

# TEST REPORT

Reference No..... : WTX25X05139192W002  
FCC ID ..... : 2ATT5-AC02CS  
Applicant ..... : Dnake (Xiamen) Intelligent Technology Co., Ltd.  
Address ..... : No.8, Haijing North 2nd Road, Haicang District, Xiamen, Fujian, China  
Manufacturer ..... : The same as Applicant  
Address ..... : The same as Applicant  
Product Name ..... : Access Control  
Model No..... : AC02C/S  
Standards ..... : FCC Part 15.225  
Date of Receipt sample .... : 2025-05-29  
Date of Test..... : 2025-05-29 to 2025-07-08  
Date of Issue ..... : 2025-07-08  
Test Report Form No. .... : WTX\_Part 15\_225W  
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.

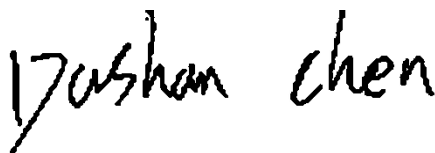
**Prepared By:**

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Tested by:



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Approved by:



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Jason Su/Manager

## **TABLE OF CONTENTS**

|                                                              |           |
|--------------------------------------------------------------|-----------|
| <b>1. GENERAL INFORMATION .....</b>                          | <b>4</b>  |
| 1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) ..... | 4         |
| 1.2 TEST STANDARDS.....                                      | 5         |
| 1.3 TEST METHODOLOGY .....                                   | 5         |
| 1.4 TEST FACILITY .....                                      | 5         |
| 1.5 EUT SETUP AND TEST MODE .....                            | 6         |
| 1.6 MEASUREMENT UNCERTAINTY .....                            | 7         |
| 1.7 TEST EQUIPMENT LIST AND DETAILS .....                    | 8         |
| <b>2. SUMMARY OF TEST RESULTS.....</b>                       | <b>12</b> |
| <b>3. ANTENNA REQUIREMENT.....</b>                           | <b>13</b> |
| 3.1 STANDARD APPLICABLE .....                                | 13        |
| 3.2 TEST RESULT.....                                         | 13        |
| <b>4. RADIATED EMISSIONS.....</b>                            | <b>14</b> |
| 4.1 STANDARD APPLICABLE .....                                | 14        |
| 4.2 TEST PROCEDURE .....                                     | 14        |
| 4.3 CORRECTED AMPLITUDE & MARGIN CALCULATION.....            | 16        |
| 4.4 SUMMARY OF TEST RESULTS/PLOTS.....                       | 17        |
| <b>5. OUT OF BAND EMISSIONS.....</b>                         | <b>20</b> |
| 5.1 STANDARD APPLICABLE .....                                | 20        |
| 5.2 TEST PROCEDURE .....                                     | 20        |
| 5.3 SUMMARY OF TEST RESULTS/PLOTS.....                       | 20        |
| <b>6. FREQUENCY STABILITY .....</b>                          | <b>22</b> |
| 6.1 STANDARD APPLICABLE .....                                | 22        |
| 6.2 TEST PROCEDURE .....                                     | 22        |
| 6.3 SUMMARY OF TEST RESULTS/PLOTS.....                       | 22        |
| <b>7. EMISSION BANDWIDTH.....</b>                            | <b>23</b> |
| 7.1 APPLICABLE STANDARD .....                                | 23        |
| 7.2 TEST PROCEDURE .....                                     | 23        |
| 7.3 SUMMARY OF TEST RESULTS/PLOTS.....                       | 23        |
| <b>8. CONDUCTED EMISSIONS .....</b>                          | <b>25</b> |
| 8.1 TEST PROCEDURE .....                                     | 25        |
| 8.2 BASIC TEST SETUP BLOCK DIAGRAM .....                     | 25        |
| 8.3 TEST RECEIVER SETUP .....                                | 25        |
| 8.4 SUMMARY OF TEST RESULTS/PLOTS.....                       | 25        |
| <b>APPENDIX PHOTOGRAPHS.....</b>                             | <b>28</b> |

Report version

| Version No. | Date of issue | Description |
|-------------|---------------|-------------|
| Rev.00      | 2025-07-08    | Original    |
| /           | /             | /           |

# 1. GENERAL INFORMATION

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

| General Description of EUT                                                                                                                                                                                                                                                                  |                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:                                                                                                                                                                                                                                                                               | Access Control                                                                                                                        |
| Trade Name                                                                                                                                                                                                                                                                                  | DNAKE                                                                                                                                 |
| Model No.:                                                                                                                                                                                                                                                                                  | AC02C/S                                                                                                                               |
| Adding Model(s):                                                                                                                                                                                                                                                                            | AC01/S, AC01/F, AC02/S, AC02/F, AC02C/F, AC01C/S, AC01C/F, AC01P/S, AC01P/F, AC02P/S, AC02P/F, AC02PC/S, AC02PC/F, AC01CP/S, AC01CP/F |
| Rated Voltage:                                                                                                                                                                                                                                                                              | DC12V                                                                                                                                 |
| Power Adapter:                                                                                                                                                                                                                                                                              | /                                                                                                                                     |
| <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 AC02C/S, but the circuit and the electronic construction do not change, declared by the manufacturer.</i> |                                                                                                                                       |

| Technical Characteristics of EUT                                                                 |                     |
|--------------------------------------------------------------------------------------------------|---------------------|
| Support Standards:                                                                               | NFC                 |
| Frequency Range:                                                                                 | 13.56MHz            |
| Max. Field Strength:                                                                             | 49.88dBuV/m (at 3m) |
| Antenna Type:                                                                                    | Coil Antenna        |
| Antenna Gain:                                                                                    | 0dBi                |
| <i>Note The Antenna Gain is provided by the customer and can affect the validity of results.</i> |                     |

## 1.2 Test Standards

The tests were performed according to following standards:

**FCC Rules Part 15.225**: Operation within the band 13.110-14.010MHz.

**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/immunity, 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, The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

## 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 Test Mode

The EUT was operated in the continuous transmitting mode that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

| Test Mode List |              |          |
|----------------|--------------|----------|
| Test Mode      | Description  | Remark   |
| TM1            | Transmitting | 13.56MHz |

| Test Conditions    |           |
|--------------------|-----------|
| Temperature:       | 22~25 °C  |
| Relative Humidity: | 45~75 %   |
| ATM Pressure:      | 1019 mbar |

| Special Cable List and Details |            |                     |                        |
|--------------------------------|------------|---------------------|------------------------|
| Cable Description              | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| Network Cable                  | 1.0        | Unshielded          | Without Ferrite        |

| Auxiliary Equipment List and Details |              |                  |               |
|--------------------------------------|--------------|------------------|---------------|
| Description                          | Manufacturer | Model            | Serial Number |
| Adapter                              | KELI         | AB-700P2         | /             |
| Wireless Router                      | MERCURY      | MS08CP           | /             |
| Notebook                             | Lenovo       | TianYi 100-14IBD | PF0F4ABV      |

