

## Industrial Internet Innovation Center (Shanghai) Co.,Ltd.

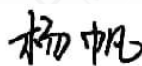
## SRD TEST REPORT

|             |                                    |
|-------------|------------------------------------|
| PRODUCT     | Smart POS System                   |
| BRAND       | SUNMI                              |
| MODEL       | T6F10                              |
| APPLICANT   | Shanghai Sunmi Technology Co.,Ltd. |
| FCC ID      | 2AH25T6F10                         |
| ISSUE DATE  | January 25, 2024                   |
| STANDARD(S) | FCC Part15C                        |

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Approved by: Zhang Min

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## 1. Summary of Test Report

### 1.1 Test Standard(s)

| No. | Test Standard | Title                                                                                                                                                                                                                    | Version |
|-----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 1   | FCC Part15C   | FCC CFR 47, Part 15, Subpart C:<br>15.205 Restricted bands of operation;<br>15.209 Radiated emission limits, general requirements;<br>15.247 Operation within the bands 902-928MHz,<br>2400-2483.5MHz, and 5725-5850MHz. | --      |

### 1.2 Reference Documents

| No. | Test Standard                              | Title                                                                                                                      | Version |
|-----|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------|
| 1   | ANSI C63.10                                | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices                             | 2013    |
| 2   | KDB 558074 D01 15.247 Meas Guidance v05r02 | Guidance for Performing Compliance Measurements on Frequency Hopping Spread Spectrum systems (DSS) Operating Under §15.247 | --      |

Note: KDB 558074 D01 15.247 Meas Guidance v05r02 is not A2LA certified.

### 1.3 Summary of Test Results

| No. | Measurement Items                       | FCC Rules            | Verdict                |
|-----|-----------------------------------------|----------------------|------------------------|
| 1   | Maximum Peak Output Power               | 15.247(b)            | Pass                   |
| 2   | 20dB Occupied Bandwidth                 | 15.247(a)            | Pass                   |
| 3   | 99% Occupied Bandwidth                  | 15.247(a)            | Pass                   |
| 4   | Band Edges Compliance                   | 15.247 (d)           | Pass                   |
| 5   | Time Of Occupancy (Dwell Time)          | 15.247(a)            | Pass                   |
| 6   | Carrier Frequency Separation            | 15.247(a)            | Pass                   |
| 7   | Number Of Hopping Channels              | 15.247(a)            | Pass                   |
| 8   | Transmitter Spurious Emission-Conducted | 15.247(d)            | Pass                   |
| 9   | Transmitter Spurious Emission-Radiated  | 15.247,15.209,15.205 | Pass                   |
| 10  | AC Powerline Conducted Emission         | 15.207               | Pass                   |
| 11  | Antenna requirement                     | 15.203/15.247(c)     | Pass <sup>Note 2</sup> |

**Note 1:**

The T6F10 manufactured by Shanghai Sunmi Technology Co.,Ltd. is a new products for testing.  
There are two configurations S16aa&S14aa (Mainly Supply) and S21aa (Secondary Supply) in this

project. We mainly tested the S16aa&S14aa (Mainly Supply), and the S21aa (Secondary Supply) tested the worst mode of the mainly supply, and recorded the test results of the worst mode respectively in the report.

The description of the differences between S16aa&S14aa (Mainly Supply) and S21aa (Secondary Supply) are as follows:

| Model<br>Difference               | T6F10 (High Configuration)<br>S16aa&S14aa (Mainly Supply) | T6F10 (Basic Configuration)<br>S21aa (Secondary Supply) |
|-----------------------------------|-----------------------------------------------------------|---------------------------------------------------------|
| Scanner                           | Yes                                                       | No                                                      |
| LCD(Just different manufacturers) | SHENZHEN DJN PHOTOELECTRIC TECHNOLOGY CO., LTD            | CPT Technology ( Group ) Co.,Ltd                        |
| DDR                               | It's just that the manufacturer and memory are different  |                                                         |
| EMMC                              | It's just that the manufacturer and memory are different  |                                                         |

Industrial Internet Innovation Center (Shanghai) Co., Ltd. only performed test cases which identified with Pass/Fail/Inc result in section 1.3.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. has verified that the compliance of the tested device specified in section 4 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 1 of this test report.

Note 2:

Bluetooth used a FPC antenna with max Gain 2.21dBi that complied with 15.203 Requirements.

Note:

- All the test data for each data were verified, but only the worst case was reported.
- The GFSK,  $\pi/4$  DQPSK and 8DPSK were set in DH5 for GFSK, 2-DH5 for  $\pi/4$  DQPSK, 3-DH5 for 8DPSK.

#### 1.4 Data Provided by Applicant

| No. | Item(s)             | Data     |
|-----|---------------------|----------|
| 1   | Antenna gain of EUT | 2.21 dBi |

Note:

The data of antenna gain is provided by the Antenna specification may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.



## 2. General Information of The Laboratory

### 2.1 Testing Laboratory

|                      |                                                            |
|----------------------|------------------------------------------------------------|
| Lab Name             | Industrial Internet Innovation Center (Shanghai) Co.,Ltd.  |
| Address              | Building 4, No. 766, Jingang Road, Pudong, Shanghai, China |
| Telephone            | 021-68866880                                               |
| FCC Registration No. | 708870                                                     |
| FCC Designation No.  | CN1364                                                     |

### 2.2 Laboratory Environmental Requirements

|                      |              |
|----------------------|--------------|
| Temperature          | 15°C~35°C    |
| Relative Humidity    | 25%RH~75%RH  |
| Atmospheric Pressure | 86kPa~106kPa |

### 2.3 Project Information

|                 |                                      |
|-----------------|--------------------------------------|
| Project Manager | Gao Hongning                         |
| Test Date       | December 5, 2023 to January 23, 2024 |

### 3. General Information of The Customer

#### 3.1 Applicant

|           |                                                              |
|-----------|--------------------------------------------------------------|
| Company   | Shanghai Sunmi Technology Co.,Ltd.                           |
| Address   | Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China |
| Telephone | 18826519551                                                  |

#### 3.2 Manufacturer

|           |                                                              |
|-----------|--------------------------------------------------------------|
| Company   | Shanghai Sunmi Technology Co.,Ltd.                           |
| Address   | Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China |
| Telephone | 18826519551                                                  |



## 4. General Information of The Product

### 4.1 Product Description for Equipment under Test

|                                                                                                                                                 |                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name                                                                                                                                    | Smart POS System                                                                                                                                                                                                          |
| Model name                                                                                                                                      | T6F10                                                                                                                                                                                                                     |
| Date of Receipt                                                                                                                                 | S16aa/ S14aa /s21aa:<br>December 05,2023                                                                                                                                                                                  |
| EUT ID*                                                                                                                                         | S16aa/ S14aa /s21aa                                                                                                                                                                                                       |
| SN/IMEI                                                                                                                                         | S16aa:P305D3BP10037<br>S14aa:P305D3BP10020<br>S21aa:P302D3BF10251                                                                                                                                                         |
| Supported Radio Technology and Bands                                                                                                            | GSM850/GSM900/GSM1800/GSM1900<br>WCDMA Band I/II/IV/V/VI/VIII/XIX<br>LTE Band 1/2/3/4/5/7/8/18/19/20/26/28/34/38/39/40/41<br>BT 5.0 BR/EDR/BLE<br>WLAN 802.11b,g,n<br>WLAN 802.11a,n,ac<br>GPS/Galileo/GLONASS/BDS<br>NFC |
| Hardware Version                                                                                                                                | V1.0(LA+EU)                                                                                                                                                                                                               |
| Software Version                                                                                                                                | V3.0.0                                                                                                                                                                                                                    |
| FCC ID                                                                                                                                          | 2AH25T6F10                                                                                                                                                                                                                |
| Power Rating                                                                                                                                    | DC 7.7V form battery, DC 5V form adapter                                                                                                                                                                                  |
| NOTE1: EUT ID is the internal identification code of the laboratory.                                                                            |                                                                                                                                                                                                                           |
| NOTE2: Samples in the test report are provided by the customer. The test results are only applicable to the samples received by the laboratory. |                                                                                                                                                                                                                           |

### 4.2 Internal Identification of AE used during the test

| AE ID* | Description | Model              | SN/Remark                               |
|--------|-------------|--------------------|-----------------------------------------|
| AE1    | RF Cable    | N/A                | N/A                                     |
| CD01   | Adapter     | TPA-141A050200UU01 | N/A                                     |
| CH02   | Adapter     | UC13US             | N/A                                     |
| CI02   | Adapter     | TPA-23A050200UU01  | N/A                                     |
| UA09   | USB Cable   | N/A                | N/A                                     |
| BA12   | Battery     | HPPA               | ICON ENERGY SYSTEM (SHENZHEN) CO., LTD. |

|                                                                                                                                                                                                         |         |      |                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|-----------------------------------------------------|
| BB07                                                                                                                                                                                                    | Battery | HPPA | Guangdong Highpower New Energy Technology Co., Ltd. |
| NOTE1: AE ID is the internal identification code of the laboratory.<br>NOTE2: By verifying that BA12+CI02 is the worst battery and adapter combination, this battery and adapter are used in all tests. |         |      |                                                     |

### 4.3 Additional Information

|                      |                            |
|----------------------|----------------------------|
| Bluetooth Frequency  | 2402MHz-2480MHz            |
| Bluetooth Channel    | Ch0-78                     |
| Bluetooth Modulation | GFSK; $\pi/4$ DQPSK; 8DPSK |

Test frequency list:

|               |             |      |      |      |
|---------------|-------------|------|------|------|
| GFSK          | Channel     | 0    | 39   | 78   |
|               | Freq. (MHz) | 2402 | 2441 | 2480 |
| $\pi/4$ DQPSK | Channel     | 0    | 39   | 78   |
|               | Freq. (MHz) | 2402 | 2441 | 2480 |
| 8DPSK         | Channel     | 0    | 39   | 78   |
|               | Freq. (MHz) | 2402 | 2441 | 2480 |

Note: This report is for BT only.



## 5. Test Configuration Information

### 5.1 Laboratory Environmental Conditions

#### 5.1.1 Permanent Facilities

|                        |                          |         |         |
|------------------------|--------------------------|---------|---------|
| Relative Humidity      | Min. = 45 %, Max. = 55 % |         |         |
| Atmospheric Pressure   | 101kPa                   |         |         |
| Temperature            | Normal                   | Minimum | Maximum |
|                        | 25°C                     | -10°C   | 50°C    |
| Working Voltage of EUT | Normal                   | Minimum | Maximum |
|                        | 7.7V                     | 6.0V    | 8.8V    |

### 5.2 Test Equipments Utilized

#### 5.2.1 Conducted Test System

| No. | Name                                        | Model         | S/N               | SW Version              | HW Version | Manufacturer | Cal. Date  | Cal. Interval |
|-----|---------------------------------------------|---------------|-------------------|-------------------------|------------|--------------|------------|---------------|
| 1   | Test Software                               | TS1120        | 10727             | V3.2.22                 | N/A        | Tonscend     | N/A        | N/A           |
| 2   | Automatic control unit                      | JS0806-2      | 2218060623        | N/A                     | N/A        | Tonscend     | 2023-05-06 | 1 Year        |
| 3   | Wireless communication comprehensive tester | CMW500        | 164865            | V3.8.12                 | N/A        | R&S          | 2023-07-26 | 1 Year        |
| 4   | Spectrum Analyzer                           | FSQ40         | 200063            | V4.75                   | N/A        | R&S          | 2023-10-16 | 1 Year        |
| 5   | Analog Signal Generator                     | SMF           | 104770            | V3.0.13.0-2.20.530.15.4 | N/A        | R&S          | 2023-10-16 | 1 year        |
| 6   | Vector Signal Generator                     | SMCV100B      | 103691            | V5.00.122.24            | N/A        | R&S          | 2023-07-27 | 1 Year        |
| 7   | Programmable Power Supply                   | Keithley 2303 | 4039070           | N/A                     | N/A        | Keithley     | 2023-06-23 | 1 Year        |
| 8   | Temperature box                             | B-TF-107C     | BTF107C-201804107 | N/A                     | N/A        | Boyi         | 2023-06-28 | 1 Year        |
| 9   | Network test unit AP                        | GT-AXE11000   | N2IG0X401637KWF   | V3.0.0.4.386_45940      | N/A        | ASUS         | N/A        | N/A           |
| 10  | Vector Signal Generator                     | SMBV100A      | 257904            | V4.15.125.49            | N/A        | R&S          | 2023-10-16 | 1 Year        |

### 5.2.2 Radiated Emission Test System

| No. | Name                                 | Model           | S/N      | SW Version | HW Version   | Manufacturer | Cal. Date                | Cal. Interval |
|-----|--------------------------------------|-----------------|----------|------------|--------------|--------------|--------------------------|---------------|
| 1   | Universal Radio Communication Tester | CMU200          | 123126   | V5.2.1     | B12          | R&S          | 2023-10-16               | 1 Year        |
| 2   | Universal Radio Communication Tester | CMW500          | 104178   | V3.7.20    | 1206.0600.00 | R&S          | 2023-10-16               | 1 Year        |
| 3   | EMI Test Receiver                    | ESU40           | 100307   | V5.1-24-3  | 01           | R&S          | 2022-12-19               | 1 Year        |
| 4   | TRILOG Broadband Antenna             | VULB9163        | 01345    | N/A        | N/A          | Schwarzbeck  | 2023-03-23               | 1 Year        |
| 5   | Double-ridged Waveguide Antenna      | ETS-3117        | 00135890 | N/A        | N/A          | ETS          | 2022-03-09               | 2 Years       |
| 6   | EMI Test Software                    | EMC32 V10.35.02 | N/A      | N/A        | N/A          | R&S          | N/A                      | N/A           |
| 7   | Horn Antenna                         | 3160-09         | LM6321   | N/A        | N/A          | R&S          | 2023-07-16               | 1 Year        |
| 8   | Horn Antenna                         | 3160-10         | LM5942   | N/A        | N/A          | R&S          | 2023-07-16               | 1 Year        |
| 9   | Loop Antenna                         | AL-130R         | 121083   | N/A        | N/A          | COM-POWER    | 2023/9/13                | 1 Year        |
| 10  | Preamplifier                         | SCU08F1         | 8320024  | N/A        | N/A          | R&S          | 2023/10/16               | 1 Year        |
| 11  | Preamplifier                         | SCU18           | 10155    | N/A        | N/A          | R&S          | 2023/10/16               | 1 Year        |
| 12  | Preamplifier                         | SCU26           | 10025    | N/A        | N/A          | R&S          | 2023/10/16               | 1 Year        |
| 13  | Preamplifier                         | SCU40           | 10020    | N/A        | N/A          | R&S          | 2023/10/16               | 1 Year        |
| 14  | 2-Line V-Network                     | ENV216          | 101380   | N/A        | N/A          | R&S          | 2022-12-29<br>2023-12-19 | 1 Year        |
| 15  | EMI Test Software                    | EMC32 V10.35.02 | N/A      | N/A        | N/A          | R&S          | N/A                      | N/A           |
| 16  | Test Receiver                        | ESCI            | 101235   | V5.1-24-3  | 0            | R&S          | 2022-12-29<br>2023-12-19 | 1 Year        |



### 5.2.3 Test Environment

**Shielding Room1** (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

|                          |                            |
|--------------------------|----------------------------|
| Temperature              | Min. = 15 °C, Max. = 35 °C |
| Relative humidity        | Min. = 20 %, Max. = 75 %   |
| Shielding effectiveness  | > 100 dB                   |
| Ground system resistance | < 0.5 Ω                    |
| Temperature              | Min. = 15 °C, Max. = 35 °C |

**Control room** did not exceed following limits along the EMC testing:

|                          |                            |
|--------------------------|----------------------------|
| Temperature              | Min. = 15 °C, Max. = 35 °C |
| Relative humidity        | Min. = 30 %, Max. = 60 %   |
| Shielding effectiveness  | > 100 dB                   |
| Electrical insulation    | > 10 kΩ                    |
| Ground system resistance | < 0.5 Ω                    |

**Fully-anechoic chamber1** (9.8 meters×6.7 meters×6.7 meters) did not exceed following limits along the EMC testing:

|                            |                                        |
|----------------------------|----------------------------------------|
| Temperature                | Min. = 15 °C, Max. = 35 °C             |
| Relative humidity          | Min. = 25 %, Max. = 75 %               |
| Shielding effectiveness    | > 100 dB                               |
| Electrical insulation      | > 10 kΩ                                |
| Ground system resistance   | < 0.5 Ω                                |
| VSWR                       | Between 0 and 6 dB, from 1GHz to 18GHz |
| Site Attenuation Deviation | Between -4 and 4 dB, 30MHz to 1GHz     |

### 5.3 Measurement Uncertainty

Measurement Uncertainty of Conduction test

| Measurement Items                    | Range          | Confidence Level | Calculated Uncertainty |
|--------------------------------------|----------------|------------------|------------------------|
| 20dB Emission Bandwidth              | 2400–2483.5MHz | 95%              | ±1.9%                  |
| Carrier Frequency Separation         | 2400–2483.5MHz | 95%              | ±1.9%                  |
| Maximum Power Spectral Density Level | 2400–2483.5MHz | 95%              | ±0.98 dB               |
| Number of Hopping Channel            | 2400–2483.5MHz | 95%              | ±1.9%                  |
| Time of Occupancy                    | 2400–2483.5MHz | 95%              | ±0.11%                 |

|                                 |                |     |                                          |
|---------------------------------|----------------|-----|------------------------------------------|
| Max Peak Conducted Output Power | 2400–2483.5MHz | 95% | ±0.98 dB                                 |
| Band-edge Spurious Emission     | 2400–2483.5MHz | 95% | ±1.21dB                                  |
| Conducted RF Spurious Emission  | 9kHz-40GHz     | 95% | 9kHz-7GHz:±1.21dB<br>7GHz-40GHz: ±3.31dB |

**Measurement Uncertainty of Radiation test**

| Measurement Items                   | Uncertainty(dB) |
|-------------------------------------|-----------------|
| Radiated Emission 30MHz-1000MHz     | ±5.10           |
| Radiated Emission 1000MHz-18000MHz  | ±5.66           |
| Radiated Emission 18000MHz-40000MHz | ±5.22           |
| AC Powerline Conducted Emission     | ±4.38           |

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



## 6 Test Results

### 6.1 Peak Output Power-Conducted

#### 6.1.1 Measurement Limit

| Standard              | Limit (dBm)                          |
|-----------------------|--------------------------------------|
| FCC 47 Part 15.247(b) | GFSK:≤30, pi/4-DQPSK and 8DPSK≤20.97 |

#### 6.1.2 Test Condition

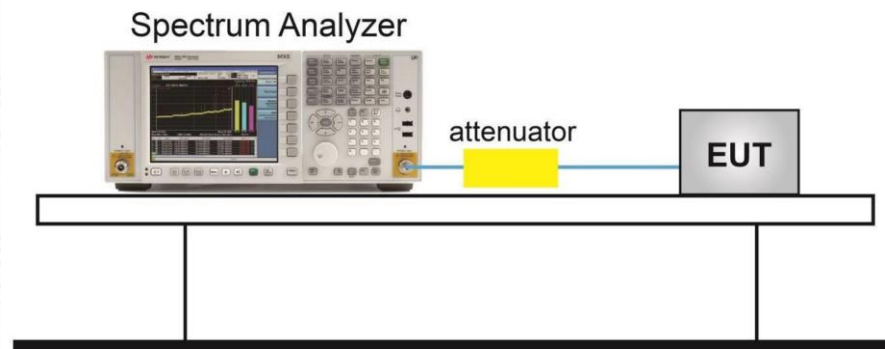
| Hopping Mode | RBW  | VBW   | Span | Sweep time |
|--------------|------|-------|------|------------|
| Hopping OFF  | 3MHz | 10MHz | 9MHz | Auto       |

#### 6.1.3 Test Procedure

The measurement is according to ANSI C63.10 clause 7.8.5.

1. The output power of EUT was connected to the spectrum analyzer by cable and divide. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Use the following spectrum analyzer settings:
  - a) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
  - b) RBW > 20 dB bandwidth of the emission being measured.
  - c) VBW ≥ RBW.
  - d) Sweep: Auto.
  - e) Detector function: Peak.
  - f) Trace: Max hold.
4. Allow trace to stabilize.
5. Use the marker-to-peak function to set the marker to the peak of the emission.
6. The indicated level is the peak output power, after any corrections for external attenuators and cables.
7. Record the results.

