TEST REPORT

Applicant Name :	Zeeva International Limited
Address :	Suite 1007B, 10th Floor, Exchange Tower, 33 Wang Chiu Road, Kowloon Bay, Hong Kong
Report Number :	SZ3220715-32243E-RF
FCC ID:	2ADM5-ET-0358C-40

Test Standard (s)

FCC PART 15.229

Sample Description

Product Type:	FIRE BREATHING DRAGON*PPK
Model No.:	ET-0358C
Trade Mark:	N/A
Date Received:	2022-07-15
Date of Test:	2022-07-26 to 2022-07-27
Report Date:	2022-07-29

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Jeff Jiang
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 "★".
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	FIRE BREATHING DRAGON*PPK
Tested Model	ET-0358C
SKU	Black Dragon: 6770028
UPC	Black Dragon: 1922345200350
Frequency Range	40.68MHz
Maximum Field Strength@3m	56.4 dBμV/m
Modulation Technique	ASK
Antenna Specification*	Integral antenna: 0dBi(It is provided by the applicant)
Voltage Range	DC 3V from two 1.5V batteries
Sample serial number	SZ3220715-32243E-RF-S1 (Assigned by ATC, Shenzhen)
Sample/EUT Status	Good condition

Objective

This test report is 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 compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.209, 15.215 and 15.229 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

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 Frequency		$0.082*10^{-7}$
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
	26.5GHz - 40GHz	4.72dB
Temperature		1℃
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 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. 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 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISEDC), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

EUT Exercise Software

No exercise software was made to the EUT tested.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

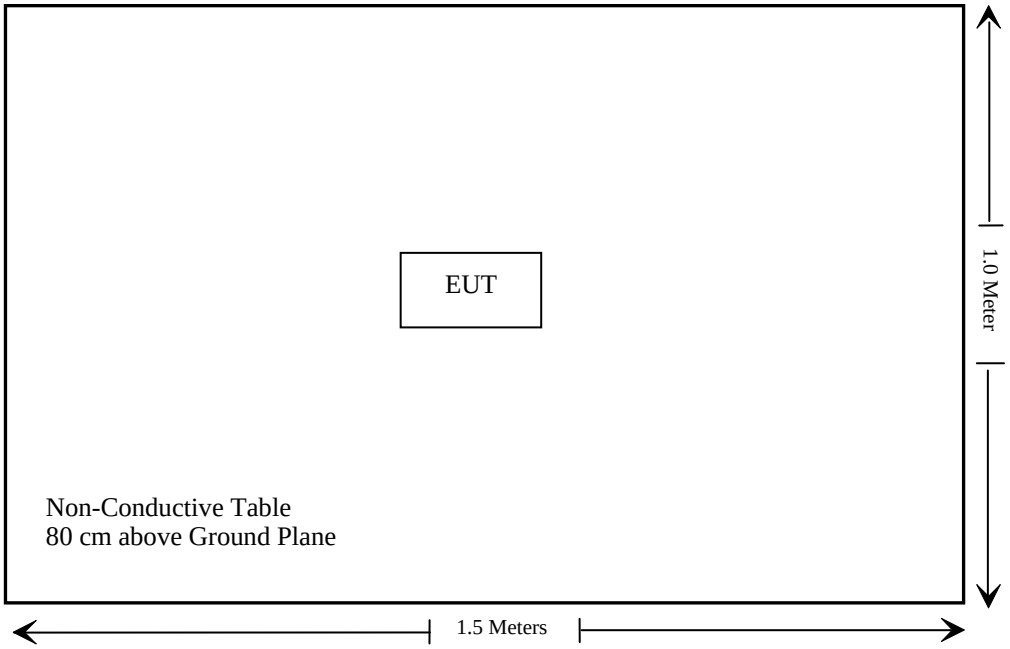
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b)	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207	AC Line Conducted Emissions	Not Applicable
§15.229 §15.209 §15.205	Radiated Emission Test	Compliant
§15.215(c)	20dB Emission Bandwidth Testing	Compliant
§15.229(d)	Frequency Tolerance	Compliant

Not Applicable: The EUT is powered by battery.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Test Receiver	ESR	101817	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
Fluke	Desktop Multi Meter	45	7664009	2021/12/14	2022/12/13
UNI-T	DC Power Supply	UTP8305B	10584	NCR	NCR
Gongwen	Temp. & Humid. Chamber	HSD-500	109	2021/12/14	2022/12/13

*** 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).

§1.1307 (b) – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b), 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 D04 Interim General RF Exposure Guidance v01, clause 2.1.2 – 1-mW test Exemption:

Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device (from the requirement to show data demonstrating compliance to RF exposure limits, as previously mentioned) if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance.
This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions. This is a standalone exemption, and it cannot be applied in conjunction with any other test exemption.

