TEST REPORT

APPLICANT	:	Shenzhen Sincodynamic Technology Co.,Ltd
PRODUCT NAME	:	ANC Headphone
MODEL NAME	:	BSNCH102BK-BMCYTKT BSNCH102WH-BMCYTKT B8-ANC B6-ANC
BRAND NAME	:	/
FCC ID	:	2AJO8-BSNCH102
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2023-02-09
TEST DATE	:	2023-02-09 to 2023-02-20
ISSUE DATE	:	2023-02-20

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DIRECTORY

Change History		
Version	Date	Reason for change
1.0	2023-02-20	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	**Shenzhen Sincodynamic Technology Co.,Ltd**
Applicant Address:	**Building 1 Changguang Industrial area AoBei Second Village Henggang town,Village Henggang town, Longgang District, Shenzhen, China**
Manufacturer:	Shenzhen Sincodynamic Technology Co.,Ltd
Manufacturer Address:	Building 1 Changguang Industrial area AoBei Second Village Henggang town,Village Henggang town, Longgang District, Shenzhen, China

1.2. Equipment Under Test (EUT) Description

Product Name:	ANC Headphone
Sample No.:	1#
Hardware Version:	V1.0
Software Version:	V1.0
Equipment Type:	Bluetooth classic
Bluetooth Version:	5.2
Modulation Type:	FHSS (GFSK(1Mbps), π/4-DQPSK(EDR 2Mbps), 8-DPSK(EDR 3Mbps))
Operating Frequency Range:	2402MHz–2480MHz
Antenna Type:	PCB Antenna
Antenna Gain:	-0.58dBi

Note 1: We use the dedicated software to control the EUT continuous transmission.

Note 2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. The Channel Number and Frequency

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	**2402**	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	**78**	**2480**
19	2421	**39**	**2441**	59	2461		

Note 1: The black bold channels were selected for test.

1.4. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	15.247(a) 15.247(h)	Hopping Mechanism	N/A	N/A	PASS	No deviation
3	15.247(a)	Number of Hopping Frequency	Feb. 19, 2023	Zhong Yanshan	PASS	No deviation
4	ANSI C63.10	Duty Cycle	Feb. 19, 2023	Zhong Yanshan	PASS	No deviation
5	15.247(b)	Maximum Peak Conducted Output Power	Feb. 19, 2023	Zhong Yanshan	PASS	No deviation
6	15.247(b)	Maximum Average Conducted Output Power	Feb. 19, 2023	Zhong Yanshan	PASS	No deviation
7	15.247(a)	20dB Bandwidth	Feb. 19, 2023	Zhong Yanshan	PASS	No deviation
8	15.247(a)	Carrier Frequency Separation	Feb. 19, 2023	Zhong Yanshan	PASS	No deviation
9	15.247(a)	Time of Occupancy (Dwell time)	Feb. 19, 2023	Zhong Yanshan	PASS	No deviation
10	15.247(d)	Conducted Spurious Emission	Feb. 19, 2023	Zhong Yanshan	PASS	No deviation
11	15.207	Conducted Emission	Feb. 19, 2023	Wu Zhaoling	PASS	No deviation
12	15.247(d)	Restricted Frequency Bands	Feb. 19, 2023	Lin Jiayong	PASS	No deviation
13	15.209,	Radiated Emission	Feb. 19, 2023	Lin Jiayong	PASS	No deviation

	15.247(d)					

Note 1: The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013, KDB558074 D01 v05r02 and DA 00-075.

Note 2: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The Ref offset 10.83dB means the cable loss is 10.83dB.

Note 3: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 4: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15-35
Relative Humidity (%):	30-60
Atmospheric Pressure (kPa):	86-106

2. 47 CFR Part 15C Requirements

2.1. Antenna Requirement

2.1.1. Applicable Standard

According to FCC 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 an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

2.1.2. Test Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

2.2. Hopping Mechanism

2.2.1. Requirement

According to FCC §15.247(a)(1), a frequency hopping spread spectrum system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.
According to FCC §15.247(h), the incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hop sets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

2.2.2. Result: Compliant

The hopping mechanism of the EUT is in compliance with the document "***Bluetooth core specification v5.2***".

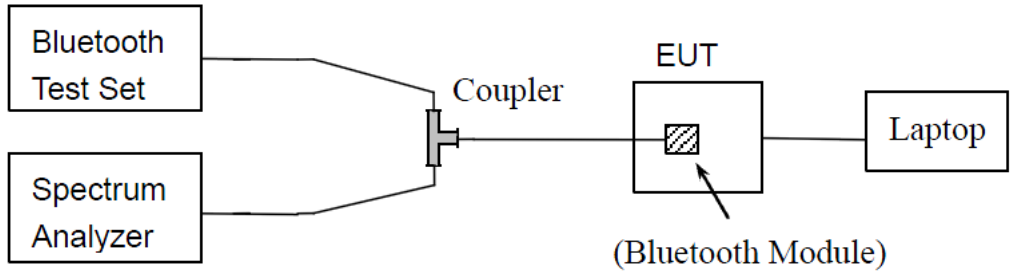
2.3. Number of Hopping Frequency

2.3.1. Requirement

According to FCC §15.247(a)(1)(iii), frequency hopping systems operating in the 2400MHz to 2483.5MHz bands shall use at least 15 hopping frequencies.

2.3.2. Test Description

Test Setup:



The Bluetooth Module of the EUT is coupled to the Spectrum Analyzer (SA) and the Bluetooth Test Set through the coupler; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.3.3. Test Procedure

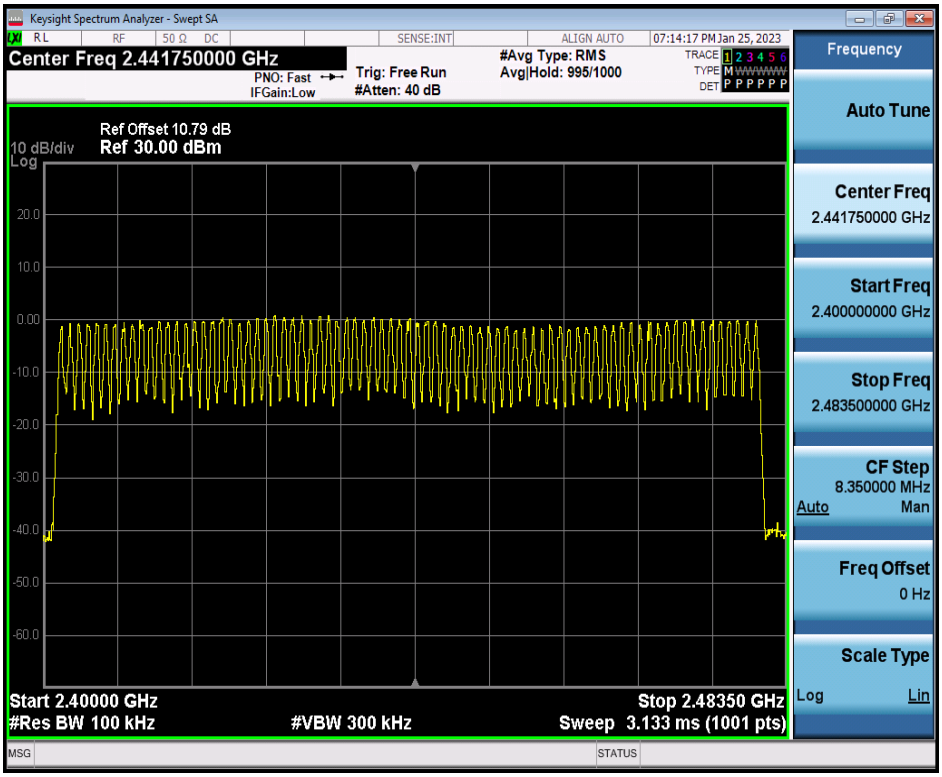
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = the frequency band of operation
RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize

2.3.4. Test Result

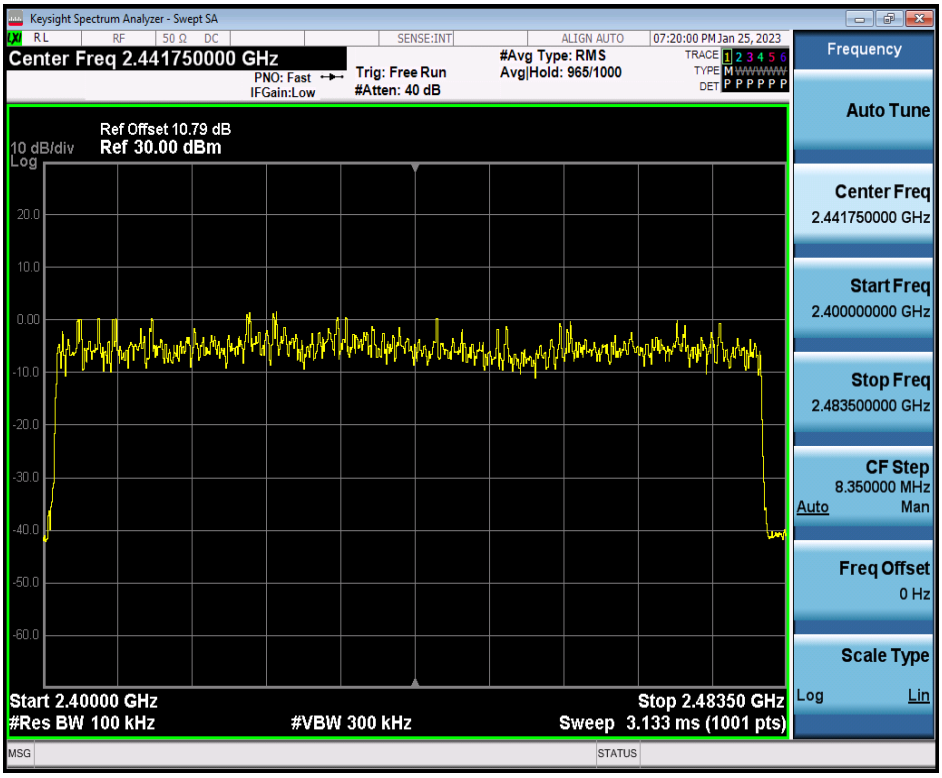
A. Test Verdict:

Test Mode	Frequency Block (MHz)	Measured Channel Numbers	Min. Limit	Verdict
GFSK	2400 - 2483.5	79	15	PASS
π/4-DQPSK	2400 - 2483.5	79	15	PASS
8-DPSK	2400 - 2483.5	79	15	PASS

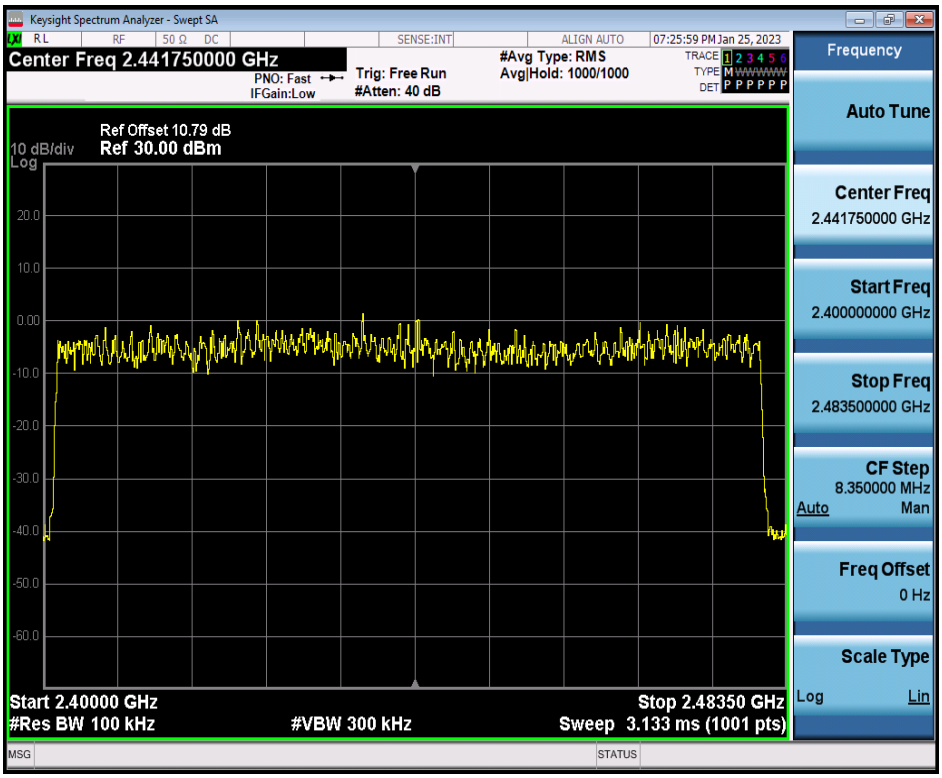
B. Test Plot:



(GFSK)



(π/4-DQPSK)



(8-DPSK)

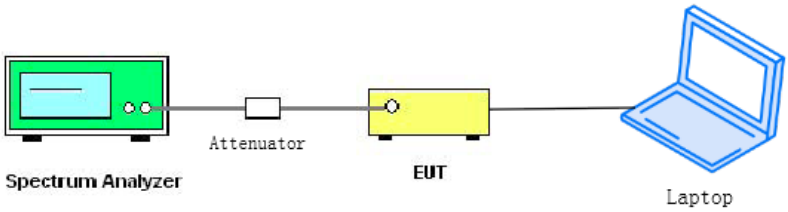
2.4. Duty Cycle of Test Signal

2.4.1. Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%).When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e., no transmitter OFF-time is to be considered).
When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this sub clause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than ±2%; otherwise, the duty cycle is considered to be nonconstant.

