

# TEST REPORT

**Reference No.**..... : WTN22X12256062W001  
**FCC ID** ..... : 2BBU5-ZG-JJM1215A  
**Applicant** ..... : Guangdong Zhangong Electric Technology Co., Ltd.  
**Address**..... : 7th Floor,Building29,Zhifugarden,ShundeDistrict, FoshanCity,  
GuangdongProvince, China  
**Manufacturer** ..... : The same as Applicant  
**Address**..... : The same as Applicant  
**Product Name** ..... : Furniture socket  
**Model No.**..... : ZG-JJM/12/15A  
**Standards** ..... : FCC Part 15C  
**Date of Receipt sample** .... : 2022-12-20  
**Date of Test**..... : 2022-12-20 to 2023-05-23  
**Date of Issue** ..... : 2023-05-23  
**Test Report Form No.** ..... : WTX\_Part 15CW  
**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:**

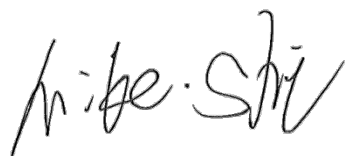
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Tested by:

Approved by:



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Silin Chen

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Report version

| Version No. | Date of issue | Description |
|-------------|---------------|-------------|
| Rev.00      | 2023-05-23    | Original    |
| /           | /             | /           |

## 1. GENERAL INFORMATION

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

| General Description of EUT                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:                                                                                                                                                                                                                                                                                     | Furniture socket                                                                                                                                                                                                                                          |
| Trade Name:                                                                                                                                                                                                                                                                                       | /                                                                                                                                                                                                                                                         |
| Model No.:                                                                                                                                                                                                                                                                                        | ZG-JJM/12/15A                                                                                                                                                                                                                                             |
| Adding Model:                                                                                                                                                                                                                                                                                     | ZG-PDU00/10A/15A, ZG-PDUG1/10A/15A, ZG-PDUG1/10A/15A, ZG-PDUC3/10A/15A, ZG-PDUC9/10A/15A, ZG-PDUA/10A/15A, ZG-PDUY/10A/15A, ZG-PDUM/12A/15A, ZG-JJ/12A/15A, ZG-HG/12A/15A, ZG-ZJ/12A/15A, ZG-SJ/12A/15A, ZG-DQ/12A/15A, ZG-PC/12A/15A, ZG-PDU JO0/12A/15A |
| Battery Capacity                                                                                                                                                                                                                                                                                  | /                                                                                                                                                                                                                                                         |
| <i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model ZG-JJM/12/15A, but the circuit and the electronic construction do not change, declared by the manufacturer.</i> |                                                                                                                                                                                                                                                           |

| Technical Characteristics of EUT |              |
|----------------------------------|--------------|
| Frequency Range:                 | 112-205kHz   |
| Modulation Type:                 | ASK          |
| Antenna Type:                    | Coil Antenna |
| Wireless output:                 | 15W(MAX)     |

## 1.2 Test Standards

**FCC Part 15 Subpart C:** Intentional Radiators.

**FCC Rules Part 15.207:** Conducted limits.

**FCC Rules Part 15.209:** Radiated emission limits; general requirements.

**FCC Rules Part 15.215:** Additional provisions to the general radiated emission limitations.

**ANSI C63.10-2013:** American National Standard for Testing Unlicensed Wireless Devices.

**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 C63.10-2013, 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 and the CAB identifier is CN0057.

## 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       | Wireless charging | Wireless output(5W)   | AC120V 60Hz       |
| TM2       | Wireless charging | Wireless output(7.5W) | AC120V 60Hz       |
| TM3       | Wireless charging | Wireless output(15W)  | AC120V 60Hz       |

EUT Cable List and Details

| Cable Description | Length (M) | Shielded/Unshielded | With Core/Without Core |
|-------------------|------------|---------------------|------------------------|
| AC CABLE          | 1.9        | Unshielded          | Without Ferrite        |

Auxiliary Equipment List and Details

| Description              | Manufacturer | Model | Serial Number |
|--------------------------|--------------|-------|---------------|
| Wireless charging tester | /            | YBZ   | /             |

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  | ±2.88dB     |
| Transmitter Spurious Emissions | Radiated   | ±5.1dB      |

**1.7 Test Equipment List and Details**

2022

| No.                                                       | Description             | Manufacturer    | Model                 | Serial No. | Cal Date   | Due. Date  |
|-----------------------------------------------------------|-------------------------|-----------------|-----------------------|------------|------------|------------|
| SEMT-1075                                                 | Communication Tester    | Rohde & Schwarz | CMW500                | 148650     | 2022-03-22 | 2023-03-21 |
| SEMT-1063                                                 | GSM Tester              | Rohde & Schwarz | CMU200                | 114403     | 2022-03-22 | 2023-03-21 |
| SEMT-1072                                                 | Spectrum Analyzer       | Agilent         | E4407B                | MY41440400 | 2022-03-25 | 2023-03-24 |
| SEMT-1079                                                 | Spectrum Analyzer       | Agilent         | N9020A                | US47140102 | 2022-03-22 | 2023-03-21 |
| SMET-1313                                                 | Spectrum Analyzer       | Agilent         | N9020A                | MY54320548 | 2022-03-22 | 2023-03-21 |
| SEMT-1080                                                 | Signal Generator        | Agilent         | 83752A                | 3610A01453 | 2022-03-22 | 2023-03-21 |
| SEMT-1081                                                 | Vector Signal Generator | Agilent         | N5182A                | MY47070202 | 2022-03-22 | 2023-03-21 |
| SEMT-1028                                                 | Power Divider           | Weinschel       | 1506A                 | PM204      | 2022-03-22 | 2023-03-21 |
| SEMT-C001                                                 | Cable                   | Zheng DI        | LL142-07-07-10M(A)    | /          | /          | /          |
| SEMT-C002                                                 | Cable                   | Zheng DI        | ZT40-2.92J-2.92J-6M   | /          | /          | /          |
| SEMT-C003                                                 | Cable                   | Zheng DI        | ZT40-2.92J-2.92J-2.5M | /          | /          | /          |
| SEMT-C004                                                 | Cable                   | Zheng DI        | 2M0RFC                | /          | /          | /          |
| SEMT-C005                                                 | Cable                   | Zheng DI        | 1M0RFC                | /          | /          | /          |
| SEMT-C006                                                 | Cable                   | Zheng DI        | 1M0RFC                | /          | /          | /          |
| <input checked="" type="checkbox"/> Chamber A: Below 1GHz |                         |                 |                       |            |            |            |
| SEMT-1031                                                 | Spectrum Analyzer       | Rohde & Schwarz | FSP30                 | 836079/035 | 2022-03-22 | 2023-03-21 |
| SEMT-1007                                                 | EMI Test Receiver       | Rohde & Schwarz | ESVB                  | 825471/005 | 2022-03-22 | 2023-03-21 |
| SEMT-1008                                                 | Amplifier               | HP              | 8447F                 | 2805A03475 | 2022-12-30 | 2023-12-29 |
| SEMT-1069                                                 | Loop Antenna            | Schwarz beck    | FMZB 1516             | 9773       | 2021-03-20 | 2023-03-19 |
| SEMT-1068                                                 | Broadband Antenna       | Schwarz beck    | VULB9163              | 9163-333   | 2021-03-20 | 2023-03-19 |
| <input checked="" type="checkbox"/> Chamber A: Above 1GHz |                         |                 |                       |            |            |            |
| SEMT-1031                                                 | Spectrum Analyzer       | Rohde & Schwarz | FSP30                 | 836079/035 | 2022-03-22 | 2023-03-21 |
| SEMT-1007                                                 | EMI Test                | Rohde &         | ESVB                  | 825471/00  | 2022-03-22 | 2023-03-21 |

|                                                       |                                |                    |             |                 |            |            |
|-------------------------------------------------------|--------------------------------|--------------------|-------------|-----------------|------------|------------|
|                                                       | Receiver                       | Schwarz            |             | 5               |            |            |
| SEMT-1043                                             | Amplifier                      | C&D                | PAP-1G18    | 2002            | 2022-03-22 | 2023-03-21 |
| SEMT-1042                                             | Horn Antenna                   | ETS                | 3117        | 00086197        | 2021-03-19 | 2023-03-18 |
| SEMT-1121                                             | Horn Antenna                   | Schwarzbeck        | BBHA 9170   | BBHA917<br>0582 | 2021-04-27 | 2023-04-26 |
| SEMT-1216                                             | Pre-amplifier                  | Schwarzbeck        | BBV 9721    | 9721-031        | 2022-03-25 | 2023-03-24 |
| SEMT-1163                                             | Spectrum<br>Analyzer           | Rohde &<br>Schwarz | FSP40       | 100612          | 2022-03-22 | 2023-03-21 |
| <input type="checkbox"/> Chamber B:Below 1GHz         |                                |                    |             |                 |            |            |
| SEMT-1068                                             | Trilog<br>Broadband<br>Antenna | Schwarz beck       | VULB9163(B) | 9163-635        | 2021-04-09 | 2023-04-08 |
| SEMT-1067                                             | Amplifier                      | Agilent            | 8447D       | 2944A101<br>79  | 2022-03-22 | 2023-03-21 |
| SEMT-1066                                             | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESPI        | 101391          | 2022-03-22 | 2023-03-21 |
| <input type="checkbox"/> Chamber C:Below 1GHz         |                                |                    |             |                 |            |            |
| SEMT-1319                                             | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESIB 26     | 100401          | 2022-12-30 | 2023-12-29 |
| SEMT-1343                                             | Trilog<br>Broadband<br>Antenna | Schwarz beck       | VULB 9168   | 1194            | 2021-05-28 | 2023-05-27 |
| SEMT-1333                                             | Amplifier                      | HP                 | 8447F       | 2944A038<br>69  | 2022-03-22 | 2023-03-21 |
| <input checked="" type="checkbox"/> Conducted Room 1# |                                |                    |             |                 |            |            |
| SEMT-1001                                             | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESPI        | 101611          | 2022-03-21 | 2023-03-20 |
| SEMT-1002                                             | Pulse Limiter                  | Rohde &<br>Schwarz | ESH3-Z2     | 100911          | 2022-03-25 | 2023-03-24 |
| SEMT-1003                                             | AC LISN                        | Schwarz beck       | NSLK8126    | 8126-224        | 2022-03-22 | 2023-03-21 |
| <input type="checkbox"/> Conducted Room 2#            |                                |                    |             |                 |            |            |
| SEMT-1334                                             | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESPI        | 101259          | 2022-03-22 | 2023-03-21 |
| SEMT-1336                                             | LISN                           | Rohde &<br>Schwarz | ENV 216     | 100097          | 2022-03-22 | 2023-03-21 |

