

TEST REPORT

Applicant: LANSITEC Technology Co., Ltd.
Address: 501, No.21 Huashen Avenue, Yuhuatai District,
Nanjing, China.
Equipment Type: Micro Bluetooth Gateway(100-02048)
Model Name: 100-02048 (refer to section 2.3)
Brand Name: Lansitec
FCC ID: 2APPL-02048
Test Standard: 47 CFR Part 15 Subpart C
(refer to section 3.1)
Sample Arrival Date: Jul. 21, 2025
Test Date: Jul. 29, 2025 - Oct. 23, 2025
Date of Issue: Apr. 28, 2026

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Li Ganming**Checked by:** Ye Hongji**Approved by:** Tolan Tu
(Testing Director)*Li Ganming**Ye Hongji**Tolan Tu*

Revision History

Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Apr. 20, 2026</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>Apr. 27, 2026</u>	<u>Updated the test date</u>
<u>Rev. 03</u>	<u>Apr. 28, 2026</u>	<u>Added the test diagram in section A.2</u>

TABLE OF CONTENTS

1	GENERAL INFORMATION.....	4
1.1	Test Laboratory	4
1.2	Test Location	4
2	PRODUCT INFORMATION	5
2.1	Applicant Information	5
2.2	Manufacturer Information.....	5
2.3	General Description for Equipment under Test (EUT).....	5
2.4	Technical Information	6
3	SUMMARY OF TEST RESULTS	7
3.1	Test Standards	7
3.2	Test Verdict	8
4	GENERAL TEST CONFIGURATIONS	9
4.1	Test Environments.....	9
4.2	Test Equipment List.....	9
4.3	Measurement Uncertainty.....	10
4.4	Description of Test Setup	10
4.5	Measurement Results Explanation Example.....	13
5	TEST ITEMS	14
5.1	Antenna Requirements	14
5.2	Number of Hopping Frequencies	15
5.3	Peak Output Power	16
5.4	Occupied Bandwidth.....	17
5.5	Carrier Frequency Separation.....	18
5.6	Time of Occupancy (Dwell time)	19

5.7	Conducted Spurious Emission & Authorized-band band-edge.....	20
5.8	Conducted Emission.....	21
5.9	Radiated Spurious Emission.....	22
5.10	Band Edge (Restricted-band band-edge).....	24
ANNEX A	TEST RESULT	25
A.1	Number of Hopping Frequency.....	25
A.2	Peak Output Power	26
A.3	20 dB and 99% bandwidth	27
A.4	Hopping Frequency Separation	29
A.5	Average Time of Occupancy.....	30
A.6	Conducted Spurious Emissions & Authorized-band band-edge	31
A.7	Conducted Emissions.....	35
A.8	Radiated Spurious Emission.....	36
A.9	Band Edge (Restricted-band band-edge).....	44
ANNEX B	TEST SETUP PHOTOS	46
ANNEX C	EUT EXTERNAL PHOTOS.....	46
ANNEX D	EUT INTERNAL PHOTOS.....	46

1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☐ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☒ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1352.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	LANSITEC Technology Co., Ltd.
Address	501, No.21 Huashen Avenue, Yuhuatai District, Nanjing, China.

2.2 Manufacturer Information

Manufacturer	LANSITEC Technology Co., Ltd.
Address	501, No.21 Huashen Avenue, Yuhuatai District, Nanjing, China.

2.3 General Description for Equipment under Test (EUT)

EUT Name	Micro Bluetooth Gateway(100-02048)
Model Name Under Test	100-02048
Series Model Name	100-00703, 100-00704, 100-00705, 100-00706, 100-00707, 100-00708, 100-00709, 100-00710, 100-00711, 100-00712, 100-00713, 100-00714, 100-00715, 100-00716, 100-00717, 100-00718, 100-00719, 100-00720, 100-00721, 100-00722, 100-00BG1, 100-00BG2, 100-00BG3, 100-00BG4, 100-00BG5, 100-00BG6
Description of Model name differentiation	It's just that the software and hardware casing are different (this information provided by the applicant)
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	Bluetooth BLE, LoRa
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The requirement for the following technical information of the EUT was tested in this report:

Modulation Technology	Frequency hopping system
Modulation Type	LoRa
Product Type	☒ Mobile ☐ Portable ☐ Fix Location
Frequency Range	The frequency range used is 902 MHz to 928 MHz.
Number of channel	64
Tested Channel	0 (902.3 MHz), 32 (908.7 MHz), 63 (914.9 MHz)
Antenna Type	FPC Antenna
Antenna Gain	3.0 dBi
Antenna System(MIMO Smart Antenna)	N/A

All channel was listed on the following table:

Channel Number	Freq. (MHz)	Channel Number	Freq. (MHz)	Channel Number	Freq. (MHz)	Channel Number	Freq. (MHz)
0	902.3	16	905.5	32	908.7	48	911.9
1	902.5	17	905.7	33	908.9	49	912.1
2	902.7	18	905.9	34	909.1	50	912.3
3	902.9	19	906.1	35	909.3	51	912.5
4	903.1	20	906.3	36	909.5	52	912.7
5	903.3	21	906.5	37	909.7	53	912.9
6	903.5	22	906.7	38	909.9	54	913.1
7	903.7	23	906.9	39	910.1	55	913.3
8	903.9	24	907.1	40	910.3	56	913.5
9	904.1	25	907.3	41	910.5	57	913.7
10	904.3	26	907.5	42	910.7	58	913.9
11	904.5	27	907.7	43	910.9	59	914.1
12	904.7	28	907.9	44	911.1	60	914.3
13	904.9	29	908.1	45	911.3	61	914.5
14	905.1	30	908.3	46	911.5	62	914.7
15	905.3	31	908.5	47	911.7	63	914.9

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Intentional radiators of radio frequency equipment
2	KDB Publication 558074 D01v05r02	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES
3	ANSI C63.10-2020	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

3.2 Test Verdict

No.	Description	FCC Part No.	Modulation Technology	Channel	Test Result	Verdict
1	Antenna Requirement	15.203	N/A	N/A	--	Pass ^{Note1}
2	Number of Hopping Frequencies	15.247(a)	Frequency hopping system	Hopping Mode	ANNEX A.1	Pass
3	Peak Output Power	15.247(b)	Frequency hopping system	Low/Middle/High	ANNEX A.2	Pass
4	Occupied Bandwidth	15.247(a)	Frequency hopping system	Low/Middle/High	ANNEX A.3	Pass
5	Carrier Frequency Separation	15.247(a)	Frequency hopping system	Hopping Mode	ANNEX A.4	Pass
6	Time of Occupancy (Dwell time)	15.247(a)	Frequency hopping system	Hopping Mode	ANNEX A.5	Pass
7	Conducted Spurious Emission & Authorized-band band-edge	15.247(d)	Frequency hopping system	Low/Middle/High, Hopping Mode	ANNEX A.6	Pass
8	Conducted Emission	15.207	Frequency hopping system	Low/Middle/High	ANNEX A.7	N/A ^{Note2}
9	Radiated Spurious Emission	15.209 15.247(d)	Frequency hopping system	Low/Middle/High, Hopping Mode	ANNEX A.8	Pass
10	Band Edge(Restricted-band band-edge)	15.209 15.247(d)	Frequency hopping system	Low/Middle/High, Hopping Mode	ANNEX A.9	Pass

Note1: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203.

Note2: The EUT only powered by battery, so the Conducted Emission test is not applicable.

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity	40% to 69%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+20.8℃ to +25.1℃
Working Voltage of the EUT	NV (Normal Voltage)	3.6V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-40	101544	2024.12.16	2025.12.15
Power meter	R&S	NRP8S	101498	2025.07.07	2026.07.06
Test Antenna-Horn	A-INFO	LB-180400KF	J211060273	2024.06.15	2027.06.14
Test Antenna-Bi-Log	Schwarzbeck	VULB 9163	01414	2023.11.03	2026.11.02
Test Antenna-Horn	Schwarzbeck	BBHA 9120D	02459	2023.10.26	2026.10.25
Test Antenna-Loop	Schwarzbeck	FMZB 1513-60	00015	2024.05.07	2026.05.06
Anechoic Chamber	YIHENG	C8-966	107	2024.05.12	2027.05.11
Filtering unit	BALUN	SU319F	LW-SZ19D0001F01	N/A	N/A
Switching unit	BALUN	SU319	LW-SZ19D0001S01	N/A	N/A

4.3 Measurement Uncertainty

The following measurement 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.

