



**中认信通**

CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)



# TEST REPORT

**Applicant:** Xiamen Milesight IoT Co., Ltd.

Address: Building C09, Software Park Phase III, Xiamen 361024, Fujian, China

**FCC ID:** 2AYHY- UR41

**Product Name:** Mini Industrial Router

**Model Number:** UR41-L08AF, NA41-L08AF

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

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:** CR221152488-00A

**Date Of Issue:** 2023/1/13

**Reviewed By:** Sun Zhong *Sun Zhong*

Title: Manager

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

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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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## DOCUMENT REVISION HISTORY

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Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR221152488-00A	Original Report	2023/1/13

## 1. GENERAL INFORMATION

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

<b>EUT Name:</b>	Mini Industrial Router
<b>EUT Model:</b>	UR41-L08AF, NA41-L08AF
<b>Highest Operation Frequency:</b>	2155 MHz
<b>Rated Input Voltage:</b>	DC 5V from USB port or DC 12V from Adapter
<b>Serial Number:</b>	1PGZ-2
<b>EUT Received Date:</b>	2022/11/15
<b>EUT Received Status:</b>	Good

### Accessory Information:

<b>Accessory Description</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Parameters</b>
Adapter	ORIENTAL HERO ELE. FTY.	OH- 1015A1201000U3-UL	Input: 100~240V, 50/60H, 0.35A Output: 12.0V, 1.0A

## 1.2 Description of Test Configuration

### 1.2.1 EUT Operation Condition:

<b>EUT Operation Mode:</b>	The system was configured for testing in Typical Use Mode, which was provided by the manufacturer. Test Mode : Operating
<b>Equipment Modifications:</b>	No
<b>EUT Exercise Software:</b>	LanTest20

### 1.2.2 Support Equipment List and Details

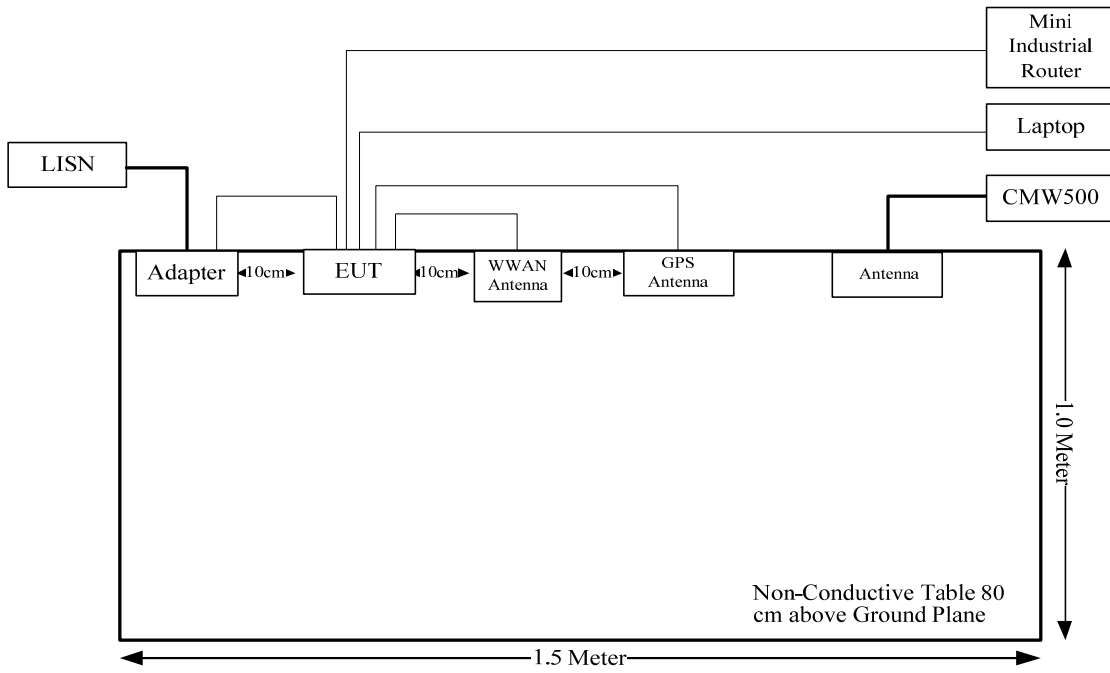
Manufacturer	Description	Model	Serial Number
Dongguan Aohai Technology Co., Ltd	USB Adapter	A138A-120150U-US2	AH2002107160
Lenovo	Laptop	ThinkPad T460s	PC0J92SU
R&S	Wideband Radio Communication Tester	CMW500	144976
Milesight	Mini Industrial Router	UR41-L08AF	1PH3-6

