

# TEST REPORT

**Reference No.**..... : WTX22X03053166W  
**FCC ID** ..... : 2A5YS-LL-200271-ART  
**Applicant** ..... : Lucie Labs S.A.S.  
**Address** ..... : 1681 Route des Dolines, Les Taissounières, Le BELEM 06560 Valbonne  
France  
**Manufacturer** ..... : Staymatel  
**Address** ..... : Pôle Production Lot 23 1108 Avenue des Lions 83600 Fréjus France  
**Product Name** ..... : MetalScan V1.5  
**Model No.**..... : LL-200271-ART  
**Standards** ..... : FCC Part 18  
**Date of Receipt sample** .... : 2022-03-25  
**Date of Test**..... : 2022-03-25 to 2022-04-06  
**Date of Issue** ..... : 2022-04-06  
**Test Report Form No.** ..... : WTX\_Part 18W  
**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:**

**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  
Tel.: +86-755-33663308 Fax.: +86-755-33663309 Email: sem@waltek.com.cn

Tested by:

*Jack Huang*

Jack Huang

Approved by:

*Silin Chen*

Silin Chen

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## Report version

| Version No. | Date of issue | Description |
|-------------|---------------|-------------|
| Rev.00      | 2022-04-06    | Original    |
| /           | /             | /           |

## 1. GENERAL INFORMATION

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

| General Description of EUT                                                              |                |
|-----------------------------------------------------------------------------------------|----------------|
| Product Name:                                                                           | MetalScan V1.5 |
| Trade Name:                                                                             | Thieren        |
| Model No.:                                                                              | LL-200271-ART  |
| Adding Model(s):                                                                        | /              |
| Note: The test data is gathered from a production sample, provided by the manufacturer. |                |

| Technical Characteristics of EUT |               |
|----------------------------------|---------------|
| Antenna Type:                    | Coil Antenna  |
| Antenna Gain:                    | 0dBi          |
| Rated Voltage:                   | Battery DC 9V |
| Equipment Type:                  | Any type      |
| Any non-ISM frequency:           | 1kHz-148.5kHz |

## 1.2 Test Standards

The tests were performed according to following standards:

**FCC Part 18 Subpart C**: Industrial, Scientific, and medical medical equipment.

**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

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

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C. (518101)

### **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 level. 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 | DC Battery Powered | Battery DC 9V     |

EUT Cable List and Details

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

Auxiliary Equipment List and Details

| Description | Manufacturer | Model | Serial Number |
|-------------|--------------|-------|---------------|
| Metal       | /            | /     | /             |

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 $\pm 3.74\text{dB}$   |
|                         |            | 0.15-30MHz $\pm 3.34\text{dB}$ |
| Radiated Emissions      | Radiated   | 30-200MHz $\pm 4.52\text{dB}$  |
|                         |            | 0.2-1GHz $\pm 5.56\text{dB}$   |
|                         |            | 1-6GHz $\pm 3.84\text{dB}$     |
|                         |            | 6-18GHz $\pm 3.92\text{dB}$    |

**1.7 Test Equipment List and Details**

| Description              | Manufacturer    | Model       | Serial No. | Cal Date   | Due Date   |
|--------------------------|-----------------|-------------|------------|------------|------------|
| 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 |
| Amplifier                | C&D             | PAP-1G18    | 2002       | 2022-03-22 | 2023-03-21 |
| 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 |
| 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 |
| Pulse Limiter            | Rohde & Schwarz | ESH3-Z2     | 100911     | 2022-03-25 | 2023-03-24 |

| 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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| FCC RULES    | DESCRIPTION OF TEST | RESULT    |
|--------------|---------------------|-----------|
| § 18.307 (b) | Conducted Emission  | N/A       |
| § 18.305 (b) | Radiated Emission   | Compliant |

N/A: Not applicable.

