

# TEST REPORT

**Reference No.**..... : WTH24X10234117W  
**FCC ID** ..... : 2AEHC-RADIOKEYDPLUS  
**Applicant** ..... : PRASTEL FRANCE  
**Address** ..... : ZI ATHELIA II 225 IMPASSE DU SERPOLET 13704, LA CIOTAT CEDEX,  
France  
**Manufacturer** ..... : The same as Applicant  
**Address** ..... : The same as Applicant  
**Product Name** ..... : RADIOKEYD+  
**Model No.**..... : L8074-3  
**Standards** ..... : FCC Part 15.231  
**Date of Receipt sample** .... : 2024-10-11  
**Date of Test**..... : 2024-10-11 to 2024-10-28  
**Date of Issue** ..... : 2024-10-28  
**Test Report Form No.** ..... : WTX\_Part 15\_231W  
**Test Result**..... : **Pass**

**Remarks:**

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

**Prepared By:**

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Report version

| Version No. | Date of issue | Description |
|-------------|---------------|-------------|
| Rev.00      | 2024-10-28    | Original    |
| /           | /             | /           |

## 1. GENERAL INFORMATION

---

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

| General Description of EUT                                                                    |            |
|-----------------------------------------------------------------------------------------------|------------|
| Product Name:                                                                                 | RADIOKEYD+ |
| Trade Name:                                                                                   | PRATEL     |
| Model No.:                                                                                    | L8074-3    |
| Adding Model(s):                                                                              | /          |
| Rated Voltage:                                                                                | DC3V       |
| Power Adaptor :                                                                               | /          |
| <i>Note: The test data is gathered from a production sample provided by the manufacturer.</i> |            |

| Technical Characteristics of EUT                                                                 |                            |
|--------------------------------------------------------------------------------------------------|----------------------------|
| Frequency Range:                                                                                 | 433.92 MHz                 |
| Max. Field Strength:                                                                             | 433.92MHz: 81.98dBuV/m(3m) |
| Data Rate:                                                                                       | /                          |
| Modulation:                                                                                      | GFSK                       |
| Antenna Type:                                                                                    | Integral Antenna           |
| Antenna Gain:                                                                                    | -20.0dBi                   |
| <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 15.231:** Periodic operation in the band 40.66-40.70MHz and above 70MHz.

**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 at 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 | 433.92MHz |

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

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

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

| Auxiliary Equipment List and Details |              |       |               |
|--------------------------------------|--------------|-------|---------------|
| Description                          | Manufacturer | Model | Serial Number |
| /                                    | /            | /     | /             |

## 1.6 Measurement Uncertainty

| Measurement uncertainty        |            |                                |
|--------------------------------|------------|--------------------------------|
| Parameter                      | Conditions | Uncertainty                    |
| Occupied Bandwidth             | Conducted  | $\pm 1.5\%$                    |
| Conducted Spurious Emission    | Conducted  | $\pm 2.17\text{dB}$            |
| Transmission Time              | Conducted  | $\pm 5\%$                      |
| Conducted Emissions            | Conducted  | 9-150kHz $\pm 3.74\text{dB}$   |
|                                |            | 0.15-30MHz $\pm 3.34\text{dB}$ |
| Transmitter Spurious Emissions | Radiated   | 30-200MHz $\pm 4.52\text{dB}$  |
|                                |            | 0.2-1GHz $\pm 5.56\text{dB}$   |
|                                |            | 1-6GHz $\pm 3.84\text{dB}$     |
|                                |            | 6-18GHz $\pm 3.92\text{dB}$    |

**1.7 Test Equipment List and Details**

| Fixed asset Number                             | Description       | Manufacturer    | Model     | Serial No.     | Cal Date   | Due. Date  |
|------------------------------------------------|-------------------|-----------------|-----------|----------------|------------|------------|
| WTXE1004A<br>1-001                             | Spectrum Analyzer | Rohde & Schwarz | FSP40     | 100612         | 2024-02-27 | 2025-02-26 |
| WTXE1103A<br>1003                              | Attenuator        | Pasternack      | PE4007-4  | /              | 2024-02-24 | 2025-02-23 |
| WTXE1003A<br>1-005                             | Coaxial Cable     | /               | 0M4RFC    | /              | 2024-07-03 | 2025-01-03 |
| <input type="checkbox"/> Chamber A: Below 1GHz |                   |                 |           |                |            |            |
| WTXE1005A<br>1003                              | Spectrum Analyzer | Rohde & Schwarz | FSP30     | 836079/03<br>5 | 2024-02-24 | 2025-02-23 |
| WTXE1001A<br>1001                              | EMI Test Receiver | Rohde & Schwarz | ESPI      | 101611         | 2024-03-19 | 2025-03-18 |
| WTXE1007A<br>1001                              | Amplifier         | HP              | 8447F     | 2805A034<br>75 | 2024-02-24 | 2025-02-23 |
| WTXE1010A<br>1007                              | Loop Antenna      | Schwarz beck    | FMZB 1516 | 9773           | 2024-02-26 | 2025-02-25 |
| WTXE1010A<br>1006                              | Broadband Antenna | Schwarz beck    | VULB9163  | 9163-333       | 2024-02-24 | 2025-02-23 |
| WTXE1104A<br>1032-1                            | Coaxial Cable     | /               | RC_6G-N-M | /              | 2024-03-15 | 2025-03-14 |
| WTXE1104A<br>1032-2                            | Coaxial Cable     | /               | RC_6G-N-M | /              | 2024-03-15 | 2025-03-14 |
| WTXE1104A<br>1032-3                            | Coaxial Cable     | /               | RC_6G-N-M | /              | 2024-03-15 | 2025-03-14 |
| <input type="checkbox"/> Chamber A: Above 1GHz |                   |                 |           |                |            |            |
| WTXE1005A<br>1003                              | Spectrum Analyzer | Rohde & Schwarz | FSP30     | 836079/03<br>5 | 2024-02-24 | 2025-02-23 |
| WTXE1001A<br>1001                              | EMI Test Receiver | Rohde & Schwarz | ESPI      | 101611         | 2024-03-19 | 2025-03-18 |
| WTXE1065A<br>1001                              | Amplifier         | C&D             | PAP-1G18  | 2002           | 2024-02-27 | 2025-02-26 |
| WTXE1010A<br>1005                              | Horn Antenna      | ETS             | 3117      | 00086197       | 2024-02-26 | 2025-02-25 |
| WTXE1010A<br>1010                              | DRG Horn Antenna  | A.H. SYSTEMS    | SAS-574   | 571            | 2024-03-17 | 2025-03-16 |
| WTXE1003A<br>1001                              | Pre-amplifier     | Schwarzbeck     | BBV 9721  | 9721-031       | 2024-02-29 | 2025-02-28 |
| WTXE1104A<br>1033-1                            | Coaxial Cable     | /               | C16-07-07 | /              | 2024-03-15 | 2025-03-14 |
| WTXE1104A                                      | Coaxial Cable     | /               | C16-07-07 | /              | 2024-03-15 | 2025-03-14 |



