

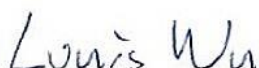


NCC RADIO TEST REPORT

Equipment : Mobile Cellular Phone
Brand Name : Motorola
Model Name : XT2173-2
Applicant : Motorola Mobility LLC
222 W, Merchandise Mart Plaza,
Chicago, IL60654 USA
Manufacturer : Motorola Mobility LLC
222 W, Merchandise Mart Plaza,
Chicago, IL60654 USA
Standard : NCC LP0002 (2020-07-01)

The product was received on Aug. 02, 2021 and testing was started from Aug. 10, 2021 and completed on Aug. 25, 2021. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures NCC LP0002 (2020-07-01) 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



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History of this test report

Report No.	Version	Description	Issued Date
TR170932-01E	01	Initial issue of report	Sep. 27, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	LP0002 5.7.3 5.7.5	6dB & 26dB Bandwidth	Pass	-
3.1	LP0002 5.7.3	99% Occupied Bandwidth	Reporting only	-
3.2	LP0002 5.7.3	Maximum Conducted Output Power	Pass	-
3.3	LP0002 5.7.3	Power Spectral Density	Pass	-
3.4	LP0002 5.7.4	Unwanted Emissions	Pass	Under limit 6.90 dB at 5649.250 MHz
3.5	LP0002 3.3	AC Conducted Emission	Pass	Under limit 17.41 dB at 18.850 MHz
3.6	LP0002 3.2 5.7.8	Antenna Requirement	Pass	-
Annex A	LP0002 3.9	Receiver Radiated Emission	Pass	Please refer to Annex A
Annex B	LP0002 3.2 6.20.2	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: Keven Cheng

Report Producer: Tina Chuang

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2173-2
Sample 1	1st source (refer to the PED)
Sample 2	2nd source (refer to the PED)
Sample 3	3rd source (refer to the PED)
Sample 4	4th source (refer to the PED)
IMEI Code	Conducted : IMEI 1: 354943970039171 IMEI 2: 354943970039189
	Conduction : IMEI 1: 354943970023498 IMEI 2: 354943970023506
	Radiation : IMEI 1: 354943970023514 IMEI 2: 354943970023522
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/FM/ Galileo/Glonass/GPS WLAN 11b/g/n HT20 WLAN 11an HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	DVT2
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer.

Accessory List	
AC Adapter 1	Brand Name : Motorola
	Model Name : MC-101
	Manufacturer : Salcomp
AC Adapter 2	Brand Name : Motorola
	Model Name : MC-101
	Manufacturer : Aohai
Battery 1	Brand Name : Motorola
	Model Name : JK50
	Manufacturer : Sunwoda
Battery 2	Brand Name : Motorola
	Model Name : JK50
	Manufacturer : ATL
Battery 3	Brand Name : Motorola
	Model Name : JK50
	Manufacturer : SCUD
Earphone	Brand Name : Motorola
	Model Name : MH202
USB Cable 1	Brand Name : Motorola
	Model Name : 5269AA000185
USB Cable 2	Brand Name : Motorola
	Model Name : 5269AA000189

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Frequency Range	5725 MHz ~ 5850 MHz
Maximum Output Power to Antenna	802.11a: 17.40 dBm / 0.0550 W 802.11n HT20: 17.30 dBm / 0.0537 W 802.11n HT40: 17.30 dBm / 0.0537 W 802.11ac VHT20: 17.20 dBm / 0.0525 W 802.11ac VHT40: 17.20 dBm / 0.0525 W 802.11ac VHT80: 17.10 dBm / 0.0513 W
99% Occupied Bandwidth	802.11a: 18.03 MHz 802.11n HT20: 18.73 MHz 802.11n HT40: 36.76 MHz 802.11ac VHT80: 75.41 MHz
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

Antenna Information				
Antenna 2	Brand Name	HT	Peak gain	WLAN 5GHz (Band 4): -6.8dBi
	Model Name	SH1371DIV	Type	PIFA Antenna

Remark:

1. The detail internal, external and transmit antenna photo please refer to Sporton report no.: EP170932-01.
2. The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.3 Modification of EUT

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

1.4 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 TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No.
	TH05-HY, 03CH20-HY, CO07-HY

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

FCC designation No.: TW3786

1.5 Applicable Standards

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

- ♦ NCC LP0002 (2020-07-01)
- ♦ 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). 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 Z 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

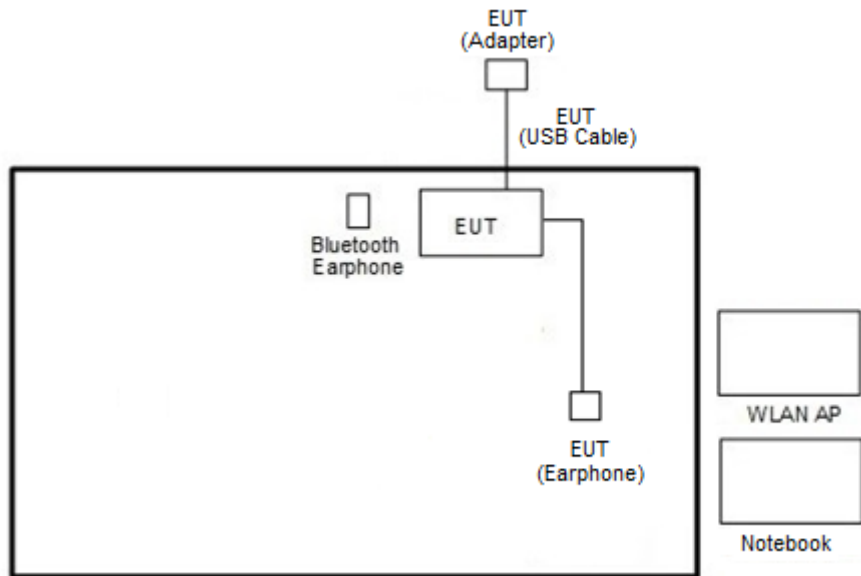
Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN (5GHz) Link + MPEG4 + Earphone + Battery 1 + USB Cable 1 (Charging from Adapter 1) for Sample 1
Remark: - For Radiated Test Cases, the tests were performed with Adapter 1, Battery 1, USB Cable 1 and Sample 1. - For radiation spurious emission, after the test voltage (120Vac/60Hz and 110Vac/60Hz) is verified by lab, the test data can conform to the test requirements of NCC rule.	

Ch. #		Band IV : 5725-5850 MHz			
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

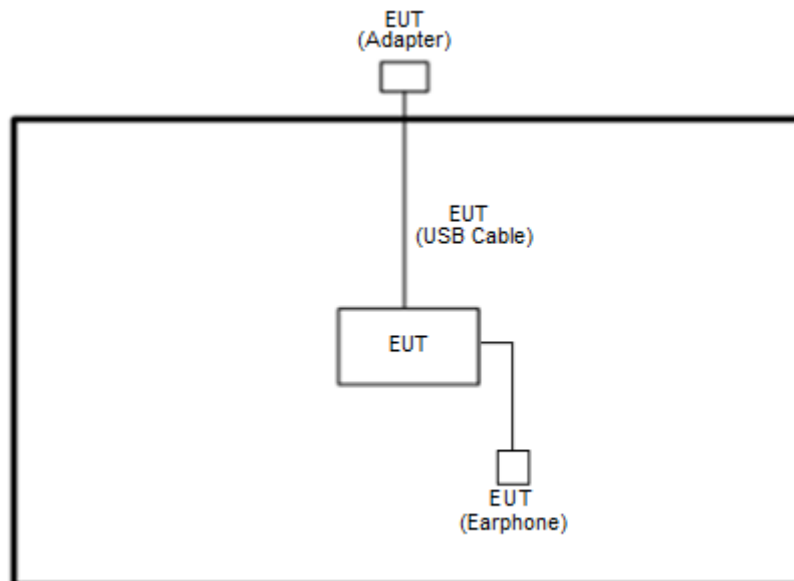
Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System

<AC Conducted Emission Mode>



<WLAN Tx Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	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 support unit would not be attached with the product on the market, support unit is provided by lab for testing.

2.5 EUT Operation Test Setup

The RF test items, make the EUT (SW: coful_g_userdebug_11_RRWB31.Q3-38_0bea6_intcfg_test-keys) 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.

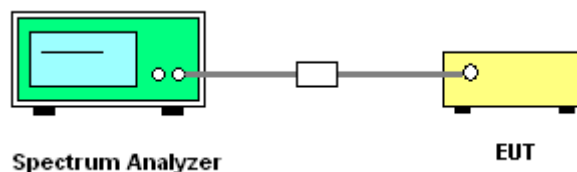
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

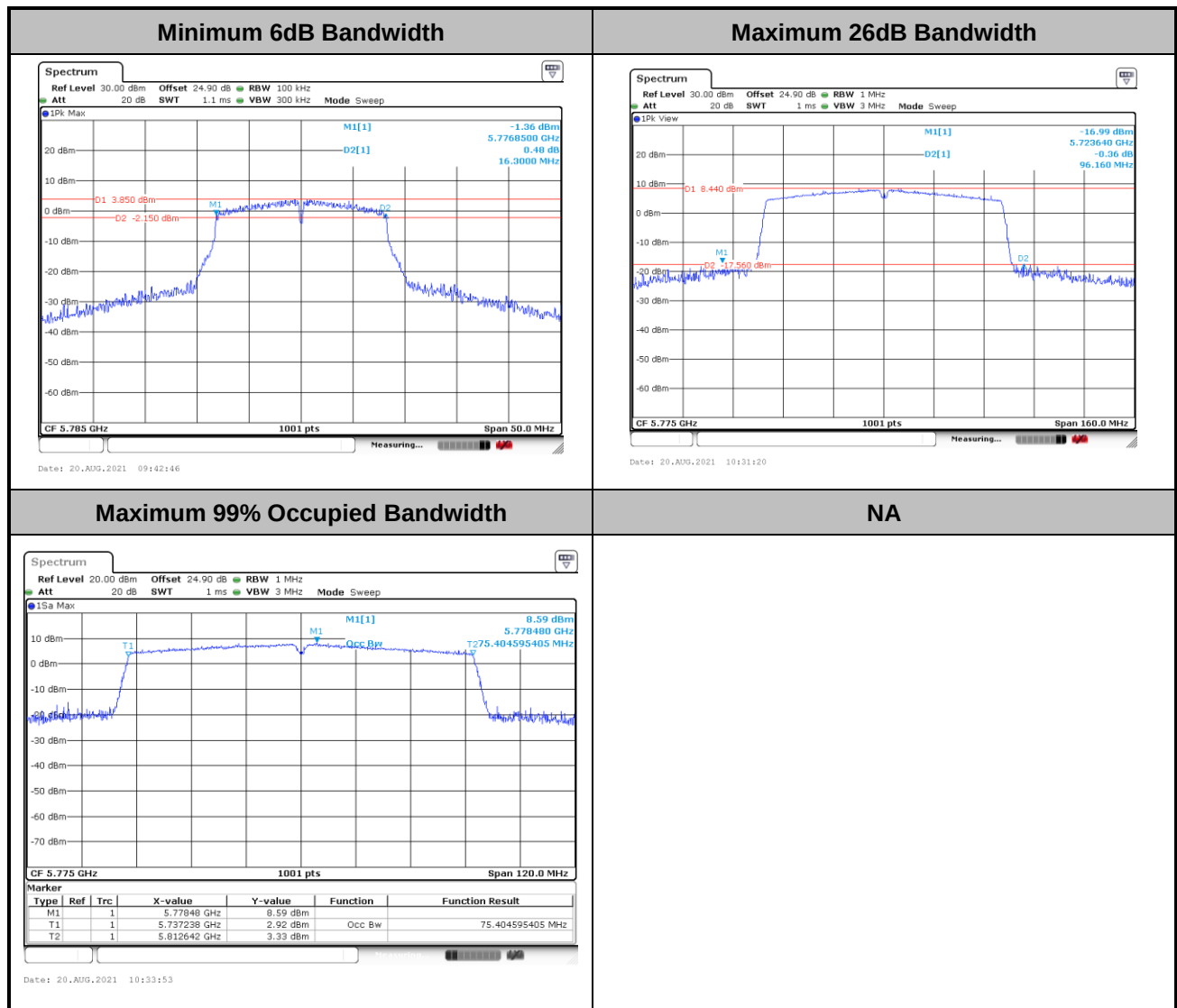
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section C) Emission bandwidth for the band 5.725-5.85 GHz
2. Set RBW = 100 kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is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

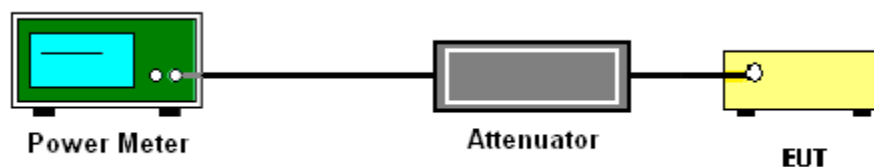
3.2.3 Test Procedures

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

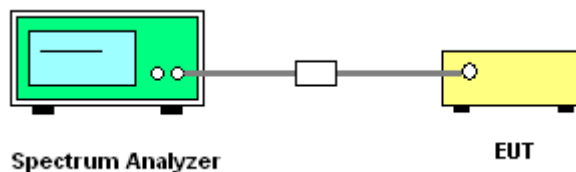
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section F) Maximum power spectral density.

