RF MEASUREMENT REPORT

FCC ID:	2AQVB- RS101A
Applicant:	Taisync Technology Inc.
Product:	S1 RC
Model No.:	RS101A
Brand Name:	Viulinx
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.247)
Result:	Complies
Received Date:	2023-08-28
Test Date:	2023-09-01 ~ 2023-10-20

Reviewed By: Jame Yuan

Approved By: Robin Wu

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
2308RSU081-U1	V01	Initial Report	2023-11-10	Valid

CONTENTS

1. General Information

1.1. Applicant

Taisync Technology Inc.

2055 Junction Ave. Ste 235, San Jose, CA 95131

1.2. Manufacturer

Wuxi Yuanchuan Rongchuang Technology Co., Ltd

204-01, Second floor, Convention Center, 78 Jinghui East Road, Xinwu District, Wuxi, Jiangsu, China

1.3. Testing Facility

☒	**Test Site – MRT Suzhou Laboratory**				
	Laboratory Location (Suzhou - Wuzhong)				
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China				
	Laboratory Location (Suzhou - SIP)				
	4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China				
	Laboratory Accreditations				
	A2LA: 3628.01		CNAS: L10551		
	FCC: CN1166		ISED: CN0001		
	VCCI:	☐R-20025	☐G-20034	☐C-20020	☐T-20020
		☐R-20141	☐G-20134	☐C-20103	☐T-20104
☐	**Test Site – MRT Shenzhen Laboratory**				
	Laboratory Location (Shenzhen)				
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China				
	Laboratory Accreditations				
	A2LA: 3628.02		CNAS: L10551		
	FCC: CN1284		ISED: CN0105		
☐	**Test Site – MRT Taiwan Laboratory**				
	Laboratory Location (Taiwan)				
	No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)				
	Laboratory Accreditations				
	TAF: 3261				
	FCC: 291082, TW3261		ISED: TW3261		

1.4. Product Information

Product Name	S1 RC
Model No.	RS101A
EUT Identification No	20230828Sample#01
Wireless Specification	2417 ~ 2470MHz & 5731 ~ 5782MHz
Antenna Information	Refer to selection 1.7
Working Voltage	6S-16S (DC 18V-70V), Typically DC 24V
Operating Temperature	-10 ~ 55 °C
Note 1: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer. Note 2: There are two antenna ports of the EUT, and the two antenna ports could not transmit simultaneous.	

1.5. Radio Specification under Test

Frequency Range	2417 ~ 2470MHz
Channel Number	3
Type of Modulation	OFDM
Data Rate	Upstream: 600kbps Downstream: 2.08~7.78Mbps

1.6. Working Frequencies

Low Channel	Mid Channel	High Channel
2417 MHz	2444 MHz	2470 MHz

1.7. Antenna Details

Antenna No.	Antenna Model	Antenna Type	Frequency Band (MHz)	Antenna Gain (dBi)	
				Ant 0	Ant 1
Antenna 1#	ANTWRJQ24585V50SJB	Dipole Antenna	2417 ~ 2470	5.0	5.0
			5731 ~ 5782	5.0	5.0
Antenna 2#	N12-7419-R0A	Dipole Antenna	2417 ~ 2470	5.0	5.0
			5731 ~ 5782	5.0	5.0

Note 1: The antenna gain is from antenna data sheet provided by the manufacturer.

Note 2: We choose Antenna 1# to test for this report.

2. Test Configuration

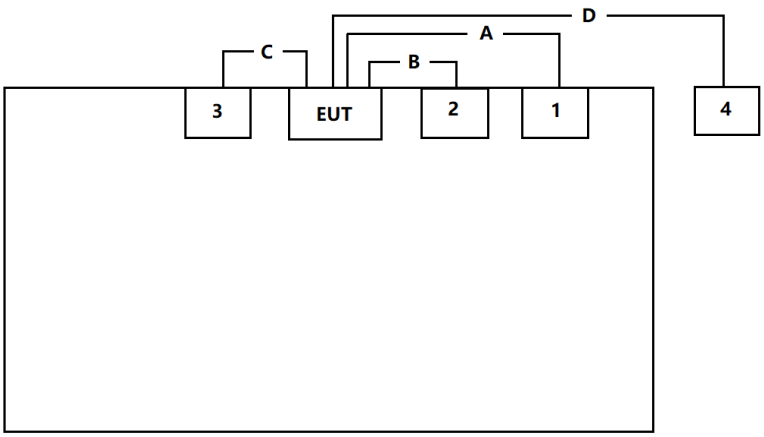
2.1. Test Mode

Mode 1: Transmit at 2417MHz - SISO Mode (Ant 0).
Mode 2: Transmit at 2444MHz - SISO Mode (Ant 0).
Mode 3: Transmit at 2470MHz - SISO Mode (Ant 0).
Mode 4: Transmit at 2417MHz - SISO Mode (Ant 1).
Mode 5: Transmit at 2444MHz - SISO Mode (Ant 1).
Mode 6: Transmit at 2470MHz - SISO Mode (Ant 1).

2.2. Test System Connection Diagram

The device was tested per the guidance ANSI C63.10: 2013 was used to reference the appropriate EUT setup for radiated emissions testing.

Connection Diagram



Cable Type		Cable Description	Length
A	Power Cable	Non shielded	1.8m
B	Signal Cable	Non shielded	0.16m
C	Signal Cable	Non shielded	0.75m
D	Type-C Cable	Shielding	>10m
Product		Manufacturer	Model No.
1	Adapter	FLYPOWER	PS12T120K1000ED
2	Radio Link	PIXHAWK	N/A
3	Camera	N/A	N/A
4	Notebook	Lenovo	E430C

2.3. Test Software

The test utility software used during testing was “IPOP”, and the version was 4.1.
Final power setting please refer to operational description.

2.4. Applied Standards

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

- FCC Part 15.247
- KDB 558074 D01v05r02
- ANSI C63.10-2013

2.5. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20 ~ 75%RH

3. Antenna Requirements

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The product is defined as the professional installation of equipment by the manufacturer, there is no necessary to comply with the requirement of §15.203.

4. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2023-12-28	WZ-AC1
Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2023-12-28	WZ-AC1
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2024-09-17	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2024-08-09	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2023-11-05	WZ-AC1
Preamplifier	Agilent	83017A	MRTSUE06076	1 year	2024-05-07	WZ-AC1
Preamplifier	EMCI	EMC184045SE	MRTSUE06640	1 year	2024-01-12	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE06403	1 year	2024-05-31	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11039	1 year	2023-11-01	WZ-AC1
Anechoic Chamber	TDK	WZ-AC1	MRTSUE06212	1 year	2024-04-20	WZ-AC1
EMI Test Receiver	Agilent	N9038A	MRTSUE06125	1 year	2024-05-23	WZ-AC2
TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2024-05-15	WZ-AC2
Thermohygrometer	Mingle	ETH529	MRTSUE06170	1 year	2023-11-27	WZ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11038	1 year	2023-11-01	WZ-AC2
Anechoic Chamber	RIKEN	WZ-AC2	MRTSUE06213	1 year	2024-04-20	WZ-AC2
USB Power Sensor	Keysight	U2021XA	MRTSUE06446	1 year	2024-05-23	WZ-SR4
Signal Analyzer	Keysight	N9010B	MRTSUE06457	1 year	2024-05-23	WZ-SR4
Attenuator	MVE	MVE2213	MRTSUE11088	1 year	2024-06-08	WZ-SR4
Shielding Room	HUAMING	WZ-SR4	MRTSUE06441	N/A	N/A	WZ-SR4

Software	Version	Function
EMI Software	V3.0.0	EMI Test Software
Controller_MF 7802	2.03C	RE Antenna & Turntable
Controller_MF 7802	1.02	RE Antenna & Turntable
BenchVue Power Meter	2018.1	Power

5. Decision Rules and Measurement Uncertainty

5.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.2. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Radiated Emission Measurement
The maximum measurement uncertainty is evaluated as: Coaxial: 9kHz~30MHz: 2.61dB Coplanar: 9kHz~30MHz: 2.62dB Horizontal: 30MHz~200MHz: 3.79dB 200MHz~1GHz: 3.91dB 1GHz~40GHz: 4.99dB Vertical: 30MHz~200MHz: 4.06dB 200MHz~1GHz: 5.21dB 1GHz~40GHz: 4.90dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.2dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.4dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.2dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.7%

6. Test Result

6.1. Summary

FCC Section(s)	Test Description	Test Condition	Verdict
15.247(a)(2)	6dB Bandwidth	Conducted	Pass
15.247(b)(3)	Output Power		Pass
15.247(e)	Power Spectral Density		Pass
15.247(d)	Band Edge / Out-of-Band Emissions		Pass
15.205 15.209	General Field Strength (Restricted Bands and Radiated Emission)	Radiated	Pass
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	N/A

Notes:

1. The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
2. For radiated emission tests, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
3. “N/A” means this item is not applicable, and the details refer to relevant section.

6.2. 6dB Bandwidth Measurement

6.2.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

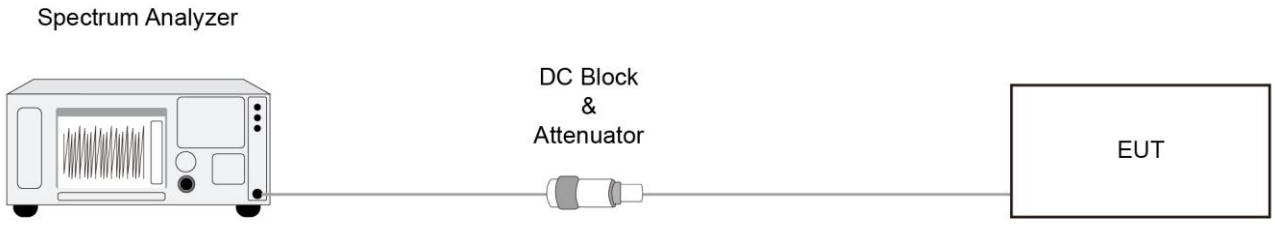
6.2.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.8

6.2.3. Test Setting

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. VBW ≥ 3 × RBW
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize.

6.2.4. Test Setup



6.2.5. Test Result

Refer to Appendix A.2.

6.3. Output Power Measurement

6.3.1. Test Limit

The maximum output power shall be less 1 Watt (30dBm).

The conducted output power limit specified in paragraph FCC Part 15.247(b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs FCC Part 15.247(b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.3.2. Test Procedure

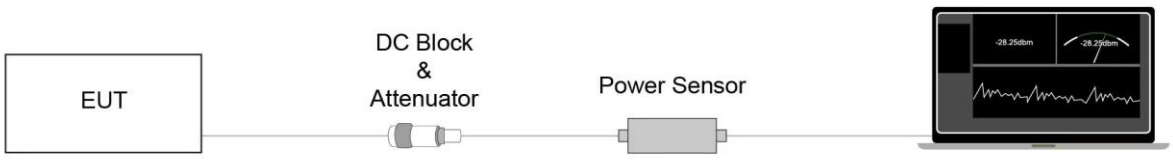
ANSI C63.10 - 2013 - Section 11.9.2.3.2

6.3.3. Test Setting

Average Power Measurement

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

6.3.4. Test Setup



6.3.5. Test Result

Refer to Appendix A.3.

6.4. Power Spectral Density Measurement

6.4.1. Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

The same method of determining the conducted output power shall be used to determine the power spectral density.

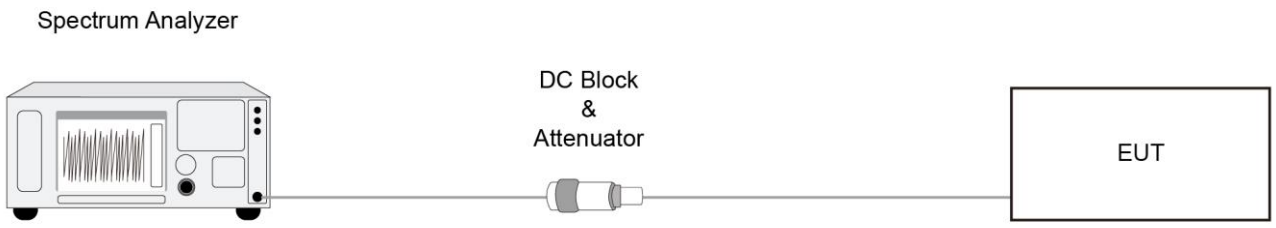
6.4.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.10.5

6.4.3. Test Setting

1. Measure the duty cycle (x) of the transmitter output signal.
2. Set instrument center frequency to DTS channel center frequency.
3. Set span to at least 1.5 times the OBW.
4. RBW = 10 kHz.
5. VBW = 30 kHz.
6. Detector = RMS.
7. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
8. Sweep time = auto couple.
9. Don’t use sweep triggering. Allow sweep to “free run”.
10. Employ trace averaging (RMS) mode over a minimum of 100 traces.
11. Use the peak marker function to determine the maximum amplitude level.
12. Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time. If measured value exceeds requirement specified by regulatory agency, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

6.4.4. Test Setup



6.4.5. Test Result

Refer to Appendix A.4.

