

FCC CO-LOCATION RADIO TEST REPORT

FCC ID	:	2AMK2- RM02AA
Equipment	:	reMarkable Paper Pro
Brand Name	:	reMarkable
Model Name	:	RM02A
Applicant	:	reMarkable AS
		Fridtjof Nansens vei 12, 0369 Oslo, Norway
Manufacturer	:	reMarkable AS
		Fridtjof Nansens vei 12, 0369 Oslo, Norway
Standard	:	FCC Part 15 Subpart C §15.247
		FCC Part 15 Subpart E §15.407

The product was received on Mar. 29, 2024 and testing was performed from Apr. 22, 2024 to May 11, 2024. 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

Hist	tory of	this test report	3
		of Test Result	
1	Gene	al Description	5
	1.1	Product Feature of Equipment Under Test	5
	1.2	Modification of EUT	5
	1.3	Testing Location	
	1.4	Applicable Standards	6
2	Test (Configuration of Equipment Under Test	7
	2.1	Carrier Frequency and Channel	7
	2.2	Test Mode	7
	2.3	Connection Diagram of Test System	8
	2.4	Support Unit used in test configuration and system	В
	2.5	EUT Operation Test Setup	8
3	Test F	Result	9
	3.1	Unwanted Emissions Measurement	9
	3.2	Antenna Requirements	3
4	List o	f Measuring Equipment1	4
5	Meas	urement Uncertainty1	5
App	endix	A. Radiated Spurious Emission	
App	endix	B. Radiated Spurious Emission Plots	
		C. Duty Cycle Plots	

Appendix D. Setup Photographs



History of this test report

Report No.	Version	Description	Issue Date
FR432902G	01	Initial issue of report	Jun. 18, 2024
FR432902G	02	Revise applicant information This report is an updated version, replacing the report issued on Jun. 18, 2024.	Jun. 27, 2024



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.407(b)	Unwanted Emissions	Pass	5.02 dB under the limit at 5140.66 MHz
3.2	15.203 15.407(a)	Antenna Requirement	Pass	-

Conformity Assessment Condition:

 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: Keven Cheng Report Producer: Ming Chen



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature					
General Specs	General Specs Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac/ax, Wi-Fi 5GHz 802.11a/n/ac/ax, and NFC.				
Antenna Type	WLAN: Monopole Antenna Bluetooth: Monopole Antenna NFC: Coil Inductor Antenna				

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

1.2 Modification of EUT

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



1.3 Testing Location

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

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

FCC designation No.: TW1190

1.4 Applicable Standards

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

- FCC Part 15 Subpart E
- FCC 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.
- 3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

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 only the worst case emissions were reported in this report.

2.1 Carrier Frequency and Channel

2400-248	3.5 MHz	5150-5250 MHz		
Bluetoc	oth-LE	802.11ax HE80		
Channel Freq. (MHz)		Channel	Freq. (MHz)	
00	2402	42	5210	

2.2 Test Mode

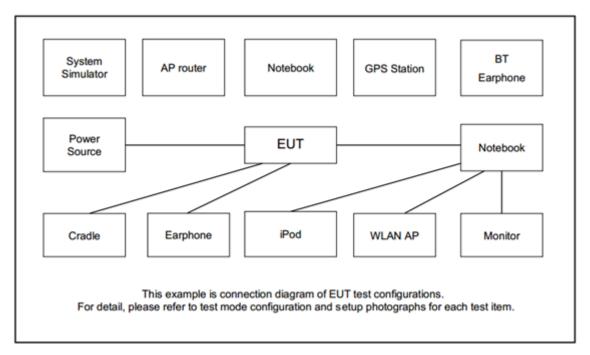
Final test modes are considering the modulation and worse data rates as below table.

