



## RADIO TEST REPORT

|                         |   |                                                                                                                                                                                                                                           |
|-------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant               | : | Harman International Industries, Inc.                                                                                                                                                                                                     |
| Address of Applicant    | : | 8500 Balboa Boulevard, Northridge, CA 91329,<br>UNITED STATES                                                                                                                                                                             |
| Manufacturer            | : | Harman International Industries, Inc.                                                                                                                                                                                                     |
| Address of Manufacturer | : | 8500 Balboa Boulevard, Northridge, CA 91329,<br>UNITED STATES                                                                                                                                                                             |
| Equipment under Test    | : | Portable Bluetooth Speaker                                                                                                                                                                                                                |
| Model No.               | : | FLIP ESSENTIAL 3 SE                                                                                                                                                                                                                       |
| FCC ID                  | : | APIJBLFLIPE3SE                                                                                                                                                                                                                            |
| IC                      | : | 6132A-JBLFLIPE3SE                                                                                                                                                                                                                         |
| Test Standard(s)        | : | FCC Rules and Regulations Part 15 Subpart C,<br>ANSI C63.10-2020,<br>RSS-247 Issue 4 July 24, 2025,<br>RSS-Gen Issue 5, Apr. 2018, Amendment 2<br>(February 2021),<br>ANSI C63.10-2020+Cor.1-2023+C63.10a-<br>2024+Errata to C63.10a-2024 |
| Report No.              | : | DDT-RE25102410-1E02                                                                                                                                                                                                                       |
| Issue Date              | : | 2025/12/29                                                                                                                                                                                                                                |
| Issue By                | : | Guangdong Dongdian Testing Service Co., Ltd.<br>Unit 2, Building 1, No. 17, Zongbu 2nd Road,<br>Songshan Lake Park, Dongguan, Guangdong, China,<br>523808                                                                                 |

# REPORT

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Test Report Declare

|                         |   |                                                            |
|-------------------------|---|------------------------------------------------------------|
| Applicant               | : | Harman International Industries, Inc.                      |
| Address of Applicant    | : | 8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES |
| Equipment under Test    | : | Portable Bluetooth Speaker                                 |
| Model No.               | : | FLIP ESSENTIAL 3 SE                                        |
| Manufacturer            | : | Harman International Industries, Inc.                      |
| Address of Manufacturer | : | 8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES |

Test Standard Used:  
FCC Rules and Regulations Part 15 Subpart C,  
ANSI C63.10-2020,  
RSS-247 Issue 4 July 24, 2025,  
RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021),  
ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024

We Declare:  
The equipment described above is tested by Guangdong Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangdong Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

|                  |                     |               |                         |
|------------------|---------------------|---------------|-------------------------|
| Report No.:      | DDT-RE25102410-1E02 |               |                         |
| Date of Receipt: | 2025/11/19          | Date of Test: | 2025/11/19 - 2025/12/17 |

|                                                                                     |                                                                                     |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Created: Ella Gong                                                                  | Reviewed: Chen Ziqin                                                                | Approved: Damon Hu                                                                    |
|  |  |  |
| 2025/12/19                                                                          | 2025/12/29                                                                          | 2025/12/29                                                                            |

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

Revision History

| Version | Revision Content | Issue Date | Approved |
|---------|------------------|------------|----------|
| V0      | Initial issue    | 2025/12/29 | Damon Hu |
|         |                  |            |          |

## 1. Summary of Test Results

| No. | Test Parameter                   | Clause No.                                                                                                                          | Condition | Result |
|-----|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------|--------|
| 1   | 6 dB Bandwidth and 99% Bandwidth | 47 CFR Part 15 15.247(a)(2), RSS-247 clause 6.3.1, RSS-Gen clause 6.7                                                               | /         | Pass   |
| 2   | Peak Output Power                | 47 CFR Part 15 15.247(b)(3), RSS-247 clause 6.3.2                                                                                   | /         | Pass   |
| 3   | Power Spectral Density           | 47 CFR Part 15 15.247(e), RSS-247 clause 6.3.1                                                                                      | /         | Pass   |
| 4   | RF Conducted Spurious Emissions  | 47 CFR Part 15 15.247(d), RSS-247 clause 6.6                                                                                        | /         | Pass   |
| 5   | Radiated Emission                | 47 CFR Part 15 15.205, 47 CFR Part 15 15.209, 47 CFR Part 15 15.247(d), RSS-247 clause 6.6, RSS-Gen clause 8.9, RSS-Gen clause 8.10 | /         | Pass   |
| 6   | Band Edge Compliance             | 47 CFR Part 15 15.205, 47 CFR Part 15 15.209, 47 CFR Part 15 15.247(d), RSS-247 clause 6.6, RSS-Gen clause 8.9, RSS-Gen clause 8.10 | /         | Pass   |
| 7   | Antenna Requirement              | 47 CFR Part 15 15.203, RSS-Gen clause 6.8                                                                                           | /         | Pass   |
| 8   | Power Line Conducted Emissions   | 47 CFR Part 15 15.207(a), RSS-Gen clause 8.8                                                                                        | /         | Pass   |

Note: N/A is an abbreviation for Not Applicable, and means this item is not applicable for this device or no need to test according to standard.

## 2. General Test Information

### 2.1. Description of EUT

|                            |                                                                                        |
|----------------------------|----------------------------------------------------------------------------------------|
| EUT Name                   | : Portable Bluetooth Speaker                                                           |
| Model Number               | : FLIP ESSENTIAL 3 SE                                                                  |
| Difference of model number | : /                                                                                    |
| EUT Function Description   | : Please reference user manual of this device                                          |
| Power Supply               | : DC 5V/3A from external AC Adapter<br>DC 3.6V 4800mAh Polymer Li-ion built-in battery |
| Hardware Version           | : V0.3                                                                                 |
| Software Version           | : V25.45.12                                                                            |
| Antenna Type               | : FPC Antenna                                                                          |
| Max Antenna Gain(dBi)      | : 2.03 dBi                                                                             |

|                     |                        |
|---------------------|------------------------|
| Radio Specification | : Bluetooth LE         |
| Operation Frequency | : 2402 MHz to 2480 MHz |
| Modulation          | : GFSK                 |

| Bluetooth LE 1Mbps Channel information |                 |         |                 |         |                 |
|----------------------------------------|-----------------|---------|-----------------|---------|-----------------|
| Channel                                | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 0                                      | 2402            | 14      | 2430            | 28      | 2458            |
| 1                                      | 2404            | 15      | 2432            | 29      | 2460            |
| 2                                      | 2406            | 16      | 2434            | 30      | 2462            |
| 3                                      | 2408            | 17      | 2436            | 31      | 2464            |
| 4                                      | 2410            | 18      | 2438            | 32      | 2466            |
| 5                                      | 2412            | 19      | 2440            | 33      | 2468            |
| 6                                      | 2414            | 20      | 2442            | 34      | 2470            |
| 7                                      | 2416            | 21      | 2444            | 35      | 2472            |
| 8                                      | 2418            | 22      | 2446            | 36      | 2474            |
| 9                                      | 2420            | 23      | 2448            | 37      | 2476            |
| 10                                     | 2422            | 24      | 2450            | 38      | 2478            |
| 11                                     | 2424            | 25      | 2452            | 39      | 2480            |
| 12                                     | 2426            | 26      | 2454            |         |                 |
| 13                                     | 2428            | 27      | 2456            |         |                 |

| Bluetooth LE 2Mbps Channel information |                 |         |                 |         |                 |
|----------------------------------------|-----------------|---------|-----------------|---------|-----------------|
| Channel                                | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 0                                      | 2402            | 14      | 2430            | 28      | 2458            |
| 1                                      | 2404            | 15      | 2432            | 29      | 2460            |
| 2                                      | 2406            | 16      | 2434            | 30      | 2462            |
| 3                                      | 2408            | 17      | 2436            | 31      | 2464            |

|    |      |    |      |    |      |
|----|------|----|------|----|------|
| 4  | 2410 | 18 | 2438 | 32 | 2466 |
| 5  | 2412 | 19 | 2440 | 33 | 2468 |
| 6  | 2414 | 20 | 2442 | 34 | 2470 |
| 7  | 2416 | 21 | 2444 | 35 | 2472 |
| 8  | 2418 | 22 | 2446 | 36 | 2474 |
| 9  | 2420 | 23 | 2448 | 37 | 2476 |
| 10 | 2422 | 24 | 2450 | 38 | 2478 |
| 11 | 2424 | 25 | 2452 | 39 | 2480 |
| 12 | 2426 | 26 | 2454 | /  |      |
| 13 | 2428 | 27 | 2456 | /  |      |

The channels denoted with the grey background are excluded, because they are primary advertising channel only for the Bluetooth LE 1Mbps according to the Bluetooth Core Specification.

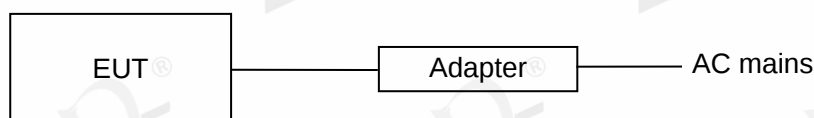
Note: The above EUT information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications or User's Manual. The above Antenna information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

“☑” means to be chosen or applicable; “☐” means don't to be chosen or not applicable; This note applies to entire report.

## 2.2. Accessories of EUT

| Accessories | Manufacturer | Model number | Description |
|-------------|--------------|--------------|-------------|
| /           | /            | /            | /           |

## 2.3. Block diagram of EUT configuration for test



## 2.4. Decision of final test mode

According pre-test, the worst test modes were reported as below:

Test software: FCC\_Tool\_V3.0

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table:

The pathloss of external cable: 0.5dB (According to the manufacturer's claims)

| Tested mode, Tx Power Setting, Channel, and Frequency |                  |         |                 |
|-------------------------------------------------------|------------------|---------|-----------------|
| Mode                                                  | Setting Tx Power | Channel | Frequency (MHz) |
| GFSK 1M                                               | 11               | CH0     | 2402            |
|                                                       | 11               | CH19    | 2440            |
|                                                       | 11               | CH39    | 2480            |
| GFSK 2M                                               | 11               | CH1     | 2404            |
|                                                       | 11               | CH19    | 2440            |
|                                                       | 11               | CH38    | 2478            |

## 2.5. Deviations of test standard

No deviation.

## 2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

|                    |                   |
|--------------------|-------------------|
| Temperature range: | +15°C to +35 °C   |
| Humidity range:    | 20% to 75%        |
| Pressure range:    | 86 kPa to 106 kPa |

Note: The specific temperature and humidity information of each test item refers to the temperature and humidity record in the corresponding test data.

