



**中认信通**

CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)



# TEST REPORT

**Applicant: Rolling Seeds Inc.**

Address: FCC:57, Mokdongjungangbon-ro 20-gil, Yangcheon-gu, Seoul, 07976 South Korea  
IC:57, Mokdongjungangbon-ro 20-gil, Yangcheon-gu, Seoul 07976 Korea  
(Republic Of)

**FCC ID: 2A3RGRSMS01**

**IC: 27977-RSMS01**

**HVIN: RSMS01**

**Product Name: Rolling Seeds Smart Game Console**

**Model Number: RSMS01**

**Standard(s): 47 CFR Part 15, Subpart C(15.225)  
ANSI C63.10-2013  
RSS-210 Issue 10, December 2019,  
Amendment (April 2020)  
RSS-Gen, Issue 5, February 2021 Amendment 2**

The above equipment has been tested and found compliance with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

**Report Number: CR21120008-00C**

**Date Of Issue: 2022-08-17**

**Reviewed By: Sun Zhong**

*Sun Zhong*

Title: Manager

**Test Laboratory: China Certification ICT Co., Ltd (Dongguan)**

No. 113, Pingkang Road, Dalang Town, Dongguan,  
Guangdong, China  
Tel: +86-769-82016888

**Test Facility**

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 442868, the FCC Designation No. : CN1314.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0123.

**Declarations**

China Certification ICT Co., Ltd (Dongguan) 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 a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

This report cannot be reproduced except in full, without prior written approval of the Company.

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk “★”.

# CONTENTS

<b>TEST FACILITY .....</b>	<b>2</b>
<b>DECLARATIONS.....</b>	<b>2</b>
<b>1. GENERAL INFORMATION .....</b>	<b>5</b>
<b>1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....</b>	<b>5</b>
<b>1.2 DESCRIPTION OF TEST CONFIGURATION.....</b>	<b>6</b>
1.2.2 Support Equipment List and Details .....	6
1.2.3 Support Cable List and Details .....	6
1.2.4 Block Diagram of Test Setup .....	7
<b>1.3 MEASUREMENT UNCERTAINTY .....</b>	<b>8</b>
<b>2. SUMMARY OF TEST RESULTS .....</b>	<b>9</b>
<b>3. REQUIREMENTS AND TEST PROCEDURES .....</b>	<b>10</b>
<b>3.1 AC LINE CONDUCTED EMISSIONS.....</b>	<b>10</b>
3.1.1 Applicable Standard.....	10
3.1.2 EUT Setup.....	12
3.1.3 EMI Test Receiver Setup .....	12
3.1.4 Test Procedure .....	13
3.1.5 Corrected Amplitude & Margin Calculation.....	13
<b>3.2 RADIATED EMISSIONS .....</b>	<b>14</b>
3.2.1 Applicable Standard.....	14
3.2.2 EUT Setup.....	14
3.2.3 EMI Test Receiver & Spectrum Analyzer Setup .....	15
3.2.4 Corrected Amplitude & Margin Calculation.....	15
<b>3.3 20 DB EMISSION BANDWIDTH: .....</b>	<b>16</b>
3.3.1 Applicable Standard.....	16
3.3.2 EUT Setup.....	16
3.3.3 Test Procedure .....	16
<b>3.4 99% OCCUPIED BANDWIDTH: .....</b>	<b>17</b>
3.4.1 Applicable Standard.....	17
3.4.2 EUT Setup.....	17
3.4.3 Test Procedure .....	17
<b>3.5 FREQUENCY STABILITY.....</b>	<b>18</b>
3.5.1 Applicable Standard.....	18
3.5.2 EUT Setup.....	18
3.5.3 Test Procedure .....	18
<b>3.6 ANTENNA REQUIREMENT.....</b>	<b>19</b>
3.6.1 Applicable Standard.....	19
3.6.2 Judgment .....	19
<b>4. TEST DATA AND RESULTS .....</b>	<b>20</b>
<b>4.1 AC LINE CONDUCTED EMISSIONS.....</b>	<b>20</b>
<b>4.2 RADIATION SPURIOUS EMISSIONS.....</b>	<b>23</b>

<b>4.3 20 DB EMISSION BANDWIDTH .....</b>	<b>35</b>
<b>4.4 99% OCCUPIED BANDWIDTH.....</b>	<b>37</b>
<b>4.5 FREQUENCY STABILITY.....</b>	<b>39</b>
<b>5. RF EXPOSURE EVALUATION .....</b>	<b>40</b>
<b>5.1 EXEMPTION LIMITS FOR ROUTINE EVALUATION – RF EXPOSURE EVALUATION</b>	<b>40</b>
<b>5.1.1 APPLICABLE STANDARD.....</b>	<b>40</b>
<b>5.1.2 CALCULATED RESULT .....</b>	<b>40</b>

## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment under Test (EUT)

<b>EUT Name:</b>	Rolling Seeds Smart Game Console
<b>EUT Model:</b>	RSMS01
<b>Operation Frequency:</b>	13.56 MHz
<b>Modulation Type:</b>	ASK
<b>Rated Input Voltage:</b>	DC 3.7V from battery or DC 5V from USB port
<b>Serial Number:</b>	CR21120008-RF-S1
<b>EUT Received Date:</b>	2021.12.16
<b>EUT Received Status:</b>	Good

#### Operation Frequency Detail:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	13.56	/	/

#### Antenna Information Detail ▲:

Antenna Manufacturer	Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range	§15.203 RSS-Gen Requirement
Rolling Seeds Inc.	PCB	50	13.56MHz	Compliance
The Method of §15.203 Compliance: <input checked="" type="checkbox"/> Antenna must be permanently attached to the unit. <input type="checkbox"/> Antenna must use a unique type of connector to attach to the EUT. <input type="checkbox"/> Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.				

#### Accessory Information:

NO.

## 1.2 Description of Test Configuration

### 1.2.1 EUT Operation Condition:

EUT Operation Mode:	The system was configured for testing in Engineering Mode, which was provided by the manufacturer.	
Equipment Modifications:	No	
EUT Exercise Software:	engineering mode	
Engineering Mode was provided by manufacturer▲. The maximum power was configured default setting.		
Channel	Frequency (MHz)	Power Level Setting
Middle	13.56	Default

### 1.2.2 Support Equipment List and Details

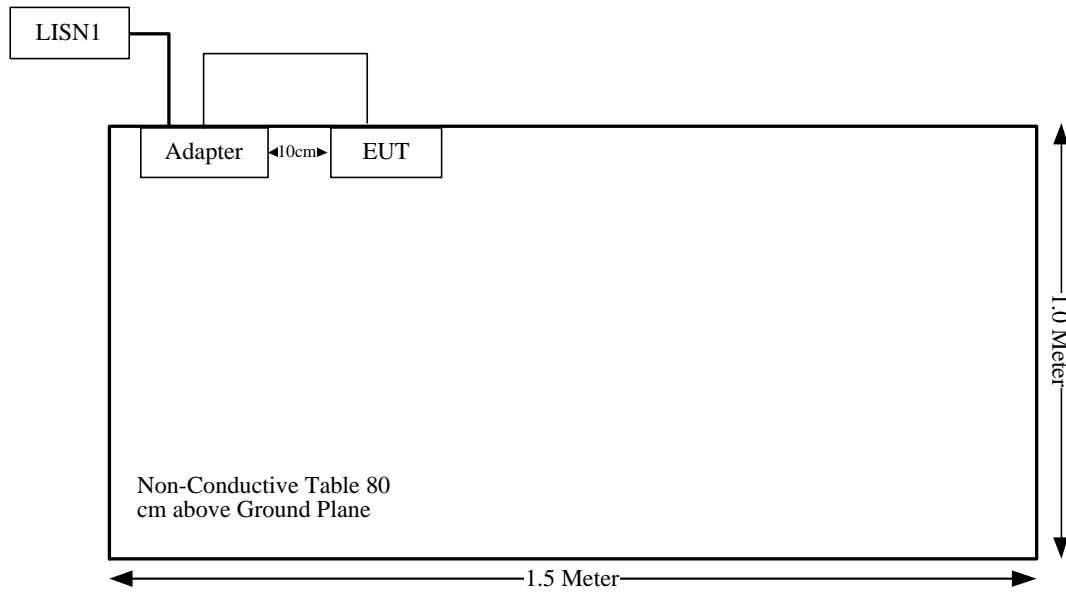
Manufacturer	Description	Model	Serial Number
DOOGEE	Adapter	HJ0502000W2-EU	EMZBUA21103001EN

