中认信通
CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)

ACCREDITED
TESTING LABORATORY
CERTIFICATE # 6356.01

TEST REPORT

Applicant: **ASA Electronics Shenzhen Limited**

Address: Room 503, 5/F., Unit A, Skyworth Building, Gaoxin Avenue.1.S.,Nanshan District,Shenzhen,China

FCC ID: **2AHU2PXXVBSD32SEN**

Product Name: **24GHz mmWave sensor**

Standard(s): **47 CFR Part 15, Subpart C(15.249)**
ANSI C63.10-2013

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

Report Number: **CR22080059-00B**

Date Of Issue: **2022-09-19**

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.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	24GHz mmWave sensor
EUT Model:	PXXVBSD32SEN
Multiple Models:	VBSD1A,VBSD3,VBSD32, RMVBSD1A, RMVBSD3, RMVBSD32
Operation Frequency:	24000-24250 MHz
Modulation Type:	FMCW
Rated Input Voltage:	DC 9~16V
Serial Number:	CR22080059-RF-S1
EUT Received Date:	2022.09.01
EUT Received Status:	Good
Note: The Multiple model is electrically identical with test model, please refer to the declaration letter for more detail, which was provided by manufacturer. The circuit board of the left and right ears is the same, testing is done with the left sensor	

Antenna Information Detail▲:

Antenna Manufacturer	Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range	§15.203 Requirement
ASA Electronics Shenzhen Limited	PCB	50	10 dBi/24~24.25GHz	**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:

Accessory Description	Manufacturer	Model	Parameters
Control Module	Xiamen Autostar Electronics CO., Ltd	Unknown	/
Left Warning Light	Xiamen Autostar Electronics CO., Ltd	Unknown	/
Right Warning Light	Xiamen Autostar Electronics CO., Ltd	Unknown	/
Buzzer	Xiamen Autostar Electronics CO., Ltd	Unknown	/
Main Harness	Xiamen Autostar Electronics CO., Ltd	Unknown	Unshielded, 12.5m

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:	No
Engineering Mode was provided by manufacturer▲. The maximum power was configured default setting.	

1.2.2 Support Equipment List and Details

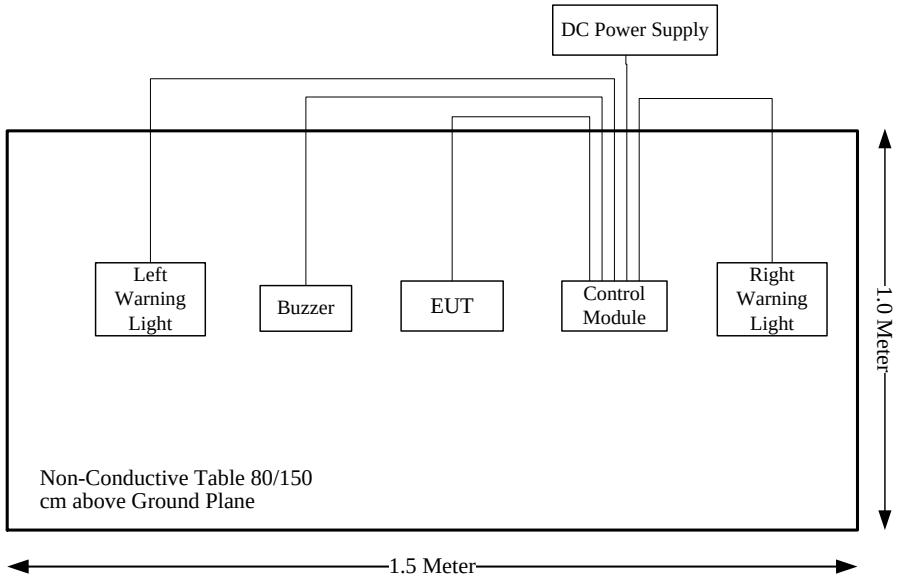
Manufacturer	Description	Model	Serial Number
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386

1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Power Cable	No	No	1.5	DC Power Supply	AC Manis

1.2.4 Block Diagram of Test Setup

Radiated Emissions:



1.3 FAR Field Boundary Calculations

The far-field boundary is given in ANSI C63.10-2013:

$$R_m = 2D^2 / \lambda$$

Where:

D is the largest dimension of the antenna aperture in m and

λ is the free-space wavelength in m at the frequency of measurement.

The minimum test distance for the frequency range 40GHz-140GHz determine as below:

Model	Frequency Range (GHz)	Largest Dimension of the Horn Antenna (mm)	Minimum Test Distance R_m (m)
M19RH	40-60	46.3	0.57
861V/385	50-75	43.7	0.64
M12RH	60-90	30.02	0.36
M08RH	90-140	19.7	0.23

Note: The test distances used were 1.0 m from 40 GHz to 90 GHz, and 0.5 m from 90 GHz to 100 GHz, it can be seen that the EUT was always in the Far-field of the Receive Antenna during all Radiated Emissions Tests.

1.4 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	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℃
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

Standard(s)/Rule(s)	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emissions	Not applicable
15.205, §15.209, §15.249	Radiated Emissions	Compliant
§15.215 (c)	20 dB Bandwidth	Compliant

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 μH/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.

