

# TEST REPORT

Applicant Name: Telepower Communication Co., Ltd.  
Address: 5 Bld, Zone A, Hantian Technology Town No.17 ShenHai RD,  
Nanhai District Foshan China  
Report Number: 2401A35544E-RF-00B  
FCC ID: 2AJ2B-M1K

## Test Standard (s)

FCC PART 15.247

## Sample Description

Product Type: POS Terminal  
Model No.: M1  
Multiple Model(s) No.: M1K, M1KC  
Trade Mark: Telpo  
Date Received: 2024-12-03  
Issue Date: 2025-04-11

Test Result:

Pass▲

▲ In the configuration tested, the EUT complied with the standards above.

## Prepared and Checked By:

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GaLa Liu  
RF Engineer

## Approved By:

Nancy Wang

Nancy Wang  
RF Supervisor

Note: The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

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DOCUMENT REVISION HISTORY

| Revision Number | Report Number      | Description of Revision | Date of Revision |
|-----------------|--------------------|-------------------------|------------------|
| 0               | 2401A35544E-RF-00B | Original Report         | 2025-04-11       |

## GENERAL INFORMATION

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

|                                          |                                                                                                 |
|------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Product Type</b>                      | POS Terminal                                                                                    |
| <b>Test Model</b>                        | M1                                                                                              |
| <b>Multiple Model(s)</b>                 | M1K, M1KC                                                                                       |
| <b>Frequency Range</b>                   | 2402~2480MHz                                                                                    |
| <b>Transmit Peak Power</b>               | 4.72dBm                                                                                         |
| <b>Modulation Technique</b>              | Bluetooth: GFSK, $\pi/4$ -DQPSK, 8DPSK                                                          |
| <b>Antenna Specification<sup>#</sup></b> | 0.7dBi (provided by the applicant)                                                              |
| <b>Voltage Range</b>                     | DC 7.60V from Li-ion Battery or DC 5V from Adapter                                              |
| <b>Sample serial number</b>              | 2VH5-2 for Radiated Emissions Test<br>2VH6-3 for RF Conducted Test (Assigned by BACL, Shenzhen) |
| <b>Sample/EUT Status</b>                 | Good condition                                                                                  |
| <b>Adapter Information</b>               | Model: TPA-147A050200UU01<br>Input: 100-240V~50/60Hz 0.3A<br>Output: 5.0V, 2.0A                 |

Note: The Multiple models are electrically identical with the test model except for model name and sales channels. Please refer to the declaration letter<sup>#</sup> for more detail, which was provided by manufacturer.

### Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.207, 15.205, 15.209 and 15.247 rules.

### Test Methodology

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

And KDB 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

## Measurement Uncertainty

| Parameter                          |                             | Uncertainty                            |
|------------------------------------|-----------------------------|----------------------------------------|
| Occupied Channel Bandwidth         |                             | 109.2kHz(k=2, 95% level of confidence) |
| RF output power, conducted         |                             | 0.86dB(k=2, 95% level of confidence)   |
| AC Power Lines Conducted Emissions | 9kHz-150kHz                 | 3.63dB(k=2, 95% level of confidence)   |
|                                    | 150kHz-30MHz                | 3.66dB(k=2, 95% level of confidence)   |
| Radiated Emissions                 | 0.009MHz~30MHz              | 3.60dB(k=2, 95% level of confidence)   |
|                                    | 30MHz~200MHz (Horizontal)   | 5.32dB(k=2, 95% level of confidence)   |
|                                    | 30MHz~200MHz (Vertical)     | 5.43dB(k=2, 95% level of confidence)   |
|                                    | 200MHz~1000MHz (Horizontal) | 5.77dB(k=2, 95% level of confidence)   |
|                                    | 200MHz~1000MHz (Vertical)   | 5.73dB(k=2, 95% level of confidence)   |
|                                    | 1GHz - 6GHz                 | 5.34dB(k=2, 95% level of confidence)   |
|                                    | 6GHz - 18GHz                | 5.40dB(k=2, 95% level of confidence)   |
|                                    | 18GHz - 40GHz               | 5.64dB(k=2, 95% level of confidence)   |
| Temperature                        |                             | ±1°C                                   |
| Humidity                           |                             | ±1%                                    |
| Supply voltages                    |                             | ±0.4%                                  |

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

## Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 715558, the FCC Designation No. : CN5045.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in an engineering mode.

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 0       | 2402            | 40      | 2442            |
| 1       | 2403            | 41      | 2443            |
| 2       | 2404            | 42      | 2444            |
| ...     | ...             | ...     | ...             |
| ...     | ...             | ...     | ...             |
| 36      | 2438            | 75      | 2477            |
| 37      | 2439            | 76      | 2478            |
| 38      | 2440            | 77      | 2479            |
| 39      | 2441            | 78      | 2480            |

EUT was tested with Channel 0, 39 and 78.

### EUT Exercise Software

|                                |                  |
|--------------------------------|------------------|
| Exercise Software <sup>#</sup> | Engineering mode |
| Power Level <sup>#</sup>       | 6                |

### Special Accessories

No special accessory.

### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

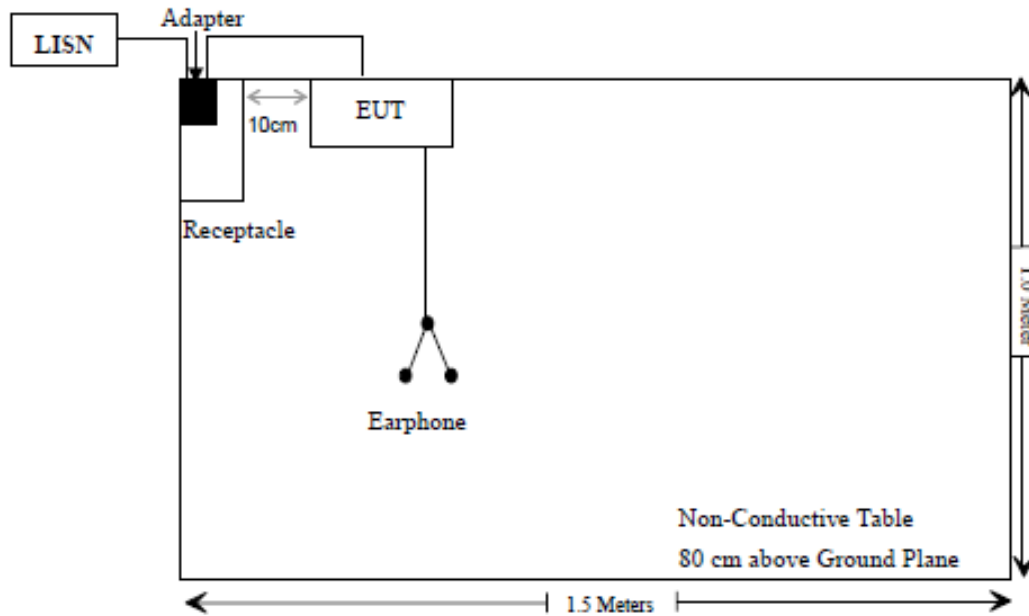
| Manufacturer | Description | Model   | Serial Number |
|--------------|-------------|---------|---------------|
| Unknown      | Receptacle  | Unknown | Unknown       |
| Unknown      | Earphone    | Unknown | Unknown       |

### External I/O Cable

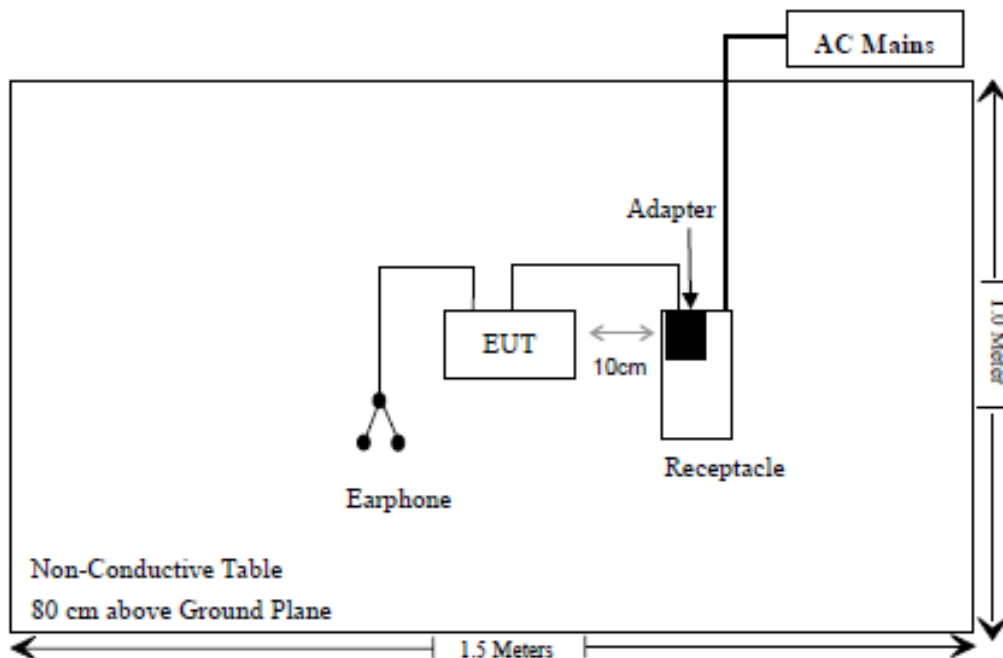
| Cable Description                  | Length (m) | From Port  | To           |
|------------------------------------|------------|------------|--------------|
| Unshielded Un-detachable AC Cable  | 1.5        | Receptacle | LISN/AC Main |
| Un-shielding Detachable USB Cable  | 0.8        | EUT        | Adapter      |
| Un-shielded Detachable Audio cable | 1.2        | EUT        | Earphone     |

## Block Diagram of Test Setup

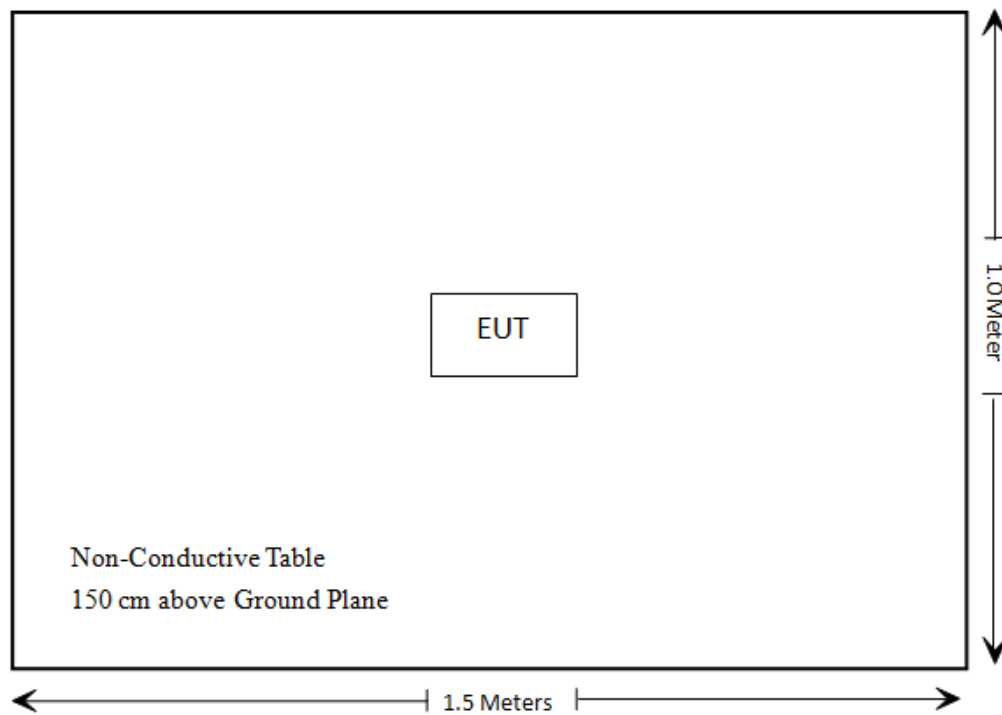
For Conducted Emissions:



For Radiated Emissions below 1GHz:



For Radiated Emissions above 1GHz:





**SUMMARY OF TEST RESULTS**

| FCC Rules                        | Description of Test                      | Result    |
|----------------------------------|------------------------------------------|-----------|
| FCC §15.203                      | Antenna Requirement                      | Compliant |
| FCC §15.207(a)                   | AC Line Conducted Emissions              | Compliant |
| FCC §15.205, §15.209, §15.247(d) | Radiated Spurious Emission               | Compliant |
| FCC §15.247(a)(1)                | 20 dB Emission Bandwidth                 | Compliant |
| FCC §15.247(a)(1)                | Channel Separation                       | Compliant |
| FCC §15.247(a)(1)(iii)           | Number of Hopping Frequency              | Compliant |
| FCC §15.247(a)(1)(iii)           | Time of Occupancy (dwell time)           | Compliant |
| FCC §15.247(b)(1)                | Maximum Conducted Output Power           | Compliant |
| FCC §15.247(d)                   | 100 kHz Bandwidth of Frequency Band Edge | Compliant |
| FCC §1.1307&§2.1093&§15.247 (i)  | RF Exposure                              | Compliant |

**TEST EQUIPMENT LIST**

| Manufacturer                   | Description                       | Model           | Serial Number          | Calibration Date | Calibration Due Date |
|--------------------------------|-----------------------------------|-----------------|------------------------|------------------|----------------------|
| <b>Conducted Emission Test</b> |                                   |                 |                        |                  |                      |
| Rohde & Schwarz                | EMI Test Receiver                 | ESCI            | 101120                 | 2024/12/04       | 2025/12/03           |
| Rohde & Schwarz                | LISN                              | ENV216          | 101613                 | 2024/12/04       | 2025/12/03           |
| Rohde & Schwarz                | Transient Limiter                 | ESH3Z2          | DE25985                | 2024/05/21       | 2025/05/20           |
| Unknown                        | CE Cable                          | Unknown         | UF A210B-1-0720-504504 | 2024/05/21       | 2025/05/20           |
| Audix                          | EMI Test software                 | E3              | 191218(V9)             | NCR              | NCR                  |
| <b>Radiated Emission Test</b>  |                                   |                 |                        |                  |                      |
| Rohde & Schwarz                | EMI Test Receiver                 | ESR3            | 102455                 | 2024/12/04       | 2025/12/03           |
| Sonoma instrument              | Pre-amplifier                     | 310N            | 186238                 | 2024/05/21       | 2025/05/20           |
| Sunol Sciences                 | Broadband Antenna                 | JB1             | A040904-1              | 2023/07/20       | 2026/07/19           |
| Unknown                        | Cable                             | Chamber Cable 1 | F-03-EM236             | 2024/06/18       | 2025/06/17           |
| Unknown                        | Cable                             | XH500C          | J-10M-A                | 2024/06/18       | 2025/06/17           |
| BACL                           | Active Loop Antenna               | 1313-1A         | 4031911                | 2024/05/14       | 2027/05/13           |
| Audix                          | EMI Test software                 | E3              | 19821b(V9)             | NCR              | NCR                  |
| Rohde&Schwarz                  | Spectrum Analyzer                 | FSV40           | 101605                 | 2024/03/27       | 2025/03/26           |
| A.H.System                     | Preamplifier                      | PAM-0118P       | 489                    | 2024/11/15       | 2025/11/14           |
| Schwarzbeck                    | Horn Antenna                      | BBHA9120D(1201) | 1143                   | 2023/07/26       | 2026/07/25           |
| Unknown                        | RF Cable                          | KMSE            | 0735                   | 2024/12/06       | 2025/12/05           |
| Unknown                        | RF Cable                          | UFA147          | 219661                 | 2024/12/06       | 2025/12/05           |
| Unknown                        | RF Cable                          | XH750A-N        | J-10M                  | 2024/12/06       | 2025/12/05           |
| JD                             | Filter Switch Unit                | DT7220FSU       | DS79906                | 2024/09/09       | 2025/09/08           |
| JD                             | Multiplex Switch Test Control Set | DT7220SCU       | DS79903                | 2024/09/09       | 2025/09/08           |
| A.H.System                     | Pre-amplifier                     | PAM-1840VH      | 190                    | 2024/06/18       | 2025/06/17           |
| Electro-Mechanics Co           | Horn Antenna                      | 3116            | 9510-2270              | 2023/09/18       | 2026/09/17           |
| UTIFLEX                        | RF Cable                          | NO. 13          | 232308-001             | 2024/12/18       | 2025/12/17           |
| Audix                          | EMI Test software                 | E3              | 191218(V9)             | NCR              | NCR                  |
| <b>RF Conducted Test</b>       |                                   |                 |                        |                  |                      |
| Rohde & Schwarz                | Spectrum Analyzer                 | FSU26           | 200982                 | 2024/09/20       | 2025/09/19           |
| Unknown                        | 10dB Attenuator                   | Unknown         | F-03-EM190             | 2024/06/27       | 2025/06/26           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

