FCC CO-LOCATION RADIO TEST REPORT

FCC ID	:	**A4RGXQ96**
Equipment	:	**Phone**
Model Name	:	**GXQ96**
Applicant	:	**Google LLC** **1600 Amphitheatre Parkway,** **Mountain View, California, 94043 USA**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Jul. 10, 2024 and testing was performed from Jul. 11, 2024 to Sep. 06, 2024. 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 from 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	Issue Date
FR451606M	01	Initial issue of report	Sep. 30, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(d) 15.407(b)	Unwanted Emissions	Pass	5.57 dB under the limit at 4874.00 MHz
3.2	15.203	Antenna Requirement	Pass	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”.

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: William Chen

Report Producer: Ming Chen

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature
General Specs GSM/WCDMA/LTE/5G NR, Bluetooth, BLE, BLE channel sounding, Wi-Fi 802.11ax, NFC, WPC Rx and GNSS. **Antenna Type** WLAN: **<Ant. 4>:** IFA Antenna **<Ant. 3>:** IFA Antenna Bluetooth: **<Ant. 4>:** IFA Antenna **<Ant. 3>:** IFA Antenna

EUT Information List	
S/N	**Performed Test Item**
46181JEBF10894	Radiated Spurious Emission

Antenna information (Open Mode)		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	<Ant. 3>: -0.8 <Ant. 4>: -4.4
5150 MHz ~ 5250 MHz	Peak Gain (dBi)	<Ant. 3>: -3.6 <Ant. 4>: -2.9
5925 MHz ~ 6425 MHz	Peak Gain (dBi)	<Ant. 3>: -4.9 <Ant. 4>: -1.8

Remark: The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

1.2 Modification of EUT

No modifications made to the EUT during the testing.

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.**
	03CH12-HY

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

FCC designation No.: TW3786

1.4 Applicable Standards

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

- FCC Part 15 Subpart E
- FCC Part 15 Subpart C §15.247
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB Publication No. 558074 D01 15.247 Meas Guidance v05r02
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, 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 accessory (Adapter or Earphone), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find Y plane with Adapter as worst plane.

2.1 Carrier Frequency and Channel

2400-2483.5 MHz			
Bluetooth – LE 1Mbps		802.11g	
Channel	Channel	Channel	Freq. (MHz)
39	2480	06	2437

5150-5250 MHz		5925-6425 MHz	
802.11a		802.11a	
Channel	Freq. (MHz)	Channel	Freq. (MHz)
36	5180	01	5955

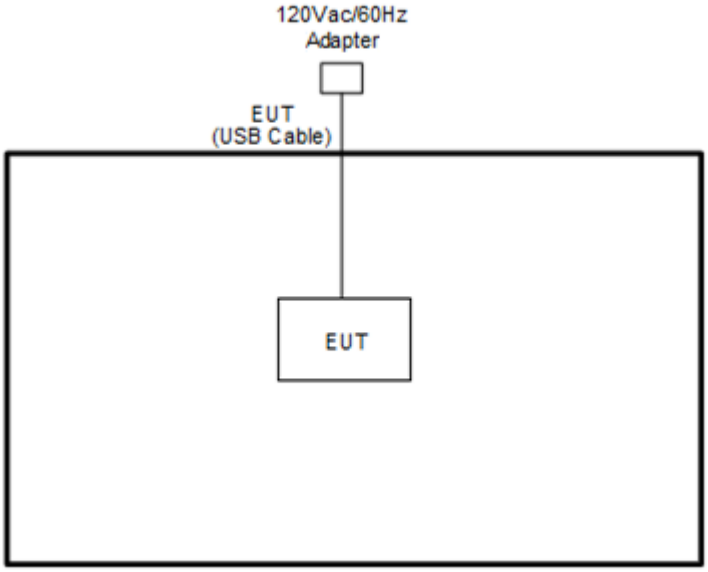
<Co-Location>

Modulation	Data Rate	Worst Plane
2.4GHz 802.11g for MIMO <Ant. 4+3> + 5GHz 802.11a for MIMO <Ant. 4+3>	6 Mbps + 6 Mbps	Y Plane with Adapter
2.4GHz 802.11g for MIMO <Ant. 4+3> + 6GHz 802.11a for MIMO <Ant. 4+3>	6 Mbps + 6 Mbps	Y Plane with Adapter
Bluetooth – LE for <Ant. 4> + 5GHz 802.11a for MIMO <Ant. 4+3>	1 Mbps + 6 Mbps	Y Plane with Adapter

Remark:

1. For Radiated Test Cases, the tests were performed with USB Cable 1.
2. During the preliminary test, both charging modes (Adapter mode and WPC Rx mode) were verified. It is determined that the adaptor mode is the worst case for official test.

