

RF MEASUREMENT REPORT

Applicant: Shure Incorporated
Product: Wireless Microphone Transmitter
Model No.: BLX1
Trademark: 
FCC Rule Part(s): Part 15 Subpart C Section 15.236
Clause (d) & (g)
Result: Complies
Test Date: 2022-10-10 ~ 2022-10-11

Reviewed By:

Jame Yuan

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 and EN 300 422-1 V1.4.2. 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
2209RSU053-U3	Rev. 01	Initial Report	2022-10-18	Valid

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1. General Information

1.1. Applicant

Shure Incorporated

5800 West Touhy Avenue, Niles, IL 60714-4608, USA

1.2. Manufacturer

Shure Incorporated

5800 West Touhy Avenue, Niles, IL 60714-4608, USA

1.3. Testing Facility

☒	Test Site – MRT Suzhou Laboratory Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China Laboratory Accreditations A2LA: 3628.01 CNAS: L10551 FCC: CN1166 ISED: CN0001 VCCI: ☐ R-20025 ☐ G-20034 ☐ C-20020 ☐ T-20020 ☐ R-20141 ☐ G-20134 ☐ C-20103 ☐ T-20104
☐	Test Site – MRT Shenzhen Laboratory Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China Laboratory Accreditations A2LA: 3628.02 CNAS: L10551 FCC: CN1284 ISED: CN0105
☐	Test Site – MRT Taiwan Laboratory Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) Laboratory Accreditations TAF: L3261-190725 FCC: 291082, TW3261 ISED: TW3261

1.4. Product Information

Product Name	Wireless Microphone Transmitter
Model No.	BLX1
EUT Identification No.	H11: 20220921Sample#02 (Radiated), 20220921Sample#01 (Conducted) J11: 20220921Sample#04 (Radiated), 20220921Sample#05 (Conducted)
Working Voltage	2pcs AA Batteries (DC 3.0V)
Remark: 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	H11 Band: 572.125 - 595.850MHz J11 Band: 596.125 - 607.875MHz & 614.125 - 615.875MHz
Declared Power Level	10mW
Type of Modulation	FM
Channel Spacing	25kHz

1.6. Working Frequencies

Groups	Channel	Frequency	Groups	Channel	Frequency
H11 Band	Low	572.125 MHz	J11 Band	Low	596.125 MHz
	...	...		...	...
	Mid	584.125 MHz		Mid	606.150 MHz
	...	...		...	...
	High	595.850 MHz		High	615.875 MHz

2. Test Configuration

2.1. Test Mode

Mode 1: Transmit at Low Channel 572.125MHz (H11 Band)
Mode 2: Transmit at Mid Channel 584.125MHz (H11 Band)
Mode 3: Transmit at High Channel 595.850MHz (H11 Band)
Mode 4: Transmit at Low Channel 596.125MHz (J11 Band)
Mode 5: Transmit at Mid Channel 606.150MHz (J11 Band)
Mode 6: Transmit at High Channel 615.875MHz (J11 Band)

2.2. Test Software

There is no test utility software used during testing. Radio frequency can be set by the button on the device.

2.3. Applied Standards

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

- FCC Part 15.236
- ETSI EN 300 422-1 v1.4.2
- KDB 206256 D01v02
- ANSI C63.10 - 2013

2.4. Test Environment Condition

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

3. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2022-12-29	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2023-08-22	WZ-AC1
Preamplifier	Agilent	83017A	MRTSUE06076	1 year	2022-11-12	WZ-AC1
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2023-06-21	WZ-AC1
Anechoic Chamber	TDK	WZ-AC1	MRTSUE06212	1 year	2023-04-21	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE06403	1 year	2023-06-06	WZ-AC1
Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2022-12-29	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11039	1 year	2022-11-11	WZ-AC1
Audio Analyzer	R&S	UPV	MRTSUE06357	1 year	2023-04-28	WZ-SR5
Thermohygrometer	testo	608-H1	MRTSUE06402	1 year	2023-06-06	WZ-SR5
Shielding Room	HUAMING	WZ-SR5	MRTSUE06442	N/A	N/A	WZ-SR5
Signal Analyzer	Keysight	N9010B	MRTSUE06457	1 year	2023-06-04	WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11079	1 year	2023-06-09	WZ-SR5

Software	Version	Function
EMI V3	V 3.0.0	EMI Test Software
Controller_MF 7802BS	2.03C	RE Antenna & Turntable

4. 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 Disturbance
Measurement Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): Horizontal: 30MHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~40GHz: 6.40dB Vertical: 30MHz~300MHz: 5.24dB 300MHz~1GHz: 6.03dB 1GHz~40GHz: 6.40dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 1.13dB

5. Test Result

5.1. Summary

FCC Section(s)	Test Description	Test Condition	Verdict
15.236(d)(1), (2)	Output Power	Conducted	Pass
15.236(g)	Necessary Bandwidth		Pass
15.236(g)	Radiated Spurious Emission	Radiated	Pass

Remark:

1. The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
2. For radiated emission tests, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

5.2. Output Power Measurement

5.2.1. Test Limit

In the bands allocated and assigned for broadcast television and in the 600 MHz service band: 50 mW EIRP.

In the 600 MHz guard band and the 600 MHz duplex gap: 20 mW EIRP.

