



FCC CO-LOCATION RADIO TEST REPORT

FCC ID : A4RGKWS6
Equipment : Phone
Model Name : GKWS6
Applicant : Google LLC
1600 Amphitheatre Parkway,
Mountain View, California, 94043 USA
Standard : FCC Part 15 Subpart E §15.407

The product was received on Mar. 29, 2023 and testing was performed from Apr. 10, 2023 to Jun. 16, 2023. 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 from 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 333, Taiwan (R.O.C.)



Table of Contents

History of this test report..... 3

Summary of Test Result..... 4

1 General Description 5

 1.1 Product Feature of Equipment Under Test..... 5

 1.2 Product Specification of Equipment Under Test..... 6

 1.3 Modification of EUT 6

 1.4 Testing Location 7

 1.5 Applicable Standards..... 7

2 Test Configuration of Equipment Under Test 8

 2.1 Carrier Frequency and Channel 8

 2.2 Test Mode..... 8

 2.3 Connection Diagram of Test System 9

 2.4 EUT Operation Test Setup 9

3 Test Result 10

 3.1 Unwanted Emissions Measurement 10

 3.2 Antenna Requirements..... 16

4 List of Measuring Equipment..... 17

5 Measurement Uncertainty 18

Appendix A. Radiated Spurious Emission

Appendix B. Radiated Spurious Emission Plots

Appendix C. Duty Cycle Plots

Appendix D. Setup Photographs



History of this test report

Report No.	Version	Description	Issue Date
FR2D0208-011	01	Initial issue of report	Jun. 28, 2023



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.407(b)	Unwanted Emissions	Pass	1.59 dB under the limit at 5150.00 MHz
3.2	15.203 15.407(a)	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: Rachel Hsieh



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Phone
Model Name	GKWS6
FCC ID	A4RGKWS6
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/5G NR/NFC/GNSS/WPT WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80/VHT160 WLAN 11ax HE20/HE40/HE80/HE160 WLAN 11be EHT20/EHT40/EHT80/EHT160 Bluetooth BR/EDR/LE/HR

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

EUT Information List	
S/N	Performed Test Item
33131FDJH0006J	Radiated Spurious Emission



1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard										
Tx/Rx Channel Frequency Range	2402 MHz ~ 2480 MHz 5150 MHz ~ 5250 MHz 5925 MHz ~ 6425 MHz									
Antenna Type / Gain	<p><Bluetooth-LE> <Ant. 3> : Loop Antenna with gain -2.2 dBi <Ant. 4> : Monopole Antenna with gain -0.1 dBi <2402 MHz ~ 2480 MHz> <Ant. 3> : Loop Antenna with gain -2.2 dBi <Ant. 4> : Monopole Antenna with gain -0.1 dBi <5150 MHz ~ 5250 MHz> <Ant. 3> : Loop Antenna with gain -4.0 dBi <Ant. 4> : Monopole Antenna with gain -2.5 dBi <5925 MHz ~ 6425 MHz> <Ant. 3> : Loop Antenna with gain -3.4 dBi <Ant. 4> : Monopole Antenna with gain -5.6 dBi</p>									
Type of Modulation	Bluetooth LE: GFSK 802.11g/a: OFDM (BPSK / QPSK / 16QAM / 64QAM)									
Antenna Function for Transmitter	<table border="1"> <thead> <tr> <th></th> <th>Ant. 3</th> <th>Ant. 4</th> </tr> </thead> <tbody> <tr> <td>Bluetooth-LE</td> <td>V</td> <td>V</td> </tr> <tr> <td>802.11g/a MIMO</td> <td>V</td> <td>V</td> </tr> </tbody> </table>		Ant. 3	Ant. 4	Bluetooth-LE	V	V	802.11g/a MIMO	V	V
	Ant. 3	Ant. 4								
Bluetooth-LE	V	V								
802.11g/a MIMO	V	V								

Remark:

1. MIMO Ant. 3+4 is a calculated result from sum of the power MIMO Ant. 3 and MIMO Ant. 4.
2. The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

1.3 Modification of EUT

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



1.4 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. 03CH07-HY

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

FCC designation No.: TW1190

1.5 Applicable Standards

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

- ♦ FCC Part 15 Subpart E
- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 15.247 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.
- ♦ 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 accessory (Adapter or Earphone) and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and only the worst case emissions were reported in this report.

2.1 Carrier Frequency and Channel

2400-2483.5 MHz			
Bluetooth – LE for 1Mbps		802.11g	
Channel	Freq. (MHz)	Channel	Freq. (MHz)
39	2480	6	2437

5150~5250 MHz		5925~6425 MHz	
802.11a		802.11a	
Channel	Freq. (MHz)	Channel	Freq. (MHz)
36	5180	1	5955

2.2 Test Mode

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

<Co-Location>

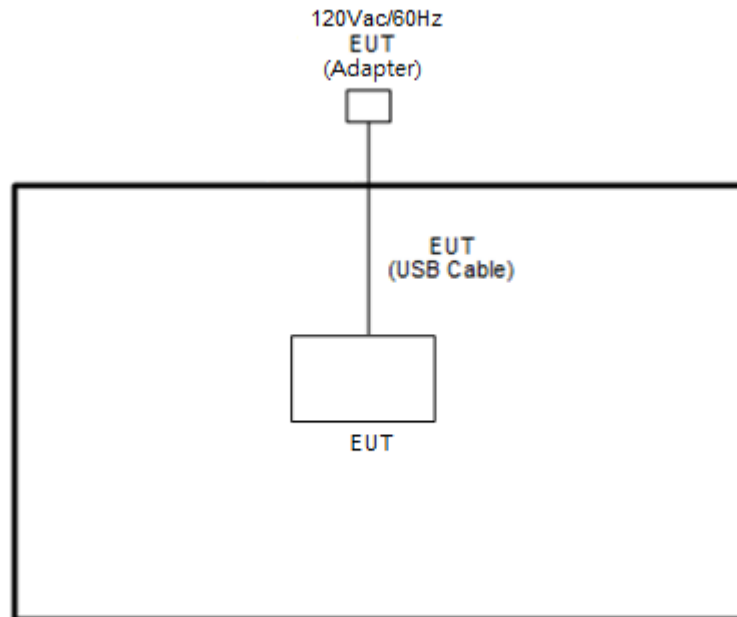
Test Mode	Modulation	Data Rate
Mode 1	WLAN 2.4GHz 802.11g for MIMO < Ant. 3+4> + WLAN 5GHz 802.11a for MIMO < Ant. 3+4>	6Mbps + 6Mbps
Mode 2	WLAN 2.4GHz 802.11g for MIMO < Ant. 3+4> + WLAN 6GHz 802.11a for MIMO < Ant. 3+4>	6Mbps + 6Mbps
Mode 3	WLAN 5GHz 802.11a for MIMO < Ant. 3+4> + Bluetooth-LE for MIMO < Ant. 3+4>	6Mbps + 1Mbps

Remark:

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

2.3 Connection Diagram of Test System

<Co-Location Tx Mode>



2.4 EUT Operation Test Setup

The RF test items, utility “CMD Version 6.1.7601” 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.

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

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

KDB789033 D02 v02r01 G)2)c)

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

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



3.1.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

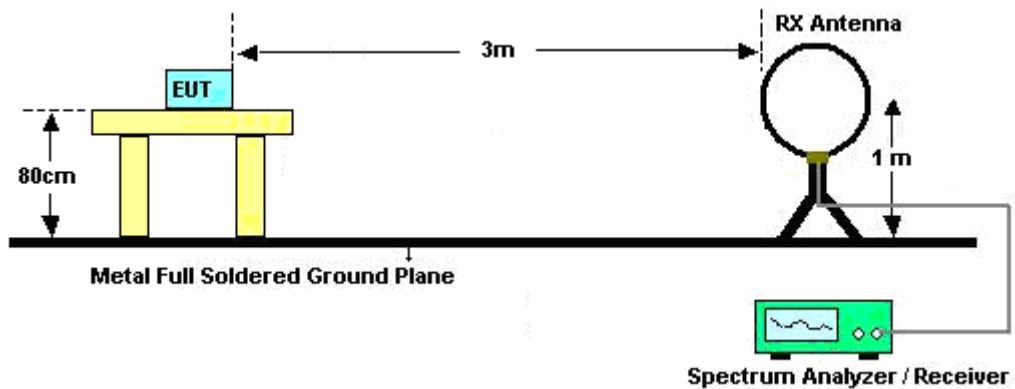
3.1.3 Test Procedures

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 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 \geq 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 \geq 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.