2.4.2. Test Description

Test Setup:



ANSI C63.10 2013 Clause 11.6 was used in order to prove compliance.

2.4.3. Test Result

Test Mode	Duty Cycle (%) (D)
GFSK	79.66
π/4-DQPSK	79.66
8-DPSK	79.66

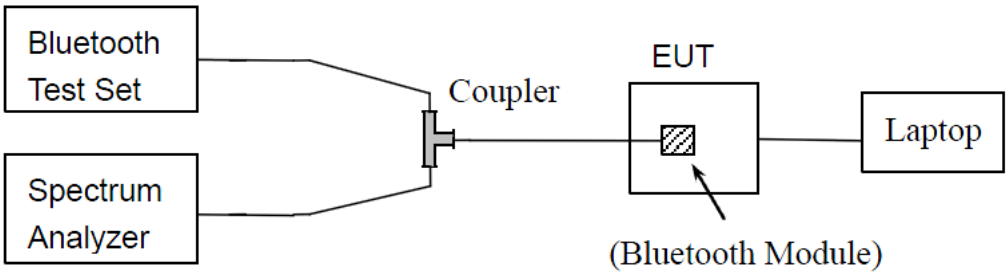
2.5. Maximum Peak Conducted Output Power

2.5.1. Requirement

According to FCC §15.247(b)(1), for frequency hopping systems that operates in the 2400MHz to 2483.5MHz band employing at least 75 hopping channels, the maximum peak output power of the intentional radiator shall not exceed 1Watt. For all other frequency hopping systems in the 2400MHz to 2483.5MHz band, it is 0.125Watts.

2.5.2. Test Description

Test Setup:



The Bluetooth Module of the EUT is coupled to the Spectrum Analyzer (SA) and the Bluetooth Test Set through the coupler; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

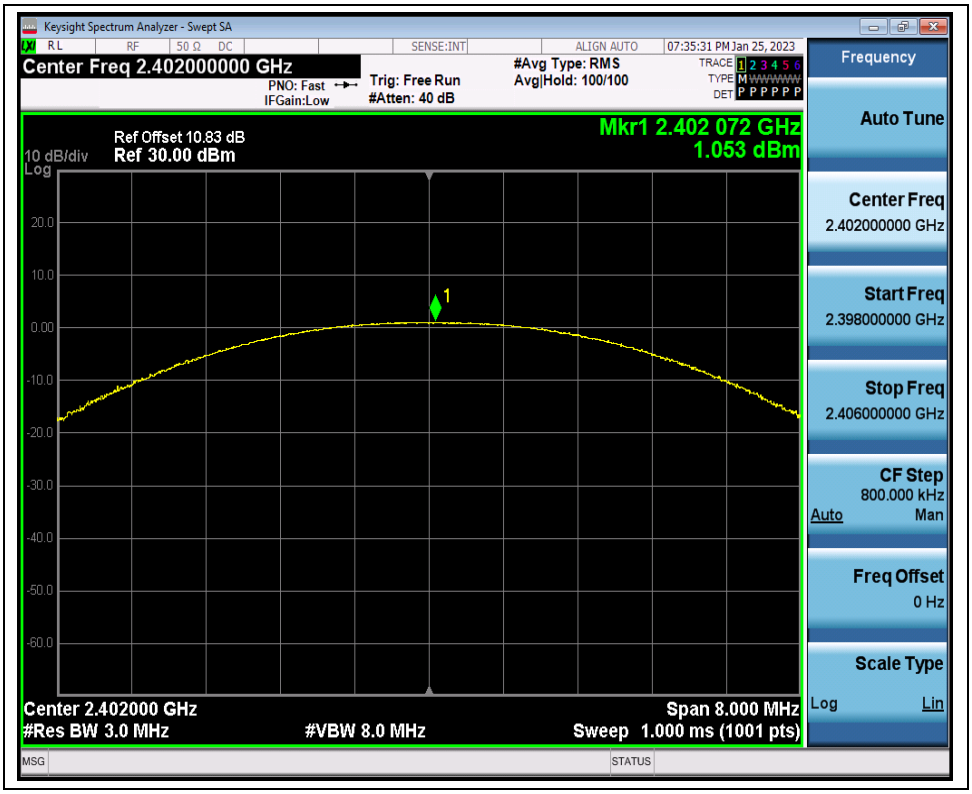
2.5.3. Test Result

GFSK Mode

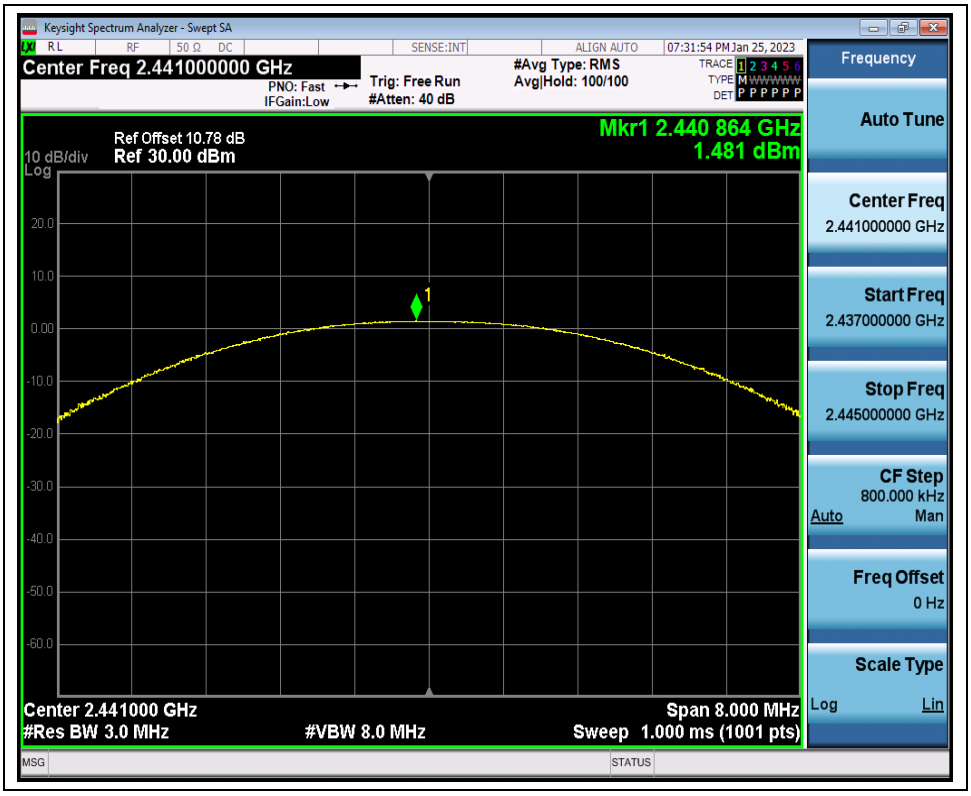
A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	1.05	0.0013	20.96	0.125	PASS
39	2441	1.48	0.0014			PASS
78	2480	1.53	0.0014			PASS

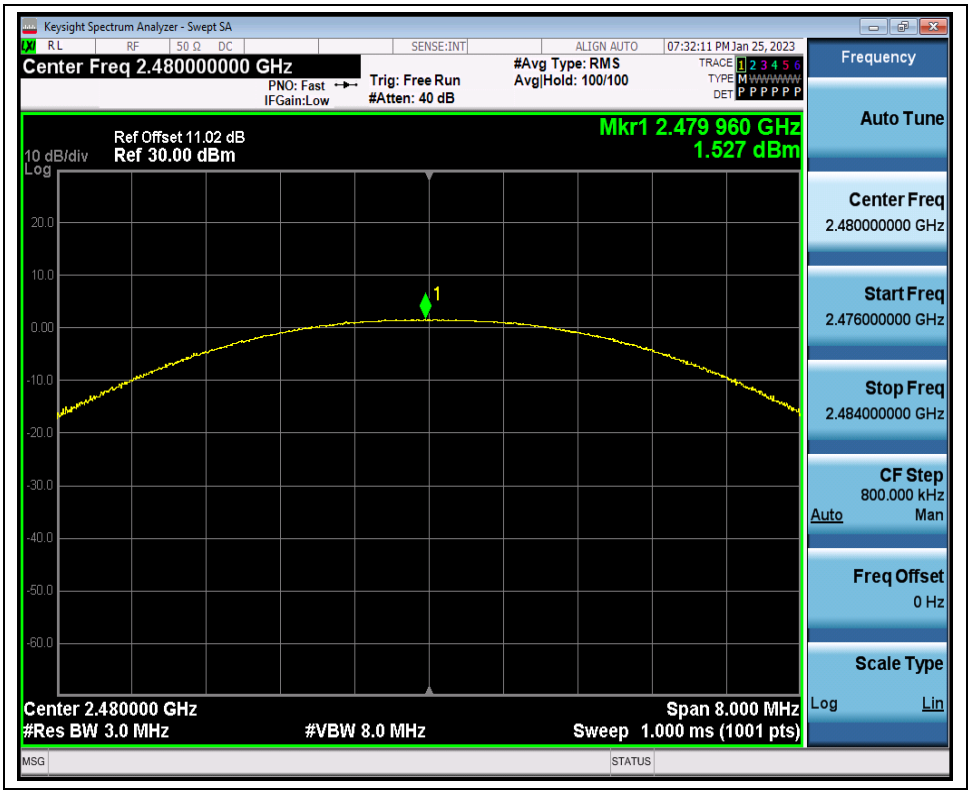
B. Test Plot:



(Channel 0, GFSK)



(Channel 39, GFSK)



