



中认信通

CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)



TEST REPORT

Applicant: PO FUNG ELECTRONIC (HK) INTERNATIONAL GROUP COMPANY LIMITED

Address: Room 1508, 15/F, Office Tower II, Grand Plaza, 625 Nathan Road, Kowloon, Hong Kong

FCC ID: 2AJGM-FR31S

Product Name: FRS TWO WAY RADIO

Model Number: FR-31S, FR-S31, FR-W31

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: CR230311926-00B

Date Of Issue: 2023/4/26

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

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230311926-00B	Original Report	2023/4/26

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	FRS TWO WAY RADIO
Trade Name:	BAOFENG, POFUNG
EUT Model:	HS-5000G
Multiple Models:	FR-S31, FR-W31
Highest Operation Frequency:	467.7125 MHz
Rated Input Voltage:	DC 3.7V from battery ,DC 5V from USB port
Serial Number:	234L_2
EUT Received Date:	2023/3/15
EUT Received Status:	Good
Note: The Multiple models are electrically identical with the test model. Please refer to the declaration letter for more detail, which was provided by manufacturer.	

Accessory Information:

Accessory Description	Manufacturer	Model	Parameters
/	/	/	/

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

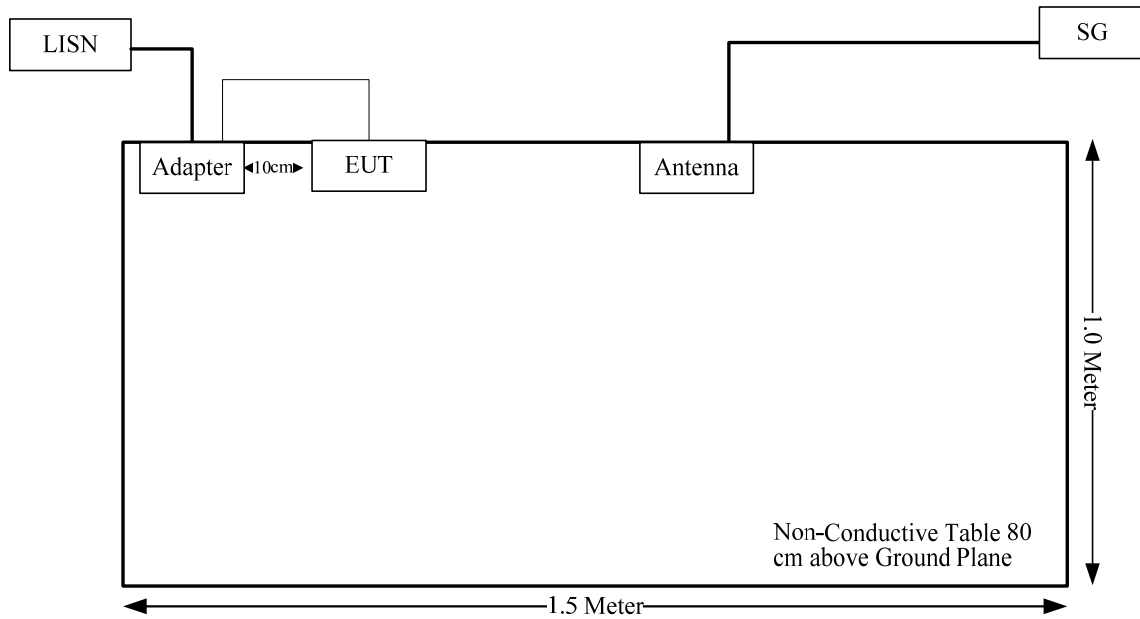
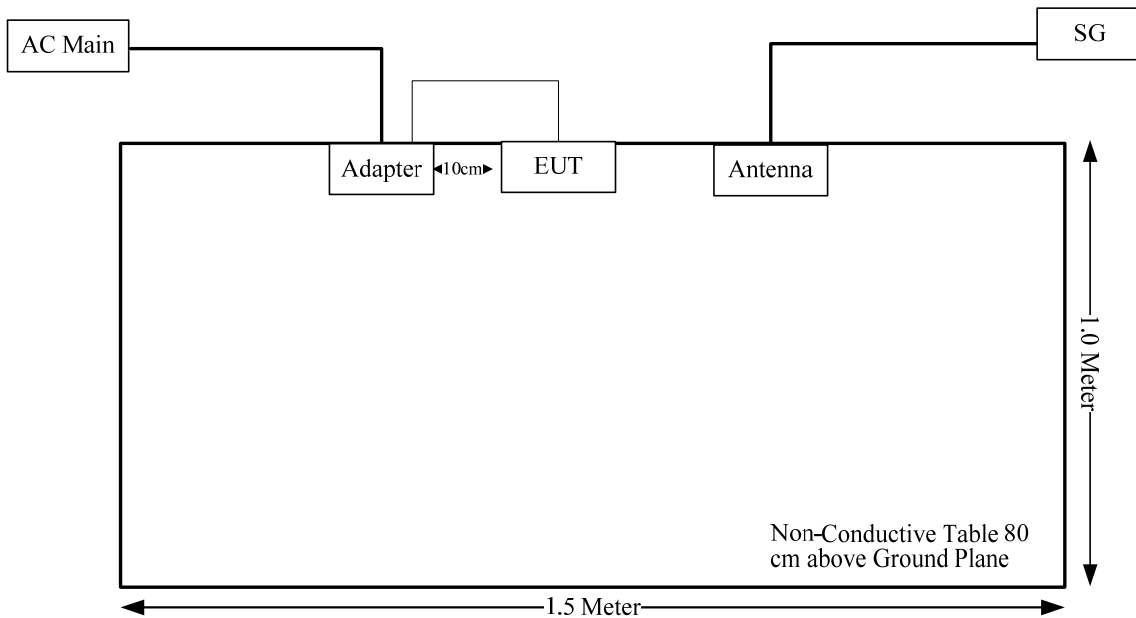
EUT Operation Mode:	The system was configured for testing in Typical Use Mode, which was provided by the manufacturer. Test Mode : FRS Receiving(462.6375MHz, 467.6375MHz) NOAA Receiving(161.65MHz, 163.275MHz)
Equipment Modifications:	No
EUT Exercise Software:	No

1.2.2 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Fangxin	Adapter	FX2U-050200U	AD220930001
Agilent	MXG Vector Signal Generator	N5182B	MY51350142

1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	0.8	adapter	EUT
Coaxial Cable	No	No	1.5	antenna	N5182B

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)

