

# TEST REPORT

Reference No..... : WTX21X09092084W  
FCC ID ..... : 2AU3A-MP100-V2  
Applicant ..... : Good Sportsman Marketing, LLC  
Address..... : 5250 Frye Rd, Irving, TX 75061, United States  
Product Name ..... : Mantis Pro 100  
Test Model ..... : WRC-MP100 V2  
Standards ..... : **FCC PART15 SUBPART B**  
Date of Receipt sample .... : Sept. 01, 2021  
Date of Test..... : Sept. 01, 2021 to Sept. 06, 2021  
Date of Issue ..... : Sept. 06, 2021  
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 compiler and approver.

**Prepared By:**

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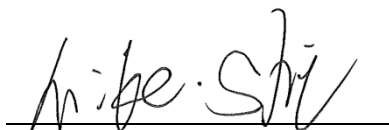
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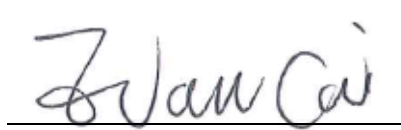
Tested by:

Reviewed By:

Approved & Authorized By:



Mike Shi / Project Engineer



Evan Cai / EMC Manager



Silin Chen / Manager

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**Report version**

Version No.	Date of issue	Description
Rev.00	Sept. 06, 2021	Original
/	/	/

## 1. GENERAL INFORMATION

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

#### Client Information

Applicant: Good Sportsman Marketing, LLC  
 Address of applicant: 5250 Frye Rd, Irving, TX 75061, United States

Manufacturer: K-Mark Industrial Limited.  
 Address of manufacturer: Flat A, 7/F., Mai On Ind. Bldg 17-21 Kung Yip St.,  
 Kwai Chung Hong Kong

General Description of EUT	
Product Name:	Mantis Pro 100
Trade Name:	/
Model No.:	WRC-MP100 V2
Adding Model(s):	/
Software Version:	3.1
Hardware Version:	1.0
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	Power Port::DC12V Batter:1.5V*8
Rated Current:	/
Rated Power:	/
Power Adapter Model:	/
Lowest Internal Frequency:	24 MHz
Highest Internal Frequency:	433MHz
Classification of ITE:	Class B
Antenna Type:	PCB Antenna
Antenna Gain:	3dBi

## 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	Normal working 433MHz Receiver	Connect to the adapter, the AC120V 60Hz for adapter	Power Port::DC12V Batter:1.5V*8
TM2	Normal working 433MHz Receiver	Powered by batter	Power Port::DC12V Batter:1.5V*8

EUT Cable List and Details				
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite	With / Without Chip
/	/	/	/	/

Special Cable List and Details				
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite	With / Without Chip
DC CABLE	1.5	Unshielded	Without Ferrite	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Adapter	/	YCL-B120100EU	/

## 1.6 Measurement Uncertainty

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

**1.7 Test Equipment List and Details**

Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2021-03-30	2022-03-29
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2021-04-12	2022-04-11
Amplifier	Agilent	8447F	3113A06717	2021-04-12	2022-04-11
Amplifier	C&D	PAP-1G18	2002	2021-04-12	2022-04-11
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2021-03-20	2023-03-19
Horn Antenna	ETS	3117	00086197	2021-03-19	2023-03-18
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2023-03-19
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2021-05-06	2022-05-05
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2023-04-08
Amplifier	Agilent	8447D	2944A10179	2021-04-12	2022-04-11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2021-04-15	2022-04-14

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

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<b>Description of Test</b>	<b>Result</b>
§15.107(a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

N/A: not applicable



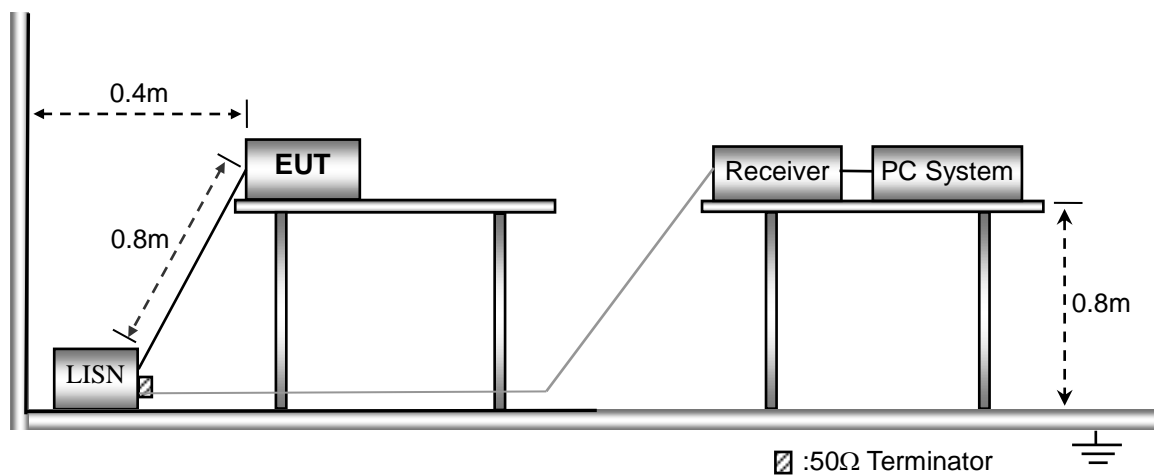
### 3. Conducted Emissions

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#### 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