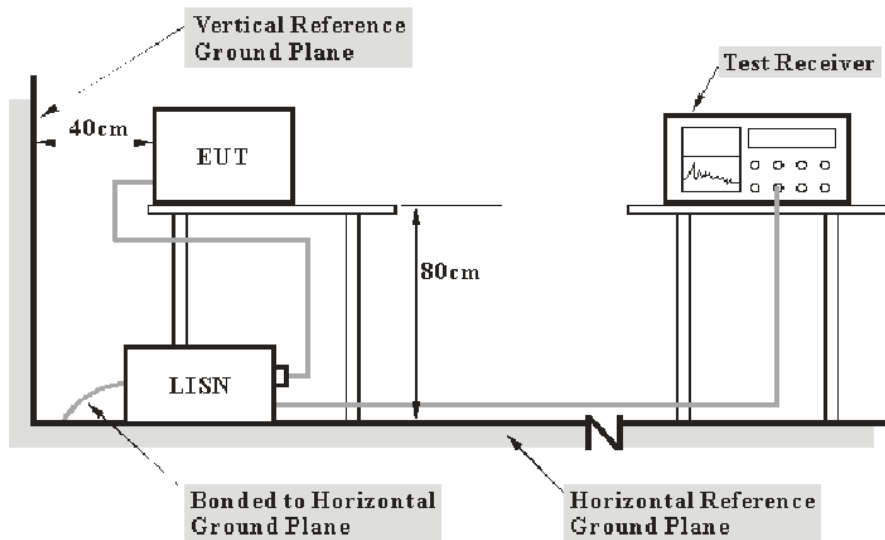
## REQUIREMENTS AND TEST PROCEDURES

### AC Line Conducted Emissions

#### Applicable Standard

FCC §15.207(a)

#### EUT Setup



Note: 1. Support units were connected to second LISN.  
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

#### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

| Frequency Range  | IF B/W |
|------------------|--------|
| 150 kHz – 30 MHz | 9 kHz  |

#### Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

**Factor & Over Limit Calculation**

The factor is calculated by adding LISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

$$\text{Factor} = \text{LISN VDF} + \text{Cable Loss}$$

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

$$\begin{aligned}\text{Over Limit} &= \text{Level} - \text{Limit} \\ \text{Level} &= \text{Read Level} + \text{Factor}\end{aligned}$$

Note: The term "cable loss" refers to the combination of a cable and a 10dB transient limiter (attenuator).

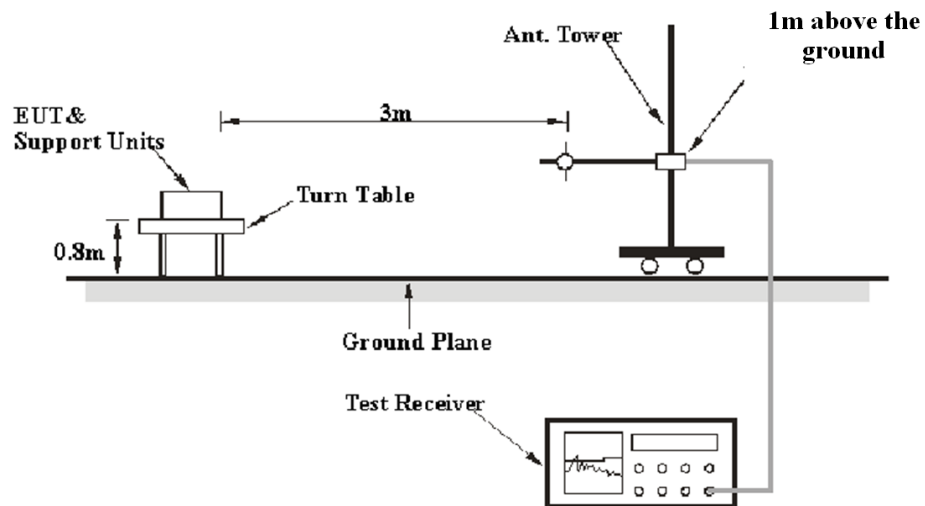
## Radiated Emissions

### Applicable Standard

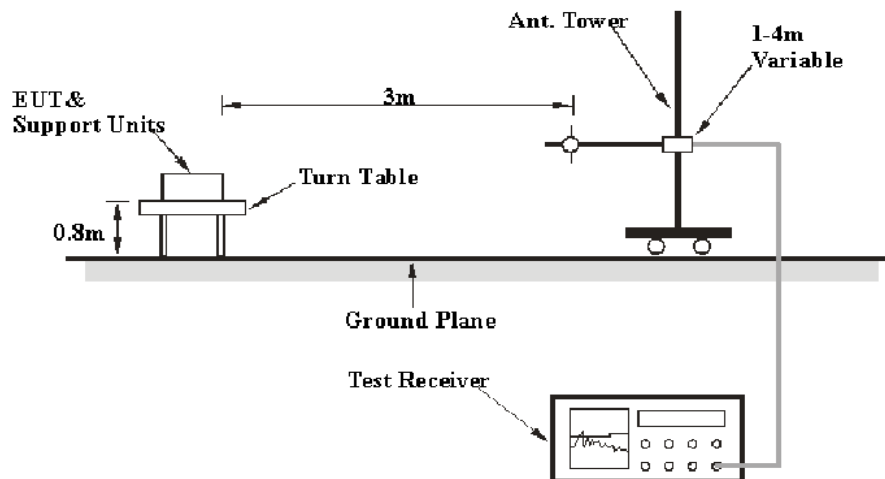
FCC §15.205; §15.209; §15.247(d)

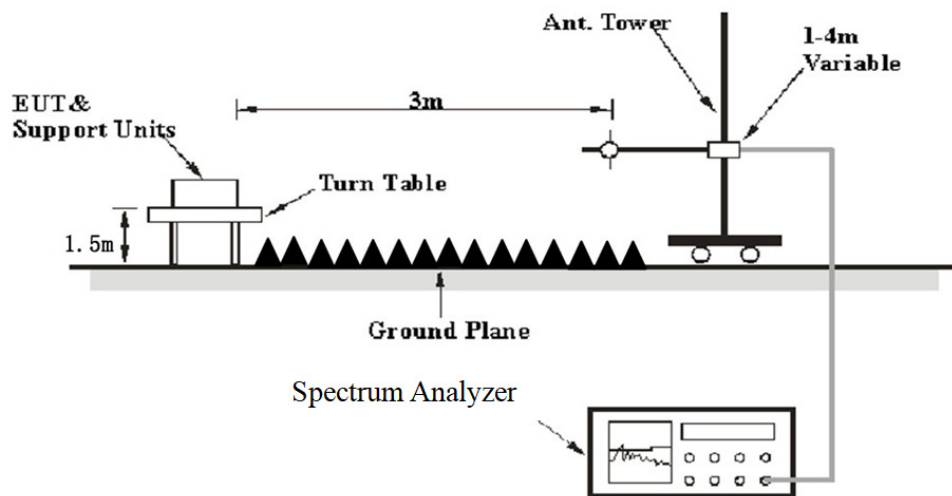
### EUT Setup

9 kHz-30MHz:



30MHz-1GHz:



**Above 1GHz:**

The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.247 limits.

**EMI Test Receiver & Spectrum Analyzer Setup**

The EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

| Frequency Range   | RBW                                                           | Video B/W | IF B/W  | Measurement | Detector |
|-------------------|---------------------------------------------------------------|-----------|---------|-------------|----------|
| 9 kHz – 150 kHz   | /                                                             | /         | 200 Hz  | QP          | QP       |
|                   | 300 Hz                                                        | 1 kHz     | /       | PK          | Peak     |
| 150 kHz – 30 MHz  | /                                                             | /         | 9 kHz   | QP          | QP       |
|                   | 10 kHz                                                        | 30 kHz    | /       | PK          | Peak     |
| 30 MHz – 1000 MHz | /                                                             | /         | 120 kHz | QP          | QP       |
|                   | 100 kHz                                                       | 300 kHz   | /       | PK          | Peak     |
| Above 1 GHz       | Harmonics                                                     |           |         |             |          |
|                   | 1MHz                                                          | 3 MHz     | /       | PK          | Peak     |
|                   | Average Emission Level=Peak Emission Level+20*log(Duty cycle) |           |         |             |          |
|                   | Band Edge & Other Emissions                                   |           |         |             |          |
|                   | 1MHz                                                          | 3 MHz     | /       | PK          | Peak     |
|                   | 1MHz                                                          | ≥10 Hz    | /       | Average     | Peak     |

For Duty cycle measurement:

Use the duty cycle factor correction factor method per 15.35(c).

Duty cycle=On time/100milliseconds, On time= $N_1 \cdot L_1 + N_2 \cdot L_2 + \dots + N_{n-1} \cdot L_{n-1} + N_n \cdot L_n$ ,

Where  $N_1$  is number of type 1 pulses,  $L_1$  is length of type 1 pulse, etc.

**Test Procedure**

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

All final data was recorded in Quasi-peak detection mode except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, average detection modes for frequency bands 9–90 kHz and 110–490 kHz, peak and average detection modes for frequencies above 1 GHz.

For 9 kHz-30MHz, the report shall list the six emissions with the smallest margin relative to the limit, for each of the three antenna orientations (parallel, perpendicular, and ground-parallel) unless the margin is greater than 20 dB.

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

All emissions under the average limit and under the noise floor have not recorded in the report.

**Factor & Over Limit/Margin Calculation**

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

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

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

$$\begin{aligned}\text{Over Limit/Margin} &= \text{Level/Corrected Amplitude} - \text{Limit} \\ \text{Level / Corrected Amplitude} &= \text{Read Level} + \text{Factor}\end{aligned}$$

## 20 dB Emission Bandwidth

### Applicable Standard

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

### Test Procedure

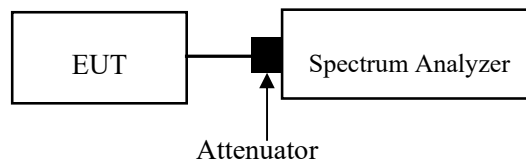
Test Method: ANSI C63.10-2013 Clause 7.8.7 & Clause 6.9.2

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement.
- c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than  $[10 \log (\text{OBW}/\text{RBW})]$  below the reference level.
- d) Steps a) through c) might require iteration to adjust within the specified tolerances.
- e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “–xx dB down” requirement; that is, if the requirement calls for measuring the –20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.
- f) Set detection mode to peak and trace mode to max hold.
- g) Determine the reference value: Set the EUT to transmit an un-modulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
- h) Determine the “–xx dB down amplitude” using  $[(\text{reference value}) - \text{xx}]$ . Alternatively, this calculation may be made by using the marker-delta function of the instrument.
- i) If the reference value is determined by an un-modulated carrier, then turn the EUT modulation on, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j).
- j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “–xx dB down amplitude” determined in step h). If a marker is below this “–xx dB down amplitude” value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the



spectral display, such that the marker is at or slightly below the “-xx dB down amplitude” determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.

k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).



## Channel Separation Test

### Applicable Standard

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

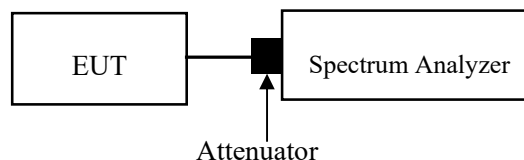
### Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.2

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

- a) Span: Wide enough to capture the peaks of two adjacent channels.
- b) 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.
- c) Video (or average) bandwidth (VBW)  $\geq$  RBW.
- d) Sweep: Auto.
- e) Detector function: Peak.
- f) Trace: Max hold.
- g) Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Compliance of an EUT with the appropriate regulatory limit shall be determined.



Note: The limit is  $\frac{2}{3} \times 20$  dB bandwidth

## Quantity of Hopping Channel Test

### Applicable Standard

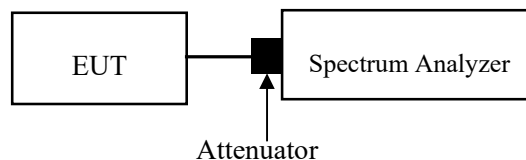
Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.3

- a) 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.
- b) 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.
- c) VBW  $\geq$  RBW.
- d) Sweep: Auto.
- e) Detector function: Peak.
- f) Trace: Max hold.

It might prove necessary to break the span up into sub ranges to show clearly all of the hopping frequencies. Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels.



## Time of Occupancy (Dwell Time)

### Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.4

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

- a) Span: Zero span, centered on a hopping channel.
- b) 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.
- c) 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.
- d) Detector function: Peak.
- e) Trace: Max hold.

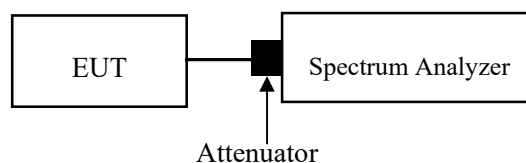
Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time.

Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

$$\begin{aligned} &(\text{Number of hops in the period specified in the requirements}) = (\text{number of hops on spectrum analyzer}) \\ &\times (\text{period specified in the requirements} / \text{analyzer sweep time}) \end{aligned}$$

The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements. If the number of hops in a specific time varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation.

The measured transmit time and time between hops shall be consistent with the values described in the operational description for the EUT.



## Peak Output Power Measurement

### Applicable Standard

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

### Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.5

This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:

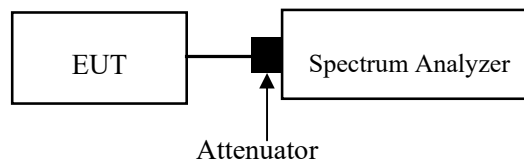
a) Use the following spectrum analyzer settings:

- 1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
- 2) RBW > 20 dB bandwidth of the emission being measured.
- 3) VBW  $\geq$  RBW.
- 4) Sweep: Auto.
- 5) Detector function: Peak.
- 6) Trace: Max hold.

b) Allow trace to stabilize.

c) Use the marker-to-peak function to set the marker to the peak of the emission.

d) The indicated level is the peak output power, after any corrections for external attenuators and cables.



Note: A short RF cable with low cable loss connected to the EUT antenna port, which was provided by client or lab, the cable loss was added with offset into test equipment, the total offset consists of attenuator and/or RF cable loss

## Band Edges

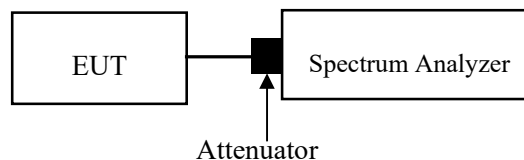
### Applicable Standard

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

### Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.6 & Clause 6.10

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.



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## ANTENNA REQUIREMENT

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### Applicable Standard

According to FCC § 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### Antenna Connector Construction

The EUT has an internal antenna arrangement, which was permanently attached, the antenna gain<sup>#</sup> is 0.7dBi, fulfill the requirement of this section. Please refer to the EUT photos.