## 1.6 Measurement Uncertainty

| Measurement uncertainty        |            |                    |
|--------------------------------|------------|--------------------|
| Parameter                      | Conditions | Uncertainty        |
| Frequency Deviation            | 2.3%       | 5%                 |
| Conducted Emissions            | Conducted  | 9-150kHz, 3.74dB   |
|                                |            | 0.15-30MHz, 3.34dB |
| Transmitter Spurious 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**

| Fixed asset Number                             | Description       | Manufacturer    | Model     | Serial No.     | Cal Date   | Due. Date  |
|------------------------------------------------|-------------------|-----------------|-----------|----------------|------------|------------|
| WTXE1005A<br>1005                              | Spectrum Analyzer | Agilent         | N9020A    | US471401<br>02 | 2025-02-23 | 2026-02-22 |
| WTXE1084A<br>1001                              | Spectrum Analyzer | Agilent         | N9020A    | MY543205<br>48 | 2025-02-23 | 2026-02-22 |
| WTXE1004A<br>1-001                             | Spectrum Analyzer | Rohde & Schwarz | FSP40     | 100612         | 2025-02-23 | 2026-02-22 |
| WTXE1103A<br>1003                              | Attenuator        | Pasternack      | PE4007-4  | /              | 2025-02-23 | 2026-02-22 |
| WTXE1003A<br>1-005                             | Coaxial Cable     | /               | 0M4RFC    | /              | 2025-02-23 | 2026-02-22 |
| <input type="checkbox"/> Chamber A: Below 1GHz |                   |                 |           |                |            |            |
| WTXE1005A<br>1003                              | Spectrum Analyzer | Rohde & Schwarz | FSP30     | 836079/03<br>5 | 2025-02-23 | 2026-02-22 |
| WTXE1001A<br>1001                              | EMI Test Receiver | Rohde & Schwarz | ESPI      | 101611         | 2025-02-23 | 2026-02-22 |
| WTXE1007A<br>1001                              | Amplifier         | HP              | 8447F     | 2805A034<br>75 | 2025-02-23 | 2026-02-22 |
| WTXE1010A<br>1007                              | Loop Antenna      | Schwarz beck    | FMZB 1516 | 9773           | 2024-02-26 | 2026-02-25 |
| WTXE1010A<br>1006                              | Broadband Antenna | Schwarz beck    | VULB9163  | 9163-333       | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1032-1                            | Coaxial Cable     | /               | RC_6G-N-M | /              | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1032-2                            | Coaxial Cable     | /               | RC_6G-N-M | /              | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1032-3                            | Coaxial Cable     | /               | RC_6G-N-M | /              | 2025-02-23 | 2026-02-22 |
| <input type="checkbox"/> Chamber A: Above 1GHz |                   |                 |           |                |            |            |
| WTXE1005A<br>1003                              | Spectrum Analyzer | Rohde & Schwarz | FSP30     | 836079/03<br>5 | 2025-02-23 | 2026-02-22 |
| WTXE1001A<br>1001                              | EMI Test Receiver | Rohde & Schwarz | ESPI      | 101611         | 2025-02-23 | 2026-02-22 |
| WTXE1065A<br>1001                              | Amplifier         | C&D             | PAP-1G18  | 2002           | 2025-02-23 | 2026-02-22 |
| WTXE1010A<br>1005                              | Horn Antenna      | ETS             | 3117      | 00086197       | 2025-02-23 | 2026-02-22 |
| WTXE1010A<br>1010                              | DRG Horn Antenna  | A.H. SYSTEMS    | SAS-574   | 571            | 2024-03-17 | 2026-03-16 |

|                                                           |                                |                    |              |                |            |            |
|-----------------------------------------------------------|--------------------------------|--------------------|--------------|----------------|------------|------------|
| WTXE1003A<br>1001                                         | Pre-amplifier                  | Schwarzbeck        | BBV 9721     | 9721-031       | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1033-1                                       | Coaxial Cable                  | /                  | C16-07-07    | /              | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1033-2                                       | Coaxial Cable                  | /                  | C16-07-07    | /              | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1033-3                                       | Coaxial Cable                  | /                  | C16-07-07    | /              | 2025-02-23 | 2026-02-22 |
| <input type="checkbox"/> Chamber B:Below 1GHz             |                                |                    |              |                |            |            |
| WTXE1010A<br>1006                                         | Trilog<br>Broadband<br>Antenna | Schwarz beck       | VULB9163(B)  | 9163-635       | 2024-03-17 | 2027-03-16 |
| WTXE1038A<br>1001                                         | Amplifier                      | Agilent            | 8447D        | 2944A104<br>57 | 2025-02-23 | 2026-02-22 |
| WTXE1001A<br>1002                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESPI         | 101391         | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1031-1                                       | Coaxial Cable                  | /                  | 1.5MRFC-LWB3 | /              | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1031-2                                       | Coaxial Cable                  | /                  | RG 316       | /              | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1031-3                                       | Coaxial Cable                  | /                  | RG 316       | /              | 2025-02-23 | 2026-02-22 |
| <input checked="" type="checkbox"/> Chamber C:Below 1GHz  |                                |                    |              |                |            |            |
| WTXE1093A<br>1001                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESIB 26      | 100401         | 2025-02-23 | 2026-02-22 |
| WTXE1010A<br>1013-1                                       | Trilog<br>Broadband<br>Antenna | Schwarz beck       | VULB 9168    | 1194           | 2024-04-18 | 2027-04-17 |
| WTXE1010A<br>1007                                         | Loop Antenna                   | Schwarz beck       | FMZB 1516    | 9773           | 2024-02-26 | 2026-02-25 |
| WTXE1007A<br>1002                                         | Amplifier                      | HP                 | 8447F        | 2944A038<br>69 | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1034-1                                       | Coaxial Cable                  | /                  | RC_6G-N-M    | /              | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1034-2                                       | Coaxial Cable                  | /                  | RC_6G-N-M    | /              | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1034-3                                       | Coaxial Cable                  | /                  | RC_6G-N-M    | /              | 2025-02-23 | 2026-02-22 |
| <input checked="" type="checkbox"/> Chamber C: Above 1GHz |                                |                    |              |                |            |            |
| WTXE1093A<br>1001                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESIB 26      | 100401         | 2025-02-23 | 2026-02-22 |
| WTXE1103A                                                 | Horn Antenna                   | POAM               | RTF-118A     | 1820           | 2023-03-10 | 2026-03-09 |