### 1.2.3 Support Cable List and Details

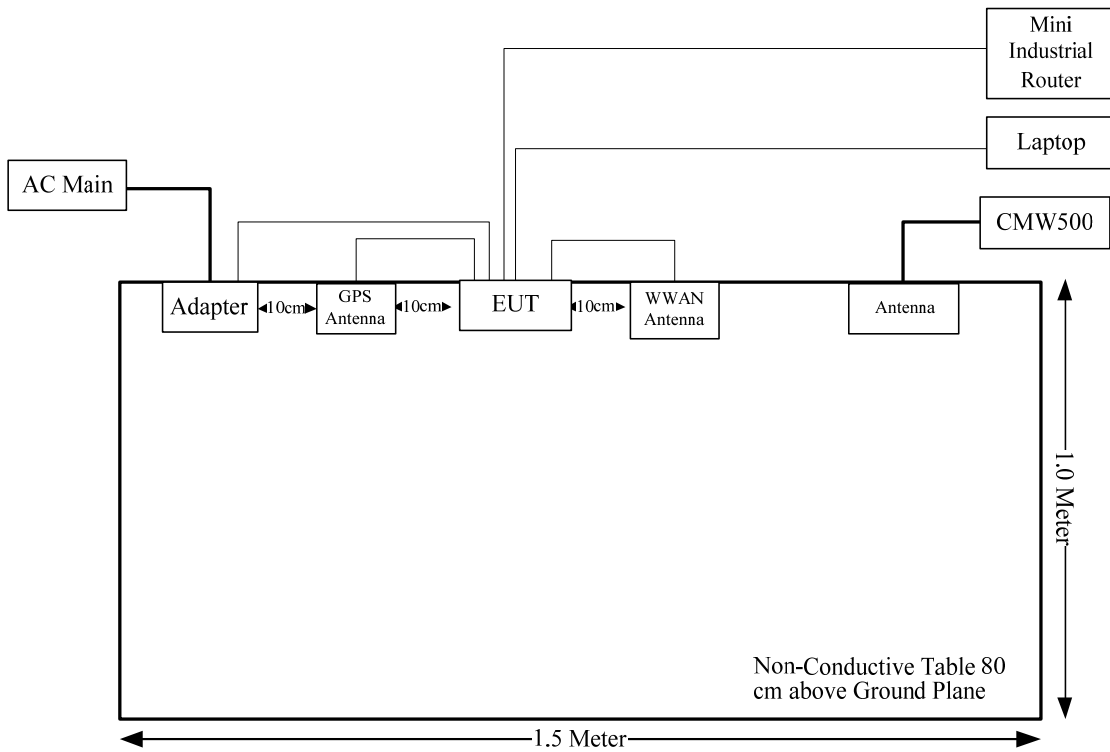
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Signal Cable	No	No	5	EUT	Mini Industrial Router
RJ45 Cable	No	Yes	10	EUT	Laptop
Coaxial cable	Yes	No	10	Antenna	Wideband Radio Communication Tester
DC power Cable	No	Yes	1.2	Adapter	EUT
USB Cable	No	No	1.0	Adapter	EUT
GPS Signal Cable	Yes	No	2.0	EUT	GPS Antenna
WWAN Signal Cable	Yes	No	2.0	EUT	WWAN Antenna

### 1.2.4 Block Diagram of Test Setup

AC line conducted emissions:



### Radiated 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
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	$\pm 5\%$
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)



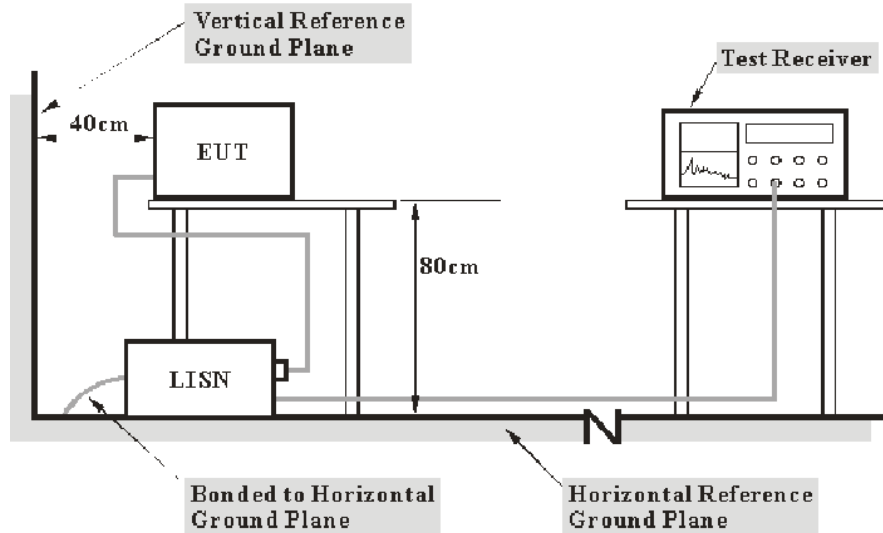
## 2. SUMMARY OF TEST RESULTS

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

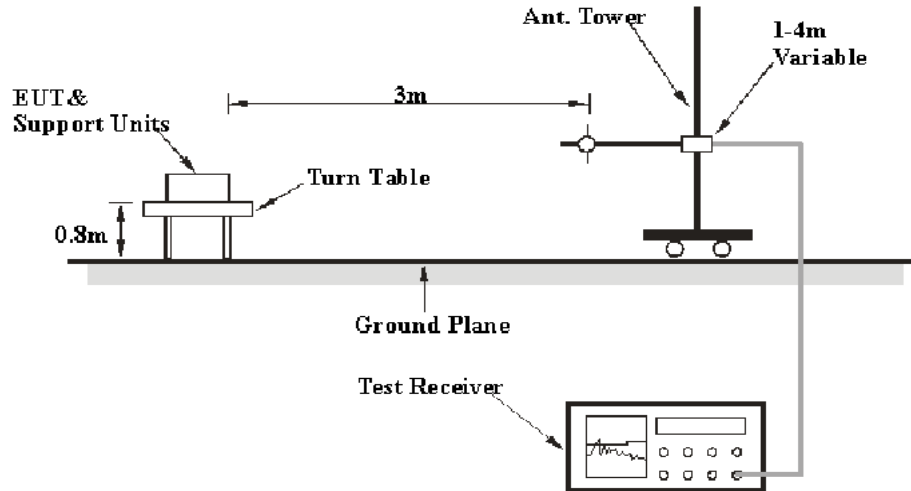
The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