6.5. Conducted Band Edge and Out-of-Band Emissions Measurement

6.5.1. Test Limit

The limit for out-of-band spurious emissions at the band edge is 30dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

6.5.2. Test Procedure

ANSI C63.10-2013 - Section 11.11

6.5.3. Test Settitng

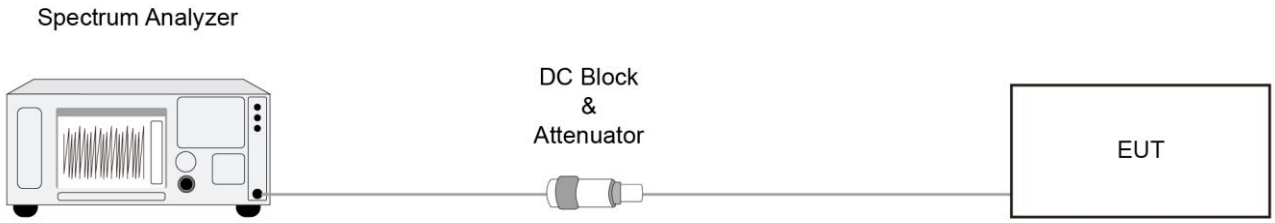
Reference level measurement

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to ≥ 1.5 times the DTS bandwidth
3. Set the RBW = 100 kHz
4. Set the VBW ≥ 3 x RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize

Emission level measurement

1. Set the center frequency and span to encompass frequency range to be measured
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

6.5.4. Test Setup



6.5.5. Test Result

Refer to Appendix A.5.

6.6. Radiated Spurious Emission Measurement

6.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [μV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.6.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.11 & 11.12

ANSI C63.10 - 2013 - Section 6.3 (General Requirements)

ANSI C63.10 - 2013 - Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 - 2013 - Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10 - 2013 - Section 6.6 (Standard test method above 1GHz)

6.6.3. Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000MHz	1MHz

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest

2. Span was set greater than 1MHz

3. RBW = as specified in Table 1

4. Detector = CISPR quasi-peak

5. Sweep time = auto couple

6. Trace was allowed to stabilize

Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest

2. RBW = 1MHz

3. VBW = 3MHz

4. Detector = peak

5. Sweep time = auto couple

6. Trace mode = max hold

7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest

2. RBW = 1MHz

3. VBW; If the EUT is configured to transmit with duty cycle ≥ 98%, set VBW = 10 Hz.

If the EUT duty cycle is < 98%, set VBW ≥ 1/T. T is the minimum transmission duration.

4. Detector = Peak

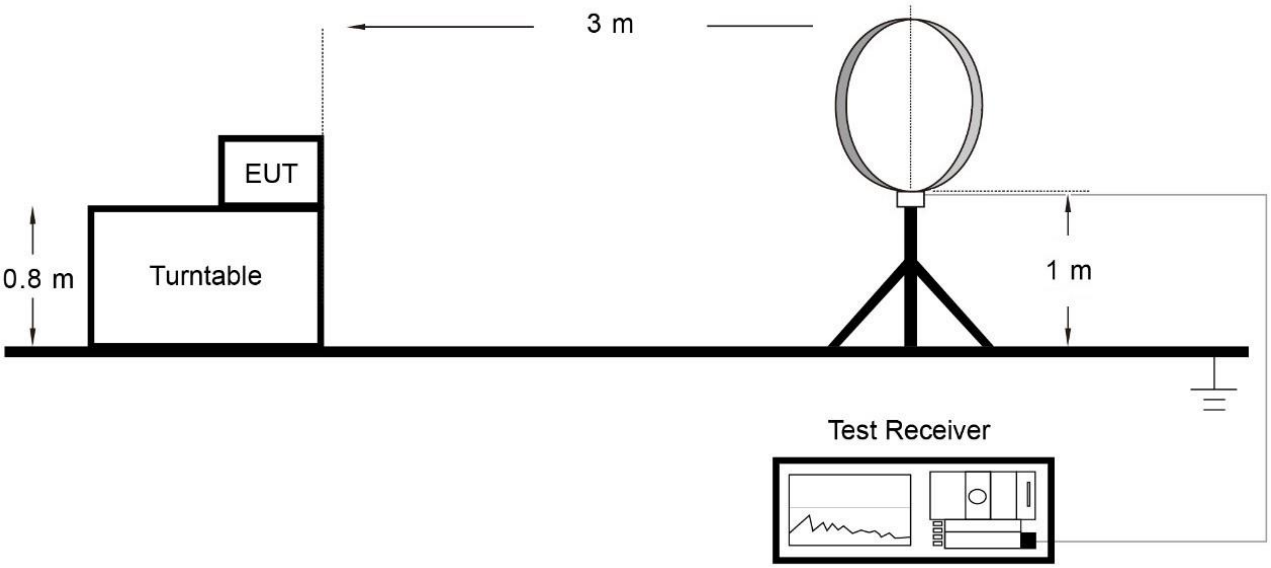
5. Sweep time = auto

6. Trace mode = max hold

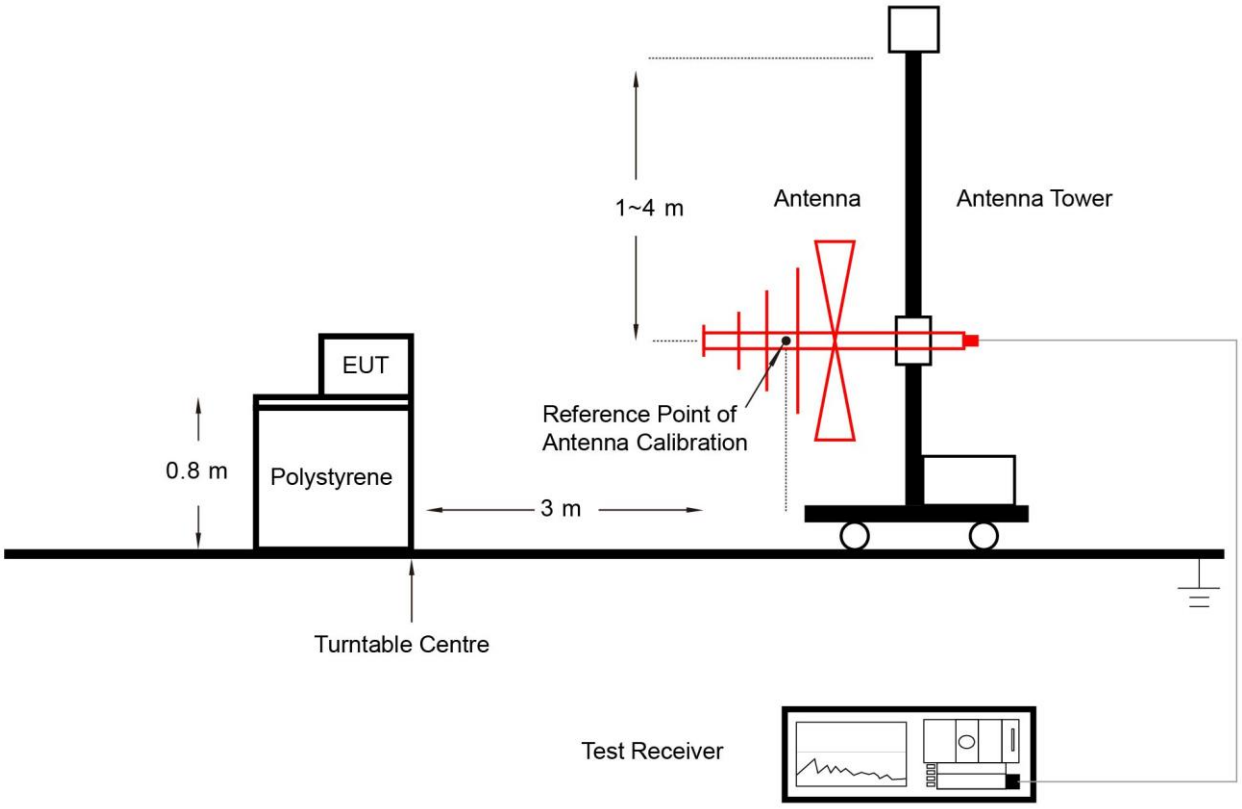
7. Trace was allowed to stabilize

6.6.4. Test Setup

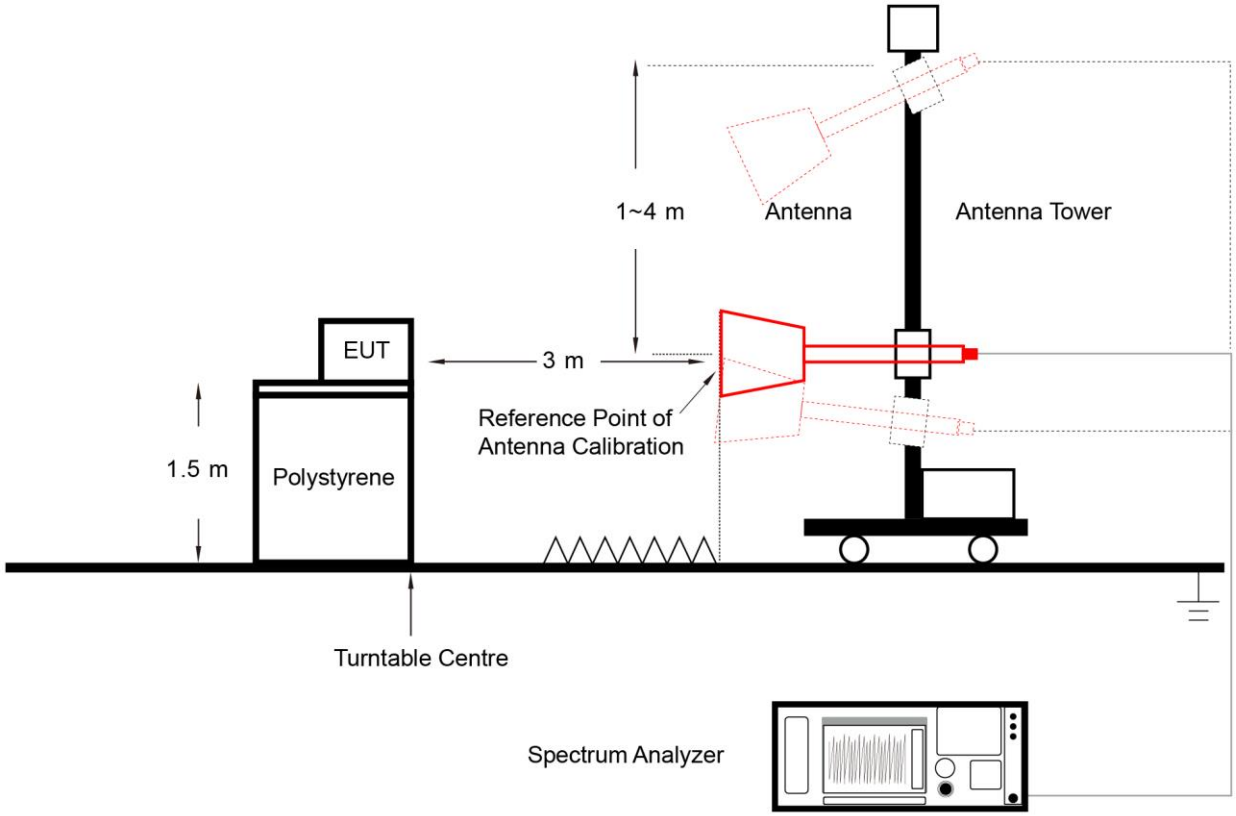
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.6.5. Test Result

Refer to Appendix A.6.

6.7. Radiated Restricted Band Edge Measurement

6.7.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1] 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41	--	--	--

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [μV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.7.2. Test Procedure

ANSI C63.10-2013 Section 6.3 & 6.6 & 11.13

6.7.3. Test Setting

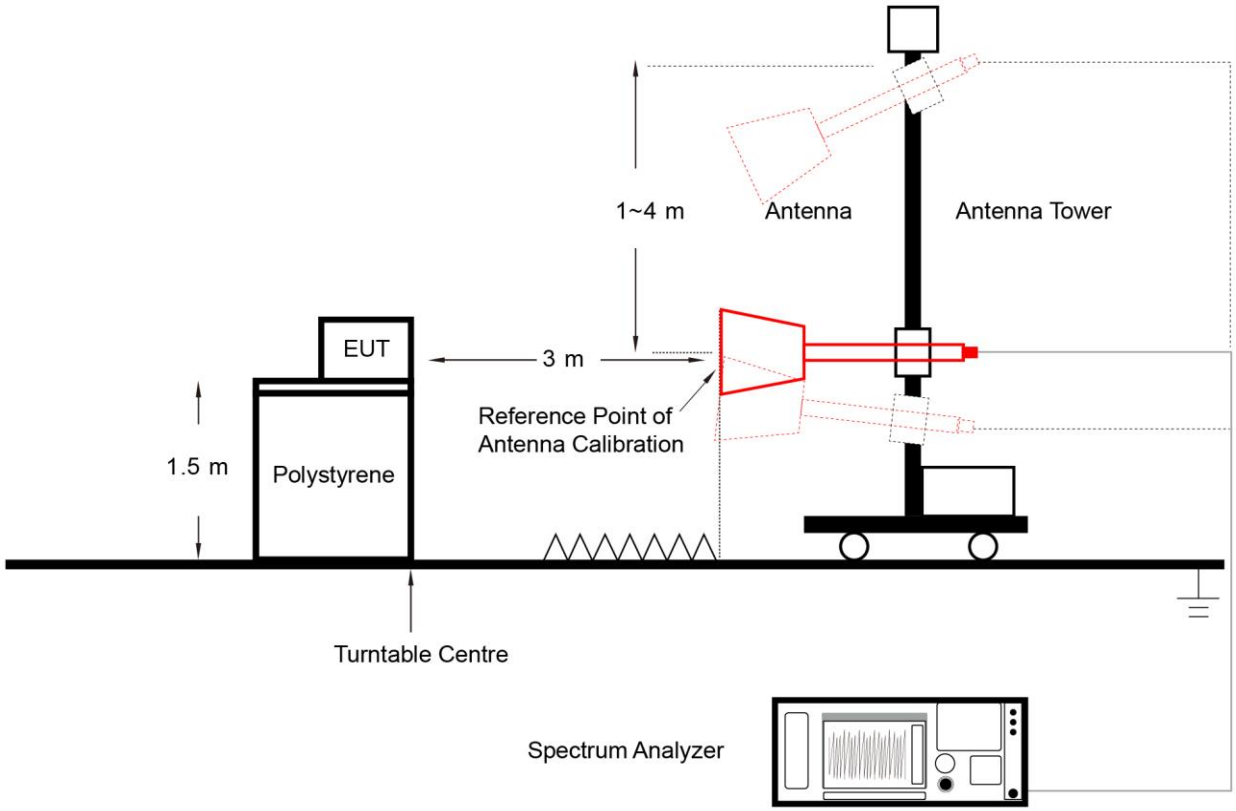
Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

