

## FCC 47 CFR PART 15 SUBPART C AND ANSI C63.10: 2013 TEST REPORT

For

### STEREO TURNTABLE SYSTEM

Model: YY2098C

Data Applies To: N/A

Brand Name: SONY

Issued for

**Sony Group Corporation**  
**1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan**

Issued By

**Compliance Certification Services Inc.**  
**Tainan Lab.**  
**No. 168, Ln. 523, Sec. 3, Zhongzheng Rd.,**  
**Rende Dist., Tainan City, 717017, Taiwan**

**Issued Date: August 27, 2025**

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.  
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**REVISION HISTORY**

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 27, 2025	Initial Issue	All Page	Gina Lin

**TABLE OF CONTENTS**

TITLE	PAGE NO.
<b>1. TEST REPORT CERTIFICATION .....</b>	<b>4</b>
<b>2. TEST RESULT SUMMARY.....</b>	<b>5</b>
<b>3. EUT DESCRIPTION .....</b>	<b>6</b>
3.1 DESCRIPTION OF EUT & POWER.....	6
<b>4. DESCRIPTION OF TEST MODES .....</b>	<b>7</b>
<b>5. TEST METHODOLOGY .....</b>	<b>9</b>
<b>6. FACILITIES AND ACCREDITATIONS.....</b>	<b>10</b>
6.1 FACILITIES .....	10
6.2 EQUIPMENT .....	10
6.3 LABORATORY ACCREDITATIONS LISTINGS.....	10
6.4 TABLE OF ACCREDITATIONS AND LISTINGS .....	11
6.5 MEASUREMENT EQUIPMENT USED .....	12
6.6 MEASURING INSTRUMENT CALIBRATION .....	13
6.7 MEASUREMENT UNCERTAINTY .....	13
<b>7. SETUP OF EQUIPMENT UNDER TEST.....</b>	<b>14</b>
7.1 SETUP CONFIGURATION OF EUT .....	14
7.2 SUPPORT EQUIPMENT.....	16
<b>8. APPLICABLE LIMITS AND TEST RESULTS.....</b>	<b>19</b>
8.1 20DB BANDWIDTH FOR HOPPING.....	19
8.2 MAXIMUM PEAK OUTPUT POWER .....	27
8.3 HOPPING CHANNEL SEPARATION.....	43
8.4 NUMBER OF HOPPING FREQUENCY USED .....	50
8.5 DWELL TIME ON EACH CHANNEL .....	54
8.6 DUTY CYCLE.....	75
8.7 CONDUCTED SPURIOUS EMISSION .....	83
8.8 RADIATED EMISSIONS .....	96
8.8.1 TRANSMITTER RADIATED SUPURIOUS EMSSIONS .....	96
8.8.2 WORST-CASE RADIATED EMISSION BELOW 1 GHZ.....	101
8.8.3 TRANSMITTER RADIATED EMISSION ABOVE 1 GHZ .....	107
8.8.4 RESTRICTED BAND EDGES .....	125
8.9 POWERLINE CONDUCTED EMISSIONS .....	131
<b>APPENDIX I PHOTOGRPHS OF TEST SETUP .....</b>	<b>137</b>

## 1. TEST REPORT CERTIFICATION

<b>Applicant</b>	: Sony Group Corporation 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
<b>Manufacturer</b>	: Sony Group Corporation 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
<b>Equipment Under Test</b>	: STEREO TURNTABLE SYSTEM
<b>Model Number</b>	: YY2098C
<b>Data Applies To</b>	: N/A
<b>Brand Name</b>	: SONY
<b>Date of Test</b>	: July 01, 2025 ~ August 22, 2025

APPLICABLE STANDARD	
STANDARD	TEST RESULT
FCC Part 15 Subpart C AND ANSI C63.10: 2013	PASS
Statements of Conformity	
Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

### We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in **ANSI C63.10: 2013** and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:




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**John Chen**  
Supervisor

## 2. TEST RESULT SUMMARY

FCC Standard Section	Report Section	Test Item	Result
15.203	3	ANTENNA REQUIREMENT	Pass
15.247(a)(1)	8.1	20dB BANDWIDTH	Pass
15.247(b)(1)	8.2	MAXIMUM PEAK OUTPUT POWER	Pass
15.247(a)(1)	8.3	HOPPING CHANNEL SEPARATION	Pass
15.247(a)(1)(iii)	8.4	NUMBER OF HOPPING FREQUENCY USED	Pass
15.247(a)(1)(iii)	8.5	DWELL TIME	Pass
-	8.6	DUTY CYCLE	-
15.247(d)	8.7	CONDUCTED SPURIOUS EMISSION	Pass
15.247(d)	8.8	RADIATED EMISSIONS	Pass
15.207(a)	8.9	POWERLINE CONDUCTED EMISSIONS	Pass

### 3. EUT DESCRIPTION

#### 3.1 DESCRIPTION OF EUT & POWER

<b>Product</b>	STEREO TURNTABLE SYSTEM
<b>Model Number</b>	YY2098C
<b>Data Applies To</b>	N/A
<b>Brand Name</b>	SONY
<b>Received Date</b>	June 30, 2025
<b>Reported Date</b>	August 25, 2025
<b>Frequency Range</b>	2402MHz ~ 2480MHz
<b>Transmit Peak Power</b>	GFSK: 3.34dBm / 2.16mW π/4-DQPSK: 2.63dBm / 1.83mW 8DPSK: 3.19dBm / 2.08mW
<b>Channel Spacing</b>	1MHz
<b>Transmit Data Rate</b>	GFSK Mode: 1 Mbps π/4-DQPSK Mode: 2Mbps 8DPSK Mode: 3Mbps
<b>Modulation Type</b>	GFSK、π/4-DQPSK、8DPSK
<b>Number of Channels</b>	79 Channels
<b>EUT Power Supply</b>	AC 100-240V
<b>Antenna Type</b>	Manufacturer: Sunitec Type: Layout Antenna Model: TL/TH Gain: 3.0 dBi
<b>Firmware Version</b>	V1.0
<b>Software Version</b>	V1.0

**Power Adapter :**

Manufacturer	Model No.	Power Input	Power Output
SONY	FJ-SW7260502000DU	100-240V~ 50/60Hz 0.4A	DC5V 2.0A

**Remark:**

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for **FCC ID: AK8YY2098C** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.
3. For more details, please refer to the User's manual of the EUT.

## 4. DESCRIPTION OF TEST MODES

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2402
Middle	2441
High	2480

### Radiated Emission Test (Below 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Normal Operation

### Radiated Emission Test (Above 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Tested Channel	Modulation Technology	Modulation Type	Packet Type
Low, Mid, High	FHSS	GFSK	DH5
Low, Mid, High	FHSS	$\pi/4$ -DQPSK	2-DH5
Low, Mid, High	FHSS	8-DPSK	3-DH5

**Bandedge Measurement :**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Tested Channel	Modulation Technology	Modulation Type	Packet Type
Low, High	FHSS	GFSK	DH5
Low, Mid, High	FHSS	$\pi/4$ -DQPSK	2-DH5
Low, Mid, High	FHSS	8-DPSK	3-DH5

**Antenna Port Conducted Measurement :**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

Tested Channel	Modulation Technology	Modulation Type	Packet Type
Low, Mid, High	FHSS	GFSK	DH5
Low, Mid, High	FHSS	$\pi/4$ -DQPSK	2-DH5
Low, Mid, High	FHSS	8-DPSK	3-DH5

## **5. TEST METHODOLOGY**

The tests documented in this report were performed in accordance with ANSI C63.10 : 2013 and FCC CFR 47 15.207, 15.209 and 15.247.

Report No.: TMTN2506000665NR

## 6. FACILITIES AND ACCREDITATIONS

### 6.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

- No.8, Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)
- No. 168, Ln. 523, Sec. 3, Zhongzheng Rd., Rende Dist., Tainan City 717, Taiwan

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

### 6.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 6.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 1109 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: TW1109).

## 6.4 TABLE OF ACCREDITATIONS AND LISTINGS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

<b>Taiwan</b>	TAF
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The measuring facility of laboratories has been authorized or registered by the following approval agencies.

<b>Canada</b>	Industry Canada (ISED#: 2324H)
<b>Germany</b>	TUV NORD
<b>Taiwan</b>	BSMI
<b>USA</b>	FCC

Report No.: TMTN2506000665NR

## 6.5 MEASUREMENT EQUIPMENT USED

### For §8.8.2~8.8.3

Chamber 1166 Room (Radiation Test)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Active Loop Antenna	ETS-LINDREN	6502	8905-2356	08/29/2024	08/28/2025
Attenuator	MCL	BW-S10W5	0605	01/15/2025	01/14/2026
Notch Filter	MICRO-TRONICS	BRM50702-01	018	01/15/2025	01/14/2026
Bilog Antenna with 6dB Attenuator	SUNOL SCIENCES & EMC I	JB1 & N-6-06	A021306 & AT-N0682	09/27/2024	09/26/2025
Cable	EMCI	EM102-KMKM	CB1166-01	01/15/2025	01/14/2026
Double Ridged Guide Horn Antenna	ETS-LINDGREN	3116	00078900	03/27/2025	03/26/2026
EMI Test Receiver	R&S	ESCI	101203	10/23/2024	10/22/2025
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/24/2025	07/23/2026
Double Ridged Guide Horn Antenna	ETS.LINDGREN	3117	00078733	04/28/2025	04/27/2026
Pre-Amplifier	EMEC	EM01G40GA	060919/S02-13041 7-307	05/06/2025	05/05/2026
Software	Excel(ccs-o6-2020 v1.1) , e3(v6.101222)				

### For §8.1~8.7 8.8.4

Chamber 1166 Room (Conducted Test)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/24/2025	07/23/2026
SMA Cable+10dB Attenuator	CCS	SMA+10dB ATT	SMA/10dB	01/15/2025	01/14/2026
Software	Excel(ccs-o6-2020 v1.1)				

### For §8.9

Conducted Emission room #1					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
BNC Coaxial Cable	CCS	BNC50	11	01/14/2025	01/13/2026
EMI Test Receiver	R&S	ESCI	100782	05/27/2025	05/26/2026
LISN	R&S	ENV216	101495	07/14/2024	07/13/2025
LISN	R&S	NNLK 8130	8130124	01/20/2025	01/19/2026
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	797	01/14/2025	01/13/2026
Test S/W	e3(v6.101222)				

## 6.6 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer’s recommendations, and is traceable to recognized national standards.

## 6.7 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

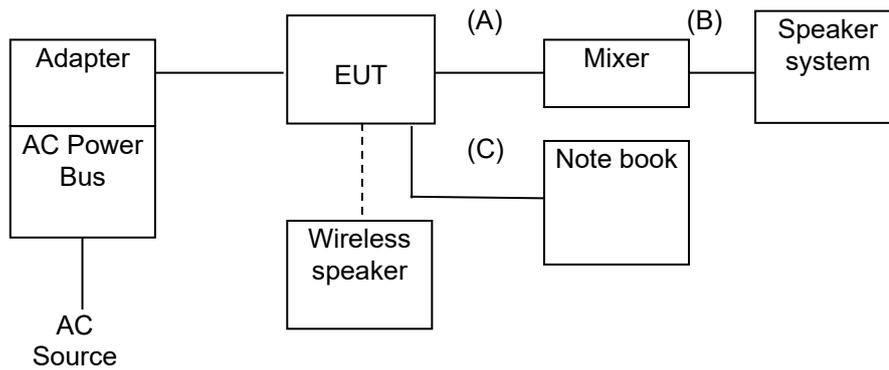
Measurement	Uncertainty
AC Powerline Conducted Emission	±2.21dB
Channel Bandwidth	±2.87 %
RF output power (Spectrum)	±2.88dB
RF Output power (Power Meter & Power sensor)	±0.243dB
Power Density	±2.87dB
Conducted Badnedge	±2.87dB
Conducted Spurious Emission	±2.88dB
Channel Separation	±2.87dB
In-Band Emission (Channel Mask)	±2.88dB
Frequency Stability	±0.03 ppm

This measurement uncertainty is confidence of approximately 95%, k=2

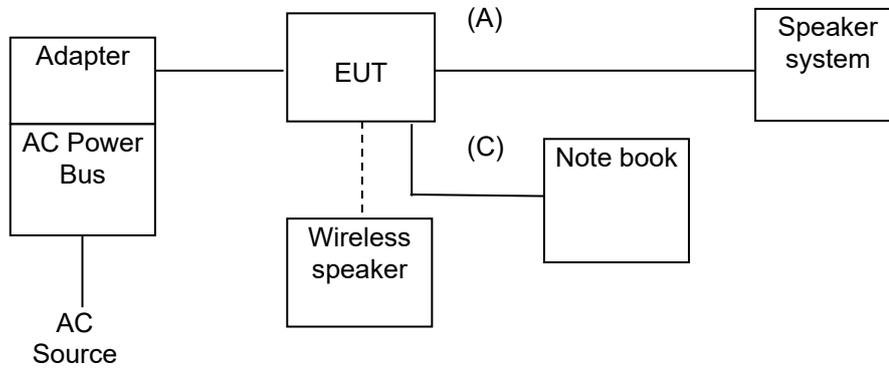
## 7. SETUP OF EQUIPMENT UNDER TEST

### 7.1 SETUP CONFIGURATION OF EUT

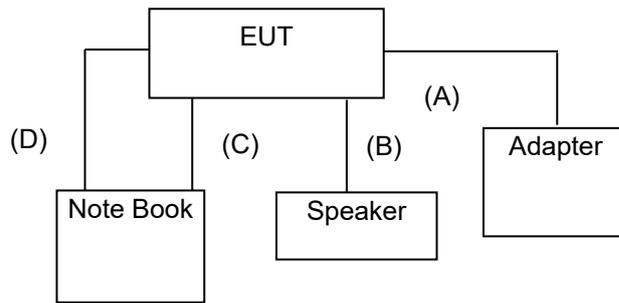
EMI  
Phono Mode



Line Mode



RF



## 7.2 SUPPORT EQUIPMENT

### For EMI test

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	Speaker System	infotec	SP-102	DOC	Unshielded, 2.0m
2	Wireless Speaker	PHILIPS	TAS1505	DOC	N/A
3	Note Book	TOSHIBA	PORTEGE	DOC	N/A
4	MIXER	akiyama	S2P PHPMU 1B 17	DOC	N/A

No.	Signal cable description	
A	Audio	Shielded, 1.3m 1 pcs.
B	Audio	Shielded, 1.0m 1 pcs.
C	USB	Shielded, 1.5m 1 pcs.

### For RF test

No.	Product	Manufacturer	Model No.	Certify No.	Power cable
1	Speaker System	infotec	SP-102	DOC	Power: Unshielded, 2.0m Audio: Shielded, 1.0m
2	Note Book	ASUS	X515J	DOC	N/A

No.	Signal cable description	
A	Power	Unshielded, 1.5m 1 pcs.
B	Audio	Shielded, 1.3m 1 pcs.
C	USB	Shielded, 1.5m 1 pcs
D	USB	Shielded, 2.9m 1 pcs with 1 core.

