



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



TEST REPORT

Applicant: Quanzhou Tesunho Electronics Co., Ltd

Address: 2#, 5F E-19# Phase 2 Xunmei, Quanzhou, Fujian, China

FCC ID: 2AKS9TD682

Product Name: DIGITAL PORTABLE RADIO

Model Number: TD-682

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: CR230310076-00A

Date Of Issue: 2023/6/13

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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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230310076-00A	Original Report	2023/6/13

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	DIGITAL PORTABLE RADIO
EUT Model:	TD-682
Highest Operation Frequency:	470MHz
Rated Input Voltage:	DC 7.4V from battery or Charged by Charger/ USB port
Serial Number:	22R4 1
EUT Received Date:	2023/3/7
EUT Received Status:	Good

Accessory Information:

Accessory Description	Manufacturer	Model
Adapter	Tesunho	ZM-01A1210
Charger	Unknown	TC-12A

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:Charging by Charger& Receiving (Test frequency: 400.0125MHz, 450MHz, 469.9875MHz) M2: Charging by USB & Receiving (Test frequency: 400.0125MHz, 450MHz, 469.9875MHz)
Equipment Modifications:	No
EUT Exercise Software:	No

1.2.2 Support Equipment List and Details

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

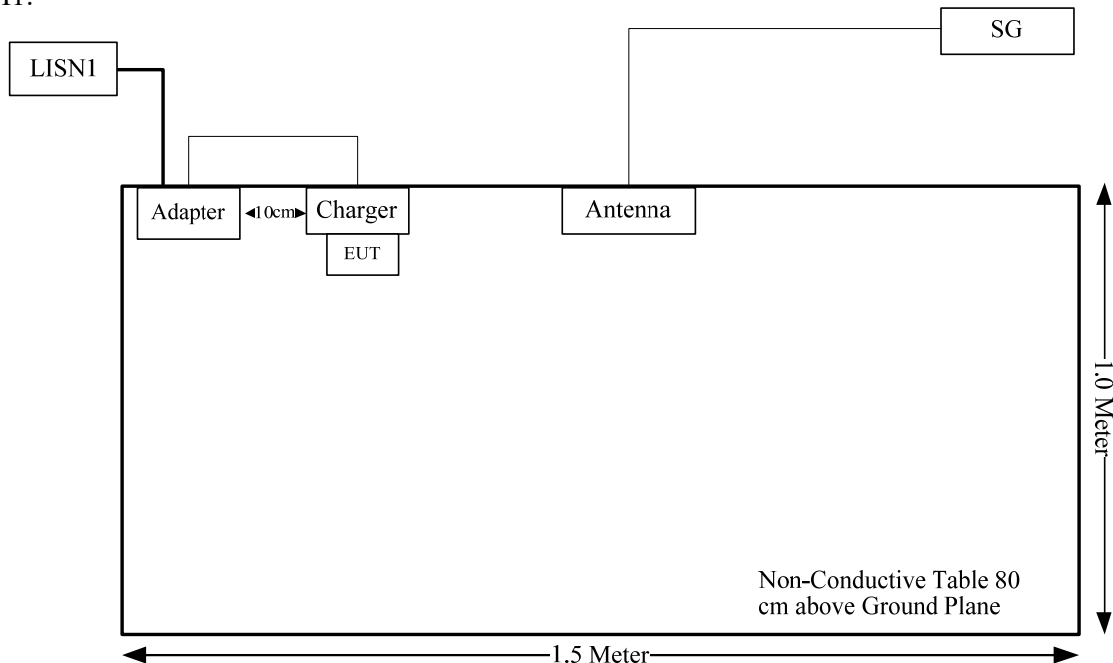
1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Adapter cable	No	No	1	Adapter	Charger
USB Cable	No	No	1	Adapter	EUT

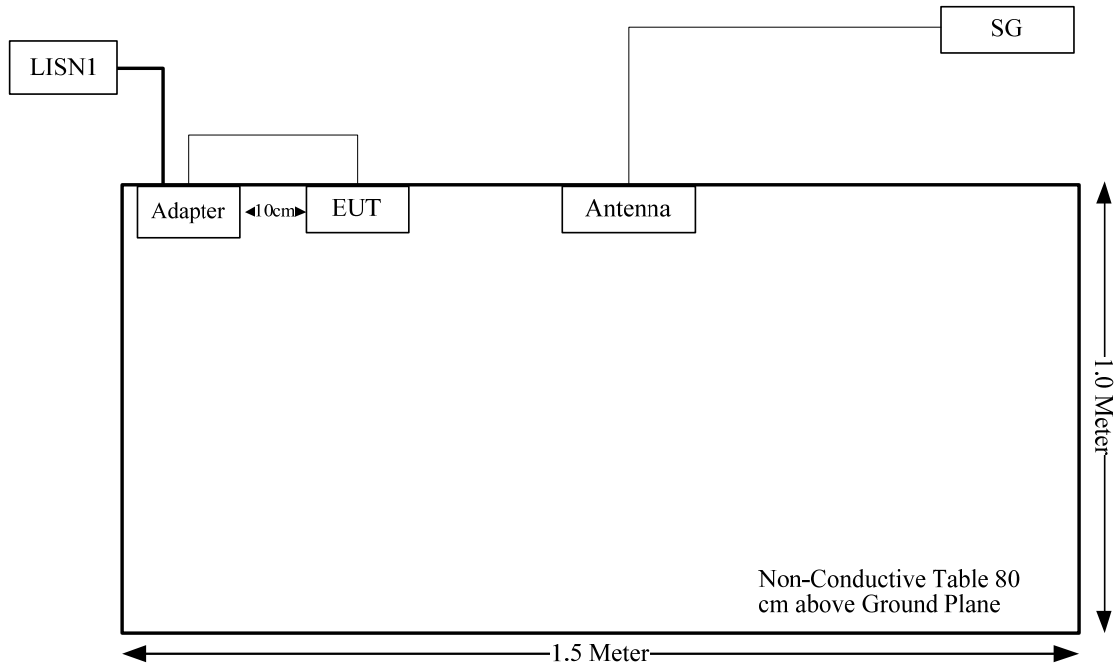
1.2.4 Block Diagram of Test Setup

AC line conducted emissions::

M1:

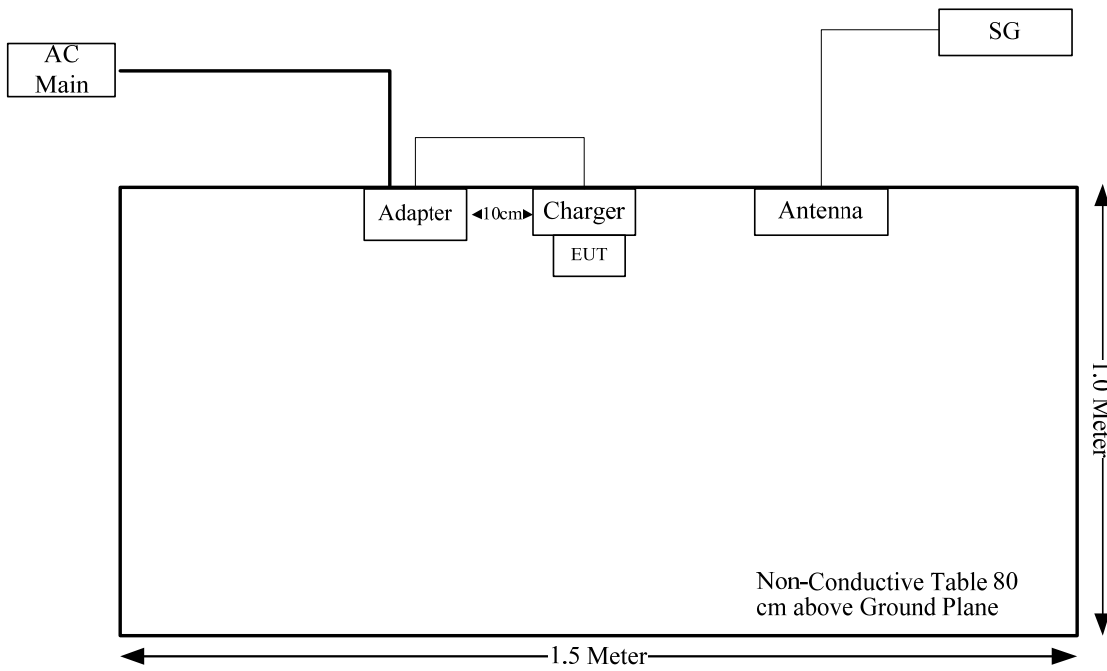


M2:

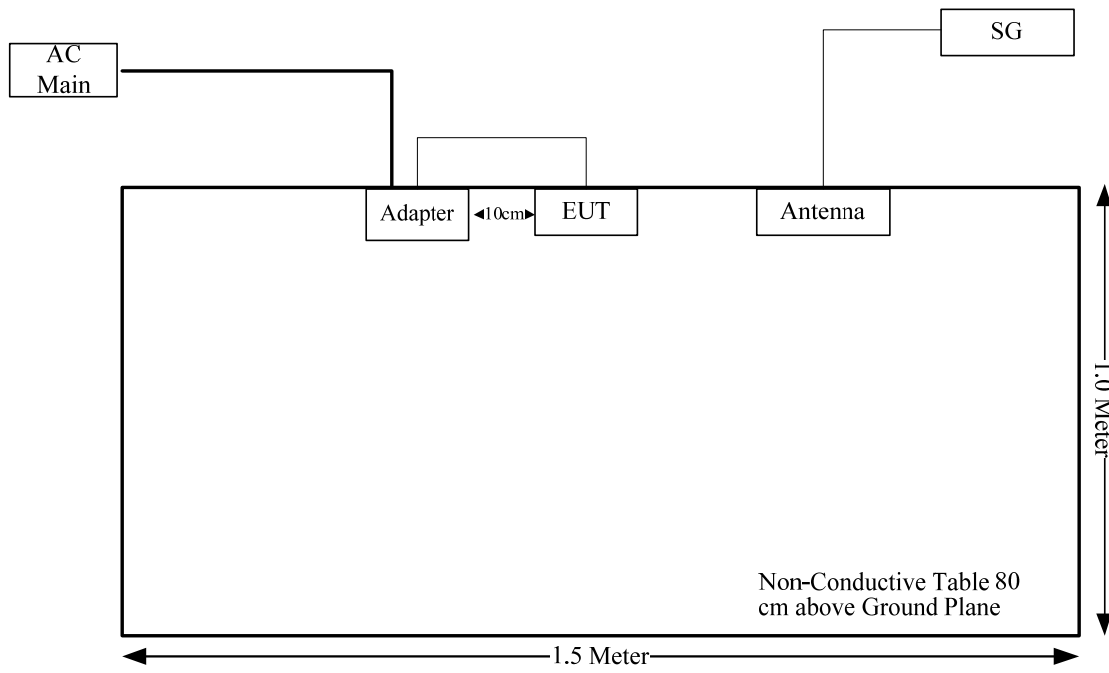


Spurious Emissions:

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	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5\%$
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)
Unwanted Emissions, Conducted	0.61 dB

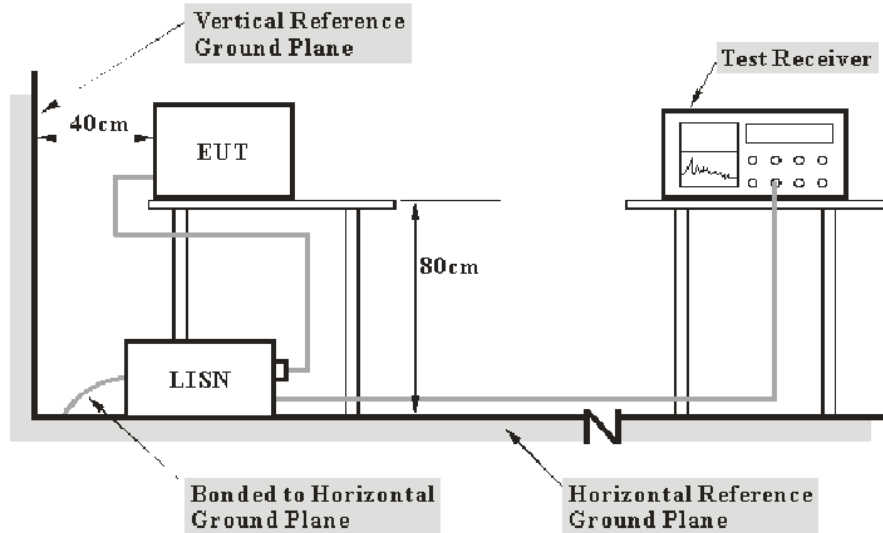
2. SUMMARY OF TEST RESULTS

Standard(s) Section	Description of Test	Result
§15.107	Conducted emissions	Compliant
§15.109	Radiated emissions	Compliant
§15.111	Antenna power conduction limits for receivers	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

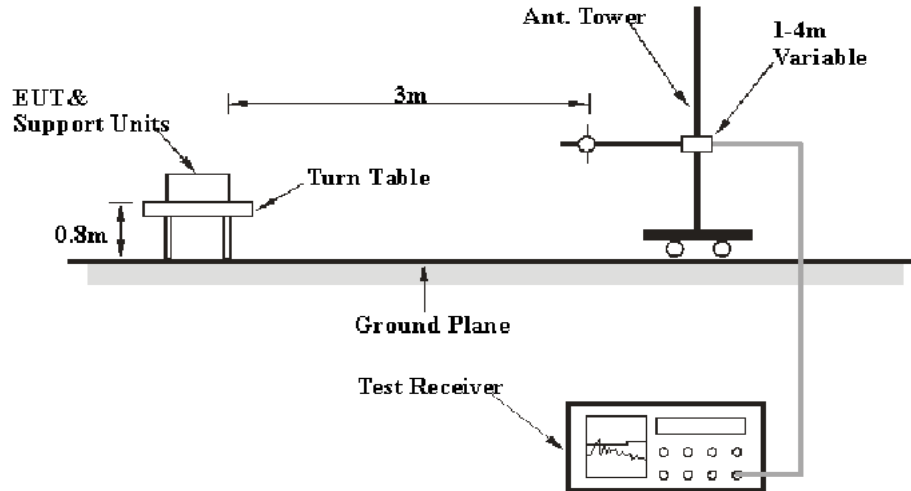
The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

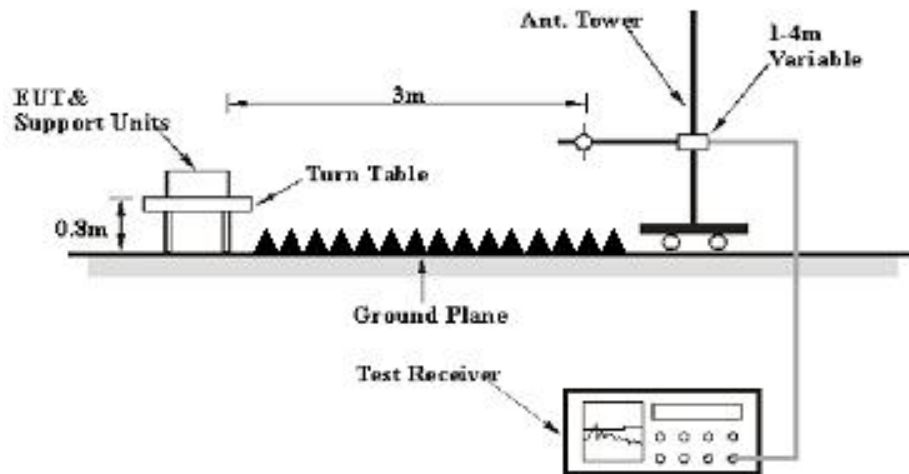
3.2 Radiation Spurious Emissions

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 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

3.3 Antenna Power Conduction Limits for Receivers

3.3.1 Applicable Standard

FCC§15.111.

(a) In addition to the radiated emission limits, receivers that operate (tune) in the frequency range 30 to 960 MHz and CB receivers that provide terminals for the connection of an external receiving antenna may be tested to demonstrate compliance with the provisions of § 15.109 with the antenna terminals shielded and terminated with a resistive termination equal to the impedance specified for the antenna, provided these receivers also comply with the following: With the receiver antenna terminal connected to a resistive termination equal to the impedance specified or employed for the antenna, the power at the antenna terminal at any frequency within the range of measurements specified in § 15.33 shall not exceed 2.0 nanowatts.

Test Procedure

EUT antenna port connected to a spectrum analyzer, the traces were recorded as shown on the data pages.

4. TEST DATA AND RESULTS

4.1 AC Line Conducted Emissions

Serial Number:	22R4_1	Test Date:	2023/03/15
Test Site:	CE	Test Mode:	M1/M2
Tester:	Bob	Test Result:	Pass

Environmental Conditions:

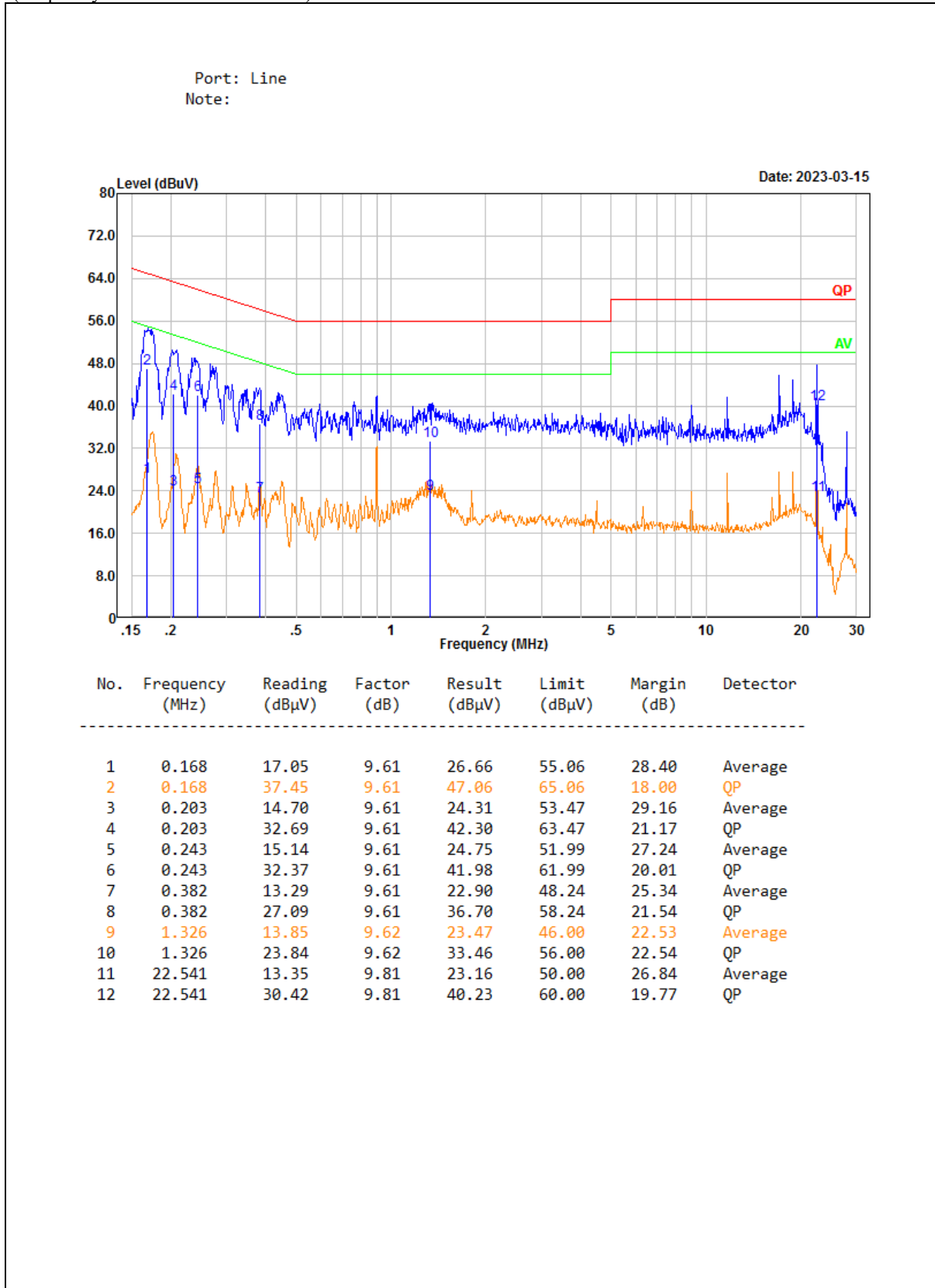
Temperature: (°C)	25	Relative Humidity: (%)	60	ATM Pressure: (kPa)	102
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Test Equipment List and Details:

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

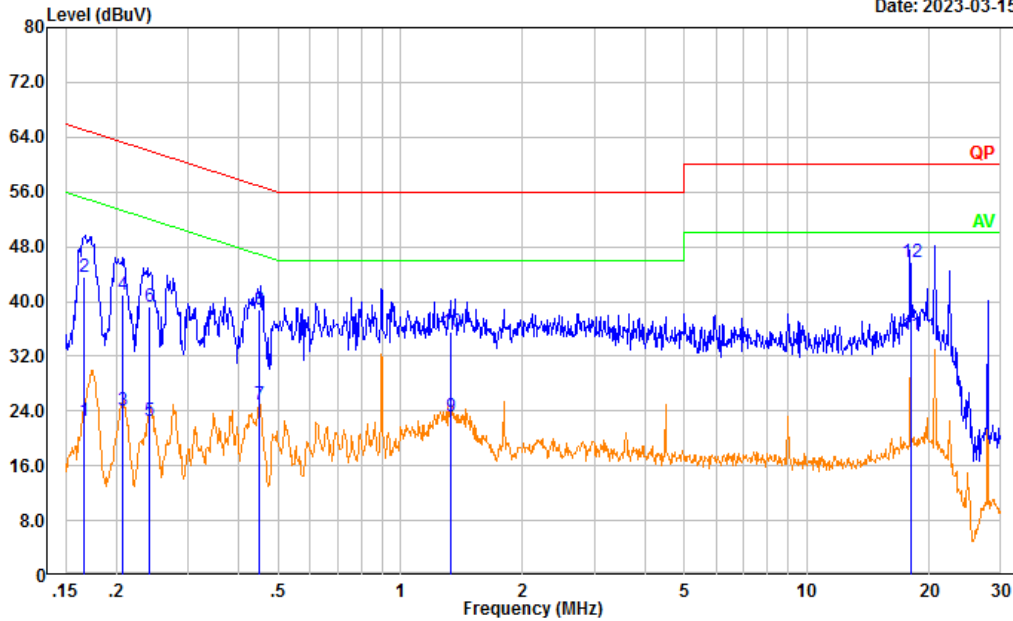
* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

M1(frequency: 450MHz was the worst):



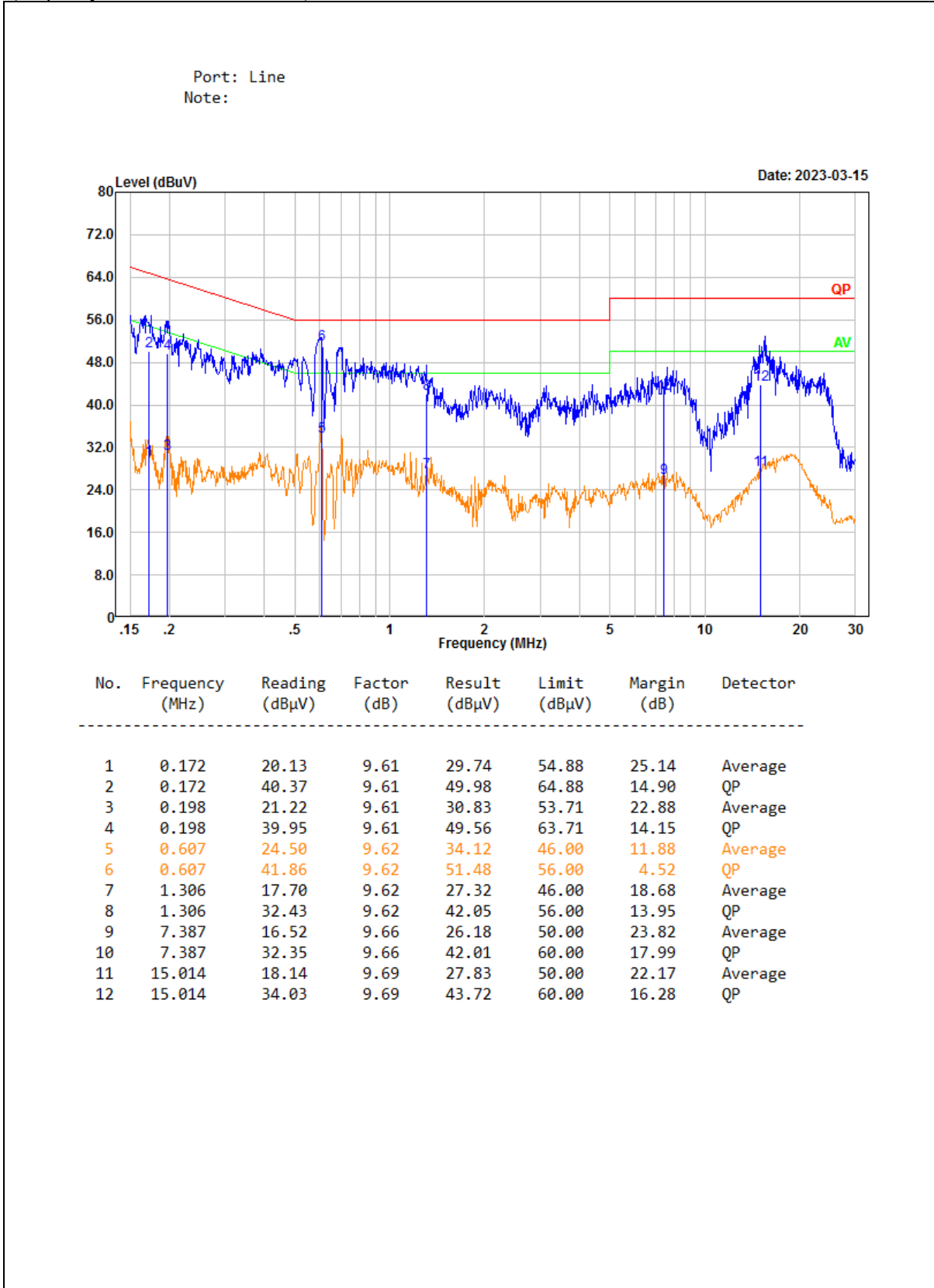
Port: neutral
Note:

Date: 2023-03-15

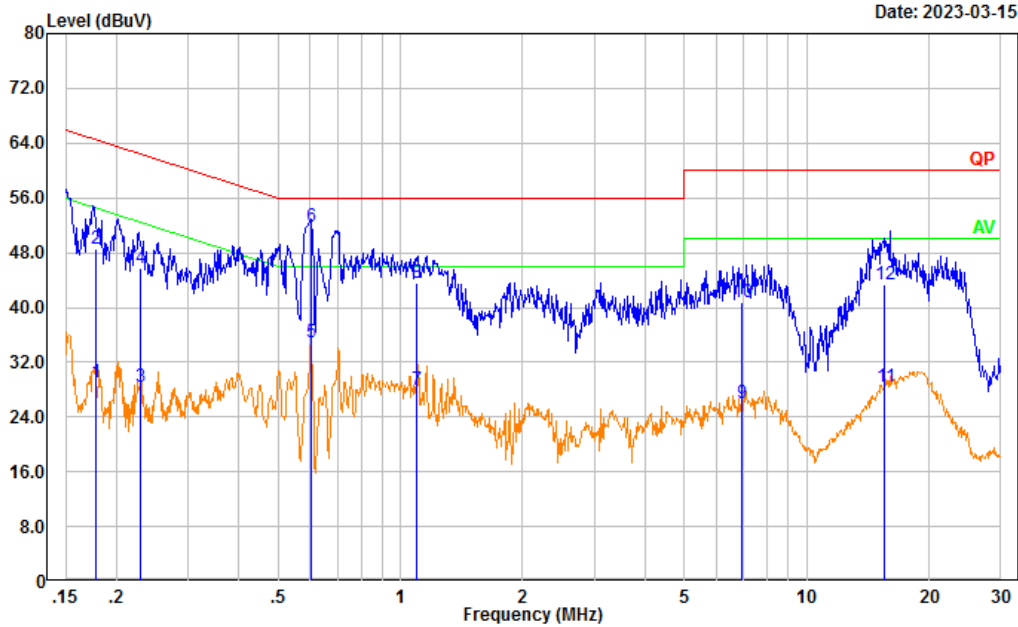


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.166	13.04	9.61	22.65	55.14	32.49	Average
2	0.166	33.99	9.61	43.60	65.14	21.54	QP
3	0.207	14.37	9.61	23.98	53.33	29.35	Average
4	0.207	31.32	9.61	40.93	63.33	22.40	QP
5	0.240	12.98	9.61	22.59	52.09	29.50	Average
6	0.240	29.58	9.61	39.19	62.09	22.90	QP
7	0.450	15.39	9.61	25.00	46.88	21.88	Average
8	0.450	29.20	9.61	38.81	56.88	18.07	QP
9	1.332	13.49	9.62	23.11	46.00	22.89	Average
10	1.332	26.02	9.62	35.64	56.00	20.36	QP
11	18.015	25.43	9.69	35.12	50.00	14.88	Average
12	18.015	36.10	9.69	45.79	60.00	14.21	QP

M2(frequency: 450MHz was the worst):



Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.178	19.48	9.61	29.09	54.56	25.47	Average
2	0.178	38.93	9.61	48.54	64.56	16.02	QP
3	0.229	18.79	9.61	28.40	52.48	24.08	Average
4	0.229	36.18	9.61	45.79	62.48	16.69	QP
5	0.605	25.19	9.62	34.81	46.00	11.19	Average
6	0.605	42.09	9.62	51.71	56.00	4.29	QP
7	1.095	18.32	9.62	27.94	46.00	18.06	Average
8	1.095	33.86	9.62	43.48	56.00	12.52	QP
9	6.917	16.46	9.66	26.12	50.00	23.88	Average
10	6.917	31.08	9.66	40.74	60.00	19.26	QP
11	15.553	18.65	9.69	28.34	50.00	21.66	Average
12	15.553	33.61	9.69	43.30	60.00	16.70	QP