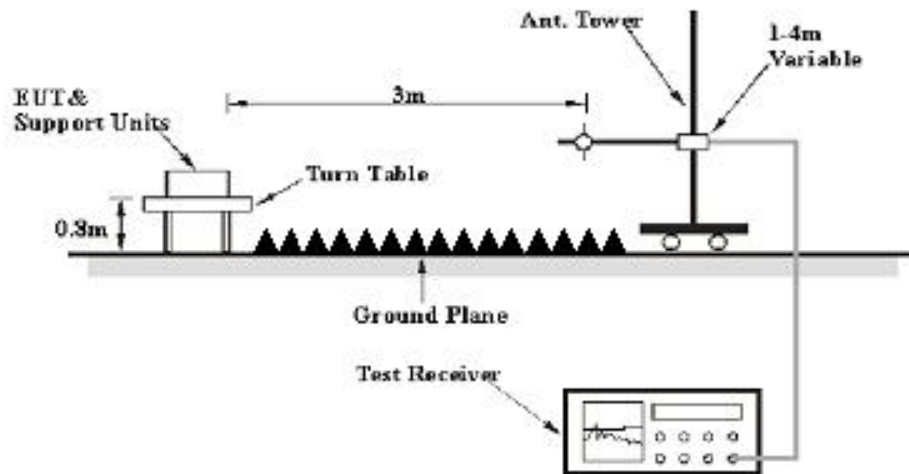
## 3.2 Radiation Spurious Emissions

### 3.2.1 EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission 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 13 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	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10Hz	/	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.

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:

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

## 4. TEST DATA AND RESULTS

### 4.1 AC Line Conducted Emissions

Serial Number:	1PGZ-2	Test Date:	2022/11/24
Test Site:	CE	Test Mode:	Operating
Tester:	Vic Du	Test Result:	Pass

#### Environmental Conditions:

Temperature: (°C)	26.1	Relative Humidity: (%)	65	ATM Pressure: (kPa)	100.8
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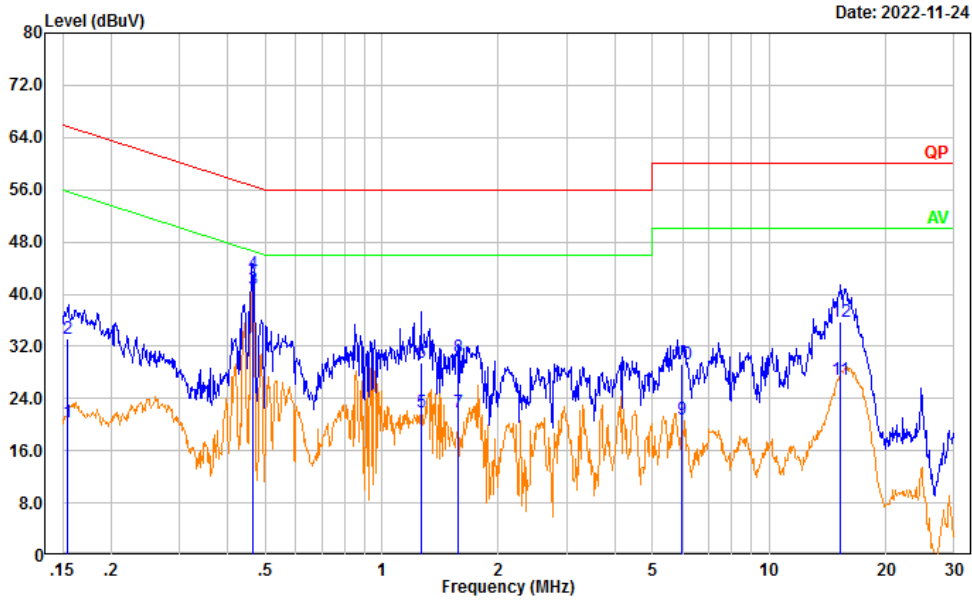
#### Test Equipment List and Details:

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	2022/08/07	2023/08/06
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).

**USB Adapter Mode:**  
**Line:**

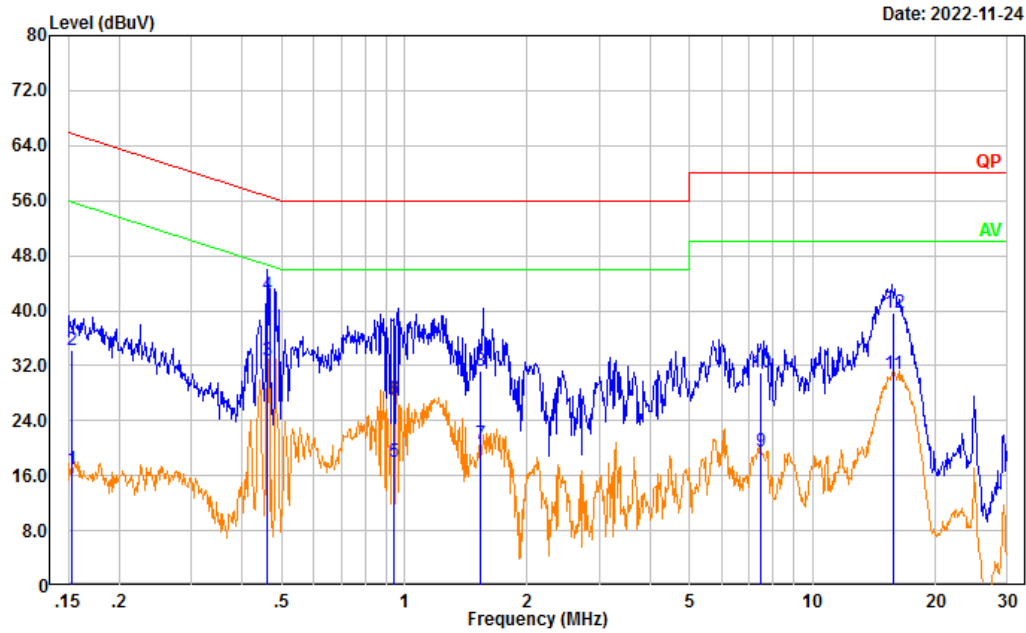
Port: Line  
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.154	10.69	9.61	20.30	55.77	35.47	Average
2	0.154	23.47	9.61	33.08	65.77	32.69	QP
3	0.464	31.13	9.61	40.74	46.62	5.88	Average
4	0.464	33.60	9.61	43.21	56.62	13.41	QP
5	1.260	12.29	9.62	21.91	46.00	24.09	Average
6	1.260	19.94	9.62	29.56	56.00	26.44	QP
7	1.576	12.31	9.63	21.94	46.00	24.06	Average
8	1.576	20.75	9.63	30.38	56.00	25.62	QP
9	5.955	11.07	9.66	20.73	50.00	29.27	Average
10	5.955	19.58	9.66	29.24	60.00	30.76	QP
11	15.216	17.13	9.69	26.82	50.00	23.18	Average
12	15.216	26.00	9.69	35.69	60.00	24.31	QP

