

TEST REPORT

Reference No...... : WTX22X09182363W003
FCC ID : OU9-NOVA
Applicant : Guangdong Transtek Medical Electronics Co., Ltd.
Address..... : Zone A. No. 105, Dongli Road, Torch Development District, 528437
Zhongshan, Guangdong, China
Manufacturer : The same as Applicant
Address..... : The same as Applicant
Product Name : Hearing Aids
Model No...... : Nova
Standards : **FCC PART15 SUBPART B**
Date of Receipt sample : 2022-09-07
Date of Test..... : 2022-09-07 to 2022-11-16
Date of Issue : 2022-11-16
Test Report Form No. : WTX_FCC PART15B_001
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:

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Report version

Version No.	Date of issue	Description
Rev.00	2022-11-16	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Hearing Aids
Trade Name:	LINNER
Model No.:	Nova
Adding Model(s):	/
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Rated Voltage:	Charging Box : Battery DC 3.7V Earphone : Battery DC 3.7V
Battery Capacity:	Charging Box : 500mAh Earphone : 50mAh
Rated Power:	/
Power Adapter Model:	/
Lowest Internal Frequency:	26MHz
Highest Internal Frequency:	2480MHz
Classification of ITE:	Class B

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15 Subpart B: Unintentional Radiators.

ANSI C63.4-2014: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark	Power Supply Mode
TM1	Charging	Connect to the Adapter;	AC120V 60Hz for Adapter
TM2	Bluetooth Playing	Connect the phone	DC 3.7V
TM3	2.4GHz Receive	Connect the LINNERR CONNECT	DC 3.7V

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB-C Cable	0.19	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E445	EB12648265
Mobile phone	HUAWEI	VOG-AL00	/
Adapter	FUSHIGANG	AS1201A-0502000U SU	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Radiated Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
☒ Chamber A:Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2022-03-22	2023-03-21
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2022-03-22	2023-03-21
Amplifier	Agilent	8447F	3113A06717	2022-01-07	2023-01-06
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2023-03-19
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2021-03-20	2023-03-19
☐ Chamber A:Above 1GHz					
Amplifier	C&D	PAP-1G18	2002	2022-03-22	2023-03-21
Horn Antenna	ETS	3117	00086197	2021-03-19	2023-03-18
☐ Chamber B:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2022-03-25	2023-03-24
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2023-04-08
Amplifier	Agilent	8447D	2944A10179	2022-03-22	2023-03-21
☐ Chamber C:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2022-01-07	2023-01-06
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2023-05-27
Amplifier	HP	8447F	2944A03869	2022-03-22	2023-03-21
☒ Conducted Room 1#					
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2022-03-25	2023-03-24
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2022-03-22	2023-03-21
AC LISN	Schwarz beck	NSLK8126	8126-224	2022-03-22	2023-03-21
☐ Conducted Room 2#					
EMI Test Receiver	Rohde & Schwarz	ESPI	10129	2022-03-22	2023-03-21
LISN	Rohde & Schwarz	ENV 216	100097	2022-03-22	2023-03-21

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

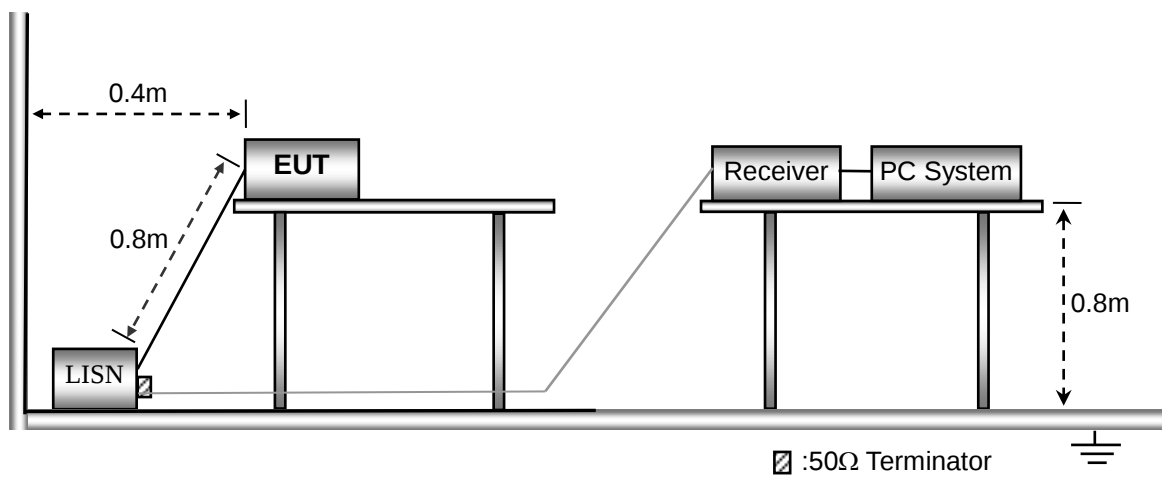
Description of Test	Result
§15.107(a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

