

12 Dwell Time Test

12.1 Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1) & RSS-247.5.1(4)
Test Limit	0.4 sec

12.2 Test Setup



12.3 Test Procedure

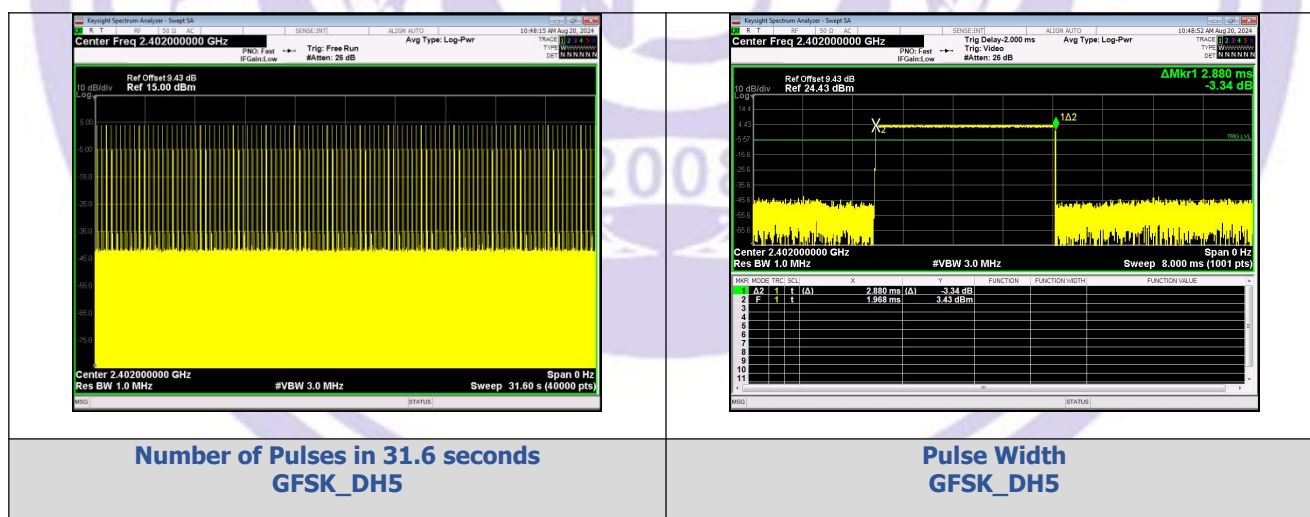
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span= zero span, centered on a hopping channel
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Sweep time = as necessary to capture the entire dwell time per hopping channel.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

