FCC RADIO TEST REPORT

FCC ID	**:**	**UZ7MC220K**
Equipment	**:**	**Mobile computer**
Brand Name	**:**	**Zebra**
Model Name	**:**	**MC220K**
Applicant	**:**	**Zebra Technologies Corporation** **1 Zebra Plaza, Holtsville, NY 11742**
Manufacturer	**:**	**Zebra Technologies Corporation** **1 Zebra Plaza, Holtsville, NY 11742**
Standard	**:**	**FCC Part 15 Subpart E §15.407**

The product was received on Apr. 07, 2020 and testing was started from Apr. 11, 2020 and completed on Jul. 09, 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 test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

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
FR040803-02F	01	Initial issue of report	Aug. 28, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.403 (i)	6dB & 26dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.407 (a)	Maximum Conducted Output Power	Pass	-
3.3	15.407 (a)	Power Spectral Density	Pass	-
3.4	15.407(b)	Unwanted Emissions	Pass	Under limit 2.32 dB at 5648.600 MHz
3.5	15.207	AC Conducted Emission	Pass	Under limit 14.88 dB at 13.560 MHz
3.6	15.407 (c)	Automatically Discontinue Transmission	Pass	-
3.7	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: Dara Chiu

1 General Description

1.1 Product Feature of Equipment Under Test

Product Specification subjective to this standard	
Equipment	Mobile computer
Brand Name	Zebra
Model Name	MC220K
FCC ID	UZ7MC220K
EUT supports Radios application	NFC WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	EV1
SW Version	10-11-31.00-QG-U00-PRD-HEL-04
OS Version	Android 10
MFD	22APR20
EUT Stage	Engineering Sample

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

Specification of Accessories				
AC Adapter	**Brand Name**	Zebra	**Part Number**	PWR-WUA5V12W0US
Battery	**Brand Name**	Zebra	**Part Number**	BT-000418-10
USB Cable (TypeA plug to TypeC plug)	**Brand Name**	Zebra	**Part Number**	CBL-TC2X-USBC-01
Trigger Handle	**Brand Name**	Zebra	**Part Number**	TRG-MC2X-SNP1-01
Holster 1	**Brand Name**	Zebra	**Part Number**	SG-MC2X-HLSTR-01
Holster 2	**Brand Name**	Zebra	**Part Number**	SG-MC3021212-01R

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5725 MHz ~ 5850 MHz
Maximum Output Power to Antenna	802.11a : 21.30 dBm / 0.1349 W 802.11n HT20 : 21.00 dBm / 0.1259 W 802.11n HT40 : 21.10 dBm / 0.1288 W 802.11ac VHT20: 21.10 dBm / 0.1288 W 802.11ac VHT40: 21.20 dBm / 0.1318 W 802.11ac VHT80: 21.20 dBm / 0.1318 W
99% Occupied Bandwidth	802.11a : 25.82 MHz 802.11ac VHT20 : 26.17 MHz 802.11ac VHT40 : 48.25 MHz 802.11ac VHT80 : 79.24 MHz
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Antenna Type/ Gain	Monopole Antenna with gain 3.40 dBi

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. EMC & Wireless Communications Laboratory		
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	**Sporton Site No.**		
	TH05-HY	CO05-HY	03CH07-HY

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

FCC designation No.: TW1190

1.5 Applicable Standards

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

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

Remark:

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

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	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 (Covered by VHT20)	**MCS0**
802.11n HT40 (Covered by VHT40)	**MCS0**
802.11ac VHT20	**MCS0**
802.11ac VHT40	**MCS0**
802.11ac VHT80	**MCS0**

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

Ch. #		Band IV：5725-5850 MHz			
		802.11a	802.11ac VHT20	802.11ac VHT40	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.

802.11a RF Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	Data Rate (bps) 6M	Channel	Data Rate (bps) 9M	12M	18M	24M	36M	48M	54M
CH 149	5745	20.70	CH 165	20.90	20.90	21.10	21.10	20.50	20.50	20.50
CH 157	5785	20.90								
CH 165	5825	21.30								

802.11n HT20 RF Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 149	5745	21.00	CH 149	20.80	20.80	20.80	20.50	20.50	20.50	20.50
CH 157	5785	20.80								
CH 165	5825	20.10								

802.11n HT40 RF Output Power (dBm)										
Power vs. Channel			Power vs Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS Index MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 151	5755	20.60	CH 159	20.8	20.6	20.6	20	20	20	20.1
CH 159	5795	21.10								

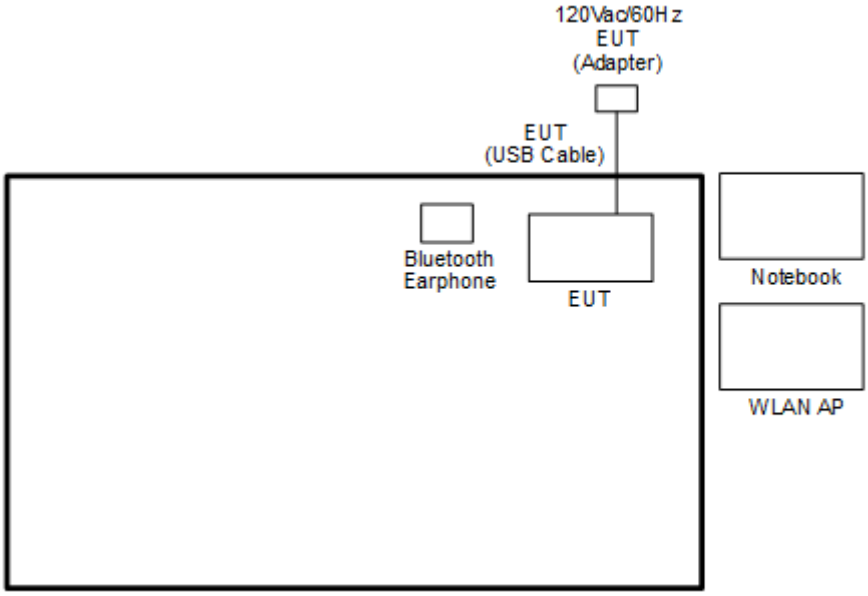
802.11ac VHT20 RF Output Power (dBm)											
Power vs. Channel			Power vs Data Rate								
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index							
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
CH 149	5745	21.10	CH 149	20.90	20.90	20.90	20.60	20.60	20.60	20.60	20.60
CH 157	5785	20.90									
CH 165	5825	20.20									

802.11ac VHT40 RF Output Power (dBm)										
Power vs. Channel			Power vs Data Rate								
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index							
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 151	5755	20.70	CH 159	20.8	20.6	20.6	20	20	20	20.1	20.1	20.1
CH 159	5795	21.20										

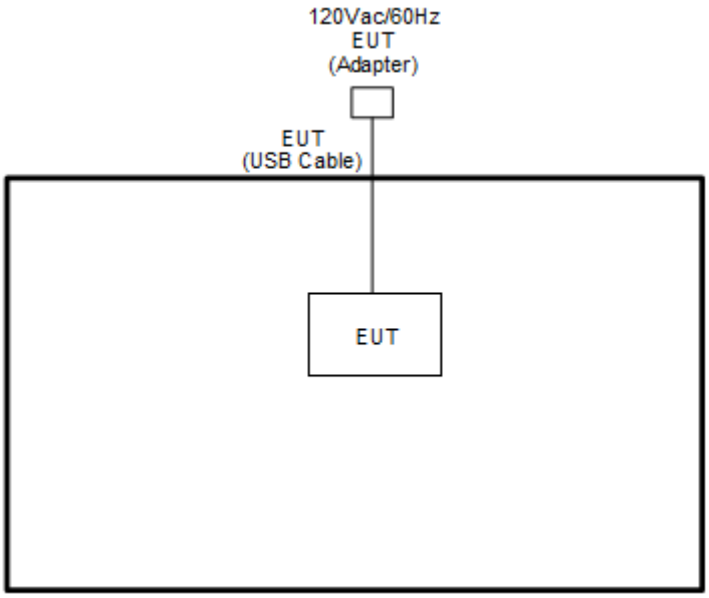
802.11ac VHT80 RF Output Power (dBm)										
Power vs. Channel			Power vs Data Rate								
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index							
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 155	5775	21.20	CH 155	20.90	21.00	20.90	20.40	20.40	20.40	20.30	20.30	20.30

2.3 Connection Diagram of Test System

<AC Conducted Emission Mode>



<For WLAN Tx Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	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
4.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT V4.0.00156.0” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

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

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

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

26dB and 99% Occupied bandwidth are reporting only.

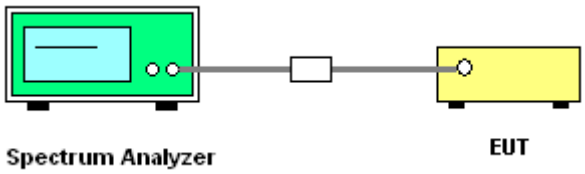
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

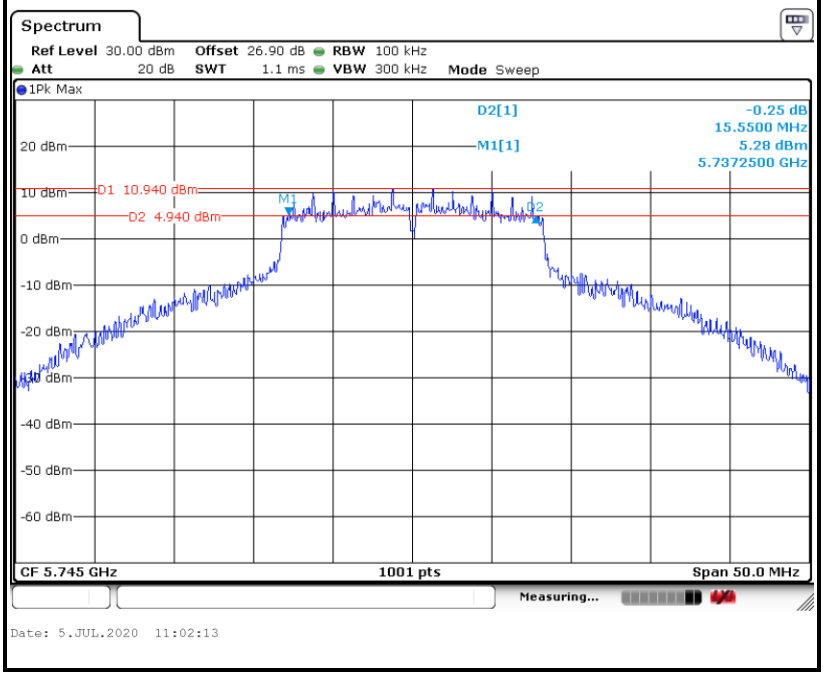


3.1.5 Test Result of 6dB and 26dB and 99% Occupied Bandwidth

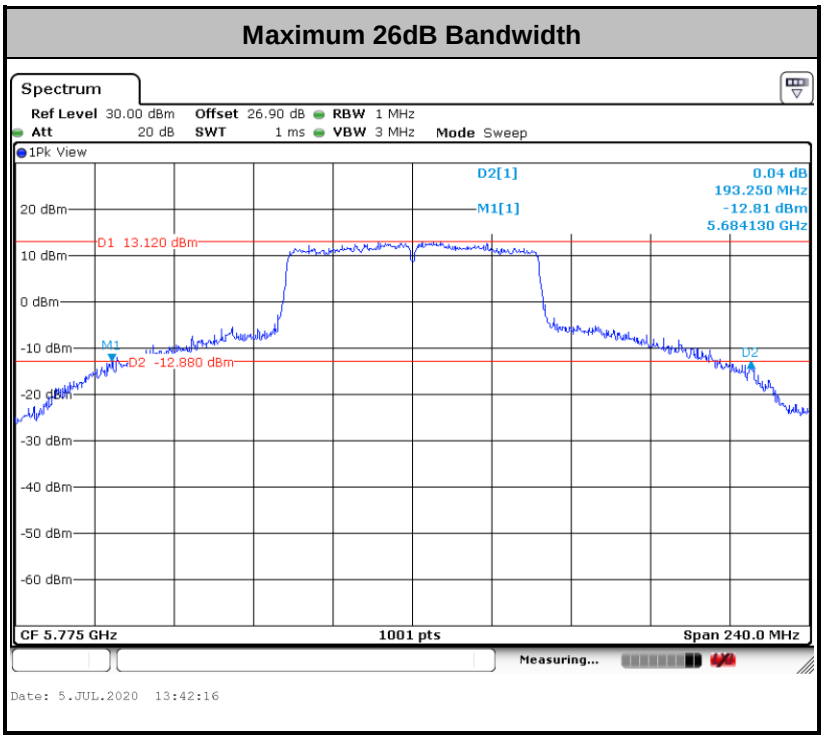
Test Engineer :	Hank Hsu and Tommy Lee	Temperature :	21.1 ~ 24.9℃
		Relative Humidity :	50.1 ~ 58.8%

