FCC CO-LOCATION RADIO TEST REPORT

FCC ID	:	2AFZZK2G
Equipment	:	Mobile Phone
Brand Name	:	Xiaomi
Model Name	:	M2011K2G
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 Nov. 10, 2020 and testing was started from Nov. 16, 2020 and completed on Dec. 10, 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
FR0N0303H	01	Initial issue of report	Dec. 17, 2020

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 8.27 dB at 5112.580 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, NFC, WPC/WPT and GNSS.

Product Specification subjective to this standard	
Sample 1	Memory (8+256GB)
Sample 2	Memory (8+128GB)
Antenna Type	WWAN: PIFA Antenna WLAN **<2400 MHz ~ 2483.5 MHz>** <Ant. 5>: PIFA Antenna <Ant. 7>: PIFA Antenna **<5150 MHz ~ 5850 MHz>** <Ant. 8>: PIFA Antenna <Ant. 10>: 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: -1.35 Ant. 7: -1.87
2400 MHz ~ 2483.5 MHz (WLAN)	Peak Gain (dBi)	Ant. 5: -1.35 Ant. 7: -1.87
5150 MHz ~ 5250 MHz	Peak Gain (dBi)	Ant. 8: -2.58 Ant. 10: 1.38

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.**
	03CH16-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 E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 414788 D01 Radiated Test Site v01r01
- ANSI C63.10-2013

Remark:

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

2 Test Configuration of Equipment Under Test

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 for Bluetooth; X Plane for WLAN) were recorded in this report.

2.1 Carrier Frequency and Channel

2400-2483.5 MHz Bluetooth		2400-2483.5 MHz 802.11g	
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
78	2480	01	2412

5150~5250MHz 802.11ax HE160	
Channel	**Frequency (MHz)**
50	5250

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

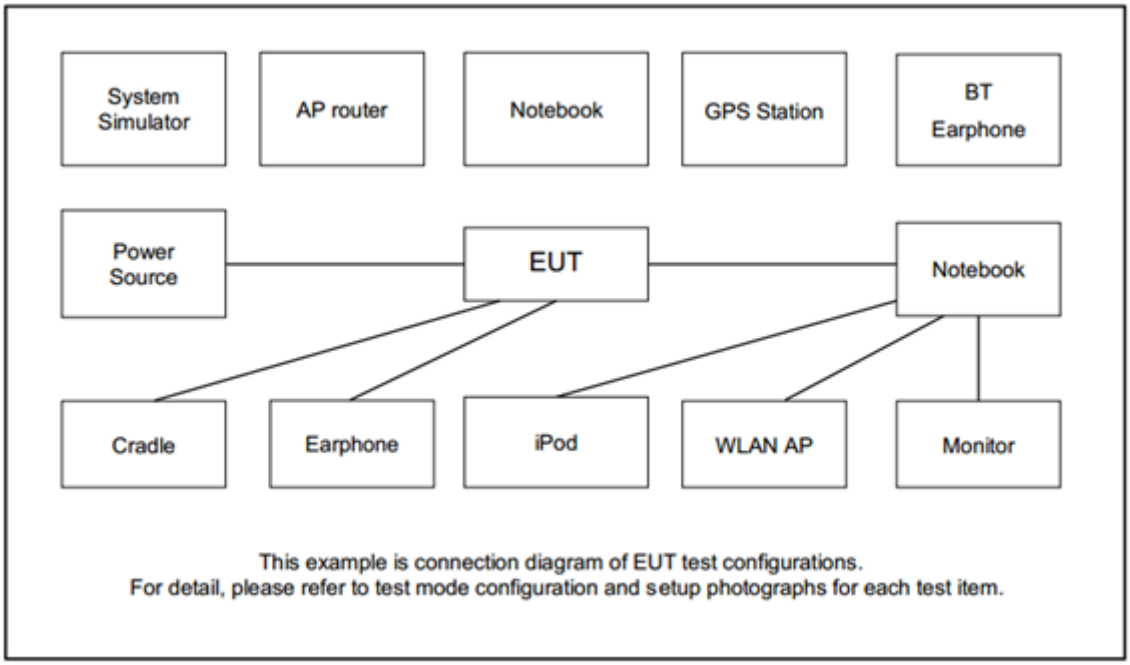
2.2 Test Mode

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

<Co-Location>

Modulation	Data Rate
2.4GHz 802.11g + 5GHz 802.11ax HE160 + LTE Band 7	**MCS0 + MCS0 + QPSK**
Bluetooth + 5GHz 802.11ax HE160 + LTE Band 7	**1Mbps + MCS0 + QPSK**
Bluetooth + 5GHz 802.11ax HE160 + 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	MT8821C	N/A	N/A	Unshielded, 1.8 m

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT V4.0.00158” was installed in Notebook which was programmed in order to 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.

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.

3.1.1 Limit of Radiated band edge and Spurious Emission Measurement

(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.

3.1.2 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 G) Unwanted emissions measurement.

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

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

(2) 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 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 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.

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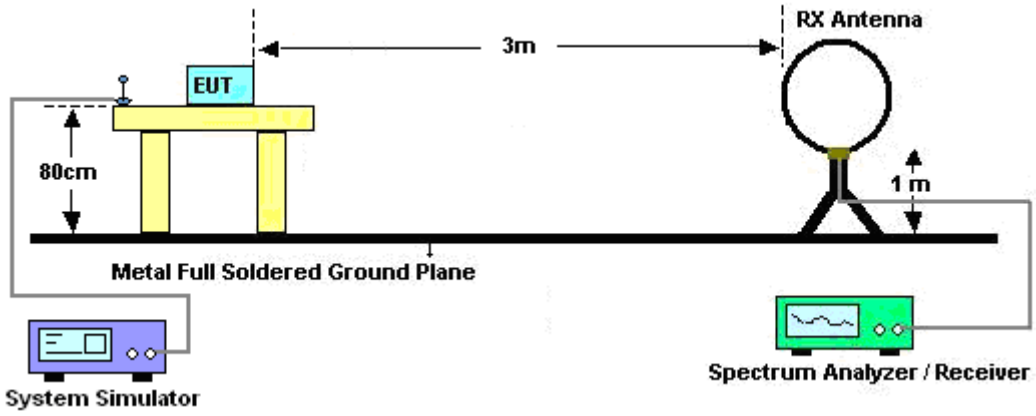
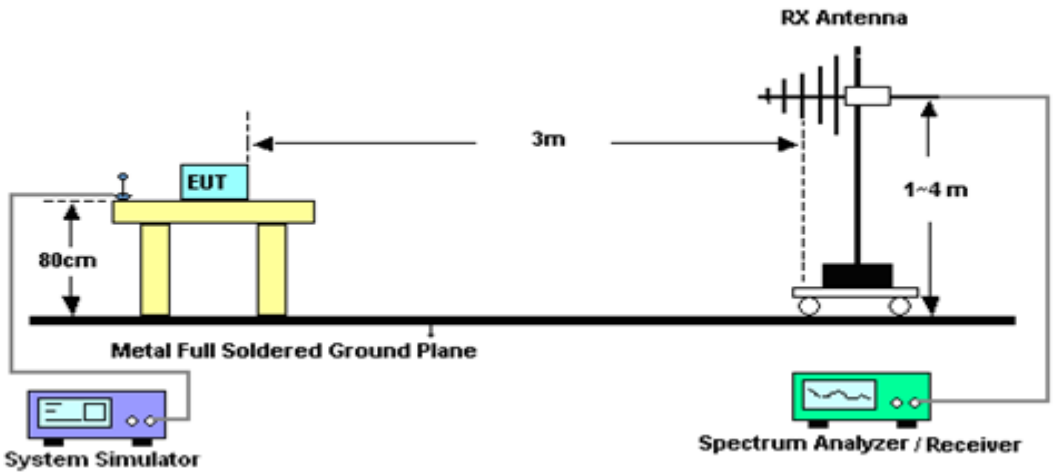
3.1.4 Test Setup