	Conducted limit (dBμV)	
Frequency of emission (MHz)	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:

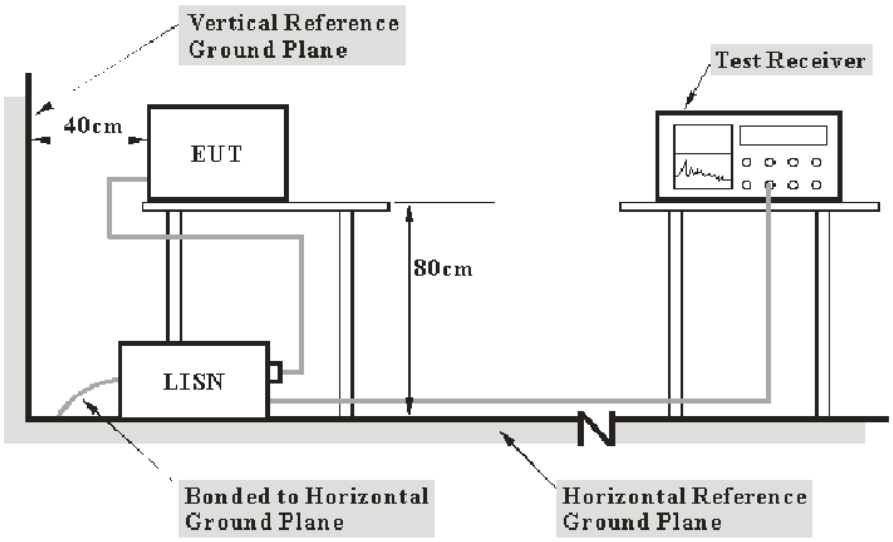
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

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

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 EUT was connected to the outlet of the first 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.

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 §15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

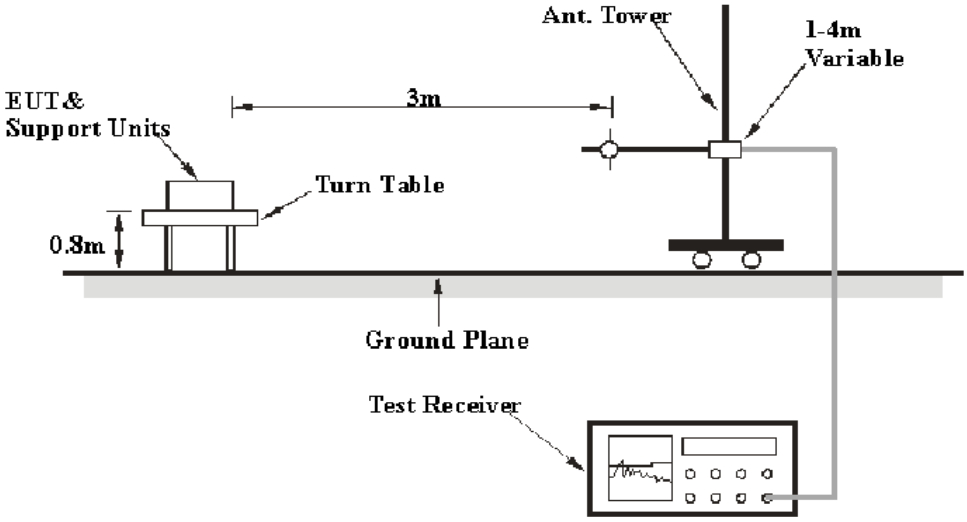
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC §15.249 (c), Field strength limits are specified at a distance of 3 meters.

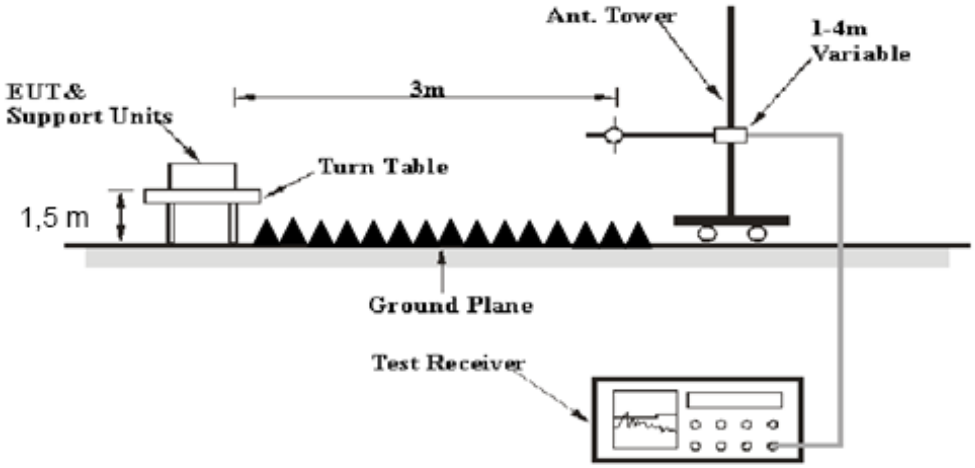
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

