ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

EUT Description:	Mini
Applicant:	Quanta Computer Inc. No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City 33377, Taiwan
Manufacturer:	Quanta Computer Inc. No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City 33377, Taiwan
Brand Name:	Clover
Model No./ISED HVIN:	C306
ISED PMN:	C306
Report Number:	TERF2606002120E2
FCC ID	HFS-C306
IC:	1787B-C306
Date of EUT Received:	June 17, 2026
Date of Test:	July 8, 2026 ~ July 30, 2026
Issue Date:	August 10, 2026

Approved By _____

Aken Huang

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 and the energy emitted by the sample EUT comply with FCC rule part §15.247, ISED RSS-247.

The results of this report relate only to the sample identified in this report.

Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2606002120E2	00	Original	August 10, 2026	Karen Huang	

Note:

1、The remark "*" indicates modification of the report upon requests from certification body.

Table of Contents

1 GENERAL INFORMATION

1.1 Equipment Under Test (EUT)

EUT Description	Mini
Brand Name	Clover
Model No. /ISED HVIN	C306
Firmware Version	N/A
Power Supply	12 Vdc
Test Software (Name/Version)	Qualcomm Radio Control Toolkit /v4.1

1.2 RF Specification

Radio Technology:	BT BR+EDR
Channel number:	79 channels
Modulation type:	GFSK + π/4DQPSK + 8DPSK
Transmit Power:	7.47 dBm
Frequency Range:	2.402GHz ~ 2.480GHz
Dwell Time:	≦ 0.4s

1.3 Antenna Designation

Ant. Type	Brand	Model No.	Freq. (MHz)	Peak Gain(dBi)
PIFA	AWAN	DQ60ALP6Y02	2400~2483.5	2.87

Note:

1. Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
2. The antenna information is provided by the applicant. The laboratory does not verify the accuracy of this information, and all test results related to antenna characteristics are based solely on the data supplied. Responsibility for the authenticity and accuracy of these specifications rests entirely with the party who provided the information.
3. The antenna complies with part 15.203 requirement and no consideration of replacement. Please see EUT photo for details.

1.4 Operating Frequencies

2400~2483.5 MHz							
Item	Freq.	Item	Freq.	Item	Freq.	Item	Freq.
0	2402 MHz	1	2403 MHz	2	2404 MHz	3	2405 MHz
4	2406 MHz	5	2407 MHz	6	2408 MHz	7	2409 MHz
8	2410 MHz	9	2411 MHz	10	2412 MHz	11	2413 MHz
12	2414 MHz	13	2415 MHz	14	2416 MHz	15	2417 MHz
16	2418 MHz	17	2419 MHz	18	2420 MHz	19	2421 MHz
20	2422 MHz	21	2423 MHz	22	2424 MHz	23	2425 MHz
24	2426 MHz	25	2427 MHz	26	2428 MHz	27	2429 MHz
28	2430 MHz	29	2431 MHz	30	2432 MHz	31	2433 MHz
32	2434 MHz	33	2435 MHz	34	2436 MHz	35	2437 MHz
36	2438 MHz	37	2439 MHz	38	2440 MHz	39	2441 MHz
40	2442 MHz	41	2443 MHz	42	2444 MHz	43	2445 MHz
44	2446 MHz	45	2447 MHz	46	2448 MHz	47	2449 MHz
48	2450 MHz	49	2451 MHz	50	2452 MHz	51	2453 MHz
52	2454 MHz	53	2455 MHz	54	2456 MHz	55	2457 MHz
56	2458 MHz	57	2459 MHz	58	2460 MHz	59	2461 MHz
60	2462 MHz	61	2463 MHz	62	2464 MHz	63	2465 MHz
64	2466 MHz	65	2467 MHz	66	2468 MHz	67	2469 MHz
68	2470 MHz	69	2471 MHz	70	2472 MHz	71	2473 MHz
72	2474 MHz	73	2475 MHz	74	2476 MHz	75	2477 MHz
76	2478 MHz	77	2479 MHz	78	2480 MHz	-	-

1.5 EUT Availability and The Worst Test Modes

1. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
2. The field strength of radiation emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.
3. Investigation has been done on all the possible configurations for searching the worst case. The given UE is pre-scanned among modes below.

ANTENNA PORT CONDUCTED TEST			
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	PACKET TYPE
Peak Output Power, 20dB Band Width, Spurious Emission			
Bluetooth	0 to 78	0,39,78	DH5
	0 to 78	0,39,78	2DH5
	0 to 78	0,39,78	3DH5
Band Edge, Number of Hopping Frequency, Hopping Band edge			
Bluetooth	0 to 78	0 to 78	DH5,3DH5
Frequency Separation			
Bluetooth	0 to 78	0,1,2, 38,39,40, 76,77,78	DH5
			2DH5
			3DH5
Time of Occupancy(Dwell time)			
Bluetooth	0 to 78	39	DH1,DH3,DH5
			2DH1,2DH3,2DH5
			3DH1,3DH3,3DH5

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	PACKET TYPE
TRANSMIT RADIATED EMISSION TEST (BELOW 1 GHz)				
Bluetooth	0 to 78	39	GFSK	DH5
TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)				
Bluetooth	0 to 78	0,39,78	GFSK,8-DPSK	DH5,3DH5
Note: The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for channel Low, Mid and High, the worst case position was reported.				

2 SUMMARY OF TEST RESULTS

FCC Rules	ISED Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b)(1)	RSS-247 §6.2.3.2	Peak Output Power	Compliant
§15.247(a)(1)	RSS-247 §6.2.1.a RSS-Gen §6.7	Emission Bandwidth	Compliant
§15.205 §15.209 §15.247(d)	RSS-247 §6.6 RSS-Gen §8.9 RSS-Gen §8.10	Out of Band Emission	Compliant
§15.205 §15.209 §15.247(d)	RSS-247 §6.6 RSS-Gen §8.9 RSS-Gen §8.10	Unwanted Emission	Compliant
§15.247(a)(1)	RSS-247 §6.2.1.b & 6.2.3.1.a	Frequency Separation	Compliant
§15.247(a)(1)(iii)	RSS-247 §6.2.3.1.b	Number of hopping frequency Time of Occupancy	Compliant
§15.203	N/A	Antenna Requirement	Compliant

2.1 Test Methodology of Applied Standards

1. FCC Part 15, Subpart C §15.247
2. ANSI C63.10:2020
3. FCC KDB 558074 D01 15.247 Meas Guidance v05r02
4. ISED RSS-247, Issue 4, Jul. 24, 2025
5. ISED RSS-Gen, Issue 5, Apr. 2018
6. ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024

2.2 Measurement Uncertainty

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 1.61 dB
Output Power measurement	+/- 0.97 dB
Emission Bandwidth	+/- 1.38 Hz
Conducted emission measurement	+/- 0.77 dB
Frequency Separation	+/- 1.48 Hz
Number of hopping frequency	+/- 1.48 Hz
Time of Occupancy	+/- 1.48 Hz
Temperature	+/- 0.60 °C
Humidity	+/- 3.00 %
DC / AC Power Source	+/- 1.00 %

Radiated Spurious Emission Measurement Uncertainty		
Polarization: Vertical	+/- 1.89 dB	9kHz - 30MHz
	+/- 4.10 dB	30MHz - 1000MHz
	+/- 3.41 dB	1GHz - 18GHz
	+/- 3.89 dB	18GHz - 40GHz
Polarization: Horizontal	+/- 1.89 dB	9kHz - 30MHz
	+/- 4.10 dB	30MHz - 1000MHz
	+/- 3.41 dB	1GHz - 18GHz
	+/- 3.89 dB	18GHz - 40GHz
Radiated Spurious Emission	+/- 2.00 dB	33GHz - 50GHz
	+/- 1.59 dB	50GHz - 60GHz
	+/- 1.71 dB	60GHz - 90GHz
	+/- 1.64 dB	90GHz - 140GHz
	+/- 3.84 dB	140GHz - 220GHz

Note
1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

2.3 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number / Registration Number	IC CAB identifier / Company Number
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803	SAC 1 / SAC 2 / SAC 3 Conduction 1 / Conducted 1 Conducted 2 / Conducted 3 Conducted 4 / Conducted 5 Conducted 6 / FAC 1	TW0027 / 891563	TW3702 / 4620A
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.2, Keji 1st Rd, Guishan District, Taoyuan City, Taiwan 333	SAC C / SAC D / SAC G Conduction C/ Conducted A Conducted B / Conducted C Conducted D / Conducted E Conducted F / Conducted G FAC A	TW0028 / 200037	TW3702 / 4620E

Measurement	Test Site Name	Test Engineer	EUT S/N	Test Environment	Test Date
Conducted	Conducted D	Henry Chiang	C036UG62040030	23.4~24.1°C / 67~71%	2026/07/15 ~ 2026/07/30
Radiated	SAC G Chamber	Temo Chen	C036UG62020002	22.7~24.7°C / 51~69%	2026/07/21 ~ 2026/07/29
Conduction	Conduction C	Temo Chen	C036UG62020002	23.7°C / 55%	2026/07/29 ~ 2026/07/29

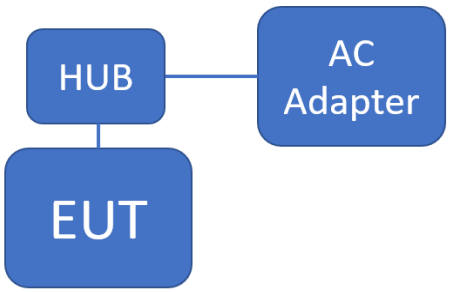
3 CONTROL UNIT(S) AND PERIPHERAL(S)

3.1 EUT Exercise

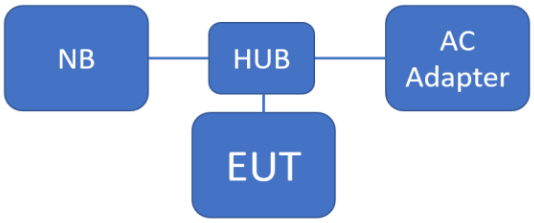
An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.
The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

3.2 Diagrams

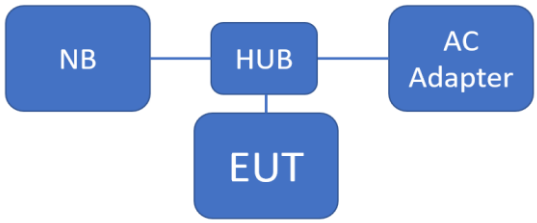
Conduction Setup



Conducted Setup



Radiated Setup



3.3 List

3.3.1 Conduction Setup

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
HUB	clover	H306	H036WG54640059	N/A	N/A
Adapter	clover	FSP040-RHBN3	N/A	N/A	N/A

3.3.2 Conducted Setup

Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
HUB	clover	H306	H036WG54640068	N/A	N/A
AC adapter	MASS POWER	S042-1B120333M3	N/A	N/A	N/A
Type-A To Type-B Cable	AWM	2725-E322903	N/A	N/A	N/A
Notebook	Lenovo	T440p	P0000665	N/A	N/A

3.3.3 Radiated Setup

Radiated Emission Test Site: SAC G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
HUB	clover	H306	H036WG54640059	N/A	N/A
Adapter	clover	FSP040-RHBN3	N/A	N/A	N/A
Notebook	Lenovo	T470	P0001293	N/A	N/A

4 TEST INSTRUMENT

4.1 Conducted Measurement

Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Attenuator	Woken	WATT-218FS-10	RF16	11/13/2025	11/12/2026
Attenuator	Woken	WATT-218FS-10	RF17	11/13/2025	11/12/2026
Attenuator	Woken	WATT-218FS-10	RF21	11/13/2025	11/12/2026
DC Block	Marvelous	MVE6114	RF42	11/13/2025	11/12/2026
Power Meter	Anritsu	ML2496A	2138005	09/22/2025	09/21/2026
Power Sensor	Anritsu	MA2411B	1911395	09/22/2025	09/21/2026
Power Sensor	Anritsu	MA2411B	1911396	09/22/2025	09/21/2026
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071574	07/01/2026	06/30/2027

