FCC CO-LOCATION RADIO TEST REPORT

FCC ID	:	**2AFZZ122G**
Equipment	:	**Mobile Phone**
Brand Name	:	**Xiaomi**
Model Name	:	**2201122G**
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. 15, 2021 and testing was performed from Dec. 04, 2021 and completed on Dec. 17, 2021. We, Sporton International Inc. Wensan 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. Wensan Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory
No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR1N1013E	01	Initial issue of report	Dec. 21, 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 3.25 dB at 2500.000 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: Keven Cheng

Report Producer: Celery Wei

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, GNSS and WPC/WPT.

Product Feature	
Sample 1	EMMC 12G + 256GB
Sample 2	EMMC 8G + 256GB
Antenna Type	**WWAN:** PIFA Antenna **WLAN 2.4GHz:** <Ant. 17>: PIFA Antenna <Ant. 18>: PIFA Antenna **WLAN 5GHz:** <Ant. 16>: PIFA Antenna <Ant. 18>: PIFA Antenna **WLAN 6GHz:** <Ant. 16>: PIFA Antenna <Ant. 18>: PIFA Antenna **Bluetooth:** <Ant. 17>: PIFA Antenna <Ant. 18>: PIFA Antenna **GPS/Glonass/BDS/Galileo/SBAS/QZSS :** PIFA Antenna **NFC:** Planar Antenna **WPC/WPT:** Coil Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz (Bluetooth)	Peak Gain (dBi)	<Ant. 17>: -4.4 <Ant. 18>: -2.0
2400 MHz ~ 2483.5 MHz (WLAN)	Peak Gain (dBi)	<Ant. 17>: -4.4 <Ant. 18>: -2.0
5250 MHz ~ 5350 MHz	Peak Gain (dBi)	<Ant. 16>: -1.5 <Ant. 18>: -4.5

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. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH20-HY

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

FCC designation No.: TW3786

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

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, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find X plane as worst plane.

2.1 Carrier Frequency and Channel

2400-2483.5 MHz Bluetooth		2400-2483.5 MHz 802.11ax HE20		5250~5350 MHz 802.11ac VHT40	
Channel	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**
78	2480	11	2462	62	5310

2.2 Test Mode

The final test modes consider the modulation and the worst data rates as shown in the table below.

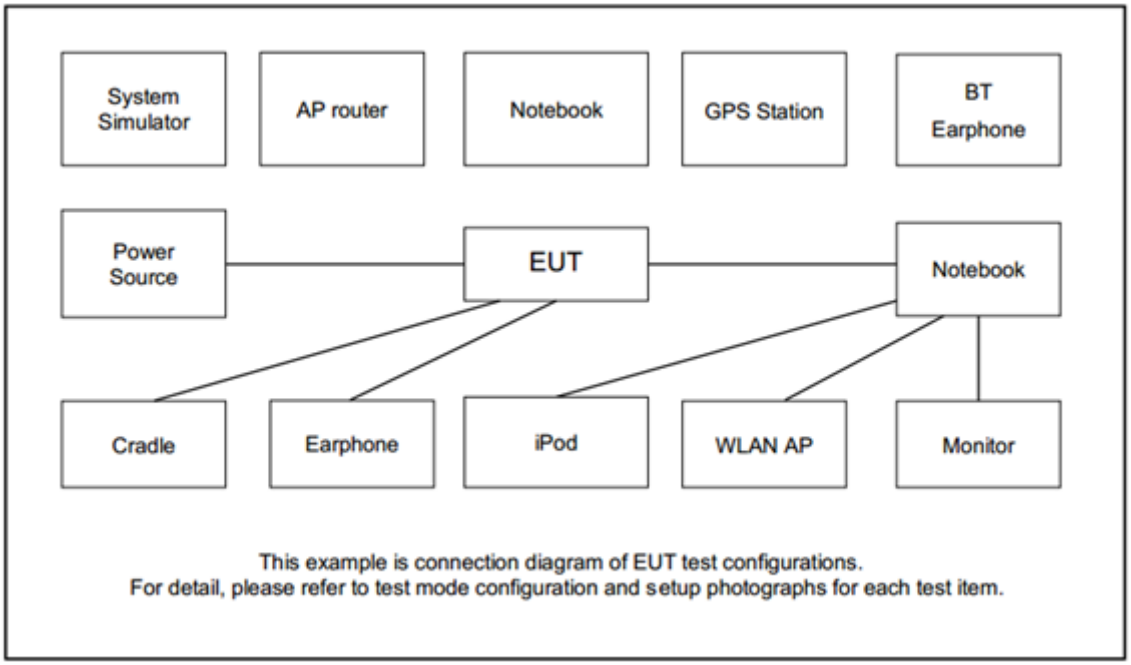
<Co-Location>

Modulation	Data Rate
2.4GHz 802.11ax HE20 (Partial RU26/8) for MIMO <Ant. 17 + 18> 5GHz 802.11ac VHT40 for <MIMO Ant. 16+18> + LTE Band 7	**MCS0 + MCS0 + QPSK**
Bluetooth for Ant. 17 + 5GHz 802.11ac VHT40 for <MIMO Ant. 16+18> + LTE Band 7	**1Mbps + MCS0 + QPSK**
Bluetooth for Ant. 18 + 5GHz 802.11ac VHT40 for <MIMO Ant. 16+18> + LTE Band 7	**1Mbps + MCS0 + QPSK**

Remark:

1. For Radiated Test Cases, the tests were performed with USB Cable 1 and Sample 1.
2. During the Radiated Spurious Emission test, the EUT turn on the WWAN functions simultaneously, the WWAN mode selected the frequency band with the closest transmission frequency and used the WLAN worst case output power.

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.	Notebook	DELL	Latitude5310	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
2.	Bluetooth Base Station	R&S	CBT32	N/A	N/A	Unshielded, 1.8 m
3.	System Simulator	R&S	MT8821C	N/A	N/A	Unshielded, 1.8 m

2.5 EUT Operation Test Setup

For Bluetooth test items, utility “QRCT Version 4.0.00158.0” 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.

For WLAN test items, EUT (SW: SKQ1.211006.001) get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

For WLAN Partial RU test items, utility “QSPR Version 5.0-00188” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

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

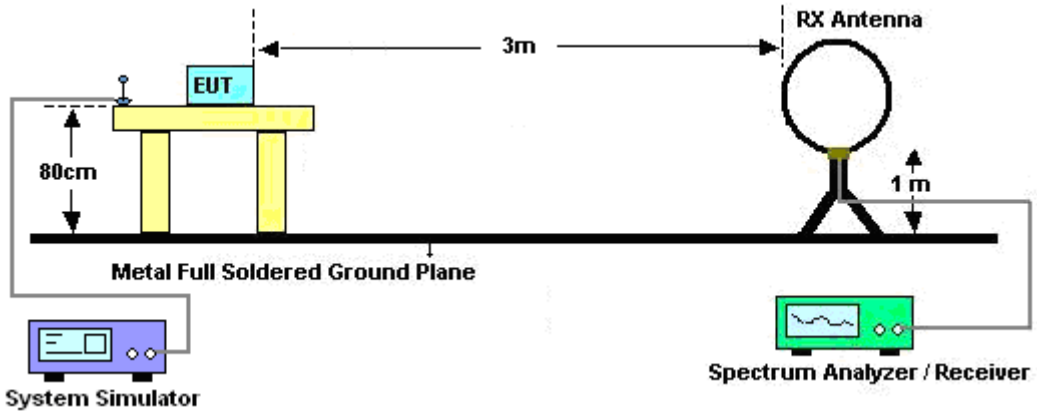
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

2. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT is set 3 meters away from the receiving antenna which is 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 is 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.

