FCC CO-LOCATION RADIO TEST REPORT

FCC ID	:	**2AFZZK1G**
Equipment	:	**Mobile Phone**
Brand Name	:	**Xiaomi**
Model Name	:	**M2102K1G**
Applicant	:	**Xiaomi Communications Co., Ltd. #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085**
Manufacturer	:	**Xiaomi Communications Co., Ltd. #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Jan. 07, 2021 and testing was started from Jan. 25, 2021 and completed on Jan. 26, 2021. 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
FR110703H	01	Initial issue of report	Feb. 10, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.407(b)	Unwanted Emissions	Pass	Under limit 3.55 dB at 5725.625 MHz
3.2	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: Amy Chen

1 General Description

1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE/5G NR, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ax, Wi-Fi 5GHz 802.11a/n/ac/ax, Wi-Fi 6GHz 802.11ax, NFC, WPC/WPT, and GNSS.

Product Specification subjective to this standard	
Antenna Type	**WWAN:** PIFA Antenna **WLAN 2.4GHz:** <Ant. 5>: PIFA Antenna <Ant. 7>: PIFA Antenna **WLAN 5GHz:** <Ant. 11>: PIFA Antenna <Ant. 8>: PIFA Antenna **WLAN 6GHz:** <Ant. 11>: PIFA Antenna <Ant. 8>: PIFA Antenna **Bluetooth:** <Ant. 5>: PIFA Antenna <Ant. 7>: PIFA Antenna **GPS / Glonass / Galileo / BDS:** PIFA Antenna **NFC:** Planar Antenna **WPC/WPT:** Coil antenna

Antenna information		
2400 MHz ~ 2483.5 MHz (Bluetooth)	Peak Gain (dBi)	Ant. 5: -2.46 Ant. 7: -2.58
2400 MHz ~ 2483.5 MHz (WLAN)	Peak Gain (dBi)	Ant. 5: -2.46 Ant. 7: -2.58
5250 MHz ~ 5350 MHz	Peak Gain (dBi)	Ant. 11: -4.03 Ant. 8: -5.01
5470 MHz ~ 5725 MHz	Peak Gain (dBi)	Ant. 11: -4.57 Ant. 8: -5.34

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

1.2 Modification of EUT

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

1.3 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH11-HY

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

FCC designation No.: TW0007

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 C §15.247
- FCC Part 15 Subpart E
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- 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.
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: 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 (Z plane) were recorded in this report.

2.1 Carrier Frequency and Channel

2400-2483.5 MHz Bluetooth		2400-2483.5 MHz 802.11ax HE40		5250-5350 MHz 802.11ax HE80		5470-5725 MHz 802.11ax HE160	
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
78	2480	03	2422	58	5290	114	5570

Remark: During the Radiated Spurious Emission test, the EUT turn on the WWAN functions simultaneously.

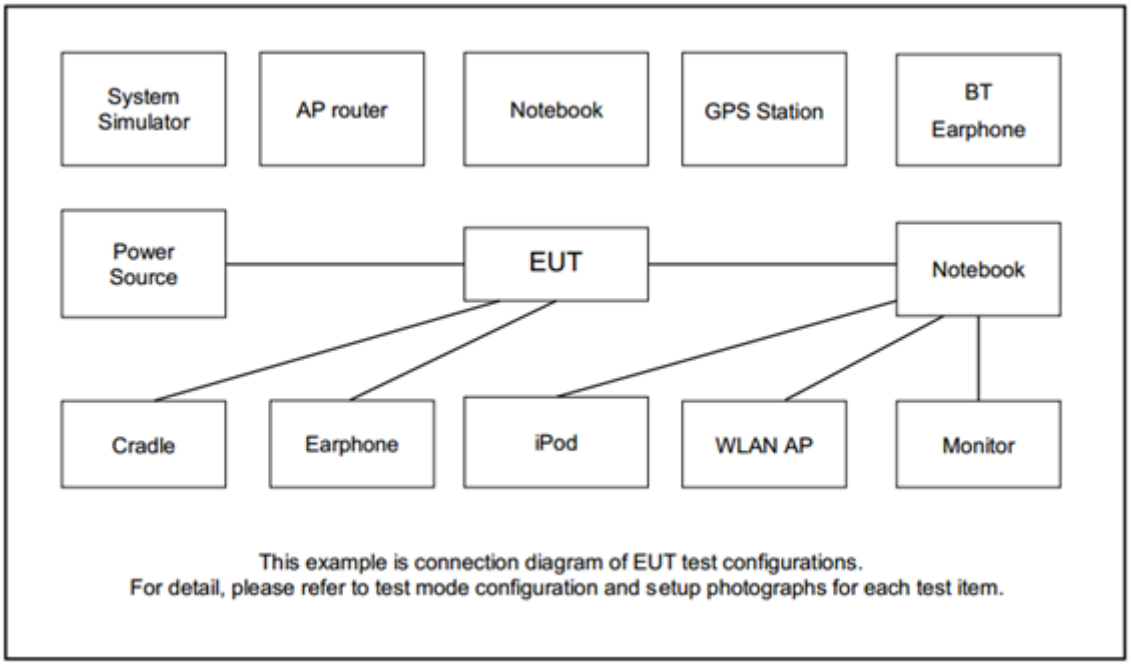
2.2 Test Mode

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

<Co-Location>

Modulation	Data Rate
2.4GHz 802.11ax HE40 for MIMO Ant. 5+7 + 5GHz 802.11ax HE80 for MIMO Ant. 11+8+ LTE Band 7	MCS0 + MCS0 + QPSK
Bluetooth for Ant. 5 + 5GHz 802.11ax HE160 for MIMO Ant. 11+8 + LTE Band 7	1Mbps + MCS0 + QPSK
Bluetooth for Ant. 7 + 5GHz 802.11ax HE160 for MIMO Ant. 11+8 + LTE Band 7	1Mbps + MCS0 + QPSK

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m

2.5 EUT Operation Test Setup

The Bluetooth test items make the EUT get into the engineering modes to contact with base station to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

The WLAN test items, 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 Unwanted Emissions Measurement

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

<Limit of Unwanted Emissions>

(1) 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

(2) 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.

3.1.1 Measuring Instruments

See list of measuring equipment of this test report.

3.1.2 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

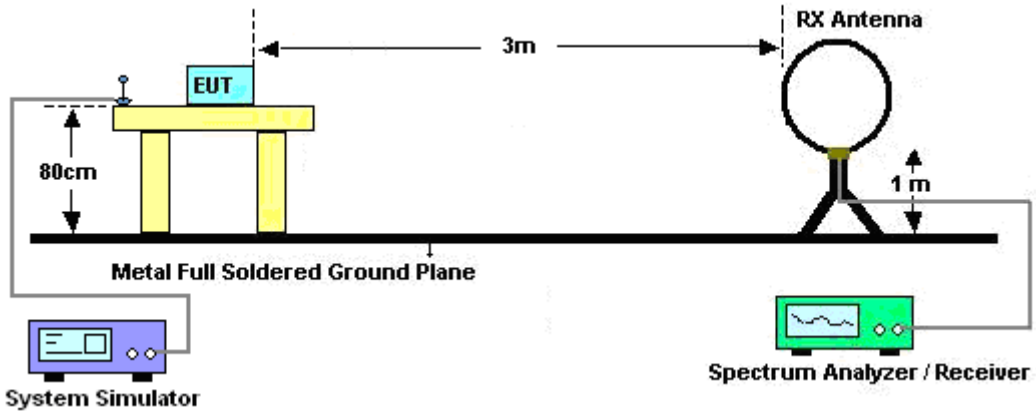
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - 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.