4.2 Radiation Spurious Emissions

Serial Number:	22R4_1	Test Date:	2023/03/17 ~2023/04/09
Test Site:	966-1, 966-2	Test Mode:	M1/M2
Tester:	Carl Xue, Tao	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25~25.9	Relative Humidity: (%)	55~60	ATM Pressure: (kPa)	101.1~102
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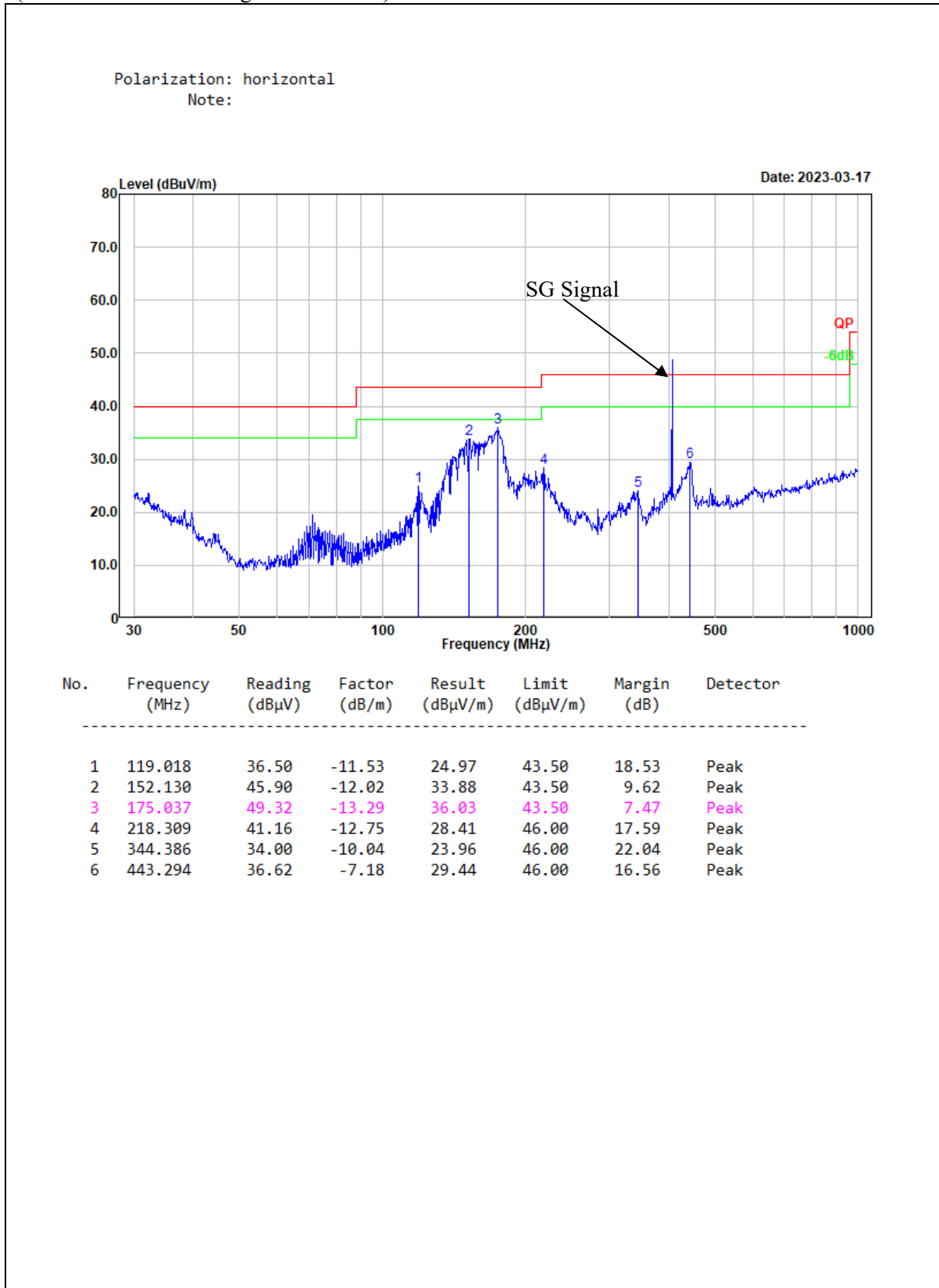
Test Equipment List and Details:

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
Audix	Test Software	E3	201021 (V9)	N/A	N/A
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

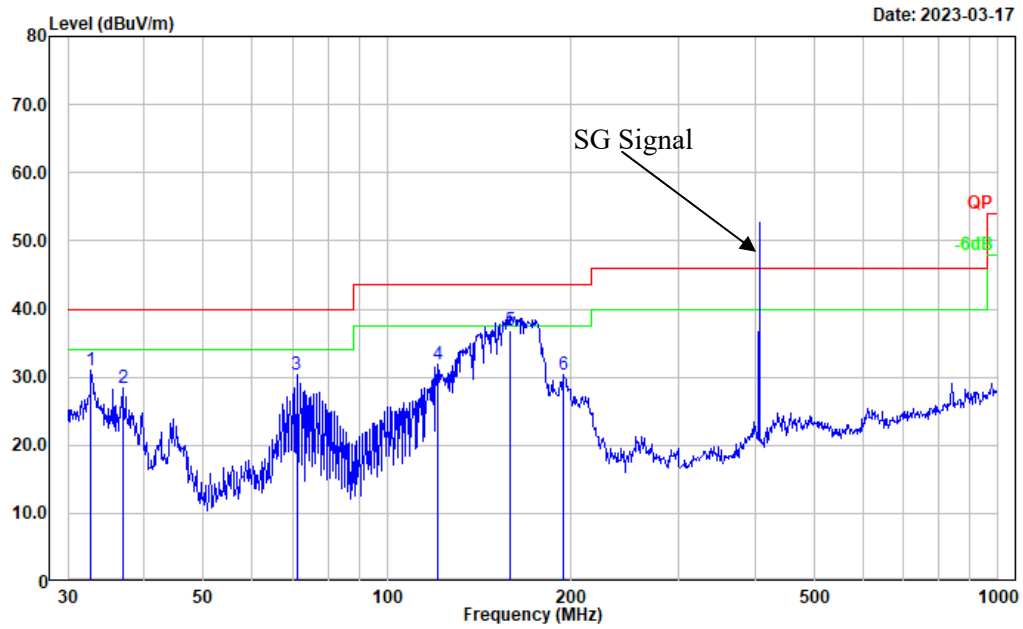
* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:

1) 30MHz-1GHz
 M1(400.0125 MHz receiving was the worst)

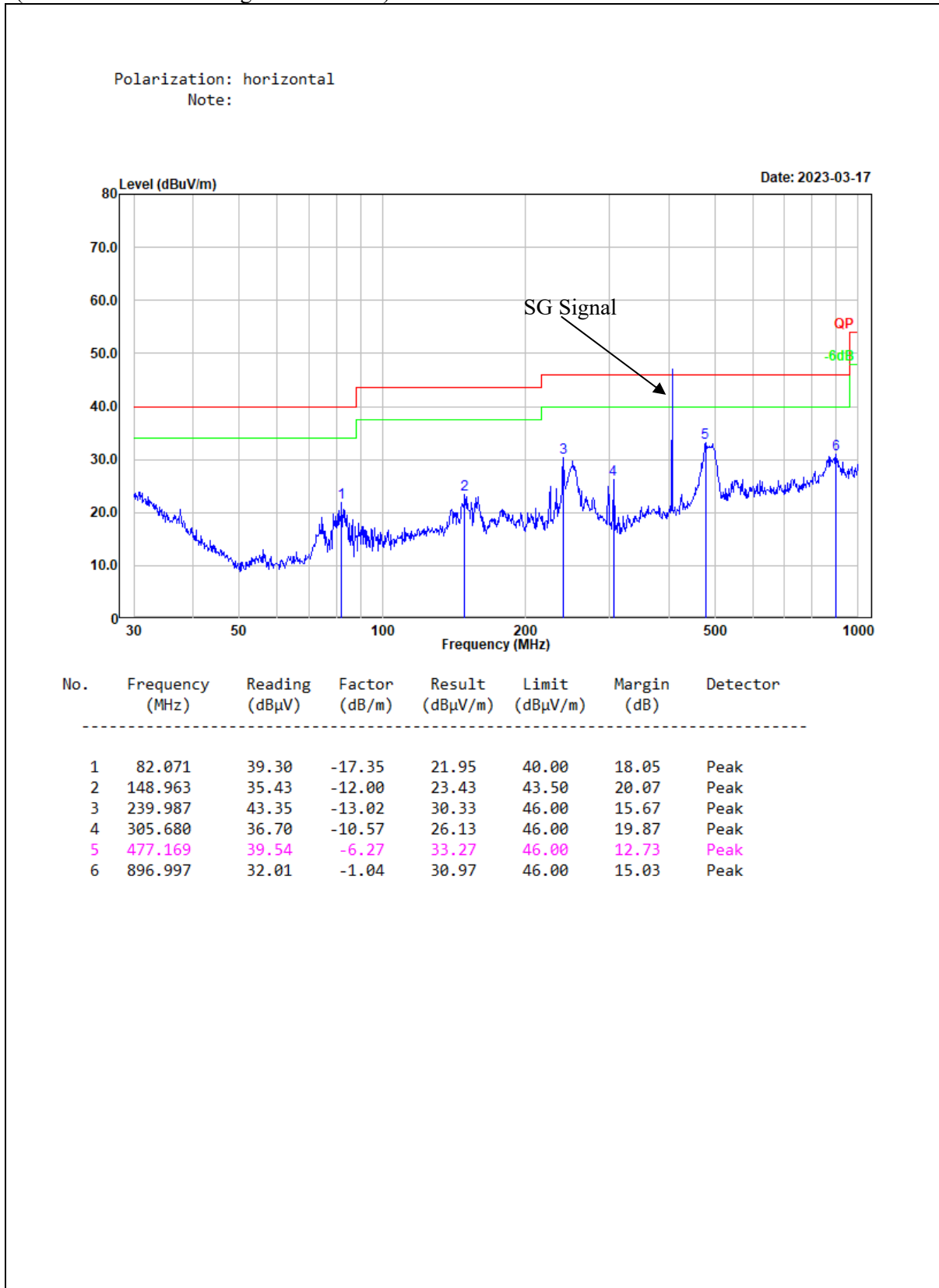


Polarization: vertical
Note:

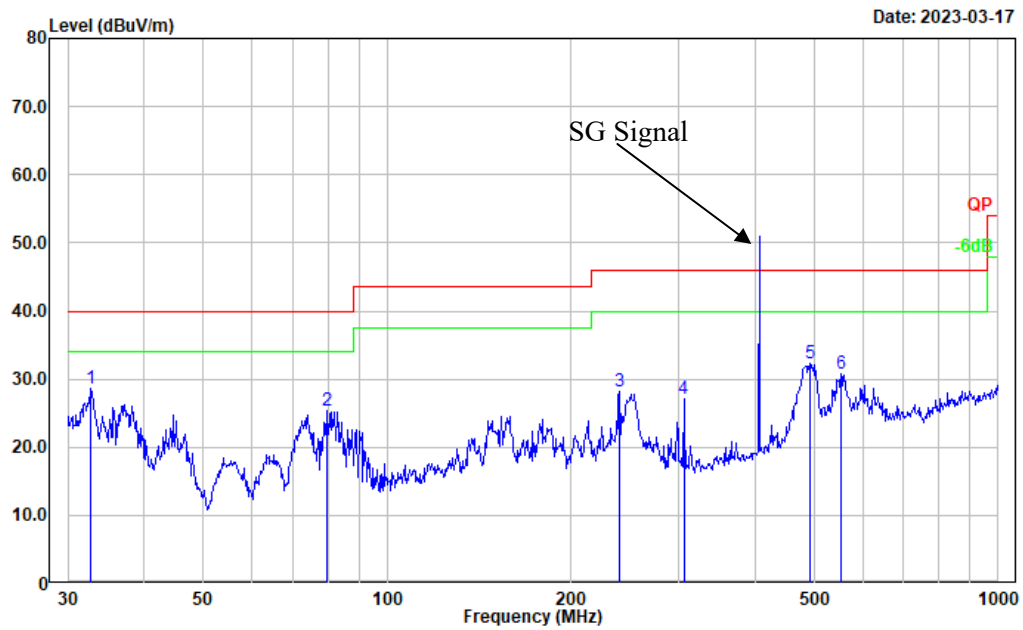


No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	32.749	36.75	-5.71	31.04	40.00	8.96	Peak
2	36.895	37.38	-8.93	28.45	40.00	11.55	Peak
3	71.080	47.02	-16.59	30.43	40.00	9.57	Peak
4	120.699	43.35	-11.44	31.91	43.50	11.59	Peak
5	158.738	48.91	-12.05	36.86	43.50	6.64	QP
6	193.773	43.22	-12.96	30.26	43.50	13.24	Peak