### Note:

- 1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
- 3) shd. = shielded; unshd. = unshielded

Report No.: TMTN2506000665NR

## **EUT OPERATING CONDITION**

### **RF Setup**

1. Set up all computers like the setup diagram.
2. The “Blue Test 3 V3.3.10.1199” software was used for testing
3. Choose Transport “DEBUG” and Device “USB DBG(100)”

### **GFSK**

#### **TX Mode:**

PACKET TX

Channel 1~5 (0-78) > 0,39,78

Payload : Pseudo - random

GFSK(DH1)

Packet Type : DH1 > Packet Length 27

Power(0-11) : 6

GFSK (DH3)

Packet Type : DH3 > Packet Length 183

Power(0-11) : 6

GFSK (DH5)

Packet Type : DH5 > Packet Length 339

Power(0-11) : 6

### **$\pi/4$ -DQPSK**

#### **TX Mode:**

PACKET TX

Channel 1~5 (0-78) > 0,39,78

Payload : Pseudo - random

$\pi/4$ -DQPSK(2DH1)

Packet Type : 2DH1 > Packet Length 54

Power(0-11) : 6

$\pi/4$ -DQPSK(2DH3)

Packet Type : 2DH3 > Packet Length 367

Power(0-11) : 6

$\pi/4$ -DQPSK(2DH5)

Packet Type : 2DH5 > Packet Length 679

Power(0-11) : 6

## 8-DPSK

### TX Mode:

PACKET TX

Channel 1~5 (0-78) > 0,39,78

Payload : Pseudo - random

8-DPSK(3DH1)

Packet Type : 3DH1 > Packet Length 83

Power(0-11) : 6

8-DPSK(3DH3)

Packet Type : 3DH3 > Packet Length 552

Power(0-11) : 6

8-DPSK(3DH5)

Packet Type : 3DH5 > Packet Length 1021

Power(0-11) : 6

### RX Mode:

PACKET RX

4. All of the function are under run.
5. Start test.

## 8. APPLICABLE LIMITS AND TEST RESULTS

### 8.1 20dB BANDWIDTH FOR HOPPING

#### LIMIT

None; for reporting purposes only.

#### TEST SETUP



#### TEST PROCEDURE

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

**TEST RESULTS**

<b>Model Name</b>	YY2098C	<b>Test By</b>	Ted Huang
<b>Temp &amp; Humidity</b>	25.6°C, 42%	<b>Test Date</b>	2025/8/22

**Modulation Type: GFSK / DH5**

Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)	Two-third of 20dB Bandwidth (MHz)
Low	2402	1109.10	0.74
Middle	2441	1107.66	0.74
High	2480	1108.89	0.74

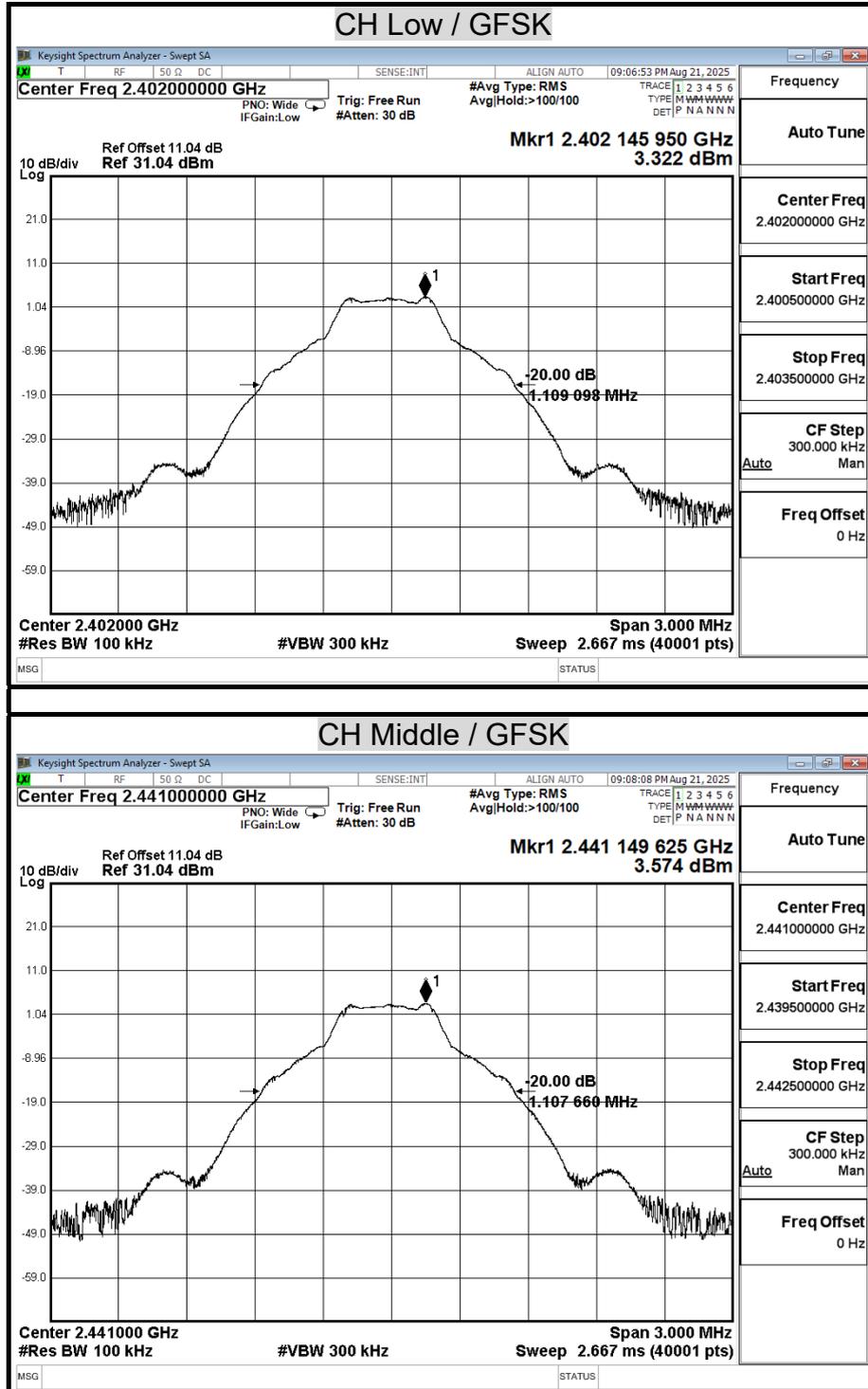
**Modulation Type:  $\pi/4$ -DQPSK / 2-DH5**

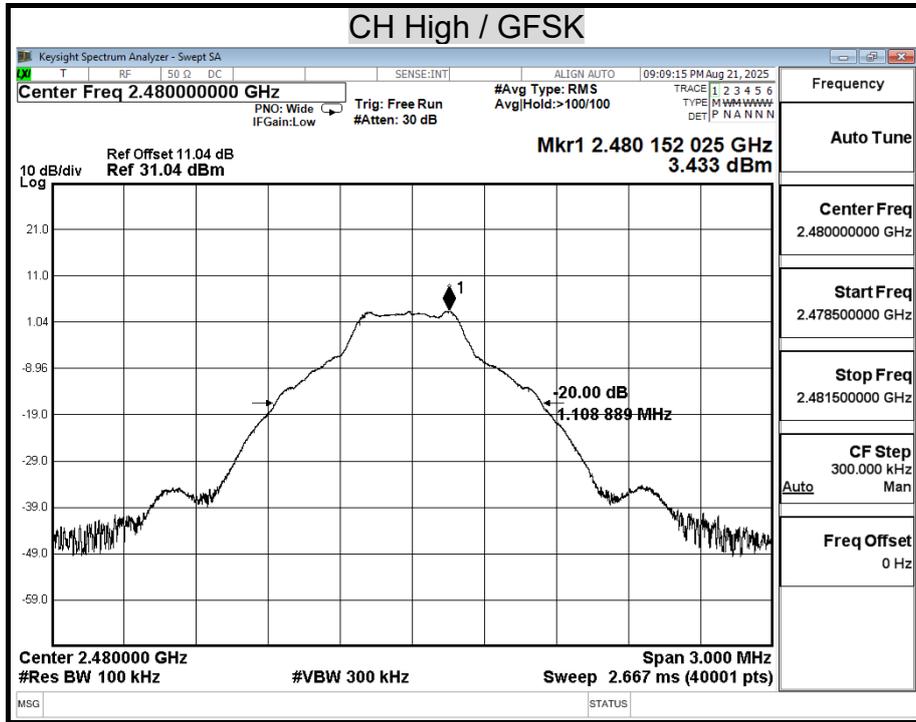
Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)	Two-third of 20dB Bandwidth (MHz)
Low	2402	1389.52	0.93
Middle	2441	1388.61	0.93
High	2480	1390.32	0.93

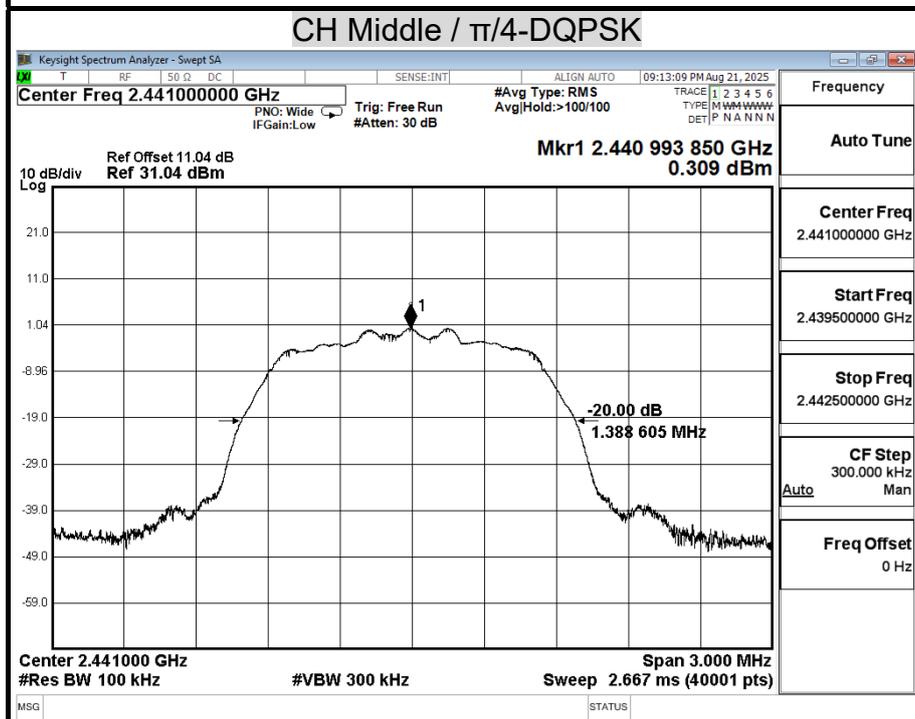
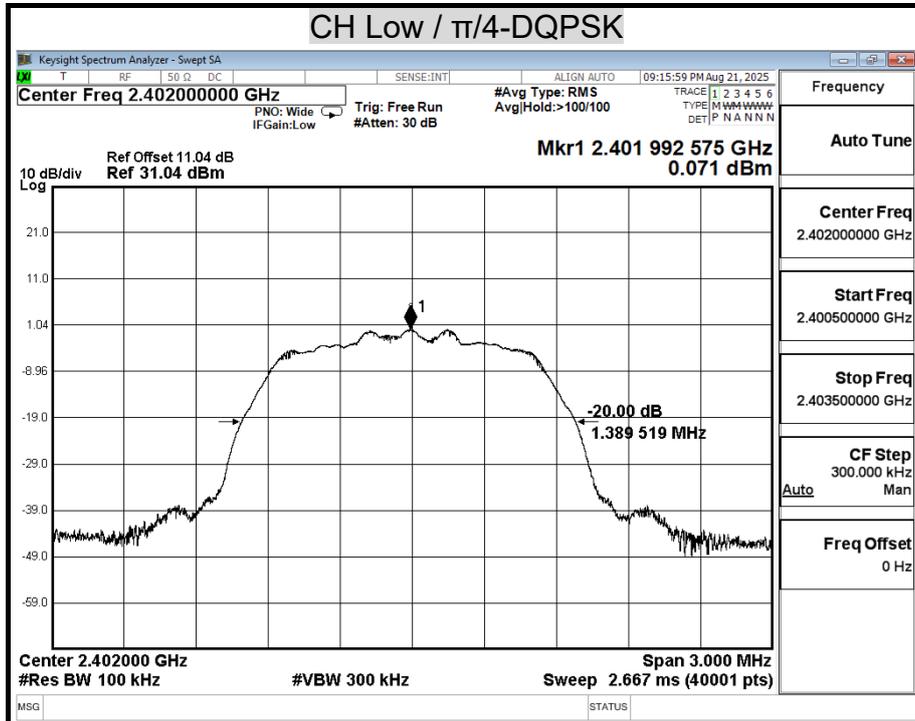
**Modulation Type: 8-DPSK / 3-DH5**

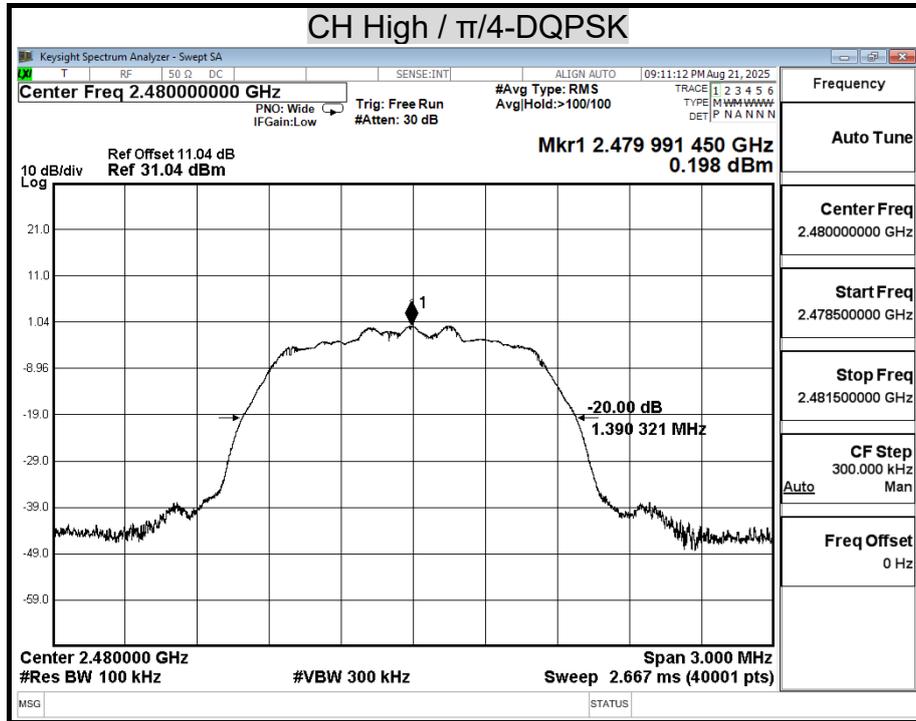
Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)	Two-third of 20dB Bandwidth (MHz)
Low	2402	1389.15	0.93
Middle	2441	1388.49	0.93
High	2480	1388.08	0.93