**Result: Compliant**

## TEST DATA AND RESULTS

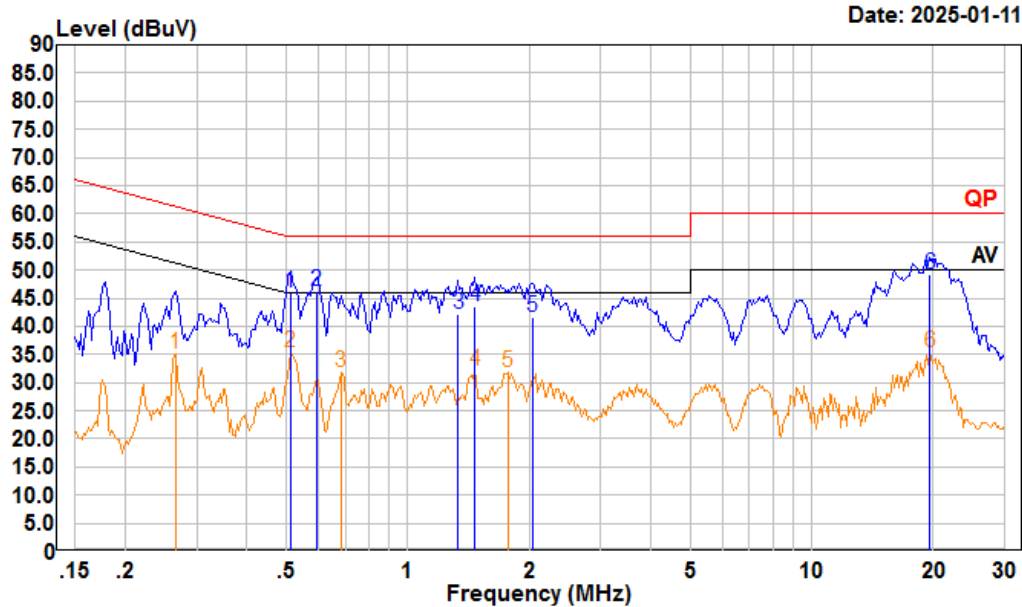
### AC Line Conducted Emissions

#### Environmental Conditions

|                               |                                                                    |                                  |          |
|-------------------------------|--------------------------------------------------------------------|----------------------------------|----------|
| <b>Temperature<br/>(°C)</b>   | 24                                                                 | <b>Relative Humidity<br/>(%)</b> | 54       |
| <b>ATM Pressure<br/>(kPa)</b> | 101                                                                | <b>Test engineer</b>             | Macy Shi |
| <b>Test date</b>              | 2025.01.11                                                         |                                  |          |
| <b>EUT operation mode</b>     | Transmitting(Maximum output power mode, BDR (GFSK) Middle Channel) |                                  |          |



## AC 120V 60 Hz, Line



Trace: 1

Condition: Line

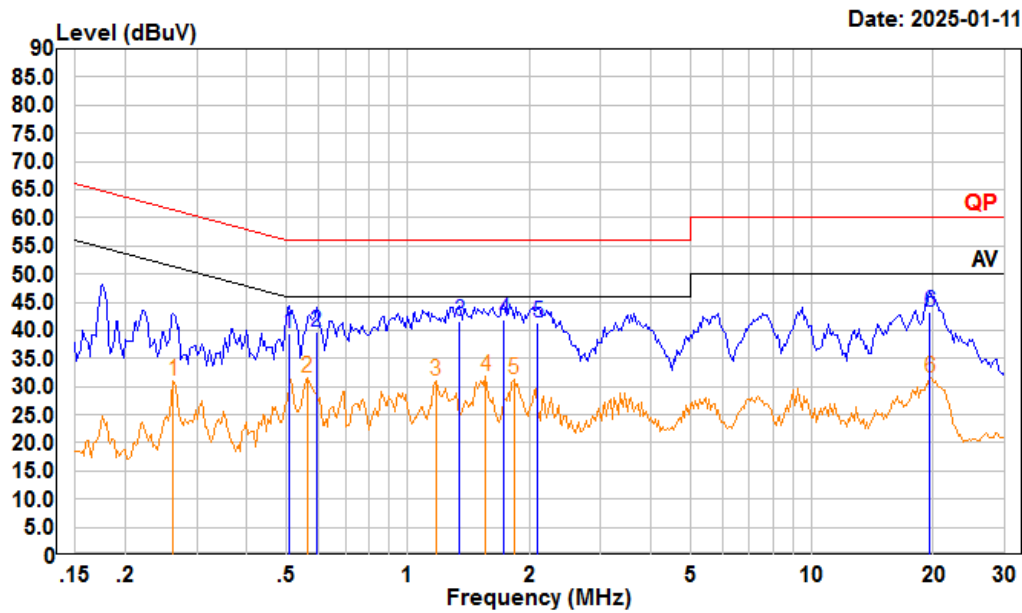
Project : 2401A35544E-RF

tester : Macy.shi Note:Transmitting

Setting : RBW:9kHz

|   | Read<br>Freq | Read<br>Level | LISN<br>Level | LISN<br>Factor | Cable<br>Loss | Limit<br>Line | Over<br>Limit | Remark  |
|---|--------------|---------------|---------------|----------------|---------------|---------------|---------------|---------|
|   | MHz          | dBuV          | dBuV          | dB             | dB            | dBuV          | dB            |         |
| 1 | 0.513        | 25.20         | 45.87         | 10.53          | 10.14         | 56.00         | -10.13        | QP      |
| 2 | 0.595        | 25.40         | 46.23         | 10.71          | 10.12         | 56.00         | -9.77         | QP      |
| 3 | 1.331        | 21.09         | 42.05         | 10.81          | 10.15         | 56.00         | -13.95        | QP      |
| 4 | 1.464        | 22.60         | 43.63         | 10.87          | 10.16         | 56.00         | -12.37        | QP      |
| 5 | 2.033        | 20.29         | 41.58         | 11.10          | 10.19         | 56.00         | -14.42        | QP      |
| 6 | 19.635       | 28.20         | 49.33         | 10.96          | 10.17         | 60.00         | -10.67        | QP      |
|   | Read<br>Freq | Read<br>Level | LISN<br>Level | LISN<br>Factor | Cable<br>Loss | Limit<br>Line | Over<br>Limit | Remark  |
|   | MHz          | dBuV          | dBuV          | dB             | dB            | dBuV          | dB            |         |
| 1 | 0.266        | 14.47         | 35.20         | 10.64          | 10.09         | 51.25         | -16.05        | Average |
| 2 | 0.513        | 14.74         | 35.41         | 10.53          | 10.14         | 46.00         | -10.59        | Average |
| 3 | 0.683        | 10.86         | 31.87         | 10.87          | 10.14         | 46.00         | -14.13        | Average |
| 4 | 1.464        | 11.03         | 32.06         | 10.87          | 10.16         | 46.00         | -13.94        | Average |
| 5 | 1.772        | 10.60         | 31.79         | 11.01          | 10.18         | 46.00         | -14.21        | Average |
| 6 | 19.635       | 14.33         | 35.46         | 10.96          | 10.17         | 50.00         | -14.54        | Average |

## AC 120V 60 Hz, Neutral



Condition: Neutral

Project : 2401A35544E-RF

tester : Macy.shi Note:Transmitting

Setting : RBW:9kHz

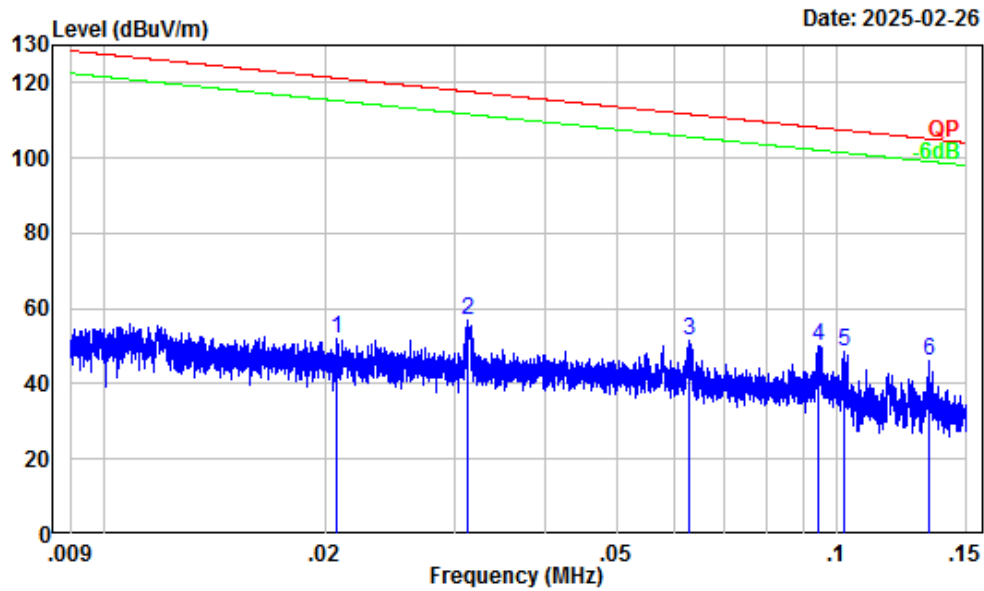
|   | Read<br>Freq | Read<br>Level | LISN<br>Level | LISN<br>Factor | Cable<br>Loss | Limit<br>Line | Over<br>Limit | Remark  |
|---|--------------|---------------|---------------|----------------|---------------|---------------|---------------|---------|
|   | MHz          | dBuV          | dBuV          | dB             | dB            | dBuV          | dB            |         |
| 1 | 0.507        | 18.70         | 39.34         | 10.50          | 10.14         | 56.00         | -16.66        | QP      |
| 2 | 0.595        | 19.10         | 39.77         | 10.55          | 10.12         | 56.00         | -16.23        | QP      |
| 3 | 1.345        | 20.70         | 41.61         | 10.76          | 10.15         | 56.00         | -14.39        | QP      |
| 4 | 1.734        | 21.10         | 41.99         | 10.72          | 10.17         | 56.00         | -14.01        | QP      |
| 5 | 2.099        | 20.30         | 41.21         | 10.72          | 10.19         | 56.00         | -14.79        | QP      |
| 6 | 19.635       | 22.10         | 43.32         | 11.05          | 10.17         | 60.00         | -16.68        | QP      |
|   | Read<br>Freq | Read<br>Level | LISN<br>Level | LISN<br>Factor | Cable<br>Loss | Limit<br>Line | Over<br>Limit | Remark  |
|   | MHz          | dBuV          | dBuV          | dB             | dB            | dBuV          | dB            |         |
| 1 | 0.263        | 10.22         | 31.02         | 10.71          | 10.09         | 51.34         | -20.32        | Average |
| 2 | 0.564        | 10.89         | 31.56         | 10.54          | 10.13         | 46.00         | -14.44        | Average |
| 3 | 1.172        | 10.06         | 30.98         | 10.78          | 10.14         | 46.00         | -15.02        | Average |
| 4 | 1.560        | 10.90         | 31.80         | 10.74          | 10.16         | 46.00         | -14.20        | Average |
| 5 | 1.829        | 10.29         | 31.18         | 10.71          | 10.18         | 46.00         | -14.82        | Average |
| 6 | 19.635       | 10.34         | 31.56         | 11.05          | 10.17         | 50.00         | -18.44        | Average |

**Radiated Emissions****Environmental Conditions**

|                            |                                                                                                                                                                                                                                                                                                                                        |                              |                       |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------|
| <b>Temperature (°C)</b>    | 24-25                                                                                                                                                                                                                                                                                                                                  | <b>Relative Humidity (%)</b> | 53-54                 |
| <b>ATM Pressure (kPa):</b> | 101-101.3                                                                                                                                                                                                                                                                                                                              | <b>Test engineer:</b>        | Alex Yan & Zenos Qiao |
| <b>Test date:</b>          | 2025.01.07-2025.02.26                                                                                                                                                                                                                                                                                                                  |                              |                       |
| <b>EUT operation mode:</b> | Below 1GHz: Transmitting (Maximum output power mode, BDR Middle Channel)<br>Above 1GHz: Transmitting (Maximum output power mode, BDR (GFSK))                                                                                                                                                                                           |                              |                       |
| <b>Note:</b>               | 1. For the radiated spurious emission below 30MHz, only the worst case (parallel) was recorded.<br>2. When the test result of peak was less than the limit of QP/Average more than 6dB, just peak value were recorded.<br>3. After pre-scan in the X, Y and Z axes of orientation, the worst case z-axis of orientation were recorded. |                              |                       |

**Below 1GHz:**

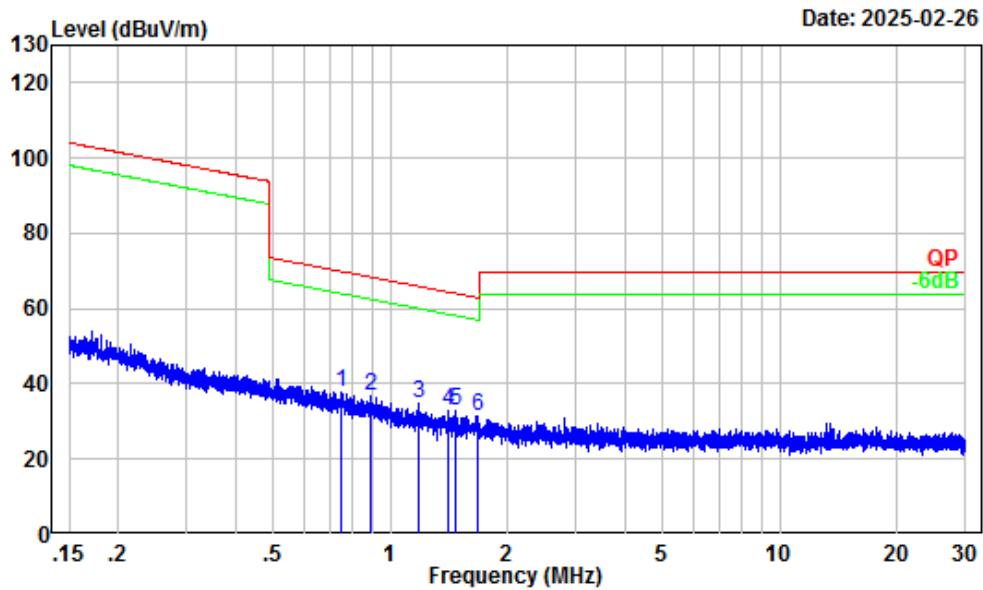
9kHz-150kHz



Site : Chamber A  
 Condition : 3m  
 Project Number : 2401A35544E-RF  
 Test Mode : BDR Transmitting  
 Detector: Peak RBW/VBW: 0.3/1kHz  
 Tester : Alex Yan

|   | Freq | Factor | Read Level | Level  | Limit  | Over Limit | Remark |
|---|------|--------|------------|--------|--------|------------|--------|
|   | MHz  | dB/m   | dBuV       | dBuV/m | dBuV/m | dB         |        |
| 1 | 0.02 | 30.25  | 21.55      | 51.80  | 121.24 | -69.44     | Peak   |
| 2 | 0.03 | 28.36  | 28.74      | 57.10  | 117.68 | -60.58     | Peak   |
| 3 | 0.06 | 25.13  | 26.24      | 51.37  | 111.66 | -60.29     | Peak   |
| 4 | 0.09 | 22.40  | 27.72      | 50.12  | 108.11 | -57.99     | Peak   |
| 5 | 0.10 | 21.88  | 26.77      | 48.65  | 107.43 | -58.78     | Peak   |
| 6 | 0.13 | 20.03  | 26.18      | 46.21  | 105.10 | -58.89     | Peak   |