2023

| Fixed asset Number                                        | Description              | Manufacturer    | Model       | Serial No.     | Cal Date   | Due. Date      |
|-----------------------------------------------------------|--------------------------|-----------------|-------------|----------------|------------|----------------|
| WTXE1004A<br>1-001                                        | Spectrum Analyzer        | Rohde & Schwarz | FSP40       | 100612         | 2023-02-25 | 2024-02-24     |
| <input checked="" type="checkbox"/> Chamber A: Below 1GHz |                          |                 |             |                |            |                |
| WTXE1005<br>A1003                                         | Spectrum Analyzer        | Rohde & Schwarz | FSP30       | 836079/0<br>35 | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1007<br>A1001                                         | EMI Test Receiver        | Rohde & Schwarz | ESVB        | 825471/0<br>05 | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1007<br>A1001                                         | Amplifier                | HP              | 8447F       | 2805A034<br>75 | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1010<br>A1007                                         | Loop Antenna             | Schwarz beck    | FMZB 1516   | 9773           | 2021-03-20 | 2024-03-1<br>9 |
| WTXE1010<br>A1006                                         | Broadband Antenna        | Schwarz beck    | VULB9163    | 9163-333       | 2023-03-20 | 2026-03-1<br>9 |
| <input checked="" type="checkbox"/> Chamber A: Above 1GHz |                          |                 |             |                |            |                |
| WTXE1005<br>A1003                                         | Spectrum Analyzer        | Rohde & Schwarz | FSP30       | 836079/0<br>35 | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1007<br>A1001                                         | EMI Test Receiver        | Rohde & Schwarz | ESVB        | 825471/0<br>05 | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1065<br>A1001                                         | Amplifier                | C&D             | PAP-1G18    | 14918          | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1010<br>A1005                                         | Horn Antenna             | ETS             | 3117        | 00086197       | 2021-03-19 | 2024-03-1<br>8 |
| WTXE1010<br>A1010                                         | DRG Horn Antenna         | A.H.<br>SYSTEMS | SAS-574     | 571            | 2021-03-19 | 2024-03-1<br>8 |
| WTXE1003<br>A1001                                         | Pre-amplifier            | Schwarzbeck     | BBV 9721    | 9721-031       | 2023-02-25 | 2024-02-2<br>4 |
| <input type="checkbox"/> Chamber B:Below 1GHz             |                          |                 |             |                |            |                |
| WTXE1010<br>A1006                                         | Trilog Broadband Antenna | Schwarz beck    | VULB9163(B) | 9163-635       | 2021-04-09 | 2024-04-0<br>8 |
| WTXE1038<br>A1001                                         | Amplifier                | Agilent         | 8447D       | 2944A101<br>79 | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1001<br>A1002                                         | EMI Test Receiver        | Rohde & Schwarz | ESPI        | 101391         | 2023-02-25 | 2024-02-2<br>4 |
| <input type="checkbox"/> Chamber C:Below 1GHz             |                          |                 |             |                |            |                |
| WTXE1093<br>A1001                                         | EMI Test Receiver        | Rohde & Schwarz | ESIB 26     | 100401         | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1010<br>A1013-1                                       | Trilog Broadband         | Schwarz beck    | VULB 9168   | 1194           | 2021-05-28 | 2024-05-2<br>7 |

|                                                       |                      |                    |             |                 |            |                |
|-------------------------------------------------------|----------------------|--------------------|-------------|-----------------|------------|----------------|
|                                                       | Antenna              |                    |             |                 |            |                |
| WTXE1007<br>A1002                                     | Amplifier            | HP                 | 8447F       | 2944A038<br>69  | 2023-02-25 | 2024-02-2<br>4 |
| <input type="checkbox"/> Chamber C: Above 1GHz        |                      |                    |             |                 |            |                |
| WTXE1093<br>A1001                                     | EMI Test<br>Receiver | Rohde &<br>Schwarz | ESIB 26     | 100401          | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1103<br>A1005                                     | Horn Antenna         | POAM               | RTF-11A     | LP228060<br>221 | 2023-03-10 | 2026-03-0<br>9 |
| WTXE1103<br>A1006                                     | Amplifier            | Tonscend           | TAP01018050 | AP22E80<br>6235 | 2023-02-25 | 2024-02-2<br>4 |
| <input checked="" type="checkbox"/> Conducted Room 1# |                      |                    |             |                 |            |                |
| WTXE1001<br>A1001                                     | EMI Test<br>Receiver | Rohde &<br>Schwarz | ESPI        | 101611          | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1002<br>A1001                                     | Pulse Limiter        | Rohde &<br>Schwarz | ESH3-Z2     | 100911          | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1003<br>A1001                                     | AC LISN              | Schwarz beck       | NSLK8126    | 8126-224        | 2023-02-25 | 2024-02-2<br>4 |
| <input type="checkbox"/> Conducted Room 2#            |                      |                    |             |                 |            |                |
| WTXE1001<br>A1004                                     | EMI Test<br>Receiver | Rohde &<br>Schwarz | ESPI        | 101259          | 2023-02-25 | 2024-02-2<br>4 |
| WTXE1003<br>A1003                                     | LISN                 | Rohde &<br>Schwarz | ENV 216     | 100097          | 2023-02-25 | 2024-02-2<br>4 |

2. SUMMARY OF TEST RESULTS

---

| Description of Test             | Result    |
|---------------------------------|-----------|
| §15.207(a) Conducted Emission   | Compliant |
| §15.209(a) Radiated Emission    | Compliant |
| §15.215 20dB Emission Bandwidth | Compliant |

N/A: not applicable

### **3. RF Exposure**

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#### **3.1 Standard Applicable**

According to §1.1307 and §2.1093, the portable transmitter must comply the RF exposure requirements.

#### **3.2 Test Result**

This product complied with the requirement of the RF exposure, please see the RF Exposure Report.

## **4. Antenna Requirement**

---

### **4.1 Standard Applicable**

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

### **4.2 Evaluation Information**

This product has a Coil antenna, fulfill the requirement of this section.

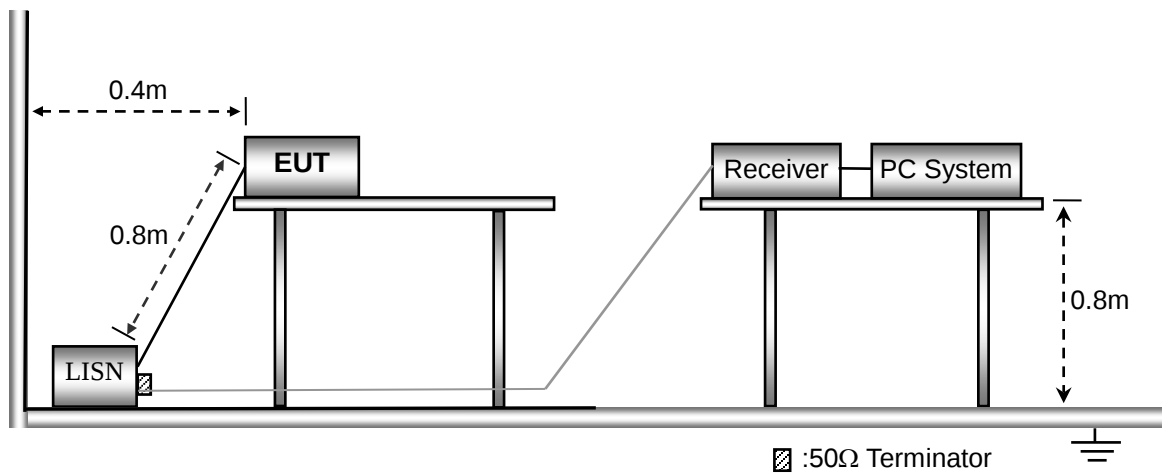
## 5. Conducted Emissions

### 5.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 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.

### 5.2 Basic Test Setup Block Diagram



### 5.3 Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 23.5 °C   |
| Relative Humidity: | 54%       |
| ATM Pressure:      | 1012 mbar |

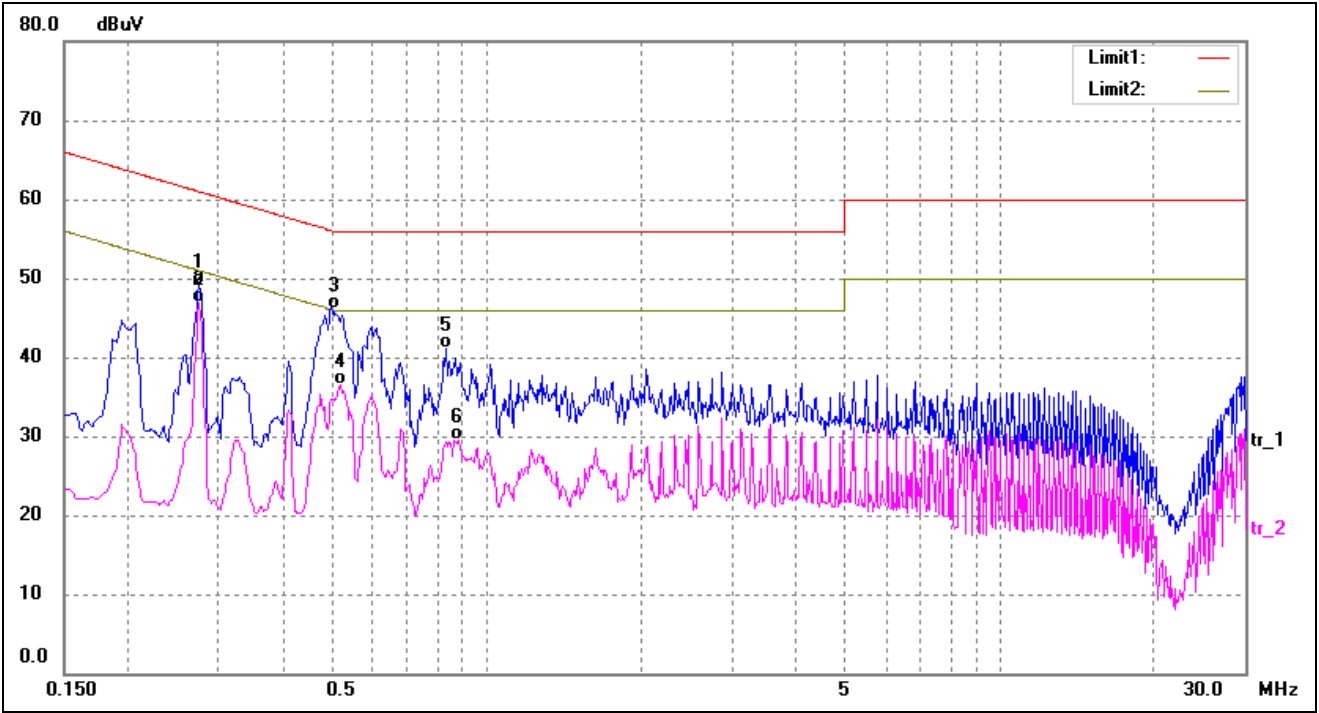
5.4 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz  
Stop Frequency ..... 30 MHz  
Sweep Speed ..... Auto  
IF Bandwidth..... 10 kHz  
Quasi-Peak Adapter Bandwidth..... 9 kHz  
Quasi-Peak Adapter Mode ..... Normal