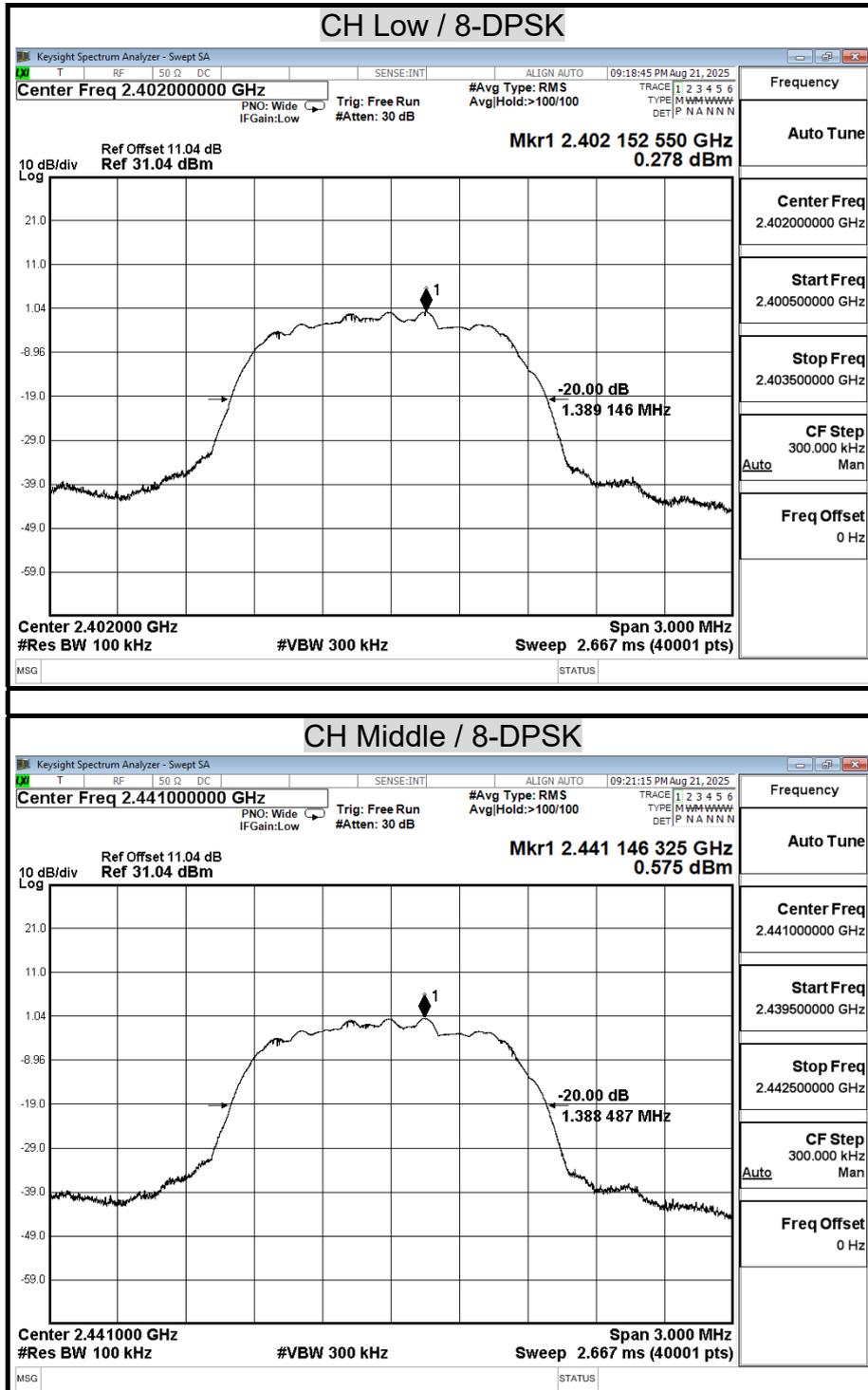
## 20dB BANDWIDTH

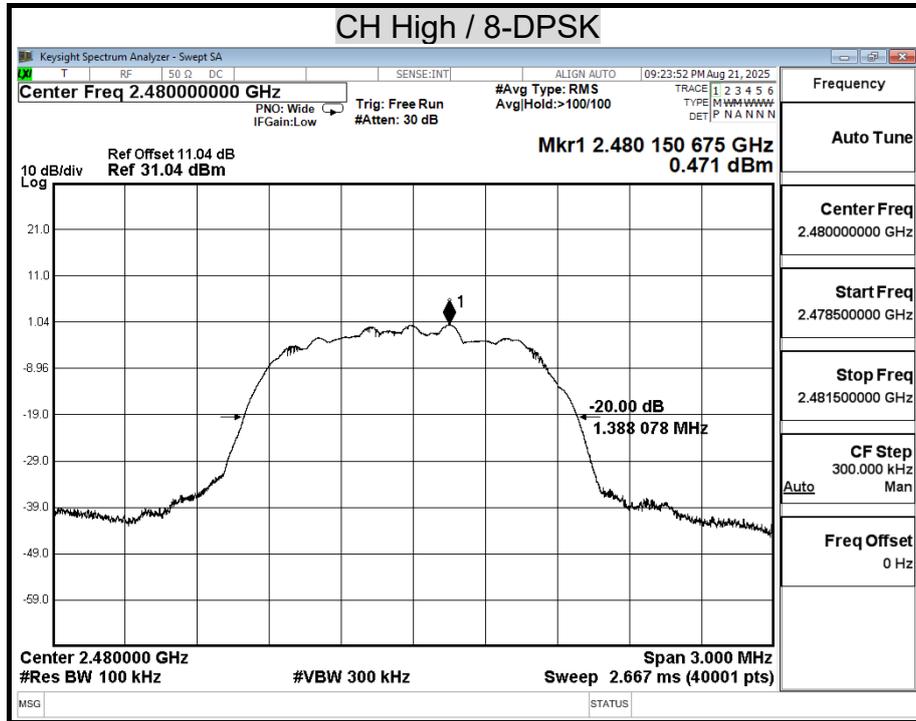












Report No.: TMTN2506000665NR

## 8.2 MAXIMUM PEAK OUTPUT POWER

### LIMIT

§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. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

### Test Configuration



### TEST PROCEDURE

The RF power output 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.

Peak Power set:

1. Set the RBW  $\geq$  DTS bandwidth.
2. Set the VBW  $\geq$  [3  $\times$  RBW].
3. Set the span  $\geq$  [1.5  $\times$  DTS bandwidth].
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector). If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS channel bandwidth.

Average power set:

1. Measure the duty cycle  $D$  of the transmitter output signal
2. Set span  $> 1.5$  times the OBW.
3. Set the RBW = 1% ~5% OBW,  $< 1$  MHz.
4. Set VBW  $\geq [3 \times \text{RBW}]$ .
5. Number of points in sweep  $\geq [2 \times \text{span} / \text{RBW}]$ . (This gives bin-to-bin spacing  $\leq \text{RBW} / 2$ , so that narrowband signals are not lost between frequency bins.)
6. Manually set sweep time  $\geq [10 \times (\text{number of points in sweep}) \times (\text{total ON/OFF period of the transmitted signal})]$ .
7. Set detector = power averaging(rms).
8. Trace average at least 100 traces.
9. Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW.
10. Add  $[10 \log (1 / D)]$ , where  $D$  is the duty cycle, to the measured power to compute the average power during the actual transmission times.

**TEST RESULTS**

<b>Model Name</b>	YY2098C	<b>Test By</b>	Ted Huang
<b>Temp &amp; Humidity</b>	25.6°C, 42%	<b>Test Date</b>	2025/8/22

**Modulation Type: GFSK / DH5**

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)	Limit (mW)	Result
Low	2402	3.06	2.02	125	PASS
Mid	2441	3.34	2.16		PASS
High	2480	3.32	2.15		PASS

**Modulation Type:  $\pi/4$ -DQPSK / 2-DH5**

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)	Limit (mW)	Result
Low	2402	2.43	1.75	125	PASS
Mid	2441	2.63	1.83		PASS
High	2480	2.58	1.81		PASS

**Modulation Type: 8-DPSK / 3-DH5**

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)	Limit (mW)	Result
Low	2402	2.98	1.99	125	PASS
Mid	2441	3.18	2.08		PASS
High	2480	3.19	2.08		PASS

## Average Power Data

### Modulation Type: GFSK / DH5

Channel	Channel Frequency (MHz)	Measure Power (dBm)	10 log (1 / D)	Average Power (dBm)
Low	2402	2.05	1.10	3.15
Middle	2441	2.17	1.10	3.27
High	2480	2.14	1.10	3.24

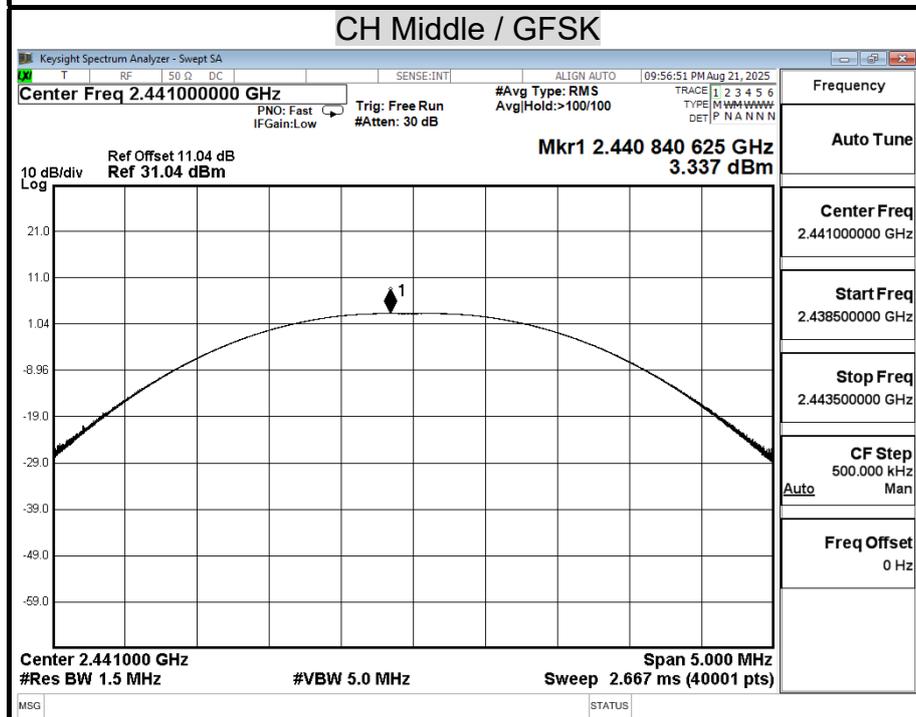
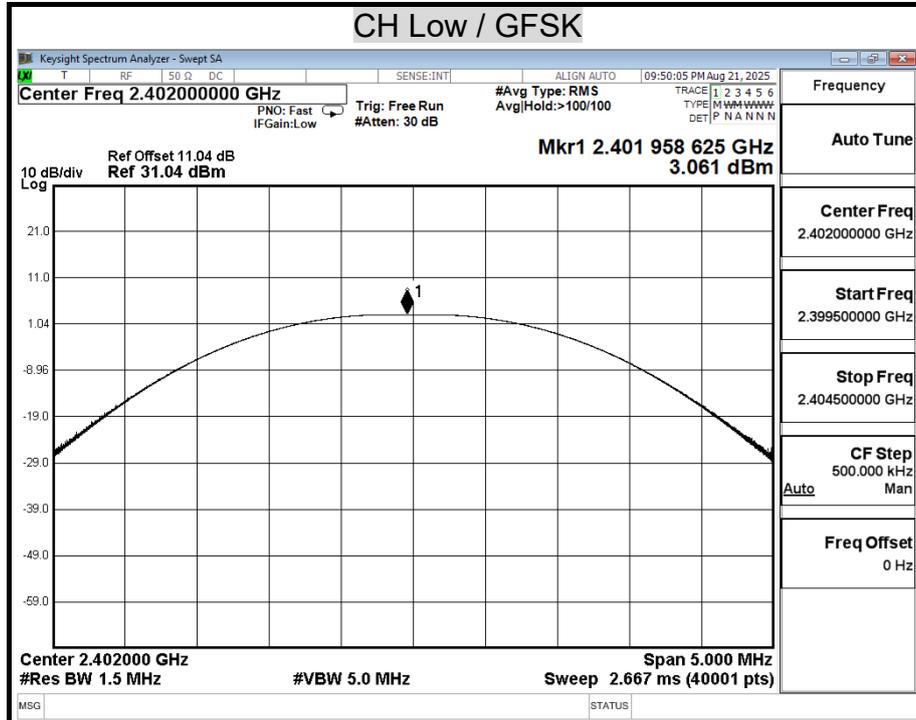
### Modulation Type: $\pi/4$ -DQPSK / 2-DH5

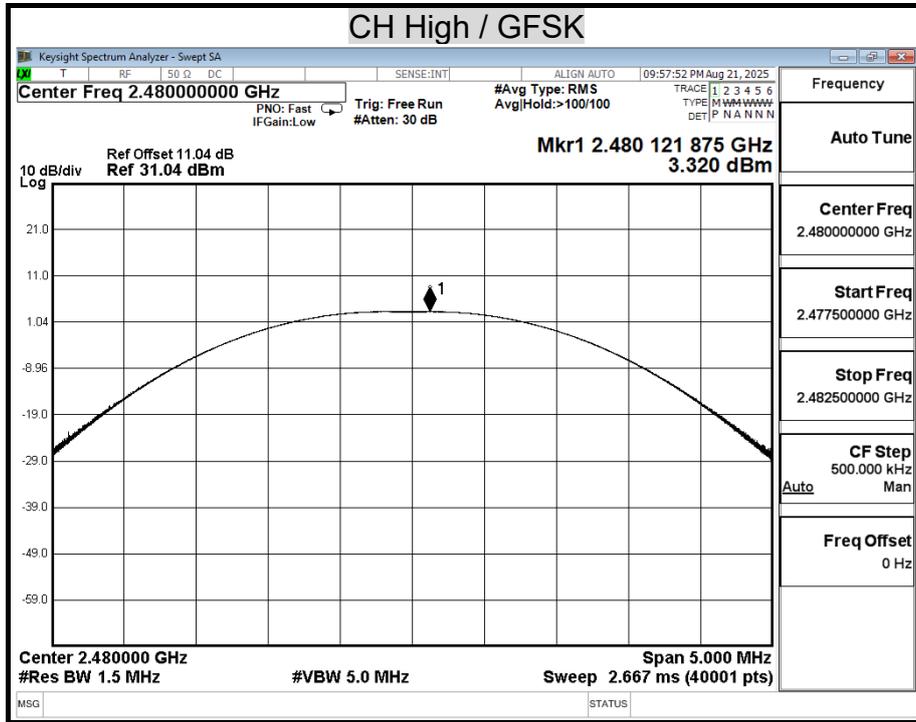
Channel	Channel Frequency (MHz)	Measure Power (dBm)	10 log (1 / D)	Average Power (dBm)
Low	2402	-1.19	1.10	-0.09
Middle	2441	-0.97	1.10	0.13
High	2480	-1.01	1.10	0.09

