

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 1 of 49

Applicant : ShangHai Ehong Technology Co.,Ltd.
Address of Applicant : Room 501, No.485 Xingmei Road,
Minhang district, Shanghai, China

Product Name : AIOT Module
Model No. : EH-MW24
Brand Name : Ehong
Sample No. : E22070069-01#12
E22070069-01#01

FCC ID : 2ACCRMW24

Standards : FCC CFR47 Part 15, Subpart C

Date of Receipt : 2022-07-26
Date of Test : 2022-08-05~ 2022-08-30
Date of Issue : 2022-08-31

Remark:

This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

Prepared by:



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(Authorized signatory: Guoyou Chi)

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 2 of 49

Contents

1	GENERAL INFORMATION	3
1.1	TESTING LABORATORY	3
1.2	DETAILS OF APPLICATION	3
1.3	DETAILS OF EUT	3
1.4	TEST METHODOLOGY	4
1.5	TEST SUMMARY	5
2	TEST CONDITION	6
2.1	ENVIRONMENTAL CONDITIONS	6
2.2	EQUIPMENT LIST	6
2.3	MEASUREMENT UNCERTAINTY	6
3	TEST SET-UP AND OPERATION MODES	7
3.1	DETAILS OF TEST MODE	7
3.2	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	7
3.3	SUPPORT SOFTWARE	7
3.4	TEST SETUP DIAGRAM	8
4	TEST RESULTS	10
4.1	TRANSMITTER REQUIREMENT & TEST SUITES	10
4.1.1	<i>Antenna Requirement</i>	10
4.1.2	<i>Maximum peak conducted output power</i>	11
4.1.3	<i>6dB Bandwidth</i>	14
4.1.4	<i>Maximum conducted output power spectral density</i>	17
4.1.5	<i>Conducted Spurious Emission & Authorized-band band-edge</i>	20
4.1.6	<i>Radiated Emission</i>	27
4.1.7	<i>Band Edge (Restricted-band band-edge)</i>	42
5	APPENDIXES	45
5.1	PHOTOGRAPHS OF THE SAMPLE	45
5.2	SET-UP FOR CONDUCTED RF TEST AT ANTENNA PORT	48
5.3	SET-UP FOR SPURIOUS EMISSIONS BELOW 1GHZ	49
5.4	SET-UP FOR SPURIOUS EMISSIONS ABOVE 1GHZ	49

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 3 of 49

1 General Information

1.1 Testing Laboratory

Company Name	ICAS Testing Technology Service (Shanghai) Co., Ltd.
Address	No.1298 Pingan Rd, Minhang District, Shanghai, China
Telephone	0086 21-51682999
Fax	0086 21-54711112
Homepage	www.icasiso.com

1.2 Details of Application

Applicant Company Name	ShangHai Ehong Technology Co.,Ltd.
Address	Room 501, No.485 Xingmei Road, Minhang district,Shanghai, China
Contact Person	Rik Tang
Telephone	02164769993
Email	rik.tang@ehonglink.com
Manufacturer Company Name	ShangHai Ehong Technology Co.,Ltd.
Address	Room 501, No.485 Xingmei Road, Minhang district,Shanghai, China
Factory Company Name	ShangHai Ehong Technology Co.,Ltd.
Address	Room 501, No.485 Xingmei Road, Minhang district,Shanghai, China

1.3 Details of EUT

Product Name	AIOT Module
Brand Name	Ehong
Test Model No.	EH-MW24
FCC ID	2ACCRMW24
Mode of Operation	Zigbee
Frequency Range	2405MHz ~ 2480MHz
Number of Channels	16 (at intervals of 5 MHz)
Modulation Type	O-QPSK
Antenna Type	PCB Antenna
Antenna Gain	0.54dBi
Extreme Temperature Range	-10℃~ +85℃
Test Voltage	DC 3.3V By DC Power Supply
Hardware version	EH-MW24-V1.1
Software version	EH-MW24-C000-V1.0
Test SW Version	BL410_R;BL410_E
RF power setting in TEST SW	QRCT_Power level setting_Default

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 4 of 49

Note:

1. The above information was declared by the manufacture.
2. For more details, please refer to the User's manual of the EUT.

Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	2405	19	2445
12	2410	20	2450
13	2415	21	2455
14	2420	22	2460
15	2425	23	2465
16	2430	24	2470
17	2435	25	2475
18	2440	26	2480

1.4 Test Methodology

47 CFR Part 15, Subpart C	Telecommunication-Radio Frequency Devices-Intentional Radiators
KDB Publication 558074 D01 v05r02	15.247 Meas Guidance.
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Note(s):

All test items were verified and recorded according to the standards and without any addition/deviation/exclusion during the test.

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 5 of 49

1.5 Test Summary

Test Item	FCC Rules	Result
Antenna Requirement	FCC Part 15.247(b)(4), Part 15.203	PASS
Maximum peak conducted output power	FCC Part 15.247(b)(3)	PASS
6dB Bandwidth	FCC Part 15.247(a)(2)	PASS
Maximum conducted output power spectral density	FCC Part 15.247(e)	PASS
Conducted Spurious Emission & Authorized-band band-edge	FCC Part 15.247(d)	PASS
Radiated Emission	FCC Part 15.247(d), 15.205, 15.209	PASS
Band Edge (Restricted-band band-edge)	FCC Part 15.247(d), 15.205, 15.209	PASS
Conducted Emission on AC Mains	FCC Part 15.207(a)	N/A ^{note}

Note(s): N/A means not applicable. The EUT is powered by DC Power Supply (DC 3.3V). Conducted Emission on AC Mains Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 6 of 49

2 Test Condition

2.1 Environmental conditions

Temperature (°C)	18-25
Humidity (%RH)	40-65
Barometric Pressure (mbar)	960-1060

2.2 Equipment List

Name of Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	Keysight	N9020B	MY59260184	2022-08-02	2023-08-01
Spectrum Analyzer	Rohde & Schwarz	FSV40N	101450	2022-06-10	2023-06-09
EMI Test Receiver	Rohde & Schwarz	ESR 7	101911	2022-06-10	2023-06-09
Broadband Antenna	SCHWARZBECK	VULB9163	9163-1037	2021-06-08	2023-06-07
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1775	2021-06-08	2023-06-07
Loop Antenna	SCHWARZBECK	FMZB 1513	/	2022-06-10	2023-06-09
Broadband Preamplifier	SCHWARZBECK	BBV 9718	346	2022-06-10	2023-06-09
EMC chamber 9*6*6 (L*W*H)	CHANGNING	966	N/A	2022-06-10	2023-06-09
DC Power Supply	ITECH	IT6512A	N/A	2022-06-07	2024-06-06
Test Software	BL	BL410_E	N/A	N/A	N/A
Test Software	BL	BL410_R	N/A		N/A

2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI. The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Parameter		Uncertainty
Antenna Port Conducted Emission	< 1GHz	± 1.5 dB
	> 1GHz	± 1.5 dB
Radiated Emission	< 1GHz	± 5.00 dB
	> 1GHz	± 4.88 dB
Occupied Channel Bandwidth		± 5 %

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 7 of 49

3 Test Set-up and Operation Modes

3.1 Details of Test Mode

Using test software was control EUT work in continuous transmitter and receiver mode. Select test channel as below:

Channel	Frequency
The lowest channel(CH11)	2405MHz
The middle channel(CH18)	2440MHz
The Highest channel(CH26)	2480MHz

The basic operation modes are:

- A. On
 - 1. zigbee mode
 - a. Transmitting
 - i. Low Channel
 - ii. Middle Channel
 - iii. High Channel
 - b. Receiving
 - 2. Normal working with Bluetooth on
- B. Standby
- C. Off

3.2 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.	Serial No.
Laptop	HP	HP ZHAN 66 Pro G1	N/A

3.3 Support Software

Description	Manufacturer	Software Name
Software	Qualcomm	QRCT Version 4.0.00132.0

TEST REPORT

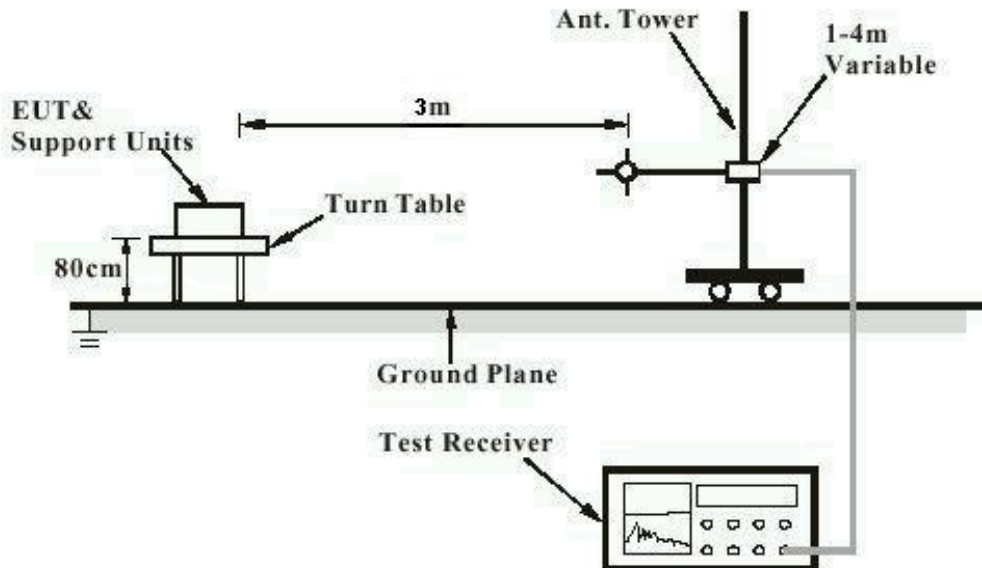
Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 8 of 49

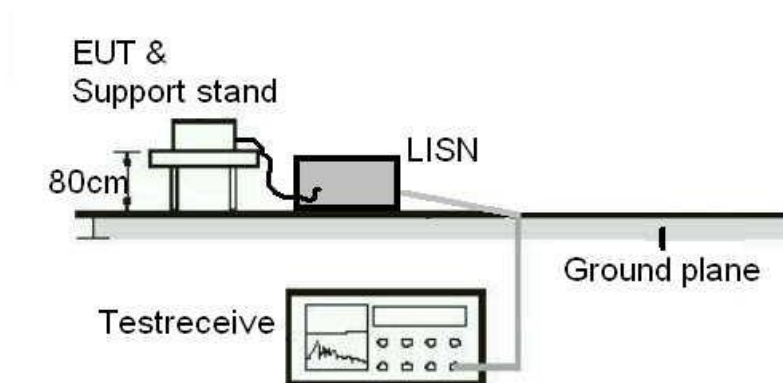
3.4 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Equipment Configuration for Conduction Measurement



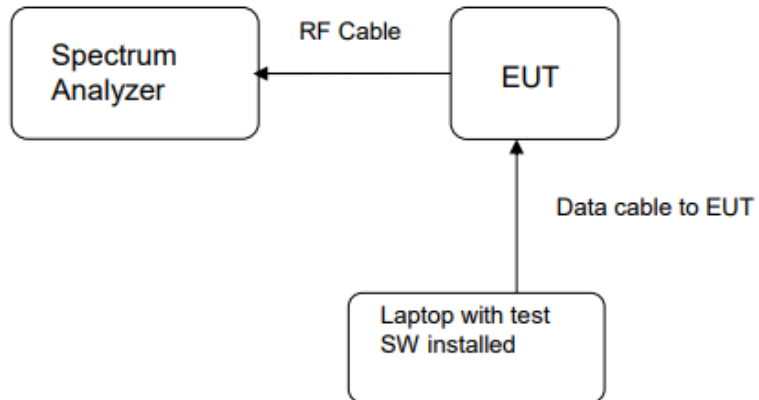
TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 9 of 49

Diagram of Measurement Equipment Configuration for Transmitter Measurement



TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 10 of 49

4 Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

RESULT:

PASS

Test standard	: FCC Part 15.247(b)(4), Part 15.203
Requirement	: The use of approved antennas only with directional gains that do not exceed 6dBi

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 0.54dBi. The antenna is pcb antenna with no possibility of replacement with a non-approved antenna by the end-user.

Therefore, the EUT is considered to comply with this provision.

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 11 of 49

4.1.2 Maximum peak conducted output power

RESULT:

PASS

Test standard : FCC Part 15.247(b)(3)
Requirement : ANSI C63.10-2013 clause 11.9.1.1,
KDB 558074 clause 8.3.1.1
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 24.9°C
Relative humidity : 56%

Table 1: Maximum peak conducted output power

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(mW)	
Zigbee	2405	-0.12	0.97	< 1
	2440	-0.09	0.98	
	2480	-0.01	1.00	

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 12 of 49

Figure 1: Peak Output Power, 2405MHz, Zigbee



Figure 2: Peak Output Power, 2440MHz, Zigbee



TEST REPORT

Report No.:

SHE22070069-02BE

Date:

2022-08-31

Page 13 of 49

Figure 3: Peak Output Power, 2480MHz, Zigbee



TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 14 of 49

4.1.3 6dB Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.247(a)(2)
Requirement : ANSI C63.10-2013 clause 11.8.1,
KDB 558074 clause 8.2
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 24.9°C
Relative humidity : 56%

Table 2: 6dB Bandwidth

Test Mode	Test Channel (MHz)	6dB Bandwidth (MHz)	Limit
Zigbee	2405	1.635	>0.5 MHz
	2440	1.666	
	2480	1.621	

TEST REPORT

Report No.: SHE22070069-02BE

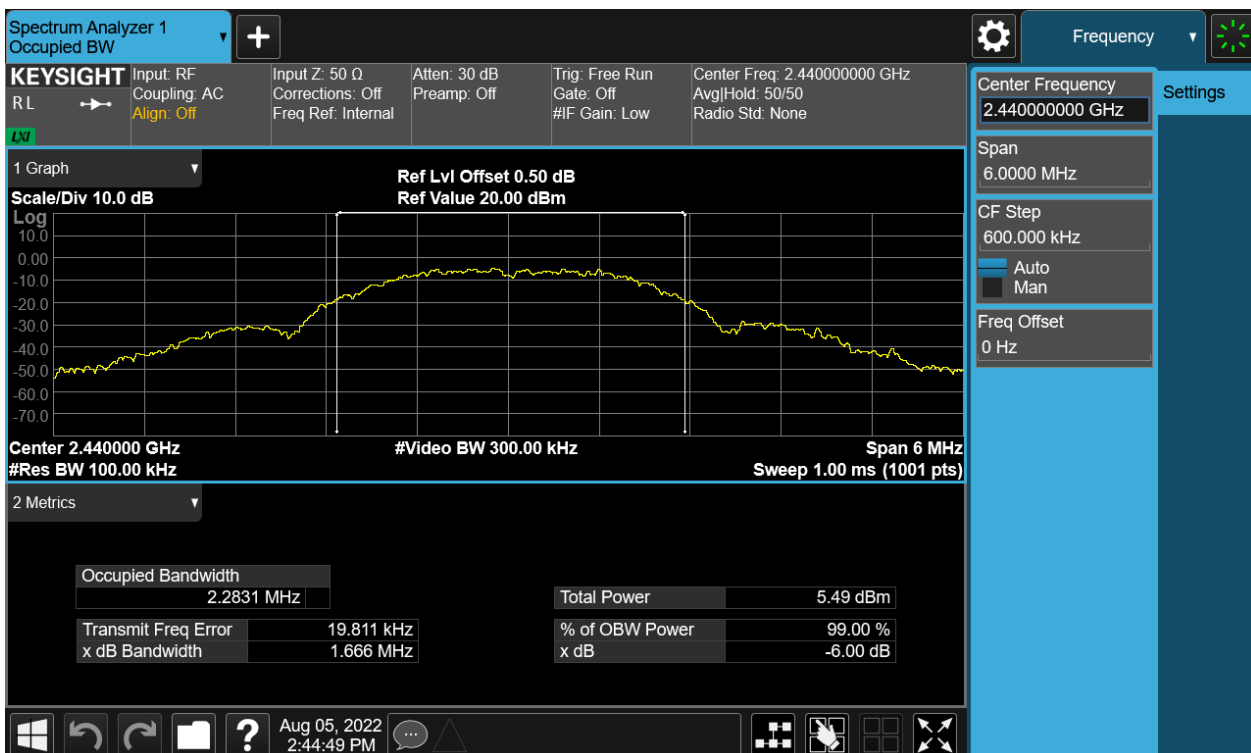
Date: 2022-08-31

Page 15 of 49

Figure 4: 6dB Bandwidth, 2405MHz, Zigbee



Figure 5: 6dB Bandwidth, 2440MHz, Zigbee



TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 16 of 49

Figure 6: 6dB Bandwidth, 2480MHz, Zigbee



TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 17 of 49

4.1.4 Maximum conducted output power spectral density

RESULT:

PASS

Test standard : FCC Part 15.247(e)

Requirement : ANSI C63.10-2013 clause 11.10.2,
KDB 558074 clause 8.4

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 24.9°C

Relative humidity : 56%

Table 3: Power Spectral Density

Test Mode	Test Channel (MHz)	Measured Result (dBm/3kHz)	Limit (dBm/3kHz)
Zigbee	2405	-16.91	8
	2440	-17.32	
	2480	-16.92	

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 18 of 49

Figure 7: Power Spectral Density, 2405MHz, Zigbee



Figure 8: Power Spectral Density, 2440MHz, Zigbee



TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 19 of 49

Figure 9: Power Spectral Density, 2480MHz, Zigbee



TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 20 of 49

4.1.5 Conducted Spurious Emission & Authorized-band band-edge

RESULT:

PASS

Test standard : FCC Part 15.247(d)
Requirement : ANSI C63.10-2013 clause 11.11,
KDB 558074 clause 8.5
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High for spurious, Low/High for Band
Edge
Operation Mode : A.1.a
Ambient temperature : 24.9°C
Relative humidity : 56%

For details refer to following test plot.