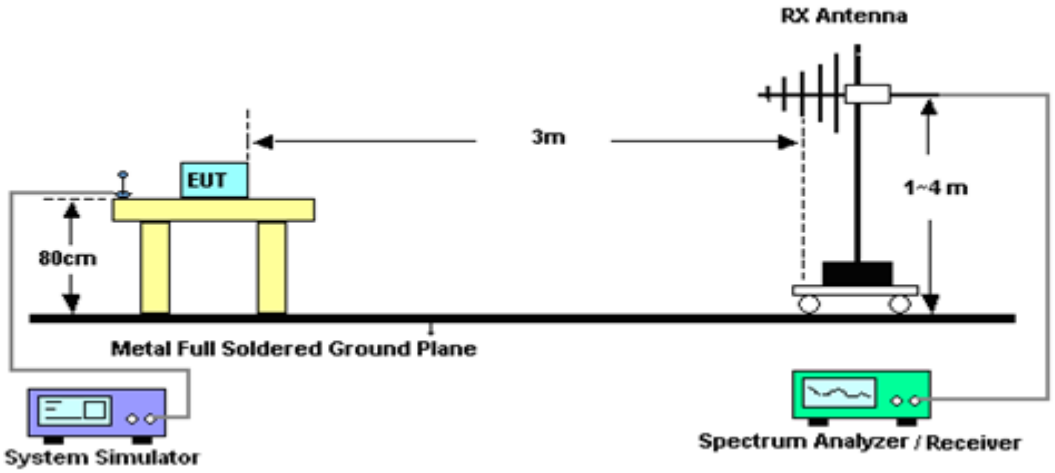
7. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as "-".
8. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as "-".

3.1.3 Test Setup

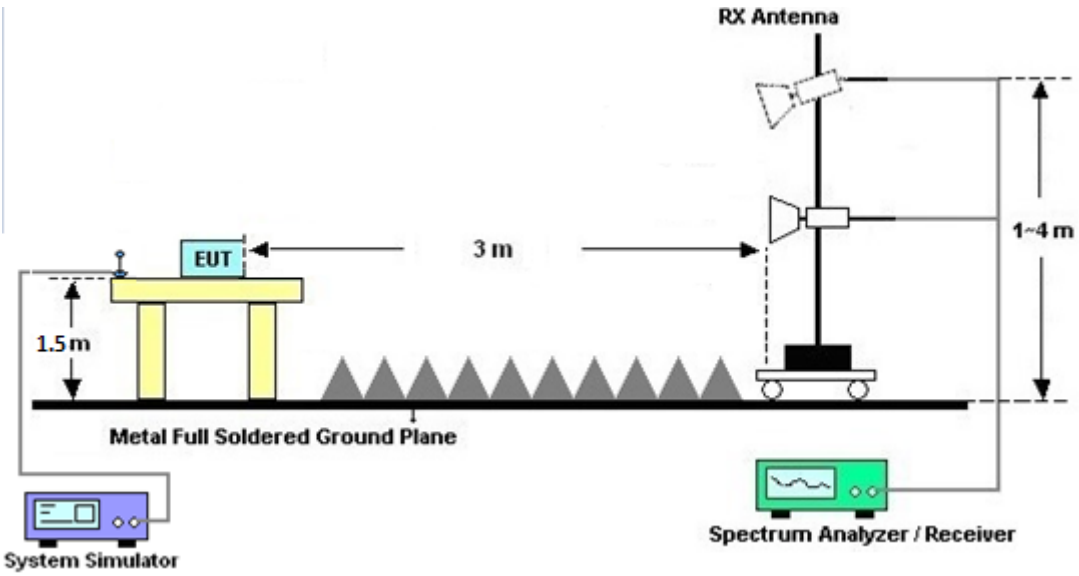
For radiated emissions below 30MHz



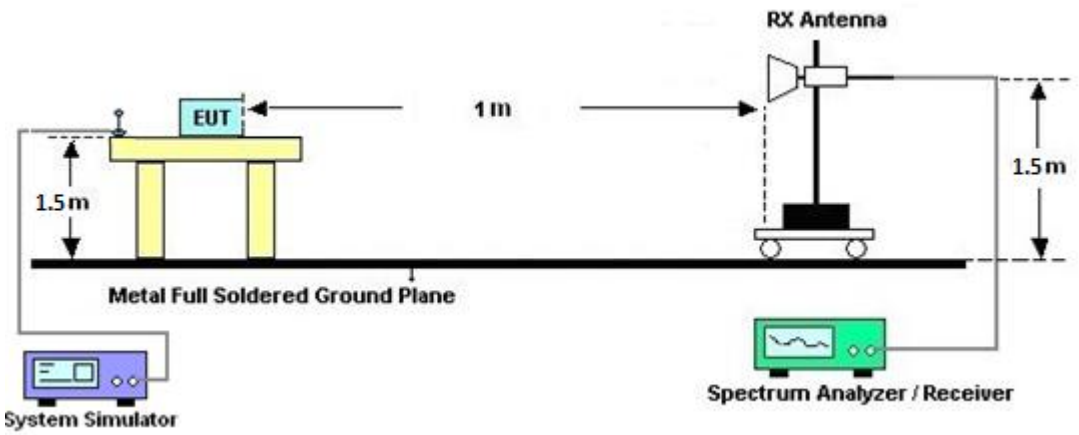
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



