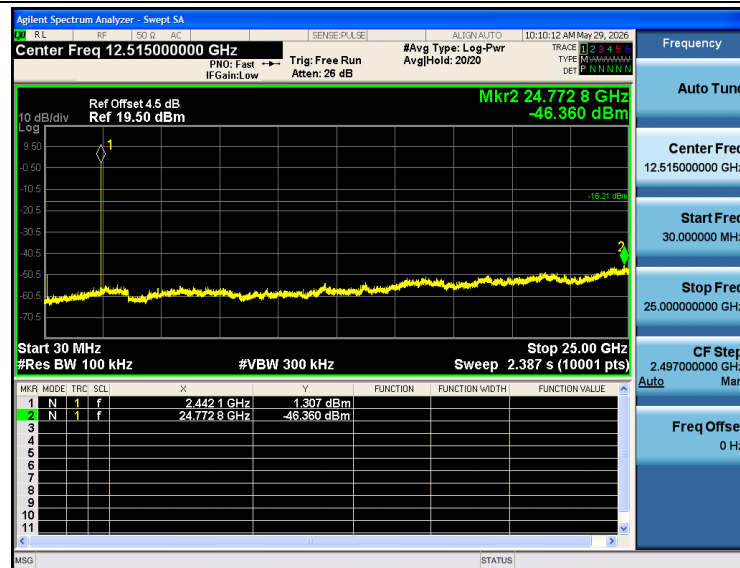
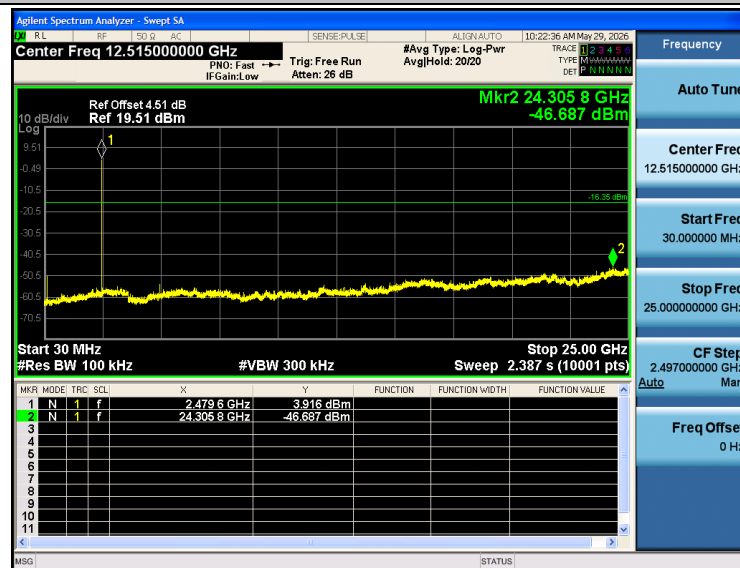
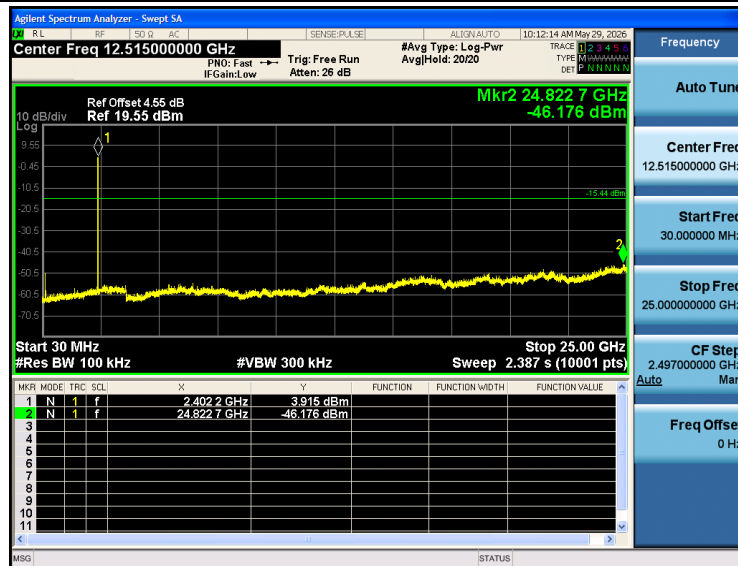


 $\pi/4$ -DQPSK_2480_0~Reference $\pi/4$ -DQPSK_2480_30~25000

8-DPSK_2402_0~Reference



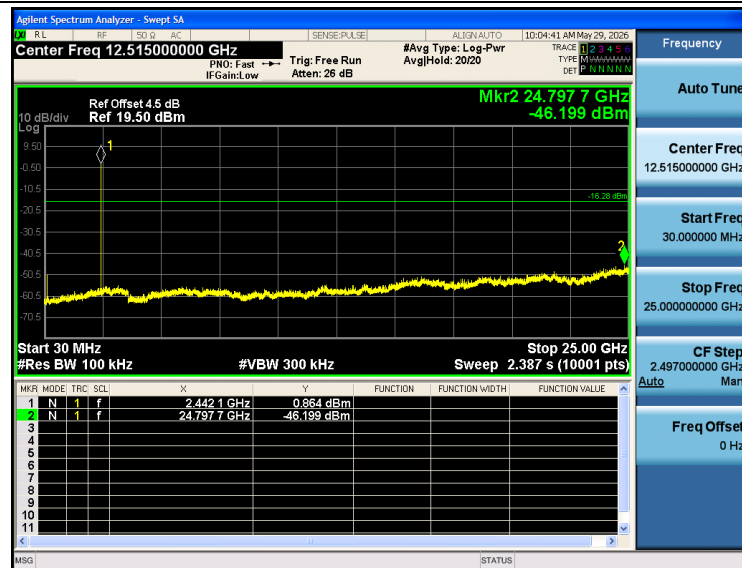
8-DPSK_2402_30~25000



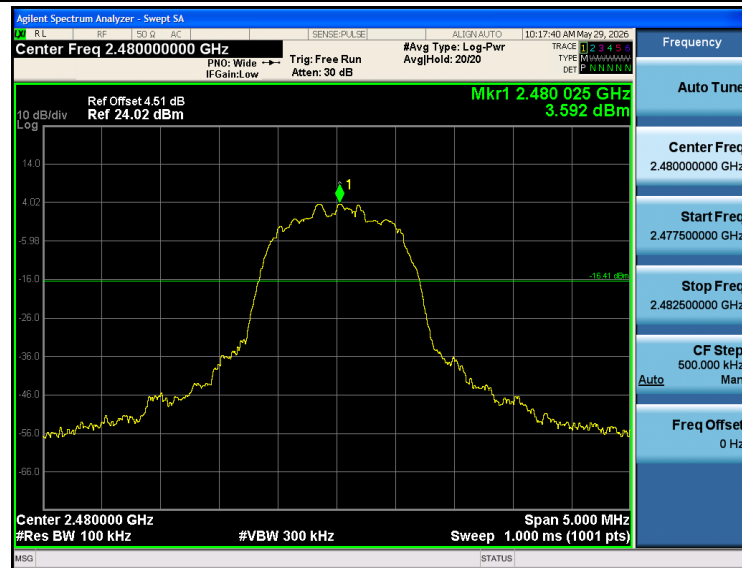
8-DPSK_2441_0~Reference



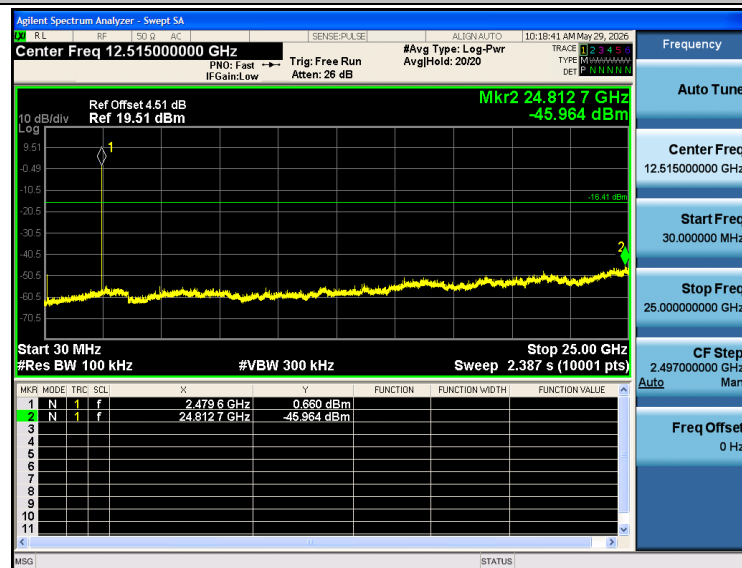
8-DPSK_2441_30~25000



8-DPSK_2480_0~Reference



8-DPSK_2480_30~25000



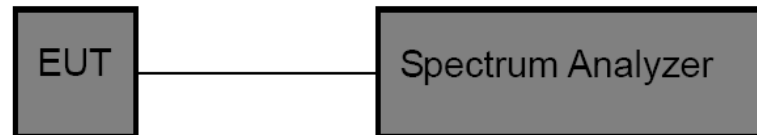


3.5. 20DB Bandwidth

Limit

N/A

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. OCB and 20dB Spectrum Setting:
 - (1) Set RBW = 1% ~ 5% occupied bandwidth.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

Note: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

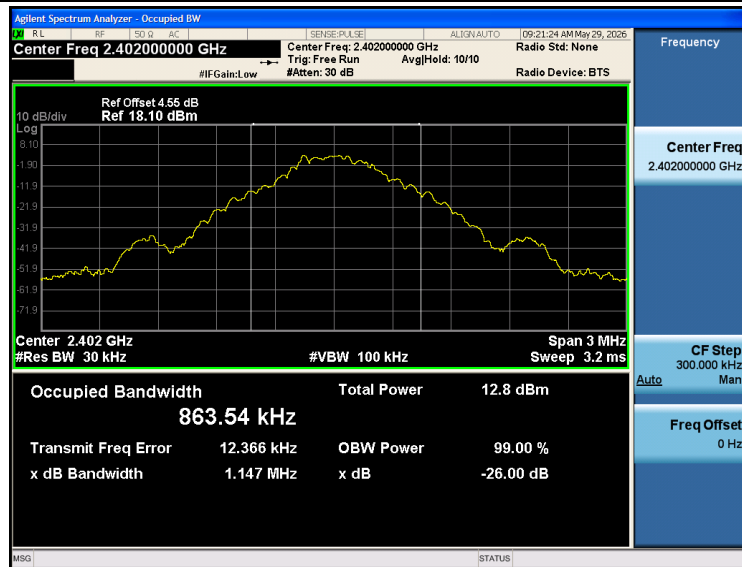
Please refer to the clause 2.4.