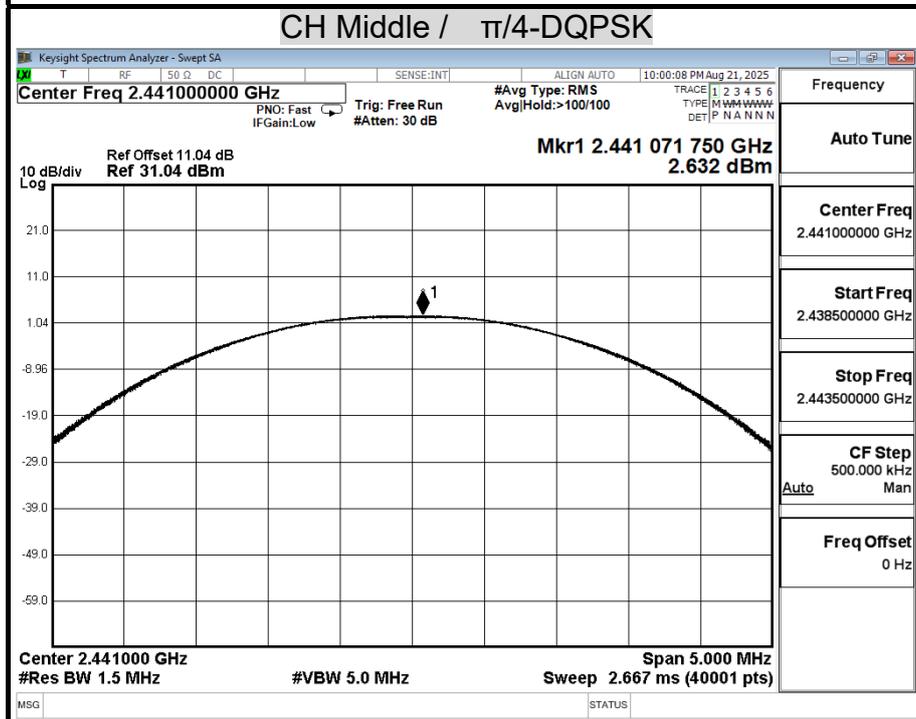
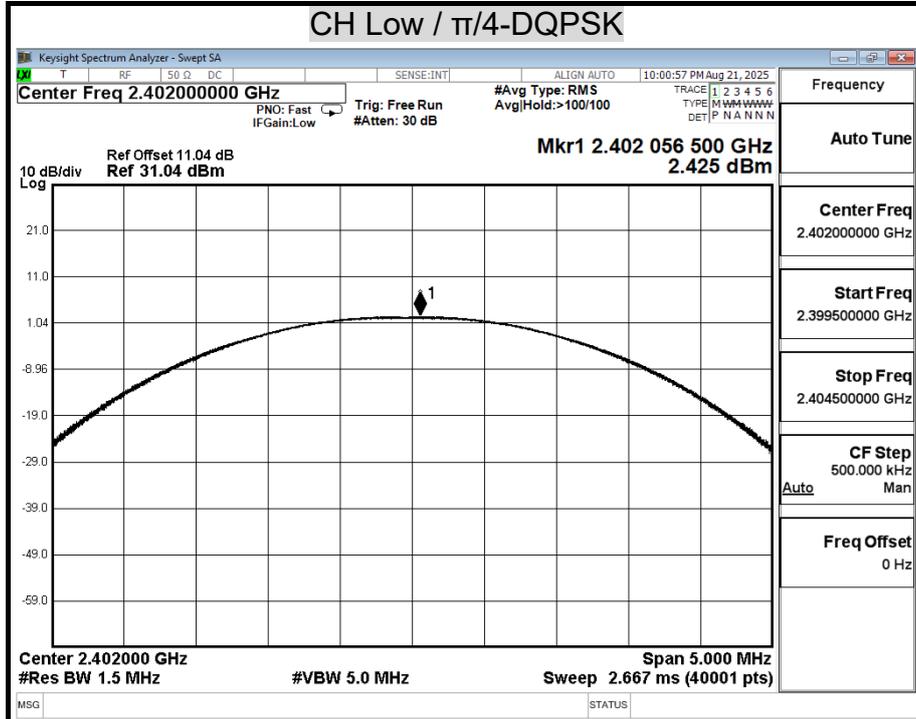
### Modulation Type: 8-DPSK / 3-DH5

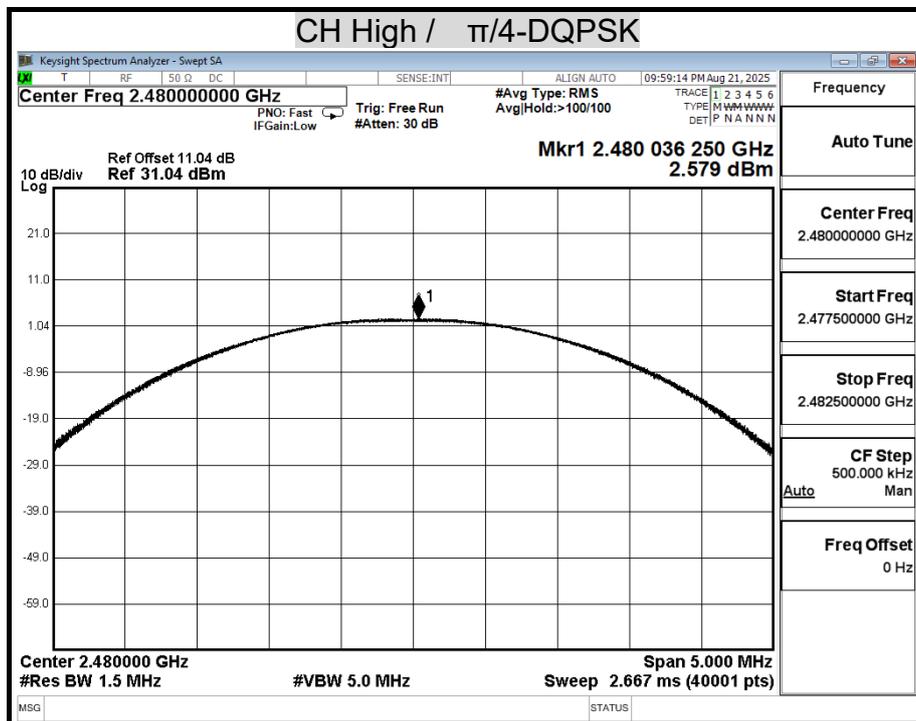
Channel	Channel Frequency (MHz)	Measure Power (dBm)	10 log (1 / D)	Average Power (dBm)
Low	2402	-1.20	1.10	-0.10
Middle	2441	-0.92	1.10	0.18
High	2480	-1.05	1.10	0.05

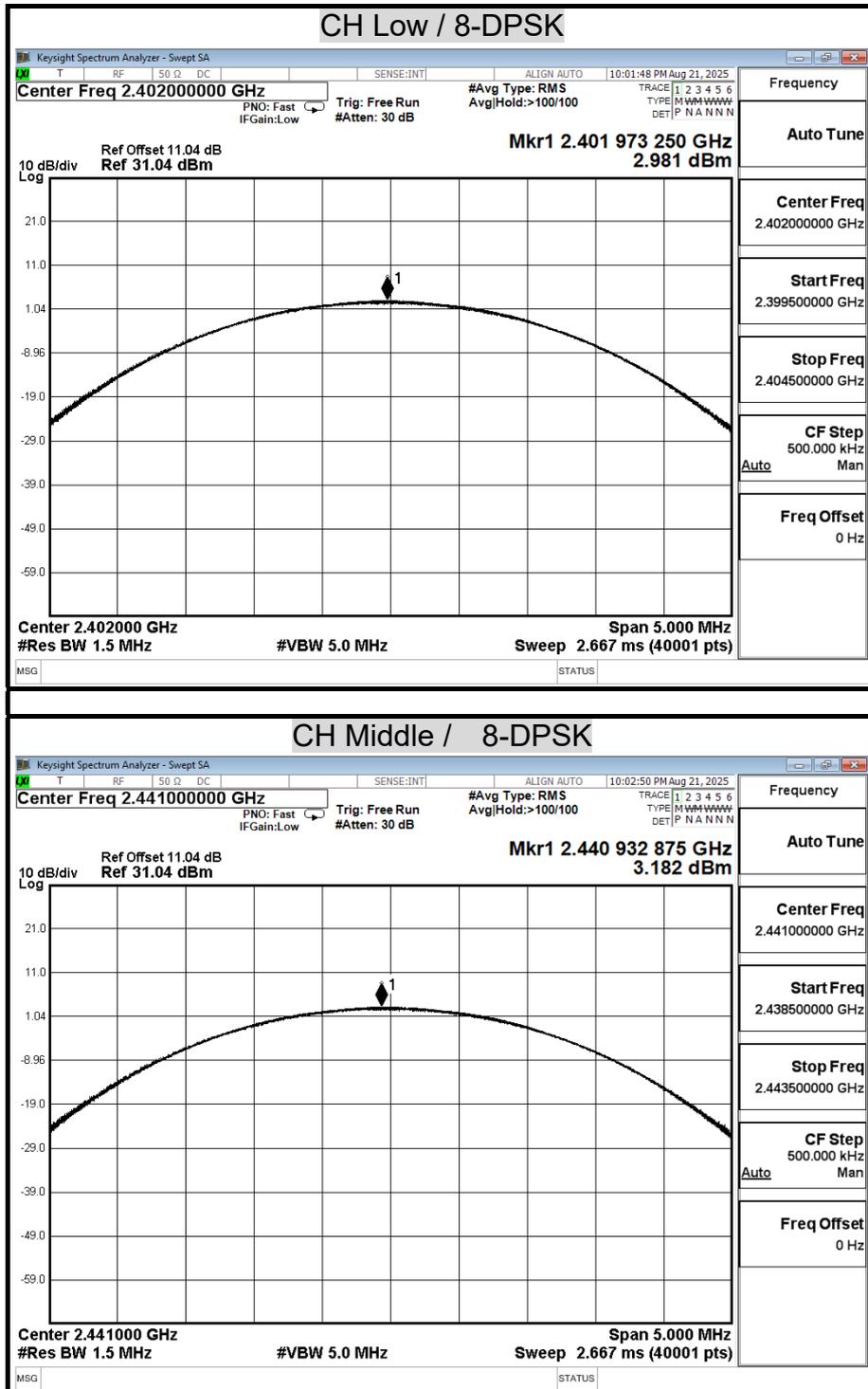
## MAXIMUM PEAK OUTPUT POWER

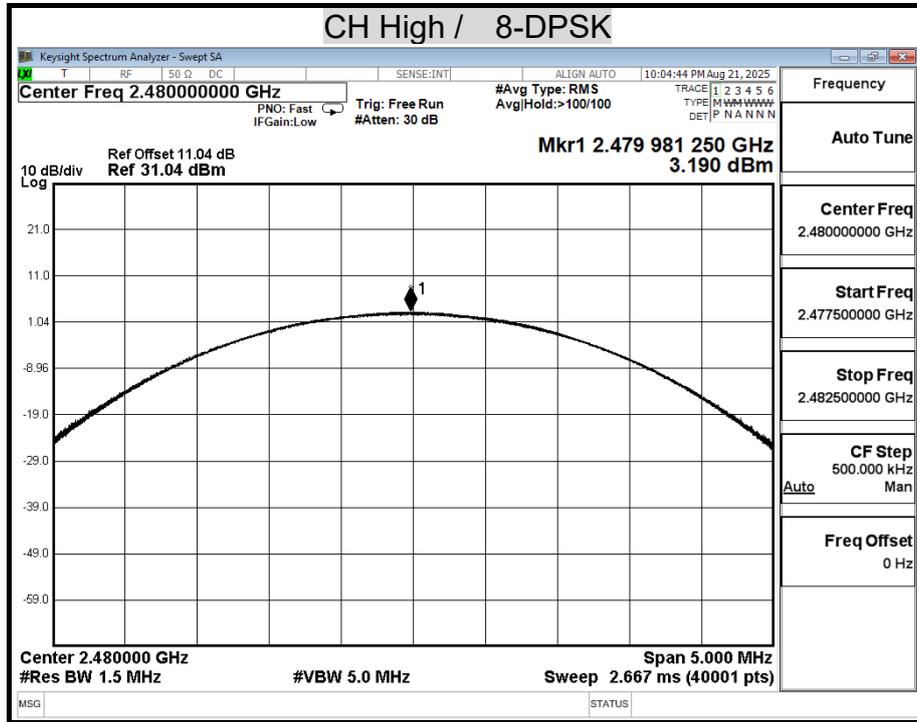




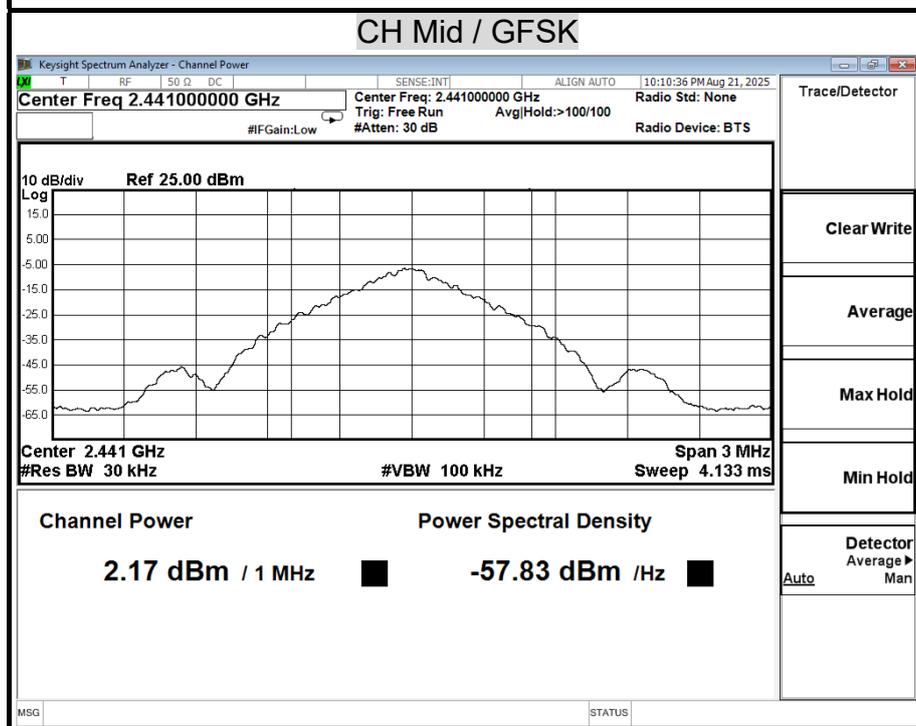
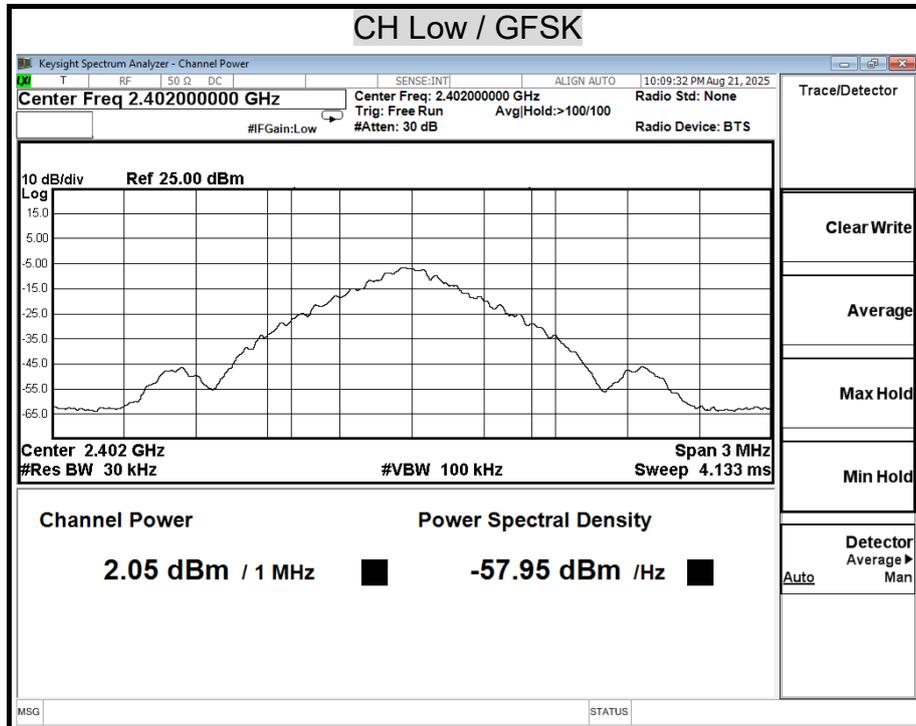


