



# RADIO TEST REPORT

**FCC ID** : 2AIHD-2511  
**Equipment** : Samsara LM11  
**Brand Name** : Samsara  
**Model Name** : 060-00010  
**Applicant** : SAMSARA INC  
1 De Haro Street, San Francisco, CA, 94107, USA  
**Manufacturer** : WNC Corporation  
20 Park Avenue II Hsinchu Science Park, Hsinchu  
300, Taiwan  
**Standard** : 47 CFR FCC Part 15.255

The product was received on Sep. 08, 2025, and testing was started from Sep. 12, 2025 and completed on Sep. 17, 2025. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2020 47 CFR FCC Part 15.255 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

**Sporton International Inc. Hsinchu Laboratory**

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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### Appendix A. Test Photos

#### Photographs of EUT v01



TEL : 886-3-656-9065  
FAX : 886-3-656-9085  
Report Temp.late No.: CB-A9\_3 Ver1.0



## Summary of Test Result

| Report Clause | Ref Std. Clause      | Test Items                                   | Result (PASS/FAIL) | Remark |
|---------------|----------------------|--|--------------------|--------|
| -             | 15.207               | AC Power Conducted Emissions                 | N/A                | Note   |
| 3.1           | 15.255(e)            | Occupied Bandwidth                           | PASS               | -      |
| 3.2           | 15.255(c)(2)(iii)(B) | EIRP Power                                   | PASS               | -      |
| 3.3           | 15.255(d)            | Transmitter Spurious Emissions               | PASS               | -      |
| 3.4           | 15.255(f)            | Frequency Stability                          | PASS               | -      |
| 3.5           | 15.255(a),(h)        | Operation Restriction and Group Installation | PASS               | -      |

Note:

The EUT was powered by battery(DC 3V\*2); there is no need to test AC Power Port Conducted Emissions test.

### Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

### Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

**Reviewed by: Sam Chen**

**Report Producer: Cathy Chiu**



# 1 General Description

## 1.1 Information

### 1.1.1 RF General Information

| RF General Information |                                 |                      |            |
|------------------------|---------------------------------|----------------------|------------|
| Frequency Range (GHz)  | Operating Frequency Range (GHz) | Test Frequency (GHz) | Modulation |
| 57-71 GHz              | 60.212                          | 60.212               | FMCW       |

### 1.1.2 Antenna Information

| Ant. | Port |    | Brand   | Model Name     | Antenna Type                 | Connector | Gain (dBi) |           |     |
|------|------|----|---------|----------------|------------------------------|-----------|------------|-----------|-----|
|      | TX   | RX |         |                |                              |           | 60GHz      | Bluetooth | UWB |
| 1    | 1    | 1  | Samsara | DVT2 lens      | Embedded patch array antenna | N/A       | 17         | -         | -   |
| 2    | 1    |    | WNC     | CFR_0000002308 | PCB trace antenna            | N/A       | -          | 3.82      | -   |
| 3    | 1    |    | WNC     | CFR_0000002483 | PCB trace antenna            | N/A       | -          | -         | 4.4 |

Note1: The above information was declared by manufacturer.

Note2: The UWB function of Antenna 3 doesn't be enabled at this time.

**For 60GHz function (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving antenna.

**For Bluetooth function (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving antenna.

**For UWB function (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving antenna.

### 1.1.3 Power Levels

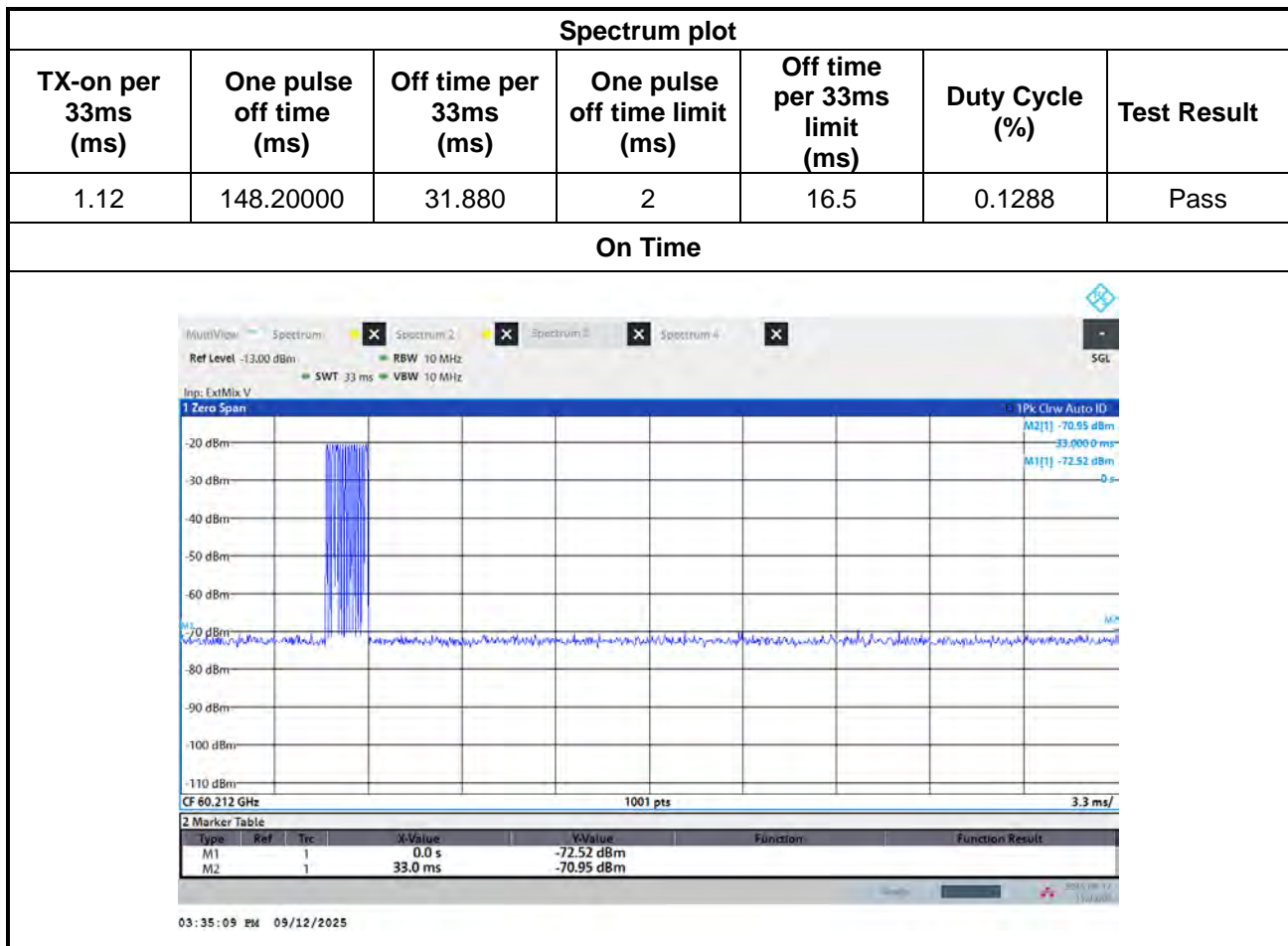
| Worst Power Levels      |   |                  |
|-------------------------|---|------------------|
| Applicable power levels | <input type="checkbox"/> Conducted <input checked="" type="checkbox"/> EIRP |                  |
| Frequency (GHz)         | Highest ( $P_{high}$ ):   |                  |
|                         | Mode  | Peak Power (dBm) |
| 60.212                  | FMCW  | 19.95            |

**1.1.4 Operating Conditions**

| Operating Conditions  |  |                  |     |
|---|--|------------------|-----|
| <input type="checkbox"/> -20 °C to +50 °C                   |  |                  |     |
| <input type="checkbox"/> 0 °C to +40 °C                     |  |                  |     |
| <input checked="" type="checkbox"/> Other: -40 °C to +70 °C |  |                  |     |
| EUT Power Type  | From internal battery*2 (DC 3V*2)      |                  |     |
| Test Software Version                                       | DOS [ver 6.1.7601]                     |                  |     |
| Supply Voltage  | <input type="checkbox"/> AC            | State AC voltage | V   |
| Supply Voltage  | <input checked="" type="checkbox"/> DC | State DC voltage | 6 V |