### 1.2.3 Support Cable List and Details

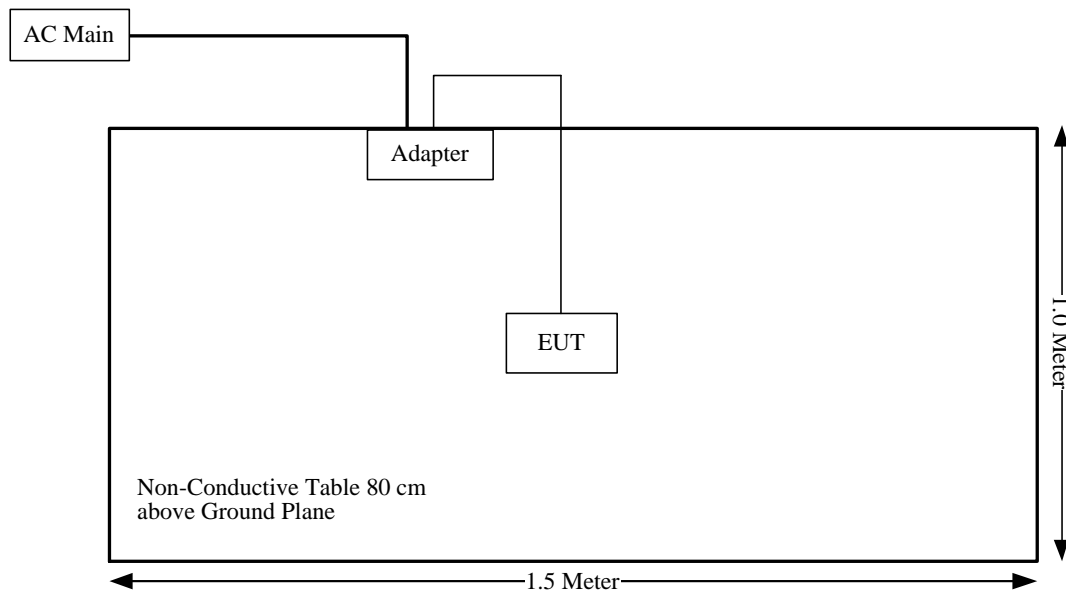
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	yes	No	0.8	Adapter	EUT

### 1.2.4 Block Diagram of Test Setup

AC line conducted emissions:



Spurious Emissions:



### 1.3 Measurement Uncertainty

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

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	$\pm 5\%$
Unwanted Emissions, radiated	30M~200MHz: 4.15 dB, 200M~1GHz: 5.61 dB, 1G~6GHz: 5.14 dB, 6G~18GHz: 5.93 dB, 18G~26.5G: 5.47 dB, 26.5G~40G: 5.63 dB
Temperature	$\pm 1^\circ\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 0.4\%$
Duty Cycle	1%
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)



## 2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.207 (a) RSS-Gen Clause 8.8	Conducted Emissions	Compliance
§15.225 §15.209 §15.205 RSS-Gen Clause 8.10 RSS-210 Annex B.6 (a)	Radiated Emission Test	Compliance
§15.225(e) RSS-210 Annex B.6 (b)	Frequency Stability	Compliance
§15.215(c)	20 dB Bandwidth	Compliance
RSS-Gen Clause 6.7	99% Occupied Bandwidth	Compliance
§15.203 RSS-GEN Clause 6.8	Antenna Requirement	Compliance

### 3. REQUIREMENTS AND TEST PROCEDURES

#### 3.1 AC Line Conducted Emissions

##### 3.1.1 Applicable Standard

FCC §15.207(a).

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that 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 the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000  $\mu$ V within the frequency band 535-1705 kHz, as measured using a 50  $\mu$ H/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

## RSS-Gen Clause 8.8

Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in table 4, as measured using a 50  $\mu$ H / 50  $\Omega$  line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

**Table 4 – AC power-line conducted emissions limits**

Frequency (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 <sup>1</sup>	56 to 46 <sup>1</sup>
0.5 – 5	56	46
5 – 30	60	50

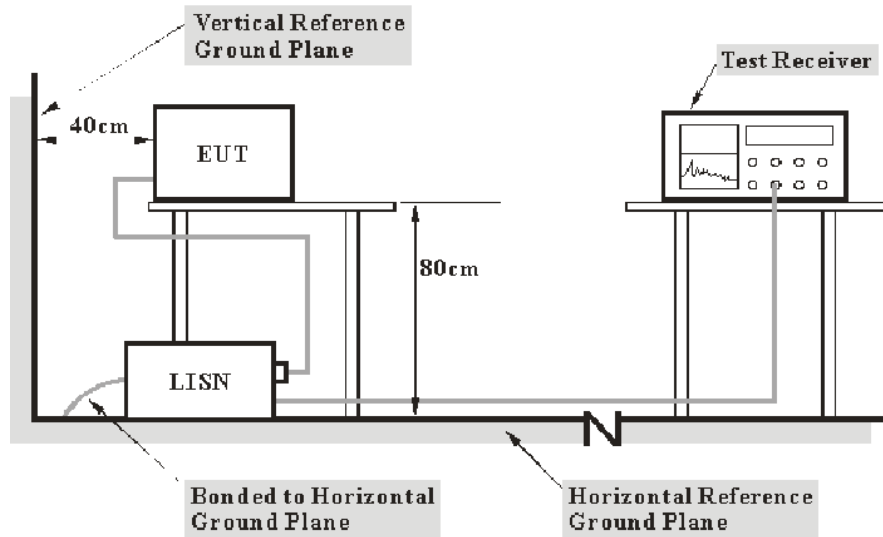
**Note 1:** The level decreases linearly with the logarithm of the frequency.

For an EUT with a permanent or detachable antenna operating between 150 kHz and 30 MHz, the AC power-line conducted emissions must be measured using the following configurations:

(a) Perform the AC power-line conducted emissions test with the antenna connected to determine compliance with the limits of table 4 outside the transmitter's fundamental emission band.

(b) Retest with a dummy load instead of the antenna to determine compliance with the limits of table 4 within the transmitter's fundamental emission band. For a detachable antenna, remove the antenna and connect a suitable dummy load to the antenna connector. For a permanent antenna, remove the antenna and terminate the RF output with a dummy load or network that simulates the antenna in the fundamental frequency band.

### 3.1.2 EUT Setup



Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207, RSS-Gen limits.

The spacing between the peripherals was 10 cm.

The adapter or EUT was connected to the main LISN with a 120 V/60 Hz AC power source.

### 3.1.3 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

### 3.1.4 Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase (“hot”) line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

According FCC publication number 174176, for a device with a permanent antenna operating at or below 30 MHz, the measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

### 3.1.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor

Factor = attenuation caused by cable loss + voltage division factor of AMN

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

### 3.2 Radiated Emissions

#### 3.2.1 Applicable Standard

As per FCC Part 15.225

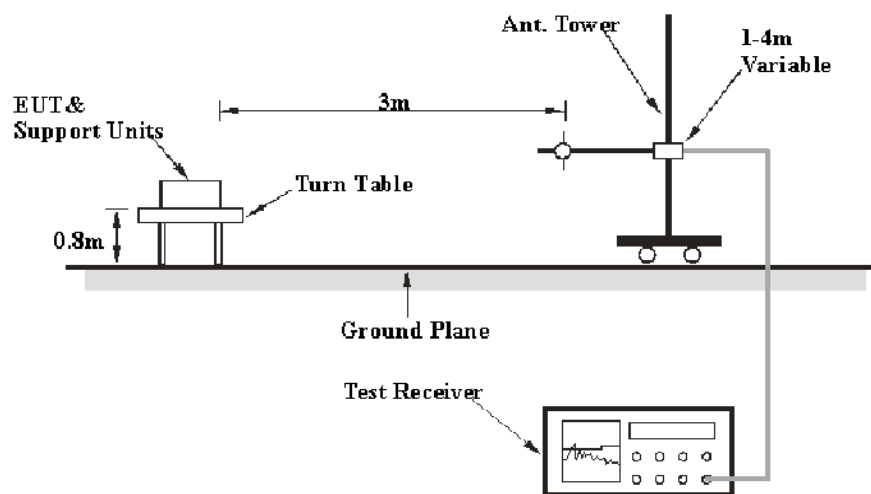
- (a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

As per RSS-210 B.6(a)

(a) the field strength of any emission shall not exceed the following limits:

- (i) 15.848 mV/m (84 dB $\mu$ V/m) at 30 m, within the band 13.553-13.567 MHz
- (ii) 334  $\mu$ V/m (50.5 dB $\mu$ V/m) at 30 m, within the bands 13.410-13.553 MHz and 13.567-13.710 MHz
- (iii) 106  $\mu$ V/m (40.5 dB $\mu$ V/m) at 30 m, within the bands 13.110-13.410 MHz and 13.710-14.010 MHz
- (iv) RSS-Gen general field strength limits for frequencies outside the band 13.110-14.010 MHz

#### 3.2.2 EUT Setup



The radiated emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.10-2013.

The spacing between the peripherals was 10 cm.

### 3.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 1 GHz.

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

Frequency Range	RBW	Video B/W	Detector
9 kHz – 150 kHz	200 Hz	1 kHz	QP
150 kHz – 30 MHz	9 kHz	30 kHz	QP
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP measurement

### 3.2.4 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor

Factor = Antenna Factor + Cable Loss- Amplifier Gain

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

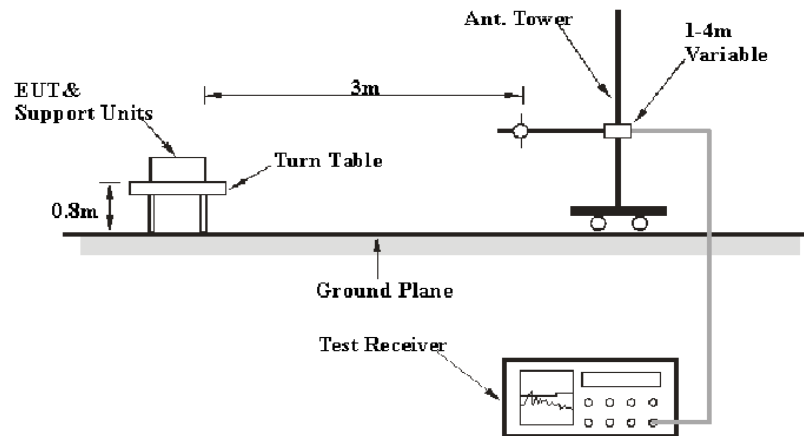
### 3.3 20 dB Emission Bandwidth:

#### 3.3.1 Applicable Standard

FCC §15.215

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. 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.