6.7.4. Test Setup



6.7.5. Test Result

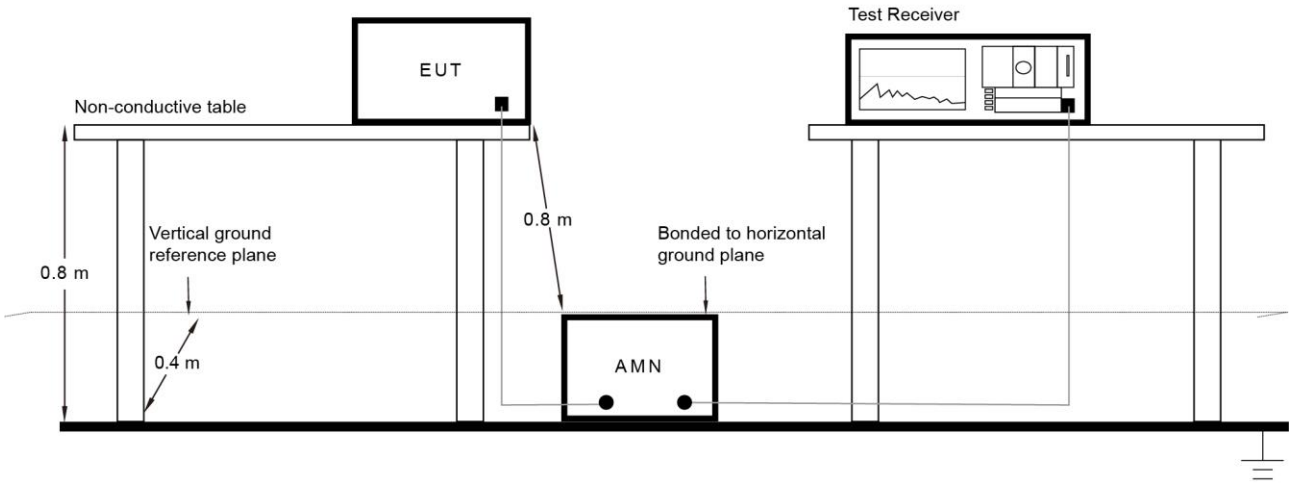
Refer to Appendix A.7.

6.8. AC Conducted Emissions Measurement

6.8.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBμV)	AV (dBμV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50
Note 1: The lower limit shall apply at the transition frequencies. Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.		

6.8.2. Test Setup



6.8.3. Test Result

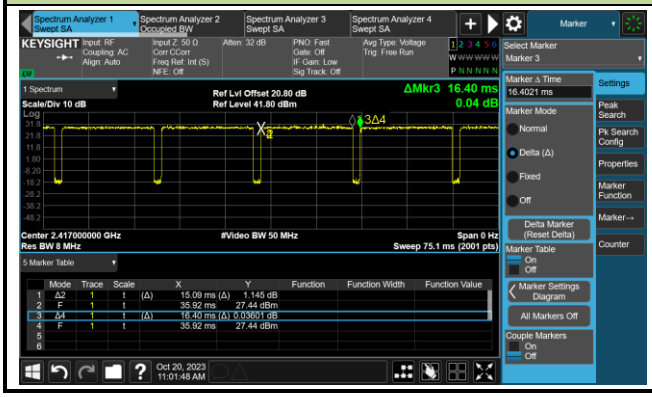
The device is powered by battery in actual use, so this test item is not applicable.

Appendix A – Test Result

A.1 Duty Cycle Test Result

Test Site	WZ-SR4	Test Engineer	Jeff Yang
Test Date	2023-10-20		

Duty Cycle	92.01%

Duty Cycle (T = Transmission Duration)	
T = 15.09 ms	
	

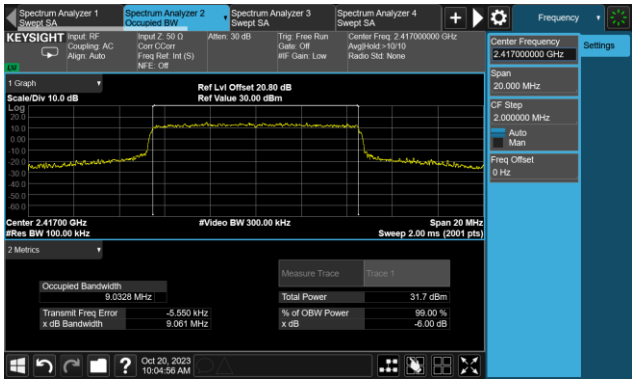
A.2 6dB Bandwidth Test Result

Test Site	WZ-SR4	Test Engineer	Jeff Yang
Test Date	2023-10-20		

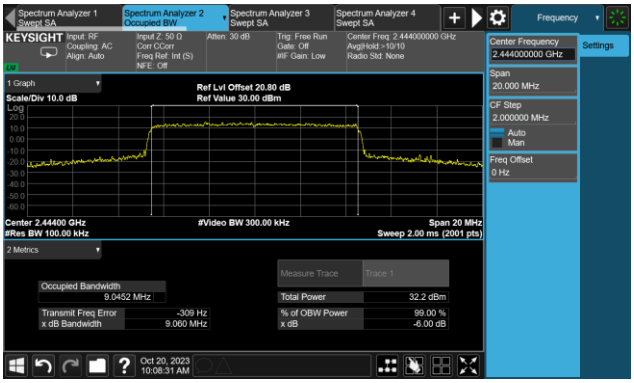
Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
SISO Mode - Ant 0		
2417	9.061	≥ 0.5
2444	9.060	≥ 0.5
2470	9.072	≥ 0.5
SISO Mode - Ant 1		
2417	9.045	≥ 0.5
2444	9.052	≥ 0.5
2470	9.060	≥ 0.5

6dB Bandwidth – Ant 0

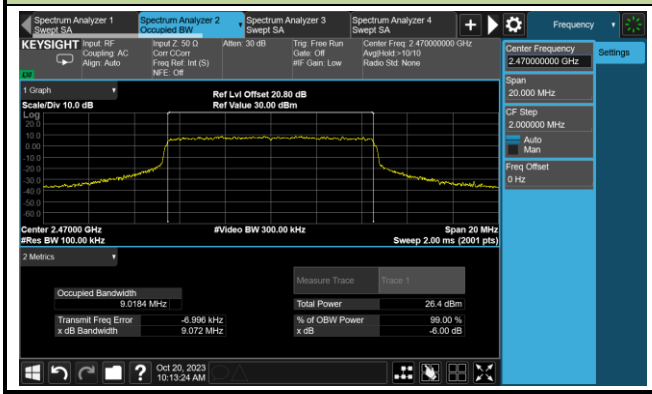
2417MHz

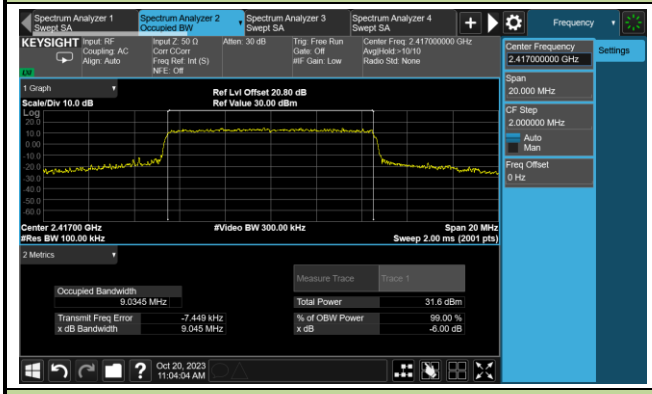
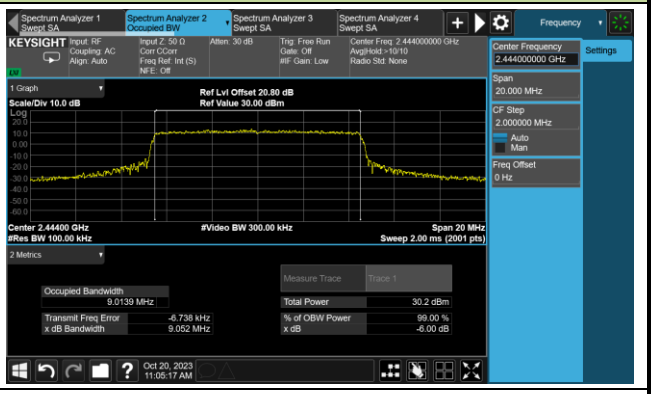
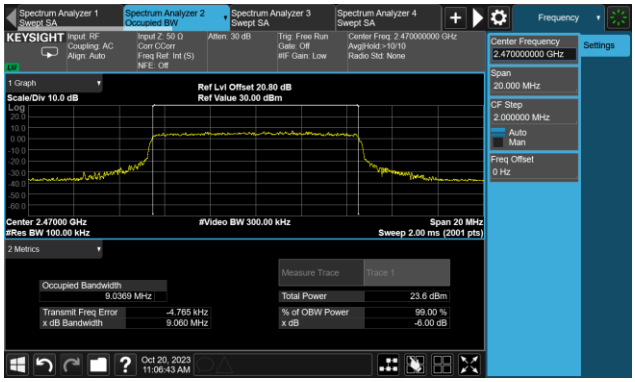


2444MHz



2470MHz



6dB Bandwidth – Ant 1	
2417MHz	2444MHz
	
2470MHz	
	

A.3 Output Power Test Result

Test Site	WZ-SR4	Test Engineer	Jeff Yang
Test Date	2023-09-01		

Freq. (MHz)	Average Power (dBm)		Limit (dBm)
	Ant 0	Ant 1	
2417	25.31	25.63	≤ 30.00
2444	25.88	25.87	≤ 30.00
2470	20.03	20.27	≤ 30.00

A.4 Power Spectral Density Test Result

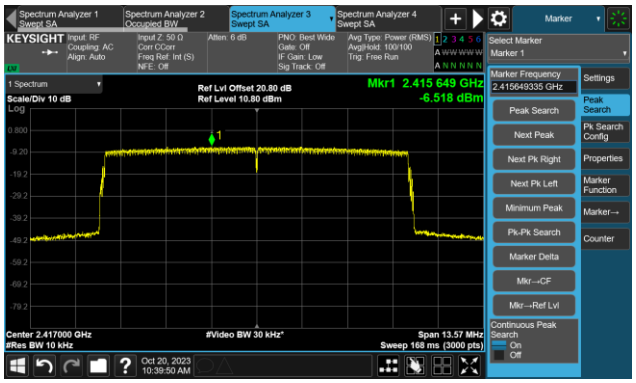
Test Site	WZ-SR4	Test Engineer	Jeff Yang
Test Date	2023-10-20		

Freq. (MHz)	AV PSD (dBm/3kHz)		Duty Cycle (%)	10*log(1/x)	Total PSD (dBm/3kHz)		Limit (dBm/3kHz)
	Ant 0	Ant 1			Ant 0	Ant 1	
2417	-6.52	-6.08	92.01	0.362	-6.16	-5.72	≤ 8.00
2444	-5.44	-7.24	92.01	0.362	-5.07	-6.88	≤ 8.00
2470	-12.30	-14.60	92.01	0.362	-11.94	-14.24	≤ 8.00

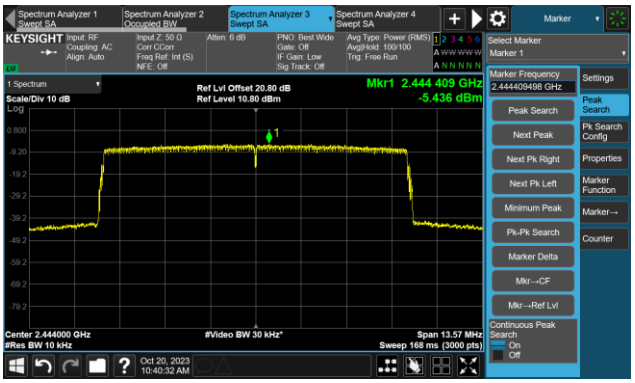
Note: When Duty Cycle < 98%, Total PSD (dBm/10kHz) = AV PSD (dBm/10kHz) + 10*log (1/Duty Cycle).

