



FCC RADIO TEST REPORT

FCC ID : QYLAX201NG
Equipment : WLAN module
Brand Name : Getac
Model Name : AX201NGW
Marketing Name : AX201NGW
Applicant : Getac Technology Corporation.
5F., Building A, No. 209, Sec. 1, Nangang Rd.,
Nangang Dist., Taipei City 11568, Taiwan, R.O.C.
Standard : FCC Part 15 Subpart E §15.407

The product was received on Jan. 06, 2020 and testing was started from Jan. 21, 2020 and completed on Feb. 15, 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 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 partial 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.

Louis Wu

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
FR6D2154-33D	01	Initial issue of report	Feb. 25, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)
3.1	15.407(a)	Maximum Conducted Output Power	Pass
3.2	15.407(b)	Unwanted Emissions	Pass
3.3	15.203 15.407(a)	Antenna Requirement	Pass

Declaration of Conformity:

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

Comments and Explanations:

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

Reviewed by: Wii Chang

Report Producer: Ching Chen

1 General Description

1.1 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ax, and Wi-Fi 5GHz 802.11a/n/ac/ax

Product Specification subjective to this standard	
Sample 1	EUT with Host 1
Sample 2	EUT with Host 2
Antenna Type	WLAN: <Chain A> : PIFA Antenna <Chain B> : PIFA Antenna Bluetooth: PIFA Antenna

The product was installed into Tablet PC (Brand Name: Getac, Model Name: A140,A140G2) during test, and the host information was recorded in the following table.

Host Information		
Host 1	EUT with Model Name A140G2 and SKU 1	
Host 2	EUT with Model Name A140G2 and SKU 2	

SKU	SKU 1	SKU 2
CPU	i5 (i5-10210U)	i7 (i7-10510U)
WWAN	Support (EM7455)	Support (EM7455)
WLAN	Support (AX201NGW)	Support (AX201NGW)
RFID	Not Support	Support (PN7462)
GPS	Not Support	Support (MC1010)
Finger printer	N/A(RS-232)	Support
BCR	Not Support	Support

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	03CH07-HY

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

FCC designation No.: TW1190

1.4 Applicable Standards

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

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

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

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:, 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. The worst cases (X plane) were recorded in this report.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	42 [#]	5210		
Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5250-5350 MHz Band 2 (U-NII-2A)	52	5260	60	5300
	54*	5270	62*	5310
	56	5280	64	5320
	58 [#]	5290		
Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5470-5725 MHz Band 3 (U-NII-2C)	100	5500	112	5560
	102*	5510	116	5580
	104	5520	132	5660
	106 [#]	5530	134*	5670
	108	5540	136	5680
	110*	5550	140	5700
Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
TDWR Channel	118*	5590	124	5620
	120	5600	126*	5630
	122 [#]	5610	128	5640



Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
Straddle Channel	138 [#]	5690	144	5720
	142 [*]	5710		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
160 MHz BW	50	5250	114	5570

Note:

1. The above Frequency and Channel in "*" were 802.11n HT40, 802.11ac VHT40, and 802.11ax HE40.
2. The above Frequency and Channel in "[#]" were 802.11ac VHT80 and 802.11ax HE80.



2.2 Test Mode

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

Single Mode

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0
802.11ac VHT160	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0
802. 11ax HE80	MCS0
802.11ax HE160	MCS0

MIMO Mode

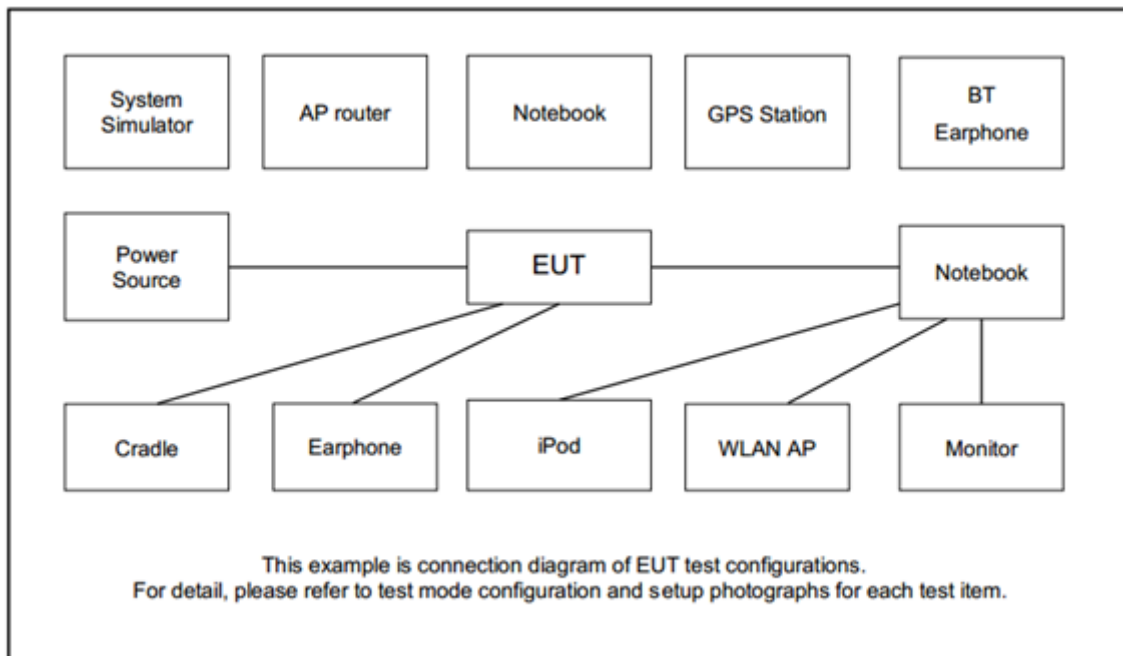
Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0
802.11ac VHT160	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0
802. 11ax HE80	MCS0
802.11ax HE160	MCS0

Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band II : 5250-5350 MHz
		802.11ax HE20	802.11ax HE40	802.11ax HE160
L	Low	36	-	50
M	Middle	-	-	-
H	High	-	62	-

Remark:

1. For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.
2. For Radiated Test Cases, the tests were performed with sample 2 and AC adapter (FSP065-RBBN3).

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A

2.5 EUT Operation Test Setup

The RF test items, utility "DRTU_V12.1947.0-10428" was installed in EUT 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.

3 Test Result

3.1 Maximum Conducted Output Power Measurement

3.1.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For the 5.15–5.25 GHz bands:

- For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

For the 5.25–5.725 GHz bands:

- The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

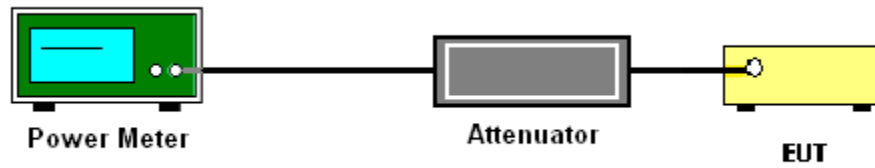
3.1.3 Test Procedures

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

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit 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.

3.1.4 Test Setup



3.1.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.