|                                                       |                      |                    |             |                 |            |            |
|-------------------------------------------------------|----------------------|--------------------|-------------|-----------------|------------|------------|
| 1005                                                  |                      |                    |             |                 | 2025-06-13 | 2027-06-12 |
| WTXE1103A<br>1006                                     | Amplifier            | Tonscend           | TAP01018050 | AP22E806<br>235 | 2025-02-23 | 2026-02-22 |
| WTXE1010A<br>1010                                     | DRG Horn<br>Antenna  | A.H. SYSTEMS       | SAS-574     | 571             | 2024-03-17 | 2026-03-16 |
| WTXE1003A<br>1001                                     | Pre-amplifier        | Schwarzbeck        | BBV 9721    | 9721-031        | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1035-1                                   | Coaxial Cable        | /                  | RC-18G-N-M  | /               | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1035-2                                   | Coaxial Cable        | /                  | RC-18G-N-M  | /               | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1035-3                                   | Coaxial Cable        | /                  | RC-18G-N-M  | /               | 2025-02-23 | 2026-02-22 |
| <input type="checkbox"/> Conducted Room 1#            |                      |                    |             |                 |            |            |
| WTXE1104A<br>1029                                     | EMI Test<br>Receiver | Rohde &<br>Schwarz | ESCI        | 100525          | 2024-12-08 | 2025-12-07 |
| WTXE1002A<br>1001                                     | Pulse Limiter        | Rohde &<br>Schwarz | ESH3-Z2     | 100911          | 2025-02-23 | 2026-02-22 |
| WTXE1003A<br>1001                                     | AC LISN              | Schwarz beck       | NSLK8126    | 8126-279        | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1036                                     | Coaxial Cable        | /                  | RG 316      | /               | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1038                                     | Coaxial Cable        | /                  | 6MRFC-DP    | /               | 2025-02-23 | 2026-02-22 |
| <input checked="" type="checkbox"/> Conducted Room 2# |                      |                    |             |                 |            |            |
| WTXE1001A<br>1004                                     | EMI Test<br>Receiver | Rohde &<br>Schwarz | ESPI        | 101259          | 2025-02-23 | 2026-02-22 |
| WTXE1003A<br>1003                                     | LISN                 | Rohde &<br>Schwarz | ENV 216     | 100097          | 2025-02-23 | 2026-02-22 |
| WTXE1104A<br>1037                                     | Coaxial Cable        | /                  | RG 316      | /               | 2025-02-23 | 2026-02-22 |

| Software List                                        |              |        |                        |
|------------------------------------------------------|--------------|--------|------------------------|
| Description                                          | Manufacturer | Model  | Version                |
| EMI Test Software<br>(Radiated Emission A)           | Farad        | EZ-EMC | RA-03A1<br>(1.1.4.2)   |
| EMI Test Software<br>(Radiated Emission B)           | Farad        | EZ-EMC | RA-03A1<br>(1.1.4.2)   |
| EMI Test Software<br>(Radiated Emission C)           | Farad        | EZ-EMC | RA-03A1-2<br>(1.1.4.2) |
| EMI Test Software<br>(Conducted Emission Room<br>1#) | Farad        | EZ-EMC | 3A1*CE-RE<br>1.1.4.3   |
| EMI Test Software<br>(Conducted Emission Room<br>2#) | Farad        | EZ-EMC | 3A1*CE-RE<br>1.1.4.3   |

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

## 2. SUMMARY OF TEST RESULTS

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| FCC Rules     | Description of Test Item     | Result    |
|---------------|------------------------------|-----------|
| §15.203       | Antenna Requirement          | Compliant |
| §15.205       | Restricted Band of Operation | Compliant |
| §15.209       | Radiated Emission            | Compliant |
| §15.225(a)    | Field Strength               | Compliant |
| §15.225(b)(c) | Out of Band Emission         | Compliant |
| §15.225(e)    | Frequency Stability          | Compliant |
| §15.207(a)    | Conducted Emission           | Compliant |
| §15.215(c)    | Emission Bandwidth           | Compliant |

N/A: not applicable.

### **3. Antenna Requirement**

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#### **3.1 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.

#### **3.2 Test Result**

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

## 4. Radiated Emissions

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### 4.1 Standard Applicable

According to §15.225(a), the field strength of any emissions within the band 13.553–13.567MHz shall not exceed 15,848 microvolts/meter at 30 meters.

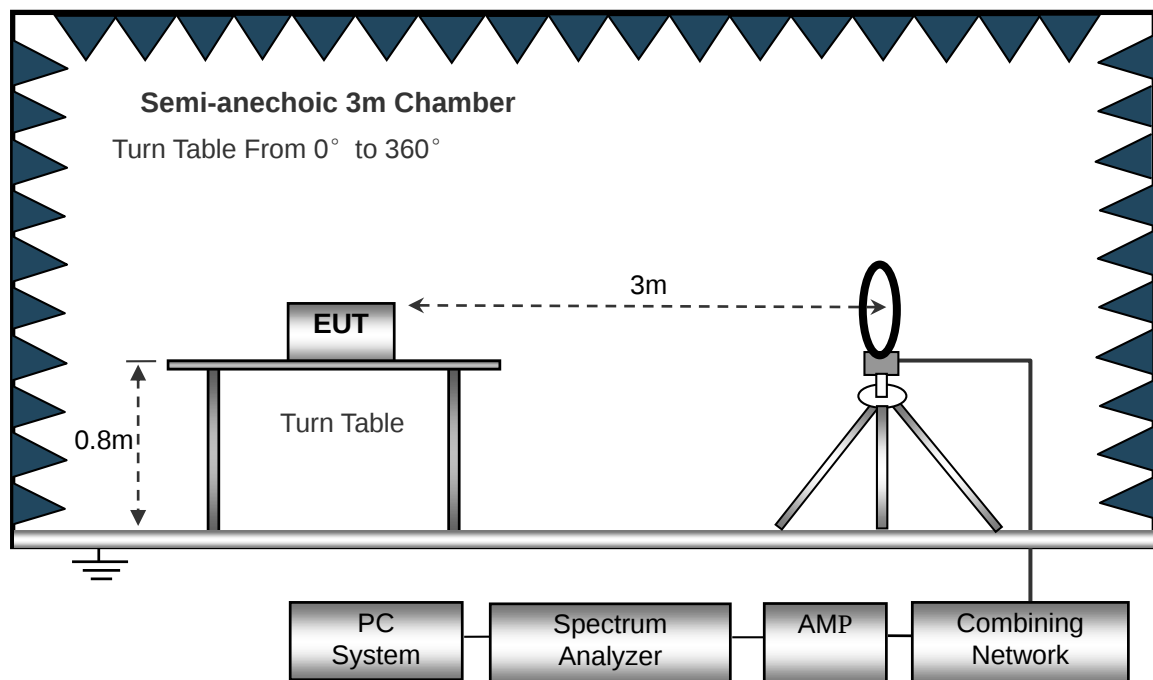
According to §15.225(d), the field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in §15.209.