## 2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: [ddt@dgddt.com](mailto:ddt@dgddt.com).

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20240, G-20118

## 2.8. Measurement uncertainty

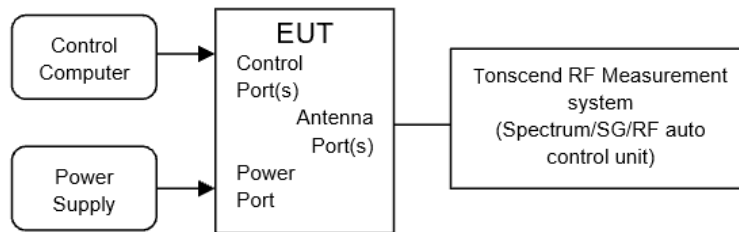
| Test Item                                                                                                                                     | Uncertainty                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bandwidth                                                                                                                                     | 1.1%                                                                                                                                                                    |
| Peak Output Power (Conducted) (Spectrum analyzer)                                                                                             | 0.86 dB ( $10 \text{ MHz} \leq f < 3.6 \text{ GHz}$ );<br>1.38 dB ( $3.6 \text{ GHz} \leq f < 8 \text{ GHz}$ )                                                          |
| Peak Output Power (Conducted) (Power Sensor)                                                                                                  | 0.74 dB                                                                                                                                                                 |
| Power Spectral Density                                                                                                                        | 0.74 dB ( $10 \text{ MHz} \leq f < 3.6 \text{ GHz}$ );<br>1.38 dB ( $3.6 \text{ GHz} \leq f < 8 \text{ GHz}$ )                                                          |
| Frequencies Stability                                                                                                                         | $6.7 \times 10^{-8}$ (Antenna couple method)<br>$5.5 \times 10^{-8}$ (Conducted method)                                                                                 |
| Conducted spurious emissions                                                                                                                  | 0.86 dB ( $10 \text{ MHz} \leq f < 3.6 \text{ GHz}$ );<br>1.40 dB ( $3.6 \text{ GHz} \leq f < 8 \text{ GHz}$ )<br>1.66 dB ( $8 \text{ GHz} \leq f < 26.5 \text{ GHz}$ ) |
| Uncertainty for radio frequency (RBW < 20 kHz)                                                                                                | $3 \times 10^{-8}$                                                                                                                                                      |
| Temperature                                                                                                                                   | 0.4 °C                                                                                                                                                                  |
| Humidity                                                                                                                                      | 2 %                                                                                                                                                                     |
| Uncertainty for Radiation Emission test<br>(9 kHz – 30 MHz)                                                                                   | 3.44 dB                                                                                                                                                                 |
| Uncertainty for Radiation Emission test<br>(30 MHz - 1 GHz)                                                                                   | 4.70 dB (Antenna Polarize: V)<br>4.84 dB (Antenna Polarize: H)                                                                                                          |
| Uncertainty for Radiation Emission test<br>(1 GHz - 40 GHz)                                                                                   | 4.10 dB (1 - 6 GHz)<br>4.40 dB (6 GHz - 18 GHz)<br>3.54 dB (18 GHz - 26 GHz)<br>4.30 dB (26 GHz - 40 GHz)                                                               |
| Uncertainty for Power line conduction emission test                                                                                           | 3.34dB (150KHz-30MHz)<br>3.72dB (9KHz-150KHz)                                                                                                                           |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. |                                                                                                                                                                         |

### 3. Equipment Used During Conductive Test

| Equipment                                                                        | Manufacturer | Model No.   | Serial Number | Due Date   |
|----------------------------------------------------------------------------------|--------------|-------------|---------------|------------|
| <input checked="" type="checkbox"/> RF Connected Test (RF Measurement System 3#) |              |             |               |            |
| SIGNAL ANALYZER                                                                  | R&S          | FSV40       | 101407        | 2026/07/06 |
| Wideband Radio Communication Tester                                              | R&S          | CMW500      | 117491        | 2026/03/28 |
| EXG Analog Signal Generator                                                      | KEYSIGHT     | N5173B      | MY62153058    | 2026/07/06 |
| MXG Vector Signal Generator                                                      | Agilent      | N5182A      | MY48180912    | 2026/03/28 |
| RF Control Unit                                                                  | Tonscend     | JS0806-2    | 20C8060230    | 2026/03/28 |
| TEMP&HUMI Programmable Chamber                                                   | ZHIXIANG     | ZXGDJS-150L | ZX170110-A    | 2026/03/28 |
| Test Software                                                                    | Tonscend     | JS1120-3    | V3.6.21       | N/A        |

## 4. 6 dB Bandwidth

### 4.1. Block diagram of test setup



### 4.2. Limits

For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz

### 4.3. Test procedure

- (1) The test according to ANSI C63.10 clause 11.8.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for 6 dB Bandwidth:

|                |                              |
|----------------|------------------------------|
| RBW:           | 100 kHz                      |
| VBW:           | $\geq [3 \times \text{RBW}]$ |
| Detector Mode: | Peak                         |
| Sweep time:    | Auto                         |
| Trace mode     | Max hold                     |
- (5) Allow the trace to stabilize, measure the 6 dB bandwidth of signal, and record the results in the report.

4.4. Test result

|                    |                |                |                          |
|--------------------|----------------|----------------|--------------------------|
| Test Engineer:     | Zeng Zhongyao  | Test Site:     | RF Measurement System 3# |
| Ambient Condition: | 24.8°C,29.8%RH | Test Date:     | 2025.11.24               |
| Test Power Supply: | Battery        | Sample Number: | s25102410-001            |

| Test Mode | Antenna | Frequency [MHz] | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit [MHz] | Verdict |
|-----------|---------|-----------------|--------------|---------|---------|-------------|---------|
| BLE_1M    | Ant1    | 2402            | 0.71         | 2401.65 | 2402.36 | 0.5         | PASS    |
|           |         | 2440            | 0.71         | 2439.66 | 2440.36 | 0.5         | PASS    |
|           |         | 2480            | 0.71         | 2479.65 | 2480.36 | 0.5         | PASS    |
| BLE_2M    | Ant1    | 2404            | 1.25         | 2403.36 | 2404.61 | 0.5         | PASS    |
|           |         | 2440            | 1.26         | 2439.36 | 2440.62 | 0.5         | PASS    |
|           |         | 2478            | 1.25         | 2477.36 | 2478.61 | 0.5         | PASS    |

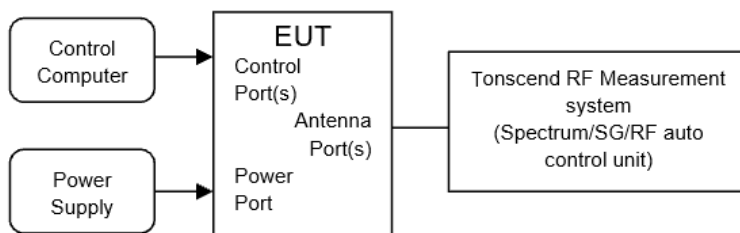
4.5. Test graphs





## 5. 99% Bandwidth

### 5.1. Block diagram of test setup



### 5.2. Limits

Just for Report.

### 5.3. Test procedure

- (1) The test according to ANSI C63.10 clause 6.9.3.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for the 99% Bandwidth:

|                |                                         |
|----------------|-----------------------------------------|
| RBW:           | 1% to 5% of the OBW                     |
| VBW:           | approximately three times RBW           |
| Span:          | between 1.5 times and 5.0 times the OBW |
| Detector Mode: | Peak                                    |
| Sweep time:    | Auto                                    |
| Trace mode     | Max hold                                |
- (5) Allow the trace to stabilize, measure the 99% bandwidth of signal, and record the results in the report.

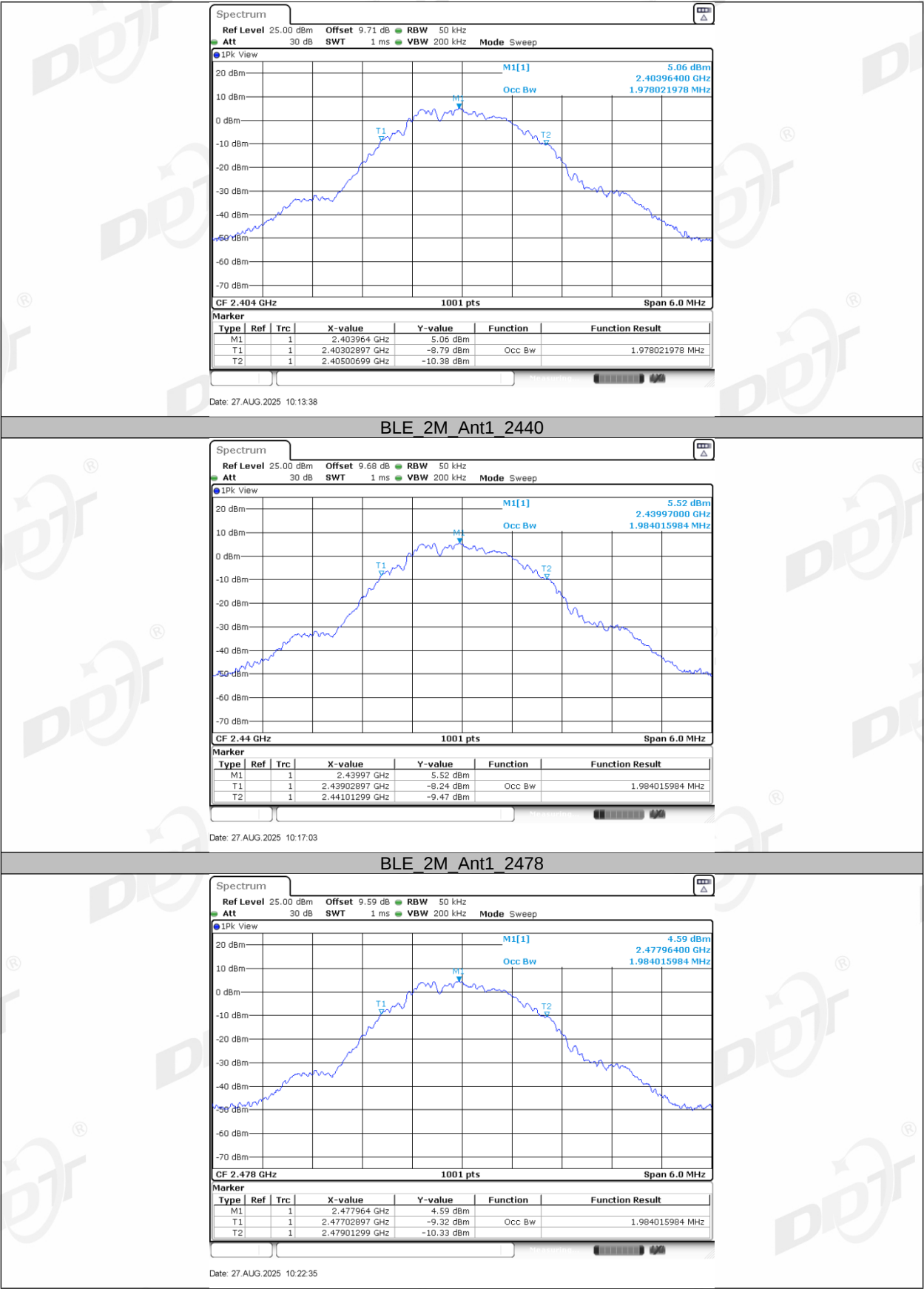
5.4. Test result

|                    |                |                |                          |
|--------------------|----------------|----------------|--------------------------|
| Test Engineer:     | Zeng Zhongyao  | Test Site:     | RF Measurement System 3# |
| Ambient Condition: | 24.8°C,29.8%RH | Test Date:     | 2025.11.24               |
| Test Power Supply: | Battery        | Sample Number: | s25102410-001            |