Method SA-3

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

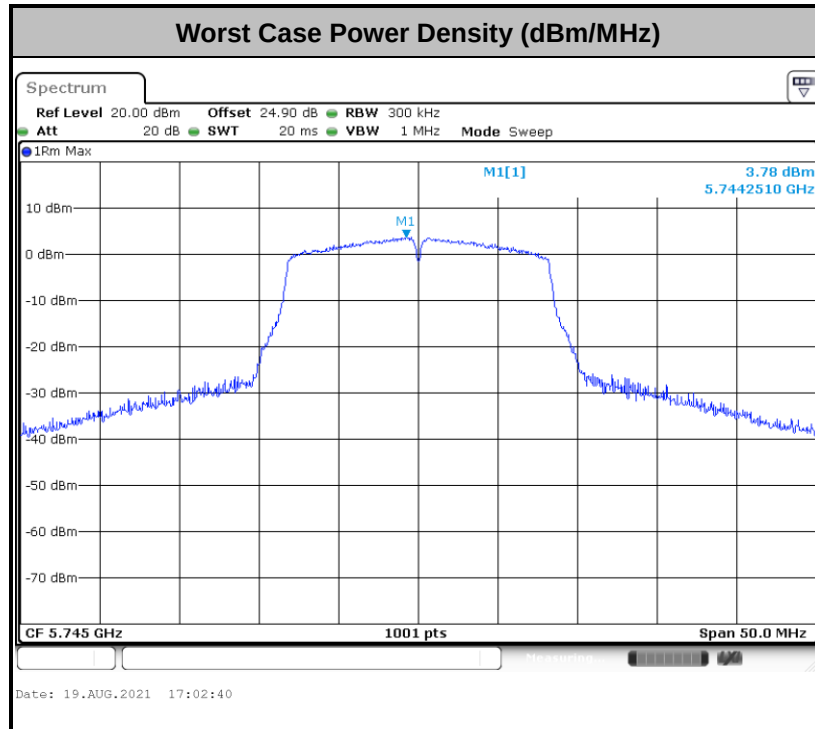
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW $\geq$ 3 MHz.
 - Number of points in sweep $\geq$ 2 Span / RBW.
 - Sweep time $\leq$ (number of points in sweep) $\times$ T, when duty cycle is less than 98 percent where T is the minimum transmission 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

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:

- 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
- 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
- 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
- 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

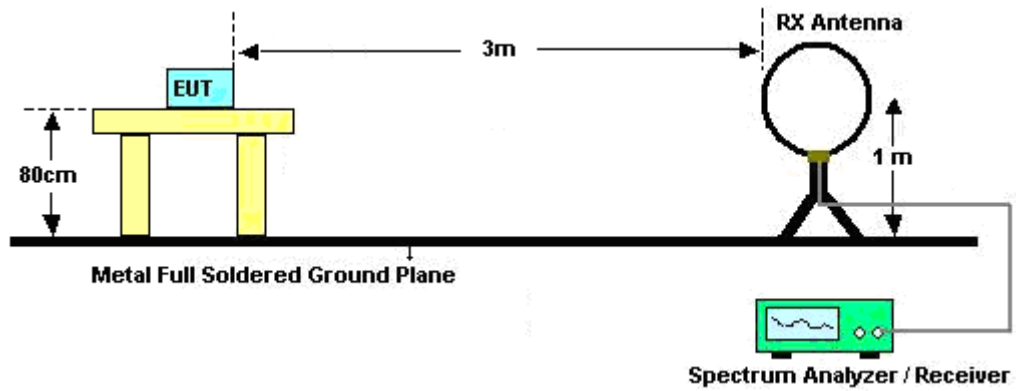
See list of measuring equipment of this test report.

3.4.3 Test Procedures

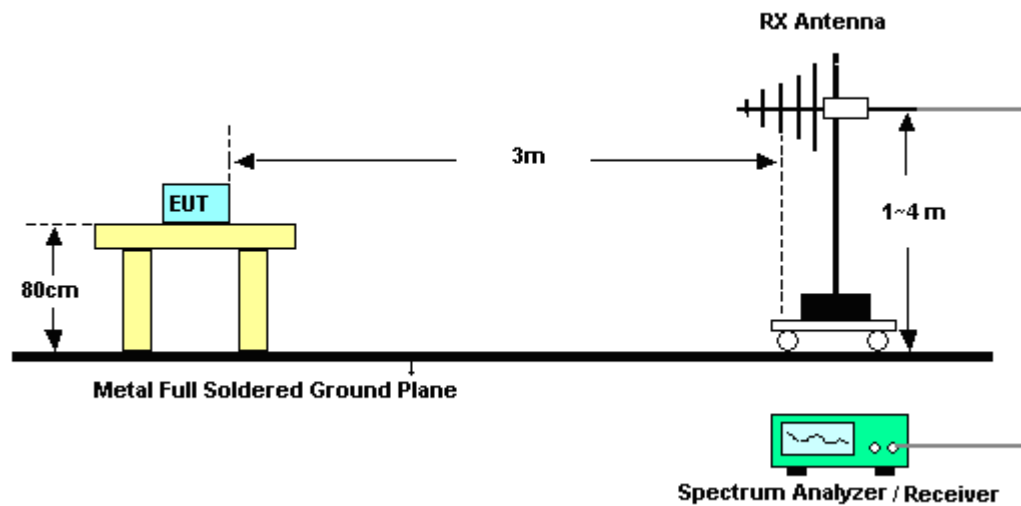
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000 MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak 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. For testing below 1 GHz, 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 1 GHz, the emission level of the EUT in peak mode was 20 dB 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

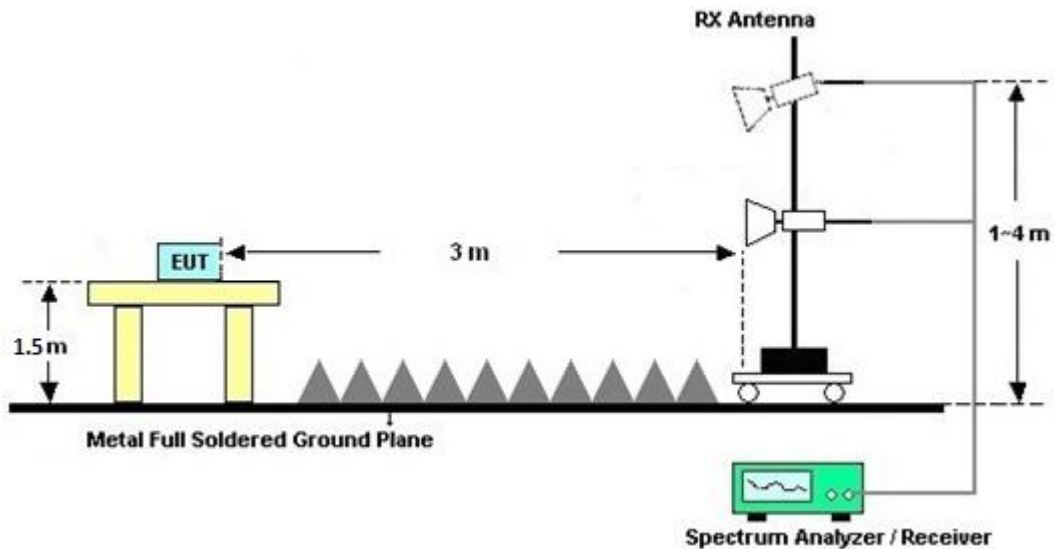
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated test 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 6.13 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.

