



RF MEASUREMENT REPORT

FCC ID: BRWSPMSR615

Applicant: Horizon Hobby LLC.

Product: SPMSR615 DSMR 6-Channel Waterproof Receiver

Model No.: SR615

Brand Name: Spektrum™

FCC Classification: Part 15 Low Power Communication Device Transmitter (DXX)

FCC Rule Part(s): Part 15 Subpart C (Section 15.249)

Result: Complies

Received Date: 2024-11-11

Test Date: 2024-12-04 ~ 2024-12-30

Reviewed By:

Denise Zhou

Approved By:

Robin Wu



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.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2411RSU012-U2	V01	Initial Report	2025-01-03	Invalid
2411RSU012-U2	V02	Update Measuring Instrument	2025-01-17	Invalid
2411RSU012-U2	V03	Update Measuring Instrument	2025-01-21	Valid

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1.4. Product Information

Product	SPMSR615 DSMR 6-Channel Waterproof Receiver
Model No.	SR615
Brand Name	Spektrum
EUT Identification No.	20241111Sampl#03
Wireless Specification	DSMR: 2405~2478MHz
Antenna Information	Refer to section 1.5
Operating Temperature	0~50°C
Power Type	3.5 ~ 9.6Vdc (Typical: 6Vdc Battery)
Note: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Radio Specification

Frequency Range	DSMR: 2405~2478MHz
Channel Number	23
Type of Modulation	GFSK
Antenna Type	Monopole Antenna
Antenna Gain	3.26 dBi

1.6. Working Frequencies

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2405 MHz	01	2408 MHz	02	2412 MHz
03	2415 MHz	04	2418 MHz	05	2421 MHz
06	2425 MHz	07	2428 MHz	08	2431 MHz
09	2434 MHz	10	2438 MHz	11	2440 MHz
12	2444 MHz	13	2447 MHz	14	2451 MHz
15	2454 MHz	16	2457 MHz	17	2460 MHz
18	2464 MHz	19	2467 MHz	20	2470 MHz
21	2474 MHz	22	2478 MHz	--	--

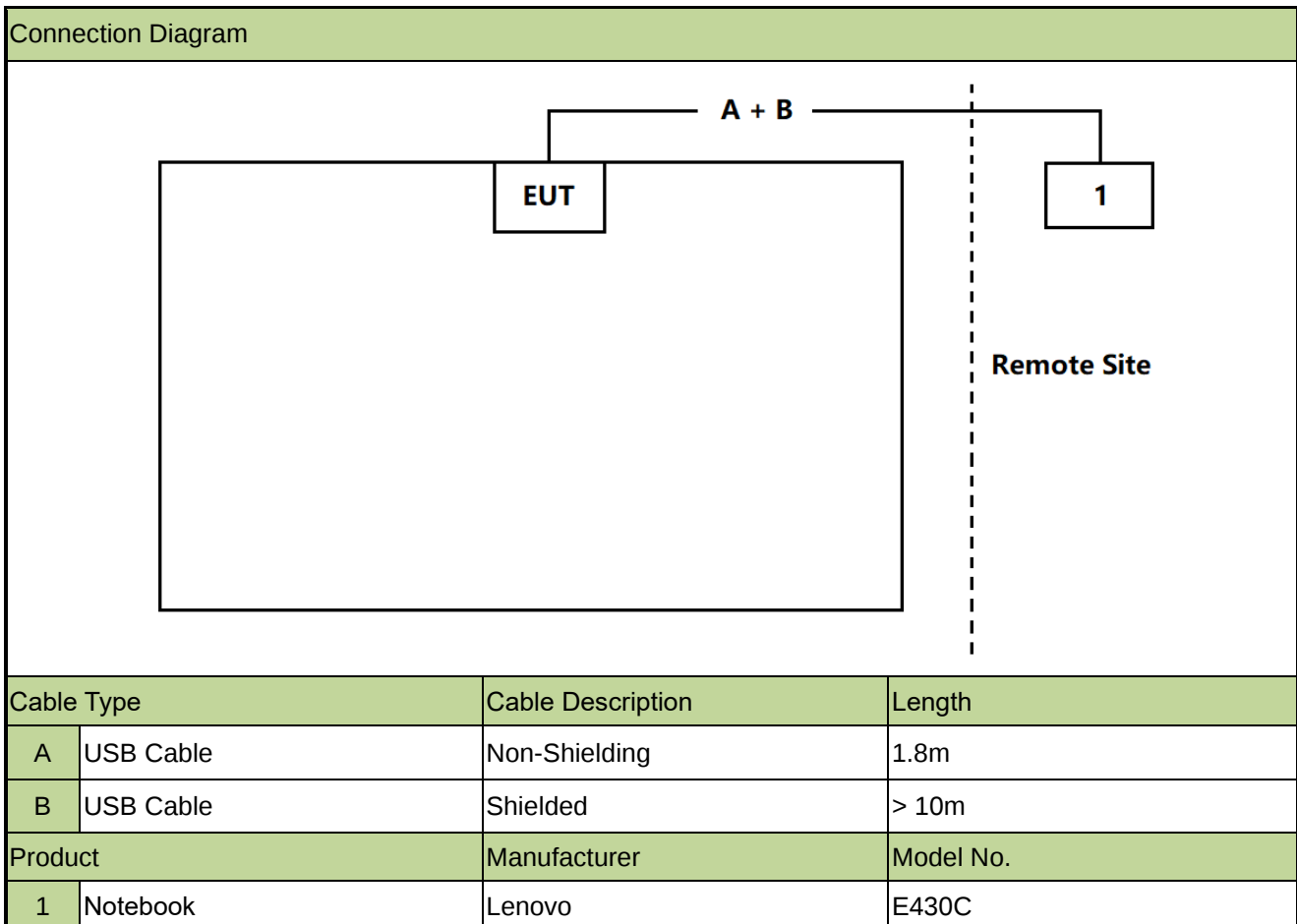
2. Test Configuration

2.1. Test Mode

Mode 1: Transmit by DSMR

2.2. Test Configuration

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



2.3. Test Software

The test utility software used during testing was “RF Compliance Mode Setup”, and the version was “4.1”.

2.4. Applied Standards

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

- FCC Part 15.249
- 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 antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

This unit complies 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	2025-12-05	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2025-07-26	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2025-09-23	WZ-AC1
Preamplifier	Agilent	83017A	MRTSUE06076	1 year	2025-11-08	WZ-AC1
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2025-05-15	WZ-AC1
Anechoic Chamber	TDK	WZ-AC1	MRTSUE06212	1 year	2025-04-19	WZ-AC1
Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2025-10-13	WZ-AC1
Loop Antenna	Schwarzbeck	FMZB 1519 B	MRTSUE06937	1 year	2025-01-27	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11039	1 year	2025-10-16	WZ-AC1
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2025-12-05	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2025-11-03	WZ-AC1
Preamplifier	EMCI	EMC184045SE	MRTSUE06640	1 year	2025-01-11	WZ-AC1
Cable	HUBER+SUHNER	SF106	MRTSUE06056	1 year	2025-04-19	WZ-AC1
Cable	HUBER+SUHNER	SF106	MRTSUE11034	1 year	2025-04-19	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2025-09-23	WZ-AC2
Anechoic Chamber	RIKEN	WZ-AC2	MRTSUE06213	1 year	2025-04-18	WZ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11263	1 year	2025-10-16	WZ-AC2
Signal Analyzer	Keysight	N9010B	MRTSUE06558	1 year	2025-05-20	WZ-AC2
Cable	HUBER+SUHNER	SF126	MRTSUE06733	1 year	2025-04-06	WZ-AC2
Cable	HUBER+SUHNER	SF106	MRTSUE11374	1 year	2025-09-05	WZ-AC2
Thermohygrometer	testo	608-H1	MRTSUE06402	1 year	2025-05-12	WZ-SR5
Shielding Room	HUAMING	WZ-SR5	MRTSUE06442	N/A	N/A	WZ-SR5
Signal Analyzer	Keysight	N9010B	MRTSUE06457	1 year	2025-05-08	WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11079	1 year	2025-06-05	WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11080	1 year	2025-06-05	WZ-SR5
Cable	UCwave	UCE500	24060015	Note	Note	WZ-SR5

Note: The loss of the RF cable will be measured before testing.

