Certificate #7130.01

# FCC Radio Test Report

## FCC ID: 2A33X-ESW1

**This report concerns: Original Grant**

| | | |
|---|---|---|
| **Project No.** | : | 2409C082 |
| **System Name** | : | QYX Pro |
| **Brand Name** | : | Qianxun SI |
| **System Model Name** | : | QYX Pro |
| **Equipment** | : | Electric steering wheel |
| **Test Model** | : | ESW1 |
| **Series Model** | : | N/A |
| **Applicant** | : | Qianxun Spatial Intelligence(Zhejiang) Inc. |
| **Address** | : | No.1,Building12,Area C,Deqing Geographic Info Town,Wuyang Street,Deqing County,Huzhou City,Zhejiang Province,China |
| **Manufacturer** | : | Qianxun Spatial Intelligence(Zhejiang) Inc. |
| **Address** | : | No.1,Building12,Area C,Deqing Geographic Info Town,Wuyang Street,Deqing County,Huzhou City,Zhejiang Province,China |
| **Date of Receipt** | : | Sep. 24, 2024 |
| **Date of Test** | : | Sep. 25, 2024 ~ Nov. 09, 2024 |
| **Issued Date** | : | Nov. 26, 2024 |
| **Report Version** | : | R00 |
| **Test Sample** | : | Engineering Sample No.: DG2024092426 for conducted, DG2024092426-7 for others. |
| **Standard(s)** | : | FCC CFR Title 47, Part 15, Subpart C |

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

**Prepared by** : Evan Yang

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**Approved by** : Chay Cai

Chay Cai

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**Declaration**

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**BTL**'s reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL.

The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

**BTL**'s laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

**BTL** is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

**Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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## REPORT ISSUED HISTORY

| Report No. | Version | Description | Issued Date | Note |
|---|---|---|---|---|
| BTL-FCCP-1-2409C082 | R00 | Original Report. | Nov. 26, 2024 | Valid |

## 1. APPLICABLE STANDARDS

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:
ANSI C63.10-2013
The following reference test guidance is not within the scope of accreditation of A2LA:
KDB 558074 D01 15.247 Meas Guidance v05r02

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

| FCC CFR Title 47, Part 15, Subpart C | | | | |
|---|---|---|---|---|
| **Standard(s) Section** | **Test Item** | **Test Result** | **Judgment** | **Remark** |
| 15.207 | AC Power Line Conducted Emissions | ------ | N/A | ------ |
| 15.247(d)<br>15.205(a)<br>15.209(a) | Radiated Emissions | APPENDIX A<br>APPENDIX B<br>APPENDIX C | PASS | ------ |
| 15.247(a)(2) | Bandwidth | APPENDIX D | PASS | ------ |
| 15.247(b)(3) | Maximum Output Power | APPENDIX E | PASS | ------ |
| 15.247(d) | Conducted Spurious Emission | APPENDIX F | PASS | ------ |
| 15.247(e) | Power Spectral Density | APPENDIX G | PASS | ------ |
| 15.203 | Antenna Requirement | ------ | PASS | **Note(2)** |

Note:
(1) “N/A” denotes test is not applicable to this device.
(2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of 1-2/F, 4/F, Building A, 1-2/F, Building B, 3/F, Building C, No.3, Jinshagang 1st Road, Dalang Town, Dongguan City, Guangdong People's Republic of China.
BTL's Registration Number for FCC: 747969
BTL's Designation Number for FCC: CN1377

## 2.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95.45% confidence level (based on a coverage factor (k=2))
The BTL measurement uncertainty as below table:

A. Radiated emissions Measurement:

| Test Site | Method | Measurement Frequency Range | *U*,(dB) |
|---|---|---|---|
| DG-CB01 | CISPR | 9kHz ~ 30MHz | 2.36 |

| Test Site | Method | Measurement Frequency Range | Ant. H / V | *U*,(dB) |
|---|---|---|---|---|
| DG-CB03 (3m) | CISPR | 30MHz ~ 200MHz | V | 4.40 |
| | | 30MHz ~ 200MHz | H | 3.62 |
| | | 200MHz ~ 1,000MHz | V | 4.58 |
| | | 200MHz ~ 1,000MHz | H | 3.98 |

| Test Site | Method | Measurement Frequency Range | *U*,(dB) |
|---|---|---|---|
| DG-CB03 (3m) | CISPR | 1GHz ~ 6GHz | 4.08 |
| | | 6GHz ~ 18GHz | 4.62 |

| Test Site | Method | Measurement Frequency Range | *U*,(dB) |
|---|---|---|---|
| DG-CB03 (1m) | CISPR | 18 ~ 26.5 GHz | 3.36 |
| | | 26.5 ~ 40 GHz | 3.58 |

B. Other Measurement:

| Test Item | Uncertainty |
|---|---|
| Bandwidth | 0.90 % |
| Maximum Output Power | 1.3 dB |
| Conducted Spurious Emission | 1.9 dB |
| Power Spectral Density | 1.4 dB |
| Temperature | 0.8 °C |
| Humidity | 2.2 % |

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

## 2.3 TEST ENVIRONMENT CONDITIONS

| Test Item | Temperature | Humidity | Test Voltage | Tested By | Tested Date |
|---|---|---|---|---|---|
| Radiated Emissions-9 kHz to 30 MHz | 26°C | 46% | DC 3V | Hayden Chen | Oct. 16, 2024 |
| Radiated Emissions-30 MHz to 1000 MHz | 22°C | 49% | DC 3V | Allen Tong | Oct. 17, 2024 |
| Radiated Emissions-Above 1000 MHz | 22°C | 50% | DC 5V | Allen Tong | Oct. 16, 2024 |
| Bandwidth | 23°C | 62% | DC 5V | Arvin Tong | Oct. 12, 2024 |
| Maximum Output Power | 23°C | 62% | DC 5V | Arvin Tong | Oct. 12, 2024 |
| Conducted Spurious Emission | 23°C | 62% | DC 5V | Arvin Tong | Oct. 12, 2024 |
| Power Spectral Density | 23°C | 62% | DC 5V | Arvin Tong | Oct. 12, 2024 |

# 3. GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| System Name | QYX Pro |
| Brand Name | Qianxun SI |
| System Model Name | QYX Pro |
| Equipment | Electric steering wheel |
| Test Model | ESW1 |
| Series Model | N/A |
| Model Difference(s) | N/A |
| Power Source | DC Power Supply. |
| Power Rating | DC 9V-36V |
| Operation Frequency | 2402 MHz ~ 2480 MHz |
| Modulation Type | GFSK |
| Bit Rate of Transmitter | 1Mbps |
| Max. Output Power | 1Mbps: 2.72 dBm (0.0019 W) |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|
| 00 | 2402 | 20 | 2442 |
| 01 | 2404 | 21 | 2444 |
| 02 | 2406 | 22 | 2446 |
| 03 | 2408 | 23 | 2448 |
| 04 | 2410 | 24 | 2450 |
| 05 | 2412 | 25 | 2452 |
| 06 | 2414 | 26 | 2454 |
| 07 | 2416 | 27 | 2456 |
| 08 | 2418 | 28 | 2458 |
| 09 | 2420 | 29 | 2460 |
| 10 | 2422 | 30 | 2462 |
| 11 | 2424 | 31 | 2464 |
| 12 | 2426 | 32 | 2466 |
| 13 | 2428 | 33 | 2468 |
| 14 | 2430 | 34 | 2470 |
| 15 | 2432 | 35 | 2472 |
| 16 | 2434 | 36 | 2474 |
| 17 | 2436 | 37 | 2476 |
| 18 | 2438 | 38 | 2478 |
| 19 | 2440 | 39 | 2480 |

3. Table for Filed Antenna:

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) |
|---|---|---|---|---|---|
| 1 | Sun & Lynn | QYX Multifunctional steering wheel PCB V1P0 | PCB | N/A | 1.2 |

4.

| Equipment / RF specification | Automated Steering System (Model: QYX Pro receiver) | Tablet (Model: S11) | Electric steering wheel (Model: ESW1) |
|---|---|---|---|
| GPS | support | / | / |
| Bluetooth(BT+BLE) | / | BT+BLE | BLE |
| WIFI | 2.4G | 2.4G | / |
| GSM | / | / | / |
| WCDMA | / | Band 2, 4, 5 | / |
| LTE | Band 2, 4, 5, 7, 12, 13, 25, 26, 38, 40, 41, 66 | Band 2, 4, 5, 7, 12, 13, 25, 26, 38, 41 | / |

Note: The system (QYX Pro) consists of three parts, automated steering system (Model: QYX Pro receiver), electric steering wheel (Model: ESW1) and tablet (Model: S11).

## 3.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

| Pretest Mode | Description |
|---|---|
| Mode 1 | TX Mode_1Mbps Channel 00/19/39 |
| Mode 2 | TX Mode_1Mbps Channel 39 |

Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

| **AC power line conducted emissions test** | |
|---|---|
| Final Test Mode | Description |
| Mode 2 | TX Mode_1Mbps Channel 39 |

| **Radiated emissions test - Below 1GHz** | |
|---|---|
| Final Test Mode | Description |
| Mode 2 | TX Mode_1Mbps Channel 39 |

| **Radiated emissions test - Above 1GHz** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | TX Mode_1Mbps Channel 00/19/39 |

| **Conducted test** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | TX Mode_1Mbps Channel 00/19/39 |

Note:

(1) For radiated emission above 1 GHz test, the spurious points of 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.

(2) For AC power line conducted emissions and radiated emissions below 1 GHz test, the 1Mbps Channel 39 is found to be the worst case and recorded.

(3) For radiated emission Harmonic 18-26.5GHz test, only tested the worst case and recorded.

(4) For radiated emission of Harmonic above 1 GHz test, the polarization of Vertical and Horizontal are evaluated, the worst case is Vertical and recorded.

(5) For radiated emission of Band edge above 1 GHz test, the polarization of Vertical and Horizontal are evaluated, the worst case is Horizontal and recorded.

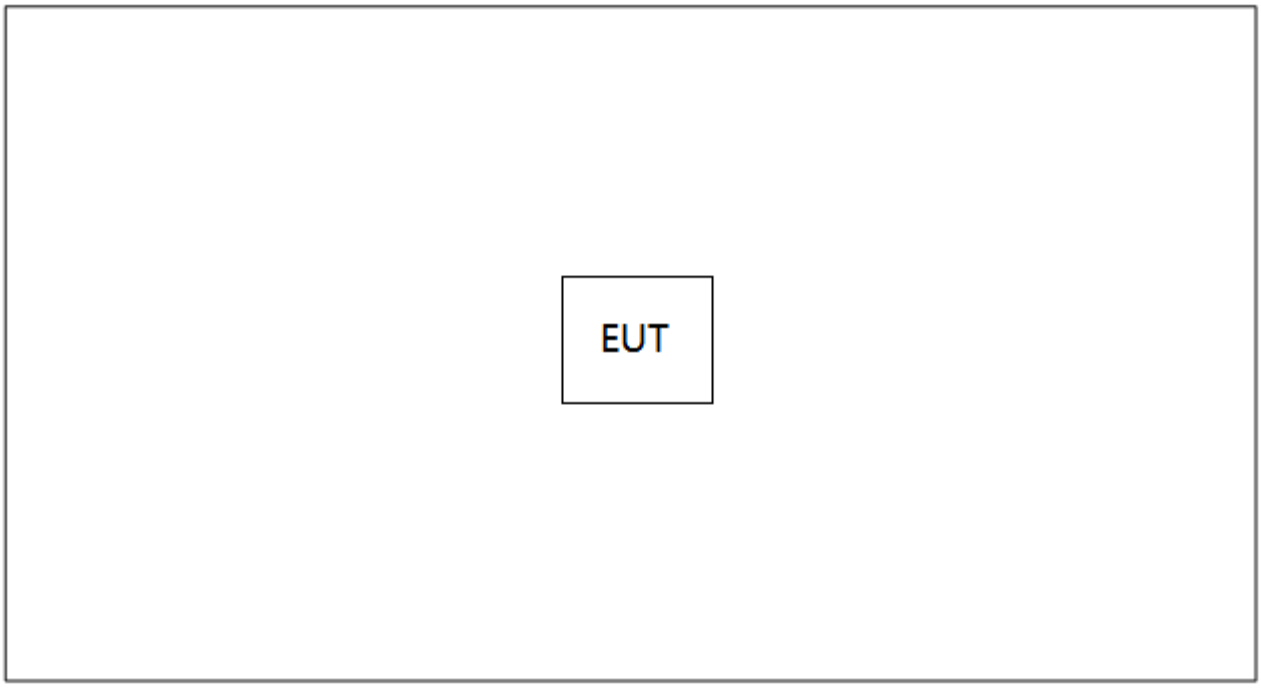
## 3.3 PARAMETERS OF TEST SOFTWARE

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

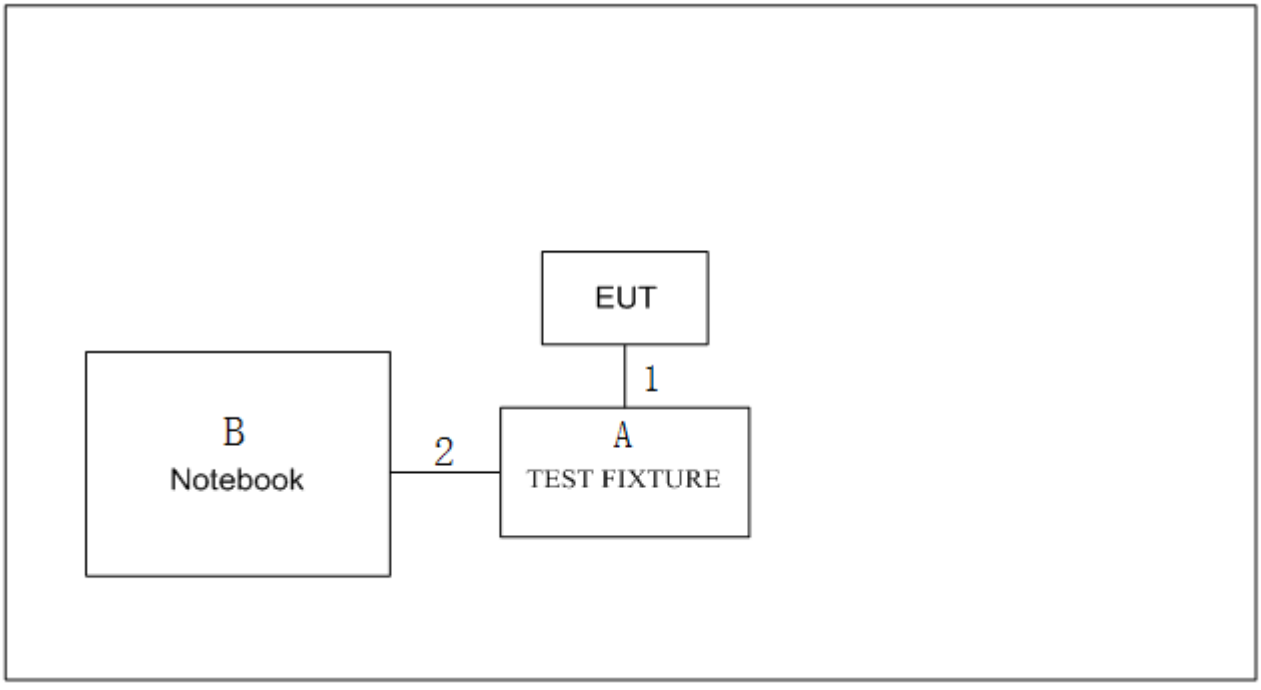
| Test Software Version | BK32xx RF Test_V2.1.0 | | |
|---|---|---|---|
| Frequency (MHz) | 2402 | 2440 | 2480 |
| 1Mbps | 4 | 4 | 4 |