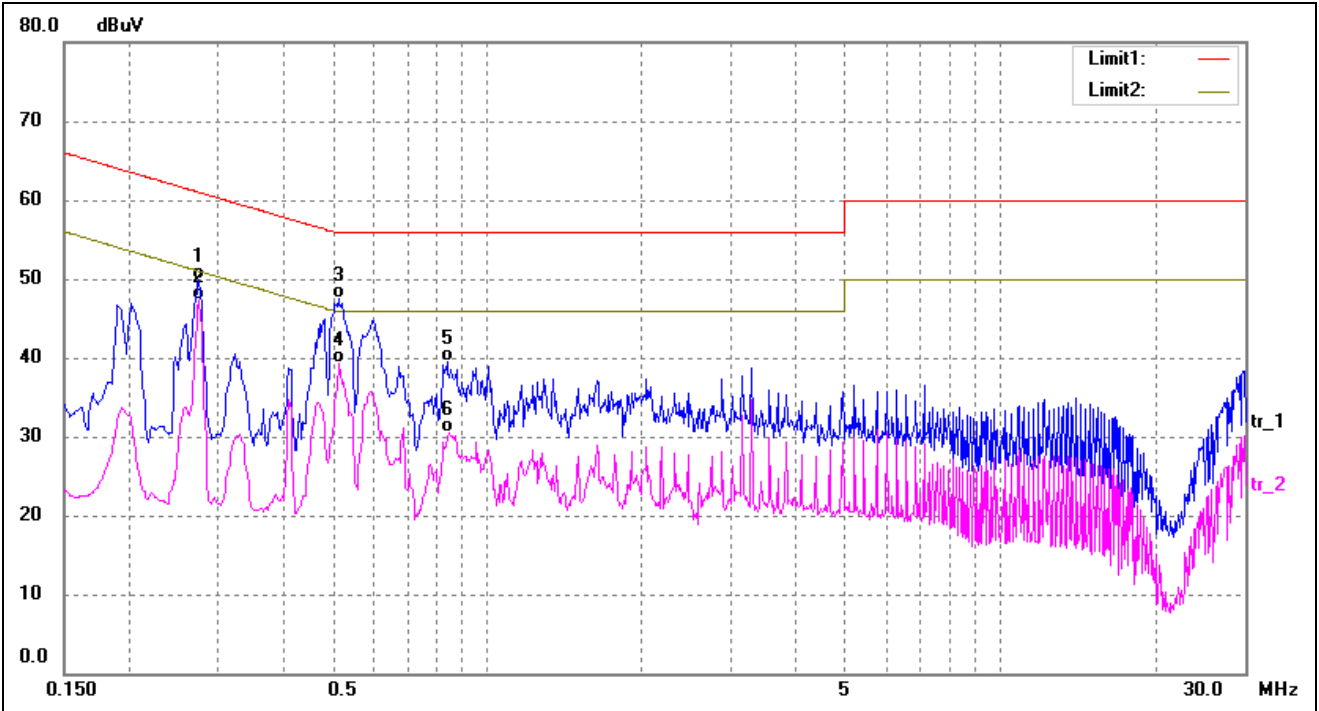
5.5 Summary of Test Results/Plots

|            |     |           |      |
|------------|-----|-----------|------|
| Test mode: | TM1 | Polarity: | Line |
|------------|-----|-----------|------|



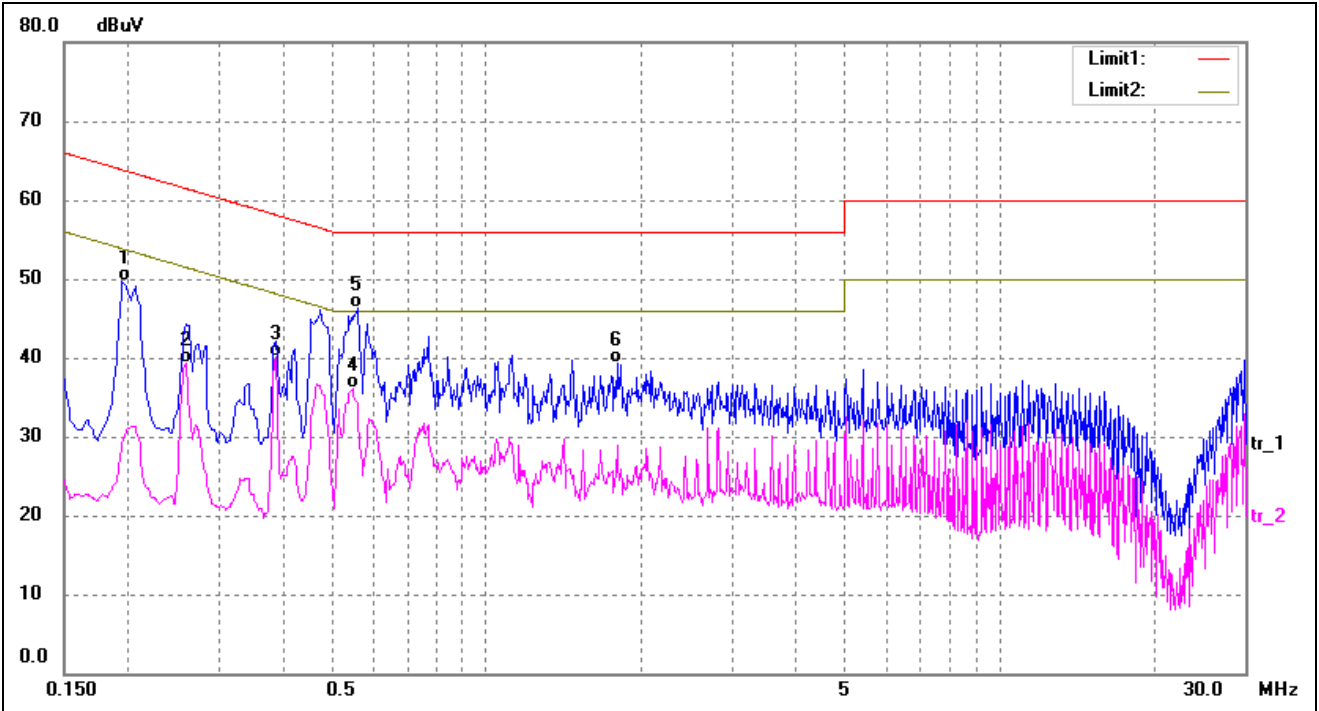
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Detector |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|----------|
| 1   | 0.2740             | 38.78             | 10.33           | 49.11            | 61.00           | -11.89         | QP       |
| 2*  | 0.2740             | 36.53             | 10.33           | 46.86            | 51.00           | -4.14          | AVG      |
| 3   | 0.4980             | 35.97             | 10.23           | 46.20            | 56.03           | -9.83          | QP       |
| 4   | 0.5180             | 26.23             | 10.23           | 36.46            | 46.00           | -9.54          | AVG      |
| 5   | 0.8340             | 30.95             | 10.17           | 41.12            | 56.00           | -14.88         | QP       |
| 6   | 0.8820             | 19.32             | 10.16           | 29.48            | 46.00           | -16.52         | AVG      |

|            |     |           |         |
|------------|-----|-----------|---------|
| Test mode: | TM1 | Polarity: | Neutral |
|------------|-----|-----------|---------|



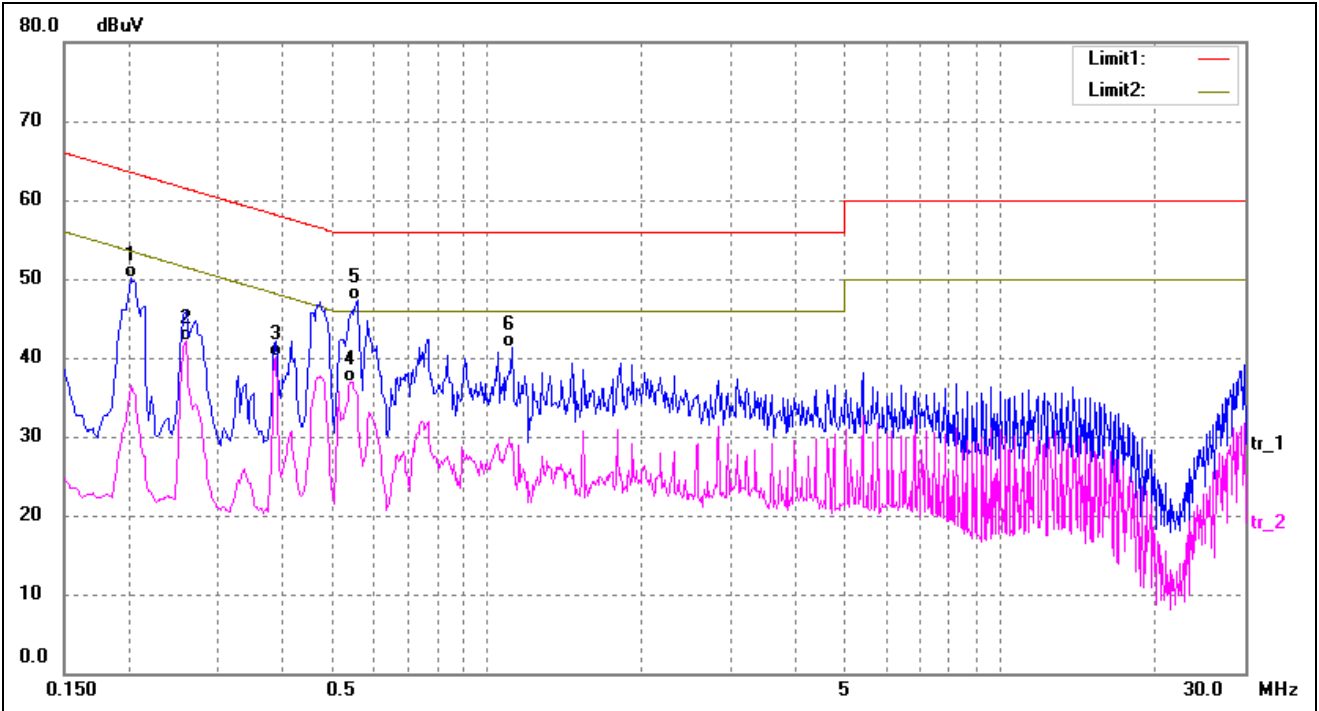
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Detector |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|----------|
| 1   | 0.2740             | 39.61             | 10.33           | 49.94            | 61.00           | -11.06         | QP       |
| 2*  | 0.2740             | 36.99             | 10.33           | 47.32            | 51.00           | -3.68          | AVG      |
| 3   | 0.5140             | 37.21             | 10.23           | 47.44            | 56.00           | -8.56          | QP       |
| 4   | 0.5140             | 29.06             | 10.23           | 39.29            | 46.00           | -6.71          | AVG      |
| 5   | 0.8380             | 29.34             | 10.17           | 39.51            | 56.00           | -16.49         | QP       |
| 6   | 0.8460             | 20.27             | 10.17           | 30.44            | 46.00           | -15.56         | AVG      |

|            |     |           |      |
|------------|-----|-----------|------|
| Test mode: | TM2 | Polarity: | Line |
|------------|-----|-----------|------|