Parameters	Uncertainty
Occupied Channel Bandwidth	2.8%
RF output power, conducted	1.28 dB
Power Spectral Density, conducted	1.30 dB
Unwanted Emissions, conducted	1.84 dB
All emissions, radiated	5.36 dB
Temperature	0.8°C
Humidity	4%

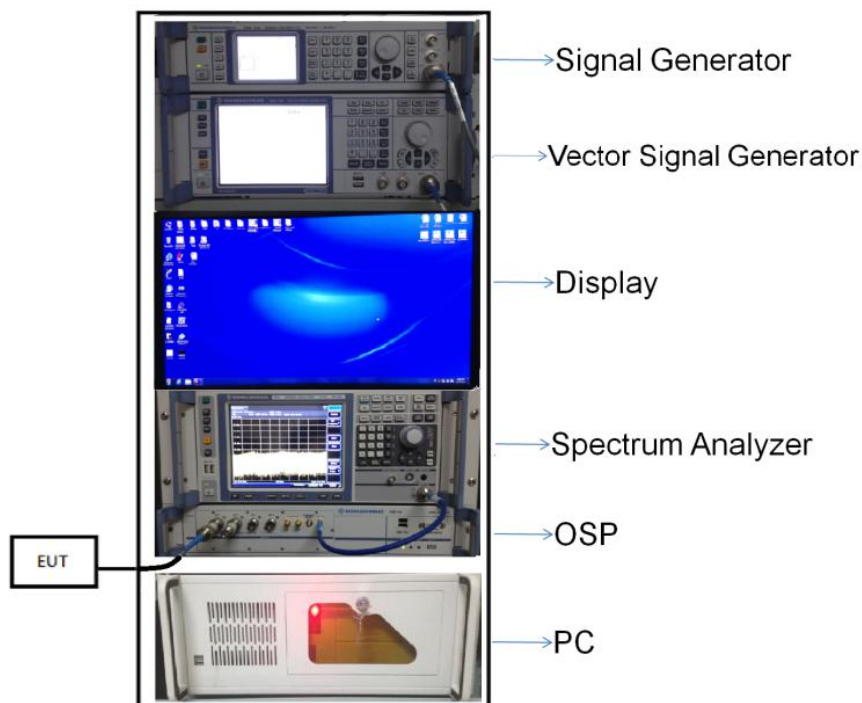
4.4 Description of Test Setup

4.4.1 For Antenna Port Test

Conducted value (dBm) = Measurement value (dBm) + cable loss (dB)

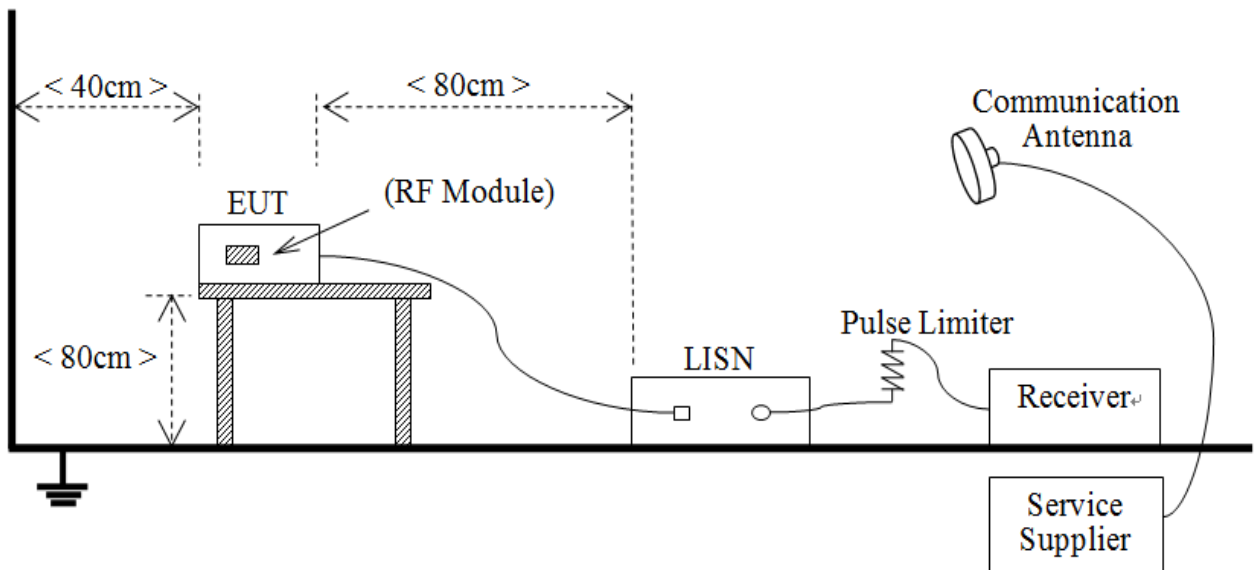
For example: the measurement value is 10 dBm and the cable 0.5dBm used, then the final result of EUT:

Conducted value (dBm) = 10 dBm + 0.5 dB = 10.5 dBm



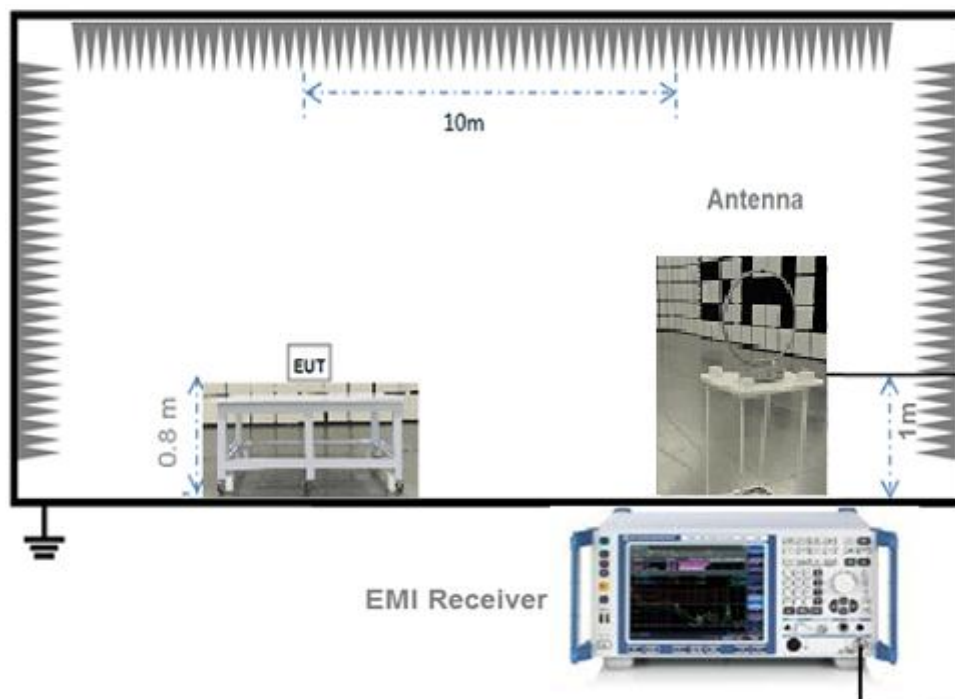
(Diagram 1)

4.4.2 For AC Power Supply Port Test



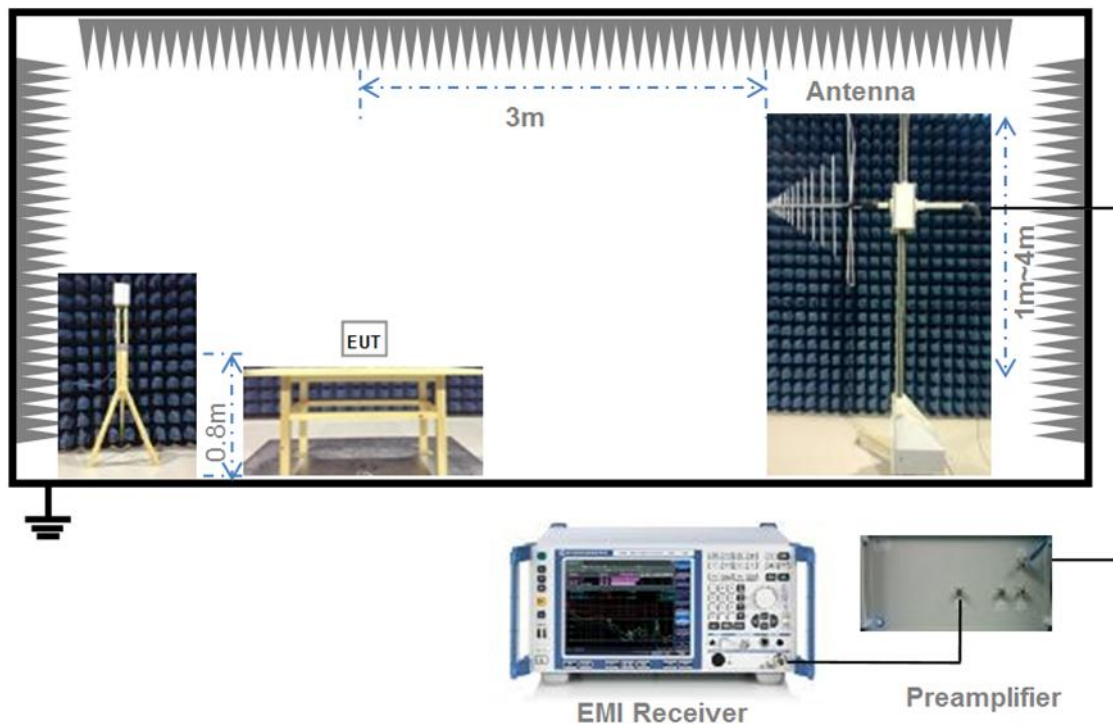
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