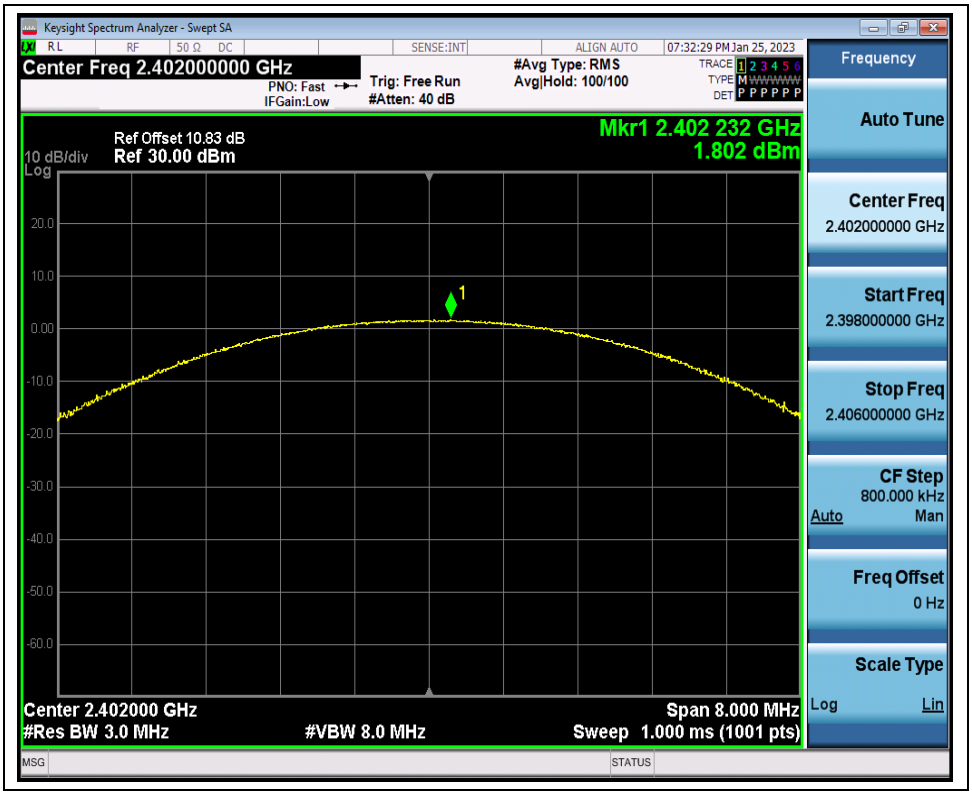
(Channel 78, GFSK)

π/4-DQPSK Mode

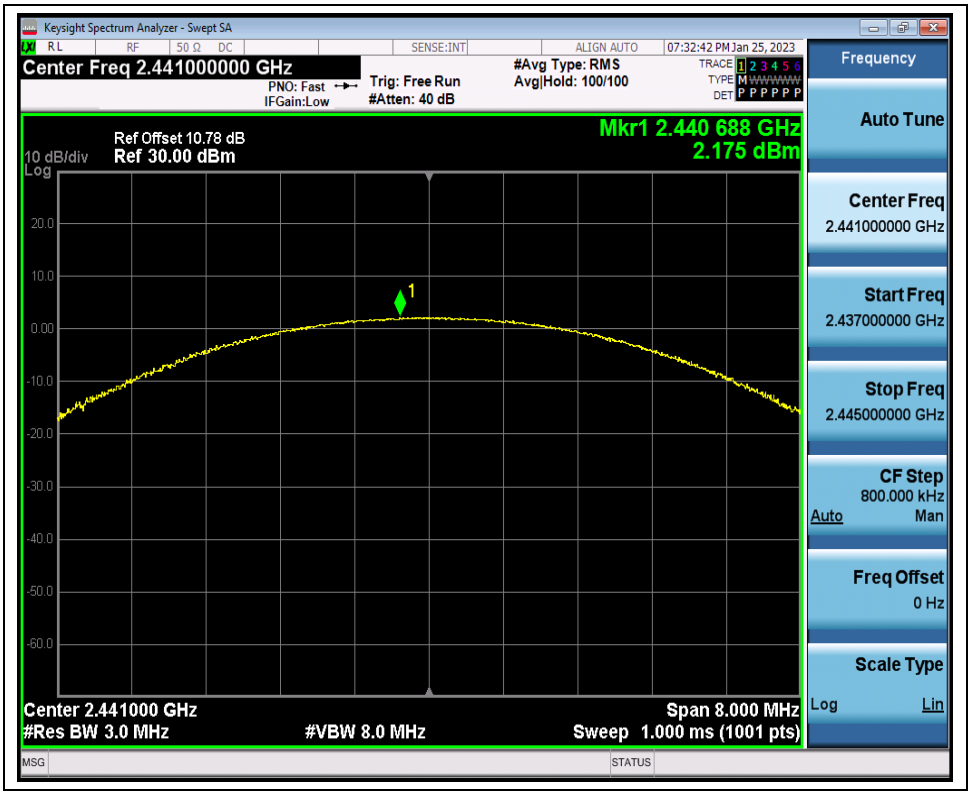
A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	1.80	0.0015	20.96	0.125	PASS
39	2441	2.18	0.0016			PASS
78	2480	2.25	0.0017			PASS

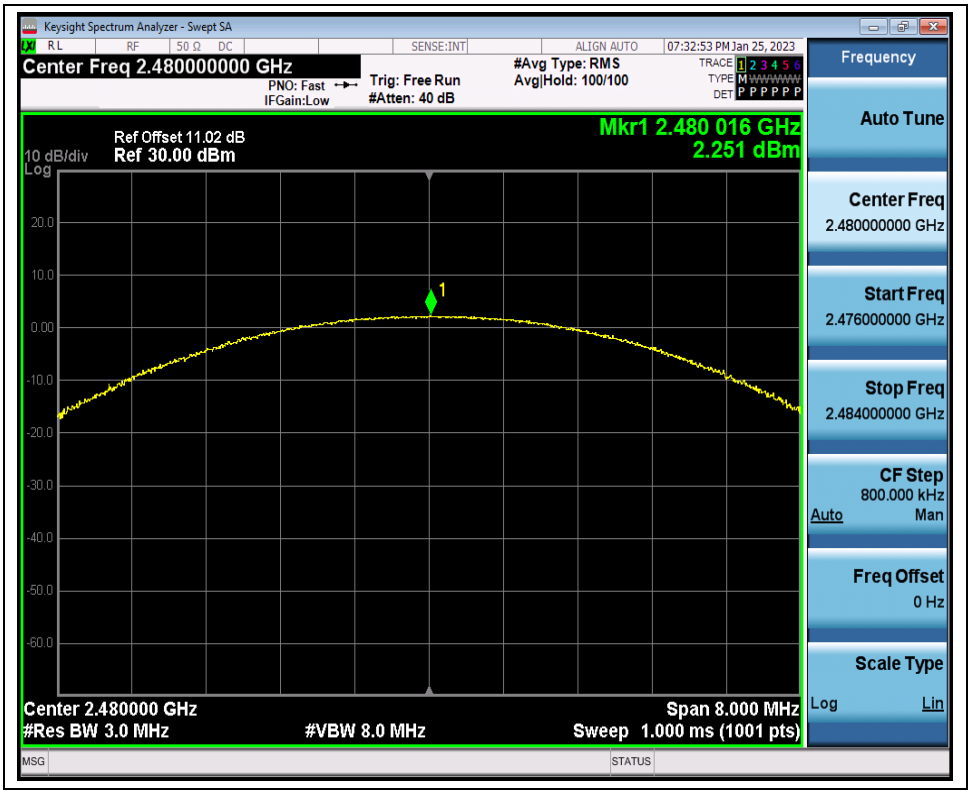
B. Test Plot:



(Channel 0, π/4-DQPSK)



(Channel 39, π/4-DQPSK)



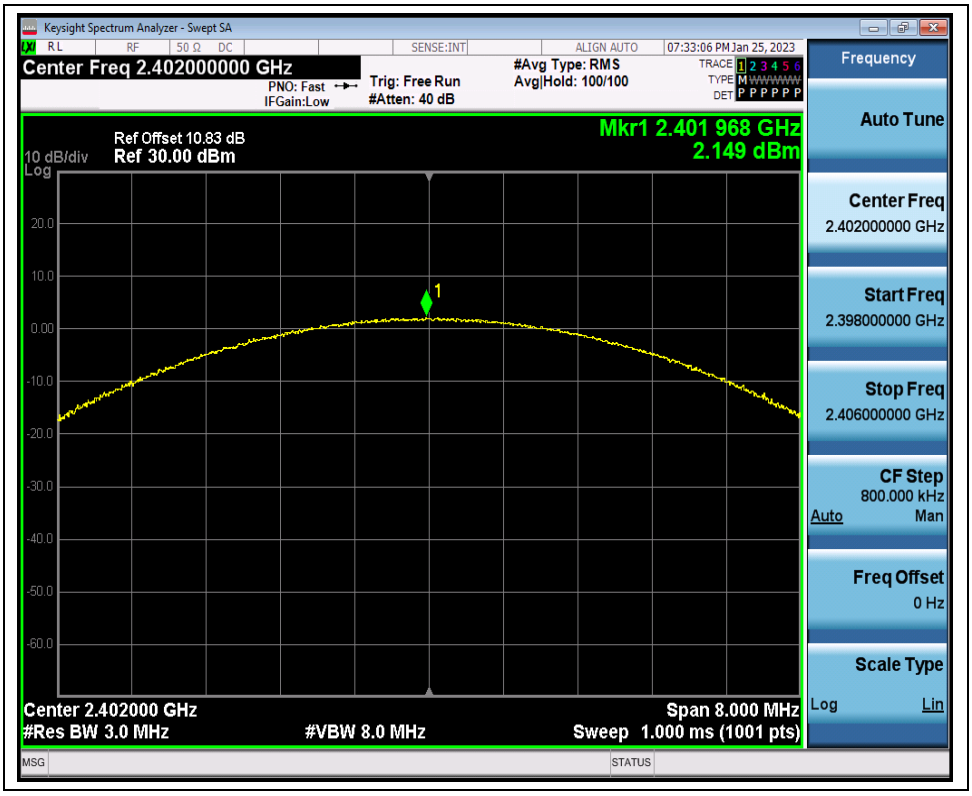
(Channel 78, π/4-DQPSK)

8-DPSK Mode

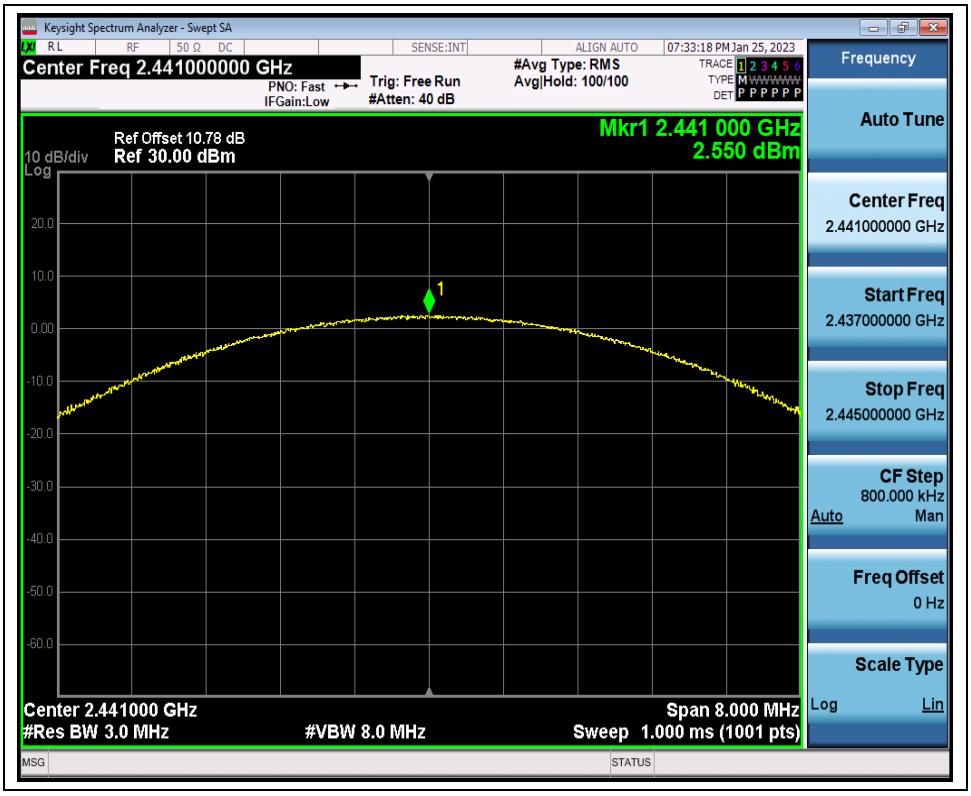
A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	2.15	0.0016	20.96	0.125	PASS
39	2441	2.55	0.0018			PASS
78	2480	2.68	0.0019			PASS