<Co-Location>

Test Mode	Modulation	Data Rate
Mode 1	Bluetooth-LE Tx CH00_2402 MHz_2Mbps + WLAN 5GHz	Mhmo + MCSO
	802.11ax HE80	1Mbps + MCS0



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.	Adapter	PHILIPS	DLP6341C	NA	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility "Tere Term_Version 4.95" was installed in EUT 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

(1) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

Note: The following formula is used to convert the EIRP to field strength.

$$E = \frac{1000000\sqrt{30P}}{3}$$

- μV/m, where P is the eirp (Watts)

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

(2) KDB789033 D02 v02r01 G)2)c)

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

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

3.1.2 Measuring Instruments

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

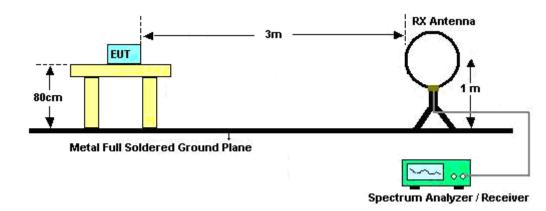


3.1.3 Test Procedures

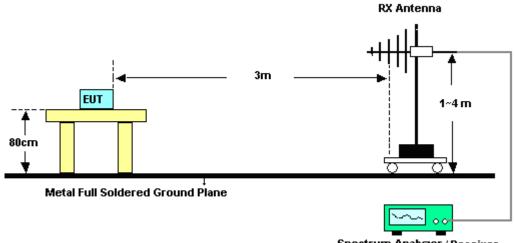
- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak 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.
- 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

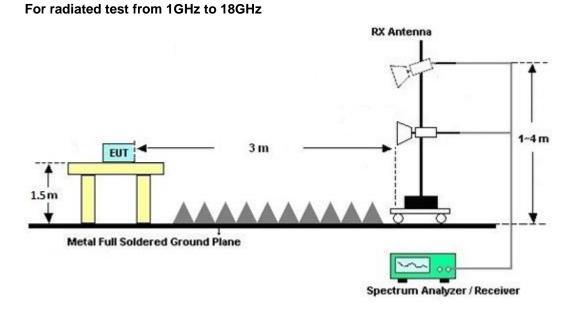
For radiated emissions below 30MHz

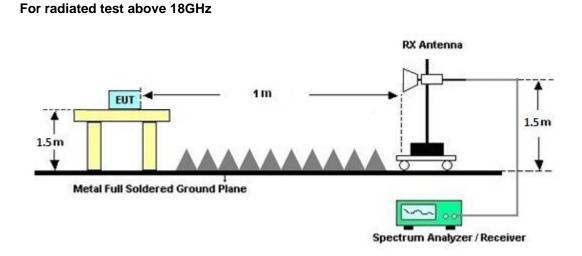


For radiated emissions from 30MHz to 1GHz



Spectrum Analyzer / Receiver





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
Double Ridge Horn Antenna	ETS-Lindgren	3117	00075962	1GHz ~ 18GHz	Nov. 27, 2023	Apr. 22, 2024 ~ May 11, 2024	Nov. 26, 2024	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010180 0-30-10P	1590075	1GHz~18GHz	Apr. 19, 2024	Apr. 22, 2024 ~ May 11, 2024	Apr. 18, 2025	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Mar. 23, 2024	Apr. 22, 2024 ~ May 11, 2024	Mar. 22, 2025	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Jul. 25, 2023	Apr. 22, 2024 ~ May 11, 2024	Jul. 24, 2024	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Mar. 26, 2024	Apr. 22, 2024 ~ May 11, 2024	Mar. 25, 2025	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4 MY24971/4 MY15682/4	30MHz to 18GHz	Feb. 21, 2024	Apr. 22, 2024 ~ May 11, 2024	Feb. 20, 2025	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4 MY24971/4	9kHz to 30MHz	Feb. 21, 2024	Apr. 22, 2024 ~ May 11, 2024	Feb. 20, 2025	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126	532078/126E	30MHz~18GHz	Sep. 15, 2023	Apr. 22, 2024 ~ May 11, 2024	Sep. 14, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2	18GHz~40GHz	Feb. 21, 2024	Apr. 22, 2024 ~ May 11, 2024	Feb. 20, 2025	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	801606/2	9KHz ~ 40GHz	Apr. 22, 2024	Apr. 22, 2024 ~ May 11, 2024	Apr. 21, 2025	Radiation (03CH07-HY)
Controller	EMEC	EM1000	N/A	Control Ant Mast	N/A	Apr. 22, 2024 ~ May 11, 2024	N/A	Radiation (03CH07-HY)
Controller	MF	MF-7802	N/A	Control Turn table	N/A	Apr. 22, 2024 ~ May 11, 2024	N/A	Radiation (03CH07-HY)
Antenna Mast	EMEC	AM-BS-4500E	N/A	Boresight mast 1M~4M	N/A	Apr. 22, 2024 ~ May 11, 2024	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Apr. 22, 2024 ~ May 11, 2024	N/A	Radiation (03CH07-HY)
Software	Audix	E3	N/A	N/A	N/A	Apr. 22, 2024 ~ May 11, 2024	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	Mar. 01, 2024	Apr. 22, 2024 ~ May 11, 2024	Feb. 28, 2025	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917025 1	18GHz~40GHz	Nov. 24, 2023	Apr. 22, 2024 ~ May 11, 2024	Nov. 23, 2024	Radiation (03CH07-HY)



