Radiated Emission Measurement

A.1 Limit of Receiver Radiated Emission

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

A.2 Measuring Instruments

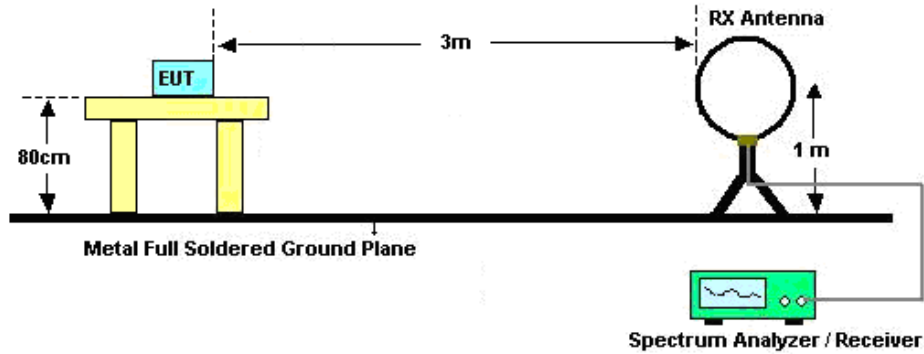
See list of measuring equipment of this test report.

A.3 Test Procedures

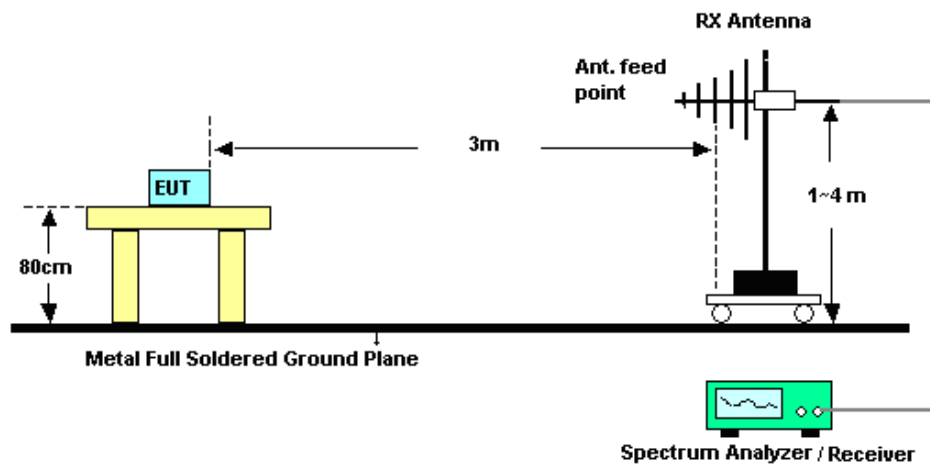
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to 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 tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

A.4 Test Setup

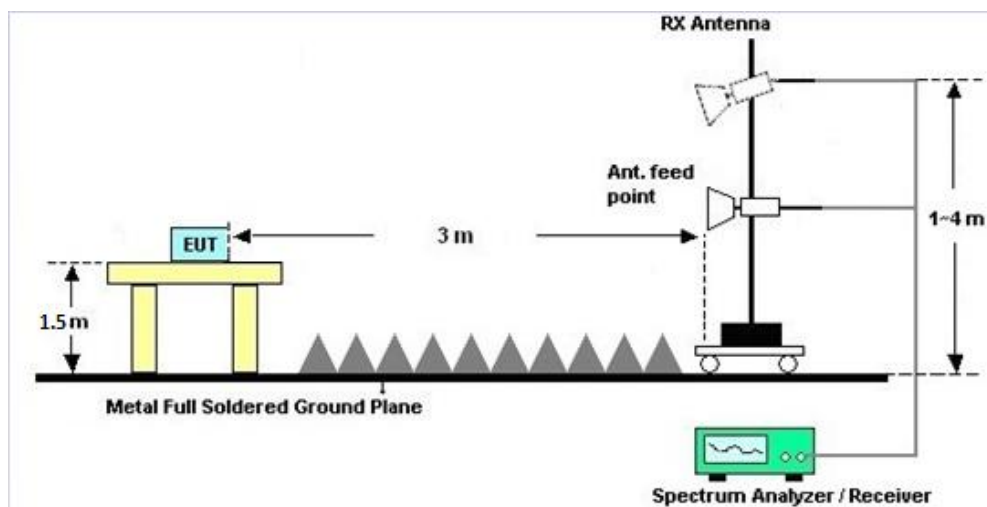
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