### 3. Radiated Emissions

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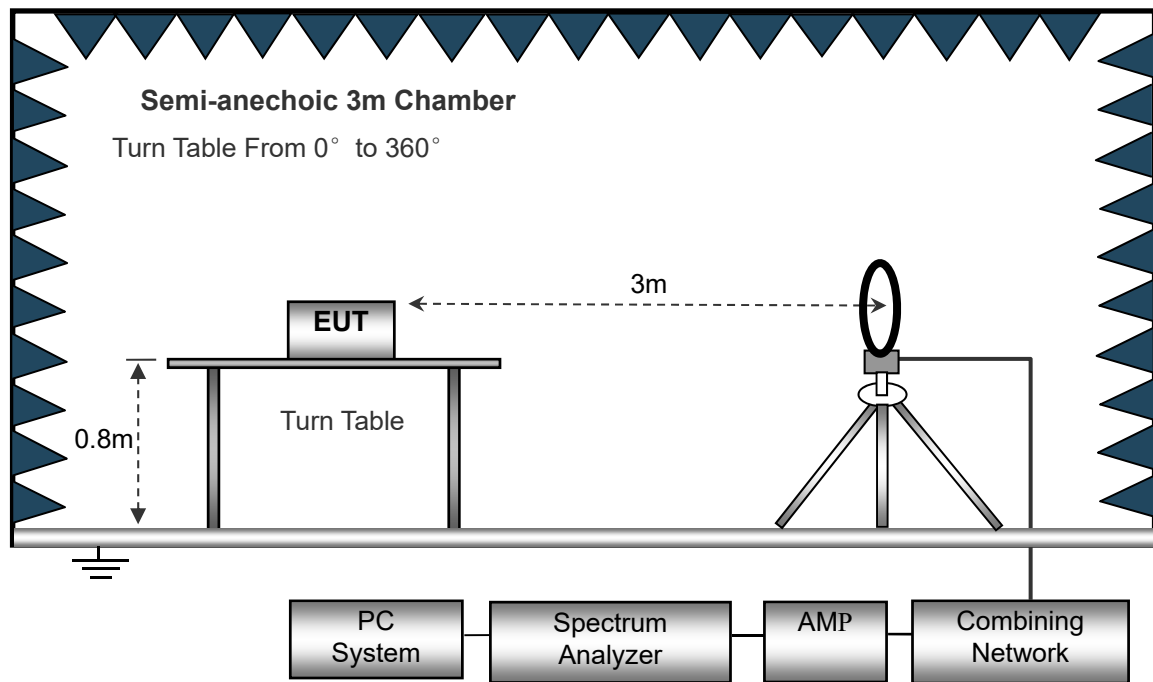
#### 3.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 18.305 Limit.

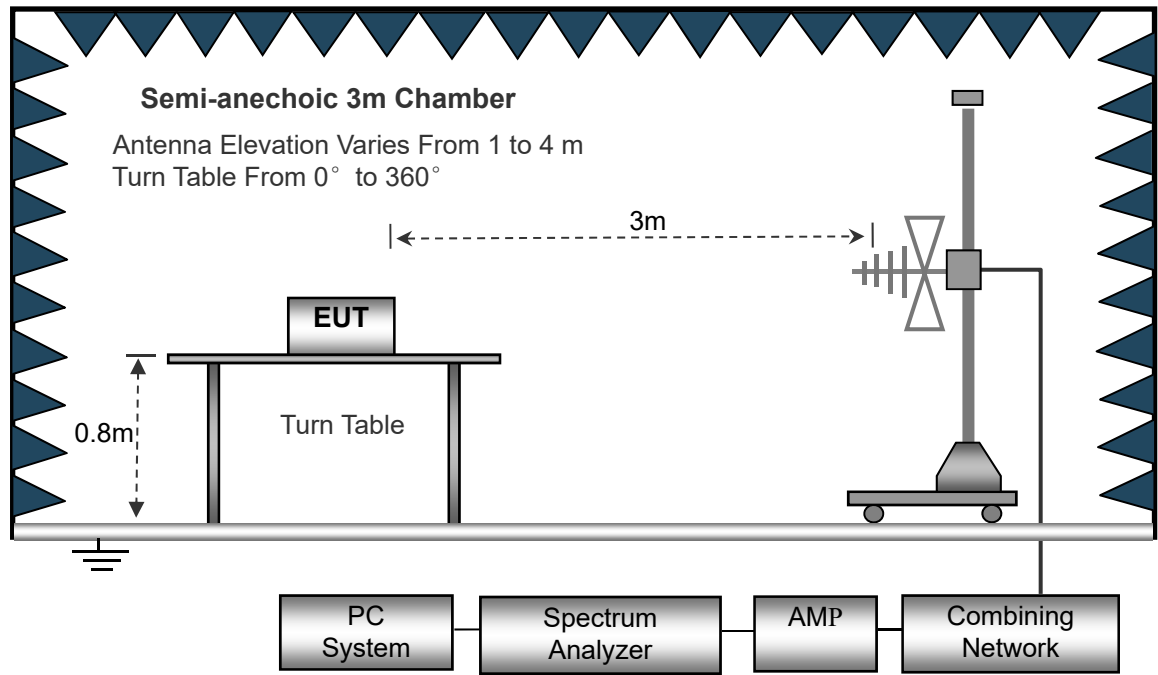
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The test setup for emission measurement below 30MHz..