Power Spectral Density - Ant 0

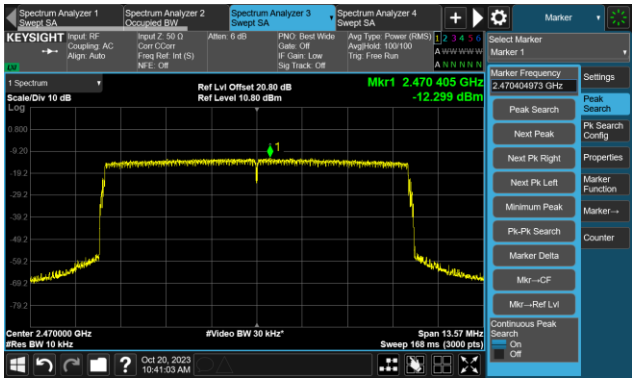
2417MHz)

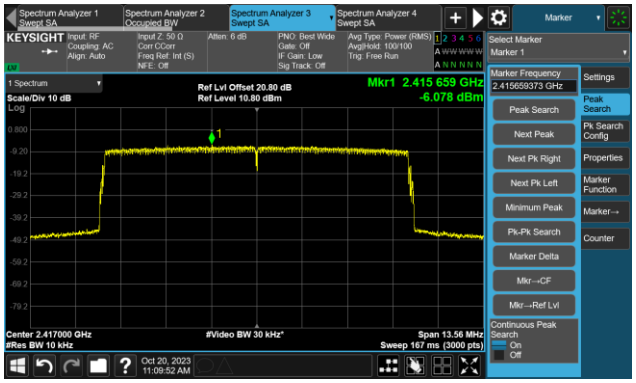
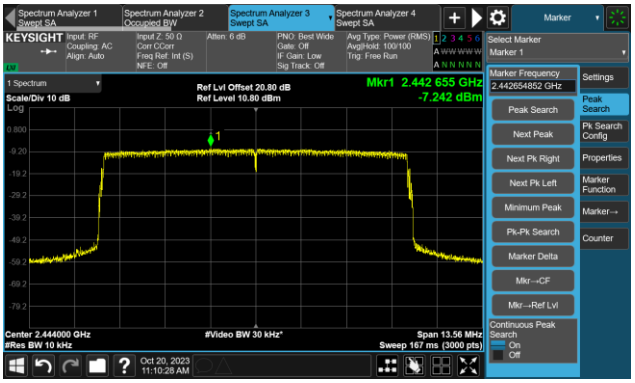
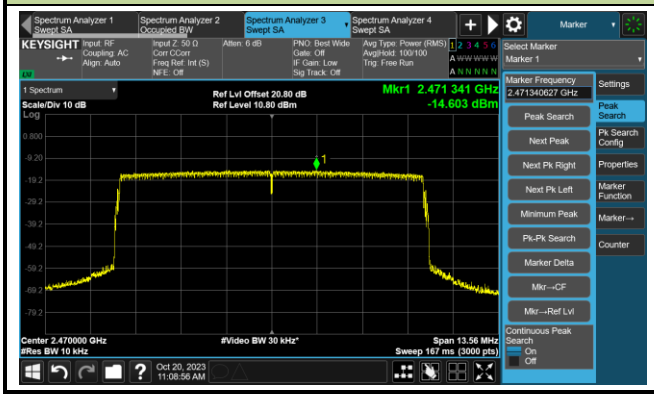


2444MHz



2470MHz

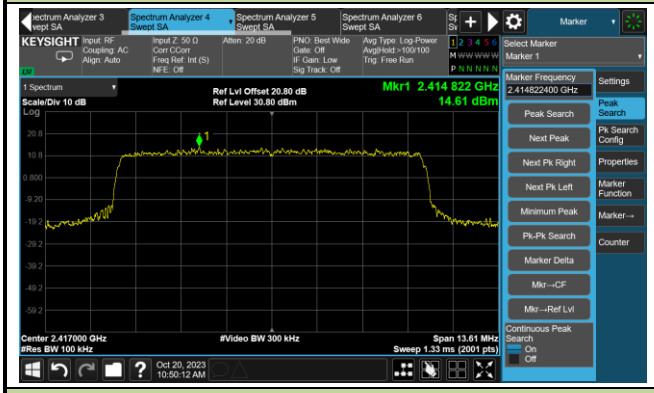
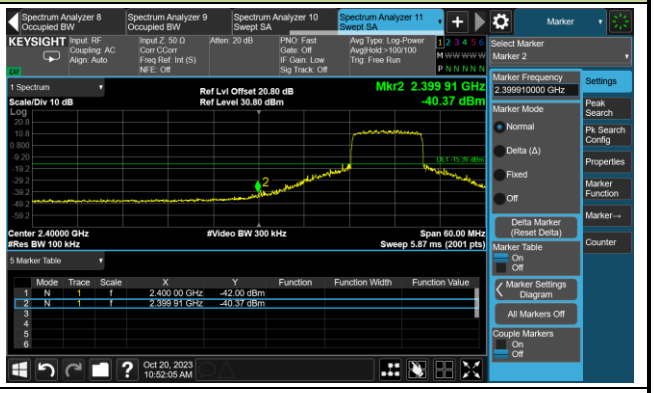


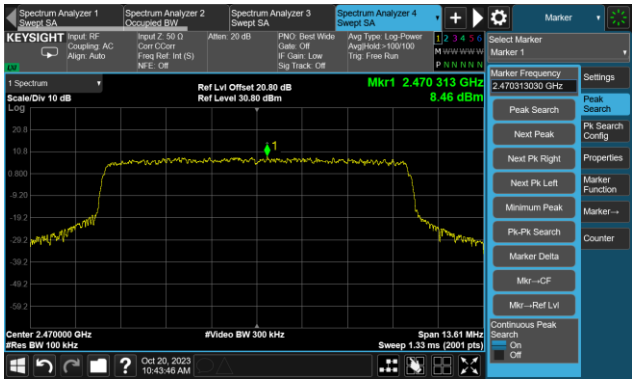
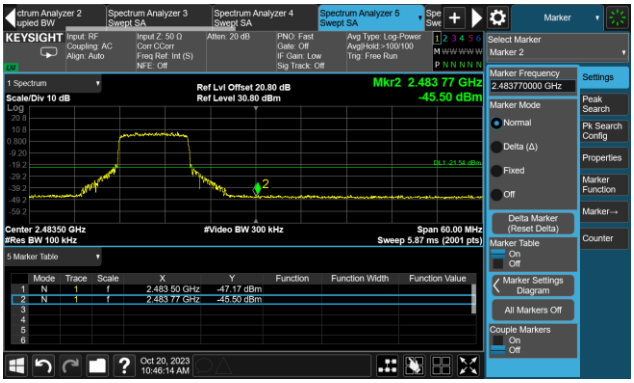
Power Spectral Density - Ant 1	
2417MHz)	2444MHz
	
2470MHz	
	

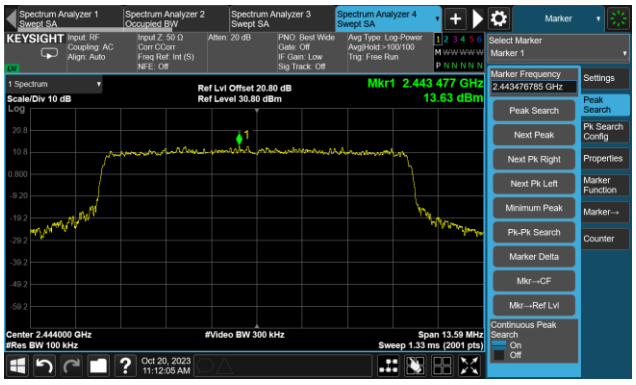
A.5 Conducted Band Edge and Out-of-Band Emissions Test Result

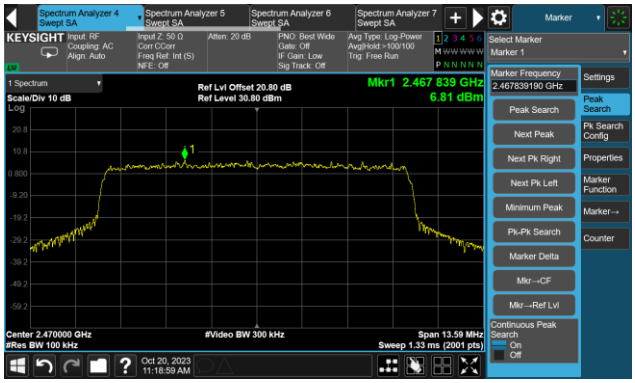
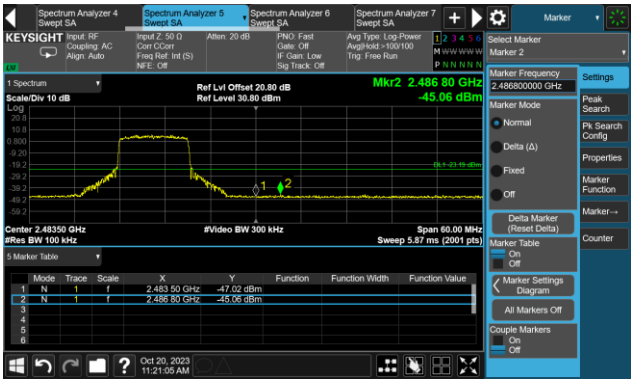
Test Site	WZ-SR4	Test Engineer	Jeff Yang
Test Date	2023-10-20		

Frequency (MHz)	Limit
2417	30dBc
2444	30dBc
2470	30dBc

Out-of-Band Emissions – Ant 0	
2417MHz	
Reference Level	Low Band Edge
	
Spurious Emission	
	
2444MHz	
Reference Level	Spurious Emission
	

Out-of-Band Emissions – Ant 0	
2470MHz	
Reference Level	High Band Edge
	
Spurious Emission	
	

Out-of-Band Emissions – Ant 1	
2417MHz	
Reference Level	Low Band Edge
	
Spurious Emission	
	
2444MHz	
Reference Level	Spurious Emission
	

Out-of-Band Emissions – Ant 1	
2470MHz	
Reference Level	High Band Edge
	
Spurious Emission	
	

A.6 Radiated Spurious Emission Test Result

Test Site	WZ-AC1	Test Engineer	Carl Jiang
Test Date	2023-09-03	Test Mode	SISO Mode Ant 0
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Test Freq.	Frequency (MHz)	Reading Level (dBµV)	Factor (dB/m)	Measure Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Polarization
2417MHz	7256.0	49.4	8.1	57.5	74.0	-16.5	Peak	Horizontal
	7256.0	35.3	8.1	43.4	54.0	-10.6	Average	Horizontal
	11072.5	35.4	14.0	49.4	74.0	-24.6	Peak	Horizontal
	12101.0	35.3	12.4	47.7	74.0	-26.3	Peak	Horizontal
	7256.0	55.3	8.1	63.4	74.0	-10.6	Peak	Vertical
	7256.0	40.8	8.1	48.9	54.0	-5.1	Average	Vertical
	11081.0	35.8	14.0	49.8	74.0	-24.2	Peak	Vertical
	11871.5	35.8	12.3	48.1	74.0	-25.9	Peak	Vertical
2444MHz	7324.0	50.1	8.2	58.3	74.0	-15.7	Peak	Horizontal
	7324.0	35.5	8.2	43.7	54.0	-10.3	Average	Horizontal
	11251.0	35.1	13.4	48.5	74.0	-25.5	Peak	Horizontal
	11948.0	34.5	12.3	46.8	74.0	-27.2	Peak	Horizontal
	7324.0	57.2	8.2	65.4	74.0	-8.6	Peak	Vertical
	7324.0	42.8	8.2	51.0	54.0	-3.0	Average	Vertical
	10962.0	35.1	14.1	49.2	74.0	-24.8	Peak	Vertical
	11761.0	36.6	12.5	49.1	74.0	-24.9	Peak	Vertical
2470MHz	7502.5	36.2	8.5	44.7	74.0	-29.3	Peak	Horizontal
	11064.0	35.0	13.9	48.9	74.0	-25.1	Peak	Horizontal
	11897.0	34.3	12.2	46.5	74.0	-27.5	Peak	Horizontal
	8310.0	35.1	8.7	43.8	74.0	-30.2	Peak	Vertical
	11004.5	34.6	14.3	48.9	74.0	-25.1	Peak	Vertical
	12109.5	36.1	12.4	48.5	74.0	-25.5	Peak	Vertical

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Site	WZ-AC1	Test Engineer	Carl Jiang
Test Date	2023-09-03	Test Mode	SISO Mode Ant 1
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