4.2 Radiated Measurement

Radiated Emission Test Site: SAC G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
1G Low pass Filter	Woken	EWT-56-0019	RF156	11/13/2025	11/12/2026
2400-2500 Notch Filter	Micro-Tronics	BRM50701-02	RF201	11/13/2025	11/12/2026
3G High Pass Filter	Titan Microwave	T04H30001800070 S01	RF181	11/13/2025	11/12/2026
3m Site NSA	SGS	966 chamber G	N/A	03/30/2026	03/29/2027
Active Loop Antenna	COM-POWER	AL-130R	10160105	12/16/2025	12/15/2026
Broadband Antenna	SCHWARZBECK	VULB 9168	1206	01/08/2026	01/07/2027
Coaxial Cable	EMCI+Huber Suhner	EMCCFD400-NM-NM-8000+EMCCFD400-NM-NM-5000+SUCOFLEX100+EMC104-SM-SM-2000+EMC104-SM-SM-8000+EMC104-SM-SM-5000	210216+210217+84103701/15+160105+210217+210220	11/13/2025	11/12/2026
Horn Antenna	RF SPIN	DRH0844	KV2E19A0844	03/11/2026	03/10/2027
Horn Antenna	RF SPIN	DRH18-E	210105A18E	04/24/2026	04/23/2027
Pre-Amplifier	EMC Instruments	EMC118A45SE	980815	11/13/2025	11/12/2026
Pre-Amplifier	EMC Instruments	EMC184045SEE	980881	11/13/2025	11/12/2026
Pre-Amplifier	EMC Instruments	EMC330N	980781	11/13/2025	11/12/2026
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071574	07/01/2026	06/30/2027
Test Software	audix	e3	E3 210616 SGS Ver.9 (C)	N.C.R	N.C.R

4.3 Emission from AC power line

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2026	03/26/2027
EMI Test Receiver	R&S	ESCI	101342	04/16/2026	04/15/2027
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	973	04/20/2026	04/19/2027
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2026	03/26/2027
Test Software	audix	e3	E3 210616 SGS Ver.9 (C)	N.C.R	N.C.R

NOTE: N.C.R refers to Not Calibrated Required.

5 REGULATORY REQUIREMENTS

5.1 Emission Bandwidth

This is the factor to determine applicable frequency separation.

5.2 Frequency Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping chan-nel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

5.3 Number Of Hopping Frequency

Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

5.4 Maximum Output Power

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, The Limit: 1Watt. For all other frequency hopping systems in the 2400 – 2483.5MHz band: The Limit: 0.125 Watts. The power limit for 1Mbps is 1watt, and 2Mbps, 3Mbps and AFH mode are 0.125 watts.
EIRP shall not exceed 4 W.

5.5 Time Of Occupancy (Dwell Time)

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

5.6 Out of Band Emission

For emissions in non-restricted frequency bands, 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 produced by the intentional radiator shall be at least 20 dB below the power measured in the 100 kHz bandwidth that contains the highest level of the desired signal. This requirement is based on either a conducted or radiated RF measurement, provided the transmitter complies with the applicable peak conducted power limits.

5.7 Unwanted Emissions

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.
In addition, radiated emissions which fall in the restricted bands must also comply with the applicable radiated emission limit tables.
Moreover, for an intentional radiator operating below 10 GHz, the frequency range of measurements shall extend up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	2400/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3
Note: The lower limit shall apply at the transition frequencies.		

5.8 AC Power Line Conducted Emission

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz		

5.9 Antenna Requirements

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. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

6 TEST CONFIGURATION

6.1 Emission Bandwidth

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. 20dB BW measurements
   The testing is performed in accordance with the applicable regulatory measurement procedure.
   Set the spectrum analyzer as
   RBW= 1 % to 5% of OBW without going below 10kHz,
   VBW ≥ 3 X RBW,
   Span= 2 to 5 times of the OBW,
   Sweep=Auto, Detector = Peak, and Trace mode = Max Hold.
   Use the X dB bandwidth mode function of the spectrum analyzer and set to 20dB.
   Repeat above procedures until all test default channel is completed.
4. 99% BW measurements
   The testing is performed in accordance with the applicable regulatory measurement procedure.
   Set the spectrum analyzer as
   RBW= 1 % to 5% of 99% Bandwidth without going below 10kHz,
   VBW≥3 X RBW
   Span= 1.5 to 5 times of the 99% Bandwidth,
   Sweep=Auto, Detector = Peak, and Trace mode = Max Hold.
   Use the 99% power bandwidth function of the spectrum analyzer.
   Repeat above procedures until all test default channel is completed.

6.2 Frequency Separation

Place the EUT on the table and set it to transmit mode.

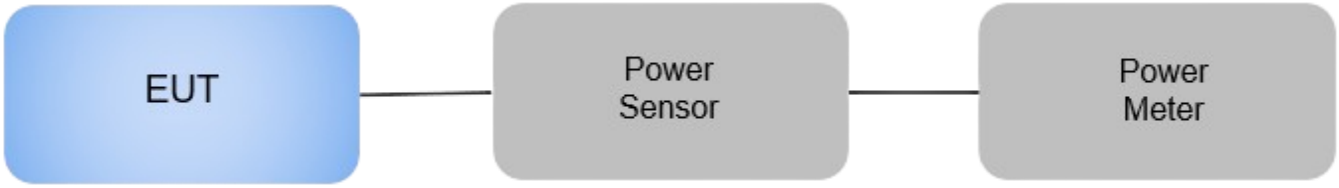
The testing is performed in accordance with the applicable measurement procedure.

1. Set center frequency of spectrum analyzer = middle of hopping channel.
2. Set the RBW approximately 30% of the channel spacing, VBW ≥ 1/10 of RBW.
3. Adjust Span to Wide enough to capture the peaks of two adjacent channels.
4. Sweep time = Auto Couple.
5. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

6.3 Number Of Hopping Frequency

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. The testing is performed in accordance with the applicable measurement procedure.
4. Configure the spectrum analyzer as follows:
   Start frequency= 2400 MHz
   Stop frequency= 2483.5 MHz
   RBW = 30% of the channel spacing
   VBW ≥ 1/10 of RBW
   Detector = Peak
   Sweep = Auto
   Trace mode = Max Hold.
   View and count the number of hopping channels within the band.

6.4 Maximum Output Power



1. Place the EUT on the table and set it to transmit mode.
2. The testing was performed in accordance with the applicable measurement procedure.
3. Remove the antenna from the EUT and connect a low-loss RF cable from the antenna port to the power meter.
4. Record the maximum reading as observed from the power meter(Max Hold, Detector = Peak, RBW ≥20dB bandwidth).
5. Repeat the above procedures until all default test channels have been measured.

6.5 Time Of Occupancy (Dwell Time)

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. The testing is performed in accordance with the applicable measurement procedure.
4. Configure the spectrum analyzer as follows:
   Set the center frequency of the spectrum analyzer to the operating frequency.
   RBW = 1 MHz
   VBW = 3 MHz
   Span = 0Hz
   Detector = Peak
   Adjust Sweep = 2 ~ 8ms
   Repeat above procedures until all datarate of the interest measured were complete.
5. Formula Deduced: time occupancy of one time slot X Hopping rate / total slot in one channel / total channel that hops X period of working channels.
6. Where, standard hopping rate is 1600 hops/s, slot in one channel for DH1, DH3, and DH5 is 2, 4, and 6, respectively.
   DH1 consists of single time slot of the uplink, and one slot of the downlink Total Slot: 2
   DH3 consists of three time slot of the uplink, and one slot of the downlink. Total Slot: 4
   DH5 consists of five time slot of the uplink, and one slot of the downlink. Total Slot: 6

*Note: the result of the complete test default channel at 1Mbps is recorded on the test report, 2Mbps, and 3Mbps only records the measurement result at middle channel that reveals no much deviation.

6.6 Out of Band Emission

6.6.1 Conducted Band Edge

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. The testing is performed in accordance with the applicable measurement procedure.
4. Configure the spectrum analyzer as follows:
   Set the center frequency of the spectrum analyzer to the operating frequency.
   RBW = 100 kHz
   VBW = 300 kHz
   Sweep = Auto
   Mark Peak, below 2.4GHz and above 2.4835GHz and record the max. level.
   Repeat above procedures until all frequency measured were complete.

6.6.2 Conducted Spurious Emission

1. The testing is performed in accordance with the applicable measurement procedure.
2. Connect the antenna port of the EUT to the spectrum analyzer.
3. Configure the spectrum analyzer as follows:
   RBW = 100 kHz
   VBW = 300 kHz
   Detector = Peak
   Sweep = Auto
   Allow the trace to fully stabilize.
   Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental emission bandwidth (EBW).
4. Repeat above procedures until all default test channel measured were complete.

6.7 Unwanted Emissions

6.7.1 Duty Cycle Correction Factor

1. Correction Factor For Radiated Unwanted Emission
2. Adjust and configure any EUT switches, controls, or input data streams to ensure that the EUT is transmitting or encoded to produce the worst-case pulse ON time.
3. The testing was performed in accordance with the applicable measurement procedure.
4. Remove the antenna from the EUT and connect a low-loss RF cable from the antenna port to the spectrum analyzer.
5. Set the center frequency of the spectrum analyzer to the operating frequency.
6. Configure the spectrum analyzer as follows:
   RBW = 1 MHz
   VBW = 3 MHz
   Span = 0 Hz
   Detector = Peak
   Sweep Time = 100 ms (manually adjusted)
   Repeat the above procedure until all datarate of interest have been measured.
7. Average Value (dBμV/m) = Peak Actual Field Strength (dBμV/m) + Duty Cycle Correction Factor (dB)
8. Duty Cycle Correction Factor (dB) = $20 \times \log_{10}$ (Ton / 100 ms)

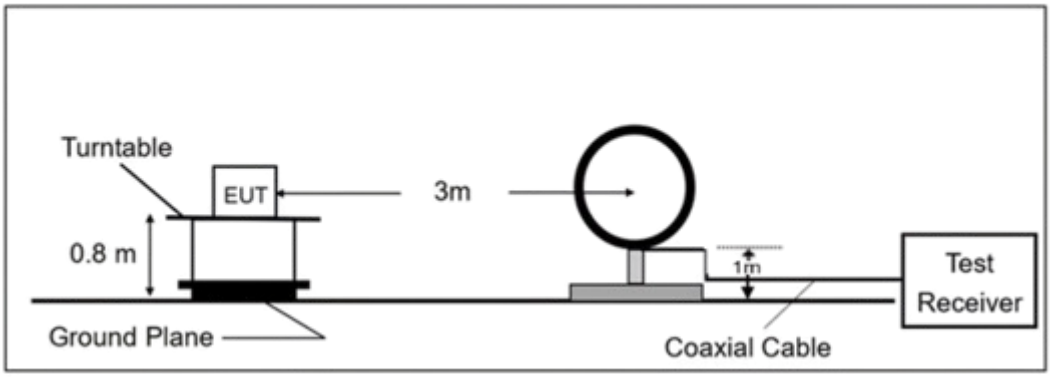
6.7.2 Radiated Emission

For Measurements From 9 kHz To 30 MHz

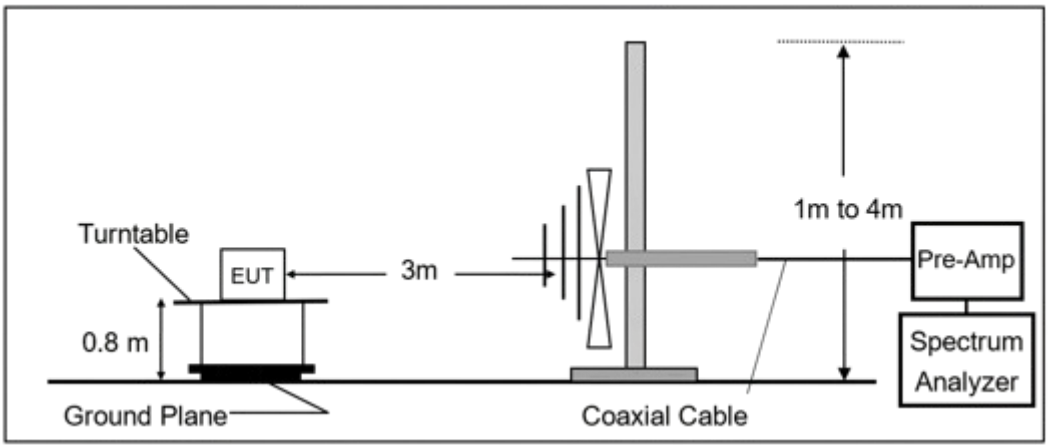
Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