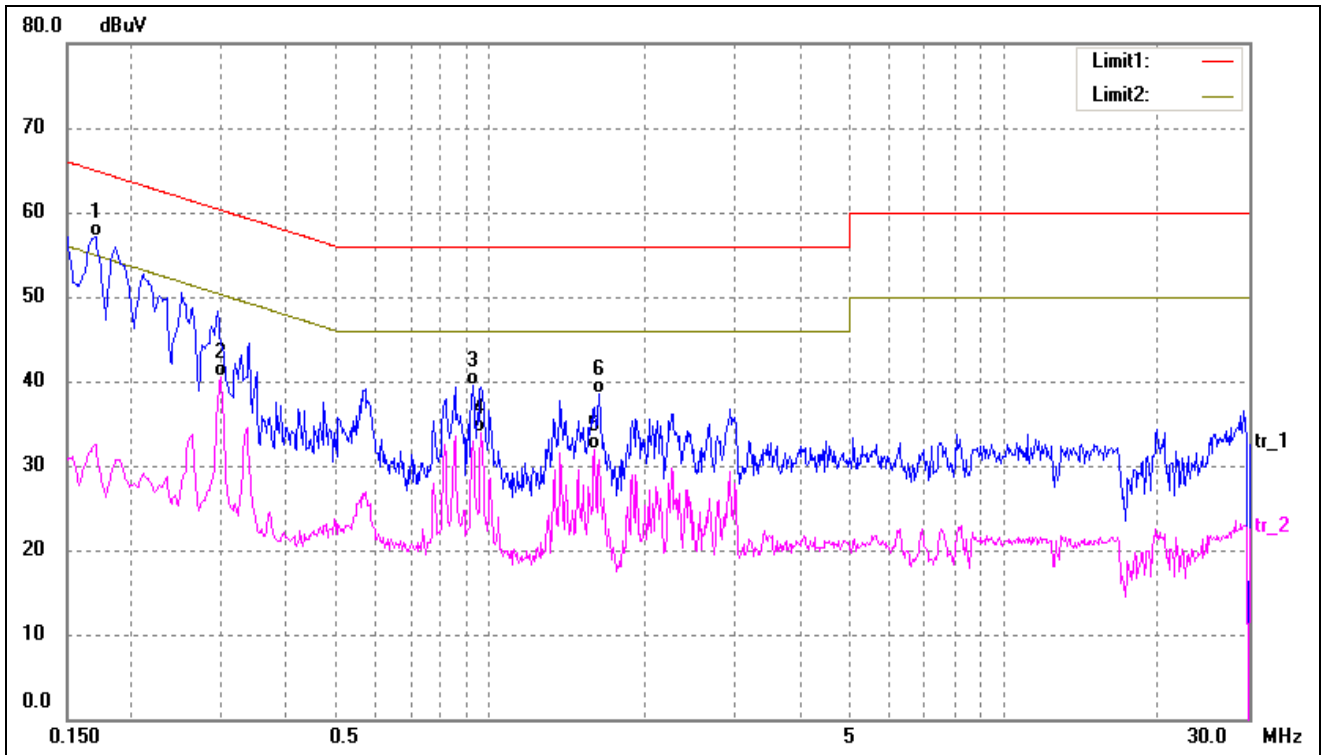
Temperature:	23.5 °C
Relative Humidity:	54 %
ATM Pressure:	1011 mbar

#### 3.4 Summary of Test Results

Look at the graphs and data below :