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 21 of 49

Figure 10: Conducted Spurious Emission & Authorized-band band-edge, 2405MHz, Zigbee Carrier Level



Band Edge



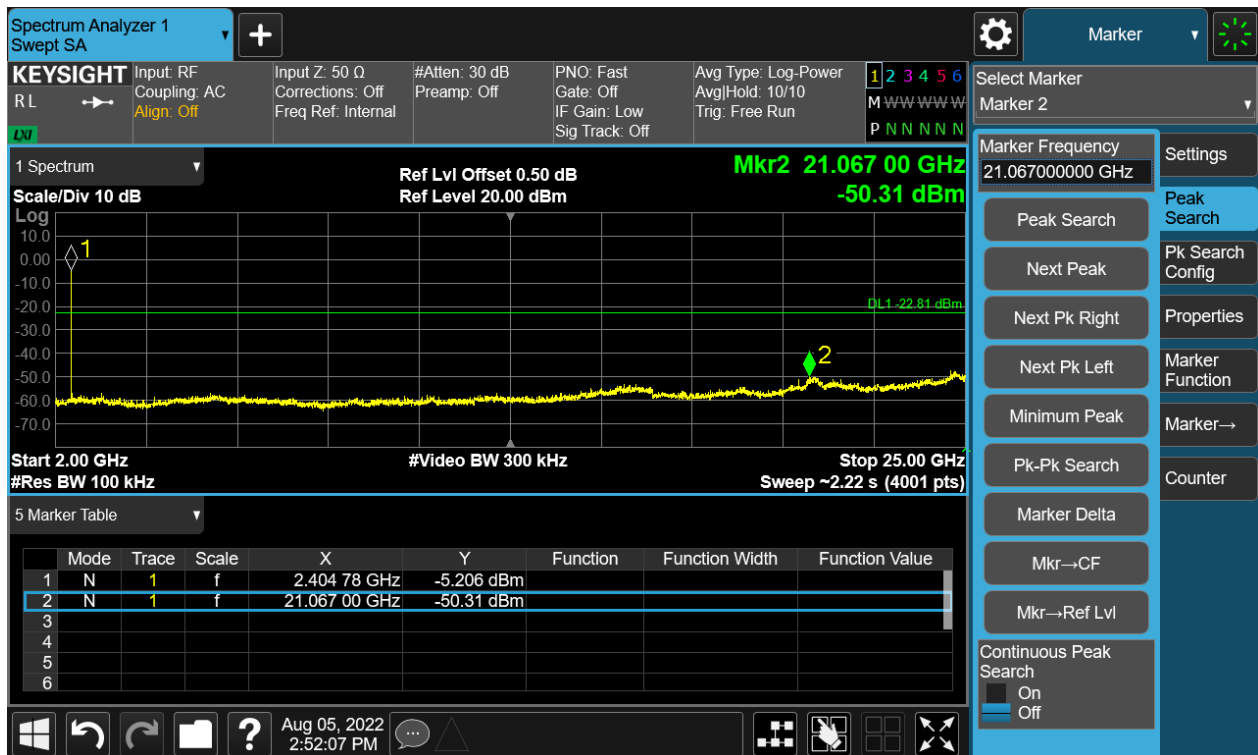
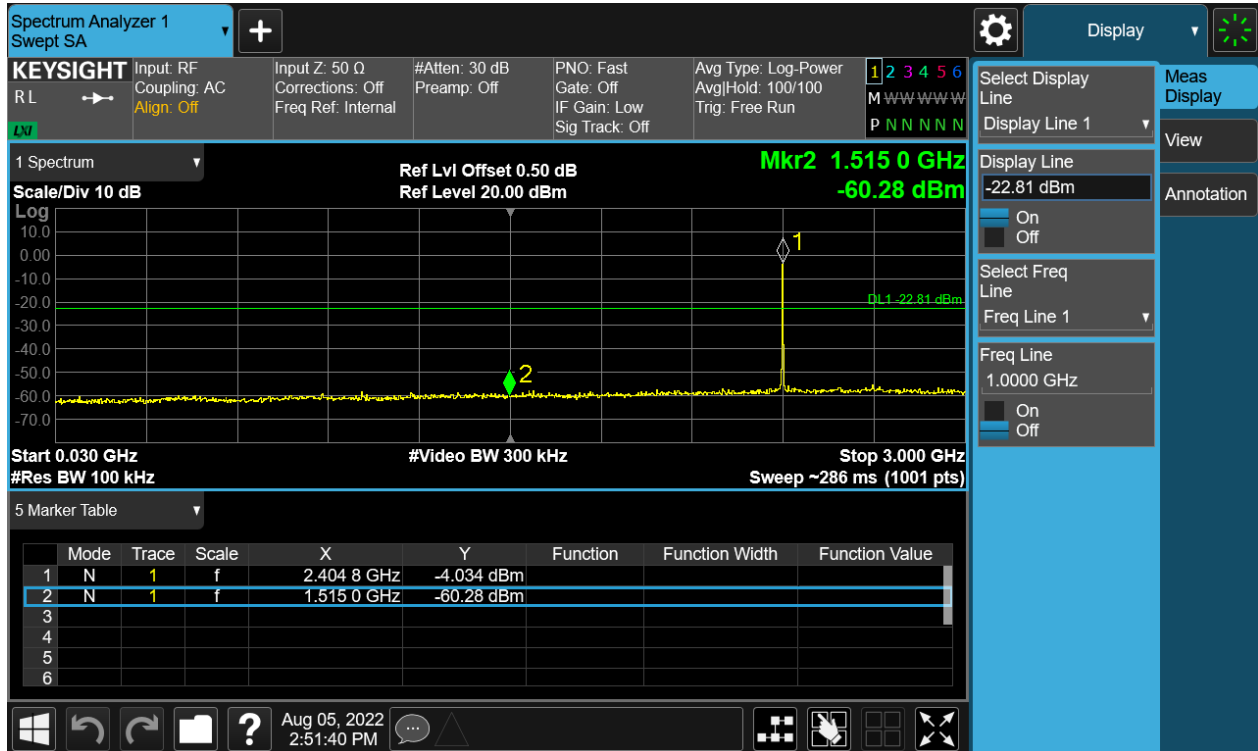
TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 22 of 49

Conducted spurious emissions 30MHz-25GHz



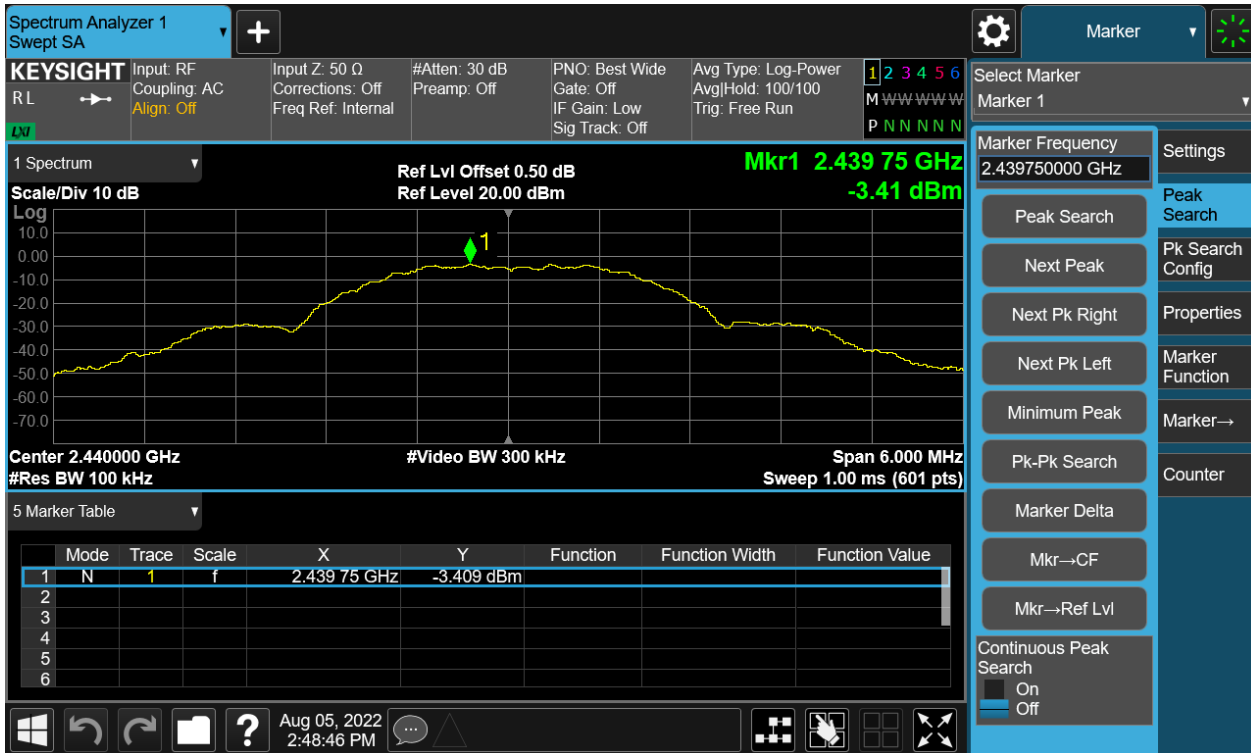
TEST REPORT

Report No.: SHE22070069-02BE

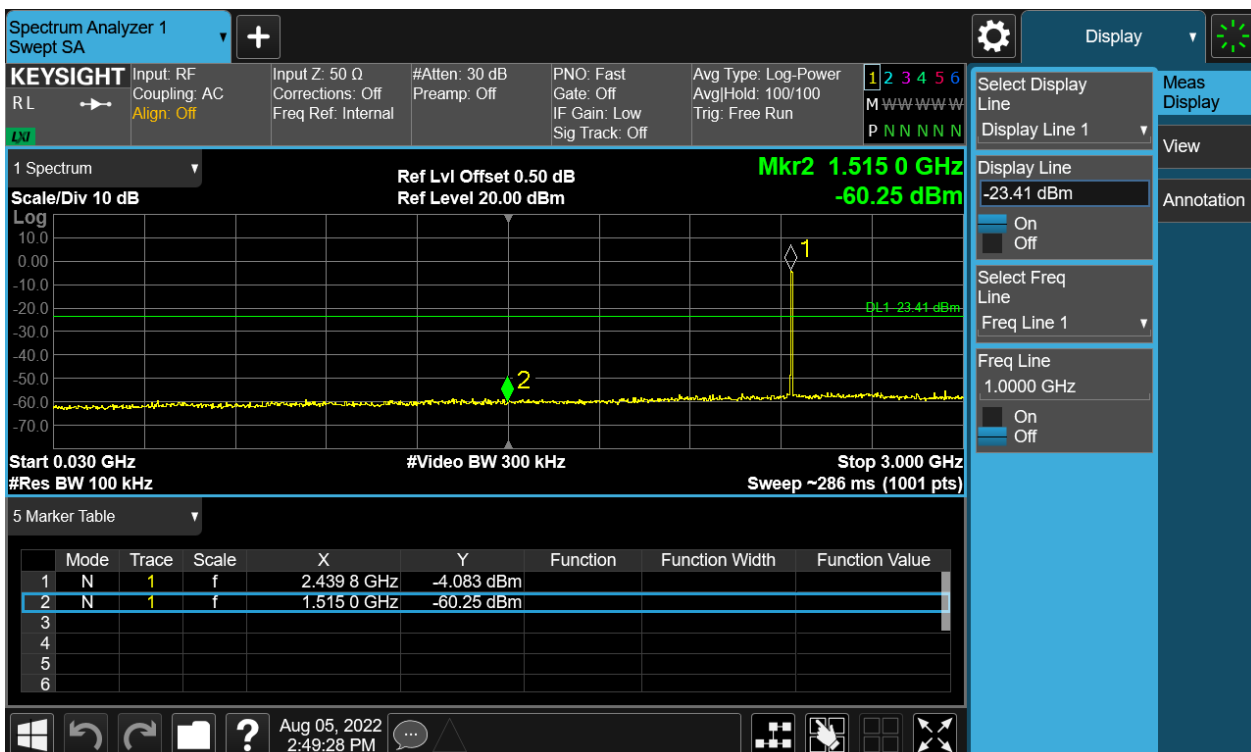
Date: 2022-08-31

Page 23 of 49

Figure 11: Conducted Spurious Emission & Authorized-band band-edge, 2440MHz, Zigbee Carrier Level



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 24 of 49

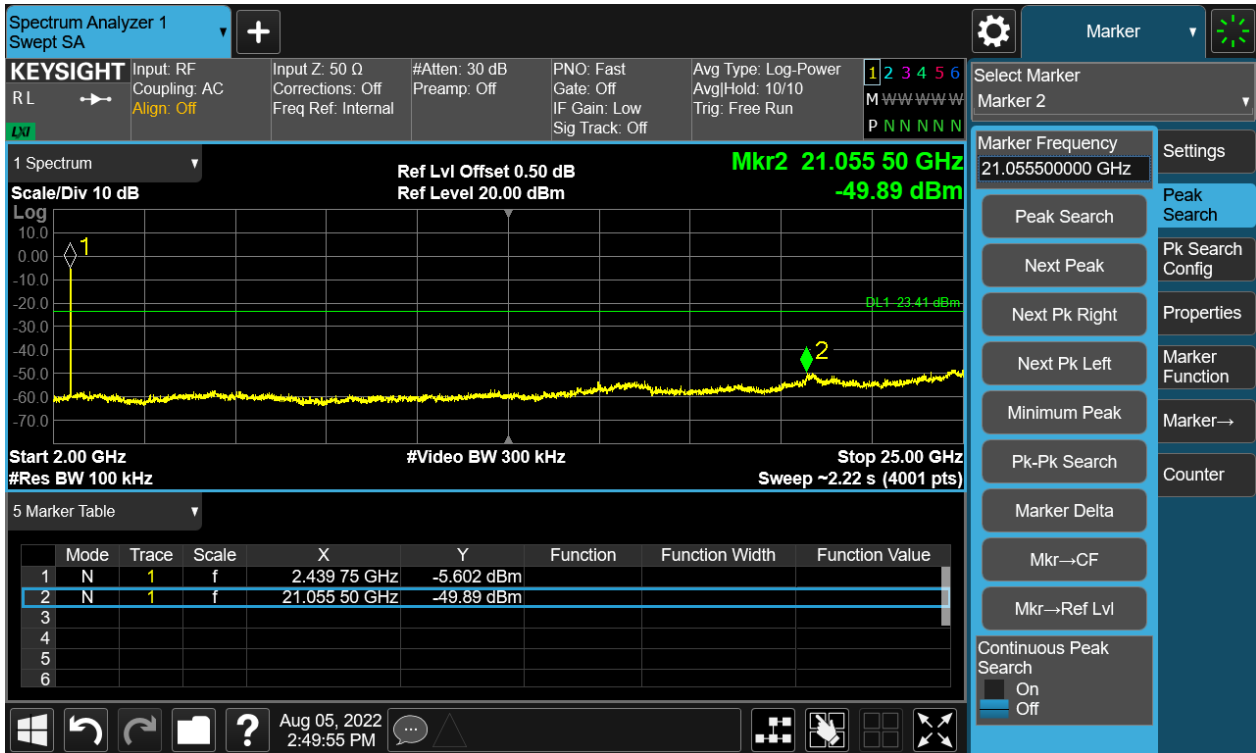


Figure 12: Conducted Spurious Emission & Authorized-band band-edge, 2480MHz, Zigbee Carrier Level