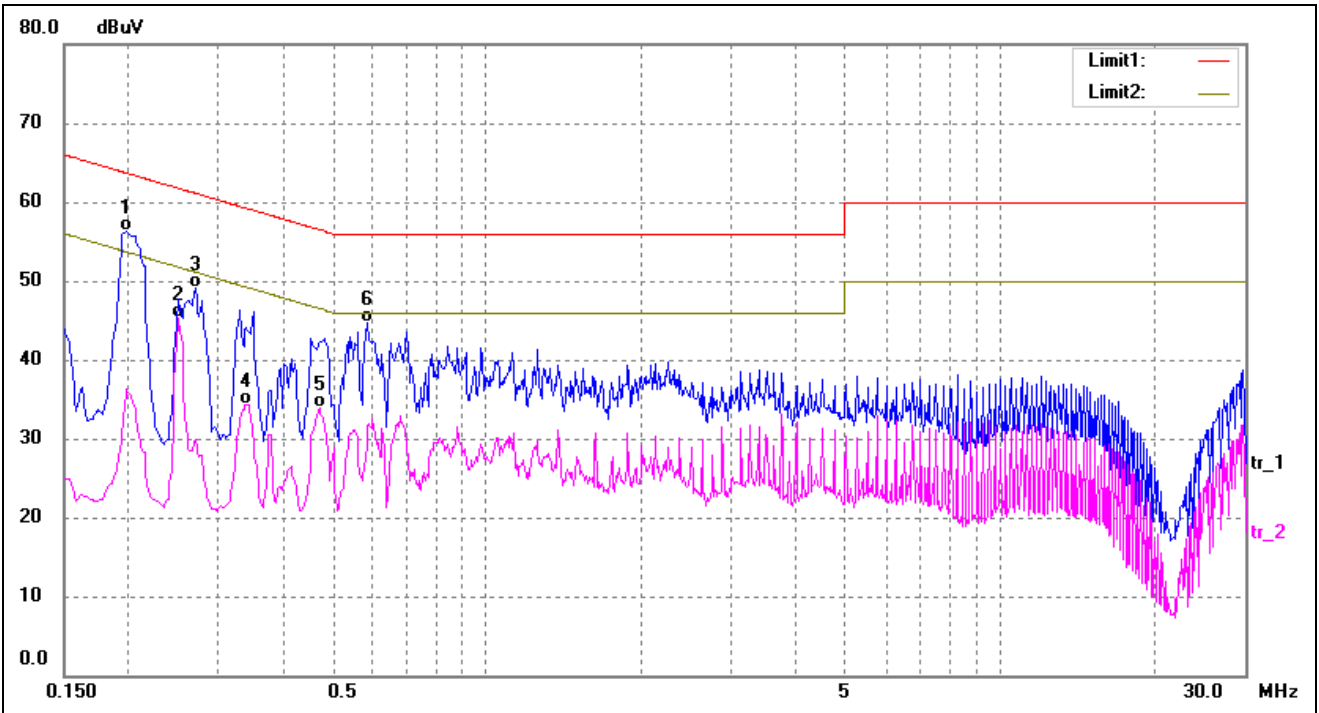
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Detector |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|----------|
| 1   | 0.1940             | 39.22             | 10.39           | 49.61            | 63.86           | -14.25         | QP       |
| 2   | 0.2580             | 28.96             | 10.34           | 39.30            | 51.50           | -12.20         | AVG      |
| 3*  | 0.3860             | 29.79             | 10.27           | 40.06            | 48.15           | -8.09          | AVG      |
| 4   | 0.5460             | 25.90             | 10.22           | 36.12            | 46.00           | -9.88          | AVG      |
| 5   | 0.5620             | 36.12             | 10.22           | 46.34            | 56.00           | -9.66          | QP       |
| 6   | 1.7980             | 28.99             | 10.29           | 39.28            | 56.00           | -16.72         | QP       |

|            |     |           |         |
|------------|-----|-----------|---------|
| Test mode: | TM2 | Polarity: | Neutral |
|------------|-----|-----------|---------|



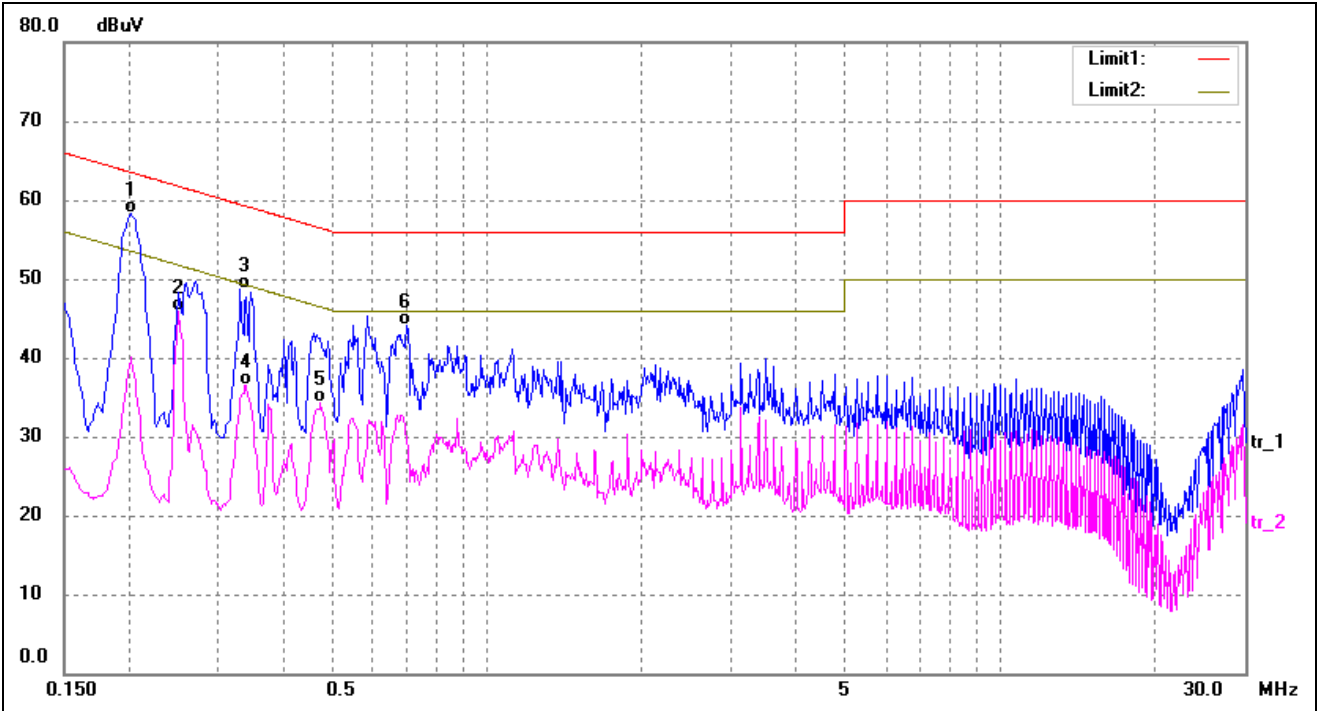
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Detector |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|----------|
| 1   | 0.2020             | 39.65             | 10.39           | 50.04            | 63.53           | -13.49         | QP       |
| 2   | 0.2580             | 31.86             | 10.34           | 42.20            | 51.50           | -9.30          | AVG      |
| 3*  | 0.3860             | 29.88             | 10.27           | 40.15            | 48.15           | -8.00          | AVG      |
| 4   | 0.5420             | 26.65             | 10.23           | 36.88            | 46.00           | -9.12          | AVG      |
| 5   | 0.5580             | 37.16             | 10.22           | 47.38            | 56.00           | -8.62          | QP       |
| 6   | 1.1180             | 31.13             | 10.16           | 41.29            | 56.00           | -14.71         | QP       |

|            |     |           |      |
|------------|-----|-----------|------|
| Test mode: | TM3 | Polarity: | Line |
|------------|-----|-----------|------|



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Detector |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|----------|
| 1   | 0.1980             | 45.90             | 10.39           | 56.29            | 63.69           | -7.40          | QP       |
| 2*  | 0.2500             | 35.04             | 10.34           | 45.38            | 51.76           | -6.38          | AVG      |
| 3   | 0.2700             | 38.87             | 10.33           | 49.20            | 61.12           | -11.92         | QP       |
| 4   | 0.3380             | 24.08             | 10.28           | 34.36            | 49.25           | -14.89         | AVG      |
| 5   | 0.4700             | 23.57             | 10.25           | 33.82            | 46.51           | -12.69         | AVG      |
| 6   | 0.5860             | 34.53             | 10.22           | 44.75            | 56.00           | -11.25         | QP       |

|            |     |           |         |
|------------|-----|-----------|---------|
| Test mode: | TM3 | Polarity: | Neutral |
|------------|-----|-----------|---------|



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Detector |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|----------|
| 1*  | 0.2020             | 47.98             | 10.39           | 58.37            | 63.53           | -5.16          | QP       |
| 2   | 0.2500             | 35.55             | 10.34           | 45.89            | 51.76           | -5.87          | AVG      |
| 3   | 0.3300             | 38.43             | 10.29           | 48.72            | 59.45           | -10.73         | QP       |
| 4   | 0.3380             | 26.31             | 10.28           | 36.59            | 49.25           | -12.66         | AVG      |
| 5   | 0.4740             | 23.96             | 10.25           | 34.21            | 46.44           | -12.23         | AVG      |
| 6   | 0.6980             | 33.96             | 10.19           | 44.15            | 56.00           | -11.85         | QP       |

## 6. Field Strength of Spurious Emissions

### 6.1 Standard Applicable

According to §15.209(a), Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:.

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009-0.490     | 2400/F(kHz)                       | 300                           |
| 0.490-1.705     | 24000/F(kHz)                      | 30                            |
| 1.705-30.0      | 30                                | 30                            |
| 30-88           | 100**                             | 3                             |
| 88-216          | 150**                             | 3                             |
| 216-960         | 200**                             | 3                             |
| Above 960       | 500                               | 3                             |

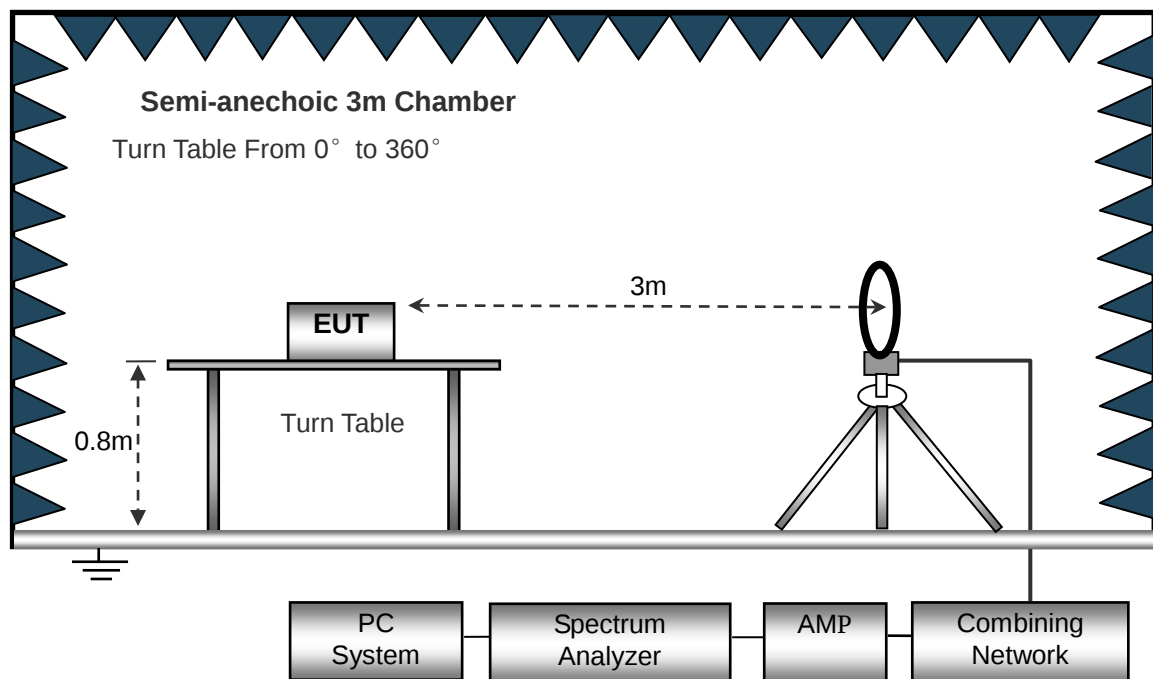
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