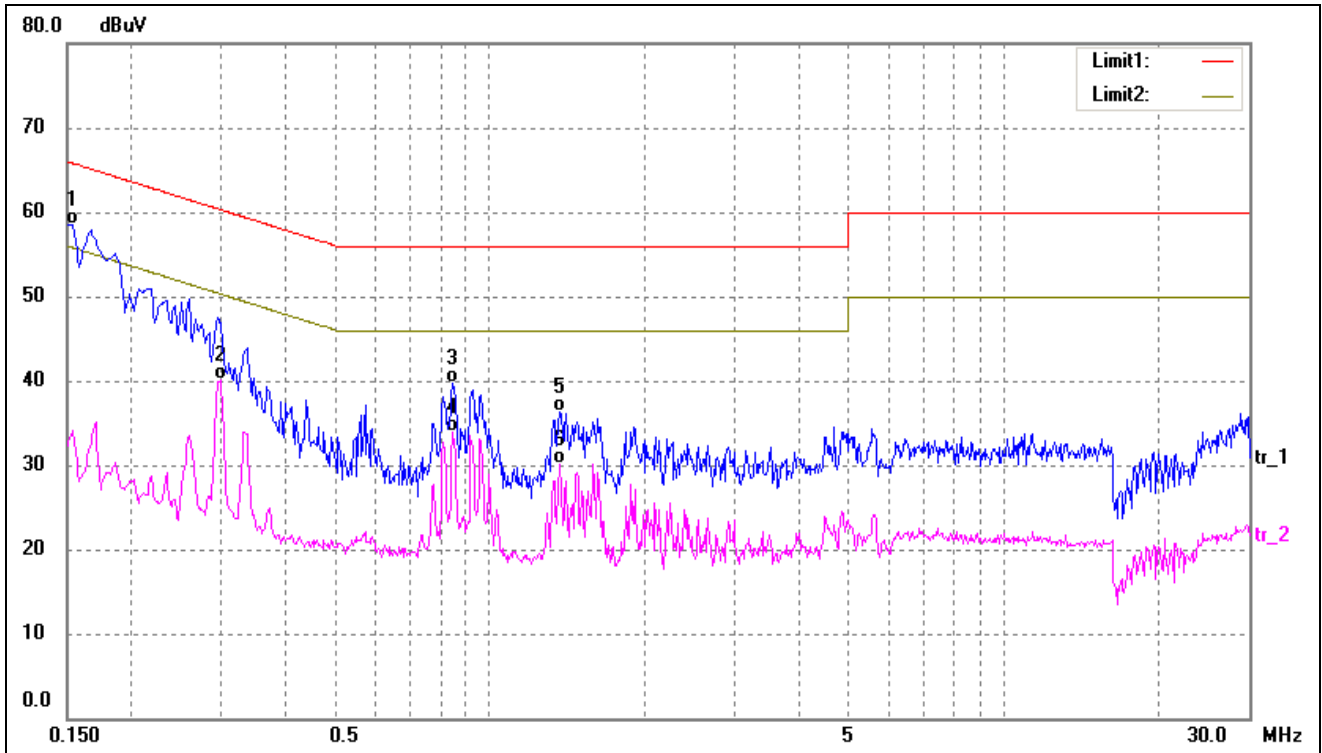
#### 3.5 Conducted Emissions Test Data

Test mode:	TM1	Polarity:	Line
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1700	46.91	10.25	57.16	64.96	-7.80	QP
2	0.2980	30.28	10.24	40.52	50.30	-9.78	AVG
3	0.9260	29.19	10.22	39.41	56.00	-16.59	QP
4	0.9620	23.74	10.21	33.95	46.00	-12.05	AVG
5	1.5940	21.70	10.24	31.94	46.00	-14.06	AVG
6	1.6300	28.33	10.25	38.58	56.00	-17.42	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*	0.1540	48.31	10.25	58.56	65.78	-7.22	QP
2	0.2980	29.77	10.24	40.01	50.30	-10.29	AVG
3	0.8460	29.46	10.20	39.66	56.00	-16.34	QP
4	0.8460	23.75	10.20	33.95	46.00	-12.05	AVG
5	1.3660	26.08	10.22	36.30	56.00	-19.70	QP
6	1.3700	19.91	10.22	30.13	46.00	-15.87	AVG

## 4. RADIATED EMISSION

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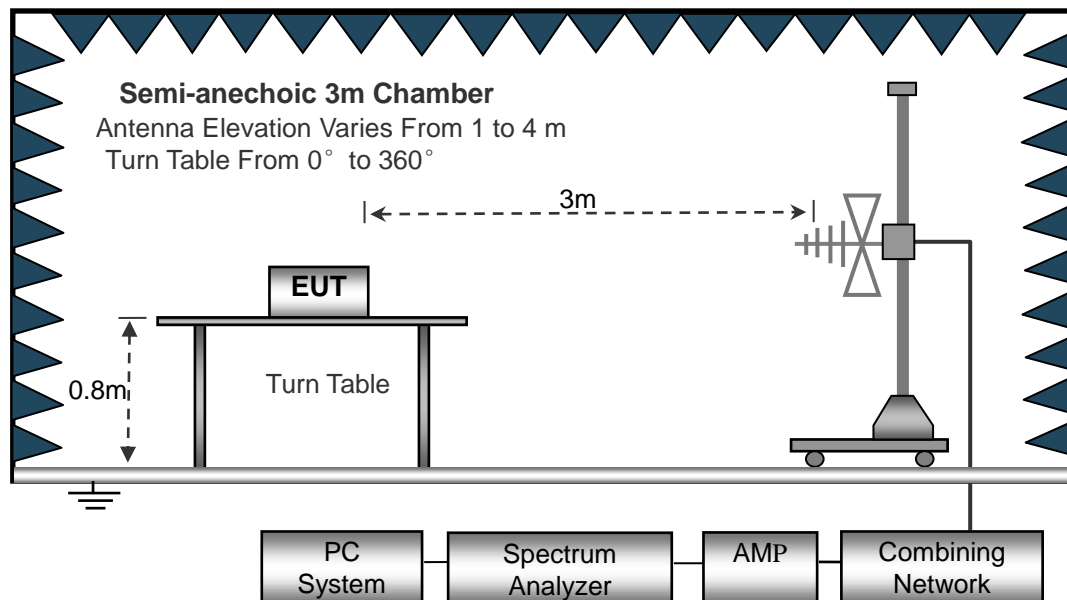
### 4.1 Test Procedure