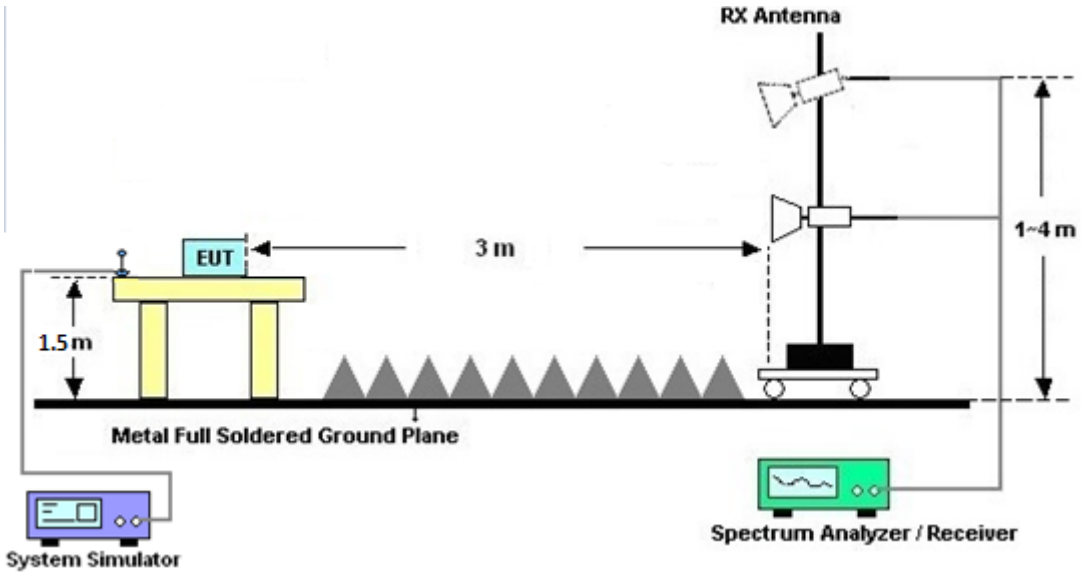
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line 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.

3.1.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and B.

3.1.7 Duty Cycle

Please refer to Appendix C.

3.1.8 Test Result of Radiated Spurious Emission

Please refer to Appendix A and B.

3.2 Antenna Requirements

3.2.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached Antenna or of an Antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

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
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jul. 14, 2020	Nov. 16, 2020~ Dec. 10, 2020	Jul. 13, 2021	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz~18GHz	Jul. 15, 2020	Nov. 16, 2020~ Dec. 10, 2020	Jul. 14, 2021	Radiation (03CH13-HY)
Hygrometer	TECPEL	DTM-303B	TP150115	N/A	N/A	Nov. 16, 2020~ Dec. 10, 2020	N/A	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590074	1GHz~18GHz	May 19, 2020	Nov. 16, 2020~ Dec. 10, 2020	May 18, 2021	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Oct. 28, 2020	Nov. 16, 2020~ Dec. 10, 2020	Oct. 27, 2021	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 20, 2020	Nov. 16, 2020~ Dec. 10, 2020	Mar. 19, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 12, 2020	Nov. 16, 2020~ Dec. 10, 2020	Mar. 11, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz~40GHz	Mar. 12, 2020	Nov. 16, 2020~ Dec. 10, 2020	Mar. 11, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz~40GHz	Mar. 12, 2020	Nov. 16, 2020~ Dec. 10, 2020	Mar. 11, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30MHz~18GHz	Feb. 12, 2020	Nov. 16, 2020~ Dec. 10, 2020	Feb. 11, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	804793/4	30MHz~18GHz	Feb. 12, 2020	Nov. 16, 2020~ Dec. 10, 2020	Feb. 11, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24961/4	30MHz~18GHz	Feb. 12, 2020	Nov. 16, 2020~ Dec. 10, 2020	Feb. 11, 2021	Radiation (03CH13-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Nov. 16, 2020~ Dec. 10, 2020	N/A	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Nov. 16, 2020~ Dec. 10, 2020	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Nov. 16, 2020~ Dec. 10, 2020	N/A	Radiation (03CH13-HY)
Software	AUDIX	E3 6.2009-8-24c	RK-001124	N/A	N/A	Nov. 16, 2020~ Dec. 10, 2020	N/A	Radiation (03CH13-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY53290045	20MHz~8.4GHz	Jan. 18, 2020	Nov. 16, 2020~ Dec. 10, 2020	Jan. 17, 2021	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz~40GHz	May 22, 2020	Nov. 16, 2020~ Dec. 10, 2020	May 21, 2021	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	0600789	18GHz~40GHz	Jul. 31, 2020	Nov. 16, 2020~ Dec. 10, 2020	Jul. 30, 2021	Radiation (03CH13-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40ST	SN5	6.75GHz High Pass Filter	Mar. 12, 2020	Nov. 16, 2020~ Dec. 10, 2020	Mar. 11, 2021	Radiation (03CH13-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN12	1.53GHz Low Pass Filter	Sep. 15, 2020	Nov. 16, 2020~ Dec. 10, 2020	Sep. 14, 2021	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60SS	SN2	3GHz High Pass Filter	Jul. 13, 2020	Nov. 16, 2020~ Dec. 10, 2020	Jul. 12, 2021	Radiation (03CH13-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))	**4.8**

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.8**

Appendix A. Radiated Spurious Emission

Test Engineer :	Daniel Lee, Jacky Hong, and Wilson Wu	Temperature :	20~25°C
		Relative Humidity :	50~60%

2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz + LTE B7 M CH

WIFI 802.11g + WIFI 802.11ax HE160 Full (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.
5+7/8+10		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		2389.59	56.66	-17.34	74	42.89	27.62	13.99	27.84	148	303	P	H
		2390	44.93	-9.07	54	31.16	27.62	13.99	27.84	148	303	A	H
	*	2412	108.2	-	-	94.45	27.58	14.01	27.84	148	303	P	H
	*	2412	100.54	-	-	86.79	27.58	14.01	27.84	148	303	A	H
													H
													H
		2387.595	54.52	-19.48	74	40.75	27.62	13.99	27.84	400	36	P	V
		2389.905	43.73	-10.27	54	29.96	27.62	13.99	27.84	400	36	P	V
	*	2412	105.99	-	-	92.24	27.58	14.01	27.84	400	36	P	V
	*	2412	98.87	-	-	85.12	27.58	14.01	27.84	400	36	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11g + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

WIFI Ant. 5+7/8+10	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 Full CH 50 5250MHz		5116.74	54.82	-19.18	74	43.67	31.97	6.6	27.42	110	126	P	H
		5137.54	44.37	-9.63	54	33.26	31.92	6.6	27.41	110	126	A	H
	*	5250	94.57	-	-	84.02	31.3	6.64	27.39	110	126	P	H
	*	5250	84.56	-	-	74.01	31.3	6.64	27.39	110	126	A	H
		5423.04	52.12	-21.88	74	41.17	31.59	6.7	27.34	110	126	P	H
		5371.24	42.42	-11.58	54	31.7	31.38	6.69	27.35	110	126	A	H
		5118.56	53.43	-20.57	74	42.29	31.96	6.6	27.42	100	281	P	V
		5124.02	44.42	-9.58	54	33.29	31.95	6.6	27.42	100	281	A	V
	*	5250	95.58	-	-	85.03	31.3	6.64	27.39	100	281	P	V
	*	5250	85.1	-	-	74.55	31.3	6.64	27.39	100	281	A	V
		5390.28	52.87	-21.13	74	42.07	31.46	6.69	27.35	100	281	P	V
		5384.4	43.11	-10.89	54	32.33	31.44	6.69	27.35	100	281	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 1 - 5150~5250MHz