#### 3.3.2 EUT Setup



#### 3.3.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.



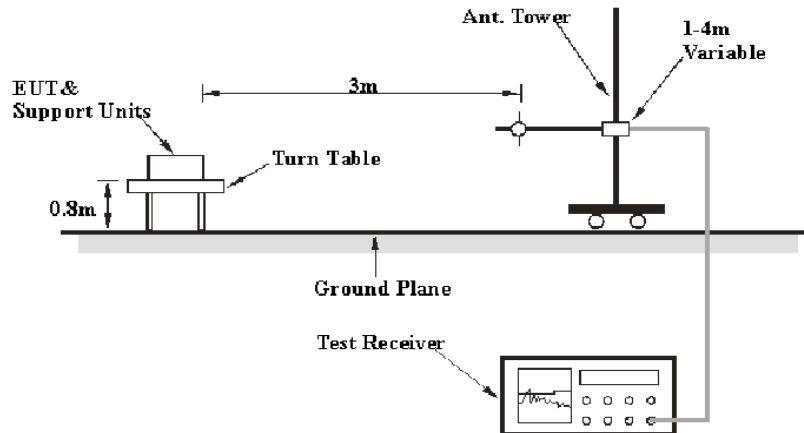
### 3.4 99% Occupied Bandwidth:

#### 3.4.1 Applicable Standard

RSS-210, Annex A, A.1.3

The occupied bandwidth of momentarily operated devices shall be less than or equal to 0.25% of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the occupied bandwidth shall be less than or equal to 0.5% of the centre frequency.

#### 3.4.2 EUT Setup



#### 3.4.3 Test Procedure

- The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, unless otherwise specified by the applicable requirement.
- Set the video bandwidth (VBW)  $\geq 3 \times \text{RBW}$ .
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- use the 99% Occupied bandwidth function to test the bandwidth.

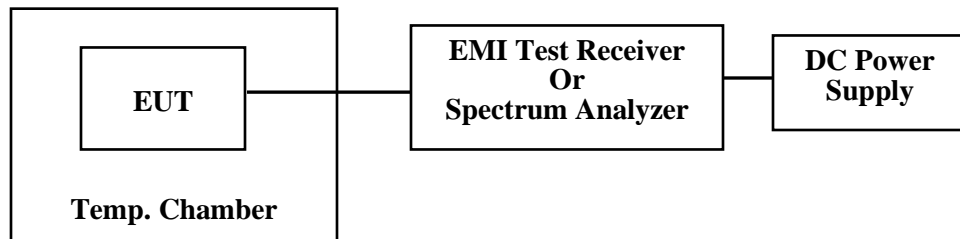
### 3.5 Frequency Stability

#### 3.5.1 Applicable Standard

As per FCC Part 15.225:

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  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.

#### 3.5.2 EUT Setup



#### 3.5.3 Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power.

The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

Frequency Stability vs. Voltage: An external variable DC power supply Source. The voltage was set to the end point of the battery. The output frequency was recorded for each voltage.

### **3.6 Antenna Requirement**

#### **3.6.1 Applicable Standard**

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. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.
- c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

#### **3.6.2 Judgment**

Please refer to the Antenna Information detail in Section 1.

## 4. TEST DATA AND RESULTS

### 4.1 AC Line Conducted Emissions

Serial Number:	CR21120008-RF-S1	Test Date:	2021-12-20
Test Site:	CE	Test Mode:	Transmitting
Tester:	Nick Tang	Test Result:	Pass

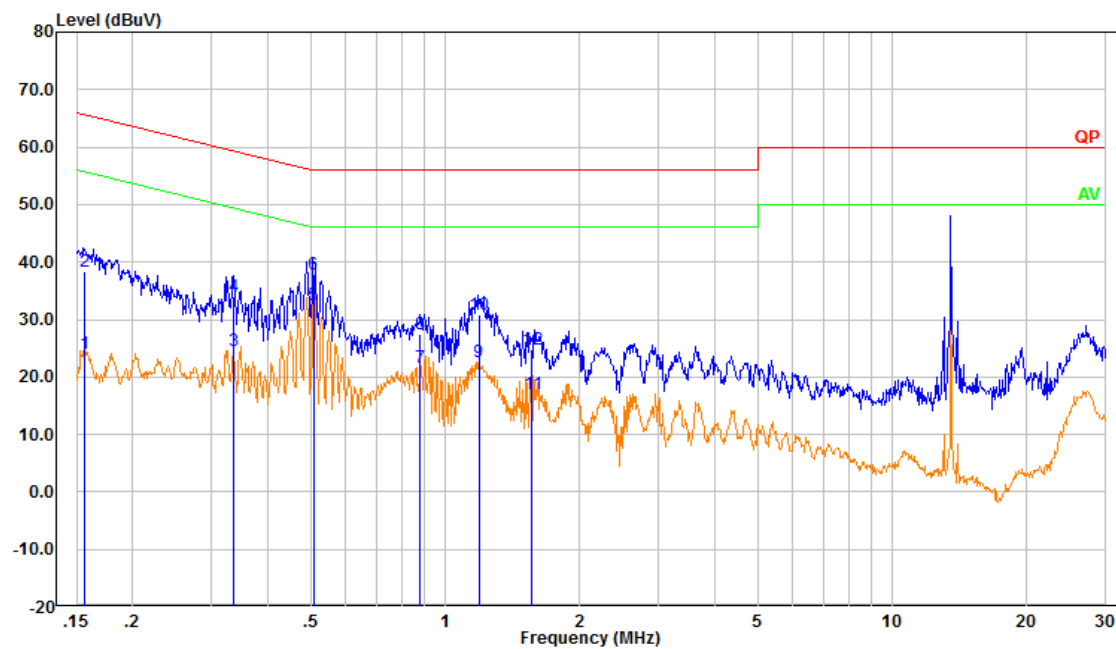
Environmental Conditions:					
Temperature: (°C)	19.9	Relative Humidity: (%)	47	ATM Pressure: (kPa)	101.3

#### Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	2021-04-25	2022-04-24
R&S	EMI Test Receiver	ESR3	102726	2021-07-22	2022-07-21
MICRO-COAX	Coaxial Cable	UTIFLEX	C-0200-01	2021-08-08	2022-08-07
Audix	Test Software	E3	190306 (V9)	N/A	N/A

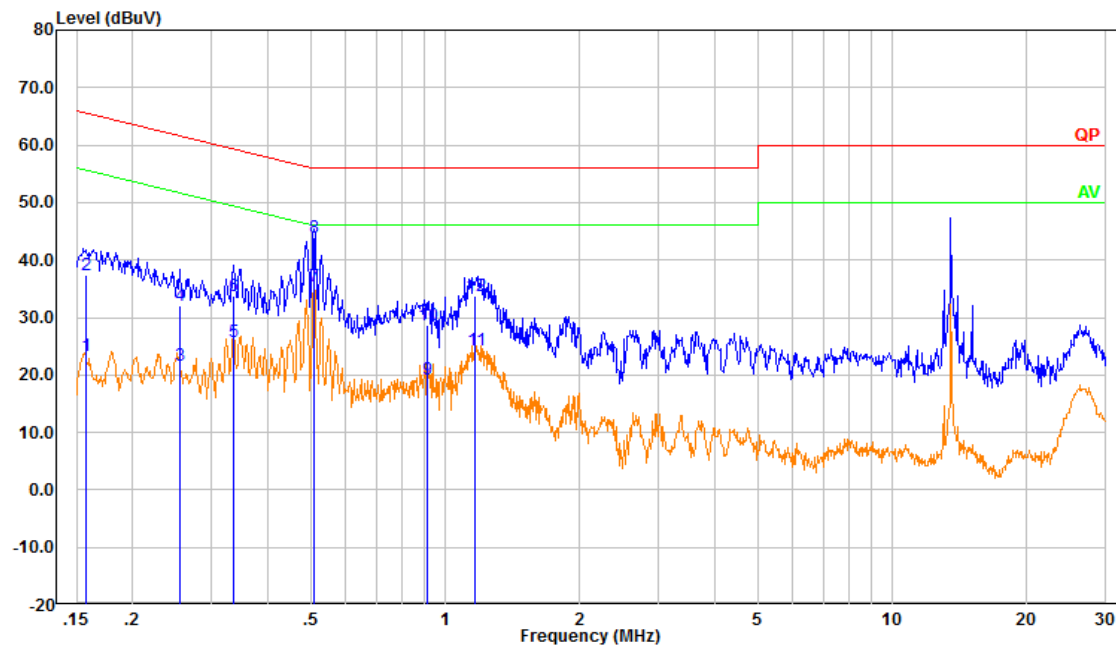
\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Line:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.156	14.45	9.61	24.06	55.67	31.61	Average
2	0.156	28.74	9.61	38.35	65.67	27.32	QP
3	0.335	15.02	9.61	24.63	49.31	24.68	Average
4	0.335	24.27	9.61	33.88	59.31	25.43	QP
5	0.507	22.95	9.61	32.56	46.00	13.44	Average
6	0.507	28.34	9.61	37.95	56.00	18.05	QP
7	0.878	12.08	9.62	21.70	46.00	24.30	Average
8	0.878	17.96	9.62	27.58	56.00	28.42	QP
9	1.189	12.93	9.62	22.56	46.00	23.44	Average
10	1.189	21.33	9.62	30.95	56.00	25.05	QP
11	1.563	7.37	9.63	17.00	46.00	29.00	Average
12	1.563	15.07	9.63	24.69	56.00	31.31	QP