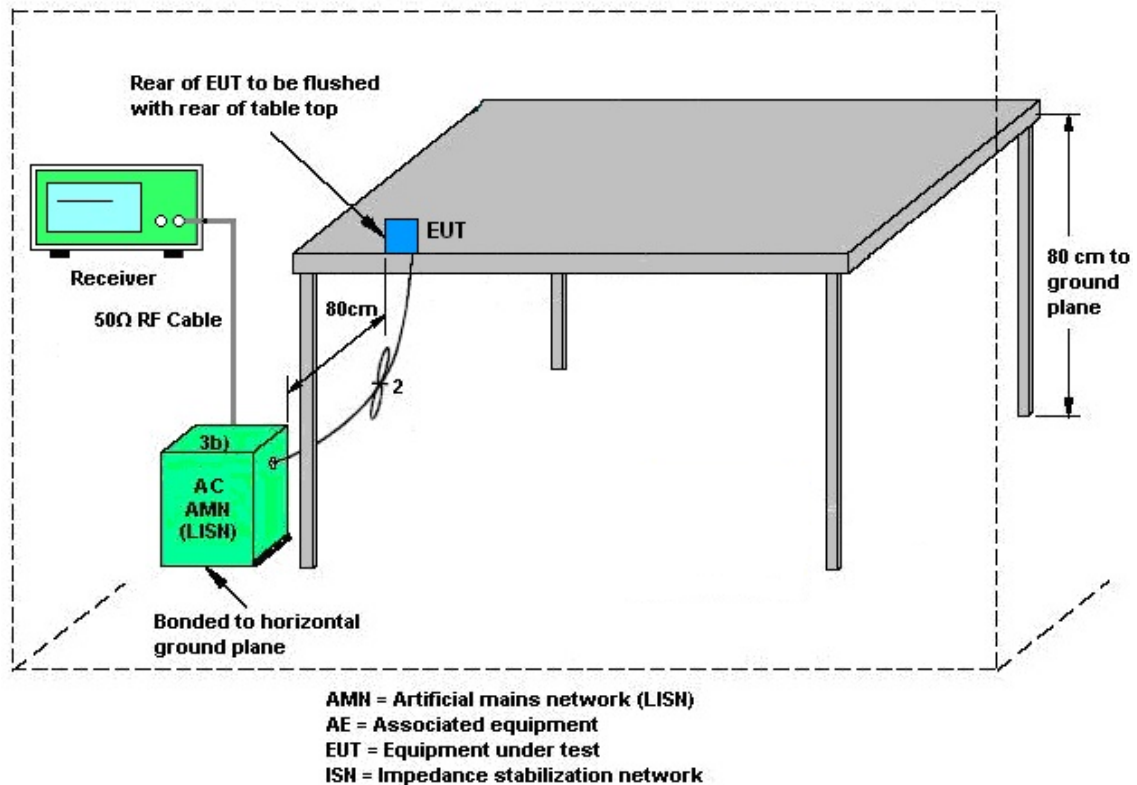
3.5.2 Measuring Instruments

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
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Oct. 23, 2020	Aug. 13, 2021~ Aug. 25, 2021	Oct. 22, 2021	Radiation (03CH20-HY)
EMI Test Receiver	Keysight	N9038A	MY59053012	N/A	Nov. 18, 2020	Aug. 13, 2021~ Aug. 25, 2021	Nov. 17, 2021	Radiation (03CH20-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Aug. 13, 2021~ Aug. 25, 2021	Jan. 03, 2022	Radiation (03CH20-HY)
Bilog Antenna	TESEQ	CBL 6111D&00802 N1D01N-06	55606 & 08	30MHz~1GHz	Oct. 22, 2020	Aug. 13, 2021~ Aug. 25, 2021	Oct. 21, 2021	Radiation (03CH20-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	002360	1GHz~18GHz	Nov. 03, 2020	Aug. 13, 2021~ Aug. 25, 2021	Nov. 02, 2021	Radiation (03CH20-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00993	18GHz~40GHz	Nov. 19, 2020	Aug. 13, 2021~ Aug. 25, 2021	Nov. 18, 2021	Radiation (03CH20-HY)
Filter	Wainwright	WLK4-1000-15 30-8000-40SS	SN27	1.53GHz Low Pass Filter	May 25, 2021	Aug. 13, 2021~ Aug. 25, 2021	May 24, 2022	Radiation (03CH20-HY)
Filter	Wainwright	WHKX8-6090- 7000-18000-40 SS	SN99	N/A	Nov. 05, 2020	Aug. 13, 2021~ Aug. 25, 2021	Nov. 04, 2021	Radiation (03CH20-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 OST	SN8	N/A	Mar. 26, 2021	Aug. 13, 2021~ Aug. 25, 2021	Mar. 25, 2022	Radiation (03CH20-HY)
Preamplifier	COM-POWER	PAM-103	18020201	1MHz~1000MHz	Jan. 04, 2021	Aug. 13, 2021~ Aug. 25, 2021	Jan. 03, 2022	Radiation (03CH20-HY)
Amplifier	EMCI	EMC118A45S E	980792	N/A	Nov. 16, 2020	Aug. 13, 2021~ Aug. 25, 2021	Nov. 15, 2021	Radiation (03CH20-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 11, 2020	Aug. 13, 2021~ Aug. 25, 2021	Dec. 10, 2021	Radiation (03CH20-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	519229/2,804 015/2,804027 /2	N/A	Jan. 20, 2021	Aug. 13, 2021~ Aug. 25, 2021	Jan. 19, 2022	Radiation (03CH20-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Aug. 13, 2021~ Aug. 25, 2021	N/A	Radiation (03CH20-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Aug. 13, 2021~ Aug. 25, 2021	N/A	Radiation (03CH20-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Aug. 13, 2021~ Aug. 25, 2021	N/A	Radiation (03CH20-HY)
Hygrometer	TECEPEL	DTM-303B	TP200728	N/A	Mar. 09, 2021	Aug. 13, 2021~ Aug. 25, 2021	Mar. 08, 2022	Radiation (03CH20-HY)
Software	Audix	E3 6.2009-8-24	RK-002156	N/A	N/A	Aug. 13, 2021~ Aug. 25, 2021	N/A	Radiation (03CH20-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 01, 2021	Aug. 10, 2021~ Aug. 20, 2021	Feb. 28, 2022	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO 12	10MHz~6GHz	Dec. 16, 2020	Aug. 10, 2021~ Aug. 20, 2021	Dec. 15, 2021	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101565	10Hz ~ 40GHz	Nov. 13, 2020	Aug. 10, 2021~ Aug. 20, 2021	Nov. 12, 2021	Conducted (TH05-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2021	Aug. 10, 2021~ Aug. 20, 2021	Mar. 16, 2022	Conducted (TH05-HY)
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	Aug. 12, 2021	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Aug. 12, 2021	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	9561-F N00373	9kHz-200MHz	Nov. 02, 2020	Aug. 12, 2021	Nov. 01, 2021	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	N/A	Aug. 12, 2021	N/A	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Feb. 01, 2021	Aug. 12, 2021	Jan. 31, 2022	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 11, 2020	Aug. 12, 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% ($U = 2Uc(y)$)	3.9 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.8 dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.5 dB
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Jacob Yu	Temperature:	24.4~24.8	°C
Test Date:	2021/8/10-2021/8/20	Relative Humidity:	49.5~51.5	%

Maximum Power Density				
Max. Power	Gain	EIRP	20 cm PSD	PSD Limit
17.40	-6.80	10.60	0.0023	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 2	-	Ant 2	-	Ant 2	-		
11a	6Mbps	1	149	5745	17.88	-	27.65	-	16.35	-	0.5	Pass
11a	6Mbps	1	157	5785	18.03	-	37.20	-	16.30	-	0.5	Pass
11a	6Mbps	1	165	5825	17.78	-	30.90	-	16.34	-	0.5	Pass
HT20	MCS0	1	149	5745	18.73	-	28.60	-	17.59	-	0.5	Pass
HT20	MCS0	1	157	5785	18.73	-	37.80	-	17.60	-	0.5	Pass
HT20	MCS0	1	165	5825	18.73	-	34.05	-	17.54	-	0.5	Pass
HT40	MCS0	1	151	5755	36.56	-	58.95	-	35.96	-	0.5	Pass
HT40	MCS0	1	159	5795	36.76	-	61.02	-	36.07	-	0.5	Pass
VHT80	MCS0	1	155	5775	75.41	-	96.16	-	76.48	-	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 2	-	SUM	Ant 2	-	Ant 2	-	
11a	6Mbps	1	149	5745	17.40	-		30.00	-	-6.80	-	Pass
11a	6Mbps	1	157	5785	17.30	-		30.00	-	-6.80	-	Pass
11a	6Mbps	1	165	5825	17.30	-		30.00	-	-6.80	-	Pass
HT20	MCS0	1	149	5745	17.30	-		30.00	-	-6.80	-	Pass
HT20	MCS0	1	157	5785	17.20	-		30.00	-	-6.80	-	Pass
HT20	MCS0	1	165	5825	17.10	-		30.00	-	-6.80	-	Pass
HT40	MCS0	1	151	5755	17.30	-		30.00	-	-6.80	-	Pass
HT40	MCS0	1	159	5795	17.10	-		30.00	-	-6.80	-	Pass
VHT20	MCS0	1	149	5745	17.20	-		30.00	-	-6.80	-	Pass
VHT20	MCS0	1	157	5785	17.10	-		30.00	-	-6.80	-	Pass
VHT20	MCS0	1	165	5825	17.00	-		30.00	-	-6.80	-	Pass
VHT40	MCS0	1	151	5755	17.20	-		30.00	-	-6.80	-	Pass
VHT40	MCS0	1	159	5795	17.00	-		30.00	-	-6.80	-	Pass
VHT80	MCS0	1	155	5775	17.10	-		30.00	-	-6.80	-	Pass

Power Setting	
Ant 2	-
18	-
18	-
18	-
18	-
18	-
18	-
18	-
18	-
18	-
18	-
18	-
18	-
18	-
18	-

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 2	-	Ant 2	-	SUM	Ant 2	-	Ant 2	-	
11a	6Mbps	1	149	5745	2.22	-	6.00	-		30.00	-	-6.80	-	Pass
11a	6Mbps	1	157	5785	2.22	-	5.86	-		30.00	-	-6.80	-	Pass
11a	6Mbps	1	165	5825	2.22	-	5.88	-		30.00	-	-6.80	-	Pass
HT20	MCS0	1	149	5745	2.22	-	5.62	-		30.00	-	-6.80	-	Pass
HT20	MCS0	1	157	5785	2.22	-	5.59	-		30.00	-	-6.80	-	Pass
HT20	MCS0	1	165	5825	2.22	-	5.47	-		30.00	-	-6.80	-	Pass
HT40	MCS0	1	151	5755	2.22	-	2.97	-		30.00	-	-6.80	-	Pass
HT40	MCS0	1	159	5795	2.22	-	2.71	-		30.00	-	-6.80	-	Pass
VHT80	MCS0	1	155	5775	2.22	-	-0.46	-		30.00	-	-6.80	-	Pass



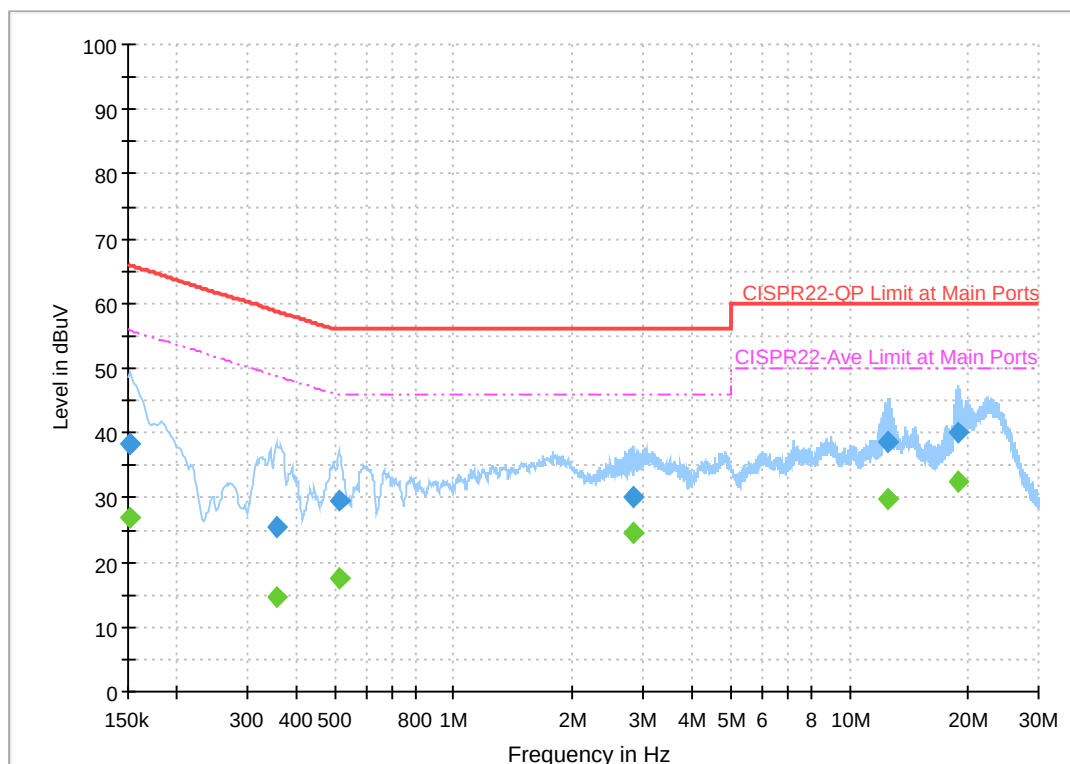
Appendix B. AC Conducted Emission Test Results

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

EUT Information

Report NO : 170932-01
Test Mode : Mode 1
Test Voltage : 110Vac/60Hz
Phase : Line

Full Spectrum



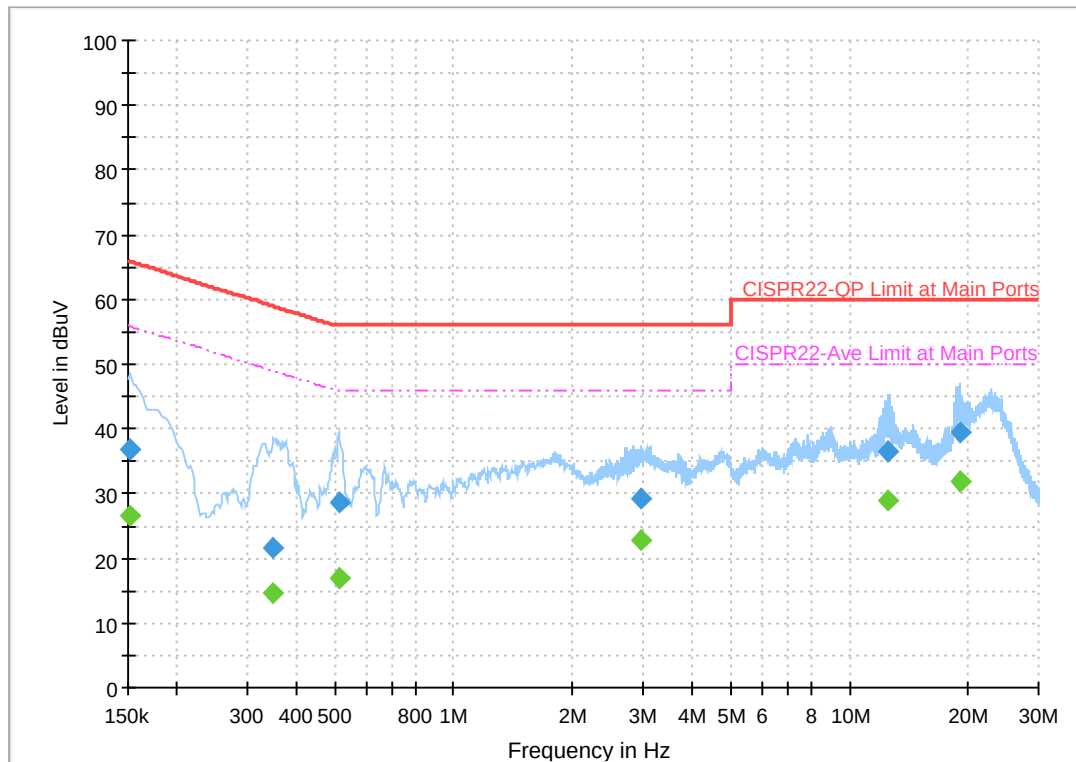
Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	26.87	55.88	29.01	L1	OFF	20.0
0.152250	38.39	---	65.88	27.48	L1	OFF	20.0
0.354750	---	14.52	48.85	34.33	L1	OFF	20.0
0.354750	25.36	---	58.85	33.49	L1	OFF	20.0
0.512250	---	17.45	46.00	28.55	L1	OFF	20.0
0.512250	29.57	---	56.00	26.43	L1	OFF	20.0
2.825250	---	24.42	46.00	21.58	L1	OFF	20.1
2.825250	30.00	---	56.00	26.00	L1	OFF	20.1
12.464250	---	29.82	50.00	20.18	L1	OFF	20.2
12.464250	38.69	---	60.00	21.31	L1	OFF	20.2
18.849750	---	32.59	50.00	17.41	L1	OFF	20.2
18.849750	40.09	---	60.00	19.91	L1	OFF	20.2