**Neutral:**

Port: neutral  
Note:



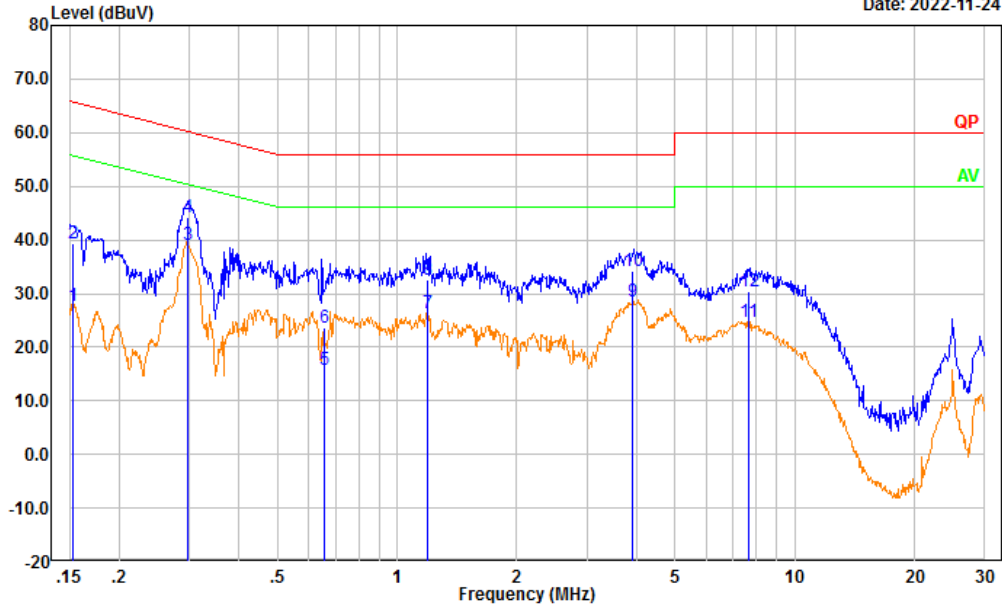
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.154	7.32	9.61	16.93	55.80	38.87	Average
2	0.154	24.57	9.61	34.18	65.80	31.62	QP
3	0.460	23.17	9.61	32.78	46.69	13.91	Average
4	0.460	32.68	9.61	42.29	56.69	14.40	QP
5	0.945	8.44	9.62	18.06	46.00	27.94	Average
6	0.945	17.42	9.62	27.04	56.00	28.96	QP
7	1.539	10.96	9.63	20.59	46.00	25.41	Average
8	1.539	21.58	9.63	31.21	56.00	24.79	QP
9	7.445	9.83	9.66	19.49	50.00	30.51	Average
10	7.445	21.32	9.66	30.98	60.00	29.02	QP
11	15.751	21.03	9.69	30.72	50.00	19.28	Average
12	15.751	29.89	9.69	39.58	60.00	20.42	QP



**DC Adapter Mode:**  
**Line:**

Port: Line  
Note:

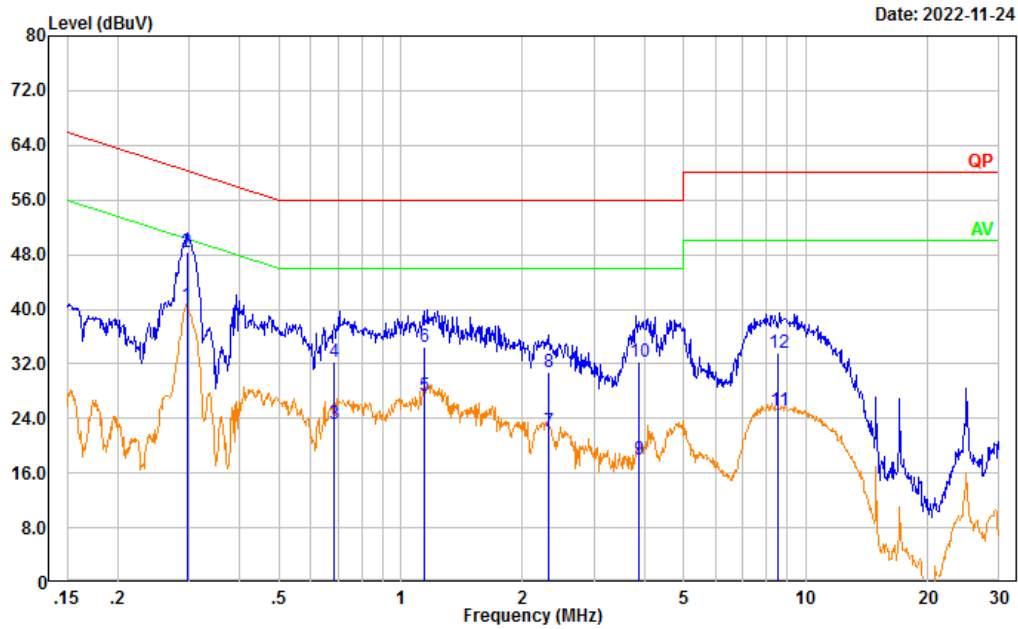
Date: 2022-11-24



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.153	18.09	9.61	27.70	55.82	28.12	Average
2	0.153	29.61	9.61	39.22	65.82	26.60	QP
3	0.298	29.40	9.61	39.01	50.31	11.30	Average
4	0.298	34.73	9.61	44.34	60.31	15.97	QP
5	0.657	6.18	9.62	15.80	46.00	30.20	Average
6	0.657	13.99	9.62	23.61	56.00	32.39	QP
7	1.188	16.76	9.62	26.38	46.00	19.62	Average
8	1.188	23.08	9.62	32.70	56.00	23.30	QP
9	3.901	18.96	9.65	28.61	46.00	17.39	Average
10	3.901	24.60	9.65	34.25	56.00	21.75	QP
11	7.661	14.97	9.67	24.64	50.00	25.36	Average
12	7.661	20.61	9.67	30.28	60.00	29.72	QP