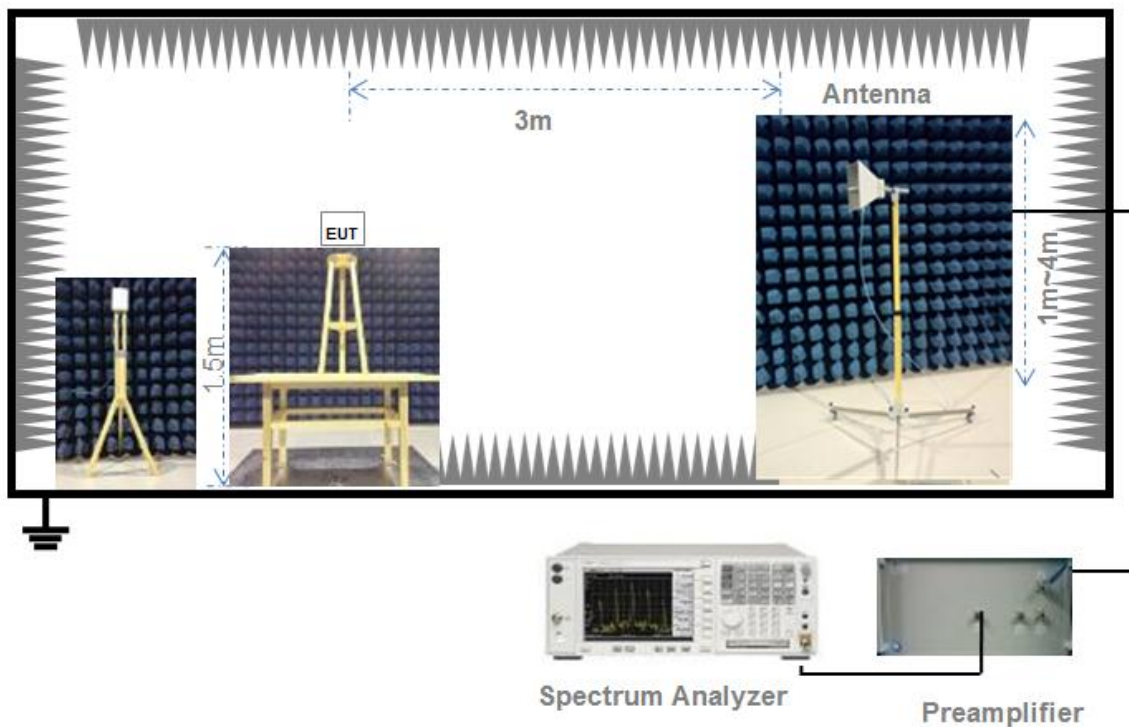
(Diagram 3)

4.4.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

4.4.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

4.5 Measurement Results Explanation Example

4.5.1 For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Relevant Standards

FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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 manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. 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 FCC rule.

5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is embedded in the product	The antenna is welded on the mainboard, can't be replaced by the consumer

Reference Documents	Item
Photo	Please refer to the EUT Photo documents.

5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

5.2 Number of Hopping Frequencies

5.2.1 Limit

FCC §15.247(a)

For FHSs in the band 902-928 MHz: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping channels and the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 20-second period. If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping channels and the average time of occupancy on any channel shall not be greater than 0.4 seconds within a 10-second period. The maximum 20 dB bandwidth of the hopping channel shall be 500 kHz.

5.2.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW $\geq$ 1% of the span

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize

5.2.4 Test Result

Please refer to ANNEX A.1.

5.3 Peak Output Power

5.3.1 Test Limit

FCC § 15.247(b)

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

5.3.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

The Module operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

RBW > the 20 dB bandwidth of the emission being measured

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize.

5.3.4 Test Result

Please refer to ANNEX A.2.

5.4 Occupied Bandwidth

5.4.1 Limit

FCC §15.247(a)

5.4.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW = in the range of 1% to 5% of the OBW

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate, Allow the trace to stabilize.

5.4.4 Test Result

Please refer to ANNEX A.3.

5.5 Carrier Frequency Separation

5.5.1 Limit

FCC §15.247(a)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

5.5.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) $\geq 1\%$ of the span

Video (or Average) Bandwidth (VBW) $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

5.5.4 Test Result

Please refer to ANNEX A.4.

5.6 Time of Occupancy (Dwell time)

5.6.1 Limit

FCC §15.247(a)

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

5.6.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

The lowest, middle and highest channels are selected to perform testing to record the dwell time of each occupation measured in this channel, which is called Pulse Time here.

5.6.4 Test Result

Please refer to ANNEX A.5.

5.7 Conducted Spurious Emission & Authorized-band band-edge

5.7.1 Limit

FCC §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.7.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.7.3 Test Procedure

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

RBW = 100 kHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize

5.7.4 Test Result

Please refer to ANNEX A.6.

5.8 Conducted Emission

5.8.1 Limit

FCC §15.207

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

5.8.2 Test Setup

See section 4.4.2 for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

5.8.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.8.4 Test Result

Please refer to ANNEX A.7.

5.9 Radiated Spurious Emission

5.9.1 Limit

FCC §15.209&15.247(d)

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	902/F(kHz)	300
0.490 - 1.705	9020/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

1. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
2. In the emission tables above, the tighter limit applies at the band edges.
3. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
4. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

5.9.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.9.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5.9.4 Test Result

Please refer to ANNEX A.8.

5.10 Band Edge (Restricted-band band-edge)

5.10.1 Limit

FCC §15.209&15.247(d)

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

5.10.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.10.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5.10.4 Test Result

Please refer to ANNEX A.9.

ANNEX A TEST RESULT

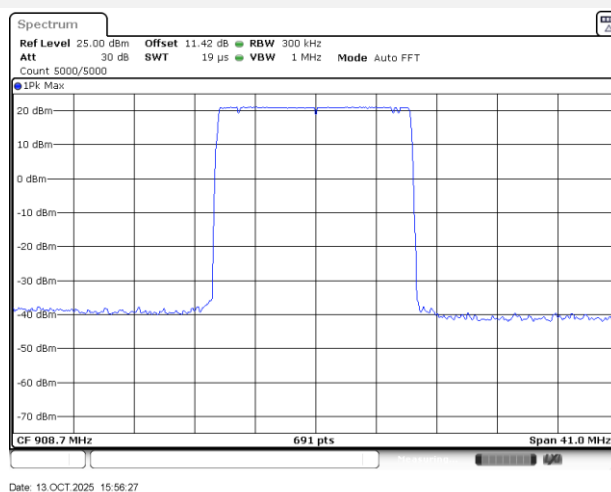
A.1 Number of Hopping Frequency

Test Data

Test Mode	Frequency Block (MHz)	Measured Channel Numbers	Min. Limit	Verdict
LoRa	902-928	64	50	Pass

Test Plots

LoRa



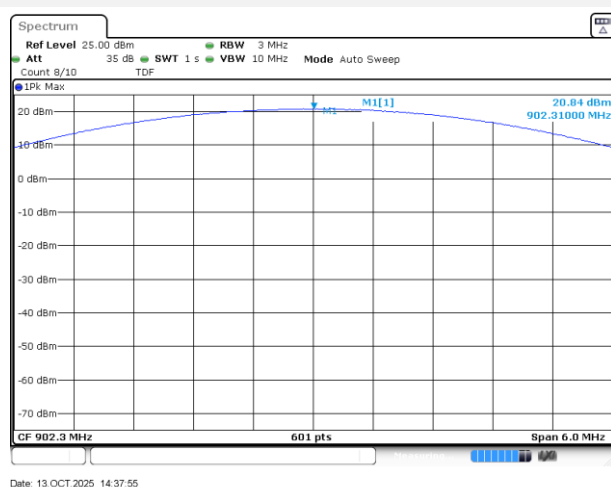
A.2 Peak Output Power

Peak Power Test Data

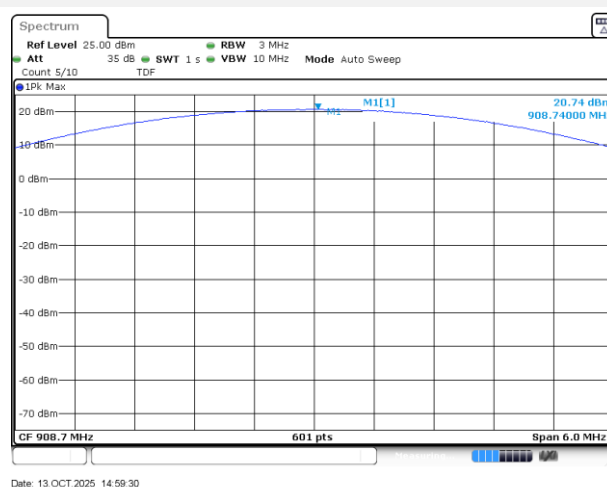
Channel	Measured Output Peak Power		Limit		Verdict
	LoRa		dBm	mW	
	dBm	mW			
Low	20.84	121.34	30	1000	Pass
Middle	20.74	118.58			Pass
High	20.77	119.40			Pass

Test Plots

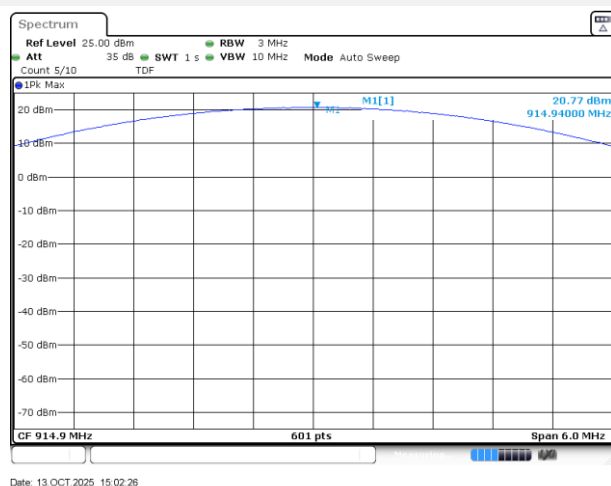
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