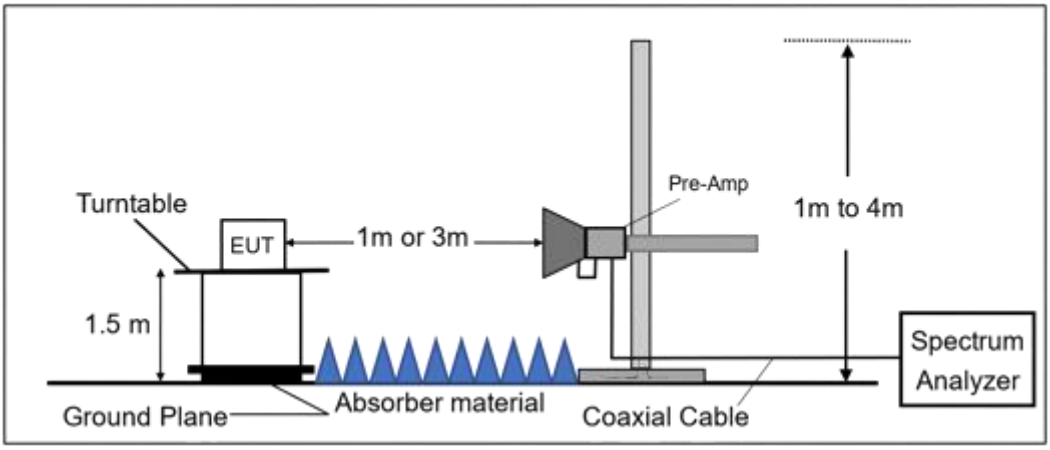
Radiated Emission Test Set-Up, Frequency Below 30MHz.



Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



Radiated Emission Test Set-Up, Frequency Above 1GHz.



1. The testing was performed in accordance with the applicable radiated emission measurement procedure.
2. The EUT was placed on a turntable at a height of 0.8 m for frequencies below 1 GHz and 1.5 m for frequencies above 1 GHz.
3. The turntable was rotated 360 degrees to determine the position of the maximum emission level.
4. The EUT was positioned 3 meters away from the receiving antenna, which was varied in height from 1 m to 4 m to locate the highest emissions.
5. The spectrum analyzer was set with RBW = 100 kHz and VBW = 300 kHz, using a Peak detector for frequencies between 30 MHz and 1 GHz.
6. A receiver mode with RBW = 120 kHz was used for Quasi-Peak (QP) measurements between 30 MHz and 1 GHz.
7. For frequencies above 1 GHz, the spectrum analyzer was set with RBW = 1 MHz, VBW = 3 MHz, and Detector = Peak for maximum emission measurements.
8. For average emission measurements above 1 GHz where the duty cycle (D) is ≥ 98%, the analyzer was set with RBW = 1 MHz, VBW = 3 MHz, and the RMS detector with correction factor [10 log(1/D)]. If the emission is continuous (D ≥ 98%) and does not switch ON/OFF with the transmit cycle, then no duty cycle correction is required.
9. For average emission measurements above 1 GHz where D < 98%, the analyzer was set with RBW = 1 MHz and VBW ≥ 1/T.
10. The average value of pulsed emissions is determined using the duty cycle correction method, applying a correction factor of $20 \times \log_{10}$ (Ton / 100 ms).
11. When measuring radiated emissions above 1 GHz, the receiving antenna was maintained within the "cone of radiation" and pointed at the emission source in both azimuth and elevation, with polarization oriented for maximum response, ensuring it remained within the 3 dB illumination beamwidth of the measurement antenna.
12. The six highest emissions were fully maximized using the above procedures to ensure EUT compliance.
13. Each emission was further maximized by changing the receiving antenna polarization between horizontal and vertical.

14. Repeat the above procedures until all default test channels (low, middle, and high) are measured.

Note: Emissions from 9 kHz to 30 MHz were pre-scanned and found to be at least 20 dB below the applicable limits, and are therefore not reported.

6.7.3 Field Strength Calculation

The field strength is calculated by adding the antenna factor and cable loss, then subtracting the amplifier gain and any applicable duty cycle correction factor from the measured reading. The basic equation and an example calculation are as follows:

FS = RA + AF + CL – AG

Where:

FS = Field Strength (dBμV/m)
RA = Reading Amplitude (dBμV)
AF = Antenna Factor (dB/m)
CL = Cable Loss (dB)
AG = Amplifier Gain (dB)

The emission limit is expressed in dBμV/m, which corresponds to the logarithmic conversion of 20 × $\log_{10}$ (μV/m).

Actual Field Strength (dBμV/m) = Spectrum Analyzer Reading (dBμV) + Total Factor (dB)

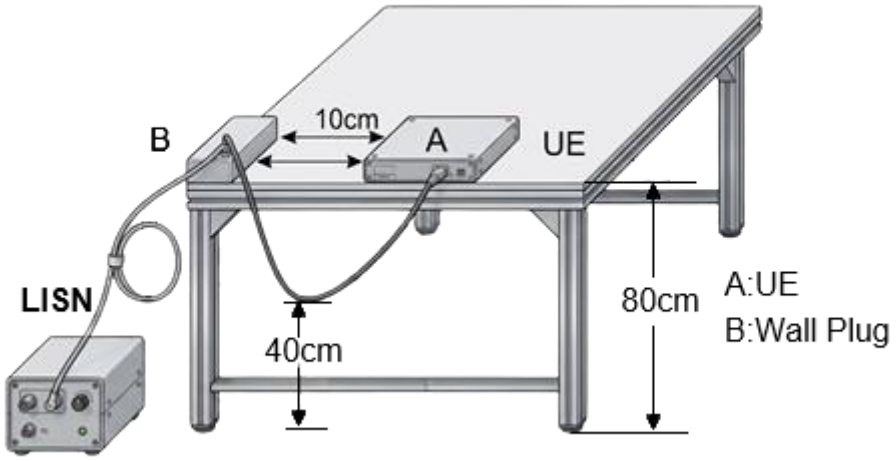
Total Factor (dB) = Antenna Factor (dB) + Cable Loss (dB) – Preamplifier Gain (dB)

Average value(dBμV/m)=Peak Actual FS(dBμV/m)+ Duty Cycle Correction Factor(dB)

Duty Cycle Correction Factor(dB) = 20 log (Ton/100 ms)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not reported.

6.8 AC Power Line Conducted Emission



1. The conducted emission tests were performed at the designated test site using a setup in accordance with ANSI_C63.10
2. The EUT was placed on a non-conductive table that is 0.8 meters above the ground plane. Conducted emissions were measured in the frequency range from 0.15 MHz to 30 MHz using CISPR Quasi-Peak and Average detector modes. The two LISNs provided 50 μH / 50 ohm coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
3. The AC/DC power adaptor of the EUT was connected to the LISN. The EUT was positioned flush with the rear edge of the table, with a minimum 0.4-meter distance from the shielding wall.
4. The LISNs were connected to the power source and configured according to the test requirements.
5. The maximum emission levels were investigated for each mode of operation. The six highest emissions were further maximized to ensure compliance.
6. The above procedures were repeated for all power supply configurations of the EUT.

7 TEST RESULTS

7.1 Emission Bandwidth

7.1.1 20dB Bandwidth

GFSK_DH5

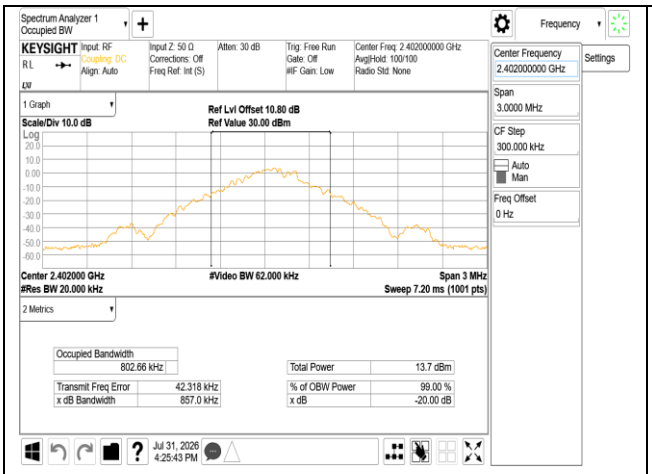
CH	20 dB BW (MHz)	2/3 BW (MHz)
0	0.857	0.57
39	0.8573	0.57
78	0.8571	0.57

π/4DQPSK_2DH5

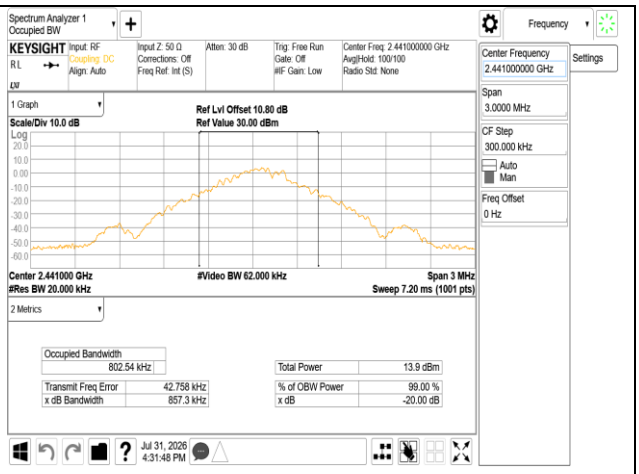
CH	20 dB BW (MHz)	2/3 BW (MHz)
0	1.287	0.86
39	1.287	0.86
78	1.285	0.86

8DPSK_3DH5

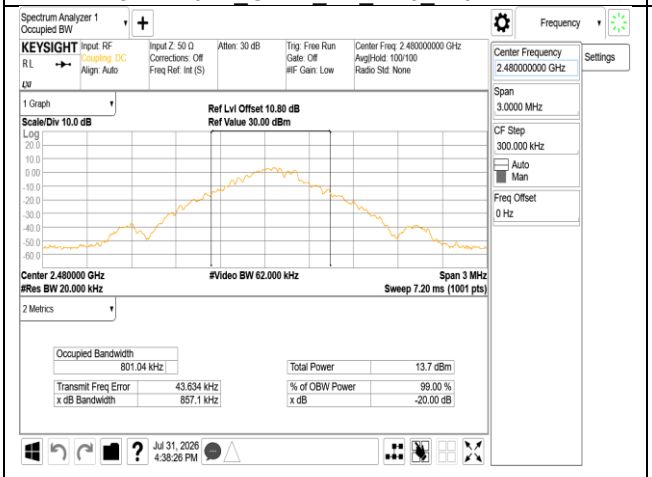
CH	20 dB BW (MHz)	2/3 BW (MHz)
0	1.301	0.87
39	1.302	0.87
78	1.302	0.87