3.2 Basic Test Setup Block Diagram



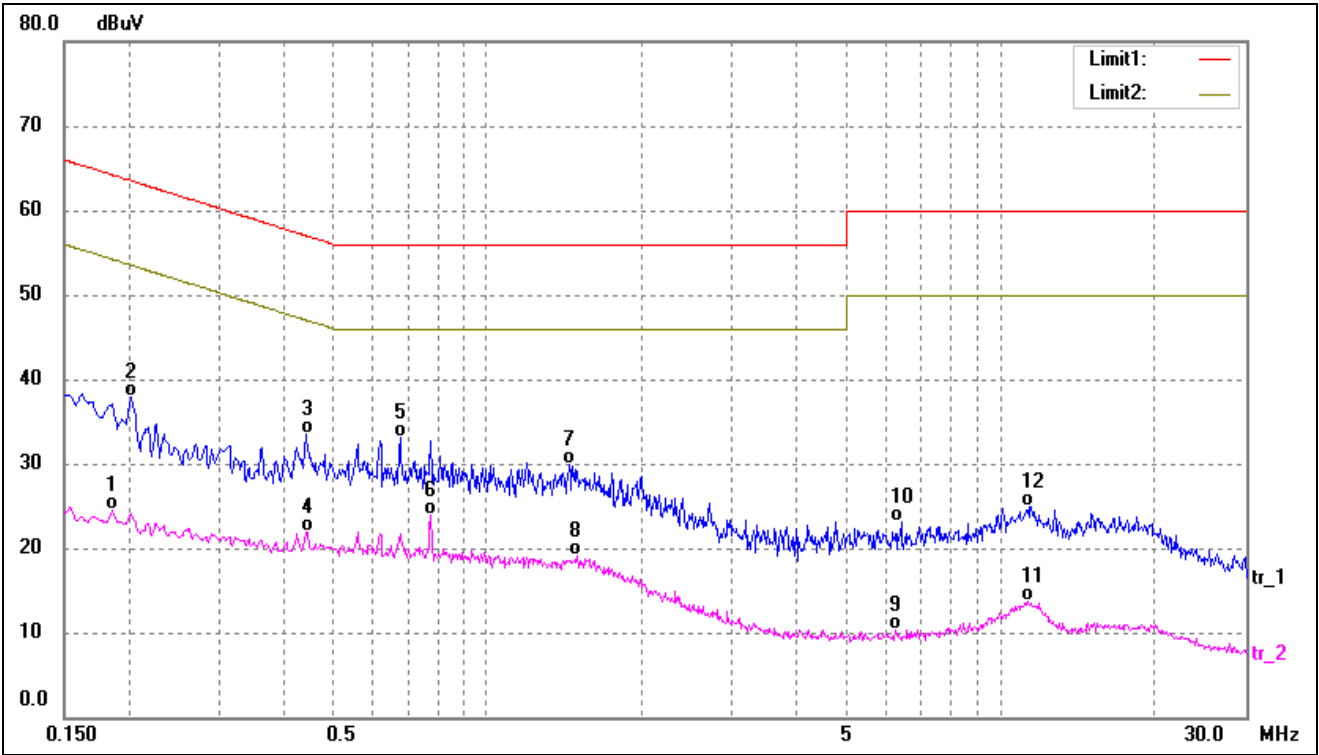
3.3 Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

3.4 Summary of Test Results

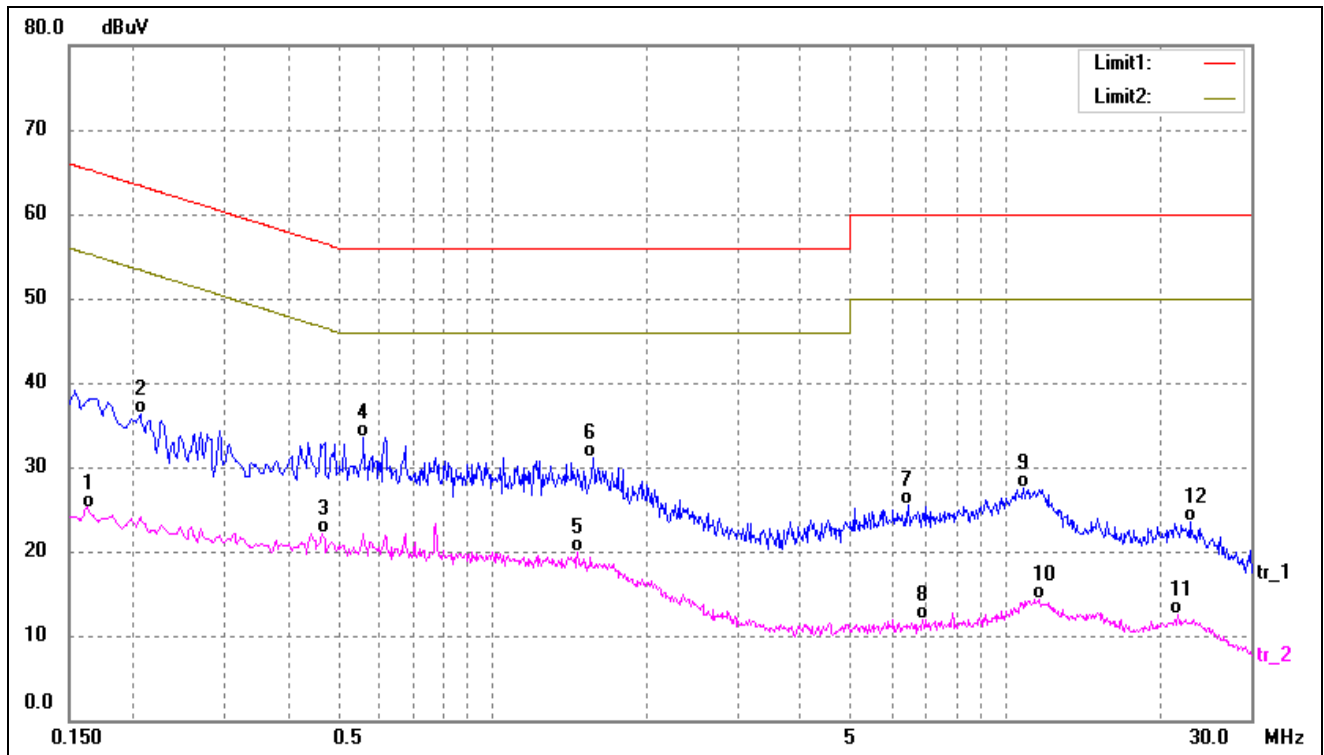
Look at the graphs and data below:

Test mode:	TM1	Polarity:	Line
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1860	14.16	10.31	24.47	54.21	-29.74	AVG
2	0.2020	27.57	10.30	37.87	63.52	-25.65	QP
3	0.4420	23.32	10.23	33.55	57.02	-23.47	QP
4	0.4460	11.68	10.23	21.91	46.95	-25.04	AVG
5	0.6780	22.97	10.20	33.17	56.00	-22.83	QP
6*	0.7780	13.64	10.17	23.81	46.00	-22.19	AVG
7	1.4460	19.64	10.18	29.82	56.00	-26.18	QP
8	1.5020	8.92	10.19	19.11	46.00	-26.89	AVG
9	6.2260	0.03	10.33	10.36	50.00	-39.64	AVG
10	6.3980	12.80	10.34	23.14	60.00	-36.86	QP
11	11.2780	3.30	10.32	13.62	50.00	-36.38	AVG
12	11.4100	14.65	10.32	24.97	60.00	-35.03	QP

Test mode:	TM1	Polarity:	Neutral
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1620	14.89	10.31	25.20	55.36	-30.16	AVG
2	0.2060	25.92	10.29	36.21	63.36	-27.15	QP
3	0.4660	11.87	10.23	22.10	46.58	-24.48	AVG
4*	0.5620	23.32	10.21	33.53	56.00	-22.47	QP
5	1.4660	9.76	10.19	19.95	46.00	-26.05	AVG
6	1.5740	20.81	10.21	31.02	56.00	-24.98	QP
7	6.4540	15.12	10.34	25.46	60.00	-34.54	QP
8	6.9060	1.63	10.34	11.97	50.00	-38.03	AVG
9	10.7980	17.15	10.33	27.48	60.00	-32.52	QP
10	11.6059	4.05	10.32	14.37	50.00	-35.63	AVG
11	21.6980	2.15	10.37	12.52	50.00	-37.48	AVG
12	22.8020	13.09	10.38	23.47	60.00	-36.53	QP

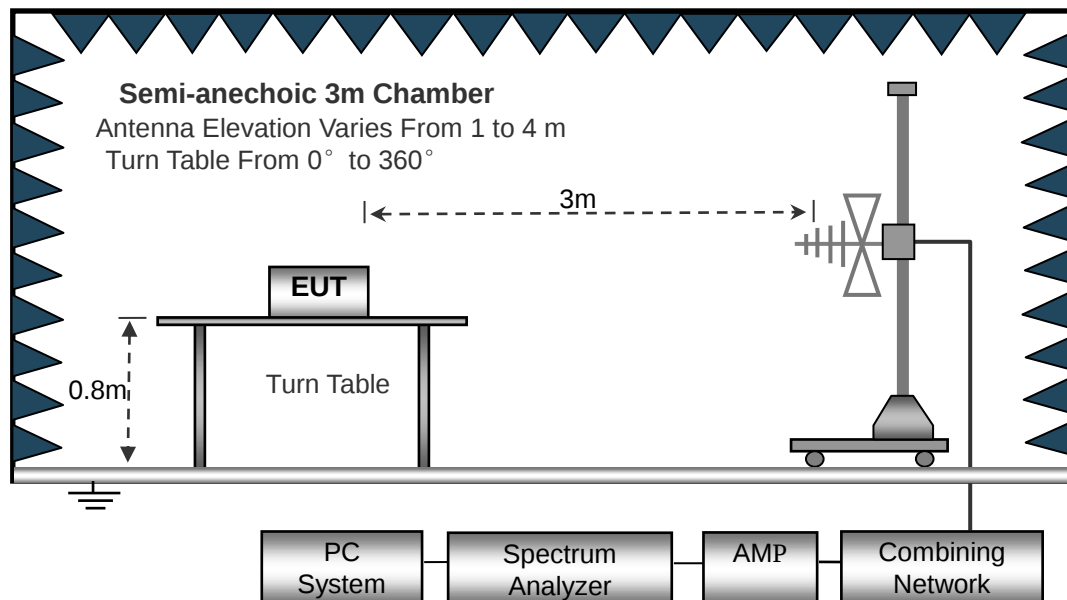
4. RADIATED EMISSION

4.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

4.2 Block Diagram of Test Setup



4.3 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

4.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\begin{aligned}\text{Corr. Ampl.} &= \text{Indicated Reading} + \text{Correct} \\ \text{Correct} &= \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}\end{aligned}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