#### 6.1.4 Test setup

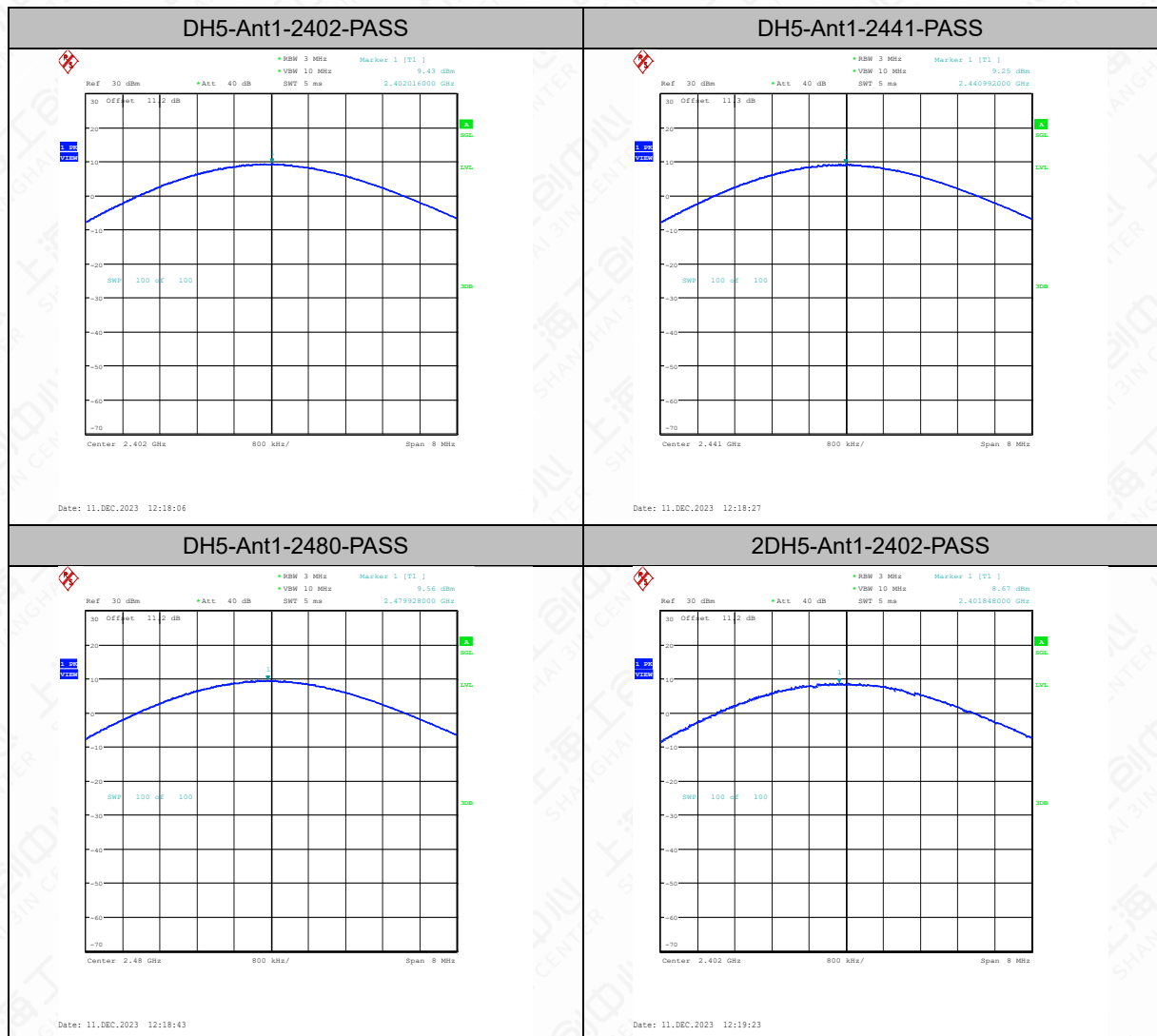


### 6.1.5 Measurement Results

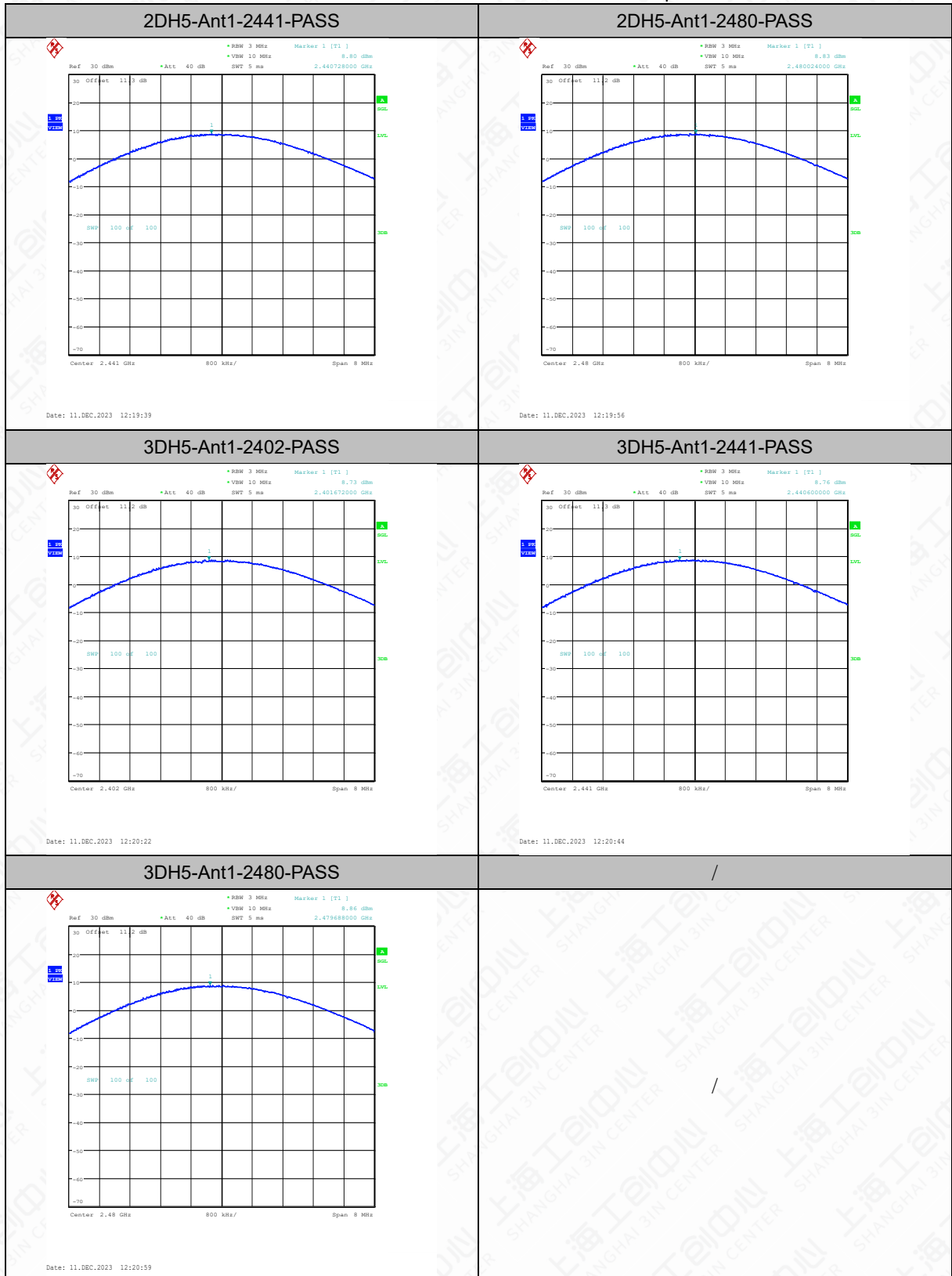
| Test Mode | Antenna | Frequency[MHz] | Conducted Peak Power[dBm] | Conducted Limit[dBm] | Verdict |
|-----------|---------|----------------|---------------------------|----------------------|---------|
| DH5       | Ant1    | 2402           | 9.43                      | ≤30                  | PASS    |
| DH5       | Ant1    | 2441           | 9.25                      | ≤30                  | PASS    |
| DH5       | Ant1    | 2480           | 9.56                      | ≤30                  | PASS    |
| 2DH5      | Ant1    | 2402           | 8.67                      | ≤20.97               | PASS    |
| 2DH5      | Ant1    | 2441           | 8.80                      | ≤20.97               | PASS    |
| 2DH5      | Ant1    | 2480           | 8.83                      | ≤20.97               | PASS    |
| 3DH5      | Ant1    | 2402           | 8.73                      | ≤20.97               | PASS    |
| 3DH5      | Ant1    | 2441           | 8.76                      | ≤20.97               | PASS    |
| 3DH5      | Ant1    | 2480           | 8.86                      | ≤20.97               | PASS    |

Note: Bold font is the maximum Value

### Test Graphs







## 6.2 Frequency Band Edges-Conducted

### 6.2.1 Measurement Limit

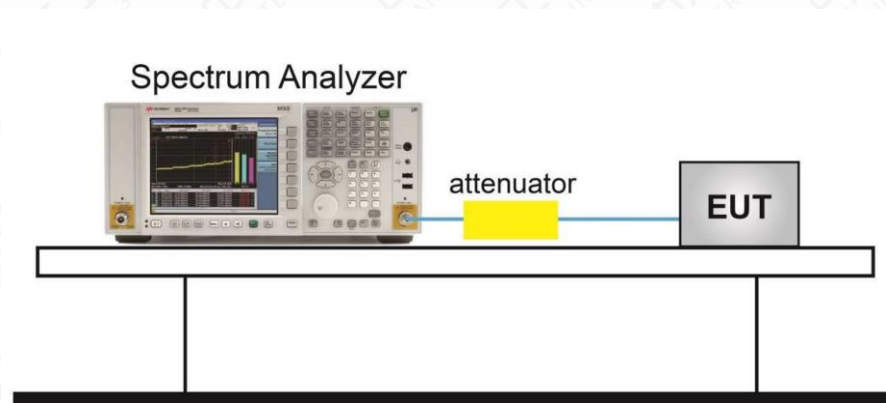
| Standard                  | Limit(dBc) |
|---------------------------|------------|
| FCC 47 CFR Part 15.247(d) | >20        |

### 6.2.2 Test procedures

The measurement is according to ANSI C63.10 clause 7.8.6.

1. Connect the EUT to spectrum analyzer.
2. Set RBW=100KHz, VBW=300KHz, span more than 1.5 times channel bandwidth (2MHz).
3. Detector =peak, sweep time=auto couple, trace mode=max hold.Allow sweep to continue until the trace stabilizes.

### 6.2.3 Test setup

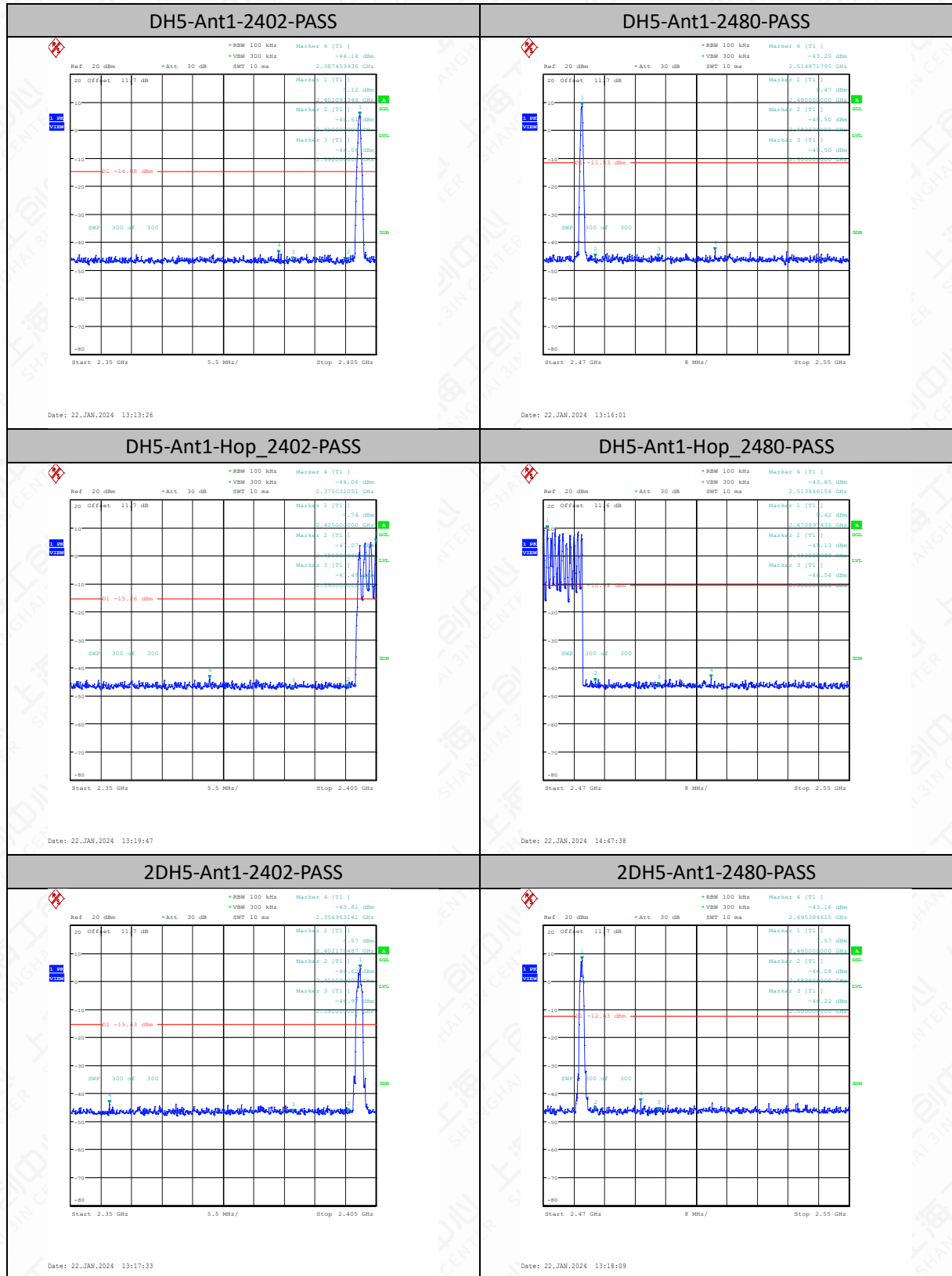




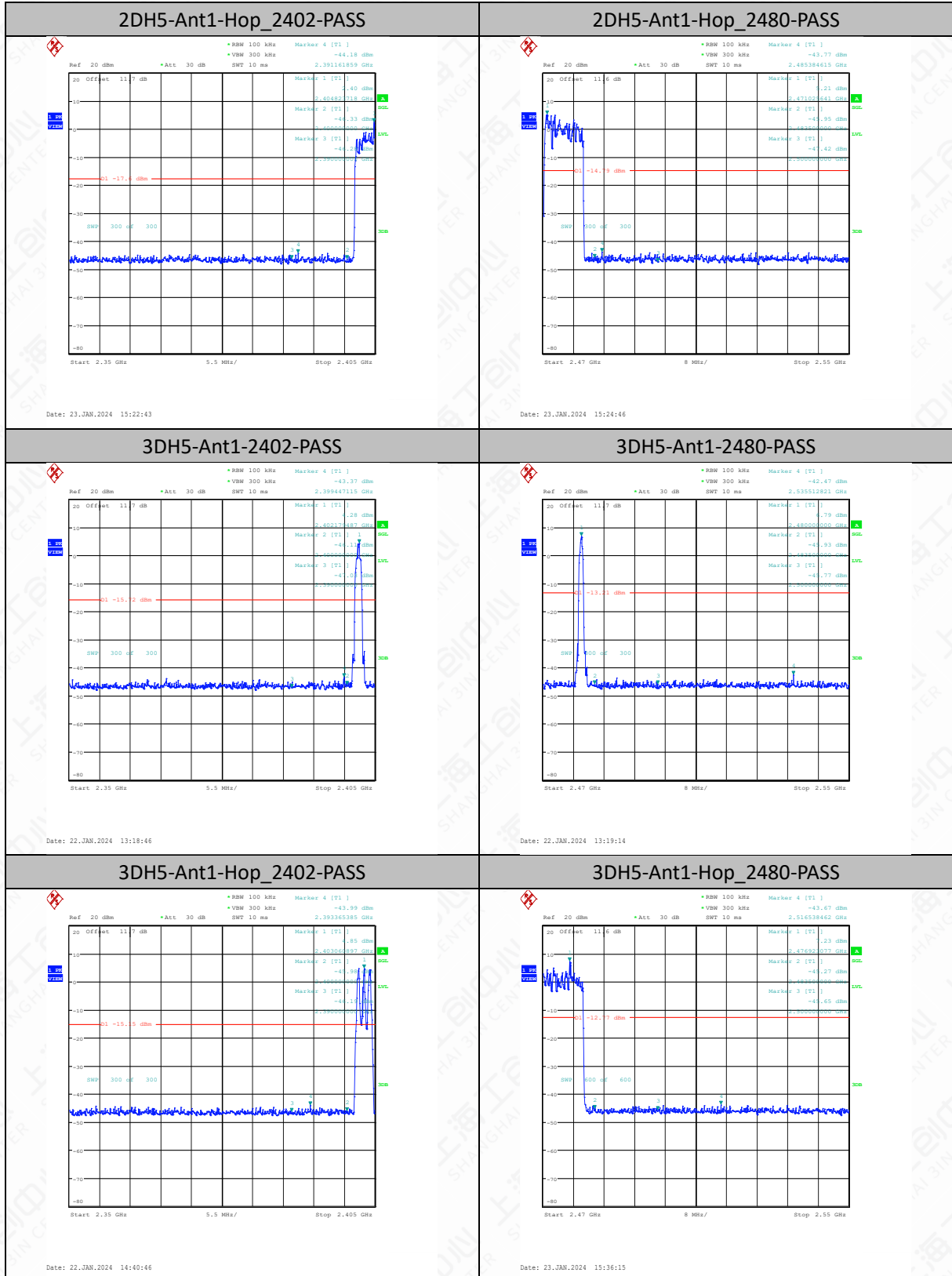
#### 6.2.4 Measurement Result

| TestMode | Antenna | ChName | Frequency[MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|----------|---------|--------|----------------|----------------|--------------|-------------|---------|
| DH5      | Ant1    | Low    | 2402           | 5.12           | -44.14       | ≤-14.88     | PASS    |
| DH5      | Ant1    | High   | 2480           | 8.47           | -43.2        | ≤-11.53     | PASS    |
| DH5      | Ant1    | Low    | Hop_2402       | 4.74           | -44.06       | ≤-15.26     | PASS    |
| DH5      | Ant1    | High   | Hop_2480       | 9.42           | -43.85       | ≤-10.58     | PASS    |
| 2DH5     | Ant1    | Low    | 2402           | 4.57           | -43.81       | ≤-15.43     | PASS    |
| 2DH5     | Ant1    | High   | 2480           | 7.57           | -43.16       | ≤-12.43     | PASS    |
| 2DH5     | Ant1    | Low    | Hop_2402       | 2.40           | -44.18       | ≤-17.6      | PASS    |
| 2DH5     | Ant1    | High   | Hop_2480       | 5.21           | -43.77       | ≤-14.79     | PASS    |
| 3DH5     | Ant1    | Low    | 2402           | 4.28           | -43.37       | ≤-15.72     | PASS    |
| 3DH5     | Ant1    | High   | 2480           | 6.79           | -42.47       | ≤-13.21     | PASS    |
| 3DH5     | Ant1    | Low    | Hop_2402       | 4.85           | -43.99       | ≤-15.15     | PASS    |
| 3DH5     | Ant1    | High   | Hop_2480       | 7.23           | -43.67       | ≤-12.77     | PASS    |

## Test Graphs







### 6.3 Conducted Emission

#### 6.3.1 Measurement Limit

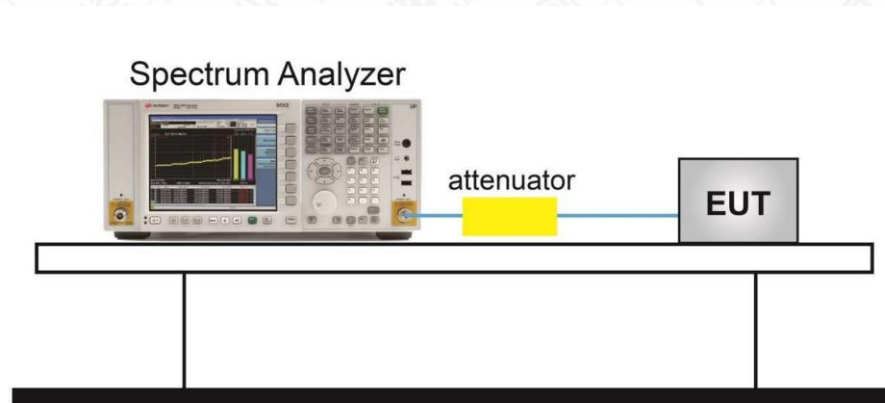
| Standard                  | Limit                                            |
|---------------------------|--------------------------------------------------|
| FCC 47 CFR Part15.247 (d) | 20dB below peak output power in 100kHz bandwidth |

#### 6.3.2 Test procedures

The measurement is according to ANSI C63.10 clause 7.8.8.

1. Connect the EUT to spectrum analyzer.
2. Set RBW=100KHz, VBW=300KHz.
3. Detector =peak, sweep time=auto couple, trace mode=max hold