12.4 Test Data

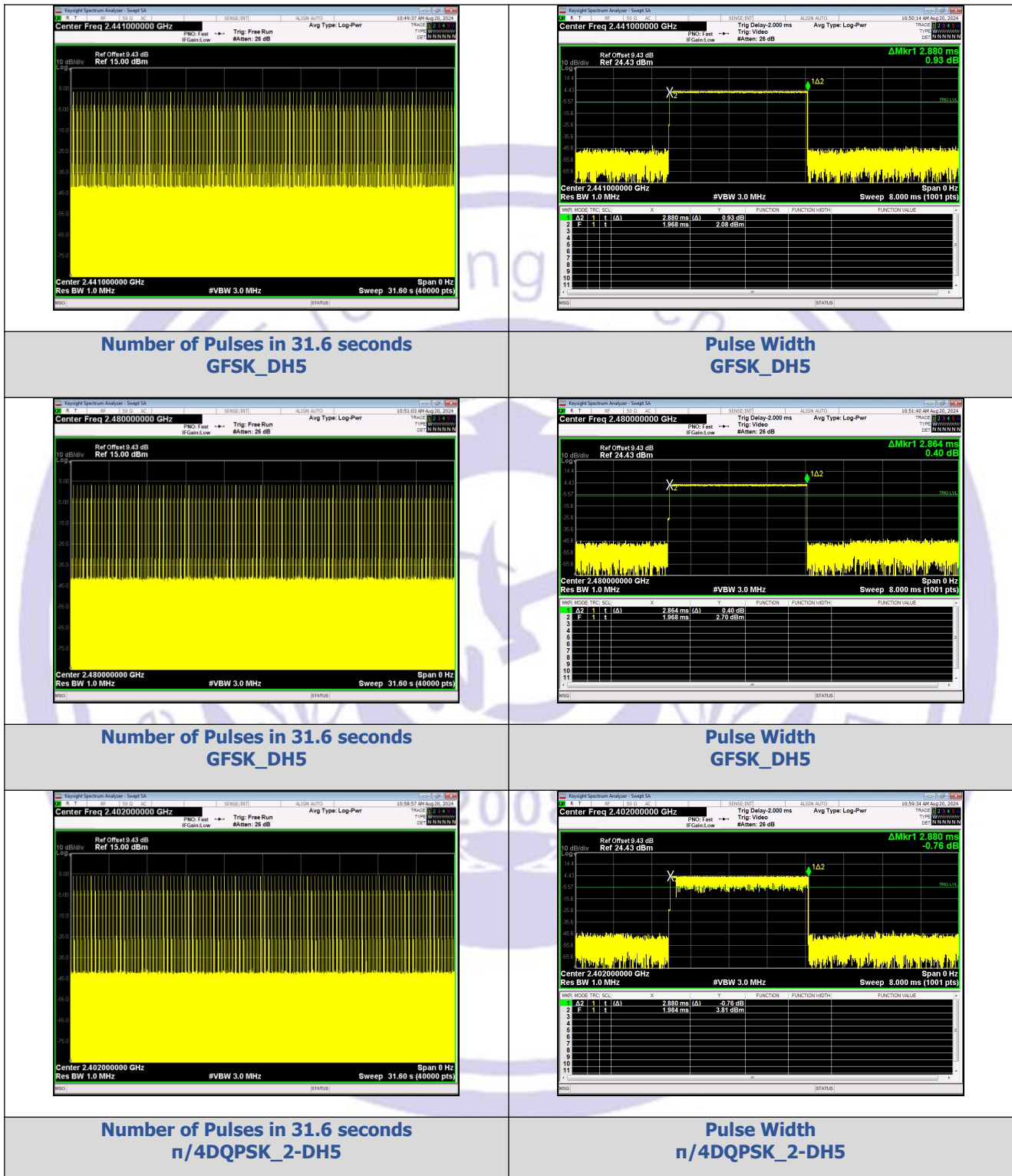
Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH0 (2402MHz)	2.880	107	308.16	< 400	PASS
	DH5	CH39 (2441MHz)	2.880	106	305.28		PASS
	DH5	CH78 (2480MHz)	2.864	106	303.58		PASS
$\pi/4$ DQPSK	2-DH5	CH0 (2402MHz)	2.880	106	305.28		PASS
	2-DH5	CH39 (2441MHz)	2.880	107	308.16		PASS
	2-DH5	CH78 (2480MHz)	2.880	106	305.28		PASS
8DPSK	3-DH5	CH0 (2402MHz)	2.880	106	305.28		PASS
	3-DH5	CH39 (2441MHz)	2.880	107	308.16		PASS
	3-DH5	CH78 (2480MHz)	2.880	107	308.16		PASS

