



# TEST REPORT

Applicant Name : EZTECH DIGITAL INC.  
Address : 251 Little Falls Drive Wilmington Delaware 19808 United States  
Report Number : RA230321-13736E-RF-00A  
FCC ID: 2A4AS-2212A

## Test Standard (s)

FCC PART 15.231

## Sample Description

Product Type: IP Camera  
Model No.: Reolink TrackMix LTE Plus  
Trade Mark: **reolink**  
Date Received: 2023-03-21  
Date of Test: 2023-04-21 to 2023-06-02  
Report Date: 2023-06-03

|              |       |
|--------------|-------|
| Test Result: | Pass* |
|--------------|-------|

\* In the configuration tested, the EUT complied with the standards above.

## Prepared and Checked By:

*Bob. Liao*

Bob.Liao  
EMC Engineer

## Approved By:

*Candy. Li*

Candy Li  
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

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DOCUMENT REVISION HISTORY

| Revision Number | Report Number          | Description of Revision | Date of Revision |
|-----------------|------------------------|-------------------------|------------------|
| 0               | RA230321-13736E-RF-00A | Original Report         | 2023-06-03       |

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

|                        |                                                    |
|------------------------|----------------------------------------------------|
| Product                | IP Camera                                          |
| Tested Model           | Reolink TrackMix LTE Plus                          |
| Frequency Range        | 433.92MHz                                          |
| E-field strength       | 60.66dBuV/m@3m                                     |
| Modulation Technique   | FSK                                                |
| Antenna Specification* | Integral Antenna (It is provided by the applicant) |
| Voltage Range          | DC10.8V from battery                               |
| Sample serial number   | RA230321-13736E-RF-S1 (Assigned by ATC, Shenzhen)  |
| Sample/EUT Status      | Good condition                                     |

### Objective

All the test measurements were performed according to the measurement procedure described in ANSI C63.10 - 2013.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.209, 15.35(c) and 15.231 rules.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.10 - 2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.  
Each test item follows test standards and with no deviation.

## Measurement Uncertainty

| Parameter                    |              | Uncertainty |
|------------------------------|--------------|-------------|
| Occupied Channel Bandwidth   |              | 5%          |
| RF output power, conducted   |              | 0.71dB      |
| Unwanted Emission, conducted |              | 1.6dB       |
| Emissions,<br>Radiated       | 30MHz - 1GHz | 5.08dB      |
|                              | 1GHz - 18GHz | 4.96dB      |
| Temperature                  |              | 1°C         |
| Humidity                     |              | 6%          |
| Supply voltages              |              | 0.4%        |

*Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.*

## Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189.

Accredited by American Association for Laboratory Accreditation (A2LA). The Certificate Number is 4297.01.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 30241.

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing by manufacturer.

Operating frequency: 433.92MHz

### EUT Exercise Software

No software was used during testing and the power level was default\*.

### Special Accessories

No special accessories was used

### Equipment Modifications

No modification was made to the EUT.

### Support Equipment List and Details

| Manufacturer               | Description                 | Model        | Serial Number   |
|----------------------------|-----------------------------|--------------|-----------------|
| REOLINK INNOVATION LIMITED | Rechargeable Li-ion Battery | Battery-Li12 | C493A122JHB0323 |
| Unknown                    | SD Card                     | Unknown      | Unknown         |

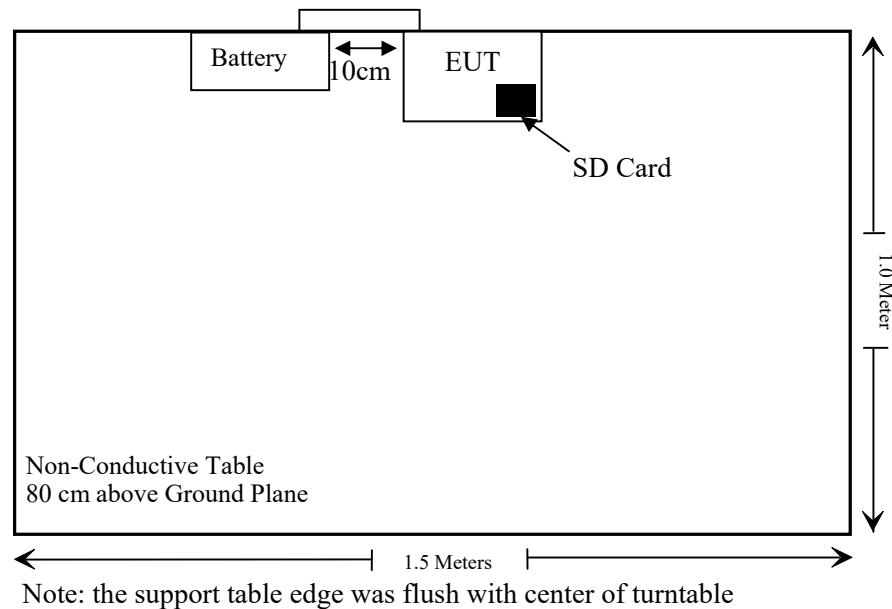
### External I/O Cable

| Cable Description                 | Length (m) | From / Port | To                          |
|-----------------------------------|------------|-------------|-----------------------------|
| Unshielded Un-detachable DC cable | 1.0        | EUT         | Rechargeable Li-ion Battery |

