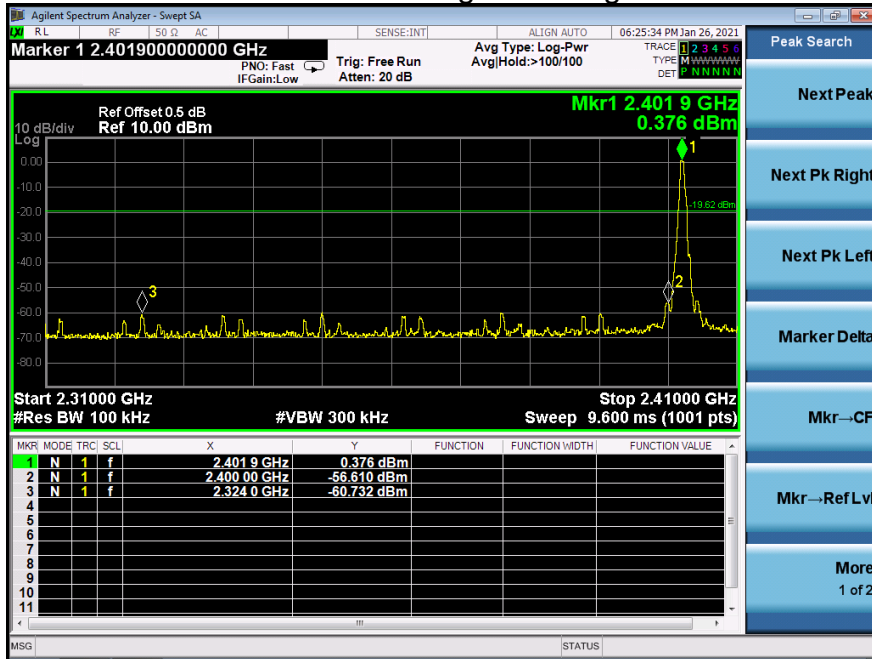
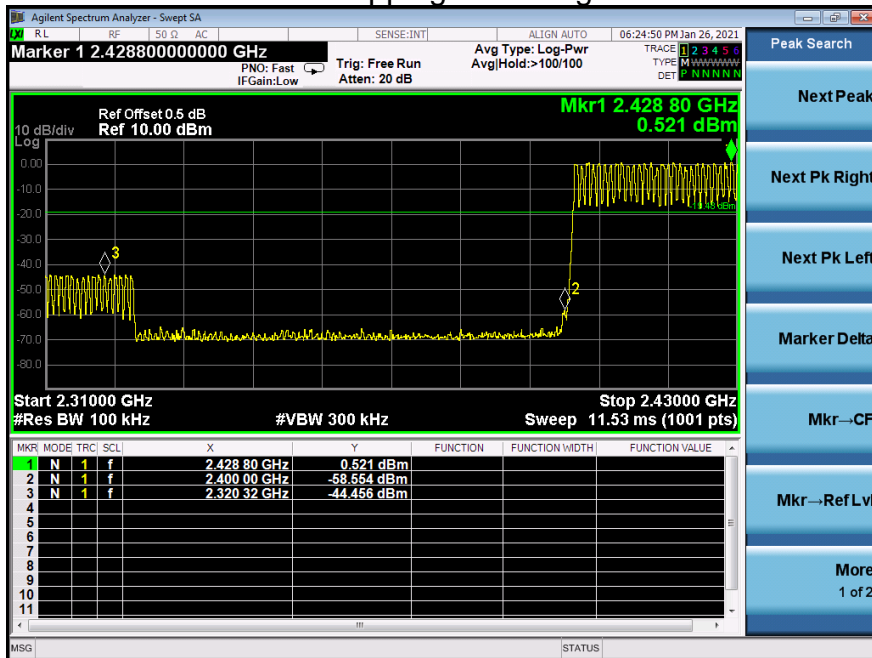


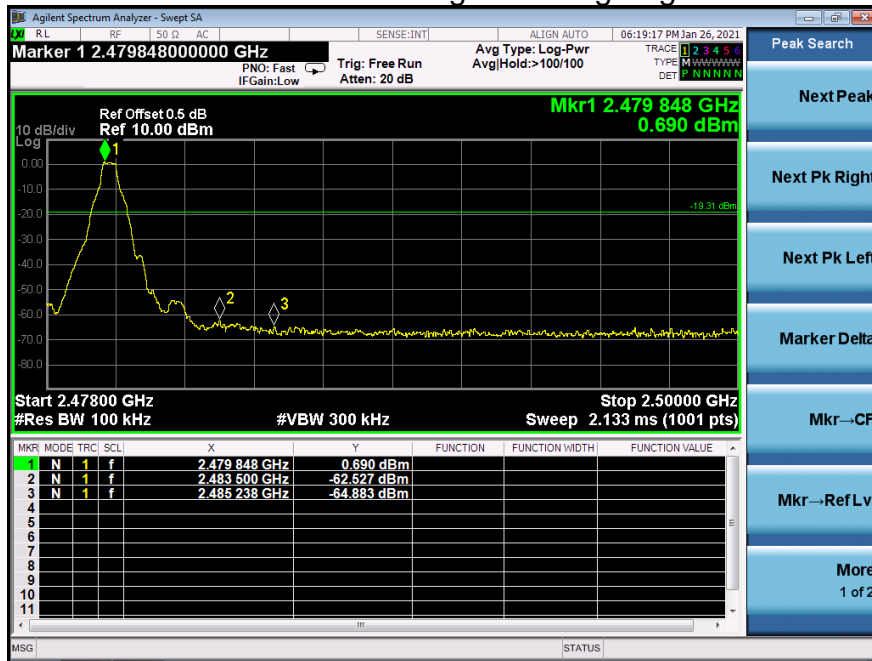
GFSK Transmitting Band edge-left side



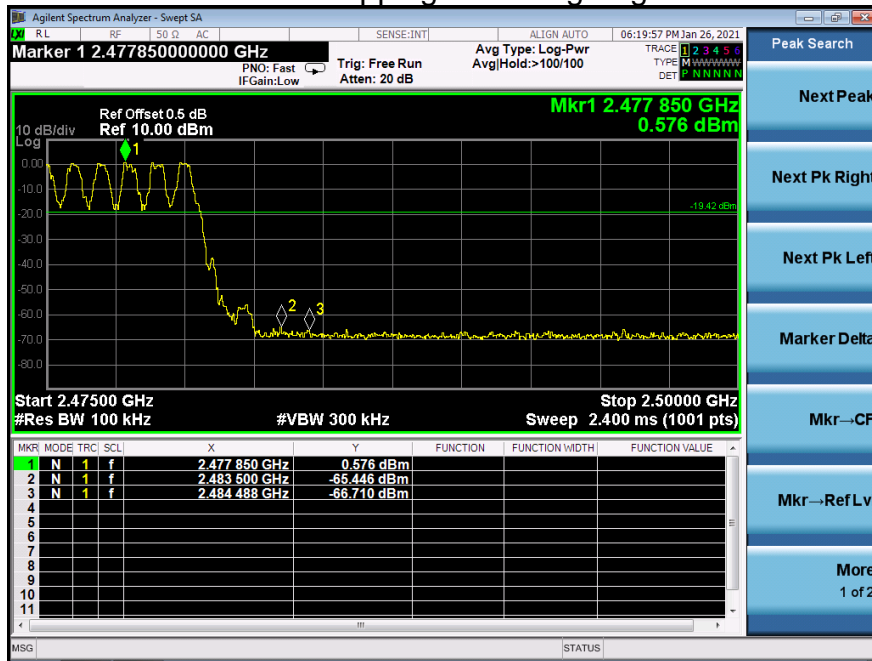
GFSK Hopping Band edge-left side



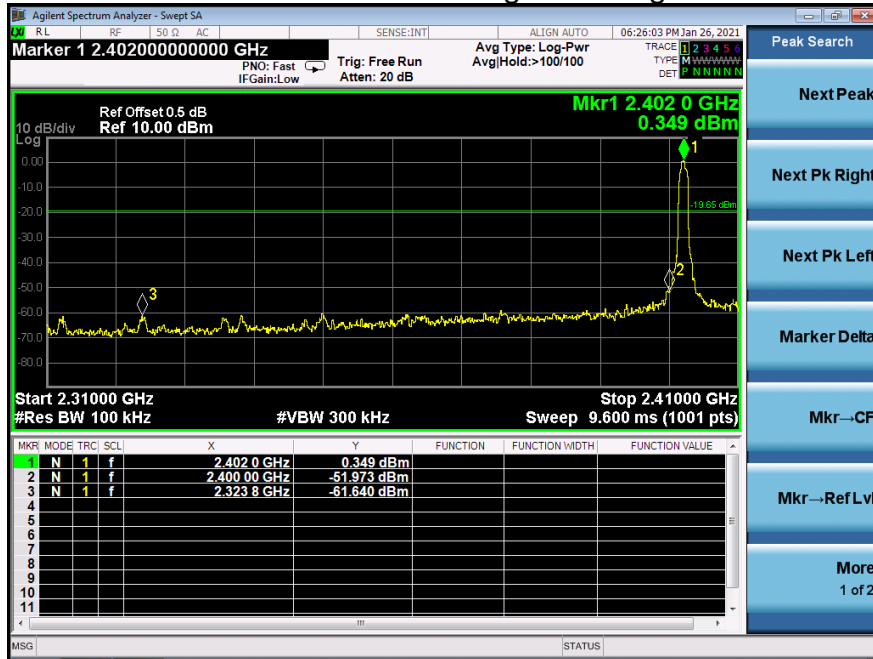
GFSK Transmitting Band edge-right side



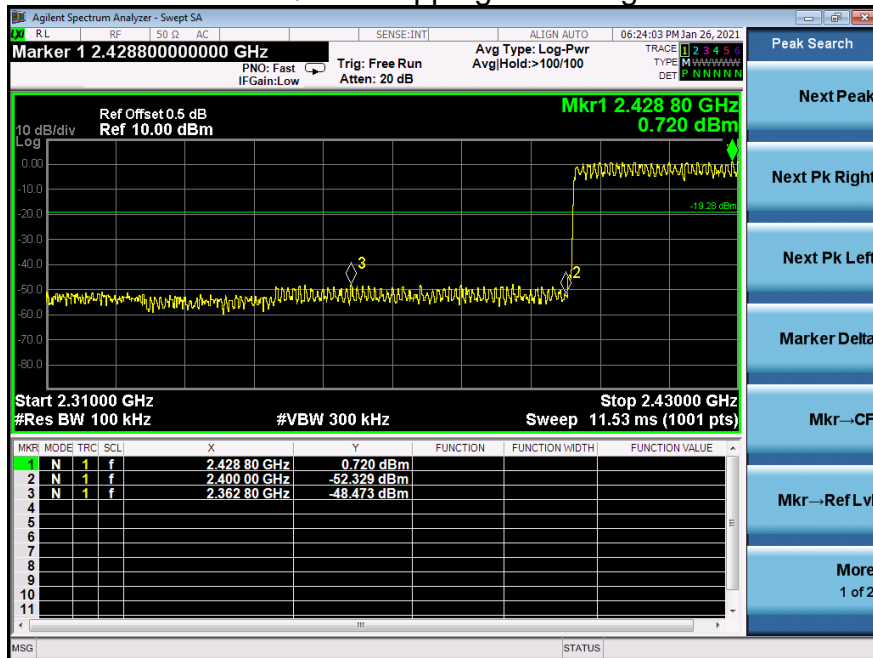
GFSK Hopping Band edge-right side



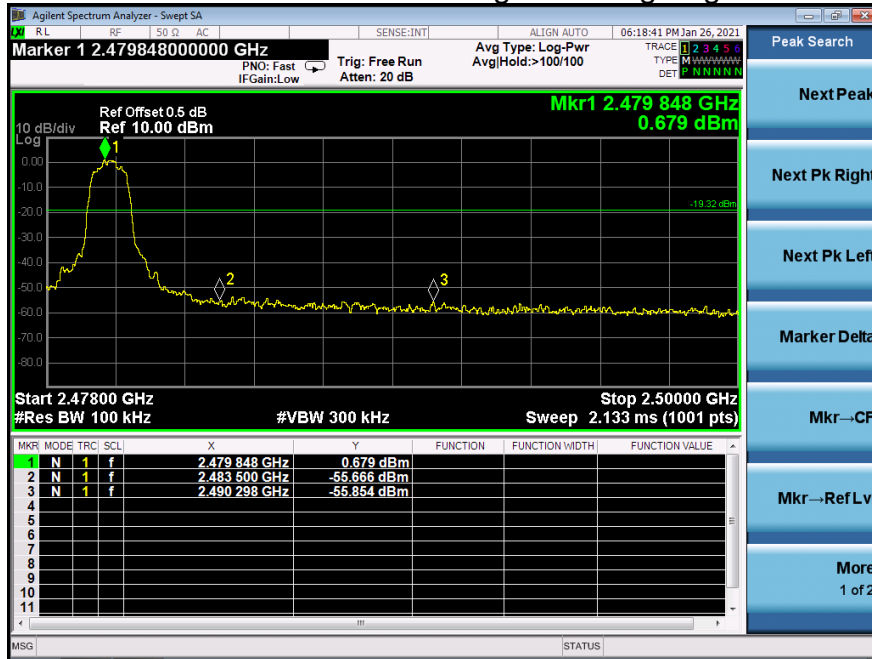
Pi/4 DQPSK Transmitting Band edge-left side



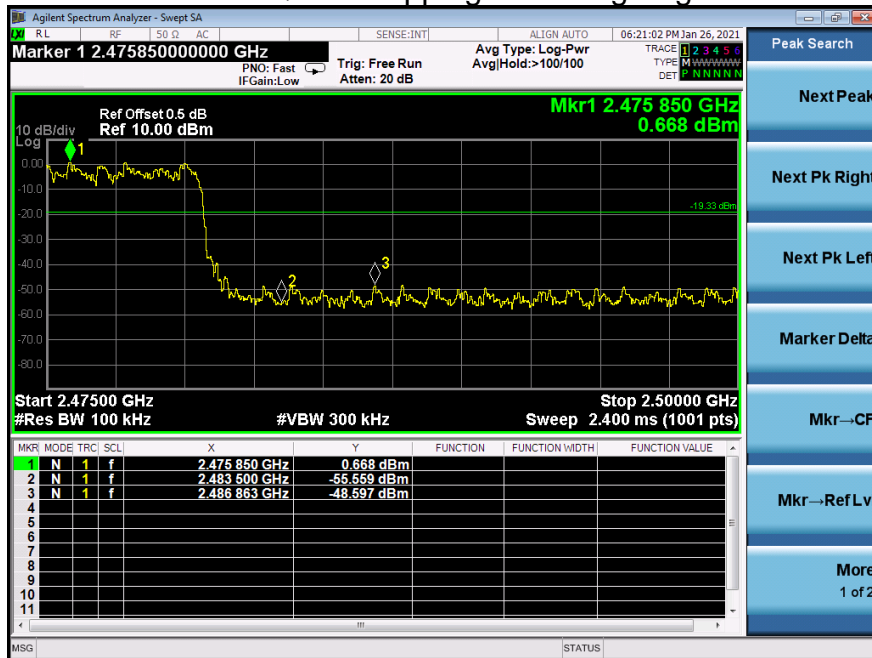
Pi/4 DQPSK Hopping Band edge-left side



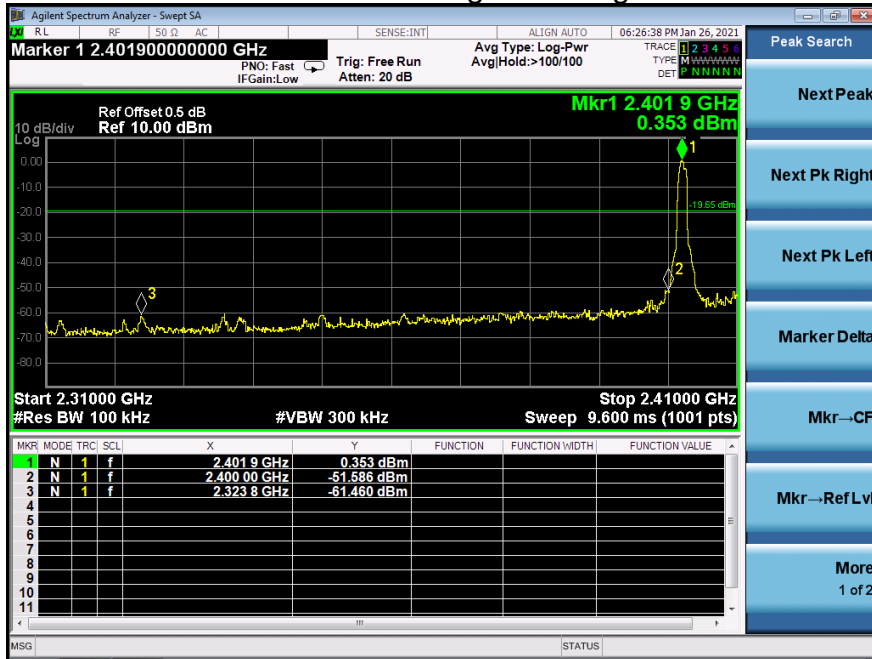
Pi/4 DQPSK Transmitting Band edge-right side



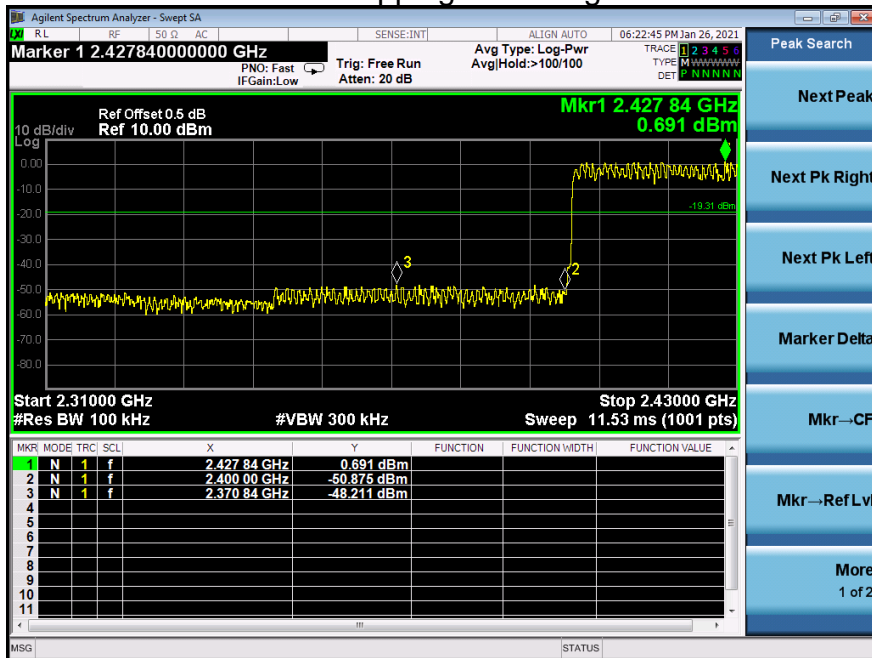
Pi/4 DQPSK Hopping Band edge-right side



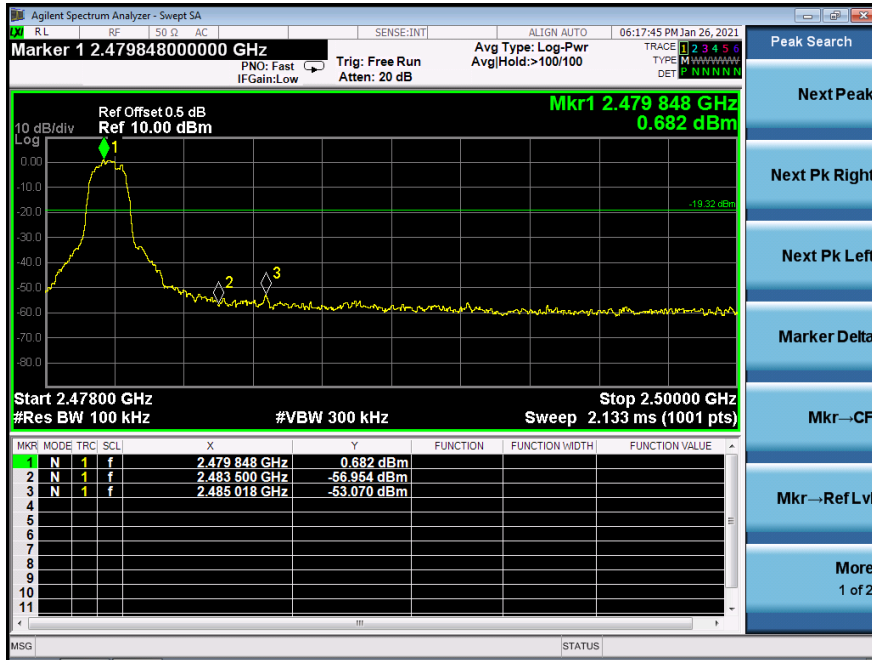
8DPSK Transmitting Band edge-left side



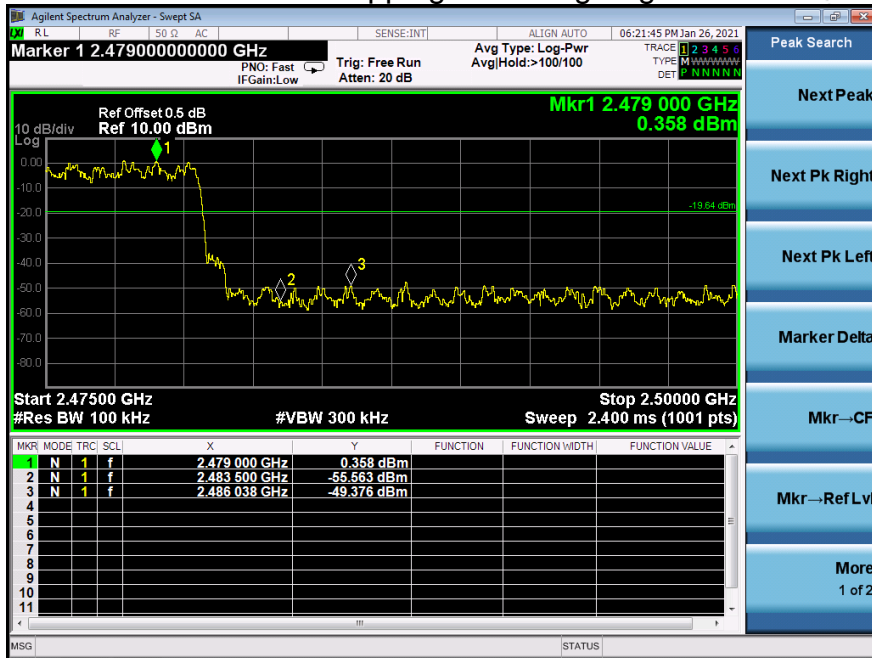
8DPSK Hopping Band edge-left side



8DPSK Transmitting Band edge-right side

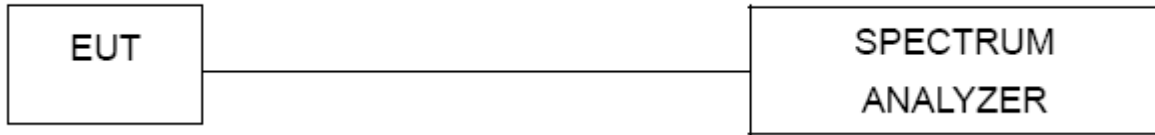


8DPSK Hopping Band edge-right side



10. 20 DB BANDWIDTH

10.1 Block Diagram Of Test Setup



10.2 Limit

N/A

10.3 Test procedure

1. Set RBW = 30kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. 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 6 dB relative to the maximum level measured in the fundamental emission. .

10.4 Test Result

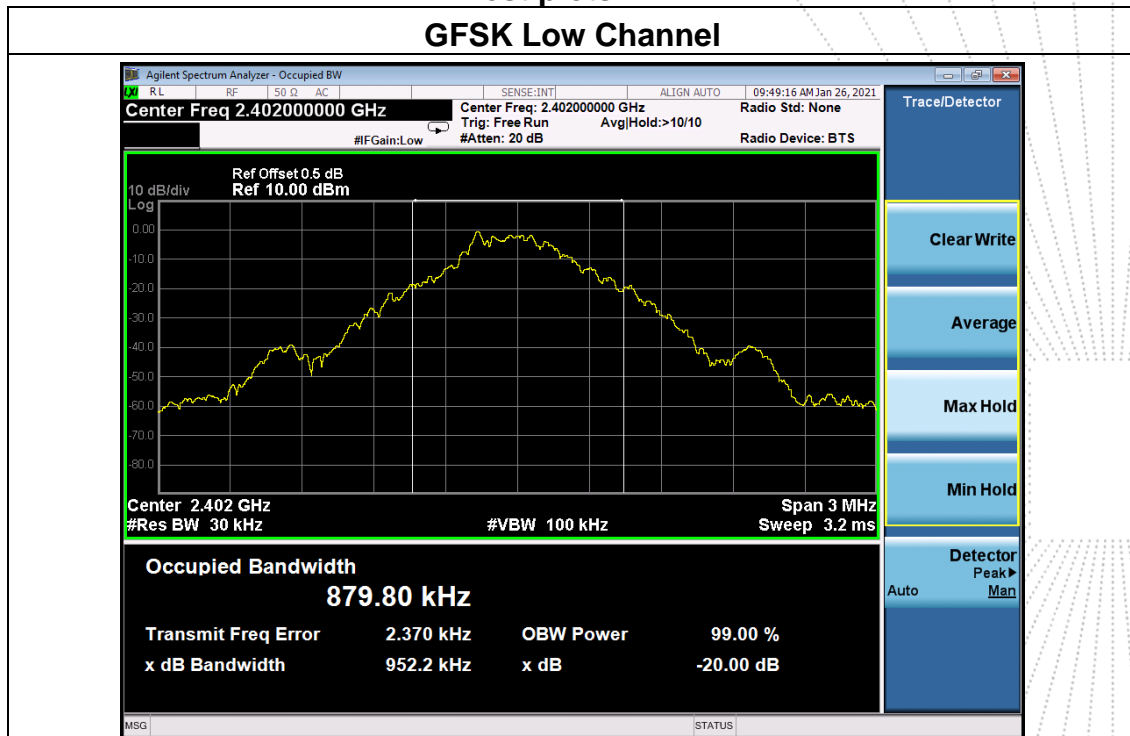
Temperature :	26°C	Relative Humidity :	54%
Test Voltage :	DC 3.7V	Remark	N/A

Left

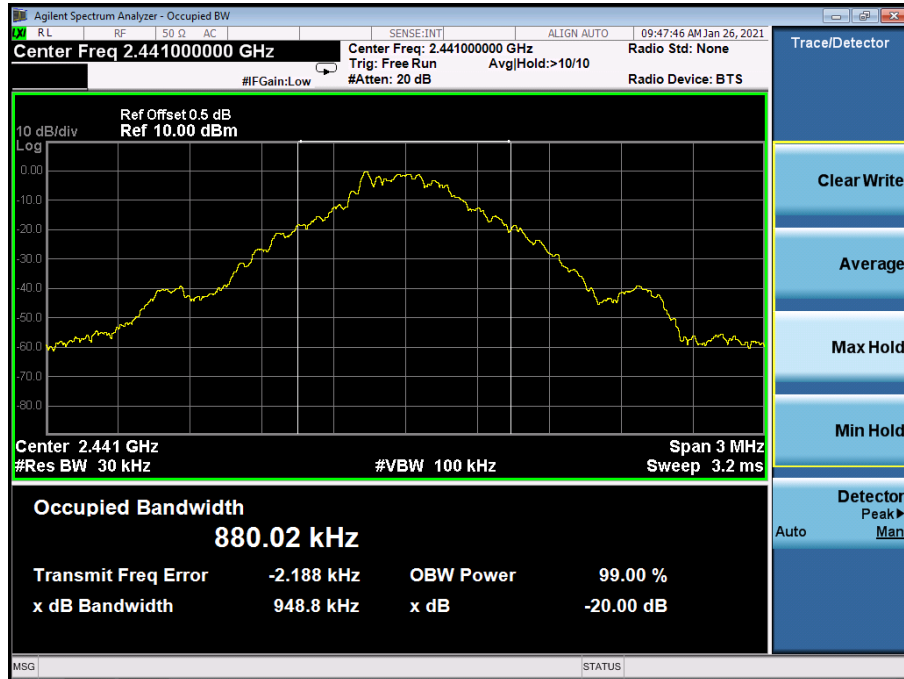
Modulation	Test Channel	Bandwidth(MHz)
GFSK	Low	0.952
GFSK	Middle	0.949
GFSK	High	0.953
Pi/4 DQPSK	Low	1.289
Pi/4 DQPSK	Middle	1.286
Pi/4 DQPSK	High	1.286
8DPSK	Low	1.294
8DPSK	Middle	1.285
8DPSK	High	1.300

Test plots

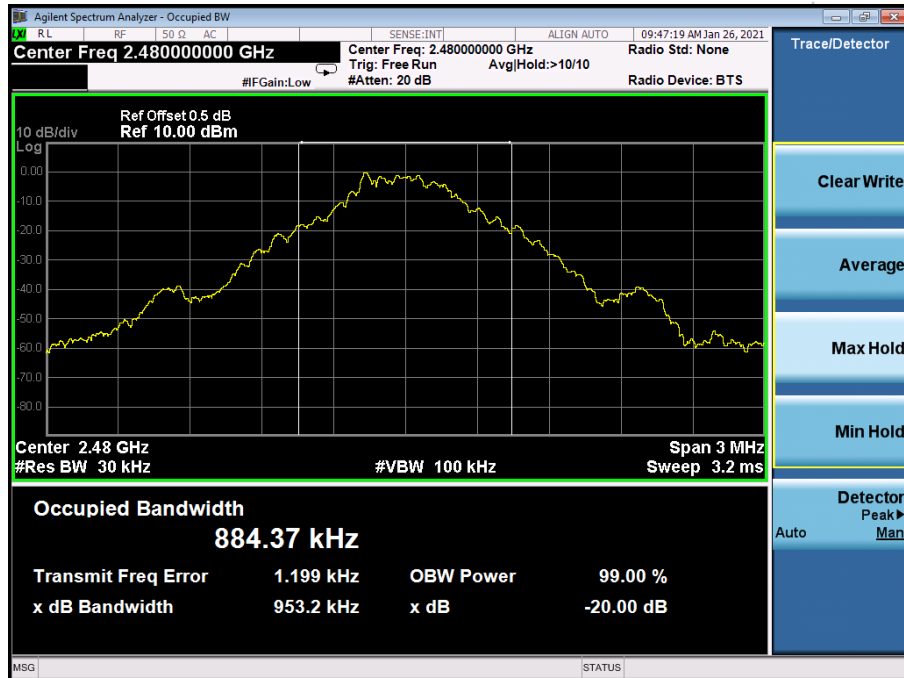
GFSK Low Channel

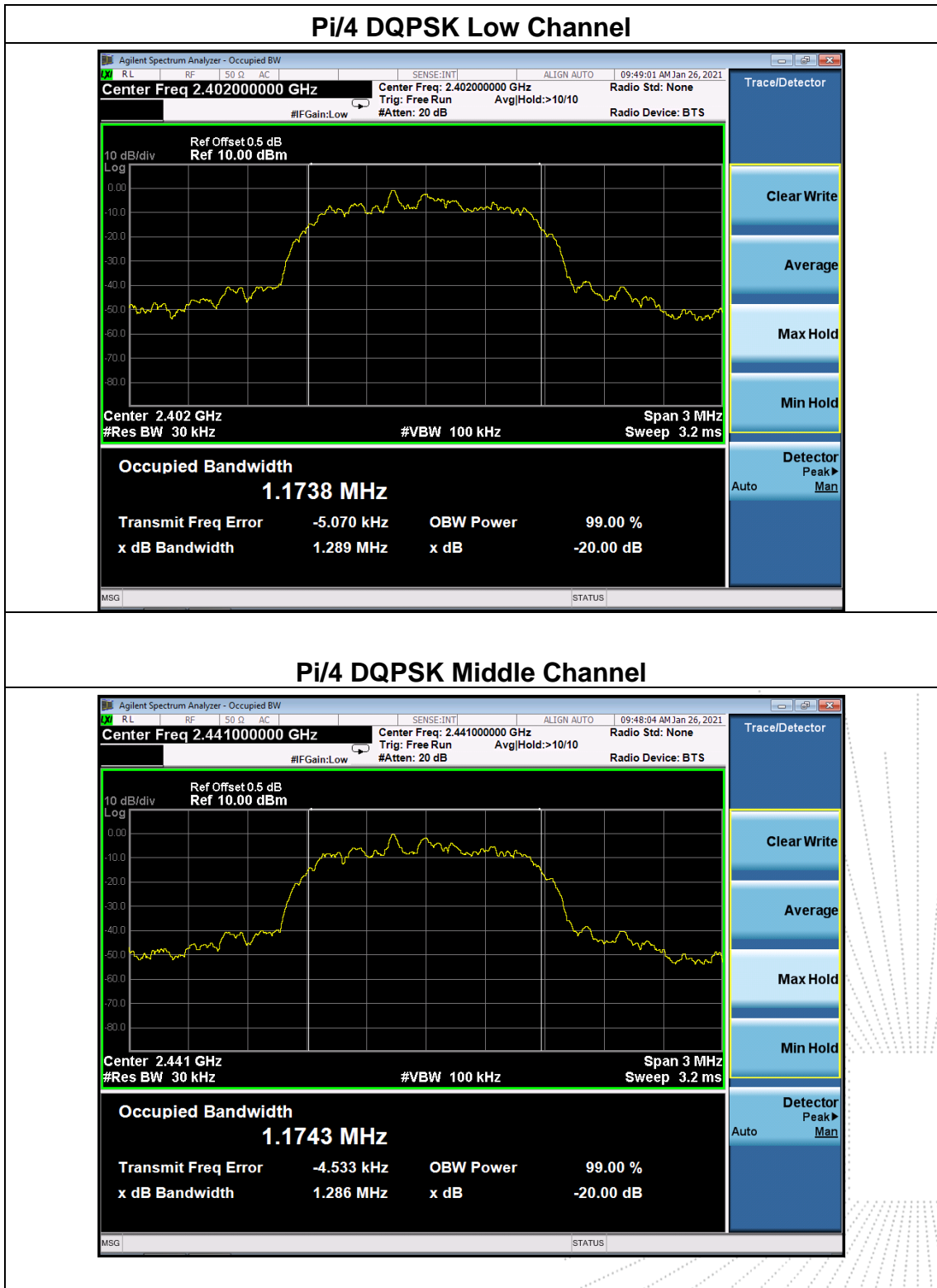


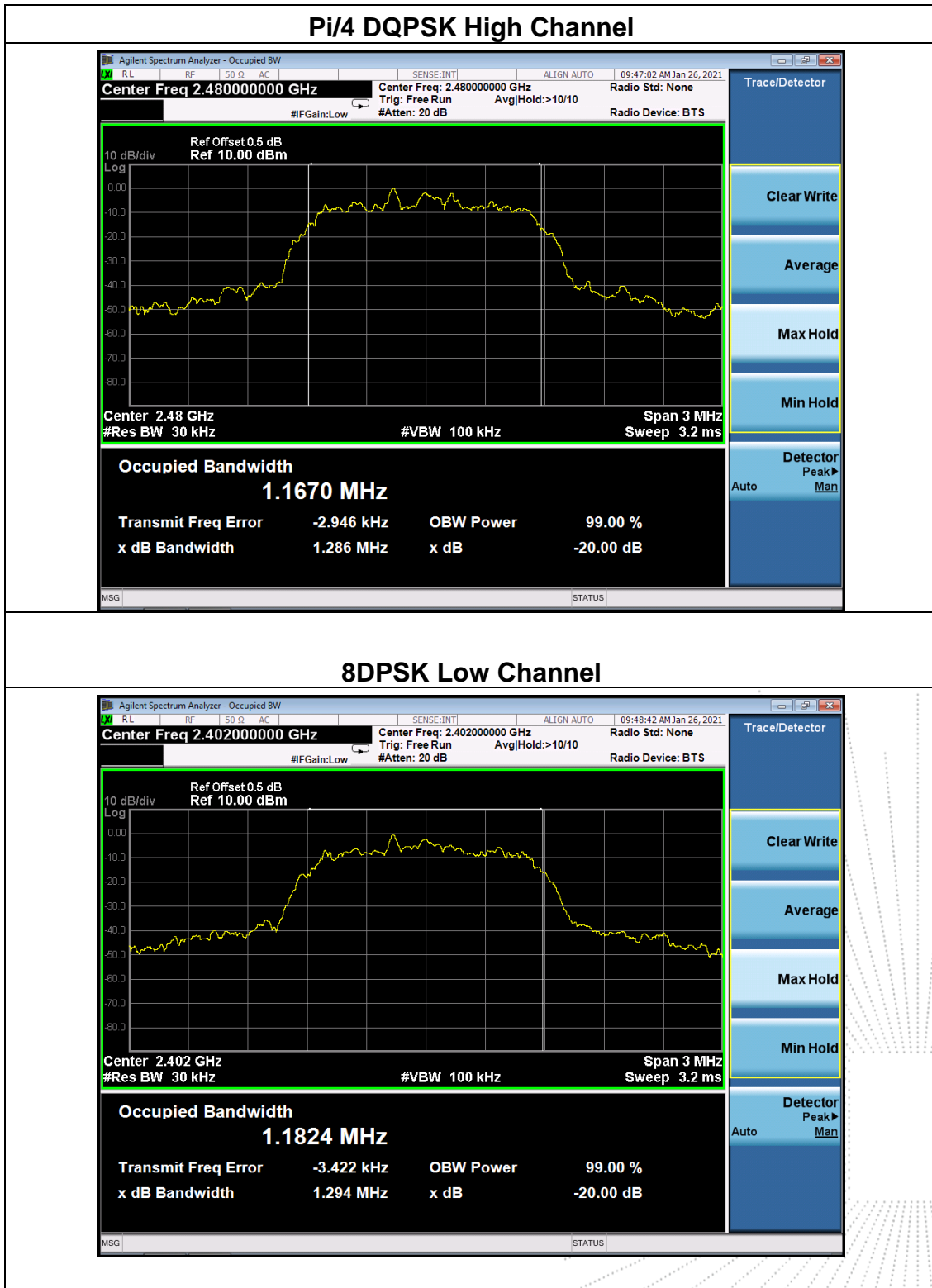
GFSK Middle Channel

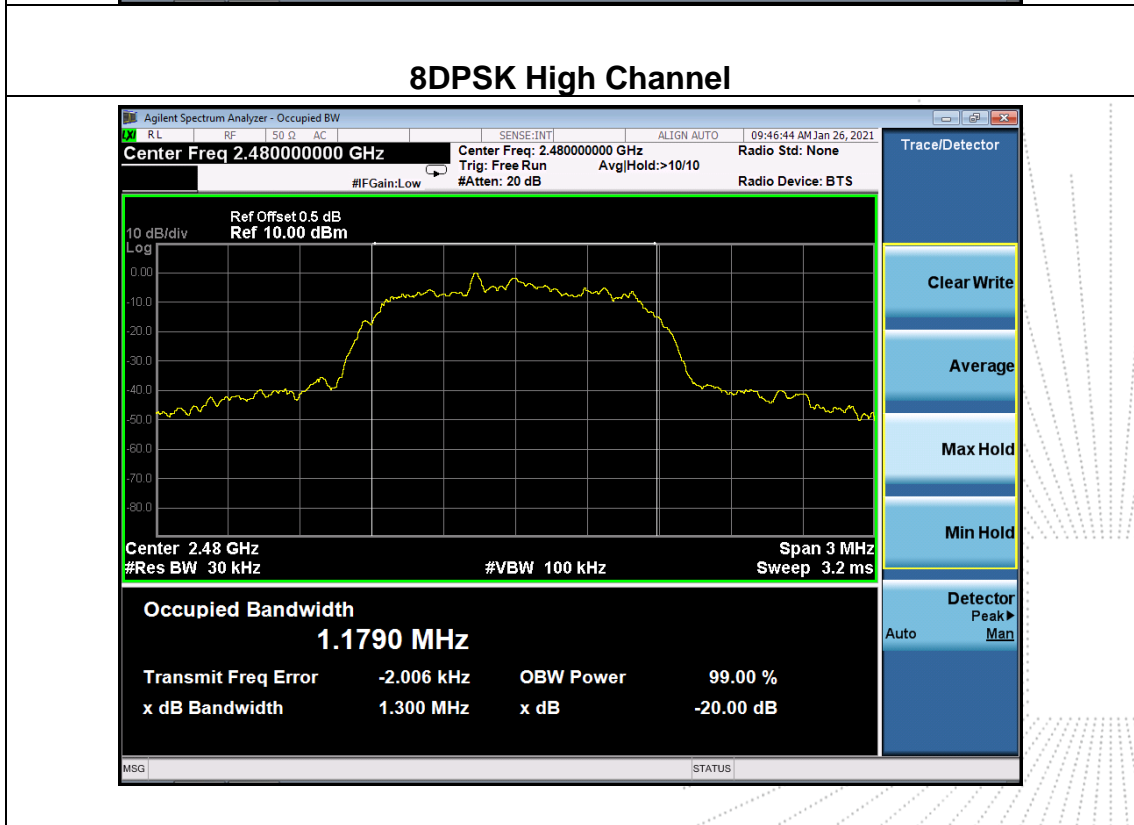
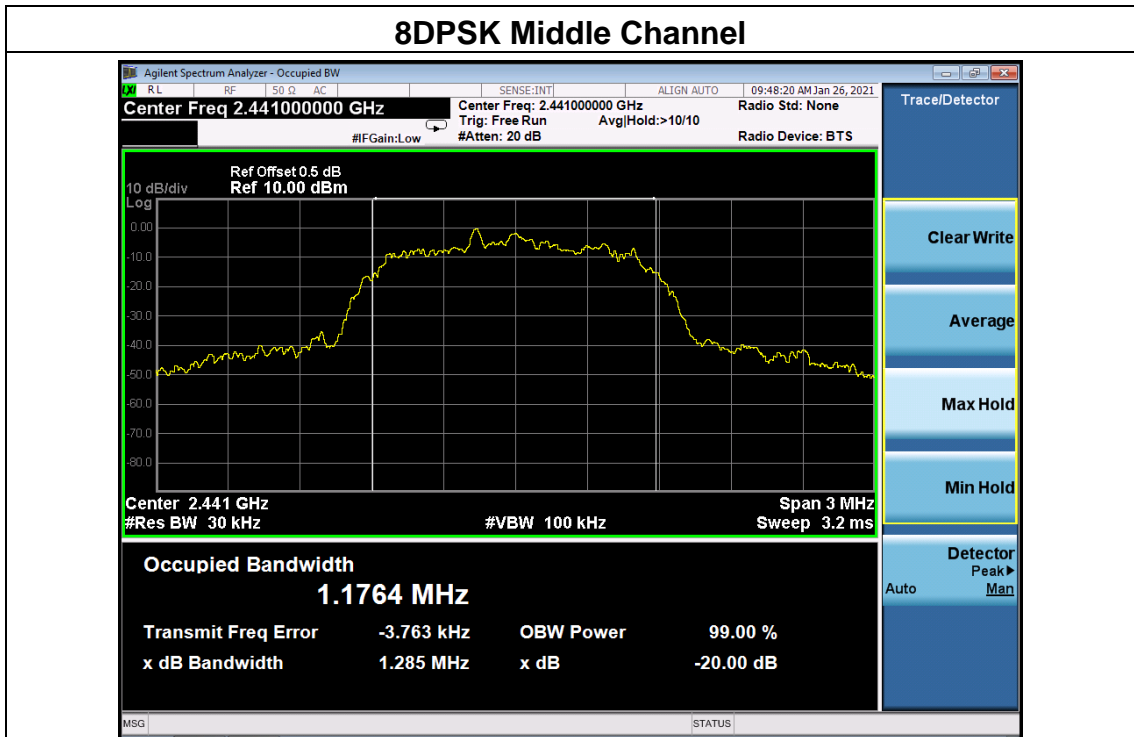


GFSK High Channel









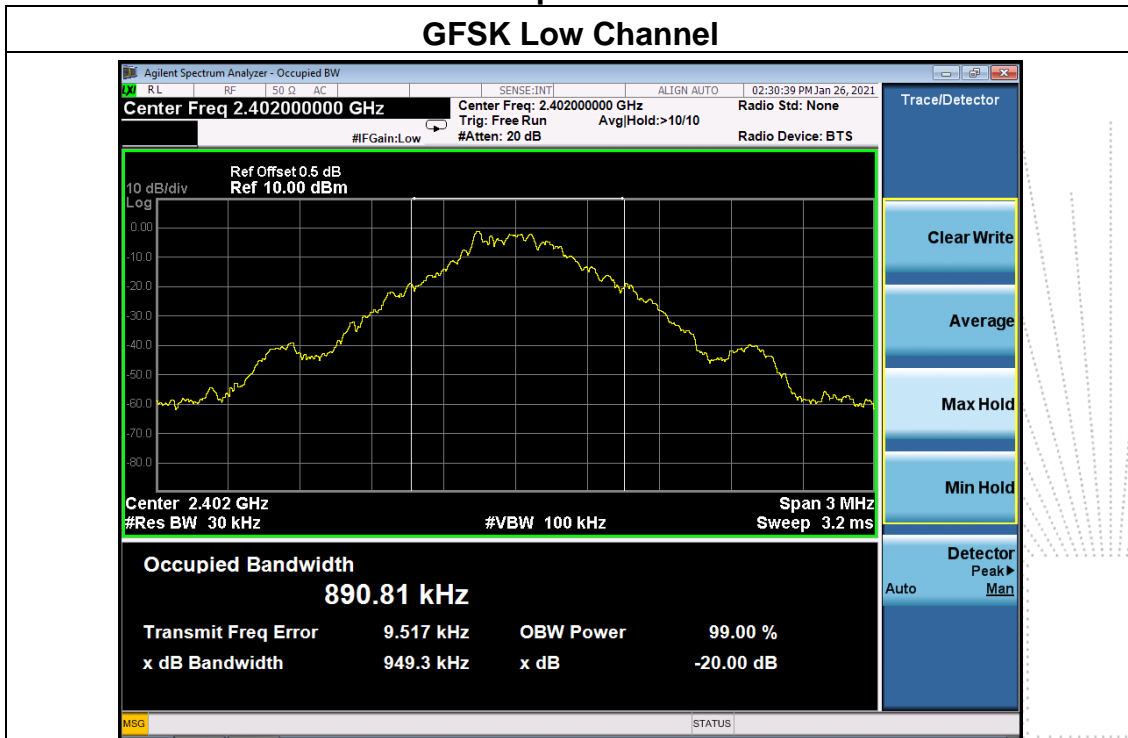


Right

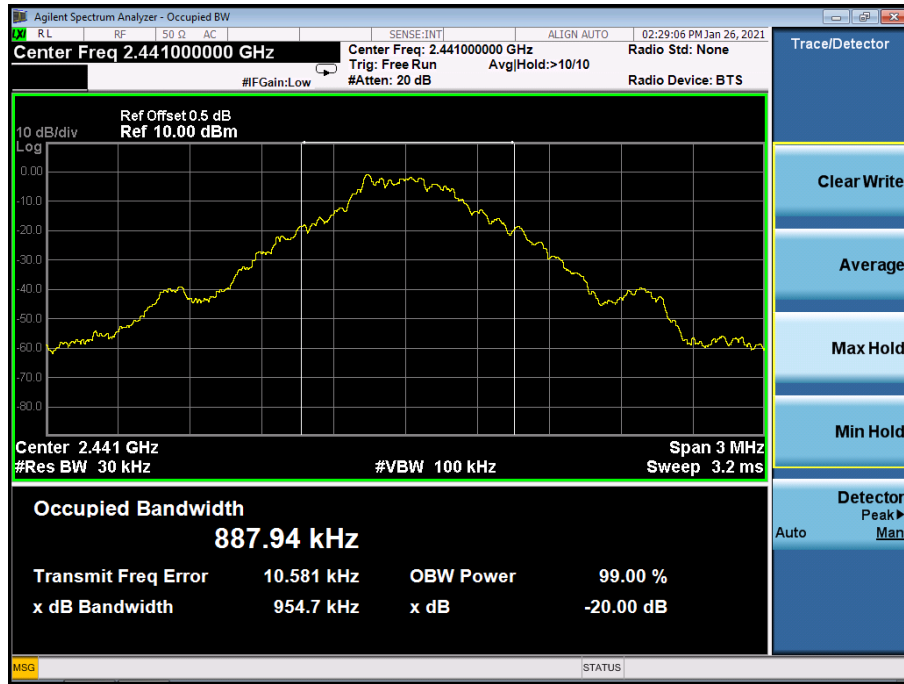
Modulation	Test Channel	Bandwidth(MHz)
GFSK	Low	0.949
GFSK	Middle	0.955
GFSK	High	0.952
Pi/4 DQPSK	Low	1.285
Pi/4 DQPSK	Middle	1.290
Pi/4 DQPSK	High	1.271
8DPSK	Low	1.295
8DPSK	Middle	1.297
8DPSK	High	1.298

Test plots

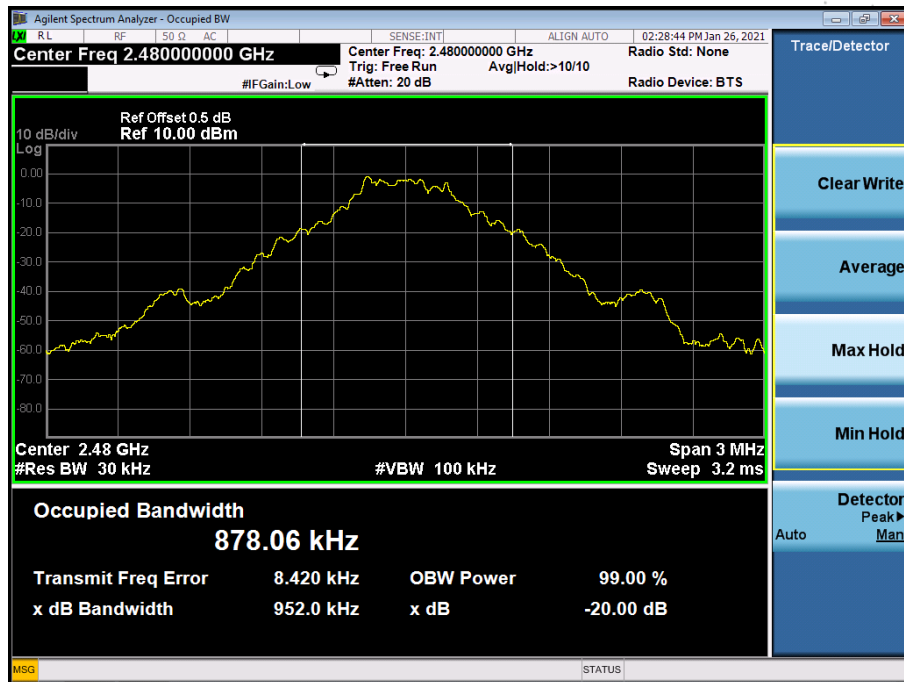
GFSK Low Channel

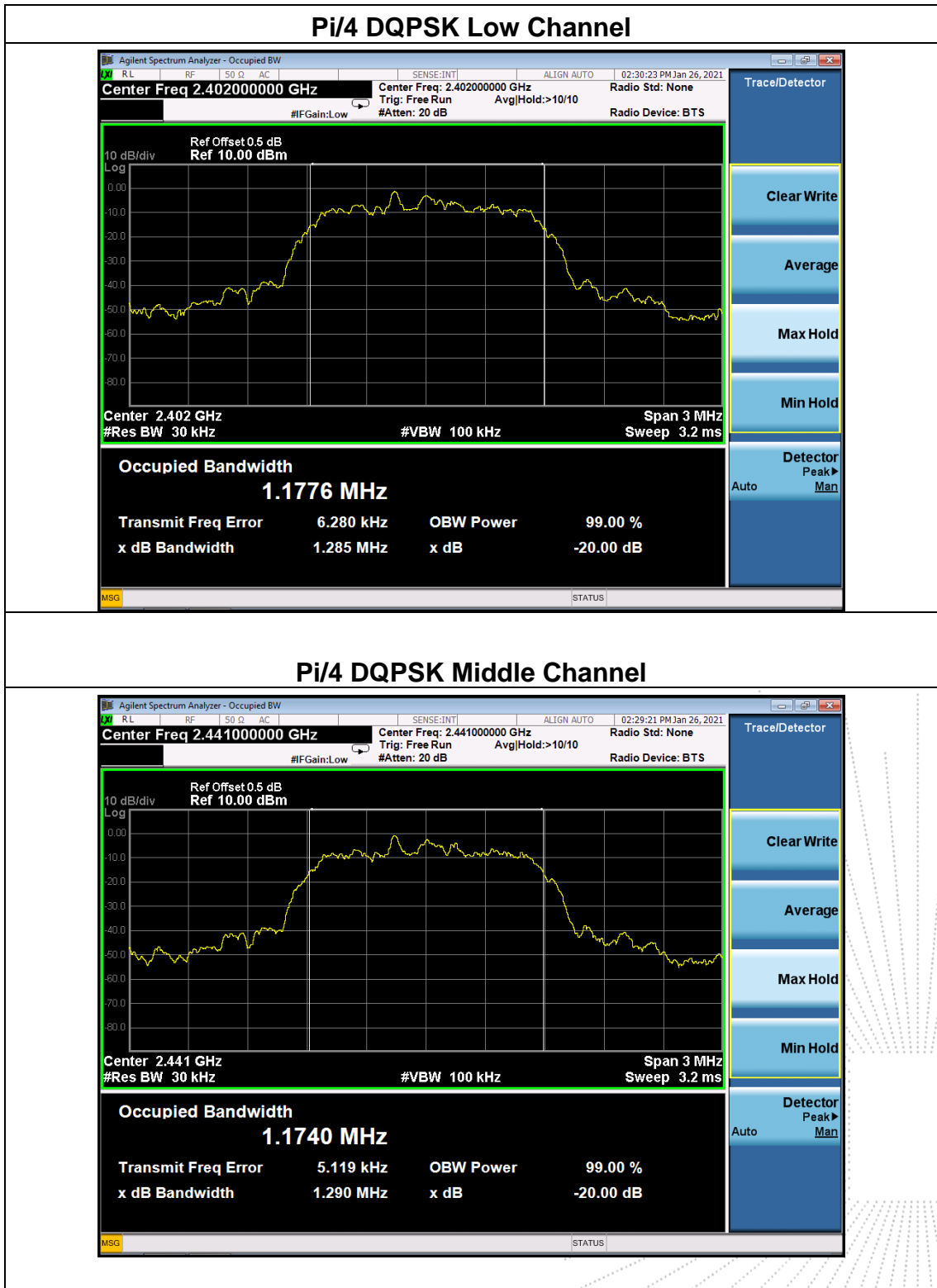


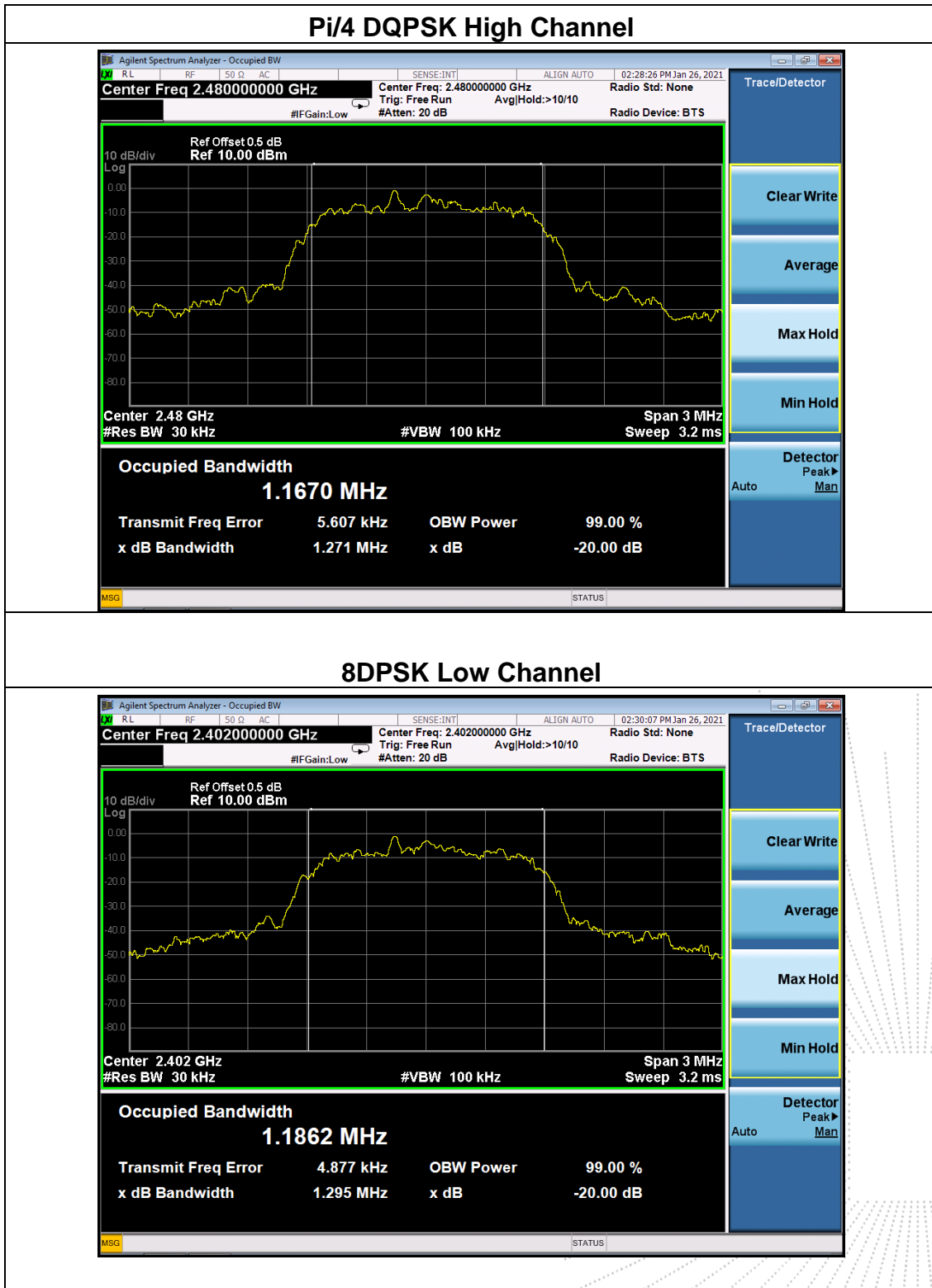
GFSK Middle Channel

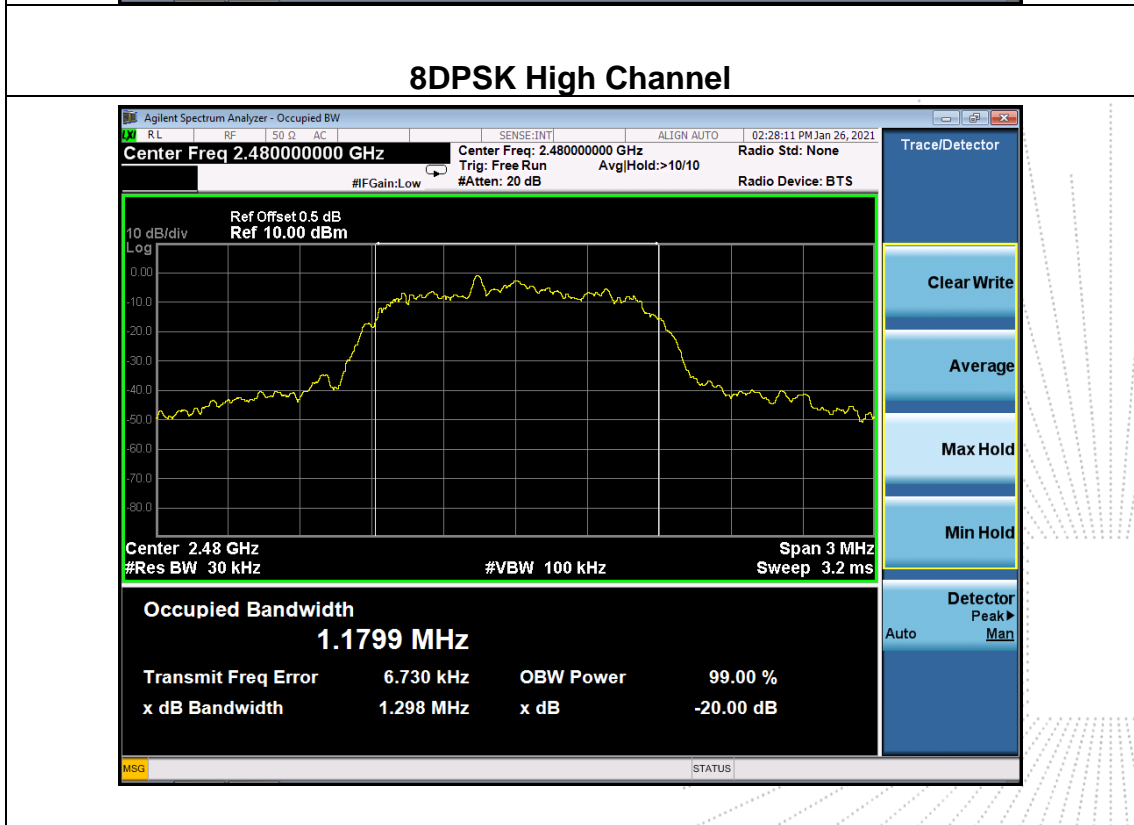
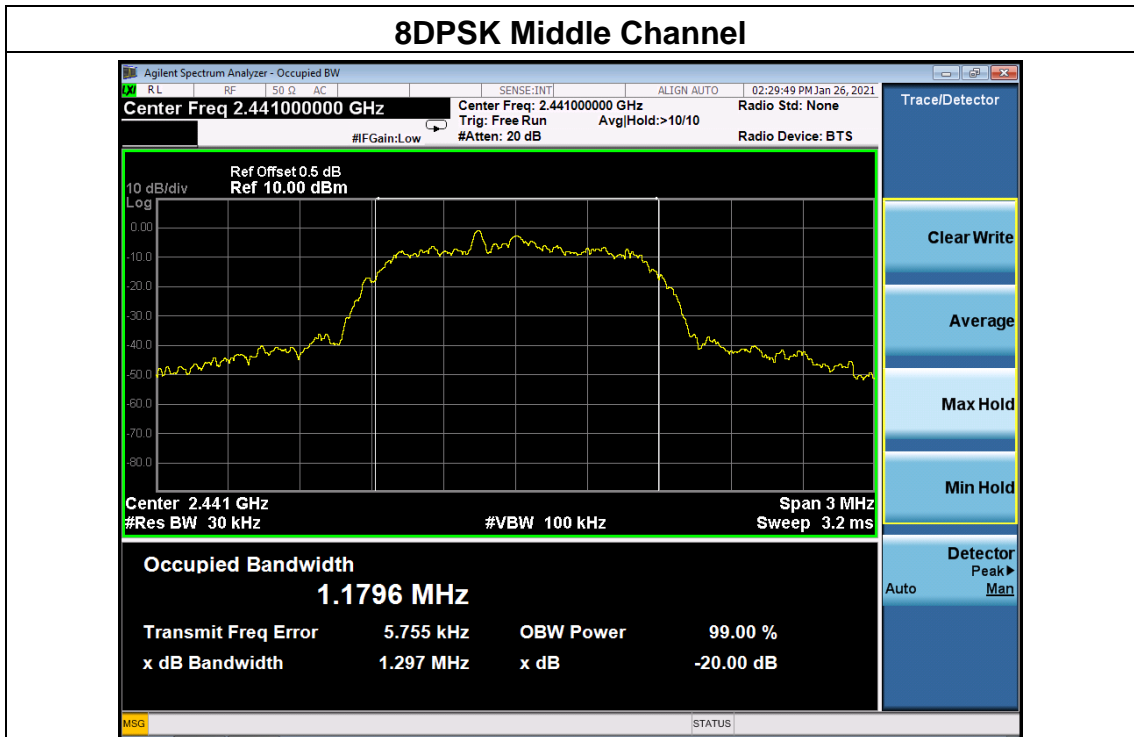


GFSK High Channel









11. MAXIMUM PEAK OUTPUT POWER

11.1 Block Diagram Of Test Setup

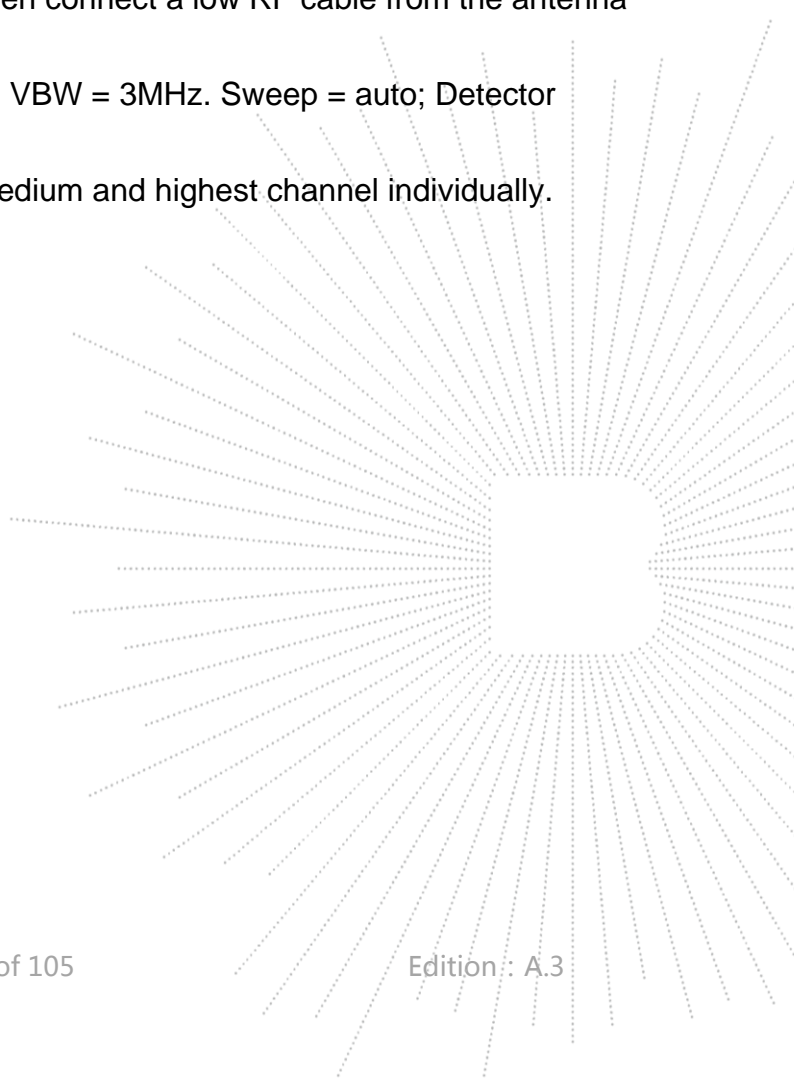


11.2 Limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1)	Peak Output Power	0.125 watt or 21dBm	2400-2483.5	PASS

11.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3MHz. VBW = 3MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.



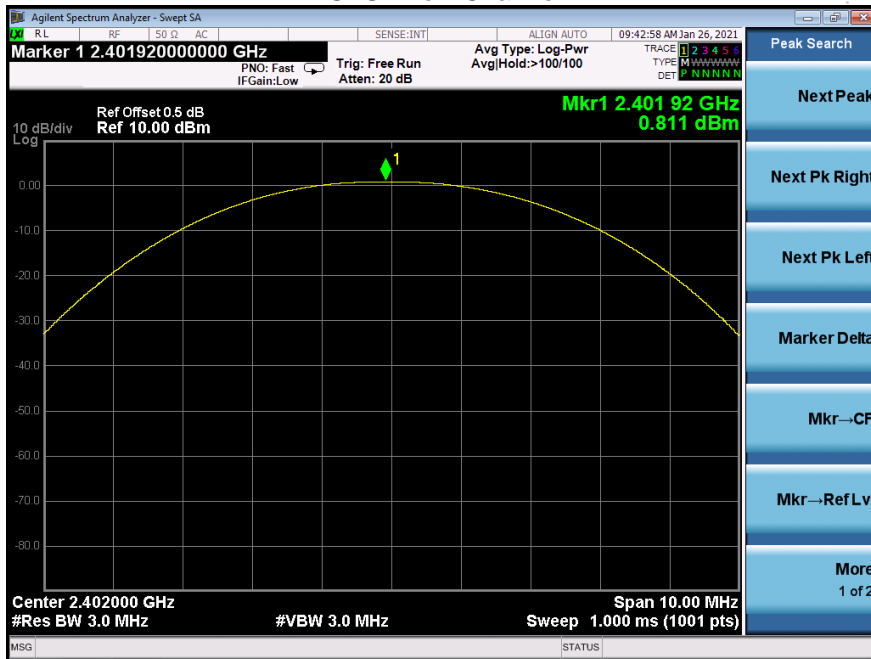
11.4 Test Result

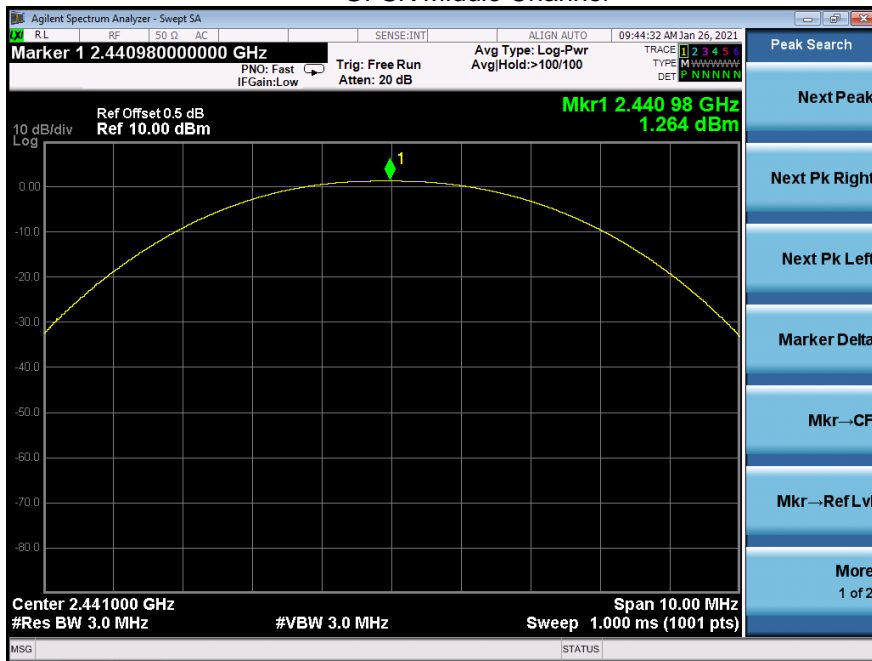
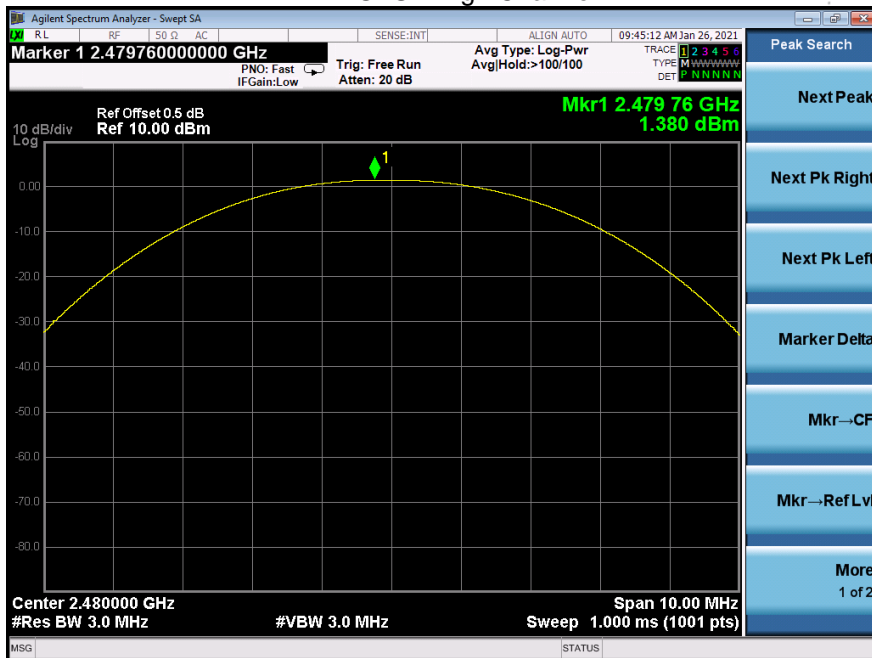
Temperature :	26°C	Relative Humidity :	54%
Test Voltage :	DC 3.7V	Remark:	N/A

Left

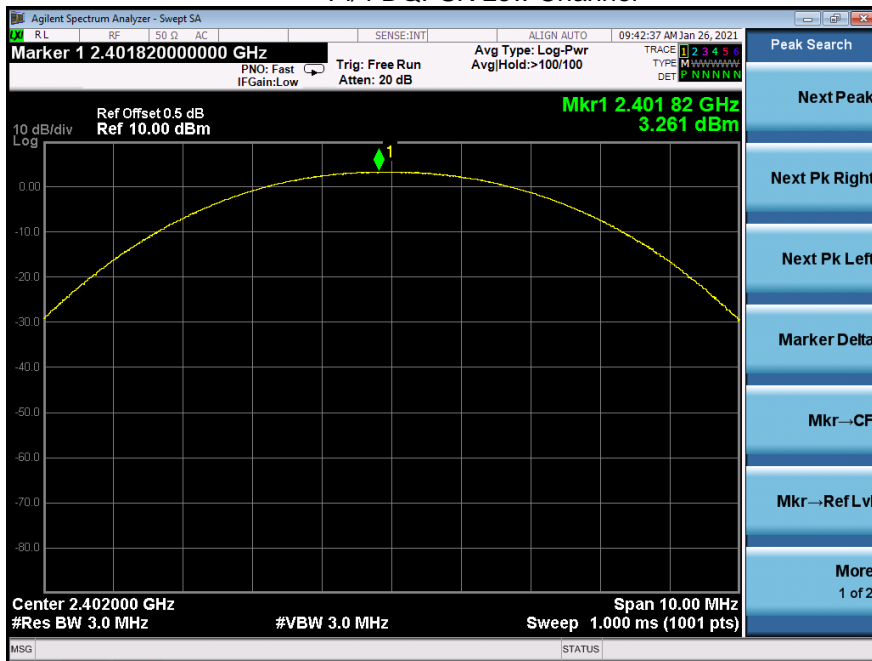
Modulation	Test Channel	Output Power (dBm)	Limit (dBm)
GFSK	Low	0.811	21
GFSK	Middle	1.264	21
GFSK	High	1.380	21
Pi/4 DQPSK	Low	3.261	21
Pi/4 DQPSK	Middle	3.699	21
Pi/4 DQPSK	High	3.803	21
8DPSK	Low	3.840	21
8DPSK	Middle	4.276	21
8DPSK	High	4.372	21

Test plots
GFSK Low Channel

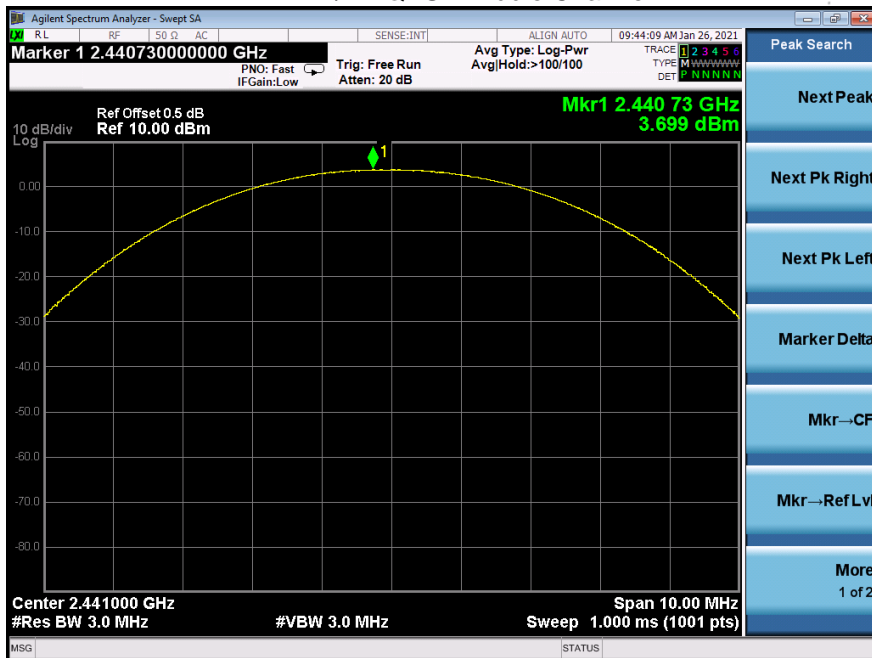


GFSK Middle Channel

GFSK High Channel


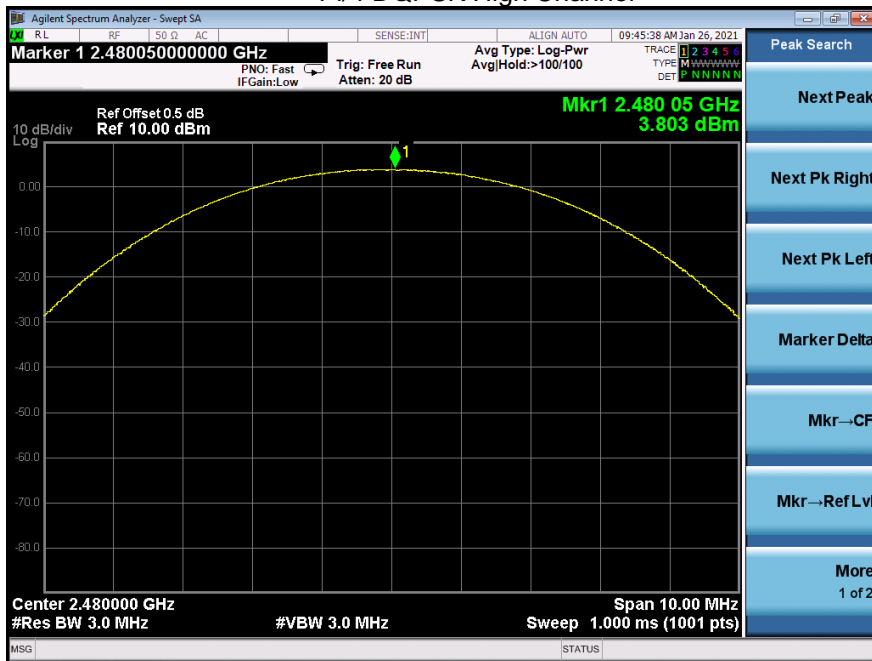
Pi/4 DQPSK Low Channel



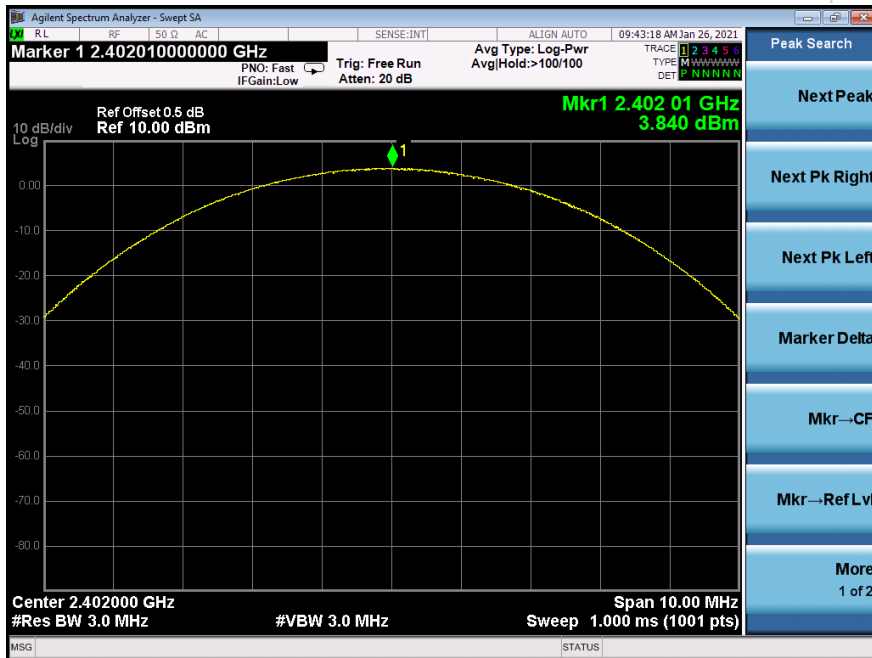
Pi/4 DQPSK Middle Channel

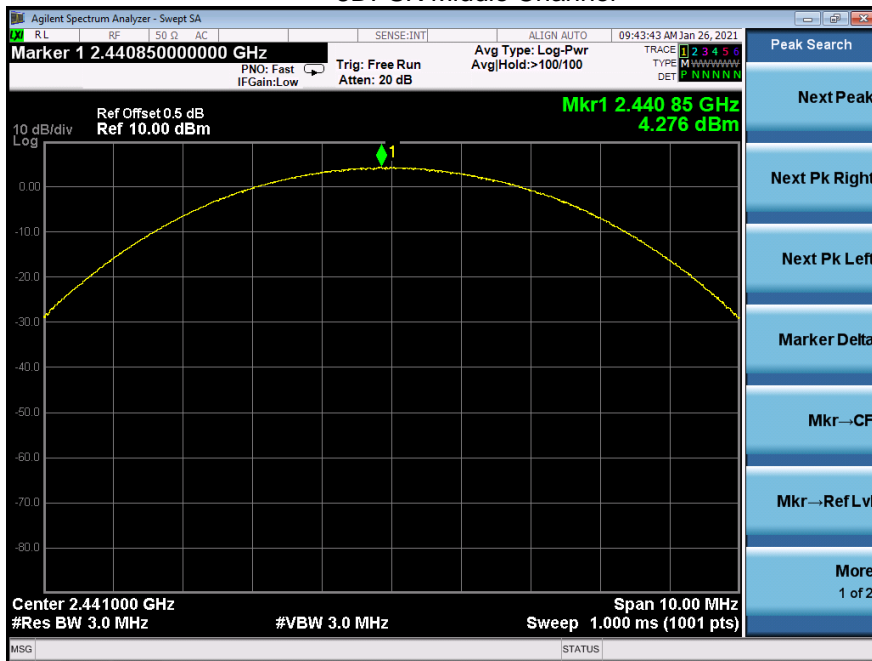
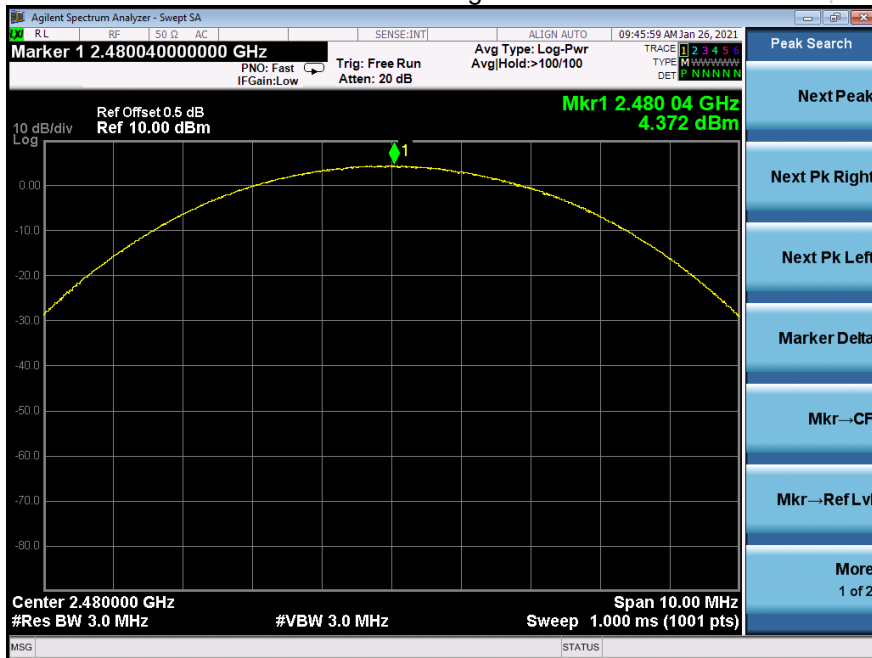


Pi/4 DQPSK High Channel



8DPSK Low Channel

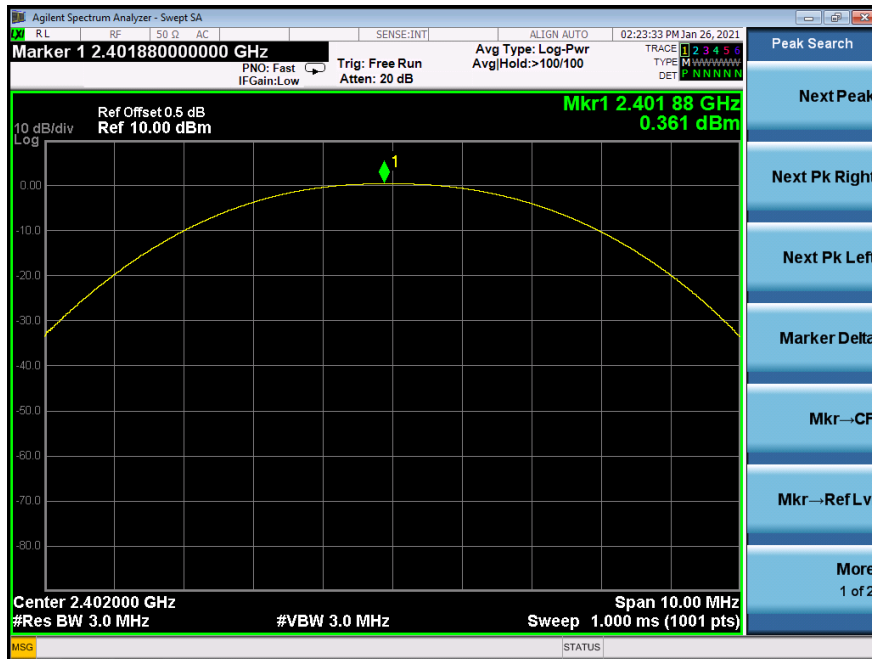


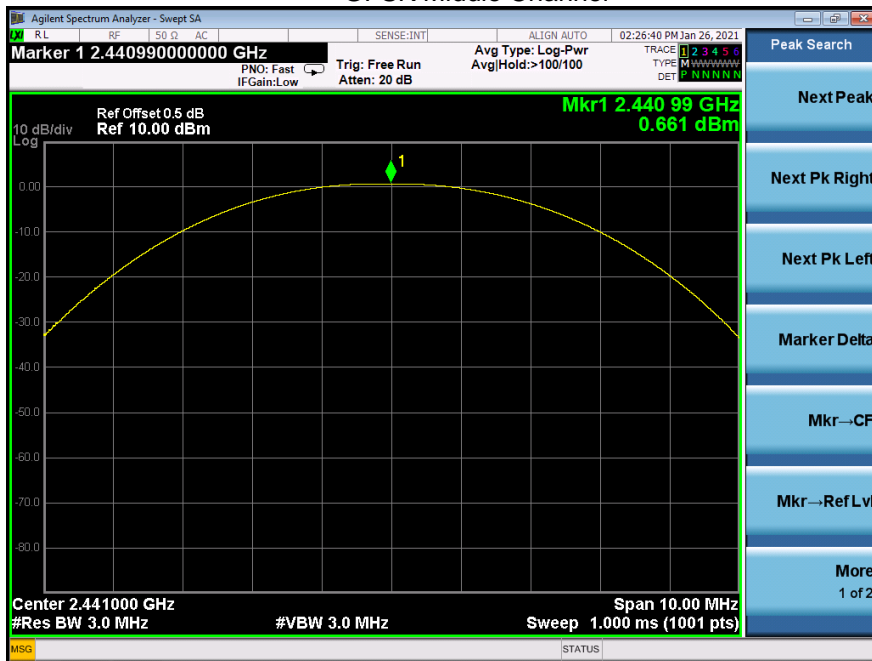
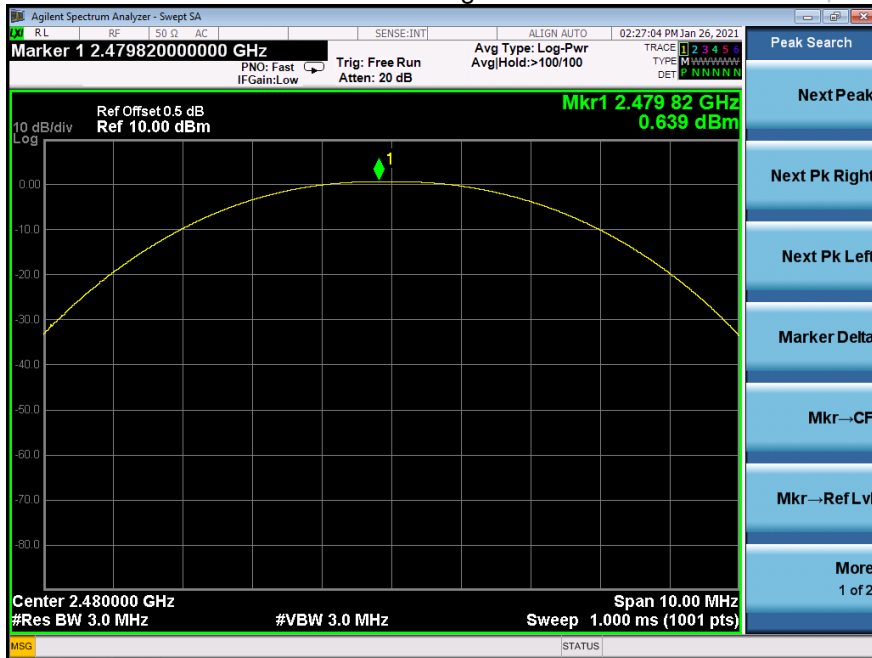
8DPSK Middle Channel

8DPSK High Channel


Right

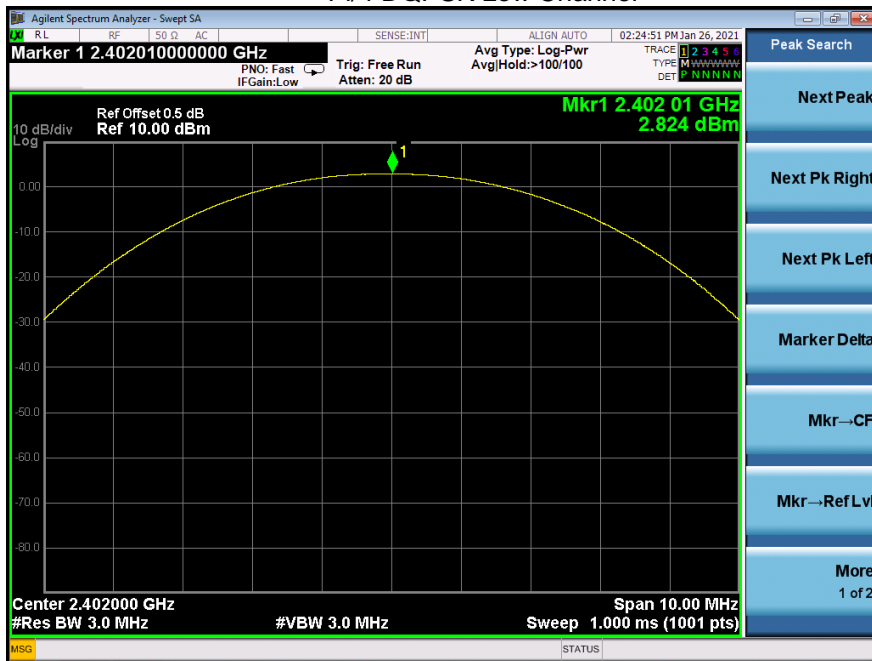
Modulation	Test Channel	Output Power (dBm)	Limit (dBm)
GFSK	Low	0.361	21
GFSK	Middle	0.661	21
GFSK	High	0.639	21
Pi/4 DQPSK	Low	2.824	21
Pi/4 DQPSK	Middle	3.139	21
Pi/4 DQPSK	High	3.091	21
8DPSK	Low	3.357	21
8DPSK	Middle	3.705	21
8DPSK	High	3.669	21

Test plots
GFSK Low Channel

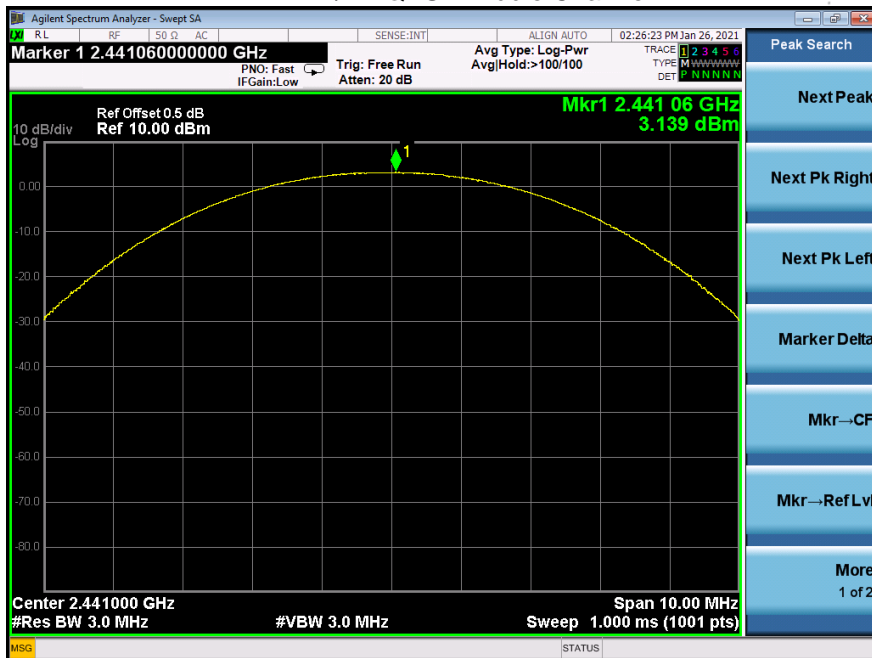


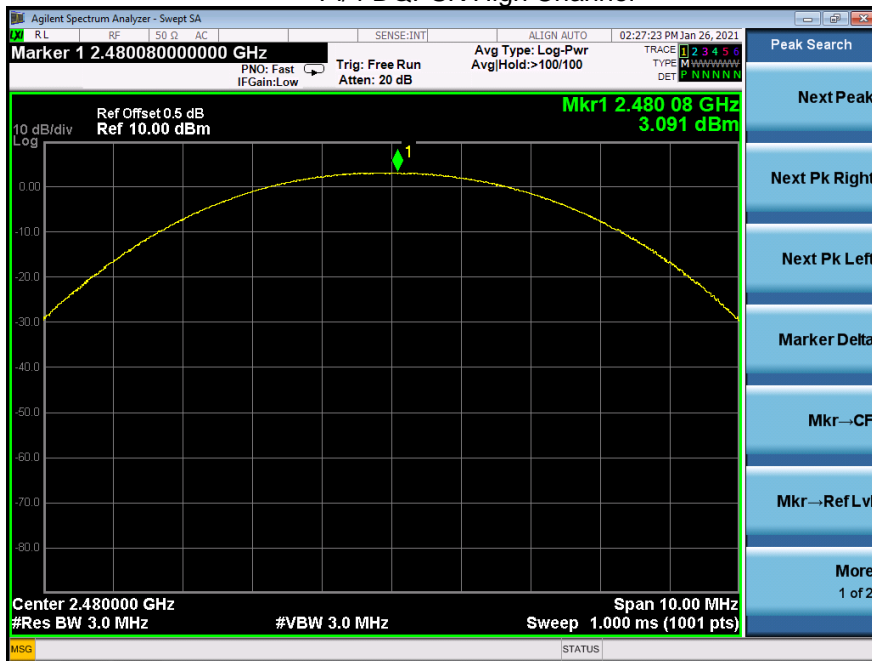
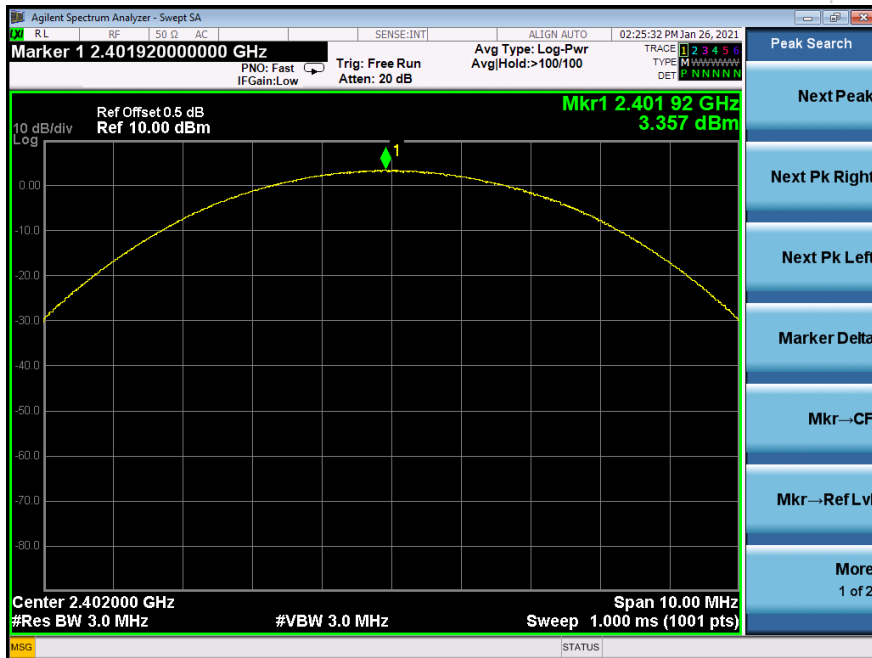
GFSK Middle Channel

GFSK High Channel


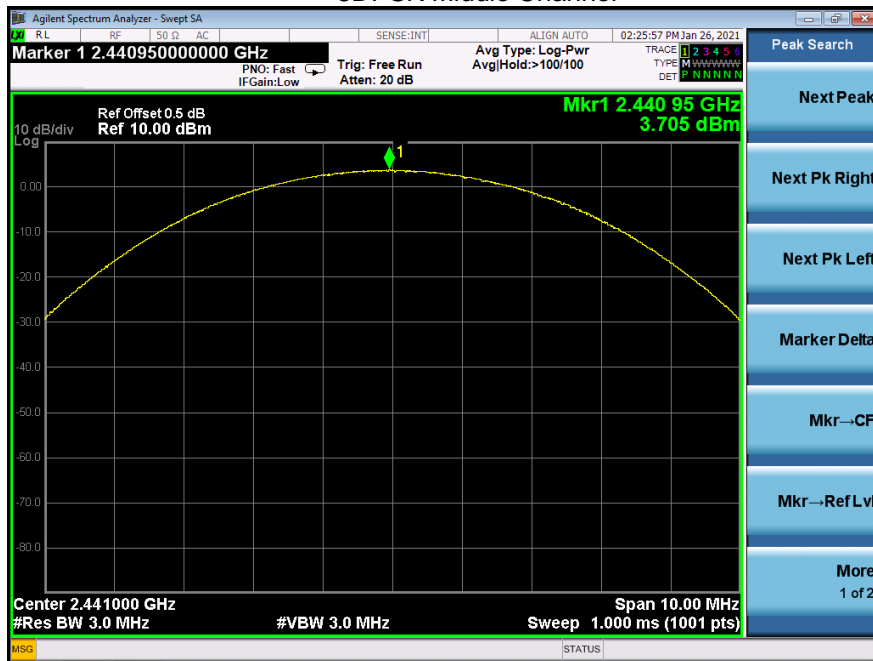
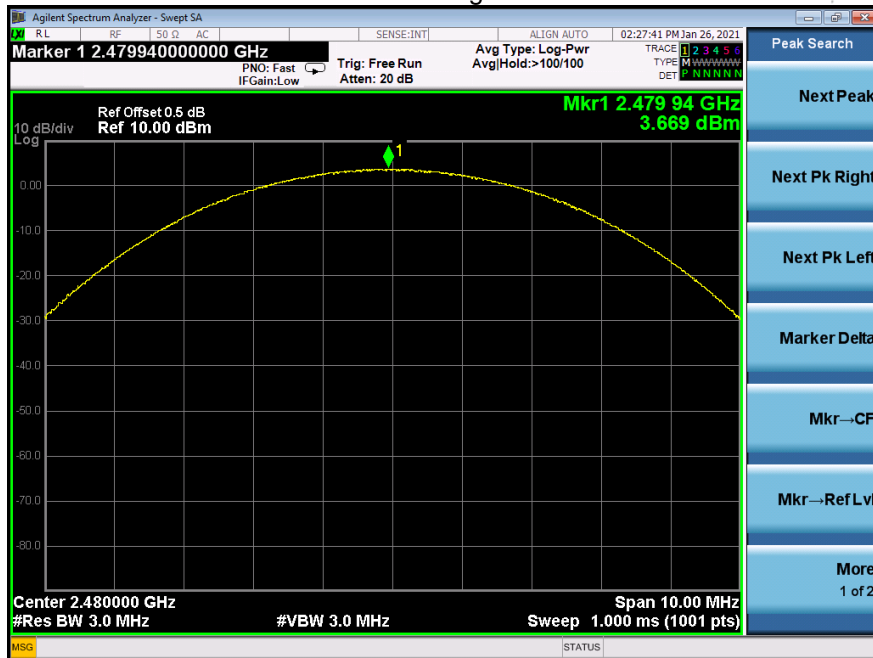
Pi/4 DQPSK Low Channel



Pi/4 DQPSK Middle Channel



Pi/4 DQPSK High Channel

8DPSK Low Channel


8DPSK Middle Channel

8DPSK High Channel


12. HOPPING CHANNEL SEPARATION

12.1 Block Diagram Of Test Setup



12.2 Limit

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 0.125W.

12.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 2.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

12.4 Test Result

Left

Modulation	Test Channel	Separation (MHz)	Limit(MHz)	Result
GFSK	Low	0.998	0.635	PASS
GFSK	Middle	1.000	0.633	PASS
GFSK	High	1.004	0.635	PASS
Pi/4 DQPSK	Low	1.002	0.859	PASS
Pi/4 DQPSK	Middle	0.992	0.857	PASS
Pi/4 DQPSK	High	1.004	0.857	PASS
8DPSK	Low	0.996	0.863	PASS
8DPSK	Middle	0.998	0.857	PASS
8DPSK	High	0.996	0.867	PASS

Test plots GFSK Low Channel



GFSK Middle Channel



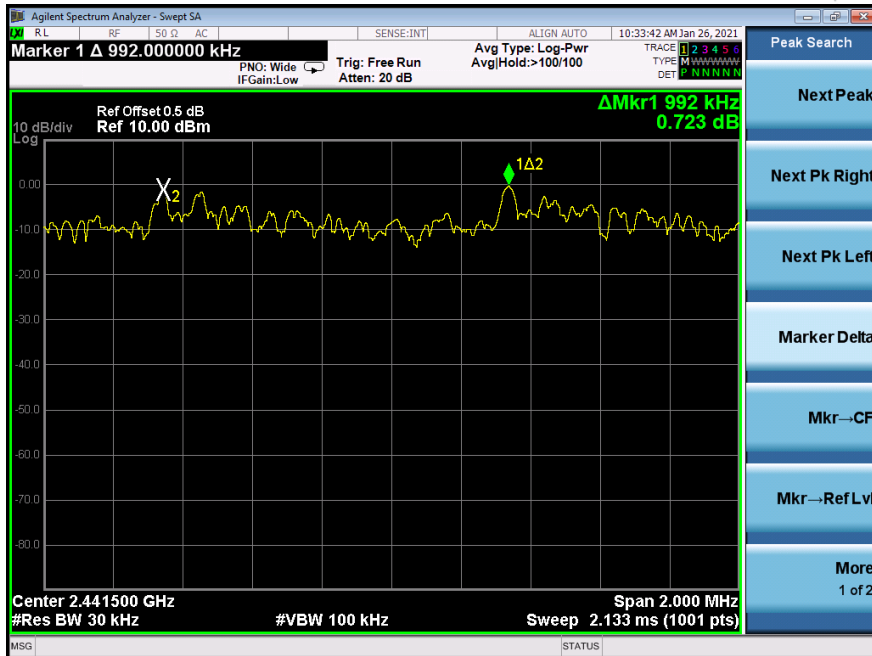
GFSK High Channel



Pi/4 DQPSK Low Channel



Pi/4 DQPSK Middle Channel



Pi/4 DQPSK High Channel



8DPSK Low Channel



8DPSK Middle Channel



8DPSK High Channel



Right

Modulation	Test Channel	Separation (MHz)	Limit(MHz)	Result
GFSK	Low	1.000	0.633	PASS
GFSK	Middle	0.994	0.637	PASS
GFSK	High	1.000	0.635	PASS
Pi/4 DQPSK	Low	0.998	0.857	PASS
Pi/4 DQPSK	Middle	1.000	0.860	PASS
Pi/4 DQPSK	High	1.002	0.847	PASS
8DPSK	Low	0.998	0.863	PASS
8DPSK	Middle	1.000	0.865	PASS
8DPSK	High	0.994	0.865	PASS

Test plots GFSK Low Channel



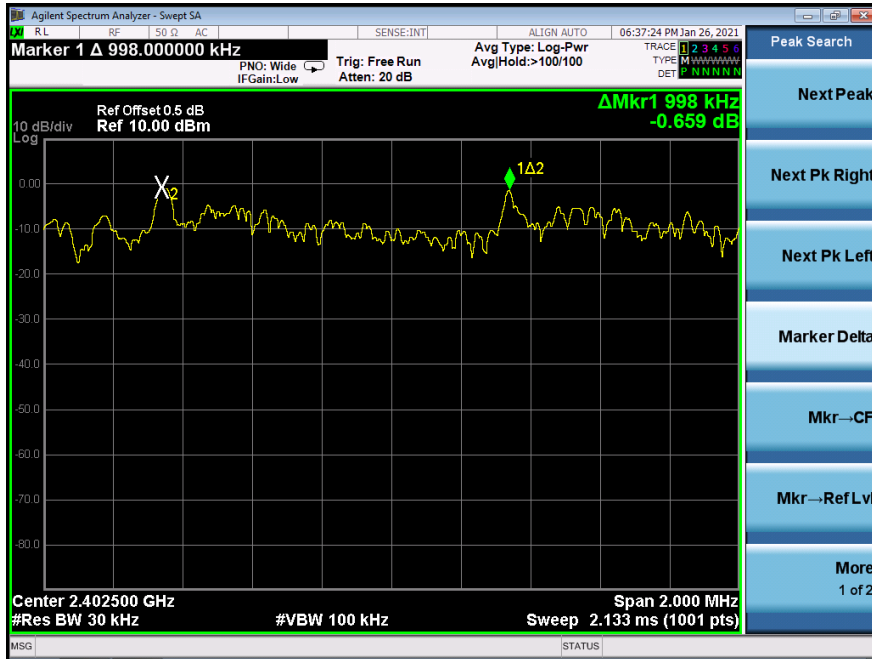
GFSK Middle Channel



GFSK High Channel



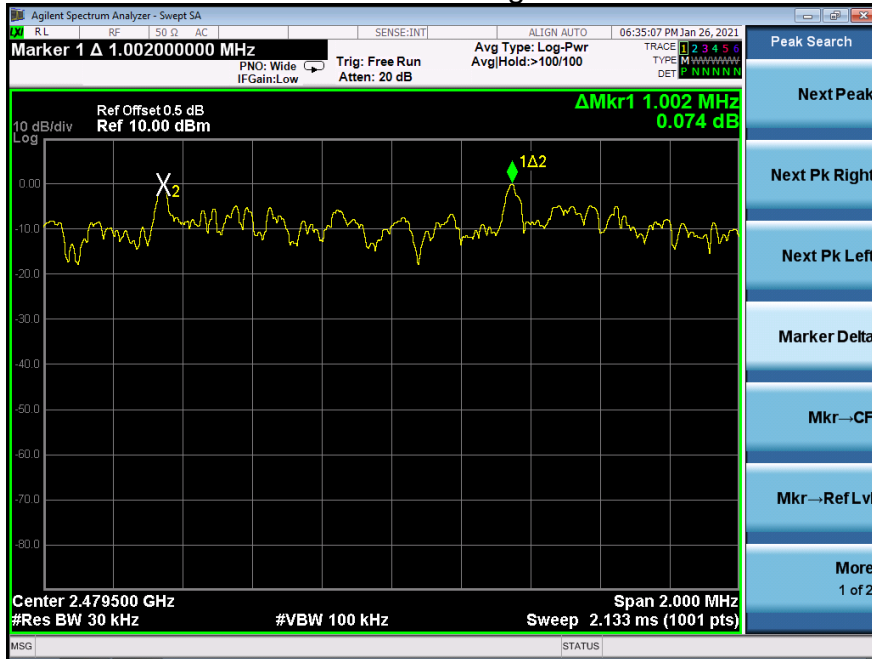
Pi/4 DQPSK Low Channel



Pi/4 DQPSK Middle Channel



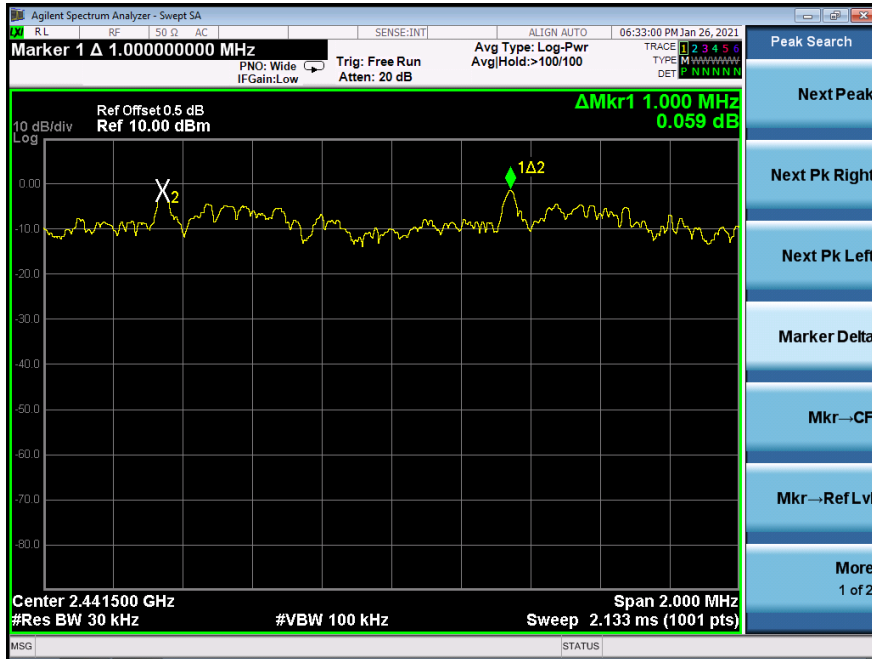
Pi/4 DQPSK High Channel



8DPSK Low Channel



8DPSK Middle Channel

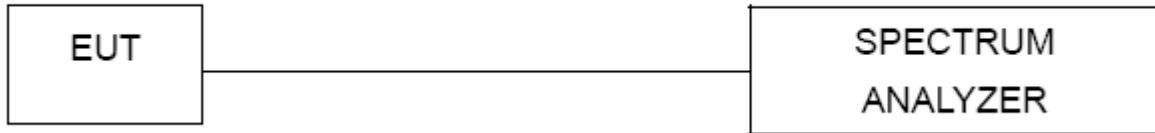


8DPSK High Channel



13. NUMBER OF HOPPING FREQUENCY

13.1 Block Diagram Of Test Setup



13.2 Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

13.3 Test procedure

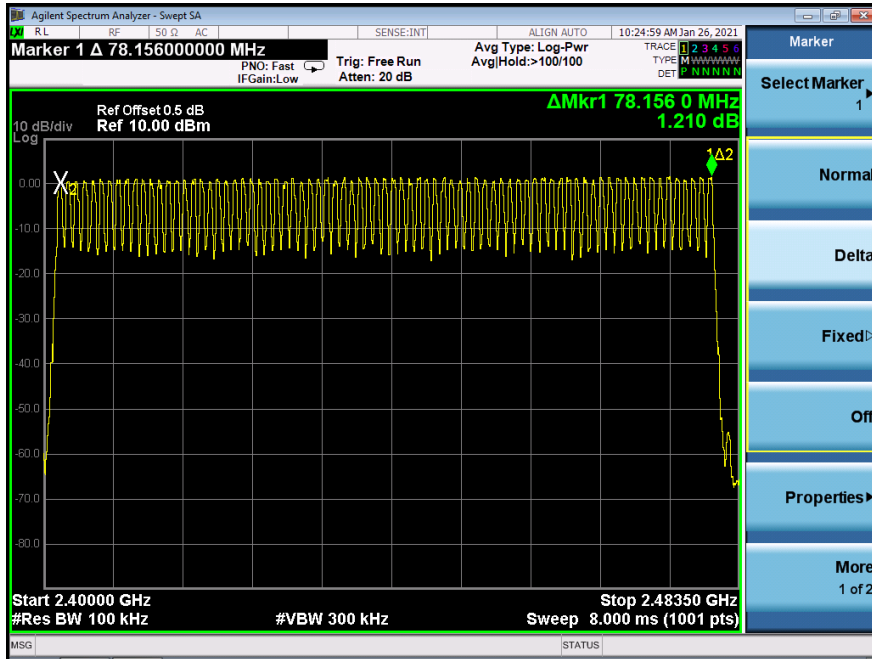
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

13.4 Test Result

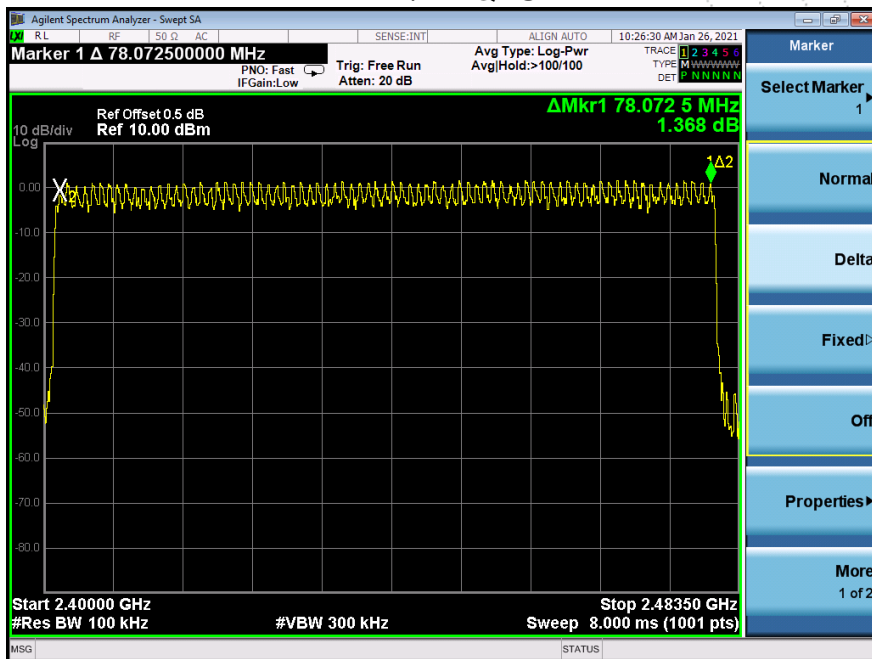
Test Plots:

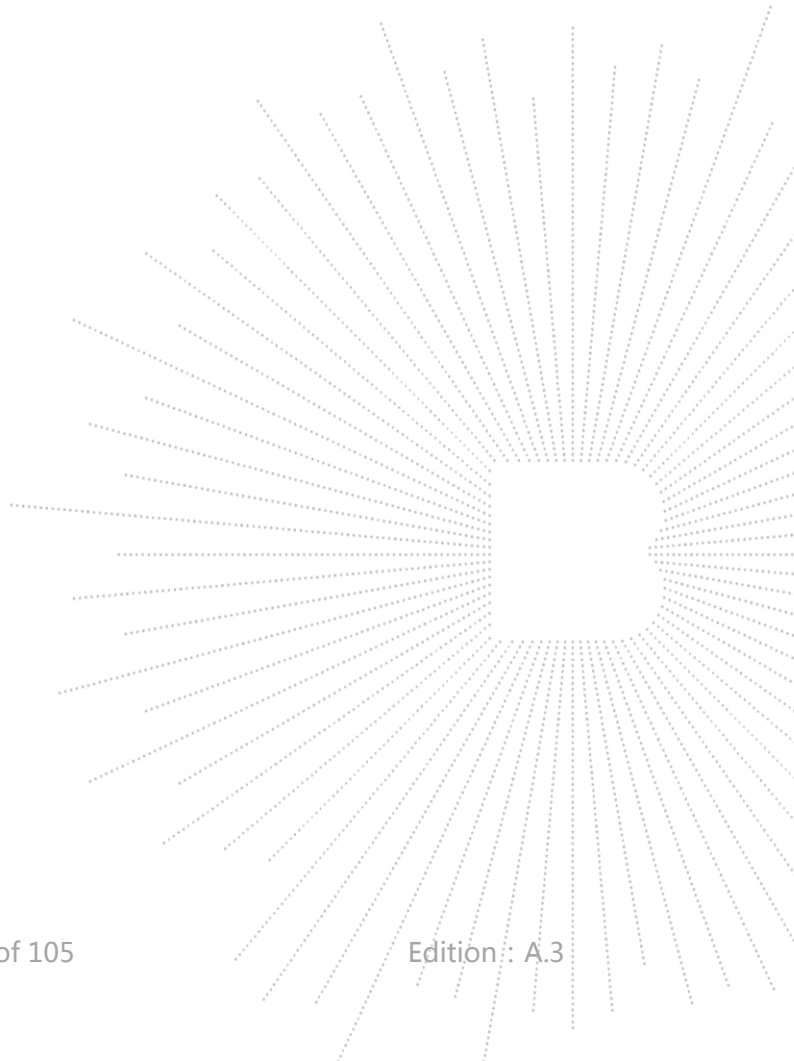
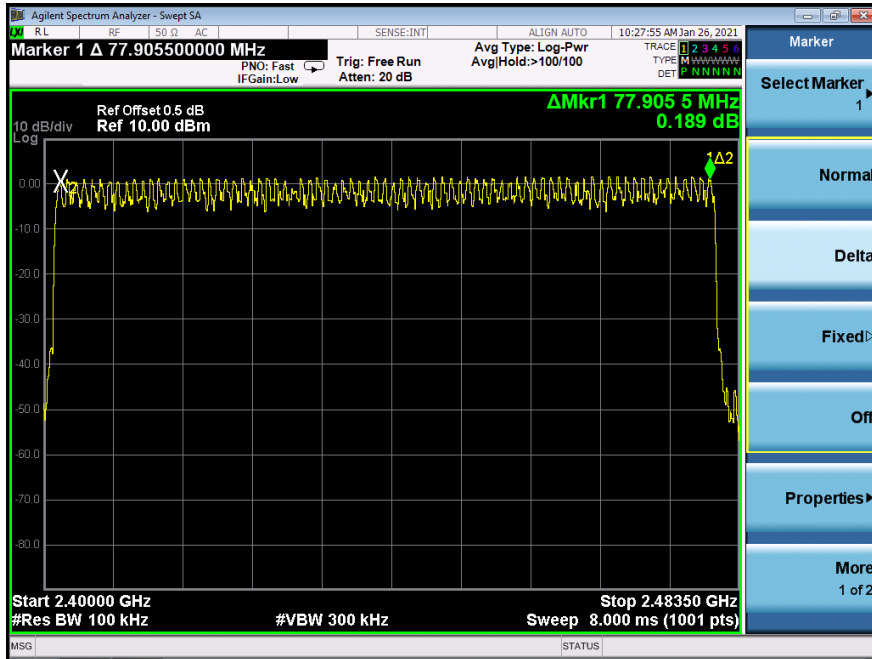
Left

79 Channels in total
GFSK



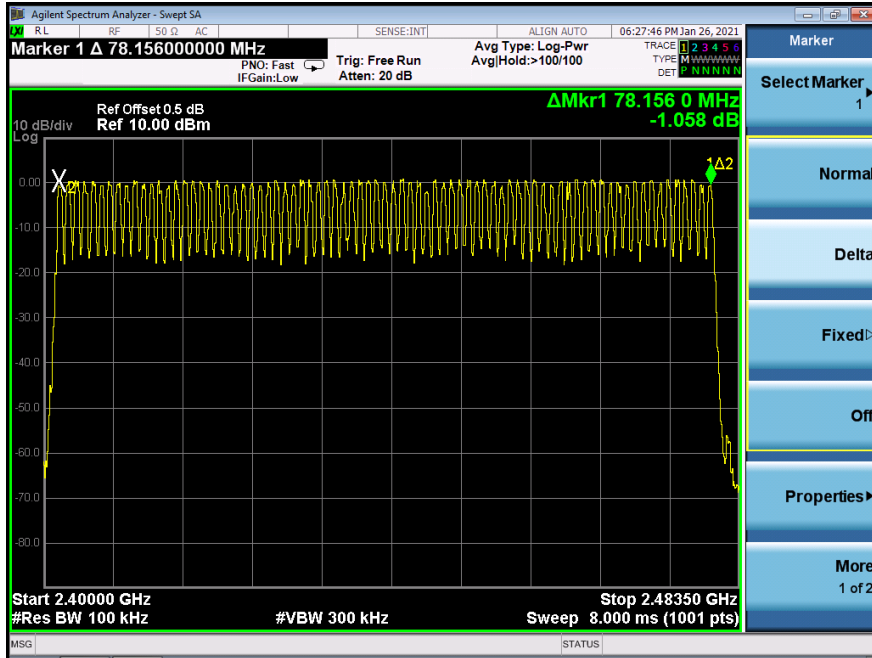
Pi/4 DQPSK



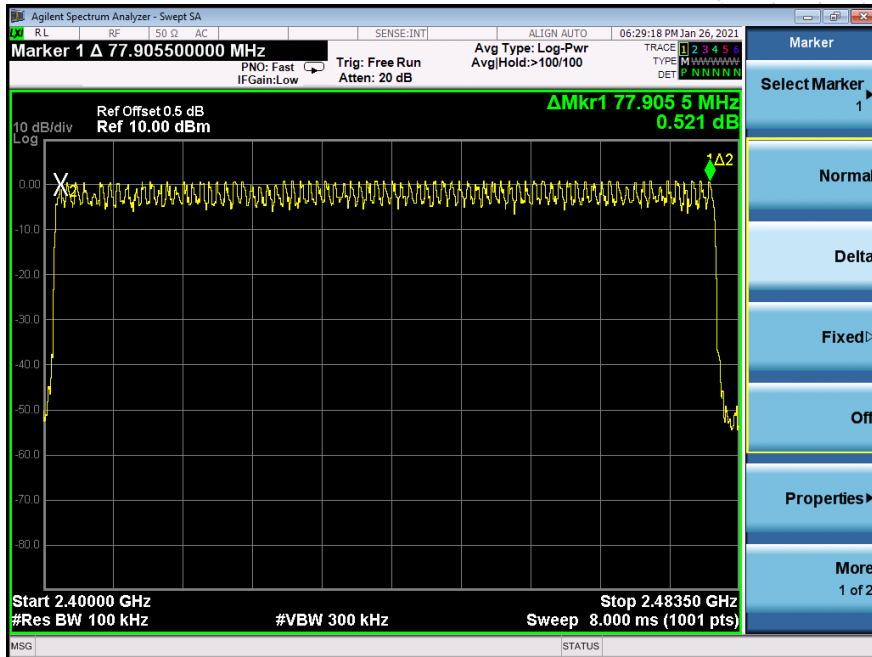
8DPSK

Right

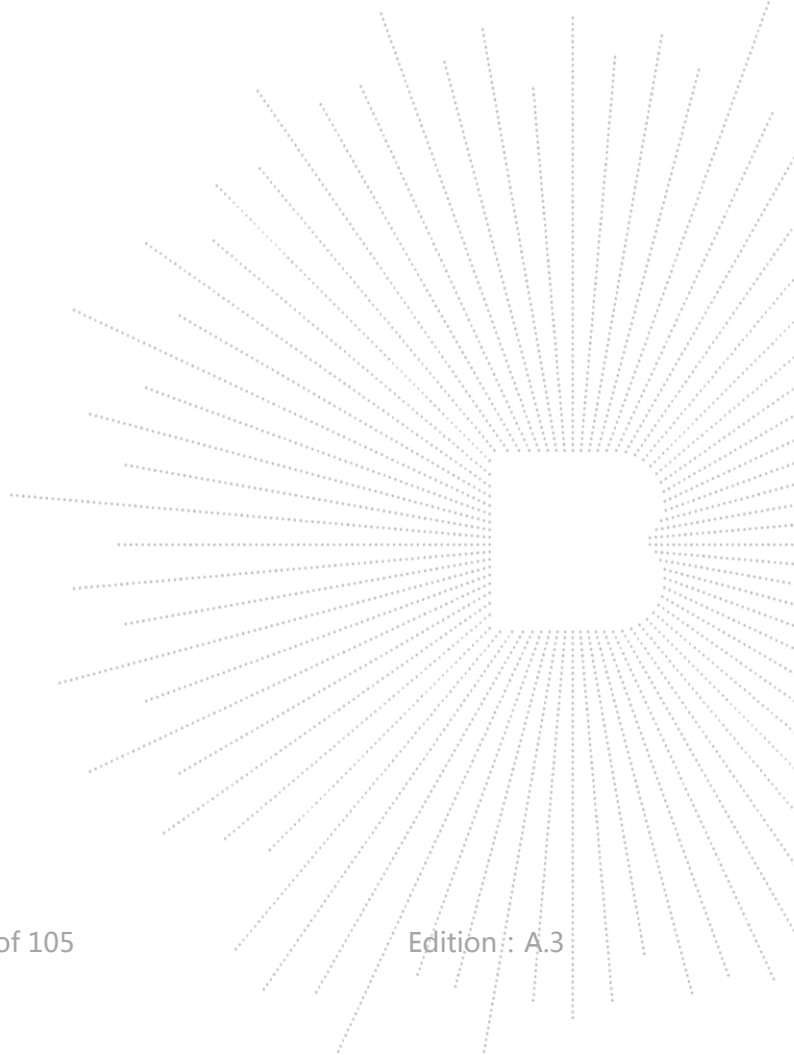
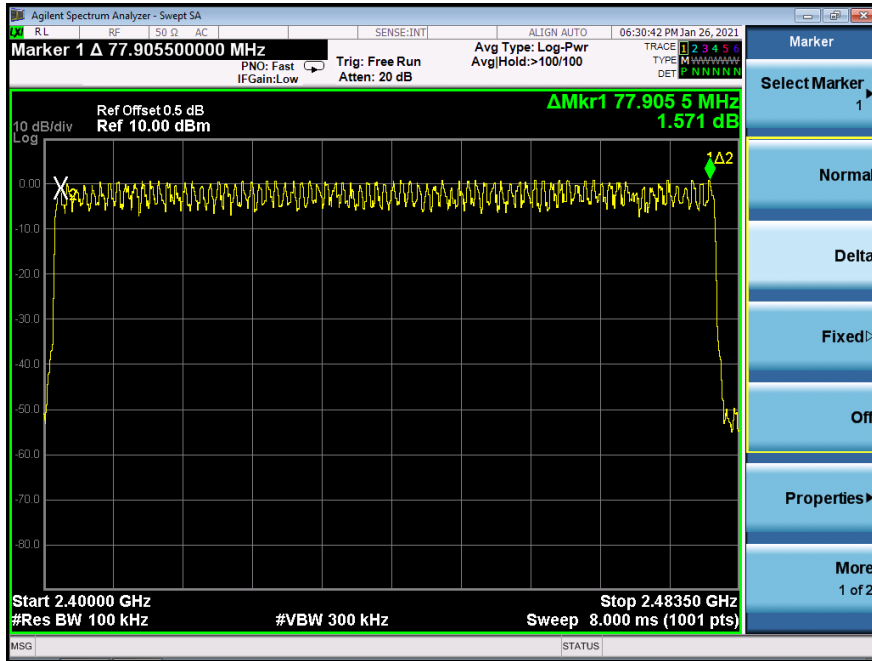
79 Channels in total GFSK



Pi/4 DQPSK

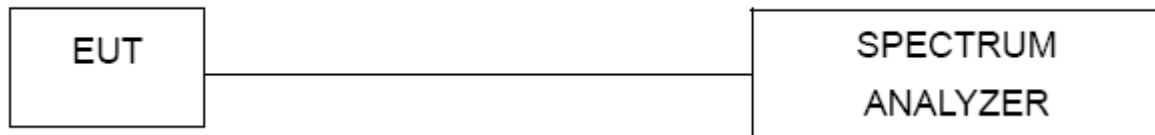


8DPSK



14. DWELL TIME

14.1 Block Diagram Of Test Setup



14.2 Limit

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

14.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. Centred on a hopping channel;
3. Set RBW = 1MHz and VBW = 3MHz. Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 and DH1 packet transmitting.
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

14.4 Test Result

DH5 Packet permit maximum 1600 / 79 / 6 hops per second in each channel (5 time slots RX, 1 time slot TX).

DH3 Packet permit maximum 1600 / 79 / 4 hops per second in each channel (3 time slots RX, 1 time slot TX).

DH1 Packet permit maximum 1600 / 79 / 2 hops per second in each channel (1 time slot RX, 1 time slot TX). So, the Dwell Time can be calculated as follows:

DH5: $1600/79/6*0.4*79*(MkrDelta)/1000$

DH3: $1600/79/4*0.4*79*(MkrDelta)/1000$

DH1: $1600/79/2*0.4*79*(MkrDelta)/1000$

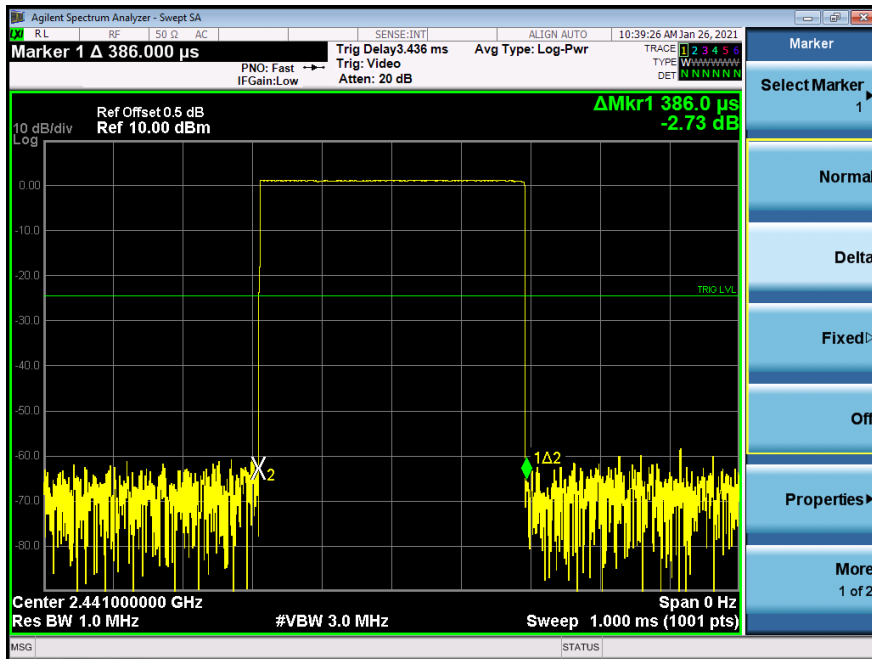
Remark: Mkr Delta is once pulse time.

Left

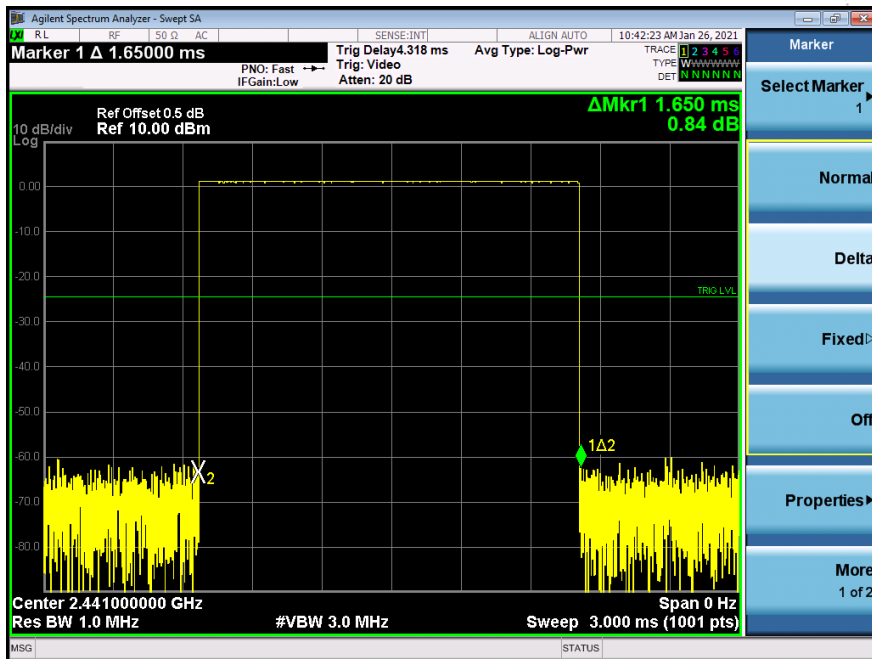
Modulation	Channel Data	Packet	pulse time(ms)	Dwell Time(s)	Limits(s)
GFSK	Middle	DH1	0.386	0.124	0.4
		DH3	1.650	0.264	0.4
		DH5	2.910	0.310	0.4
Pi/4DQPSK	Middle	2DH1	0.394	0.126	0.4
		2DH3	1.650	0.264	0.4
		2DH5	2.910	0.310	0.4
8DPSK	Middle	3DH1	0.394	0.126	0.4
		3DH3	1.650	0.264	0.4
		3DH5	2.910	0.310	0.4

Test Plots

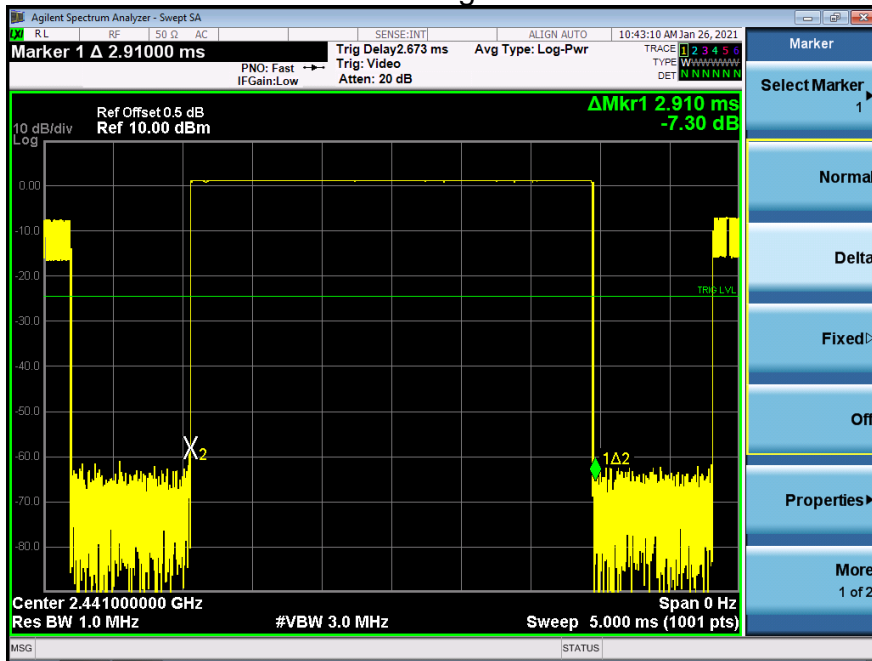
GFSK DH1 Middle Channel



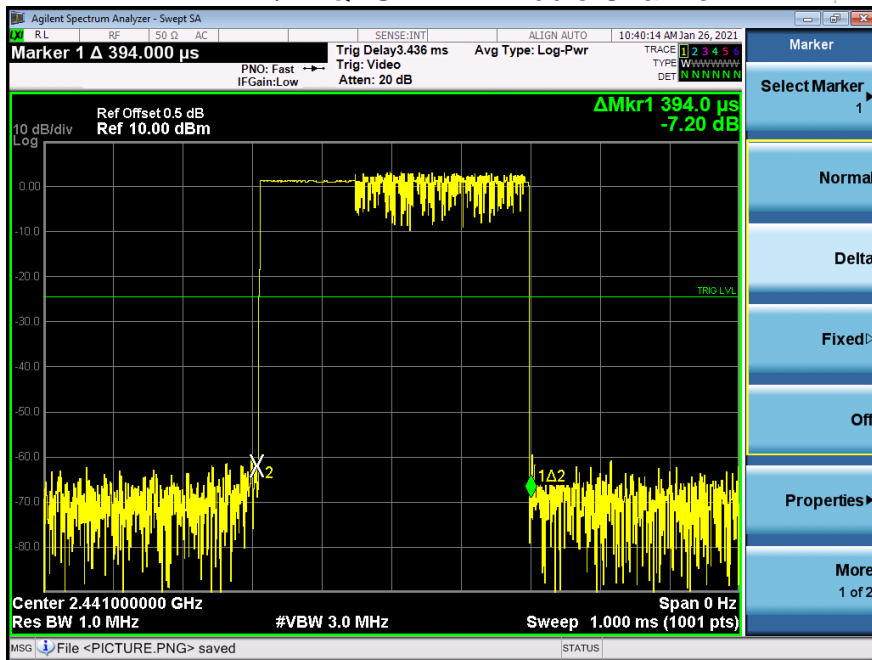
GFSK DH3 Middle Channel



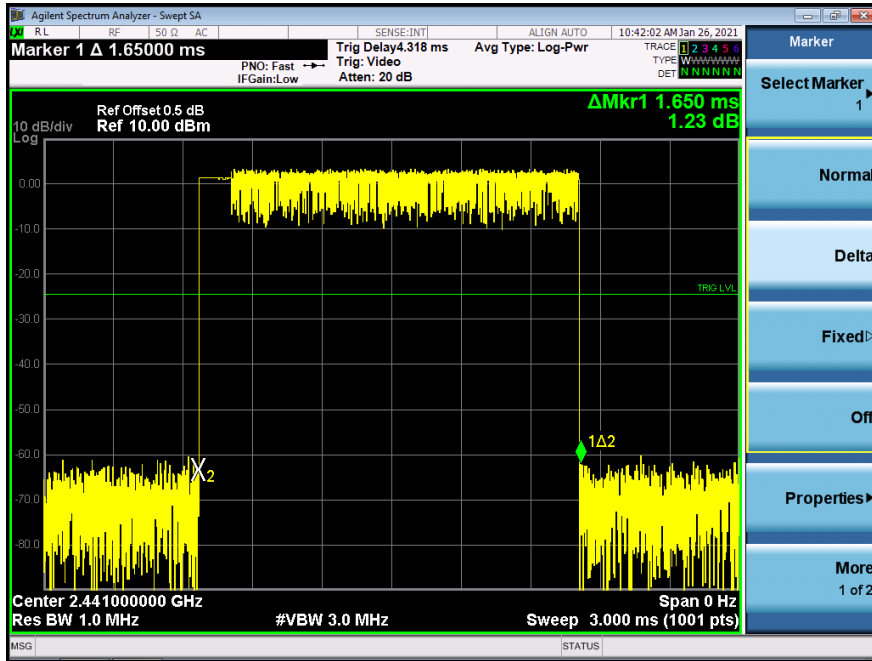
GFSK DH5 High Middle Channel



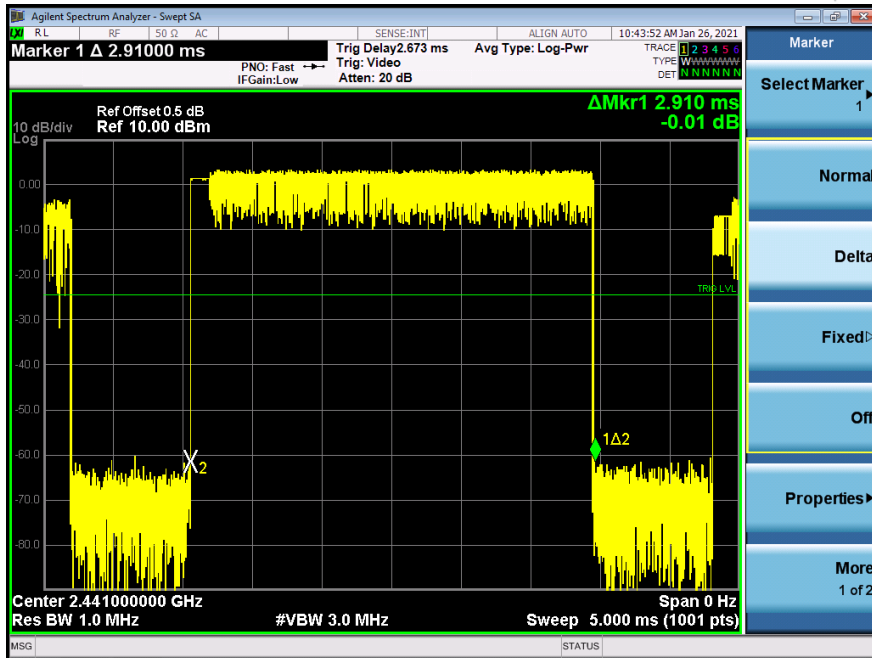
Pi/4DQPSK DH1 Middle Channel



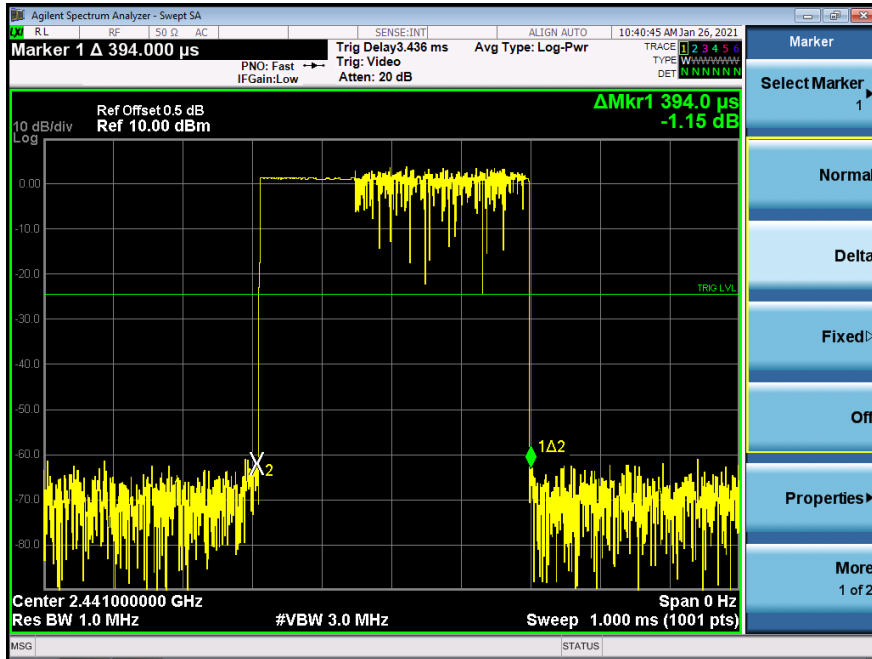
Pi/4DQPSK DH3 Middle Channel



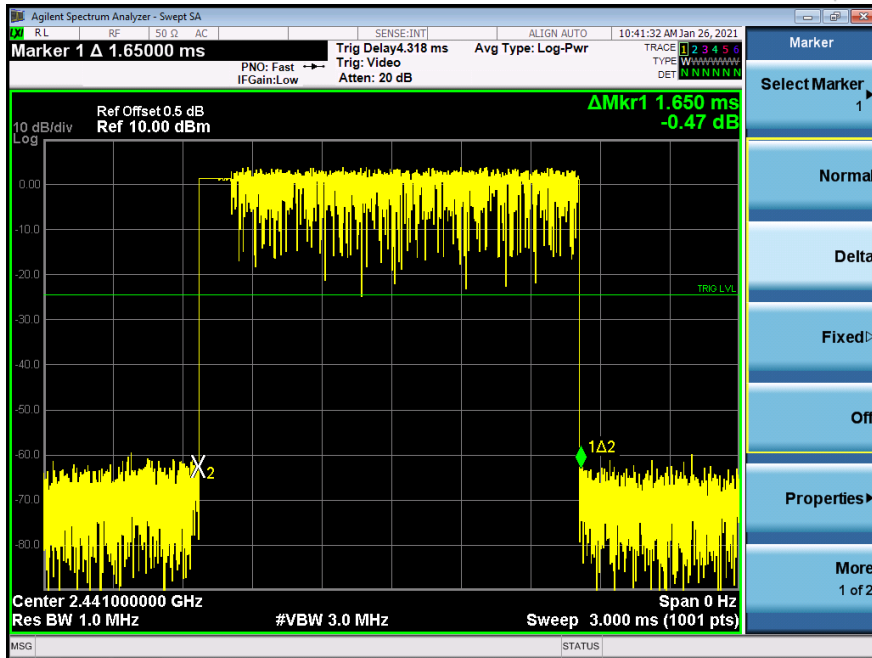
Pi/4DQPSK DH5 Middle Channel



8DPSK DH1 Middle Channel



8DPSK DH3 Middle Channel



8DPSK DH5 Middle Channel