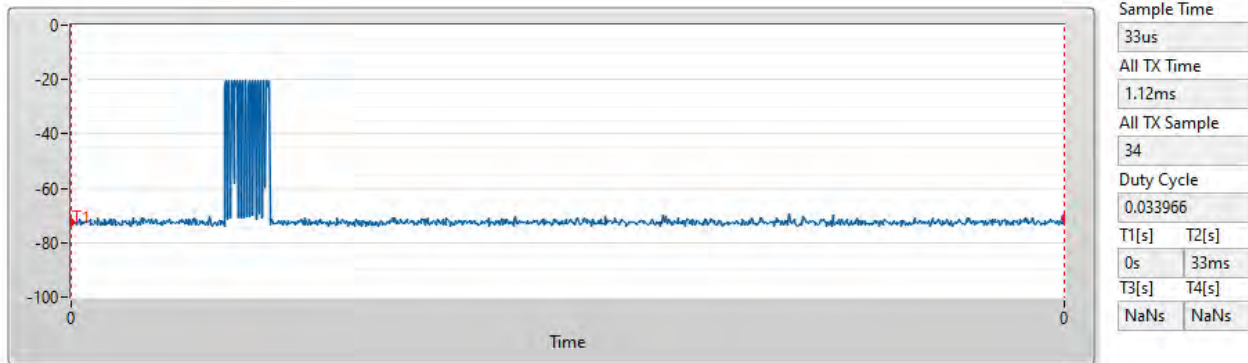
**1.1.5 Equipment Use Condition**

| Equipment Use Condition             |  |
|-------------------------------------|--|
| <input type="checkbox"/>            | Fixed field disturbance sensors at 61-61.5GHz                                      |
| <input type="checkbox"/>            | Except fixed field disturbance sensors at 61-61.5GHz                               |
| <input type="checkbox"/>            | Except fixed field disturbance sensors   |
| <input type="checkbox"/>            | Field disturbance sensors/radar  |
| <input type="checkbox"/>            | For fixed field disturbance sensors that occupy 500 MHz or less                    |
| <input type="checkbox"/>            | Field disturbance sensor/radar Personal portable equipment                         |
| <input type="checkbox"/>            | Field disturbance Sensors /radar(Outdoor drones/UA uses)                           |
| <input type="checkbox"/>            | Field disturbance Sensors /radar(vehicular applications (e.g., in-cabin radars))   |
| <input type="checkbox"/>            | Field disturbance Sensors /radar(unrestricted radar use-case applications)         |
| <input checked="" type="checkbox"/> | Field disturbance Sensors /radar(Fixed outdoor or vehicular uses)(except in-cabin) |
| <input type="checkbox"/>            | For pulsed field disturbance sensors/radars  |

**1.1.6 Duty Cycle**



**Scope Result**

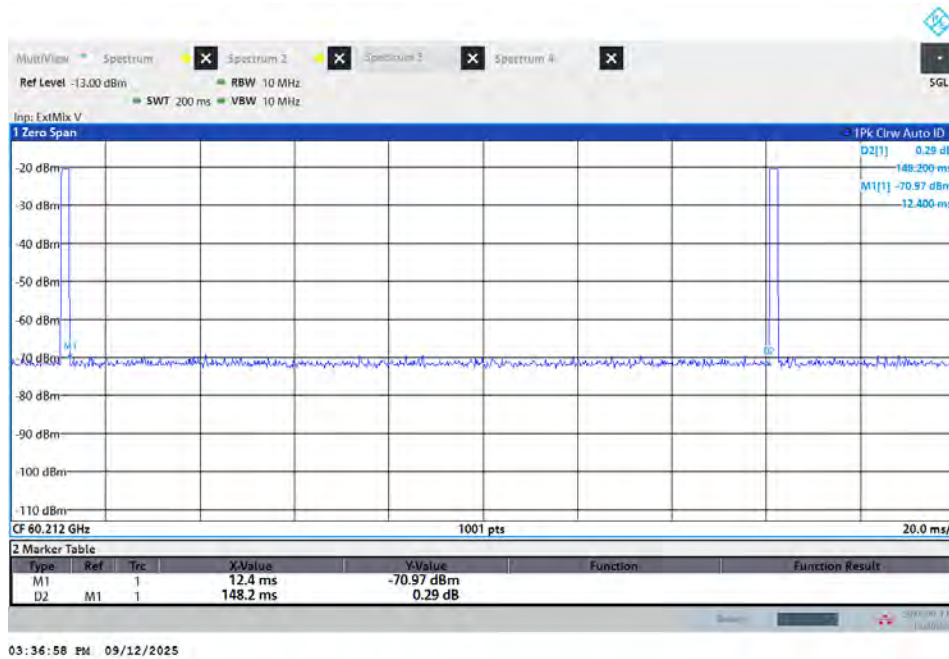


T1:0s, T2:33ms, Sample time = 33us  
All TX sample = 34  
All TX time = 33us x 34 = 1122us  
Off Time = 33ms - 1.122us = 31.878 ms





**Off Time**



**1.1.7 Desensitization**

| FMCW Chirp Width (MHz) | Chirp Time (µs) | Chirp Rate (MHz/µs) | Chirp Rate (Hz/S) | RBW (MHz) | RBW (Hz) | Normalized Sweep Rate (lin) | Peak Amplitude Response (lin) | Desensitization Factor (dB) |
|------------------------|-----------------|---------------------|-------------------|-----------|----------|-----------------------------|-------------------------------|-----------------------------|
| 3870                   | 90              | 43.00               | 4.30E+13          | 1         | 1.00E+06 | 43.00                       | 0.229                         | 12.79                       |



## 1.2 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR FCC Part 15.255
- ♦ ANSI C63.10-2020 Section 9. "Procedures for testing millimeter-wave systems"

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ FCC KDB 414788 D01 v01r01
- ♦ FCC KDB 364244 D01 v01r01

## 1.3 Testing Location

| Testing Location Information  |  |  |  |  |
|---|--|--|--|--|
| Test Lab. : Sporton International Inc. Hsinchu Laboratory                                       |  |  |  |  |
| Hsinchu      ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.) |  |  |  |  |
| (TAF: 3787)      TEL: 886-3-656-9065      FAX: 886-3-656-9085                                   |  |  |  |  |
| Test site Designation No. TW3787 with FCC.  |  |  |  |  |
| Conformity Assessment Body Identifier (CABID) TW3787 with ISED.                                 |  |  |  |  |

| Test Condition | Test Site No. | Test Engineer | Test Environment<br>(°C / %) | Test Date                       |
|----------------|---------------|---------------|------------------------------|---------------------------------|
| RF Radiated    | TH03-CB       | Eddie Weng    | 24.3-24.6 / 62-68            | Sep. 17, 2025                   |
| Radiated       | 03CH04-CB     | Justin Lin    | 21.4~22.6 / 57~61            | Sep. 12, 2025~<br>Sep. 16, 2025 |



## 2 Test Configuration of Equipment under Test

### 2.1 Parameters of Test Software Setting

|                  |         |
|------------------|---------|
| Frequency (GHz)  | 60.212  |
| Software Setting | Default |

### 2.2 Conformance Tests and Related Test Frequencies

| Test Item                                     | Test Frequencies (GHz) |
|---|------------------------|
| Occupied Bandwidth                            | 60.212                 |
| EIRP Power                                    | 60.212                 |
| Transmitter Spurious Emissions (below 1 GHz)  | 60.212                 |
| Transmitter Spurious Emissions (1 GHz-40 GHz) | 60.212                 |
| Transmitter Spurious Emissions (above 40 GHz) | 60.212                 |
| Frequency Stability                           | 60.212                 |

Note:

After evaluating, and the worst case was found at Z axis, so it was selected to perform test and its test result was written in the report.

### 2.3 EUT Operation during Test

During the test, executed the test program to control the EUT continuously transmit RF signal.

### 2.4 Accessories

| Accessories    |            |            |             |
|----------------|------------|------------|-------------|
| Equipment Name | Brand Name | Model Name | Rating      |
| Battery*2      | FDK        | CR17450ES  | Voltage: 3V |

### 2.5 Far Field Boundary Calculations

The far-field boundary is given as:

$$\text{far field} = (2 * L^2) / \lambda$$

where:

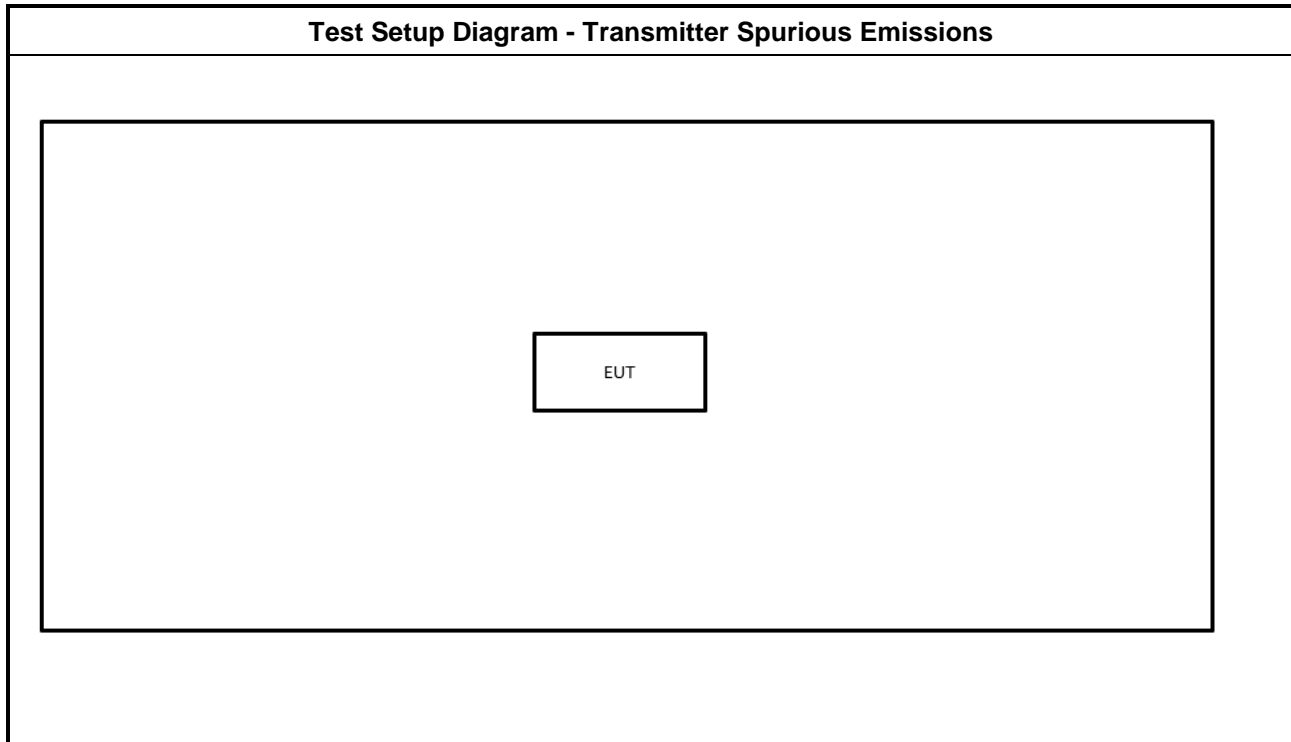
L = Largest Antenna Dimension, including the reflector, in meters