Neutral:



No.	Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB)	Result (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Detector
1	0.157	13.62	9.61	23.23	55.62	32.39	Average
2	0.157	27.78	9.61	37.39	65.62	28.23	QP
3	0.254	11.93	9.61	21.54	51.61	30.07	Average
4	0.254	22.46	9.61	32.07	61.61	29.54	QP
5	0.335	16.07	9.61	25.68	49.32	23.64	Average
6	0.335	24.12	9.61	33.73	59.32	25.59	QP
7	0.509	25.74	9.61	35.35	46.00	10.65	Average
8	0.509	34.23	9.61	43.84	56.00	12.16	QP
9	0.913	9.53	9.62	19.15	46.00	26.85	Average
10	0.913	18.95	9.62	28.57	56.00	27.43	QP
11	1.170	14.65	9.62	24.27	46.00	21.73	Average
12	1.170	24.14	9.62	33.77	56.00	22.23	QP

**4.2 Radiation Spurious Emissions**

Serial Number:	CR21120008-RF-S1	Test Date:	2021-12-21
Test Site:	966-2	Test Mode:	Transmitting
Tester:	Carl Liang	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	19.1	Relative Humidity: (%)	54	ATM Pressure: (kPa)	99.9
----------------------	------	---------------------------	----	------------------------	------

**Test Equipment List and Details:**

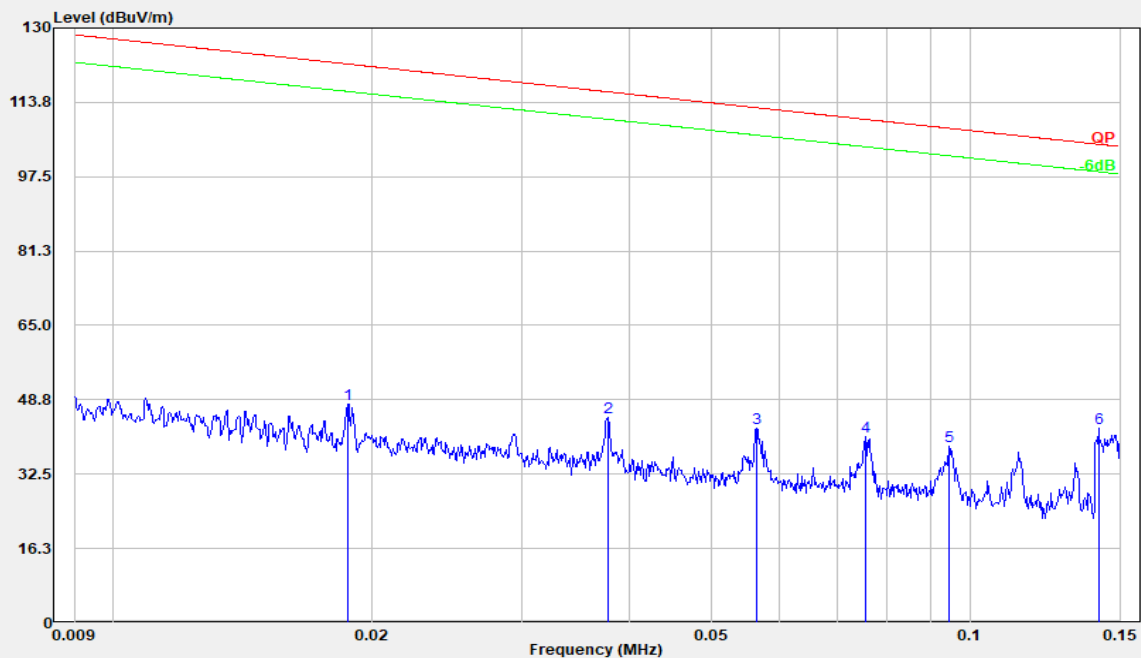
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TESEQ	HF Loop Antenna	HLA6120	33561	2021-02-03	2024-02-02
Sunol Sciences	Antenna	JB6	A082520-5	2020-10-19	2023-10-18
R&S	EMI Test Receiver	ESR3	102724	2021-07-22	2022-07-21
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2021-07-18	2022-07-17
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2021-07-18	2022-07-17
Sonoma	Amplifier	310N	186165	2021-07-18	2022-07-17
Audix	Test Software	E3	201021 (V9)	N/A	N/A

*\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

**Test Data:**

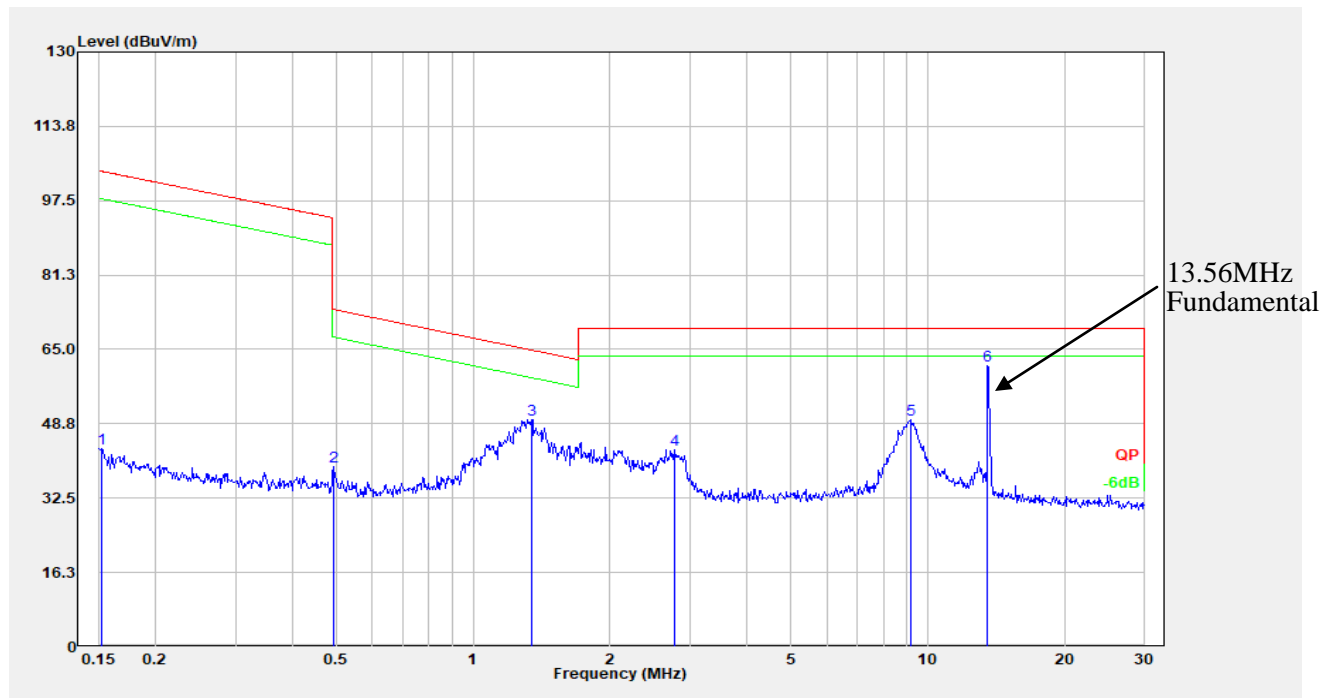
1) 9 kHz~30MHz:

Parallel:



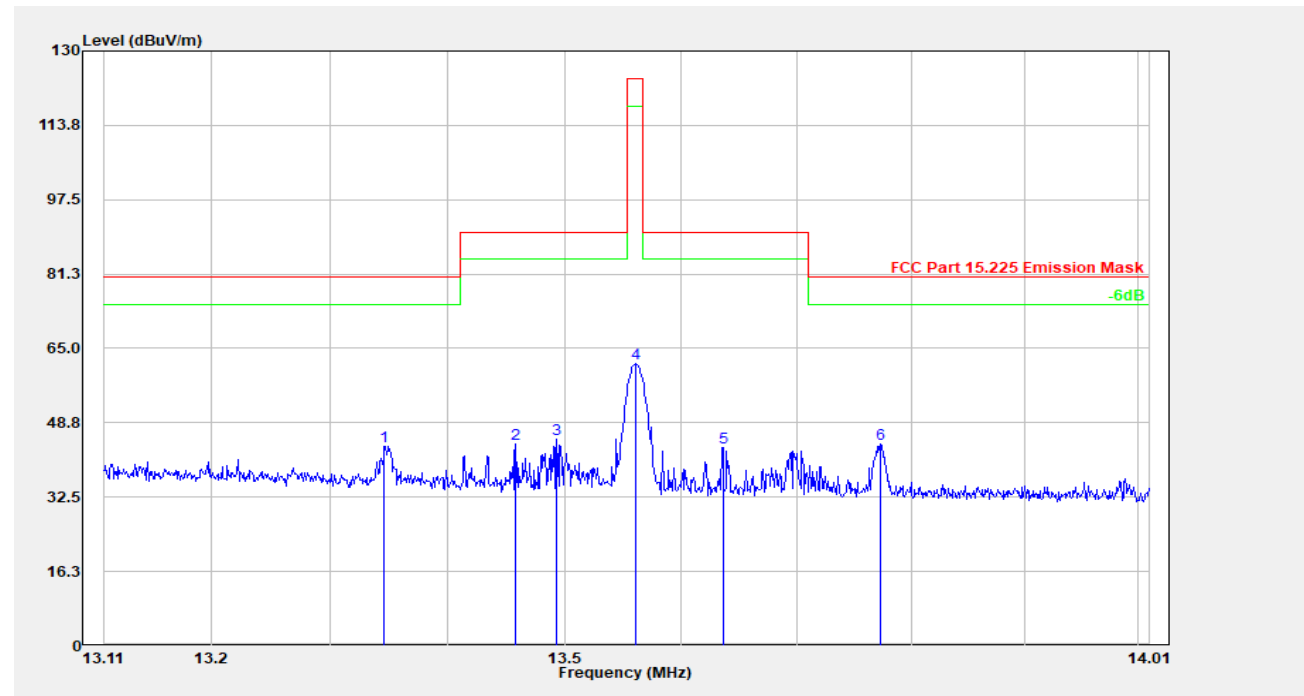
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.019	27.27	20.51	47.78	122.14	74.36	Peak
2	0.038	24.42	20.41	44.83	116.06	71.23	Peak
3	0.056	22.24	20.41	42.65	112.59	69.93	Peak
4	0.076	20.21	20.38	40.60	110.05	69.45	Peak
5	0.095	18.35	20.26	38.60	108.09	69.49	Peak
6	0.141	22.45	20.22	42.67	104.60	61.93	Peak





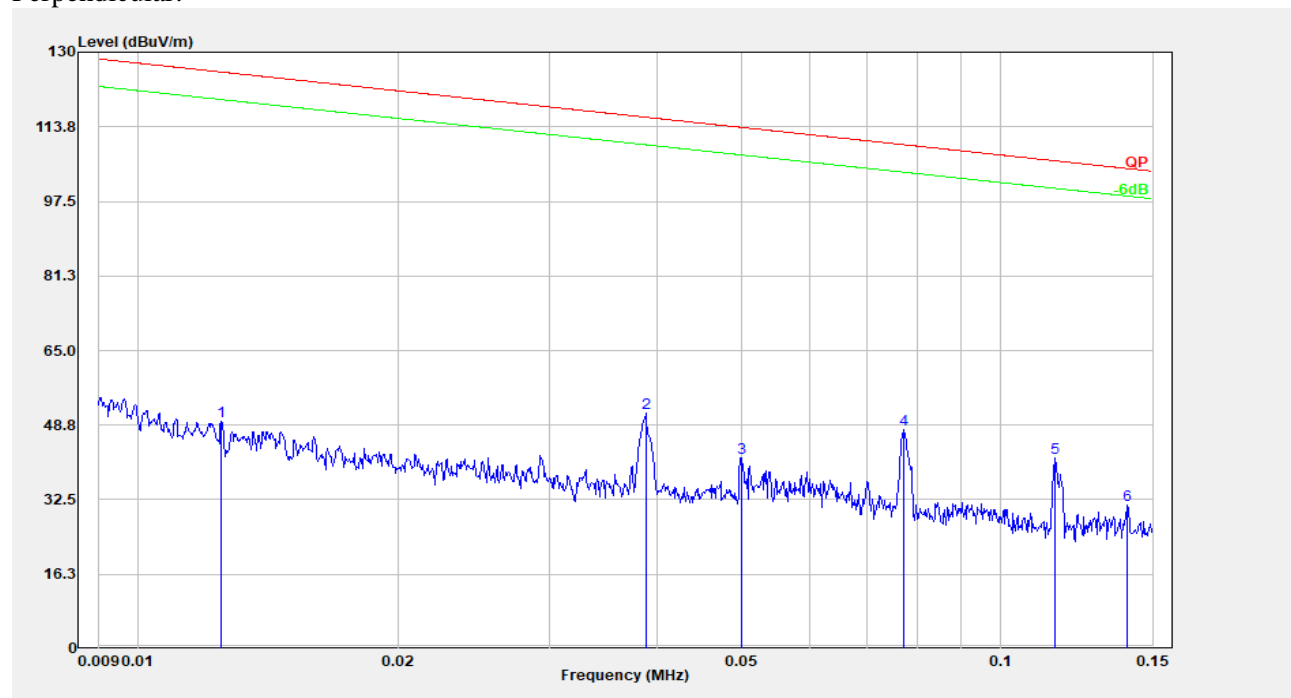
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.152	23.20	20.22	43.42	103.94	60.53	Peak
2	0.494	19.47	20.02	39.50	73.73	34.23	Peak
3	1.345	29.77	19.97	49.74	64.84	15.10	Peak
4	2.779	23.13	19.98	43.10	69.54	26.44	Peak
5	9.156	29.52	20.23	49.75	69.54	19.79	Peak
6	13.551	41.09	20.39	61.47	69.54	8.07	Peak

## Fundamental:

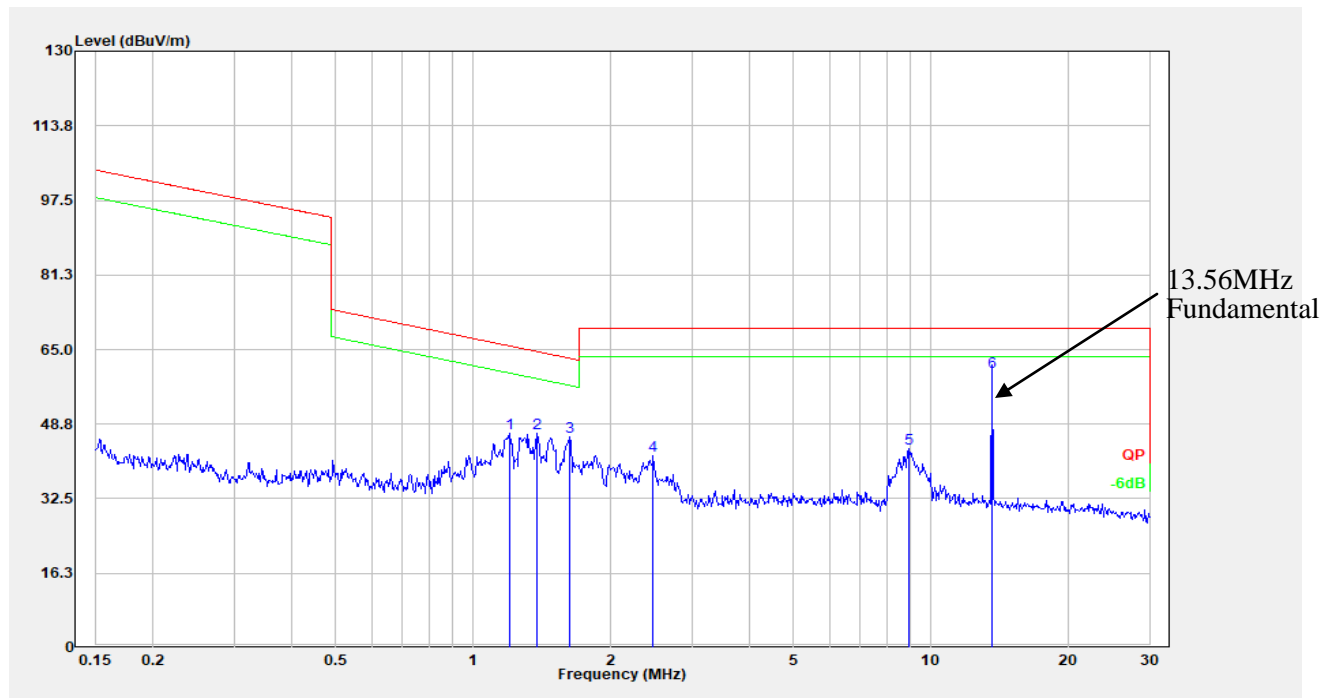


No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	13.346	23.27	20.38	43.65	80.51	36.86	Peak
2	13.457	23.63	20.38	44.01	90.47	46.46	Peak
3	13.493	24.76	20.38	45.14	90.47	45.33	Peak
4	13.560	41.26	20.39	61.65	124.00	62.35	Peak
5	13.636	23.00	20.39	43.39	90.47	47.08	Peak
6	13.772	23.73	20.39	44.13	80.51	36.38	Peak

