

# TEST REPORT

**Report Number:** 14954500-E2V1

**Applicant :** SRAM LLC  
1000 W Fulton Market 4<sup>th</sup> Floor  
Chicago, IL 60607, United States

**Model :** 12300

**Brand :** SRAM

**FCC ID :** C9O-HKB1

**IC :** 10161A-HKB1

**EUT Description :** BICYCLE HEAD UNIT

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C  
ISED RSS-247 ISSUE 3  
ISED RSS-GEN ISSUE 5 + A1 + A2

**Date Of Issue:**  
2023-11-09

**Prepared by:**  
UL VERIFICATION SERVICES  
47173 Benicia Street  
Fremont, CA 94538 U.S.A.  
TEL: (510) 319-4000  
FAX: (510) 661-0888



## REPORT REVISION HISTORY

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	2023-11-09	Initial Issue	

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SRAM LLC  
1000 W Fulton Market 4<sup>th</sup> Floor  
Chicago, IL 60607, United States

**EUT DESCRIPTION:** Bicycle Head Unit

**MODEL:** 12300

**BRAND:** SRAM

**SERIAL NUMBER:** Radiated: 00416GA23270005 and 00416GA23270009  
Conducted: 00413PA232960044 and 00413PA232960035

**SAMPLE RECEIPT DATE:** 2023-09-22 and 2023-09-28

**DATE TESTED:** 2023-09-29 to 2023-10-31

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC 47 CFR Part 15 Subpart C	Complies
ISED RSS-247 Issue 3	Complies
ISED RSS-GEN Issue 5 + A1 + A2	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. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For  
UL Verification Services Inc. By:

Prepared By:



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Dan Corona  
Operations Leader  
Consumer Technology Division  
UL Verification Services Inc.

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Glenn Escano  
Senior Test Engineer  
Consumer Technology Division  
UL Verification Services Inc.

1<sup>st</sup> Reviewed By:

2<sup>nd</sup> Reviewed By:



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Vien Tran  
Senior Laboratory Engineer  
Consumer Technology Division  
UL Verification Services Inc.

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Kiya Kedida  
Senior Project Engineer  
Consumer Technology Division  
UL Verification Services Inc.

## 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 the validity of results after the integration of the data provided by the customer.

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

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

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6.
-	RSS-GEN 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.3.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW	Compliant	None.
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power	Compliant	None.
See Comment		Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	RSS-247 5.2 (b)	PSD	Compliant	None.
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions	Compliant	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Compliant	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Compliant	None

### 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5 + A1 + A2, and RSS-247 Issue 3.

### 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 checked="" type="checkbox"/>	Building 1: 47173 Benicia Street Fremont, CA 94538, U.S.A	US0104	2324A	550739
<input type="checkbox"/>	Building 2: 47266 Benicia Street Fremont, CA 94538, U.S.A	US0104	2324A	550739
<input checked="" type="checkbox"/>	Building 4: 47658 Kato Rd Fremont, CA 94538, U.S.A	US0104	2324A	550739



## 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 <sub>Lab</sub>
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Power Spectral Density	2.47 dB
RF Power Measurement Direct Method Using Power Meter	1.3 dB (PK) / 0.45 dB (AV)
Unwanted Emissions, Conducted	1.94 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 Bicycle Head Unit.

### 6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak and average conducted output powers as follows:

#### 6.2.1. QUALCOMM RADIO

Frequency Range (MHz)	Mode	Peak		Average	
		Output Power (dBm)	Output Power (mW)	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE (1Mbps)	1.83	1.52	0.80	1.20

#### 6.2.2. RIGHT NORDIC RADIO

Frequency Range (MHz)	Mode	Peak		Average	
		Output Power (dBm)	Output Power (mW)	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE (1Mbps)	6.54	4.51	6.47	4.44
2402 - 2480	BLE (2Mbps)	6.66	4.63	6.59	4.56
2402 - 2480	BLE (125kbps)	6.65	4.62	6.57	4.54
2402 - 2480	BLE (500kbps)	6.66	4.63	6.57	4.54

### 6.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

The Qualcomm Radio utilizes a PIFA antenna, with a maximum gain of 2.08 dBi.

The Left Nordic Radio utilizes a Monopole antenna, with a maximum gain of 0.66 dBi.

The Right Nordic Radio utilizes a PIFA antenna, with a maximum gain of 2.23 dBi.

### 6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed, and the test utility software used during testing was FVIN: H-2.0.

## 6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed on (Right) radio with the EUT set to transmit at the channel with highest output power as worst-case scenario.

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.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X(Flatbed) orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Left and Right Nordic Radio are identical the same except antenna type and gain. Full conducted data was performed on (Right) radio and full radiated testing was performed on both Left and Right Nordic radios.

The worst-case data rate provided by the client were:

### **Qualcomm Radio:**

- BLE: 1Mbps

### **Left / Right Nordic Radio:**

- BLE: 1Mbps
- BLE: 2Mbps
- BLE: 125kbps
- BLE: 500kbps

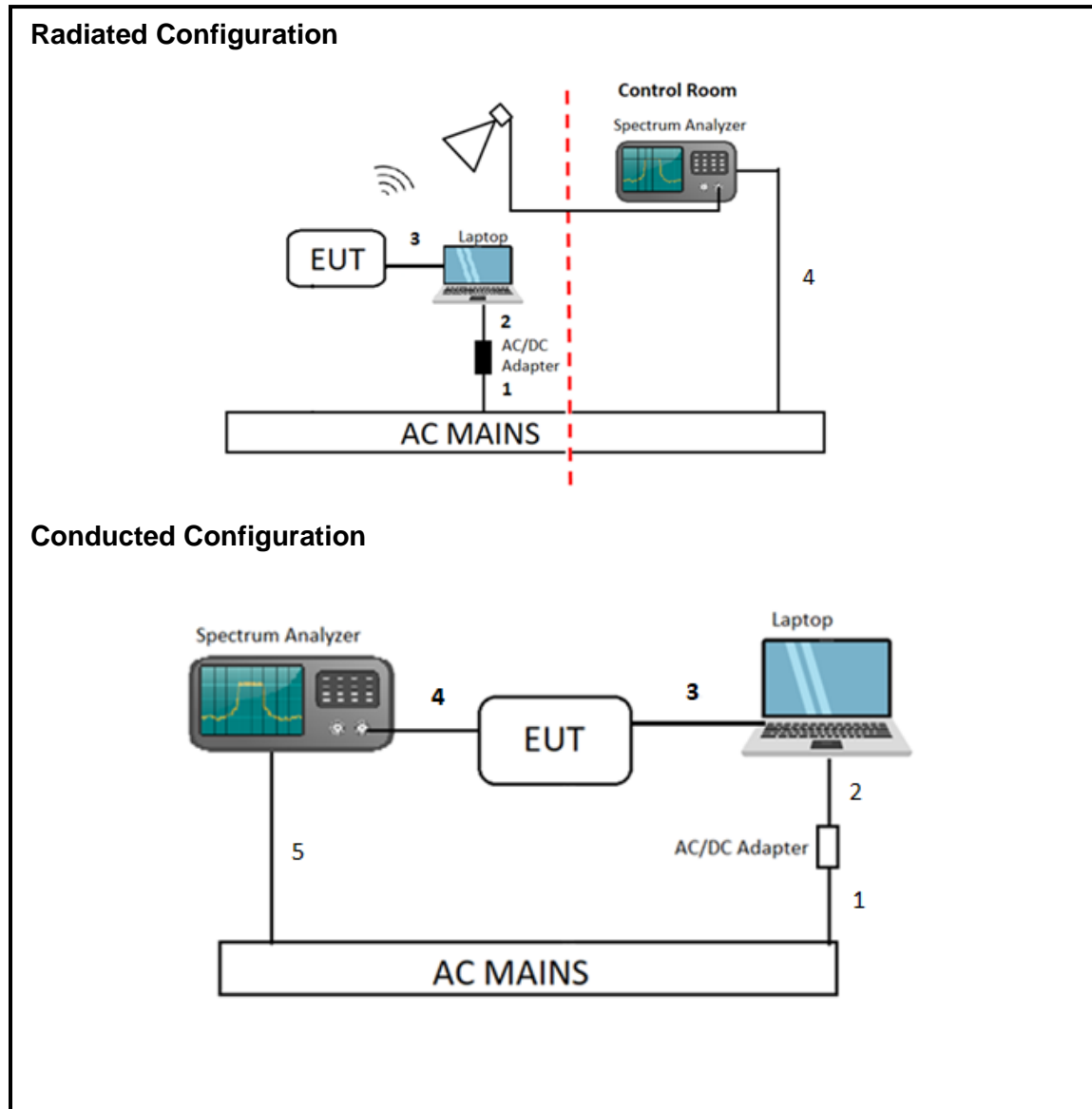
## 6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC		
Laptop	Lenovo	ThinkPad P15s Gen 2	PF-2YV2K6	DoC		
Laptop AC/DC Adapter	Lenovo	ADLX65Y	8SSA10R16875C1SG09PRSHT	DoC		
I/O CABLES (CONDUCTED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	2-Prong	Un-shielded	1	AC Mains to LT AC/DC Adapter
2	DC	1	DC	Un-shielded	1.5	AC/DC Adapter to Laptop
3	USB	1	USB A to USB C	Un-shielded	1	Laptop to EUT
4	SMA	1	SMA	Un-shielded	0.1	EUT to Spectrum Analyzer
5	AC	1	3-Prong	Un-shielded	1.5	AC Mains to Spectrum Analyzer
I/O CABLES (RADIATED TEST EMISSIONS)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	2-Prong	Un-shielded	1	AC Mains to LT AC/DC Adapter
2	DC	1	DC	Un-shielded	1.5	AC/DC Adapter to Laptop
3	USB	1	USB A to USB C	Un-shielded	1	Laptop to EUT
4	AC	1	3-Prong	Un-shielded	1.5	AC Mains to Spectrum Analyzer

### TEST SETUP

For the purposes of testing, the EUT is connected to a laptop via USB A to USB C for radiated emissions above 1GHz. The EUT is normally powered by a Li-Ion battery at 3.85V. The laptop is used for setting up purposes and was used during testing.

**SETUP DIAGRAMS**



## 7. MEASUREMENT 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

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Output Power: ANSI C63.10 Subclause -11.9.1.3 Method PKPM1 Peak-reading power meter

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 -11.10.2 Method PKPSD (peak PSD)

Radiated emissions non-restricted frequency bands: ANSI C63.10 Subclause -11.11

Radiated emissions restricted frequency bands: ANSI C63.10 Subclause -11.12.1

Conducted emissions in restricted frequency bands: ANSI C63.10 Subclause -11.12.2

Band-edge: ANSI C63.10 Section 6.10

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

## 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, Broadband Hybrid, 30MHz to 1GHz	Sunol Sciences Corp.	JB3	232075	2024-03-31	2023-03-13
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	223083	2023-10-31	2022-10-25
RF Filter Box, 1-18GHz	UL-FR1	n/a	197920	2024-05-31	2023-05-17
EMI TEST RECEIVER, with B8 option	Rohde & Schwarz	ESW44	191429	2024-02-29	2023-02-15
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	225688 (chamber K)	2024-02-29	2023-02-14
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	199659	2023-12-06	2022-12-06
Amplifier 18-26.5GHz, +5Vdc, -54dBm P1dB	AMPLICAL	AMP18G26.5-60	234683	2024-03-29	2023-03-18
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	170015	2024-07-31	2022-07-28
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO METRICS	EM-6871	170013	2024-07-31	2022-07-28
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent Technologies	N9030A	80396	2024-01-31	2023-01-27
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90754	2024-01-31	2023-01-24
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	81319	2024-01-25	2023-01-25
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	N/A	Verified	Verified
AC Line Conducted					
LISN	Fischer Custom Communications, Inc	FCC-LISN-50/250-25-2-01-480V	175765	2024-01-31	2023-01-27
EMI TEST RECEIVER	Rohde & Schwarz	ESR	171646	2024-02-29	2023-02-20
Transient Limiter	TE	TBFL1	207996	2024-08-31	2023-08-10
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		

### NOTES:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.



## 9. ANTENNA PORT TEST RESULTS

### 9.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

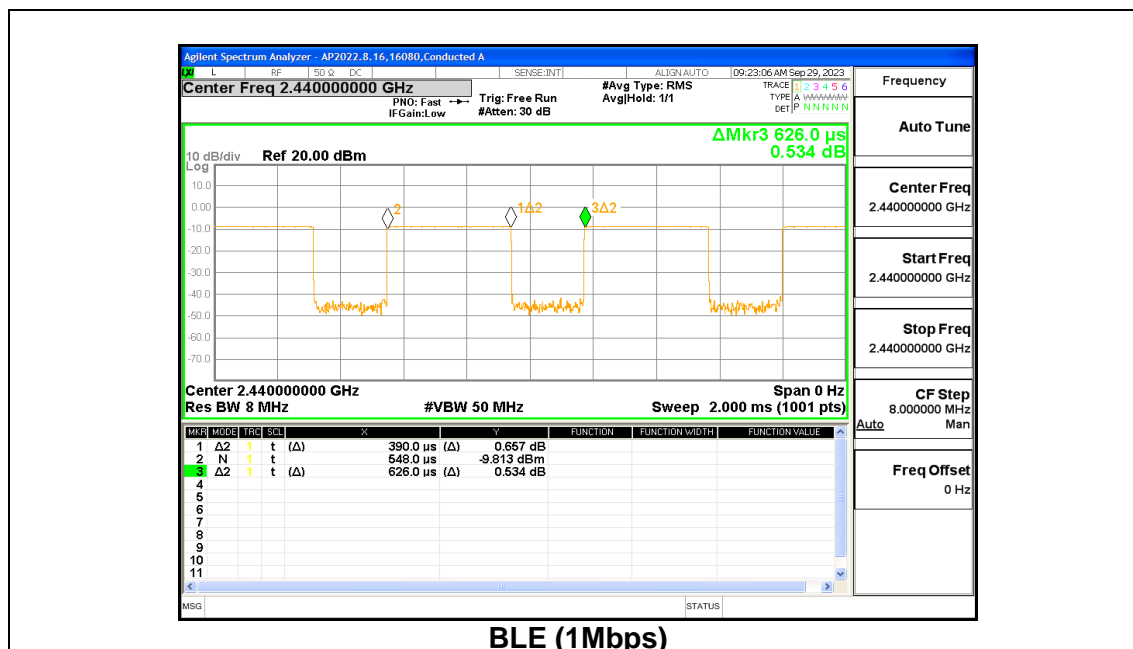
#### PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

