

TEST REPORT

Applicant Name : The Singing Machine Company, Inc.
Address : 6301 NW 5th Way, Suite 2900, Fort Lauderdale, FL, 33309, U.S.A.
Report Number : RA230510-25333E-RF
FCC ID: 2AAXO-MIC9010

Test Standard (s)

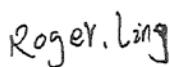
FCC PART 15.236

Sample Description

Product Type: Wireless Microphone
Model No.: MIC9010
Trade Mark: Singing Machine
Date Received: 2023-05-10
Date of Test: 2023-05-18 to 2023-06-14
Report Date: 2023-06-14

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Roger Ling
EMC Engineer

Approved By:

Candy Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk ★.

Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk **. Customer model name, addresses, names, trademarks etc. are not considered data.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230510-25333E-RF	Original Report	2023-06-14

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Wireless Microphone
Tested Model	MIC9010
Frequency Range	210.475MHz
EIRP	16.04dBm
Antenna Specification	Internal Antenna: 0dBi (provided by the applicant)
Voltage Range	DC1.5V*2 AAA battery
Sample serial number	2508-1(CE&RE Test); 2508-3 (RF Conducted Test) (Assigned by ATC, Shenzhen)
Sample/EUT Status	Good condition

Objective

This type approval report is prepared in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine Compliant with FCC Part 15, Subpart C, and section 15.205, 15.209 and 15.236 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliant Testing of Unlicensed Wireless Devices, and ETSI EN 300 422-1 V1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter	Uncertainty	
Occupied Channel Bandwidth	5%	
RF output power, conducted	0.71dB	
Unwanted Emission, conducted	1.6dB	
Emissions, Radiated	9kHz - 30MHz	2.06dB
	30MHz - 1GHz	5.08dB
	1GHz- 18GHz	4.96dB
	18GHz- 26.5GHz	5.16dB
Temperature	1°C	
Humidity	6%	
Supply voltages	0.4%	

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189.

Accredited by American Association for Laboratory Accreditation (A2LA).The Certificate Number is 4297.01.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 30241.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in engineering mode and the power is default, which was provided and declared by manufacturer.

Test frequency: 210.475MHz

Special Accessories

No special accessories was used

EUT Exercise Software

No software used in test.

Equipment Modifications

No modifications were made to the unit tested.

Local Support Equipment

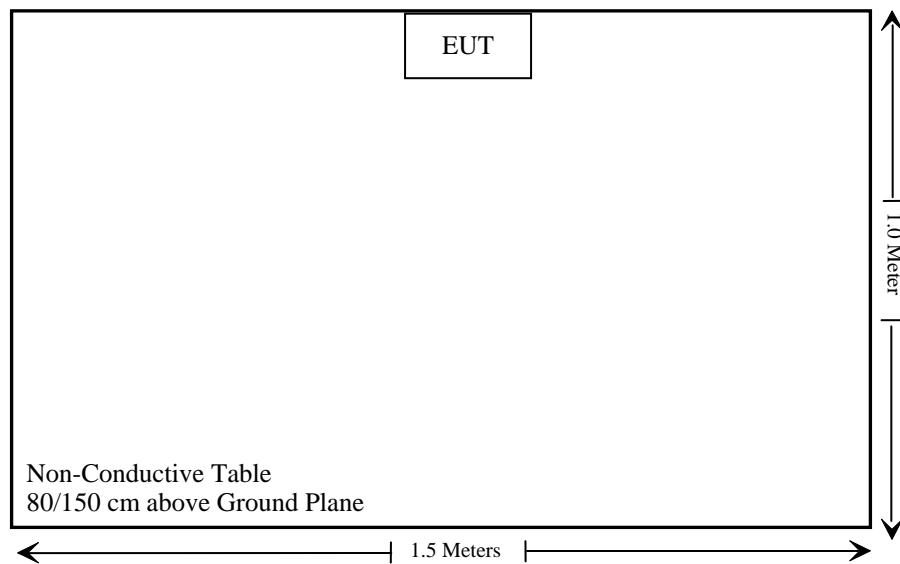
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup

For Radiated Emissions:



Note: the support table edge was flush with the center of turntable.