#### 6.3.3 Test Setup



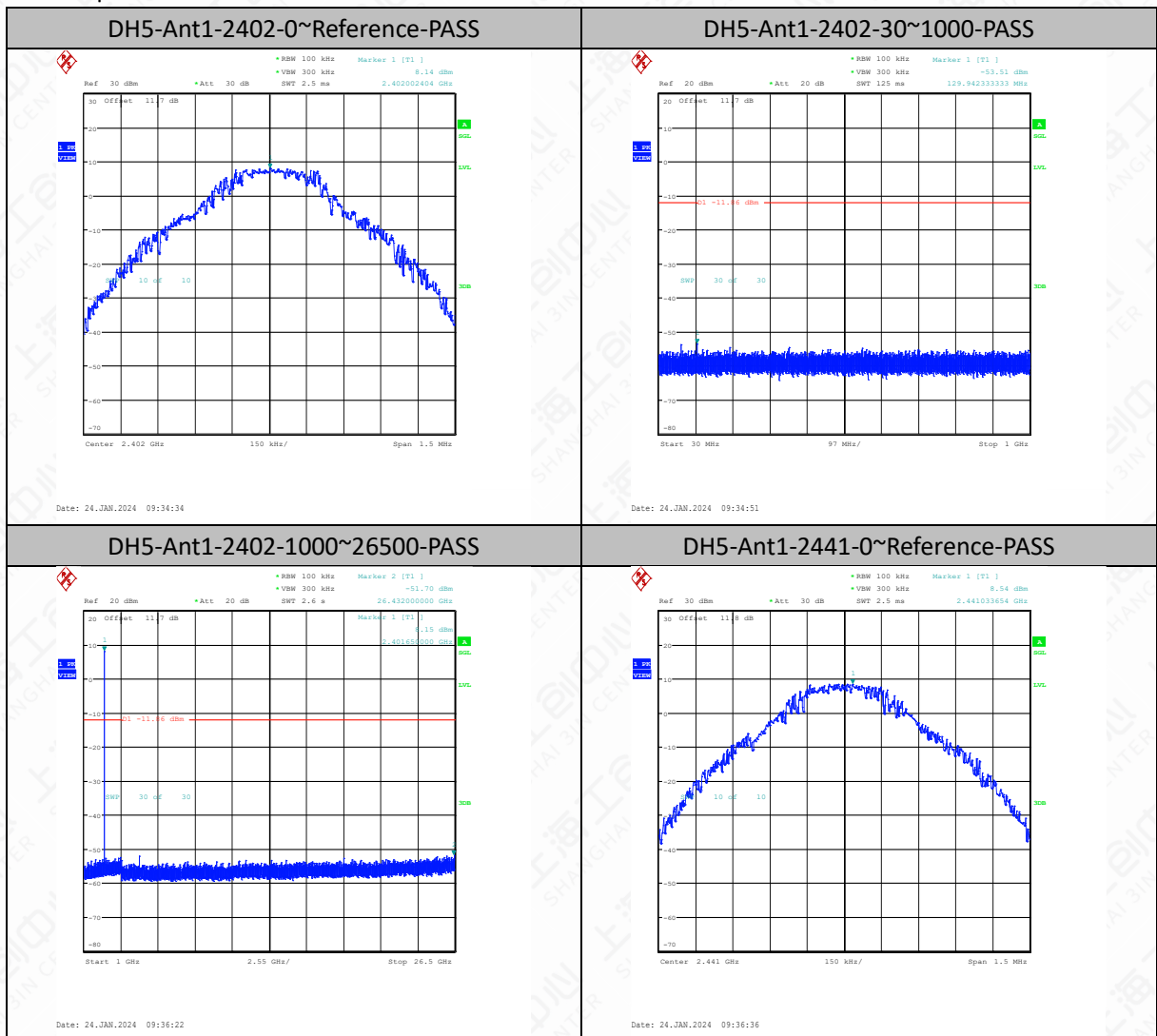
#### 6.3.4 Measurement Results

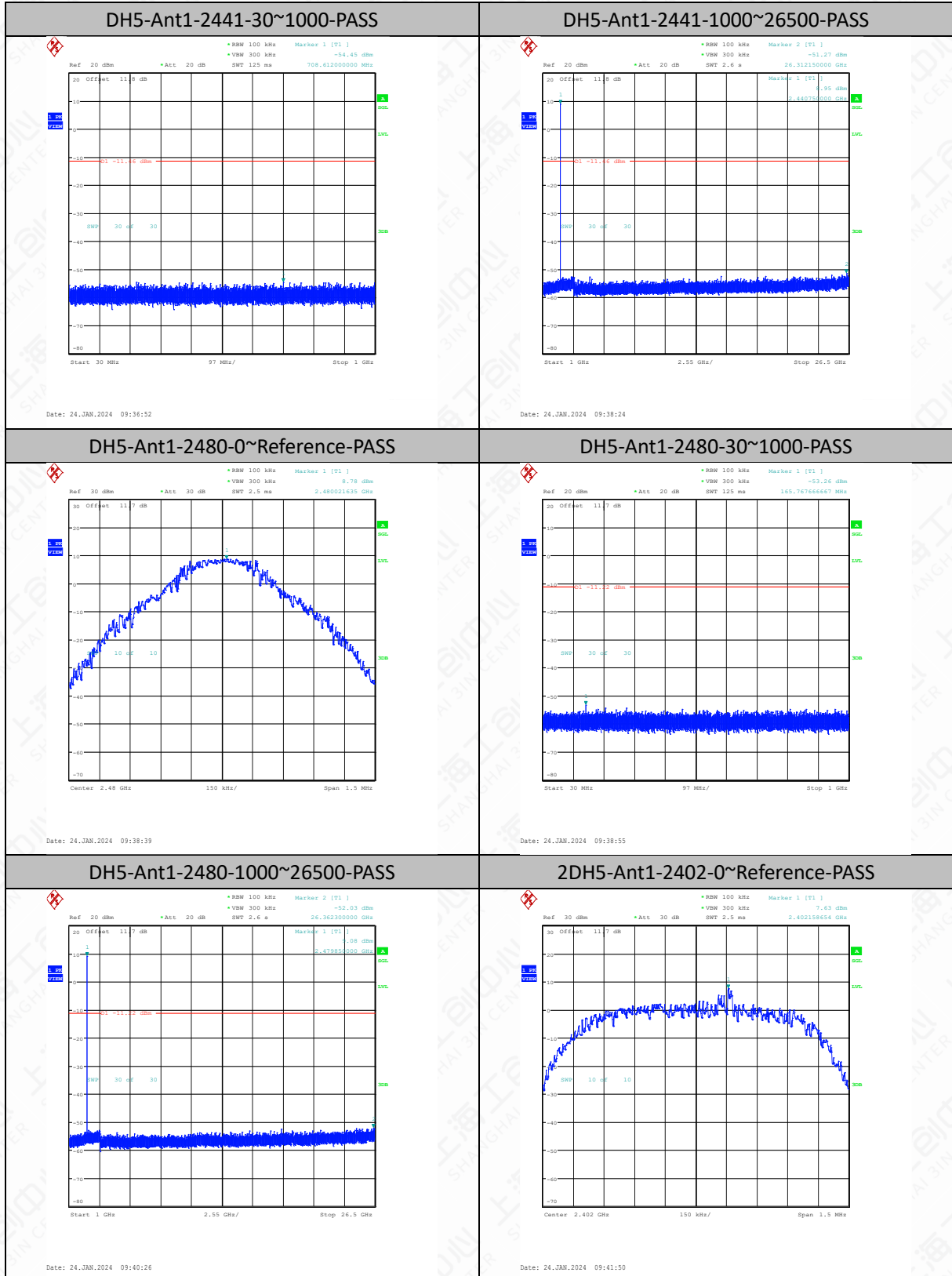
| TestMode | Antenna | Frequency[MHz] | FreqRange [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|----------|---------|----------------|-----------------|----------------|--------------|-------------|---------|
| DH5      | Ant1    | 2402           | 0~Reference     | 8.14           | 8.14         | ---         | PASS    |
| DH5      | Ant1    | 2402           | 30~1000         | 8.14           | -53.51       | ≤-11.86     | PASS    |
| DH5      | Ant1    | 2402           | 1000~26500      | 8.14           | -51.7        | ≤-11.86     | PASS    |
| DH5      | Ant1    | 2441           | 0~Reference     | 8.54           | 8.54         | ---         | PASS    |
| DH5      | Ant1    | 2441           | 30~1000         | 8.54           | -54.45       | ≤-11.46     | PASS    |
| DH5      | Ant1    | 2441           | 1000~26500      | 8.54           | -51.27       | ≤-11.46     | PASS    |
| DH5      | Ant1    | 2480           | 0~Reference     | 8.78           | 8.78         | ---         | PASS    |
| DH5      | Ant1    | 2480           | 30~1000         | 8.78           | -53.26       | ≤-11.22     | PASS    |
| DH5      | Ant1    | 2480           | 1000~26500      | 8.78           | -52.03       | ≤-11.22     | PASS    |
| 2DH5     | Ant1    | 2402           | 0~Reference     | 7.63           | 7.63         | ---         | PASS    |
| 2DH5     | Ant1    | 2402           | 30~1000         | 7.63           | -53.97       | ≤-12.37     | PASS    |
| 2DH5     | Ant1    | 2402           | 1000~26500      | 7.63           | -51.65       | ≤-12.37     | PASS    |
| 2DH5     | Ant1    | 2441           | 0~Reference     | 7.28           | 7.28         | ---         | PASS    |
| 2DH5     | Ant1    | 2441           | 30~1000         | 7.28           | -53.26       | ≤-12.72     | PASS    |
| 2DH5     | Ant1    | 2441           | 1000~26500      | 7.28           | -50.83       | ≤-12.72     | PASS    |

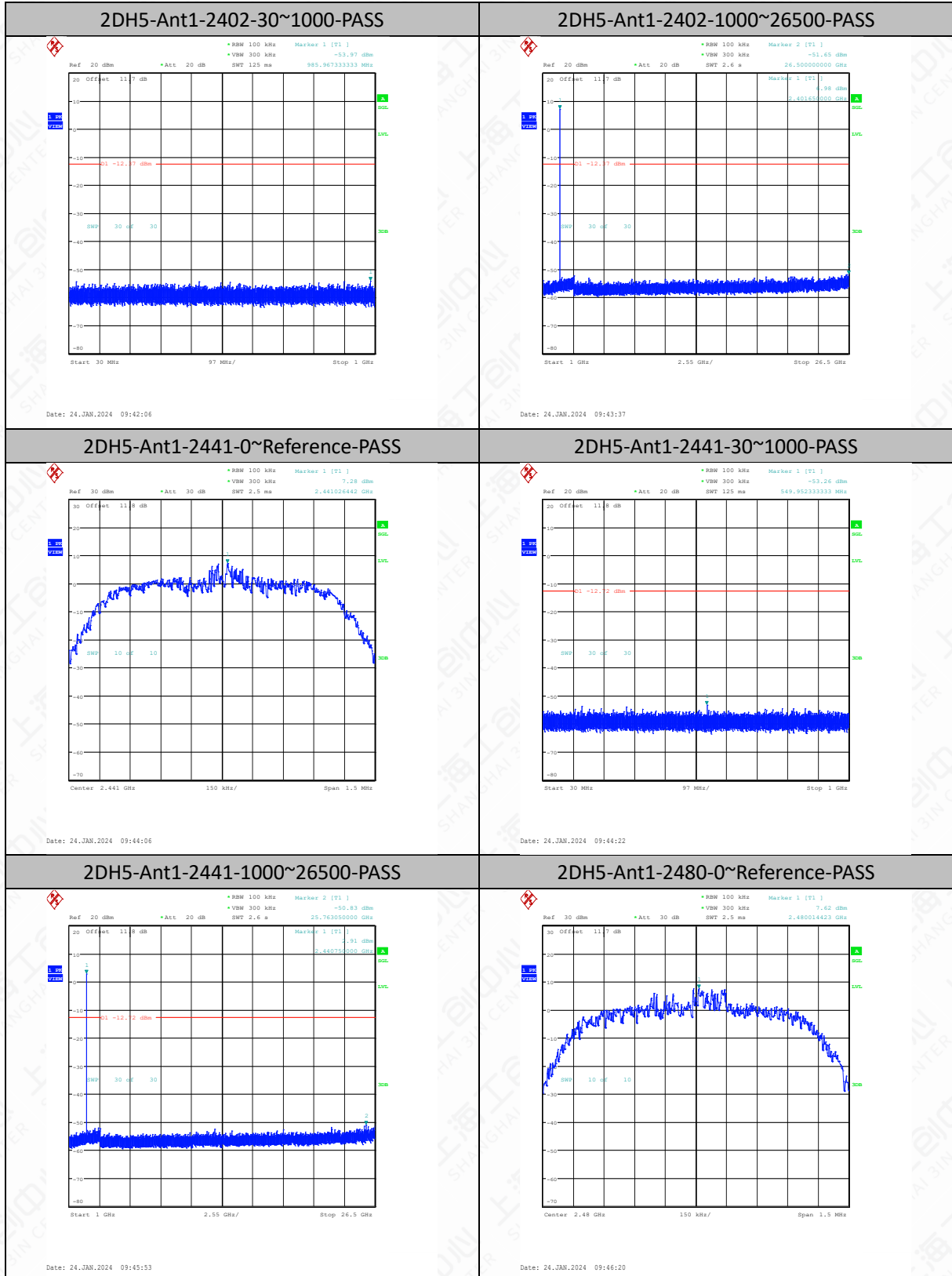


|      |      |      |             |      |        |         |      |
|------|------|------|-------------|------|--------|---------|------|
| 2DH5 | Ant1 | 2480 | 0~Reference | 7.62 | 7.62   | ---     | PASS |
| 2DH5 | Ant1 | 2480 | 30~1000     | 7.62 | -54.37 | ≤-12.38 | PASS |
| 2DH5 | Ant1 | 2480 | 1000~26500  | 7.62 | -52.03 | ≤-12.38 | PASS |
| 3DH5 | Ant1 | 2402 | 0~Reference | 6.82 | 6.82   | ---     | PASS |
| 3DH5 | Ant1 | 2402 | 30~1000     | 6.82 | -54.04 | ≤-13.18 | PASS |
| 3DH5 | Ant1 | 2402 | 1000~26500  | 6.82 | -41.81 | ≤-13.18 | PASS |
| 3DH5 | Ant1 | 2441 | 0~Reference | 6.49 | 6.49   | ---     | PASS |
| 3DH5 | Ant1 | 2441 | 30~1000     | 6.49 | -53.82 | ≤-13.51 | PASS |
| 3DH5 | Ant1 | 2441 | 1000~26500  | 6.49 | -50.51 | ≤-13.51 | PASS |
| 3DH5 | Ant1 | 2480 | 0~Reference | 7.85 | 7.85   | ---     | PASS |
| 3DH5 | Ant1 | 2480 | 30~1000     | 7.85 | -54.22 | ≤-12.15 | PASS |
| 3DH5 | Ant1 | 2480 | 1000~26500  | 7.85 | -44.51 | ≤-12.15 | PASS |

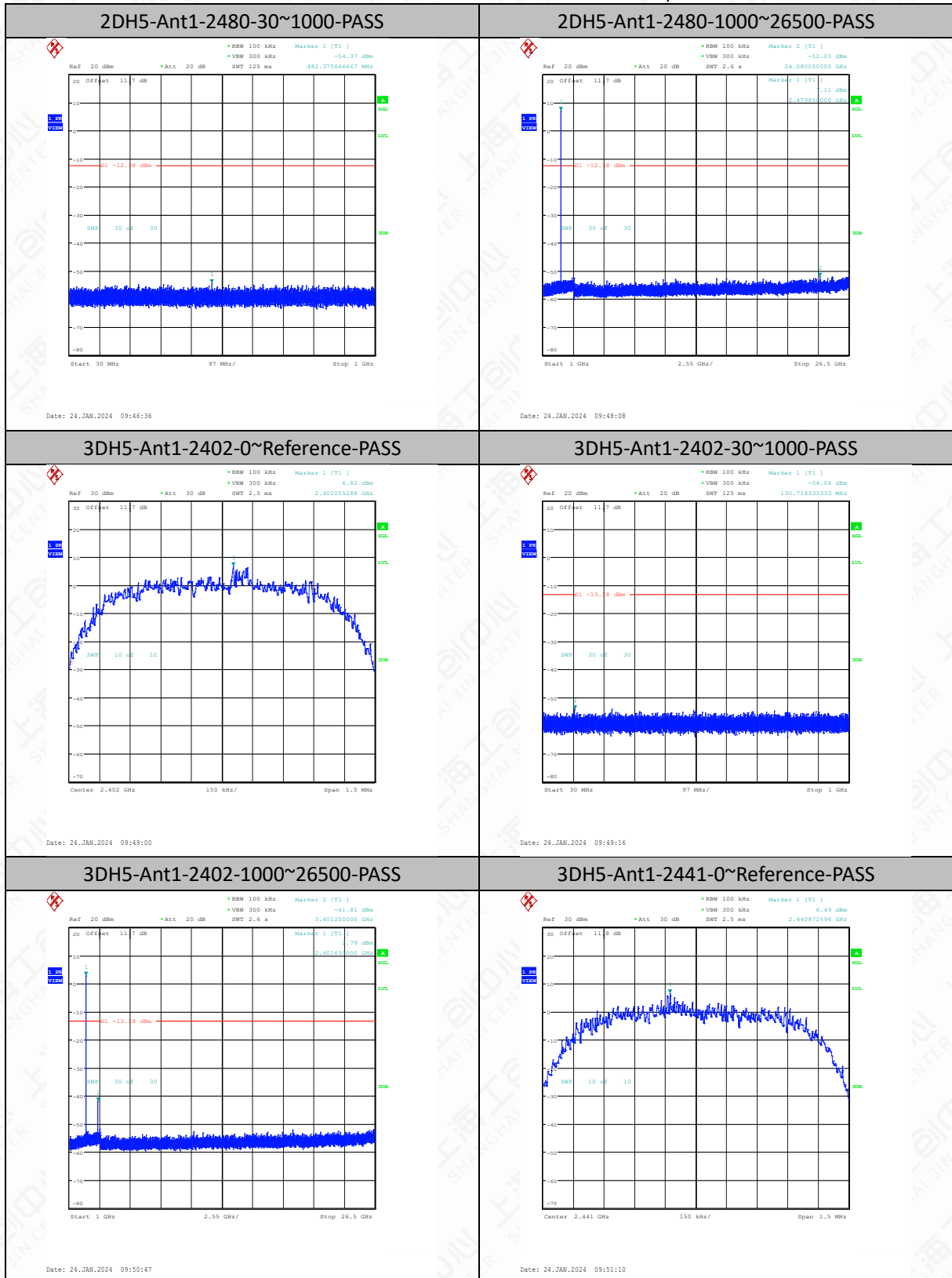
### Test Graphs

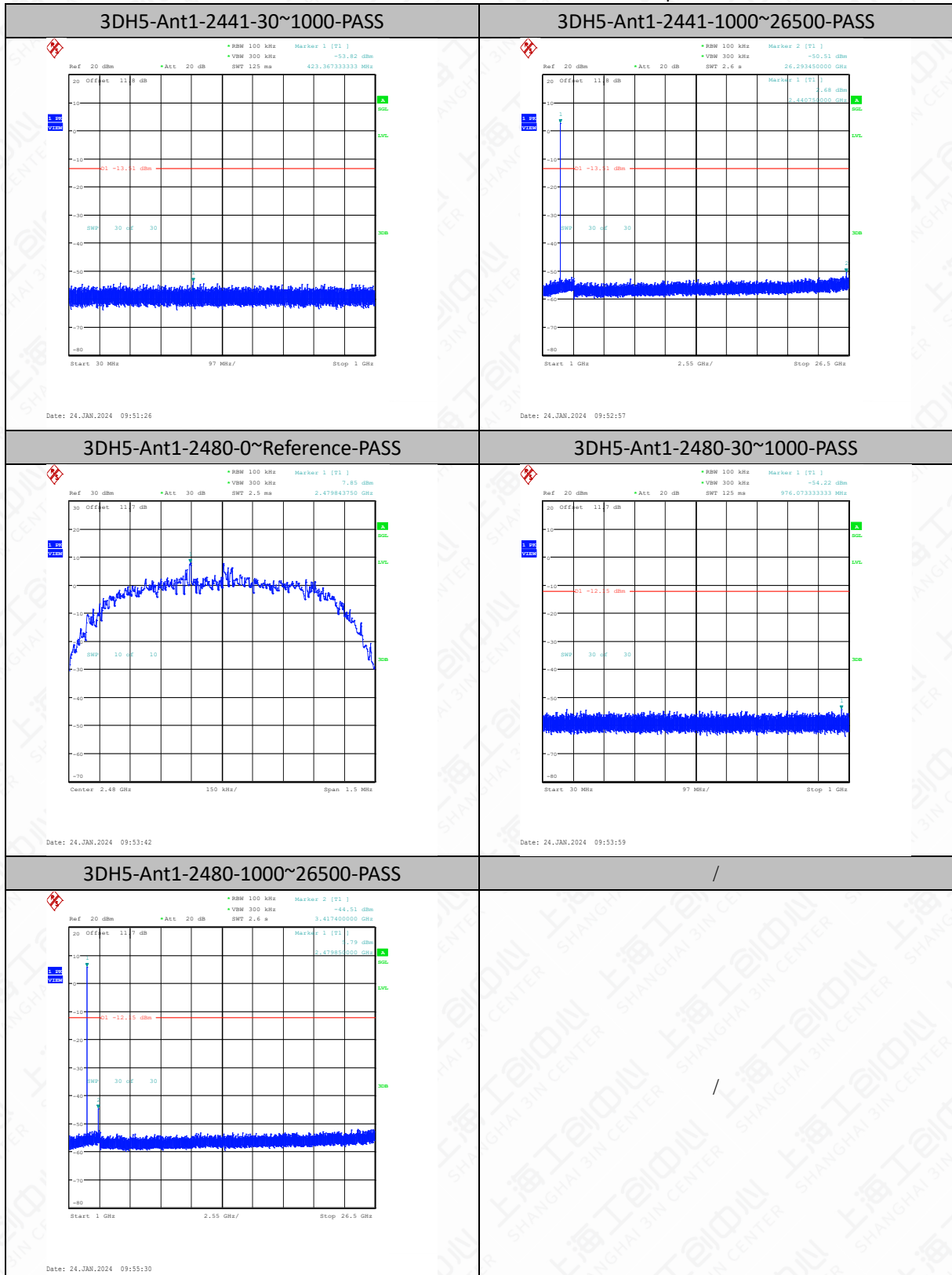












## 6.4 Radiated Emission

### 6.4.1 Measurement Limit

| Standard                               | Limit                        |
|----------------------------------------|------------------------------|
| FCC 47 CFR Part 15.247, 15.205, 15.209 | 20dB below peak output power |

In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see 15.205(c)).

Limit in restricted band

| Frequency of emission (MHz) | Field strength (mV/m) | Field strength (dBuV/m) |
|-----------------------------|-----------------------|-------------------------|
| 0.009~0.49                  | 2400/F (kHz)          | 129-94                  |
| 0.49~1.705                  | 24000/F (kHz)         | 74-63                   |
| 1.705~30                    | 30                    | 70                      |
| 30~88                       | 100                   | 40                      |
| 88~216                      | 150                   | 43.5                    |
| 216~960                     | 200                   | 46                      |
| Above 960                   | 500                   | 54                      |

### 6.4.2 Test Method

Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a non-conducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by the EUT arrangement is 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. but it may be larger or smaller to accommodate various sized EUTs. For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see also ANSI C63.10-2013 section 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

#### Test Settings – Below 1GHz (Quasi-Peak Field Strength Measurements)

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = 100 kHz.
3. Set the VBW = 300 kHz.
4. Detector = quasi-peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Trace was allowed to stabilize.