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Adapter	N/A	GW8L7	N/A	N/A	N/A

2.4 EUT Operation Test Setup

The RF test items, utility “Cmd Version 4.0.211.0” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

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 Unwanted Emissions

<For 2402 MHz ~ 2480 MHz>

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device is measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

<For 5150 MHz ~ 5250 MHz>

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

<For 5925 MHz ~ 6425 MHz>

For transmitters operating within the 5.925-7.125 GHz band: Any emissions outside of the 5.925-7.125 GHz band must not exceed an e.i.r.p. of −27 dBm/MHz.

EIRP (dBm)	Field Strength at 3m (dBµV/m)
- 27 (RMS)	68.3
- 7 (Peak)	88.3

According 987594 D02 U-NII 6GHz EMC Measurement v01 section G:
Unwanted emissions outside of restricted bands are measured with a RMS detector.
In addition, 15.35(b) applies where the peak emissions must be limited to no more than 20 dB above the average limit

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

Please refer to the measuring equipment list in 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 Unwanted Emissions Measurements Below 1000 MHz
   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

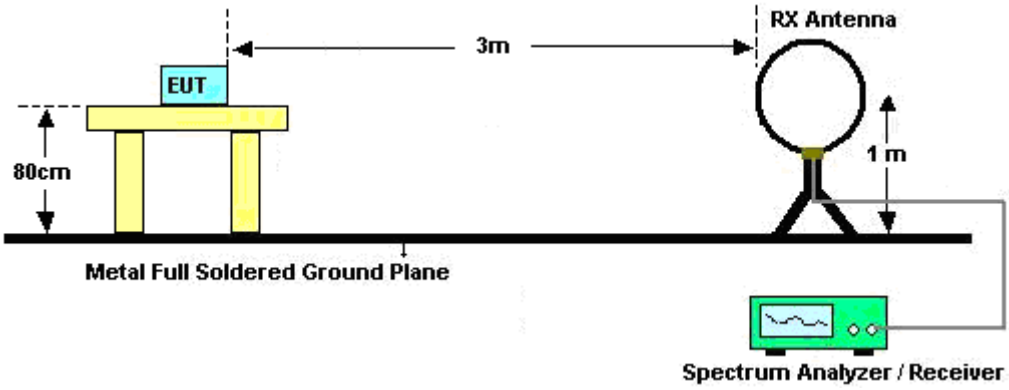
   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

   (3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz
   - 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.
6. 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 “-“.

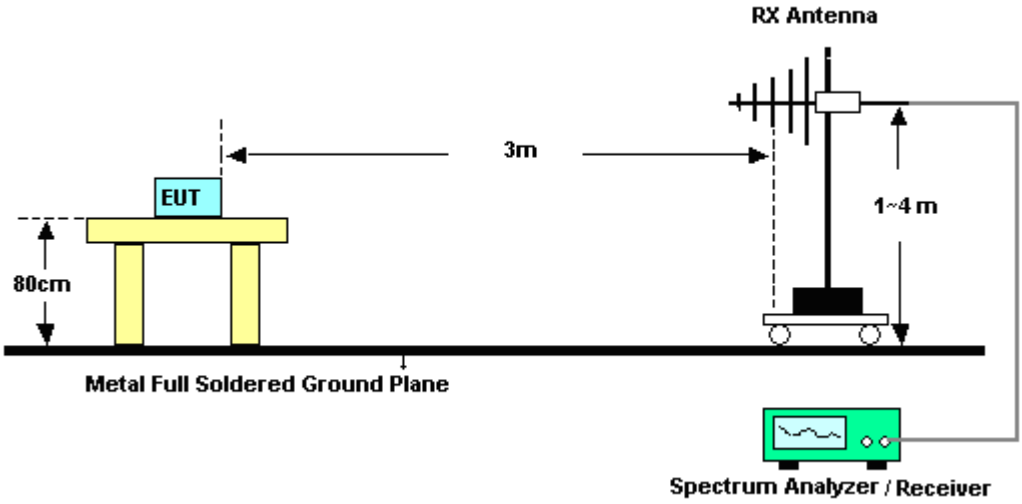
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with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