Test Results

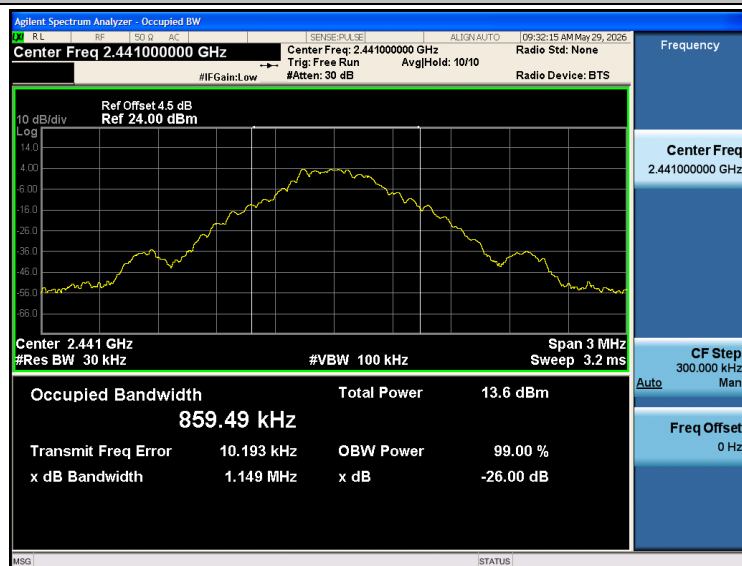
Test Mode	Frequency[MHz]	99% OBW[MHz]	20db EBW[MHz]	20dB Bandwidth *2/3 (kHz)	Verdict
GFSK	2402	0.864	0.962	641	PASS
	2441	0.859	0.960	640	PASS
	2480	0.865	0.961	641	PASS
$\pi/4$ -DQPSK	2402	1.161	1.283	855	PASS
	2441	1.159	1.277	851	PASS
	2480	1.159	1.278	852	PASS
8-DPSK	2402	1.166	1.300	867	PASS
	2441	1.166	1.297	865	PASS
	2480	1.164	1.298	865	PASS



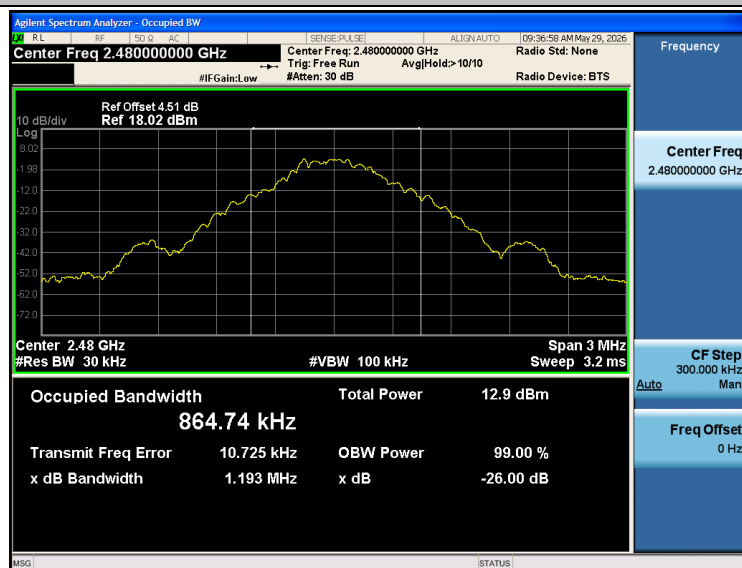
GFSK_OBW_2402

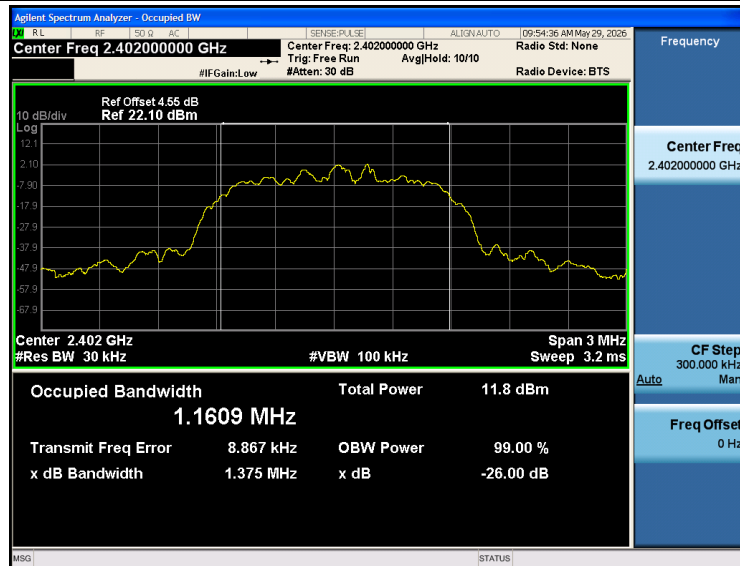
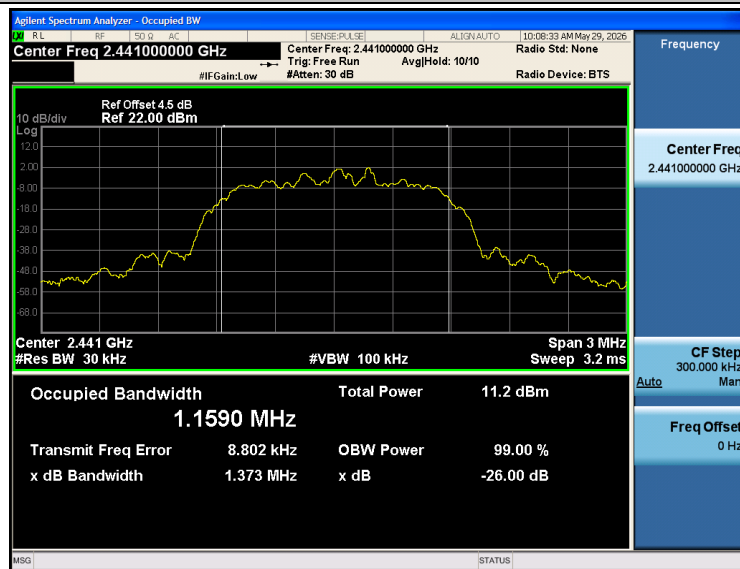
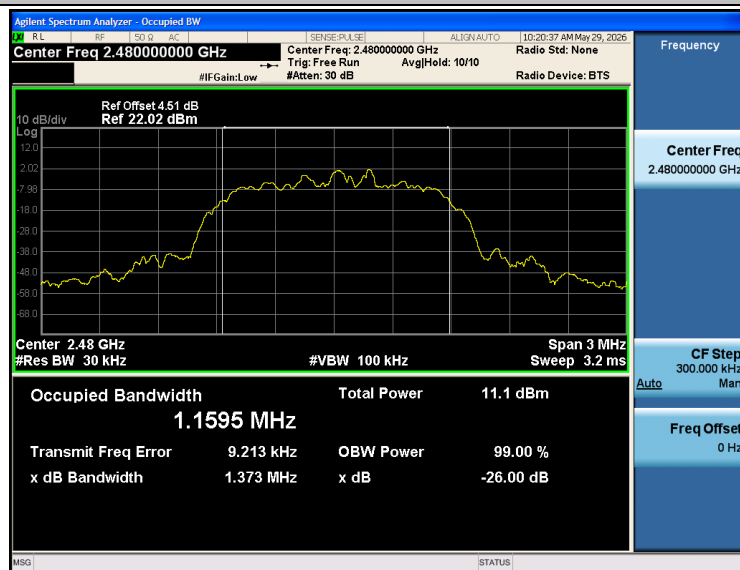


