



中认信通

CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)



TEST REPORT

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

Address: 10/F, No.56 Guanri Road, Software Park II, Xiamen 361009, China

FCC ID: 2AHCR-R20AV5

Product Name: Door Phone

Model Number: R20A

**Standard(s): 47 CFR Part 15 Subpart B
ANSI C63.4-2014**

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: CR22060019-00A

Date Of Issue: 2022-08-25

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

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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:	Door Phone
EUT Model:	R20A
Highest Operation Frequency:	1500 MHz
Rated Input Voltage:	DC 12V from adapter or POE 48V
Serial Number:	CR22060019-RF-S1
EUT Received Date:	2022.06.23
EUT Received Status:	GOOD

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 Typical Use Mode, which was provided by the manufacturer. Test Mode: M1: Camera on & data transmission (adapter) M2: Camera on & data transmission (POE)
Equipment Modifications:	No
EUT Exercise Software:	No

1.2.2 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Huntkey	Adapter(USB)	HKA01105021-XE	0D1805002143
TP-link	Adapter(POE)	TL-SF1005P	1.1676E+12
AKUVOX	Card reader	N5632	MN52P0024
Unknown	Load 1	10W	1001
Unknown	Load 2	10W	1002
Unknown	Load 3	10W	1003
TOTO LINK	Router	X5000R	X5000RK9T0560

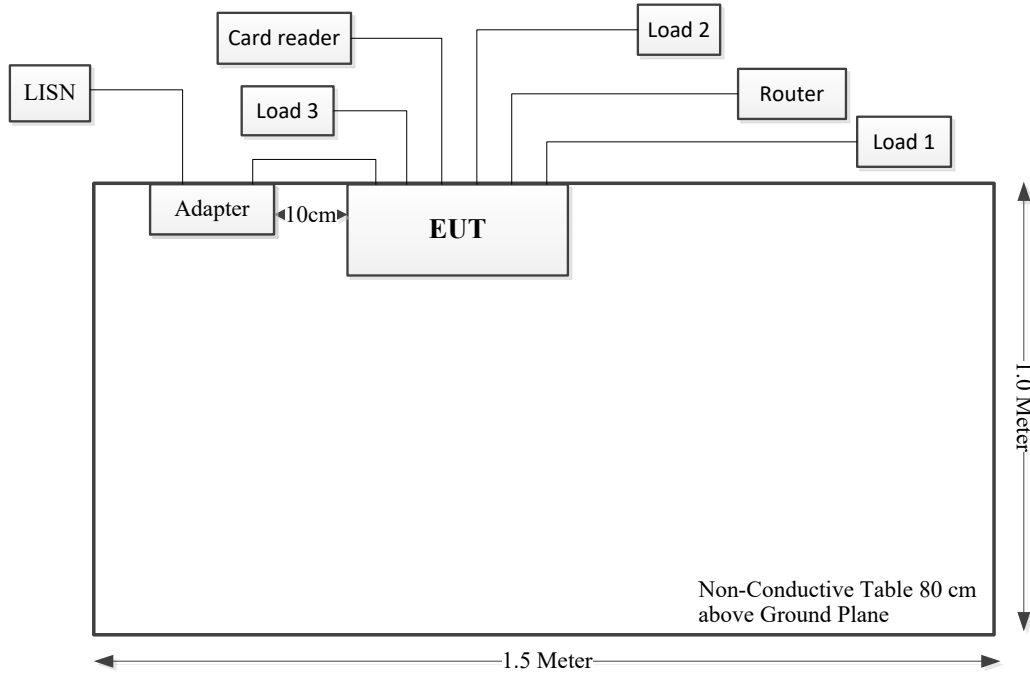
1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	No	No	3	EUT	Router
RJ45 Cable	No	No	3	POE	Router
RJ45 Cable	No	No	1.5	POE	EUT
Power Cable	No	No	1.2	POE	LISN
Power Cable	No	No	1.5	Adapter	EUT
Cable	No	No	2	EUT(RS485)	Load 1
Cable	No	No	2	EUT(RelayA)	Load 2
Cable	No	No	2	EUT(RelayB)	Load 3
Cable	No	No	3	EUT	Card reader

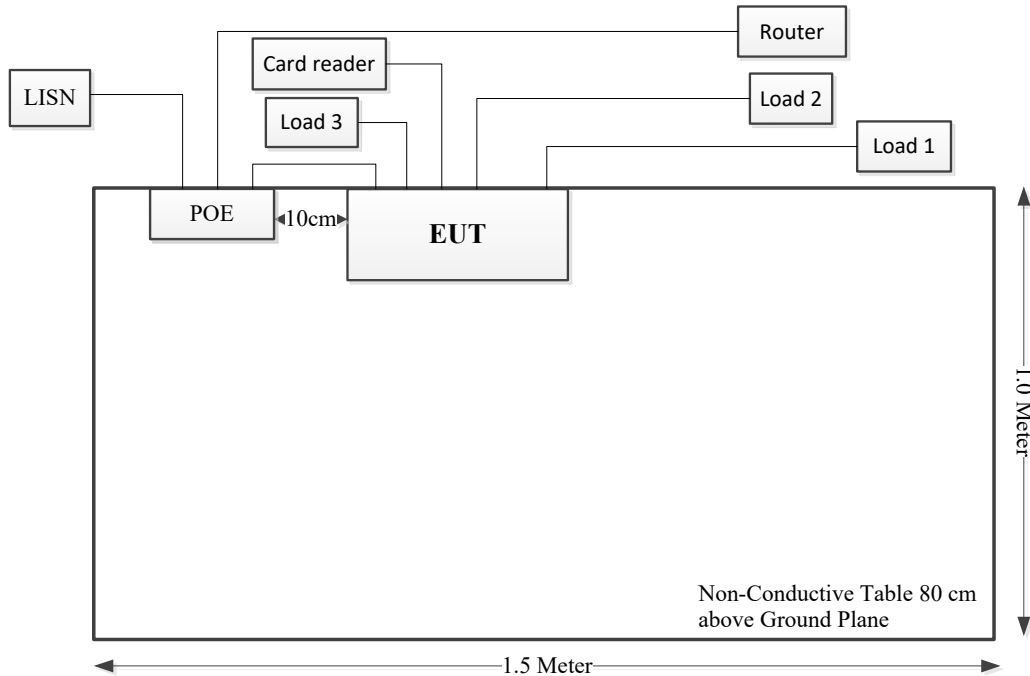
1.2.4 Block Diagram of Test Setup

Conducted emissions:

M1:

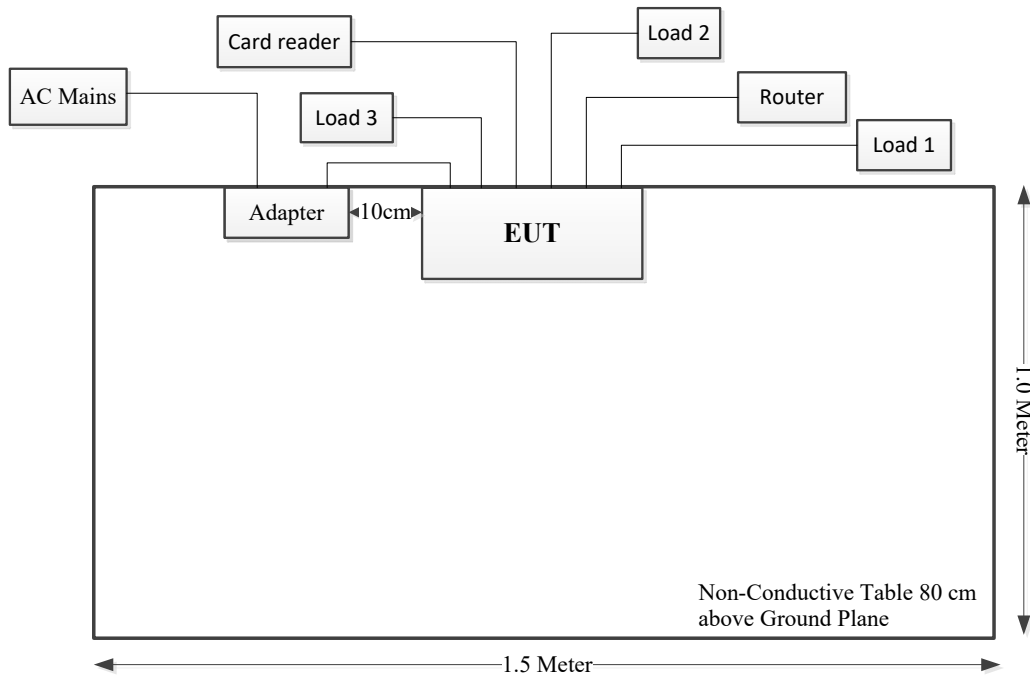


M2:

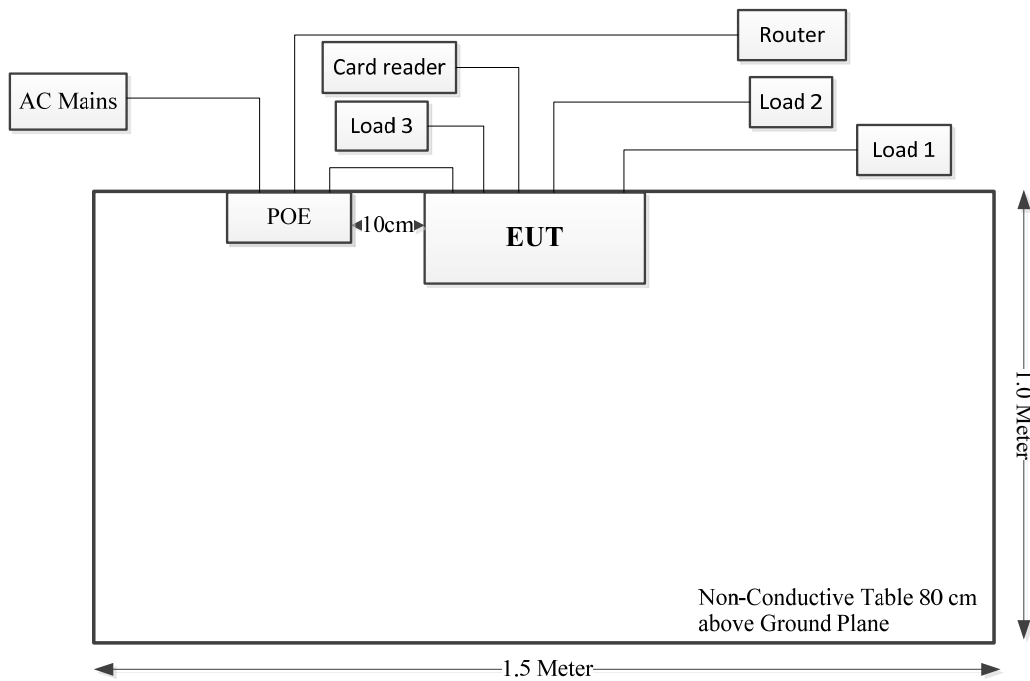


Radiated emissions:

M1:



M2:



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
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°C
Humidity	±5%
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)

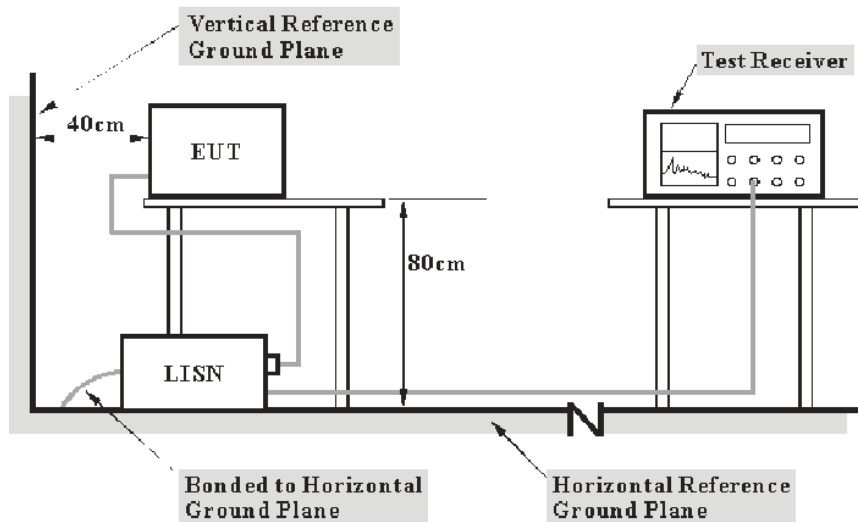
2. SUMMARY OF TEST RESULTS

Standard(s) Section	Description of Test	Result
§15.107	Conducted emissions	Compliant
§15.109	Radiated emissions	Compliant

3. REQUIREMENTS AND TEST PROCEDURES

3.1 AC Line Conducted Emissions

3.1.1 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 C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

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

3.1.2 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

3.1.3 Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT, the report shall list the six emissions with the smallest margin relative to the limit, unless the margin is greater than 20 dB.

All data was recorded in the Quasi-peak and average detection mode.

The report shall list the six emissions with the smallest margin relative to the limit, unless the margin is greater than 20 dB.