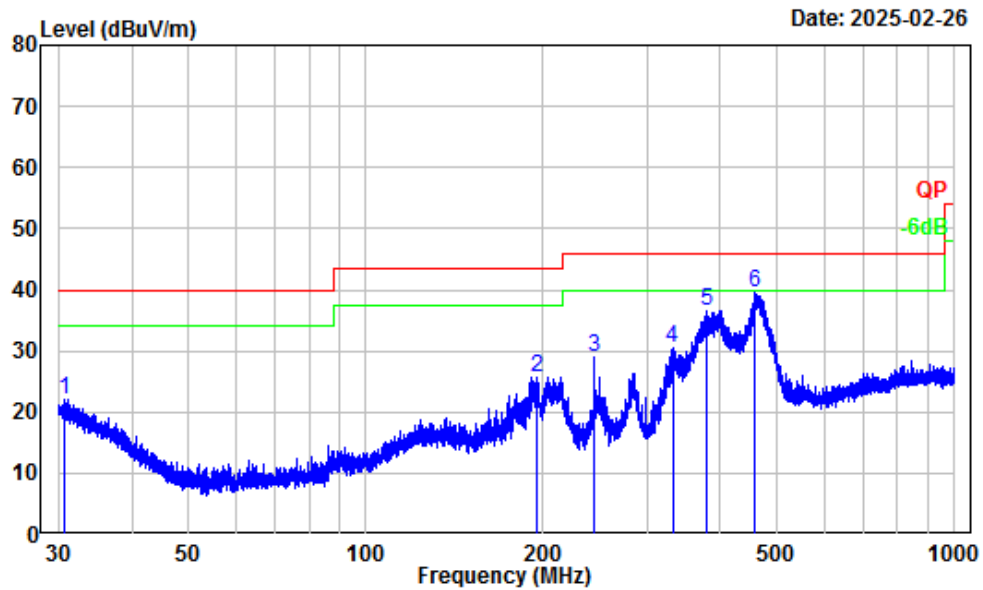
## 150kHz-30MHz



Site : Chamber A  
Condition : 3m  
Project Number : 2401A35544E-RF  
Test Mode : BDR Transmitting  
Detector: Peak RBW/VBW: 10/30kHz  
Tester : Alex Yan

|   | Freq | Factor | Read<br>Level | Level  | Limit<br>Line | Over<br>Limit | Remark |
|---|------|--------|---------------|--------|---------------|---------------|--------|
|   | MHz  | dB/m   | dBuV          | dBuV/m | dBuV/m        | dB            |        |
| 1 | 0.75 | 3.32   | 34.69         | 38.01  | 70.03         | -32.02        | Peak   |
| 2 | 0.89 | 2.00   | 34.67         | 36.67  | 68.47         | -31.80        | Peak   |
| 3 | 1.18 | 0.70   | 34.17         | 34.87  | 66.01         | -31.14        | Peak   |
| 4 | 1.42 | 0.04   | 33.02         | 33.06  | 64.39         | -31.33        | Peak   |
| 5 | 1.47 | -0.10  | 32.79         | 32.69  | 64.08         | -31.39        | Peak   |
| 6 | 1.67 | -0.68  | 32.25         | 31.57  | 62.92         | -31.35        | Peak   |

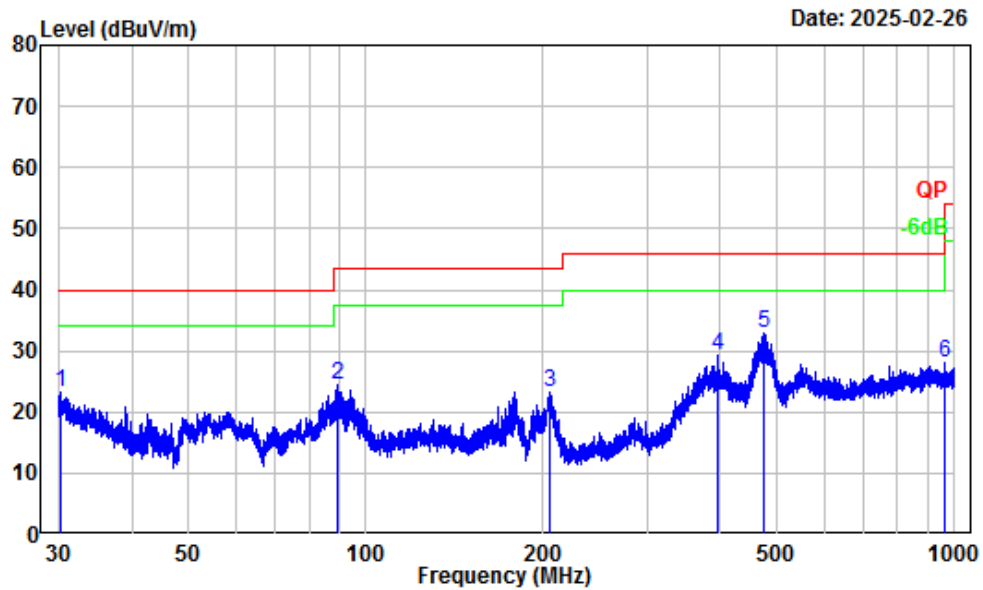
## 30MHz-1GHz\_Horizontal



Site : Chamber A  
Condition : 3m Horizontal  
Project Number : 2401A35544E-RF  
Test Mode : BDR Transmitting  
Detector: Peak RBW/VBW: 100/300kHz  
Tester : Alex Yan

|   | Freq   | Factor | Read<br>Level | Level  | Limit<br>Line | Over<br>Limit | Remark |
|---|--------|--------|---------------|--------|---------------|---------------|--------|
|   | MHz    | dB/m   | dBuV          | dBuV/m | dBuV/m        | dB            |        |
| 1 | 30.64  | -6.29  | 28.31         | 22.02  | 40.00         | -17.98        | Peak   |
| 2 | 195.82 | -13.52 | 39.18         | 25.66  | 43.50         | -17.84        | Peak   |
| 3 | 244.13 | -13.23 | 42.29         | 29.06  | 46.00         | -16.94        | Peak   |
| 4 | 331.79 | -10.61 | 41.02         | 30.41  | 46.00         | -15.59        | Peak   |
| 5 | 380.41 | -9.14  | 45.81         | 36.67  | 46.00         | -9.33         | Peak   |
| 6 | 458.71 | -7.16  | 46.81         | 39.65  | 46.00         | -6.35         | Peak   |

## 30MHz-1GHz\_Vertical



Site : Chamber A  
Condition : 3m Vertical  
Project Number : 2401A35544E-RF  
Test Mode : BDR Transmitting  
Detector: Peak RBW/VBW: 100/300kHz  
Tester : Alex Yan

|   | Freq   | Factor | Read<br>Level | Level  | Limit<br>Line | Over<br>Limit | Remark |
|---|--------|--------|---------------|--------|---------------|---------------|--------|
|   | MHz    | dB/m   | dBuV          | dBuV/m | dBuV/m        | dB            |        |
| 1 | 30.34  | -6.13  | 29.50         | 23.37  | 40.00         | -16.63        | Peak   |
| 2 | 89.16  | -18.05 | 42.37         | 24.32  | 43.50         | -19.18        | Peak   |
| 3 | 204.69 | -13.41 | 36.77         | 23.36  | 43.50         | -20.14        | Peak   |
| 4 | 395.89 | -8.60  | 37.83         | 29.23  | 46.00         | -16.77        | Peak   |
| 5 | 473.83 | -6.57  | 39.42         | 32.85  | 46.00         | -13.15        | Peak   |
| 6 | 963.85 | -0.87  | 28.94         | 28.07  | 54.00         | -25.93        | Peak   |

**Above 1GHz:**

| Frequency (MHz) | Reading (dB $\mu$ V) | PK/Ave | Polar (H/V) | Factor (dB/m) | Corrected Amplitude (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|----------------------|--------|-------------|---------------|------------------------------------|----------------------|-------------|
| <b>GFSK</b>     |                      |        |             |               |                                    |                      |             |
| Low Channel     |                      |        |             |               |                                    |                      |             |
| 4804            | 55.09                | PK     | H           | -7.79         | 47.3                               | 74                   | -26.70      |
| 4804            | 54.16                | PK     | V           | -7.79         | 46.37                              | 74                   | -27.63      |
| Middle Channel  |                      |        |             |               |                                    |                      |             |
| 4882            | 54.37                | PK     | H           | -7.58         | 46.79                              | 74                   | -27.21      |
| 4882            | 53.48                | PK     | V           | -7.58         | 45.9                               | 74                   | -28.10      |
| High Channel    |                      |        |             |               |                                    |                      |             |
| 4960            | 55.72                | PK     | H           | -7.56         | 48.16                              | 74                   | -25.84      |
| 4960            | 54.85                | PK     | V           | -7.56         | 47.29                              | 74                   | -26.71      |

Note:

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

Corrected Amplitude = Factor + Reading

Margin = Corrected. Amplitude - Limit

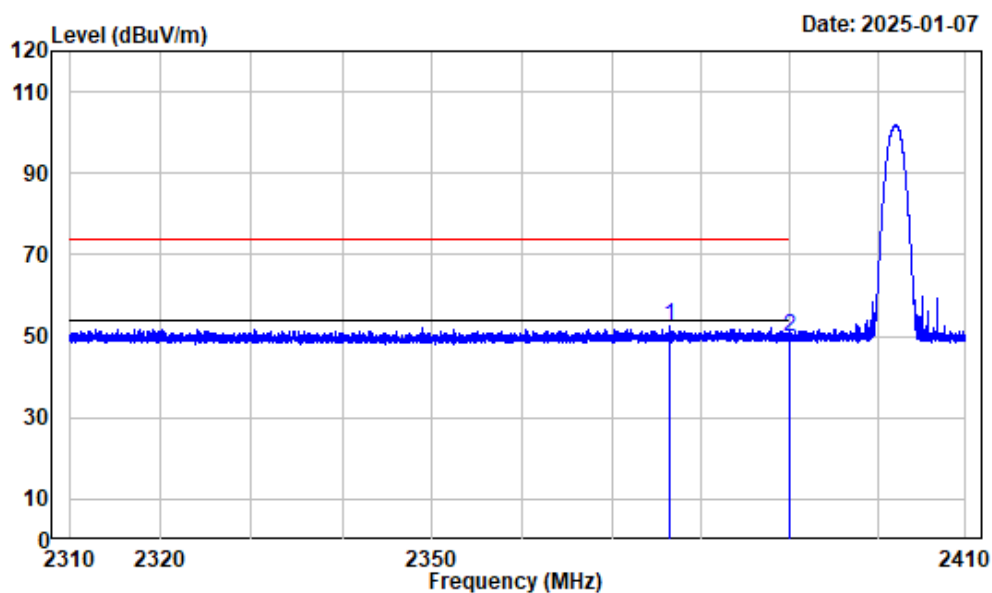
The other spurious emission which is in the noise floor level was not recorded.

The test result of peak was less than the limit of average, so just peak values were recorded.



## Test plots

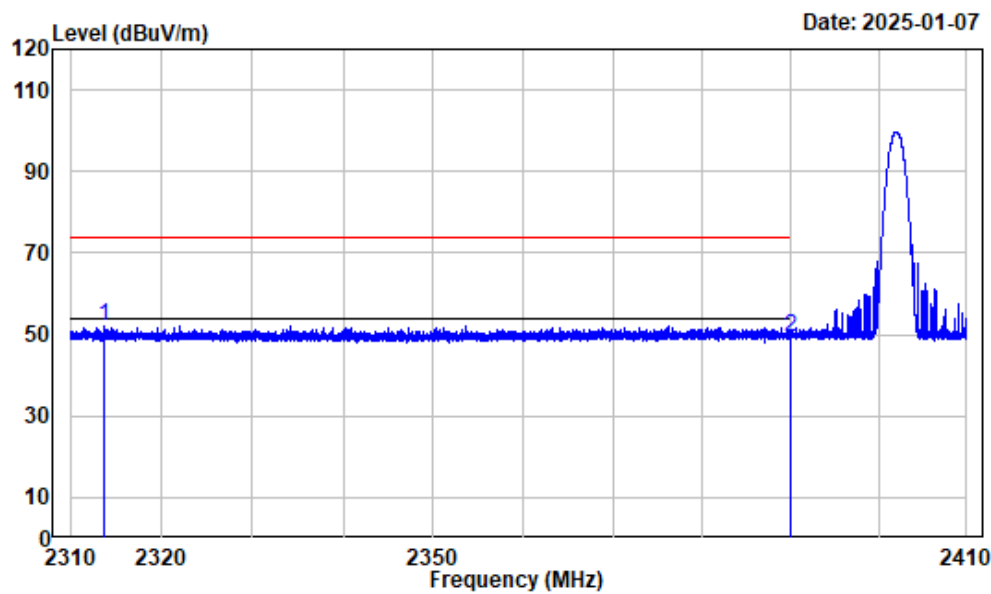
## Left Band edge\_Horizontal



Condition : Horizontal  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Peak reading:RBW:1MHz VBW:3MHz Detector:Peak  
Note : BT-DH5-2402

| Freq |          | Factor | Read<br>Level | Level  | Limit<br>Line | Over<br>Limit | Remark |
|------|----------|--------|---------------|--------|---------------|---------------|--------|
| MHz  |          | dB/m   | dBuV          | dBuV/m | dBuV/m        | dB            |        |
| 1    | 2376.533 | -10.95 | 63.48         | 52.53  | 74.00         | -21.47        | Peak   |
| 2    | 2390.000 | -10.98 | 60.79         | 49.81  | 74.00         | -24.19        | Peak   |

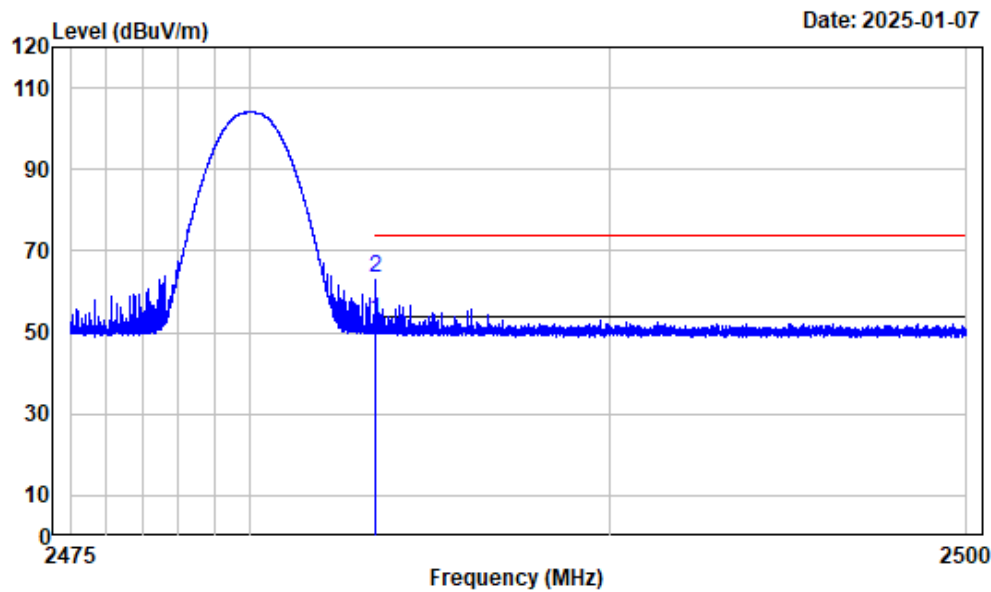
Left Band edge\_Vertical



Condition : Vertical  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Peak reading:RBW:1MHz VBW:3MHz Detector:Peak  
Note : BT-DH5-2402

|            |        | Read  |        | Limit  | Over   | Remark |
|------------|--------|-------|--------|--------|--------|--------|
| Freq       |        | Level | Level  | Line   | Limit  |        |
| MHz        | dB/m   | dBuV  | dBuV/m | dBuV/m | dB     |        |
| 1 2313.700 | -10.81 | 63.03 | 52.22  | 74.00  | -21.78 | Peak   |
| 2 2390.000 | -10.98 | 60.37 | 49.39  | 74.00  | -24.61 | Peak   |