3.2 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

3.2.1 Limit of Unwanted Emissions

- (1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

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

- (i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz.
- (ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

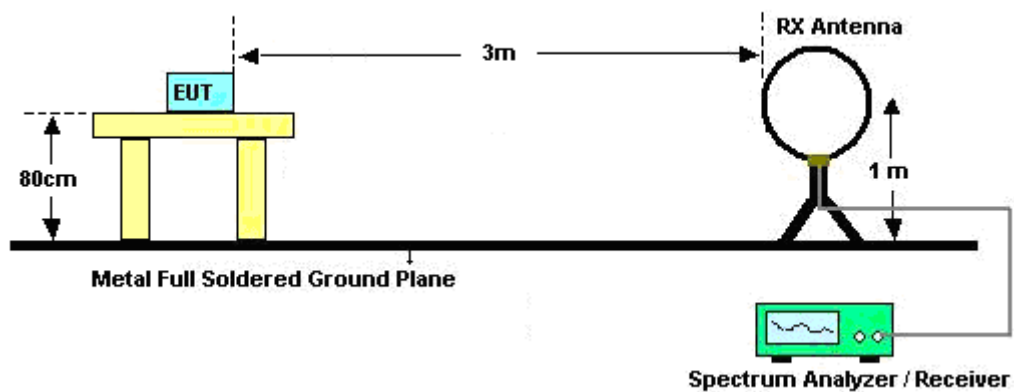
3.2.3 Test Procedures

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.

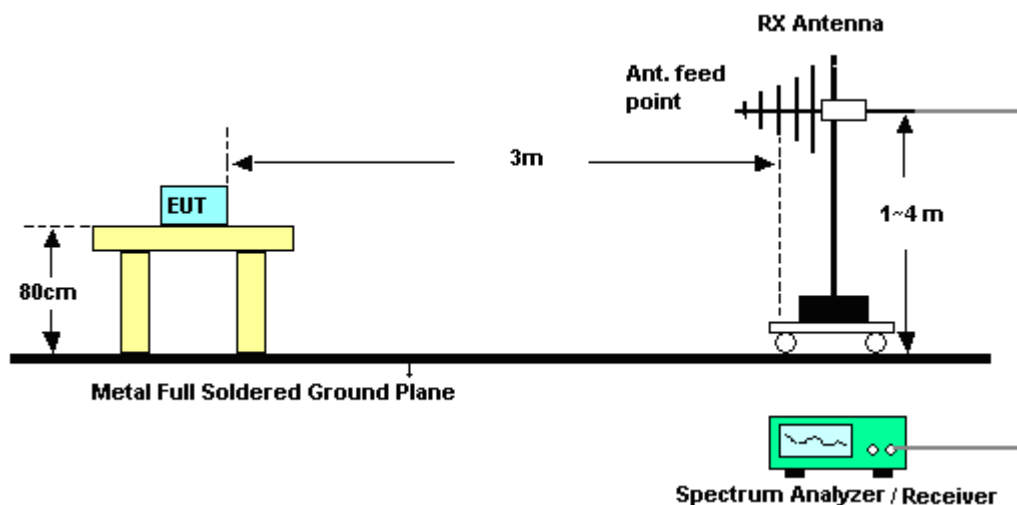
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, 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.

3.2.4 Test Setup

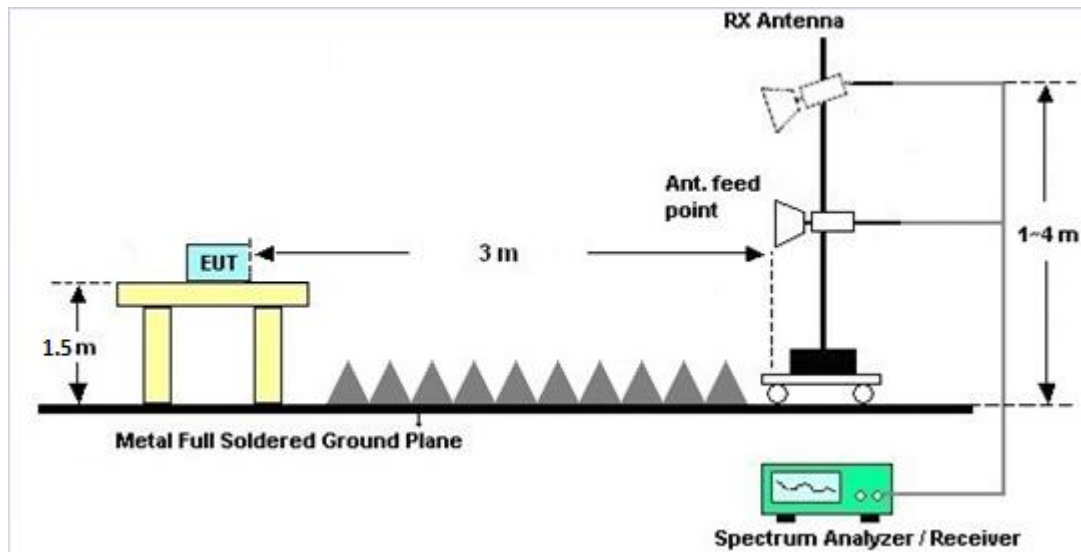
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

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

3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B and C.

3.2.7 Duty Cycle

Please refer to Appendix D.

3.2.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix B and C.

3.3 Antenna Requirements

3.3.1 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.

3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.3.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = GANT + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(\text{NANT}/\text{NSS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $\text{NANT} \leq 4$.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with GANT set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain "DG" is calculated as following table.

<CDD Modes>						
	Chain A	Chain B	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band I	0.45	-0.15	0.45	3.17	0.00	0.00
Band II	0.43	-0.97	0.43	2.77	0.00	0.00
Band III	1.24	0.26	1.24	3.77	0.00	0.00

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

PSD limit reduction = Composite gain + PSD Array gain – 6dBi, (min = 0)



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H2	41410069	N/A	Jun. 17, 2019	Jan. 21, 2020~ Jan. 22, 2020	Jun. 16, 2020	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO 10	10MHz~6GHz	Dec. 23, 2019	Jan. 21, 2020~ Jan. 22, 2020	Dec. 22, 2020	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Aug. 14, 2019	Jan. 21, 2020~ Jan. 22, 2020	Aug. 13, 2020	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1208382	N/A	Mar. 27, 2019	Jan. 21, 2020~ Jan. 22, 2020	Mar. 26, 2020	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Dec. 26, 2019	Feb. 14, 2020~ Feb. 15, 2020	Dec. 25, 2020	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	35419 & 03	30MHz~1GHz	Apr. 30, 2019	Feb. 14, 2020~ Feb. 15, 2020	Apr. 29, 2020	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 06, 2019	Feb. 14, 2020~ Feb. 15, 2020	Dec. 05, 2020	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917058 4	18GHz~40GHz	Dec. 10, 2019	Feb. 14, 2020~ Feb. 15, 2020	Dec. 09, 2020	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	May 20, 2019	Feb. 14, 2020~ Feb. 15, 2020	May 19, 2020	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 24, 2019	Feb. 14, 2020~ Feb. 15, 2020	Apr. 23, 2020	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Nov. 01, 2019	Feb. 14, 2020~ Feb. 15, 2020	Oct. 31, 2020	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 13, 2019	Feb. 14, 2020~ Feb. 15, 2020	Dec. 12, 2020	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz~26.5GHz	Jan. 18, 2020	Feb. 14, 2020~ Feb. 15, 2020	Jan. 17, 2021	Radiation (03CH07-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz~44GHz	Feb. 10, 2020	Feb. 14, 2020~ Feb. 15, 2020	Feb. 09, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4, MY28655/4	9kHz~30MHz	Feb. 26, 2019	Feb. 14, 2020~ Feb. 15, 2020	Feb. 25, 2020	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	30MHz~1GHz	Feb. 26, 2019	Feb. 14, 2020~ Feb. 15, 2020	Feb. 25, 2020	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	1GHz~18GHz	Feb. 26, 2019	Feb. 14, 2020~ Feb. 15, 2020	Feb. 25, 2020	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Feb. 14, 2020~ Feb. 15, 2020	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Feb. 14, 2020~ Feb. 15, 2020	N/A	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	N/A	N/A	N/A	Feb. 14, 2020~ Feb. 15, 2020	N/A	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2	18GHz~40GHz	Feb. 26, 2019	Feb. 14, 2020~ Feb. 15, 2020	Feb. 25, 2020	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.6
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.3
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Kathy Chen	Temperature:	21~25	°C
Test Date:	2020/1/21~2020/1/22	Relative Humidity:	51~54	%