GFSK_OBW_2441

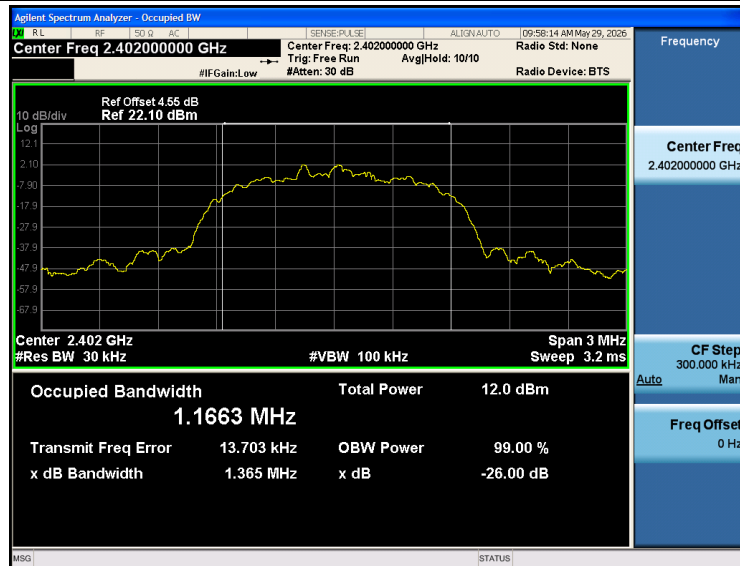


GFSK_OBW_2480

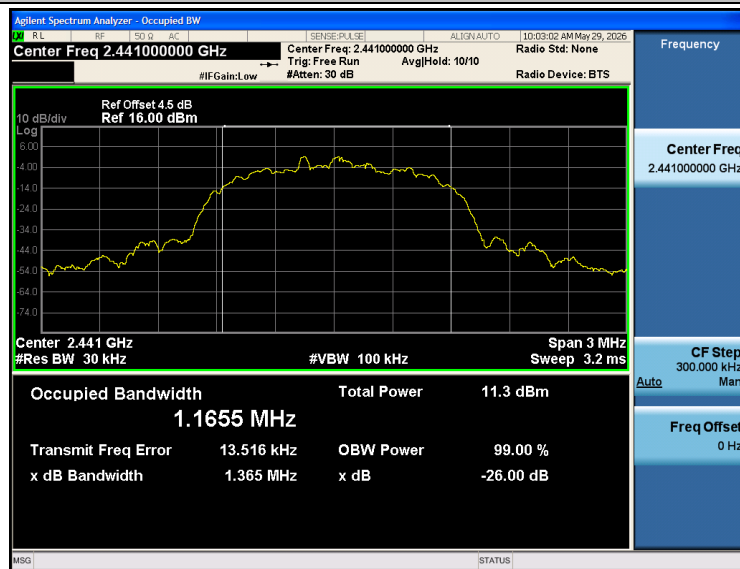
 $\pi/4$ -DQPSK_OBW_2402

 $\pi/4$ -DQPSK_OBW_2441 $\pi/4$ -DQPSK_OBW_2480

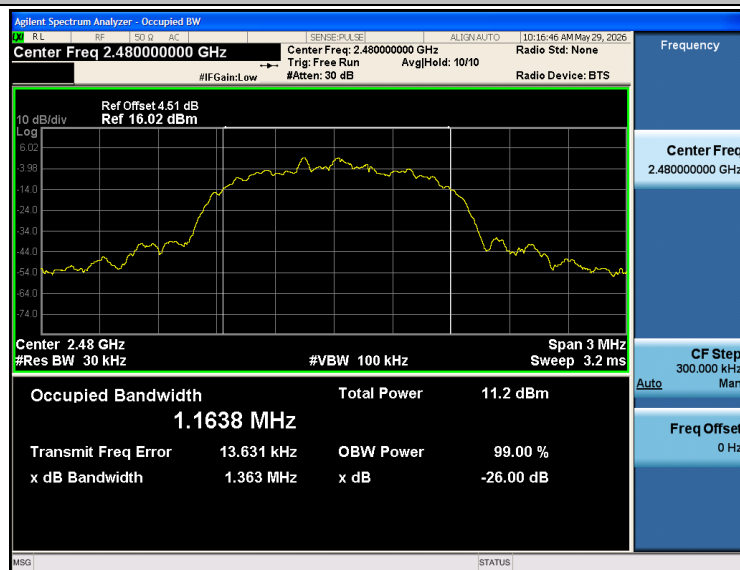
8-DPSK_OBW_2402



8-DPSK_OBW_2441

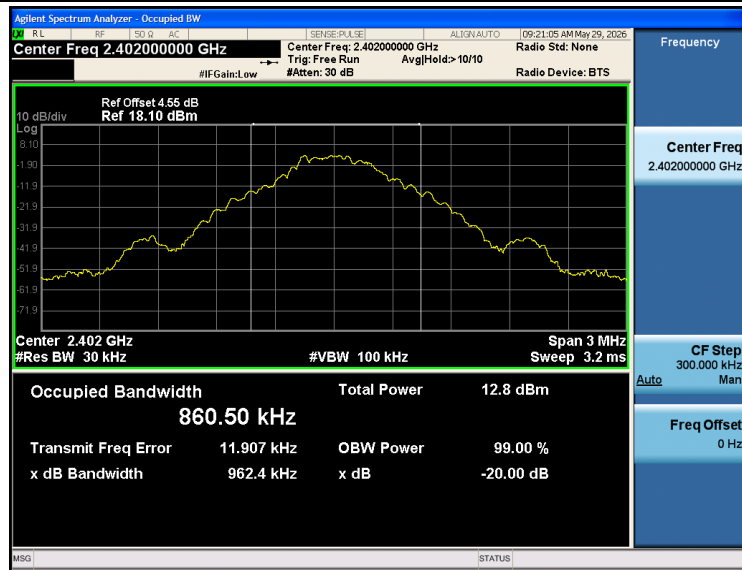


8-DPSK_OBW_2480

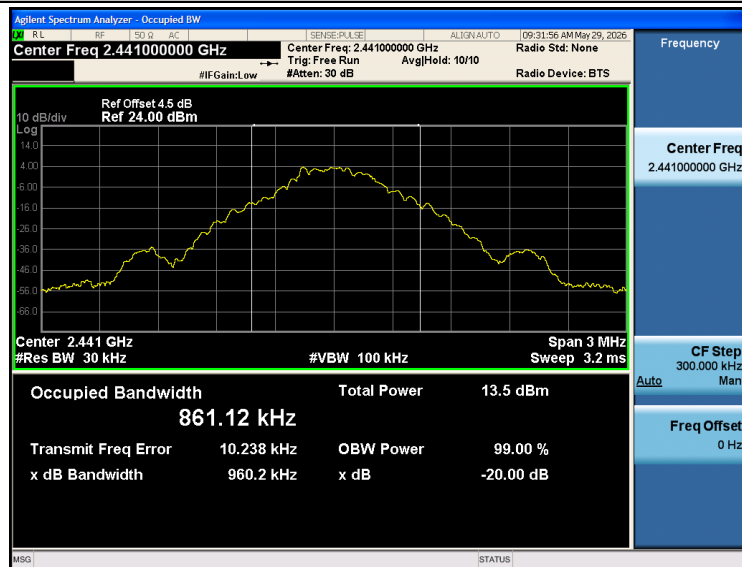




GFSK_EBW_2402

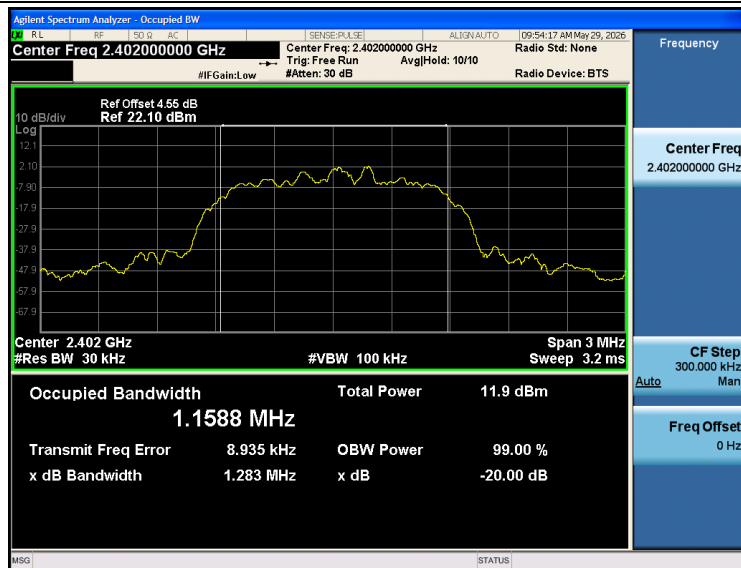
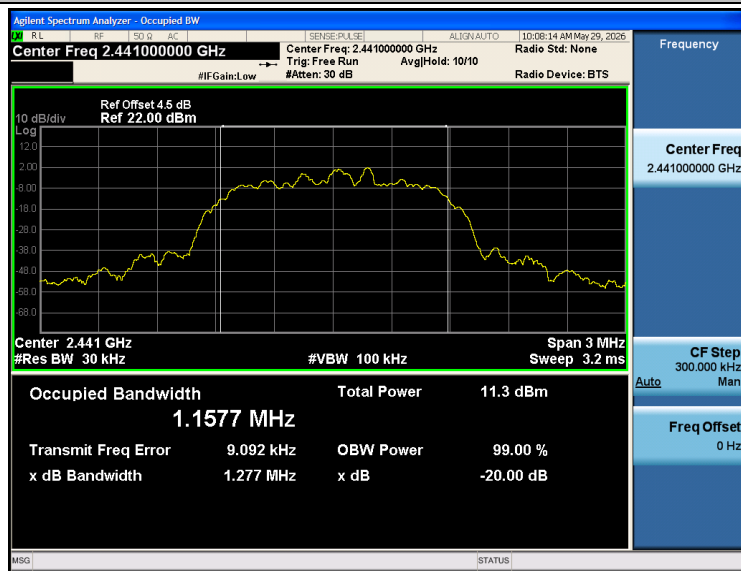
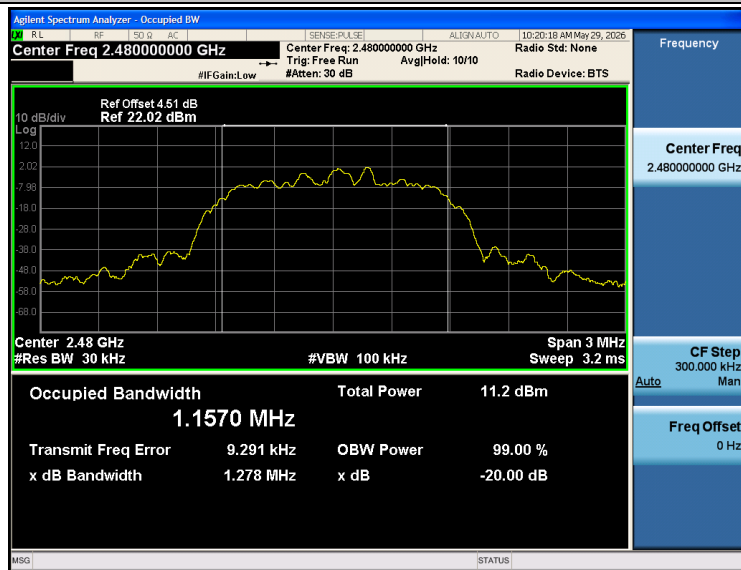