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

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

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

3.1.5 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
EMI Test Receicver	Keysight	N9010B	MY60241055	10Hz~44GHz	Jul. 12, 2021	Dec. 04, 2021~ Dec. 17, 2021	Jul. 11, 2022	Radiation (03CH20-HY)
Preamplifier	COM-POWER	PAM-103	18020201	1MHz-1000MHz	Jan. 04, 2021	Dec. 04, 2021~ Dec. 17, 2021	Jan. 03, 2022	Radiation (03CH20-HY)
Amplifier	EMCI	EMC118A45SE	980792	N/A	Nov. 15, 2021	Dec. 04, 2021~ Dec. 17, 2021	Nov. 14, 2022	Radiation (03CH20-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 22, 2021	Dec. 04, 2021~ Dec. 17, 2021	Jun. 21, 2022	Radiation (03CH20-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Dec. 04, 2021~ Dec. 17, 2021	Jan. 03, 2022	Radiation (03CH20-HY)
Bilog Antenna	TESEQ	CBL 6111D&00802N1D01N-06	55606 & 08	30MHz~1GHz	Oct. 17, 2021	Dec. 04, 2021~ Dec. 17, 2021	Oct. 16, 2022	Radiation (03CH20-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02294	1GHz~18GHz	Jun. 23, 2021	Dec. 04, 2021~ Dec. 17, 2021	Jun. 22, 2022	Radiation (03CH20-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00991	18GHz-40GHz	May 12, 2021	Dec. 04, 2021~ Dec. 17, 2021	May 11, 2022	Radiation (03CH20-HY)
Hygrometer	TECPEL	DTM-303B	TP200728	N/A	Mar. 09, 2021	Dec. 04, 2021~ Dec. 17, 2021	Mar. 08, 2022	Radiation (03CH20-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	519229/2,804015/2,804027/2	N/A	Jan. 20, 2021	Dec. 04, 2021~ Dec. 17, 2021	Jan. 19, 2022	Radiation (03CH20-HY)
1.53GHz Low Pass Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN27	N/A	May 25, 2021	Dec. 04, 2021~ Dec. 17, 2021	May 24, 2022	Radiation (03CH20-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN8	N/A	Mar. 26, 2021	Dec. 04, 2021~ Dec. 17, 2021	Mar. 25, 2022	Radiation (03CH20-HY)
Filter	Wainwright	WHKX8-6090-7000-18000-40SS	SN99	N/A	Nov. 04, 2021	Dec. 04, 2021~ Dec. 17, 2021	Nov. 03, 2022	Radiation (03CH20-HY)
Software	Audix	E3 6.2009-8-24	RK-002156	N/A	N/A	Dec. 04, 2021~ Dec. 17, 2021	N/A	Radiation (03CH20-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Dec. 04, 2021~ Dec. 17, 2021	N/A	Radiation (03CH20-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Dec. 04, 2021~ Dec. 17, 2021	N/A	Radiation (03CH20-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Dec. 04, 2021~ Dec. 17, 2021	N/A	Radiation (03CH20-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))	**5.9 dB**

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.7 dB**

Appendix A. Radiated Spurious Emission

Test Engineer :	Bill Chang, JC Liang and Nick Yu	Temperature :	18~20°C
		Relative Humidity :	65~68%

MIMO <Ant. 17+18> WLAN 2.4GHz 802.11ax HE20 (Partial RU26/8) CH11 + MIMO <Ant. 16+18> WLAN 5GHz 802.11ac VHT40 CH62 + LTE Band 7

2.4GHz 2400~2483.5MHz

MIMO <Ant. 17+18> WLAN 2.4G 802.11ax HE20 (Partial RU26/8) CH11 (Band Edge @ 3m)

WIFI ANT 17+18	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)	CHain Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ax HE20 Partial 26/8 CH 11 2462MHz	*	2462	118.9	-	-	109.1	27.55	8.52	36.3	100	58	P	H
	*	2462	110.55	-	-	100.75	27.55	8.52	36.3	100	58	A	H
		2483.6	67.5	-6.5	74	57.59	27.63	8.56	36.31	100	58	P	H
		2500	50.75	-3.25	54	40.75	27.7	8.59	36.32	100	58	A	H
												P	H
												A	H
	*	2462	114.36	-	-	104.56	27.55	8.52	36.3	384	292	P	V
	*	2462	106.85	-	-	97.05	27.55	8.52	36.3	384	292	A	V
		2483.76	65.33	-8.67	74	55.41	27.64	8.56	36.31	384	292	P	V
		2500	44.39	-9.61	54	34.39	27.7	8.59	36.32	384	292	A	V
												P	V
												A	V

Band 2 - 5250~5350MHz

MIMO <Ant. 16+18> WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	CHain	Table	Peak	Pol.
ANT				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
16+18		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		5077.52	50.71	-23.29	74	42.9	33.06	12.47	37.72	100	301	P	H
		5010.2	42.08	-11.92	54	34.3	33.08	12.39	37.69	100	301	A	H
	*	5310	109.13	-	-	101.26	32.94	12.73	37.8	100	301	P	H
	*	5310	101.04	-	-	93.17	32.94	12.73	37.8	100	301	A	H
802.11ac		5350.08	56.19	-17.81	74	48.54	32.7	12.77	37.82	100	301	P	H
VHT40		5351.04	49.18	-4.82	54	41.53	32.7	12.77	37.82	100	301	A	H
CH 62		5004.08	49.49	-24.51	74	41.71	33.09	12.38	37.69	319	259	P	V
5310MHz		5012.92	39.92	-14.08	54	32.14	33.07	12.4	37.69	319	259	A	V
	*	5310	106.68	-	-	98.81	32.94	12.73	37.8	319	259	P	V
	*	5310	97.99	-	-	90.12	32.94	12.73	37.8	319	259	A	V
		5351.04	56.44	-17.56	74	48.79	32.7	12.77	37.82	319	259	P	V
		5351.04	48.73	-5.27	54	41.08	32.7	12.77	37.82	319	259	A	V

MIMO <Ant. 17+18> WLAN 2.4GHz 802.11ax HE20 (Partial RU26/8) CH11 + MIMO <Ant. 16+18> WLAN 5GHz 802.11ac VHT40 CH62 + LTE Band 7

(Harmonic @ 3m)

WIFI ANT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	CHain Pos	Table Pos	Peak Avg.	Pol.
17+18/ 16+18		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802. 11ax (Partial RU26/8) CH11 2462MHz + 802.11ac VHT40 CH 62 5310MHz + LTE Band 7 CH21100 2535MHz		4874	45.91	-28.09	74	38.68	32.54	12.29	37.6	-	-	P	H
		7311	47.32	-26.68	74	33.07	36.78	16	38.53	-	-	P	H
		10620	49.07	-24.93	74	33.31	38.82	18.66	41.72	100	285	P	H
		10620	40.34	-13.66	54	24.58	38.82	18.66	41.72	100	285	A	H
		15930	50.22	-23.78	74	33.73	37.46	23.44	44.41	114	317	P	H
		15930	41.62	-12.38	54	25.13	37.46	23.44	44.41	114	317	A	H
													H
													H
		4874	44.87	-29.13	74	37.64	32.54	12.29	37.6	-	-	P	V
		7311	47.58	-26.42	74	33.33	36.78	16	38.53	-	-	P	V
		10620	48.44	-25.56	74	32.68	38.82	18.66	41.72	325	34	P	V
		10620	40.31	-13.69	54	24.55	38.82	18.66	41.72	325	34	A	V
		15930	50.19	-23.81	74	33.7	37.46	23.44	44.41	368	28	P	V
		15930	41.71	-12.29	54	25.22	37.46	23.44	44.41	368	28	A	V
													V
													V

Ant. 17_BT_Tx_CH78 + MIMO <Ant. 16+18> WLAN 5GHz 802.11ac VHT40 CH62 + LTE Band 7

2.4GHz 2400~2483.5MHz

Ant. 17_BT_CH78 (Band Edge @ 3m)

BT ANT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	CHain Pos	Table Pos	Peak Avg.	Pol.
17		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH 78 2480MHz	*	2480	104.81	-	-	104.95	27.62	8.55	36.31	351	245	P	H
	*	2480	80.02	-	-	-	-	-	-	-	-	A	H
		2499.64	66.5	-7.5	74	66.54	27.7	8.58	36.32	351	245	P	H
		2499.64	41.71	-12.29	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	103.02	-	-	103.16	27.62	8.55	36.31	374	279	P	V
	*	2480	78.23	-	-	-	-	-	-	-	-	A	V
		2496.56	53.2	-20.8	74	53.25	27.69	8.58	36.32	374	279	P	V
		2496.56	28.41	-25.59	54	-	-	-	-	-	-	A	V
													V
													V