**Neutral:**

Port: neutral  
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.296	30.95	9.61	40.56	50.35	9.79	Average
2	0.296	38.69	9.61	48.30	60.35	12.05	QP
3	0.686	13.53	9.62	23.15	46.00	22.85	Average
4	0.686	22.69	9.62	32.31	56.00	23.69	QP
5	1.141	17.75	9.62	27.37	46.00	18.63	Average
6	1.141	24.85	9.62	34.47	56.00	21.53	QP
7	2.323	12.44	9.64	22.08	46.00	23.92	Average
8	2.323	21.11	9.64	30.75	56.00	25.25	QP
9	3.878	8.41	9.65	18.06	46.00	27.94	Average
10	3.878	22.70	9.65	32.35	56.00	23.65	QP
11	8.567	15.38	9.67	25.05	50.00	24.95	Average
12	8.567	24.02	9.67	33.69	60.00	26.31	QP

## 4.2 Radiation Spurious Emissions

Serial Number:	1PGZ-2	Test Date:	2022/12/01~2023/01/12
Test Site:	966-1, 966-2	Test Mode:	Operating
Tester:	Carl Xue, coco Tian	Test Result:	Pass

### Environmental Conditions:

Temperature: (°C)	21.6~24.2	Relative Humidity: (%)	42~52	ATM Pressure: (kPa)	101.2~101.6
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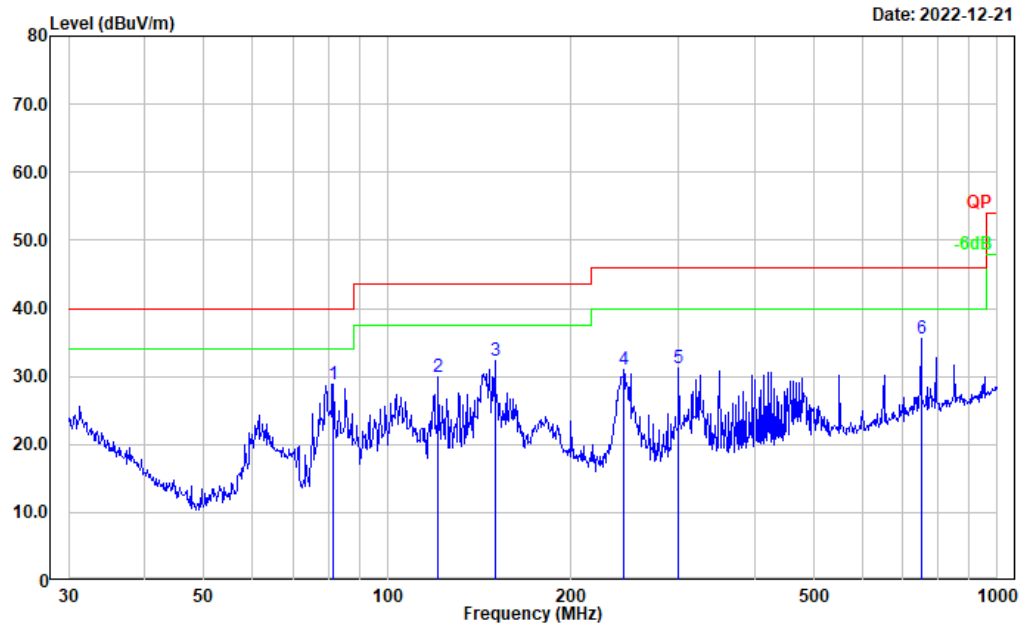
### Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Below 1GHz					
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
Audix	Test Software	E3	201021 (V9)	N/A	N/A
Above 1GHz					
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	2022/11/09	2023/11/08
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).

