



# TEST REPORT

100, Jangjateo-ro, Hobeop-myeon,  
Icheon-si, Gyeonggi-do, 17396, Korea  
Tel: 031-637-8898 / Fax: 0505-116-8895

## 1. Client

- Name ..... : Sena Technologies Co., Ltd.
- Address ..... : 19, Heolleung-ro 569-gil, Gangnam-gu, Seoul,  
Republic of Korea

## 2. Use of Report ..... : FCC Approval

## 3. Sample Description

- Product Name : Wireless Communication Systems
- Model Name : N-Com Wireless Pro

## 4. Date of Receipt..... : 2026-08-06

## 5. Date of Test ..... : 2026-08-27 ~ 2026-09-16

## 6. Test Method ..... : FCC Part 15 Subpart C 15.247

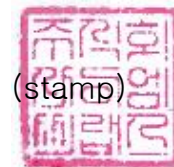
## 7. Test Results ..... : Refer to the test results

- ※ The results shown in this test report are the results of testing the samples provided.
- ※ This test report is prepared according to the requirements of ISO / IEC 17025.

|             |                                                                                                                               |                                                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Affirmation | <b>Tested by</b><br>Jeheon, Lee<br> (Sign) | <b>Tested by</b><br>Yongsoo, Park<br> (Sign) |
|-------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|

September 18, 2026

EMC Labs Co., Ltd.



(stamp)

# Contents

|                                                                        |    |
|------------------------------------------------------------------------|----|
| 1. Applicant & Manufacturer & Test Laboratory Information.....         | 4  |
| 2. Equipment under Test(EUT) Information.....                          | 5  |
| 3. Test Summary.....                                                   | 6  |
| 4. Used equipment on test.....                                         | 7  |
| 5. Antenna Requirement.....                                            | 8  |
| 6. 20 dB Bandwidth & Occupied Bandwidth (99%).....                     | 9  |
| 7. Number of Hopping Frequencies .....                                 | 11 |
| 8. Time of Occupancy (Dwell Time).....                                 | 15 |
| 9. Carrier Frequencies Separation.....                                 | 18 |
| 10. Peak Output Power .....                                            | 20 |
| 11. TX Radiated Spurious Emission and Conducted Spurious Emission..... | 26 |
| 12. Conducted Emission .....                                           | 63 |

## APPENDIX

|                              |    |
|------------------------------|----|
| APPENDIX I TEST SETUP.....   | 68 |
| APPENDIX II UNCERTAINTY..... | 70 |

# Version

| TEST REPORT NO. | DATE               | DESCRIPTION   |
|-----------------|--------------------|---------------|
| EL-RF2609001    | September 18, 2026 | Initial Issue |
|                 |                    |               |
|                 |                    |               |



## 1. Applicant & Manufacturer & Test Laboratory Information

### 1.1 Applicant Information

|                   |                                                                |
|-------------------|----------------------------------------------------------------|
| Applicant         | Sena Technologies Co., Ltd.                                    |
| Applicant Address | 19, Heolleung-ro 569-gil, Gangnam-gu, Seoul, Republic of Korea |
| Contact Person    | Seunghyun Kim                                                  |
| Telephone No.     | +82-2-573-7772                                                 |
| Fax No.           | +82-2-573-7710                                                 |
| E-mail            | shkim77@sena.com                                               |

### 1.2. Manufacturer Information

|                      |                                                                |
|----------------------|----------------------------------------------------------------|
| Manufacturer         | Sena Technologies Co., Ltd.                                    |
| Manufacturer Address | 19, Heolleung-ro 569-gil, Gangnam-gu, Seoul, Republic of Korea |

### 1.3 Test Laboratory Information

|                               |                                                                            |
|-------------------------------|----------------------------------------------------------------------------|
| Laboratory                    | EMC Labs Co., Ltd.                                                         |
| Laboratory Address            | 100, Jangjateo-ro, Hobeop-myeon, Icheon-si, Gyeonggi-do, Republic of Korea |
| Contact Person                | Yongsoo Park                                                               |
| Telephone No.                 | +82-31-637-8895                                                            |
| Fax No.                       | +82-505-116-8895                                                           |
| FCC Designation and CABID No. | KR0140                                                                     |
| FCC Registration No.          | 580000                                                                     |
| IC Site Registration No.      | 28751                                                                      |

## 2. Equipment under Test(EUT) Information

### 2.1 General Information

|               |                                |
|---------------|--------------------------------|
| Product Name  | Wireless Communication Systems |
| Model Name    | N-Com Wireless Pro             |
| FCC ID        | S7A-SP206                      |
| Rated Voltage | DC 3.8 V                       |

### 2.2 Additional Information

|                     |                                                                                                       |
|---------------------|-------------------------------------------------------------------------------------------------------|
| Operating Frequency | 2 402 MHz ~ 2 480 MHz                                                                                 |
| Number of channel   | 79                                                                                                    |
| Modulation Type     | BDR Mode(GFSK), EDR Mode(Pi/4 DQPSK, 8DPSK)                                                           |
| Antenna Type & Gain | BT1 : Dipole Antenna (with Max gain: 0.56 dBi)<br>BT2 : PCB Pattern Antenna (with Max gain: 0.30 dBi) |
| Firmware Version    | 1.0                                                                                                   |
| Hardware Version    | 1.0                                                                                                   |
| Test software       | BT1: BlueTest3 V3.3.5<br>BT2: AB1585/88 Lab Test Tool-3.10.0.6                                        |

### 2.3 Test Frequency

| Test mode  | Test Frequency (MHz) |                  |                |
|------------|----------------------|------------------|----------------|
|            | Low Frequency        | Middle Frequency | High Frequency |
| GFSK       | 2 402                | 2 441            | 2 480          |
| Pi/4 DQPSK | 2 402                | 2 441            | 2 480          |
| 8DPSK      | 2 402                | 2 441            | 2 480          |

### 2.4 Worst-Case

|     |     |               |
|-----|-----|---------------|
| BT1 | BR  | GFSK (DH3)    |
|     | EDR | 8DPSK (3-DH1) |
| BT2 | BR  | GFSK (DH3)    |
|     | EDR | 8DPSK (3-DH3) |

Note: The power measurement has been conducted to determine the worst-case mode from all possible Combinations between available modulations, data rates.

### 2.5 Mode of operation during the test

- The EUT continuous transmission mode during the test with set at Low Channel, Middle Channel, and High Channel. To get a maximum radiated emission levels from the EUT, the EUT was moved throughout the XY, YZ, XZ planes.

### 2.6 Modifications of EUT

- None



### 3. Test Summary

| Applied                             | FCC Rule                        | IC Rule                                   | Test Items                     | Test Condition       | Result |
|-------------------------------------|---------------------------------|-------------------------------------------|--------------------------------|----------------------|--------|
| <input checked="" type="checkbox"/> | 15.203                          | –                                         | Antenna Requirement            | Conducted            | C      |
| <input checked="" type="checkbox"/> | 15.247(a)                       | –                                         | 20 dB Bandwidth                |                      | C      |
| <input checked="" type="checkbox"/> | –                               | RSS-247<br>(6.3.1 a)                      | Occupied Bandwidth (99%)       |                      | C      |
| <input checked="" type="checkbox"/> | 15.247(a)                       | RSS-247<br>(6.2.3.1 b)                    | Number of Hopping Frequencies  |                      | C      |
| <input checked="" type="checkbox"/> | 15.247(a)                       | RSS-247<br>(6.2.3.1 b)                    | Time of Occupancy (Dwell Time) |                      | C      |
| <input checked="" type="checkbox"/> | 15.247(a)                       | RSS-247<br>(6.2.3.1 a)                    | Carrier Frequencies Separation |                      | C      |
| <input checked="" type="checkbox"/> | 15.247(b)                       | RSS-247<br>(6.2.3.2 a)                    | Peak Output Power              |                      | C      |
| <input checked="" type="checkbox"/> | 15.247(d)                       | RSS-247 (6.6)                             | Conducted Spurious Emission    | Radiated             | C      |
| <input checked="" type="checkbox"/> | 15.247(d)<br>15.205 &<br>15.209 | RSS-247 (6.6)<br>RSS-GEN<br>(5.5 & 6.2.2) | Radiated Spurious Emission     |                      | C      |
| <input checked="" type="checkbox"/> | 15.207                          | RSS-GEN<br>(7.4.2)                        | Conducted Emissions            | AC Line<br>Conducted | C      |

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

The sample was tested according to the following specification: ANSI C63.10:2020.