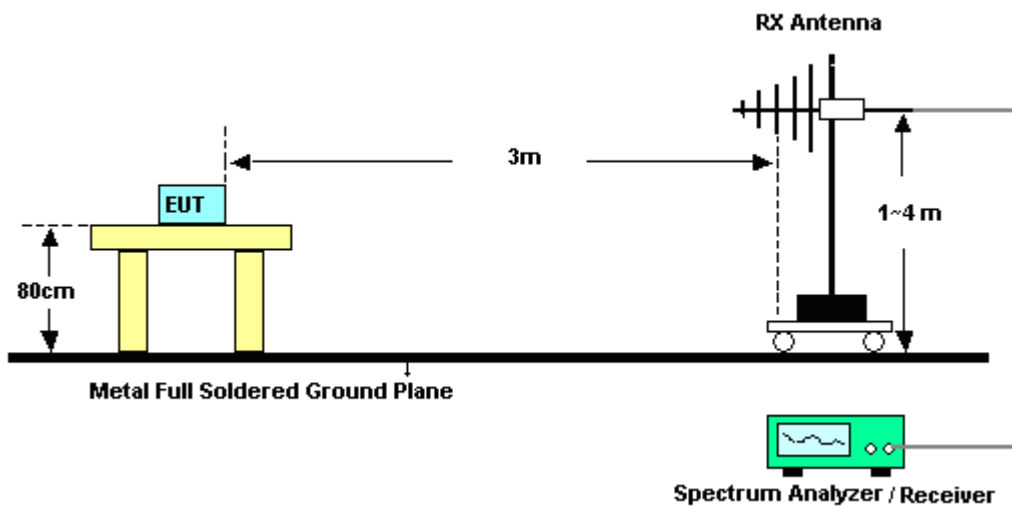
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit 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

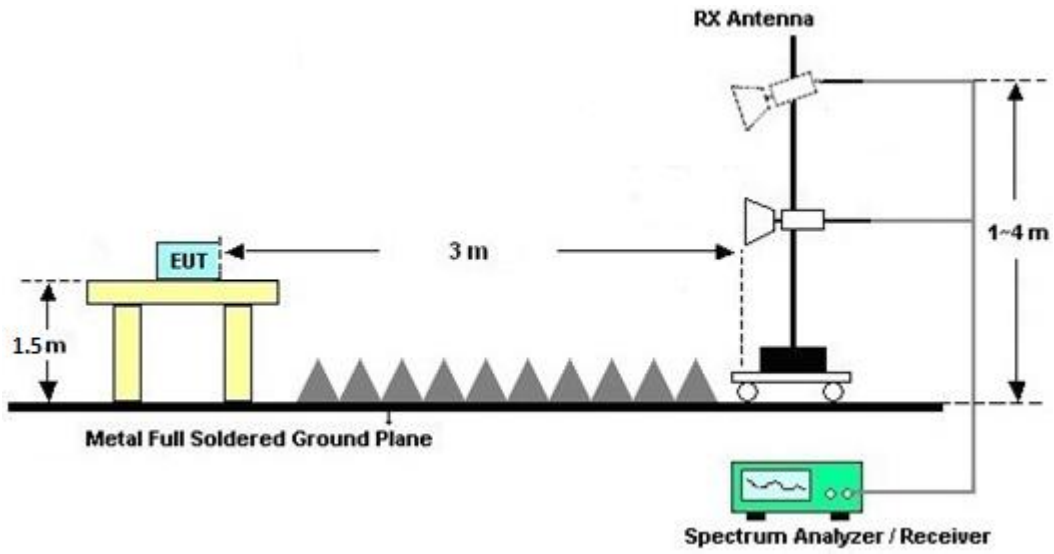
For radiated emissions below 30MHz



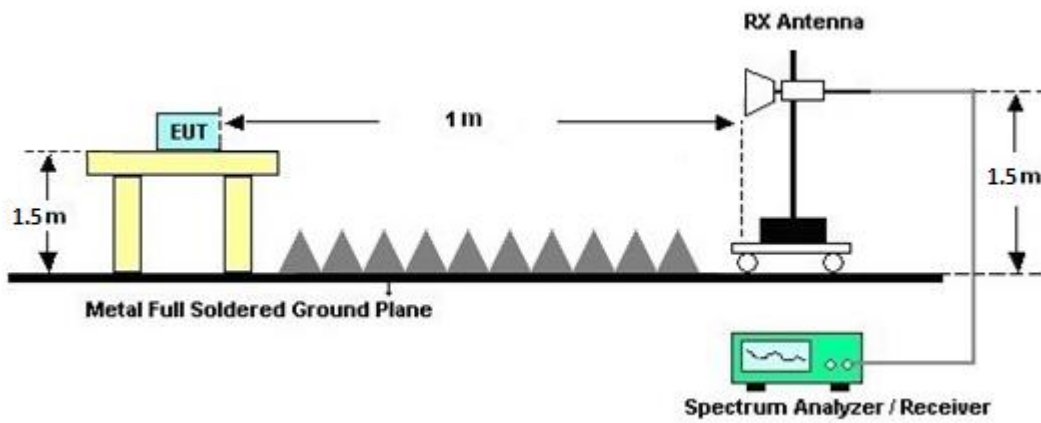
For radiated emissions from 30MHz to 1GHz



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 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 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

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.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	35419 & 03	30MHz~1GHz	Apr. 24, 2022	Apr. 10, 2023~ Apr. 22, 2023	Apr. 23, 2023	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	35419 & 03	30MHz~1GHz	Apr. 23, 2023	Apr. 23, 2023~ Jun. 16, 2023	Apr. 22, 2024	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 01, 2022	Apr. 10, 2023~ Jun. 16, 2023	Nov. 30, 2023	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Feb. 28, 2023	Apr. 10, 2023~ Jun. 16, 2023	Feb. 27, 2024	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800 -30-10P	1590075	1GHz~18GHz	Apr. 21, 2022	Apr. 10, 2023~ Apr. 19, 2023	Apr. 20, 2023	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800 -30-10P	1590075	1GHz~18GHz	Apr. 20, 2023	Apr. 20, 2023~ Jun. 16, 2023	Apr. 19, 2024	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Oct. 03, 2022	Apr. 10, 2023~ Jun. 16, 2023	Oct. 02, 2023	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Mar. 24, 2023	Apr. 10, 2023~ Jun. 16, 2023	Mar. 23, 2024	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Jul. 21, 2022	Apr. 10, 2023~ Jun. 16, 2023	Jul. 20, 2023	Radiation (03CH07-HY)
Spectrum Analyzer	Keysight	Keysight	MY60241058	10Hz~44GHz	Jul. 07, 2022	Apr. 10, 2023~ Jun. 16, 2023	Jul. 06, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15682/4	30MHz to 18GHz	Feb. 22, 2023	Apr. 10, 2023~ Jun. 16, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4	9kHz to 18GHz	Feb. 22, 2023	Apr. 10, 2023~ Jun. 16, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4	9kHz to 18GHz	Feb. 22, 2023	Apr. 10, 2023~ Jun. 16, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126	532078/126E	30MHz~18GHz	Sep. 16, 2022	Apr. 10, 2023~ Jun. 16, 2023	Sep. 15, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2	18GHz~40GHz	Feb. 22, 2023	Apr. 10, 2023~ Jun. 16, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
Controller	EMEC	EM1000	N/A	Control Ant Mast	N/A	Apr. 10, 2023~ Jun. 16, 2023	N/A	Radiation (03CH07-HY)
Controller	MF	MF-7802	N/A	Control Turn table	N/A	Apr. 10, 2023~ Jun. 16, 2023	N/A	Radiation (03CH07-HY)
Antenna Mast	EMEC	AM-BS-4500E	N/A	Boresight mast 1M~4M	N/A	Apr. 10, 2023~ Jun. 16, 2023	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Apr. 10, 2023~ Jun. 16, 2023	N/A	Radiation (03CH07-HY)
Software	Audix	E3	N/A	N/A	N/A	Apr. 10, 2023~ Jun. 16, 2023	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	Mar. 14, 2023	Apr. 10, 2023~ Jun. 16, 2023	Mar. 13, 2024	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz~26.5GHz	Feb. 13, 2023	Apr. 10, 2023~ Jun. 16, 2023	Feb. 12, 2024	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Nov. 24, 2022	Apr. 10, 2023~ Jun. 16, 2023	Nov. 23, 2023	Radiation (03CH07-HY)