TEST RESULTS DATA
Average Power Table

FCC Band I single antenna													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)			Pass/Fail
					Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
11a	6Mbps	1	36	5180	15.80	15.80		24.00	24.00	0.45	-0.15		Pass
11a	6Mbps	1	44	5220	15.90	15.90		24.00	24.00	0.45	-0.15		Pass
11a	6Mbps	1	48	5240	15.90	15.90		24.00	24.00	0.45	-0.15		Pass
HT20	MCS0	1	36	5180	15.80	15.80		24.00	24.00	0.45	-0.15		Pass
HT20	MCS0	1	44	5220	15.90	15.90		24.00	24.00	0.45	-0.15		Pass
HT20	MCS0	1	48	5240	15.90	15.90		24.00	24.00	0.45	-0.15		Pass
HT40	MCS0	1	38	5190	15.90	15.80		24.00	24.00	0.45	-0.15		Pass
HT40	MCS0	1	46	5230	15.90	15.90		24.00	24.00	0.45	-0.15		Pass
VHT20	MCS0	1	36	5180	15.70	15.70		24.00	24.00	0.45	-0.15		Pass
VHT20	MCS0	1	44	5220	15.70	15.80		24.00	24.00	0.45	-0.15		Pass
VHT20	MCS0	1	48	5240	15.80	15.80		24.00	24.00	0.45	-0.15		Pass
VHT40	MCS0	1	38	5190	15.80	15.70		24.00	24.00	0.45	-0.15		Pass
VHT40	MCS0	1	46	5230	15.80	15.80		24.00	24.00	0.45	-0.15		Pass
VHT80	MCS0	1	42	5210	15.80	15.90		24.00	24.00	0.45	-0.15		Pass
VHT160	MCS0	1	50	5250	14.90	14.80		24.00	24.00	0.45	-0.15		Pass

FCC Band I MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)			Pass/Fail
					Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HT20	MCS0	2	36	5180	12.90	12.70	15.81	24.00		0.45			Pass
HT20	MCS0	2	44	5220	12.90	12.30	15.62	24.00		0.45			Pass
HT20	MCS0	2	48	5240	12.90	12.30	15.62	24.00		0.45			Pass
HT40	MCS0	2	38	5190	12.90	12.30	15.62	24.00		0.45			Pass
HT40	MCS0	2	46	5230	12.90	12.30	15.62	24.00		0.45			Pass
VHT20	MCS0	2	36	5180	12.80	12.60	15.71	24.00		0.45			Pass
VHT20	MCS0	2	44	5220	12.80	12.20	15.52	24.00		0.45			Pass
VHT20	MCS0	2	48	5240	12.80	12.30	15.57	24.00		0.45			Pass
VHT40	MCS0	2	38	5190	12.80	12.10	15.47	24.00		0.45			Pass
VHT40	MCS0	2	46	5230	12.80	12.00	15.43	24.00		0.45			Pass
VHT80	MCS0	2	42	5210	12.90	12.20	15.57	24.00		0.45			Pass
VHT160	MCS0	2	50	5250	11.90	10.80	14.40	24.00		0.45			Pass

TEST RESULTS DATA
Average Power Table

FCC Band II single antenna													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
11a	6Mbps	1	52	5260	15.90	15.80		23.98	23.98	0.43	-0.97	30	Pass
11a	6Mbps	1	60	5300	15.90	15.90		23.98	23.98	0.43	-0.97	30	Pass
11a	6Mbps	1	64	5320	15.80	15.90		23.98	23.98	0.43	-0.97	30	Pass
HT20	MCS0	1	52	5260	15.90	15.80		23.98	23.98	0.43	-0.97	30	Pass
HT20	MCS0	1	60	5300	15.90	15.80		23.98	23.98	0.43	-0.97	30	Pass
HT20	MCS0	1	64	5320	15.90	15.90		23.98	23.98	0.43	-0.97	30	Pass
HT40	MCS0	1	54	5270	15.90	15.90		23.98	23.98	0.43	-0.97	30	Pass
HT40	MCS0	1	62	5310	15.90	15.90		23.98	23.98	0.43	-0.97	30	Pass
VHT20	MCS0	1	52	5260	15.80	15.70		23.98	23.98	0.43	-0.97	30	Pass
VHT20	MCS0	1	60	5300	15.80	15.70		23.98	23.98	0.43	-0.97	30	Pass
VHT20	MCS0	1	64	5320	15.80	15.80		23.98	23.98	0.43	-0.97	30	Pass
VHT40	MCS0	1	54	5270	15.80	15.80		23.98	23.98	0.43	-0.97	30	Pass
VHT40	MCS0	1	62	5310	15.80	15.80		23.98	23.98	0.43	-0.97	30	Pass
VHT80	MCS0	1	58	5290	15.80	15.90		23.98	23.98	0.43	-0.97	30	Pass

FCC Band II MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HT20	MCS0	2	52	5260	12.90	12.30	15.62	23.98		0.43		30	Pass
HT20	MCS0	2	60	5300	12.90	12.70	15.81	23.98		0.43		30	Pass
HT20	MCS0	2	64	5320	12.90	12.80	15.86	23.98		0.43		30	Pass
HT40	MCS0	2	54	5270	12.90	12.30	15.62	23.98		0.43		30	Pass
HT40	MCS0	2	62	5310	12.90	12.50	15.71	23.98		0.43		30	Pass
VHT20	MCS0	2	52	5260	12.80	12.20	15.52	23.98		0.43		30	Pass
VHT20	MCS0	2	60	5300	12.80	12.40	15.61	23.98		0.43		30	Pass
VHT20	MCS0	2	64	5320	12.80	12.80	15.81	23.98		0.43		30	Pass
VHT40	MCS0	2	54	5270	12.80	12.10	15.47	23.98		0.43		30	Pass
VHT40	MCS0	2	62	5310	12.80	12.30	15.57	23.98		0.43		30	Pass
VHT80	MCS0	2	58	5290	12.90	12.20	15.57	23.98		0.43		30	Pass