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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Correct}$$

$$\text{Correct} = \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB $\mu$ V means the emission is 6dB $\mu$ 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

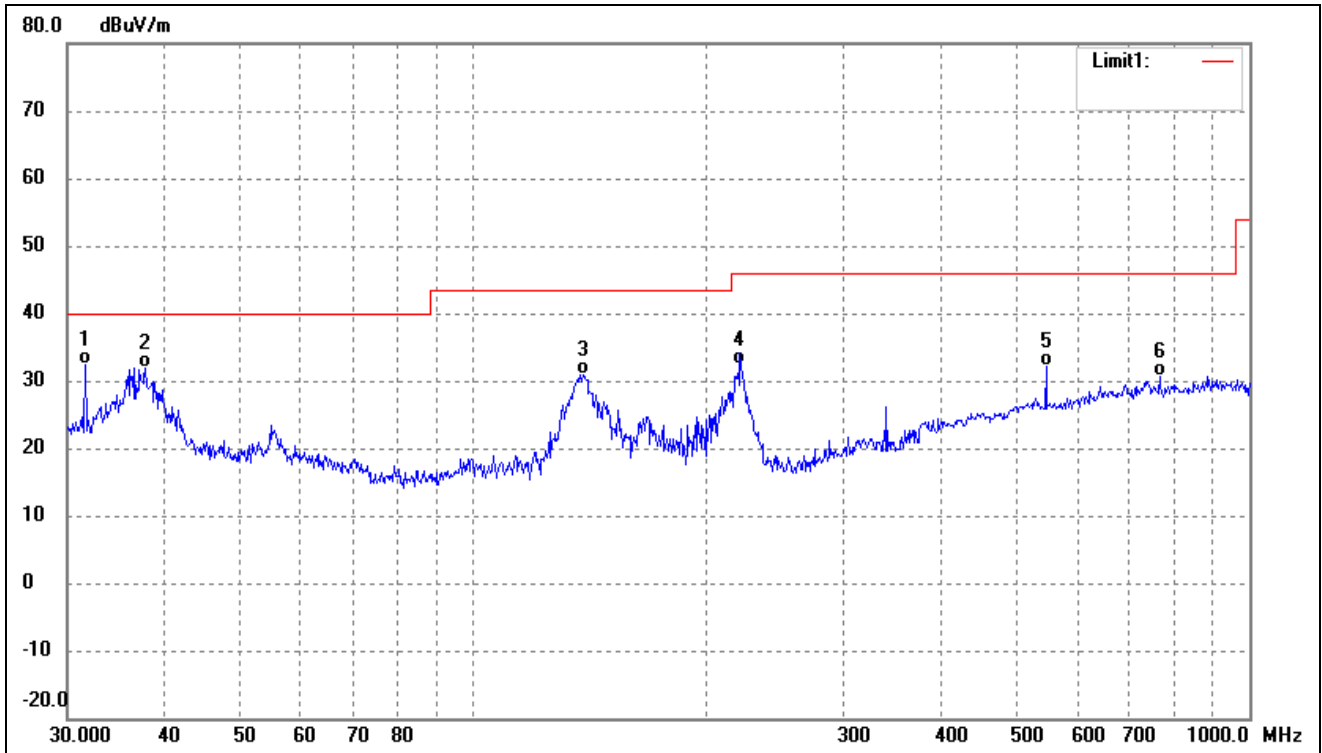
Temperature:	23.5 °C
Relative Humidity:	54 %
ATM Pressure:	1011 mbar

### 4.6 Summary of Test Results

Look at the graphs and data below :