Compliance was determined by specification limits of the applicable standard according to customer requirements.



## 4. Used equipment on test

|   | Description                 | Manufacturer      | Model Name   | Serial Name  | Next Cal.  |
|---|-----------------------------|-------------------|--------------|--------------|------------|
| ■ | MXG ANALOG SIGNAL GENERATOR | AGILENT           | N5183A       | MY50141890   | 2026.11.05 |
| □ | VECTOR SIGNAL GENERATOR     | ROHDE & SCHWARZ   | SMBV100A     | 257524       | 2026.11.05 |
| □ | SPECTRUM ANALYZER           | ROHDE & SCHWARZ   | FSU26        | 200444       | 2027.02.09 |
| ■ | SPECTRUM ANALYZER           | Agilent           | N9020A       | MY46471021   | 2027.04.02 |
| ■ | EMI TEST RECEIVER           | ROHDE & SCHWARZ   | ESW44        | 101952       | 2027.03.26 |
| □ | SLIDE-AC                    | DAEKWANG TECH     | SV-1023      | NONE         | 2026.11.05 |
| ■ | DIGITAL MULTIMETER          | HUMANTECHSTORE    | 15B+         | 50561541WS   | 2026.11.05 |
| ■ | SYSTEM DC POWER SUPPLY      | AGILENT           | 6674A        | MY53000118   | 2026.11.05 |
| □ | DC POWER SUPPLY             | AGILENT           | E3634A       | MY40012120   | 2027.02.10 |
| □ | DIRECTIONAL COUPLER         | AGILENT           | 773D         | 2839A01855   | 2026.11.05 |
| □ | POWER DIVIDER               | HEWLETT PACKARD   | 11636A       | 06916        | 2026.11.05 |
| □ | TERMINATION                 | HEWLETT PACKARD   | 909D         | 07492        | 2026.11.06 |
| ■ | ATTENUATOR                  | AGILENT           | 8493C        | 73193        | 2026.11.06 |
| ■ | ATTENUATOR                  | Mini-Circuits     | BW-K10-2W44+ | 2307         | 2027.04.02 |
| ■ | ATTENUATOR                  | Mini-Circuits     | BW-K3-2W44+  | 2318-1       | 2027.02.09 |
| ■ | ATTENUATOR                  | Mini-Circuits     | BW-K3-2W44+  | 2318-1       | 2027.02.09 |
| ■ | High Pass Filter            | WT Microwave INC. | WT-A1935-HS  | WT22111804-2 | 2026.11.05 |
| □ | USB Peak Power Sensor       | Anritsu           | MA24408A     | 12321        | 2026.11.05 |
| ■ | ACTIVE LOOP ANTENNA         | TESEQ             | HLA 6121     | 55685        | 2028.04.16 |
| ■ | Biconilog ANT               | Schwarzbeck       | VULB 9160    | 3260         | 2028.03.27 |
| ■ | Amplifier                   | SONOMA INSTRUMENT | 310N         | 185757       | 2027.06.25 |
| ■ | Horn ANT                    | Schwarzbeck       | BBHA9120D    | 974          | 2026.12.01 |
| ■ | Amplifier                   | TESTEK            | TK-PA18H     | 200104-L     | 2027.05.07 |
| ■ | Horn ANT                    | Schwarzbeck       | BBHA9170     | 01188        | 2027.03.17 |
| ■ | AMPLIFIER                   | TESTEK            | TK-PA1840H   | 220105-L     | 2027.03.16 |
| ■ | Test Receiver               | ROHDE & SCHWARZ   | ESR7         | 101616       | 2027.06.25 |
| ■ | LISN                        | ROHDE & SCHWARZ   | ENV216       | 100409       | 2027.04.13 |
| ■ | PULSE LIMITER               | lignex1           | EPL-30       | NONE         | 2027.01.07 |

## 5. Antenna Requirement

According to §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.

According to §15.247(b)(4) e conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 5.1 Result

#### Complies

The device was evaluated with the antenna types listed below.

- BT1: Dipole Antenna with U.FL connector, maximum gain 0.56 dBi
- BT2: PCB Pattern Antenna, maximum gain 0.30 dBi

The PCB pattern antenna is integrated on the PCB and is not user-replaceable. The dipole antennas are connected through U.FL connectors inside the device. These antenna connections are not accessible to the end user and are not intended to allow substitution or replacement of the antennas by the end user.

The device is not designed to permit the use of any antenna other than the antenna types evaluated with this device. Therefore, the device satisfies the antenna requirement of FCC §15.203.

The maximum antenna gain used with this device is 0.56 dBi, which does not exceed 6 dBi. Therefore, no conducted output power reduction is required under FCC §15.247(b)(4).

Based on the above, the device complies with FCC §15.203 and §15.247(b)(4).



## 6. 20 dB Bandwidth & Occupied Bandwidth (99%)

### 6.1 Test Setup

Refer to the APPENDIX I.

### 6.2 Limit

Limit : Not Applicable

### 6.3 Test Procedure

1. The 20 dB bandwidth & Occupied bandwidth were measured with a spectrum analyzer connected to RF antenna Connector (conducted measurement) while EUT was operating in transmit mode. The analyzer center frequency was set to the EUT carrier frequency, using the analyzer.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using below setting:  
RBW = 1% to 5% of the 20 dB Bandwidth & Occupied Bandwidth  
VBW  $\geq 3 \times$  RBW  
Span = between two times and five times the 20 dB Bandwidth & Occupied Bandwidth  
Sweep = Auto  
Detector function = Peak  
Trace = Max Hold

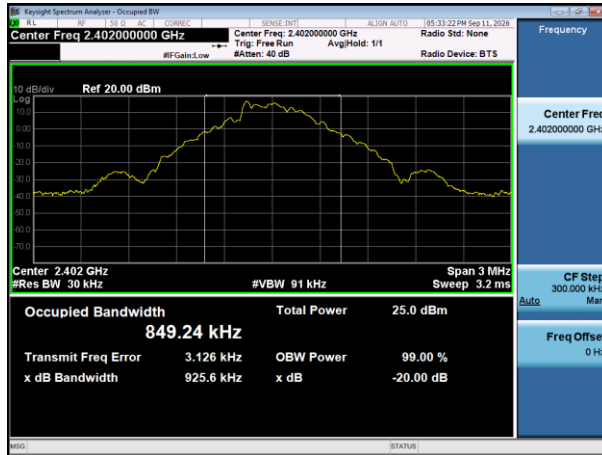
### 6.4 Test Result

| Test Mode  | Test Frequency | 20 dB Bandwidth (MHz) | Occupied Bandwidth (MHz) |
|------------|----------------|-----------------------|--------------------------|
| GFSK(BT1)  | Low            | 0.849                 | 0.926                    |
|            | Middle         | 0.865                 | 0.962                    |
|            | High           | 0.843                 | 0.921                    |
| 8DPSK(BT1) | Low            | 1.439                 | 1.302                    |
|            | Middle         | 1.401                 | 1.289                    |
|            | High           | 1.288                 | 1.291                    |
| GFSK(BT2)  | Low            | 0.863                 | 0.928                    |
|            | Middle         | 0.863                 | 0.929                    |
|            | High           | 0.864                 | 0.929                    |
| 8DPSK(BT2) | Low            | 1.158                 | 1.277                    |
|            | Middle         | 1.159                 | 1.276                    |
|            | High           | 1.160                 | 1.278                    |

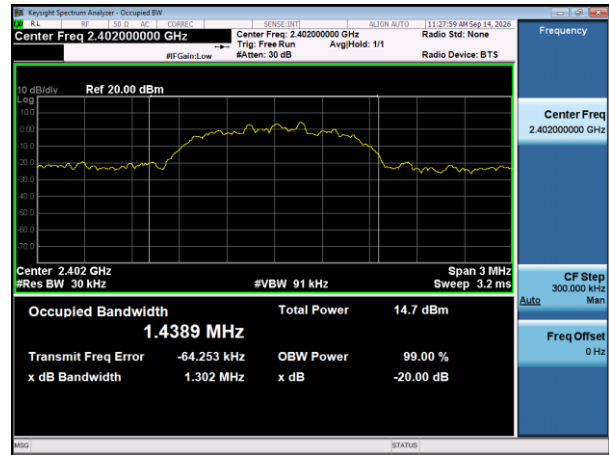
## 6.5 Test Plot

### 6.5.1 BT1

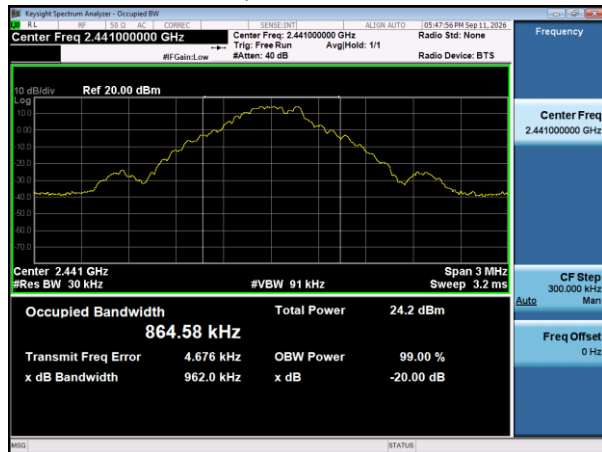
GFSK Low Channel – 20 dB Bandwidth & Occupied Bandwidth