Band 2 - 5250~5350MHz

MIMO <Ant. 16+18> WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	CHain	Table	Peak	Pol.
ANT				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
16+18		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		5076.84	47.91	-26.09	74	40.11	33.05	12.47	37.72	100	300	P	H
		5086.02	38.9	-15.1	54	31.07	33.07	12.48	37.72	100	300	A	H
	*	5310	105.16	-	-	97.29	32.94	12.73	37.8	100	300	P	H
	*	5310	97.1	-	-	89.23	32.94	12.73	37.8	100	300	A	H
802.11ac		5350.56	49.74	-24.26	74	42.09	32.7	12.77	37.82	100	300	P	H
VHT40		5350.32	41.69	-12.31	54	34.04	32.7	12.77	37.82	100	300	A	H
CH 62		5074.46	49.88	-24.12	74	42.08	33.05	12.47	37.72	318	252	P	V
5310MHz		5081.26	42.21	-11.79	54	34.39	33.06	12.48	37.72	318	252	A	V
	*	5310	106.85	-	-	98.98	32.94	12.73	37.8	318	252	P	V
	*	5310	98.25	-	-	90.38	32.94	12.73	37.8	318	252	A	V
		5355.12	49.97	-24.03	74	42.29	32.72	12.78	37.82	318	252	P	V
		5350.08	43.3	-10.7	54	35.65	32.7	12.77	37.82	318	252	A	V

Ant. 17_BT_Tx_CH78 + MIMO <Ant. 16+18> WLAN 5GHz 802.11ac VHT40 CH62 + LTE Band 7

(Harmonic @ 3m)

BT+WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	CHain	Table	Peak	Pol.
ANT				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
17/16+18		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT_Tx CH78 2480MHz + 802.11ac VHT40 CH 62 5310MHz + LTE Band 7 CH21100 2535MHz		4960	47.71	-26.29	74	40	33.02	12.35	37.66			P	H
		4960	22.92	-31.08	54	-	-	-	-	-	-	A	H
		7440	47.19	-26.81	74	33.65	36.22	15.95	38.63			P	H
		7440	22.4	-31.6	54	-	-	-	-	-	-	A	H
		10620	49.09	-24.91	74	33.33	38.82	18.66	41.72	100	326	P	H
		10620	41.07	-12.93	54	25.31	38.82	18.66	41.72	100	326	A	H
		15930	50.21	-23.79	74	33.72	37.46	23.44	44.41	102	325	P	H
		15930	42.16	-11.84	54	25.67	37.46	23.44	44.41	102	325	A	H
		4960	46.98	-27.02	74	39.27	33.02	12.35	37.66			P	V
		4960	22.19	-31.81	54	-	-	-	-	-	-	A	V
		7440	46.56	-27.44	74	33.02	36.22	15.95	38.63			P	V
		7440	21.77	-32.23	54	-	-	-	-	-	-	A	V
		10620	49.8	-24.2	74	34.04	38.82	18.66	41.72	328	257	P	V
		10620	41.1	-12.9	54	25.34	38.82	18.66	41.72	328	257	A	V
		15930	50.55	-23.45	74	34.06	37.46	23.44	44.41	333	311	P	V
		15930	42.07	-11.93	54	25.58	37.46	23.44	44.41	333	311	A	V

Ant. 18_BT_Tx_CH78 + MIMO <Ant. 16+18> WLAN 5G 802.11ac VHT40 CH62 + LTE Band 7

2.4GHz 2400~2483.5MHz

Ant. 18_BT (Band Edge @ 3m)

BT ANT 18	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)	CHain Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 78 2480MHz	*	2480	110.1	-	-	110.24	27.62	8.55	36.31	101	285	P	H
	*	2480	85.34	-	-	-	-	-	-	-	-	A	H
		2495.28	61.98	-12.02	74	62.04	27.68	8.58	36.32	101	285	P	H
		2495.28	37.22	-16.78	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	106.63	-	-	106.77	27.62	8.55	36.31	390	274	P	V
	*	2480	81.87	-	-	-	-	-	-	-	-	A	V
		2496.96	56.27	-17.73	74	56.32	27.69	8.58	36.32	390	274	P	V
		2496.96	31.51	-22.49	54	-	-	-	-	-	-	A	V
													V
													V

Band 2 - 5250~5350MHz

<Ant. 16+18> WLAN 5G WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	CHain	Table	Peak	Pol.
ANT				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
16+18		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		5014.28	55.37	-18.63	74	47.6	33.07	12.4	37.7	100	298	P	H
		5020.74	44.55	-9.45	54	36.79	33.06	12.4	37.7	100	298	A	H
	*	5310	107.99	39.79	68.2	100.12	32.94	12.73	37.8	100	298	P	H
	*	5310	99.09	45.09	54	91.22	32.94	12.73	37.8	100	298	A	H
802.11ac		5350.8	55.12	-18.88	74	47.47	32.7	12.77	37.82	100	298	P	H
VHT40		5355.36	45.05	-8.95	54	37.37	32.72	12.78	37.82	100	298	A	H
CH 62		5023.46	49.79	-24.21	74	42.03	33.05	12.41	37.7	390	242	P	V
5310MHz		5084.66	39.42	-14.58	54	31.59	33.07	12.48	37.72	390	242	A	V
	*	5310	106.55	38.35	68.2	98.68	32.94	12.73	37.8	390	242	P	V
	*	5310	98.45	44.45	54	90.58	32.94	12.73	37.8	390	242	A	V
		5351.04	53.62	-20.38	74	45.97	32.7	12.77	37.82	390	242	P	V
		5350.08	44.22	-9.78	54	36.57	32.7	12.77	37.82	390	242	A	V

Ant. 18_BT_CH78 + MIMO <Ant. 17+18> WLAN 5G 802.11ac VHT40 CH62 + LTE Band 7

(Harmonic @ 3m)

BT+WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	CHain	Table	Peak	Pol.
ANT				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
18/16+18		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT_Tx CH78 2480MHz + 802.11ac VHT40 CH 62 5310MHz + LTE Band 7 CH21100 2535MHz		4960	47.66	-26.34	74	39.95	33.02	12.35	37.66	-	-	P	H
		4960	22.9	-31.1	54	-	-	-	-	-	-	A	H
		7440	46.9	-27.1	74	33.36	36.22	15.95	38.63	-	-	P	H
		7440	22.14	-31.86	54	-	-	-	-	-	-	A	H
		10620	48.58	-25.42	74	32.82	38.82	18.66	41.72	100	358	P	H
		10620	40.87	-13.13	54	25.11	38.82	18.66	41.72	100	358	A	H
		15930	49.72	-24.28	74	33.23	37.46	23.44	44.41	115	325	P	H
		15930	41.66	-12.34	54	25.17	37.46	23.44	44.41	115	325	A	H
		4960	46.68	-27.32	74	38.97	33.02	12.35	37.66	-	-	P	V
		4960	21.92	-32.08	54	-	-	-	-	-	-	A	V
		7440	46.89	-27.11	74	33.35	36.22	15.95	38.63	-	-	P	V
		7440	22.13	-31.87	54	-	-	-	-	-	-	A	V
		10620	49.12	-24.88	74	33.36	38.82	18.66	41.72	325	28	P	V
		10620	41.07	-12.93	54	25.31	38.82	18.66	41.72	325	28	A	V
		15930	51.27	-22.73	74	34.78	37.46	23.44	44.41	381	138	P	V
		15930	41.77	-12.23	54	25.28	37.46	23.44	44.41	381	138	A	V