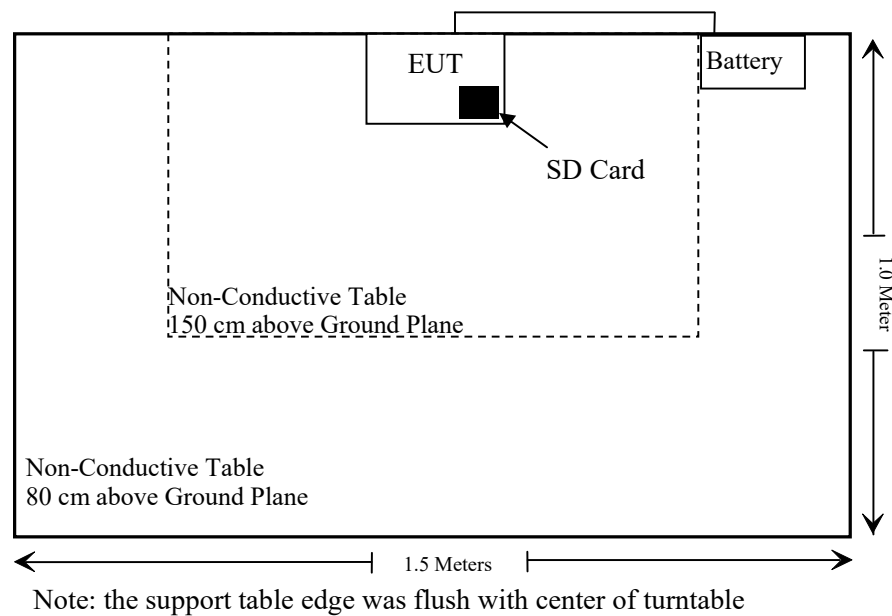
**Block Diagram of Test Setup**

**For Radiated Emission**

**Below 1G**



**Above 1G**



**SUMMARY OF TEST RESULTS**

| FCC Rules                     | Description of Test     | Result         |
|-------------------------------|-------------------------|----------------|
| § 1.1307 (b) & §2.1093        | RF Exposure             | Compliant      |
| §15.203                       | Antenna Requirement     | Compliant      |
| §15.207 (a)                   | Conducted Emissions     | Not Applicable |
| § 15.205, §15.209, §15.231(e) | Radiated Emissions      | Compliant      |
| §15.231 (c)                   | 20dB Emission Bandwidth | Compliant      |
| § 15.231 (e)                  | Deactivation            | Compliant      |

Note: Not Applicable: The EUT is powered by battery.

**TEST EQUIPMENT LIST AND DETAILS**

| Manufacturer                                   | Description       | Model     | Serial Number | Calibration Date | Calibration Due Date |
|------------------------------------------------|-------------------|-----------|---------------|------------------|----------------------|
| Rohde & Schwarz                                | Test Receiver     | ESR       | 102725        | 2022/11/25       | 2023/11/24           |
| Rohde & Schwarz                                | Spectrum Analyzer | FSV40     | 101949        | 2022/11/25       | 2023/11/24           |
| SONOMA INSTRUMENT                              | Amplifier         | 310 N     | 186131        | 2022/11/08       | 2023/11/07           |
| A.H. Systems, inc.                             | Preamplifier      | PAM-0118P | 135           | 2022/11/08       | 2023/11/07           |
| Schwarzbeck                                    | Bilog Antenna     | VULB9163  | 9163-194      | 2023/02/14       | 2026/02/13           |
| Schwarzbeck                                    | Horn Antenna      | BBHA9120D | 837           | 2023/02/22       | 2026/02/21           |
| Unknown                                        | RF Coaxial Cable  | No.10     | N050          | 2022/11/25       | 2023/11/24           |
| Unknown                                        | RF Coaxial Cable  | No.11     | N1000         | 2022/11/25       | 2023/11/24           |
| Unknown                                        | RF Coaxial Cable  | No.12     | N040          | 2022/11/25       | 2023/11/24           |
| Unknown                                        | RF Coaxial Cable  | No.13     | N300          | 2022/11/25       | 2023/11/24           |
| Unknown                                        | RF Coaxial Cable  | No.14     | N800          | 2022/11/25       | 2023/11/24           |
| Radiated Emission Test Software:e3 191218 (V9) |                   |           |               |                  |                      |

\* **Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## FCC §1.1307 (b) & §2.1093 – RF EXPOSURE

### Applicable Standard

According to FCC §1.1307(b), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D04 Interim General RF Exposure Guidance v01, clause 2.1.2 - 1-mW test Exemption:

Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device (from the requirement to show data demonstrating compliance to RF exposure limits, as previously mentioned) if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance.

This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions. This is a standalone exemption, and it cannot be applied in conjunction with any other test exemption.

### Test Result:

For worst case:

| Mode | Frequency | Turn up Power(ERP) |        | 1-mW test Exemption |
|------|-----------|--------------------|--------|---------------------|
|      | (MHz)     | (dBm)              | (mW)   |                     |
| SRD  | 433.92    | -36                | 0.0003 | Yes                 |

Note: The highest E-field strength is 60.66dBuV/m@3  
 $E(\text{dBuV/m}) = \text{EIRP}(\text{dBm}) - 95.2$  for distance 3m  
 so the  $\text{EIRP} = 60.66\text{dBuV/m} - 95.2 = -34.54\text{dBm}$

$\text{ERP} = \text{EIRP} - 2.15$ , so the  $\text{ERP} = -36.69\text{dBm}$

The turn up ERP is -36dBm

**Result:** Compliant.

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## **FCC §15.203 - ANTENNA REQUIREMENT**

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### **Applicable Standard**

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.