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.247 (i), §1.1307 (b) (1) &§2.1093	RF EXPOSURE	Compliant
§15.207(a)	AC Line Conducted Emissions	Not Applicable
§15.236(d)	Peak Output Power Measurement	Compliant
§15.236(f)(2)	Occupied Bandwidth & Emission Mask	Compliant
§15.236(g)	Spurious Emissions At The Antenna Port	Compliant
§15.236(f)(3)	Frequency Stability	Compliant

Note: The device is powered by battery only.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
Rohde& Schwarz	Spectrum Analyzer	FSV40	101949	2022/11/25	2023/11/24
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2023/02/14	2026/02/13
Schwarzbeck	Horn Antenna	BBHA9120D	837	2023/02/22	2026/02/21
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-655	2022/12/26	2025/12/25
Agilent	Signal Generator	N5183A	MY51040755	2022/11/25	2023/11/24
Unknown	RF CoaxialCable	No.10	N050	2022/11/25	2023/11/24
Unknown	RF CoaxialCable	No.11	N1000	2022/11/25	2023/11/24
Unknown	RF CoaxialCable	No.12	N040	2022/11/25	2023/11/24
Unknown	RF CoaxialCable	No.13	N300	2022/11/25	2023/11/24
Unknown	RF CoaxialCable	No.14	N800	2022/11/25	2023/11/24
Unknown	RF CoaxialCable	No.16	N200	2022/11/25	2023/11/24
Radiated Emission Test Software:e3 191218 (V9)					
RF Conducted Test					
Rohde& Schwarz	Spectrum Analyzer	FSV-40	101495	2022/11/25	2023/11/24
WEINSCHEL	10dB Attenuator	5324	AU 3842	2022/11/25	2023/11/24
BACL	Temp. & Humid. Chamber	BTH-150-40	30192	2023/02/09	2024/02/08
Fluke	Multi Meter	45	7664009	2022/11/23	2023/11/22
Manson	DC Power Source	KPS-6604	ATCS-205	NCR	NCR
Unknown	RF CoaxialCable	No.31	RF-01	Each time	

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.247 (i), §1.1307 (b) (1) &§2.1093 – RF EXPOSURE**Applicable Standard**

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$

1. $f(\text{GHz})$ is the RF channel transmit frequency in GHz.

2. Power and distance are rounded to the nearest mW and mm before calculation.

3. The result is rounded to one decimal place for comparison.

4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

Test Result:**For worst case:**

Frequency (MHz)	Maximum Tune-up power		Calculated Distance (mm)	Calculated Value	Threshold (10-g Extremity SAR)	SAR Test Exclusion
	(dBm)	(mW)				
210.475	17.0	50.12	5	4.6	7.5	Yes

Note: The device is a handheld.

Result: Compliant.

FCC §15.236(d) - RF OUTPUT POWER

Applicable Standard

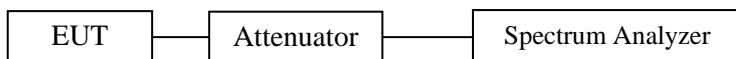
FCC §15.236(d)

The maximum radiated power shall not exceed the following values:

- (1) In the bands allocated and assigned for broadcast television and in the 600 MHz service band: 50 mW EIRP
- (2) In the 600 MHz guard band and the 600 MHz duplex gap: 20 mW EIRP.

Test Procedure

- 1) Connect the equipment as below setup block.



- 2) Correct for all losses in the RF path.
- 3) Set the RBW of 100kHz and VBW of 300kHz for Spectrum Analyzer.
- 4) Detector of Peak.
- 5) Trace mode is Maxhold.
- 6) Allow trace to fully stabilize.
- 7) The peak value recorded is the conducted output power.