Band IV single antenna												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	1	149	5745	22.83	-	39.10	-	**15.55**	-	0.5	Pass
11a	6Mbps	1	157	5785	24.58	-	39.95	-	15.80	-	0.5	Pass
11a	6Mbps	1	165	5825	25.82	-	41.55	-	16.05	-	0.5	Pass
VHT20	MCS0	1	149	5745	26.17	-	45.00	-	17.55	-	0.5	Pass
VHT20	MCS0	1	157	5785	24.53	-	38.45	-	17.55	-	0.5	Pass
VHT20	MCS0	1	165	5825	20.58	-	37.65	-	17.55	-	0.5	Pass
VHT40	MCS0	1	151	5755	40.46	-	90.39	-	36.27	-	0.5	Pass
VHT40	MCS0	1	159	5795	48.25	-	94.35	-	36.00	-	0.5	Pass
VHT80	MCS0	1	155	5775	**79.24**	-	**193.25**	-	75.20	-	0.5	Pass

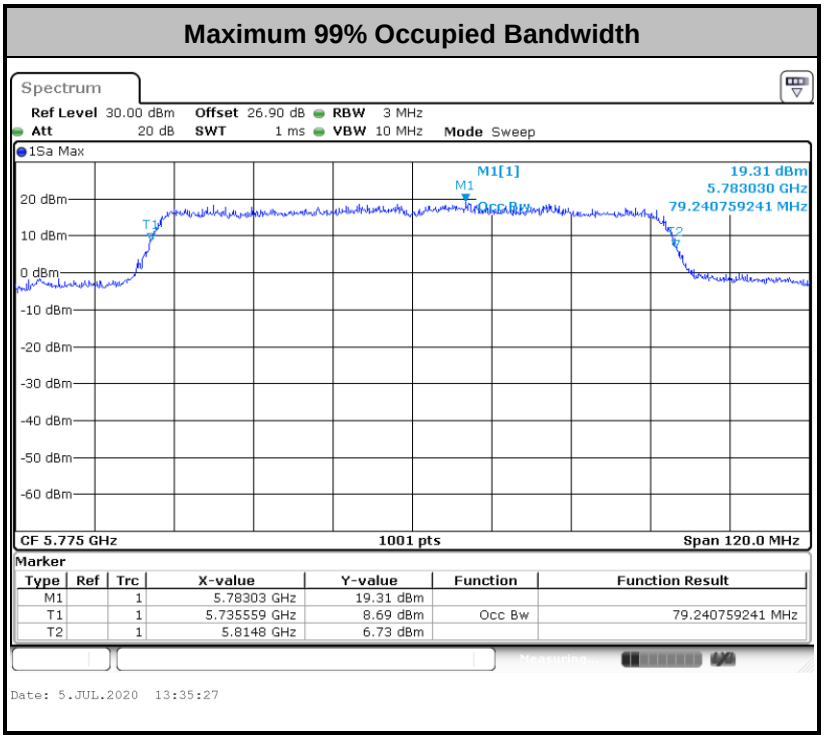
Minimum 6dB Bandwidth



Maximum 26dB Bandwidth



Maximum 99% Occupied Bandwidth



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.

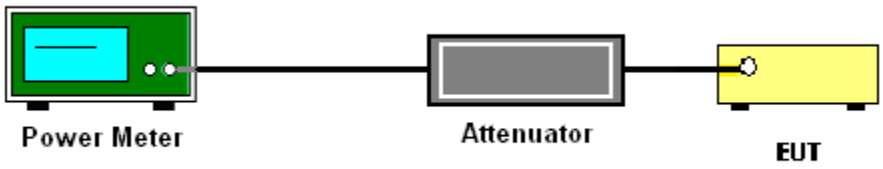
3.2.3 Test Procedures

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

Method PM-G (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.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Test Engineer :	Hank Hsu and Tommy Lee	Temperature :	21.1 ~ 24.9℃
		Relative Humidity :	50.1 ~ 58.8%

Band IV single antenna												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	20.70	-	-	30.00	-	3.40	-	Pass
11a	6Mbps	1	157	5785	20.90			30.00	-	3.40	-	Pass
11a	6Mbps	1	165	5825	**21.30**			30.00	-	3.40	-	Pass
HT20	MCS0	1	149	5745	21.00	-		30.00	-	3.40	-	Pass
HT20	MCS0	1	157	5785	20.80	-		30.00	-	3.40	-	Pass
HT20	MCS0	1	165	5825	20.10	-		30.00	-	3.40	-	Pass
HT40	MCS0	1	151	5755	20.60	-		30.00	-	3.40	-	Pass
HT40	MCS0	1	159	5795	21.10	-		30.00	-	3.40	-	Pass
VHT20	MCS0	1	149	5745	21.10	-		30.00	-	3.40	-	Pass
VHT20	MCS0	1	157	5785	20.90	-		30.00	-	3.40	-	Pass
VHT20	MCS0	1	165	5825	20.20	-		30.00	-	3.40	-	Pass
VHT40	MCS0	1	151	5755	20.70	-		30.00	-	3.40	-	Pass
VHT40	MCS0	1	159	5795	21.20	-		30.00	-	3.40	-	Pass
VHT80	MCS0	1	155	5775	21.20	-		30.00	-	3.40	-	Pass

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 ≥ 3 MHz
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time ≤ (number of points in sweep) × T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
- Detector = power averaging (rms).
- Trace mode = max hold.
- Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

1. The RF output of EUT 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.

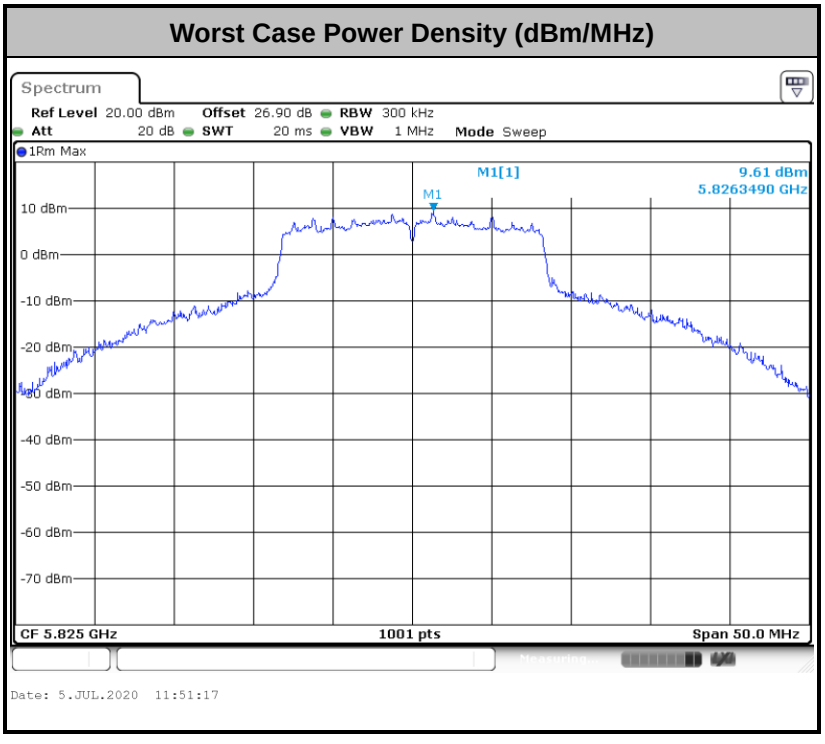
3.3.4 Test Setup

3.3.5 Test Result of Power Spectral Density

Test Engineer :	Hank Hsu and Tommy Lee	Temperature :	21.1 ~ 24.9℃
		Relative Humidity :	50.1 ~ 58.8%

Band IV single antenna														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	2.22	-	10.92	-		30.00	-	3.40	-	Pass
11a	6Mbps	1	157	5785	2.22	-	11.46	-		30.00	-	3.40	-	Pass
11a	6Mbps	1	165	5825	2.22	-	**11.83**	-		30.00	-	3.40	-	Pass
VHT20	MCS0	1	149	5745	2.22	-	11.69	-		30.00	-	3.40	-	Pass
VHT20	MCS0	1	157	5785	2.22	-	11.30	-	-	30.00	-	3.40	-	Pass
VHT20	MCS0	1	165	5825	2.22	-	10.65	-		30.00	-	3.40	-	Pass
VHT40	MCS0	1	151	5755	2.22	-	7.00	-		30.00	-	3.40	-	Pass
VHT40	MCS0	1	159	5795	2.22	-	7.67	-		30.00	-	3.40	-	Pass
VHT80	MCS0	1	155	5775	2.22	-	6.02	-		30.00	-	3.40	-	Pass

Worst Case Power Density (dBm/MHz)



3.4 Unwanted Emissions Measurement

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

3.4.1 Limit of Unwanted Emissions

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

15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(2) Unwanted spurious emissions 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.

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

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

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

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

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

3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz

   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

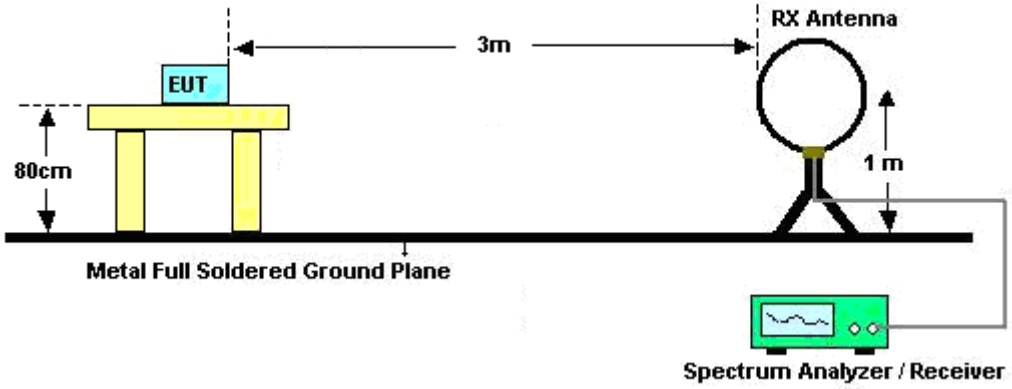
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.