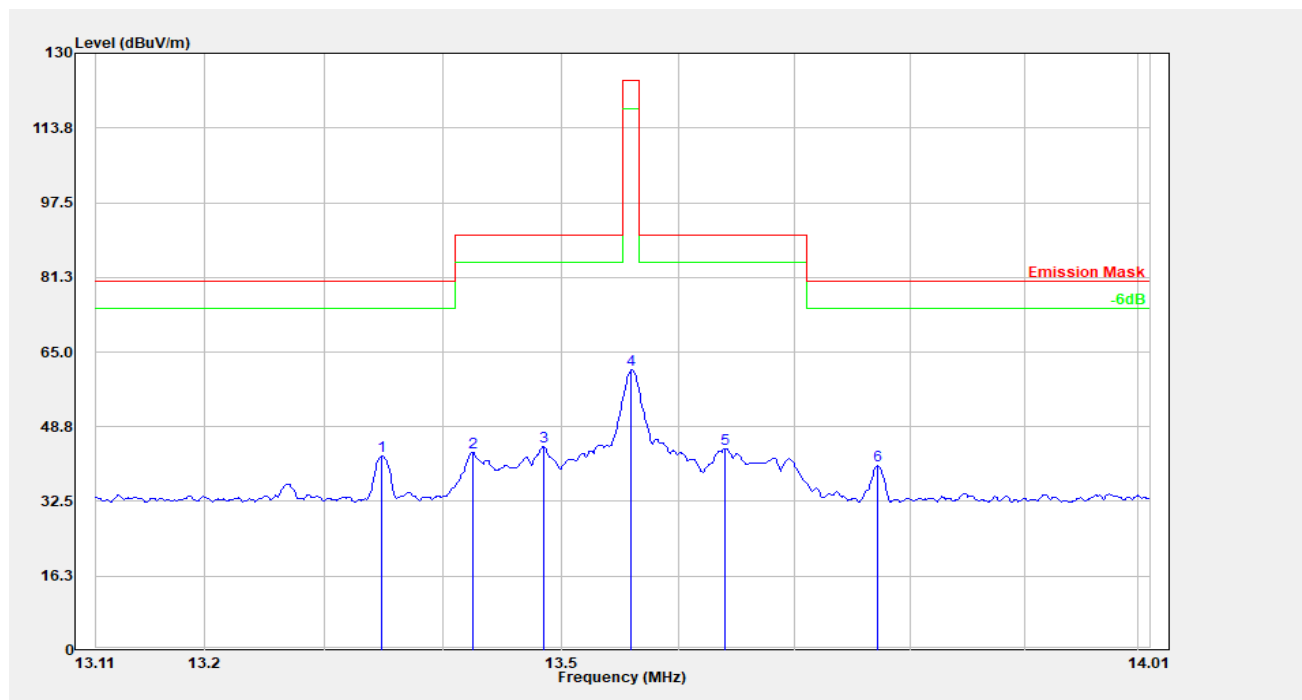
Perpendicular:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.012	29.14	20.51	49.65	125.69	76.04	Peak
2	0.039	30.97	20.41	51.38	115.84	64.46	Peak
3	0.050	21.21	20.41	41.62	113.61	71.99	Peak
4	0.077	27.30	20.37	47.67	109.85	62.18	Peak
5	0.115	21.41	20.22	41.63	106.36	64.72	Peak
6	0.140	11.22	20.22	31.44	104.67	73.23	Peak

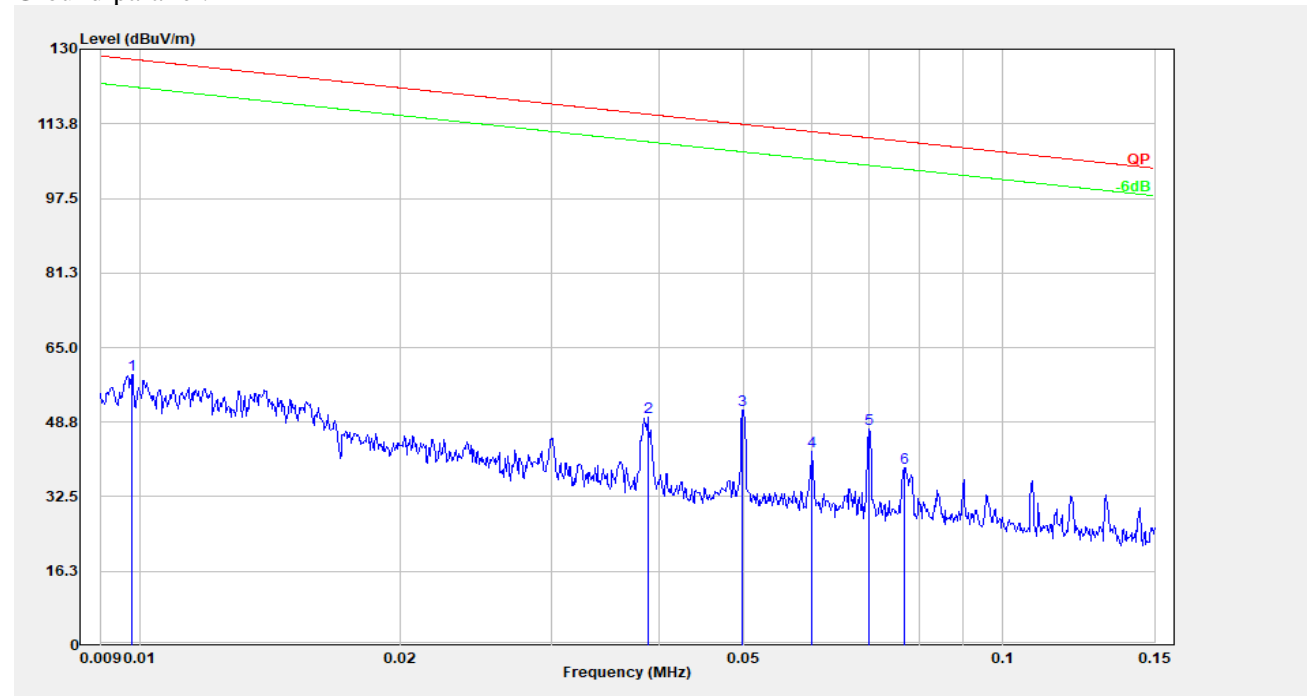


No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	1.203	26.64	20.00	46.64	65.83	19.19	Peak
2	1.381	26.83	19.97	46.79	64.61	17.82	Peak
3	1.619	26.00	19.95	45.95	63.20	17.25	Peak
4	2.474	21.88	19.97	41.85	69.54	27.69	Peak
5	8.964	23.33	20.21	43.54	69.54	26.00	Peak
6	13.551	39.69	20.39	60.08	69.54	9.46	Peak

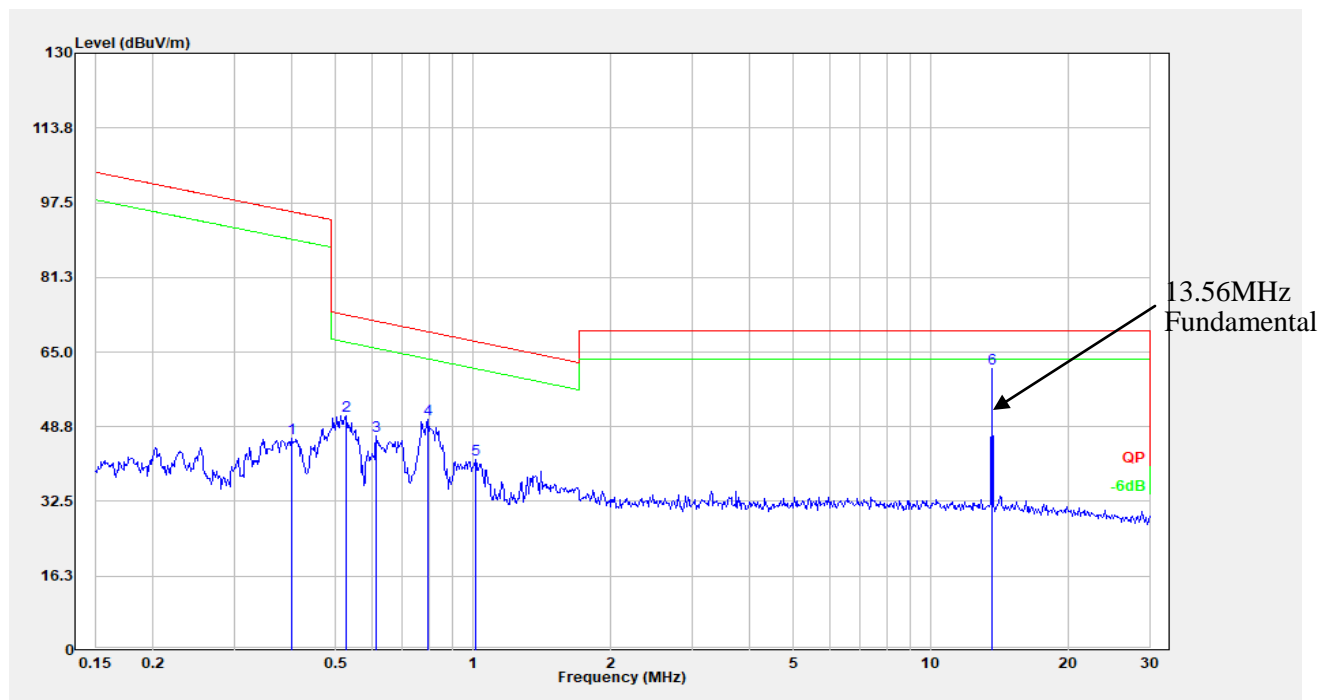


No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	13.349	22.07	20.38	42.45	80.51	38.06	Peak
2	13.425	22.80	20.38	43.18	90.47	47.29	Peak
3	13.485	24.06	20.38	44.44	90.47	46.03	Peak
4	13.560	40.68	20.39	61.07	124.00	62.93	Peak
5	13.640	23.60	20.39	43.99	90.47	46.48	Peak
6	13.772	19.92	20.39	40.31	80.51	40.20	Peak