3.1.4 Test Setup

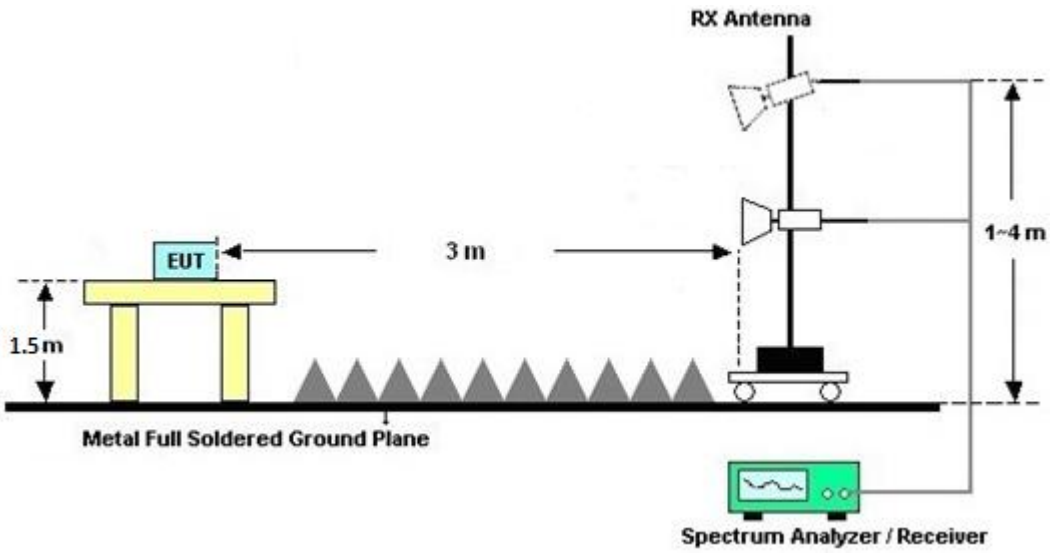
For radiated emissions below 30MHz



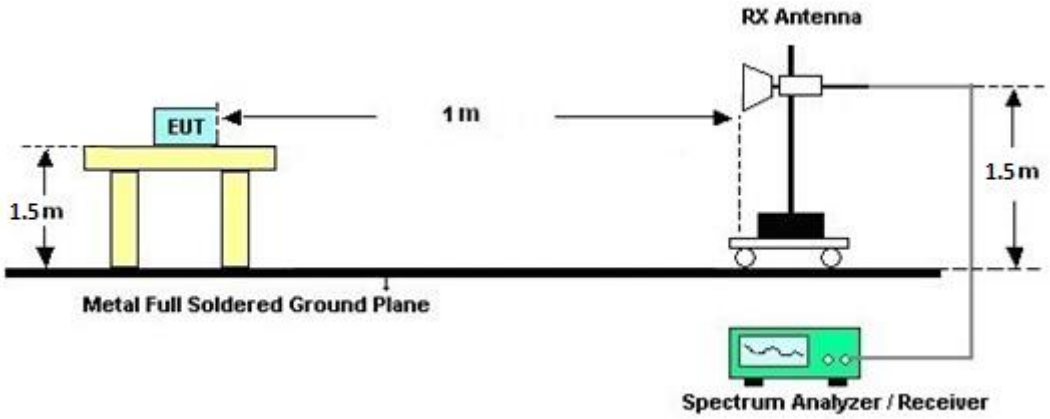
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



3.1.5 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.

3.1.6 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 Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix A and B.

3.2 Antenna Requirements

3.2.1 Standard Applicable

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

3.2.2 Antenna Anti-Replacement Construction

b) Unique (non-standard) antenna connector.

(3) Use of a standard connector is also allowed if the connector is within the transmitter enclosure and can only be accessed by disassembly of the transmitter, where such disassembly is not normally required. The user manual must not show that user has access to the connector.