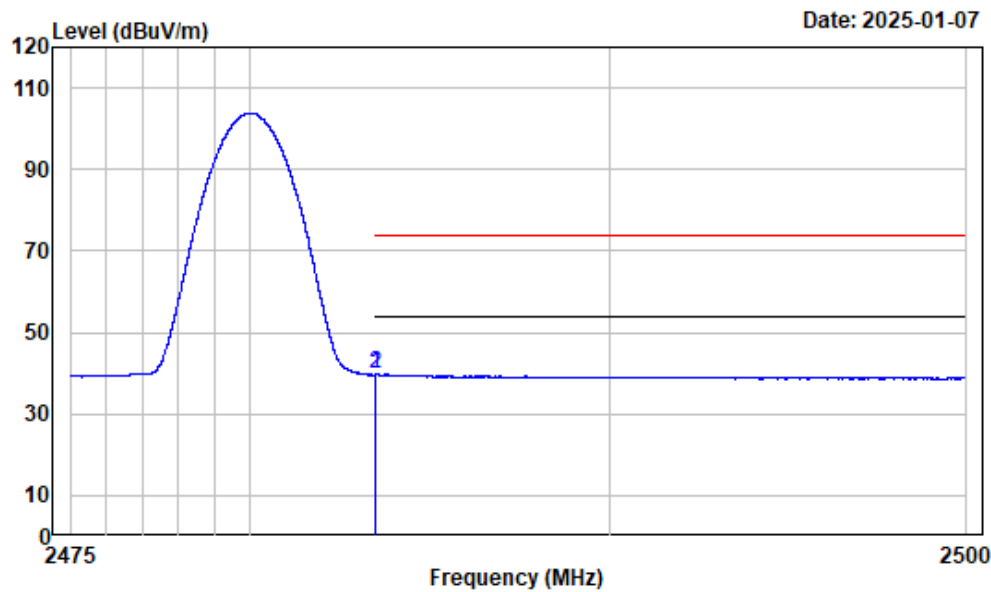
Right Band edge\_Horizontal\_Peak



Condition : Horizontal  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Peak reading:RBW:1MHz VBW:3MHz Detector:Peak  
Note : BT-DH5-2480

| Freq |          | Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|------|----------|--------|------------|--------|------------|------------|--------|
| MHz  |          | dB/m   | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1    | 2483.500 | -10.97 | 63.90      | 52.93  | 74.00      | -21.07     | Peak   |
| 2    | 2483.504 | -10.97 | 74.19      | 63.22  | 74.00      | -10.78     | Peak   |

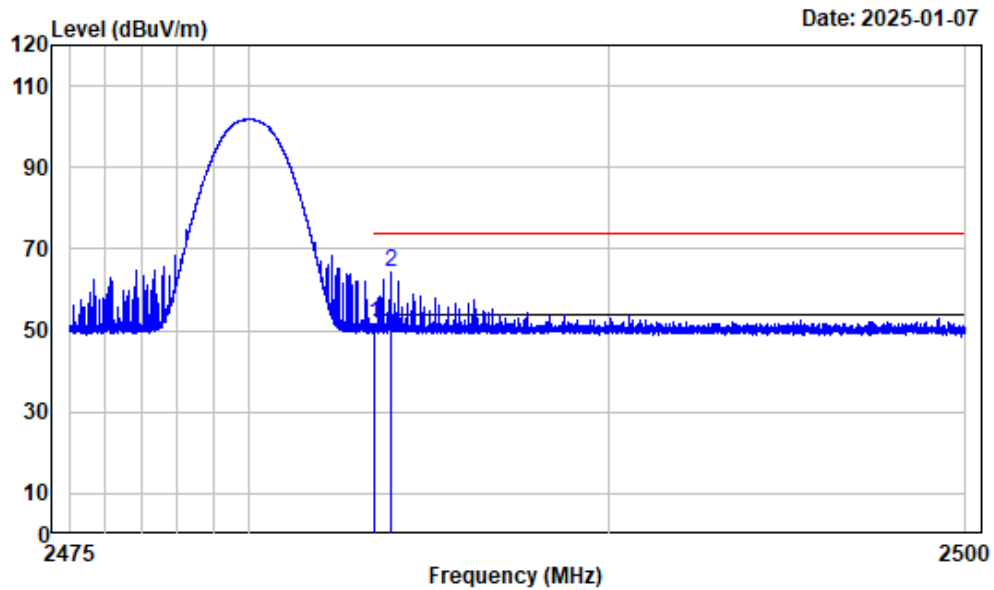
Right Band edge\_Horizontal\_Average



Condition : Horizontal  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Average reading:RBW:1MHz VBW:1kHz Detector:Peak  
Note : BT-DH5-2480

|            |        | Read  |        | Limit  | Over   | Remark  |
|------------|--------|-------|--------|--------|--------|---------|
| Freq       | Factor | Level | Level  | Line   | Limit  |         |
| MHz        | dB/m   | dBuV  | dBuV/m | dBuV/m | dB     |         |
| 1 2483.500 | -10.97 | 50.77 | 39.80  | 54.00  | -14.20 | Average |
| 2 2483.504 | -10.97 | 50.89 | 39.92  | 54.00  | -14.08 | Average |

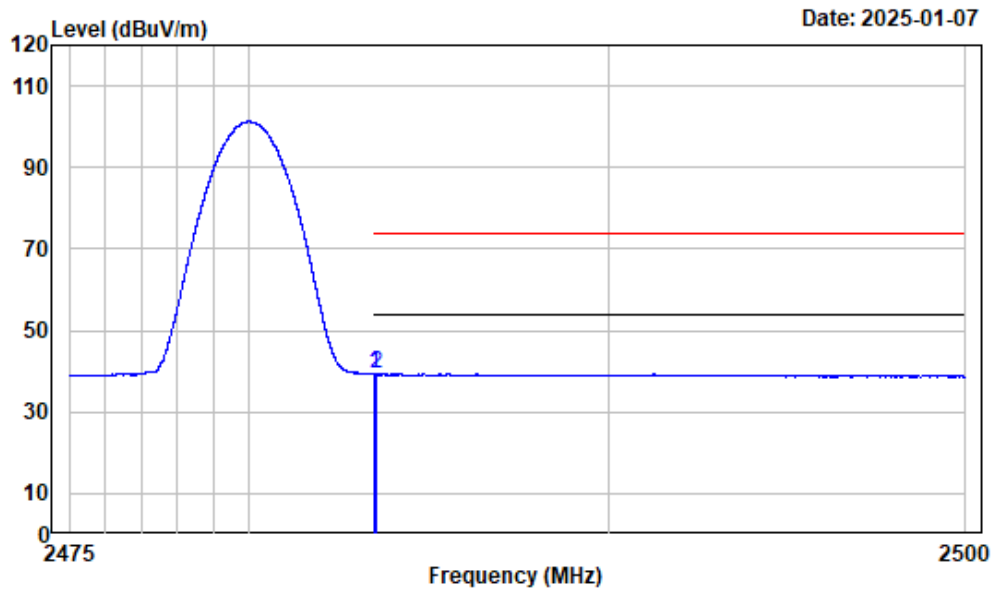
Right Band edge\_Vertical\_Peak



Condition : Vertical  
 Project No. : 2401A35544E-RF  
 Tester : Zenos Qiao  
 Spectrum setting: Peak reading:RBW:1MHz VBW:3MHz Detector:Peak  
 Note : BT-DH5-2480

|   | Freq     | Factor | Read<br>Level | Level  | Limit<br>Line | Over<br>Limit | Remark |
|---|----------|--------|---------------|--------|---------------|---------------|--------|
|   | MHz      | dB/m   | dBuV          | dBuV/m | dBuV/m        | dB            |        |
| 1 | 2483.500 | -10.97 | 62.68         | 51.71  | 74.00         | -22.29        | Peak   |
| 2 | 2483.957 | -10.97 | 75.12         | 64.15  | 74.00         | -9.85         | Peak   |

Right Band edge\_Vertical\_Average

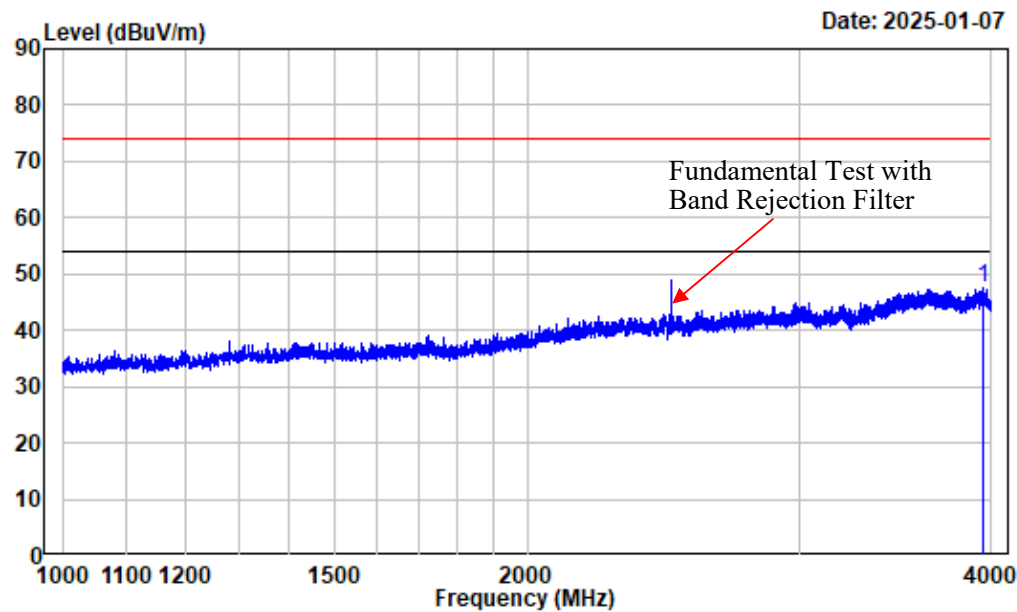


Condition : Vertical  
 Project No. : 2401A35544E-RF  
 Tester : Zenos Qiao  
 Spectrum setting: Average reading:RBW:1MHz VBW:1kHz Detector:Peak  
 Note : BT-DH5-2480

|   | Freq     | Factor | Read<br>Level | Level  | Limit<br>Line | Over<br>Limit | Remark  |
|---|----------|--------|---------------|--------|---------------|---------------|---------|
|   | MHz      | dB/m   | dBuV          | dBuV/m | dBuV/m        | dB            |         |
| 1 | 2483.500 | -10.97 | 50.37         | 39.40  | 54.00         | -14.60        | Average |
| 2 | 2483.517 | -10.97 | 50.48         | 39.51  | 54.00         | -14.49        | Average |

Listed with the worst harmonic margin test plot

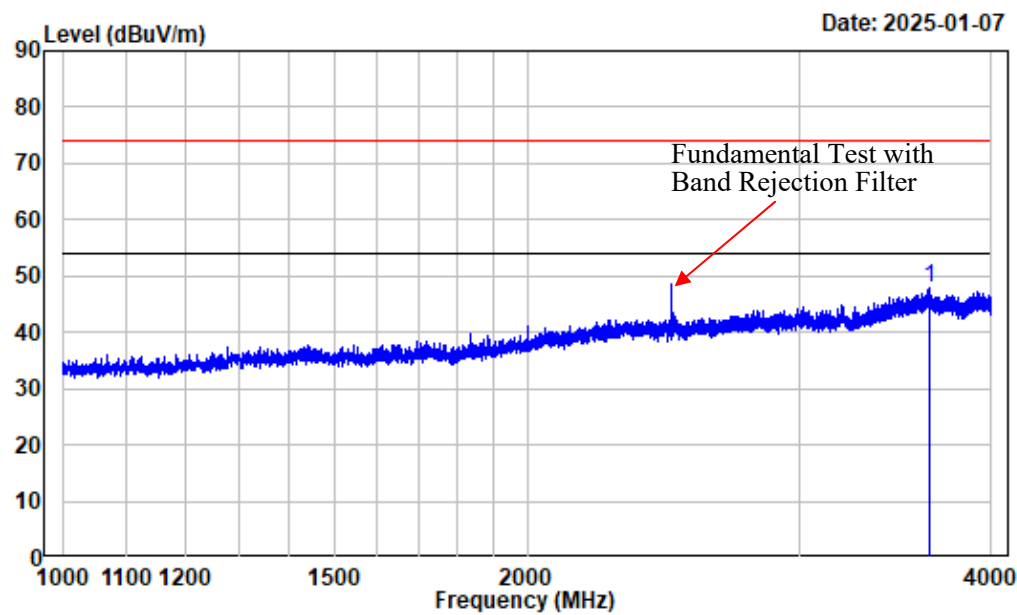
1-4GHz\_Horizontal



Condition : Horizontal  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Peak reading:RBW:1MHz VBW:3MHz Detector:Peak  
Note : BT-DH5-2480

|   | Freq     | Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|---|----------|--------|------------|--------|------------|------------|--------|
|   | MHz      | dB/m   | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1 | 3947.118 | -9.36  | 56.76      | 47.40  | 74.00      | -26.60     | Peak   |

1-4GHz\_Vertical

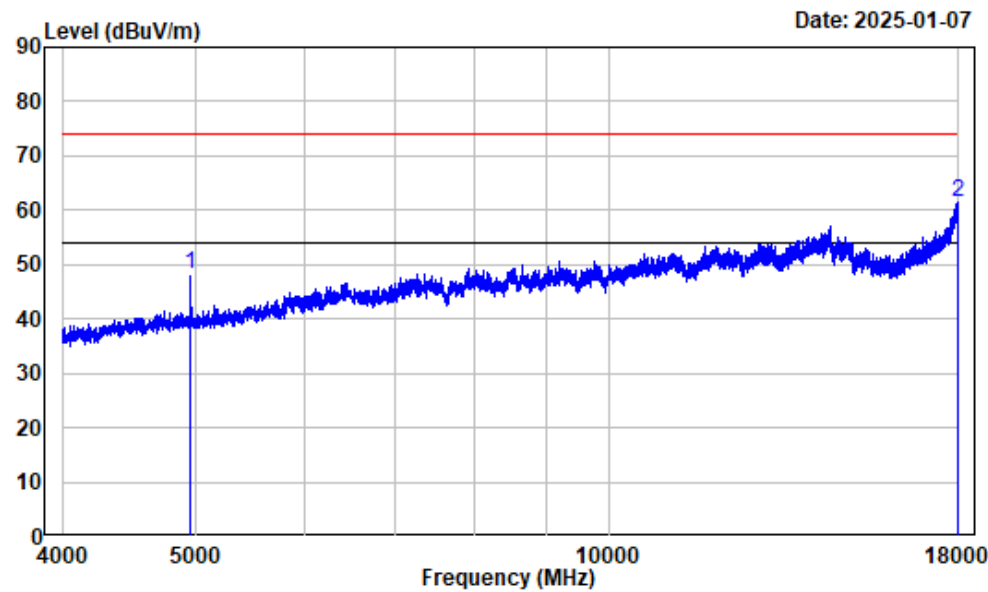


Condition : Vertical  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Peak reading:RBW:1MHz VBW:3MHz Detector:Peak  
Note : BT-DH5-2480

| Freq Factor |          | Read Level |        | Limit  | Over  | Remark      |
|-------------|----------|------------|--------|--------|-------|-------------|
| MHz         | dB/m     | dBuV       | dBuV/m | dBuV/m | dB    |             |
| 1           | 3645.206 | -9.81      | 57.78  | 47.97  | 74.00 | -26.03 Peak |



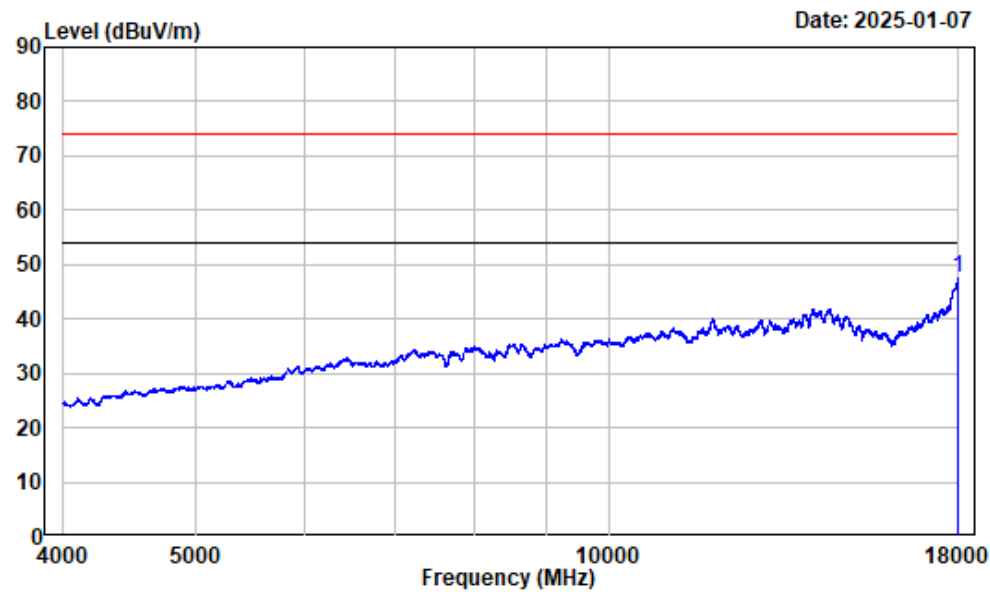
4-18GHz\_Horizontal\_Peak



Condition : Horizontal  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Peak reading:RBW:1MHz VBW:3MHz Detector:Peak  
Note : BT-DH5-2480

| Freq |           | Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|------|-----------|--------|------------|--------|------------|------------|--------|
| MHz  |           | dB/m   | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1    | 4960.000  | -7.56  | 55.72      | 48.16  | 74.00      | -25.84     | Peak   |
| 2    | 17993.000 | 13.17  | 48.37      | 61.54  | 74.00      | -12.46     | Peak   |