The test setup for emission measurement from 30 MHz to 1 GHz..



### 3.2 Test Receiver Setup

|                          |                              |
|--------------------------|------------------------------|
| Frequency :9kHz-30MHz    | Frequency :30MHz-1GHz        |
| RBW=10KHz,               | RBW=120KHz,                  |
| VBW =30KHz               | VBW=300KHz                   |
| Sweep time= Auto         | Sweep time= Auto             |
| Trace = max hold         | Trace = max hold             |
| Detector function = peak | Detector function = peak, QP |

### 3.3 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Any non-ISM frequency device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 18.305 Limit}$$

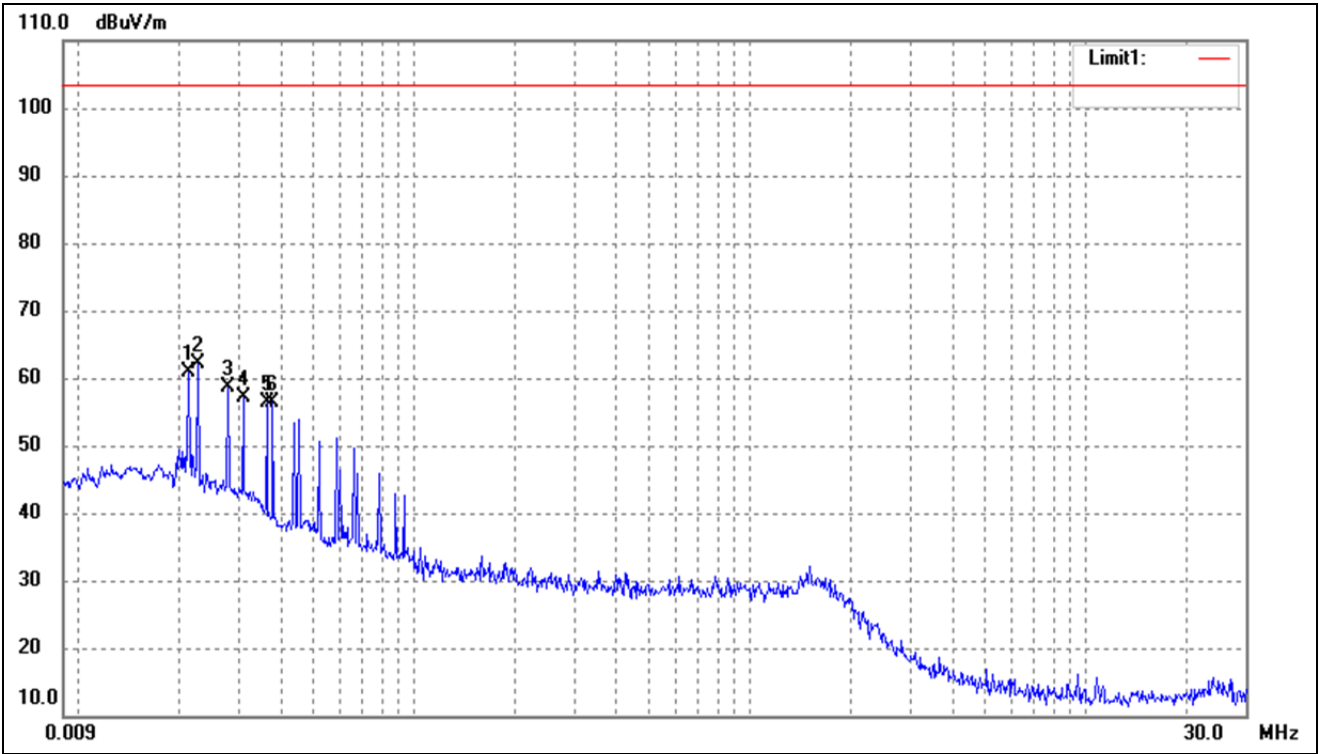
### 3.4 Environmental Conditions

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

### 3.5 Summary of Test Results/Plots

Plot of Radiated Emissions Test Data ( Below 30MHz)