A.3 20 dB and 99% bandwidth

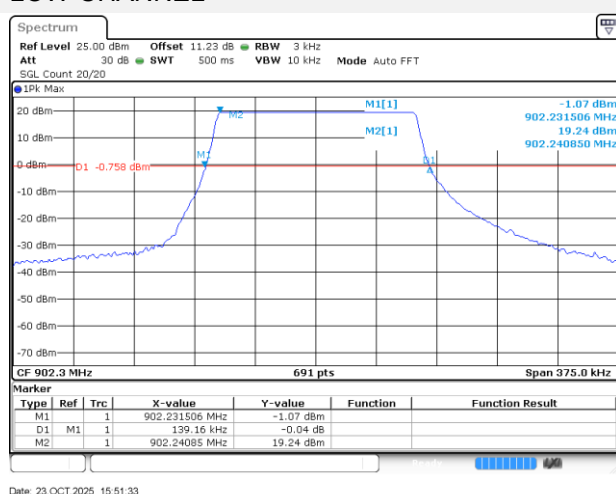
Test Data

LoRa		
Channel	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	0.139160	182.344428
Middle	0.139099	178.002894
High	0.139099	182.344428

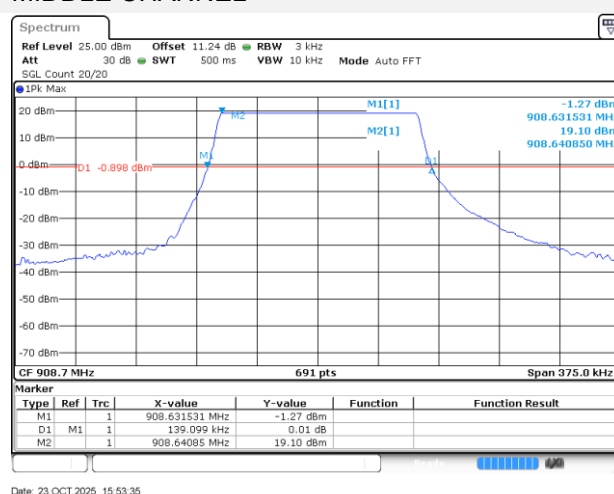
Test Plots

20 dB Bandwidth

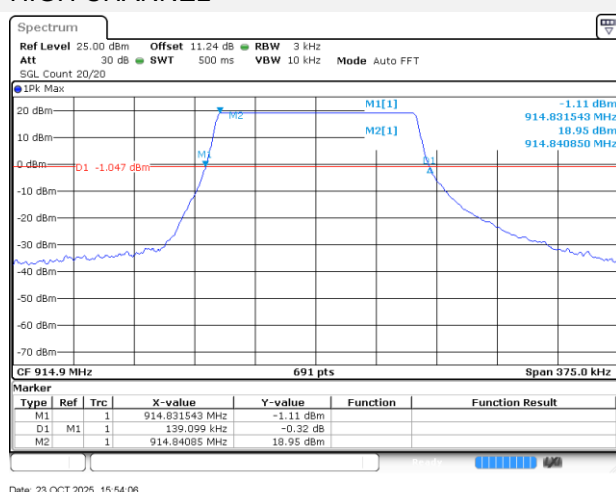
LOW CHANNEL



MIDDLE CHANNEL

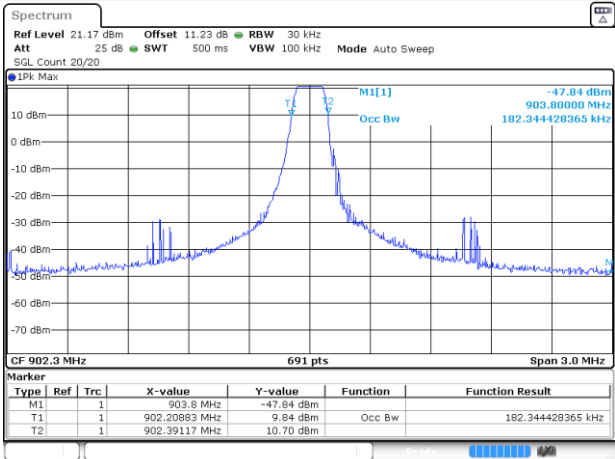


HIGH CHANNEL



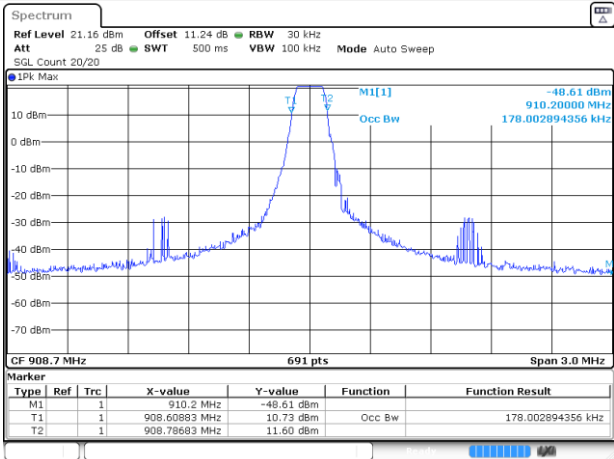
99% Bandwidth

LOW CHANNEL



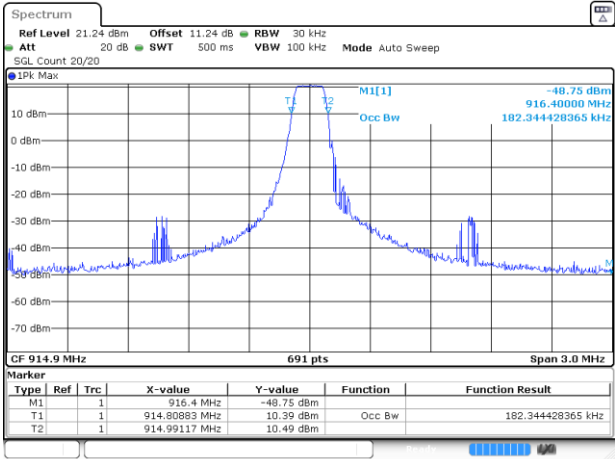
Date: 13.OCT.2025 14:38:42

MIDDLE CHANNEL



Date: 13.OCT.2025 15:00:14

HIGH CHANNEL



Date: 13.OCT.2025 15:03:28

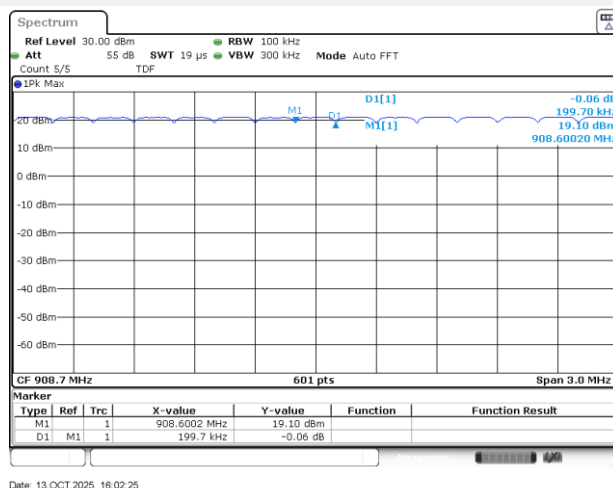
A.4 Hopping Frequency Separation

Test Data

Mode	Frequency separation (MHz)	Max 20 dB Bandwidth (MHz)	Verdict
LoRa	0.1997	0.139160	Pass

Test Plots

LoRa



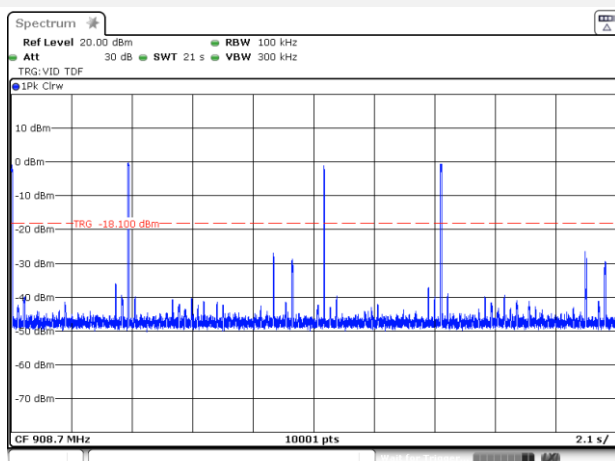
A.5 Average Time of Occupancy

Test Data

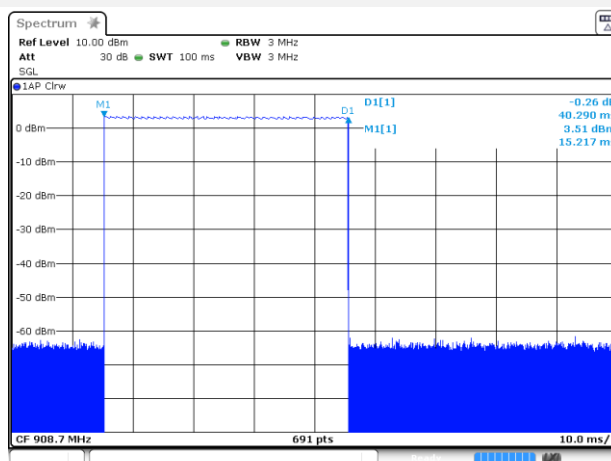
Total of Dwell (ms)	Limit (sec)	Verdict
161.160	0.4	Pass