5 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence	6.3 dB
of 95% (U = 2Uc(y))	0.3 UB

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

Measuring Uncertainty for a Level of Confidence	4.6 dB
of 95% (U = 2Uc(y))	4.0 UB

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

Measuring Uncertainty for a Level of Confidence	4.3 dB
of 95% (U = 2Uc(y))	

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

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



Appendix A. Radiated Spurious Emission

Tost	Engineer :	Jesse Wang, Stan Hsieh and Ken Wu	Temperature :	22.1~26°C
Test	L'Engineer.		Relative Humidity :	48.2~69.5%

BLE_Tx_Ch00 + 802.11ax HE80_Tx_CH42

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)
		2321.05	54.39	-19.61	74	38.4	32.1	18.24	34.35	167	144	Р	Н
		2377.49	46.8	-7.2	54	30.89	31.9	18.33	34.32	167	144	А	Н
	*	2402	91.63	-	-	75.57	32	18.37	34.31	167	144	Ρ	Н
	*	2402	90.36	-	-	74.3	32	18.37	34.31	167	144	А	Н
													Н
BLE(2M) Ch00													Н
+													
11AX(HE80)_Tx _Ch42		2315.44	54.82	-19.18	74	38.84	32.1	18.23	34.35	359	183	Ρ	V
_01142		2374.43	46.8	-7.2	54	30.9	31.9	18.33	34.33	359	183	Α	V
	*	2402	94.16	-	-	78.1	32	18.37	34.31	359	183	Ρ	V
	*	2402	93.09	-	-	77.03	32	18.37	34.31	359	183	А	V
													V
													V
Remark	1. No	o other spurious	s found.										
	2. All	results are PA	SS against F	Peak and	Average lim	it line.							

BLE_Tx_Ch00 (Band Edge @ 3m)



BLE_Tx_Ch00 + 802.11ax HE80_Tx_CH42

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)
		5117.26	57.52	-16.48	74	45.83	34.1	12.28	34.69	100	148	Р	Н
		5140.92	46.32	-7.68	54	34.43	34.25	12.32	34.68	100	148	Α	Н
	*	5210	92.76	-	-	80.46	34.54	12.43	34.67	100	148	Р	Н
	*	5210	85.32	-	-	73.02	34.54	12.43	34.67	100	148	А	Н
		5435.64	49.05	-24.95	74	36.31	34.77	12.6	34.63	100	148	Ρ	Н
BLE(2M) Ch00 +		5452.16	41.94	-12.06	54	29.15	34.8	12.62	34.63	100	148	Α	Н
11AX(HE80)_Tx_													
Ch42		5134.68	59.41	-14.59	74	47.58	34.21	12.31	34.69	335	220	Р	V
		5140.66	48.98	-5.02	54	37.1	34.24	12.32	34.68	335	220	А	V
	*	5210	92.89	-	-	80.59	34.54	12.43	34.67	335	220	Р	V
	*	5210	86.71	-	-	74.41	34.54	12.43	34.67	335	220	А	V
		5441.24	50.26	-23.74	74	37.5	34.78	12.61	34.63	335	220	Р	V
		5443.76	41.83	-12.17	54	29.06	34.79	12.61	34.63	335	220	А	V
Remark	1. No	o other spuri	ous found.										
	2. All	results are	PASS again	st Peak ai	nd Averag	e limit line.							