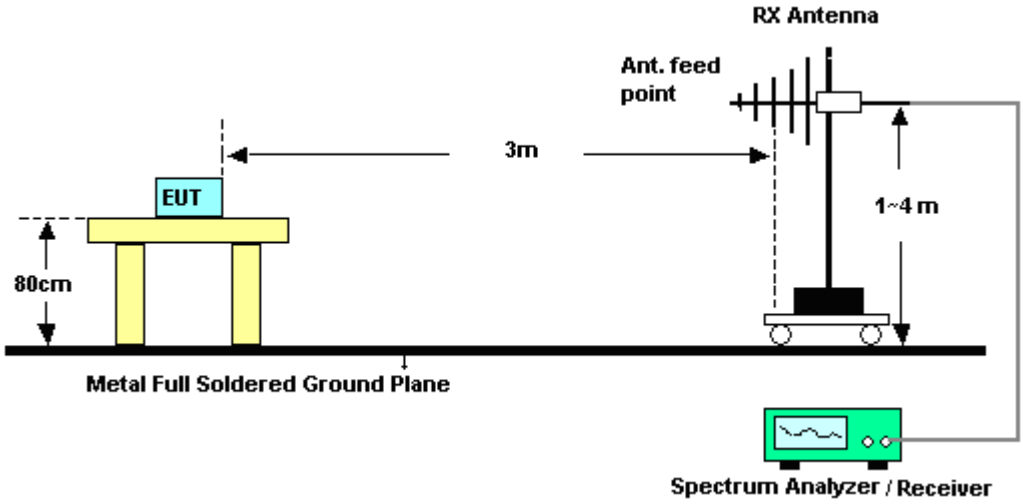
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

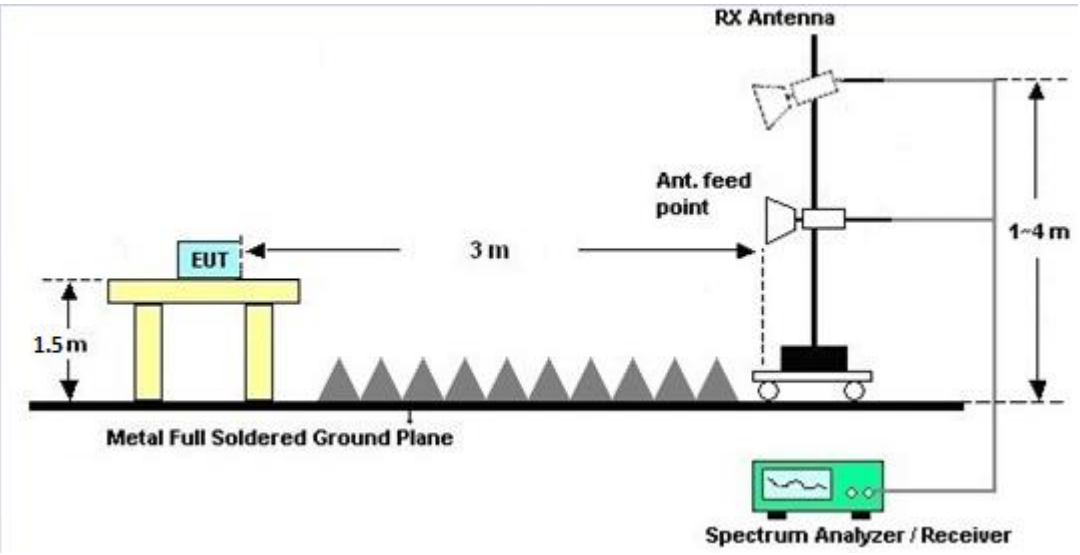
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

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

3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix B and C.

3.4.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix B and C.

3.5 AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

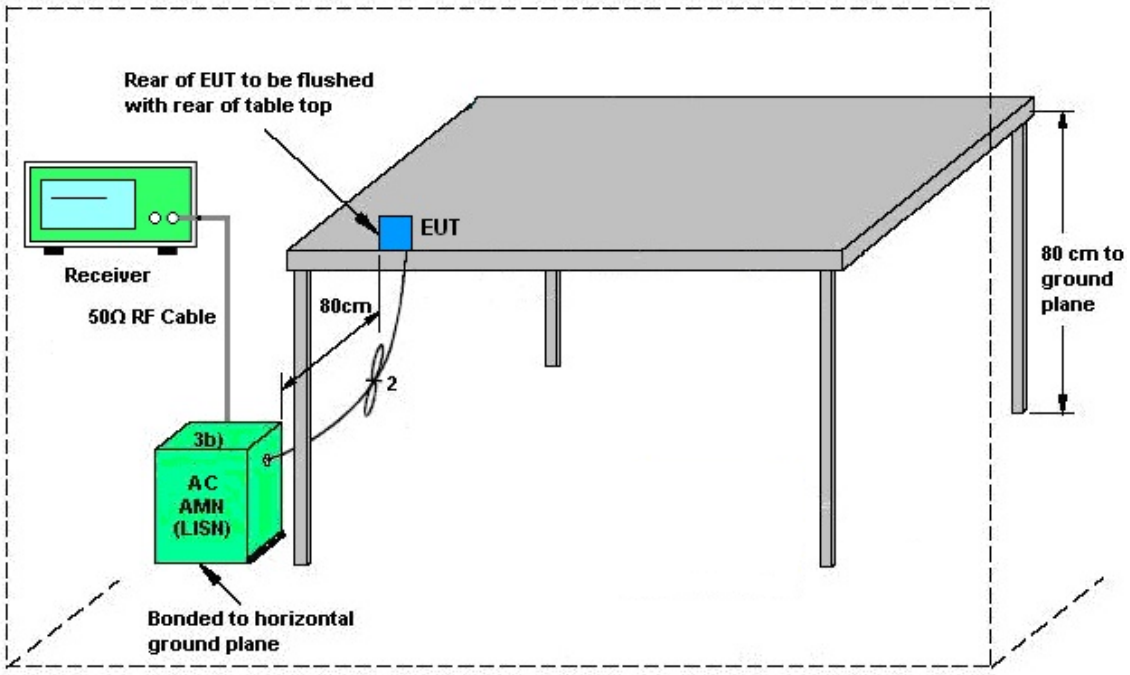
3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

3.5.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



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

3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix A.

3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

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

3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Result of Automatically Discontinue Transmission

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

3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 02. 2020	Apr. 11, 2020 ~ Jul. 09, 2020	Mar. 01. 2021	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO10	10MHz~6GHz	Dec. 23, 2019	Apr. 11, 2020 ~ Jul. 09, 2020	Dec. 22, 2020	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Jul. 15, 2019	Apr. 11, 2020 ~ Jul. 09, 2020	Jul. 14, 2020	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1300484	N/A	Aug. 22, 2019	Apr. 11, 2020 ~ Jul. 09, 2020	Aug. 21, 2020	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jun. 25, 2020	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 15, 2019	Jun. 25, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 07, 2019	Jun. 25, 2020	Nov. 06, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 15, 2019	Jun. 25, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jun. 25, 2020	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 02, 2020	Jun. 25, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 02, 2020	Jun. 25, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	35419 & 03	30MHz~1GHz	Apr. 30, 2019	Apr. 22, 2020 ~ Apr. 28, 2020	Apr. 29, 2020	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	35419 & 03	30MHz~1GHz	Apr. 29, 2020	Apr. 29, 2020 ~ Jul. 09, 2020	Apr. 28, 2021	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 06, 2019	Apr. 22, 2020 ~ Jul. 09, 2020	Dec. 05, 2020	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz~26.5GHz	Jan. 18, 2020	Apr. 22, 2020 ~ Jul. 09, 2020	Jan. 17, 2021	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Dec. 26, 2019	Apr. 22, 2020 ~ Jul. 09, 2020	Dec. 25, 2020	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590075	1GHz~18GHz	Apr. 24, 2019	Apr. 22, 2020 ~ Apr. 22, 2020	Apr. 23, 2020	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590075	1GHz~18GHz	Apr. 23, 2020	Apr. 23, 2020 ~ Jul. 09, 2020	Apr. 22, 2021	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	May 20, 2019	Apr. 22, 2020 ~ May 18, 2020	May 19, 2020	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	May 19, 2020	May 19, 2020 ~ Jul. 09, 2020	May 18, 2021	Radiation (03CH07-HY)
Notch Filter	Wainwright	WRCJV12-5695-5725-5850-5880-40SS	SN1	5G Band 4	Mar. 15, 2020	Apr. 22, 2020 ~ Jul. 09, 2020	Mar. 14, 2021	Radiation (03CH07-HY)
3m Semi Anechoic Chamber (NSA)	TDK	SAC-3M	03CH07-HY	30MHz~1GHz	Jan. 01, 2020	Apr. 22, 2020 ~ Jul. 09, 2020	Dec. 31, 2020	Radiation (03CH07-HY)
3m Semi Anechoic Chamber (Site VSWR)	TDK	SAC-3M	03CH07-HY	1GHz~18GHz	Dec. 24, 2019	Apr. 22, 2020 ~ Jul. 09, 2020	Dec. 23, 2020	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2,801606/2	18GHz~40GHz	Feb. 25, 2020	Apr. 22, 2020 ~ Jul. 09, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126	532078/126E	30MHz~18GHz	N/A	Apr. 22, 2020 ~ Jul. 09, 2020	N/A	Radiation (03CH07-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4, MY28655/4	9kHz~30MHz	Feb. 25, 2020	Apr. 22, 2020 ~ Jul. 09, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	30MHz~1GHz	Feb. 25, 2020	Apr. 22, 2020 ~ Jul. 09, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	1GHz~18GHz	Feb. 25, 2020	Apr. 22, 2020 ~ Jul. 09, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
Controller	ChainTek	Chaintek 3000	N/A	Control Turn table	N/A	Apr. 22, 2020 ~ Jul. 09, 2020	N/A	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF780208368	Control Ant Mast	N/A	Apr. 22, 2020 ~ Jul. 09, 2020	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Apr. 22, 2020 ~ Jul. 09, 2020	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Apr. 22, 2020 ~ Jul. 09, 2020	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	N/A	Apr. 22, 2020 ~ Jul. 09, 2020	N/A	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Nov. 26, 2019	Apr. 22, 2020 ~ Jul. 09, 2020	Nov. 25, 2020	Radiation (03CH07-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz~44GHz	Feb. 10, 2020	Apr. 22, 2020 ~ Jul. 09, 2020	Feb. 09, 2021	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	N/A	Apr. 22, 2020 ~ Jul. 09, 2020	N/A	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	80504004656H	N/A	N/A	Apr. 22, 2020 ~ Jul. 09, 2020	N/A	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.30**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.60**

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

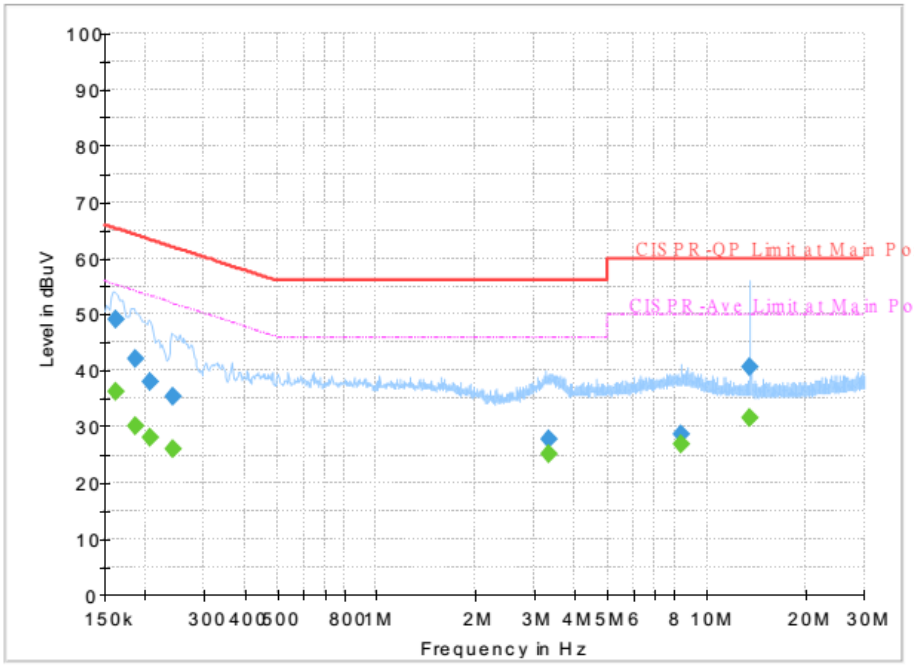
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.20**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.30**