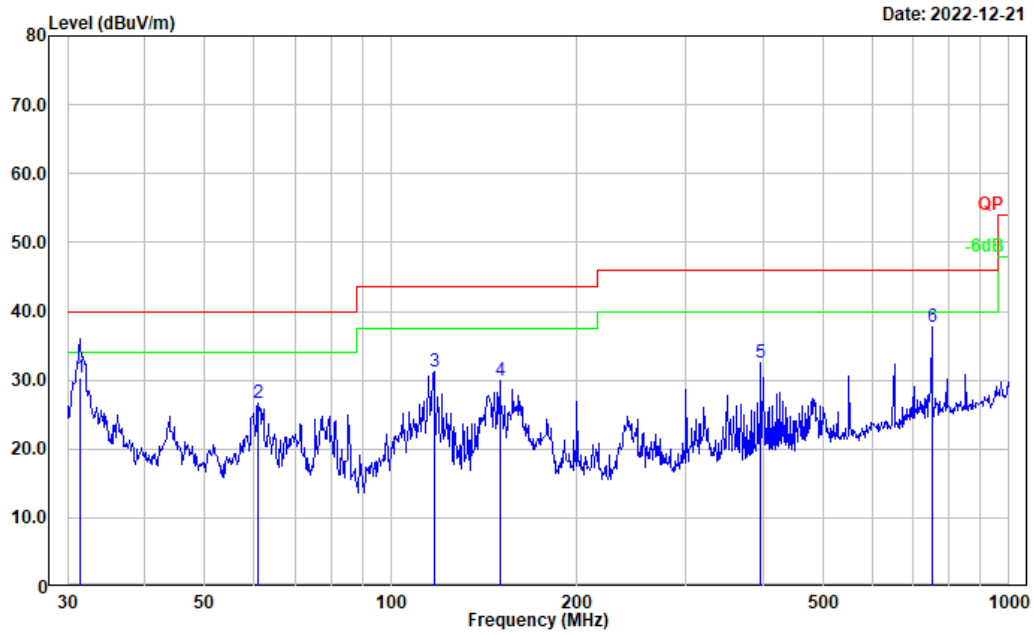
**1) 30MHz-1GHz:  
USB Adapter Mode:**

Polarization: horizontal  
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	81.497	46.24	-17.37	28.87	40.00	11.13	Peak
2	121.123	41.29	-11.44	29.85	43.50	13.65	Peak
3	150.011	44.21	-12.00	32.21	43.50	11.29	Peak
4	244.232	43.99	-12.98	31.01	46.00	14.99	Peak
5	300.367	41.93	-10.63	31.30	46.00	14.70	Peak
6	750.108	38.53	-3.00	35.53	46.00	10.47	Peak

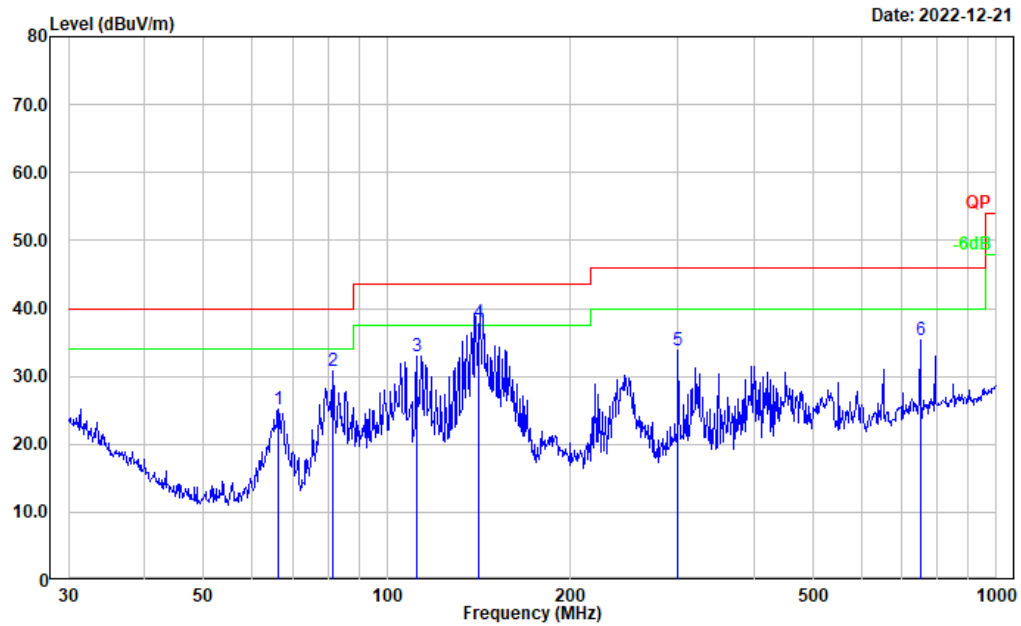
Polarization: vertical  
 Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	31.399	35.10	-4.67	30.43	40.00	9.57	QP
2	60.918	43.99	-17.37	26.62	40.00	13.38	Peak
3	117.360	42.81	-11.67	31.14	43.50	12.36	Peak
4	150.011	41.99	-12.00	29.99	43.50	13.51	Peak
5	396.242	41.34	-8.81	32.53	46.00	13.47	Peak
6	750.108	40.66	-3.00	37.66	46.00	8.34	Peak

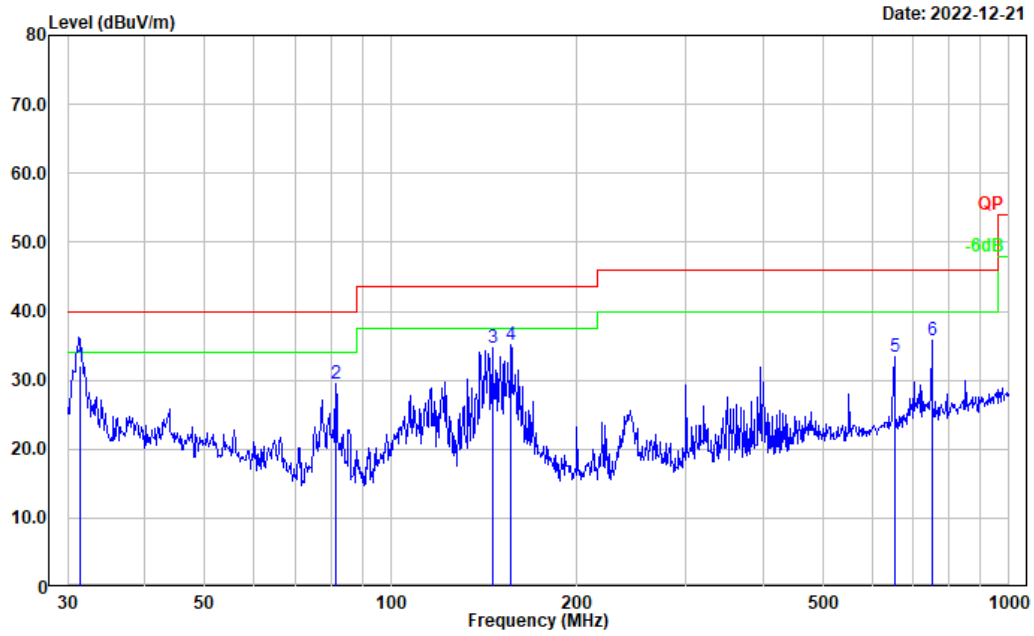
**DC Adapter Mode:**

Polarization: horizontal  
 Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	66.266	42.08	-16.84	25.24	40.00	14.76	Peak
2	81.497	48.07	-17.37	30.70	40.00	9.30	Peak
3	111.738	45.17	-12.18	32.99	43.50	10.51	Peak
4	141.713	49.76	-11.91	37.85	43.50	5.65	QP
5	300.367	44.52	-10.63	33.89	46.00	12.11	Peak
6	750.108	38.39	-3.00	35.39	46.00	10.61	Peak