11AX(HE80)_Tx_Ch42 (Band Edge @ 3m)



BLE_Tx_Ch00 + 802.11ax HE80_Tx_CH42

	-		[F	(паппопіс				T		ſ	r	
WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	(110.0)
Simultaneously		(MHz) 4804	(dBµV/m) 51.36	(dB) -22.64	(dBµV/m) 74	(dBµV) 40.05	(dB/m) 34.2	(dB) 11.88	(dB) 34.77	(cm)	(deg)	P P	(н/v) Н
		4804	43.97	-10.03	54	32.66	34.2	11.88	34.77	-	-	A	н
		10420	43.97	-23.38	68.2	47.51	37.4	18.7	58.79	-	-	P	н
				-25.36								P	
		15630	47.54	-20.40	74	40.75	40.46	22.8	56.47	-	-	P	н
													H
													Н
													Н
													Н
													Н
													Н
BLE(2M) Ch00													Н
+													Н
11AX(HE80)_Tx		4804	51.7	-22.3	74	40.39	34.2	11.88	34.77	-	-	Р	V
_Ch42		4804	44.16	-9.84	54	32.85	34.2	11.88	34.77	-	-	А	V
		10420	45.33	-22.87	68.2	48.02	37.4	18.7	58.79	-	-	Р	V
		15630	46.9	-27.1	74	40.11	40.46	22.8	56.47	-	-	Р	V
													V
													V
													V
													V
													V
													V
													V
													V
	1. No	o other spuriou	s found										•
		results are PA		Peak and	Average lim	it line.							
Remark		e emission pos					ission found	d with suf	ficient mar	gin aqai	inst limit	line or	noise
		or only.								<u> </u>			
		,-											

(Harmonic @ 3m)



Emission below 1GHz

BLE_Tx_Ch00 + 802.11ax HE80_Tx_CH42

(LF @ 3m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				J	Line	Level		ļ	Factor		Pos		
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)		(cm))(P/A)	(H/V)
		30.54	23.04	-16.96	40	27.59	24.27	1.12	29.94	-	-	Ρ	Н
		163.92	35.14	-8.36	43.5	46.31	16.07	2.6	29.84	I	-	Ρ	Н
		186.33	33.82	-9.68	43.5	46.21	14.67	2.77	29.83	-	-	Ρ	Н
		746.6	31.58	-14.42	46	28.34	27.65	5.08	29.49	-	-	Ρ	Н
		856.5	32.79	-13.21	46	27.52	28.9	5.5	29.13	-	-	Р	Н
		953.1	33.86	-12.14	46	26.25	30.49	5.77	28.65	-	-	Ρ	Н
													Н
													Н
													Н
													Н
													Н
BLE(2M) Ch00 +													Н
11AX(HE80)_Tx_Ch42		30	30.38	-9.62	40	34.7	24.51	1.11	29.94	-	-	Ρ	V
		52.68	28.96	-11.04	40	44.37	13	1.51	29.92	-	-	Ρ	V
		184.98	32.63	-10.87	43.5	45.01	14.69	2.76	29.83	-	-	Ρ	V
		779.5	30.91	-15.09	46	27.27	27.81	5.19	29.36	-	-	Ρ	V
		860	32.67	-13.33	46	27.35	28.91	5.51	29.1	-	-	Ρ	V
		946.1	34.74	-11.26	46	27.63	30.05	5.75	28.69	-	-	Ρ	V
													V
													V
													V
													V
													V
													V
		o other spuriou											
Remark		II results are PA	•										
		he emission po					mission fou	nd an	d emissio	on leve	el has a	at leas	t 6dB
	m	argin against li	mit or emiss	ion is noi	se floor only	/.							