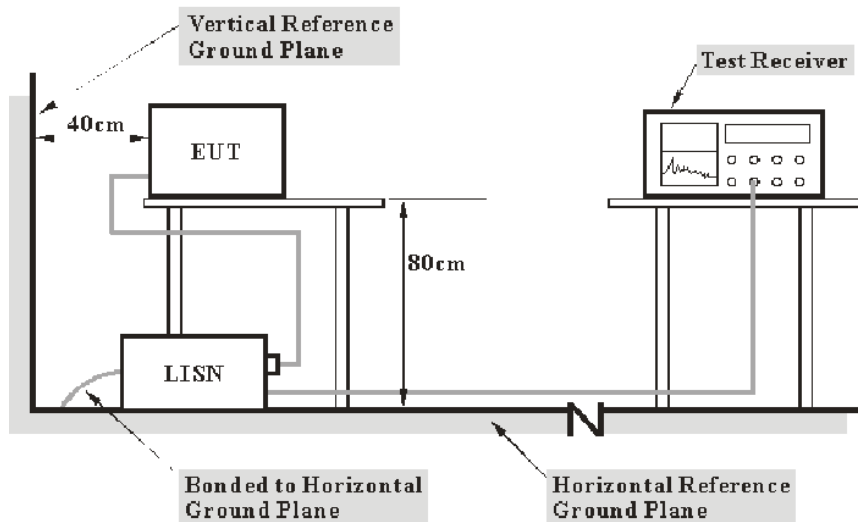
2. SUMMARY OF TEST RESULTS

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

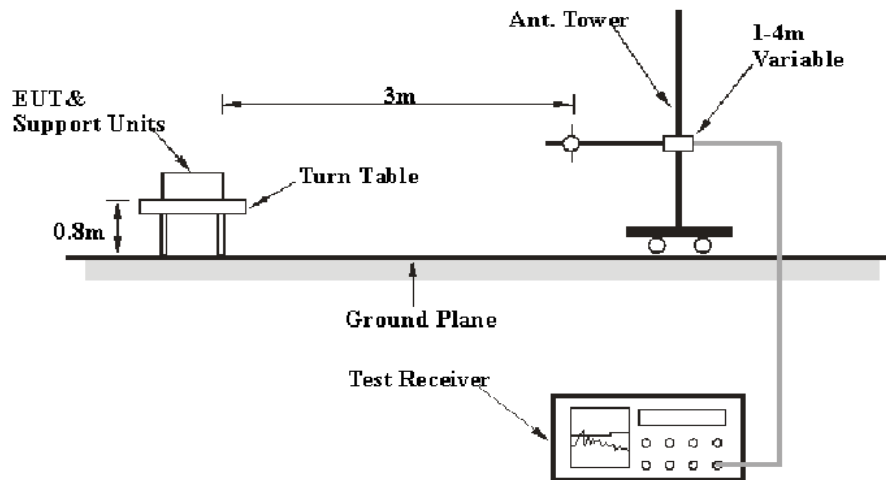
The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

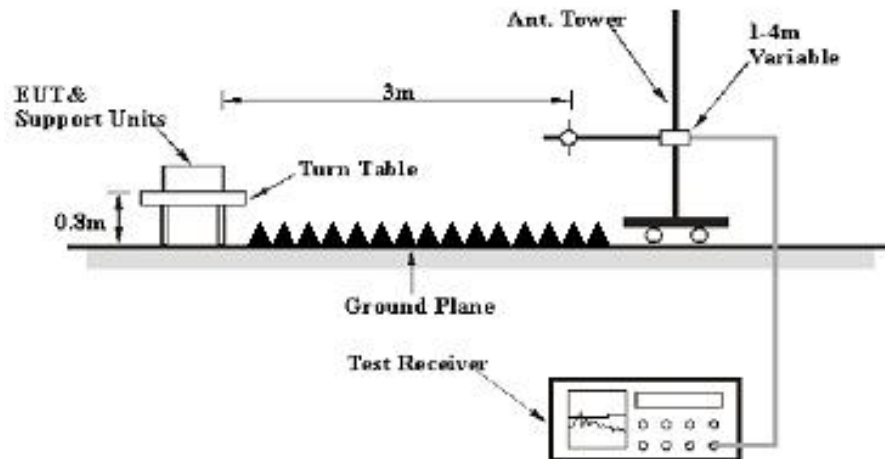
3.2 Radiation Spurious Emissions

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 2 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.

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:	234L_2	Test Date:	2023/4/3
Test Site:	CE	Test Mode:	Receiving
Tester:	David	Test Result:	Pass

Environmental Conditions:

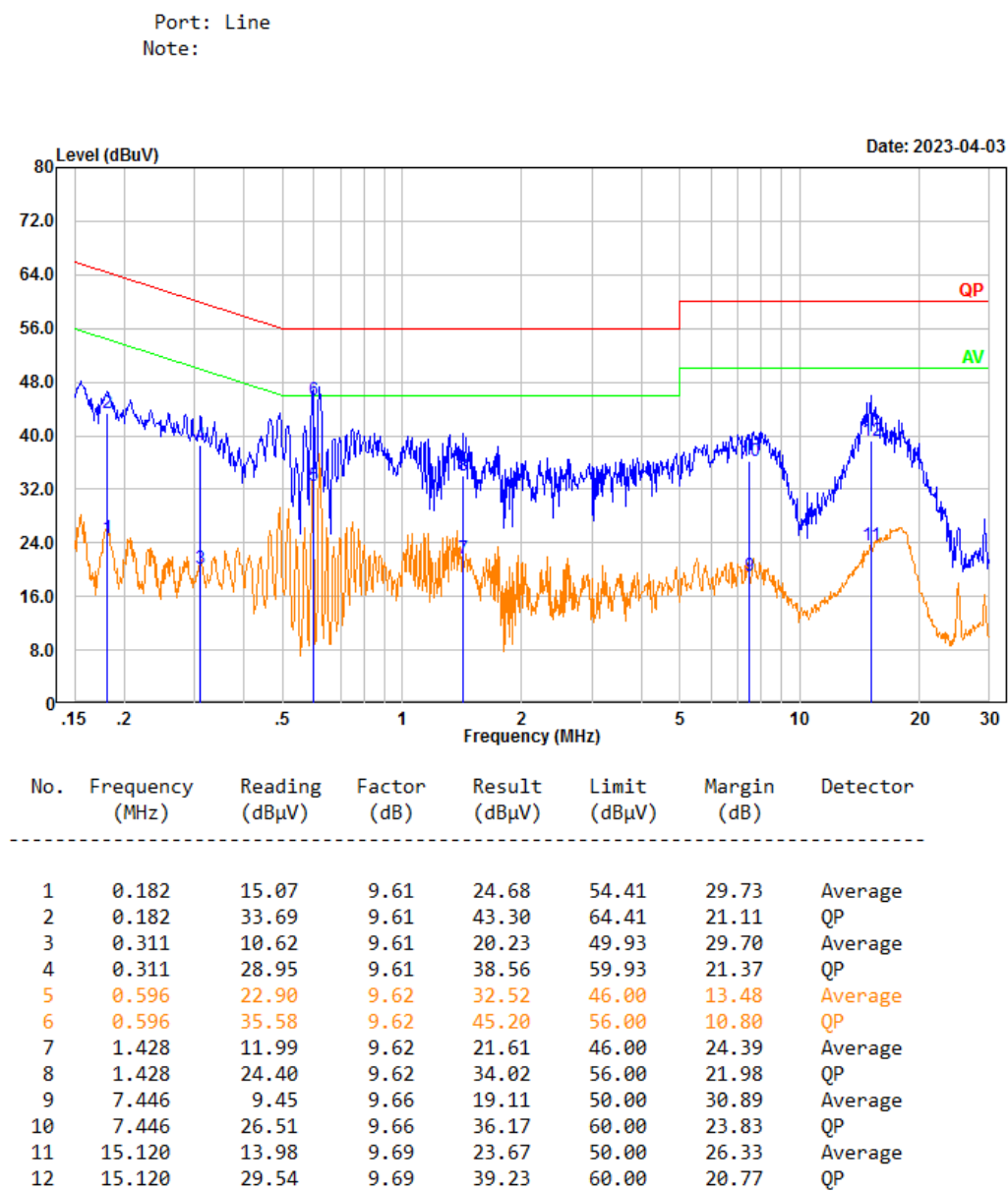
Temperature: (°C)	24	Relative Humidity: (%)	58	ATM Pressure: (kPa)	100.5
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
COM-POWER	LISN	LI-3P-132	20200005	2022/11/18	2023/11/17
R&S	LISN	ENV216	101132	2023/03/31	2024/03/30
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

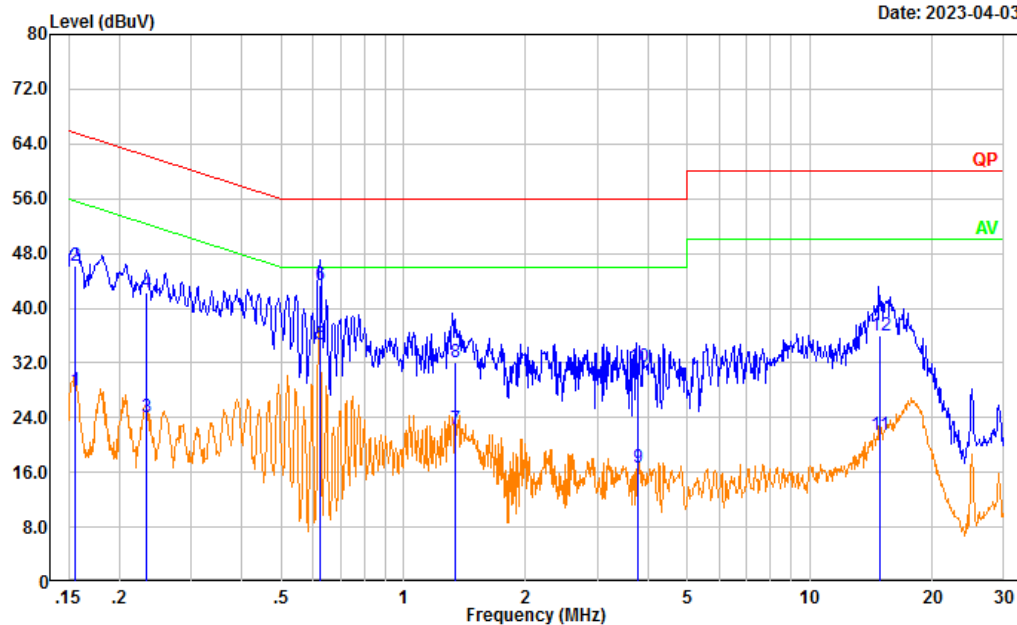
* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

FRS Receiving(462.6375MHz was the worst):



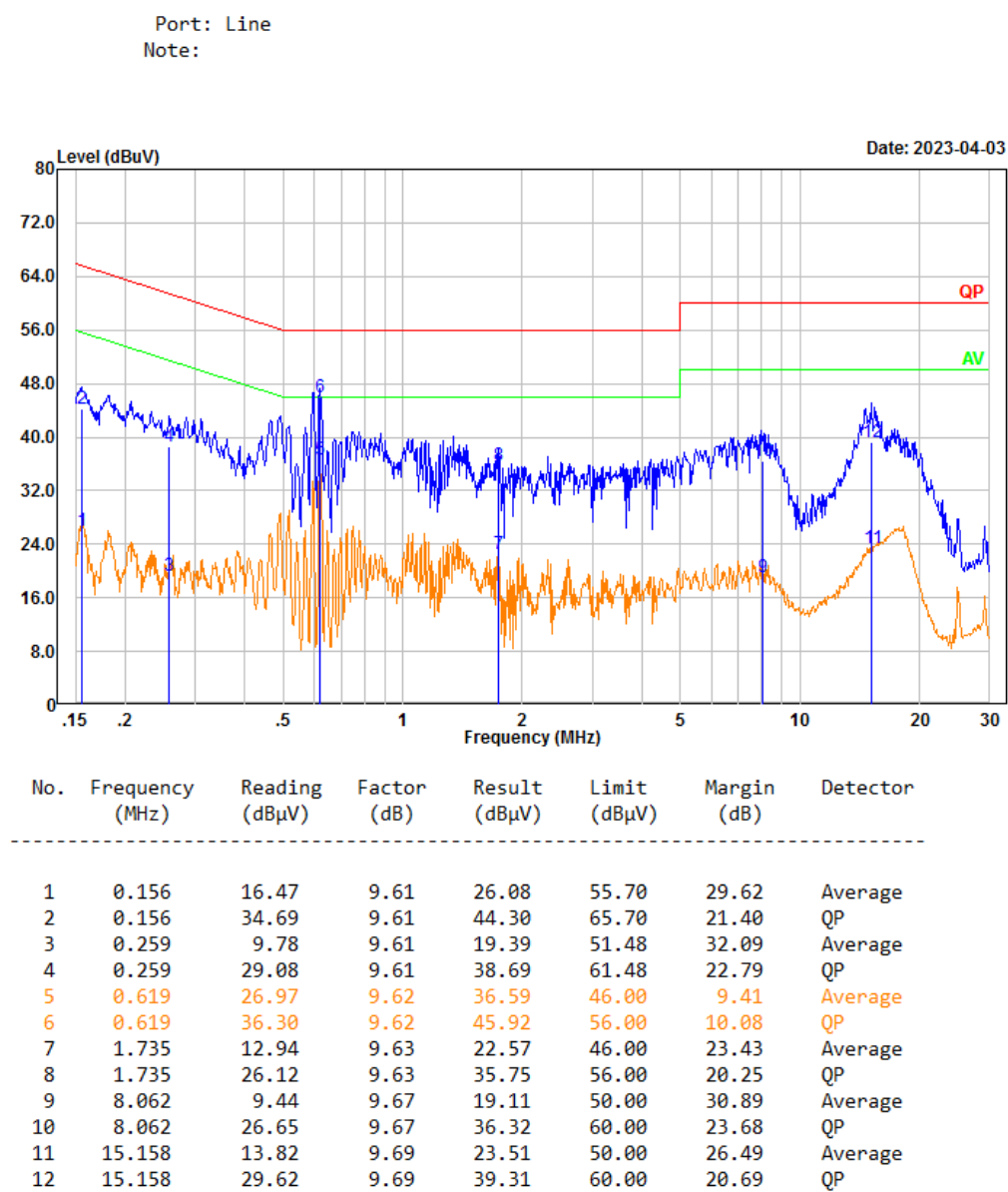
Port: neutral
Note:

Date: 2023-04-03



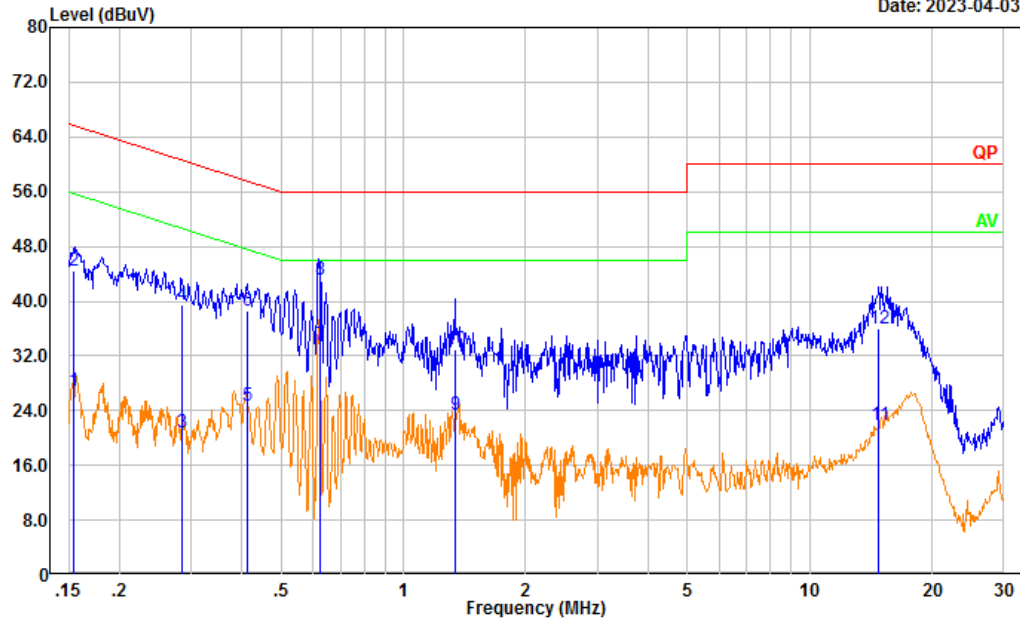
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.156	18.40	9.61	28.01	55.70	27.69	Average
2	0.156	36.46	9.61	46.07	65.70	19.63	QP
3	0.233	14.52	9.61	24.13	52.33	28.20	Average
4	0.233	32.71	9.61	42.32	62.33	20.01	QP
5	0.624	25.05	9.62	34.67	46.00	11.33	Average
6	0.624	33.78	9.62	43.40	56.00	12.60	QP
7	1.339	12.68	9.62	22.30	46.00	23.70	Average
8	1.339	22.45	9.62	32.07	56.00	23.93	QP
9	3.767	6.99	9.65	16.64	46.00	29.36	Average
10	3.767	21.89	9.65	31.54	56.00	24.46	QP
11	14.847	11.67	9.69	21.36	50.00	28.64	Average
12	14.847	26.31	9.69	36.00	60.00	24.00	QP

NOAA Receiving(161.65MHz was the worst):



Port: neutral
Note:

Date: 2023-04-03



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.155	17.25	9.61	26.86	55.73	28.87	Average
2	0.155	34.88	9.61	44.49	65.73	21.24	QP
3	0.285	11.17	9.61	20.78	50.67	29.89	Average
4	0.285	29.79	9.61	39.40	60.67	21.27	QP
5	0.414	15.03	9.61	24.64	47.56	22.92	Average
6	0.414	29.08	9.61	38.69	57.56	18.87	QP
7	0.623	24.09	9.62	33.71	46.00	12.29	Average
8	0.623	33.47	9.62	43.09	56.00	12.91	QP
9	1.338	13.83	9.62	23.45	46.00	22.55	Average
10	1.338	23.38	9.62	33.00	56.00	23.00	QP
11	14.788	12.22	9.69	21.91	50.00	28.09	Average
12	14.788	26.32	9.69	36.01	60.00	23.99	QP

