

TEST REPORT

Report Number: 15107858-E7V3

Applicant : Google LLC
1600 Amphitheatre Parkway
Mountain View, CA 94043 U.S.A.

Model : GGX8B

FCC ID : A4RGGX8B

EUT Description : Phone

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C

Date Of Issue:

2024-05-03

Prepared by:

UL VERIFICATION SERVICES

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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024-04-16	Initial Issue	---
V2	2024-04-25	Revised Section 6.2, 6.3, 8, 9.2.2, 9.2.6, 9.4.5, 9.3.2 to address TCB's questions	Tina Chu
V3	2024-05-03	Revised Section 6.3, 9.4.6 to address TCB's questions	Tina Chu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Google LLC
 1600 Amphitheatre Parkway
 Mountain View, CA 94043 U.S.A.

EUT DESCRIPTION: Phone

MODEL NUMBER: GGX8B

SERIAL NUMBER: 41051FDAS00083 (Radiated)
 41121FDAS00098 (Conducted)

SAMPLE RECEIPT DATE: 2024-01-18

DATE TESTED: 2024-01-31 to 2024-04-27

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document.

Approved & Released For
UL Verification Services Inc. By:



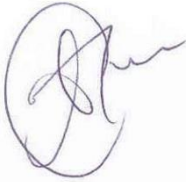
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2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for correctly integrating customer-provided data with measurements performed by UL Verification Services Inc.

Below is a list of the data provided by the customer:

- 1) Antenna gain and type (see section 6.3)

FCC Clause	Requirement	Result	Comment
See Comment	Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6.
-	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.3.
15.247 (a) (2)	6dB BW	Complies	None.
15.247 (b) (3)	Output Power	Complies	None.
See Comment	Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	PSD	Complies	None.
15.247 (d)	Conducted Spurious Emissions	Complies	None.
15.209, 15.205	Radiated Emissions	Complies	None.
15.207	AC Mains Conducted Emissions	Complies	None.

3. TEST METHODOLOGY

- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- ANSI C63.10-2013
- KDB 558074 D01 15.247 Meas Guidance
- KDB 662911 Measurement of Transmitters with Multiple Output, MIMO
- KDB 414788 D01 Radiated Test Site

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
<input type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
<input type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
<input type="checkbox"/>	Building 3: 843 Auburn Court, Fremont, CA 94538, USA			
<input checked="" type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
<input checked="" type="checkbox"/>	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
RF Power Measurement Direct Method Using Power Meter	1.3 dB (PK) / 0.45 dB (AV)
Unwanted Emissions, Conducted	1.94 dB
Power Spectral Density	2.466 dB
Worst Case Conducted Disturbance, 9kHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9kHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB
Time Domain Measurements	3.39%
Temperature	0.57°C
Humidity	3.39%
DC Supply Voltages	0.57%

Uncertainty figures are valid to a confidence level of 95%.

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a phone.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	BT DQPSK TXBF	21.89	154.53
	BT 8PSK TXBF	21.84	152.76
2402 - 2480	BLE TXBF 1Mbps	21.86	153.46
2404 - 2478	BLE TXBF 2Mbps	22.03	159.59
2404 - 2478	BLE 1Mbps GFSK, MODE 0 (CHANNEL SOUNDING)	19.88	97.27
	BLE 2Mbps GFSK, MODE 0 (CHANNEL SOUNDING)	20.00	100.00

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type as provided by the manufacturer' are as follows:

The radio utilizes one IFA antenna (Ant3) and one ILA antenna (Ant4) for unlicensed radios.

Band	Antenna Peak Gain	
	Tx0 (Ant3) (dBi)	Tx1 (Ant4) (dBi)
2.4G	-3.30	-0.50

6.4. WORST-CASE CONFIGURATION AND MODE

BT DQPSK/8PSK and BLE 1Mbps/2Mbps supports SISO diversity antennas and MIMO beamforming. Beamforming is chosen as worse case to cover SISO diversity antennas.

BLE Channel Sounding, mode 0 GFSK modulated 1Mbps/2Mbps only supports SISO diversity antennas.

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. There were no emissions found with less than 20dB of margin from 9kHz to 30MHz and above 18GHz.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle, and high channels.

Investigation was performed with/without adapter. Also, the fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, the following is the worst-case orientation:

- For 2Tx BT DQPSK/8PSK/BLE 1Mbps/2Mbps: X (Flatbed) orientation was worst-case orientation with adapter
- For BLE channel sounding:
 - Tx0: X (Flatbed) orientation was worst-case orientation with adapter
 - Tx1: Y (Landscape) orientation was worst case orientation with adapter

Worst-case data rates as provided by the client were:

DQPSK mode: 2-DH5

8PSK mode : 3-DH5

BLE 1Mbps: 1Mbps

BLE 2Mbps: 2Mbps

BLE 1Mbps GFSK, MODE 0 (CHANNEL SOUNDING): 1Mbps

BLE 2Mbps GFSK, MODE 0 (CHANNEL SOUNDING): 2Mbps

Plots included in the report are representative of the method and settings parameters used for the test.

7. MEASUREMENT METHOD

Test Item	Test Method
On Time and Duty Cycle	ANSI C63.10 Section 11.6
6 dB BW	ANSI C63.10 Subclause -11.8.1 RBW \geq DTS BW
99% BW	ANSI C63.10-2013, Subclause 6.9.3.
Output Power	ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)
PSD	ANSI C63.10 Subclause -11.10.3 Method AVGPSD-1
Radiated emissions non-restricted frequency bands	ANSI C63.10 Subclause -11.11 & Clause 13
Radiated emissions restricted frequency bands	ANSI C63.10 Subclause -11.12.1 & Clause 13
Conducted emissions in restricted frequency bands	ANSI C63.10 Subclause -11.12.2
Band-edge	ANSI C63.10 Subclause -11.13.3.2 & Clause 13: Integration method -Peak detection
Band-edge	ANSI C63.10 Subclause -11.13.3.4 & Clause 13: Integration method -Trace averaging across ON and OFF times DC correction
Radiated Spurious Emissions Below 30MHz	ANSI C63.10-2013 Subclause 6.4 & Clause 13
AC Power Line Conducted Emissions	ANSI C63.10-2013, Subclause 6.2

8. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO METRICS	EM-6871	219908	2024-09-30	2023-09-13
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	219910	2024-05-31	2023-05-31
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB1	80293	2024-04-30	2023-04-11
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	213877	2024-12-31	2023-12-27
Antenna, Horn 1-18GHz (Chamber T)	ETS-Lindgren	3117	80430	2024-08-31	2022-08-08
Antenna, Horn 1-18GHz (Chamber J)	ETS-Lindgren	3117	222741	2024-08-31	2022-08-22
RF Filter Box, 1-18GHz (Chamber T)	UL-FR1	RATS 2	226781	2024-09-30	2023-09-30
RF Filter Box, 1-18GHz (Chamber J)	UL-FR1	NA	171875	2024-05-31	2023-05-30
EMI TEST RECEIVER (Chamber T)	Rohde & Schwarz	ESW44	169935	2025-02-28	2024-02-11
EMI TEST RECEIVER (Chamber J)	Rohde & Schwarz	ESW44	171875	2024-05-31	2023-05-30
Antenna, Horn 18 to 26.5GHz	A.R.A.	MWH-1826/B	199659	2024-12-31	2022-12-06
Amplifier 18-26.5GHz, +5Vdc, -54dBm P1dB	AMPLICAL	AMP18G26.5-60	234683	*2024-03-31	2023-03-18
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030B	222074	2024-08-31	2023-08-14
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030B	222073	2024-08-31	2023-08-14
10dB Fixed Attenuator, up to 26GHz	Pasternack Enterprises	PE7087-10	236189	Verified/characterized before use	
Power Meter, P-series single channel	Keysight Technologies Inc	N1921A	90731	2025-01-31	2024-01-25
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1911A	90388	2024-06-30	2023-06-23
AC Line Conducted					
LISN	Fischer Custom Communications, Inc	FCC-LISN-50/250-25-2-01-480V	175765	2025-01-31	2024-01-26
EMI TEST RECEIVER	Rohde & Schwarz	ESR	171646	2025-02-28	2024-02-27
Transient Limiter	TE	TBFL1	127455	2025-02-28	2024-02-27
UL TEST SOFTWARE LIST					
Radiated Software	UL	UL EMC	Ver 2023-01-18, 2023-03-03, 2023-05-01		
Antenna Port Software	UL	UL RF	Ver 2022-08-16		
AC Line Conducted Software	UL	UL EMC	Rev 9.5, 2022-02-17		

*Test was performed before calibration due date

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

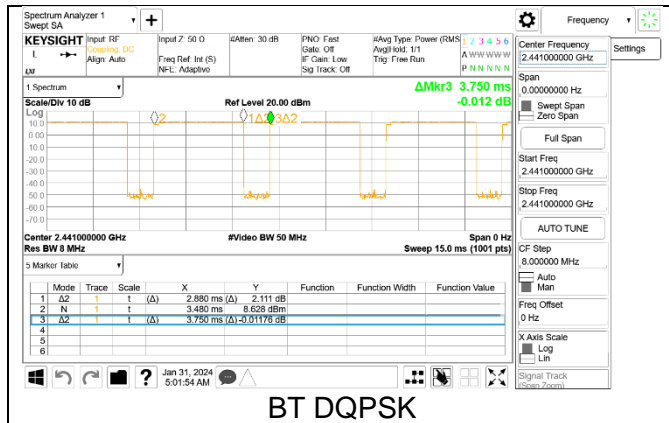
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Test Engineer: 32933 LM

Mode	ON Time T (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	DCCF (dB)	1/T Minimum VBW (kHz)
BT DQPSK	2.88	3.75	0.77	76.80	1.15	0.35
BT 8PSK	2.88	3.75	0.77	76.80	1.15	0.35
BLE 1Mbps	0.376	0.624	0.60	60.26	2.20	2.66
BLE 2Mbps	1.065	1.875	0.57	56.80	2.46	0.94
BLE 1Mbps (channel sounding, GFSK modulated)	0.043543	0.288937	0.15	15.07	8.22	22.97
BLE 2Mbps (channel sounding, GFSK modulated)	0.025725	0.252217	0.10	10.20	9.91	38.87



9.2. 6dB AND 99% BANDWIDTH

99% BANDWIDTH LIMITS

None; for reporting purposes only.