$\lambda$  = wavelength in meters

| Far Field (m)   |         |            |                  |                   |
|-----------------|---------|------------|------------------|-------------------|
| Frequency (GHz) | L (m)   | Lambda (m) | d(Far Field) (m) | d(Far Field) (cm) |
| 60.212          | 0.00243 | 0.0049824  | 0.002            | 0.24              |



## 2.6 Test Setup Diagram





### 3 Transmitter Test Result

#### 3.1 Occupied Bandwidth

##### 3.1.1 Limit of Occupied Bandwidth

|  |      |
|--|------|
| <b>6dBc Bandwidth</b> (see Note 1)   | None |
| <b>99% Occupied Bandwidth</b> (see Note 2)   | None |
| NOTE 1: The 6dBc bandwidth is the frequency bandwidth of the signal power at the -6 dBc points when measured with a 100 kHz resolution bandwidth. These measurements shall also be performed at normal test conditions.  |      |
| NOTE 2: The 99% occupied bandwidth is the frequency bandwidth of the signal power at the 99% channel power of occupied bandwidth when resolution bandwidth should be approximately 1 % to 5 % of the occupied bandwidth (OBW). These measurements shall also be performed at normal test conditions. |      |

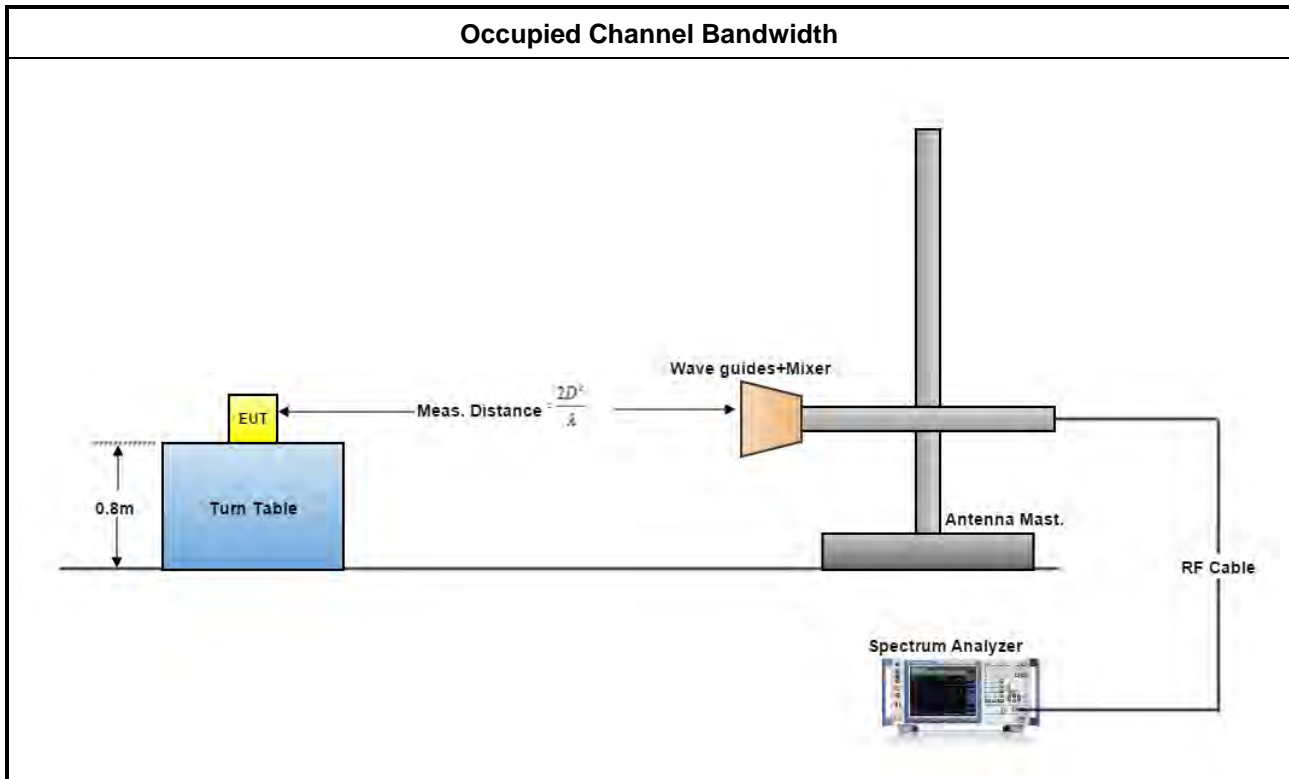
##### 3.1.2 Measuring Instruments

Refer a measuring instruments list in this test report.

##### 3.1.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2020, clauses 9.4.

### 3.1.4 Test Setup





### 3.1.5 Test Result of Occupied Bandwidth

|  |                              |
|--|------------------------------|
| <b>Test Conditions</b>   | see ANSI C63.10, clause 5.11 |
| <b>Test Setup</b>  | see ANSI C63.10, clause 9.4  |
| NOTE: If equipment having different transmit operating modes (see test report clause 1.1.2), the measurements are uninfluenced by different transmit operating modes, may not need to be repeated for all the operating modes. Similar, if the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.11 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing. Refer as ANSI C63.10, clause 15, observe and record with plotted graphs or photographs the worst-case (i.e., widest) occupied bandwidth produced by these different modulation sources. |                              |

| Test Results        |                          |                                 |                |
|---------------------|--------------------------|---------------------------------|----------------|
| Test Freq.<br>(GHz) | 6 dBc Bandwidth<br>(MHz) | 99% Occupied Bandwidth<br>(MHz) | Limit<br>(MHz) |
| 60.212              | 3908.10                  | 3829.40                         | N/A            |



### 3.1.5.1 Bandwidth Plots

#### 6 dBc Bandwidth



#### Occupied Bandwidth





## 3.2 EIRP Power

### 3.2.1 Limit of EIRP Power

| Applications  | Frequency Range (GHz) | Peak (dBm)                  | Average (dBm) | Duty Cycle Requirement   |
|---|-----------------------|-----------------------------|---------------|--|
| Field disturbance sensors/radar   | 57 ~ 71               | < 10                        | N/A           | N/A  |
| For fixed field disturbance sensors that occupy 500 MHz or less                         | 61 ~ 61.5             | < 43                        | < 40          | N/A  |
|   | 57 ~ 61 & 61.5 ~ 71   | < 13                        | < 10          | N/A  |
| Field disturbance sensor/radar<br>Personal portable equipment                           | 59.3 ~ 71             | < 10                        | N/A           | N/A  |
| Field disturbance Sensors /radar<br>(Outdoor drones/UA uses)                            | 60 ~ 64               | < 20                        | N/A           | At least 16.5 ms off time per 33 ms<br>Operation shall be limited to a maximum of 121.92 m above ground level. |
| Field disturbance Sensors /radar<br>(vehicular applications (e.g., in-cabin radars))    | 57 ~ 59.4             | Indoor < 20<br>Outdoor < 30 | N/A           | N/A  |
| Field disturbance Sensors /radar<br>(unrestricted radar use-case applications)          | 57 ~ 61.56            | < 3                         | N/A           | N/A  |
|   |                       | < 20                        | N/A           | At least 16.5 ms off time per 33 ms  |
|   | 57 ~ 64               | < 14                        | N/A           | At least 25.5 ms off time per 33 ms  |
| Field disturbance Sensors /radar<br>(Fixed outdoor or vehicular uses) (except in-cabin) | 57 ~ 64               | < 20                        | N/A           | At least 16.5 ms off time per 33 ms  |
| For pulsed field disturbance sensors/radars   | 57 ~ 64               | < 33                        | < 13          | Pulse duration < 6 ns<br>Duty cycle < 10%, in any 0.3 $\mu$ s time window                                      |
|   | 61.5 ~ 64             | < 25                        | < 5           | Any 0.3 $\mu$ s time window  |

NOTE: For the applicable limit, see 15.255 (c)