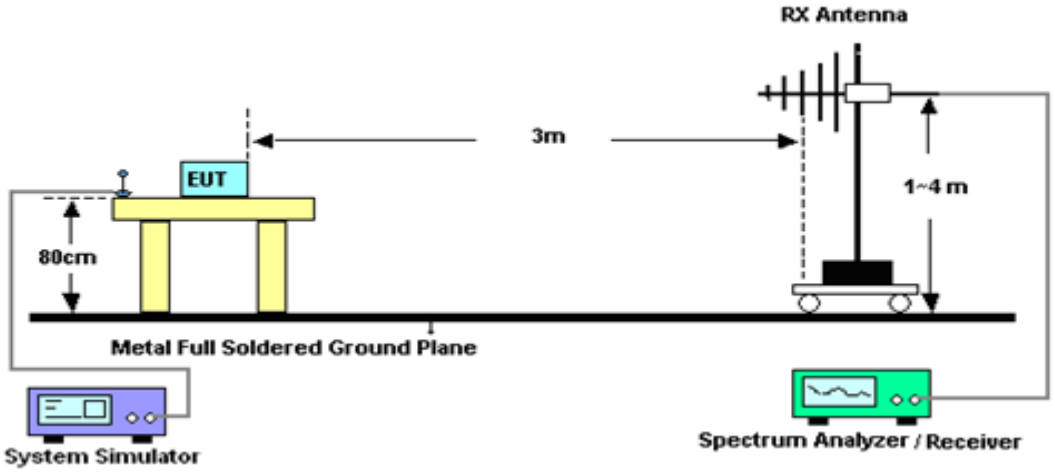
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband 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.

3.1.3 Test Setup

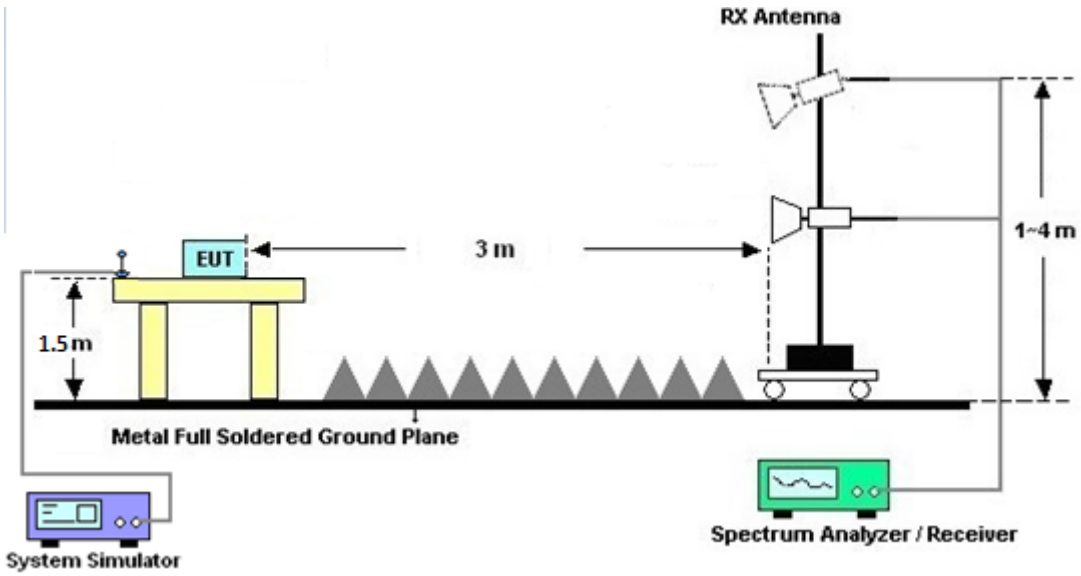
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated test above 1GHz



3.1.4 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.

3.1.5 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and B.

3.1.6 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix A and B.

3.2 Antenna Requirements

3.2.1 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.

3.2.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.2.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Nov. 03, 2020	Jan. 25, 2021~ Jan. 26, 2021	Nov. 02, 2021	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jul. 14, 2020	Jan. 25, 2021~ Jan. 26, 2021	Jul. 13, 2021	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00994	18GHz- 40GHz	Nov. 29, 2020	Jan. 25, 2021~ Jan. 26, 2021	Nov. 28, 2021	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 11, 2020	Jan. 25, 2021~ Jan. 26, 2021	Oct. 10, 2021	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 12, 2020	Jan. 25, 2021~ Jan. 26, 2021	Nov. 11, 2021	Radiation (03CH11-HY)
Preamplifier	EMEC	EM1G18G	060812	1GHz~18GHz	Oct. 27, 2020	Jan. 25, 2021~ Jan. 26, 2021	Oct. 26, 2021	Radiation (03CH11-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 15, 2020	Jan. 25, 2021~ Jan. 26, 2021	Jun. 14, 2021	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 02, 2020	Jan. 25, 2021~ Jan. 26, 2021	Dec. 01, 2021	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Feb. 10, 2020	Jan. 25, 2021~ Jan. 26, 2021	Feb. 09, 2021	Radiation (03CH11-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY55420170	20MHz~8.4GHz	Oct. 23, 2020	Jan. 25, 2021~ Jan. 26, 2021	Oct. 22, 2021	Radiation (03CH11-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Jan. 25, 2021~ Jan. 26, 2021	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Jan. 25, 2021~ Jan. 26, 2021	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Jan. 25, 2021~ Jan. 26, 2021	N/A	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-001053	N/A	N/A	Jan. 25, 2021~ Jan. 26, 2021	N/A	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz-30MHz	Mar. 12, 2020	Jan. 25, 2021~ Jan. 26, 2021	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 12, 2020	Jan. 25, 2021~ Jan. 26, 2021	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	30M-18G	Mar. 12, 2020	Jan. 25, 2021~ Jan. 26, 2021	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz-40GHz	Mar. 12, 2020	Jan. 25, 2021~ Jan. 26, 2021	Mar. 11, 2021	Radiation (03CH11-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN11	1.53G Low Pass	Sep. 14, 2020	Jan. 25, 2021~ Jan. 26, 2021	Sep. 13, 2021	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60SS	SN3	3GHz High Pass Filter	Sep. 14, 2020	Jan. 25, 2021~ Jan. 26, 2021	Sep. 13, 2021	Radiation (03CH11-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40SS	SN3	6.75GHz High Pass Filter	Sep. 15, 2020	Jan. 25, 2021~ Jan. 26, 2021	Sep. 14, 2021	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTM-303B	TP140325	N/A	Nov. 18, 2020	Jan. 25, 2021~ Jan. 26, 2021	Nov. 17, 2021	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTM-303B	TP200880	QA-3-031	Oct. 22, 2020	Jan. 25, 2021~ Jan. 26, 2021	Oct. 21, 2021	Radiation (03CH11-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))	**4.4**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.2**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.1**

Appendix A. Radiated Spurious Emission

Test Engineer :	Bill Cheng, Fu Chen, and Troye Hsieh	Temperature :	18.8~24°C
		Relative Humidity :	33.2~66.1%