|                                                           |                                |                    |              |                 |            |            |
|-----------------------------------------------------------|--------------------------------|--------------------|--------------|-----------------|------------|------------|
| 1033-2                                                    |                                |                    |              |                 |            |            |
| WTXE1104A<br>1033-3                                       | Coaxial Cable                  | /                  | C16-07-07    | /               | 2024-03-15 | 2025-03-14 |
| <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  | 2024-02-24 | 2025-02-23 |
| WTXE1001A<br>1002                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESPI         | 101391          | 2024-02-24 | 2025-02-23 |
| WTXE1104A<br>1031-1                                       | Coaxial Cable                  | /                  | 1.5MRFC-LWB3 | /               | 2024-07-03 | 2025-07-02 |
| WTXE1104A<br>1031-2                                       | Coaxial Cable                  | /                  | RG 316       | /               | 2024-07-03 | 2025-07-02 |
| WTXE1104A<br>1031-3                                       | Coaxial Cable                  | /                  | RG 316       | /               | 2024-07-03 | 2025-07-02 |
| <input checked="" type="checkbox"/> Chamber C:Below 1GHz  |                                |                    |              |                 |            |            |
| WTXE1093A<br>1001                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESIB 26      | 100401          | 2024-02-27 | 2025-02-26 |
| WTXE1010A<br>1013-1                                       | Trilog<br>Broadband<br>Antenna | Schwarz beck       | VULB 9168    | 1194            | 2024-04-18 | 2027-04-17 |
| WTXE1007A<br>1002                                         | Amplifier                      | HP                 | 8447F        | 2944A038<br>69  | 2024-02-24 | 2025-02-23 |
| WTXE1010A<br>1007                                         | Loop Antenna                   | Schwarz beck       | FMZB 1516    | 9773            | 2024-02-26 | 2025-02-25 |
| WTXE1104A<br>1034-1                                       | Coaxial Cable                  | /                  | RC_6G-N-M    | /               | 2024-07-03 | 2025-07-02 |
| WTXE1104A<br>1034-2                                       | Coaxial Cable                  | /                  | RC_6G-N-M    | /               | 2024-07-03 | 2025-07-02 |
| WTXE1104A<br>1034-3                                       | Coaxial Cable                  | /                  | RC_6G-N-M    | /               | 2024-07-03 | 2025-07-02 |
| <input checked="" type="checkbox"/> Chamber C: Above 1GHz |                                |                    |              |                 |            |            |
| WTXE1093A<br>1001                                         | EMI Test<br>Receiver           | Rohde &<br>Schwarz | ESIB 26      | 100401          | 2024-02-27 | 2025-02-26 |
| WTXE1103A<br>1005                                         | Horn Antenna                   | POAM               | RTF-118A     | 1820            | 2023-03-10 | 2026-03-09 |
| WTXE1103A<br>1006                                         | Amplifier                      | Tonscend           | TAP01018050  | AP22E806<br>235 | 2024-02-27 | 2025-02-26 |
| WTXE1010A<br>1010                                         | DRG Horn<br>Antenna            | A.H. SYSTEMS       | SAS-574      | 571             | 2024-03-17 | 2025-03-16 |

|                                                       |                   |                 |            |          |            |            |
|-------------------------------------------------------|-------------------|-----------------|------------|----------|------------|------------|
| WTXE1003A<br>1001                                     | Pre-amplifier     | Schwarzbeck     | BBV 9721   | 9721-031 | 2024-02-29 | 2025-02-28 |
| WTXE1104A<br>1035-1                                   | Coaxial Cable     | /               | RC-18G-N-M | /        | 2024-07-03 | 2025-07-02 |
| WTXE1104A<br>1035-2                                   | Coaxial Cable     | /               | RC-18G-N-M | /        | 2024-07-03 | 2025-07-02 |
| WTXE1104A<br>1035-3                                   | Coaxial Cable     | /               | RC-18G-N-M | /        | 2024-07-03 | 2025-07-02 |
| <input type="checkbox"/> Conducted Room 1#            |                   |                 |            |          |            |            |
| WTXE1104A<br>1029                                     | EMI Test Receiver | Rohde & Schwarz | ESCI       | 100525   | 2023-12-12 | 2024-12-11 |
| WTXE1002A<br>1001                                     | Pulse Limiter     | Rohde & Schwarz | ESH3-Z2    | 100911   | 2024-02-24 | 2025-02-23 |
| WTXE1003A<br>1001                                     | AC LISN           | Schwarz beck    | NSLK8126   | 8126-279 | 2024-02-24 | 2025-02-23 |
| WTXE1104A<br>1036                                     | Coaxial Cable     | /               | RG 316     | /        | 2024-07-03 | 2025-07-02 |
| WTXE1104A<br>1038                                     | Coaxial Cable     | /               | 6MRFC-DP   | /        | 2024-07-03 | 2025-07-02 |
| <input checked="" type="checkbox"/> Conducted Room 2# |                   |                 |            |          |            |            |
| WTXE1001A<br>1004                                     | EMI Test Receiver | Rohde & Schwarz | ESPI       | 101259   | 2024-02-24 | 2025-02-23 |
| WTXE1003A<br>1003                                     | LISN              | Rohde & Schwarz | ENV 216    | 100097   | 2024-02-24 | 2025-02-23 |
| WTXE1104A<br>1037                                     | Coaxial Cable     | /               | RG 316     | /        | 2024-07-03 | 2025-07-02 |

| 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

---

| FCC Rules  | Description of Test Item     | Result    |
|------------|------------------------------|-----------|
| §15.203    | Antenna Requirement          | Compliant |
| §15.205    | Restricted Band of Operation | Compliant |
| §15.209    | Radiated Spurious Emissions  | Compliant |
| §15.231(a) | Deactivation Testing         | Compliant |
| §15.231(b) | Radiated Emissions           | Compliant |
| §15.231(c) | 20dB Bandwidth Testing       | Compliant |
| §15.207(a) | Conducted Emission           | N/A       |

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 an Integral antenna, fulfill the requirement of this section.