5 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	6.5 dB
---	--------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.5 dB
---	--------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.2 dB
---	--------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.3 dB
---	--------



Appendix A. Radiated Spurious Emission

Test Engineer :	Jesse Wang, Stan Hsieh and Ken Wu	Temperature :	20.3~26.1°C
		Relative Humidity :	43.5~68.1%

2.4GHz 2402~2480MHz + Band 1 - 5150~5250MHz

802.11g_Tx_Ch06 (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Margin	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
3+4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 06 2437MHz		2369.36	54.95	-19.05	74	38.88	32.1	18.16	34.19	304	134	P	H
		2389.66	45.76	-8.24	54	29.59	32.1	18.27	34.2	304	134	A	H
	*	2437	112.46	-	-	96.3	32.03	18.34	34.21	304	134	P	H
	*	2437	105.13	-	-	88.97	32.03	18.34	34.21	304	134	A	H
		2493.28	55.66	-18.34	74	39.49	32	18.39	34.22	304	134	P	H
		2483.9	46.15	-7.85	54	29.98	32	18.39	34.22	304	134	A	H
		2388.68	54.92	-19.08	74	38.75	32.1	18.27	34.2	100	294	P	V
		2389.52	45.96	-8.04	54	29.79	32.1	18.27	34.2	100	294	A	V
	*	2437	114.59	-	-	98.43	32.03	18.34	34.21	100	294	P	V
	*	2437	107.48	-	-	91.32	32.03	18.34	34.21	100	294	A	V
		2483.9	56	-18	74	39.83	32	18.39	34.22	100	294	P	V
		2484.11	46.23	-7.77	54	30.06	32	18.39	34.22	100	294	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



802.11a_Tx_Ch36 (Band Edge @ 3m)

WIFI Ant. 3+4	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11a CH 36 5180MHz		5150	60.46	-13.54	74	48.2	34.1	12.05	33.89	269	115	P	H	
		5150	50.74	-3.26	54	38.48	34.1	12.05	33.89	269	115	A	H	
	*	5180	110.48	-	-	98.04	34.28	12.05	33.89	269	115	P	H	
	*	5180	102.55	-	-	90.11	34.28	12.05	33.89	269	115	P	H	
													H	
													H	
			5150	52.81	-21.19	74	40.55	34.1	12.05	33.89	306	94	P	V
			5149.76	46.67	-7.33	54	34.41	34.1	12.05	33.89	306	94	A	V
	*		5180	105.91	-	-	93.47	34.28	12.05	33.89	306	94	P	V
	*		5180	99.6	-	-	87.16	34.28	12.05	33.89	306	94	P	V
													V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



802.11g_Tx_Ch06 + 802.11a_Tx_Ch36 (Harmonic @ 3m)

WIFI Ant. Simultaneously	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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 06 2437MHz + 802.11a CH 36 5180MHz Harmonic		4874	53.12	-20.88	74	39.88	34.15	13.04	33.95	-	-	P	H	
		4874	42.73	-11.27	54	29.49	34.15	13.04	33.95	-	-	A	H	
		7311	41.66	-32.34	74	47.85	35.7	15.67	57.56	-	-	P	H	
		10360	44.77	-23.43	68.2	47.76	37.3	18.66	58.95	-	-	P	H	
		15540	48.88	-25.12	74	42.36	40.2	22.58	56.26	-	-	P	H	
														H
														H
														H
														H
			4874	52.49	-21.51	74	39.25	34.15	13.04	33.95	-	-	P	V
			4874	42.86	-11.14	54	29.62	34.15	13.04	33.95	-	-	A	V
			7311	42.61	-31.39	74	48.8	35.7	15.67	57.56	-	-	P	V
			10360	43.8	-24.4	68.2	46.79	37.3	18.66	58.95	-	-	P	V
			15540	48.04	-25.96	74	41.52	40.2	22.58	56.26	-	-	P	V
														V
														V
														V
													V	
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. 													



Emission below 1GHz

802.11g_Tx_Ch06 + 802.11a_Tx_Ch36 (LF @ 3m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
802.11g CH 06 2437MHz + 802.11a CH 36 5180MHz LF		30.81	24.05	-15.95	40	28.57	24.15	1.4	30.81	-	-	P	H	
		157.17	26.7	-16.8	43.5	37.71	16.59	2.37	157.17	-	-	P	H	
		222.51	21.89	-24.11	46	34.32	14.87	2.69	222.51	-	-	P	H	
		734.7	29.43	-16.57	46	27.09	27.35	4.7	734.7	-	-	P	H	
		838.3	32.56	-13.44	46	28.47	28.35	5.1	838.3	-	-	P	H	
		950.3	34.86	-11.14	46	27.86	30.32	5.51	950.3	-	-	P	H	
														H
														H
														H
														H
			30	32.32	-7.68	40	36.49	24.51	1.4	30	-	-	P	V
			43.5	31.51	-8.49	40	42.39	17.64	1.44	43.5	-	-	P	V
			101.28	24.36	-19.14	43.5	36.26	16	2.11	101.28	-	-	P	V
			738.9	29.93	-16.07	46	27.5	27.45	4.7	738.9	-	-	P	V
			883.8	32.36	-13.64	46	27.46	28.63	5.38	883.8	-	-	P	V
			953.1	33.75	-12.25	46	26.56	30.49	5.51	953.1	-	-	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 and emission level has at least 6dB margin against limit or emission is noise floor only.													



2.4GHz 2402~2480MHz + Band 5 - 5925~6425MHz

802.11g_Tx_Ch06 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
3+4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 06 2437MHz		2389.94	55.52	-18.48	74	39.35	32.1	18.27	34.2	100	274	P	H
		2389.1	46.42	-7.58	54	30.25	32.1	18.27	34.2	100	274	A	H
	*	2437	111.88	-	-	95.72	32.03	18.34	34.21	100	274	P	H
	*	2437	105.74	-	-	89.58	32.03	18.34	34.21	100	274	A	H
		2485.23	56.74	-17.26	74	40.57	32	18.39	34.22	100	274	P	H
		2483.9	46	-8	54	29.83	32	18.39	34.22	100	274	A	H
		2377.2	55	-19	74	38.93	32.1	18.17	34.2	392	119	P	V
		2388.12	45.38	-8.62	54	29.21	32.1	18.27	34.2	392	119	A	V
	*	2437	112.86	-	-	96.7	32.03	18.34	34.21	392	119	P	V
	*	2437	105.34	-	-	89.18	32.03	18.34	34.21	392	119	A	V
		2496.71	54.89	-19.11	74	38.72	32	18.39	34.22	392	119	P	V
		2493.28	45.41	-8.59	54	29.24	32	18.39	34.22	392	119	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



802.11a_Tx_Ch01 (Band Edge @ 3m)