TEST RESULTS DATA
Average Power Table

FCC Band III single antenna													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
11a	6Mbps	1	100	5500	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
11a	6Mbps	1	116	5580	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
11a	6Mbps	1	140	5700	15.80	15.90		23.98	23.98	1.24	0.26	30	Pass
HT20	MCS0	1	100	5500	15.80	15.90		23.98	23.98	1.24	0.26	30	Pass
HT20	MCS0	1	116	5580	15.80	15.90		23.98	23.98	1.24	0.26	30	Pass
HT20	MCS0	1	140	5700	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
HT40	MCS0	1	102	5510	15.90	15.90		23.98	23.98	1.24	0.26	30	Pass
HT40	MCS0	1	110	5550	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
HT40	MCS0	1	134	5670	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
VHT20	MCS0	1	100	5500	15.70	15.80		23.98	23.98	1.24	0.26	30	Pass
VHT20	MCS0	1	116	5580	15.70	15.80		23.98	23.98	1.24	0.26	30	Pass
VHT20	MCS0	1	140	5700	15.70	15.70		23.98	23.98	1.24	0.26	30	Pass
VHT40	MCS0	1	102	5510	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
VHT40	MCS0	1	110	5550	15.70	15.70		23.98	23.98	1.24	0.26	30	Pass
VHT40	MCS0	1	134	5670	15.70	15.70		23.98	23.98	1.24	0.26	30	Pass
VHT80	MCS0	1	106	5530	15.90	15.90		23.98	23.98	1.24	0.26	30	Pass
VHT80	MCS0	1	122	5610	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
VHT160	MCS0	1	114	5570	14.40	14.80		23.98	23.98	1.24	0.26	30	Pass

FCC Band III MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HT20	MCS0	2	100	5500	12.90	12.60	15.76	23.98		1.24		30	Pass
HT20	MCS0	2	116	5580	12.90	12.80	15.86	23.98		1.24		30	Pass
HT20	MCS0	2	140	5700	12.90	12.60	15.76	23.98		1.24		30	Pass
HT40	MCS0	2	102	5510	12.90	12.60	15.76	23.98		1.24		30	Pass
HT40	MCS0	2	110	5550	12.90	12.60	15.76	23.98		1.24		30	Pass
HT40	MCS0	2	134	5670	12.90	12.50	15.71	23.98		1.24		30	Pass
VHT20	MCS0	2	100	5500	12.80	12.60	15.71	23.98		1.24		30	Pass
VHT20	MCS0	2	116	5580	12.80	12.80	15.81	23.98		1.24		30	Pass
VHT20	MCS0	2	140	5700	12.80	12.60	15.71	23.98		1.24		30	Pass
VHT40	MCS0	2	102	5510	12.80	12.50	15.66	23.98		1.24		30	Pass
VHT40	MCS0	2	110	5550	12.80	12.40	15.61	23.98		1.24		30	Pass
VHT40	MCS0	2	134	5670	12.80	12.30	15.57	23.98		1.24		30	Pass
VHT80	MCS0	2	106	5530	12.90	12.70	15.81	23.98		1.24		30	Pass
VHT80	MCS0	2	122	5610	12.90	12.80	15.86	23.98		1.24		30	Pass
VHT160	MCS0	2	114	5570	11.30	10.90	14.11	23.98		1.24		30	Pass

FCC Band III straddle channel single antenna													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HT20	MCS0	1	144	5720	15.90	15.90		23.98	23.98	1.24	0.26	30	Pass
HT40	MCS0	1	142	5710	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
VHT20	MCS0	1	144	5720	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
VHT40	MCS0	1	142	5710	15.70	15.70		23.98	23.98	1.24	0.26	30	Pass
VHT80	MCS0	1	138	5690	15.90	15.80		23.98	23.98	1.24	0.26	30	Pass

FCC Band III straddle channel MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HT20	MCS0	2	144	5720	12.90	12.70	15.81	23.98		1.24		30	Pass
HT40	MCS0	2	142	5710	12.90	12.50	15.71	23.98		1.24		30	Pass
VHT20	MCS0	2	144	5720	12.80	12.50	15.66	23.98		1.24		30	Pass
VHT40	MCS0	2	142	5710	12.80	12.30	15.57	23.98		1.24		30	Pass
VHT80	MCS0	2	138	5690	12.90	12.60	15.76	23.98		1.24		30	Pass

TEST RESULTS DATA
Average Power Table

FCC Band I single antenna													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
						Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B	
HE20	MCS0	1	36	5180	Full	15.80	15.80		24.00	24.00	0.45	-0.15	Pass
HE20	MCS0	1	44	5220	Full	15.80	15.90		24.00	24.00	0.45	-0.15	Pass
HE20	MCS0	1	48	5240	Full	15.80	15.80		24.00	24.00	0.45	-0.15	Pass
HE40	MCS0	1	38	5190	Full	15.80	15.70		24.00	24.00	0.45	-0.15	Pass
HE40	MCS0	1	46	5230	Full	15.80	15.80		24.00	24.00	0.45	-0.15	Pass
HE80	MCS0	1	42	5210	Full	15.90	15.80		24.00	24.00	0.45	-0.15	Pass
HE160	MCS0	1	50	5250	Full	14.90	14.80		24.00	24.00	0.45	-0.15	Pass

FCC Band I MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
						Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B	
HE20	MCS0	2	36	5180	Full	12.90	12.50	15.71	24.00		0.45		Pass
HE20	MCS0	2	44	5220	Full	12.90	12.30	15.62	24.00		0.45		Pass
HE20	MCS0	2	48	5240	Full	12.90	12.30	15.62	24.00		0.45		Pass
HE40	MCS0	2	38	5190	Full	12.90	12.20	15.57	24.00		0.45		Pass
HE40	MCS0	2	46	5230	Full	12.90	12.10	15.53	24.00		0.45		Pass
HE80	MCS0	2	42	5210	Full	12.90	12.30	15.62	24.00		0.45		Pass
HE160	MCS0	2	50	5250	Full	11.90	11.00	14.48	24.00		0.45		Pass

TEST RESULTS DATA
Average Power Table

FCC Band II single antenna														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
						Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HE20	MCS0	1	52	5260	Full	15.90	15.80		23.98	23.98	0.43	-0.97	30	Pass
HE20	MCS0	1	60	5300	Full	15.90	15.80		23.98	23.98	0.43	-0.97	30	Pass
HE20	MCS0	1	64	5320	Full	15.90	15.90		23.98	23.98	0.43	-0.97	30	Pass
HE40	MCS0	1	54	5270	Full	15.90	15.80		23.98	23.98	0.43	-0.97	30	Pass
HE40	MCS0	1	62	5310	Full	15.90	15.80		23.98	23.98	0.43	-0.97	30	Pass
HE80	MCS0	1	58	5290	Full	15.90	15.80		23.98	23.98	0.43	-0.97	30	Pass