## 4. Radiated Emissions

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### 4.1 Standard Applicable

According to §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

| Fundamental Frequency (MHz) | Field Strength of Fundamental (microvolts/meter) | Field Strength of Spurious Emissions (microvolts/meter) |
|-----------------------------|--------------------------------------------------|---------------------------------------------------------|
| 40.66 - 40.70               | 2,250                                            | 225                                                     |
| 70 - 130                    | 1,250                                            | 125                                                     |
| 130 - 174                   | 1,250 to 3,750 **                                | 125 to 375 **                                           |
| 174 - 260                   | 3,750                                            | 375                                                     |
| 260 - 470                   | 3,750 to 12,500 **                               | 375 to 1,250 **                                         |
| Above 470                   | 12,500                                           | 1,250                                                   |

---

\*\* linear interpolations

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.

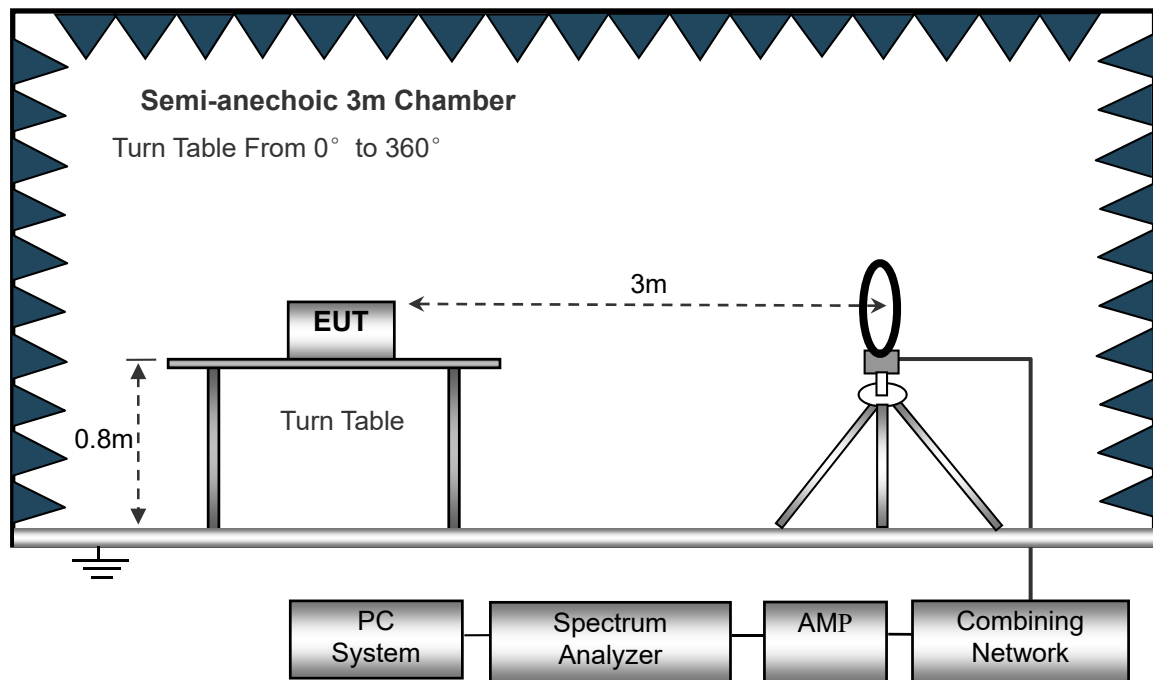
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

Compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.

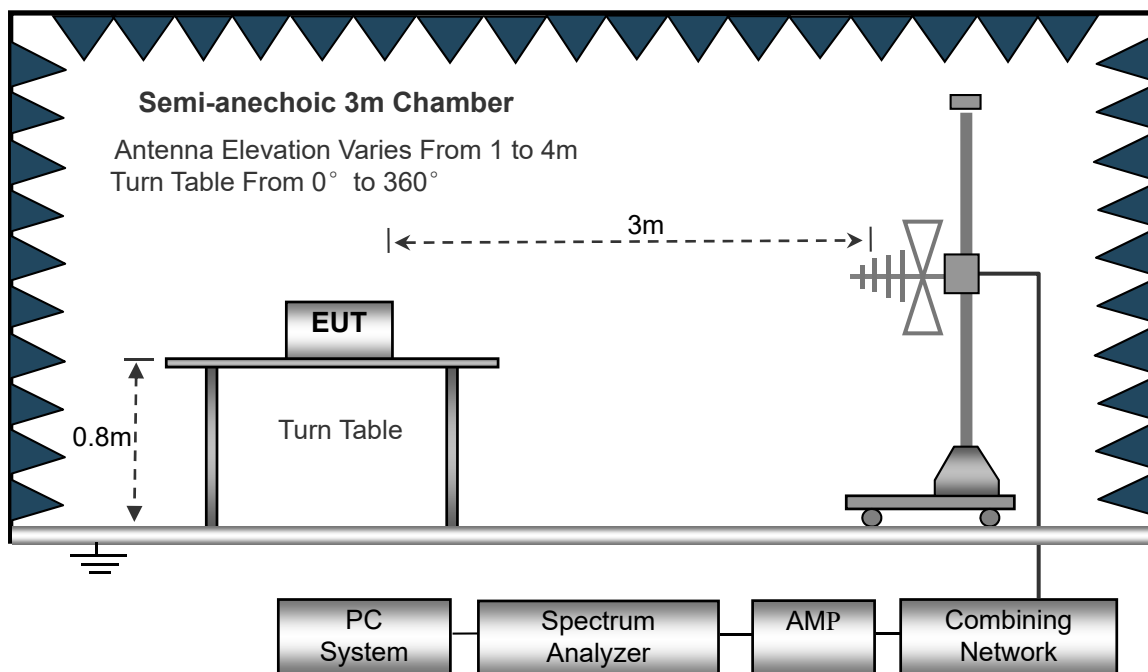
## 4.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.231(b) and FCC Part 15.209 Limit.