### **Antenna Connector Construction**

The EUT has one internal antenna arrangement which was permanently attached.; fulfill the requirement of this section. Please refer to EUT photos.

Result: Compliant.

**FCC §15.205, §15.209, §15.231 (e) - RADIATED EMISSIONS****Applicable Standard**

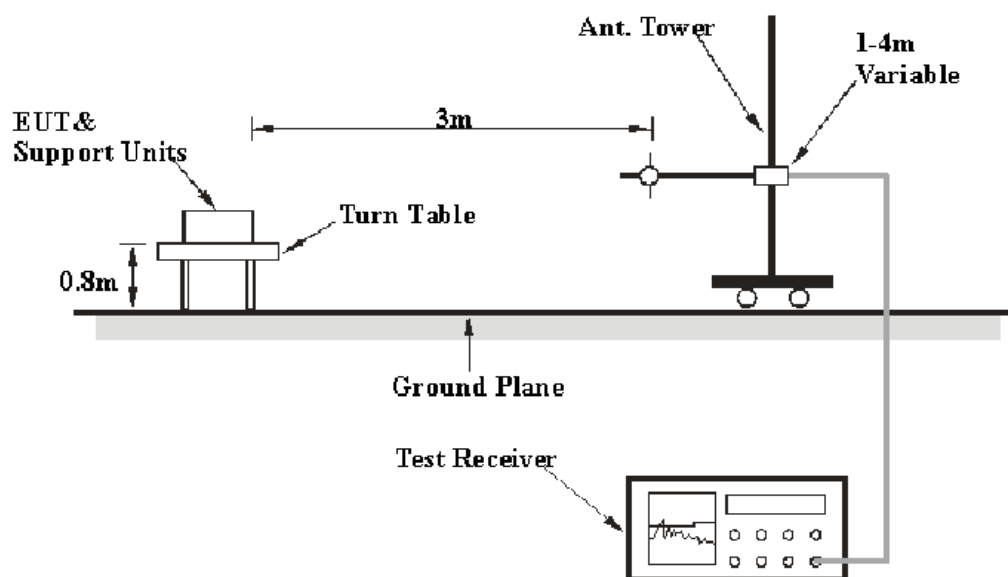
FCC §15.205, §15.209, §15.231 (e)

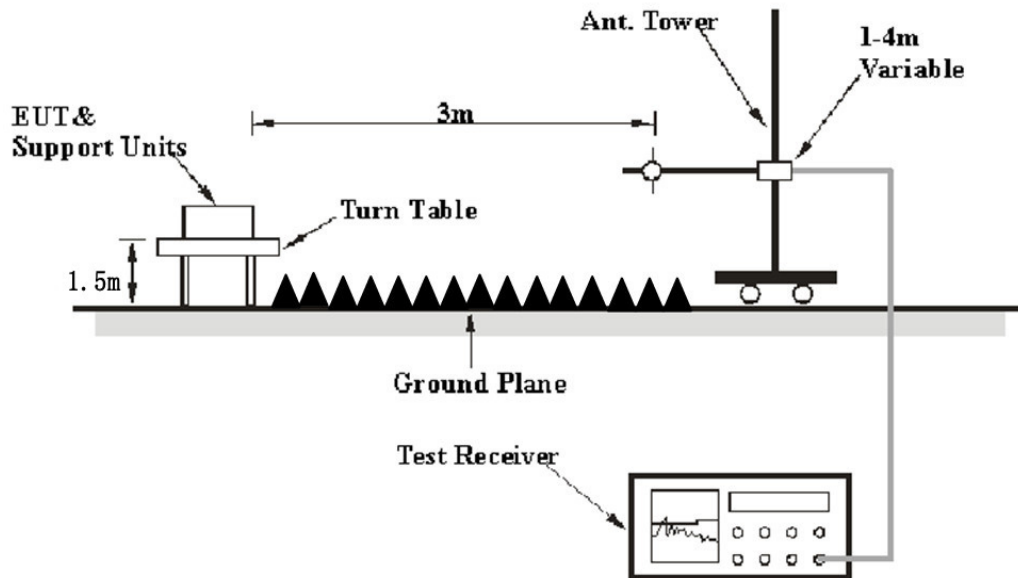
According to FCC §15.231(e), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

| Fundamental frequency (MHz) | Field Strength of Fundamental (Microvolts /meter) | Field Strength of spurious emissions ((Microvolts /meter) |
|-----------------------------|---------------------------------------------------|-----------------------------------------------------------|
| 40.66-40.70                 | 1000                                              | 100                                                       |
| 70-130                      | 500                                               | 50                                                        |
| 130-174                     | 500 to 1500*                                      | 50 to 150*                                                |
| 174-260                     | 1500                                              | 150                                                       |
| 260-470                     | 1500 to 5000*                                     | 150 to 500*                                               |
| Above 470                   | 5000                                              | 500                                                       |

\*Linear interpolations.