3.2.2 EUT Setup

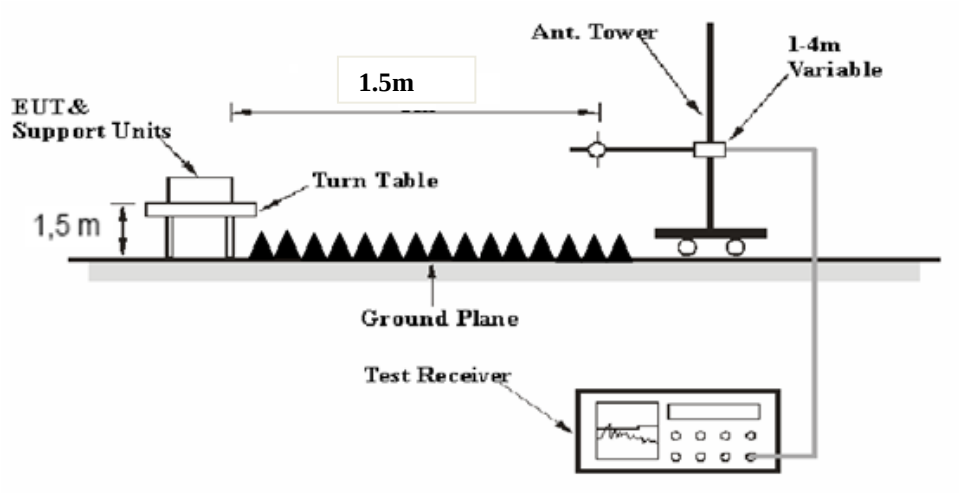
Below 1GHz:



1-26.5GHz:



26.5-40 GHz:



Above 40GHz:

The antenna is scanned around the entire perimeter surface of the EUT, in both horizontal and vertical polarizations, at the distance of 1.0 m from 40 GHz to 90 GHz, and 0.5 m from 90 GHz to 200 GHz.

The radiated emissions were performed in the 3 meters distance, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.249 limits.

3.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 100 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	AV

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

3.2.4 Test Procedure

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz - 1 GHz, peak and average detection modes for frequencies above 1 GHz.

According to C63.10, the 26.5-40GHz test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1.5m

Distance extrapolation factor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.02 dB

All emissions under the average limit and under the noise floor have not recorded in the report.

3.2.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Factor = Antenna Factor + Cable Loss- Amplifier Gain

For 30MHz-1GHz:
Result = Reading + Factor

For 1GHz-40GHz
Result = Reading + Factor-Distance extrapolation Factor

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

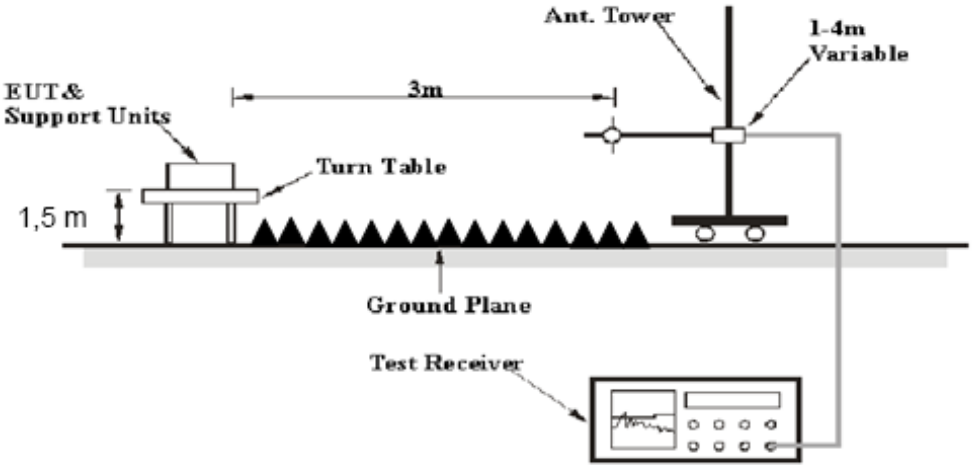
3.3 20 dB Emission Bandwidth:

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.

3.3.2 EUT Setup



3.3.3Test Procedure

1. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
2. Repeat above procedures until all frequencies measured were complete.

3.4 Antenna Requirement

3.4.1 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.

3.4.2 Judgment

Please refer to the Antenna Information detail in Section 1.

4. Test DATA AND RESULTS

4.1 AC Line Conducted Emissions

Not applicable. The device is vehicle device.