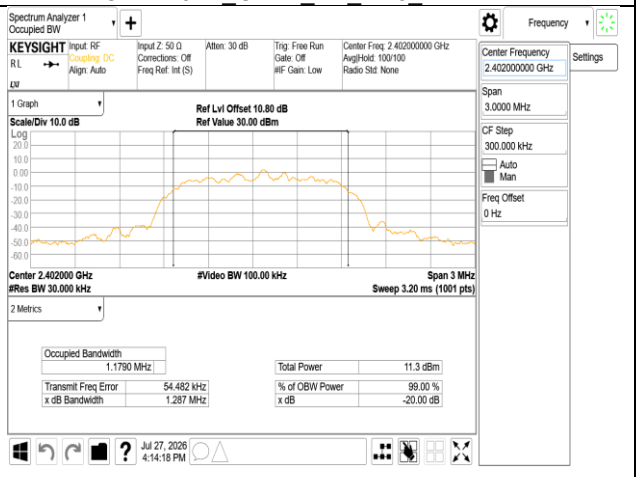
OBW 20dB_GFSK_1M_DH5_2402MHz



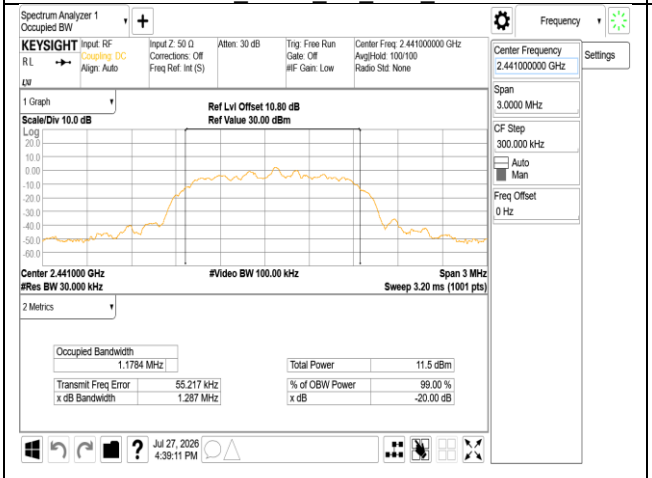
OBW 20dB_GFSK_1M_DH5_2441MHz



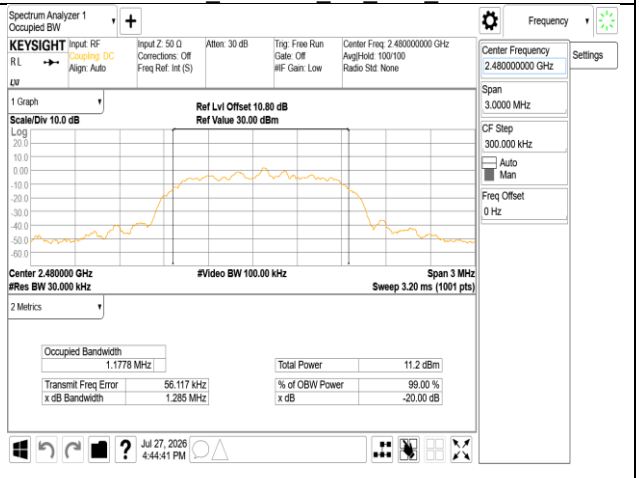
OBW 20dB_GFSK_1M_DH5_2480MHz



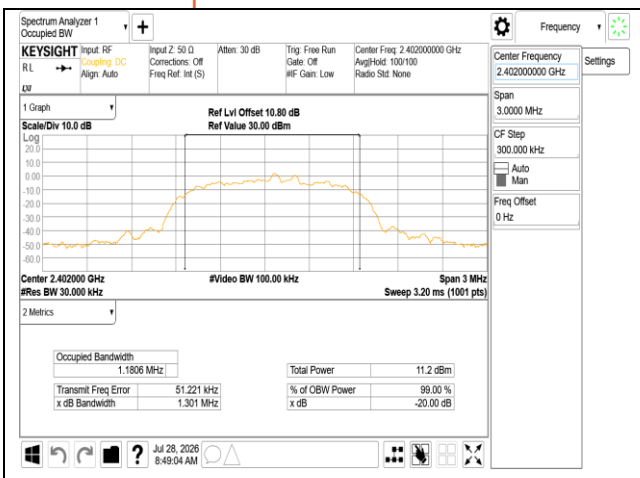
OBW 20dB_4DQPSK_2M_DH5_2402MHz



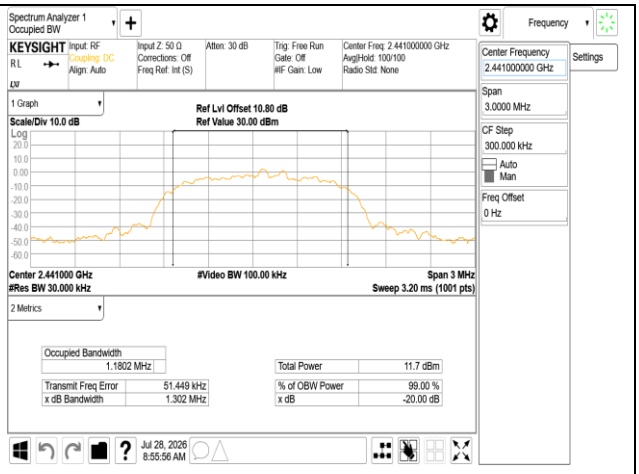
OBW 20dB_4DQPSK_2M_DH5_2441MHz



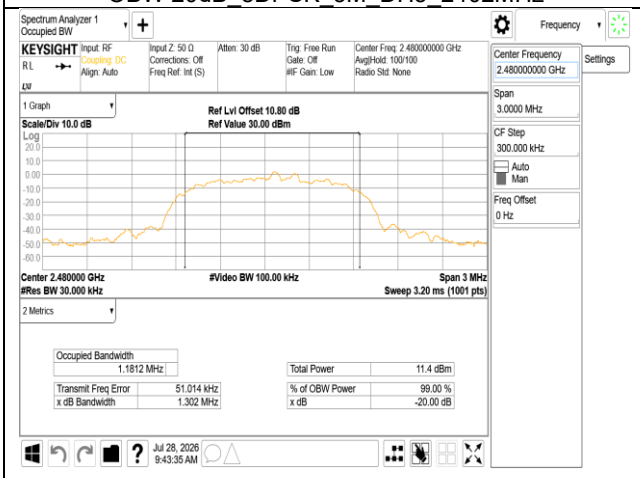
OBW 20dB_4DQPSK_2M_DH5_2480MHz



OBW 20dB_8DPSK_3M_DH5_2402MHz



OBW 20dB_8DPSK_3M_DH5_2441MHz



OBW 20dB_8DPSK_3M_DH5_2480MHz

7.1.2 99% Bandwidth

GFSK_DH5

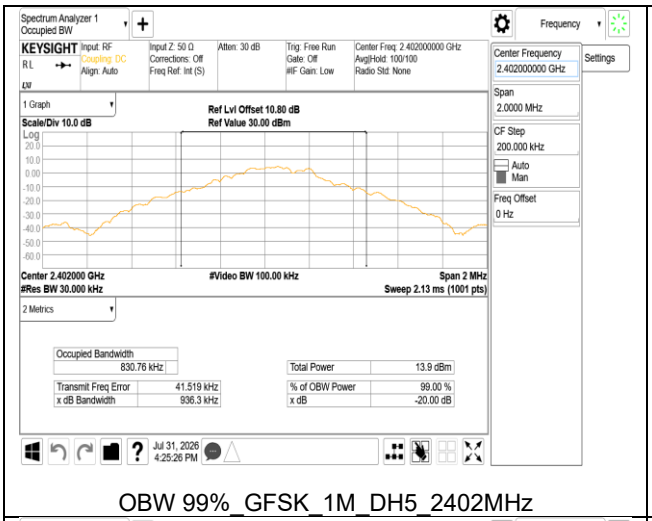
CH	99% BW (MHz)
0	0.83076
39	0.83106
78	0.83016

π/4DQPSK_2DH5

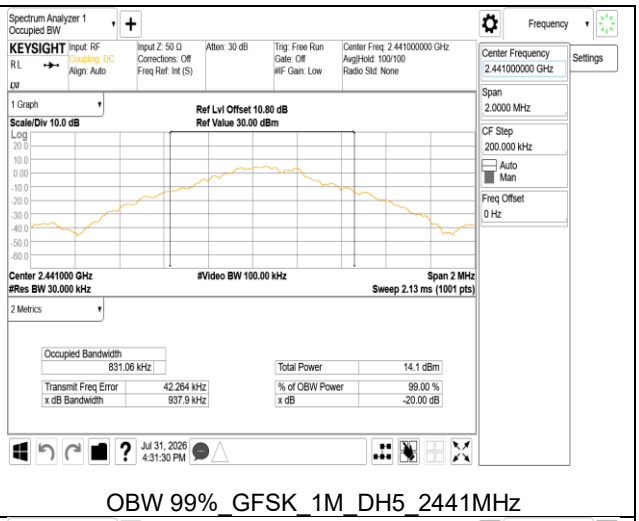
CH	99% BW (MHz)
0	1.1775
39	1.1772
78	1.1778

8DPSK_3DH5

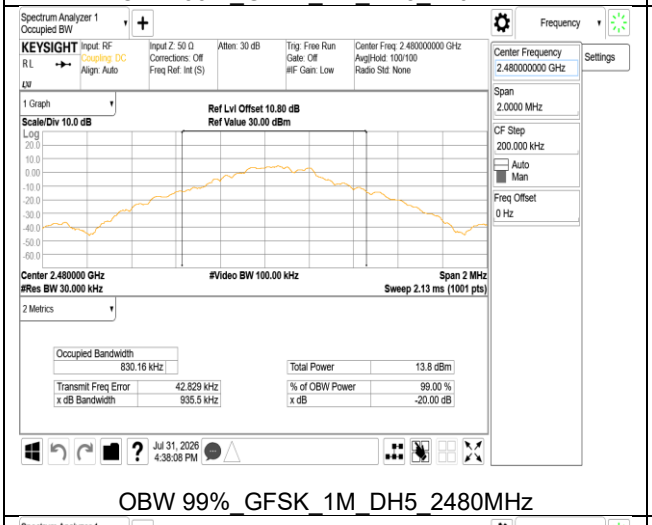
CH	99% BW (MHz)
0	1.1796
39	1.1794
78	1.1803