Emission below 1GHz

MIMO <Ant. 17+18> WLAN 2.4GHz 802.11ax HE20 (Partial RU26/8) CH11 + MIMO <Ant. 16+18> WLAN 5GHz 802.11ac VHT40 CH62 + LTE Band 7

(LF)

WIFI	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
LF		30.97	22.75	-17.25	40	33.6	23.9	0.97	35.72	-	-	P	H
		191.99	28.24	-15.26	43.5	46.54	14.79	2.4	35.49	-	-	P	H
		245.34	26.27	-19.73	46	41.03	17.89	2.73	35.38	-	-	P	H
		569.32	29.19	-16.81	46	33.69	25.81	4.2	34.51	-	-	P	H
		845.77	32.61	-13.39	46	32.2	28.7	5.26	33.55	-	-	P	H
		937.92	34.8	-11.2	46	32.62	29.8	5.58	33.2	-	-	P	H
													H
													H
													H
													H
		30.97	32.14	-7.86	40	42.99	23.9	0.97	35.72	-	-	P	V
		39.7	29.25	-10.75	40	44.41	19.45	1.11	35.72	-	-	P	V
		123.12	24.14	-19.36	43.5	40.39	17.44	1.92	35.61	-	-	P	V
		188.11	24.71	-18.79	43.5	43.11	14.73	2.37	35.5	-	-	P	V
		751.68	32.05	-13.95	46	33.42	27.67	4.84	33.88	-	-	P	V
		919.49	34.52	-11.48	46	33.09	29.17	5.53	33.27	-	-	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

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

WIFI CHain. 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)	CHain Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (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 :	Bill Chang, JC Liang and Nick Yu	**Temperature :**	18~20°C
		Relative Humidity :	65~68%

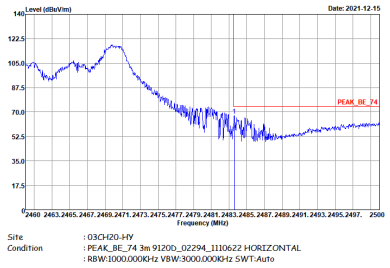
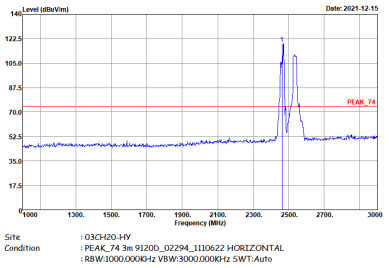
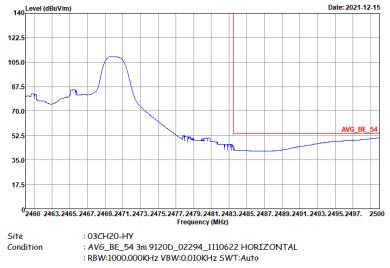
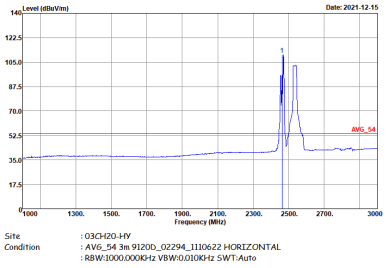
Note symbol

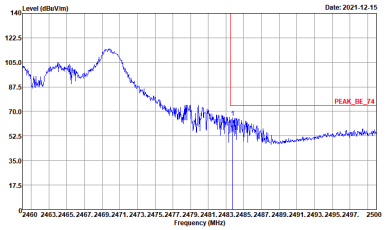
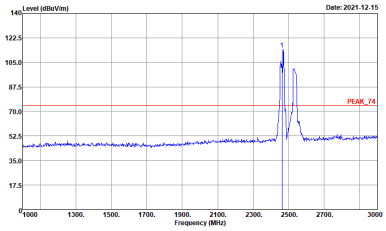
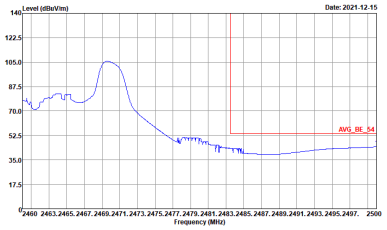
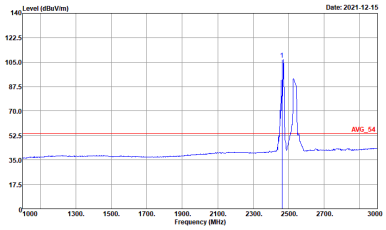
-L	**Low channel location**
-R	**High channel location**

MIMO <Ant. 17+18> WLAN 2.4GHz 802.11ax HE20 (Partial RU26/8) CH11 + MIMO <Ant. 16+18> WLAN 5GHz 802.11ac VHT40 CH62 + LTE Band 7

2.4GHz 2400~2483.5MHz

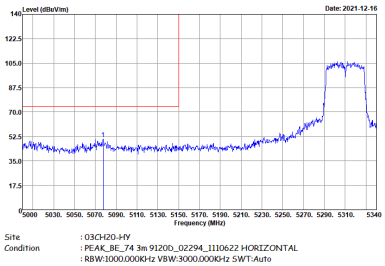
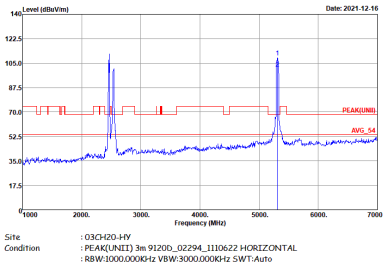
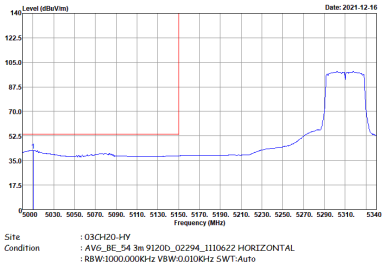
MIMO <Ant. 17+18> WLAN 2.4G 802.11ax HE20 (Partial RU26/8) CH11 (Band Edge @ 3m)