WIFI Ant. 3+4	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11a CH 01 5955MHz		5924.52	65.71	-22.49	88.2	51.74	35.2	12.75	33.98	100	76	P	H	
		5924.52	55.35	-12.85	68.2	41.38	35.2	12.75	33.98	100	76	A	H	
	*	5955	108.22	-	-	94.18	35.2	12.83	33.99	100	76	P	H	
	*	5955	101.08	-	-	87.04	35.2	12.83	33.99	100	76	A	H	
													H	
													H	
			5924.52	67.95	-20.25	88.2	53.98	35.2	12.75	33.98	354	179	P	V
			5925	57.9	-10.3	68.2	43.93	35.2	12.75	33.98	354	179	A	V
	*		5955	110.33	22.13	88.2	96.29	35.2	12.83	33.99	354	179	P	V
	*		5955	103.28	35.08	68.2	89.24	35.2	12.83	33.99	354	179	A	V
														V
														V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



802.11g_Tx_Ch06 + 802.11a_Tx_Ch01 (Harmonic @ 3m)

WIFI Ant. Simultaneously	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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 06 2437MHz + 802.11a CH 01 5955MHz Harmonic		4874	52.62	-21.38	74	39.93	34.15	12.49	33.95	-	-	P	H	
		4874	42.42	-11.58	54	29.73	34.15	12.49	33.95	-	-	A	H	
		7311	41.92	-32.08	74	47.88	35.7	15.9	57.56	-	-	P	H	
		11910	45.66	-28.34	74	44.18	38.62	19.52	56.66	-	-	P	H	
		17865	55.48	-18.52	74	46.38	41.4	23.36	55.66	100	286	P	H	
		17865	45.01	-8.99	54	35.91	41.4	23.36	55.66	100	286	A	H	
														H
														H
														H
														H
														H
														H
														H
			4874	53.34	-20.66	74	40.65	34.15	12.49	33.95	-	-	P	V
			4874	43.2	-10.8	54	30.51	34.15	12.49	33.95	-	-	A	V
			7311	43.16	-30.84	74	49.12	35.7	15.9	57.56	-	-	P	V
			11910	44.95	-29.05	74	43.47	38.62	19.52	56.66	-	-	P	V
			17865	60.5	-13.5	74	51.4	41.4	23.36	55.66	100	153	P	V
			17865	50.67	-3.33	54	41.57	41.4	23.36	55.66	100	153	A	V
														V
													V	
													V	
													V	
													V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.													



2.4GHz 2402~2480MHz + Band 1 - 5150~5250MHz

BLE_Tx_Ch39 (Band Edge @ 3m)

BLE	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
3+4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 39 2480MHz	*	2480	104.97	-	-	88.79	32	18.4	34.22	100	134	P	H
	*	2480	103.28	-	-	87.1	32	18.4	34.22	100	134	A	H
		2483.92	55.44	-18.56	74	39.27	32	18.39	34.22	100	134	P	H
		2483.52	45.47	-8.53	54	29.3	32	18.39	34.22	100	134	A	H
													H
													H
	*	2480	105.08	-	-	88.9	32	18.4	34.22	204	200	P	V
	*	2480	101.94	-	-	85.76	32	18.4	34.22	204	200	A	V
		2485.76	56.19	-17.81	74	40.02	32	18.39	34.22	204	200	P	V
		2483.56	45.56	-8.44	54	29.39	32	18.39	34.22	204	200	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



802.11a_Tx_Ch36 (Band Edge @ 3m)

BLE Ant. 3+4	Note	Frequency (MHz)	Level (dBμV/m)	Margin (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)	
BLE CH 39 2480MHz		5149.76	61.67	-12.33	74	49.41	34.1	12.05	33.89	232	119	P	H	
		5150	52.41	-1.59	54	40.15	34.1	12.05	33.89	232	119	A	H	
	*	5180	108.36	-	-	95.92	34.28	12.05	33.89	232	119	P	H	
	*	5180	102.74	-	-	90.3	34.28	12.05	33.89	232	119	A	H	
													H	
														H
			5149.24	61.97	-12.03	74	49.71	34.1	12.05	33.89	298	99	P	V
			5149.5	50.87	-3.13	54	38.61	34.1	12.05	33.89	298	99	A	V
	*		5180	105.94	-	-	93.5	34.28	12.05	33.89	298	99	P	V
	*		5180	99.3	-	-	86.86	34.28	12.05	33.89	298	99	A	V
														V
														V
	Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. 												



BLE_Tx_Ch39 + 802.11a_Tx_Ch36 (Harmonic @ 3m)

WIFI Ant. Simultaneously	Note	Frequency (MHz)	Level (dBµV/m)	Margin (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)	
BLE CH 39 2480MHz + 802.11a CH 36 5180MHz Harmonic		4960	52.41	-21.59	74	39.48	34.3	12.55	33.92	100	284	P	H	
		4960	43.09	-10.91	54	30.16	34.3	12.55	33.92	-	-	A	H	
		7440	41.76	-32.24	74	48.08	35.6	15.78	57.7	-	-	P	H	
		10360	45.89	-22.31	68.2	48.88	37.3	18.66	58.95	-	-	P	H	
		15540	46.38	-27.62	74	39.86	40.2	22.58	56.26	-	-	P	H	
														H
														H
														H
														H
														H
														H
														H
														H
														H
			4960	53.21	-20.79	74	40.28	34.3	12.55	33.92	-	-	P	V
			4960	42.79	-11.21	54	29.86	34.3	12.55	33.92	-	-	A	V
			7440	41.87	-32.13	74	48.19	35.6	15.78	57.7	-	-	P	V
			10360	44.19	-24.01	68.2	47.18	37.3	18.66	58.95	-	-	P	V
			15540	46.4	-27.6	74	39.88	40.2	22.58	56.26	-	-	P	V
														V
													V	
													V	
													V	
													V	
													V	
													V	
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. 													



Note symbol

*	Fundamental Frequency which can be ignored. However, tEHT level of any unwanted emissions shall not exceed tEHT level of tEHT fundamental frequency.
!	Test result is over limit line.
P/A	Peak or Average
H/V	Horizontal or Vertical



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

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
3+4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a		5150	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 36		5150	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H
5180MHz													

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. Margin(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. Margin(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. Margin(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 :	Jesse Wang, Stan Hsieh and Ken Wu	Temperature :	20.3~26.1°C
		Relative Humidity :	43.5~68.1%

Note symbol

-L	Low channel location
-R	High channel location



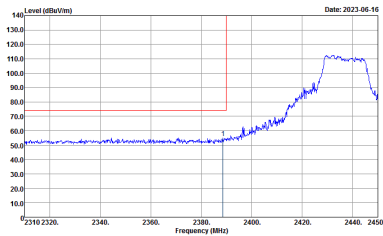
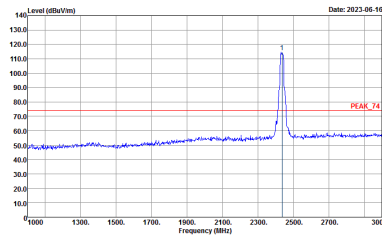
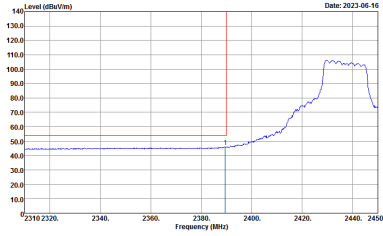
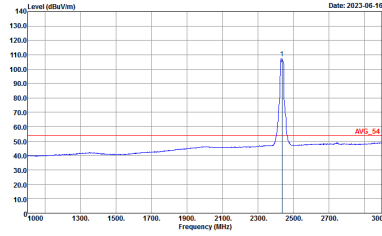
2.4GHz 2402~2480MHz + Band 1 - 5150~5250MHz
802.11g_Tx_Ch06 + 802.11a_Tx_Ch36 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
3+4	Horizontal	Fundamental
Peak	<p>Level (dBm/Vm) vs Frequency (MHz) Date: 2023-06-16</p> <p>Site : 03CH07-HY Condition : PEAK_BE_3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Level (dBm/Vm) vs Frequency (MHz) Date: 2023-06-16</p> <p>Site : 03CH07-HY Condition : PEAK_3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Level (dBm/Vm) vs Frequency (MHz) Date: 2023-06-16</p> <p>Site : 03CH07-HY Condition : AVG_BE_3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>	<p>Level (dBm/Vm) vs Frequency (MHz) Date: 2023-06-16</p> <p>Site : 03CH07-HY Condition : AVG_3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
3+4	Horizontal	Fundamental
Peak	<p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	Left blank
Avg.	<p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>	Left blank