5.2.2. Test Procedure

N/A

5.2.3. Test Setting

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

5.2.4. Test Setup



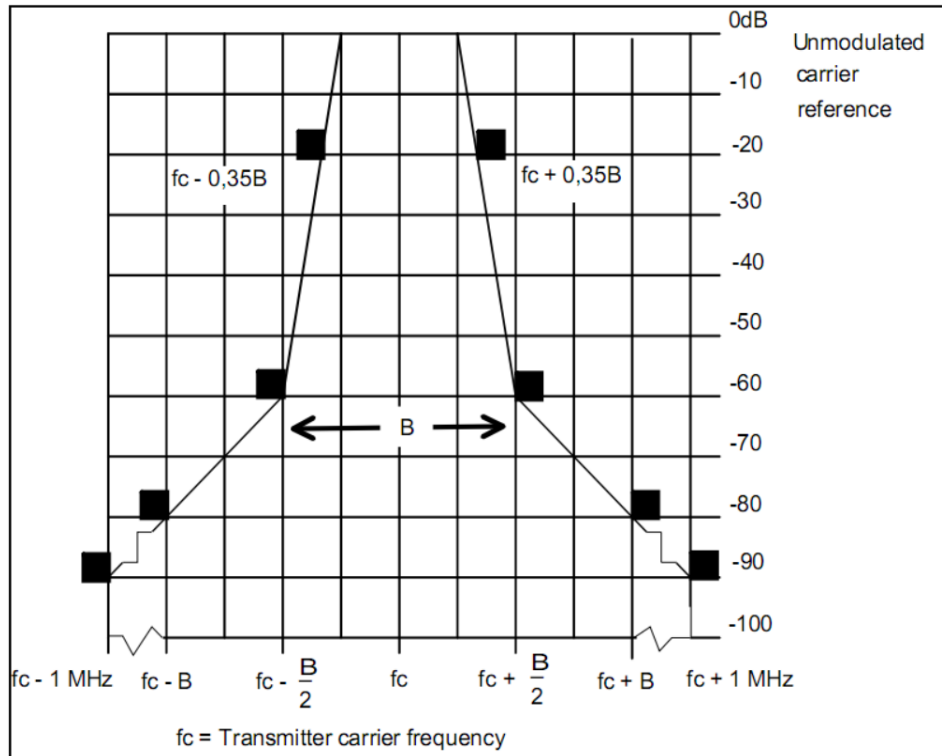
5.2.5. Test Result

Refer to Appendix A.1.

5.3. Necessary Bandwidth Measurement

5.3.1. Test Limit

Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.1.2 of EN 300 422-1 V1.4.2, as shown below.



5.3.2. Test Procedure

EN 300 422-1 V1.4.2 Clause 8.3.1.1.

5.3.3. Test Setting

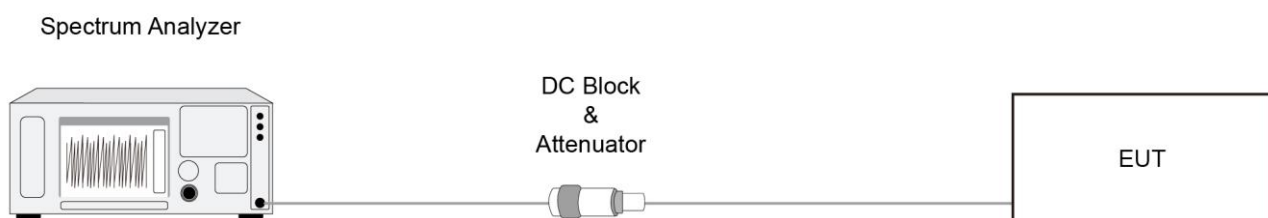
The EUT was powered up and the transmit frequency & power output of the EUT were selected.

The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.

Inject the 1kHz audio signal to the EUT to meet EN 300 422-1 requirements.

Only lowest and highest channel is required, at an output power level of 10mW.

5.3.4. Test Setup



5.3.5. Test Result

Refer to Appendix A.2.

5.4. Radiated Spurious Emission Measurement

5.4.1. Test Limit

Emissions outside of this band shall comply with the limits specified in section 8.4 of EN 300 422-1 V1.4.2, as shown below.

State	Frequency		
	47 MHz to 74 MHz, 87.5 MHz to 137 MHz 174 MHz to 230 MHz, 470 MHz to 862 MHz	Other frequencies below 1000 MHz	Frequencies above 1000 MHz
Operation	4 nW	250 nW	1 μ W
Standby	2 nW	2 nW	20 nW

5.4.2. Test Procedure

EN 300 422-1 V1.4.2 Clause 8.4.2.

5.4.3. Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
25 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000MHz	1MHz

Emissions shall be investigated up to the 10th harmonic of the fundamental.

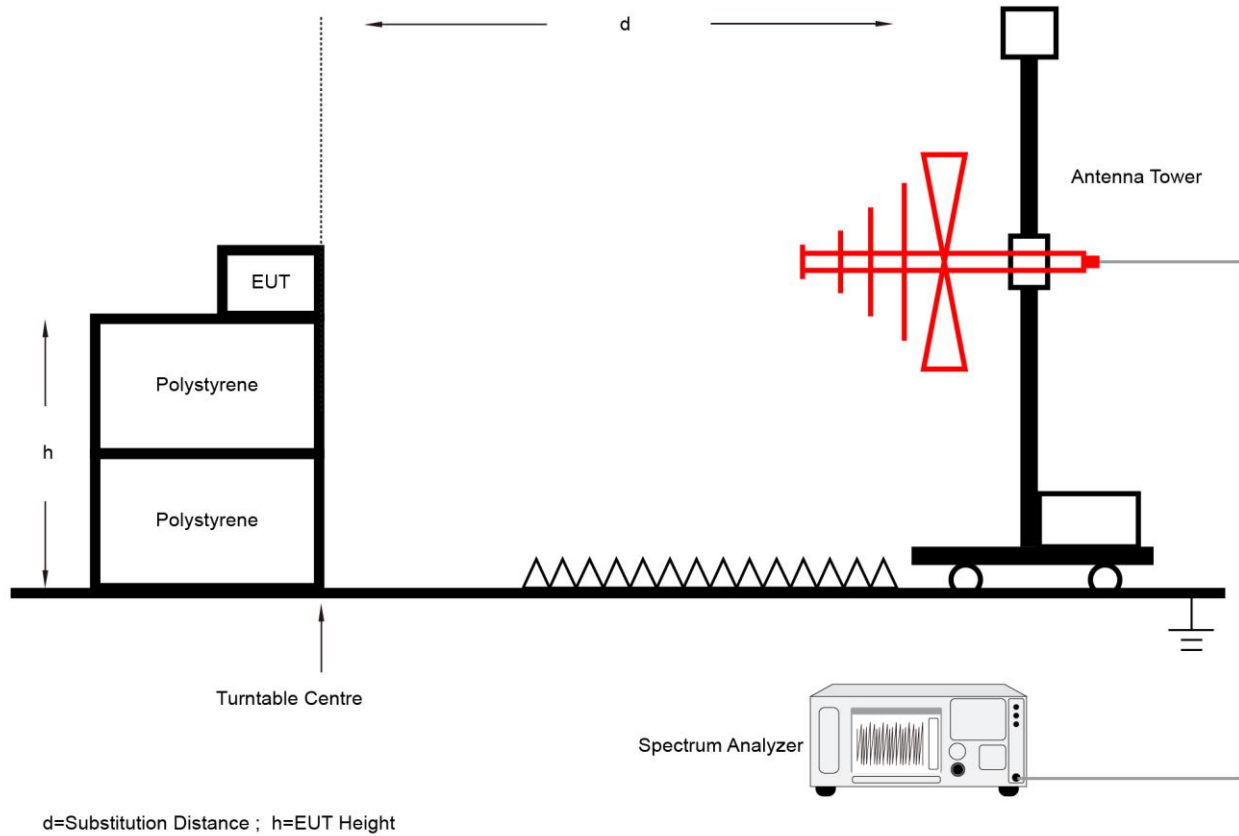
All the emissions shall be demonstrated using a QP detector below 1 GHz and a RMS Average detector above 1 GHz.