The above field strength limits are specified at a distance of 3-meters the tighter limits apply at the band edges.

**EUT Setup****Below 1 GHz:**

**Above 1 GHz:**

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10 - 2013. The specification used was the FCC 15 § 15.209, 15.205 and 15.231.

**EMI Test Receiver Setup**

The system was investigated from 30 MHz to 5 GHz.

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

| Frequency Range  | RBW     | Video B/W | IF B/W  | Measurement |
|------------------|---------|-----------|---------|-------------|
| 30MHz – 1000 MHz | 100 kHz | 300 kHz   | 120 kHz | PK          |
| Above 1 GHz      | 1 MHz   | 3 MHz     | /       | PK          |

**Test Procedure**

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All final data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz, Peak and average detection mode above 1 GHz.

If the maximized peak measured value complies with the limit, then it is unnecessary to perform QP/Average measurement.

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

$$\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin/Over limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin/over limit of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

$$\begin{aligned}\text{Margin / Over Limit} &= \text{Result / Absolute Level} - \text{Limit} \\ \text{Result / Absolute Level} &= \text{Reading} + \text{Factor}\end{aligned}$$

## Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.205, §15.209, §15.231 (e).

## Test Data

### Environmental Conditions

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 23°C      |
| <b>Relative Humidity:</b> | 52-53 %   |
| <b>ATM Pressure:</b>      | 101.0 kPa |

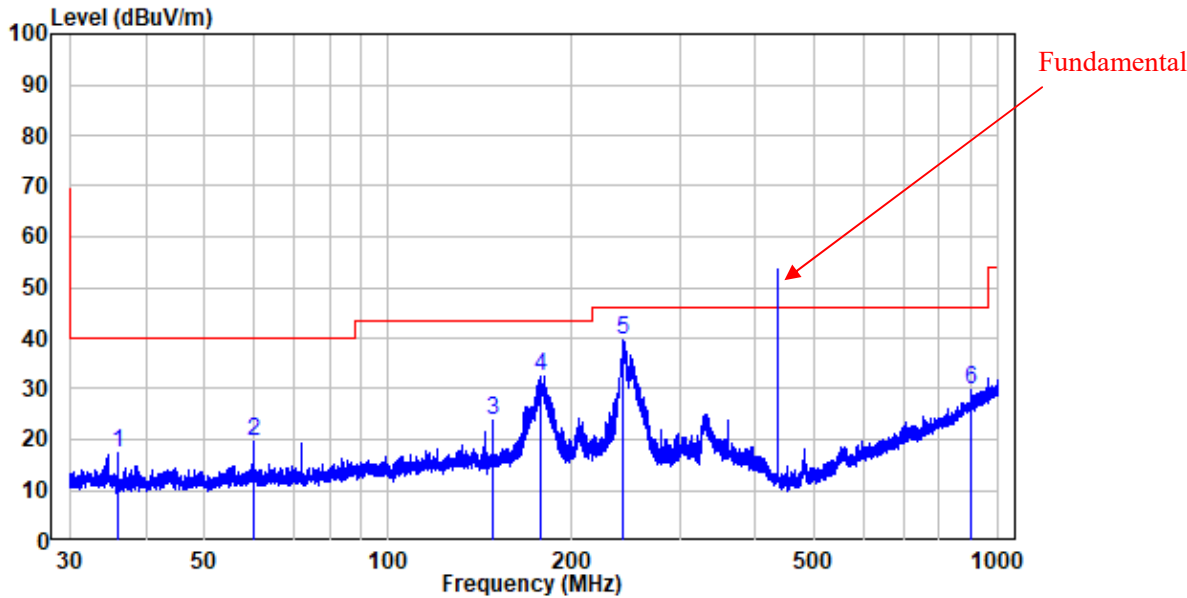
*The Below 1G testing was performed by Jason Liu on 2023-05-24.*

*The Above 1G testing was performed by Jimmy Zheng on 2023-05-25.*

*Test mode: Transmitting (Pre-scan in the X, Y and Z axes of orientation, the worst case Y-axis of orientation was recorded)*

30MHz – 1 GHz:

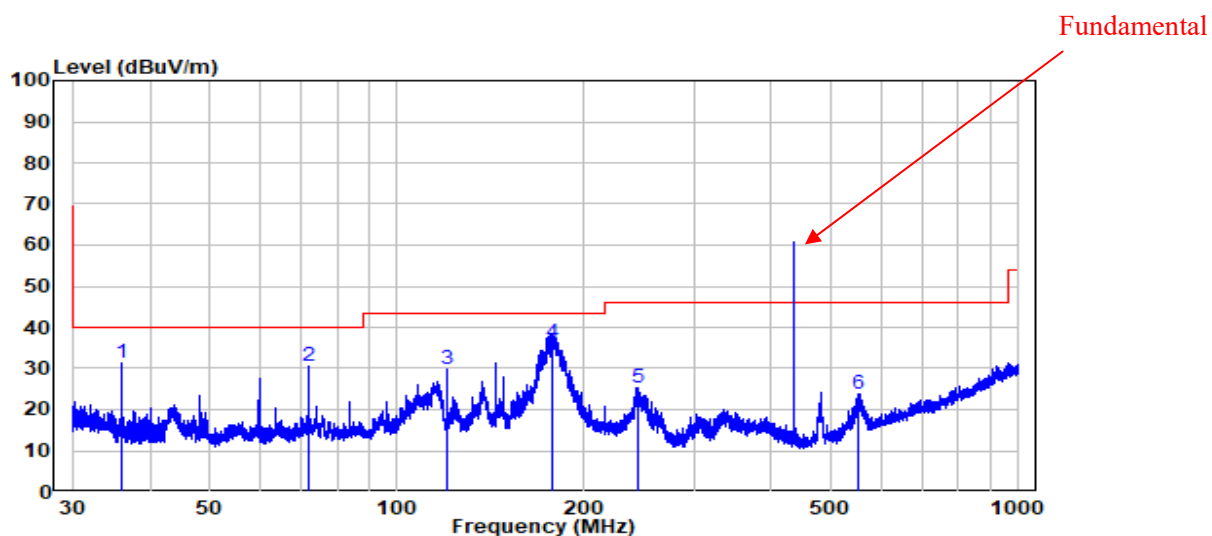
Horizontal



Site : chamber  
Condition: 3m HORIZONTAL  
Job No. : RA230321-13736E-RF  
Test Mode: Transmitting

|   | Freq    | Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|---|---------|--------|------------|--------|------------|------------|--------|
|   | MHz     | dB/m   | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1 | 36.001  | -11.20 | 28.47      | 17.27  | 40.00      | -22.73     | Peak   |
| 2 | 59.990  | -10.62 | 30.09      | 19.47  | 40.00      | -20.53     | Peak   |
| 3 | 148.506 | -15.35 | 39.07      | 23.72  | 43.50      | -19.78     | Peak   |
| 4 | 177.587 | -12.99 | 45.53      | 32.54  | 43.50      | -10.96     | Peak   |
| 5 | 242.525 | -10.75 | 50.49      | 39.74  | 46.00      | -6.26      | Peak   |
| 6 | 904.102 | 1.64   | 28.10      | 29.74  | 46.00      | -16.26     | Peak   |

## Vertical



Site : chamber  
Condition: 3m VERTICAL  
Job No. : RA230321-13736E-RF  
Test Mode: Transmitting

|   | Freq    | Factor | Read<br>Level | Level  | Limit<br>Line | Over<br>Limit | Remark |
|---|---------|--------|---------------|--------|---------------|---------------|--------|
|   | MHz     | dB/m   | dBuV          | dBuV/m | dBuV/m        | dB            |        |
| 1 | 35.985  | -11.20 | 42.52         | 31.32  | 40.00         | -8.68         | Peak   |
| 2 | 71.990  | -15.62 | 46.14         | 30.52  | 40.00         | -9.48         | Peak   |
| 3 | 120.013 | -13.53 | 43.32         | 29.79  | 43.50         | -13.71        | Peak   |
| 4 | 177.665 | -12.99 | 49.12         | 36.13  | 43.50         | -7.37         | QP     |
| 5 | 244.339 | -10.62 | 36.00         | 25.38  | 46.00         | -20.62        | Peak   |
| 6 | 551.915 | -4.07  | 27.76         | 23.69  | 46.00         | -22.31        | Peak   |

**Fundamental:**

| Frequency<br>(MHz) | Receiver          |            | Turn-Table      | Rx Antenna    |                | Corrected<br>Factor<br>(dB/m) | Corrected<br>Amplitude<br>(dBμV/m) | FCC Part 15.231(e) |                |
|--------------------|-------------------|------------|-----------------|---------------|----------------|-------------------------------|------------------------------------|--------------------|----------------|
|                    | Reading<br>(dBμV) | PK/QP/Ave. | Angle<br>Degree | Height<br>(m) | Polar<br>(H/V) |                               |                                    | Limit<br>(dBμV/m)  | Margin<br>(dB) |
| 433.92MHz          |                   |            |                 |               |                |                               |                                    |                    |                |
| 433.92             | 59.42             | PK         | 220             | 1.7           | H              | -5.73                         | 53.69                              | 72.87              | -19.18         |
| 433.92             | 66.39             | PK         | 174             | 2.1           | V              | -5.73                         | <b>60.66</b>                       | 72.87              | -12.21         |

**Harmonic and 1-5GHz:**

| Frequency<br>(MHz) | Receiver          |            | Turntable<br>Degree | Rx Antenna    |                | Corrected<br>Factor<br>(dB/m) | Corrected<br>Amplitude<br>(dBμV/m) | FCC Part 15.231(e) |                |
|--------------------|-------------------|------------|---------------------|---------------|----------------|-------------------------------|------------------------------------|--------------------|----------------|
|                    | Reading<br>(dBμV) | PK/QP/Ave. |                     | Height<br>(m) | Polar<br>(H/V) |                               |                                    | Limit<br>(dBμV/m)  | Margin<br>(dB) |
| 433.92MHz          |                   |            |                     |               |                |                               |                                    |                    |                |
| 867.84             | 24.44             | PK         | 171                 | 1.4           | H              | 0.85                          | 25.29                              | 52.87              | -27.58         |
| 867.84             | 24.21             | PK         | 193                 | 1.9           | V              | 0.85                          | 25.06                              | 52.87              | -27.81         |
| 1301.76            | 53.23             | PK         | 132                 | 1.7           | H              | -13.98                        | 39.25                              | 54                 | -14.75         |
| 1301.76            | 52.37             | PK         | 149                 | 1.6           | V              | -13.98                        | 38.49                              | 54                 | -15.51         |

**Note:**

The peak value can meet the limit of the average value.

Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

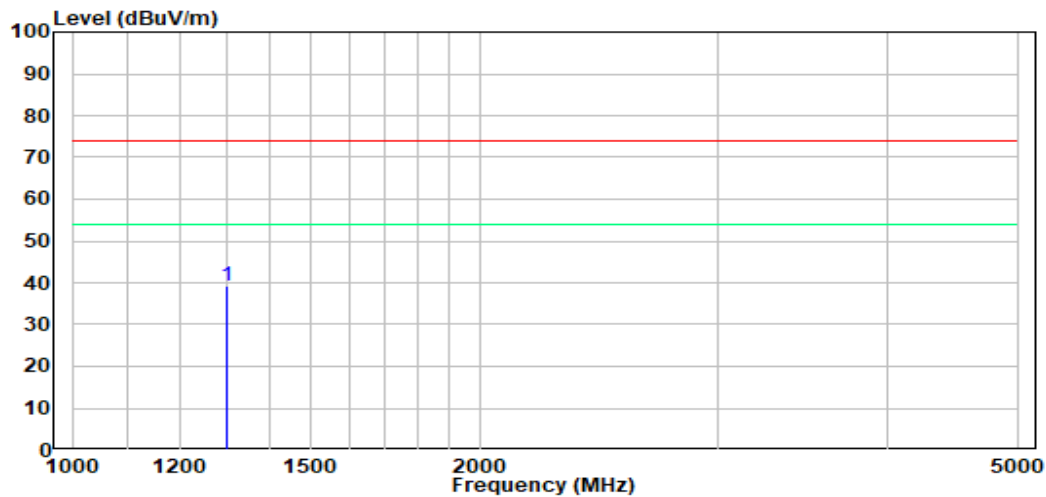
Corrected Amplitude = Factor + Reading

Margin = Corrected Amplitude – Limit

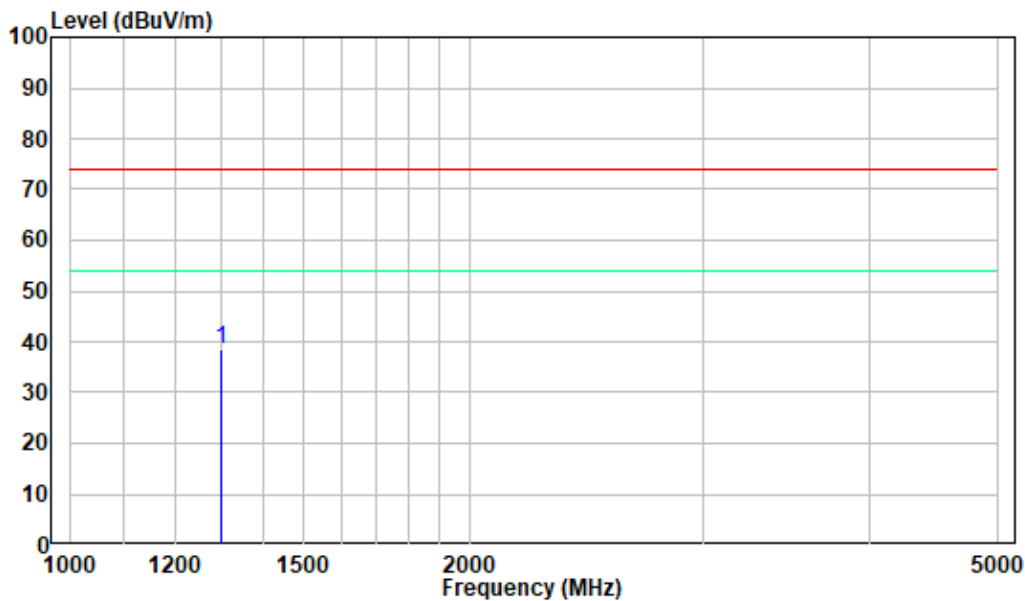
The other spurious emission which is 20dB below the limit or in the noise floor level was not recorded.

Above 1 GHz: (Pre-scan plots)

Horizontal



Vertical



Note: All spurious emissions are compliant to the limit.

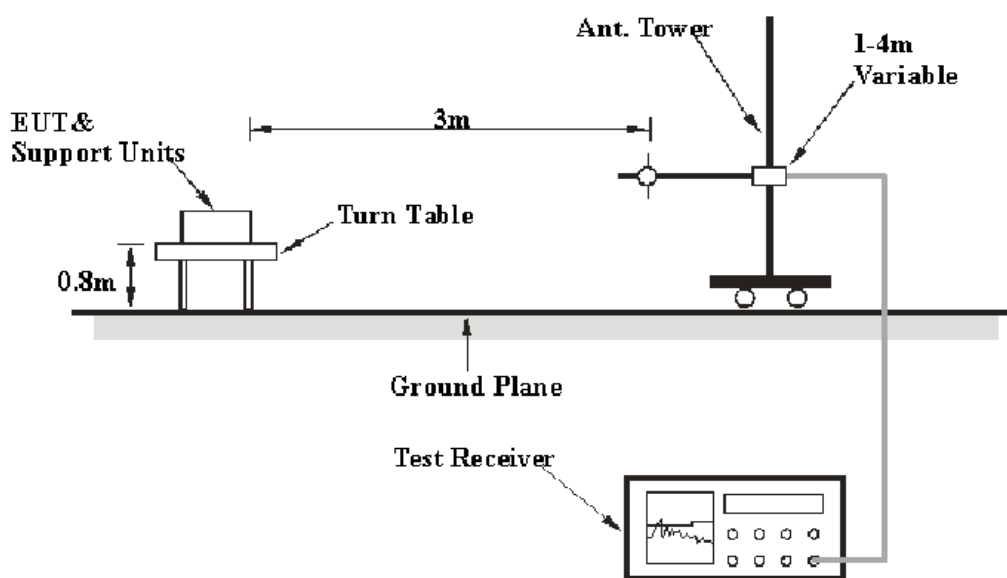
## FCC §15.231(e) - DEACTIVATION TESTING