**Test Settings – Above 1GHz (Peak Field Strength Measurements)**

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = 1MHz.
3. Set the VBW = 3MHz.
4. Detector = peak
5. Trace mode = max hold
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

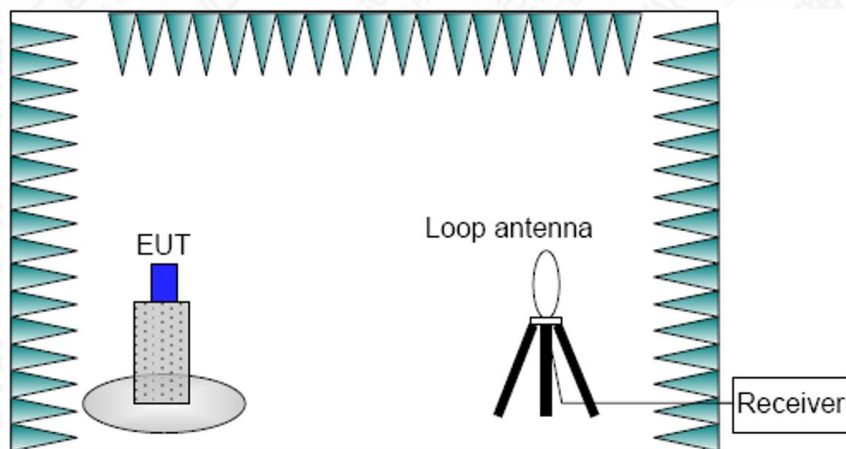
**Test Settings – Above 1GHz (Average Field Strength Measurements)**

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = 1MHz.
3. Set the VBW = 3MHz.
4. Detector = power average (RMS).
5. Number of measurement points = 1001 (Number of points must be  $\geq 2 \times \text{span} \backslash \text{RBW}$ )
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

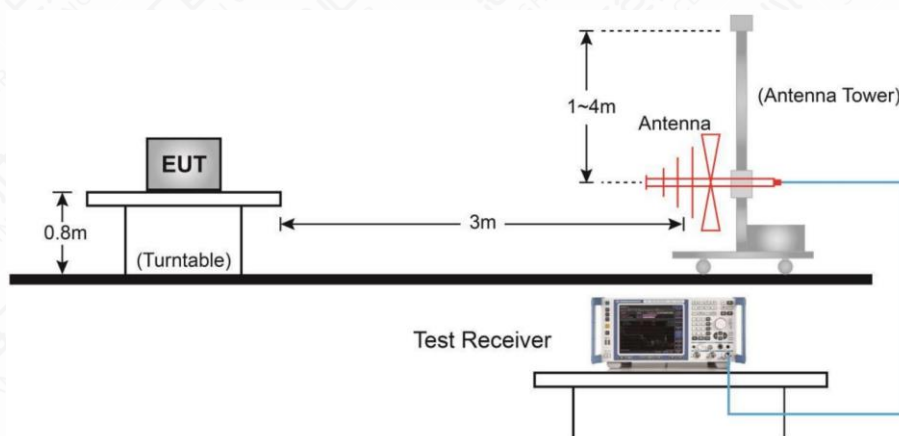
| Frequency of emission | RBW/VBW       | Sweep Time (s) |
|-----------------------|---------------|----------------|
| 0.009~30              | 9KHz/30KHz    | Auto           |
| 30~1000               | 100KHz/300KHz | 5              |
| 1000~4000             | 1MHz/3MHz     | 15             |
| 4000~18000            | 1MHz/3MHz     | 40             |
| 18000~26500           | 1MHz/3MHz     | 20             |

### 6.4.3 Test Setup

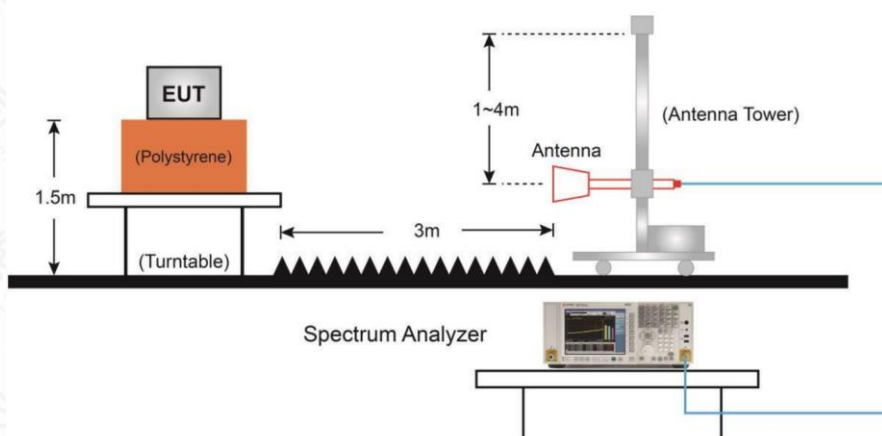
#### Below 30MHz Test Setup



#### Below 1GHz Test Setup



#### Above 1GHz Test Setup



#### 6.4.4 Measurement Results

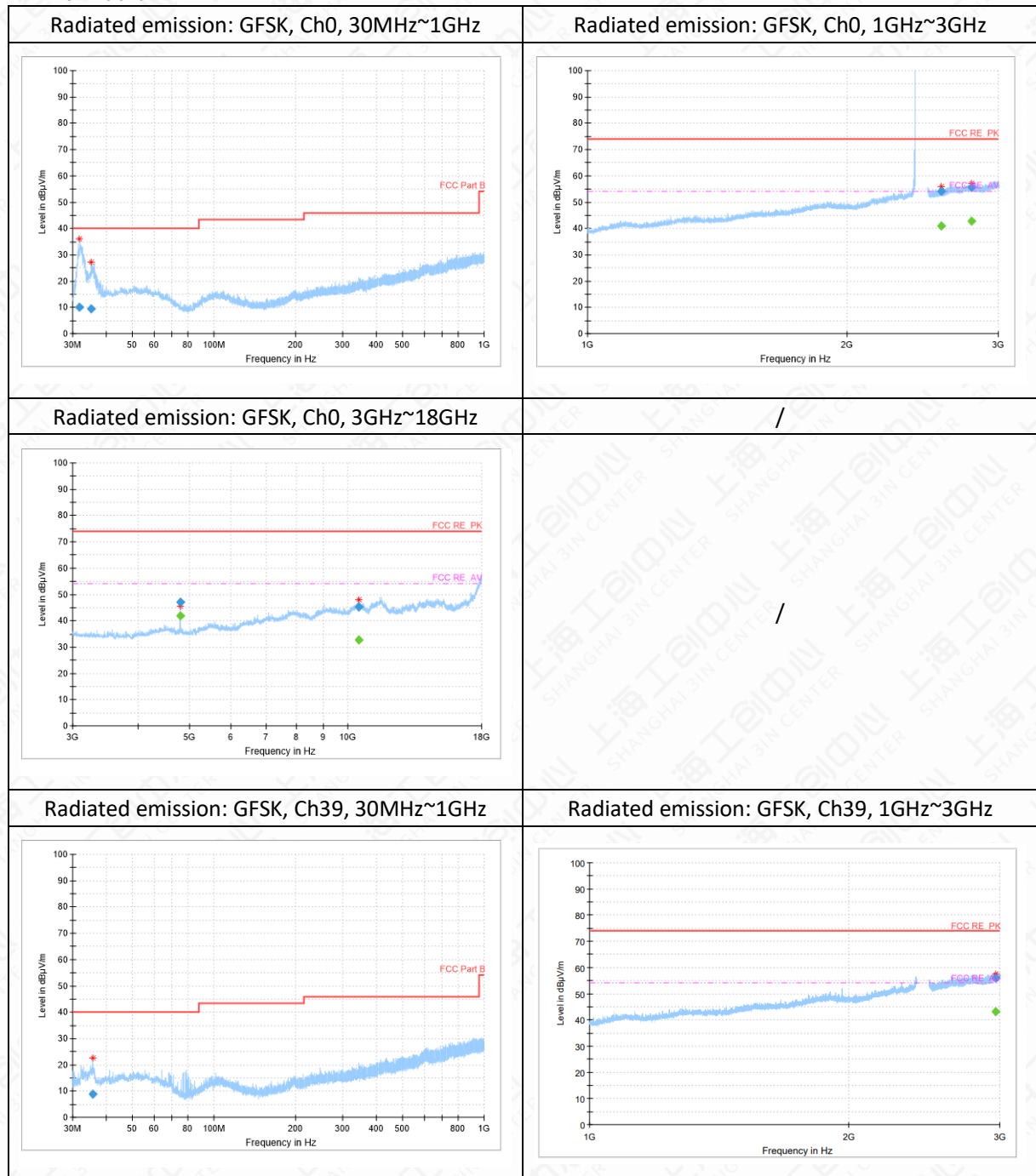
A “reference path loss” is established and  $AR_{pi}$  is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

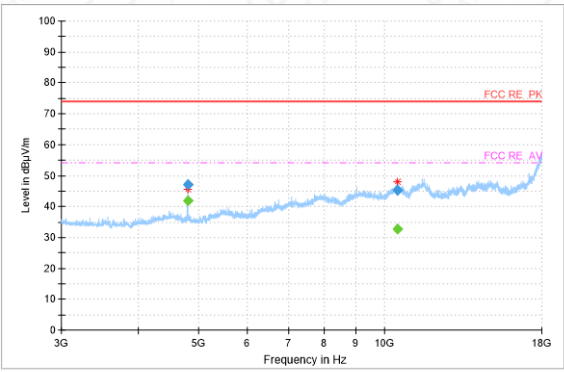
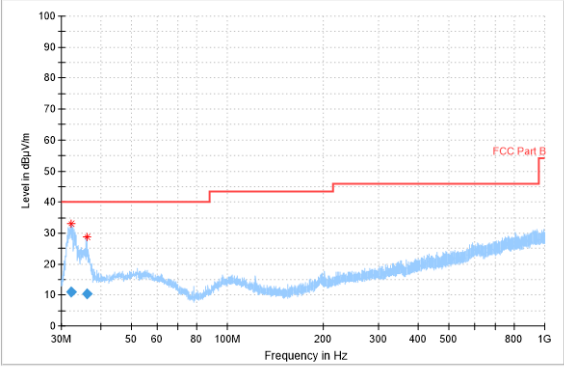
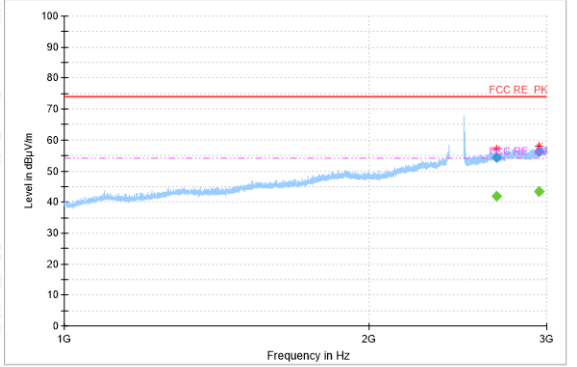
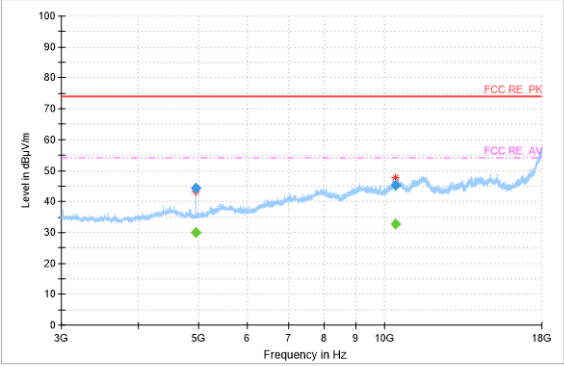
$AR_{pi} = \text{Cable loss} + \text{Antenna Factor} - \text{Preamplifier gain}$

$\text{Result} = P_{\text{Mea}} + AR_{pi}$

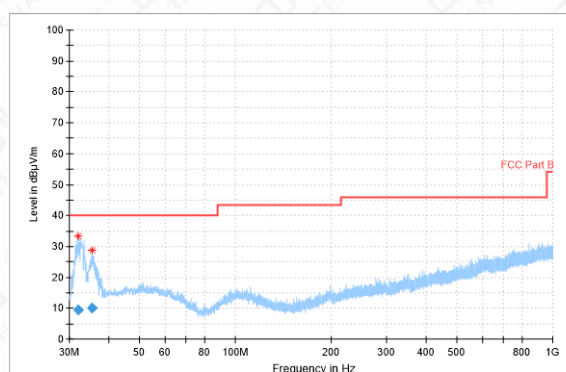
#### Mainly Supply (S14)



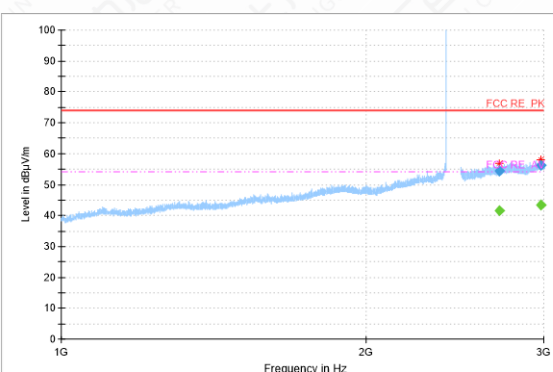


|                                                                                                                                      |                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <p>Radiated emission: GFSK, Ch39, 3GHz~18GHz</p>    | <p>/</p>                                                                                                                            |
| <p>Radiated emission: GFSK, Ch78, 30MHz~1GHz</p>   | <p>Radiated emission: GFSK, Ch78, 1GHz~3GHz</p>  |
| <p>Radiated emission: GFSK, Ch78, 3GHz~18GHz</p>  | <p>/</p>                                                                                                                            |

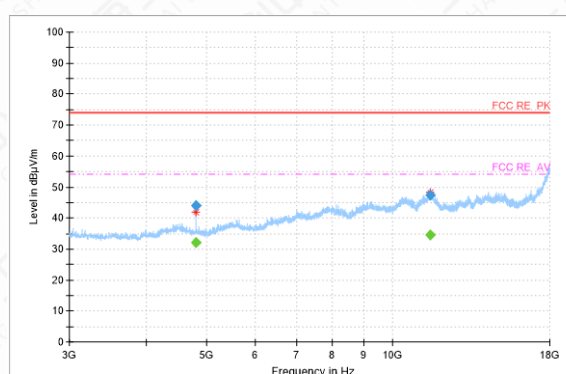
Radiated emission:  $\pi/4$  DQPSK, Ch0, 30MHz~1GHz



Radiated emission:  $\pi/4$  DQPSK, Ch0, 1GHz~3GHz



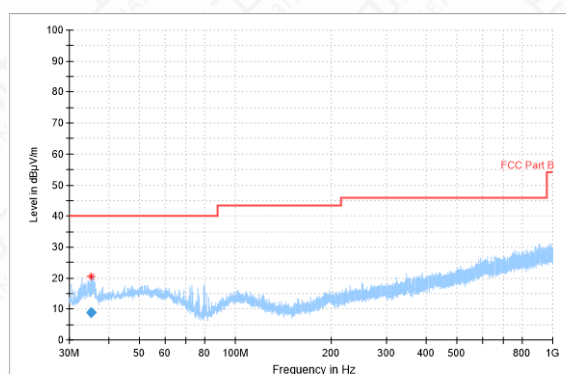
Radiated emission:  $\pi/4$  DQPSK, Ch0, 3GHz~18GHz



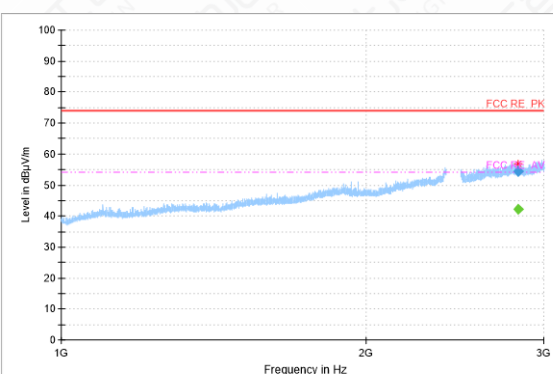
/

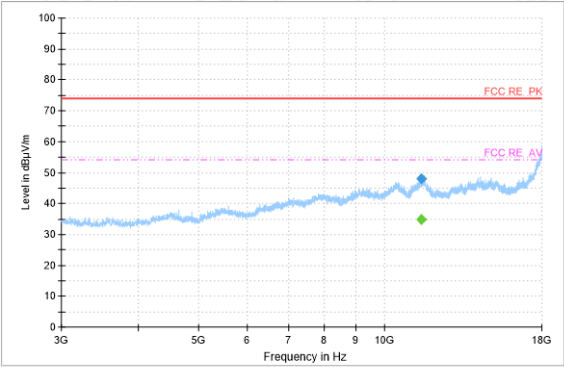
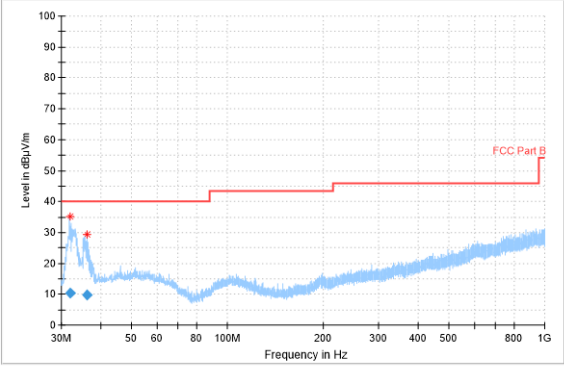
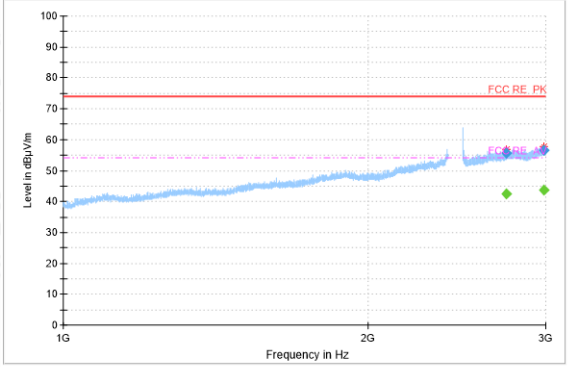
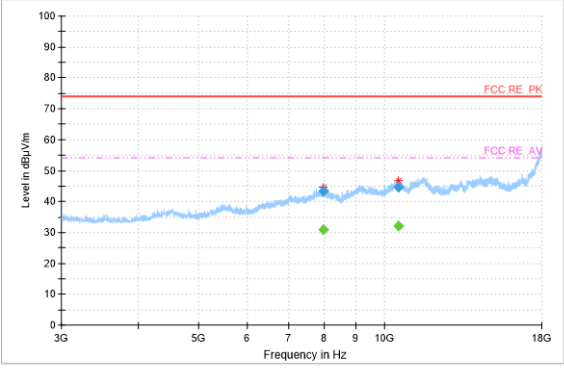
/

Radiated emission:  $\pi/4$  DQPSK, Ch39, 30MHz~1GHz



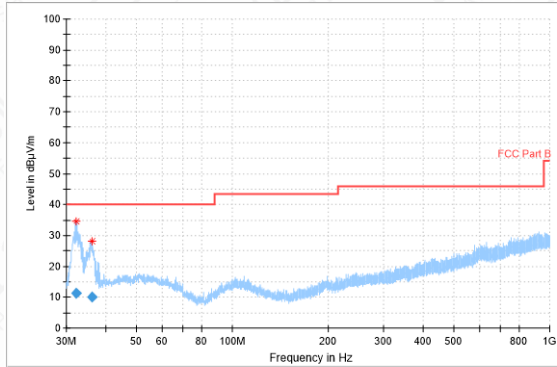
Radiated emission:  $\pi/4$  DQPSK, Ch39, 1GHz~3GHz



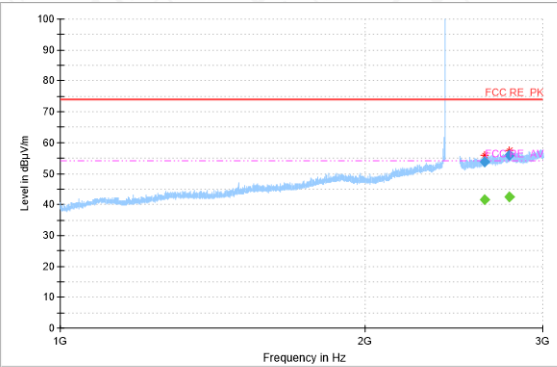
|                                                                                                                                                            |                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Radiated emission: <math>\pi/4</math> DQPSK, Ch39,<br/>3GHz~18GHz</p>  | <p>/</p>                                                                                                                                                |
| <p>Radiated emission: <math>\pi/4</math> DQPSK, Ch78, 30MHz~1GHz</p>     | <p>Radiated emission: <math>\pi/4</math> DQPSK, Ch78, 1GHz~3GHz</p>  |
| <p>Radiated emission: <math>\pi/4</math> DQPSK, Ch78, 3GHz~18GHz</p>    | <p>/</p>                                                                                                                                                |



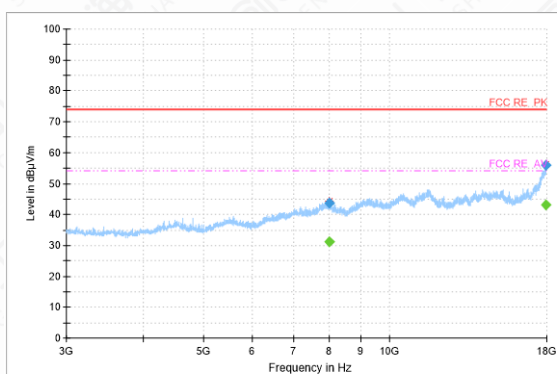
Radiated emission: 8DPSK, Ch0, 30MHz~1GHz



Radiated emission: 8DPSK, Ch0, 1GHz~3GHz



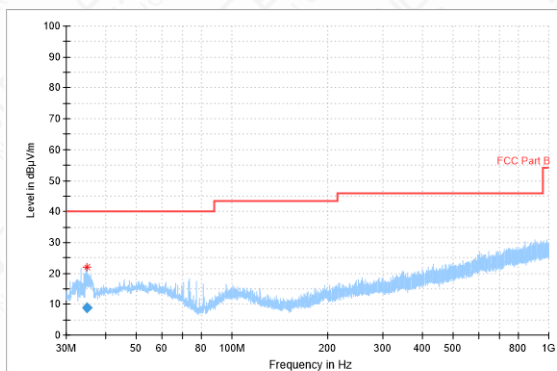
Radiated emission: 8DPSK, Ch0, 3GHz~18GHz



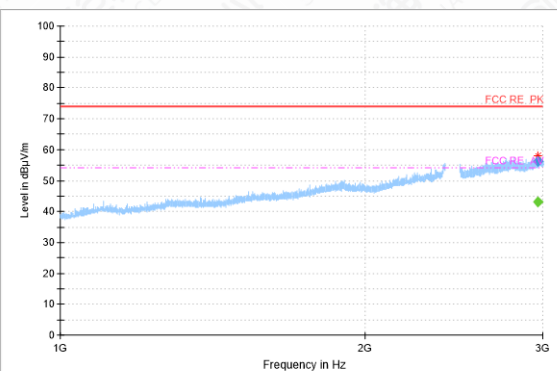
/

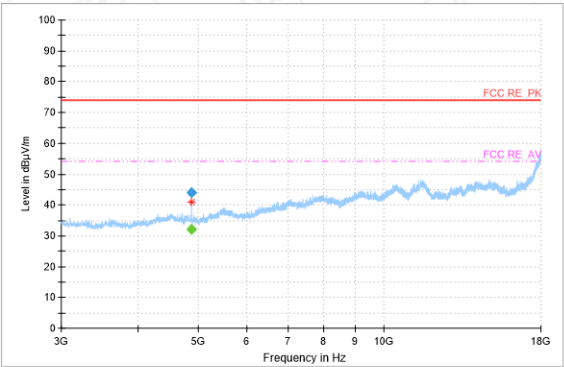
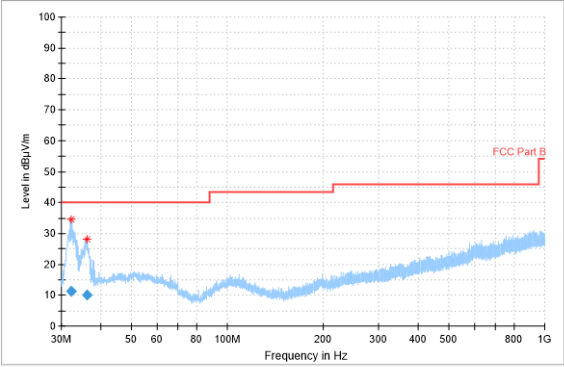
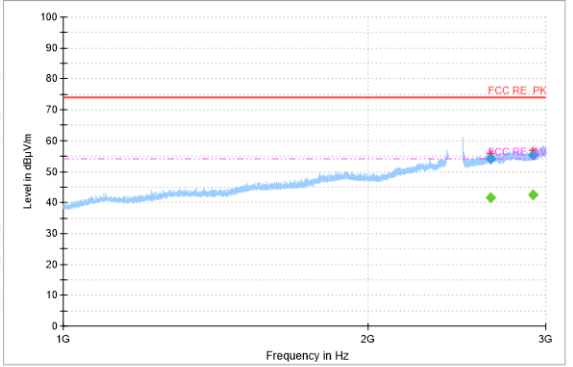
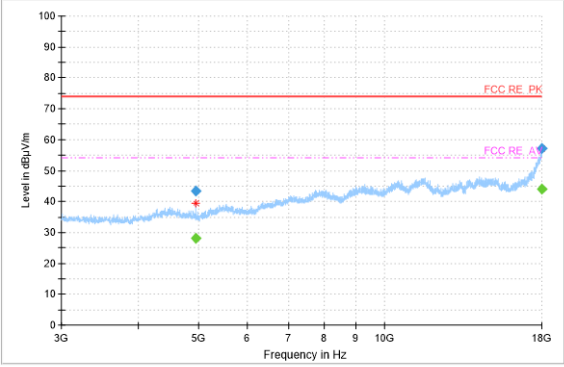
/