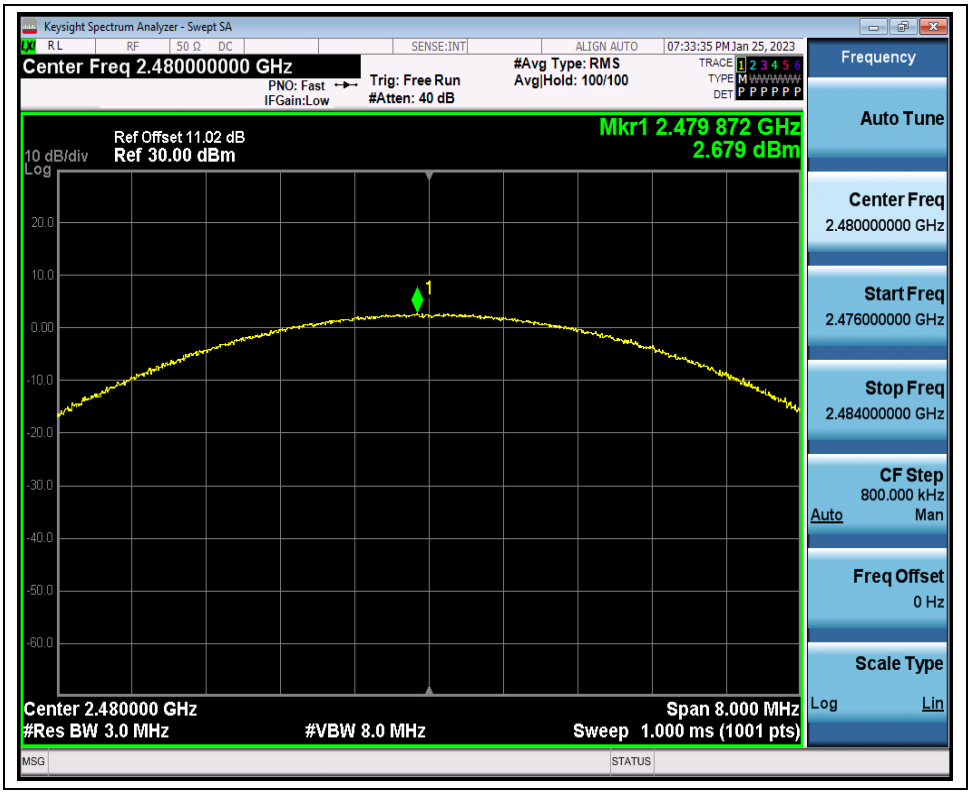
B. Test Plot:



(Channel 0, 8-DPSK)



(Channel 39, 8-DPSK)



(Channel 78, 8-DPSK)

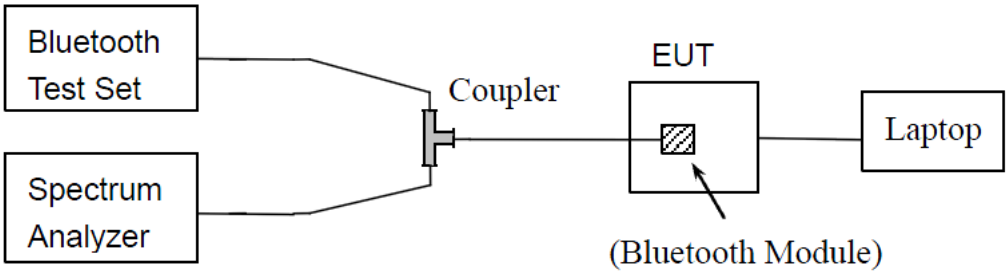
2.6. 20 dB Bandwidth

2.6.1. Definition

According to FCC §15.247(a)(1), the 20 dB bandwidth is known as the 99% emission bandwidth, or 20 dB bandwidth (10*log1% = 20 dB) taking the total RF output power.

2.6.2. Test Description

Test Setup:



The Bluetooth Module of the EUT is coupled to the Spectrum Analyzer (SA) and the Bluetooth Test Set through the coupler; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.6.3. Test Procedure

Use the following spectrum analyzer settings:
Span = between 2 to 5 times the OBW, centered on the test channel
RBW= 1% to 5% of the OBW
VBW ≥ 3 x RBW
Sweep = auto
Detector function = peak
Trace = max hold

2.6.4. Test Result

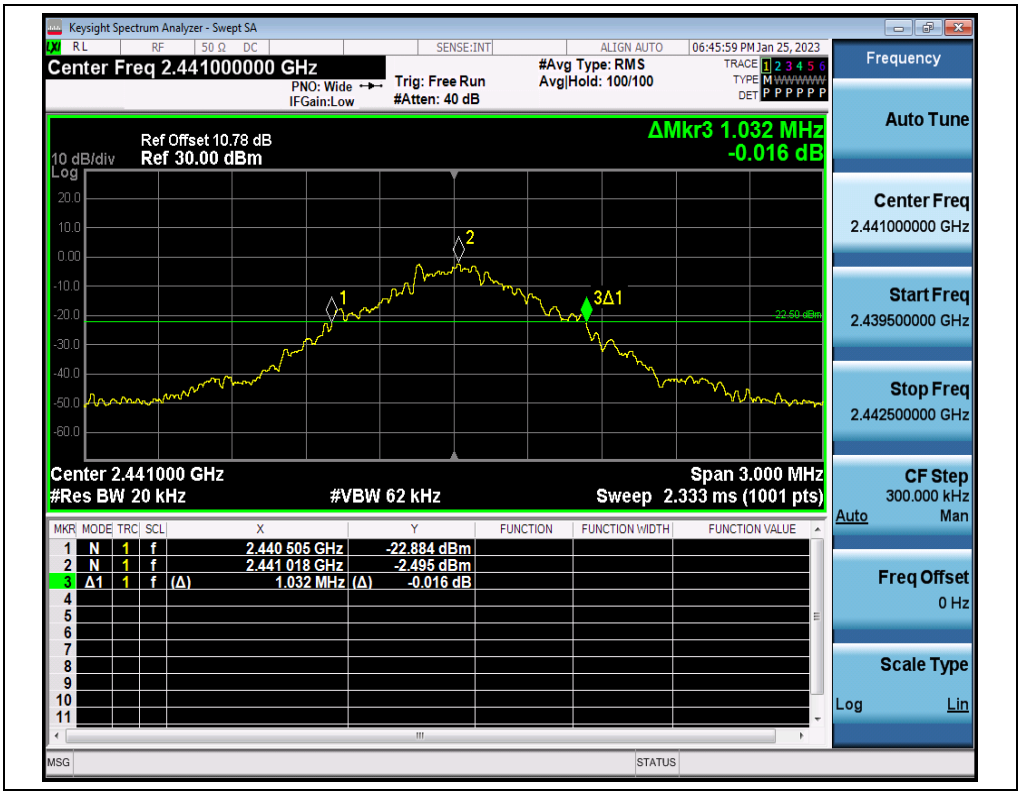
GFSK Mode

A. Test Verdict:

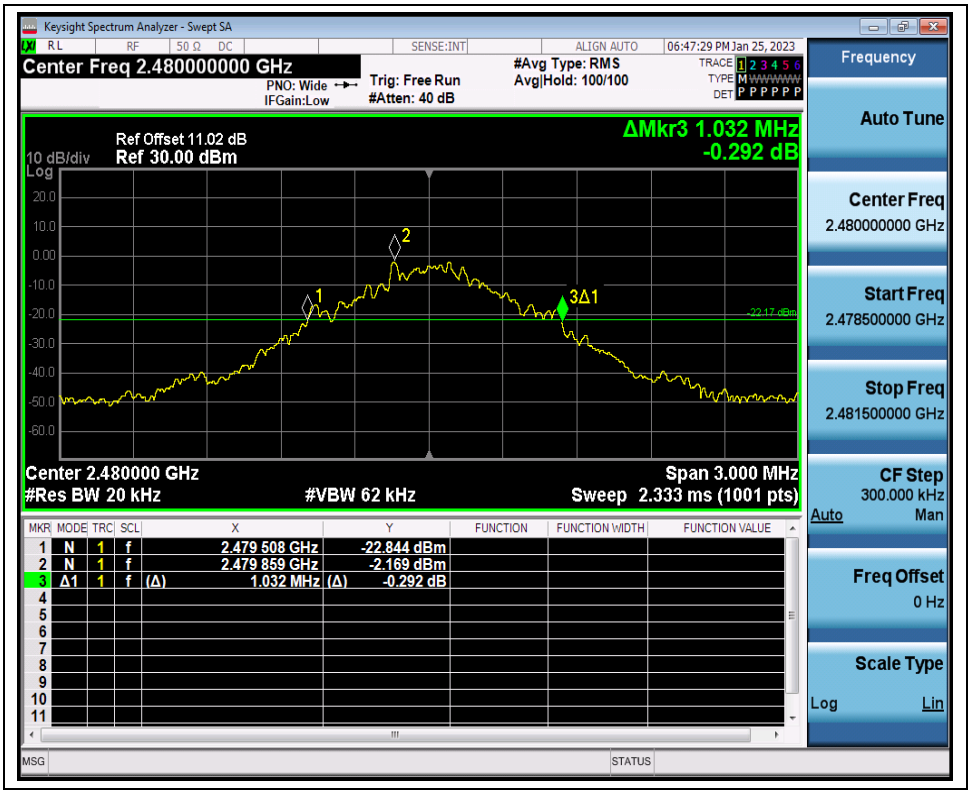
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	Result
0	2402	1.023	PASS
39	2441	1.032	PASS
78	2480	1.032	PASS

B. Test Plot:

(Channel 0, GFSK)



(Channel 39, GFSK)



(Channel 78, GFSK)

π/4-DQPSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Result
0	2402	1.329	PASS
39	2441	1.350	PASS
78	2480	1.323	PASS

B. Test Plot:

(Channel 0, π/4-DQPSK)

(Channel 39, π/4-DQPSK)

(Channel 78, π/4-DQPSK)

8-DPSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Result
0	2402	1.281	PASS
39	2441	1.383	PASS
78	2480	1.287	PASS

B. Test Plot:

(Channel 0, 8-DPSK)

(Channel 39, 8-DPSK)

(Channel 78, 8-DPSK)

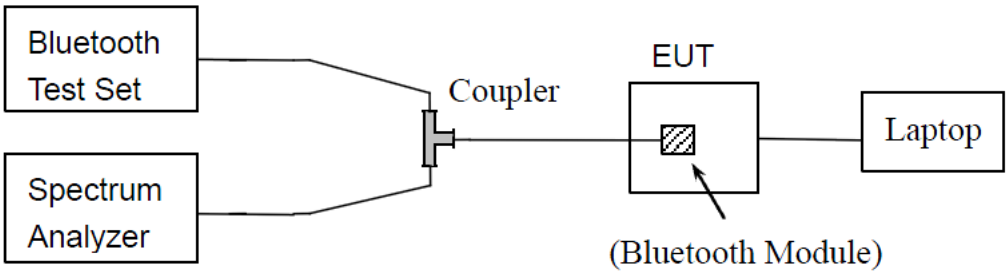
2.7. Carried Frequency Separation

2.7.1. Definition

According to FCC §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

2.7.2. Test Description

Test Setup:



The Bluetooth Module of the EUT is coupled to the Spectrum Analyzer (SA) and the Bluetooth Test Set through the coupler; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.7.3. Test Procedure

The EUT must have its hopping function enabled. According to DA 00-705, use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels
Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
Video (or Average) Bandwidth (VBW) ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