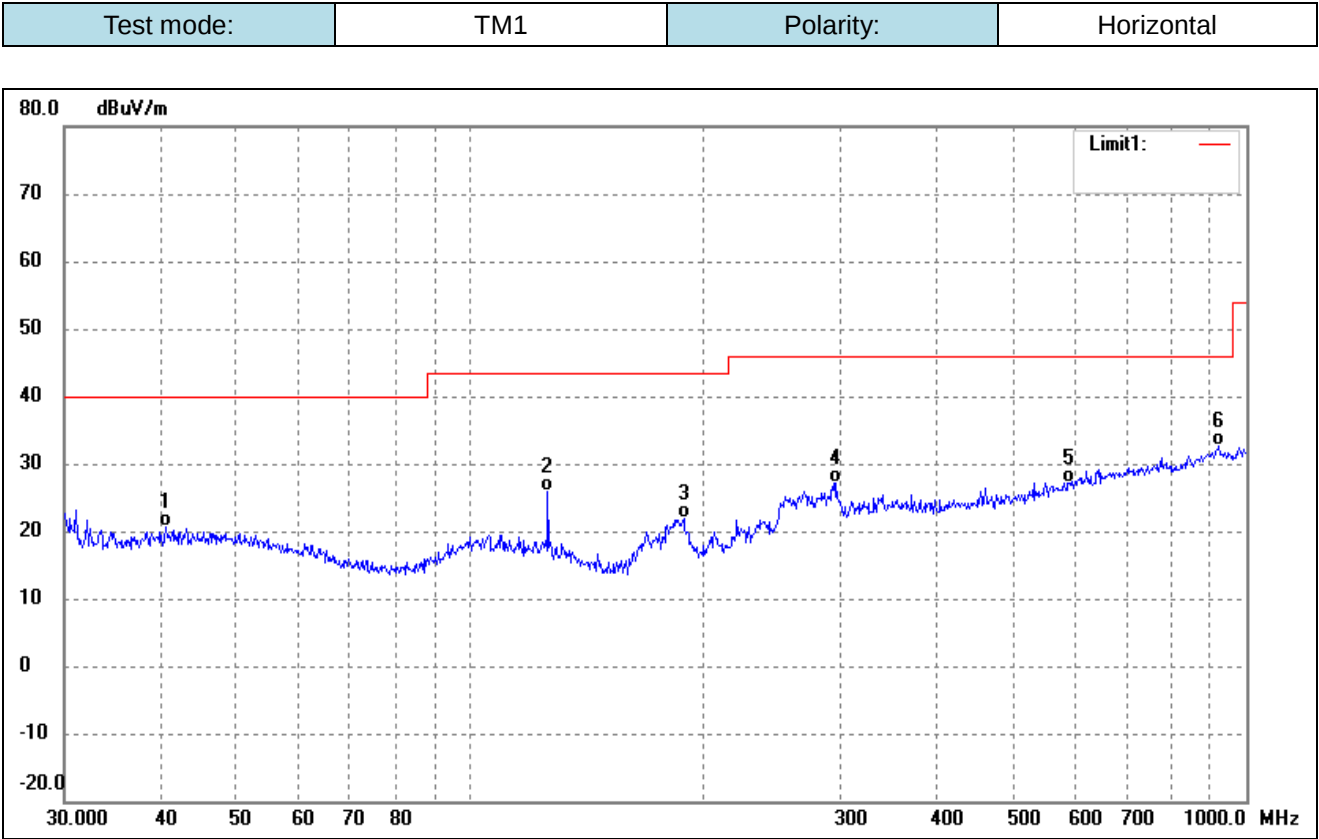
4.5 Environmental Conditions

Temperature:	22.5 °C
Relative Humidity:	54 %
ATM Pressure:	1011 mbar

4.6 Summary of Test Results

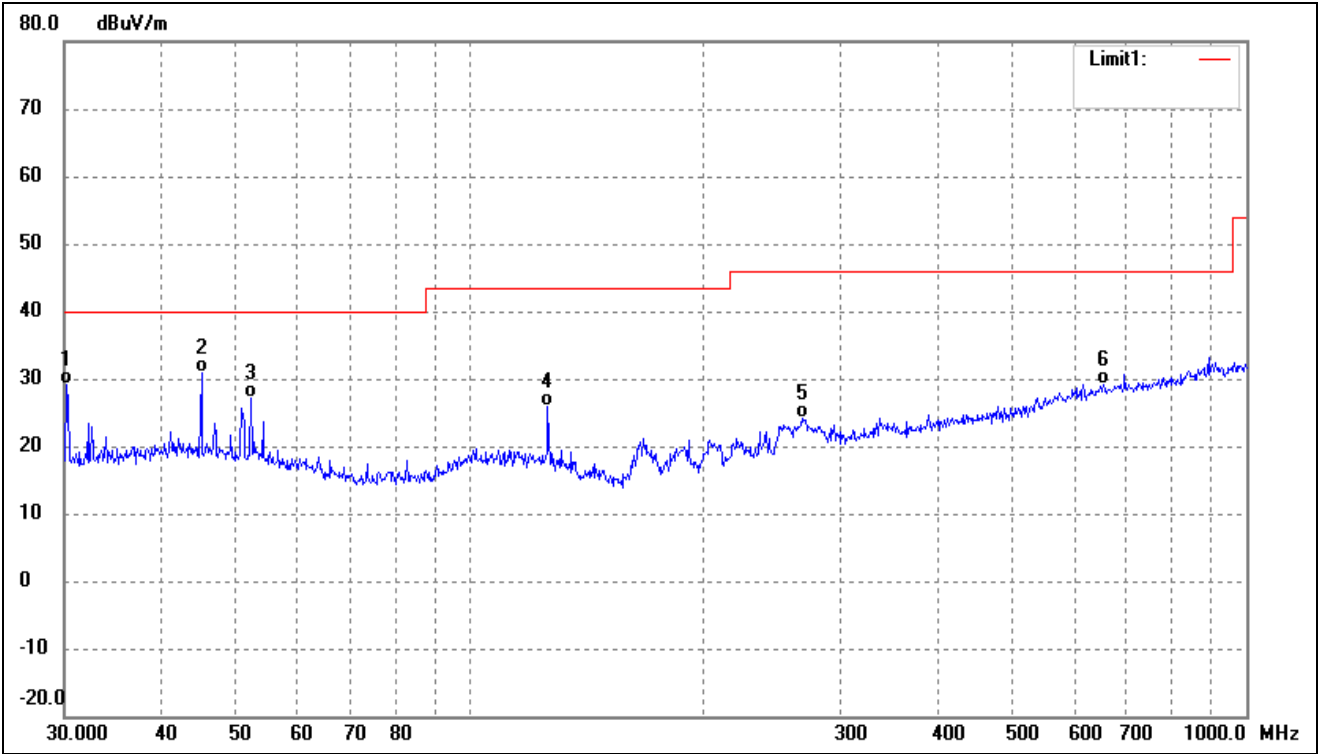
Look at the graphs and data below:

➤ Below 1GHz



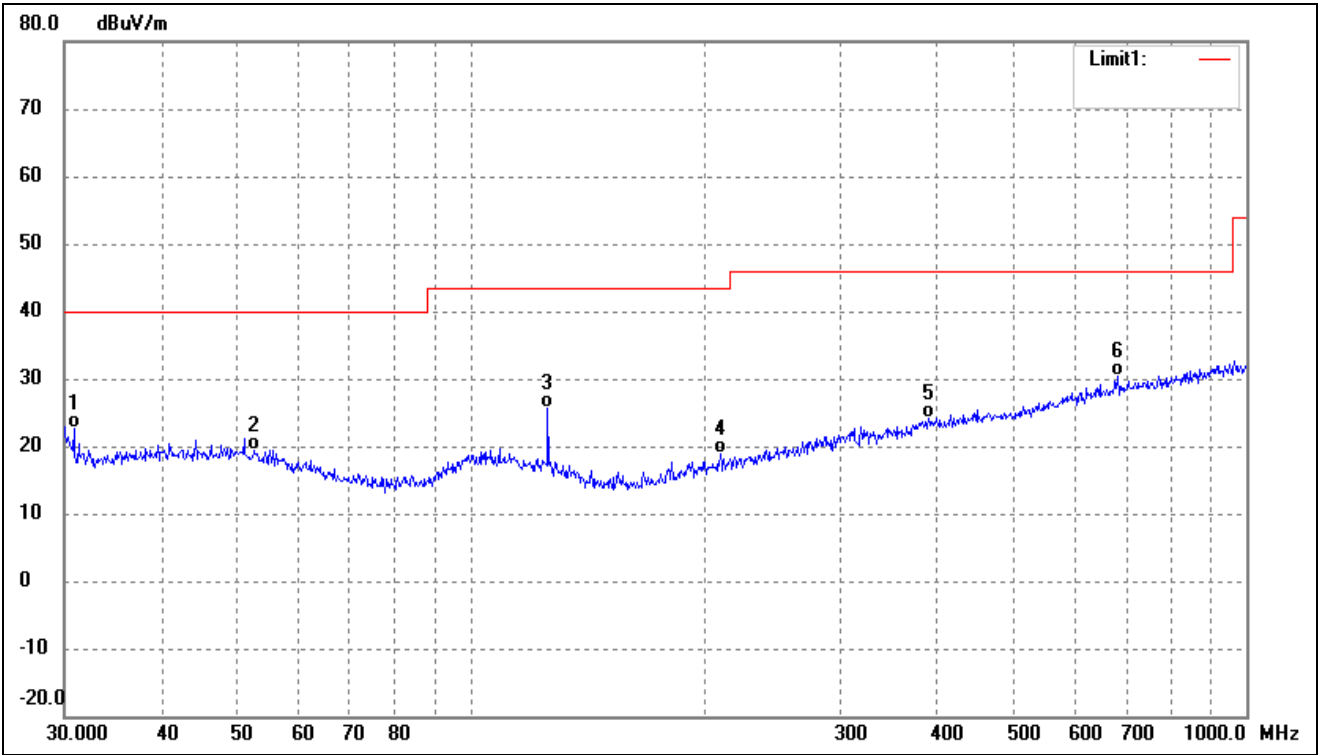
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	()	(cm)	
1	40.5591	27.69	-7.13	20.56	40.00	-19.44	-	-	QP
2	125.8864	35.77	-9.87	25.90	43.50	-17.60	-	-	QP
3	188.4125	31.03	-9.04	21.99	43.50	-21.51	-	-	QP
4	296.1836	32.31	-5.15	27.16	46.00	-18.84	-	-	QP
5	590.9737	27.53	-0.31	27.22	46.00	-18.78	-	-	QP
6	922.5157	28.61	4.06	32.67	46.00	-13.33	-	-	QP

Test mode:	TM1	Polarity:	Vertical
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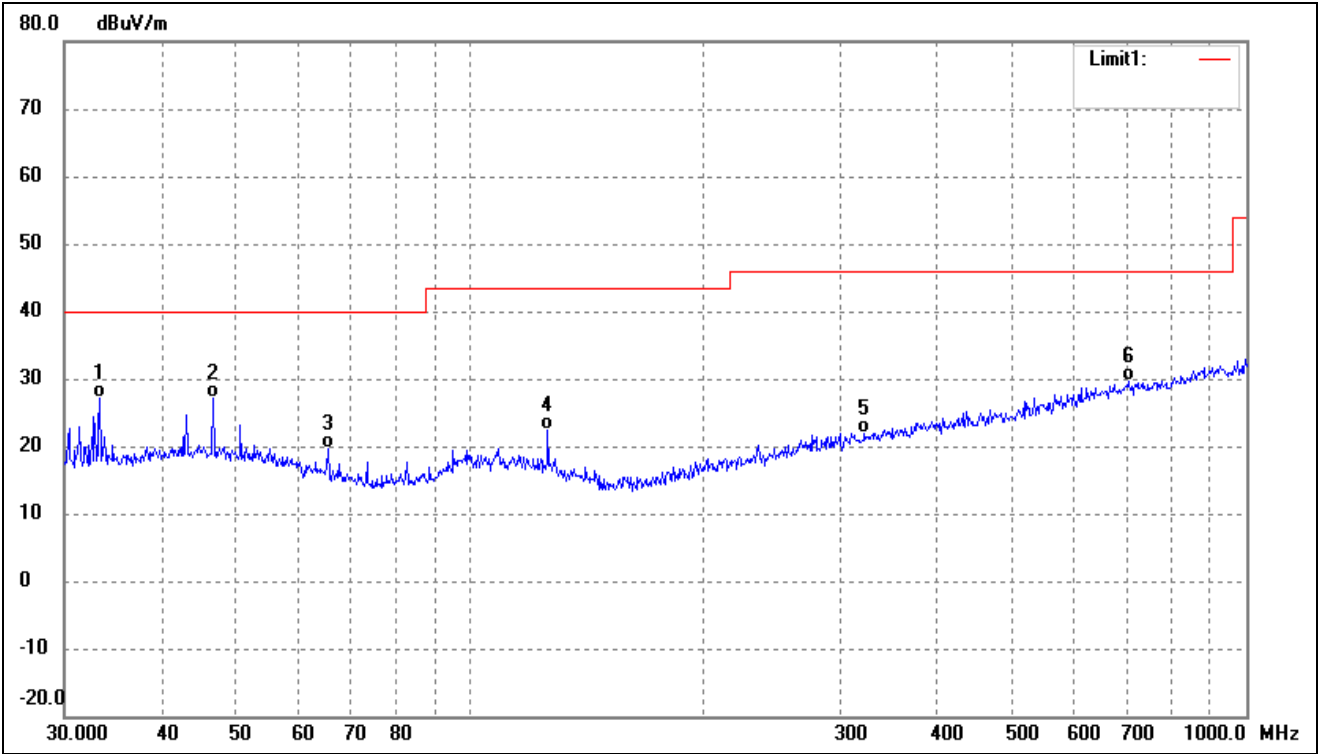
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	30.2111	38.42	-9.28	29.14	40.00	-10.86	-	-	QP
2	45.0583	38.05	-7.22	30.83	40.00	-9.17	-	-	QP
3	52.2079	34.90	-7.71	27.19	40.00	-12.81	-	-	QP
4	125.8864	35.70	-9.87	25.83	43.50	-17.67	-	-	QP
5	267.5455	30.18	-6.11	24.07	46.00	-21.93	-	-	QP
6	654.2318	28.54	0.64	29.18	46.00	-16.82	-	-	QP