#### ON TIME AND DUTY CYCLE RESULTS

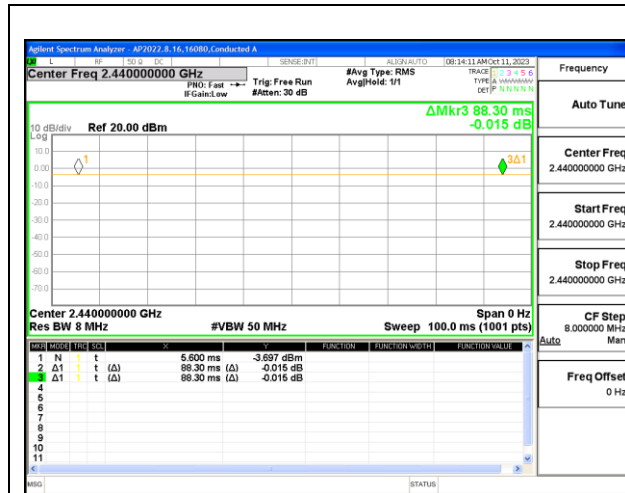
##### 9.1.1. QUALCOMM RADIO

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
<b>2.4GHz Band</b>						
BLE	0.390	0.626	0.623	62.30	2.06	2.564

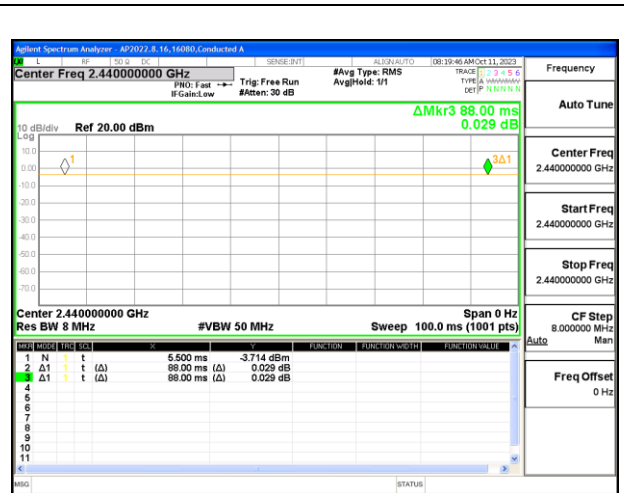


### 9.1.2. RIGHT NORDIC RADIO

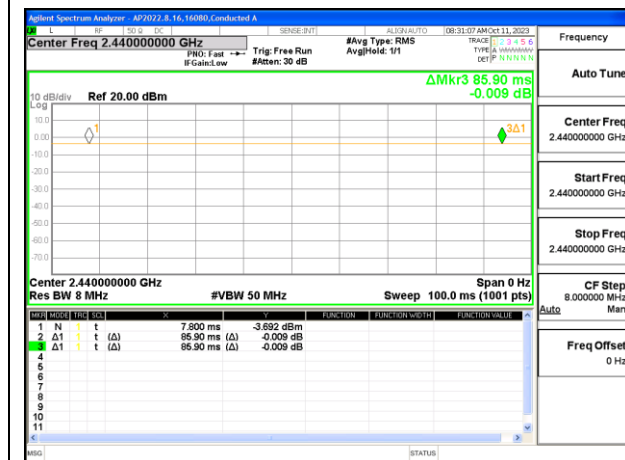
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
<b>2.4GHz Band</b>						
BLE (1Mbps)	88.3	88.3	1.000	100.00%	0.00	0.010
BLE (2Mbps)	88.0	88.0	1.000	100.00%	0.00	0.010
BLE (125kbps)	85.9	85.9	1.000	100.00%	0.00	0.010
BLE (500kbps)	87.3	87.3	1.000	100.00%	0.00	0.010



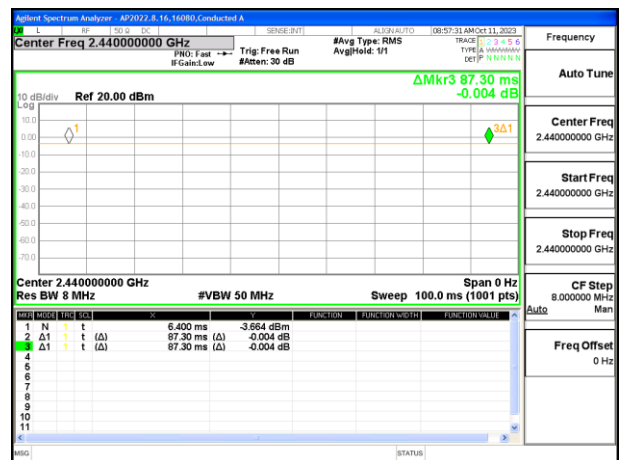
BLE (1Mbps)



BLE (2Mbps)



BLE (125kbps)



BLE (500kbps)

## 9.2. 99% BANDWIDTH

### LIMITS

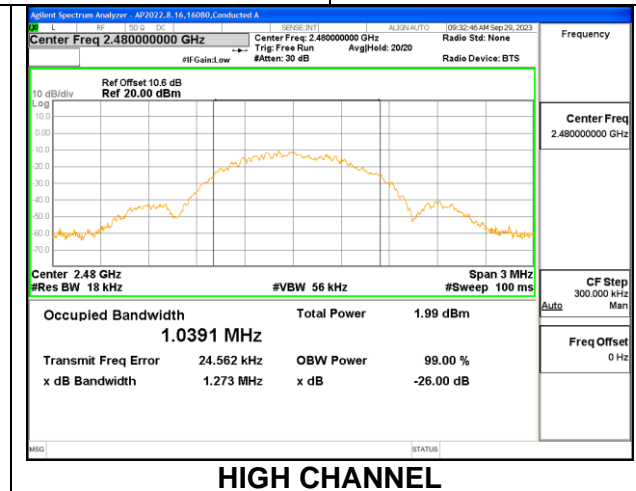
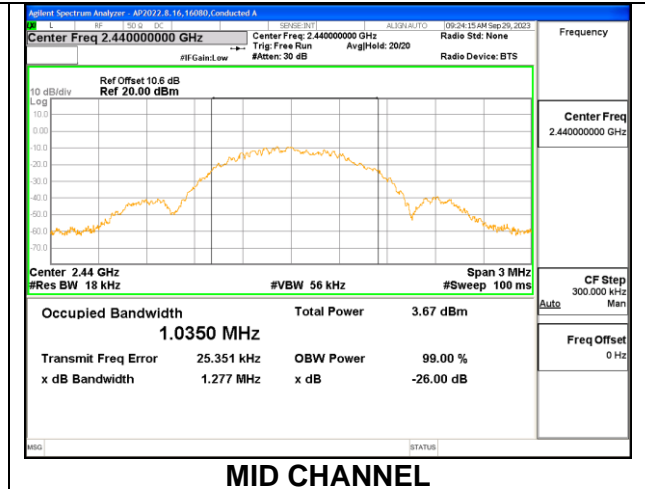
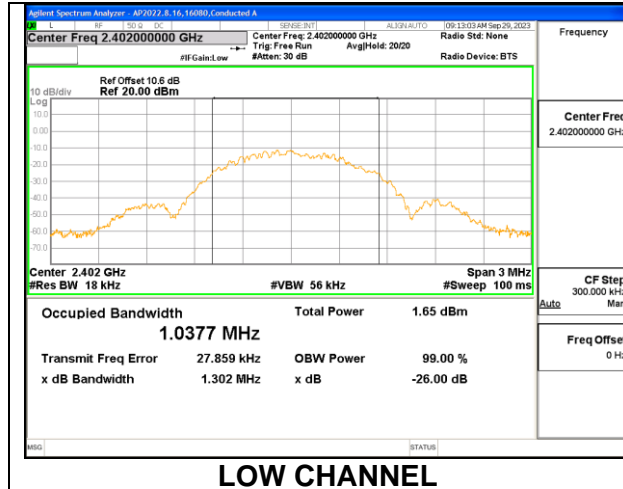
None; for reporting purposes only.