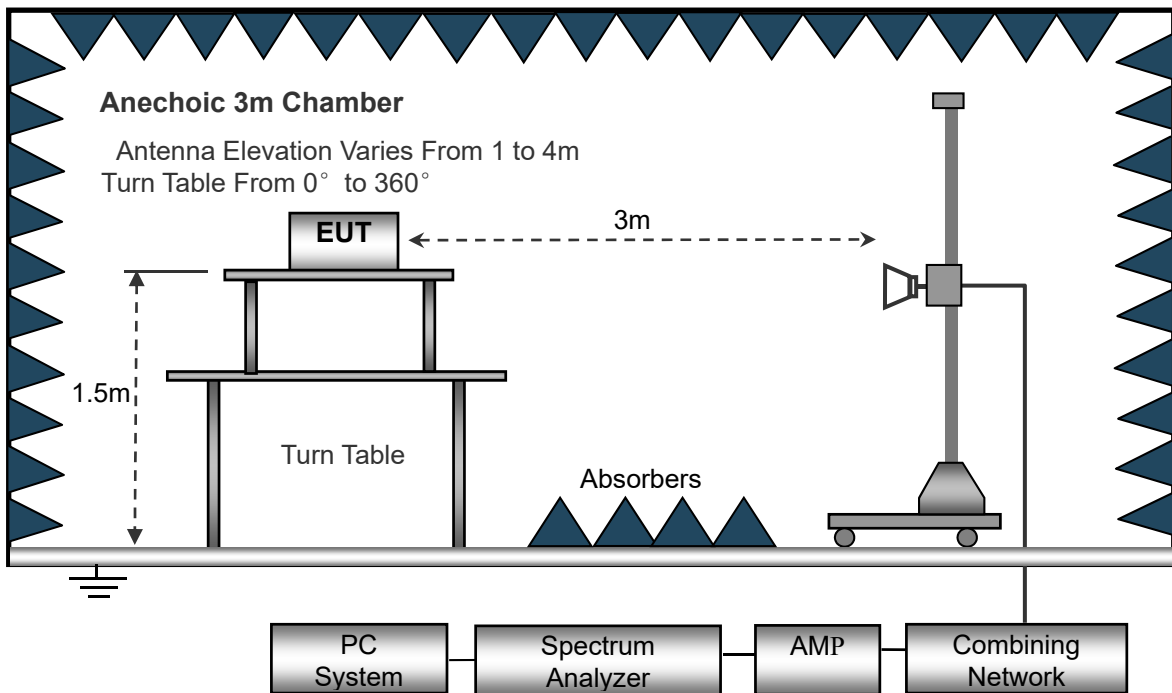
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1GHz.



### 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:

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

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:

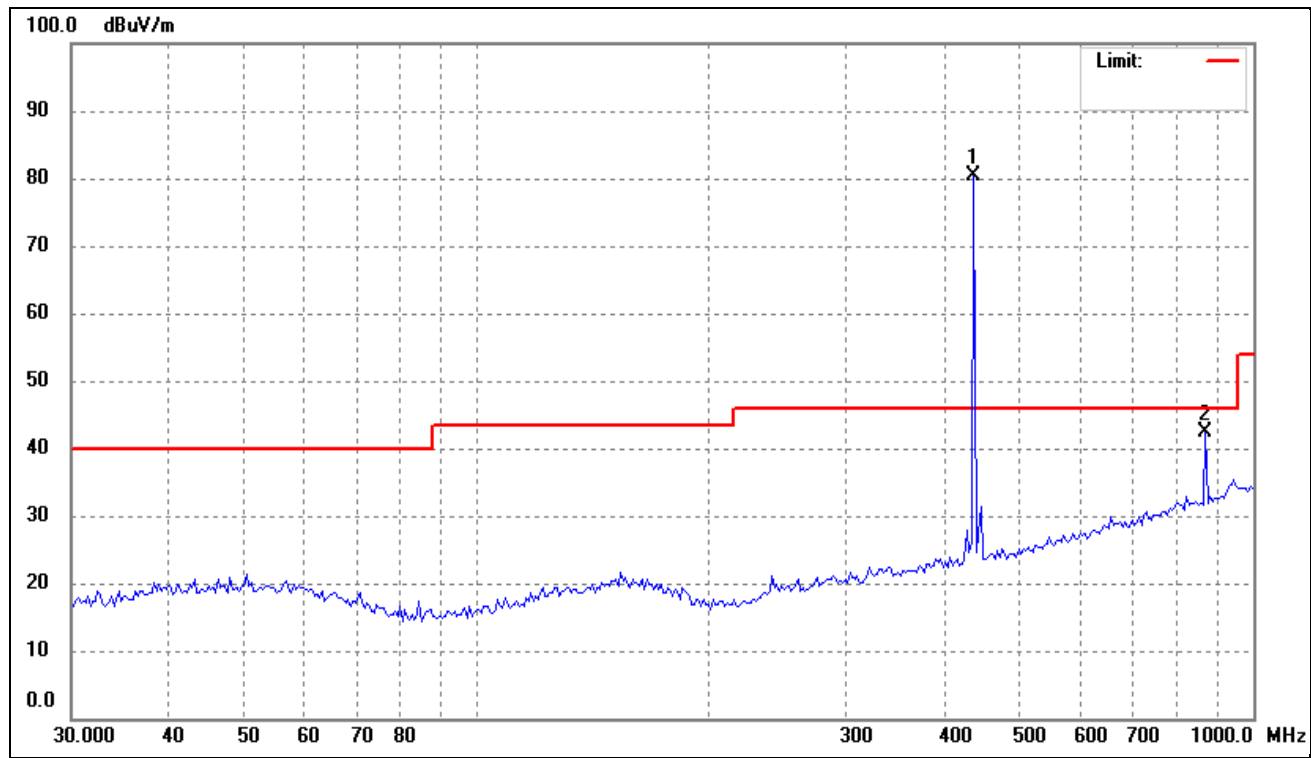
$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15C Limit}$$