Radiated emission: 8DPSK, Ch0, 30MHz~1GHz

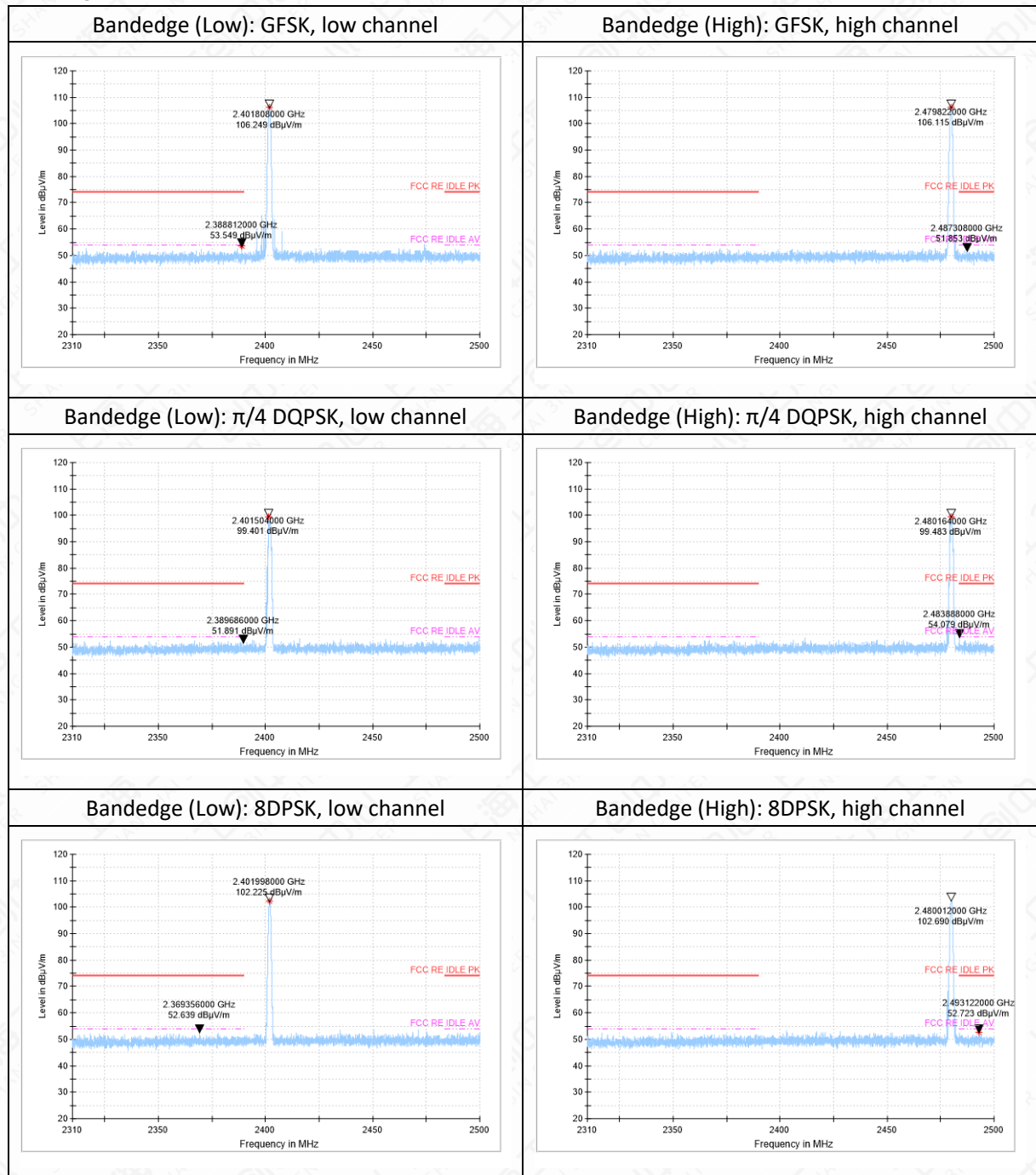


Radiated emission: 8DPSK, Ch0, 1GHz~3GHz



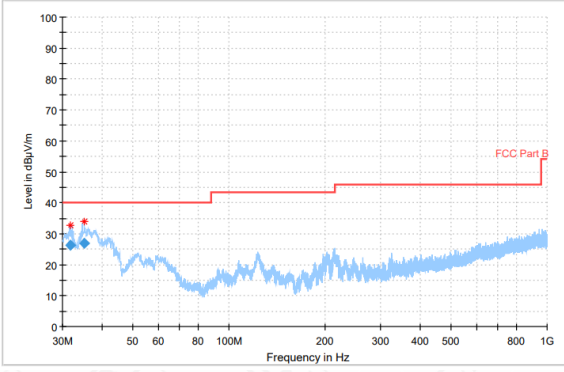
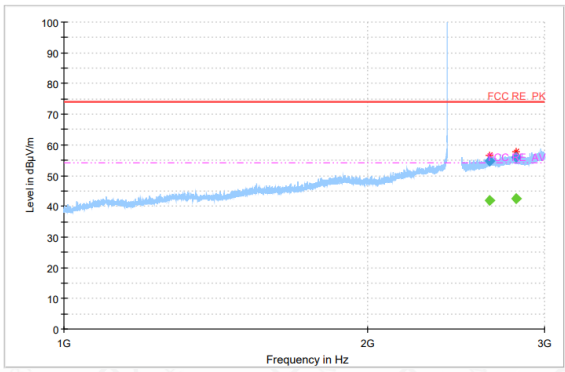
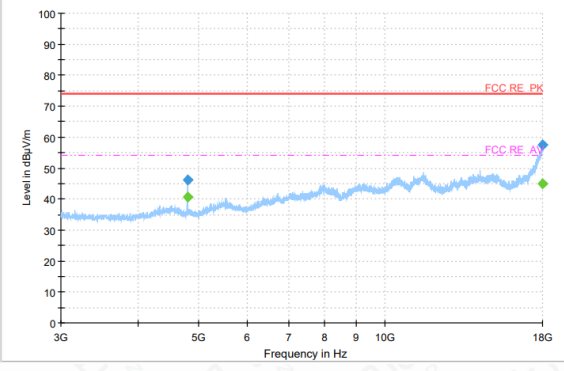
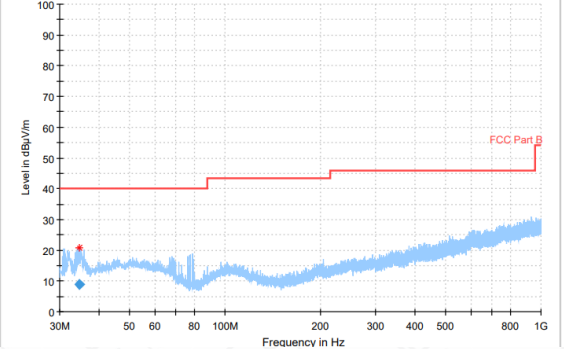
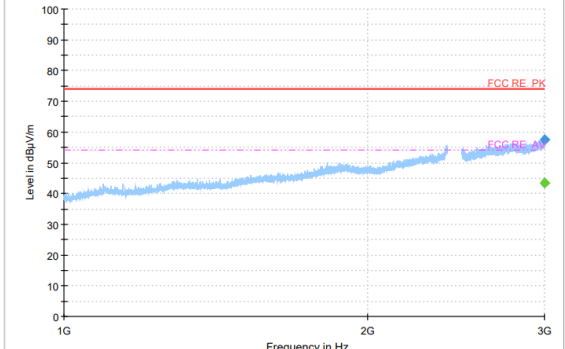
|                                                                                                                                       |                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <p>Radiated emission: 8DPSK, Ch0, 3GHz~18GHz</p>     | <p>/</p>                                                                                                                             |
| <p>Radiated emission: 8DPSK, Ch78, 30MHz~1GHz</p>   | <p>Radiated emission: 8DPSK, Ch78, 1GHz~3GHz</p>  |
| <p>Radiated emission: 8DPSK, Ch78, 3GHz~18GHz</p>  | <p>/</p>                                                                                                                             |

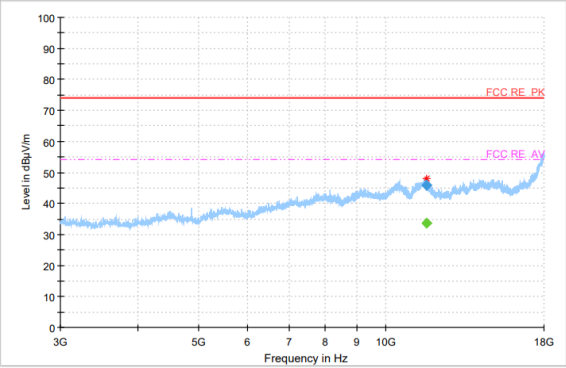
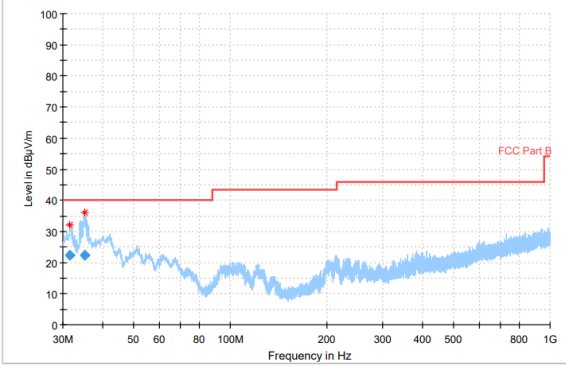
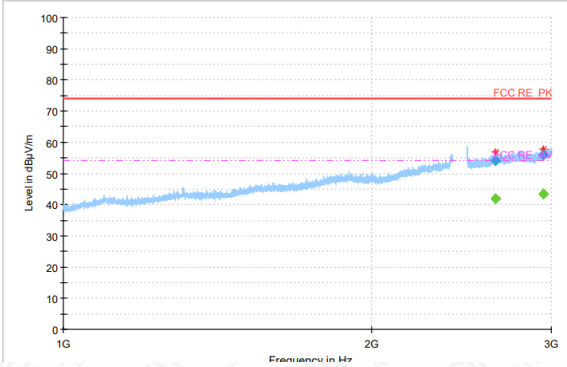
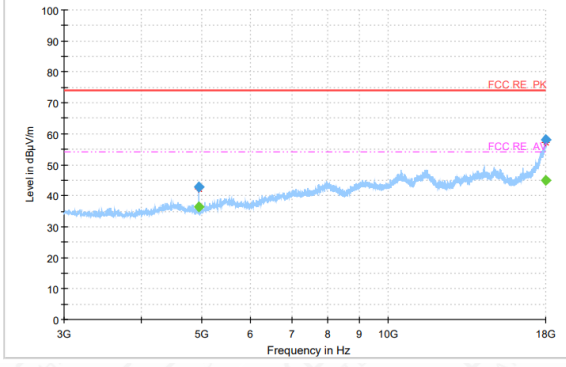
Bandedge



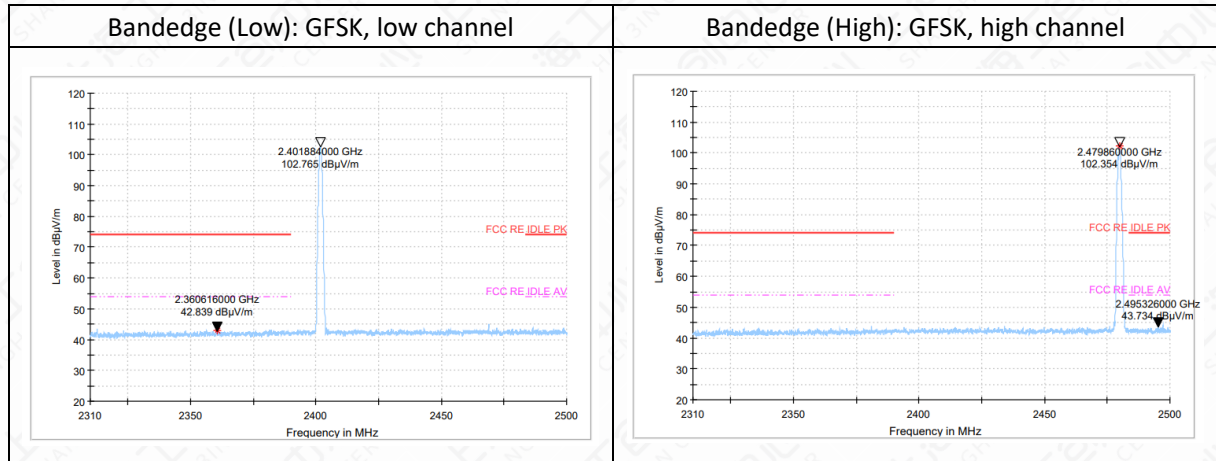


**Secondary supply(S21)**

|                                                                                                                                      |                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <p>Radiated emission: GFSK, Ch0, 30MHz~1GHz</p>     | <p>Radiated emission: GFSK, Ch0, 1GHz~3GHz</p>     |
| <p>Radiated emission: GFSK, Ch0, 3GHz~18GHz</p>    | <p>/</p>                                                                                                                             |
| <p>Radiated emission: GFSK, Ch39, 30MHz~1GHz</p>  | <p>Radiated emission: GFSK, Ch39, 1GHz~3GHz</p>  |

|                                                                                                                                      |                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <p>Radiated emission: GFSK, Ch39, 3GHz~18GHz</p>    | <p>/</p>                                                                                                                            |
| <p>Radiated emission: GFSK, Ch78, 30MHz~1GHz</p>   | <p>Radiated emission: GFSK, Ch78, 1GHz~3GHz</p>  |
| <p>Radiated emission: GFSK, Ch78, 3GHz~18GHz</p>  | <p>/</p>                                                                                                                            |

## Bandedge



### Note:

1. The out-of- limit signal in the picture is the main frequency signal.
2. Only data in worst mode is provided.
3. Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier, the Emissions in the frequency band 18GHz-26.5GHz is more than 20dB below the limit are not report.
4. The test data below 30MHz is more than 20dB lower than the limit value, so it is not provided in the report.
5. Horizontal and vertical polarity is all have been tested, the result of them is synthesized in the above data diagram.



### Mainly Supply (S14)

#### GFSK Ch0 30M-1G

| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|--------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 31.882660       | 9.97               | 40.00          | 30.03       | 1000.0         | 120.000         | 100.0       | V   | 176.0         |
| 35.186488       | 9.53               | 40.00          | 30.47       | 1000.0         | 120.000         | 200.0       | V   | 176.0         |

#### GFSK Ch0 1G-3G

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 2577.503000     | 53.98            | ---              | 74.00          | 20.02       | 500.0          | 1000.000        | 200.0       | H   | 319.0         |
| 2577.503000     | ---              | 41.02            | 54.00          | 12.98       | 500.0          | 1000.000        | 200.0       | H   | 319.0         |
| 2792.785938     | 55.53            | ---              | 74.00          | 18.47       | 500.0          | 1000.000        | 200.0       | H   | 297.0         |
| 2792.785938     | ---              | 42.73            | 54.00          | 11.27       | 500.0          | 1000.000        | 200.0       | H   | 297.0         |

#### GFSK Ch0 3G-18G

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 4803.750000     | ---              | 41.89            | 54.00          | 12.11       | 500.0          | 1000.000        | 100.0       | H   | 187.0         |
| 4803.750000     | 47.12            | ---              | 74.00          | 26.88       | 500.0          | 1000.000        | 100.0       | H   | 187.0         |
| 10502.375000    | ---              | 32.79            | 54.00          | 21.21       | 500.0          | 1000.000        | 100.0       | V   | 80.0          |
| 10502.375000    | 45.34            | ---              | 74.00          | 28.66       | 500.0          | 1000.000        | 100.0       | V   | 80.0          |

#### GFSK Ch78 30M-1G

| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|--------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 32.322980       | 11.15              | 40.00          | 28.85       | 1000.0         | 120.000         | 100.0       | V   | 182.0         |
| 36.144012       | 10.25              | 40.00          | 29.75       | 1000.0         | 120.000         | 100.0       | V   | 47.0          |

#### GFSK Ch78 1G-3G

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 2674.831688     | ---              | 41.88            | 54.00          | 12.12       | 500.0          | 1000.000        | 200.0       | V   | 2674.831688   |
| 2674.831688     | 54.44            | ---              | 74.00          | 19.56       | 500.0          | 1000.000        | 200.0       | V   | 2674.831688   |
| 2947.317000     | ---              | 43.31            | 54.00          | 10.69       | 500.0          | 1000.000        | 200.0       | V   | 2947.317000   |
| 2947.317000     | 56.13            | ---              | 74.00          | 17.87       | 500.0          | 1000.000        | 200.0       | V   | 2947.317000   |

#### GFSK Ch78 3G-18G

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 4960.375000     | 44.47            | ---              | 74.00          | 29.53       | 500.0          | 1000.000        | 200.0       | H   | 4960.375000   |
| 4960.375000     | ---              | 29.87            | 54.00          | 24.13       | 500.0          | 1000.000        | 200.0       | H   | 4960.375000   |
| 10440.875000    | 45.28            | ---              | 74.00          | 28.72       | 500.0          | 1000.000        | 200.0       | H   | 10440.875000  |
| 10440.875000    | ---              | 32.82            | 54.00          | 21.18       | 500.0          | 1000.000        | 200.0       | H   | 10440.875000  |

$\pi/4$  DQPSK Ch0 30M-1G

| Frequency (MHz) | QuasiPeak (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|--------------------------|----------------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 31.989008       | 9.43                     | 40.00                | 30.57       | 1000.0         | 120.000         | 100.0       | V   | 18.0          |
| 35.435780       | 9.99                     | 40.00                | 30.01       | 1000.0         | 120.000         | 100.0       | V   | 145.0         |

 $\pi/4$  DQPSK Ch0 1G-3G

| Frequency (MHz) | MaxPeak (dB $\mu$ V/m) | Average (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------------|------------------------|----------------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 2712.938625     | ---                    | 41.71                  | 54.00                | 12.29       | 500.0          | 1000.000        | 100.0       | H   | 2712.938625   |
| 2712.938625     | 54.46                  | ---                    | 74.00                | 19.54       | 500.0          | 1000.000        | 100.0       | H   | 2712.938625   |
| 2977.144875     | ---                    | 43.50                  | 54.00                | 10.50       | 500.0          | 1000.000        | 100.0       | V   | 2977.144875   |
| 2977.144875     | 56.23                  | ---                    | 74.00                | 17.77       | 500.0          | 1000.000        | 100.0       | V   | 2977.144875   |

 $\pi/4$  DQPSK Ch0 3G-18G

| Frequency (MHz) | MaxPeak (dB $\mu$ V/m) | Average (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------------|------------------------|----------------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 4804.250000     | ---                    | 32.17                  | 54.00                | 21.83       | 500.0          | 1000.000        | 100.0       | H   | 182.0         |
| 4804.250000     | 44.12                  | ---                    | 74.00                | 29.88       | 500.0          | 1000.000        | 100.0       | H   | 182.0         |
| 11520.000000    | ---                    | 34.53                  | 54.00                | 19.47       | 500.0          | 1000.000        | 100.0       | V   | 144.0         |
| 11520.000000    | 47.50                  | ---                    | 74.00                | 26.50       | 500.0          | 1000.000        | 100.0       | V   | 144.0         |

 $\pi/4$  DQPSK Ch78 30M-1G

| Frequency (MHz) | QuasiPeak (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|--------------------------|----------------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 31.937224       | 10.40                    | 40.00                | 29.60       | 1000.0         | 120.000         | 100.0       | V   | 184.0         |
| 36.065180       | 9.90                     | 40.00                | 30.10       | 1000.0         | 120.000         | 100.0       | V   | 65.0          |

 $\pi/4$  DQPSK Ch78 1G-3G

| Frequency (MHz) | MaxPeak (dB $\mu$ V/m) | Average (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------------|------------------------|----------------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 2742.460188     | ---                    | 42.36                  | 54.00                | 11.64       | 500.0          | 1000.000        | 100.0       | H   | 272.0         |
| 2742.460188     | 55.60                  | ---                    | 74.00                | 18.40       | 500.0          | 1000.000        | 100.0       | H   | 272.0         |
| 2988.039438     | ---                    | 43.75                  | 54.00                | 10.25       | 500.0          | 1000.000        | 100.0       | V   | -27.0         |
| 2988.039438     | 56.60                  | ---                    | 74.00                | 17.40       | 500.0          | 1000.000        | 100.0       | V   | -27.0         |

 $\pi/4$  DQPSK Ch78 3G-18G

| Frequency (MHz) | MaxPeak (dB $\mu$ V/m) | Average (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------------|------------------------|----------------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 7964.500000     | ---                    | 30.93                  | 54.00                | 23.07       | 500.0          | 1000.000        | 100.0       | H   | -13.0         |
| 7964.500000     | 43.42                  | ---                    | 74.00                | 30.58       | 500.0          | 1000.000        | 100.0       | H   | -13.0         |
| 10551.125000    | ---                    | 32.21                  | 54.00                | 21.79       | 500.0          | 1000.000        | 100.0       | V   | 113.0         |
| 10551.125000    | 44.70                  | ---                    | 74.00                | 29.30       | 500.0          | 1000.000        | 100.0       | V   | 113.0         |