### RESULTS

#### 9.2.1. QUALCOMM RADIO

#### BLE (1Mbps):

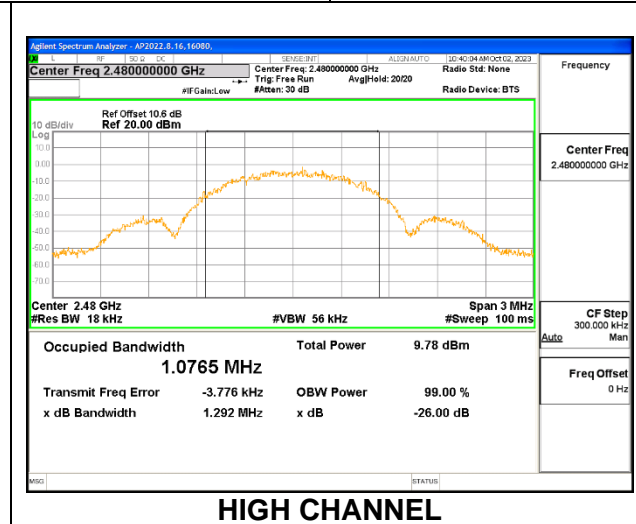
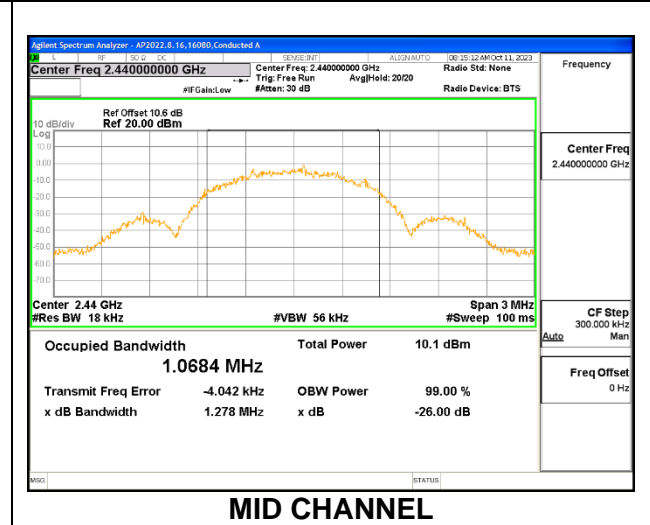
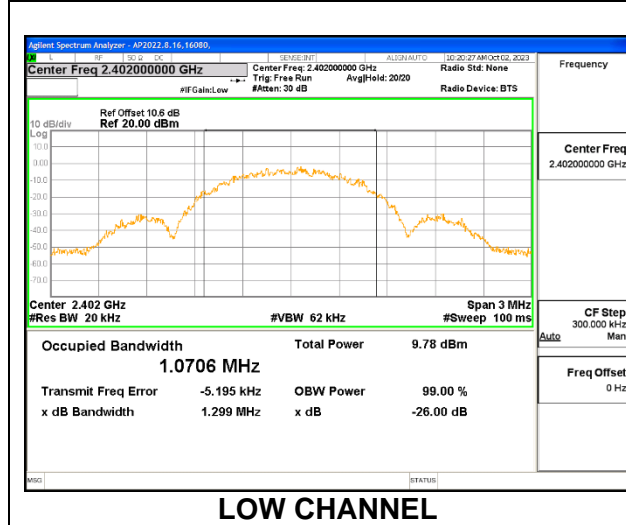
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0377
Middle	2440	1.0350
High	2480	1.0391



### 9.2.2. RIGHT NORDIC RADIO

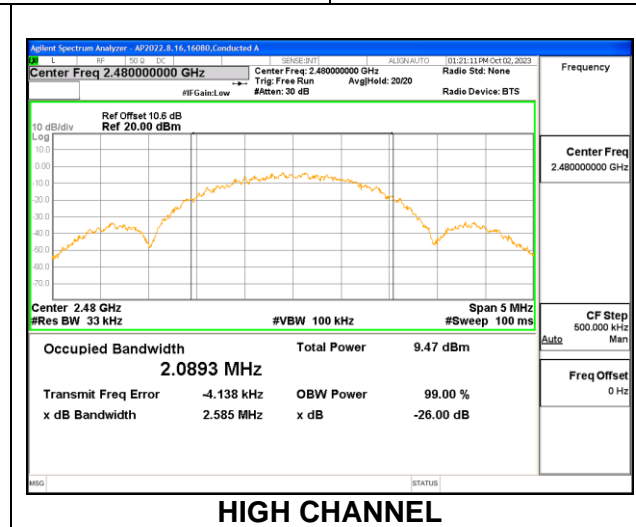
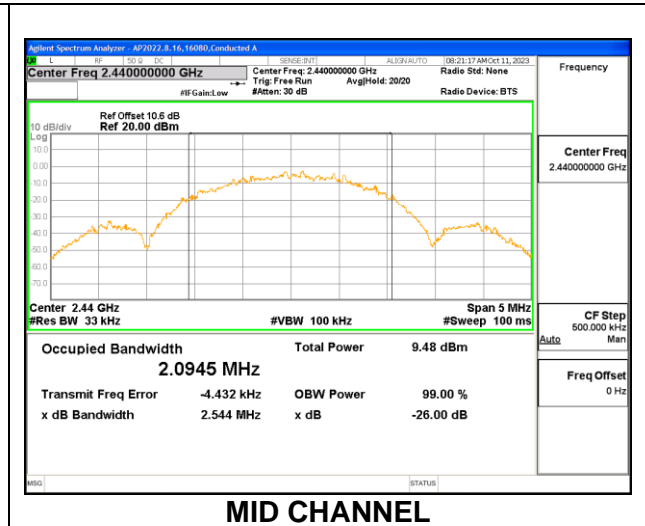
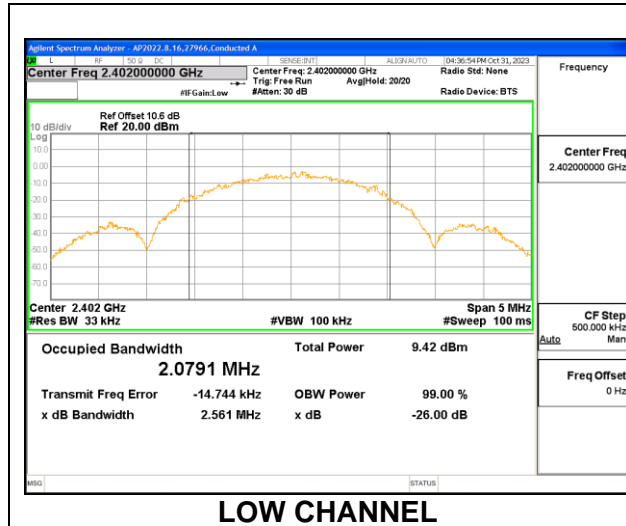
**BLE (1Mbps):**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0706
Middle	2440	1.0684
High	2480	1.0765