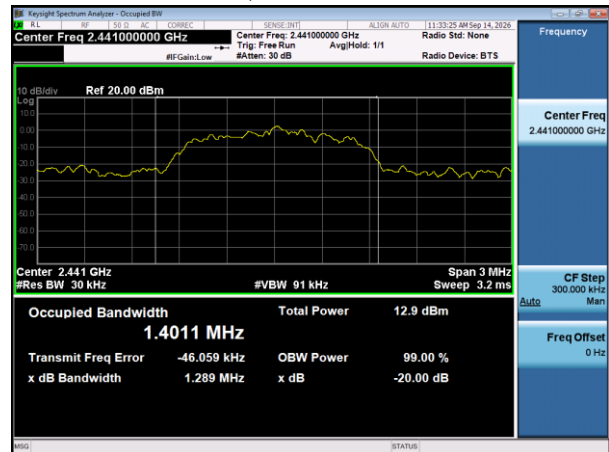
8DPSK Low Channel – 20 dB Bandwidth & Occupied Bandwidth



GFSK Mid Channel – 20 dB Bandwidth & Occupied Bandwidth



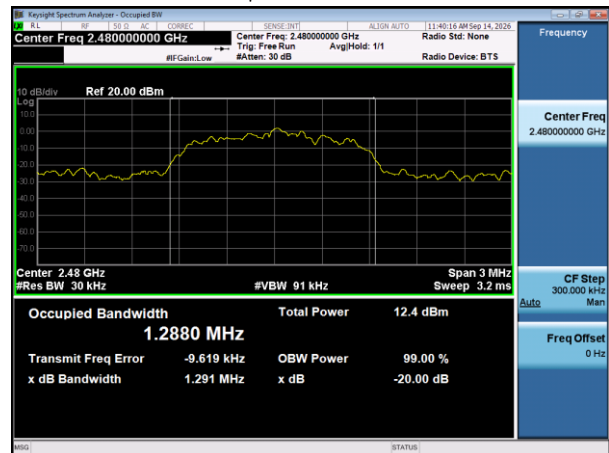
8DPSK Mid Channel – 20 dB Bandwidth & Occupied Bandwidth



GFSK High Channel – 20 dB Bandwidth & Occupied Bandwidth

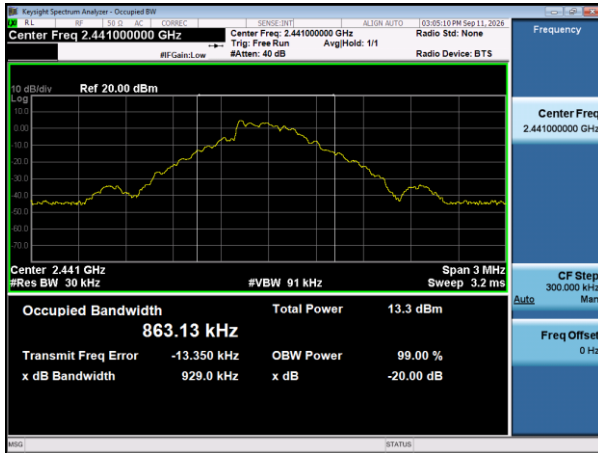


8DPSK High Channel – 20 dB Bandwidth & Occupied Bandwidth

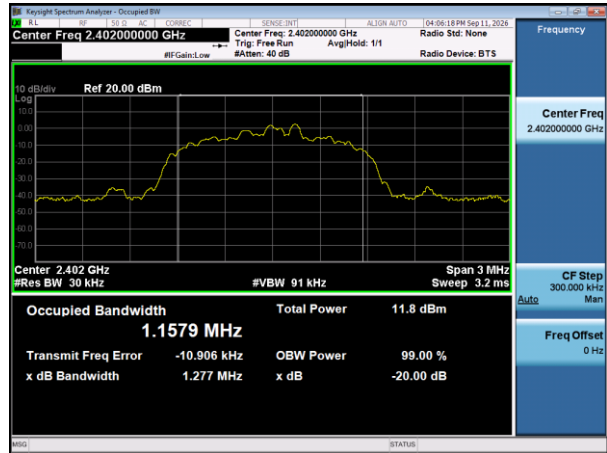


### 6.5.1 BT2

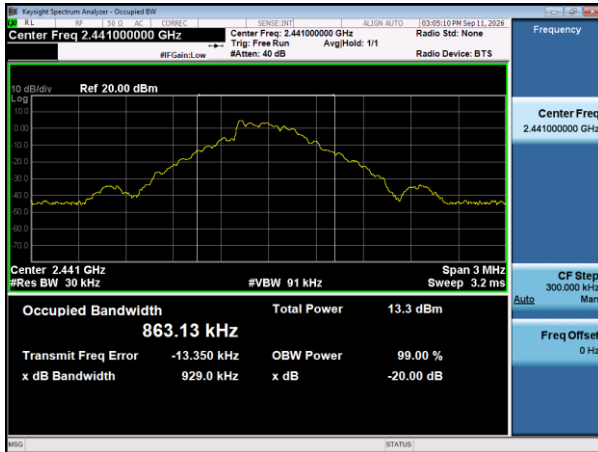
GFSK Low Channel – 20 dB Bandwidth & Occupied Bandwidth



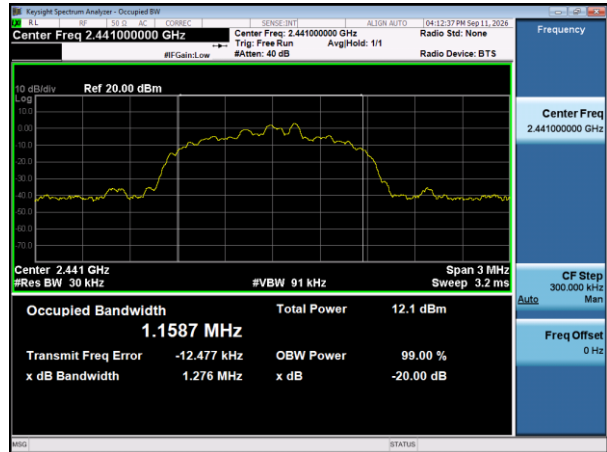
8DPSK Low Channel – 20 dB Bandwidth & Occupied Bandwidth



GFSK Mid Channel – 20 dB Bandwidth & Occupied Bandwidth



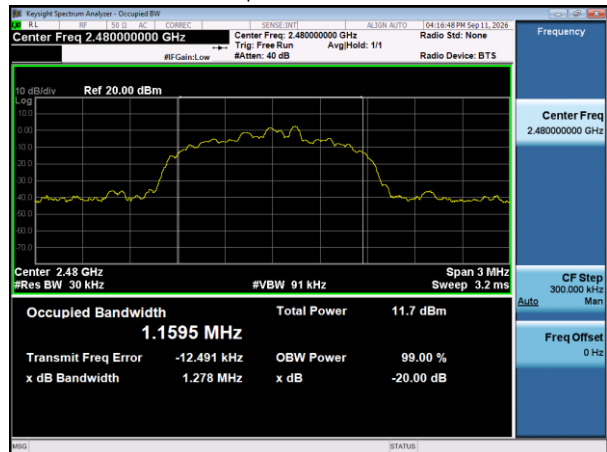
8DPSK Mid Channel – 20 dB Bandwidth & Occupied Bandwidth



GFSK High Channel – 20 dB Bandwidth & Occupied Bandwidth



8DPSK High Channel – 20 dB Bandwidth & Occupied Bandwidth





## 7. Number of Hopping Frequencies

### 7.1 Test Setup

Refer to the APPENDIX I.