Test Plots

LoRa



Date: 13.OCT.2025 16:28:12



Date: 13.OCT.2025 16:29:22

A.6 Conducted Spurious Emissions & Authorized-band band-edge

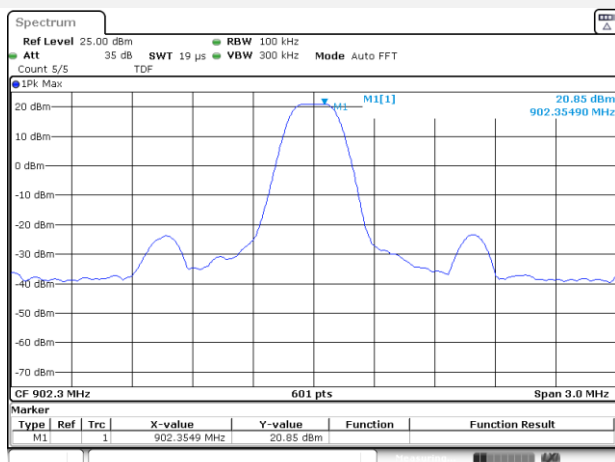
Test Data

LoRa				
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-30.48	20.85	0.85	Pass
Middle	-29.53	20.84	0.84	Pass
High	-30.50	20.83	0.83	Pass

LoRa				
Mode	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Hopping	-26.54	20.95	0.95	Pass