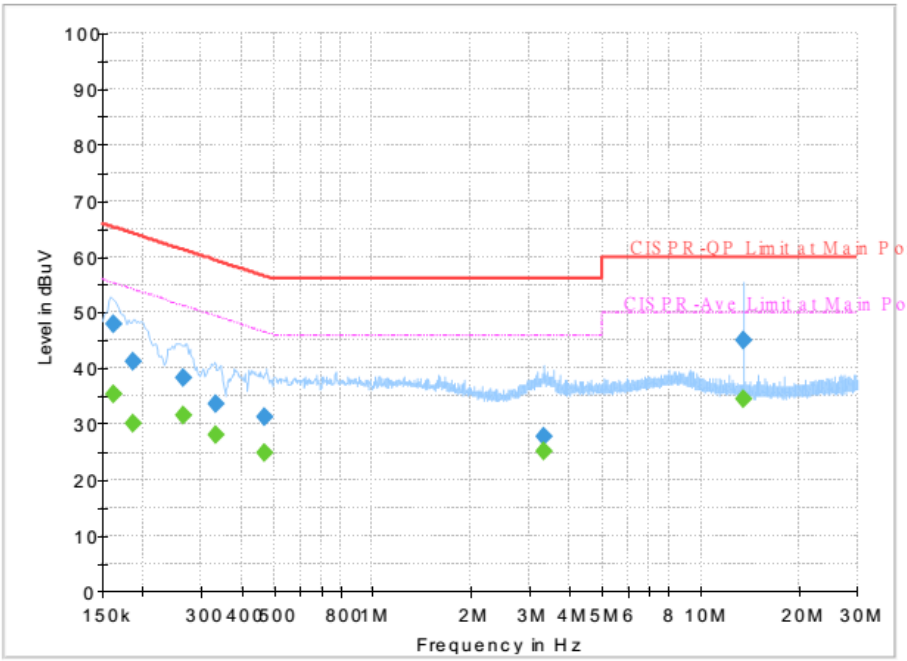
Appendix A. AC Conducted Emission Test Results

Test Engineer :	Tom Lee	Temperature :	23~25℃
		Relative Humidity :	42~50%
Test Voltage :	120Vac / 60Hz	Phase :	Line



Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.161790	---	36.28	55.37	19.09	L1	OFF	19.6
0.161790	49.25	---	65.37	16.12	L1	OFF	19.6
0.186000	---	30.12	54.21	24.09	L1	OFF	19.6
0.186000	42.17	---	64.21	22.04	L1	OFF	19.6
0.206970	---	28.13	53.33	25.20	L1	OFF	19.6
0.206970	37.91	---	63.33	25.42	L1	OFF	19.6
0.242880	---	25.93	52.00	26.07	L1	OFF	19.6
0.242880	35.42	---	62.00	26.58	L1	OFF	19.6
3.315750	---	25.04	46.00	20.96	L1	OFF	19.7
3.315750	27.65	---	56.00	28.35	L1	OFF	19.7
8.379780	---	26.76	50.00	23.24	L1	OFF	20.0
8.379780	28.74	---	60.00	31.26	L1	OFF	20.0
13.560000	---	31.69	50.00	18.31	L1	OFF	20.2
13.560000	40.69	---	60.00	19.31	L1	OFF	20.2

Test Engineer :	Tom Lee	Temperature :	23~25℃
		Relative Humidity :	42~50%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.162510	---	35.24	55.34	20.10	N	OFF	19.5
0.162510	47.94	---	65.34	17.40	N	OFF	19.5
0.186000	---	30.02	54.21	24.19	N	OFF	19.5
0.186000	41.20	---	64.21	23.01	N	OFF	19.5
0.264750	---	31.59	51.28	19.69	N	OFF	19.5
0.264750	38.30	---	61.28	22.98	N	OFF	19.5
0.331800	---	28.04	49.41	21.37	N	OFF	19.5
0.331800	33.76	---	59.41	25.65	N	OFF	19.5
0.471300	---	24.86	46.49	21.63	N	OFF	19.5
0.471300	31.15	---	56.49	25.34	N	OFF	19.5
3.343020	---	25.00	46.00	21.00	N	OFF	19.6
3.343020	27.84	---	56.00	28.16	N	OFF	19.6
13.560000	---	34.55	50.00	15.45	N	OFF	19.9
13.560000	45.12	---	60.00	14.88	N	OFF	19.9

Appendix B. Radiated Spurious Emission

Test Engineer :	Jesse Wang, Stan Hsieh, and Ken Wu	Temperature :	21~25°C
		Relative Humidity :	48~53%