| Test Mode | Antenna | Frequency [MHz] | OCB [MHz] | FL[MHz]   | FH[MHz]   | Limit [MHz] | Verdict |
|-----------|---------|-----------------|-----------|-----------|-----------|-------------|---------|
| BLE_1M    | Ant1    | 2402            | 1.0310    | 2401.4925 | 2402.5235 | ---         | ---     |
|           |         | 2440            | 1.0310    | 2439.4965 | 2440.5275 | ---         | ---     |
|           |         | 2480            | 1.0310    | 2479.4925 | 2480.5235 | ---         | ---     |
| BLE_2M    | Ant1    | 2404            | 1.9780    | 2403.0290 | 2405.0070 | ---         | ---     |
|           |         | 2440            | 1.9840    | 2439.0290 | 2441.0130 | ---         | ---     |
|           |         | 2478            | 1.9840    | 2477.0290 | 2479.0130 | ---         | ---     |

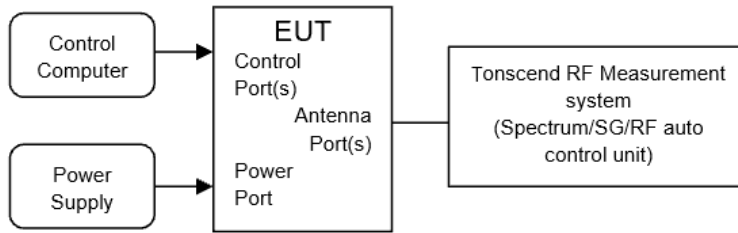
5.5. Test graphs





## 6. Maximum Peak Output Power

### 6.1. Block diagram of test setup



### 6.2. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi, the e.i.r.p shall not exceed 4W.

### 6.3. Test procedure

- (1) The test according to ANSI C63.10 clause 11.9.1.1.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for the maximum peak output power measurement:
 

|                |                |
|----------------|----------------|
| RBW:           | ≥DTS bandwidth |
| VBW:           | ≥3 x RBW       |
| Span           | ≥3 x RBW       |
| Detector Mode: | Peak           |
| Sweep time:    | Auto           |
| Trace mode     | Max hold       |
- (5) Allow the trace to stabilize, use peak marker function to determine the peak amplitude level.

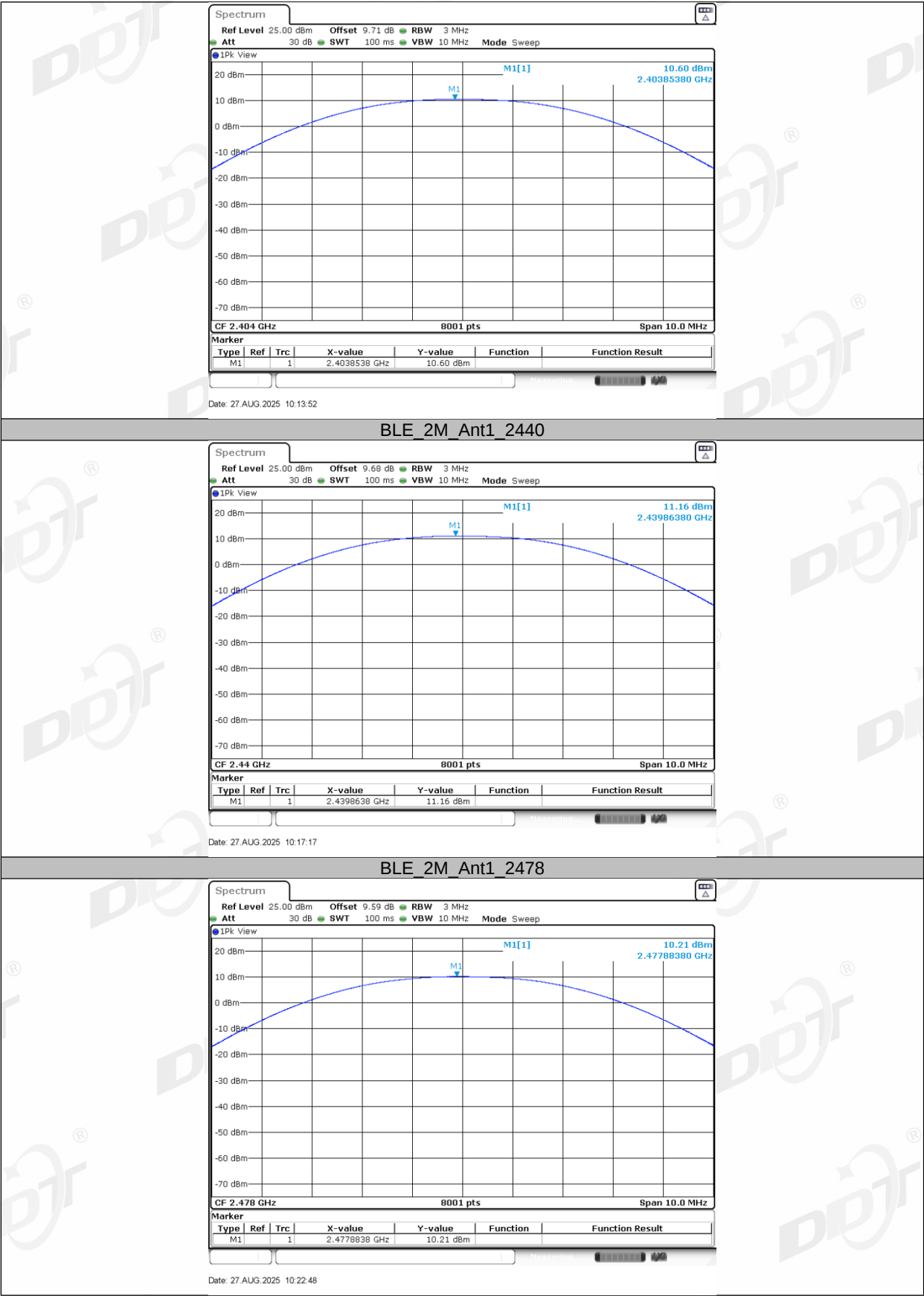
6.4. Test result

|                    |                |                |                          |
|--------------------|----------------|----------------|--------------------------|
| Test Engineer:     | Zeng Zhongyao  | Test Site:     | RF Measurement System 3# |
| Ambient Condition: | 24.8°C,29.8%RH | Test Date:     | 2025.11.24               |
| Test Power Supply: | Battery        | Sample Number: | s25102410-001            |

| Test Mode | Antenna | Frequency [MHz] | Conducted Peak Power[dBm] | Conducted Limit[dBm] | EIRP[dBm] | EIRP Limit[dBm] | Verdict |
|-----------|---------|-----------------|---------------------------|----------------------|-----------|-----------------|---------|
| BLE_1M    | Ant1    | 2402            | 10.97                     | ≤30                  | 12.54     | ≤36             | PASS    |
|           |         | 2440            | 11.38                     | ≤30                  | 12.95     | ≤36             | PASS    |
|           |         | 2480            | 10.51                     | ≤30                  | 12.08     | ≤36             | PASS    |
| BLE_2M    | Ant1    | 2404            | 10.60                     | ≤30                  | 12.17     | ≤36             | PASS    |
|           |         | 2440            | 11.16                     | ≤30                  | 12.73     | ≤36             | PASS    |
|           |         | 2478            | 10.21                     | ≤30                  | 11.78     | ≤36             | PASS    |

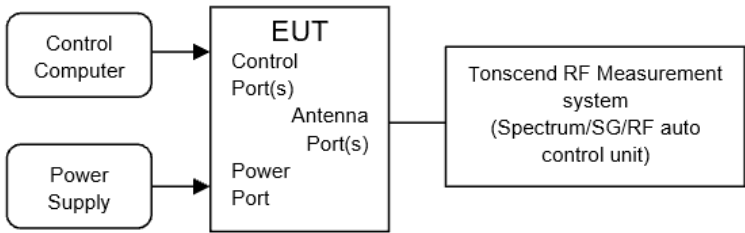
6.5. Test graphs





7. Power Spectral Density

7.1. Block diagram of test setup



7.2. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

7.3. Test procedure

- (1) The test according to ANSI C63.10 clause 11.10.2.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for Power Spectral Density measurement:

|                  |                                                    |
|------------------|----------------------------------------------------|
| Center frequency | DTS Channel center frequency                       |
| RBW:             | $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$ |
| VBW:             | $\geq 3\text{RBW}$                                 |
| Span             | 1.5 times the DTS bandwidth                        |
| Detector Mode:   | Peak                                               |
| Sweep time:      | Auto                                               |
| Trace mode       | Max hold                                           |

- (5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.