EUT Information

Report NO : 170932-01
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)
0.152250	---	26.74	55.88	29.13	N	OFF	20.0
0.152250	36.87	---	65.88	29.01	N	OFF	20.0
0.350250	---	14.76	48.96	34.20	N	OFF	20.0
0.350250	21.61	---	58.96	37.35	N	OFF	20.0
0.512250	---	17.09	46.00	28.91	N	OFF	20.0
0.512250	28.78	---	56.00	27.22	N	OFF	20.0
2.980500	---	22.76	46.00	23.24	N	OFF	20.1
2.980500	29.20	---	56.00	26.80	N	OFF	20.1
12.484500	---	28.90	50.00	21.10	N	OFF	20.2
12.484500	36.61	---	60.00	23.39	N	OFF	20.2
18.939750	---	31.94	50.00	18.06	N	OFF	20.3
18.939750	39.51	---	60.00	20.49	N	OFF	20.3



Appendix C. Radiated Spurious Emission

Test Engineer :	Troye Hsieh	Temperature :	20.4~22.3°C
		Relative Humidity :	62.9~67.5%

Band 4 - 5725~5850MHz

WIFI 802.11a (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)
802.11a CH 149 5745MHz		5648.8	46.34	-21.86	68.2	37.97	33.09	13.11	37.83	265	118	P	H
		5699.4	53.83	-50.93	104.76	45.19	33.3	13.17	37.83	265	118	P	H
		5720	66.1	-44.7	110.8	57.32	33.42	13.19	37.83	265	118	P	H
		5724	69.79	-50.13	119.92	60.98	33.44	13.2	37.83	265	118	P	H
	*	5745	105.37	-	-	96.41	33.57	13.22	37.83	265	118	P	H
	*	5745	98.32	-	-	89.36	33.57	13.22	37.83	265	118	A	H
													H
													H
		5638.2	47.97	-20.23	68.2	39.67	33.03	13.1	37.83	100	21	P	V
		5687.8	57.55	-38.65	96.2	48.97	33.25	13.16	37.83	100	21	P	V
		5719	68.72	-41.8	110.52	59.95	33.41	13.19	37.83	100	21	P	V
		5724.2	73.69	-46.69	120.38	64.87	33.45	13.2	37.83	100	21	P	V
	*	5745	109.75	-	-	100.79	33.57	13.22	37.83	100	21	P	V
	*	5745	102.37	-	-	93.41	33.57	13.22	37.83	100	21	A	V
													V
													V



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)
802.11a CH 157 5785MHz		5622.5	46.33	-21.87	68.2	38.15	32.93	13.08	37.83	261	116	P	H
		5666	46.46	-33.62	80.08	38	33.16	13.13	37.83	261	116	P	H
		5715.25	45.5	-63.97	109.47	36.75	33.39	13.19	37.83	261	116	P	H
		5723.75	46.93	-72.42	119.35	38.12	33.44	13.2	37.83	261	116	P	H
	*	5785	102.42	-	-	93.33	33.67	13.26	37.84	261	116	P	H
	*	5785	95.42	-	-	86.33	33.67	13.26	37.84	261	116	A	H
		5853.25	46.28	-68.51	114.79	36.87	33.91	13.34	37.84	261	116	P	H
		5866.5	47.56	-60.02	107.58	38.11	33.93	13.36	37.84	261	116	P	H
		5897.25	46.92	-41.78	88.7	37.37	33.99	13.4	37.84	261	116	P	H
		5931	46.19	-22.01	68.2	36.59	34	13.44	37.84	261	116	P	H
													H
													H
		5634	46.87	-21.33	68.2	38.6	33	13.1	37.83	100	21	P	V
		5690.75	47.07	-51.31	98.38	38.48	33.26	13.16	37.83	100	21	P	V
		5714	47.71	-61.41	109.12	38.97	33.38	13.19	37.83	100	21	P	V
		5721.75	47.91	-66.88	114.79	39.12	33.43	13.19	37.83	100	21	P	V
	*	5785	106.13	-	-	97.04	33.67	13.26	37.84	100	21	P	V
	*	5785	99.42	-	-	90.33	33.67	13.26	37.84	100	21	A	V
		5853.5	48.45	-65.77	114.22	39.04	33.91	13.34	37.84	100	21	P	V
		5860	47.56	-61.84	109.4	38.13	33.92	13.35	37.84	100	21	P	V
		5881.75	48.07	-52.12	100.19	38.57	33.96	13.38	37.84	100	21	P	V
		5928.25	46.98	-21.22	68.2	37.39	34	13.43	37.84	100	21	P	V
													V
													V



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)
802.11a CH 165 5825MHz	*	5825	104.52	-	-	95.25	33.8	13.31	37.84	263	119	P	H
	*	5825	97.59	-	-	88.32	33.8	13.31	37.84	263	119	A	H
		5850.6	63.69	-57.14	120.83	54.29	33.9	13.34	37.84	263	119	P	H
		5858.2	60.91	-48.99	109.9	51.48	33.92	13.35	37.84	263	119	P	H
		5875.2	52.91	-52.14	105.05	43.43	33.95	13.37	37.84	263	119	P	H
		5932	48.31	-19.89	68.2	38.71	34	13.44	37.84	263	119	P	H
													H
													H
	*	5825	107.41	-	-	98.14	33.8	13.31	37.84	100	24	P	V
	*	5825	100.39	-	-	91.12	33.8	13.31	37.84	100	24	A	V
		5851.6	67.11	-51.44	118.55	57.71	33.9	13.34	37.84	100	24	P	V
		5858	66.73	-43.23	109.96	57.3	33.92	13.35	37.84	100	24	P	V
		5877.4	52.43	-50.99	103.42	42.95	33.95	13.37	37.84	100	24	P	V
		5946	47.09	-21.11	68.2	37.47	34	13.46	37.84	100	24	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. 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)
802.11a CH 149 5745MHz		11490	48.77	-25.23	74	32.87	38.92	19.38	42.4	100	0	P	H
		17235	49.98	-24.02	74	31.92	38.26	24.33	44.53	100	0	P	H
													H
													H
													H
													H
		11490	49.33	-24.67	74	33.43	38.92	19.38	42.4	100	0	P	V
		17235	49.82	-24.18	74	31.76	38.26	24.33	44.53	100	0	P	V
													V
													V
													V
													V
													V
													V
802.11a CH 157 5785MHz		11570	49.83	-24.17	74	33.69	38.93	19.68	42.47	100	0	P	H
		17355	49.91	-18.29	68.2	31.86	38.42	24.26	44.63	100	0	P	H
													H
													H
													H
													H
		11570	49.63	-24.37	74	33.49	38.93	19.68	42.47	100	0	P	V
		17355	49.83	-18.37	68.2	31.78	38.42	24.26	44.63	100	0	P	V
													V
													V
													V
													V
													V
													V



802.11a CH 165 5825MHz		11650	49.84	-24.16	74	33.8	38.85	19.74	42.55	100	0	P	H
		17475	51.02	-17.18	68.2	32.7	38.75	24.3	44.73	100	0	P	H
													H
													H
													H
													H
		11650	49.72	-24.28	74	33.68	38.85	19.74	42.55	100	0	P	V
		17475	52.38	-15.82	68.2	34.06	38.75	24.3	44.73	100	0	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 802.11n HT20 (Band Edge @ 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 149 5745MHz		5609.8	45.98	-22.22	68.2	37.88	32.86	13.07	37.83	267	118	P	H
		5698.8	58.32	-46	104.32	49.68	33.3	13.17	37.83	267	118	P	H
		5719.4	66.28	-44.35	110.63	57.5	33.42	13.19	37.83	267	118	P	H
		5724.4	69.7	-51.13	120.83	60.88	33.45	13.2	37.83	267	118	P	H
	*	5745	105.2	-	-	96.24	33.57	13.22	37.83	267	118	P	H
	*	5745	97.91	-	-	88.95	33.57	13.22	37.83	267	118	A	H
													H
													H
		5632	48.46	-19.74	68.2	40.2	32.99	13.1	37.83	100	20	P	V
		5685.6	60.61	-33.97	94.58	52.05	33.24	13.15	37.83	100	20	P	V
		5717.8	70.93	-39.25	110.18	62.16	33.41	13.19	37.83	100	20	P	V
		5722.6	73.08	-43.65	116.73	64.28	33.44	13.19	37.83	100	20	P	V
	*	5745	109.95	-	-	100.99	33.57	13.22	37.83	100	20	P	V
	*	5745	102.52	-	-	93.56	33.57	13.22	37.83	100	20	A	V
													V
													V



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 157 5785MHz		5615.25	46.74	-21.46	68.2	38.6	32.89	13.08	37.83	263	142	P	H
		5674	46.62	-39.38	86	38.11	33.2	13.14	37.83	263	142	P	H
		5718.5	51.98	-58.4	110.38	43.21	33.41	13.19	37.83	263	142	P	H
		5724.5	49.49	-71.57	121.06	40.67	33.45	13.2	37.83	263	142	P	H
	*	5785	104.8	-	-	95.71	33.67	13.26	37.84	263	142	P	H
	*	5785	96.47	-	-	87.38	33.67	13.26	37.84	263	142	A	H
		5854.5	46.1	-65.84	111.94	36.68	33.91	13.35	37.84	263	142	P	H
		5864.25	47.71	-60.5	108.21	38.26	33.93	13.36	37.84	263	142	P	H
		5898	46.75	-41.39	88.14	37.19	34	13.4	37.84	263	142	P	H
		5936	46.3	-21.9	68.2	36.7	34	13.44	37.84	263	142	P	H
													H
													H
		5641	47.69	-20.51	68.2	39.36	33.05	13.11	37.83	100	16	P	V
		5689.25	48.56	-48.71	97.27	39.97	33.26	13.16	37.83	100	16	P	V
		5711.25	51.12	-57.23	108.35	42.4	33.37	13.18	37.83	100	16	P	V
		5721	53.53	-59.55	113.08	44.74	33.43	13.19	37.83	100	16	P	V
	*	5785	108.94	-	-	99.85	33.67	13.26	37.84	100	16	P	V
	*	5785	100.62	-	-	91.53	33.67	13.26	37.84	100	16	A	V
		5850.25	48.43	-73.2	121.63	39.03	33.9	13.34	37.84	100	16	P	V
		5857.75	50.27	-59.76	110.03	40.84	33.92	13.35	37.84	100	16	P	V
		5910.5	47.46	-31.44	78.9	37.89	34	13.41	37.84	100	16	P	V
		5932.25	47.07	-21.13	68.2	37.47	34	13.44	37.84	100	16	P	V
													V
													V