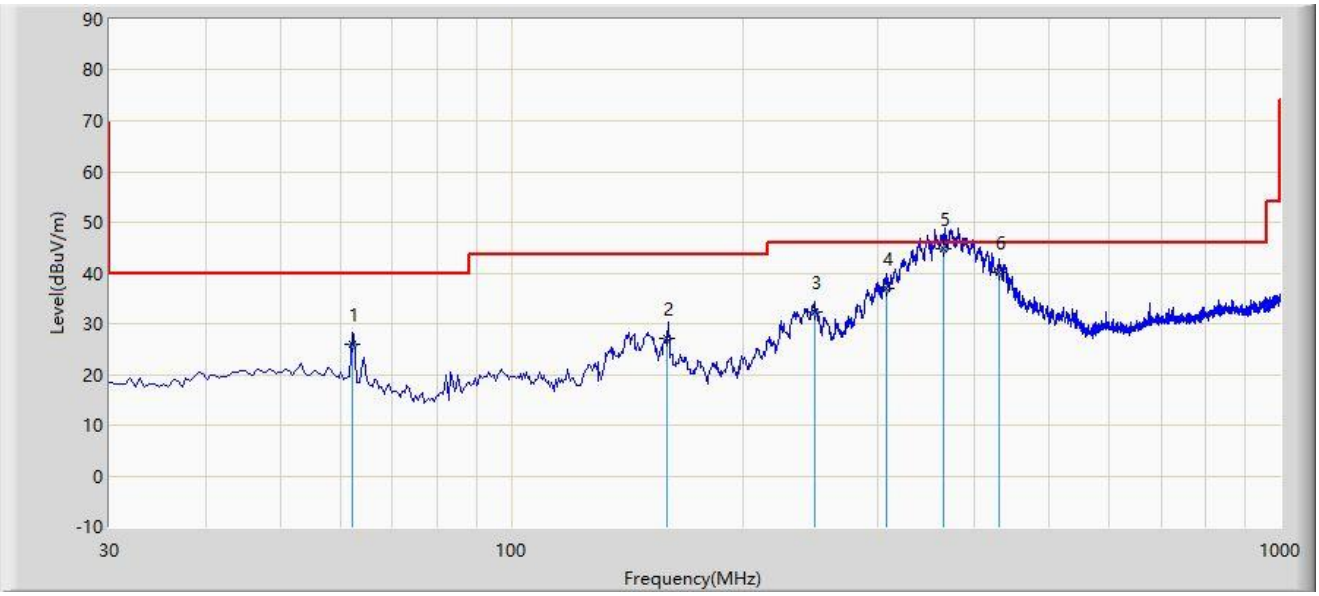
Test Freq.	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
2417MHz	7251.0	48.4	8.1	56.5	74.0	-17.5	Peak	Horizontal
	7251.0	31.9	8.1	40.0	54.0	-14.0	Average	Horizontal
	10953.5	34.8	14.1	48.9	74.0	-25.1	Peak	Horizontal
	11582.5	36.5	13.2	49.7	74.0	-24.3	Peak	Horizontal
	7251.0	51.2	8.1	59.3	74.0	-14.7	Peak	Vertical
	7251.0	34.5	8.1	42.6	54.0	-11.4	Average	Vertical
	10885.5	35.0	14.0	49.0	74.0	-25.0	Peak	Vertical
	11769.5	35.6	12.5	48.1	74.0	-25.9	Peak	Vertical
2444MHz	7332.5	49.0	8.2	57.2	74.0	-16.8	Peak	Horizontal
	7332.5	35.2	8.2	43.4	54.0	-10.6	Average	Horizontal
	11064.0	35.2	13.9	49.1	74.0	-24.9	Peak	Horizontal
	12041.5	35.1	12.5	47.6	74.0	-26.4	Peak	Horizontal
	7332.5	51.2	8.2	59.4	74.0	-14.6	Peak	Vertical
	7332.5	39.2	8.2	47.4	54.0	-6.6	Average	Vertical
	10962.0	34.3	14.1	48.4	74.0	-25.6	Peak	Vertical
	11693.0	34.6	12.7	47.3	74.0	-26.7	Peak	Vertical
2470MHz	7545.0	36.4	8.6	45.0	74.0	-29.0	Peak	Horizontal
	10953.5	34.6	14.1	48.7	74.0	-25.3	Peak	Horizontal
	12211.5	34.9	12.5	47.4	74.0	-26.6	Peak	Horizontal
	8208.0	35.1	8.9	44.0	74.0	-30.0	Peak	Vertical
	11081.0	34.7	14.0	48.7	74.0	-25.3	Peak	Vertical
	12092.5	34.8	12.4	47.2	74.0	-26.8	Peak	Vertical

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

The Result of Radiated Emission 30MHz~1GHz:

Site: WZ-AC2	Test Date: 2023-10-13
Limit: FCC_Part15.209_RSE(3m)	Engineer: Karl Gao
Probe: VULB9162_30-7000MHz	Polarity: Horizontal
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2444MHz ANT 0	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		62.100	26.080	7.300	-13.920	40.000	18.780	QP
2		159.400	27.164	11.500	-16.336	43.500	15.664	QP
3		247.600	32.390	12.600	-13.610	46.000	19.790	QP
4		307.900	37.086	15.900	-8.914	46.000	21.186	QP
5	*	364.600	44.807	22.500	-1.193	46.000	22.306	QP
6		431.200	40.225	16.300	-5.775	46.000	23.925	QP

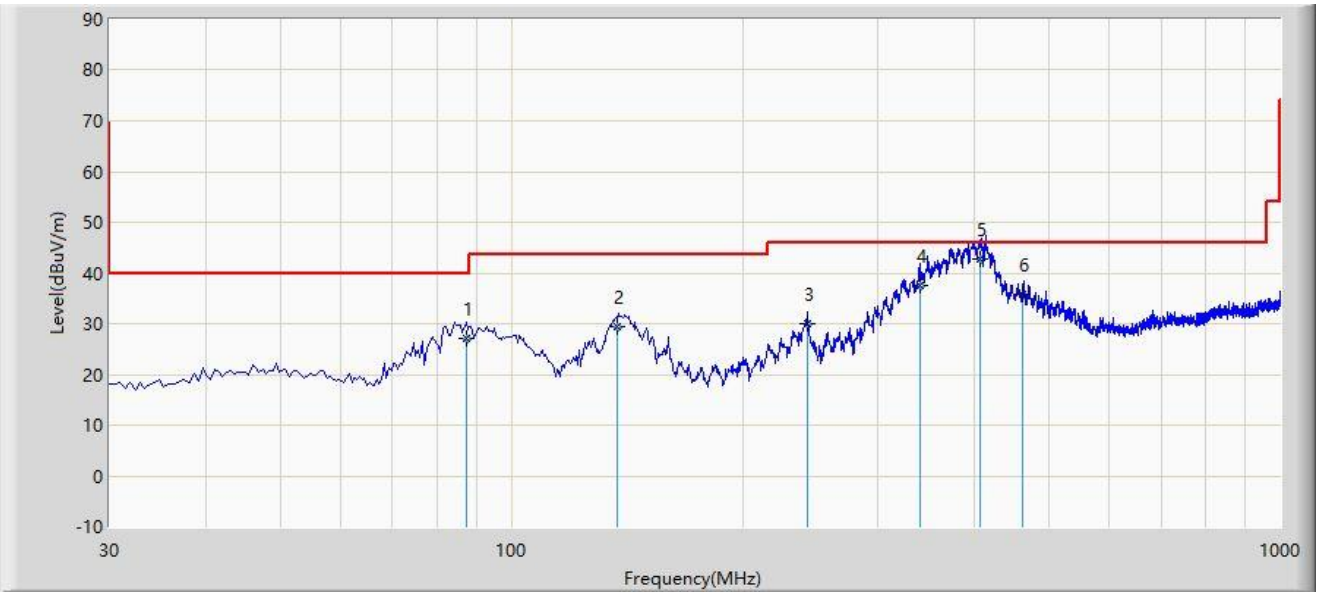
Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

Site: WZ-AC2	Test Date: 2023-10-13
Limit: FCC_Part15.209_RSE(3m)	Engineer: Karl Gao
Probe: VULB9162_30-7000MHz	Polarity: Vertical
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2444MHz ANT 0	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		87.600	27.149	11.600	-12.851	40.000	15.548	QP
2		137.200	29.478	14.300	-14.022	43.500	15.178	QP
3		242.600	30.048	10.300	-15.952	46.000	19.749	QP
4		340.200	37.557	15.100	-8.443	46.000	22.457	QP
5	*	407.400	42.666	18.900	-3.334	46.000	23.767	QP
6		463.200	35.708	11.300	-10.292	46.000	24.408	QP

Note 1: " * ", means this data is the worst emission level.

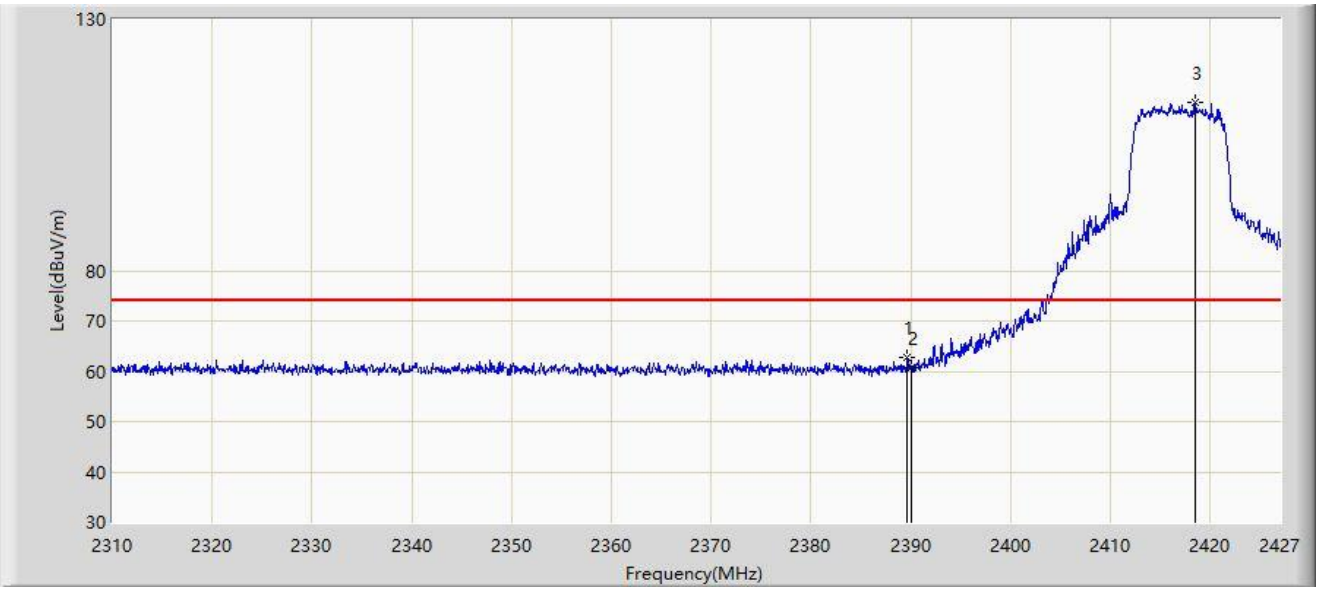
Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

A.7 Radiated Restricted Band Edge Test Result

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2417MHz Ant 0	



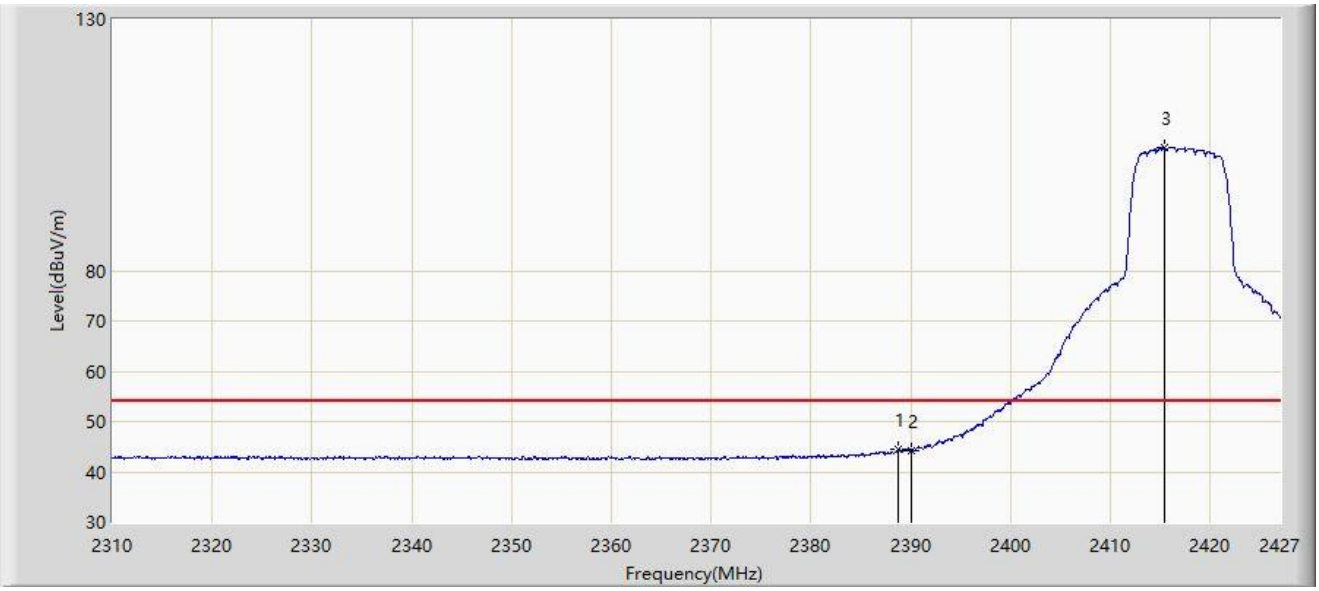
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	2389.677	62.765	31.511	-11.235	74.000	31.254	PK
2		2390.000	60.778	29.524	-13.222	74.000	31.254	PK
3		2418.459	113.502	82.253	N/A	N/A	31.249	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2417MHz Ant 0	



