5.6 TEST RESULT

	Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Detector Type	Result
GFSK	Low Channel: 2402MHz									
	H	2390.00	54.16	30.22	4.85	23.98	52.77	74.00	PK	PASS
	H	2390.00	44.47	30.22	4.85	23.98	43.08	54.00	AV	PASS
	H	2400.00	54.97	30.22	4.85	23.98	53.58	74.00	PK	PASS
	H	2400.00	44.66	30.22	4.85	23.98	43.27	54.00	AV	PASS
	V	2390.00	54.24	30.22	4.85	23.98	52.85	74.00	PK	PASS
	V	2390.00	44.20	30.22	4.85	23.98	42.81	54.00	AV	PASS
	V	2400.00	54.70	30.22	4.85	23.98	53.31	74.00	PK	PASS
	V	2400.00	44.10	30.22	4.85	23.98	42.71	54.00	AV	PASS
	High Channel: 2480MHz									
	H	2483.50	53.80	30.22	4.85	23.98	52.41	74.00	Pk	PASS
	H	2483.50	44.57	30.22	4.85	23.98	43.18	54.00	AV	PASS
	H	2500.00	53.53	30.22	4.85	23.98	52.14	74.00	Pk	PASS
	H	2500.00	44.98	30.22	4.85	23.98	43.59	54.00	AV	PASS
	V	2483.50	53.40	30.22	4.85	23.98	52.01	74.00	Pk	PASS
	V	2483.50	44.84	30.22	4.85	23.98	43.45	54.00	AV	PASS
	V	2500.00	54.22	30.22	4.85	23.98	52.83	74.00	Pk	PASS
	V	2500.00	44.69	30.22	4.85	23.98	43.30	54.00	AV	PASS
π/4-DQPSK	Low Channel: 2402MHz									
	H	2390.00	53.58	30.22	4.85	23.98	52.19	74.00	PK	PASS
	H	2390.00	44.92	30.22	4.85	23.98	43.53	54.00	AV	PASS
	H	2400.00	54.38	30.22	4.85	23.98	52.99	74.00	PK	PASS
	H	2400.00	44.49	30.22	4.85	23.98	43.10	54.00	AV	PASS
	V	2390.00	53.92	30.22	4.85	23.98	52.53	74.00	PK	PASS
	V	2390.00	44.66	30.22	4.85	23.98	43.27	54.00	AV	PASS
	V	2400.00	54.75	30.22	4.85	23.98	53.36	74.00	PK	PASS
	V	2400.00	44.13	30.22	4.85	23.98	42.74	54.00	AV	PASS
	High Channel: 2480MHz									
	H	2483.50	53.86	30.22	4.85	23.98	52.47	74.00	PK	PASS
	H	2483.50	44.66	30.22	4.85	23.98	43.27	54.00	AV	PASS
	H	2500.00	53.22	30.22	4.85	23.98	51.83	74.00	PK	PASS
	H	2500.00	44.14	30.22	4.85	23.98	42.75	54.00	AV	PASS
	V	2483.50	54.71	30.22	4.85	23.98	53.32	74.00	PK	PASS
	V	2483.50	44.82	30.22	4.85	23.98	43.43	54.00	AV	PASS
	V	2500.00	54.03	30.22	4.85	23.98	52.64	74.00	PK	PASS
	V	2500.00	44.43	30.22	4.85	23.98	43.04	54.00	AV	PASS
8-DPSK	Low Channel: 2402MHz									
	H	2390.00	53.41	30.22	4.85	23.98	52.02	74.00	PK	PASS
	H	2390.00	44.33	30.22	4.85	23.98	42.94	54.00	AV	PASS
	H	2400.00	53.88	30.22	4.85	23.98	52.49	74.00	PK	PASS
	H	2400.00	44.61	30.22	4.85	23.98	43.22	54.00	AV	PASS
	V	2390.00	53.14	30.22	4.85	23.98	51.75	74.00	PK	PASS
	V	2390.00	44.83	30.22	4.85	23.98	43.44	54.00	AV	PASS
	V	2400.00	54.54	30.22	4.85	23.98	53.15	74.00	PK	PASS
	V	2400.00	44.77	30.22	4.85	23.98	43.38	54.00	AV	PASS
	High Channel: 2480MHz									
	H	2483.50	54.33	30.22	4.85	23.98	52.94	74.00	PK	PASS
	H	2483.50	44.22	30.22	4.85	23.98	42.83	54.00	AV	PASS
	H	2500.00	54.25	30.22	4.85	23.98	52.86	74.00	PK	PASS
	H	2500.00	44.36	30.22	4.85	23.98	42.97	54.00	AV	PASS
	V	2483.50	54.16	30.22	4.85	23.98	52.77	74.00	PK	PASS
	V	2483.50	44.32	30.22	4.85	23.98	42.93	54.00	AV	PASS

	V	2500.00	54.18	30.22	4.85	23.98	52.79	74.00	PK	PASS
	V	2500.00	44.30	30.22	4.85	23.98	42.91	54.00	AV	PASS

Remark:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit

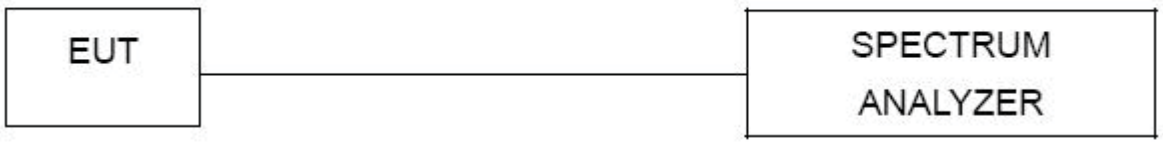
6. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

6.1 Limit

Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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) (see §15.205(c)).

6.2 Test Setup



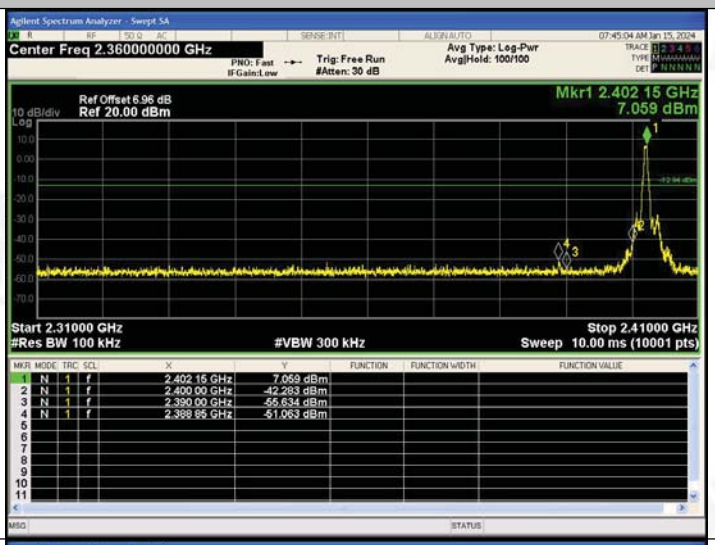
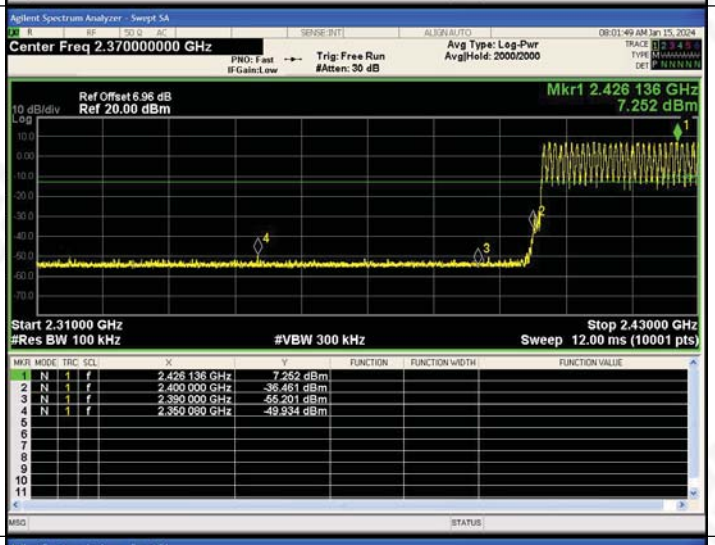
6.3 Test procedure

