



中认信通

CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)



TEST REPORT

Applicant: AKUVOX (XIAMEN) NETWORKS CO., LTD.

Address: 10/F, No.56, Software Park II , Xiamen, China

FCC ID: 2AHCR-A02X

Product Name: Access Control Terminal

Model Number: A02S,A01S

Standard(s): 47 CFR Part 15, Subpart C(15.225)
ANSI C63.10-2013

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: CR21100121-00B

Date Of Issue: 2021-12-29

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

TEST FACILITY	2
DECLARATIONS.....	2
1. GENERAL INFORMATION	4
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
1.2 DESCRIPTION OF TEST CONFIGURATION.....	5
1.2.2 Support Equipment List and Details	5
1.2.3 Support Cable List and Details	5
1.2.4 Block Diagram of Test Setup.....	6
1.3 MEASUREMENT UNCERTAINTY	8
2. SUMMARY OF TEST RESULTS	9
3. REQUIREMENTS AND TEST PROCEDURES	10
3.1 AC LINE CONDUCTED EMISSIONS.....	10
3.1.1 Applicable Standard.....	10
3.1.2 EUT Setup.....	11
3.1.3 EMI Test Receiver Setup	11
3.1.4 Test Procedure	12
3.1.5 Corrected Amplitude & Margin Calculation.....	12
3.2 RADIATED EMISSIONS	13
3.2.1 Applicable Standard.....	13
3.2.2 EUT Setup.....	13
3.2.3 EMI Test Receiver & Spectrum Analyzer Setup	14
3.2.4 Corrected Amplitude & Margin Calculation.....	14
3.3 20 DB EMISSION BANDWIDTH:	15
3.3.1 Applicable Standard.....	15
3.3.2 EUT Setup.....	15
3.3.3 Test Procedure	15
3.4 FREQUENCY STABILITY.....	16
3.4.1 Applicable Standard.....	16
3.4.2 EUT Setup.....	16
3.4.3 Test Procedure	16
3.5 ANTENNA REQUIREMENT.....	17
3.5.1 Applicable Standard.....	17
3.5.2 Judgment.....	17
4. TEST DATA AND RESULTS.....	18
4.1 AC LINE CONDUCTED EMISSIONS.....	18
4.2 RADIATION SPURIOUS EMISSIONS.....	23
4.3 20 DB EMISSION BANDWIDTH	46
4.4 FREQUENCY STABILITY.....	48

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Access Control Terminal
EUT Model:	A02S
Multiple Model:	A01S
Operation Frequency:	13.56 MHz
Modulation Type:	ASK
Rated Input Voltage:	DC 12V from adapter or 48V from POE
Serial Number:	CR21100121-RF-S1
EUT Received Date:	2021.10.28
EUT Received Status:	Good
Note: Note: The Multiple models are electrically identical with Test model, please refer to the declaration letter for more detail, which was provided by manufacturer. Test only performed with model: A02S.	

Operation Frequency Detail:

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

Per section 15.31(m), the frequency was performed the test as below:

Test Channel	Frequency (MHz)
1	13.56

Antenna Information Detail ▲:

Antenna Manufacturer	Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range	§15.203 Requirement
AKUVOX (XIAMEN) NETWORKS CO., LTD.	PCB	50	Unknown	Compliance
The Method of §15.203 Compliance: ☒ Antenna must be permanently attached to the unit. ☐ Antenna must use a unique type of connector to attach to the EUT. ☐ 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
1	13.56	Default

1.2.2 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
GOSPELL DIGITAL TECHNOLOGY CO.,LTD	POE	G0720-480-050	2014-0002925
ORIENTAL HERO ELE.FTY	Adapter	OH-1015A1201000U3-UL	96DG E230964
Unknown	Load	Unknown	Load3
TOTOLINK	Wireless Router	LR1200	LR1200155P00167
LANDI	NFC Card	EINOLDA	Card1

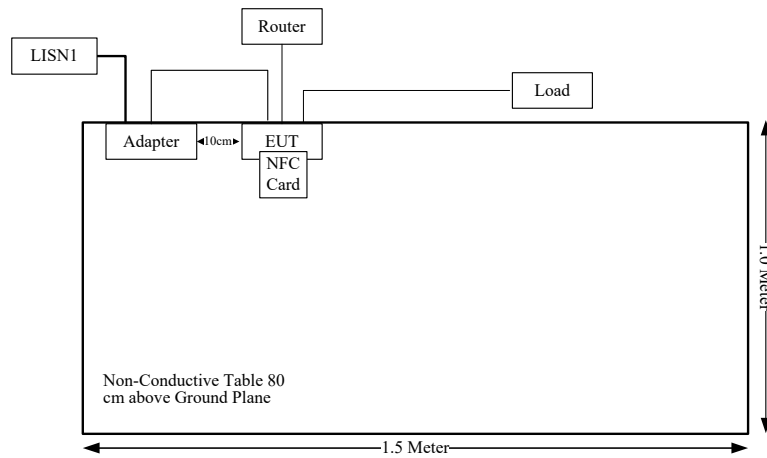
1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	No	No	3	POE	Router
RJ45 Cable	No	No	0.3	POE	EUT
RJ45 Cable	No	Yes	3	EUT	Router
Adapter Cable	No	Yes	2	Adapter	EUT
Cable	No	Yes	3	EUT	Load

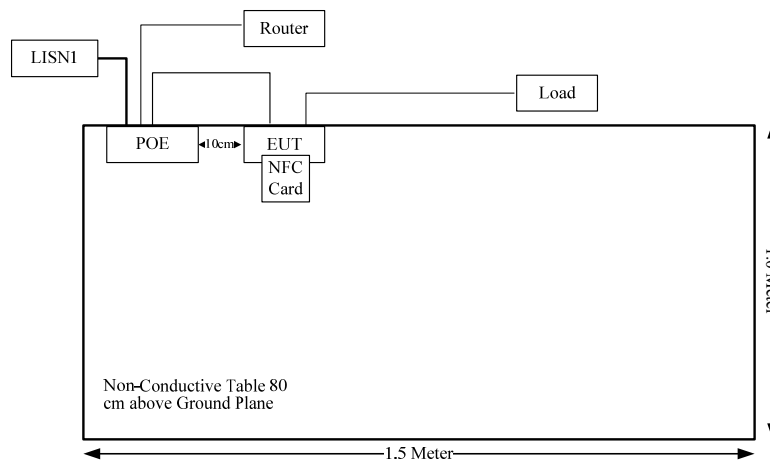
1.2.4 Block Diagram of Test Setup

AC line conducted emissions:

AC/DC Adapter:

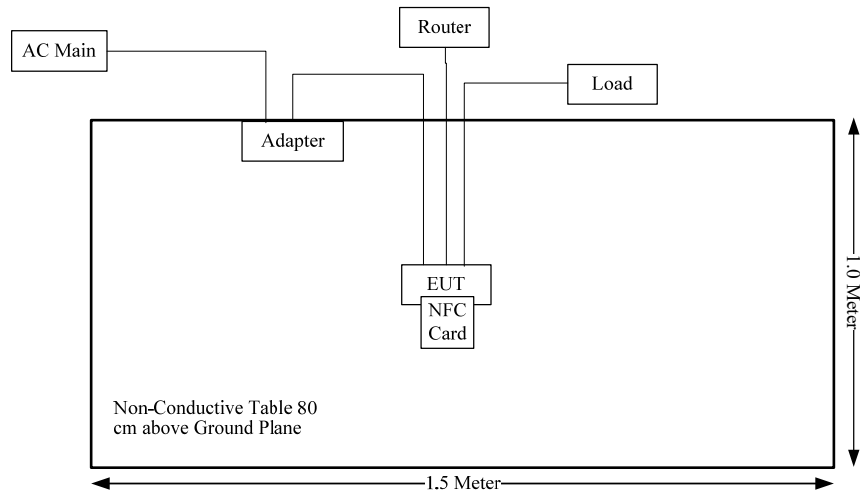


POE Adapter:

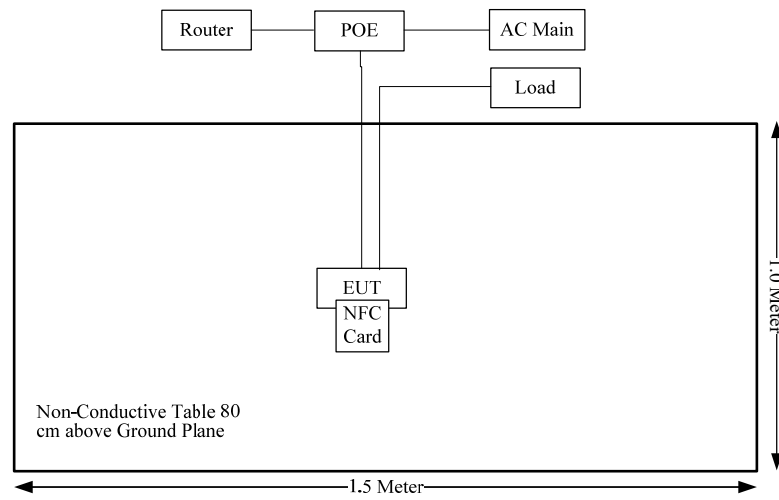


Radiated Emission:

AC/DC Adapter:



POE Adapter:



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	±5 %
Unwanted Emissions, radiated	9kHz~30MHz: 4.12dB 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	±1 °C
Humidity	±5%
DC and low frequency voltages	±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§15.203	Antenna Requirement	Compliance
FCC§15.207 (a)	Conducted Emissions	Compliance
§15.225 §15.209 §15.205	Radiated Emission Test	Compliance
§15.225(e)	Frequency Stability	Compliance
§15.215(c)	20 dB Bandwidth	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 μ 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 μ 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:

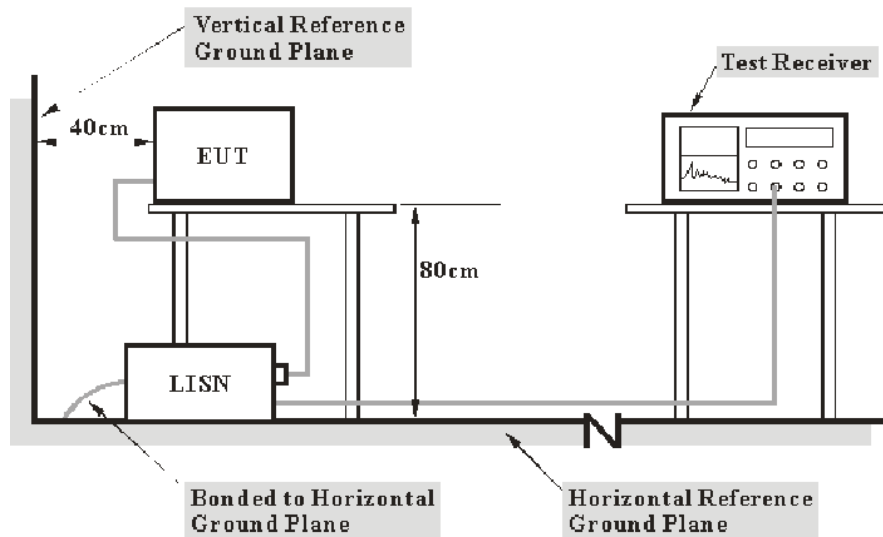
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 μ V within the frequency band 535-1705 kHz, as measured using a 50 μ 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.

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 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

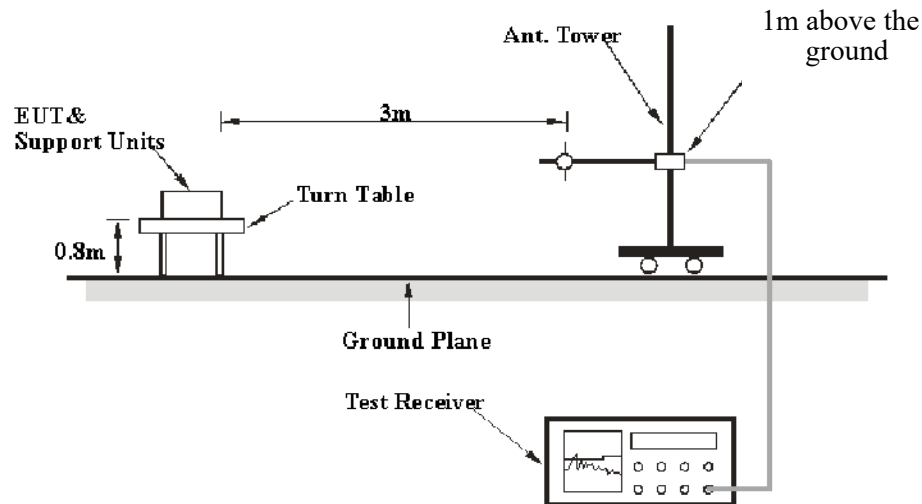
3.2.1 Applicable Standard

As per FCC Part 15.225

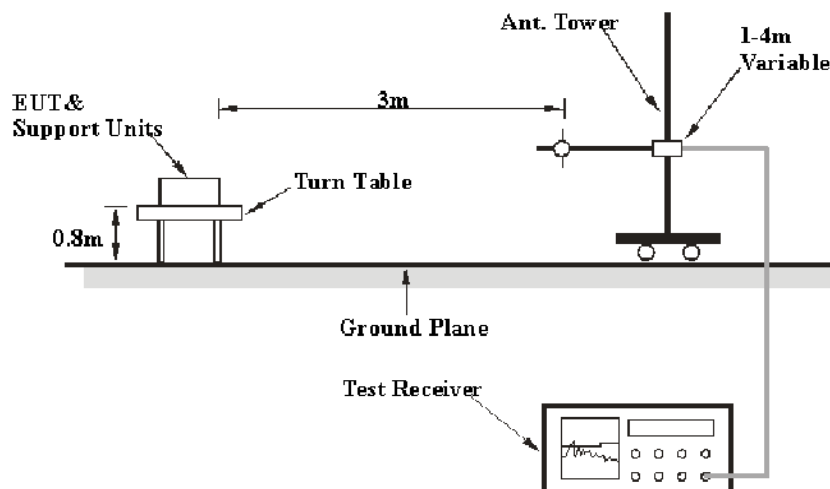
- (a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 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.