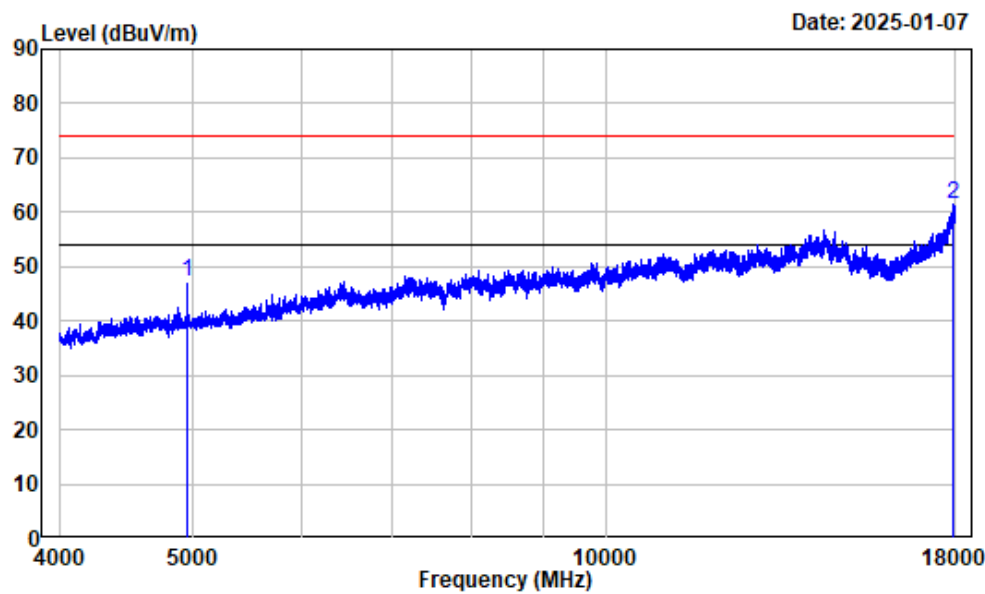
4-18GHz\_Horizontal\_Average



Condition : Horizontal  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Average reading:RBW:1MHz VBW:1kHz Detector:Peak  
Note : BT-DH5-2480

| Freq |           | Factor | Read Level | Level  | Limit Line | Over Limit | Remark  |
|------|-----------|--------|------------|--------|------------|------------|---------|
| MHz  |           | dB/m   | dBuV       | dBuV/m | dBuV/m     | dB         |         |
| 1    | 17998.630 | 13.20  | 34.49      | 47.69  | 54.00      | -6.31      | Average |

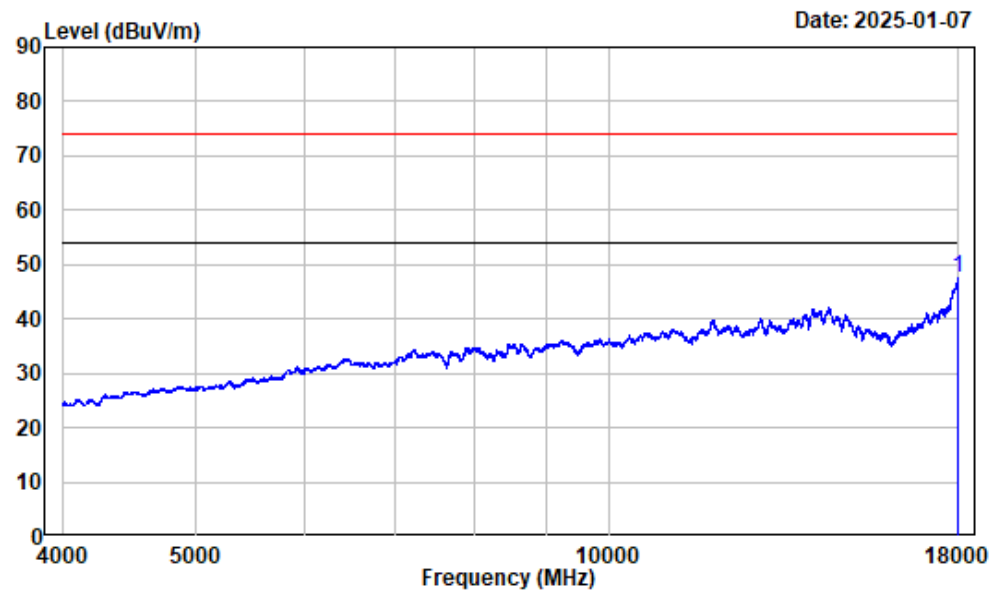
4-18GHz\_Vertical\_Peak



Condition : Vertical  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Peak reading:RBW:1MHz VBW:3MHz Detector:Peak  
Note : BT-DH5-2480

| Freq |           | Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|------|-----------|--------|------------|--------|------------|------------|--------|
| MHz  |           | dB/m   | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1    | 4960.000  | -7.56  | 54.85      | 47.29  | 74.00      | -26.71     | Peak   |
| 2    | 17917.740 | 12.79  | 48.71      | 61.50  | 74.00      | -12.50     | Peak   |

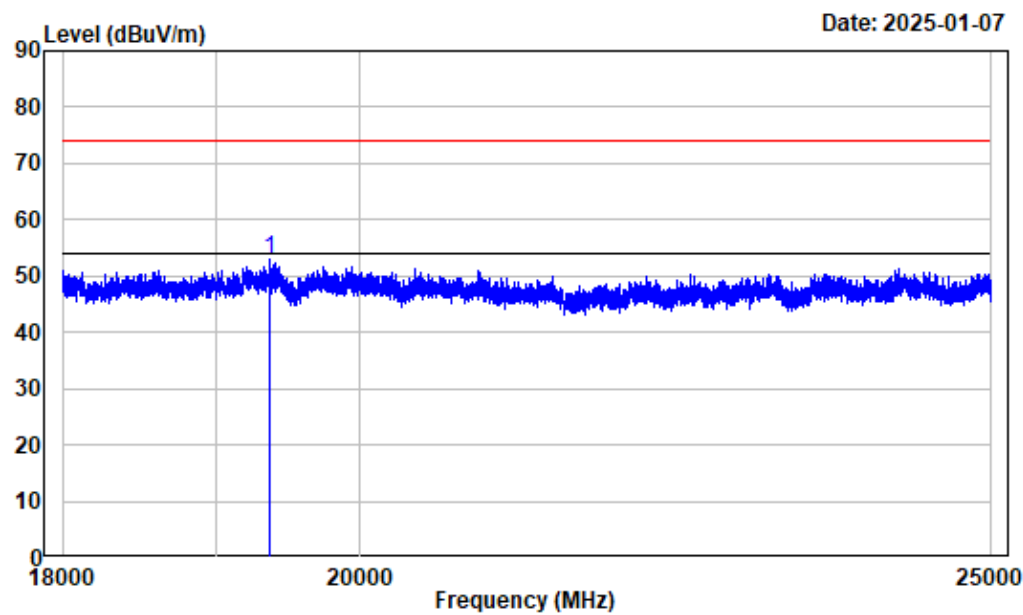
4-18GHz\_Vertical\_Average



Condition : Vertical  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Average reading:RBW:1MHz VBW:1kHz Detector:Peak  
Note : BT-DH5-2480

| Freq Factor |       | Read Level |        | Limit  | Over  | Remark  |
|-------------|-------|------------|--------|--------|-------|---------|
| MHz         | dB/m  | dBuV       | dBuV/m | dBuV/m | dB    |         |
| 1 17991.250 | 13.16 | 34.32      | 47.48  | 54.00  | -6.52 | Average |

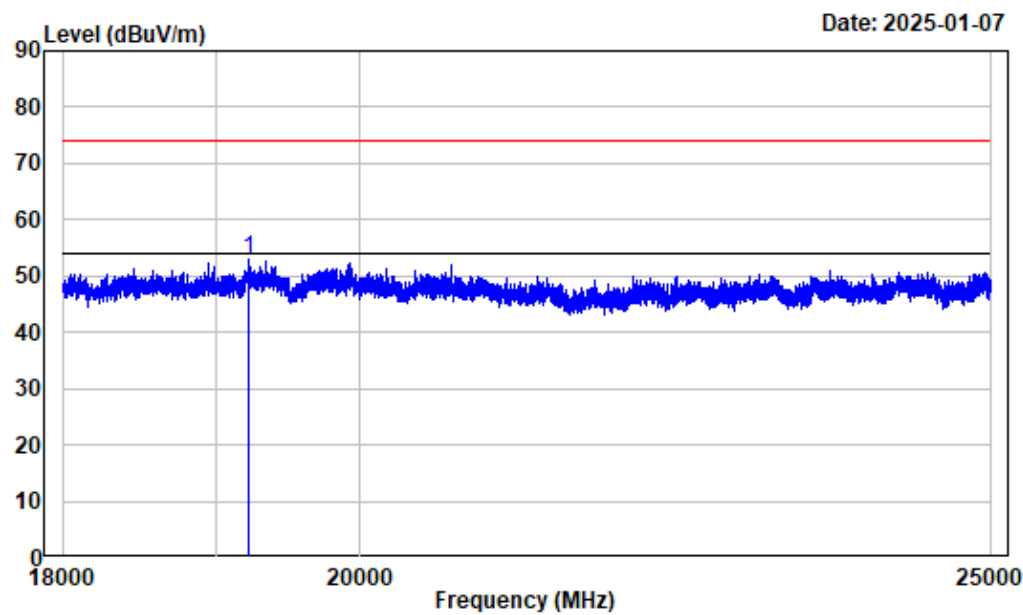
18-25GHz\_Horizontal



Condition : Horizontal  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Peak reading:RBW:1MHz VBW:3MHz Detector:Peak  
Note : BT-DH5-2480

| Freq Factor |       | Read Level | Level  | Limit  | Over Limit | Remark |
|-------------|-------|------------|--------|--------|------------|--------|
| MHz         | dB/m  | dBuV       | dBuV/m | dBuV/m | dB         |        |
| 1 19366.040 | 15.12 | 37.84      | 52.96  | 74.00  | -21.04     | Peak   |

18-25GHz\_Vertical



Condition : Vertical  
Project No. : 2401A35544E-RF  
Tester : Zenos Qiao  
Spectrum setting: Peak reading:RBW:1MHz VBW:3MHz Detector:Peak  
Note : BT-DH5-2480

|   | Freq      | Factor | Read Level | Level  | Limit Line | Over Limit | Remark |
|---|-----------|--------|------------|--------|------------|------------|--------|
|   | MHz       | dB/m   | dBuV       | dBuV/m | dBuV/m     | dB         |        |
| 1 | 19222.530 | 15.29  | 37.66      | 52.95  | 74.00      | -21.05     | Peak   |

20 dB Emission Bandwidth

Test Information:

|             |          |              |              |
|-------------|----------|--------------|--------------|
| Sample No.: | 2VH6-3   | Test Date:   | 2024/12/13   |
| Test Site:  | RF       | Test Mode:   | Transmitting |
| Tester:     | Brian Li | Test Result: | N/A          |

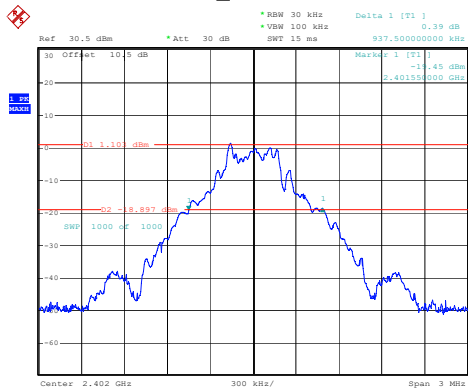
Environmental Conditions:

|                      |    |                              |    |                        |     |
|----------------------|----|------------------------------|----|------------------------|-----|
| Temperature:<br>(°C) | 25 | Relative<br>Humidity:<br>(%) | 45 | ATM Pressure:<br>(kPa) | 101 |
|----------------------|----|------------------------------|----|------------------------|-----|

Test Data:

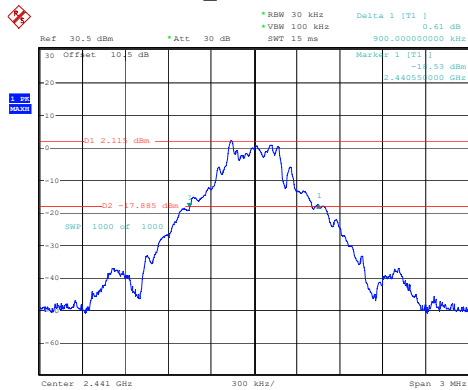
| Mode | Channel        | Result<br>(MHz) |
|------|----------------|-----------------|
| DH1  | Low Channel    | 0.938           |
|      | Middle Channel | 0.900           |
|      | High Channel   | 0.904           |
| 2DH1 | Low Channel    | 1.279           |
|      | Middle Channel | 1.283           |
|      | High Channel   | 1.283           |
| 3DH1 | Low Channel    | 1.268           |
|      | Middle Channel | 1.264           |
|      | High Channel   | 1.268           |

DH1\_Low 0.938MHz



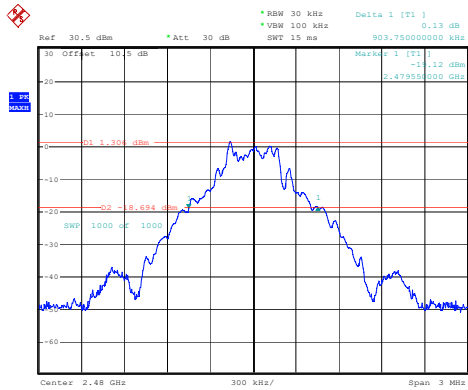
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:00:42

DH1\_Middle 0.900MHz



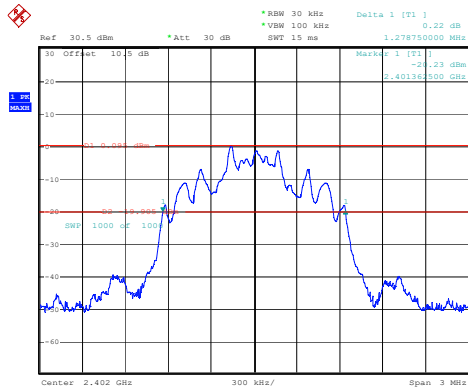
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:04:46

DH1\_High 0.904MHz



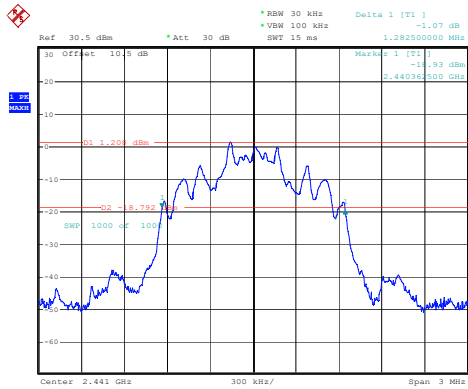
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:08:44