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5620.2	49.32	-18.88	68.2	37.66	34.9	12.07	35.31	304	78	P	H
		5699	50.23	-54.23	104.46	38.35	35	12.2	35.32	304	78	P	H
		5720	65.83	-44.97	110.8	53.91	35	12.24	35.32	304	78	P	H
		5725	75.61	-46.59	122.2	63.68	35	12.25	35.32	304	78	P	H
	*	5745	110.25	-	-	98.29	35	12.28	35.32	304	78	P	H
	*	5745	102.35	-	-	90.39	35	12.28	35.32	304	78	A	H
													H
													H
		5619.6	49.97	-18.23	68.2	38.31	34.9	12.07	35.31	149	357	P	V
		5698.4	56.24	-47.78	104.02	44.36	35	12.2	35.32	149	357	P	V
		5717	73.81	-36.15	109.96	61.9	35	12.23	35.32	149	357	P	V
		5724.2	84.52	-35.86	120.38	72.6	35	12.24	35.32	149	357	P	V
	*	5745	115.55	-	-	103.59	35	12.28	35.32	149	357	P	V
	*	5745	107.77	-	-	95.81	35	12.28	35.32	149	357	A	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5603.6	48.54	-19.66	68.2	36.8	35	12.05	35.31	313	60	P	H
		5685.6	49.98	-44.6	94.58	38.12	35	12.18	35.32	313	60	P	H
		5715	49.84	-59.56	109.4	37.93	35	12.23	35.32	313	60	P	H
		5722	49.27	-66.09	115.36	37.35	35	12.24	35.32	313	60	P	H
	*	5785	111.32	-	-	99.3	35	12.35	35.33	313	60	P	H
	*	5785	104.02	-	-	92	35	12.35	35.33	313	60	A	H
		5854	49.77	-63.31	113.08	37.64	35.07	12.4	35.34	313	60	P	H
		5859.4	50.15	-59.42	109.57	38.02	35.07	12.4	35.34	313	60	P	H
		5883.6	51	-47.81	98.81	38.8	35.13	12.41	35.34	313	60	P	H
		5932	49.22	-18.98	68.2	36.92	35.2	12.44	35.34	313	60	P	H
													H
802.11a CH 157 5785MHz													H
		5615.2	49	-19.2	68.2	37.24	35	12.07	35.31	146	358	P	V
		5682.4	50.04	-42.17	92.21	38.33	34.85	12.18	35.32	146	358	P	V
		5708	51.14	-56.3	107.44	39.24	35	12.22	35.32	146	358	P	V
		5720.6	52.02	-60.15	112.17	40.1	35	12.24	35.32	146	358	P	V
	*	5785	116.62	-	-	104.6	35	12.35	35.33	146	358	P	V
	*	5785	108.62	-	-	96.6	35	12.35	35.33	146	358	A	V
		5853.6	51.13	-62.86	113.99	39	35.07	12.4	35.34	146	358	P	V
		5867	52.2	-55.24	107.44	40.07	35.07	12.4	35.34	146	358	P	V
		5886.2	50.12	-46.76	96.88	37.92	35.13	12.41	35.34	146	358	P	V
		5925.8	50.48	-17.72	68.2	38.19	35.2	12.43	35.34	146	358	P	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	*	5825	112.45	-	-	100.4	35	12.38	35.33	310	63	P	H
	*	5825	104.35	-	-	92.3	35	12.38	35.33	310	63	A	H
		5850	71.31	-50.89	122.2	59.24	35	12.4	35.33	310	63	P	H
		5855.4	60.18	-50.51	110.69	48.05	35.07	12.4	35.34	310	63	P	H
		5876.6	52.95	-51.06	104.01	40.75	35.13	12.41	35.34	310	63	P	H
		5930.6	50.52	-17.68	68.2	38.22	35.2	12.44	35.34	310	63	P	H
													H
802.11a													H
CH 165	*	5825	115.95	-	-	103.9	35	12.38	35.33	145	357	P	V
5825MHz	*	5825	108.35	-	-	96.3	35	12.38	35.33	145	357	A	V
		5851.6	74.62	-43.93	118.55	62.56	35	12.4	35.34	145	357	P	V
		5856.4	66.5	-43.91	110.41	54.37	35.07	12.4	35.34	145	357	P	V
		5879.8	59.72	-41.91	101.63	47.52	35.13	12.41	35.34	145	357	P	V
		5945.2	49.9	-18.3	68.2	37.6	35.2	12.44	35.34	145	357	P	V
													V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	49.01	-24.99	74	49.87	38.18	18.48	57.52	100	0	P	H
		17235	50.09	-18.11	68.2	41.92	41.53	22.95	56.31	100	0	P	H
													H
													H
		11490	48.06	-25.94	74	48.92	38.18	18.48	57.52	100	0	P	V
		17235	50.32	-17.88	68.2	42.15	41.53	22.95	56.31	100	0	P	V
													V
													V
802.11a CH 157 5785MHz		11570	49.56	-24.44	74	50.02	38.33	18.55	57.34	100	0	P	H
		17355	52.67	-15.53	68.2	44.5	41.5	23.02	56.35	100	0	P	H
													H
													H
		11570	48.93	-25.07	74	49.39	38.33	18.55	57.34	100	0	P	V
		17355	50.98	-17.22	68.2	42.81	41.5	23.02	56.35	100	0	P	V
													V
													V
802.11a CH 165 5825MHz		11650	47.23	-26.77	74	47.31	38.44	18.63	57.15	100	0	P	H
		17475	49.61	-18.59	68.2	41.57	41.33	23.09	56.38	100	0	P	H
													H
													H
		11650	46.33	-27.67	74	46.41	38.44	18.63	57.15	100	0	P	V
		17475	49.72	-18.48	68.2	41.68	41.33	23.09	56.38	100	0	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 VHT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5620.8	48.6	-19.6	68.2	36.94	34.9	12.07	35.31	304	78	P	H
		5692	54.43	-44.87	99.3	42.56	35	12.19	35.32	304	78	P	H
		5720	72.25	-38.55	110.8	60.33	35	12.24	35.32	304	78	P	H
		5725	81.63	-40.57	122.2	69.7	35	12.25	35.32	304	78	P	H
	*	5745	109.55	-	-	97.59	35	12.28	35.32	304	78	P	H
	*	5745	102.45	-	-	90.49	35	12.28	35.32	304	78	A	H
802.11ac													H
VHT20													H
CH 149		5644.4	49.26	-18.94	68.2	37.66	34.8	12.11	35.31	149	357	P	V
5745MHz		5698.6	59.13	-45.04	104.17	47.25	35	12.2	35.32	149	357	P	V
		5718.6	77.92	-32.49	110.41	66	35	12.24	35.32	149	357	P	V
		5723.2	84.64	-33.46	118.1	72.72	35	12.24	35.32	149	357	P	V
	*	5745	116.25	-	-	104.29	35	12.28	35.32	149	357	P	V
	*	5745	108.25	-	-	96.29	35	12.28	35.32	149	357	A	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5639.4	48	-20.2	68.2	36.4	34.8	12.11	35.31	313	60	P	H
		5678.6	50.08	-39.32	89.4	38.38	34.85	12.17	35.32	313	60	P	H
		5705	48.74	-57.86	106.6	36.85	35	12.21	35.32	313	60	P	H
		5722.2	49.37	-66.45	115.82	37.45	35	12.24	35.32	313	60	P	H
	*	5785	111.67	-	-	99.65	35	12.35	35.33	313	60	P	H
	*	5785	103.62	-	-	91.6	35	12.35	35.33	313	60	A	H
		5851	52.01	-67.91	119.92	39.95	35	12.4	35.34	313	60	P	H
		5861.2	49.09	-59.97	109.06	36.96	35.07	12.4	35.34	313	60	P	H
		5904.2	49.68	-33.87	83.55	37.4	35.2	12.42	35.34	313	60	P	H
		5931.8	50.61	-17.59	68.2	38.31	35.2	12.44	35.34	313	60	P	H
802.11ac													H
VHT20													H
CH 157		5648.6	49.33	-18.87	68.2	37.72	34.8	12.12	35.31	146	358	P	V
5785MHz		5671.8	49.28	-35.09	84.37	37.59	34.85	12.16	35.32	146	358	P	V
		5717.4	51.41	-58.66	110.07	39.5	35	12.23	35.32	146	358	P	V
		5724.6	54.52	-66.77	121.29	42.59	35	12.25	35.32	146	358	P	V
	*	5785	115.72	-	-	103.7	35	12.35	35.33	146	358	P	V
	*	5785	108.25	-	-	96.23	35	12.35	35.33	146	358	A	V
		5853.4	50.4	-64.05	114.45	38.34	35	12.4	35.34	146	358	P	V
		5860.4	56.78	-52.51	109.29	44.65	35.07	12.4	35.34	146	358	P	V
		5883.6	50.71	-48.1	98.81	38.51	35.13	12.41	35.34	146	358	P	V
		5928.6	50.73	-17.47	68.2	38.44	35.2	12.43	35.34	146	358	P	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	*	5825	112.2	-	-	100.15	35	12.38	35.33	310	63	P	H
	*	5825	103.95	-	-	91.9	35	12.38	35.33	310	63	A	H
		5850	74.59	-47.61	122.2	62.52	35	12.4	35.33	310	63	P	H
		5857.2	65.5	-44.68	110.18	53.37	35.07	12.4	35.34	310	63	P	H
		5876.8	55.86	-48	103.86	43.66	35.13	12.41	35.34	310	63	P	H
		5949.6	51.09	-17.11	68.2	38.79	35.2	12.44	35.34	310	63	P	H
802.11ac													H
VHT20													H
CH 165	*	5825	115.15	-	-	103.1	35	12.38	35.33	145	357	P	V
5825MHz	*	5825	107.55	-	-	95.5	35	12.38	35.33	145	357	A	V
		5850	78.68	-43.52	122.2	66.61	35	12.4	35.33	145	357	P	V
		5855.4	67.6	-43.09	110.69	55.47	35.07	12.4	35.34	145	357	P	V
		5875.8	57.42	-47.19	104.61	45.22	35.13	12.41	35.34	145	357	P	V
		5934	50.33	-17.87	68.2	38.03	35.2	12.44	35.34	145	357	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 VHT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11490	52.38	-21.62	74	53.24	38.18	18.48	57.52	181	339	P	H
		11490	42.51	-11.49	54	43.37	38.18	18.48	57.52	181	339	A	H
802.11ac		17235	52.09	-16.11	68.2	43.92	41.53	22.95	56.31	100	0	P	H
VHT20													H
CH 149		11490	47.18	-26.82	74	48.04	38.18	18.48	57.52	100	0	P	V
5745MHz		17235	50.67	-17.53	68.2	42.5	41.53	22.95	56.31	100	0	P	V
		11490	47.18	-26.82	74	48.04	38.18	18.48	57.52	100	0	P	V
													V
		11570	52.95	-21.05	74	53.41	38.33	18.55	57.34	178	339	P	H
		11570	42.13	-11.87	54	42.59	38.33	18.55	57.34	178	339	A	H
802.11ac		17355	52.35	-15.85	68.2	44.18	41.5	23.02	56.35	100	0	P	H
VHT20													H
CH 157		11570	46.96	-27.04	74	47.42	38.33	18.55	57.34	100	0	P	V
5785MHz		17355	51.5	-16.7	68.2	43.33	41.5	23.02	56.35	100	0	P	V
		11570	46.96	-27.04	74	47.42	38.33	18.55	57.34	100	0	P	V
													V
		11650	47.78	-26.22	74	47.86	38.44	18.63	57.15	100	0	P	H
		17475	49.62	-18.58	68.2	41.58	41.33	23.09	56.38	100	0	P	H
802.11ac													H
VHT20													H
CH 165		11650	47.26	-26.74	74	47.34	38.44	18.63	57.15	100	0	P	V
5825MHz		17475	49.89	-18.31	68.2	41.85	41.33	23.09	56.38	100	0	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 VHT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5614.6	48.89	-19.31	68.2	37.14	35	12.06	35.31	316	61	P	H
		5694.4	60.21	-40.86	101.07	48.33	35	12.2	35.32	316	61	P	H
		5719.4	78.32	-32.31	110.63	66.4	35	12.24	35.32	316	61	P	H
		5723.4	81.95	-36.6	118.55	70.03	35	12.24	35.32	316	61	P	H
	*	5755	108.87	-	-	96.9	35	12.3	35.33	316	61	P	H
	*	5755	100.97	-	-	89	35	12.3	35.33	316	61	A	H
		5854.2	53.13	-59.49	112.62	41	35.07	12.4	35.34	316	61	P	H
		5858.6	51.96	-57.83	109.79	39.83	35.07	12.4	35.34	316	61	P	H
		5875.6	51.35	-53.4	104.75	39.15	35.13	12.41	35.34	316	61	P	H
		5944.4	49.88	-18.32	68.2	37.58	35.2	12.44	35.34	316	61	P	H
802.11ac													H
VHT40													H
CH 151		5650	55.23	-12.97	68.2	43.72	34.7	12.12	35.31	157	357	P	V
5755MHz		5696.8	70.88	-31.96	102.84	59	35	12.2	35.32	157	357	P	V
		5718.4	87.41	-22.94	110.35	75.49	35	12.24	35.32	157	357	P	V
		5724.6	90.83	-30.46	121.29	78.9	35	12.25	35.32	157	357	P	V
	*	5755	113.31	-	-	101.34	35	12.3	35.33	157	357	P	V
	*	5755	105.67	-	-	93.7	35	12.3	35.33	157	357	A	V
		5853.4	53.37	-61.08	114.45	41.31	35	12.4	35.34	157	357	P	V
		5858.6	50.6	-59.19	109.79	38.47	35.07	12.4	35.34	157	357	P	V
		5908.4	51.9	-28.55	80.45	39.62	35.2	12.42	35.34	157	357	P	V
		5937.8	51	-17.2	68.2	38.7	35.2	12.44	35.34	157	357	P	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5644.4	49.03	-19.17	68.2	37.43	34.8	12.11	35.31	361	63	P	H
		5694	53.23	-47.55	100.78	41.35	35	12.2	35.32	361	63	P	H
		5718	56.55	-53.69	110.24	44.64	35	12.23	35.32	361	63	P	H
		5724	58.69	-61.23	119.92	46.77	35	12.24	35.32	361	63	P	H
	*	5795	110.6	-	-	98.57	35	12.36	35.33	361	63	P	H
	*	5795	102.26	-	-	90.23	35	12.36	35.33	361	63	A	H
		5850	66.58	-55.62	122.2	54.51	35	12.4	35.33	361	63	P	H
		5858	65.49	-44.47	109.96	53.36	35.07	12.4	35.34	361	63	P	H
		5875	57.65	-47.55	105.2	45.45	35.13	12.41	35.34	361	63	P	H
		5925.8	52.8	-15.4	68.2	40.51	35.2	12.43	35.34	361	63	P	H
802.11ac													H
VHT40													H
CH 159		5647.4	49.34	-18.86	68.2	37.73	34.8	12.12	35.31	136	355	P	V
5795MHz		5699.6	57.75	-47.16	104.91	45.87	35	12.2	35.32	136	355	P	V
		5716.6	63.33	-46.52	109.85	51.42	35	12.23	35.32	136	355	P	V
		5724.2	65.16	-55.22	120.38	53.24	35	12.24	35.32	136	355	P	V
	*	5795	113.63	-	-	101.6	35	12.36	35.33	136	355	P	V
	*	5795	105.43	-	-	93.4	35	12.36	35.33	136	355	A	V
		5851.6	59.28	-59.27	118.55	47.22	35	12.4	35.34	136	355	P	V
		5862	59.2	-49.64	108.84	47.07	35.07	12.4	35.34	136	355	P	V
		5893.8	52.33	-38.92	91.25	40.05	35.2	12.42	35.34	136	355	P	V
		5936.2	50.18	-18.02	68.2	37.88	35.2	12.44	35.34	136	355	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 VHT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11510	46.64	-27.36	74	47.41	38.2	18.51	57.48	100	0	P	H
		17265	49.54	-18.66	68.2	41.43	41.47	22.96	56.32	100	0	P	H
802.11ac													H
VHT40													H
CH 151		11510	45.84	-28.16	74	46.61	38.2	18.51	57.48	100	0	P	V
5755MHz		17265	49.66	-18.54	68.2	41.55	41.47	22.96	56.32	100	0	P	V
													V
													V
		11590	47.43	-26.57	74	47.78	38.37	18.57	57.29	100	0	P	H
		17385	50.7	-17.5	68.2	42.45	41.57	23.04	56.36	100	0	P	H
802.11ac													H
VHT40													H
CH 159		11590	46.17	-27.83	74	46.52	38.37	18.57	57.29	100	0	P	V
5795MHz		17385	50.51	-17.69	68.2	42.26	41.57	23.04	56.36	100	0	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 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5639	58.71	-9.49	68.2	47.12	34.8	12.1	35.31	362	67	P	H
		5696.6	76.87	-25.82	102.69	64.99	35	12.2	35.32	362	67	P	H
		5715.6	81.58	-27.99	109.57	69.67	35	12.23	35.32	362	67	P	H
		5723.2	82.77	-35.33	118.1	70.85	35	12.24	35.32	362	67	P	H
	*	5775	105.43	-	-	93.43	35	12.33	35.33	362	46	P	H
	*	5775	95.3	-	-	83.3	35	12.33	35.33	362	46	A	H
		5852.8	79.37	-36.45	115.82	67.31	35	12.4	35.34	362	44	P	H
		5856.4	78.63	-31.78	110.41	66.5	35.07	12.4	35.34	362	44	P	H
		5875.4	72.86	-32.04	104.9	60.66	35.13	12.41	35.34	362	44	P	H
		5927.2	58.56	-9.64	68.2	46.27	35.2	12.43	35.34	362	44	P	H
802.11ac													H
VHT80													H
CH 155		5648.6	65.88	-2.32	68.2	54.27	34.8	12.12	35.31	148	360	P	V
5775MHz		5699.4	84.63	-20.13	104.76	72.75	35	12.2	35.32	148	360	P	V
		5717.4	87.22	-22.85	110.07	75.31	35	12.23	35.32	148	360	P	V
		5723.2	87.63	-30.47	118.1	75.71	35	12.24	35.32	148	360	P	V
	*	5775	110.52	-	-	98.52	35	12.33	35.33	148	360	P	V
	*	5775	102.53	-	-	90.53	35	12.33	35.33	148	360	A	V
		5850.6	85.74	-35.09	120.83	73.68	35	12.4	35.34	148	360	P	V
		5857.8	84.57	-25.44	110.01	72.44	35.07	12.4	35.34	148	360	P	V
		5877	79.81	-23.9	103.71	67.61	35.13	12.41	35.34	148	360	P	V
		5927	62.7	-5.5	68.2	50.41	35.2	12.43	35.34	148	360	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11550	46.45	-27.55	74	46.99	38.3	18.54	57.38	100	0	P	H
		17325	50.05	-18.15	68.2	41.96	41.43	23	56.34	100	0	P	H
802.11ac													H
VHT80													H
CH 155		11550	46.04	-27.96	74	46.58	38.3	18.54	57.38	100	0	P	V
5775MHz		17325	50.41	-17.79	68.2	42.32	41.43	23	56.34	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 802.11ac VHT80 (LF)

