

Right earbud

Radiated Emission Test Data (Above 1GHz):								
Lowest Channel:								
No.	Frequency (MHz)	Reading (dBµV)	Correction factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Antenna Polaxis
1	4804.00	39.42	-2.42	37.00	74.00	-37.00	Peak	Horizontal
2	4804.00	27.27	-2.42	24.85	54.00	-29.15	Average	Horizontal
3	7206.00	35.66	1.62	37.28	74.00	-36.72	Peak	Horizontal
4	7206.00	25.18	1.62	26.80	54.00	-27.2	Average	Horizontal
5	4804.00	36.84	-2.42	34.42	74.00	-39.58	Peak	Vertical
6	4804.00	27.53	-2.42	25.11	54.00	-28.89	Average	Vertical
7	7206.00	39.30	1.62	40.92	74.00	-33.08	Peak	Vertical
8	7206.00	25.68	1.62	27.30	54.00	-26.70	Average	Vertical
Middle Channel:								
1	4882.000	39.80	-2.35	37.45	74.00	-36.55	Peak	Horizontal
2	4882.000	26.66	-2.35	24.31	54.00	-29.69	Average	Horizontal
3	7323.000	40.26	1.69	41.95	74.00	-32.05	Peak	Horizontal
4	7323.00	24.08	1.69	25.77	54.00	-28.23	Average	Horizontal
5	4882.000	40.30	-2.35	37.95	74.00	-36.05	Peak	Vertical
6	4882.00	26.76	-2.35	24.41	54.00	-29.59	Average	Vertical
7	7323.000	39.02	1.69	40.71	74.00	-33.29	Peak	Vertical
8	7323.00	24.27	1.69	25.96	54.00	-28.04	Average	Vertical
Highest Channel:								
1	4960.000	40.30	-2.27	38.03	74.00	-35.97	Peak	Horizontal
2	4960.00	26.22	-2.27	23.95	54.00	-30.05	Average	Horizontal
3	7440.000	36.75	1.77	38.52	74.00	-35.48	Peak	Horizontal
4	7440.00	25.68	1.77	27.45	54.00	-26.55	Average	Horizontal
5	4960.000	36.49	-2.27	34.22	74.00	-39.78	Peak	Vertical
6	4960.00	25.68	-2.27	23.41	54.00	-30.59	Average	Vertical
7	7440.00	40.12	1.77	41.89	74.00	-32.11	Peak	Vertical
8	7440.00	25.59	1.77	27.36	54.00	-26.64	Average	Vertical

Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit

5.10 BAND EDGE MEASUREMENTS (RADIATED)

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.205/15.209
RSS-247 Issue 2, Section 5.5

Test Method: ANSI C63.10-2013 Section 6.10.5

Limits:

Radiated emissions which fall in the restricted bands, as defined in section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a).

Frequency	Limit (dBµV/m @3m)	Remark
30 MHz-88 MHz	40.0	Quasi-peak Value
88 MHz-216 MHz	43.5	Quasi-peak Value
216 MHz-960 MHz	46.0	Quasi-peak Value
960 MHz-1 GHz	54.0	Quasi-peak Value
Above 1 GHz	54.0	Average Value
	74.0	Peak Value

Test Setup: Refer to section 4.5.1 for details.

Test Procedures:

Radiated band edge measurements at 2390 MHz and 2483.5 MHz were made with the unit transmitting in the low end of the channel range and the high end closest to the restricted bands respectively. The emissions were made on the 966 Semi-Chamber. Use (resolution bandwidth (RBW) = 1 MHz, video bandwidth (VBW) = 3 MHz for peak levels and RBW = 1 MHz and VBW = 10 Hz or 1/T for average levels).

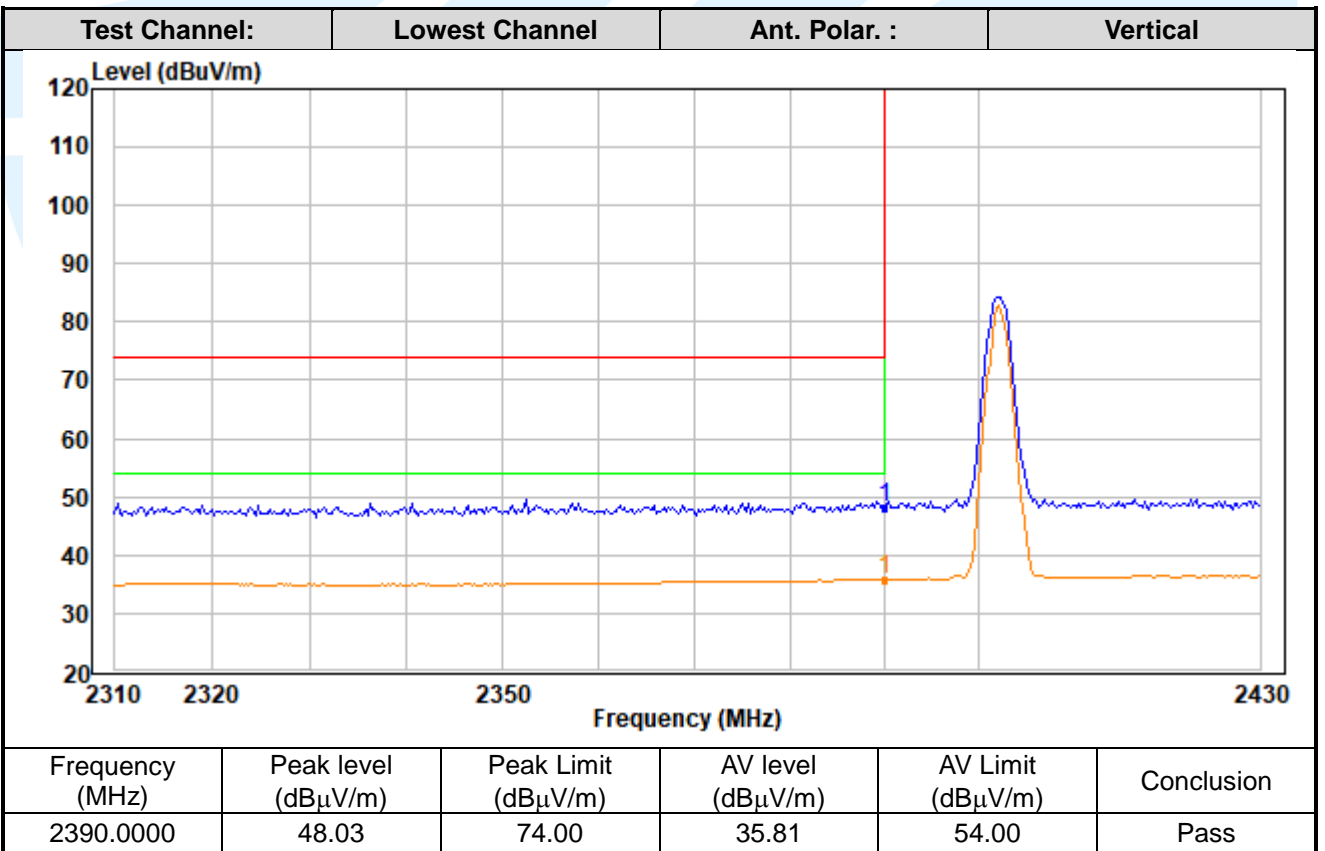
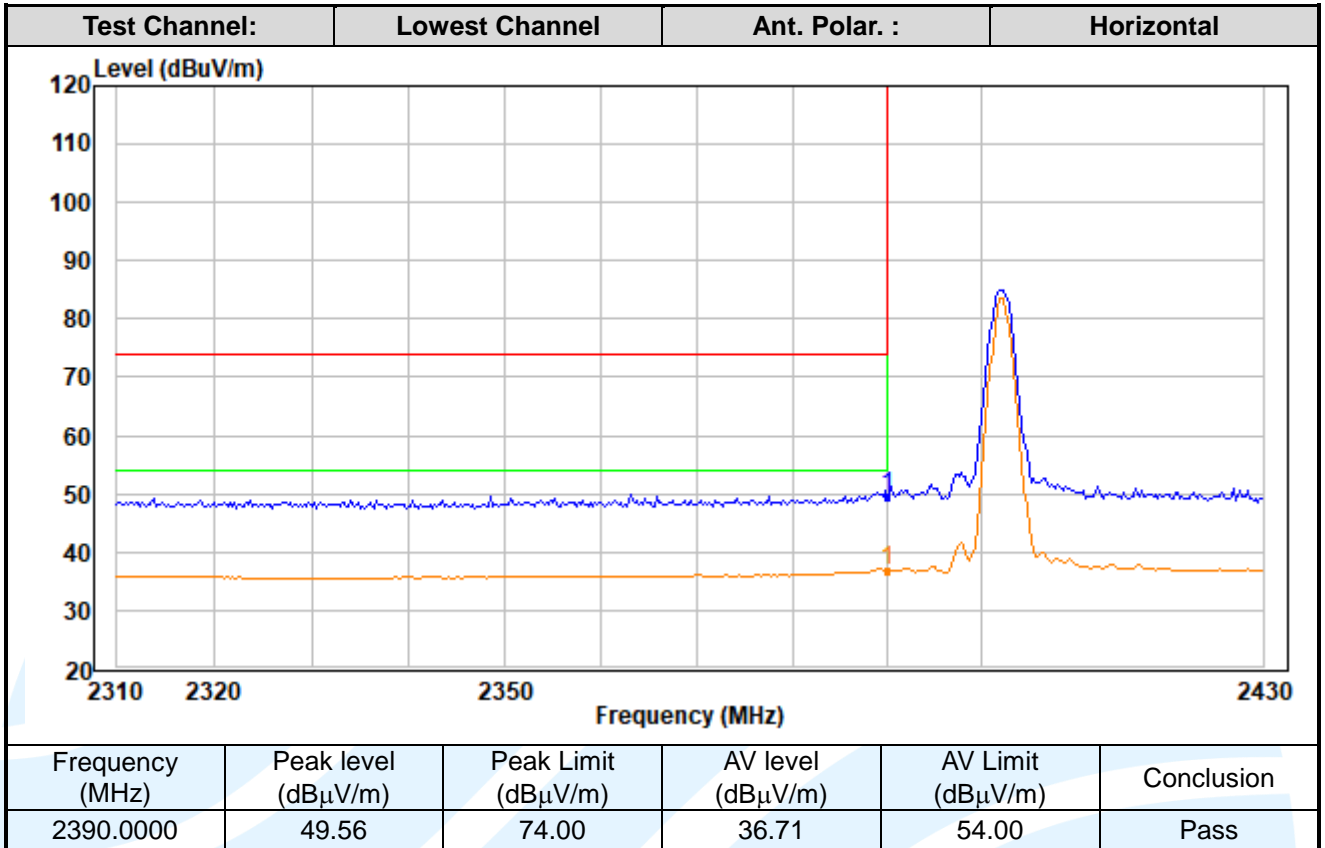
1. Use radiated spurious emission test procedure described in clause 5.10. The transmitter output (antenna port) was connected to the test receiver.
2. Set the PK and AV limit line.
3. Record the fundamental emission and emissions out of the band-edge.
4. Determine band-edge compliance as required.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