6dB BANDWIDTH LIMITS

FCC §15.247 (a) (2)

The minimum 6 dB bandwidth shall be at least 500 kHz.

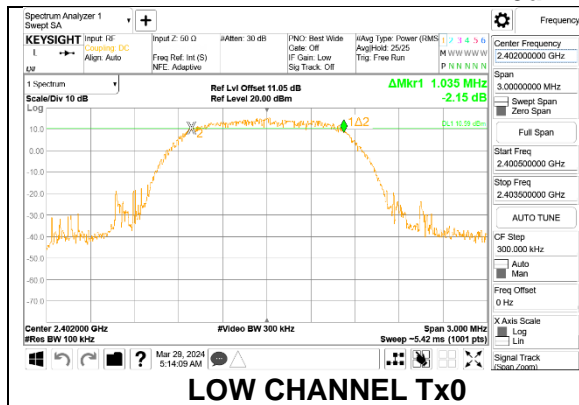
RESULTS

Test Engineer:	BN 24971
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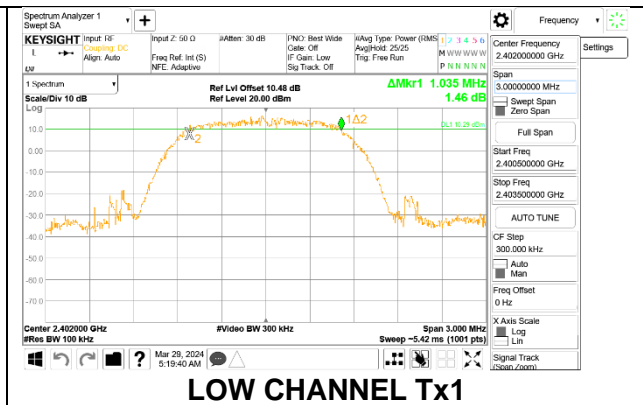
9.2.1. BT DQPSK TXBF

No. of Tx	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Tx0	Tx1	Tx0	Tx1
2	Low	2402	1.035	1.035	1.2112	1.2045
	Mid	2441	1.065	1.077	1.2077	1.2041
	High	2480	1.023	1.005	1.2094	1.2069

6dB BANDWIDTH

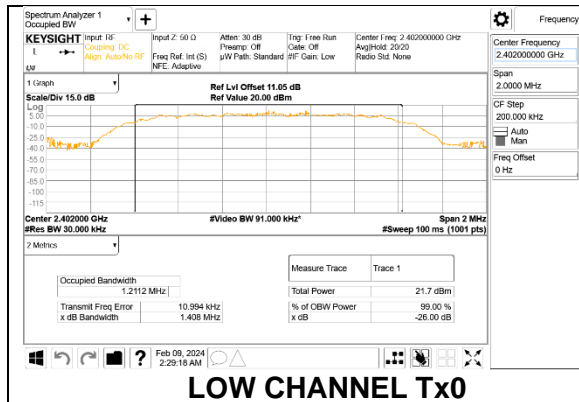


LOW CHANNEL Tx0

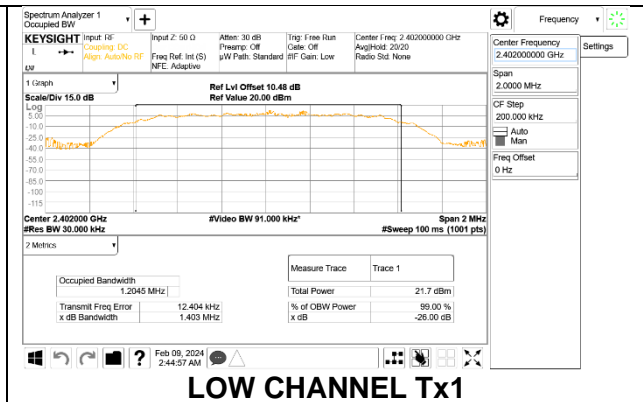


LOW CHANNEL Tx1

99% BANDWIDTH



LOW CHANNEL Tx0

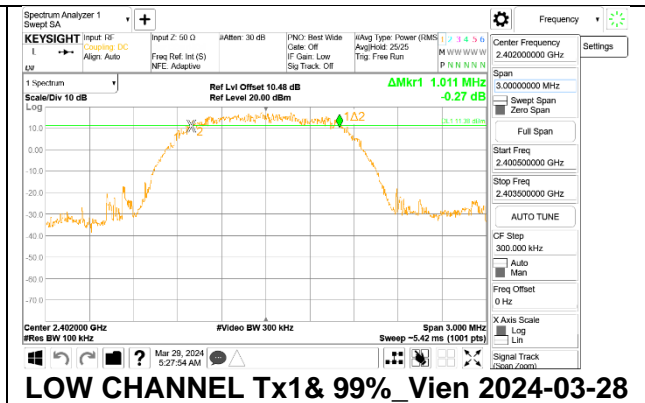
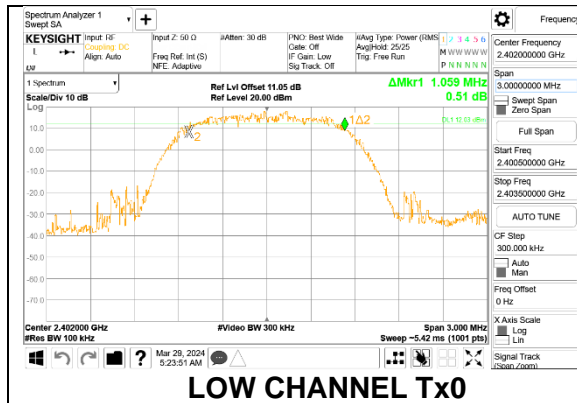


LOW CHANNEL Tx1

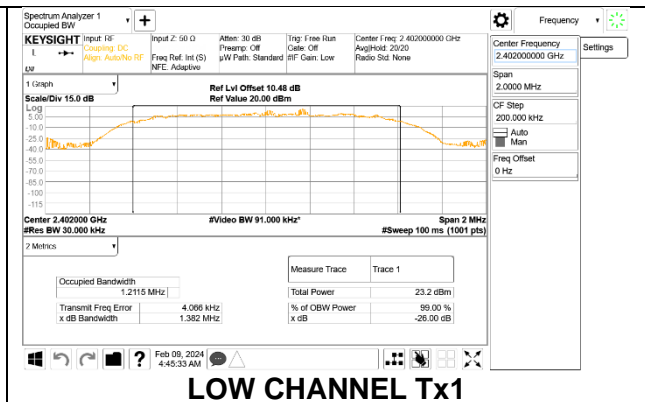
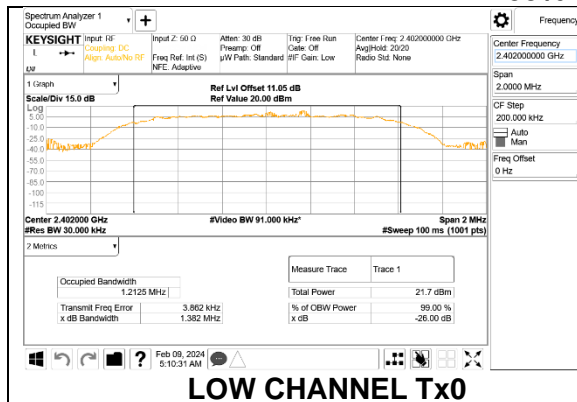
9.2.2. BT 8PSK TXBF

No. of Tx	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Tx0	Tx1	Tx0	Tx1
2	Low	2402	1.059	1.011	1.2125	1.2115
	Mid	2441	1.014	1.017	1.2146	1.2139
	High	2480	1.071	1.005	1.2148	1.2128

6dB BANDWIDTH



99% BANDWIDTH

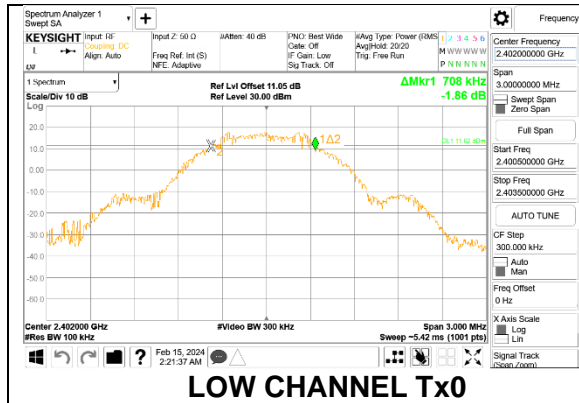


9.2.3. BLE TXBF 1Mbps

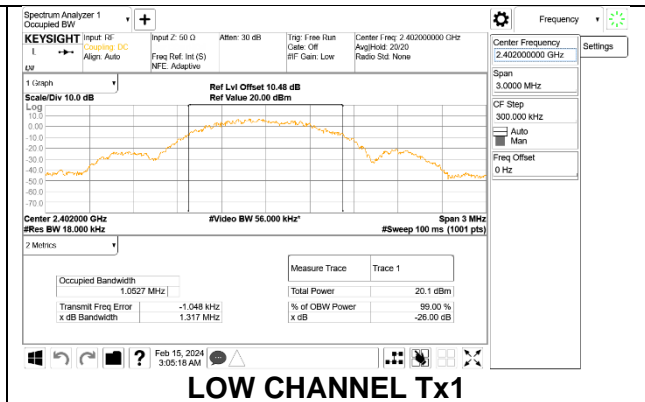
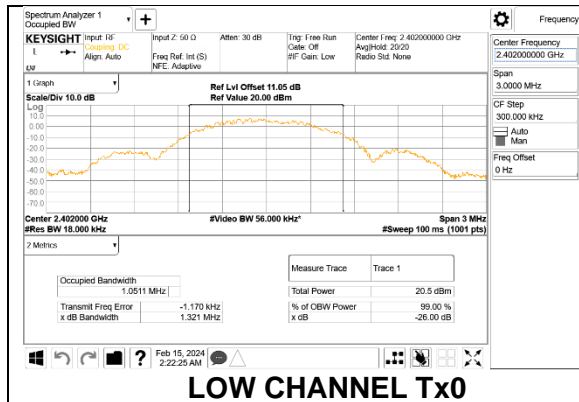
2Tx