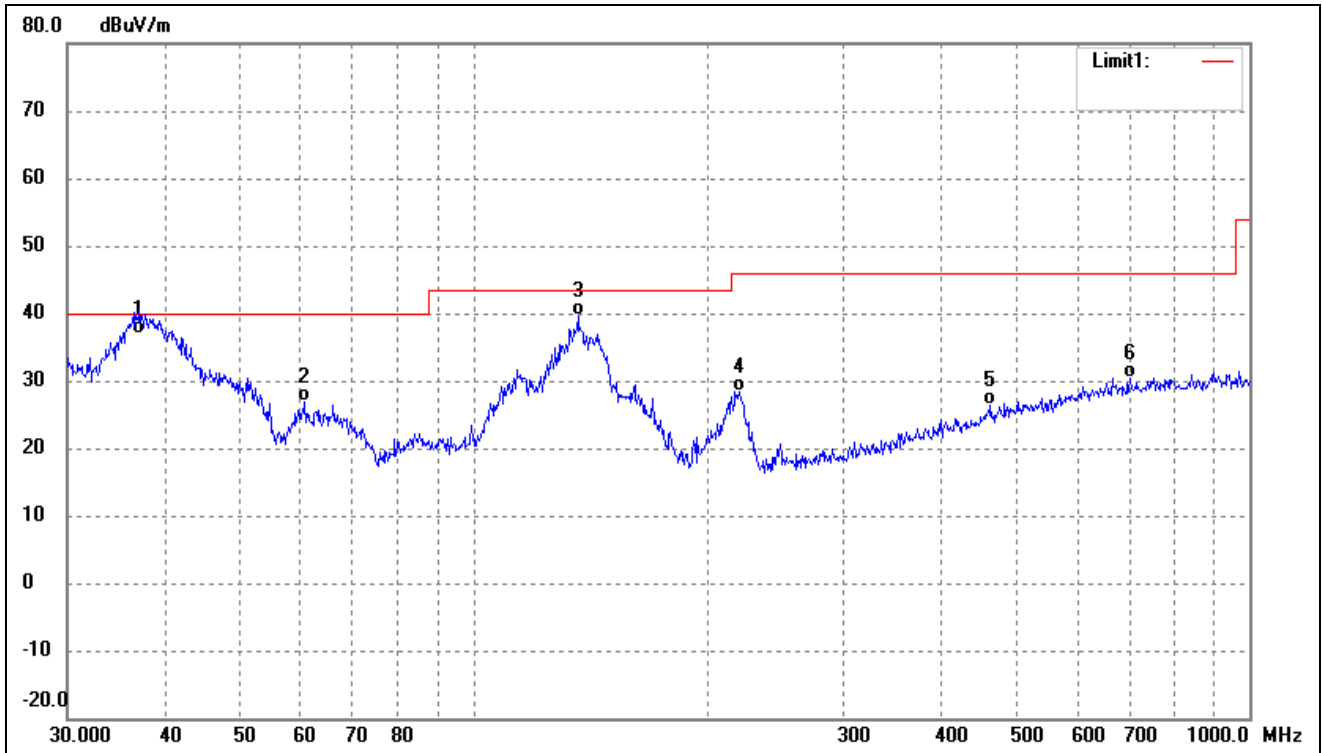
**Below 1GHz**

Test mode:	TM1	Polarity:	Horizontal
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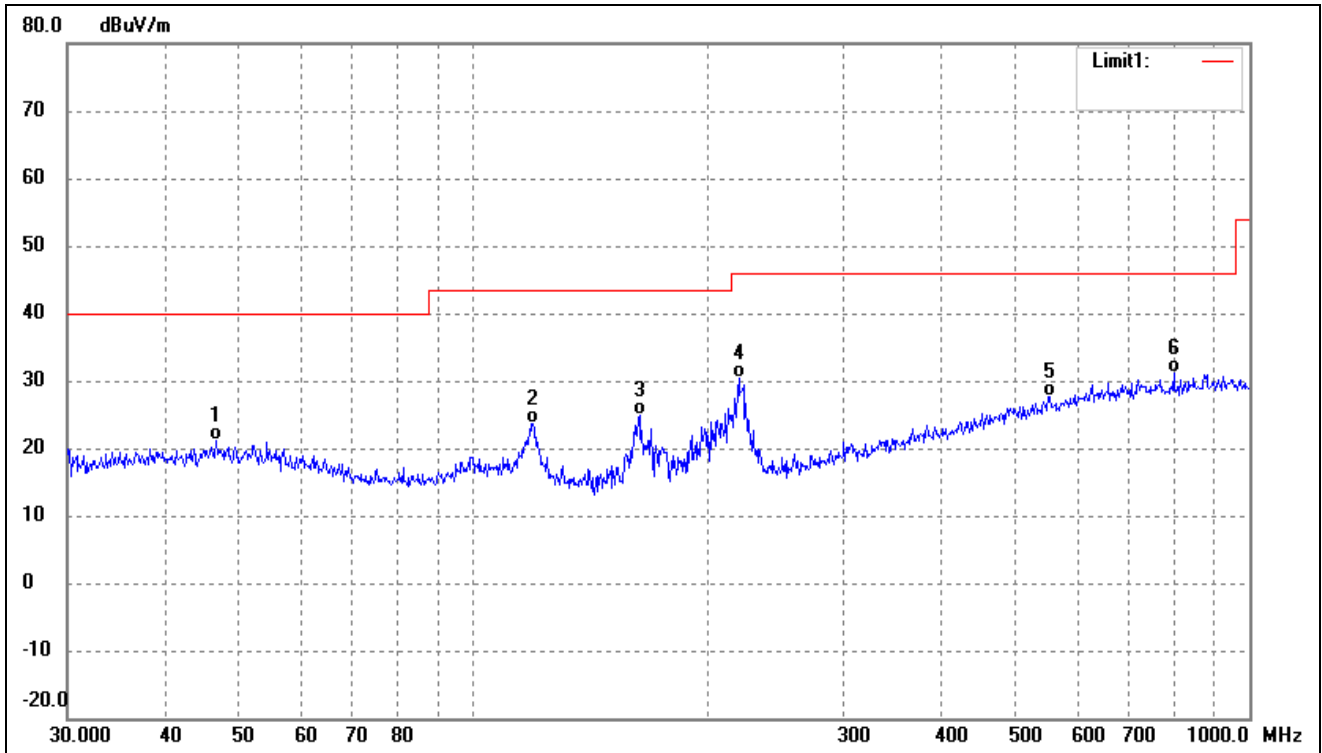
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	31.6202	41.38	-9.06	32.32	40.00	-7.68	-	-	QP
2	37.8121	39.44	-7.53	31.91	40.00	-8.09	-	-	QP
3	138.8735	43.06	-12.18	30.88	43.50	-12.62	-	-	QP
4	221.3921	41.59	-9.11	32.48	46.00	-13.52	-	-	QP
5	547.0977	32.74	-0.52	32.22	46.00	-13.78	-	-	QP
6	766.0572	28.67	1.87	30.54	46.00	-15.46	-	-	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	37.1550	44.58	-7.70	36.88	40.00	-3.12	-	-	QP