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	*	5825	102.88	-	-	93.61	33.8	13.31	37.84	261	117	P	H
	*	5825	96.03	-	-	86.76	33.8	13.31	37.84	261	117	A	H
		5854.8	64.88	-46.38	111.26	55.46	33.91	13.35	37.84	261	117	P	H
		5856.6	58.72	-51.63	110.35	49.3	33.91	13.35	37.84	261	117	P	H
		5875.2	49.45	-55.6	105.05	39.97	33.95	13.37	37.84	261	117	P	H
		5941.6	47.55	-20.65	68.2	37.94	34	13.45	37.84	261	117	P	H
													H
													H
	*	5825	108.84	-	-	99.57	33.8	13.31	37.84	100	21	P	V
	*	5825	101.57	-	-	92.3	33.8	13.31	37.84	100	21	A	V
		5851.6	68.19	-50.36	118.55	58.79	33.9	13.34	37.84	100	21	P	V
		5856.2	67.48	-42.98	110.46	58.06	33.91	13.35	37.84	100	21	P	V
		5881	54.88	-45.86	100.74	45.38	33.96	13.38	37.84	100	21	P	V
		5949.6	47.24	-20.96	68.2	37.62	34	13.46	37.84	100	21	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 149 5745MHz		11490	49.53	-24.47	74	33.39	38.92	19.62	42.4	100	0	P	H
		17235	50.56	-17.64	68.2	32.59	38.26	24.24	44.53	100	0	P	H
													H
													H
													H
													H
		11490	49.56	-24.44	74	33.42	38.92	19.62	42.4	100	0	P	V
		17235	50.68	-17.52	68.2	32.71	38.26	24.24	44.53	100	0	P	V
													V
													V
													V
													V
802.11n HT20 CH 157 5785MHz		11570	49.45	-24.55	74	33.31	38.93	19.68	42.47	100	0	P	H
		17355	50.29	-17.91	68.2	32.24	38.42	24.26	44.63	100	0	P	H
													H
													H
													H
													H
		11570	49.42	-24.58	74	33.28	38.93	19.68	42.47	100	0	P	V
		17355	51.16	-17.04	68.2	33.11	38.42	24.26	44.63	100	0	P	V
													V
													V
													V
													V



802.11n HT20 CH 165 5825MHz		11650	49.94	-24.06	74	33.9	38.85	19.74	42.55	100	0	P	H
		17475	50.9	-17.3	68.2	32.58	38.75	24.3	44.73	100	0	P	H
													H
													H
													H
													H
		11650	49.43	-24.57	74	33.39	38.85	19.74	42.55	100	0	P	V
		17475	51.1	-17.1	68.2	32.78	38.75	24.3	44.73	100	0	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 802.11n HT40 (Band Edge @ 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 HT40 CH 151 5755MHz		5650	49.82	-18.38	68.2	41.44	33.1	13.11	37.83	250	141	P	H
		5695.25	60.92	-40.78	101.7	52.31	33.28	13.16	37.83	250	141	P	H
		5716	71.22	-38.46	109.68	62.46	33.4	13.19	37.83	250	141	P	H
		5723.25	72.88	-45.33	118.21	64.07	33.44	13.2	37.83	250	141	P	H
	*	5755	102.12	-	-	93.12	33.61	13.23	37.84	250	141	P	H
	*	5755	93.91	-	-	84.91	33.61	13.23	37.84	250	141	A	H
		5853.25	47.88	-66.91	114.79	38.47	33.91	13.34	37.84	250	141	P	H
		5855.5	48.58	-62.08	110.66	39.16	33.91	13.35	37.84	250	141	P	H
		5907.25	48.21	-33.09	81.3	38.64	34	13.41	37.84	250	141	P	H
		5932.5	47.94	-20.26	68.2	38.34	34	13.44	37.84	250	141	P	H
													H
													H
		5645	52.42	-15.78	68.2	44.07	33.07	13.11	37.83	116	21	P	V
		5699.75	66.35	-38.67	105.02	57.71	33.3	13.17	37.83	116	21	P	V
		5717.25	77.11	-32.92	110.03	68.35	33.4	13.19	37.83	116	21	P	V
		5725	78.2	-44	122.2	69.38	33.45	13.2	37.83	116	21	P	V
	*	5755	105.6	-	-	96.6	33.61	13.23	37.84	116	21	P	V
	*	5755	97.07	-	-	88.07	33.61	13.23	37.84	116	21	A	V
		5854	51.99	-61.09	113.08	42.58	33.91	13.34	37.84	116	21	P	V
		5858.5	52.73	-57.09	109.82	43.3	33.92	13.35	37.84	116	21	P	V
		5882	49.73	-50.27	100	40.23	33.96	13.38	37.84	116	21	P	V
		5935.5	47.45	-20.75	68.2	37.85	34	13.44	37.84	116	21	P	V
													V
													V



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 HT40 CH 159 5795MHz		5615.25	47.1	-21.1	68.2	38.96	32.89	13.08	37.83	233	61	P	H
		5676.5	47.48	-40.37	87.85	38.96	33.21	13.14	37.83	233	61	P	H
		5717.25	49.72	-60.31	110.03	40.96	33.4	13.19	37.83	233	61	P	H
		5722.5	51.45	-65.05	116.5	42.66	33.43	13.19	37.83	233	61	P	H
	*	5795	98.74	-	-	89.62	33.69	13.27	37.84	233	61	P	H
	*	5795	90.18	-	-	81.06	33.69	13.27	37.84	233	61	A	H
		5854	55.31	-57.77	113.08	45.9	33.91	13.34	37.84	233	61	P	H
		5859	54.54	-55.14	109.68	45.11	33.92	13.35	37.84	233	61	P	H
		5889.5	50.26	-44.18	94.44	40.73	33.98	13.39	37.84	233	61	P	H
		5929.5	47.46	-20.74	68.2	37.86	34	13.44	37.84	233	61	P	H
													H
													H
		5640.5	48.59	-19.61	68.2	40.28	33.04	13.1	37.83	106	20	P	V
		5698.5	55.91	-48.18	104.09	47.28	33.29	13.17	37.83	106	20	P	V
		5719	59.32	-51.2	110.52	50.55	33.41	13.19	37.83	106	20	P	V
		5723	60.16	-57.48	117.64	51.35	33.44	13.2	37.83	106	20	P	V
	*	5795	105.61	-	-	96.49	33.69	13.27	37.84	106	20	P	V
	*	5795	98.81	-	-	89.69	33.69	13.27	37.84	106	20	A	V
		5853	63.78	-51.58	115.36	54.37	33.91	13.34	37.84	106	20	P	V
		5860.25	61.48	-47.85	109.33	52.05	33.92	13.35	37.84	106	20	P	V
		5876.25	57.07	-47.2	104.27	47.59	33.95	13.37	37.84	106	20	P	V
		5929.5	49.14	-19.06	68.2	39.54	34	13.44	37.84	106	20	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. 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 HT40 CH 151 5755MHz		11510	49.58	-24.42	74	33.37	38.99	19.64	42.42	100	0	P	H
		17265	51.02	-17.18	68.2	33.08	38.24	24.25	44.55	100	0	P	H
													H
													H
													H
													H
		11510	49.31	-24.69	74	33.1	38.99	19.64	42.42	100	0	P	V
		17265	50.65	-17.55	68.2	32.71	38.24	24.25	44.55	100	0	P	V
													V
													V
													V
													V
802.11n HT40 CH 159 5795MHz		11590	49.98	-24.02	74	33.87	38.91	19.69	42.49	100	0	P	H
		17385	51.2	-17	68.2	33.04	38.54	24.27	44.65	100	0	P	H
													H
													H
													H
													H
		11590	49.17	-24.83	74	33.06	38.91	19.69	42.49	100	0	P	V
		17385	51.84	-16.36	68.2	33.68	38.54	24.27	44.65	100	0	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 802.11ac VHT80 (Band Edge @ 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)
802.11ac VHT80 CH 155 5775MHz		5650	57.07	-11.13	68.2	48.69	33.1	13.11	37.83	248	115	P	H
		5690.75	67.87	-30.51	98.38	59.28	33.26	13.16	37.83	248	115	P	H
		5703.75	70.96	-35.29	106.25	62.3	33.32	13.17	37.83	248	115	P	H
		5724.25	69.47	-51.02	120.49	60.65	33.45	13.2	37.83	248	115	P	H
	*	5775	96.93	-	-	87.87	33.65	13.25	37.84	248	115	P	H
	*	5775	89.03	-	-	79.97	33.65	13.25	37.84	248	115	A	H
		5851.75	64.28	-53.93	118.21	54.88	33.9	13.34	37.84	248	115	P	H
		5864.25	62.99	-45.22	108.21	53.54	33.93	13.36	37.84	248	115	P	H
		5883.25	59.12	-39.95	99.07	49.61	33.97	13.38	37.84	248	115	P	H
		5926.75	52.19	-16.01	68.2	42.6	34	13.43	37.84	248	115	P	H
													H
													H
		5649.25	61.3	-6.9	68.2	52.92	33.1	13.11	37.83	100	22	P	V
		5697	71.85	-31.14	102.99	63.22	33.29	13.17	37.83	100	22	P	V
		5718.75	74.7	-35.75	110.45	65.93	33.41	13.19	37.83	100	22	P	V
		5722.25	78.95	-36.98	115.93	70.16	33.43	13.19	37.83	100	22	P	V
	*	5775	102.52	-	-	93.46	33.65	13.25	37.84	100	22	P	V
	*	5775	94.25	-	-	85.19	33.65	13.25	37.84	100	22	A	V
		5854.75	70.82	-40.55	111.37	61.4	33.91	13.35	37.84	100	22	P	V
		5855	69.02	-41.78	110.8	59.6	33.91	13.35	37.84	100	22	P	V
		5875	64.4	-40.8	105.2	54.92	33.95	13.37	37.84	100	22	P	V
		5931.25	54.84	-13.36	68.2	45.24	34	13.44	37.84	100	22	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. 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)
802.11ac VHT80 CH 155 5775MHz		11550	49.87	-24.13	74	33.71	38.95	19.67	42.46	100	0	P	H
		17325	50.66	-17.54	68.2	32.71	38.3	24.25	44.6	100	0	P	H
													H
													H
													H
													H
		11550	49.97	-24.03	74	33.81	38.95	19.67	42.46	100	0	P	V
		17325	50.74	-17.46	68.2	32.79	38.3	24.25	44.6	100	0	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11ac VHT80 (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.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11ac VHT80 LF		30.97	22.66	-17.34	40	33.28	24.13	0.97	35.72	-	-	P	H
		105.66	24.26	-19.24	43.5	41.24	16.87	1.79	35.64	-	-	P	H
		165.8	27.2	-16.3	43.5	44.59	15.92	2.23	35.54	-	-	P	H
		856.44	32.38	-13.62	46	31.42	29.17	5.3	33.51	-	-	P	H
		874.87	34.09	-11.91	46	33.04	29.12	5.37	33.44	-	-	P	H
		944.71	34.48	-11.52	46	31.54	30.51	5.6	33.17	100	0	P	H
													H
													H
													H
													H
													H
													H
													H
		30.97	23.64	-16.36	40	34.26	24.13	0.97	35.72	-	-	P	V
		145.43	24.91	-18.59	43.5	40.77	17.6	2.11	35.57	-	-	P	V
		162.89	22.99	-20.51	43.5	40.07	16.24	2.22	35.54	-	-	P	V
		873.9	33.02	-12.98	46	31.98	29.11	5.37	33.44	-	-	P	V
		924.34	33.71	-12.29	46	31.72	29.7	5.54	33.25	-	-	P	V
		943.74	34.85	-11.15	46	31.99	30.44	5.6	33.18	100	0	P	V
													V
												V	
												V	
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

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

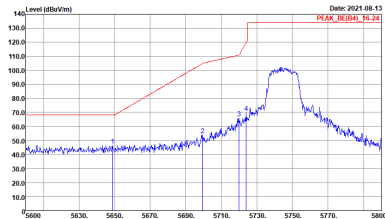
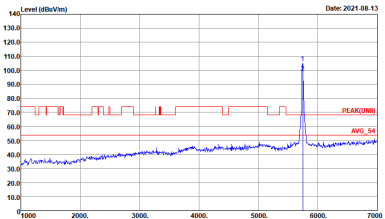


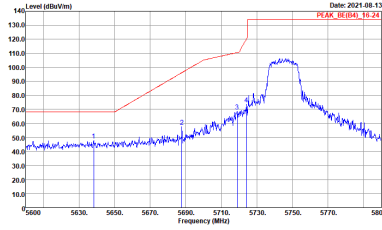
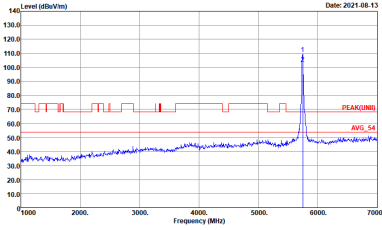
Appendix D. Radiated Spurious Emission Plots