Note: Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

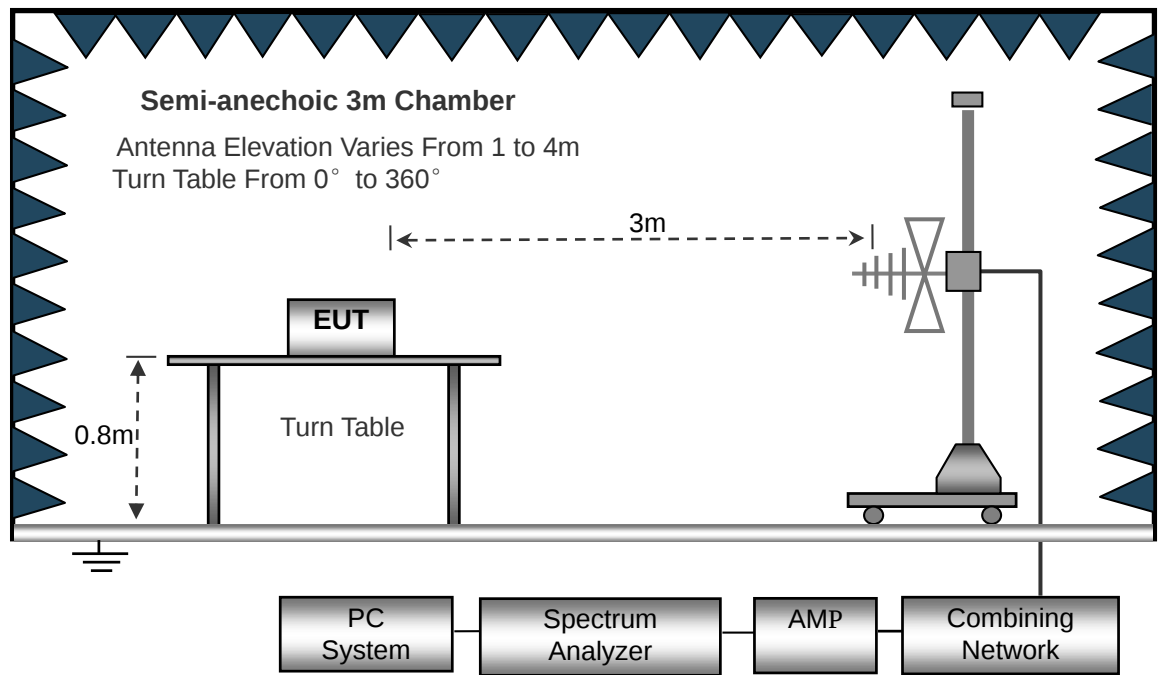
### 4.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.225(d) and FCC Part 15.209 Limit.

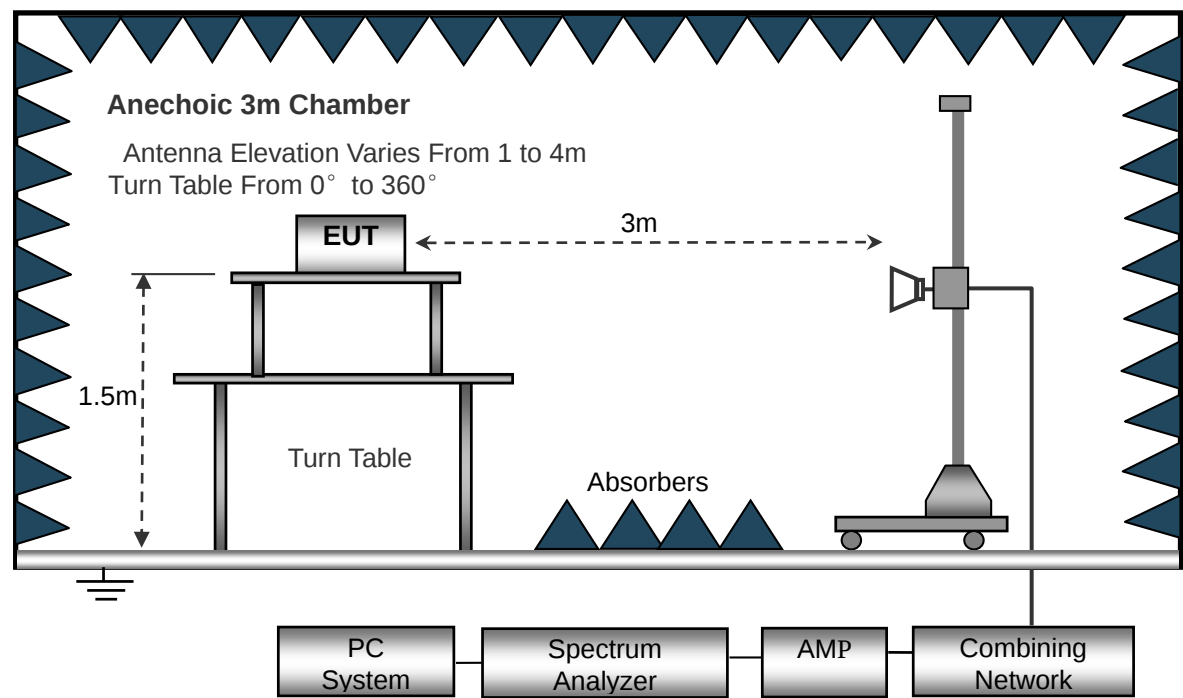
The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm. The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1GHz.



|                          |                              |                              |
|--------------------------|------------------------------|------------------------------|
| Frequency :9kHz-30MHz    | Frequency :30MHz-1GHz        | Frequency :Above 1GHz        |
| RBW=10kHz,               | RBW=120kHz,                  | RBW=1MHz,                    |
| VBW =30kHz               | VBW=300kHz                   | VBW=3MHz(Peak), 10Hz(AV)     |
| Sweep time= Auto         | Sweep time= Auto             | Sweep time= Auto             |
| Trace = max hold         | Trace = max hold             | Trace = max hold             |
| Detector function = peak | Detector function = peak, QP | Detector function = peak, AV |

### 4.3 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 -6dB $\mu$ V means the emission is 6dB $\mu$ V below the maximum limit for Class B. The equation for margin calculation is as follows:

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

#### 4.4 Summary of Test Results/Plots

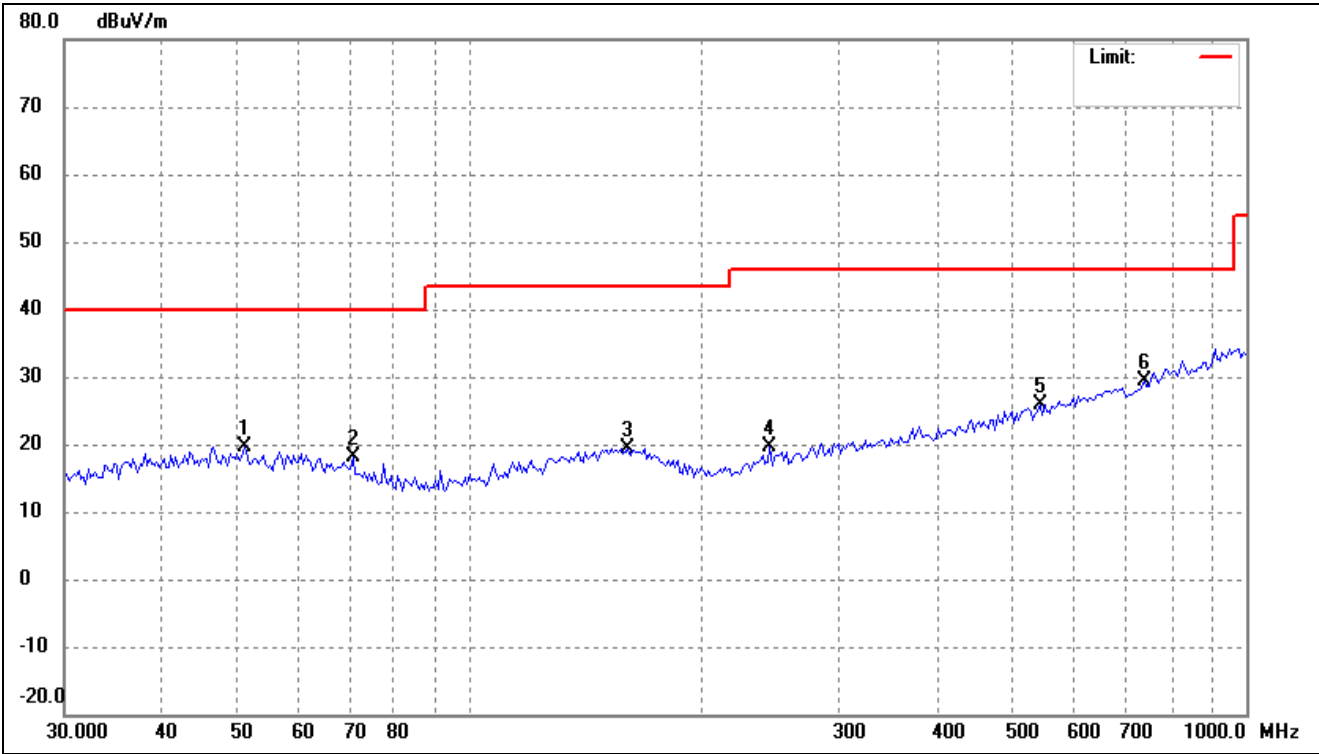
**Note:** this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

➤ Below 30MHz

| Frequency | Reading | Correction Factor | Result | Limit  | Margin | Polar | Detector |
|-----------|---------|-------------------|--------|--------|--------|-------|----------|
| MHz       | dBuV/m  | dB/m              | dBuV/m | dBuV/m | dB     | X/Y/Z |          |
| 13.56     | 47.26   | -2.08             | 45.18  | 124.0  | -78.82 | X     | Peak     |
| 27.12     | 39.54   | -2.27             | 37.27  | 69.5   | -32.23 | X     | Peak     |
| 13.56     | 46.62   | -2.08             | 44.54  | 124.0  | -79.46 | Y     | Peak     |
| 27.12     | 39.19   | -2.27             | 36.92  | 69.5   | -32.58 | Y     | Peak     |
| 13.56     | 45.35   | -2.08             | 43.27  | 124.0  | -80.73 | Z     | Peak     |
| 27.12     | 38.14   | -2.27             | 35.87  | 69.5   | -33.63 | Z     | Peak     |

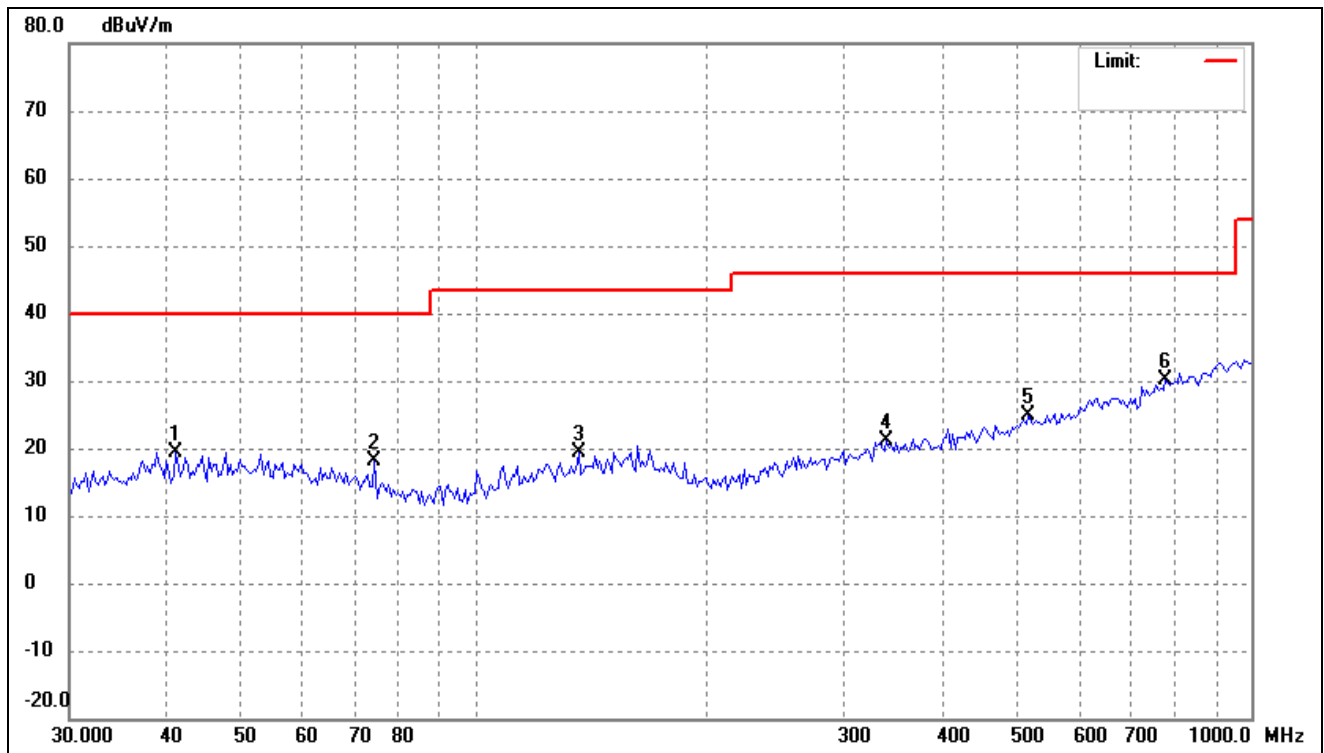
➤ Above 30MHz

|           |     |           |            |
|-----------|-----|-----------|------------|
| 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   | 51.1756            | 27.46               | -7.72           | 19.74              | 40.00             | -20.26         | -             | -              | peak   |
| 2   | 70.7047            | 28.48               | -10.41          | 18.07              | 40.00             | -21.93         | -             | -              | peak   |
| 3   | 159.7586           | 27.55               | -8.05           | 19.50              | 43.50             | -24.00         | -             | -              | peak   |
| 4   | 243.5431           | 29.50               | -9.90           | 19.60              | 46.00             | -26.40         | -             | -              | peak   |
| 5   | 542.6104           | 29.72               | -3.78           | 25.94              | 46.00             | -20.06         | -             | -              | peak   |
| 6   | 739.2136           | 29.56               | -0.09           | 29.47              | 46.00             | -16.53         | -             | -              | peak   |

|           |     |           |          |
|-----------|-----|-----------|----------|
| 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   | 41.1581            | 27.33               | -7.96           | 19.37              | 40.00             | -20.63         | -             | -              | peak   |
| 2   | 74.2696            | 29.32               | -11.18          | 18.14              | 40.00             | -21.86         | -             | -              | peak   |
| 3   | 135.9163           | 28.41               | -9.07           | 19.34              | 43.50             | -24.16         | -             | -              | peak   |
| 4   | 338.8546           | 28.29               | -7.18           | 21.11              | 46.00             | -24.89         | -             | -              | peak   |
| 5   | 516.5651           | 29.36               | -4.48           | 24.88              | 46.00             | -21.12         | -             | -              | peak   |
| 6   | 776.4849           | 29.43               | 0.62            | 30.05              | 46.00             | -15.95         | -             | -              | 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.