M2(400.0125 MHz receiving was the worst)

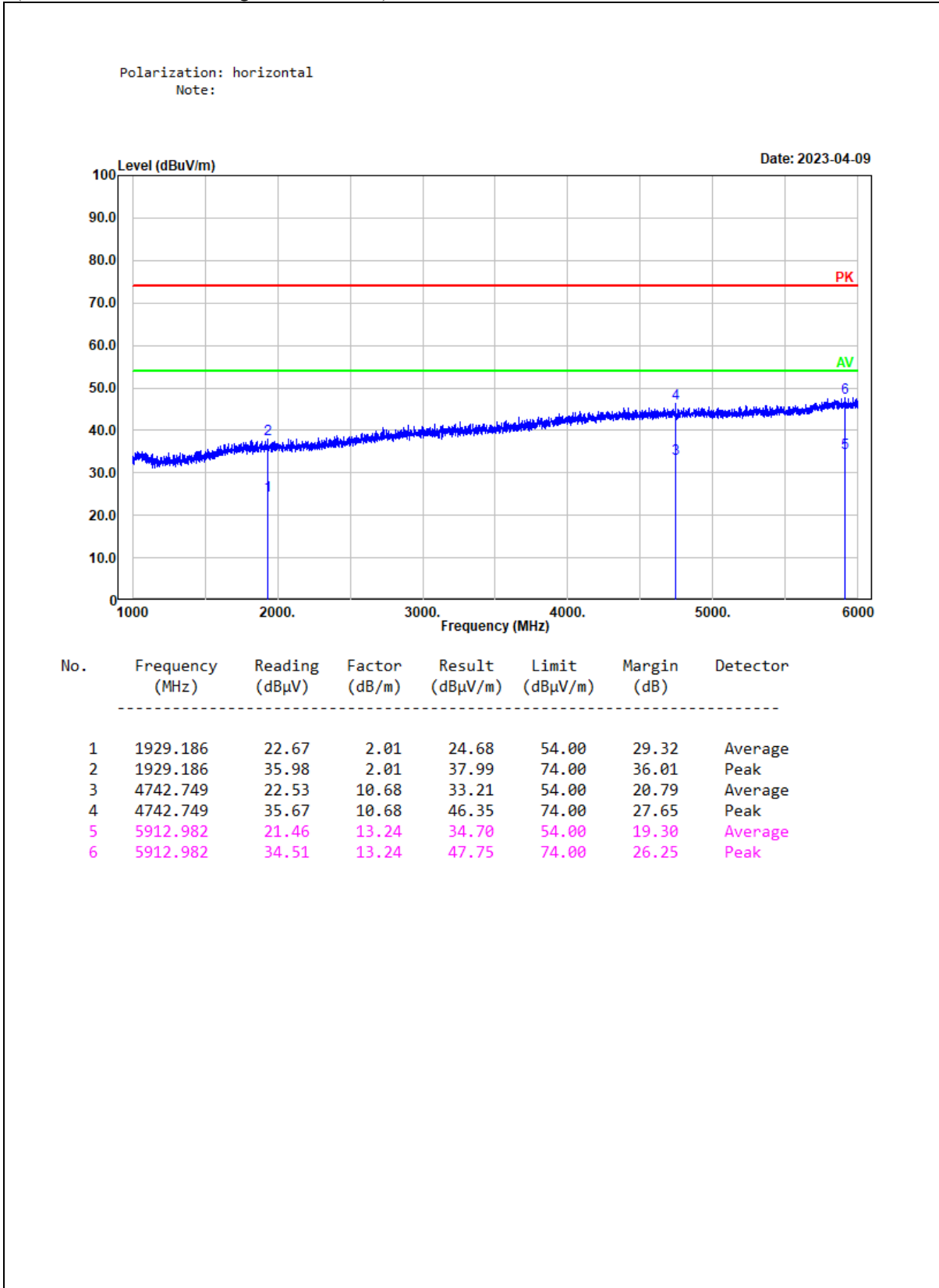


Polarization: vertical
 Note:



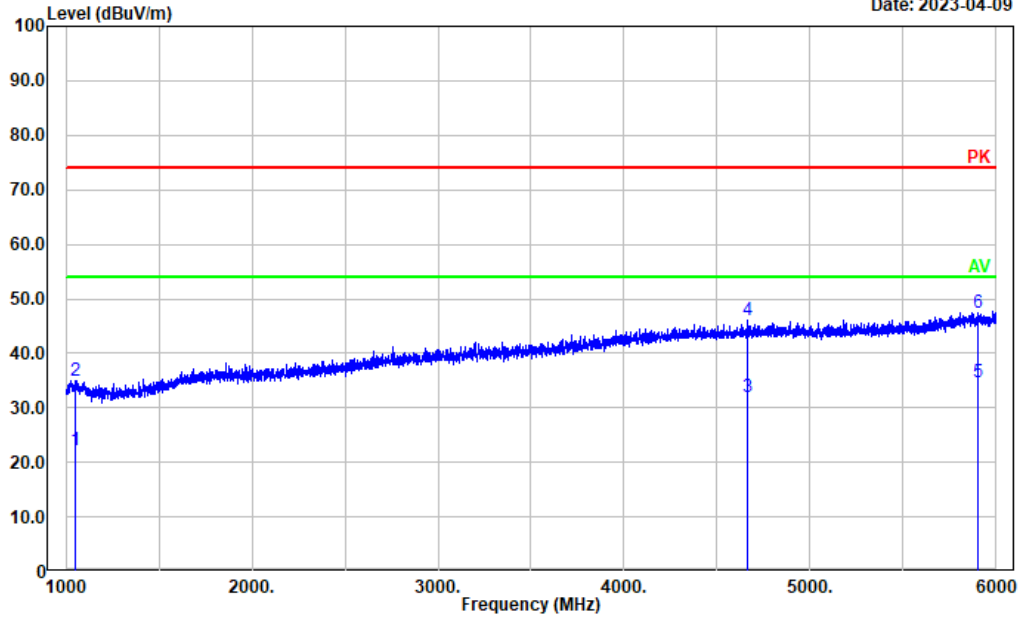
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	32.749	34.24	-5.71	28.53	40.00	11.47	Peak
2	79.800	42.87	-17.44	25.43	40.00	14.57	Peak
3	239.987	41.25	-13.02	28.23	46.00	17.77	Peak
4	305.680	37.63	-10.57	27.06	46.00	18.94	Peak
5	490.745	38.41	-6.20	32.21	46.00	13.79	Peak
6	552.883	36.50	-5.71	30.79	46.00	15.21	Peak

2) Above 1GHz
 M1(400.0125 MHz receiving was the worst)



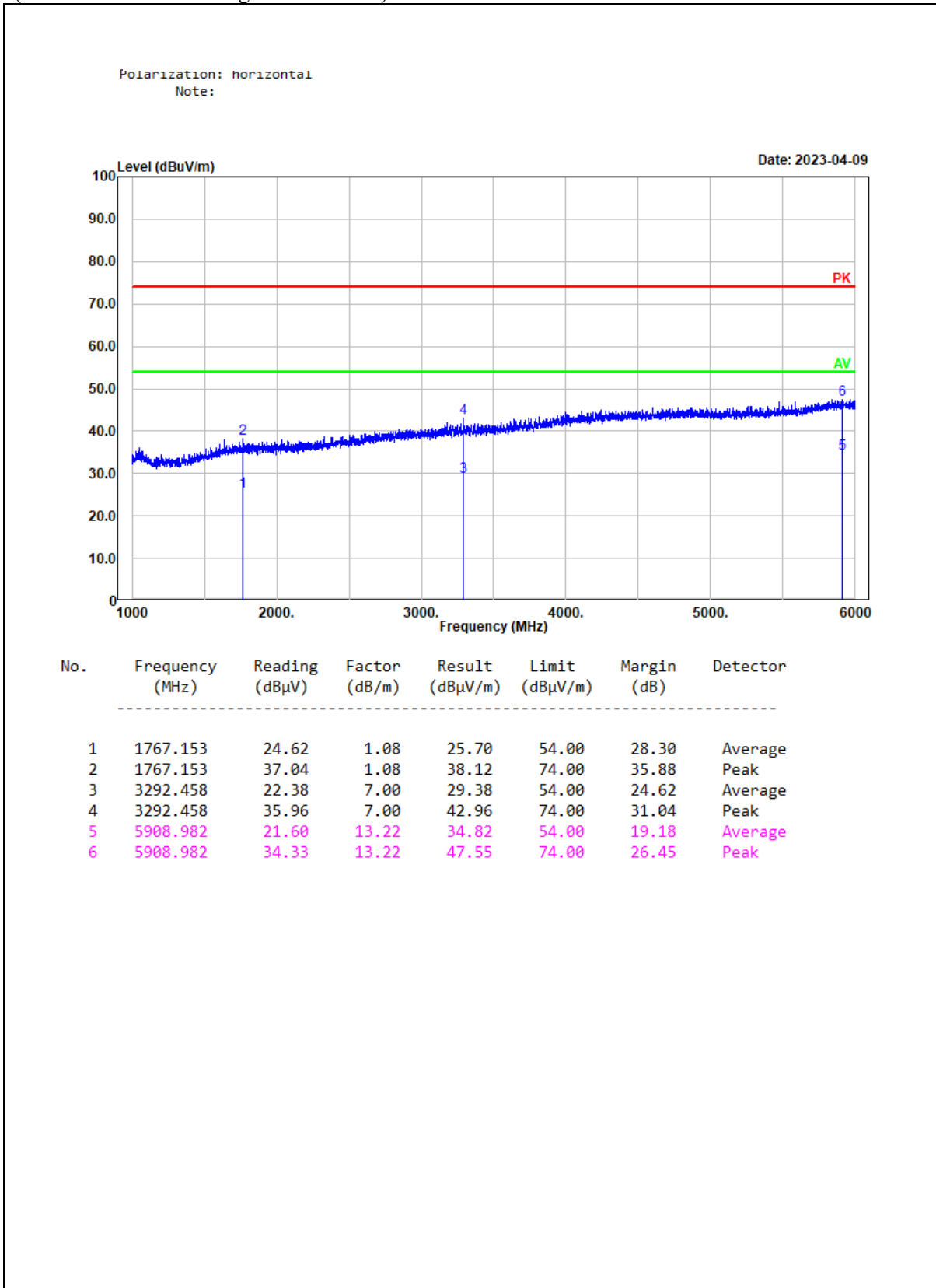
Polarization: vertical
Note:

Date: 2023-04-09



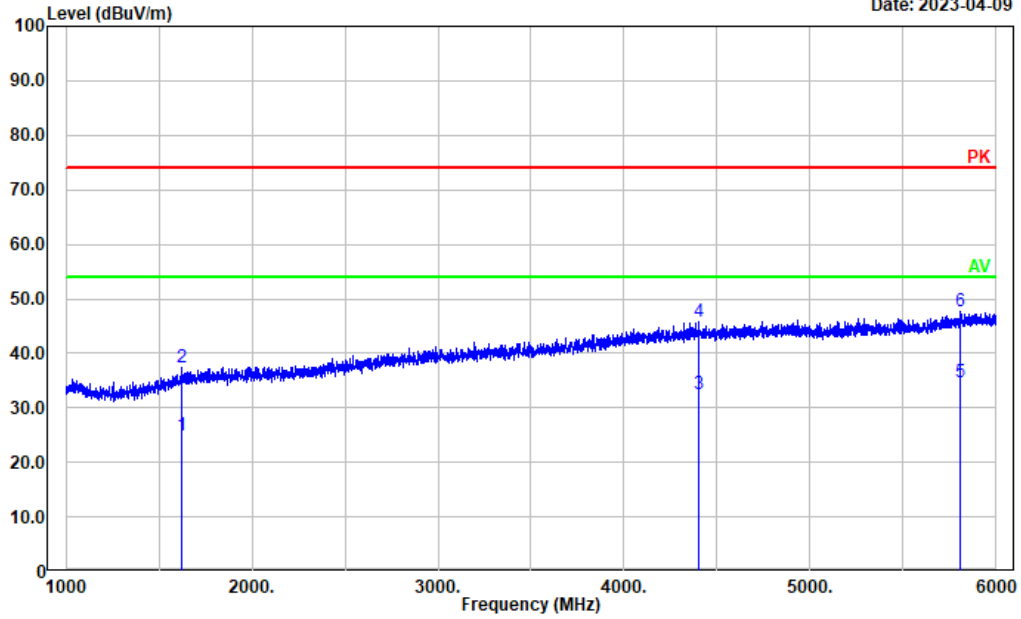
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	1054.011	24.57	-2.42	22.15	54.00	31.85	Average
2	1054.011	37.37	-2.42	34.95	74.00	39.05	Peak
3	4662.732	21.36	10.49	31.85	54.00	22.15	Average
4	4662.732	35.46	10.49	45.95	74.00	28.05	Peak
5	5901.980	21.58	13.24	34.82	54.00	19.18	Average
6	5901.980	34.11	13.24	47.35	74.00	26.65	Peak

M2(400.0125 MHz receiving was the worst)



Polarization: vertical
Note:

Date: 2023-04-09



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	1623.125	24.68	0.34	25.02	54.00	28.98	Average
2	1623.125	37.04	0.34	37.38	74.00	36.62	Peak
3	4399.680	22.57	9.84	32.41	54.00	21.59	Average
4	4399.680	35.95	9.84	45.79	74.00	28.21	Peak
5	5802.960	21.54	13.02	34.56	54.00	19.44	Average
6	5802.960	34.70	13.02	47.72	74.00	26.28	Peak

4.3 Antenna Power Conduction Limits for Receivers

Serial Number:	22R4_1	Test Date:	2023/5/22~2023/6/13
Test Site:	RF	Test Mode:	Receiving
Tester:	Morpheus Shi	Test Result:	Pass

Environmental Conditions:

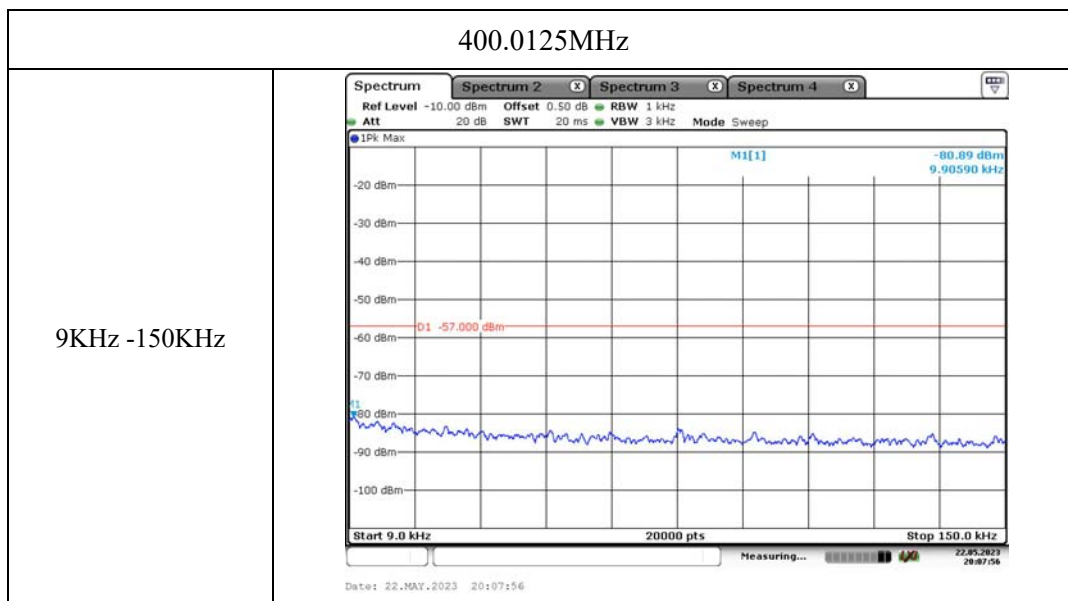
Temperature: (°C)	26.9~27.1	Relative Humidity: (%)	62.0~63.0	ATM Pressure: (kPa)	100.2~100.3
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Test Equipment List and Details:

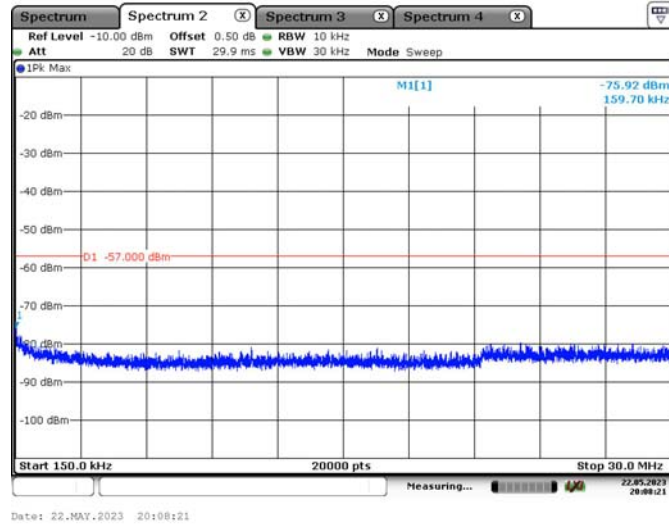
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2022/7/15	2023/7/14
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
Agilent	Signal Generator	E8247C	MY43321352	2022/11/18	2023/11/17
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	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).

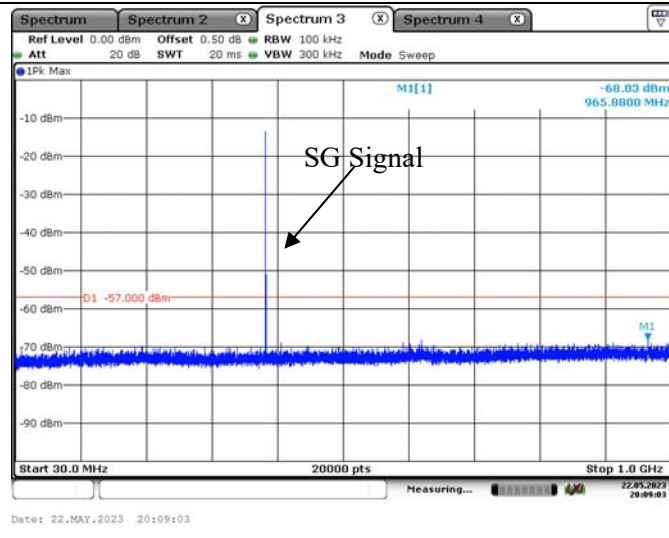
M1:



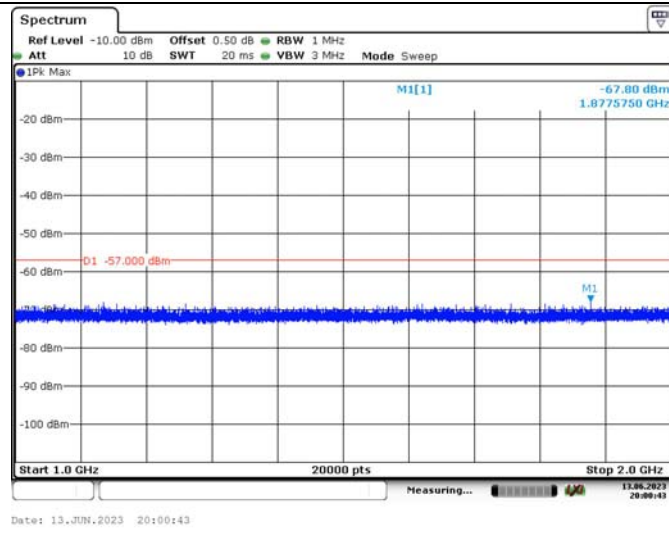
150KHz -30MHz



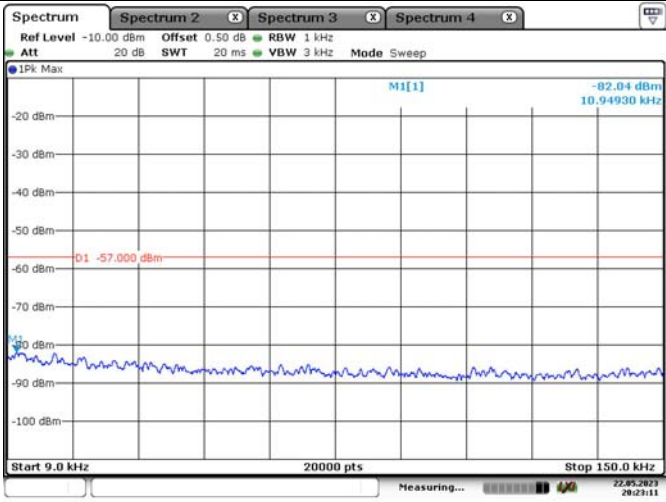
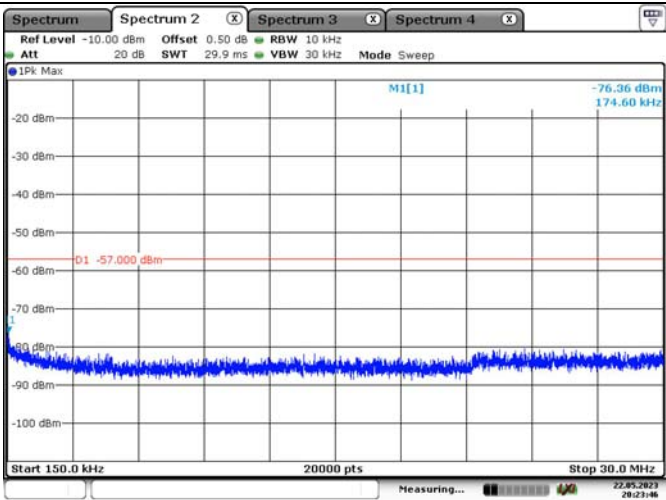
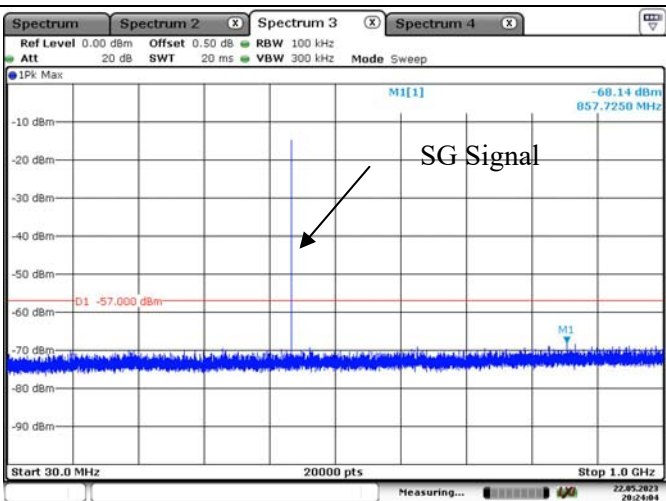
30MHz -1GHz