4.2 Radiation Spurious Emissions

Serial Number:	234L_2	Test Date:	2023/4/17 ~2023/4/21
Test Site:	966-1,966-2	Test Mode:	Receiving
Tester:	Tao,Vic Du	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	23.7~26.7	Relative Humidity: (%)	59~61	ATM Pressure: (kPa)	100.1~100.5
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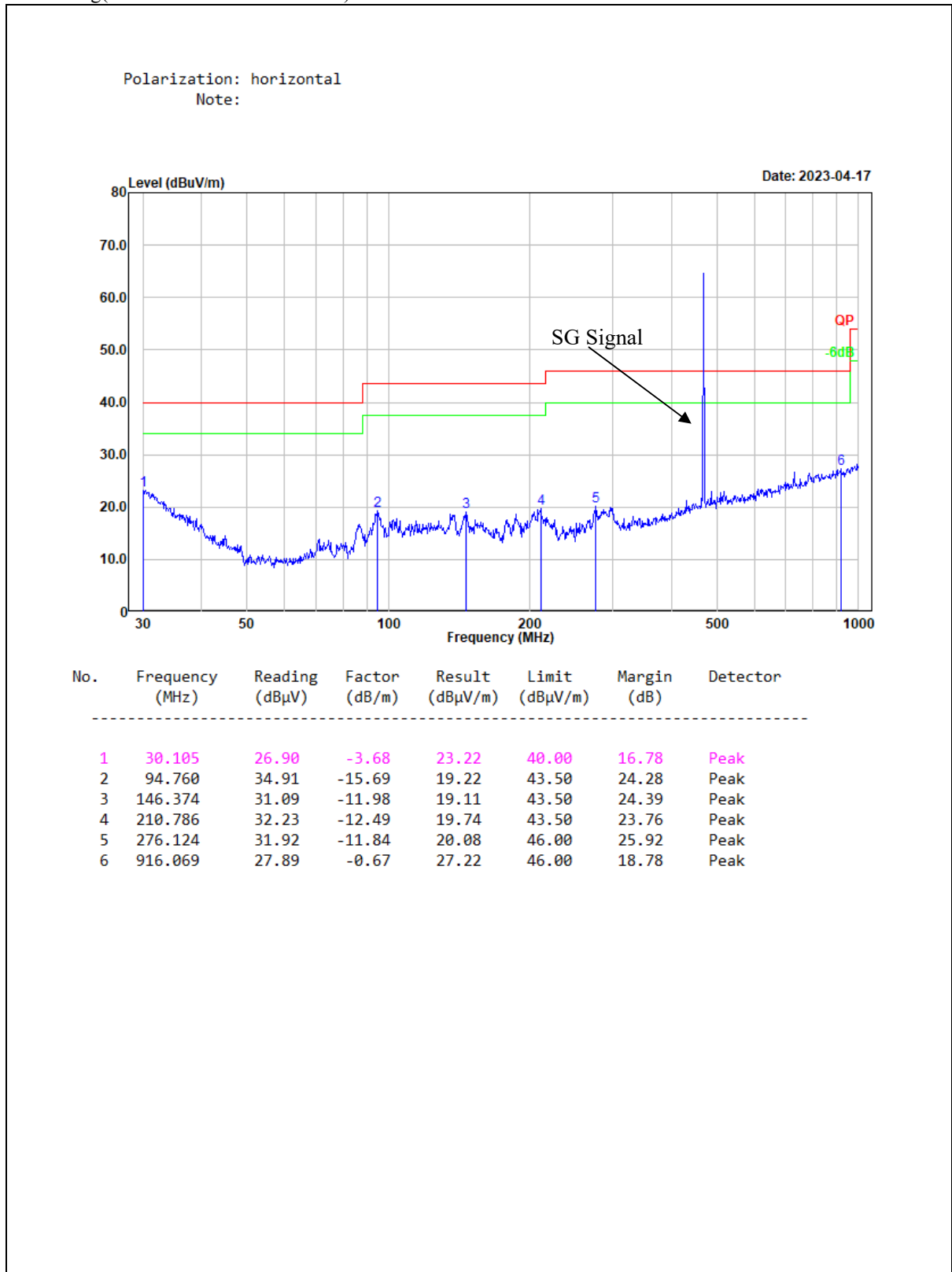
Test Equipment List and Details:

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).

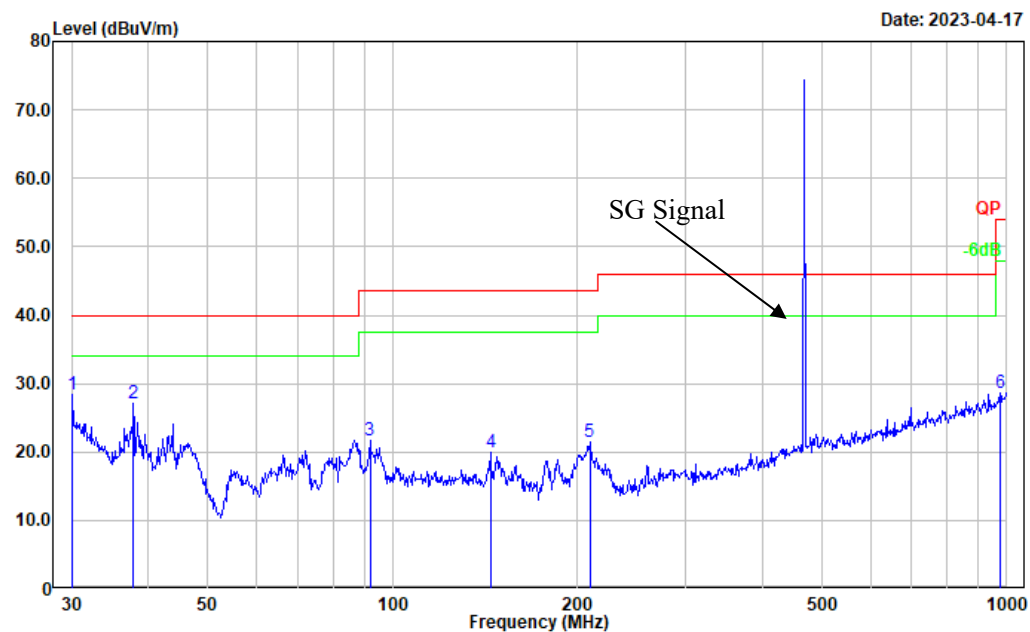
1) 30MHz-1GHz:

FRS Receiving(467.6375MHz was the worst):