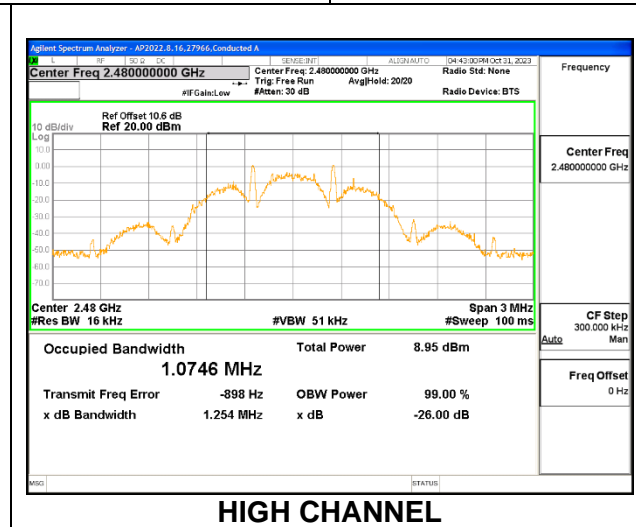
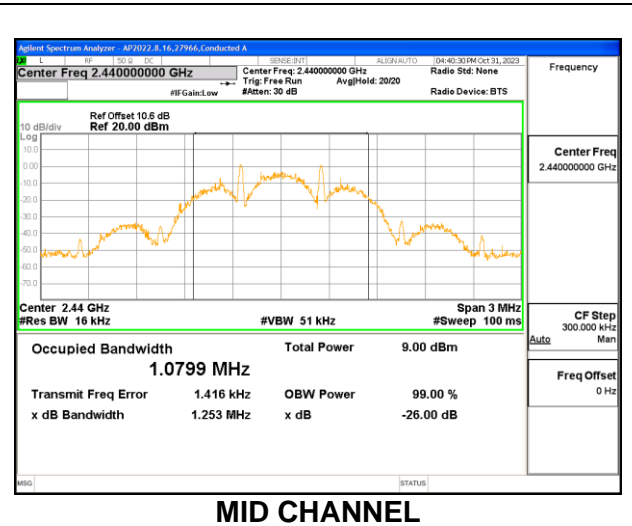
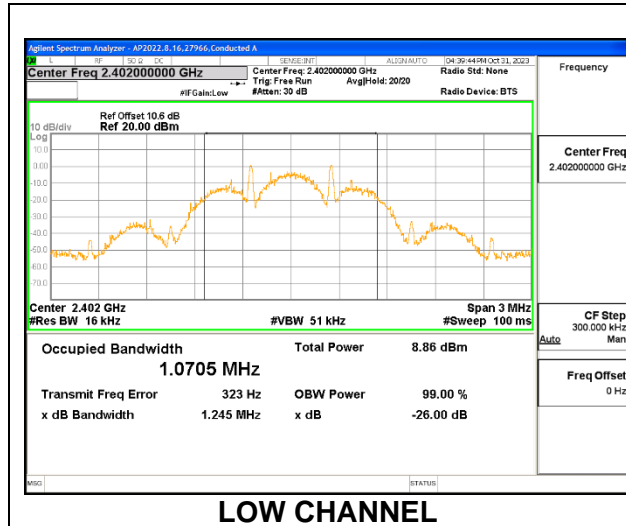
**BLE (2Mbps):**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	2.0791
Middle	2440	2.0945
High	2480	2.0893



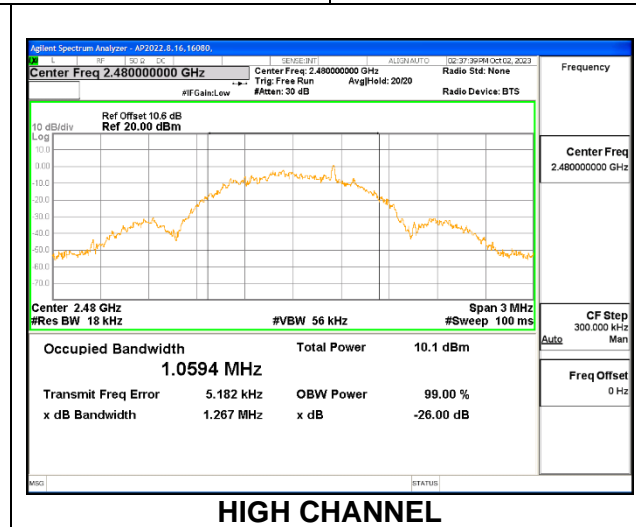
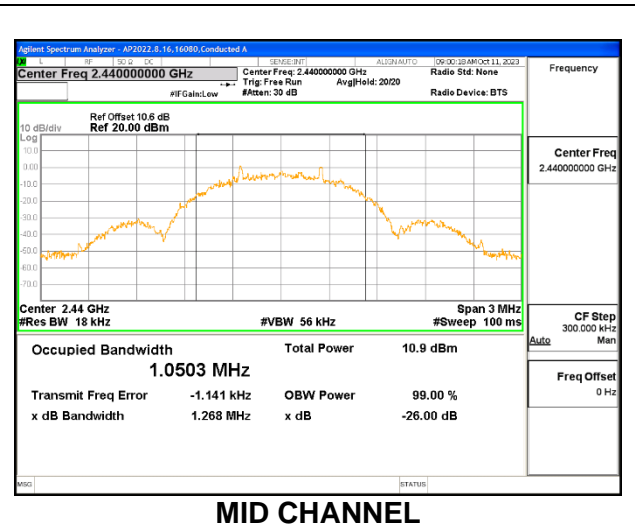
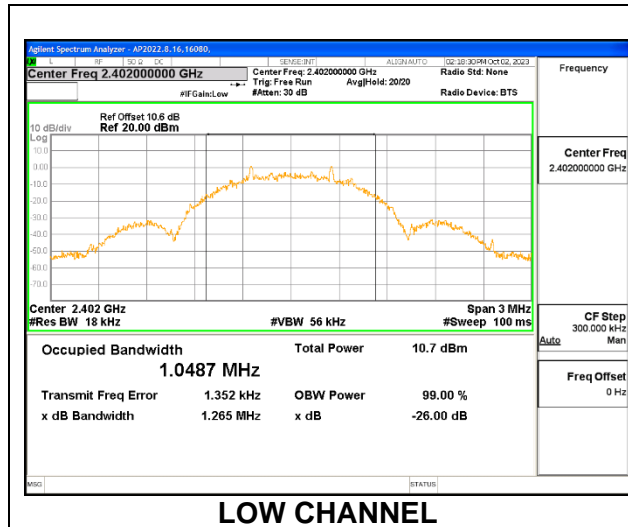
**BLE (125kbps):**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0705
Middle	2440	1.0799
High	2480	1.0746