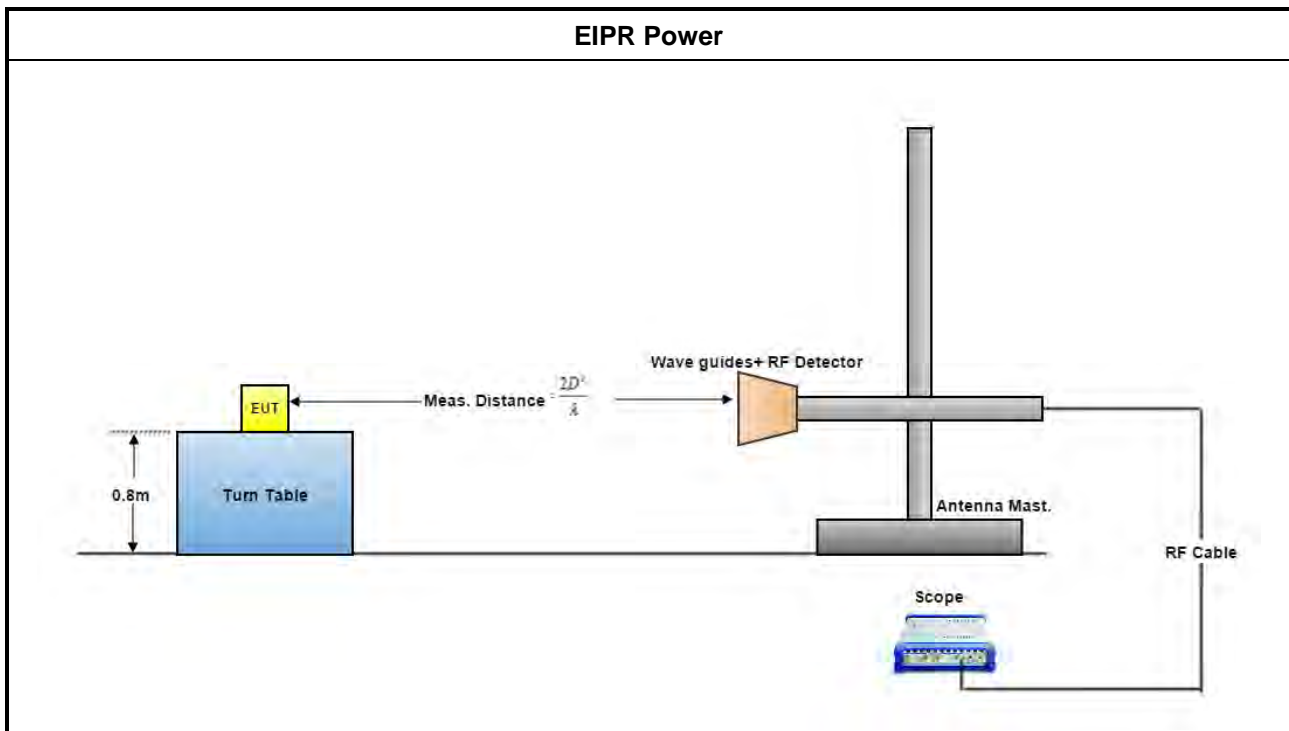
### 3.2.2 Measuring Instruments

Refer a measuring instruments list in this test report.

### 3.2.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2020 clause 9.8.

### 3.2.4 Test Setup



### 3.2.5 Test Result of EIRP Power

**Test Conditions** see ANSI C63.10, clause 5.11 & clause 9

**Test Setup** see ANSI C63.10, clause 9.8

NOTE: If the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.11 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worst case combination to be used for the conformance testing.

**3.2.6 Test Result of EIRP Power**

| Freq.<br>(GHz) | Rx Gain<br>(dBi) | P-Peak<br>(dBm) | Test Distance<br>(m) | Desensitization<br>Factor<br>(dB) | EIRP-Peak<br>(dBm) | EIRP-Peak<br>Limit (dBm) | Test<br>Result |
|----------------|------------------|-----------------|----------------------|-----------------------------------|--------------------|--------------------------|----------------|
| 60.212         | 23.6             | -31.25          | 0.50                 | 12.79                             | 19.95              | 20                       | Pass           |

Calculate the EIRP from the radiated measurement in the far-field using Equation:

$$\text{EIRP} = 21.98 - 20\log(\lambda) + 20\log(D) + P - G$$

where:

EIRP: is the equivalent isotropic radiated power, in dBm

P: is the power measured at the output of the test antenna, in dBm

$\lambda$ : is the wavelength of the emission under investigation  $[300/\text{fMHz}]$ , in m

G: is the gain of the test antenna, in dBi.

### 3.3 Transmitter Spurious Emissions

#### 3.3.1 Limit of Transmitter Spurious Emissions

| Frequency Range                          | Limit  |
|--|--|
| Radiated emissions below 40 GHz          | Reference to section 15.209                                    |
| Radiated emissions above 40 GHz – 200GHz | 90 pW/cm <sup>2</sup> @ 3 m (Equivalent EIRP 102 μW, -9.91dBm) |

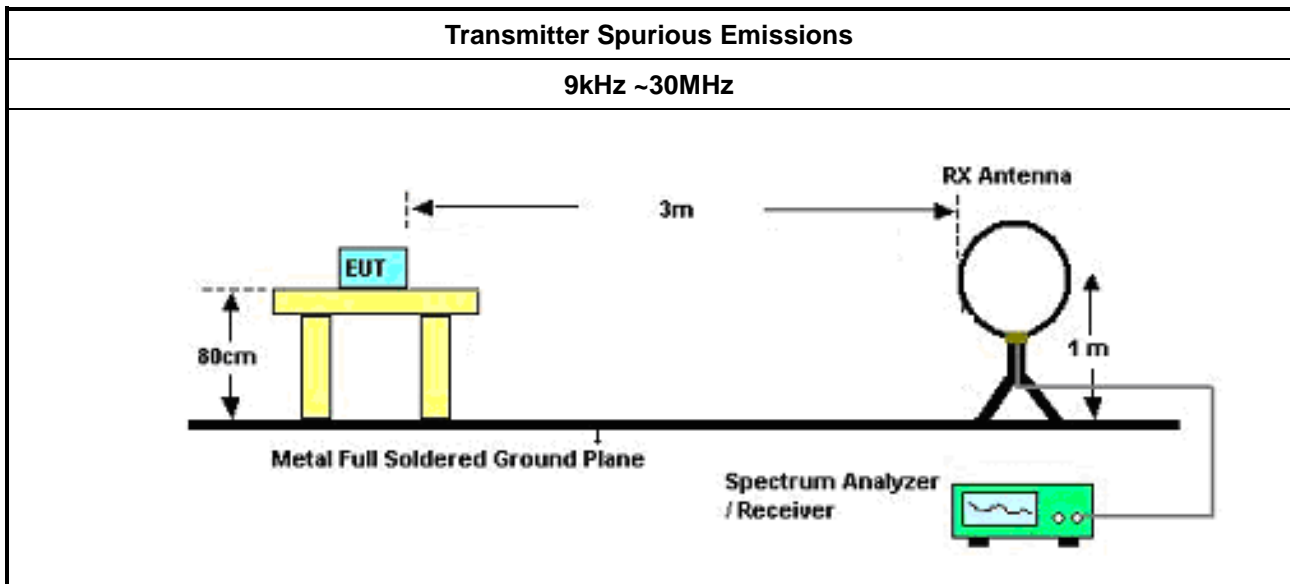
NOTE 1: For the applicable limit, see 15.255(d).

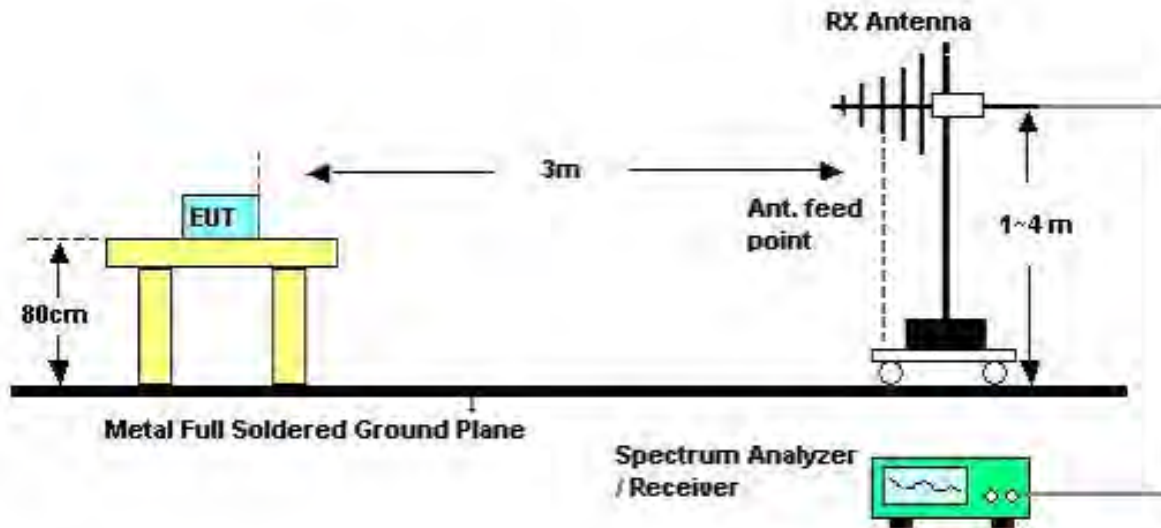
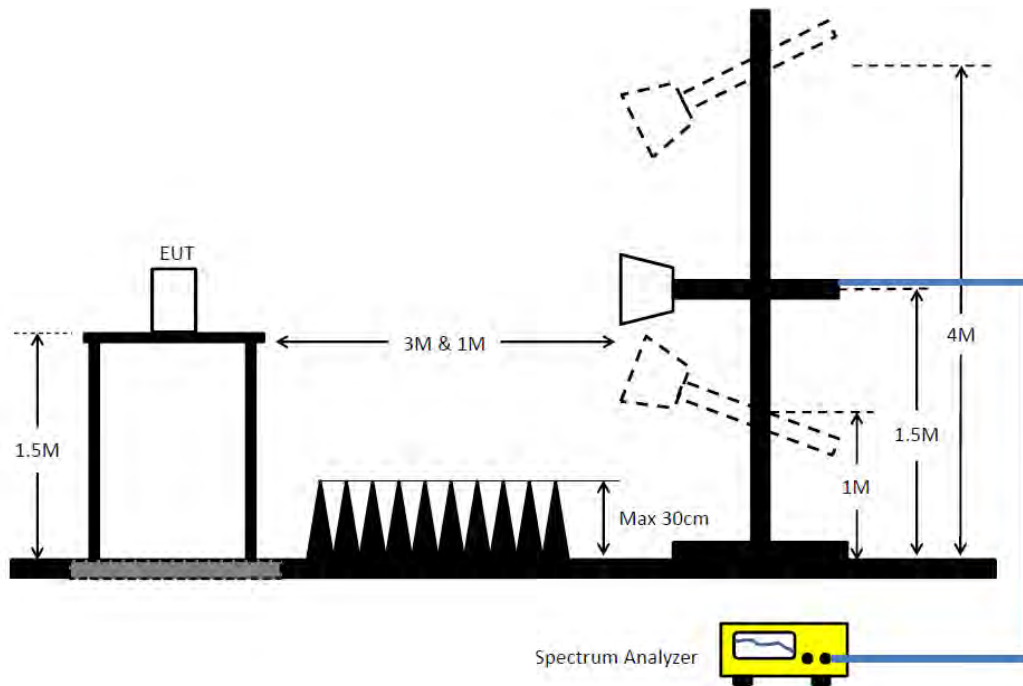
NOTE 2: Spurious emissions shall not exceed the level of the fundamental emission.

