TEST REPORT

Applicant: **8devices**

Address: FCC:Antakalnio 17 - 6 Vilnius Lithuania
IC: Antakalnio g. 17-6 Vilnius Vilnius County LT-10312 Lithuania

FCC ID: **Z9WMAN**

Product Name: **Mango**

Model Number: **Mango**

Standard(s): **FCC Part 15B**
ICES-003, Issue 7, October 2020
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: **CR230633479-00CA1**

Date Of Issue: **2023/6/25**

Reviewed By: **Julie Tan** Julie Tan
Title: RF Engineer

Approved 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 "★".

CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	CR22010029-00C	Original Report	2022/6/3
1	CR230633479-00CA1	Class II Permissive Change Report	2023/6/25

Note: This is the Class II Permissive Change report application which was based on the original report. The differences between them as following:

1. Added PIFA type antenna.

The changes between the previous device and the current one are stated and guaranteed by the Applicant, the differences between them will affect the test results, we will update the test results, test photos, and the related EUT photos.

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Mango
EUT Model:	Mango
Highest Operation Frequency:	5825 MHz
Rated Input Voltage:	DC 3.3V
Serial Number:	26SH-1
EUT Received Date:	2023/6/13
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: Operating
Equipment Modifications:	No
EUT Exercise Software:	No

1.2.2 Support Equipment List and Details

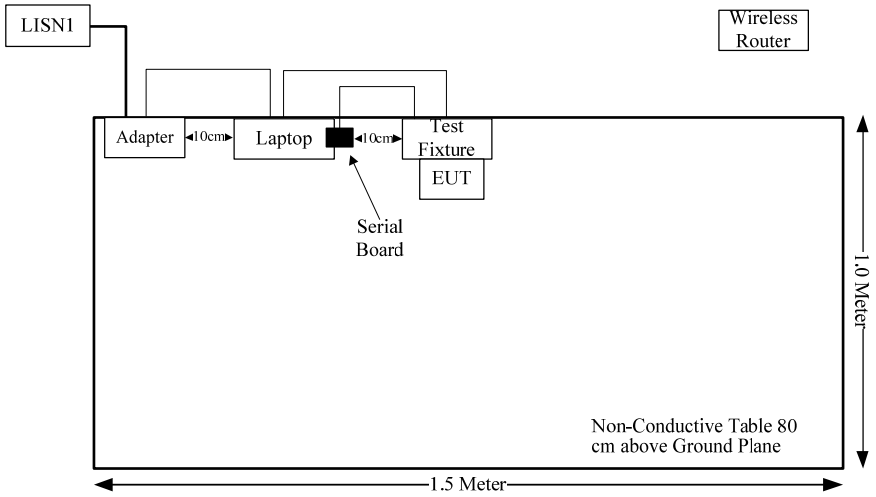
Manufacturer	Description	Model	Serial Number
Lenovo	Laptop	E480	PF-1QQYYP 19/06
TOTO LINK	Wireless Router	X5000R	X5000RK9T0560
Unknown	Serial Board	Unknown	CR22010029-RF-S4
8devices	Test Fixture	Unknown	CR22010029-RF-S3

1.2.3 Support Cable List and Details

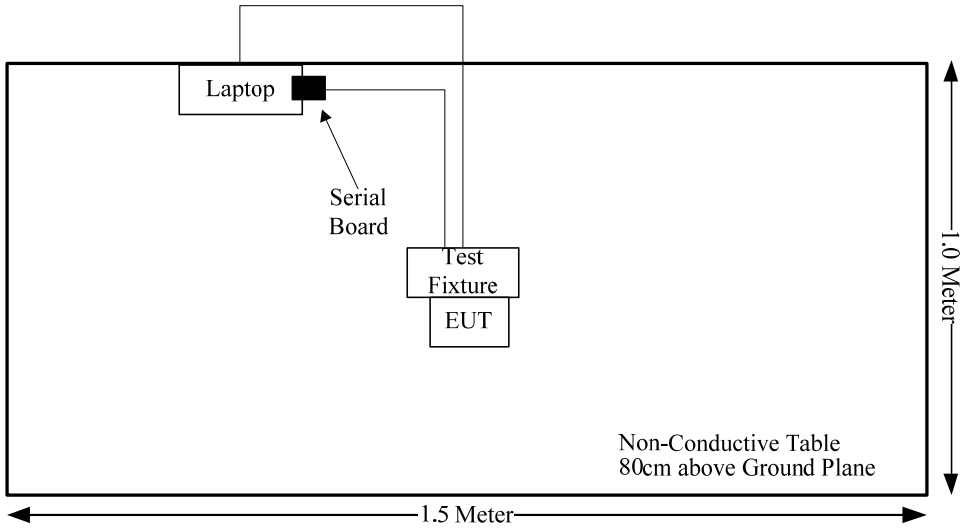
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	1.5	Serial Board	Test Fixture
USB Cable	No	No	1.5	Laptop	Test Fixture

1.2.4 Block Diagram of Test Setup

AC line conducted emissions:



Radiated Spurious 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	±1℃
Humidity	±5%
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)