TEST REPORT

Report No.: SHE22070069-02BE

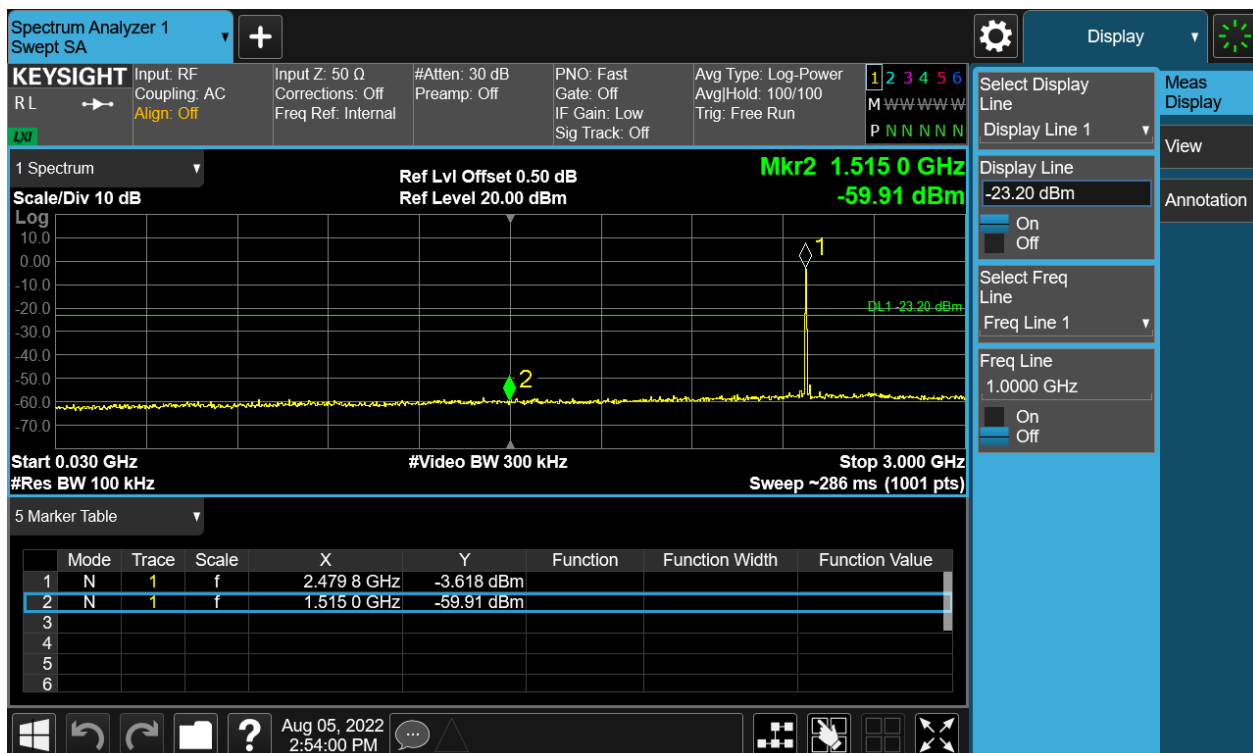
Date: 2022-08-31

Page 25 of 49

Band Edge



Conducted spurious emissions 30MHz-25GHz



TEST REPORT

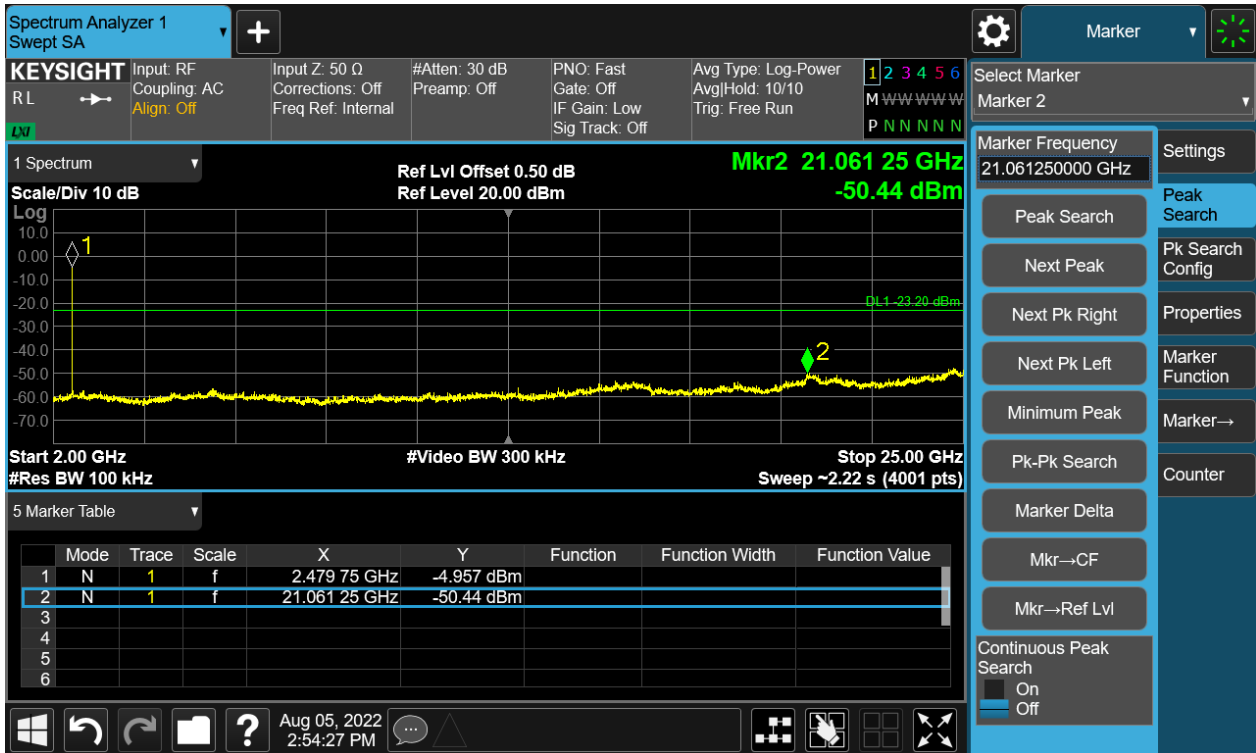
Report No.:

SHE22070069-02BE

Date:

2022-08-31

Page 26 of 49



TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 27 of 49

4.1.6 Radiated Emission

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209
Requirement	: ANSI C63.10-2013 clause 11.12, KDB 558074 clause 8.6
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A
Ambient temperature	: 24.5°C
Relative humidity	: 53%

Notes

1. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
2. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.
3. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.
4. All test modes had been pre-tested, but only the low channel of below 1 GHz is the worst case and recorded in the report.

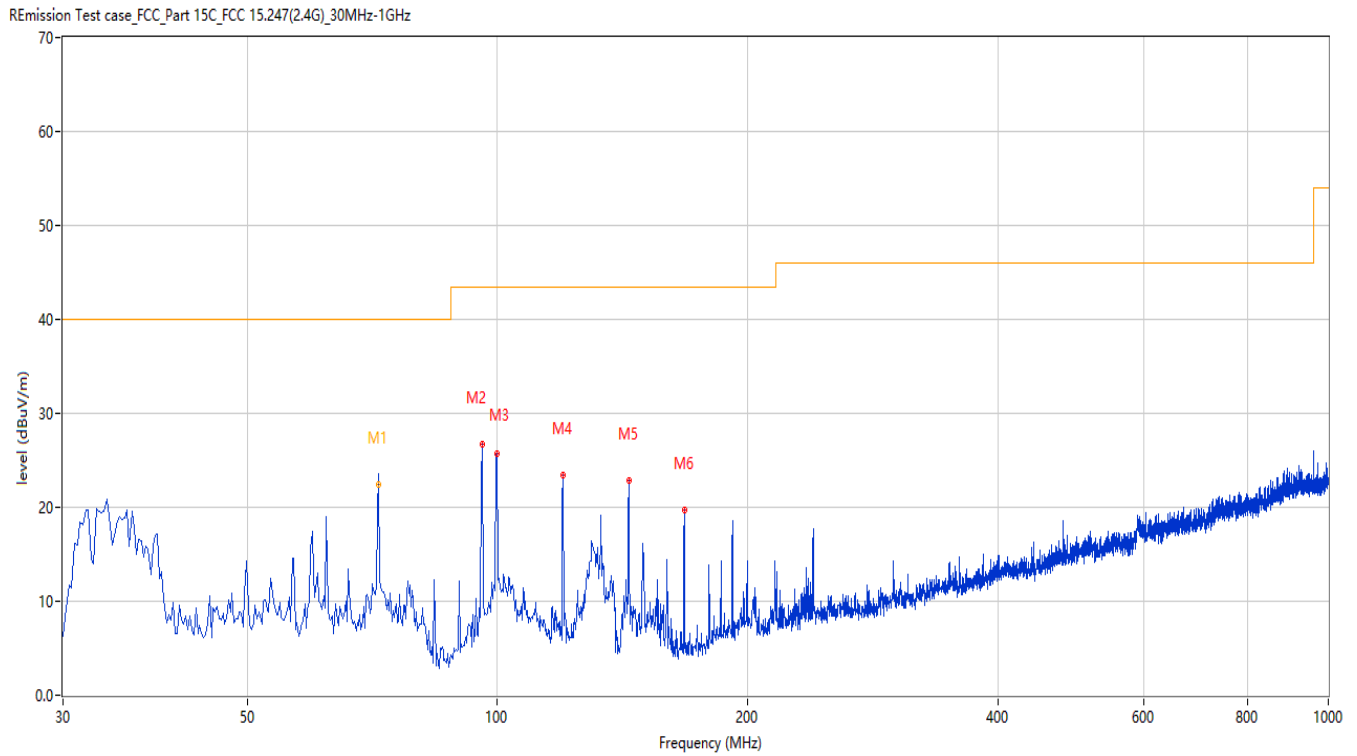
TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 28 of 49

Figure 13: Radiated Emission, Zigbee, 2405MHz_30MHz_1GHz
Horizontal polarization



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	71.942	23.61	-30.08	40.0	-16.39	Peak	200.00	200	Horizontal	Pass
1*	71.942	22.38	-30.08	40.0	-17.62	QP	200.00	200	Horizontal	Pass
2	95.944	26.70	-27.17	43.5	-16.80	Peak	2.90	200	Horizontal	Pass
3	99.823	25.78	-26.67	43.5	-17.72	Peak	46.90	200	Horizontal	Pass
4	119.945	23.41	-28.31	43.5	-20.09	Peak	107.30	200	Horizontal	Pass
5	143.947	22.86	-30.00	43.5	-20.64	Peak	37.20	200	Horizontal	Pass
6	167.948	19.67	-29.07	43.5	-23.83	Peak	153.80	200	Horizontal	Pass

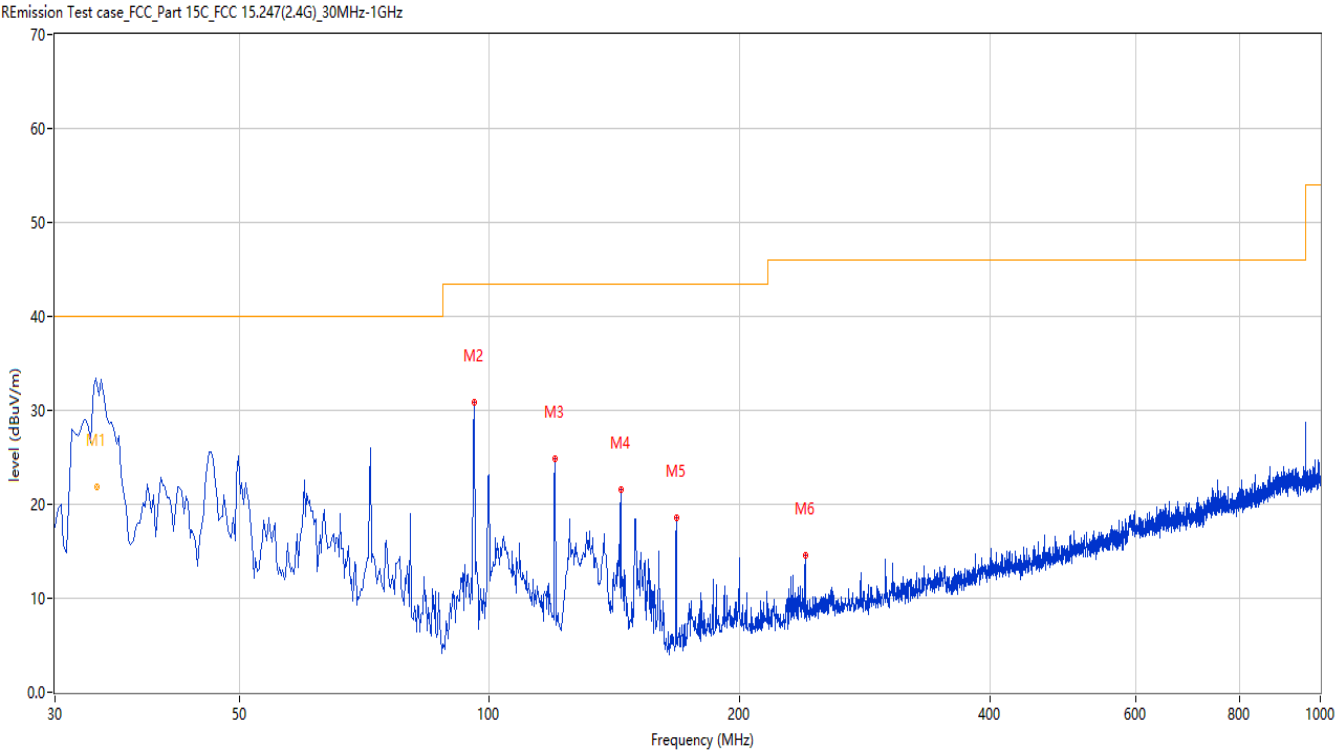
TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 29 of 49

Vertical polarization



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	33.684	35.20	-28.53	40.0	-4.80	Peak	285.40	101	Vertical	Pass
1*	33.684	21.91	-28.53	40.0	-18.09	QP	285.40	101	Vertical	Pass
2	95.944	30.84	-27.17	43.5	-12.66	Peak	32.30	100	Vertical	Pass
3	119.945	24.51	-28.31	43.5	-18.99	Peak	9.20	100	Vertical	Pass
4	143.947	21.52	-30.00	43.5	-21.98	Peak	2.80	100	Vertical	Pass
5	167.948	18.51	-29.07	43.5	-24.99	Peak	336.30	100	Vertical	Pass
6	239.953	14.52	-25.19	46.0	-31.48	Peak	196.10	100	Vertical	Pass