Test Plots



Number of Pulses in 31.6 seconds
GFSK_DH5

Pulse Width
GFSK_DH5



Number of Pulses in 31.6 seconds
GFSK_DH5

Pulse Width
GFSK_DH5

Number of Pulses in 31.6 seconds
GFSK_DH5

Pulse Width
GFSK_DH5

Number of Pulses in 31.6 seconds
n/4DQPSK_2-DH5

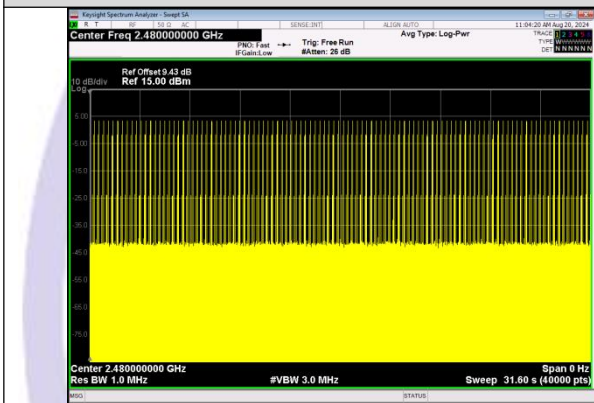
Pulse Width
n/4DQPSK_2-DH5



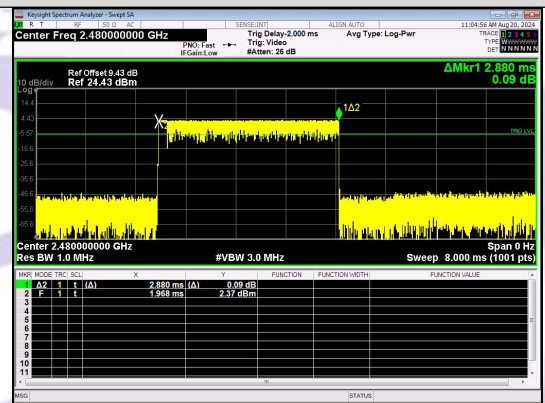
**Number of Pulses in 31.6 seconds
n/4DQPSK_2-DH5**



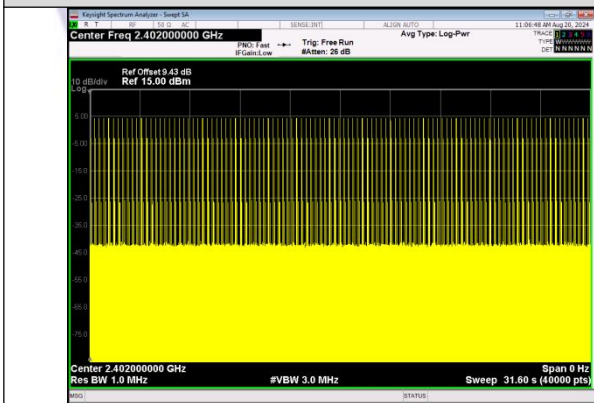
**Pulse Width
n/4DQPSK_2-DH5**



**Number of Pulses in 31.6 seconds
n/4DQPSK_2-DH5**



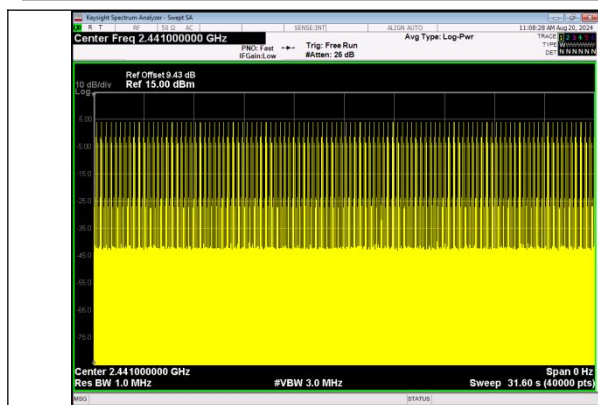
**Pulse Width
n/4DQPSK_2-DH5**



**Number of Pulses in 31.6 seconds
8DPSK_3-DH5**



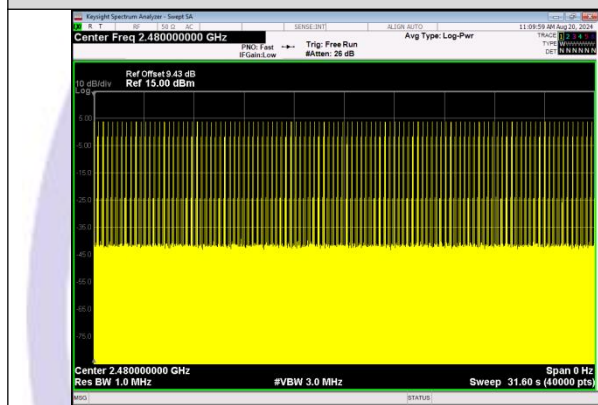
**Pulse Width
8DPSK_3-DH5**



**Number of Pulses in 31.6 seconds
8DPSK_3-DH5**



**Pulse Width
8DPSK_3-DH5**



**Number of Pulses in 31.6 seconds
8DPSK_3-DH5**



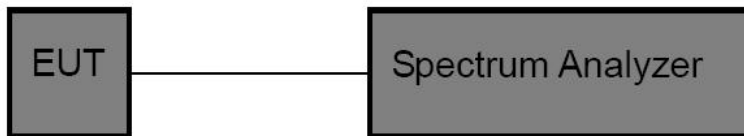
**Pulse Width
8DPSK_3-DH5**

13 100kHz Bandwidth of Frequency Band Edge Requirement

13.1 Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (d)
Test Limit	in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