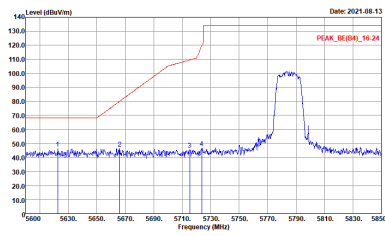
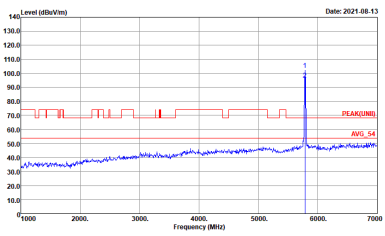
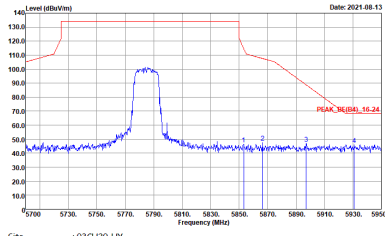
Test Engineer :	Troye Hsieh	Temperature :	20.4~22.3°C
		Relative Humidity :	62.9~67.5%

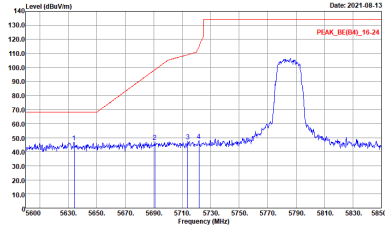
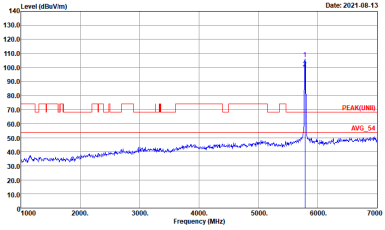
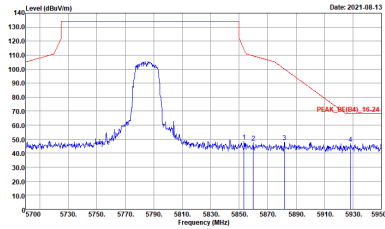
Band 4 - 5725~5850MHz

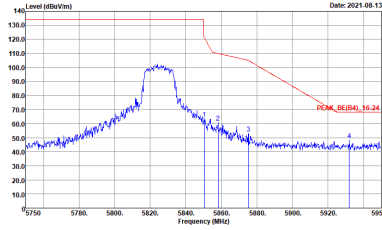
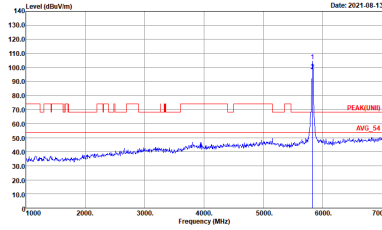
WIFI 802.11a (Band Edge @ 3m)

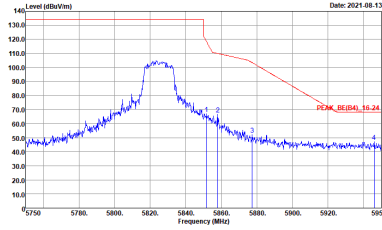
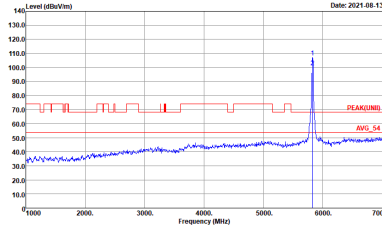
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 HORIZONTAL

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(04) 16-24 3m 91200 002360 1091103 VERTICAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 VERTICAL

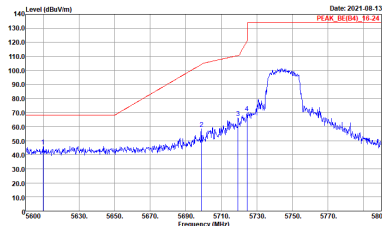
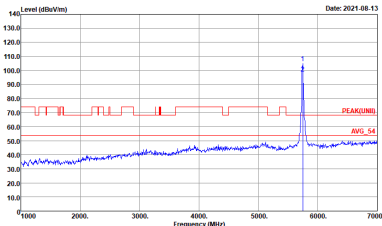
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 91200 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK UNITE1 3m 91200 002360 1091103 HORIZONTAL
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 91200 002360 1091103 HORIZONTAL	Left blank

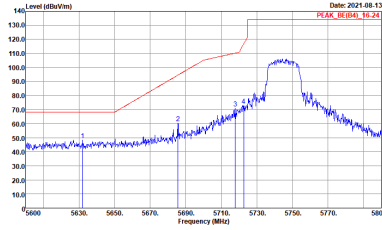
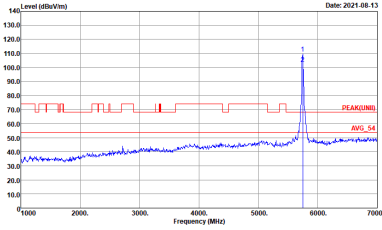
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 VERTICAL
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	Left blank

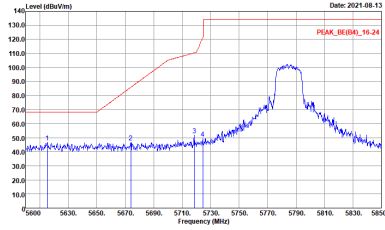
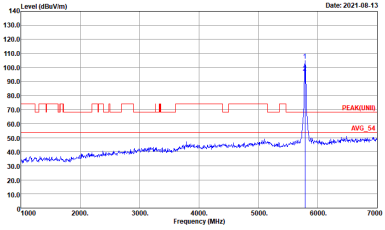
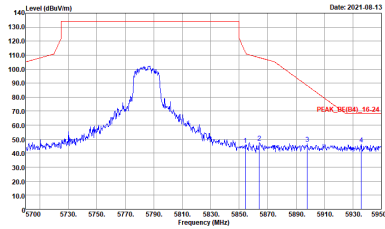
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 HORIZONTAL

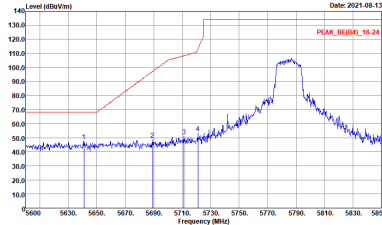
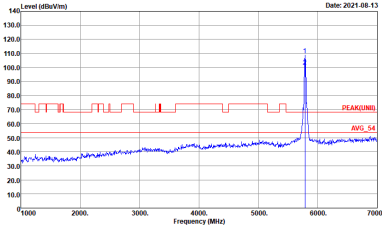
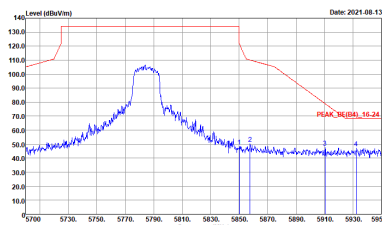
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 VERTICAL

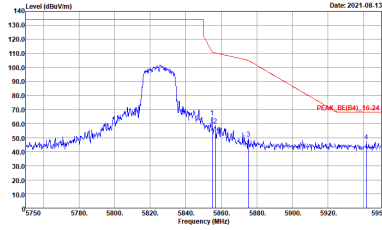
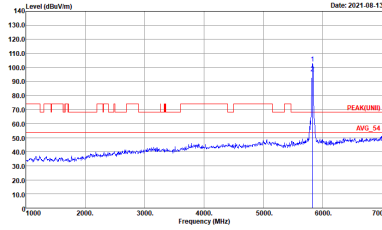
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

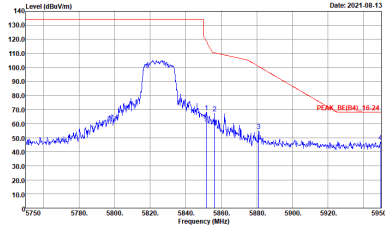
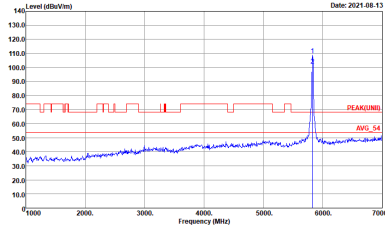
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 91200 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UWB) 3m 91200 002360 1091103 HORIZONTAL

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(04) 16-24 3m 9120D 002360 1091103 VERTICAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 VERTICAL

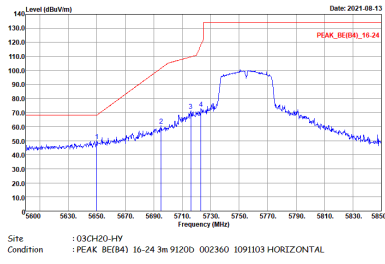
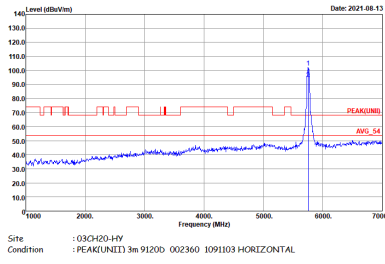
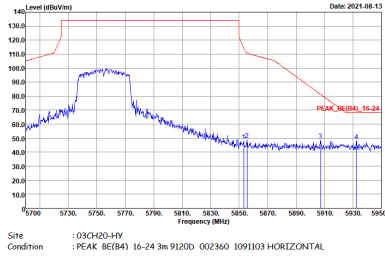
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 HORIZONTAL
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 HORIZONTAL	Left blank

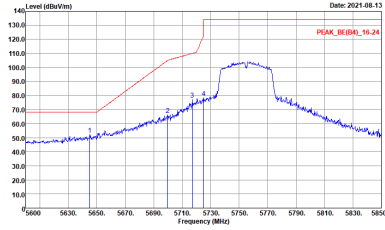
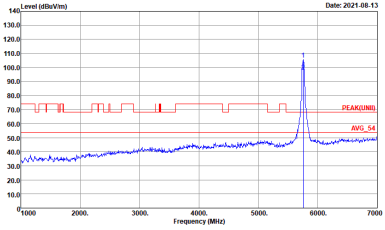
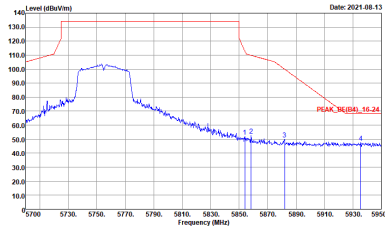
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 VERTICAL
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	Left blank

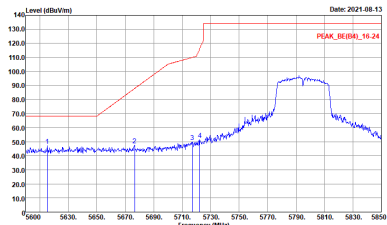
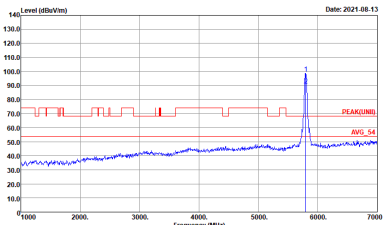
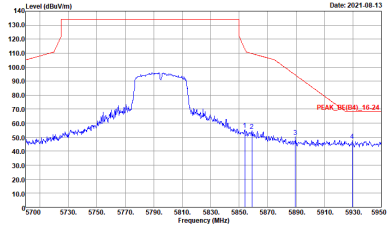
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 HORIZONTAL

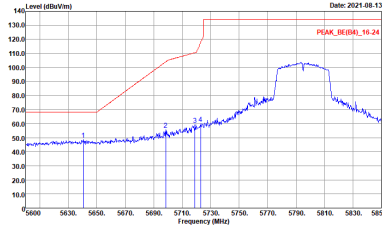
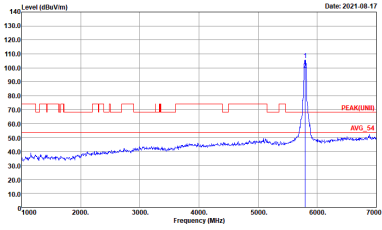
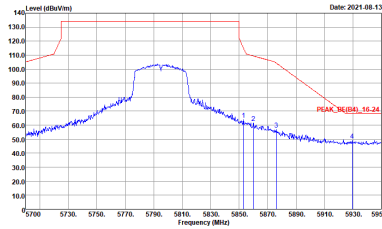
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE(B4) 16-24 3m 91200 002360 1091103 VERTICAL	 Site : 03CH20-HY Condition : PEAK(FUND) 16-24 3m 91200 002360 1091103 VERTICAL

