



FCC TEST REPORT

For

Beijing Zhongheng Zhuochuang Technology Co., Ltd.

Dual-mode Industrial Wireless Remote Controller

Test Model: Z-XZ4Y-a

Additional Model No.: Please Refer to Page 6

Prepared for : Beijing Zhongheng Zhuochuang Technology Co., Ltd.
Address : D1, No.18 Jianshe Road, Kaixuan Avenue, Liangxiang, Fangshan District, Beijing, P.R.China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : March 04, 2026
Number of tested samples : 2
Sample No. : A260106086-1, A260106086-2
Serial number : Prototype
Date of Test : March 04, 2026 ~ March 26, 2026
Date of Report : March 27, 2026



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**FCC TEST REPORT**
FCC CFR 47 PART 15 C(15.231)**Report Reference No. : LCSA03046091EA**

Date of Issue..... : March 27, 2026

Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.Address..... : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei,
Shajing Street, Baoan District, Shenzhen, 518000, ChinaTesting Location/ Procedure..... : Full application of Harmonised standards ■
Partial application of Harmonised standards □
Other standard testing method □**Applicant's Name..... : Beijing Zhongheng Zhuochuang Technology Co., Ltd.**Address..... : D1, No.18 Jianshe Road, Kaixuan Avenue, Liangxiang, Fangshan
District, Beijing, P.R.China**Test Specification**

Standard..... : FCC CFR 47 PART 15 Subpart C, ANSI C63.10-2020

Test Report Form No..... : TRF-4-E-176 A/0

TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

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Test Item Description..... : Dual-mode Industrial Wireless Remote Controller

Trade Mark..... : N/A

Test Model..... : Z-XZ4Y-a

Ratings..... : Please Refer to Page 6

Result : **PASS****Compiled by:**

Li Huan/ Administrator

Supervised by:

Kevin Huang/ RF Manager

Approved by:

Gavin Liang/ Manager



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**FCC -- TEST REPORT**

Test Report No. : LCSA03046091EA	<u>March 27, 2026</u> Date of issue
---	--

Test Mode.....	: Z-XZ4Y-a
EUT.....	: Dual-mode Industrial Wireless Remote Controller
Applicant	: Beijing Zhongheng Zhuochuang Technology Co., Ltd.
Address.....	: D1, No.18 Jianshe Road, Kaixuan Avenue, Liangxiang, Fangshan District, Beijing, P.R.China
Telephone.....	: /
Fax.....	: /
Manufacturer	: Beijing Zhongheng Zhuochuang Technology Co., Ltd.
Address.....	: D1, No.18 Jianshe Road, Kaixuan Avenue, Liangxiang, Fangshan District, Beijing, P.R.China
Telephone.....	: /
Fax.....	: /
Factory	: Beijing Zhongheng Zhuochuang Technology Co., Ltd.
Address.....	: D1, No.18 Jianshe Road, Kaixuan Avenue, Liangxiang, Fangshan District, Beijing, P.R.China
Telephone.....	: /
Fax.....	: /

Test Result	PASS
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



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Revision History

Report Version	Issue Date	Revision Content	Revised By
000	March 27, 2026	Initial Issue	--



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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: Dual-mode Industrial Wireless Remote Controller
Test Model	: Z-XZ4Y-a
Additional Model No.	: Z-XZ3Y-a, Z-XZ5Y-a, Z-XZ6Y-a, Z-YZ3Y-a, Z-YZ4Y-a, Z-YZ5Y-a, Z-YZ6Y-a, Z-XYJS-JD-a, Z-XYJS-TX-a (a: A~Z, A~Z: Different letters represent different clients)
Model Declaration	: PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Ratings	: Battery: 7.4V, 5200mAh
Hardware version	: /
Software version	: /
433MHz	:
Operation frequency	433.1MHz ~434.5MHz
Channel Number	: 3 Channels(433.1MHz, 433.8MHz, 434.5MHz)
Modulation Type	: FSK/LORA
Antenna Description	: Spring Antenna, 3.0dBi(Max)
2.4G	:
Operation frequency	2401MHz~2483MHz
Channel Number	: 3 Channels(2401MHz, 2442MHz, 2483MHz)
Modulation Type	: FSK/LORA
Antenna Description	: FPC Antenna, 1.5dBi(max.)
Note: For a more detailed antenna description, please refer to the antenna specifications or the antenna report provided by the customer.	





1.2. Objective

The primary objective of the manufacturer is compliance with Subpart C of Part 15 of FCC Rules for the radiated and conducted emissions of intentional radiator. Certification of these devices is required as a prerequisite to marketing as defined in Part 2 the FCC Rules Certification is a procedure where the manufacturer or a contracted laboratory makes measurements and submits the test data and technical information to the FCC. The FCC issues a grant of equipment authorization upon successful completion of their review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured. Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

1.3. Environmental Conditions

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

- Temperature: 15-35°C
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

1.4. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
---	---	---	---	---

1.5. External I/O Port

I/O Port Description	Quantity	Cable
---	---	---





1.6. EUT Operation

The EUT was placed in a RF test mode for testing of the transmitter and in normal mode of operation for testing the digital circuitry and receiver.

1.7. Antenna System

The directional gains of antenna used for transmitting is 3.0dBi, and EUT uses an Internal Antenna which is permanently attached.

1.8. Description of Test Facility

Site Description
EMC Lab.

: NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.
Test Firm Registration Number: 254912.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10:2020 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.9. Statement of The Measurement Uncertainty

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with NAMAS document NIS 81.

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.10dB	(1)
		30MHz~200MHz	±2.96dB	(1)
		200MHz~1000MHz	±3.10dB	(1)
		1GHz~26.5GH	±4.20dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±1.63dB	(1)
Power disturbance	:	30MHz~300MHz	±1.60dB	(1)
Occupied Channel Bandwidth	:	0.01MHz~26.5GHz	5%	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.





2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2020, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd.

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the normal operating mode. The TX frequency that was fixed which was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.209 and 15.231 under the FCC Rules Part 15 Subpart C.

2.3. General Test Procedures

2.3.1 Conducted Emissions(N/A)

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane and for below 1GHz and 1.5m for above 1GHz. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10

2.4. Instrument Calibration

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

2.5. Test Mode

The EUT has been tested under engineering mode. The field strength of radiation emission was measured in the following position: EUT stand-up position (Y axis), lie-down position (X, Z axis). The worst case of X axis was reported.

A new battery supplied DC 7.4V power to the EUT for testing.

***Note: Using a temporary antenna connector for the EUT when conducted measurements are performed.



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3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmits condition.

3.2. EUT Exercise Software

N/A

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.



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4. SUMMARY OF TEST RESULTS

Rules	Description of test	Result
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band	Compliant
§15.209	General Requirement	Compliant
§15.231 (b)	Radiated Emissions	Compliant
§15.231 (c)	20dB Bandwidth Testing	Compliant
§15.231 (a)(1)	Deactivation Testing	Compliant
§15.207	Conducted Emissions	N/A

Note: All test modes were taken into consideration, but we only recorded the worst case in this report.





5. TEST ITEMS AND RESULTS

5.1. Transmitter Deactivation Time

FCC 15.231 (a)

5.1.1. Limit

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

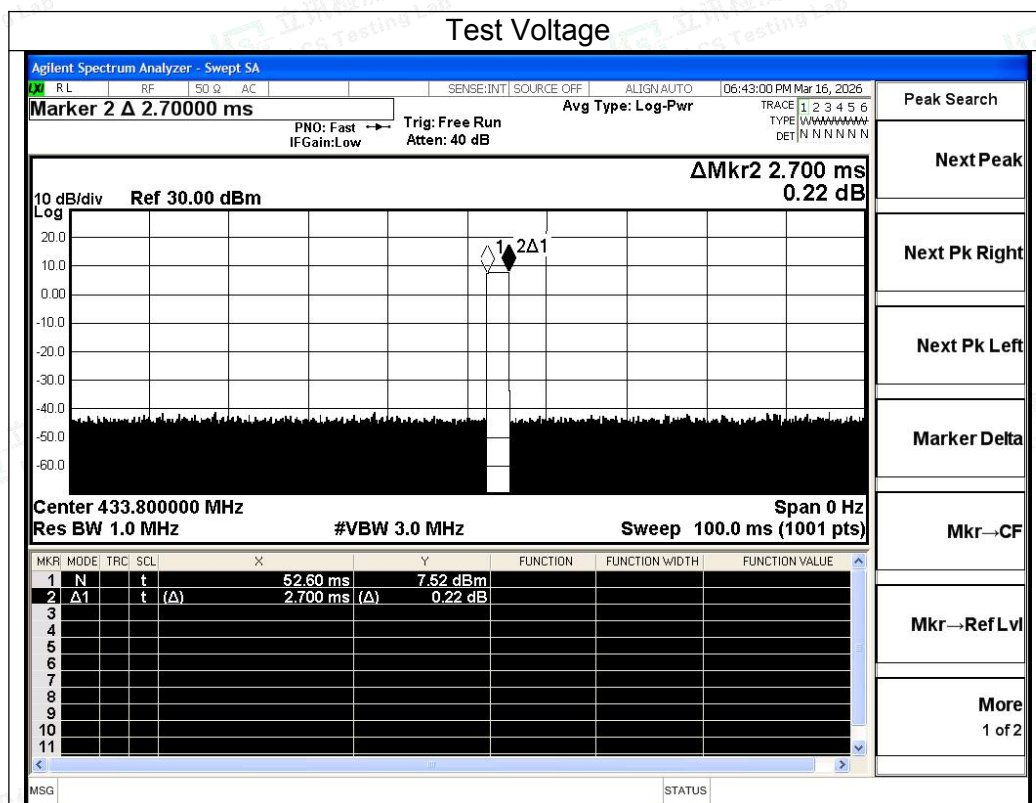
5.1.2. Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

5.1.3. Test Results

Temperature	23.2°C	Humidity	52.3%
Test Engineer	Jerry Chu	Configurations	TX Mode-FSK

Frequency (MHz)	Activation Time (s)	Limit: not more than 5 seconds of being released (s)	Conclusion
433.8	0.0027	5	PASS