### 6.2 Test Procedure

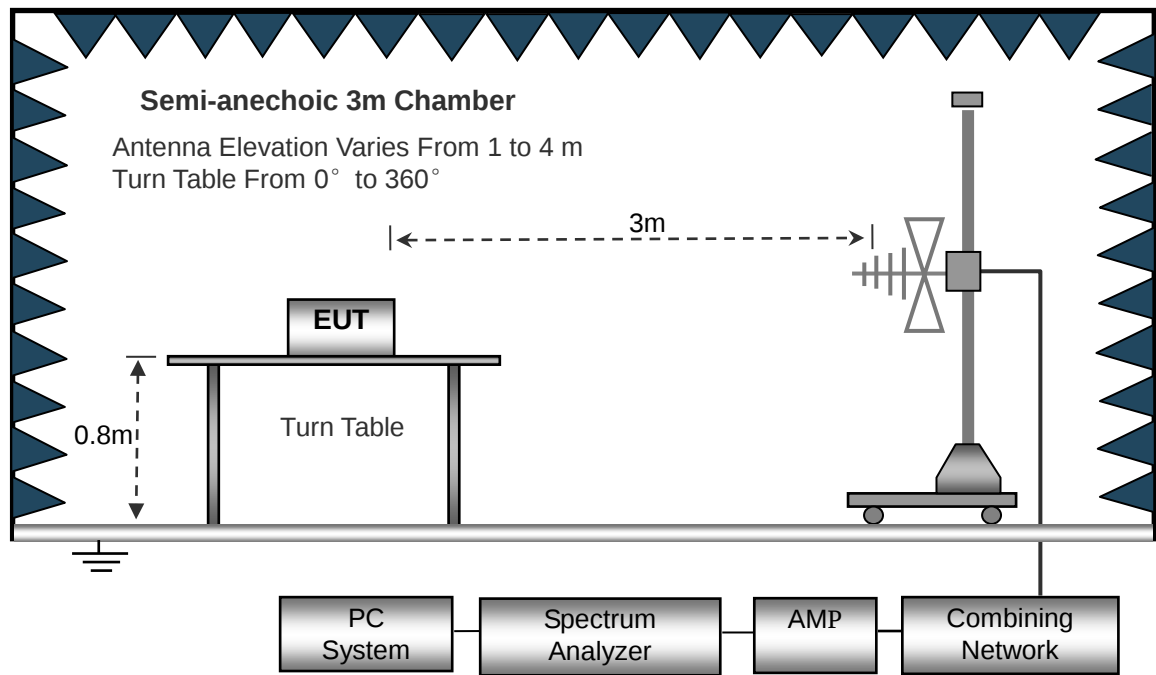
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.209 Limit.

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..



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

6.3 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

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

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

## 6.4 Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 25 °C     |
| Relative Humidity: | 52%       |
| ATM Pressure:      | 1012 mbar |

## 6. Reference Measurement at open field site

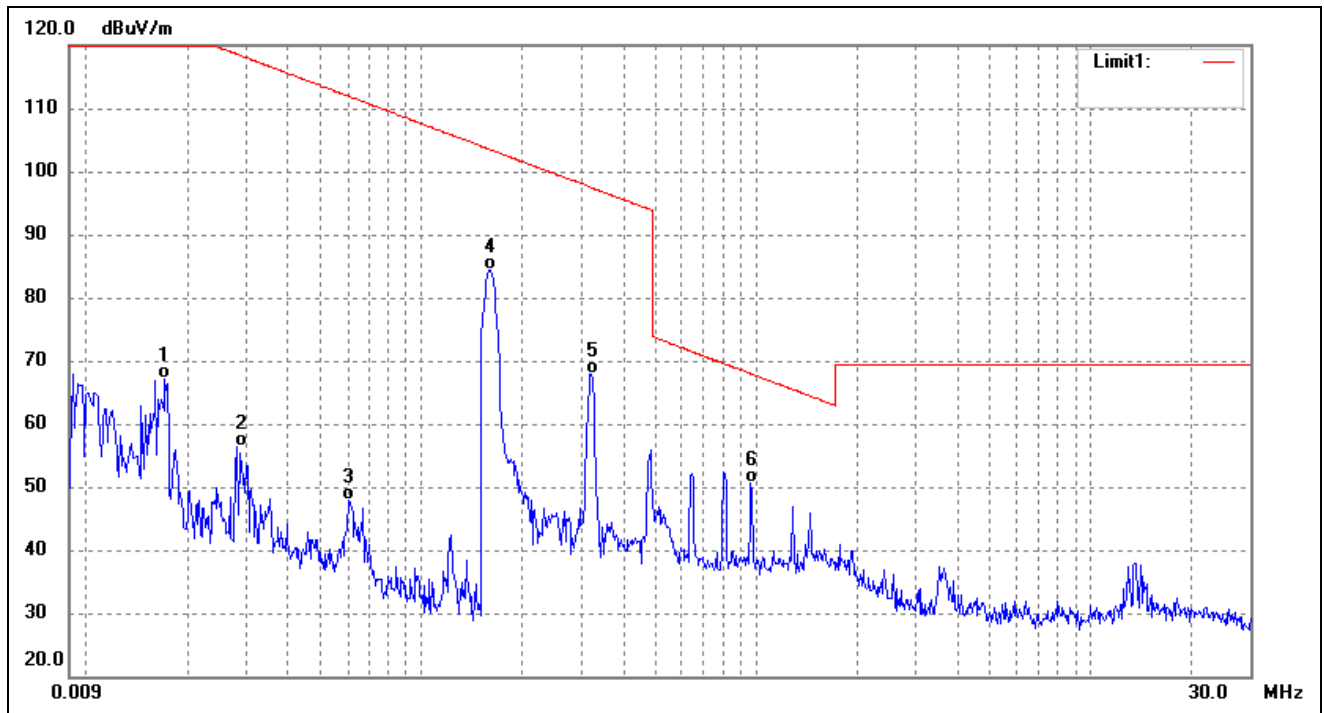
The measurement was performed with set-up consisting of a single turn loop antenna with a diameter of 0.15 m, fed by a signal generator. The loop dimension was chosen to simulate the EUT as far as possible. The signal generator was set to a fixed output level with an unmodulated 10 kHz and 14 kHz sinusoidal signal. The radiated H field strength at 10 kHz and 14 kHz generated by this set-up was measured with the same test setup as used in the SAC in 3 m distance first, and then repeated at the open field site in 3 m and 10 m distance

## 6.5 Summary of Test Results/Plots

*Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

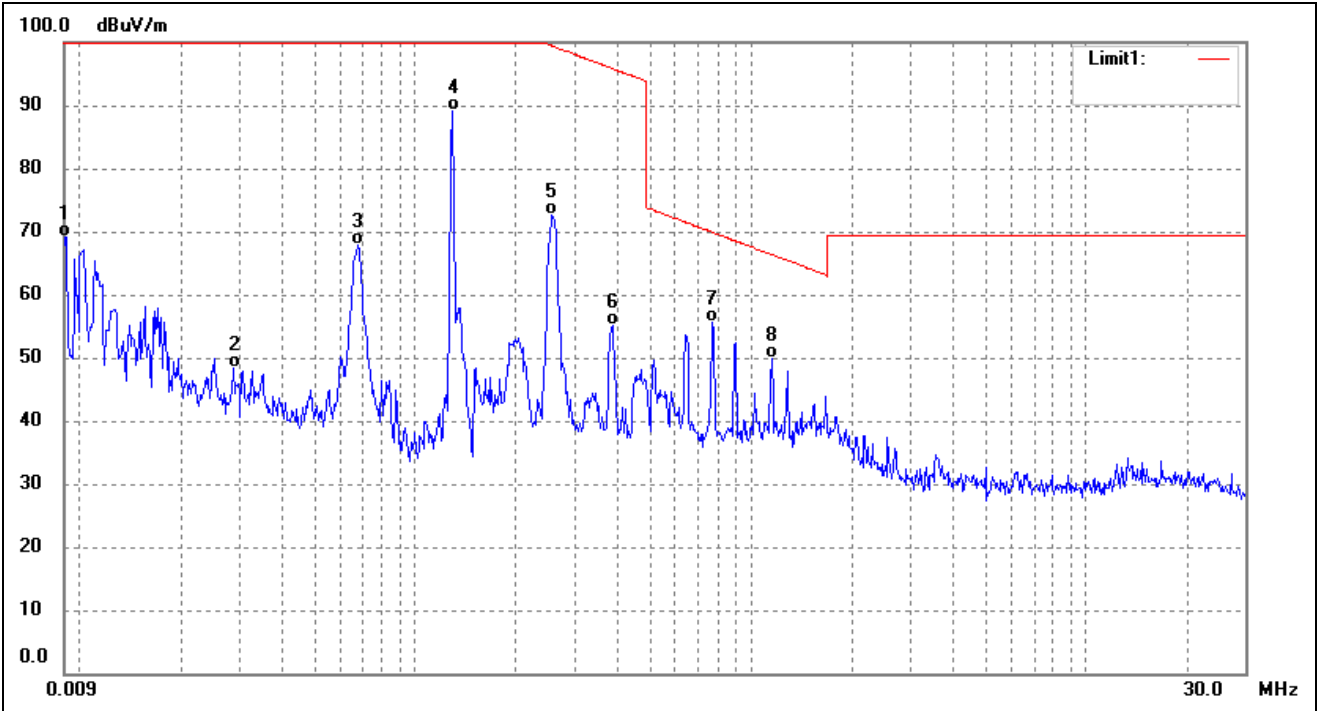
## Radiated Emissions Test Data (Below 30MHz)( Worst case EUT X axis)

|            |     |           |   |
|------------|-----|-----------|---|
| Test mode: | TM1 | Polarity: | X |
|------------|-----|-----------|---|