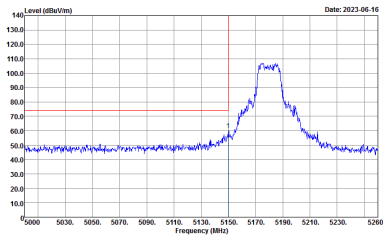
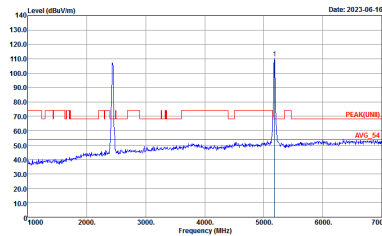
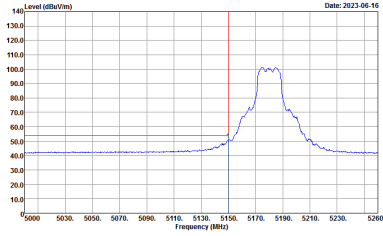
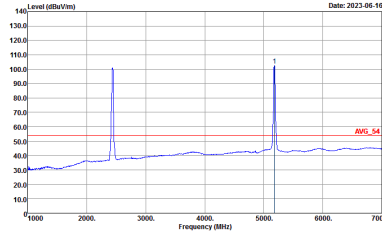


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
3+4	Vertical	Fundamental
Peak	 <p>Date: 2023-06-16</p> <p>Site Condition : 03CH07-HY : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz; VBW:3000.000kHz; SWT:Auto</p>	 <p>Date: 2023-06-16</p> <p>Site Condition : 03CH07-HY : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz; VBW:3000.000kHz; SWT:Auto</p>
Avg.	 <p>Date: 2023-06-16</p> <p>Site Condition : 03CH07-HY : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz; VBW:3.000kHz; SWT:Auto</p>	 <p>Date: 2023-06-16</p> <p>Site Condition : 03CH07-HY : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz; VBW:3.000kHz; SWT:Auto</p>

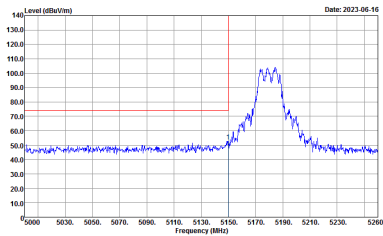
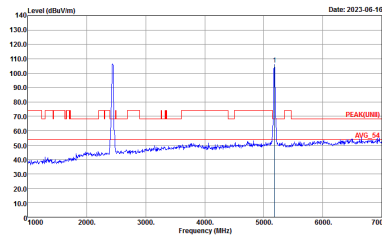
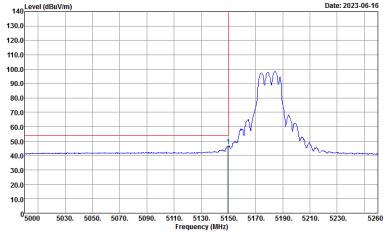
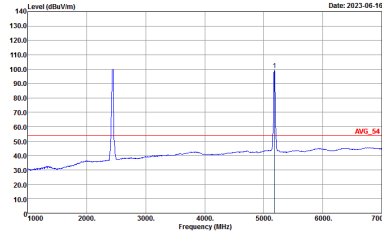


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
3+4	Vertical	Fundamental
Peak	<p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWF:Auto</p>	Left Blank
Avg.	<p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3.000kHz SWF:Auto</p>	Left Blank



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
3+4	Horizontal	Fundamental
Peak	 <p>Level (dBV/m) vs Frequency (MHz) plot showing a peak at 5180 MHz. The y-axis ranges from 10.0 to 140.0 dBV/m, and the x-axis ranges from 5000 to 5260 MHz. A red vertical line marks the peak at 5180 MHz. The plot shows a blue signal trace with a red horizontal line at approximately 75 dBV/m.</p> <p>Site : 03CH07-HY Condition : PEAK_BE_34 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz; VBW:3000.000kHz; SWT:Auto</p>	 <p>Level (dBV/m) vs Frequency (MHz) plot showing a peak at 5180 MHz. The y-axis ranges from 10.0 to 140.0 dBV/m, and the x-axis ranges from 1000 to 7000 MHz. A red vertical line marks the peak at 5180 MHz. The plot shows a blue signal trace with a red horizontal line at approximately 75 dBV/m. Labels 'PEAK(LNB)' and 'AVG_54' are present.</p> <p>Site : 03CH07-HY Condition : PEAK(LNB)_3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz; VBW:3000.000kHz; SWT:Auto</p>
Avg.	 <p>Level (dBV/m) vs Frequency (MHz) plot showing an average signal at 5180 MHz. The y-axis ranges from 10.0 to 140.0 dBV/m, and the x-axis ranges from 5000 to 5260 MHz. A red vertical line marks the peak at 5180 MHz. The plot shows a blue signal trace with a red horizontal line at approximately 50 dBV/m.</p> <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz; VBW:3.000kHz; SWT:Auto</p>	 <p>Level (dBV/m) vs Frequency (MHz) plot showing an average signal at 5180 MHz. The y-axis ranges from 10.0 to 140.0 dBV/m, and the x-axis ranges from 1000 to 7000 MHz. A red vertical line marks the peak at 5180 MHz. The plot shows a blue signal trace with a red horizontal line at approximately 50 dBV/m. Label 'AVG_54' is present.</p> <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz; VBW:3.000kHz; SWT:Auto</p>



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
3+4	Vertical	Fundamental
Peak	 <p>Site Condition : 03CH07-HY : PEAK_BE_34 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site Condition : 03CH07-HY : PEAK(LIN) 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site Condition : 03CH07-HY : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>	 <p>Site Condition : 03CH07-HY : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto</p>



802.11g_Tx_Ch06 + 802.11a_Tx_Ch36 (Harmonic @ 3m)

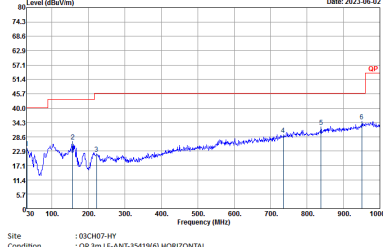
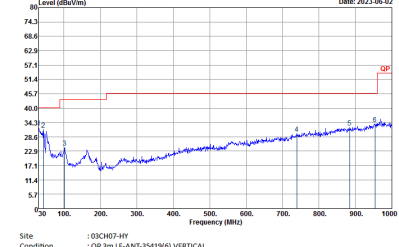
WIFI	2.4GHz 2402~2480MHz + Band 1 - 5150~5250MHz Harmonic @ 3m	
ANT	802.11g_Tx_Ch06 + 802.11a_Tx_Ch36	
Simultaneously	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH07-HY Condition : PEAK[UNII] 3m HF_ANT_00075962 HORIZONTAL</p>	<p>Site : 03CH07-HY Condition : PEAK[UNII] 3m HF_ANT_00075962 VERTICAL</p>



WIFI	2.4GHz 2402~2480MHz + Band 1 - 5150~5250MHz Harmonic @ 3m	
ANT	802.11g_Tx_Ch06 + 802.11a_Tx_Ch36	
Simultaneously	Horizontal	Vertical
<p style="text-align: center;">14.47G ~14.5G Avg.</p>	<p style="font-size: small;">Date: 2023-06-01 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL</p>	<p style="font-size: small;">Date: 2023-06-01 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL</p>
<p style="text-align: center;">17.7G ~18G Avg</p>	<p style="font-size: small;">Date: 2023-06-01 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL</p>	<p style="font-size: small;">Date: 2023-06-01 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL</p>