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	100315	9kHz~30MHz	Feb. 23, 2024	Jul. 11, 2024~ Sep. 06, 2024	Feb. 22, 2025	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	37059 & 01	30MHz~1GHz	Nov. 03, 2023	Jul. 11, 2024~ Sep. 06, 2024	Nov. 02, 2024	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02114	1GHz~18GHz	Jul. 11, 2024	Jul. 11, 2024~ Sep. 06, 2024	Jul. 10, 2025	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00993	18GHz-40GHz	Nov. 24, 2023	Jul. 11, 2024~ Sep. 06, 2024	Nov. 23, 2024	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 20, 2024	Jul. 11, 2024~ Sep. 06, 2024	Mar. 19, 2025	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5GHz	May 22, 2024	Jul. 11, 2024~ Sep. 06, 2024	May 21, 2025	Radiation (03CH12-HY)
Preamplifier	E-INSTRUMENT TECH LTD.	ERA-100M-18G-56-01-A70	EC1900249	1GHz-18GHz	Dec. 20, 2023	Jul. 11, 2024~ Sep. 06, 2024	Dec. 19, 2024	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 07, 2023	Jul. 11, 2024~ Sep. 06, 2024	Dec. 06, 2024	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Jan. 10, 2024	Jul. 11, 2024~ Sep. 06, 2024	Jan. 09, 2025	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Aug. 09, 2024	Jul. 11, 2024~ Sep. 06, 2024	Aug. 08, 2025	Radiation (03CH12-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz~26.5GHz	Aug. 29, 2023	Jul. 11, 2024~ Sep. 06, 2024	Aug. 28, 2024	Radiation (03CH12-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290045	20Hz~8.4GHz	Apr. 17, 2024	Jul. 11, 2024~ Sep. 06, 2024	Apr. 16, 2025	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12SS	SN2	1.2GHz Low Pass Filter	Mar. 13, 2024	Jul. 11, 2024~ Sep. 06, 2024	Mar. 12, 2025	Radiation (03CH12-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40ST	SN2	6.75GHz High Pass Filter	Mar. 13, 2024	Jul. 11, 2024~ Sep. 06, 2024	Mar. 12, 2025	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9kHz~30MHz	Mar. 06, 2024	Jul. 11, 2024~ Sep. 06, 2024	Mar. 05, 2025	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 18, 2023	Jul. 11, 2024~ Sep. 06, 2024	Dec. 17, 2024	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Dec. 18, 2023	Jul. 11, 2024~ Sep. 06, 2024	Dec. 17, 2024	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803953/2	30MHz~40GHz	Dec. 18, 2023	Jul. 11, 2024~ Sep. 06, 2024	Dec. 17, 2024	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP210117	N/A	Oct. 19, 2023	Jul. 11, 2024~ Sep. 06, 2024	Oct. 18, 2024	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Jul. 11, 2024~ Sep. 06, 2024	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jul. 11, 2024~ Sep. 06, 2024	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jul. 11, 2024~ Sep. 06, 2024	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Jul. 11, 2024~ Sep. 06, 2024	N/A	Radiation (03CH12-HY)

5 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	6.10 dB

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 6000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.30 dB

Uncertainty of Radiated Emission Measurement (6000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.80 dB

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

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

Appendix A. Radiated Spurious Emission

Test Engineer :	Ken Kuo, Tim Lee and Wilson Wu	**Temperature :**	21.7~23.5°C
		Relative Humidity :	55.2~62.4%

A1. Radiated Spurious Emission Test Modes

Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode1	2400-2483.5	3+4	802.11g	06	2437	6Mbps	-	-
	5.15-5.25	3+4	802.11a	36	5180	6Mbps	-	-
Mode2	2400-2483.5	3+4	802.11g	06	2437	3Mbps		
	5.925-6.425	3+4	802.11a	01	5955	6Mbps		
Mode3	3+4	3+4	Bluetooth-LE_GFSK	39	2480	1Mbps		
	5.15-5.25	3+4	802.11a	36	5180	6Mbps		

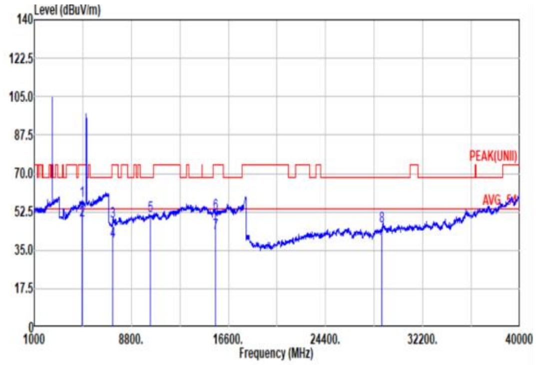
A2. Summary of each worse mode

Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	RU	Remark
1	802.11g+802.11a	6+36	4874	48.43	54.00	-5.57	H	Avg.	Pass	-	Harmonic
2	802.11g +802.11a	6+1	17865	47.62	54.00	-6.38	V	Avg.	Pass	-	Harmonic
3	Bluetooth-LE_GFSK + 802.11a	39+36	4960	47.29	54.00	-6.71	V	Avg.	Pass	-	Harmonic