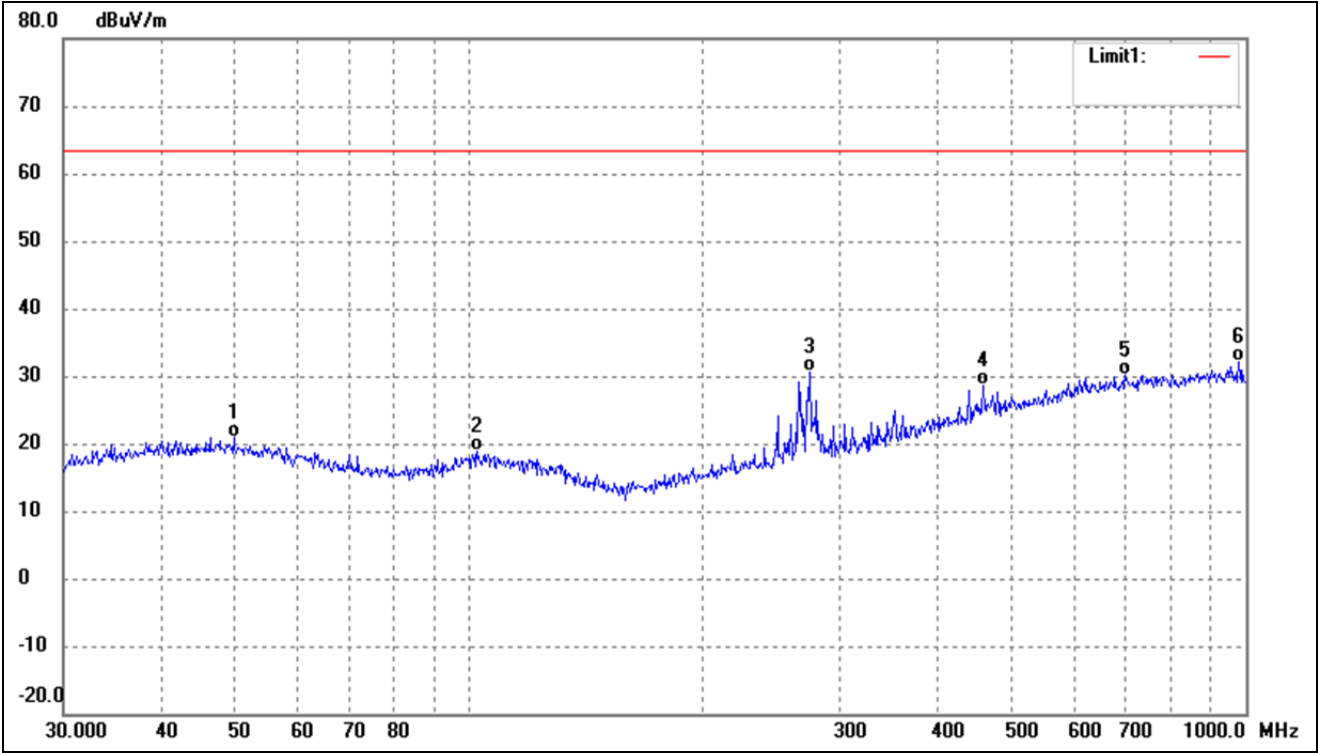
|            |     |           |            |
|------------|-----|-----------|------------|
| Test mode: | TM1 | Polarity: | Horizontal |
|------------|-----|-----------|------------|



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 0.0213             | 87.03               | -26.08          | 60.95              | 103.50            | -42.55         | -             | -              | peak   |
| 2   | 0.0227             | 88.24               | -26.08          | 62.16              | 103.50            | -41.34         | -             | -              | peak   |
| 3   | 0.0278             | 84.69               | -26.07          | 58.62              | 103.50            | -44.88         | -             | -              | peak   |
| 4   | 0.0309             | 83.29               | -26.07          | 57.22              | 103.50            | -46.28         | -             | -              | peak   |
| 5   | 0.0363             | 82.39               | -26.07          | 56.32              | 103.50            | -47.18         | -             | -              | peak   |
| 6   | 0.0378             | 82.55               | -26.06          | 56.49              | 103.50            | -47.01         | -             | -              | peak   |