Test Result

For worst case:

Mode	Frequency	Maximum Tune-up Conducted Power		1-mW test Exemption
	(MHz)	(dBm)	(mW)	
SRD	40.68	-38	0.00016	Yes

Note: The tune-up power was declared by the applicant.

Result: Compliant.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has one integral antenna arrangement, which was permanently attached and the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to EUT photos.

Result: Compliant.

FCC §15.229, §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

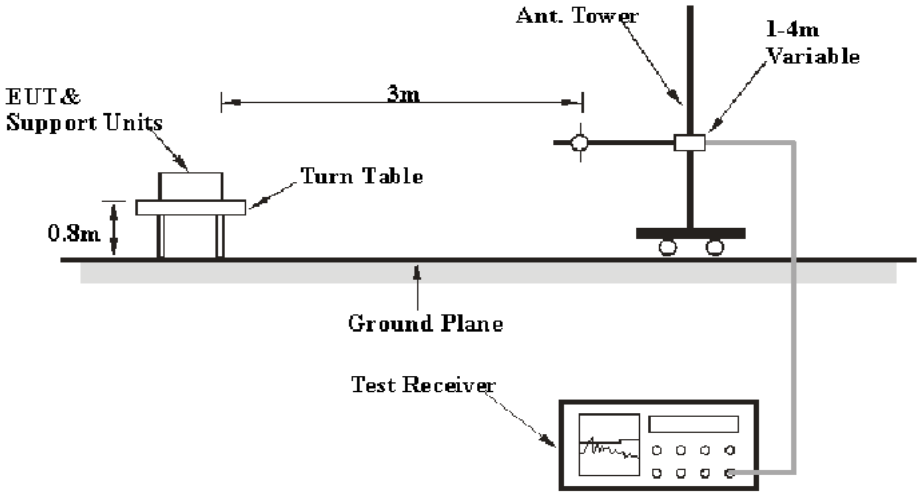
As per FCC Part 15.229

(a) Unless operating pursuant to the provisions in §15.231, the field strength of any emissions within this band shall not exceed 1,000 microvolts/meter at 3 meters.

(b) As an alternative to the limit in paragraph (a) of this section, perimeter protection systems may demonstrate compliance with the following: the field strength of any emissions within this band shall not exceed 500 microvolts/meter at 3 meters, as determined using measurement instrumentations employing an average detector. The provisions in §15.35 for limiting peak emissions apply where compliance of these devices is demonstrated under this alternative emission limit.

(c) The field strength of any emissions appearing outside of this band shall not exceed the general radiated emission limits in §15.209.

EUT Setup



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.205 and 15.209 and 15.229 limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 1000 MHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP

Test Procedure

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

All final data out of band was recorded in Quasi-peak detection mode for frequency range of 30 MHz -1 GHz, within the operating band was recorded in peak and average detection mode.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Level = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin / Over limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin/over limit of -7dB means the emission is 7dB below the limit. The equation calculation is as follows:

Margin / Over limit = Level - Limit

Test Data

Environmental Conditions

Temperature:	27 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

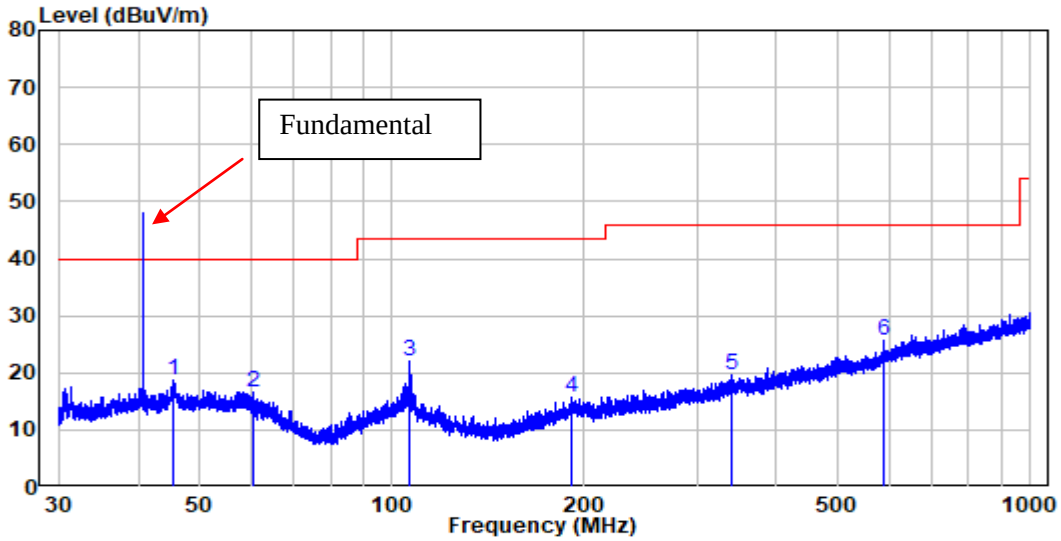
Testing was performed by Level Li on 2022-07-27.