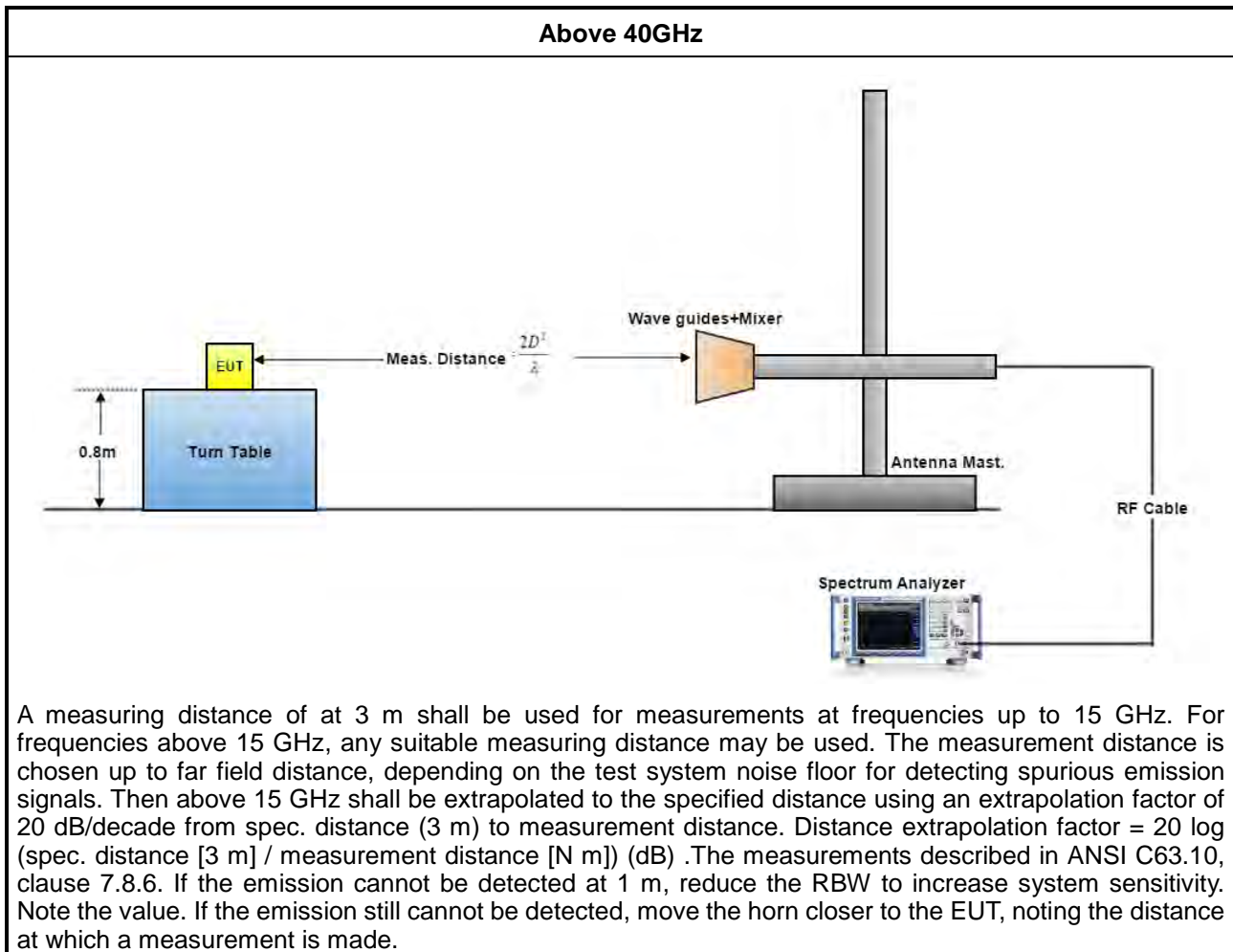
#### 3.3.2 Test Procedures

Method of measurement: Refer as ANSI C63.10-2020, clause 9.11

#### 3.3.3 Test Setup



**30MHz~1GHz**

**1GHz ~40GHz**




### 3.3.4 Measurement Results Calculation

The measured Level is calculated using:

For below 40GHz

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

For above 40GHz

$\text{EIRP} = \text{Meas. Level} - \text{RX Antenna Gain} + 20 \cdot \log(4 \cdot \pi \cdot (3.14159) \cdot D / (300 / (\text{Frequency} \cdot 1000)))$



### 3.3.5 Test Result of Transmitter Spurious Emissions

|  |   |
|--|---|
| <b>Test Conditions</b>   | see ANSI C63.10, clause 5.11 & clause 9 |
| <b>Test Setup</b>  | see ANSI C63.10, clause 9.11, 9.12      |
| NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes. |   |

#### 3.3.5.1 Test Result of Transmitter Spurious Emissions (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

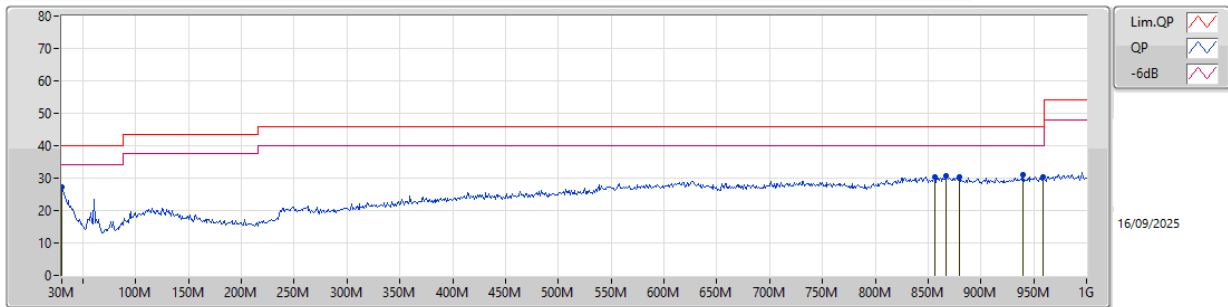
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

**3.3.5.2 Test Result of Transmitter Spurious Emissions**

|                    |                   |               |     |
|--------------------|-------------------|---------------|-----|
| Test Range         | 30 MHz – 1000 MHz | Test Distance | 3 m |
| Test Configuration | CTX               |               |     |