### 7.2 Limit

Limit :  $\geq 15$  hops

### 7.3 Test Procedure

The number of hopping frequencies was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

To get higher resolution, two frequency ranges for FH mode within the 2400 ~ 2483.5 MHz were examined.

The spectrum analyzer is set to:

Span = 50 MHz

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.

VBW  $\geq$  RBW

Sweep = Auto

Detector = Peak

Trace = Max hold

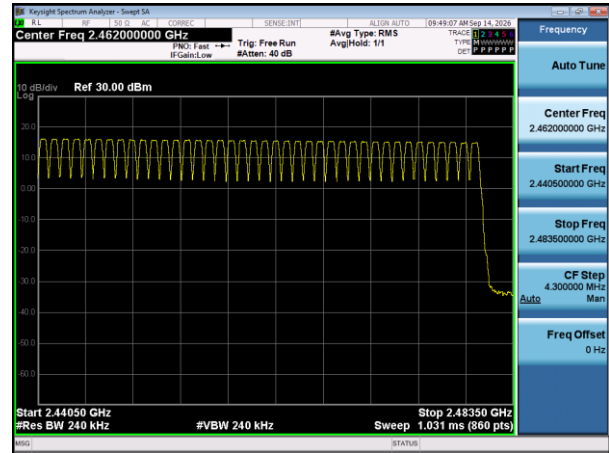
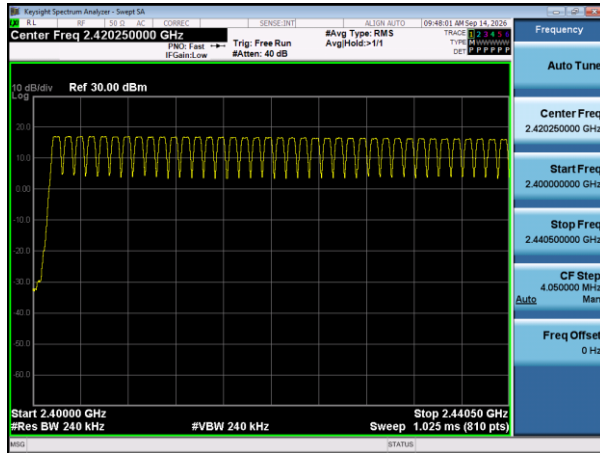
### 7.4 Test Result

| Test Mode  | Number of Hopping Channels |
|------------|----------------------------|
| GFSK(BT1)  | 79                         |
| 8DPSK(BT1) | 79                         |
| GFSK(BT2)  | 79                         |
| 8DPSK(BT2) | 79                         |

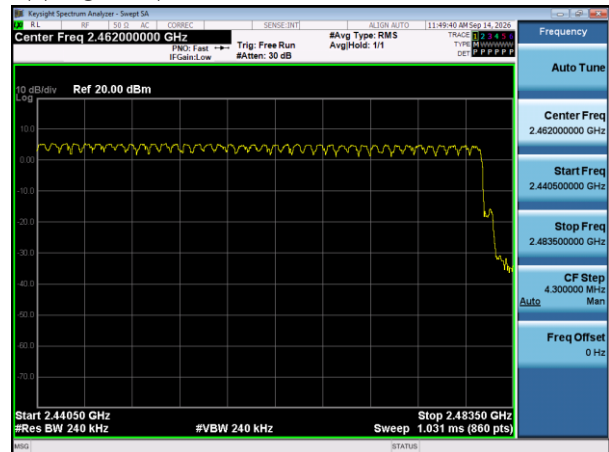
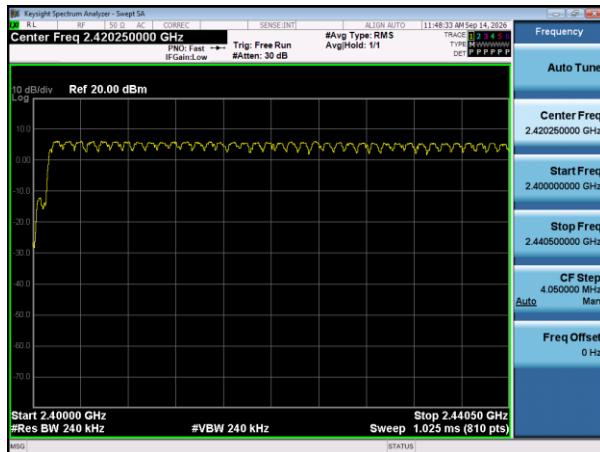
## 7.5 Test Plot

### 7.5.1 BT1

#### GFSK – Number of Hopping Frequencies

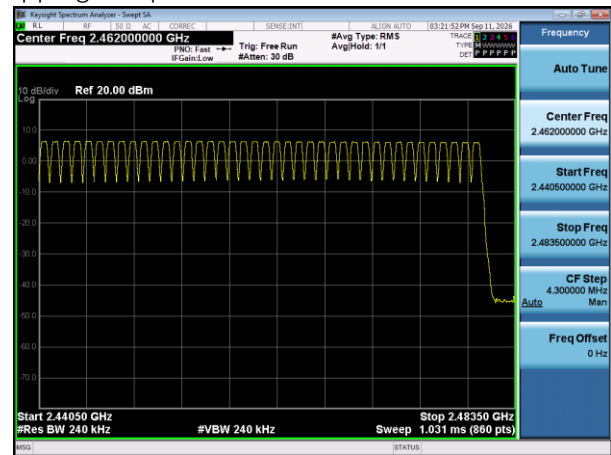
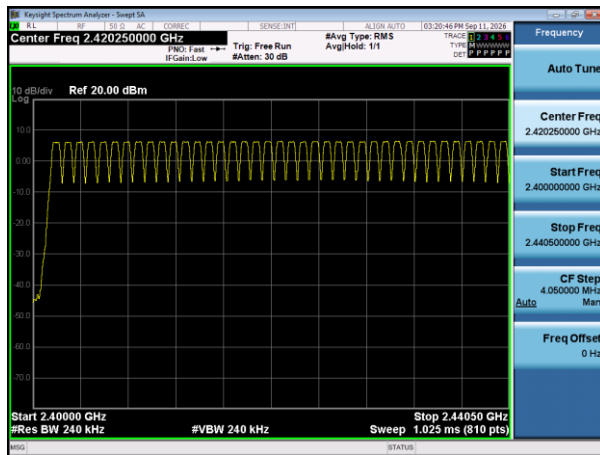


#### 8DPSK – Number of Hopping Frequencies

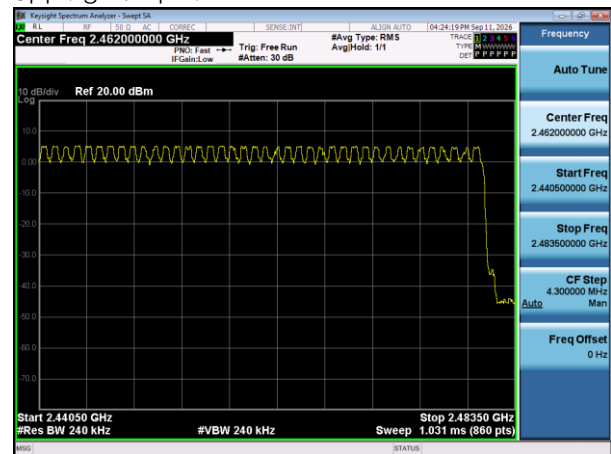
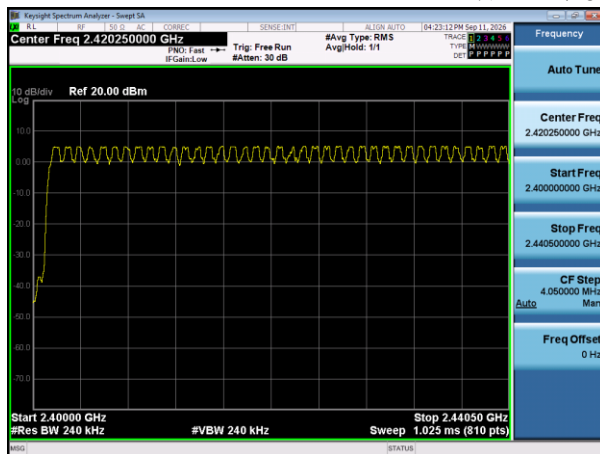


## 7.5.2 BT2

### GFSK – Number of Hopping Frequencies



### 8DPSK – Number of Hopping Frequencies





## 8. Time of Occupancy (Dwell Time)

### 8.1 Test Setup

Refer to the APPENDIX I.