## 8DPSK Ch0 30M-1G

| Frequency (MHz) | QuasiPeak (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|--------------------------|----------------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 32.291492       | 11.21                    | 40.00                | 28.79       | 1000.0         | 120.000         | 100.0       | V   | 198.0         |



|           |      |       |       |        |         |       |   |      |
|-----------|------|-------|-------|--------|---------|-------|---|------|
| 36.087708 | 9.95 | 40.00 | 30.05 | 1000.0 | 120.000 | 100.0 | V | 79.0 |
|-----------|------|-------|-------|--------|---------|-------|---|------|

**8DPSK Ch0 1G-3G**

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 2630.363188     | 53.97            | ---              | 74.00          | 20.03       | 500.0          | 1000.000        | 100.0       | V   | 335.0         |
| 2630.363188     | ---              | 41.59            | 54.00          | 12.41       | 500.0          | 1000.000        | 100.0       | V   | 335.0         |
| 2781.681188     | ---              | 42.60            | 54.00          | 11.40       | 500.0          | 1000.000        | 100.0       | H   | 42.0          |
| 2781.681188     | 55.90            | ---              | 74.00          | 18.10       | 500.0          | 1000.000        | 100.0       | H   | 42.0          |

**8DPSK Ch0 3G-18G**

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 7988.500000     | ---              | 31.15            | 54.00          | 22.85       | 500.0          | 1000.000        | 100.0       | V   | 24.0          |
| 7988.500000     | 43.62            | ---              | 74.00          | 30.38       | 500.0          | 1000.000        | 100.0       | V   | 24.0          |
| 17924.500000    | ---              | 43.09            | 54.00          | 10.91       | 500.0          | 1000.000        | 100.0       | V   | 191.0         |
| 17924.500000    | 55.95            | ---              | 74.00          | 18.05       | 500.0          | 1000.000        | 100.0       | V   | 191.0         |

**8DPSK Ch78 30M-1G**

| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|--------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 32.828836       | 9.74               | 40.00          | 30.26       | 1000.0         | 120.000         | 100.0       | V   | 0.0           |
| 35.178236       | 9.65               | 40.00          | 30.35       | 1000.0         | 120.000         | 100.0       | V   | 47.0          |

**8DPSK Ch78 1G-3G**

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 2644.616438     | 54.11            | ---              | 74.00          | 19.89       | 500.0          | 1000.000        | 100.0       | V   | 216.0         |
| 2644.616438     | ---              | 41.71            | 54.00          | 12.29       | 500.0          | 1000.000        | 100.0       | V   | 216.0         |
| 2912.986250     | 55.47            | ---              | 74.00          | 18.53       | 500.0          | 1000.000        | 100.0       | V   | 187.0         |
| 2912.986250     | ---              | 42.61            | 54.00          | 11.39       | 500.0          | 1000.000        | 100.0       | V   | 187.0         |

**8DPSK Ch78 3G-18G**

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|------------------|------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 4960.375000     | ---              | 27.98            | 54.00          | 26.02       | 500.0          | 1000.000        | 100.0       | H   | 190.0         |
| 4960.375000     | 43.52            | ---              | 74.00          | 30.48       | 500.0          | 1000.000        | 100.0       | H   | 190.0         |
| 17967.625000    | ---              | 44.02            | 54.00          | 9.98        | 500.0          | 1000.000        | 100.0       | H   | 244.0         |
| 17967.625000    | 57.12            | ---              | 74.00          | 16.88       | 500.0          | 1000.000        | 100.0       | H   | 244.0         |

**Secondary supply(S21)**
**GFSK Ch0 30M-1G**

| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) |
|-----------------|--------------------|----------------|-------------|----------------|-----------------|-------------|-----|---------------|
| 31.753304       | 26.31              | 40.00          | 13.69       | 1000.0         | 120.000         | 100.0       | V   | 351.0         |
| 35.168864       | 26.86              | 40.00          | 13.14       | 1000.0         | 120.000         | 100.0       | V   | 47.0          |

**GFSK Ch0 1G-3G**

| Frequency | MaxPeak | Average | Limit | Margin | Meas.Time | Bandwidth | Height | Pol | Azimuth |
|-----------|---------|---------|-------|--------|-----------|-----------|--------|-----|---------|
|-----------|---------|---------|-------|--------|-----------|-----------|--------|-----|---------|



| (MHz)       | (dBμV/m) | (dBμV/m) | (dBμV/m) | (dB)  | (ms)  | (kHz)    | (cm)  |   | (deg) |
|-------------|----------|----------|----------|-------|-------|----------|-------|---|-------|
| 2644.066938 | ---      | 41.74    | 54.00    | 12.26 | 500.0 | 1000.000 | 100.0 | H | 32.0  |
| 2644.066938 | 54.78    | ---      | 74.00    | 19.22 | 500.0 | 1000.000 | 100.0 | H | 32.0  |
| 2811.573625 | ---      | 42.43    | 54.00    | 11.57 | 500.0 | 1000.000 | 100.0 | V | 86.0  |
| 2811.573625 | 56.06    | ---      | 74.00    | 17.94 | 500.0 | 1000.000 | 100.0 | V | 86.0  |

## GFSK Ch0 3G-18G

| Frequency<br>(MHz) | MaxPeak<br>(dBμV/m) | Average<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) | Meas.Time<br>(ms) | Bandwidth<br>(kHz) | Height<br>(cm) | Pol | Azimuth<br>(deg) |
|--------------------|---------------------|---------------------|-------------------|----------------|-------------------|--------------------|----------------|-----|------------------|
| 4803.750000        | ---                 | 40.53               | 54.00             | 13.47          | 500.0             | 1000.000           | 100.0          | H   | 242.0            |
| 4803.750000        | 46.24               | ---                 | 74.00             | 27.76          | 500.0             | 1000.000           | 100.0          | H   | 242.0            |
| 17999.500000       | ---                 | 45.08               | 54.00             | 8.92           | 500.0             | 1000.000           | 100.0          | H   | 261.0            |
| 17999.500000       | 57.50               | ---                 | 74.00             | 16.50          | 500.0             | 1000.000           | 100.0          | H   | 261.0            |

## GFSK Ch78 30M-1G

| Frequency<br>(MHz) | QuasiPeak<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) | Meas.Time<br>(ms) | Bandwidth<br>(kHz) | Height<br>(cm) | Pol | Azimuth<br>(deg) |
|--------------------|-----------------------|-------------------|----------------|-------------------|--------------------|----------------|-----|------------------|
| 31.628184          | 22.44                 | 40.00             | 17.56          | 1000.0            | 120.000            | 100.0          | V   | 328.0            |
| 35.200164          | 22.32                 | 40.00             | 17.68          | 1000.0            | 120.000            | 100.0          | V   | 314.0            |

## GFSK Ch78 1G-3G

| Frequency<br>(MHz) | MaxPeak<br>(dBμV/m) | Average<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) | Meas.Time<br>(ms) | Bandwidth<br>(kHz) | Height<br>(cm) | Pol | Azimuth<br>(deg) |
|--------------------|---------------------|---------------------|-------------------|----------------|-------------------|--------------------|----------------|-----|------------------|
| 2643.244125        | 53.99               | ---                 | 74.00             | 20.01          | 500.0             | 1000.000           | 100.0          | V   | 269.0            |
| 2643.244125        | ---                 | 41.77               | 54.00             | 12.23          | 500.0             | 1000.000           | 100.0          | V   | 269.0            |
| 2948.301938        | 55.87               | ---                 | 74.00             | 18.13          | 500.0             | 1000.000           | 100.0          | V   | 316.0            |
| 2948.301938        | ---                 | 43.40               | 54.00             | 10.60          | 500.0             | 1000.000           | 100.0          | V   | 316.0            |

## GFSK Ch78 3G-18G

| Frequency<br>(MHz) | MaxPeak<br>(dBμV/m) | Average<br>(dBμV/m) | Limit<br>(dBμV/m) | Margin<br>(dB) | Meas.Time<br>(ms) | Bandwidth<br>(kHz) | Height<br>(cm) | Pol | Azimuth<br>(deg) |
|--------------------|---------------------|---------------------|-------------------|----------------|-------------------|--------------------|----------------|-----|------------------|
| 4959.875000        | ---                 | 36.42               | 54.00             | 17.58          | 500.0             | 1000.000           | 100.0          | H   | 71.0             |
| 4959.875000        | 42.92               | ---                 | 74.00             | 31.08          | 500.0             | 1000.000           | 100.0          | H   | 71.0             |
| 17997.625000       | ---                 | 44.88               | 54.00             | 9.12           | 500.0             | 1000.000           | 100.0          | V   | 308.0            |
| 17997.625000       | 58.02               | ---                 | 74.00             | 15.98          | 500.0             | 1000.000           | 100.0          | V   | 308.0            |

Note: Only the worst case is written in the report.

## 6.5 Time Of Occupancy (Dwell Time)

### 6.5.1 Measurement Limit

| Standard                         | Limit(ms) |
|----------------------------------|-----------|
| FCC 47 Part 15.247 (a) (1) (iii) | <400      |

### 6.5.2 Test procedures

The measurement is according to ANSI C63.10 clause 7.8.4

1. Connect the EUT through cable and divide with spectrum analyzer.
2. Enable the EUT transmit maximum power.
3. Set the spectrum analyzer as step 4 to step 8.
4. Span: Zero span, centered on a hopping channel.
5. RBW shall be  $\leq$  channel spacing and where possible RBW should be set  $\gg 1/T$ , where T is the expected dwell time per channel.
6. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
7. Detector function: Peak.
8. Trace: Clear-write, single sweep
9. Place markers at the start of the first transmission on the channel and at the end of the last transmission. The dwell time per hop is the time between these two markers.

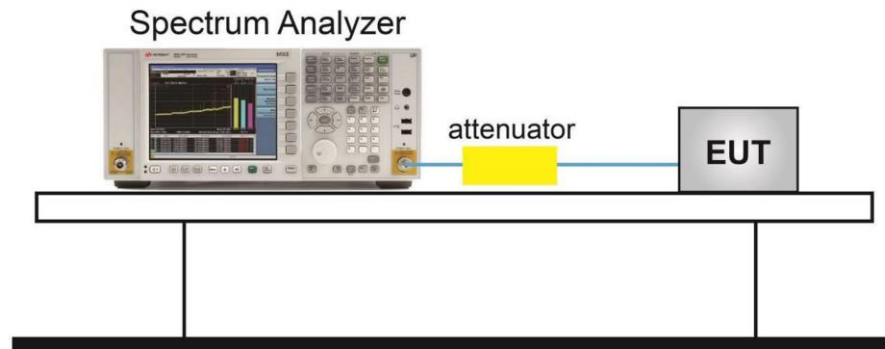
To determine the number of hops on a channel in the regulatory observation period repeat the measurement using a longer sweep time. When the device uses a single hopping sequence the period of measurement should be sufficient to capture at least 2 hops. When the device uses a dynamic hopping sequence, or the sequence varies, the period of measurement may need to capture multiple hops to better determine the average time of occupancy. Count the number of hops on the channel across the sweep time. The average number of hops on the same channel within the regulatory observation period is calculated from the number of hops on the channel divided by the spectrum analyzer sweep time multiplied by the regulatory observation period. For example, if three hops are counted with an analyzer sweep time of 500 ms and the regulatory observation period is 10 s, then the number of hops in that ten seconds is  $3 / 0.5 \times 10$ , or 60 hops.

The average time of occupancy is calculated by multiplying the dwell time per hop by the number of hops in the observation period. Where the device shares the same hopping algorithms (dwell time, channel selection) across multiple data rates or modulation schemes then the time of occupancy need only be measured for one of those modulation schemes or data rates. If the dwell time value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in dwell time.

Spectral plots of the channel occupancy shall be included in the report.



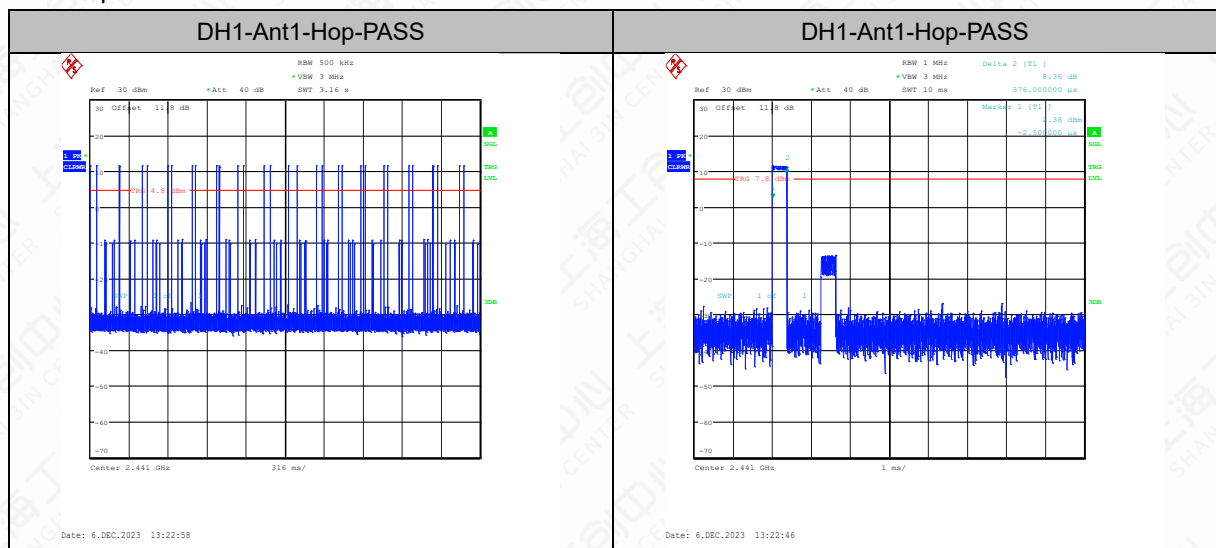
### 6.5.3 Test Setup



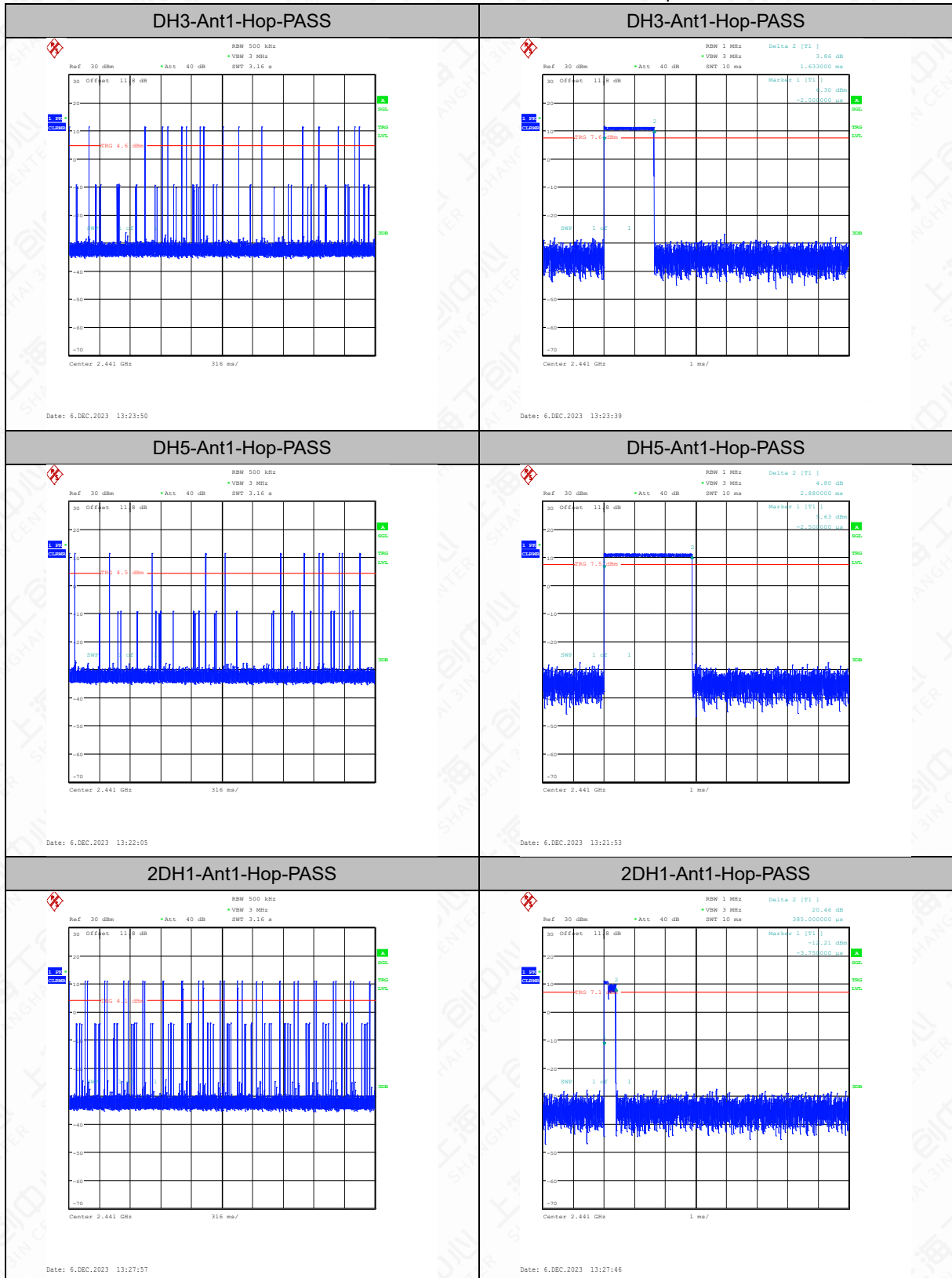
### Measurement Results

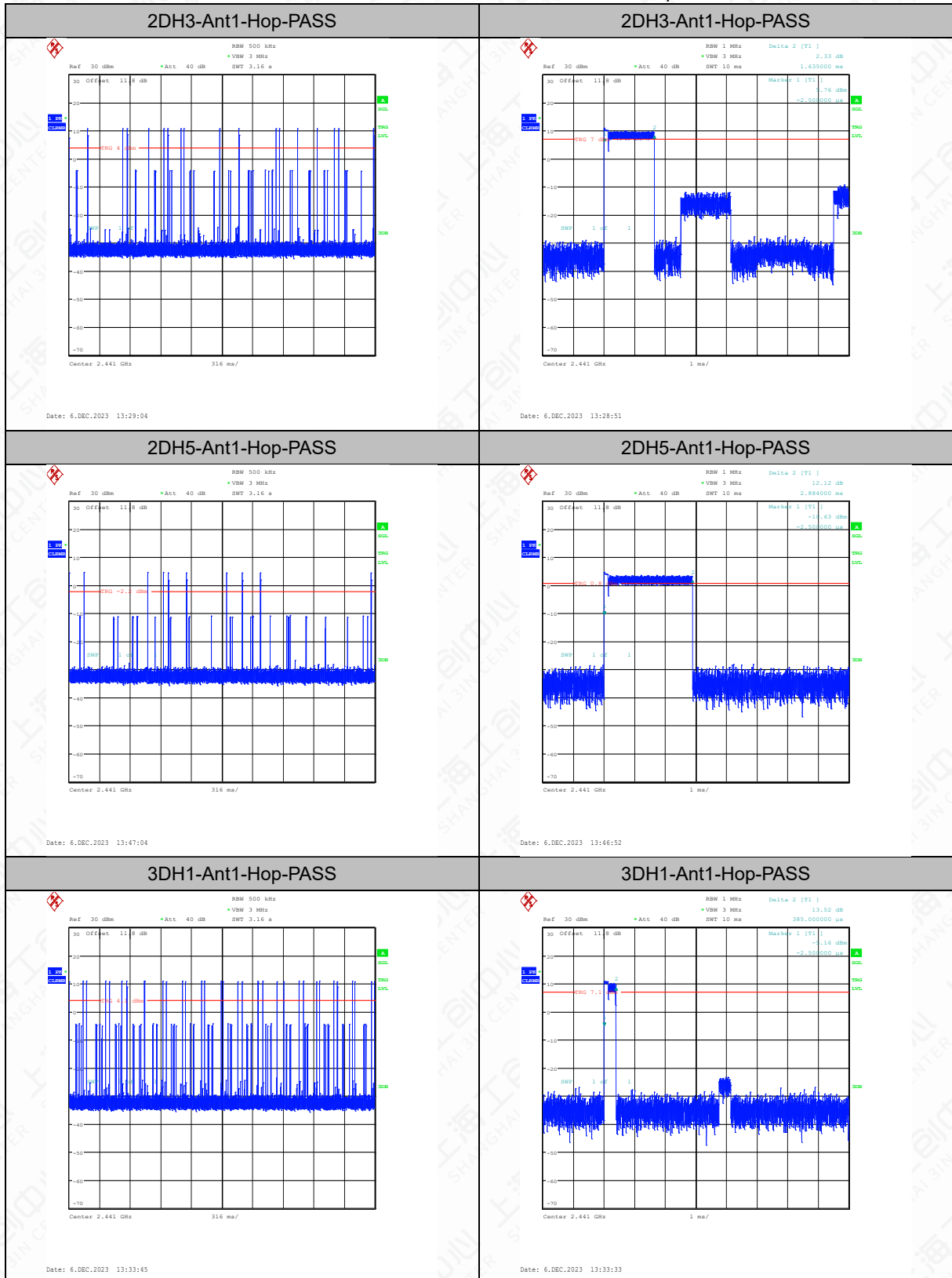
| TestMode | Antenna | Frequency[MHz] | BurstWidth [ms] | TotalHops [Num] | Result[s] | Limit[s] | Verdict |
|----------|---------|----------------|-----------------|-----------------|-----------|----------|---------|
| DH1      | Ant1    | Hop            | 0.376           | 320             | 0.12      | ≤0.4     | PASS    |
| DH3      | Ant1    | Hop            | 1.633           | 170             | 0.278     | ≤0.4     | PASS    |
| DH5      | Ant1    | Hop            | 2.880           | 130             | 0.374     | ≤0.4     | PASS    |
| 2DH1     | Ant1    | Hop            | 0.385           | 320             | 0.123     | ≤0.4     | PASS    |
| 2DH3     | Ant1    | Hop            | 1.635           | 180             | 0.294     | ≤0.4     | PASS    |
| 2DH5     | Ant1    | Hop            | 2.884           | 100             | 0.288     | ≤0.4     | PASS    |
| 3DH1     | Ant1    | Hop            | 0.385           | 330             | 0.127     | ≤0.4     | PASS    |
| 3DH3     | Ant1    | Hop            | 1.635           | 160             | 0.262     | ≤0.4     | PASS    |
| 3DH5     | Ant1    | Hop            | 2.886           | 110             | 0.317     | ≤0.4     | PASS    |