2DH1\_Low 1.279MHz



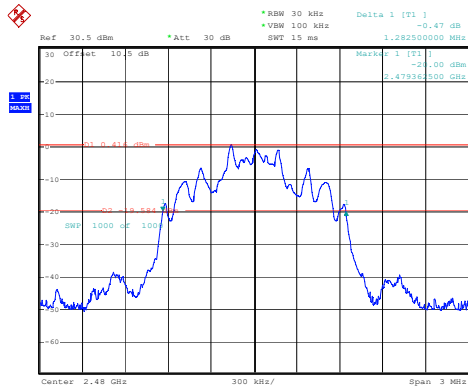
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:13:12

2DH1\_Middle 1.283MHz



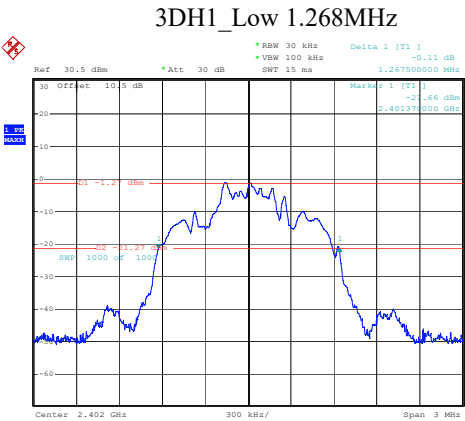
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:19:54

2DH1\_High 1.283MHz

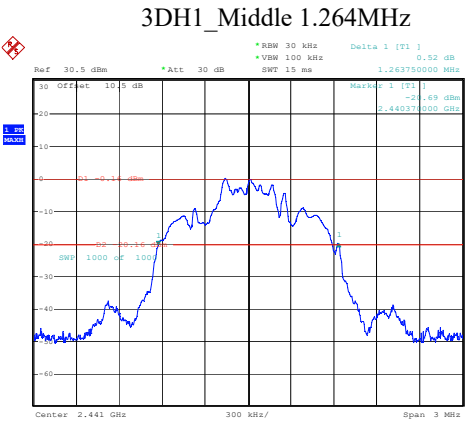


ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:23:34

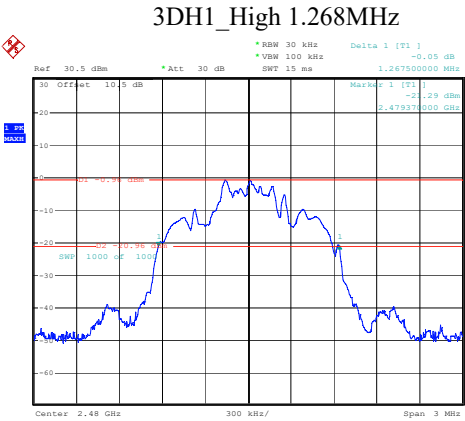




ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:28:43



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:32:22



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:34:56

**Channel Separation****Test Information:**

|                    |          |                     |              |
|--------------------|----------|---------------------|--------------|
| <b>Sample No.:</b> | 2VH6-3   | <b>Test Date:</b>   | 2025/01/09   |
| <b>Test Site:</b>  | RF       | <b>Test Mode:</b>   | Transmitting |
| <b>Tester:</b>     | Brian Li | <b>Test Result:</b> | Pass         |

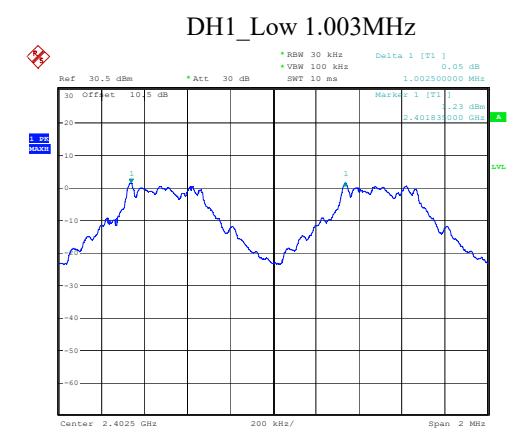
**Environmental Conditions:**

|                             |    |                                  |    |                               |     |
|-----------------------------|----|----------------------------------|----|-------------------------------|-----|
| <b>Temperature:</b><br>(°C) | 25 | <b>Relative Humidity:</b><br>(%) | 45 | <b>ATM Pressure:</b><br>(kPa) | 101 |
|-----------------------------|----|----------------------------------|----|-------------------------------|-----|

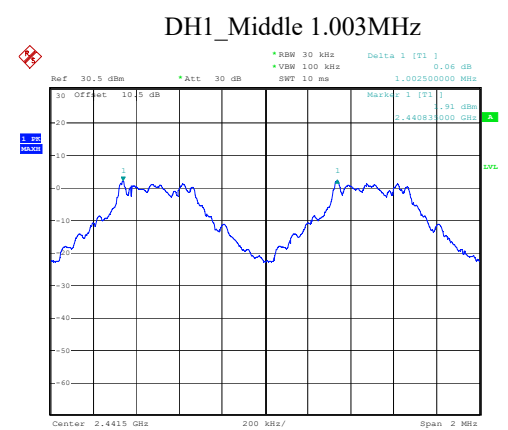
**Test Data:**

| Mode | Channel        | Result (MHz) | Limit (MHz) | Verdict |
|------|----------------|--------------|-------------|---------|
| DH1  | Low Channel    | 1.003        | 0.853       | Pass    |
|      | Middle Channel | 1.003        | 0.855       | Pass    |
|      | High Channel   | 1.003        | 0.855       | Pass    |

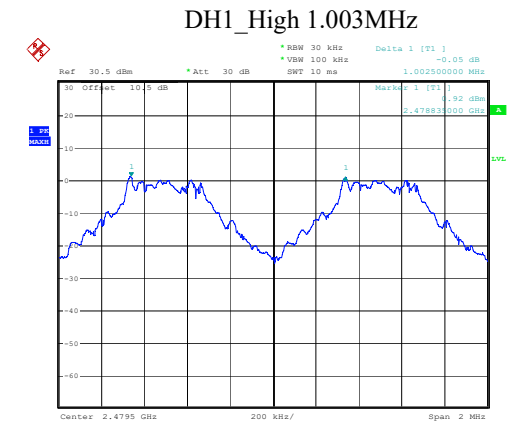
**Note:** Only the BDR (GFSK) mode result is reported since EDR ( $\pi/4$ -DQPSK) and EDR (8DPSK) modes have the exact same channel plan, and the limit is the maximum 20dB bandwidth \*2/3



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 13:22:47



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 13:34:13



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 13:39:06

Number of Hopping Frequency

Test Information:

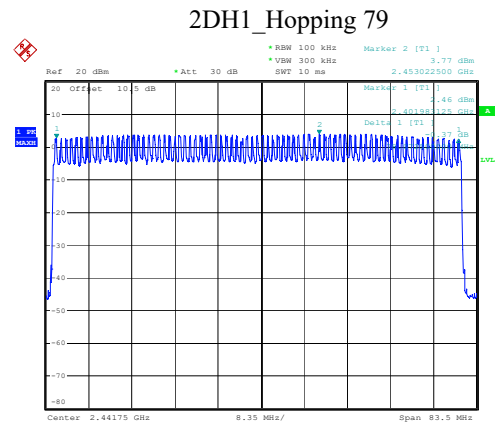
|             |          |              |                       |
|-------------|----------|--------------|-----------------------|
| Sample No.: | 2VH6-3   | Test Date:   | 2024/12/13~2025/03/12 |
| Test Site:  | RF       | Test Mode:   | Transmitting          |
| Tester:     | Brian Li | Test Result: | Pass                  |

Environmental Conditions:

|                      |       |                              |       |                        |     |
|----------------------|-------|------------------------------|-------|------------------------|-----|
| Temperature:<br>(°C) | 25-27 | Relative<br>Humidity:<br>(%) | 45-48 | ATM Pressure:<br>(kPa) | 101 |
|----------------------|-------|------------------------------|-------|------------------------|-----|

Test Data:

| Mode | Channel         | Result | Limit | Verdict |
|------|-----------------|--------|-------|---------|
| DH1  | Hopping Channel | 79     | 15    | Pass    |
| 2DH1 | Hopping Channel | 79     | 15    | Pass    |
| 3DH1 | Hopping Channel | 79     | 15    | Pass    |



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 12.MAR.2025 11:41:45

Maximum Conducted Output Power

Test Information:

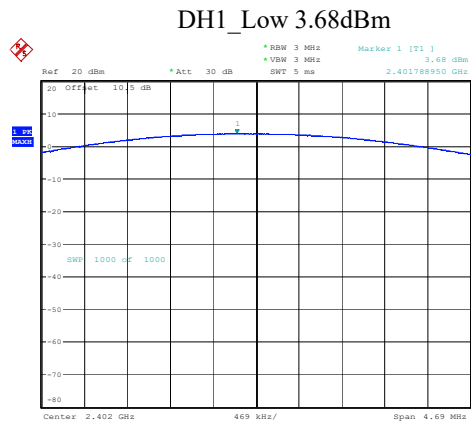
|             |          |              |              |
|-------------|----------|--------------|--------------|
| Sample No.: | 2VH6-3   | Test Date:   | 2024/12/13   |
| Test Site:  | RF       | Test Mode:   | Transmitting |
| Tester:     | Brian Li | Test Result: | Pass         |

Environmental Conditions:

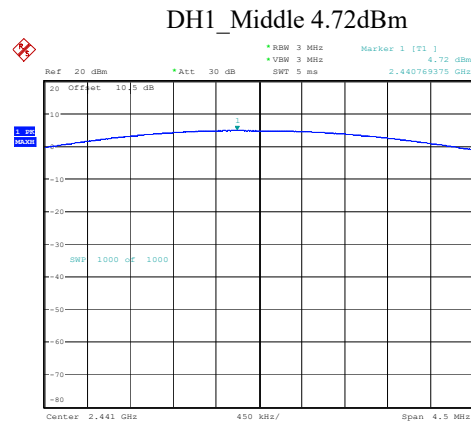
|                      |    |                              |    |                        |     |
|----------------------|----|------------------------------|----|------------------------|-----|
| Temperature:<br>(°C) | 25 | Relative<br>Humidity:<br>(%) | 45 | ATM Pressure:<br>(kPa) | 101 |
|----------------------|----|------------------------------|----|------------------------|-----|

Test Data:

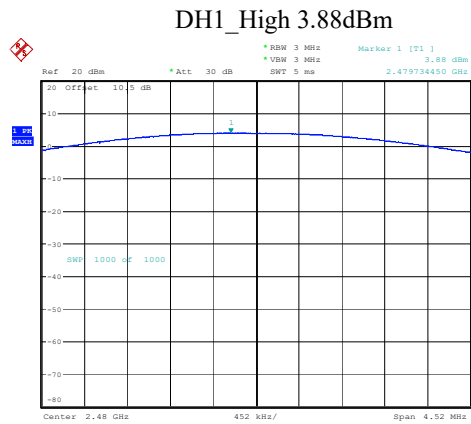
| Mode | Channel        | Result<br>(dBm) | Limit<br>(dBm) | Verdict |
|------|----------------|-----------------|----------------|---------|
| DH1  | Low Channel    | 3.68            | 21.00          | Pass    |
|      | Middle Channel | 4.72            | 21.00          | Pass    |
|      | High Channel   | 3.88            | 21.00          | Pass    |
| 2DH1 | Low Channel    | 2.68            | 21.00          | Pass    |
|      | Middle Channel | 3.77            | 21.00          | Pass    |
|      | High Channel   | 2.98            | 21.00          | Pass    |
| 3DH1 | Low Channel    | 2.70            | 21.00          | Pass    |
|      | Middle Channel | 3.76            | 21.00          | Pass    |
|      | High Channel   | 2.97            | 21.00          | Pass    |



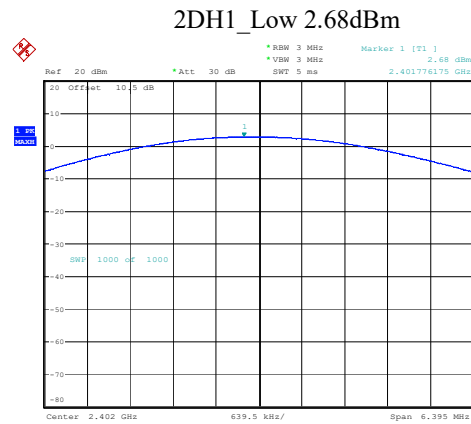
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:02:18



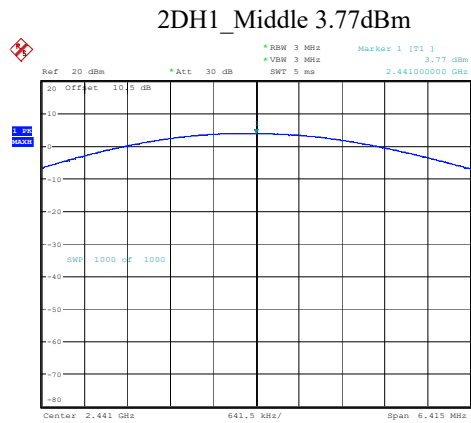
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:05:06



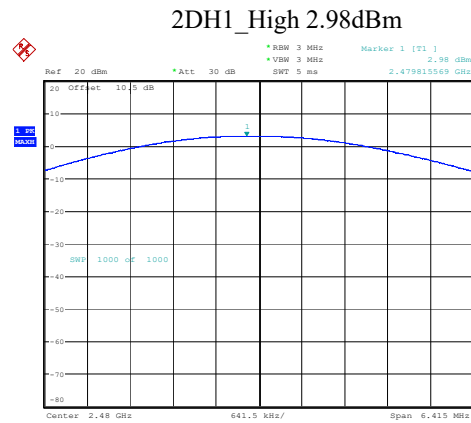
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:10:38



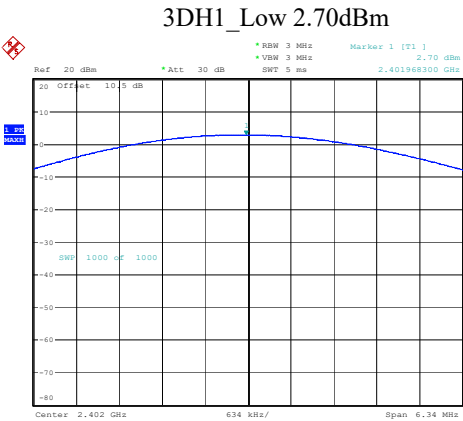
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:14:28



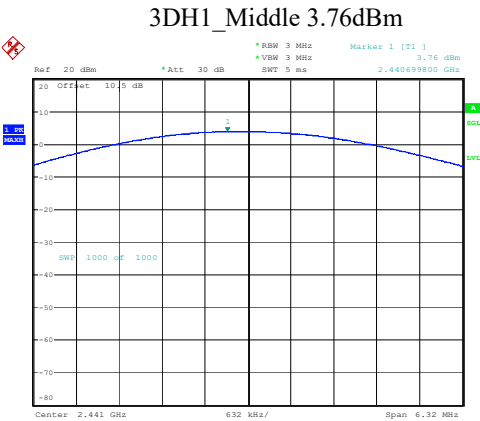
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:20:15



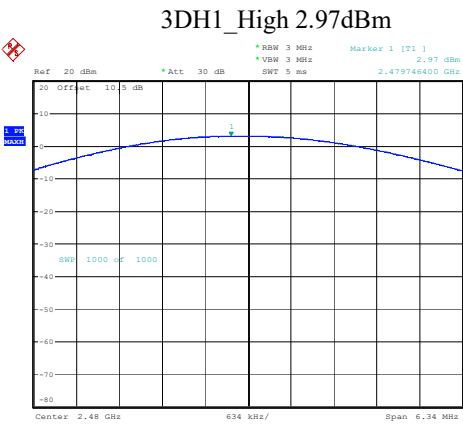
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:25:28