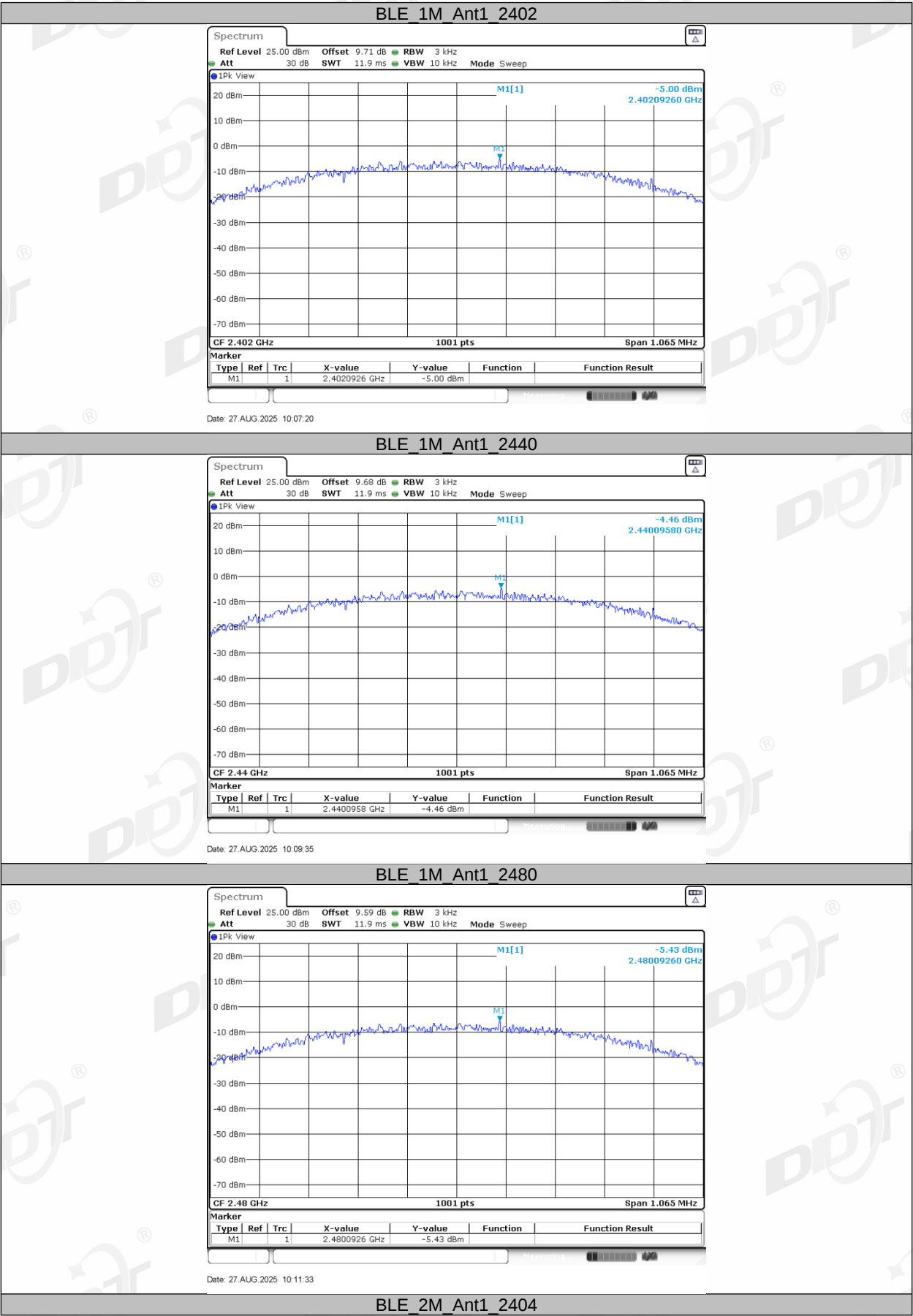
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

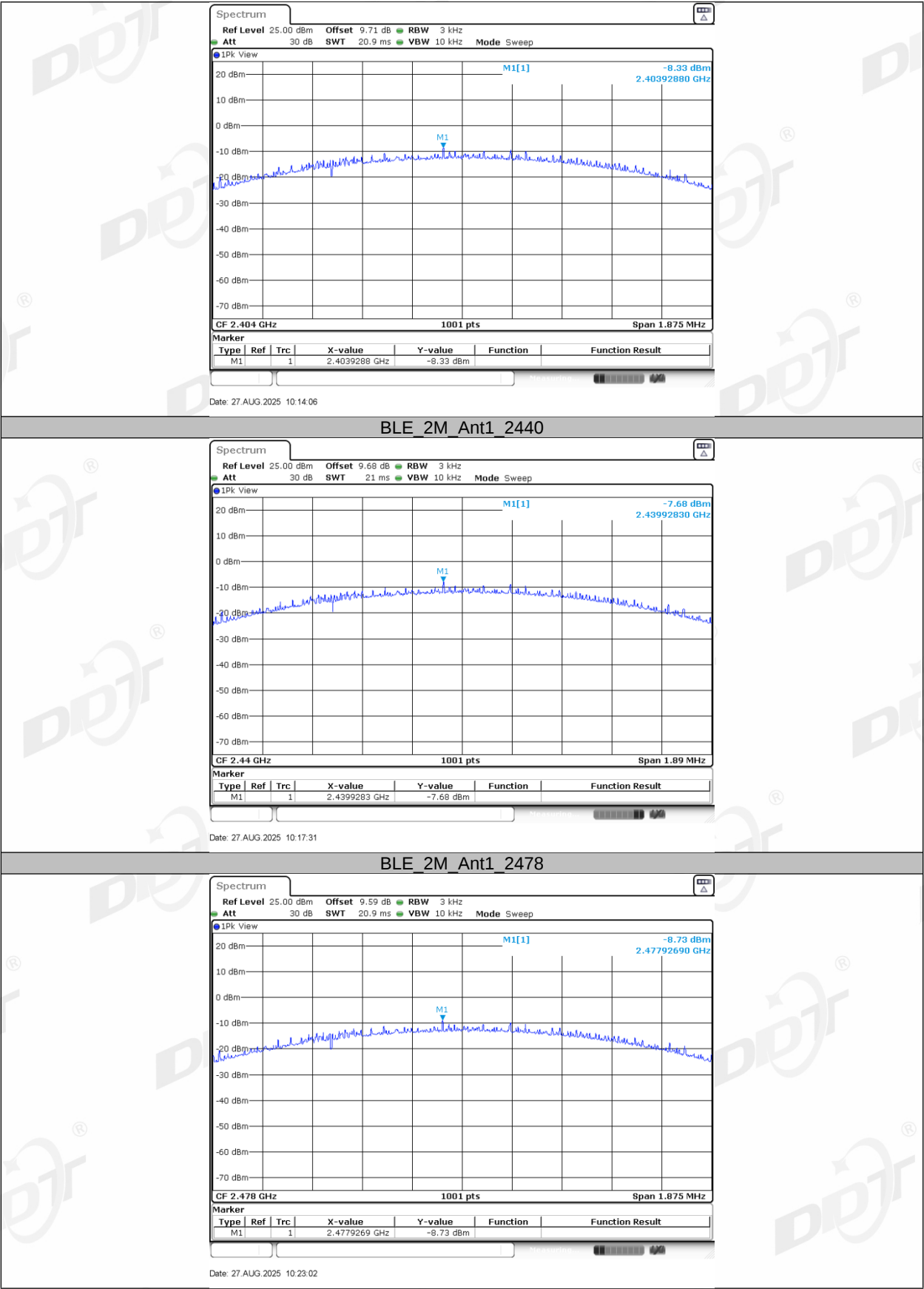
7.4. Test result

|                    |                |                |                          |
|--------------------|----------------|----------------|--------------------------|
| Test Engineer:     | Zeng Zhongyao  | Test Site:     | RF Measurement System 3# |
| Ambient Condition: | 24.8°C,29.8%RH | Test Date:     | 2025.11.24               |
| Test Power Supply: | Battery        | Sample Number: | s25102410-001            |

| Test Mode | Antenna | Frequency [MHz] | Result [dBm/3kHz] | Limit [dBm/3kHz] | Verdict |
|-----------|---------|-----------------|-------------------|------------------|---------|
| BLE_1M    | Ant1    | 2402            | -5.00             | ≤8.00            | PASS    |
|           |         | 2440            | -4.46             | ≤8.00            | PASS    |
|           |         | 2480            | -5.43             | ≤8.00            | PASS    |
| BLE_2M    | Ant1    | 2404            | -8.33             | ≤8.00            | PASS    |
|           |         | 2440            | -7.68             | ≤8.00            | PASS    |
|           |         | 2478            | -8.73             | ≤8.00            | PASS    |

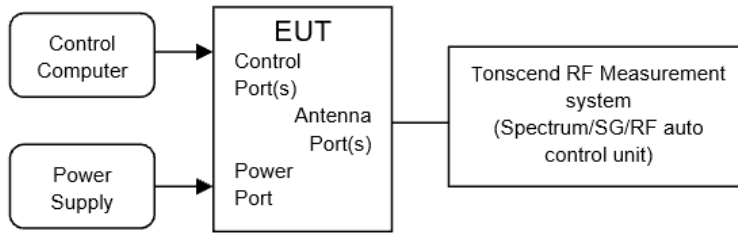
7.5. Test graphs





## 8. Band Edge Compliance (Conducted Method)

### 8.1. Block diagram of test setup



### 8.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

### 8.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

|                |                                          |
|----------------|------------------------------------------|
| RBW:           | 100 kHz                                  |
| VBW:           | 300 kHz                                  |
| Span           | Encompass frequency range to be measured |
| Detector Mode: | Peak                                     |
| Sweep time:    | Auto                                     |
| Trace mode     | Max hold                                 |

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

(4) Then mark the maximum amplitude of all unwanted emissions outside of the authorized frequency band.