2	60.7044	35.36	-8.55	26.81	40.00	-13.19	-	-	QP
3	136.4598	51.64	-11.97	39.67	43.50	-3.83	-	-	QP
4	219.8449	37.50	-9.15	28.35	46.00	-17.65	-	-	QP
5	463.9696	28.50	-2.21	26.29	46.00	-19.71	-	-	QP
6	701.7610	29.00	1.44	30.44	46.00	-15.56	-	-	QP

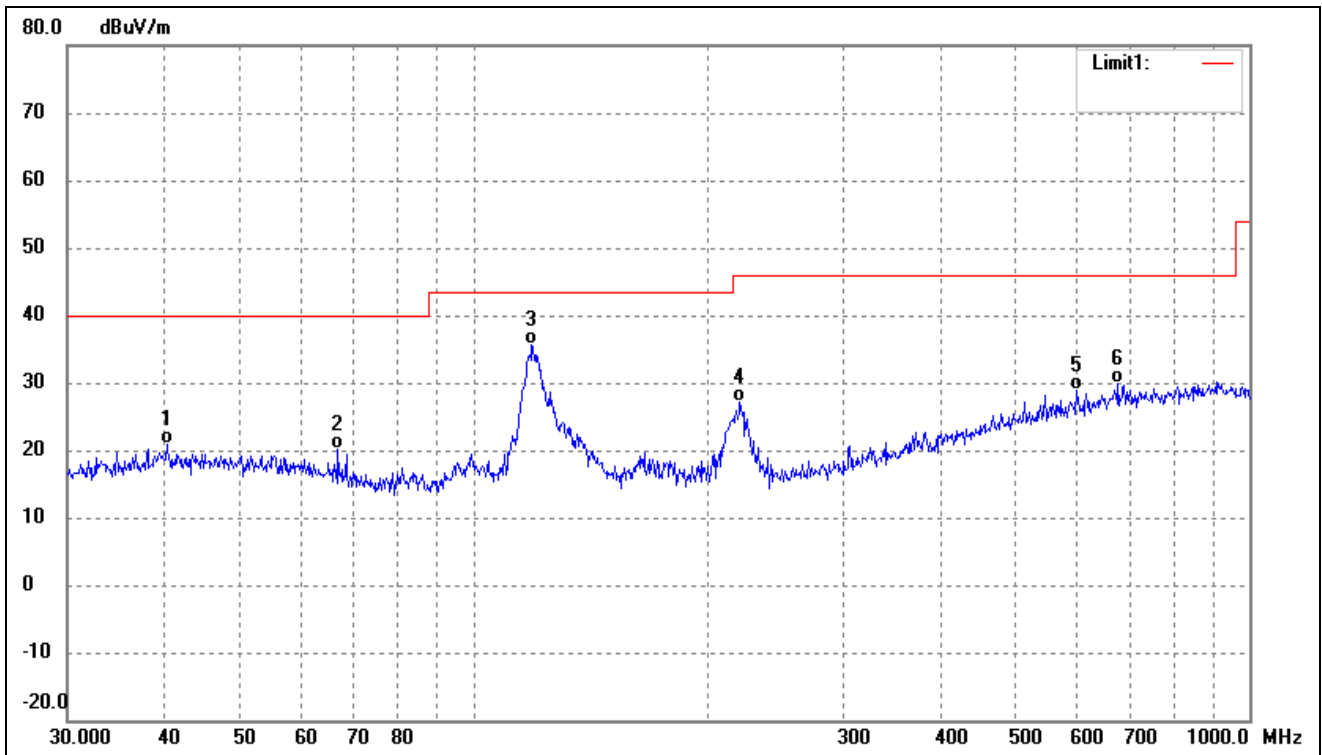
Test mode:	TM2	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	46.6664	28.14	-6.98	21.16	40.00	-18.84	-	-	QP
2	119.4361	33.16	-9.56	23.60	43.50	-19.90	-	-	QP
3	163.7550	36.93	-12.00	24.93	43.50	-18.57	-	-	QP
4	219.8449	39.53	-9.15	30.38	46.00	-15.62	-	-	QP
5	552.8833	28.01	-0.42	27.59	46.00	-18.41	-	-	QP
6	798.9797	28.95	2.09	31.04	46.00	-14.96	-	-	QP