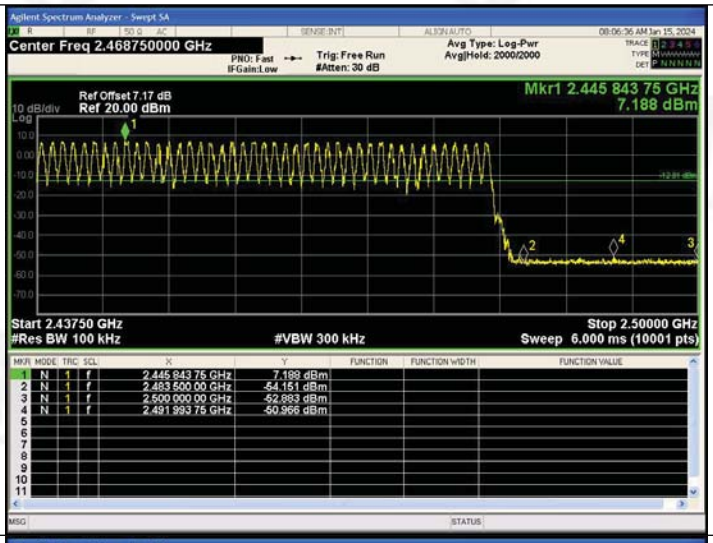
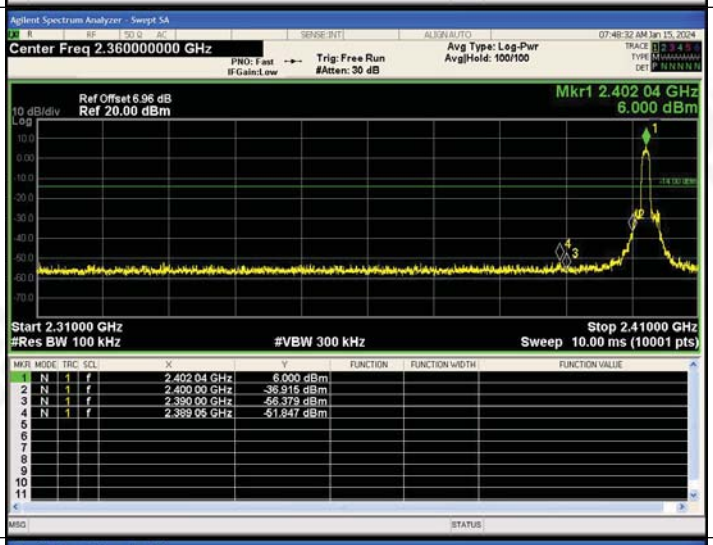
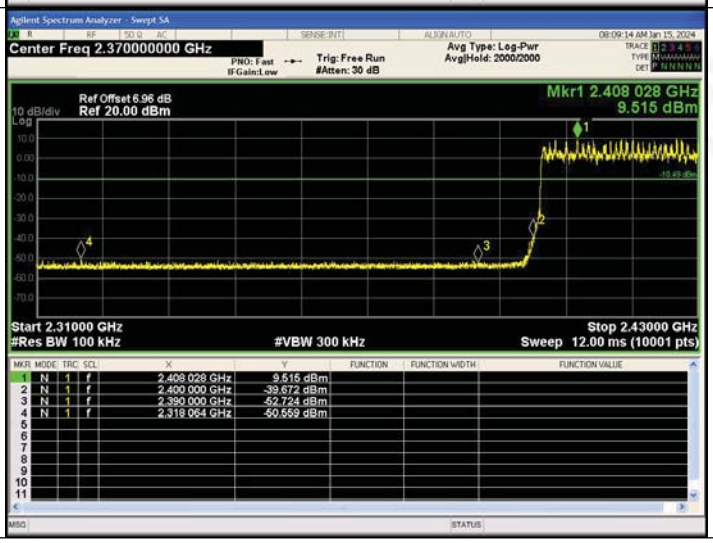
Using the following spectrum analyzer setting:
A) Set the RBW = 100KHz.
B) Set the VBW = 300KHz.
C) Sweep time = auto couple.
D) Detector function = peak.
E) Trace mode = max hold.
F) Allow trace to fully stabilize.

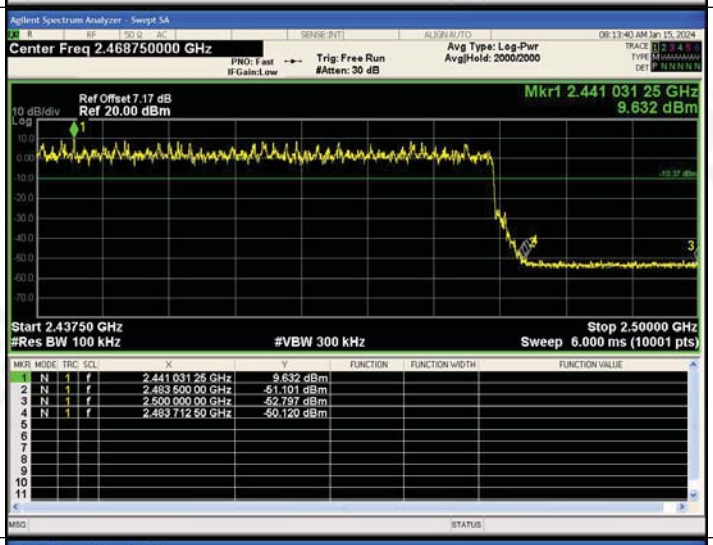
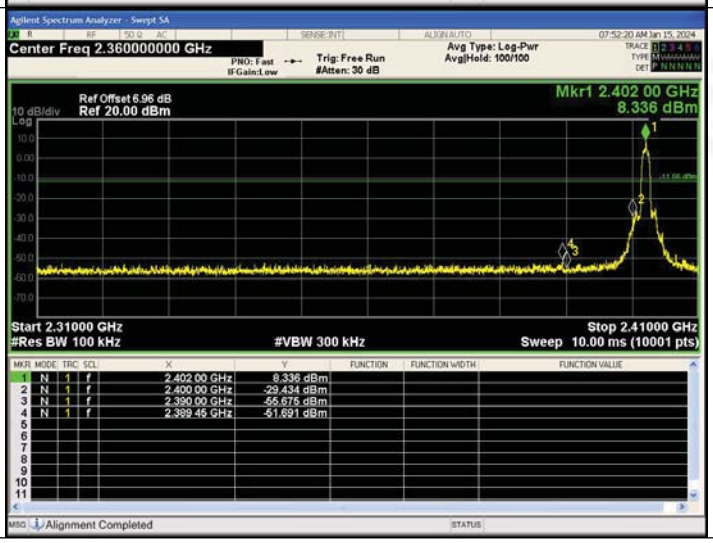
6.4 DEVIATION FROM STANDARD

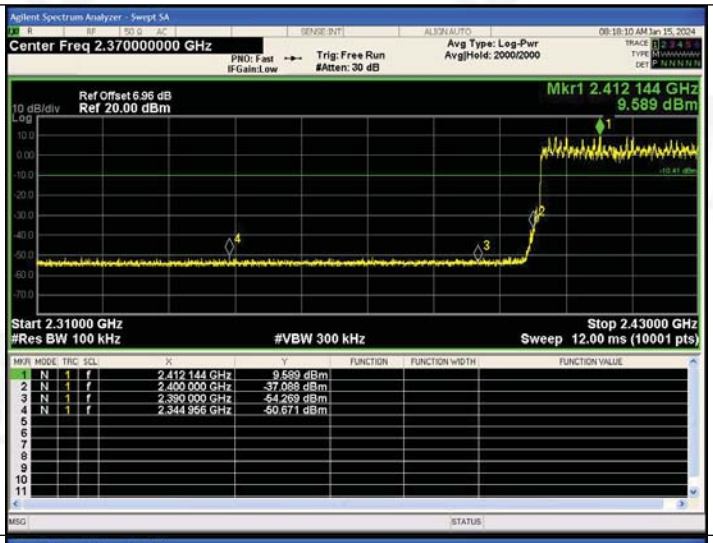
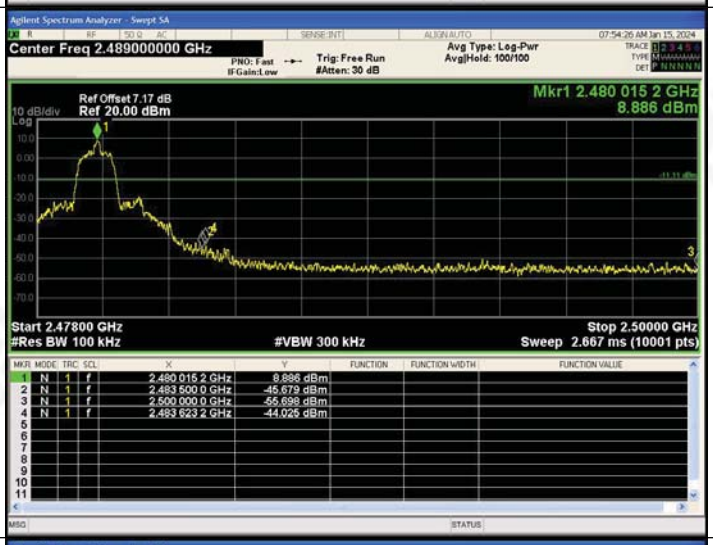
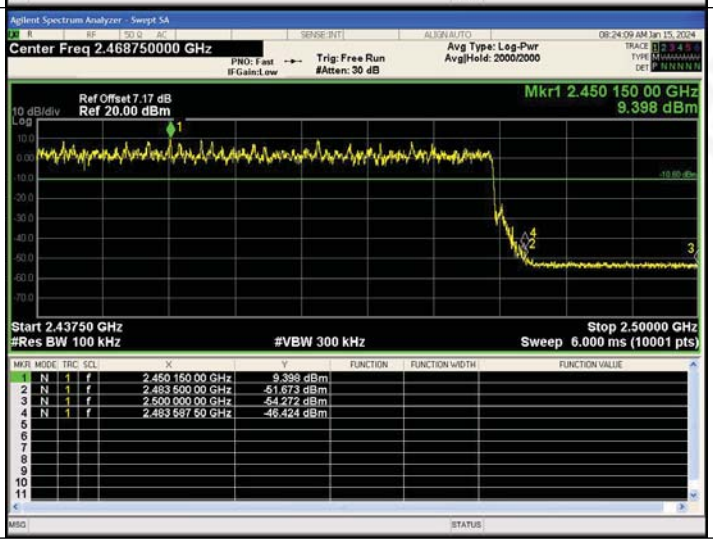
No deviation.