Mode	1
	Harmonic
	2400-2483.5_802.11g_CH06_2437MHz
	5150-5250_802.11a_CH36_5180MHz
Pol.	**Horizontal** / **Vertical**

Peak / Avg

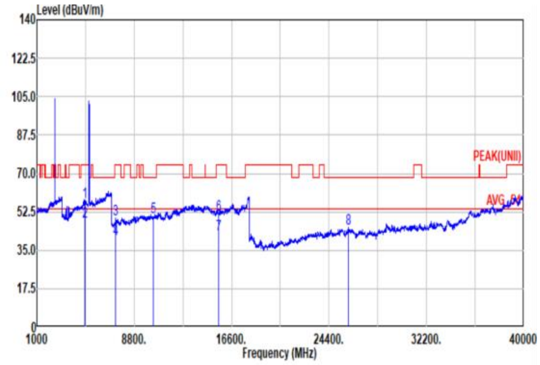
Horizontal



Site : 03CH12-HY
Condition: PEAK(UNII) 3m 9120D-02114-240711 HORIZONTAL

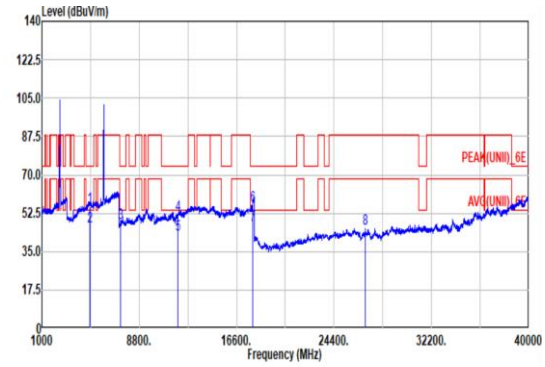
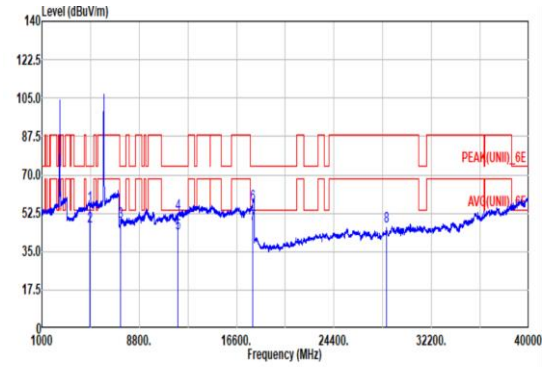
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	4874.00	57.51	74.00	-16.49	45.81	32.85	11.15	32.74	0.44	176	71	Peak
2	4874.00	48.43	54.00	-5.57	36.73	32.85	11.15	32.74	0.44	176	71	Average
3	7308.00	48.28	74.00	-25.72	62.06	37.15	14.25	66.03	0.85	188	77	Peak
4	7308.00	39.26	54.00	-14.74	53.04	37.15	14.25	66.03	0.85	188	77	Average
5	10355.00	50.90	68.20	-17.30	62.38	38.71	17.20	67.64	0.25	--	--	Peak
6	15536.00	51.97	74.00	-22.03	58.63	38.33	21.90	67.27	0.38	188	76	Peak
7	15536.00	42.85	54.00	-11.15	49.51	38.33	21.90	67.27	0.38	188	76	Average
8	28934.23	46.16	74.00	-27.84	39.29	41.03	29.93	54.55	-9.54	--	--	PEAK