## 3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated emissions test - Below 1GHz




Radiated emissions test - Above 1GHz



## 3.5 SUPPORT UNITS

Radiated emissions test - Below 1GHz

| Item | Equipment | Brand | Model No. | Series No. |
|---|---|---|---|---|
| - | - | - | - | - |

| Item | Cable Type | Shielded Type | Ferrite Core | Length |
|---|---|---|---|---|
| - | - | - | - | - |

Radiated emissions test - Above 1GHz

| Item | Equipment | Brand | Model No. | Series No. |
|---|---|---|---|---|
| A | Test Fixture | N/A | N/A | N/A |
| B | Notbook | Lenovo | Pro 13 | N/A |

| Item | Cable Type | Shielded Type | Ferrite Core | Length |
|---|---|---|---|---|
| 1 | Data Cable | NO | NO | 0.1m |
| 2 | USB Cable | NO | NO | 0.5m |

## 3.6 CUSTOMER INFORMATION DESCRIPTION

1) The antenna gain is provided by the manufacturer.
2) Except for AC power line conducted emissions and radiated emissions, the results of all test items include cable losses. All cable losses are provided by the testing laboratory.

# 4. RADIATED EMISSIONS

## 4.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-1000 MHz)

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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

| Frequency (MHz) | Band edge/ Harmonic at 3m (dBμV/m) | | Harmonic at 1m (dBμV/m) | |
|---|---|---|---|---|
| | Peak | Average | Peak | Average |
| Above 1000 | 74 | 54 | 83.5 (Note 4) | 63.5 (Note 4) |

Note:

(1) The limit for radiated test was performed according to FCC CFR Title 47, Part 15, Subpart C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

(4)

$$FS_{\text{limit}} = FS_{\text{max}} - 20\log\left(\frac{d_{\text{limit}}}{d_{\text{measure}}}\right)$$

20log ($d_{limit}/d_{measure}$)=20log (3/1)=9.5 dB.

$FS_{limit}$: Harmonic at 3m Peak and Average limit.

$FS_{max}$: Harmonic at 1m Peak and Average Maximum value.

$d_{limit}$: Harmonic at 3m test distance.

$d_{measure}$: Harmonic Actual test distance.

## 4.2 TEST PROCEDURE

a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
b. The measuring distance of 3 m or 1m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1 GHz)
h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform. (above 1 GHz)
i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

The following table is the setting of the receiver:

| Spectrum Parameters | Setting |
|---|---|
| Start ~ Stop Frequency | 9 kHz~150 kHz for RBW 200 Hz |
| Start ~ Stop Frequency | 0.15 MHz~30 MHz for RBW 9 kHz |
| Start ~ Stop Frequency | 30 MHz~1000 MHz for RBW 100 kHz |

| Spectrum Parameters | Setting |
|---|---|
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RBW / VBW<br>(Emission in restricted band) | 1 MHz / 3 MHz for PK value<br>1 MHz / 1/T Hz for AVG value |

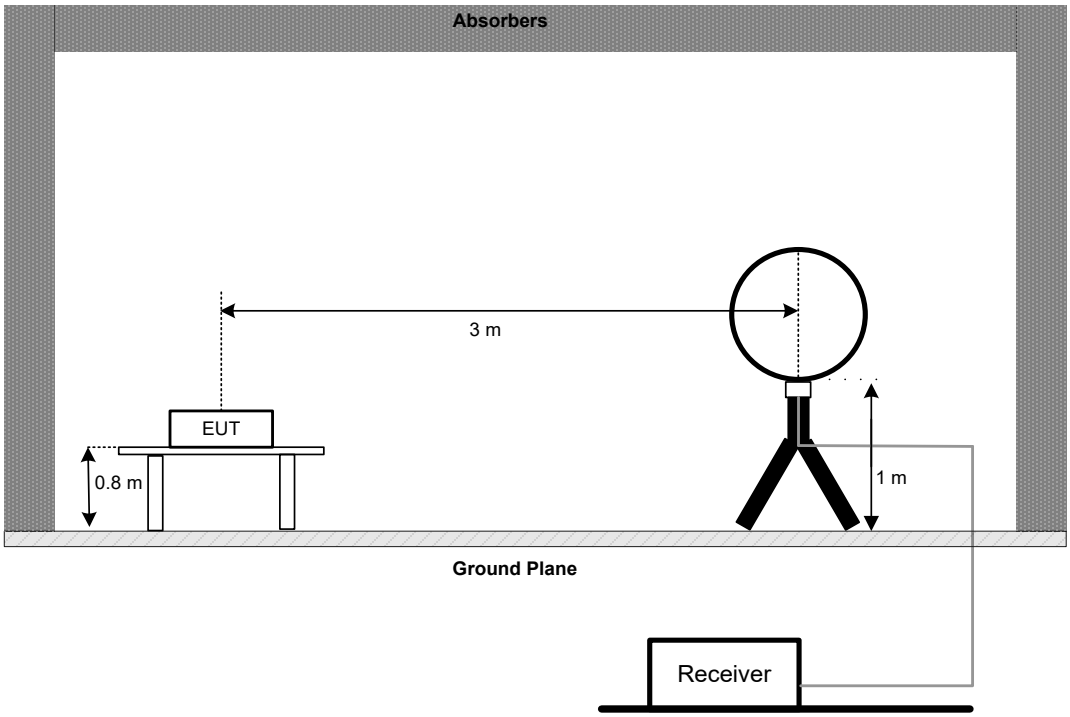
| Spectrum Parameters | Setting |
|---|---|
| Start ~ Stop Frequency | 9 kHz~90 kHz for PK/AVG detector |
| Start ~ Stop Frequency | 90 kHz~110 kHz for QP detector |
| Start ~ Stop Frequency | 110 kHz~490 kHz for PK/AVG detector |
| Start ~ Stop Frequency | 490 kHz~30 MHz for QP detector |
| Start ~ Stop Frequency | 30 MHz~1000 MHz for QP detector |
| Start ~ Stop Frequency | 1 GHz~26.5 GHz for PK/AVG detector |

## 4.3 DEVIATION FROM TEST STANDARD

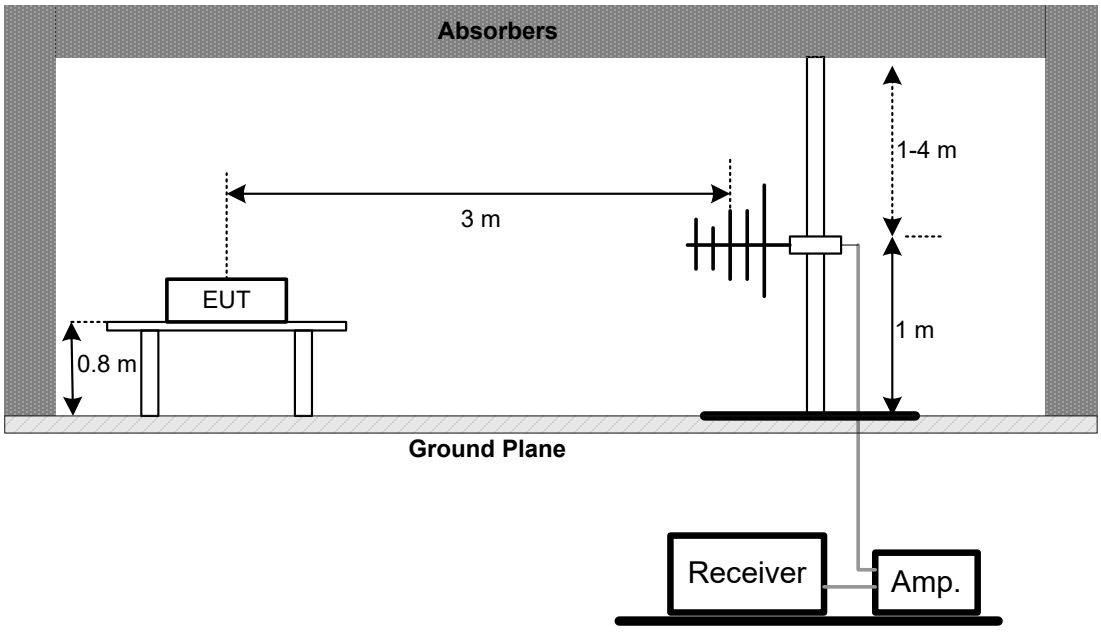
No deviation.