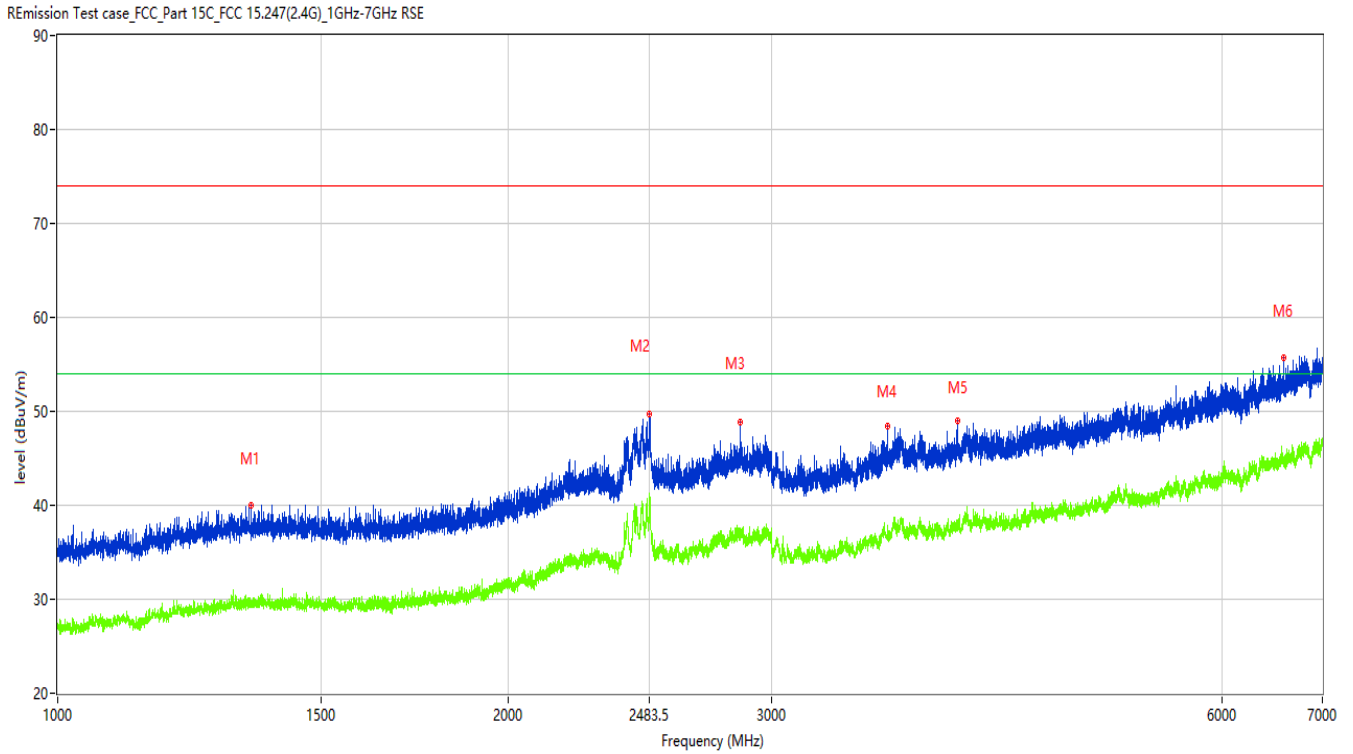
TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 30 of 49

Figure 14: Radiated Emission, Zigbee, 2405MHz_1GHz_7GHz
Horizontal polarization



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1345.750	39.94	-12.79	74.0	-34.06	Peak	360.00	100	Horizontal	Pass
1**	1345.750	29.53	-12.79	54.0	-24.47	AV	360.00	100	Horizontal	Pass
2	2486.250	49.78	-1.91	74.0	-24.22	Peak	360.00	100	Horizontal	Pass
2**	2486.250	40.24	-1.91	54.0	-13.76	AV	360.00	100	Horizontal	Pass
3	2857.500	48.82	-3.83	74.0	-25.18	Peak	237.10	100	Horizontal	Pass
3**	2857.500	37.52	-3.83	54.0	-16.48	AV	237.10	100	Horizontal	Pass
4	3584.000	48.40	-2.36	74.0	-25.60	Peak	291.10	100	Horizontal	Pass
4**	3584.000	37.85	-2.36	54.0	-16.15	AV	291.10	100	Horizontal	Pass
5	3993.000	49.00	-1.21	74.0	-25.00	Peak	58.90	100	Horizontal	Pass
5**	3993.000	38.46	-1.21	54.0	-15.54	AV	58.90	100	Horizontal	Pass
6	6597.000	55.69	4.31	74.0	-18.31	Peak	153.80	100	Horizontal	Pass
6**	6597.000	44.94	4.31	54.0	-9.06	AV	153.80	100	Horizontal	Pass

TEST REPORT

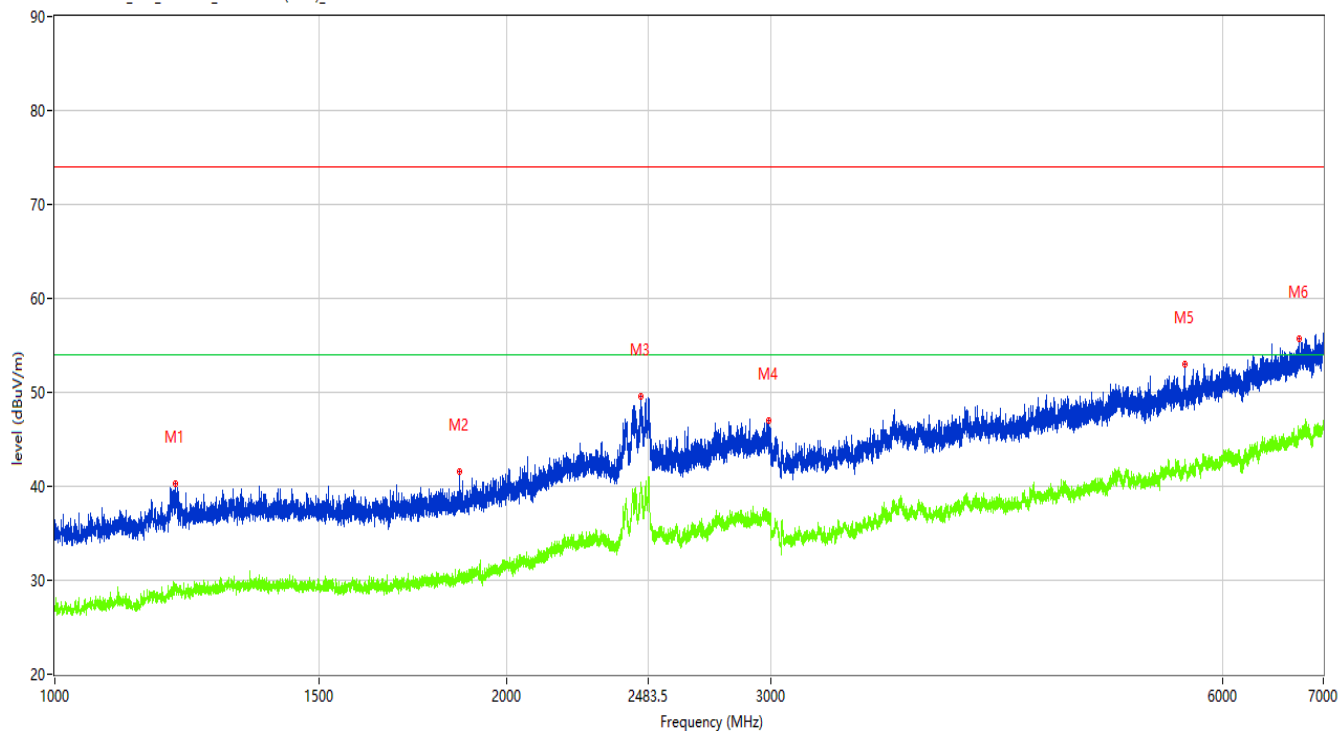
Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 31 of 49

Vertical polarization

REmission Test case_FCC_Part 15C_FCC 15.247(2.4G)_1GHz-7GHz RSE



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1204.000	40.29	-13.57	74.0	-33.71	Peak	72.20	100	Vertical	Pass
1**	1204.000	29.56	-13.57	54.0	-24.44	AV	72.20	100	Vertical	Pass
2	1860.750	41.53	-12.10	74.0	-32.47	Peak	157.50	100	Vertical	Pass
2**	1860.750	31.08	-12.10	54.0	-22.92	AV	157.50	100	Vertical	Pass
3	2458.250	49.63	-2.59	74.0	-24.37	Peak	157.50	100	Vertical	Pass
3**	2458.250	40.11	-2.59	54.0	-13.89	AV	157.50	100	Vertical	Pass
4	2991.500	46.99	-3.08	74.0	-27.01	Peak	132.50	100	Vertical	Pass
4**	2991.500	36.72	-3.08	54.0	-17.28	AV	132.50	100	Vertical	Pass
5	5658.500	52.98	1.61	74.0	-21.02	Peak	0.50	100	Vertical	Pass
5**	5658.500	42.22	1.61	54.0	-11.78	AV	0.50	100	Vertical	Pass
6	6745.500	55.78	4.80	74.0	-18.22	Peak	219.80	100	Vertical	Pass
6**	6745.500	45.77	4.80	54.0	-8.23	AV	219.80	100	Vertical	Pass

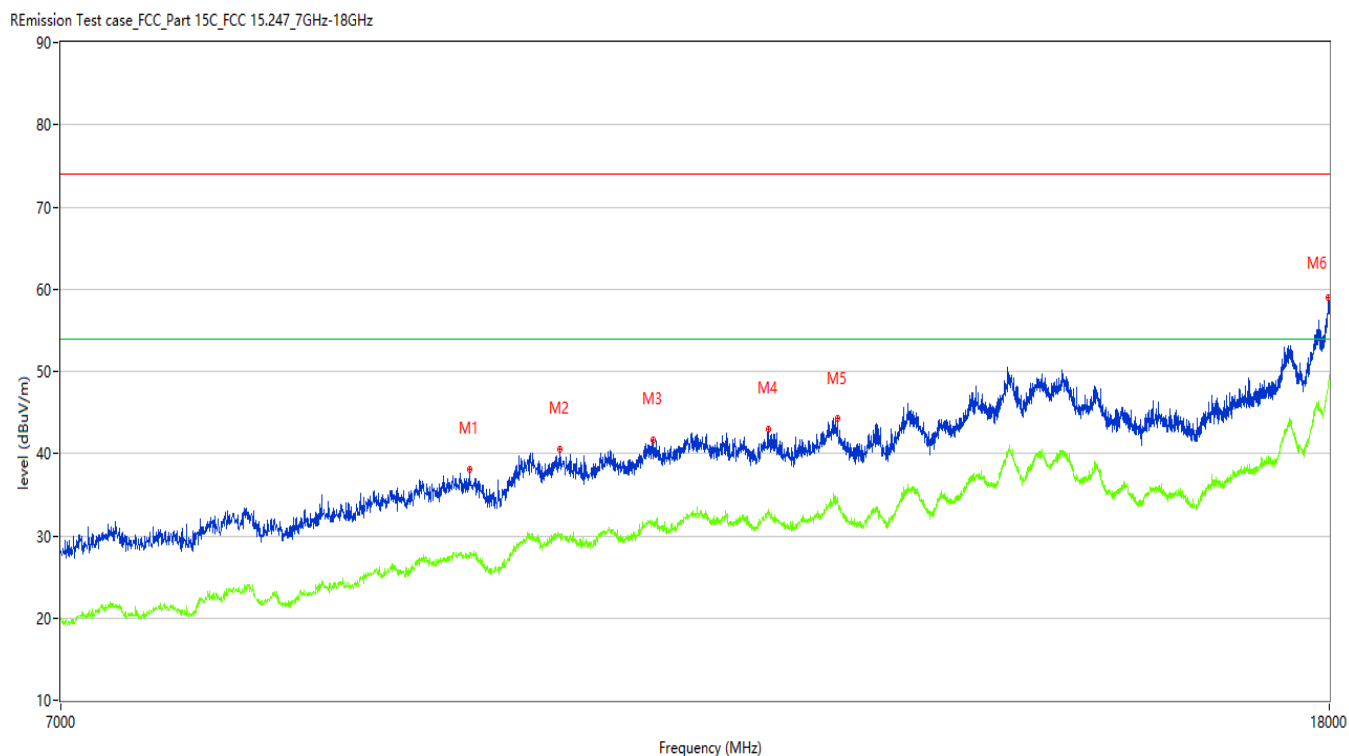
TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 32 of 49

Figure 15: Radiated Emission, Zigbee, 2405MHz_7GHz_18GHz
Horizontal polarization



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9488.750	38.13	7.83	74.0	-35.87	Peak	254.10	100	Horizontal	Pass
1**	9488.750	27.68	7.83	54.0	-26.32	AV	254.10	100	Horizontal	Pass
2	10148.750	40.58	9.25	74.0	-33.42	Peak	127.10	100	Horizontal	Pass
2**	10148.750	29.79	9.25	54.0	-24.21	AV	127.10	100	Horizontal	Pass
3	10877.500	41.72	11.12	74.0	-32.28	Peak	19.80	100	Horizontal	Pass
3**	10877.500	31.51	11.12	54.0	-22.49	AV	19.80	100	Horizontal	Pass
4	11856.500	42.98	11.96	74.0	-31.02	Peak	19.80	100	Horizontal	Pass
4**	11856.500	32.78	11.96	54.0	-21.22	AV	19.80	100	Horizontal	Pass
5	12483.500	44.25	12.14	74.0	-29.75	Peak	1.60	100	Horizontal	Pass
5**	12483.500	34.57	12.14	54.0	-19.43	AV	1.60	100	Horizontal	Pass
6	17991.750	58.94	27.41	74.0	-15.06	Peak	185.20	100	Horizontal	Pass
6**	17991.750	48.52	27.41	54.0	-5.48	AV	185.20	100	Horizontal	Pass

TEST REPORT

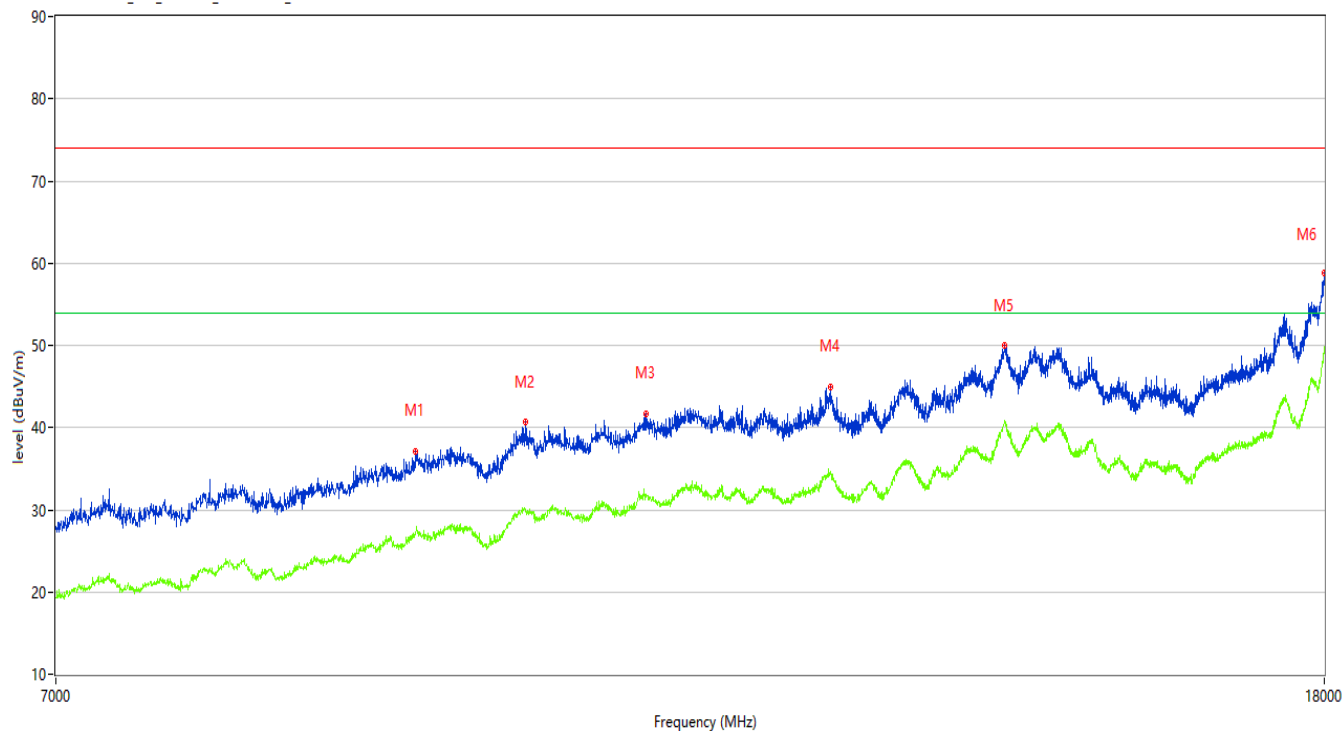
Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 33 of 49