No. of Tx	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Tx0	Tx1	Tx0	Tx1
2	1	2402	.708	.717	1.0511	1.0527
2	19	2440	.711	.717	1.0512	1.0503
2	39	2480	.702	.714	1.0524	1.0524

6dB BANDWIDTH



99% BANDWIDTH

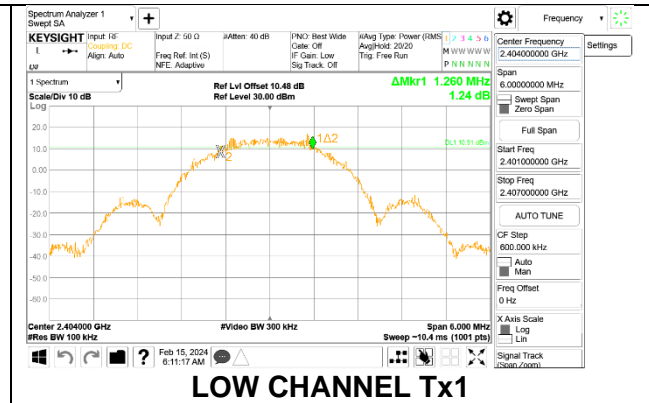
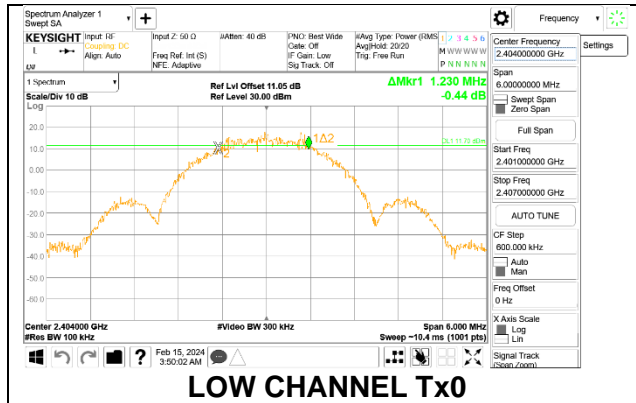


9.2.4. BLE TXBF 2Mbps

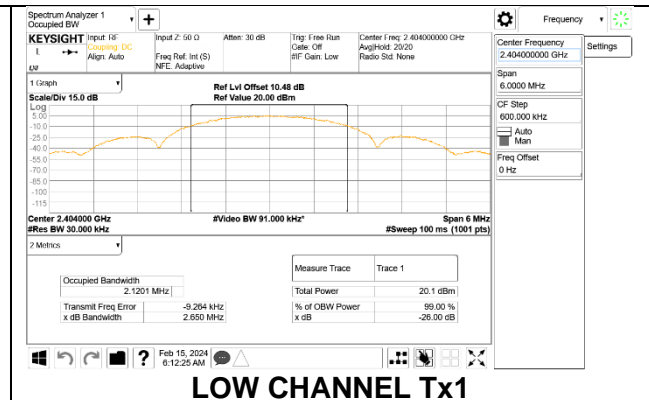
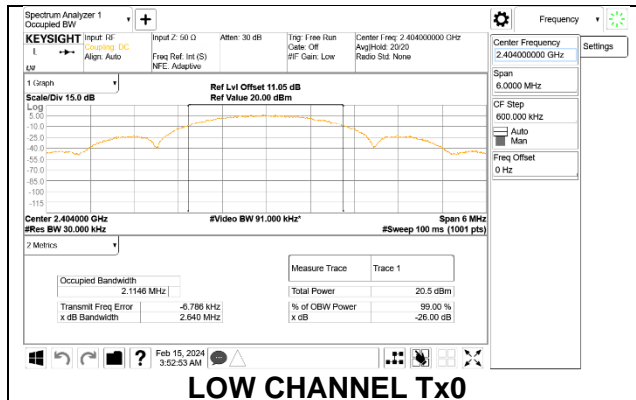
2Tx

No. of Tx	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Tx0	Tx1	Tx0	Tx1
2	Low	2404	1.230	1.260	2.1146	2.1201
	Mid	2440	1.248	1.254	2.1192	2.1189
	High	2478	1.236	1.236	2.1221	2.1188

6dB BANDWIDTH



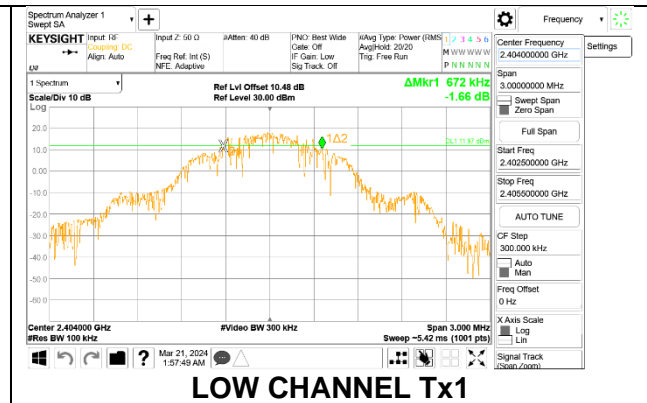
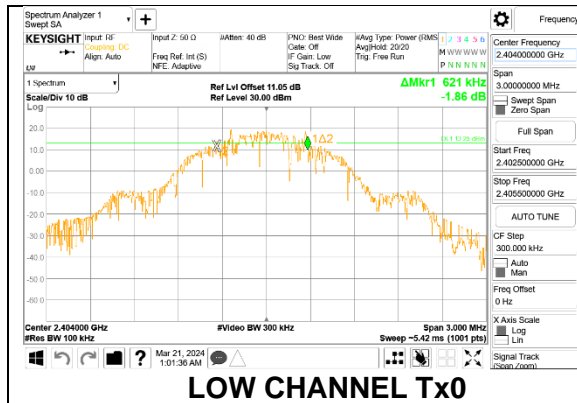
99% BANDWIDTH



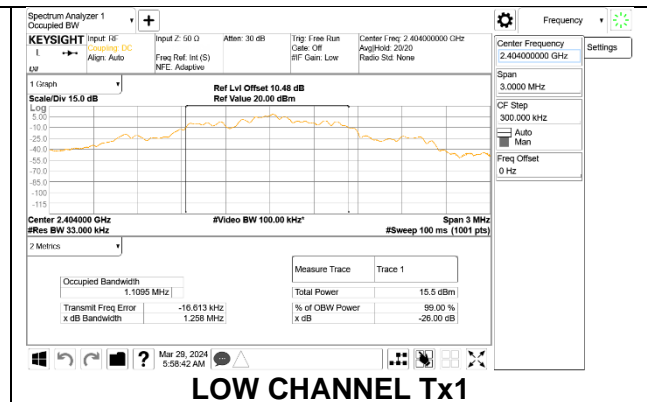
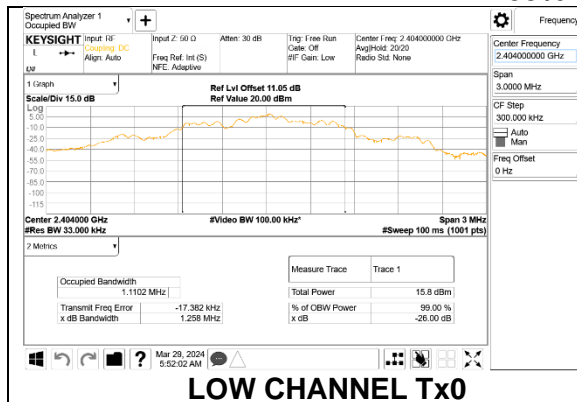
9.2.5. BLE 1Mbps GFSK, MODE 0 (CHANNEL SOUNDING)

No. of Tx	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Tx0	Tx1	Tx0	Tx1
1	Low	2404	0.621	0.672	1.1102	1.1095
	Mid	2440	0.687	0.606	1.1104	1.1095
	High	2478	0.702	0.633	1.1097	1.1106

6dB BANDWIDTH



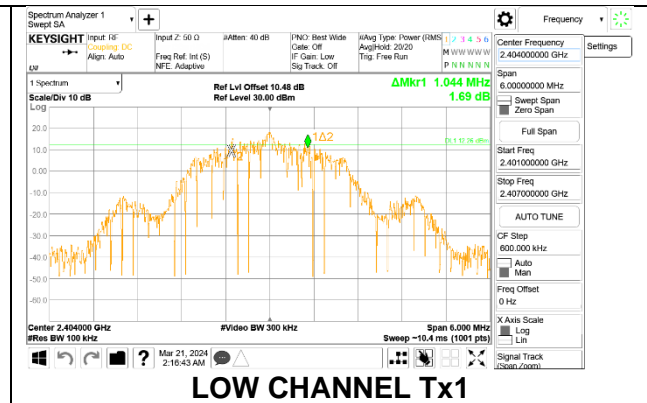
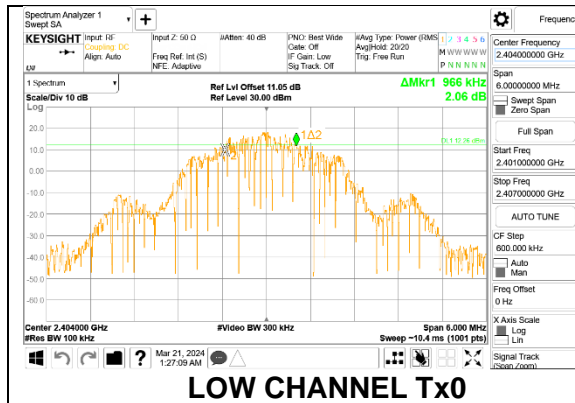
99% BANDWIDTH