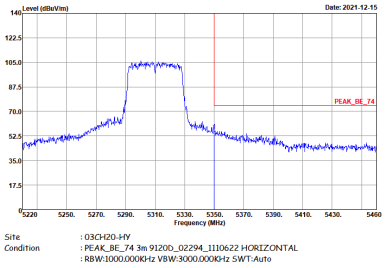
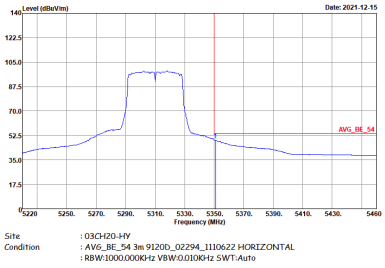
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Partial RU26/8 CH11 2462MHz	
17+18	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_02294_1110622 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_02294_1110622 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_02294_1110622 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02294_1110622 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

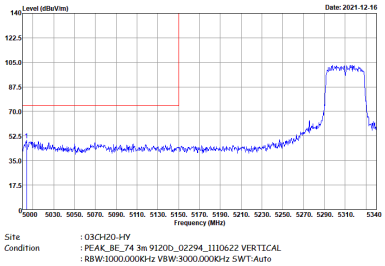
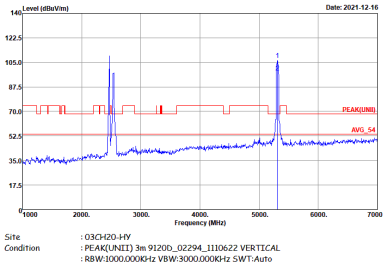
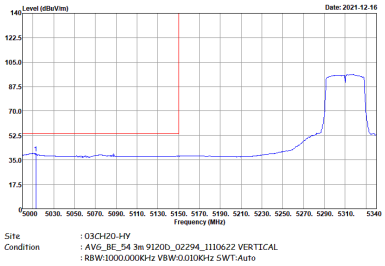
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Partial RU26 8CH11 2462MHz	
17+18	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_02294_1110622 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_02294_1110622 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_02294_1110622 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02294_1110622 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

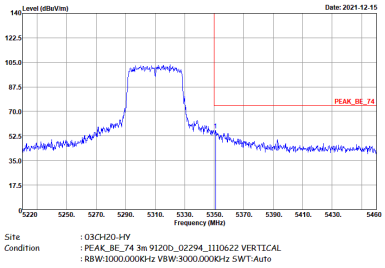
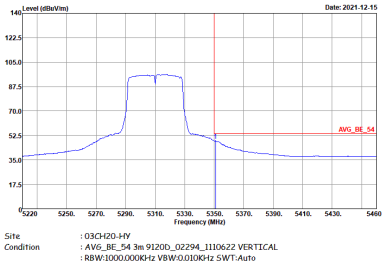
Band 2 - 5250~5350MHz

MIMO <Ant. 16+18> WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310MHz - L	
16+18	Horizontal	Fundamental
Peak		
Avg.		Left blank

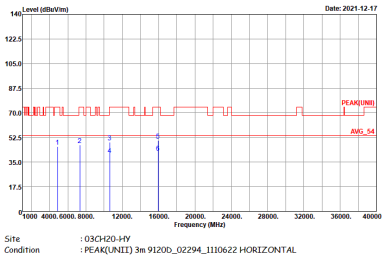
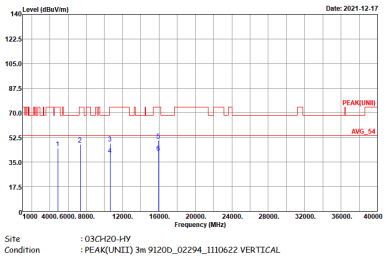
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310MHz - R	
16+18	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310MHz - L	
16+18	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310MHz - R	
16+18	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

MIMO <Ant. 17+18> WLAN 2.4GHz 802.11ax HE20 (Partial RU26/8) CH11 + MIMO <Ant. 16+18> WLAN 5GHz 802.11ac VHT40 CH62 + LTE Band 7

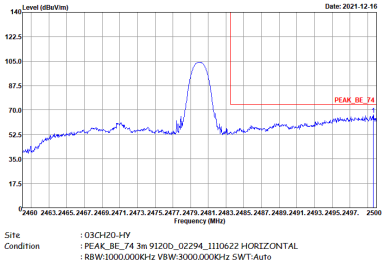
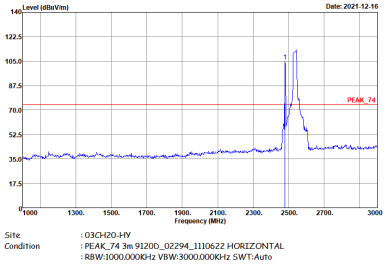
(Harmonic @ 3m)

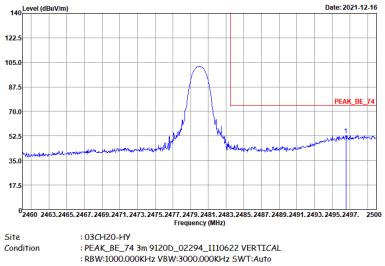
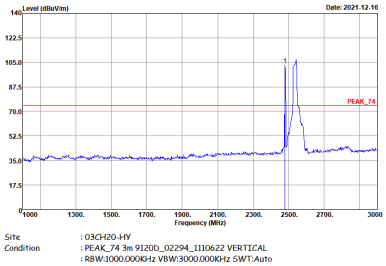
ANT	WLAN 2.4G 802.11 ax20(Partial RU26/8)_Tx_Ch11+ WLAN 5G 802.11ac(40)_Tx_Ch62 + LTE Band 7	
17+18/ 16+18	Horizontal	Vertical
Peak Avg.		

Ant. 17_BT_Tx_CH78 + MIMO <Ant. 16+18> WLAN 5GHz 802.11ac VHT40 CH62 + LTE Band 7

2.4GHz 2400~2483.5MHz

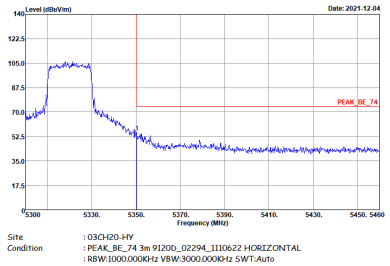
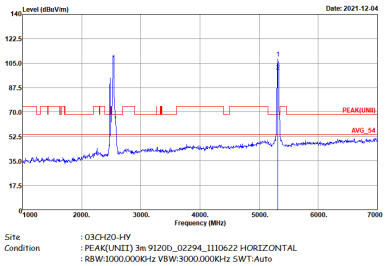
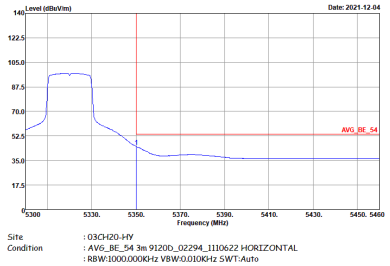
Ant. 17_BT_CH78 (Band Edge @ 3m)