4.2 Radiation Spurious Emissions

Serial Number:	CR22080059-RF-S1	Test Date:	2022-09-05~2022-09-08
Test Site:	966-1,966-2	Test Mode:	Transmitting
Tester:	Carl Xue, Nick Tang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	25.4~26.3	Relative Humidity: (%)	53~54	ATM Pressure: (kPa)	100.1~100.8

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB6	A082520-5	2020-10-19	2023-10-18
R&S	EMI Test Receiver	ESR3	102724	2022-07-15	2023-07-14
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2022-07-17	2023-07-16
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2022-07-17	2023-07-16
Sonoma	Amplifier	310N	186165	2022-07-17	2023-07-16
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020-10-13	2023-10-12
R&S	Spectrum Analyzer	FSV40	101591	2022-07-15	2023-07-14
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2022-08-07	2023-08-06
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2022-08-07	2023-08-06
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2021-11-10	2022-11-09
Audix	Test Software	E3	201021 (V9)	N/A	N/A
PASTERNACK	Horn Antenna	PE9852/2F-20	112002	2021-02-05	2024-02-04
AH	Preamplifier	PAM-1840VH	190	2021-11-19	2022-11-18
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2022-08-07	2023-08-06
PASTERNACK	Horn Antenna	PE9850/2F-20	072001	2021-02-05	2024-02-04
OML	Harmonic Mixer	WR19/M19HWD	U60314-1	2020-10-16	2023-10-15
OML	Horn Antenna	M19RH	11648-03	2020-10-16	2023-10-15
OML	Harmonic Mixer	WR12/M12HWD	E60119-1	2020-10-17	2023-10-16
OML	Horn Antenna	M12RH	E60119-2	2020-10-18	2023-10-17
OML	Harmonic Mixer	WR08/M08HWD	F60315-1	2020-10-22	2023-10-21
OML	Horn Antenna	M08RH	F60315-2	2020-10-24	2023-10-23

** 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:

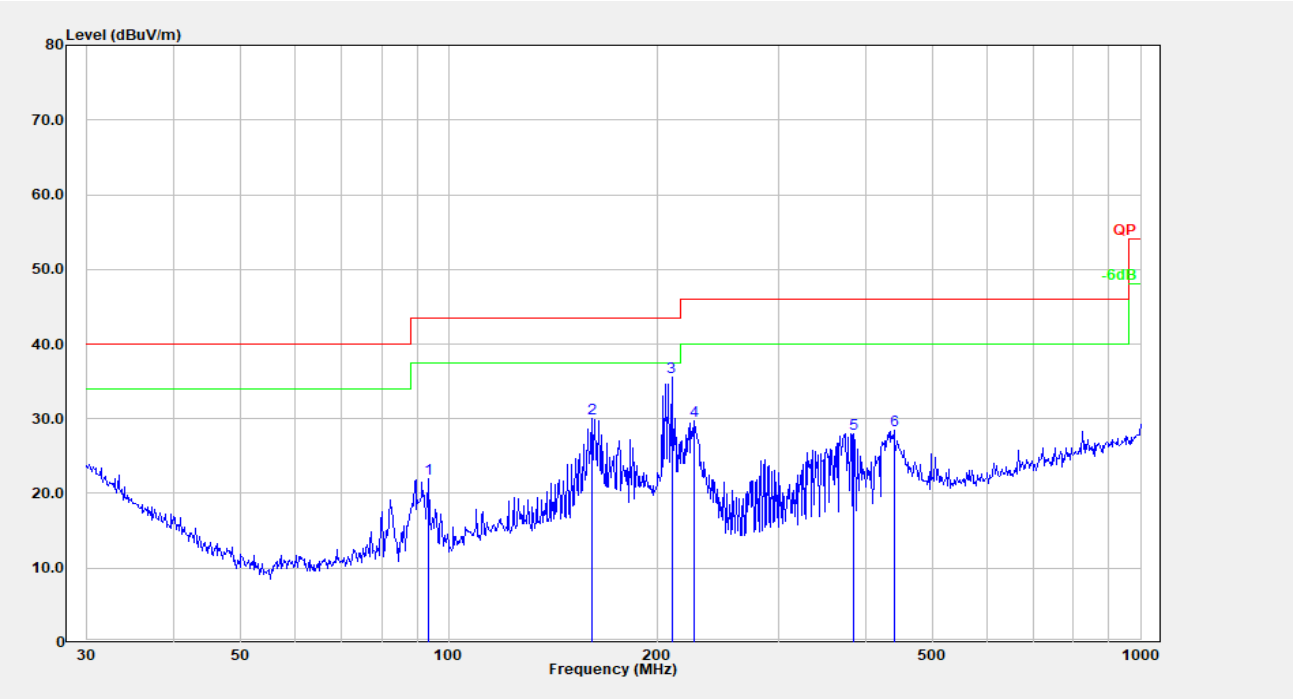
Please refer to the below table and plots.

Note: The device can be mounted in multiple orientations, test was performed with X,Y, Z Axis according to C63.10 figure 8, the worst orientation was photographed and it`s data was recorded.