## 4.4 TEST SETUP

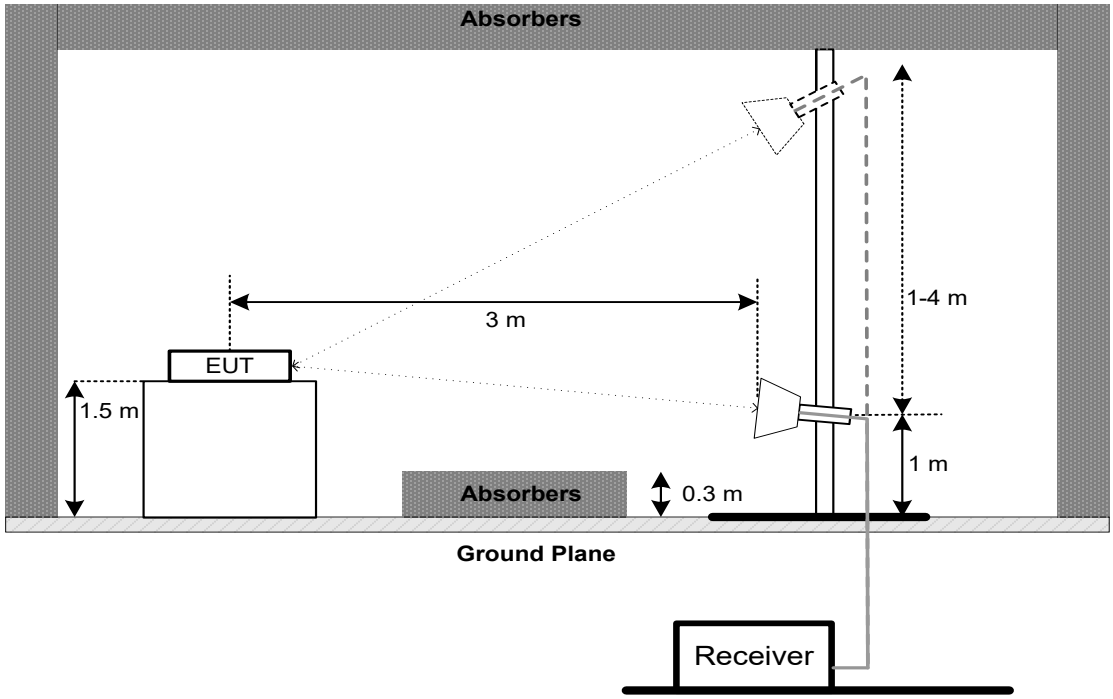
**9 kHz to 30 MHz**



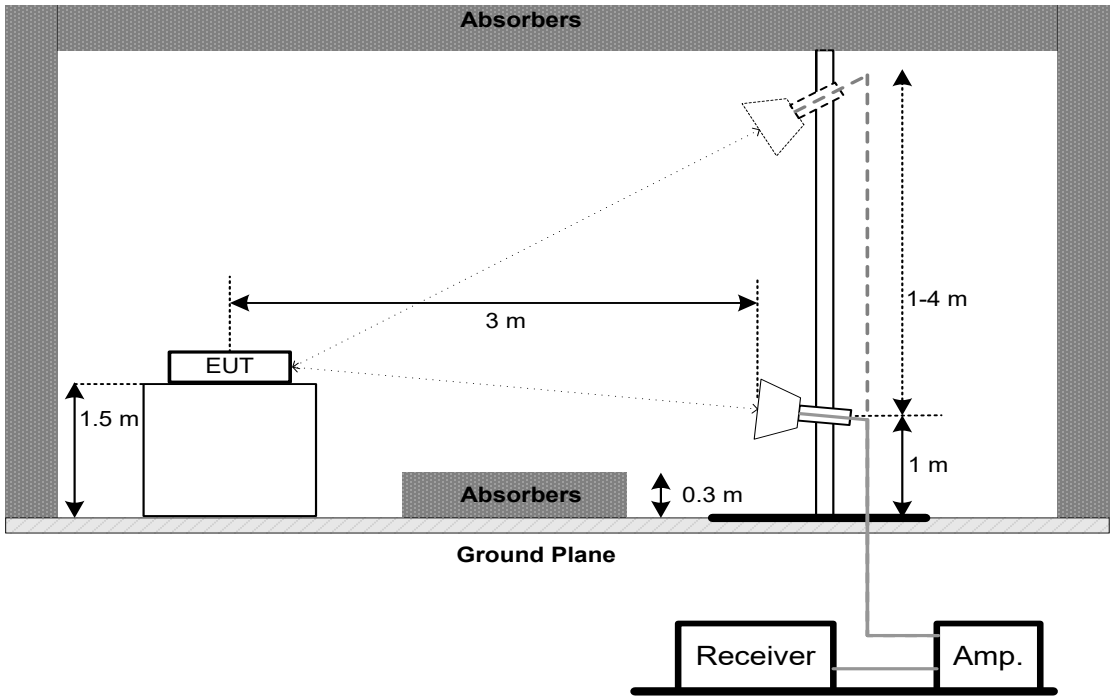

**30 MHz to 1 GHz**



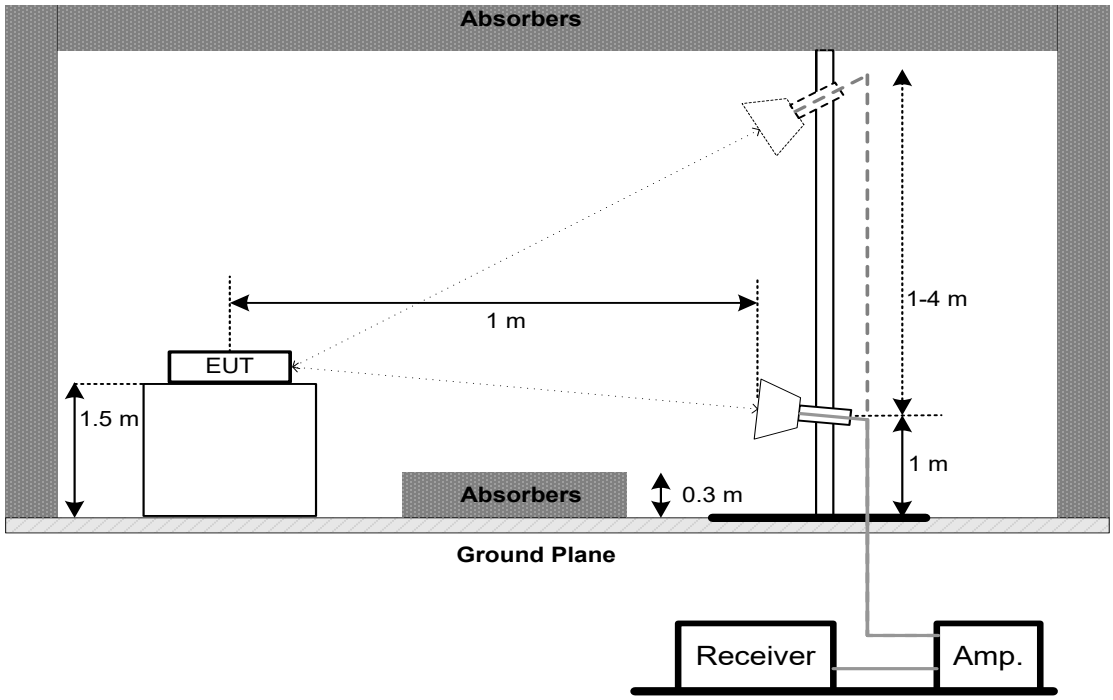
**Above 1 GHz**
Band edge




**Harmonic(1 GHz to 18 GHz)**



**Harmonic(18 GHz to 26.5 GHz)**




## 4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 4.6 TEST RESULT - 9 kHz TO 30 MHz

Please refer to the APPENDIX A.

Remark:

(1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
(2) Limit line = specific limits (dBuV) + distance extrapolation factor.

## 4.7 TEST RESULT - 30 MHz TO 1000 MHz

Please refer to the APPENDIX B.

## 4.8 TEST RESULT - ABOVE 1000 MHz

Please refer to the APPENDIX C.

Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

# 5. BANDWIDTH

## 5.1 LIMIT

| Section | Test Item | Limit |
|---|---|---|
| FCC 15.247(a)(2) | 6 dB Bandwidth | >= 500 kHz |
| | 99% Emission Bandwidth | - |

## 5.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

b. The following table is the setting of the spectrum analyzer:

For 6 dB Bandwidth:

| Spectrum Parameters | Setting |
|---|---|
| Span Frequency | > Measurement Bandwidth |
| RBW | 100 kHz |
| VBW | 300 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

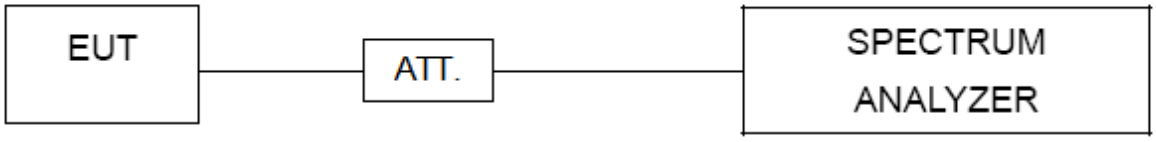
For 99% Emission Bandwidth:

| Spectrum Parameters | Setting |
|---|---|
| Span Frequency | Between 1.5 times and 5.0 times the OBW |
| RBW | 30 kHz |
| VBW | 100 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

## 5.3 DEVIATION FROM STANDARD

No deviation.

## 5.4 TEST SETUP




## 5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 5.6 TEST RESULTS

Please refer to the APPENDIX D.

# 6. MAXIMUM OUTPUT POWER

## 6.1 LIMIT

| Section | Test Item | Limit |
|---|---|---|
| FCC 15.247(b)(3) | Maximum Output Power | 1.0000 watt or 30.00 dBm |

## 6.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

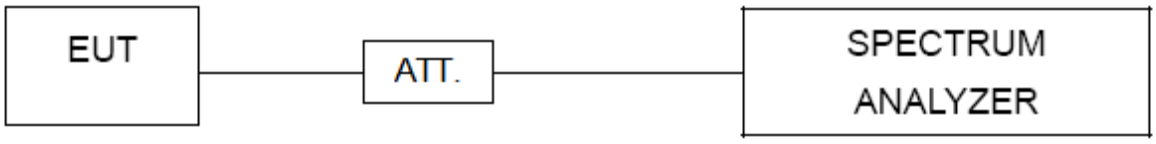
b. The following table is the setting of the spectrum analyzer:

| Spectrum Parameters | Setting |
|---|---|
| Span Frequency | ≥ 3×RBW |
| RBW | 3 MHz |
| VBW | 3 MHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

## 6.3 DEVIATION FROM STANDARD

No deviation.

## 6.4 TEST SETUP




## 6.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 6.6 TEST RESULTS

Please refer to the APPENDIX E.

# 7. CONDUCTED SPURIOUS EMISSION

## 7.1 LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

## 7.2 TEST PROCEDURE

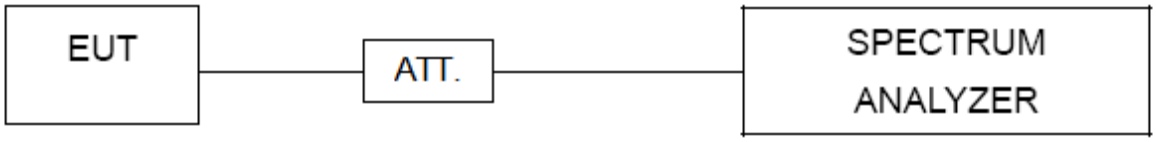
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

| Spectrum Parameters | Setting |
|---|---|
| Start Frequency | 30 MHz |
| Stop Frequency | 26.5 GHz |
| RBW | 100 kHz |
| VBW | 300 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

## 7.3 DEVIATION FROM STANDARD

No deviation.

## 7.4 TEST SETUP




## 7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 7.6 TEST RESULTS

Please refer to the APPENDIX F.

## 8. POWER SPECTRAL DENSITY

### 8.1 LIMIT

| Section | Test Item | Limit |
|---|---|---|
| FCC 15.247(e) | Power Spectral Density | 8 dBm<br>(in any 3 kHz) |

### 8.2 TEST PROCEDURE

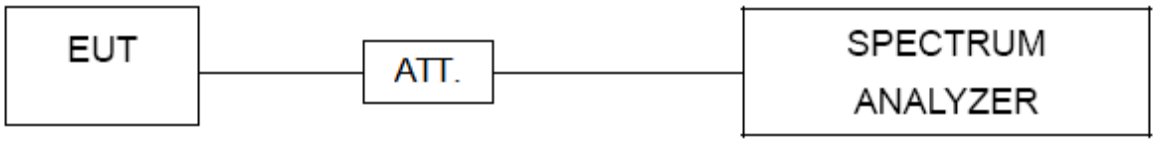
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

| Spectrum Parameters | Setting |
|---|---|
| Span Frequency | 2 MHz (1 Mbps) |
| RBW | 3 kHz |
| VBW | 10 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 8.3 DEVIATION FROM STANDARD

No deviation.

### 8.4 TEST SETUP




### 8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 8.6 TEST RESULTS

Please refer to the APPENDIX G.

## 9. MEASUREMENT INSTRUMENTS LIST

| Radiated Emissions - 9 kHz to 30 MHz | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Active Loop Antenna | Schwarzbeck | FMZB 1513-60B | 1513-60 B-034 | Mar. 30, 2025 |
| 2 | MXE EMI Receiver | Keysight | N9038A | MY56400091 | Dec. 22, 2024 |
| 3 | Cable | N/A | RW2350-3.8A-NMB M-1.5M | N/A | Jun. 09, 2025 |
| 4 | Cable | N/A | LMR400-NMNM-8 M | N/A | Sep. 09, 2025 |
| 5 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |
| 6 | 966 Chamber room | ETS | 9*6*6 | N/A | May 16, 2025 |

| Radiated Emissions - 30 MHz to 1 GHz | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Trilog-Broadband Antenna | Schwarzbeck | VULB 9168 | 01462 | Dec. 13, 2024 |
| 2 | Attenuator | EMC INSTRUMENT | EMCI-N-6-06 | AT-06009 | Dec. 13, 2024 |
| 3 | Preamplifier | EMC INSTRUMENT | EMC001330 | 980998 | Nov. 17, 2024 |
| 4 | Cable | RegalWay | LMR400-NMNM-12 .5m | N/A | Jun. 06, 2025 |
| 5 | Cable | RegalWay | LMR400-NMNM-3 m | N/A | Jun. 06, 2025 |
| 6 | Cable | RegalWay | LMR400-NMNM-0. 5m | N/A | Jun. 06, 2025 |
| 7 | Receiver | Agilent | N9038A | MY52130039 | Dec. 22, 2024 |
| 8 | Positioning Controller | MF | MF-7802 | N/A | N/A |
| 9 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |
| 10 | 966 Chamber room | CM | 9*6*6 | N/A | May 16,2 025 |

| Radiated Emissions - Above 1 GHz | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Receiver | Agilent | N9038A | MY52130039 | Dec. 22, 2024 |
| 2 | Preamplifier | EMC INSTRUMENT | EMC118A45SE | 980888 | Nov. 17, 2024 |
| 3 | Double Ridged Guide Antenna | ETS | 3115 | 75789 | Jun. 15, 2025 |
| 4 | Cable | RegalWay | RWLP50-4.0A-SMS M-12.5M | N/A | Jul. 03, 2025 |
| 5 | Cable | RegalWay | RWLP50-4.0A-NM RASM-2.5M | N/A | Jul. 03, 2025 |
| 6 | Cable | RegalWay | RWLP50-4.0A-NM RASMRA-0.8M | N/A | Jul. 03, 2025 |
| 7 | 966 Chamber room | CM | 9*6*6 | N/A | May 19, 2025 |
| 8 | Filter | STI | STI15-9912 | N/A | May 31, 2025 |
| 9 | Attenuator | Talent Microwave | TA10A2-S-18 | N/A | N/A |
| 10 | Positioning Controller | MF | MF-7802 | N/A | N/A |
| 11 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |

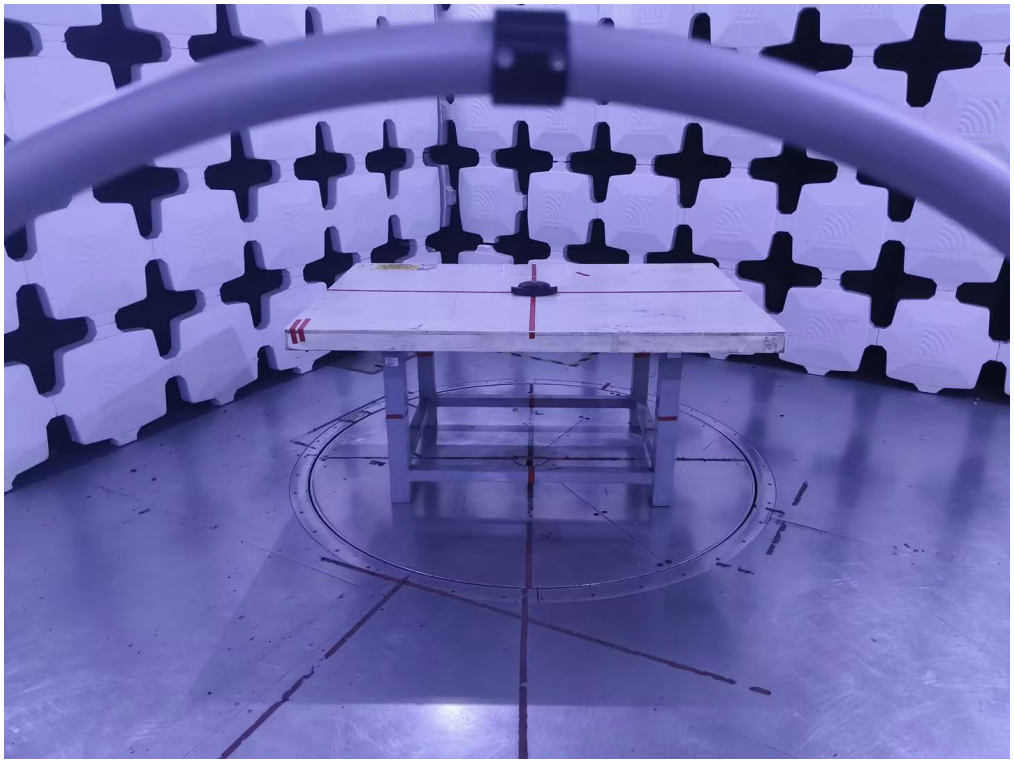
| Bandwidth & Maximum Output Power & Power Spectral Density & Conducted Spurious Emission | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100185 | May 31, 2025 |
| 2 | Measurement Software | BTL | BTL Conducted Test | N/A | N/A |
| 3 | Isolation attenuator | Z-Link | ASMA-16-18-2W | N/A | N/A |