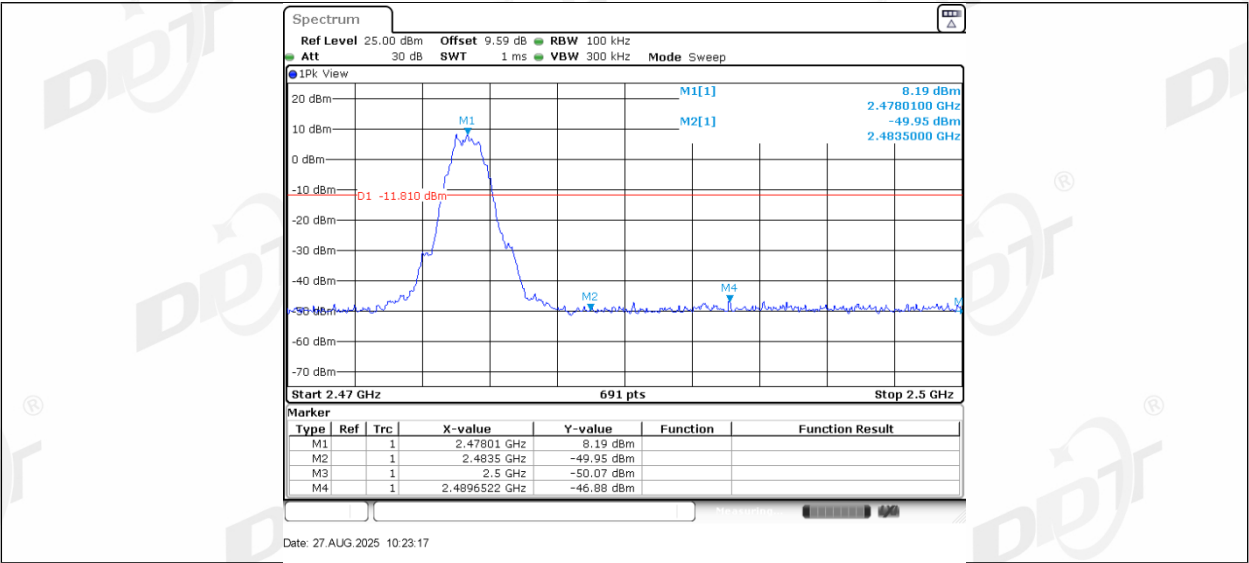
8.4. Test result

|                    |                |                |                          |
|--------------------|----------------|----------------|--------------------------|
| Test Engineer:     | Zeng Zhongyao  | Test Site:     | RF Measurement System 3# |
| Ambient Condition: | 24.8°C,29.8%RH | Test Date:     | 2025.11.24               |
| Test Power Supply: | Battery        | Sample Number: | s25102410-001            |

| Mode    | Frequency [MHz] | Measured Range        | Verdict |
|---------|-----------------|-----------------------|---------|
| GFSK 1M | 2402            | 2.310 GHz - 2.410 GHz | Pass    |
|         | 2480            | 2.470 GHz - 2.500 GHz | Pass    |
| GFSK 2M | 2404            | 2.310 GHz - 2.410 GHz | Pass    |
|         | 2478            | 2.470 GHz - 2.500 GHz | Pass    |

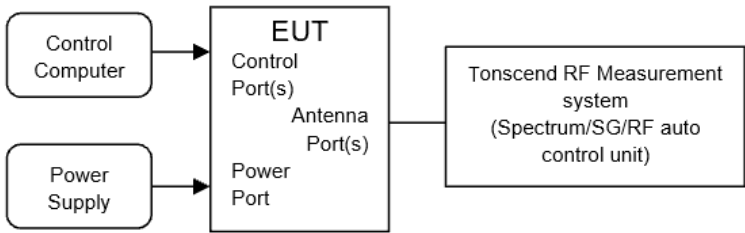
8.5. Test graphs





9. RF Conducted Spurious Emissions

9.1. Block diagram of test setup



9.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

9.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Establish a reference level by using the following procedure:

|                  |                                                               |
|------------------|---------------------------------------------------------------|
| Center frequency | Test frequency                                                |
| RBW:             | 100 kHz                                                       |
| VBW:             | 300 kHz                                                       |
| Span             | Wide enough to capture the peak level of the in-band emission |
| Detector Mode:   | Peak                                                          |
| Sweep time:      | Auto                                                          |
| Trace mode       | Max hold                                                      |
- (3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.
- (4) Set the spectrum analyzer as follows:

|                              |                                          |
|------------------------------|------------------------------------------|
| RBW:                         | 100 kHz                                  |
| VBW:                         | 300 kHz                                  |
| Span                         | Encompass frequency range to be measured |
| Number of measurement points | $\geq \text{Span/RBW}$                   |
| Detector Mode:               | Peak                                     |
| Sweep time:                  | Auto                                     |
| Trace mode                   | Max hold                                 |

Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

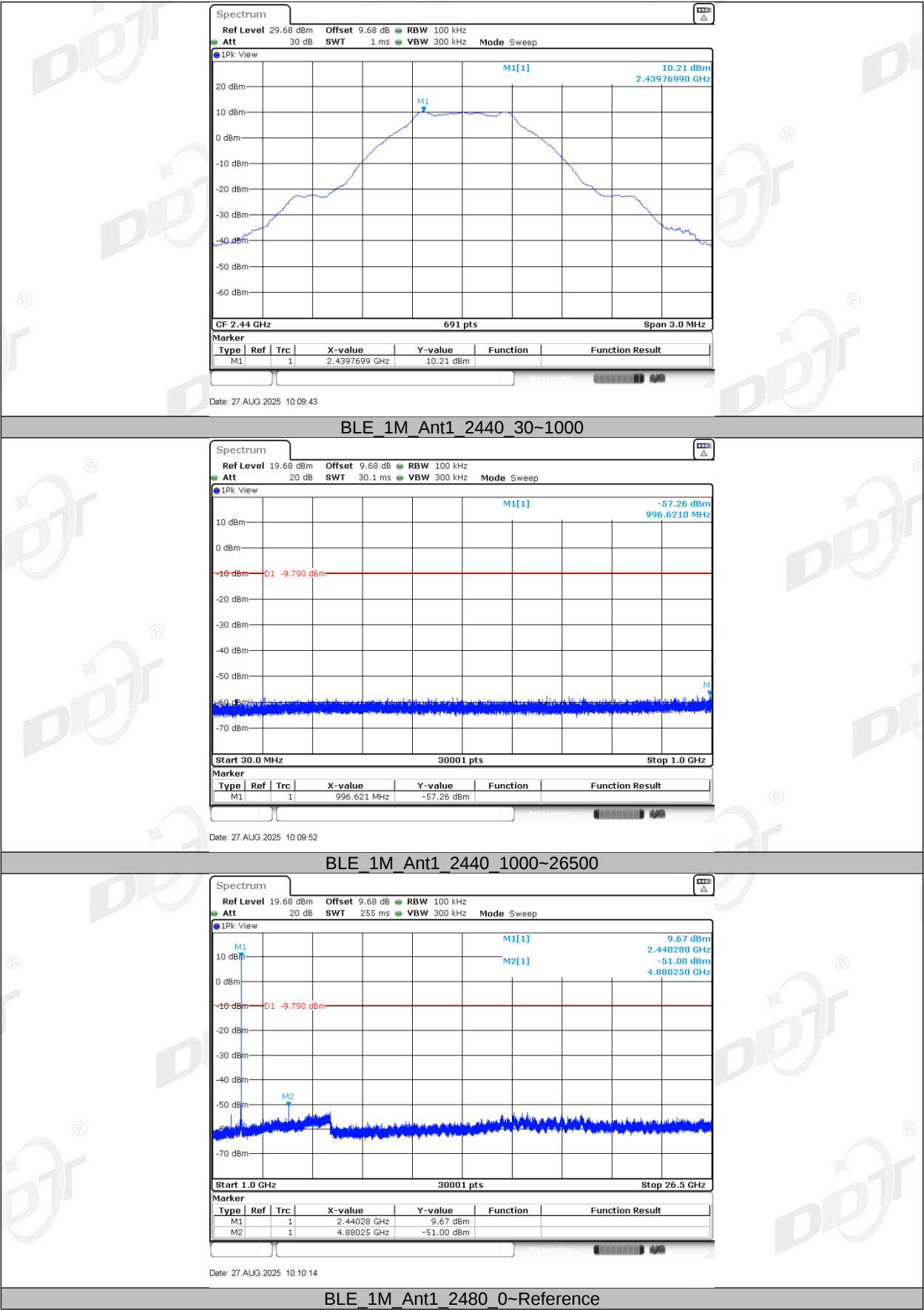
9.4. Test result

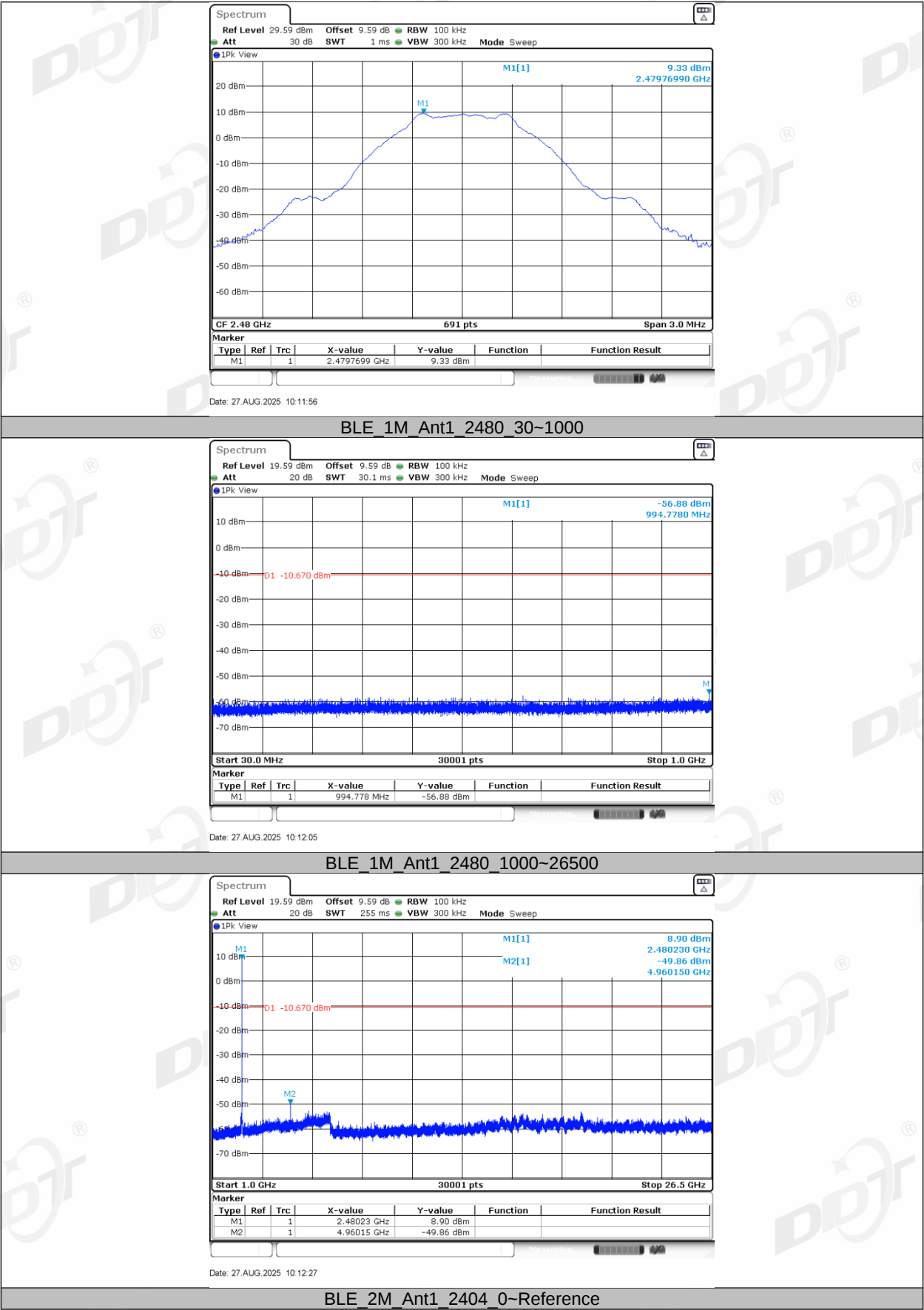
|                    |                |                |                          |
|--------------------|----------------|----------------|--------------------------|
| Test Engineer:     | Zeng Zhongyao  | Test Site:     | RF Measurement System 3# |
| Ambient Condition: | 24.8°C,29.8%RH | Test Date:     | 2025.11.24               |
| Test Power Supply: | Battery        | Sample Number: | s25102410-001            |