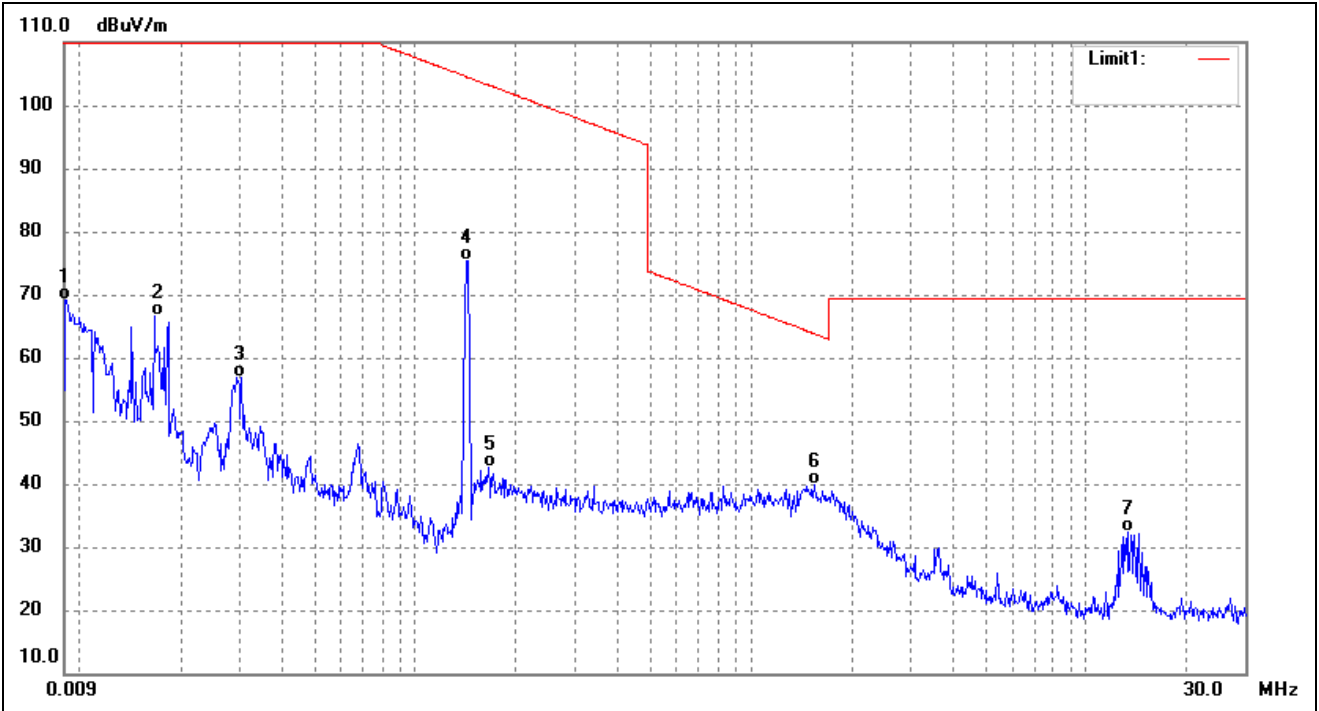
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ° ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|-----------------|----------------|--------|
| 1   | 0.0171             | 74.16               | -7.03           | 67.13              | 122.93            | -55.80         | -               | -              | QP     |
| 2   | 0.0283             | 62.95               | -6.60           | 56.35              | 118.55            | -62.20         | -               | -              | QP     |
| 3   | 0.0608             | 53.83               | -5.86           | 47.97              | 111.92            | -63.95         | -               | -              | QP     |
| 4   | 0.1590             | 90.81               | -6.45           | 84.36              | 103.57            | -19.21         | -               | -              | QP     |
| 5   | 0.3217             | 75.74               | -7.80           | 67.94              | 97.45             | -29.51         | -               | -              | QP     |
| 6   | 0.9633             | 56.99               | -6.27           | 50.72              | 67.95             | -17.23         | -               | -              | QP     |

|            |     |           |   |
|------------|-----|-----------|---|
| Test mode: | TM2 | Polarity: | X |
|------------|-----|-----------|---|



| 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   | 0.0091             | 69.06               | 0.00            | 69.06              | 128.40            | -59.34         | -               | -              | QP     |
| 2   | 0.0287             | 48.44               | 0.00            | 48.44              | 118.43            | -69.99         | -               | -              | QP     |
| 3   | 0.0673             | 67.87               | 0.00            | 67.87              | 111.03            | -43.16         | -               | -              | QP     |
| 4   | 0.1289             | 89.14               | 0.00            | 89.14              | 105.39            | -16.25         | -               | -              | QP     |
| 5   | 0.2562             | 72.64               | 0.00            | 72.64              | 99.43             | -26.79         | -               | -              | QP     |
| 6   | 0.3852             | 55.16               | 0.00            | 55.16              | 95.89             | -40.73         | -               | -              | QP     |
| 7   | 0.7711             | 55.72               | 0.00            | 55.72              | 69.87             | -14.15         | -               | -              | QP     |
| 8   | 1.1534             | 49.98               | 0.00            | 49.98              | 66.39             | -16.41         | -               | -              | QP     |

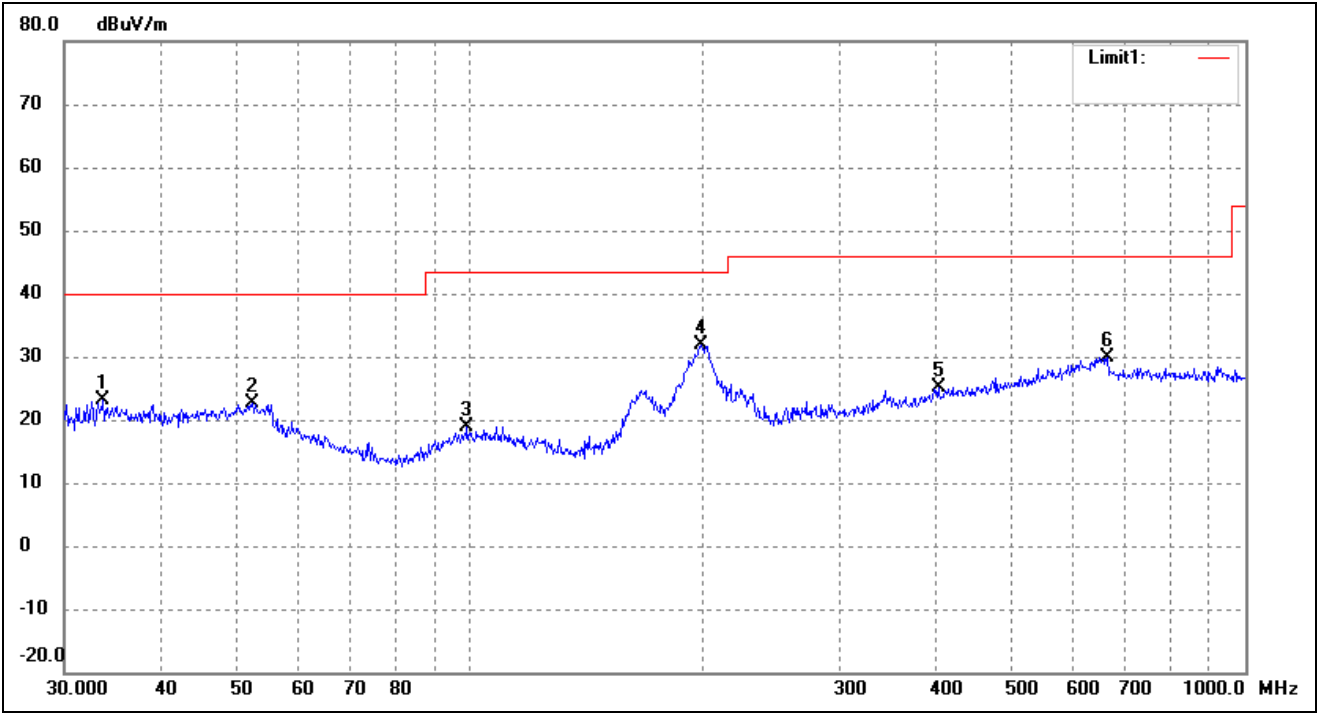
|            |     |           |   |
|------------|-----|-----------|---|
| Test mode: | TM3 | Polarity: | X |
|------------|-----|-----------|---|



| 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   | 0.0091             | 69.14               | 0.00            | 69.14              | 128.40            | -59.26         | -               | -              | QP     |
| 2   | 0.0165             | 66.67               | 0.00            | 66.67              | 123.24            | -56.57         | -               | -              | QP     |
| 3   | 0.0302             | 56.99               | 0.00            | 56.99              | 117.99            | -61.00         | -               | -              | QP     |
| 4   | 0.1418             | 75.40               | 0.00            | 75.40              | 104.56            | -29.16         | -               | -              | QP     |
| 5   | 0.1650             | 42.59               | 0.00            | 42.59              | 103.25            | -60.66         | -               | -              | QP     |
| 6   | 1.5436             | 39.79               | 0.00            | 39.79              | 63.86             | -24.07         | -               | -              | QP     |
| 7   | 13.4080            | 32.41               | 0.00            | 32.41              | 69.50             | -37.09         | -               | -              | QP     |

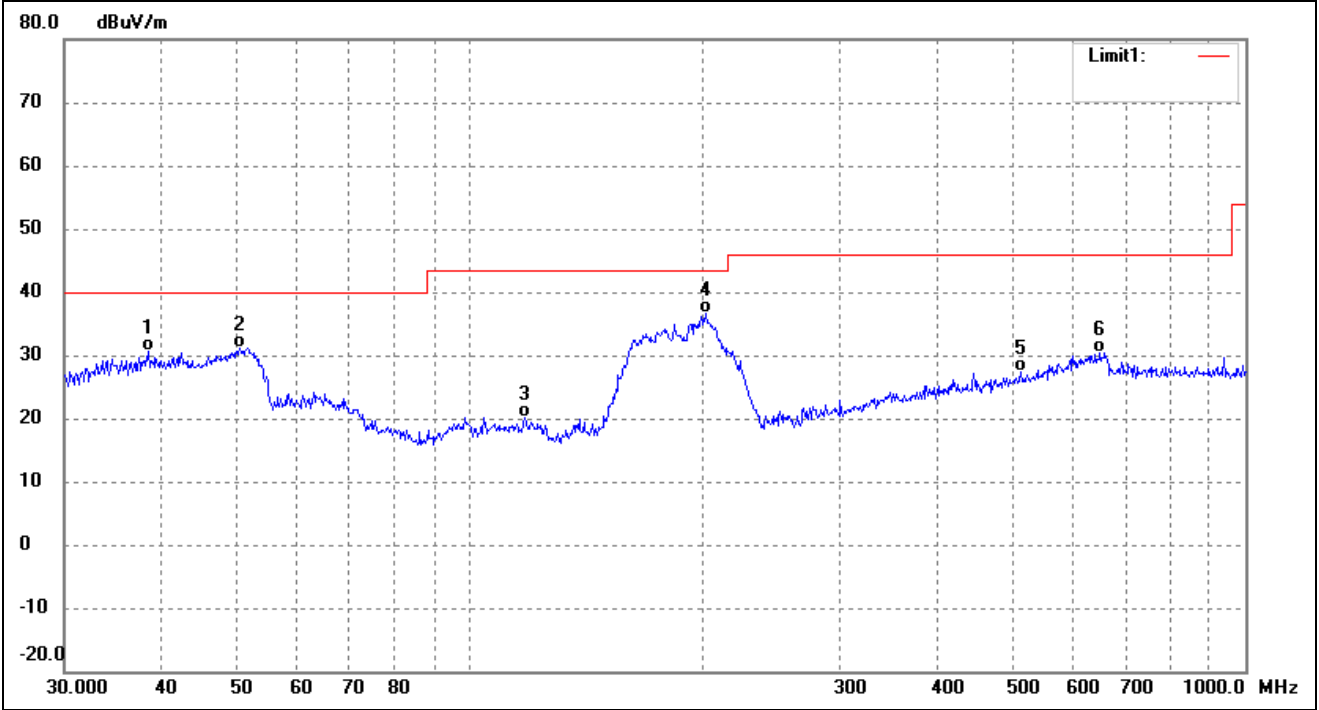
Plot of Radiated Emissions Test Data ( Above 30MHz)