3.2.2 EUT Setup

9kHz-30MHz:



30MHz-1GHz:



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.

For 9 kHz-30 MHz test, the lowest height of the magnetic antenna shall be 1 m above the ground and three antenna orientations (parallel, perpendicular, and ground-parallel) shall be measured.

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

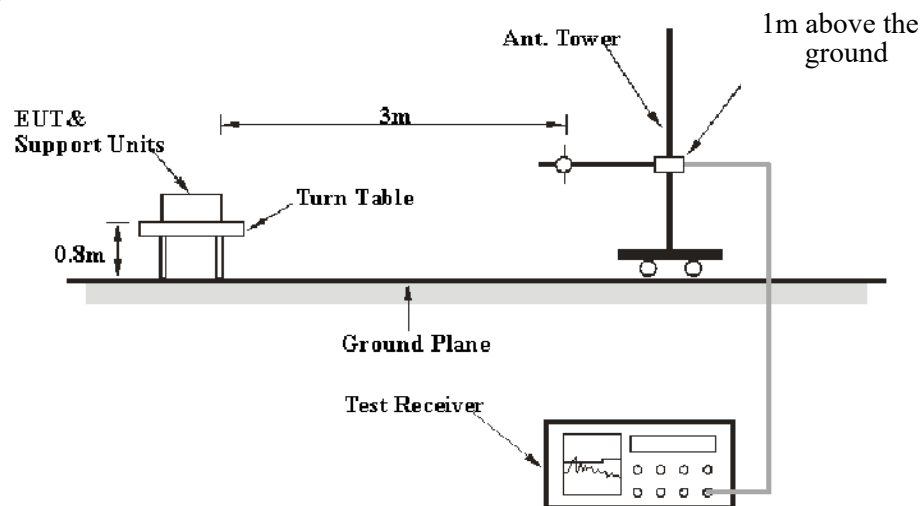
3.3 20 dB Emission Bandwidth:

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

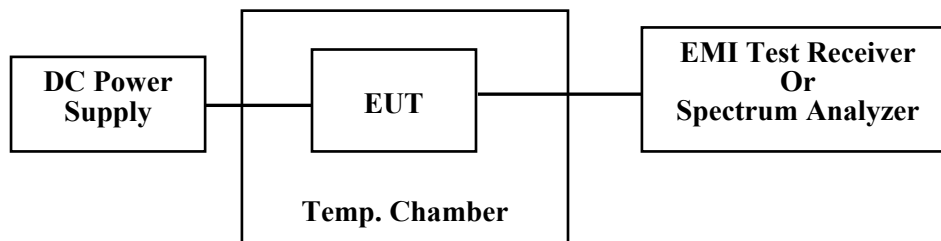
3.4 Frequency Stability

3.4.1 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.

3.4.2 EUT Setup



3.4.3 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.

3.5 Antenna Requirement

3.5.1 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 user 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.

3.5.2 Judgment

Please refer to the Antenna Information detail in Section 1.

4. TEST DATA AND RESULTS

4.1 AC Line Conducted Emissions

Serial Number:	CR21100121-RF-S1	Test Date:	2021-12-15
Test Site:	CE	Test Mode:	Transmitting
Tester:	Nick Tang	Test Result:	Pass

Environmental Conditions:					
Temperature: (°C)	22.2	Relative Humidity: (%)	70	ATM Pressure: (kPa)	101.2

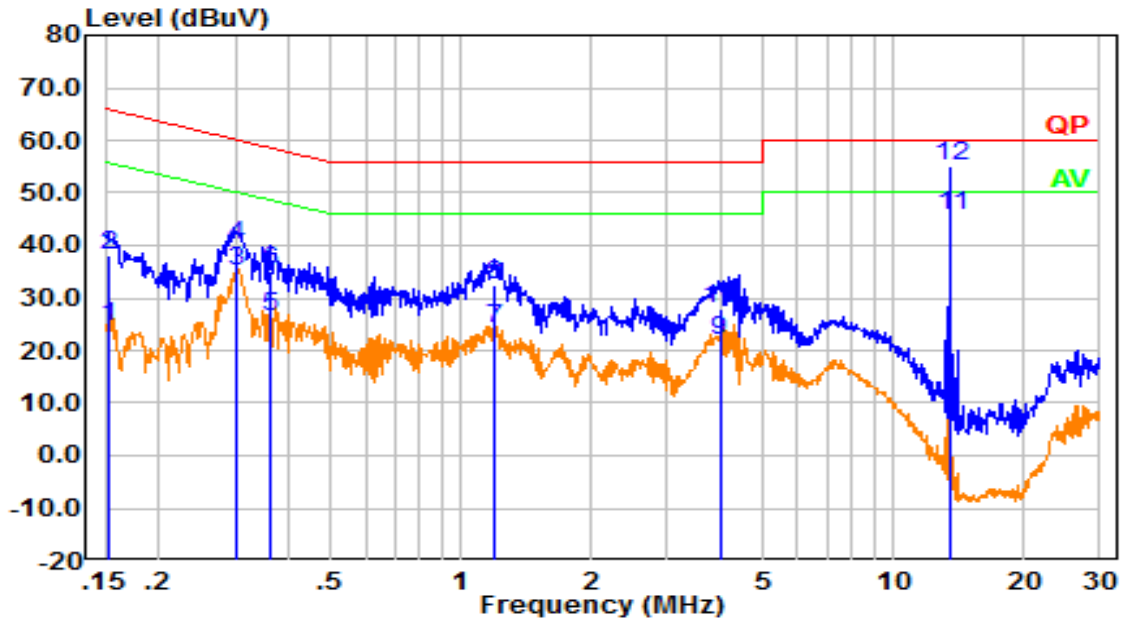
Test Equipment List and Details:

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).

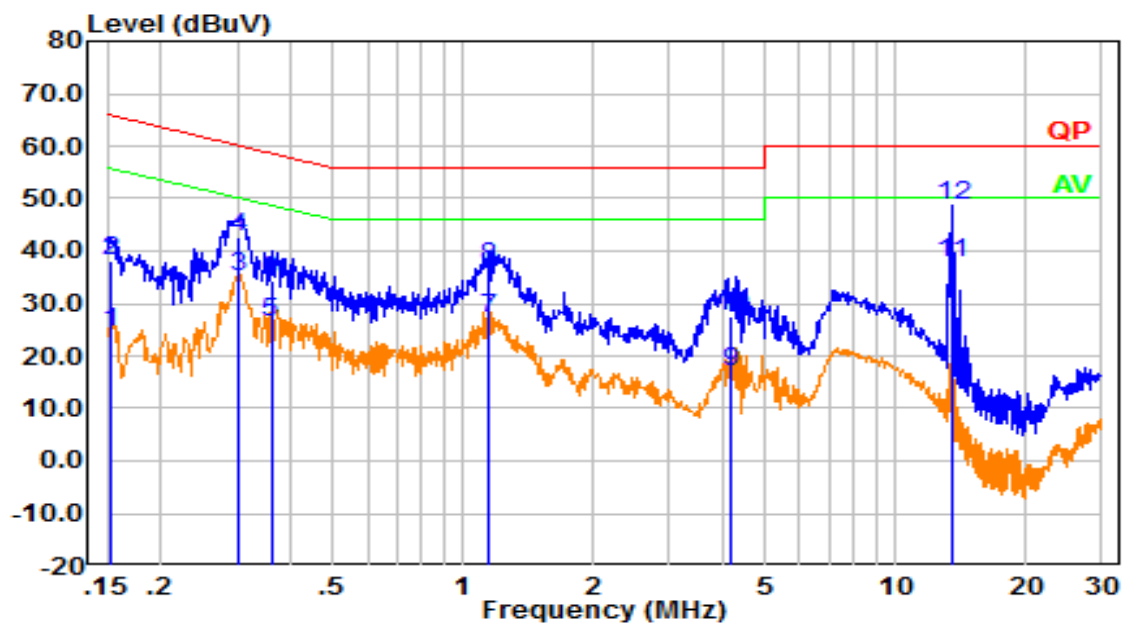
AC/DC Adapter:

Line:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.153	14.90	9.61	24.51	55.86	31.35	Average
2	0.153	28.38	9.61	37.99	65.86	27.87	QP
3	0.301	25.33	9.61	34.94	50.22	15.28	Average
4	0.301	30.50	9.61	40.11	60.22	20.11	QP
5	0.360	16.65	9.61	26.26	48.72	22.46	Average
6	0.360	25.34	9.61	34.95	58.72	23.77	QP
7	1.189	14.63	9.62	24.26	46.00	21.74	Average
8	1.189	22.93	9.62	32.55	56.00	23.45	QP
9	3.963	12.38	9.65	22.03	46.00	23.97	Average
10	3.963	18.43	9.65	28.08	56.00	27.92	QP
11	13.561	36.07	9.68	45.75	50.00	4.25	Average
12	13.561	45.48	9.68	55.16	60.00	4.84	QP

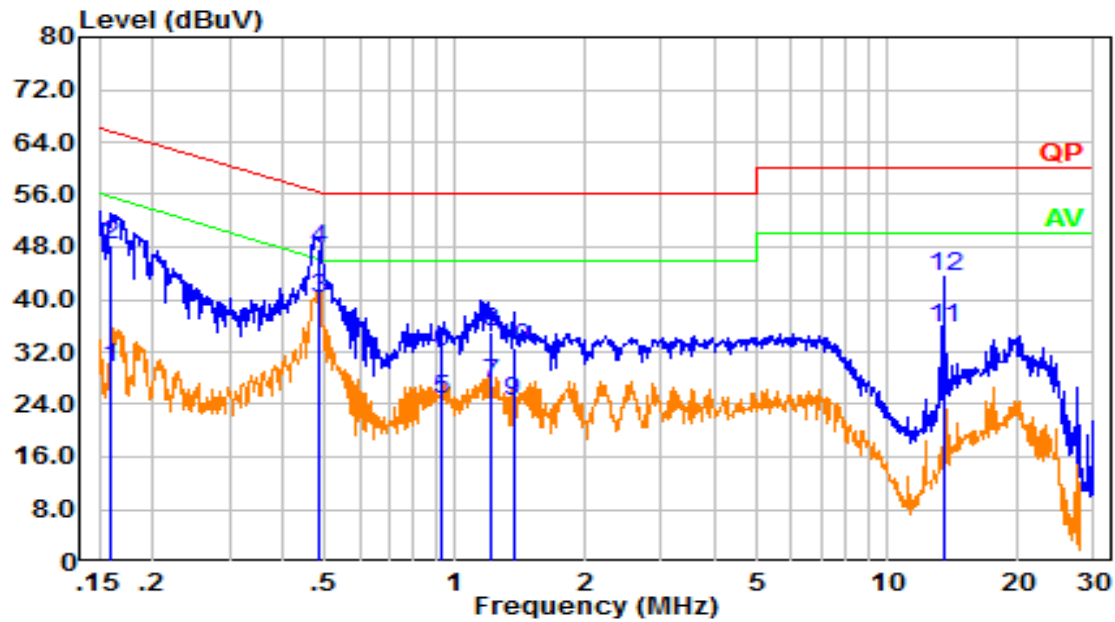
Neutral:



No.	Frequency (MHz)	Reading (dBUV)	Factor (dB)	Result (dBUV)	Limit (dBUV)	Margin (dB)	Detector
1	0.154	15.02	9.61	24.63	55.80	31.17	Average
2	0.154	28.37	9.61	37.98	65.80	27.82	QP
3	0.302	25.30	9.61	34.91	50.18	15.27	Average
4	0.302	33.12	9.61	42.73	60.18	17.45	QP
5	0.359	16.95	9.61	26.56	48.75	22.19	Average
6	0.359	24.77	9.61	34.38	58.75	24.37	QP
7	1.145	17.41	9.62	27.03	46.00	18.97	Average
8	1.145	27.27	9.62	36.89	56.00	19.11	QP
9	4.179	7.42	9.65	17.07	46.00	28.93	Average
10	4.179	17.75	9.65	27.40	56.00	28.60	QP
11	13.514	28.08	9.68	37.76	50.00	12.24	Average
12	13.514	38.90	9.68	48.58	60.00	11.42	QP

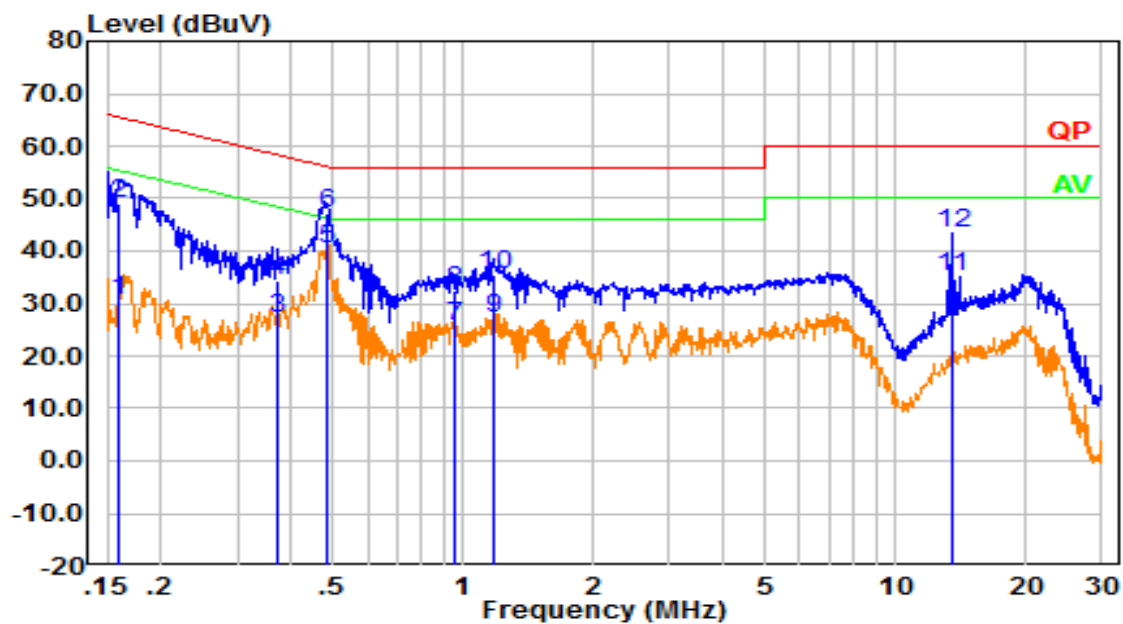
POE Adapter:

Line:



No.	Frequency (MHz)	Reading (dBUV)	Factor (dB)	Result (dBUV)	Limit (dBUV)	Margin (dB)	Detector
1	0.159	20.01	9.61	29.62	55.50	25.88	Average
2	0.159	38.69	9.61	48.30	65.50	17.20	QP
3	0.481	30.59	9.61	40.20	46.32	6.12	Average
4	0.481	38.13	9.61	47.74	56.32	8.58	QP
5	0.928	15.09	9.62	24.71	46.00	21.29	Average
6	0.928	22.25	9.62	31.87	56.00	24.13	QP
7	1.204	17.58	9.62	27.20	46.00	18.80	Average
8	1.204	25.46	9.62	35.08	56.00	20.92	QP
9	1.361	14.69	9.62	24.31	46.00	21.69	Average
10	1.361	22.95	9.62	32.57	56.00	23.43	QP
11	13.514	26.05	9.68	35.73	50.00	14.27	Average
12	13.514	33.71	9.68	43.39	60.00	16.61	QP

Neutral:



No.	Frequency (MHz)	Reading (dBUV)	Factor (dB)	Result (dBUV)	Limit (dBUV)	Margin (dB)	Detector
1	0.160	20.92	9.61	30.53	55.45	24.92	Average
2	0.160	39.52	9.61	49.13	65.45	16.32	QP
3	0.371	17.45	9.61	27.06	48.48	21.42	Average
4	0.371	24.91	9.61	34.52	58.48	23.96	QP
5	0.483	30.86	9.61	40.47	46.29	5.82	Average
6	0.483	37.65	9.61	47.26	56.29	9.03	QP
7	0.958	15.94	9.62	25.56	46.00	20.44	Average
8	0.958	22.73	9.62	32.35	56.00	23.65	QP
9	1.181	17.61	9.62	27.23	46.00	18.77	Average
10	1.181	25.78	9.62	35.40	56.00	20.60	QP
11	13.514	25.40	9.68	35.08	50.00	14.92	Average
12	13.514	33.59	9.68	43.27	60.00	16.73	QP

4.2 Radiation Spurious Emissions

Serial Number:	CR21100121-RF-S1	Test Date:	2021-12-16
Test Site:	966-2	Test Mode:	Transmitting
Tester:	Carl Laing	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	24.2	Relative Humidity: (%)	43	ATM Pressure: (kPa)	101.1
----------------------	------	---------------------------	----	------------------------	-------

Test Equipment List and Details:

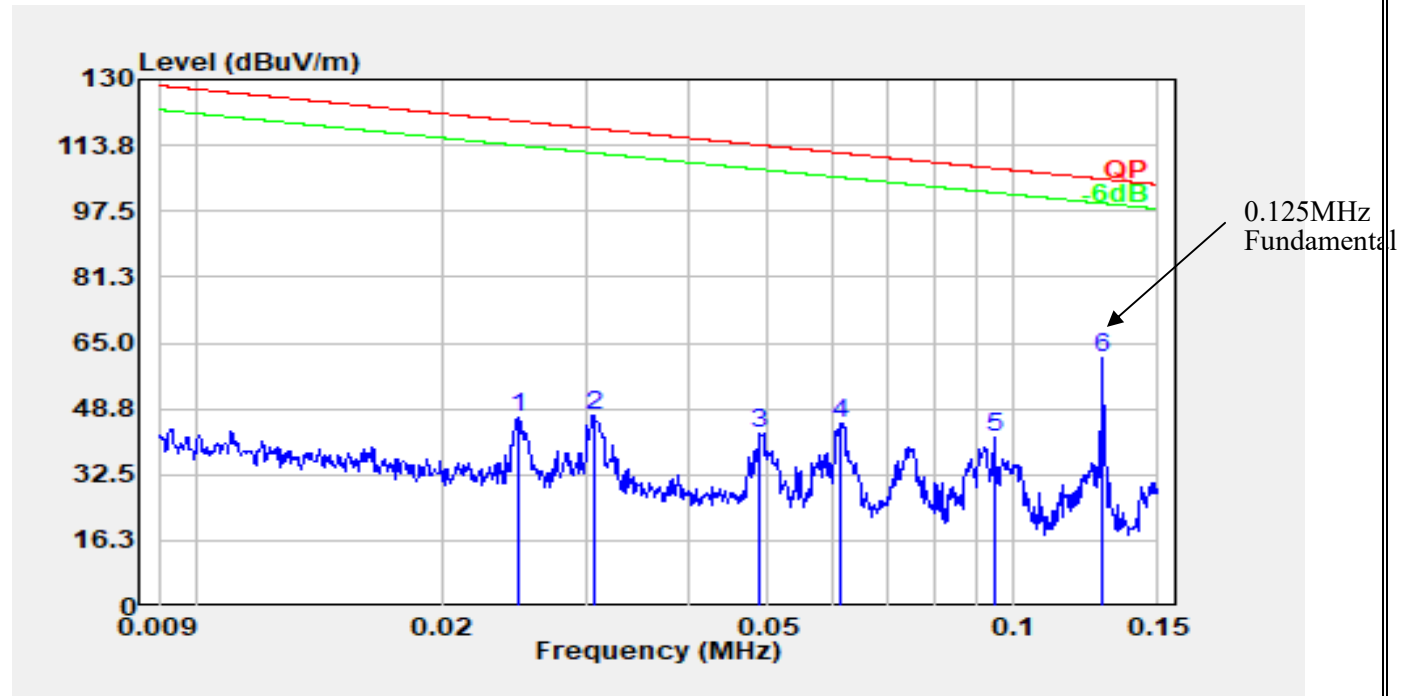
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TESEQ	HF Loop Antenna	HLA6120	33561	2021-02-03	2024-02-02
Sunol Sciences	Antenna	JB6	A082520-5	2020-10-19	2023-10-18
R&S	EMI Test Receiver	ESR3	102724	2021-07-22	2022-07-21
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	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).*

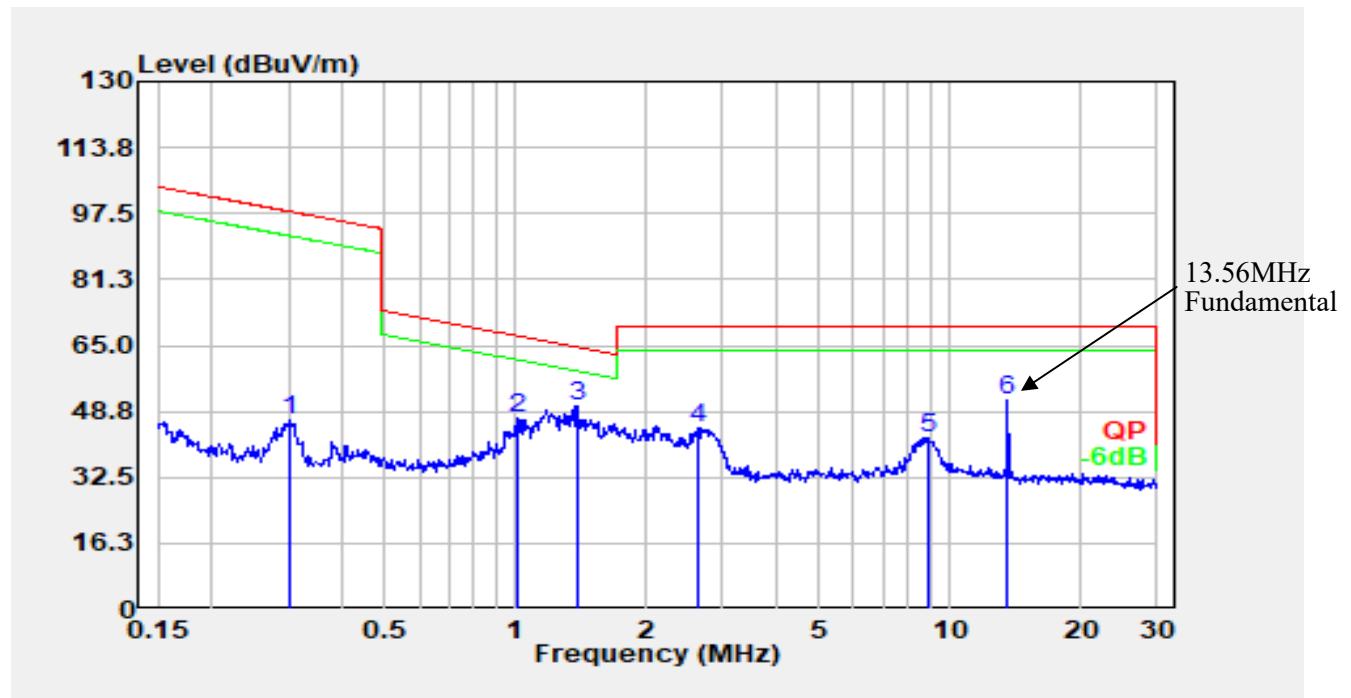
Test Data:

AC/DC Adapter:

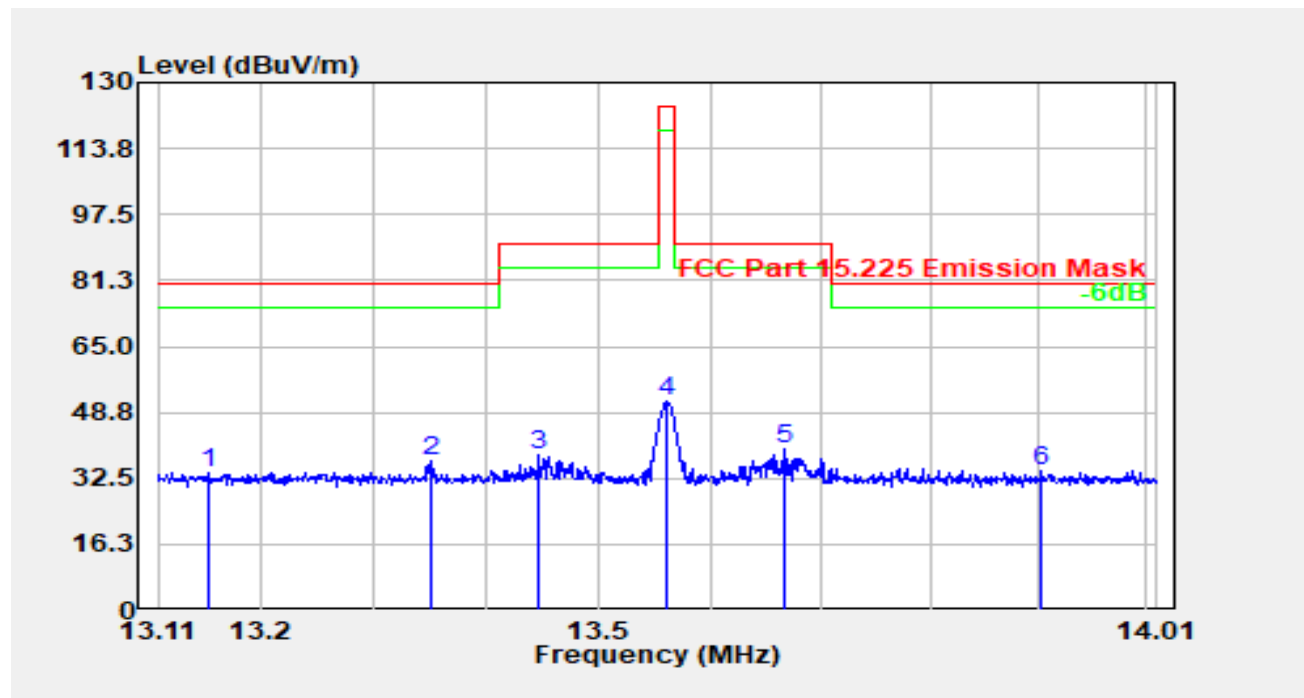
1) 9 kHz~30MHz:

Parallel:

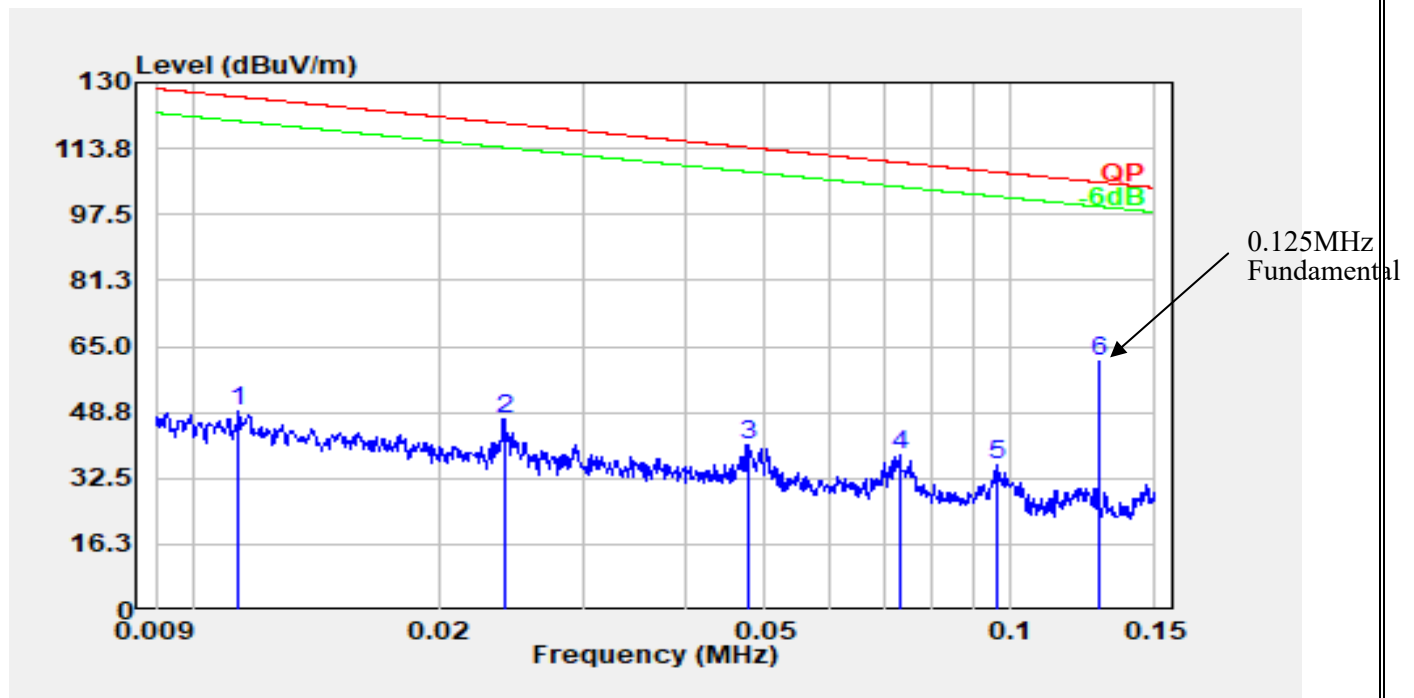
No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	0.025	26.07	20.42	46.49	119.75	73.26	Peak
2	0.031	26.83	20.41	47.24	117.89	70.65	Peak
3	0.049	22.43	20.41	42.84	113.81	70.97	Peak
4	0.061	24.73	20.41	45.14	111.88	66.74	Peak
5	0.095	21.55	20.26	41.81	108.09	66.28	Peak
6	0.125	41.28	20.22	61.50	105.45	43.95	Peak



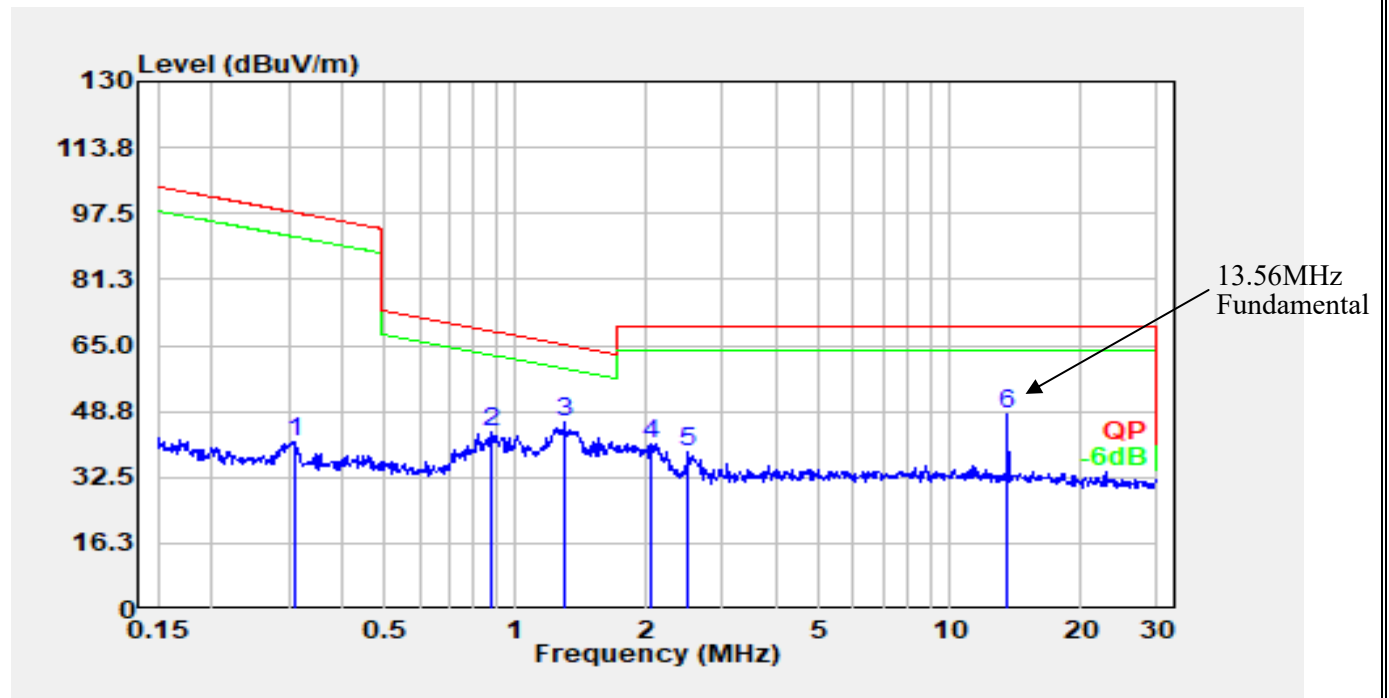
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.300	26.29	20.12	46.41	98.05	51.64	Peak
2	1.016	27.10	20.03	47.13	67.33	20.20	Peak
3	1.388	30.25	19.96	50.21	64.56	14.35	Peak
4	2.636	24.64	19.97	44.61	69.54	24.93	Peak
5	8.869	22.12	20.20	42.32	69.54	27.22	Peak
6	13.551	31.06	20.39	51.45	69.54	18.09	Peak



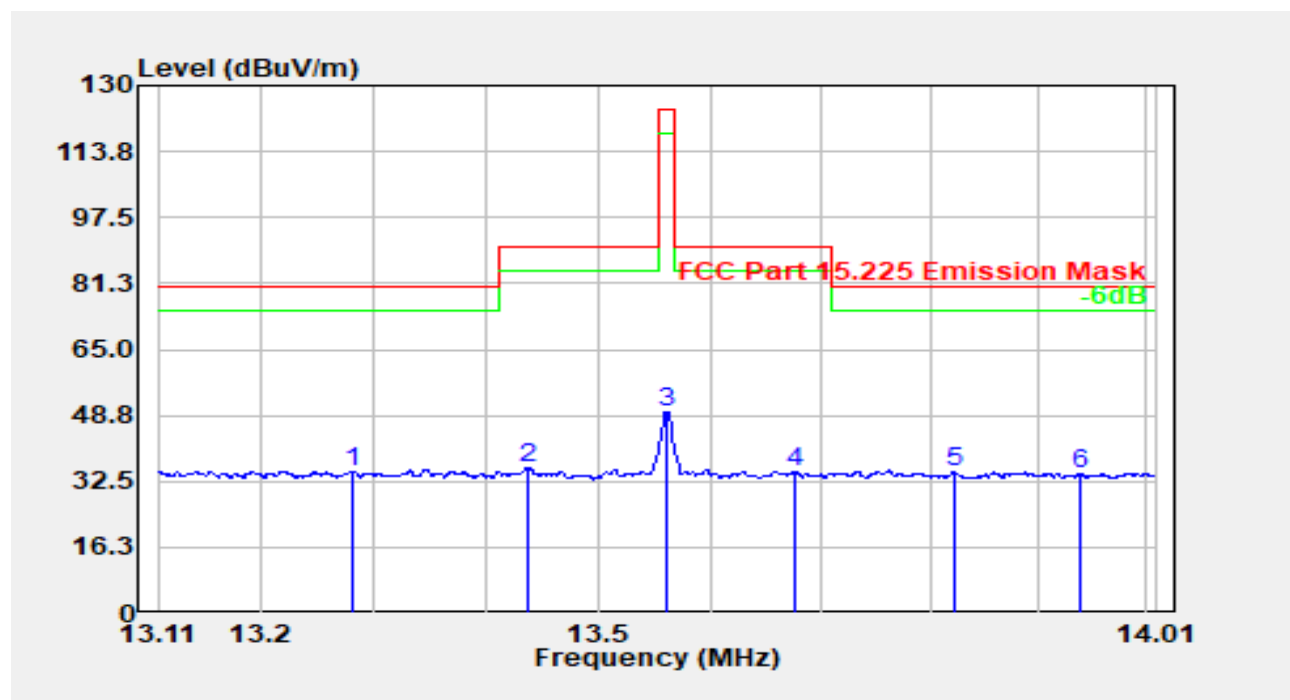
No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	13.155	13.33	20.37	33.71	80.51	46.80	Peak
2	13.351	16.19	20.38	36.57	80.51	43.94	Peak
3	13.447	17.84	20.38	38.23	90.47	52.24	Peak
4	13.561	30.95	20.39	51.34	124.00	72.66	Peak
5	13.667	19.51	20.39	39.90	90.47	50.57	Peak
6	13.902	13.75	20.40	34.15	80.51	46.36	Peak

Perpendicular:

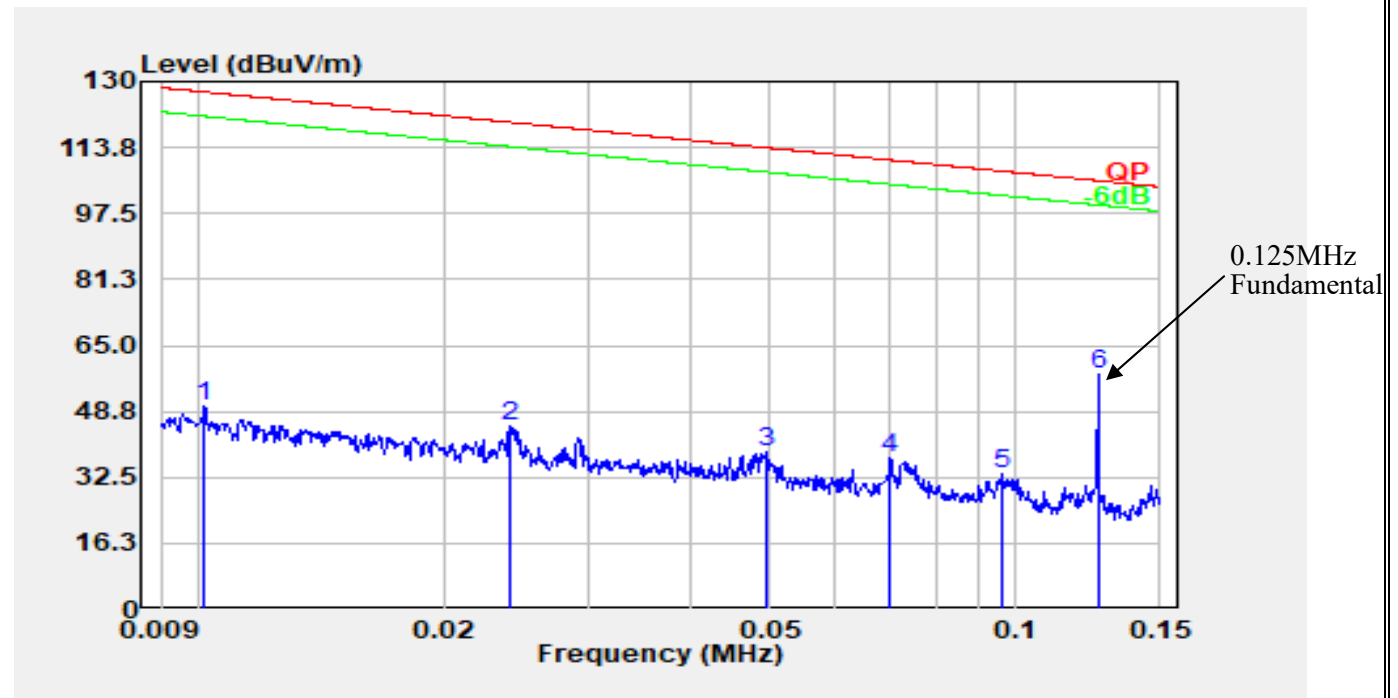
No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	0.011	28.56	20.51	49.07	126.52	77.45	Peak
2	0.024	26.85	20.43	47.28	119.99	72.71	Peak
3	0.048	20.55	20.41	40.96	114.03	73.07	Peak
4	0.073	17.83	20.40	38.23	110.31	72.09	Peak
5	0.096	15.77	20.24	36.01	107.92	71.91	Peak
6	0.125	40.95	20.22	61.17	105.45	44.28	Peak