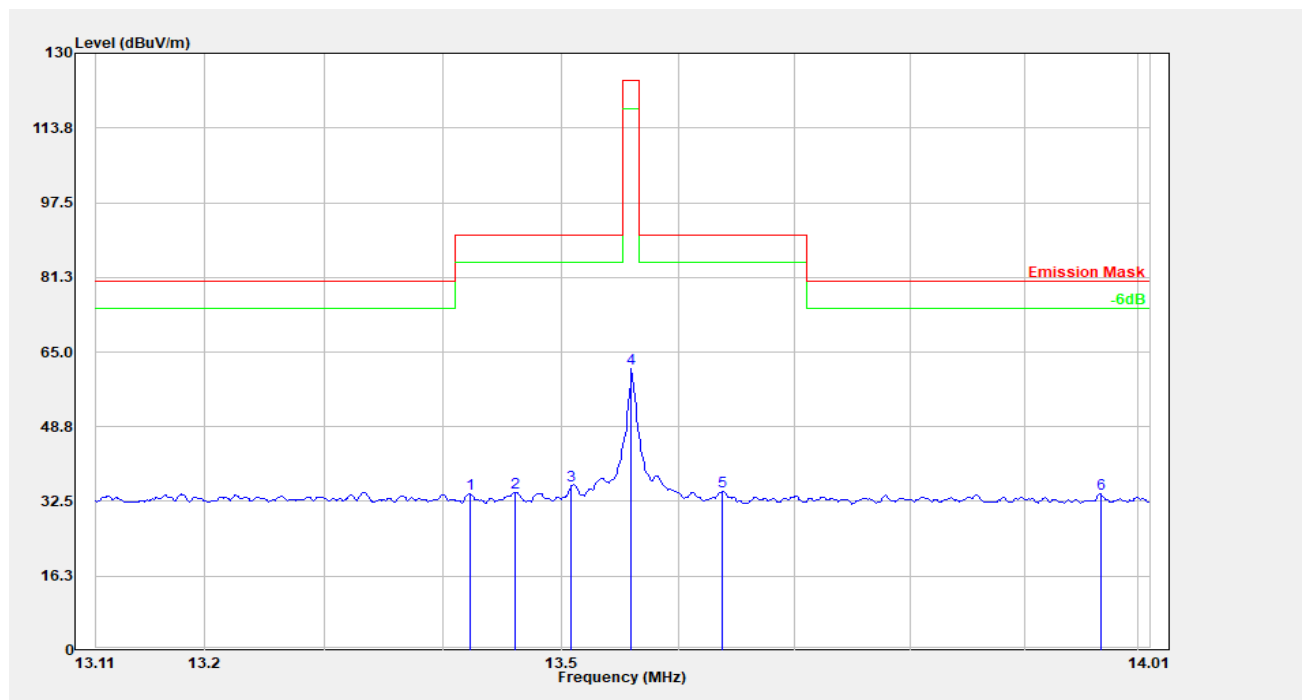
## Ground-parallel:



No.	Frequency (MHz)	Reading (dB $\mu$ V)	Factor (dB/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector
1	0.010	38.59	20.51	59.10	127.81	68.71	Peak
2	0.039	29.36	20.41	49.77	115.84	66.07	Peak
3	0.050	31.01	20.41	51.42	113.64	62.22	Peak
4	0.060	22.06	20.41	42.47	112.02	69.55	Peak
5	0.070	26.74	20.42	47.16	110.71	63.55	Peak
6	0.077	18.41	20.37	38.78	109.90	71.12	Peak



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.402	26.14	20.07	46.21	95.52	49.31	Peak
2	0.527	31.23	20.02	51.25	73.16	21.91	Peak
3	0.614	26.79	20.02	46.81	71.80	24.99	Peak
4	0.796	30.39	20.03	50.42	69.50	19.07	Peak
5	1.010	21.48	20.03	41.51	67.38	25.88	Peak
6	13.551	41.07	20.39	61.45	69.54	8.09	Peak

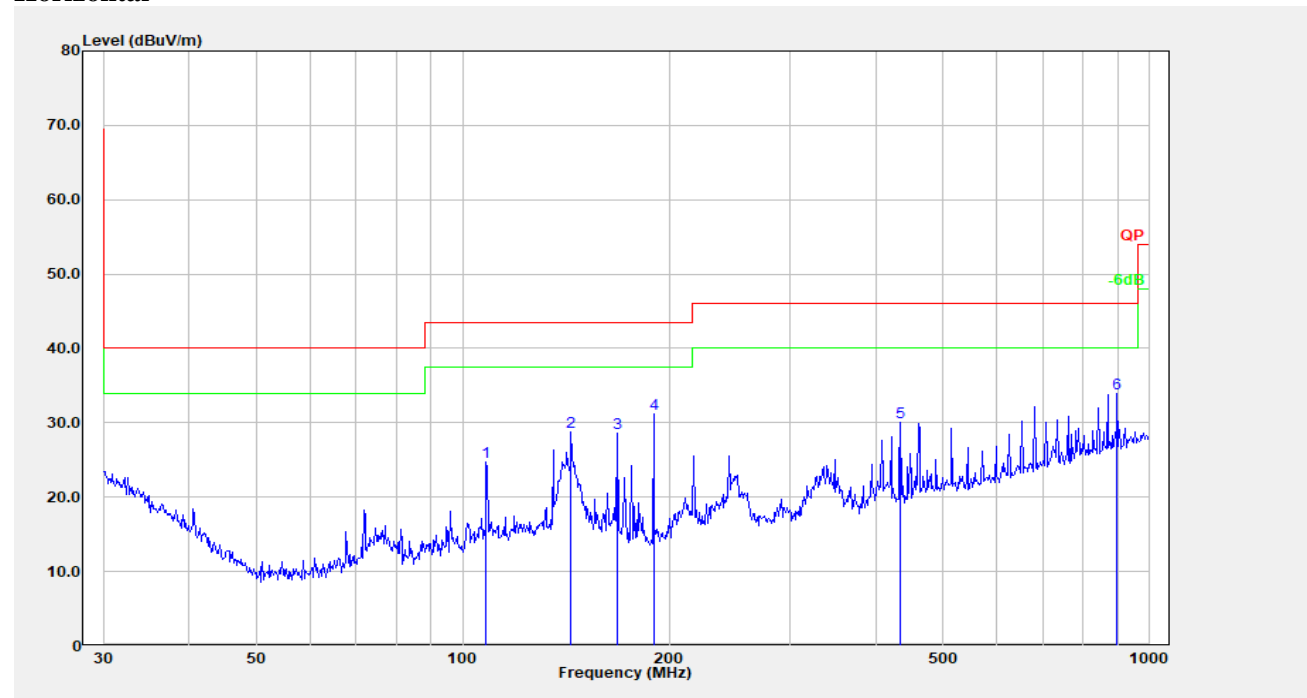


No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	13.422	13.77	20.38	34.15	90.47	56.32	Peak
2	13.461	14.16	20.38	34.55	90.47	55.92	Peak
3	13.509	15.51	20.39	35.89	90.47	54.58	Peak
4	13.560	41.12	20.39	61.51	124.00	62.49	Peak
5	13.638	14.25	20.39	34.64	90.47	55.83	Peak
6	13.967	13.72	20.40	34.12	80.51	46.40	Peak

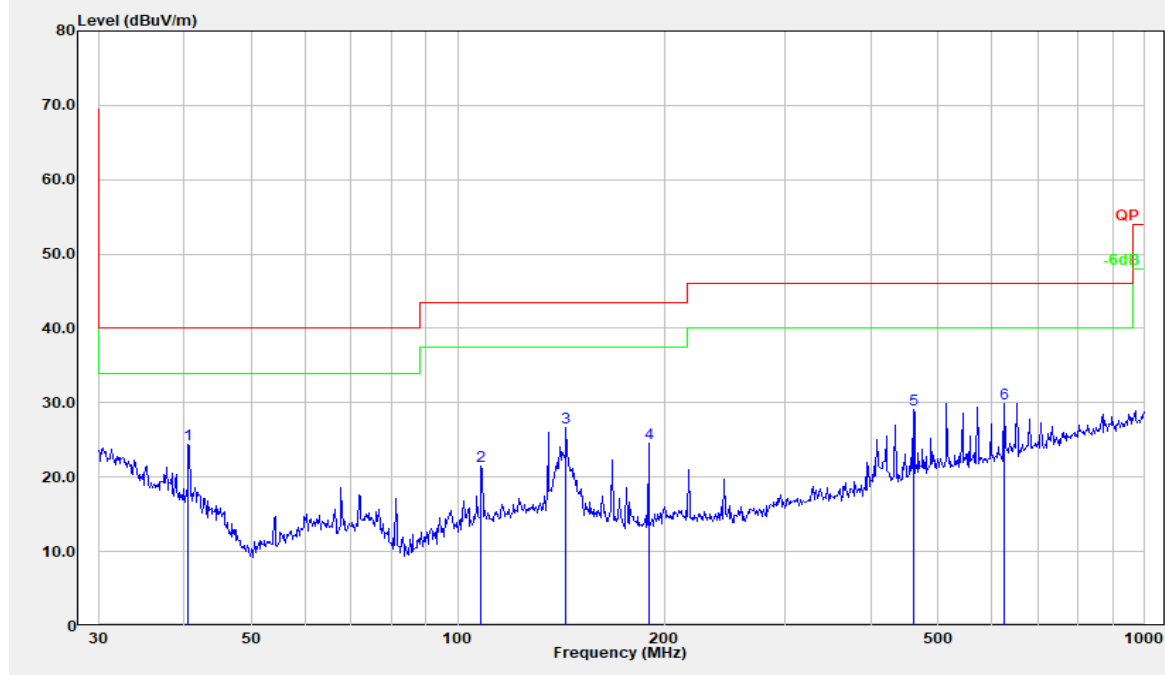


## 2) Above 30 MHz

## Horizontal



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	108.267	37.72	-12.91	24.81	43.50	18.69	Peak
2	143.830	40.92	-12.20	28.72	43.50	14.78	Peak
3	167.824	41.51	-12.96	28.55	43.50	14.95	Peak
4	189.739	44.82	-13.64	31.18	43.50	12.32	Peak
5	434.065	37.72	-7.58	30.14	46.00	15.86	Peak
6	896.997	35.28	-1.29	33.99	46.00	12.01	Peak