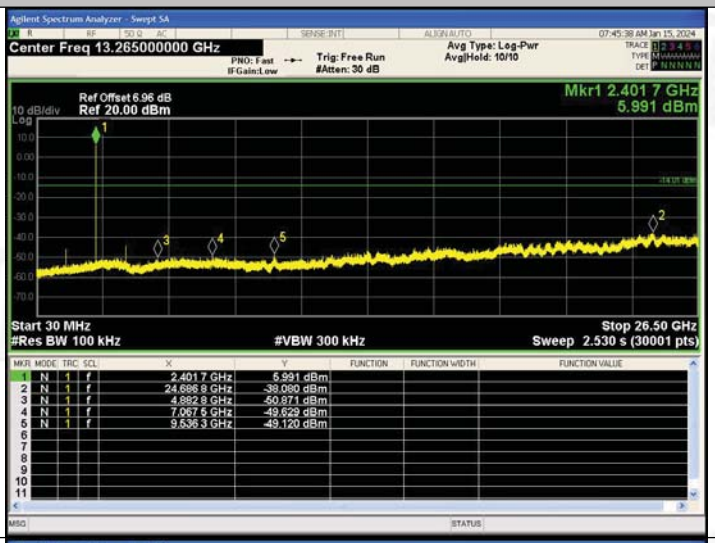
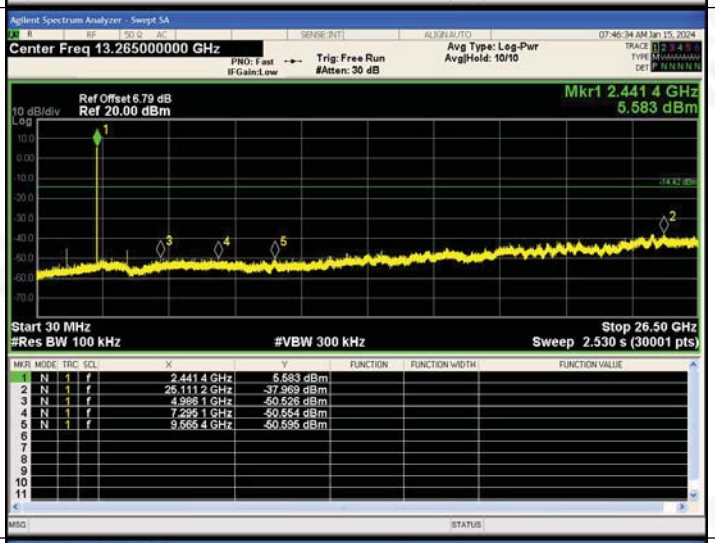
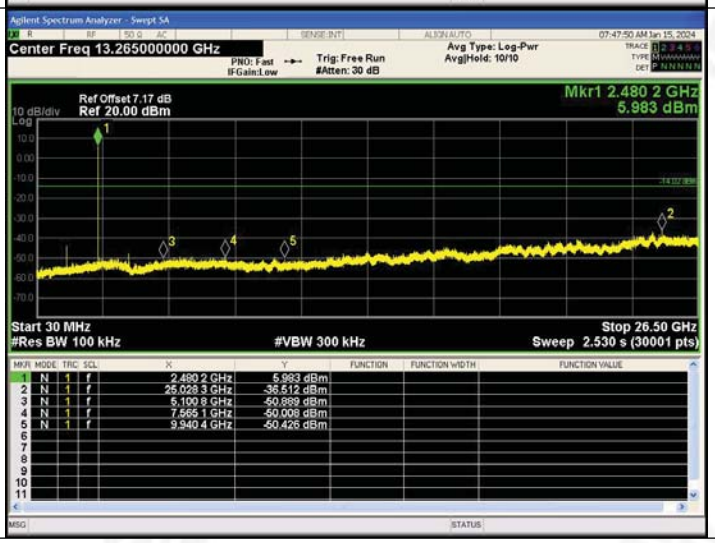
6.5 Test Result

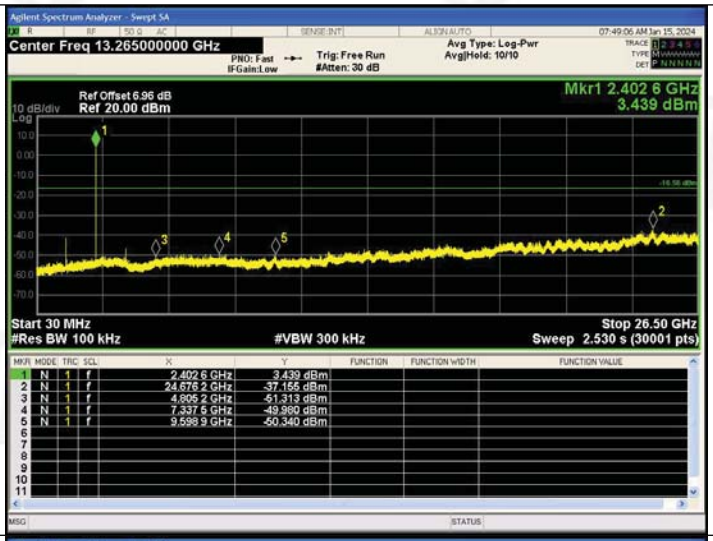
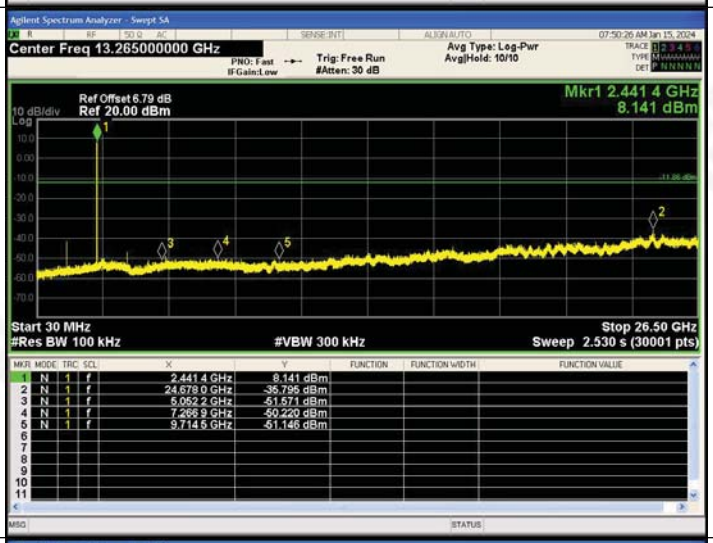
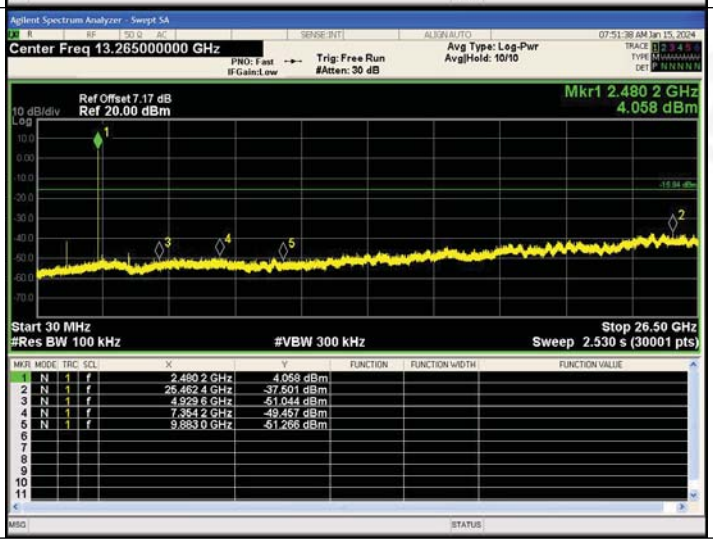
BAND EDGE Graphs			
GFSK/LCH/ No Hop			
GFSK/LCH/ Hop			
GFSK/HCH/ No Hop			