Test mode:	TM2	Polarity:	Horizontal
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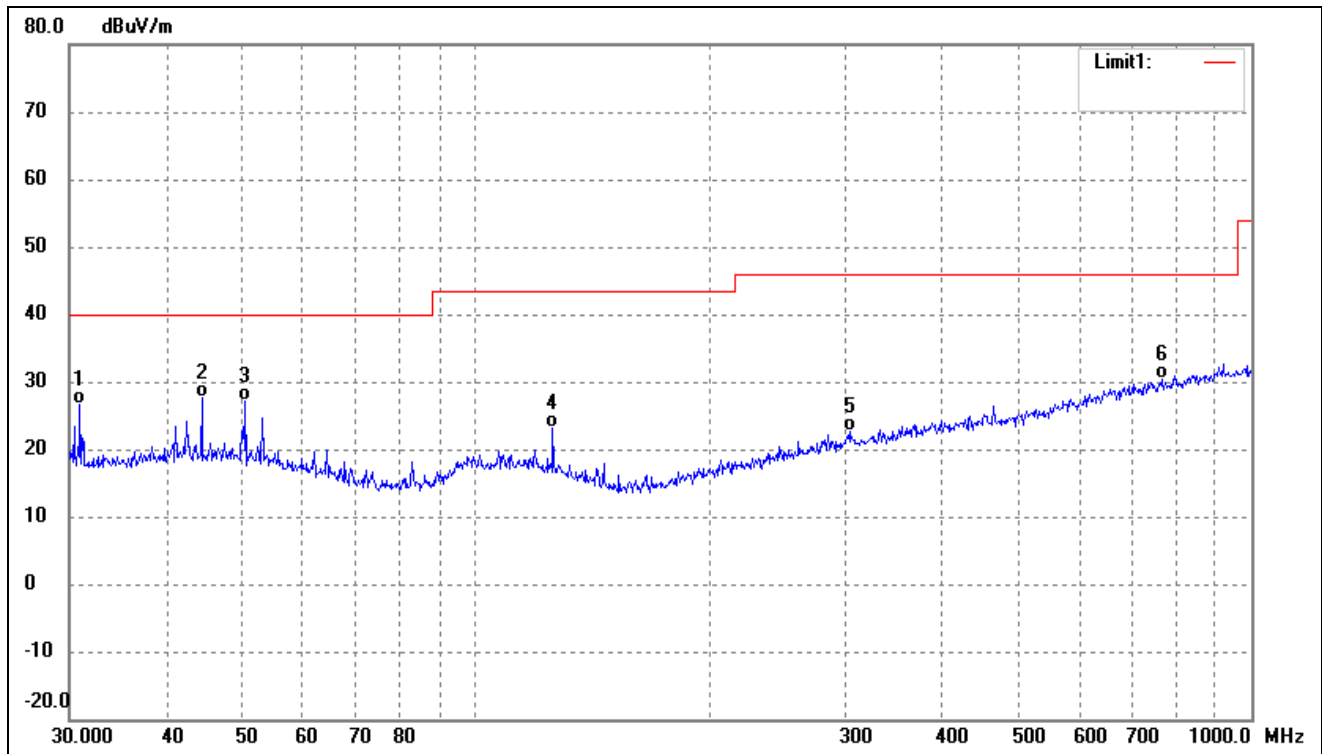
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	30.8535	31.77	-9.13	22.64	40.00	-17.36	-	-	QP
2	52.7600	27.15	-7.80	19.35	40.00	-20.65	-	-	QP
3	125.8864	35.50	-9.87	25.63	43.50	-17.87	-	-	QP
4	210.0482	27.00	-8.07	18.93	43.50	-24.57	-	-	QP
5	389.3549	27.62	-3.48	24.14	46.00	-21.86	-	-	QP
6	682.3484	29.36	1.09	30.45	46.00	-15.55	-	-	QP