### Applicable Standard

Per 15.231(e), devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

### Test Procedure

1. Set center frequency of spectrum analyzer=operating frequency.
2. Set the spectrum analyzer as RBW=100kHz/ VBW=300kHz/ Span=0Hz.
3. Repeat above procedures until all frequency measured was complete.



### Test Data

#### Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 24°C     |
| Relative Humidity: | 56%      |
| ATM Pressure:      | 101.0kPa |

The testing was performed by Matt Liang on 2023-04-21.

Test mode: Transmitting

**Test Result:** Compliant. Please refer to following tables and plots.

## Transmission period

| Transmission period (s) | Limit (s) | Result (s) |
|-------------------------|-----------|------------|
| 0.68696                 | < 1       | Pass       |

## Silent period

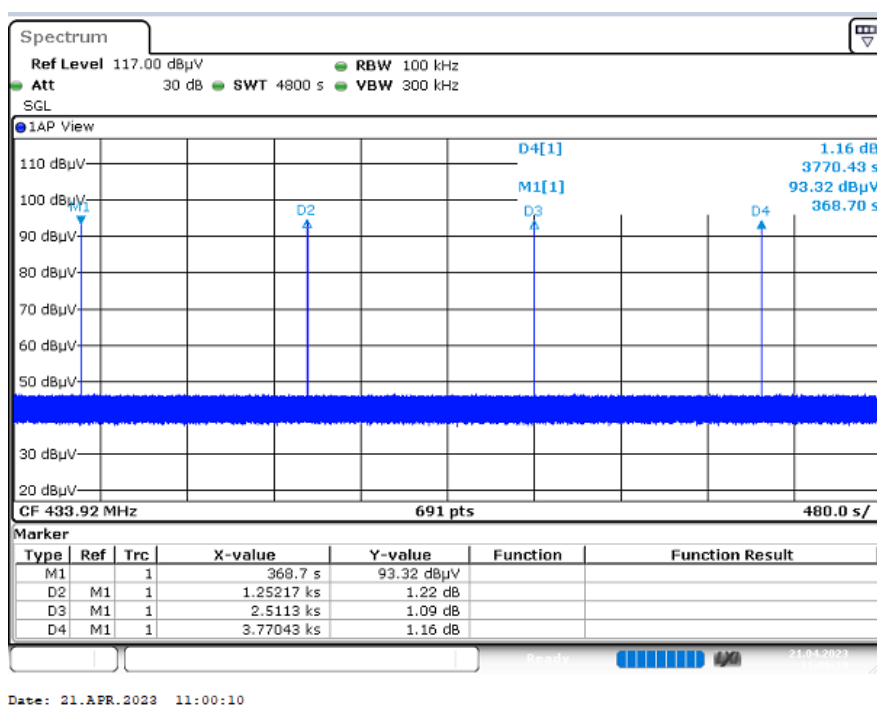
| Silent period (s) | Limit (s) | Result (s) |
|-------------------|-----------|------------|
| 1252.17           | >20.6088  | Pass       |

## Note:

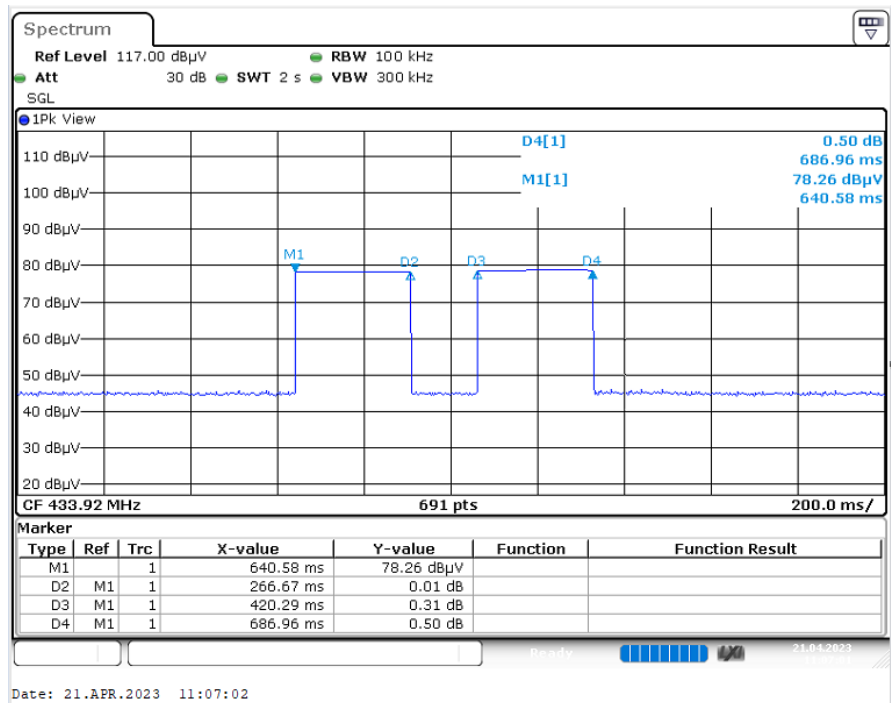
The silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