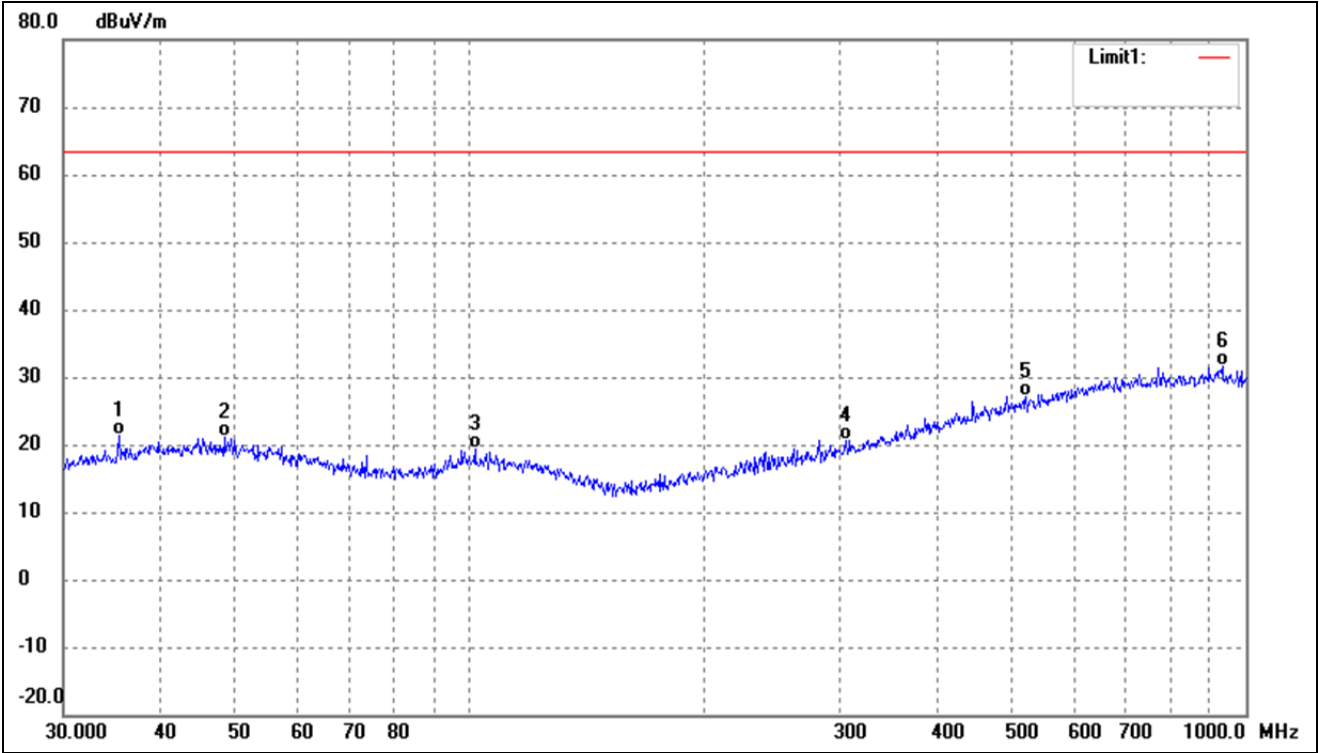
Plot of Radiated Emissions Test Data ( Above 30MHz)

|            |     |           |            |
|------------|-----|-----------|------------|
| Test mode: | TM1 | Polarity: | Horizontal |
|------------|-----|-----------|------------|



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 49.7068            | 27.92               | -6.96           | 20.96              | 63.50             | -42.54         | -             | -              | QP     |
| 2   | 102.3597           | 27.71               | -8.77           | 18.94              | 63.50             | -44.56         | -             | -              | QP     |
| 3   | 274.1939           | 38.39               | -7.65           | 30.74              | 63.50             | -32.76         | -             | -              | QP     |
| 4   | 459.1144           | 30.92               | -2.33           | 28.59              | 63.50             | -34.91         | -             | -              | QP     |
| 5   | 699.3046           | 28.69               | 1.42            | 30.11              | 63.50             | -33.39         | -             | -              | QP     |
| 6   | 979.1804           | 29.55               | 2.49            | 32.04              | 63.50             | -31.46         | -             | -              | QP     |

|            |     |           |          |
|------------|-----|-----------|----------|
| Test mode: | TM1 | Polarity: | Vertical |
|------------|-----|-----------|----------|



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 35.3750            | 29.63               | -8.13           | 21.50              | 63.50             | -42.00         | -             | -              | QP     |
| 2   | 48.3318            | 28.10               | -6.96           | 21.14              | 63.50             | -42.36         | -             | -              | QP     |
| 3   | 101.6443           | 28.11               | -8.75           | 19.36              | 63.50             | -44.14         | -             | -              | QP     |
| 4   | 305.6800           | 27.48               | -6.79           | 20.69              | 63.50             | -42.81         | -             | -              | QP     |
| 5   | 520.8882           | 28.08               | -0.94           | 27.14              | 63.50             | -36.36         | -             | -              | QP     |
| 6   | 932.2715           | 29.09               | 2.64            | 31.73              | 63.50             | -31.77         | -             | -              | QP     |

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 \*\*\*\*\*