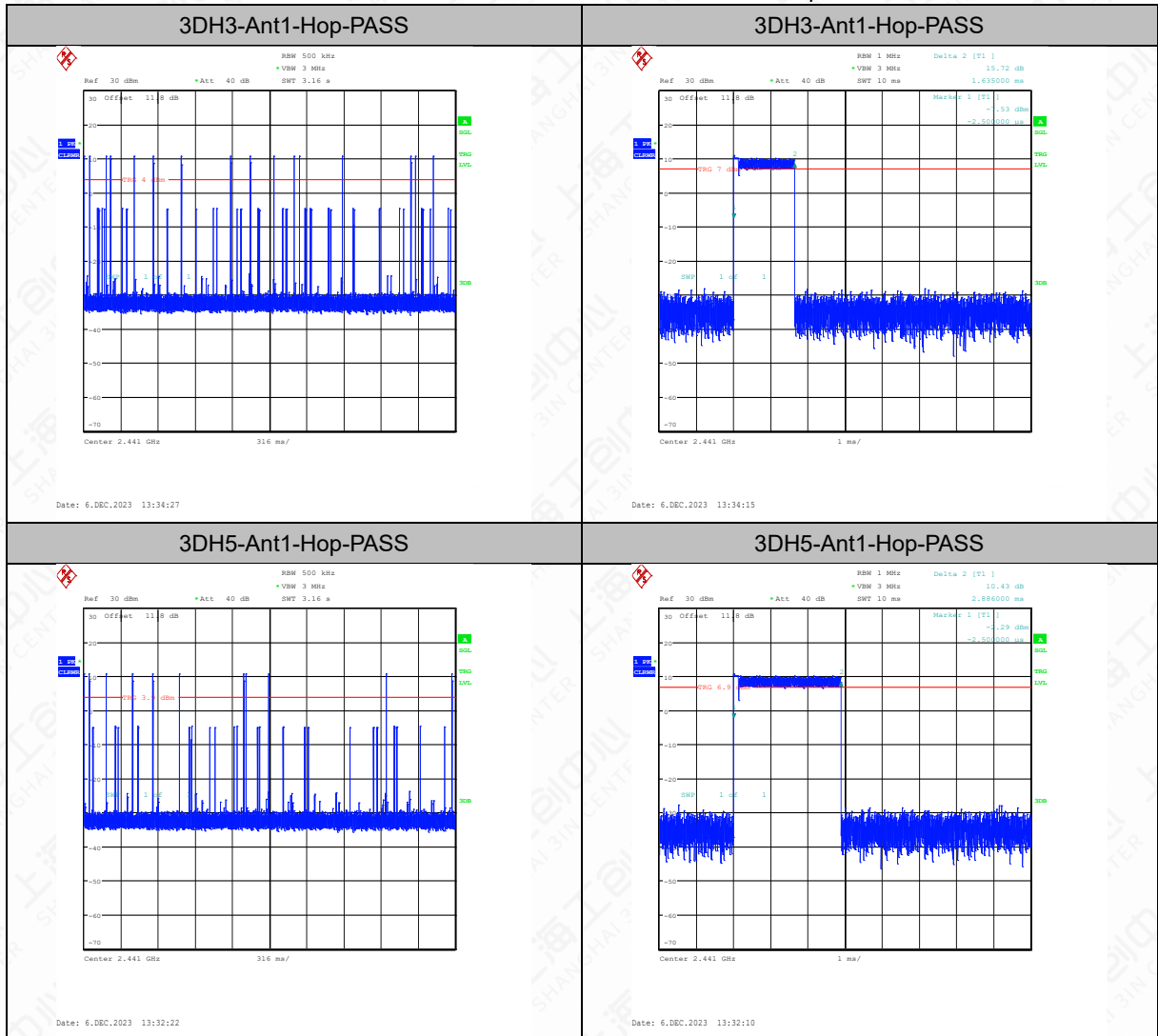
### Test Graphs













## 6.6 20dB Bandwidth

### 6.6.1 Measurement Limit

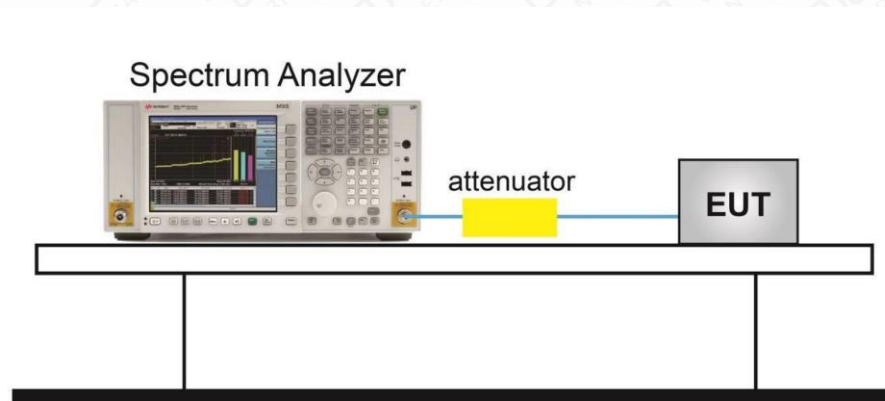
| Standard              | Limit |
|-----------------------|-------|
| FCC 47 Part 15.247(a) | N/A   |

### 6.6.2 Test procedures

The measurement is according to ANSI C63.10 clause 7.8.7

1. Connect the EUT through cable and divide with CMW270 and spectrum analyzer.
2. Enable the EUT transmit maximum power.
3. Set the spectrum analyzer as step 4 to step 7.
4. Span: two or five times of OBW
5. RBW= 1% to 5% of the OBW; VBW is approximately three times of RBW; Max Hold.
6. Select the max peak, and N DB DOWN=20dB.
7. Record the results.

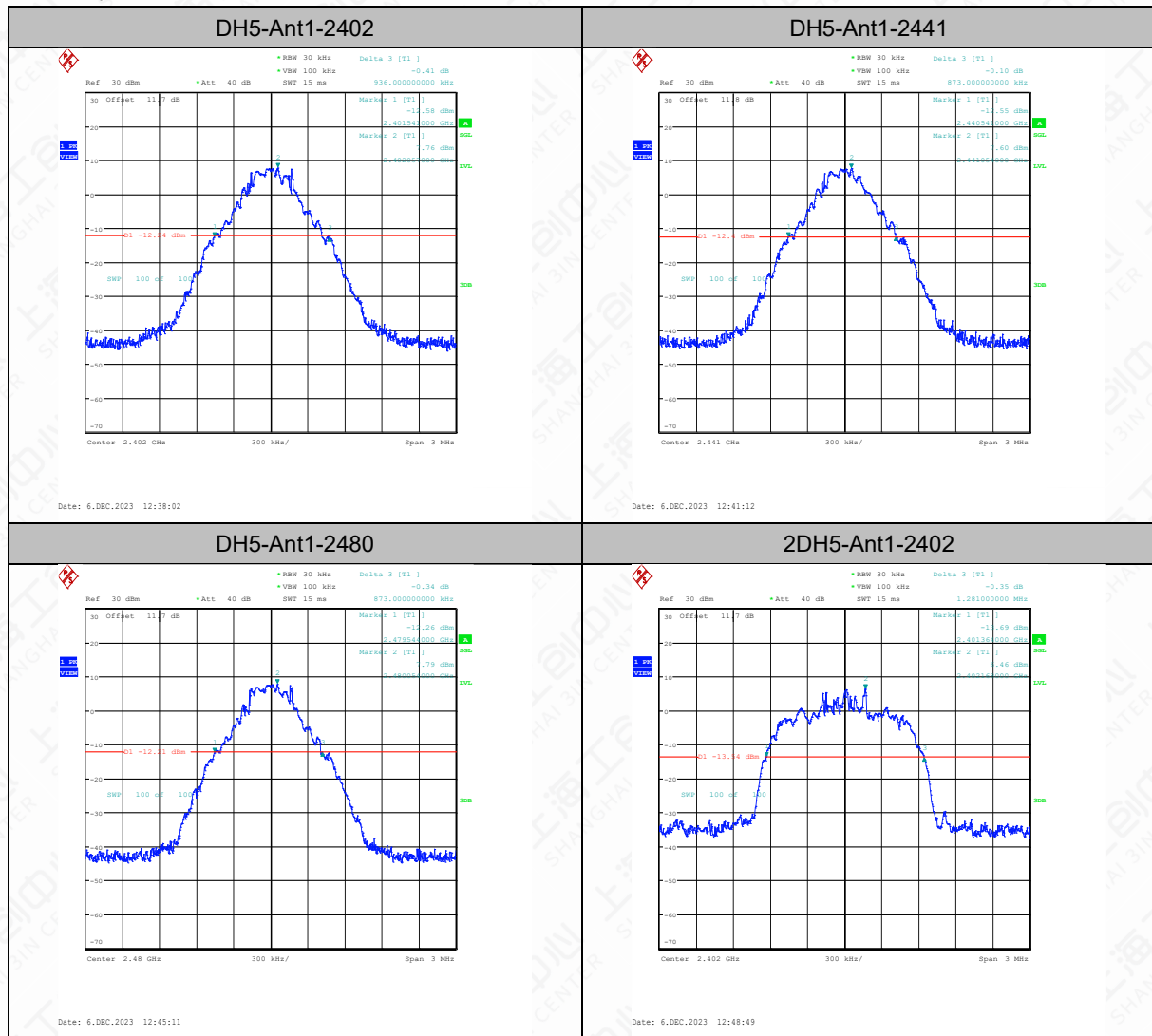
### 6.6.3 Test Setup

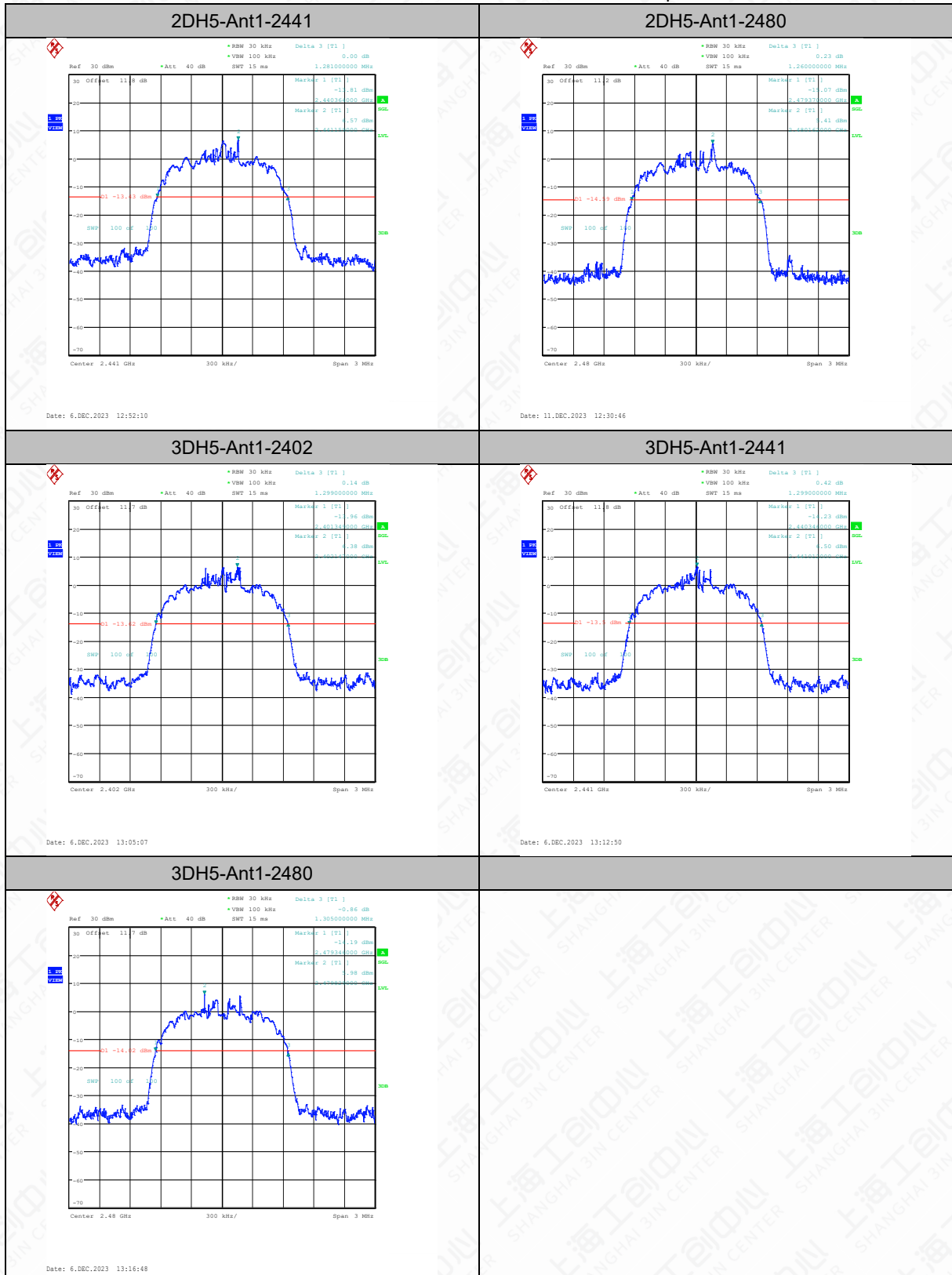


## 6.6.4 Measurement Result

| TestMode | Antenna | Frequency[MHz] | 20db<br>EBW[MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|----------|---------|----------------|------------------|---------|---------|------------|---------|
| DH5      | Ant1    | 2402           | 0.94             | 2401.54 | 2402.48 | ---        | ---     |
| DH5      | Ant1    | 2441           | 0.87             | 2440.54 | 2441.41 | ---        | ---     |
| DH5      | Ant1    | 2480           | 0.87             | 2479.54 | 2480.42 | ---        | ---     |
| 2DH5     | Ant1    | 2402           | 1.28             | 2401.36 | 2402.65 | ---        | ---     |
| 2DH5     | Ant1    | 2441           | 1.28             | 2440.36 | 2441.65 | ---        | ---     |
| 2DH5     | Ant1    | 2480           | 1.26             | 2479.37 | 2480.63 | ---        | ---     |
| 3DH5     | Ant1    | 2402           | 1.30             | 2401.35 | 2402.65 | ---        | ---     |
| 3DH5     | Ant1    | 2441           | 1.30             | 2440.35 | 2441.65 | ---        | ---     |
| 3DH5     | Ant1    | 2480           | 1.30             | 2479.35 | 2480.65 | ---        | ---     |

## Test Graphs







## 6.7 99% Occupied Bandwidth

### 6.7.1 Measurement Limit

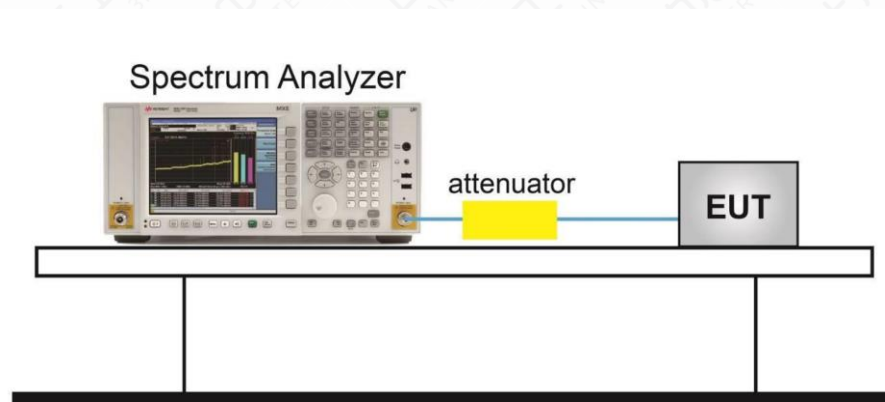
| Standard  | Limit |
|-----------|-------|
| 15.247(a) | N/A   |

### 6.7.2 Test procedures

The measurement is according to ANSI C63.10 clause 6.9.3.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set RBW shall be in the range of 1% to 5% of the OBW.
4. Set the VBW  $\geq [3 \times \text{RBW}]$ .
5. Detector = peak.
6. Trace mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize.
9. The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

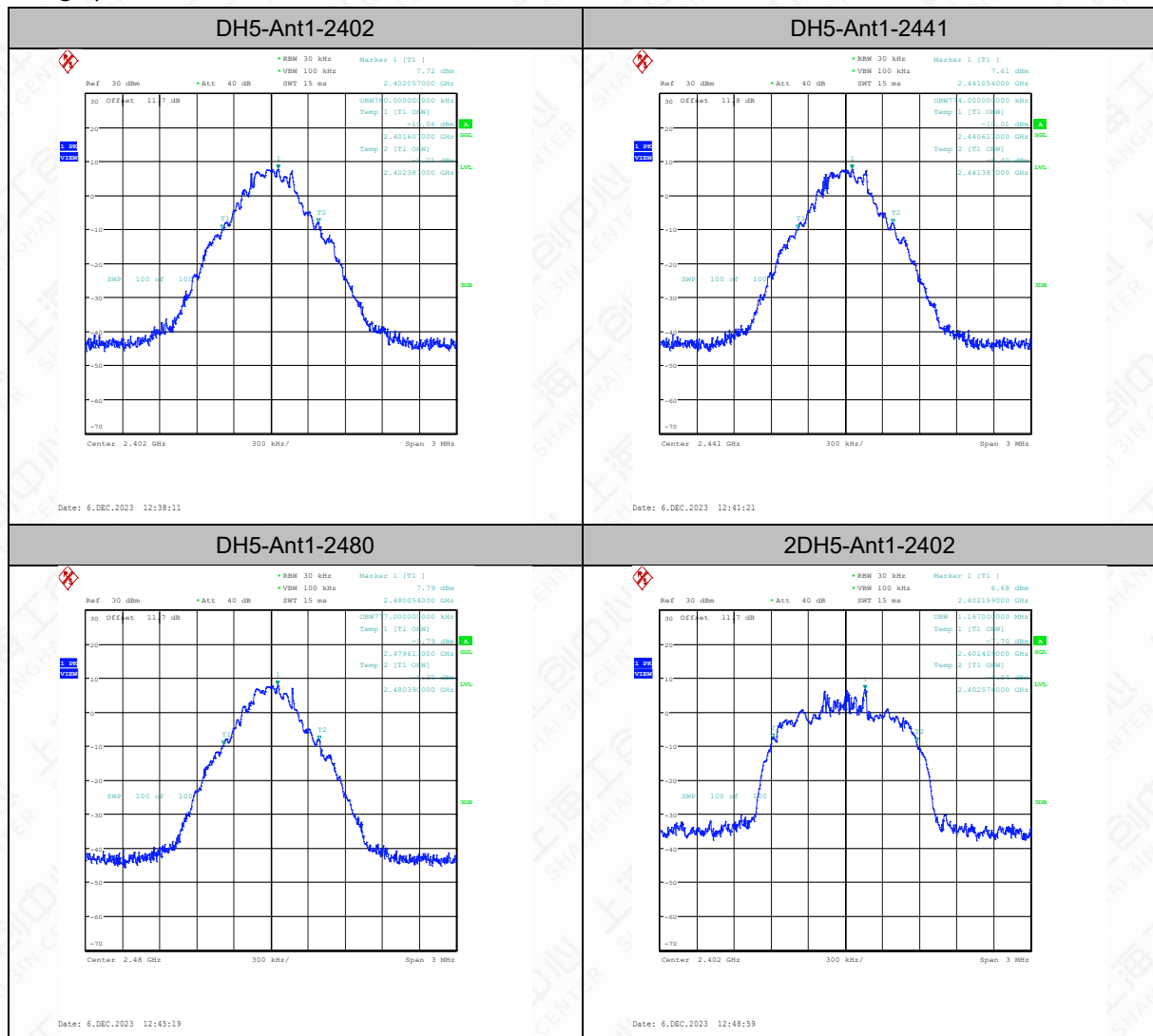
### 6.7.3 Test setup

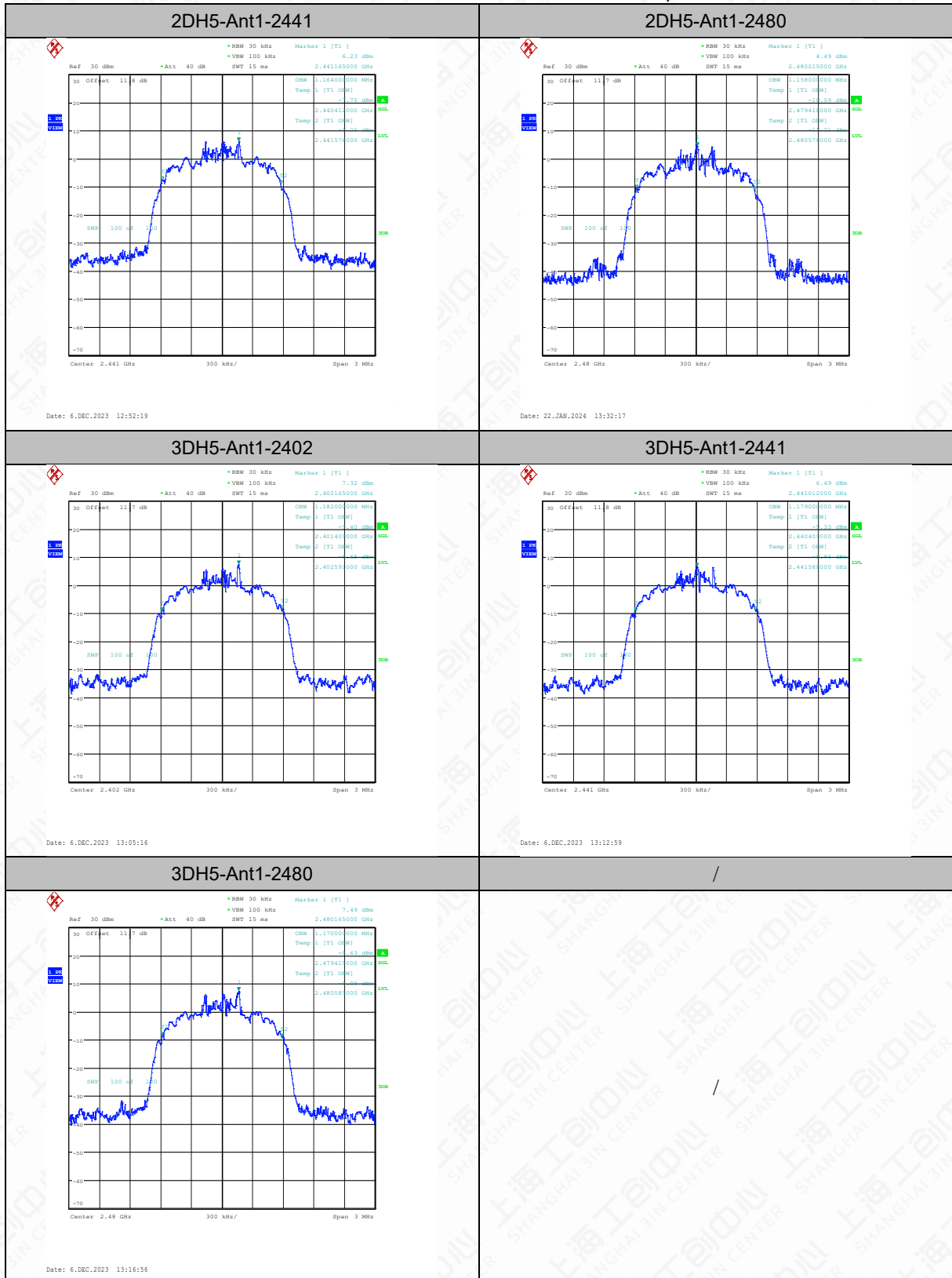


## 6.7.4 Measurement Result

| TestMode | Antenna | Frequency[MHz] | OCB [MHz] | FL[MHz]   | FH[MHz]   | Limit[MHz] | Verdict |
|----------|---------|----------------|-----------|-----------|-----------|------------|---------|
| DH5      | Ant1    | 2402           | 0.78      | 2401.6070 | 2402.3870 | ---        | ---     |
| DH5      | Ant1    | 2441           | 0.774     | 2440.6130 | 2441.3870 | ---        | ---     |
| DH5      | Ant1    | 2480           | 0.777     | 2479.6130 | 2480.3900 | ---        | ---     |
| 2DH5     | Ant1    | 2402           | 1.167     | 2401.4090 | 2402.5760 | ---        | ---     |
| 2DH5     | Ant1    | 2441           | 1.164     | 2440.4120 | 2441.5760 | ---        | ---     |
| 2DH5     | Ant1    | 2480           | 1.158     | 2479.4180 | 2480.5760 | ---        | ---     |
| 3DH5     | Ant1    | 2402           | 1.182     | 2401.4090 | 2402.5910 | ---        | ---     |
| 3DH5     | Ant1    | 2441           | 1.179     | 2440.4090 | 2441.5880 | ---        | ---     |
| 3DH5     | Ant1    | 2480           | 1.17      | 2479.4150 | 2480.5850 | ---        | ---     |