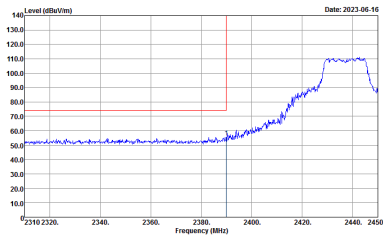
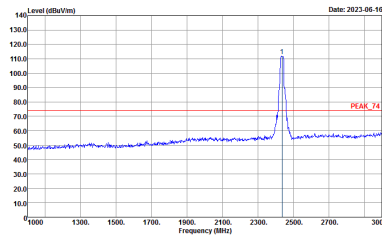
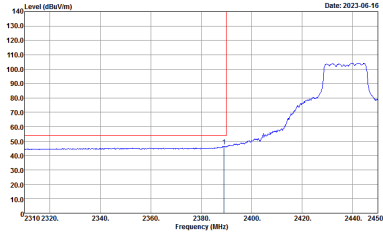
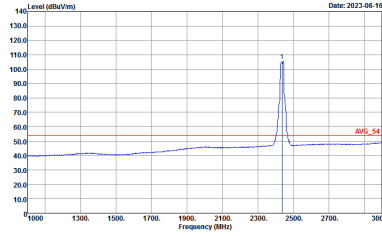


2.4GHz 2402~2480MHz + Band 1 - 5150~5250MHz
802.11g_Tx_Ch06 + 802.11a_Tx_Ch36 (LF)

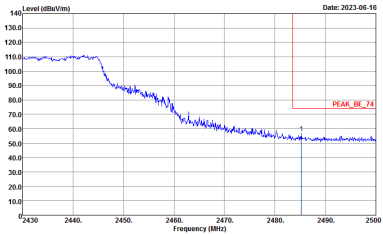
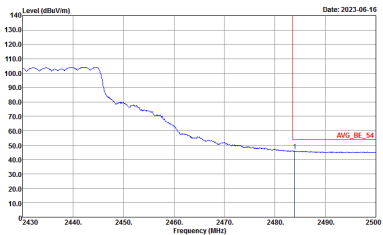
WIFI	2.4GHz 2402~2480MHz + Band 1 - 5150~5250MHz LF	
ANT	802.11g_Tx_Ch06 + 802.11a_Tx_Ch36	
Simultaneously	Horizontal	Vertical
QP / Peak	 <p>Site : 03CH07-HY Condition : QP 3m LF-ANT-35415(6) HORIZONTAL</p>	 <p>Site : 03CH07-HY Condition : QP 3m LF-ANT-35415(6) VERTICAL</p>



2.4GHz 2402~2480MHz + Band 5 - 5925~6425MHz
 802.11g_Tx_Ch06 + 802.11a_Tx_Ch01 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
3+4	Horizontal	Fundamental
Peak	 <p>Level (dBV/m) vs Frequency (MHz) plot for Horizontal. The y-axis ranges from 10.0 to 140.0 dBV/m, and the x-axis ranges from 2310 to 2450 MHz. A red vertical line is at 2437 MHz. A red horizontal line indicates the peak level at approximately 110 dBV/m. The plot shows a rising signal starting around 2400 MHz and peaking at 2437 MHz.</p> <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWTA:Auto</p>	 <p>Level (dBV/m) vs Frequency (MHz) plot for Fundamental. The y-axis ranges from 10.0 to 140.0 dBV/m, and the x-axis ranges from 1000 to 3000 MHz. A red horizontal line indicates the peak level at approximately 75 dBV/m. A sharp peak is visible at 2437 MHz.</p> <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWTA:Auto</p>
	 <p>Level (dBV/m) vs Frequency (MHz) plot for Horizontal. The y-axis ranges from 10.0 to 140.0 dBV/m, and the x-axis ranges from 2310 to 2450 MHz. A red vertical line is at 2437 MHz. A red horizontal line indicates the average level at approximately 55 dBV/m. The plot shows a rising signal starting around 2400 MHz and peaking at 2437 MHz.</p> <p>Site : 03CH07-HY Condition : AVG_BE_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:1.000kHz SWTA:Auto</p>	 <p>Level (dBV/m) vs Frequency (MHz) plot for Fundamental. The y-axis ranges from 10.0 to 140.0 dBV/m, and the x-axis ranges from 1000 to 3000 MHz. A red horizontal line indicates the average level at approximately 55 dBV/m. A sharp peak is visible at 2437 MHz.</p> <p>Site : 03CH07-HY Condition : AVG_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:1.000kHz SWTA:Auto</p>
Avg.		



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
3+4	Horizontal	Fundamental
<p>Peak</p>	 <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Left blank</p>
<p>Avg.</p>	 <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>	<p>Left blank</p>

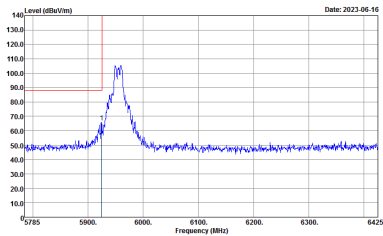
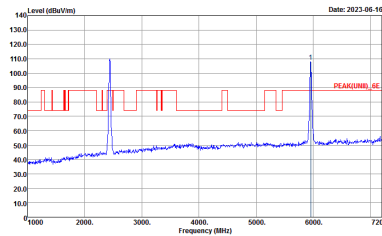
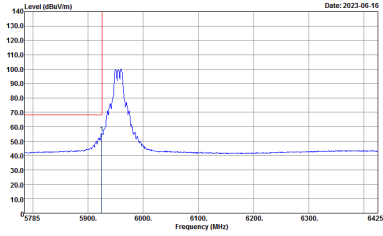
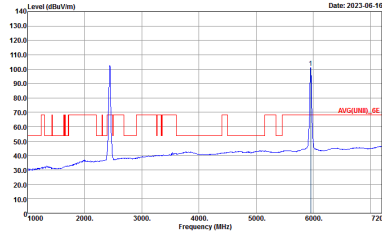


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
3+4	Vertical	Fundamental
Peak	<p>Level (dBuV/m) vs Frequency (MHz) plot for Vertical polarization. The y-axis ranges from 10.0 to 140.0 dBuV/m, and the x-axis ranges from 2310 to 2450 MHz. A red vertical line marks the peak at approximately 2437 MHz. The plot shows a rising signal level starting around 2380 MHz, reaching a plateau of about 110 dBuV/m between 2420 and 2440 MHz.</p> <p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz; VBW:3000.000kHz; SWT:Auto</p>	<p>Level (dBuV/m) vs Frequency (MHz) plot for Fundamental polarization. The y-axis ranges from 10.0 to 140.0 dBuV/m, and the x-axis ranges from 1000 to 3000 MHz. A red vertical line marks the peak at approximately 2437 MHz. The plot shows a sharp peak at 2437 MHz with a level of about 110 dBuV/m.</p> <p>Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz; VBW:3000.000kHz; SWT:Auto</p>
	Avg.	<p>Level (dBuV/m) vs Frequency (MHz) plot for Vertical polarization. The y-axis ranges from 10.0 to 140.0 dBuV/m, and the x-axis ranges from 2310 to 2450 MHz. A red vertical line marks the average level at approximately 2437 MHz. The plot shows a rising signal level starting around 2380 MHz, reaching a plateau of about 110 dBuV/m between 2420 and 2440 MHz.</p> <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz; VBW:3.000kHz; SWT:Auto</p>