Software	Version	Function
e3	230711	RE & CE
Controller_MF 7802	2.03C	RE Antenna & Turntable

5. 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: 2.35dB
Coplanar:	9kHz~30MHz: 2.37dB
Horizontal:	30MHz~200MHz: 3.46dB
	200MHz~1GHz: 3.78dB
	1GHz~40GHz: 4.97dB
Vertical:	30MHz~200MHz: 4.07dB
	200MHz~1GHz: 5.28dB
	1GHz~40GHz: 4.78dB
Occupied Bandwidth	
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$):	
2.7%	

6. Test Result

6.1. Summary

FCC Part Section(s)	Test Description	Test Condition	Verdict
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	N/A
15.209 15.249	General Field Strength Limits (Fundamental and Radiated Emission Limits)	Radiated	Pass
15.215(c)	20dB Bandwidth	Conducted	Pass

Notes:

1. The radiation measurements are performed in X, Y, Z axis positioning. The test results shown in the following sections represent the worst-case emissions.
2. 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.
3. "N/A" means that this item is not applicable, and the detail information refer to relevant section.

6.2. AC Conducted Emissions Measurement

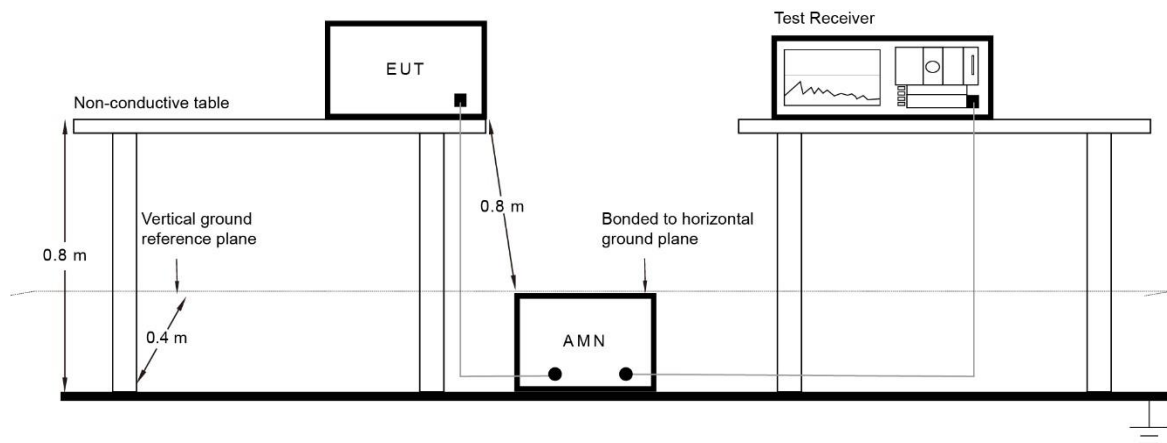
6.2.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dB μ V)	Average (dB μ V)
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.

6.2.2. Test Setup



6.2.3. Test Result

The EUT is powered by battery, so this item is not applicable.

6.3. Fundamental & Radiated Spurious Emission Measurement

6.3.1. Test Limit

The field strength of fundamental and harmonic emissions measured at 3 m shall not exceed the limits shown in Table per Section 15.249.

FCC Part 15 Subpart C Paragraph 15.249		
Fundamental Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (μ V/m)
902 ~ 928	50	500
2400 ~ 2483.5	50	500
5725 ~ 5875	50	500
24000 ~ 24250	250	2500

All out of band emissions must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Field Strength (μ V/m)	Measurement Distance (m)
0.009 ~ 0.490	$2400/F(\text{kHz})$	300
0.490 ~ 1.705	$24000/F(\text{kHz})$	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

6.3.2. Test Procedure

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)

6.3.3. Test Setting

Measurement of harmonic and spurious emissions below 40 GHz

Peak Field Strength Measurements

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

Table 1 - RBW as a function of frequency

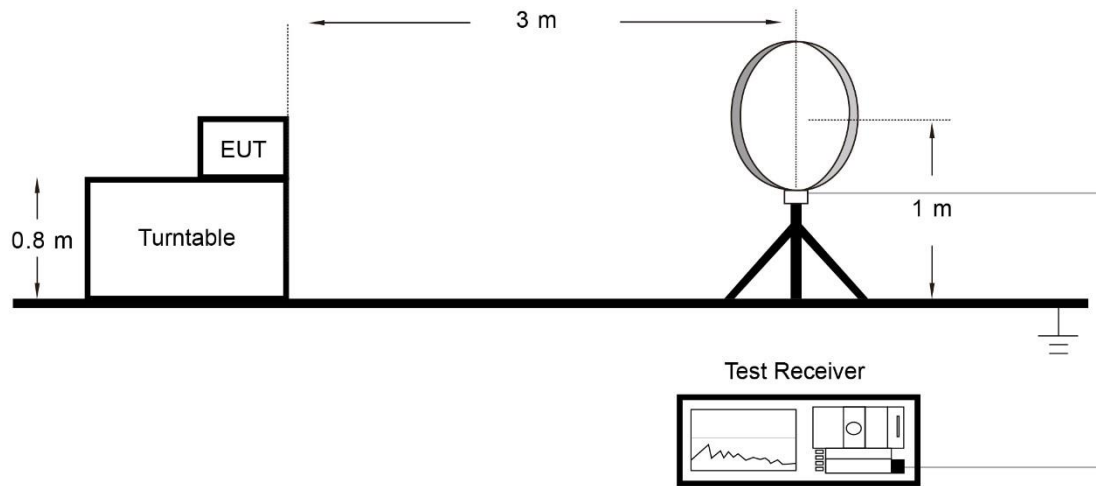
Frequency	RBW
9 ~ 150 kHz	200 Hz
0.15 ~ 30 MHz	9 kHz
30 ~ 1000 MHz	120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