GFSK_EBW_2441

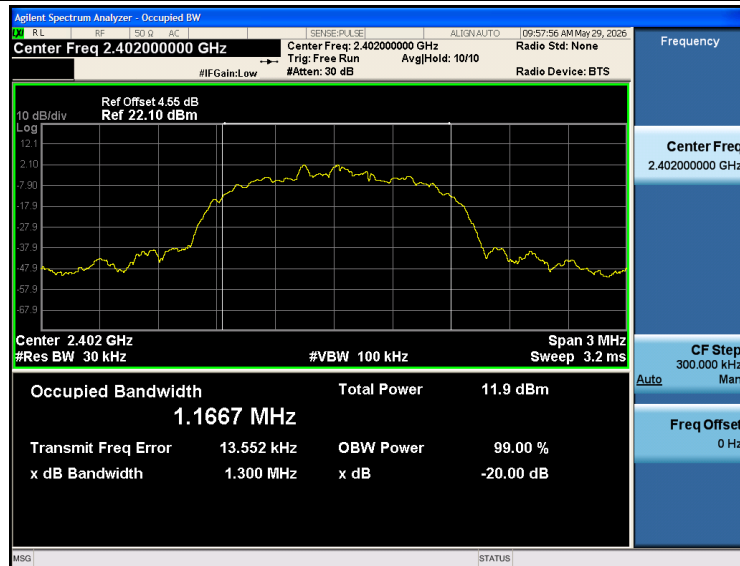


GFSK_EBW_2480

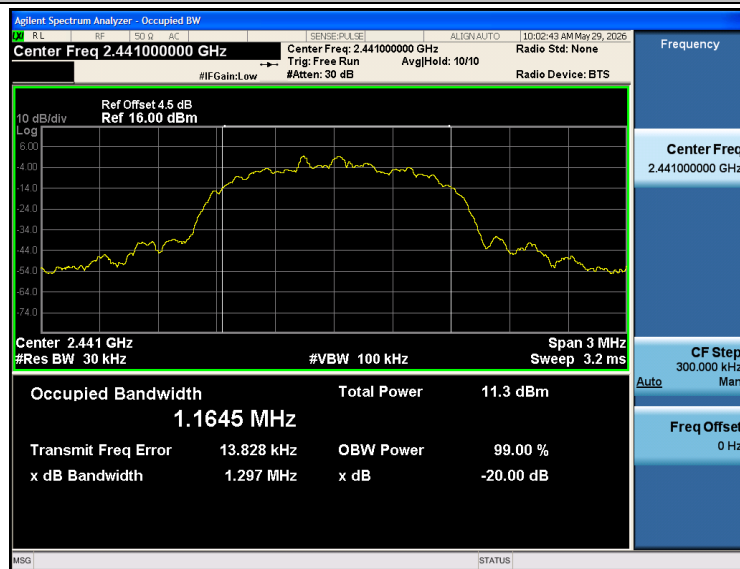
 $\pi/4$ -DQPSK_EBW_2402

 $\pi/4$ -DQPSK_EBW_2441 $\pi/4$ -DQPSK_EBW_2480

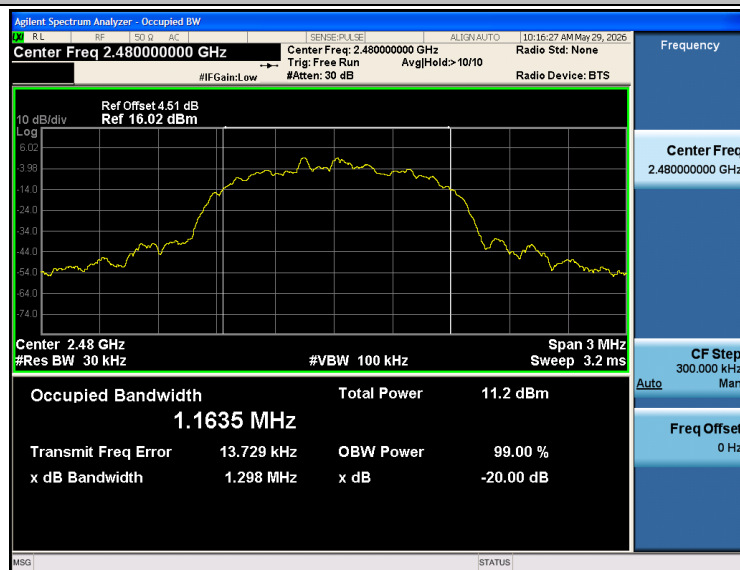
8-DPSK_EBW_2402



8-DPSK_EBW_2441



8-DPSK_EBW_2480





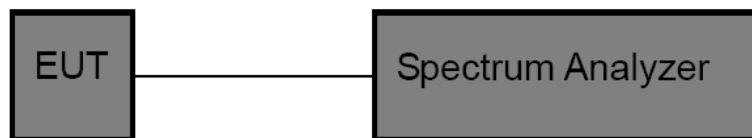
3.6. Channel Separation

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1)/ RSS-247 6.2.3.1 (a):

Test Item	Limit	Frequency Range(MHz)
Channel Separation	>25KHz or >two-thirds of the 20 dB bandwidth Which is greater	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Set RBW = Set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

Test Mode

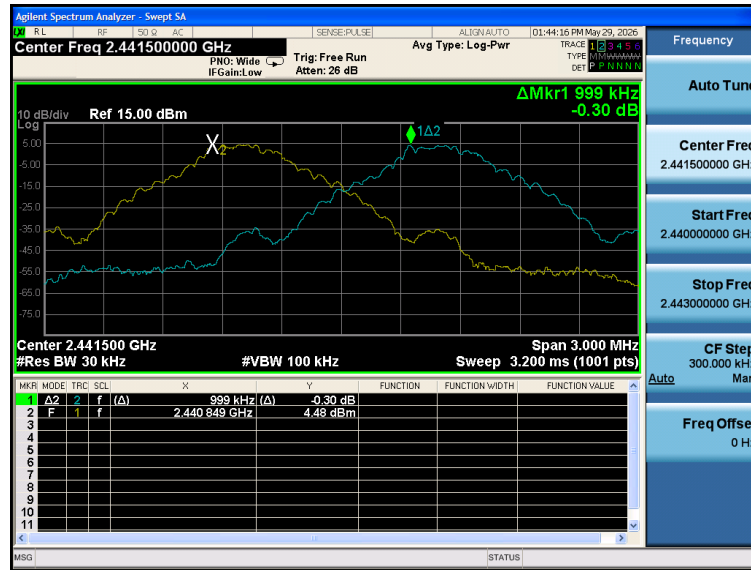
Please refer to the clause 2.4.

Test Results

Test Mode	Frequency[MHz]	Result[MHz]	Limit[kHz]	Verdict
GFSK	Hop_2441	0.999	>640	PASS
$\pi/4$ -DQPSK	Hop_2441	0.993	>851	PASS
8-DPSK	Hop_2441	1.005	>865	PASS



GFSK_Hop_2441

 $\pi/4$ -DQPSK_Hop_2441

8-DPSK_Hop_2441





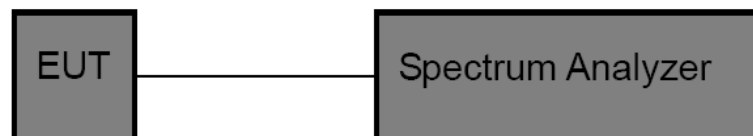
3.7. Number of Hopping Channel

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(iii)/ RSS-247 6.2.3.1 (b):

Section	Test Item	Limit
15.247 (a)(iii)/ RSS-247 6.2.3.1 (b):	Number of Hopping Channel	>15

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Peak Detector: RBW=100 kHz, VBW $\geq$ RBW, Sweep time= Auto.

Test Mode

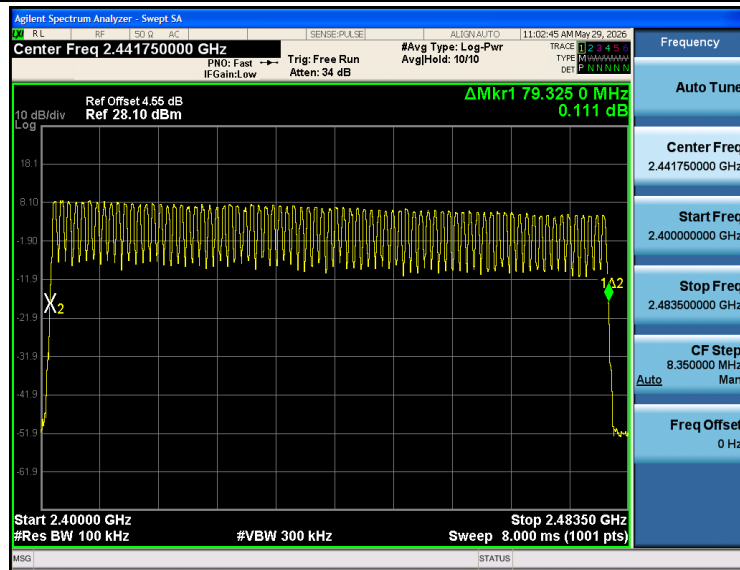
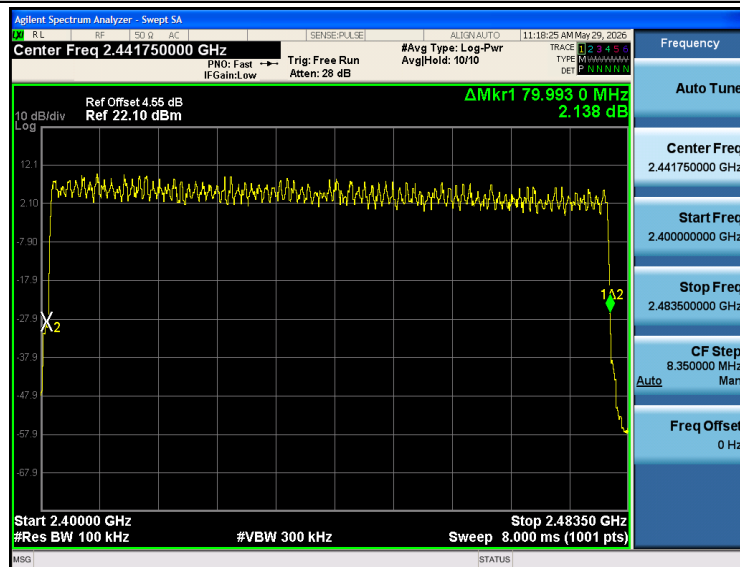
Please refer to the clause 2.4.