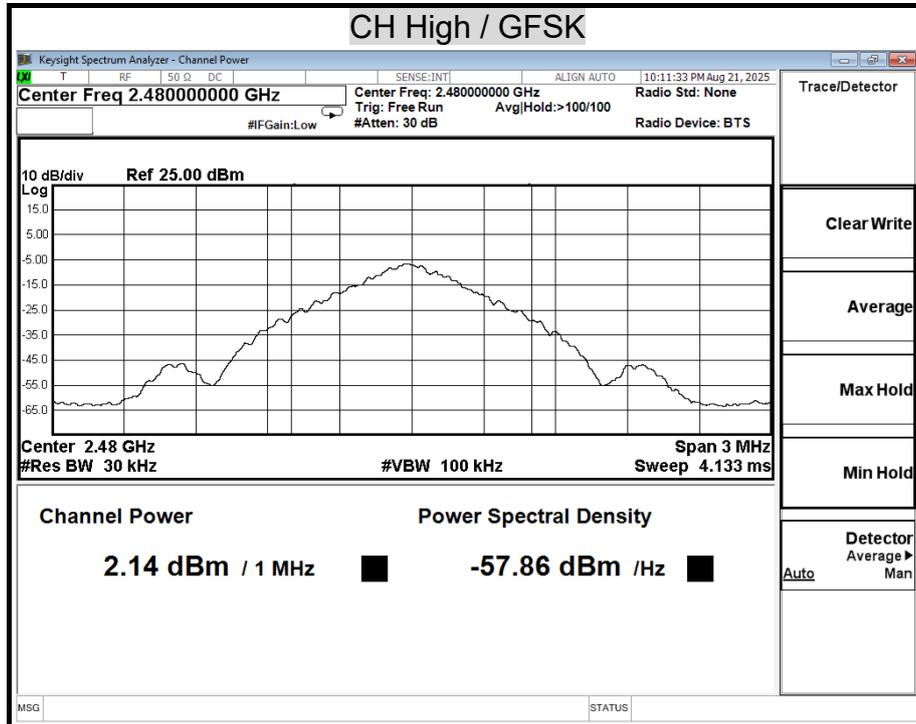


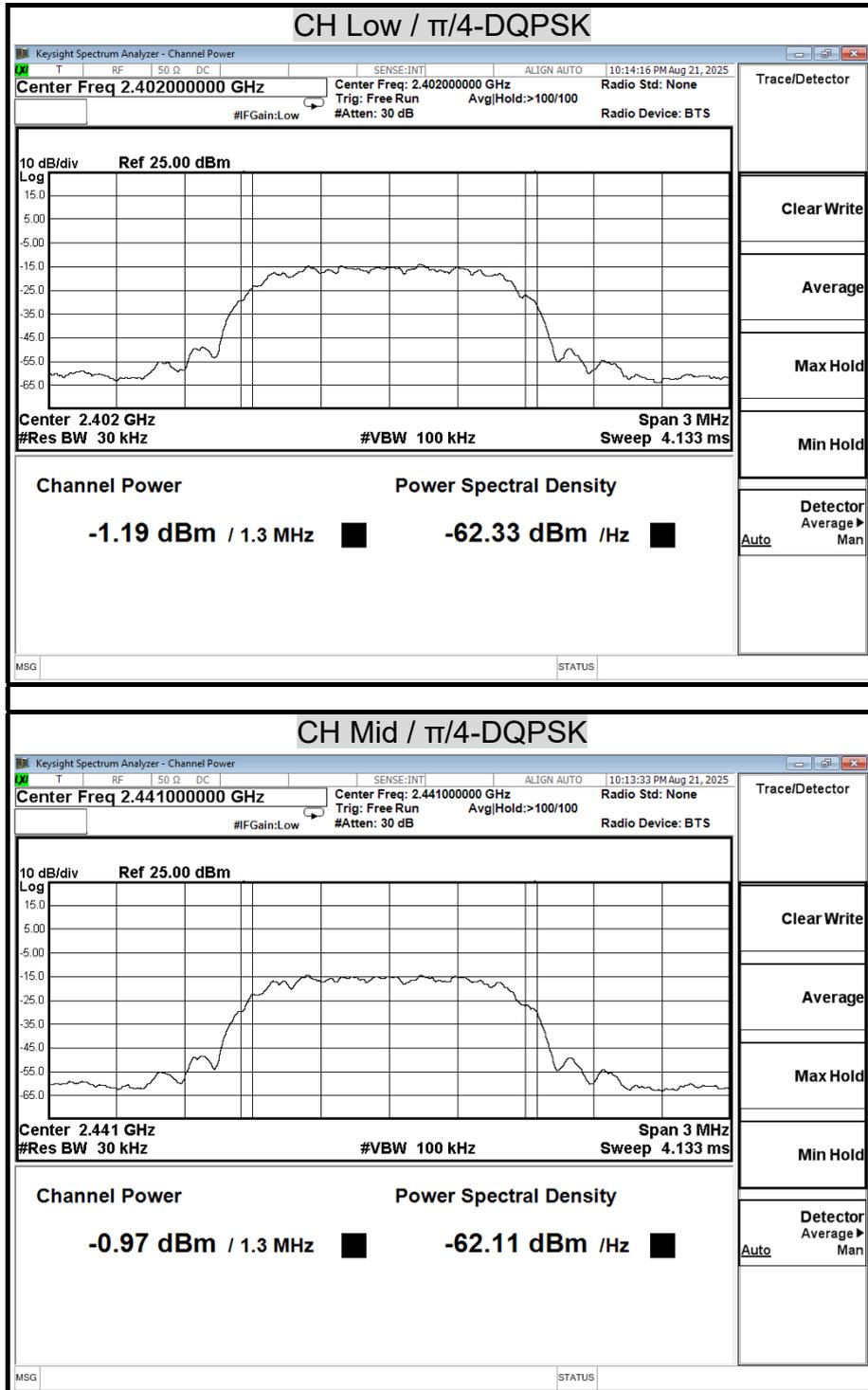


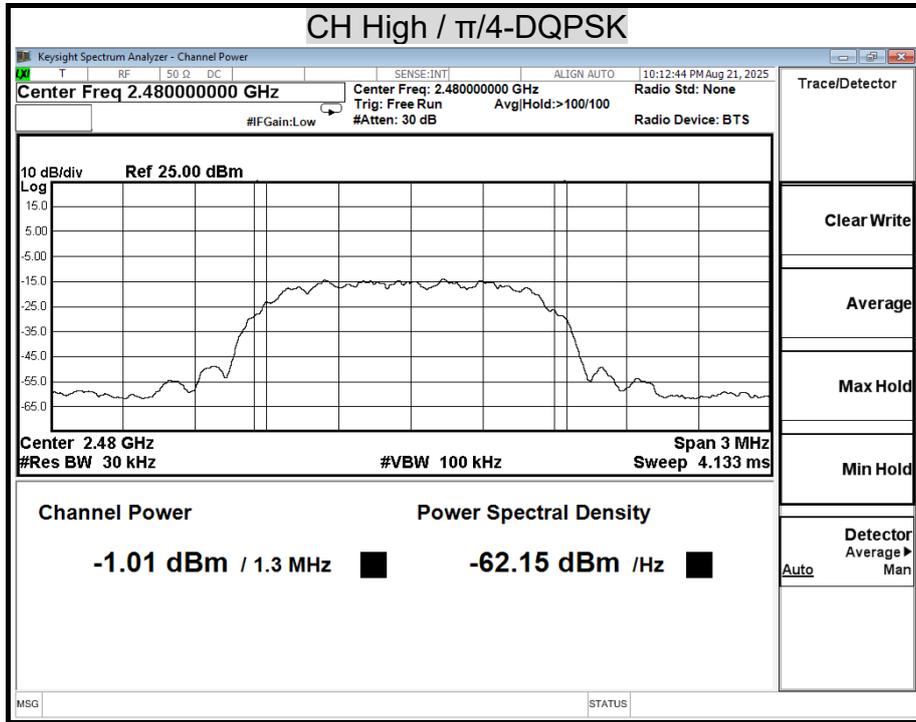


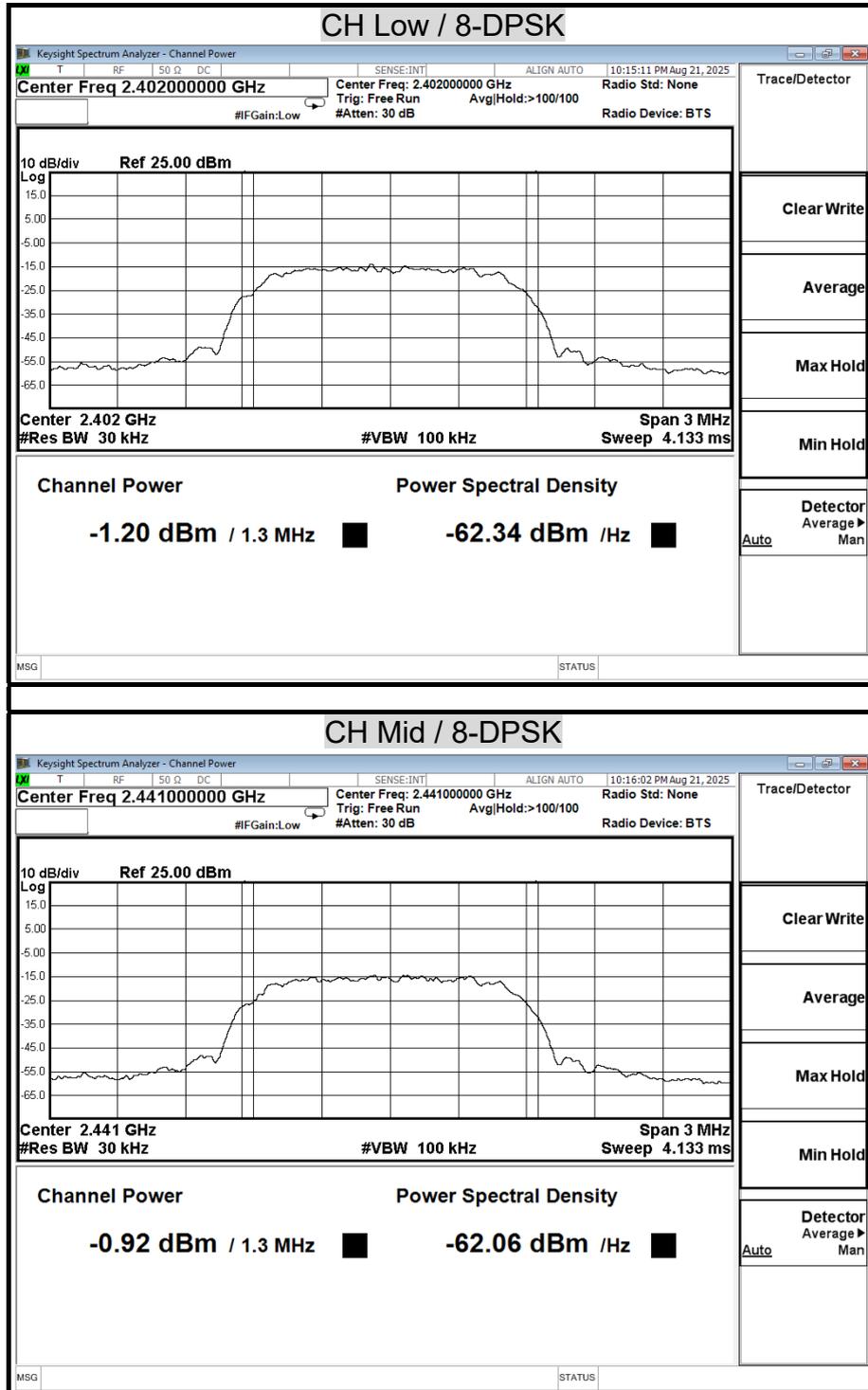
## AVERAGE POWER

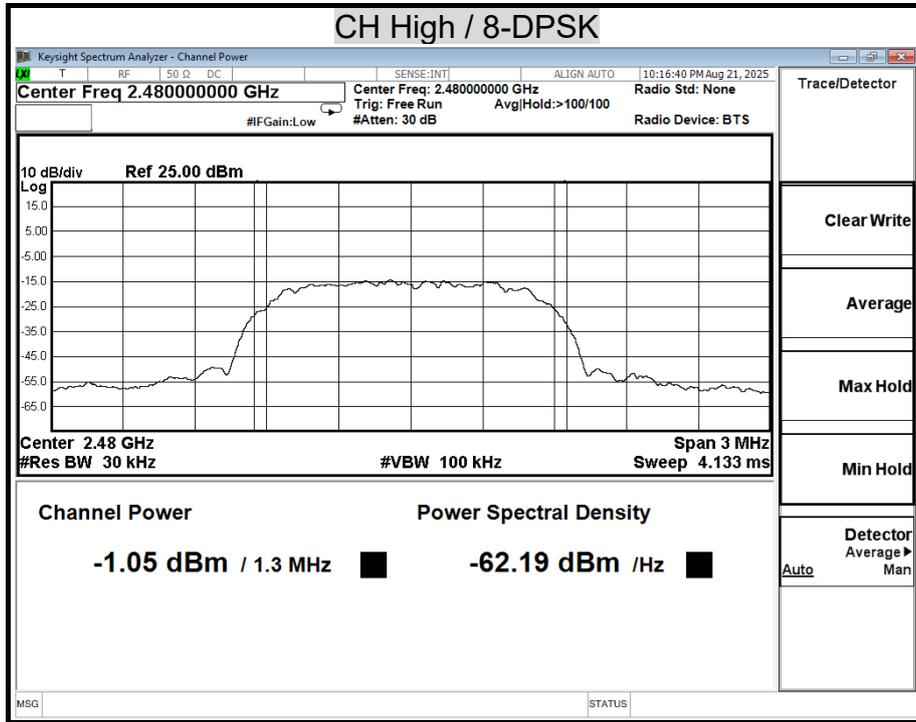












## 8.3 HOPPING CHANNEL SEPARATION

### LIMIT

§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. 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 SETUP



### TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in test setup without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of adjacent channels.
4. Measure the frequency difference of these two adjacent channels by spectrum analyzer MARK function. And then plot the result on spectrum analyzer screen.
5. Repeat above procedures until all frequencies measured were complete.