Vertical

**Mode 1**

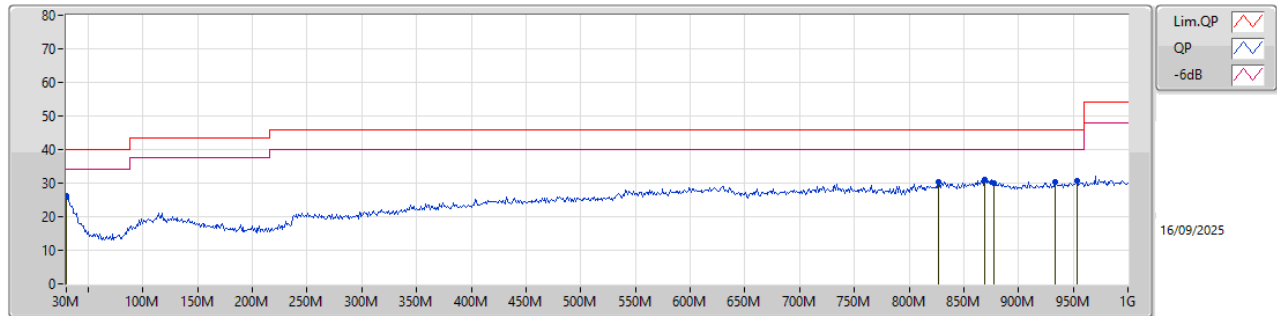
| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB/m) | Dist<br>(m) | Condition | Azimuth<br>(°) | Height<br>(m) | Comment | Raw<br>(dBuV) | AF<br>(dB/m) | CL<br>(dB) | PA<br>(dB) |
|------|--------------|-------------------|-------------------|----------------|------------------|-------------|-----------|----------------|---------------|---------|---------------|--------------|------------|------------|
| PK   | 30M          | 27.31             | 40.00             | -12.69         | -6.43            | 3           | Vertical  | 269            | 1.50          | -       | 33.74         | 23.85        | 0.32       | 30.60      |
| PK   | 856.44M      | 30.42             | 46.00             | -15.58         | -2.74            | 3           | Vertical  | 156            | 1.25          | -       | 33.16         | 26.24        | 3.30       | 32.28      |
| PK   | 867.11M      | 30.71             | 46.00             | -15.29         | -2.66            | 3           | Vertical  | 350            | 1.00          | -       | 33.37         | 26.28        | 3.32       | 32.26      |
| PK   | 879.72M      | 30.19             | 46.00             | -15.81         | -2.55            | 3           | Vertical  | 340            | 2.00          | -       | 32.74         | 26.33        | 3.35       | 32.23      |
| PK   | 939.86M      | 30.94             | 46.00             | -15.06         | -1.98            | 3           | Vertical  | 203            | 1.00          | -       | 32.92         | 26.63        | 3.45       | 32.06      |
| PK   | 959.26M      | 30.33             | 46.00             | -15.67         | -1.75            | 3           | Vertical  | 18             | 1.25          | -       | 32.08         | 26.81        | 3.49       | 32.05      |





## Horizontal

### Mode 1

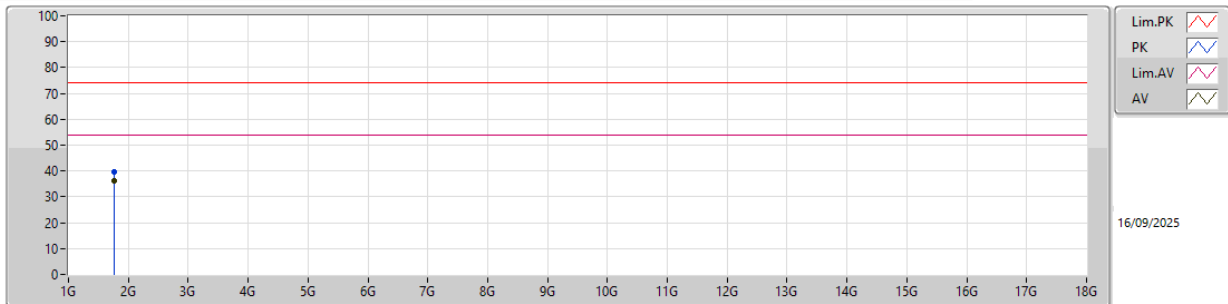


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB/m) | Dist<br>(m) | Condition  | Azimuth<br>(°) | Height<br>(m) | Comment | Raw<br>(dBuV) | AF<br>(dB/m) | CL<br>(dB) | PA<br>(dB) |  |  |
|------|--------------|-------------------|-------------------|----------------|------------------|-------------|------------|----------------|---------------|---------|---------------|--------------|------------|------------|--|--|
| PK   | 30M          | 26.26             | 40.00             | -13.74         | -6.43            | 3           | Horizontal | 125            | 1.00          | -       | 32.69         | 23.85        | 0.32       | 30.60      |  |  |
| PK   | 827.34M      | 30.43             | 46.00             | -15.57         | -3.03            | 3           | Horizontal | 195            | 1.25          | -       | 33.46         | 26.08        | 3.24       | 32.35      |  |  |
| PK   | 869.05M      | 31.02             | 46.00             | -14.98         | -2.63            | 3           | Horizontal | 255            | 1.00          | -       | 33.65         | 26.29        | 3.33       | 32.25      |  |  |
| PK   | 877.78M      | 30.09             | 46.00             | -15.91         | -2.55            | 3           | Horizontal | 91             | 2.00          | -       | 32.64         | 26.33        | 3.35       | 32.23      |  |  |
| PK   | 933.07M      | 30.34             | 46.00             | -15.66         | -2.04            | 3           | Horizontal | 106            | 1.25          | -       | 32.38         | 26.60        | 3.44       | 32.08      |  |  |
| PK   | 953.44M      | 30.57             | 46.00             | -15.43         | -1.82            | 3           | Horizontal | 163            | 2.00          | -       | 32.39         | 26.74        | 3.48       | 32.04      |  |  |



|                  |                |               |     |
|------------------|----------------|---------------|-----|
| Test Range       | 1 GHz – 18 GHz | Test Distance | 3 m |
| Test Freq. (GHz) | 60.212         |               |     |

Vertical

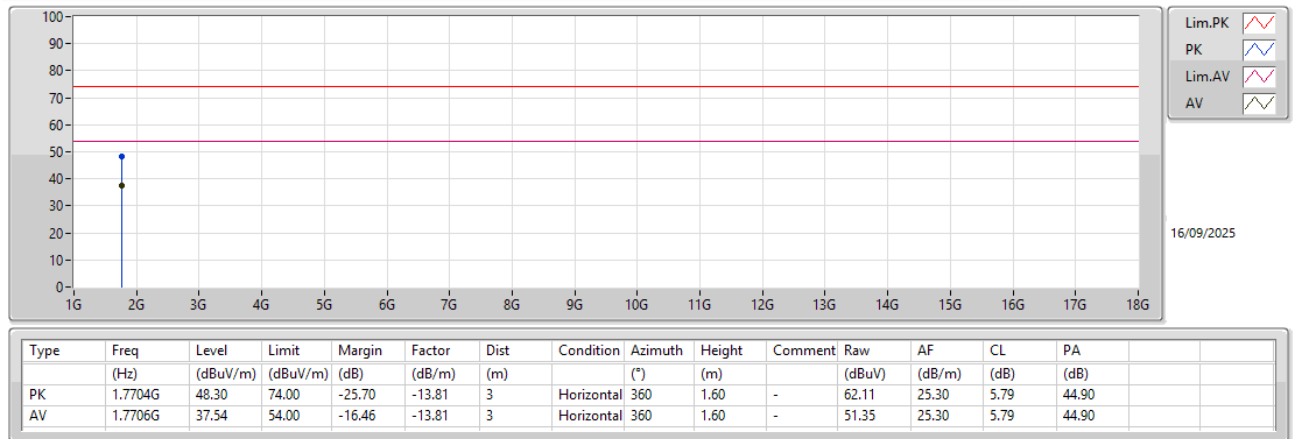
**Mode 1**

| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB/m) | Dist<br>(m) | Condition | Azimuth<br>(°) | Height<br>(m) | Comment | Raw<br>(dBuV) | AF<br>(dB/m) | CL<br>(dB) | PA<br>(dB) |  |  |
|------|--------------|-------------------|-------------------|----------------|------------------|-------------|-----------|----------------|---------------|---------|---------------|--------------|------------|------------|--|--|
| PK   | 1.768G       | 39.57             | 74.00             | -34.43         | -13.79           | 3           | Vertical  | 4              | 1.57          | -       | 53.36         | 25.32        | 5.79       | 44.90      |  |  |
| AV   | 1.7614G      | 36.22             | 54.00             | -17.78         | -13.73           | 3           | Vertical  | 4              | 1.57          | -       | 49.95         | 25.39        | 5.78       | 44.90      |  |  |



Horizontal

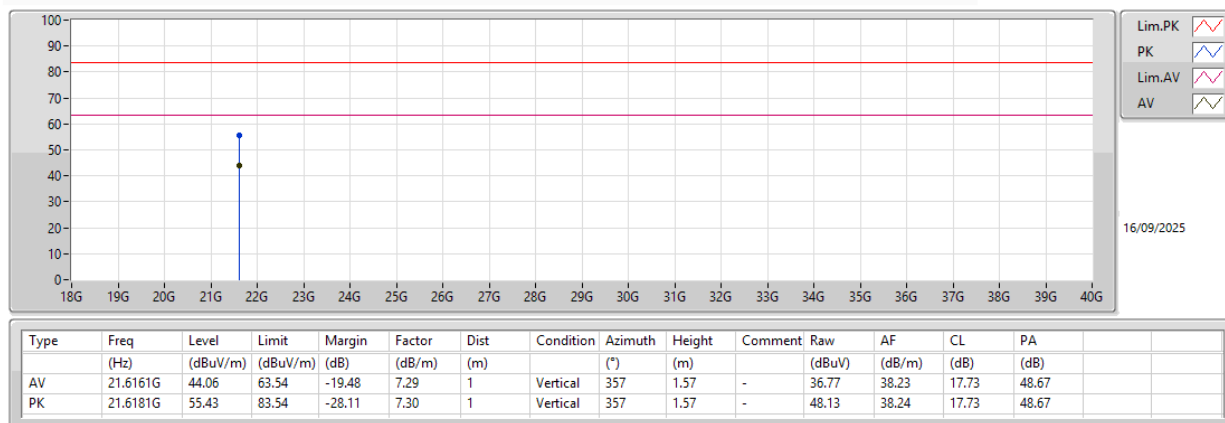
**Mode 1**





|                  |                 |               |     |
|------------------|-----------------|---------------|-----|
| Test Range       | 18 GHz – 40 GHz | Test Distance | 1 m |
| Test Freq. (GHz) | 60.212          |               |     |