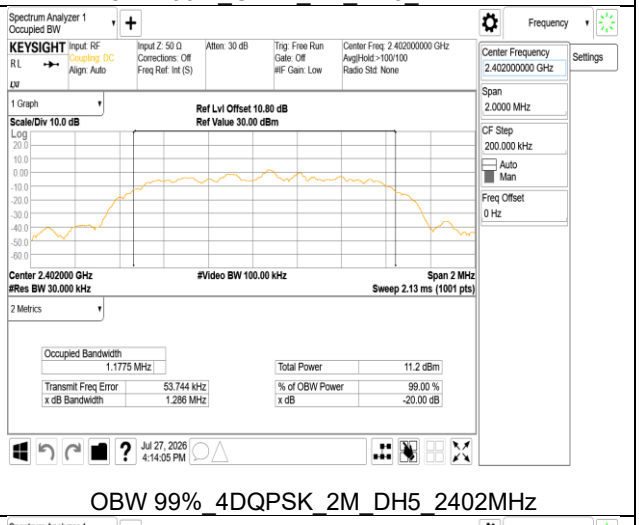
OBW 99%_GFSK_1M_DH5_2402MHz



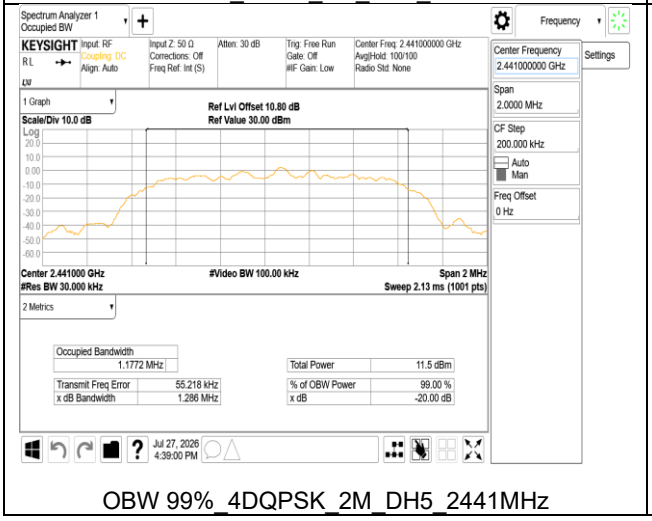
OBW 99%_GFSK_1M_DH5_2441MHz



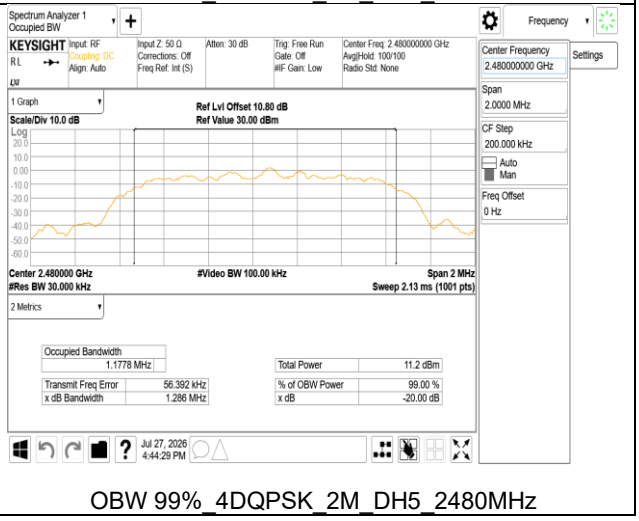
OBW 99%_GFSK_1M_DH5_2480MHz



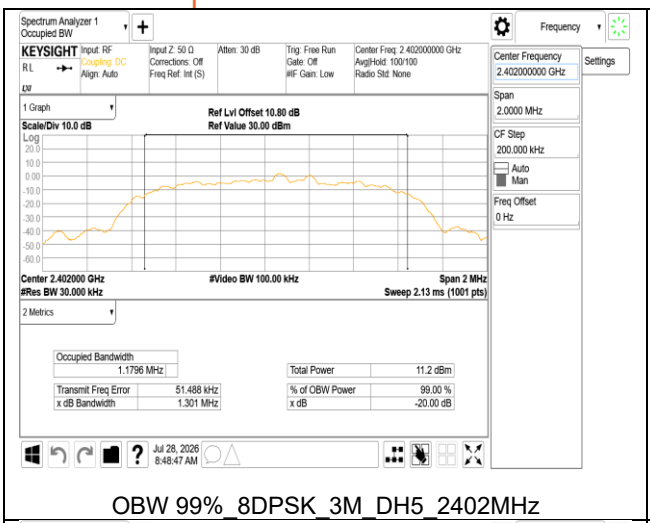
OBW 99%_4DQPSK_2M_DH5_2402MHz



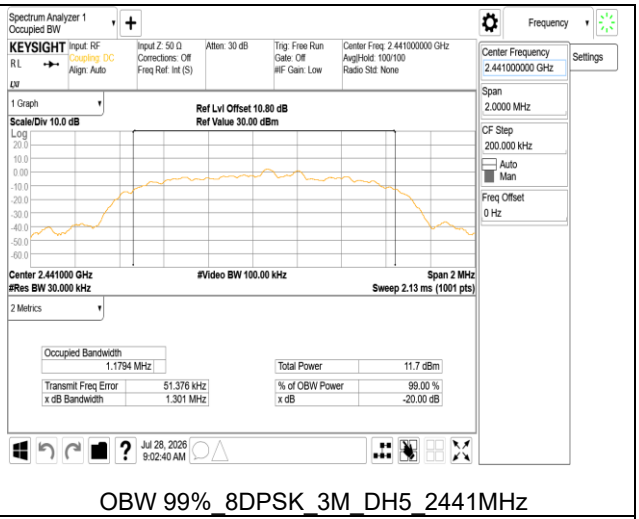
OBW 99%_4DQPSK_2M_DH5_2441MHz



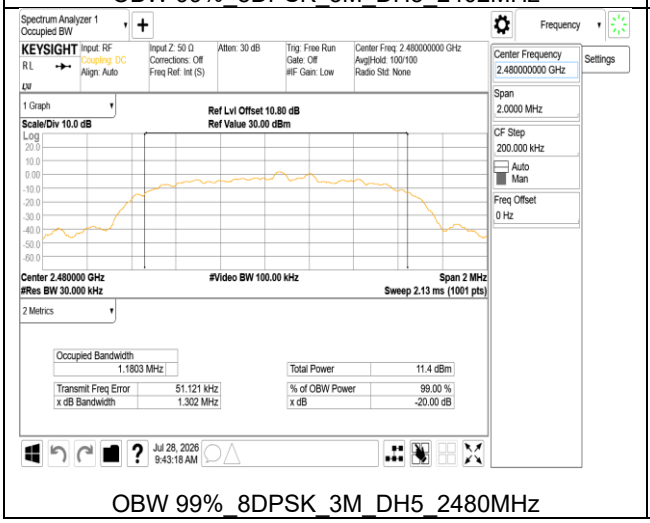
OBW 99%_4DQPSK_2M_DH5_2480MHz



OBW 99%_8DPSK_3M_DH5_2402MHz



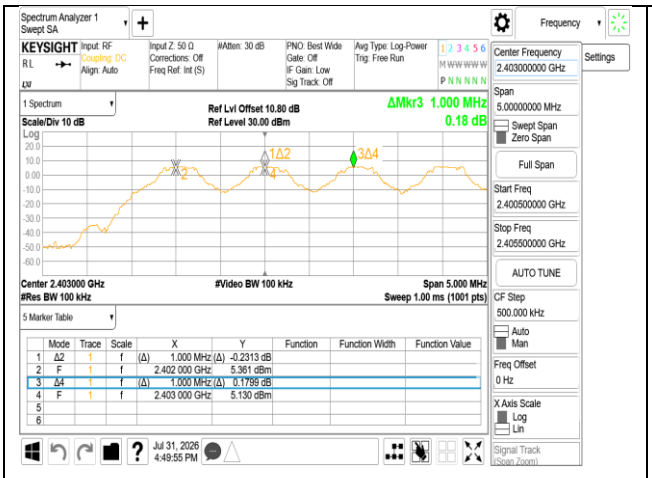
OBW 99%_8DPSK_3M_DH5_2441MHz



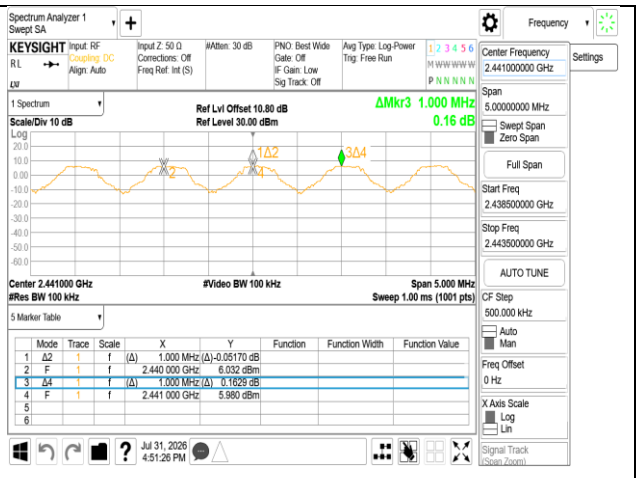
OBW 99%_8DPSK_3M_DH5_2480MHz

7.2 Frequency Separation

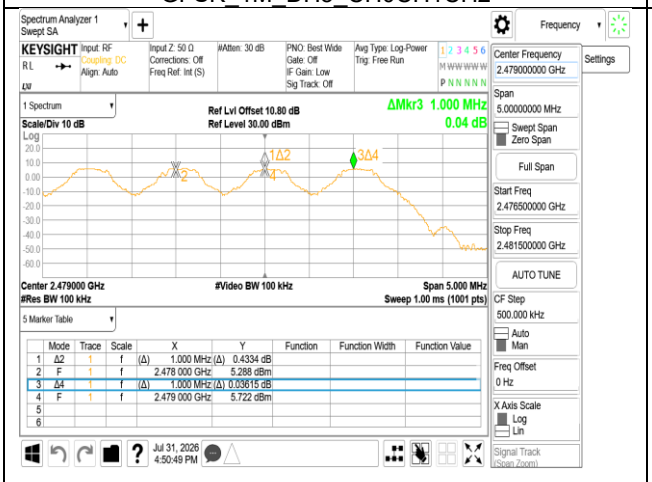
Channel separation (MHz)	Limit	Result
1	≧25 kHz or 2/3 times 20dB bandwidth	PASS