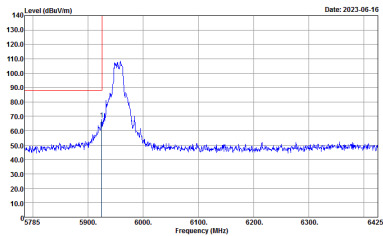
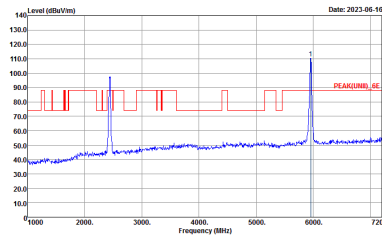
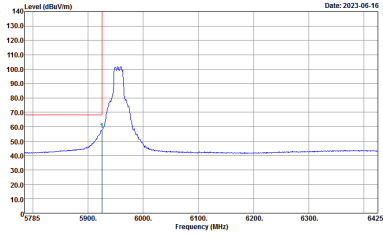
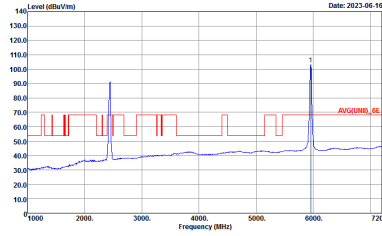


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
3+4	Vertical	Fundamental
Peak	<p>Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWF:Auto</p>	Left Blank
Avg.	<p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3.000kHz SWF:Auto</p>	Left Blank



WIFI	Band 5 5925~6425MHz Band Edge @ 3m	
ANT	802.11a CH01 5955MHz	
3+4	Horizontal	Fundamental
Peak	 <p>Level (dBuV/m) vs Frequency (MHz) plot for Horizontal orientation. The y-axis ranges from 10.0 to 140.0 dBuV/m, and the x-axis ranges from 5785 to 6425 MHz. A prominent peak is visible at approximately 5955 MHz, reaching a level of about 105 dBuV/m. A red vertical line marks the peak. The plot is dated 2023-06-16.</p> <p>Site : 03CH07-HY Condition : PEAK_BE(LNLI)_E 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz; VBW:3000.000kHz; SWT:Auto</p>	 <p>Level (dBuV/m) vs Frequency (MHz) plot for Fundamental orientation. The y-axis ranges from 10.0 to 140.0 dBuV/m, and the x-axis ranges from 1000 to 7200 MHz. A peak is visible at approximately 5955 MHz, reaching a level of about 105 dBuV/m. A red vertical line marks the peak. The plot is dated 2023-06-16.</p> <p>Site : 03CH07-HY Condition : PEAK(LNLI)_E 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz; VBW:3000.000kHz; SWT:Auto</p>
Avg.	 <p>Level (dBuV/m) vs Frequency (MHz) plot for Horizontal orientation. The y-axis ranges from 10.0 to 140.0 dBuV/m, and the x-axis ranges from 5785 to 6425 MHz. A peak is visible at approximately 5955 MHz, reaching a level of about 105 dBuV/m. A red vertical line marks the peak. The plot is dated 2023-06-16.</p> <p>Site : 03CH07-HY Condition : AVG_BE(LNLI)_E 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz; VBW:3.000kHz; SWT:Auto</p>	 <p>Level (dBuV/m) vs Frequency (MHz) plot for Fundamental orientation. The y-axis ranges from 10.0 to 140.0 dBuV/m, and the x-axis ranges from 1000 to 7200 MHz. A peak is visible at approximately 5955 MHz, reaching a level of about 105 dBuV/m. A red vertical line marks the peak. The plot is dated 2023-06-16.</p> <p>Site : 03CH07-HY Condition : AVG(LNLI)_E 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz; VBW:1.000kHz; SWT:Auto</p>



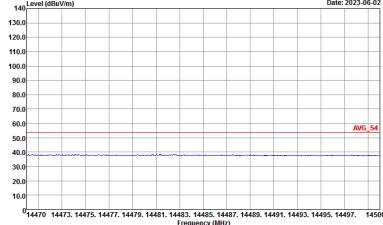
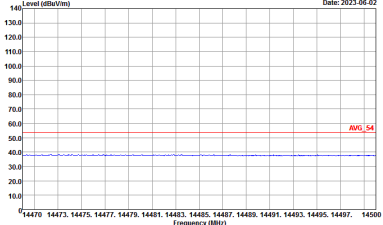
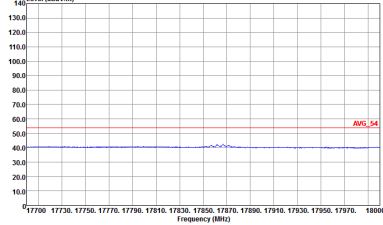
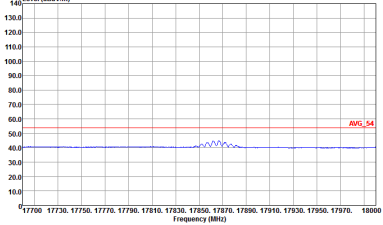
WIFI	Band 5 5925~6425MHz Band Edge @ 3m	
ANT	802.11a CH01 5955MHz	
3+4	Vertical	Fundamental
Peak	 <p>Site Condition : 03CH07-HY : PEAK_BE(LNUI)_E 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site Condition : 03CH07-HY : PEAK(LNUI)_E 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site Condition : 03CH07-HY : AVG_BE(LNUI)_E 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:3.000kHz SWT:Auto</p>	 <p>Site Condition : 03CH07-HY : AVG(LNUI)_E 3m HF_ANT_00075962 VERTICAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto</p>



802.11g_Tx_Ch06 + 802.11a_Tx_Ch01 (Harmonic @ 3m)

WIFI	2.4GHz 2402~2480MHz + Band 5 - 5925~6425MHz Harmonic @ 3m	
ANT	802.11g_Tx_Ch06 + 802.11a_Tx_Ch01	
Simultaneously	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH07-HY Condition : PEAK[UNII] 3m HF_ANT_00075962 HORIZONTAL</p>	<p>Site : 03CH07-HY Condition : PEAK[UNII] 3m HF_ANT_00075962 VERTICAL</p>

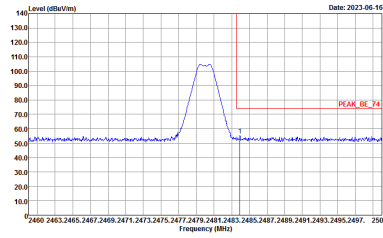
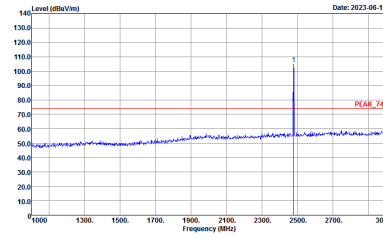
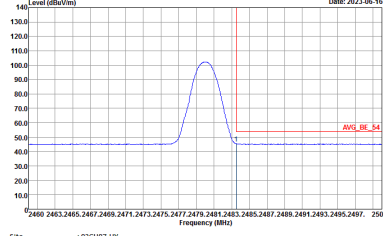
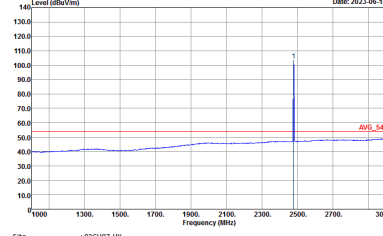


<p>WIFI</p>	<p>2.4GHz 2402~2480MHz + Band 5 - 5925~6425MHz Harmonic @ 3m</p>	
<p>ANT</p>	<p>802.11g_Tx_Ch06 + 802.11a_Tx_Ch01</p>	
<p>Simultaneously</p>	<p>Horizontal</p>  <p>Date: 2023-06-02</p> <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL</p>	<p>Vertical</p>  <p>Date: 2023-06-02</p> <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL</p>
<p>14.47G ~14.5G Avg.</p>	<p>17.7G ~18G Avg</p>  <p>Date: 2023-06-02</p> <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL</p>	 <p>Date: 2023-06-02</p> <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL</p>