**BLE (500kpbs):**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0487
Middle	2440	1.0503
High	2480	1.0594



### **9.3. 6 dB BANDWIDTH**

#### **LIMITS**

FCC §15.247 (a) (2)

RSS-247 5.2 (a)

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

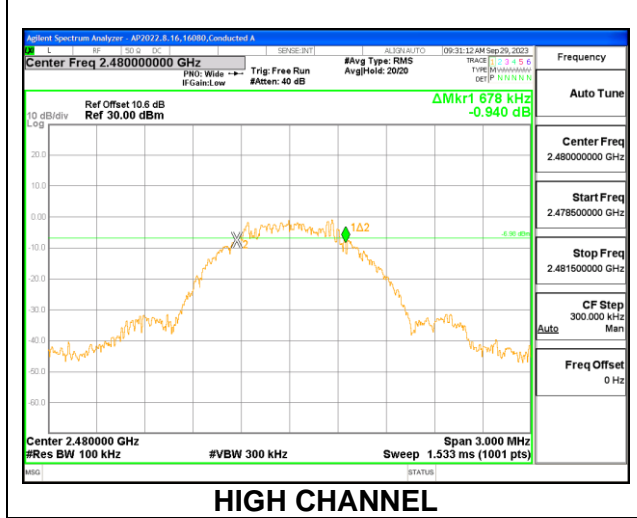
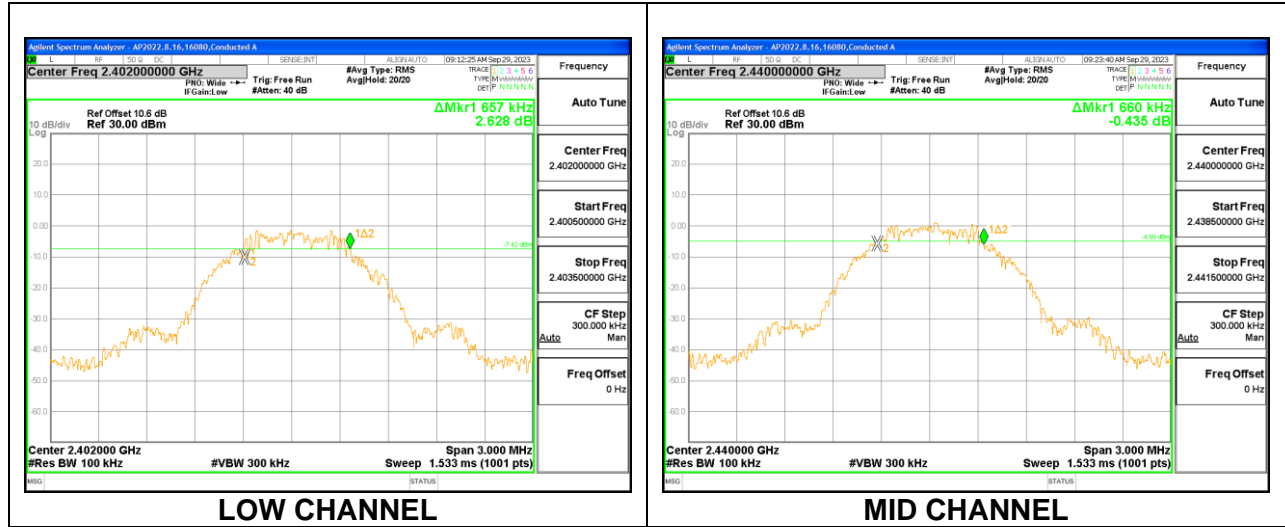
#### **RESULTS**



### 9.3.1. QUALCOMM RADIO

**BLE (1Mbps):**

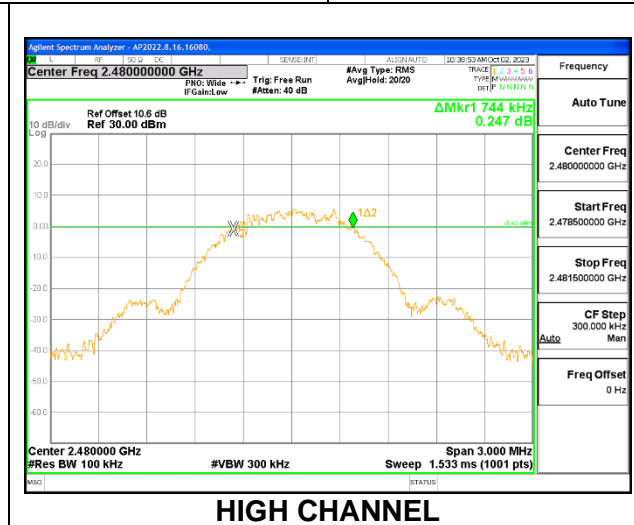
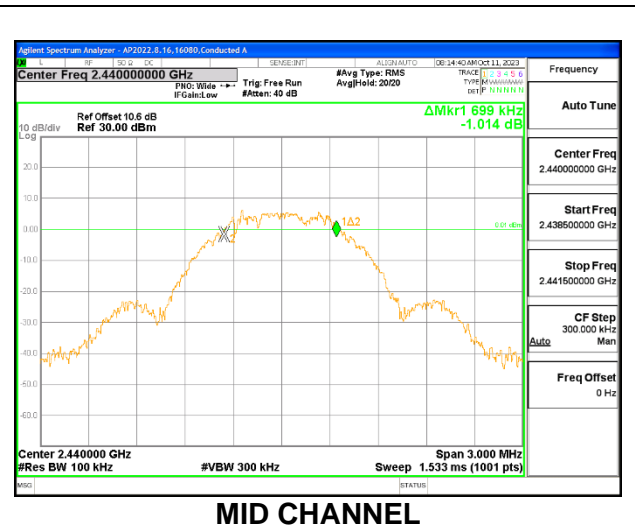
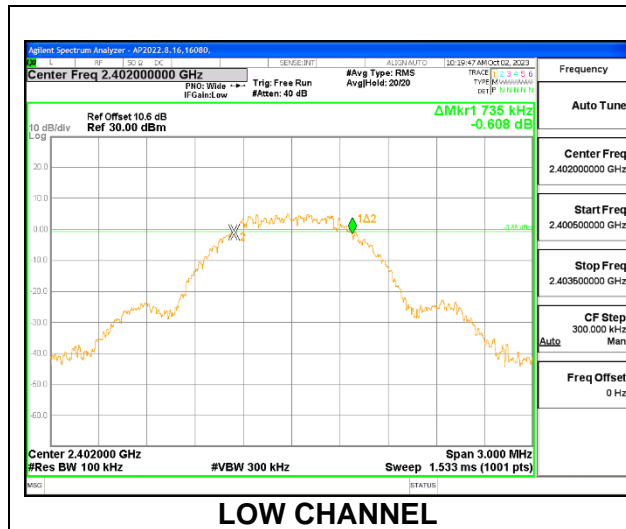
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.657	0.5
Middle	2440	0.660	0.5
High	2480	0.678	0.5