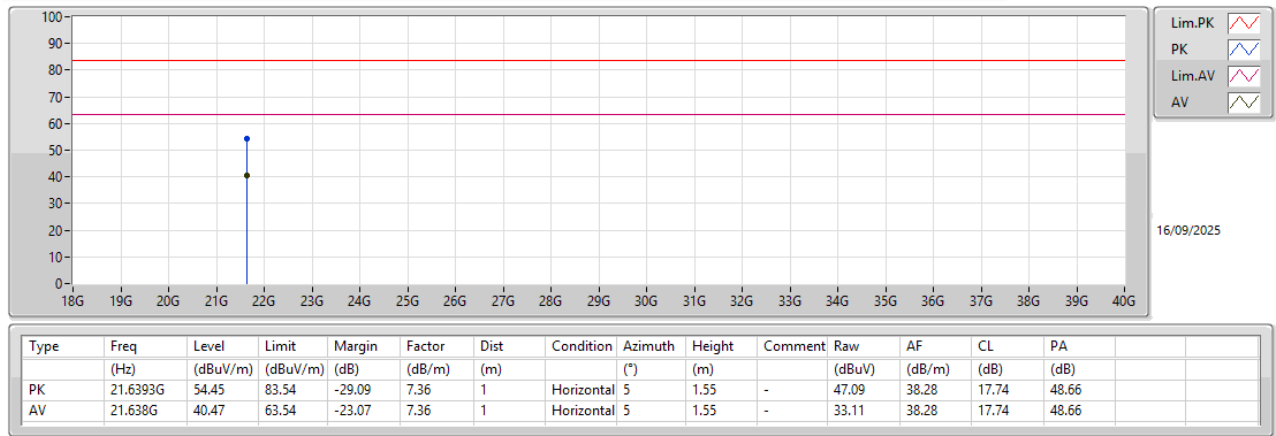
Vertical

**Mode 1**



Horizontal

Mode 1





|                   |                |
|-------------------|----------------|
| <b>Test Range</b> | 40GHz – 200GHz |
|-------------------|----------------|

| <b>Test Frequency<br/>(GHz)</b> | <b>Rx Antenna Gain<br/>(dBi)</b>          | <b>Measurement<br/>Distance<br/>(m)</b>      | <b>Read Worse<br/>Frequency<br/>(GHz)</b> | <b>Read Level<br/>(dBm)</b> |
|---------------------------------|---|--|---|-----------------------------|
| 60.212                          | 23.60                                     | 1.00   | 56.01                                     | -84.42                      |
| <b>EIRP<br/>(dBm)</b>           | <b>Specification<br/>Distance<br/>(m)</b> | <b>Power Density<br/>(pW/cm<sup>2</sup>)</b> | <b>Limit<br/>(pW/cm<sup>2</sup>)</b>      | <b>Test Result</b>          |
| -40.62                          | 3   | 0.0767                                       | 90  | PASS                        |

Note:

Calculate the EIRP from the radiated measurement in the far-field using Equation:

$$\text{EIRP} = 21.98 - 20\log(\lambda) + 20\log(D) + P - G$$

where:

EIRP: is the equivalent isotropic radiated power, in dBm

P: is the power measured at the output of the test antenna, in dBm

$\lambda$ : is the wavelength of the emission under investigation [300/fMHz], in m

G: is the gain of the test antenna, in dBi.

### 3.4 Frequency Stability

#### 3.4.1 Limit of Frequency Stability

| Frequency Stability   | Limit                      |
|---|----------------------------|
| Refer as 15.255(f) and<br>ANSI C63.10-2020, clause 9.5                                  | within the frequency bands |
| Note: These measurements shall also be performed at normal and extreme test conditions. |                            |

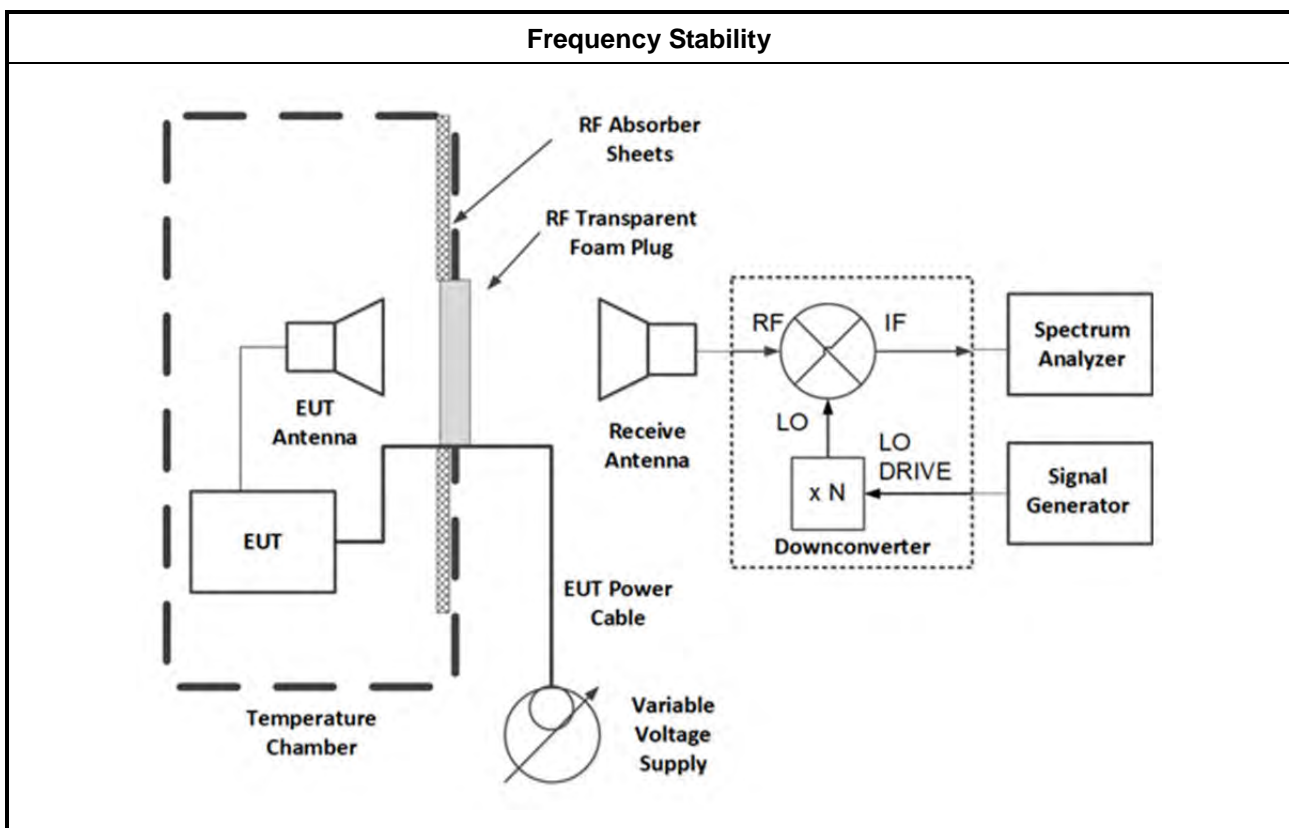
#### 3.4.2 Measuring Instruments

Refer a measuring instruments list in this test report.

#### 3.4.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2020, clauses 9.5.

#### 3.4.4 Test Setup





### 3.4.5 Test Result of Frequency Stability

|  |   |
|--|---|
| <b>Test Conditions</b>   | see ANSI C63.10, clause 5.11 & clause 9 |
| <b>Test Setup</b>  | see ANSI C63.10, clause 9.5             |
| NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes. |   |

#### 3.4.5.1 Frequency Stability with Respect to Ambient Temperature

| Frequency Stability with Respect to Ambient Temperature              |                          |                       |              |
|--|--------------------------|-----------------------|--------------|
| Test Results   |                          |                       |              |
| Test Temperature (°C)  | Measured Frequency (MHz) | Delta Frequency (kHz) | Limit (±kHz) |
| -40  | 60244.34                 | 20750                 | within band  |
| -30  | 60249.115                | 25530                 | within band  |
| -20  | 60249.415                | 25830                 | within band  |
| -10  | 60244.04                 | 20455                 | within band  |
| 0  | 60247.25                 | 23665                 | within band  |
| 10   | 60425.635                | 202050                | within band  |
| 20   | 60223.585                | Reference             | within band  |
| 30   | 60235.84                 | 12255                 | within band  |
| 40   | 60240.54                 | 16955                 | within band  |
| 50   | 60221.3                  | -2285                 | within band  |
| 65   | 60229.8                  | 6215                  | within band  |
| 70   | 60238.39                 | 14805                 | within band  |
| NOTE: The manufacturer's specified temperature range of -40 to 70°C. |                          |                       |              |



**3.4.5.2 Frequency Stability When Varying Supply Voltage**

| Frequency Stability When Varying Supply Voltage |                          |                       |              |
|---|--------------------------|-----------------------|--------------|
| Test Results                                    |                          |                       |              |
| Test Voltage: (Vdc)                             | Measured Frequency (MHz) | Delta Frequency (kHz) | Limit (±kHz) |
| 5.1   | 60221.3                  | -2285                 | within band  |
| 6   | 60223.585                | Reference             | within band  |
| 6.9   | 60229.8                  | 6215                  | within band  |



### **3.5 Operation Restriction and Group Installation**

#### **3.5.1 Limit of Operation Restriction and Group Installation**

| Item                  | Limit   |
|-----------------------|---|
| Operation Restriction | Operation is not permitted for the following products: <ul style="list-style-type: none"><li>♦ Equipment used on aircraft or satellites. (Refer as 15.255 (a))</li><li>♦ Field disturbance sensors, including vehicle radar systems, unless the field disturbance sensors are employed for fixed operation. (Refer as 15.255 (a))</li></ul> |
| Group Installation    | Operation is not permitted for the following products: <ul style="list-style-type: none"><li>♦ External phase-locking (Refer as 15.255 (h))</li></ul>   |

#### **3.5.2 Result of Operation Restriction**

Manufacturer declares that EUT will not be used on aircraft or satellites. Then user manual will include a statement to caution EUT is not permitted for use on aircraft or satellites.