### 4.4 Summary of Test Results/Plots

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



|           |     |           |            |
|-----------|-----|-----------|------------|
| Test Mode | TM1 | Polarity: | Horizontal |
|-----------|-----|-----------|------------|

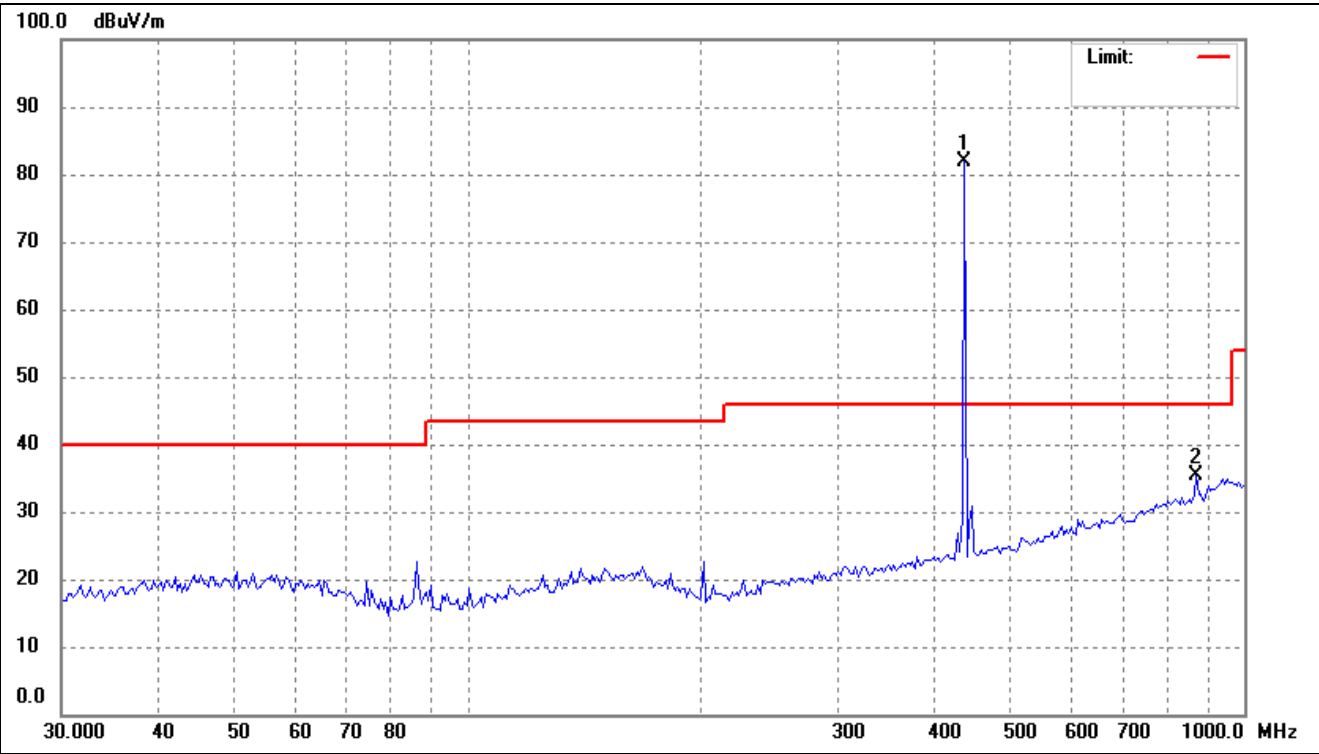


| No. | Frequency | Reading | Corr.       | Duty cycle  | Result | Limit  | Margin | Deg.  | Height | Remark |
|-----|-----------|---------|-------------|-------------|--------|--------|--------|-------|--------|--------|
|     | MHz       | dBuV/m  | Factor (dB) | Factor (dB) | dBuV/m | dBuV/m | (dB)   | ( ° ) | (cm)   |        |
| 1   | 436.3956  | 85.92   | -5.47       | N/A         | 80.45  | 100.83 | -20.38 | -     | -      | peak   |
| /   | /         | /       | /           | -2.38       | 78.07  | 80.83  | -2.76  | -     | -      | Ave    |
| 2   | 868.8860  | 40.55   | 1.75        | N/A         | 42.30  | 80.83  | -38.53 | -     | -      | peak   |
| /   | /         | /       | /           | -2.38       | 39.92  | 60.83  | -20.91 | -     | -      | Ave    |

*Above 1GHz*

| No. | Frequency | Reading | Corr.       | Duty cycle  | Result | Limit  | Margin | Deg. | Height | Remark |
|-----|-----------|---------|-------------|-------------|--------|--------|--------|------|--------|--------|
|     | MHz       | dBuV/m  | Factor (dB) | Factor (dB) | dBuV/m | dBuV/m | dB     | (°)  | (cm)   |        |
| 1   | 1299.684  | 74.18   | -23.40      | N/A         | 50.78  | 80.83  | -30.05 | -    | -      | peak   |
| /   | /         | /       | /           | -2.38       | 48.40  | 60.83  | -12.43 | -    | -      | ave    |
| 2   | 1732.174  | 72.13   | -21.68      | N/A         | 50.45  | 80.83  | -30.38 | -    | -      | peak   |
| /   | /         | /       | /           | -2.38       | 48.07  | 60.83  | -12.76 | -    | -      | ave    |
| 3   | 2171.876  | 65.74   | -19.97      | N/A         | 45.77  | 80.83  | -35.06 | -    | -      | peak   |
| /   | /         | /       | /           | -2.38       | 43.39  | 60.83  | -17.44 | -    | -      | ave    |