### 8.2 Limit

The maximum permissible time of occupancy is 400 ms within a period of 400 ms multiplied by the number of hopping channels employed.

### 8.3 Test Procedure

The dwell time was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to:

Center frequency = 2441 MHz                      Span = Zero

RBW = 1 MHz (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)

VBW  $\geq$  RBW

Detector = Peak

Trace = Max hold



## 8.4 Test Result

| Test Mode  | Number of Hopping Channels | Burst On Time (ms) | Result (ms) | Limit (ms) |
|------------|----------------------------|--------------------|-------------|------------|
| GFSK(BT1)  | 79                         | 2.890              | 308.07      | $\leq 400$ |
| 8DPSK(BT1) | 79                         | 2.900              | 309.14      | $\leq 400$ |
| GFSK(BT2)  | 79                         | 2.880              | 307.01      | $\leq 400$ |
| 8DPSK(BT2) | 79                         | 2.890              | 308.07      | $\leq 400$ |

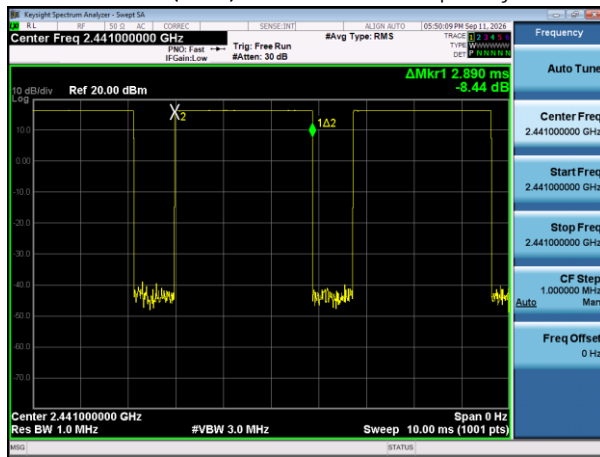
Note: Dwell Time =  $0.4 \times \text{Hopping channel} \times \text{Burst On Time} \times ((\text{Hopping rate} / \text{Time slots}) / \text{Hopping channel})$

- Time slots for DH5 = 6 slots (TX = 5 slot / RX = 1 slot)

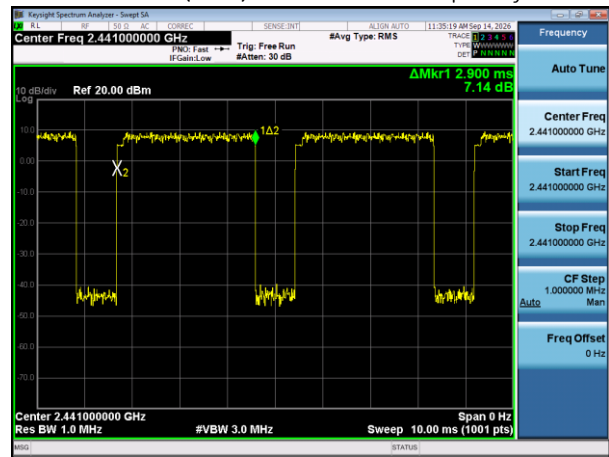
- Hopping Rate = 1600 for FH mode

## 8.5 Test Plot

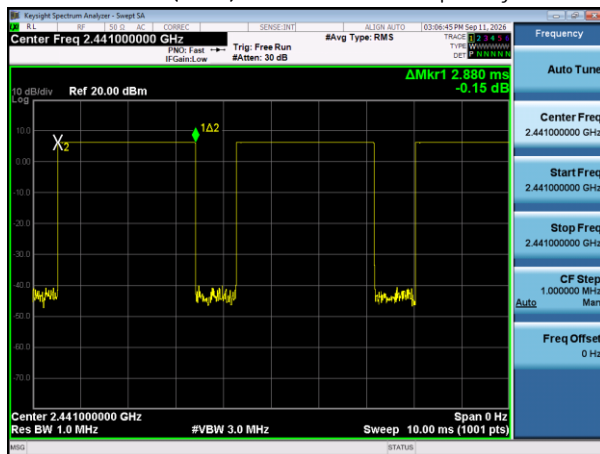
GFSK(BT1) – Time of Occupancy



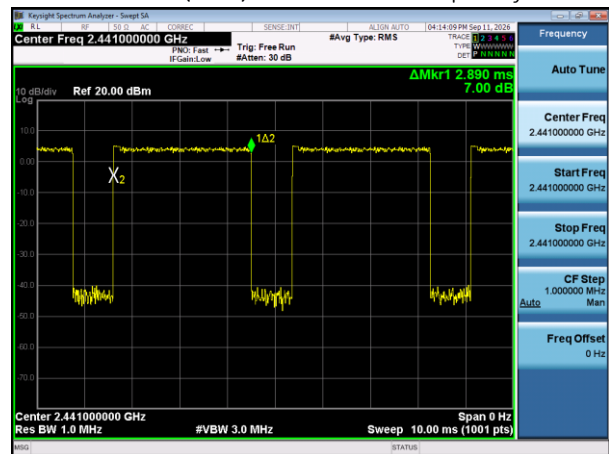
8DPSK(BT1) – Time of Occupancy



GFSK(BT2) – Time of Occupancy



8DPSK(BT2) – Time of Occupancy





## 9. Carrier Frequencies Separation

### 9.1 Test Setup

Refer to the APPENDIX I.

### 9.2 Limit

Limit :  $\geq 25$  kHz or  $\geq$  Two-Thirds of the 20 dB Bandwidth whichever is greater.

### 9.3 Test Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

After the trace being stable, the reading value between the peaks of the adjacent channels using the marker delta function was recorded as the measurement results.

The spectrum analyzer is set to:

Span = wide enough to capture the peaks of two adjacent channels

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.

VBW  $\geq$  RBW

Sweep = Auto

Detector = Peak

Trace = Max hold

### 9.4 Test Result

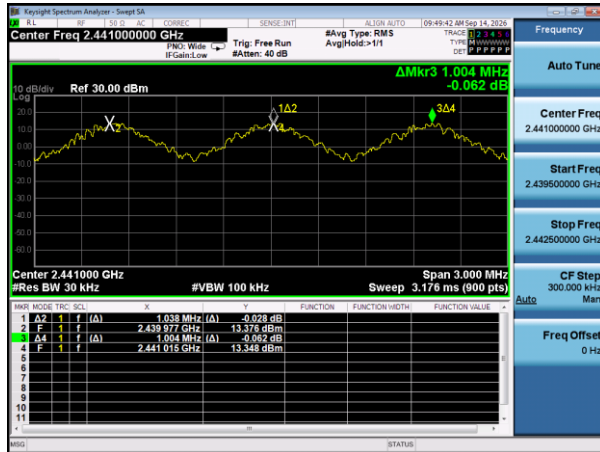
| Test Mode  | Carrier Frequencies Separation (kHz) | Min. Limit (kHz) |
|------------|--------------------------------------|------------------|
| GFSK(BT1)  | 1004.449                             | $\geq 669.633$   |
| 8DPSK(BT1) | 1004.449                             | $\geq 669.633$   |
| GFSK(BT2)  | 820.912                              | $\geq 547.275$   |
| 8DPSK(BT2) | 991.101                              | $\geq 660.734$   |