FCC Band II MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
						Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HE20	MCS0	2	52	5260	Full	12.90	12.30	15.62	23.98		0.43		30	Pass
HE20	MCS0	2	60	5300	Full	12.90	12.40	15.67	23.98		0.43		30	Pass
HE20	MCS0	2	64	5320	Full	12.90	12.90	15.91	23.98		0.43		30	Pass
HE40	MCS0	2	54	5270	Full	12.90	12.20	15.57	23.98		0.43		30	Pass
HE40	MCS0	2	62	5310	Full	12.90	12.40	15.67	23.98		0.43		30	Pass
HE80	MCS0	2	58	5290	Full	12.90	12.30	15.62	23.98		0.43		30	Pass

TEST RESULTS DATA
Average Power Table

FCC Band III single antenna														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
						Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HE20	MCS0	1	100	5500	Full	15.90	15.90		23.98	23.98	1.24	0.26	30	Pass
HE20	MCS0	1	116	5580	Full	15.80	15.90		23.98	23.98	1.24	0.26	30	Pass
HE20	MCS0	1	140	5700	Full	15.70	15.80		23.98	23.98	1.24	0.26	30	Pass
HE40	MCS0	1	102	5510	Full	15.90	15.90		23.98	23.98	1.24	0.26	30	Pass
HE40	MCS0	1	110	5550	Full	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
HE40	MCS0	1	134	5670	Full	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
HE80	MCS0	1	106	5530	Full	15.80	15.90		23.98	23.98	1.24	0.26	30	Pass
HE80	MCS0	1	122	5610	Full	15.80	15.90		23.98	23.98	1.24	0.26	30	Pass
HE160	MCS0	1	114	5570	Full	14.40	14.30		23.98	23.98	1.24	0.26	30	Pass

FCC Band III MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
						Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HE20	MCS0	2	100	5500	Full	12.90	12.60	15.76	23.98		1.24		30	Pass
HE20	MCS0	2	116	5580	Full	12.90	12.80	15.86	23.98		1.24		30	Pass
HE20	MCS0	2	140	5700	Full	12.90	12.60	15.76	23.98		1.24		30	Pass
HE40	MCS0	2	102	5510	Full	12.90	12.50	15.71	23.98		1.24		30	Pass
HE40	MCS0	2	110	5550	Full	12.90	12.50	15.71	23.98		1.24		30	Pass
HE40	MCS0	2	134	5670	Full	12.90	12.40	15.67	23.98		1.24		30	Pass
HE80	MCS0	2	106	5530	Full	12.90	12.80	15.86	23.98		1.24		30	Pass
HE80	MCS0	2	122	5610	Full	12.90	12.60	15.76	23.98		1.24		30	Pass
HE160	MCS0	2	114	5570	Full	11.30	10.70	14.02	23.98		1.24		30	Pass

FCC Band III straddle channel single antenna														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
						Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HE20	MCS0	1	144	5720	Full	15.70	15.80		23.98	23.98	1.24	0.26	30	Pass
HE40	MCS0	1	142	5710	Full	15.80	15.80		23.98	23.98	1.24	0.26	30	Pass
HE80	MCS0	1	138	5690	Full	15.80	15.90		23.98	23.98	1.24	0.26	30	Pass

FCC Band III straddle channel MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
						Chain A	Chain B	SUM	Chain A	Chain B	Chain A	Chain B		
HE20	MCS0	2	144	5720	Full	12.90	12.80	15.86	23.98		1.24		30	Pass
HE40	MCS0	2	142	5710	Full	12.80	12.40	15.61	23.98		1.24		30	Pass
HE80	MCS0	2	138	5690	Full	12.90	12.60	15.76	23.98		1.24		30	Pass



Appendix B. Radiated Spurious Emission

Test Engineer :	Jesse Wang, Stan Hsieh, and Ken Wu	Temperature :	21~23°C
		Relative Humidity :	55~57%

Band 1 - 5150~5250MHz

WIFI 802.11ax HE20 (Band Edge @ 3m)

WIFI Chain	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
A		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE20 CH 36 5180MHz		5142.22	52.08	-21.92	74	41.81	34.4	11.29	35.42	104	291	P	H
		5150	43.46	-10.54	54	33.19	34.4	11.29	35.42	104	291	A	H
	*	5180	107.58	-	-	97.23	34.47	11.29	35.41	104	291	P	H
	*	5180	97.92	-	-	87.57	34.47	11.29	35.41	104	291	A	H
													H
													H
													H
													H
		5142.22	50.15	-23.85	74	39.88	34.4	11.29	35.42	103	244	P	V
		5150	41.54	-12.46	54	31.27	34.4	11.29	35.42	103	244	A	V
	*	5180	105.22	-	-	94.87	34.47	11.29	35.41	103	244	P	V
	*	5180	96.13	-	-	85.78	34.47	11.29	35.41	103	244	A	V
													V
													V
													V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												



Band 1 - 5150~5250MHz

WIFI 802.11ax HE20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Chain				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
A		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE20 CH 36 5180MHz		10360	43.61	-24.59	68.2	47.81	37.47	17.91	59.58	100	0	P	H
		15540	45	-29	74	40.42	40.1	21	56.52	100	0	P	H
													H
													H
		10360	43.51	-24.69	68.2	47.71	37.47	17.91	59.58	100	0	P	V
		15540	45.14	-28.86	74	40.56	40.1	21	56.52	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 - 5250~5350MHz

WIFI 802.11ax HE40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Chain				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
B		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE40 CH 62 5310MHz		5146.65	49.24	-24.76	74	38.97	34.4	11.29	35.42	100	22	P	H
		5105.35	39.84	-14.16	54	29.73	34.3	11.24	35.43	100	22	A	H
	*	5310	102.42	-	-	91.7	34.63	11.45	35.36	100	22	P	H
	*	5310	93.72	-	-	83	34.63	11.45	35.36	100	22	A	H
		5351.04	50.45	-23.55	74	39.81	34.5	11.49	35.35	100	22	P	H
		5350.8	41.81	-12.19	54	31.17	34.5	11.49	35.35	100	22	A	H
													H
													H
		5134.05	48.62	-25.38	74	38.43	34.37	11.24	35.42	100	115	P	V
		5095.55	39.82	-14.18	54	29.78	34.3	11.18	35.44	100	115	A	V
	*	5310	99.64	-	-	88.92	34.63	11.45	35.36	100	115	P	V
	*	5310	90.42	-	-	79.7	34.63	11.45	35.36	100	115	A	V
		5416.56	48.04	-25.96	74	37.14	34.7	11.53	35.33	100	115	P	V
		5350.56	40.98	-13.02	54	30.34	34.5	11.49	35.35	100	115	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 - 5250~5350MHz

WIFI 802.11ax HE40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Chain				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
B		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE40 CH 62 5310MHz		10620	43.95	-30.05	74	47.55	37.62	17.99	59.21	100	0	P	H
		15930	45.11	-28.89	74	40.21	40.8	21.22	57.12	100	0	P	H
													H
													H
		10620	44.06	-29.94	74	47.66	37.62	17.99	59.21	100	0	P	V
		15930	46.55	-27.45	74	41.65	40.8	21.22	57.12	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 - 5250~5350MHz

WIFI 802.11ax HE160 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Chain				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
A+B		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE160 CH 50 5250MHz		5147.7	52.47	-21.53	74	42.2	34.4	11.29	35.42	100	335	P	H
		5140.7	44.93	-9.07	54	34.66	34.4	11.29	35.42	100	335	A	H
	*	5250	96.18	-	-	85.69	34.5	11.38	35.39	100	335	P	H
	*	5250	86.59	-	-	76.1	34.5	11.38	35.39	100	335	A	H
		5388.24	55.19	-18.81	74	44.37	34.63	11.53	35.34	100	335	P	H
		5390.88	46.29	-7.71	54	35.47	34.63	11.53	35.34	100	335	A	H
													H
													H
		5150	51.52	-22.48	74	41.25	34.4	11.29	35.42	101	184	P	V
		5142.45	43.44	-10.56	54	33.17	34.4	11.29	35.42	101	184	A	V
	*	5250	93.69	-	-	83.2	34.5	11.38	35.39	101	184	P	V
	*	5250	83.59	-	-	73.1	34.5	11.38	35.39	101	184	A	V
		5403.6	53.86	-20.14	74	42.96	34.7	11.53	35.33	101	184	P	V
		5378.4	44.96	-9.04	54	34.18	34.63	11.49	35.34	101	184	A	V
													V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												

**Band 2 - 5250~5350MHz****WIFI 802.11ax HE160 (Harmonic @ 3m)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Chain				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
A+B		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE160 CH 50 5250MHz		10500	44.58	-23.62	68.2	48.52	37.6	17.95	59.49	100	0	P	H
		15750	45.69	-28.31	74	40.87	40.55	21.13	56.86	100	0	P	H
													H
													H
		10500	44.23	-23.97	68.2	48.17	37.6	17.95	59.49	100	0	P	V
		15750	46.11	-27.89	74	41.29	40.55	21.13	56.86	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

5GHz WIFI 802.11ax HE160 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Chain				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
A+B		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11ax HE160 LF		30	28.44	-11.56	40	32.62	24.6	1.2	29.98	100	0	P	H
		46.2	24.87	-15.13	40	37.77	15.89	1.2	29.99	-	-	P	H
		249.51	28.11	-17.89	46	37.13	18.26	2.53	29.81	-	-	P	H
		720	29.52	-16.48	46	28.03	26.74	4.28	29.53	-	-	P	H
		870.5	31.19	-14.81	46	26.36	28.97	4.89	29.03	-	-	P	H
		958	33.22	-12.78	46	25.86	30.8	5.06	28.5	-	-	P	H
													H
													H
													H
													H
													H
													H
		30	32.02	-7.98	40	36.2	24.6	1.2	29.98	100	0	P	V
		72.12	23.18	-16.82	40	39.09	12.5	1.58	29.99	-	-	P	V
		250.59	25.56	-20.44	46	34.45	18.38	2.53	29.8	-	-	P	V
		789.3	30.5	-15.5	46	27.31	27.97	4.53	29.31	-	-	P	V
		860.7	33.14	-12.86	46	28.31	29.03	4.87	29.07	-	-	P	V
		951	33.04	-12.96	46	26.14	30.39	5.06	28.55	-	-	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	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.
Chain				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
A+B		(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 C. Radiated Spurious Emission Plots

Test Engineer :	Jesse Wang, Stan Hsieh, and Ken Wu	Temperature :	21~23°C
		Relative Humidity :	55~57%

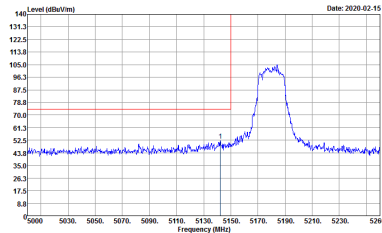
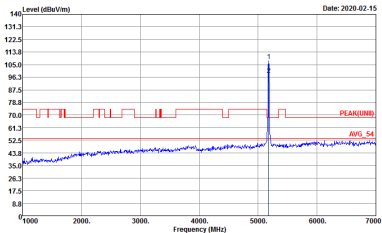
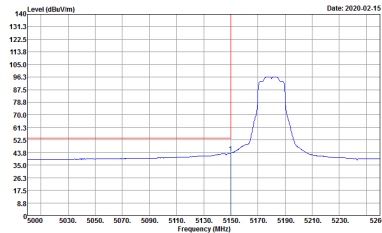
Note symbol

-L	Low channel location
-R	High channel location



Band 1 - 5150~5250MHz

WIFI 802.11ax HE20 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
Chain	802.11ax HE20 CH36 5180MHz	
A	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HE_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 1	 Site : 03CH07-HY Condition : PEAK(LIN) 3m HE_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 1
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HE_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:0.010kHz SWT:Auto Project : 6D2154-33 Mode : 1	Left blank

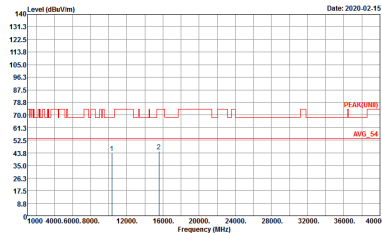
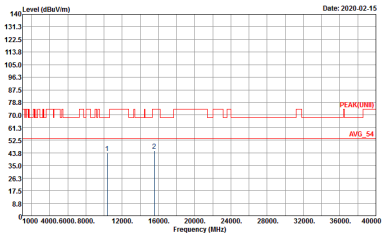


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
Chain	802.11ax HE20 CH36 5180MHz	
A	Vertical	Fundamental
Peak	Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 6D2154-33 : 1	Site : 03CH07-HY Condition : PEAK(UIN) 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 6D2154-33 : 1
Avg.	Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 6D2154-33 : 1	Left blank

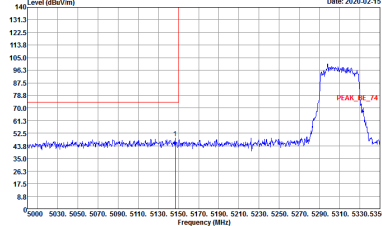
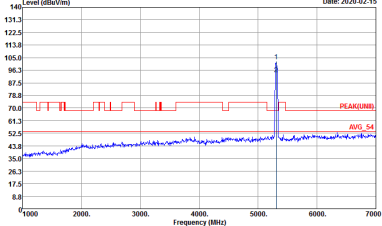
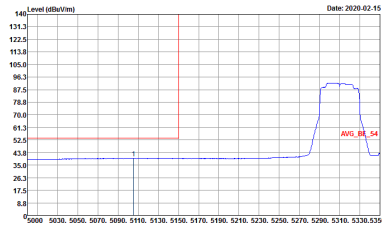


Band 1 - 5150~5250MHz

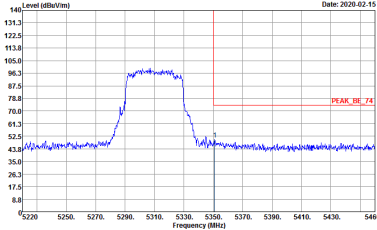
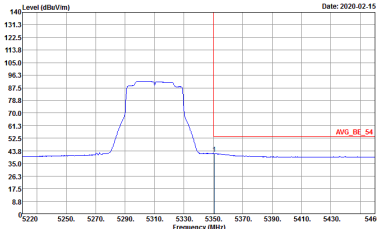
WIFI 802.11ax HE20 (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
Chain	802.11ax HE20 CH36 5180MHz	
A	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK(AVG) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 6D2154-33 Mode : 1	 Site : 03CH07-HY Condition : PEAK(AVG) 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 6D2154-33 Mode : 1

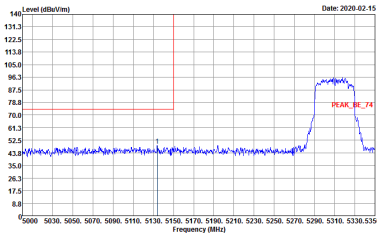
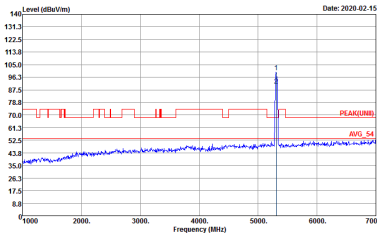
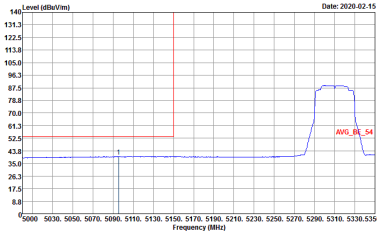
Band 2 - 5250~5350MHz
WIFI 802.11ax HE40 (Band Edge @ 3m)

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
Chain	802.11ax HE40 CH62 5310MHz - L	
B	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HE_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 3	 Site : 03CH07-HY Condition : PEAK(LINB) 3m HE_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 3
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HE_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 3	Left blank

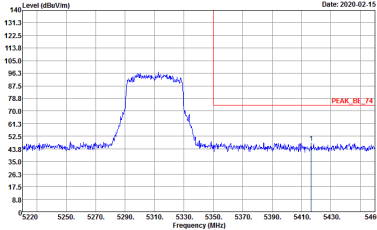
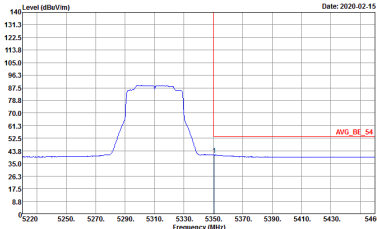


WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
Chain	802.11ax HE40 CH62 5310MHz - R	
B	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 3	Left blank
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3.000kHz SWT:Auto Project : 6D2154-33 Mode : 3	Left blank



WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
Chain	802.11ax HE40 CH62 5310MHz - L	
B	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 3	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 3
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 3	Left blank

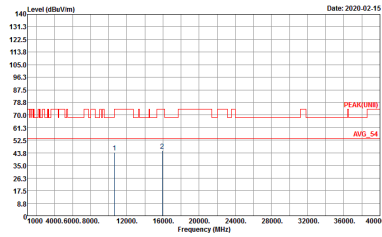
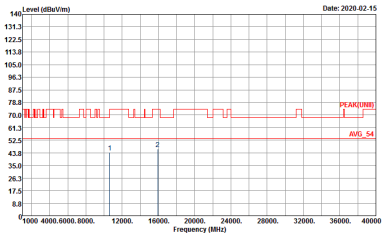


WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
Chain	802.11ax HE40 CH62 5310MHz - R	
B	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 3	Left blank
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 3	Left blank

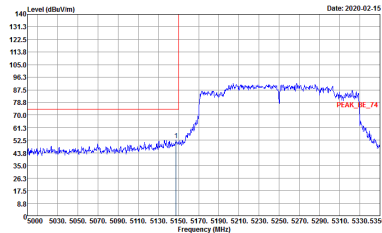
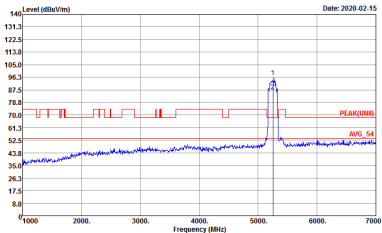
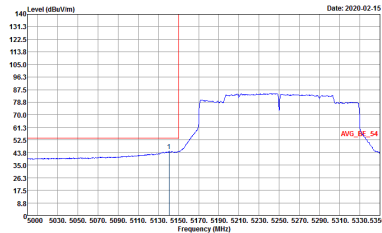


Band 2 - 5250~5350MHz

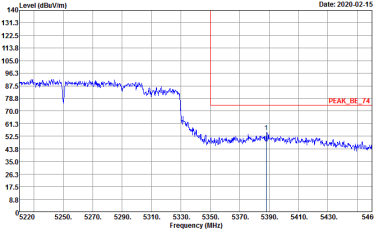
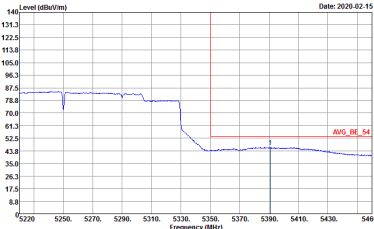
WIFI 802.11ax HE40 (Harmonic @ 3m)

WIFI	Band 2 5250~5350MHz Harmonic @ 3m	
Chain	802.11ax HE40 CH62 5310MHz	
B	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK(AVG) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 6D2154-33 Mode : 3	 Site : 03CH07-HY Condition : PEAK(AVG) 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 6D2154-33 Mode : 3

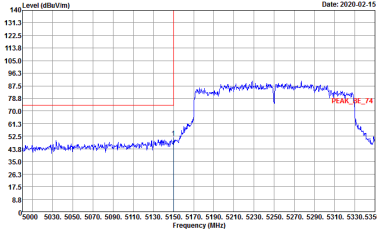
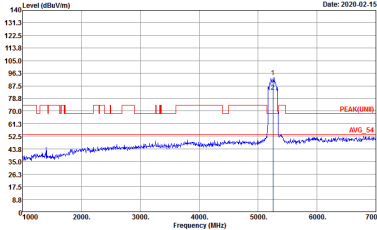
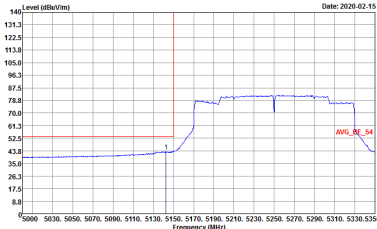
Band 2 - 5250~5350MHz
WIFI 802.11ax HE160 (Band Edge @ 3m)

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
Chain	802.11ax HE160 CH50 5250MHz - L	
A+B	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HE_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 5	 Site : 03CH07-HY Condition : PEAK(LNB) 3m HE_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : 5
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HE_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:1.000kHz SWT:Auto Project : 6D2154-33 Mode : 5	Left blank

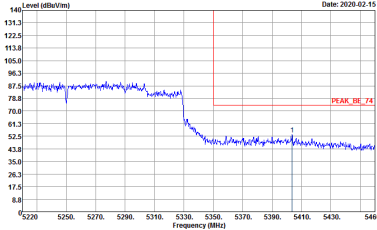
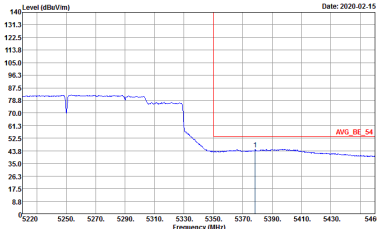


WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
Chain	802.11ax HE160 CH50 5250MHz - R	
A+B	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : Peak Mode : 6D2154-33 Date: 2020-02-15	Left blank
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:1.000kHz SWT:Auto Project : Peak Mode : 6D2154-33 Date: 2020-02-15	Left blank

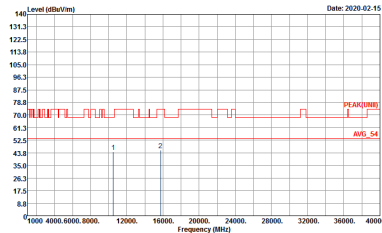
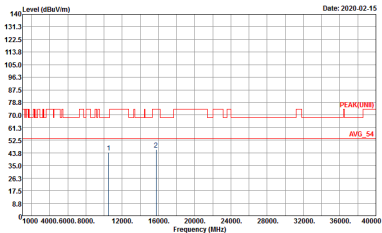


WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
Chain	802.11ax HE160 CH50 5250MHz - L	
A+B	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : Peak Mode : 6D2154-33 Date: 2020-02-15	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : Peak Mode : 6D2154-33 Date: 2020-02-15
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:1.000kHz SWT:Auto Project : Peak Mode : 6D2154-33 Date: 2020-02-15	Left blank

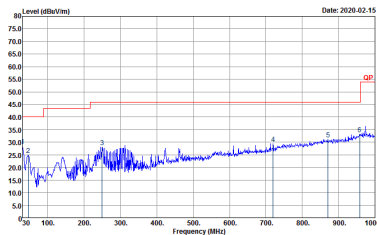
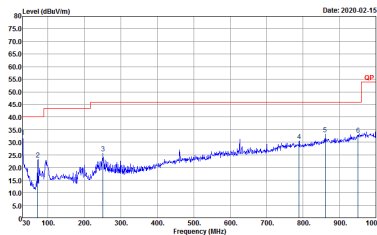


WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
Chain	802.11ax HE160 CH50 5250MHz - R	
A+B	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 6D2154-33 Mode : S	Left blank
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:1.000kHz SWT:Auto Project : 6D2154-33 Mode : S	Left blank

**Band 2 - 5250~5350MHz****WIFI 802.11ax HE160 (Harmonic @ 3m)**

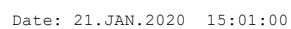
WIFI	Band 2 5250~5350MHz Harmonic @ 3m	
Chain	802.11ax HE160 CH50 5250MHz	
A+B	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK(UM) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 6D2154-33 Mode : S	 Site : 03CH07-HY Condition : PEAK(UM) 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 6D2154-33 Mode : S

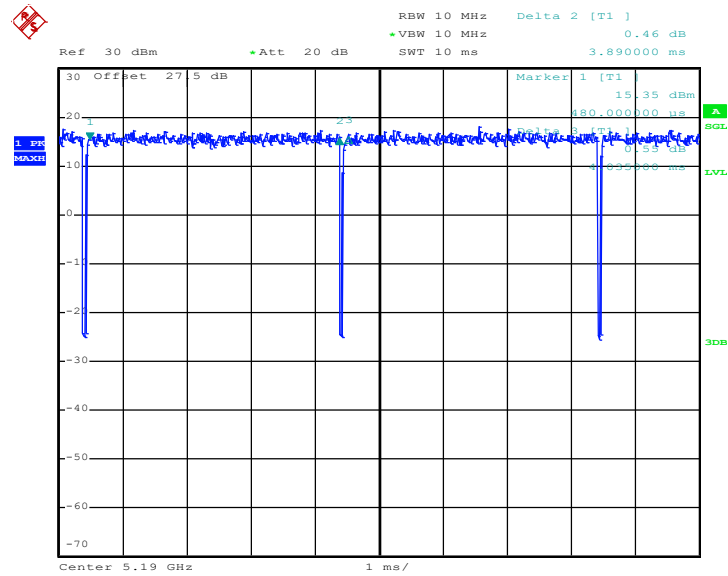
Emission below 1GHz
5GHz WIFI 802.11ax HE160 (LF)

WIFI	5GHz WIFI	
Chain	802.11ax HE160 LF	
A+B	Horizontal	Vertical
QP / Peak	 Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(G) HORIZONTAL Detector : Peak Project : 602154-33 Mode : 7	 Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(G) VERTICAL Detector : Peak Project : 602154-33 Mode : 7

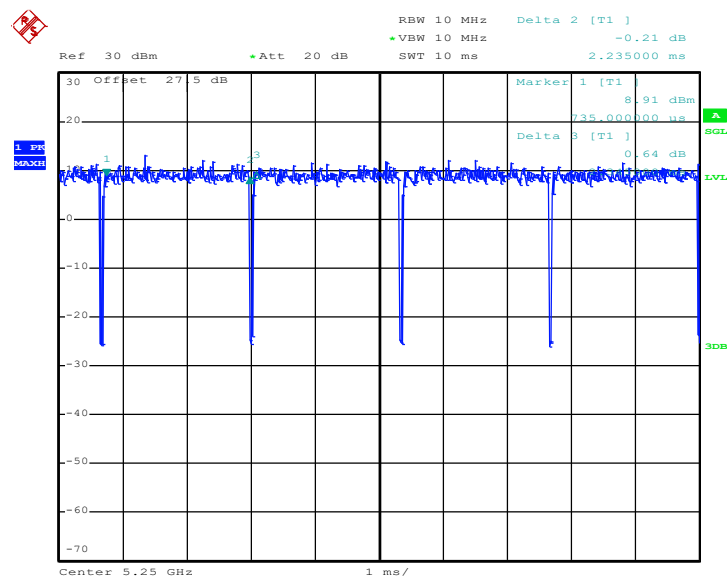


<Chain A>



<Chain B>
802.11ax HE40


Date: 21.JAN.2020 15:07:31

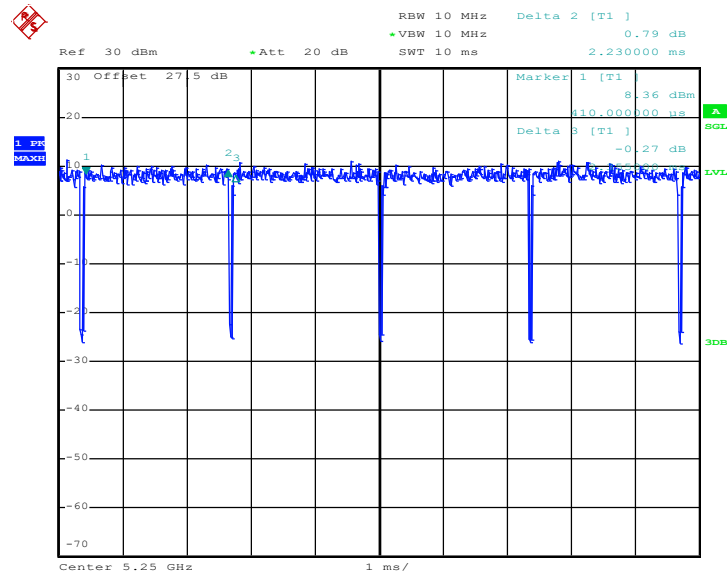
MIMO <Chain A>
802.11ax HE160


Date: 21.JAN.2020 15:20:14



MIMO <Chain B>

802.11ax HE160



Date: 21.JAN.2020 15:21:24