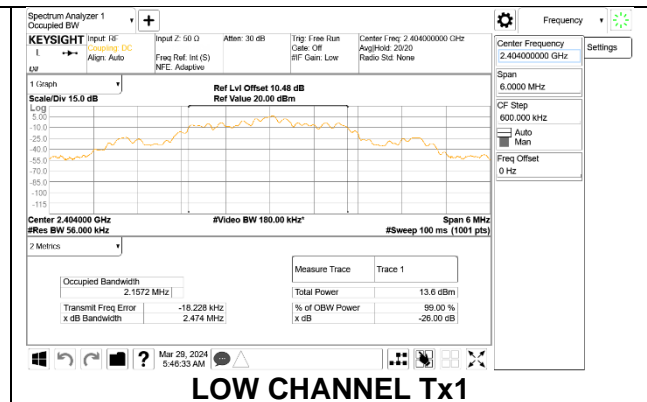
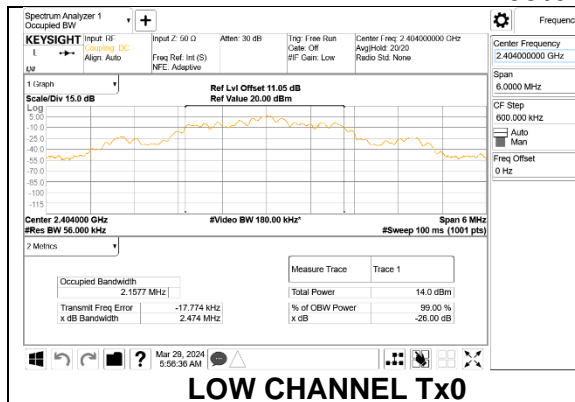
9.2.6. BLE 2Mbps GFSK, MODE 0 (CHANNEL SOUNDING)

No. of Tx	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Tx0	Tx1	Tx0	Tx1
1	Low	2404	0.966	1.044	2.1577	2.1572
	Mid	2440	0.876	1.158	2.1580	2.1572
	High	2478	1.194	1.206	2.1575	2.1588

6dB BANDWIDTH



99% BANDWIDTH



9.3. OUTPUT POWER & POWER SPECTRAL DENSITY

OUTPUT POWER LIMITS

FCC §15.247 (b) (3)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

AVERAGE OUTPUT POWER TEST PROCEDURE

The transmitter output is connected to a power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband power sensor. Gated average output power was read directly from power meter.

POWER DENSITY

LIMITS

FCC §15.247 (e)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

DIRECTIONAL GAIN CALCULATION:

For 1 TX:

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Band (GHz)	Antenna Gain (dBi)	Uncorrelated Directional Gain (dBi)	Correlated Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	FCC/ISED Power Limit (dBm)	FCC/ISED PSD Limit (dBm/3kHz)
BLE GFSK, MODE 0 (Channel Sounding) Tx0	-3.30	-3.30	-3.30	30.00	30.00	30.00	8.00
BLE GFSK, MODE 0 (Channel Sounding) Tx1	-0.50	-0.50	-0.50	30.00	30.00	30.00	8.00

For 2 TX:

Tx chains are correlated for power due to the device supporting Beamforming. The directional gains are as follows:

Band (GHz)	Tx0 Gain (dBi)	Tx1 Gain (dBi)	Uncorrelated Directional Gain (dBi)	Correlated Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	FCC/ISED Power Limit (dBm)	FCC/ISED PSD Limit (dBm/3kHz)
BT/BLE Beamforming	-3.30	-0.50	-1.68	1.22	30.00	30.00	30.00	8.00

DIRECTIONAL ANTENNA GAIN CALCULATION

ANSI C63.10-2013 section 14.4.3

$$\text{Uncorrelated directional gain} = 10 * \text{LOG}((10^{(\text{Ant1}/10)} + 10^{(\text{Ant2}/10)})/2)$$

$$\text{Correlated directional Gain} = 10 * \text{LOG}(((10^{(\text{Ant1}/20)} + 10^{(\text{Ant2}/20)})^2)/2)$$

Sample Calculation:

$$\text{Tx0} = -3.3\text{dBi}, \text{Tx1} = -0.5\text{dBi}$$

$$\text{Uncorrelated Antenna gain} = 10 \log[(10^{(-3.3/10)} + 10^{(-0.5/10)})/2] = -1.68\text{dBi}$$

$$\text{Correlated Antenna gain} = 10 \log[(10^{(-3.3/20)} + 10^{(-0.5/20)})^2/2] = 1.22\text{dBi}$$

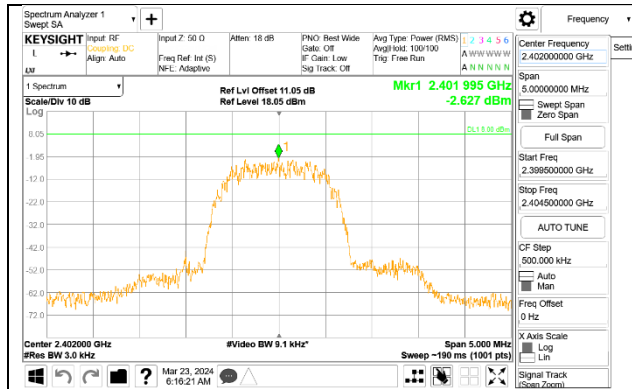
RESULTS

Test Engineer:	NM 19232 & HN 27979 & BN 24971
Test Date:	2024-03-22 to 2024-04-05

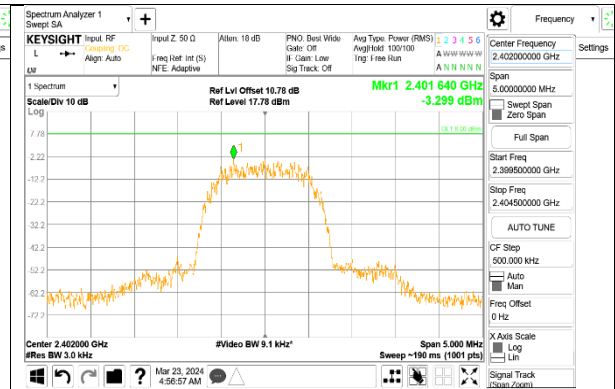
9.3.1. BT DQPSK/8PSK TXBF

2TX

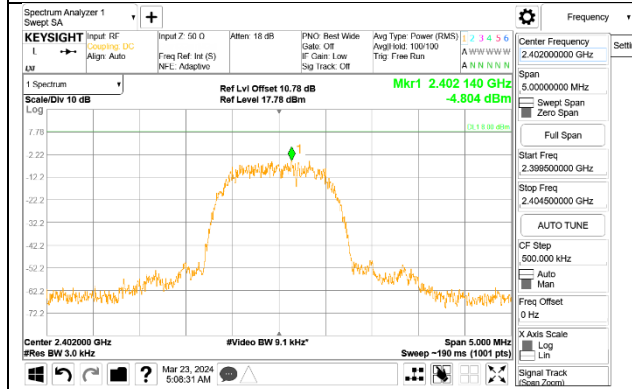
Mode	No. of Tx	Channel	Freq (MHz)	Measured Conducted Avg Power (dBm) Tx0	Measured Conducted Avg Power (dBm) Tx1	Measured Total Conducted Avg Power (dBm)	Output Power Limit (dBm)	Output Power Margin (dB)	Measured PSD (dBm/3kHz) Tx0	Measured PSD (dBm/3kHz) Tx1	Measured Corrected Total PSD with DCCF (dBm/3kHz)	PSD Limit (dBm/3kHz)	PSD Margin (dB)
BT DQPSK (Beamforming)	2	2	2402	18.60	18.57	21.60	30.00	-8.40	-2.627	-3.299	1.21	8.00	-6.79
		39	2441	19.08	18.67	21.89	30.00	-8.11	-3.455	-2.864	1.01	8.00	-6.99
		76	2480	18.69	18.55	21.63	30.00	-8.37	-2.805	-3.614	0.97	8.00	-7.03
BT 8PSK (Beamforming)	2	2	2402	18.52	18.55	21.55	30.00	-8.45	-4.804	-4.751	-0.62	8.00	-8.62
		39	2441	19.02	18.64	21.84	30.00	-8.16	-5.396	-4.714	-0.88	8.00	-8.88
		76	2480	18.75	18.59	21.68	30.00	-8.32	-4.550	-5.210	-0.71	8.00	-8.71