All significant broadband and narrowband signals found in the preliminary sweeps were measured using a peak detector at a test distance of 3 meters.

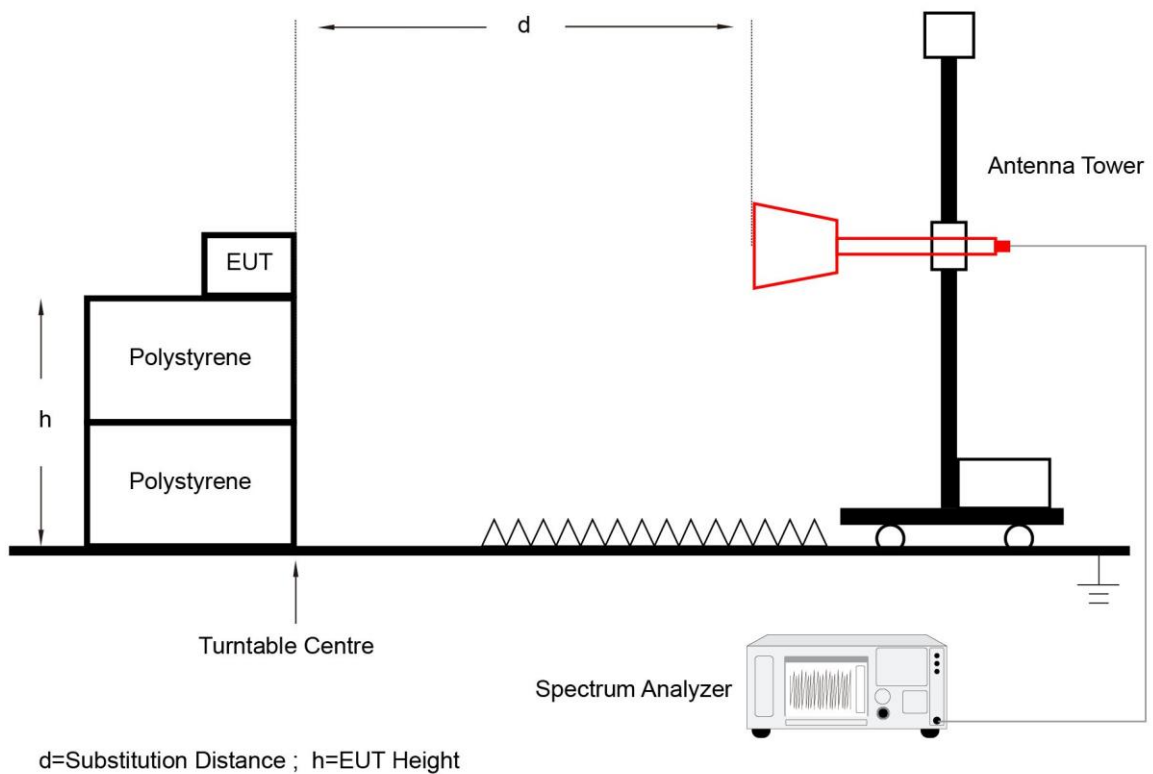
At each frequency at which a component is detected, the sample shall be rotated to obtain maximum response and the effective radiated power of that component determined by a substitution measurement.

5.4.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



5.4.5. Test Result

Refer to Appendix A.3.

Appendix A – Test Result

A.1 Output Power Test Result

Test Site	WZ-SR5	Test Engineer	Dandy Li
Test Date	2022-10-11		

Groups	Channel No.	Frequency (MHz)	Average Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
H11 Band	Low	572.125	10.80	0.14	10.94	≤ 16.99
	Mid	584.125	10.51	0.14	10.65	≤ 16.99
	High	595.850	9.92	0.14	10.06	≤ 16.99
J11 Band	Low	596.125	10.33	0.25	10.58	≤ 16.99
	Mid	606.150	10.67	0.25	10.92	≤ 16.99
	High	615.875	10.72	0.25	10.97	≤ 13.01

Note 1: EIRP (dBm) = Average Power (dBm) + Antenna Gain (dBi).