Vertical polarization

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9150.500	37.02	7.34	74.0	-36.98	Peak	223.30	100	Vertical	Pass
1**	9150.500	26.92	7.34	54.0	-27.08	AV	223.30	100	Vertical	Pass
2	9931.500	40.63	9.82	74.0	-33.37	Peak	329.80	100	Vertical	Pass
2**	9931.500	29.92	9.82	54.0	-24.08	AV	329.80	100	Vertical	Pass
3	10863.750	41.74	11.12	74.0	-32.26	Peak	52.20	100	Vertical	Pass
3**	10863.750	31.81	11.12	54.0	-22.19	AV	52.20	100	Vertical	Pass
4	12467.000	44.97	12.54	74.0	-29.03	Peak	179.00	100	Vertical	Pass
4**	12467.000	34.61	12.54	54.0	-19.39	AV	179.00	100	Vertical	Pass
5	14185.750	49.98	19.69	74.0	-24.02	Peak	358.10	100	Vertical	Pass
5**	14185.750	40.62	19.69	54.0	-13.38	AV	358.10	100	Vertical	Pass
6	17999.999	58.88	27.92	74.0	-15.12	Peak	340.60	100	Vertical	Pass
6**	17999.999	49.84	27.92	54.0	-4.16	AV	340.60	100	Vertical	Pass

TEST REPORT

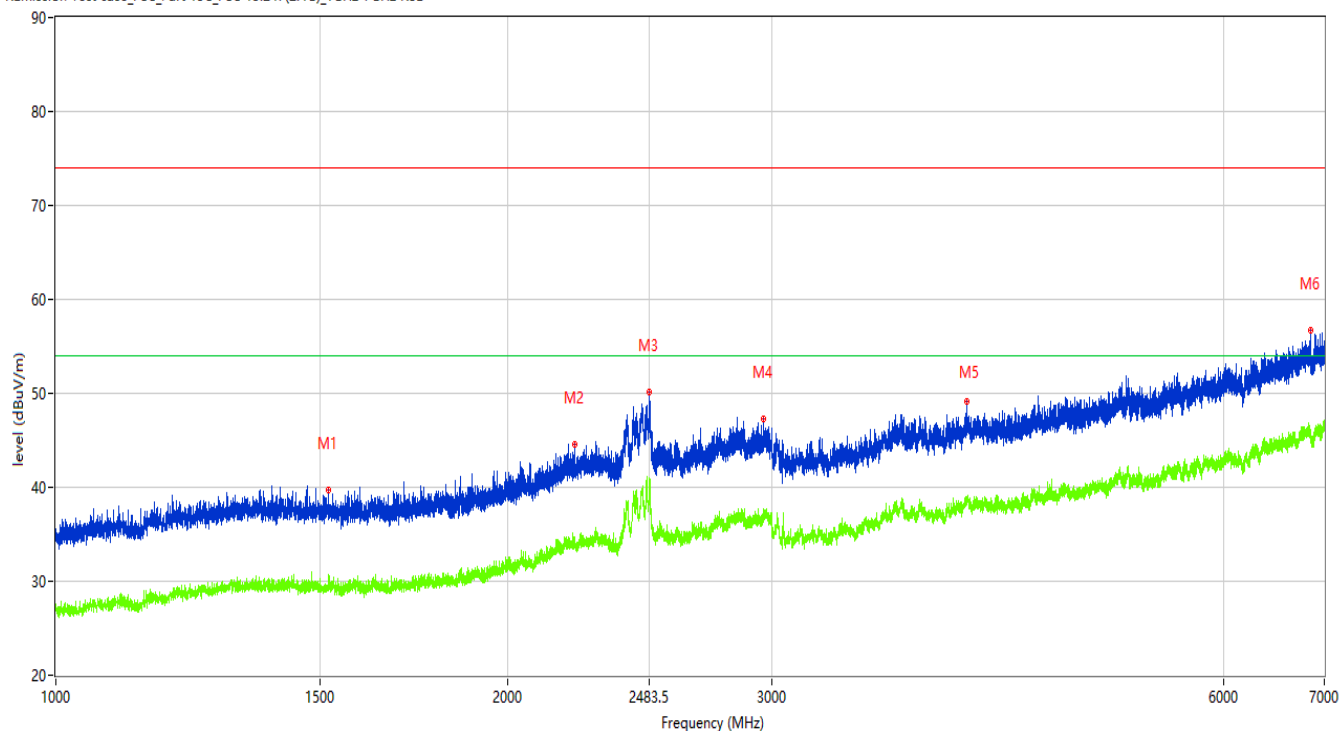
Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 34 of 49

Figure 16: Radiated Emission, Zigbee, 2440MHz_1GHz_7GHz
Horizontal polarization

REmission Test case_FCC_Part 15C_FCC 15.247(2.4G)_1GHz-7GHz RSE



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1518.750	39.66	-13.07	74.0	-34.34	Peak	53.30	100	Horizontal	Pass
1**	1518.750	29.35	-13.07	54.0	-24.65	AV	53.30	100	Horizontal	Pass
2	2216.250	44.64	-8.17	74.0	-29.36	Peak	320.50	100	Horizontal	Pass
2**	2216.250	33.91	-8.17	54.0	-20.09	AV	320.50	100	Horizontal	Pass
3	2485.750	50.16	-1.91	74.0	-23.84	Peak	274.70	100	Horizontal	Pass
3**	2485.750	40.40	-1.91	54.0	-13.60	AV	274.70	100	Horizontal	Pass
4	2962.250	47.27	-3.40	74.0	-26.73	Peak	42.90	100	Horizontal	Pass
4**	2962.250	37.04	-3.40	54.0	-16.96	AV	42.90	100	Horizontal	Pass
5	4043.000	49.13	-0.89	74.0	-24.87	Peak	265.50	100	Horizontal	Pass
5**	4043.000	38.26	-0.89	54.0	-15.74	AV	265.50	100	Horizontal	Pass
6	6852.000	56.73	5.04	74.0	-17.27	Peak	265.50	100	Horizontal	Pass
6**	6852.000	45.45	5.04	54.0	-8.55	AV	265.50	100	Horizontal	Pass

TEST REPORT

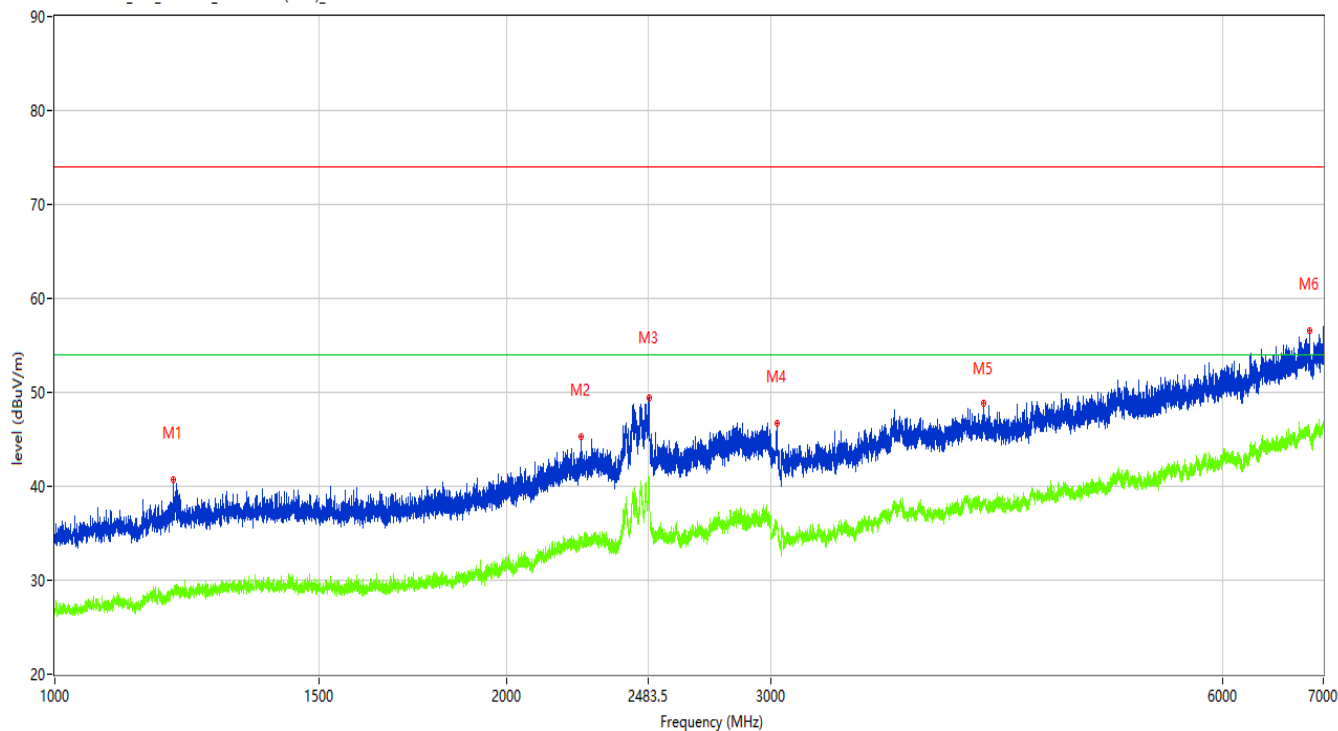
Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 35 of 49

Vertical polarization

REmission Test case_FCC_Part 15C_FCC 15.247(2.4G)_1GHz-7GHz RSE



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1199.500	40.69	-13.52	74.0	-33.31	Peak	111.30	100	Vertical	Pass
1**	1199.500	28.65	-13.52	54.0	-25.35	AV	111.30	100	Vertical	Pass
2	2240.750	45.28	-8.03	74.0	-28.72	Peak	166.80	100	Vertical	Pass
2**	2240.750	34.25	-8.03	54.0	-19.75	AV	166.80	100	Vertical	Pass
3	2487.000	49.39	-1.89	74.0	-24.61	Peak	360.00	100	Vertical	Pass
3**	2487.000	41.01	-1.89	54.0	-12.99	AV	360.00	100	Vertical	Pass
4	3029.000	46.67	-4.38	74.0	-27.33	Peak	34.80	100	Vertical	Pass
4**	3029.000	35.49	-4.38	54.0	-18.51	AV	34.80	100	Vertical	Pass
5	4159.500	48.85	-1.35	74.0	-25.15	Peak	152.00	100	Vertical	Pass
5**	4159.500	38.23	-1.35	54.0	-15.77	AV	152.00	100	Vertical	Pass
6	6857.500	56.57	5.05	74.0	-17.43	Peak	360.00	100	Vertical	Pass
6**	6857.500	45.13	5.05	54.0	-8.87	AV	360.00	100	Vertical	Pass

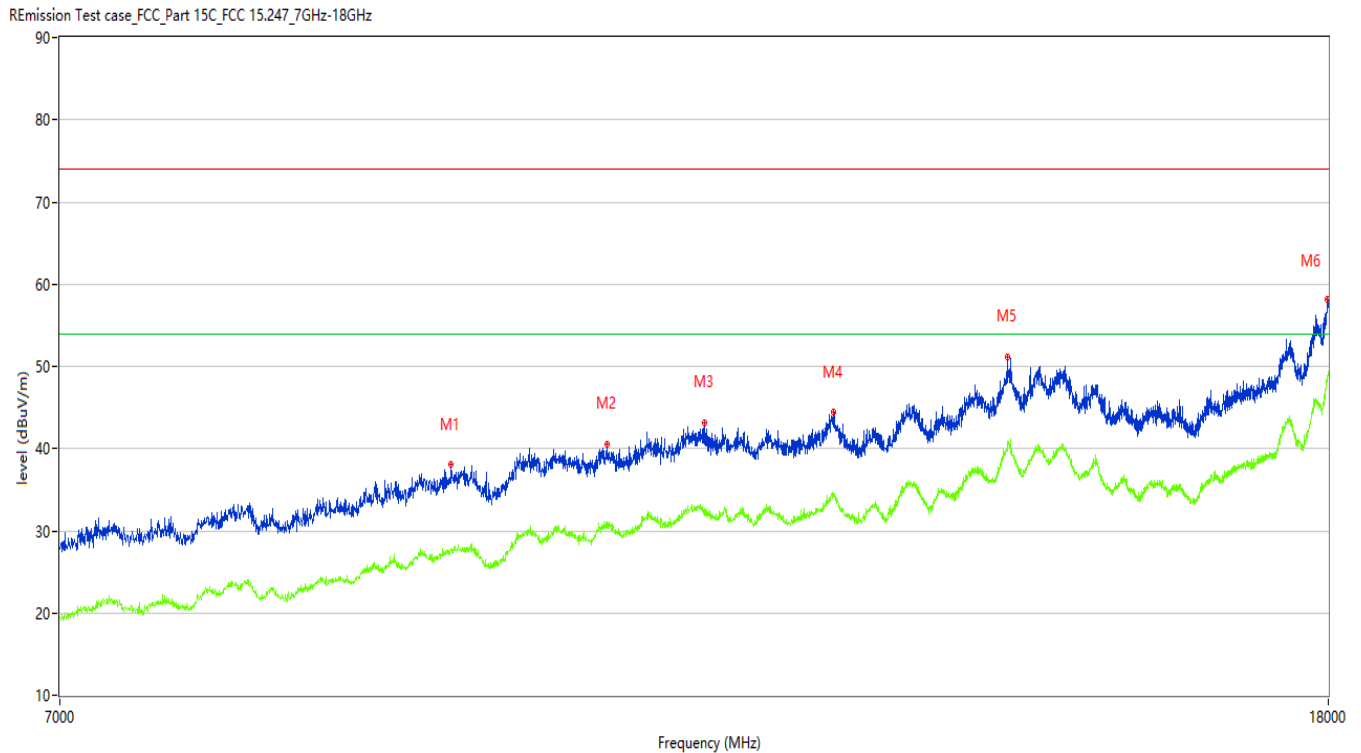
TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 36 of 49

Figure 17: Radiated Emission, Zigbee, 2440MHz_7GHz_18GHz
Horizontal polarization



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9367.750	38.04	7.59	74.0	-35.96	Peak	179.50	100	Horizontal	Pass
1**	9367.750	27.74	7.59	54.0	-26.26	AV	179.50	100	Horizontal	Pass
2	10522.750	40.51	10.21	74.0	-33.49	Peak	261.40	100	Horizontal	Pass
2**	10522.750	30.53	10.21	54.0	-23.47	AV	261.40	100	Horizontal	Pass
3	11309.250	43.17	12.20	74.0	-30.83	Peak	155.30	100	Horizontal	Pass
3**	11309.250	32.34	12.20	54.0	-21.66	AV	155.30	100	Horizontal	Pass
4	12455.999	44.37	12.53	74.0	-29.63	Peak	18.60	100	Horizontal	Pass
4**	12455.999	34.45	12.53	54.0	-19.55	AV	18.60	100	Horizontal	Pass
5	14174.750	51.21	19.34	74.0	-22.79	Peak	331.00	100	Horizontal	Pass
5**	14174.750	40.25	19.34	54.0	-13.75	AV	331.00	100	Horizontal	Pass
6	17991.750	58.17	27.41	74.0	-15.83	Peak	331.00	100	Horizontal	Pass
6**	17991.750	48.91	27.41	54.0	-5.09	AV	331.00	100	Horizontal	Pass

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 37 of 49

Vertical polarization

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9395.250	38.32	7.66	74.0	-35.68	Peak	282.10	100	Vertical	Pass
1**	9395.250	28.56	7.66	54.0	-25.44	AV	282.10	100	Vertical	Pass
2	10071.750	39.85	9.33	74.0	-34.15	Peak	67.40	100	Vertical	Pass
2**	10071.750	28.95	9.33	54.0	-25.05	AV	67.40	100	Vertical	Pass
3	11246.000	42.80	11.84	74.0	-31.20	Peak	196.90	100	Vertical	Pass
3**	11246.000	32.89	11.84	54.0	-21.11	AV	196.90	100	Vertical	Pass
4	12450.500	44.46	12.51	74.0	-29.54	Peak	354.60	100	Vertical	Pass
4**	12450.500	34.93	12.51	54.0	-19.07	AV	354.60	100	Vertical	Pass
5	14471.750	50.44	17.88	74.0	-23.56	Peak	10.50	100	Vertical	Pass
5**	14471.750	39.64	17.88	54.0	-14.36	AV	10.50	100	Vertical	Pass
6	17977.999	58.24	26.56	74.0	-15.76	Peak	319.70	100	Vertical	Pass
6**	17977.999	47.54	26.56	54.0	-6.46	AV	319.70	100	Vertical	Pass