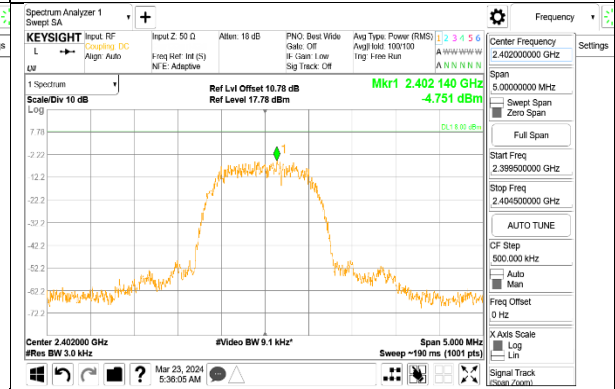
BT DQPSK LOW CHANNEL Tx0



BT DQPSK LOW CHANNEL Tx1



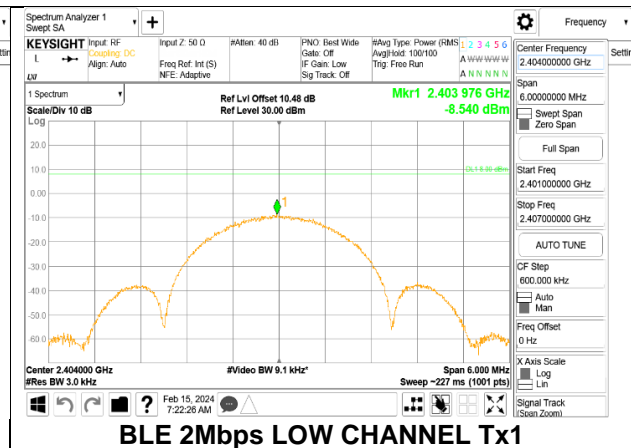
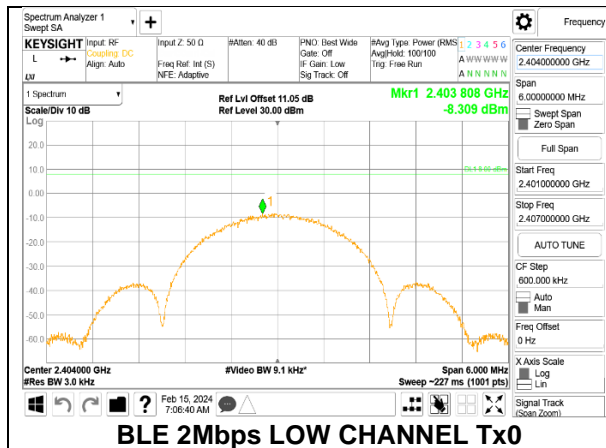
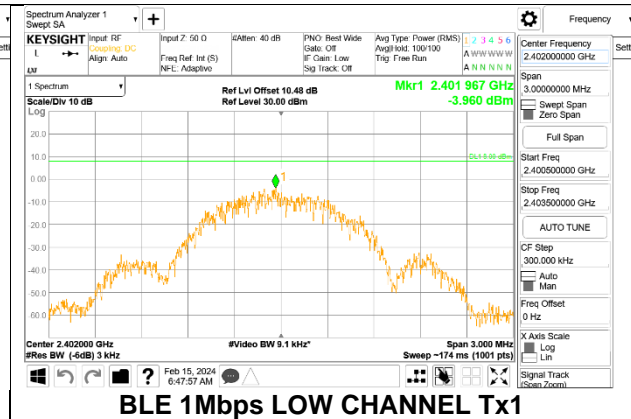
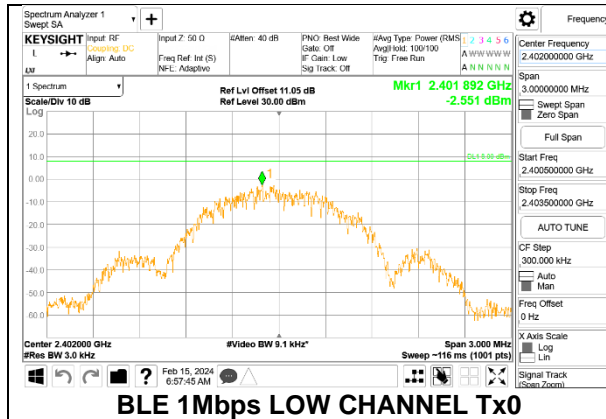
BT 8PSK LOW CHANNEL Tx0



BT 8PSK LOW CHANNEL Tx1

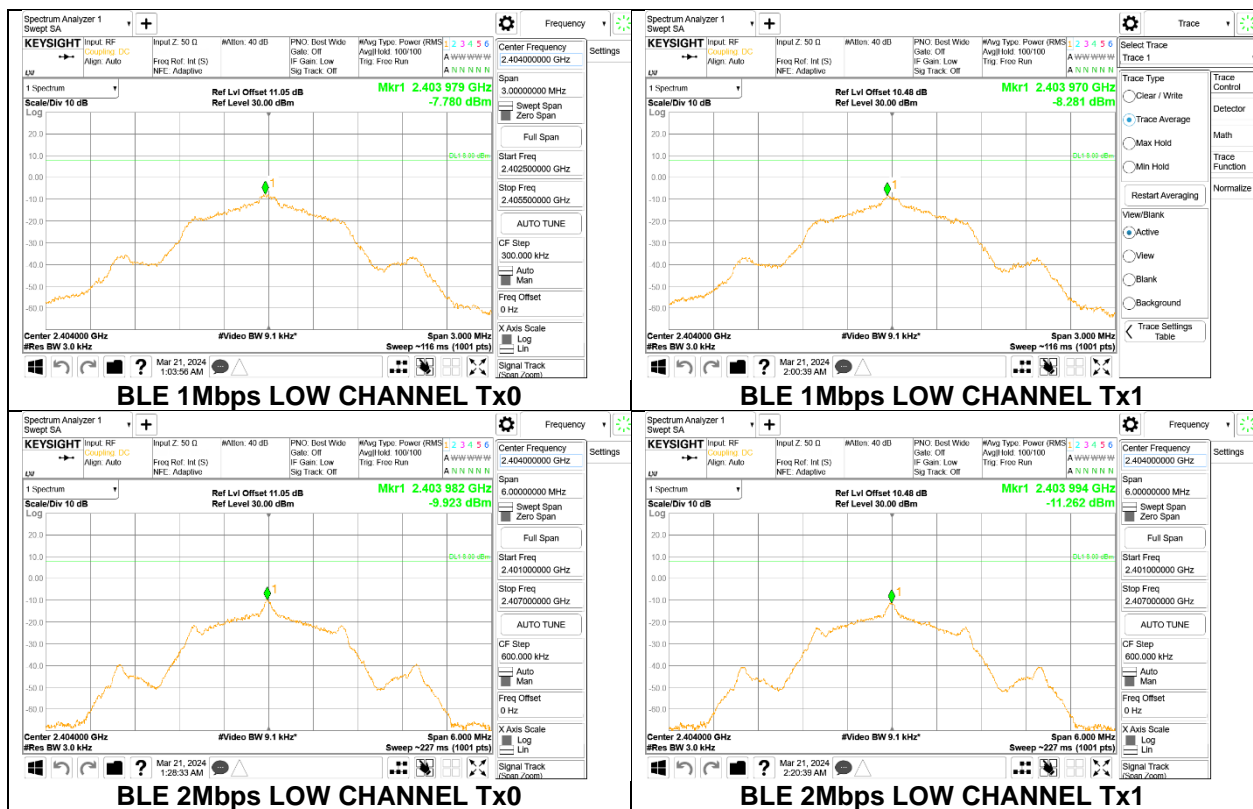
9.3.2. BLE TXBF 1Mbps/2Mbps

Mode	No. of Tx	Channel	Freq (MHz)	Measured Conducted Avg Power (dBm)	Measured Conducted Avg Power (dBm)	Measured Total Conducted Avg Power (dBm)	Output Power Limit (dBm)	Output Power Margin (dB)	Measured PSD (dBm/3kHz)	Measured PSD (dBm/3kHz)	Measured Corrected Total PSD with DCCF (dBm/3kHz)	PSD Limit (dBm/3kHz)	PSD Margin (dB)
				Tx0	Tx1				Tx0	Tx1			
BLE 1Mbps (Beamforming)	2	0	2402	18.82	18.38	21.62	30.00	-8.38	-2.551	-3.960	2.01	8.00	-5.99
		19	2440	19.13	18.54	21.86	30.00	-8.14	-1.949	-3.216	2.67	8.00	-5.33
		39	2480	18.90	18.44	21.69	30.00	-8.31	-1.411	-2.145	3.45	8.00	-4.55
BLE 2Mbps (Beamforming)	2	1	2404	19.00	18.51	21.77	30.00	-8.23	-8.309	-8.540	-2.96	8.00	-10.96
		19	2440	19.34	18.67	22.03	30.00	-7.97	-7.265	-7.921	-2.11	8.00	-10.11
		38	2478	19.07	18.59	21.85	30.00	-8.15	-7.708	-8.163	-2.46	8.00	-10.46



9.3.3. BLE 1Mbps/2Mbps GFSK, MODE 0 (CHANNEL SOUNDING)

Mode	No. of Tx	Channel	Freq (MHz)	Measured Conducted Avg Power (dBm)	Output Power Limit (dBm)	Output Power Margin (dB)	Measured PSD (dBm/3kHz)	Measured Corrected Total PSD with DCCF (dBm/3kHz)	PSD Limit (dBm/3kHz)	PSD Margin (dB)
BLE 1Mbps (channel sounding, GFSK modulated)	1 (Tx0)	1	2404	19.77	30.00	-10.23	-7.780	0.439	8.00	-7.56
		19	2440	19.88	30.00	-10.12	-7.259	0.960	8.00	-7.04
		38	2478	19.82	30.00	-10.18	-8.144	0.075	8.00	-7.93
	1 (Tx1)	1	2404	19.08	30.00	-10.92	-8.281	-0.062	8.00	-8.06
		19	2440	19.68	30.00	-10.32	-7.569	0.650	8.00	-7.35
		38	2478	19.79	30.00	-10.21	-7.552	0.667	8.00	-7.33
BLE 2Mbps (channel sounding, GFSK modulated)	1 (Tx0)	1	2404	20.00	30.00	-9.99	-9.923	-0.009	8.00	-8.01
		19	2440	20.00	30.00	-10.00	-10.134	-0.220	8.00	-8.22
		38	2478	19.92	30.00	-10.08	-11.808	-1.894	8.00	-9.89
	1 (Tx1)	1	2404	19.44	30.00	-10.56	-11.262	-1.348	8.00	-9.35
		19	2440	19.77	30.00	-10.23	-10.828	-0.914	8.00	-8.91
		38	2478	19.87	30.00	-10.13	-9.984	-0.070	8.00	-8.07