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:29:58



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:32:50



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:36:54



100 kHz Bandwidth of Frequency Band Edge

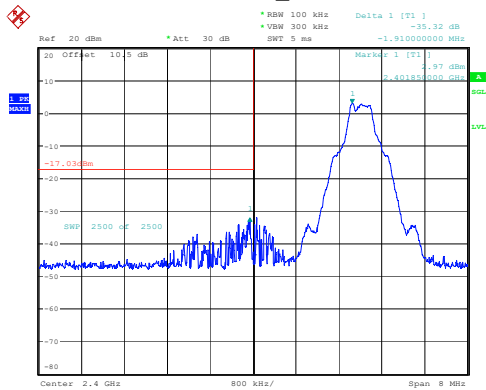
Test Information:

|             |          |              |                       |
|-------------|----------|--------------|-----------------------|
| Sample No.: | 2VH6-3   | Test Date:   | 2024/12/13~2025/01/09 |
| Test Site:  | RF       | Test Mode:   | Transmitting          |
| Tester:     | Brian Li | Test Result: | Pass                  |

Environmental Conditions:

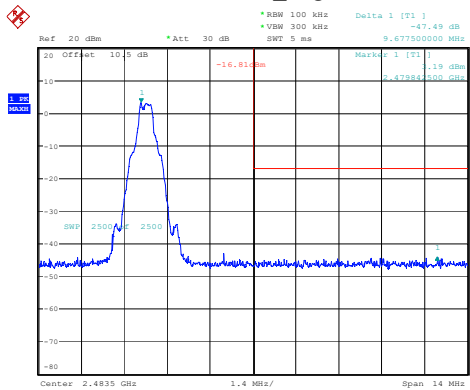
|                      |         |                              |       |                        |     |
|----------------------|---------|------------------------------|-------|------------------------|-----|
| Temperature:<br>(°C) | 25~26.2 | Relative<br>Humidity:<br>(%) | 45~52 | ATM Pressure:<br>(kPa) | 101 |
|----------------------|---------|------------------------------|-------|------------------------|-----|

DH1\_Low



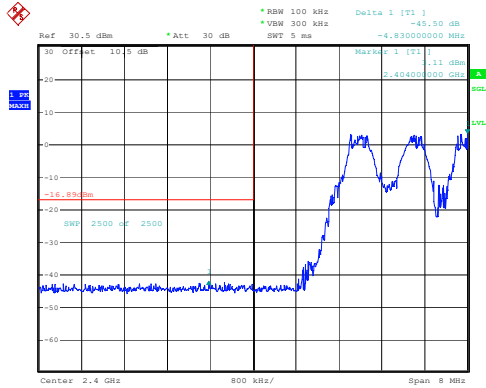
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:01:36

DH1\_High



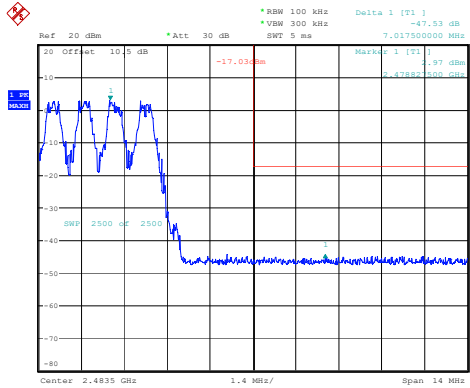
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:10:18

DH1\_Hopping\_Lower



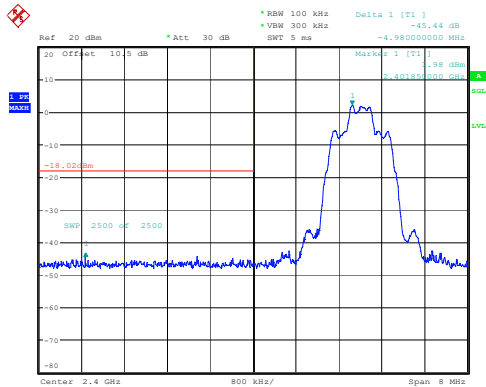
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 11:22:36

DH1\_Hopping\_Upper



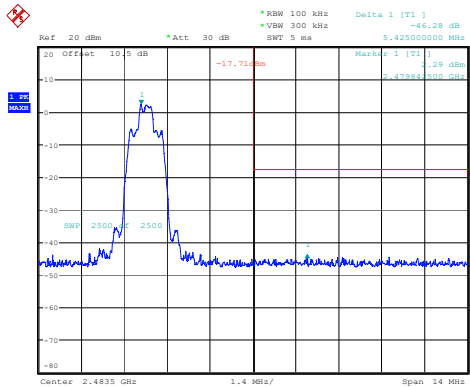
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 11:25:04

2DH1\_Low



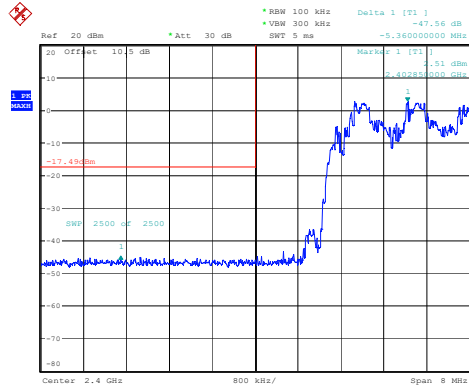
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:14:07

2DH1\_High



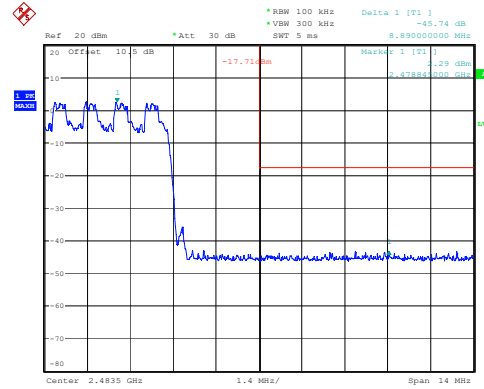
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:25:07

### 2DH1\_Hopping\_Lower



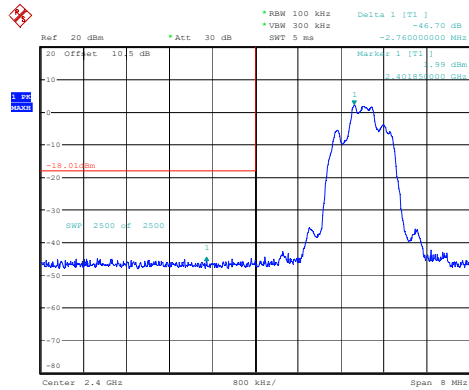
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 11:28:30

### 2DH1\_Hopping\_Upper



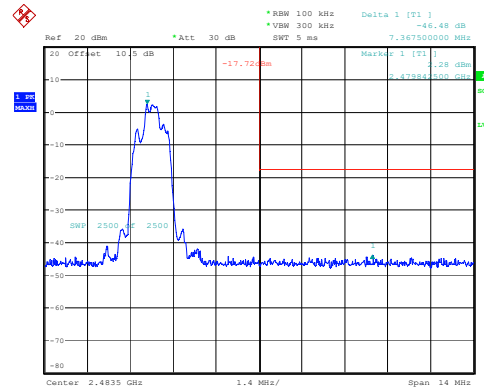
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 11:45:33

### 3DH1\_Low



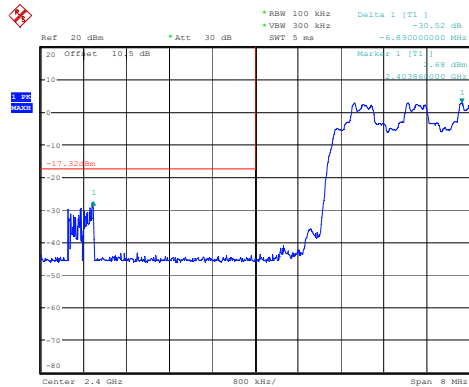
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:29:37

### 3DH1\_High



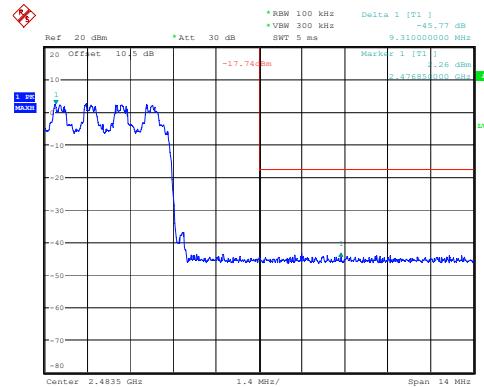
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:36:30

### 3DH1\_Hopping\_Lower



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 12:28:31

### 3DH1\_Hopping\_Upper



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 12:45:39

Time of Occupancy (dwell time)

Test Information:

|             |          |              |                       |
|-------------|----------|--------------|-----------------------|
| Sample No.: | 2VH6-3   | Test Date:   | 2024/12/13~2025/01/09 |
| Test Site:  | RF       | Test Mode:   | Transmitting          |
| Tester:     | Brian Li | Test Result: | Pass                  |

Environmental Conditions:

|                      |    |                              |    |                        |     |
|----------------------|----|------------------------------|----|------------------------|-----|
| Temperature:<br>(°C) | 25 | Relative<br>Humidity:<br>(%) | 45 | ATM Pressure:<br>(kPa) | 101 |
|----------------------|----|------------------------------|----|------------------------|-----|

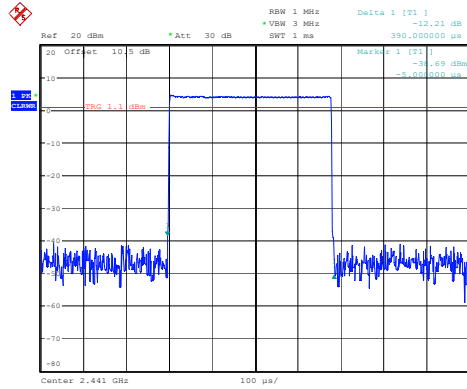
Test Data:

| Mode | Channel         | Pulse width<br>(ms) | Dwell time<br>(s) | Limit<br>(s) | Verdict |
|------|-----------------|---------------------|-------------------|--------------|---------|
| DH1  | Hopping Channel | 0.390               | 0.125             | 0.400        | Pass    |
| DH3  | Hopping Channel | 1.650               | 0.264             | 0.400        | Pass    |
| DH5  | Hopping Channel | 2.919               | 0.311             | 0.400        | Pass    |
| 2DH1 | Hopping Channel | 0.385               | 0.123             | 0.400        | Pass    |
| 2DH3 | Hopping Channel | 1.658               | 0.265             | 0.400        | Pass    |
| 2DH5 | Hopping Channel | 2.925               | 0.312             | 0.400        | Pass    |
| 3DH1 | Hopping Channel | 0.396               | 0.127             | 0.400        | Pass    |
| 3DH3 | Hopping Channel | 1.650               | 0.264             | 0.400        | Pass    |
| 3DH5 | Hopping Channel | 2.925               | 0.312             | 0.400        | Pass    |

Note:

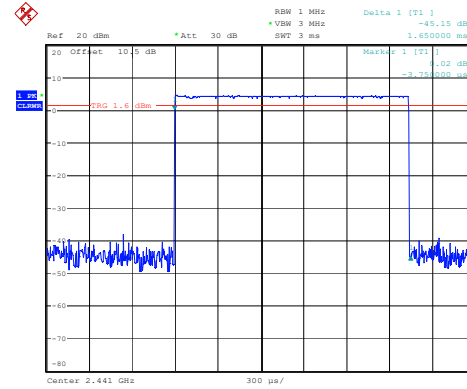
DH1:Dwell time=Pulse width (ms) × (1600/2/79) ×31.6 s  
DH3:Dwell time=Pulse width (ms) × (1600/4/79) ×31.6 s  
DH5:Dwell time=Pulse width (ms) × (1600/6/79) ×31.6 s  
2DH1: Dwell time=Pulse width (ms) × (1600/2/79) ×31.6 s  
2DH3: Dwell time=Pulse width (ms) × (1600/4/79) ×31.6 s  
2DH5: Dwell time=Pulse width (ms) × (1600/6/79) ×31.6 s  
3DH1: Dwell time=Pulse width (ms) × (1600/2/79) ×31.6 s  
3DH3: Dwell time=Pulse width (ms) × (1600/4/79) ×31.6 s  
3DH5: Dwell time=Pulse width (ms) × (1600/6/79) ×31.6 s

DH1\_Hopping 0.390ms



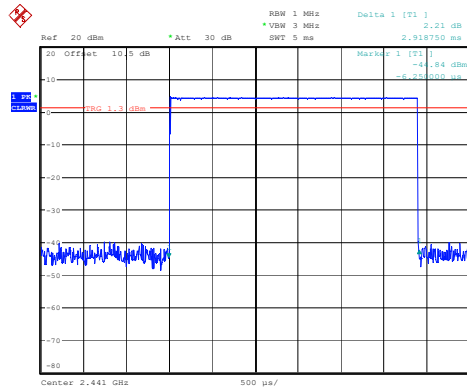
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:42:37

DH3\_Hopping 1.650ms



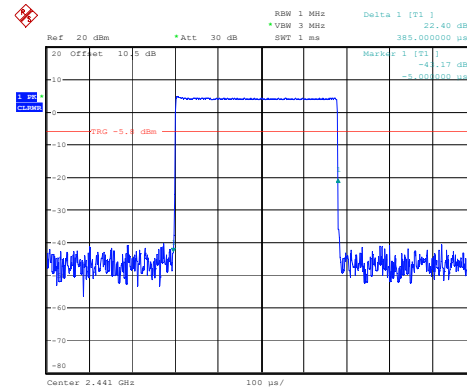
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 12:46:47

DH5\_Hopping 2.919ms



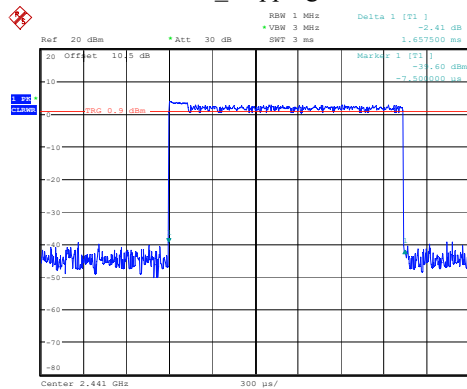
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 12:47:42

2DH1\_Hopping 0.385ms



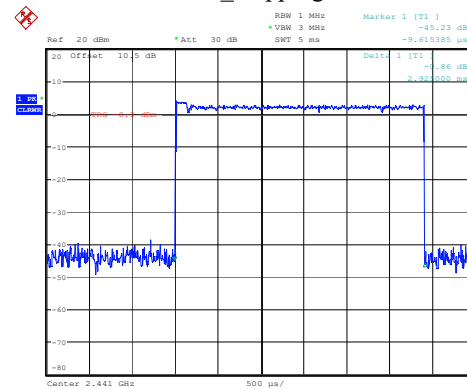
ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 13.DEC.2024 16:45:03

2DH3\_Hopping 1.658ms

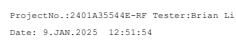
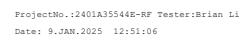
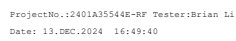


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2DH5\_Hopping 2.925ms



ProjectNo.:2401A35544E-RF Tester:Brian Li  
Date: 9.JAN.2025 12:49:32



## RF EXPOSURE EVALUATION

### RF EXPOSURE

#### Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance v06

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot$

$[\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where

1.  $f(\text{GHz})$  is the RF channel transmit frequency in GHz.

2. Power and distance are rounded to the nearest mW and mm before calculation.

3. The result is rounded to one decimal place for comparison.

4. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test Exclusion.

#### Measurement Result

For worst case:

| Mode | Frequency (MHz) | Max tune-up conducted power <sup>#</sup> (dBm) | Max tune-up conducted power <sup>#</sup> (mW) | Distance (mm) | Calculated value | Threshold (1-g SAR) | SAR Test Exclusion |
|------|-----------------|------------------------------------------------|-----------------------------------------------|---------------|------------------|---------------------|--------------------|
| BT   | 2402-2480       | 5.0                                            | 3.16                                          | 5             | 1.0              | 3.0                 | Yes                |

**Result: Compliant**

## **EUT PHOTOGRAPHS**

Please refer to the attachment 2401A35544E-RF External photo and 2401A35544E-RF Internal photo.



## **TEST SETUP PHOTOGRAPHS**

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Please refer to the attachment 2401A35544E-RFA Test Setup photo.

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