Test Data:

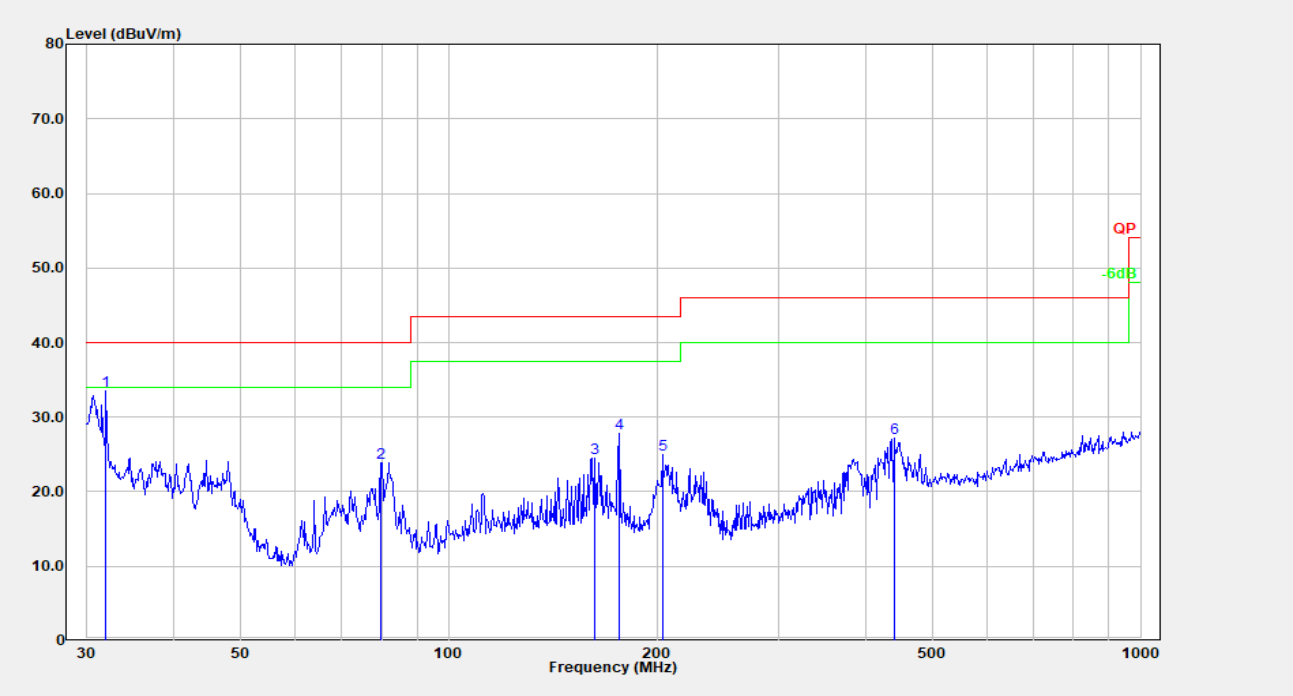
1) 30MHz-1GHz(high channel was the worst):

Horizontal:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	93.440	38.31	-16.30	22.01	43.50	21.49	Peak
2	160.909	42.37	-12.38	29.99	43.50	13.51	Peak
3	210.048	48.14	-12.60	35.54	43.50	7.96	Peak
4	226.099	42.87	-13.06	29.80	46.00	16.20	Peak
5	385.281	37.26	-9.23	28.02	46.00	17.98	Peak
6	440.196	35.97	-7.49	28.48	46.00	17.52	Peak

Vertical:

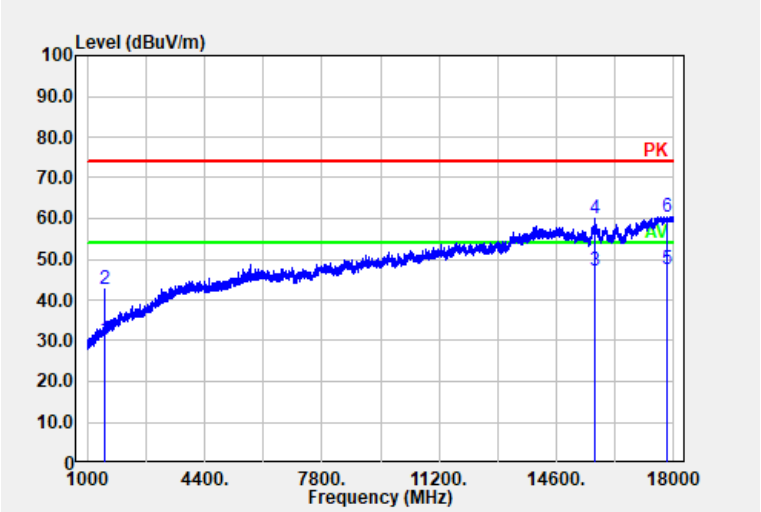
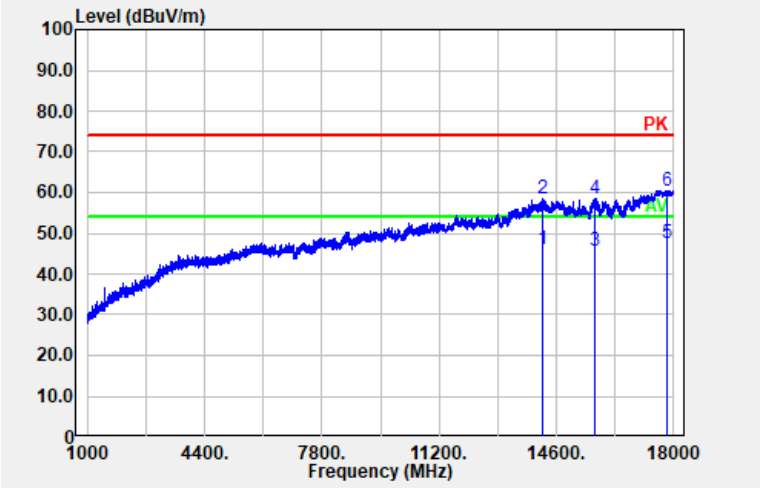
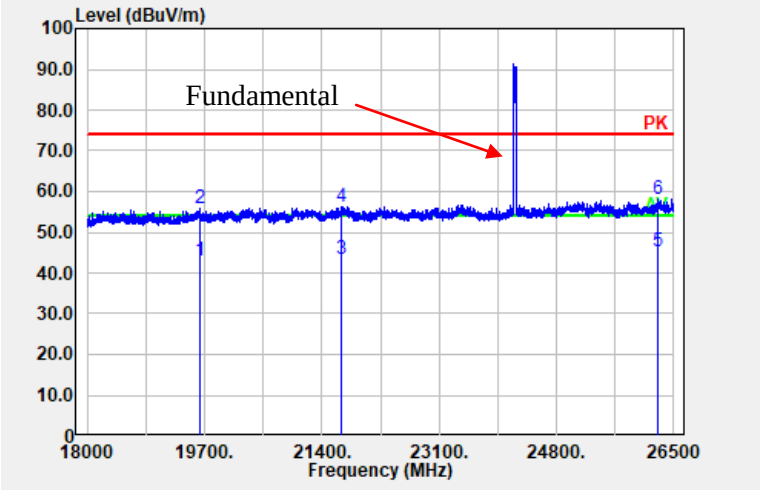