|           |     |           |          |
|-----------|-----|-----------|----------|
| Test Mode | TM1 | Polarity: | Vertical |
|-----------|-----|-----------|----------|



| No. | Frequency<br>MHz | Reading<br>dBuV/m | Corr.<br>Factor<br>(dB) | Dutycycle<br>Factor<br>(dB) | Result<br>dBuV/m | Limit<br>dBuV/m | Margin<br>(dB) | Deg.<br>( ° ) | Height<br>(cm) | Remark |
|-----|------------------|-------------------|-------------------------|-----------------------------|------------------|-----------------|----------------|---------------|----------------|--------|
| 1   | 436.3956         | 87.45             | -5.47                   | N/A                         | 81.98            | 100.83          | -18.85         | -             | -              | peak   |
| /   | /                | /                 | /                       | -2.38                       | 79.60            | 80.83           | -1.23          | -             | -              | Ave    |
| 2   | 868.8860         | 33.66             | 1.75                    | N/A                         | 35.41            | 80.83           | -45.42         | -             | -              | peak   |
| /   | /                | /                 | /                       | -2.38                       | 33.03            | 60.83           | -27.8          | -             | -              | Ave    |

*Above 1GHz*

| No. | Frequency | Reading | Corr.       | Dutycycle   | Result | Limit  | Margin | Deg. | Height | Remark |
|-----|-----------|---------|-------------|-------------|--------|--------|--------|------|--------|--------|
|     | MHz       | dBuV/m  | Factor (dB) | Factor (dB) | dBuV/m | dBuV/m | dB     | (°)  | (cm)   |        |
| 1   | 1299.684  | 76.29   | -23.40      | N/A         | 52.89  | 80.83  | -27.94 | -    | -      | Peak   |
| /   | /         | /       | /           | -2.38       | 50.51  | 60.83  | -10.32 | -    | -      | Ave    |
| 2   | 1732.174  | 74.02   | -21.68      | N/A         | 52.34  | 80.83  | -28.49 | -    | -      | Peak   |
| /   | /         | /       | /           | -2.38       | 49.96  | 60.83  | -10.87 | -    | -      | Ave    |
| 3   | 2171.876  | 65.27   | -19.97      | N/A         | 45.30  | 80.83  | -35.53 | -    | -      | Peak   |
| /   | /         | /       | /           | -2.38       | 42.92  | 60.83  | -17.91 | -    | -      | Ave    |

*Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*

5. 20dB Bandwidth

5.1 Standard Applicable

According to FCC Part 15.231(c), the bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. Bandwidth is determined at the points 20dB down from the modulated carrier.

5.1 Test Procedure

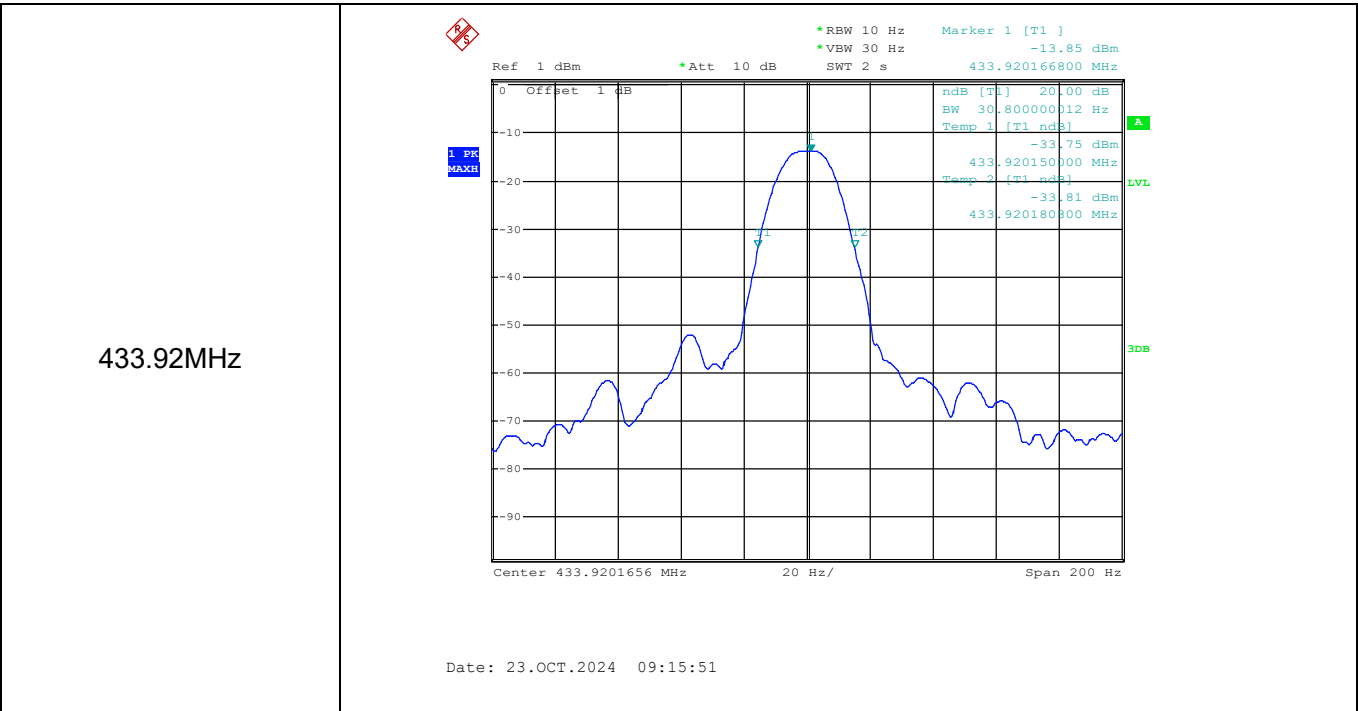
With the EUT’s antenna attached, the EUT’s 20dB Bandwidth power was received by the test antenna, which was connected to the spectrum analyzer with the START, and STOP frequencies set to the EUT’s operation band.