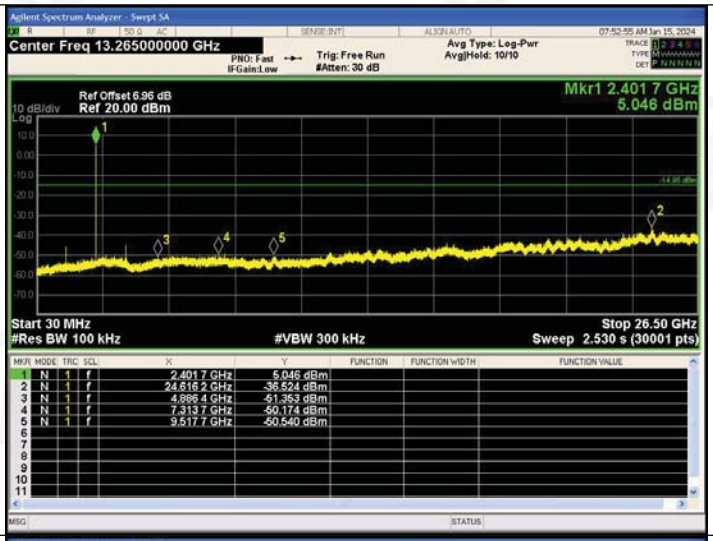
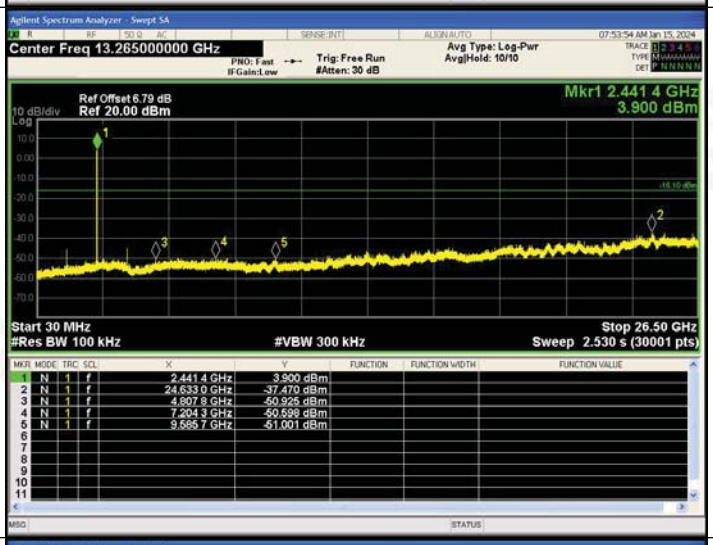
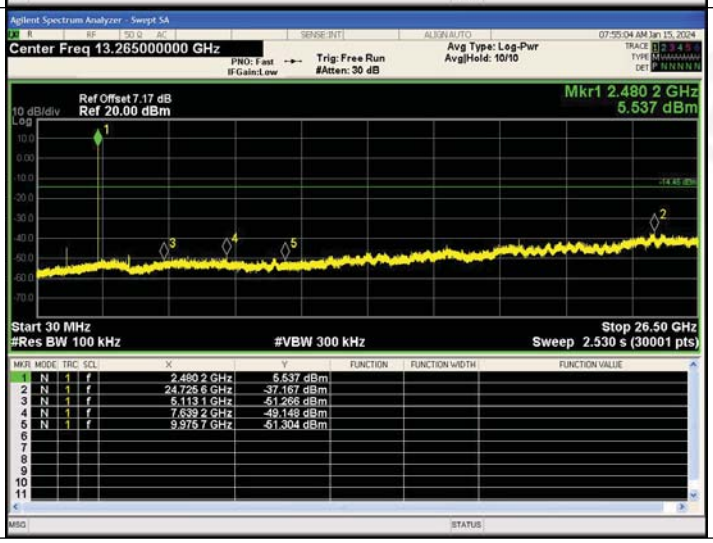
GFSK/HCH/ Hop			
π/4DQPSK/LCH/ No Hop			
π/4DQPSK/LCH/ Hop			

π/4DQPSK/HCH/ No Hop			
π/4DQPSK/HCH/ Hop			
8DPSK/LCH/No Hop			

8DPSK /LCH/Hop			
8DPSK /HCH/No Hop			
8DPSK /HCH/Hop			

RF Conducted Spurious Emissions Graphs			
GFSK/LCH			
GFSK/MCH			
GFSK/HCH			

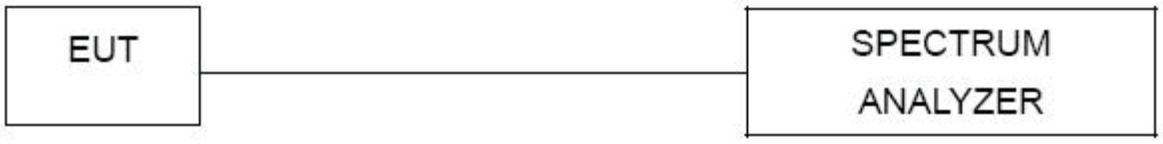
π/4DQPSK /LCH			
π/4DQPSK/MCH			
π/4DQPSK/HCH			

8DPSK /LCH			
8DPSK /MCH			
8DPSK /HCH			

7. 20DB&99% BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013

7.1 Test Setup



7.2 Limit

N/A

7.3 Test procedure

1. Set RBW = 30 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x 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.

7.4 DEVIATION FROM STANDARD

No deviation.

7.5 Test Result

Mode	Test channel	20dB Emission Bandwidth (MHz)	Result
GFSK	Lowest	0.935	Pass
	Middle	0.93	
	Highest	0.877	
π/4-DQPSK	Lowest	1.28	Pass
	Middle	1.265	
	Highest	1.271	
8-DPSK	Lowest	1.282	Pass
	Middle	1.283	
	Highest	1.301	

Test plots

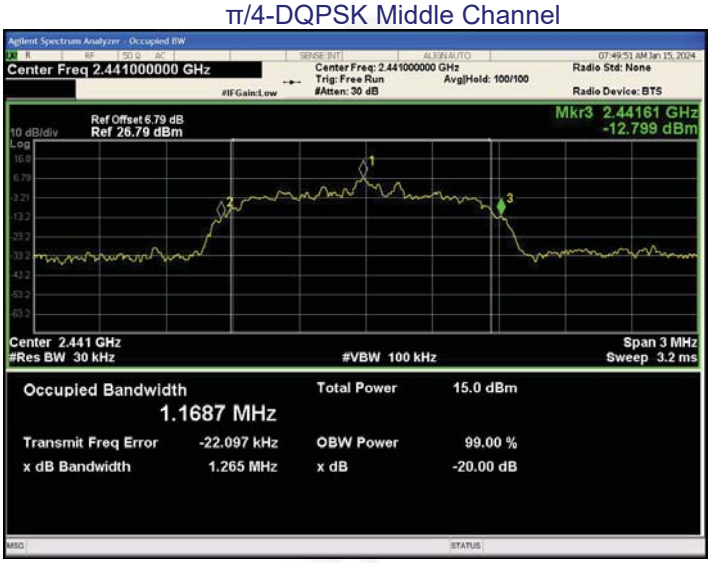
GFSK Low Channel

GFSK Middle Channel

GFSK High Channel

π/4-DQPSK Low Channel

π/4-DQPSK Middle Channel



π/4-DQPSK High Channel

8-DPSK Low Channel

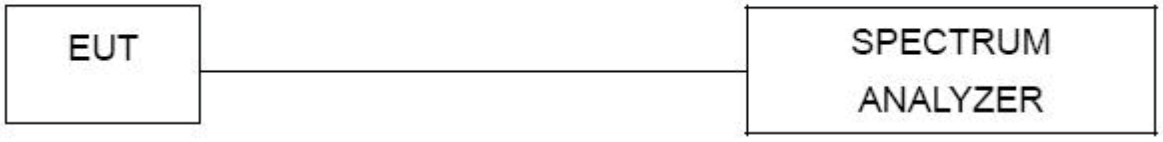
8-DPSK Middle Channel

8-DPSK High Channel

8. Maximum Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(1)
Test Method:	ANSI C63.10:2013
Limit:	GFSK:30 dBm π/4-DQPSK & 8-DPSK:20.97 dBm

8.1 Block Diagram Of Test Setup



8.2 Limit

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.

For FHSs operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W.

8.3 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 = 2MHz. VBW =6MHz. Sweep = auto; Detector Function = Peak.

3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

8.4 DEVIATION FROM STANDARD
No deviation.

8.5 Test Result

Mode	Test channel	Peak Output Power (dBm)	FCC Limit (dBm)	Result
GFSK	Lowest	7.23	30.00	Pass
	Middle	6.94		
	Highest	6.704		
π/4-DQPSK	Lowest	9.563	21.00	Pass
	Middle	9.354		
	Highest	9.092		
8-DPSK	Lowest	9.672	21.00	Pass
	Middle	9.477		
	Highest	9.226		