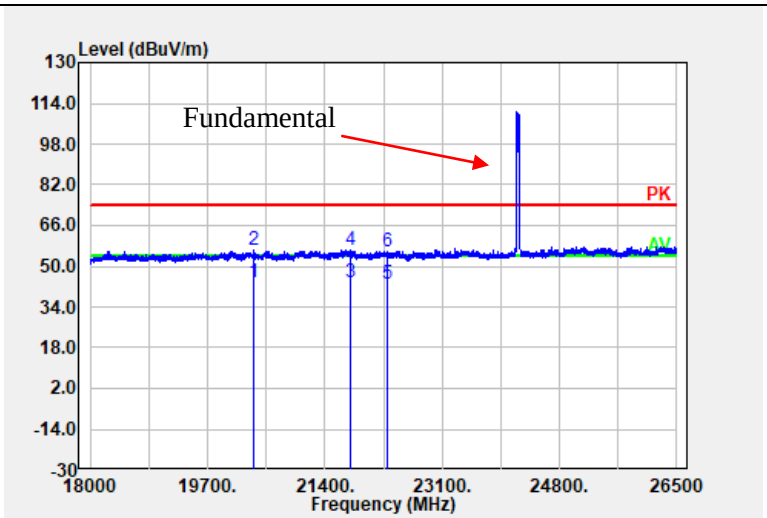
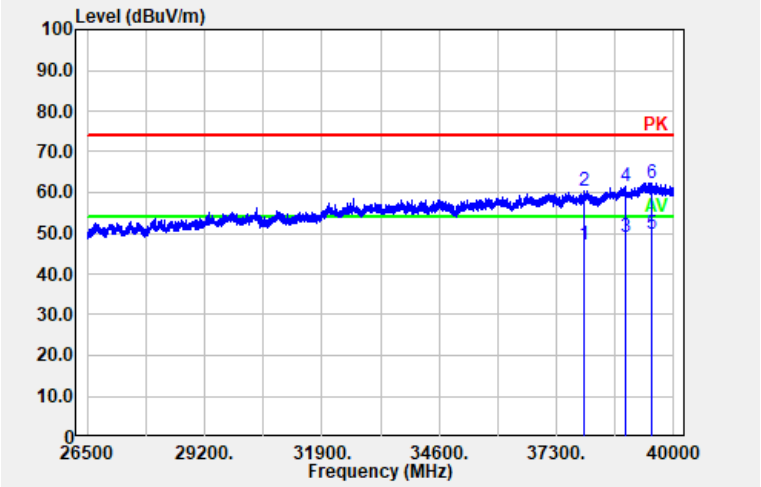
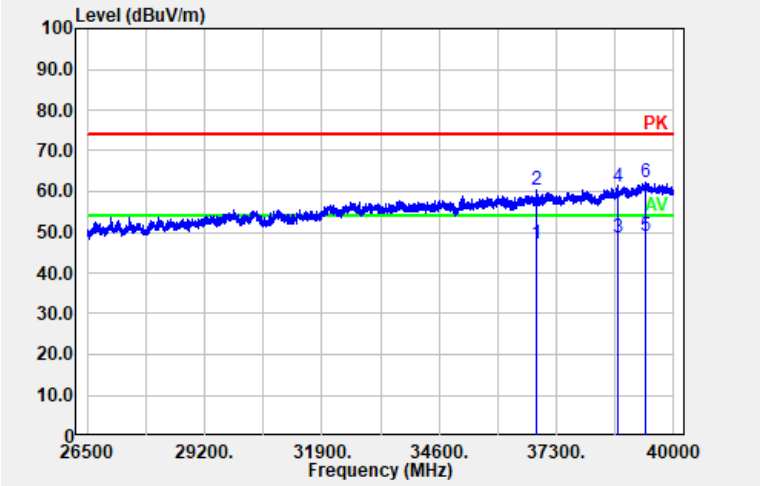
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	31.955	38.86	-5.29	33.58	40.00	6.42	Peak
2	79.800	41.58	-17.69	23.89	40.00	16.11	Peak
3	162.611	37.07	-12.54	24.52	43.50	18.98	Peak
4	176.269	41.39	-13.53	27.86	43.50	15.64	Peak
5	203.523	37.46	-12.48	24.97	43.50	18.53	Peak
6	440.196	34.70	-7.49	27.21	46.00	18.79	Peak