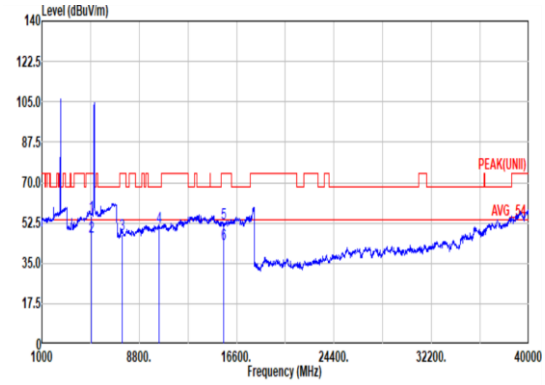
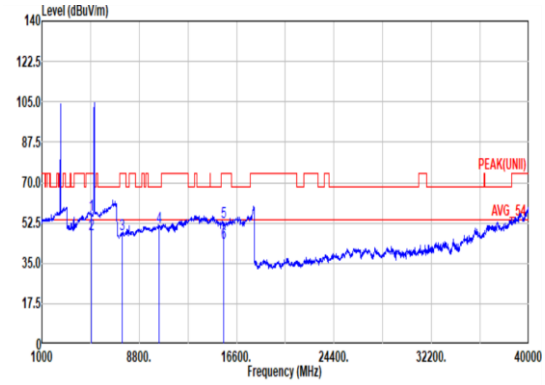
Vertical



Site : 03CH12-HY
Condition: PEAK(UNII) 3m 9120D-02114-240711 VERTICAL

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	4874.00	56.84	74.00	-17.16	45.14	32.85	11.15	32.74	0.44	188	68	Peak
2	4874.00	47.82	54.00	-6.18	36.12	32.85	11.15	32.74	0.44	188	68	Average
3	7308.00	49.12	74.00	-24.88	62.90	37.15	14.25	66.03	0.85	177	85	Peak
4	7308.00	39.92	54.00	-14.08	53.70	37.15	14.25	66.03	0.85	177	85	Average
5	10355.00	50.17	68.20	-18.03	61.65	38.71	17.20	67.64	0.25	--	--	Peak
6	15536.00	51.49	74.00	-22.51	58.15	38.33	21.90	67.27	0.38	189	68	Peak
7	15536.00	42.34	54.00	-11.66	49.00	38.33	21.90	67.27	0.38	189	68	Average
8	25952.93	44.74	74.00	-29.26	41.14	38.90	27.16	52.92	-9.54	--	--	PEAK

Mode	2	
	Harmonic	
	2400-2483.5_802.11g_CH06_2437MHz	
	5.925-6.425_802.11a _CH01_5955MHz	
Pol.	Horizontal	Vertical
Peak Avg	 Site : 03CH12-HY Condition: PEAK(UNII)_6E 3m 9120D-02114-240711 HORIZONTAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark 1 4874.00 55.67 74.00 -18.33 43.97 32.85 11.15 32.74 0.44 188 77 Peak 2 4874.00 46.65 54.00 -7.35 34.95 32.85 11.15 32.74 0.44 188 77 Average 3 7311.00 48.23 74.00 -25.77 61.05 37.13 14.26 66.03 0.97 -- -- Peak 4 11911.00 51.98 74.00 -22.02 59.64 38.92 19.25 66.40 0.57 178 66 Peak 5 11911.00 42.57 54.00 -11.43 50.23 38.92 19.25 66.40 0.57 178 66 Average 6 17865.00 55.98 74.00 -18.02 58.69 41.74 23.67 68.65 0.53 172 82 Peak 7 17865.00 46.82 54.00 -7.18 49.53 41.74 23.67 68.65 0.53 172 82 Average 8 26899.00 45.33 74.00 -28.67 40.50 39.80 27.29 52.72 -9.54 100 333 Peak	 Site : 03CH12-HY Condition: PEAK(UNII)_6E 3m 9120D-02114-240711 VERTICAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark 1 4874.00 55.80 74.00 -18.20 44.10 32.85 11.15 32.74 0.44 178 81 Peak 2 4874.00 46.72 54.00 -7.28 35.02 32.85 11.15 32.74 0.44 178 81 Average 3 7311.00 48.48 74.00 -25.52 61.30 37.13 14.26 66.03 0.97 -- -- Peak 4 11911.00 52.46 74.00 -21.54 60.12 38.92 19.25 66.40 0.57 177 78 Peak 5 11911.00 43.42 54.00 -10.58 51.08 38.92 19.25 66.40 0.57 177 78 Average 6 17865.00 56.73 74.00 -17.27 59.44 41.74 23.67 68.65 0.53 176 88 Peak 7 17865.00 47.62 54.00 -6.38 50.33 41.74 23.67 68.65 0.53 176 88 Average 8 28588.74 46.67 74.00 -27.33 40.83 40.73 28.92 54.27 -9.54 -- -- PEAK