Test Result

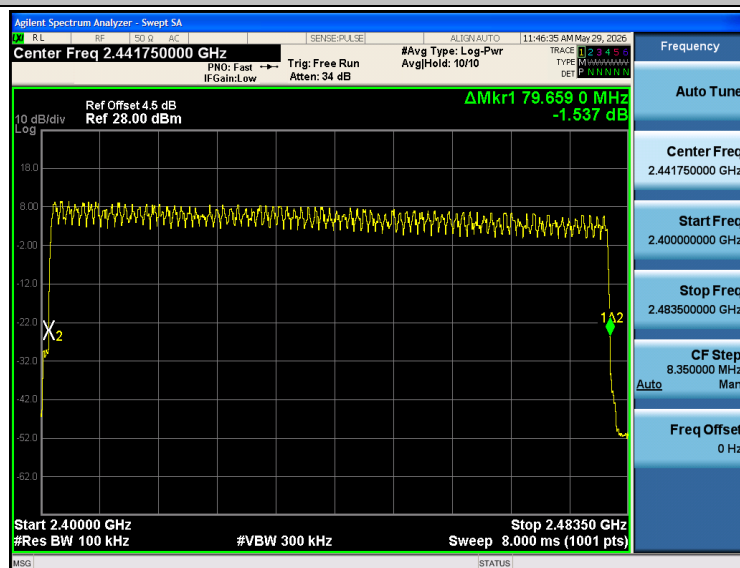
Test Mode	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ -DQPSK	Hop	79	≥ 15	PASS
8-DPSK	Hop	79	≥ 15	PASS



GFSK

 $\pi/4$ -DQPSK

8-DPSK



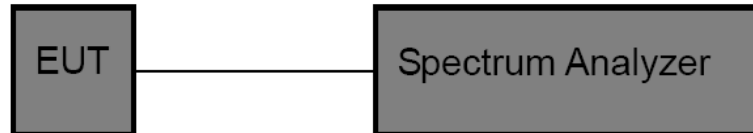


3.8. Dwell Time

Limit

Section	Test Item	Limit
15.247(a)(iii)/ RSS-247 6.2.3.1 (b)	Average Time of Occupancy	0.4 sec

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Spectrum Setting: RBW=1MHz, VBW $\geq$ RBW.
 - (2) Use video trigger with the trigger level set to enable triggering only on full pulses.
 - (3) Sweep Time is more than once pulse time.
 - (4) Set the center frequency on any frequency would be measure and set the frequency span to zero.
 - (5) Measure the maximum time duration of one single pulse.
 - (6) Set the EUT for packet transmitting.

Test Mode

Please refer to the clause 2.4.

**Test Result**

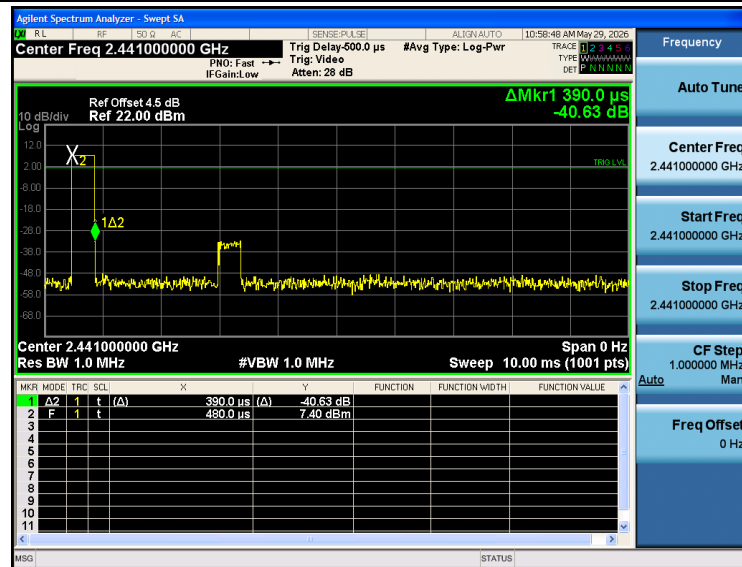
Modulation type	Channel	Frequency [MHz]	Pulse Time (ms)	Total of Dwell (ms)	Period Time (ms)	Limit (Second)	Result
GFSK	DH1	2441	0.39	124.80	31.60	≤ 0.40	Pass
	DH3	2441	1.65	264.00	31.60		
	DH5	2441	2.89	308.27	31.60		
$\pi/4$ -DQPSK	2DH1	2441	0.40	128.00	31.60	≤ 0.40	Pass
	2DH3	2441	1.65	264.00	31.60		
	2DH5	2441	2.90	309.33	31.60		
8-DPSK	3DH1	2441	0.40	128.00	31.60	≤ 0.40	Pass
	3DH3	2441	1.65	264.00	31.60		
	3DH5	2441	2.91	310.40	31.60		

Note: 1DH1/2DH1/3DH1 Total of Dwell= Pulse Time*(1600/2)*31.6/79

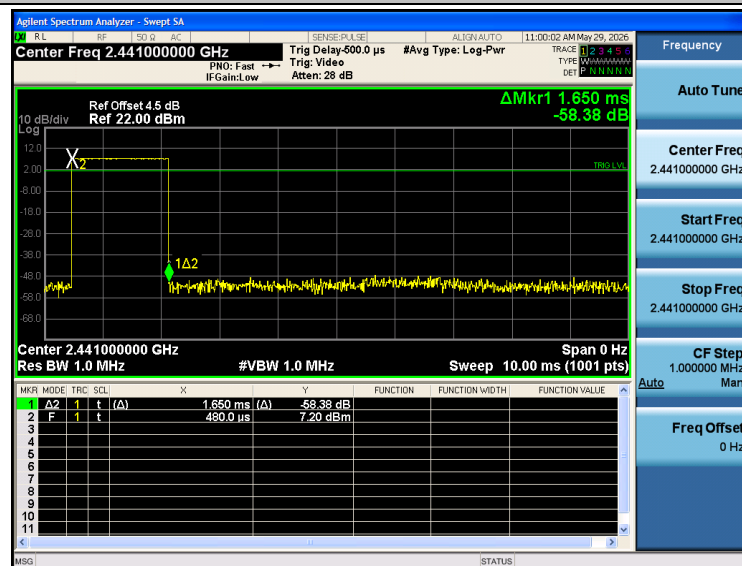
1DH3/2DH3/3DH3 Total of Dwell= Pulse Time*(1600/4)*31.6/79

1DH5/2DH5/3DH5 Total of Dwell= Pulse Time*(1600/6)*31.6/79

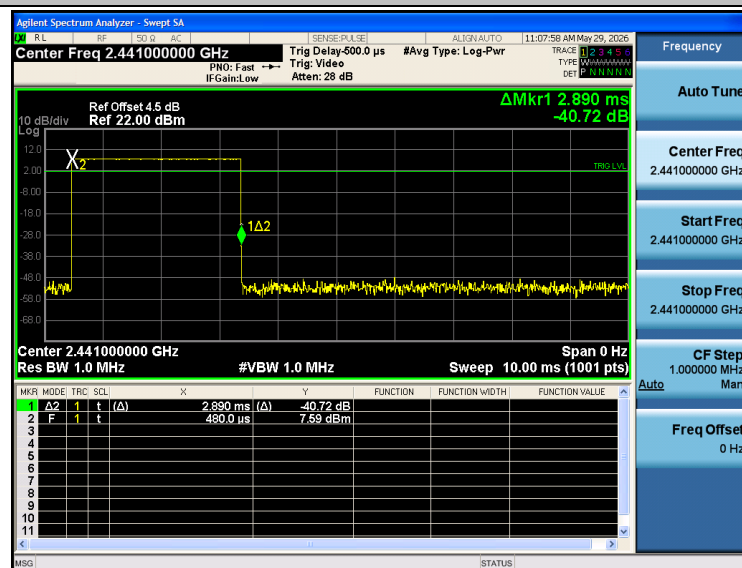
GFSK_DH1_2441



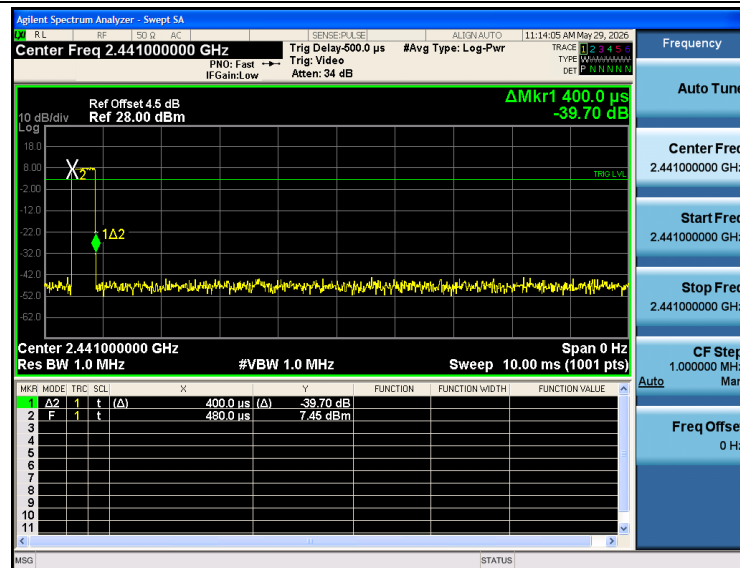
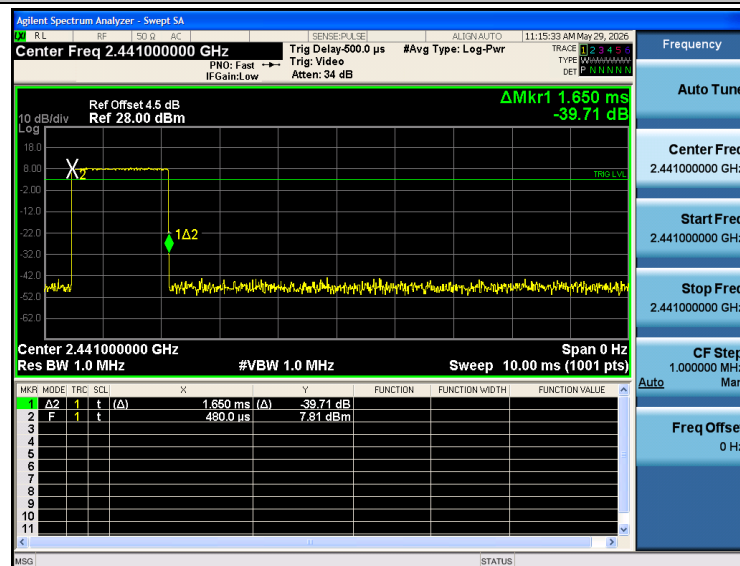
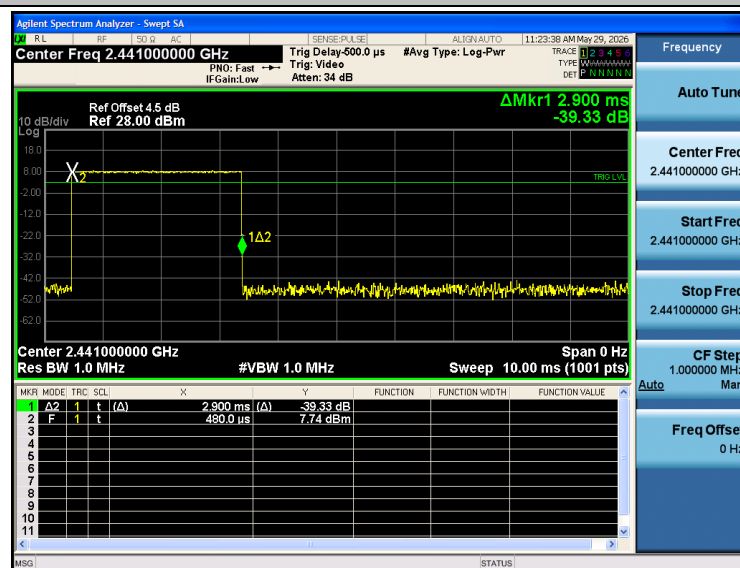
GFSK_DH3_2441