9.4. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

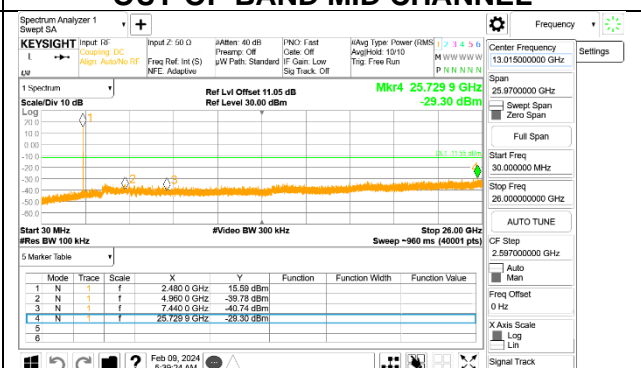
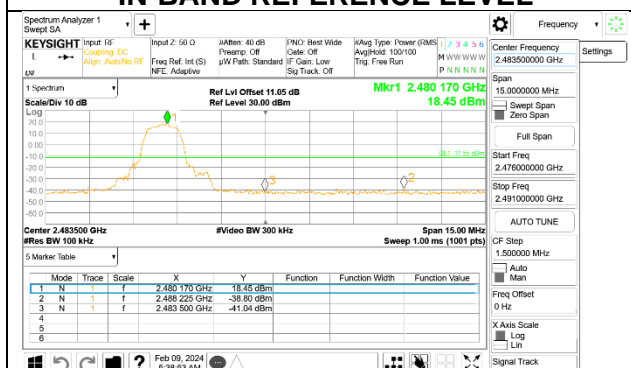
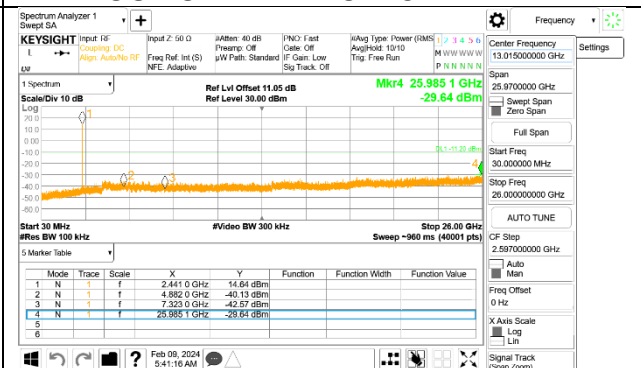
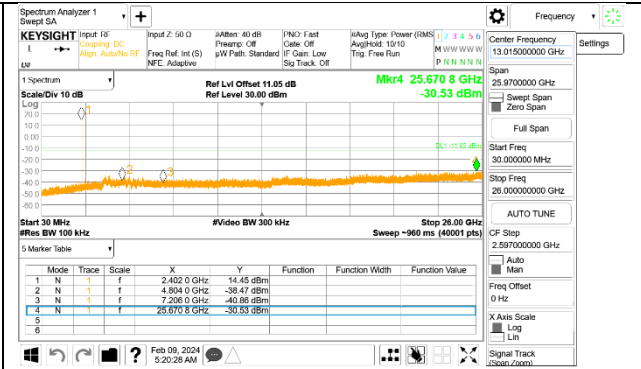
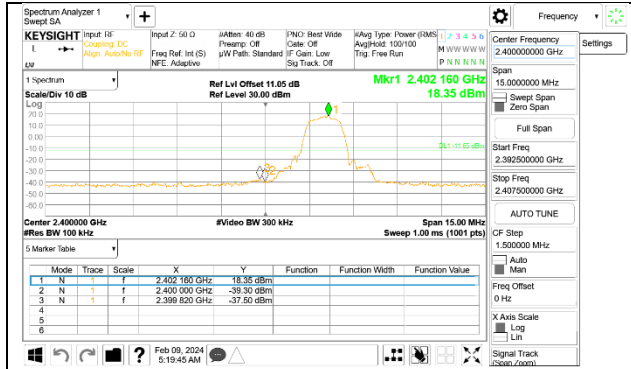
Output power was measured based on the use of an average measurement; therefore, the required attenuation is 30 dBc.

RESULTS

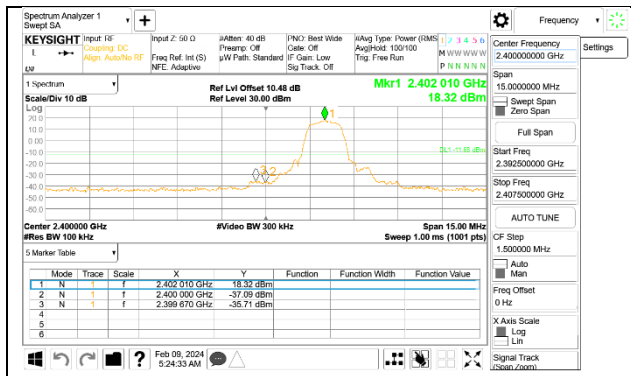
Test Engineer:	BN 24971
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9.4.1. BT DQPSK TXBF

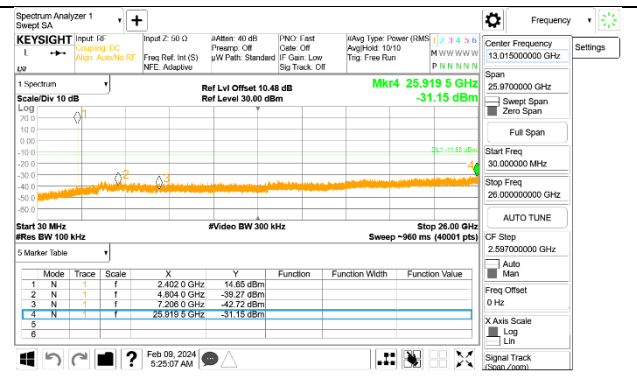
Tx0



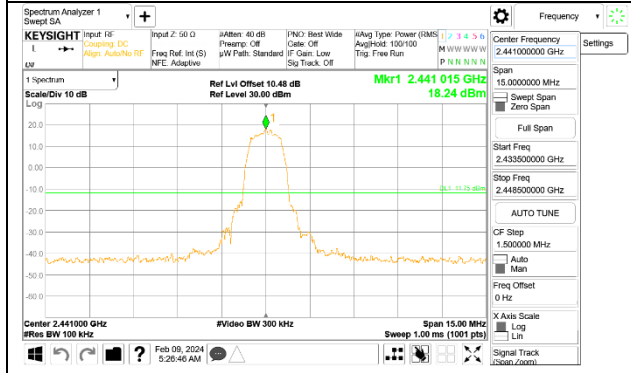
Tx1



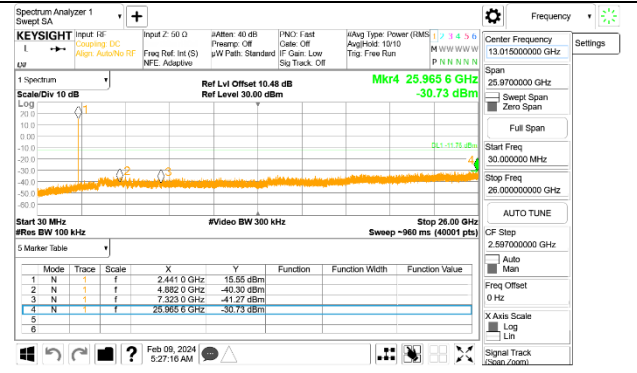
LOW CHANNEL BANDEDGE



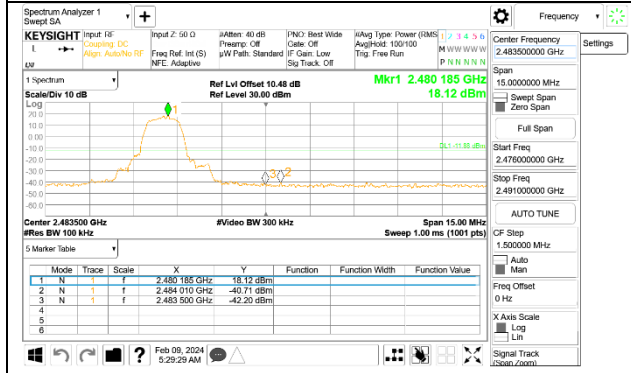
OUT-OF-BAND LOW CHANNEL



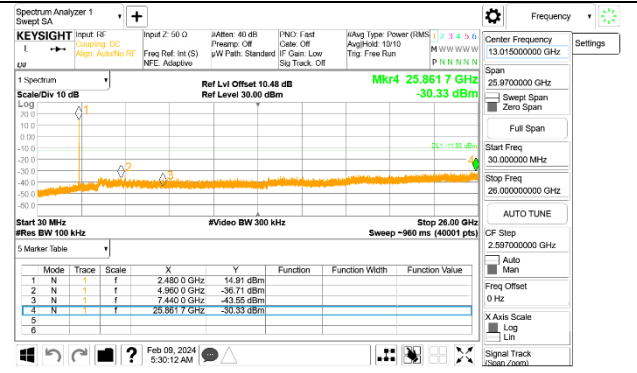
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



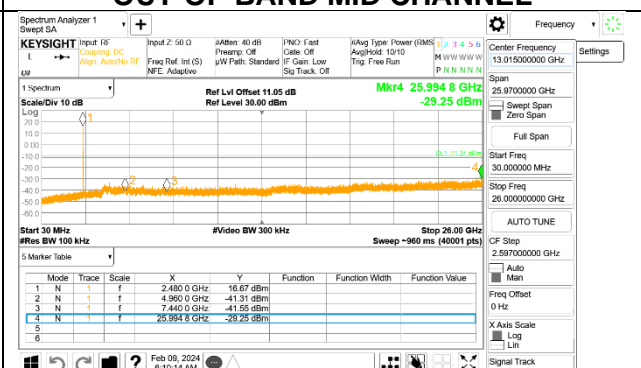
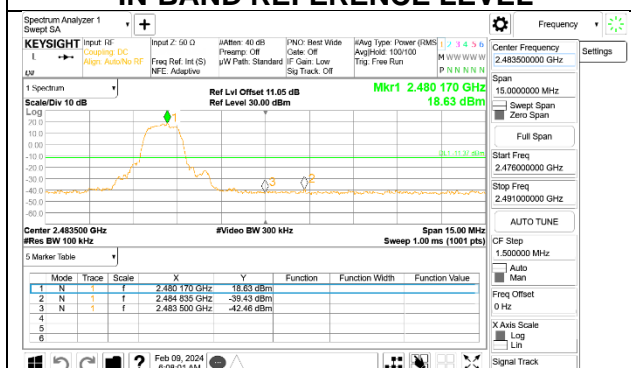
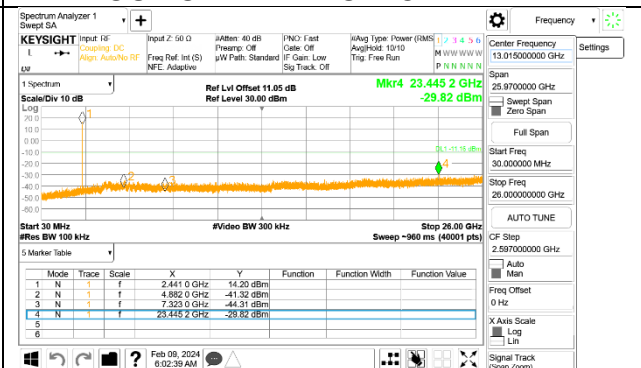
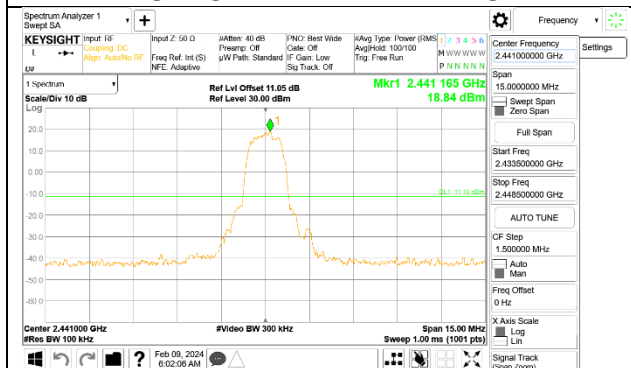
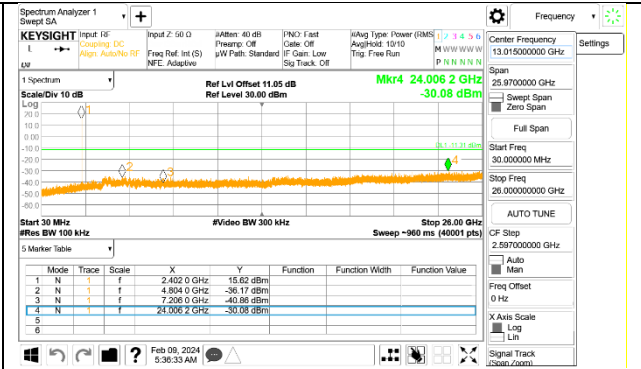
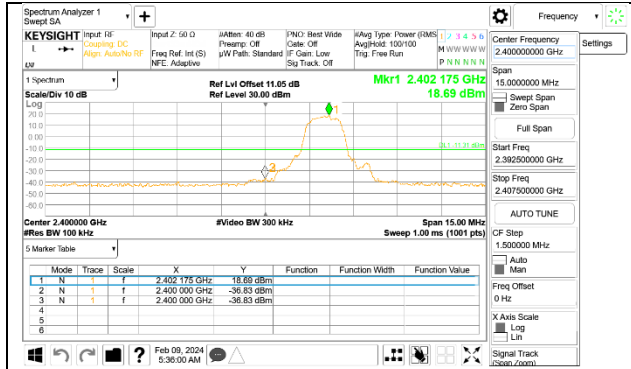
HIGH CHANNEL BANDEDGE