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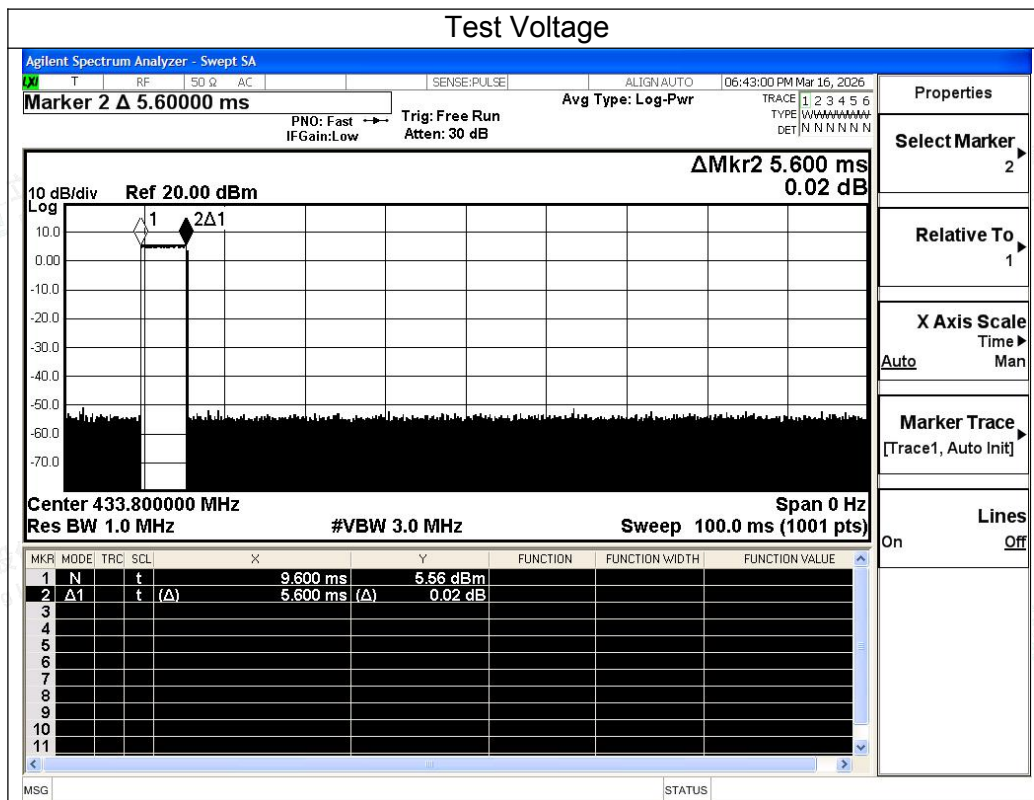
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Temperature	23.2°C	Humidity	52.3%
Test Engineer	Jerry Chu	Configurations	TX Mode-LORA

Frequency (MHz)	Activation Time (s)	Limit: not more than 5 seconds of being released (s)	Conclusion
433.8	0.0056	5	PASS



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5.2. Transmitter Field Strength of Emissions

5.2.1. Limit

FCC §15.231 (b)

In addition to the provisions of § 15.205, the field strength of emissions from Intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field Strength of Fundamental (microvolt/meter)	Field Strength of spurious emissions (microvolt/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,370	125 to 375
174-260	3,750	375
260-470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, $\mu\text{V/m}$ at 3 meters = $56.81818(F) - 6136.3636$; for the band 260-470 MHz, $\mu\text{V/m}$ at 3 meters = $41.6667(F) - 7083.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	608-614	4.5-5.15
0.495-0.505	16.69475-16.68525	960-1240	5.35-5.46
2.1735-2.1905	16.80425-16.80475	1300-1427	7.25-7.75
4.125-4.128	25.525-67	1435-1626.5	8.025-8.5
4.17725-4.17775	37.5-38.25	1645.5-1646.5	9.0-9.2
4.20725-4.20775	73-74.6	1660-1710	9.3-9.5
6.215-6.218	74.8-75.2	1718.8-1722.2	10.6-12.7
6.26775-6.26825	108-121.94	2200-2300	13.25-13.4
6.31175-6.31225	123-138	2310-2390	14.47-14.5
8.291-8.294	149.9-150.05	2483.5-2500	15.35-16.2
8.362-8.366	156.52475-156.52525	2655-2900	17.7-21.4
8.37625-8.38675	156.7-156.9	3260-3267	22.01-23.12
8.41425-8.41475	162.0125167.17	3332-3339	23.6-24.0
12.29-12.293	167.72-173.2	3345.8-3358	31.2-31.8
12.51975-12.52025	240-285	3600-4400	36.43-36.5
12.57675-12.57725	322-335.4		.(²)
13.36-13.41	399.9-410		

1. Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

2. Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.





§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 (microvolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F (KHz)	300
0.490-1.705	24000 (KHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 72 MHz, 76 88 MHz, 174 216 MHz or 470 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

5.2.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Spectrum Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP



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5.2.3. Test Procedures

1) Sequence of testing 9 kHz to 30 MHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1.5 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.





2) Sequence of testing 30 MHz to 1 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 3 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ($\pm 45^\circ$) and antenna movement between 1 and 4 meter.
- The final measurement will be done with QP detector with an EMI receiver.
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.





3) Sequence of testing 1 GHz to 12.75 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

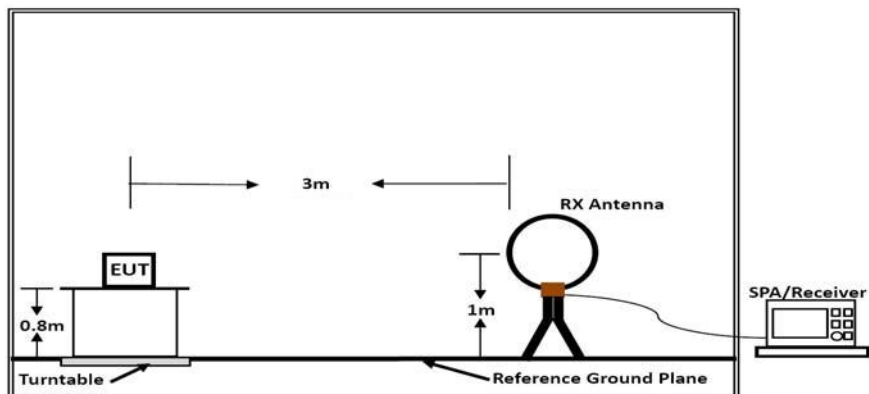
Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum found antenna polarisation and turntable position of the premeasurement the software maximizes the peaks by rotating the turntable position (0° to 360°). This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps). This procedure is repeated for both antenna polarisations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

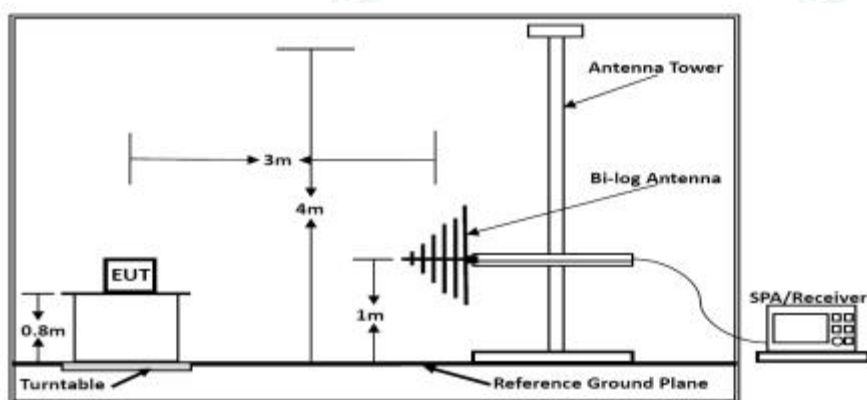




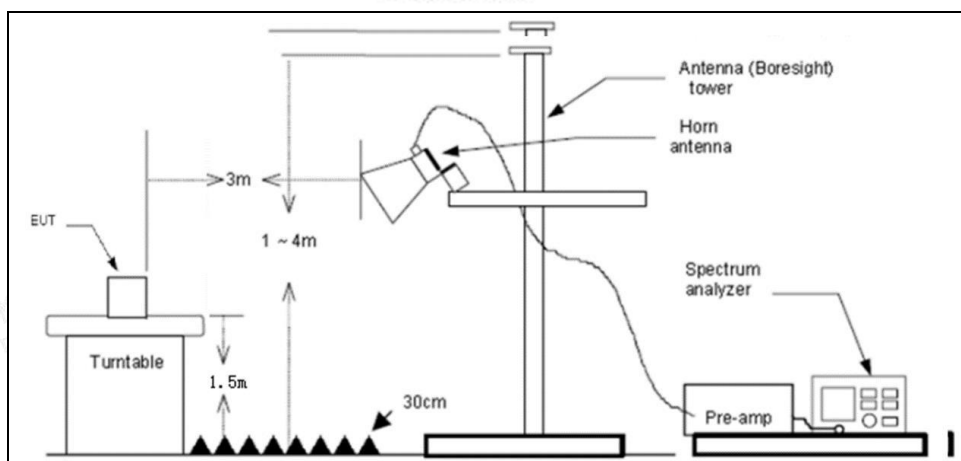
5.2.4 Block Diagram of Test Setup



Below 30MHz



Below 1GHz





5.2.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.6. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$\text{FS (dBuV/m)} = \text{RA (dBuV)} + \text{AF (dB/m)} + \text{CL (dB)} - \text{AG (dB)}$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

5.2.7. Results of Radiated Emissions (9 kHz~30MHz)

Temperature	23.8°C	Humidity	52.1%
Test Engineer	Jerry Chu	Configurations	TX Mode

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log$ (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

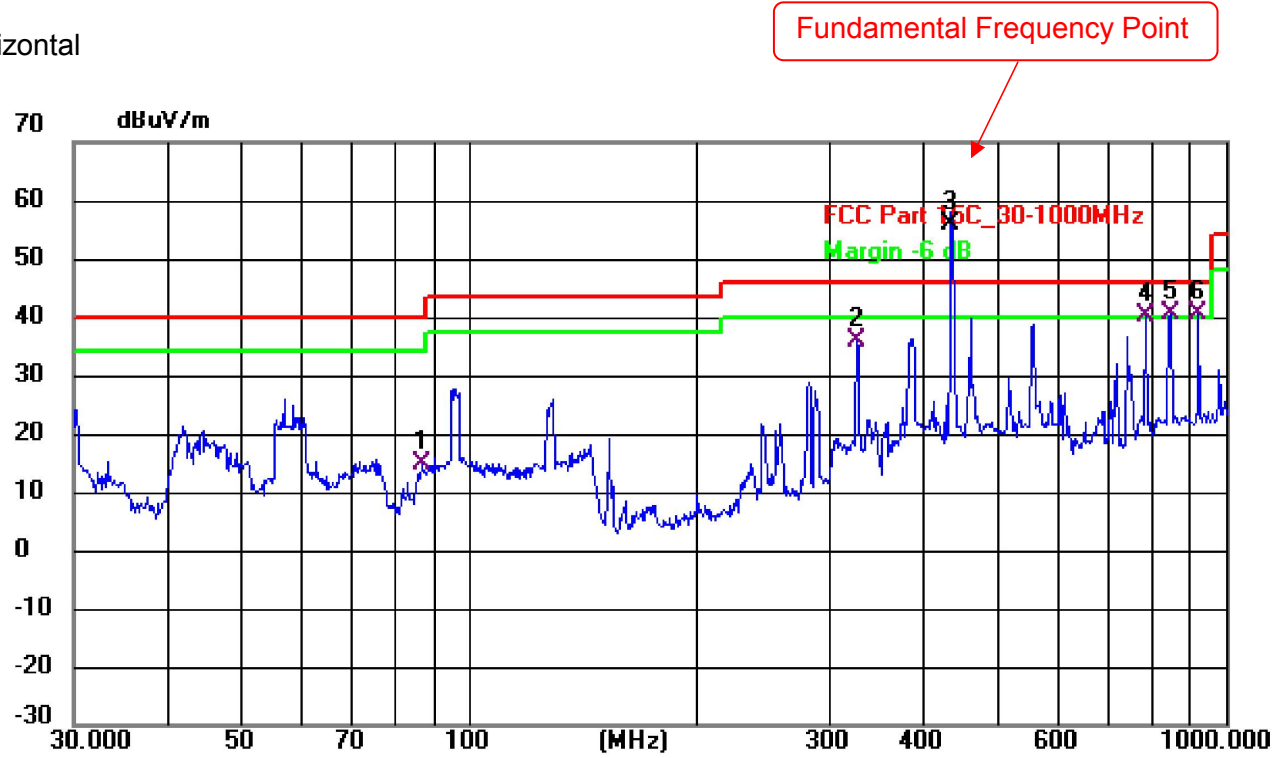




5.2.8. Results of Radiated Emissions (30MHz~1GHz)

Temperature	23.8°C	Humidity	52.1%
Test Engineer	Jerry Chu	Configurations	TX Mode-FSK

Horizontal



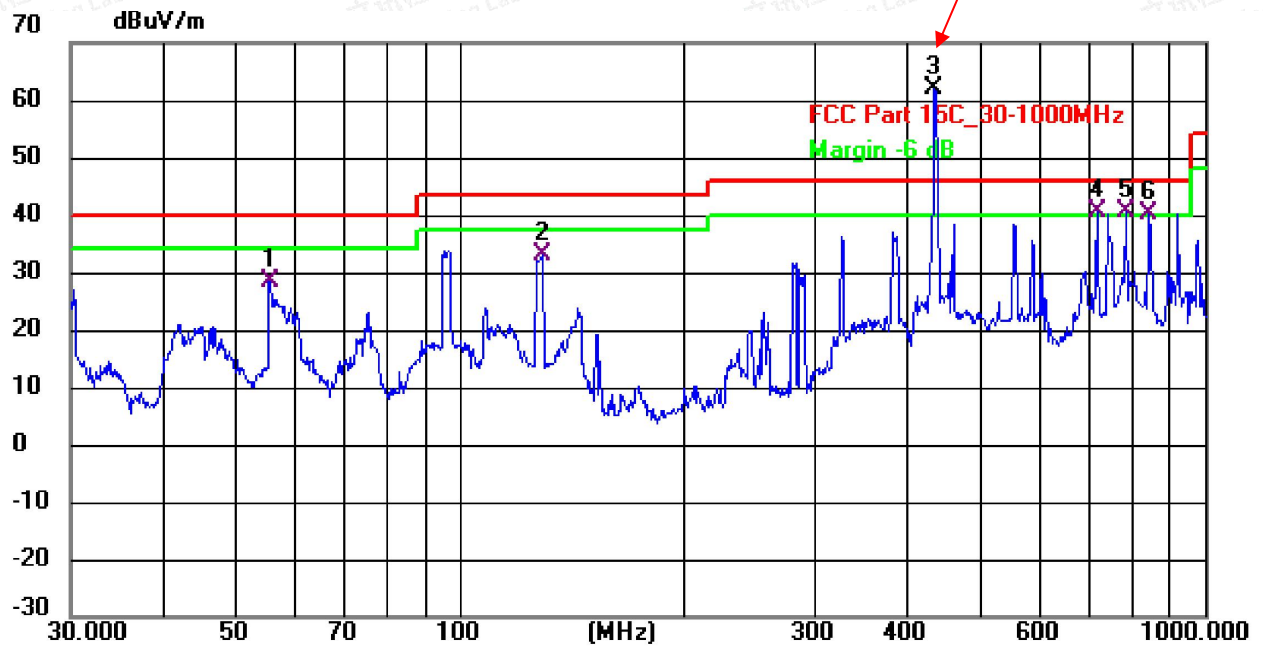
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		86.5027	35.33	-20.60	14.73	40.00	-25.27	QP	
2		325.5957	50.60	-14.74	35.86	46.00	-10.14	QP	
3	*	433.8000	70.08	-14.27	55.81	46.00	9.81	peak	
4	!	782.3451	49.23	-8.92	40.31	46.00	-5.69	QP	
5	!	848.0561	48.12	-7.66	40.46	46.00	-5.54	QP	
6	!	919.2865	47.10	-6.52	40.58	46.00	-5.42	QP	

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
433.800	55.81	80.83	100.83	PASS
848.0561	40.46	60.83	80.83	PASS





Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		55.6093	47.70	-19.30	28.40	40.00	-11.60	QP	
2		129.0145	54.91	-21.72	33.19	43.50	-10.31	QP	
3	*	433.8000	76.38	-14.27	62.11	46.00	16.11	peak	
4	!	716.6820	50.17	-9.62	40.55	46.00	-5.45	QP	
5	!	782.3453	49.54	-8.92	40.62	46.00	-5.38	QP	
6	!	842.1296	47.88	-7.70	40.18	46.00	-5.82	QP	

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
433.8000	62.11	80.83	100.83	PASS
842.1296	40.18	60.83	80.83	PASS



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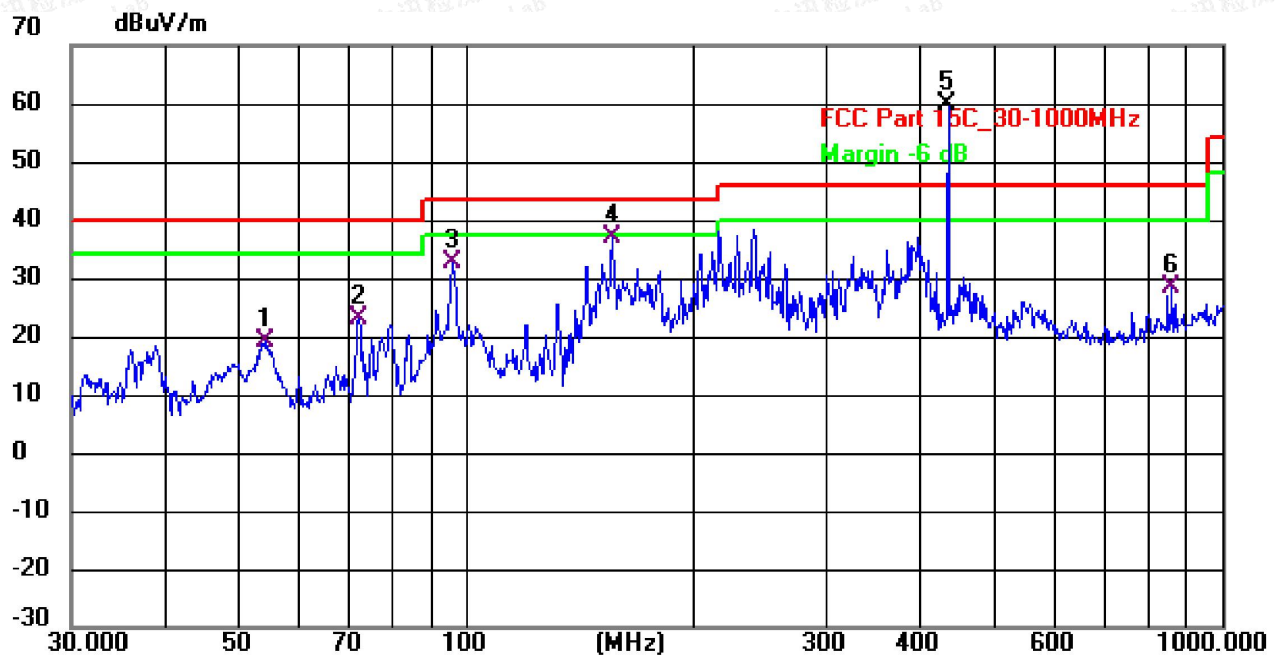
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Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		54.2610	36.64	-17.44	19.20	40.00	-20.80	QP	
2		72.0841	43.51	-20.61	22.90	40.00	-17.10	QP	
3		96.0985	52.25	-19.62	32.63	43.50	-10.87	QP	
4		155.9100	58.90	-22.03	36.87	43.50	-6.63	QP	
5	*	433.1000	72.97	-13.03	59.94	46.00	13.94	peak	
6		857.0245	35.27	-6.87	28.40	46.00	-17.60	QP	

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
433.1000	59.94	80.79	100.79	PASS
857.0245	28.40	60.79	80.79	PASS



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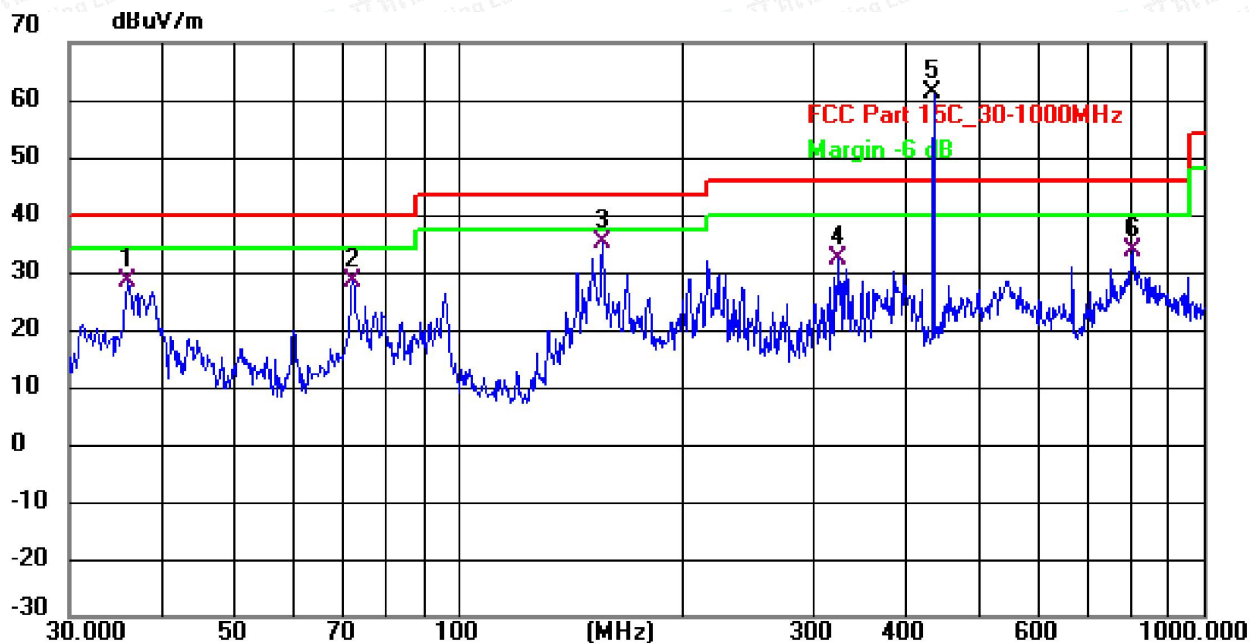
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		36.0007	47.21	-18.94	28.27	40.00	-11.73	QP	
2		72.0843	49.12	-20.90	28.22	40.00	-11.78	QP	
3		155.9101	56.06	-20.87	35.19	43.50	-8.31	QP	
4		322.1885	47.12	-14.91	32.21	46.00	-13.79	QP	
5	*	433.1000	75.54	-14.27	61.27	46.00	15.27	peak	
6		801.7863	42.33	-8.69	33.64	46.00	-12.36	QP	

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
433.1000	61.27	80.79	100.79	PASS
801.7863	33.64	60.79	80.79	PASS



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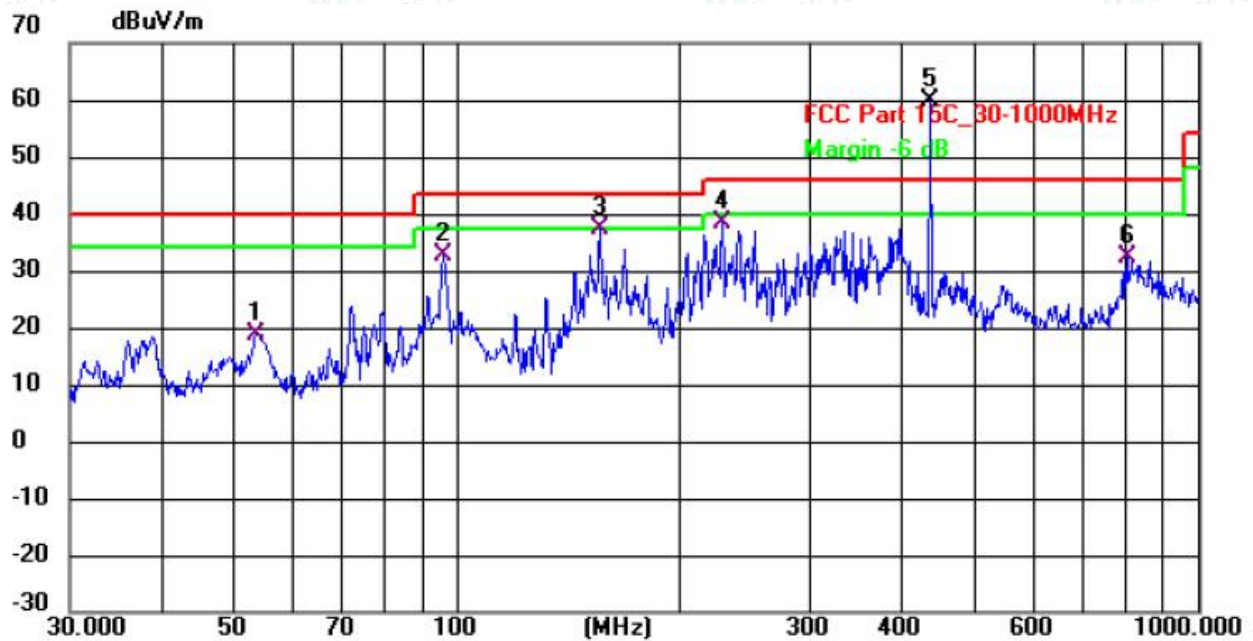
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Horizontal



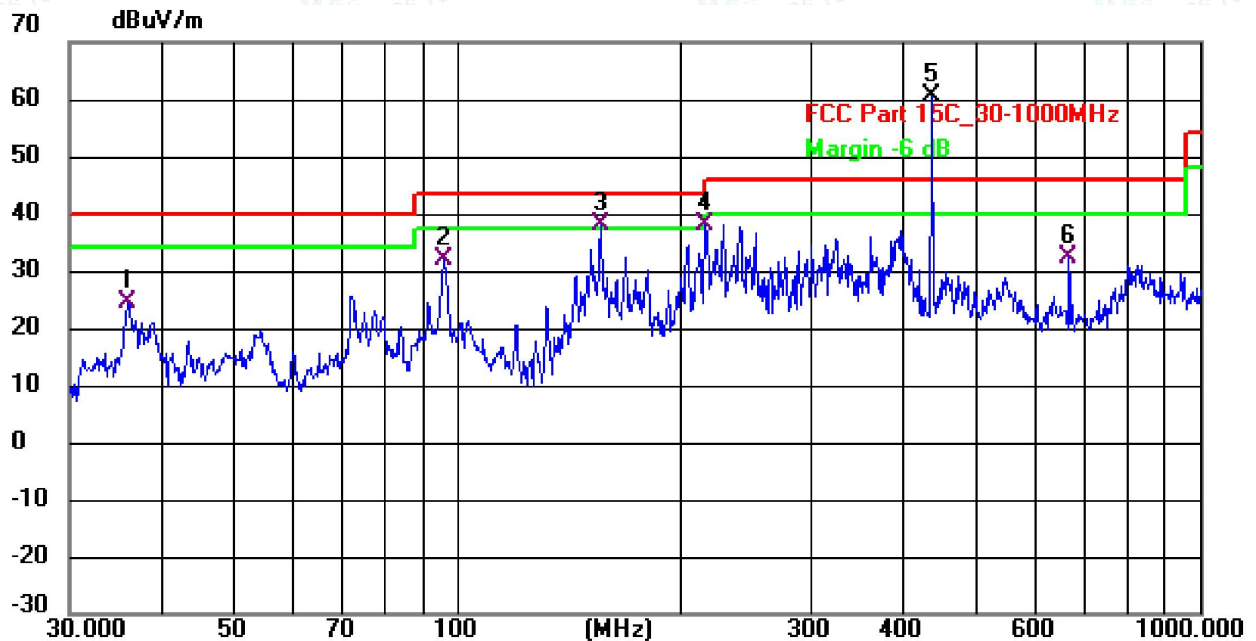
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector
1		53.5052	36.29	-17.41	18.88	40.00	-21.12	QP
2		95.7622	52.29	-19.69	32.60	43.50	-10.90	QP
3		155.9101	59.44	-22.03	37.41	43.50	-6.09	QP
4		228.4904	57.09	-18.65	38.44	46.00	-7.56	QP
5	*	434.5000	72.97	-13.01	59.96	46.00	13.96	peak
6		801.7863	40.17	-7.86	32.31	46.00	-13.69	QP

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
434.5000	59.96	80.84	100.84	PASS
801.7863	32.31	60.84	80.84	PASS





Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		35.8746	43.44	-18.96	24.48	40.00	-15.52	QP	
2		96.0985	51.87	-19.77	32.10	43.50	-11.40	QP	
3	!	155.9100	59.05	-20.87	38.18	43.50	-5.32	QP	
4		216.0240	56.13	-17.94	38.19	46.00	-7.81	QP	
5	*	434.5000	74.94	-14.27	60.67	46.00	14.67	peak	
6		665.8034	42.30	-10.13	32.17	46.00	-13.83	QP	

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
434.5000	60.67	80.84	100.84	PASS
665.8034	32.17	60.84	80.84	PASS

Note:

1. All reading are Quasi-peak values.
2. Measured = Reading + Antenna Factor + Cable Loss
3. The emission that are 20dB below the official limit are not reported
4. * - means fundamental frequency
5. ** - means harmonic frequency
6. Due to the measure PK emission level less than the AV limit value, the average doesn't need to be tested

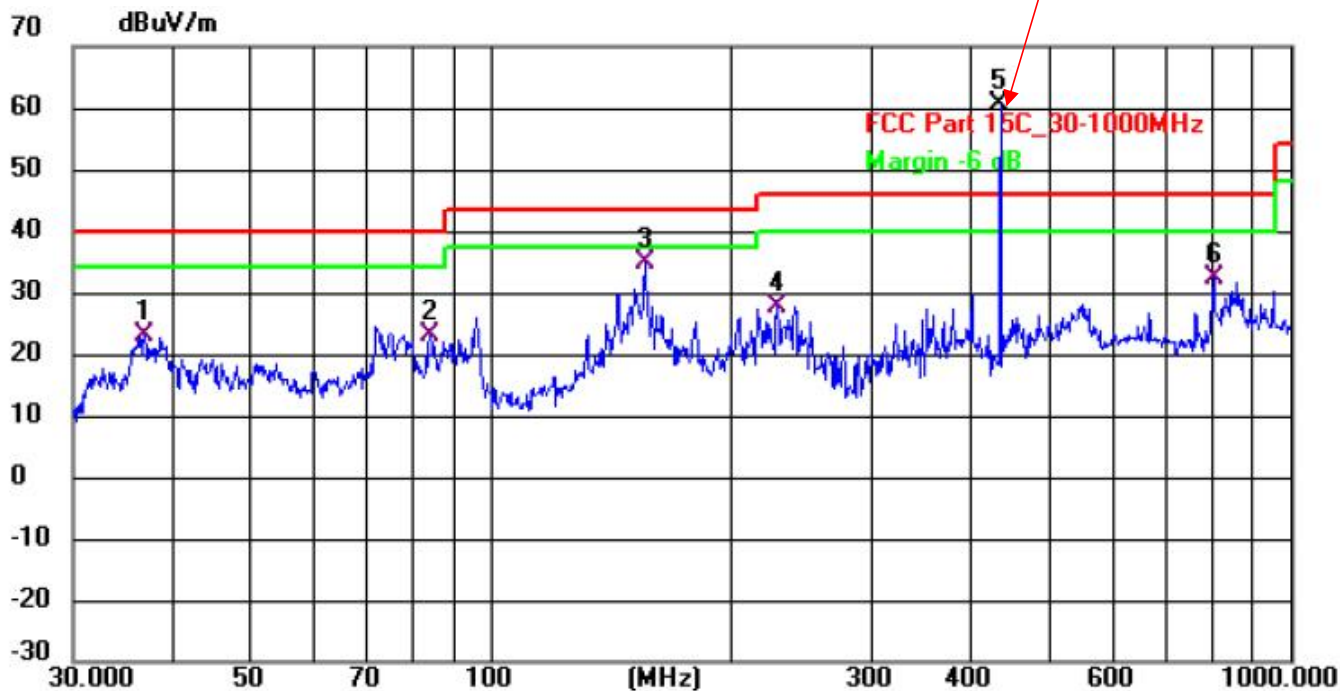




Temperature	23.8°C	Humidity	52.1%
Test Engineer	Jerry Chu	Configurations	TX Mode-LORA

Horizontal

Fundamental Frequency Point



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
		MHz	Level	Factor	ment			Detector
			dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		36.7661	41.79	-18.91	22.88	40.00	-17.12	QP
2		84.1100	43.97	-20.85	23.12	40.00	-16.88	QP
3		155.9100	55.67	-20.87	34.80	43.50	-8.70	QP
4		227.6904	45.11	-17.54	27.57	46.00	-18.43	QP
5	*	433.8000	74.69	-14.27	60.42	46.00	14.42	peak
6		801.7862	40.85	-8.69	32.16	46.00	-13.84	QP

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
433.8000	60.42	80.83	100.83	PASS
801.7862	32.16	60.83	80.83	PASS



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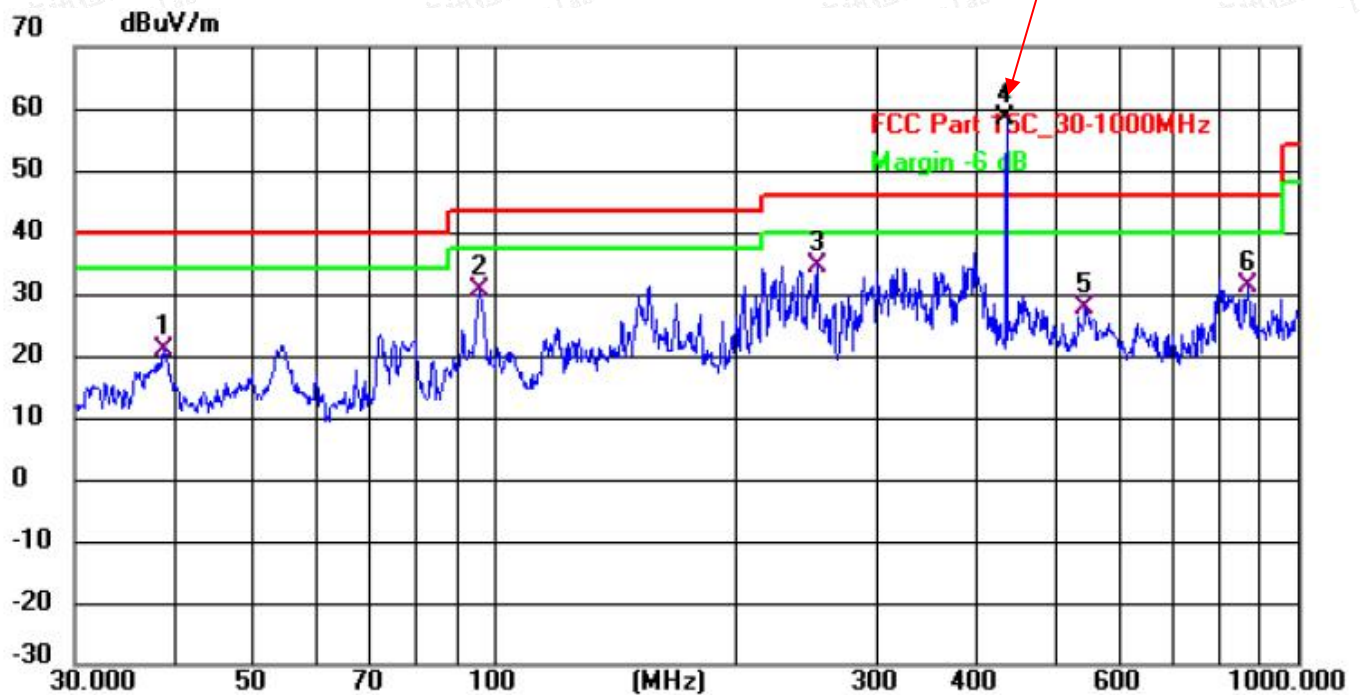
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Vertical

Fundamental Frequency Point



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector
1		38.7516	39.29	-18.28	21.01	40.00	-18.99	QP
2		96.0985	50.04	-19.62	30.42	43.50	-13.08	QP
3		252.0627	52.25	-17.79	34.46	46.00	-11.54	QP
4	*	433.8000	71.40	-13.02	58.38	46.00	12.38	peak
5		543.2740	39.19	-11.60	27.59	46.00	-18.41	QP
6		869.1300	38.09	-6.89	31.20	46.00	-14.80	QP

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
433.8000	58.38	80.83	100.83	PASS
869.1300	31.20	60.83	80.83	PASS



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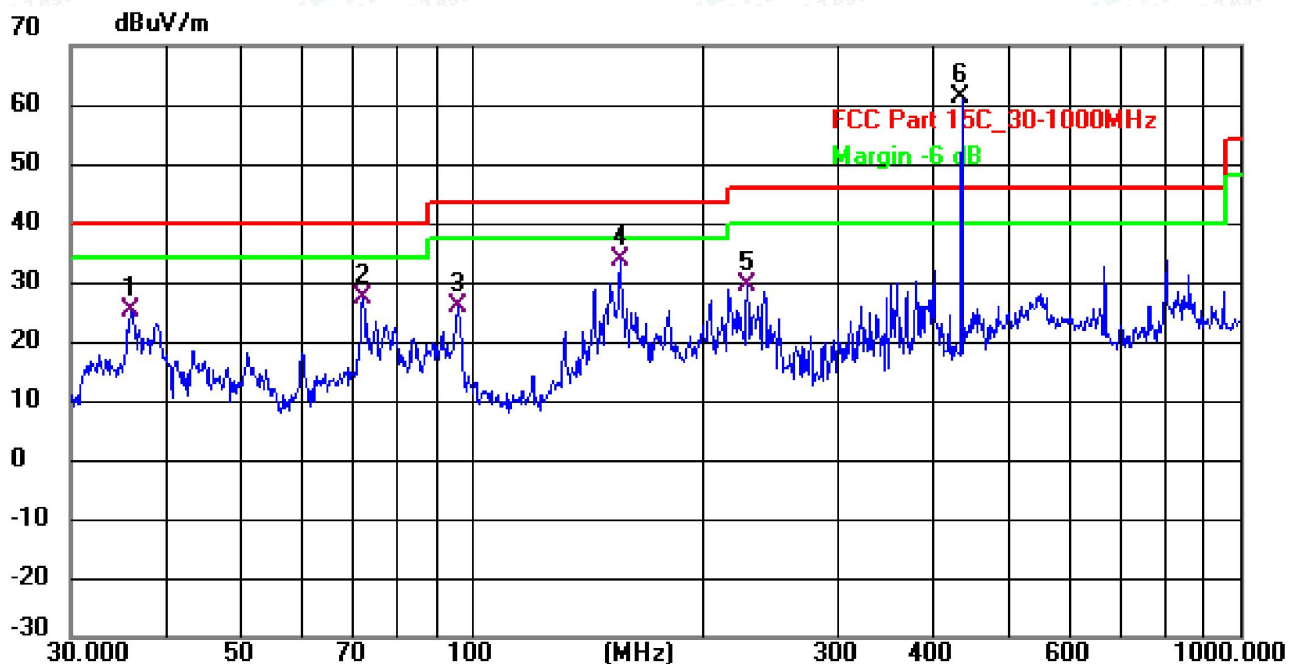
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Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		35.8746	44.18	-18.96	25.22	40.00	-14.78	QP	
2		72.0843	48.09	-20.90	27.19	40.00	-12.81	QP	
3		96.0985	45.74	-19.77	25.97	43.50	-17.53	QP	
4		155.9101	54.67	-20.87	33.80	43.50	-9.70	QP	
5		227.6906	47.11	-17.54	29.57	46.00	-16.43	QP	
6	*	433.1000	75.69	-14.27	61.42	46.00	15.42	peak	

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
433.1000	61.42	80.79	100.79	PASS



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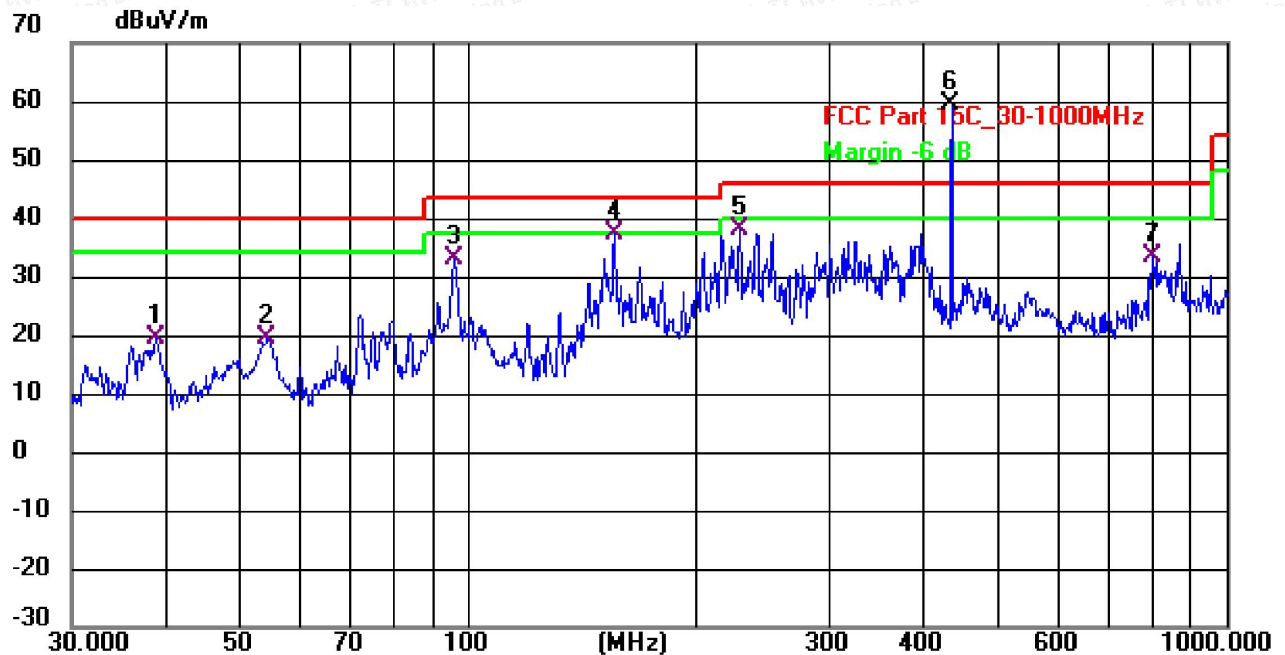
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Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		38.7516	37.79	-18.28	19.51	40.00	-20.49	QP	
2		54.2610	36.93	-17.44	19.49	40.00	-20.51	QP	
3		96.0985	52.54	-19.62	32.92	43.50	-10.58	QP	
4		155.9100	59.18	-22.03	37.15	43.50	-6.35	QP	
5		228.4903	56.59	-18.65	37.94	46.00	-8.06	QP	
6	*	433.1000	72.41	-13.03	59.38	46.00	13.38	peak	
7		798.9796	41.23	-7.87	33.36	46.00	-12.64	QP	

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
433.1000	59.38	80.79	100.79	PASS
798.9796	33.36	60.79	80.79	PASS



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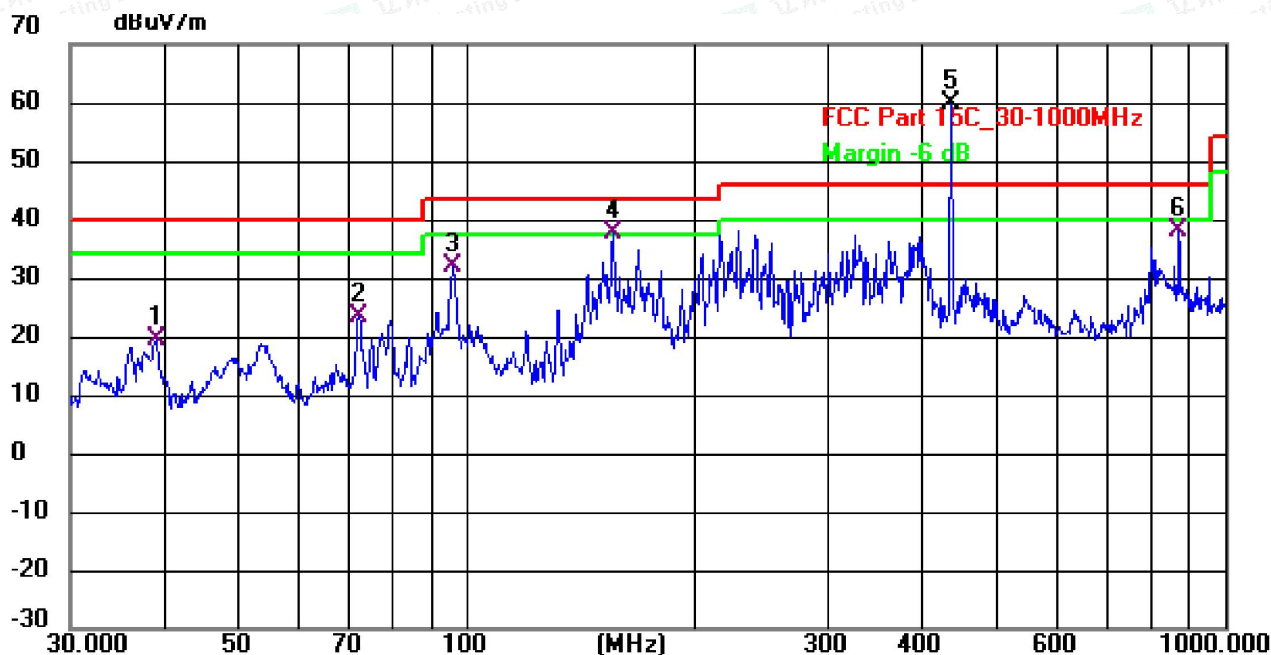
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Horizontal



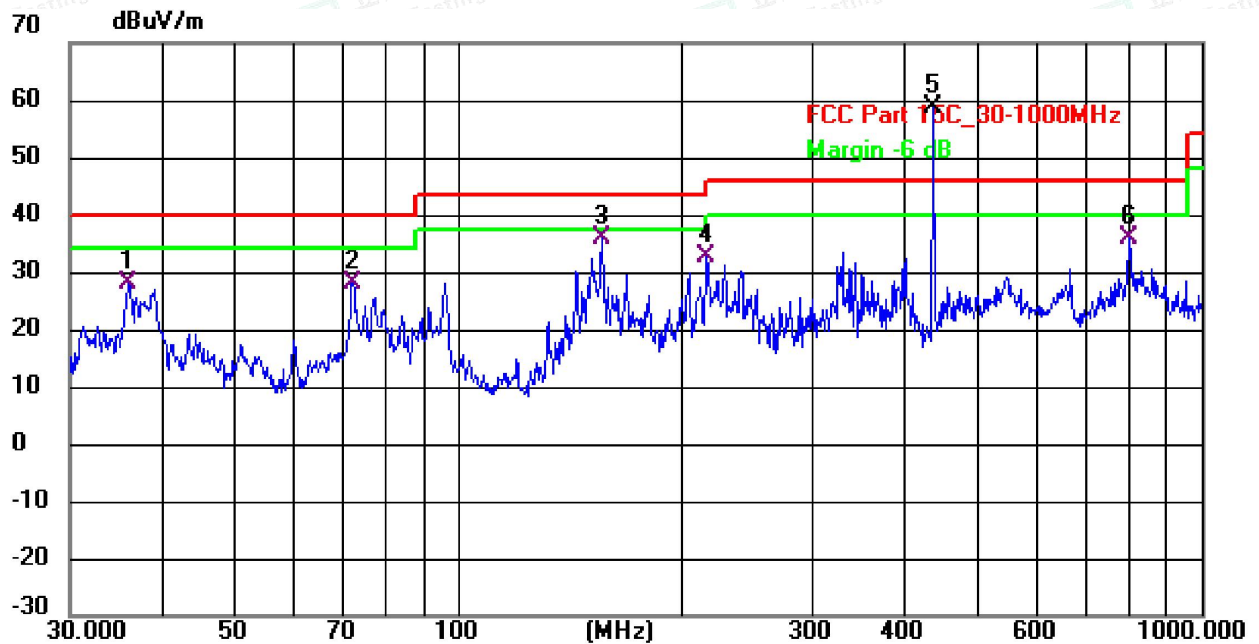
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		39.0243	37.63	-18.24	19.39	40.00	-20.61	QP	
2		72.0841	44.13	-20.61	23.52	40.00	-16.48	QP	
3		96.0985	51.63	-19.62	32.01	43.50	-11.49	QP	
4	!	155.9100	59.67	-22.03	37.64	43.50	-5.86	QP	
5	*	434.5000	72.79	-13.01	59.78	46.00	13.78	peak	
6		869.1301	44.86	-6.89	37.97	46.00	-8.03	QP	

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
434.5000	59.78	80.84	100.84	PASS
869.1301	37.97	60.84	80.84	PASS





Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		36.0007	46.98	-18.94	28.04	40.00	-11.96	QP	
2		72.0843	48.96	-20.90	28.06	40.00	-11.94	QP	
3		155.9101	56.75	-20.87	35.88	43.50	-7.62	QP	
4		216.0240	50.46	-17.94	32.52	46.00	-13.48	QP	
5	*	434.5000	72.85	-14.27	58.58	46.00	12.58	peak	
6		798.9797	44.48	-8.76	35.72	46.00	-10.28	QP	

Frequency (MHz)	Peak Level (dBμV/m)	Limit(dBμV/m) (average)	Limit(dBμV/m) (Peak)	Conclusion
434.5000	58.58	80.84	100.84	PASS
798.9797	35.72	60.84	80.84	PASS

Note:

1. All reading are Quasi-peak values.
2. Measured = Reading + Antenna Factor + Cable Loss
3. The emission that are 20dB below the official limit are not reported
4. * - means fundamental frequency
5. ** - means harmonic frequency
6. Due to the measure PK emission level less than the AV limit value, the average doesn't need to be tested





5.2.9. Results of Radiated Emissions (Above 1GHz)

Temperature	23.8°C	Humidity	52.1%
Test Engineer	Jerry Chu	Configurations	TX Mode-FSK

Peak Value:				
Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over limit (dB)	Polarization
1301.54	46.59	74.00	-27.41	Horizontal
1735.64	37.10	74.00	-36.90	Horizontal
2168.31	42.40	74.00	-31.60	Vertical
1302.08	44.84	74.00	-29.16	Vertical

1. Measuring frequencies from 9k~10th harmonic (ex. 5GHz), No emission found between lowest internal used/generated frequency to 30MHz.
2. Radiated emissions measured in frequency range from 9k~10th harmonic (ex. 5GHz) were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. Due to the measure PK emission level less than the AV limit value, the average doesn't need to be tested

Temperature	23.8°C	Humidity	52.1%
Test Engineer	Jerry Chu	Configurations	TX Mode-LORA

Peak Value:				
Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over limit (dB)	Polarization
1301.46	46.53	74.00	-27.47	Horizontal
1735.56	37.04	74.00	-36.96	Horizontal
2168.33	42.44	74.00	-31.56	Vertical
1302.16	44.92	74.00	-29.08	Vertical

1. Measuring frequencies from 9k~10th harmonic (ex. 5GHz), No emission found between lowest internal used/generated frequency to 30MHz.
2. Radiated emissions measured in frequency range from 9k~10th harmonic (ex. 5GHz) were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. Due to the measure PK emission level less than the AV limit value, the average doesn't need to be tested





5.3. 20dB Bandwidth Emissions

FCC 15.231 (c)

5.3.1. Limit

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

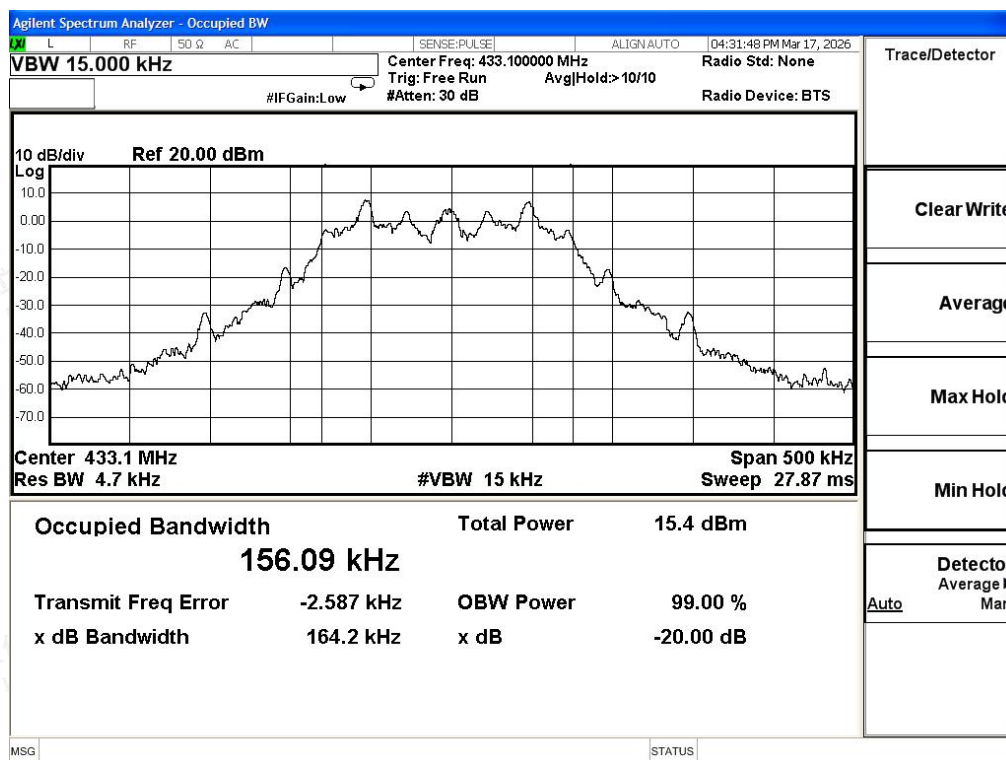
5.3.2. Test Procedure

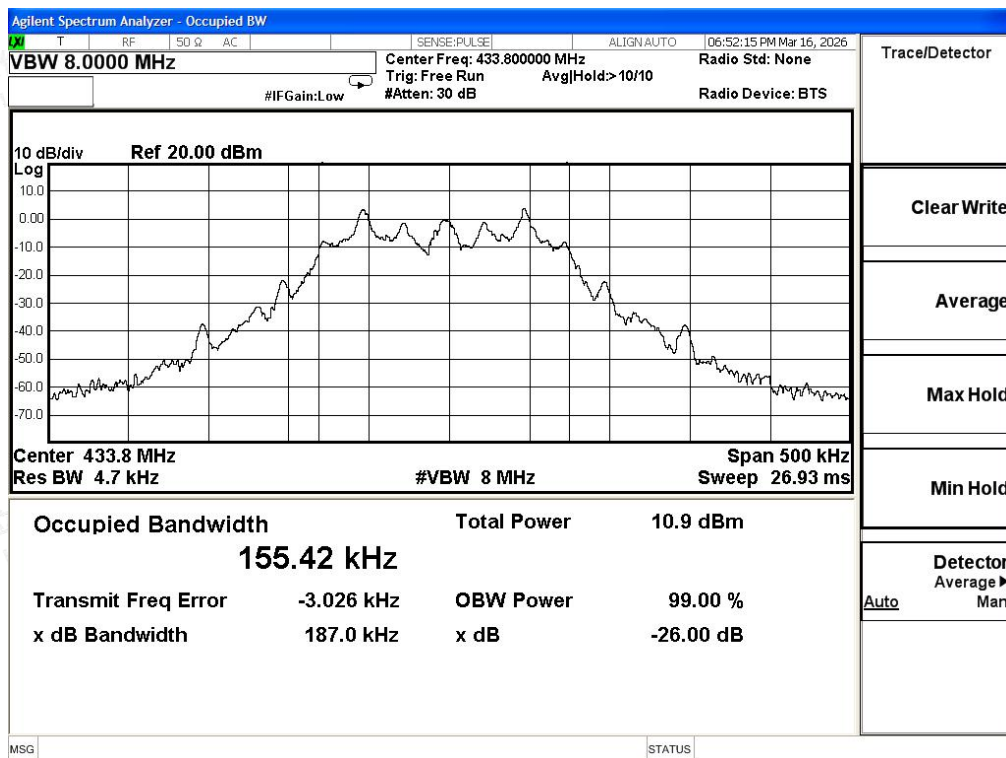
With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

5.3.3. Test Data

Temperature	23.2°C	Humidity	52.3%
Test Engineer	Jerry Chu	Configurations	TX Mode-FSK

Center Frequency of operation MHz	Maximum allowed bandwidth kHz	Measured 20dB bandwidth kHz	Result
433.1	1084.9	164.2	PASS
433.8	1084.9	187.0	PASS
434.5	1084.9	162.6	PASS
Maximum allowed bandwidth:	☒ 0.25% of the centre operating frequency ☐ 0.5% of the centre operating frequency		
RBW:	☐ 10kHz ☐ 100kHz ☒ other 1kHz		
VBW:	☐ 30kHz ☐ 300kHz ☒ other 3kHz		





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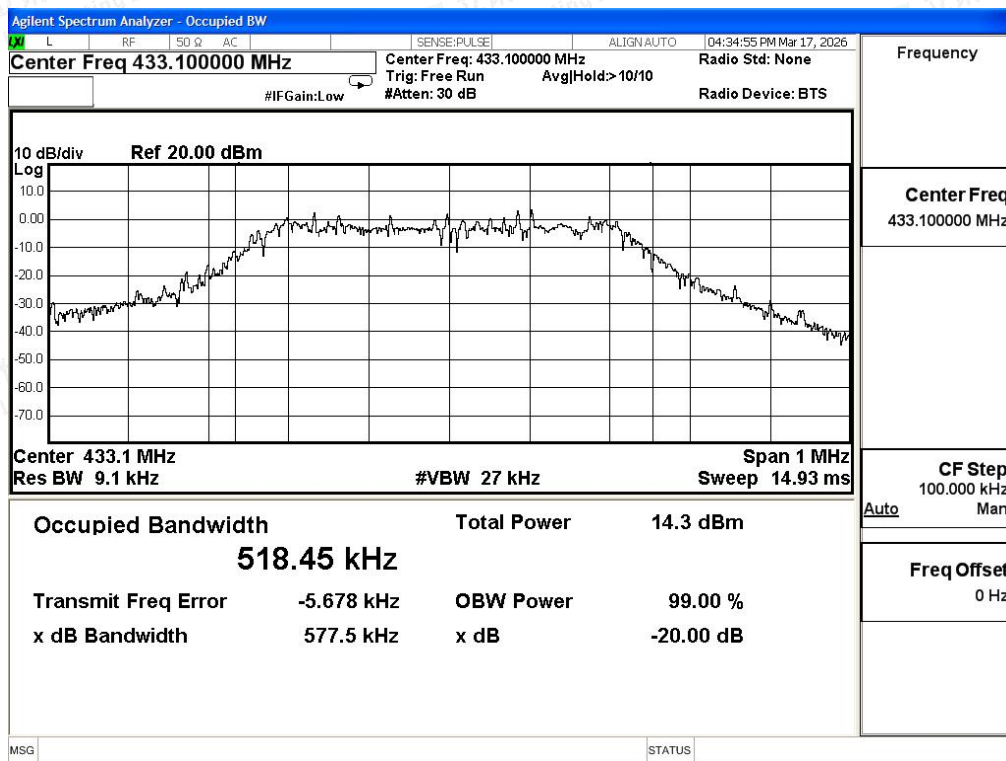
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Temperature	23.2°C	Humidity	52.3%
Test Engineer	Jerry Chu	Configurations	TX Mode-LORA

Center Frequency of operation MHz	Maximum allowed bandwidth kHz	Measured 20dB bandwidth kHz	Result
433.1	1084.9	577.5	PASS
433.8	1084.9	688.4	PASS
434.5	1084.9	573.3	PASS
Maximum allowed bandwidth:	☒ 0.25% of the centre operating frequency ☐ 0.5% of the centre operating frequency		
RBW:	☐ 10kHz ☐ 100kHz ☒ other 1kHz		
VBW:	☐ 30kHz ☐ 300kHz ☒ other 3kHz		

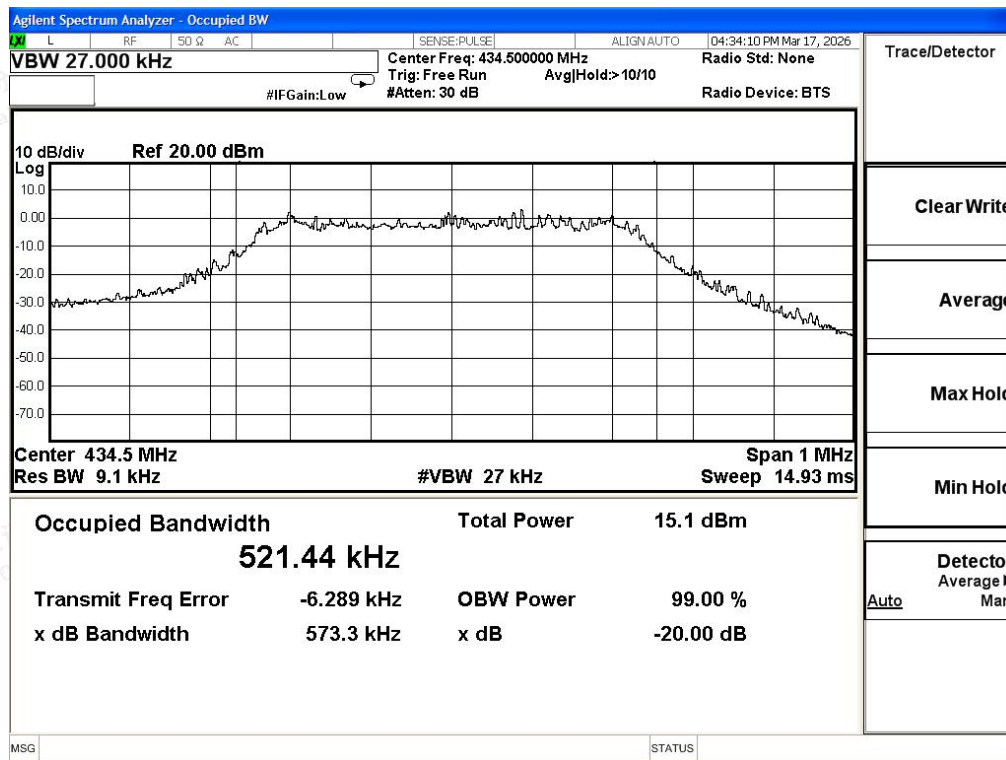
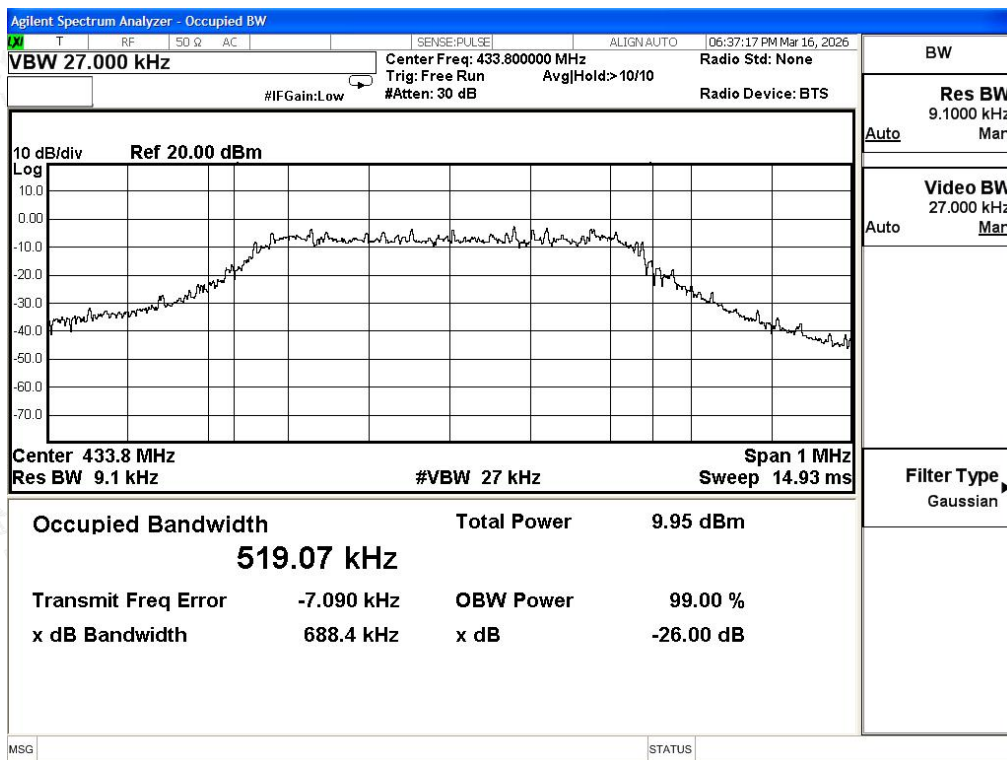


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Scan code to check authenticity



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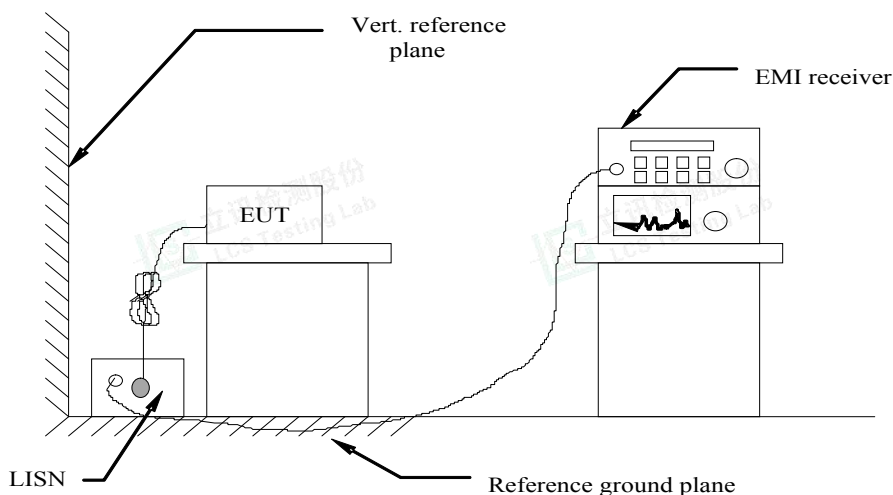
5.4. Power line conducted emissions

5.4.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which 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 or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

5.4.2 Block Diagram of Test Setup



5.4.3 Test Results

Not applicable.

The EUT is battery powered.





5.5. Antenna Requirement

FCC 15.203

5.5.1. Standard Applicable

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.

This EUT uses an integral antenna which is permanently attached.

5.5.2. Result

Compliant.

The antenna used for transmitting is permanently attached and no consideration of replacement. Please see EUT photo for details.





6. LIST OF MEASURING EQUIPMENTS

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	MXA Signal Analyzer	Agilent	N9020A	MY53300304	2025-05-22	2026-05-21
2	DC Power Supply	Agilent	E3642A	N/A	2025-09-27	2026-09-26
3	Temperature & Humidity Chamber	Baro	/	/	2025-06-04	2026-06-03
4	EMI Test Software	Farad	EZ-EMC	Ver.FARAD-3A1.1 +	N/A	N/A
5	3m Semi Anechoic Chamber	Maorui	966	/	2023-10-12	2026-10-11
6	Positioning Controller	Max-Full	MF7802BS	MF780208586	N/A	N/A
7	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2024-07-13	2027-07-12
8	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2024-08-03	2027-08-02
9	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2024-07-13	2027-07-12
10	EMI Test Receiver	R&S	ESR 7	101181	2025-05-22	2026-05-21
11	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2025-05-22	2026-05-21
12	Low-frequency amplifier	SchwarzZBECK	BBV9745	00253	2025-09-27	2026-09-26
13	High-frequency amplifier	JS Denki Pte	PA0118-43	JSPA21009	2025-09-27	2026-09-26
14	EMI Test Receiver	R&S	ESPI	101940	2025-05-22	2026-05-21
15	Artificial Mains	R&S	ENV216	101479	2025-05-23	2026-05-22
16	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2025-05-22	2026-05-21
17	EMI Test Software	Farad	EZ-EMC	Ver. EMC-CON 3A1.1+	N/A	N/A
18	Antenna Mast	Max-Full	MFA-515BSN	1308572	N/A	N/A
19	Pulse Limiter	R&S	ESH3-Z2	102750	2025-05-23	2026-05-22
20	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2024-07-13	2027-07-12
21	Broadband Preamplifier	SCHWARZBECK	BBV9719	9719-025	2024-07-30	2027-07-29





7. TEST SETUP PHOTOGRAPHS

Please refer to separated files for Test Setup Photos of the EUT.

8. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

9. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF TEST REPORT-----