Test mode:	TM2	Polarity:	Vertical
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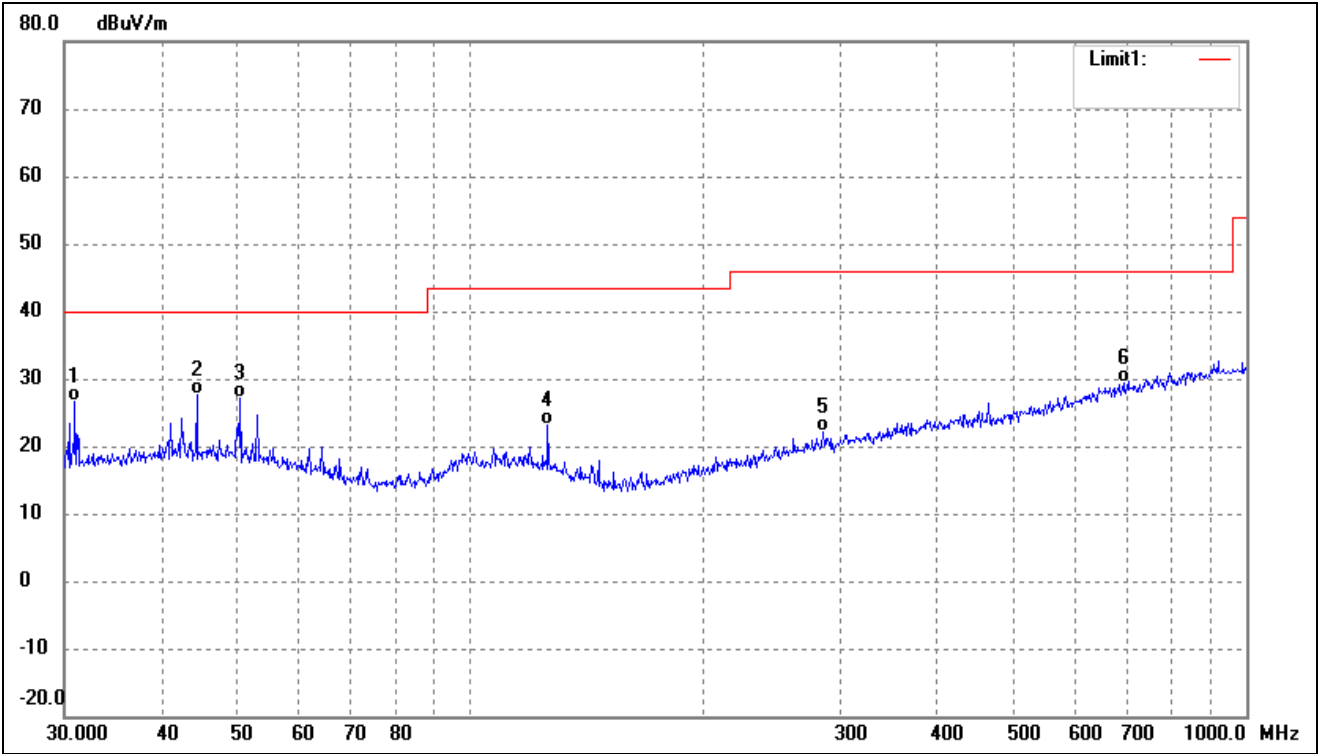
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	33.3278	35.77	-8.59	27.18	40.00	-12.82	-	-	QP
2	46.6664	34.39	-7.25	27.14	40.00	-12.86	-	-	QP
3	65.5726	29.73	-10.18	19.55	40.00	-20.45	-	-	QP
4	125.8863	32.27	-9.87	22.40	43.50	-21.10	-	-	QP
5	322.1886	26.61	-4.64	21.97	46.00	-24.03	-	-	QP
6	704.2260	28.13	1.41	29.54	46.00	-16.46	-	-	QP

Test mode:	TM3	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	30.9619	35.67	-9.11	26.56	40.00	-13.44	-	-	QP
2	44.4308	34.91	-7.21	27.70	40.00	-12.30	-	-	QP
3	50.5860	34.46	-7.42	27.04	40.00	-12.96	-	-	QP
4	125.8864	32.89	-9.87	23.02	43.50	-20.48	-	-	QP
5	304.6099	27.46	-4.94	22.52	46.00	-23.48	-	-	QP
6	768.7481	28.25	2.01	30.26	46.00	-15.74	-	-	QP

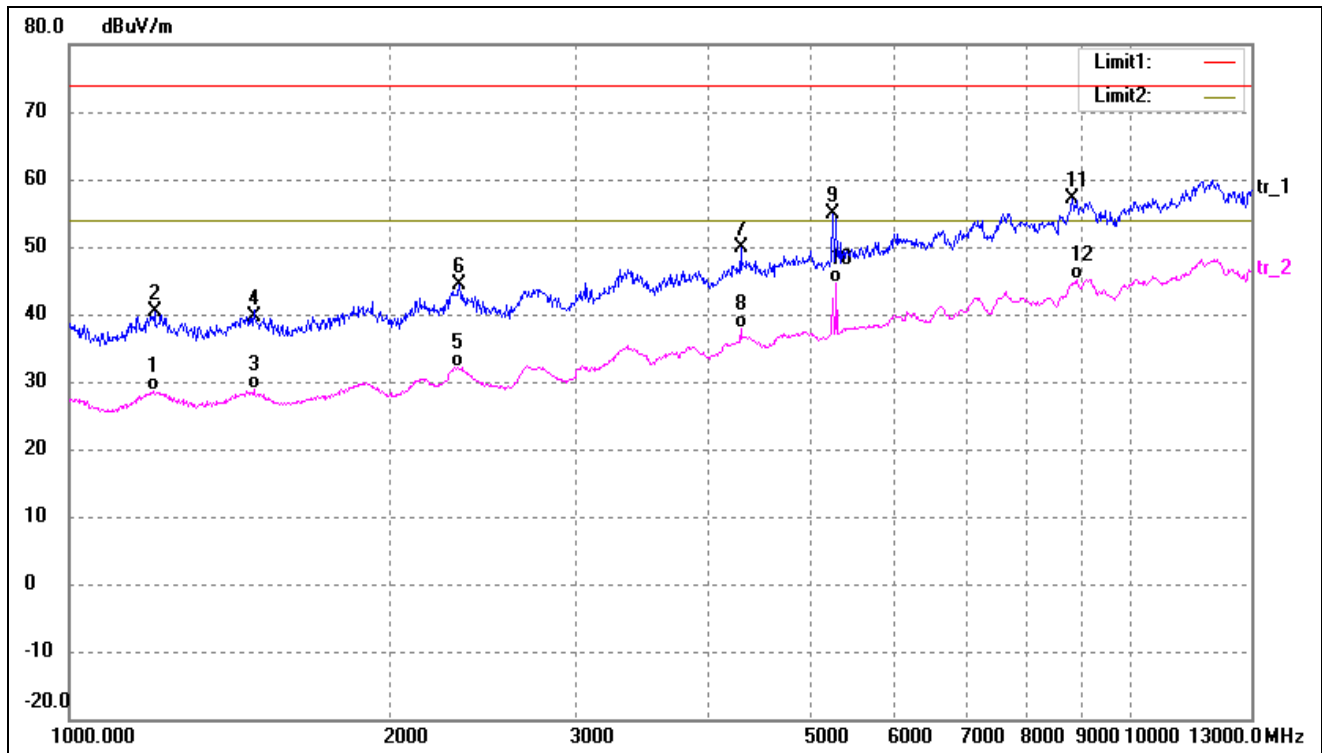
Test mode:	TM3	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	30.9619	35.67	-9.11	26.56	40.00	-13.44	-	-	QP
2	44.4308	34.91	-7.21	27.70	40.00	-12.30	-	-	QP
3	50.5860	34.46	-7.42	27.04	40.00	-12.96	-	-	QP
4	125.8864	32.89	-9.87	23.02	43.50	-20.48	-	-	QP
5	284.9767	27.62	-5.51	22.11	46.00	-23.89	-	-	QP
6	694.4174	28.09	1.28	29.37	46.00	-16.63	-	-	QP