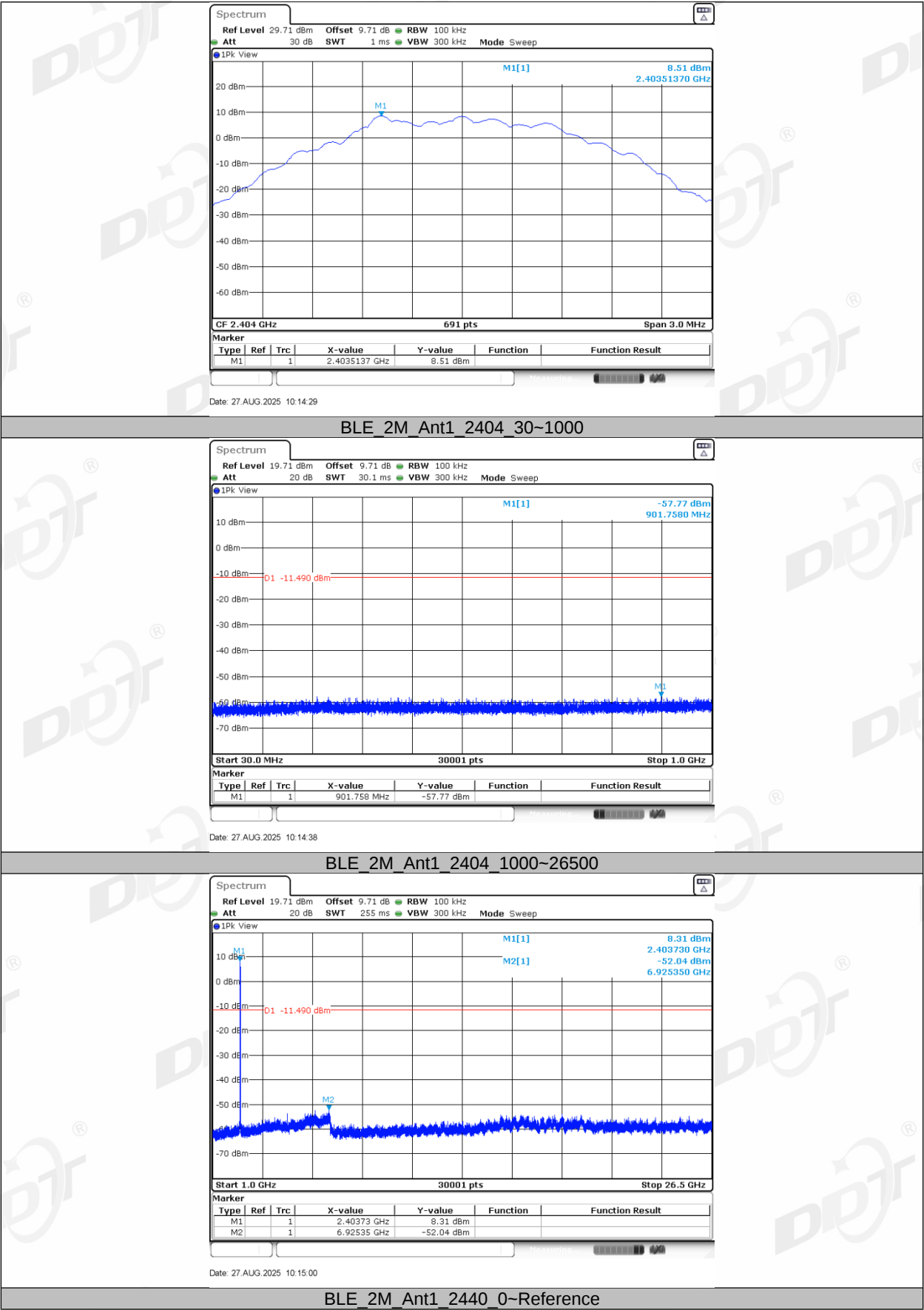
| Mode    | Frequency [MHz] | Verdict |
|---------|-----------------|---------|
| GFSK 1M | 2402            | Pass    |
|         | 2440            | Pass    |
|         | 2480            | Pass    |
| GFSK 2M | 2404            | Pass    |
|         | 2440            | Pass    |
|         | 2478            | Pass    |