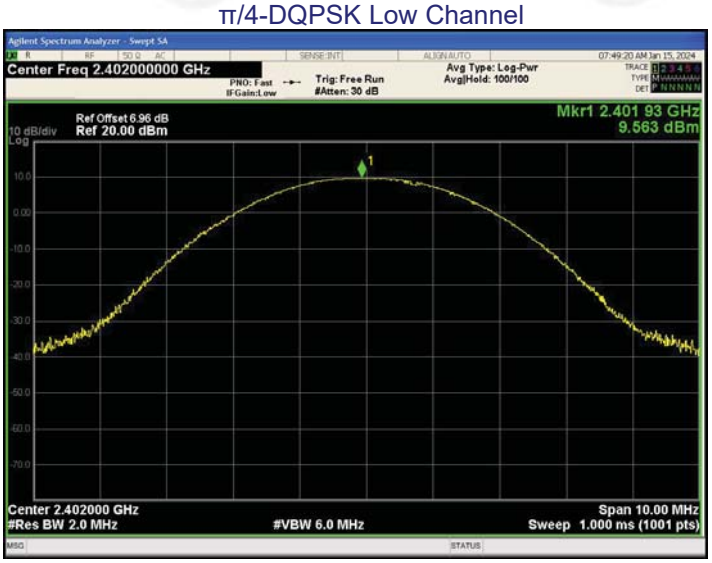
Test plots

GFSK Low Channel

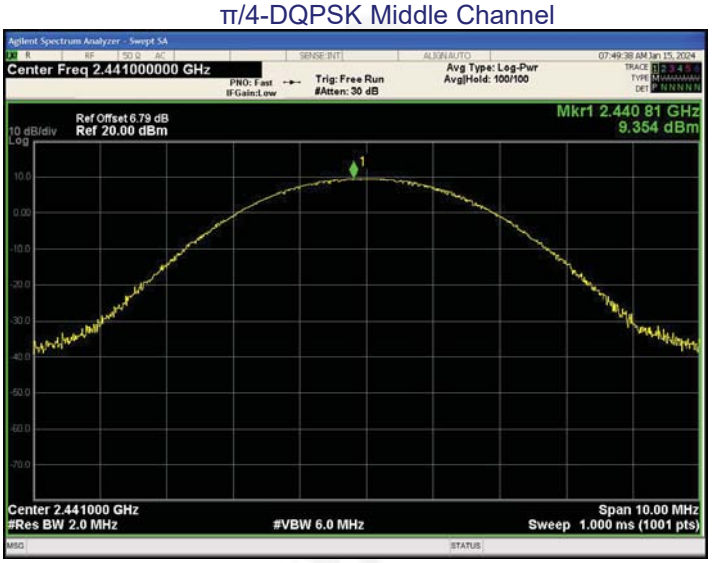
GFSK Middle Channel

GFSK High Channel

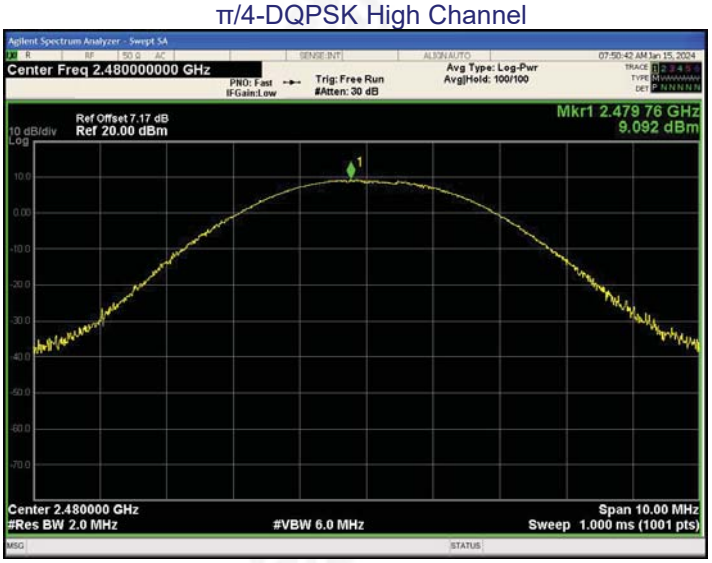
π/4-DQPSK Low Channel



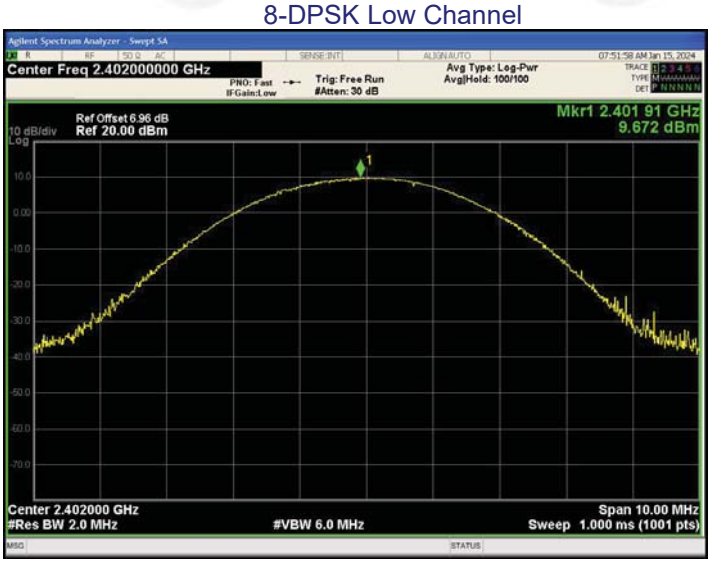
π/4-DQPSK Middle Channel



π/4-DQPSK High Channel

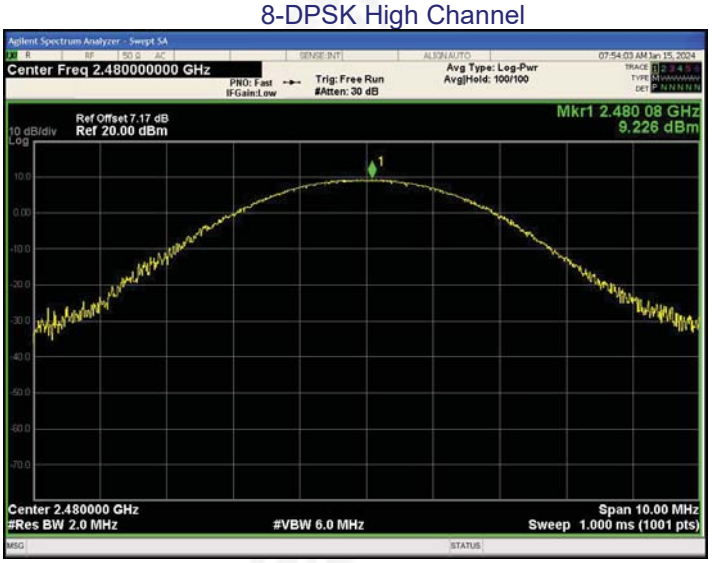


8-DPSK Low Channel



8-DPSK Middle Channel

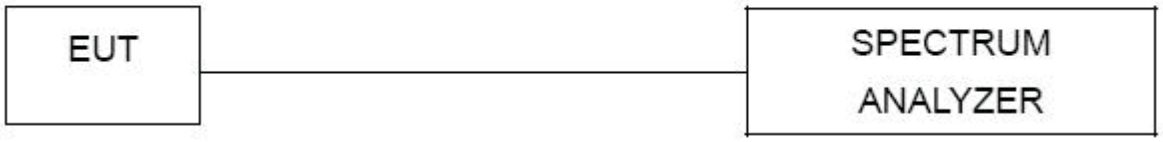
8-DPSK High Channel



9. HOPPING CHANNEL SEPARATION

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=30KHz, VBW=100KHz, detector=Peak
Limit:	GFSK: 20dB bandwidth π/4-DQPSK & 8DSK: 0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)

9.1 Test Setup



9.2 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 = 3.0MHz. 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.

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 Test Result

Modulation	Test Channel	Separation (MHz)	Limit(MHz)	Result
GFSK	Low	1.068	0.623	PASS
GFSK	Middle	0.996	0.620	PASS
GFSK	High	1.002	0.585	PASS
π/4-DQPSK	Low	1.017	0.853	PASS
π/4-DQPSK	Middle	0.939	0.843	PASS
π/4-DQPSK	High	1.299	0.847	PASS
8-DPSK	Low	1.242	0.855	PASS
8-DPSK	Middle	1.017	0.855	PASS
8-DPSK	High	1.032	0.867	PASS