13.2 Test Setup



13.3 Test Procedure

The EUT must have its hopping/Non-hopping function enabled. Using the following spectrum analyzer setting:

1. Set the RBW = 100kHz.
2. Set the VBW = 300kHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

13.4 Test Data

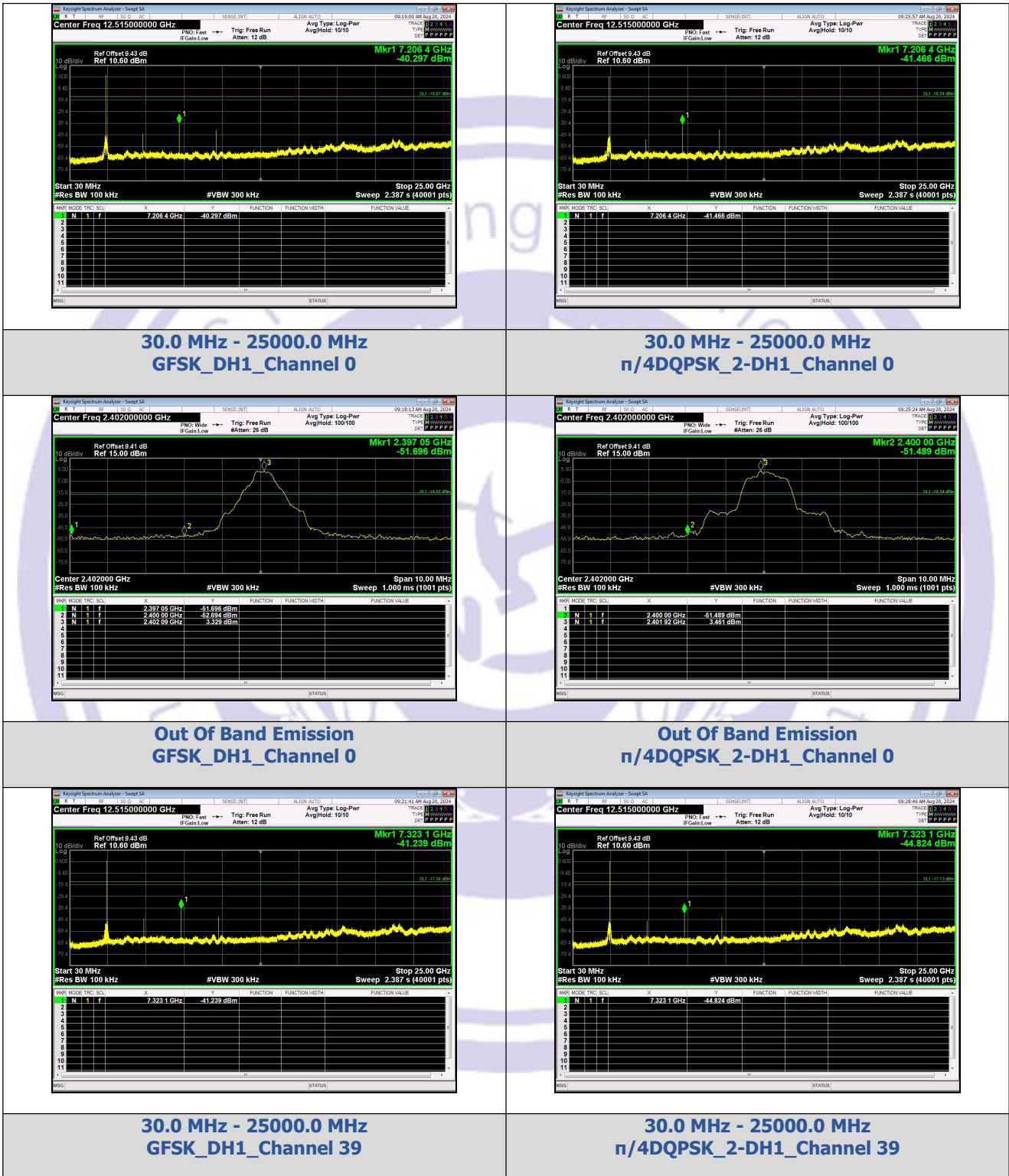
Non-Hopping

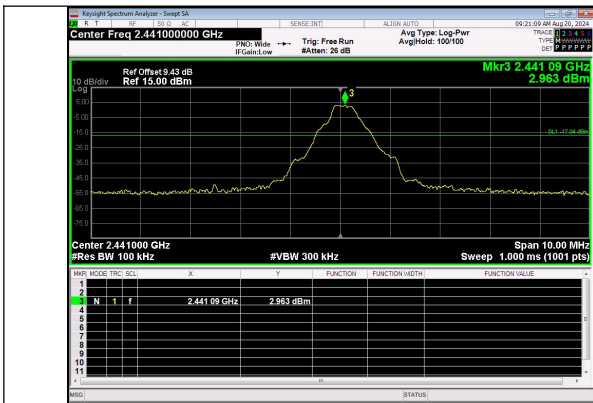
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH1	0	2397.05	-51.696	-16.67	-35.026	PASS
			2400.00	-52.694	-16.67	-36.024	PASS
			7206.40	-40.297	-16.67	-23.627	PASS
		39	7323.11	-41.239	-17.04	-24.199	PASS
		78	2483.50	-53.626	-17.3	-36.326	PASS
			9920.62	-47.282	-17.3	-29.982	PASS
$\pi/4$ DQPSK	2-DH1	0	2400.00	-51.489	-16.54	-34.949	PASS
			7206.38	-41.466	-16.54	-24.926	PASS
			7323.11	-44.824	-17.13	-27.694	PASS