3.1.4 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor

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

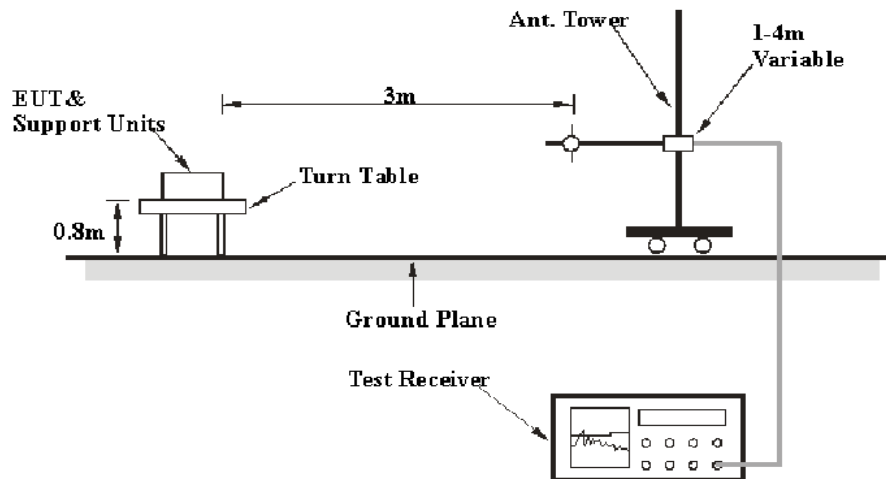
The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

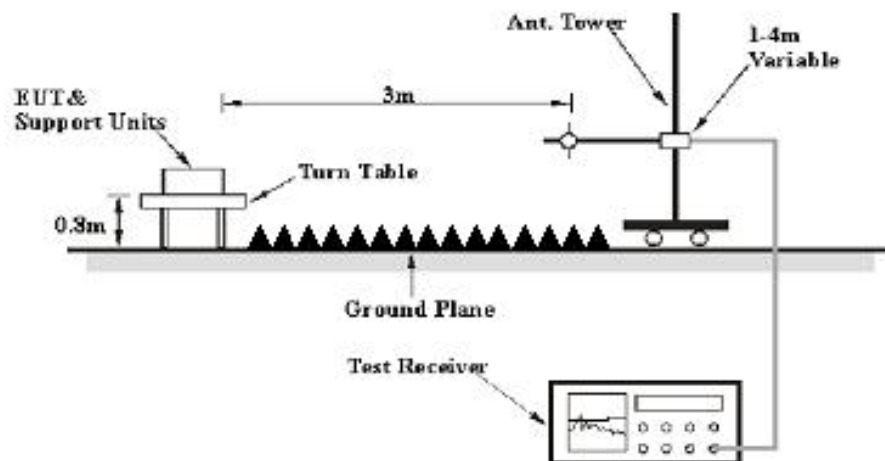
3.2 Radiation Spurious Emissions

3.2.1 EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emissions were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was with the FCC Part 15 B Class B limits.

3.2.2 EMI Test Receiver Setup

The system was investigated from 30 MHz to 7.5 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	3 MHz	/	AVG

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

3.2.3 Test Procedure

During the radiated emissions, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

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

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

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

3.2.4 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$\text{Result} = \text{Reading} + \text{Factor}$$

$$\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Result}$$

4. TEST DATA AND RESULTS

4.1 AC Line Conducted Emissions

Serial Number:	CR22060019-RF-S1	Test Date:	2022-08-06
Test Site:	CE	Test Mode:	M1, M2
Tester:	Vic Du	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	27.1	Relative Humidity: (%)	72	ATM Pressure: (kPa)	99.9
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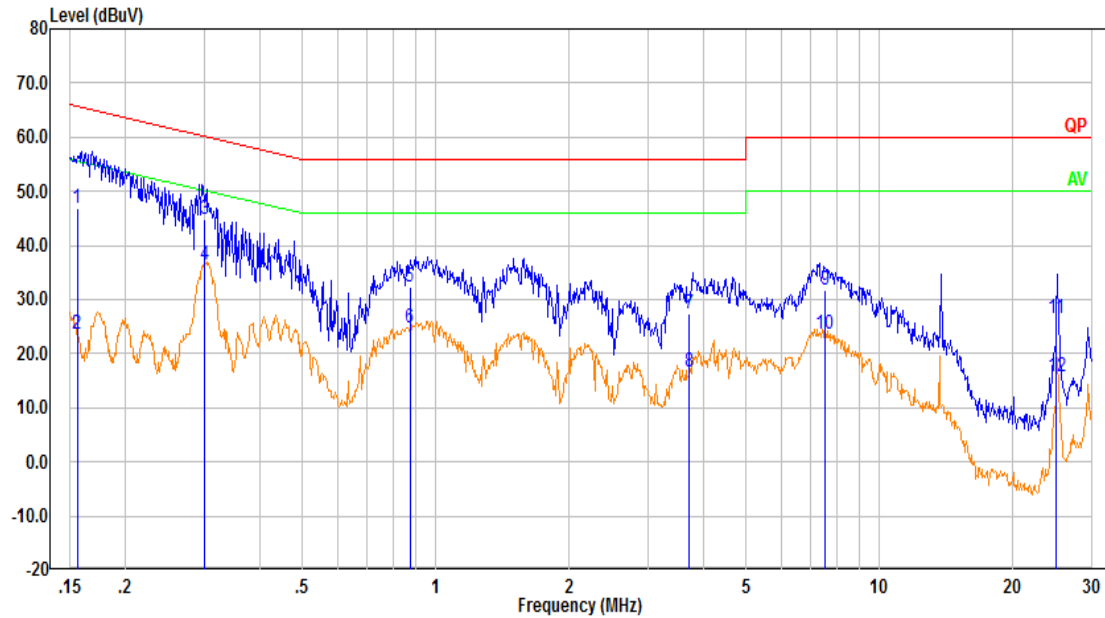
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	2022-04-01	2023-03-31
R&S	EMI Test Receiver	ESR3	102726	2022-07-15	2023-07-14
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).

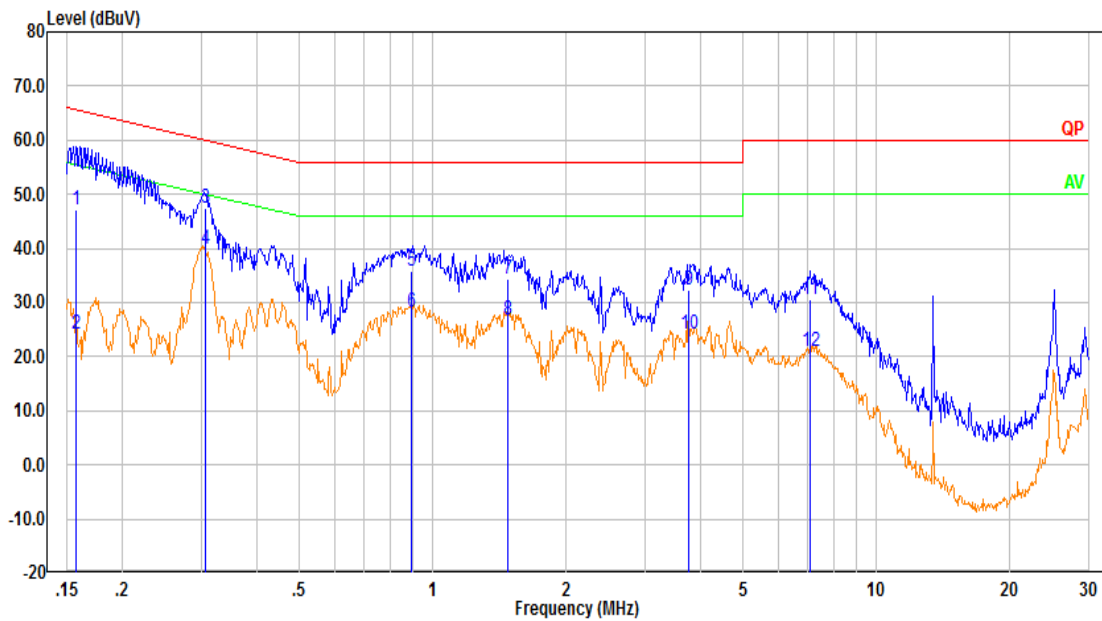
M1

Line:



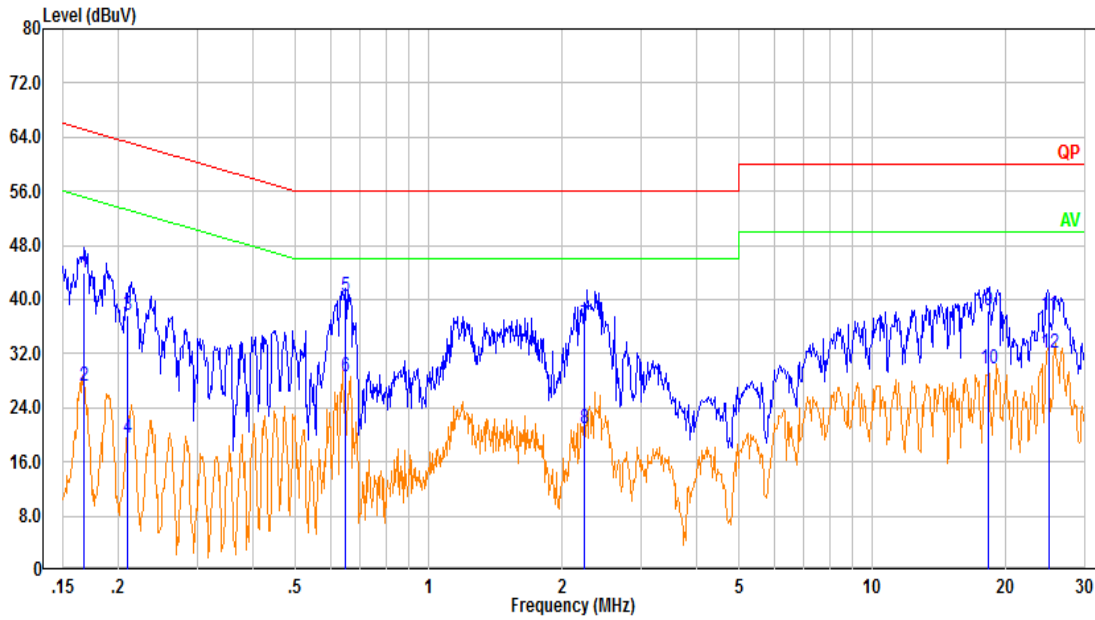
No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB)	Result (dB μ V)	Limit (dB μ V)	Margin (dB)	Detector
1	0.155	37.36	9.61	46.97	65.71	18.74	QP
2	0.155	14.10	9.61	23.71	55.71	32.00	Average
3	0.301	35.07	9.61	44.68	60.23	15.55	QP
4	0.301	26.77	9.61	36.38	50.23	13.85	Average
5	0.873	22.78	9.62	32.40	56.00	23.60	QP
6	0.873	15.03	9.62	24.65	46.00	21.35	Average
7	3.727	17.87	9.65	27.52	56.00	28.48	QP
8	3.727	7.12	9.65	16.77	46.00	29.23	Average
9	7.516	22.14	9.67	31.81	60.00	28.19	QP
10	7.516	13.91	9.67	23.57	50.00	26.43	Average
11	24.988	16.64	9.81	26.45	60.00	33.55	QP
12	24.988	6.05	9.81	15.86	50.00	34.14	Average

Neutral:



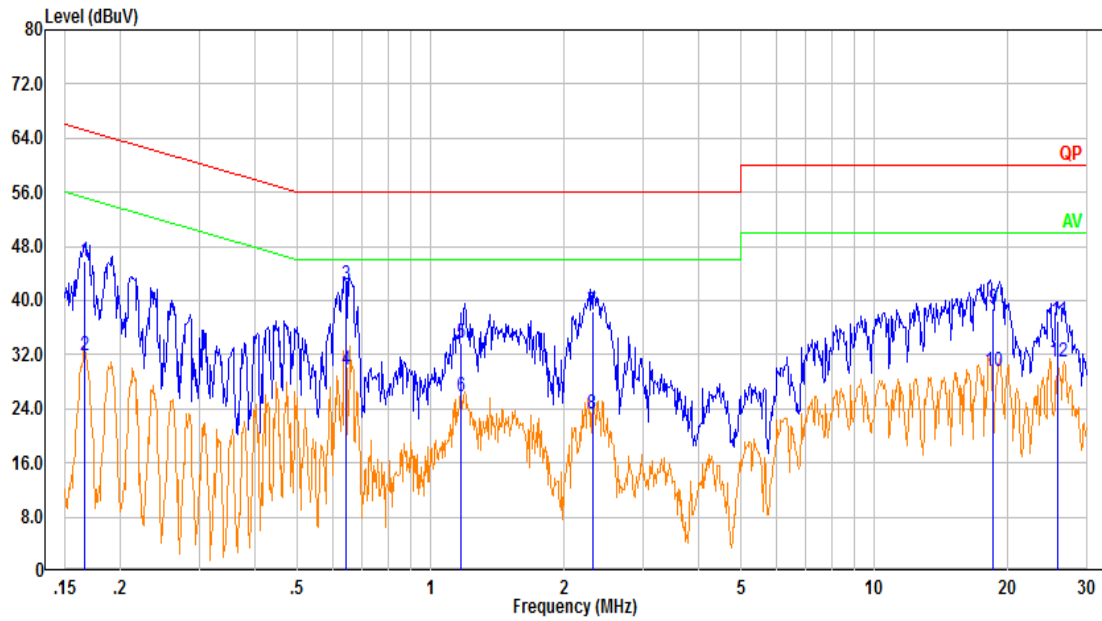
No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB)	Result (dB μ V)	Limit (dB μ V)	Margin (dB)	Detector
1	0.157	37.63	9.61	47.24	65.63	18.39	QP
2	0.157	14.55	9.61	24.16	55.63	31.47	Average
3	0.307	37.95	9.61	47.56	60.06	12.50	QP
4	0.307	30.32	9.61	39.93	50.06	10.13	Average
5	0.897	26.26	9.62	35.88	56.00	20.12	QP
6	0.897	18.77	9.62	28.39	46.00	17.61	Average
7	1.471	24.70	9.62	34.32	56.00	21.68	QP
8	1.471	17.17	9.62	26.80	46.00	19.20	Average
9	3.772	22.74	9.65	32.39	56.00	23.61	QP
10	3.772	14.42	9.65	24.07	46.00	21.93	Average
11	7.078	20.84	9.66	30.50	60.00	29.50	QP
12	7.078	11.47	9.66	21.13	50.00	28.87	Average

M2
Line:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.167	34.29	9.61	43.90	65.12	21.22	QP
2	0.167	17.62	9.61	27.23	55.12	27.89	Average
3	0.209	27.96	9.61	37.57	63.23	25.66	QP
4	0.209	9.94	9.61	19.55	53.23	33.68	Average
5	0.646	30.83	9.62	40.45	56.00	15.55	QP
6	0.646	19.07	9.62	28.69	46.00	17.31	Average
7	2.234	26.57	9.63	36.20	56.00	19.80	QP
8	2.234	11.38	9.63	21.01	46.00	24.99	Average
9	18.289	28.70	9.76	38.46	60.00	21.54	QP
10	18.289	19.92	9.76	29.68	50.00	20.32	Average
11	25.005	27.79	9.81	37.60	60.00	22.40	QP
12	25.005	22.26	9.81	32.07	50.00	17.93	Average