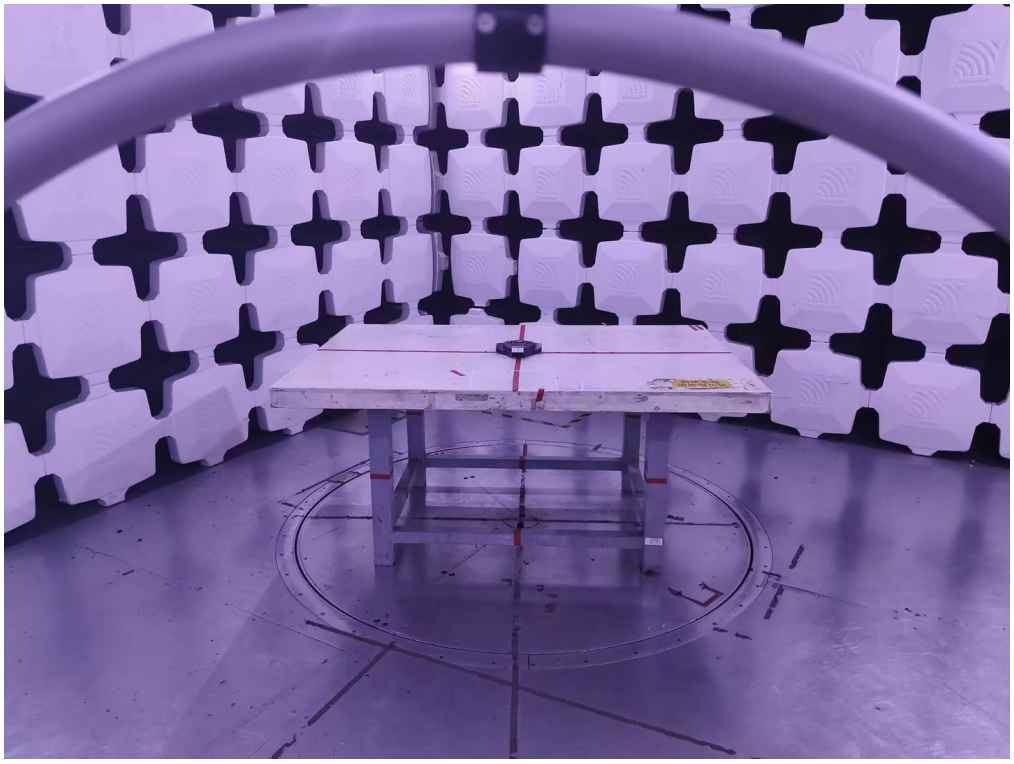
Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

## 10. EUT TEST PHOTO

**Radiated Emissions Test Photos**

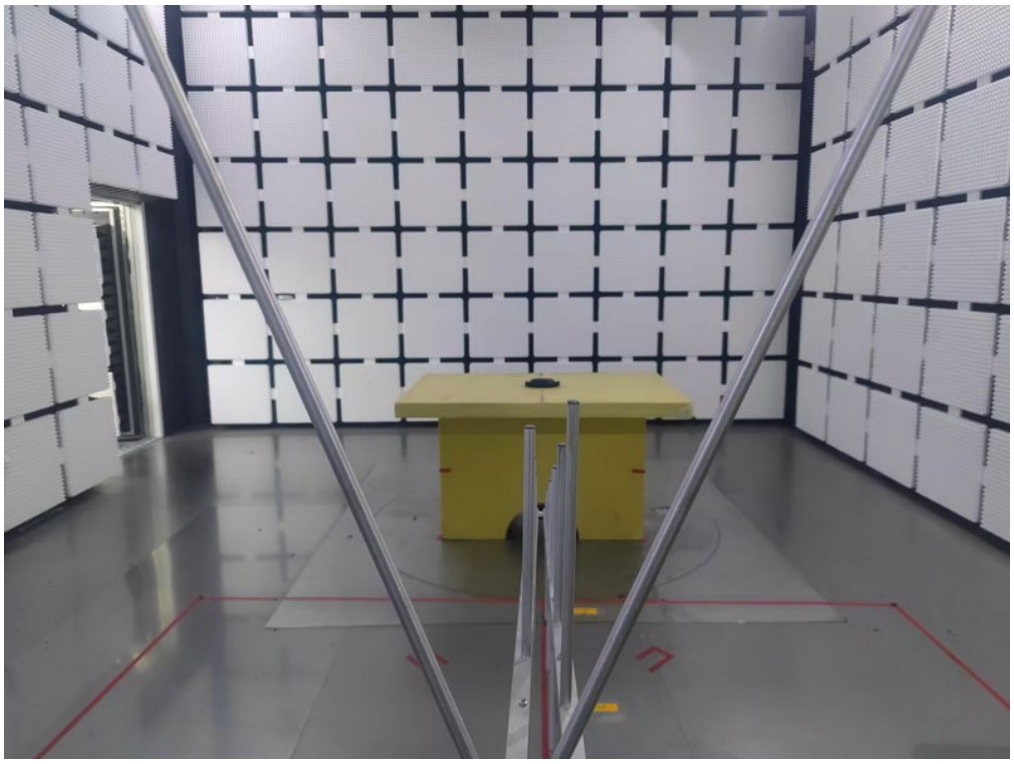
**9 kHz to 30 MHz**

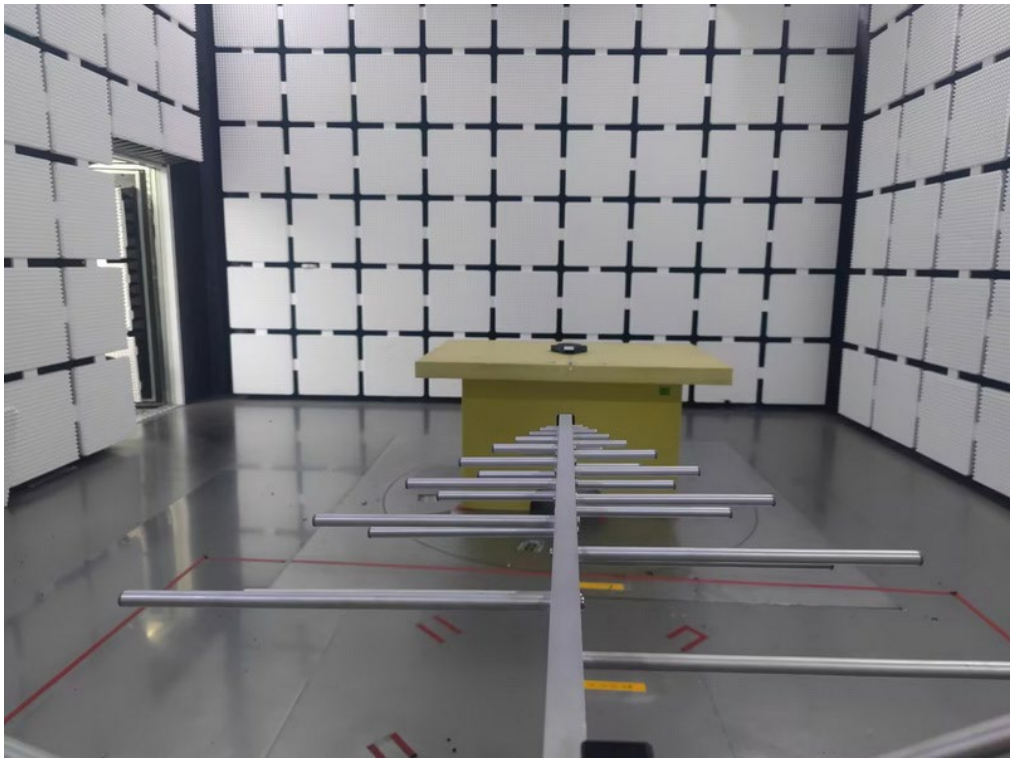




**Radiated Emissions Test Photos**

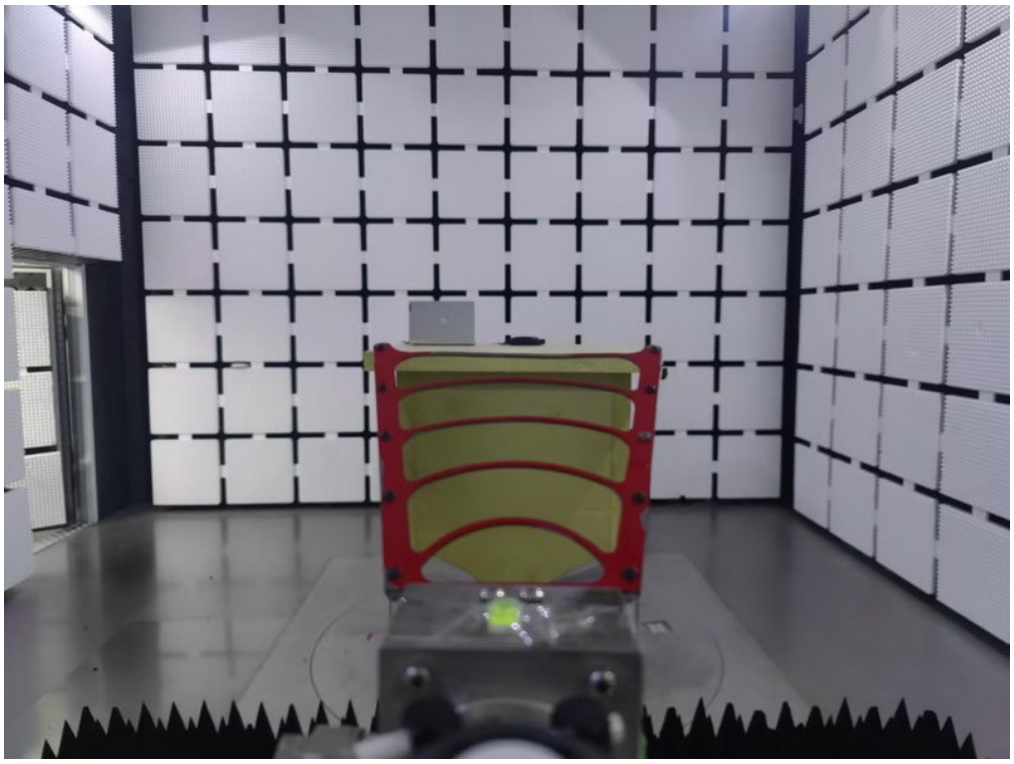
**30 MHz to 1000 MHz**

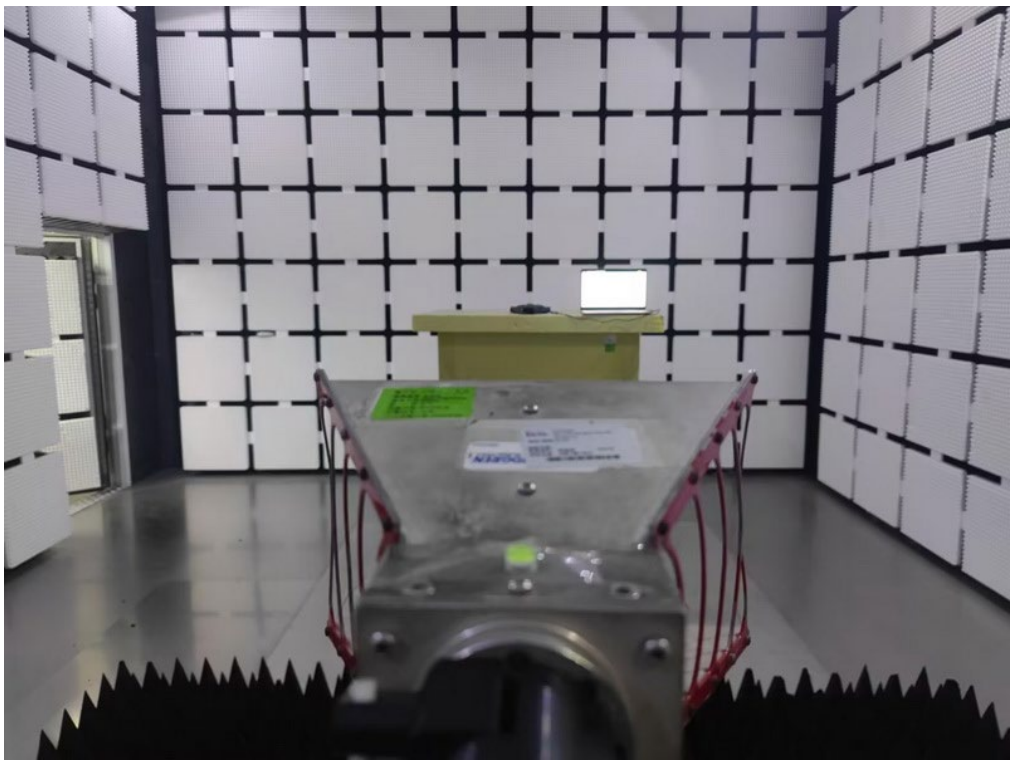




**Radiated Emissions Test Photos**

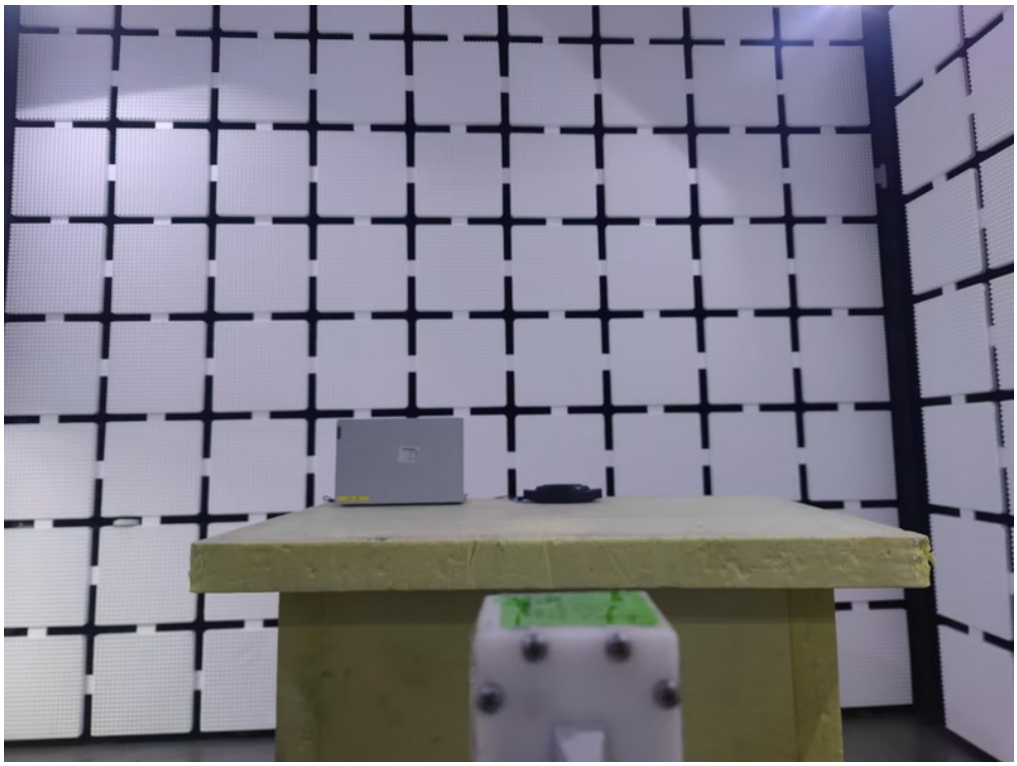
**Band edge & Harmonic (1 GHz to 18 GHz)**