Report No.: TMTN2506000665NR

**TEST RESULTS**

Refer to section 8.1, 20dB bandwidth measurement, the measured channel separation should be greater than two-third of 20dB bandwidth or Minimum bandwidth.

<b>Model Name</b>	YY2098C	<b>Test By</b>	Ted Huang
<b>Temp &amp; Humidity</b>	25.6°C, 42%	<b>Test Date</b>	2025/8/22

**Modulation Type: GFSK / DH5**

Channel	Adjacent Hopping Channel Separation (MHz)	Two -third of 20dB bandwidth (MHz)	Minimum Bandwidth (kHz)	Result
2402MHz	1.00	0.74	25 KHz	PASS
2441MHz	1.00	0.74	25 KHz	PASS
2480MHz	1.00	0.74	25 KHz	PASS

**Modulation Type:  $\pi/4$ -DQPSK / 2-DH5**

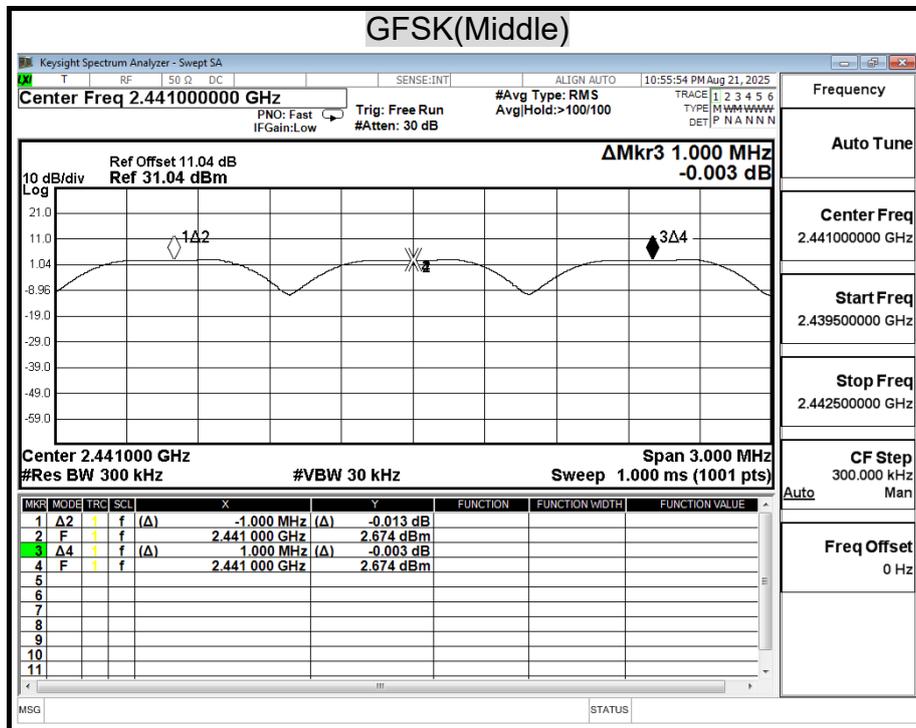
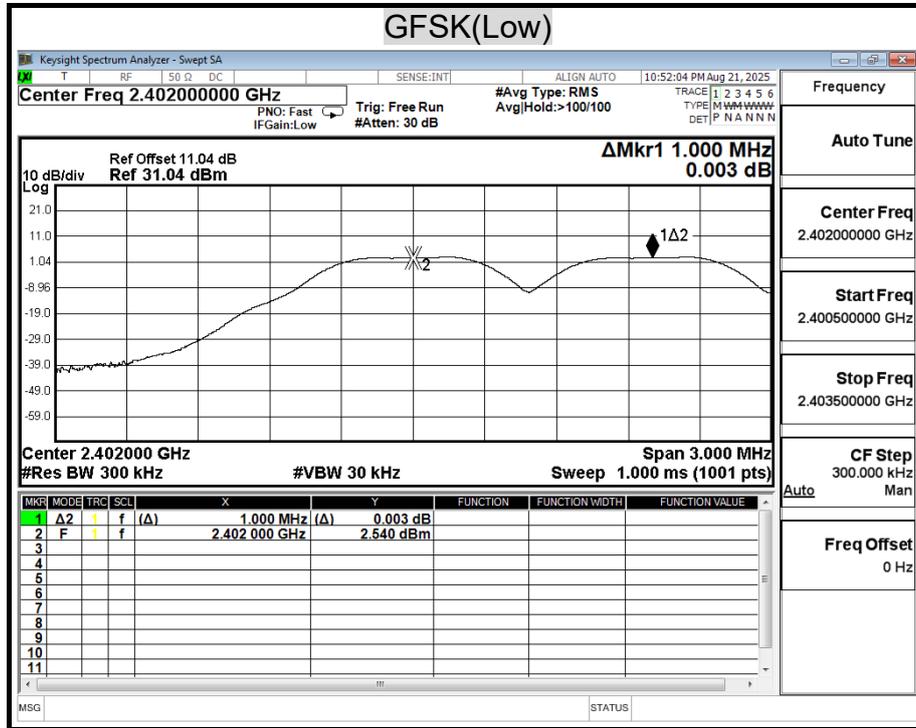
Channel	Adjacent Hopping Channel Separation (kHz)	Two -third of 20dB bandwidth (kHz)	Minimum Bandwidth (kHz)	Result
2402MHz	1.00	0.93	25 KHz	PASS
2441MHz	1.00	0.93	25 KHz	PASS
2480MHz	1.00	0.93	25 KHz	PASS

**Modulation Type: 8-DPSK / 3-DH5**

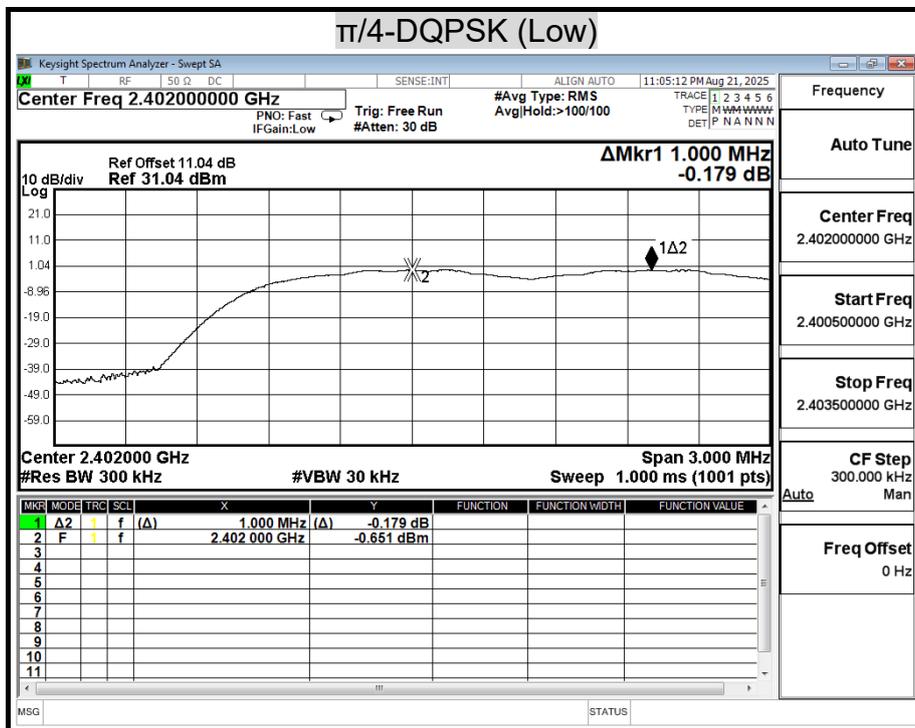
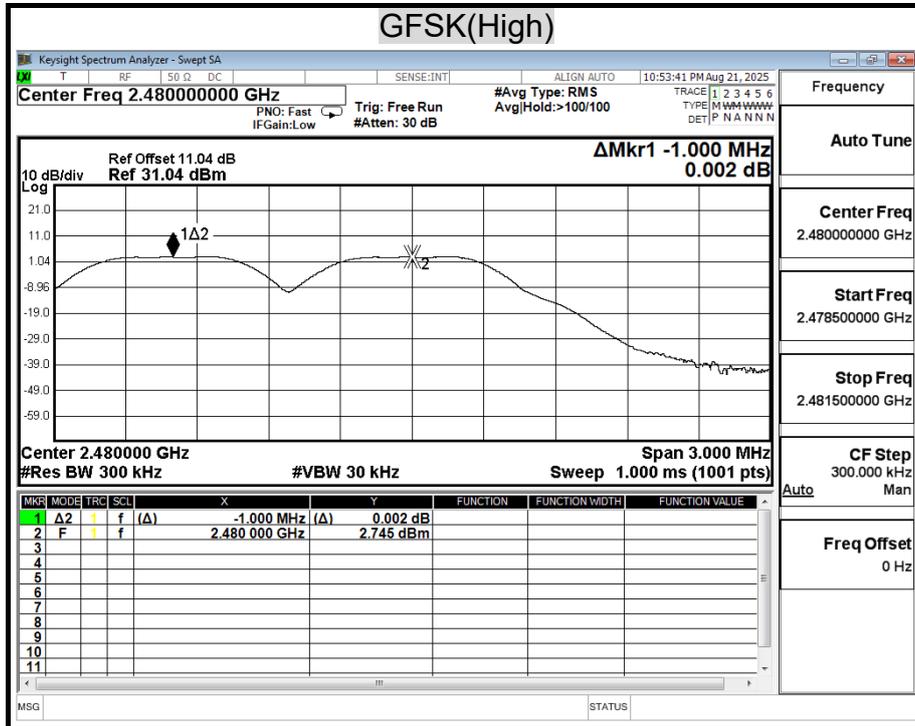
Channel	Adjacent Hopping Channel Separation (kHz)	Two -third of 20dB bandwidth (kHz)	Minimum Bandwidth (kHz)	Result
2402MHz	1.00	0.93	25 KHz	PASS
2441MHz	1.00	0.93	25 KHz	PASS
2480MHz	1.00	0.93	25 KHz	PASS

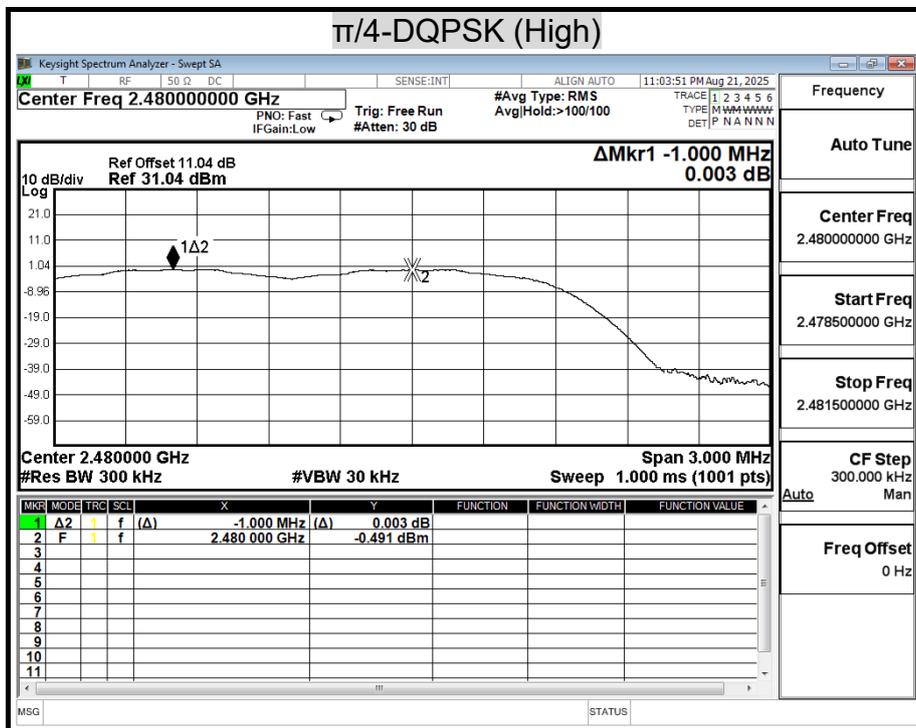
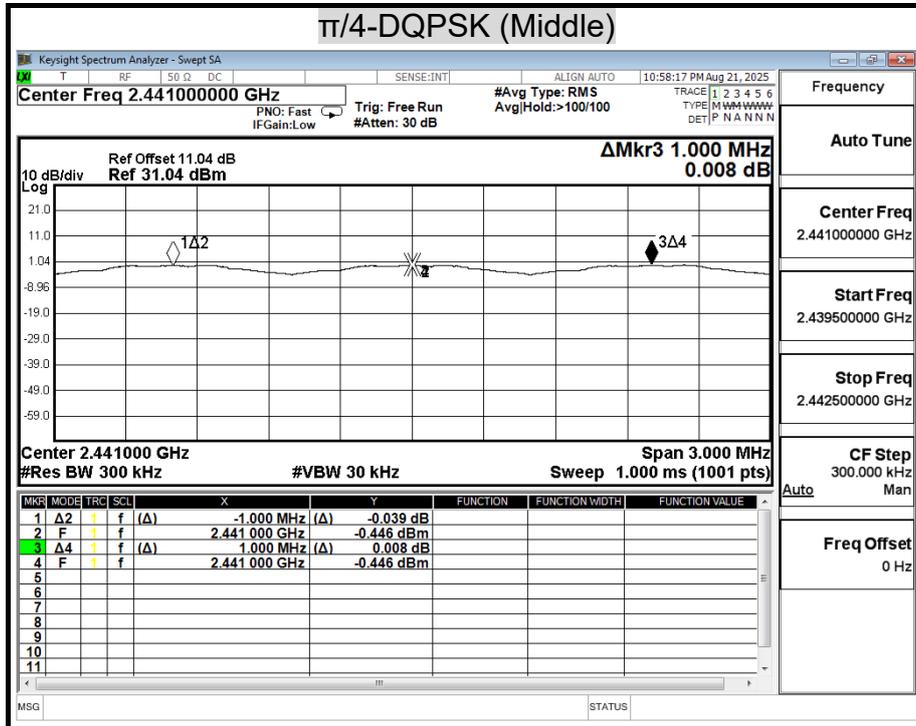
Report No.: TMTN2506000665NR