### 9.3.2. RIGHT NORDIC RADIO

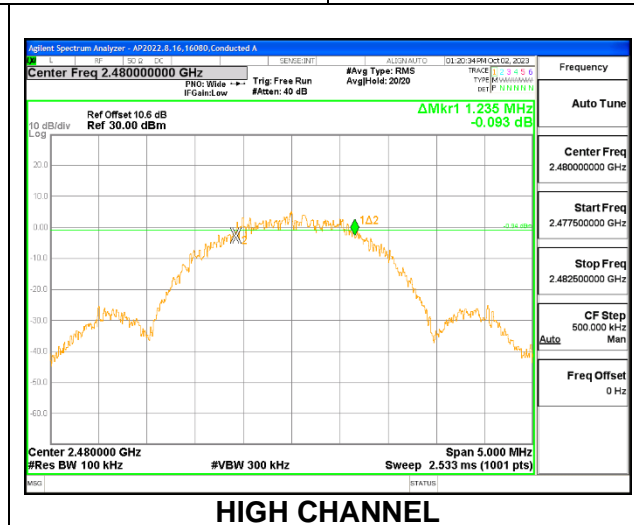
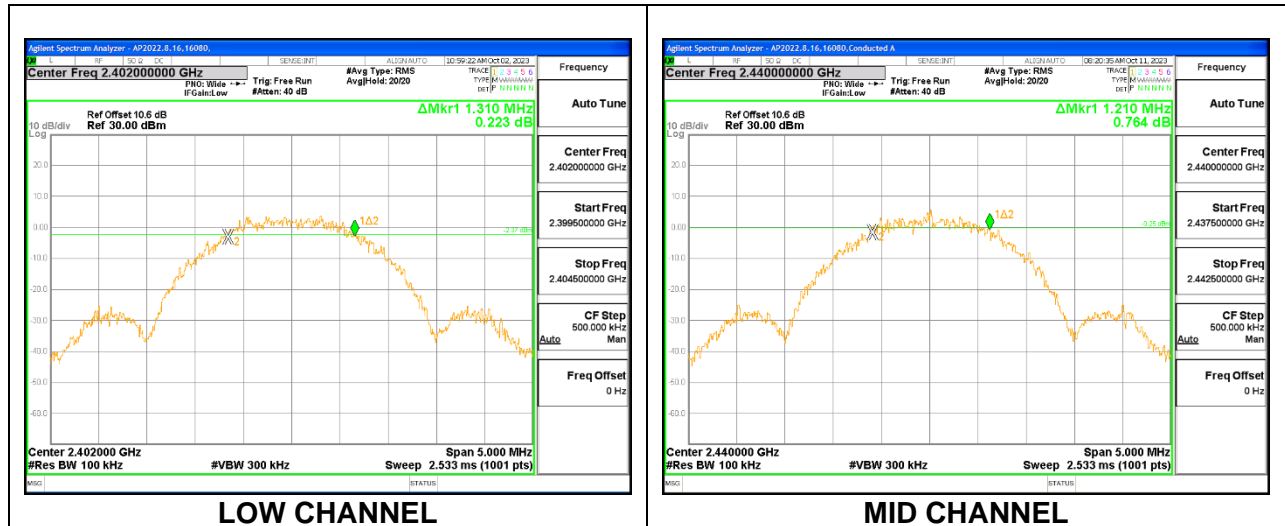
**BLE (1Mbps):**

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.735	0.5
Middle	2440	0.699	0.5
High	2480	0.744	0.5



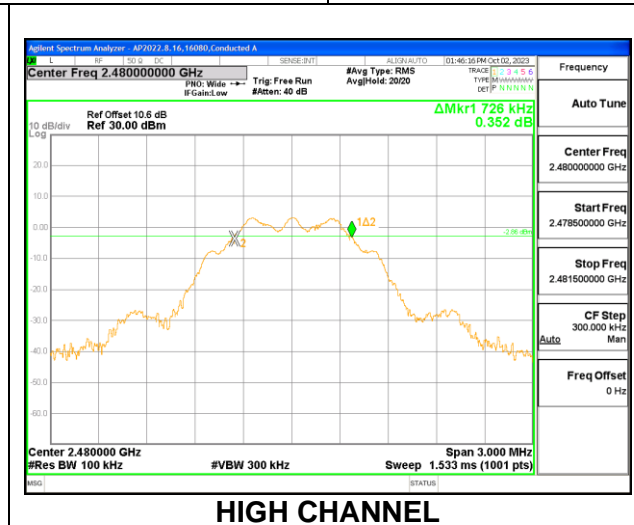
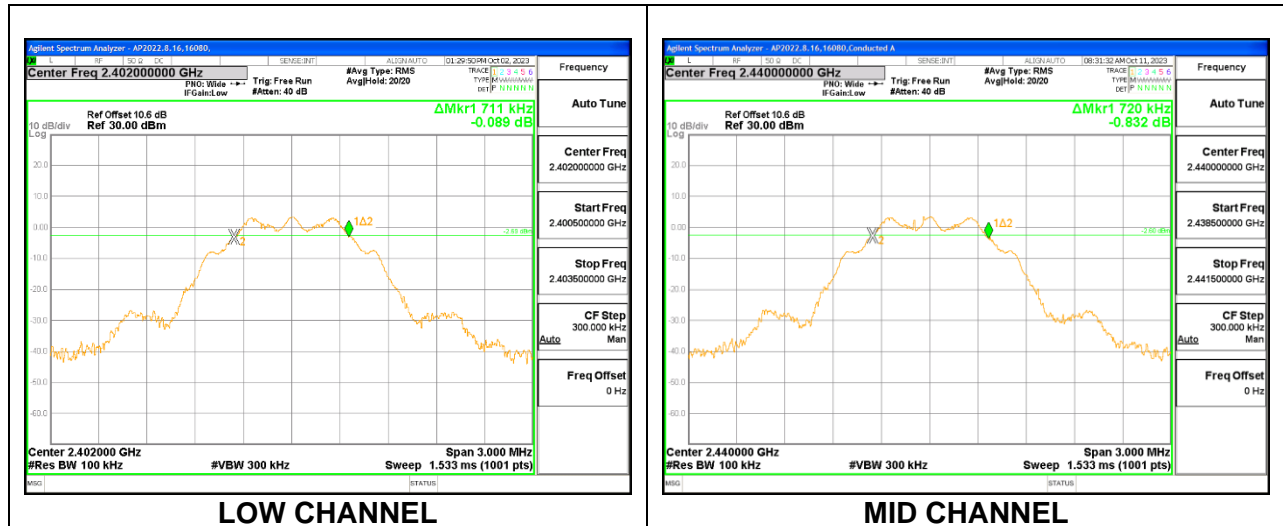
**BLE (2Mbps):**