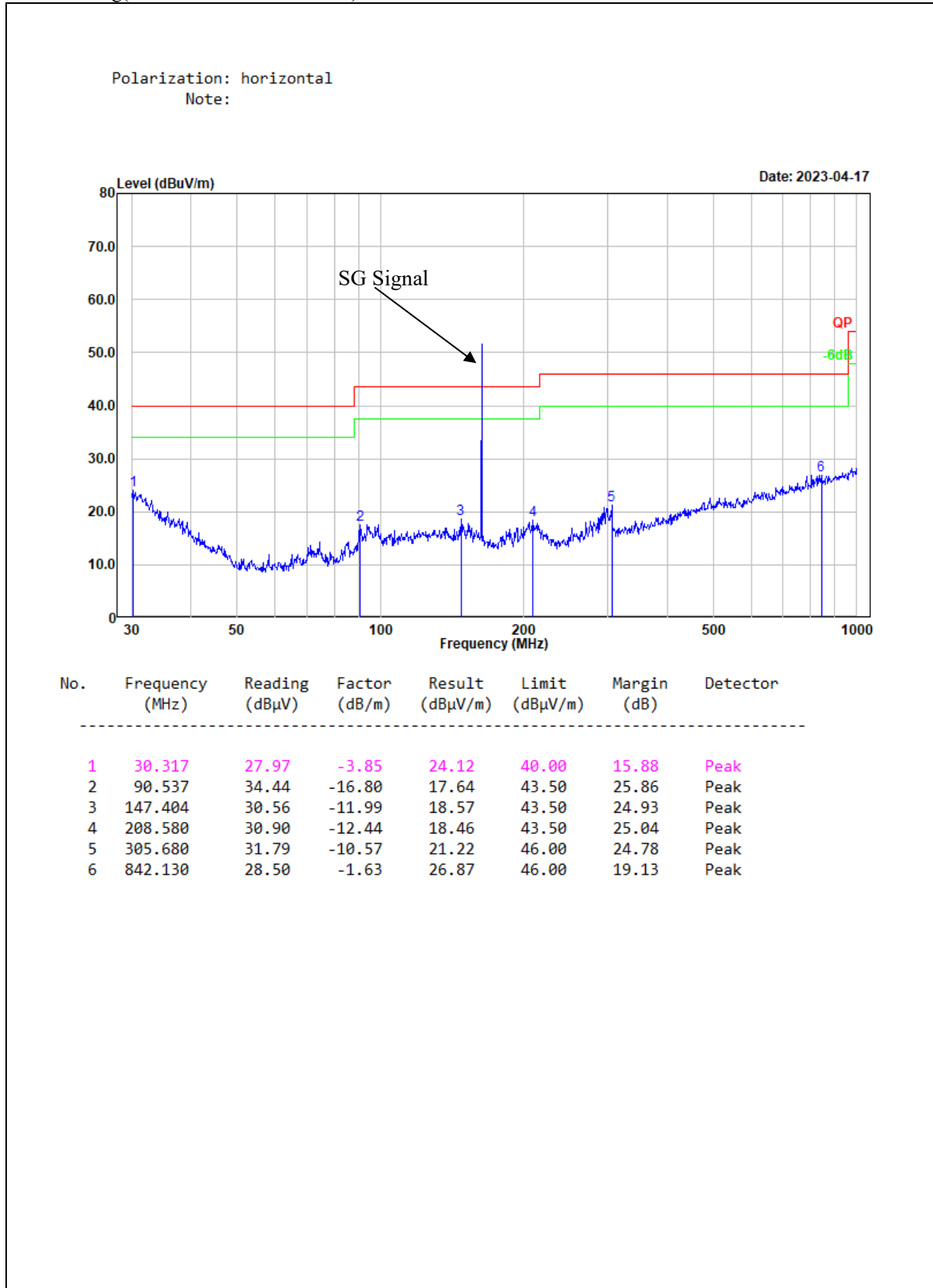
Polarization: vertical

Note:



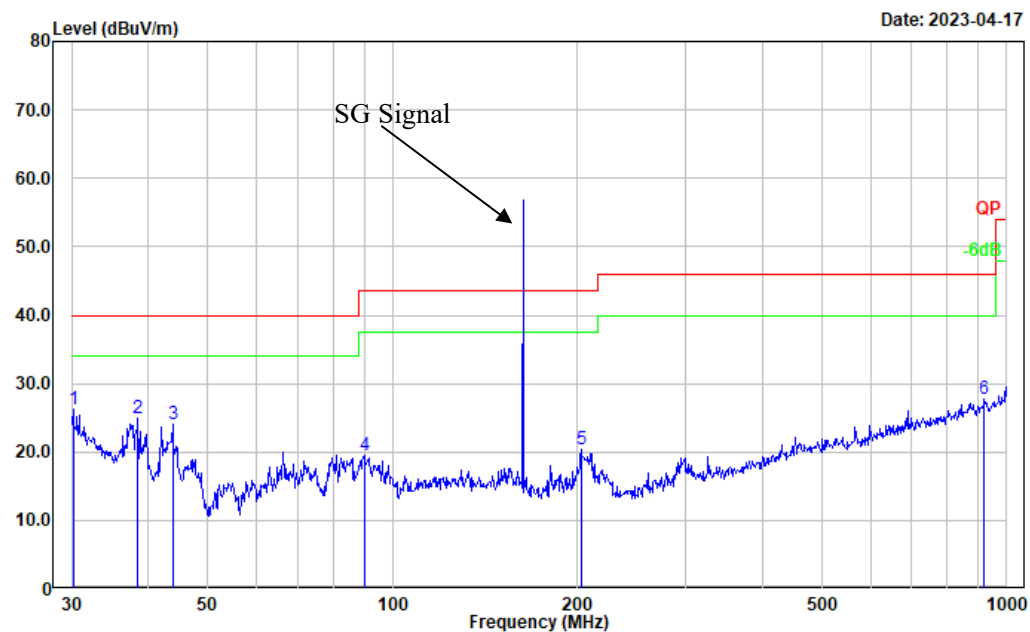
No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	30.000	31.99	-3.60	28.39	40.00	11.61	Peak
2	37.812	36.73	-9.59	27.14	40.00	12.86	Peak
3	91.816	38.15	-16.50	21.65	43.50	21.85	Peak
4	144.335	31.80	-11.96	19.84	43.50	23.66	Peak
5	209.313	33.98	-12.46	21.52	43.50	21.98	Peak
6	975.753	28.16	0.40	28.56	54.00	25.44	Peak

NOAA Receiving(163.275MHz was the worst):