GFSK_DH5_2441



$\pi/4$ -DQPSK 2DH1 2441

 $\pi/4$ -DQPSK_2DH3_2441 $\pi/4$ -DQPSK_2DH5_2441

8-DPSK_3DH1_2441



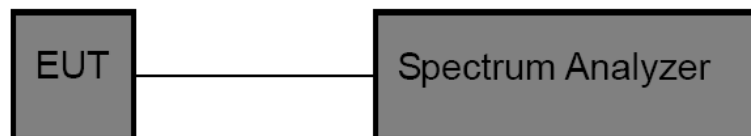
3.9. Peak Output Power

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(1)/ RSS-247 6.2.3.2:

Test Item	Limit	Frequency Range(MHz)
Maximum Conducted Peak Output Power	Hopping Channels>75 Power<1W(30dBm) Other <125mW(21dBm)	2400~2483.5
E.I.R.P	4 Watt or 36dBm	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Set RBW> 20DB Bandwidth.
 - (2) Set the video bandwidth (VBW) ≥ RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

Test Mode

Please refer to the clause 2.4.

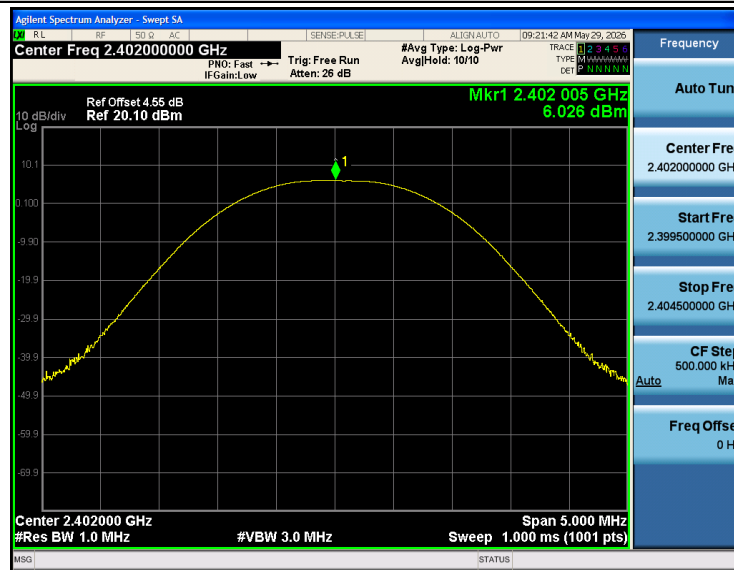
Test Result

Test Mode	Frequency[MHz]	Conducted output power [dBm]	E.I.R.P Result[dBm]	Conducted Limit[dBm]	E.I.R.P Limit[dBm]	Verdict
GFSK	2402	6.03	7.23	<=21	<=36	PASS
	2441	6.14	7.34	<=21	<=36	PASS
	2480	5.54	6.74	<=21	<=36	PASS
π/4-DQPSK	2402	5.81	7.01	<=21	<=36	PASS
	2441	5.37	6.57	<=21	<=36	PASS
	2480	5.02	6.22	<=21	<=36	PASS
8-DPSK	2402	6.31	7.51	<=21	<=36	PASS
	2441	5.88	7.08	<=21	<=36	PASS
	2480	5.51	6.71	<=21	<=36	PASS

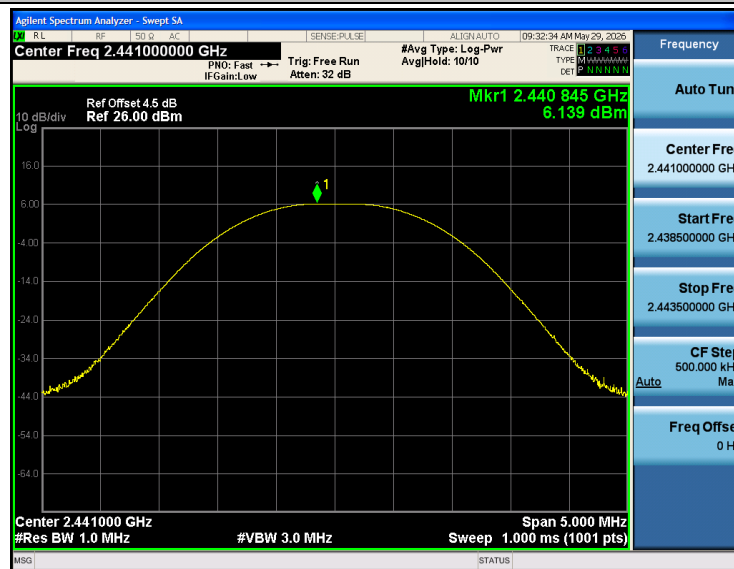
Note: E.I.R.P output power = Conducted output power + Antenna gain



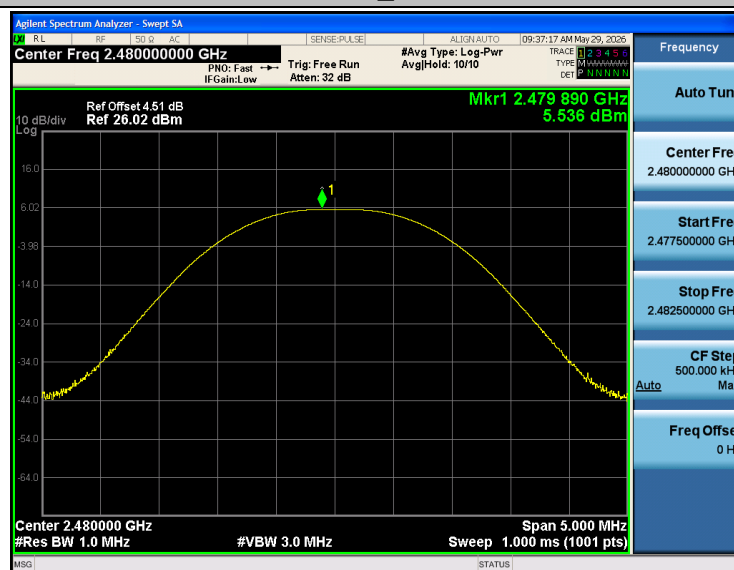
GFSK_2402

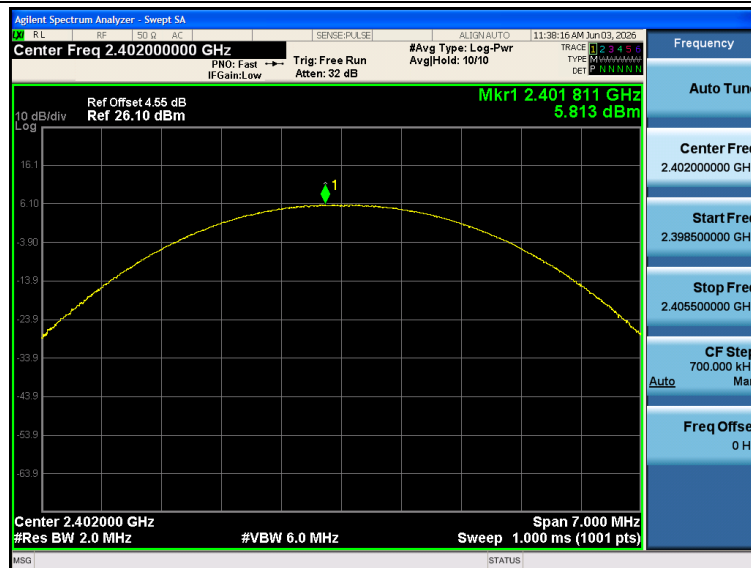
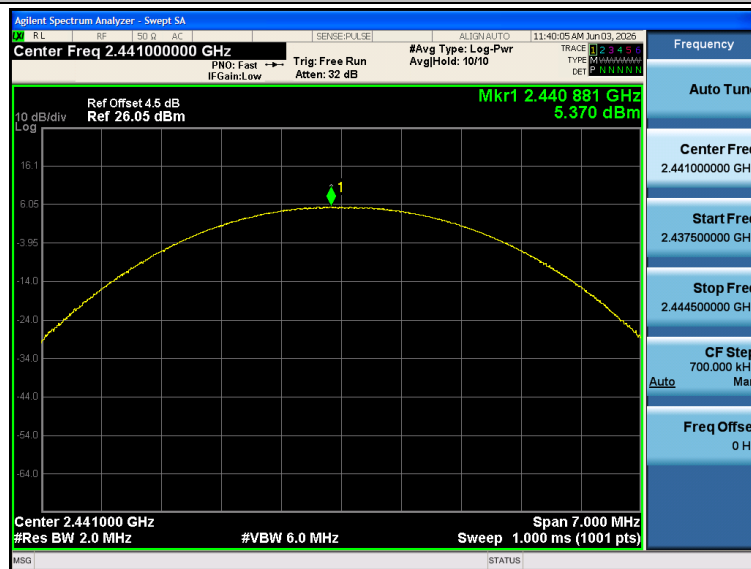
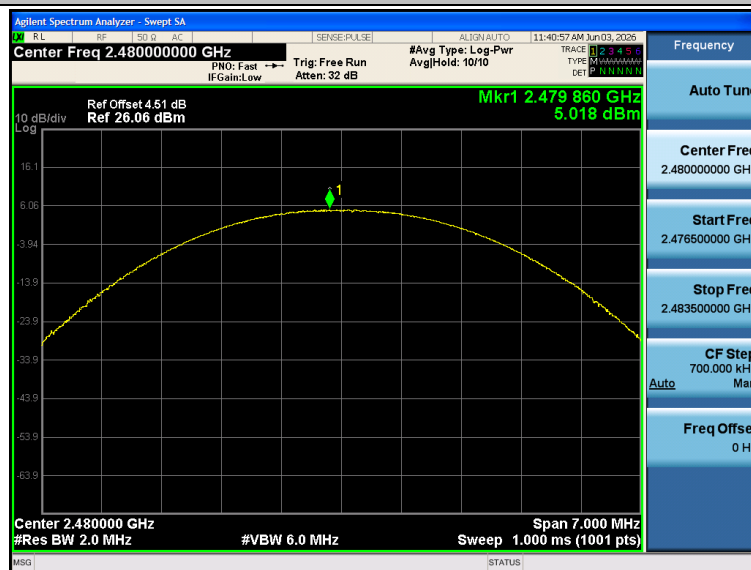