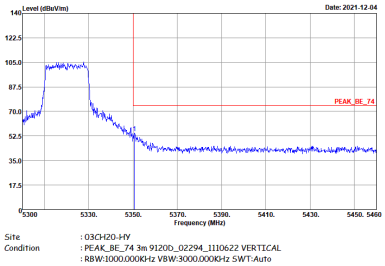
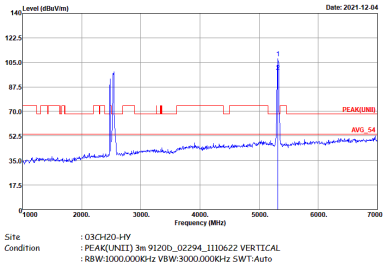
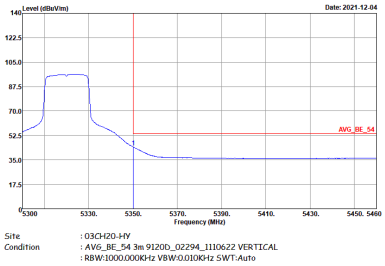
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
17	Horizontal	Fundamental
Peak		

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
17	Vertical	Fundamental
Peak		

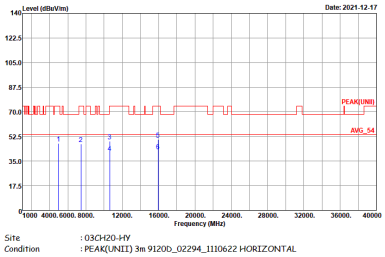
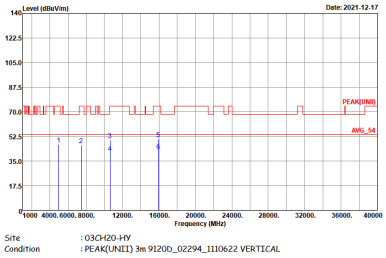
Band 2 - 5250~5350MHz

MIMO <Ant. 16+18> WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310MHz	
16+18	Horizontal	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	8802.11ac VHT40CH62 53100MHz	
16+18	Vertical	Fundamental
Peak		
Avg.		Left blank

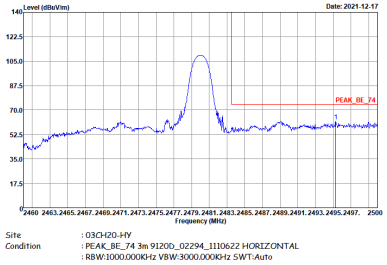
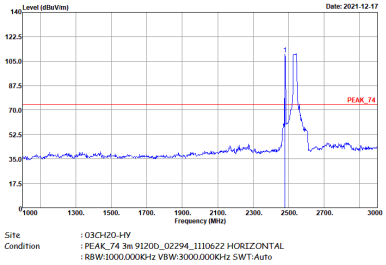
Ant. 17_BT_Tx_CH78 + MIMO <Ant. 16+18> WLAN 5GHz 802.11ac VHT40 CH62 + LTE Band 7 (Harmonic @ 3m)

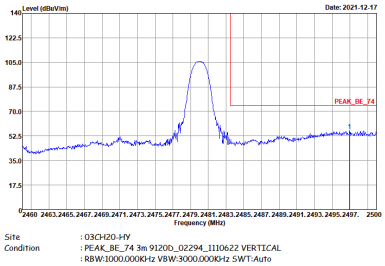
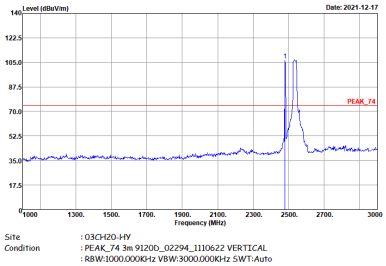
ANT	BT_Tx_Ch78+ WLAN 5G 802.11ac(40)_Tx_Ch62+ LTE_B7_BW:20MHzCH21100	
17/ 16+18	Horizontal	Vertical
Peak Avg.		

Ant. 18_BT_Tx_CH78 + MIMO <Ant. 16+18> WLAN 5G 802.11ac VHT40 CH62 + LTE Band 7

2.4GHz 2400~2483.5MHz

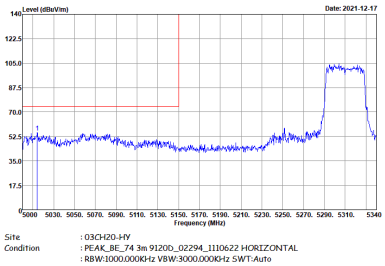
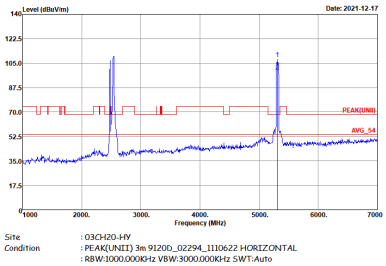
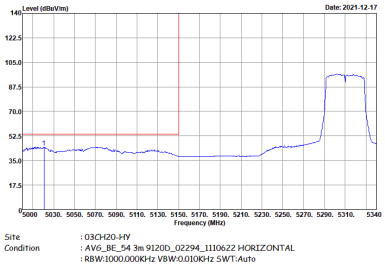
Ant. 18_BT (Band Edge @ 3m)

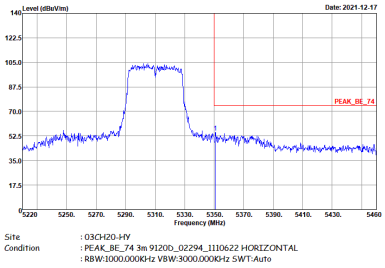
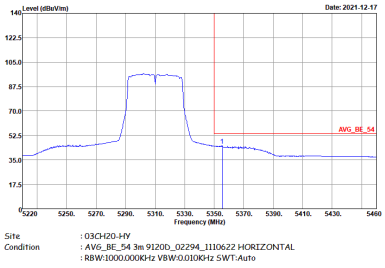
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
18	Horizontal	Fundamental
Peak		

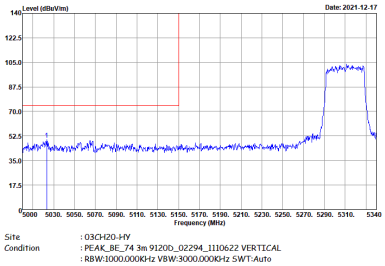
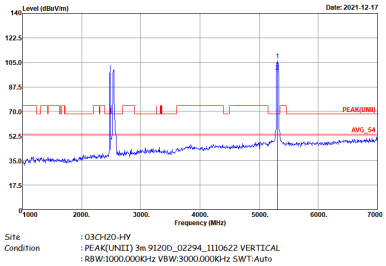
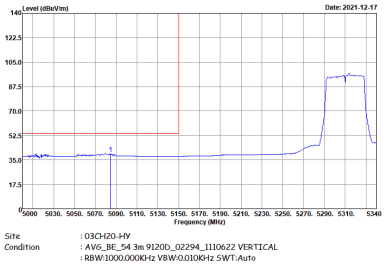
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
18	Vertical	Fundamental
Peak		

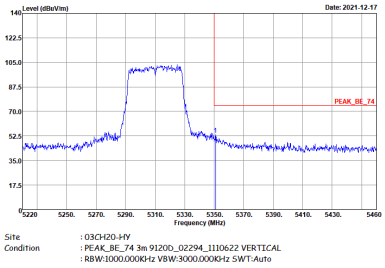
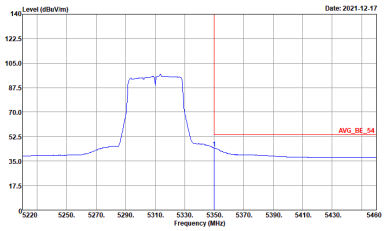
Band 2 - 5250~5350MHz