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

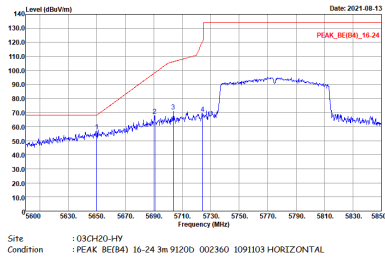
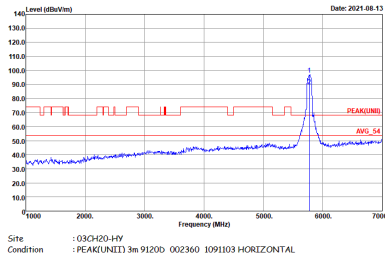
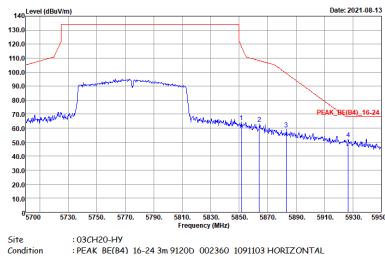
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH20-1HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 HORIZONTAL	 Site : 03CH20-1HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 HORIZONTAL
Peak	 Site : 03CH20-1HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 HORIZONTAL	Left blank

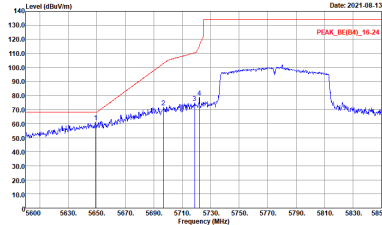
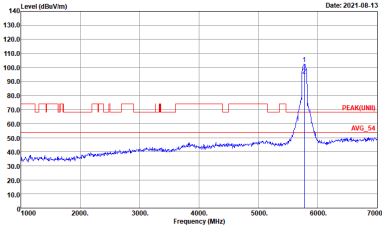
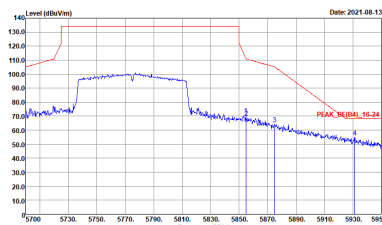
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 VERTICAL
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE(04)_16-24 3m 9120D 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT)_16-24 3m 9120D 002360 1091103 HORIZONTAL
	 Site : 03CH20-HY Condition : PEAK_BE(04)_16-24 3m 9120D 002360 1091103 HORIZONTAL	Left blank

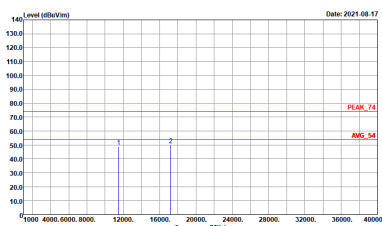
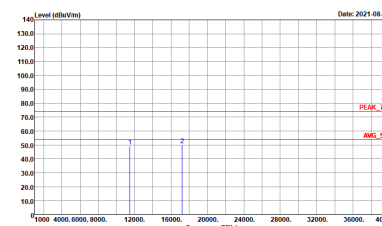
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 VERTICAL
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	Left blank

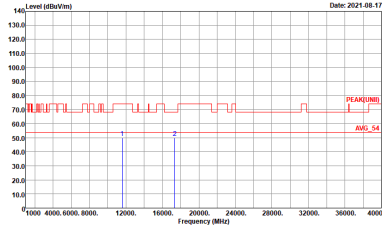
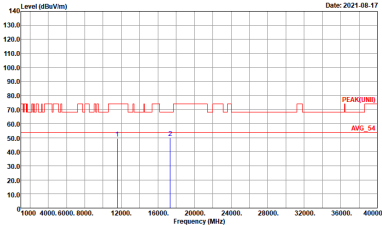
Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

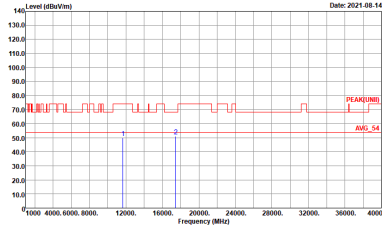
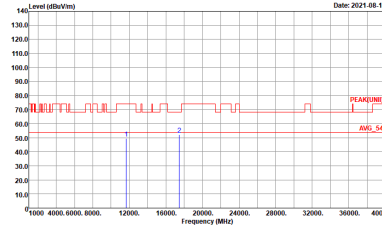
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 HORIZONTAL
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 HORIZONTAL	Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 9120D 002360 1091103 VERTICAL
Peak	 Site : 03CH20-HY Condition : PEAK BE(B4) 16-24 3m 9120D 002360 1091103 VERTICAL	Left blank

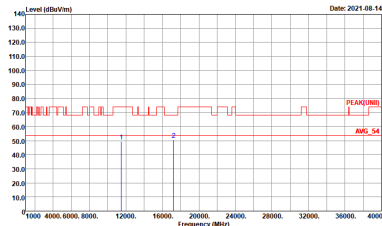
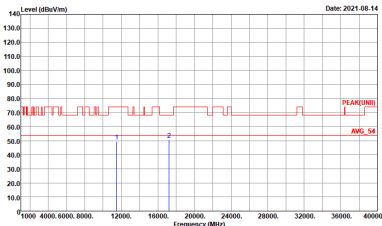
Band 4 - 5725~5850MHz
WIFI 802.11a (Harmonic @ 3m)

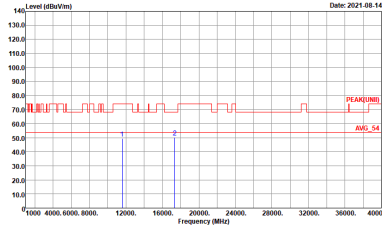
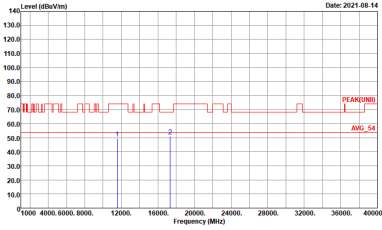
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK 74 3m 91200 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK 74 3m 91200 002360 1091103 VERTICAL

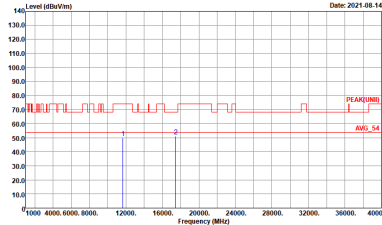
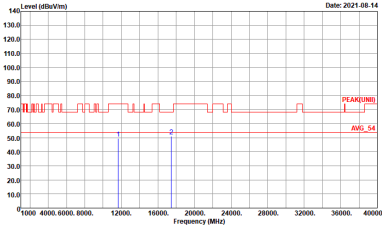
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 VERTICAL

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 VERTICAL

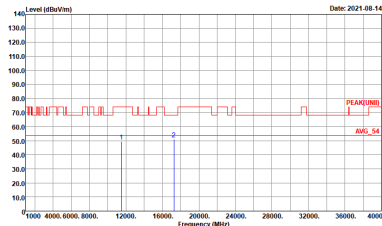
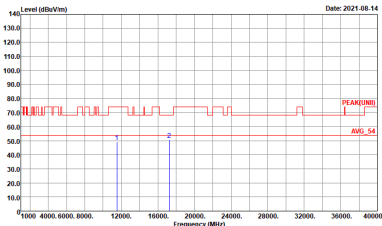
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

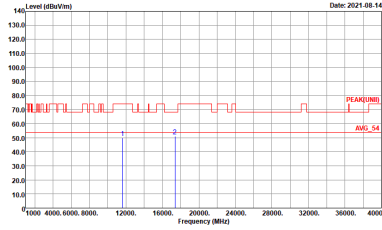
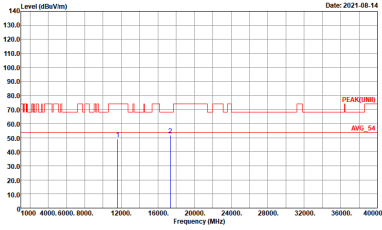
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 VERTICAL

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 VERTICAL

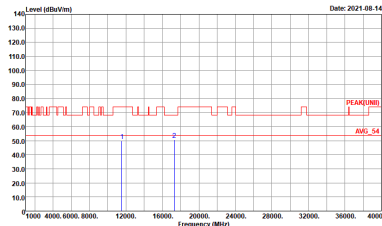
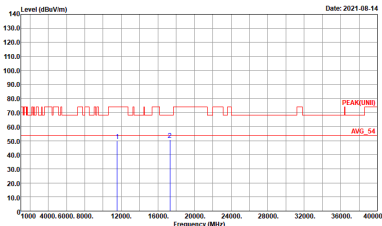
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 VERTICAL

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

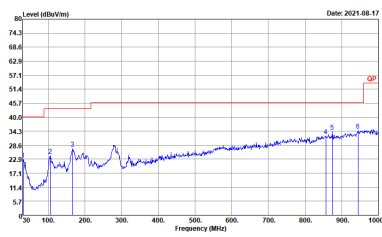
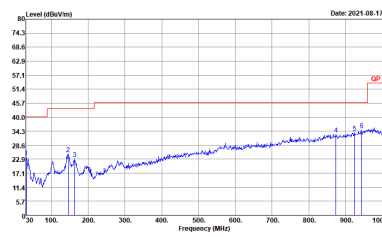
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 VERTICAL

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK[UNIT] 3m 91200 002360 109103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK[UNIT] 3m 91200 002360 109103 VERTICAL

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

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 HORIZONTAL	 Site : 03CH20-HY Condition : PEAK(UNIT) 3m 91200 002360 1091103 VERTICAL

Emission below 1GHz
5GHz WIFI 802.11ac VHT80 (LF @ 3m)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
2	Horizontal	Vertical
QP / Peak	 Site : 03CH20-1HY Condition : QP 3m LF 55606408 1091022 HORIZONTAL	 Site : 03CH20-1HY Condition : QP 3m LF 55606408 1091022 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

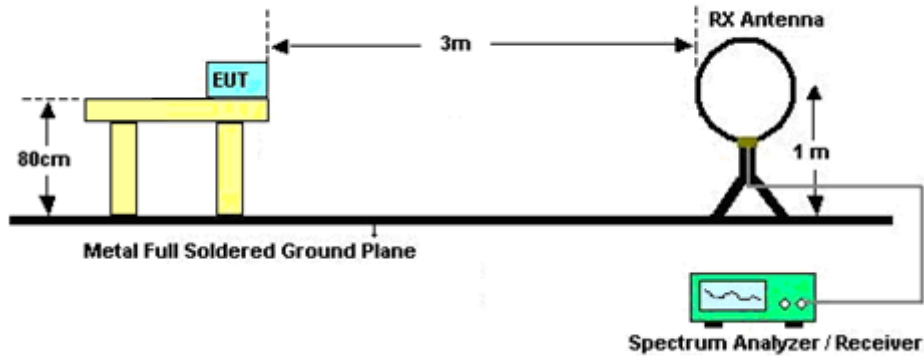
See list of measuring equipment of this test report.