Test mode: Transmitting (*Scan with X-AXIS, Y-AXIS, Z-AXIS, the worst case was Y-AXIS which was recorded*)

Frequency (MHz)	Reading (dBµV)	PK/QP/Ave.	Turntable Degree	Rx Antenna		Factor (dB/m)	Level (dBuV/m)	FCC PART 15.229		Remark
				Height (m)	Polar (H / V)			Limit (dBµV/m)	Margin (dB)	
40.68	60.06	PK	352	1.0	H	-10.23	49.83	60	-10.17	Fundamental
40.68	66.63	PK	125	1.8	V	-10.23	56.4	60	-3.6	
40.66	45.11	PK	114	1.5	V	-10.23	34.88	40	-5.12	Band edge
40.7	45.8	PK	111	2.0	V	-10.23	35.57	40	-4.43	Band edge

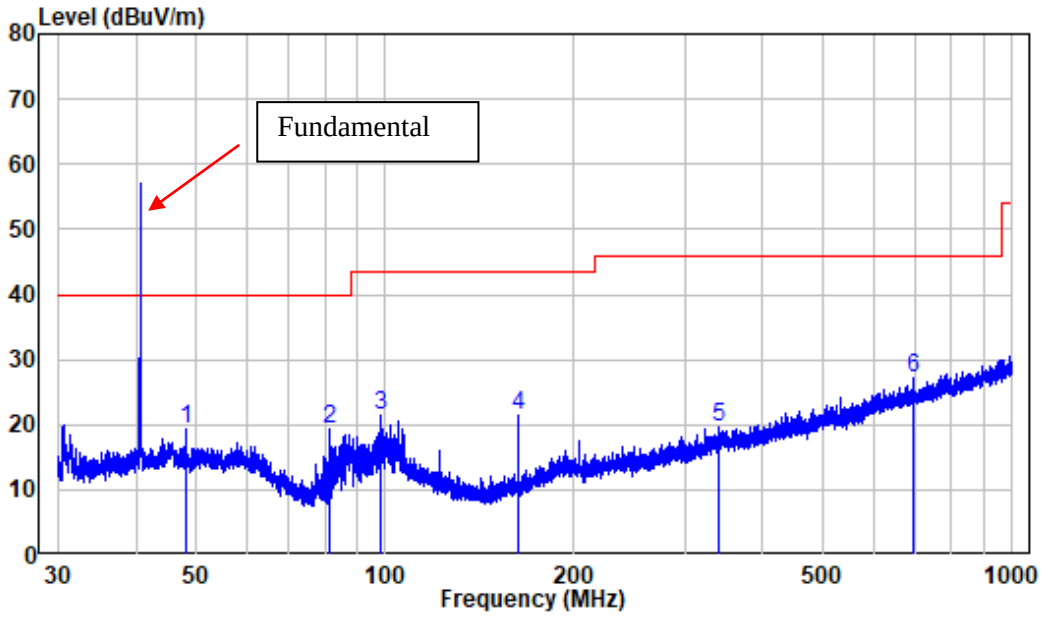
Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Level = Corrected Factor + Reading
Margin = Level - Limit
The other spurious emission which is 20dB to the limit was not recorded.