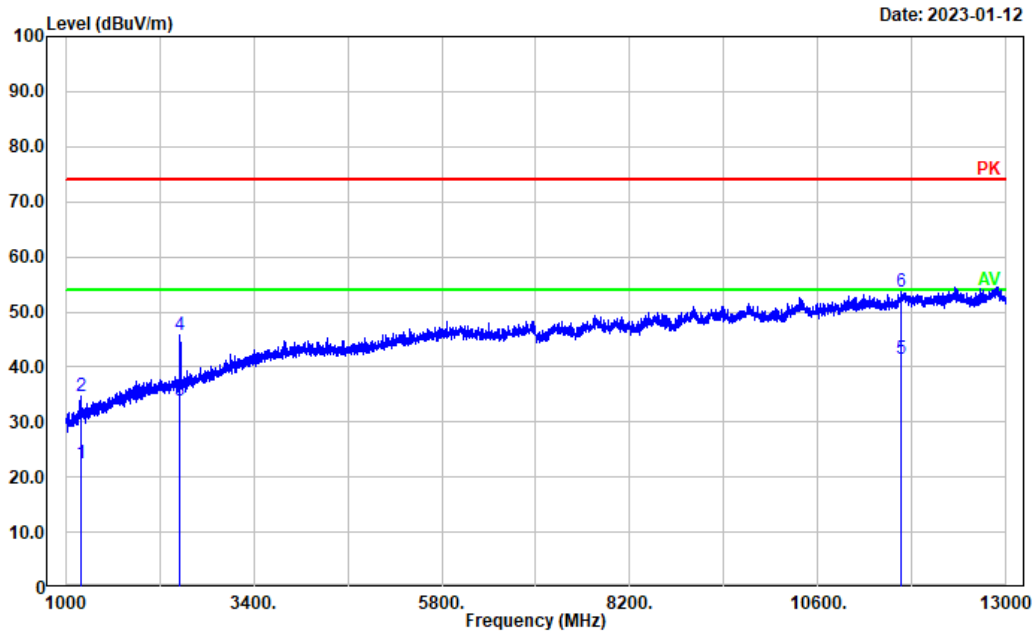
Polarization: vertical  
 Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	31.391	36.70	-4.66	32.04	40.00	7.96	QP
2	81.497	46.76	-17.37	29.39	40.00	10.61	Peak
3	145.861	46.64	-11.97	34.67	43.50	8.83	Peak
4	156.458	47.22	-12.04	35.18	43.50	8.32	Peak
5	651.942	37.54	-4.19	33.35	46.00	12.65	Peak
6	750.108	38.69	-3.00	35.69	46.00	10.31	Peak

**2) Above 1GHz:  
USB Adapter Mode:**

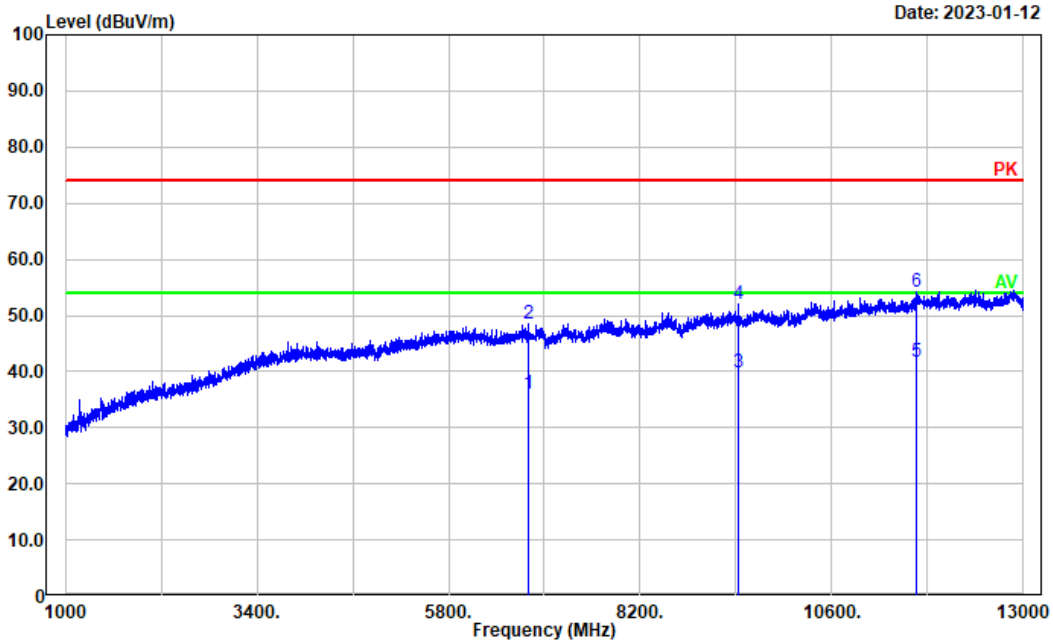
Polarization: horizontal  
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	1189.638	24.37	-1.97	22.40	54.00	31.60	Average
2	1189.638	36.73	-1.97	34.76	74.00	39.24	Peak
3	2459.492	30.05	3.70	33.75	54.00	20.25	Average
4	2459.492	42.10	3.70	45.80	74.00	28.20	Peak
5	11658.130	21.30	20.13	41.43	54.00	12.57	Average
6	11658.130	33.60	20.13	53.73	74.00	20.27	Peak



Polarization: vertical  
 Note:

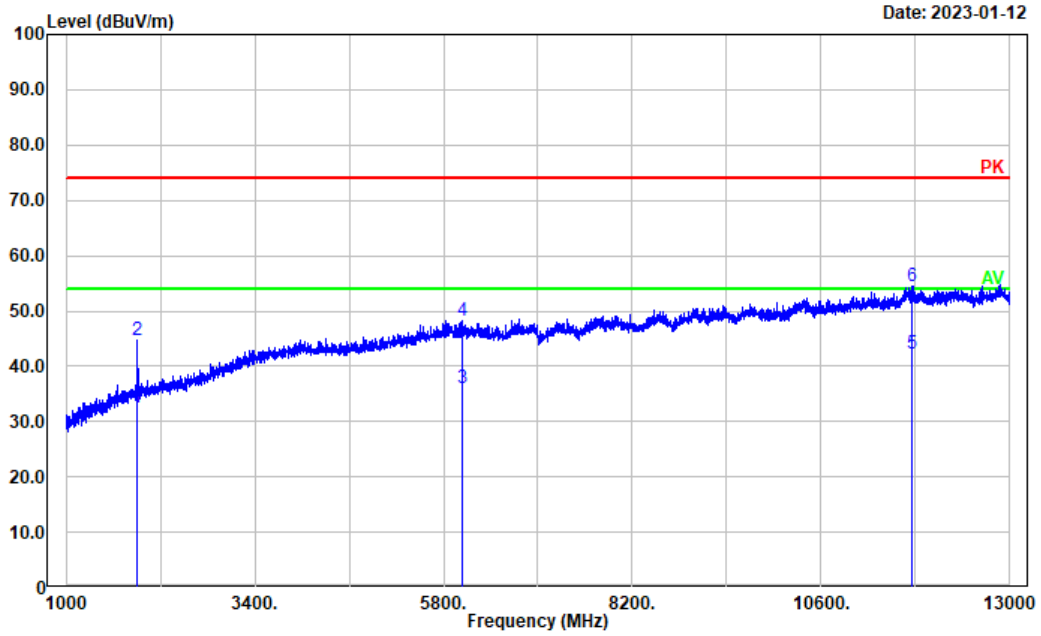


Date: 2023-01-12

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	6809.162	22.43	13.67	36.10	54.00	17.90	Average
2	6809.162	34.87	13.67	48.54	74.00	25.46	Peak
3	9425.686	22.21	17.60	39.81	54.00	14.19	Average
4	9425.686	34.42	17.60	52.02	74.00	21.98	Peak
5	11660.530	21.46	20.16	41.62	54.00	12.38	Average
6	11660.530	33.92	20.16	54.08	74.00	19.92	Peak

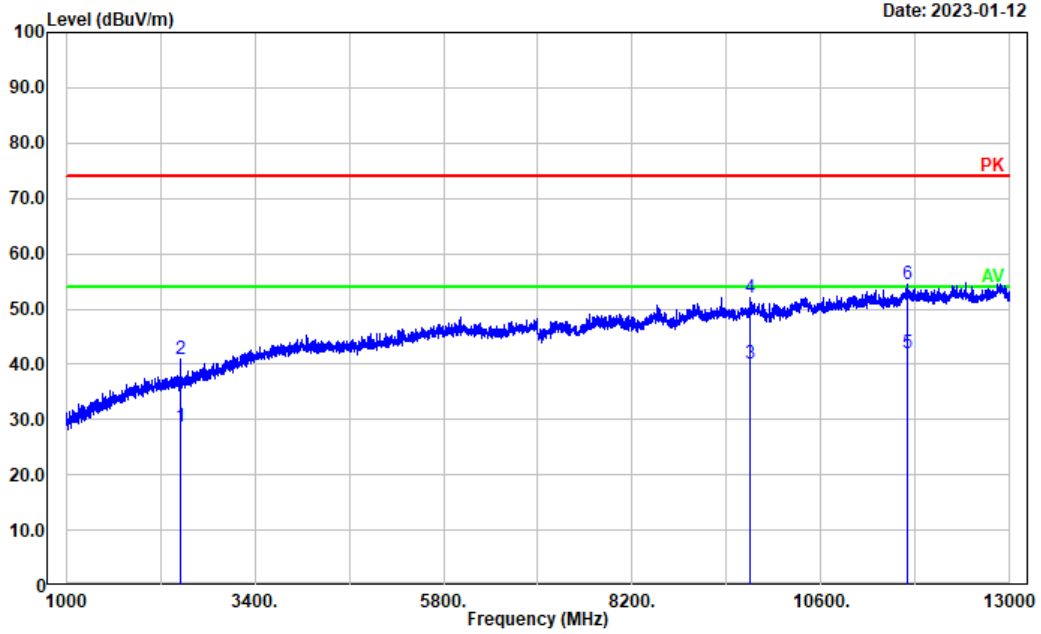
**DC Adapter Mode:**

Polarization: horizontal  
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	1912.182	30.39	2.02	32.41	54.00	21.59	Average
2	1912.182	42.78	2.02	44.80	74.00	29.20	Peak
3	6033.807	22.37	13.63	36.00	54.00	18.00	Average
4	6033.807	34.73	13.63	48.36	74.00	25.64	Peak
5	11756.550	22.10	20.18	42.28	54.00	11.72	Average
6	11756.550	34.21	20.18	54.39	74.00	19.61	Peak

Polarization: vertical  
 Note:



Date: 2023-01-12

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	2459.492	25.06	3.70	28.76	54.00	25.24	Average
2	2459.492	37.11	3.70	40.81	74.00	33.19	Peak
3	9699.340	22.08	17.91	39.99	54.00	14.01	Average
4	9699.340	34.15	17.91	52.06	74.00	21.94	Peak
5	11694.140	21.47	20.52	41.99	54.00	12.01	Average
6	11694.140	33.94	20.52	54.46	74.00	19.54	Peak

==== END OF REPORT ====