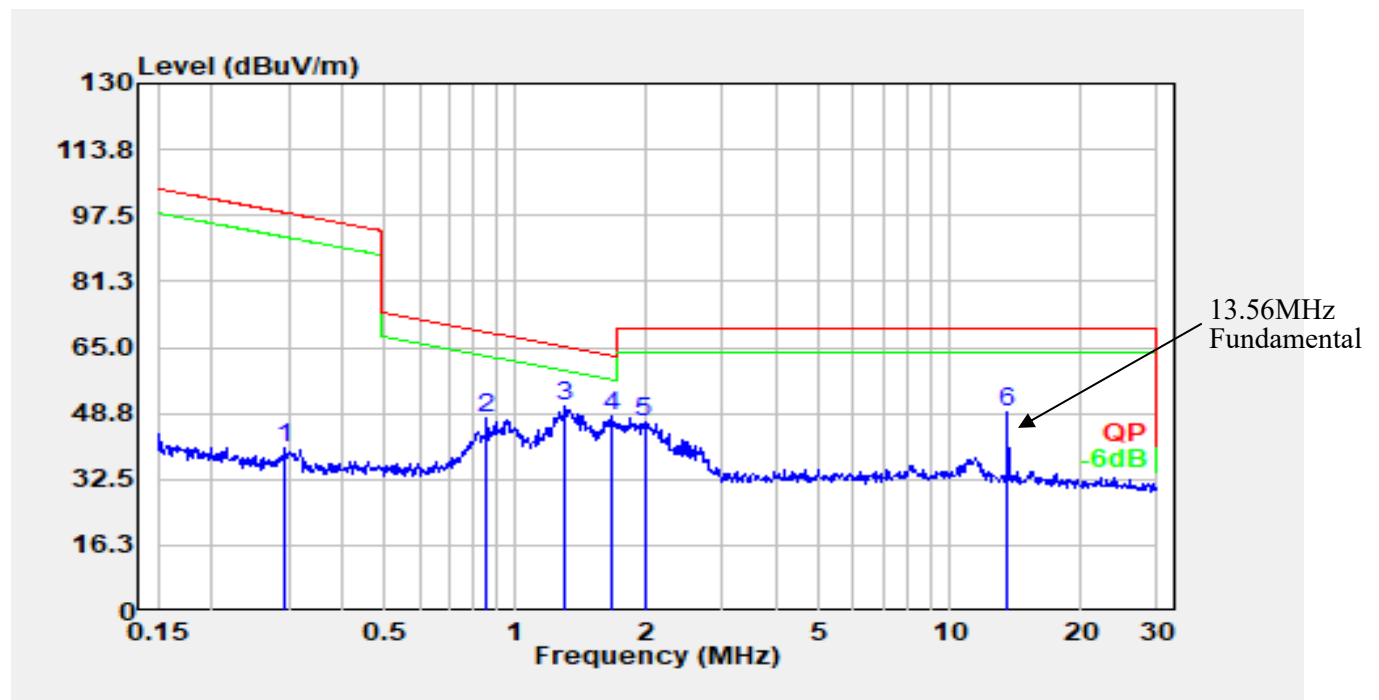
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.308	21.00	20.12	41.11	97.82	56.71	Peak
2	0.876	23.53	20.03	43.56	68.65	25.09	Peak
3	1.296	25.93	19.98	45.91	65.17	19.26	Peak
4	2.055	20.89	19.96	40.85	69.54	28.69	Peak
5	2.487	18.95	19.97	38.92	69.54	30.62	Peak
6	13.551	27.89	20.39	48.28	69.54	21.26	Peak



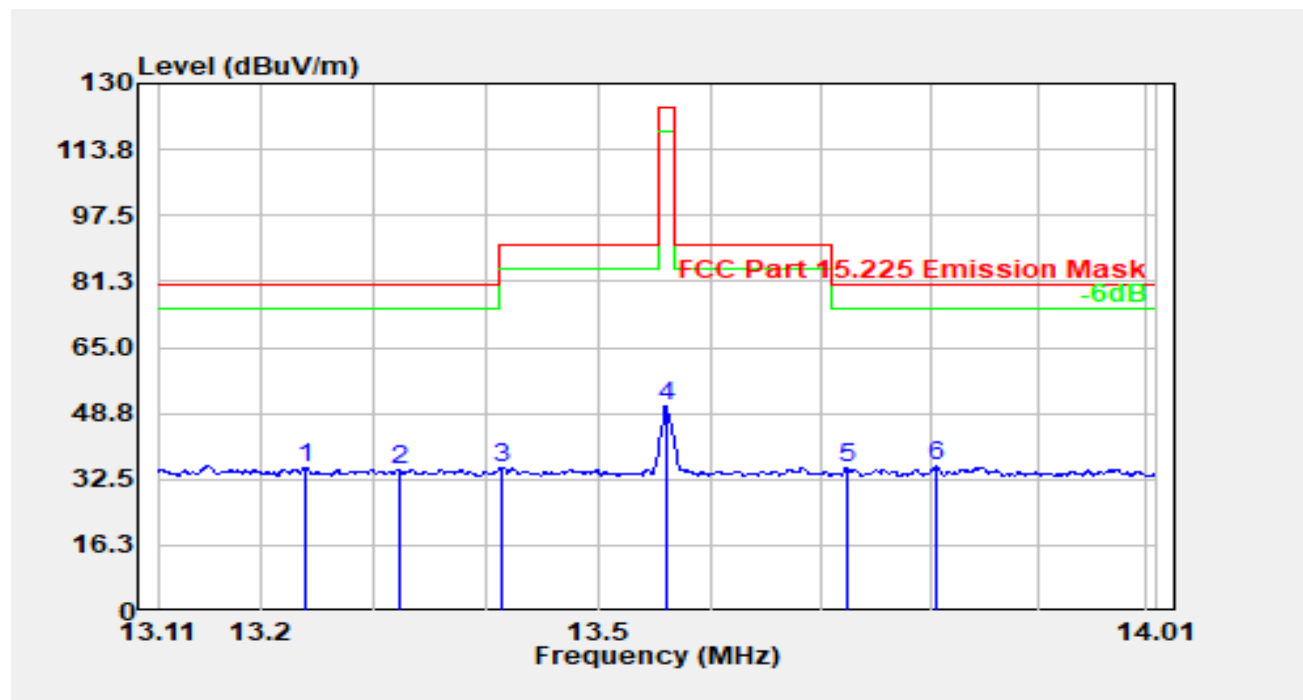
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	13.281	14.59	20.38	34.97	80.51	45.54	Peak
2	13.437	15.38	20.38	35.76	90.47	54.71	Peak
3	13.561	29.23	20.39	49.62	124.00	74.38	Peak
4	13.677	14.54	20.39	34.93	90.47	55.54	Peak
5	13.822	14.57	20.39	34.97	80.51	45.54	Peak
6	13.938	14.13	20.40	34.52	80.51	45.99	Peak

Ground-parallel:

No.	Frequency (MHz)	Reading (dBUV)	Factor (dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector
1	0.010	29.58	20.51	50.09	127.44	77.35	Peak
2	0.024	24.65	20.43	45.07	119.97	74.89	Peak
3	0.049	18.14	20.41	38.55	113.74	75.18	Peak
4	0.070	17.03	20.42	37.45	110.71	73.25	Peak
5	0.096	13.29	20.25	33.53	107.97	74.44	Peak
6	0.126	37.69	20.22	57.91	105.60	47.69	Peak



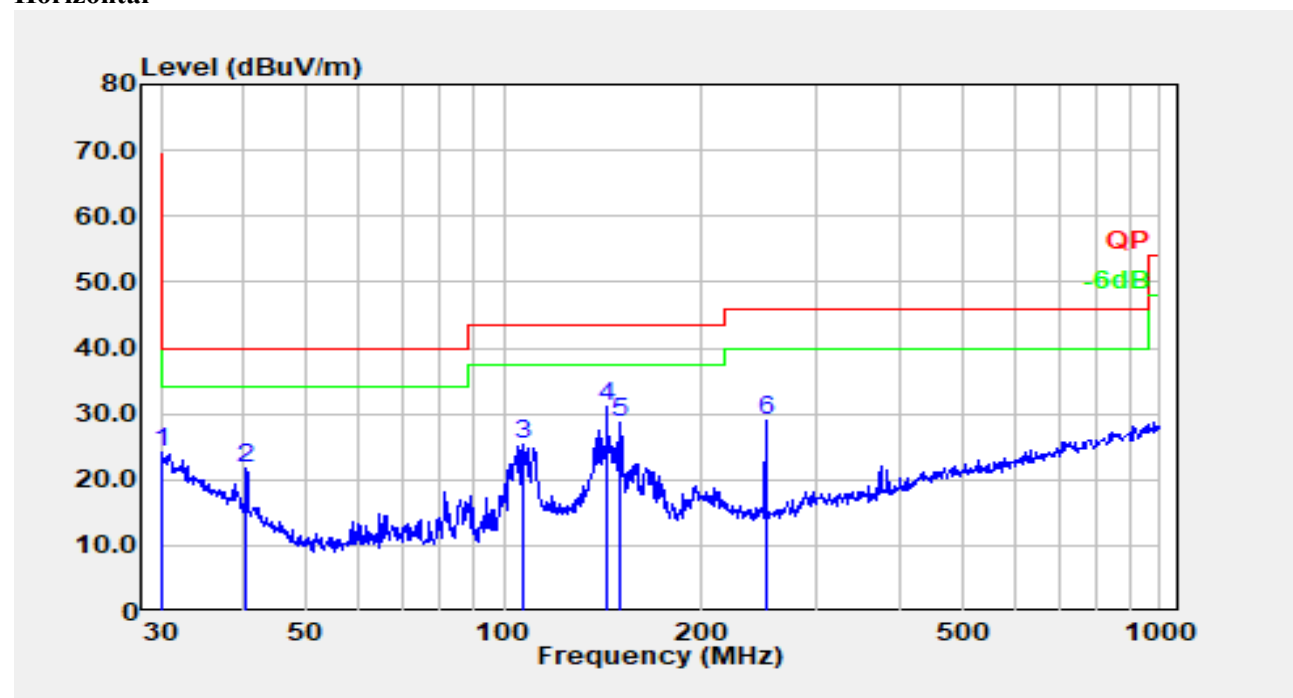
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.294	19.89	20.12	40.01	98.24	58.23	Peak
2	0.857	27.52	20.03	47.55	68.84	21.28	Peak
3	1.296	30.38	19.98	50.36	65.17	14.81	Peak
4	1.662	28.12	19.95	48.07	62.96	14.89	Peak
5	1.980	26.78	19.96	46.74	69.54	22.80	Peak
6	13.623	28.77	20.39	49.16	69.54	20.38	Peak



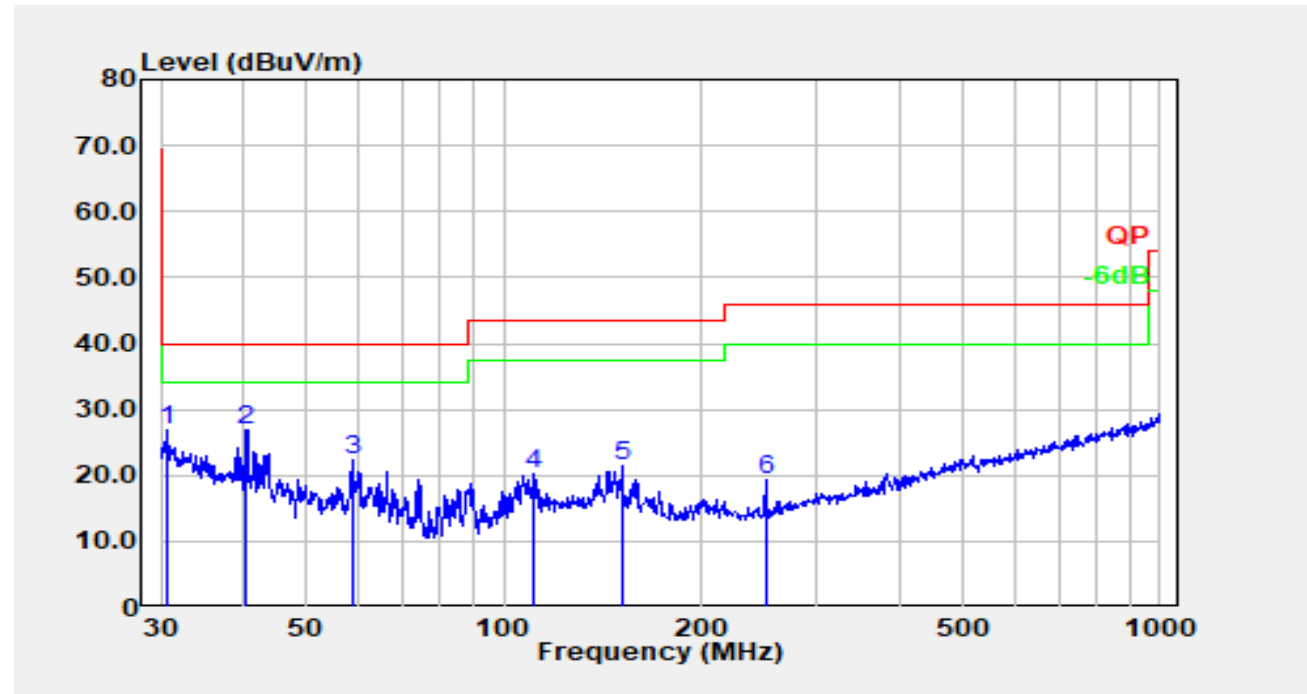
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	13.240	14.91	20.38	35.29	80.51	45.22	Peak
2	13.322	14.43	20.38	34.81	80.51	45.70	Peak
3	13.414	15.16	20.38	35.54	90.47	54.93	Peak
4	13.561	30.24	20.39	50.63	124.00	73.37	Peak
5	13.724	14.81	20.39	35.20	80.51	45.31	Peak
6	13.807	15.26	20.39	35.65	80.51	44.86	Peak

2) Above 30 MHz

Horizontal



No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	30.105	27.97	-3.87	24.10	40.00	15.90	Peak
2	40.559	33.65	-11.86	21.79	40.00	18.21	Peak
3	106.759	38.73	-13.22	25.51	43.50	17.99	Peak
4	143.326	43.24	-12.18	31.06	43.50	12.44	Peak
5	150.011	40.87	-12.26	28.61	43.50	14.89	Peak
6	250.301	42.22	-13.25	28.97	46.00	17.03	Peak