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics.

## 5. OUT OF BAND EMISSIONS

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### 5.1 Standard Applicable

According to FCC 15.225 (b), within the bands 13.410–13.553MHz and 13.567–13.710MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters. (c) Within the bands 13.110–13.410MHz and 13.710–14.010MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

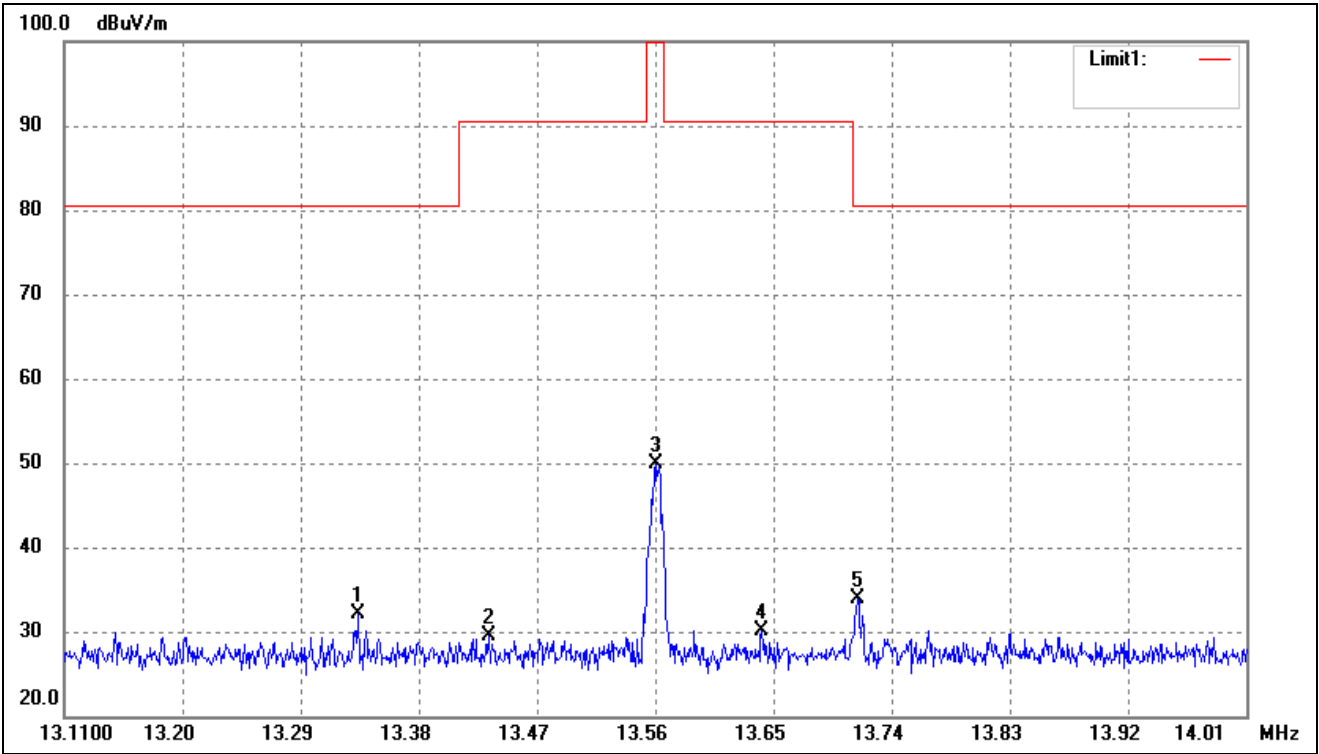
### 5.2 Test Procedure

As the radiation test, set the RBW=10kHz VBW=30kHz, observed the outside band of 13.11MHz to 14.01MHz, than mark the higher-level emission for comparing with the FCC rules.

### 5.3 Summary of Test Results/Plots

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

|           |     |           |   |
|-----------|-----|-----------|---|
| Test Mode | TM1 | Polarity: | / |
|-----------|-----|-----------|---|



| 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   | 13.3341            | 39.96               | -7.88           | 32.08              | 80.50             | -48.42         | -               | -              | peak   |
| 2   | 13.4331            | 37.32               | -7.88           | 29.44              | 90.50             | -61.06         | -               | -              | peak   |
| 3   | 13.5600            | 57.74               | -7.86           | 49.88              | 124.00            | -74.12         | -               | -              | peak   |
| 4   | 13.6410            | 37.96               | -7.86           | 30.10              | 90.50             | -60.40         | -               | -              | peak   |
| 5   | 13.7139            | 41.82               | -7.85           | 33.97              | 80.50             | -46.53         | -               | -              | 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.

## 6. Frequency Stability

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### 6.1 Standard Applicable

According to 15.225(e), the frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency over a temperature variation of  $-20$  degrees to  $+50$  degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

### 6.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure.

### 6.3 Summary of Test Results/Plots

| Reference Frequency: 13.56MHz, Limit: 100ppm |            |          |              |                |
|----------------------------------------------|------------|----------|--------------|----------------|
| Voltage(%)                                   | Power(VDC) | TEMP(°C) | Freq.Dev(Hz) | Deviation(ppm) |
| 100%                                         | 12         | -30      | 651          | 48.01          |
| 100%                                         |            | -20      | 692          | 51.03          |
| 100%                                         |            | -10      | 646          | 47.64          |
| 100%                                         |            | 0        | 615          | 45.35          |
| 100%                                         |            | +10      | 676          | 49.85          |
| 100%                                         |            | +20      | 632          | 46.61          |
| 100%                                         |            | +30      | 653          | 48.16          |
| 100%                                         |            | +40      | 712          | 52.51          |
| 100%                                         |            | +50      | 786          | 57.96          |
| Low                                          | 9.6        | +20      | 832          | 61.36          |
| High                                         | 14.4       | +20      | 810          | 59.73          |

## 7. EMISSION BANDWIDTH

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### 7.1 Applicable Standard

According to 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

### 7.2 Test Procedure

According to the ANSI 63.10-2013, the emission bandwidth test method as follows.