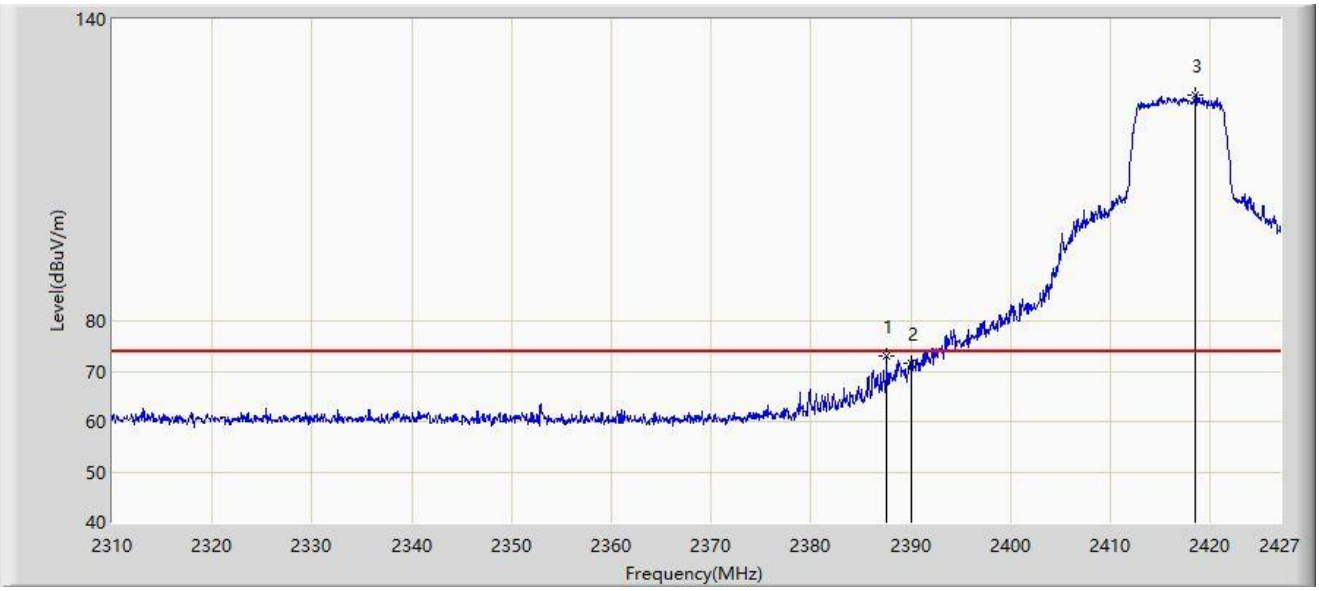
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2388.800	44.515	13.260	-9.485	54.000	31.255	AV
2		2390.000	44.317	13.063	-9.683	54.000	31.254	AV
3		2415.417	104.389	73.138	N/A	N/A	31.251	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2417MHz Ant 0	



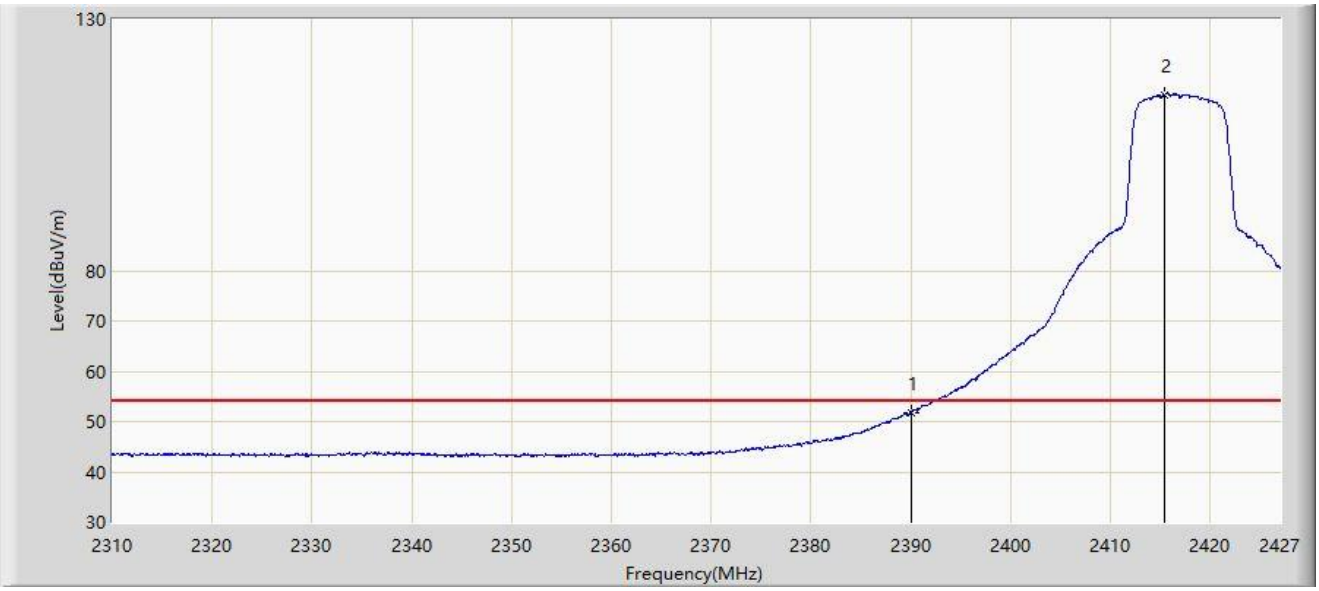
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	2387.571	73.128	41.872	-0.872	74.000	31.255	PK
2		2390.000	71.726	40.472	-2.274	74.000	31.254	PK
3		2418.518	124.797	93.548	N/A	N/A	31.249	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2417MHz Ant 0	



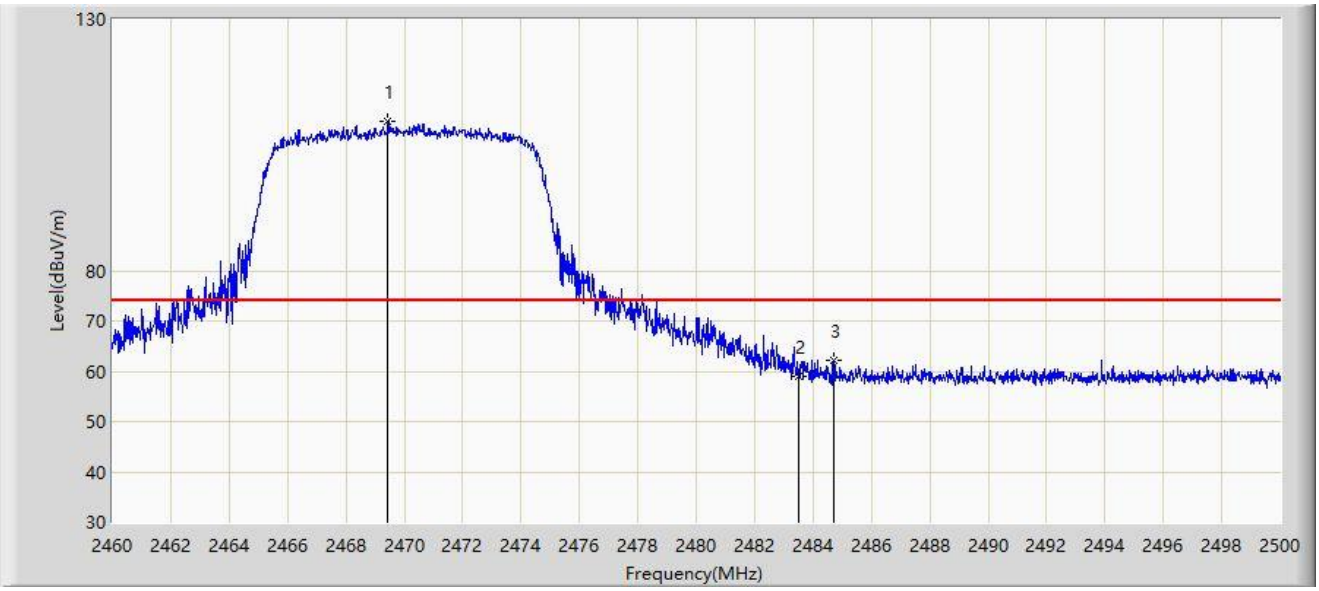
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	2390.000	51.772	20.518	-2.228	54.000	31.254	AV
2		2415.358	114.971	83.720	N/A	N/A	31.251	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2470MHz Ant 0	



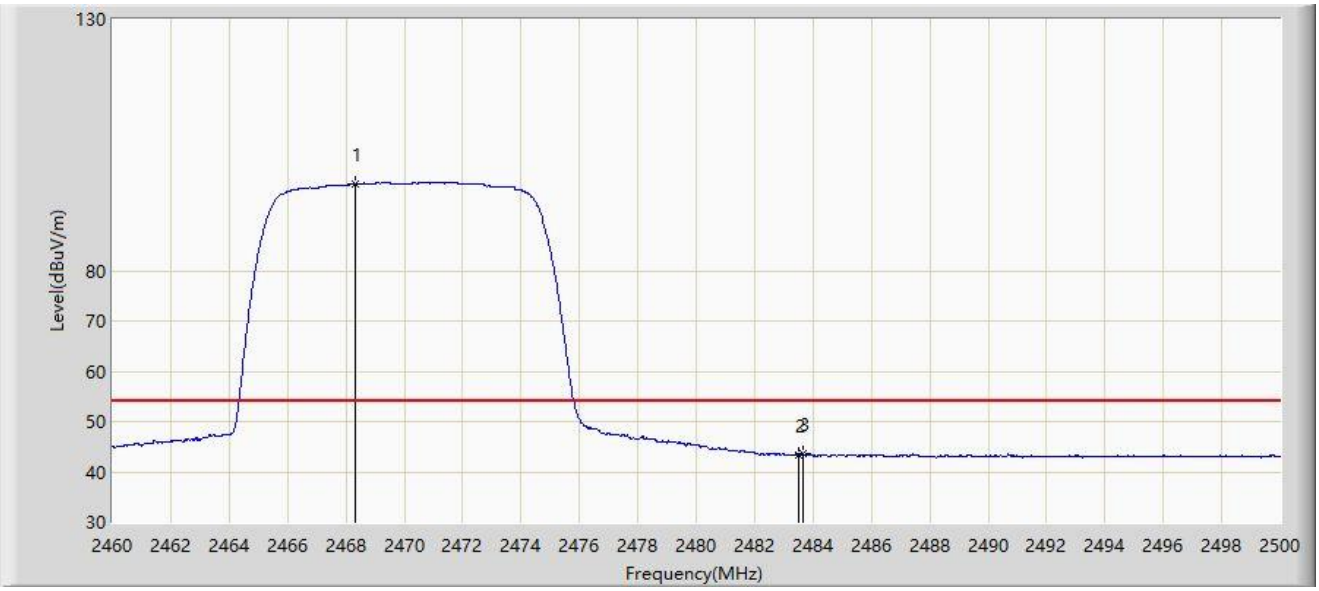
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2469.440	109.790	78.567	N/A	N/A	31.222	PK
2		2483.500	58.869	27.643	-15.131	74.000	31.226	PK
3	*	2484.720	62.274	31.047	-11.726	74.000	31.227	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2470MHz Ant 0	



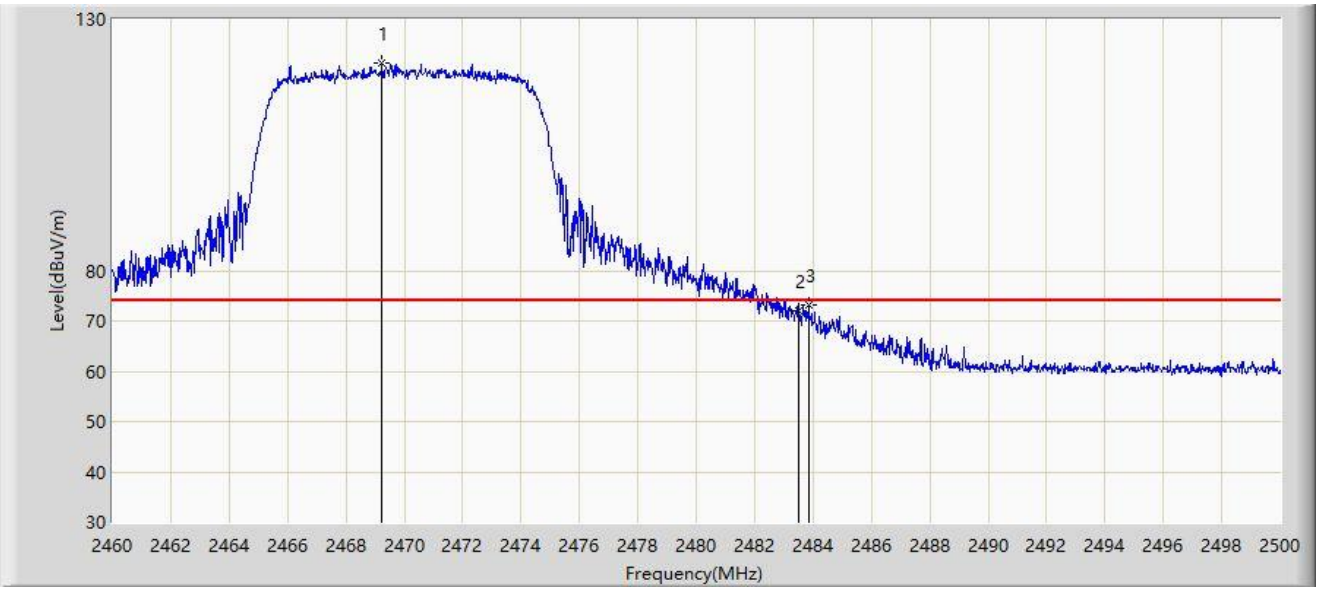
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2468.300	97.238	66.015	N/A	N/A	31.223	AV
2		2483.500	43.343	12.117	-10.657	54.000	31.226	AV
3	*	2483.640	43.579	12.353	-10.421	54.000	31.226	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2470MHz Ant 0	