WIFI 802.11g + WIFI 802.11ax HE160 Full (Harmonic @ 3m)

WIFI Ant. 5+7/8+10	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)
802.11g CH 01 2412MHz + 802.11ax HE160 Full CH 50 5250MHz		4824	49.35	-24.65	74	39.69	31.15	5.98	27.47	100	0	P	H
		10500	46.52	-21.68	68.2	53.09	39.9	9.95	56.42	100	0	P	H
		15750	45.33	-28.67	74	50.44	38.1	12.53	55.74	100	0	P	H
													H
		4824	49.19	-24.81	74	39.53	31.15	5.98	27.47	100	0	P	V
		10500	48.08	-20.12	68.2	54.65	39.9	9.95	56.42	100	0	P	V
		15750	45.42	-28.58	74	50.53	38.1	12.53	55.74	100	0	P	V
													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 1 - 5150~5250MHz + LTE B7 M CH
BT + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

WIFI Ant. 5/8+10	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	106.04	-	-	92.29	27.5	14.07	27.82	108	144	P	H
	*	2480	81.22	-	-	-	-	-	-	-	-	A	H
		2499.84	56.54	-17.46	74	42.77	27.5	14.09	27.82	108	144	P	H
		2499.84	31.72	-22.28	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	100.04	-	-	86.29	27.5	14.07	27.82	291	58	P	V
	*	2480	75.22	-	-	-	-	-	-	-	-	P	V
		2499.8	55.47	-18.53	74	41.7	27.5	14.09	27.82	291	58	P	V
		2499.8	30.65	-23.35	54	-	-	-	-	-	-	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

BT + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

WIFI Ant. 5/8+10	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 Full CH 50 5250MHz		5100.62	54.37	-19.63	74	43.19	32	6.6	27.42	203	0	P	H
		5112.58	45.73	-8.27	54	34.58	31.97	6.6	27.42	203	0	A	H
	*	5250	98.46	-	-	87.91	31.3	6.64	27.39	203	0	P	H
	*	5250	87.86	-	-	77.31	31.3	6.64	27.39	203	0	A	H
		5375.16	52.94	-21.06	74	42.21	31.4	6.68	27.35	203	0	P	H
		5373.76	43.84	-10.16	54	33.11	31.4	6.68	27.35	203	0	A	H
		5040.56	52.39	-21.61	74	41.6	31.66	6.57	27.44	246	13	P	V
		5124.02	43.11	-10.89	54	31.98	31.95	6.6	27.42	246	13	A	V
	*	5250	90.92	-	-	80.37	31.3	6.64	27.39	246	13	P	V
	*	5250	81.54	-	-	70.99	31.3	6.64	27.39	246	13	A	V
		5406.8	51.22	-22.78	74	40.34	31.53	6.69	27.34	246	13	P	V
		5395.32	41.58	-12.42	54	30.76	31.48	6.69	27.35	246	13	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 1 - 5150~5250MHz

BT + WIFI 802.11ax HE160 Full (Harmonic @ 3m)

WIFI Ant. 5/8+10	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 Full CH 50 5250MHz		4960	49.8	-24.2	74	39.8	31.42	6.03	27.45	100	0	P	H
		4960	24.98	-29.02	54	-	-	-	-	-	-	A	H
		7440	43.31	-30.69	74	55.15	36.82	8.62	57.28	100	0	P	H
		7440	18.49	-35.51	54	-	-	-	-	-	-	A	H
		10500	47.31	-20.89	68.2	53.88	39.9	9.95	56.42	100	0	P	H
		15750	45.93	-28.07	74	51.04	38.1	12.53	55.74	100	0	P	H
		4960	49.63	-24.37	74	39.63	31.42	6.03	27.45	100	0	P	V
		4960	24.81	-29.19	54	-	-	-	-	-	-	A	V
		7440	43.83	-30.17	74	55.67	36.82	8.62	57.28	100	0	P	V
		7440	19.01	-34.99	54	-	-	-	-	-	-	A	V
		10500	46.78	-21.42	68.2	53.35	39.9	9.95	56.42	100	0	P	V
		15750	45.35	-28.65	74	50.46	38.1	12.53	55.74	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 1 - 5150~5250MHz + LTE B7 M CH

BT + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

WIFI Ant. 7/8+10	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	105.5	-	-	91.75	27.5	14.07	27.82	121	98	P	H
	*	2480	80.71	-	-	-	-	-	-	-	-	A	H
		2499.32	55.86	-18.14	74	42.09	27.5	14.09	27.82	121	98	P	H
		2499.32	31.07	-22.93	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	102.86	-	-	89.11	27.5	14.07	27.82	331	72	P	V
	*	2480	78.07	-	-	-	-	-	-	-	-	P	V
		2495.4	58.7	-15.3	74	44.93	27.5	14.09	27.82	331	72	P	V
		2495.4	33.91	-20.09	54	-	-	-	-	-	-	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

BT + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

WIFI Ant. 7/8+10	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 Full CH 50 5250MHz		5107.64	54.2	-19.8	74	43.04	31.98	6.6	27.42	259	326	P	H
		5118.04	45.7	-8.3	54	34.56	31.96	6.6	27.42	259	326	A	H
	*	5250	98.16	-	-	87.61	31.3	6.64	27.39	259	326	P	H
	*	5250	86.95	-	-	76.4	31.3	6.64	27.39	259	326	A	H
		5358.92	53.68	-20.32	74	43.02	31.34	6.68	27.36	259	326	P	H
		5351.08	44.09	-9.91	54	33.47	31.3	6.68	27.36	259	326	A	H
		5114.92	54.11	-19.89	74	42.96	31.97	6.6	27.42	252	13	P	V
		5113.62	43.74	-10.26	54	32.59	31.97	6.6	27.42	252	13	A	V
	*	5250	94.4	-	-	83.85	31.3	6.64	27.39	252	13	P	V
	*	5250	83.88	-	-	73.33	31.3	6.64	27.39	252	13	A	V
		5350	52.51	-21.49	74	41.89	31.3	6.68	27.36	252	13	P	V
		5360.32	42.69	-11.31	54	32.03	31.34	6.68	27.36	252	13	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 1 - 5150~5250MHz

BT + WIFI 802.11ax HE160 Full (Harmonic @ 3m)

WIFI Ant. 7/8+10	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 Full CH 50 5250MHz		4960	49.06	-24.94	74	39.06	31.42	6.03	27.45	100	0	P	H
		4960	24.27	-29.73	54	-	-	-	-	-	-	A	H
		7440	43.05	-30.95	74	54.89	36.82	8.62	57.28	100	0	P	H
		7440	18.26	-35.74	54	-	-	-	-	-	-	A	H
		10500	47.4	-20.8	68.2	53.97	39.9	9.95	56.42	100	0	P	H
		15750	45.79	-28.21	74	50.9	38.1	12.53	55.74	100	0	P	H
		4960	49.96	-24.04	74	39.96	31.42	6.03	27.45	100	0	P	V
		4960	25.17	-28.83	54	-	-	-	-	-	-	A	V
		7440	43.53	-30.47	74	55.37	36.82	8.62	57.28	100	0	P	V
		7440	18.74	-35.26	54	-	-	-	-	-	-	A	V
		10500	47.13	-21.07	68.2	53.7	39.9	9.95	56.42	100	0	P	V
		15750	45.36	-28.64	74	50.47	38.1	12.53	55.74	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