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)
		30	23.14	-16.86	40	27.9	24.32	0.93	30.01	-	-	P	H
		46.74	18.41	-21.59	40	31.29	15.96	1.15	29.99	-	-	P	H
		131.79	20.36	-23.14	43.5	30.83	17.57	1.92	29.96	-	-	P	H
		870.5	31.27	-14.73	46	26.47	28.9	5.03	29.13	-	-	P	H
		929.3	32.31	-13.69	46	26.63	29.3	5.2	28.82	-	-	P	H
		953.1	33.4	-12.6	46	26.39	30.42	5.27	28.68	100	0	P	H
5GHz													
802.11ac													
VHT80		30.27	31.34	-8.66	40	36.1	24.32	0.93	30.01	100	0	P	V
LF		40.26	27.4	-12.6	40	37.33	19	1.07	30	-	-	P	V
		58.89	22.44	-17.56	40	39.2	11.94	1.29	29.99	-	-	P	V
		864.2	31.63	-14.37	46	26.89	28.88	5.01	29.15	-	-	P	V
		923.7	32.08	-13.92	46	26.64	29.1	5.19	28.85	-	-	P	V
		953.1	33.93	-12.07	46	26.92	30.42	5.27	28.68	-	-	P	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	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

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

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

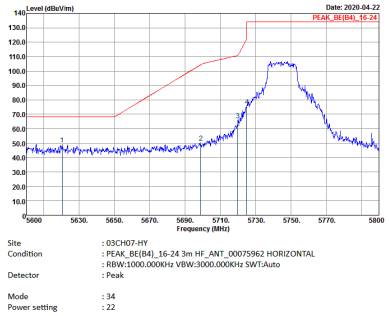
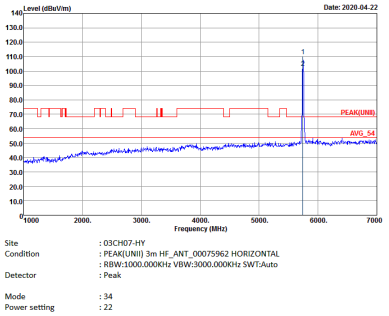
Test Engineer :	Jesse Wang, Stan Hsieh, and Ken Wu	**Temperature :**	21~25°C
		Relative Humidity :	48~53%

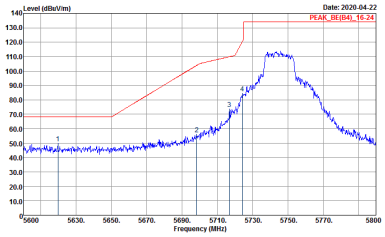
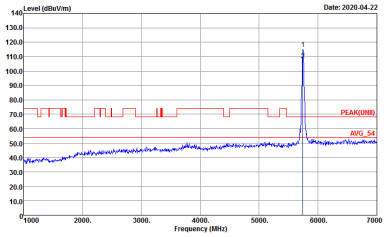
Note symbol

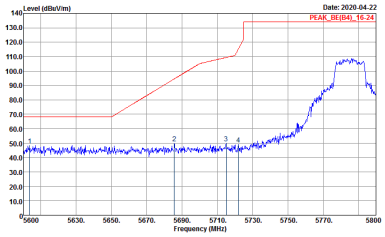
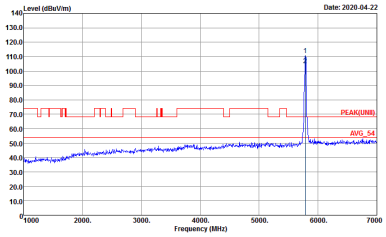
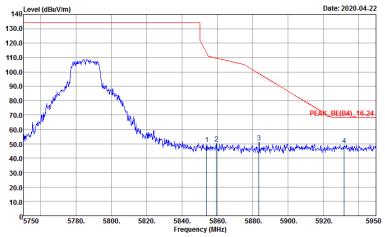
-L	**Low channel location**
-R	**High channel location**

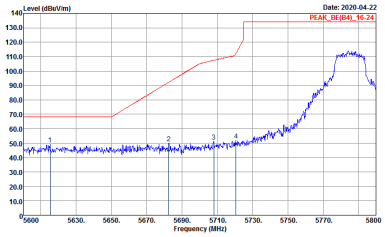
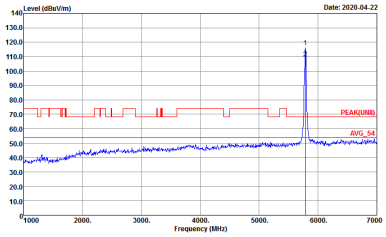
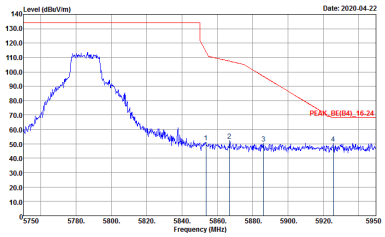
Band 4 - 5725~5850MHz

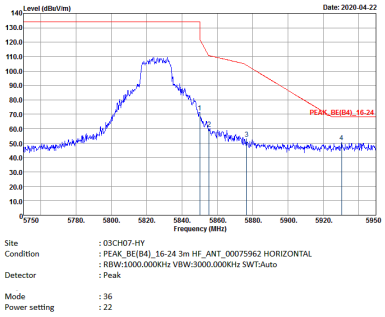
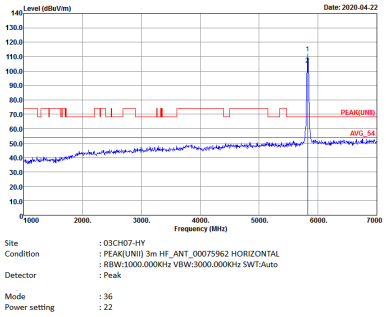
WIFI 802.11a (Band Edge @ 3m)

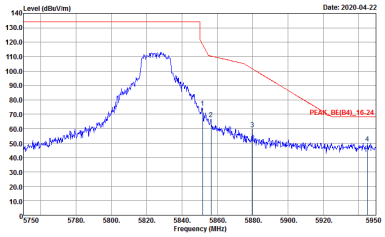
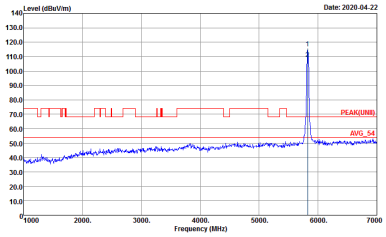
WIFI	**Band 4 5725~5850MHz Band Edge @ 3m**	
ANT	**802.11a CH149 5745MHz**	
1	**Horizontal**	**Fundamental**
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 34 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 34 Power setting : 22

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 35 Power setting : 22.5	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 35 Power setting : 22.5
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 35 Power setting : 22.5	Left blank

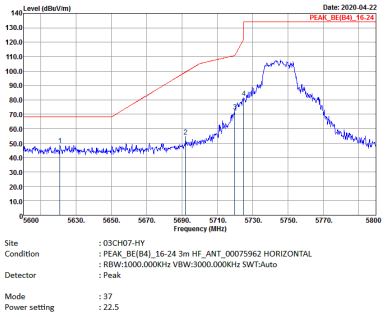
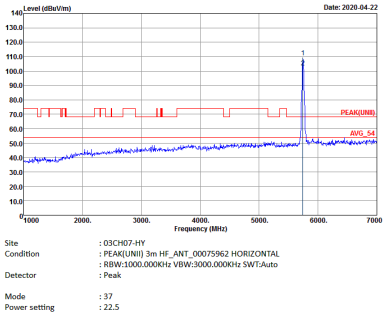
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 35 Power setting : 22.5	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 35 Power setting : 22.5
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 35 Power setting : 22.5	Left blank

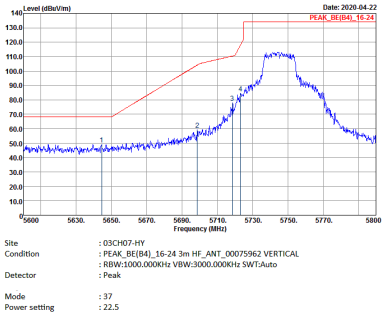
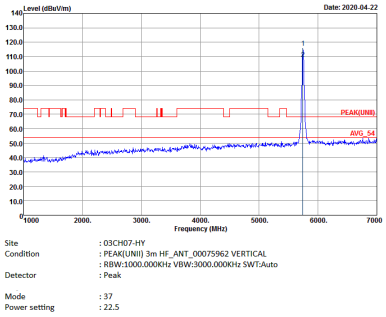
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 36 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 36 Power setting : 22

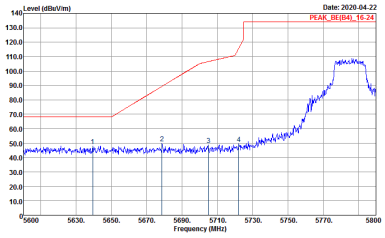
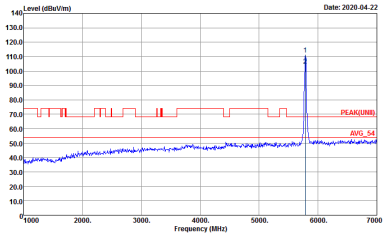
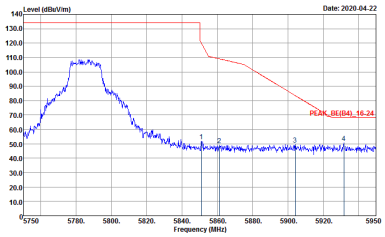
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 36 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 36 Power setting : 22

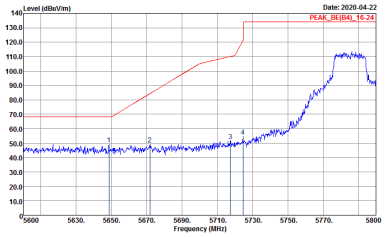
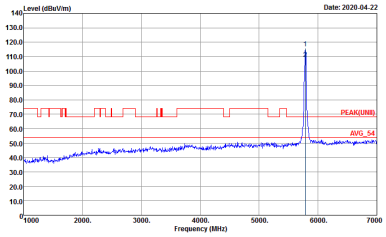
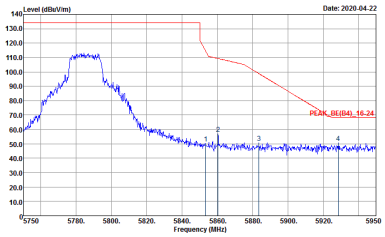
Band 4 5725~5850MHz

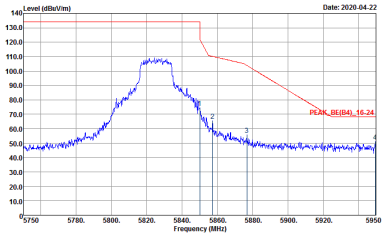
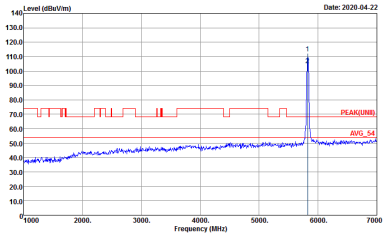
WIFI 802.11ac VHT20 (Band Edge @ 3m)