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



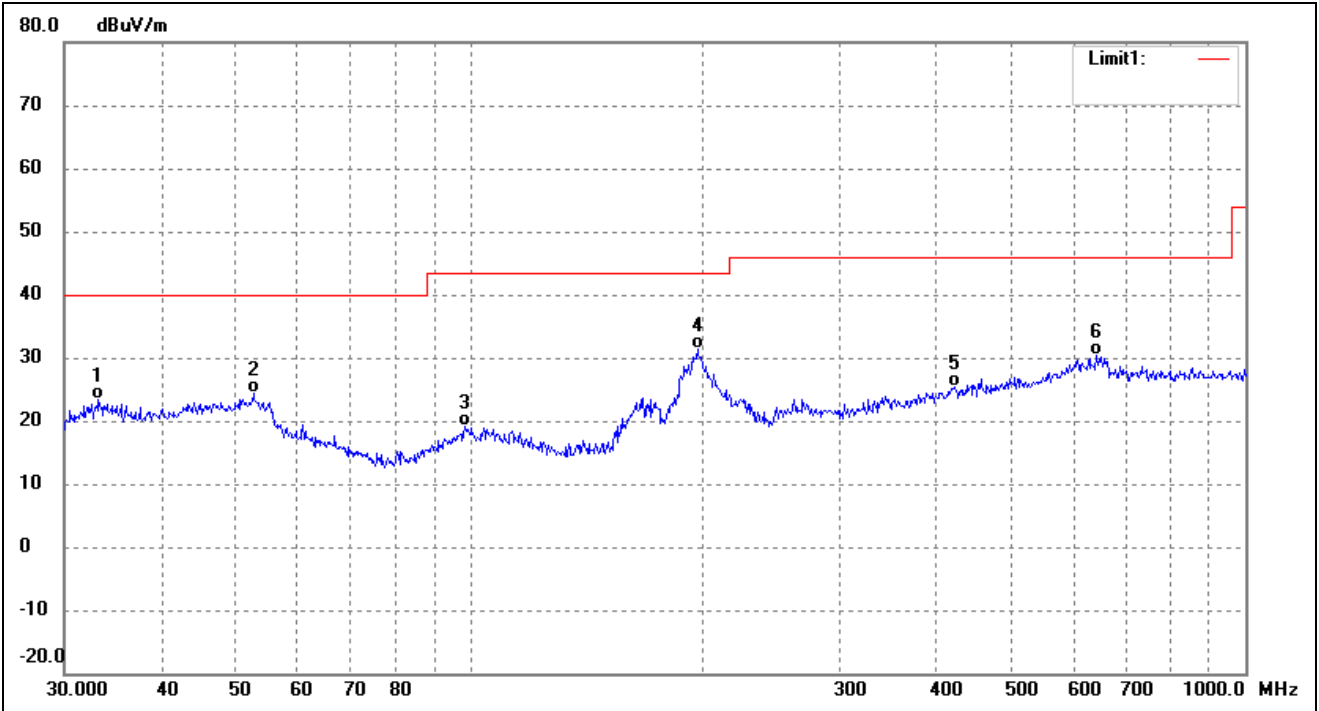
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ° ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|-----------------|----------------|--------|
| 1   | 33.6803            | 32.99               | -9.98           | 23.01              | 40.00             | -16.99         | -               | -              | QP     |
| 2   | 52.3913            | 30.07               | -7.41           | 22.66              | 40.00             | -17.34         | -               | -              | QP     |
| 3   | 99.1797            | 27.70               | -8.71           | 18.99              | 43.50             | -24.51         | -               | -              | QP     |
| 4   | 198.5880           | 39.88               | -8.05           | 31.83              | 43.50             | -11.67         | -               | -              | QP     |
| 5   | 401.8385           | 27.71               | -2.48           | 25.23              | 46.00             | -20.77         | -               | -              | QP     |
| 6   | 663.4729           | 27.76               | 2.10            | 29.86              | 46.00             | -16.14         | -               | -              | QP     |

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



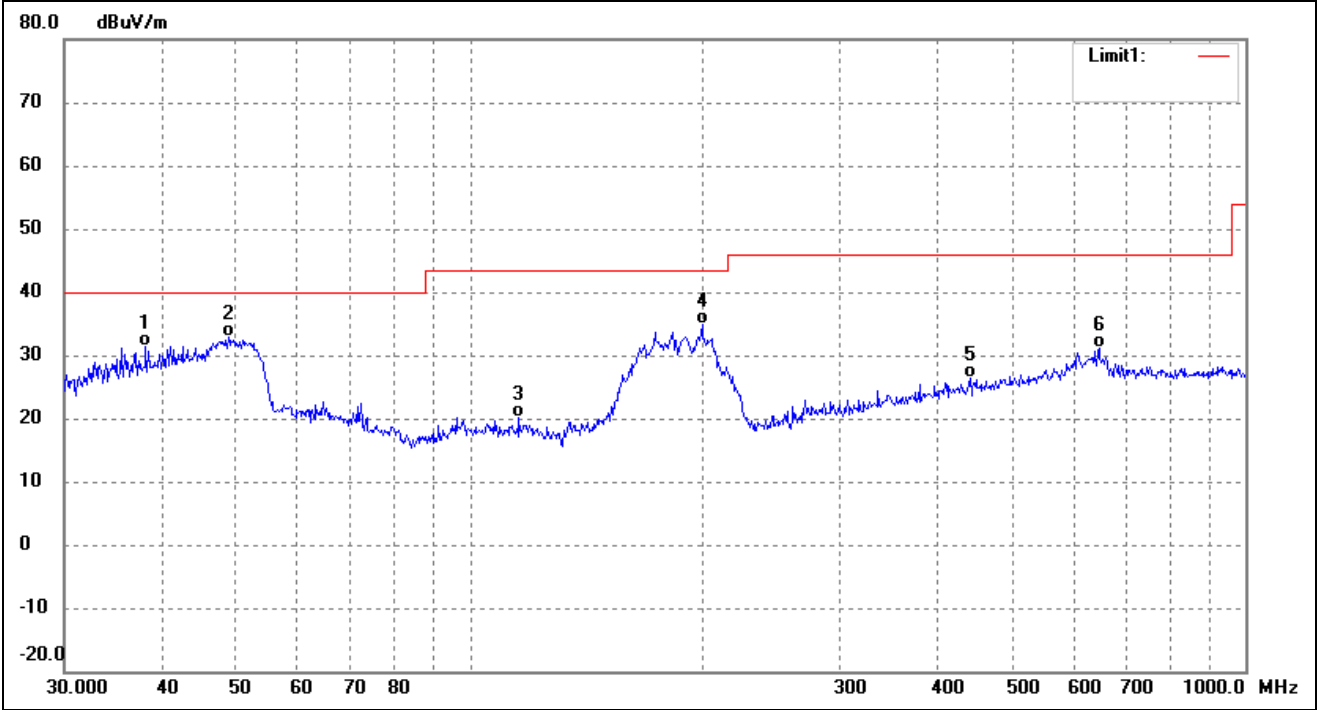
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ° ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|-----------------|----------------|--------|
| 1   | 38.4809            | 39.46               | -8.87           | 30.59              | 40.00             | -9.41          | -               | -              | QP     |
| 2   | 50.4089            | 38.49               | -7.35           | 31.14              | 40.00             | -8.86          | -               | -              | QP     |
| 3   | 117.7725           | 29.93               | -9.79           | 20.14              | 43.50             | -23.36         | -               | -              | QP     |
| 4   | 201.3930           | 44.53               | -8.00           | 36.53              | 43.50             | -6.97          | -               | -              | QP     |
| 5   | 513.6331           | 28.44               | -1.03           | 27.41              | 46.00             | -18.59         | -               | -              | QP     |
| 6   | 649.6597           | 28.46               | 2.00            | 30.46              | 46.00             | -15.54         | -               | -              | QP     |

|            |     |           |            |
|------------|-----|-----------|------------|
| Test mode: | TM2 | Polarity: | Horizontal |
|------------|-----|-----------|------------|



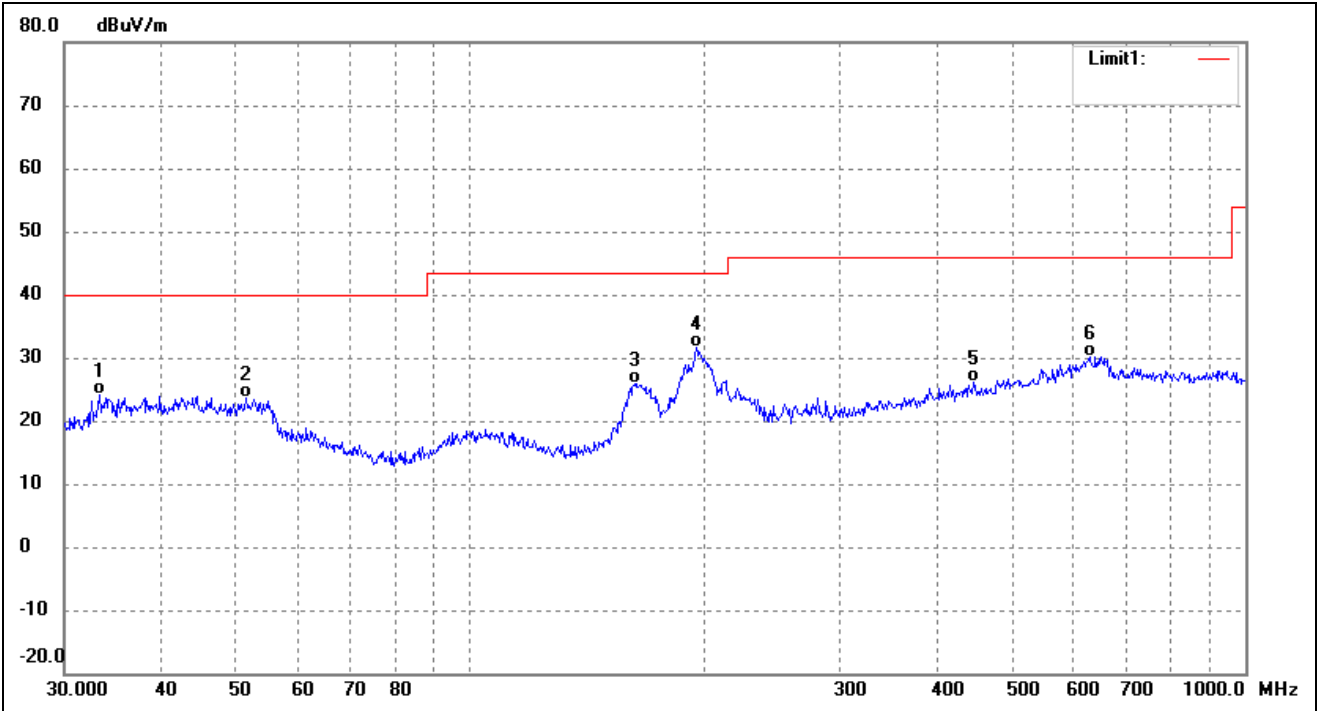
| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ° ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|-----------------|----------------|--------|
| 1   | 33.2112            | 33.55               | -10.11          | 23.44              | 40.00             | -16.56         | -               | -              | QP     |
| 2   | 52.5753            | 31.70               | -7.42           | 24.28              | 40.00             | -15.72         | -               | -              | QP     |
| 3   | 98.4866            | 27.88               | -8.81           | 19.07              | 43.50             | -24.43         | -               | -              | QP     |
| 4   | 196.5098           | 39.49               | -8.13           | 31.36              | 43.50             | -12.14         | -               | -              | QP     |
| 5   | 422.0577           | 27.58               | -2.16           | 25.42              | 46.00             | -20.58         | -               | -              | QP     |
| 6   | 642.8613           | 28.42               | 1.86            | 30.28              | 46.00             | -15.72         | -               | -              | QP     |

|            |     |           |          |
|------------|-----|-----------|----------|
| Test mode: | TM2 | Polarity: | Vertical |
|------------|-----|-----------|----------|