2.4GHz 2400~2483.5MHz + Band 2 - 5250-5350MHz + LTE Band 7

WIFI 802.11ax HE40 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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)
802.11ax HE40 Ch03 2422MHz		2386.16	53.85	-20.15	74	42.68	27.53	16.62	33.46	400	35	P	H
		2390	43.67	-10.33	54	32.51	27.52	16.62	33.46	400	35	A	H
	*	2422	104.7	-	-	93.51	27.5	16.65	33.44	400	35	P	H
	*	2422	95.21	-	-	84.02	27.5	16.65	33.44	400	35	A	H
		2492.8	52.53	-21.47	74	41.31	27.41	16.73	33.4	400	35	P	H
		2484.4	41.46	-12.54	54	30.24	27.43	16.72	33.41	400	35	A	H
		2390	56.12	-17.88	74	44.96	27.52	16.62	33.46	111	58	P	V
		2390	45.92	-8.08	54	34.76	27.52	16.62	33.46	111	58	A	V
	*	2422	107.26	-	-	96.07	27.5	16.65	33.44	111	58	P	V
	*	2422	97.43	-	-	86.24	27.5	16.65	33.44	111	58	A	V
		2490.48	52.36	-21.64	74	41.13	27.42	16.73	33.4	111	58	P	V
		2483.6	41.65	-12.35	54	30.43	27.43	16.72	33.41	111	58	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11ax HE80 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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)
802.11ax HE80 Ch58 5290MHz		5060.3	49.75	-24.25	74	40.92	31.74	9.84	32.75	100	332	P	H
		5052.2	41.45	-12.55	54	32.66	31.71	9.83	32.75	100	332	A	H
	*	5290	95.34	-	-	86.9	31.2	10.11	32.87	100	332	P	H
	*	5290	87.47	-	-	79.03	31.2	10.11	32.87	100	332	A	H
		5373.6	51.62	-22.38	74	43.07	31.29	10.17	32.91	100	332	P	H
		5351.04	44.38	-9.62	54	35.93	31.2	10.15	32.9	100	332	A	H
		5033.9	49.87	-24.13	74	41.24	31.57	9.8	32.74	100	243	P	V
		5052.2	40.57	-13.43	54	31.78	31.71	9.83	32.75	100	243	A	V
	*	5290	100.83	-	-	92.39	31.2	10.11	32.87	100	243	P	V
	*	5290	90.65	-	-	82.21	31.2	10.11	32.87	100	243	A	V
		5350.56	56.25	-17.75	74	47.8	31.2	10.15	32.9	100	243	P	V
		5350.08	47.47	-6.53	54	39.02	31.2	10.15	32.9	100	243	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz + Band 2 - 5250-5350MHz + LTE Band 7 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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)
802.11ax HE40 Ch03 2422MHz + 802.11ax HE80 Ch58 5290MHz + LTE Band 7 Ch21100 2352MHz		4844	53.07	-20.93	74	43.31	31	11.57	32.81	100	0	P	H
		4844	42.02	-11.98	54	32.26	31	11.57	32.81	100	0	A	H
		7266	45.25	-28.75	74	60.71	36.4	13.83	65.69	100	0	P	H
		10580	49.18	-19.02	68.2	58.6	39.92	17.31	66.65	100	0	P	H
		15870	45.81	-28.19	74	53.67	37.37	21.32	66.55	100	0	P	H
													H
		4844	52.66	-21.34	74	42.9	31	11.57	32.81	100	0	P	V
		4844	42	-12	54	32.24	31	11.57	32.81	100	0	A	V
		7266	43.7	-30.3	74	59.16	36.4	13.83	65.69	100	0	P	V
		10580	48.87	-19.33	68.2	58.29	39.92	17.31	66.65	100	0	P	V
		15870	45.77	-28.23	74	53.63	37.37	21.32	66.55	100	0	P	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7

BT (Band Edge @ 3m)

WIFI Ant. Simultaneously	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)
BT CH 78 2480MHz	*	2480	105.06	31.06	74	104.24	27.44	6.79	33.41	106	301	P	H
	*	2480	80.27	26.27	54	-	-	-	-	-	-	A	H
		2499.44	50.2	-23.8	74	49.39	27.4	6.81	33.4	106	301	P	H
		2499.44	25.41	-28.59	54	-	-	-	-	-	-	A	H
	*	2480	101.19	27.19	74	100.37	27.44	6.79	33.41	400	27	P	V
	*	2480	76.4	22.4	54	-	-	-	-	-	-	A	V
		2483.8	43.63	-30.37	74	42.82	27.43	6.79	33.41	400	27	P	V
		2483.8	18.84	-35.16	54	-	-	-	-	-	-	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11ax HE160 Partial 996 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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)
802.11ax HE160 Partial 996/67 CH 114 5570MHz		5448.16	62.57	-11.43	74	53.7	31.59	10.23	32.95	100	116	P	H
		5468.32	57.38	-10.82	68.2	48.46	31.64	10.24	32.96	100	116	P	H
		5457.28	43.79	-10.21	54	34.91	31.61	10.23	32.96	100	116	A	H
	*	5570	99.6	-	-	90.61	31.64	10.32	32.97	100	116	P	H
	*	5570	90.41	-	-	81.42	31.64	10.32	32.97	100	116	A	H
		5728.145	61.01	-7.19	68.2	51.56	31.91	10.48	32.94	100	116	P	H
		5444.08	61.4	-12.6	74	52.55	31.58	10.22	32.95	400	360	P	V
		5463.04	54.65	-13.55	68.2	45.74	31.63	10.24	32.96	400	360	P	V
		5448.16	43.64	-10.36	54	34.77	31.59	10.23	32.95	400	360	A	V
	*	5570	97.25	-	-	88.26	31.64	10.32	32.97	400	360	P	V
	*	5570	87.91	-	-	78.92	31.64	10.32	32.97	400	360	A	V
		5725.625	60.47	-7.73	68.2	51.03	31.9	10.48	32.94	400	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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)
BT CH 78 2480MHz + 802.11ax HE160 Partial 996/67 CH 114 5570MHz + LTE Band 7 Ch21100 2352MHz		4960	52.05	-21.95	74	42.42	31.06	11.31	32.74	100	0	P	H
		4960	27.26	-26.74	54	-	-	-	-	-	-	A	H
		7440	46.12	-27.88	74	61.68	36.56	13.67	65.79	100	0	P	H
		7440	21.33	-32.67	54	-	-	-	-	-	-	A	H
		11140	49.22	-24.78	74	58.16	39.68	17.51	66.13	100	0	P	H
		16710	48.8	-19.4	68.2	53.61	39.53	22.02	66.36	100	0	P	H
		4960	52.31	-21.69	74	42.68	31.06	11.31	32.74	100	0	P	V
		4960	27.52	-26.48	54	-	-	-	-	-	-	A	V
		7440	44.11	-29.89	74	59.67	36.56	13.67	65.79	100	0	P	V
		7440	19.32	-34.68	54	-	-	-	-	-	-	A	V
		11140	49.12	-24.88	74	58.06	39.68	17.51	66.13	100	0	P	V
		16710	49.2	-19	68.2	54.01	39.53	22.02	66.36	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (Band Edge @ 3m)

BT (Band Edge @ 3m)

WIFI Ant. Simultaneously	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)
BT CH 78 2480MHz	*	2480	99.05	25.05	74	98.23	27.44	6.79	33.41	100	144	P	H
	*	2480	74.26	20.26	54	-	-	-	-	-	-	A	H
		2498.28	45.14	-28.86	74	44.33	27.4	6.81	33.4	100	144	P	H
		2498.28	20.35	-33.65	54	-	-	-	-	-	-	A	H
	*	2480	105.78	31.78	74	104.96	27.44	6.79	33.41	150	329	P	V
	*	2480	80.99	26.99	54	-	-	-	-	-	-	A	V
		2498.88	48.68	-25.32	74	47.87	27.4	6.81	33.4	150	329	P	V
		2498.88	23.89	-30.11	54	-	-	-	-	-	-	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11ax HE160 Partial 996 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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)
802.11ax HE160 Partial 996/67 CH 114 5570MHz		5448.16	61.11	-12.89	74	52.24	31.59	10.23	32.95	100	342	P	H
		5464.24	54.64	-13.56	68.2	45.73	31.63	10.24	32.96	100	342	A	H
		5447.68	42.51	-11.49	54	33.64	31.59	10.23	32.95	100	342	P	H
	*	5570	96.5			87.51	31.64	10.32	32.97	100	342	A	H
	*	5570	86.87			77.88	31.64	10.32	32.97	100	342	P	H
		5725.625	60.67	-7.53	68.2	51.23	31.9	10.48	32.94	100	342	A	H
		5447.92	65	-9	74	56.13	31.59	10.23	32.95	100	270	P	V
		5468.08	59.29	-8.91	68.2	50.37	31.64	10.24	32.96	100	270	A	V
		5442.64	45.5	-8.5	54	36.66	31.57	10.22	32.95	100	270	P	V
	*	5570	100.52			91.53	31.64	10.32	32.97	100	270	A	V
	*	5570	91.88			82.89	31.64	10.32	32.97	100	270	P	V
		5725.625	64.65	-3.55	68.2	55.21	31.9	10.48	32.94	100	270	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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)
BT CH 78 2480MHz + 802.11ax HE160 Partial 996/67 CH 114 5570MHz + LTE Band 7 Ch21100 2535MHz		4960	52.01	-21.99	74	42.38	31.06	11.31	32.74	100	0	P	H
		4960	27.22	-26.78	54	-	-	-	-	-	-	A	H
		7440	45.95	-28.05	74	61.51	36.56	13.67	65.79	100	0	P	H
		7440	21.16	-32.84	54	-	-	-	-	-	-	A	H
		11140	48.39	-25.61	74	57.33	39.68	17.51	66.13	100	0	P	H
		16710	49.55	-18.65	68.2	54.36	39.53	22.02	66.36	100	0	P	H
		4960	52.53	-21.47	74	42.9	31.06	11.31	32.74	100	0	P	V
		4960	27.74	-26.26	54	-	-	-	-	-	-	A	V
		7440	43.58	-30.42	74	59.14	36.56	13.67	65.79	100	0	P	V
		7440	18.79	-35.21	54	-	-	-	-	-	-	A	V
		11140	50.01	-23.99	74	58.95	39.68	17.51	66.13	100	0	P	V
		16710	48.93	-19.27	68.2	53.74	39.53	22.02	66.36	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz 2400~2483.5MHz + Band 2 - 5250-5350MHz + LTE Band 7 (LF)