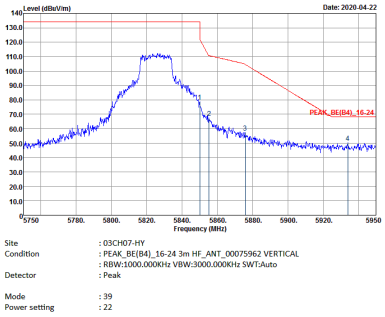
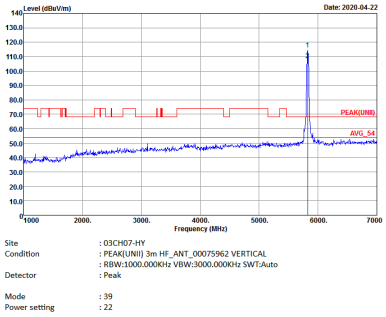
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1	Horizontal	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1	Vertical	Fundamental
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 37 Power setting : 22.5	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 37 Power setting : 22.5

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 38 Power setting : 22.5	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 38 Power setting : 22.5
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 38 Power setting : 22.5	Left blank

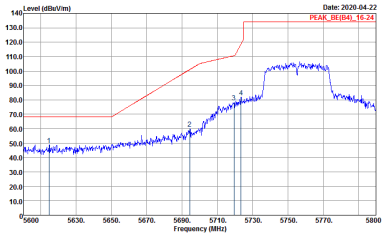
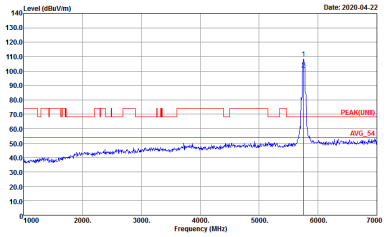
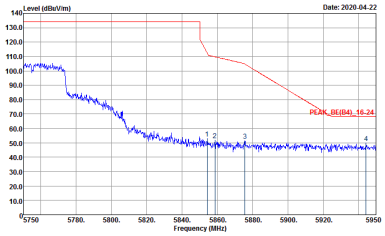
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 38 Power setting : 22.5	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 38 Power setting : 22.5
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 38 Power setting : 22.5	Left blank

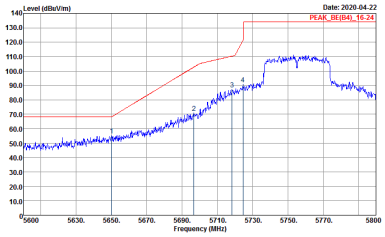
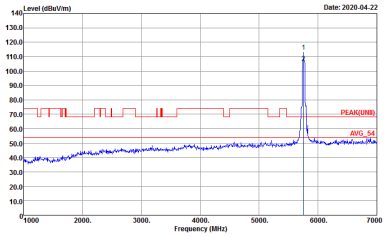
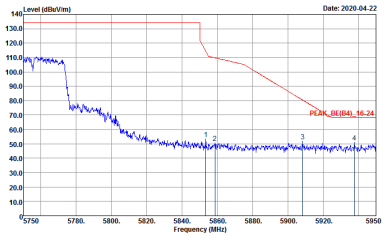
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 39 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 39 Power setting : 22

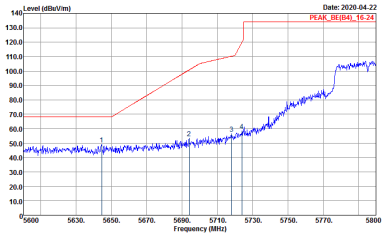
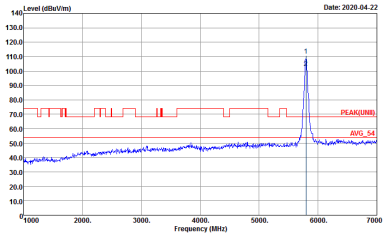
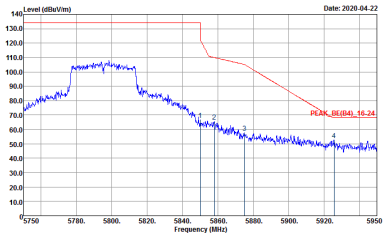
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1	Vertical	Fundamental
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 39 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 39 Power setting : 22

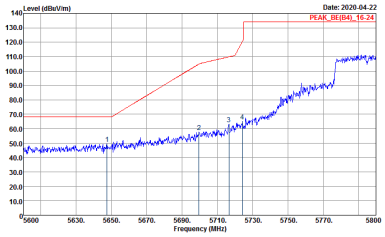
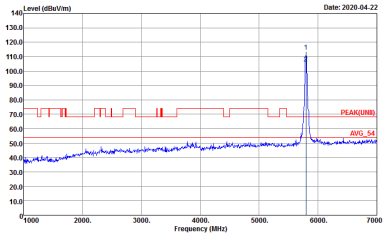
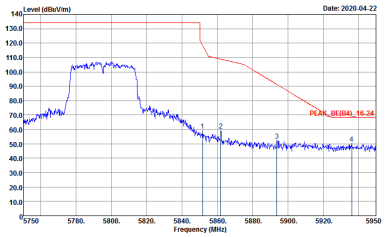
Band 4 5725~5850MHz

WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 40 Power setting : 21	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 40 Power setting : 21
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 40 Power setting : 21	Left blank

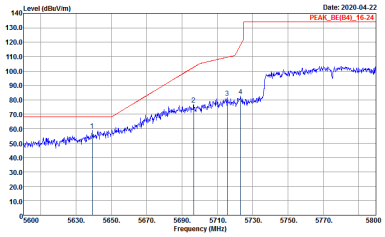
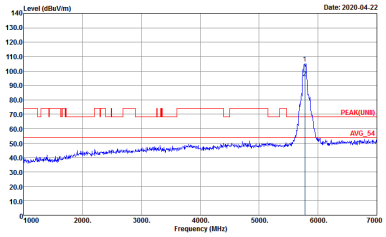
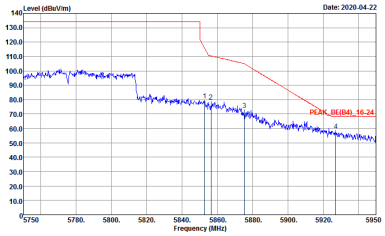
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 040803 Mode : 40 Power setting : 21	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 40 Power setting : 21
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 40 Power setting : 21	Left blank

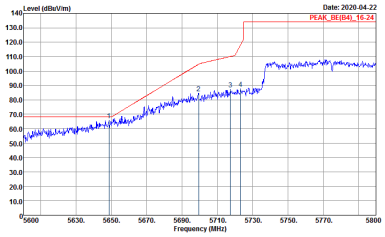
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 41 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 41 Power setting : 22
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 41 Power setting : 22	Left blank

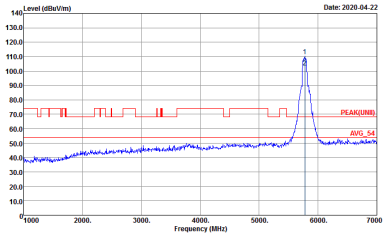
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 41 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 41 Power setting : 22
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 41 Power setting : 22	Left blank

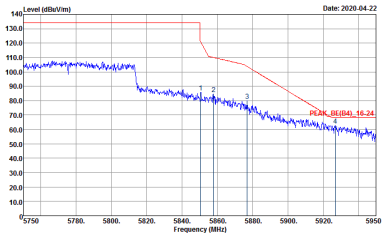
Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 42 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 42 Power setting : 22
Peak	 Site : 03CH07-HY Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Mode : 42 Power setting : 22	Left blank

<table>
<tr><td>WIFI</td><td colspan="2">Band 4 5725~5850MHz Band Edge @ 3m</td></tr>
<tr><td>ANT</td><td colspan="2">802.11ac VHT80 CH155 5775MHz</td></tr>
<tr><td>1</td><td>Vertical</td><td>Fundamental</td></tr>
<tr><td>Peak</td><td> 

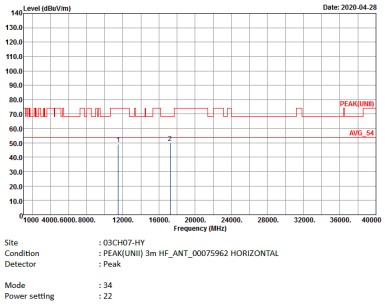
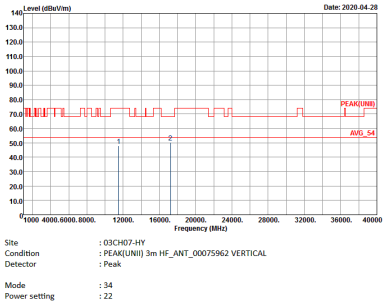
Site : 03CH07-HY
Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL
: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Detector : Peak
Project : 040803
Mode : 42
Power setting : 22</td><td> 

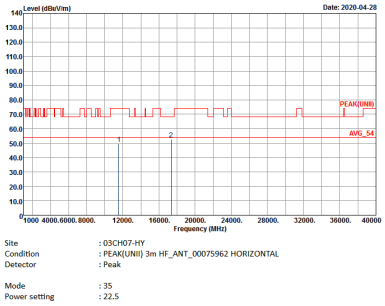
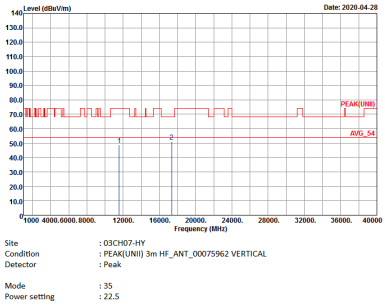
Site : 03CH07-HY
Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL
: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Detector : Peak
Mode : 42
Power setting : 22</td></tr>
<tr><td>Peak</td><td> 

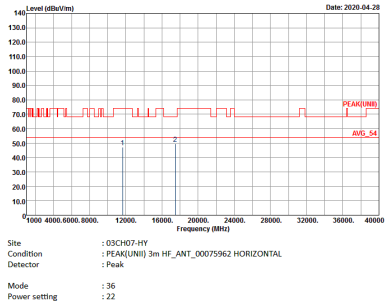
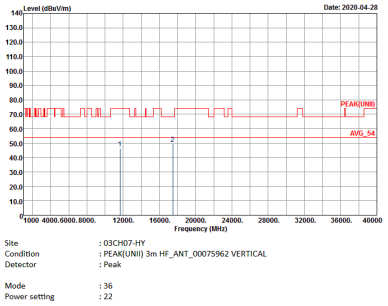
Site : 03CH07-HY
Condition : PEAK_BE(B4)_16-24 3m HF_ANT_00075962 VERTICAL
: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Detector : Peak
Mode : 42
Power setting : 22</td><td>Left blank</td></tr>
</table>

Band 4 - 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

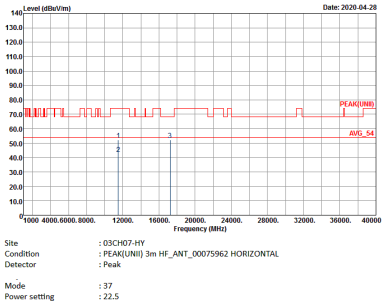
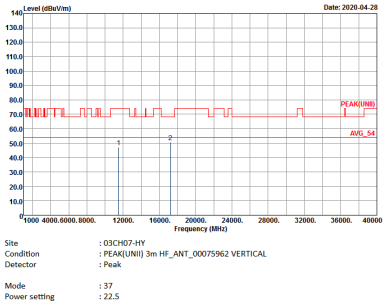
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.		