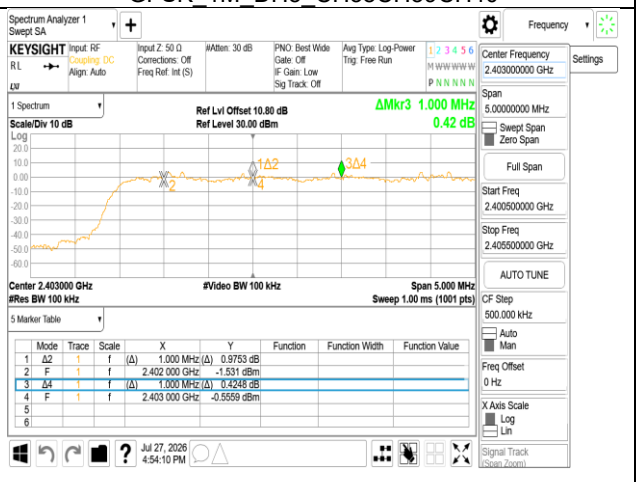
GFSK_1M_DH5_CH0CH1CH2



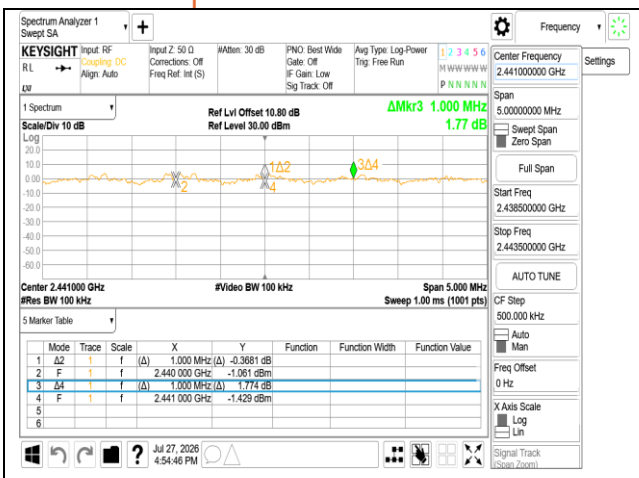
GFSK_1M_DH5_CH38CH39CH40



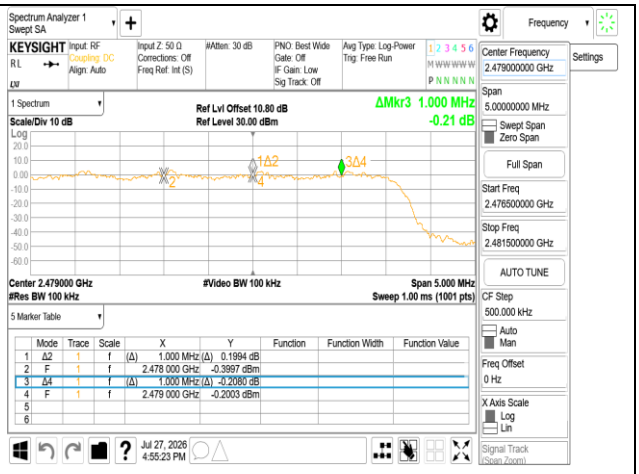
GFSK_1M_DH5_CH76CH77CH78



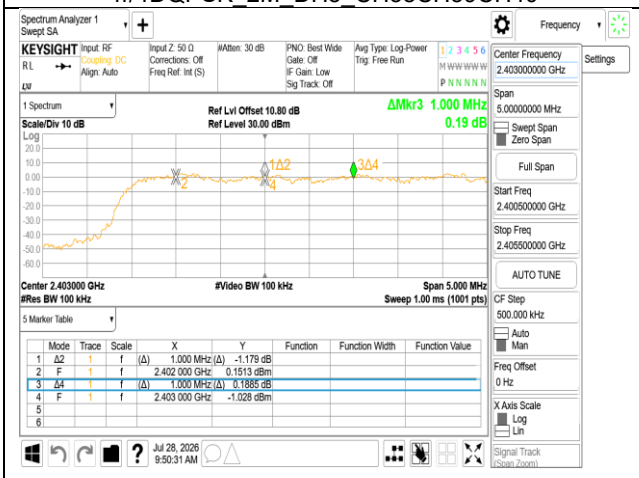
π/4DQPSK_2M_DH5_CH0CH1CH2



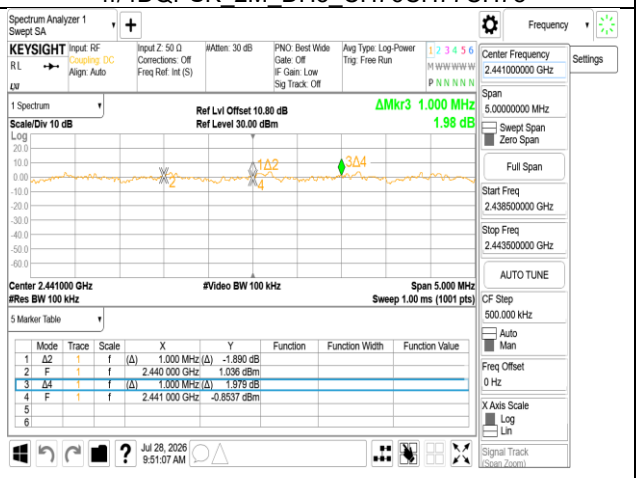
π/4DQPSK_2M_DH5_CH38CH39CH40



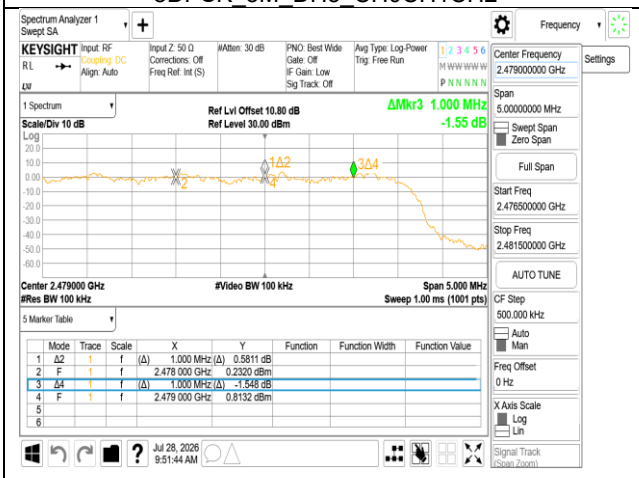
π/4DQPSK_2M_DH5_CH76CH77CH78



8DPSK_3M_DH5_CH0CH1CH2



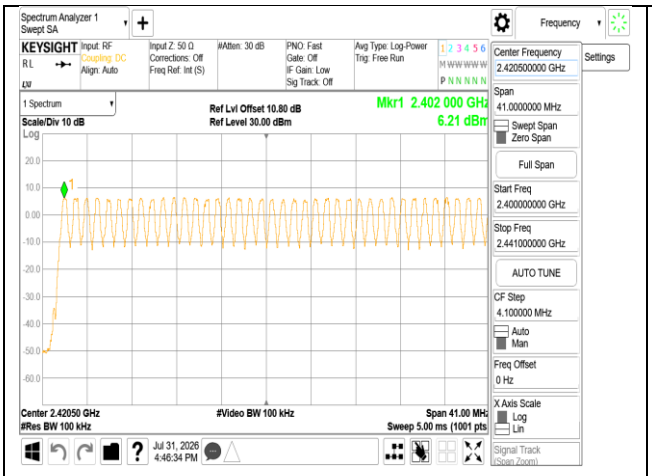
8DPSK_3M_DH5_CH38CH39CH40



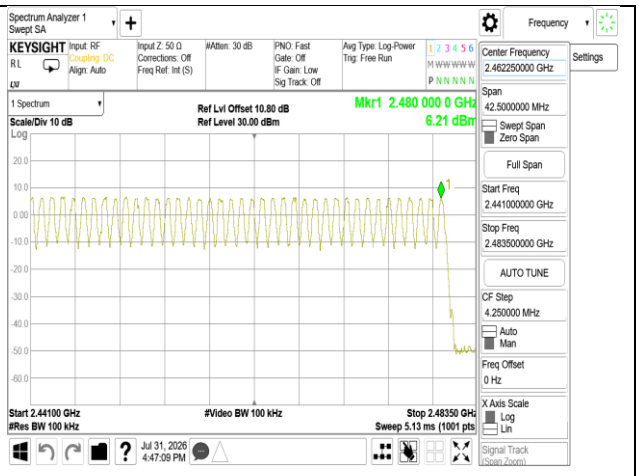
8DPSK_3M_DH5_CH76CH77CH78

7.3 Number Of Hopping Frequency Tabular Data of Total Channel Number

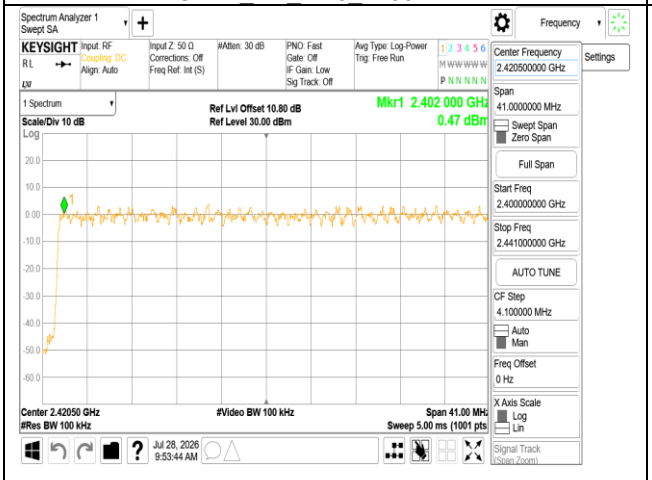
	Channel Number	Limit
2.4 GHz – 2.441 GHz	40	>15
2.441 GHz – 2.4835 GHz	39	>15
2.4 GHz ~2.4835 GHz	(40+39) = 79	>15



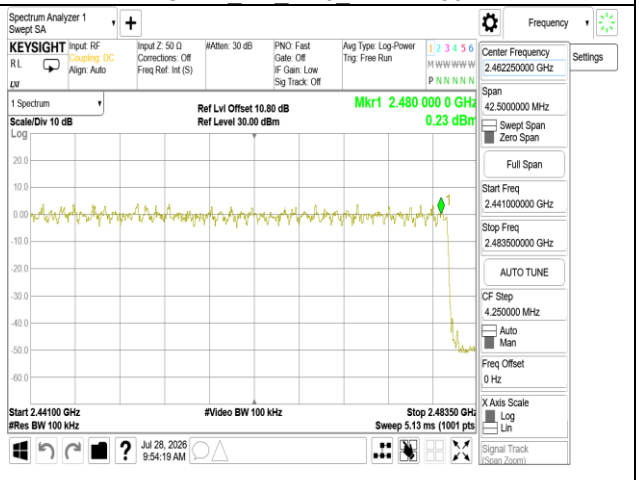
GFSK_1M_DH5_2400-2441



GFSK_1M_DH5_2441-2480



8DPSK_3M_DH5_2400-2441



8DPSK_3M_DH5_2441-2480

7.4 Maximum Output Power

PACKET TYPE	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)
DH5	76.80	1.15
2DH5	77.20	1.12
3DH5	76.80	1.15

1M BR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	7	7.34	5.420	1000
39	2441	7	**7.47**	5.585	1000
78	2480	7	7.31	5.383	1000

1M BR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	7	6.90	4.894	1000
39	2441	7	7.14	5.172	1000
78	2480	7	6.93	4.928	1000

2M EDR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	7	6.46	4.426	125
39	2441	7	**6.62**	4.592	125
78	2480	7	6.41	4.375	125

2M EDR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	7	3.83	2.418	125
39	2441	7	3.90	2.457	125
78	2480	7	3.71	2.352	125

3M EDR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	7	6.88	4.875	125
39	2441	7	**7.07**	5.093	125
78	2480	7	6.86	4.853	125

3M EDR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	7	3.88	2.441	125
39	2441	7	3.97	2.493	125
78	2480	7	3.78	2.386	125

***Note:** Avg. output power has been calculated with duty factor.*

7.4.1 EIRP Measurement Result

1M BR mode EIRP

Channel	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (mW)	Limit (mW)
0	2402	7	6.90	2.87	9.476	4000
39	2441	7	7.14	2.87	10.015	4000
78	2480	7	6.93	2.87	9.542	4000

2M EDR mode EIRP

Channel	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (mW)	Limit (mW)
0	2402	7	3.83	2.87	4.681	4000
39	2441	7	3.90	2.87	4.758	4000
78	2480	7	3.71	2.87	4.554	4000

3M EDR mode EIRP

Channel	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (mW)	Limit (mW)
0	2402	7	3.88	2.87	4.728	4000
39	2441	7	3.97	2.87	4.827	4000
78	2480	7	3.78	2.87	4.620	4000

* ***Note:*** EIRP = Average Power + Gain

7.5 Time Of Occupancy (Dwell Time)

GFSK_DH5

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)
39	DH1	121.60	400
	DH3	262.40	400
	DH5	307.20	400

π/4DQPSK_2DH5

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)
39	2DH1	123.20	400
	2DH3	262.40	400
	2DH5	308.80	400

8DPSK_3DH5

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)
39	3DH1	123.20	400
	3DH3	262.40	400
	3DH5	307.20	400

GFSK (1Mbps):

CH Mid	DH1 time slot	=	0.380	*	(1600/2/79)	*	31.6	=	121.60 (ms)
	DH3 time slot	=	1.640	*	(1600/4/79)	*	31.6	=	262.40 (ms)
	DH5 time slot	=	2.880	*	(1600/6/79)	*	31.6	=	307.20 (ms)

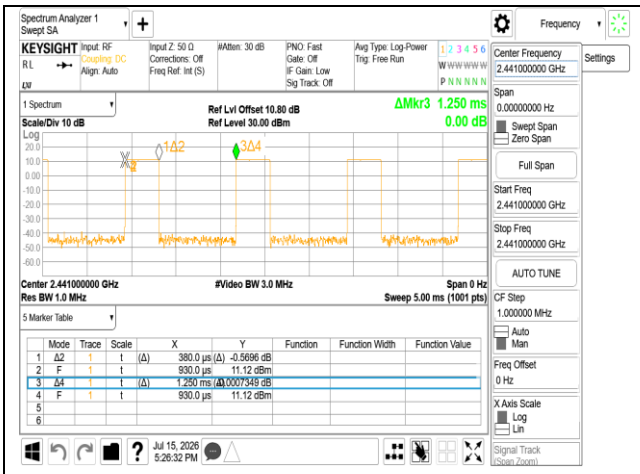
π/4 -DQPSK (2Mbps):

CH Mid	2DH1 time slot	=	0.385	*	(1600/2/79)	*	31.6	=	123.20 (ms)
	2DH3 time slot	=	1.640	*	(1600/4/79)	*	31.6	=	262.40 (ms)
	2DH5 time slot	=	2.895	*	(1600/6/79)	*	31.6	=	308.80 (ms)

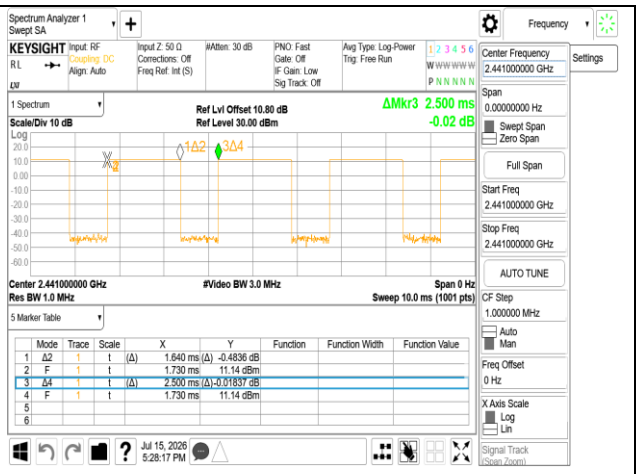
8-DPSK (3Mbps):