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	53 %
ATM Pressure:	101.0 kPa

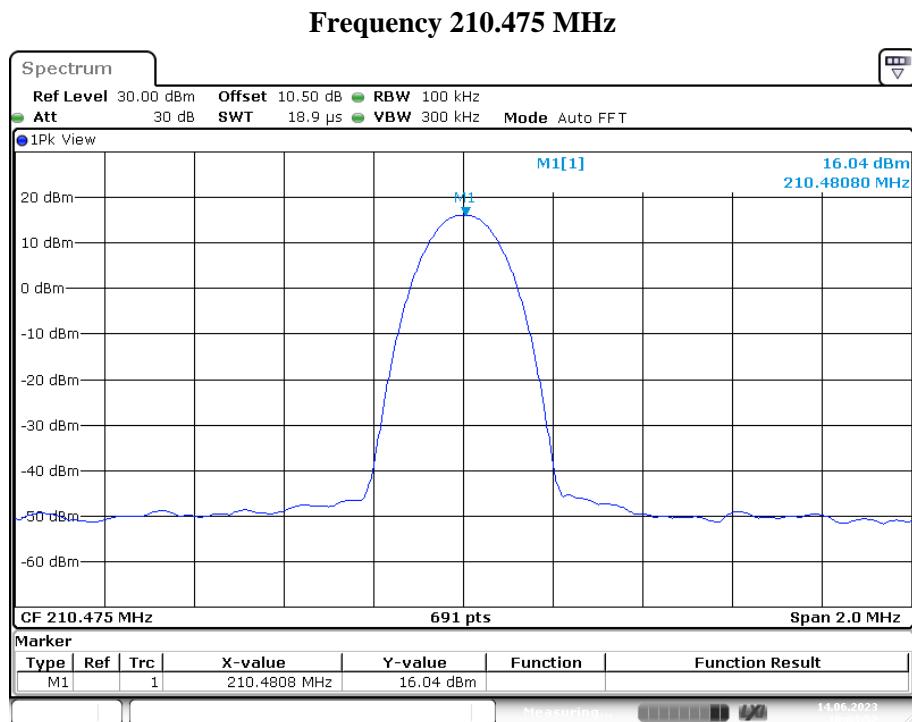
The testing was performed by Jason Liu on 2023-06-14.

Test Mode: Transmitting

Test Result: Compliant. Please refer to following table and plots.

Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP		Limit [mW]	Verdict
			dBm	mW		
210.475	16.04	0	16.04	40.18	50	PASS

Note: The antenna gain is 0 dBi which was added into the EIRP.



FCC §15.236(f) (2)(g) – OPERATING BANDWIDTH & EMISSION MASK

Applicable Standard

According to FCC§15.236 (f) (2):

(f) The operating frequency within a permissible band of operation as defined in paragraph (c) must comply with the following requirements.

One or more adjacent 25 kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200 kHz.

(g) Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in § 8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement. Emissions outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08).

Test Procedure

The operating bandwidth is according to ANSI C63.10-2013.

The Emission mask is according to sections 8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08).

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	53-54 %
ATM Pressure:	101.0 kPa

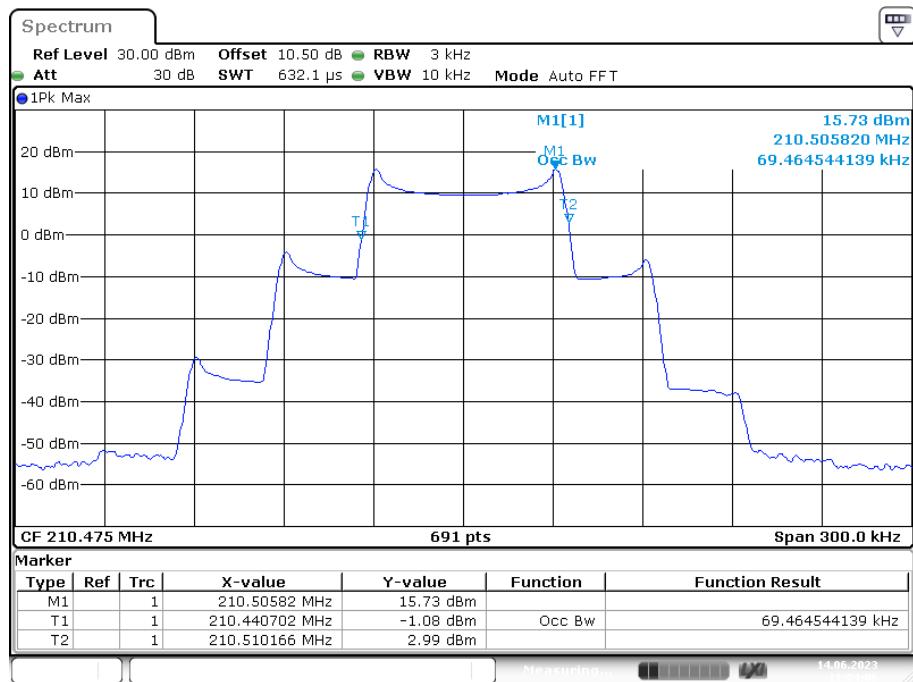
The testing was performed by Matt Liang on 2023-06-06 and 2023-06-14.