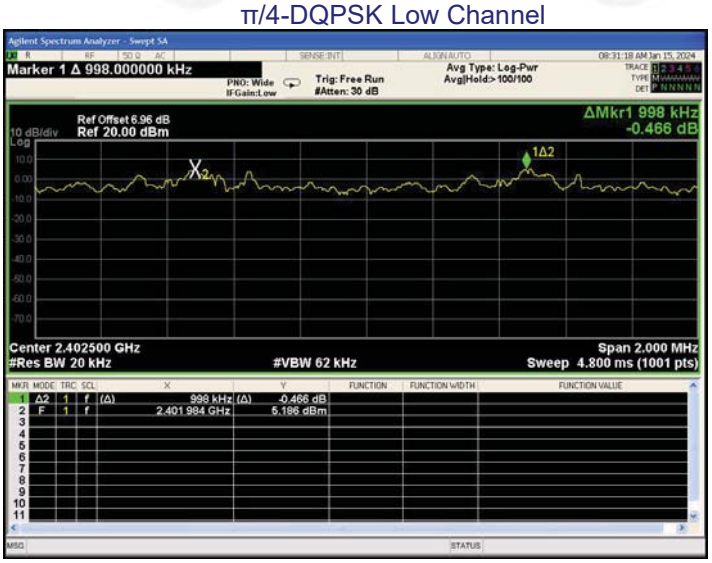
Test plots

GFSK Low Channel

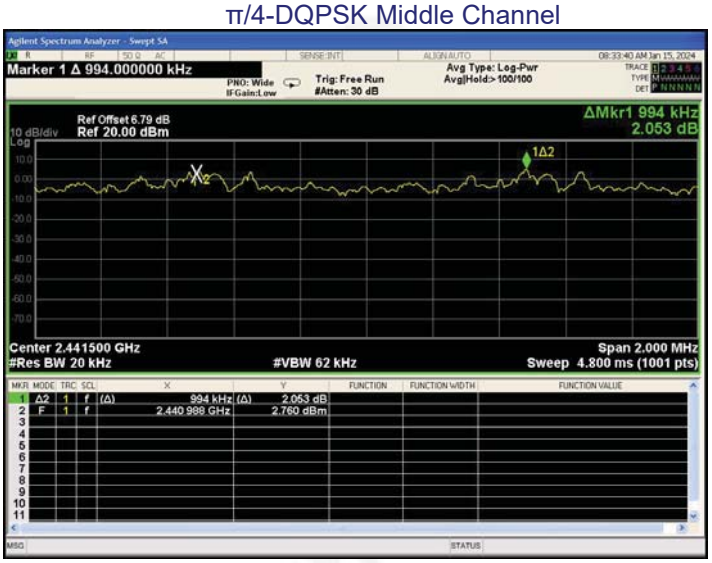
GFSK Middle Channel

GFSK High Channel

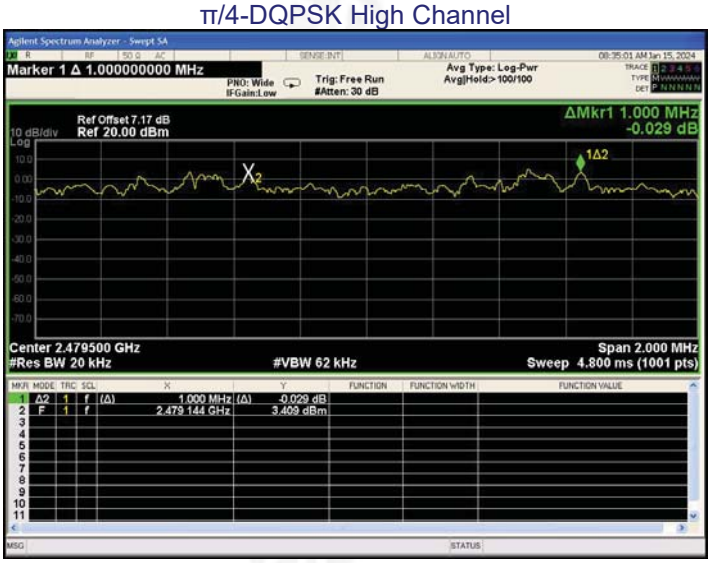
π/4-DQPSK Low Channel



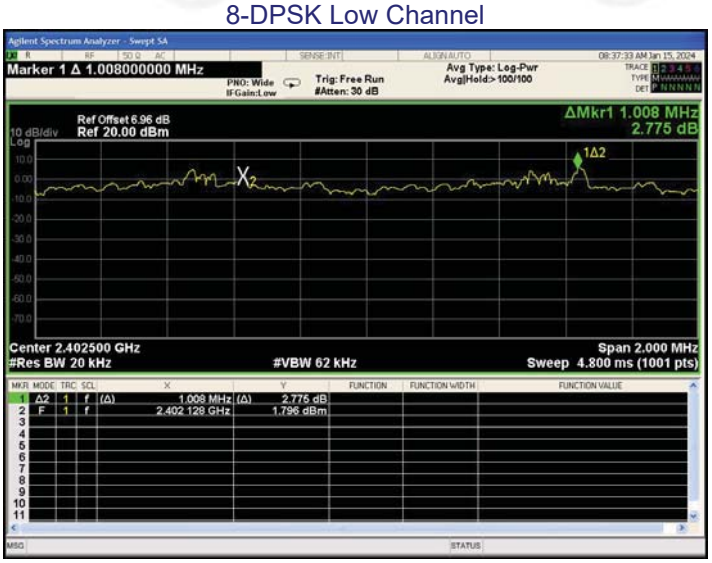
π/4-DQPSK Middle Channel



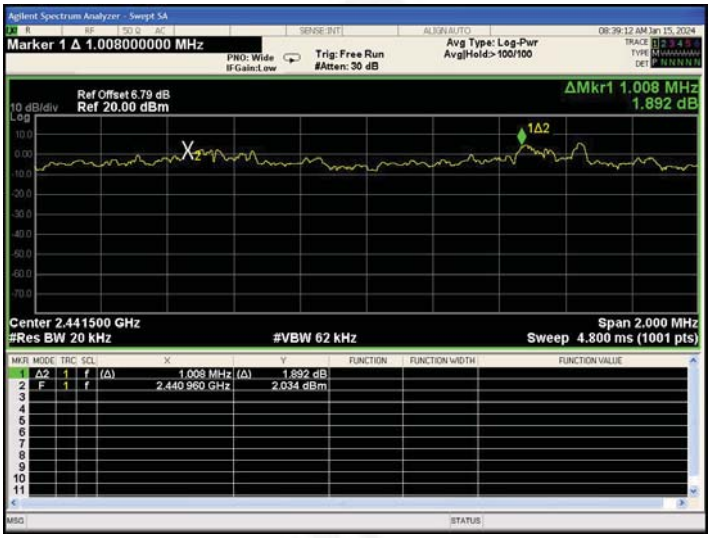
π/4-DQPSK High Channel



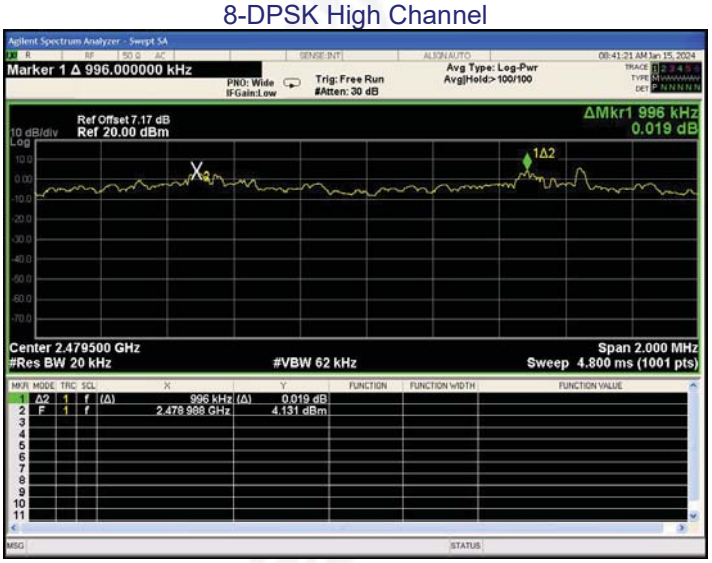
8-DPSK Low Channel



8-DPSK Middle Channel



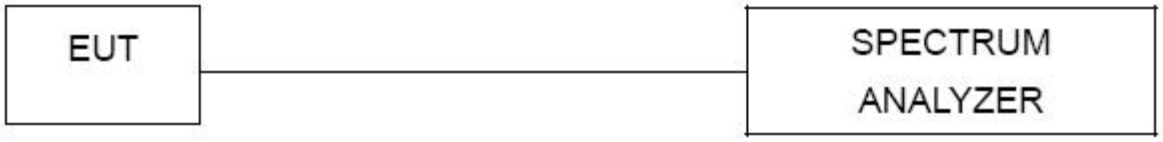
8-DPSK High Channel



10.NUMBER OF HOPPING FREQUENCY

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)(iii)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100kHz, VBW=300kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	15 channels

10.1 Test Setup



10.2 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.

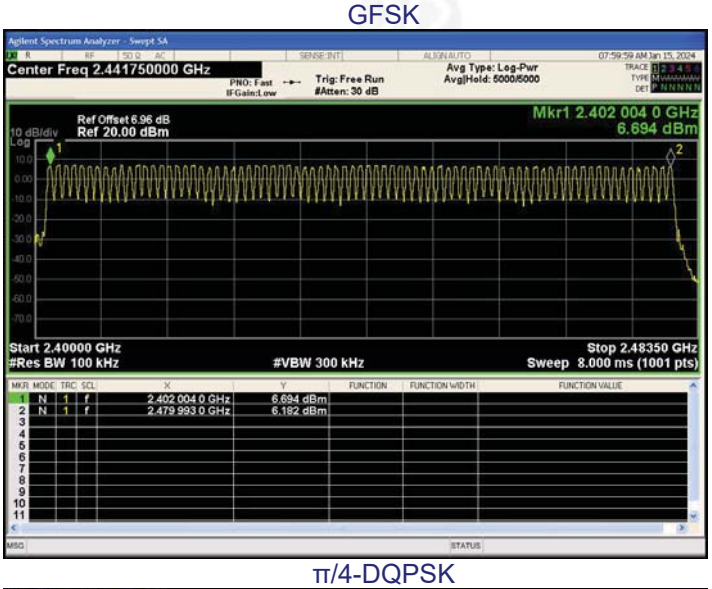
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

10.3 DEVIATION FROM STANDARD

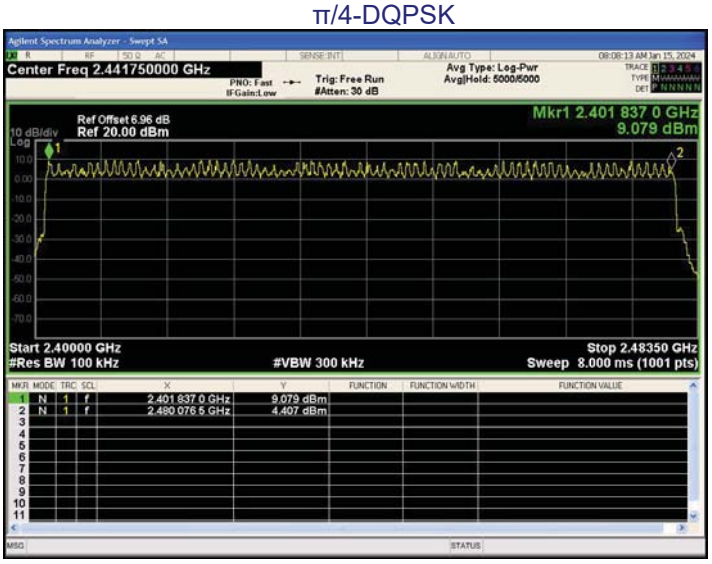
No deviation.