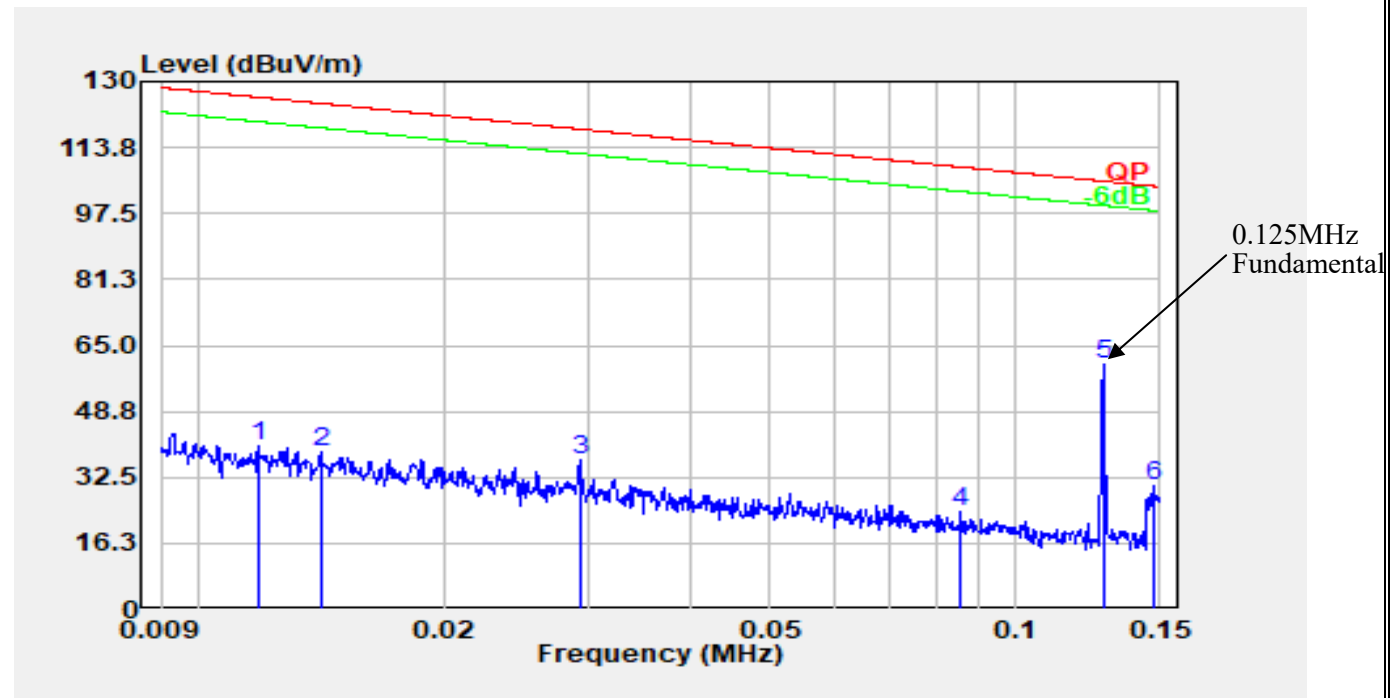
Vertical

No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	30.638	31.07	-4.28	26.78	40.00	13.22	Peak
2	40.559	38.71	-11.86	26.85	40.00	13.15	Peak
3	58.613	40.06	-17.60	22.46	40.00	17.54	Peak
4	111.347	32.62	-12.48	20.14	43.50	23.36	Peak
5	151.597	33.60	-12.29	21.31	43.50	22.19	Peak
6	250.301	32.51	-13.25	19.25	46.00	26.75	Peak

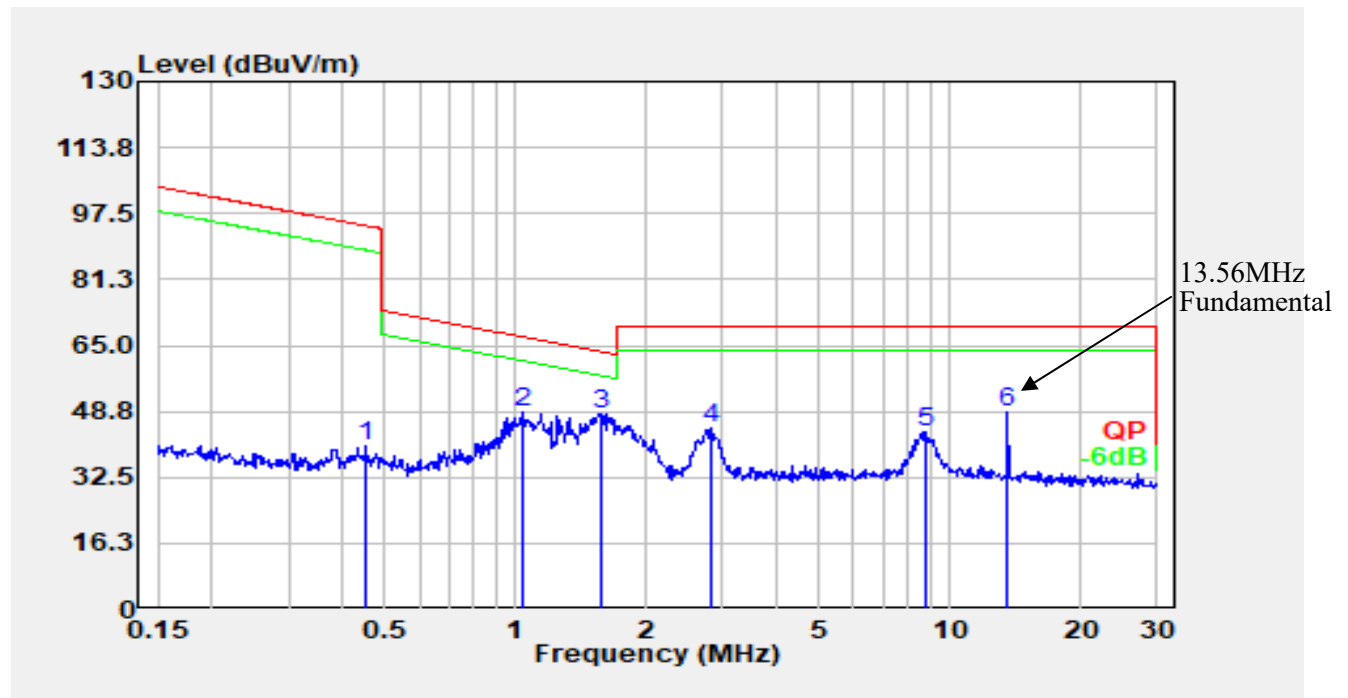
POE Adapter:

1) 9 kHz~30MHz:

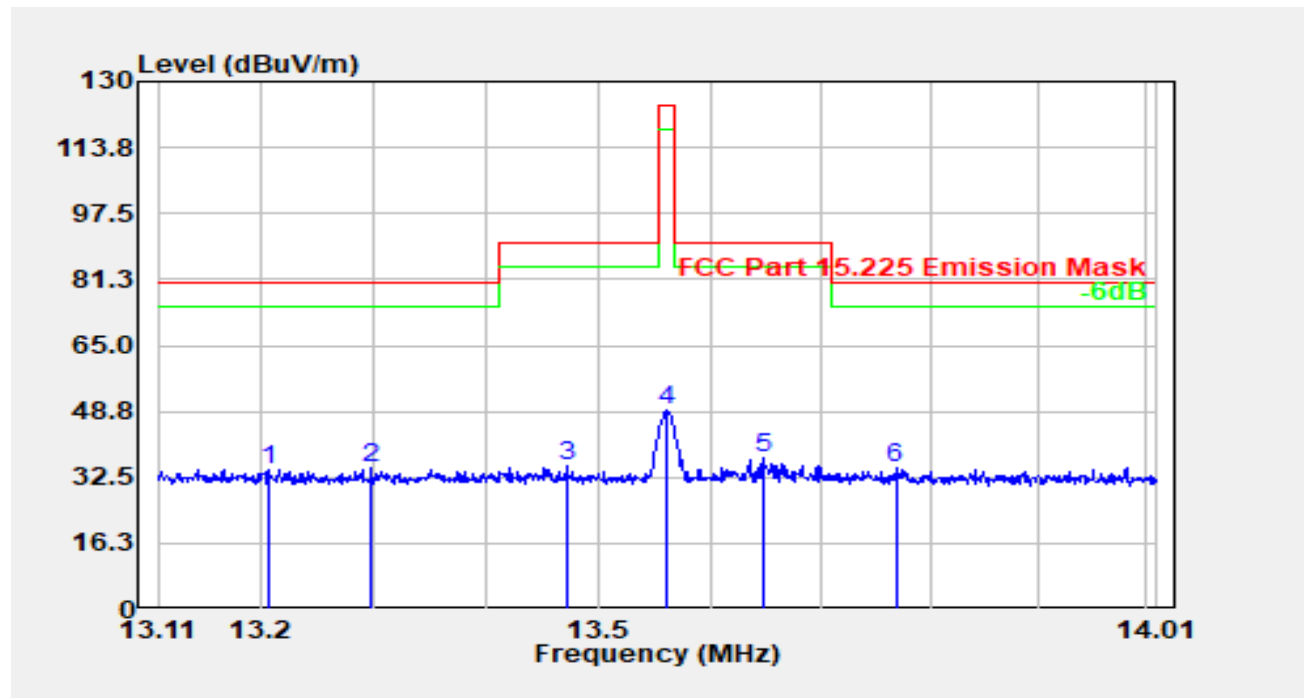
Parallel:



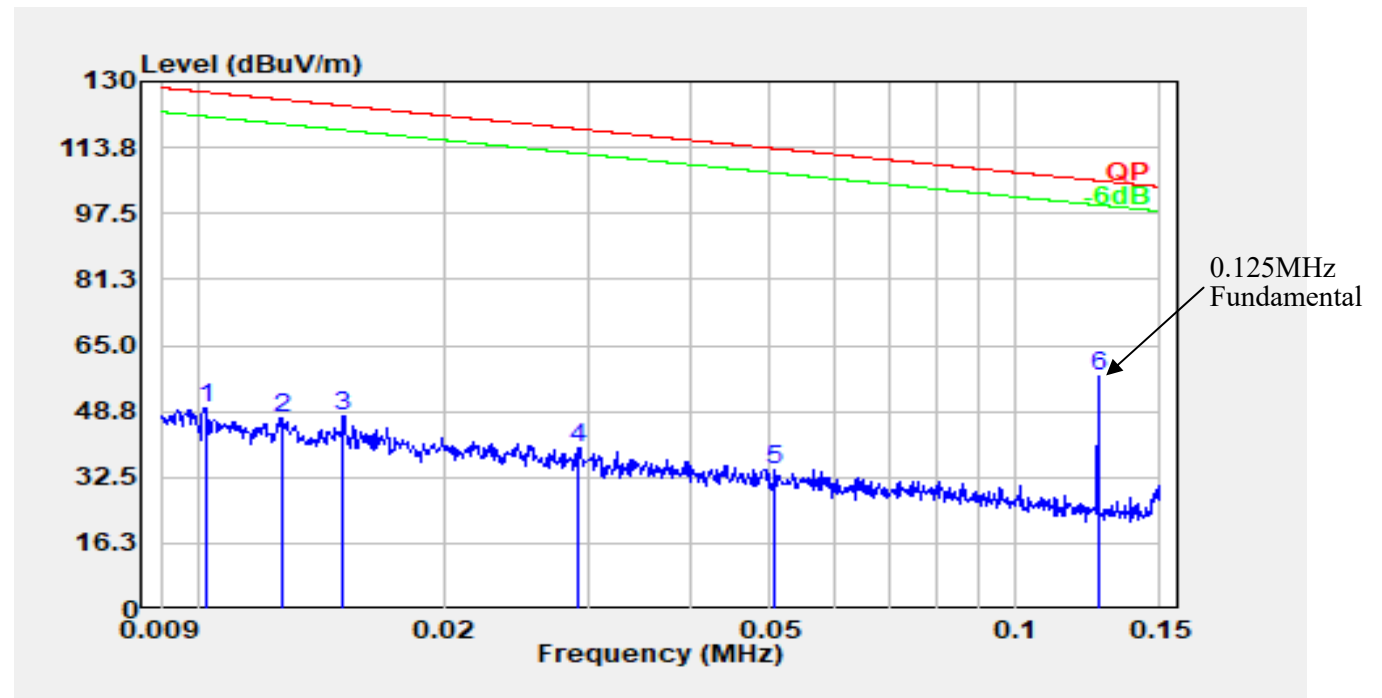
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.012	19.94	20.51	40.45	126.13	85.67	Peak
2	0.014	18.00	20.51	38.51	124.61	86.10	Peak
3	0.029	16.19	20.41	36.60	118.26	81.66	Peak
4	0.086	3.66	20.32	23.97	108.95	84.97	Peak
5	0.128	40.22	20.22	60.44	105.48	45.03	Peak
6	0.147	10.14	20.22	30.36	104.23	73.87	Peak



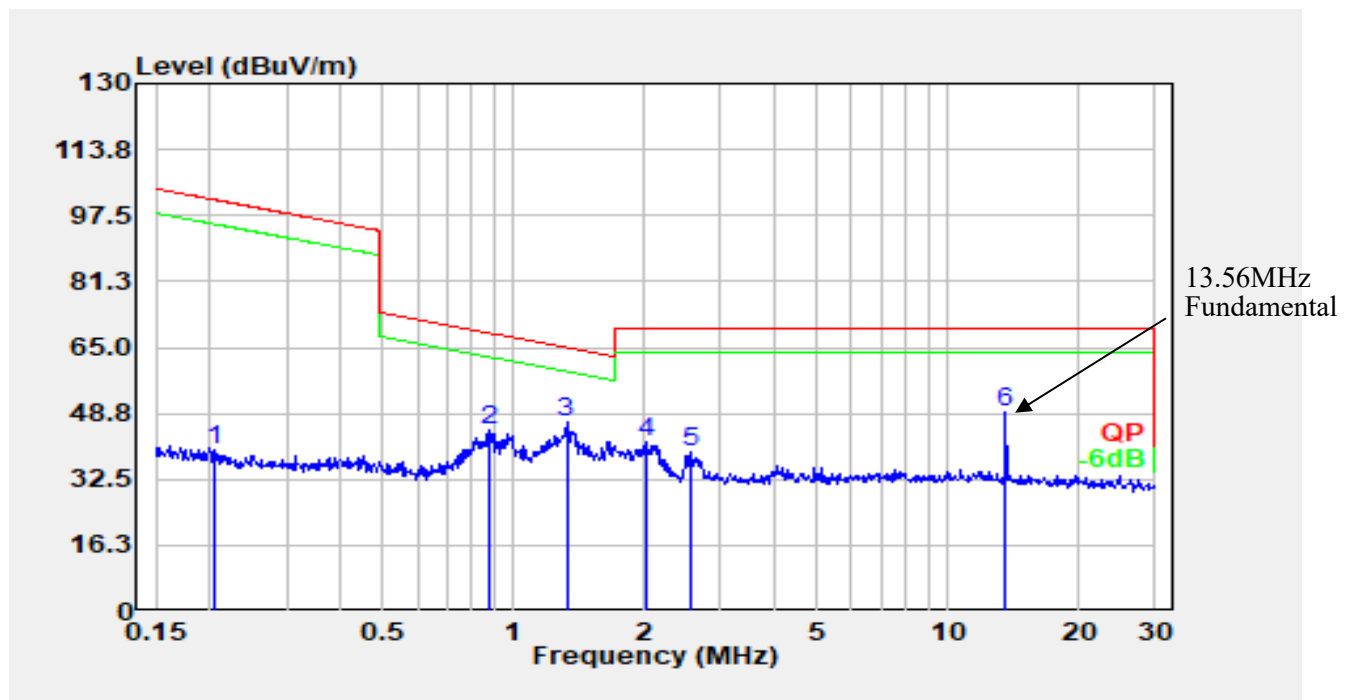
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.452	20.02	20.04	40.06	94.51	54.45	Peak
2	1.037	28.30	20.02	48.32	67.15	18.82	Peak
3	1.568	28.37	19.95	48.31	63.48	15.17	Peak
4	2.824	24.69	19.98	44.67	69.54	24.87	Peak
5	8.822	23.62	20.20	43.82	69.54	25.72	Peak
6	13.551	28.37	20.39	48.75	69.54	20.79	Peak