Note: Limit(kHz) = Test Result of 20 dB BW \* 2/3

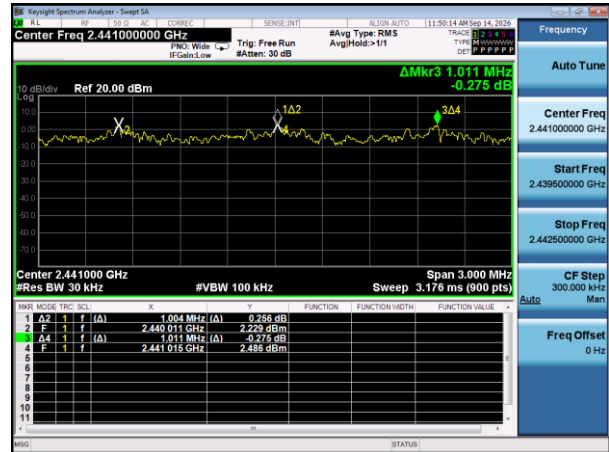
## 9.5 Test Plot

### BT1 and BT2

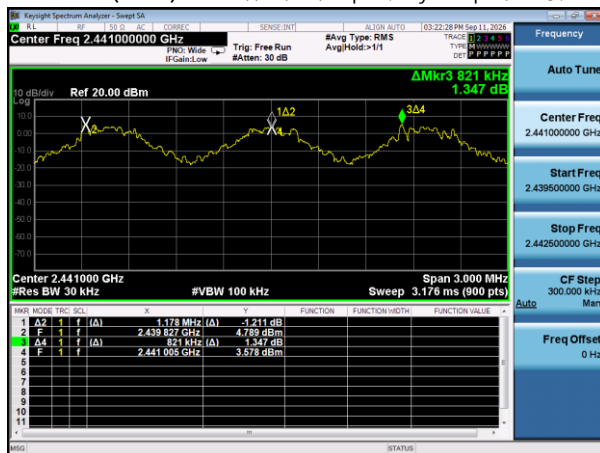
GFSK(BT1) – Carrier Frequency Separation



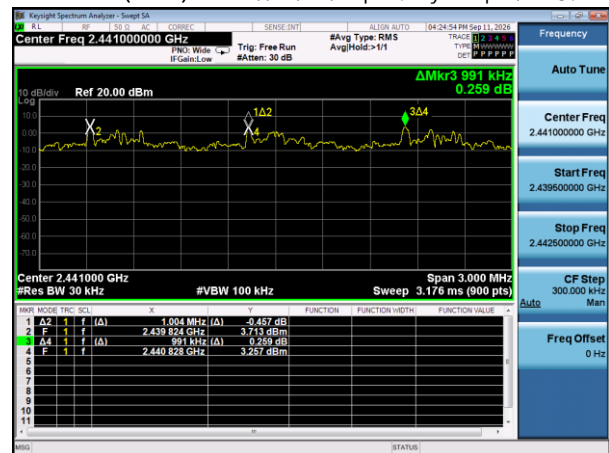
8DPSK(BT1) – Carrier Frequency Separation



GFSK(BT2) – Carrier Frequency Separation



8DPSK(BT2) – Carrier Frequency Separation





## 10. Peak Output Power

### 10.1 Test Setup

Refer to the APPENDIX I.

### 10.2 Limit

#### ■ FCC Requirements

The maximum peak output power of the intentional radiator shall not exceed the following:

1. §15.247(a)(1), 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.
2. §15.247(b)(1), For frequency hopping systems operating in the 2400 – 2483.5 MHz employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725 – 5805 MHz band: 1 Watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

#### ■ IC Requirements

1. RSS-247(5.4) (b), For FHSS operating in the band 2400 – 2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels, the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p shall not exceed 4 W, except as provided in section 5.4(e)

### 10.3 Test Procedure

1. The RF output power was measured with a spectrum analyzer connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate center frequency, a spectrum analyzer was used to record the shape of the transmit signal.
2. The peak output power of the fundamental frequency was measured with the spectrum analyzer using;
  - Span = approximately 5 times of the 20 dB bandwidth, centered on a hopping channel
  - RBW  $\geq$  20 dB Bandwidth
  - VBW  $\geq$  RBW
  - Sweep = Auto
  - Detector function = Peak
  - Trace = Max Hold



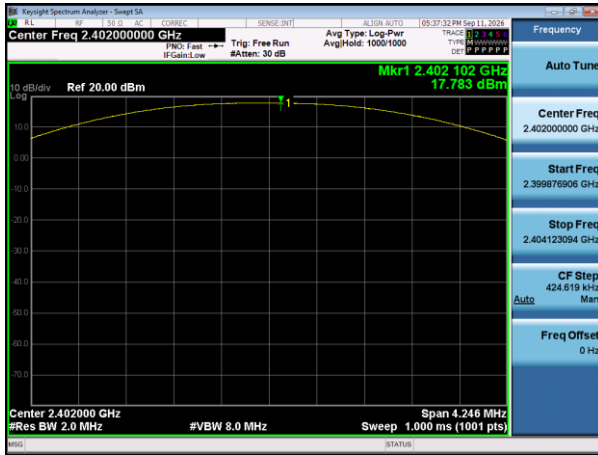
## 10.4 Test Result

| Test Mode       | Test Frequency | Peak Output Power |        |
|-----------------|----------------|-------------------|--------|
|                 |                | dBm               | mW     |
| GFSK(BT1)       | Low            | 17.783            | 60.021 |
|                 | Middle         | 17.448            | 55.565 |
|                 | High           | 15.006            | 31.666 |
| Pi/4 DQPSK(BT1) | Low            | 10.135            | 10.316 |
|                 | Middle         | 9.384             | 8.678  |
|                 | High           | 8.533             | 7.133  |
| 8DPSK(BT1)      | Low            | 11.296            | 13.477 |
|                 | Middle         | 10.299            | 10.713 |
|                 | High           | 9.519             | 8.952  |
| GFSK(BT2)       | Low            | 6.139             | 4.111  |
|                 | Middle         | 6.398             | 4.363  |
|                 | High           | 6.032             | 4.011  |
| Pi/4 DQPSK(BT2) | Low            | 4.949             | 3.125  |
|                 | Middle         | 5.188             | 3.302  |
|                 | High           | 4.828             | 3.039  |
| 8DPSK(BT2)      | Low            | 5.036             | 3.189  |
|                 | Middle         | 5.255             | 3.354  |
|                 | High           | 4.911             | 3.098  |

## 10.5 Test Plot

### 10.5.1 BT1

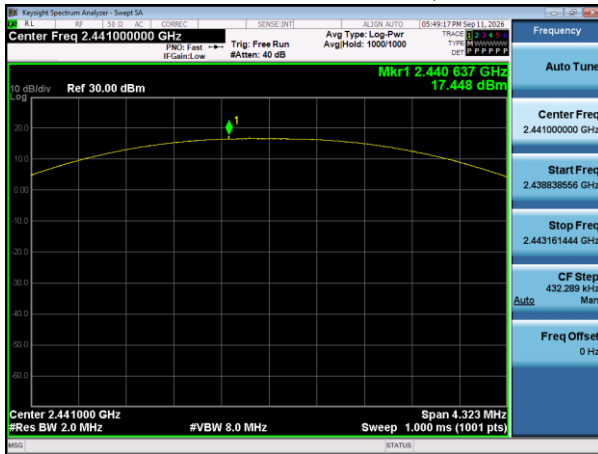
GFSK Low Channel – Peak Output Power



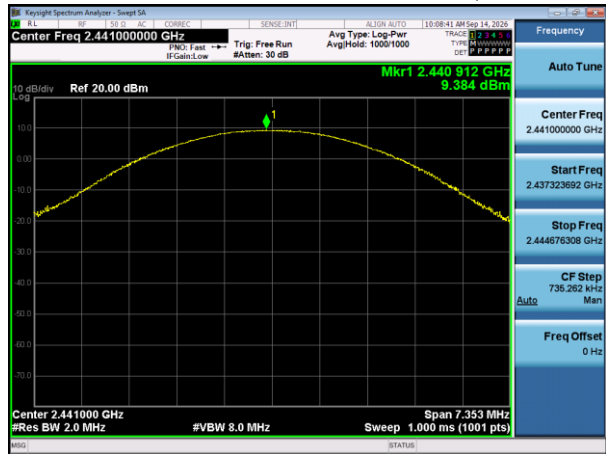
Pi/4 DQPSK Low Channel – Peak Output Power