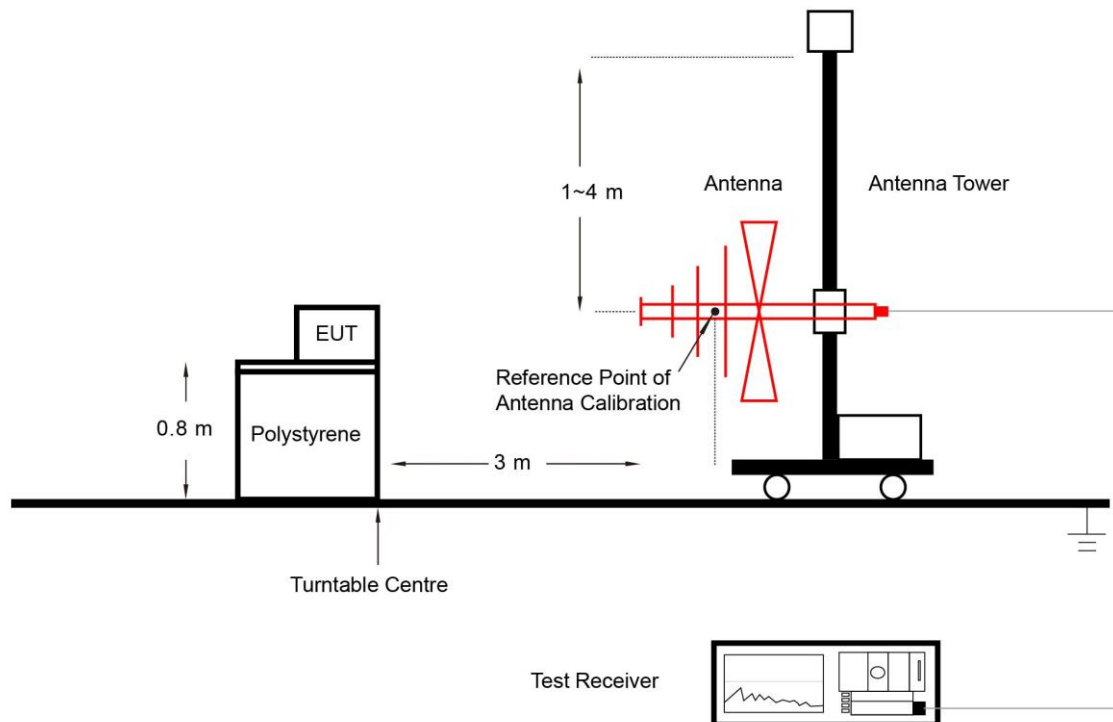
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. Set the VBW $\geq 3 \times$ RBW
4. Detector function = Average
5. Sweep time $\geq$ (number of points in sweep) $\times$ (transmission symbol period)
6. Trace mode = Max Hold
7. Allow max hold to run for suitable traces until the trace tend to stabilize.

6.3.4. Test Setup

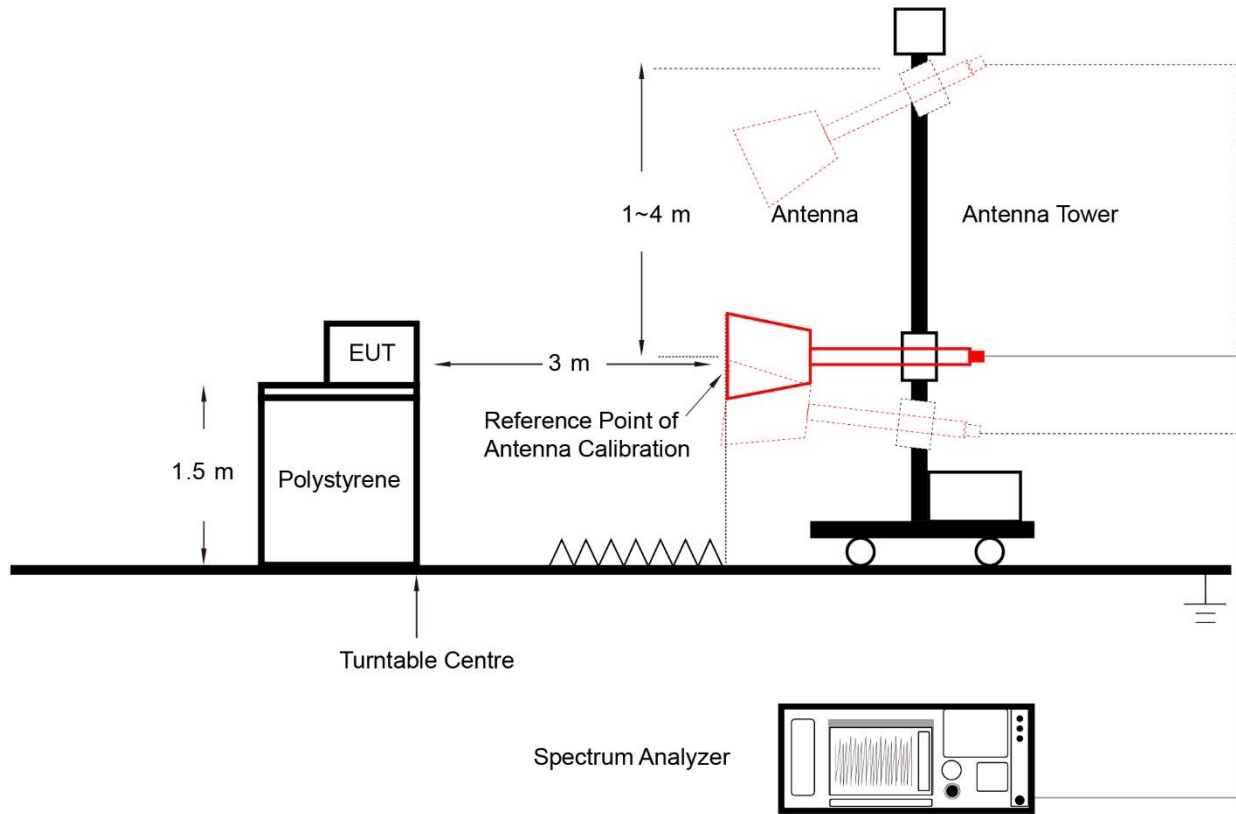
Below 30MHz Test Setup:



Below 1GHz Test Setup:



1GHz ~ 40GHz Test Setup:



6.3.5. Test Result

Refer to Appendix A.2.

6.4. Radiated Restricted Band Edge Measurement

6.4.1. Test Limit

All out of band emissions must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [$\mu\text{V/m}$]	Measured Distance [Meter]
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

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

6.4.2. Test Procedure

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

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

ANSI C63.10-2013 Section 6.10 (Band-edge testing)

6.4.3. Test Setting

Peak Field Strength Measurements

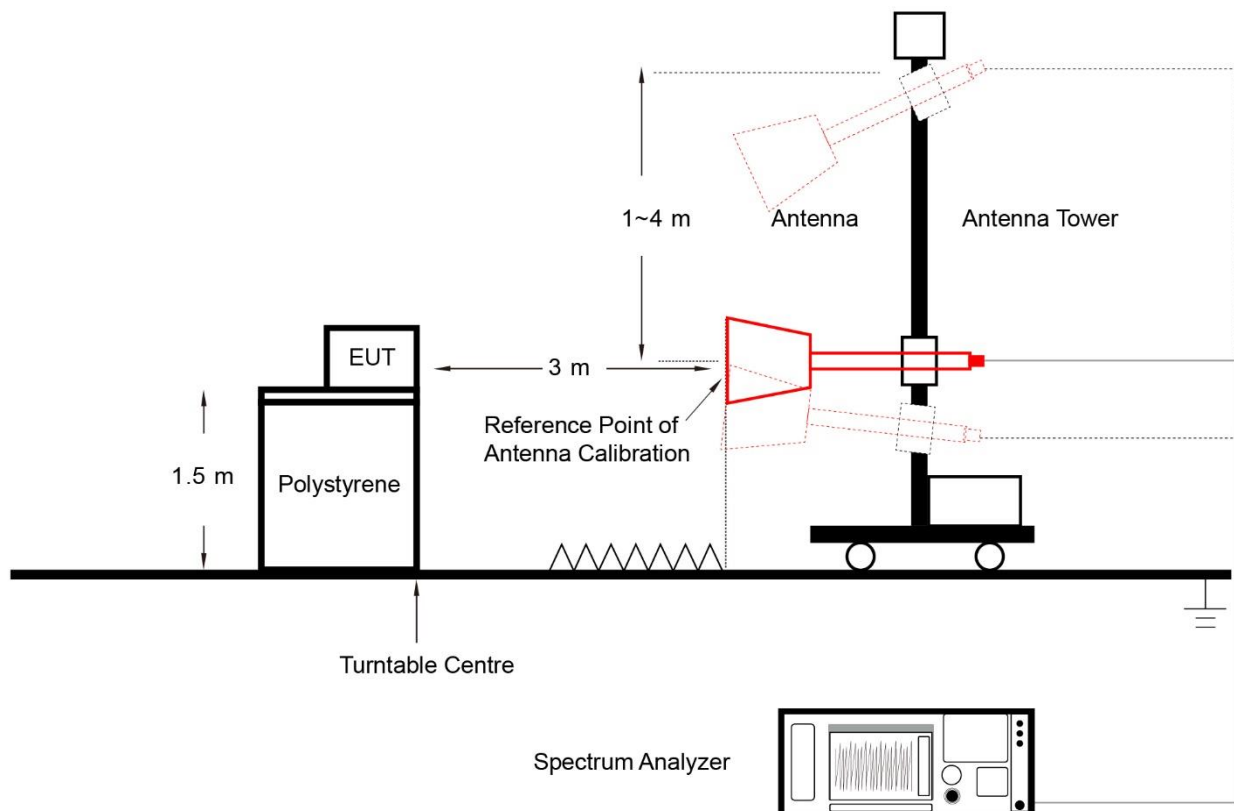
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz

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. Set the VBW $\geq 3 \times$ RBW
4. Detector function = Average
5. Sweep time $\geq$ (number of points in sweep) $\times$ (transmission symbol period)
6. Trace mode = Max Hold
7. Allow max hold to run for suitable traces until the trace tend to stabilize.

6.4.4. Test Setup



6.4.5. Test Result

Refer to Appendix A.3.

6.5. 20dB Bandwidth Measurement

6.5.1. Test Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission in the specific band.

6.5.2. Test Procedure

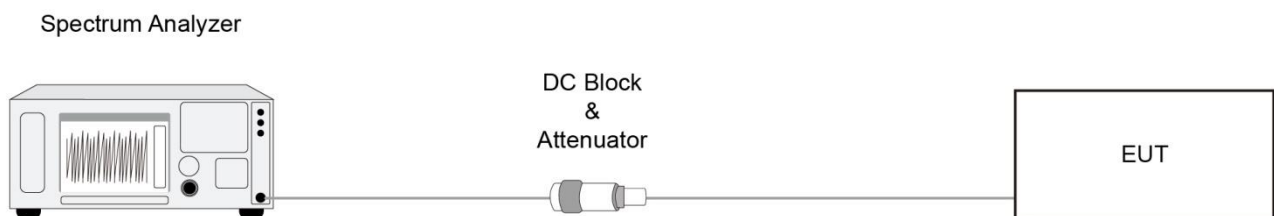
ANSI C63.10-2013 Clause 6.9.2

6.5.3. Test Setting

20dB Bandwidth

1. The analyzers' automatic bandwidth measurement capability was used to perform the 20dB bandwidth
2. Spectrum analyzer frequency is set to the nominal EUT channel center frequency.
3. The frequency span for the spectrum analyzer shall be between 2.0 times and 5.0 times the OBW
4. Set RBW = 1% ~ 5% of the OBW
5. VBW $\geq 3 \times$ RBW
6. Detector = Peak
7. Trace mode = max hold
8. Sweep = auto couple
9. Allow the trace to stabilize
10. Measure the maximum width of the emission that is 20 dB down from the maximum of the emission.

6.5.4. Test Setup



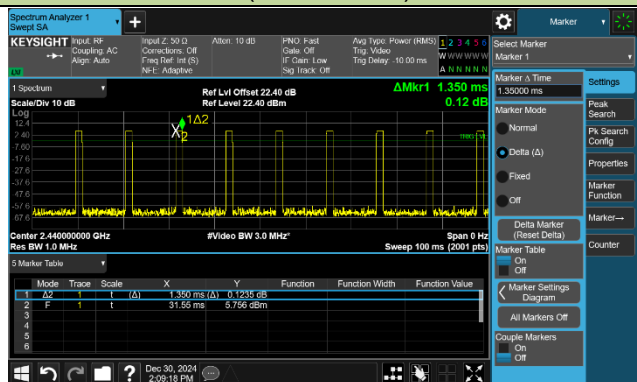
6.5.5. Test Result

Refer to Appendix A.4.

Appendix A - Test Result

A.1 Duty Cycle Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-12-30		

Test Mode	Duty Cycle
DSMR	12.15%
(T = 1.350ms)	
	

Note: The normal operation duty cycle and the correction factor was used during peak and average General Field Strength testing.

A.2 Fundamental & Radiated Emission Test Result

Test Site	WZ-AC2	Test Date	2024-12-14
Test Engineer	Lucas Wang	Test Mode	Mode 1

Frequency Band (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Result
Fundamental Radiated Emission (Horizontal)							
2405	69.0	31.4	100.4	114.0	-13.6	Peak	Pass
	58.8	31.4	90.2	94.0	-3.8	Average	Pass
2440	68.7	31.3	100.0	114.0	-14.0	Peak	Pass
	60.1	31.3	91.5	94.0	-2.5	Average	Pass
2478	69.0	31.3	100.3	114.0	-13.7	Peak	Pass
	60.8	31.3	92.1	94.0	-1.9	Average	Pass
Fundamental Radiated Emission (Vertical)							
2405	63.6	31.4	95.0	114.0	-19.0	Peak	Pass
	54.7	31.4	86.1	94.0	-7.9	Average	Pass
2440	63.8	31.3	95.1	114.0	-18.9	Peak	Pass
	56.0	31.3	87.3	94.0	-6.7	Average	Pass
2478	64.7	31.3	96.0	114.0	-18.0	Peak	Pass
	56.7	31.3	88.0	94.0	-6.0	Average	Pass
Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)							
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)							

Test Site	WZ-AC1	Test Engineer	Ajin Fan
Test Date	2024-12-12	Test Mode	Mode 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. (MHz)	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Between 1GHz ~ 18GHz								
2405	4811.400	55.1	4.3	59.4	74.0	-14.6	Peak	Horizontal
	4811.400	55.1	4.3	41.1	54.0	-12.9	Average	Horizontal
	7381.800	36.9	9.6	46.5	74.0	-27.5	Peak	Horizontal
	8225.000	36.9	10.5	47.4	74.0	-26.6	Peak	Horizontal
	4811.400	57.9	4.3	62.2	74.0	-11.8	Peak	Vertical
	4811.400	57.9	4.3	43.9	54.0	-10.1	Average	Vertical
	7373.300	36.5	9.8	46.3	74.0	-27.7	Peak	Vertical
	8155.300	35.9	10.8	46.7	74.0	-27.3	Peak	Vertical
2440	4879.400	54.2	4.2	58.4	74.0	-15.6	Peak	Horizontal
	4879.400	54.2	4.2	40.1	54.0	-13.9	Average	Horizontal
	7320.600	37.7	9.8	47.5	74.0	-26.5	Peak	Horizontal
	8058.400	35.9	10.9	46.8	74.0	-27.2	Peak	Horizontal
	4879.400	58.1	4.2	62.3	74.0	-11.7	Peak	Vertical
	4879.400	58.1	4.2	44.0	54.0	-10.0	Average	Vertical
	7320.600	42.5	9.8	52.3	74.0	-21.7	Peak	Vertical
	8325.300	36.2	10.5	46.7	74.0	-27.3	Peak	Vertical
2478	4955.900	52.6	4.6	57.2	74.0	-16.8	Peak	Horizontal
	4955.900	52.6	4.6	38.9	54.0	-15.1	Average	Horizontal
	7434.500	40.8	9.8	50.6	74.0	-23.4	Peak	Horizontal
	8325.300	37.2	10.5	47.7	74.0	-26.3	Peak	Horizontal
	4955.900	57.3	4.6	61.9	74.0	-12.1	Peak	Vertical
	4955.900	57.3	4.6	43.6	54.0	-10.4	Average	Vertical
	7434.500	44.6	9.8	54.4	74.0	-19.6	Peak	Vertical
	8434.100	36.2	10.8	47.0	74.0	-27.0	Peak	Vertical