Set span =  $1\sim 5 * \text{EBW}$ , centered on a transmitting channel

RBW =  $1\%\sim 5\% * \text{EBW}$ , VBW =  $3 * \text{RBW}$

Sweep = auto

Detector function = peak

Trace = max hold

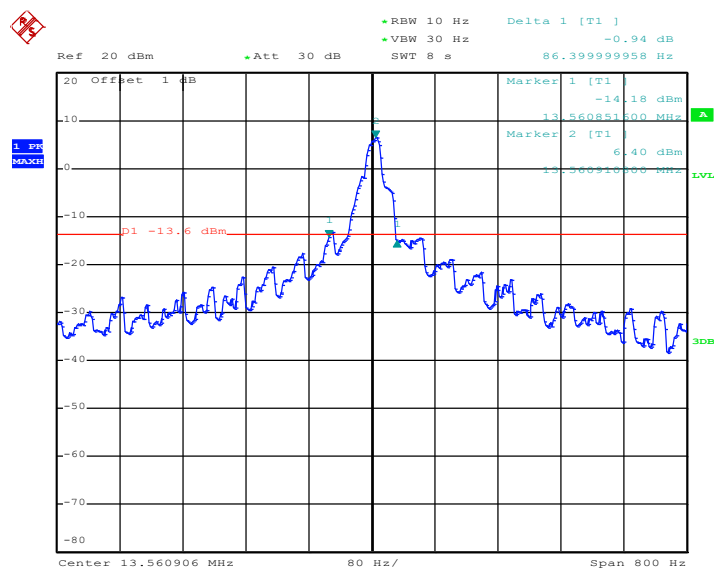
All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down of the emission.

### 7.3 Summary of Test Results/Plots

| Tx Frequency | 20dB Emission bandwidth(kHz) |
|--------------|------------------------------|
| 13.56MHz     | 0.086                        |

Reference No.: WTX25X05139192W002

Please refer to the test plots as below:



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Note: The RBW of the analyzer measuring Bandwidth cannot be adjusted to 1%-5% 20dB Bandwidth, the RBW of the test setting is the closest value.