WIFI Ant. Simultaneously	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)
		90.14	26.91	-16.59	43.5	43.45	14.59	1.38	32.51	-	-	P	H
		199.75	31.85	-11.65	43.5	47.52	14.79	2.08	32.54	-	-	P	H
		576.11	32.13	-13.87	46	35.55	25.86	3.45	32.73	-	-	P	H
		647.89	40.8	-5.2	46	43.37	26.42	3.67	32.66	170	347	QP	H
		792.42	33.27	-12.73	46	32.68	28.24	4.01	31.66	-	-	P	H
		900.09	32.59	-13.41	46	30.32	29.15	4.32	31.2	-	-	P	H
													H
													H
2.4GHz													H
802.11ax													H
LF													H
+													H
5GHz													H
802.11ax		54.25	33.32	-6.68	40	52.44	12.35	1.08	32.55	100	157	QP	V
LF		199.75	33.13	-10.37	43.5	48.8	14.79	2.08	32.54	-	-	P	V
+		576.11	35.82	-10.18	46	39.24	25.86	3.45	32.73	-	-	P	V
LTE Band 7		647.89	41.12	-4.88	46	43.69	26.42	3.67	32.66	100	0	QP	V
LF		792.42	35.63	-10.37	46	35.04	28.24	4.01	31.66	-	-	P	V
		864.2	35.33	-10.67	46	33.19	29.26	4.22	31.34	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (LF)

WIFI Ant. Simultaneously	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)
2.4GHz BT LF + 802.11ax HE160 Partial 996/67 LF + LTE Band 7 LF		90.14	26.62	-16.88	43.5	43.16	14.59	1.38	32.51	-	-	P	H
		199.75	30.8	-12.7	43.5	46.47	14.79	2.08	32.54	-	-	P	H
		480.08	26.17	-19.83	46	31.47	23.65	3.15	32.1	-	-	P	H
		647.89	40.96	-5.04	46	43.53	26.42	3.67	32.66	169	348	QP	H
		792.42	32.62	-13.38	46	32.03	28.24	4.01	31.66	-	-	P	H
		856.44	33.09	-12.91	46	31.02	29.25	4.19	31.37	-	-	P	H
													H
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													H
													H
		54.25	33.37	-6.63	40	52.49	12.35	1.08	32.55	100	157	QP	V
		199.75	33.24	-10.26	43.5	48.91	14.79	2.08	32.54	-	-	P	V
		647.89	40.9	-5.1	46	43.47	26.42	3.67	32.66	100	0	QP	V
		792.42	37.69	-8.31	46	37.1	28.24	4.01	31.66	-	-	P	V
		864.2	35.26	-10.74	46	33.12	29.26	4.22	31.34	-	-	P	V
		935.98	33.15	-12.85	46	29.82	29.89	4.41	30.97	-	-	P	V
													V
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													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (LF)

WIFI Ant. Simultaneously	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)
2.4GHz BT LF + 802.11ax HE160 Partial 996/67 LF + LTE Band 7 LF		89.17	26.47	-17.03	43.5	43.06	14.54	1.38	32.51	-	-	P	H
		199.75	33.47	-10.03	43.5	49.14	14.79	2.08	32.54	-	-	P	H
		576.11	34.11	-11.89	46	37.53	25.86	3.45	32.73	-	-	P	H
		647.89	40.98	-5.02	46	43.55	26.42	3.67	32.66	165	347	QP	H
		792.42	33.12	-12.88	46	32.53	28.24	4.01	31.66	-	-	P	H
		864.2	33.4	-12.6	46	31.26	29.26	4.22	31.34	-	-	P	H
													H
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													H
													H
													H
													H
		54.25	33.37	-6.63	40	52.49	12.35	1.08	32.55	100	157	QP	V
		199.75	33.96	-9.54	43.5	49.63	14.79	2.08	32.54	-	-	P	V
		647.89	41.11	-4.89	46	43.68	26.42	3.67	32.66	100	0	QP	V
		792.42	37.21	-8.79	46	36.62	28.24	4.01	31.66	-	-	P	V
		864.2	35.86	-10.14	46	33.72	29.26	4.22	31.34	-	-	P	V
		903.97	33.43	-12.57	46	31.17	29.1	4.33	31.17	-	-	P	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	**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 B. Radiated Spurious Emission

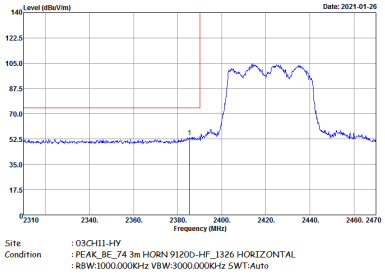
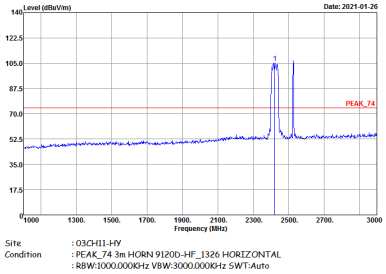
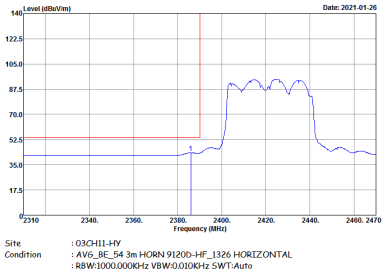
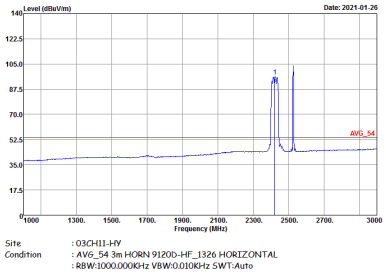
Test Engineer :	Bill Cheng, Fu Chen, and Troye Hsieh	**Temperature :**	18.8~24°C
		Relative Humidity :	33.2~66.1%

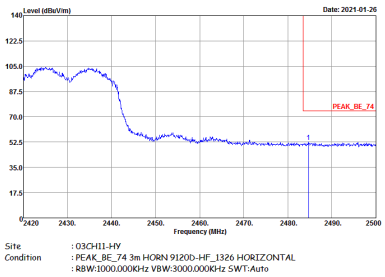
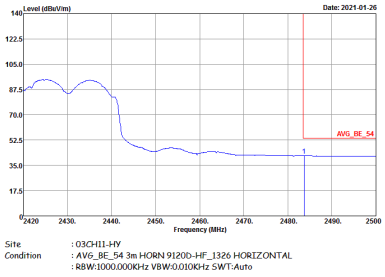
Note symbol

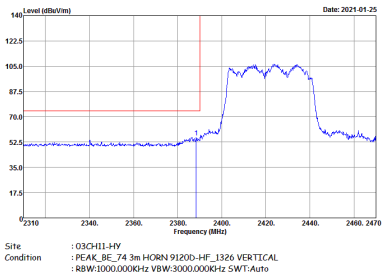
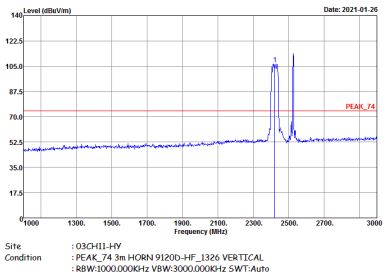
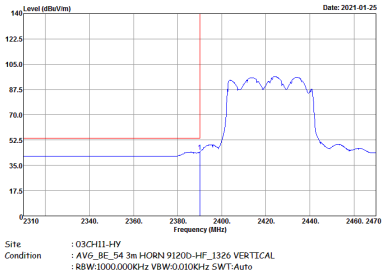
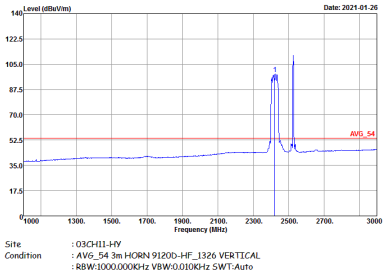
-L	**Low channel location**
-R	**High channel location**

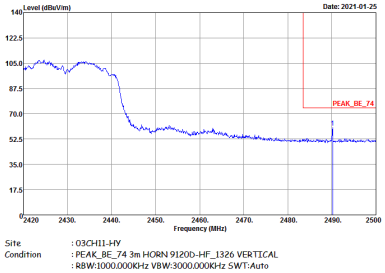
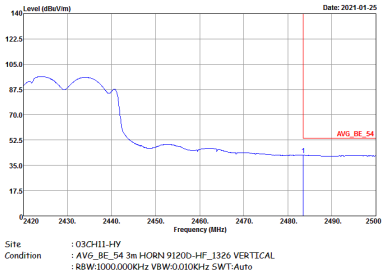
2.4GHz 2400~2483.5MHz + Band 2 - 5250-5350MHz + LTE Band 7

WIFI 802.11ax HE40 Full (Band Edge @ 3m)

ANT	802.11ax HE40 Full CH03 2422MHz - L	
	Horizontal	Fundamental
Peak		
Avg.		

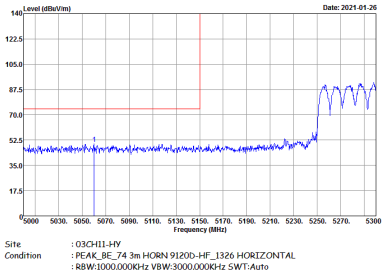
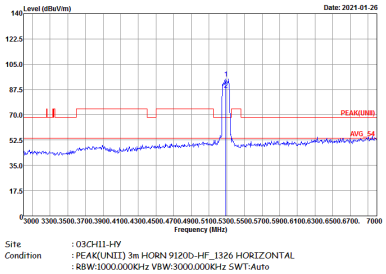
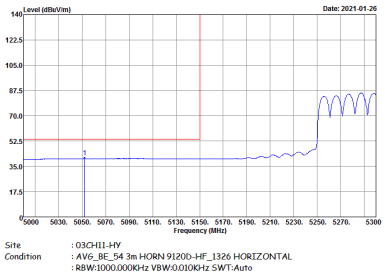
ANT	802.11ax HE40 Full CH03 2422MHz - R	
	Horizontal	Fundamental
Peak		Left Blank
Avg.		Left Blank

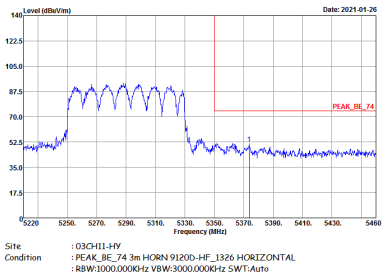
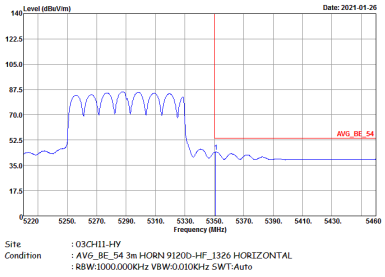
ANT	802.11ax HE40 Full CH03 2422MHz - L	
	Vertical	Fundamental
Peak		
Avg.		

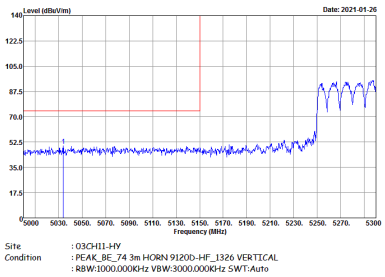
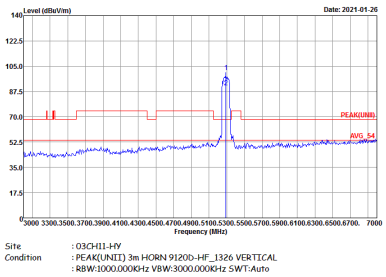
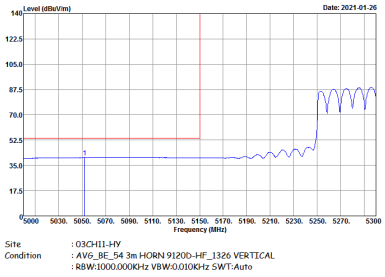
ANT	802.11ax HE40 Full CH03 2422MHz - R	
	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

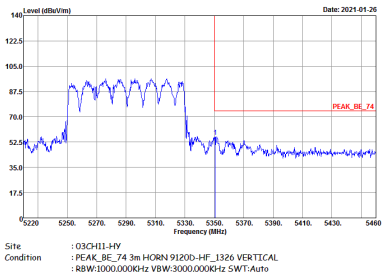
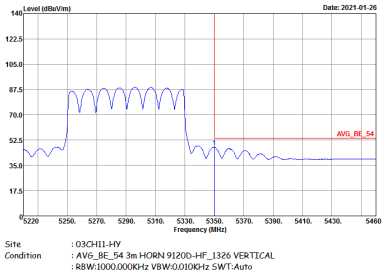
Band 2 5250~5350MHz

WIFI 802.11ax HE80 Full (Band Edge @ 3m)

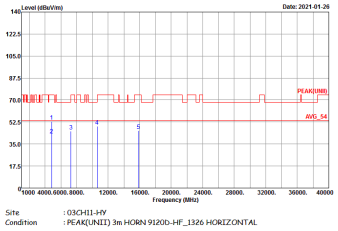
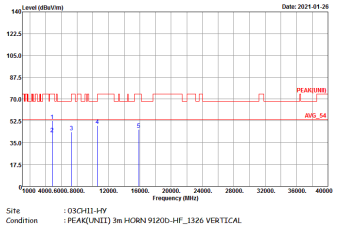
ANT	802.11ax HE80 Full CH58 5290MHz - L	
	Horizontal	Fundamental
Peak		
Avg.		

ANT	802.11ax HE80 Full CH58 5290MHz - R	
	Horizontal	Fundamental
Peak		Left Blank
Avg.		Left Blank

ANT	802.11ax HE80 Full CH58 5290MHz - L	
	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNII) 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	

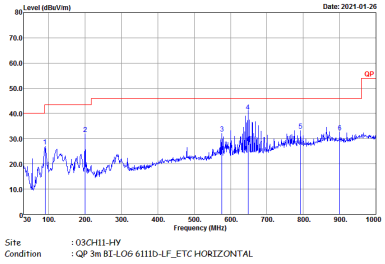
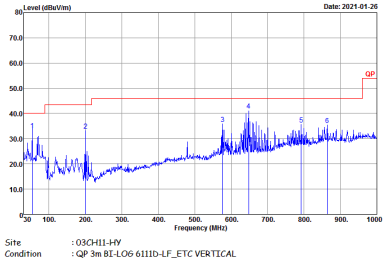
ANT	802.11ax HE80 Full CH58 5290MHz - R	
	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

2.4GHz 2400~2483.5MHz + Band 2 - 5250-5350MHz + LTE Band 7 (Harmonic @ 3m)

ANT	802.11ax HE40 Ch03 2422MHz + 802.11ax HE80 Ch58 5290MHz + LTE Band 7 Ch21100 2535MHz	
	Horizontal	Vertical
Peak Avg.		

Emission Below 1GHz

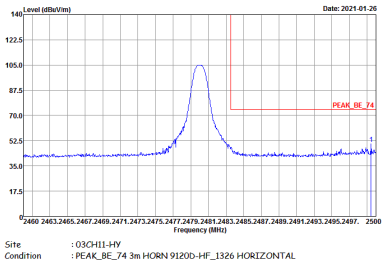
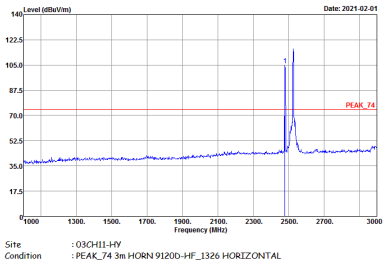
2.4GHz 2400~2483.5MHz + Band 2 - 5250-5350MHz + LTE Band 7 (LF)

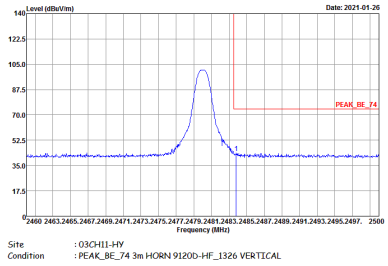
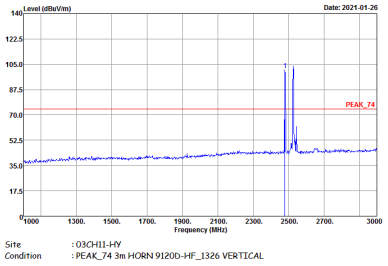
ANT	802.11ax HE40 Ch03 2422MHz + 802.11ax HE80 Ch58 5290MHz + LTE Band 7 LF	
	Horizontal	Vertical
QP / Peak		

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (Band Edge @ 3m)

2.4GHz 2400~2483.5MHz

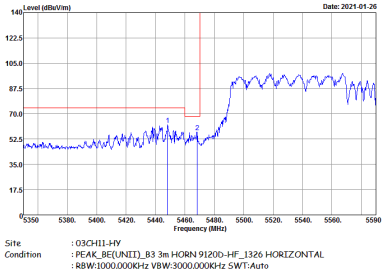
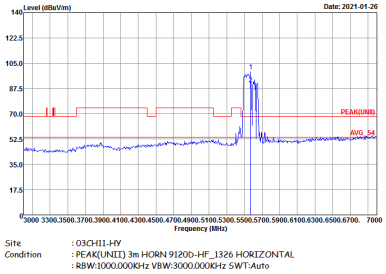
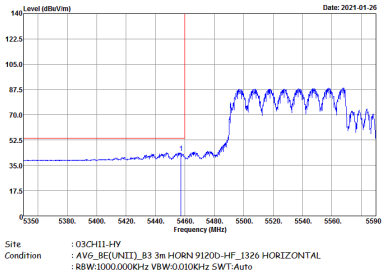
BT (Band Edge @ 3m)

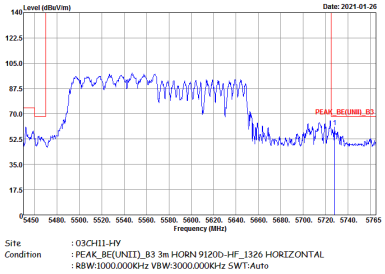
ANT	BT Ch78 2480MHz	
	Horizontal	Fundamental
Peak		

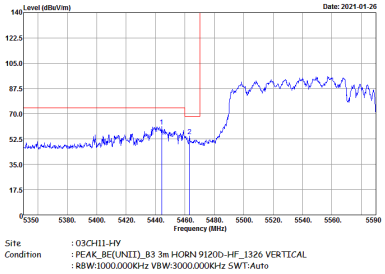
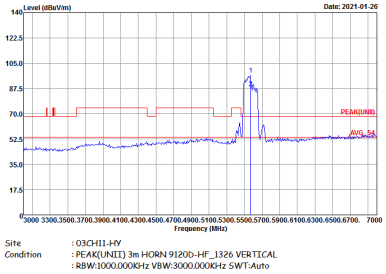
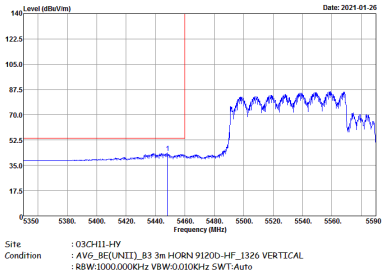
ANT	BT Ch78 2480MHz	
	Vertical	Fundamental
Peak		

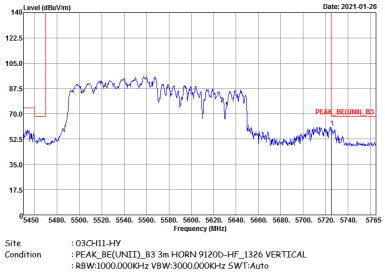
Band 3 5470~5725MHz

WIFI 802.11ax HE160 Partial RU 996 (Band Edge @ 3m)

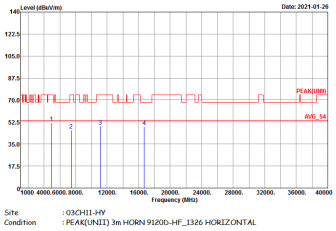
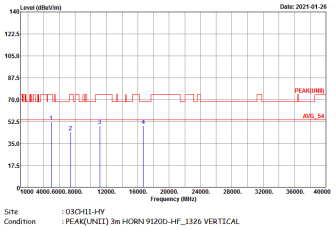
ANT	802.11ax HE160 Partial 996/67 CH114 55700MHz - L	
	Horizontal	Fundamental
Peak		
Avg.		

ANT	802.11ax HE160 Partial 996/67 CH114 55700MHz - R	
	Horizontal	Fundamental
Peak		

ANT	802.11ax HE160 Partial 996/67 CH114 55700MHz - L	
	Vertical	Fundamental
Peak		
Avg.		

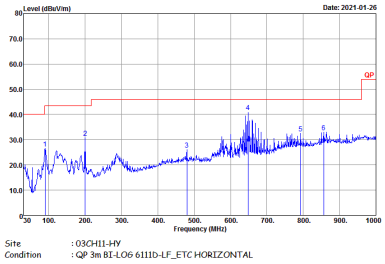
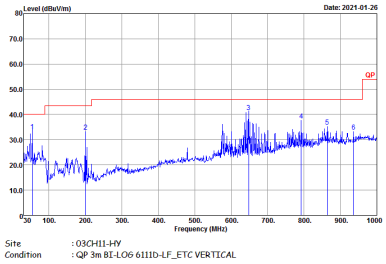
ANT	802.11ax HE160 Partial 996/67 CH114 55700MHz - R	
	Vertical	Fundamental
Peak		

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (Harmonic @ 3m)

ANT	BT Ch78 2480 MHz + 802.11ax HE160 Partial 996/67 CH114 55700MHz + LTE Band 7 Ch21100 2535MHz	
	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

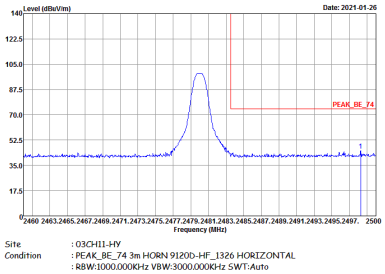
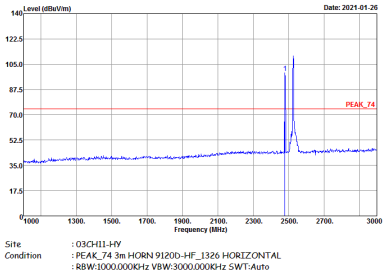
2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (LF)

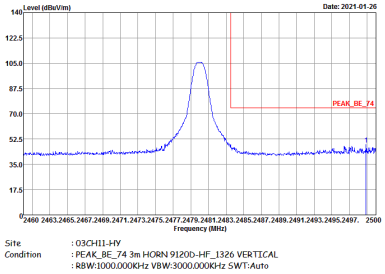
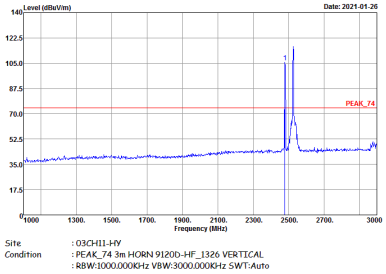
ANT	BT Ch78 2480 MHz + 802.11ax HE160 Partial 996/67 CH114 55700MHz + LTE Band 7 LF	
	Horizontal	Vertical
QP / Peak		

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (Band Edge @ 3m)

2.4GHz 2400~2483.5MHz

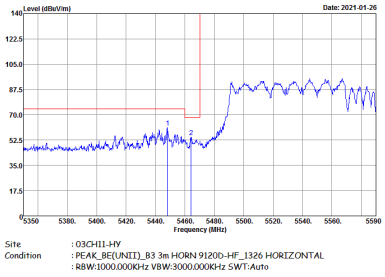
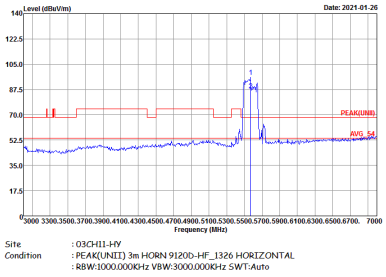
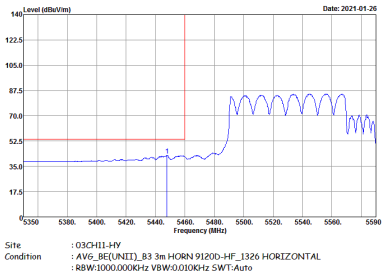
BT (Band Edge @ 3m)

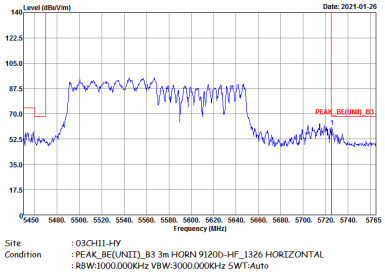
ANT	BT Ch78 2480MHz	
	Horizontal	Fundamental
Peak		

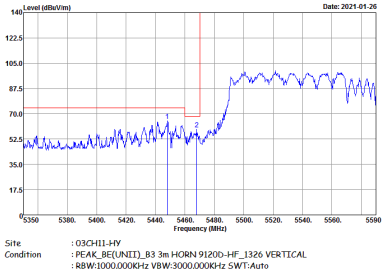
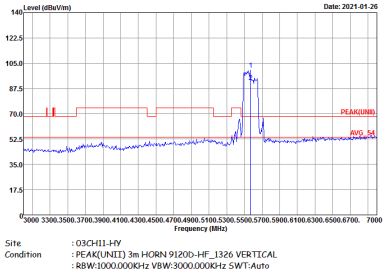
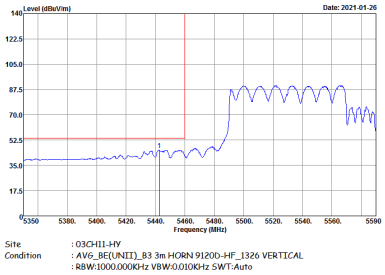
ANT	BT Ch78 2480MHz	
	Vertical	Fundamental
Peak		

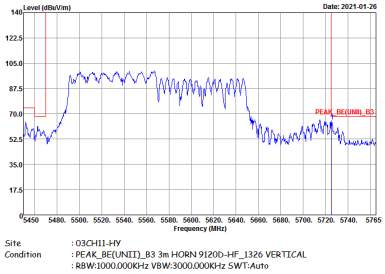
Band 3 5470~5725MHz

WIFI 802.11ax HE160 Partial 996 (Band Edge @ 3m)

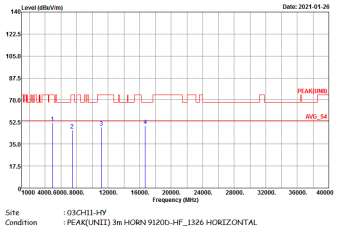
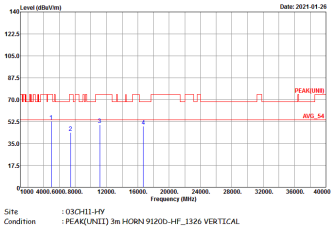
ANT	802.11ax HE160 Partial 996/67 CH114 55700MHz - L	
	Horizontal	Fundamental
Peak		
Avg.		

ANT	802.11ax HE160 Partial 996/67 CH114 55700MHz - R	
	Horizontal	Fundamental
Peak		

ANT	802.11ax HE160 Partial 996/67 CH114 55700MHz - L	
	Vertical	Fundamental
Peak		
Avg.		

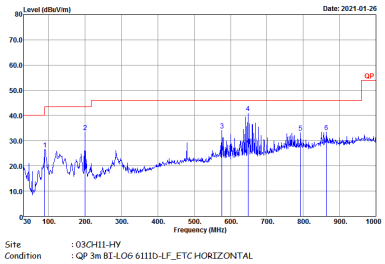
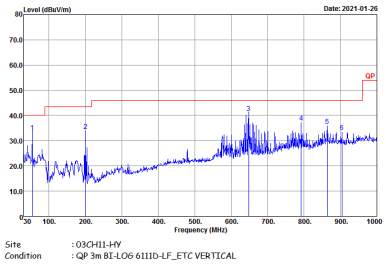
ANT	802.11ax HE160 Partial 996/67 CH114 55700MHz – R	
	Vertical	Fundamental
Peak		

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (Harmonic @ 3m)

ANT	BT Ch78 2480 MHz + 802.11ax HE160 Partial 996/67 CH114 55700MHz + LTE Band 7 Ch21100 2535MHz	
	Horizontal	Vertical
Peak Avg.		

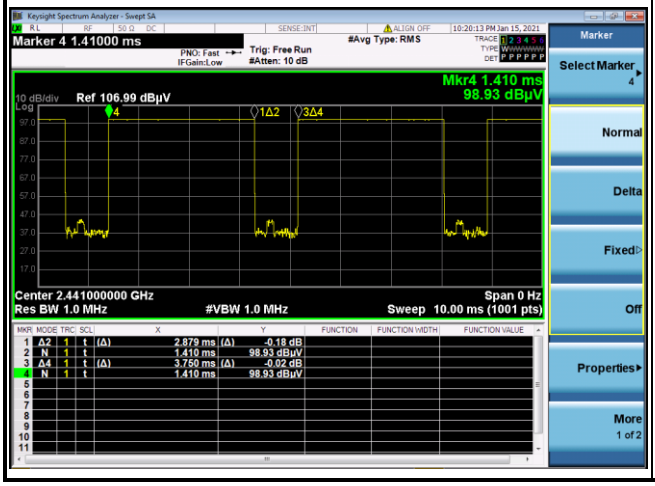
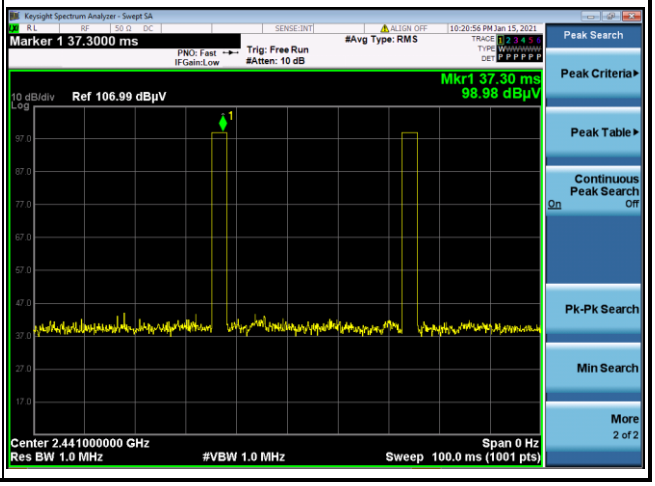
Emission below 1GHz

2.4GHz 2400~2483.5MHz + Band 3 - 5470-5725MHz + LTE Band 7 (LF)

ANT	BT Ch78 2480 MHz + 802.11ax HE160 Partial 996/67 CH114 55700MHz + LTE Band 7 LF	
	Horizontal	Vertical
QP / Peak		

Appendix C. Duty Cycle Plots

<Ant. 5>

DH5 on time (One Pulse) Plot on Channel 39	on time (Count Pulses) Plot on Channel 39
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. DH5 has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the period to have DH5 packet completing one hopping sequence is

2.88 ms x 20 channels = 57.6 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100 ms / 57.6 ms] = 2 hops