The duration time of transmission is 0.68696s,  $0.68696 \times 30 = 20.6088$ s.

## Silent period



Duration time



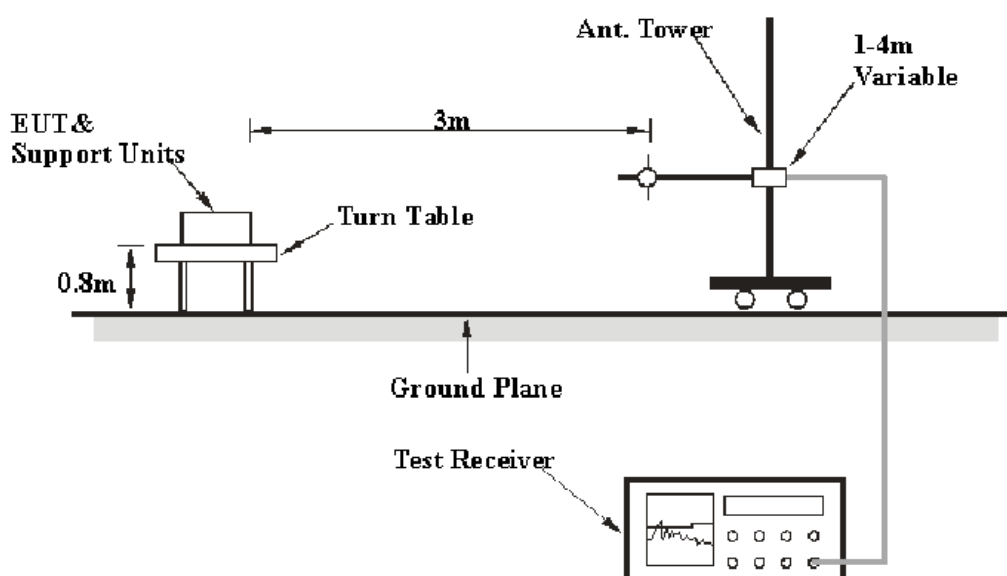
## FCC §15.231(c) – 20 dB EMISSION BANDWIDTH TESTING

### Applicable Standard

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

### Test Procedure

The EUT is setting to the transmit mode, the waveform was received by the test antenna which was connected to the spectrum analyzer, plot the 20 dB bandwidth.



### Test Data

#### Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 24°C     |
| Relative Humidity: | 58%      |
| ATM Pressure:      | 101.0kPa |

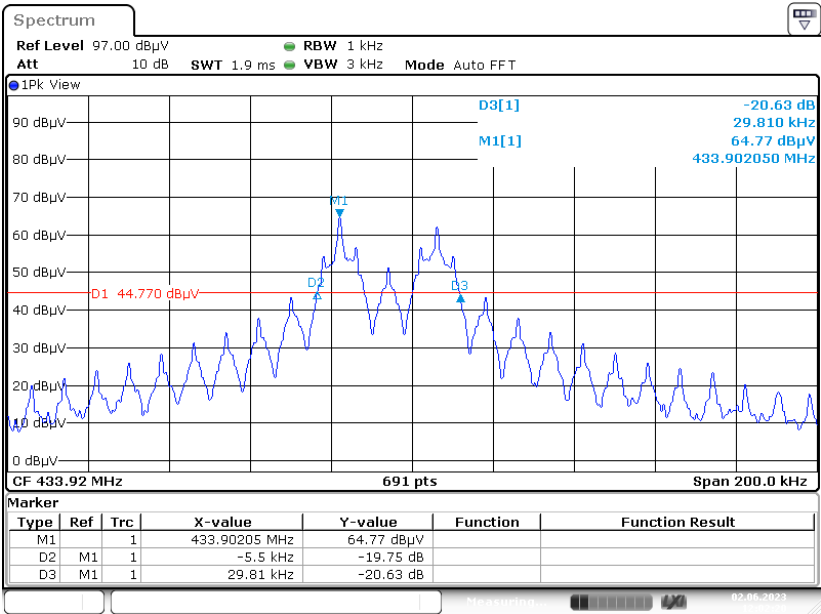
The testing was performed by Matt Liang on 2023-06-02.

Test Mode: Transmitting

**Test Result:** Compliant. Please refer to following table and plot.

| Channel Frequency (MHz ) | 20 dB Emission Bandwidth (kHz) | Limit (kHz) | Result |
|--------------------------|--------------------------------|-------------|--------|
| 433.92                   | 35.31                          | <1084.8     | Pass   |

20 dB Emission Bandwidth



Date: 2.JUN.2023 12:02:20

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