5.2 Summary of Test Results/Plots

| Test Frequency MHz | 20dB Bandwidth kHz | Limit kHz | Result |
|--------------------|--------------------|-----------|--------|
| 433.92             | 0.0308             | 1084.8    | Pass   |

Limit = Fundamental Frequency X 0.25% = 433.92MHz X 0.25% = 1084kHz

Please refer to the attached plots.



## 6. Transmission Time

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### 6.1 Standard Applicable

According to FCC Part 15.231(a), the transmitter shall be complied the following requirements:

- 1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

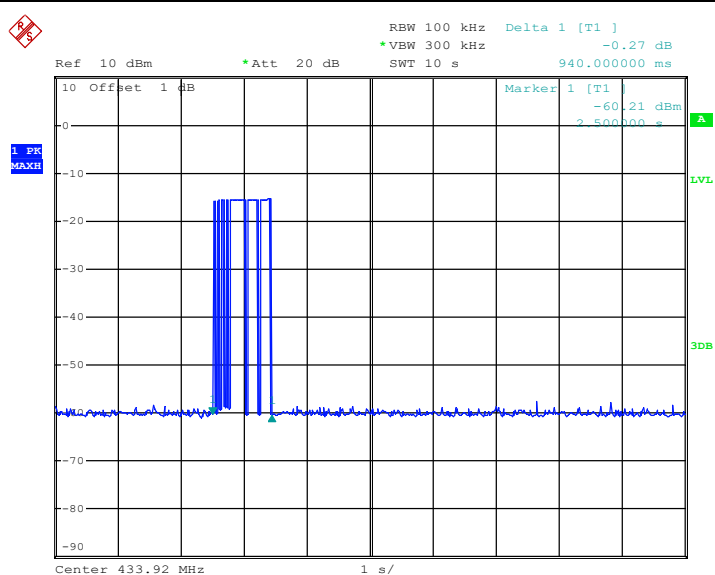
### 6.2 Test Procedure

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency to 433.92MHz, than set the spectrum analyzer to Zero Span for the release time reading. During the testing, the switch was released then the EUT automatically deactivated.

### 6.3 Summary of Test Results/Plots

| Transmission Type | Test Frequency(MHz) | Transmission Time(s) | Limit(s) | Result |
|-------------------|---------------------|----------------------|----------|--------|
| Manually          | 433.92              | 0.94                 | 5        | Pass   |

*Please refer to the attached plots.*



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## 7. Duty Cycle

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### 7.1 Standard Applicable

According to FCC Part 15.231 (b)(2) and 15.35 (c), for pulse operation transmitter, the averaging pulsed emissions are calculated by peak value of measured emission plus duty cycle factor.

### 7.2 Test Procedure

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency to 433.92MHz, then set the spectrum analyzer to Zero Span for the release time reading. During the testing, the switch was released then the EUT automatically deactivated.

### 7.3 Summary of Test Results/Plots

433.92MHz:

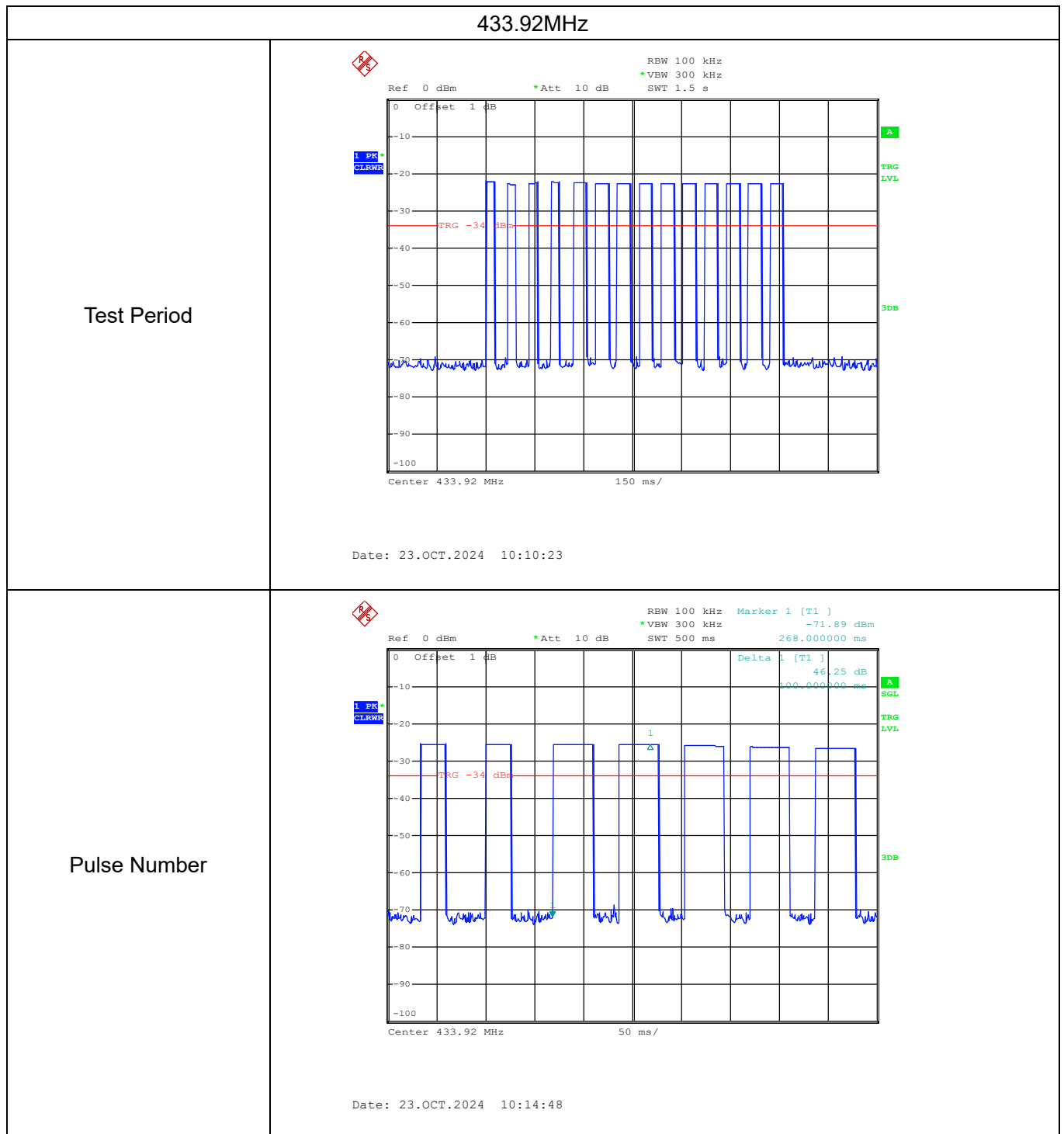
| Type of Pulse    | Width of Pulse (ms) | Quantity of Pulse | Transmission Time (ms) | Total Time (T <sub>on</sub> ) (ms) |
|------------------|---------------------|-------------------|------------------------|------------------------------------|
| Pulse 1 (Wide)   | 43.0                | 1                 | 43.0                   | 76.0                               |
| Pulse 2 (Narrow) | 33.0                | 1                 | 33.0                   |                                    |