GFSK_2441

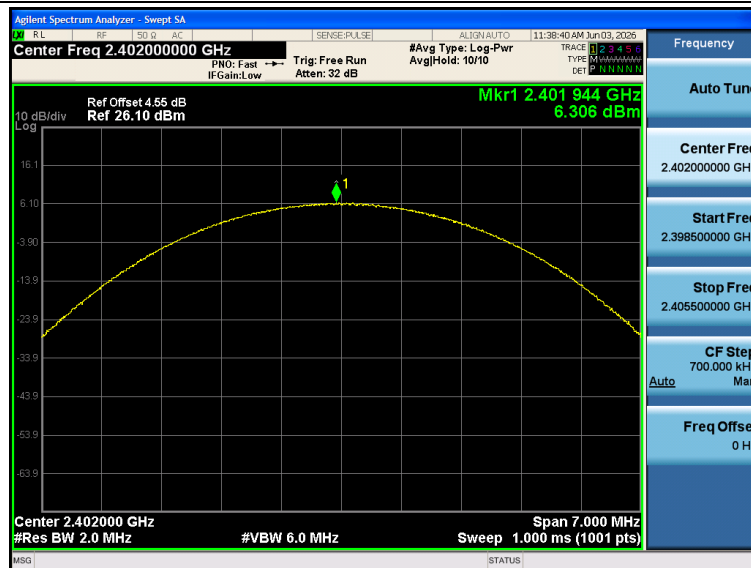


GFSK_2480

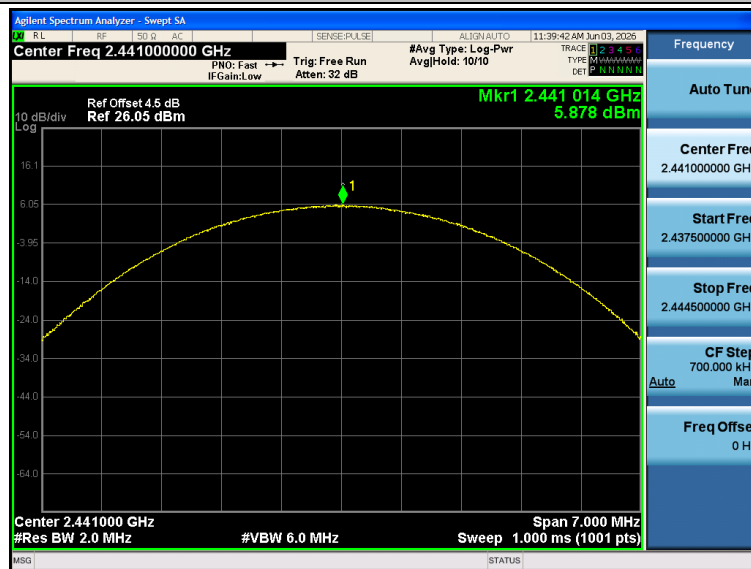
 $\pi/4$ -DQPSK_2402

 $\pi/4$ -DQPSK_2441 $\pi/4$ -DQPSK_2480

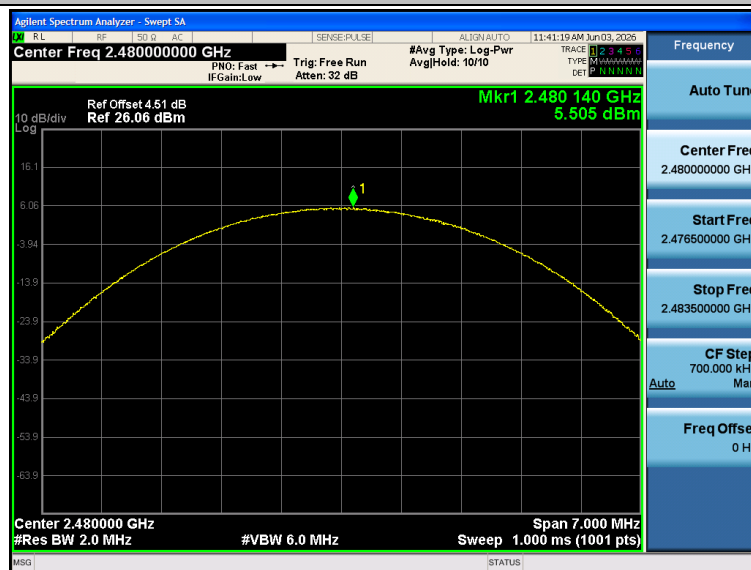
8-DPSK_2402



8-DPSK_2441



8-DPSK_2480



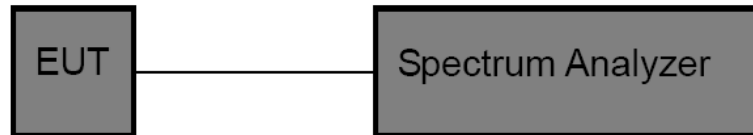


3.10. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:
Set analyzer center frequency to test channel center frequency.
Set the span to 0Hz
Set the RBW to 8MHz
Set the VBW to 8MHz
Detector: Peak
Sweep time: Auto
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

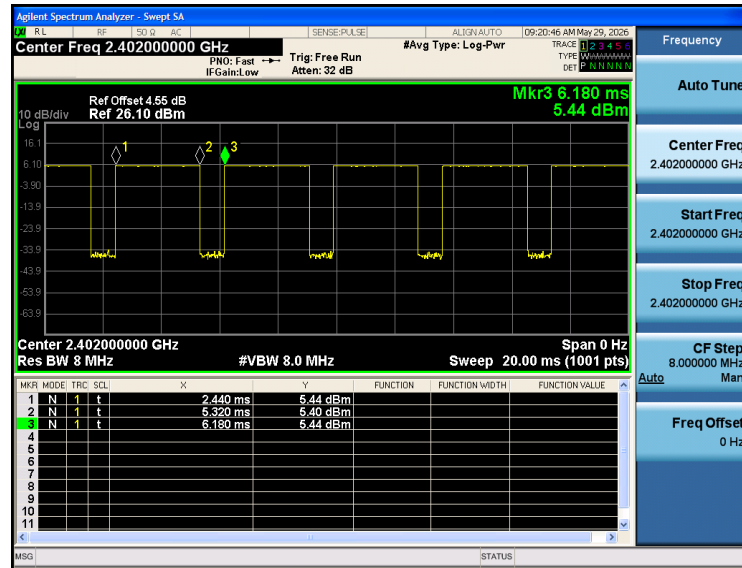
Please refer to the clause 2.4.

Test Result

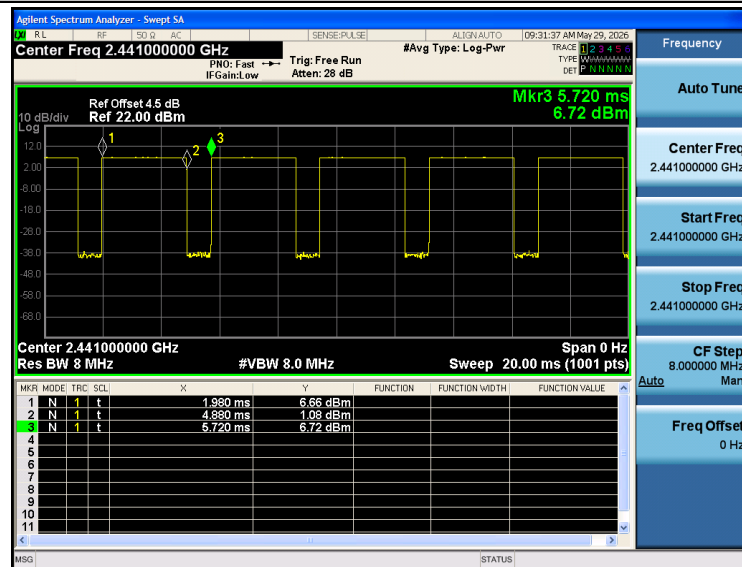
Test Mode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
GFSK	2402	2.88	3.74	77.01	0.35	1
	2441	2.90	3.74	77.54	0.34	1
	2480	2.88	3.74	77.01	0.35	1
$\pi/4$ -DQPSK	2402	2.88	3.74	77.01	0.35	1
	2441	2.90	3.74	77.54	0.34	1
	2480	2.88	3.74	77.01	0.35	1
8-DPSK	2402	2.88	3.72	77.42	0.35	1
	2441	2.88	3.74	77.01	0.35	1
	2480	2.88	3.74	77.01	0.35	1



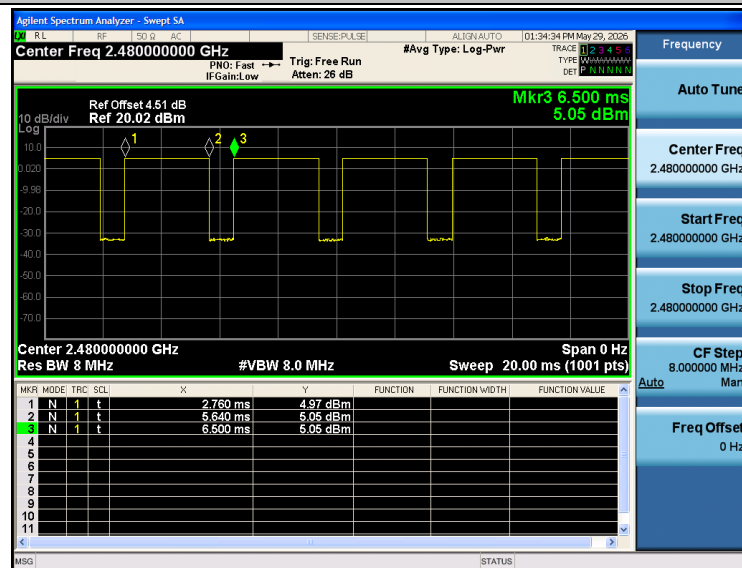
GFSK_2402

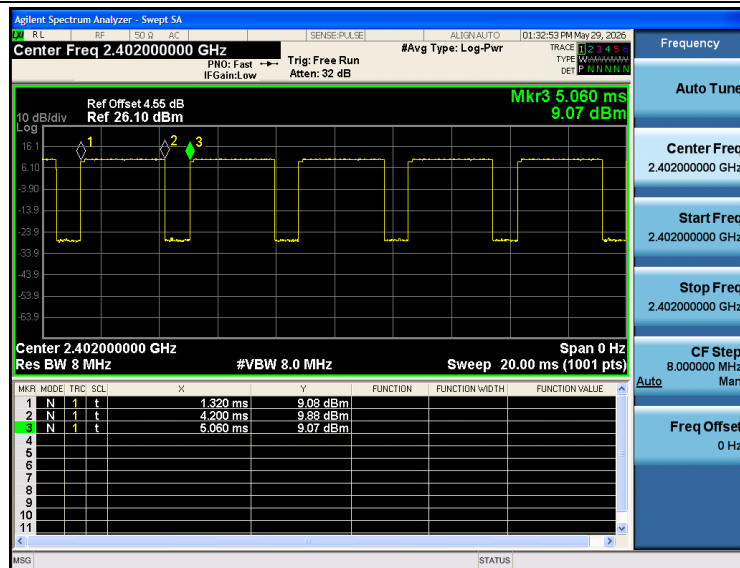
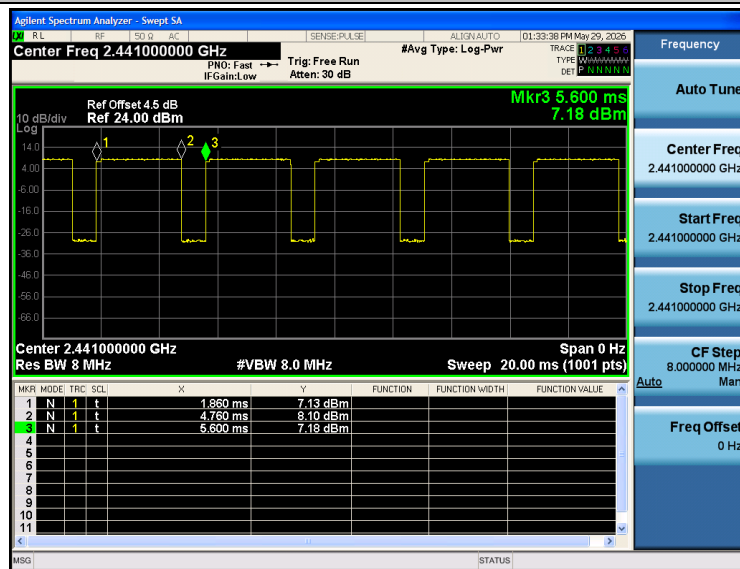
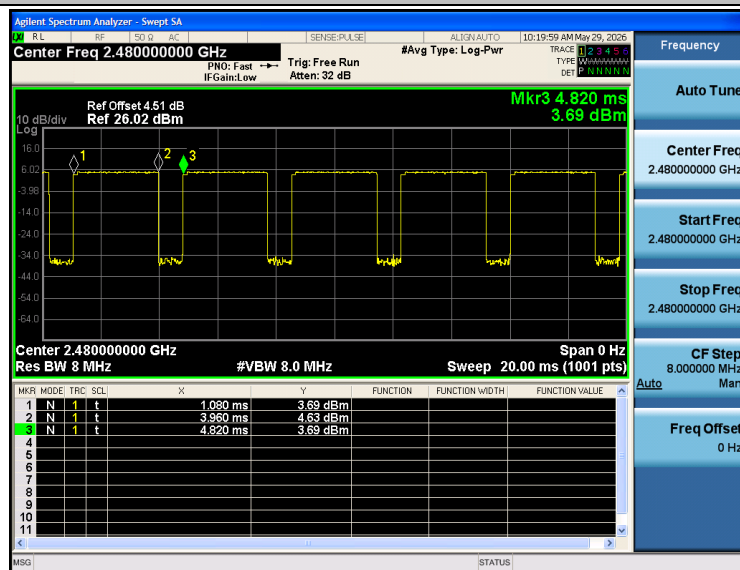


GFSK_2441

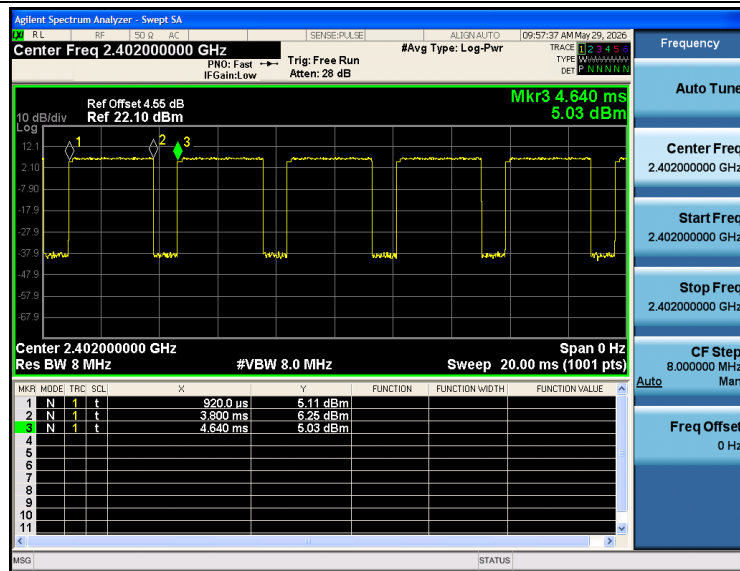


GFSK_2480

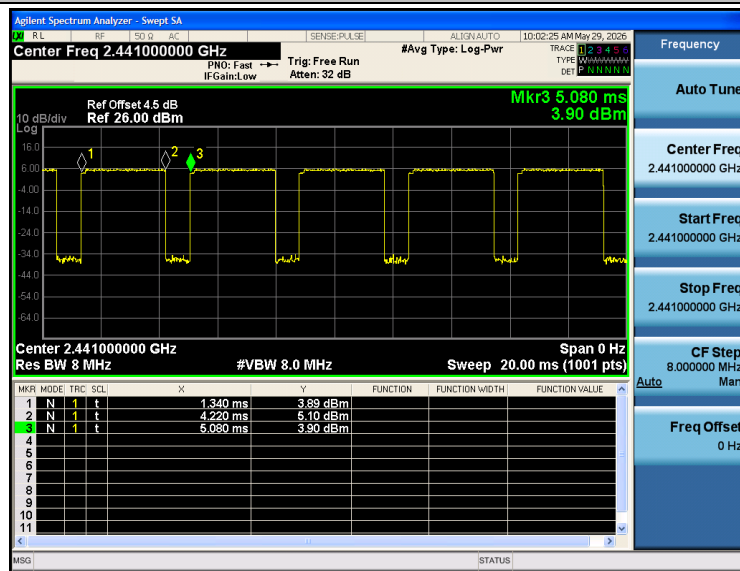
 $\pi/4$ -DQPSK_2402

 $\pi/4$ -DQPSK_2441 $\pi/4$ -DQPSK_2480

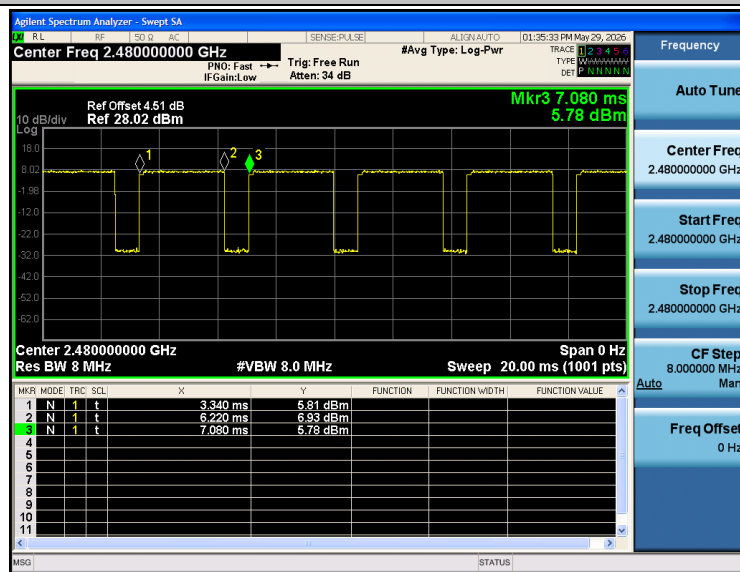
8-DPSK_2402



8-DPSK_2441



8-DPSK_2480





3.11. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, 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.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

According to RSS-GEN Issue 5, section 6.8, The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotopically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer. The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

*****THE END*****