Notes:

1. Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

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

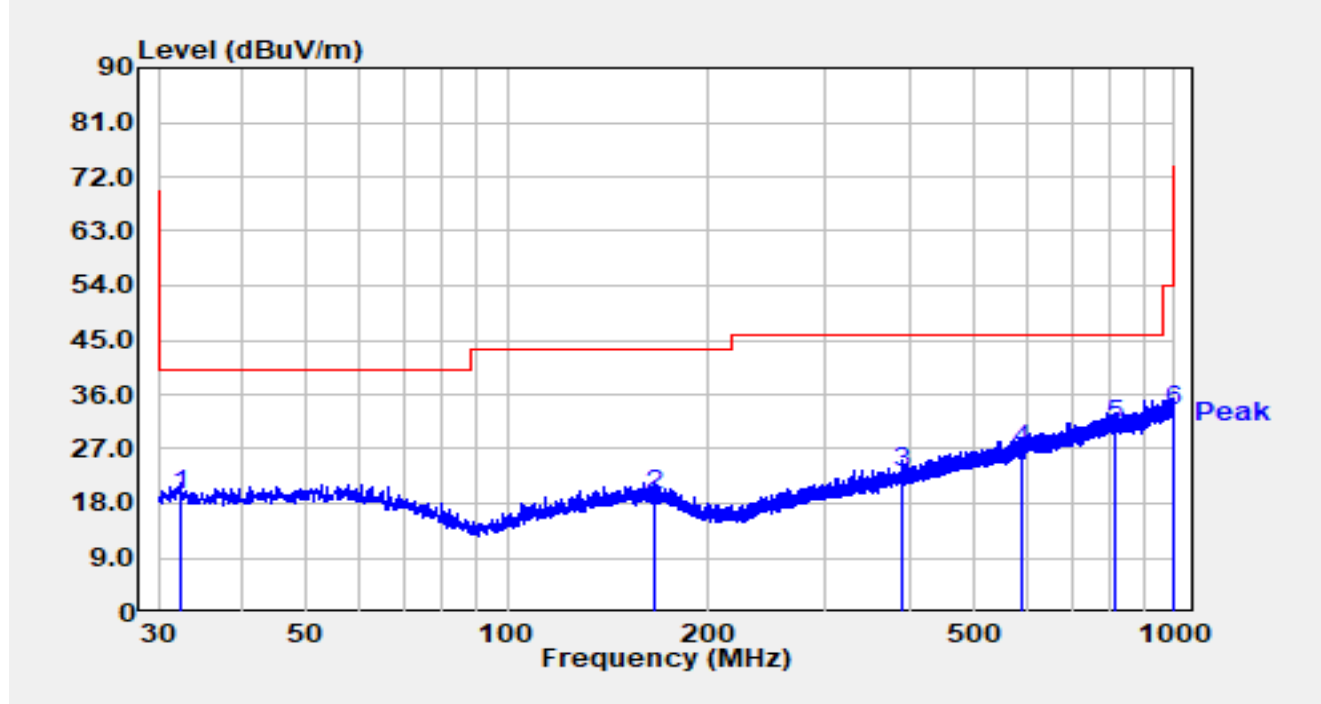
2. "*" means Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty Cycle Factor = -18.3dB.

3. 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.

The Result of Radiated Emission below 1GHz:

Site	WZ-AC1	Test Date	2024-12-12
Temperature	26.4°C	Humidity	55.3%
Limit	FCC_Part 15.209_RSE(3m)	Test Engineer	Ajin Fan
Factor	VULB 9168_25-1000MHz	Polarity	Horizontal
EUT	SPMSR615 DSMR 6-Channel Waterproof Receiver	Test Voltage	By Battery
Test Mode	Transmit by DSMR at 2405MHz		

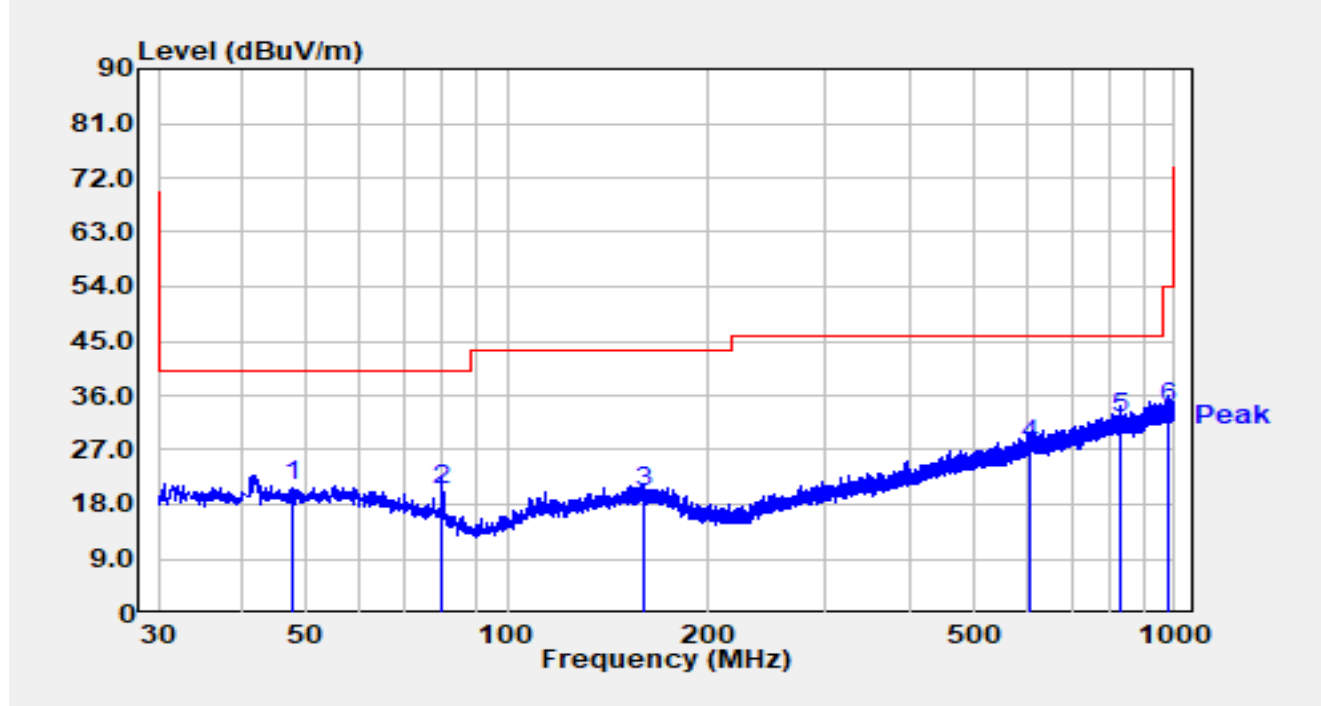


No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		32.328	1.80	17.44	19.24	-20.76	40.00	QP
2		165.606	1.15	18.36	19.51	-23.99	43.50	QP
3		389.482	2.20	21.05	23.25	-22.75	46.00	QP
4		589.302	1.11	25.63	26.75	-19.25	46.00	QP
5	*	812.499	1.49	29.52	31.01	-14.99	46.00	QP
6		996.023	2.08	31.26	33.33	-20.67	54.00	QP

Notes:

1. " *", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).
3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).