WIFI 802.11g + WIFI 802.11ax HE160 Full (LF)

WIFI Ant. 5+7/8+10	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 802.11g + 5GHz 802.11ax HE160 Full LF		30.97	21.77	-18.23	40	29.31	24.21	0.48	32.23	-	-	P	H
		127	25.32	-18.18	43.5	38.73	17.76	0.99	32.16	-	-	P	H
		383.08	27.93	-18.07	46	36.72	21.22	1.69	31.7	-	-	P	H
		431.58	26.48	-19.52	46	33.68	22.94	1.78	31.92	-	-	P	H
		850.62	30.81	-15.19	46	31.19	28.93	2.48	31.79	-	-	P	H
		956.35	32.88	-13.12	46	30.43	30.66	2.71	30.92	100	0	P	H
													H
													H
													H
													H
													H
													H
		30.97	25.18	-14.82	40	32.72	24.21	0.48	32.23	-	-	P	V
		38.73	23.49	-16.51	40	35.05	20.18	0.53	32.27	-	-	P	V
		127.97	22.03	-21.47	43.5	35.55	17.66	0.99	32.17	-	-	P	V
		434.49	29.71	-16.29	46	36.91	22.95	1.79	31.94	-	-	P	V
		757.5	31.73	-14.27	46	33.15	28.03	2.36	31.81	-	-	P	V
		954.41	32.43	-13.57	46	29.99	30.68	2.7	30.94	100	0	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

BT + WIFI 802.11ax HE160 Full (LF)

WIFI Ant. 5/8+10	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 + 5GHz 802.11ax HE160 Full LF		61.04	17.38	-22.62	40	37.07	11.93	0.65	32.27	-	-	P	H
		127	25.67	-17.83	43.5	39.08	17.76	0.99	32.16	-	-	P	H
		394.72	27.84	-18.16	46	36.11	21.67	1.72	31.66	-	-	P	H
		452.92	27.61	-18.39	46	34.71	23.19	1.82	32.11	-	-	P	H
		758.47	30.01	-15.99	46	31.44	28.02	2.37	31.82	-	-	P	H
		949.56	32.84	-13.16	46	30.66	30.5	2.69	31.01	100	0	P	H
													H
													H
													H
													H
													H
													H
		30.97	25.85	-14.15	40	33.39	24.21	0.48	32.23	-	-	P	V
		59.1	23.08	-16.92	40	42.66	12.07	0.63	32.28	-	-	P	V
		138.64	22.47	-21.03	43.5	35.92	17.71	1.03	32.19	-	-	P	V
		399.57	30.04	-15.96	46	38.07	21.88	1.73	31.64	-	-	P	V
		437.4	29.71	-16.29	46	36.93	22.96	1.79	31.97	-	-	P	V
		957.32	32.68	-13.32	46	30.24	30.63	2.72	30.91	100	0	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

BT + WIFI 802.11ax HE160 Full (LF)

WIFI Ant. 7/8+10	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 + 5GHz 802.11ax HE160 Full LF		127.97	24.69	-18.81	43.5	38.21	17.66	0.92	32.17	-	-	P	H
		383.08	26.59	-19.41	46	35.38	21.22	1.61	31.7	-	-	P	H
		551.86	26.66	-19.34	46	31.49	25.58	1.9	32.4	-	-	P	H
		782.72	32.17	-13.83	46	33.53	28.11	2.27	31.89	-	-	P	H
		926.28	33.37	-12.63	46	32.65	29.34	2.49	31.3	-	-	P	H
		957.32	33.99	-12.01	46	31.55	30.63	2.5	30.91	100	0	P	H
													H
													H
													H
													H
													H
													H
		30.97	25.12	-14.88	40	32.66	24.21	0.47	32.23	-	-	P	V
		133.79	21.72	-21.78	43.5	35.24	17.65	0.93	32.18	-	-	P	V
		390.84	28.85	-17.15	46	37.29	21.52	1.63	31.67	-	-	P	V
		445.16	29.24	-16.76	46	36.47	23.01	1.72	32.04	-	-	P	V
		783.69	32.63	-13.37	46	33.99	28.12	2.27	31.9	100	0	P	V
		953.44	32.07	-13.93	46	29.69	30.64	2.49	30.96	-	-	P	V
													V
													V
													V
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													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+2		(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 Plots

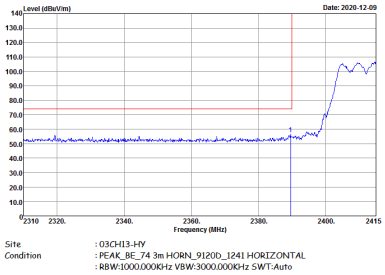
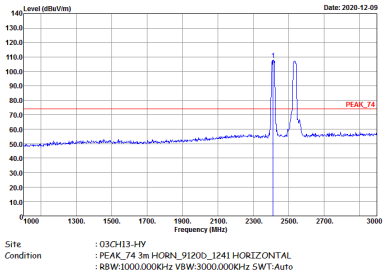
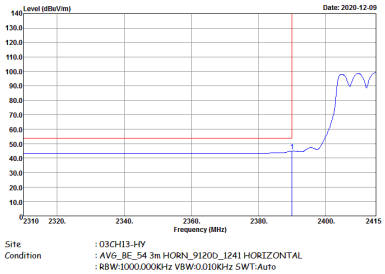
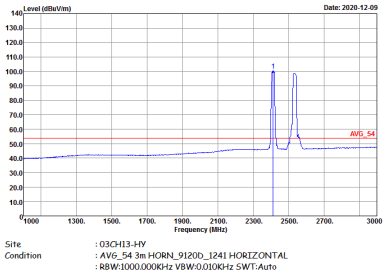
Test Engineer :	Daniel Lee, Jacky Hong, and Wilson Wu	**Temperature :**	20~25°C
		Relative Humidity :	50~60%

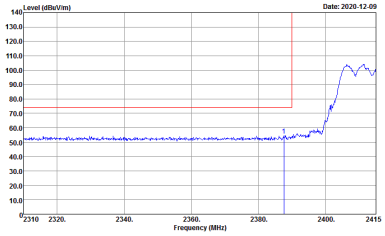
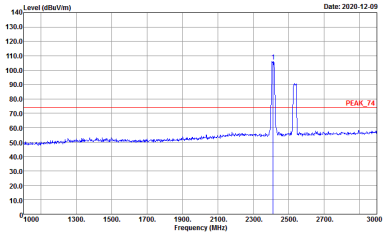
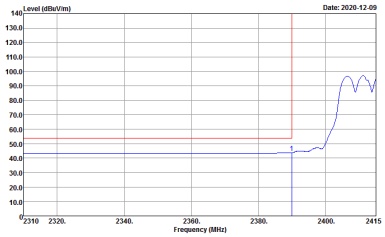
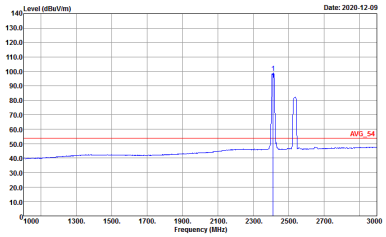
Note symbol