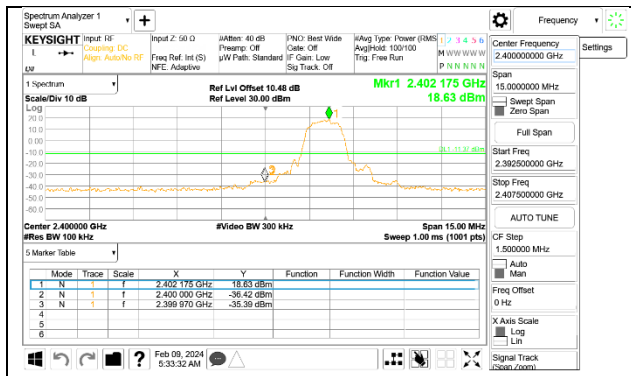
OUT-OF-BAND HIGH CHANNEL

9.4.2. BT 8PSK TXBF

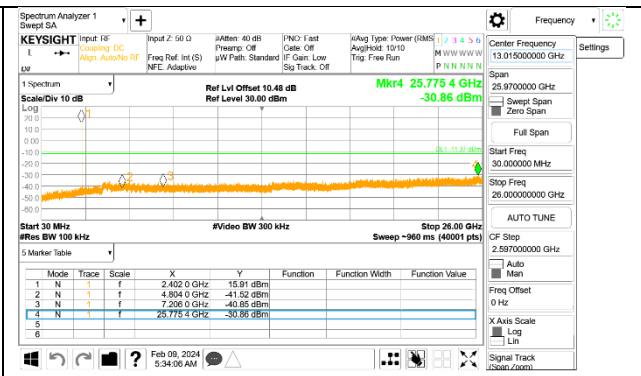
Tx0



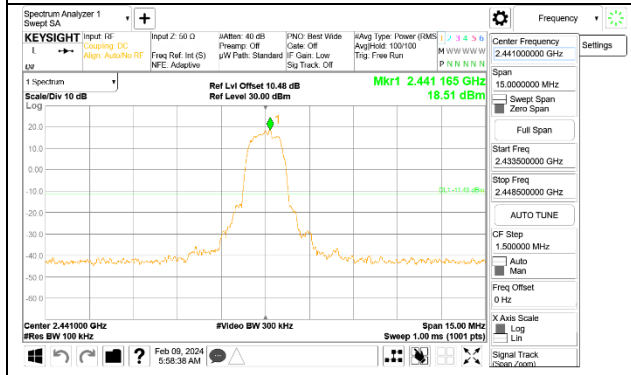
Tx1



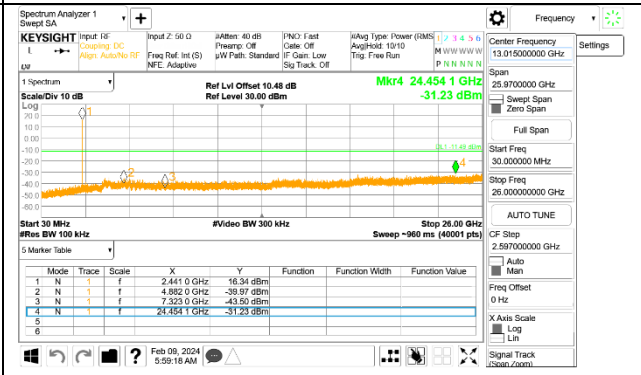
LOW CHANNEL BANDEGE



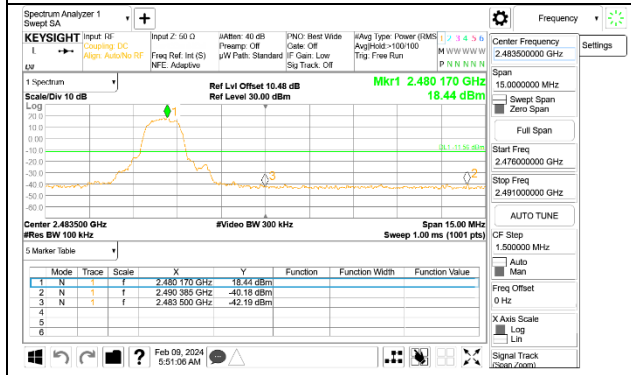
OUT-OF-BAND LOW CHANNEL



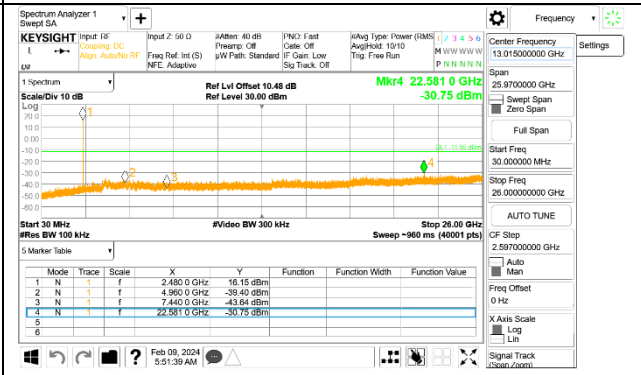
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



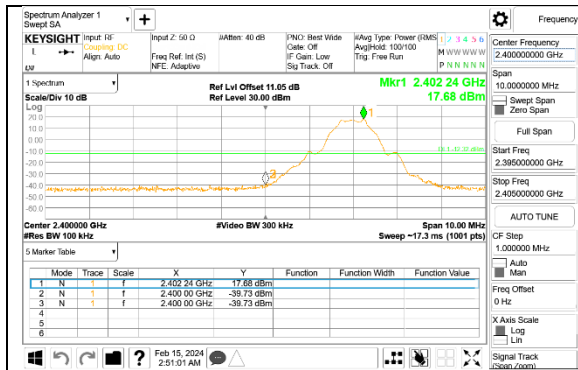
HIGH CHANNEL BANDEGE



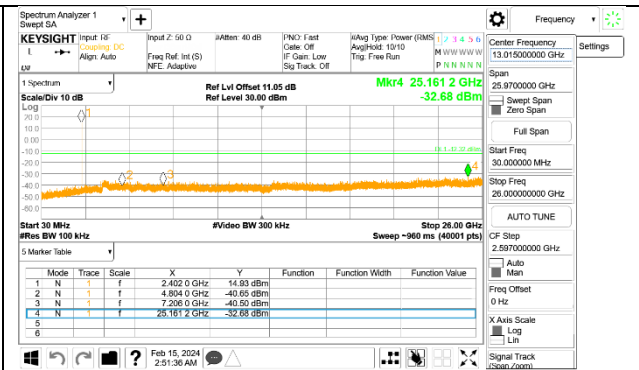
OUT-OF-BAND HIGH CHANNEL

9.4.3. BLE TXBF 1Mbps

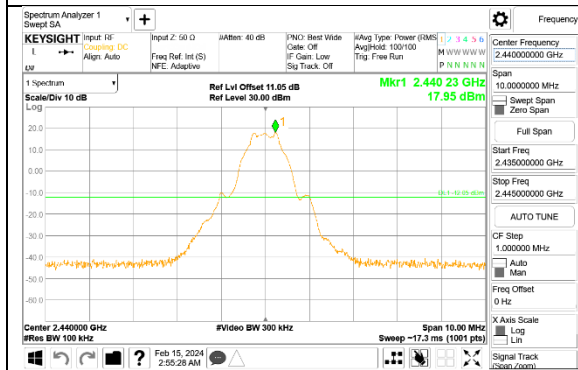
Tx0



LOW CHANNEL BANDEDGE



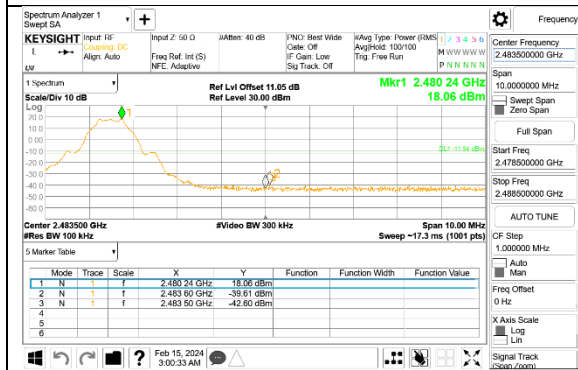
OUT-OF-BAND LOW CHANNEL



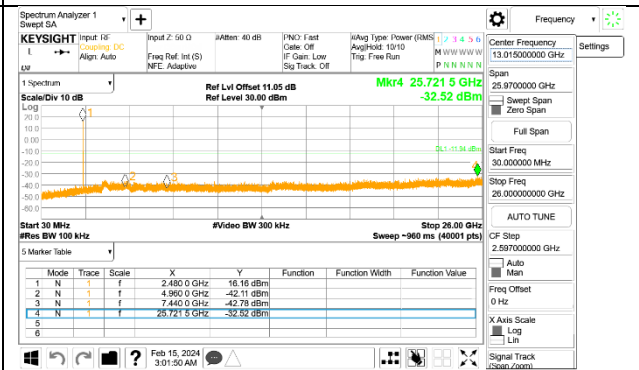
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