Site	WZ-AC1	Test Date	2024-12-12
Temperature	26.4°C	Humidity	55.3%
Limit	FCC_Part 15.209_RSE(3m)	Test Engineer	Ajin Fan
Factor	VULB 9168_25-1000MHz	Polarity	Vertical
EUT	SPMSR615 DSMR 6-Channel Waterproof Receiver	Test Voltage	By Battery
Test Mode	Transmit by DSMR at 2405MHz		



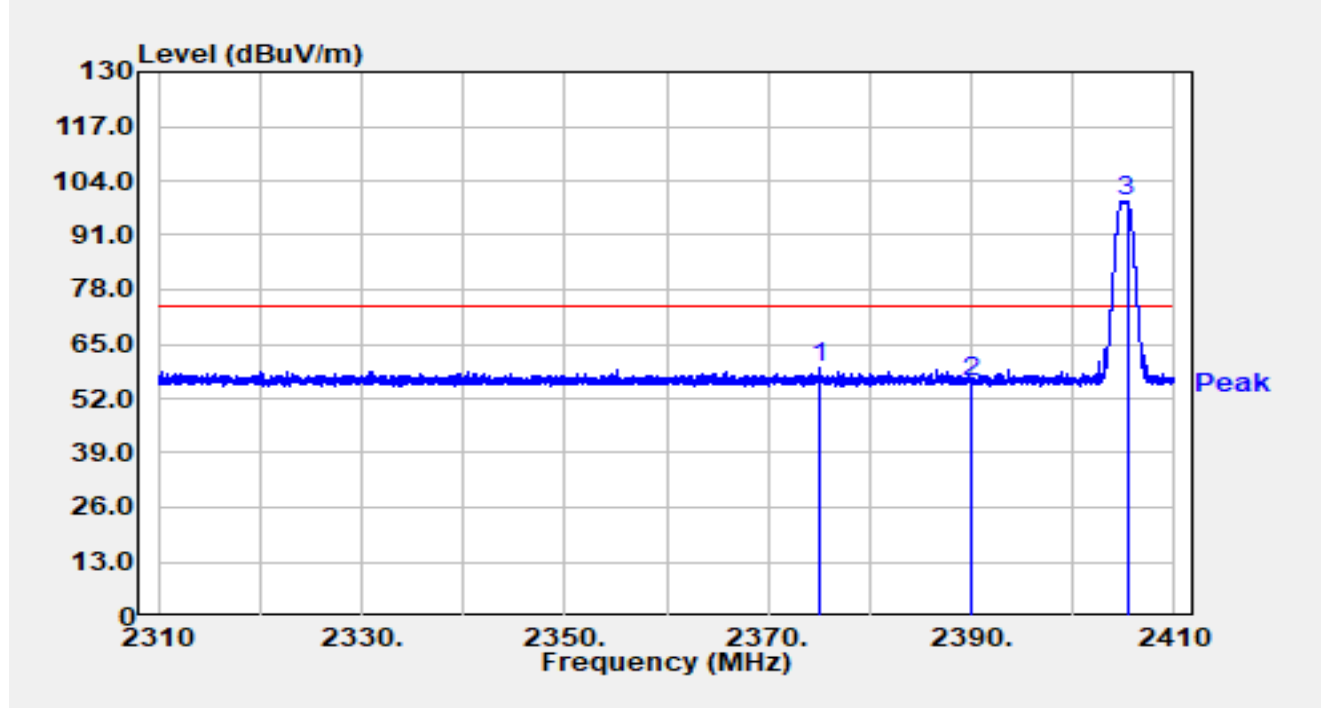
No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		47.737	2.65	18.38	21.04	-18.96	40.00	QP
2		79.955	5.66	14.69	20.35	-19.65	40.00	QP
3		159.980	1.80	18.38	20.18	-23.32	43.50	QP
4		608.217	1.44	26.44	27.88	-18.12	46.00	QP
5	*	826.273	2.58	29.61	32.19	-13.81	46.00	QP
6		975.750	2.70	31.13	33.83	-20.17	54.00	QP

Notes:

1. " *", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).
3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).

A.3 Radiated Restricted Band Edge Test Result

Site	WZ-AC1	Test Date	2024-12-09
Temperature	26.4°C	Humidity	55.3%
Limit	FCC_Part 15_Band Edge(3m)_PK	Test Engineer	Ajin Fan
Factor	BBHA 9120D_1167_1-18GHz	Polarity	Horizontal
EUT	SPMSR615 DSMR 6-Channel Waterproof Receiver	Test Voltage	By Battery
Test Mode	Transmit by DSMR at 2405MHz		

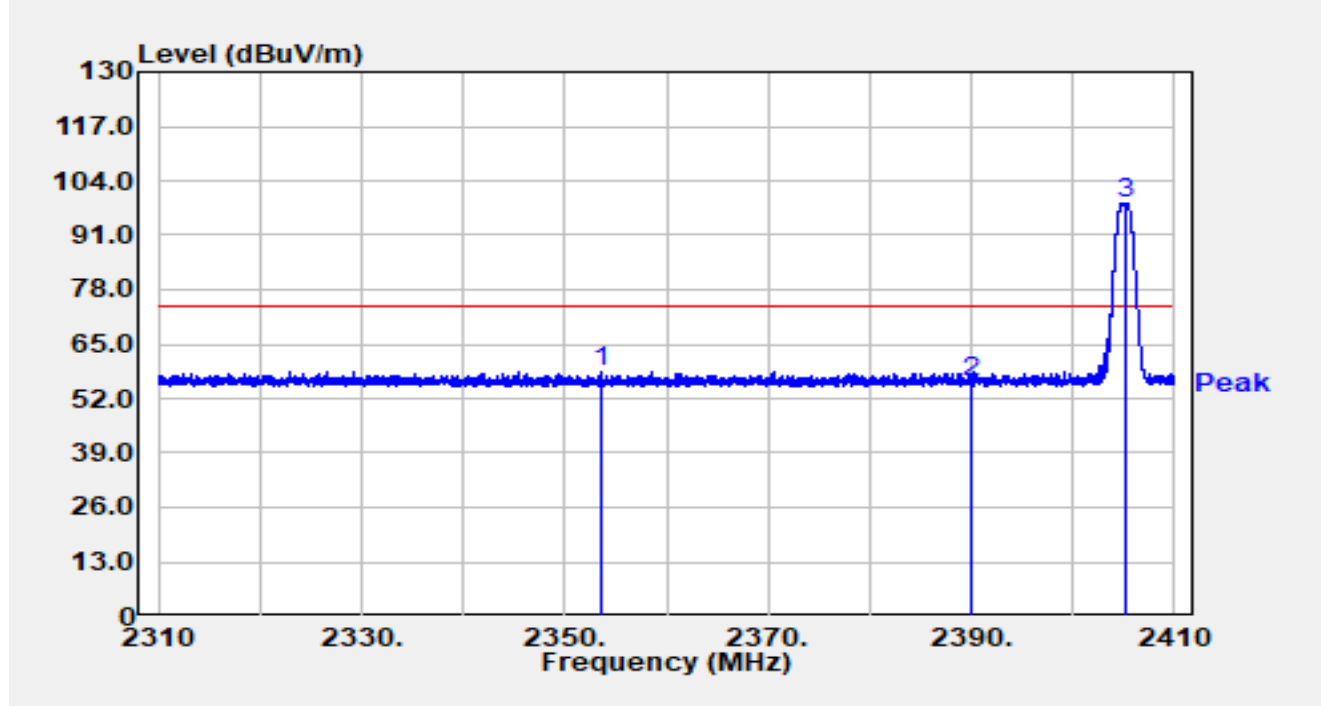


No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Duty cycle Factor (dB)	Limit (dBμV/m)	Detector
1	*	2375.080	27.39	31.96	59.35	-14.65	N/A	74.00	Peak
		2375.080	27.39	31.96	41.05	-12.95	-18.30	54.00	Average
2		2390.000	23.85	31.96	55.80	-18.20	N/A	74.00	Peak
		2390.000	23.85	31.96	37.50	-16.50	-18.30	54.00	Average
3		2405.330	67.28	31.89	99.17	N/A	N/A	N/A	Peak
		2405.330	67.28	31.89	80.87	N/A	-18.30	N/A	Average

Notes:

1. " *", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).
4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty Cycle Factor = -18.3dB.