10.4 Test Result

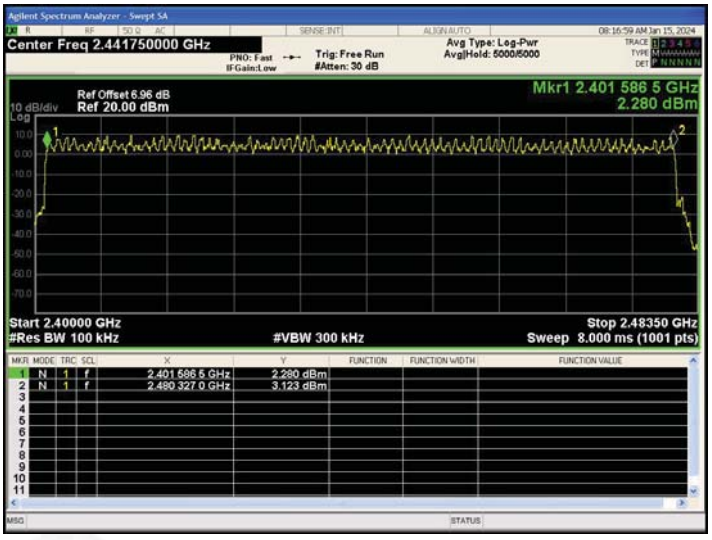
Test Plots:
79 Channels in total
GFSK



π/4-DQPSK



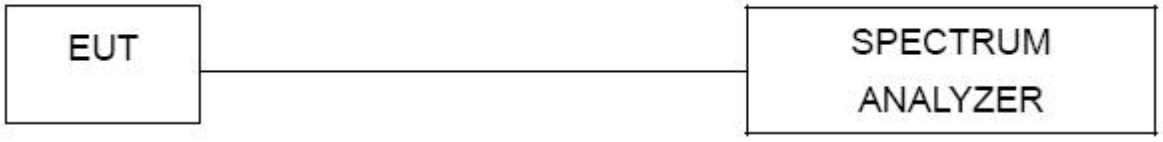
8-DPSK



11. DWELL TIME

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)(iii)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=1MHz, VBW=3MHz, Span=0Hz, Detector=Peak
Limit:	0.4 Second

11.1 Test Setup



11.2 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 = 0Hz;

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).

11.3 DEVIATION FROM STANDARD

No deviation.

11.4 Test Result

GFSK mode:

Frequency	Packet	Dwell time(ms)	Limit(ms)	Result
2441MHz	DH1	117.76	400	Pass
2441MHz	DH3	260.48	400	Pass
2441MHz	DH5	307.2	400	Pass

Remarks:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s
Test channel: as blow
CH:2441MHz time slot=0.432(ms)*(1600/ (2*79))*31.6=138.24ms
CH:2441MHz time slot=1.631(ms)*(1600/ (4*79))*31.6=260.96ms
CH:2441MHz time slot=2.832(ms)*(1600/ (6*79))*31.6=302.08ms

π/4-DQPSK mode:

Frequency	Packet	Dwell time(ms)	Limit(ms)	Result
2441MHz	2DH1	118.08	400	Pass
2441MHz	2DH3	260.8	400	Pass
2441MHz	2DH5	307.2	400	Pass

Remarks:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s
Test channel: as blow
CH:2441MHz time slot=0.492(ms)*(1600/ (2*79))*31.6=157.44ms
CH:2441MHz time slot=1.692(ms)*(1600/ (4*79))*31.6=270.72ms
CH:2441MHz time slot=2.89(ms)*(1600/ (6*79))*31.6=308.267ms

8-DPSK mode:

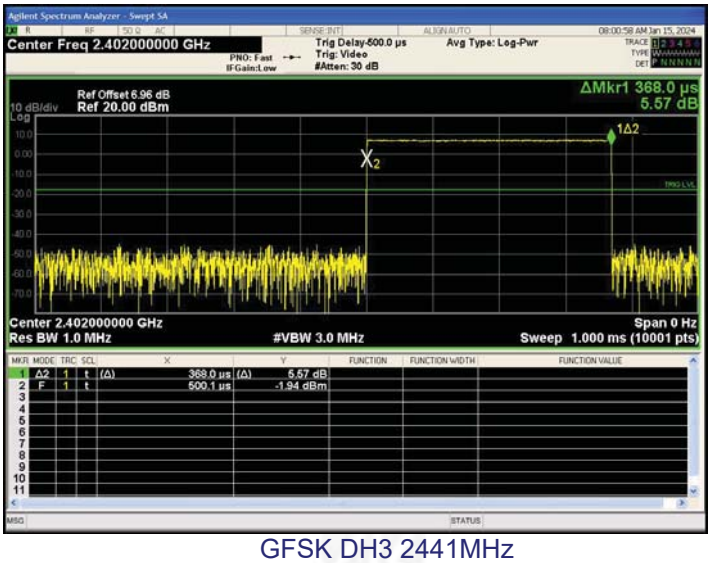
Frequency	Packet	Dwell time(ms)	Limit(ms)	Result
2441MHz	3DH1	118.08	400	Pass
2441MHz	3DH3	260.8	400	Pass
2441MHz	3DH5	307.2	400	Pass

Remarks:

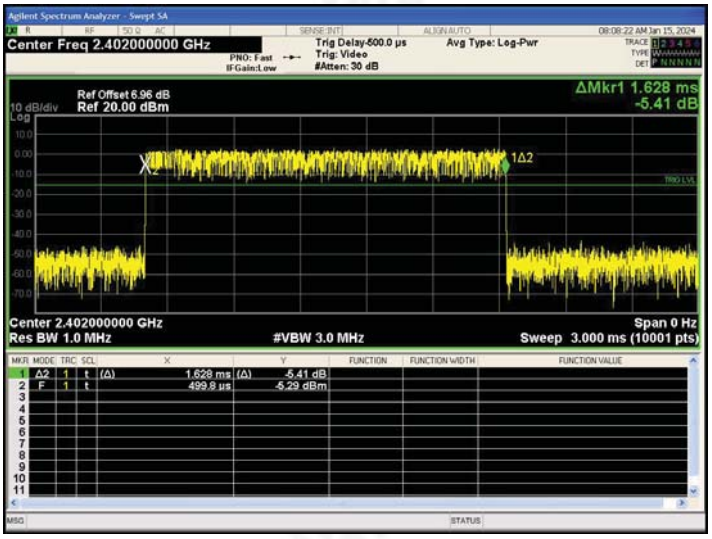
The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s
Test channel: as blow
CH:2441MHz time slot=0.418(ms)*(1600/ (2*79))*31.6=133.76ms
CH:2441MHz time slot=1.67(ms)*(1600/ (4*79))*31.6=267.2ms
CH:2441MHz time slot=2.764(ms)*(1600/ (6*79))*31.6=294.827ms