TEST REPORT

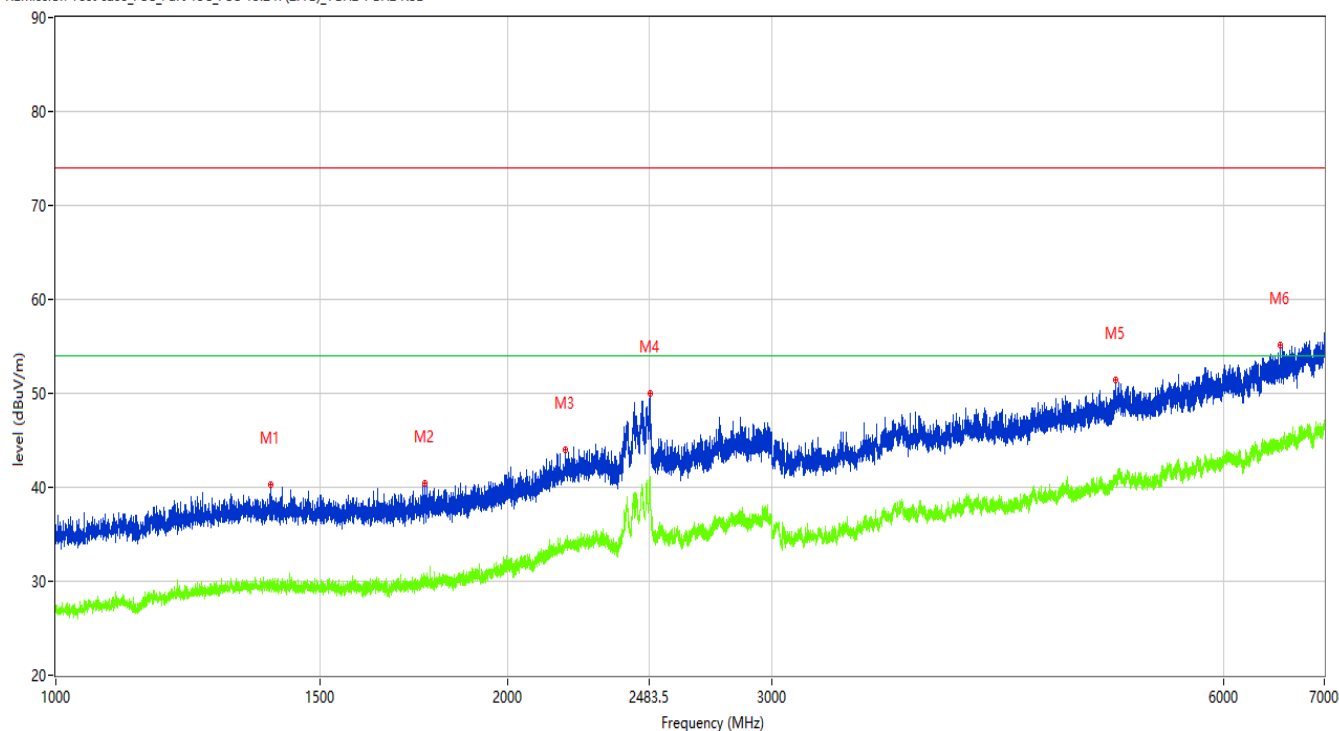
Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 38 of 49

Figure 18: Radiated Emission, Zigbee, 2480MHz_1GHz_7GHz
Horizontal polarization

REmission Test case_FCC_Part 15C_FCC 15.247(2.4G)_1GHz-7GHz RSE



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1389.750	40.32	-12.71	74.0	-33.68	Peak	121.10	100	Horizontal	Pass
1**	1389.750	29.91	-12.71	54.0	-24.09	AV	121.10	100	Horizontal	Pass
2	1761.000	40.38	-12.28	74.0	-33.62	Peak	256.60	100	Horizontal	Pass
2**	1761.000	30.51	-12.28	54.0	-23.49	AV	256.60	100	Horizontal	Pass
3	2184.500	43.94	-8.11	74.0	-30.06	Peak	281.90	100	Horizontal	Pass
3**	2184.500	34.38	-8.11	54.0	-19.62	AV	281.90	100	Horizontal	Pass
4	2488.250	49.99	-1.88	74.0	-24.01	Peak	98.40	100	Horizontal	Pass
4**	2488.250	41.17	-1.88	54.0	-12.83	AV	98.40	100	Horizontal	Pass
5	5079.000	51.41	1.09	74.0	-22.59	Peak	4.40	100	Horizontal	Pass
5**	5079.000	40.55	1.09	54.0	-13.45	AV	4.40	100	Horizontal	Pass
6	6541.000	55.09	4.15	74.0	-18.91	Peak	96.20	100	Horizontal	Pass
6**	6541.000	44.23	4.15	54.0	-9.77	AV	96.20	100	Horizontal	Pass

TEST REPORT

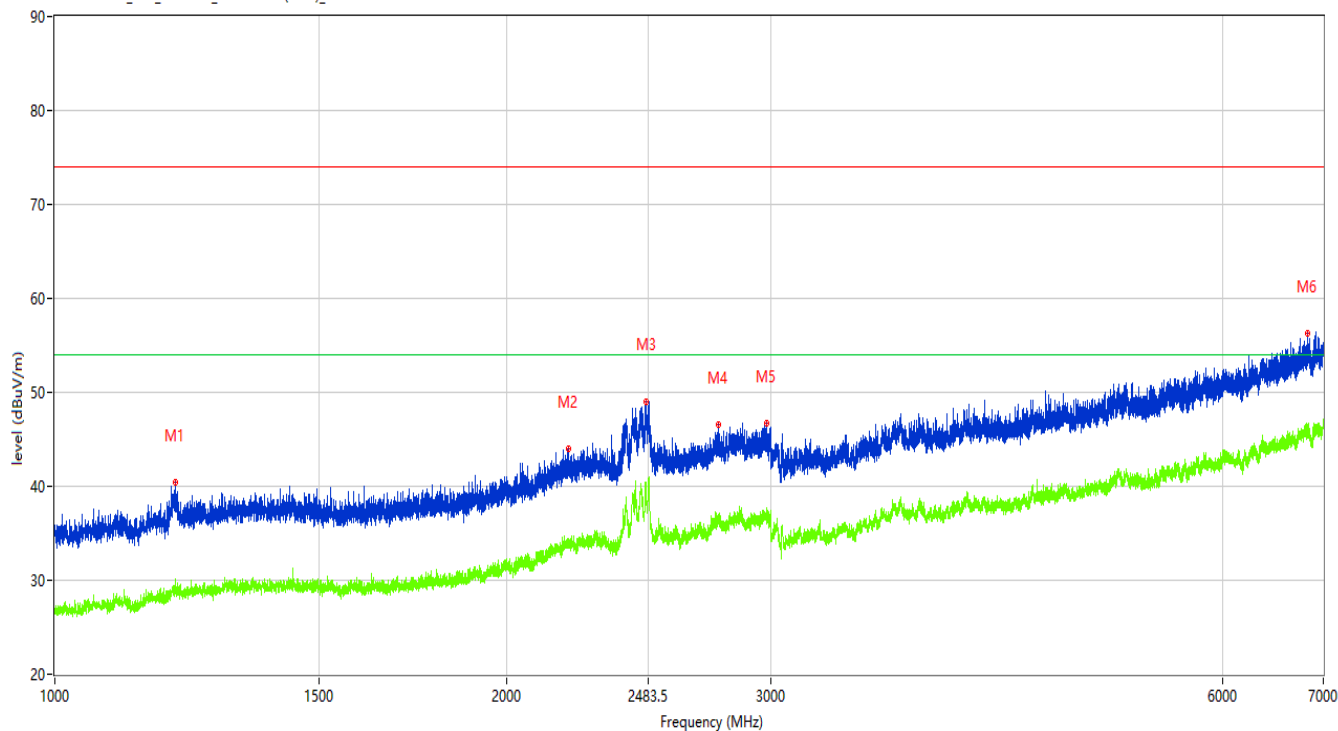
Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 39 of 49

Vertical polarization

REmission Test case_FCC_Part 15C_FCC 15.247(2.4G)_1GHz-7GHz RSE



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1203.750	40.39	-13.57	74.0	-33.61	Peak	165.00	100	Vertical	Pass
1**	1203.750	28.89	-13.57	54.0	-25.11	AV	165.00	100	Vertical	Pass
2	2199.500	44.01	-7.93	74.0	-29.99	Peak	153.80	100	Vertical	Pass
2**	2199.500	34.39	-7.93	54.0	-19.61	AV	153.80	100	Vertical	Pass
3	2475.000	49.05	-2.14	74.0	-24.95	Peak	298.20	100	Vertical	Pass
3**	2475.000	40.26	-2.14	54.0	-13.74	AV	298.20	100	Vertical	Pass
4	2767.750	46.51	-4.63	74.0	-27.49	Peak	39.90	100	Vertical	Pass
4**	2767.750	36.04	-4.63	54.0	-17.96	AV	39.90	100	Vertical	Pass
5	2978.000	46.64	-3.23	74.0	-27.36	Peak	119.60	100	Vertical	Pass
5**	2978.000	37.68	-3.23	54.0	-16.32	AV	119.60	100	Vertical	Pass
6	6829.500	56.25	5.09	74.0	-17.75	Peak	21.80	100	Vertical	Pass
6**	6829.500	46.51	5.09	54.0	-7.49	AV	21.80	100	Vertical	Pass

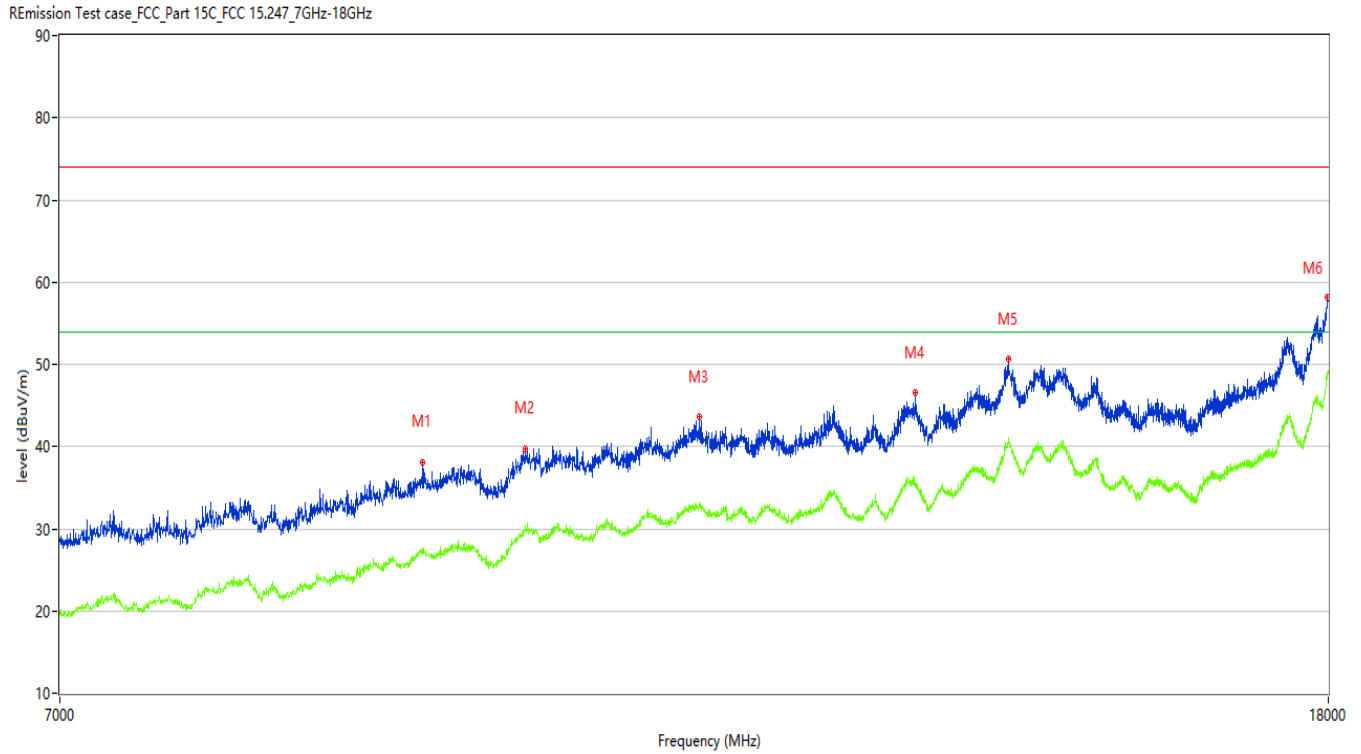
TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 40 of 49

Figure 19: Radiated Emission, Zigbee, 2480MHz_7GHz_18GHz
Horizontal polarization



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9169.750	38.11	7.29	74.0	-35.89	Peak	1.70	100	Horizontal	Pass
1**	9169.750	27.42	7.29	54.0	-26.58	AV	1.70	100	Horizontal	Pass
2	9901.250	39.76	9.72	74.0	-34.24	Peak	1.70	100	Horizontal	Pass
2**	9901.250	30.43	9.72	54.0	-23.57	AV	1.70	100	Horizontal	Pass
3	11268.000	43.56	12.13	74.0	-30.44	Peak	348.50	100	Horizontal	Pass
3**	11268.000	32.77	12.13	54.0	-21.23	AV	348.50	100	Horizontal	Pass
4	13234.250	46.50	14.18	74.0	-27.50	Peak	313.10	100	Horizontal	Pass
4**	13234.250	35.60	14.18	54.0	-18.40	AV	313.10	100	Horizontal	Pass
5	14188.500	50.59	19.75	74.0	-23.41	Peak	1.70	100	Horizontal	Pass
5**	14188.500	40.94	19.75	54.0	-13.06	AV	1.70	100	Horizontal	Pass
6	17988.999	58.09	27.24	74.0	-15.91	Peak	114.90	100	Horizontal	Pass
6**	17988.999	48.44	27.24	54.0	-5.56	AV	114.90	100	Horizontal	Pass

TEST REPORT

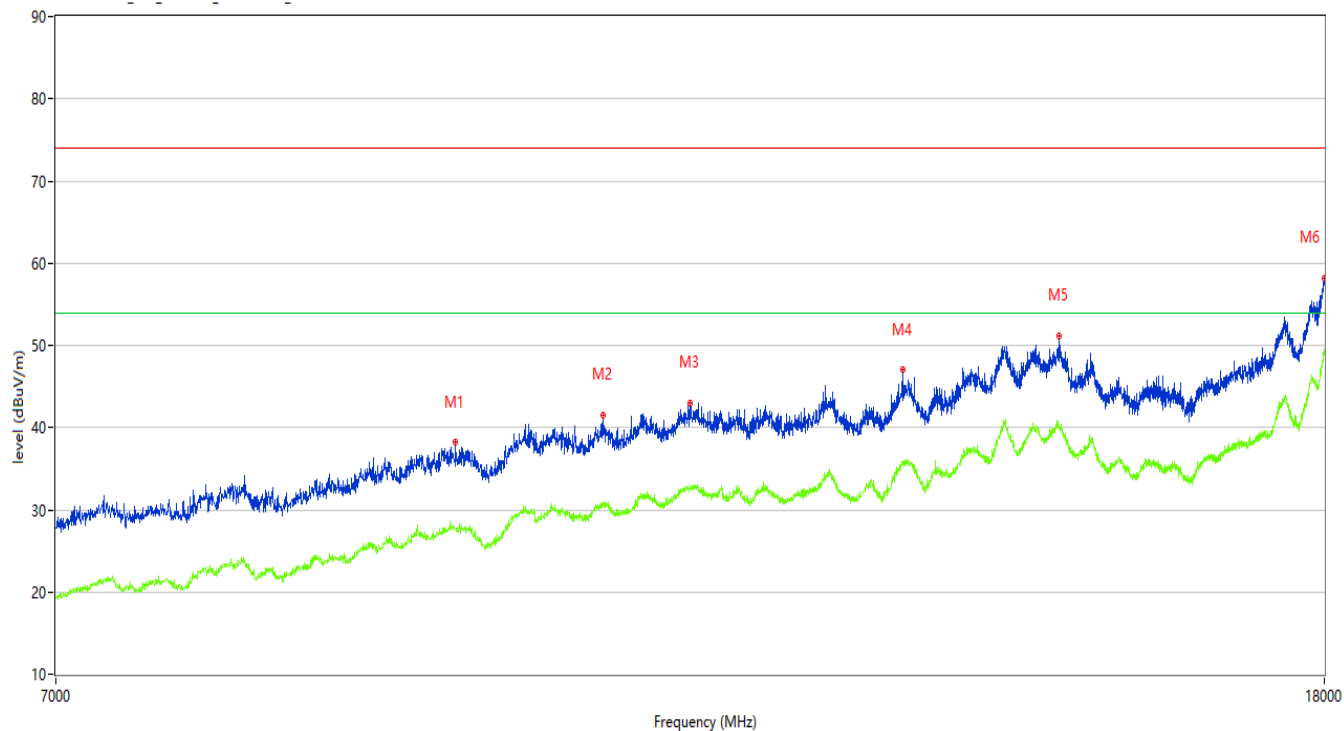
Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 41 of 49