Site	WZ-AC1	Test Date	2024-12-09
Temperature	26.4°C	Humidity	55.3%
Limit	FCC_Part 15_Band Edge(3m)_PK	Test Engineer	Ajin Fan
Factor	BBHA 9120D_1167_1-18GHz	Polarity	Vertical
EUT	SPMSR615 DSMR 6-Channel Waterproof Receiver	Test Voltage	By Battery
Test Mode	Transmit by DSMR at 2405MHz		

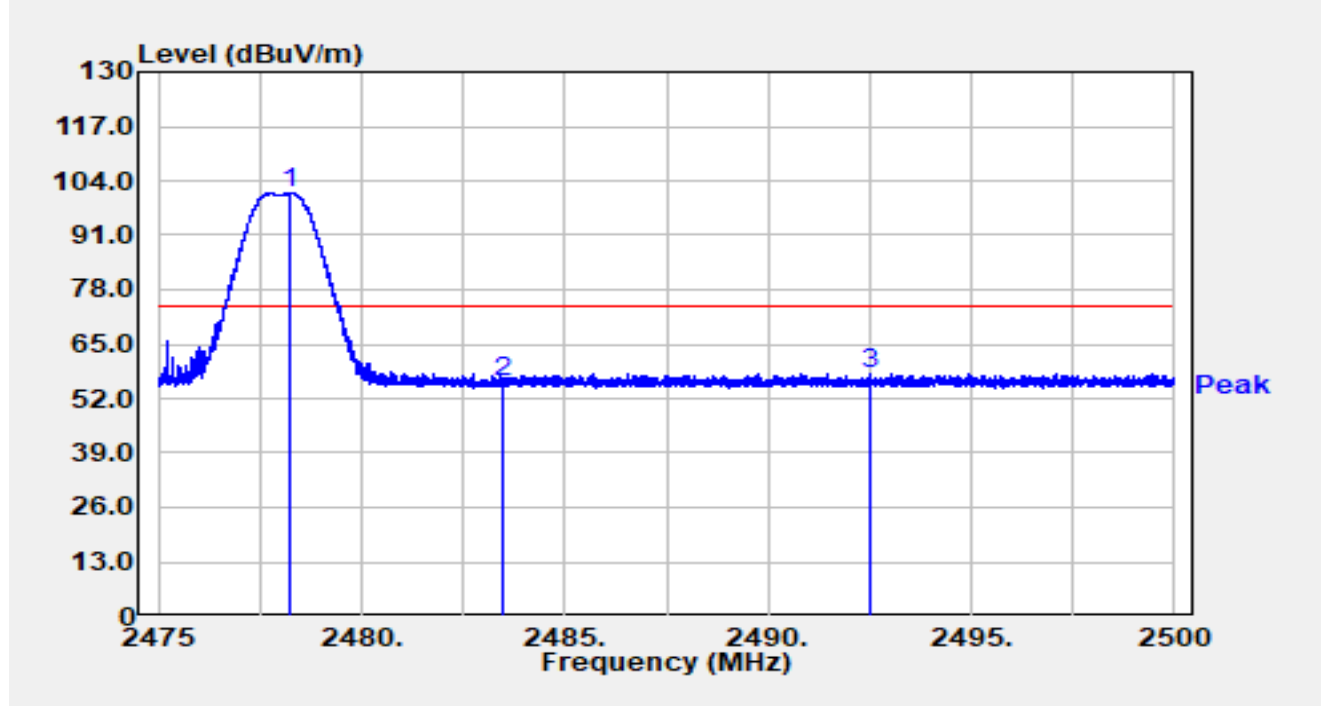


No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Duty cycle Factor (dB)	Limit (dBμV/m)	Detector
1	*	2353.610	26.32	31.97	58.28	-15.72	N/A	74.00	Peak
		2353.610	26.32	31.97	39.98	-14.02	-18.30	54.00	Average
2		2390.000	24.10	31.96	56.05	-17.95	N/A	74.00	Peak
		2390.000	24.10	31.96	37.75	-16.25	-18.30	54.00	Average
3		2405.290	66.94	31.89	98.83	N/A	N/A	N/A	Peak
		2405.290	66.94	31.89	80.53	N/A	-18.30	N/A	Average

Notes:

1. " *", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).
4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty Cycle Factor = -18.3dB.

Site	WZ-AC1	Test Date	2024-12-09
Temperature	26.4°C	Humidity	55.3%
Limit	FCC_Part 15_Band Edge(3m)_PK	Test Engineer	Ajin Fan
Factor	BBHA 9120D_1167_1-18GHz	Polarity	Horizontal
EUT	SPMSR615 DSMR 6-Channel Waterproof Receiver	Test Voltage	By Battery
Test Mode	Transmit by DSMR at 2478MHz		