CH Mid	3DH1 time slot	=	0.385	*	(1600/2/79)	*	31.6	=	123.20 (ms)
	3DH3 time slot	=	1.640	*	(1600/4/79)	*	31.6	=	262.40 (ms)
	3DH5 time slot	=	2.880	*	(1600/6/79)	*	31.6	=	307.20 (ms)

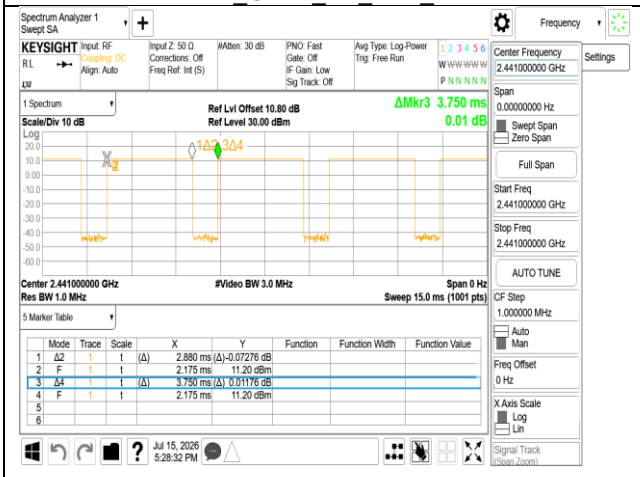
A period time = 0.4 (s) * 79 = 31.6 (s)