| Test Period (T <sub>p</sub> ) | Total Time (T <sub>on</sub> ) | Duty Cycle | Duty Cycle Factor |
|-------------------------------|-------------------------------|------------|-------------------|
| ms                            | ms                            | %          | dB                |
| 100                           | 76.0                          | 76         | -2.38             |

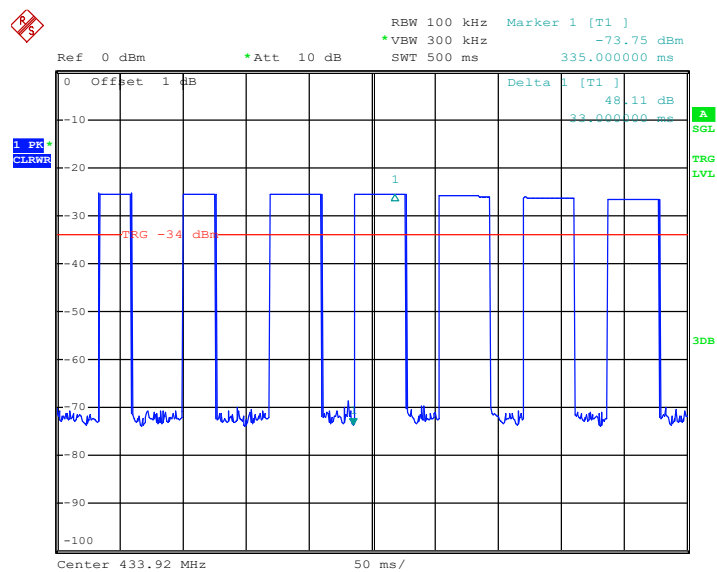
Remark: Duty Cycle Factor=20\*log(Duty Cycle)

*Please refer to the attached test plots:*



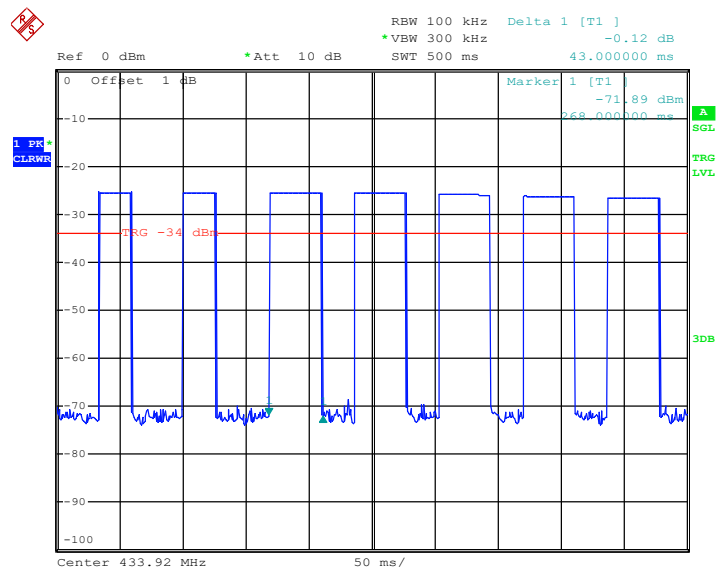


Pulse 1



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Pulse 2



Date: 23.OCT.2024 10:15:24

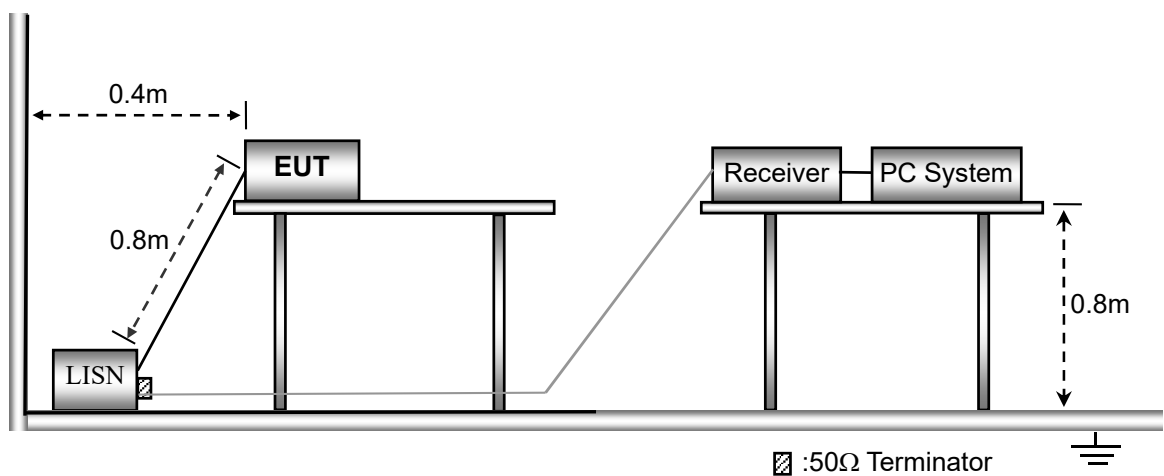
## 8. Conducted Emissions

### 8.1 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 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

Not applicable

## APPENDIX PHOTOGRAPHS

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Please refer to “ANNEX”

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