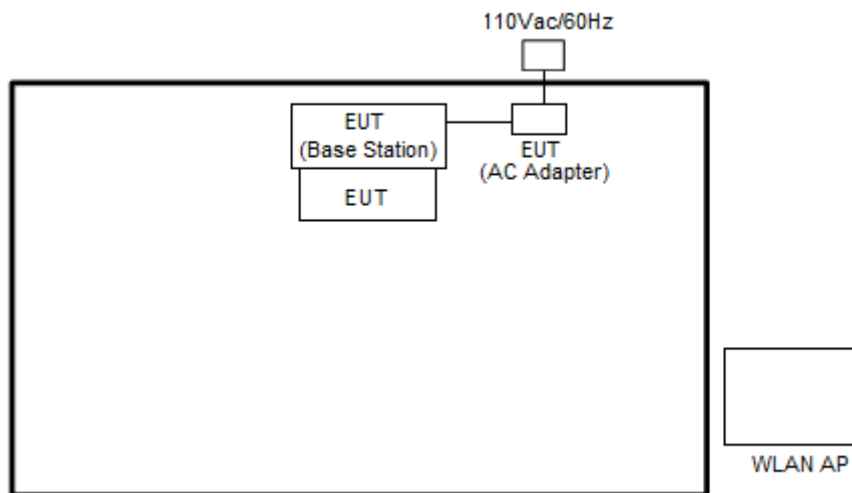


A.5 Test Result of Receiver Radiated Spurious Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per NCC LP0002 section 5.13 was not reported.

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

A.6 Connection Diagram of Test System



A.7 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m

Remark: Applicant has ensured accessory would not be attached with the product on the market, accessory is provided by lab for testing.

A.8 Test Result of Receiver Radiated Spurious Emission (30MHz ~ 5th Harmonic)

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	24.3~24.9°C
		Relative Humidity :	55~60%
Frequency	288.020 MHz	Margin	Under 1.92 dB
Test Mode	WLAN (5GHz) Idle		

	Idle Mode										
	Horizontal										
Peak Avg.	<										

Annex. B Maximum Power Density

B.1 RF Exposure Limit Introduction

According to NCC LP0002, the criteria listed in Table shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §5.20.2.1 and §5.20.2.2.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

B.2 Standalone Power Density Calculation

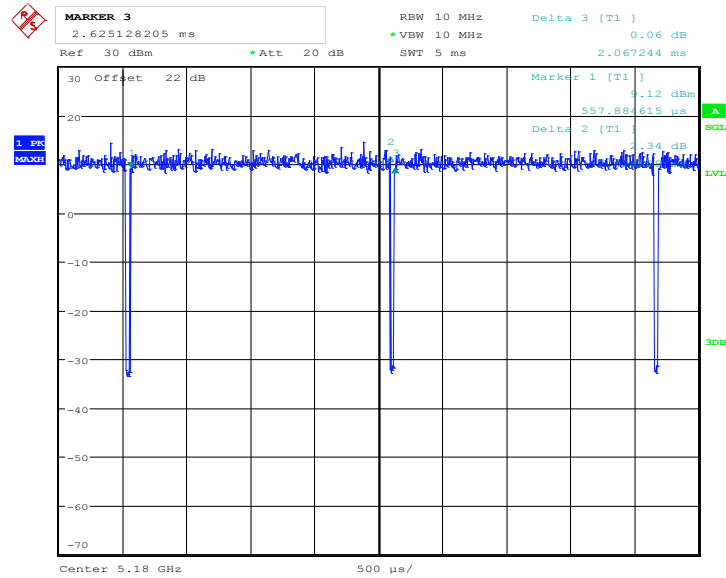
Please refer to Appendix A.

Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
1	802.11a	98.11	-	-	10Hz	0.08
2	802.11a	98.64	-	-	10Hz	0.06
1	5GHz 802.11n HT20	98.39	-	-	10Hz	0.07
2	5GHz 802.11n HT20	98.65	-	-	10Hz	0.06
1	5GHz 802.11n HT40	96.47	931	1.07	3kHz	0.16
2	5GHz 802.11n HT40	96.49	936	1.07	3kHz	0.16

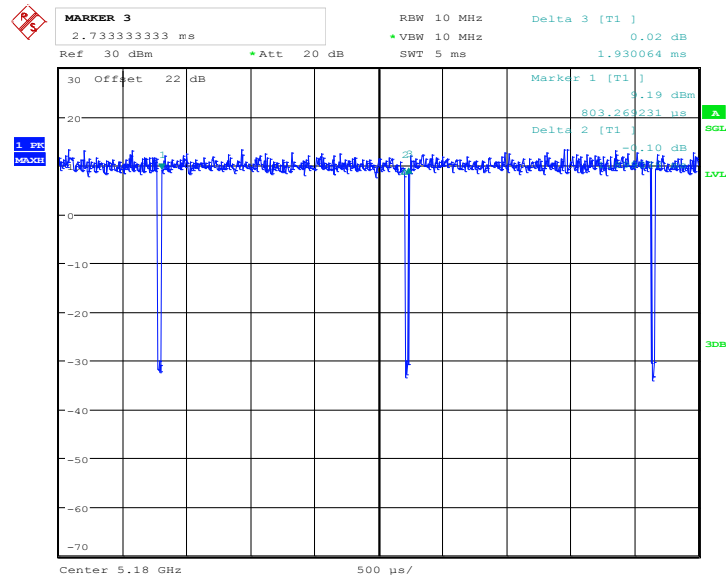
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802.11a



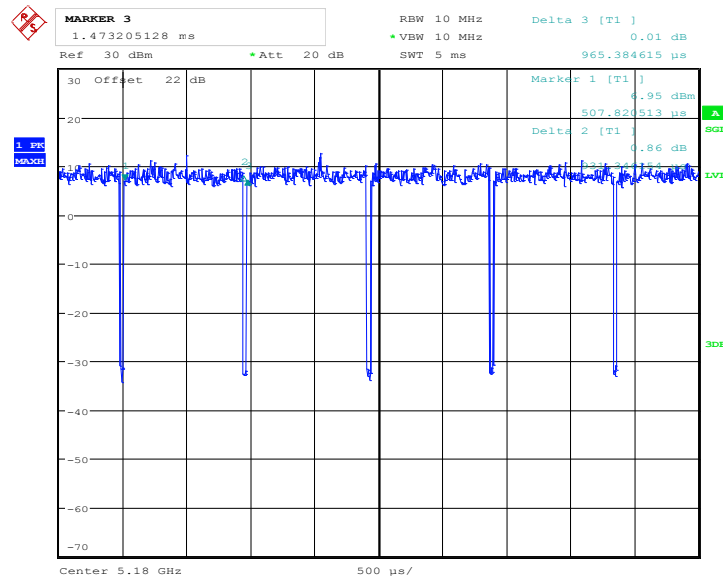
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802.11n HT20