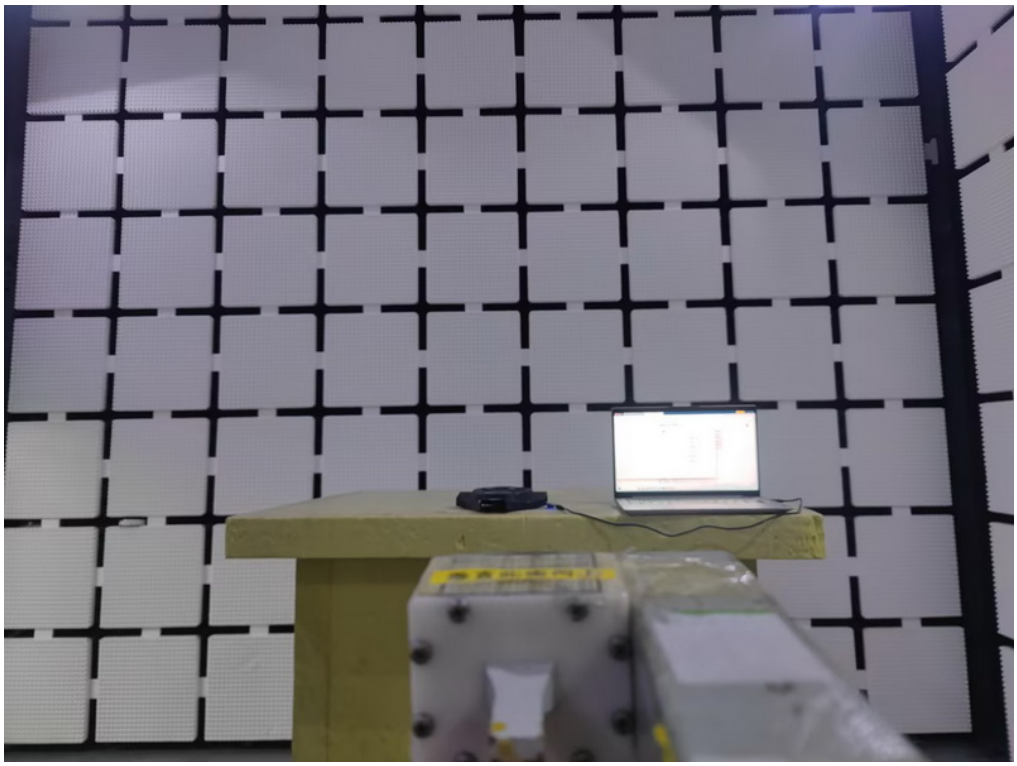




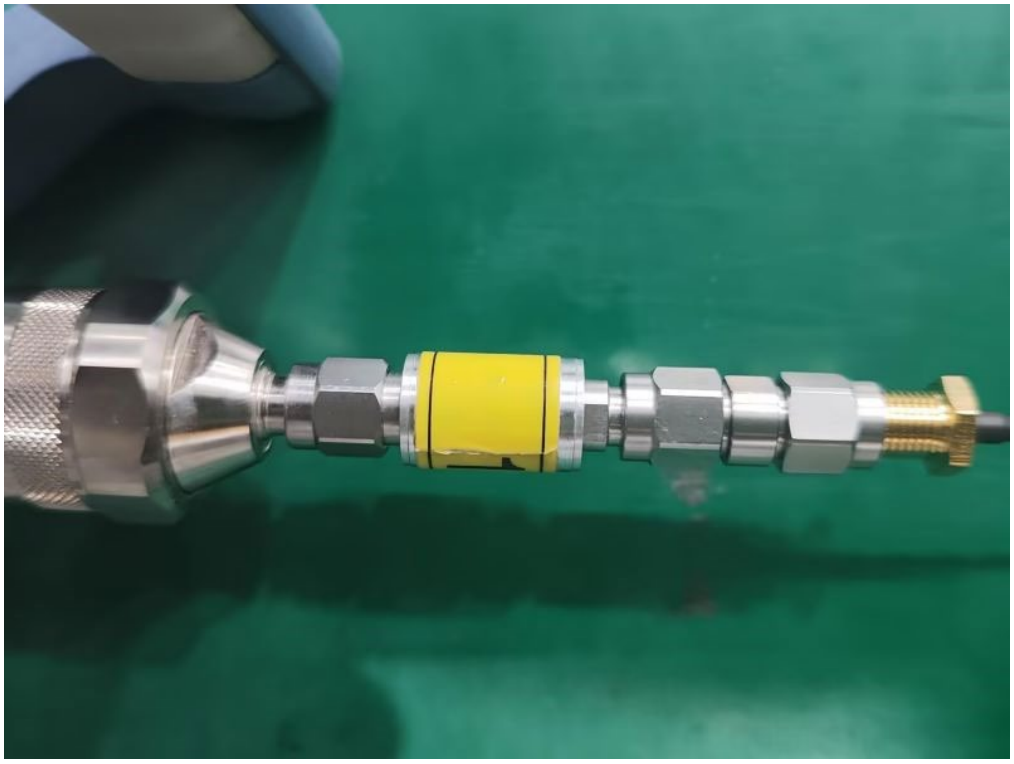
**Radiated Emissions Test Photos**

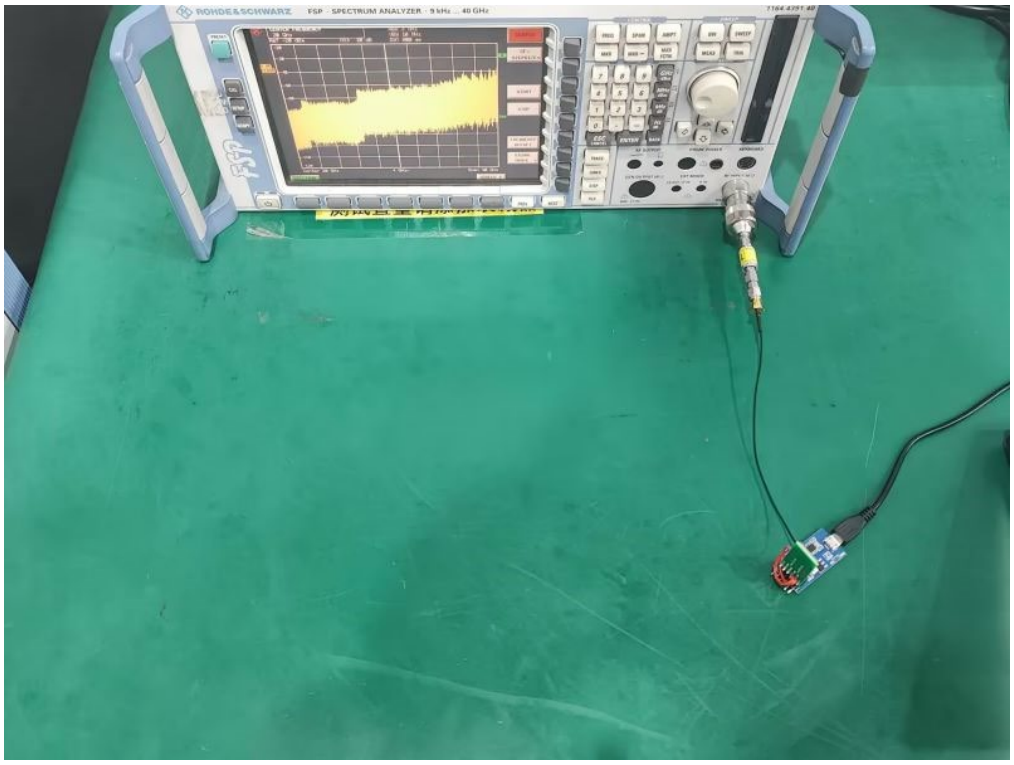
**Harmonic (18 GHz to 26.5 GHz)**





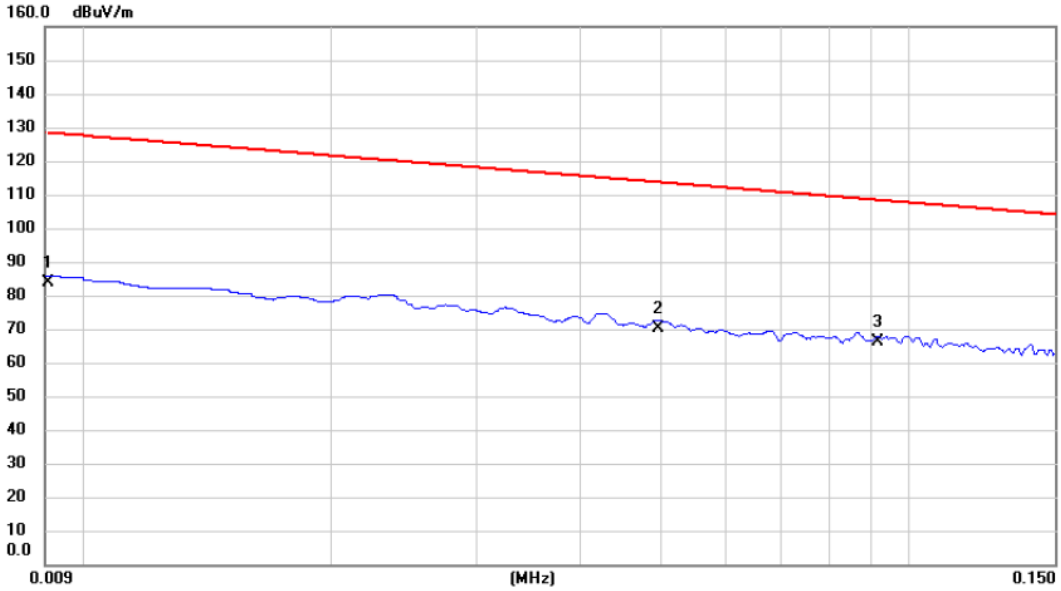
**Conducted Test Photos**





# APPENDIX A - RADIATED EMISSION - 9 KHZ TO 30 MHZ

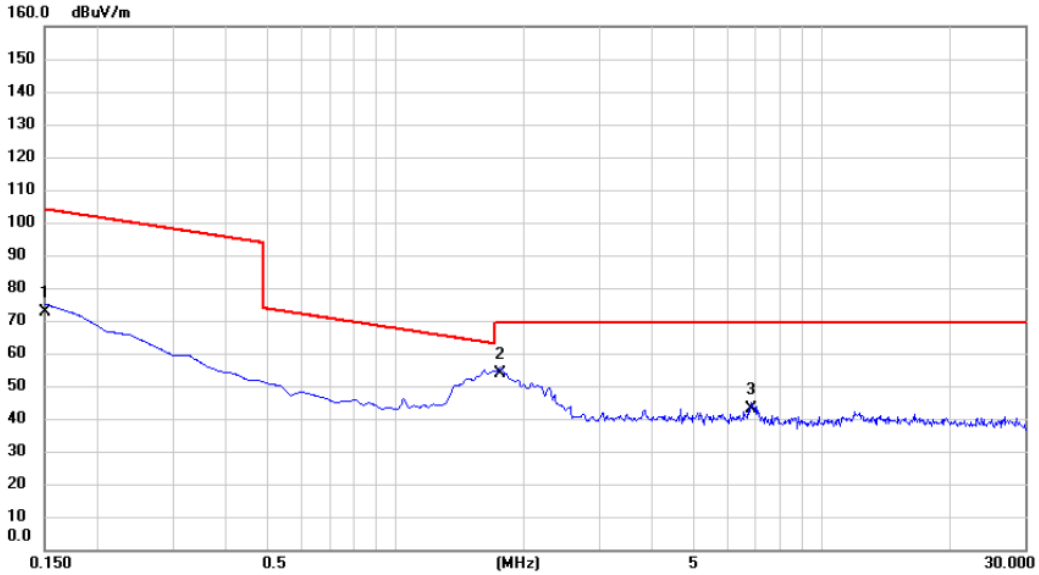
| Test Mode | TX Mode_1Mbps Channel 39 | Polarization | Ant 0° |
|---|---|---|---|




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.009 | 63.43 | 20.44 | 83.87 | 128.42 | -44.55 | AVG | |
| 2 | | 0.050 | 49.17 | 21.23 | 70.40 | 113.68 | -43.28 | AVG | |
| 3 | * | 0.092 | 44.72 | 21.33 | 66.05 | 108.37 | -42.32 | QP | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

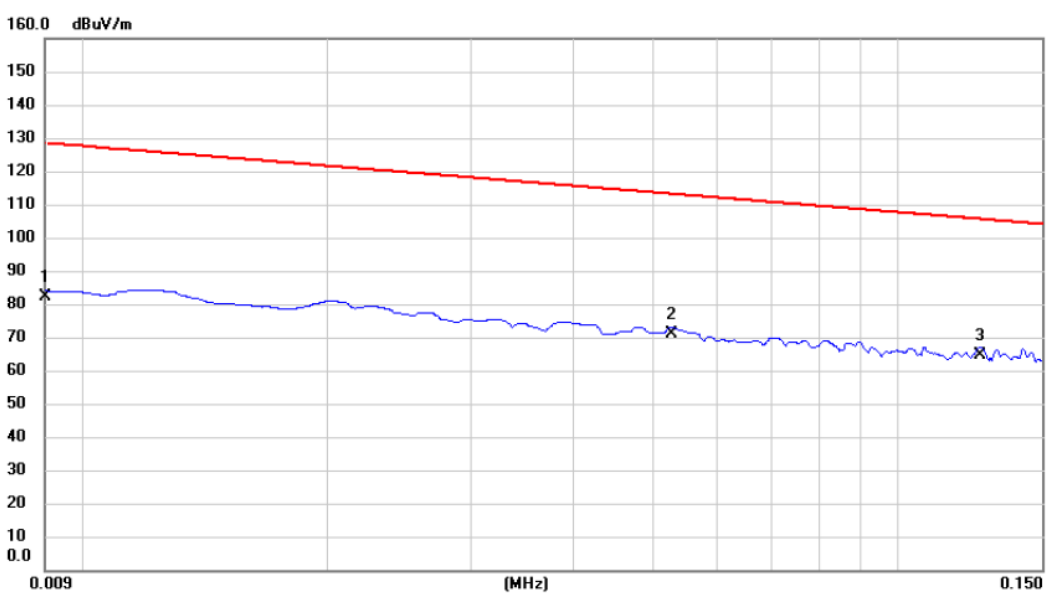
| Test Mode | TX Mode_1Mbps Channel 39 | Polarization | Ant 0° |
|---|---|---|---|




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.150 | 51.17 | 21.26 | 72.43 | 104.09 | -31.66 | AVG | |
| 2 | * | 1.762 | 32.54 | 21.12 | 53.66 | 69.54 | -15.88 | QP | |
| 3 | | 6.806 | 21.95 | 21.17 | 43.12 | 69.54 | -26.42 | QP | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