Test Plots

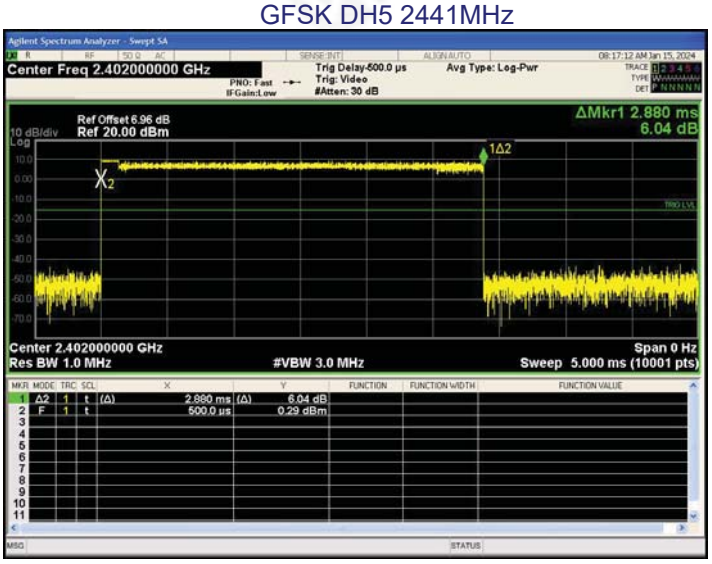
GFSK DH1 2441MHz



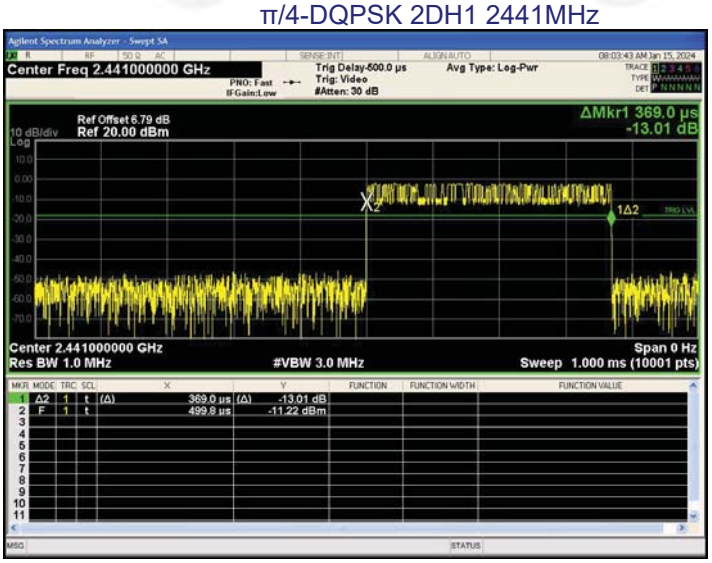
GFSK DH3 2441MHz



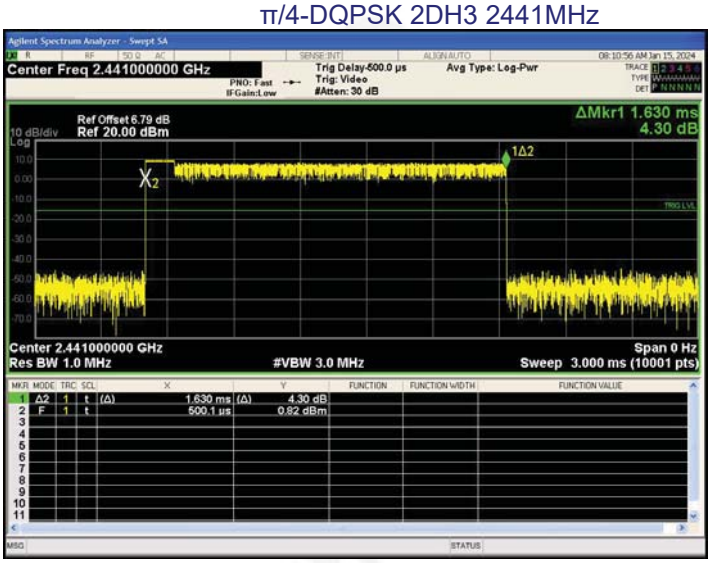
GFSK DH5 2441MHz



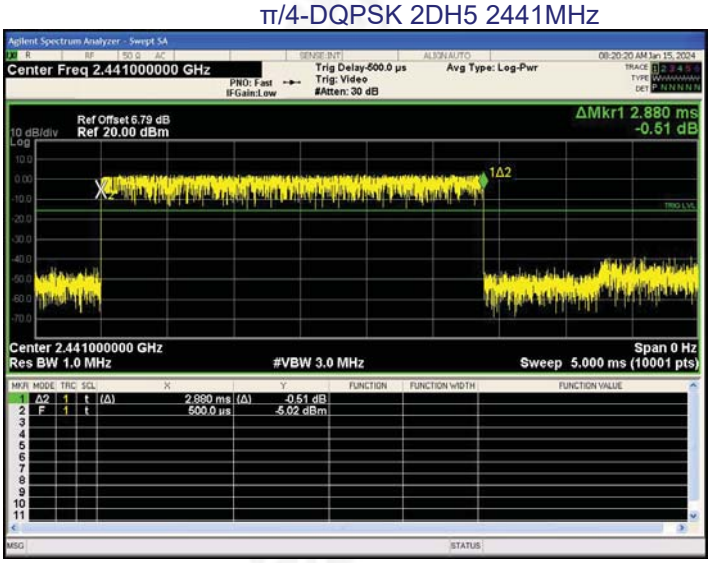
π/4-DQPSK 2DH1 2441MHz



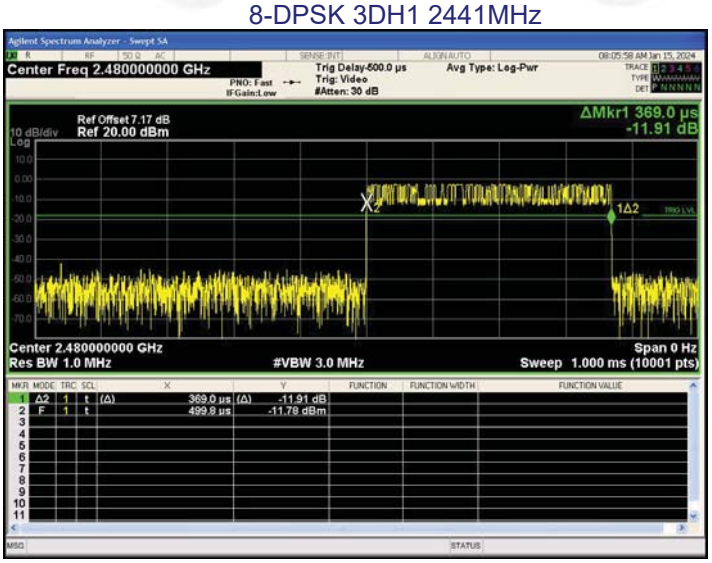
π/4-DQPSK 2DH3 2441MHz



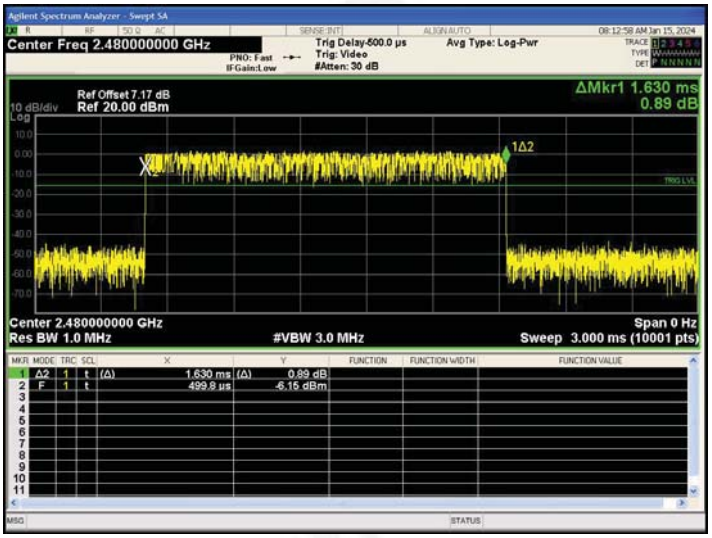
π/4-DQPSK 2DH5 2441MHz



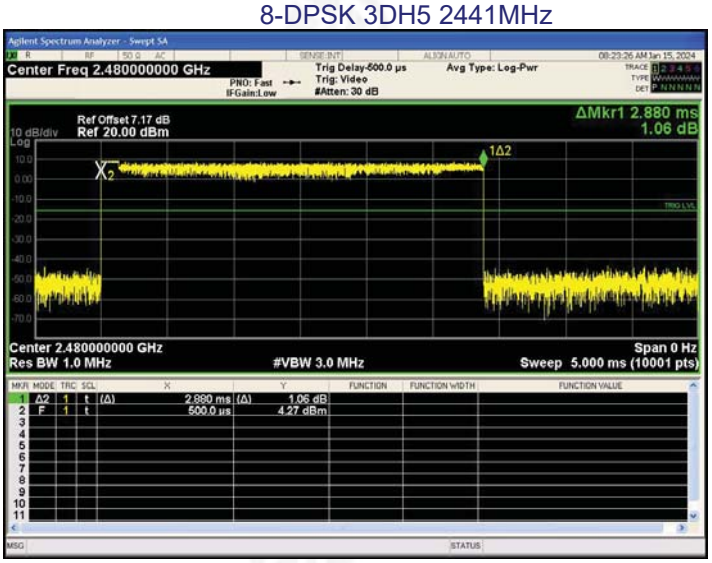
8-DPSK 3DH1 2441MHz



8-DPSK 3DH3 2441MHz



8-DPSK 3DH5 2441MHz



12. Antenna Requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: 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. 15.247(c) (1)(i) requirement: (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.	
EUT Antenna:	
The antenna is internal antenna, the best case gain of the antennas is 3.0dBi, reference to the appendix II for details	

13. Test Setup Photo

Reference to the appendix I for details.

14. EUT Constructional Details

Reference to the appendix II for details.

※※※※※ END OF REPORT ※※※※※