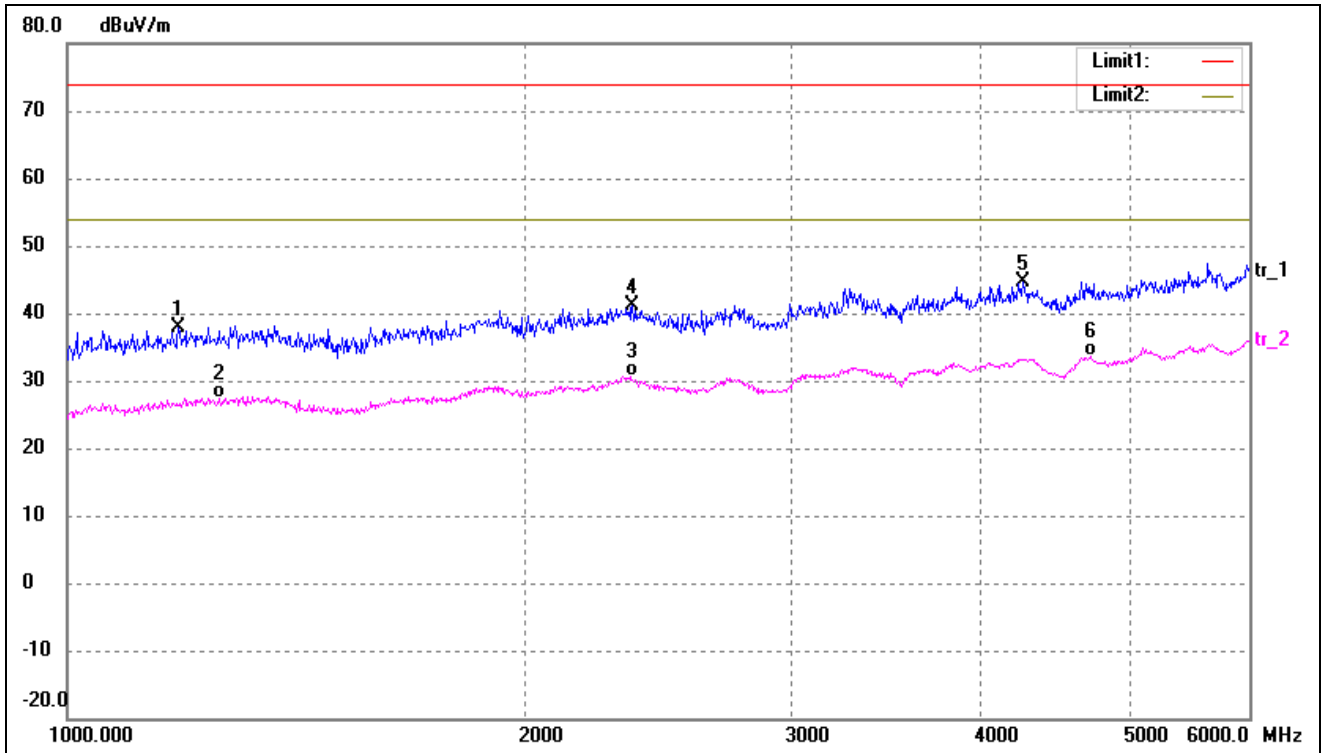
Test mode:	TM2	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	40.2757	27.78	-7.00	20.78	40.00	-19.22	-	-	QP
2	66.9669	29.66	-9.64	20.02	40.00	-19.98	-	-	QP
3	119.0180	45.27	-9.53	35.74	43.50	-7.76	-	-	QP
4	220.6171	36.29	-9.14	27.15	46.00	-18.85	-	-	QP
5	599.3213	28.63	0.36	28.99	46.00	-17.01	-	-	QP
6	677.5798	28.67	1.20	29.87	46.00	-16.13	-	-	QP