30 MHz~1 GHz



Site : chamber
Condition: 3m HORIZONTAL
Job No. : SZ3220715-32243E-RF
Test Mode: Transmitting

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	45.515	-9.97	28.71	18.74	40.00	-21.26	Peak
2	60.386	-10.77	27.40	16.63	40.00	-23.37	Peak
3	106.712	-11.95	34.00	22.05	43.50	-21.45	Peak
4	190.906	-11.43	27.03	15.60	43.50	-27.90	Peak
5	340.185	-7.42	27.09	19.67	46.00	-26.33	Peak
6	588.647	-2.81	28.47	25.66	46.00	-20.34	Peak



Site : chamber
Condition: 3m VERTICAL
Job No. : SZ3220715-32243E-RF
Test Mode: Transmitting

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	47.973	-10.00	29.28	19.28	40.00	-20.72	Peak
2	81.354	-16.70	35.97	19.27	40.00	-20.73	Peak
3	98.443	-12.15	33.70	21.55	43.50	-21.95	Peak
4	162.753	-14.29	35.87	21.58	43.50	-21.92	Peak
5	340.483	-7.41	27.06	19.65	46.00	-26.35	Peak
6	695.941	-1.54	28.83	27.29	46.00	-18.71	Peak

§15.215(c) - 20dB EMISSION BANDWIDTH TESTING

Applicable Standard

Per 15.215 (c), Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Test Procedure

Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

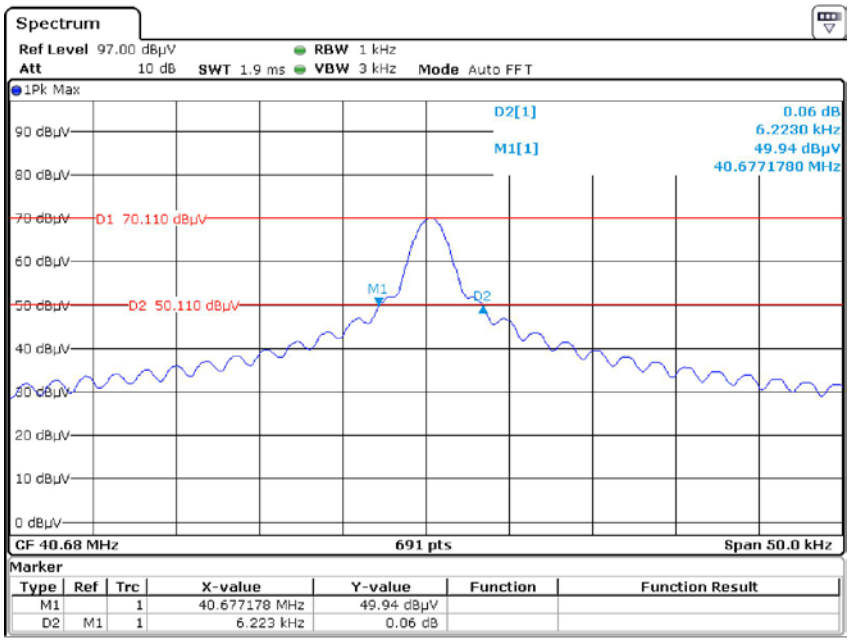
Testing was performed by Jeff Jiang on 2022-07-26.

EUT operation mode: Transmitting

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

Fl (MHz)	Fh (MHz)	20dB Bandwidth (kHz)	Permitted frequency range (MHz)	Result
40.6771780	40.68340	6.222	40.66-40.70	Compliant

20 dB Emission Bandwidth:



§15.229(d) - FREQUENCY TOLERANCE

Applicable Standard

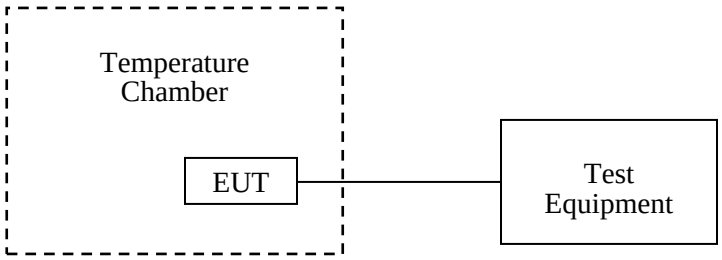
The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to + 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

Testing was performed by Jeff Jiang on 2022-07-26.

EUT operation mode: Transmitting

Test Result: Compliance.

Please refer to following table

f_o =40.68 MHz				
Temperature (℃)	**Power Supplied**	**Measured Frequency (MHz)**	**Frequency Error (%)**	**Limit (%)**
-20	New battery 3 V_{DC}	40.680131	0.00032	±0.01
-10		40.680224	0.00055	±0.01
0		40.680115	0.00028	±0.01
10		40.682531	0.00622	±0.01
20		40.681009	0.00248	±0.01
30		40.682359	0.00580	±0.01
40		40.681715	0.00422	±0.01
50		40.680024	0.00006	±0.01
20	2.55 V_{DC}	40.679608	-0.00096	±0.01
20	3.45 V_{DC}	40.679871	-0.00032	±0.01

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