Polarization: vertical

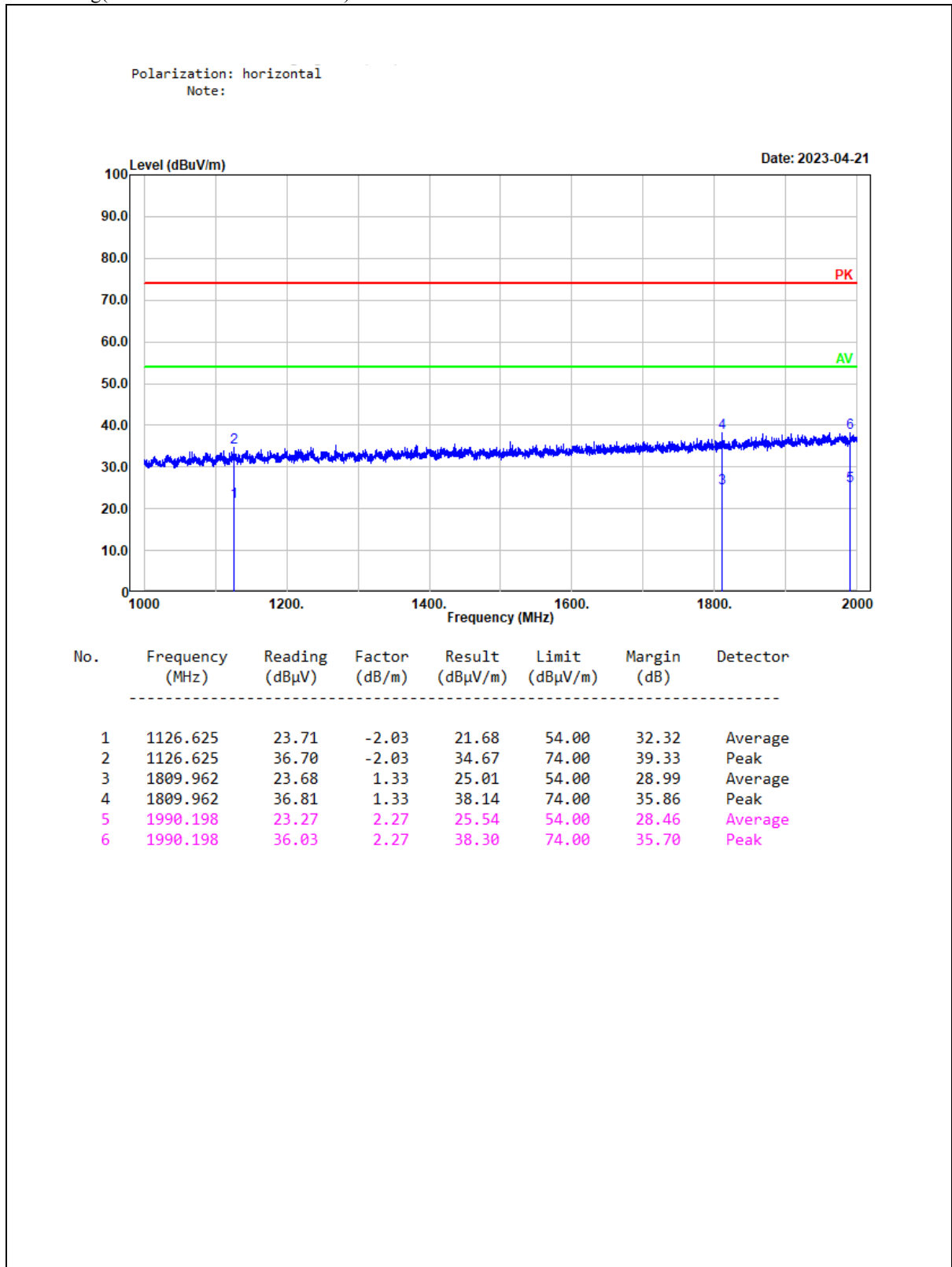
Note:



No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	30.211	30.02	-3.76	26.26	40.00	13.74	Peak
2	38.481	34.94	-10.11	24.83	40.00	15.17	Peak
3	43.812	37.53	-13.56	23.97	40.00	16.03	Peak
4	89.905	36.51	-16.93	19.58	43.50	23.92	Peak
5	202.810	32.62	-12.29	20.33	43.50	23.17	Peak
6	919.287	28.42	-0.69	27.73	46.00	18.27	Peak

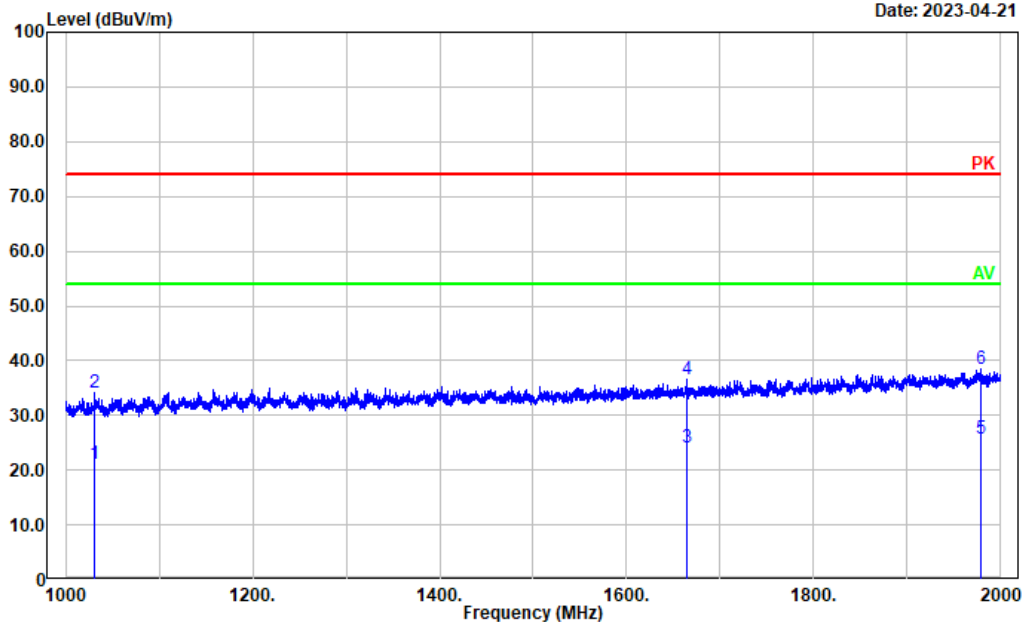
2) Above 1GHz:

FRS Receiving(462.6375MHz was the worst):