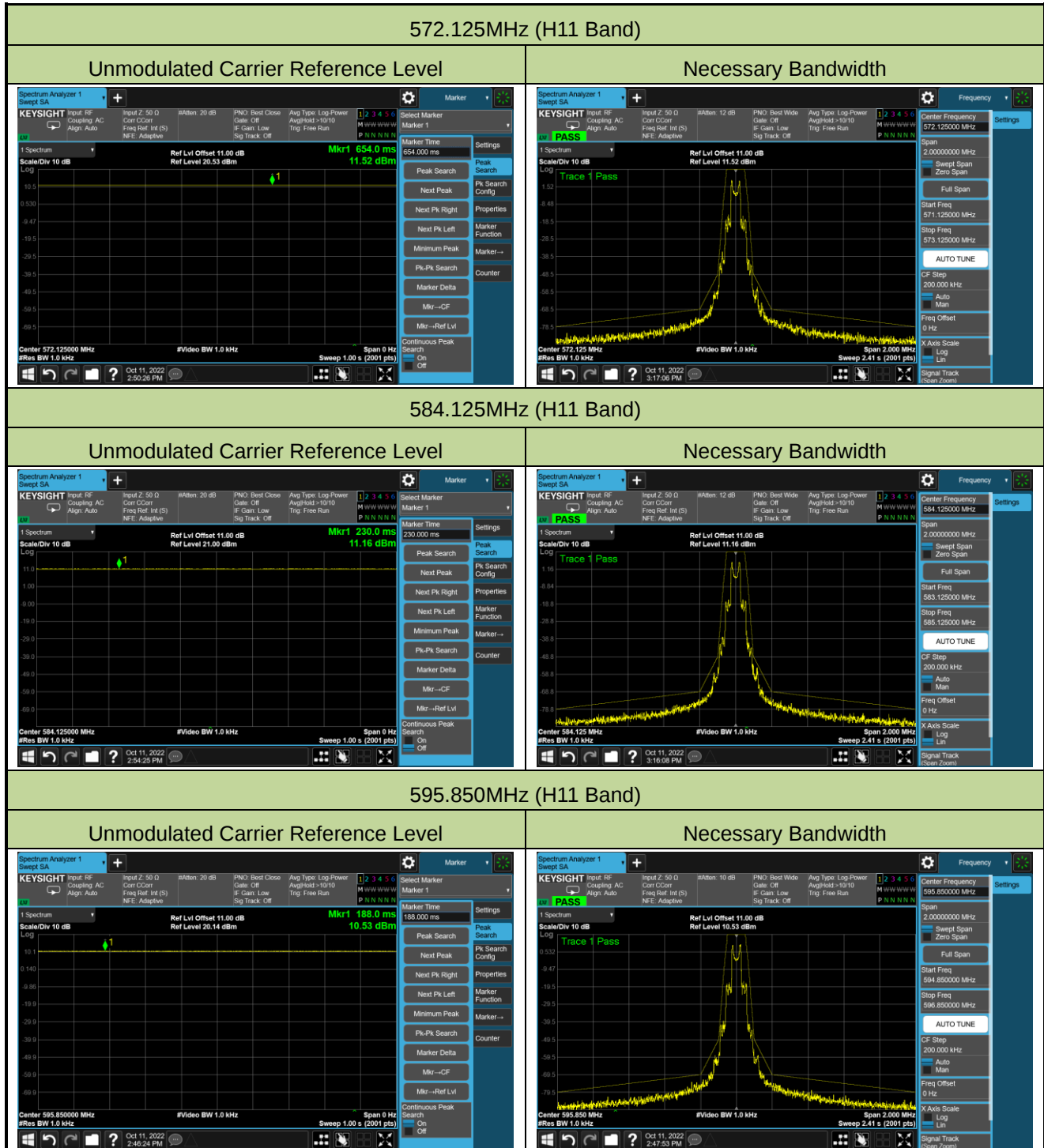
Note 2:

For the 600 MHz service band, Limit (dBm) = $10 \cdot \log(50 \text{ mW}) = 16.99 \text{ dBm}$.

For the 600 MHz guard band and duplex gap, Limit (dBm) = $10 \cdot \log(20 \text{ mW}) = 13.01 \text{ dBm}$.

A.2 Necessary Bandwidth Test Result

Test Site	WZ-SR5	Test Engineer	Dandy Li
Test Date	2022-10-11		

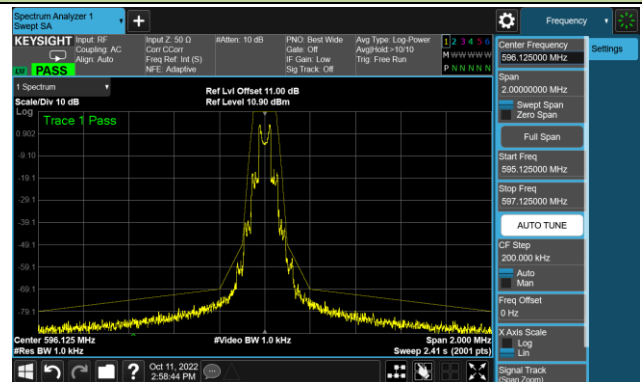


596.125MHz (J11 Band)

Unmodulated Carrier Reference Level

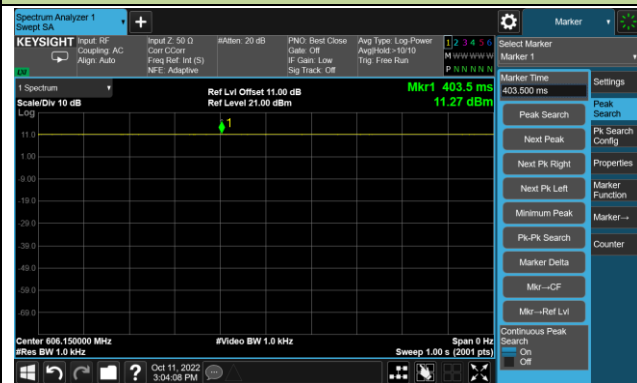


Necessary Bandwidth

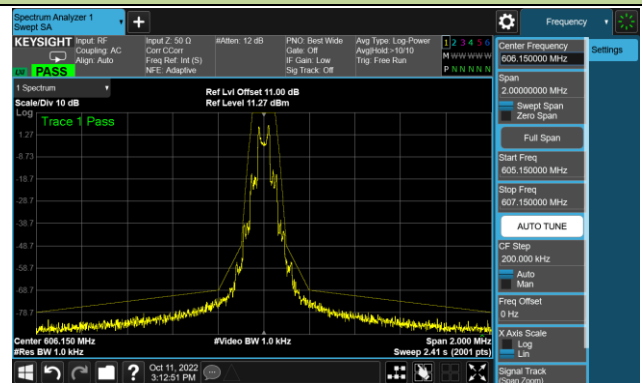


606.150MHz (J11 Band)