### Test graphs







## 6.8 Carrier Frequency Separation

### 6.8.1 Measurement Limit

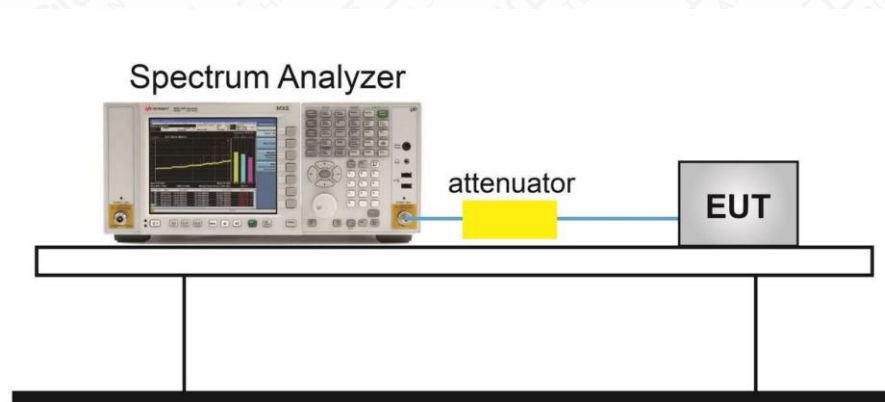
| Standard                   | Limit(KHz)                                                                                    |
|----------------------------|-----------------------------------------------------------------------------------------------|
| FCC 47 Part 15.247 (a) (1) | GFSK: Over 25kHz or 20dB bandwidth<br>$\pi/4$ DQPSK; 8DPSK: Over 25kHz or $(2/3)*20\text{dB}$ |

### 6.8.2 Test procedures

The measurement is according to ANSI C63.10 clause 7.8.2.

1. Connect the EUT through cable and divide and spectrum analyzer.
2. Enable the EUT transmit in hopping mode.
3. Span: Wide enough to capture the peaks of two adjacent channels.
4. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
5. Video (or average) bandwidth (VBW)  $\geq$  RBW.
6. Sweep: Auto.
7. Detector function: Peak.
8. Trace: Max hold.
9. Allow the trace to stabilize.

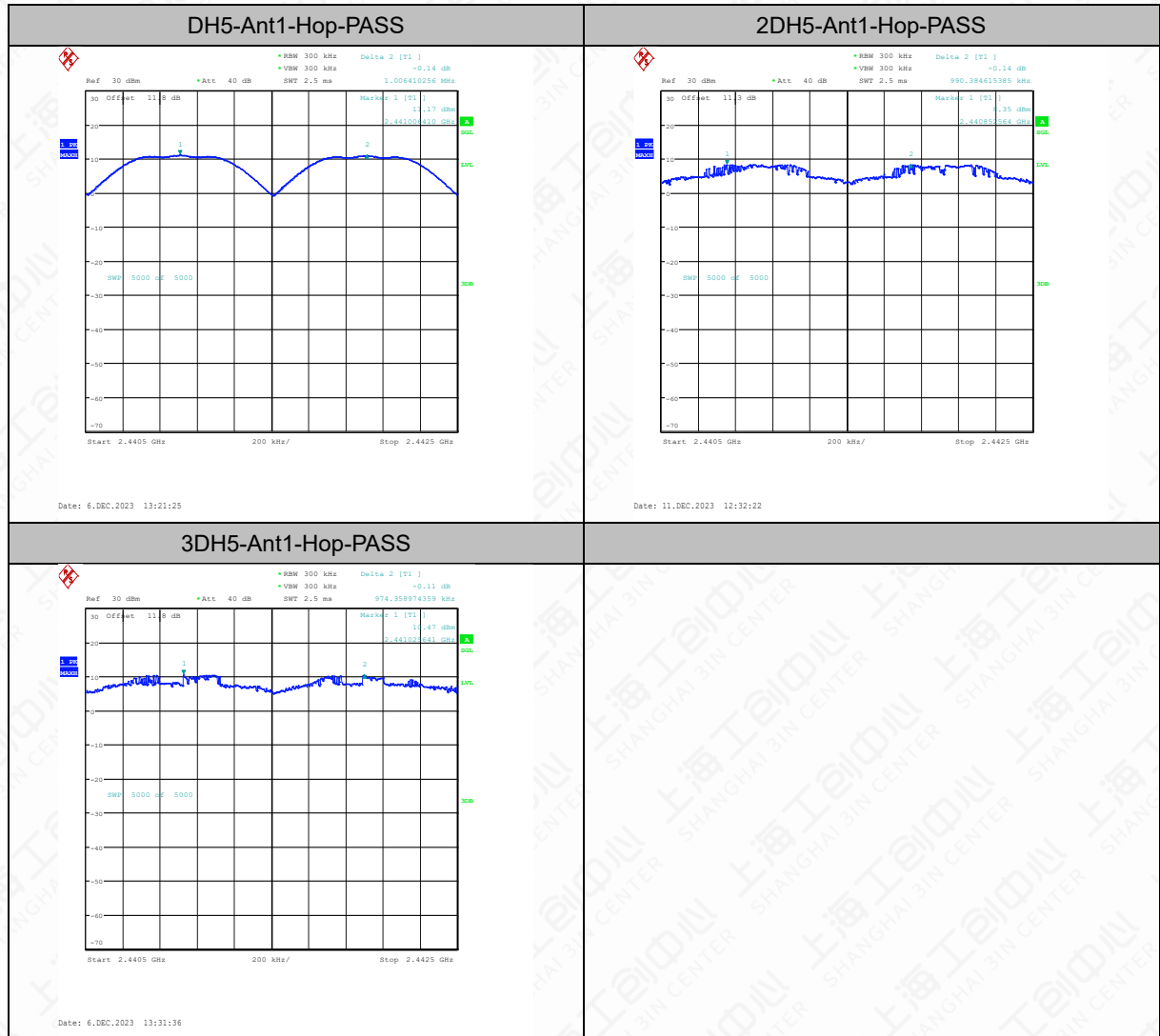
### 6.8.3 Test Setup



### 6.8.4 Measurement Result

| TestMode | Antenna | Frequency[MHz] | Result[MHz] | Limit[MHz]   | Verdict |
|----------|---------|----------------|-------------|--------------|---------|
| DH5      | Ant1    | Hop            | 1.006       | $\geq 0.940$ | PASS    |
| 2DH5     | Ant1    | Hop            | 0.99        | $\geq 0.853$ | PASS    |
| 3DH5     | Ant1    | Hop            | 0.974       | $\geq 0.867$ | PASS    |

### Test Graphs



## 6.9 Number Of Hopping Channels

### 6.9.1 Measurement Limit

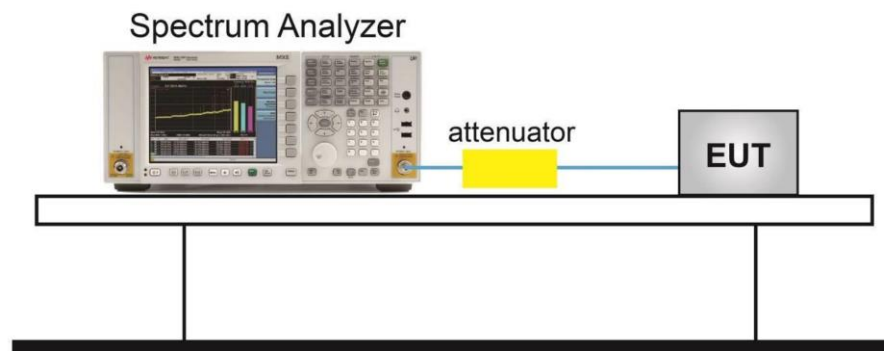
| Standard                           | Limit                                |
|------------------------------------|--------------------------------------|
| FCC 47 CFR Part 15.247 (a)(1)(iii) | At least 15 non-overlapping channels |

### 6.9.2 Test procedure

The measurement is according to ANSI C63.10 clause 7.8.3.

1. Connect the EUT through cable and divide with CMW270 and spectrum analyzer.
2. Enable the EUT transmit in hopping mode.
3. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
4. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
5. VBW  $\geq$  RBW.
6. Sweep: Auto.
7. Detector function: Peak.
8. Trace: Max hold.
9. Allow the trace to stabilize.
10. Record the test results.

### 6.9.3 Test Setup

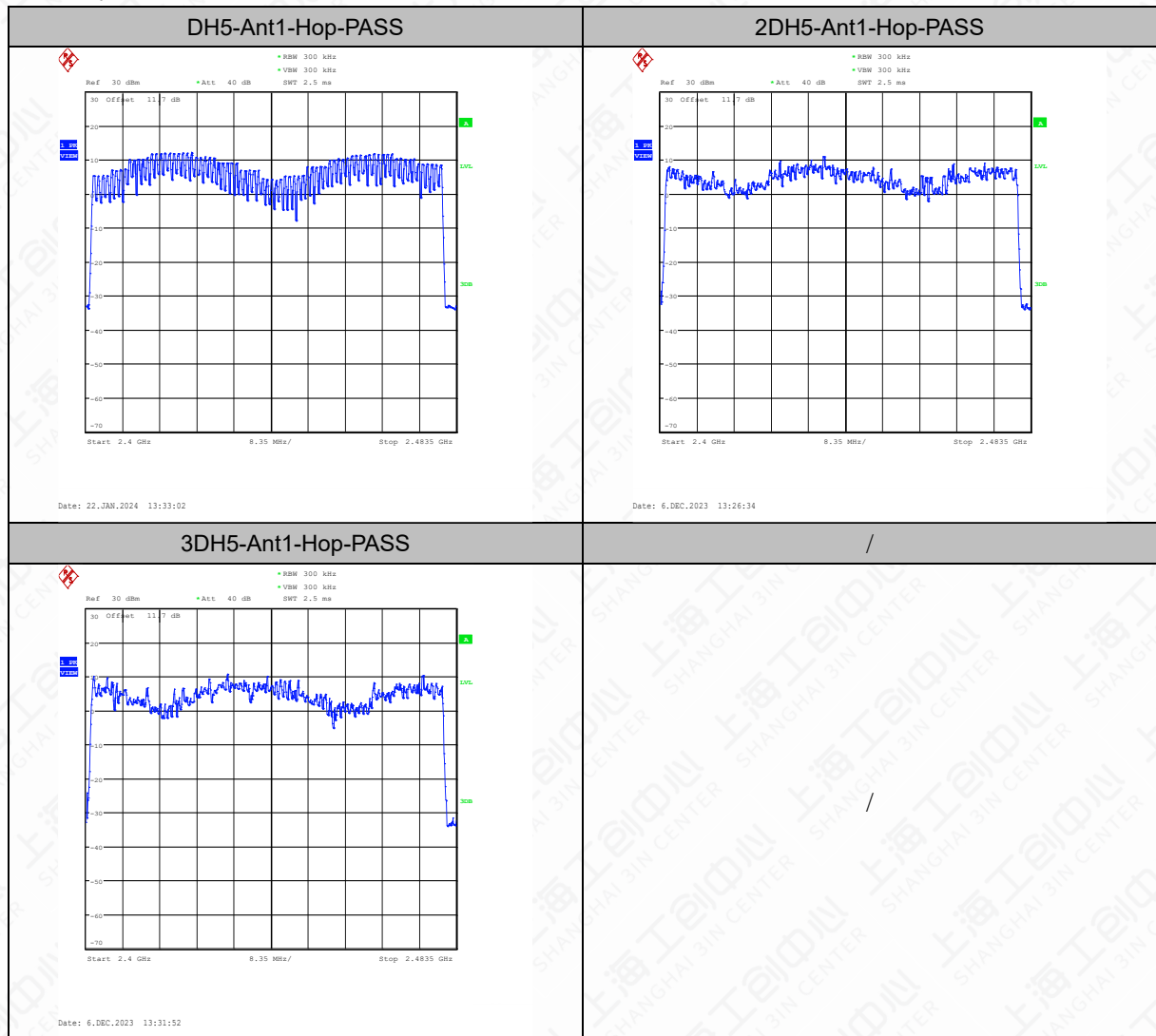


### 6.9.4 Measurement Result

| TestMode | Antenna | Frequency[MHz] | Result[Num] | Limit[Num] | Verdict |
|----------|---------|----------------|-------------|------------|---------|
| DH5      | Ant1    | Hop            | 79          | $\geq 15$  | PASS    |
| 2DH5     | Ant1    | Hop            | 79          | $\geq 15$  | PASS    |
| 3DH5     | Ant1    | Hop            | 79          | $\geq 15$  | PASS    |



## Test Graphs



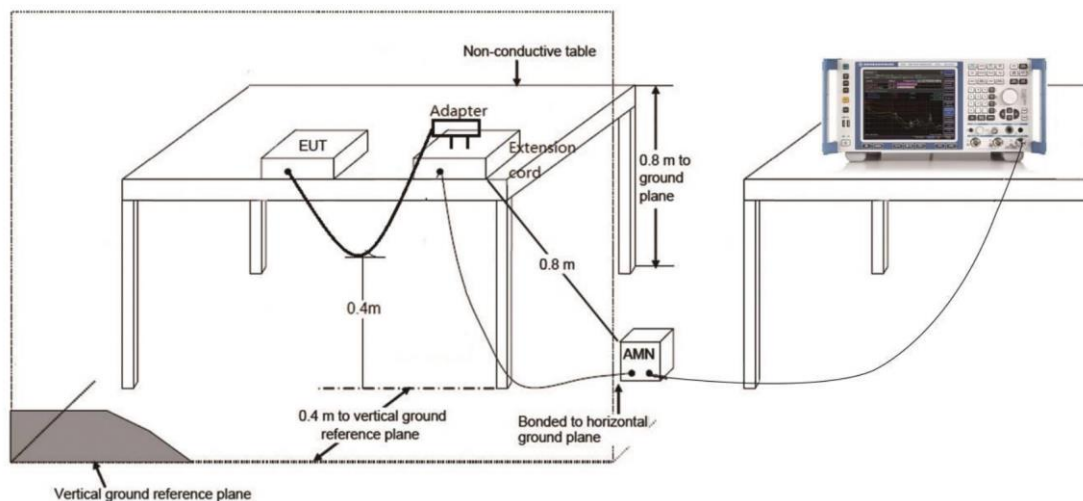
## 6.10 AC Powerline Conducted Emission

### 6.10.1 Method of Measurement: ANSI C63.10-2013-clause 6.2

1. The one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT.
2. If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed.
3. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation.
4. If the EUT is comprised of equipment units that have their own separate ac power connections, e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network, each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be separately measured. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.

If the EUT uses a detachable antenna, these measurements shall be made with a suitable dummy load connected to the antenna output terminals; otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended. When measuring the ac conducted emissions from a device that operates between 150 kHz and 30 MHz a non-detachable antenna may be replaced with a dummy load for the measurements within the fundamental emission band of the transmitter, but only for those measurements.<sup>36</sup> Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency. Diagram or photograph the test setup that was used. See Clause 8 for full reporting requirements.

### 6.10.2 Test Setup



### 6.10.3 Test Condition

|             |                |
|-------------|----------------|
| Voltage (V) | Frequency (Hz) |
| 120         | 60             |

#### 6.10.4 Measurement limit

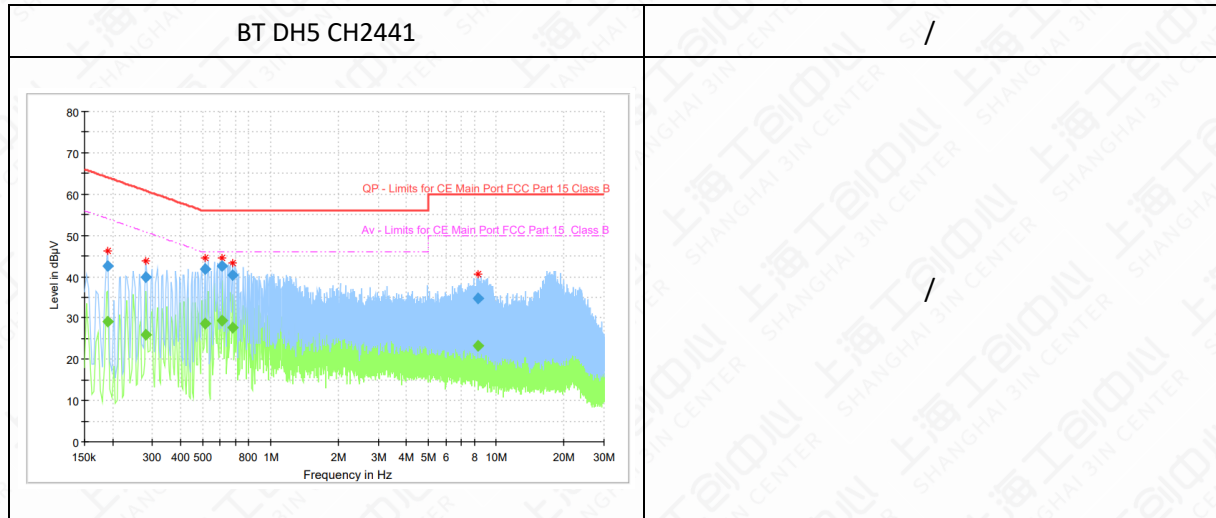
(Quasi-peak-average Limit)

| Frequency range<br>(MHz) | Quasi-peak Limit<br>(dBμV) | Average Limit<br>(dBμV) | Conclusion |
|--------------------------|----------------------------|-------------------------|------------|
| 0.15 to 0.5              | 66 to 56                   | 56 to 46                | P          |
| 0.5 to 5                 | 56                         | 46                      |            |
| 5 to 30                  | 60                         | 50                      |            |

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.



## 6.10.5 Measurement Result



| Frequency (MHz) | QuasiPeak (dBμV) | Average (dBμV) | Limit (dBμV) | Margin (dB) | Meas.Time (ms) | Bandwidth (kHz) | Line | Filter | Corr. (dB) |
|-----------------|------------------|----------------|--------------|-------------|----------------|-----------------|------|--------|------------|
| 0.191044        | ---              | 29.23          | 53.99        | 24.76       | 15000.0        | 9.000           | L1   | ON     | 9.6        |
| 0.191044        | 42.50            | ---            | 63.99        | 21.49       | 15000.0        | 9.000           | L1   | ON     | 9.6        |
| 0.280594        | 39.77            | ---            | 60.80        | 21.03       | 15000.0        | 9.000           | N    | ON     | 7.0        |
| 0.280594        | ---              | 25.83          | 50.80        | 24.97       | 15000.0        | 9.000           | N    | ON     | 7.0        |
| 0.515663        | 41.95            | ---            | 56.00        | 14.05       | 15000.0        | 9.000           | N    | ON     | 9.6        |
| 0.515663        | ---              | 28.63          | 46.00        | 17.37       | 15000.0        | 9.000           | N    | ON     | 9.6        |
| 0.612675        | 42.49            | ---            | 56.00        | 13.51       | 15000.0        | 9.000           | N    | ON     | 9.6        |
| 0.612675        | ---              | 29.30          | 46.00        | 16.70       | 15000.0        | 9.000           | N    | ON     | 9.6        |
| 0.676106        | 40.30            | ---            | 56.00        | 15.70       | 15000.0        | 9.000           | N    | ON     | 9.6        |
| 0.676106        | ---              | 27.56          | 46.00        | 18.44       | 15000.0        | 9.000           | N    | ON     | 9.6        |
| 8.317706        | ---              | 23.19          | 50.00        | 26.81       | 15000.0        | 9.000           | L1   | ON     | 9.8        |
| 8.317706        | 34.85            | ---            | 60.00        | 25.15       | 15000.0        | 9.000           | L1   | ON     | 9.8        |

Note: All modes have been tested and only the worst mode is recorded in the report.

**Annex A: Revised History**

| Version | Revised Content             |
|---------|-----------------------------|
| V00     | Initial                     |
| V01     | First change of test report |

**Annex B: Accreditation Certificate**



**Accredited Laboratory**

A2LA has accredited

**INDUSTRIAL INTERNET INNOVATION CENTER  
(SHANGHAI) CO., LTD.**

Shanghai, People's Republic of China

for technical competence in the field of

**Electrical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 20<sup>th</sup> day of September 2023.



Mr. Trace McInturff, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 3682.01  
Valid to February 28, 2025

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

**END OF REPORT**