Test mode: transmitting

Test Result: Compliant. Please refer to following table and plots.

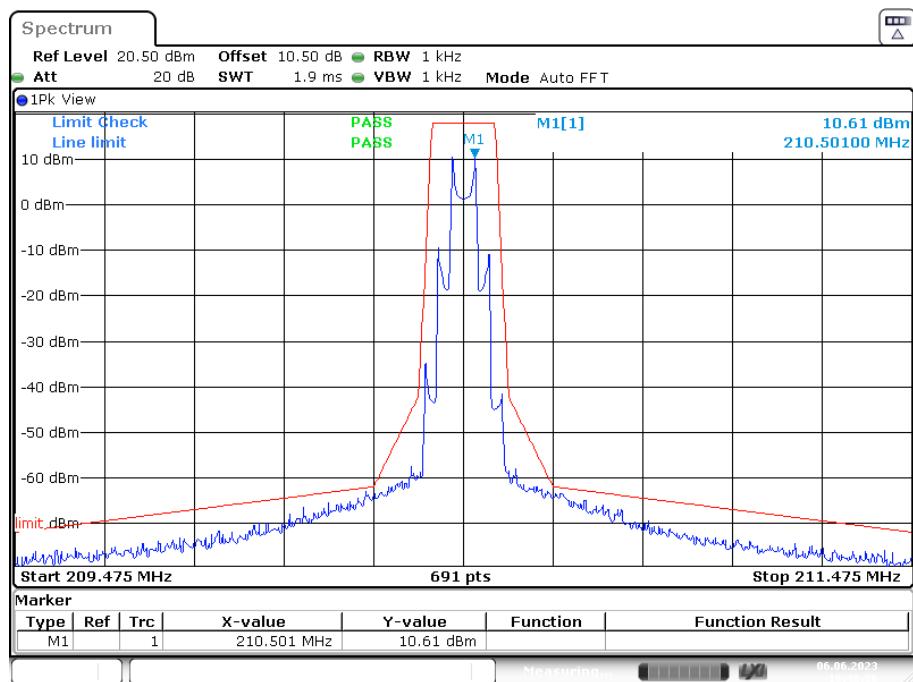
Frequency (MHz)	Emission Bandwidth (kHz)	Limit (kHz)	Result
210.475	69.46	200	PASS

Frequency 210.475 MHz: Emission Bandwidth



Date: 14.JUN.2023 11:04:07

Frequency 210.475 MHz: Emission Mask



Date: 6.JUN.2023 19:48:37

FCC §15.236(g) - FIELD STRENGTH OF SPURIOUS EMISSION

Applicable Standard

According to FCC § 15.236(g)

Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in § 8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement. Emissions outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08).

Table 3: Limits for spurious emissions

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 1 000 MHz	Frequencies above 1 000 MHz
Operation	4 nW	250 nW	1 μ W
Standby	2 nW	2 nW	20 nW

Test Procedure

Per ETSI EN 300 422-1 v1.4.2 (2011-08).

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Jimi Zheng on 2023-05-18.