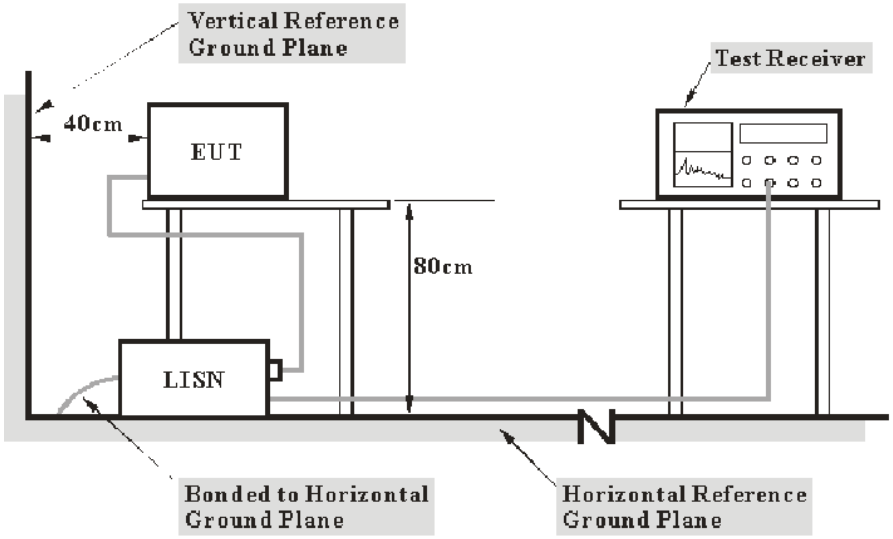
2. SUMMARY OF TEST RESULTS

Standard Clause	Description of Test	Test Result
FCC§15.107 ICES-003§3.2.1	Conducted emissions	Compliant
FCC§15.109 ICES-003§3.2.2	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 and Innovation, Science and Economic Development Canada ICES-003 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 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

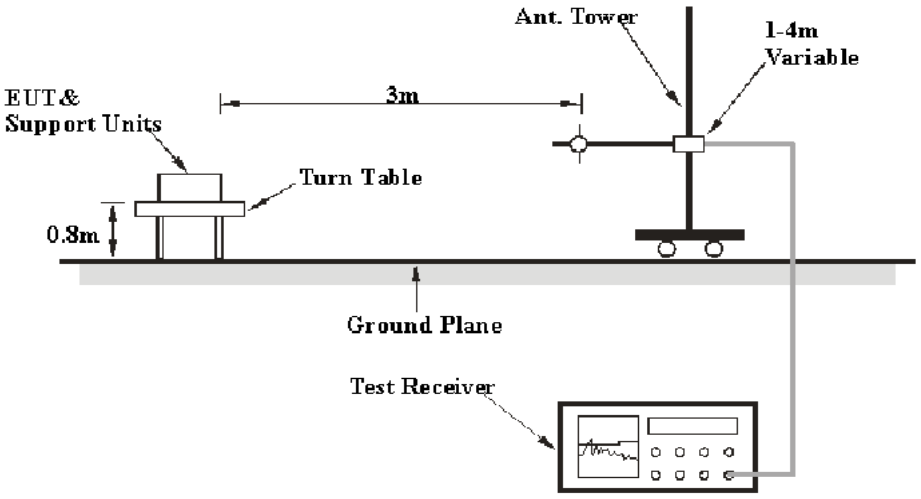
The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

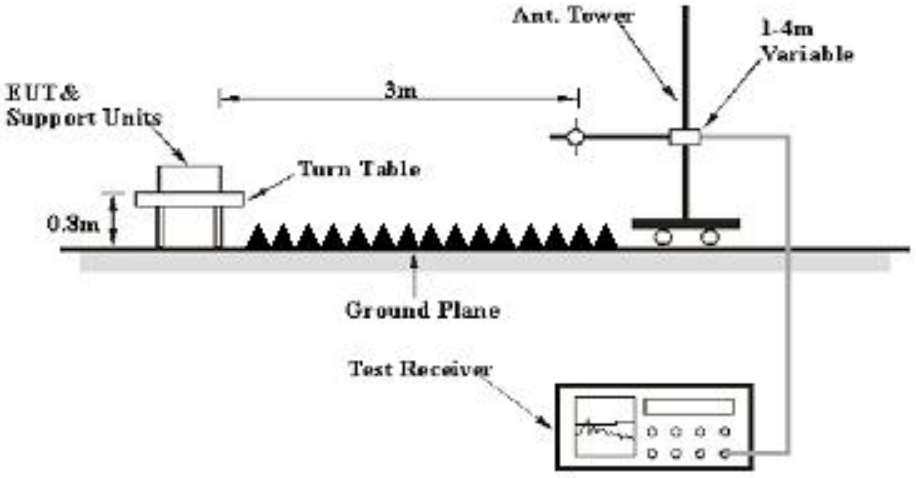
3.2 Radiation Spurious Emissions

3.2.1 EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission were performed in the 3 meters, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 and ICES-003 Class B limits.

3.2.2 EMI Test Receiver Setup

The system was investigated from 30 MHz to 30GHz.

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	Reduced video bandwidth	/	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:

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:	26SH-1	Test Date:	2023/06/20
Test Site:	CE	Test Mode:	Operating
Tester:	David Huang	Test Result:	Pass