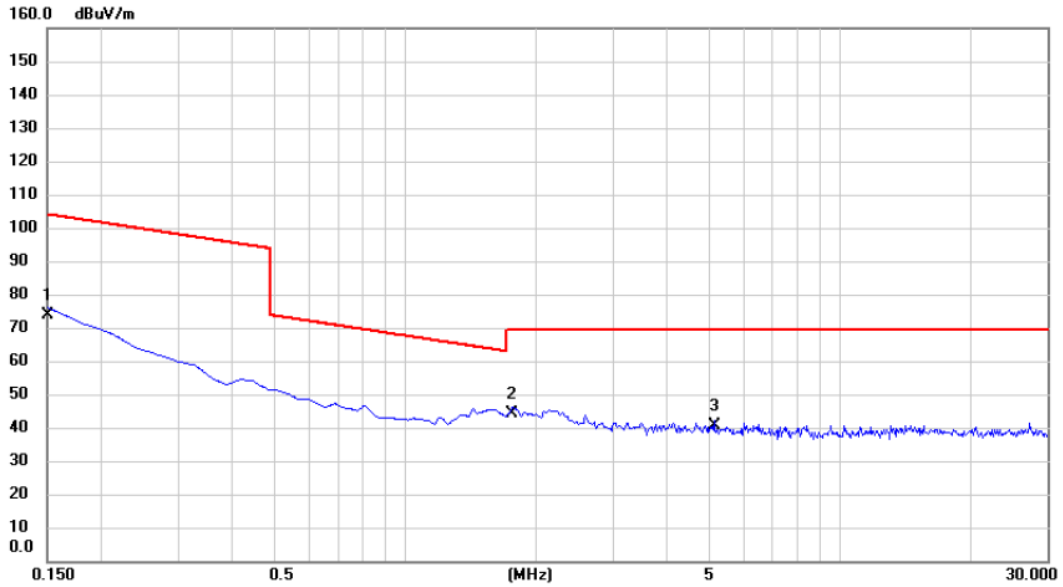
| Test Mode | TX Mode_1Mbps Channel 39 | Polarization | Ant 90° |
|---|---|---|---|




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.009 | 61.71 | 20.43 | 82.14 | 128.52 | -46.38 | AVG | |
| 2 | | 0.053 | 49.69 | 21.24 | 70.93 | 113.15 | -42.22 | AVG | |
| 3 | * | 0.126 | 43.33 | 21.29 | 64.62 | 105.60 | -40.98 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode | TX Mode_1Mbps Channel 39 | Polarization | Ant 90° |
|---|---|---|---|

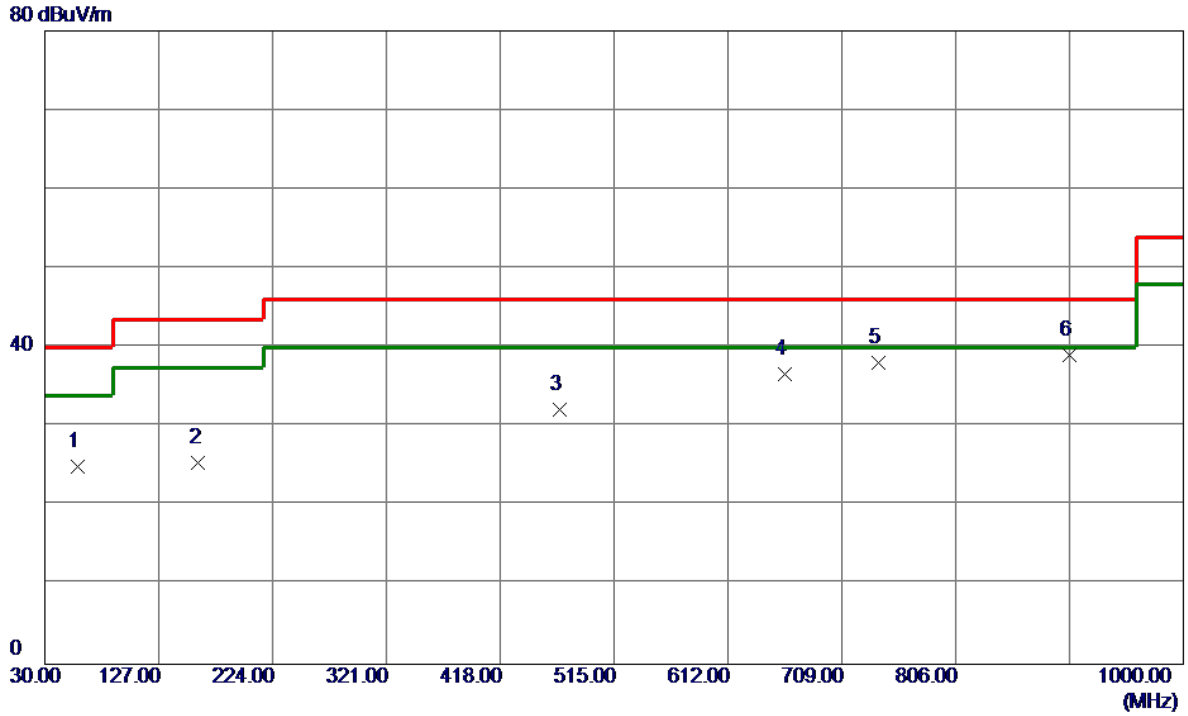



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.150 | 52.62 | 21.26 | 73.88 | 104.09 | -30.21 | AVG | |
| 2 | * | 1.762 | 23.24 | 21.12 | 44.36 | 69.54 | -25.18 | QP | |
| 3 | | 5.135 | 19.58 | 21.15 | 40.73 | 69.54 | -28.81 | QP | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

# APPENDIX B - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

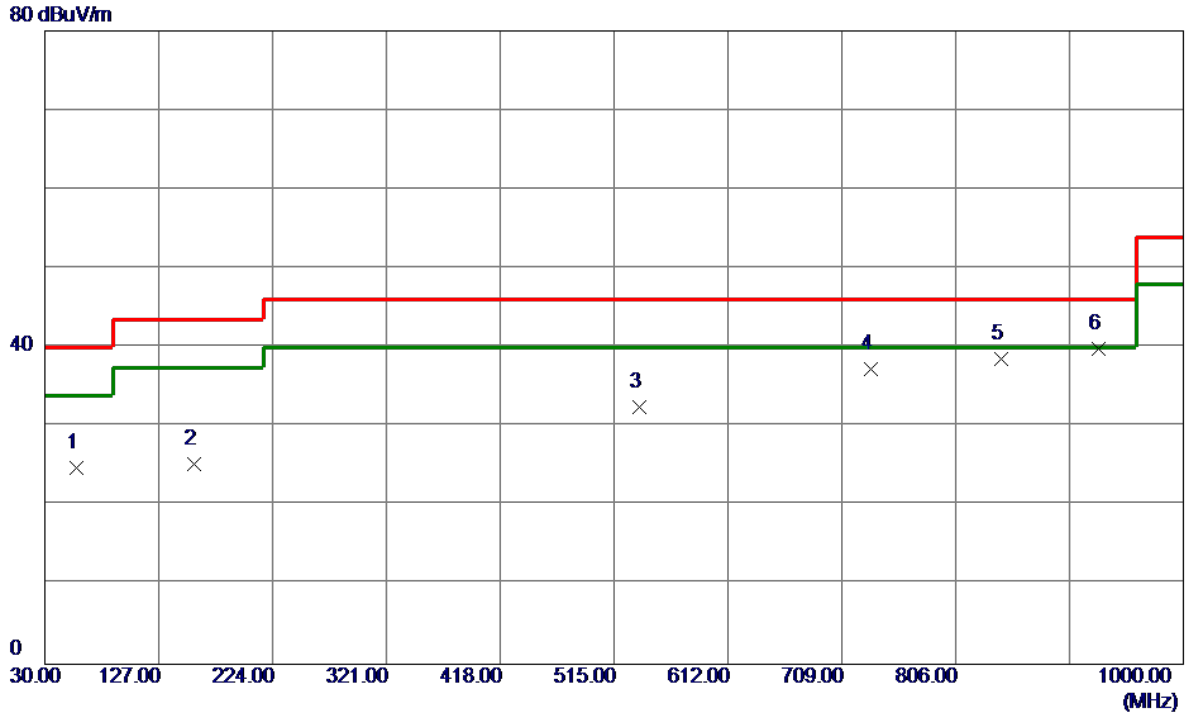
| Test Mode | TX Mode_1Mbps Channel 39 | Polarization | Vertical |
|---|---|---|---|




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 58.1300 | 36.69 | -11.74 | 24.95 | 40.00 | -15.05 | Peak | |
| 2 | 160.9500 | 36.39 | -10.88 | 25.51 | 43.52 | -18.01 | Peak | |
| 3 | 468.4400 | 38.60 | -6.50 | 32.10 | 46.02 | -13.92 | Peak | |
| 4 | 660.5000 | 39.38 | -2.72 | 36.66 | 46.02 | -9.36 | Peak | |
| 5 | 740.0400 | 39.39 | -1.30 | 38.09 | 46.02 | -7.93 | Peak | |
| 6 * | 903.0000 | 38.68 | 0.31 | 38.99 | 46.02 | -7.03 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode | TX Mode_1Mbps Channel 39 | Polarization | Horizontal |
|---|---|---|---|

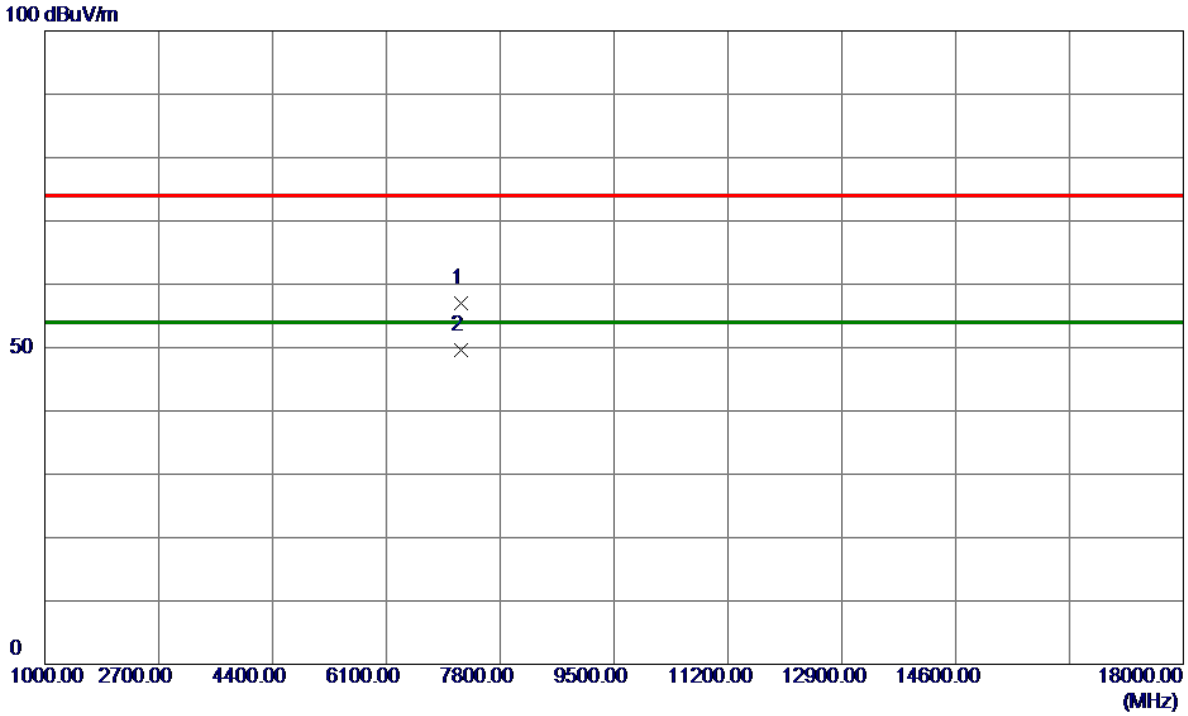



| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 57.1600 | 36.44 | -11.65 | 24.79 | 40.00 | -15.21 | Peak | |
| 2 | 157.0700 | 36.27 | -10.94 | 25.33 | 43.52 | -18.19 | Peak | |
| 3 | 536.3400 | 37.77 | -5.27 | 32.50 | 46.02 | -13.52 | Peak | |
| 4 | 734.2199 | 38.75 | -1.45 | 37.30 | 46.02 | -8.72 | Peak | |
| 5 | 844.8000 | 39.08 | -0.47 | 38.61 | 46.02 | -7.41 | Peak | |
| 6 * | 928.2200 | 39.39 | 0.44 | 39.83 | 46.02 | -6.19 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

# APPENDIX C - RADIATED EMISSION - ABOVE 1000 MHZ

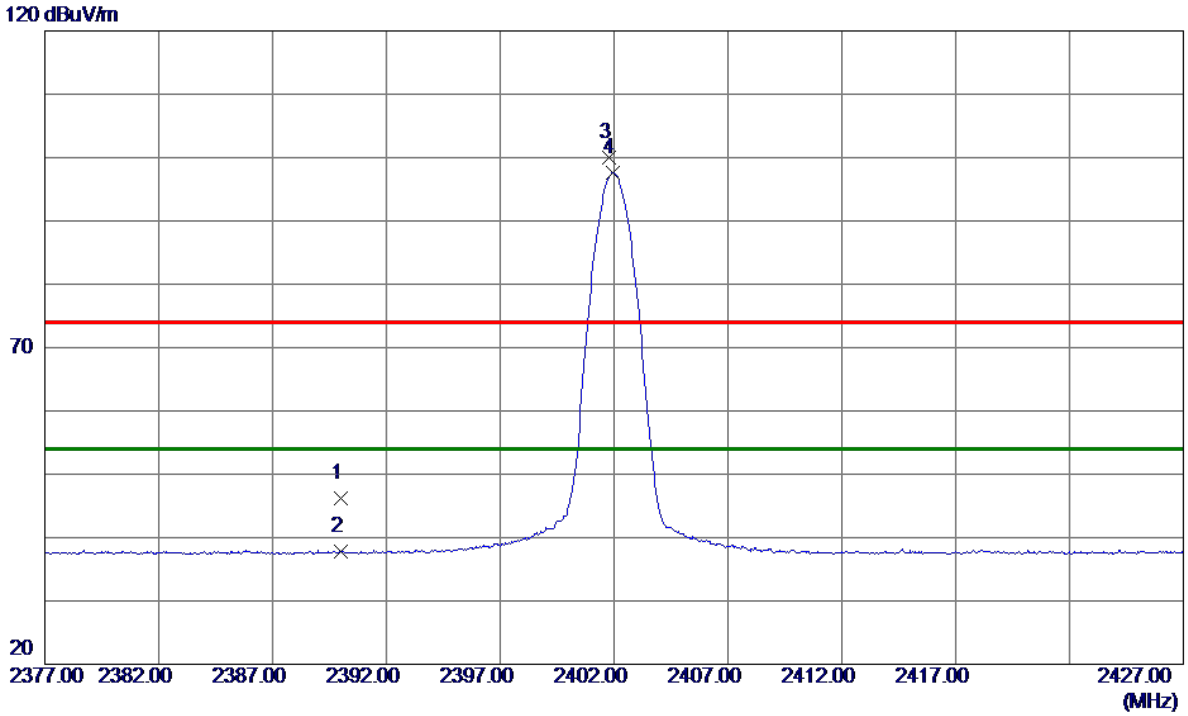
| Test Mode | TX 2402 MHz _CH00_1Mbps | Polarization | Vertical |
|---|---|---|---|