## HOPPING CHANNEL SEPARATION

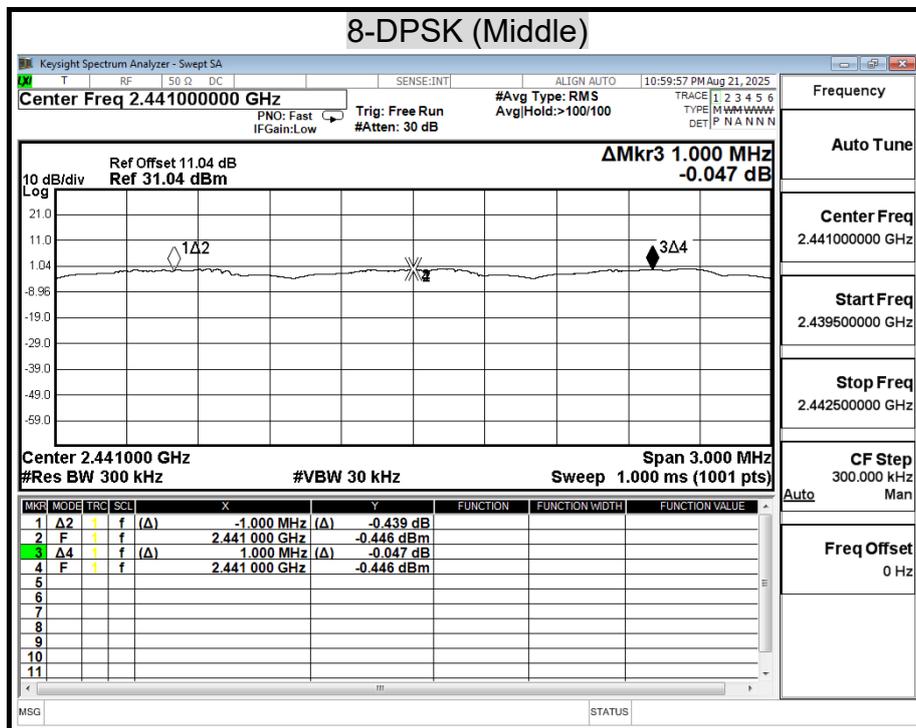
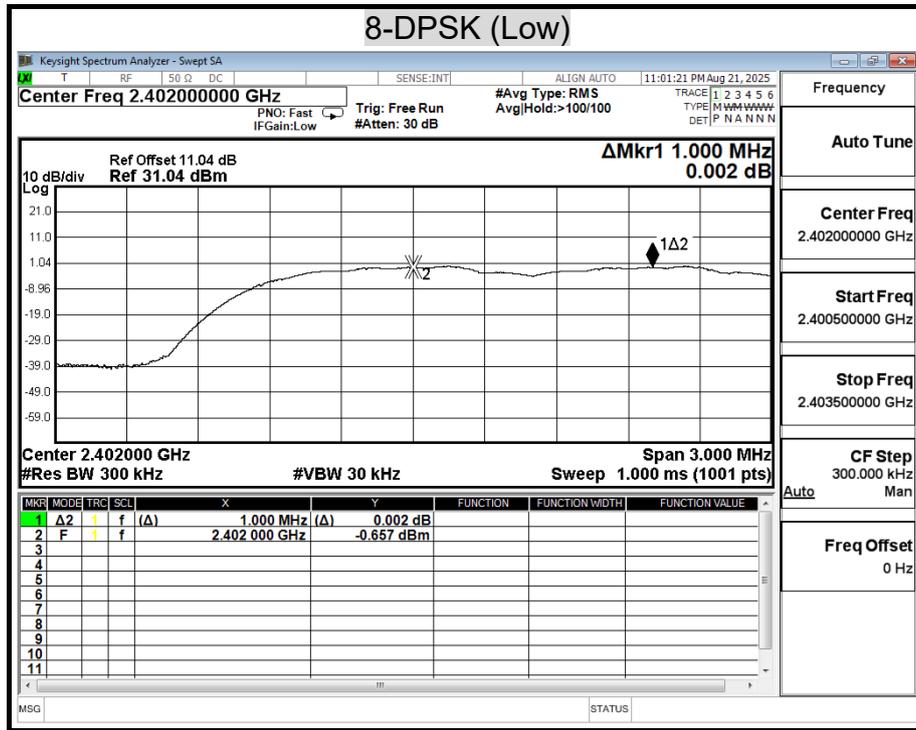


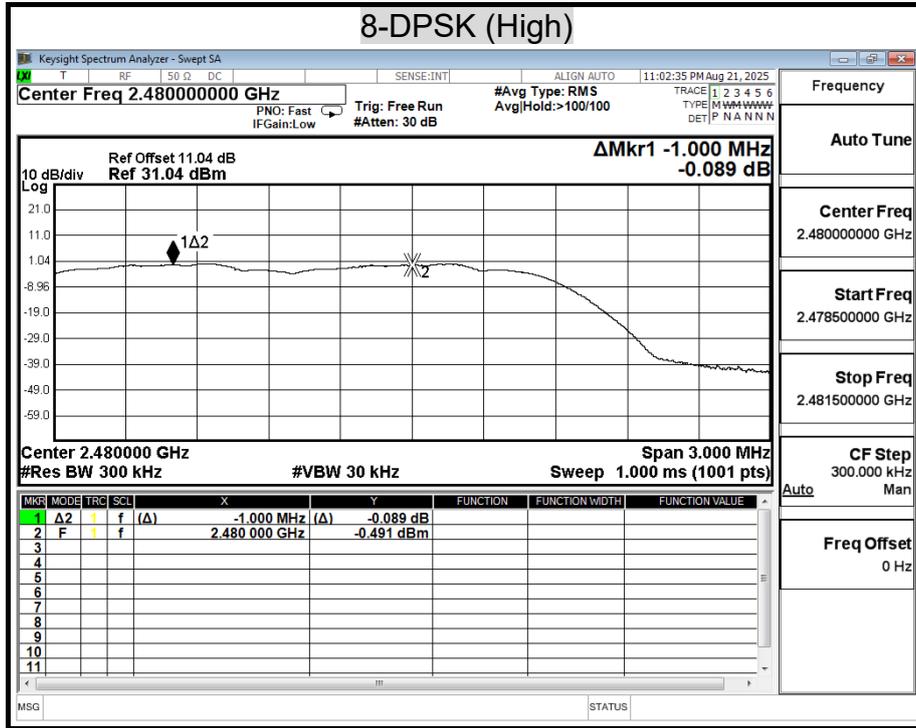
Report No.: TMTN2506000665NR





Report No.: TMTN2506000665NR





## 8.4 NUMBER OF HOPPING FREQUENCY USED

### LIMIT

§15.247(a)(1)(iii) For frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

### TEST SETUP



### TEST PROCEDURE

- 1 Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
- 2 Position the EUT as shown in test setup without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- 3 Set the spectrum analyzer on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
- 4 Set the spectrum analyzer on View mode and then plot the result on spectrum analyzer screen.
- 5 Repeat above procedures until all frequencies measured were complete.

**TEST RESULTS**

<b>Model Name</b>	YY2098C	<b>Test By</b>	Ted Huang
<b>Temp &amp; Humidity</b>	25.6°C, 42%	<b>Test Date</b>	2025/8/22

**Modulation Type: GFSK / DH5**

Result(No.of CH)	Limit(No.of CH)	Result
79	>15	PASS

**Modulation Type:  $\pi/4$ -DQPSK / 2-DH5**

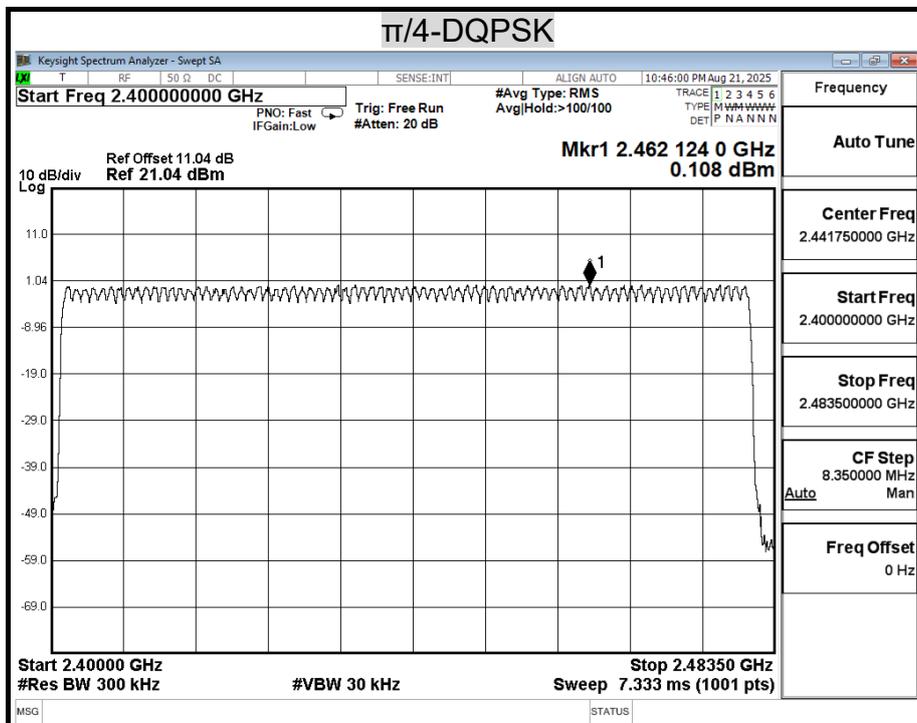
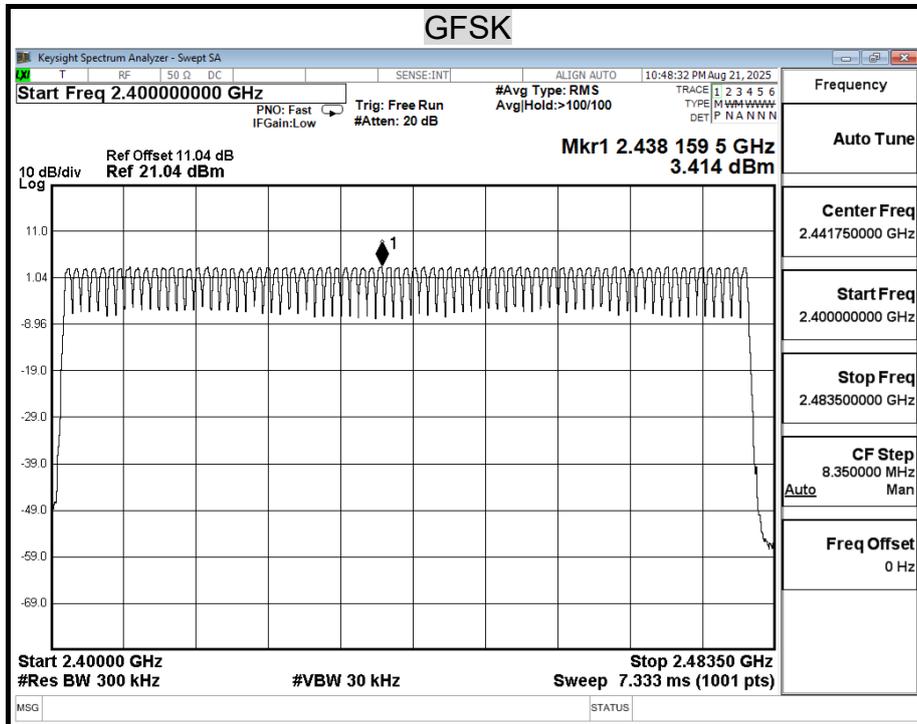
Result(No.of CH)	Limit(No.of CH)	Result
79	>15	PASS

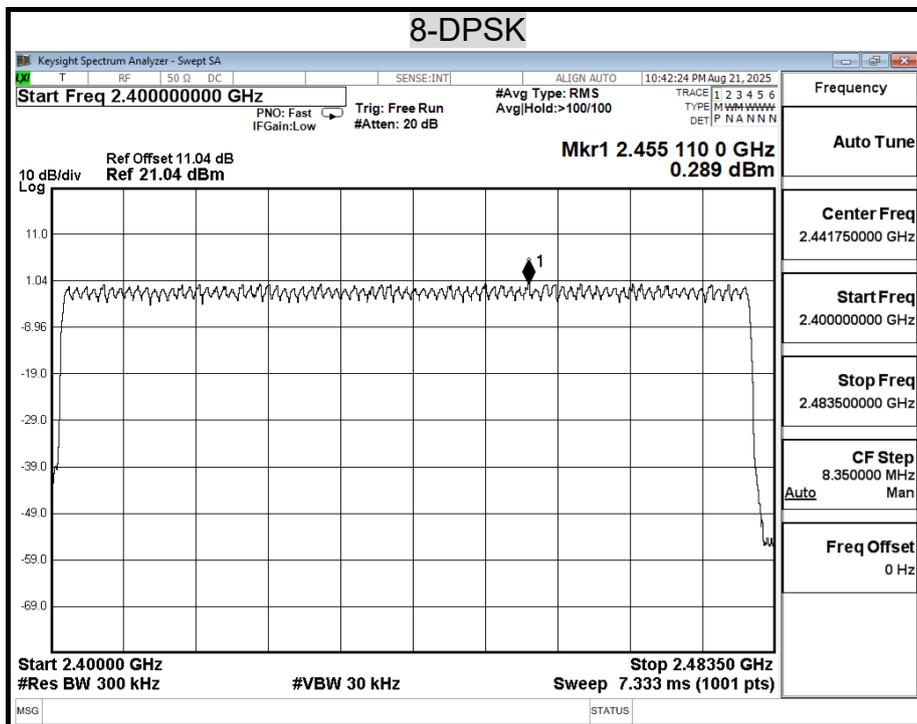
**Modulation Type: 8-DPSK / 3-DH5**

Result(No.of CH)	Limit(No.of CH)	Result
79	>15	PASS

Report No.: TMTN2506000665NR

## NUMBER OF HOPPING FREQUENCY USED



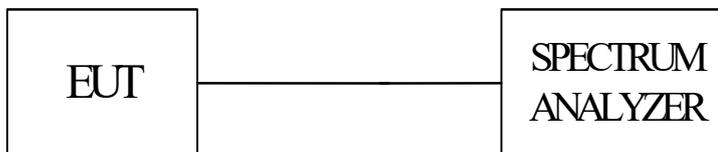


## 8.5 DWELL TIME ON EACH CHANNEL

### LIMIT

§15.247(a)(1)(iii) For frequency hopping system operating in the 2400-2483.5MHz band, the average time of occupancy on any frequency shall not be greater than 0.4 second within a 31.6 second period.

### TEST SETUP



### TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in test setup without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of spectrum analyzer on any frequency be measured and set spectrum analyzer to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
5. Repeat above procedures until all frequencies measured were complete.
6. The Bluetooth Headset has 3 type of payload, DH1, DH3, DH5. The hopping rate is 1600 per second. The longer the payload is, the slower the hopping rate is.

Report No.: TMTN2506000665NR

**TEST RESULTS**

Time of occupancy on the TX channel in 31.6sec = time domain slot length × hop rate ÷ number of hop per channel × 31.6

Refer to the attached graph.

The hopping rates of Bluetooth devices change with different types of payload. The longer the payload is, the slower the hopping rate. The hopping rate scenario is defined in Bluetooth core specification.