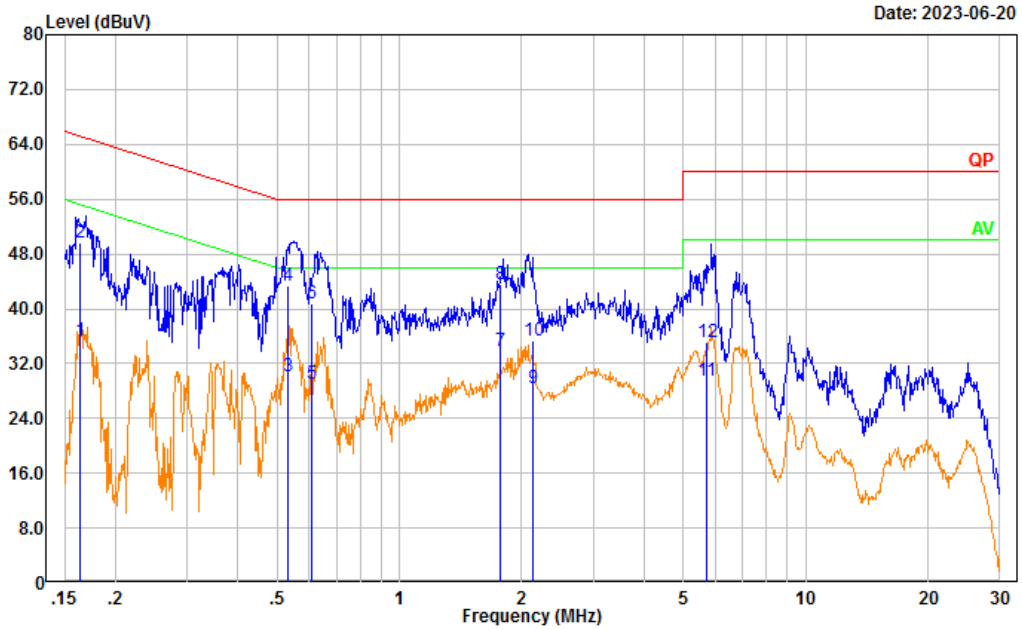
Environmental Conditions:					
Temperature: (℃)	24.9	Relative Humidity: (%)	55	ATM Pressure: (kPa)	100.8

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	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

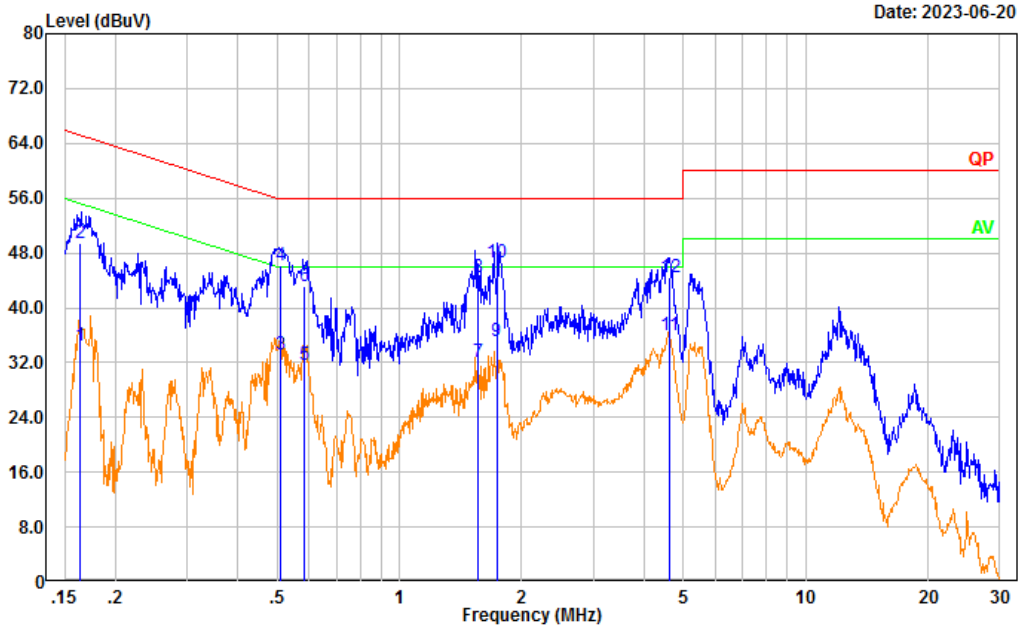
** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Mode: operating
Port: Line
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.164	25.66	9.61	35.27	55.26	19.99	Average
2	0.164	40.05	9.61	49.66	65.26	15.60	QP
3	0.533	20.43	9.61	30.04	46.00	15.96	Average
4	0.533	33.66	9.61	43.27	56.00	12.73	QP
5	0.608	19.52	9.62	29.14	46.00	16.86	Average
6	0.608	31.17	9.62	40.79	56.00	15.21	QP
7	1.769	24.27	9.63	33.90	46.00	12.10	Average
8	1.769	33.93	9.63	43.56	56.00	12.44	QP
9	2.135	18.75	9.63	28.38	46.00	17.62	Average
10	2.135	25.80	9.63	35.43	56.00	20.57	QP
11	5.686	19.77	9.66	29.43	50.00	20.57	Average
12	5.686	25.48	9.66	35.14	60.00	24.86	QP

Test Mode: operating
Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.164	24.88	9.61	34.49	55.26	20.77	Average
2	0.164	39.84	9.61	49.45	65.26	15.81	QP
3	0.508	23.63	9.61	33.24	46.00	12.76	Average
4	0.508	36.58	9.61	46.19	56.00	9.81	QP
5	0.583	22.06	9.62	31.68	46.00	14.32	Average
6	0.583	33.56	9.62	43.18	56.00	12.82	QP
7	1.562	22.55	9.63	32.18	46.00	13.82	Average
8	1.562	34.89	9.63	44.52	56.00	11.48	QP
9	1.734	25.56	9.63	35.19	46.00	10.81	Average
10	1.734	36.92	9.63	46.55	56.00	9.45	QP
11	4.614	26.38	9.66	36.04	46.00	9.96	Average
12	4.614	34.69	9.66	44.35	56.00	11.65	QP