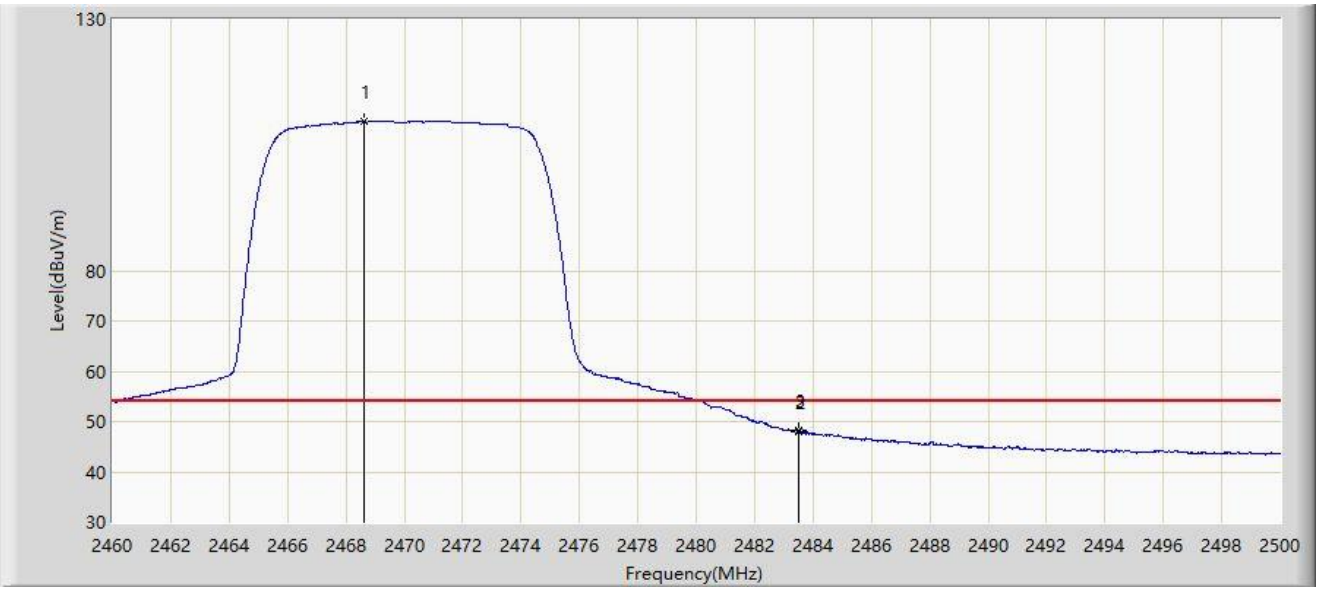
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2469.220	121.439	90.216	N/A	N/A	31.223	PK
2		2483.500	72.166	40.940	-1.834	74.000	31.226	PK
3	*	2483.840	73.198	41.972	-0.802	74.000	31.226	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2470MHz Ant 0	



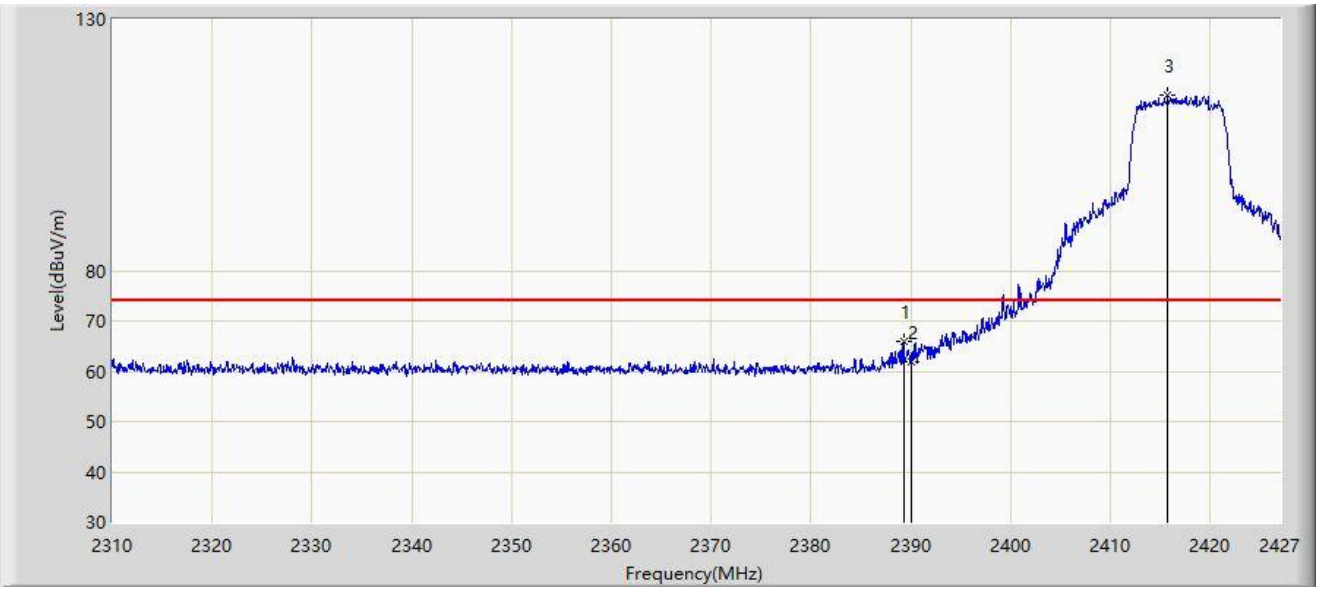
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2468.640	109.678	78.455	N/A	N/A	31.223	AV
2		2483.500	48.095	16.869	-5.905	54.000	31.226	AV
3	*	2483.520	48.287	17.061	-5.713	54.000	31.226	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2417MHz Ant 1	



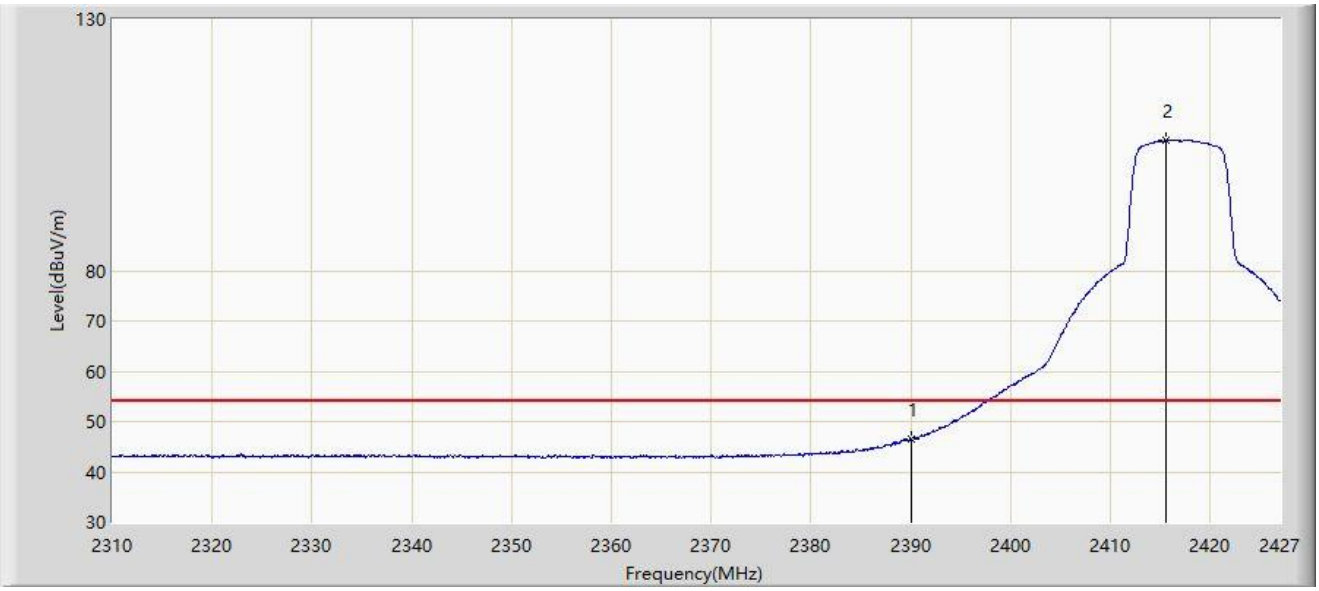
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	2389.268	65.812	34.558	-8.188	74.000	31.254	PK
2		2390.000	61.762	30.508	-12.238	74.000	31.254	PK
3		2415.709	115.005	83.755	N/A	N/A	31.250	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2417MHz Ant 1	



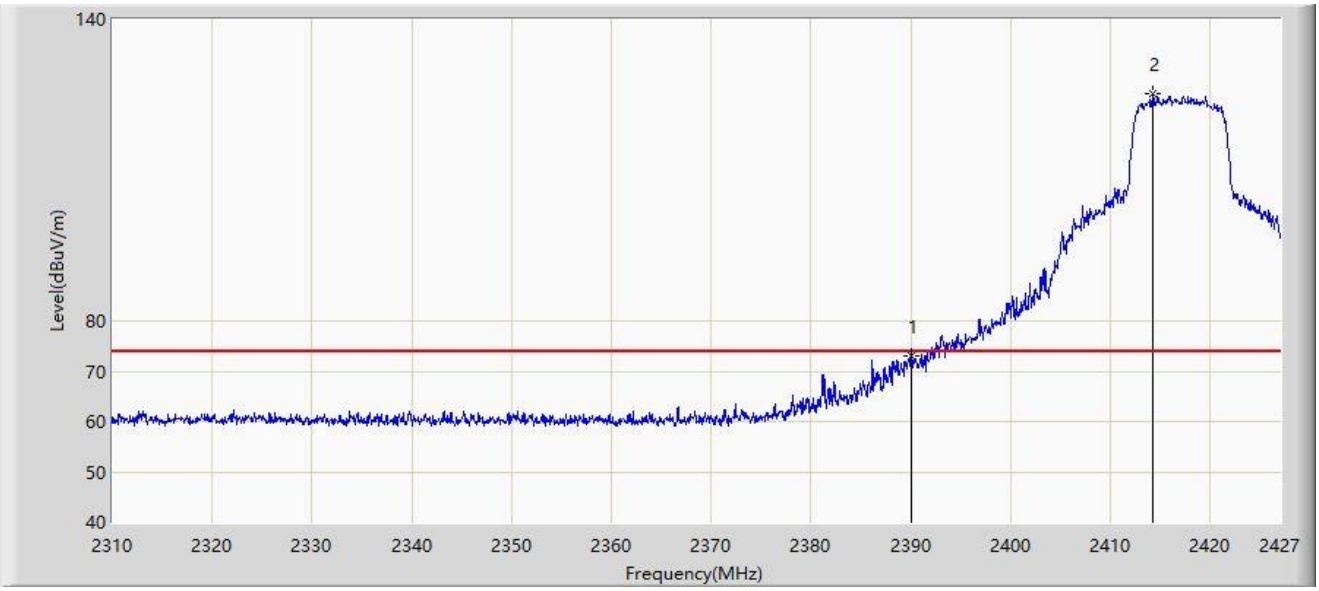
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	2390.000	46.398	15.144	-7.602	54.000	31.254	AV
2		2415.593	105.946	74.696	N/A	N/A	31.250	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2417MHz Ant 1	