Left earbud



Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China

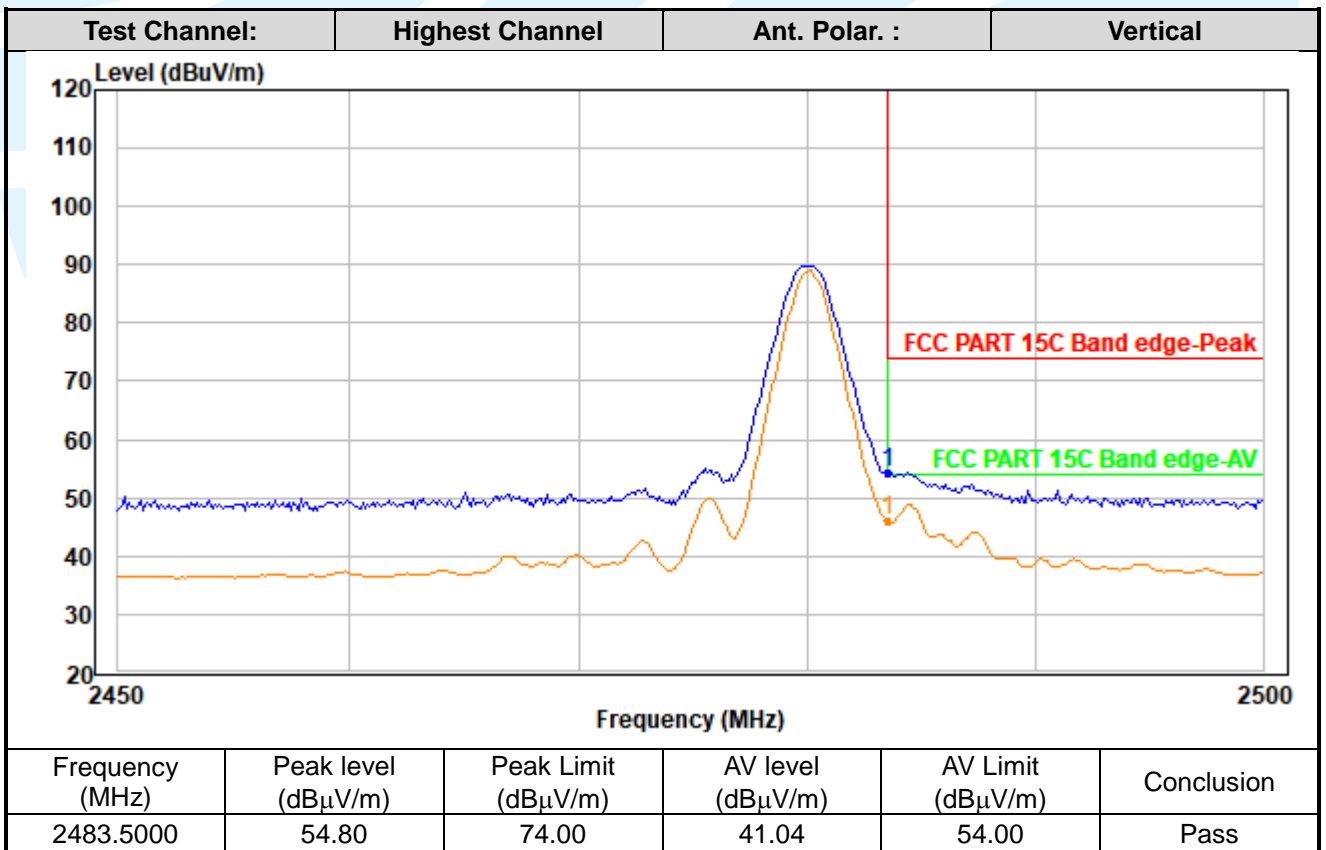
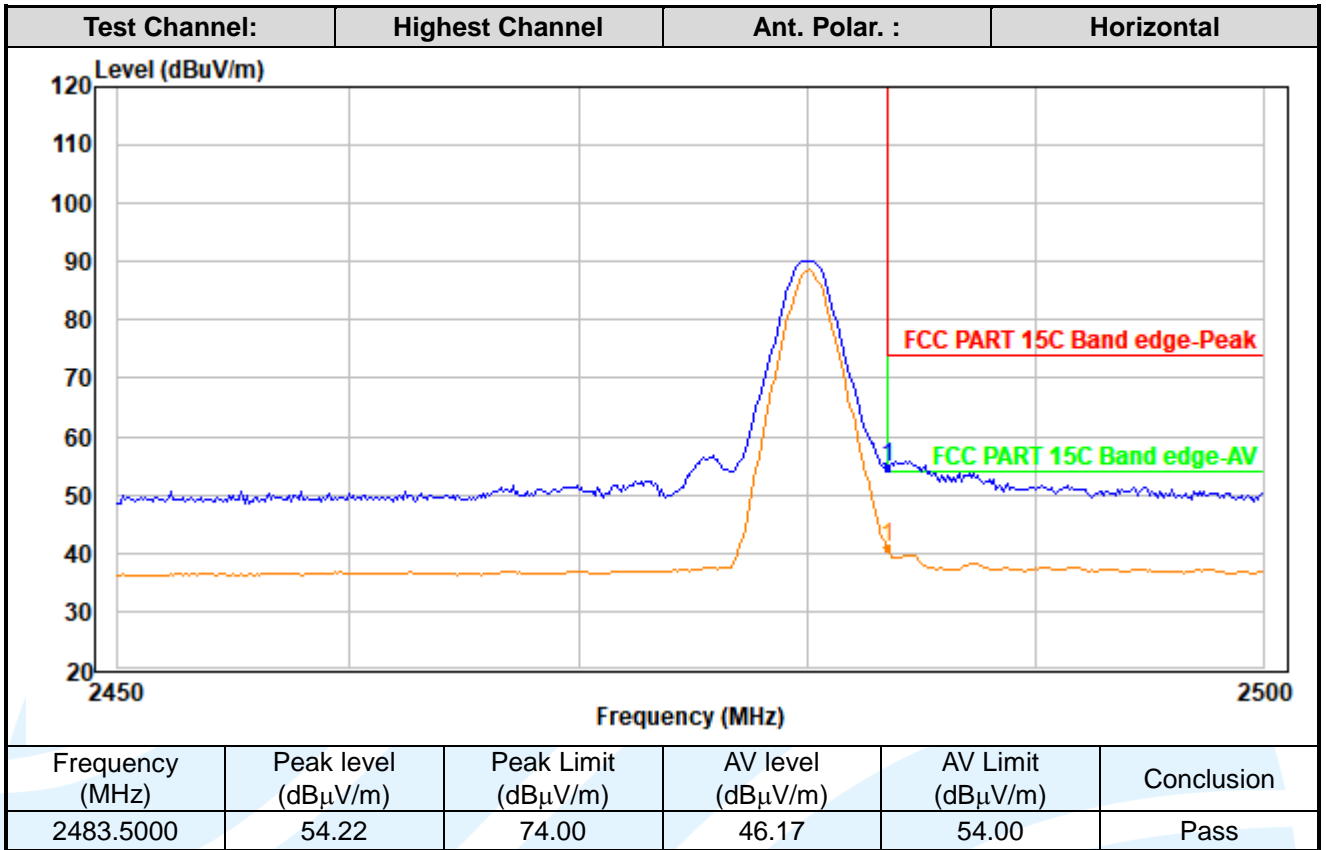
Tel: +86-755-28230888

Fax: +86-755-28230886

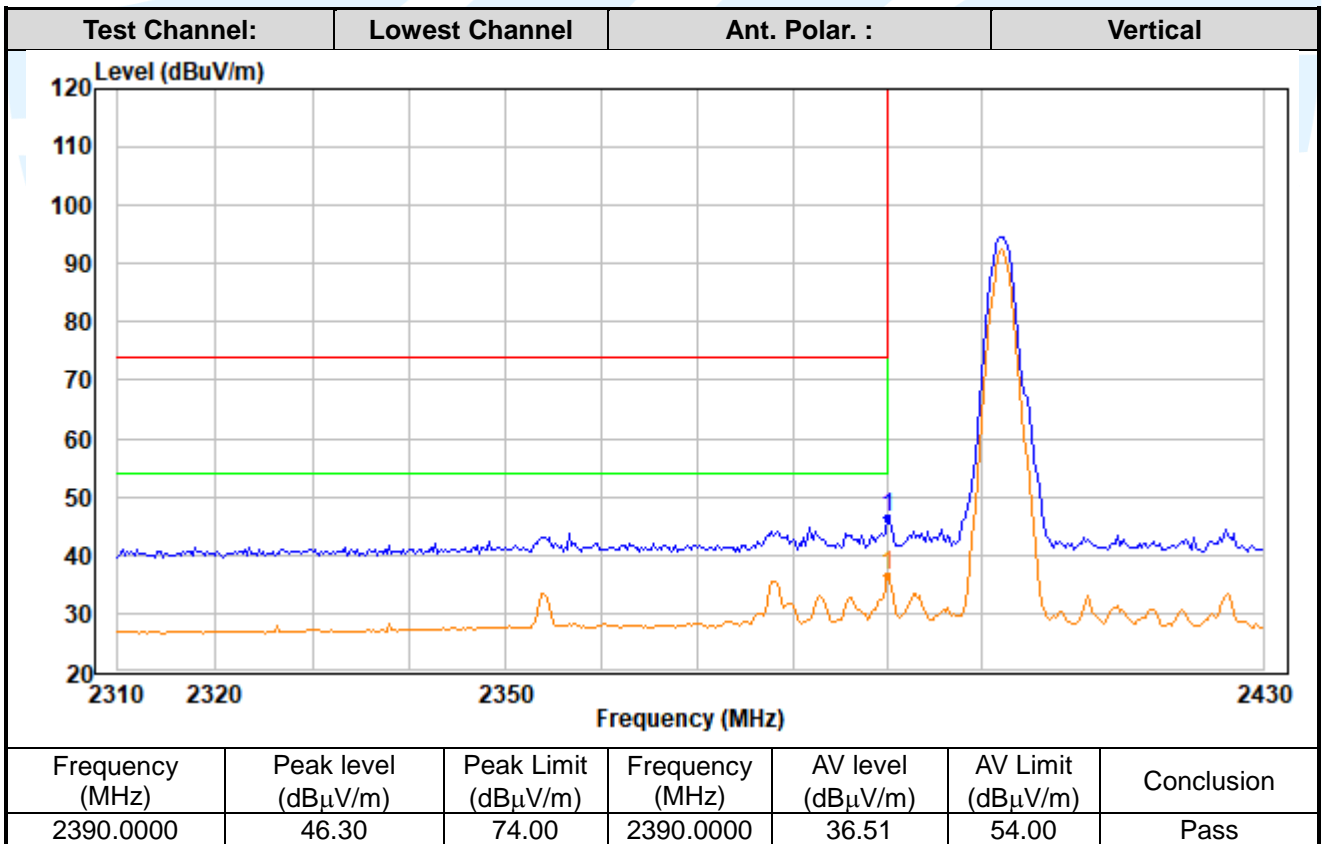
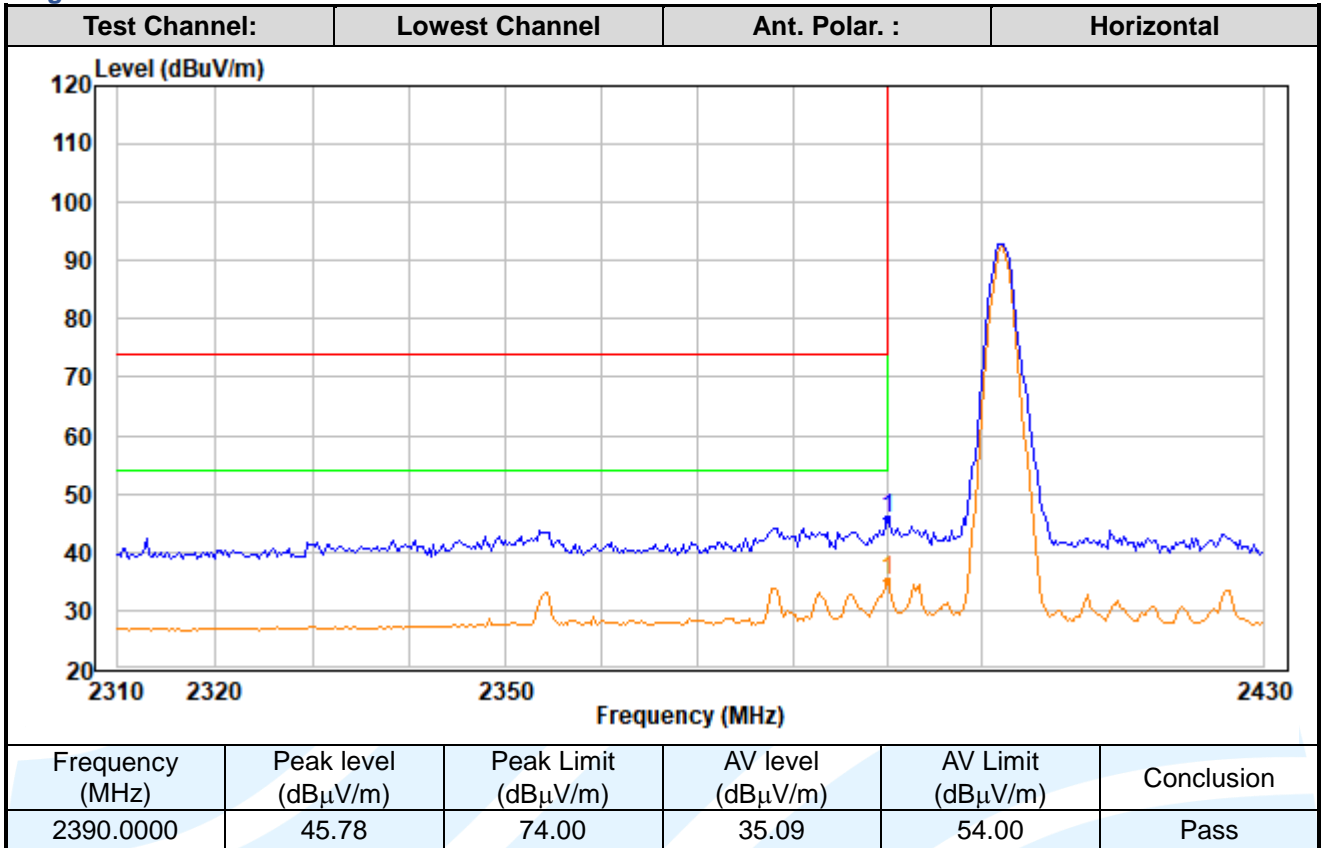
E-mail: info@uttlab.com