		39	2483.50	-53.971	-17.32	-36.651	PASS
		78	7440.47	-41.632	-17.32	-24.312	PASS
			2397.07	-51.437	-16.53	-34.907	PASS
8DPSK	3-DH1	0	2400.00	-51.551	-16.53	-35.021	PASS
			7206.40	-39.831	-16.53	-23.301	PASS
			7323.11	-43.487	-17.03	-26.457	PASS
		39	2483.50	-52.631	-17.29	-35.341	PASS
		78	7440.47	-42.206	-17.29	-24.916	PASS
			2397.05	-51.696	-16.67	-35.026	PASS

Hopping

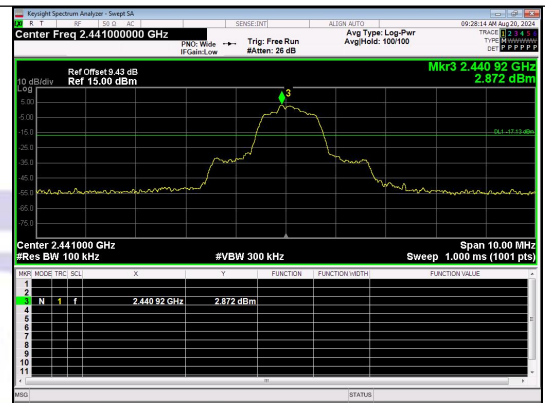
Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH1	Hopping	2398.61	-47.903	-16.54	-31.363	PASS
			2400.00	-49.357	-16.54	-32.817	PASS
$\pi/4$ DQPSK	2-DH1		2483.50	-48.640	-17.17	-31.470	PASS
			2397.44	-47.589	-16.53	-31.059	PASS
8DPSK	3-DH1		2400.00	-49.500	-16.53	-32.970	PASS
			2483.50	-49.719	-17.24	-32.479	PASS
		2397.86	-48.550	-16.46	-32.090	PASS	
			2400.00	-51.021	-16.46	-34.561	PASS

Test Graphs

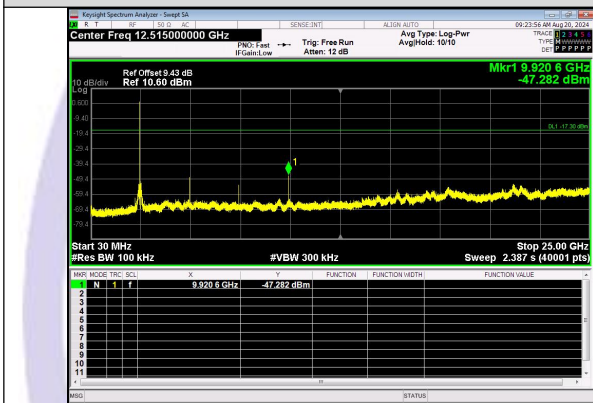




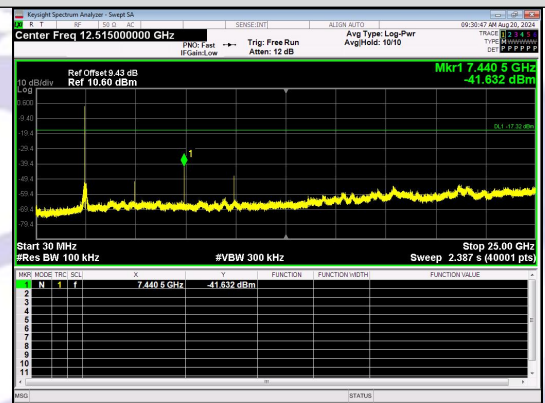
Out Of Band Emission
GFSK_DH1_Channel 39



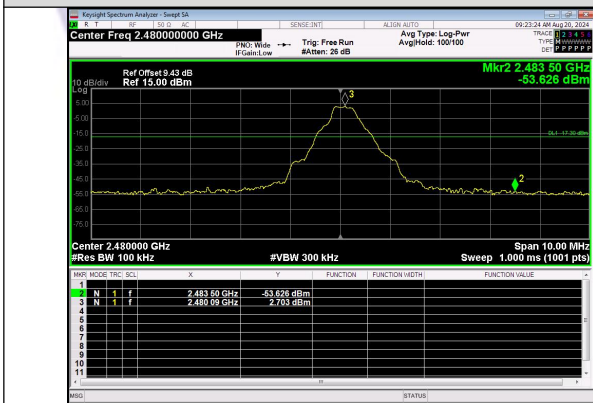
Out Of Band Emission
n/4QPSK_2-DH1_Channel 39



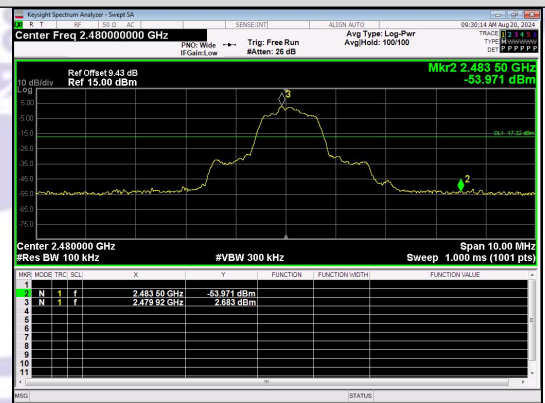
30.0 MHz - 25000.0 MHz
GFSK_DH1_Channel 78



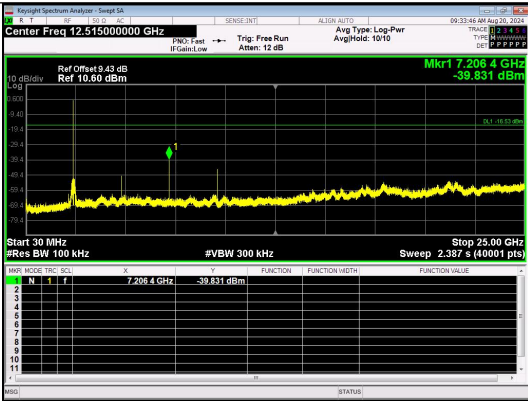
30.0 MHz - 25000.0 MHz
n/4QPSK_2-DH1_Channel 78



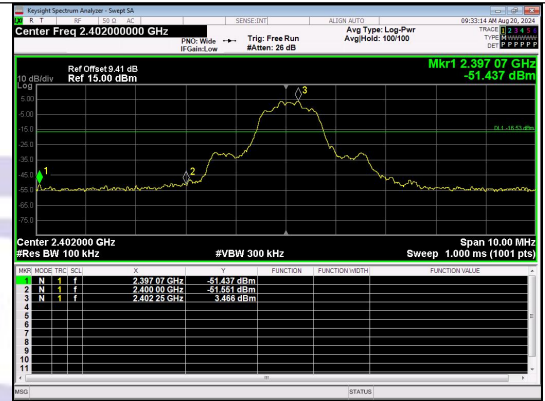
Out Of Band Emission
GFSK_DH1_Channel 78



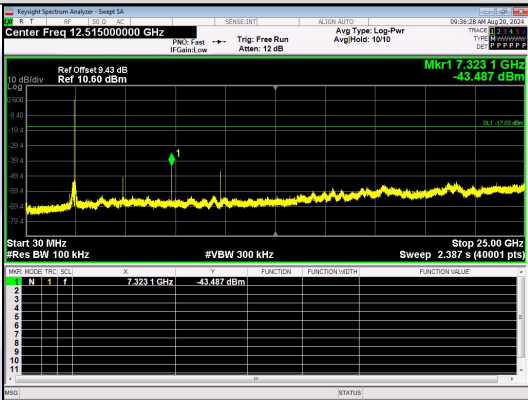
Out Of Band Emission
n/4QPSK_2-DH1_Channel 78



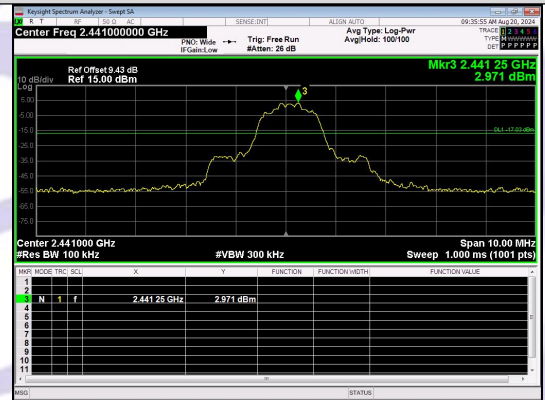
**30.0 MHz - 25000.0 MHz
8DPSK_3-DH1_Channel 0**



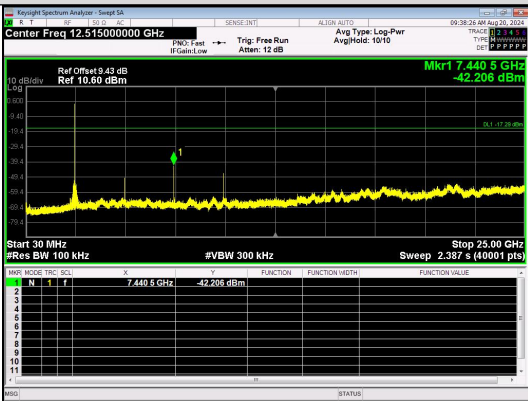
**Out Of Band Emission
8DPSK_3-DH1_Channel 0**



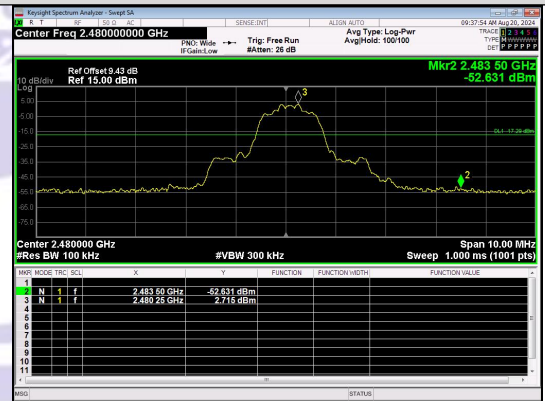
**30.0 MHz - 25000.0 MHz
8DPSK_3-DH1_Channel 39**



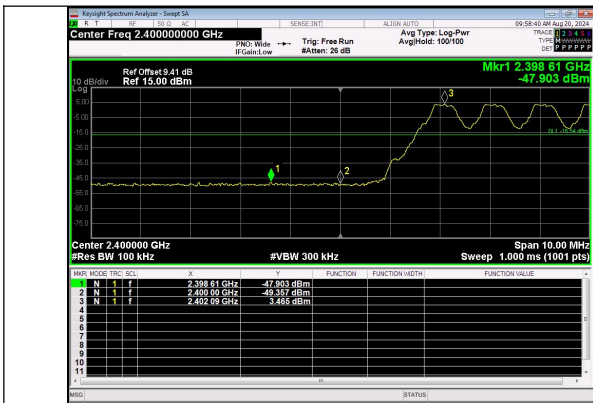
**Out Of Band Emission
8DPSK_3-DH1_Channel 39**



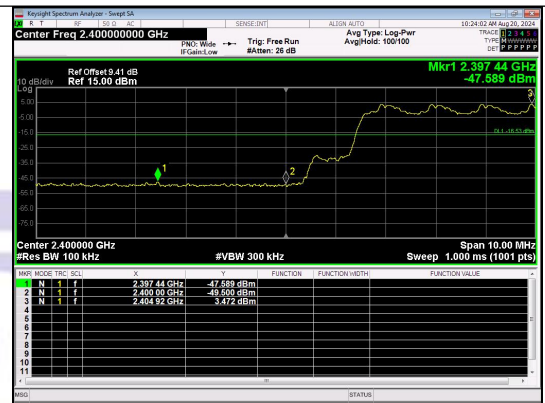
**30.0 MHz - 25000.0 MHz
8DPSK_3-DH1_Channel 78**



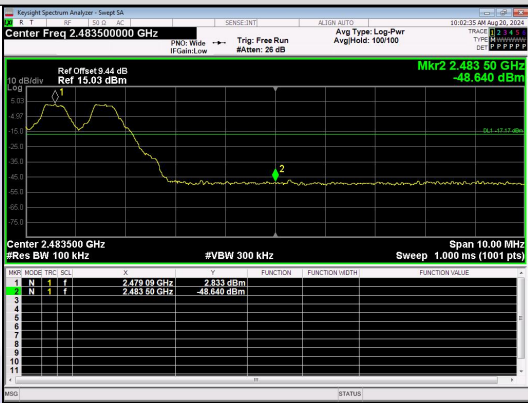
**Out Of Band Emission
8DPSK_3-DH1_Channel 78**



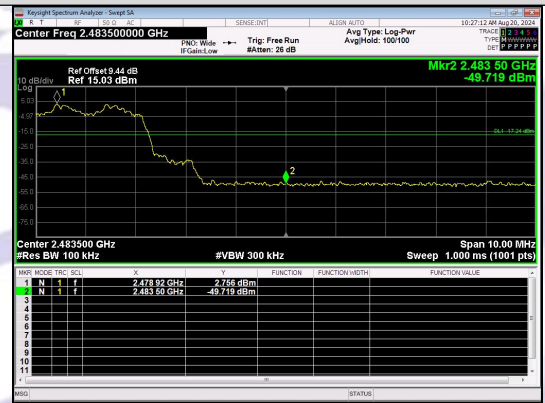
Out Of Band Emission(Left)
GFSK_DH1_Channel Hopping



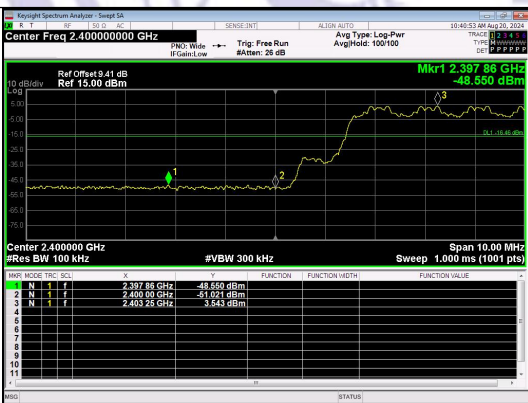
Out Of Band Emission(Left)
n/4QPSK_2-DH1_Channel Hopping



Out Of Band Emission(Right)
GFSK_DH1_Channel Hopping



Out Of Band Emission(Right)
n/4QPSK_2-DH1_Channel Hopping



Out Of Band Emission(Left)
8DPSK_3-DH1_Channel Hopping



Out Of Band Emission(Right)
8DPSK_3-DH1_Channel Hopping

14 Antenna Requirement

14.1 Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	<p>1) 15.203 requirement:</p> <p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, 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.</p> <p>2) 15.247(c) (1)(i) requirement:</p> <p>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 6 dBi.</p>

14.2 Antenna Connected Construction

The antenna is PCB Antenna which permanently attached, and the best case gain of the antenna is -1.06 dBi. It complies with the standard requirement.

15 APPENDIX I -- TEST SETUP PHOTOGRAPH

Please see the attachment for details.



16 APPENDIX II -- EUT PHOTOGRAPH

Please see the attachment for details.

----- End of Report -----