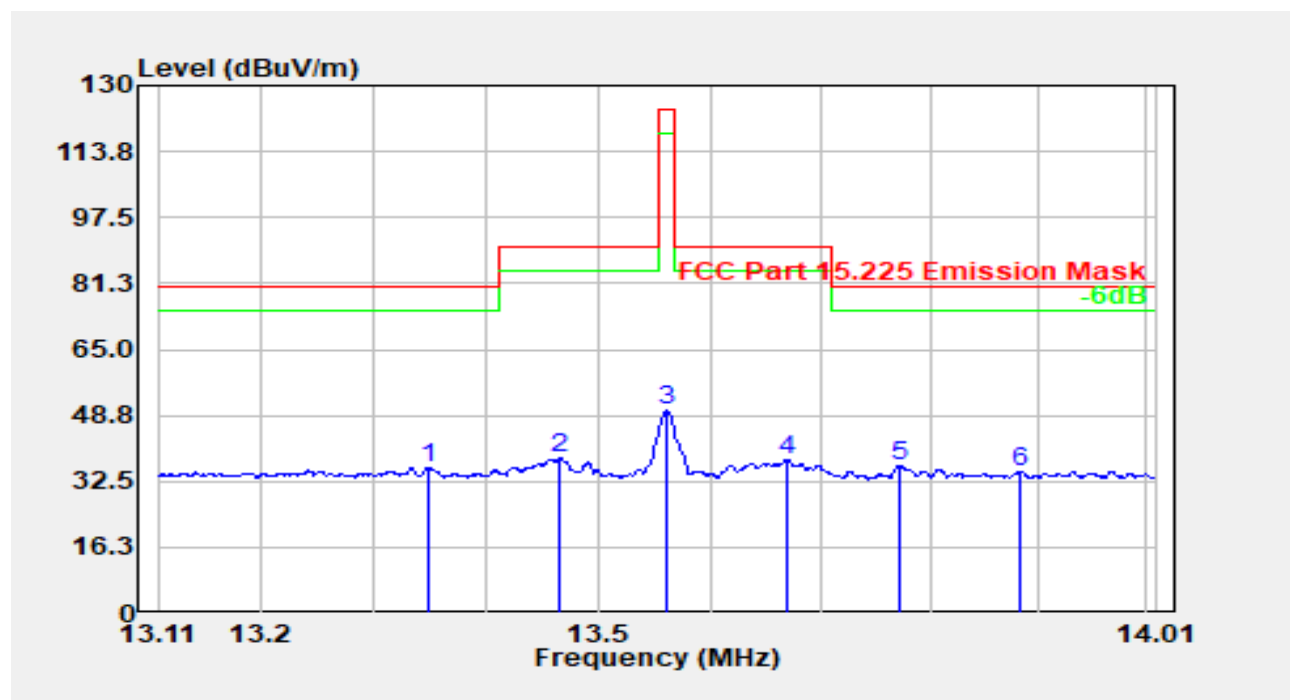
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	13.207	13.94	20.38	34.32	80.51	46.19	Peak
2	13.297	14.41	20.38	34.79	80.51	45.72	Peak
3	13.471	14.74	20.38	35.12	90.47	55.35	Peak
4	13.562	28.46	20.39	48.84	124.00	75.16	Peak
5	13.647	16.88	20.39	37.27	90.47	53.20	Peak
6	13.769	14.48	20.39	34.87	80.51	45.64	Peak

Perpendicular:

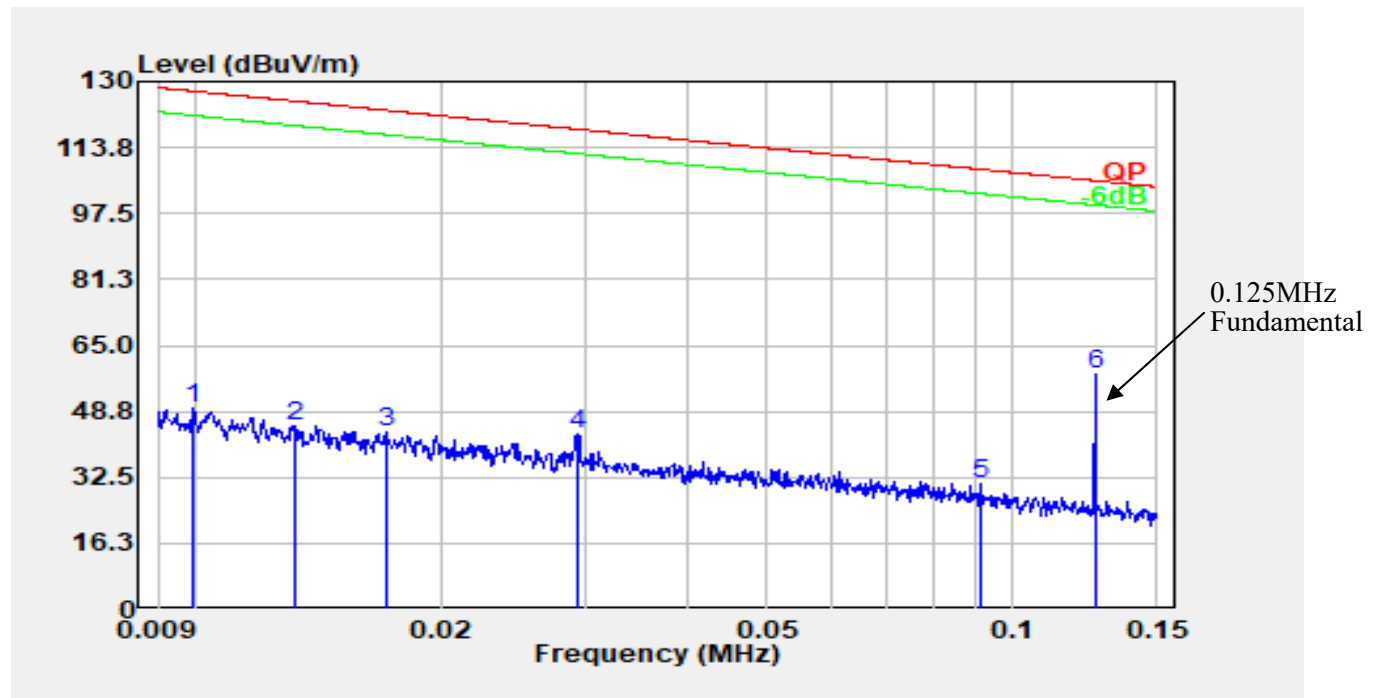
No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	0.010	28.91	20.51	49.42	127.42	78.00	Peak
2	0.013	26.70	20.51	47.21	125.56	78.35	Peak
3	0.015	27.00	20.51	47.51	124.05	76.54	Peak
4	0.029	19.17	20.41	39.58	118.33	78.75	Peak
5	0.051	13.71	20.41	34.12	113.51	79.39	Peak
6	0.126	37.08	20.22	57.30	105.60	48.30	Peak



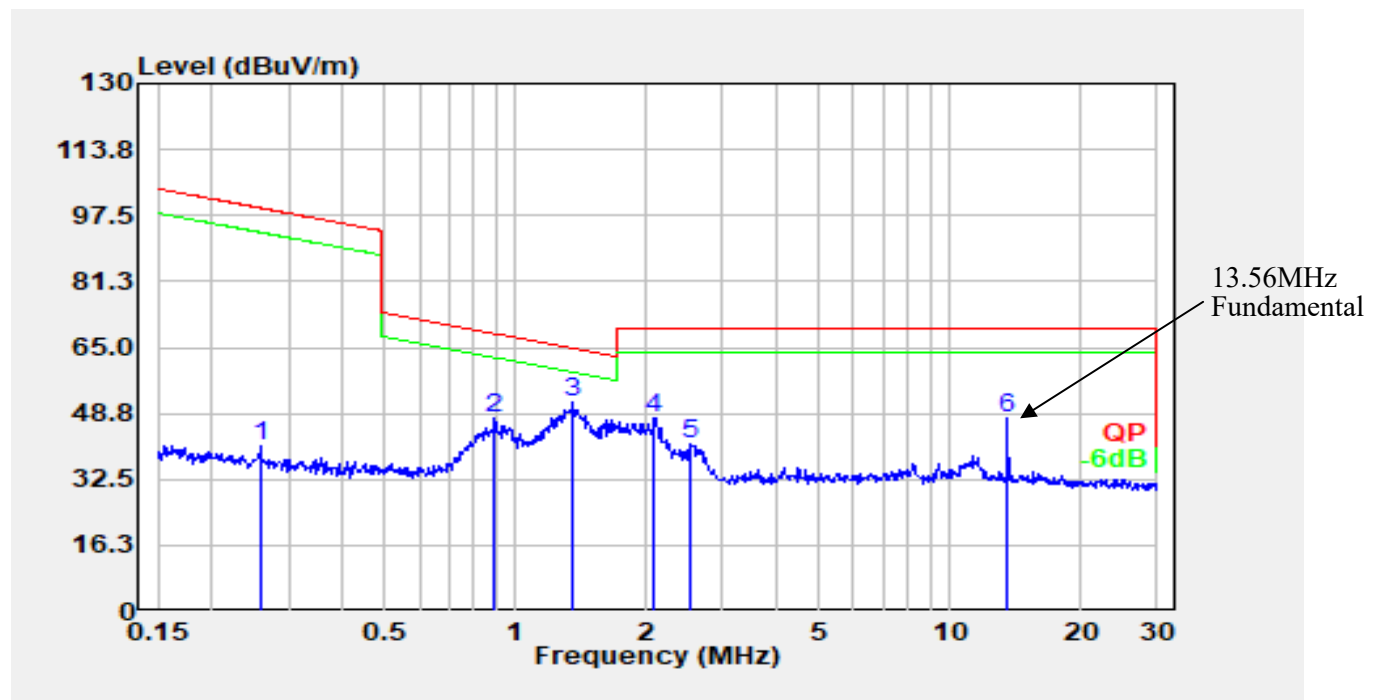
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.204	19.47	20.21	39.68	101.41	61.73	Peak
2	0.880	24.81	20.03	44.84	68.60	23.76	Peak
3	1.324	26.57	19.97	46.55	64.98	18.44	Peak
4	2.012	21.68	19.96	41.64	69.54	27.90	Peak
5	2.554	19.48	19.97	39.46	69.54	30.08	Peak
6	13.551	28.67	20.39	49.06	69.54	20.48	Peak



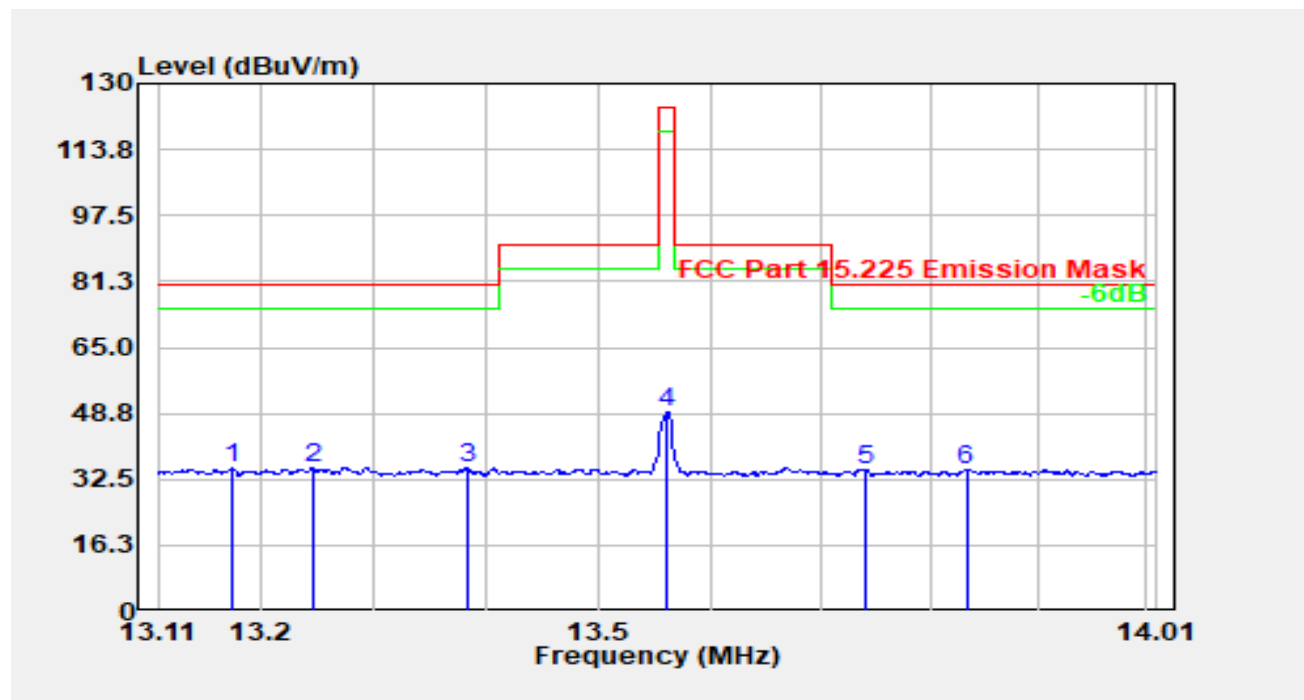
No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	13.348	15.45	20.38	35.83	80.51	44.68	Peak
2	13.465	17.97	20.38	38.35	90.47	52.12	Peak
3	13.561	29.65	20.39	50.03	124.00	73.97	Peak
4	13.670	17.34	20.39	37.73	90.47	52.74	Peak
5	13.772	16.04	20.39	36.44	80.51	44.07	Peak
6	13.883	14.44	20.40	34.83	80.51	45.68	Peak