#### **3.5.3 Result of Group Installation**

The frequency, amplitude and phase of the transmit signal are set within the EUT. There are no external phase-locking inputs or any other means of combining two or more units together to realize a beam-forming array.



## 4 Test Equipment and Calibration Data

| Instrument                         | Brand           | Model No.         | Serial No.       | Characteristics   | Calibration Date | Calibration Due Date | Remark                |
|------------------------------------|-----------------|-------------------|------------------|-------------------|------------------|----------------------|-----------------------|
| Loop Antenna                       | Teseq           | HLA 6121          | 65417            | 9kHz - 30MHz      | Oct. 17, 2024    | Oct. 16, 2025        | Radiation (03CH04-CB) |
| 3m Semi Anechoic Chamber NSA       | TDK             | SAC-3M            | 03CH04-CB        | 30 MHz ~ 1 GHz    | Jul. 30, 2025    | Jul. 29, 2026        | Radiation (03CH04-CB) |
| 3m Semi Anechoic Chamber VSWR      | TDK             | SAC-3M            | 03CH04-CB        | 1GHz ~18GHz<br>3m | Feb. 21, 2025    | Feb. 20, 2026        | Radiation (03CH04-CB) |
| BILOG ANTENNA with 6 dB attenuator | Schaffner & EMC | CBL6112B & N-6-06 | 22021&AT-N0607   | 30MHz ~ 1GHz      | Oct. 05, 2024    | Oct. 04, 2025        | Radiation (03CH04-CB) |
| Horn Antenna                       | SCHWARZBECK     | BBHA 9120 D       | BBHA 9120D-01816 | 1GHz~18GHz        | Dec. 20, 2024    | Dec. 19, 2025        | Radiation (03CH04-CB) |
| Horn Antenna                       | Schwarzbeck     | BBHA 9170         | BBHA9170252      | 15GHz ~ 40GHz     | Sep. 23, 2024    | Sep. 22, 2025        | Radiation (03CH04-CB) |
| Pre-Amplifier                      | EMCI            | EMC330N           | 980391           | 20MHz ~ 3GHz      | May 21, 2025     | May 20, 2026         | Radiation (03CH04-CB) |
| Pre-Amplifier                      | SGH             | SGH5265           | 20211115-1       | 1~ 26.5GHz        | Jan. 16, 2025    | Jan. 15, 2026        | Radiation (03CH04-CB) |
| Pre-Amplifier                      | SGH             | SGH184            | 20221107-3       | 18GHz ~ 40GHz     | Nov. 25, 2024    | Nov. 24, 2025        | Radiation (03CH04-CB) |
| Spectrum Analyzer                  | R&S             | FSP40             | 100142           | 9kHz~40GHz        | Mar. 24, 2025    | Mar. 23, 2026        | Radiation (03CH04-CB) |
| EMI Test Receiver                  | R&S             | ESR7              | 102172           | 9kHz ~ 7GHz       | Oct. 21, 2024    | Oct. 20, 2025        | Radiation (03CH04-CB) |
| RF Cable-low                       | Woken           | RG402             | Low Cable-03+67  | 30MHz – 1GHz      | Apr. 25, 2025    | Apr. 24, 2026        | Radiation (03CH04-CB) |
| RF Cable-high                      | Woken           | RG402             | High Cable-21    | 1GHz - 18GHz      | Apr. 25, 2025    | Apr. 24, 2026        | Radiation (03CH04-CB) |
| RF Cable-high                      | Woken           | RG402             | High Cable-21+67 | 1GHz - 18GHz      | Apr. 25, 2025    | Apr. 24, 2026        | Radiation (03CH04-CB) |
| High Cable                         | Woken           | WCA0929M          | 40G#5+6          | 1GHz ~ 40 GHz     | Apr. 30, 2025    | Apr. 29, 2026        | Radiation (03CH04-CB) |
| *Harmonic Mixer                    | R&S             | FS-Z60            | 100114           | 40GHz~60GHz       | Nov. 22, 2024    | Nov. 21, 2026        | Radiation (03CH04-CB) |
| *Harmonic Mixer                    | R&S             | FS-Z75            | 100966           | 50GHz~75GHz       | Nov. 22, 2024    | Nov. 21, 2026        | Radiation (03CH04-CB) |
| *Harmonic Mixer                    | R&S             | FS-Z90            | 102135           | 60GHz~90GHz       | Sep. 13, 2024    | Sep. 12, 2026        | Radiation (03CH04-CB) |
| *Harmonic Mixer                    | R&S             | FS-Z140           | 101160           | 90GHz~140GHz      | Jan. 20, 2025    | Jan. 19, 2027        | Radiation (03CH04-CB) |
| *Harmonic Mixer                    | R&S             | FS-Z220           | 101065           | 140GHz~220GHz     | Jan. 20, 2025    | Jan. 19, 2027        | Radiation (03CH04-CB) |



| Instrument                 | Brand            | Model No.        | Serial No.    | Characteristics | Calibration Date | Calibration Due Date | Remark                |
|----------------------------|------------------|------------------|---------------|-----------------|------------------|----------------------|-----------------------|
| Standard Horn Antenna      | Custom Microwave | M19RH            | U91113-A      | 40 ~ 60 GHz     | N.C.R.           | N.C.R.               | Radiation (03CH04-CB) |
| Standard Horn Antenna      | Custom Microwave | M15RH            | V91113-A      | 50 ~ 75 GHz     | N.C.R.           | N.C.R.               | Radiation (03CH04-CB) |
| Standard Horn Antenna      | Custom Microwave | M12RH            | E91113-A      | 60 ~ 90 GHz     | N.C.R.           | N.C.R.               | Radiation (03CH04-CB) |
| Standard Horn Antenna      | Custom Microwave | M08RH            | F91113-A      | 90 ~ 140 GHz    | N.C.R.           | N.C.R.               | Radiation (03CH04-CB) |
| Standard Horn Antenna      | Custom Microwave | M05RH            | G91113-A      | 140 ~ 220 GHz   | N.C.R.           | N.C.R.               | Radiation (03CH04-CB) |
| Test Software              | SPORTON          | SENSE-EMI        | V5.11.8       | 30MHz-40GHz     | N.C.R.           | N.C.R.               | Radiation (03CH04-CB) |
| Spectrum analyzer          | R&S              | FSV40            | 101028        | 9kHz~40GHz      | Jan. 02, 2025    | Jan. 01, 2026        | Radiation (TH03-CB)   |
| Temp. and Humidity Chamber | Gaint Force      | GTH-408-40-CP-AR | MAA1410-011   | -40~100 degree  | Aug. 25, 2025    | Aug. 24, 2026        | Radiation (TH03-CB)   |
| RF Cable                   | Woken            | RG402            | High Cable-11 | 30MHz ~18 GHz   | Oct. 01, 2024    | Sep. 30, 2025        | Radiation (TH03-CB)   |
| RF Cable                   | Woken            | RG402            | High Cable-12 | 30MHz ~18 GHz   | Oct. 01, 2024    | Sep. 30, 2025        | Radiation (TH03-CB)   |
| RF Cable                   | Woken            | RG402            | High Cable-13 | 30MHz ~18 GHz   | Oct. 01, 2024    | Sep. 30, 2025        | Radiation (TH03-CB)   |

Note: Calibration Interval of instruments listed above is one year.

N.C.R. means Non-Calibration required.



## 5 Measurement Uncertainty

| Test Items                           | Uncertainty | Remark                   |
|--------------------------------------|-------------|--------------------------|
| Radiated Emission (9kHz ~ 30MHz)     | 3.8 dB      | Confidence levels of 95% |
| Radiated Emission (30MHz ~ 1,000MHz) | 4.7 dB      | Confidence levels of 95% |
| Radiated Emission (1GHz ~ 18GHz)     | 4.3 dB      | Confidence levels of 95% |
| Radiated Emission (18GHz ~ 40GHz)    | 4.2 dB      | Confidence levels of 95% |
| Radiated Emission (40GHz ~ 60GHz)    | 3.0 dB      | Confidence levels of 95% |
| Radiated Emission (60GHz ~ 90GHz)    | 3.2 dB      | Confidence levels of 95% |
| Radiated Emission (90GHz ~ 200GHz)   | 3.1 dB      | Confidence levels of 95% |
| Occupied Bandwidth                   | 2.1 %       | Confidence levels of 95% |
| Frequency Stability                  | 0.02 ppm    | Confidence levels of 95% |
| Radiated EIRP                        | 3.2 dB      | Confidence levels of 95% |
| Temperature                          | 1.0°C       | Confidence levels of 95% |