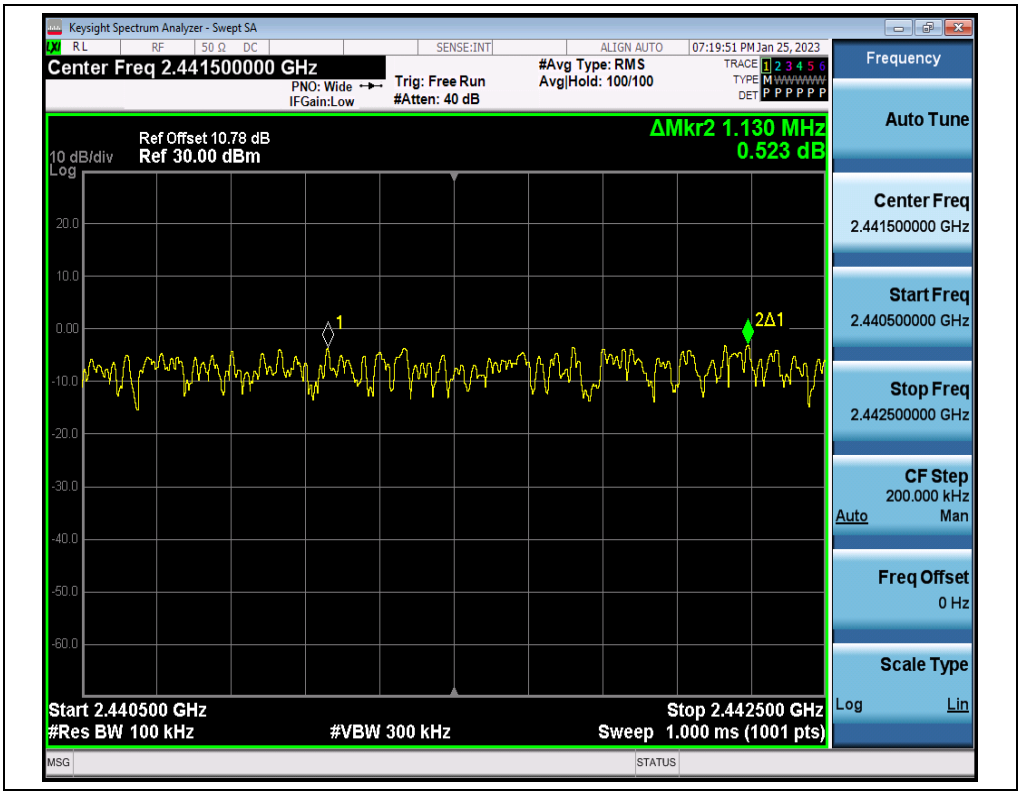
2.7.4. Test Result

A. Test Verdict:

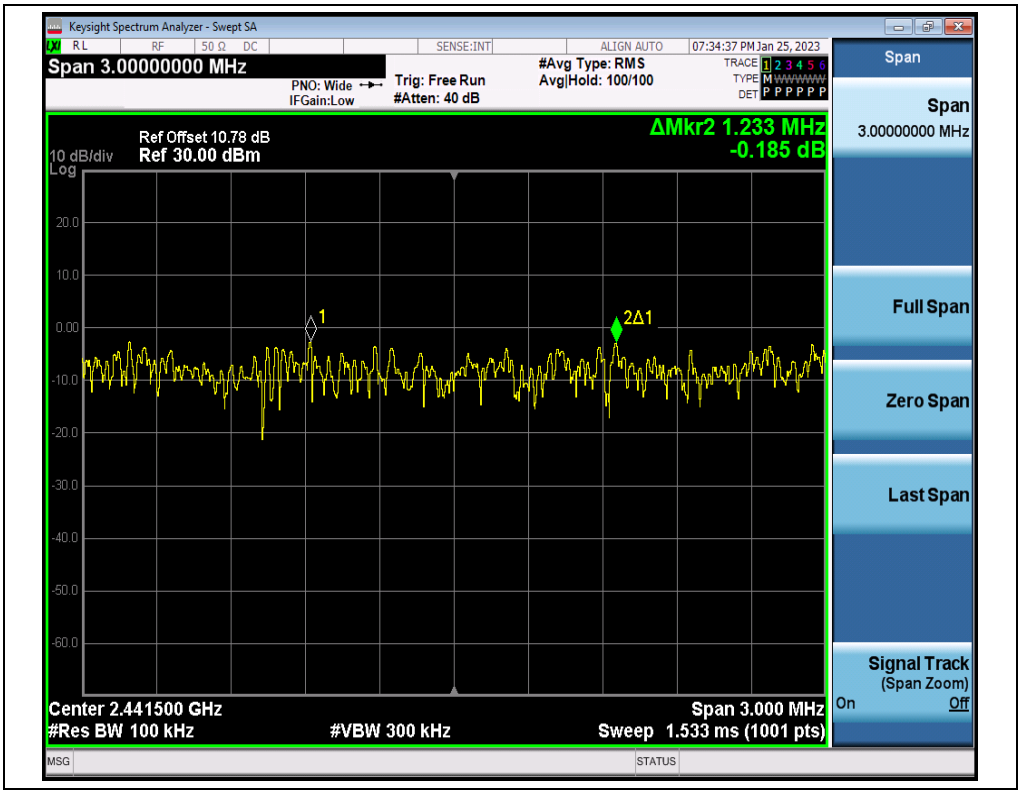
Test Mode	Carried Frequency Separation (MHz)	Min. Limit	Verdict
GFSK	1.094	≥1.032	PASS
π/4-DQPSK	1.13	≥0.900	PASS
8-DPSK	1.233	≥0.922	PASS

B. Test Plot:

(GFSK)



(π/4-DQPSK)



(8-DPSK)

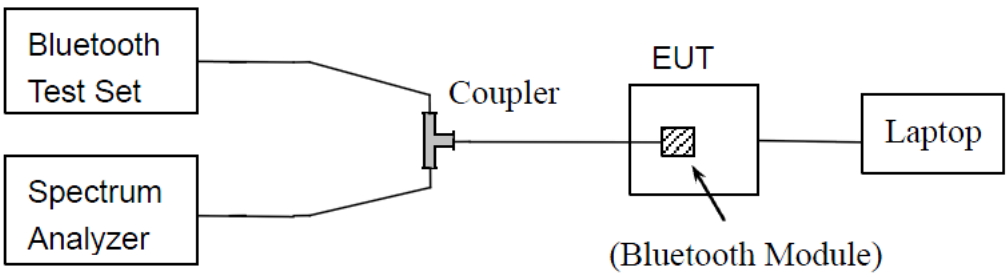
2.8. Time of Occupancy (Dwell time)

2.8.1. Requirement

According to FCC §15.247(a) (1) (iii), frequency hopping systems in the 2400 - 2483.5MHz band shall use at least 15 non-overlapping 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.

2.8.2. Test Description

Test Setup:



The Bluetooth Module of the EUT is coupled to the Spectrum Analyzer (SA) and the Bluetooth Test Set through the coupler; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.8.3. Test Procedure

Normal Mode:
DH1: Dwell time equal to Pulse time (ms) *(1600 / 2 /79)*31.6 Millisecond DH3: Dwell time equal to Pulse time (ms) * (1600 /4 /79) *31.6 Millisecond DH5: Dwell time equal to Pulse Time (ms)* (1600 / 6 /79) *31.6 Millisecond
AFH Mode:
DH1: Dwell time equal to Pulse time (ms) *(800 / 2 /20)*(0.4*20) Millisecond DH3: Dwell time equal to Pulse time (ms) * (800 / 4 /20)*(0.4*20) Millisecond DH5: Dwell time equal to Pulse Time (ms)* (800 / 6 /20)*(0.4*20) Millisecond.

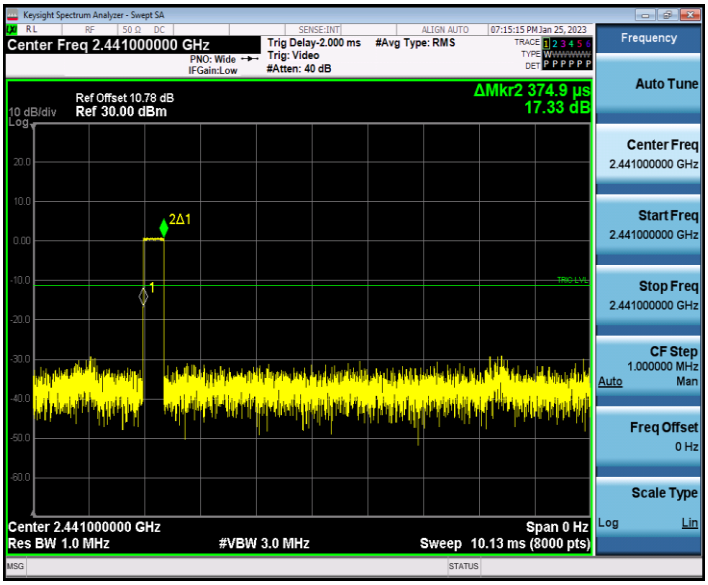
2.8.4. Test Result

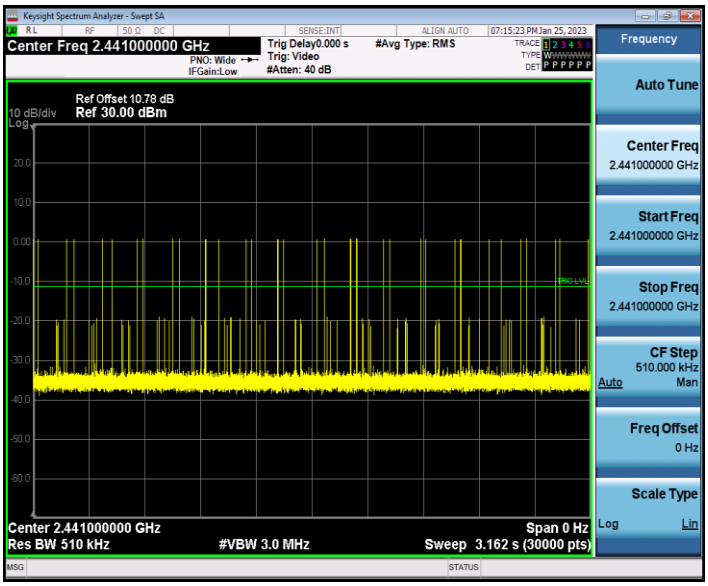
GFSK Mode

A. Test Verdict:

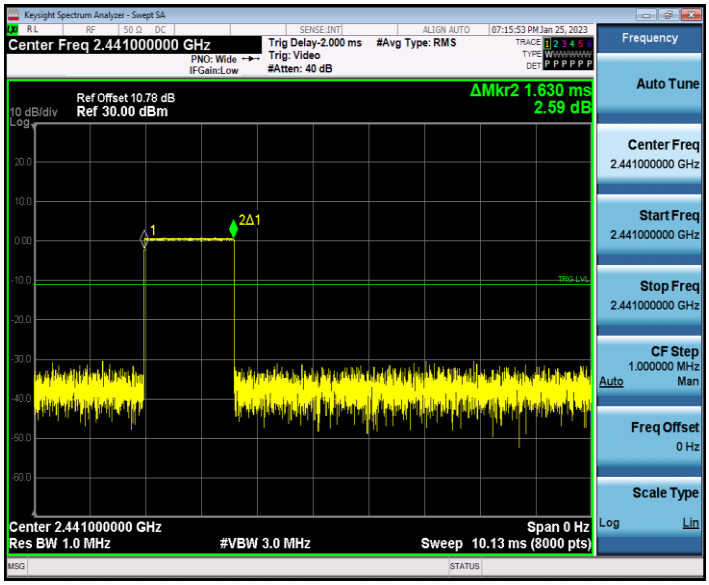
TestMode	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Hop	0.37	330	0.124	≤0.4	PASS
DH3	Hop	1.63	150	0.245	≤0.4	PASS
DH5	Hop	2.88	80	0.23	≤0.4	PASS

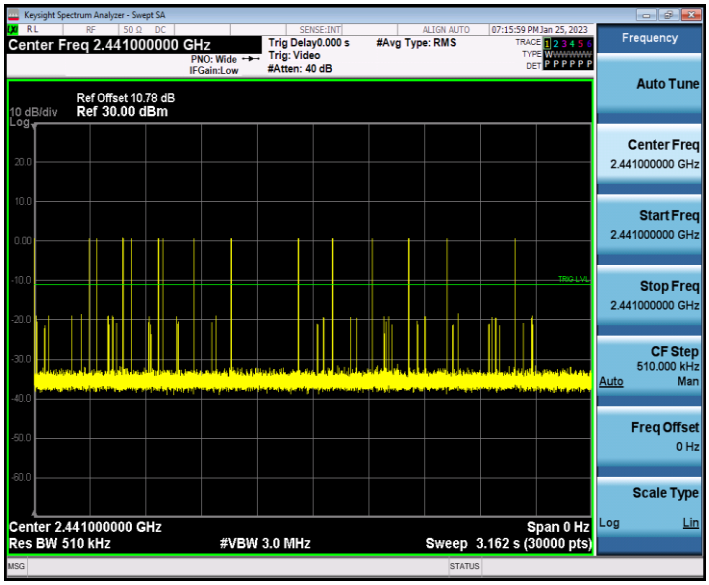
B. Test Plot:



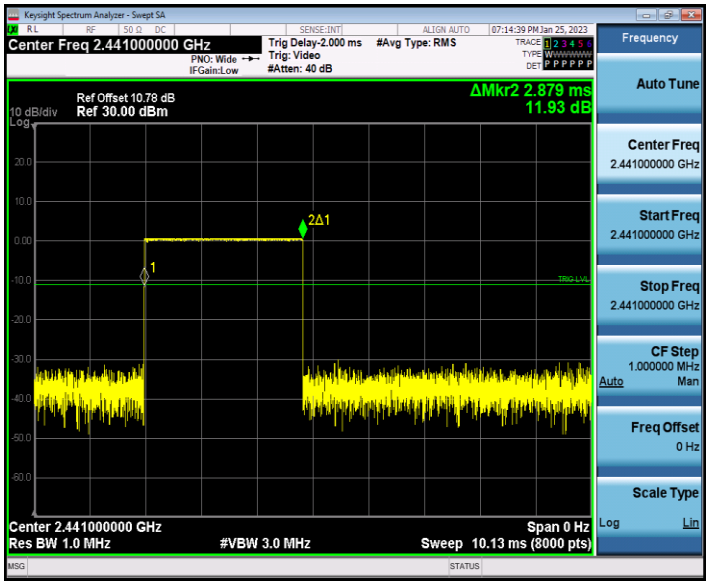


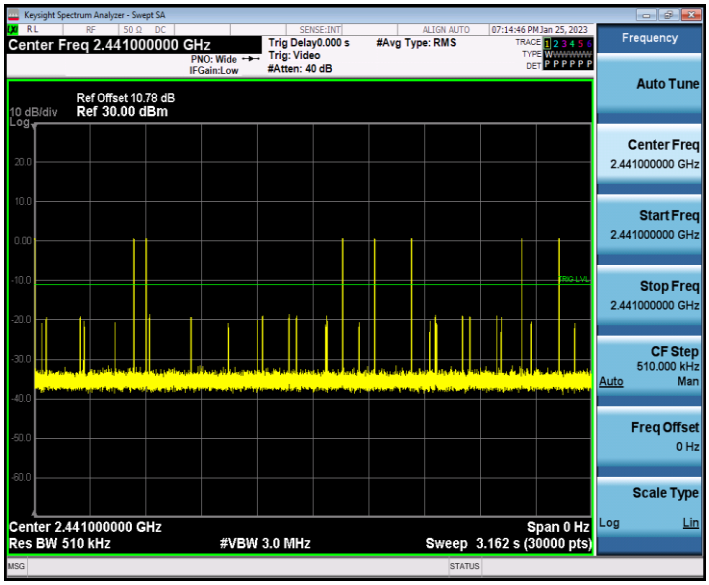
(DH1, GFSK)


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:15:53 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.630 ms
2.59 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:15:59 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

(DH3, GFSK)


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:14:39 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.879 ms
11.93 dB
2Δ1
1
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:14:46 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

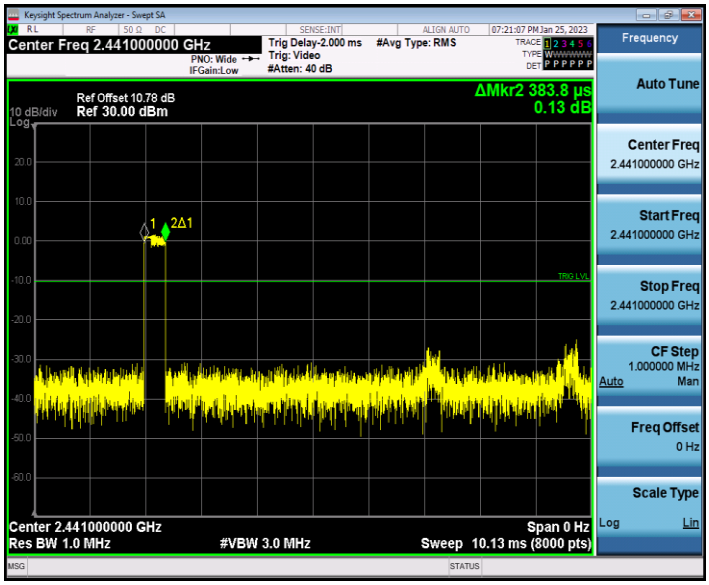
(DH5, GFSK)

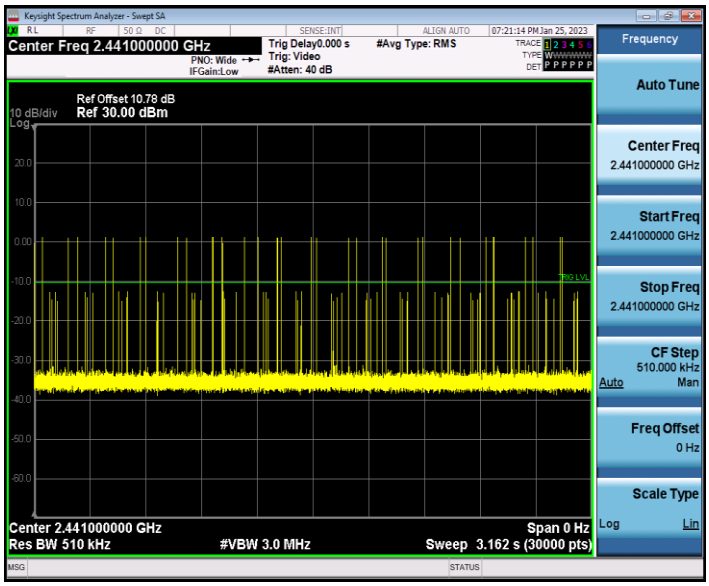
π/4-DQPSK Mode

A. Test Verdict:

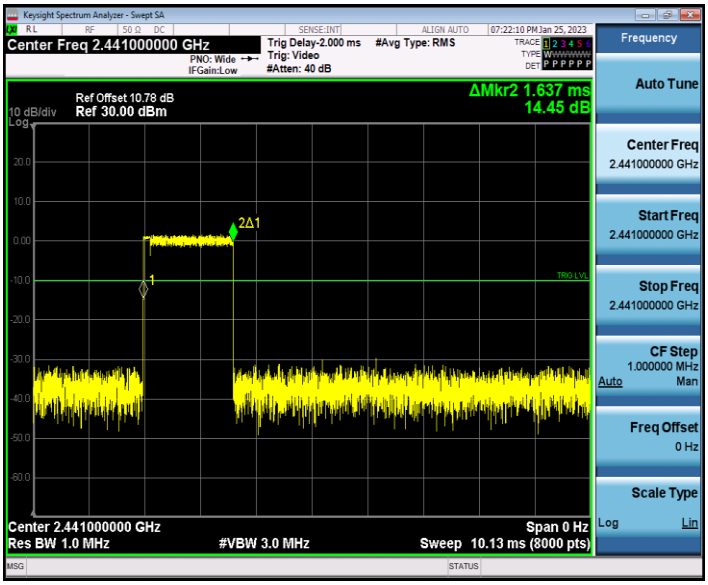
TestMode	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
2DH1	Hop	0.38	320	0.123	≤0.4	PASS
2DH3	Hop	1.64	200	0.327	≤0.4	PASS
2DH5	Hop	2.88	100	0.288	≤0.4	PASS

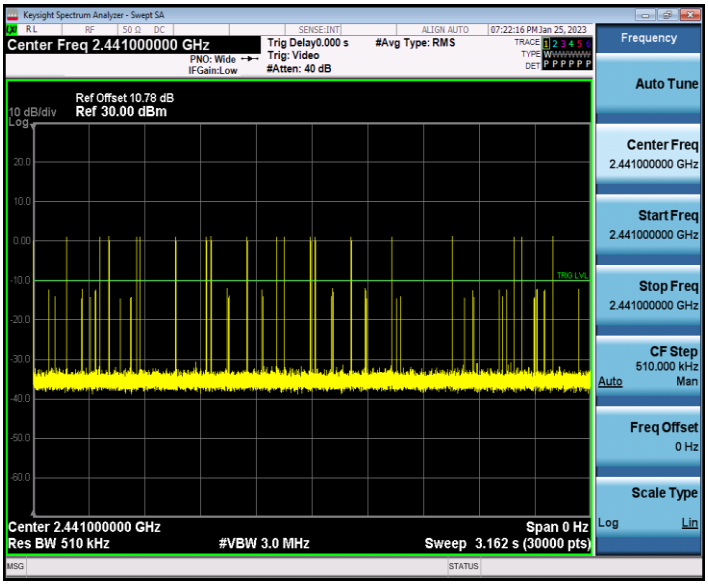
B. Test Plot:



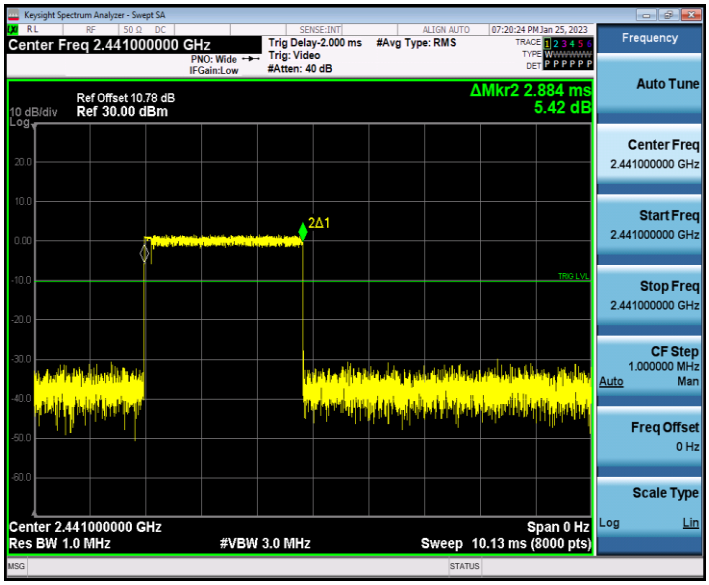


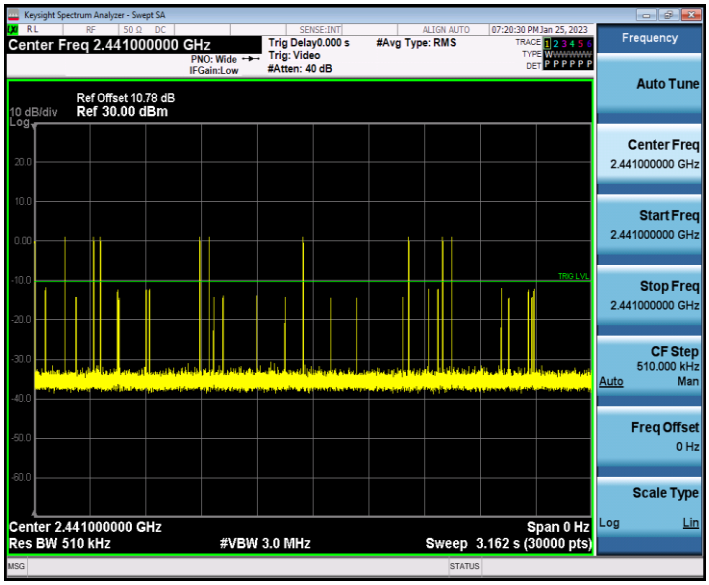
(DH1, π/4-DQPSK)


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:22:10 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.637 ms
14.45 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:22:16 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

(DH3, π/4-DQPSK)


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:20:24 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.884 ms
5.42 dB
2Δ1
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:20:30 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