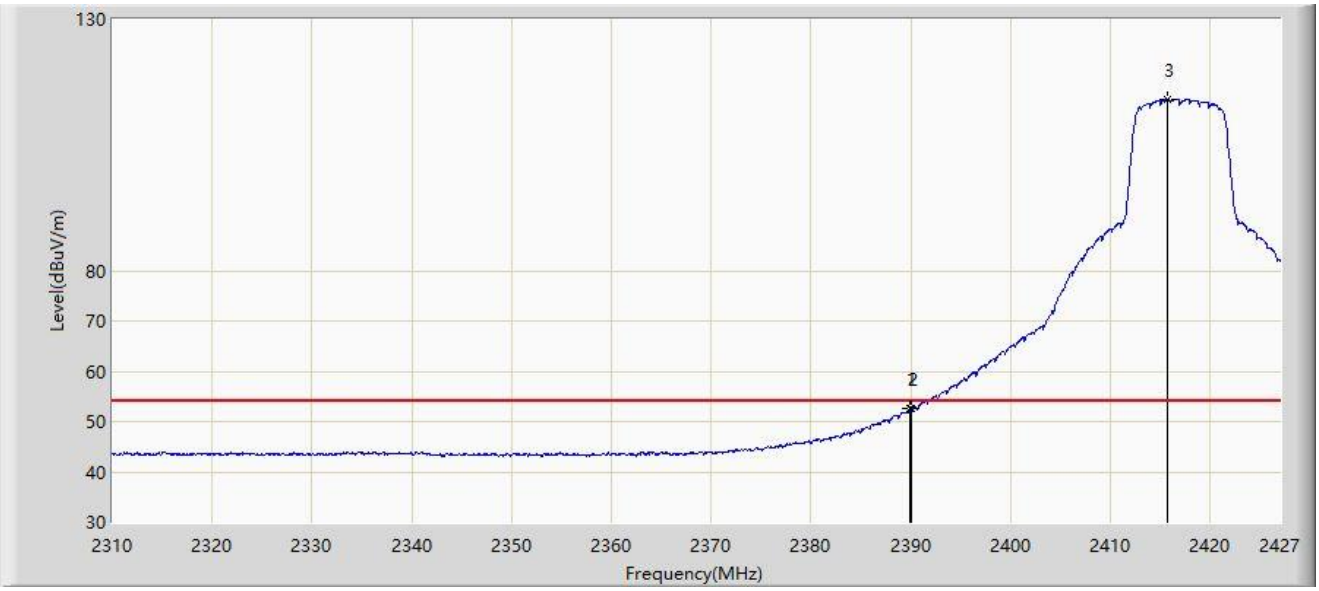
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	2390.000	73.012	41.758	-0.988	74.000	31.254	PK
2		2414.247	125.104	93.853	N/A	N/A	31.251	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2417MHz Ant 1	



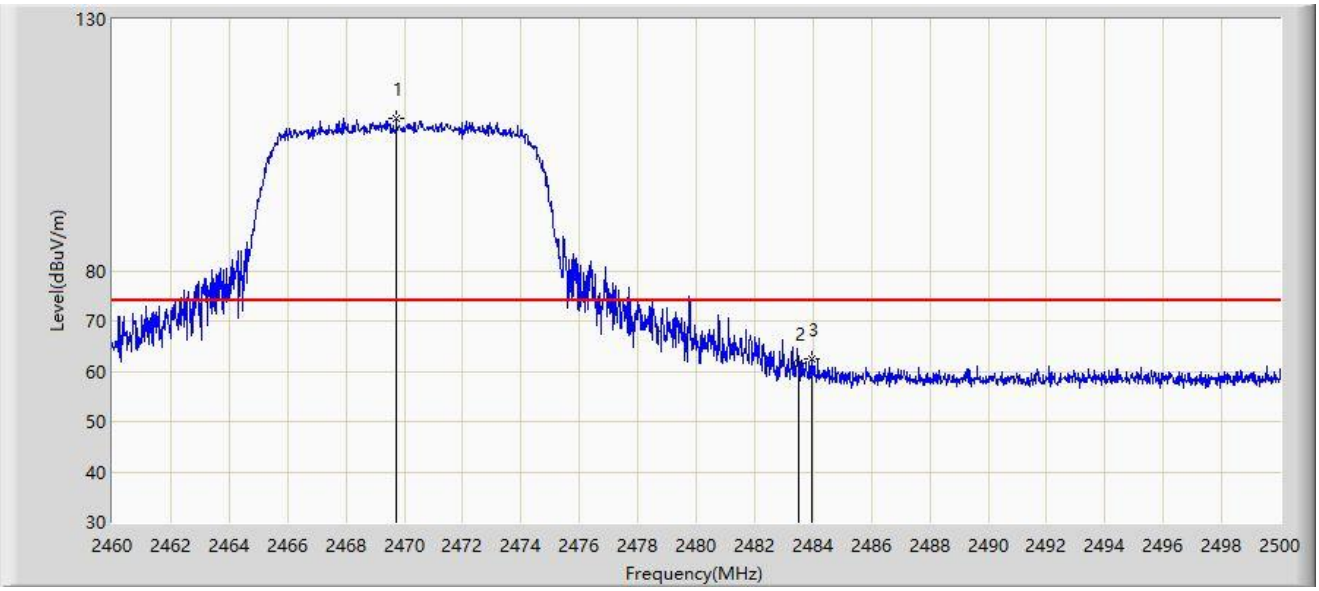
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	2389.969	52.516	21.262	-1.484	54.000	31.254	AV
2		2390.000	52.494	21.240	-1.506	54.000	31.254	AV
3		2415.651	114.050	82.800	N/A	N/A	31.250	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2470MHz Ant 1	



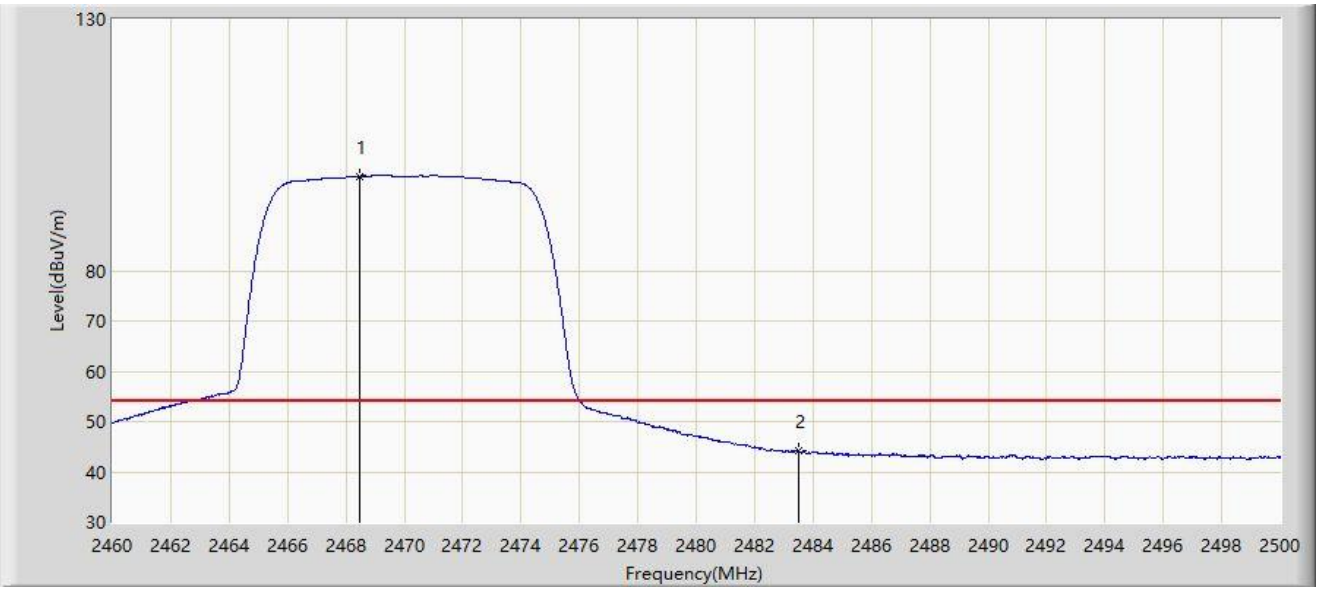
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		2469.720	110.428	79.205	N/A	N/A	31.222	PK
2		2483.500	61.646	30.420	-12.354	74.000	31.226	PK
3	*	2483.960	62.545	31.318	-11.455	74.000	31.227	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2470MHz Ant 1	



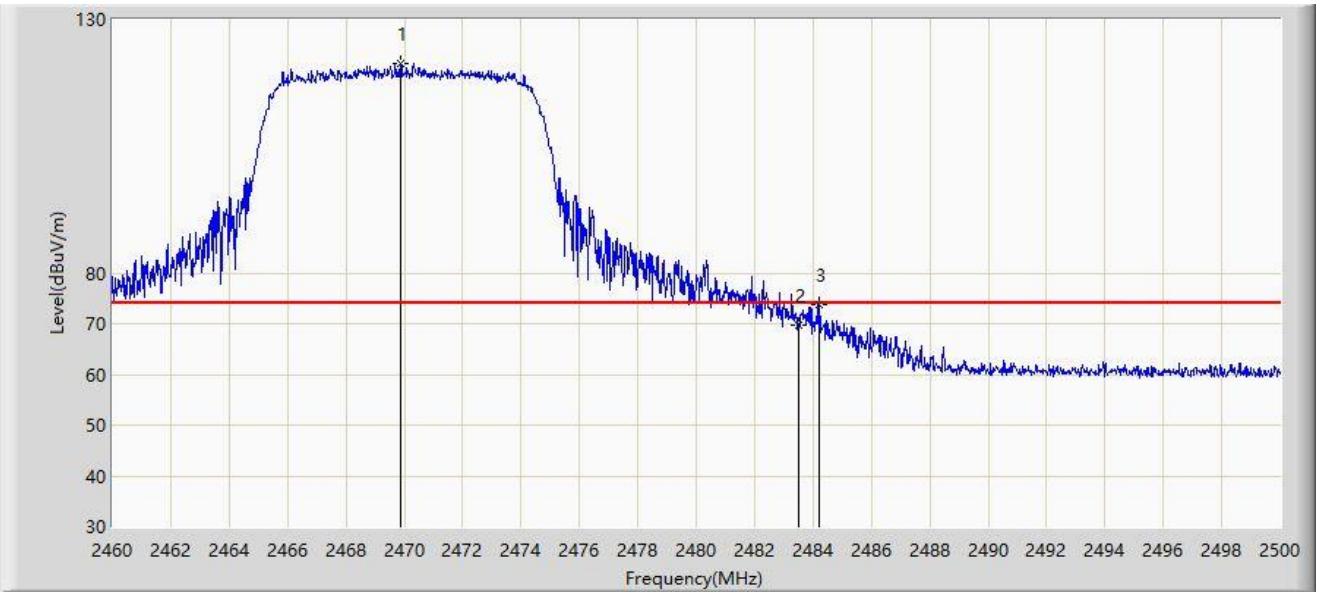
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		2468.480	98.799	67.576	N/A	N/A	31.223	AV
2	*	2483.500	44.119	12.893	-9.881	54.000	31.226	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2470MHz Ant 1	



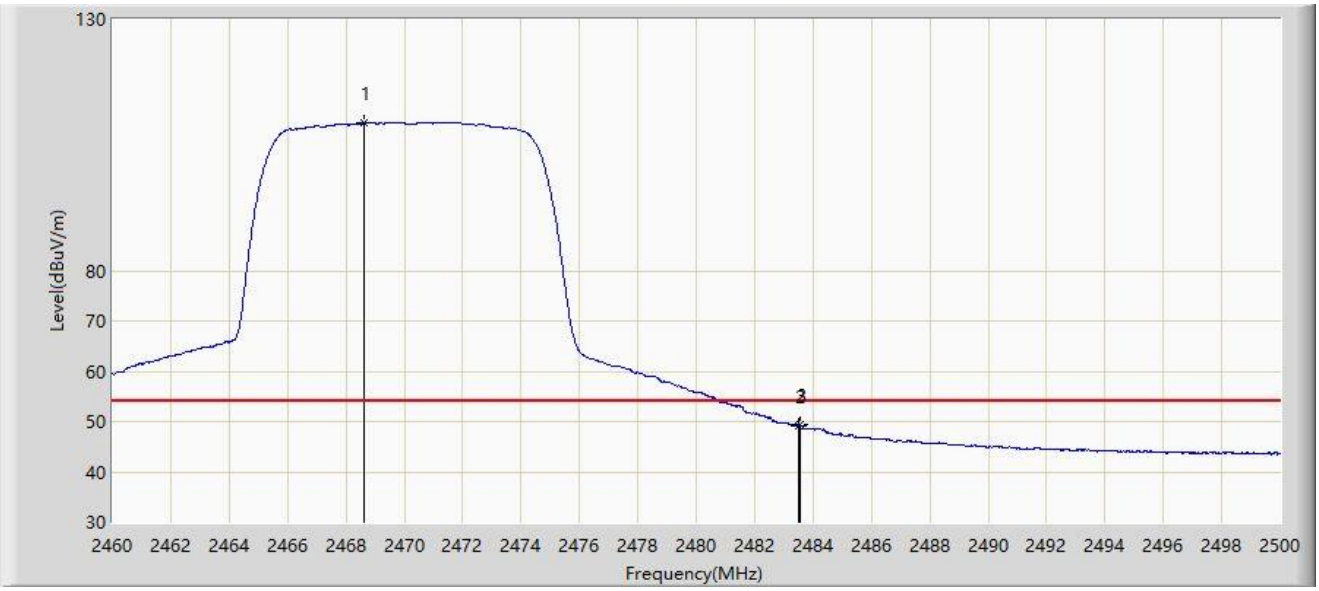
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2469.880	121.381	90.158	N/A	N/A	31.222	PK
2		2483.500	69.719	38.493	-4.281	74.000	31.226	PK
3	*	2484.200	73.761	42.534	-0.239	74.000	31.227	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-09-04
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: S1 RC	Power: AC 120V/60Hz
Test Mode: Transmit at 2470MHz Ant 1	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2468.600	109.358	78.135	N/A	N/A	31.223	AV
2		2483.500	49.151	17.925	-4.849	54.000	31.226	AV
3	*	2483.540	49.281	18.055	-4.719	54.000	31.226	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Appendix B – Test Setup Photograph

Refer to “2308RSU081-UT” file.

Appendix C – EUT Photograph

Refer to “2308RSU081-UE” file.

The End