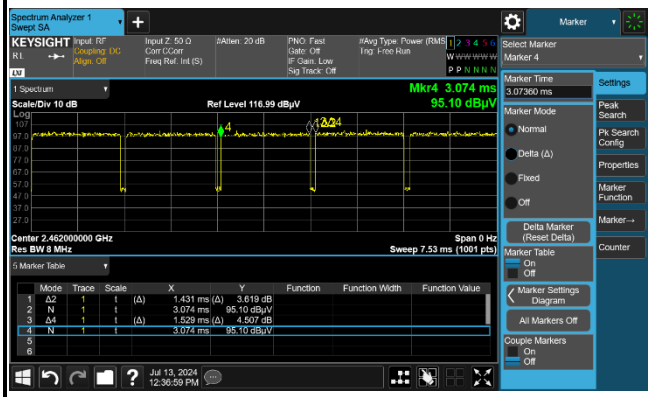
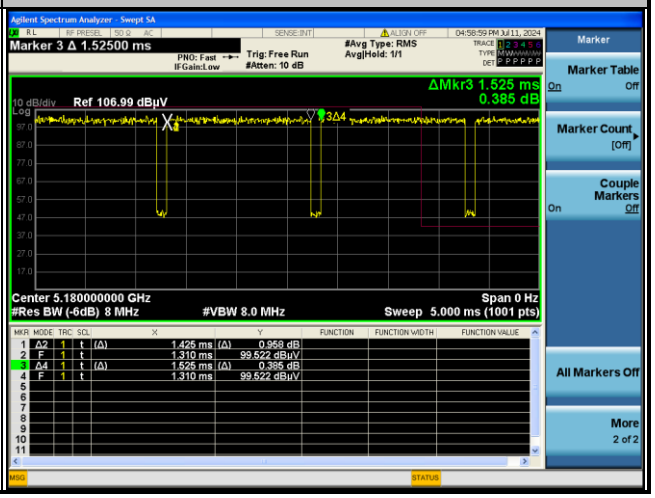
Mode	3	
	Harmonic	
	2400-2483.5_Bluetooth BR_GFSK_CH39_2480MHz	
	5150-5250_802.11a_CH36_5180MHz	
Pol.	Horizontal	Vertical
Peak Avg	 Site : 03CH12-HY Condition: PEAK(UNII) 1m SHF_00993_231124 HORIZONTAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4960.00 55.62 74.00 -18.38 44.13 33.32 10.63 32.92 0.46 122 214 Peak 2 4960.00 46.60 54.00 -7.40 35.11 33.32 10.63 32.92 0.46 122 214 Average 3 7440.00 47.34 74.00 -26.66 61.55 36.68 14.49 66.14 0.76 -- -- Peak 4 10360.00 50.91 68.20 -17.29 62.39 38.71 17.20 67.64 0.25 -- -- Peak 5 15536.00 52.56 74.00 -21.44 59.22 38.33 21.90 67.27 0.38 -- -- Peak 6 15536.00 43.55 54.00 -10.45 50.21 38.33 21.90 67.27 0.38 182 70 Average	 Site : 03CH12-HY Condition: PEAK(UNII) 1m SHF_00993_231124 VERTICAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4960.00 55.97 74.00 -18.03 44.48 33.32 10.63 32.92 0.46 85 133 Peak 2 4960.00 47.29 54.00 -6.71 35.80 33.32 10.63 32.92 0.46 85 133 Average 3 7440.00 47.49 74.00 -26.51 61.70 36.68 14.49 66.14 0.76 -- -- Peak 4 10360.00 50.45 68.20 -17.75 61.91 38.72 17.20 67.63 0.25 -- -- Peak 5 15536.00 52.86 74.00 -21.14 59.52 38.33 21.90 67.27 0.38 -- -- Peak 6 15536.00 43.66 54.00 -10.34 50.32 38.33 21.90 67.27 0.38 180 60 Average

Appendix B. Duty Cycle Plots

<Mode 1>

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
3+4	2.4GHz 802.11g	93.59	1431	0.70	750Hz
3+4	5GHz 802.11a	93.44	1425	0.70	1kHz