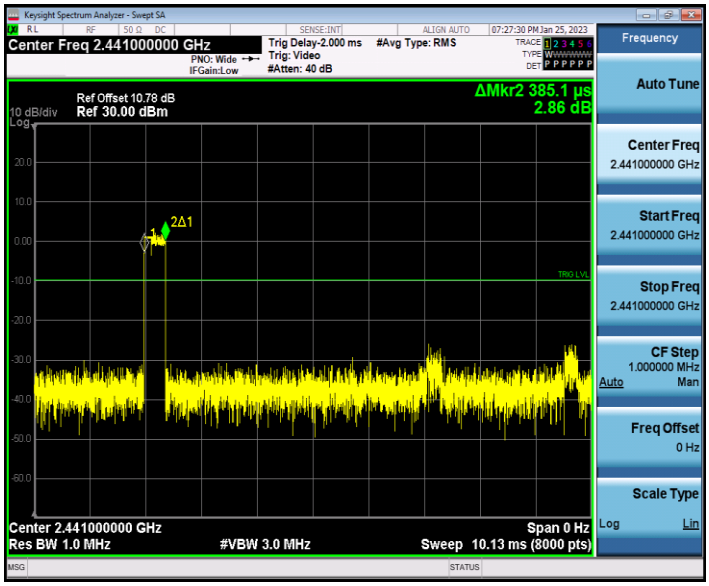
(DH5, π/4-DQPSK)

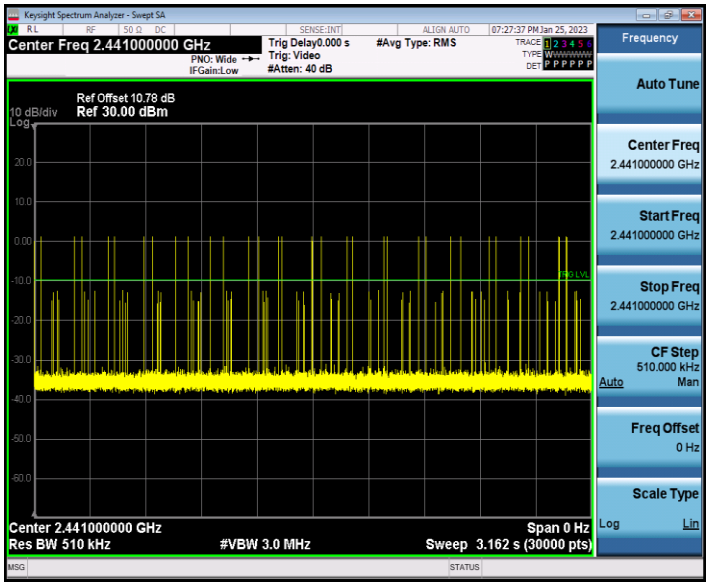
8-DPSK mode

A. Test Verdict:

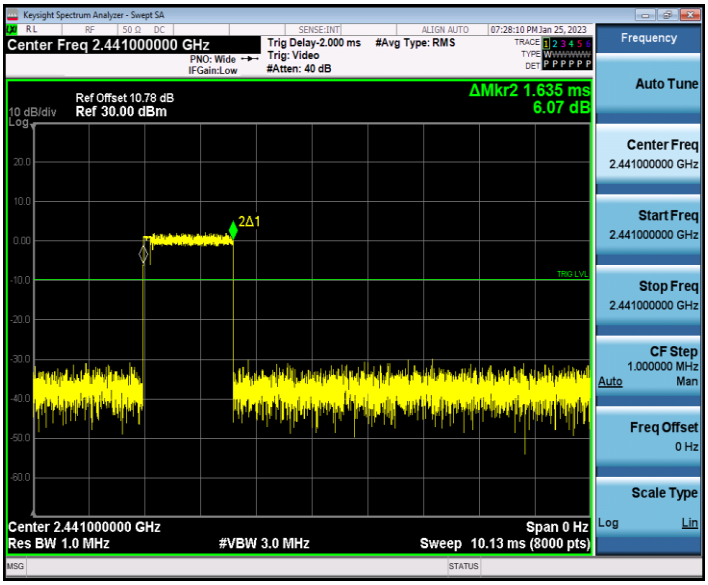
TestMode	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
3DH1	Hop	0.39	320	0.123	≤0.4	PASS
3DH3	Hop	1.64	190	0.311	≤0.4	PASS
3DH5	Hop	2.89	120	0.346	≤0.4	PASS

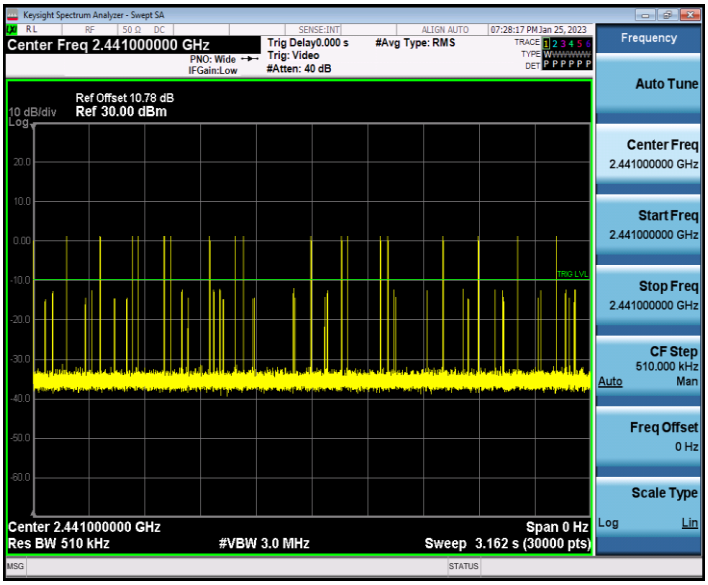
B. Test Plot:



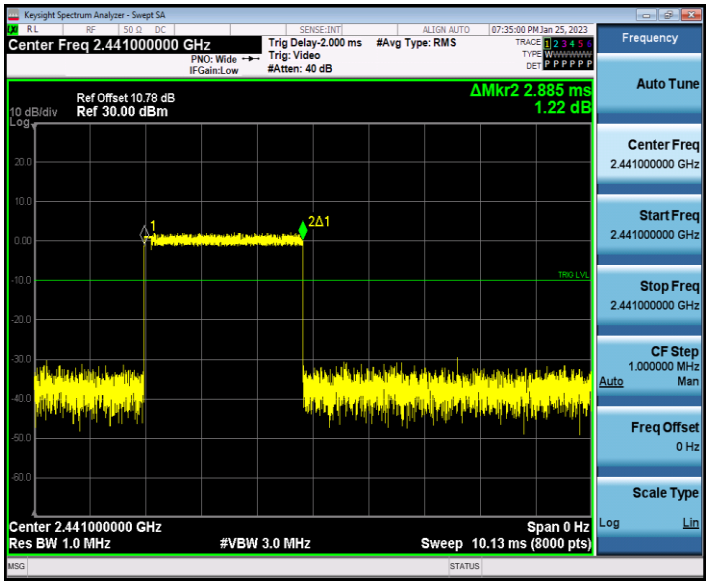


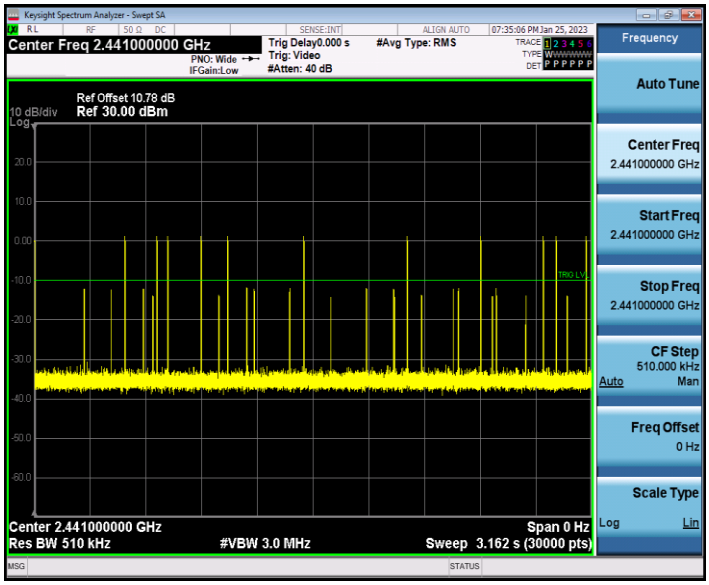
(DH1, 8-DPSK)


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:28:10 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.635 ms
6.07 dB
2Δ1
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:28:17 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

(DH3, 8-DPSK)


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:35:00 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.885 ms
1.22 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Avg Type: RMS
#Atten: 40 dB
07:35:06 PM Jan 25, 2023
Ref Offset 10.78 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

(DH5, 8-DPSK)

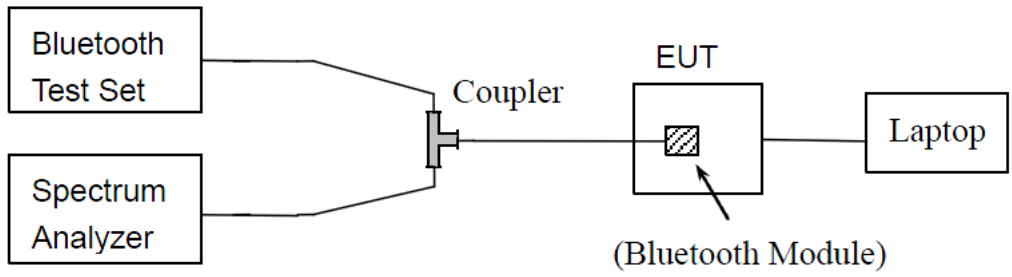
2.9. Conducted Spurious Emissions

2.9.1. Requirement

According to FCC §15.247(d), in any 100kHz 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 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

2.9.2. Test Description

Test Setup:



The Bluetooth Module of the EUT is coupled to the Spectrum Analyzer (SA) and the Bluetooth Test Set through the coupler; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.9.3. Test Procedure

Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
RBW = 100 kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize.

2.9.4. Test Result

Conducted Spurious Emission

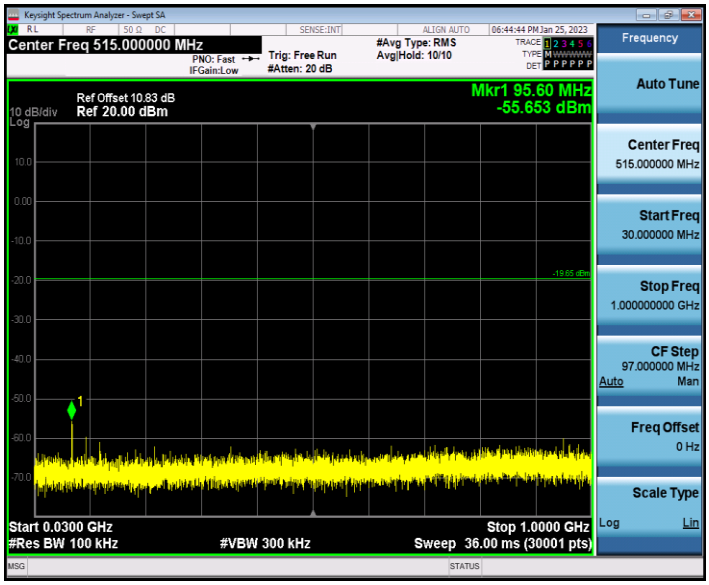
A. Test Verdict:

TestMode	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
GFSK	2402	Reference	0.35	0.35	---	PASS
		30~1000	0.35	-55.65	≤-19.65	PASS
		1000~26500	0.35	-39.55	≤-19.65	PASS
	2441	Reference	1.03	1.03	---	PASS
		30~1000	1.03	-56.46	≤-18.97	PASS
		1000~26500	1.03	-39.53	≤-18.97	PASS
	2480	Reference	0.97	0.97	---	PASS
		30~1000	0.97	-56.51	≤-19.03	PASS
		1000~26500	0.97	-37.54	≤-19.03	PASS
π/4-DQPSK	2402	Reference	0.29	0.29	---	PASS
		30~1000	0.29	-55.87	≤-19.71	PASS
		1000~26500	0.29	-43.51	≤-19.71	PASS
	2441	Reference	0.80	0.80	---	PASS
		30~1000	0.80	-56.53	≤-19.2	PASS
		1000~26500	0.80	-41.3	≤-19.2	PASS
	2480	Reference	-0.50	-0.50	---	PASS
		30~1000	-0.50	-58.04	≤-20.5	PASS
		1000~26500	-0.50	-36.38	≤-20.5	PASS
8-DPSK	2402	Reference	-0.13	-0.13	---	PASS
		30~1000	-0.13	-57.04	≤-20.13	PASS
		1000~26500	-0.13	-40.49	≤-20.13	PASS
	2441	Reference	0.47	0.47	---	PASS
		30~1000	0.47	-56.11	≤-19.53	PASS
		1000~26500	0.47	-43.09	≤-19.53	PASS
	2480	Reference	0.26	0.26	---	PASS
		30~1000	0.26	-55.96	≤-19.74	PASS
		1000~26500	0.26	-39.03	≤-19.74	PASS