Unmodulated Carrier Reference Level

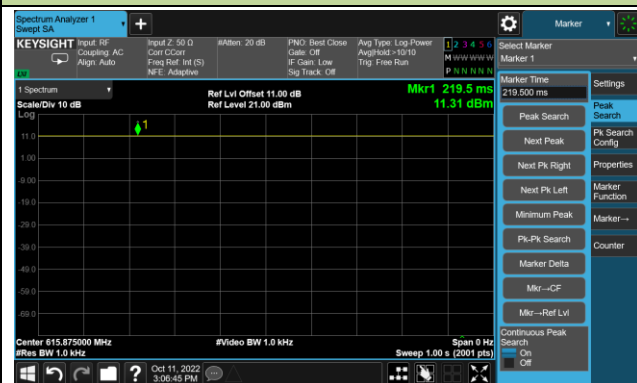


Necessary Bandwidth

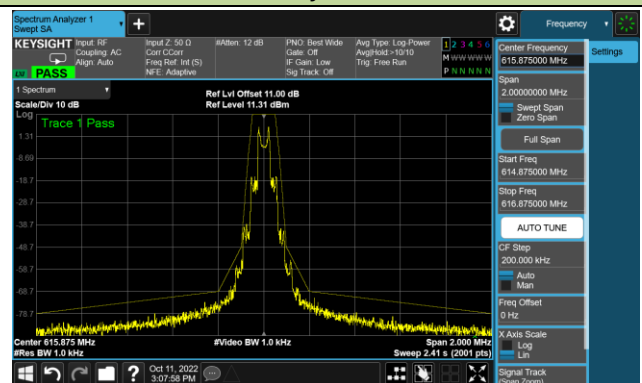


615.875MHz (J11 Band)

Unmodulated Carrier Reference Level



Necessary Bandwidth



A.3 Radiated Spurious Emission Test Result

Test Site	WZ-AC1	Test Engineer	Edith Yu
Test Date	2022-10-10 ~ 2022-10-11	Group	BLX1 H11

Test Frequency (MHz)	Frequency (MHz)	Reading Level (dBm)	Substitution Factor (dB)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
572.125	191.505	-99.5	28.0	-71.5	-54.0	-17.5	Peak	Horizontal
	717.730	-100.6	37.8	-62.8	-54.0	-8.8	Peak	Horizontal
	92.080	-99.6	31.1	-68.5	-54.0	-14.5	Peak	Vertical
	750.225	-100.0	36.7	-63.3	-54.0	-9.3	Peak	Vertical
	1146.875	-53.1	2.3	-50.8	-30.0	-20.8	Peak	Horizontal
	2862.375	-59.2	10.4	-48.8	-30.0	-18.8	Peak	Horizontal
	1716.750	-59.9	5.2	-54.7	-30.0	-24.7	Peak	Vertical
	2862.375	-62.2	11.0	-51.2	-30.0	-21.2	Peak	Vertical
584.125	213.330	-100.2	27.9	-72.3	-54.0	-18.3	Peak	Horizontal
	693.965	-100.0	36.8	-63.2	-54.0	-9.2	Peak	Horizontal
	91.110	-100.7	31.6	-69.1	-54.0	-15.1	Peak	Vertical
	745.375	-99.5	36.4	-63.1	-54.0	-9.1	Peak	Vertical
	1170.375	-55.1	3.8	-51.3	-30.0	-21.3	Peak	Horizontal
	2921.125	-55.7	10.4	-45.3	-30.0	-15.3	Peak	Horizontal
	2921.125	-56.7	10.9	-45.8	-30.0	-15.8	Peak	Vertical
	11545.625	-70.0	27.2	-42.8	-30.0	-12.8	Peak	Vertical
595.850	183.260	-101.1	28.8	-72.3	-54.0	-18.3	Peak	Horizontal
	710.940	-99.7	37.3	-62.4	-54.0	-8.4	Peak	Horizontal
	110.995	-100.6	30.0	-70.6	-54.0	-16.6	Peak	Vertical
	776.415	-100.3	36.8	-63.5	-54.0	-9.5	Peak	Vertical
	1193.875	-55.0	4.7	-50.3	-30.0	-20.3	Peak	Horizontal
	2979.875	-55.5	10.4	-45.1	-30.0	-15.1	Peak	Horizontal
	1193.875	-59.0	6.2	-52.8	-30.0	-22.8	Peak	Vertical
	2979.875	-55.9	10.9	-45.0	-30.0	-15.0	Peak	Vertical

Note 1: Measure Level (dBm) = Reading Level (dBm) + Substitution Factor (dB)

Note 2: For emission below 1GHz:

Substitution Factor (dB) = Cable Loss (dB) + Space Attenuation (dB) - Antenna Gain (dBi) - 2.15 (dB)

For emission above 1GHz:

Substitution Factor (dB) = Cable Loss (dB) + Space Attenuation (dB) - Antenna Gain (dBi) -

Pre_Amplifier Gain (dB)

Note 3: For emission below 1GHz:

QP measurement was not performed when peak level was lower than 6dB below the QP limit.

For emission above 1GHz:

RMS measurement was not performed when peak level was lower than 6dB below the RMS limit.

Test Site	WZ-AC1	Test Engineer	Edith Yu
Test Date	2022-10-10 ~ 2022-10-11	Group	BLX1 J11

Test Frequency (MHz)	Frequency (MHz)	Reading Level (dBm)	Substitution Factor (dB)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
596.125	188.595	-100.4	28.1	-72.3	-54.0	-18.3	Peak	Horizontal
	747.315	-97.9	36.6	-61.3	-54.0	-7.3	Peak	Horizontal
	91.110	-100.7	31.6	-69.1	-54.0	-15.1	Peak	Vertical
	747.315	-97.1	36.6	-60.5	-54.0	-6.5	Peak	Vertical
	1193.875	-54.6	4.7	-49.9	-30.0	-19.9	Peak	Horizontal
	3579.125	-65.8	13.0	-52.8	-30.0	-22.8	Peak	Horizontal
	1193.875	-58.1	6.2	-51.9	-30.0	-21.9	Peak	Vertical
	3579.125	-65.1	13.6	-51.5	-30.0	-21.5	Peak	Vertical
606.150	186.170	-101.0	28.5	-72.5	-54.0	-18.5	Peak	Horizontal
	747.315	-98.9	36.6	-62.3	-54.0	-8.3	Peak	Horizontal
	98.870	-101.3	29.9	-71.4	-54.0	-17.4	Peak	Vertical
	747.315	-98.9	36.6	-62.3	-54.0	-8.3	Peak	Vertical
	1211.500	-55.7	4.1	-51.6	-30.0	-21.6	Peak	Horizontal
	10793.625	-71.6	28.5	-43.1	-30.0	-13.1	Peak	Horizontal
	1211.500	-60.1	5.3	-54.8	-30.0	-24.8	Peak	Vertical
	3032.750	-63.7	11.1	-52.6	-30.0	-22.6	Peak	Vertical
615.875	195.870	-101.2	28.3	-72.9	-54.0	-18.9	Peak	Horizontal
	839.465	-100.1	37.9	-62.2	-54.0	-8.2	Peak	Horizontal
	113.420	-101.5	30.7	-70.8	-54.0	-16.8	Peak	Vertical
	838.980	-100.2	38.0	-62.2	-54.0	-8.2	Peak	Vertical
	1229.125	-59.1	3.2	-55.9	-30.0	-25.9	Peak	Horizontal
	10476.375	-71.7	27.9	-43.8	-30.0	-13.8	Peak	Horizontal
	3079.750	-64.2	11.3	-52.9	-30.0	-22.9	Peak	Vertical
	10482.250	-70.9	27.1	-43.8	-30.0	-13.8	Peak	Vertical

Note 1: Measure Level (dBm) = Reading Level (dBm) + Substitution Factor (dB)

Note 2: For emission below 1GHz:

Substitution Factor (dB) = Cable Loss (dB) + Space Attenuation (dB) - Antenna Gain (dBi) - 2.15 (dB)

For emission above 1GHz:

Substitution Factor (dB) = Cable Loss (dB) + Space Attenuation (dB) - Antenna Gain (dBi) - Pre_Amplifier Gain (dB)

Note 3: For emission below 1GHz:

QP measurement was not performed when peak level was lower than 6dB below the QP limit.

For emission above 1GHz:

RMS measurement was not performed when peak level was lower than 6dB below the RMS limit.

Appendix B – Test Setup Photograph

Description: Radiated Spurious Emission Test Setup Below 1GHz

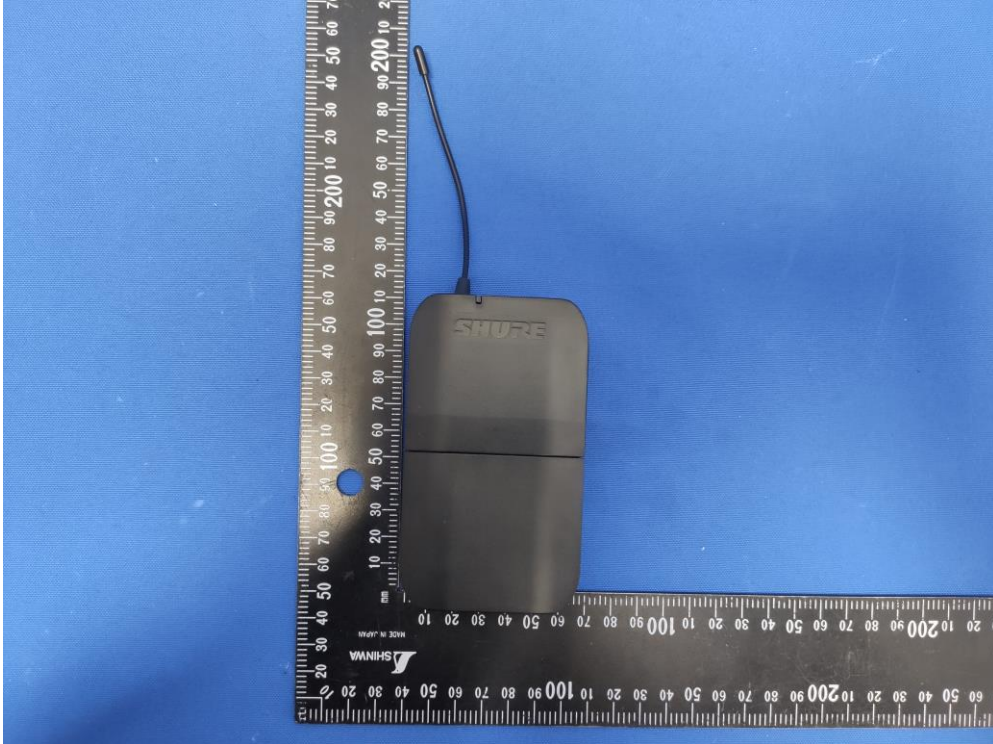


Description: Radiated Spurious Emission Test Setup Above 1GHz

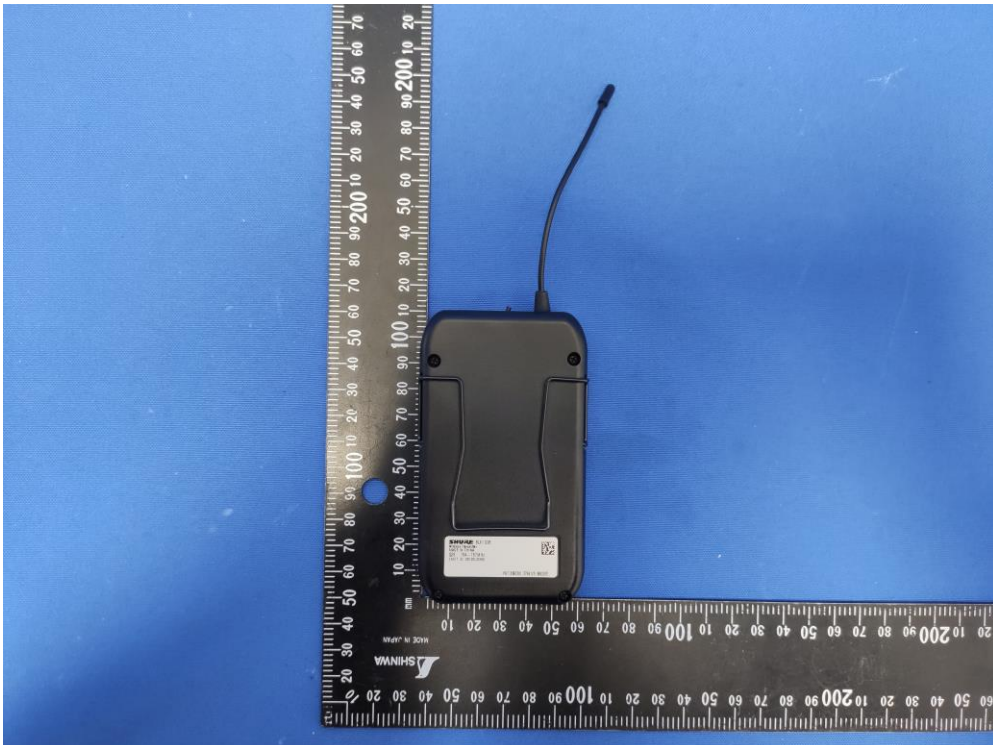


Appendix C – EUT Photograph