<Ant. 16+18> WLAN 5G WIFI 802.11ac VHT40 (Band Edge @ 3m)

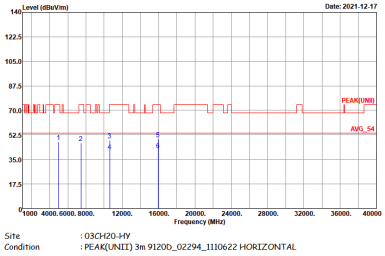
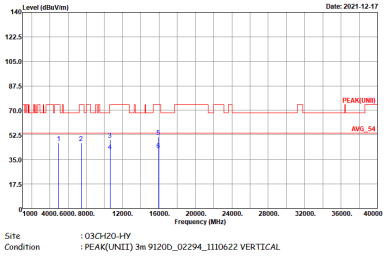
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310MHz -L	
16+18	Horizontal	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310 MHz -R	
16+18	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310 MHz - L	
16+18	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310 MHz -R	
16+18	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_02294_1110622 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_02294_1110622 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 1N1013 Ant 2 : BT_Tx_Ch78 Setting : Default Ant 1+2 : 11ac(40)_Tx_Ch62 Setting : 17 WWAN : LTE B7 CH21100 BW20M QPSK 100RB0	Left blank

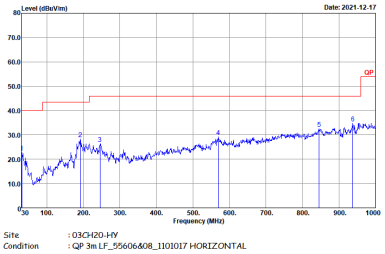
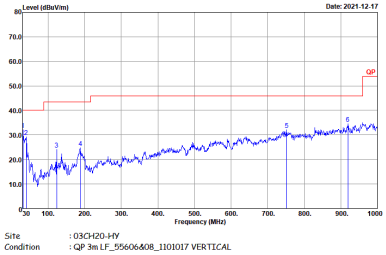
Ant. 18_BT_CH78 + MIMO <Ant. 16+18> WLAN 5G 802.11ac VHT40 CH62 + LTE Band 7 (Harmonic @ 3m)

ANT	BT_Tx_Ch78+ WLAN 5G 802.11ac(40)_Tx_Ch62 + LTE Band 7	
18/ 16+18	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

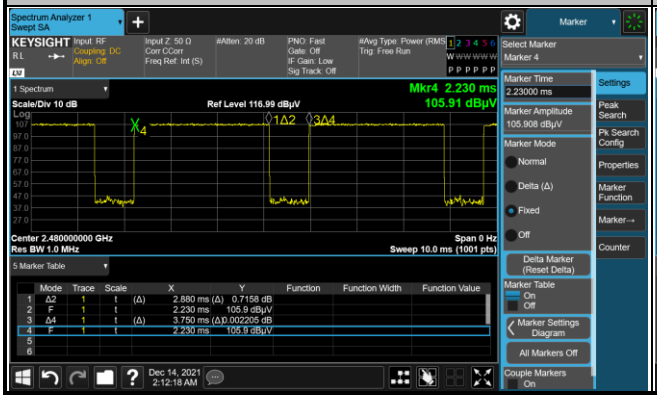
MIMO <Ant. 17+18> WLAN 2.4GHz 802.11ax HE20 (Partial RU26/8) CH11 + MIMO <Ant. 16+18> WLAN 5GHz 802.11ac VHT40 CH62 + LTE Band 7

(LF)

ANT	WLAN 2.4G 802.11 ax20(Partial RU26/8)_Tx_Ch11+ WLAN 5G 802.11ac(40)_Tx_Ch62 + LTE Band 7	
17+18 / 16+18	Horizontal	Vertical
QP / Peak		

Appendix C. Duty Cycle Plots

<Ant. 17>

3DH5 on time (One Pulse) Plot on Channel 78	on time (Count Pulses) Plot on Channel 78
	

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. **3DH5** 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 on time period to have DH5 packet completing one hopping sequence is

2.883 ms x 20 channels = 57.7 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 / 57.7 ms] = 2 hops

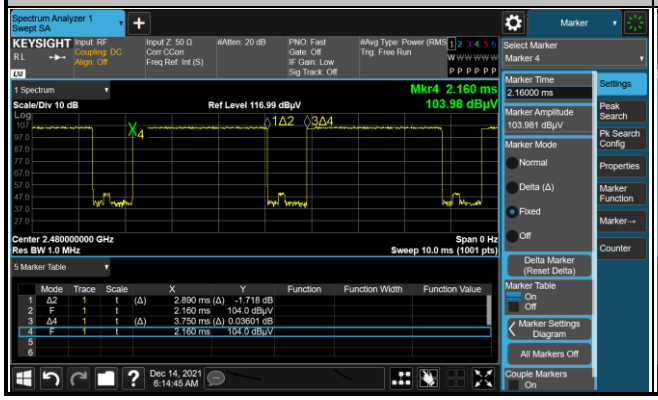
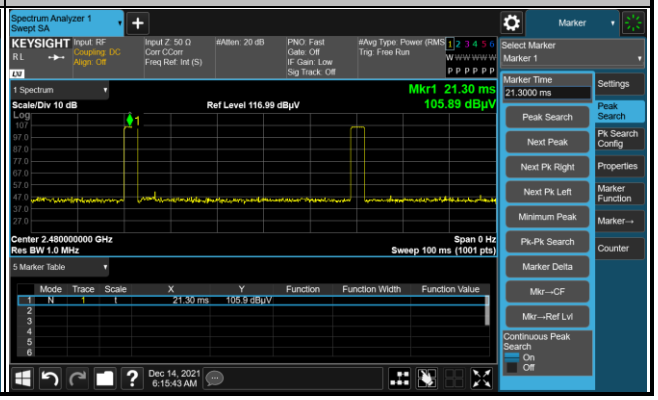
Thus, the maximum possible ON time:

2.883 ms x 2 = 5.77 ms

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

20 x log(5.77 ms/100 ms) = -24.78 dB

<Ant. 18>

3DH5 on time (One Pulse) Plot on Channel 78	on time (Count Pulses) Plot on Channel 78
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.89 / 100 = 5.78 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.76 dB
3. **3DH5** 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 on time period to have DH5 packet completing one hopping sequence is

2.89 ms x 20 channels = 57.8 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 / 57.8 ms] = 2 hops

Thus, the maximum possible ON time:

2.89 ms x 2 = 5.78 ms

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

20 x log(5.78 ms/100 ms) = -24.76 dB

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
17+18	2.4GHz 802.11ax HE20 26 RU	100.00	-	-	10Hz
16+18	5GHz 802.11ac VHT40 Full RU	100.00	-	-	10Hz

MIMO <Ant. 17+18>

2.4GHz 802.11ax HE20 26 RU

MIMO <Ant. 16+18>

5GHz 802.11ac VHT40 Full RU