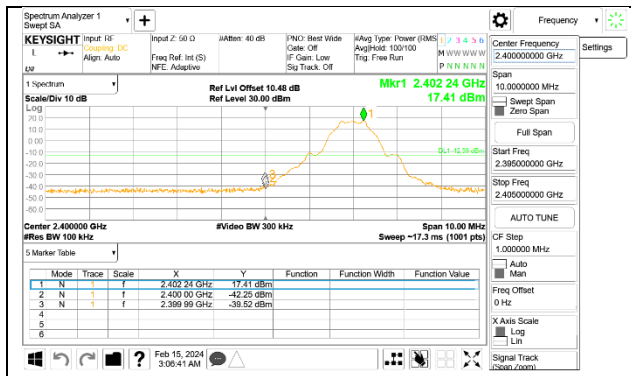


HIGH CHANNEL BANDEDGE

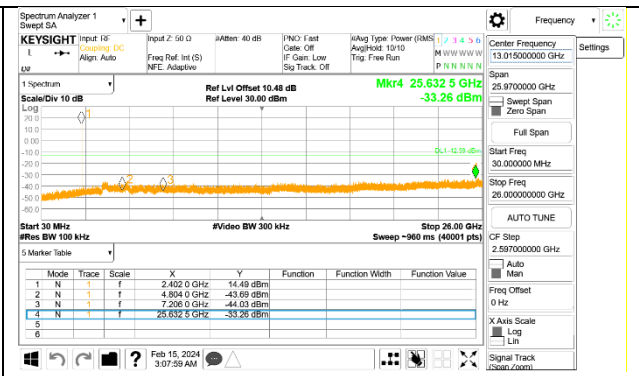


OUT-OF-BAND HIGH CHANNEL

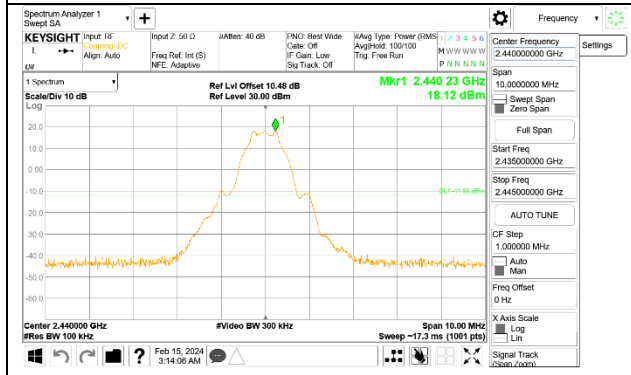
Tx1



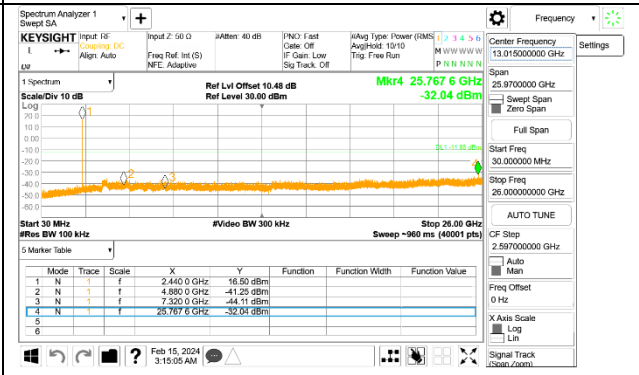
LOW CHANNEL BANDEDGE



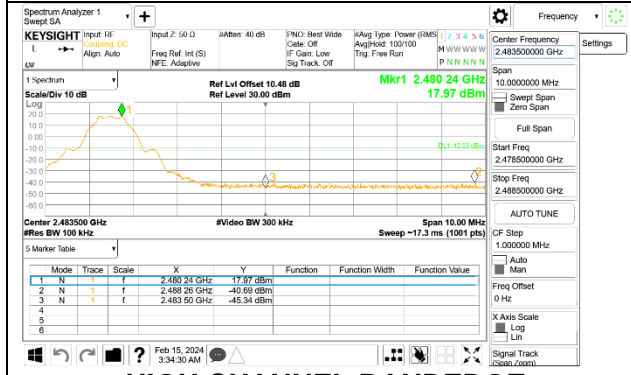
OUT-OF-BAND LOW CHANNEL



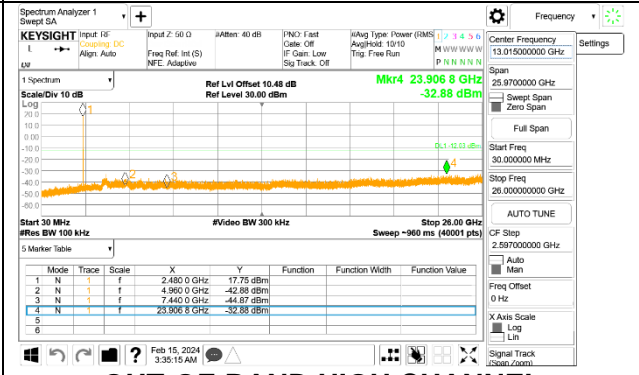
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



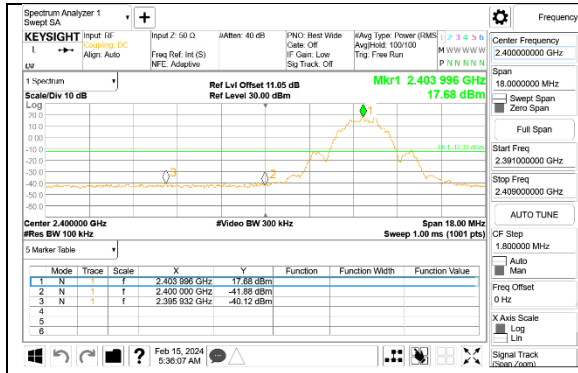
HIGH CHANNEL BANDEDGE



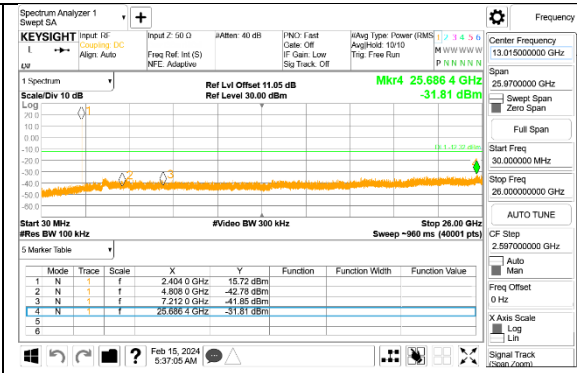
OUT-OF-BAND HIGH CHANNEL

9.4.4. BLE TXBF 2Mbps

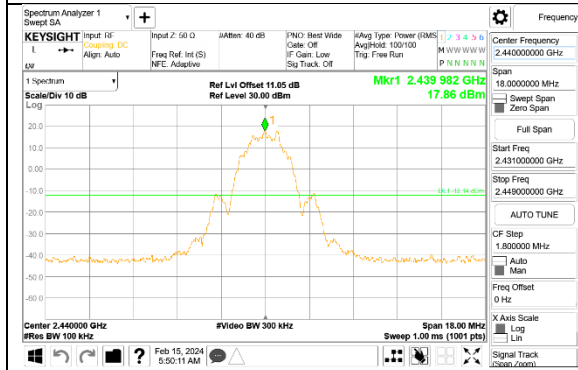
Tx0



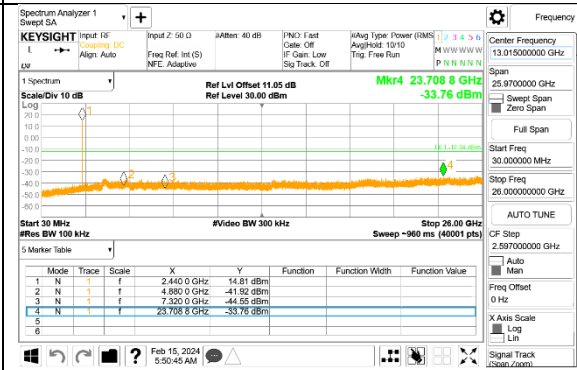
LOW CHANNEL BANDEDGE



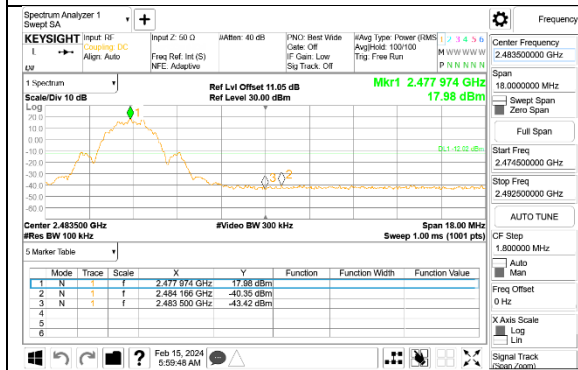
OUT-OF-BAND LOW CHANNEL



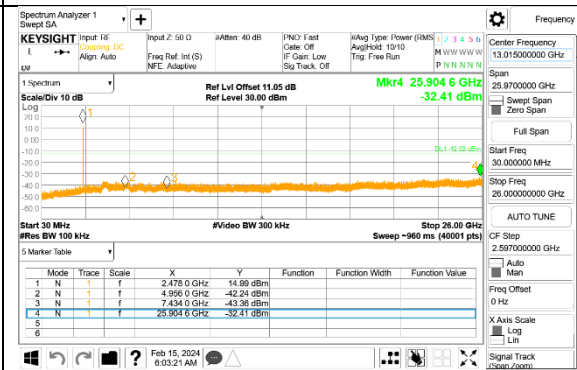
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL