

TESTING CENTRE TE	TEST REPOR	T			
FCC ID:	2AV7NMWMU-5				
Test Report No:	TCT220304E004				
Date of issue::	Mar. 15, 2022				
Testing laboratory:	SHENZHEN TONGCE TESTING	G LAB			
Testing location/ address:	TCT Testing Industrial Park Fuq Street, Bao'an District Shenzher Republic of China				
Applicant's name:	GUANGZHOU RANTION TECH	INOLOGY CO., LTD.			
Address:	Room 432, Building 4, No. 50 N District, Guangzhou, China	anxiang 1st Road, Huangpu			
Manufacturer's name:	GUANGZHOU RANTION TECH	INOLOGY CO., LTD.			
Address:	Room 432, Building 4, No. 50 Nanxiang 1st Road, Huangpu District, Guangzhou, China				
Standard(s):	FCC CFR Title 47 Part 15 Subpart C Section 15.249 ANSI C63.10:2013				
Test item description:	WIRELESS MICROPHONE				
Trade Mark:	MOUKEY				
Model/Type reference:	MwmU-5, MwmU-1, MwmU-2, M MwmU-8, MwmU-9, MK0134, M MK0110, MwnUH-1, MwmU-4				
Rating(s):	DC 3V				
Date of receipt of test item:	Mar. 04, 2022				
Date (s) of performance of test:	Mar. 04, 2022 ~ Mar. 15, 2022				
Tested by (+signature) :	Brews XU Prens State				
Check by (+signature):	Beryl ZHAO Boy(Shirt CT)				
	_				

General disclaimer:

Approved by (+signature): Tomsin

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1. General Product Information

1.1. EUT description

Test item description:	WIRELESS MICROPHONE		
Model/Type reference:	MwmU-5		
Sample Number:	TCT220304E004-0101		
Operation Frequency:	905.1MHz,920.5MHz		
Number of Channel:	2		
Modulation Technology:	GFSK	(3)	
Antenna Type:	PCB Antenna		
Antenna Gain:	0dBi		
Rating(s):	DC 3V		

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

No.	Model No.	Tested with
1 (MwmU-5	
Other models	MwmU-1, MwmU-2, MwmU-3, MwmU-6, MwmU-7, MwmU-8, MwmU-9, MK0134, MK0138, MK0049, MK0109, MK0110, MwnUH-1, MwmU-4	

Note: MwmU-5 is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names. So the test data of MwmU-5 can represent the remaining models.

1.3. Operation Frequency

Channel	Frequency	Channel	Frequency
0	905.1MHz	. 1	920.5MHz

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2. Test Result Summary

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Requirement	equirement CFR 47 Section	
Antenna Requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Field Strength of Fundamental	§15.249 (a)	PASS
Spurious Emissions	§15.249 (a) (d)/ §15.209	PASS
Band Edge	§15.249 (d)/ §15.205	PASS
20dB Occupied Bandwidth	§15.215 (c)	PASS

Note:

- 1. Pass: Test item meets the requirement.
- 2. Fail: Test item does not meet the requirement.
- 3. N/A: Test case does not apply to the test object.
- 4. The test result judgment is decided by the limit of test standard.





3. General Information

3.1. Test Environment and Mode

Operating Environment:						
Condition	Radiated Emission					
Temperature:	25.2 °C					
Humidity:	51 % RH					
Atmospheric Pressure:	1010 mbar					
Test Mode:						
Engineering mode: Keep the EUT in continuous transmitting by select channel and new batteries are used during all test.						

The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case(Z axis) are shown in Test Results of the following pages.

3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
	1	1		

Note:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

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4. Facilities and Accreditations

4.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC - Registration No.: 10668A-1

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China

District Shenzhen, Guangdong, 5 to 105, People's Republic of China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB

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5. Test Results and Measurement Data

5.1. Antenna Requirement

Standard requirement:

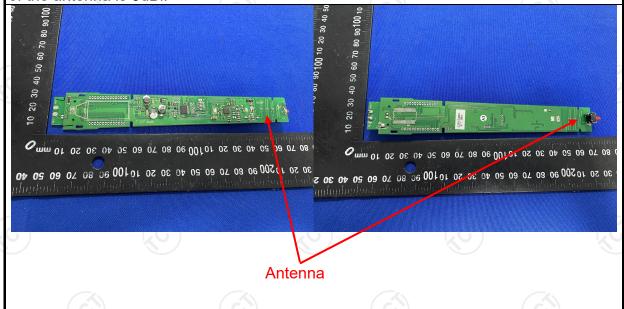
FCC Part15 C Section 15.203

15.203 requirement:

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, 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.

E.U.T Antenna:

The EUT antenna is PCB antenna which permanently attached, and the best case gain of the antenna is 0dBi.





5.2. Conducted Emission

5.2.1. Test Specification

Test Requirement:	FCC Part15 C Section	15.207	60		
Test Method:	ANSI C63.10:2013				
Frequency Range:	150 kHz to 30 MHz	<u>(~)</u>	(c^{i})		
Receiver setup:	RBW=9 kHz, VBW=30	kHz, Sweep time	=auto		
	Frequency range	Limit (dBuV)		
	(MHz)	Quasi-peak	Average		
Limits:	0.15-0.5	66 to 56*	56 to 46*		
	0.5-5	56	46		
	5-30	60	50		
	Refere	nce Plane	201		
Test Setup:	AUX Equipment E.U.T Test table/Insulation plane Remark: E.U.T: Equipment Under Test LISN: Line Impedence Stabilization Network Test table height=0.8m				
Test Mode:	Transmitting Mode				
Test Procedure:	 The E.U.T and simulation power through a line (L.I.S.N.). This proimpedance for the magnetic power through a LI coupling impedance refer to the block photographs). Both sides of A.C. conducted interferer emission, the relative magnetic power through a LI coupling impedance refer to the block photographs). 	e impedance stab ovides a 50ohm neasuring equipm ses are also conne SN that provides with 50ohm tern diagram of the line are checkence. In order to fine e positions of equ	bilization network n/50uH coupling ent. ected to the main a 50ohm/50uH nination. (Please test setup and ed for maximum and the maximum ipment and all of		
	the interface cables ANSI C63.10:2013 of		_		



5.3. Radiated Emission Measurement

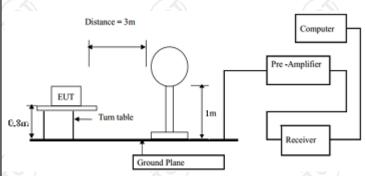
5.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209					
Test Method:	ANSI C63.10:2013					
Frequency Range:	9 kHz to 25 GHz					
Measurement Distance:	3 m	K				
Antenna Polarization:	Horizontal &	& Vertical				
Receiver Setup:	Frequency 9kHz- 150kHz 150kHz- 30MHz 30MHz-1GHz	Detector Quasi-peak Quasi-peak Quasi-peak	RBW 200Hz 9kHz	VBW 1kHz 30kHz 300kHz	Remark Quasi-peak Value Quasi-peak Value Quasi-peak Value	
	Above 1GHz	Peak Peak	1MHz 1MHz	3MHz 10Hz	Peak Value Average Value	
Limit(Field strength of the fundamental signal):	Freque 902MHz-9		Limit (dBu)		Remark Quasi-peak Value	
Limit(Spurious Emissions):	Frequency 0.009-0.490 0.490-1.705 1.705-30 30MHz-88MHz 88MHz-216MHz 216MHz-960MHz 960MHz-1GHz		Limit (dBuV/m @3m) 2400/F(KHz) 24000/F(KHz) 30 40.0 43.5 46.0 54.0		Remark Quasi-peak Value Average Value	
Limit (band edge) :	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209,					
Test Procedure:	 whichever is the lesser attenuation. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber in below 1GHz, 1.5m above the ground in above 1GHz. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 					



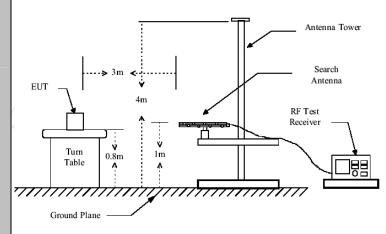
- 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

For radiated emissions below 30MHz



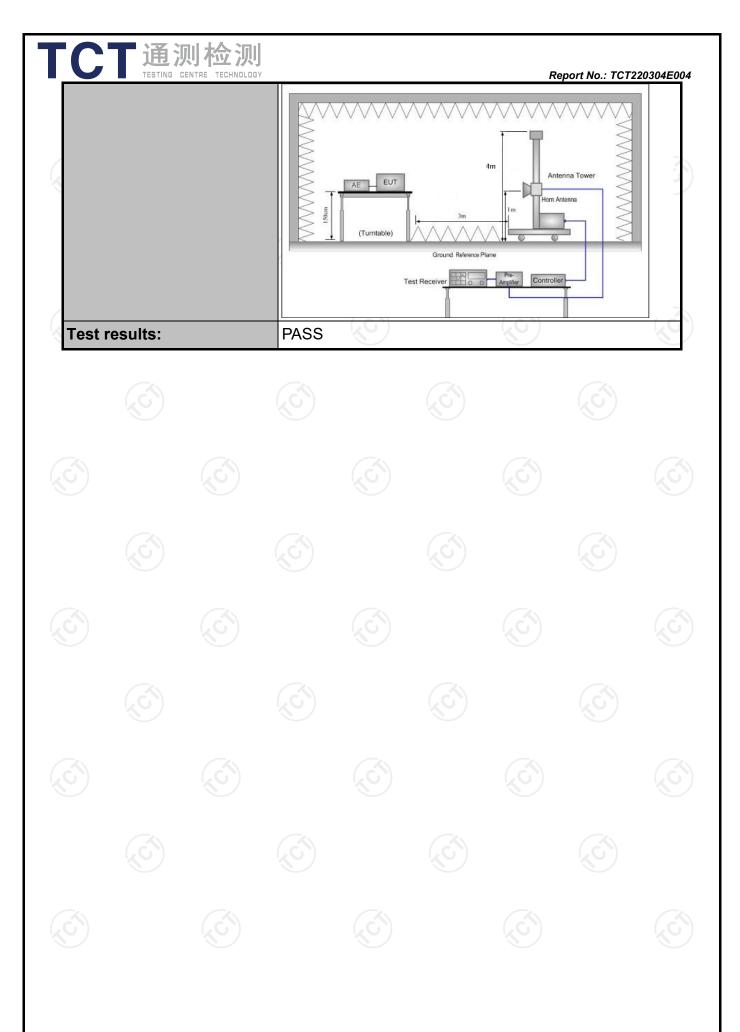
30MHz to 1GHz

Test setup:



Above 1GHz

(The diagram below shows the test setup that is utilized to make the measurements for emission from 1GHz to the tenth harmonic of the highest fundamental frequency or to 40GHz emissions, whichever is lower.)







5.3.2. Test Instruments

	Radiated En	nission Test Site	e (966)	
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESIB7	100197	Jul. 07, 2022
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 07, 2022
Pre-amplifier	SKET	LNPA_0118G- 45	SK2021012 102	Feb. 24, 2023
Pre-amplifier	SKET	LNPA_1840G- 50	SK2021092 03500	Apr. 08, 2022
Pre-amplifier	HP	8447D	2727A05017	Jul. 07, 2022
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 05, 2022
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Apr. 10, 2023
Antenna Mast	Keleto	RE-AM	N/A	N/A
Coaxial cable	SKET	RC_DC18G-N	N/A	Apr. 08, 2022
Coaxial cable	SKET	RC-DC18G-N	N/A_	Apr. 08, 2022
Coaxial cable	SKET	RC-DC40G-N	N/A	Jul. 07, 2022
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A



5.3.3. Test Data

Field Strength of Fundamental

Frequency (MHz)	Emission QP (dBuV/m)	Horizontal /Vertical	Limits QP (dBuV/m)	Margin (dB)
905.1	90.41	Н	94	-20.35
905.1	85.57	V	94	-26.65
920.5	90.23	н	94	-19.48
920.5	84.82	V	94	-25.32

Spurious Emissions

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dBµV/m)	Limit@3m (dBµV/m)		
<u> </u>	(8)			
(6)	(5)	(6) (6		

Note: 1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor.

- 2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.
- 3. For fundamental frequency, RBW >20dB BW , VBW>=RBW, PK detector is for PK value, RMS detector is for AV value.

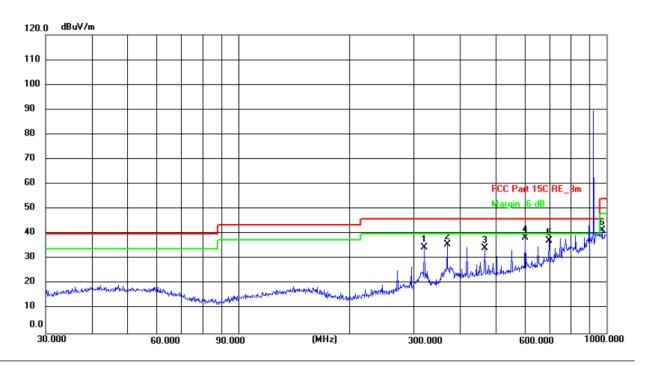




Frequency Range (30MHz-1GHz)

Report No.: TCT220304E004

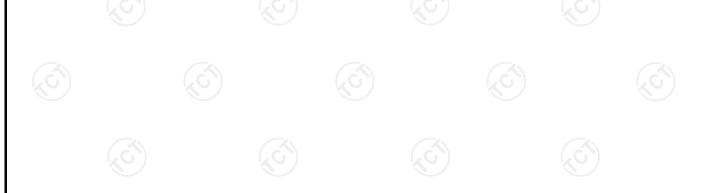
Horizontal:



Site #2 3m Anechoic Chamber Polarization: Horizontal Temperature: 25.2(C) Humidity: 51 %

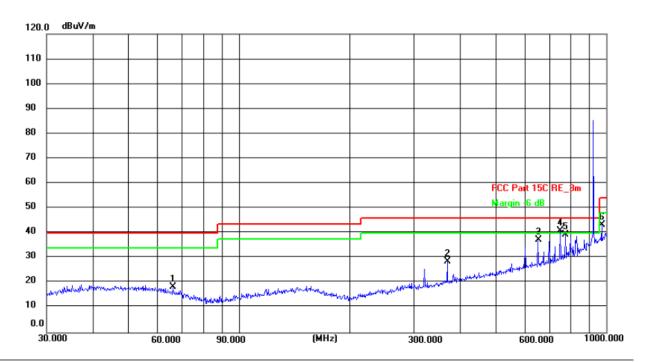
Limit: FCC Part 15C RE_3m Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	319.9368	20.27	14.44	34.71	46.00	-11.29	peak	Р	
2	369.4045	19.78	16.18	35.96	46.00	-10.04	peak	Р	
3	467.2348	15.67	18.69	34.36	46.00	-11.64	peak	Р	
4 *	601.4265	17.41	21.28	38.69	46.00	-7.31	peak	Р	
5	699.3043	14.48	22.84	37.32	46.00	-8.68	peak	Р	
6	972.3373	14.39	27.15	41.54	54.00	-12.46	peak	Р	









Site #2 3m Anechoic Chamber Polarization: Vertical Temperature: 25.2(C) Humidity: 51 % Limit: FCC Part 15C RE_3m Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	66.2660	6.69	11.86	18.55	40.00	-21.45	peak	Р	
2	369.4045	12.44	16.18	28.62	46.00	-17.38	peak	Р	
3	651.9416	15.36	22.09	37.45	46.00	-8.55	peak	Р	
4 *	750.1082	16.90	23.96	40.86	46.00	-5.14	peak	Р	
5	774.1584	14.91	24.49	39.40	46.00	-6.60	peak	Р	
6	972.3373	16.15	27.15	43.30	54.00	-10.70	peak	Р	





Above 1GHz

				Above	TGHZ				
				Low channe	l: 905.1MF	Ηz			
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak	n Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
1810.2	Н	52.83		-3.94	48.89		74	54	-5.11
2715.3	Н	47.58		0.52	48.10		74	54	-5.90
1810.2	V	51.25		-3.94	47.31		74	54	-6.69
2715.3	V	46.86	- (.G	0.52	47.38	· G - }-	74	54	-6.62
				/					

			ŀ	High channe	el: 920.5MF	Hz			
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBµV)	Correction Factor (dB/m)	Emission Peak (dBµV/m)	n Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
1841.0	Н	51.97		-3.98	47.99		74	54	-6.01
2761.5	Н	46.44		0.57	47.01		74	54	-6.99
	4-		-	·	-			-	
	(O)		I _Z C	· `)		(° O		(20)	
1841.0	V	52.90		-3.98	48.92	<u></u>	74	54	-5.08
2761.5	V	47.32	-	0.57	47.89		74	54	-6.11

Note:

- 1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss Pre-amplifier
- 2. Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)
- 3. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 5. Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
- 6. All the restriction bands are compliance with the limit of 15.209.



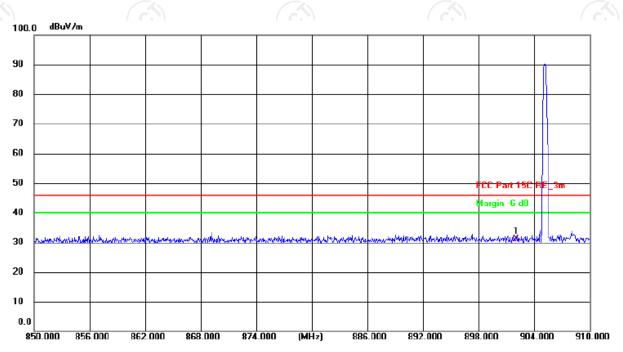
Report No.: TCT220304E004



Band Edge Requirement

Lowest channel 905.1:

Horizontal:



Temperature: 25.0(C) Humidity: 53 % Site #2 3m Anechoic Chamber Polarization: Horizontal

Limit: FCC Part 15C RE_3m

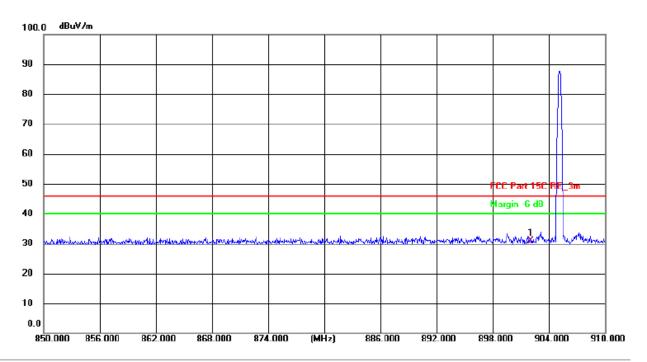
Power: DC 3 V Reading Limit Frequency Factor Level Margin Detector P/F No. Remark (MHz) (dBuV) (dB/m) (dBuV/m) (dBuV/m) (dB) 1 * 902.0000 4.62 26.48 31.10 46.00 -14.90 QP Р



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Vertical:



Site #2 3m Anechoic Chamber

Polarization: Vertical

Temperature: 25.0(C) Humidity: 53 %

Limit: FCC Part 15C RE_3m

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	902.0000	4.34	26.48	30.82	46.00	-15.18	QP	Р	











































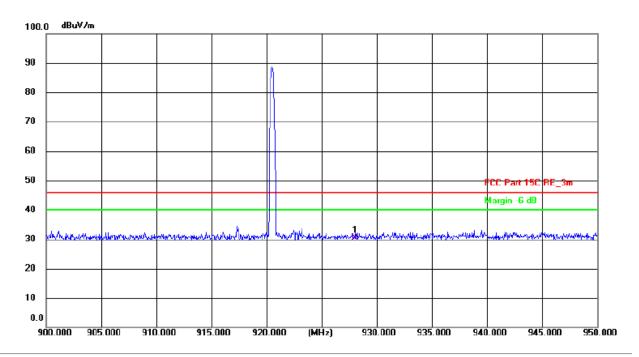






Highest channel 920.5:

Horizontal:



Site #2 3m Anechoic Chamber Polarization: Horizontal Temperature: 25.0(C) Humidity: 53 %

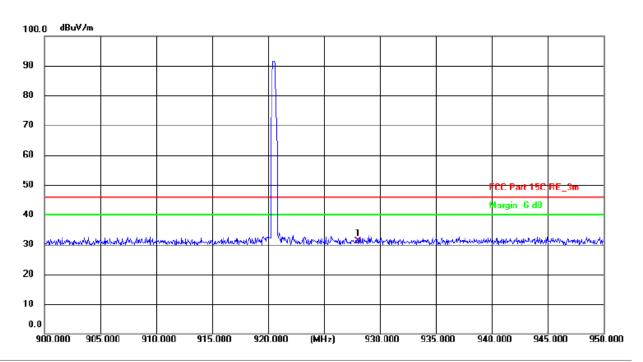
Limit: FCC Part 15C RE_3m Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	928.0000	3.61	26.73	30.34	46.00	-15.66	QP	Р	





Vertical:



Site #2 3m Anechoic Chamber

Polarization: Vertical

Temperature: 25.0(C)

Humidity: 53 %

Limit: FCC Part 15C RE_3m

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	928.0000	4.35	26.73	31.08	46.00	-14.92	QP	Р	



















































5.4. 20dB Occupied Bandwidth

5.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)							
Test Method:	ANSI C63.10: 2013							
Limit:	N/A							
Test Procedure:	 According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. Set to the maximum power setting and enable the EUT transmit continuously. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW≥1% of the 20 dB bandwidth; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. Measure and record the results in the test report. 							
Test setup:	Spectrum Analyzer EUT							
Test Mode:	Transmitting mode with modulation							
Test results:	PASS							

5.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due	
Spectrum Analyzer	R&S	FSU	200054	Jul. 18, 2022	