Ground-parallel:

No.	Frequency (MHz)	Reading (dBUV)	Factor (dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector
1	0.010	28.92	20.51	49.43	127.64	78.21	Peak
2	0.013	24.71	20.51	45.22	125.20	79.98	Peak
3	0.017	23.21	20.51	43.72	122.95	79.22	Peak
4	0.029	22.59	20.41	43.00	118.26	75.26	Peak
5	0.091	10.60	20.28	30.88	108.41	77.53	Peak
6	0.126	37.45	20.22	57.67	105.60	47.93	Peak



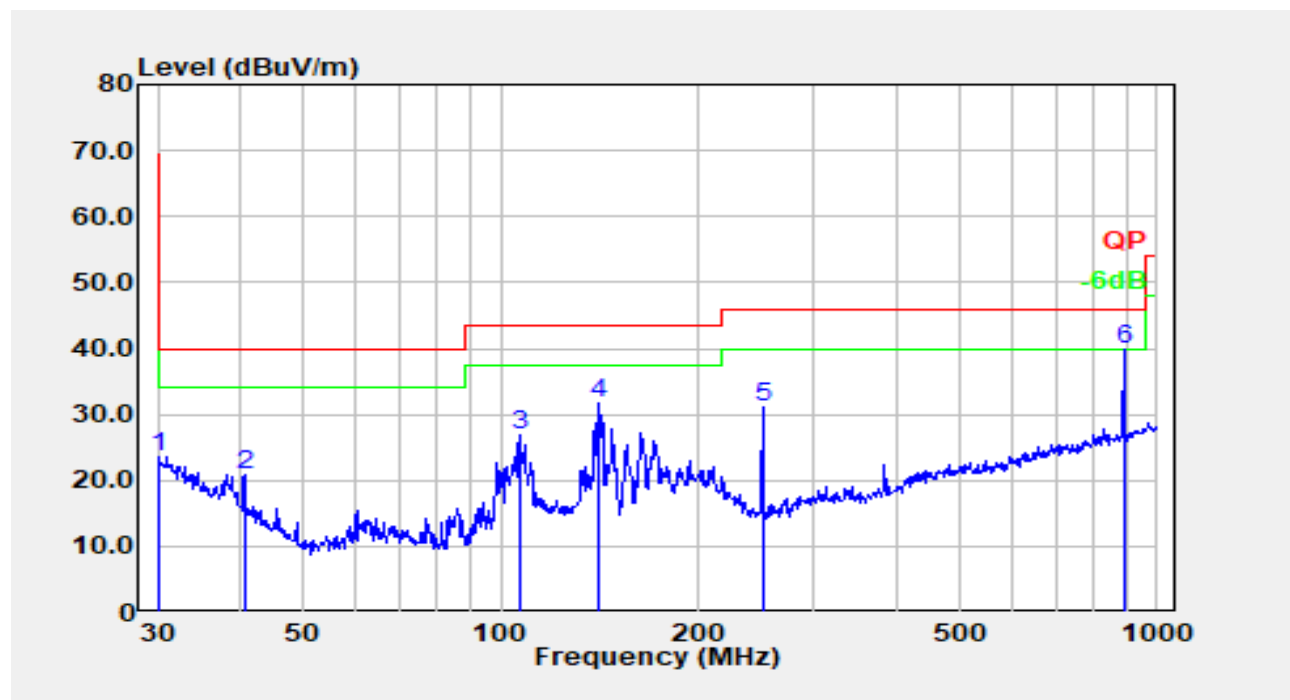
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.259	20.79	20.12	40.91	99.34	58.43	Peak
2	0.894	27.63	20.03	47.66	68.46	20.80	Peak
3	1.359	31.38	19.97	51.35	64.75	13.40	Peak
4	2.088	27.58	19.96	47.54	69.54	22.00	Peak
5	2.540	21.38	19.97	41.35	69.54	28.19	Peak
6	13.551	26.97	20.39	47.36	69.54	22.18	Peak



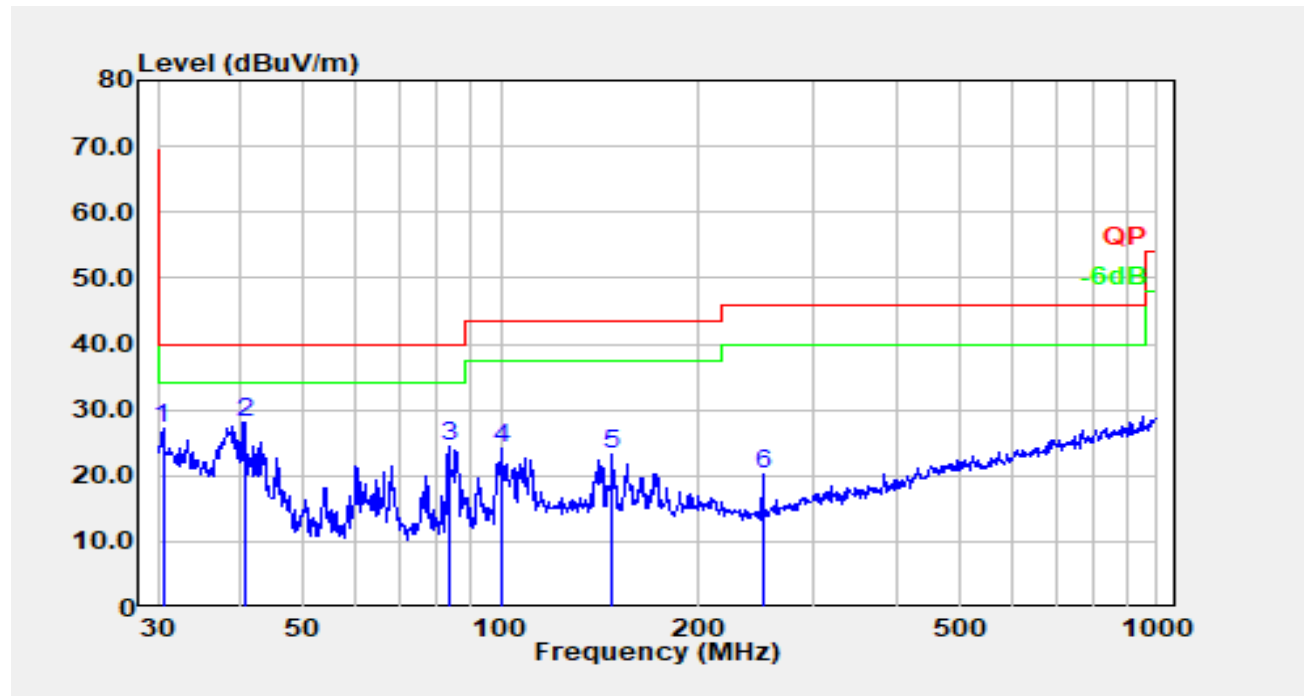
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	13.175	14.78	20.38	35.16	80.51	45.35	Peak
2	13.246	14.86	20.38	35.24	80.51	45.27	Peak
3	13.382	14.77	20.38	35.15	80.51	45.36	Peak
4	13.562	28.74	20.39	49.12	124.00	74.88	Peak
5	13.741	14.62	20.39	35.01	80.51	45.50	Peak
6	13.834	14.41	20.40	34.80	80.51	45.71	Peak

2) Above 30 MHz

Horizontal



No.	Frequency	Reading	Factor	Result	Limit	Margin	Detector
	(MHz)	(dBμV)	(dB/m)	(dBUV/m)	(dBUV/m)	(dB)	
1	30.000	27.43	-3.79	23.64	40.00	16.36	Peak
2	40.702	32.67	-11.94	20.73	40.00	19.27	Peak
3	106.759	40.23	-13.22	27.01	43.50	16.49	Peak
4	141.330	43.75	-12.18	31.57	43.50	11.93	Peak
5	250.301	44.33	-13.25	31.07	46.00	14.93	Peak
6	890.728	41.15	-1.39	39.76	46.00	6.24	Peak

Vertical

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.531	31.32	-4.20	27.12	40.00	12.88	Peak
2	40.702	40.06	-11.94	28.12	40.00	11.88	Peak
3	83.230	41.81	-17.49	24.32	40.00	15.68	Peak
4	99.878	38.75	-14.62	24.14	43.50	19.36	Peak
5	147.921	35.48	-12.24	23.24	43.50	20.26	Peak
6	250.301	33.44	-13.25	20.19	46.00	25.81	Peak

4.3 20 dB Emission Bandwidth

Serial Number:	CR21100121-RF-S1	Test Date:	2021-12-16
Test Site:	966-2	Test Mode:	Transmitting
Tester:	Carl Liang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	24.2	Relative Humidity: (%)	43	ATM Pressure: (kPa)	101.1
----------------------	------	---------------------------	----	------------------------	-------

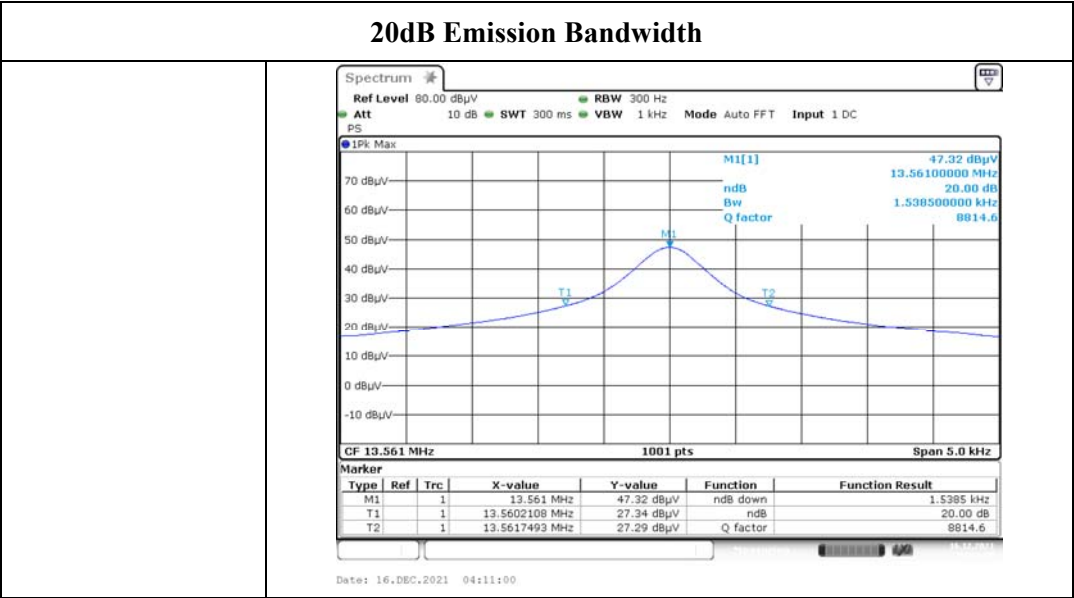
Test Equipment List and Details:

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
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:

Test Channel	Test Frequency (MHz)	20 dB Bandwidth (Hz)
1	13.56	1538.5



4.4 Frequency Stability

Serial Number:	CR21100121-RF-S1	Test Date:	2021-12-16
Test Site:	RF	Test Mode:	Transmitting
Tester:	Carl Liang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	24.7	Relative Humidity: (%)	46	ATM Pressure: (kPa)	101.1
----------------------	------	---------------------------	----	------------------------	-------

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2021-07-22	2022-07-21
Unknown	Coaxial Cable	C-SJ0010	C0010	Each time	N/A
BACL	TEMP&HUMI Test Chamber	BTH-150	30026	2021-07-22	2022-07-21
UNI-T	Multimeter	UT39A+	C210582554	2021-09-30	2022-09-29
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	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:

DC 12V:

$f_0 = 13.56 \text{ MHz}$				
Temperature	Voltage	Measured frequency	Frequency Error	Limit
°C	V _{DC}	MHz	Hz	Hz
-30	12	13.5611500	1150	±1356
-20		13.5610540	1054	±1356
-10		13.5610496	1050	±1356
0		13.5610347	1035	±1356
10		13.5610529	1053	±1356
20		13.5610000	1000	±1356
25		13.5610332	1033	±1356
30		13.5610691	1069	±1356
40		13.5610394	1039	±1356
50		13.5610489	1049	±1356
20	10.2	13.5610448	1045	±1356
20	13.8	13.5610496	1050	±1356

DC 48V:

$f_0 = 13.56 \text{ MHz}$				
Temperature	Voltage	Measured frequency	Frequency Error	Limit
°C	V _{DC}	MHz	Hz	Hz
-30	12	13.5609973	997.3	±1356
-20		13.5609992	999.2	±1356
-10		13.5609984	998.4	±1356
0		13.5609974	997.4	±1356
10		13.5609976	997.6	±1356
20		13.5609989	998.9	±1356
25		13.5610000	1000.0	±1356
30		13.5609974	997.4	±1356
40		13.5609988	998.8	±1356
50		13.5609993	999.2	±1356
20	10.2	13.5609996	999.6	±1356
20	13.8	13.5609994	999.4	±1356

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