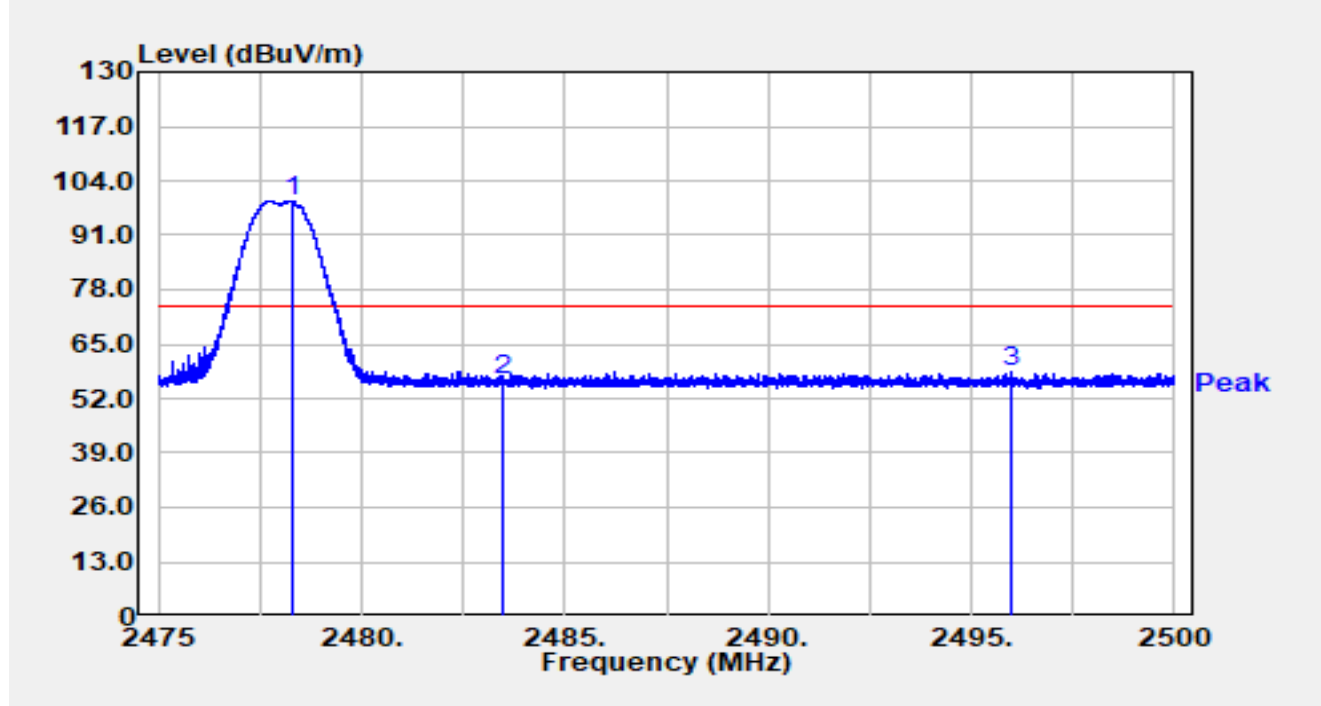


No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Duty cycle Factor (dB)	Limit (dBμV/m)	Detector
1		2478.265	69.28	31.80	101.08	N/A	N/A	N/A	Peak
		2478.265	69.28	31.80	82.78	N/A	-18.30	N/A	Average
2	*	2483.500	24.32	31.81	56.13	-17.87	N/A	74.00	Peak
		2483.500	24.32	31.81	37.83	-16.17	-18.30	54.00	Average
3		2492.522	26.28	31.82	58.09	-15.91	N/A	74.00	Peak
		2492.522	26.28	31.82	39.79	-14.21	-18.30	54.00	Average

Notes:

1. " *", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).
4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty Cycle Factor = -18.3dB.

Site	WZ-AC1	Test Date	2024-12-09
Temperature	26.4°C	Humidity	55.3%
Limit	FCC_Part 15_Band Edge(3m)_PK	Test Engineer	Ajin Fan
Factor	BBHA 9120D_1167_1-18GHz	Polarity	Vertical
EUT	SPMSR615 DSMR 6-Channel Waterproof Receiver	Test Voltage	By Battery
Test Mode	Transmit by DSMR at 2478MHz		



No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Duty cycle Factor (dB)	Limit (dBμV/m)	Detector
1		2478.278	67.27	31.80	99.08	N/A	N/A	N/A	Peak
		2478.278	67.27	31.80	80.78	N/A	-18.30	N/A	Average
2		2483.500	24.45	31.81	56.25	-17.75	N/A	74.00	Peak
		2483.500	24.45	31.81	37.95	-16.05	-18.30	54.00	Average
3	*	2495.982	26.53	31.81	58.35	-15.65	N/A	74.00	Peak
		2495.982	26.53	31.81	40.05	-13.95	-18.30	54.00	Average

Notes:

1. " *", means this data is the worst emission level.
2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).
4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty Cycle Factor = -18.3dB.

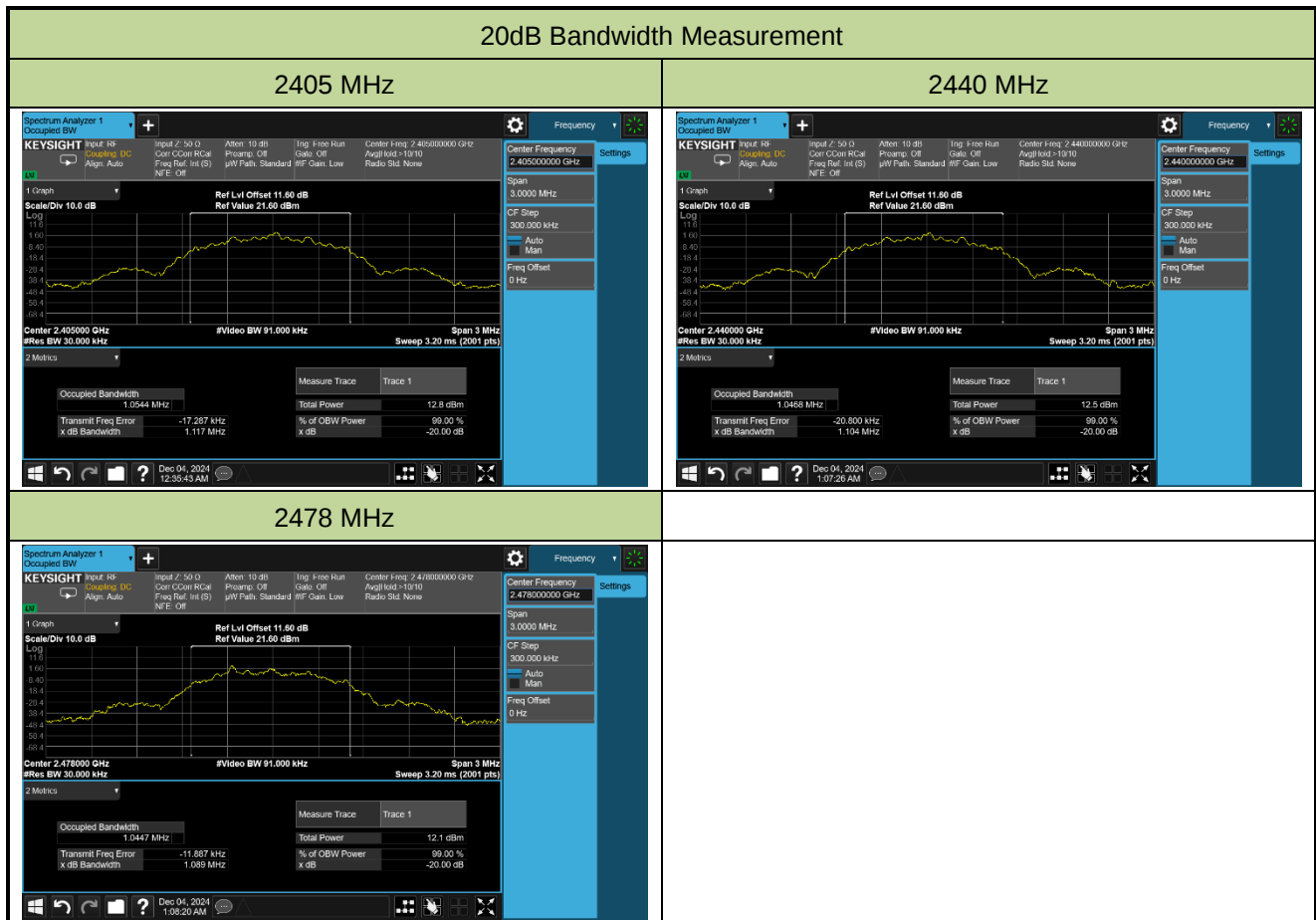
A.4 20dB Bandwidth Test Result

Test Site	WZ-SR5	Test Date	2024-12-04
Test Engineer	Luis Yang	Test Mode	Mode 1

Test Frequency (MHz)	20dB Bandwidth (MHz)	F _L (MHz)	F _L Limit (MHz)	F _H (MHz)	F _H Limit (MHz)	Result
2405	1.117	2404.4415	≥ 2400	2405.5585	≤ 2483.5	Pass
2440	1.104	2439.4480	≥ 2400	2440.5520	≤ 2483.5	Pass
2478	1.089	2477.4555	≥ 2400	2478.5445	≤ 2483.5	Pass

Note 1: F_L (MHz) = Test Frequency - 20dB Bandwidth (MHz) / 2;

Note 2: F_H (MHz) = Test Frequency + 20dB Bandwidth (MHz) / 2.



Appendix B - Test Setup Photograph

Refer to “2411RSU012-UT” file.

Appendix C - EUT Photograph

Refer to “2411RSU012-UE” file.