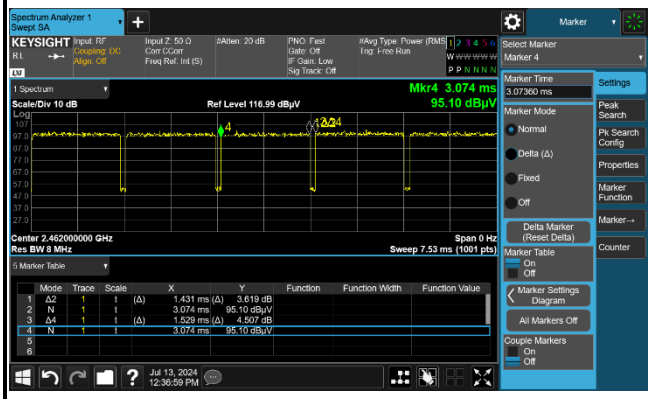
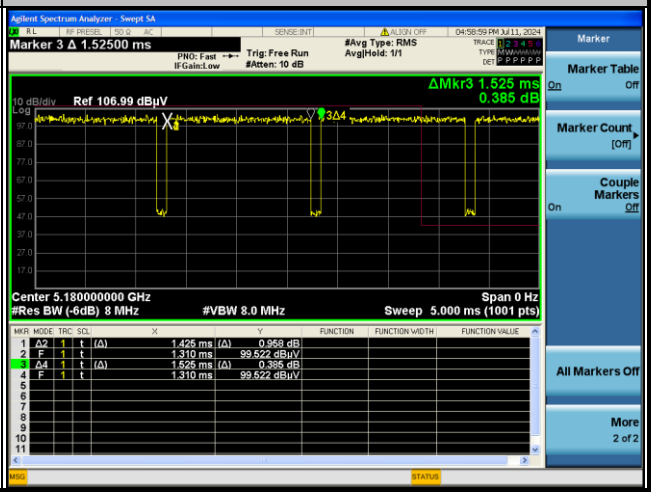
MIMO <Ant. 3+4>

2.4GHz 802.11g	5GHz 802.11a
	

<Mode 2>

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
3+4	2.4GHz 802.11g	93.59	1431	0.70	750Hz
3+4	6GHz 802.11a	93.44	1425	0.70	1kHz

MIMO <Ant. 3+4>

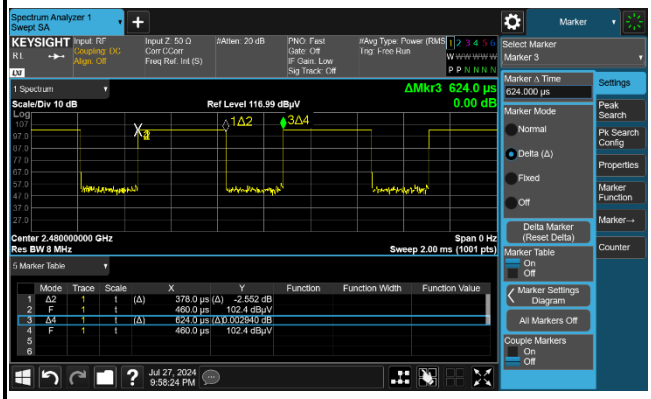
2.4GHz 802.11g	6GHz 802.11a
	

<Mode 3>

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
4	Bluetooth - LE for 1Mbps	60.58	378	2.65	2.7kHz
3+4	5GHz 802.11a	93.44	1425	0.70	1kHz

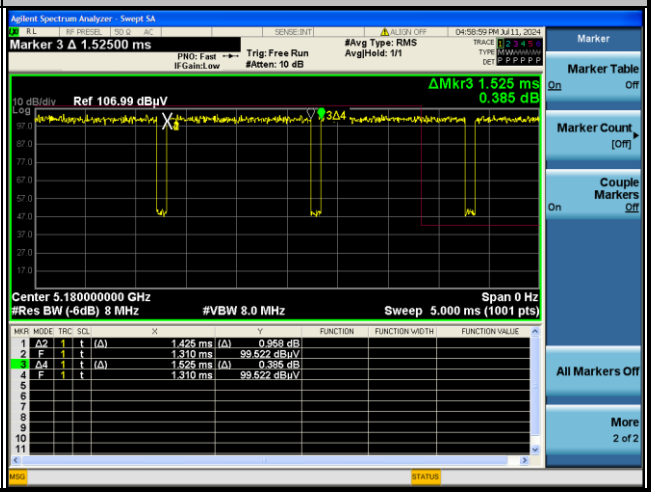
<Ant. 4>

Bluetooth - LE for 1Mbps



MIMO <Ant. 3+4>

5GHz 802.11a



———THE END———