Vertical polarization

REmission Test case_FCC_Part 15C_FCC 15.247_7GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	9425.500	38.16	7.62	74.0	-35.84	Peak	59.60	100	Vertical	Pass
1**	9425.500	27.57	7.62	54.0	-26.43	AV	59.60	100	Vertical	Pass
2	10517.250	41.48	10.16	74.0	-32.52	Peak	106.80	100	Vertical	Pass
2**	10517.250	30.56	10.16	54.0	-23.44	AV	106.80	100	Vertical	Pass
3	11226.750	42.93	11.58	74.0	-31.07	Peak	0.00	100	Vertical	Pass
3**	11226.750	32.66	11.58	54.0	-21.34	AV	0.00	100	Vertical	Pass
4	13149.000	47.06	13.97	74.0	-26.94	Peak	177.50	100	Vertical	Pass
4**	13149.000	35.54	13.97	54.0	-18.46	AV	177.50	100	Vertical	Pass
5	14777.000	51.10	18.67	74.0	-22.90	Peak	166.00	100	Vertical	Pass
5**	14777.000	40.05	18.67	54.0	-13.95	AV	166.00	100	Vertical	Pass
6	17994.500	58.14	27.58	74.0	-15.86	Peak	117.60	100	Vertical	Pass
6**	17994.500	48.85	27.58	54.0	-5.15	AV	117.60	100	Vertical	Pass

TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 42 of 49

4.1.7 Band Edge (Restricted-band band-edge)

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209
Requirement	: ANSI C63.10-2013 clause 11.13, KDB 558074 clause 8.7
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/High
Operation Mode	: A.1
Ambient temperature	: 23.9°C
Relative humidity	: 52%

TEST REPORT

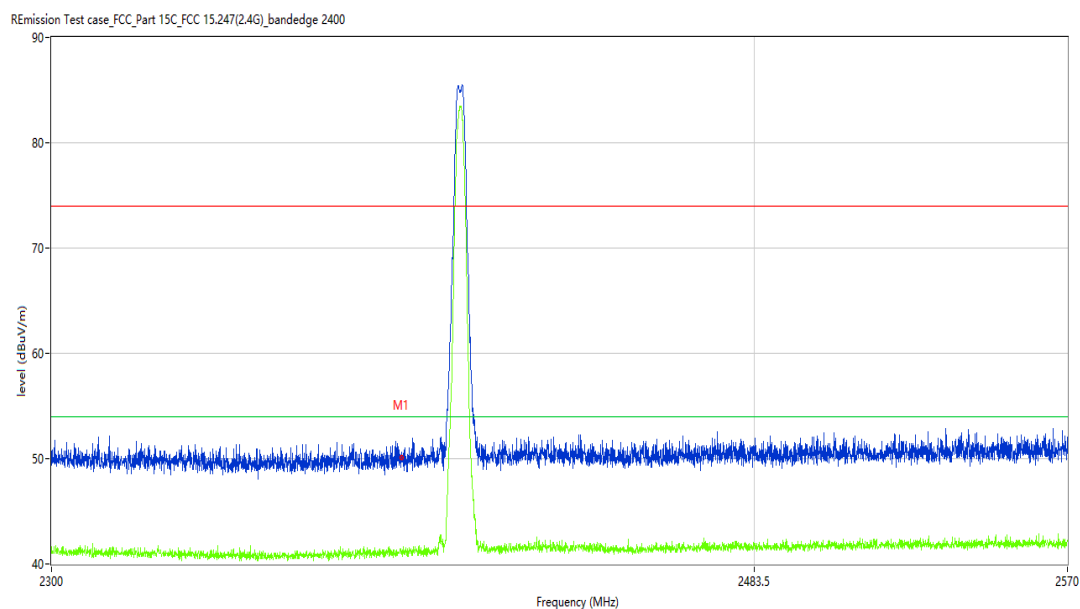
Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 43 of 49

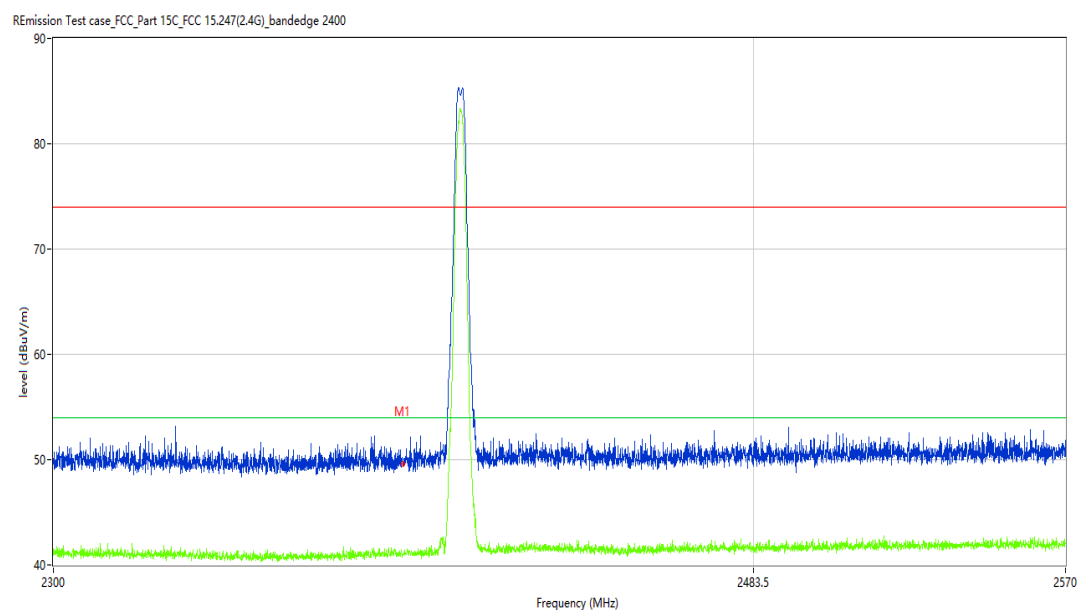
Figure 20: Band Edge, Zigbee, 2405MHz

Horizontal polarization



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2390.000	49.99	-9.96	74.0	-24.01	Peak	112.67	100	Horizontal	Pass
1**	2390.000	41.31	-9.96	54.0	-12.69	AV	112.67	100	Horizontal	Pass

Vertical polarization



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2390.000	49.57	-9.96	74.0	-24.43	Peak	200.42	100	Vertical	Pass
1**	2390.000	40.96	-9.96	54.0	-13.04	AV	200.42	100	Vertical	Pass

TEST REPORT

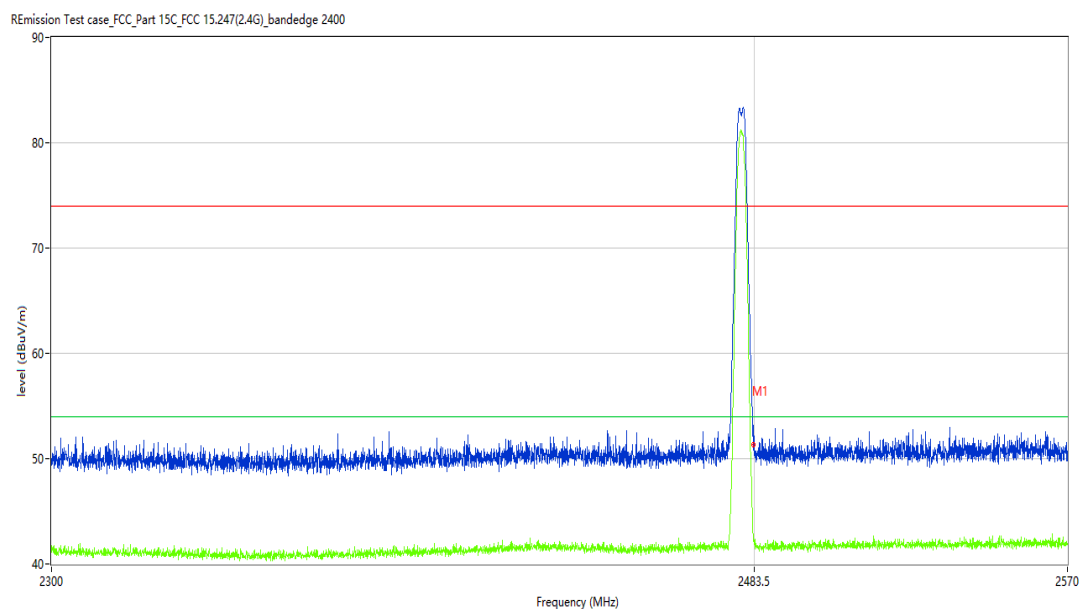
Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 44 of 49

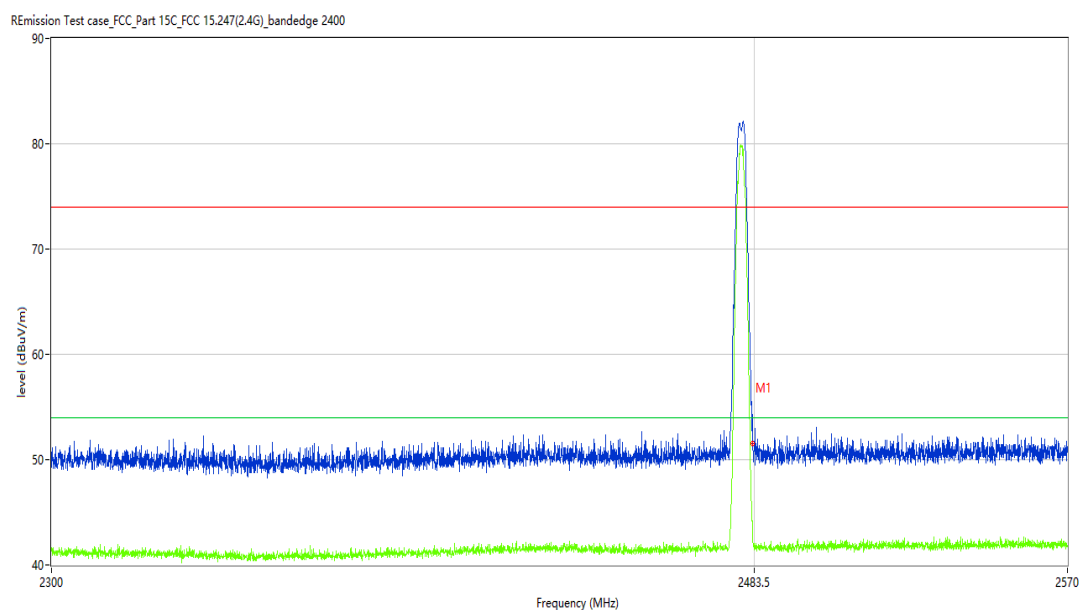
Figure 21: Band Edge, Zigbee, 2480MHz

Horizontal polarization



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	51.19	-9.51	74.0	-22.81	Peak	309.70	100	Horizontal	Pass
1**	2483.500	42.05	-9.51	54.0	-11.95	AV	309.70	100	Horizontal	Pass

Vertical polarization



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	51.32	-9.51	74.0	-22.68	Peak	76.50	100	Vertical	Pass
1**	2483.500	41.74	-9.51	54.0	-12.26	AV	76.50	100	Vertical	Pass

TEST REPORT

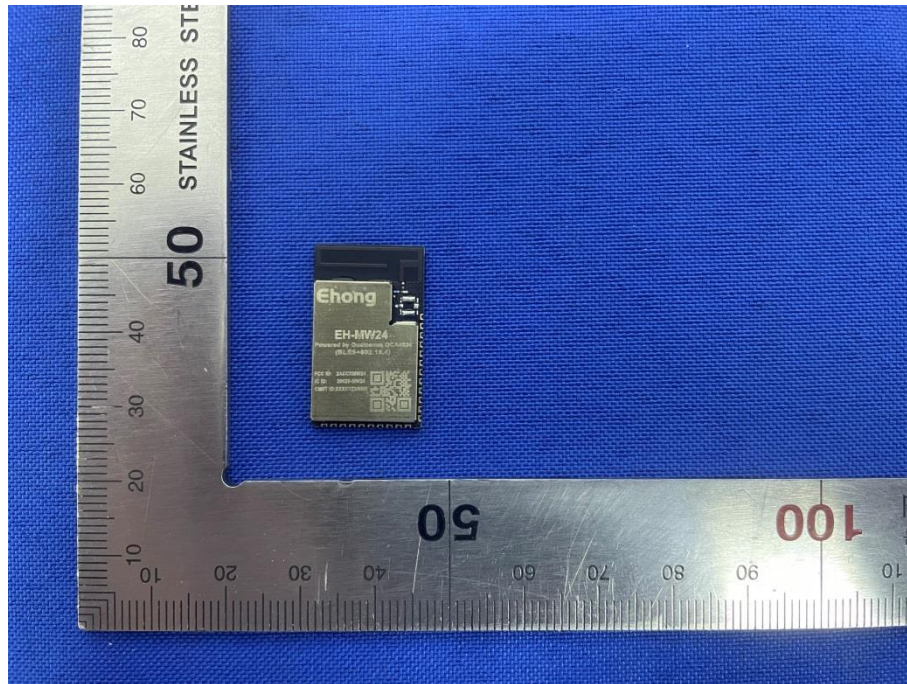
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Date: 2022-08-31