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not
	exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A	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.	
		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	Р	н
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	А	Н

- 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(dB μ V/m) – Limit Line(dB μ V/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)
- $= 55.45(dB\mu V/m) 74(dB\mu V/m)$
- = -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)
- $= 43.54(dB\mu V/m) 54(dB\mu V/m)$
- = -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 :		Temperature :	22.1~26°C
rest Engineer .	Jesse Wang, Stan Hsieh and Ken Wu	Relative Humidity :	48.2~69.5%

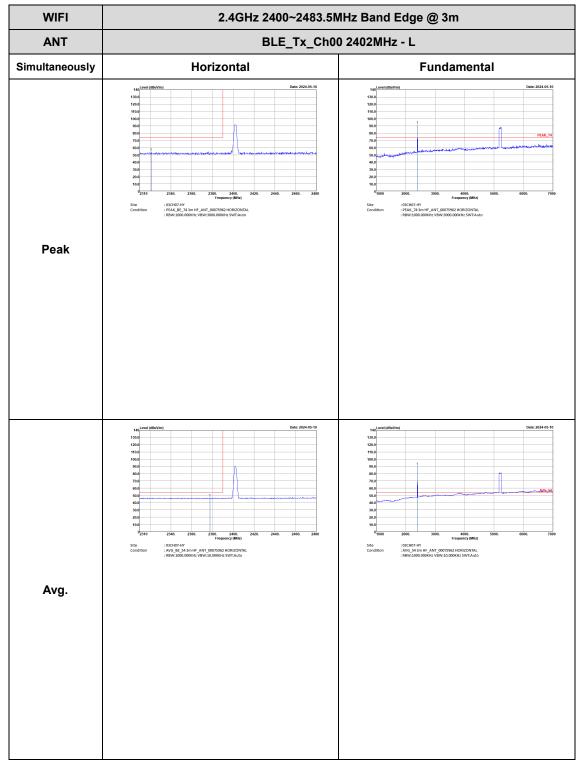
Note symbol

-L	Low channel location
-R	High channel location

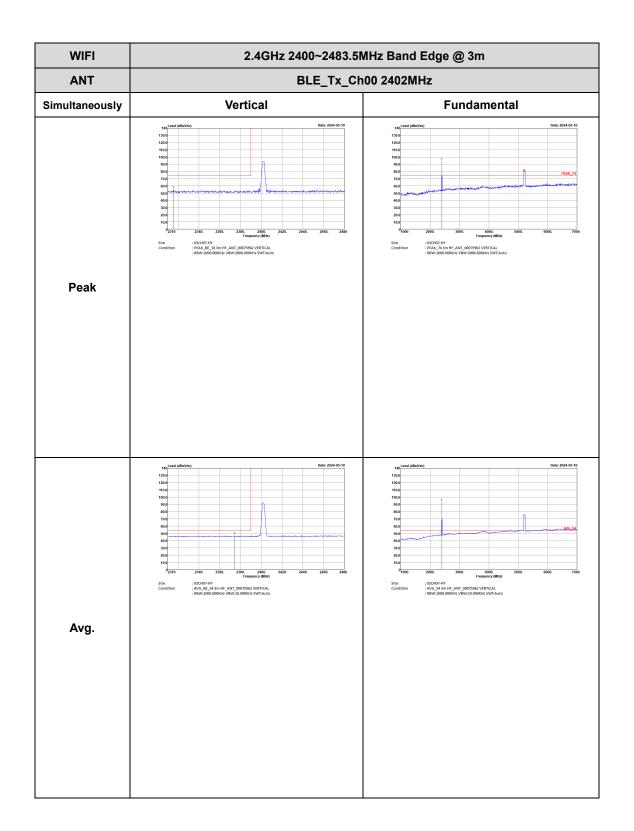


BLE_Tx_Ch00 + 11AX(HE80)_Tx_Ch42

BLE_Tx_Ch00 (Band Edge @ 3m)