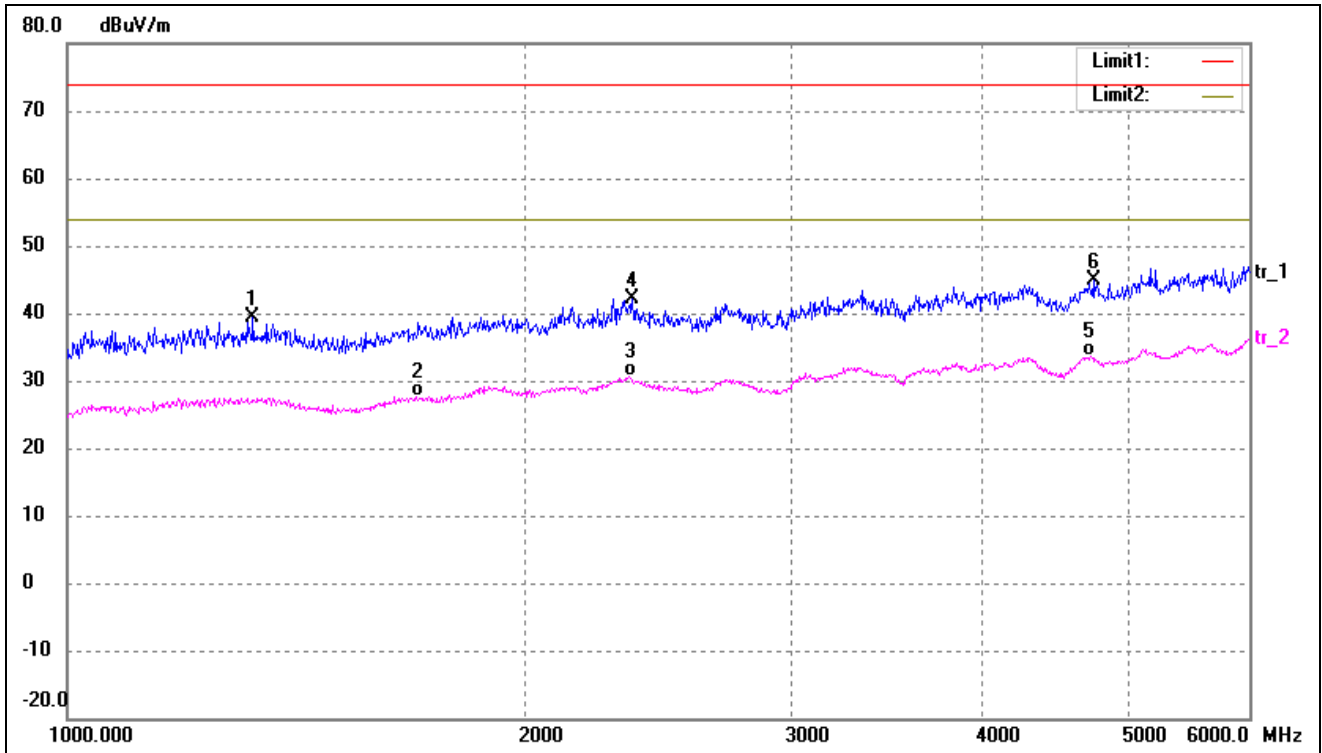
**Above 1GHz**

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	1183.440	52.06	-14.26	37.80	74.00	-36.20	-	-	peak
2	1260.032	41.34	-13.87	27.47	54.00	-26.53	-	-	AVG
3	2350.597	41.39	-10.76	30.63	54.00	-23.37	-	-	AVG
4	2354.812	51.90	-10.75	41.15	74.00	-32.85	-	-	peak
5	4253.498	51.92	-7.34	44.58	74.00	-29.42	-	-	peak
6	4719.315	39.88	-6.34	33.54	54.00	-20.46	-	-	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	1324.859	52.90	-13.55	39.35	74.00	-34.65	-	-	peak
2	1696.503	39.79	-12.11	27.68	54.00	-26.32	-	-	AVG
3	2342.189	41.29	-10.76	30.53	54.00	-23.47	-	-	AVG
4	2354.812	52.82	-10.75	42.07	74.00	-31.93	-	-	peak
5	4719.315	39.89	-6.34	33.55	54.00	-20.45	-	-	AVG
6	4736.257	51.15	-6.30	44.85	74.00	-29.15	-	-	peak

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**

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**Please refer to “ANNEX”**

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