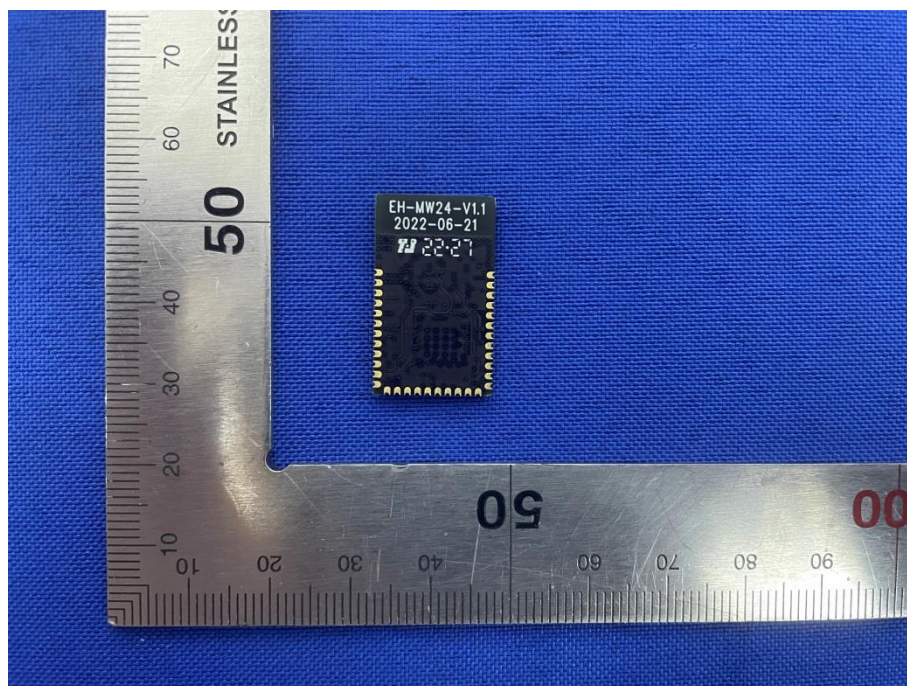
Page 45 of 49

5 Appendixes

5.1 Photographs of the Sample



Front of the sample



Rear of the sample

TEST REPORT

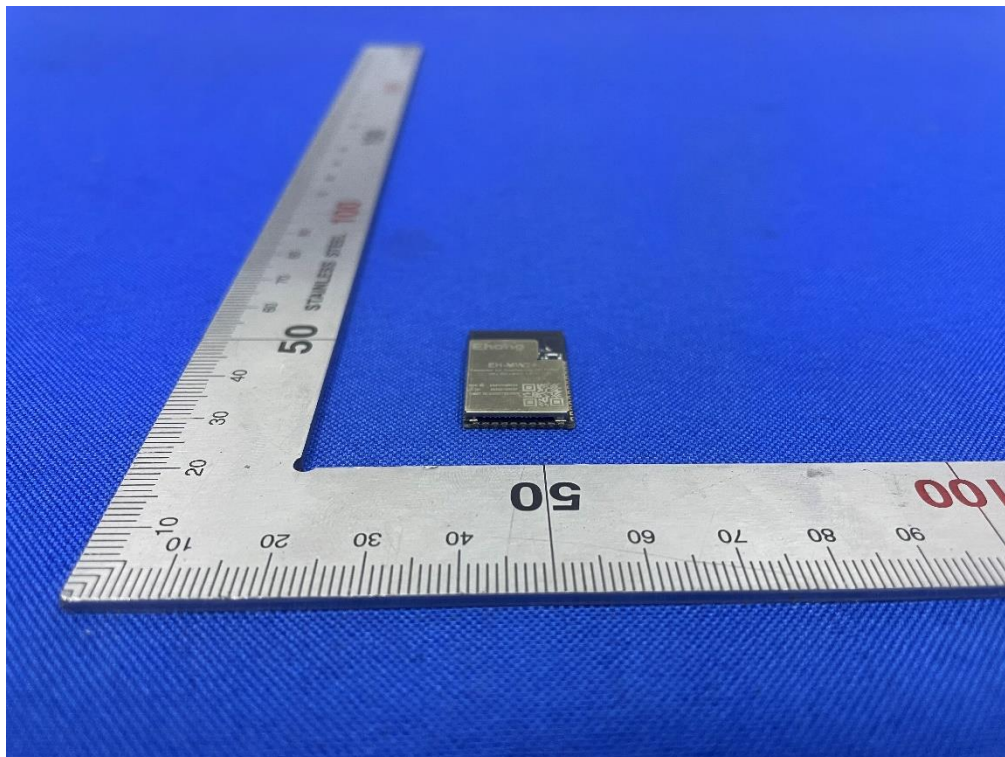
Report No.:

SHE22070069-02BE

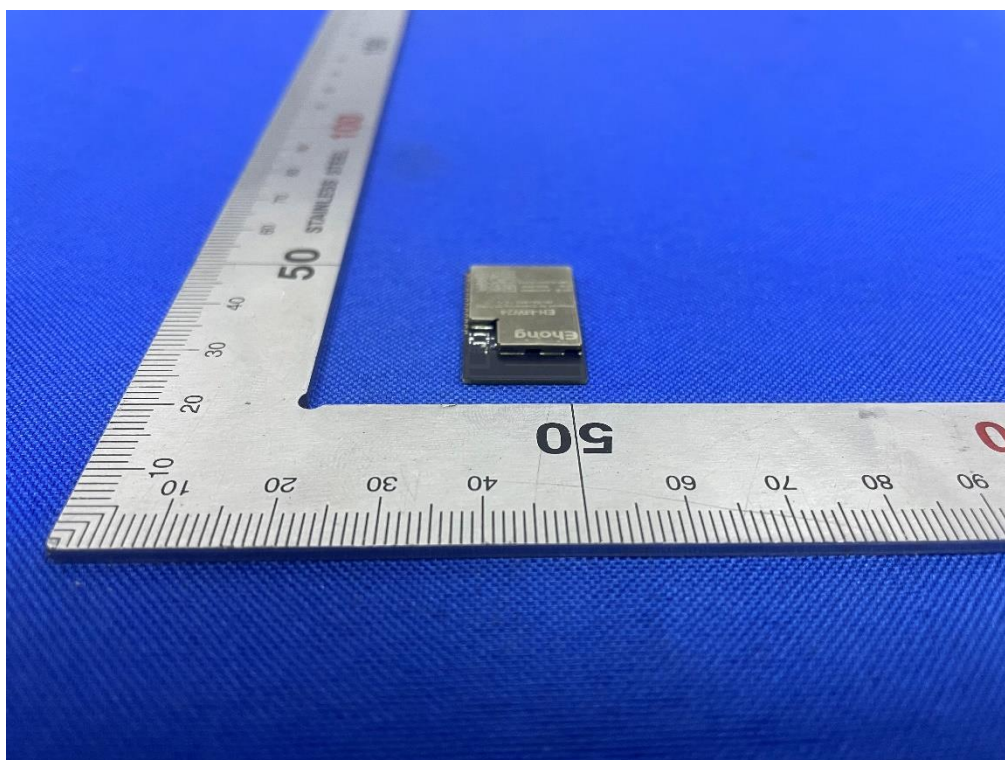
Date:

2022-08-31

Page 46 of 49



Top of the sample



Bottom of the sample

TEST REPORT

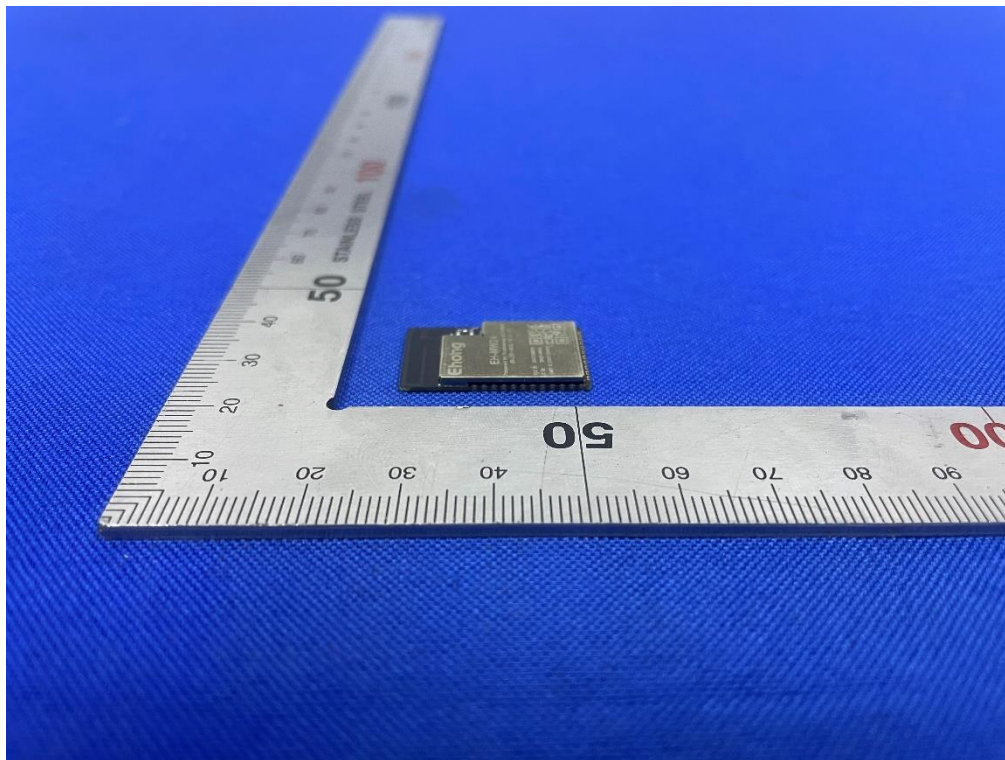
Report No.:

SHE22070069-02BE

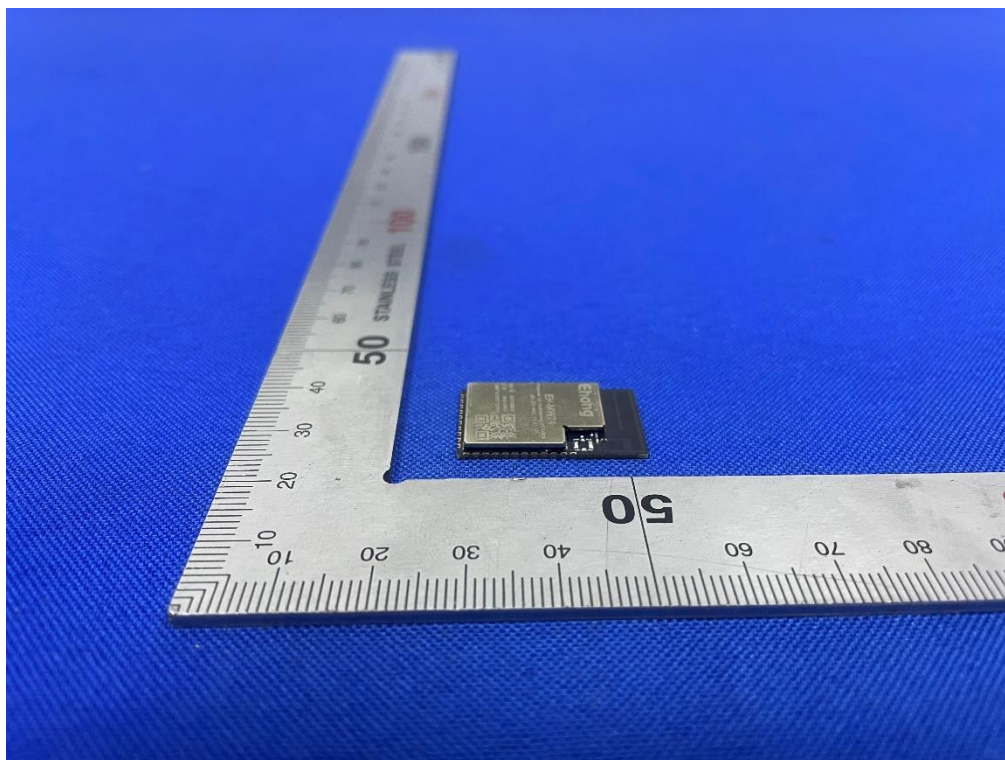
Date:

2022-08-31

Page 47 of 49



Left of the sample



Right of the sample

TEST REPORT

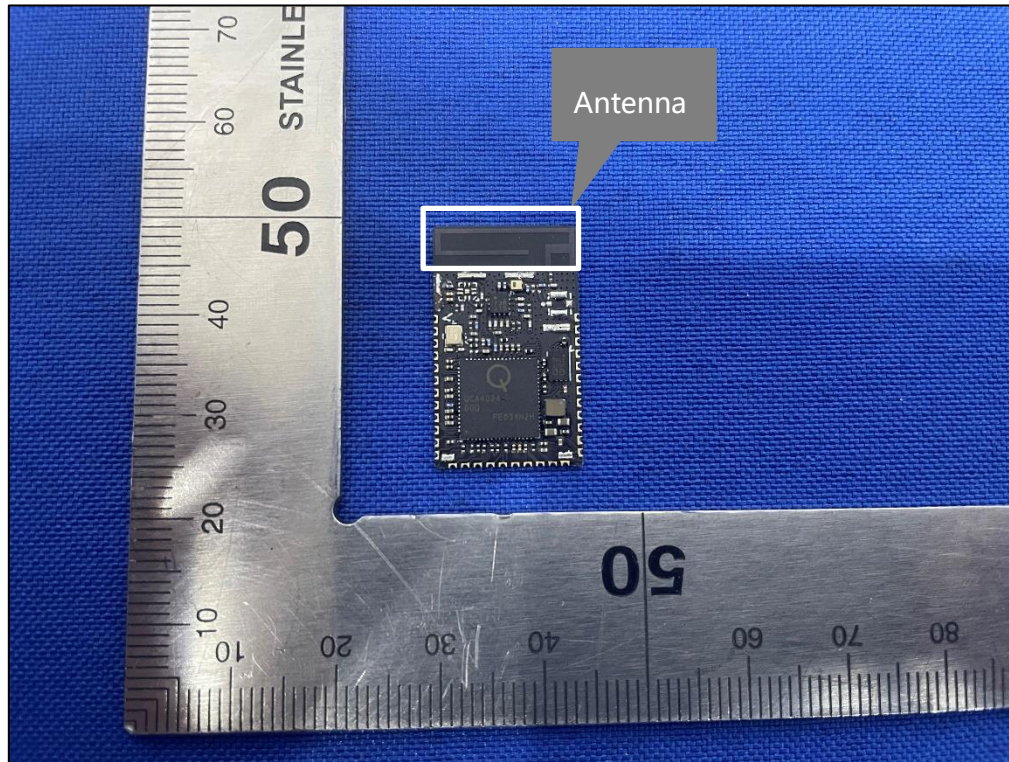
Report No.:

SHE22070069-02BE

Date:

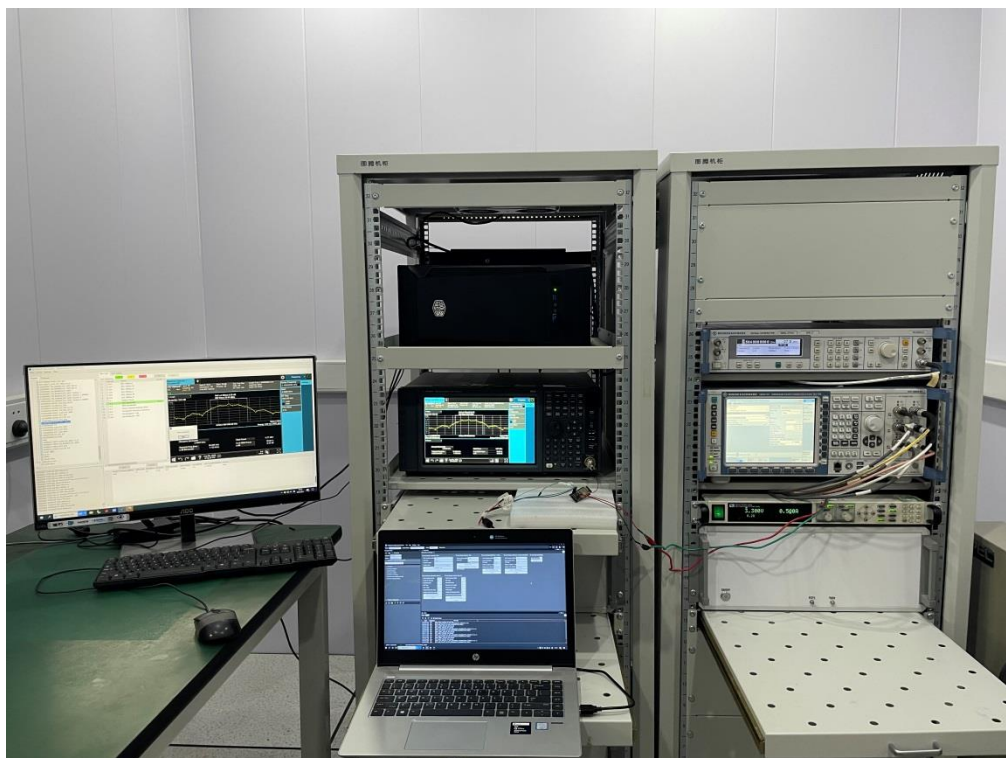
2022-08-31

Page 48 of 49



Remove the shield cover

5.2 Set-up for Conducted RF test at Antenna Port



TEST REPORT

Report No.: SHE22070069-02BE

Date: 2022-08-31

Page 49 of 49

5.3 Set-up for Spurious Emissions below 1GHz



5.4 Set-up for Spurious Emissions above 1GHz



End of the report