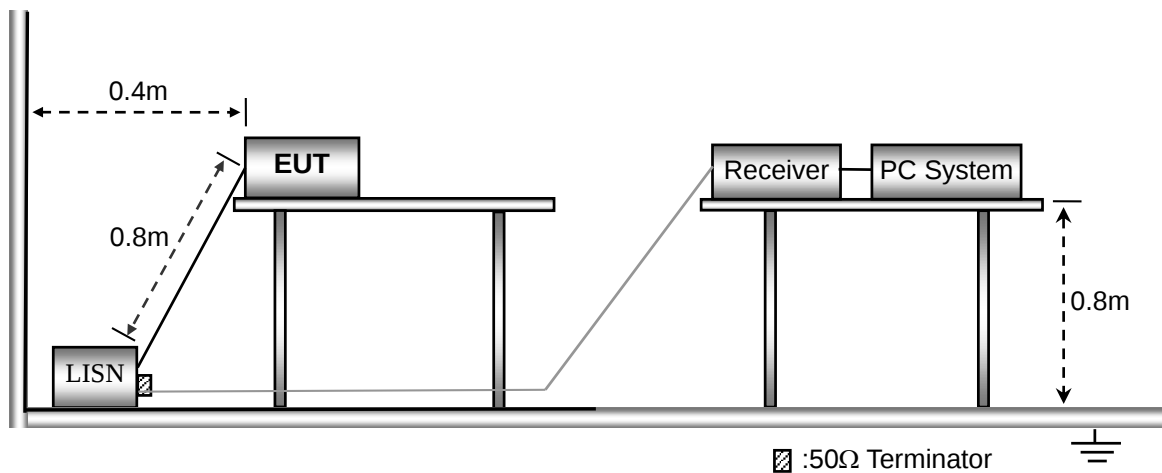
## 8. Conducted Emissions

### 8.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

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

### 8.2 Basic Test Setup Block Diagram



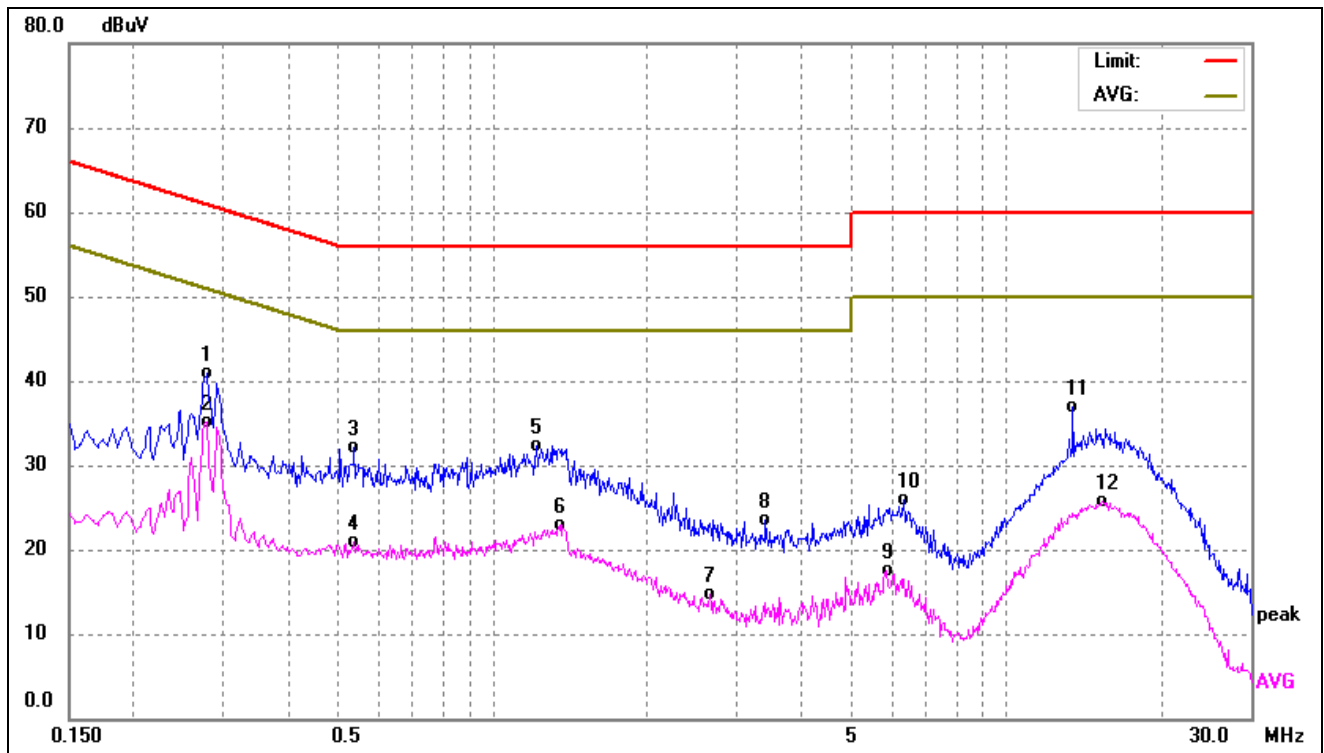
### 8.3 Test Receiver Setup

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

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

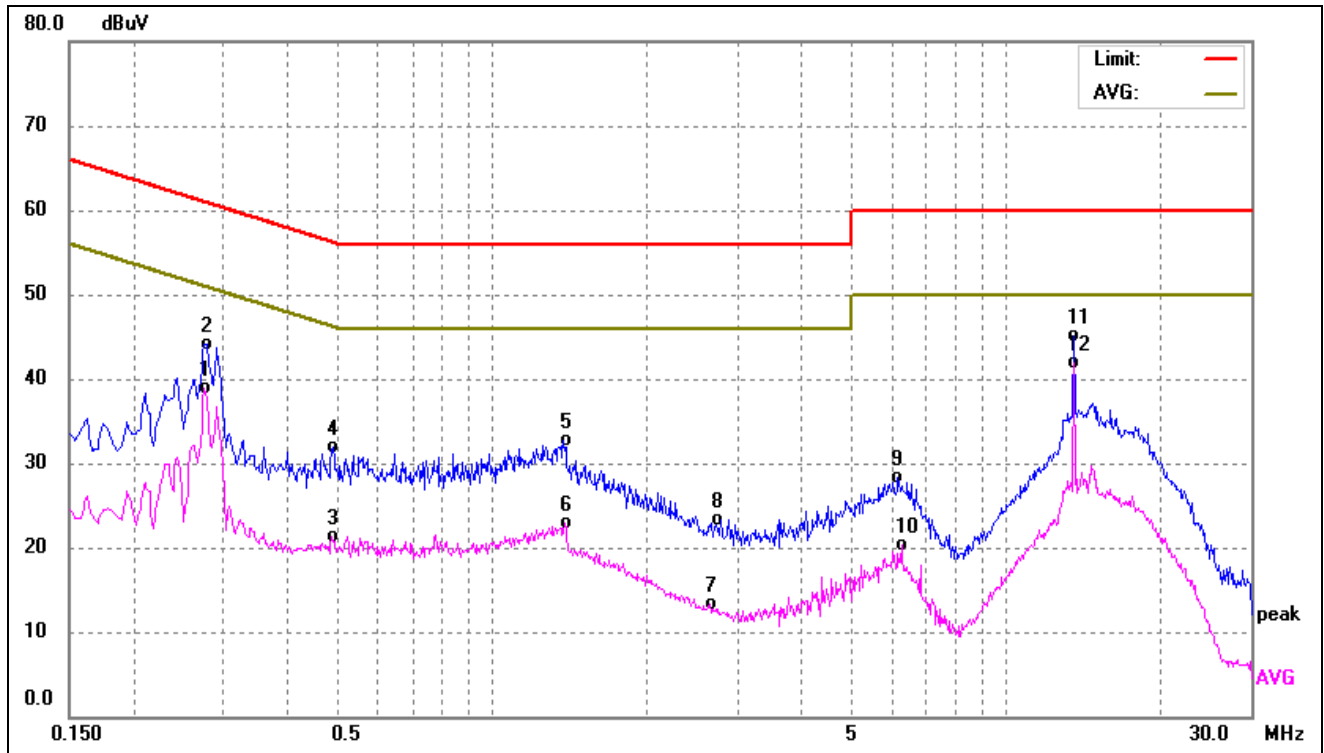
### 8.4 Summary of Test Results/Plots

|           |                  |           |         |
|-----------|------------------|-----------|---------|
| Test Mode | TM1(AC120V 60Hz) | Polarity: | Neutral |
|-----------|------------------|-----------|---------|



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|--------|
| 1   | 0.2779             | 31.21             | 9.63            | 40.84            | 60.88           | -20.04         | QP     |
| 2   | 0.2779             | 25.57             | 9.63            | 35.20            | 50.88           | -15.68         | AVG    |
| 3   | 0.5380             | 22.41             | 9.67            | 32.08            | 56.00           | -23.92         | QP     |
| 4   | 0.5380             | 11.14             | 9.67            | 20.81            | 46.00           | -25.19         | AVG    |
| 5   | 1.2180             | 22.64             | 9.67            | 32.31            | 56.00           | -23.69         | QP     |
| 6   | 1.3540             | 13.22             | 9.62            | 22.84            | 46.00           | -23.16         | AVG    |
| 7   | 2.6580             | 5.26              | 9.38            | 14.64            | 46.00           | -31.36         | AVG    |
| 8   | 3.4020             | 13.99             | 9.42            | 23.41            | 56.00           | -32.59         | QP     |
| 9   | 5.8620             | 7.76              | 9.67            | 17.43            | 50.00           | -32.57         | AVG    |
| 10  | 6.3220             | 16.20             | 9.71            | 25.91            | 60.00           | -34.09         | QP     |
| 11  | 13.5460            | 27.37             | 9.60            | 36.97            | 60.00           | -23.03         | QP     |
| 12  | 15.4300            | 16.27             | 9.51            | 25.78            | 50.00           | -24.22         | AVG    |

|           |                  |           |      |
|-----------|------------------|-----------|------|
| Test Mode | TM1(AC120V 60Hz) | Polarity: | Line |
|-----------|------------------|-----------|------|



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB) | Result<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|--------|
| 1   | 0.2740             | 29.27             | 9.63            | 38.90            | 50.99           | -12.09         | AVG    |
| 2   | 0.2779             | 34.55             | 9.63            | 44.18            | 60.88           | -16.70         | QP     |
| 3   | 0.4860             | 11.67             | 9.65            | 21.32            | 46.24           | -24.92         | AVG    |
| 4   | 0.4900             | 22.19             | 9.65            | 31.84            | 56.17           | -24.33         | QP     |
| 5   | 1.3740             | 23.02             | 9.61            | 32.63            | 56.00           | -23.37         | QP     |
| 6   | 1.3860             | 13.22             | 9.61            | 22.83            | 46.00           | -23.17         | AVG    |
| 7   | 2.6540             | 3.86              | 9.38            | 13.24            | 46.00           | -32.76         | AVG    |
| 8   | 2.7820             | 13.99             | 9.39            | 23.38            | 56.00           | -32.62         | QP     |
| 9   | 6.1700             | 18.67             | 9.70            | 28.37            | 60.00           | -31.63         | QP     |
| 10  | 6.2580             | 10.61             | 9.71            | 20.32            | 50.00           | -29.68         | AVG    |
| 11  | 13.5509            | 35.45             | 9.60            | 45.05            | 60.00           | -14.95         | QP     |
| 12  | 13.5509            | 32.39             | 9.60            | 41.99            | 50.00           | -8.01          | AVG    |

## APPENDIX PHOTOGRAPHS

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Please refer to “ANNEX”

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