Test Mode: Transmitting (Pre-scan in the X, Y and Z axes of orientation, the worst case X-axis of orientation was recorded)

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
420.95	-51.73	313	1.5	H	6.53	-45.2	-36	-9.2
420.95	-52.49	283	1.7	V	3.31	-49.18	-36	-13.18
631.425	-67.95	126	1.4	H	10.53	-57.42	-54	-3.42
631.425	-71.46	344	1.8	V	6.25	-65.21	-54	-11.21
841.9	-69.42	229	1.1	H	13.62	-55.8	-54	-1.8
841.9	-75.33	255	1.3	V	9.38	-65.95	-54	-11.95
1052.375	-52.22	96	1.7	H	-0.09	-52.31	-30	-22.31
1052.375	-51.97	222	1.1	V	1.2	-50.77	-30	-20.77
1262.85	-52.57	177	1.4	H	1.57	-51	-30	-21
1262.85	-51.13	135	1.5	V	2.59	-48.54	-30	-18.54
1473.325	-52.02	5	1.9	H	1.3	-50.72	-30	-20.72
1473.325	-51.6	298	1.3	V	1.83	-49.77	-30	-19.77
1683.8	-52.33	347	1.3	H	0.49	-51.84	-30	-21.84
1683.8	-52.21	211	1.0	V	0.69	-51.52	-30	-21.52
1894.275	-43.36	39	1.4	H	1.53	-41.83	-30	-11.83
1894.275	-43.91	198	1.3	V	1.78	-42.13	-30	-12.13
2104.475	-51.17	51	1.6	H	3.84	-47.33	-30	-17.33
2104.475	-51.59	25	2.0	V	3.89	-47.7	-30	-17.7

Note:

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: SG Level - Cable loss+ Antenna Gain

Margin = Absolute Level - Limit

FCC §15.236(f) (3) - FREQUENCY STABILITY

Applicable Standard

FCC §15.236(f) (3)

The operating frequency within a permissible band of operation as defined in paragraph (c) must comply with the following requirements.

- (1) The frequency selection shall be offset from the upper or lower band limits by 25 kHz or an integral multiple thereof.
- (2) One or more adjacent 25 kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200 kHz.
- (3) The frequency tolerance of the carrier signal shall be maintained within $\pm 0.005\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. Battery operated equipment shall be tested using a new battery.

Test Procedure

According to FCC 2.1055, (a) the frequency stability shall be measured with variation of ambient temperature as follows:

(1) From -30° to $+50^\circ$ centigrade for all equipment except that specified paragraphs (a)(2) and (3) of this section.

(2) From -20° to $+50^\circ$ centigrade for all equipment to be licensed for use in the Maritime Services under part 80 of this chapter, except for Class A, B and S Emergency Position Indicationg Radio beacons (EPIRBS), and equipment to be licensed for use above 952 MHz at operaion fixed stations in all services, statons in the Local Television Service and Point-to-Point Microwzve Radio Serivice under part 21 of this chapter, equipment licensed for use aboard aircraft in the Aviation Serivice under part 87 of this chapter, and equipment authorized for use in the Family Radio Serivice under part 95 of this chapter.

(3) From 0° to $+50^\circ$ centigrade for equipment to be licensed for use in the Radio Broadcast Serivices under part 73 of this chapter

(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on frequency of due to keying(except for broadcast transmitters) and any heating element cyslling normally occurring at each ambient temperature level also shall be shown. Only the portion or portons of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cyslling at the normally supply voltage and at each extreme also shall be shown.

If an unmodulated carrier is not available, the measurement method shall be described in the test report.

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

The testing was performed by Matt Liang on 2023-06-06.

Test Mode: Transmitting

Test Result: Compliant. Please refer to following table.

Reference Frequency: 210.475MHz, Limit: ±0.005%			
Environment Temperature (°C)	Power Supplied (V _{DC})	Measurement Frequency (MHz)	Frequency Error (%)
Frequency Stability versus Input Temperature			
50	3	210.47959	0.0022
40	3	210.47973	0.0022
30	3	210.47966	0.0022
20	3	210.47932	0.0021
10	3	210.47975	0.0023
0	3	210.47973	0.0022
-10	3	210.47921	0.0020
-20	3	210.47964	0.0022
-30	3	210.47982	0.0023
Frequency Stability versus Input Voltage			
20	2.7	210.47977	0.0023
20	3.3	210.47952	0.0021

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