4.2 Radiation Spurious Emissions

Serial Number:	26SH-1	Test Date:	2023/06/20
Test Site:	966-1/966-2	Test Mode:	Operating
Tester:	Carl Xue, Coco Tian	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	23.2~27	Relative Humidity: (%)	58~62	ATM Pressure: (kPa)	100.5

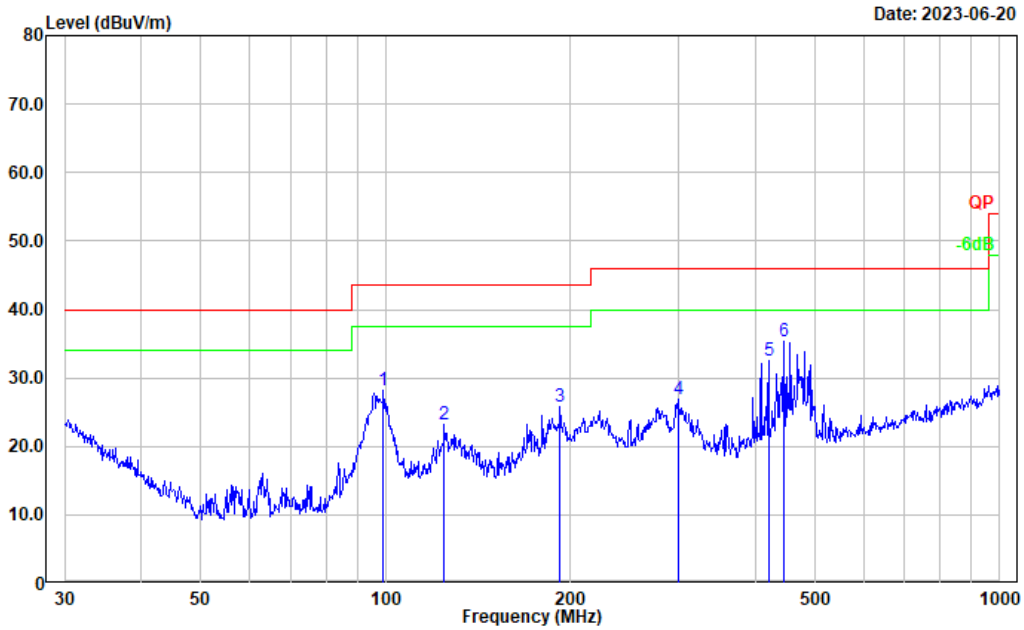
Test Equipment List and Details:

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
PASTERNACK	Horn Antenna	PE9852/2F-20	112002	2021/02/05	2024/02/04
PASTERNACK	Horn Antenna	PE9850/2F-20	072001	2021/02/05	2024/02/04
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
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2022/08/07	2023/08/06
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2022/11/09	2023/11/08
AH	Preamplifier	PAM-1840VH	190	2022/11/09	2023/11/08
E-Microwave	Band Rejection Filter	2400-2483.5MHz	OE01902424	2022/08/07	2023/08/06
Mini Circuits	High Pass Filter	VHF-6010+	31119	2022/08/07	2023/08/06
E-Microwave	Band Rejection Filter	5150-5850MHz	OE01902423	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).*

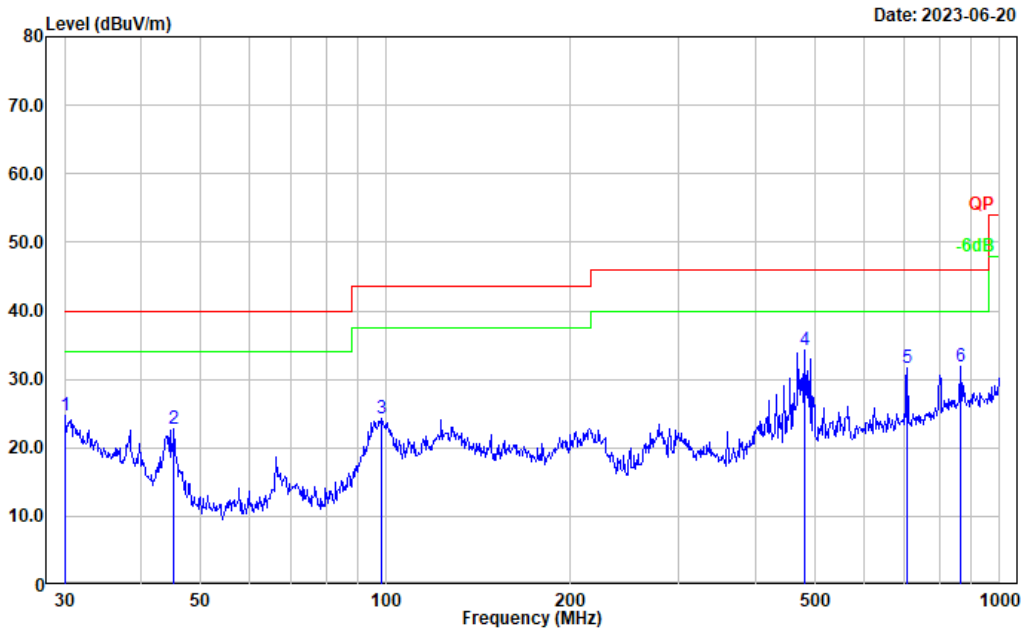
1) 30MHz-1GHz:

Test Mode: Operating
Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	99.180	42.71	-14.51	28.20	43.50	15.30	Peak
2	124.569	34.49	-11.35	23.14	43.50	20.36	Peak
3	192.419	38.99	-13.13	25.86	43.50	17.64	Peak
4	299.316	37.46	-10.65	26.81	46.00	19.19	Peak
5	420.580	40.37	-7.90	32.47	46.00	13.53	Peak
6	444.851	42.40	-7.14	35.26	46.00	10.74	Peak

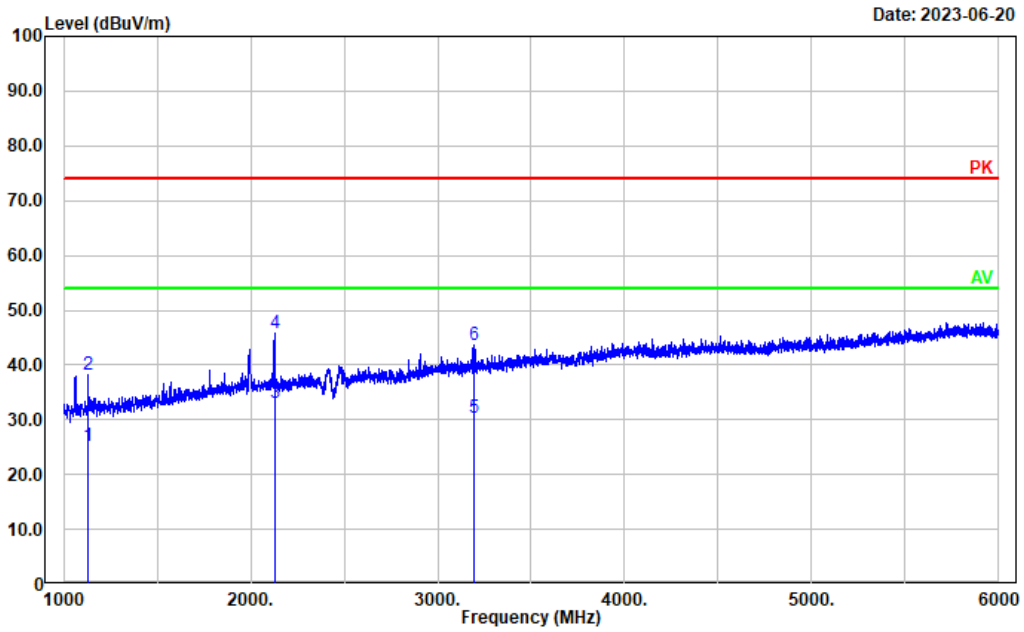
Test Mode: Operating
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.000	28.40	-3.60	24.80	40.00	15.20	Peak
2	45.217	37.06	-14.36	22.70	40.00	17.30	Peak
3	98.487	38.92	-14.66	24.26	43.50	19.24	Peak
4	480.528	40.43	-6.25	34.18	46.00	11.82	Peak
5	706.700	35.16	-3.49	31.67	46.00	14.33	Peak
6	863.056	33.13	-1.20	31.93	46.00	14.07	Peak

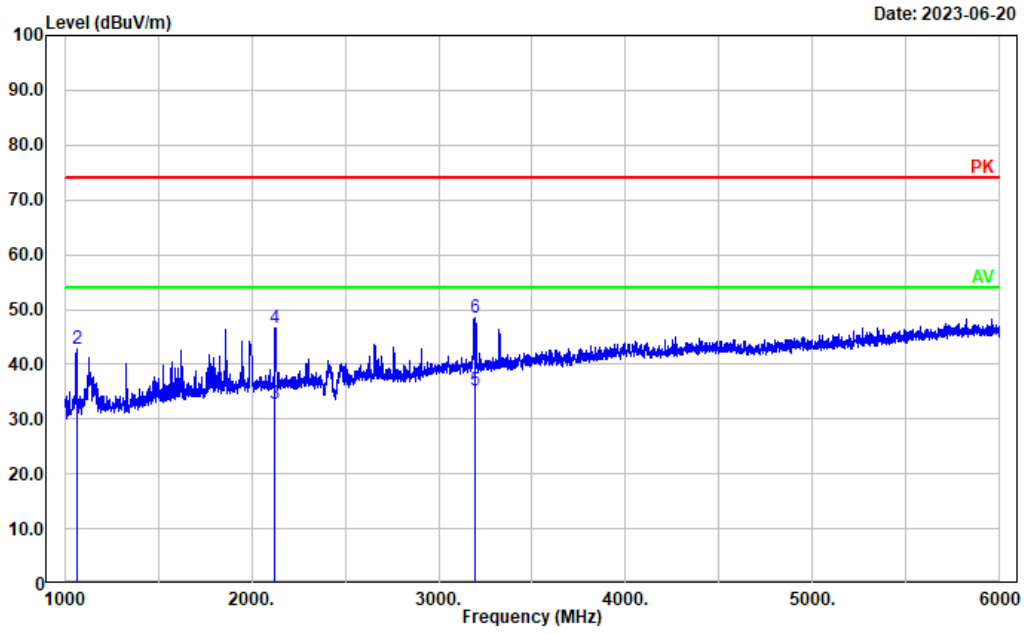
Above 1GHz:

Test Mode: operating
Polarization: horizontal
Note:



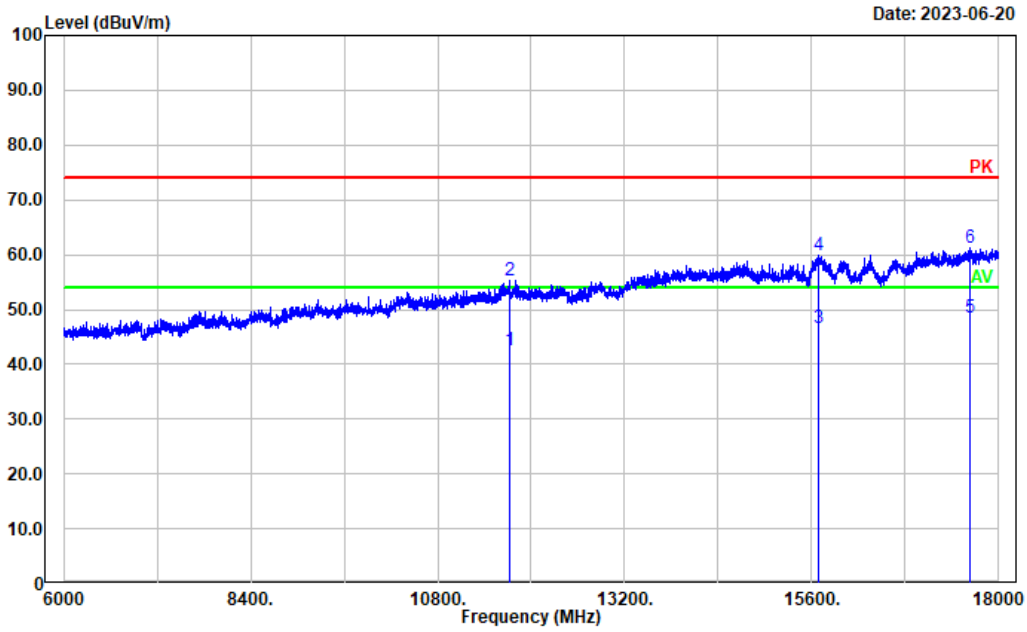
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	1131.026	27.33	-2.00	25.33	54.00	28.67	Average
2	1131.026	40.29	-2.00	38.29	74.00	35.71	Peak
3	2130.226	30.21	2.75	32.96	54.00	21.04	Average
4	2130.226	43.02	2.75	45.77	74.00	28.23	Peak
5	3195.439	23.62	6.74	30.36	54.00	23.64	Average
6	3195.439	36.89	6.74	43.63	74.00	30.37	Peak

Test Mode: operating
Polarization: vertical
Note:



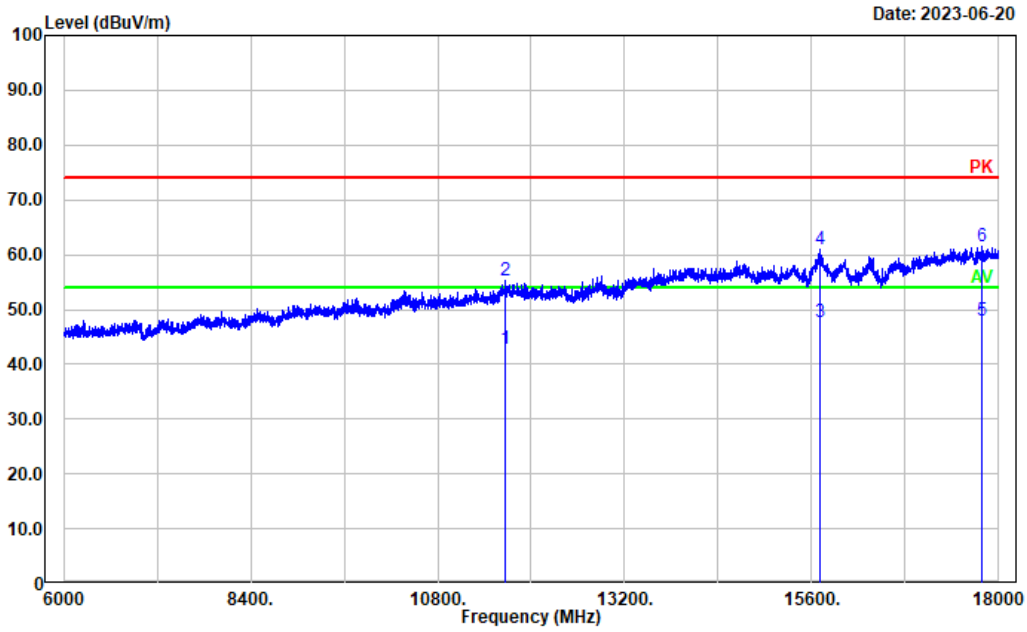
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	1065.013	32.41	-2.36	30.05	54.00	23.95	Average
2	1065.013	45.24	-2.36	42.88	74.00	31.12	Peak
3	2123.225	30.13	2.72	32.85	54.00	21.15	Average
4	2123.225	43.83	2.72	46.55	74.00	27.45	Peak
5	3197.439	28.61	6.75	35.36	54.00	18.64	Average
6	3197.439	41.68	6.75	48.43	74.00	25.57	Peak

Test Mode: operating
Polarization: horizontal
Note:



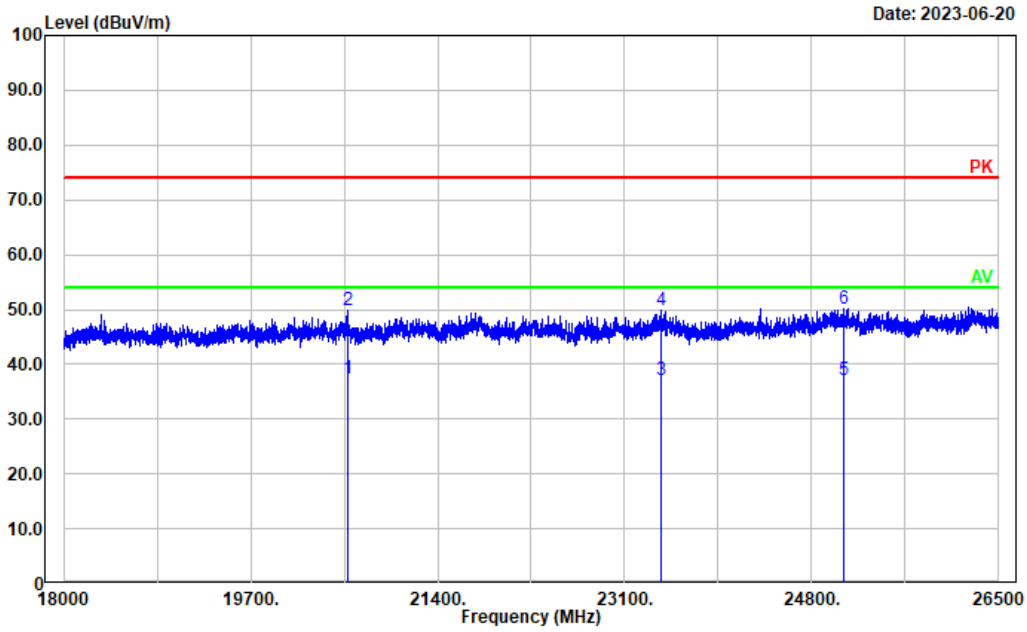
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	11717.940	21.34	21.19	42.53	54.00	11.47	Average
2	11717.940	34.01	21.19	55.20	74.00	18.80	Peak
3	15685.940	24.32	22.29	46.61	54.00	7.39	Average
4	15685.940	37.48	22.29	59.77	74.00	14.23	Peak
5	17632.730	18.64	29.81	48.45	54.00	5.55	Average
6	17632.730	31.56	29.81	61.37	74.00	12.63	Peak

Test Mode: operating
Polarization: vertical
Note:



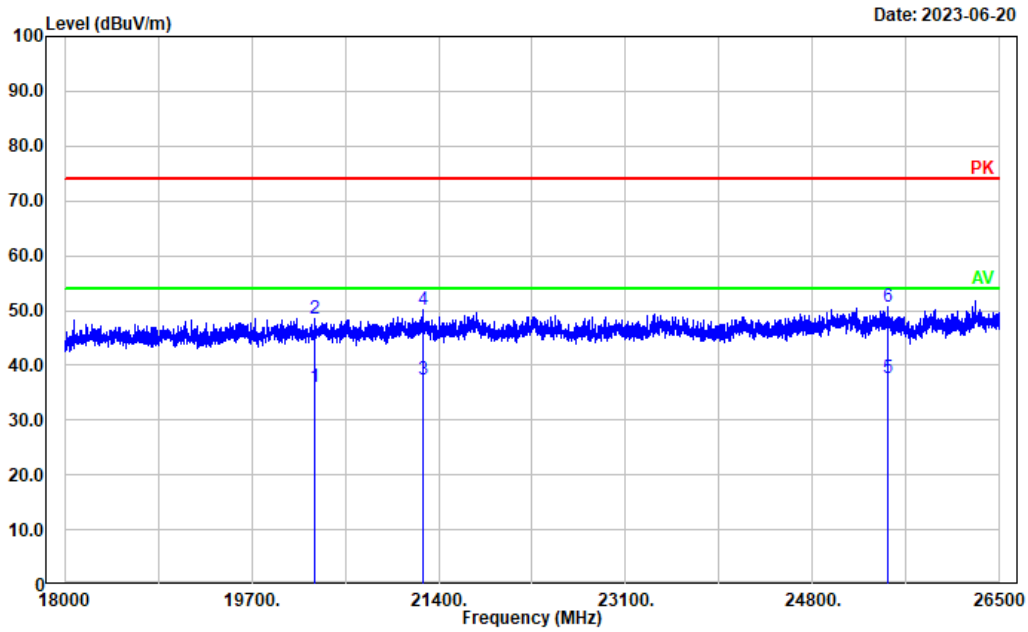
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	11669.930	21.70	21.12	42.82	54.00	11.18	Average
2	11669.930	34.28	21.12	55.40	74.00	18.60	Peak
3	15709.940	25.34	22.28	47.62	54.00	6.38	Average
4	15709.940	38.62	22.28	60.90	74.00	13.10	Peak
5	17783.960	17.34	30.76	48.10	54.00	5.90	Average
6	17783.960	30.64	30.76	61.40	74.00	12.60	Peak

Test Mode: operating
Polarization: Horizontal
Note:



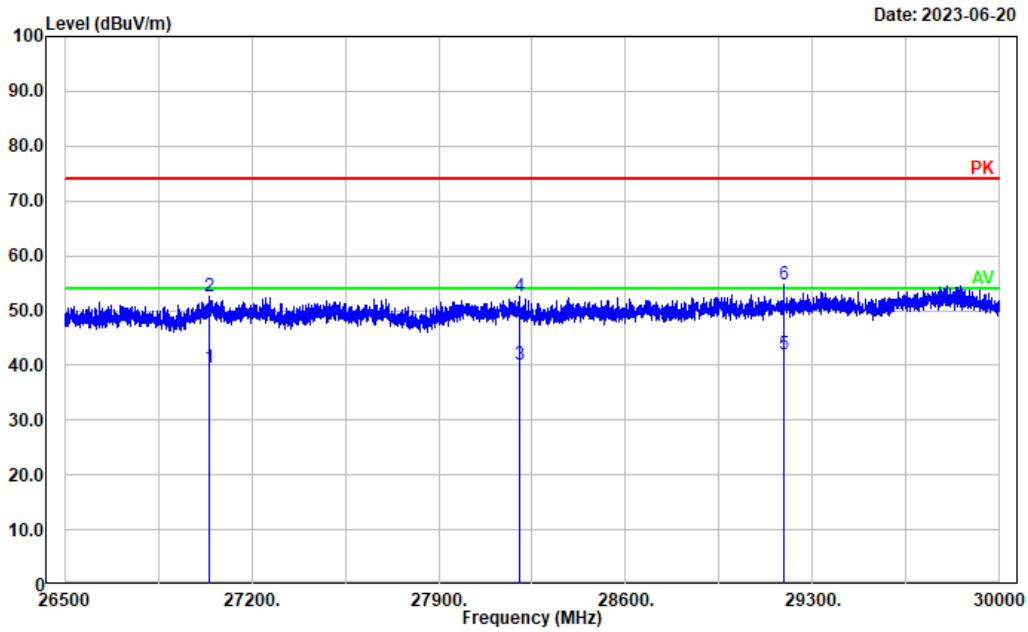
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	20577.710	38.64	-1.19	37.45	54.00	16.55	Average
2	20577.710	51.01	-1.19	49.82	74.00	24.18	Peak
3	23429.190	37.64	-0.60	37.04	54.00	16.96	Average
4	23429.190	50.49	-0.60	49.89	74.00	24.11	Peak
5	25088.720	36.34	0.83	37.17	54.00	16.83	Average
6	25088.720	49.34	0.83	50.17	74.00	23.83	Peak

Test Mode: operating
Polarization: vertical
Note:



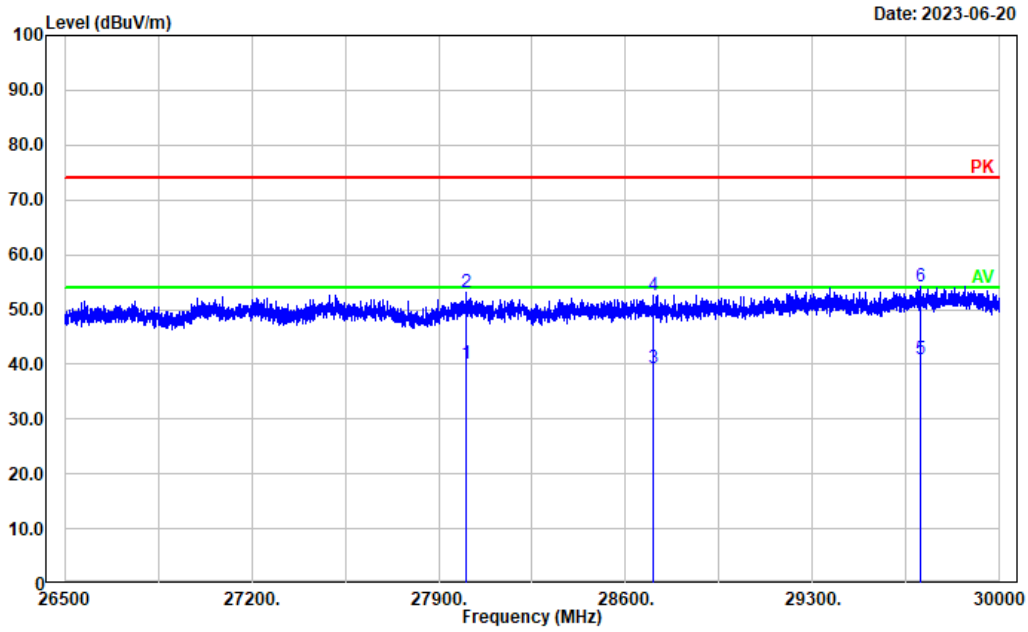
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	20273.360	37.60	-1.60	36.00	54.00	18.00	Average
2	20273.360	50.16	-1.60	48.56	74.00	25.44	Peak
3	21254.450	38.64	-1.14	37.50	54.00	16.50	Average
4	21254.450	51.37	-1.14	50.23	74.00	23.77	Peak
5	25488.300	37.43	0.28	37.71	54.00	16.29	Average
6	25488.300	50.46	0.28	50.74	74.00	23.26	Peak

Test Mode: operating
Polarization: Horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	27039.810	37.63	1.86	39.49	54.00	14.51	Average
2	27039.810	50.73	1.86	52.59	74.00	21.41	Peak
3	28205.540	37.64	2.52	40.16	54.00	13.84	Average
4	28205.540	50.02	2.52	52.54	74.00	21.46	Peak
5	29190.640	37.61	4.34	41.95	54.00	12.05	Average
6	29190.640	50.36	4.34	54.70	74.00	19.30	Peak

Test Mode: operating
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	28002.500	36.53	3.48	40.01	54.00	13.99	Average
2	28002.500	49.56	3.48	53.04	74.00	20.96	Peak
3	28705.440	36.44	2.98	39.42	54.00	14.58	Average
4	28705.440	49.72	2.98	52.70	74.00	21.30	Peak
5	29703.840	35.64	5.41	41.05	54.00	12.95	Average
6	29703.840	48.91	5.41	54.32	74.00	19.68	Peak

*****END OF REPORT*****