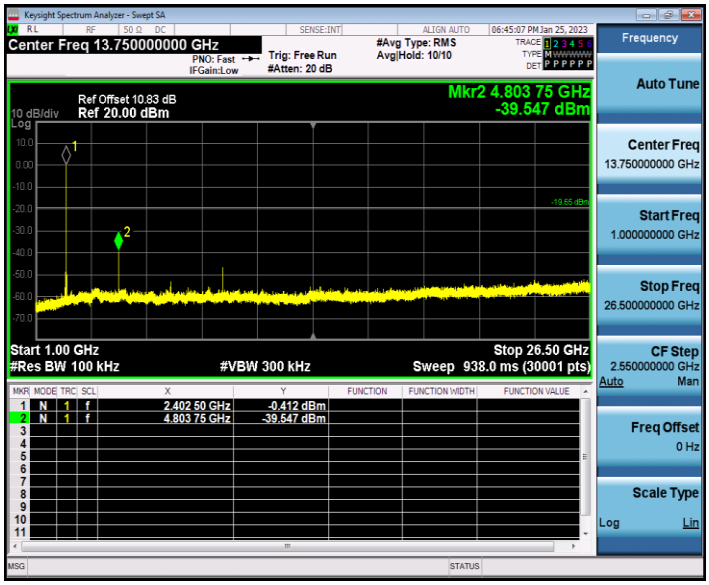
B. Test Plot:

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

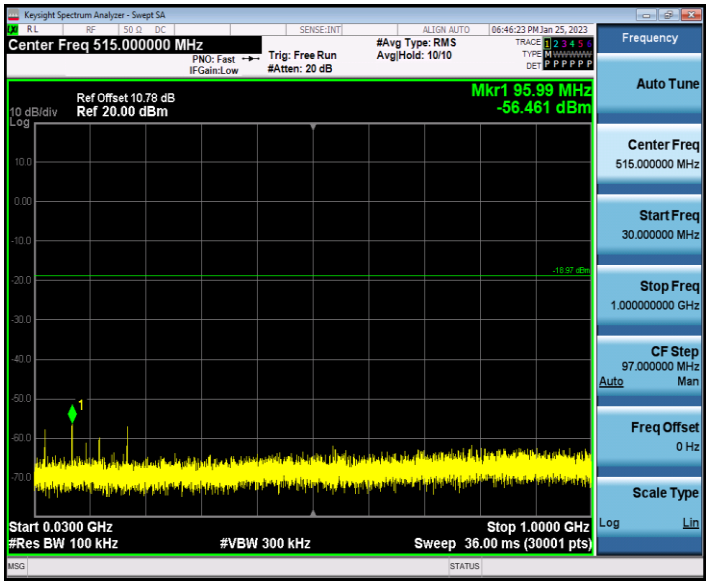


DH5_Ant1_2402_1000~26500

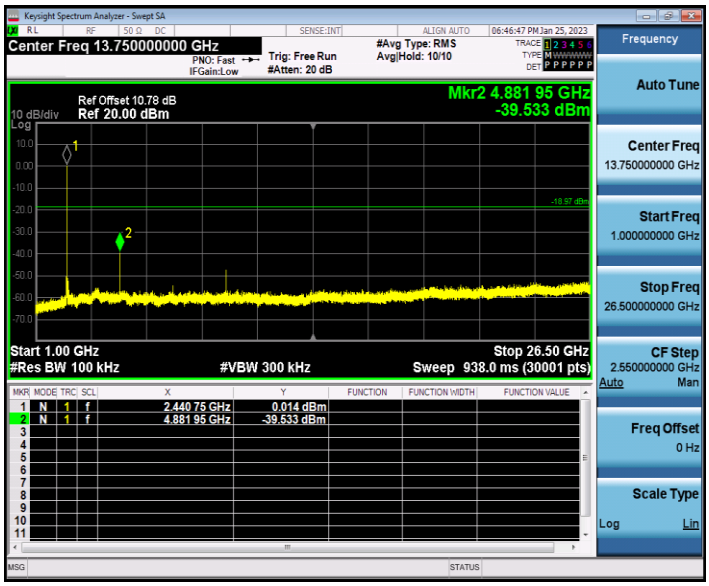


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

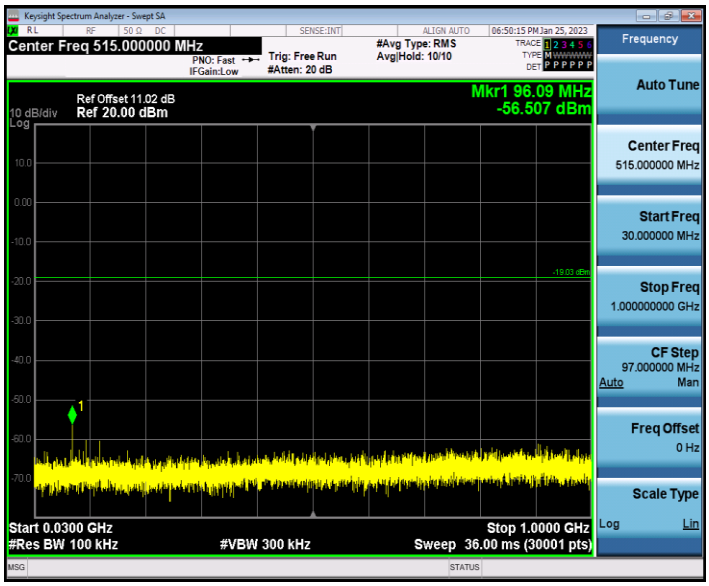


DH5_Ant1_2441_1000~26500

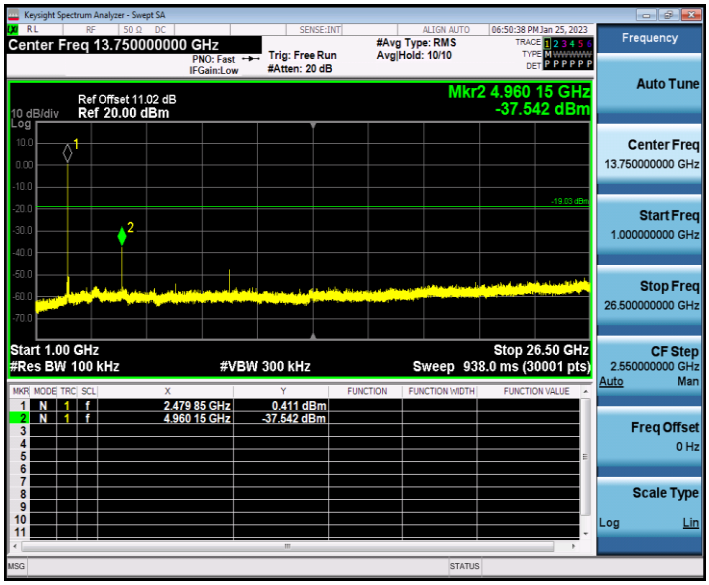


DH5_Ant1_2480_0~Reference

DH5_Ant1_2480_30~1000

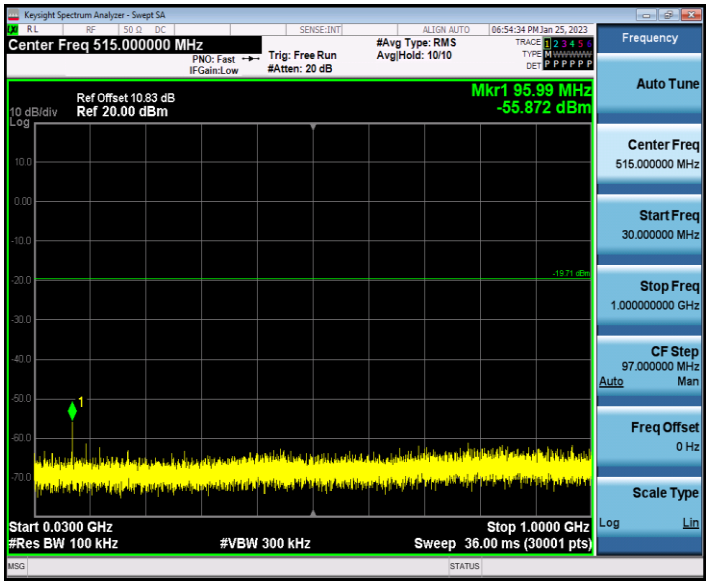


DH5_Ant1_2480_1000~26500

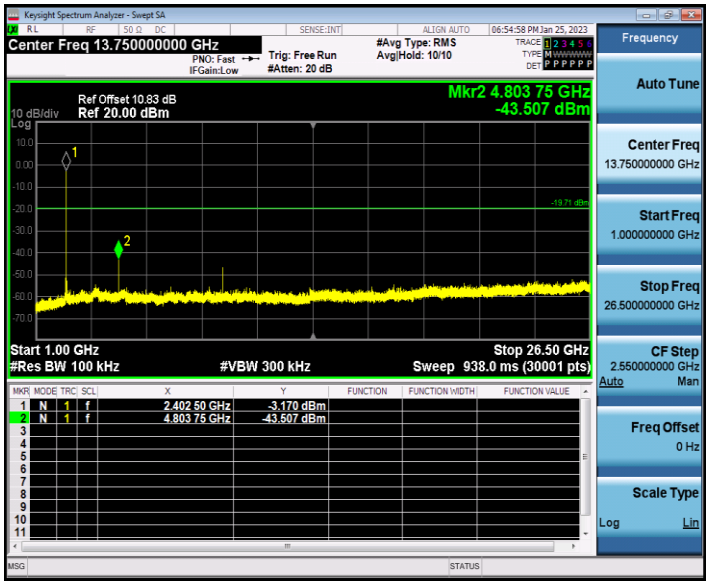


2DH5_Ant1_2402_0~Reference

2DH5_Ant1_2402_30~1000

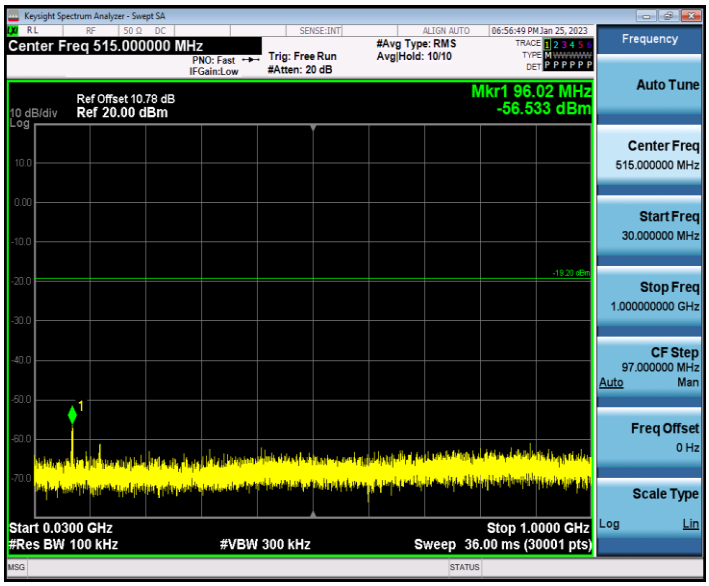


2DH5_Ant1_2402_1000~26500



2DH5_Ant1_2441_0~Reference

2DH5_Ant1_2441_30~1000



2DH5_Ant1_2441_1000~26500