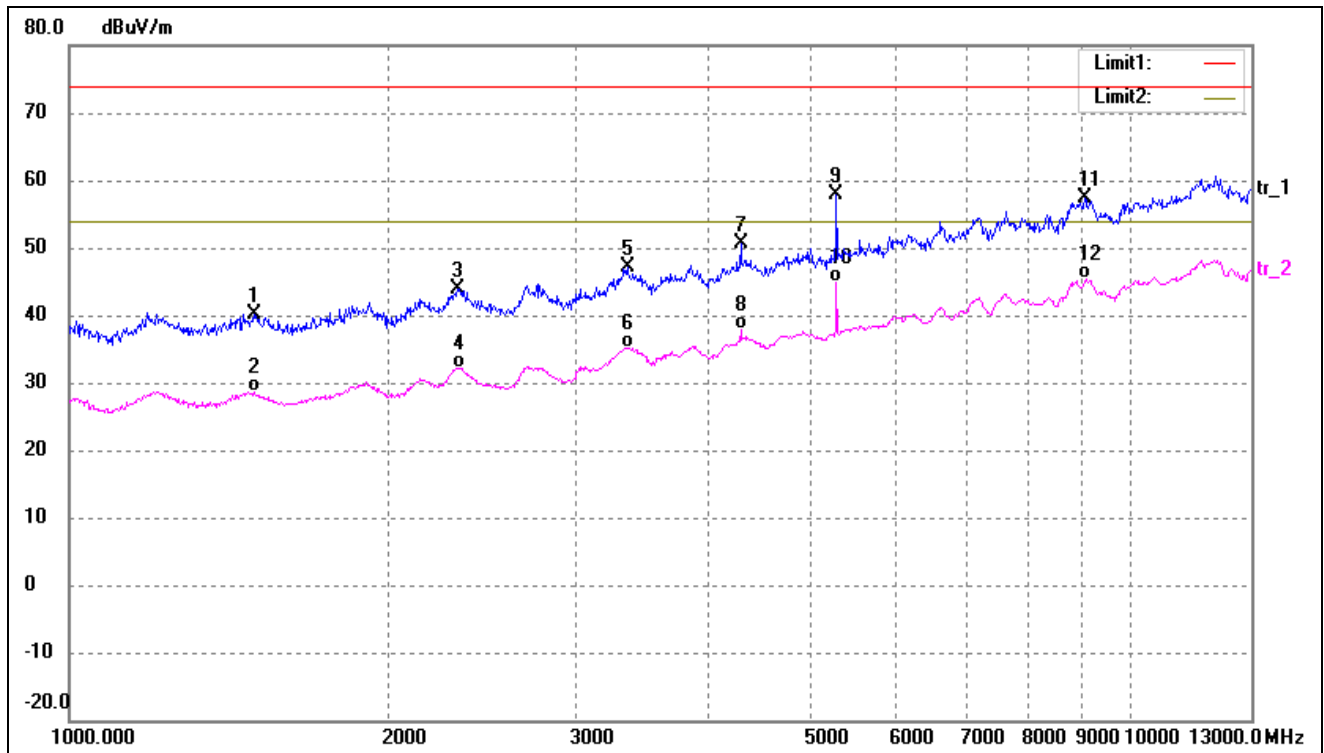
➤ Above 1GHz

Test mode:	TM1(worst case)	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	1199.748	41.52	-12.90	28.62	54.00	-25.38	-	-	AVG
2	1202.829	53.22	-12.89	40.33	74.00	-33.67	-	-	peak
3	1492.022	40.40	-11.62	28.78	54.00	-25.22	-	-	AVG
4	1495.854	51.33	-11.60	39.73	74.00	-34.27	-	-	peak
5	2319.388	40.83	-8.74	32.09	54.00	-21.91	-	-	AVG
6	2331.317	53.09	-8.70	44.39	74.00	-29.61	-	-	peak
7	4292.594	54.16	-4.38	49.78	74.00	-24.22	-	-	peak
8	4292.594	42.36	-4.38	37.98	54.00	-16.02	-	-	AVG
9	5243.333	57.02	-2.07	54.95	74.00	-19.05	-	-	peak
10	5283.835	46.59	-2.00	44.59	54.00	-9.41	-	-	AVG
11	8802.863	52.07	5.16	57.23	74.00	-16.77	-	-	peak
12	8893.644	39.46	5.77	45.23	54.00	-8.77	-	-	AVG

Test mode:	TM1(worst case)	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	1492.022	51.81	-11.62	40.19	74.00	-33.81	-	-	peak
2	1492.022	40.27	-11.62	28.65	54.00	-25.35	-	-	AVG
3	2319.388	52.64	-8.74	43.90	74.00	-30.10	-	-	peak
4	2337.304	40.85	-8.68	32.17	54.00	-21.83	-	-	AVG
5	3355.686	53.38	-6.17	47.21	74.00	-26.79	-	-	peak
6	3355.686	41.34	-6.17	35.17	54.00	-18.83	-	-	AVG
7	4292.594	55.01	-4.38	50.63	74.00	-23.37	-	-	peak
8	4292.594	42.15	-4.38	37.77	54.00	-16.23	-	-	AVG
9	5283.835	59.87	-2.00	57.87	74.00	-16.13	-	-	peak
10	5283.835	46.88	-2.00	44.88	54.00	-9.12	-	-	AVG
11	9054.768	51.03	6.25	57.28	74.00	-16.72	-	-	peak
12	9078.023	39.21	6.17	45.38	54.00	-8.62	-	-	AVG

Remark: '-Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

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