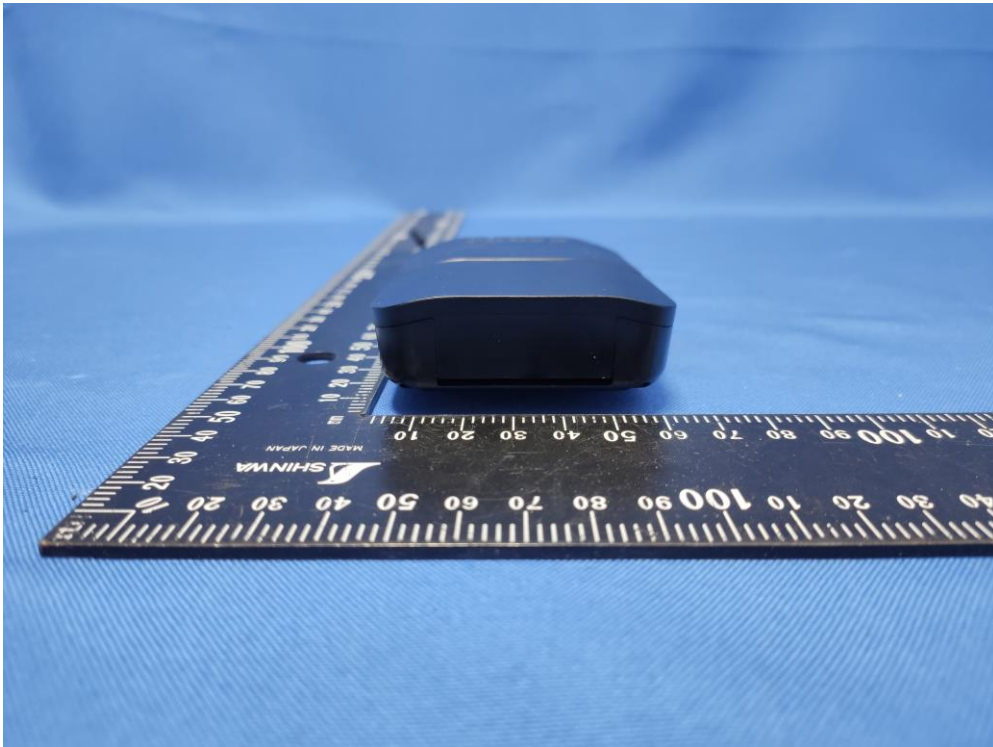
(1) EUT Photo



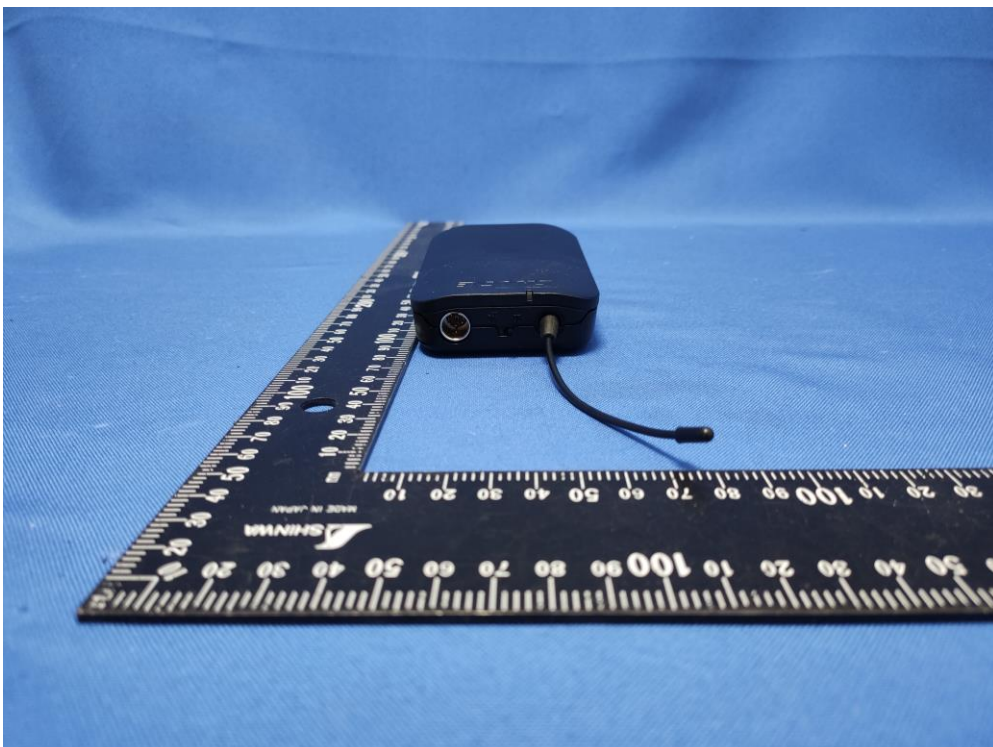
(2) EUT Photo



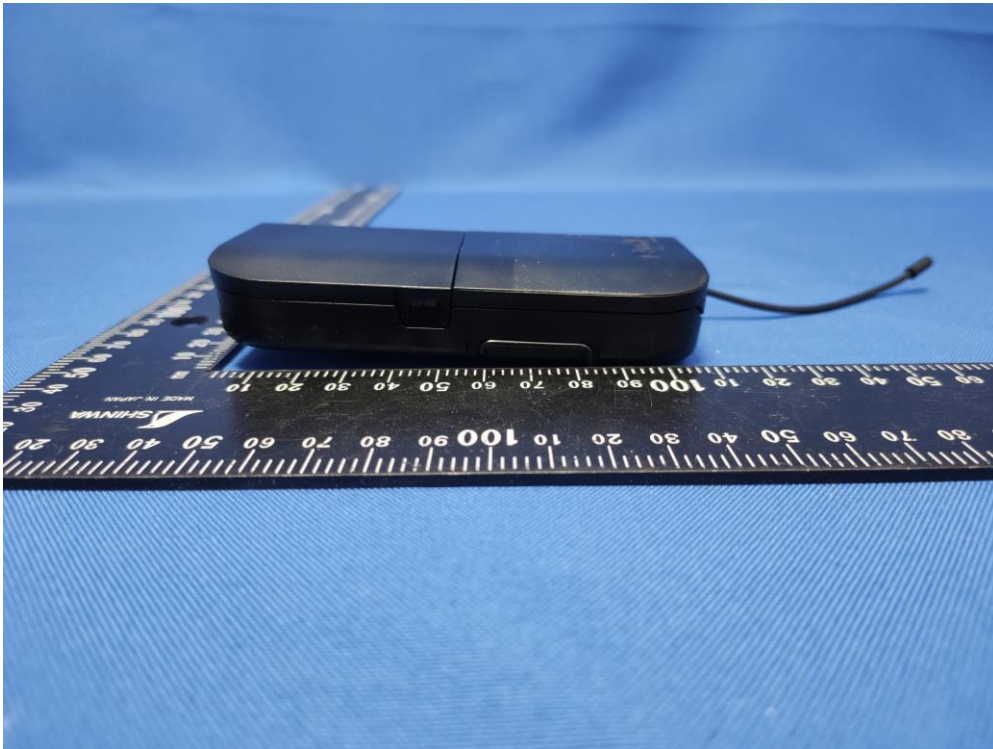
(3) EUT Photo



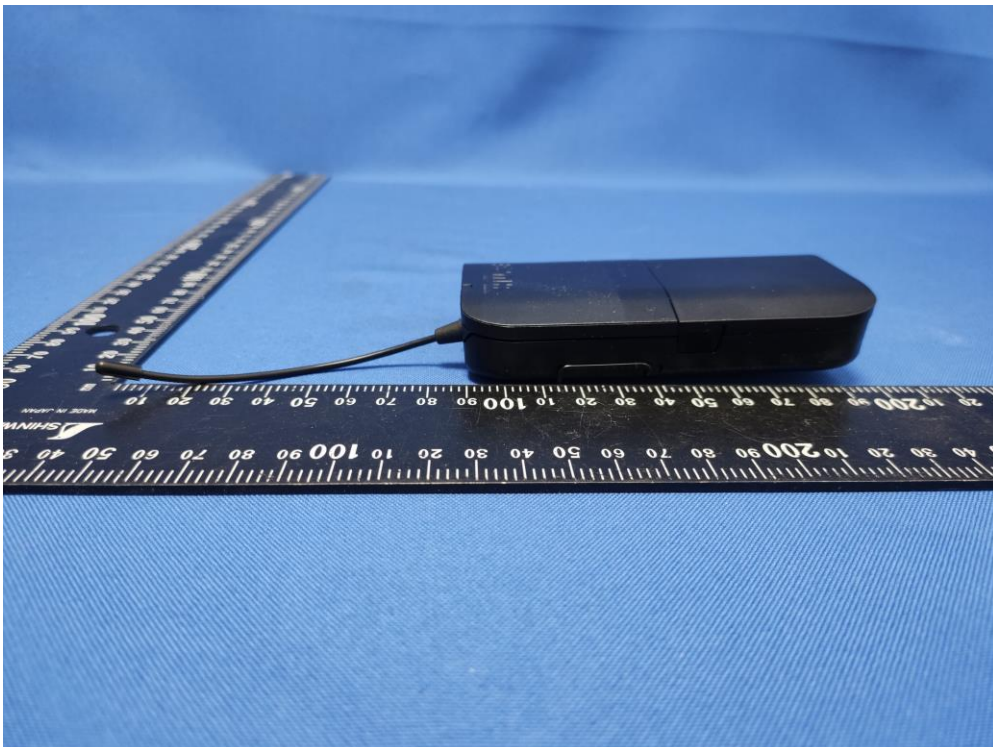
(4) EUT Photo



(5) EUT Photo



(6) EUT Photo



The End