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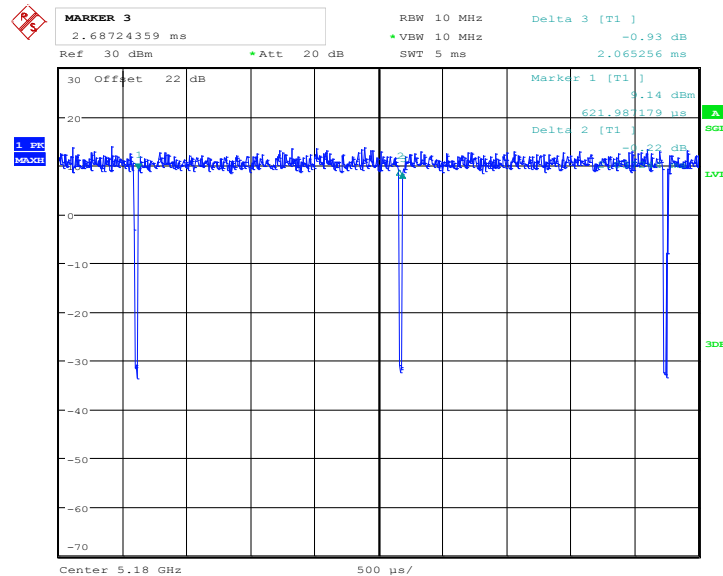
802.11n HT40



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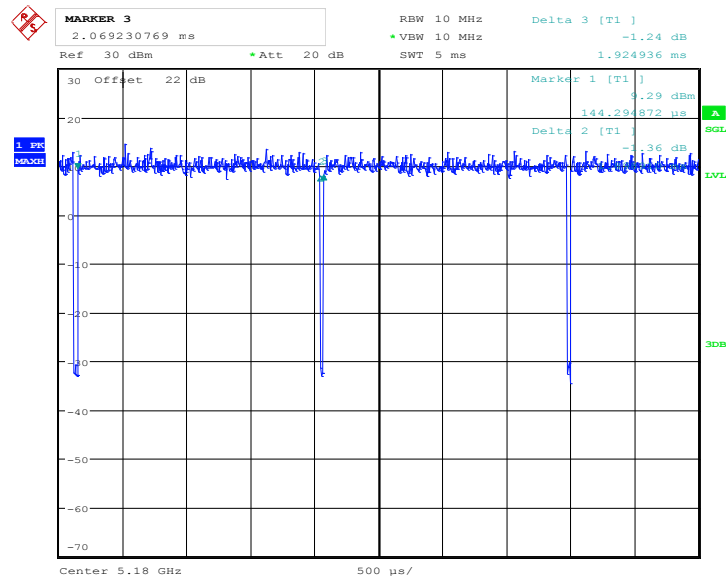
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802.11a



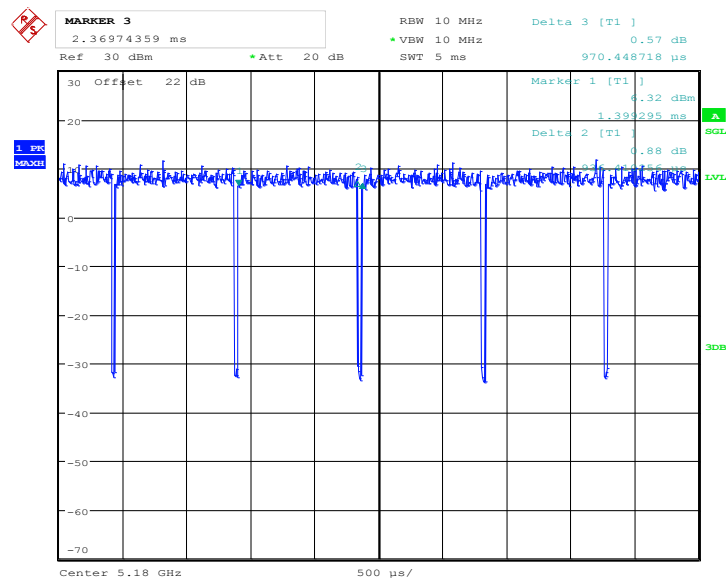
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802.11n HT20



Date: 7.APR.2020 17:22:47

802.11n HT40



Date: 7.APR.2020 17:27:49