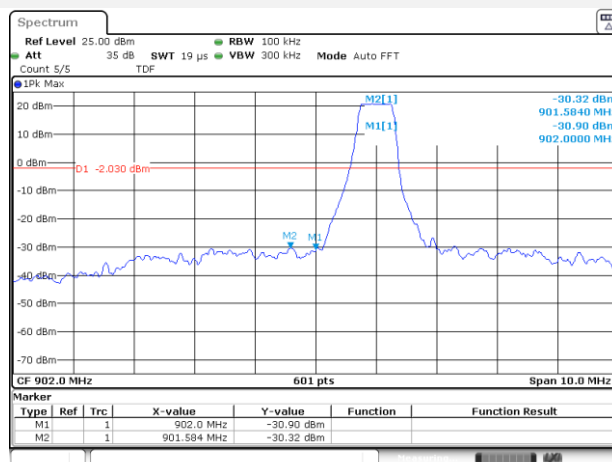
Test Plots

LOW CHANNEL, CARRIER LEVEL



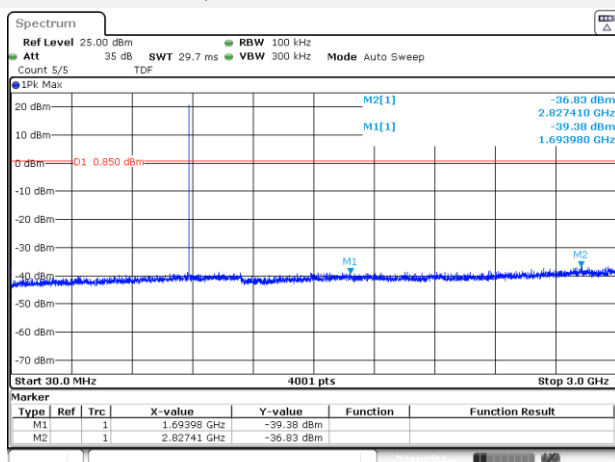
Date: 13.OCT.2025 16:33:40

LOW CHANNEL, BAND EDGE



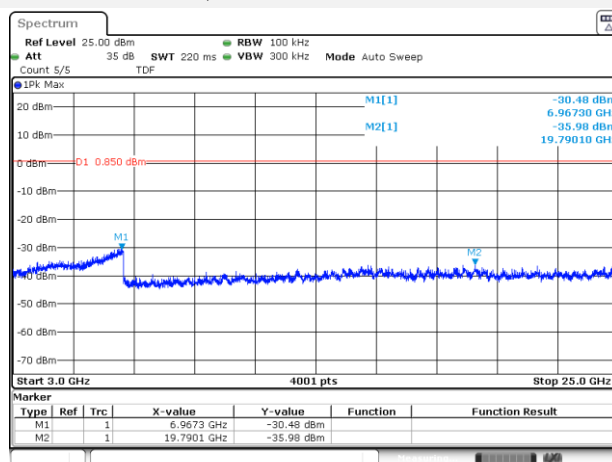
Date: 13.OCT.2025 14:02:06

LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



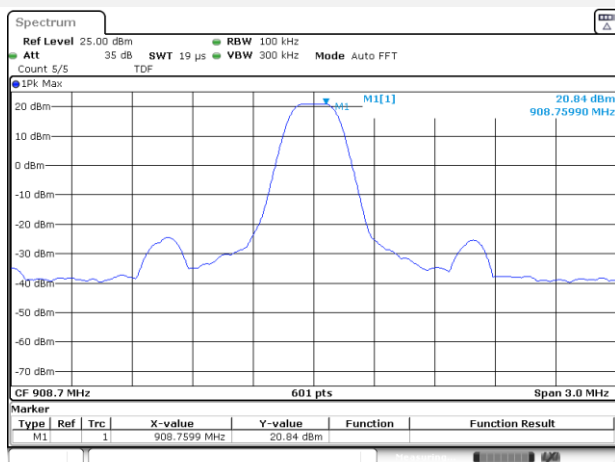
Date: 13.OCT.2025 16:34:33

LOW CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



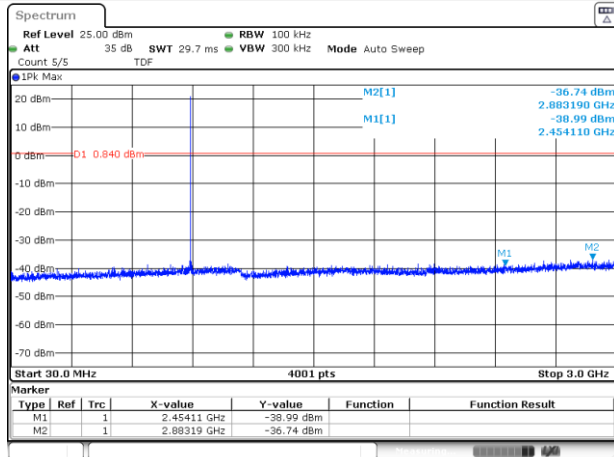
Date: 13.OCT.2025 16:34:49

MIDDLE CHANNEL, CARRIER LEVEL



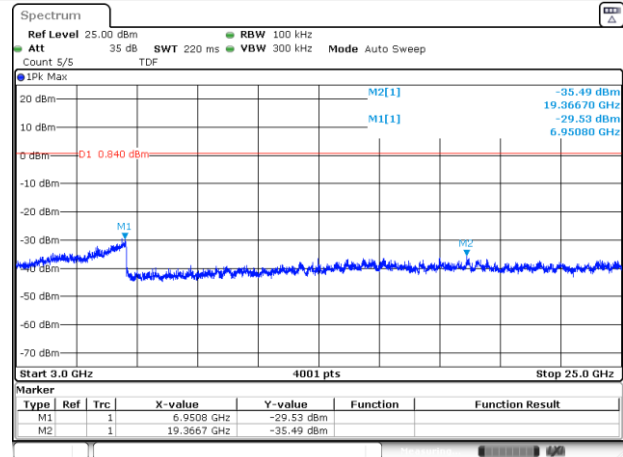
Date: 13.OCT.2025 16:36:08

MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



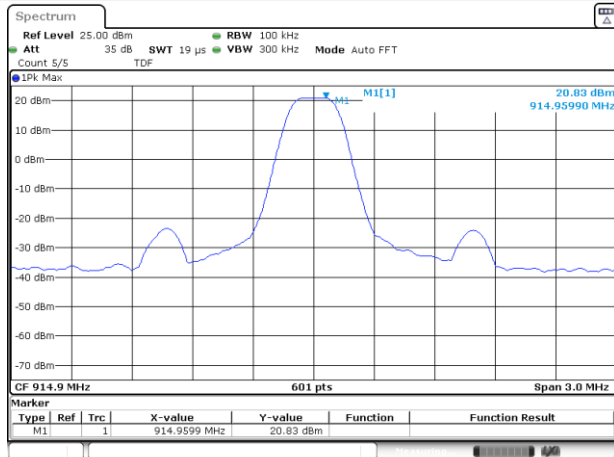
Date: 13.OCT.2025 16:36:49

MIDDLE CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



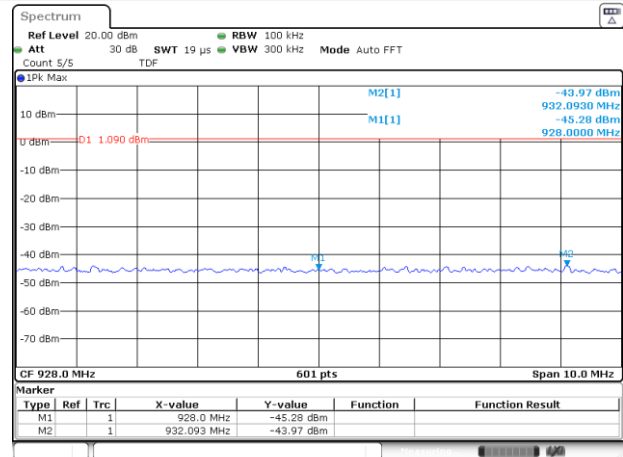
Date: 13.OCT.2025 16:37:03

HIGH CHANNEL, CARRIER LEVEL



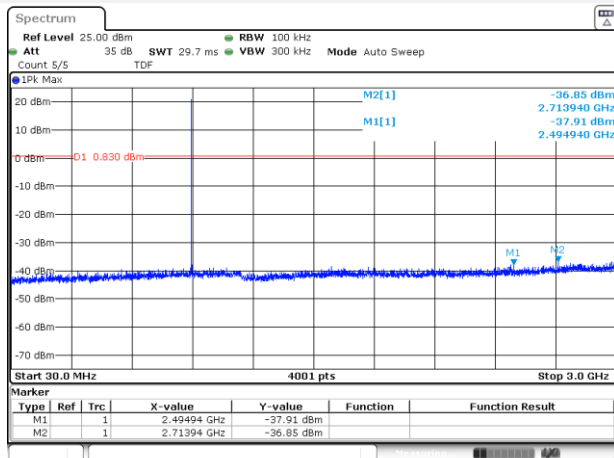
Date: 13.OCT.2025 16:37:38

HIGH CHANNEL, BAND EDGE



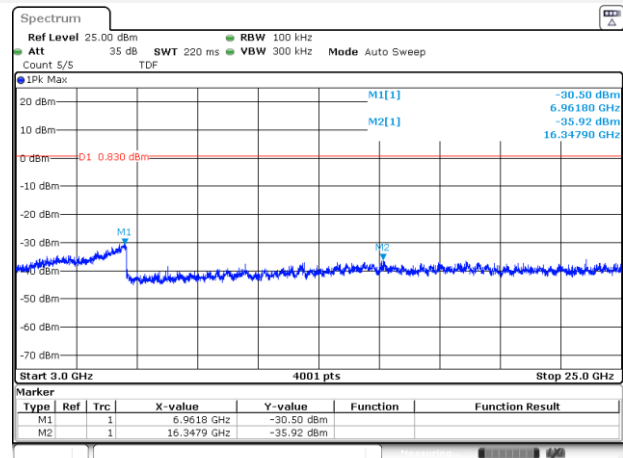
Date: 13.OCT.2025 16:42:38

HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



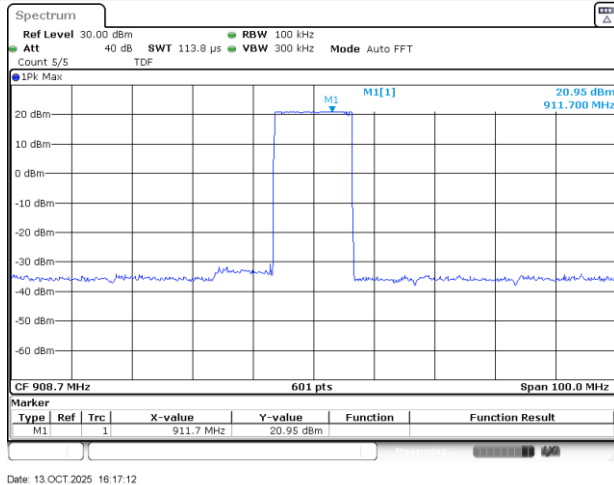
Date: 13.OCT.2025 16:38:11

HIGH CHANNEL, SPURIOUS 3 GHz ~ 25 GHz

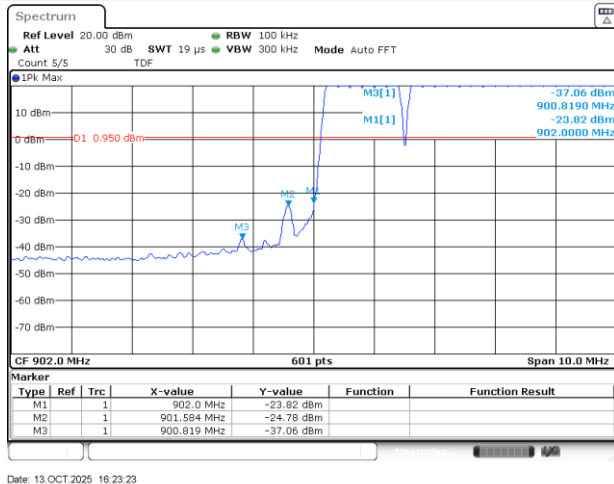


Date: 13.OCT.2025 16:38:26

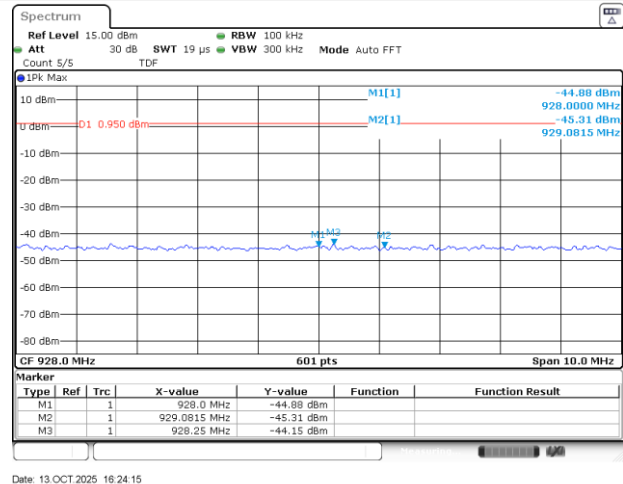
HOPPING, CARRIER LEVEL



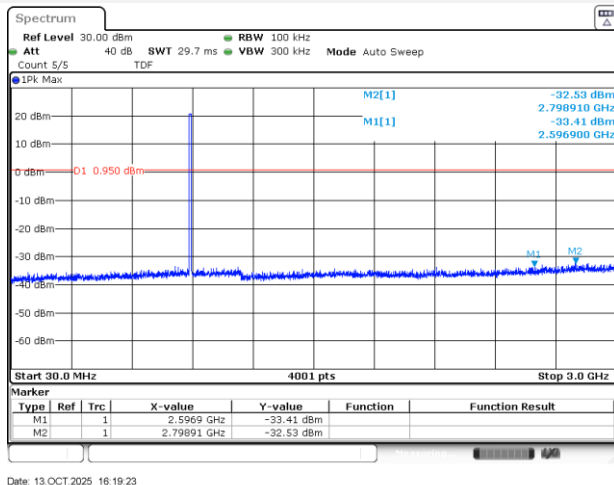
HOPPING BAND EDGE (LOW)



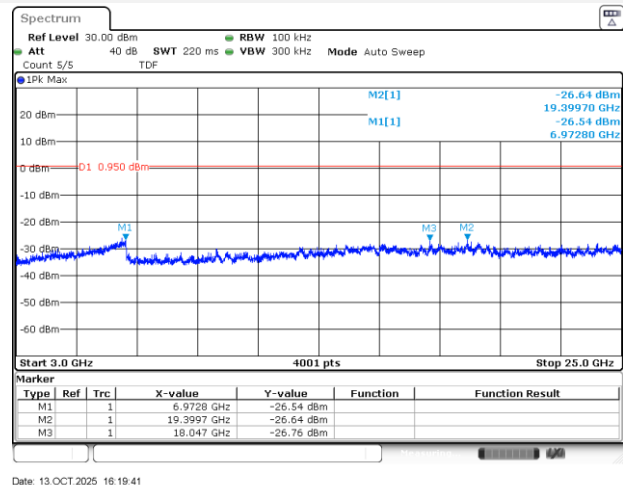
HOPPING BAND EDGE (HIGH)



Hopping Mode, SPURIOUS 30 MHz ~ 3 GHz



Hopping Mode, SPURIOUS 3GHz ~ 25 GHz



A.7 Conducted Emissions

Note: Not applicable.

A.8 Radiated Spurious Emission

Note ¹: The symbol of "--" in the table which means not application.

Note ²: For the test data above 1 GHz, according the ANSI C63.10-2020, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

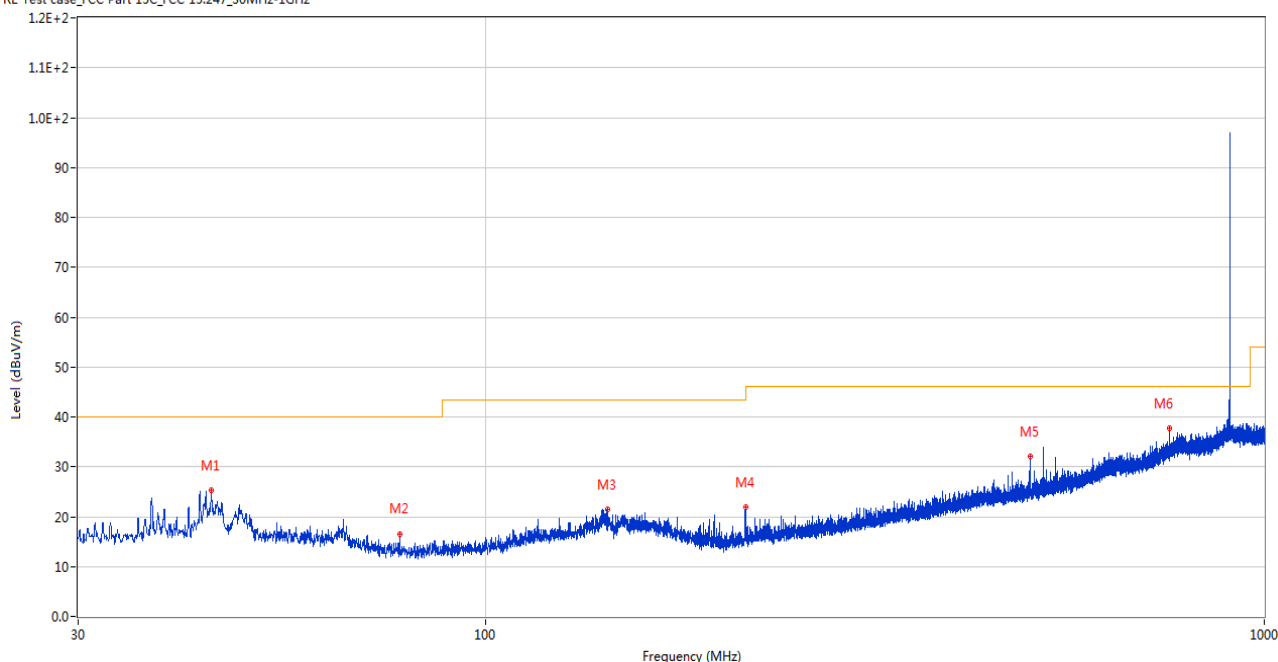
Note ³: Results (dBuV/m) = Original reading level of Spectrum Analyzer (dBuV/m) + Factor (dB)