<b>Model Name</b>	YY2098C	<b>Test By</b>	Ted Huang
<b>Temp &amp; Humidity</b>	25.6°C, 42%	<b>Test Date</b>	2025/8/22

**Modulation Type: GFSK / DH5**

Transmitting Frequency	Packet type	Dwell time (ms)	Time of occupancy on the TX channel in 31.6sec (ms)	Limit for Time of occupancy on the TX channel in 31.6sec (ms)	Results
2441MHz	DH1	0.400	128.00	400.00	PASS
2441MHz	DH3	1.660	265.60	400.00	PASS
2441MHz	DH5	2.910	310.40	400.00	PASS
2441MHz	AFH	2.910	155.20	400.00	PASS

DH1 Dwell time= 0.400 ms×(1600÷2)÷79×31.6= 128.00 (ms)  
 DH3 Dwell time= 1.660 ms×(1600÷4)÷79×31.6= 265.60 (ms)  
 DH5 Dwell time= 2.910 ms×(1600÷6)÷79×31.6= 310.40 (ms)  
 AFH Dwell time= 2.910 ms×(800÷6)÷20×8= 155.20 (ms)

**Modulation Type: π/4-DQPSK / 2-DH5**

Transmitting Frequency	Packet type	Dwell time (ms)	Time of occupancy on the TX channel in 31.6sec (ms)	Limit for Time of occupancy on the TX channel in 31.6sec (ms)	Results
2441MHz	2DH1	0.400	128.00	400.00	PASS
2441MHz	2DH3	1.660	265.60	400.00	PASS
2441MHz	2DH5	2.910	310.40	400.00	PASS
2441MHz	AFH	2.910	155.20	400.00	PASS

2DH1 Dwell time= 0.400 ms×(1600÷2)÷79×31.6= 128.00 (ms)  
 2DH3 Dwell time= 1.660 ms×(1600÷4)÷79×31.6= 265.60 (ms)  
 2DH5 Dwell time= 2.910 ms×(1600÷6)÷79×31.6= 310.40 (ms)  
 AFH Dwell time= 2.910 ms×(800÷6)÷20×8= 155.20 (ms)

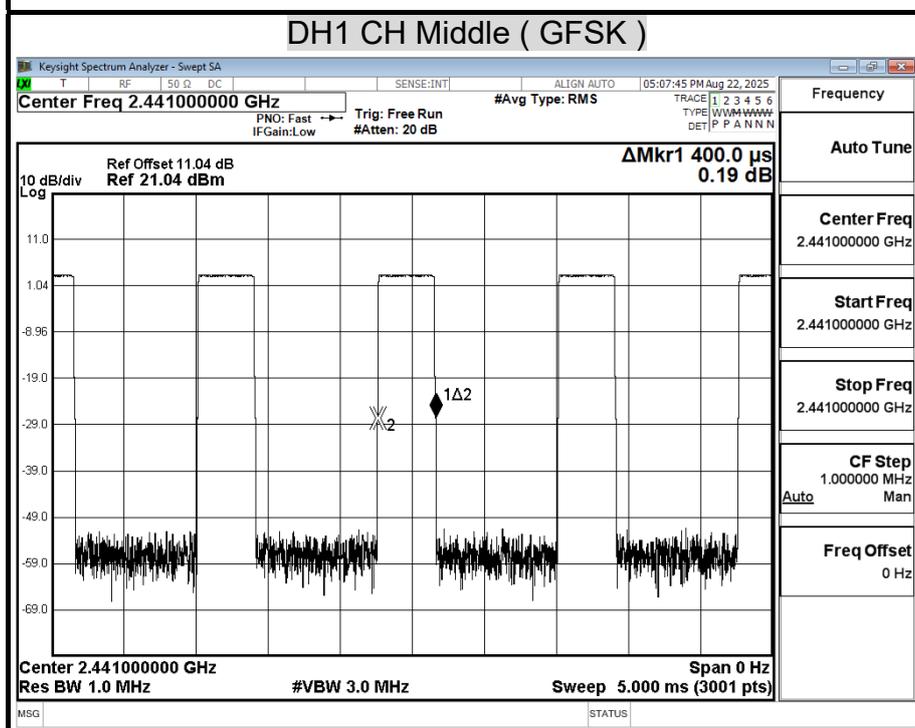
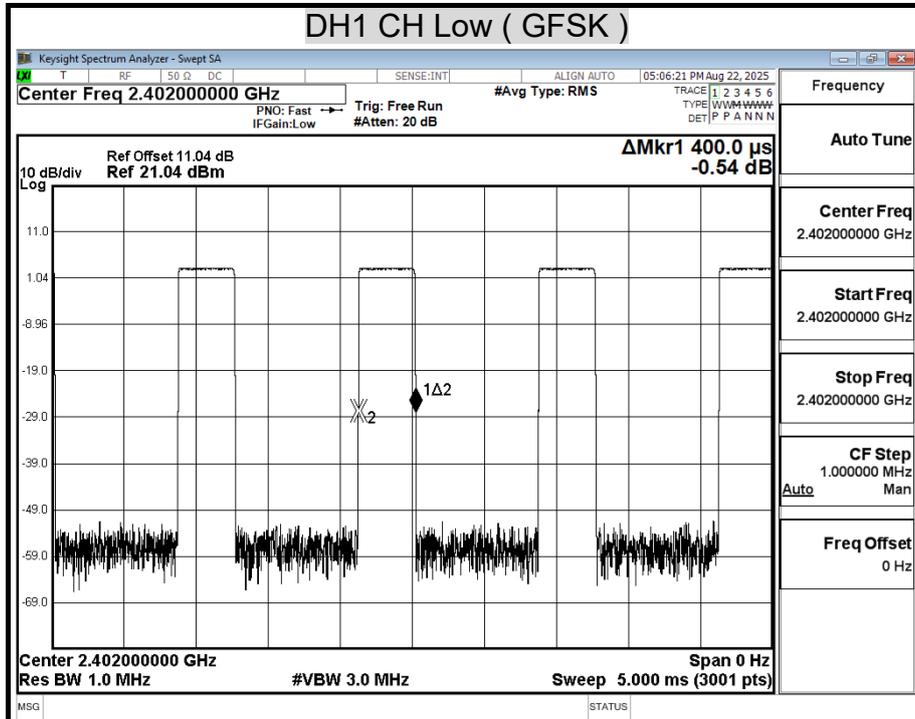
Report No.: TMTN2506000665NR

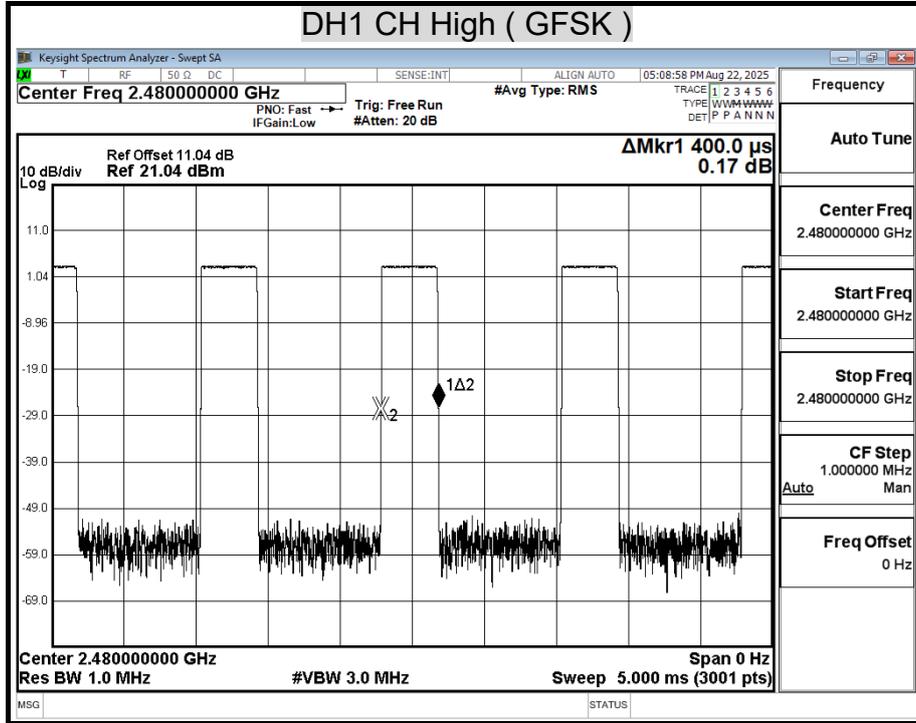
**Modulation Type: 8-DPSK / 3-DH5**

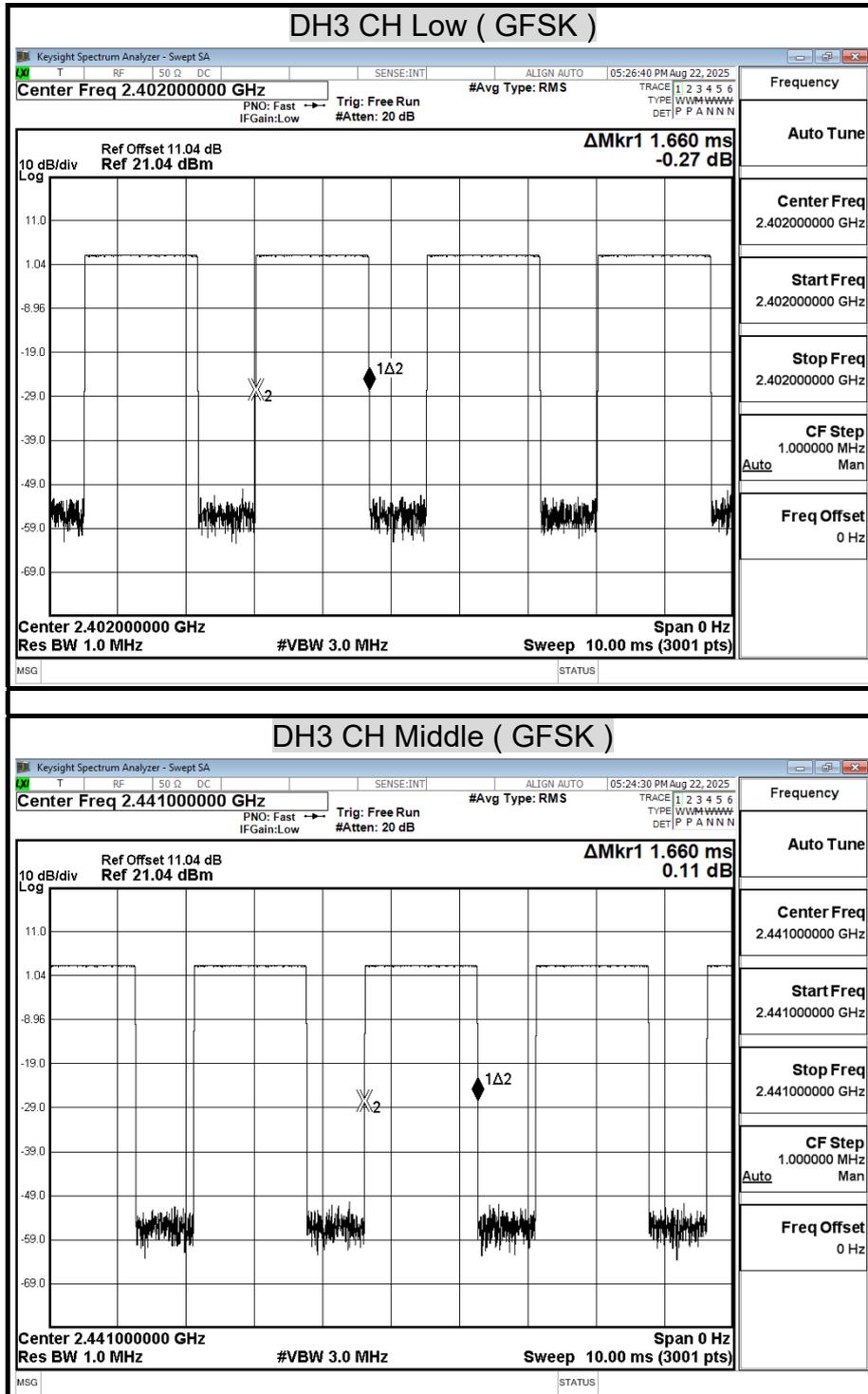
Transmitting Frequency	Packet type	Dwell time (ms)	Time of occupancy on the TX channel in 31.6sec (ms)	Limit for Time of occupancy on the TX channel in 31.6sec (ms)	Results
2441MHz	3DH1	0.400	128.00	400.00	PASS
2441MHz	3DH3	1.660	265.60	400.00	PASS
2441MHz	3DH5	2.910	310.40	400.00	PASS
2441MHz	AFH	2.910	155.20	400.00	PASS

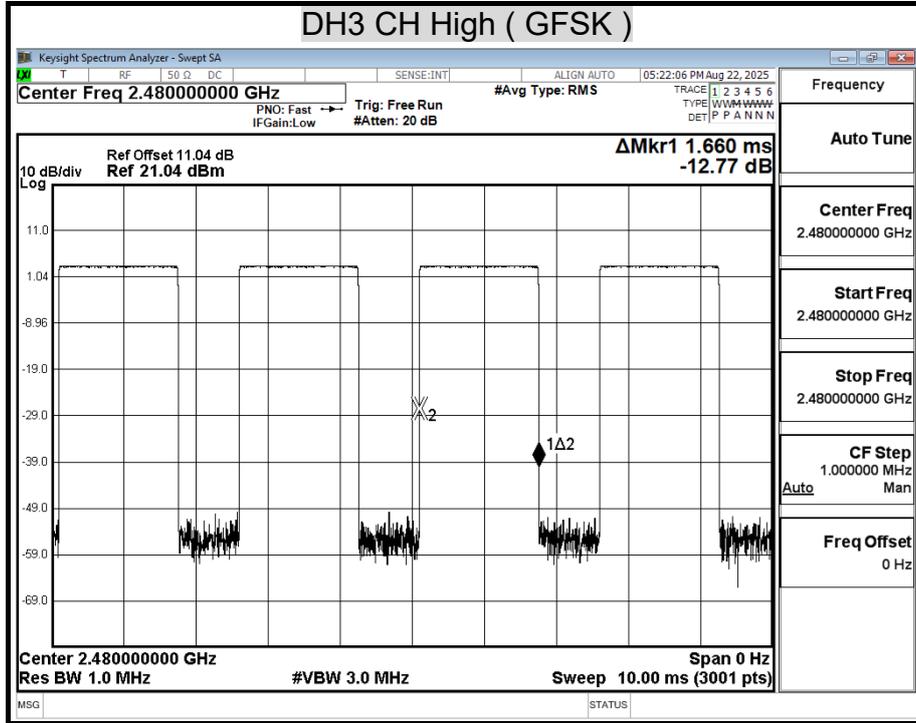
3DH1 Dwell time= 0.400 ms×(1600÷2)÷79×31.6= 128.00 (ms)  
 3DH3 Dwell time= 1.660 ms×(1600÷4)÷79×31.6= 265.60 (ms)  
 3DH5 Dwell time= 2.910 ms×(1600÷6)÷79×31.6= 310.40 (ms)  
 AFH Dwell time= 2.910 ms×(800÷6)÷20×8= 155.20 (ms)

## DWELL TIME ON EACH PAYLOAD









Report No.: TMTN2506000665NR