<http://www.uttlab.com>

UTTR-RF-RSS247-V1.1



Right earbud



Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China

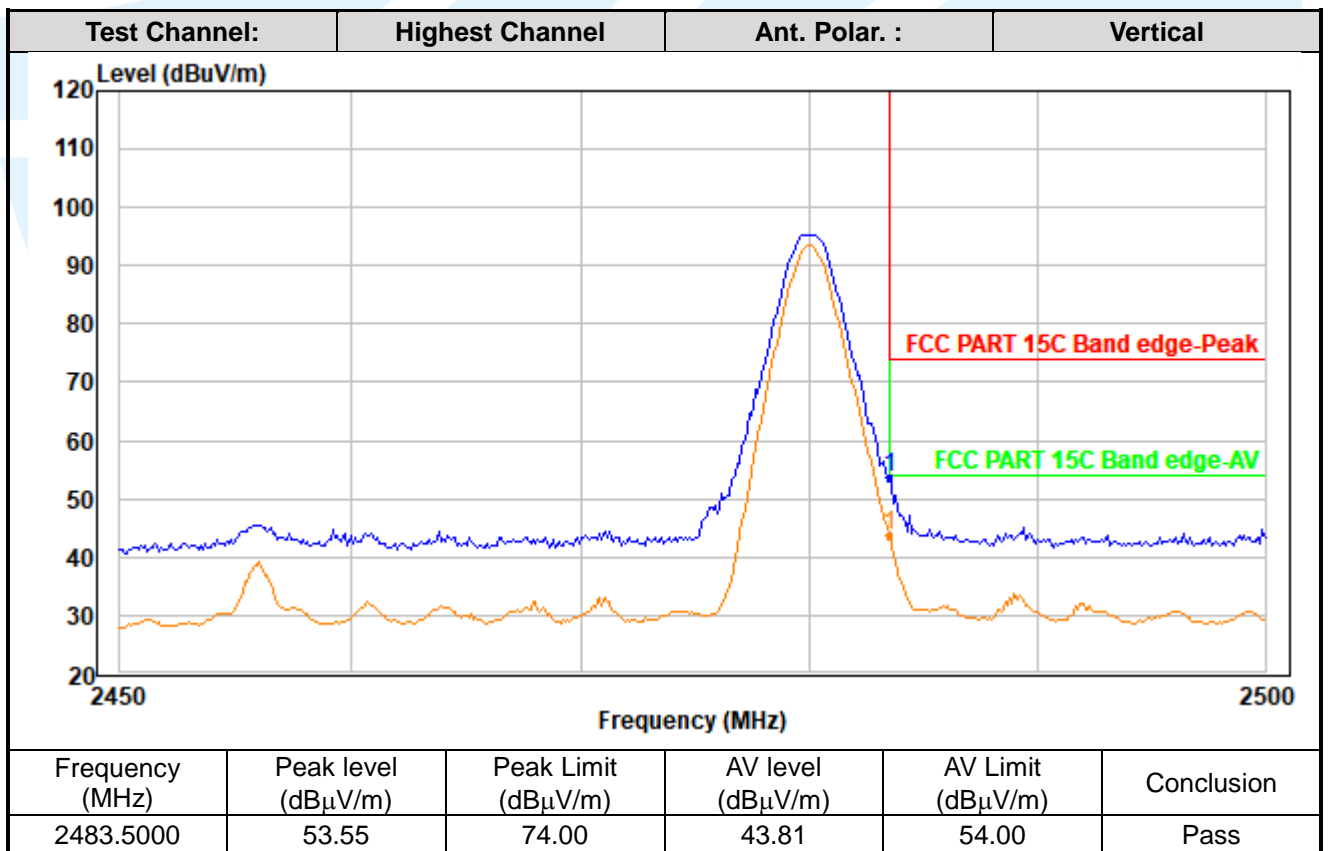
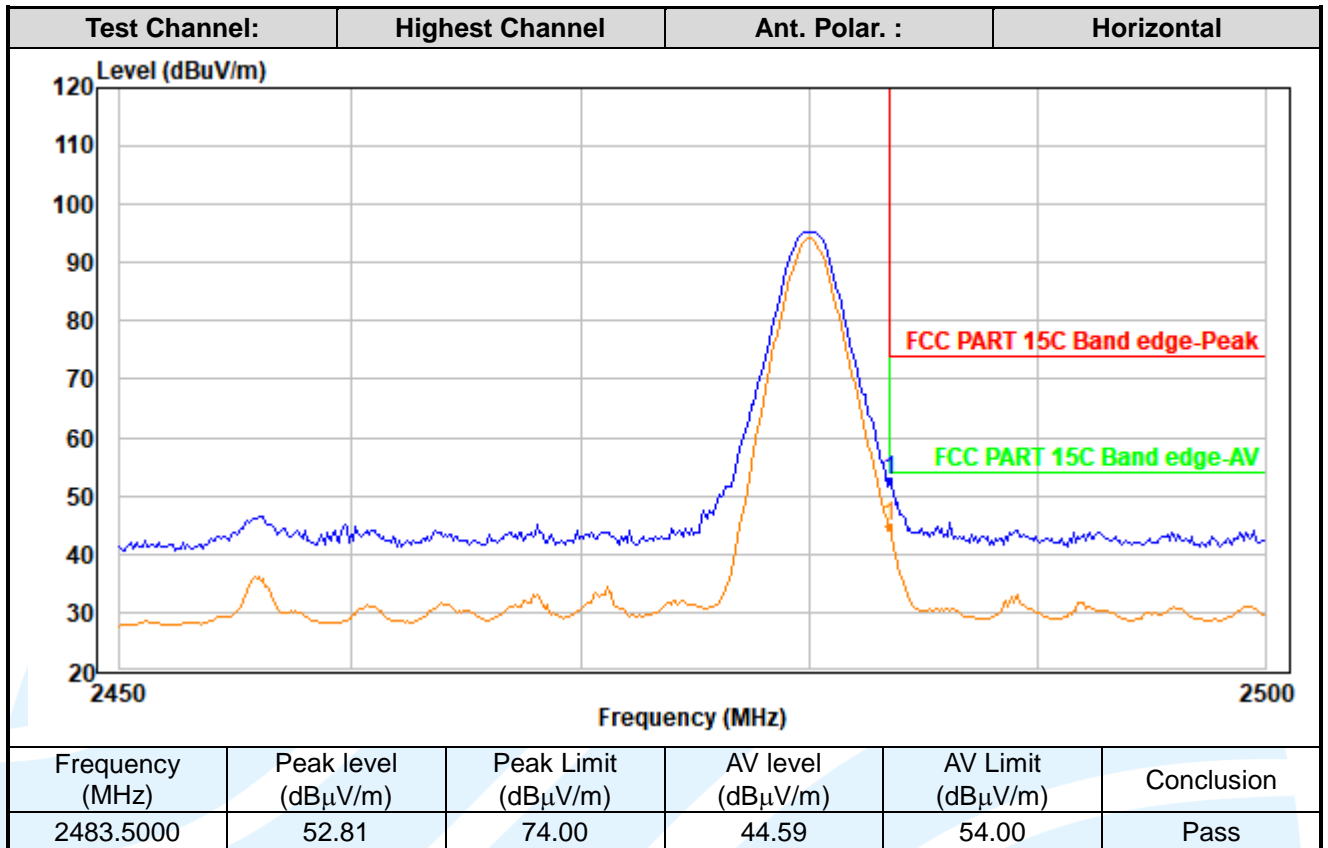
Tel: +86-755-28230888

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Tel: +86-755-28230888

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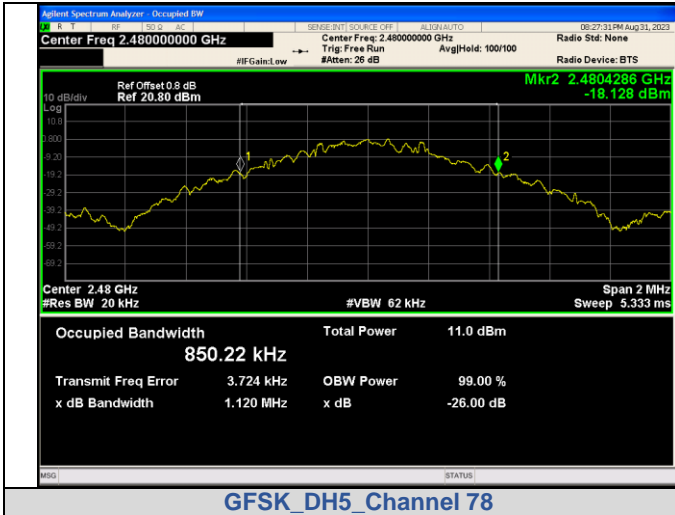
6. APPENDIX A RF TEST DATA

A.1 99% BANDWIDTH

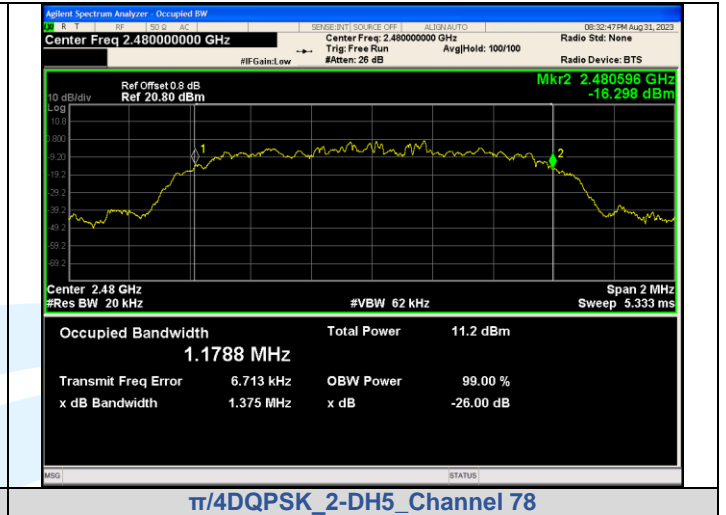
Modulation	Channel	99% BW (MHz)
GFSK	0	0.84743
	39	0.85606
	78	0.85022
$\pi/4$ DQPSK	0	1.1788
	39	1.1836
	78	1.1788
8DPSK	0	1.1834
	39	1.1849
	78	1.1883

Test Graphs

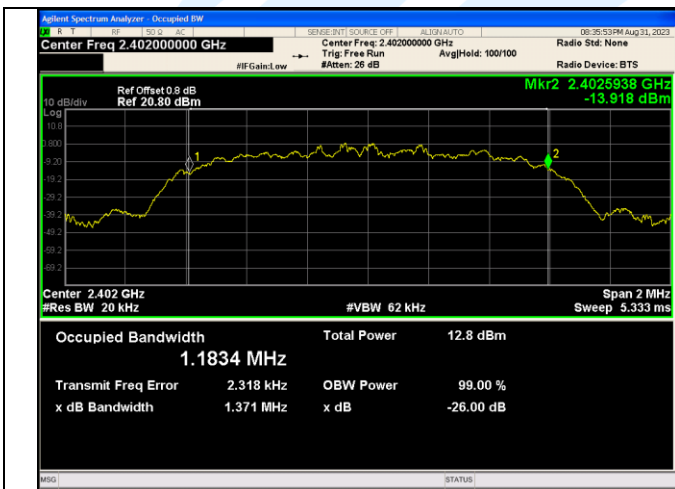




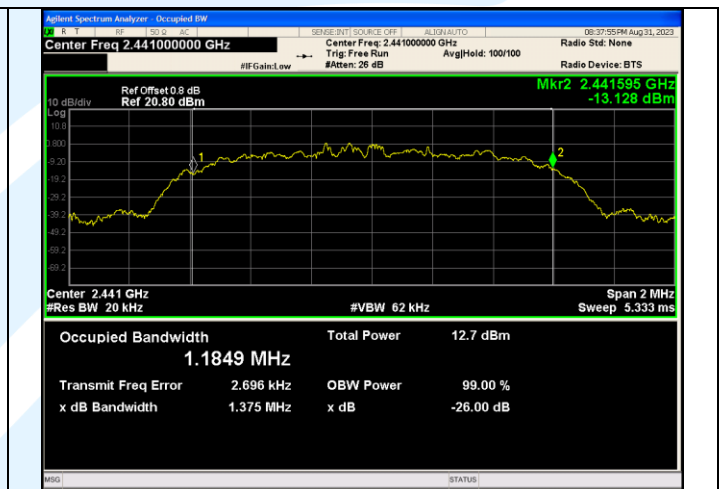
GFSK_DH5_Channel 78



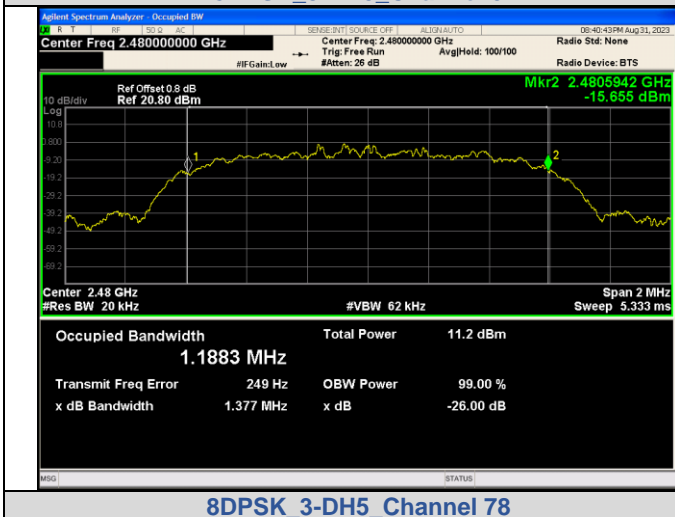
$\pi/4$ DQPSK_2-DH5_Channel 78



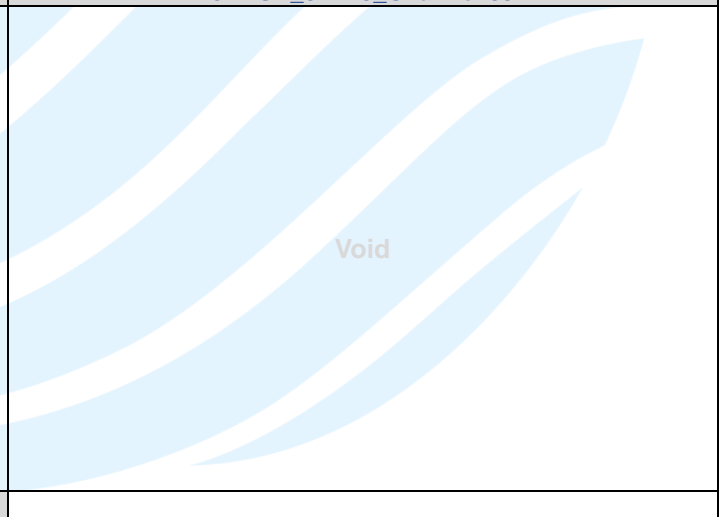
8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

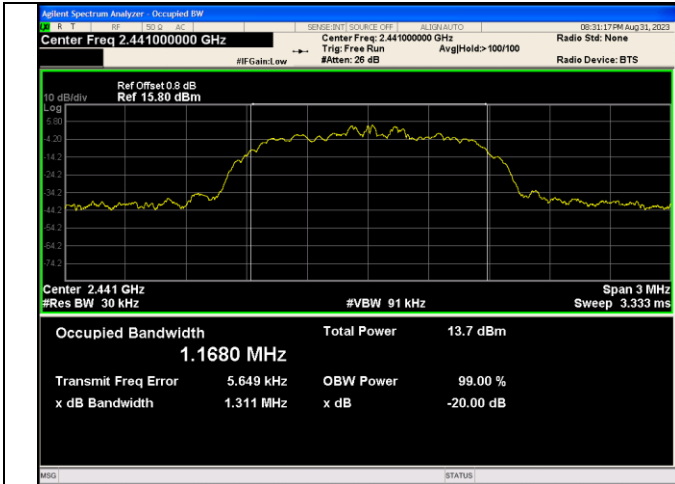


A.2 20DB BANDWIDTH

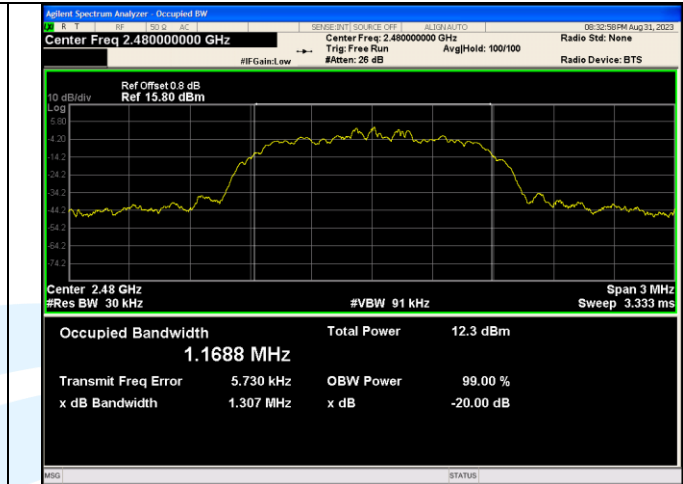
Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9478
	39	2441 MHz	0.9524
	78	2480 MHz	0.9459
$\pi/4$ DQPSK	0	2402 MHz	1.317
	39	2441 MHz	1.311
	78	2480 MHz	1.307
8DPSK	0	2402 MHz	1.299
	39	2441 MHz	1.305
	78	2480 MHz	1.301

Test Graphs

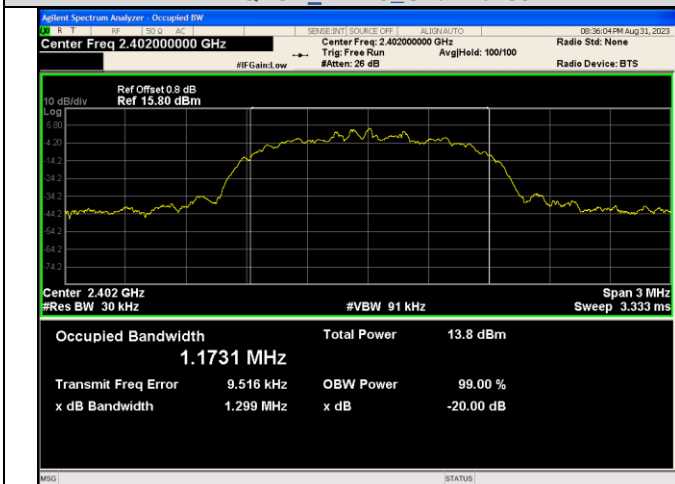




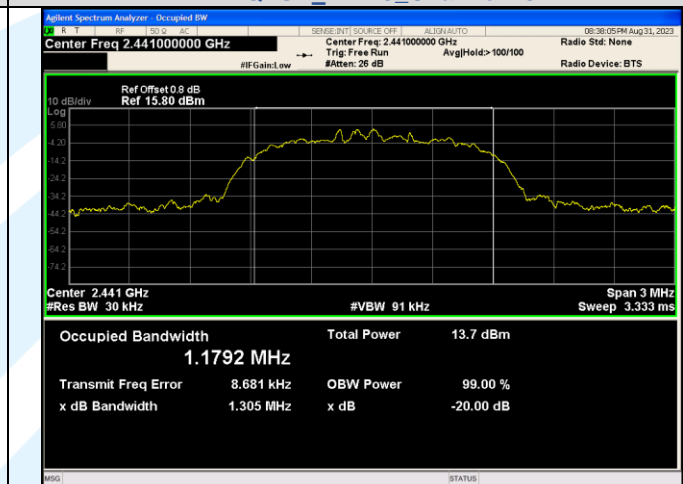
π /4DQPSK_2-DH5_Channel 39



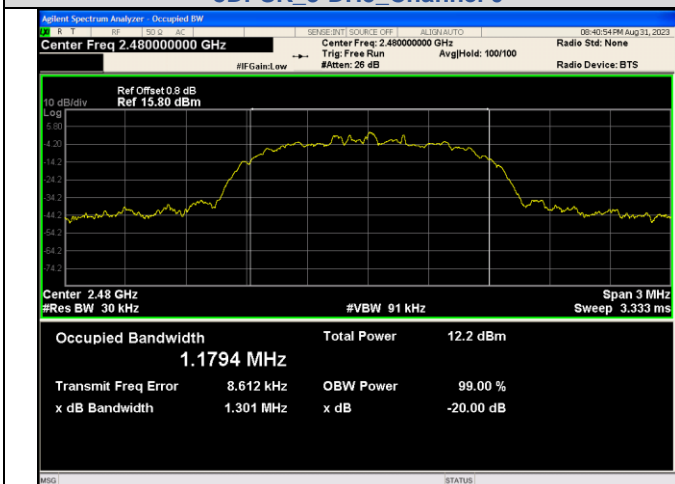
π /4DQPSK_2-DH5_Channel 78



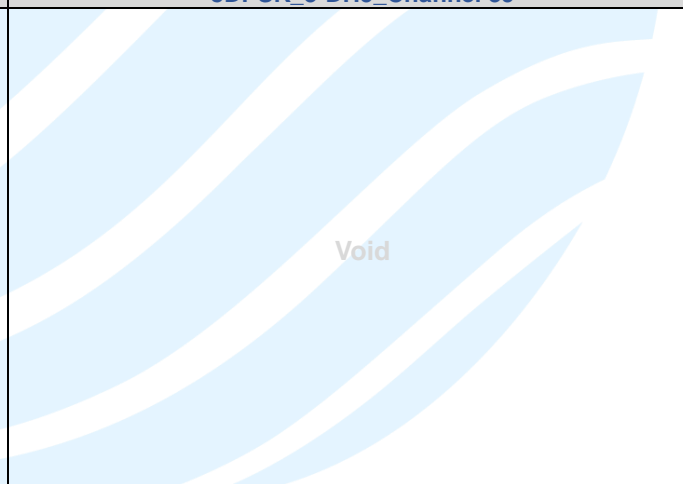
8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78



A.3 CARRIER FREQUENCIES SEPARATION

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2439.8443	2440.8347	0.9904	0.635	PASS
$\pi/4$ DQPSK	2-DH5	2440.0189	2441.0123	0.9934	0.874	PASS
8DPSK	3-DH5	2440.0111	2441.0156	1.0045	0.87	PASS

Test Graphs



A.4 CONDUCTED OUT OF BAND EMISSION

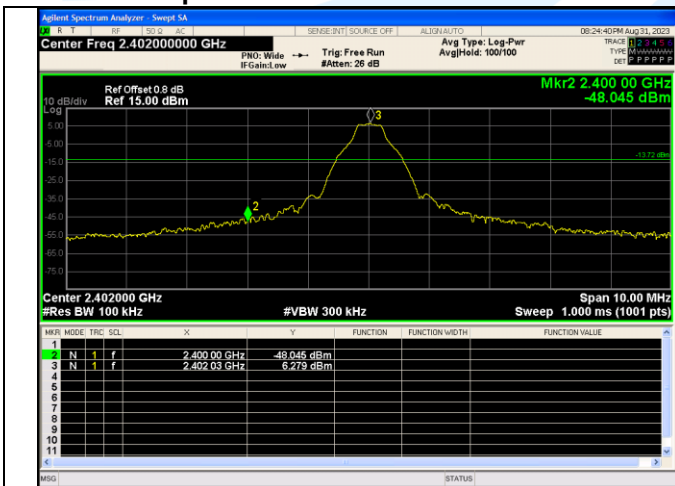
Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-48.045	-13.72	-34	PASS
			4803.76	-24.417	-13.72	-10.697	PASS
		39	4881.79	-24.652	-13.64	-11.012	PASS
			78	2483.50	-55.613	-15.24	-40
π/4DQPSK	2-DH5	0	2400.00	-46.058	-13.94	-32	PASS
			4803.76	-25.867	-13.94	-11.927	PASS
		39	4881.79	-25.741	-14.02	-11.721	PASS
			78	2483.50	-54.848	-15.22	-40
8DPSK	3-DH5	0	2400.00	-45.350	-13.8	-32	PASS
			4804.38	-26.589	-13.8	-12.789	PASS
		39	4881.79	-26.377	-13.61	-12.767	PASS
			78	2483.50	-52.849	-15.12	-38
			4960.45	-29.782	-15.12	-14.662	PASS

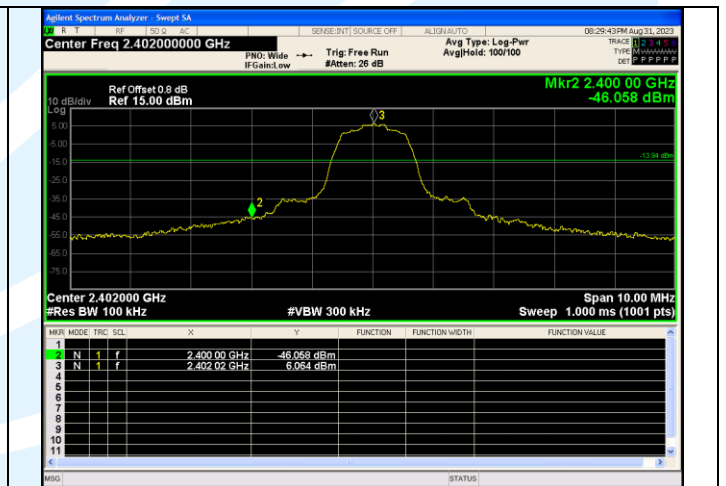
Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2400.00	-48.015	-13.73	-34.285	PASS
			2483.50	-56.262	-15.29	-40.972	PASS
π/4DQPSK	2-DH5		2400.00	-47.017	-13.83	-33.187	PASS
			2483.50	-55.850	-15.92	-39.930	PASS
8DPSK	3-DH5		2400.00	-46.993	-13.95	-33.043	PASS
			2483.50	-57.437	-15.63	-41.807	PASS

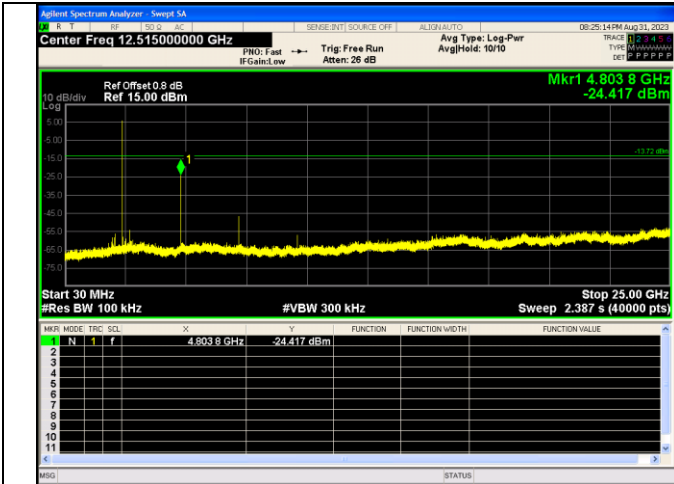
Test Graphs



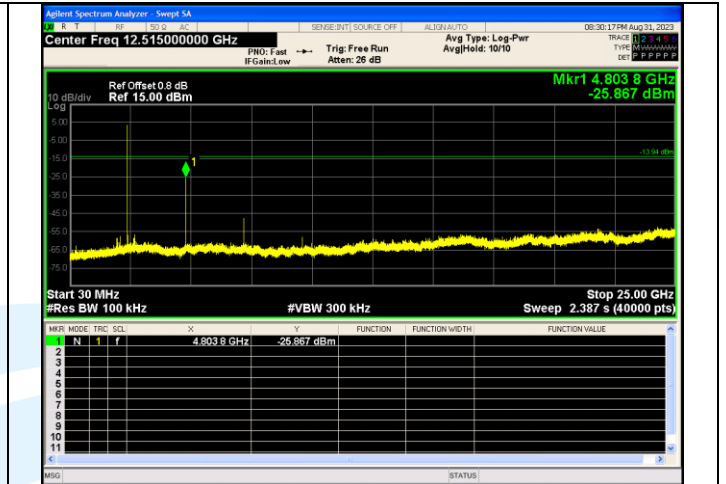
Out Of Band Emission
GFSK_DH5_Channel 0



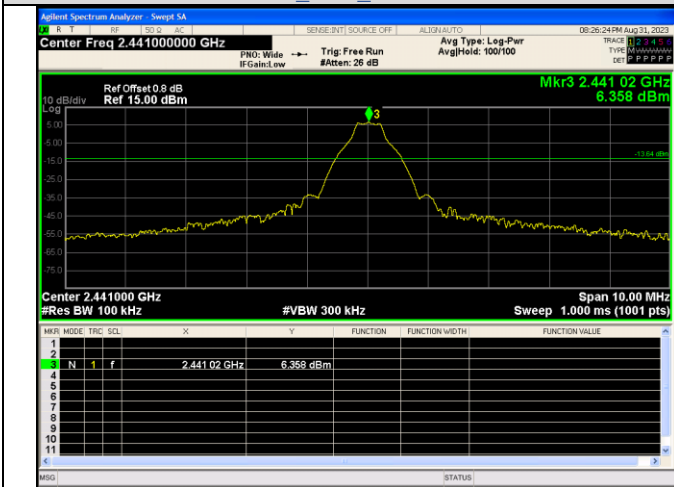
Out Of Band Emission
π/4DQPSK_2-DH5_Channel 0



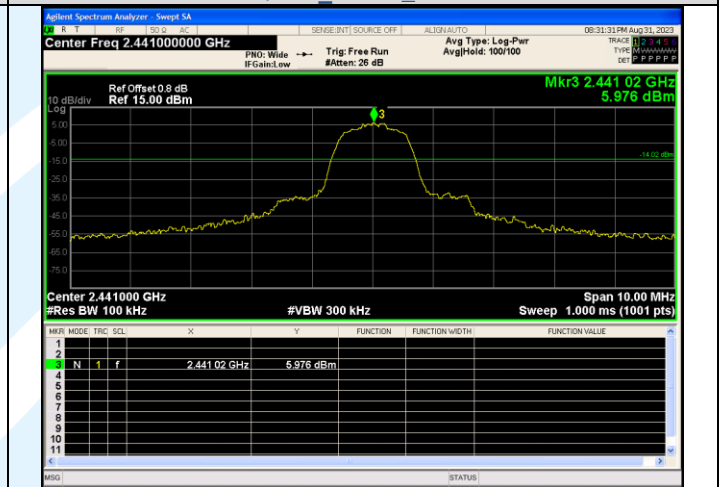
**Spurious Emission
GFSK_DH5_Channel 0**



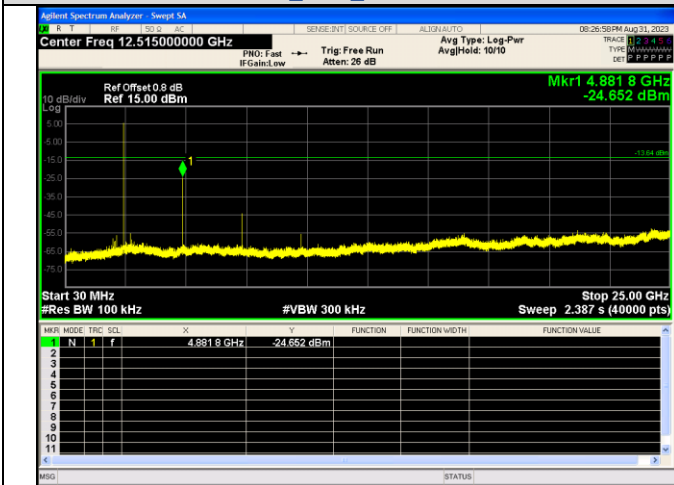
**Spurious Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0**



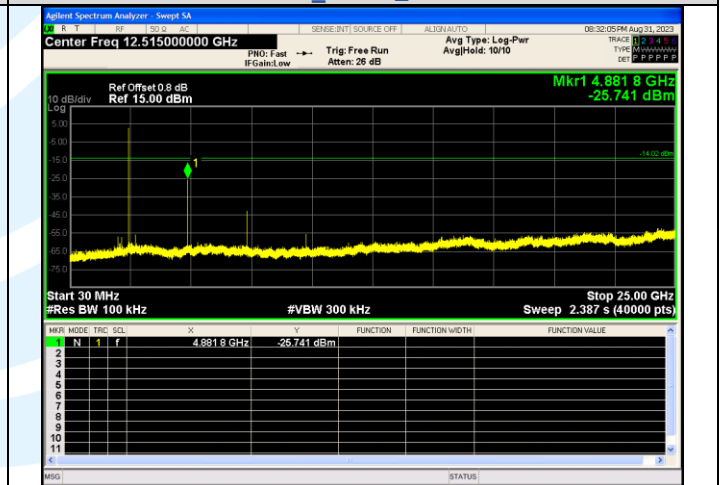
**Out Of Band Emission
GFSK_DH5_Channel 39**



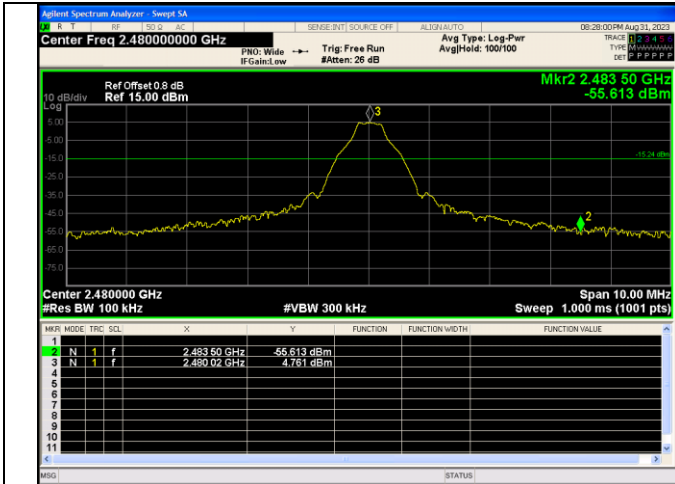
**Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39**



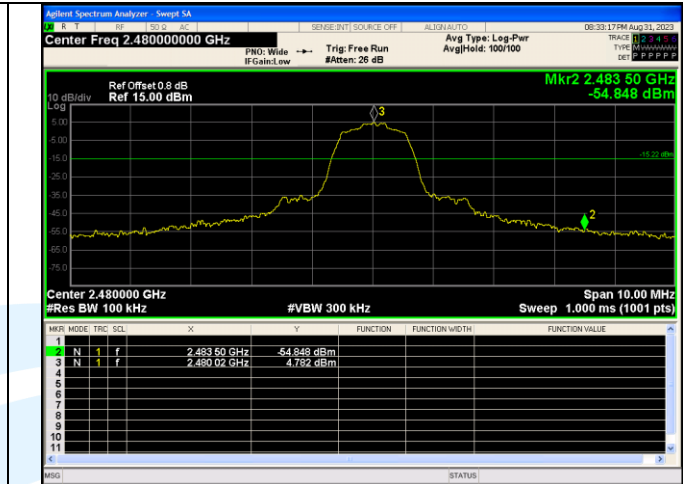
**Spurious Emissions
GFSK_DH5_Channel 39**



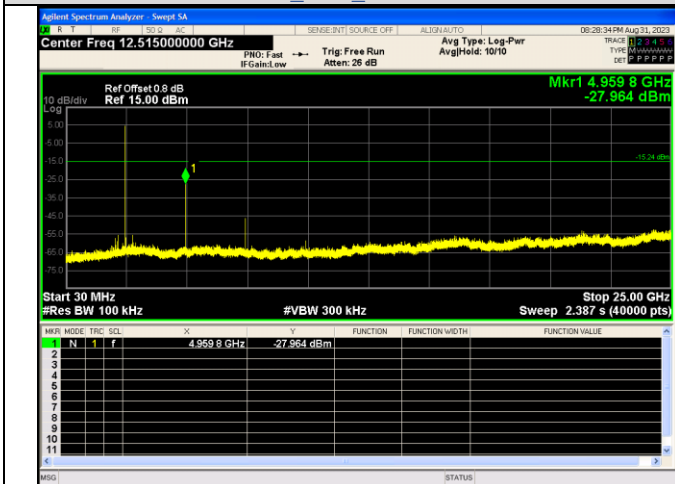
**Spurious Emissions
 $\pi/4$ DQPSK_2-DH5_Channel 39**



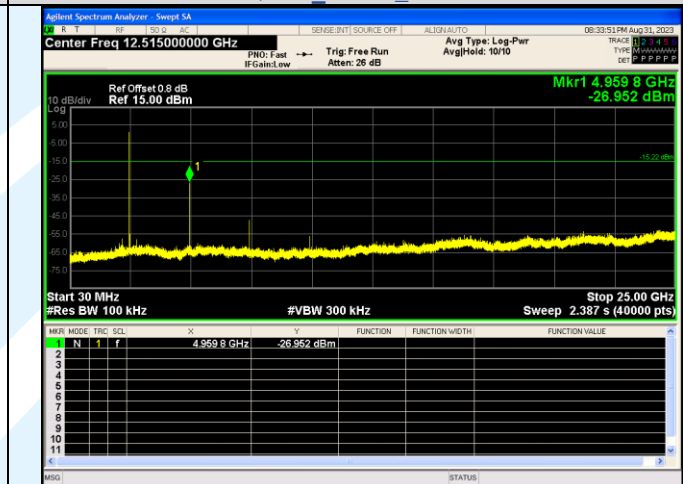
**Out Of Band Emission
GFSK_DH5_Channel 78**



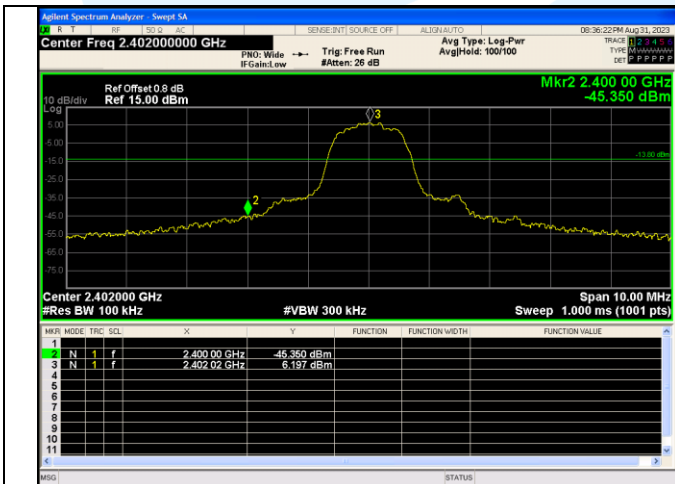
**Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78**



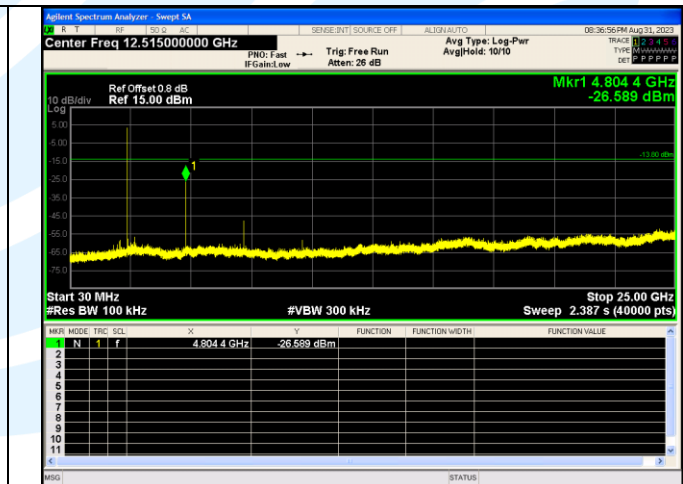
**Spurious Emission
GFSK_DH5_Channel 78**



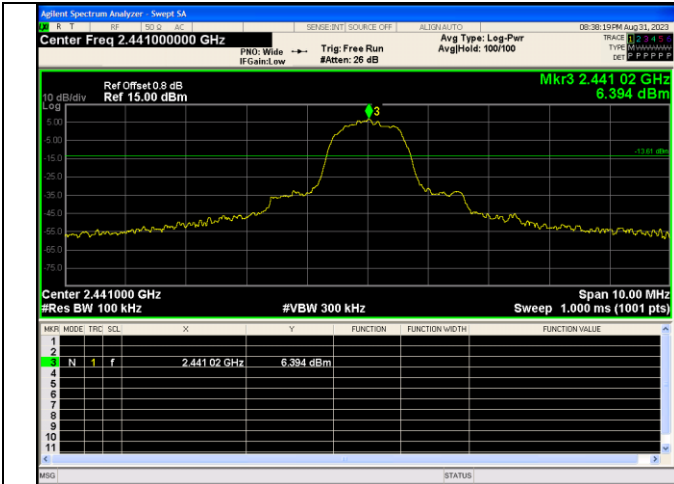
**Spurious Emission
 $\pi/4$ DQPSK_2-DH5_Channel 78**



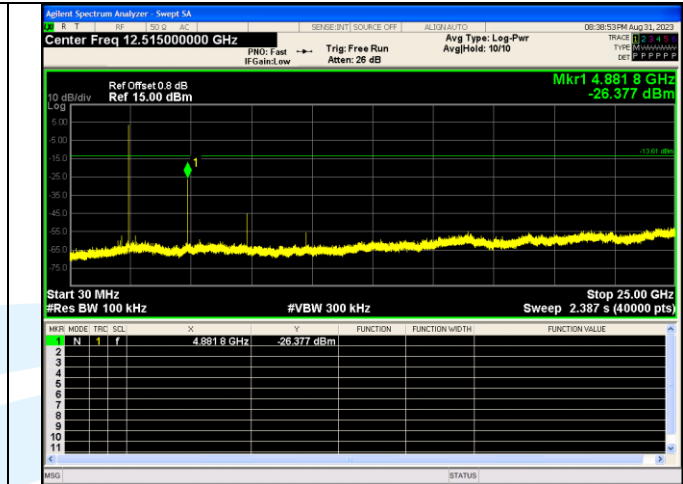
**Out Of Band Emission
8DPSK_3-DH5_Channel 0**



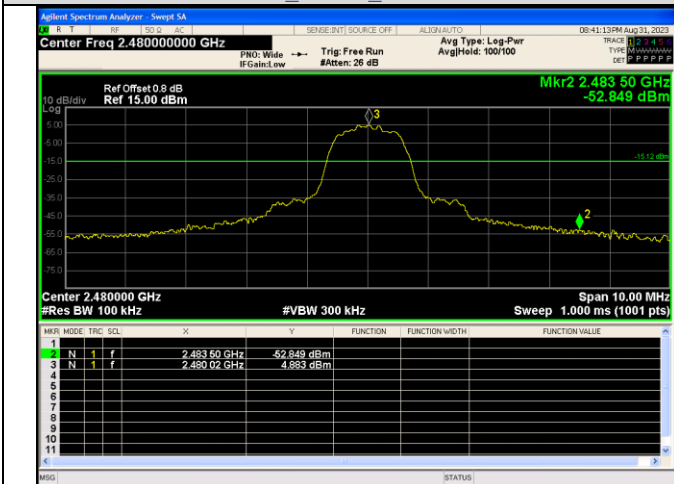
**Spurious Emission
8DPSK_3-DH5_Channel 0**



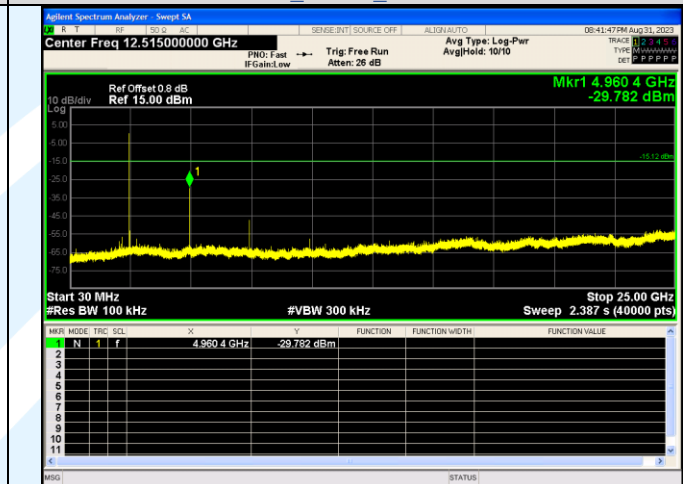
**Out Of Band Emission
8DPSK 3-DH5 Channel 39**



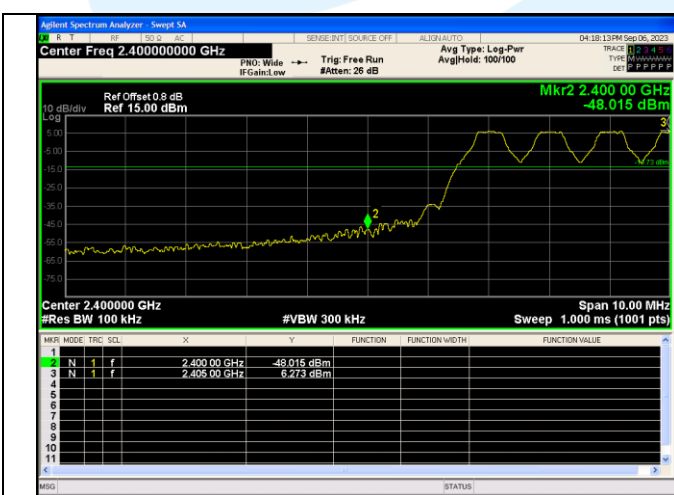
**Spurious Emissions
8DPSK 3-DH5 Channel 39**



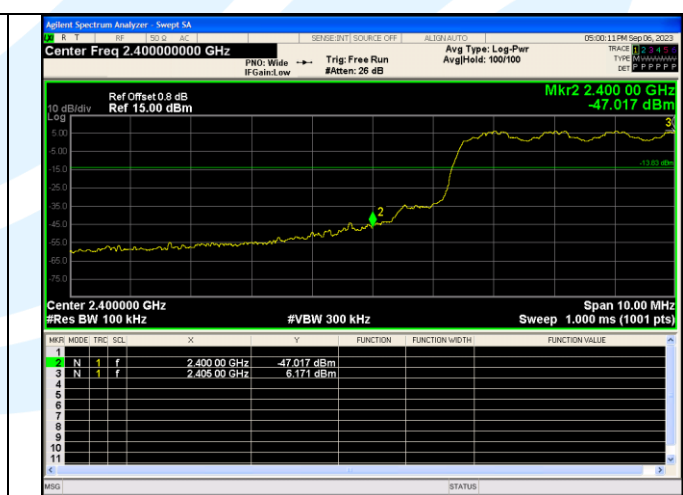
**Out Of Band Emission
8DPSK 3-DH5 Channel 78**



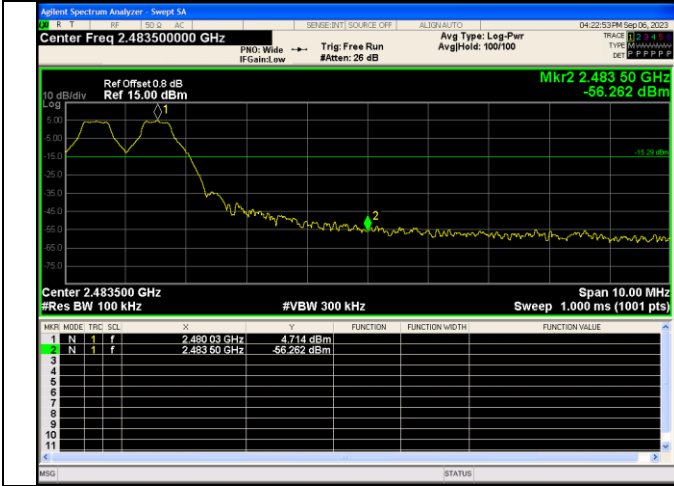
**Spurious Emission
8DPSK 3-DH5 Channel 78**



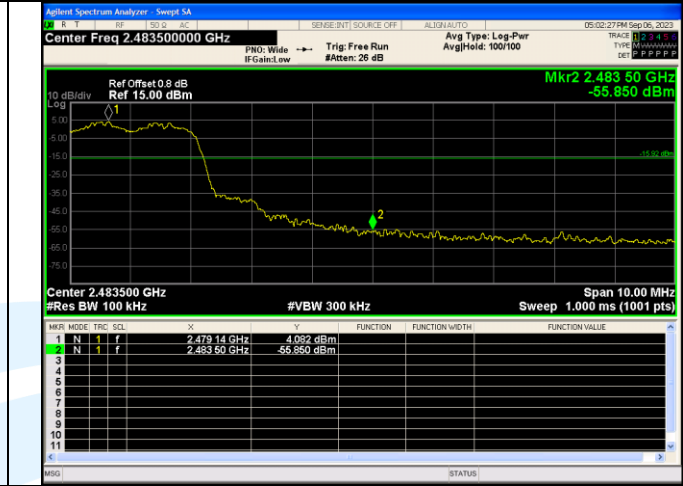
**Out Of Band Emission(Left)
GFSK DH5 Channel Hopping**



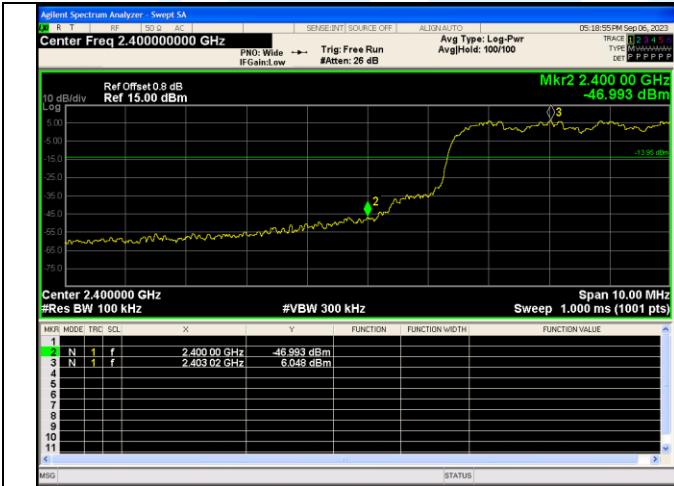
**Out Of Band Emission(Left)
π/4DQPSK 2-DH5 Channel Hopping**



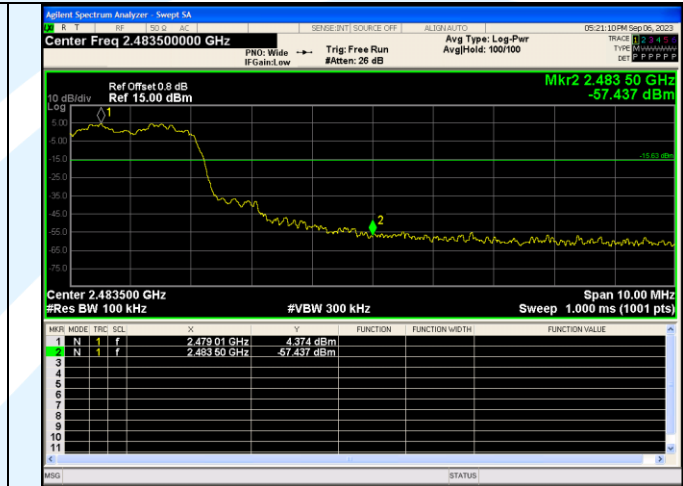
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



Out Of Band Emission(Right)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



Out Of Band Emission(Left)
8DPSK_3-DH5_Channel Hopping

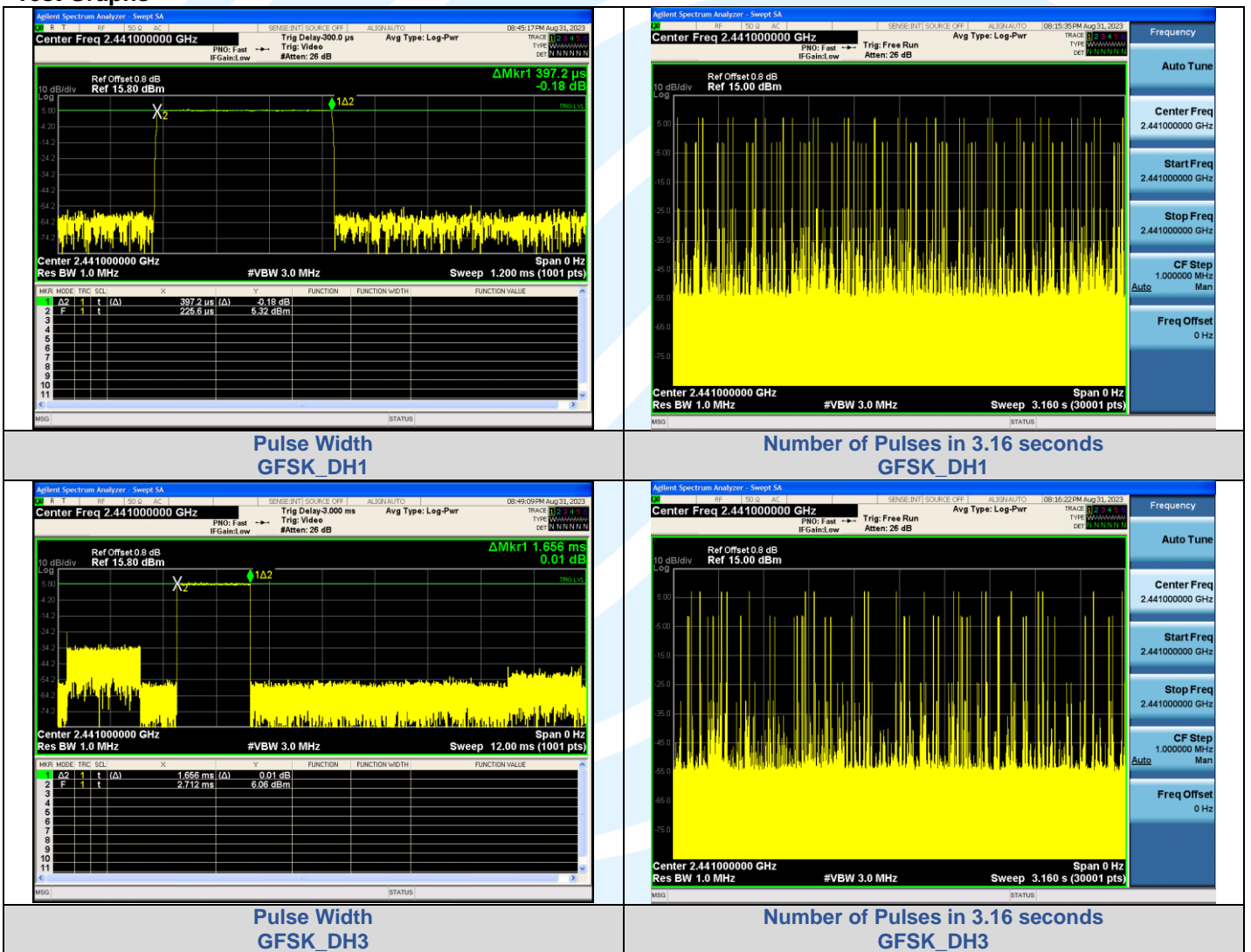


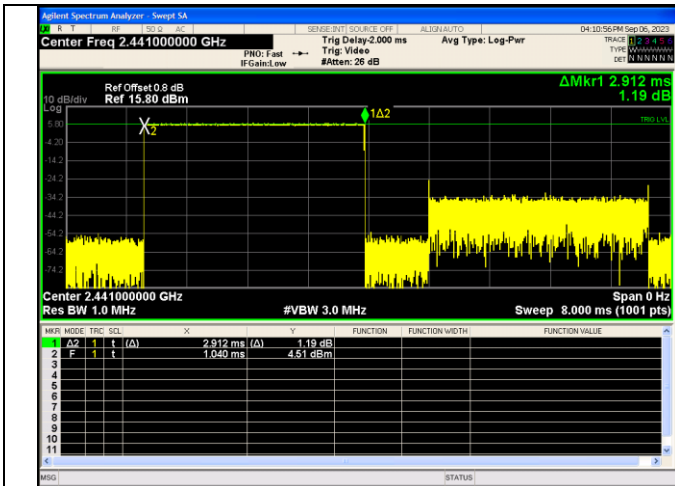
Out Of Band Emission(Right)
8DPSK_3-DH5_Channel Hopping

A.5 DWELL TIME

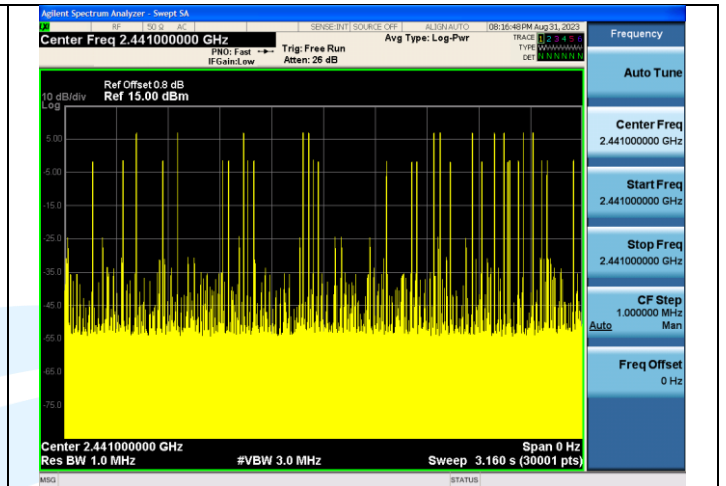
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 3.16 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH1	CH39 (2441MHz)	0.3972	310	123.132	< 400	PASS
	DH3		1.656	200	331.2		PASS
	DH5		2.912	120	349.44		PASS
π/4DQPSK	2-DH1		0.4068	320	130.176		PASS
	2-DH3		1.656	140	231.84		PASS
	2-DH5		2.784	140	389.76		PASS
8DPSK	3-DH1		0.4068	320	130.176		PASS
	3-DH3		1.656	180	298.08		PASS
	3-DH5		2.904	130	377.52		PASS

Test Graphs

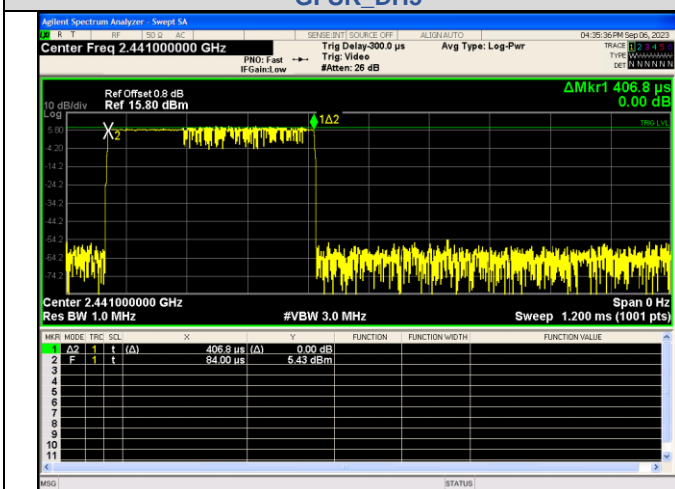




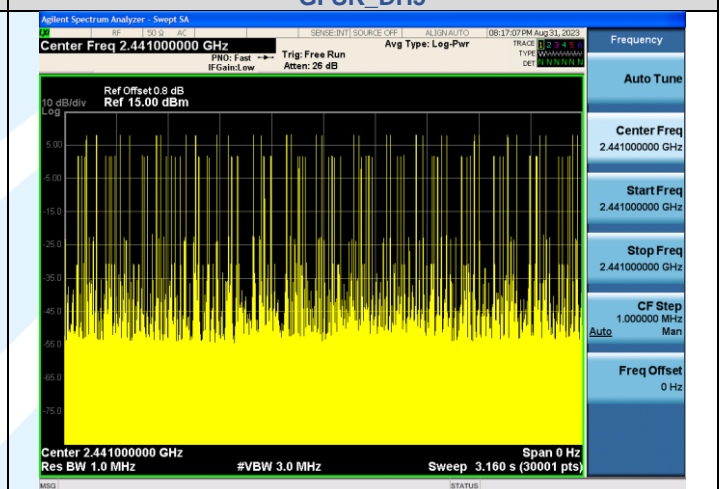
**Pulse Width
GFSK_DH5**



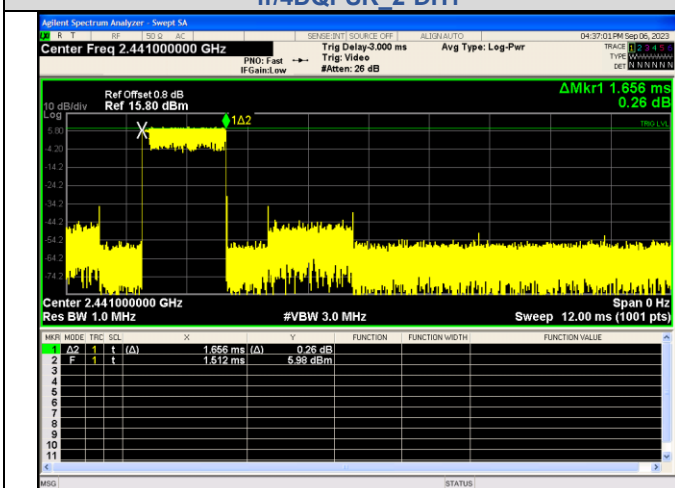
**Number of Pulses in 3.16 seconds
GFSK_DH5**



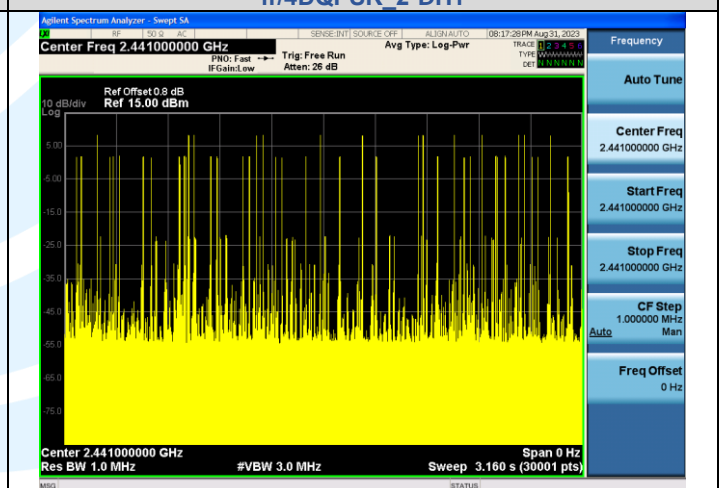
**Pulse Width
 $\pi/4$ DQPSK_2-DH1**



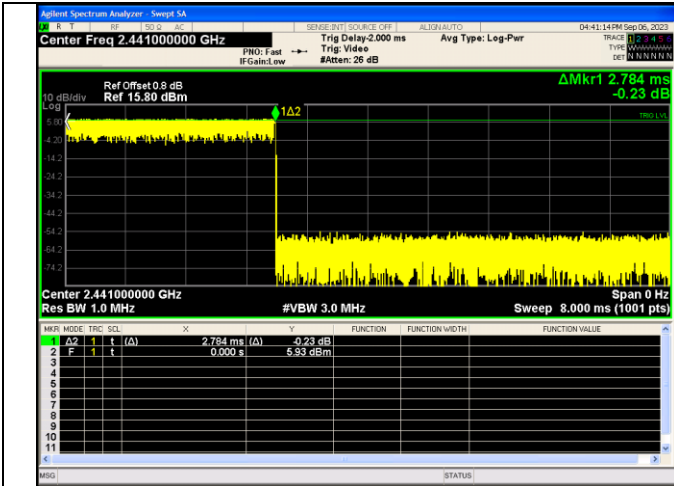
**Number of Pulses in 3.16 seconds
 $\pi/4$ DQPSK_2-DH1**



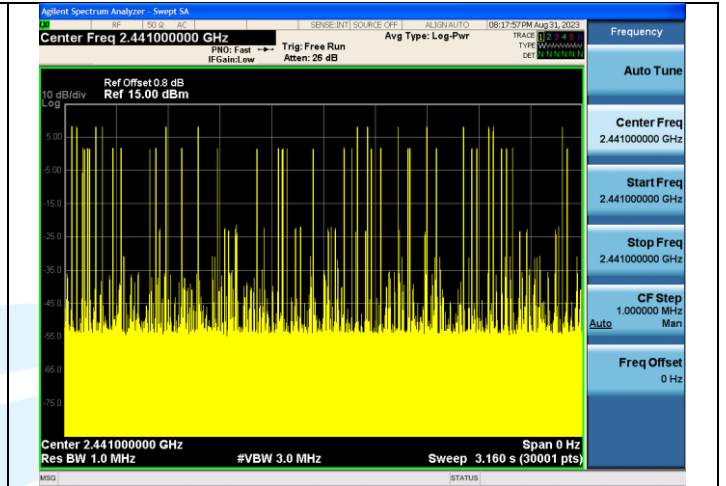
**Pulse Width
 $\pi/4$ DQPSK_2-DH3**



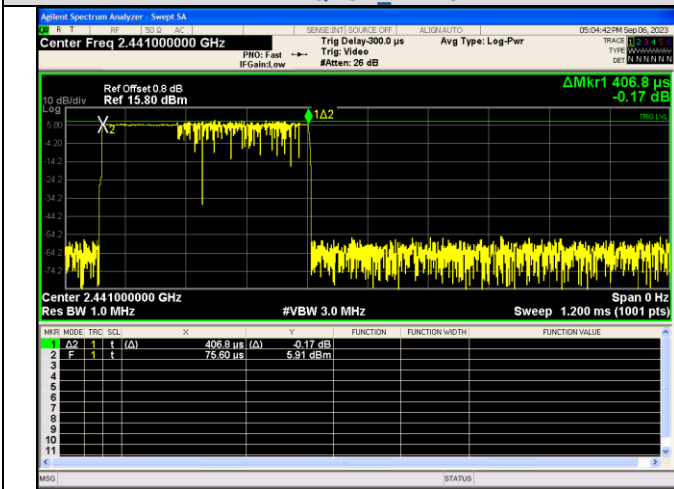
**Number of Pulses in 3.16 seconds
 $\pi/4$ DQPSK_2-DH3**



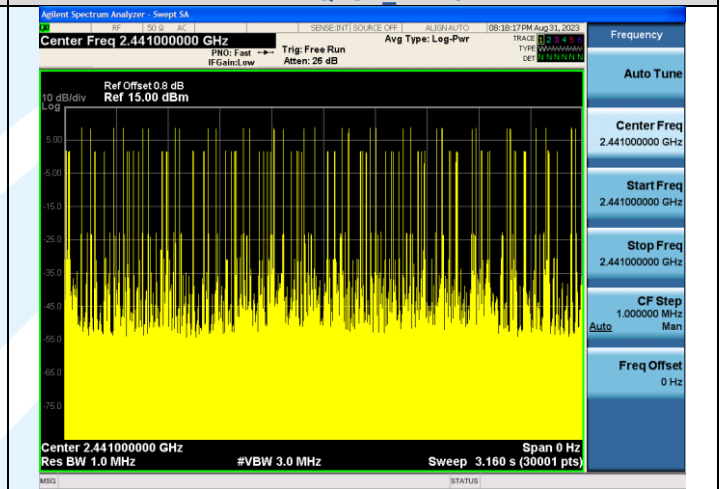
**Pulse Width
 $\pi/4$ DQPSK 2-DH5**



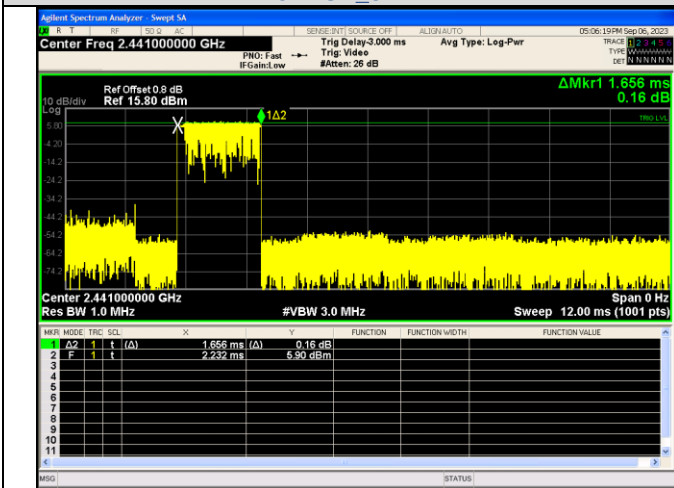
**Number of Pulses in 3.16 seconds
 $\pi/4$ DQPSK 2-DH5**



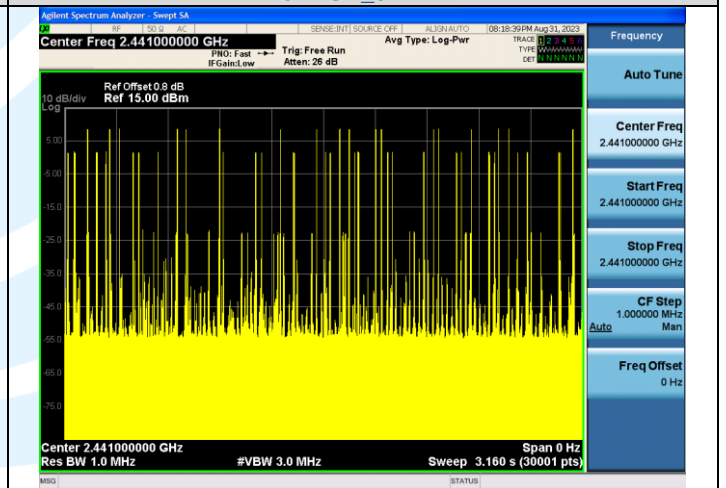
**Pulse Width
 8DPSK 3-DH1**



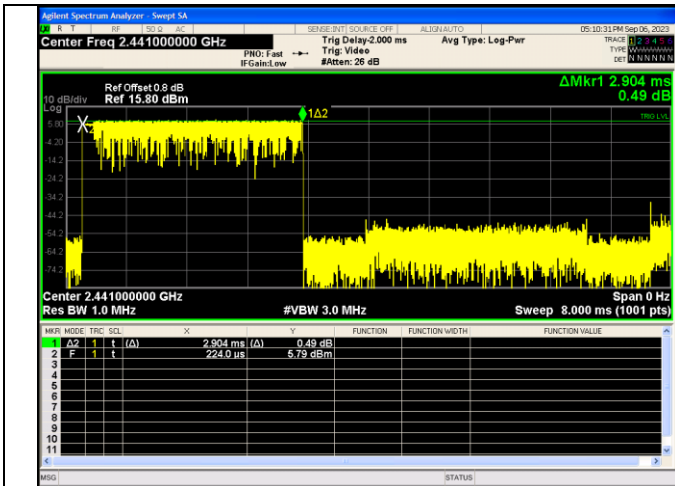
**Number of Pulses in 3.16 seconds
 8DPSK 3-DH1**



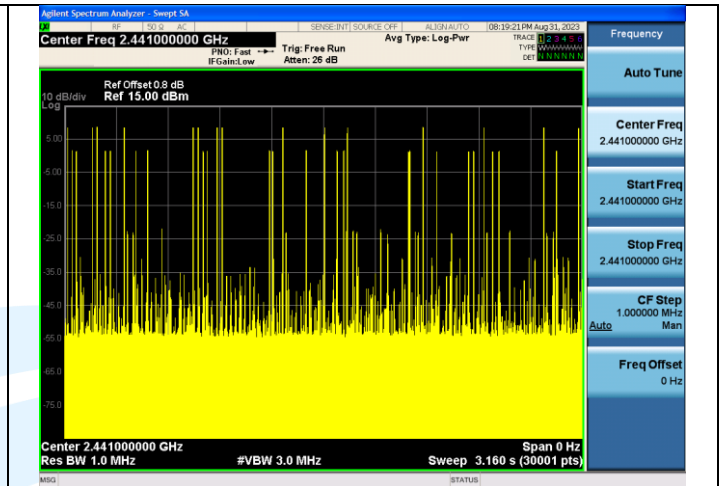
**Pulse Width
 8DPSK 3-DH3**



**Number of Pulses in 3.16 seconds
 8DPSK 3-DH3**



Pulse Width
8DPSK_3-DH5



Number of Pulses in 3.16 seconds
8DPSK_3-DH5

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

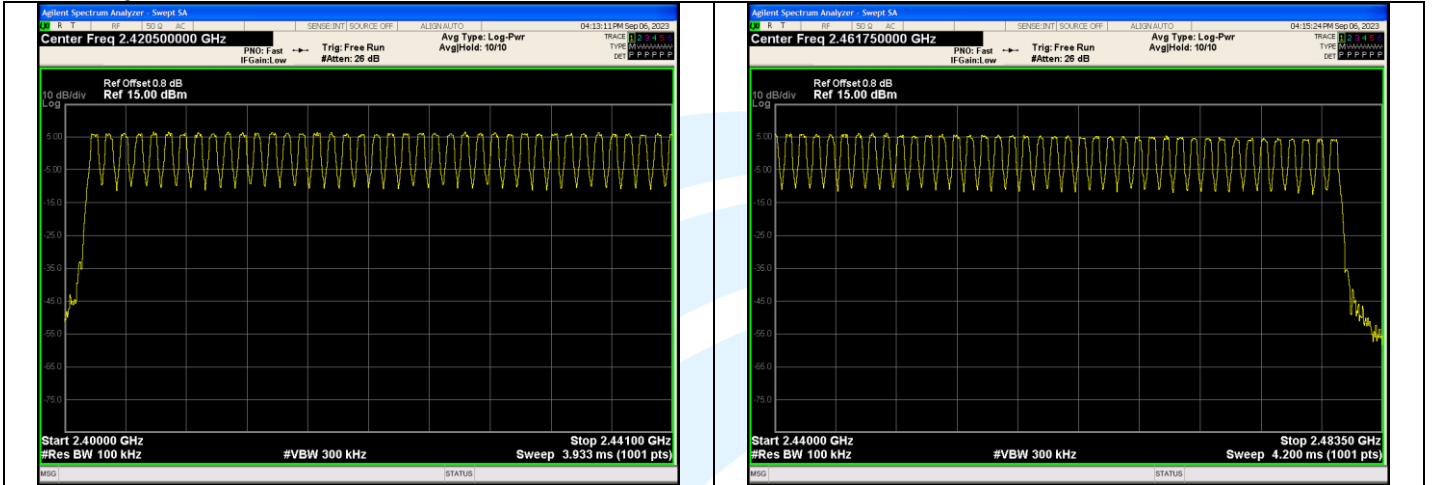
<http://www.uttlab.com>

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A.6 NUMBER OF HOPPING CHANNEL

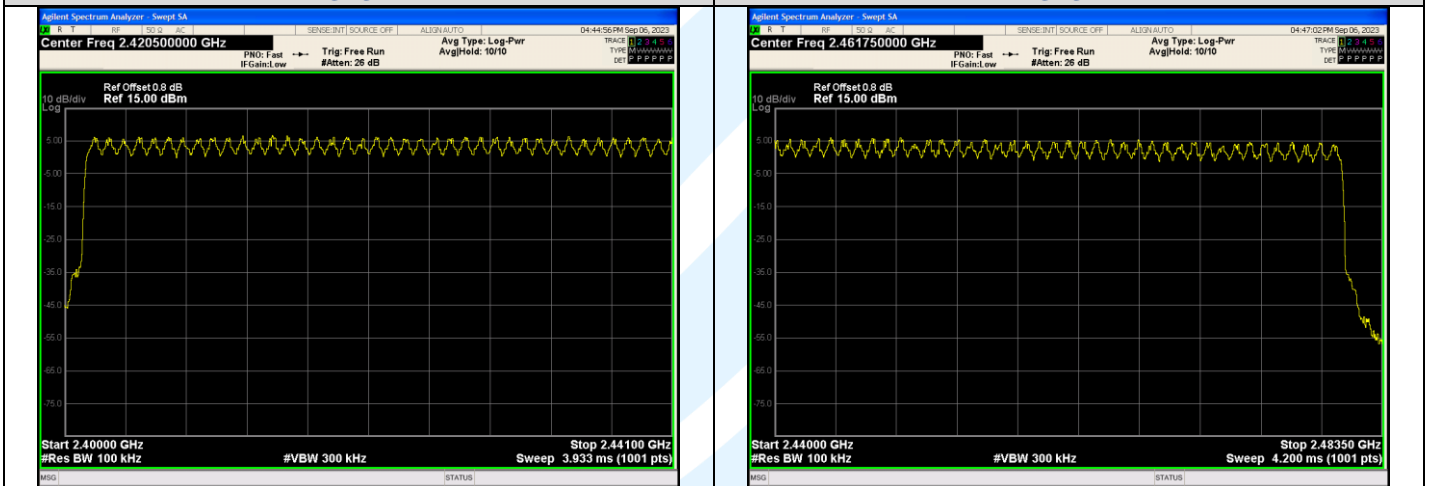
Modulation	Packet	Number of Hopping Channel	Result
GFSK	DH5	79	PASS
$\pi/4$ DQPSK	2-DH5	79	PASS
8DPSK	3-DH5	79	PASS

Test Graphs



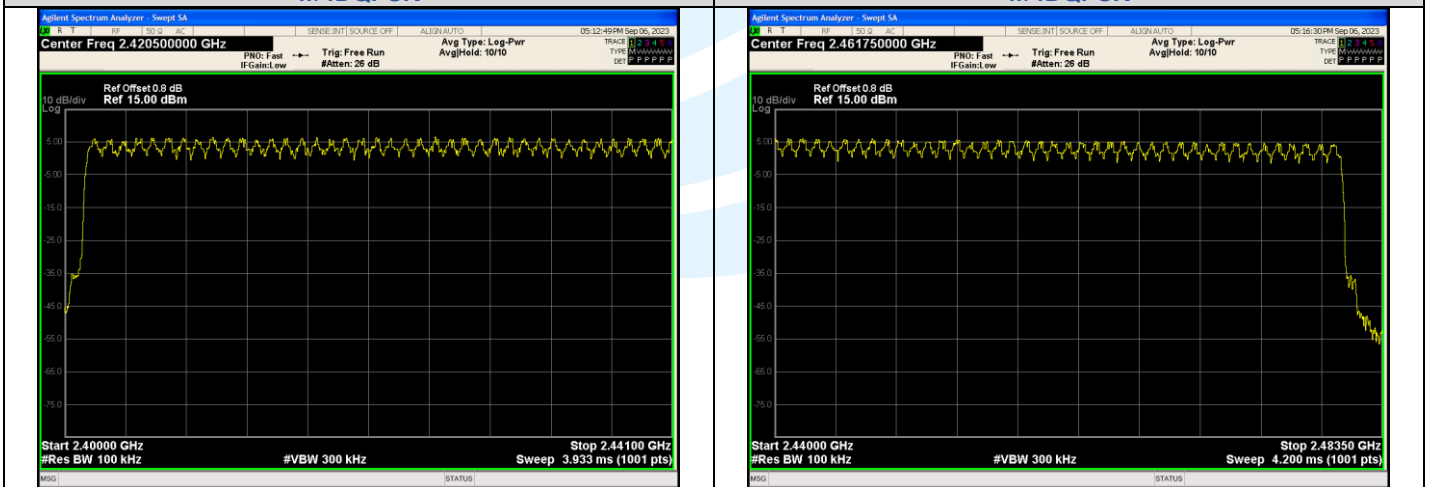
Low End Spectrum Channel Hopping Plot
GFSK

High End Spectrum Channel Hopping Plot
GFSK



Low End Spectrum Channel Hopping Plot
 $\pi/4$ DQPSK

High End Spectrum Channel Hopping Plot
 $\pi/4$ DQPSK



Low End Spectrum Channel Hopping Plot
8DPSK

High End Spectrum Channel Hopping Plot
8DPSK

APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***

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