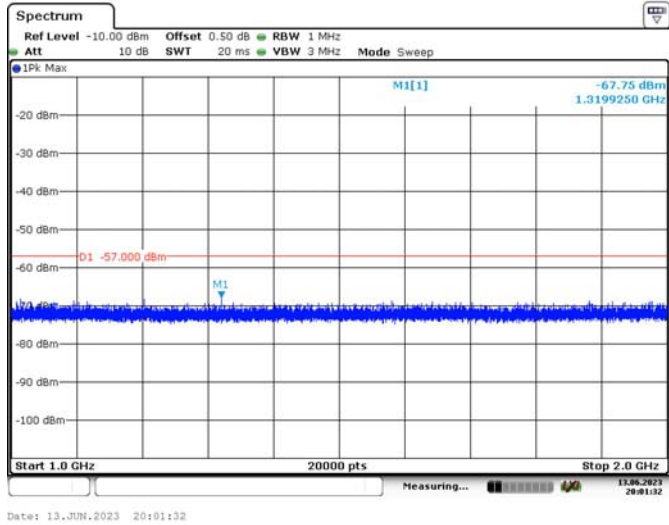
1GHz -2GHz



450MHz

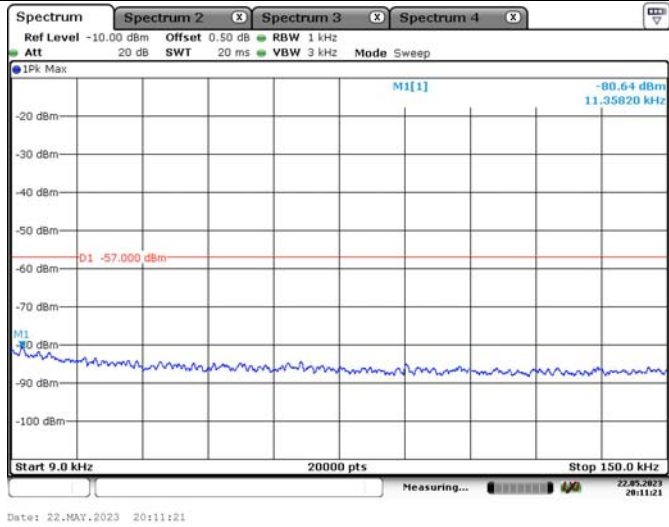
<p>9KHz -150KHz</p>	
<p>150KHz -30MHz</p>	
<p>30MHz -1GHz</p>	

1GHz -2GHz

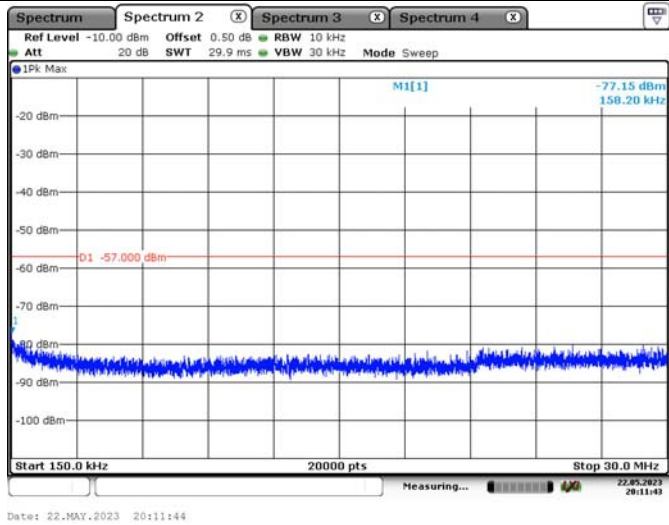


469.9875MHz

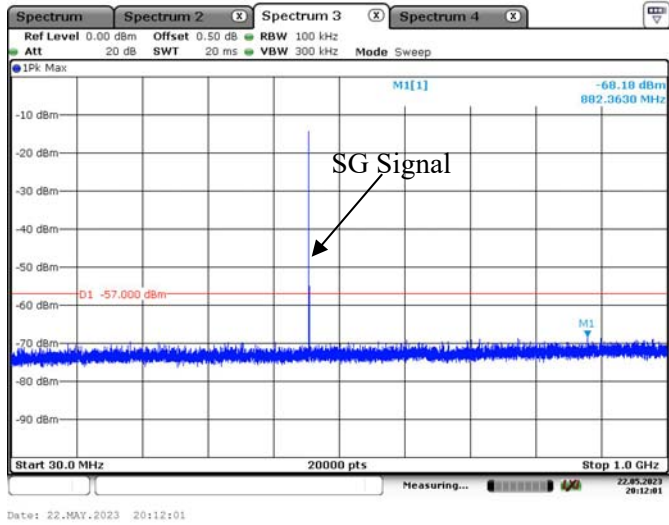
9KHz -150KHz



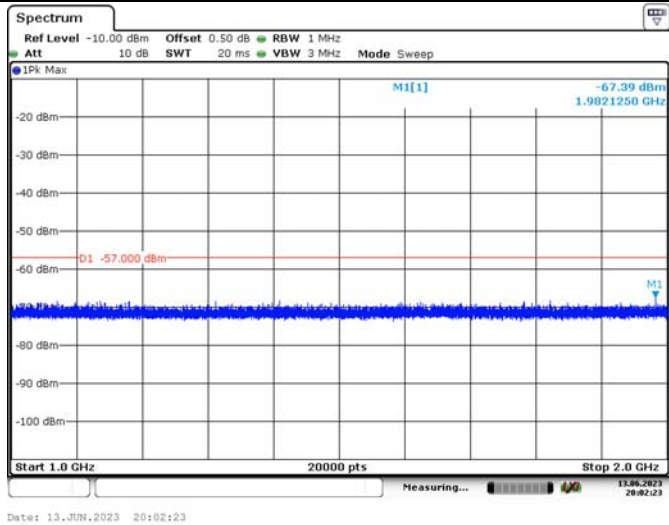
150KHz -30MHz



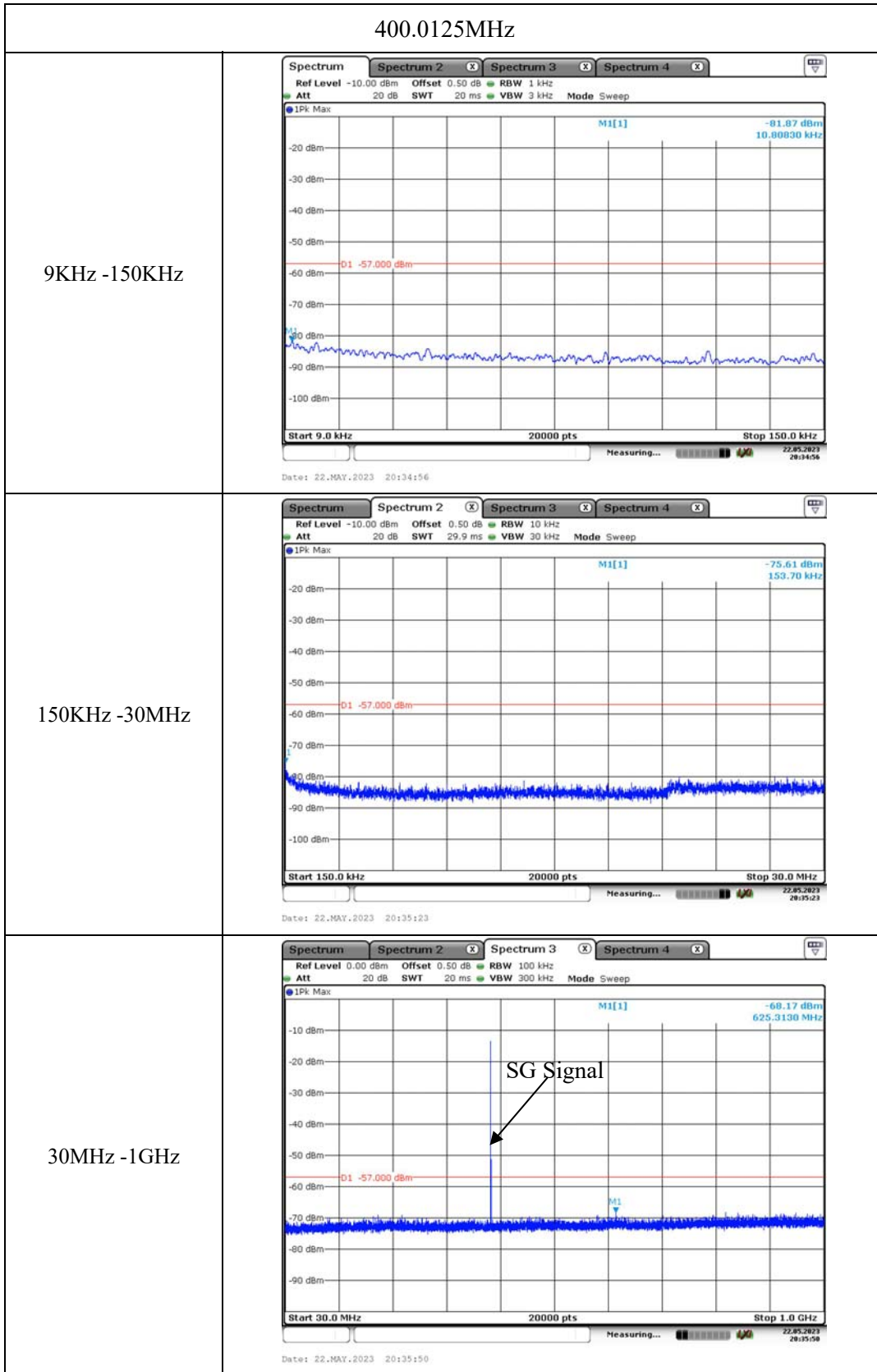
30MHz -1GHz



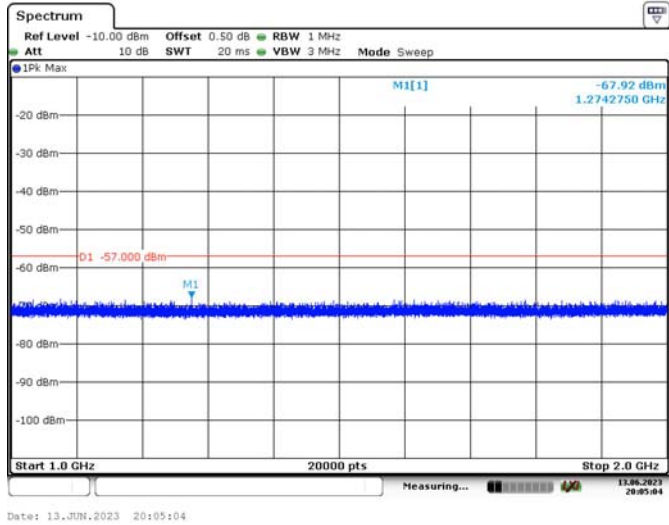
1GHz -2GHz



M2:

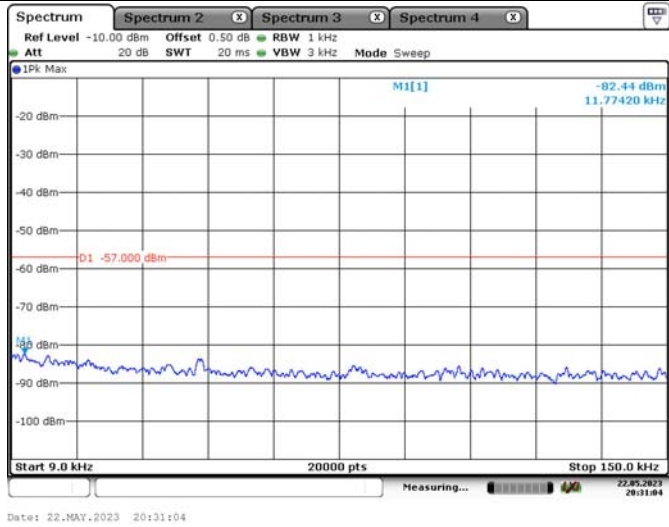


1GHz -2GHz

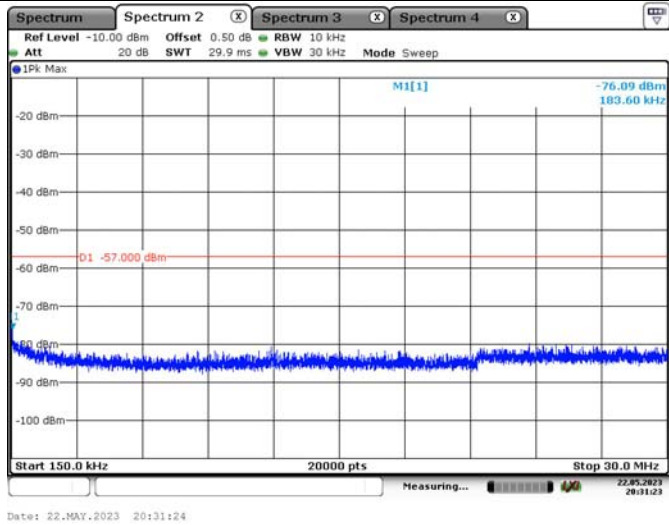


450MHz

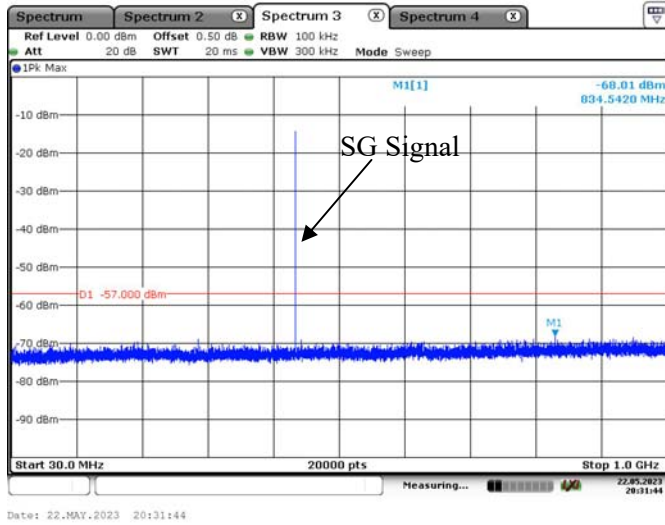
9KHz -150KHz



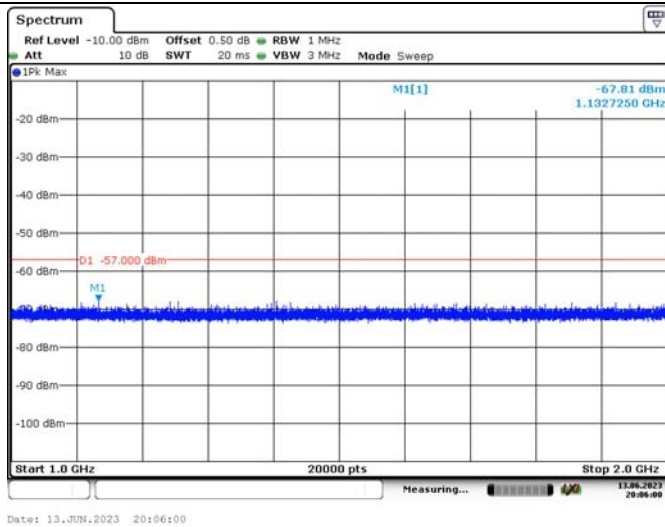
150KHz -30MHz



30MHz -1GHz

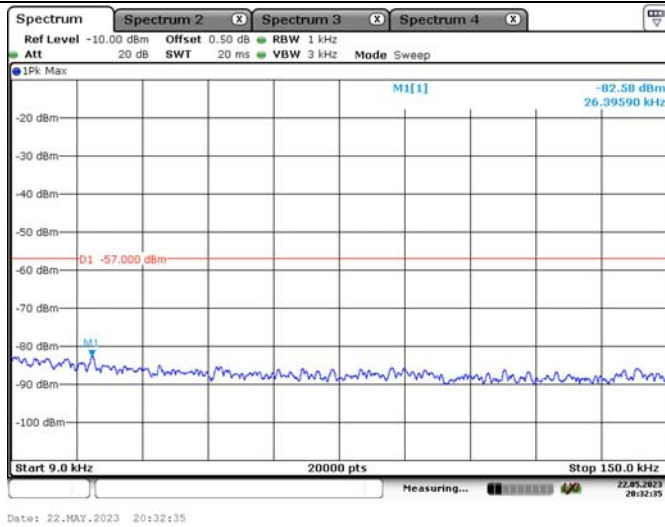


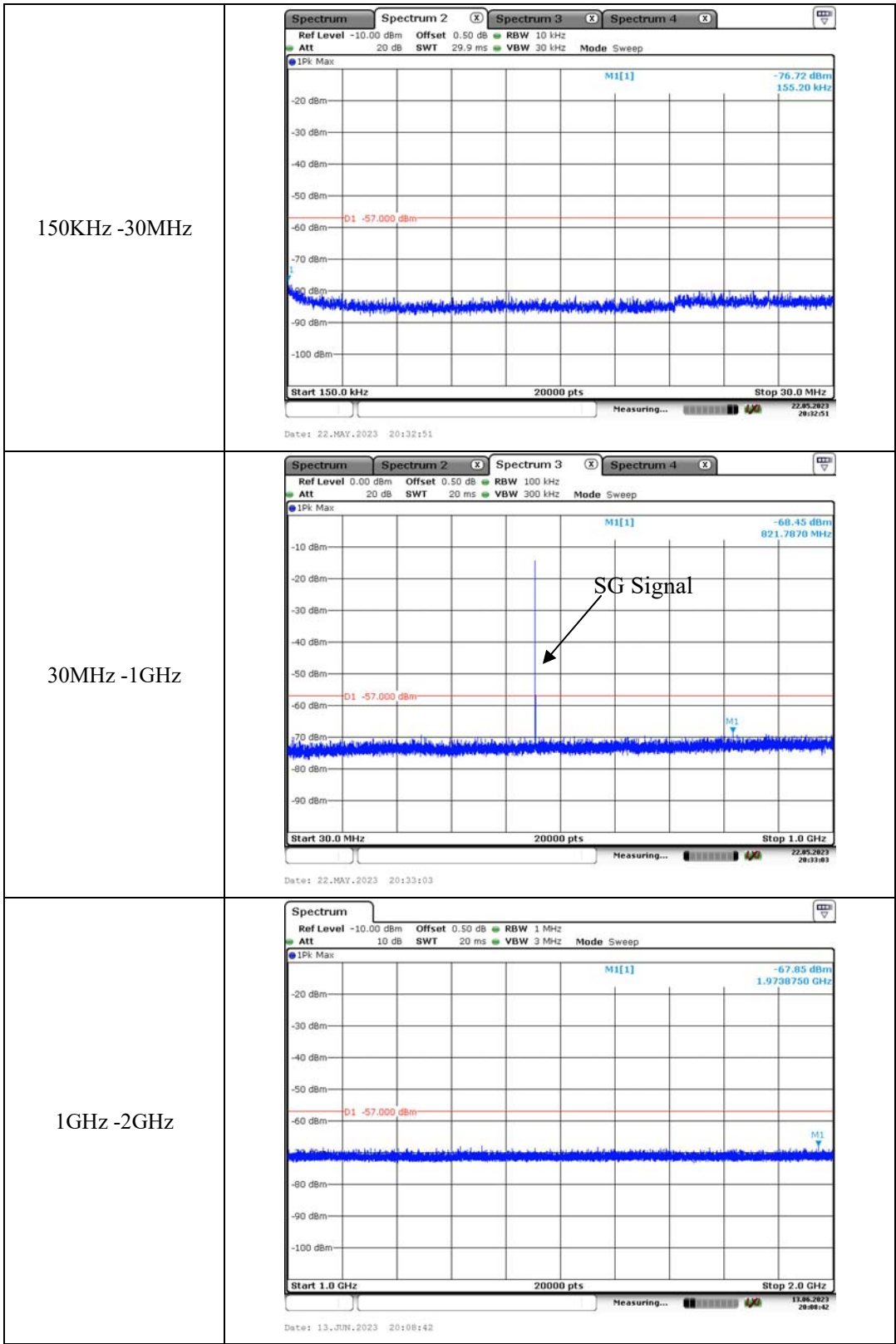
1GHz -2GHz



469.9875MHz

9KHz -150KHz





==== END OF REPORT ====