2) 1GHz-40GHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 24050 MHz							
24050.00	90.84	PK	H	5.58	96.42	127.96	31.54
24050.00	82.00	AV	H	5.58	87.58	107.96	20.38
24050.00	102.87	PK	V	5.58	108.45	127.96	19.51
24050.00	93.30	AV	V	5.58	98.88	107.96	9.08
24000.00	55.09	PK	V	5.52	60.61	74.00	13.39
24000.00	41.17	AV	V	5.52	46.69	54.00	7.31
1501.50	40.80	PK	V	-0.46	40.34	74.00	33.66
1501.50	27.67	AV	V	-0.46	27.21	54.00	26.79
15747.50	37.90	PK	V	22.27	60.17	74.00	13.83
15747.50	24.89	AV	V	22.27	47.16	54.00	6.84
25596.30	50.97	PK	V	6.79	57.76	74.00	16.24
25596.30	37.79	AV	V	6.79	44.58	54.00	9.42
35368.20	44.49	PK	V	12.41	50.88	74.00	23.12
35368.20	31.52	AV	V	12.41	37.91	54.00	16.09
Middle Channel: 24100 MHz							
24100.00	87.96	PK	H	5.63	93.59	127.96	34.37
24100.00	78.40	AV	H	5.63	84.03	107.96	23.93
24100.00	105.35	PK	V	5.63	110.98	127.96	16.98
24100.00	96.55	AV	V	5.63	102.18	107.96	5.78
1504.90	44.28	PK	H	-0.44	43.84	74.00	30.16
1504.90	31.78	AV	H	-0.44	31.34	54.00	22.66
15978.70	37.48	PK	V	22.14	59.62	74.00	14.38
15978.70	24.56	AV	V	22.14	46.70	54.00	7.30
25730.20	50.56	PK	V	6.82	57.38	74.00	16.62
25730.20	37.69	AV	V	6.82	44.51	54.00	9.49
35932.50	45.55	PK	V	12.71	52.24	74.00	21.76
35932.50	32.43	AV	V	12.71	39.12	54.00	14.88
High Channel: 24200 MHz							
24200.00	89.03	PK	H	5.74	94.77	127.96	33.19
24200.00	80.00	AV	H	5.74	85.74	107.96	22.22
24200.00	104.89	PK	V	5.74	110.63	127.96	17.33
24200.00	96.36	AV	V	5.74	102.10	107.96	5.86
24250.00	55.23	PK	V	5.80	61.03	74.00	12.97
24250.00	42.11	AV	V	5.80	47.91	54.00	6.09
1511.70	42.08	PK	V	-0.40	41.68	74.00	32.32
1511.70	29.16	AV	V	-0.40	28.76	54.00	25.24
15703.30	38.20	PK	V	22.28	60.48	74.00	13.52
15703.30	25.45	AV	V	22.28	47.73	54.00	6.27
25616.50	54.07	PK	V	6.79	60.86	74.00	13.14
25616.50	40.86	AV	V	6.79	47.65	54.00	6.35
35538.30	44.82	PK	V	12.31	51.11	74.00	22.89
35538.30	31.80	AV	V	12.31	38.09	54.00	15.91

Result = Reading + Factor- Distance extrapolation Factor
For 1-26.5GHz:
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [3m]) dB= 0 dB
For 26.5-40GHz:
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.02 dB

Test Plots(Worst for High Channel)	
1GHz-18GHz Horizontal	
1GHz-18GHz Vertical	
18GHz-26.5GHz Horizontal	