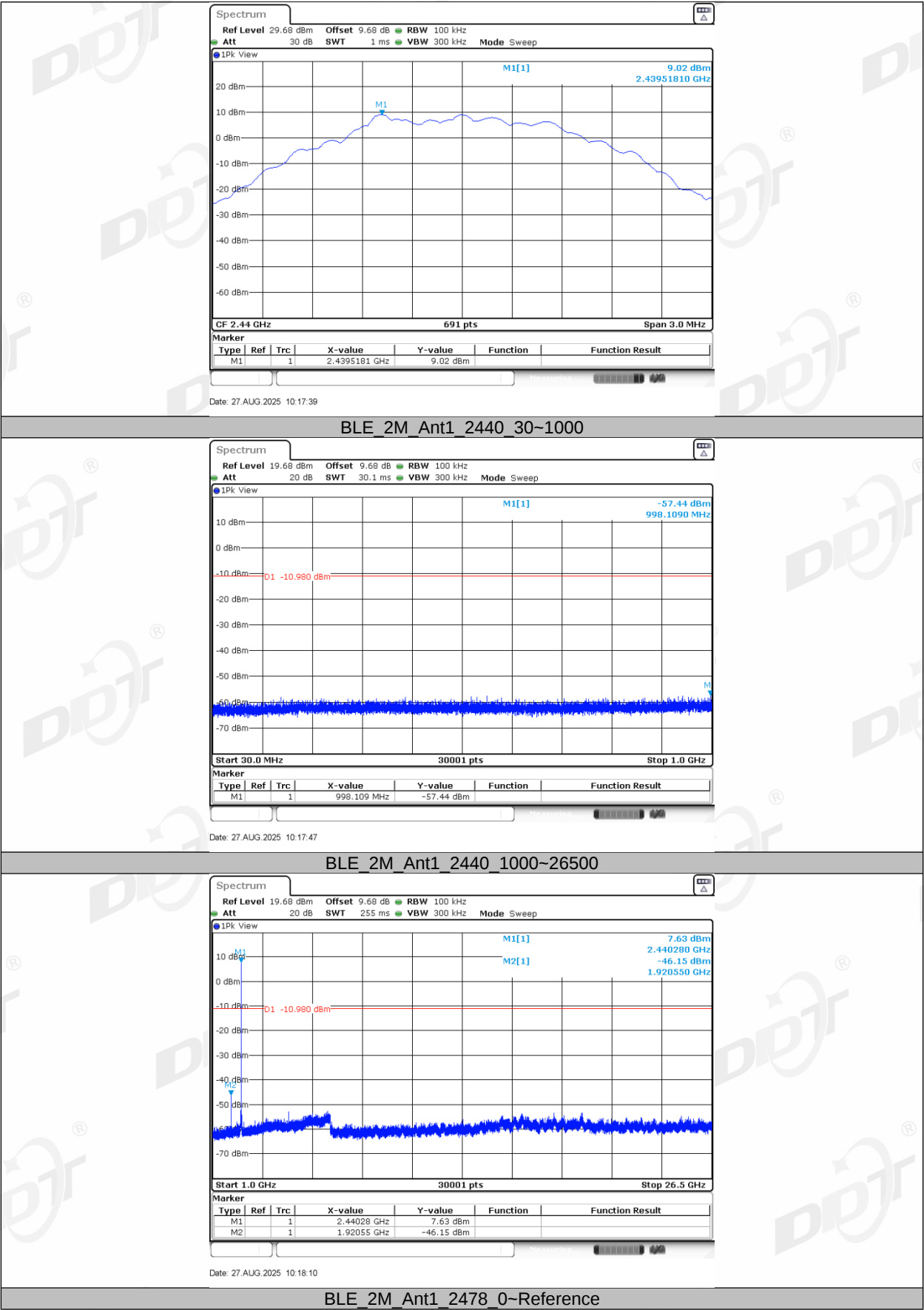
9.5. Test graphs

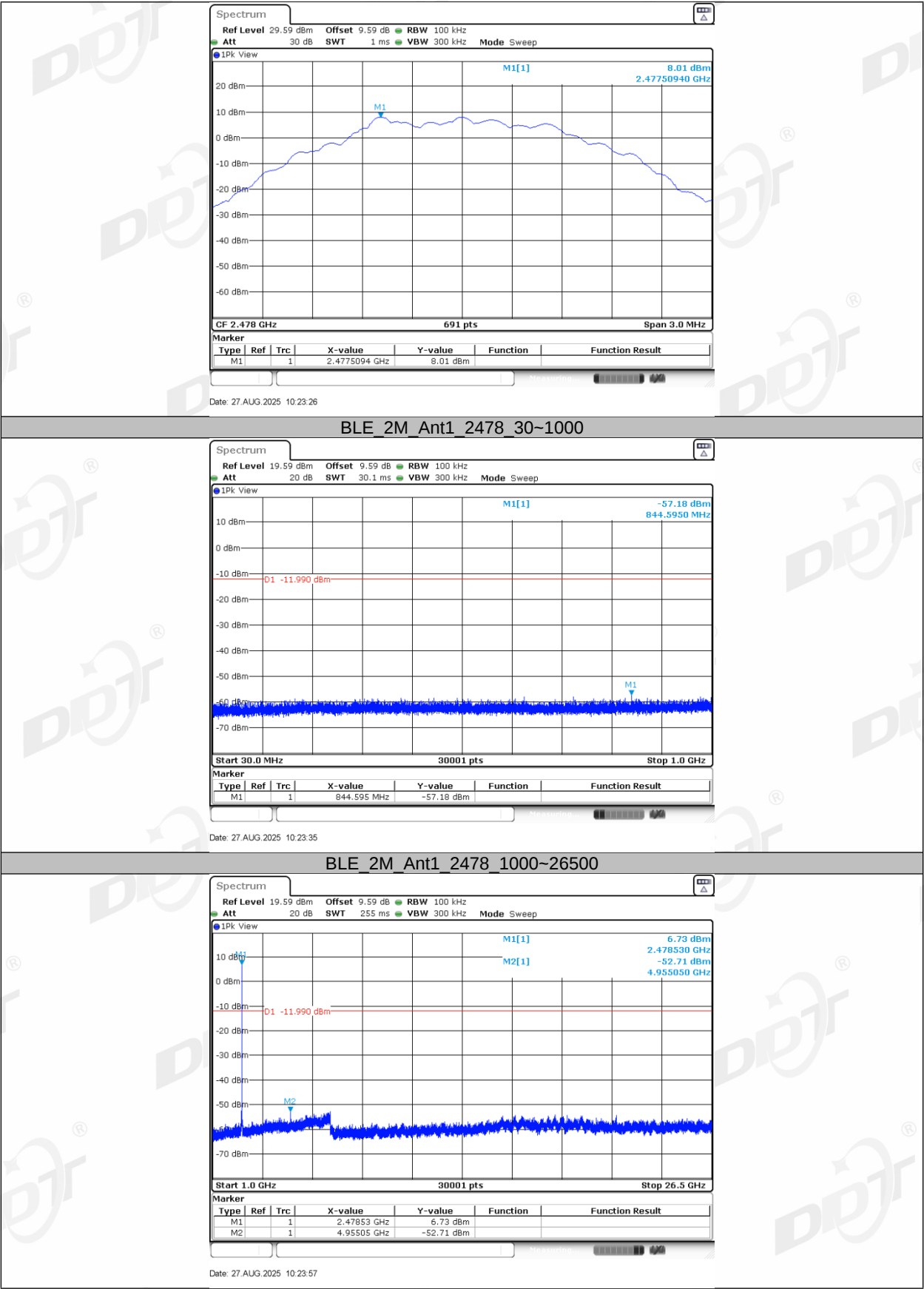






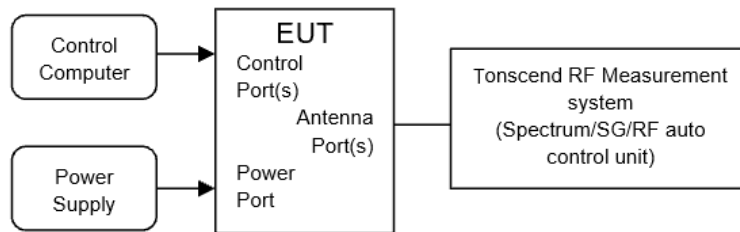






## 10. Duty Cycle

### 10.1. Block diagram of test setup



### 10.2. Limit

Just for Report.

### 10.3. Test procedure

- (1) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, The cable loss and attenuator loss have been put into spectrum analyzer as amplitude offset.  
set the Spectrum Analyzer as below:
  - Centre Frequency: The centre frequency of the middle hopping channel.
  - Resolution BW: 10 MHz.
  - Video BW: 10 MHz.
  - Span: Zero span.
  - Detector: Peak.
  - Trace Mode: Clear Write.
  - Sweep: Video Trigger
- (2) When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 burst cycle.
- (3) Calculate dwell time follow below formula:  
Duty cycle= Pulse's on time / Burst cycle

10.4. Test result

|                    |                |                |                          |
|--------------------|----------------|----------------|--------------------------|
| Test Engineer:     | Zeng Zhongyao  | Test Site:     | RF Measurement System 3# |
| Ambient Condition: | 24.8°C,29.8%RH | Test Date:     | 2025.11.24               |
| Test Power Supply: | Battery        | Sample Number: | s25102410-001            |

| Test Mode | Antenna | Frequency [MHz] | ON Time [ms] | Period [ms] | Duty Cycle [%] | Duty Cycle Factor[dB] |
|-----------|---------|-----------------|--------------|-------------|----------------|-----------------------|
| BLE_1M    | Ant1    | 2402            | 2.13         | 2.24        | 95.09          | 0.22                  |
|           |         | 2440            | 2.13         | 2.24        | 95.09          | 0.22                  |
|           |         | 2480            | 2.13         | 2.24        | 95.09          | 0.22                  |
| BLE_2M    | Ant1    | 2404            | 1.08         | 1.19        | 90.76          | 0.42                  |
|           |         | 2440            | 1.08         | 1.19        | 90.76          | 0.42                  |
|           |         | 2478            | 1.08         | 1.19        | 90.76          | 0.42                  |

10.5. Test graphs





## 11. Antenna Requirements

### 11.1. Limit

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For intentional device, according to RSS-Gen issue 5 section 6.8.

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

### 11.2. Result

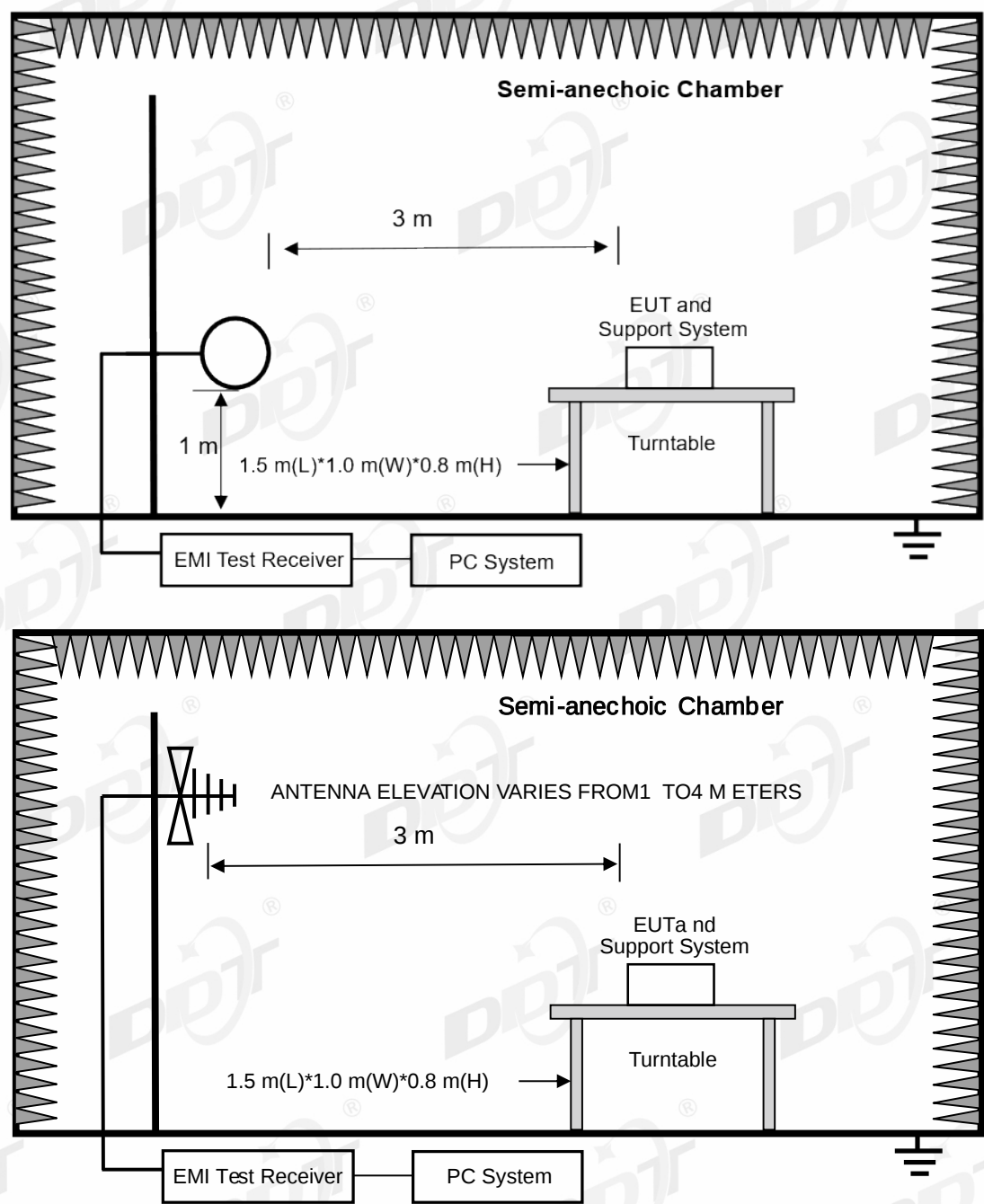
The antenna used for this product as Antenna information described in section 2.1 of the report, and there is no other antenna than that furnished by the responsible party shall be used with the device.