Neutral:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.165	36.30	9.61	45.91	65.19	19.28	QP
2	0.165	22.29	9.61	31.90	55.19	23.29	Average
3	0.645	32.65	9.62	42.27	56.00	13.73	QP
4	0.645	20.07	9.62	29.69	46.00	16.31	Average
5	1.170	24.13	9.62	33.75	56.00	22.25	QP
6	1.170	16.08	9.62	25.70	46.00	20.30	Average
7	2.312	28.69	9.64	38.32	56.00	17.68	QP
8	2.312	13.69	9.64	23.32	46.00	22.68	Average
9	18.451	29.07	9.69	38.76	60.00	21.24	QP
10	18.451	19.81	9.69	29.50	50.00	20.50	Average
11	25.971	27.10	9.78	36.88	60.00	23.12	QP
12	25.971	21.06	9.78	30.84	50.00	19.16	Average

4.2 Radiation Spurious Emissions

Serial Number:	CR22060019-RF-S1	Test Date:	2022-08-08~2022-08-11
Test Site:	966-1, 966-2	Test Mode:	M1, M2
Tester:	Gary Ling, Mack Huang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.5~28.1	Relative Humidity: (%)	59~62	ATM Pressure: (kPa)	99.9~100.2
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Test Equipment List and Details:

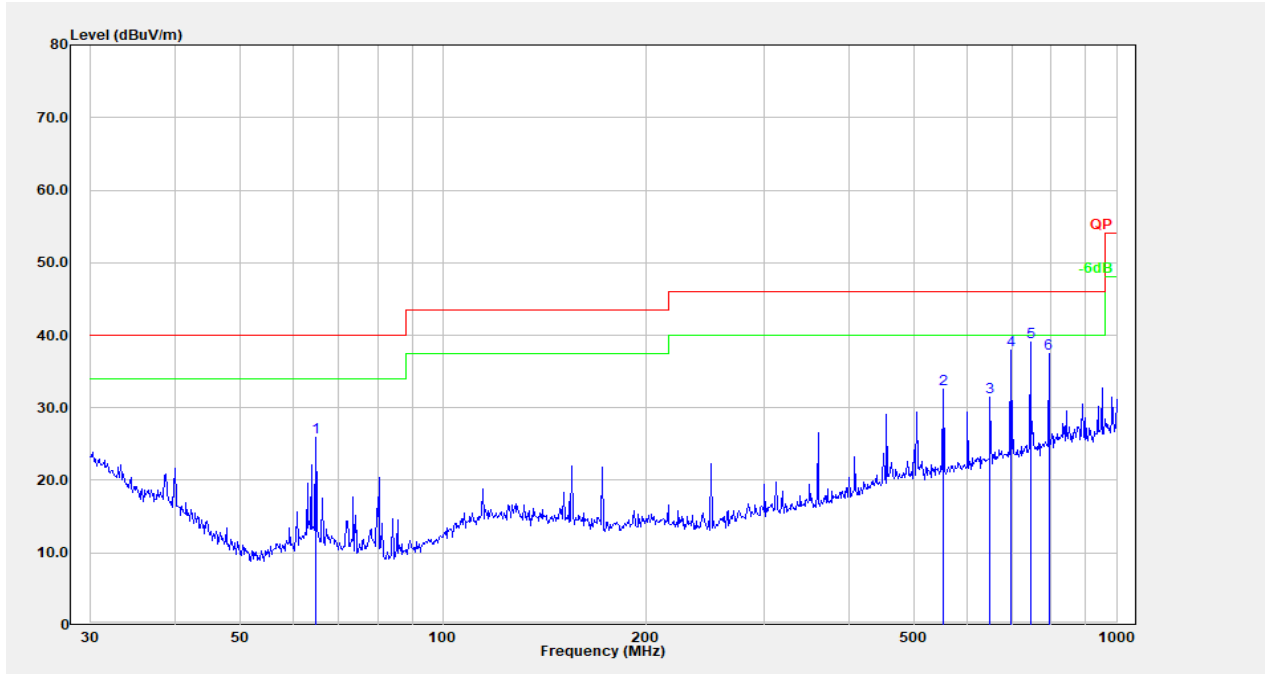
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB6	A082520-5	2020-10-19	2023-10-18
R&S	EMI Test Receiver	ESR3	102724	2022-07-15	2023-07-14
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2022-07-17	2023-07-16
TIMES MICROWAVE	Coaxial 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

* 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).

1) 30MHz-1GHz:

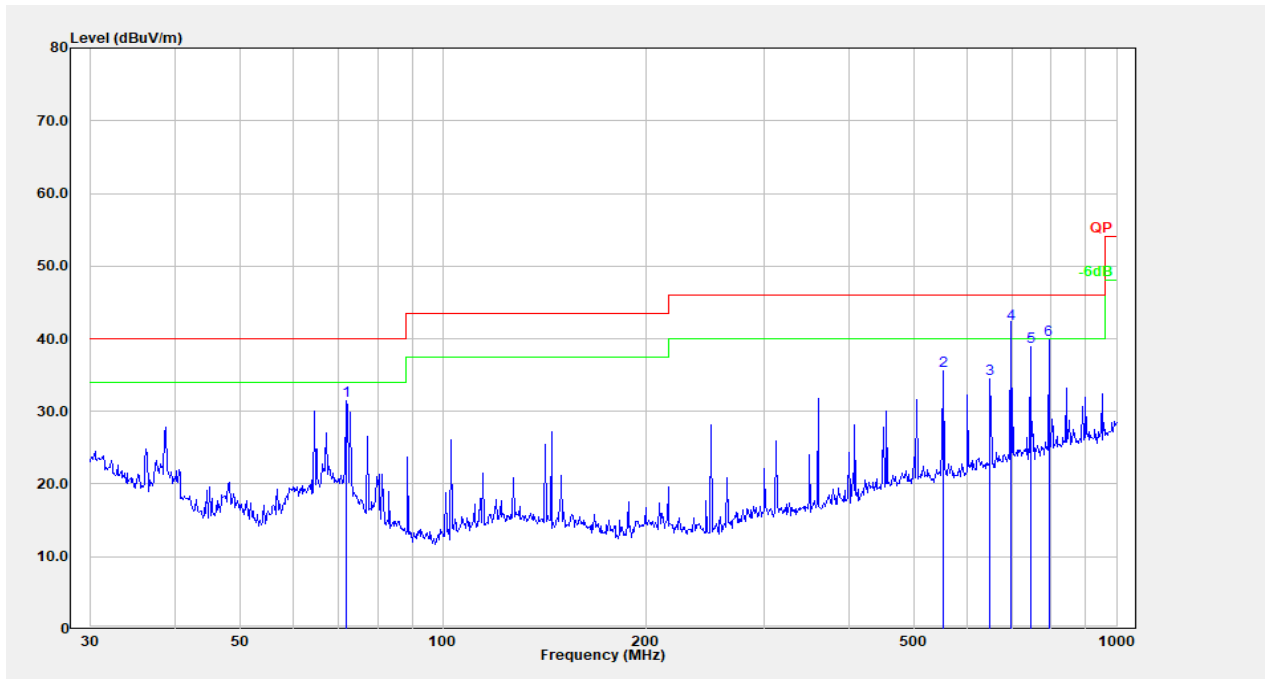
M1:

Horizontal:



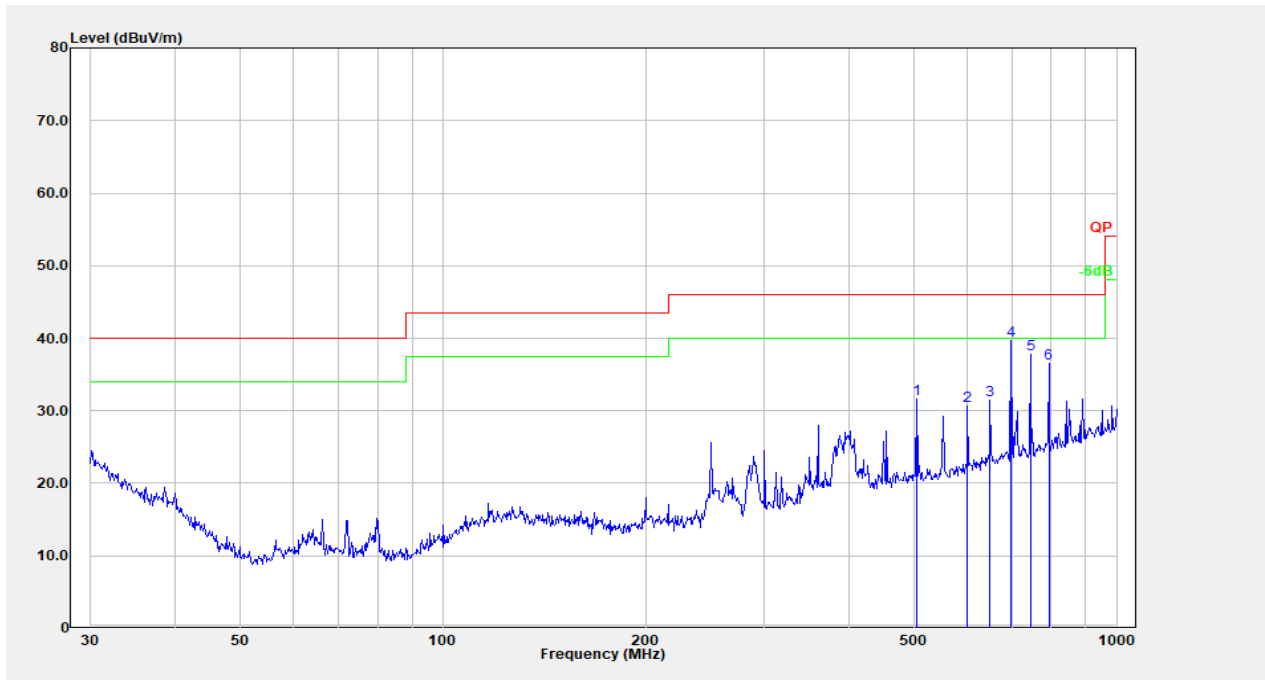
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	64.659	43.15	-17.20	25.95	40.00	14.05	Peak
2	552.883	38.45	-5.95	32.50	46.00	13.50	Peak
3	649.660	35.86	-4.40	31.45	46.00	14.55	Peak
4	696.857	41.64	-3.68	37.96	46.00	8.04	Peak
5	744.866	42.23	-3.11	39.12	46.00	6.88	Peak
6	793.396	39.97	-2.51	37.46	46.00	8.54	Peak

Vertical:



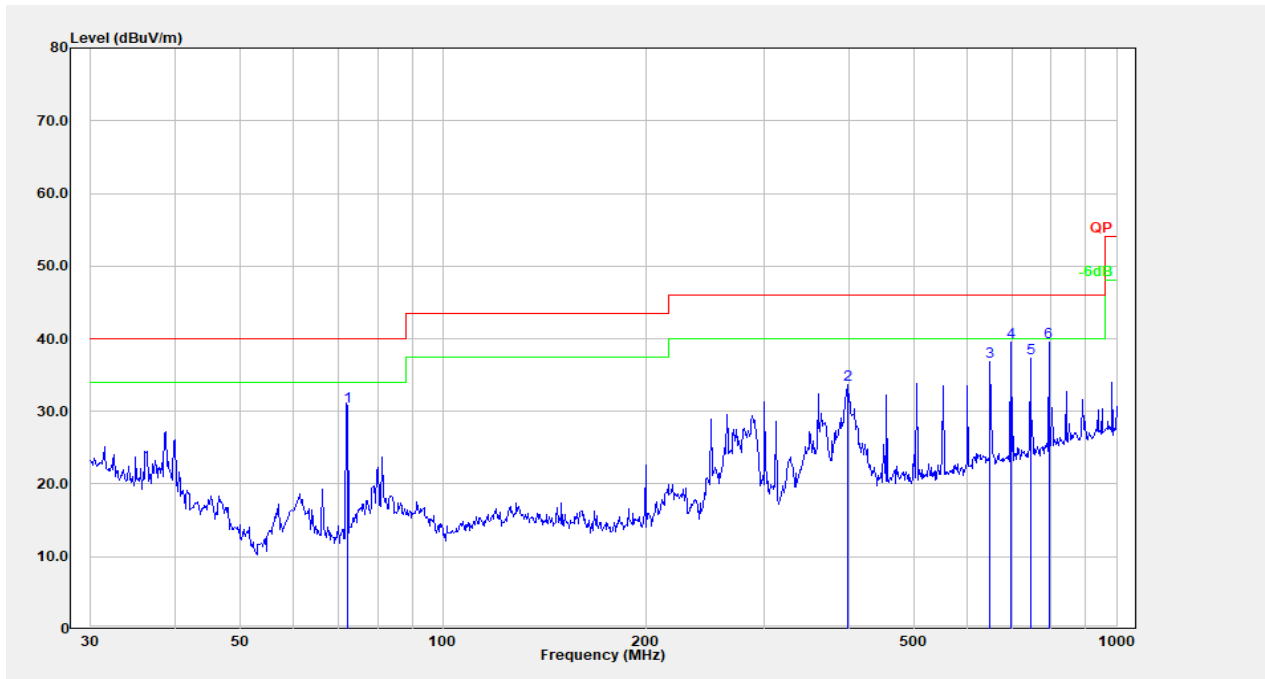
No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	71.832	48.39	-16.91	31.47	40.00	8.53	Peak
2	552.883	41.48	-5.95	35.53	46.00	10.47	Peak
3	649.660	38.89	-4.40	34.49	46.00	11.51	Peak
4	696.022	45.79	-3.66	42.13	46.00	3.87	QP
5	744.866	42.01	-3.11	38.89	46.00	7.11	Peak
6	793.396	42.29	-2.51	39.78	46.00	6.22	Peak

**M2:
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	504.706	37.81	-6.16	31.66	46.00	14.34	Peak
2	601.427	35.99	-5.27	30.72	46.00	15.28	Peak
3	649.660	35.79	-4.40	31.39	46.00	14.61	Peak
4	696.857	43.38	-3.68	39.70	46.00	6.30	Peak
5	744.866	40.85	-3.11	37.74	46.00	8.26	Peak
6	793.396	39.02	-2.51	36.51	46.00	9.49	Peak

Vertical:

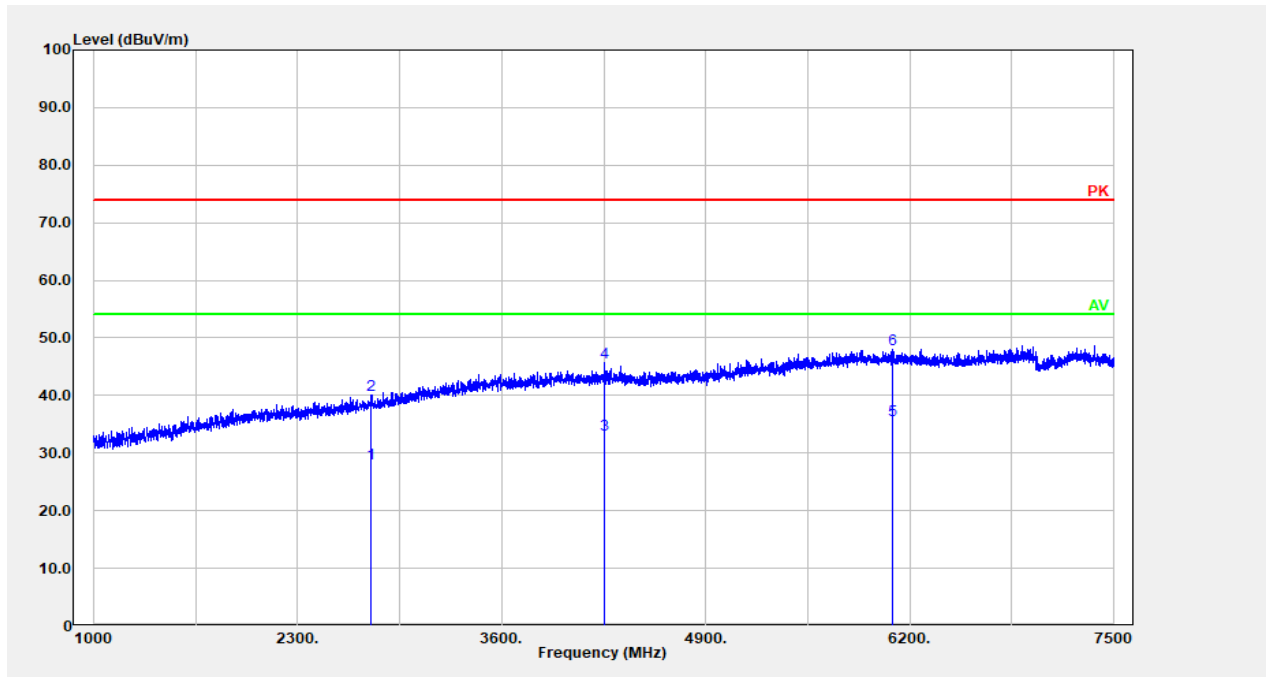


No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	72.084	47.66	-16.93	30.73	40.00	9.27	Peak
2	399.030	42.65	-9.02	33.63	46.00	12.37	Peak
3	649.660	41.19	-4.40	36.78	46.00	9.22	Peak
4	696.857	43.21	-3.68	39.53	46.00	6.47	Peak
5	744.866	40.49	-3.11	37.38	46.00	8.62	Peak
6	793.396	42.10	-2.51	39.59	46.00	6.41	Peak

2) Above 1GHz

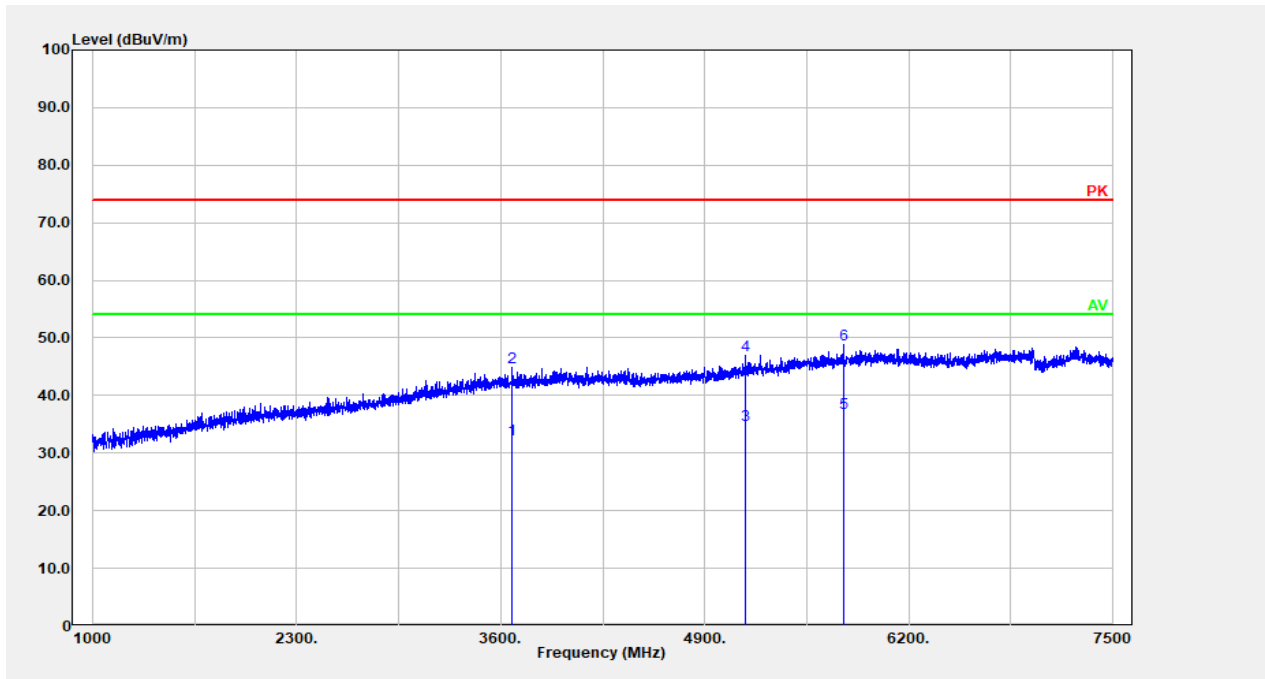
M1:

Horizontal:

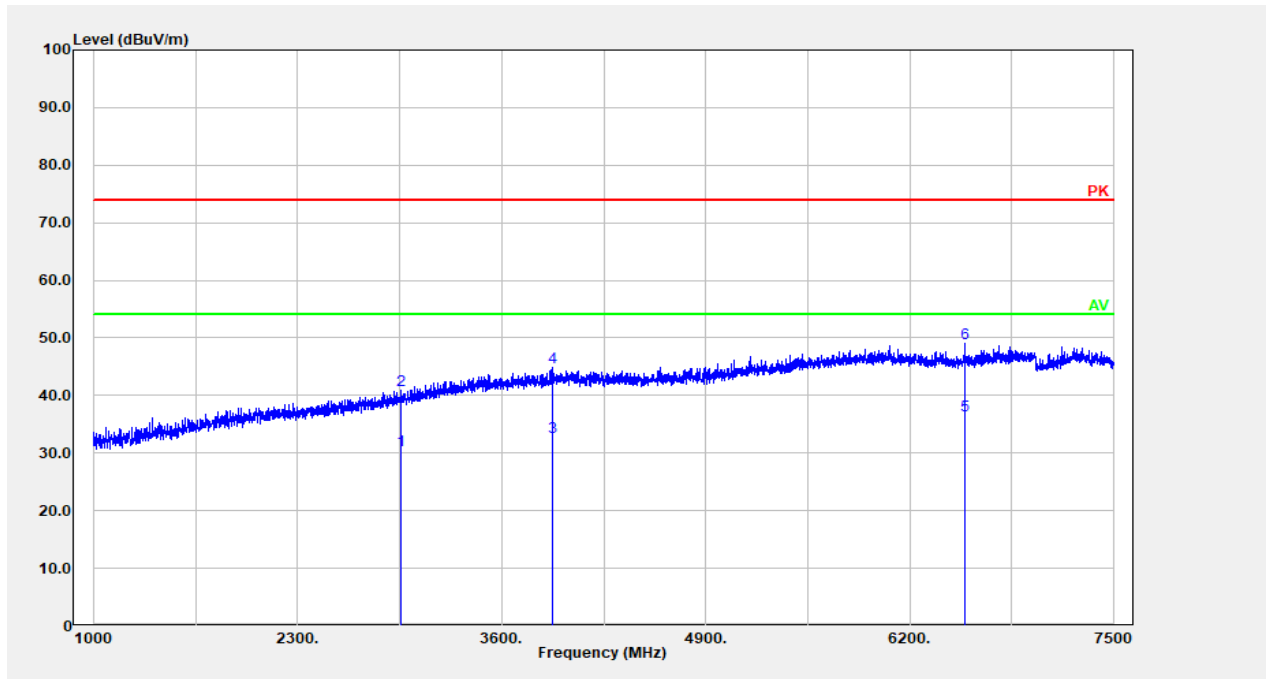


No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	2770.954	23.05	5.06	28.11	54.00	25.89	Average
2	2770.954	35.11	5.06	40.17	74.00	33.83	Peak
3	4257.151	23.41	9.73	33.14	54.00	20.86	Average
4	4257.151	35.92	9.73	45.65	74.00	28.35	Peak
5	6089.218	22.24	13.48	35.72	54.00	18.28	Average
6	6089.218	34.49	13.48	47.97	74.00	26.03	Peak

Vertical:

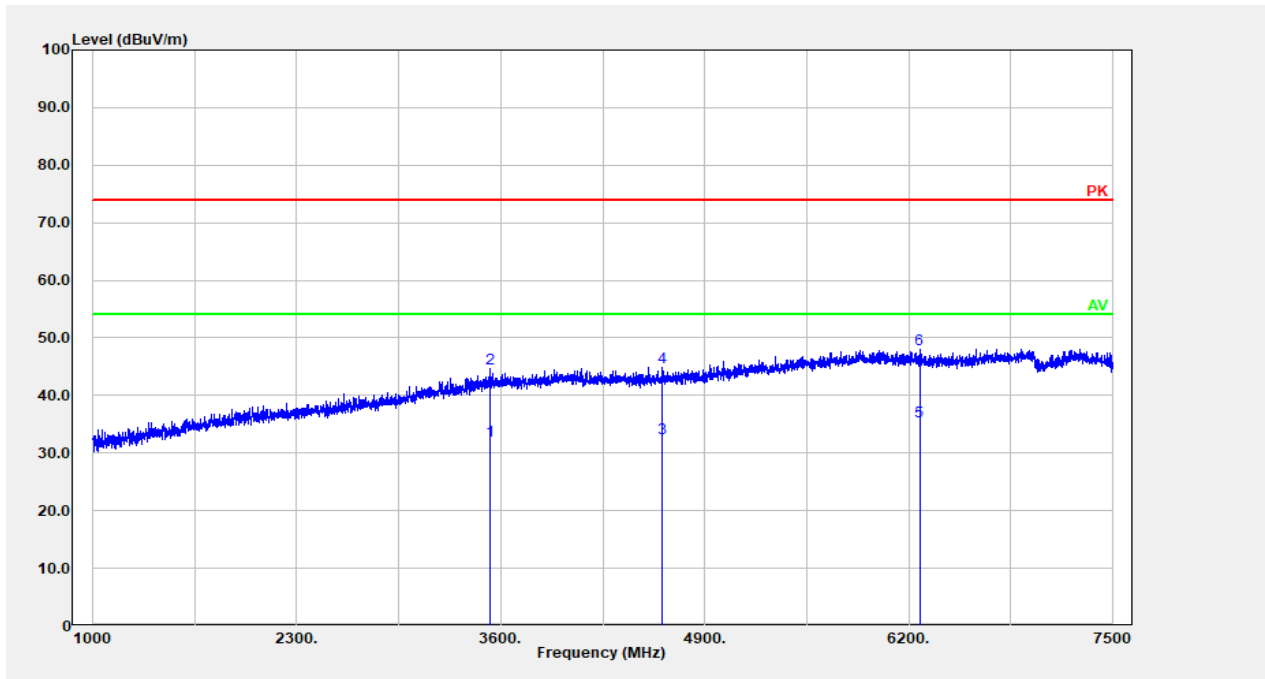


No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	3674.635	23.35	9.10	32.45	54.00	21.55	Average
2	3674.635	35.71	9.10	44.81	74.00	29.19	Peak
3	5159.532	23.24	11.57	34.81	54.00	19.19	Average
4	5159.532	35.49	11.57	47.06	74.00	26.94	Peak
5	5782.356	24.02	12.92	36.94	54.00	17.06	Average
6	5782.356	36.01	12.92	48.93	74.00	25.07	Peak

M2**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	2958.192	24.43	6.02	30.45	54.00	23.55	Average
2	2958.192	34.96	6.02	40.98	74.00	33.02	Peak
3	3922.985	23.08	9.71	32.79	54.00	21.21	Average
4	3922.985	35.14	9.71	44.85	74.00	29.15	Peak
5	6548.209	23.43	13.17	36.60	54.00	17.40	Average
6	6548.209	35.96	13.17	49.13	74.00	24.87	Peak

Vertical:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	3529.006	23.43	8.78	32.21	54.00	21.79	Average
2	3529.006	35.88	8.78	44.66	74.00	29.34	Peak
3	4629.026	22.35	10.20	32.55	54.00	21.45	Average
4	4629.026	34.71	10.20	44.91	74.00	29.09	Peak
5	6268.654	22.32	13.19	35.51	54.00	18.49	Average
6	6268.654	34.78	13.19	47.97	74.00	26.03	Peak

==== END OF REPORT ====