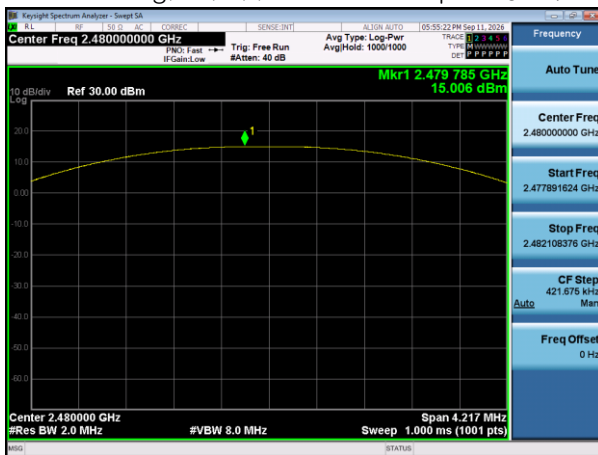
GFSK Mid Channel – Peak Output Power



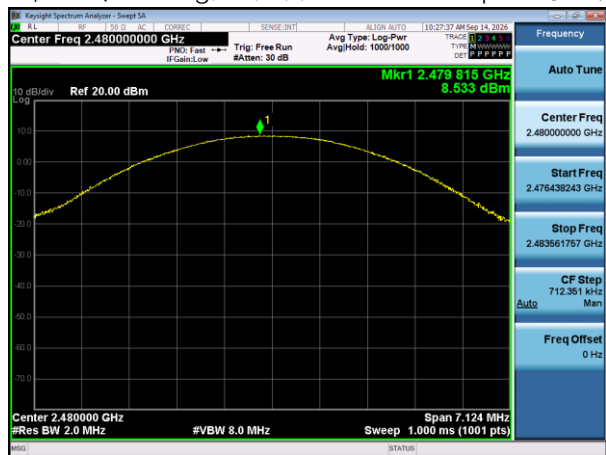
Pi/4 DQPSK Mid Channel – Peak Output Power



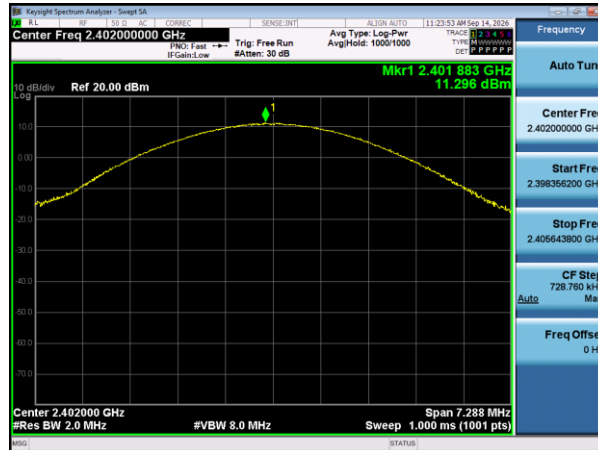
GFSK High Channel – Peak Output Power



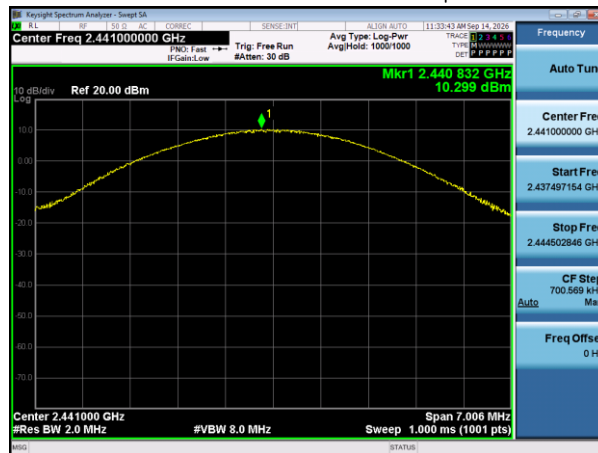
Pi/4 DQPSK High Channel – Peak Output Power



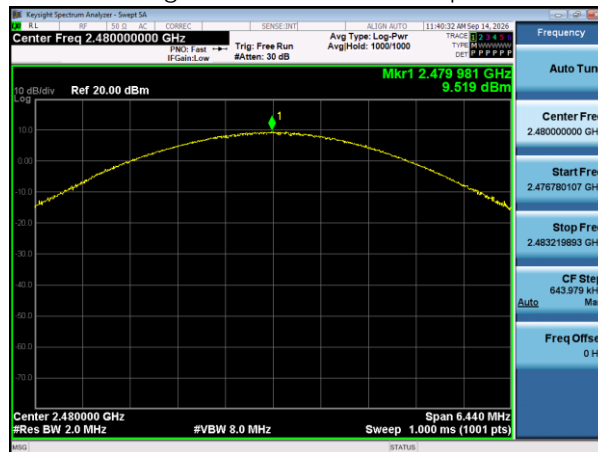
### 8DPSK Low Channel – Peak Output Power



### 8DPSK Mid Channel – Peak Output Power

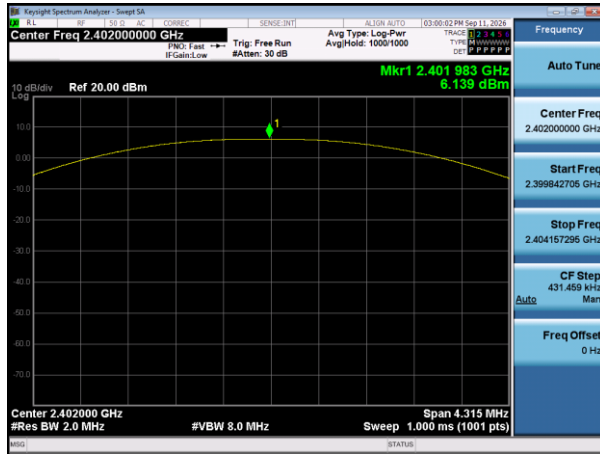


### 8DPSK High Channel – Peak Output Power

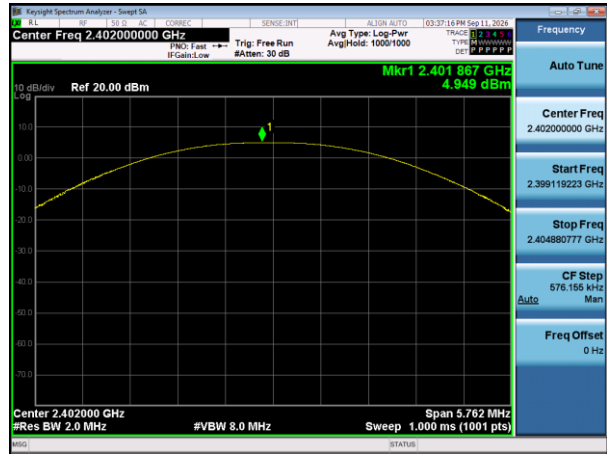


## 10.5.2 BT2

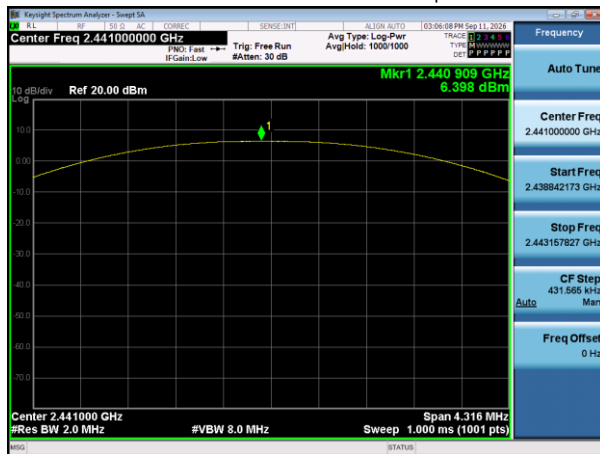
GFSK Low Channel – Peak Output Power



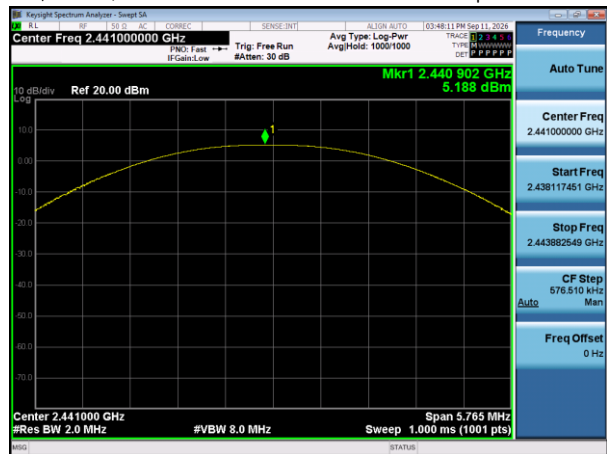
Pi/4 DQPSK Low Channel – Peak Output Power