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 7205.3250 | 48.61 | 8.30 | 56.91 | 74.00 | -17.09 | Peak | |
| 2 * | 7205.3750 | 41.38 | 8.30 | 49.68 | 54.00 | -4.32 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

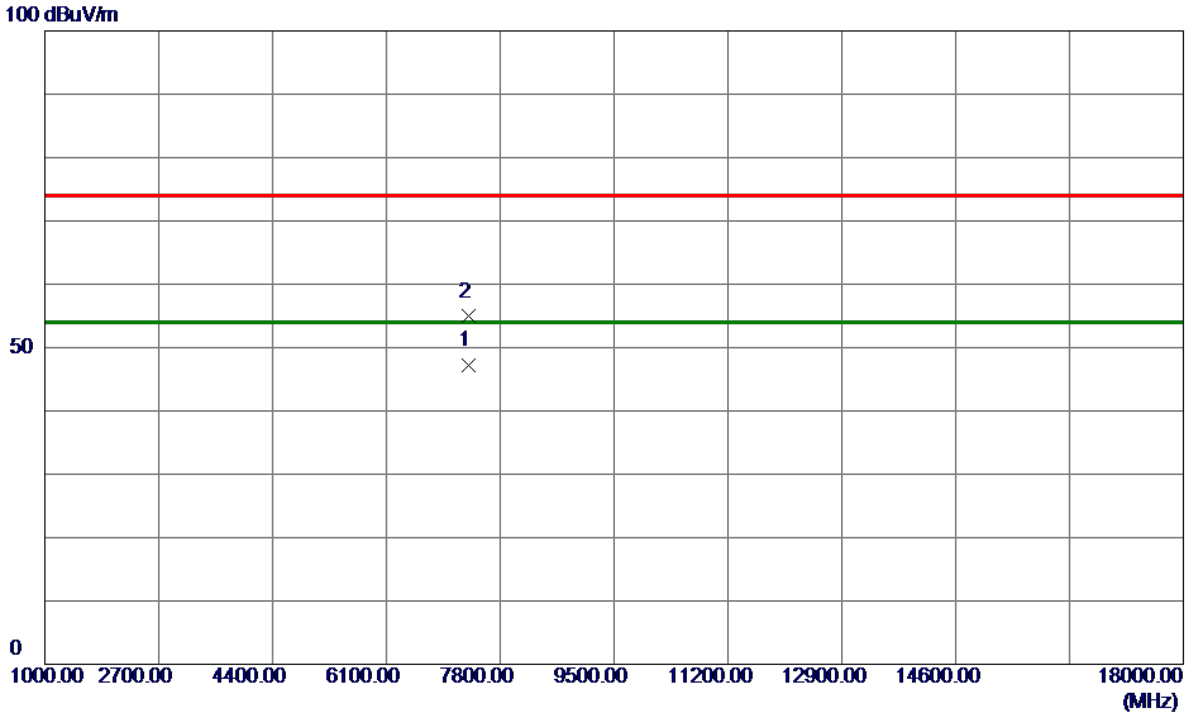
| Test Mode | TX 2402 MHz _CH00_1Mbps | Polarization | Horizontal |
|---|---|---|---|




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2390.0000 | 38.45 | 7.70 | 46.15 | 74.00 | -27.85 | Peak | |
| 2 | 2390.0000 | 30.10 | 7.70 | 37.80 | 54.00 | -16.20 | AVG | |
| 3 | 2401.7750 | 92.23 | 7.71 | 99.94 | 74.00 | 25.94 | Peak | No Limit |
| 4 * | 2401.9500 | 89.84 | 7.71 | 97.55 | 54.00 | 43.55 | AVG | No Limit |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

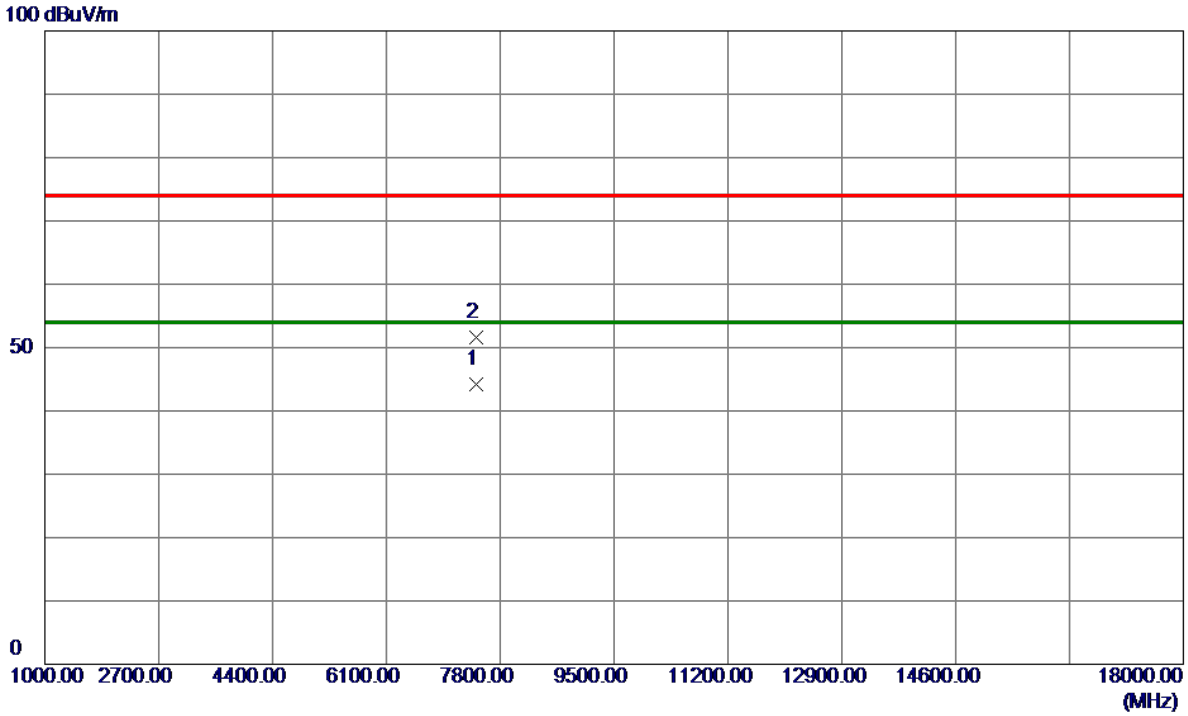
| Test Mode | TX 2440 MHz _CH19_1Mbps | Polarization | Vertical |
|---|---|---|---|




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 7319.4000 | 38.88 | 8.31 | 47.19 | 54.00 | -6.81 | AVG | |
| 2 | 7320.5750 | 46.59 | 8.31 | 54.90 | 74.00 | -19.10 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

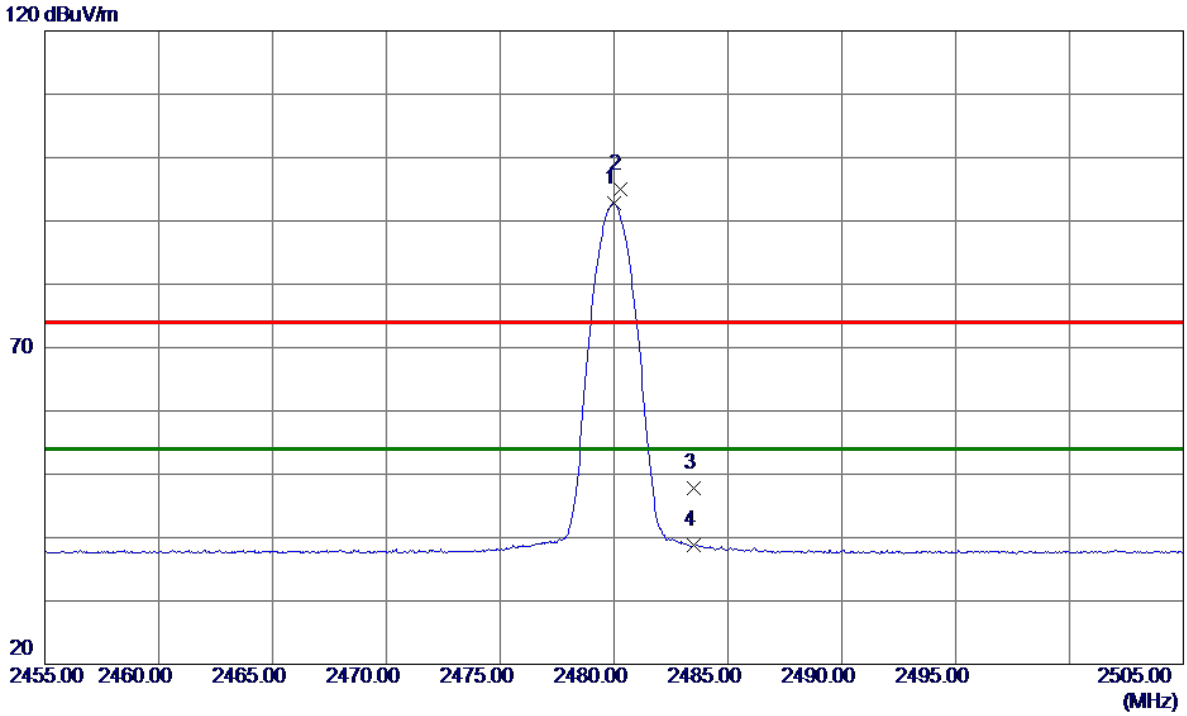
| Test Mode | TX 2480 MHz _CH39_1Mbps | Polarization | Vertical |
|---|---|---|---|




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 7439.3000 | 35.96 | 8.32 | 44.28 | 54.00 | -9.72 | AVG | |
| 2 | 7440.7750 | 43.32 | 8.32 | 51.64 | 74.00 | -22.36 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

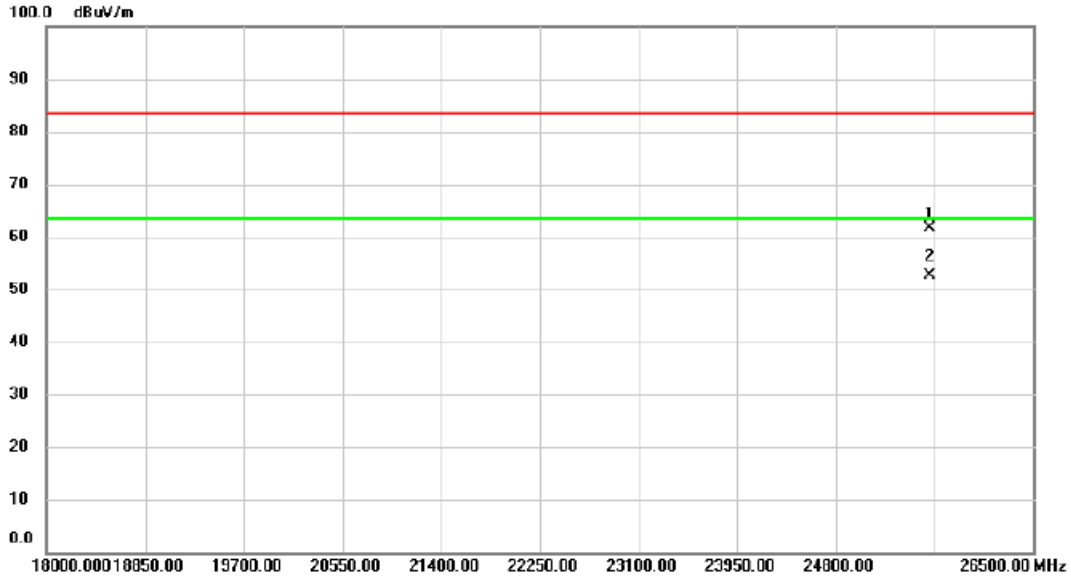
| Test Mode | TX 2480 MHz _CH39_1Mbps | Polarization | Horizontal |
|---|---|---|---|




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 2479.9750 | 84.92 | 7.81 | 92.73 | 54.00 | 38.73 | AVG | No Limit |
| 2 | 2480.2500 | 87.19 | 7.81 | 95.00 | 74.00 | 21.00 | Peak | No Limit |
| 3 | 2483.5000 | 39.90 | 7.81 | 47.71 | 74.00 | -26.29 | Peak | |
| 4 | 2483.5000 | 30.93 | 7.81 | 38.74 | 54.00 | -15.26 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

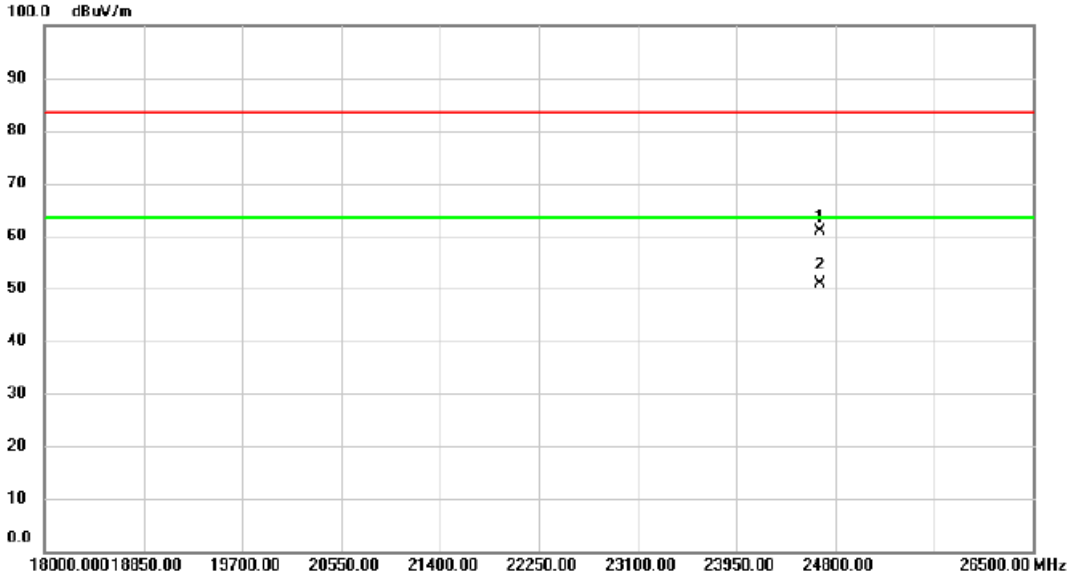
| Test Mode | TX Mode_1Mbps Channel 39 | Polarization | Vertical |
|---|---|---|---|