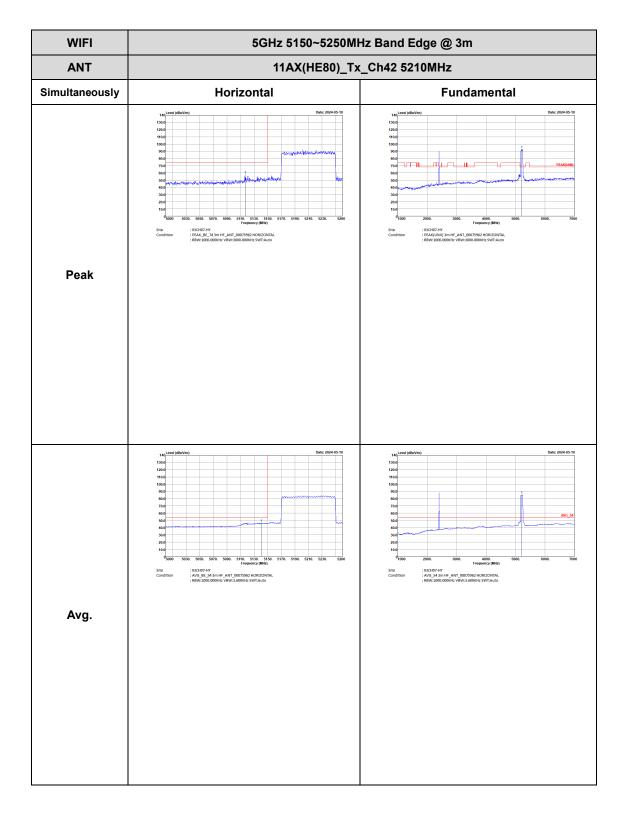


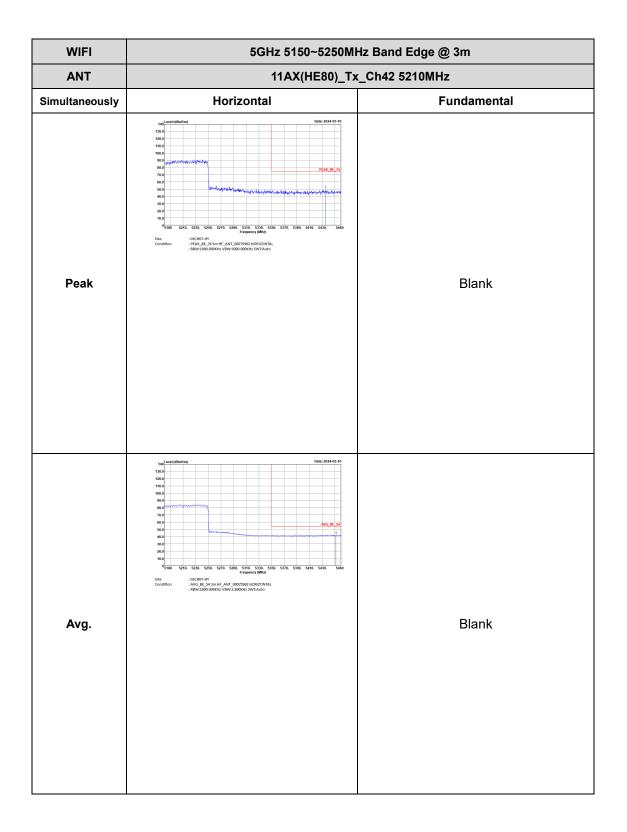


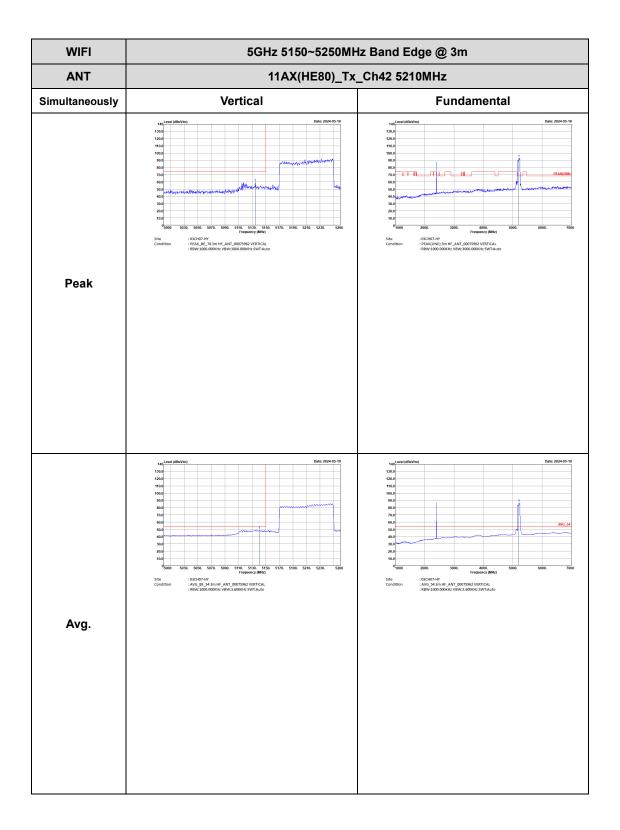


BLE_Tx_Ch00 + 11g_Tx_Ch01

11AX(HE80)_Tx_Ch42 (Band Edge @ 3m)





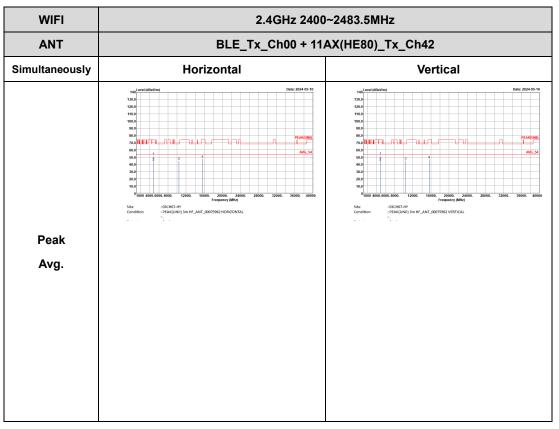




WIFI	FI 5GHz 5150~5250MHz Band Edge @ 3m						
ANT	11AX(HE80)_Tx_Ch42 5210MHz						
Simultaneously	Vertical	Fundamental					
	Det: 224.45-10 100 100 100 100 100 100 100						
Peak		Blank					
	100						
Avg.		Blank					



BLE_Tx_Ch00 + 11AX(HE80)_Tx_Ch42



(Harmonic @ 3m)

(LF @ 3m) WIFI 2.4GHz 2400~2483.5MHz BLE_Tx_Ch00 + 11AX(HE80)_Tx_Ch42 ANT Simultaneously Horizontal Vertical Date: 2024-05-1 80 74.3 68.6 62.9 57.1 51.4 45.7 40.0 34.3 28.6 22.9 17.1 11.4 5.7 0 68.6 62.9 57.1 51.4 45.7 40.0 34.3 28.6 22.9 17.1 : 03CH07-HY : QP 3m LF-ANT-35419(6) HORIZONTAL Site Condition : 03CH07-HY : QP 3m LF-ANT-35419(6) VERTICAL QP / Peak

Emission below 1GHz

BLE_Tx_Ch00 + 11AX(HE80)_Tx_Ch42



Appendix C. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
Bluetooth - LE for 2Mbps	32.48	203	4.93	10kHz
5GHz 802.11ax HE80	94.19	292	3.42	10kHz