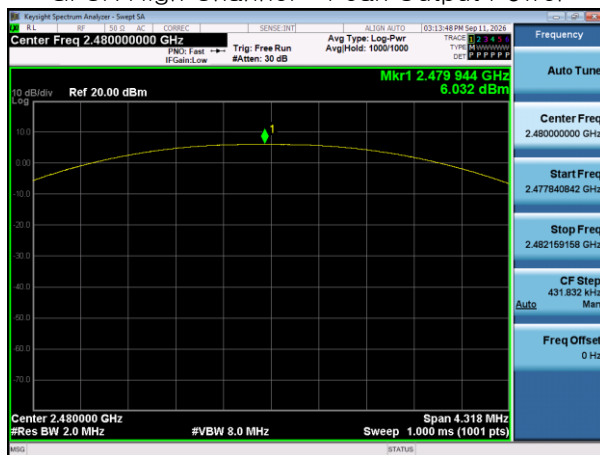
GFSK Mid Channel – Peak Output Power



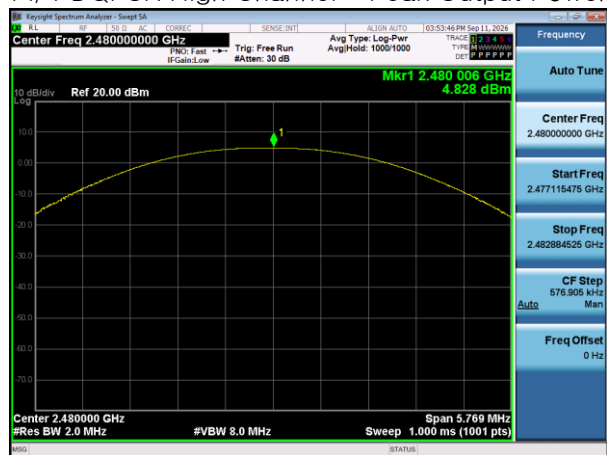
Pi/4 DQPSK Mid Channel – Peak Output Power



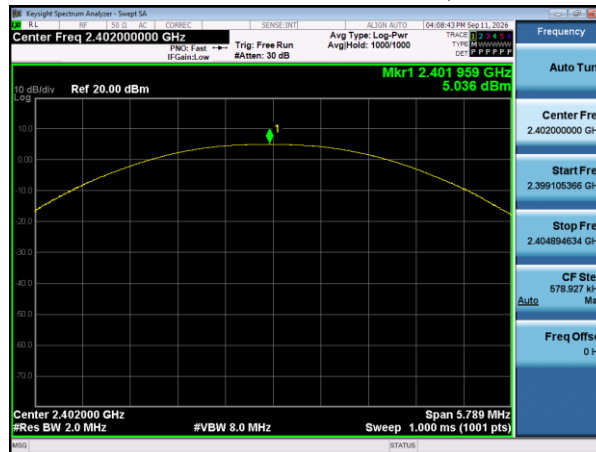
GFSK High Channel – Peak Output Power



Pi/4 DQPSK High Channel – Peak Output Power



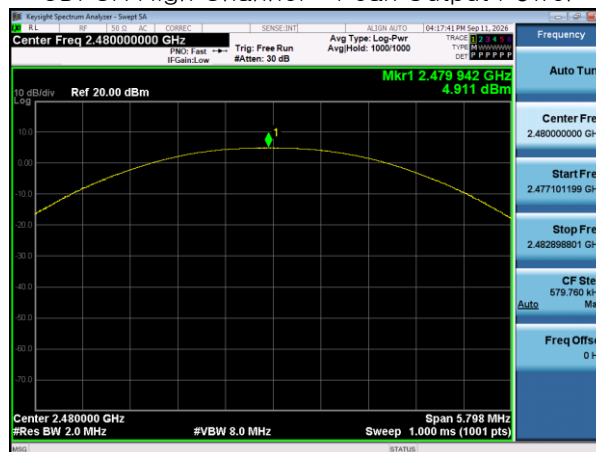
### 8DPSK Low Channel – Peak Output Power



### 8DPSK Mid Channel – Peak Output Power



### 8DPSK High Channel – Peak Output Power



## 11. TX Radiated Spurious Emission and Conducted Spurious Emission

### 11.1 Test Setup

Refer to the APPENDIX I.

### 11.2 Limit

According to §15.247(d), 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 section §15.209(a) is not required. In addition, radiated emission which in the restricted band, as define in section §15.205(a), must also comply the radiated emission limits specified in section §15.209(a) (see section §15.205(c))

According to § 15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

| Frequency (MHz) | Limit (uV/m)  | Measurement Distance (meter) |
|-----------------|---------------|------------------------------|
| 0.009 ~ 0.490   | 2400/F (kHz)  | 300                          |
| 0.490 ~ 1705    | 24000/F (kHz) | 30                           |
| 1705 ~ 30.0     | 30            | 30                           |
| 30 ~ 88         | 100 **        | 3                            |
| 88 ~ 216        | 150 **        | 3                            |
| 216 ~ 960       | 200 **        | 3                            |
| Above 960       | 500           | 3                            |

\*\* Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 – 72 MHz, 76 – 88 MHz, 174 – 216 MHz or 470 – 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.



According to § 15.205(a) and (b), only spurious emissions are permitted in any of  
The frequency bands listed below:

| MHz                 | MHz                   | MHz             | GHz           |
|---------------------|-----------------------|-----------------|---------------|
| 0.009 ~ 0.110       | 16.42 ~ 16.423        | 399.90 ~ 410    | 4.5 ~ 5.15    |
| 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   |
| 4.17725 ~ 4.17775   | 37.5 ~ 38.            | 1435 ~ 1626.5   | 9.0 ~ 9.2     |
| 4.20725 ~ 4.20775   | 25.73 ~ 74.6          | 1645.5 ~ 1646.5 | 9.3 ~ 9.5     |
| 4.17725 ~ 4.17775   | 74.8 ~ 75.2           | 1660 ~ 1710     | 10.6 ~ 12.7   |
| 6.215 ~ 6.218       | 108 ~ 121.94          | 1718.8 ~ 1722.2 | 13.25 ~ 13.4  |
| 6.26775 ~ 6.26825   | 149.9 ~ 150.05        | 2200 ~ 2300     | 14.47 ~ 14.5  |
| 6.31175 ~ 6.31225   | 156.52475 ~ 156.52525 | 2310 ~ 2390     | 15.35 ~ 16.2  |
| 8.291 ~ 8.294       | 156.7 ~ 156.9         | 2483.5 ~ 2500   | 17.7 ~ 21.4   |
| 8.362 ~ 8.366       | 162.0125 ~ 167.17     | 2690 ~ 2900     | 22.01 ~ 23.12 |
| 8.37625 ~ 8.38675   | 3345.8 ~ 3358         | 3260 ~ 3267     | 23.6 ~ 24.0   |
| 8.41425 ~ 8.41475   | 3600 ~ 4400           | 3332 ~ 3339     | 31.2 ~ 31.8   |
| 12.51975 ~ 12.52025 | 3345.8 ~ 3358         | 240 ~ 285       | 36.43 ~ 36.5  |
| 12.57675 ~ 12.57725 | 3600 ~ 4400           | 322 ~ 335.4     | Above 38.6    |
| 13.36 ~ 13.41       |                       |                 |               |

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

### 11.3 Test Procedure for Radiated Spurious Emission

1. The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 3.75 meter away from the interference-receiving antenna.
3. For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.
4. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
5. For each suspected emission, the EUT was arranged to its worst case and then The antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.  
(The EUT was pre-tested with three axes (X, Y, Z) and the final test was performed at the worst case.)
6. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

## Measurement Instrument Setting

1. Frequency Range: Below 1 GHz  
RBW = 100 or 120 kHz, VBW = 3 x RBW, Detector = Peak or Quasi Peak
2. Frequency Range: Above 1 GHz  
Peak Measurement  
RBW = 1 MHz, VBW = 3 MHz, Detector = Peak, Sweep time = Auto,  
Trace mode = Max Hold until the trace stabilizes  
  
Average Measurement  
RBW = 1MHz, VBW  $\geq 1/T$ , Detector = Peak, Sweep Time = Auto,  
Trace Mode = Max Hold until the trace stabilizes

## 11.4 Test Procedure for Conducted Spurious Emission

1. The transmitter output was connected to the spectrum analyzer.
2. The reference level of the fundamental frequency was measured with the spectrum analyzer using  
RBW = 100 kHz, VBW = 300 kHz.
3. The conducted spurious emission was tested each ranges were set as below.  
Frequency range: 30 MHz ~ 26.5 GHz  
RBW = 100 kHz, VBW = 300 kHz, Sweep Time = Auto, Detector = Peak,  
Trace = Max Hold

LIMIT LINE = 20 dB below of the reference level of above measurement procedure  
Step 2. (RBW = 100 kHz, VBW = 300 kHz)