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Test Data

LOW CHANNEL, 30 MHz to 1 GHz, ANT H

RE Test case_FCC Part 15C_FCC 15.247_30MHz-1GHz



Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
46.449	26.06	40.0	13.94	Peak	174.00	100	Horizontal	Pass
81.114	15.08	40.0	24.92	Peak	174.00	100	Horizontal	Pass
143.511	19.50	43.5	24.00	Peak	15.00	400	Horizontal	Pass
215.184	22.57	43.5	20.93	Peak	15.00	400	Horizontal	Pass
502.808	31.27	46.0	14.73	Peak	35.00	200	Horizontal	Pass
755.379	37.64	46.0	8.36	Peak	35.00	200	Horizontal	Pass

LOW CHANNEL, 30 MHz to 1 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/ m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	51.094	23.64	40.0	16.36	Peak	358.00	400	Vertical	Pass
2	142.984	25.88	43.5	17.62	Peak	358.00	400	Vertical	Pass
3	156.947	27.07	43.5	16.43	Peak	48.00	100	Vertical	Pass
4	407.890	25.96	46.0	20.04	Peak	48.00	100	Vertical	Pass
5	636.294	35.44	46.0	10.56	Peak	6.00	200	Vertical	Pass
6	774.799	33.79	46.0	12.21	Peak	6.00	200	Vertical	Pass

MIDDLE CHANNEL, 30 MHz to 1 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	51.752	21.40	40.0	18.60	Peak	309.00	400	Horizontal	Pass
2	139.668	23.54	43.5	19.96	Peak	309.00	400	Horizontal	Pass
3	216.347	34.75	43.5	8.75	Peak	108.00	100	Horizontal	Pass
4	256.647	24.92	43.5	18.58	Peak	108.00	400	Horizontal	Pass
5	458.285	25.76	46.0	20.24	Peak	81.00	100	Horizontal	Pass
6	743.808	33.60	46.0	12.40	Peak	81.00	400	Horizontal	Pass

MIDDLE CHANNEL, 30 MHz to 1 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	55.034	23.04	40.0	16.96	Peak	63.00	400	Vertical	Pass
2	143.689	31.51	43.5	11.99	Peak	63.00	400	Vertical	Pass
3	158.410	25.81	43.5	17.69	Peak	143.00	300	Vertical	Pass
4	408.770	25.77	46.0	20.23	Peak	143.00	300	Vertical	Pass
5	633.931	31.66	46.0	14.34	Peak	196.00	100	Vertical	Pass
6	777.920	33.95	46.0	12.05	Peak	196.00	100	Vertical	Pass

HIGH CHANNEL, 30 MHz to 1 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	54.794	16.91	40.0	23.09	Peak	128.00	200	Horizontal	Pass
2	141.229	25.87	43.5	17.63	Peak	128.00	200	Horizontal	Pass
3	218.657	29.64	43.5	13.86	Peak	300.00	300	Horizontal	Pass
4	254.508	24.29	43.5	19.21	Peak	300.00	300	Horizontal	Pass
5	457.003	30.86	46.0	15.14	Peak	94.00	200	Horizontal	Pass
6	743.351	31.82	46.0	14.18	Peak	94.00	300	Horizontal	Pass

HIGH CHANNEL, 30 MHz to 1 GHz, ANT V

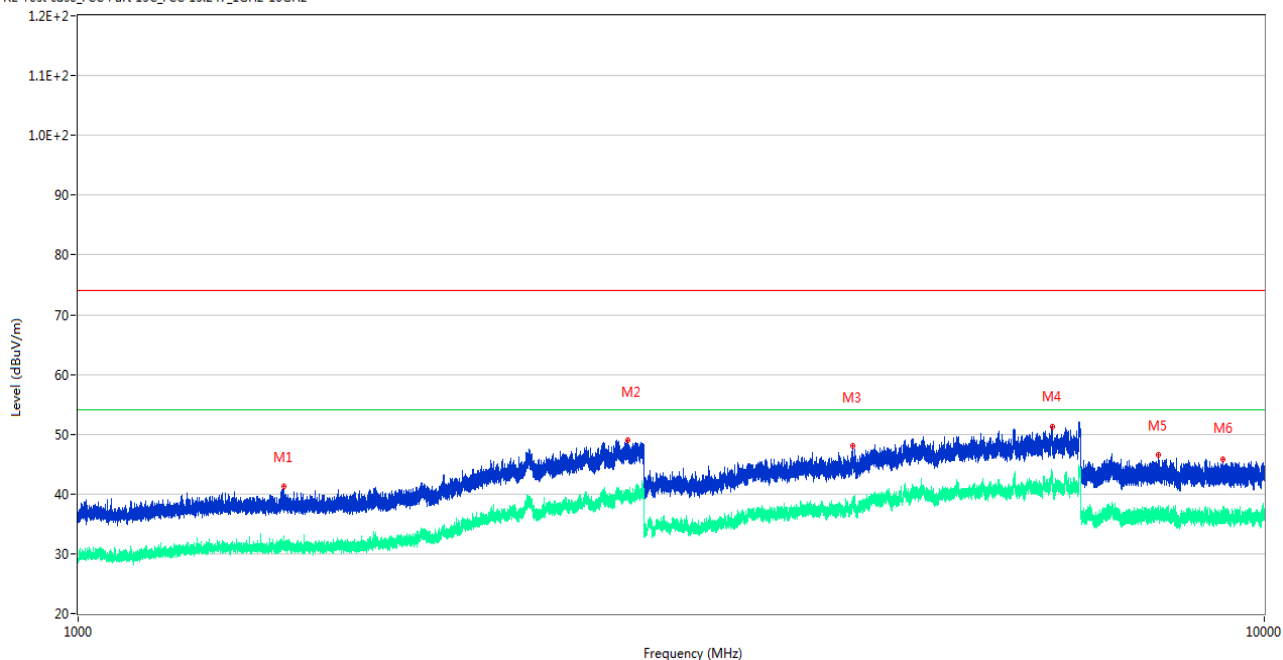
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	51.437	25.62	40.0	14.38	Peak	294.00	300	Vertical	Pass
2	137.366	28.18	43.5	15.32	Peak	294.00	300	Vertical	Pass
3	154.318	26.08	43.5	17.42	Peak	139.00	300	Vertical	Pass
4	409.282	30.48	46.0	15.52	Peak	139.00	300	Vertical	Pass
5	637.828	31.49	46.0	14.51	Peak	245.00	200	Vertical	Pass
6	775.641	36.83	46.0	9.17	Peak	245.00	200	Vertical	Pass

Note ¹: The marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal.

Note ²: The spurious from 18GHz-25GHz is noise only, do not show on the report.

LOW CHANNEL 1 GHz to 18 GHz, ANT H

RE Test case_FCC Part 15C_FCC 15.247_1GHz-10GHz



Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1487.832	41.46	74.0	32.54	Peak	94.00	200	Horizontal	Pass
1487.832	32.25	54.0	21.75	AV	94.00	200	Horizontal	Pass
2907.133	49.48	74.0	24.52	Peak	185.00	400	Horizontal	Pass
2907.133	41.34	54.0	12.66	AV	185.00	400	Horizontal	Pass
4494.214	48.46	74.0	25.54	Peak	313.00	200	Horizontal	Pass
4494.214	39.98	54.0	14.02	AV	313.00	200	Horizontal	Pass
6622.069	52.09	74.0	21.91	Peak	87.00	300	Horizontal	Pass
6622.069	44.43	54.0	9.57	AV	87.00	300	Horizontal	Pass
8145.528	48.87	74.0	25.13	Peak	85.00	100	Horizontal	Pass
8145.528	37.09	54.0	16.91	AV	85.00	100	Horizontal	Pass
9221.962	46.36	74.0	27.64	Peak	215.00	400	Horizontal	Pass
9221.962	37.26	54.0	16.74	AV	215.00	400	Horizontal	Pass