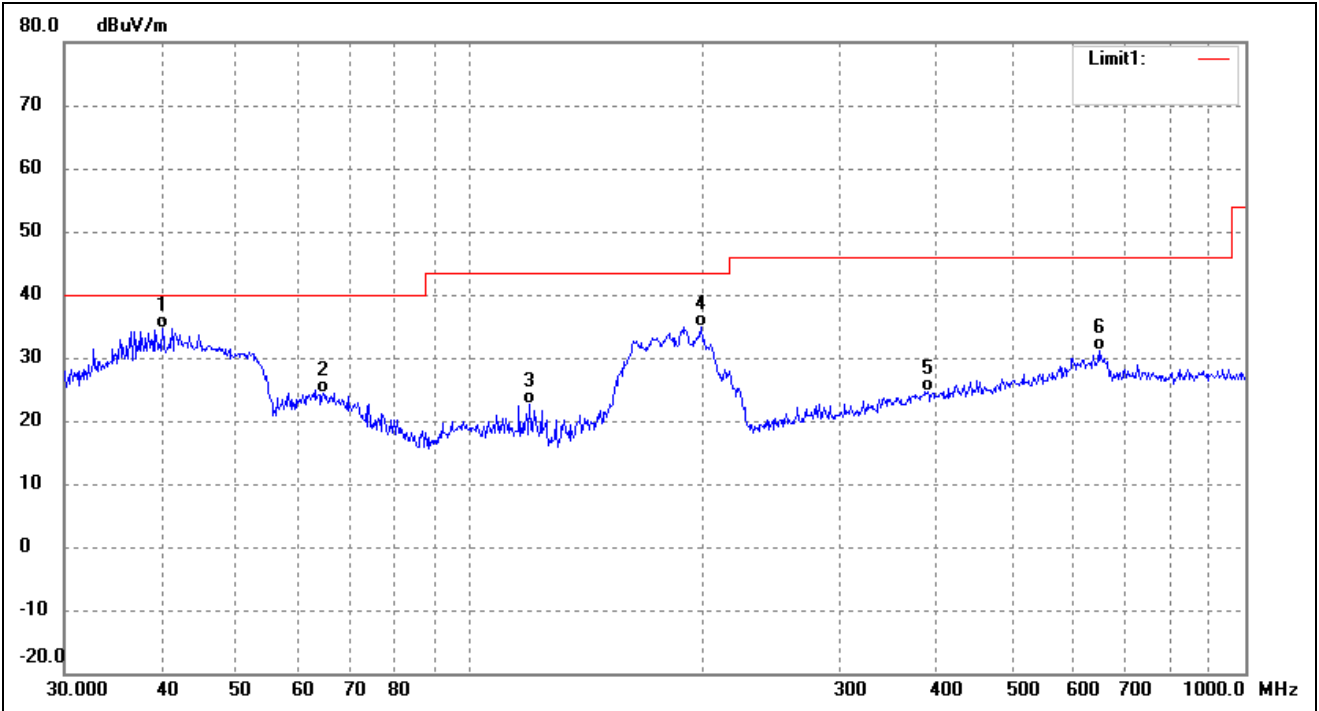
| No. | Frequency | Reading  | Correct | Result   | Limit    | Margin | Degree | Height | Remark |
|-----|-----------|----------|---------|----------|----------|--------|--------|--------|--------|
|     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   | ( ° )  | (cm)   |        |
| 1   | 38.2120   | 40.20    | -8.93   | 31.27    | 40.00    | -8.73  | -      | -      | QP     |
| 2   | 48.8429   | 40.19    | -7.38   | 32.81    | 40.00    | -7.19  | -      | -      | QP     |
| 3   | 115.7256  | 29.70    | -9.49   | 20.21    | 43.50    | -23.29 | -      | -      | QP     |
| 4   | 199.2855  | 42.96    | -8.03   | 34.93    | 43.50    | -8.57  | -      | -      | QP     |
| 5   | 441.7426  | 28.56    | -2.08   | 26.48    | 46.00    | -19.52 | -      | -      | QP     |
| 6   | 647.3856  | 29.05    | 1.99    | 31.04    | 46.00    | -14.96 | -      | -      | QP     |

|            |     |           |            |
|------------|-----|-----------|------------|
| Test mode: | TM3 | 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   | 33.3279            | 34.13               | -10.08          | 24.05              | 40.00             | -15.95         | -               | -              | QP     |
| 2   | 51.4807            | 31.10               | -7.37           | 23.73              | 40.00             | -16.27         | -               | -              | QP     |
| 3   | 163.1818           | 36.92               | -11.01          | 25.91              | 43.50             | -17.59         | -               | -              | QP     |
| 4   | 195.8220           | 39.85               | -8.16           | 31.69              | 43.50             | -11.81         | -               | -              | QP     |
| 5   | 446.4141           | 28.18               | -2.07           | 26.11              | 46.00             | -19.89         | -               | -              | QP     |
| 6   | 629.4772           | 28.58               | 1.53            | 30.11              | 46.00             | -15.89         | -               | -              | QP     |

|            |     |           |          |
|------------|-----|-----------|----------|
| Test mode: | TM3 | Polarity: | Vertical |
|------------|-----|-----------|----------|



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Degree ( ° ) | Height (cm) | Remark |
|-----|-----------------|------------------|----------------|-----------------|----------------|-------------|--------------|-------------|--------|
| 1   | 40.1347         | 43.27            | -8.57          | 34.70           | 40.00          | -5.30       | -            | -           | QP     |
| 2   | 64.6594         | 34.12            | -9.72          | 24.40           | 40.00          | -15.60      | -            | -           | QP     |
| 3   | 119.4361        | 32.65            | -10.04         | 22.61           | 43.50          | -20.89      | -            | -           | QP     |
| 4   | 198.5880        | 42.84            | -8.05          | 34.79           | 43.50          | -8.71       | -            | -           | QP     |
| 5   | 389.3549        | 27.55            | -2.83          | 24.72           | 46.00          | -21.28      | -            | -           | QP     |
| 6   | 647.3856        | 29.21            | 1.99           | 31.20           | 46.00          | -14.80      | -            | -           | 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.

## 7. 20dB Emission bandwidth.

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### 7.1 Standard Applicable

According to 15.215, 20dB emission bandwidth.

### 7.2 Test Procedure

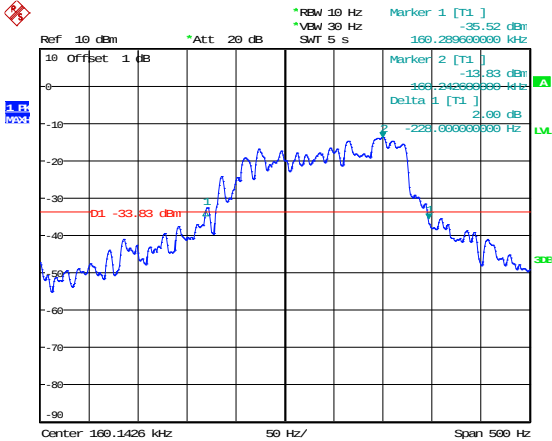
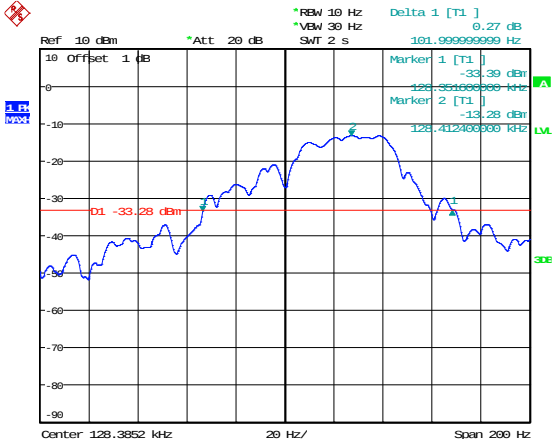
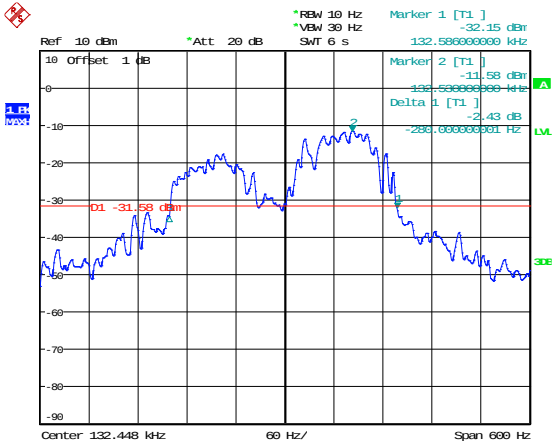
- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

### 7.3 Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 24 °C     |
| Relative Humidity: | 56%       |
| ATM Pressure:      | 1018 mbar |

### 7.4 Summary of Test Results/Plots

| Test mode | Test Channel<br>(kHz) | 20dB Bandwidth<br>(Hz) |
|-----------|-----------------------|------------------------|
| TM1       | 160.14                | 220.00                 |
| TM2       | 128.39                | 102.00                 |
| TM3       | 132.45                | 200.00                 |

|            |                                                                                                                                                                                                    |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>TM1</p> | <div data-bbox="687 275 1241 714"></div> <div data-bbox="687 770 903 786">Date: 19.MAY.2023 15:35:29</div>       |
| <p>TM2</p> | <div data-bbox="687 815 1241 1254"></div> <div data-bbox="687 1310 903 1326">Date: 19.MAY.2023 15:39:57</div>   |
| <p>TM3</p> | <div data-bbox="687 1355 1241 1794"></div> <div data-bbox="687 1850 903 1865">Date: 19.MAY.2023 15:44:44</div> |

## APPENDIX PHOTOGRAPHS

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Please refer to “ANNEX”

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