5.4.3. Test data

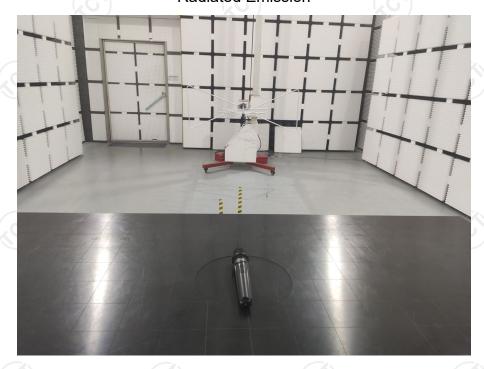
Test Channel	20dB Occupy Bandwidth (kHz)	Limit	Conclusion	
Lowest	279.45	(S)	PASS	
Highest	280.45		PASS	

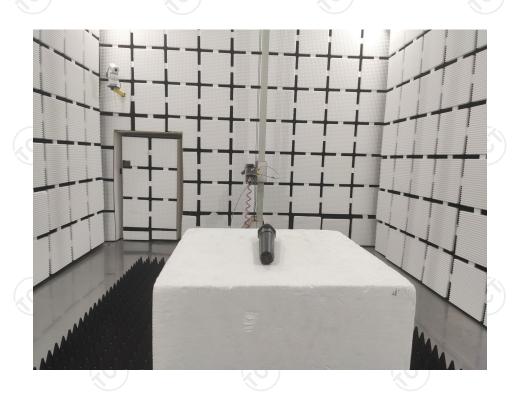
Test plo	ots as follows	5:			



Appendix A: Photographs of Test Setup

Product: WIRELESS MICROPHONE Model: MwmU-5 Radiated Emission







Appendix B: Photographs of EUT Product: WIRELESS MICROPHONE

Model: MwmU-5 External Photos



















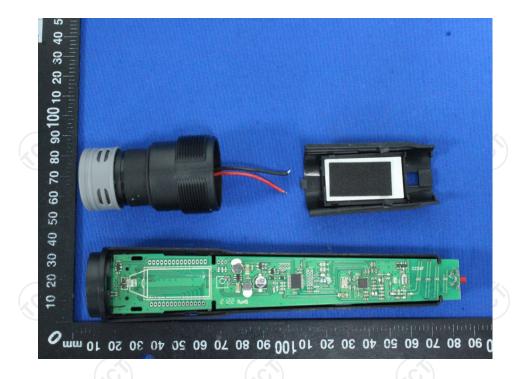
Product: WIRELESS MICROPHONE Model: MwmU-5 Internal Photos

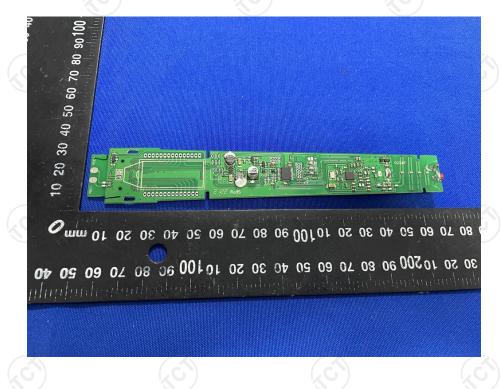






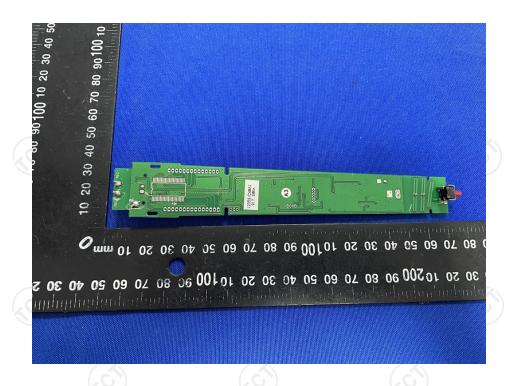


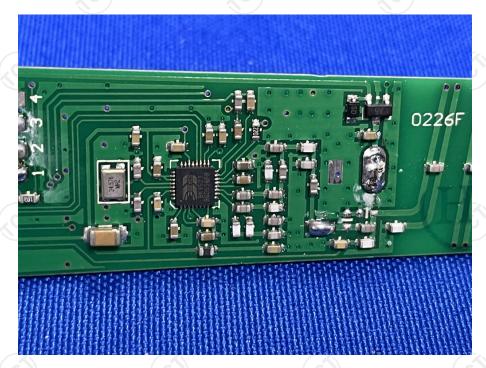












*****END OF REPORT****