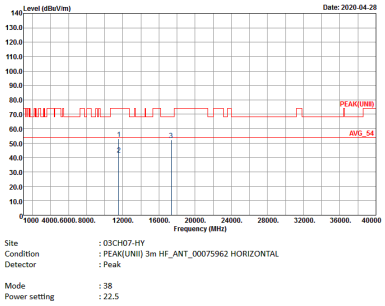
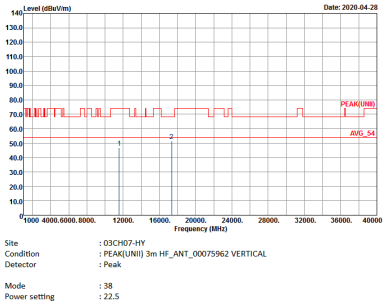
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Mode : 35 Power setting : 22.5	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL Detector : Peak Mode : 35 Power setting : 22.5

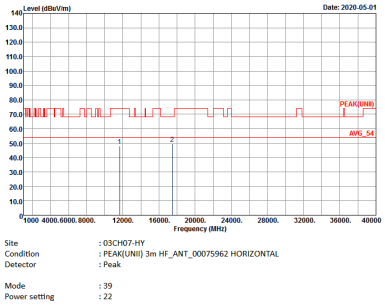
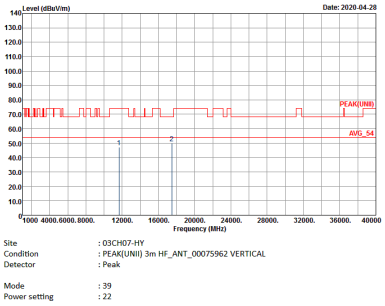
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Mode : 36 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL Detector : Peak Mode : 36 Power setting : 22

Band 4 5725~5850MHz

WIFI 802.11ac VHT20 (Harmonic @ 3m)

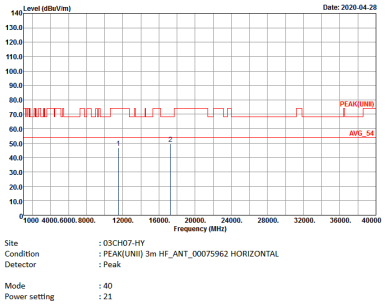
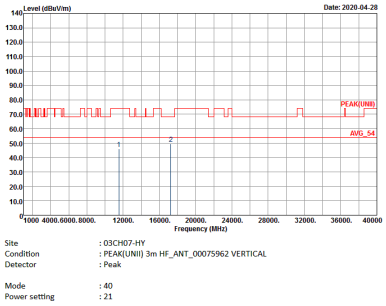
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.		

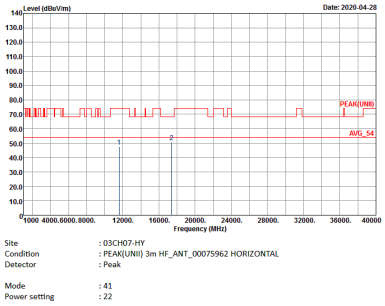
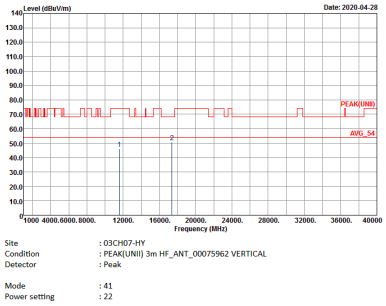
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Mode : 38 Power setting : 22.5	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL Detector : Peak Mode : 38 Power setting : 22.5

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Mode : 39 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL Detector : Peak Mode : 39 Power setting : 22

Band 4 5725~5850MHz

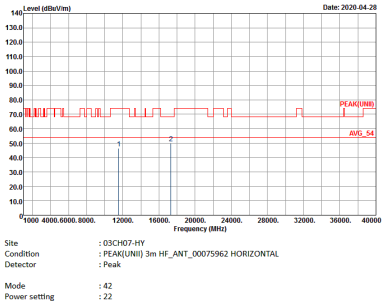
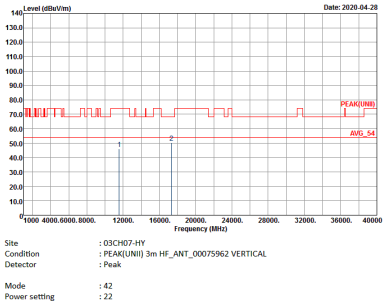
WIFI 802.11ac VHT40 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Mode : 41 Power setting : 22	 Site : 03CH07-HY Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL Detector : Peak Mode : 41 Power setting : 22

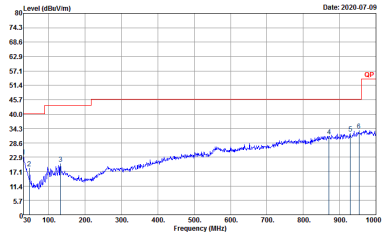
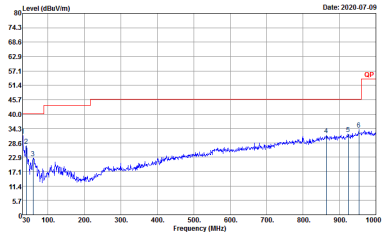
Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

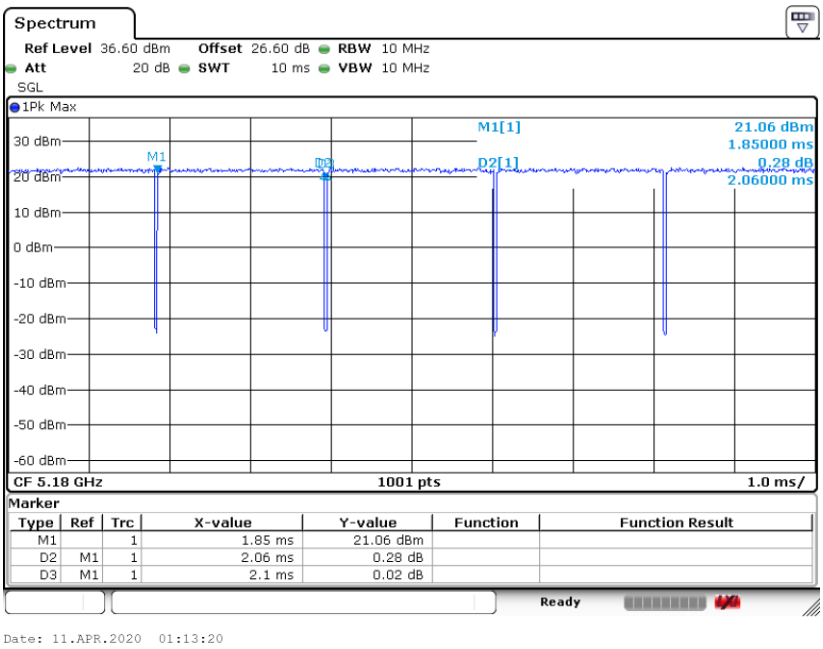
5GHz WIFI 802.11ac VHT80 (LF)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(6) HORIZONTAL Detector : Peak Mode : 43	 Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(6) VERTICAL Detector : Peak Mode : 43

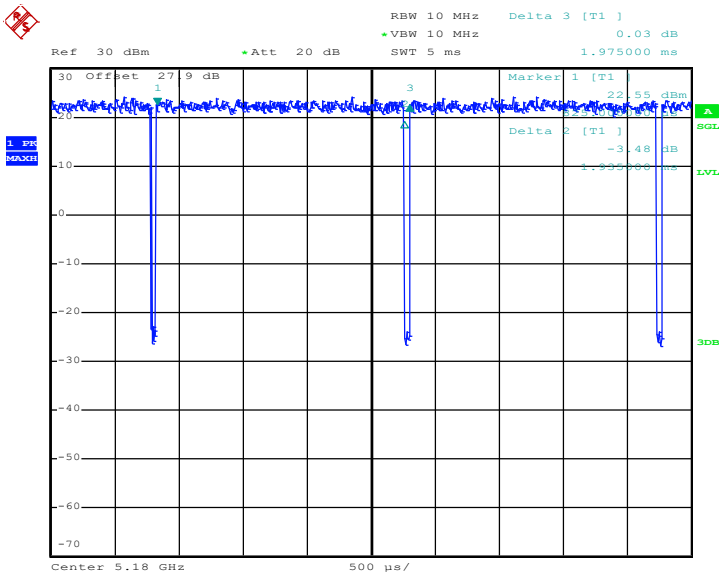
Appendix D. Duty Cycle Plots

Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor (dB)
802.11a	98.10	-	-	10Hz	0.08
5GHz 802.11ac VHT20	97.97	1935	0.52	1kHz	0.09
5GHz 802.11ac VHT40	95.43	940	1.06	3kHz	0.20
5GHz 802.11ac VHT80	92.00	460	2.17	3kHz	0.36

802.11a

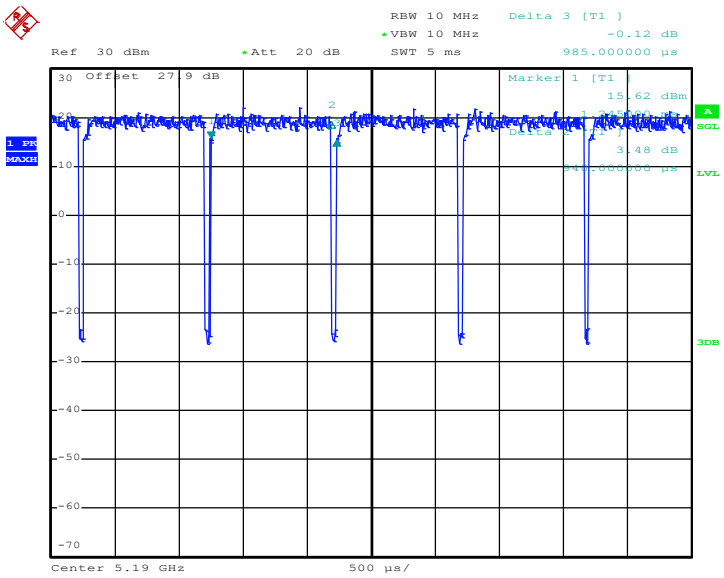


802.11ac VHT20



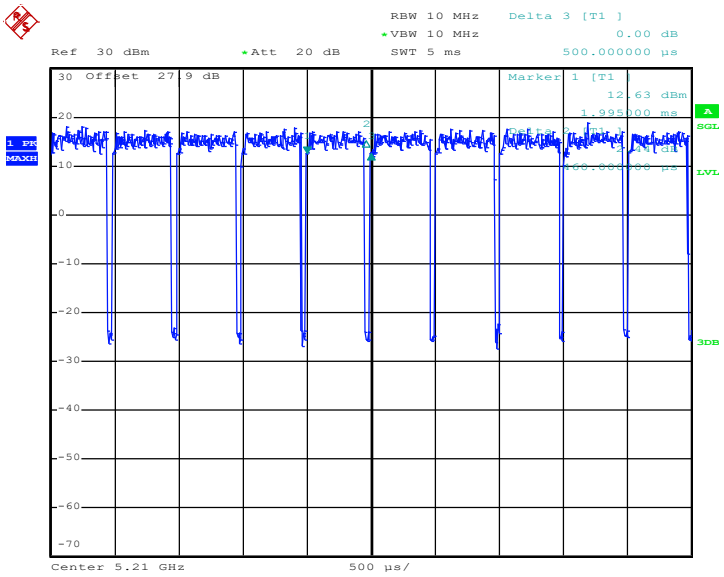
Date: 25.APR.2020 18:57:36

802.11ac VHT40



Date: 25.APR.2020 19:05:32

802.11ac VHT80



Date: 25.APR.2020 19:57:35