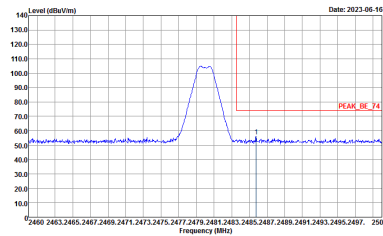
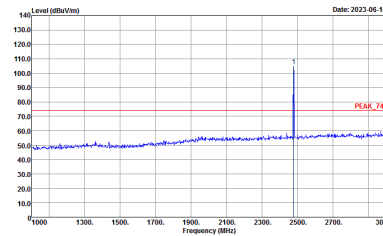
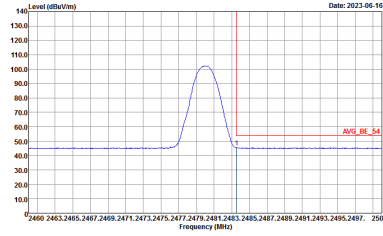
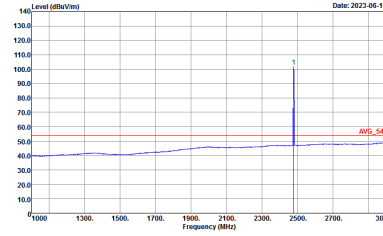


2.4GHz 2402~2480MHz + Band 1 - 5150~5250MHz

BLE_Tx_Ch39 + 802.11a_Tx_Ch36 (Band Edge @ 3m)

BLE+WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
3+4	Horizontal	Fundamental
Peak	 <p>Site : 03CH07-HY Condition : PEAK_BE_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH07-HY Condition : PEAK_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH07-HY Condition : AVG_BE_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto</p>	 <p>Site : 03CH07-HY Condition : AVG_24 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto</p>



BLE+WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
3+4	Vertical	Fundamental
Peak	 <p>Site : 03CH07-HY Condition : PEAK_BE_76 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWTAuto</p>	 <p>Site : 03CH07-HY Condition : PEAK_76 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWTAuto</p>
Avg.	 <p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWTAuto</p>	 <p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWTAuto</p>



BLE+WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
3+4	Horizontal	Fundamental
Peak	<p>Site : 03CH07-HY Condition : PEAK_BE_78 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWTAuto</p>	<p>Site : 03CH07-HY Condition : PEAK(FUN) 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWTAuto</p>
Avg.	<p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWTAuto</p>	<p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWTAuto</p>



BLE+WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
3+4	Vertical	Fundamental
Peak	<p>Site : 03CH07-HY Condition : PEAK_BE_76 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWTAuto</p>	<p>Site : 03CH07-HY Condition : PEAK(FUN) 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWTAuto</p>
Avg.	<p>Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWTAuto</p>	<p>Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWTAuto</p>



BLE_Tx_Ch39 + 802.11a_Tx_Ch36 (Harmonic @ 3m)

WIFI	2.4GHz 2402~2480MHz + Band 1 - 5150~5250MHz Harmonic @ 3m	
ANT	BLE_Tx_Ch39 + 802.11a_Tx_Ch36	
Simultaneously	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH07-HY Condition : PEAK[UNII] 3m HF_ANT_00075962 HORIZONTAL</p>	<p>Site : 03CH07-HY Condition : PEAK[UNII] 3m HF_ANT_00075962 VERTICAL</p>



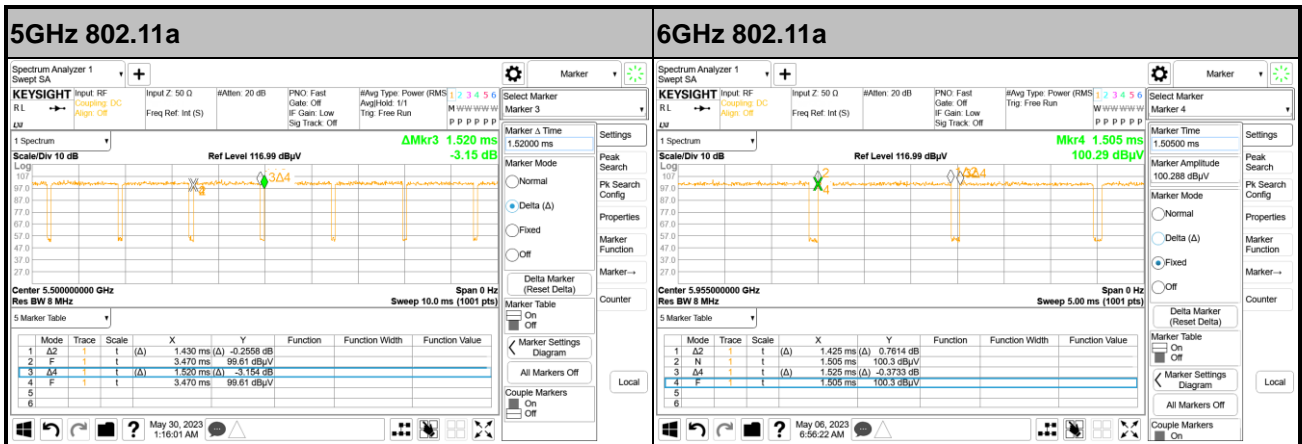
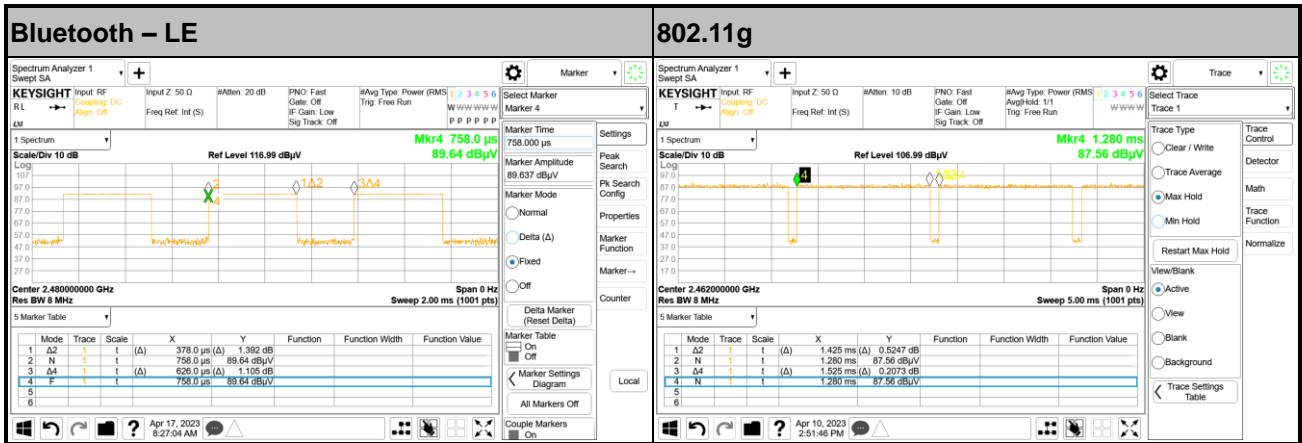
<p>WIFI</p>	<p>2.4GHz 2402~2480MHz + Band 1 - 5150~5250MHz Harmonic @ 3m</p>	
<p>ANT</p>	<p>BLE_Tx_Ch39 + 802.11a_Tx_Ch36</p>	
<p>Simultaneously</p>	<p>Horizontal</p> <p>Site : 03CH07-HY Condition : AVG_S4 3m HF_ANT_00075962 HORIZONTAL</p>	<p>Vertical</p> <p>Site : 03CH07-HY Condition : AVG_S4 3m HF_ANT_00075962 VERTICAL</p>
<p>14.47G ~14.5G Avg.</p>	<p>Site : 03CH07-HY Condition : AVG_S4 3m HF_ANT_00075962 HORIZONTAL</p>	<p>Site : 03CH07-HY Condition : AVG_S4 3m HF_ANT_00075962 VERTICAL</p>
<p>17.7G ~18G Avg</p>		



Appendix C. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
3+4	Bluetooth –LE for 1Mbps	60.38	378	2.65	3kHz
3+4	802.11g	93.44	1425	0.70	1kHz
3+4	5GHz 802.11a	94.08	1430	1kHz	
3+4	6GHz 802.11a	93.44	1425	0.70	1kHz

MIMO <Ant. 3+4>



—THE END—