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

2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz + LTE B7 M CH

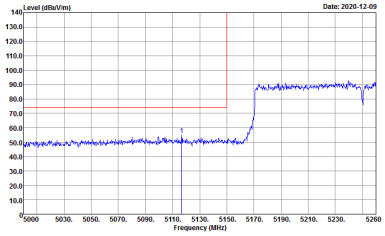
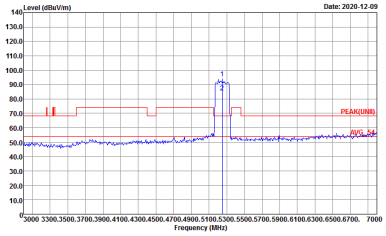
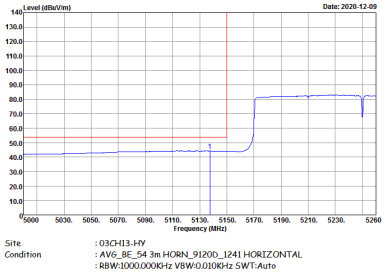
WIFI 802.11g + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

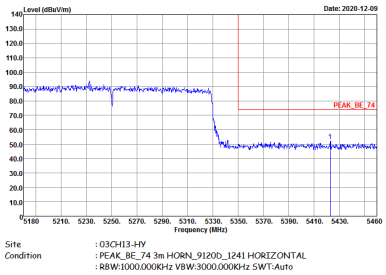
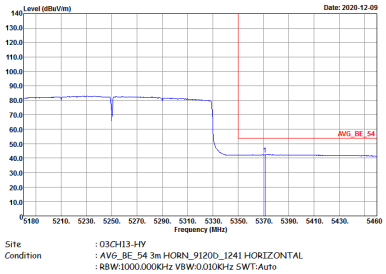
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
5+7/ 8+10	Horizontal	Fundamental
Peak		
Avg.		

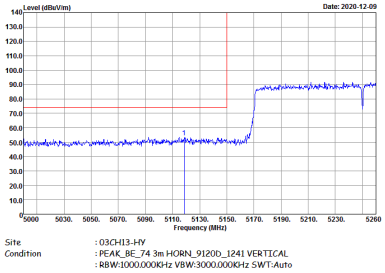
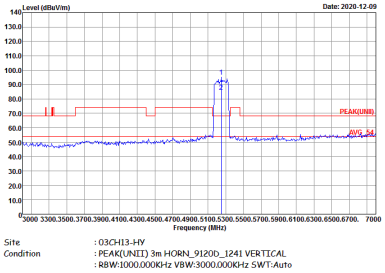
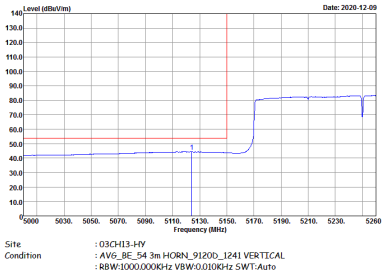
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
5+7/ 8+10	Vertical	Fundamental
Peak		
Avg.		

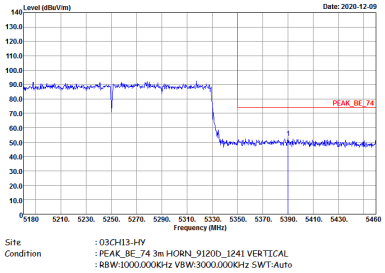
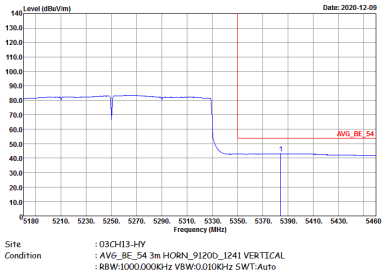
Band 1 5150~5250MHz

WIFI 802.11g + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - L	
5+7/ 8+10	Horizontal	Fundamental
Peak		
Avg.		Left blank

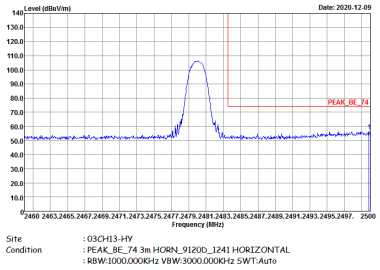
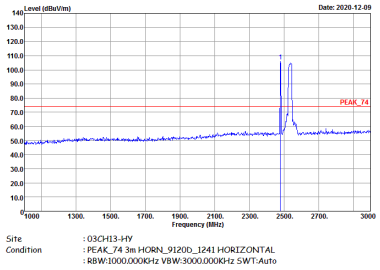
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - R	
5+7/ 8+10	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

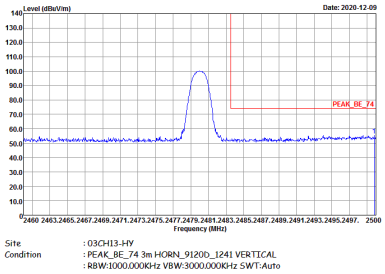
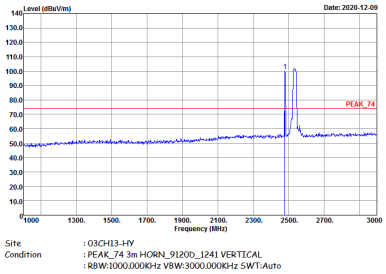
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - L	
5+7/ 8+10	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - R	
5+7/ 8+10	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz + LTE B7 M CH

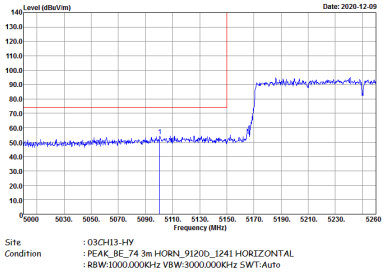
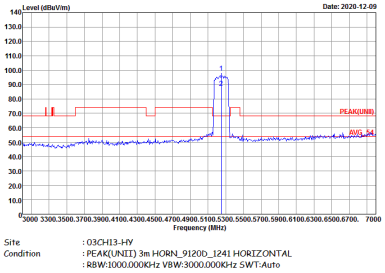
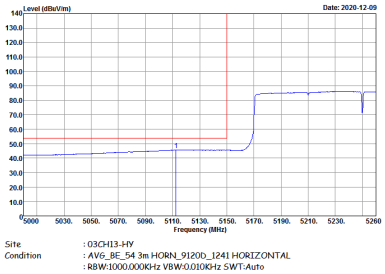
BT + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

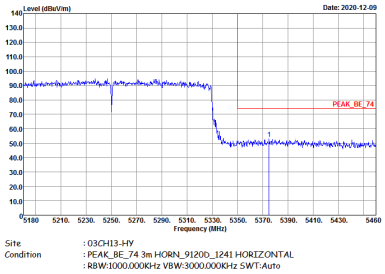
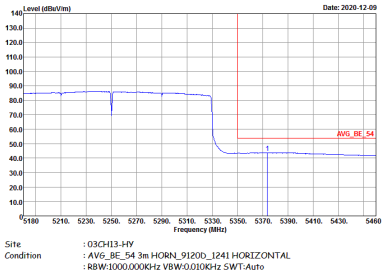
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
5/8+10	Horizontal	Fundamental
Peak		

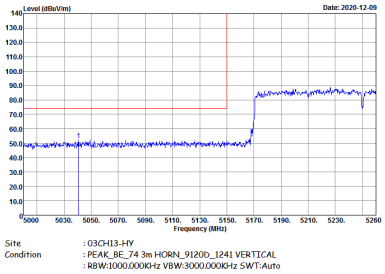
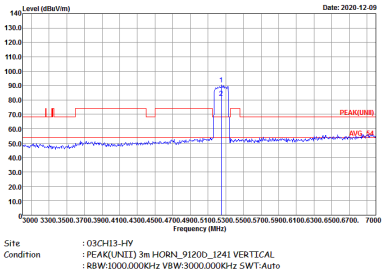
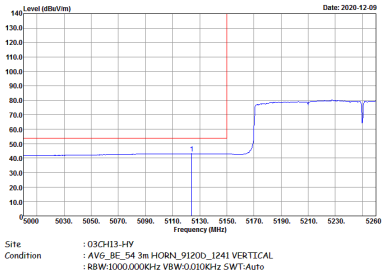
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
5/8+10	Vertical	Fundamental
Peak		

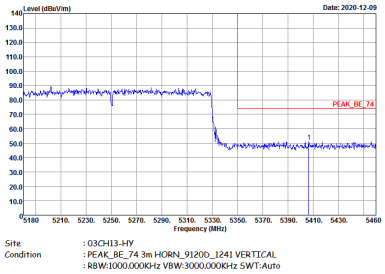
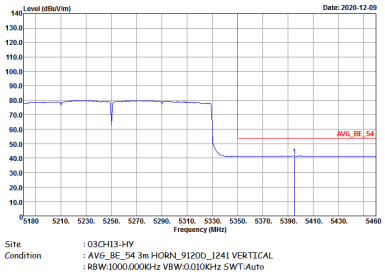
Band 1 5150~5250MHz

BT + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - L	
5/8+10	Horizontal	Fundamental
Peak		
Avg.		Left blank

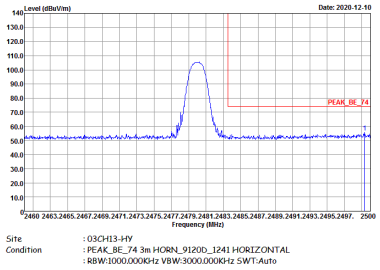
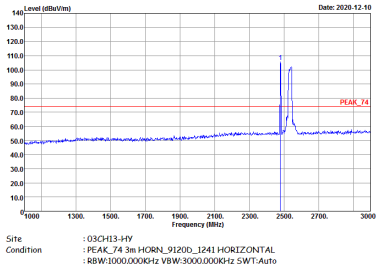
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - R	
5/8+10	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

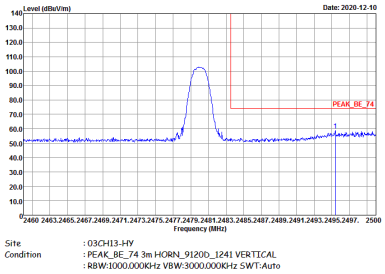
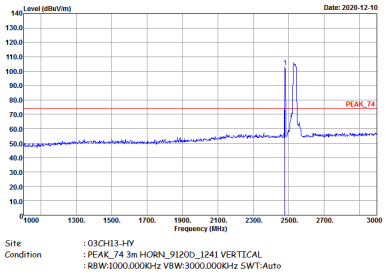
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - L	
5/8+10	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - R	
5/8+10	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz + LTE B7 M CH

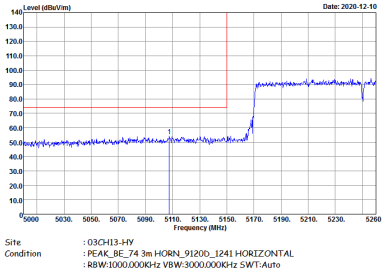
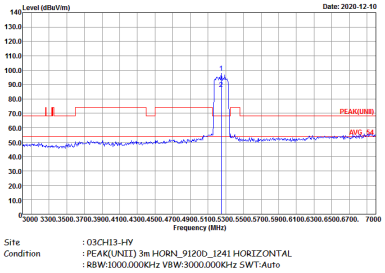
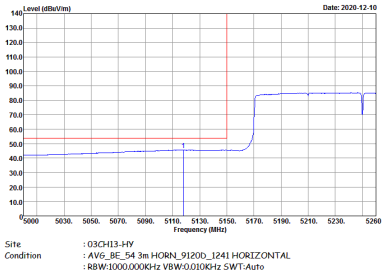
BT + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

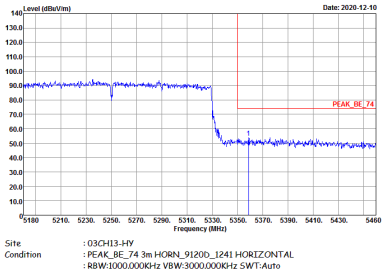
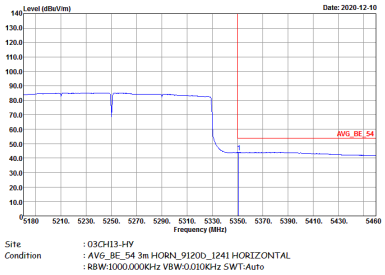
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
7/8+10	Horizontal	Fundamental
Peak		

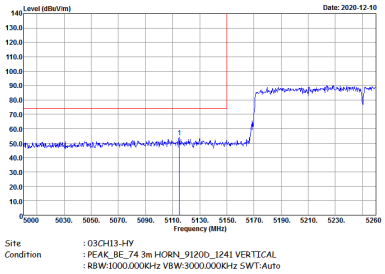
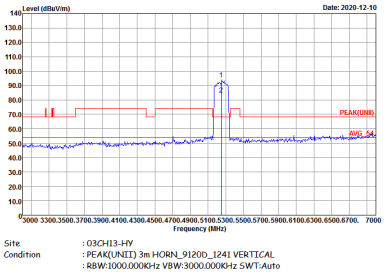
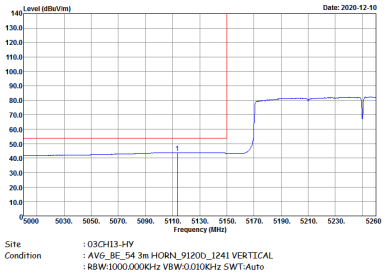
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
7/8+10	Vertical	Fundamental
Peak		

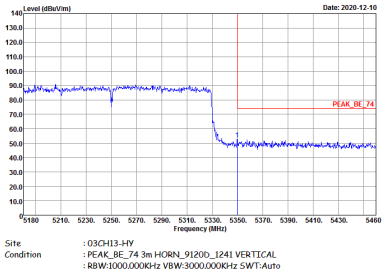
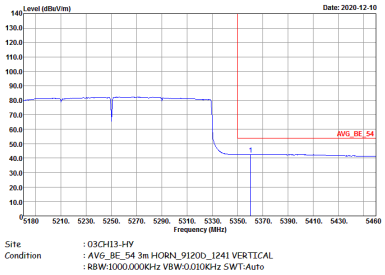
Band 1 5150~5250MHz

BT + WIFI 802.11ax HE160 Full (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - L	
7/8+10	Horizontal	Fundamental
Peak		
Avg.		Left blank

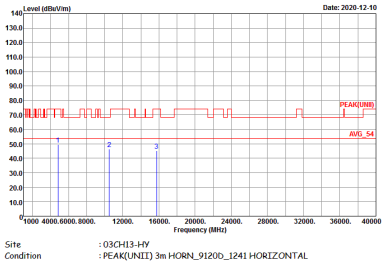
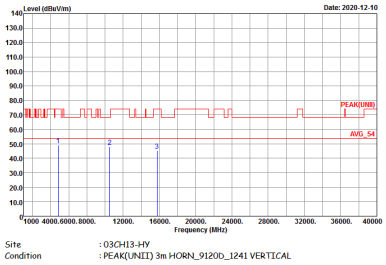
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - R	
7/8+10	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - L	
7/8+10	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH50 5250MHz - R	
7/8+10	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

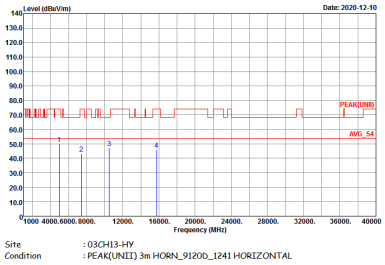
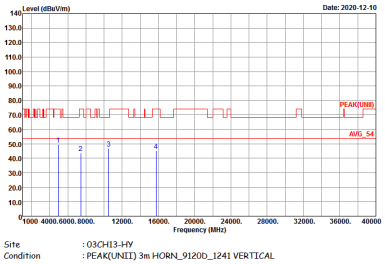
2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz + LTE B7 M CH

WIFI 802.11g + WIFI 802.11ax HE160 Full (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz + Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz + 802.11ax HE160 Full CH50 5250MHz	
5+7/ 8+10	Horizontal	Vertical
Peak Avg.		

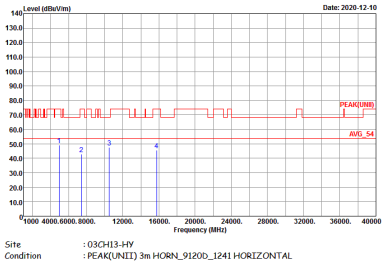
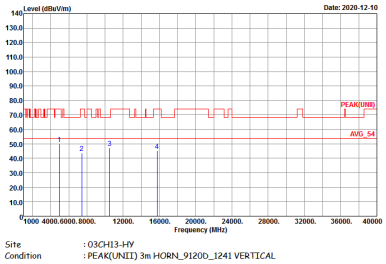
2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz + LTE B7 M CH

BT + WIFI 802.11ax HE160 Full (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz + Band 1 5150~5250MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz + 802.11ax HE160 Full CH50 5250MHz	
5/8+10	Horizontal	Vertical
Peak Avg.		

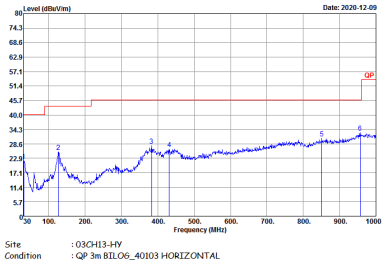
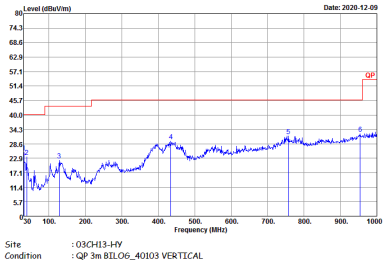
2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz + LTE B7 M CH

BT + WIFI 802.11ax HE160 Full (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz + Band 1 5150~5250MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz + 802.11ax HE160 Full CH50 5250MHz	
7/8+10	Horizontal	Vertical
Peak Avg.		

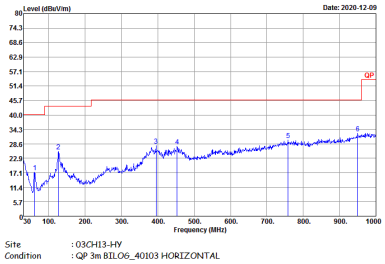
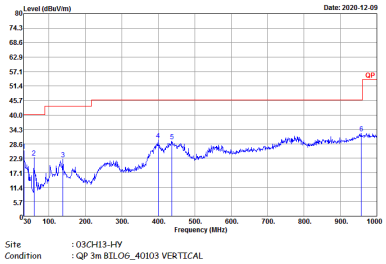
Emission below 1GHz

WIFI 802.11g + WIFI 802.11ax HE160 Full (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11g + 802.11ax HE160 Full LF	
5+7/ 8+10	Horizontal	Vertical
QP / Peak		

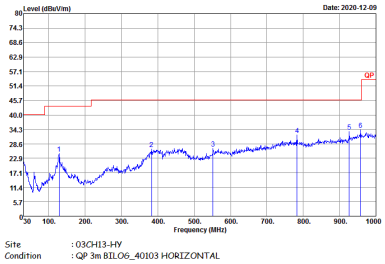
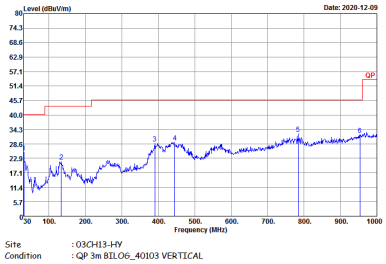
Emission below 1GHz

BT + WIFI 802.11ax HE160 Full (LF)

WIFI	2.4GHz 2400~2483.5MHz + Band 1 5150~5250MHz	
ANT	BT + 802.11ax HE160 Full LF	
5/8+10	Horizontal	Vertical
QP / Peak		

Emission below 1GHz

BT + WIFI 802.11ax HE160 Full (LF)

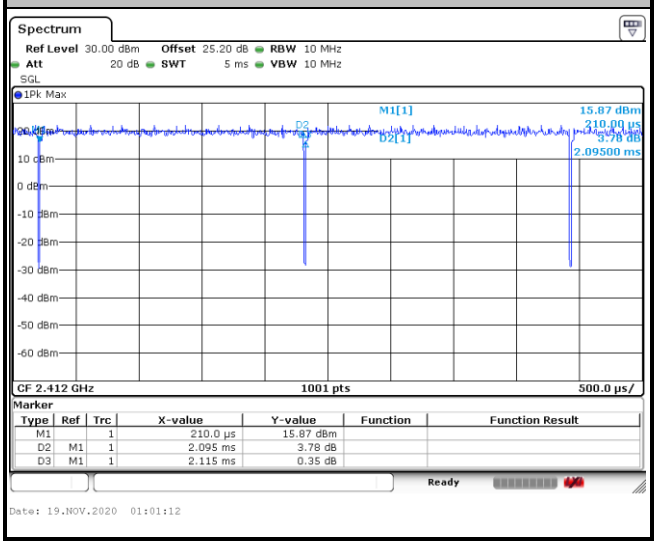
WIFI	2.4GHz 2400~2483.5MHz + Band 1 5150~5250MHz	
ANT	BT + 802.11ax HE160 Full LF	
7/8+10	Horizontal	Vertical
QP / Peak		

Appendix C. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
5+7	802.11g for Ant. 5	99.05	-	-	10Hz	0.04
5+7	802.11g for Ant. 7	99.29	-	-	10Hz	0.03
8+10	5GHz 802.11ax HE160 Full RU for Ant 8	100.00	-	-	10Hz	0.00
8+10	5GHz 802.11ax HE160 Full RU for Ant 10	100.00	-	-	10Hz	0.00

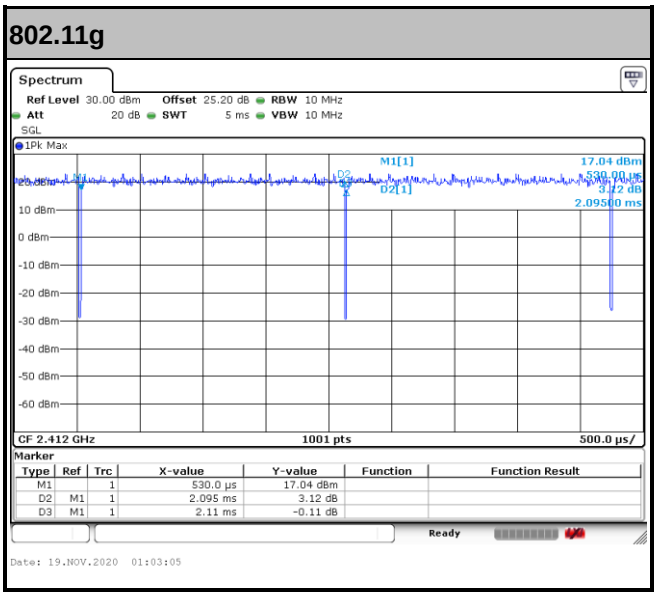
MIMO <Ant. 5>

802.11g



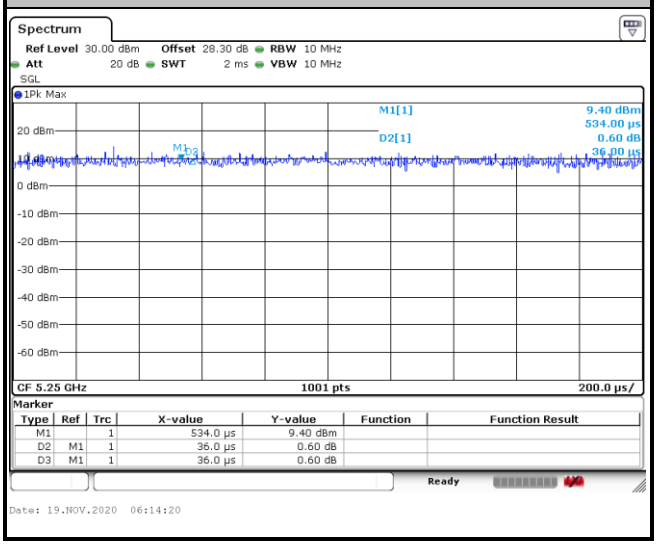
MIMO <Ant. 7>

802.11g



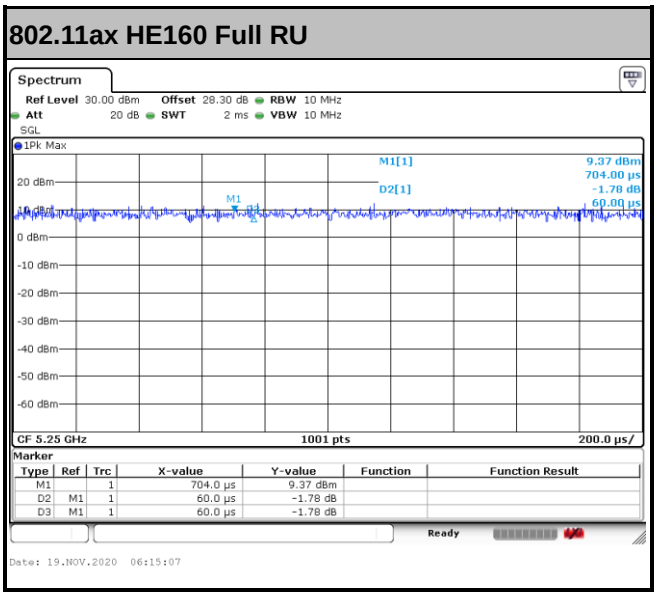
MIMO <Ant. 8>

802.11ax HE160 Full RU

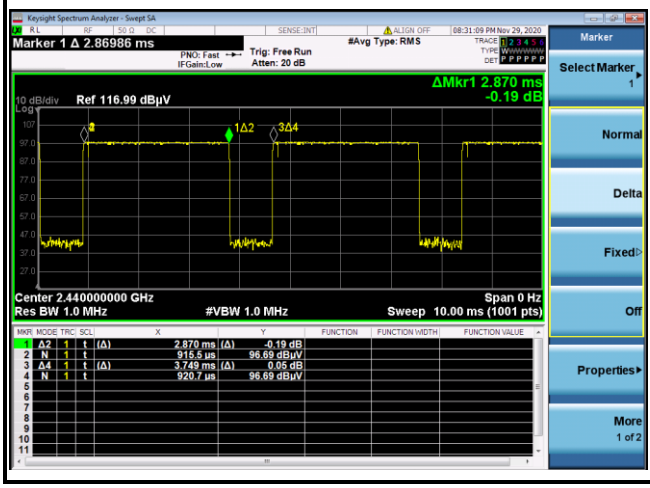
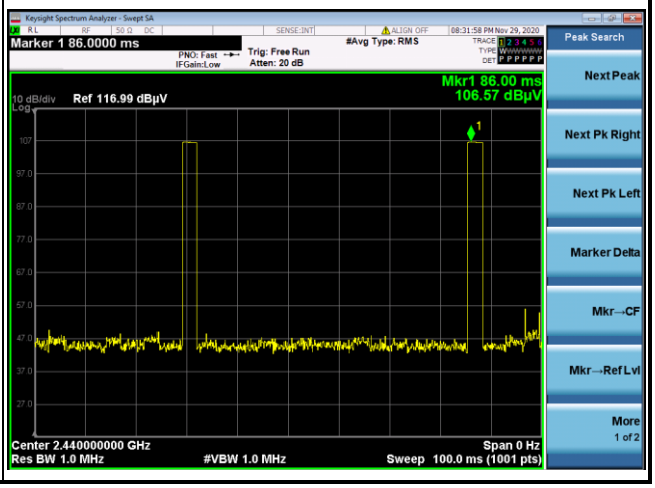


MIMO <Ant. 10>

802.11ax HE160 Full RU



<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 * 2.87 / 100 = 5.74 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.82 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

2.87 ms x 20 channels = 57.4 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 / 57.4 ms] = 2 hops

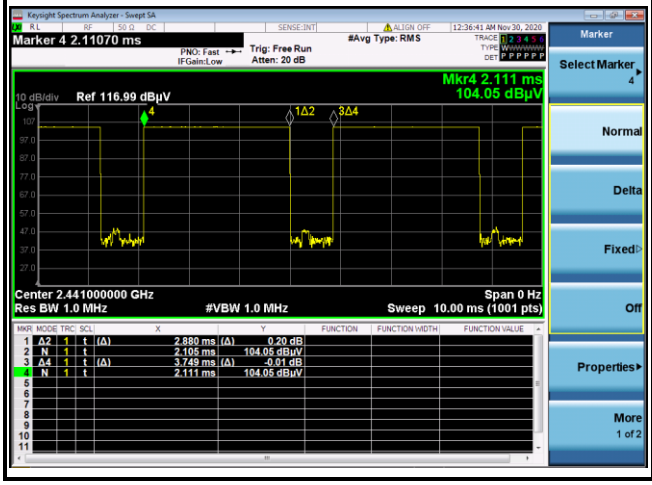
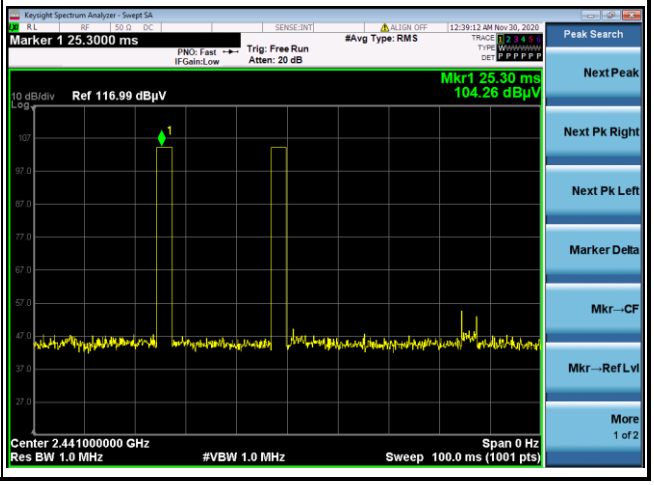
Thus, the maximum possible ON time:

2.87 ms x 2 = 5.74 ms

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

20 x log(5.74 ms/100 ms) = -24.82 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

2.87 ms x 20 channels = 57.4 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 / 57.4 ms] = 2 hops

Thus, the maximum possible ON time:

2.87 ms x 2 = 5.74 ms

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

20 x log(5.74 ms/100 ms) = -24.82 dB