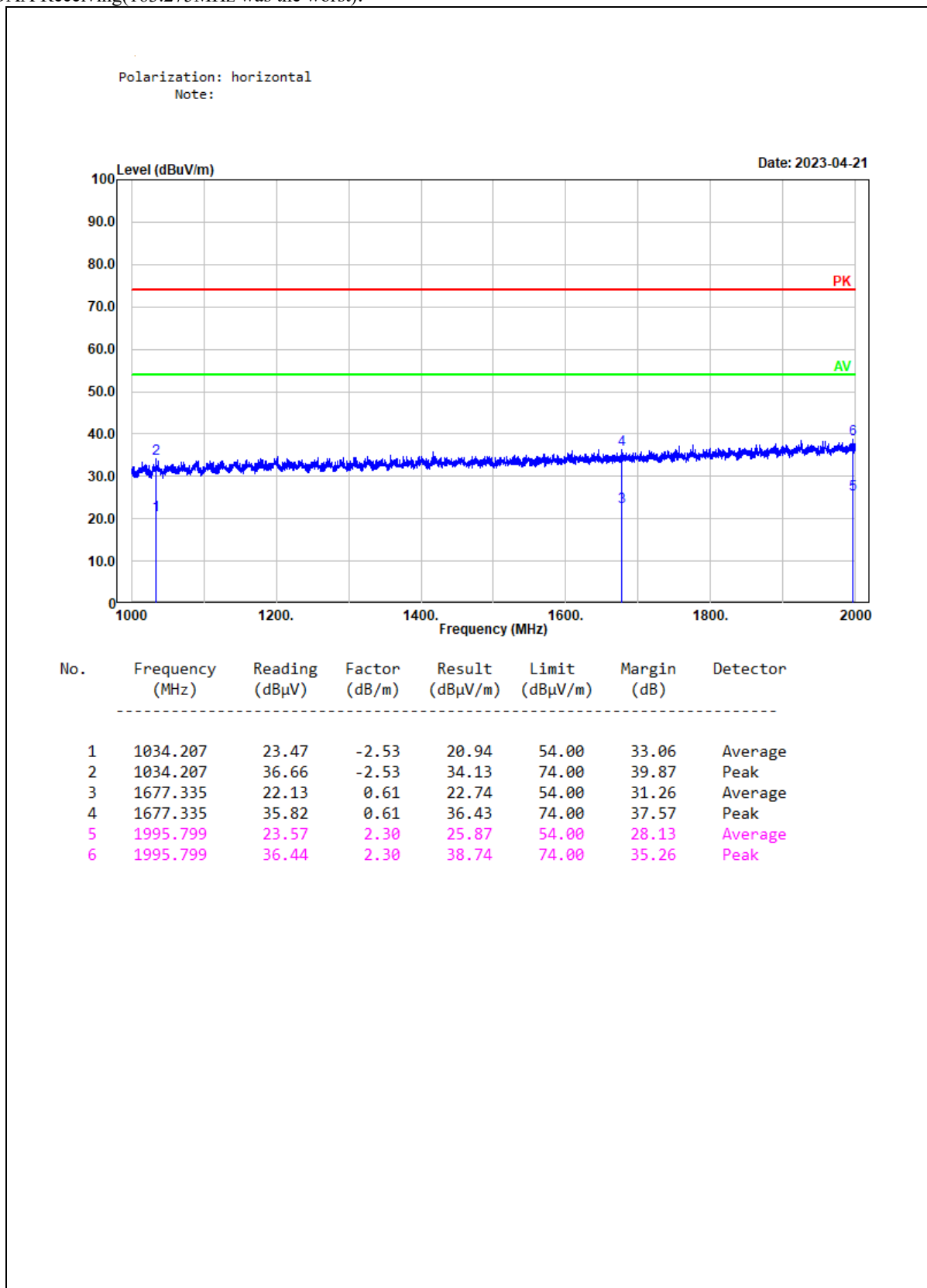
Polarization: vertical
Note:

Date: 2023-04-21



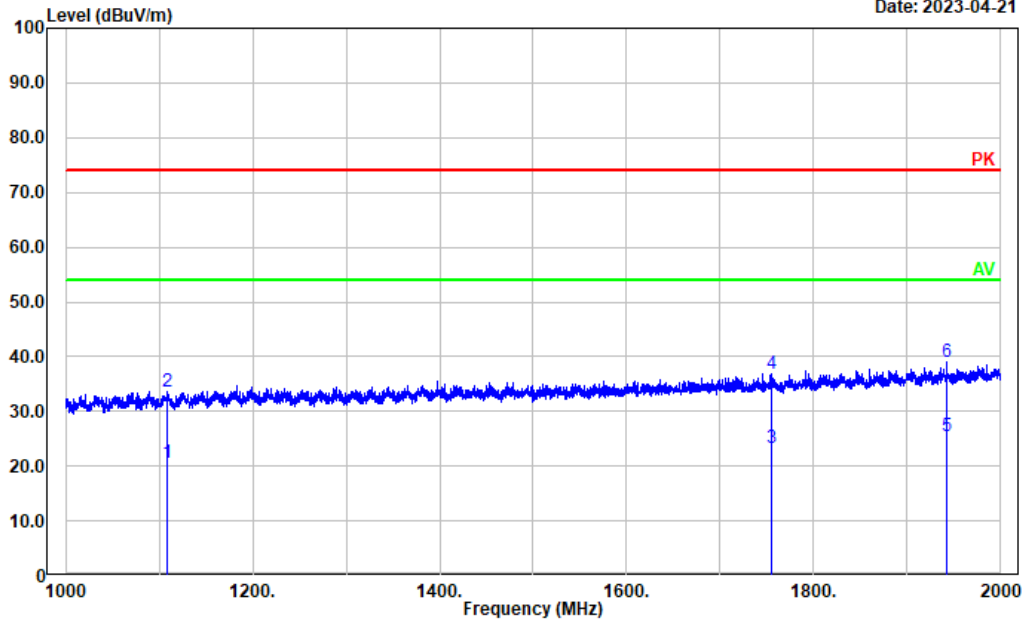
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	1031.406	23.78	-2.55	21.23	54.00	32.77	Average
2	1031.406	36.71	-2.55	34.16	74.00	39.84	Peak
3	1663.733	23.61	0.54	24.15	54.00	29.85	Average
4	1663.733	36.06	0.54	36.60	74.00	37.40	Peak
5	1977.996	23.44	2.22	25.66	54.00	28.34	Average
6	1977.996	36.18	2.22	38.40	74.00	35.60	Peak

NOAA Receiving(163.275MHz was the worst):



Polarization: vertical
Note:

Date: 2023-04-21



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	1108.622	22.68	-2.12	20.56	54.00	33.44	Average
2	1108.622	35.82	-2.12	33.70	74.00	40.30	Peak
3	1754.751	22.39	1.00	23.39	54.00	30.61	Average
4	1754.751	35.74	1.00	36.74	74.00	37.26	Peak
5	1942.188	23.48	2.05	25.53	54.00	28.47	Average
6	1942.188	36.91	2.05	38.96	74.00	35.04	Peak

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