18GHz-26.5GHz Vertical	
26.5GHz-40GHz Horizontal	
26.5GHz-40GHz Vertical	

3) 40GHz-100GHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 24.05 GHz							
48.10	36.79	PK	H	40.05	67.30	87.96	20.66
48.10	23.80	AV	H	40.05	54.31	67.96	13.65
48.10	36.96	PK	V	40.05	67.47	87.96	20.49
48.10	23.84	AV	V	40.05	54.35	67.96	13.61
72.15	35.78	PK	H	43.81	70.05	87.96	17.91
72.15	22.89	AV	H	43.81	57.16	67.96	10.80
72.15	35.76	PK	V	43.81	70.03	87.96	17.93
72.15	22.85	AV	V	43.81	57.12	67.96	10.84
96.20	37.61	PK	H	45.87	67.92	87.96	20.04
96.20	24.55	AV	H	45.87	54.86	67.96	13.10
96.20	37.90	PK	V	45.87	68.21	87.96	19.75
96.20	24.68	AV	V	45.87	54.99	67.96	12.97
Middle Channel: 24.1 GHz							
48.20	39.71	PK	H	40.07	70.24	87.96	17.72
48.20	26.69	AV	H	40.07	57.22	67.96	10.74
48.20	38.93	PK	V	40.07	69.46	87.96	18.50
48.20	25.63	AV	V	40.07	56.16	67.96	11.80
72.30	37.01	PK	H	43.83	71.30	87.96	16.66
72.30	24.09	AV	H	43.83	58.38	67.96	9.58
72.30	36.62	PK	V	43.83	70.91	87.96	17.05
72.30	23.77	AV	V	43.83	58.06	67.96	9.90
96.40	39.64	PK	H	45.90	69.98	87.96	17.98
96.40	26.57	AV	H	45.90	56.91	67.96	11.05
96.40	39.31	PK	V	45.90	69.65	87.96	18.31
96.40	26.42	AV	V	45.90	56.76	67.96	11.20
High Channel: 24.2 GHz							
48.40	38.71	PK	H	40.10	69.27	87.96	18.69
48.40	25.74	AV	H	40.10	56.30	67.96	11.66
48.40	38.49	PK	V	40.10	69.05	87.96	18.91
48.40	25.66	AV	V	40.10	56.22	67.96	11.74
72.60	36.13	PK	H	43.88	70.47	87.96	17.49
72.60	23.32	AV	H	43.88	57.66	67.96	10.30
72.60	36.25	PK	V	43.88	70.59	87.96	17.37
72.60	23.41	AV	V	43.88	57.75	67.96	10.21
96.80	36.46	PK	H	45.95	66.85	87.96	21.11
96.80	23.60	AV	H	45.95	53.99	67.96	13.97
96.80	36.22	PK	V	45.95	66.61	87.96	21.35
96.80	23.11	AV	V	45.95	53.50	67.96	14.46

Note：
Result = Reading + Factor- Distance extrapolation Factor
For 40-90GHz:
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1m]) dB= 9.54 dB
For 90-100GHz:
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [0.5m]) dB= 15.56 dB

4.3 20 dB Emission Bandwidth:

Serial Number:	CR22080059-RF-S1	Test Date:	2022.09.09
Test Site:	966-1	Test Mode:	Transmitting
Tester:	Nick Tang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	25.2	Relative Humidity: (%)	44	ATM Pressure: (kPa)	100.4

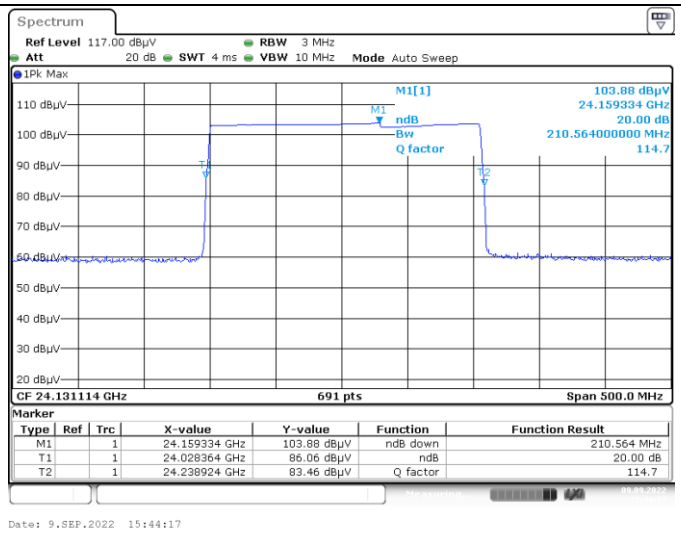
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101591	2022-07-15	2023-07-14
PASTERNACK	Horn Antenna	PE9852/2F-20	112002	2021-02-05	2024-02-04
AH	Preamplifier	PAM-1840VH	190	2021-11-19	2022-11-18
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2022-08-07	2023-08-06

**** 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 Mode	20 dB Bandwidth (MHz)
Sweep Mode	210.564

20dB Emission Bandwidth	
Channel	

5. RF EXPOSURE EVALUATION

5.1 Applicable Standard

According to §1.1307(b)(3)(i)

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to §1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

5.2 Measurement Result

Frequency (GHz)	λ/2Π (mm)	Distance (mm)	Exemption ERP		Maximum Tune up EIRP (dBm)	Maximum ERP (dBm)	Maximum ERP (mW)	MPE-Based Exemption
			(mW)	(dBm)				
24-24.25	0.78	200	768	28.85	16	13.85	24.3	Compliant

Note:
1. The Maximum Tune up EIRP power declared by Client.
2. This device maximum E-Field level is 110.98 dBuV/m at 3m, so the EIRP power is 15.78dBm.
3. Pout EIRP(dBm)=Field Strength of Fundamental(dBuV/m)-95.2 (dB)

Result: The device compliant the MPE-Based Exemption at 20cm distances.

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