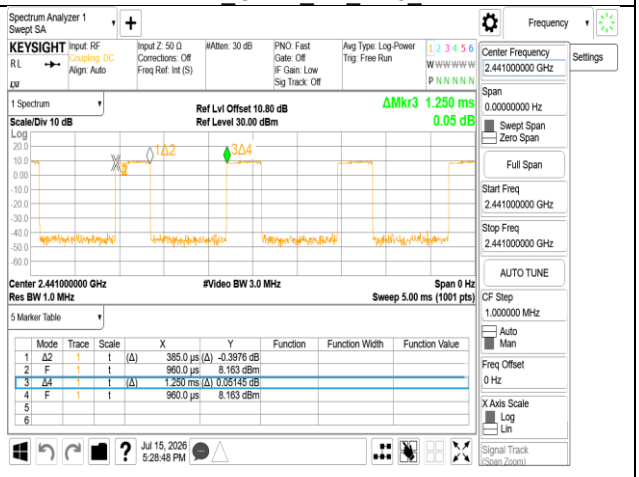
Dwell Time_GFSK_1M_DH1_2441MHz



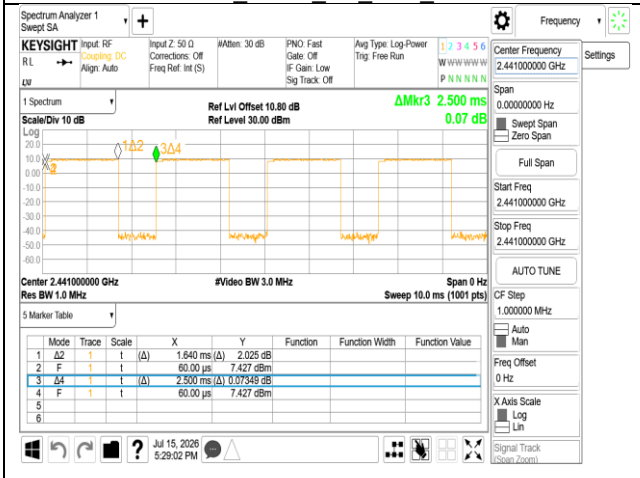
Dwell Time_GFSK_1M_DH3_2441MHz



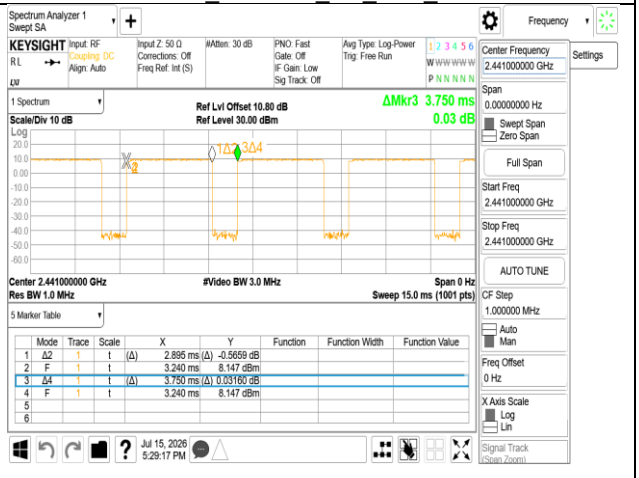
Dwell Time_GFSK_1M_DH5_2441MHz



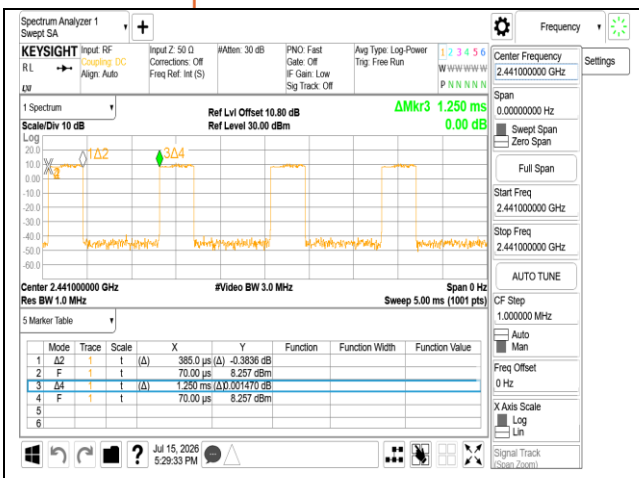
Dwell Time_4DQPSK_2M_DH1_2441MHz



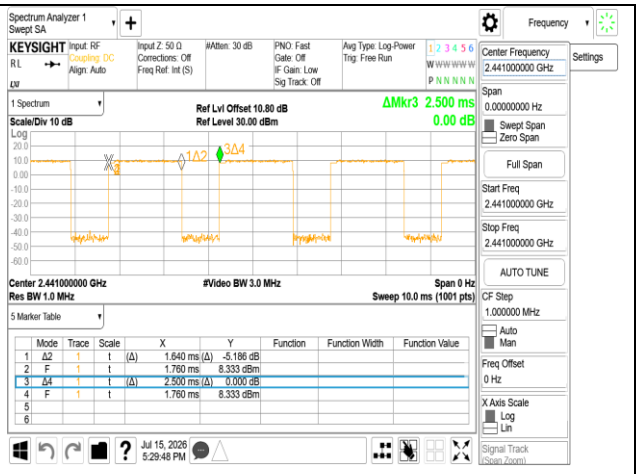
Dwell Time_4DQPSK_2M_DH3_2441MHz



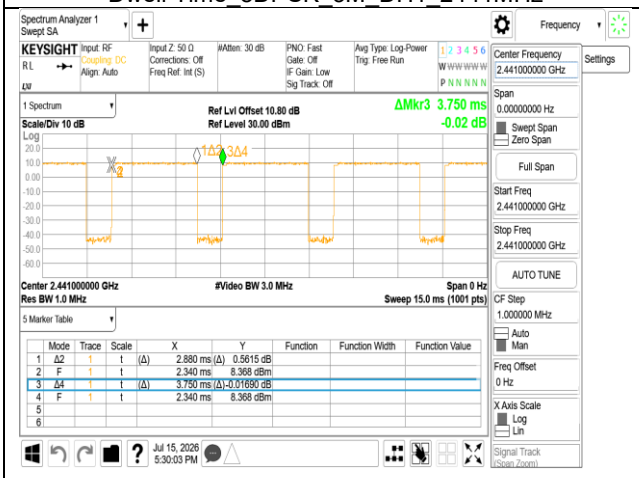
Dwell Time_4DQPSK_2M_DH5_2441MHz



Dwell Time_8DPSK_3M_DH1_2441MHz

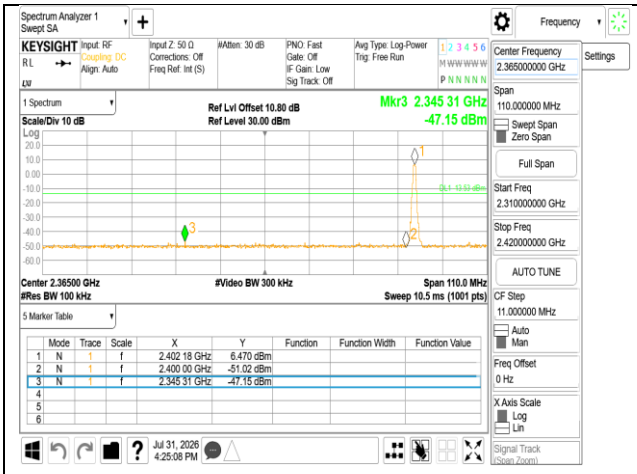


Dwell Time_8DPSK_3M_DH3_2441MHz

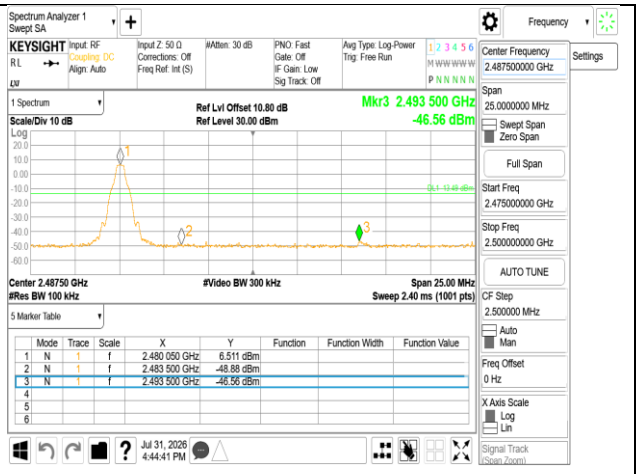


Dwell Time_8DPSK_3M_DH5_2441MHz

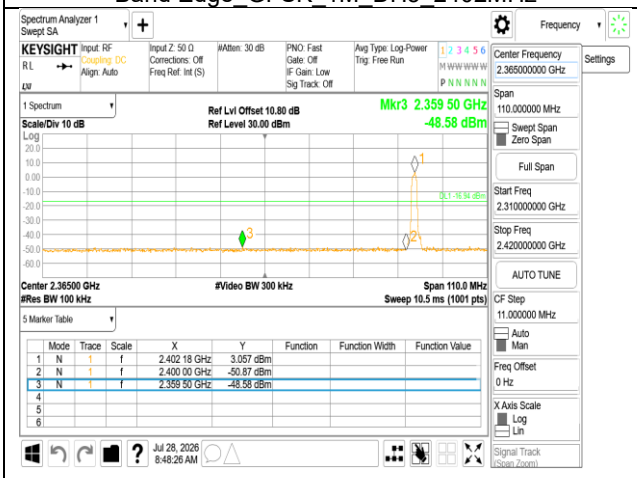
7.6 Out of Band Emission



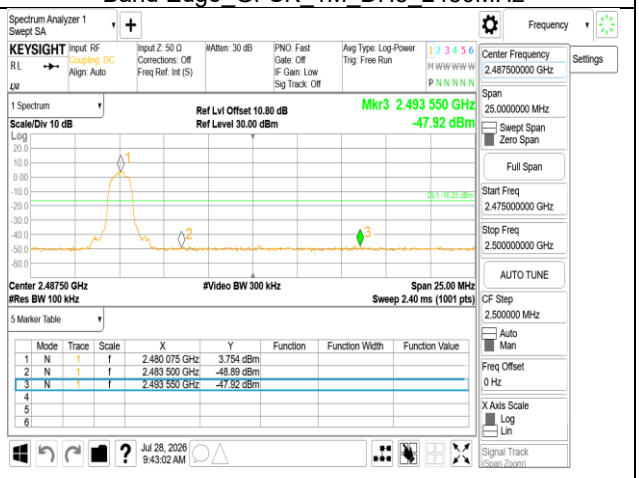
Band Edge_GFSK_1M_DH5_2402MHz



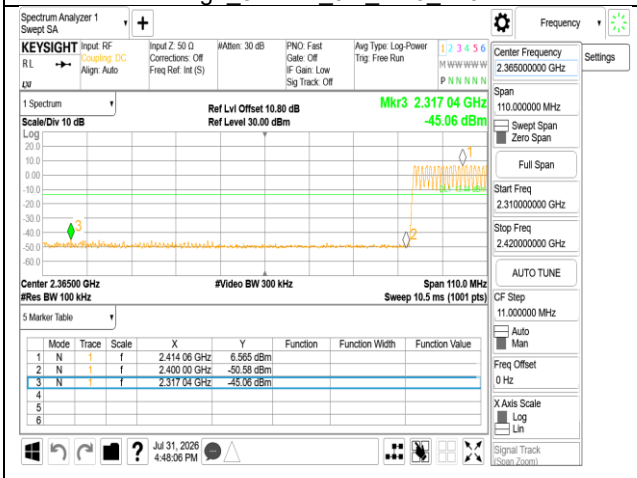
Band Edge_GFSK_1M_DH5_2480MHz



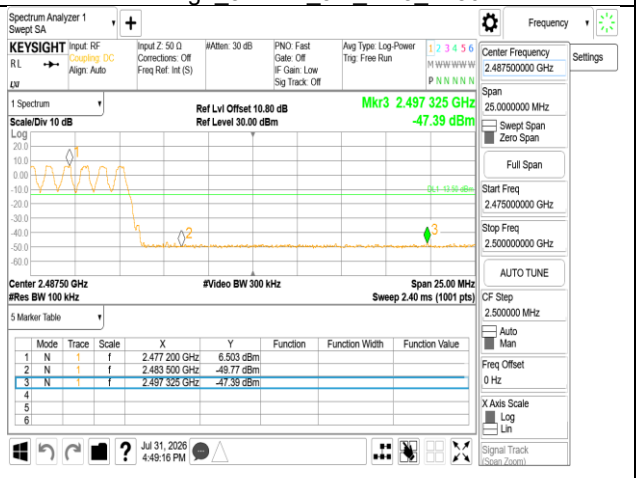
Band Edge_8DPSK_3M_DH5_2402MHz



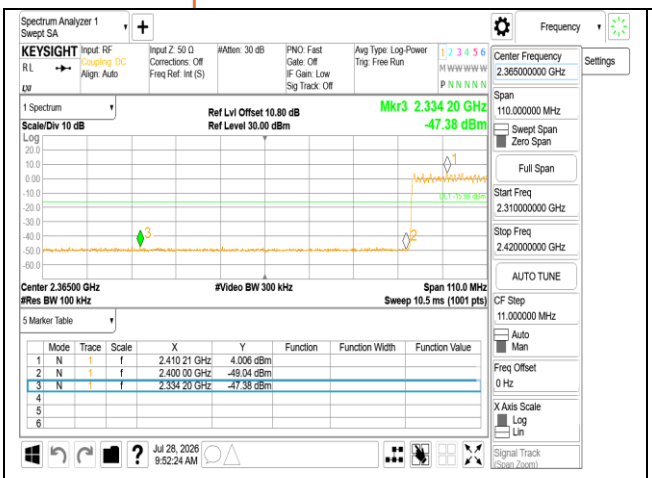
Band Edge_8DPSK_3M_DH5_2480MHz



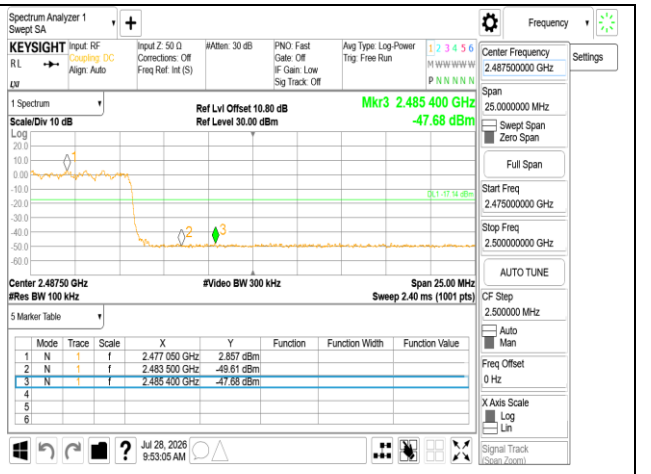
Hopping Band Edge_GFSK_1M_DH5_2402MHz



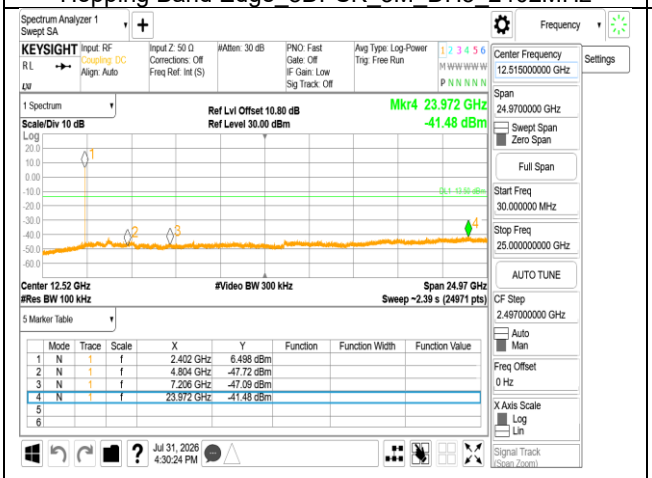
Hopping Band Edge_GFSK_1M_DH5_2480MHz



Hopping Band Edge_8DPSK_3M_DH5_2402MHz

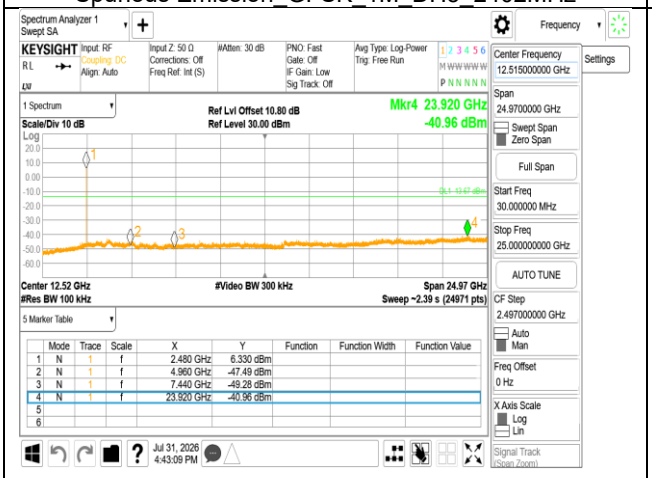


Hopping Band Edge_8DPSK_3M_DH5_2480MHz



Spurious Emission_GFSK_1M_DH5_2402MHz

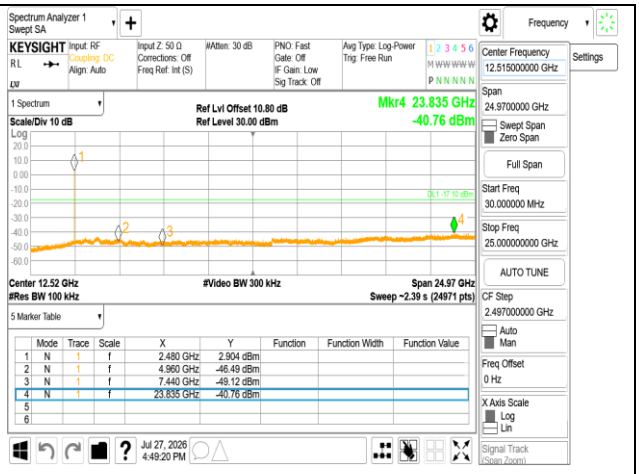
Spurious Emission_GFSK_1M_DH5_2441MHz



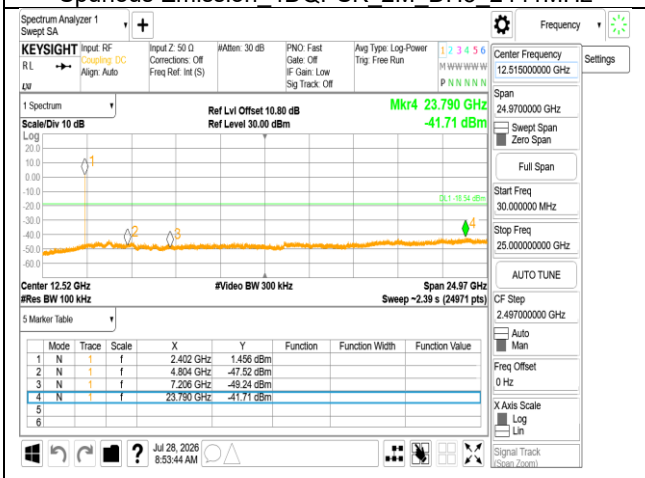
Spurious Emission_GFSK_1M_DH5_2480MHz

Spurious Emission_4DQPSK_2M_DH5_2402MHz

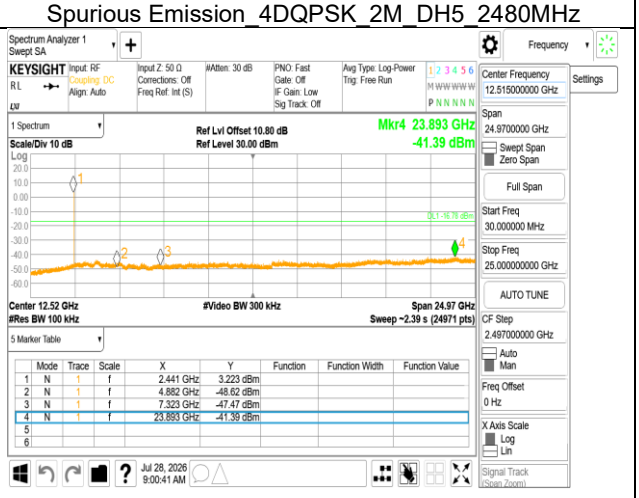
Spurious Emission_4DQPSK_2M_DH5_2441MHz



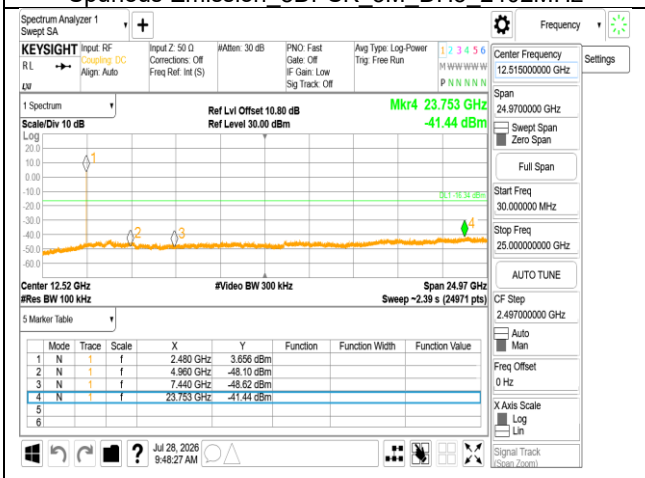
Spurious Emission_4DQPSK_2M_DH5_2480MHz



Spurious Emission_8DPSK_3M_DH5_2402MHz



Spurious Emission_8DPSK_3M_DH5_2441MHz



Spurious Emission_8DPSK_3M_DH5_2480MHz