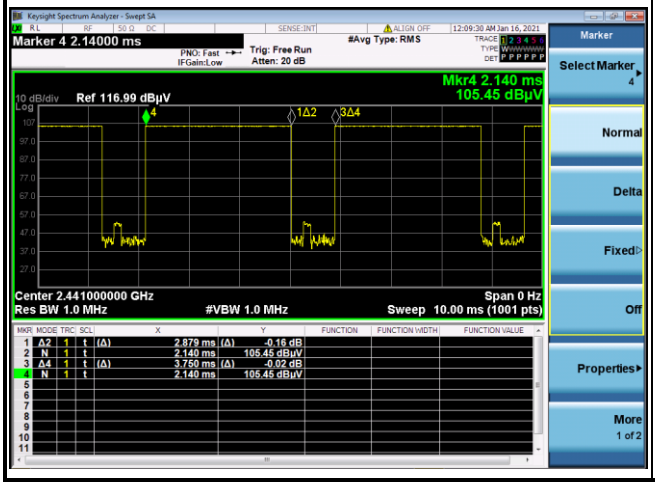
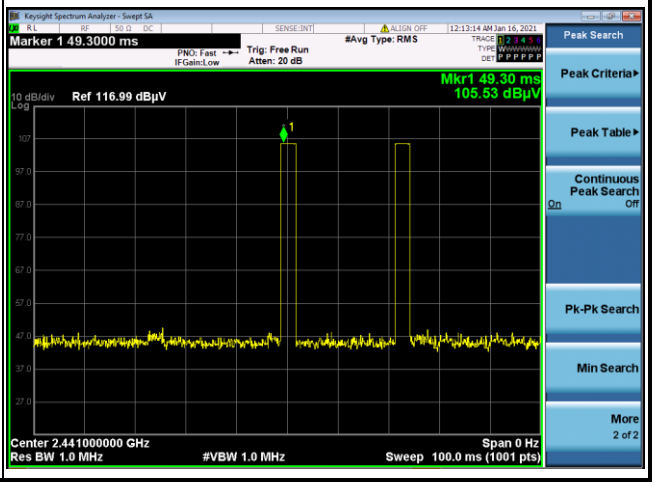
Thus, the maximum possible ON time:

2.88 ms x 2 = 5.76 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.76 ms/100 ms) = -24.79 dB

<Ant. 7>

DH5 on time (One Pulse) Plot on Channel 39	on time (Count Pulses) Plot on Channel 39
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. **DH5** has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the period to have DH5 packet completing one hopping sequence is

2.88 ms x 20 channels = 57.6 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100 ms / 57.6 ms] = 2 hops

Thus, the maximum possible ON time:

2.88 ms x 2 = 5.76 ms

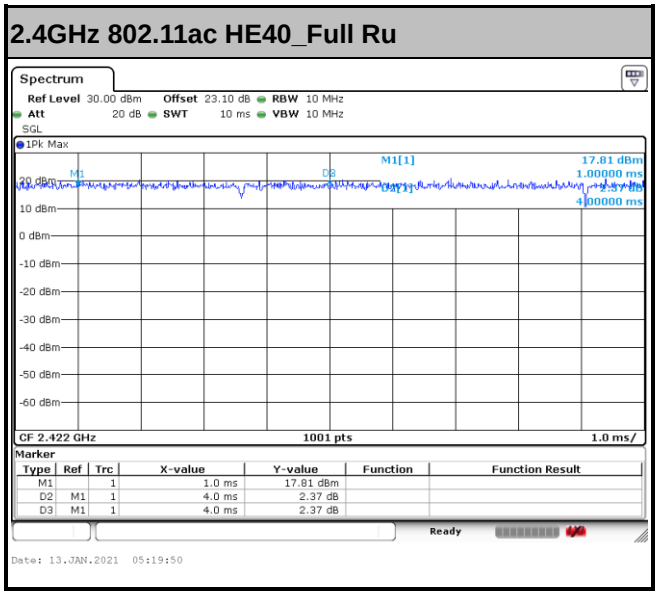
Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.76 ms/100 ms) = -24.79 dB

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
5+7	2.4GHz 802.11ax HE40 Full RU for Ant 5	100.00	-	-	10Hz	0.00
5+7	2.4GHz 802.11ax HE40 Full RU for Ant 7	100.00	-	-	10Hz	0.00
11+8	5GHz 802.11ax HE80 Full RU for Ant. 11	100.00	-	-	10Hz	0.00
11+8	5GHz 802.11ax HE80 Full RU for Ant. 8	100.00	-	-	10Hz	0.00
11+8	5GHz 802.11ax HE160 Full RU for Ant. 11	100.00	-	-	10Hz	0.00
11+8	5GHz 802.11ax HE160 Full RU for Ant. 8	100.00	-	-	10Hz	0.00

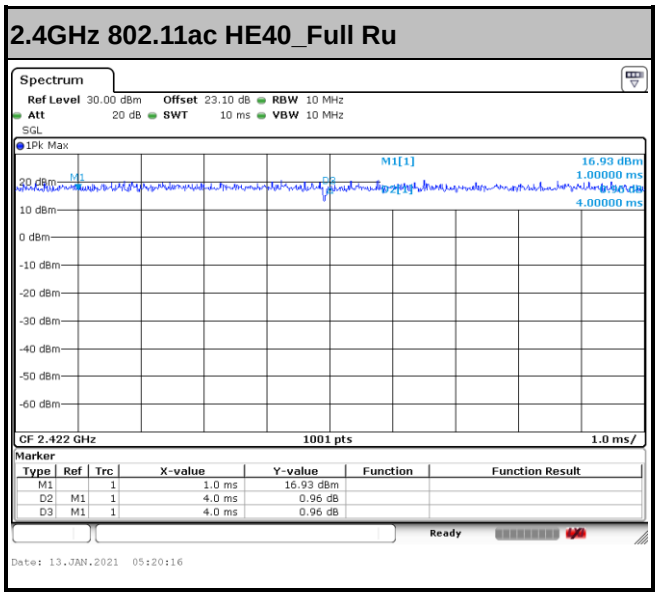
MIMO <Ant. 5>

2.4GHz 802.11ac HE40_Full Ru

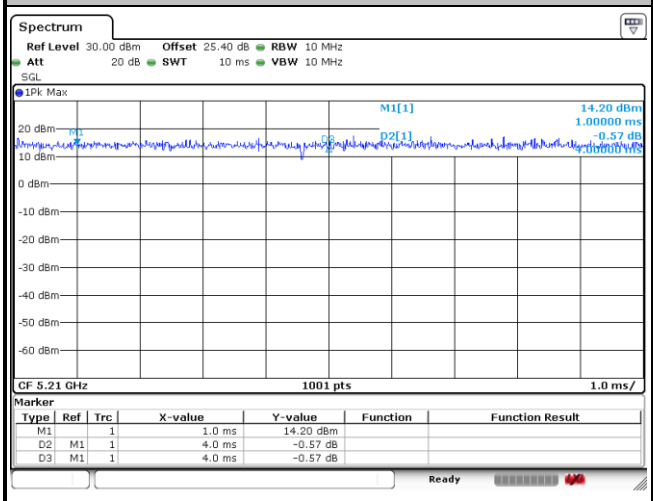
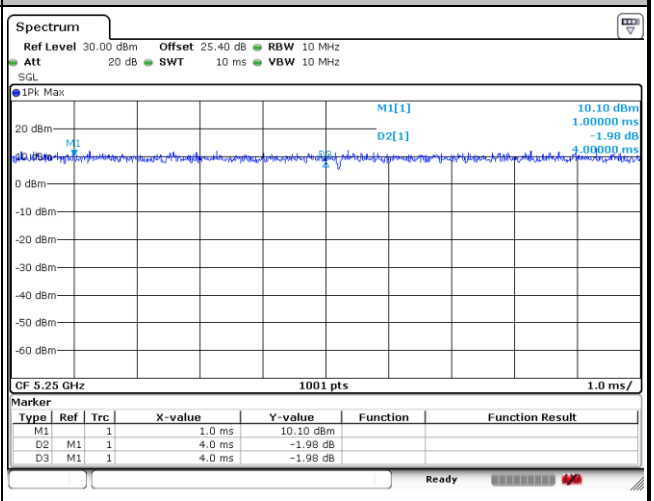


MIMO <Ant. 7>

2.4GHz 802.11ac HE40_Full Ru



MIMO <Ant. 11>

802.11ax HE80 Full RU	802.11ax HE160 Full RU
	

MIMO <Ant. 8>

802.11ax HE80 Full RU	802.11ax HE160 Full RU