LOW CHANNEL 1 GHz to 18 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1466.246	43.33	74.0	30.67	Peak	103.00	100	Vertical	Pass
1**	1466.246	30.89	54.0	23.11	AV	103.00	100	Vertical	Pass
2	2991.334	51.81	74.0	22.19	Peak	209.00	100	Vertical	Pass
2**	2991.334	41.44	54.0	12.56	AV	209.00	100	Vertical	Pass
3	4921.174	54.30	74.0	19.70	Peak	293.00	200	Vertical	Pass
3**	4921.174	43.16	54.0	10.84	AV	293.00	200	Vertical	Pass
4	6153.083	53.34	74.0	20.66	Peak	0.00	100	Vertical	Pass
4**	6153.083	41.16	54.0	12.84	AV	0.00	100	Vertical	Pass
5	7964.693	58.66	74.0	15.34	Peak	317.00	200	Vertical	Pass
5**	7964.693	44.04	54.0	9.96	AV	317.00	200	Vertical	Pass
6	8304.494	48.10	74.0	25.90	Peak	305.00	200	Vertical	Pass
6**	8304.494	37.91	54.0	16.09	AV	305.00	200	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 18 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1485.550	41.21	74.0	32.80	Peak	282.00	400	Horizontal	Pass
1**	1490.352	32.14	54.0	21.86	AV	282.00	400	Horizontal	Pass
2	2905.258	49.40	74.0	24.60	Peak	13.00	200	Horizontal	Pass
2**	2911.127	41.24	54.0	12.76	AV	13.00	200	Horizontal	Pass
3	4497.168	48.33	74.0	25.67	Peak	314.00	200	Horizontal	Pass
3**	4495.806	39.97	54.0	14.03	AV	314.00	200	Horizontal	Pass
4	6618.840	51.97	74.0	22.03	Peak	201.00	300	Horizontal	Pass
4**	6621.122	44.41	54.0	9.59	AV	201.00	300	Horizontal	Pass
5	8148.045	48.75	74.0	25.25	Peak	51.00	400	Horizontal	Pass
5**	8145.606	37.04	54.0	16.96	AV	51.00	400	Horizontal	Pass
6	9223.610	46.11	74.0	27.89	Peak	198.00	100	Horizontal	Pass
6**	9220.650	37.10	54.0	16.90	AV	198.00	100	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 18 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1468.664	43.23	74.0	30.77	Peak	137.00	100	Vertical	Pass
1**	1469.665	30.80	54.0	23.20	AV	137.00	100	Vertical	Pass
2	2987.938	51.56	74.0	22.44	Peak	141.00	300	Vertical	Pass
2**	2995.218	41.21	54.0	12.79	AV	141.00	300	Vertical	Pass
3	4922.335	54.04	74.0	19.96	Peak	206.00	200	Vertical	Pass
3**	4924.354	43.13	54.0	10.87	AV	206.00	200	Vertical	Pass
4	6150.911	53.22	74.0	20.79	Peak	152.00	200	Vertical	Pass
4**	6152.560	40.95	54.0	13.05	AV	152.00	200	Vertical	Pass
5	7960.986	58.65	74.0	15.35	Peak	213.00	400	Vertical	Pass
5**	7963.748	43.94	54.0	10.07	AV	213.00	400	Vertical	Pass
6	8304.115	47.96	74.0	26.04	Peak	34.00	200	Vertical	Pass
6**	8302.389	37.65	54.0	16.35	AV	34.00	200	Vertical	Pass

HIGH CHANNEL 1 GHz to 18 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1487.239	41.25	74.0	32.75	Peak	253.00	100	Horizontal	Pass
1**	1489.271	32.23	54.0	21.77	AV	253.00	100	Horizontal	Pass
2	2904.770	49.24	74.0	24.76	Peak	202.00	200	Horizontal	Pass
2**	2908.777	41.12	54.0	12.88	AV	202.00	200	Horizontal	Pass
3	4497.427	48.32	74.0	25.69	Peak	59.00	200	Horizontal	Pass
3**	4490.364	39.80	54.0	14.20	AV	59.00	200	Horizontal	Pass
4	6625.789	52.00	74.0	22.00	Peak	205.00	200	Horizontal	Pass
4**	6625.770	44.26	54.0	9.74	AV	205.00	200	Horizontal	Pass
5	8146.998	48.58	74.0	25.42	Peak	328.00	200	Horizontal	Pass
5**	8148.699	37.03	54.0	16.97	AV	328.00	200	Horizontal	Pass
6	9220.708	46.34	74.0	27.66	Peak	156.00	100	Horizontal	Pass
6**	9224.095	37.01	54.0	16.99	AV	156.00	100	Horizontal	Pass

HIGH CHANNEL 1 GHz to 18 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1463.554	43.17	74.0	30.83	Peak	337.00	100	Vertical	Pass
1**	1464.600	30.70	54.0	23.30	AV	337.00	100	Vertical	Pass
2	2989.401	51.79	74.0	22.21	Peak	335.00	200	Vertical	Pass
2**	2994.892	41.40	54.0	12.60	AV	335.00	200	Vertical	Pass
3	4922.156	54.11	74.0	19.89	Peak	86.00	200	Vertical	Pass
3**	4918.870	42.95	54.0	11.05	AV	86.00	200	Vertical	Pass
4	6152.372	53.11	74.0	20.89	Peak	225.00	200	Vertical	Pass
4**	6153.468	40.98	54.0	13.03	AV	225.00	200	Vertical	Pass
5	7961.093	58.49	74.0	15.51	Peak	23.00	400	Vertical	Pass
5**	7963.104	44.01	54.0	9.99	AV	23.00	400	Vertical	Pass
6	8304.427	47.97	74.0	26.03	Peak	180.00	300	Vertical	Pass
6**	8306.949	37.80	54.0	16.20	AV	180.00	300	Vertical	Pass

A.9 Band Edge (Restricted-band band-edge)

Note ¹: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

Note ²: The test data all are tested in the vertical and horizontal antenna which the trace is max hold. So these plots have shown the worst case.

Note ³: According the ANSI C63.10-2020, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

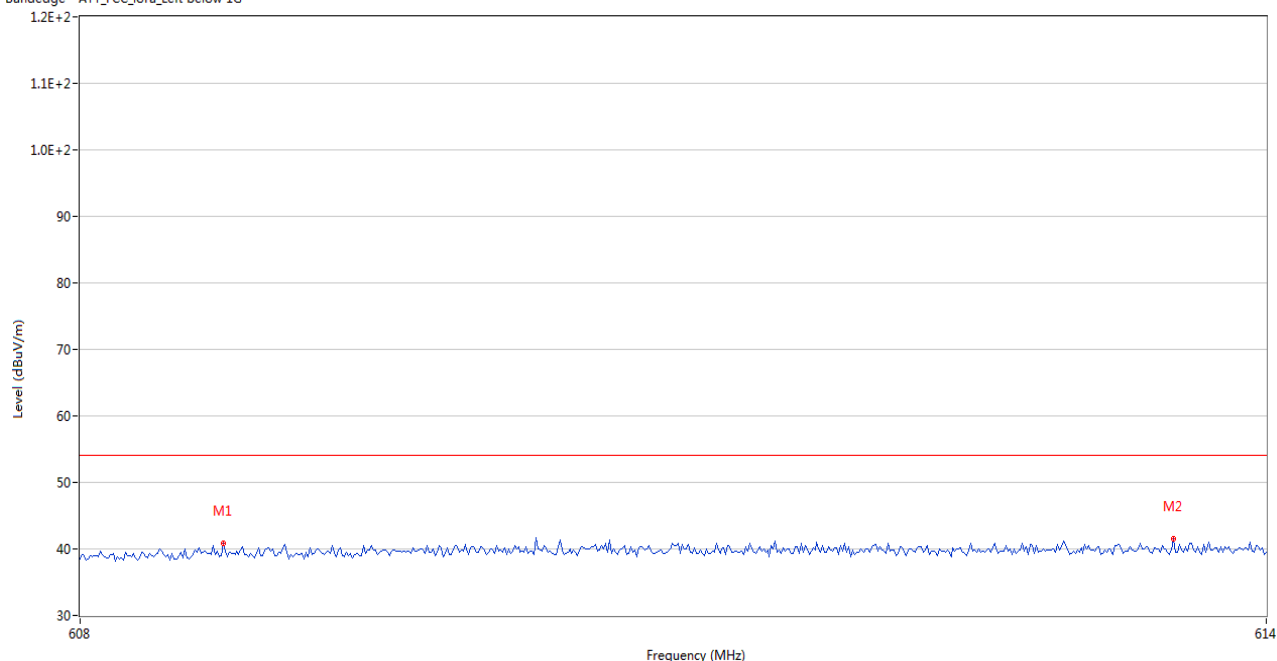
Note ⁴: The Level (dBuV/m) has been corrected by factor.

Note ⁵: Both horizontal and vertical directions were pre tested, only the worst configuration has been reported in this report.

Test Data

608 MHz to 614 MHz

Bandedge - ATT_FCC_lora_Left below 1G



Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
606.619	41.47	54.0	12.53	Peak	296.00	300	Horizontal	Pass
613.530	40.58	54.0	13.42	Peak	261.00	300	Horizontal	Pass

960 MHz to 1 GHz

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	973.166	40.75	54.0	13.25	Peak	170.00	200	Horizontal	Pass
2	996.267	40.95	54.0	13.05	Peak	297.00	200	Horizontal	Pass

1 GHz to 1.24 GHz

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1031.189	39.76	54.0	14.24	Peak	171.00	100	Horizontal	Pass
2	1215.200	42.54	54.0	11.46	Peak	54.00	300	Horizontal	Pass

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2571239-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2571239-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2571239-AI.PDF”.

Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
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--END OF REPORT--