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 25611.750 | 49.33 | 12.30 | 61.63 | 83.50 | -21.87 | peak | |
| 2 | * | 25611.750 | 40.40 | 12.30 | 52.70 | 63.50 | -10.80 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode | TX Mode_1Mbps Channel 39 | Polarization | Horizontal |
|---|---|---|---|




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 24672.500 | 49.40 | 11.44 | 60.84 | 83.50 | -22.66 | peak | |
| 2 | * | 24672.500 | 39.54 | 11.44 | 50.98 | 63.50 | -12.52 | AVG | |

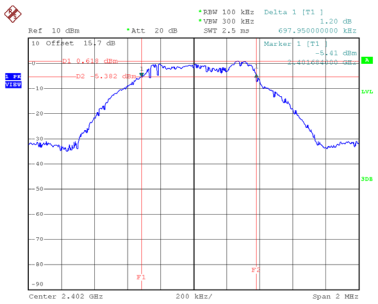
REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

# APPENDIX D - BANDWIDTH

| Test Mode | TX Mode _1Mbps |
|---|---|

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | 99 % Occupied Bandwidth (MHz) | 6 dB Bandwidth Min. Limit (MHz) | Test Result |
|---|---|---|---|---|---|
| 00 | 2402 | 0.698 | 1.016 | 0.5 | Pass |
| 19 | 2440 | 0.678 | 1.016 | 0.5 | Pass |
| 39 | 2480 | 0.680 | 1.016 | 0.5 | Pass |

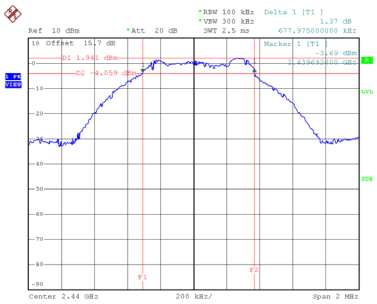
**CH00**



Date: 12.OCT.2024 15:46:37

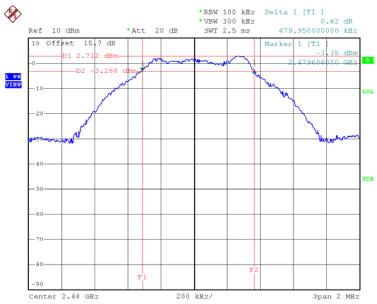
**CH19**

6 dB Bandwidth



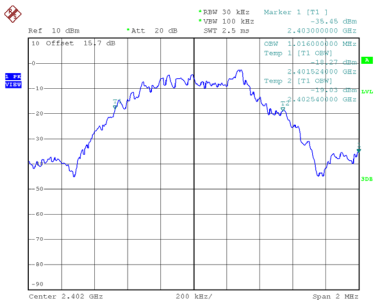
Date: 12.OCT.2024 16:08:25

**CH39**

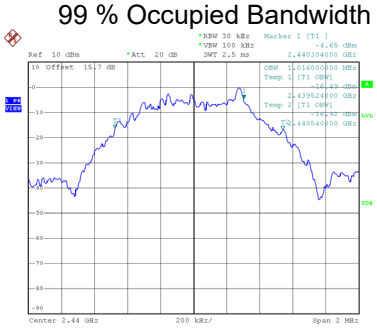


Date: 12.OCT.2024 16:10:21

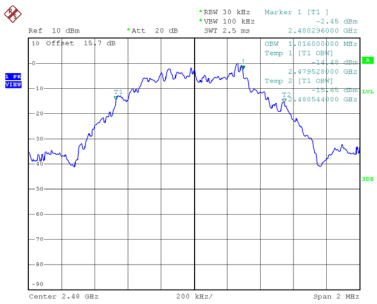
99 % Occupied Bandwidth



Date: 12.OCT.2024 15:45:53



Date: 12.OCT.2024 16:08:33



Date: 12.OCT.2024 16:10:27

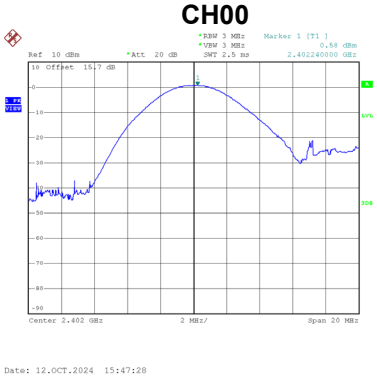
# APPENDIX E - MAXIMUM OUTPUT POWER

| Test Mode | TX Mode _1Mbps |
|---|---|

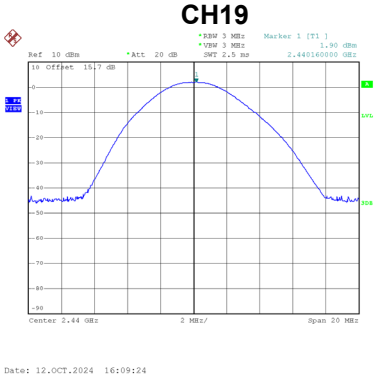
| Frequency (MHz) | Output Power (dBm) | Output Power (W) | Max. Limit (dBm) | Max. Limit (W) | Test Result |
|---|---|---|---|---|---|
| 2402 | 0.58 | 0.0011 | 30.00 | 1.0000 | Pass |
| 2440 | 1.90 | 0.0015 | 30.00 | 1.0000 | Pass |
| 2480 | 2.72 | 0.0019 | 30.00 | 1.0000 | Pass |

Note: Output power = Measure result + Cable loss

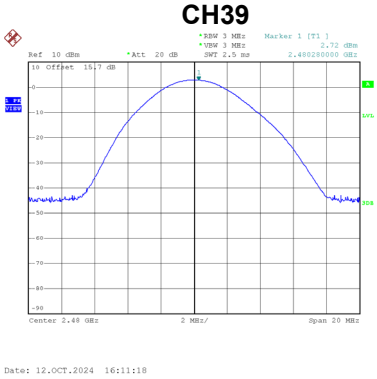
**CH00**




**CH19**



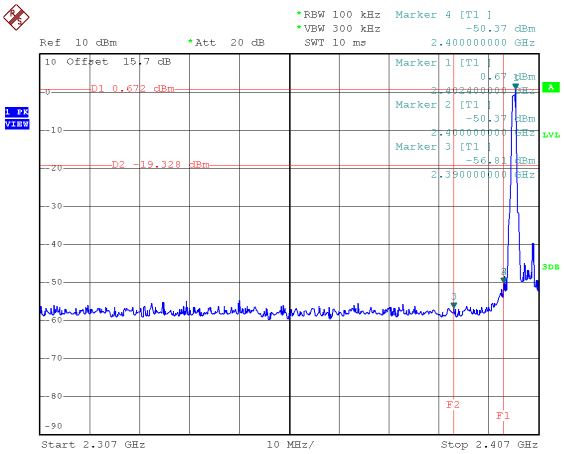

**CH39**



# APPENDIX F - CONDUCTED SPURIOUS EMISSION

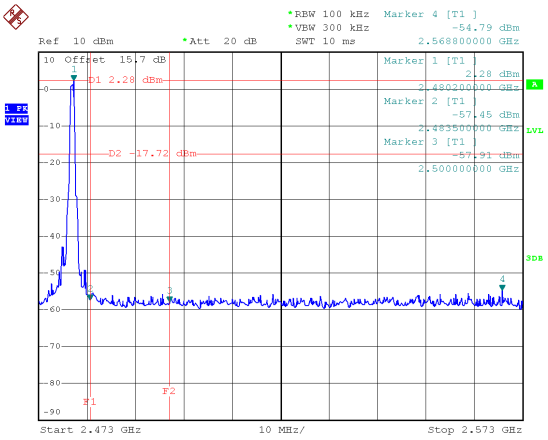
| Test Mode | TX Mode _1Mbps |
|---|---|

## Bandedge CH00 (Lower)



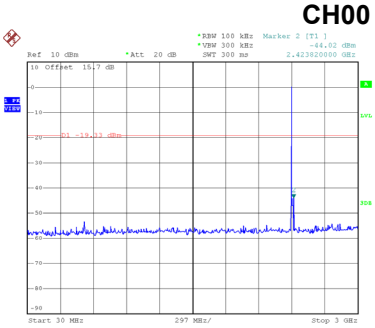

Date: 12.OCT.2024 15:46:45

## Bandedge CH39 (Upper)

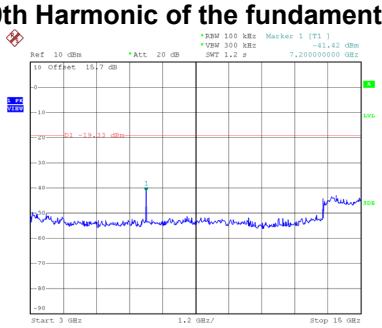



Date: 12.OCT.2024 16:10:35

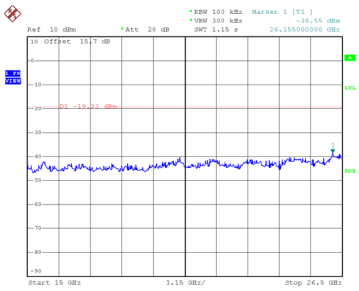
## CH00 – 10th Harmonic of the fundamental frequency



Date: 12.OCT.2024 15:46:59

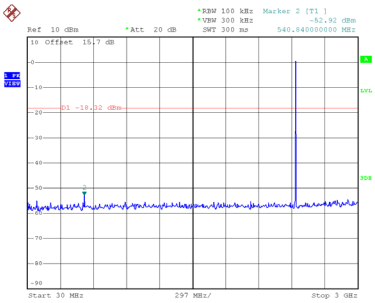


Date: 12.OCT.2024 15:47:07

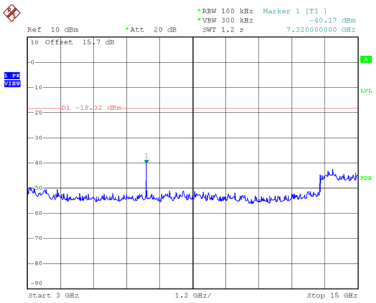


Date: 12.OCT.2024 15:47:16

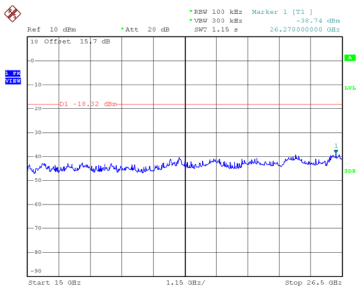
## CH19 – 10th Harmonic of the fundamental frequency



Date: 12.OCT.2024 16:08:55

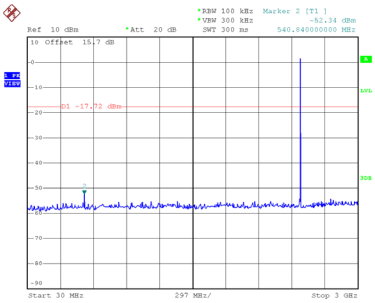


Date: 12.OCT.2024 16:09:04

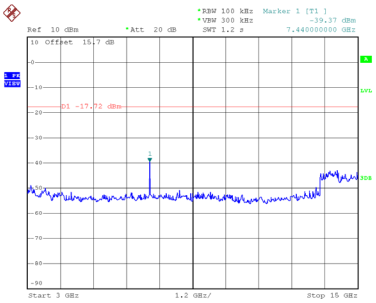


Date: 12.OCT.2024 16:09:12

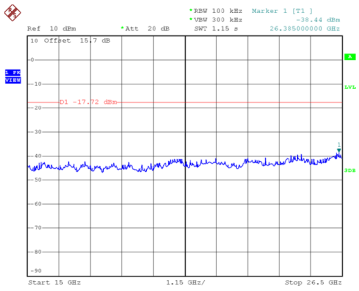
## CH39 – 10th Harmonic of the fundamental frequency



Date: 12.OCT.2024 16:10:49



Date: 12.OCT.2024 16:10:58



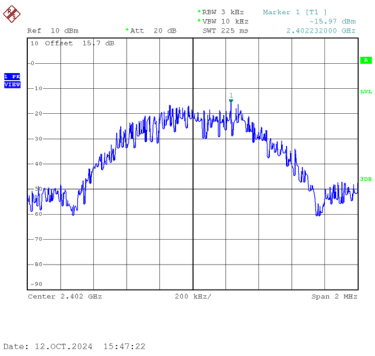
Date: 12.OCT.2024 16:11:06

# APPENDIX G - POWER SPECTRAL DENSITY

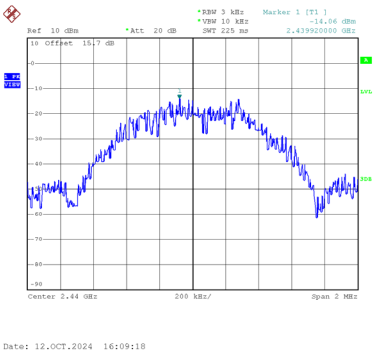
| Test Mode | TX Mode _1Mbps |
|---|---|

| Channel | Frequency (MHz) | Power Spectral Density (dBm/3 kHz) | Max. Limit (dBm/3 kHz) | Test Result |
|---|---|---|---|---|
| 00 | 2402 | -15.97 | 8.00 | Pass |
| 19 | 2440 | -14.06 | 8.00 | Pass |
| 39 | 2480 | -13.00 | 8.00 | Pass |

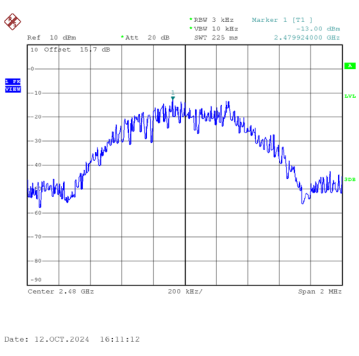
**CH00**



**CH19**



**CH39**



**End of Test Report**