A.3 Test Procedures

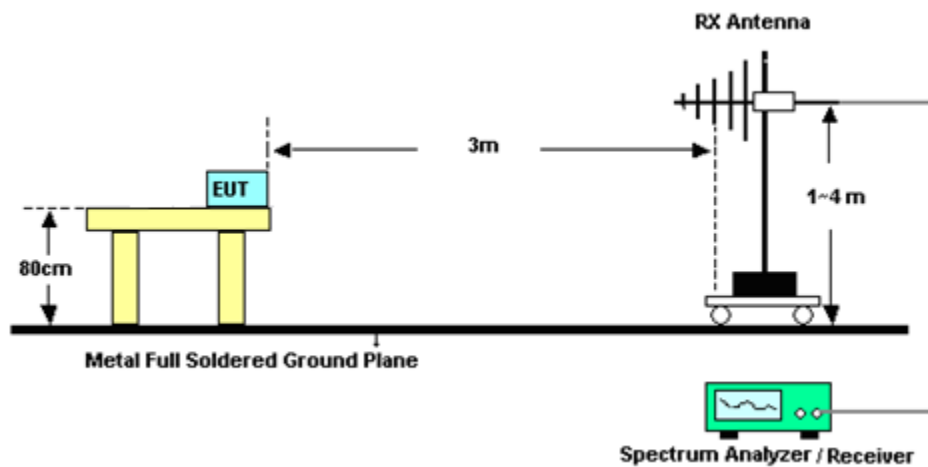
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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

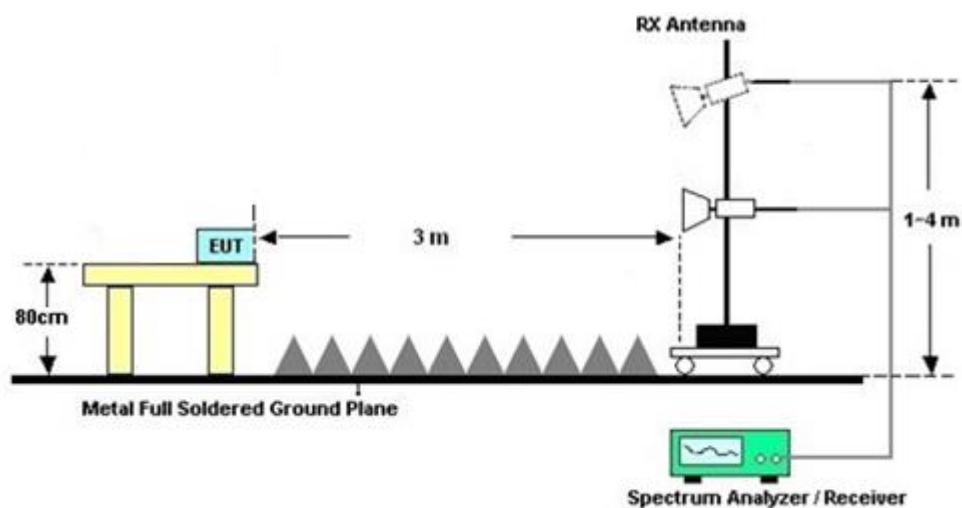
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

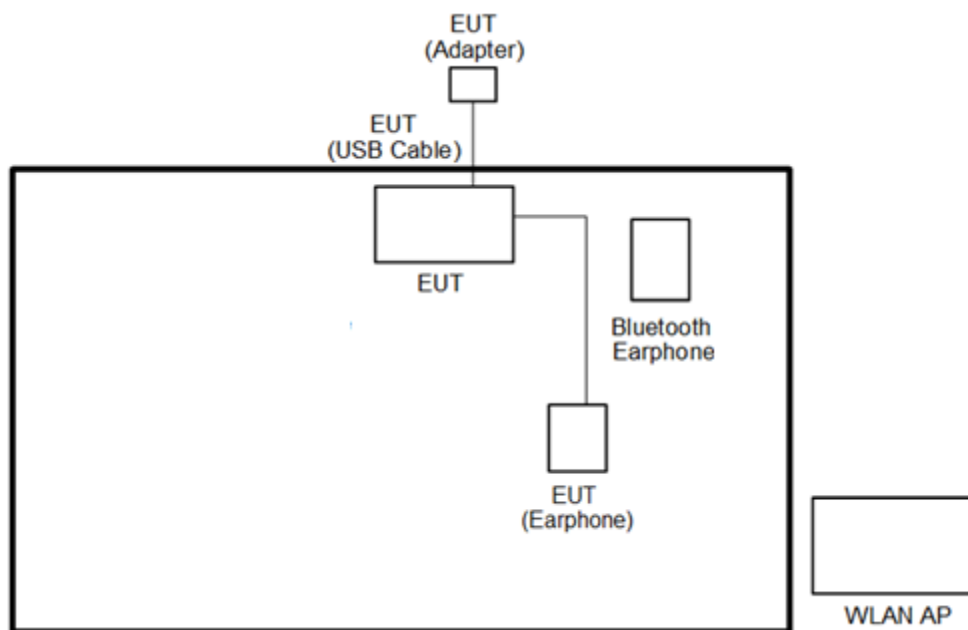


A.5 Test Result of Receiver Radiated Spurious Emissions (9kHz ~ 30MHz)

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 6.13 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.

A.6 Connection Diagram of Test System



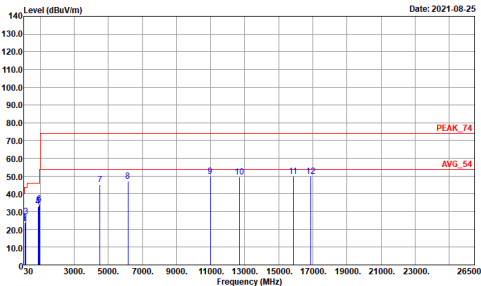
A.7 Support Unit used in test configuration and system

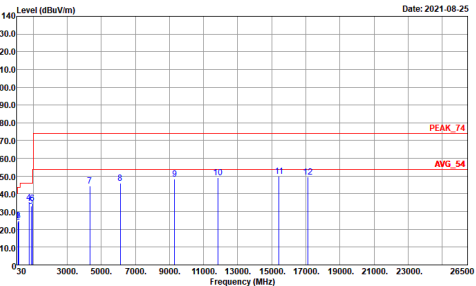
Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony	SBH20	PY7-RD0010	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m

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

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

Test Engineer :	Troye Hsieh	Temperature :	20.4~22.3°C
		Relative Humidity :	62.9~67.5%
Frequency :	750.710 MHz	Margin :	Under 11.03 dB
Test Mode :	Bluetooth Idle + WLAN (5GHz) Idle		

	Idle Mode									
	Horizontal									
Peak Avg.										
	Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 HORIZONTAL Detector : Peak Project : 170932-01 Setting : 18									
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamplifier	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
	1	36.79	23.58	-16.42	40.00	37.26	20.97	1.05	35.72	--- --- Peak
	2	102.75	23.78	-19.72	43.50	41.20	16.47	1.69	35.65	--- --- Peak
	3	165.80	27.43	-16.07	43.50	44.82	15.92	2.16	35.54	--- --- Peak
	4	865.17	32.89	-13.11	46.00	31.85	29.18	5.02	33.48	--- --- Peak
	5	909.79	33.51	-12.49	46.00	32.00	29.31	5.14	33.31	--- --- Peak
	6	944.71	34.48	-11.52	46.00	31.54	30.51	5.22	33.17	100 0 Peak
7	4584.00	45.36	-28.64	74.00	38.91	31.49	12.13	37.17	--- --- Peak	
8	6160.00	47.26	-20.94	68.20	37.58	33.84	13.70	37.86	100 0 Peak	
9	10980.00	49.78	-24.22	74.00	33.59	38.94	18.55	41.75	--- --- Peak	
10	12690.00	49.41	-24.59	74.00	32.66	39.28	19.82	42.88	--- --- Peak	
11	15855.00	49.74	-24.26	74.00	32.06	38.22	23.12	44.29	--- --- Peak	
12	16875.00	49.79	-24.21	74.00	31.65	38.20	23.56	44.27	--- --- Peak	

	Vertical									
Peak Avg.										
	Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 VERTICAL Detector : Peak Project : 170932-01 Setting : 18									
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamplifier	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
	1	36.79	24.87	-15.13	40.00	38.55	20.97	1.05	35.72	--- --- Peak
	2	102.75	24.07	-19.43	43.50	41.49	16.47	1.69	35.65	--- --- Peak
	3	140.58	25.00	-18.42	43.50	40.94	17.65	1.98	35.58	--- --- Peak
	4	750.71	34.97	-11.03	46.00	35.93	28.10	4.65	33.89	100 0 Peak
	5	873.90	33.02	-12.98	46.00	31.98	29.11	5.84	33.44	--- --- Peak
	6	943.74	34.85	-11.15	46.00	31.99	30.44	5.22	33.18	--- --- Peak
7	4324.00	44.35	-29.65	74.00	38.08	31.25	12.17	37.15	--- --- Peak	
8	6110.00	46.14	-22.06	68.20	36.54	33.80	13.65	37.85	100 0 Peak	
9	9300.00	48.47	-25.53	74.00	33.55	38.30	16.49	40.33	--- --- Peak	
10	11850.00	49.12	-24.88	74.00	33.40	38.80	19.18	42.73	--- --- Peak	
11	15435.00	49.80	-24.20	74.00	32.61	38.46	22.74	44.64	--- --- Peak	
12	17115.00	49.49	-24.51	74.00	31.50	38.13	23.63	44.43	--- --- Peak	

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 §6.20.2.1 and §6.20.2.2.

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)

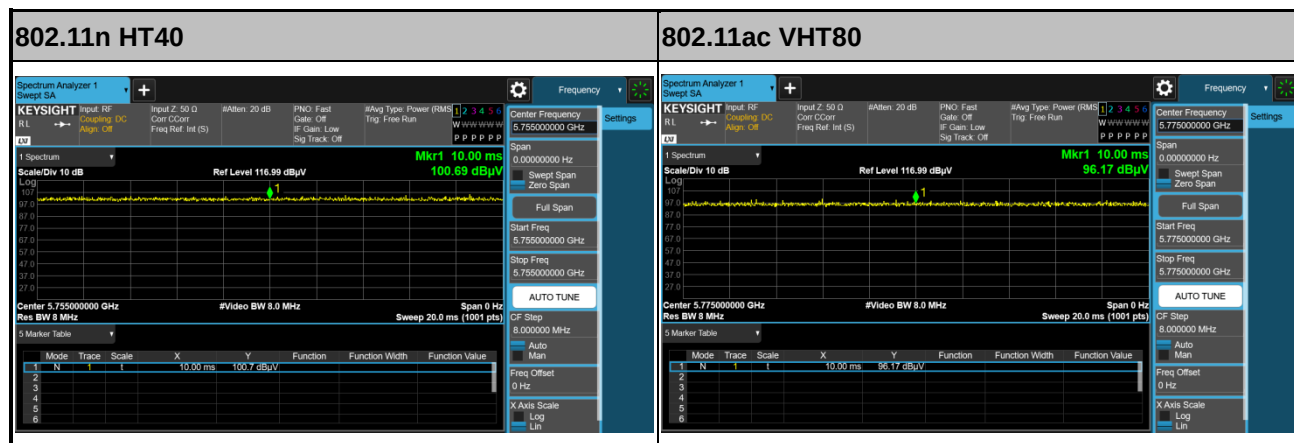
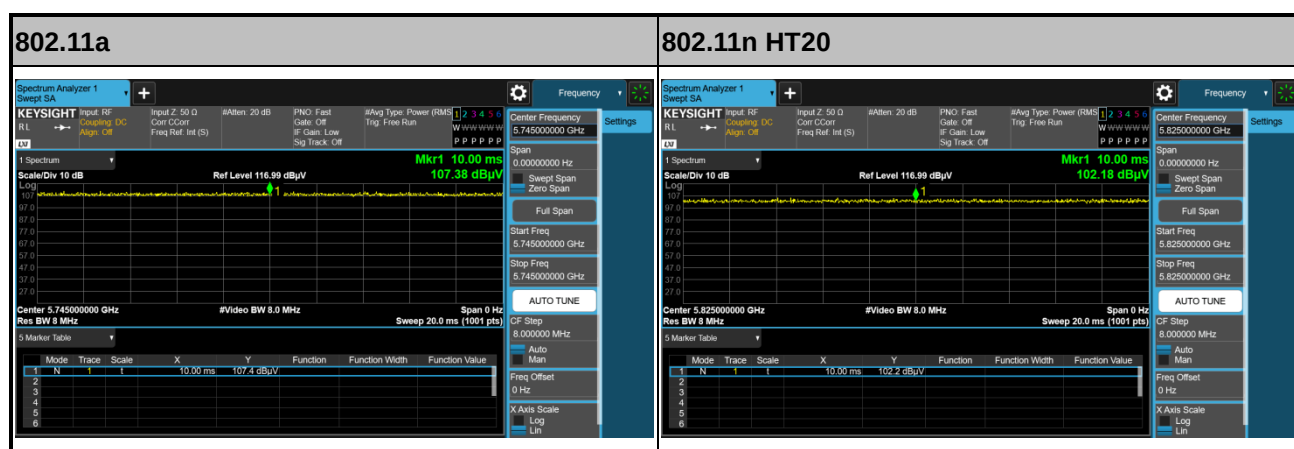
R = Distance from Transmitting Antenna

B.2 Standalone Power Density Calculation

Please refer to Appendix A.

Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11a	100.00	-	-	10Hz
5GHz 802.11n HT20	100.00	-	-	10Hz
5GHz 802.11n HT40	100.00	-	-	10Hz
5GHz 802.11ac VHT80	100.00	-	-	10Hz



—THE END—