**Vertical**

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	40.559	36.32	-11.86	24.46	40.00	15.54	Peak
2	108.267	34.34	-12.91	21.43	43.50	22.07	Peak
3	143.830	38.91	-12.20	26.70	43.50	16.80	Peak
4	189.739	38.20	-13.64	24.56	43.50	18.94	Peak
5	460.727	35.95	-6.92	29.02	46.00	16.98	Peak
6	625.078	34.81	-4.84	29.97	46.00	16.03	Peak

**4.3 20 dB Emission Bandwidth**

Serial Number:	CR21120008-RF-S1	Test Date:	2021-12-21
Test Site:	RF	Test Mode:	Transmitting
Tester:	Carl Liang	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	21.2	Relative Humidity: (%)	49	ATM Pressure: (kPa)	100.9
----------------------	------	---------------------------	----	------------------------	-------

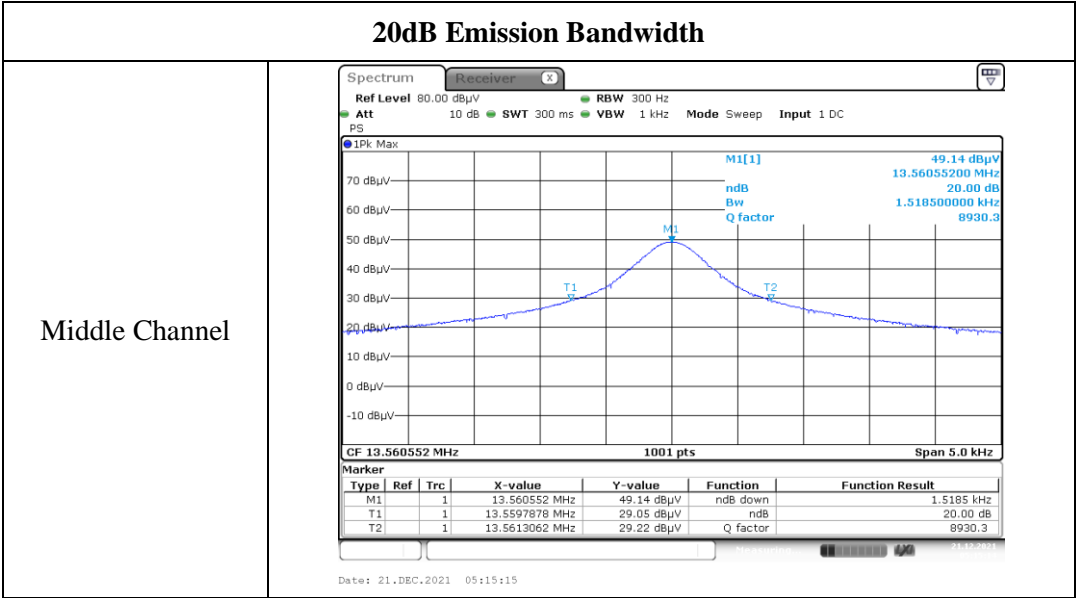
**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TESEQ	HF Loop Antenna	HLA6120	33561	2021-02-03	2024-02-02
R&S	EMI Test Receiver	ESR3	102724	2021-07-22	2022-07-21
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2021-07-18	2022-07-17
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2021-07-18	2022-07-17
Sonoma	Amplifier	310N	186165	2021-07-18	2022-07-17

*\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

**Test Data:**

Test Channel	Test Frequency (MHz)	20 dB Bandwidth (Hz)
Middle	13.56	1518.5



**4.4 99% Occupied Bandwidth**

Serial Number:	CR21120008-RF-S1	Test Date:	2021-12-21
Test Site:	RF	Test Mode:	Transmitting
Tester:	Carl Liang	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	21.2	Relative Humidity: (%)	49	ATM Pressure: (kPa)	100.9
----------------------	------	---------------------------	----	------------------------	-------

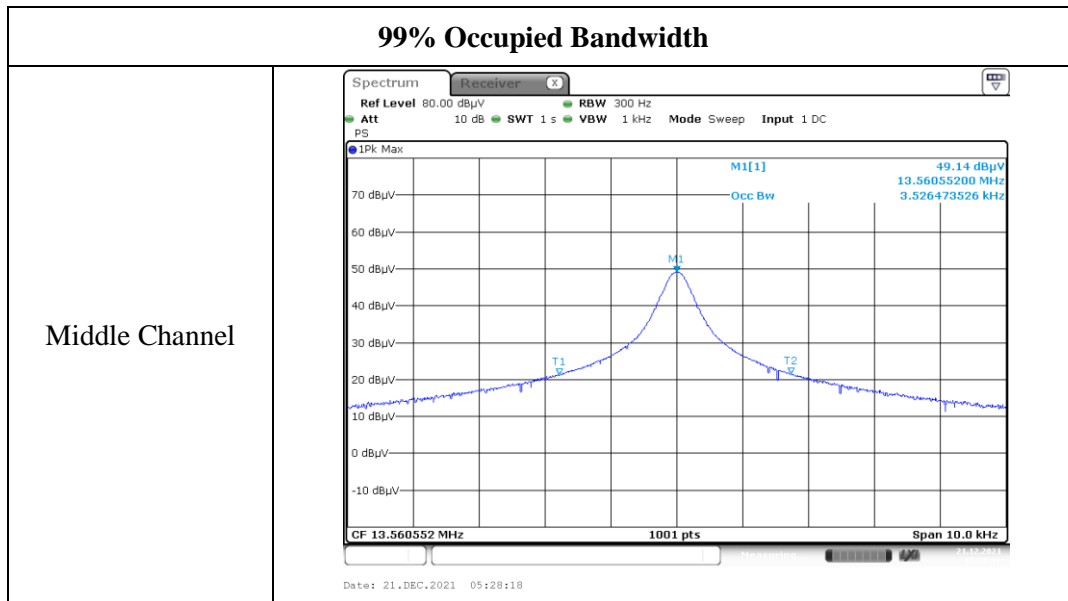
**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TESEQ	HF Loop Antenna	HLA6120	33561	2021-02-03	2024-02-02
R&S	EMI Test Receiver	ESR3	102724	2021-07-22	2022-07-21
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2021-07-18	2022-07-17
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2021-07-18	2022-07-17
Sonoma	Amplifier	310N	186165	2021-07-18	2022-07-17

*\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

**Test Data:**

Test Channel	Test Frequency (MHz)	99% Bandwidth (Hz)
Middle	13.56	3526



**4.5 Frequency Stability**

Serial Number:	CR21120008-RF-S1	Test Date:	2021-12-21
Test Site:	RF	Test Mode:	Transmit
Tester:	Carl Liang	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	21.2	Relative Humidity: (%)	49	ATM Pressure: (kPa)	100.9
----------------------	------	---------------------------	----	------------------------	-------

**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TESEQ	HF Loop Antenna	HLA6120	33561	2021-02-03	2024-02-02
R&S	EMI Test Receiver	ESR3	102724	2021-07-22	2022-07-21
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2021-07-18	2022-07-17
Sonoma	Amplifier	310N	186165	2021-07-18	2022-07-17
BACL	TEMP&HUMI Test Chamber	BTH-150	30026	2021/7/22	2022/7/22
UNI-T	Multimeter	UT39A+	C210582554	2021/9/30	2022/9/30

*\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

**Test Data:**

<b><math>f_0 = 13.56 \text{ MHz}</math></b>				
Temperature	Voltage	Measured frequency	Frequency Error	Limit
°C	V <sub>DC</sub>	MHz	Hz	Hz
-30	3.7	13.5605515	551.500000	±1356
-20		13.5605534	553.400000	±1356
-10		13.5605566	556.600000	±1356
0		13.5605537	553.700000	±1356
10		13.5605595	559.500000	±1356
20		13.5605520	552.000000	±1356
25		13.5605535	553.500000	±1356
30		13.5605596	559.600000	±1356
40		13.5605537	553.700000	±1356
50		13.5605521	552.100000	±1356
20	3.3	13.5605555	555.500000	±1356
20	4.2	13.5605531	553.100000	±1356

## 5. RF EXPOSURE EVALUATION

---

### 5.1 EXEMPTION LIMITS FOR ROUTINE EVALUATION – RF EXPOSURE EVALUATION

#### 5.1.1 Applicable Standard

RSS-102 §(2.5.2):

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $4.49/f^{0.5}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

#### 5.1.2 Calculated Result

**Result:** Compliance. NFC Transmitter is a very Low power device and compliance exemption from Routine Evaluation Limits –RF exposure Evaluation.

===== END OF REPORT =====