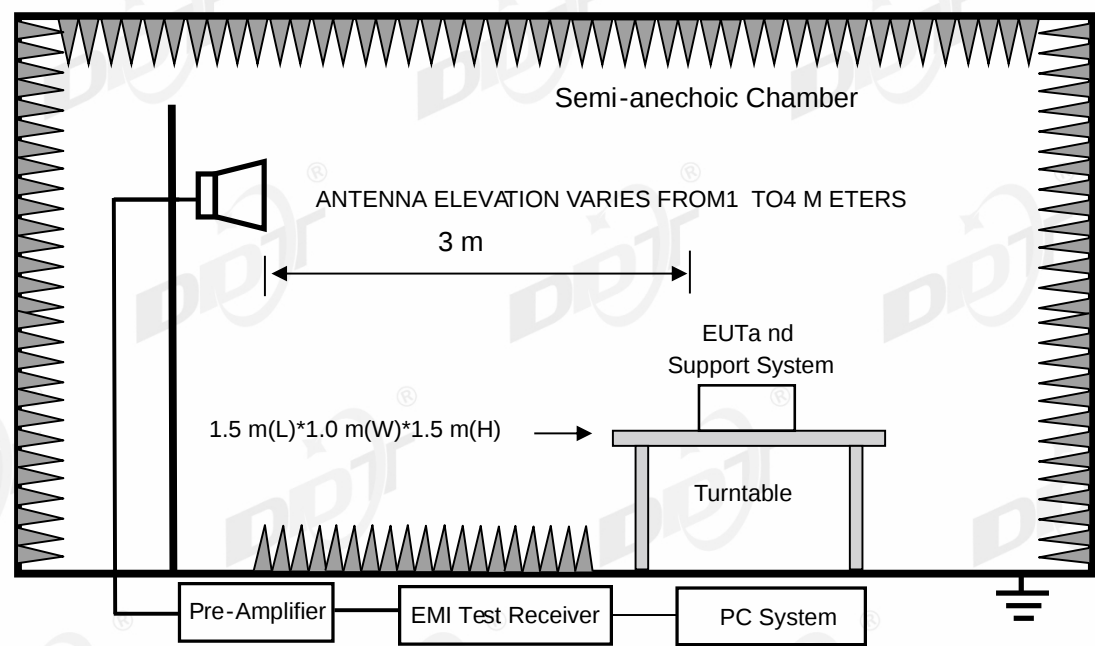
## 12. Radiated Emission

### 12.1. Test equipment

| Equipment                                           | Manufacturer      | Model No.          | Serial No.  | Cal Due To |
|-----------------------------------------------------|-------------------|--------------------|-------------|------------|
| High pass filter                                    | Micro-Tronics     | HPM50102           | DDT-ZC00561 | 2026/03/28 |
| Radiation disturbance fully automated test software | Tonscend          | JS32-RE            | DDT-ZC02739 | /          |
| Pre-amplifier                                       | SONOMA            | 310N               | DDT-ZC01969 | 2026/07/06 |
| RF Cable                                            | N/A               | W24.02 HL-562      | DDT-ZC04022 | 2026/03/28 |
| RF cable                                            | Yuhu Technology   | JCTB810-NJ-NJ-9M   | DDT-ZC02538 | 2026/03/28 |
| RF cable                                            | Zhongke Junchuang | JCT26S-NJ-NJ-1.5M  | DDT-ZC02762 | /          |
| RF cable                                            | Yuhu Technology   | ZT26S-SMAJ-SMAJ-1M | DDT-ZC02037 | 2026/10/10 |
| RF Cable                                            | N/A               | W13.02 AP1-X2      | DDT-ZC04023 | 2026/03/28 |
| Pre-amplifier                                       | COM-POWER         | PAM-840A           | DDT-ZC01693 | 2026/03/28 |
| Pre-amplifier                                       | COM-POWER         | PAM-118A           | DDT-ZC01293 | 2026/08/10 |
| EMI TEST RECEIVER                                   | R&S               | ESU26              | DDT-ZC01909 | 2026/03/28 |
| Micro-Tronics filters                               | REBES             | BRM50702           | DDT-ZC03242 | /          |
| High pass filter                                    | Micro-Tronics     | HPM50108           | DDT-ZC00560 | 2026/03/28 |
| High Pass filter                                    | Xi'an Xingbo      | XBLBQ-GTA67        | DDT-ZC02179 | 2026/03/28 |
| Micro-Tronics filters                               | REBES             | BRM50716           | DDT-ZC03240 | /          |
| Broad-Band Horn Antenna                             | Schwarzbeck       | BBHA 9170          | DDT-ZC00506 | 2026/04/01 |
| Trilog Broadband Antenna                            | Schwarzbeck       | VULB 9163          | DDT-ZC02050 | 2026/07/25 |
| Hochgewinn-Hornantenne                              | SCHWARZBEC K      | BBHA 9120 D        | DDT-ZC02129 | 2026/08/11 |
| Active Loop Antenna                                 | Schwarzbeck       | FMZB1519           | DDT-ZC00524 | 2026/08/18 |
| PSA Series Spectrum Analyzer                        | Agilent           | E4447A             | DDT-ZC00517 | 2026/03/28 |

12.2. Block diagram of test setup





12.3. Limits

(1) FCC 15.205 Restricted frequency band

| MHz                      | MHz                 | MHz           | GHz              |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110              | 16.42-16.423        | 399.9-410     | 4.5-5.15         |
| <sup>1</sup> 0.495-0.505 | 16.69475-16.69525   | 608-614       | 5.35-5.46        |
| 2.1735-2.1905            | 16.80425-16.80475   | 960-1240      | 7.25-7.75        |
| 4.125-4.128              | 25.5-25.67          | 1300-1427     | 8.025-8.5        |
| 4.1772&4.17775           | 37.5-38.25          | 1435-1626.5   | 9.0-9.2          |
| 4.2072&4.20775           | 73-74.6             | 1645.5-1646.5 | 9.3-9.5          |
| 6.215-6.218              | 74.8-75.2           | 1660-1710     | 10.6-12.7        |
| 6.26775-6.26825          | 108-121.94          | 1718.8-1722.2 | 13.25-13.4       |
| 6.31175-6.31225          | 123-138             | 2200-2300     | 14.47-14.5       |
| 8.291-8.294              | 149.9-150.05        | 2310-2390     | 15.35-16.2       |
| 8.362-8.366              | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4        |
| 8.37625-8.38675          | 156.7-156.9         | 2690-2900     | 22.01-23.12      |
| 8.41425-8.41475          | 162.0125-167.17     | 3260-3267     | 23.6-24.0        |
| 12.29-12.293             | 167.72-173.2        | 3332-3339     | 31.2-31.8        |
| 12.51975-12.52025        | 240-285             | 3345.8-3358   | 36.43-36.5       |
| 12.57675-12.57725        | 322-335.4           | 3600-4400     | ( <sup>2</sup> ) |
| 13.36-13.41              |                     |               |                  |

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

<sup>2</sup>Above 38.6

RSS-Gen section 8.10 Restricted frequency bands\*

| MHz             | MHz                 | MHz           | GHz         |
|-----------------|---------------------|---------------|-------------|
| 0.090-0.110     | 12.51975-12.52025   | 240-285       | 3.5-4.4     |
| 0.495-0.505     | 12.57675-12.57725   | 322-335.4     | 4.5-5.15    |
| 2.1735-2.1905   | 13.36-13.41         | 399.9-410     | 5.35-5.46   |
| 3.020-3.026     | 16.42-16.423        | 608-614       | 7.25-7.75   |
| 4.125-4.128     | 16.69475-16.69525   | 960-1427      | 8.025-8.5   |
| 4.1772&4.17775  | 16.80425-16.80475   | 1435-1626.5   | 9.0-9.2     |
| 4.2072&4.20775  | 25.5-25.67          | 1645.5-1646.5 | 9.3-9.5     |
| 5.677-5.683     | 37.5-38.25          | 1660-1710     | 10.6-12.7   |
| 6.215-6.218     | 73-74.6             | 1718.8-1722.2 | 13.25-13.4  |
| 6.26775-6.26825 | 74.8-75.2           | 2200-2300     | 14.47-14.5  |
| 6.31175-6.31225 | 108-138             | 2310-2390     | 15.35-16.2  |
| 8.291-8.294     | 149.9-150.05        | 2483.5-2500   | 17.7-21.4   |
| 8.362-8.366     | 156.52475-156.52525 | 2655-2900     | 22.01-23.12 |
| 8.37625-8.38675 | 156.7-156.9         | 3260-3267     | 23.6-24.0   |
| 8.41425-8.41475 | 162.0125-167.17     | 3332-3339     | 31.2-31.8   |
| 12.29-12.293    | 167.72-173.2        | 3345.8-3358   | 36.43-36.5  |
|                 |                     |               | Above 38.6  |

\* Certain frequency bands listed in table and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

(2) FCC 15.209 Limit & RSS-Gen section 8.9 Limit

| FREQUENCY     | DISTANCE | FIELD STRENGTHS LIMIT |               |
|---------------|----------|-----------------------|---------------|
| MHz           | Meters   | uV/m                  | dBuV/m        |
| 0.009 ~ 0.490 | 300      | 2400/F(kHz)           | 67.6-20log(F) |
| 0.490 ~ 1.705 | 30       | 24000/F(kHz)          | 87.6-20log(F) |
| 1.705 ~ 30.0  | 30       | 30                    | 29.54         |
| 30~88         | 3        | 100                   | 40.0          |
| 88~216        | 3        | 150                   | 43.5          |
| 216~960       | 3        | 200                   | 46.0          |
| 960~1000      | 3        | 500                   | 54.0          |
| Above 1000    | 3        | 74.0 dBuV/m(Peak)     |               |
|               |          | 54.0 dBuV/m(Average)  |               |

Note:

(1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz and above 1000 MHz, radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3m}(\text{dBuV/m}) = \text{Limit}_{30m}(\text{dBuV/m}) + 40\log(30m/3m)$$

(3) Limit for this EUT

The emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, and the emissions appearing within RSS-Gen section 8.10 Restricted frequency bands shall not exceed the limits shown in RSS-Gen section 8.9, all the other emissions shall be at least 20 dB below the fundamental emissions or comply with 15.209 limits and RSS-Gen section 8.9 limits.

#### 12.4. Assistant equipment used for test

| Assistant equipment | Manufacturer | Model number | Description | other |
|---------------------|--------------|--------------|-------------|-------|
| /                   | /            | /            | /           | /     |

#### 12.5. Test procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber for below 1G and 150 cm above the ground plane inside a fully-anechoic chamber for above 1G.

(2) Test antenna was located 3 m from the EUT on an adjustable mast, and the antenna used as below table.

| Test frequency range | Test antenna used                        | Test antenna distance |
|----------------------|------------------------------------------|-----------------------|
| 9 kHz - 30 MHz       | Active Loop antenna                      | 3 m                   |
| 30 MHz - 1 GHz       | Trilog Broadband Antenna                 | 3 m                   |
| 1 GHz - 18 GHz       | Double Ridged Horn Antenna(1 GHz-18 GHz) | 3 m                   |
| 18 GHz - 40 GHz      | Horn Antenna(18 GHz-40 GHz)              | 1 m                   |

According to ANSI C63.10 clause 6.4.6 and 6.5.3, for measurements below 30 MHz, Antenna was located 3 m from EUT, the loop antenna was positioned in three antenna orientations (parallel, perpendicular, and round-parallel), for each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable, and the lowest height of the magnetic antenna shall be 1 m above the ground. For measurement above 30 MHz, the Trilog Broadband Antenna or Horn Antenna was located 3 m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 25 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1 m above ground.)

(b) Change work frequency or channel of device if practicable.