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	1.310	0.5
Middle	2440	1.210	0.5
High	2480	1.235	0.5



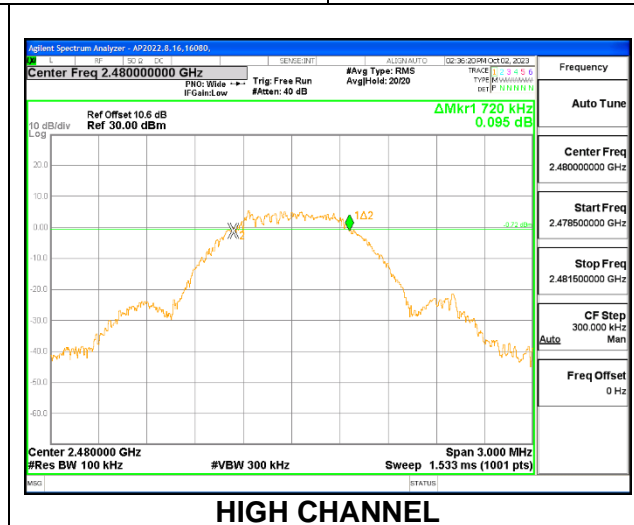
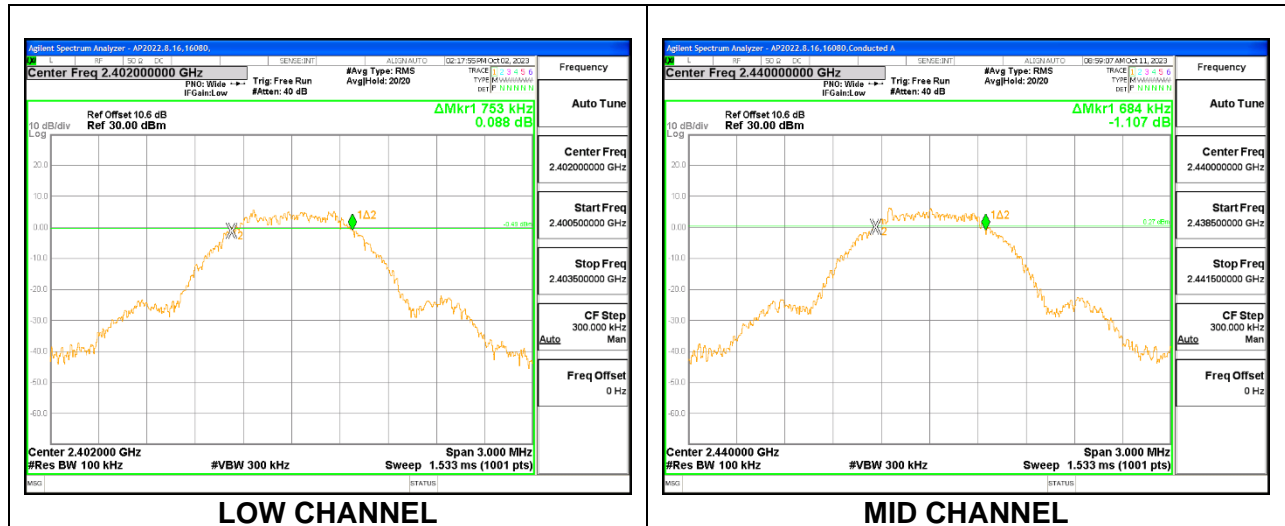
**BLE (125kbps):**

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.711	0.5
Middle	2440	0.720	0.5
High	2480	0.726	0.5



**BLE (500kpbs):**

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.753	0.5
Middle	2440	0.684	0.5
High	2480	0.720	0.5



## 9.4. OUTPUT POWER

### LIMITS

FCC §15.247 (b) (3)

RSS-247 5.4 (d)

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

### 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. Peak output power was read directly from the power meter.

### RESULTS

<b>Tested By:</b>	ZS 16080
<b>Date:</b>	2023-10-05

#### 9.4.1. QUALCOMM RADIO

##### BLE (1Mbps):

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-0.08	30	-30.08
Middle	2440	1.83	30	-28.17
High	2480	0.26	30	-29.74

**9.4.2. RIGHT NORDIC RADIO**

**BLE (1Mbps):**

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	6.46	30	-23.54
Middle	2440	6.54	30	-23.46
High	2480	6.50	30	-23.50

**BLE (2Mbps):**

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	6.60	30	-23.40
Middle	2440	6.66	30	-23.34
High	2480	6.62	30	-23.38

**BLE (125kbps):**

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	6.58	30	-23.42
Middle	2440	6.65	30	-23.35
High	2480	6.60	30	-23.40

**BLE (500kbps):**

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	6.60	30	-23.40
Middle	2440	6.66	30	-23.34
High	2480	6.60	30	-23.40

## 9.5. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### 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 the power meter.

### RESULTS

<b>Tested By:</b>	ZS 16080
<b>Date:</b>	2023-10-05

#### 9.5.1. QUALCOMM RADIO

##### BLE (1Mbps):

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>AV power (dBm)</b>
Low	2402	-0.76
Middle	2440	0.80
High	2480	-0.32



**9.5.2. RIGHT NORDIC RADIO:**

**BLE (1Mbps):**

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>AV power (dBm)</b>
Low	2402	6.39
Middle	2440	6.47
High	2480	6.43

**BLE (2Mbps):**

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>AV power (dBm)</b>
Low	2402	6.45
Middle	2440	6.59
High	2480	6.54

**BLE (125kbps):**

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>AV power (dBm)</b>
Low	2402	6.49
Middle	2440	6.57
High	2480	6.52

**BLE (500kbps):**

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>AV power (dBm)</b>
Low	2402	6.52
Middle	2440	6.57
High	2480	6.54

## **9.6. POWER SPECTRAL DENSITY**

### **LIMITS**

FCC §15.247 (e)

RSS-247 (5.2) (b)

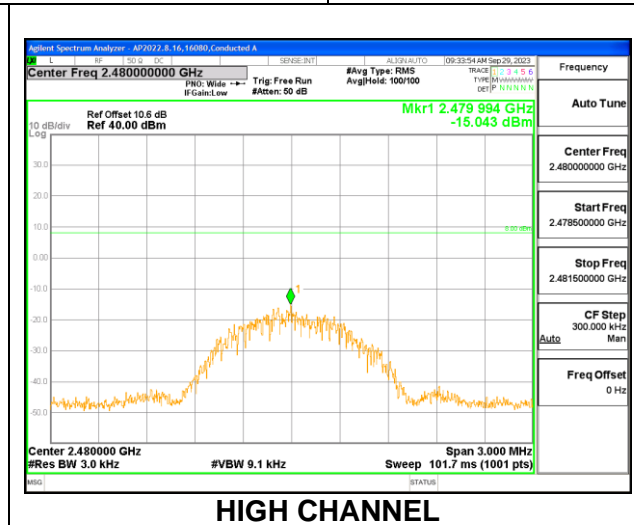
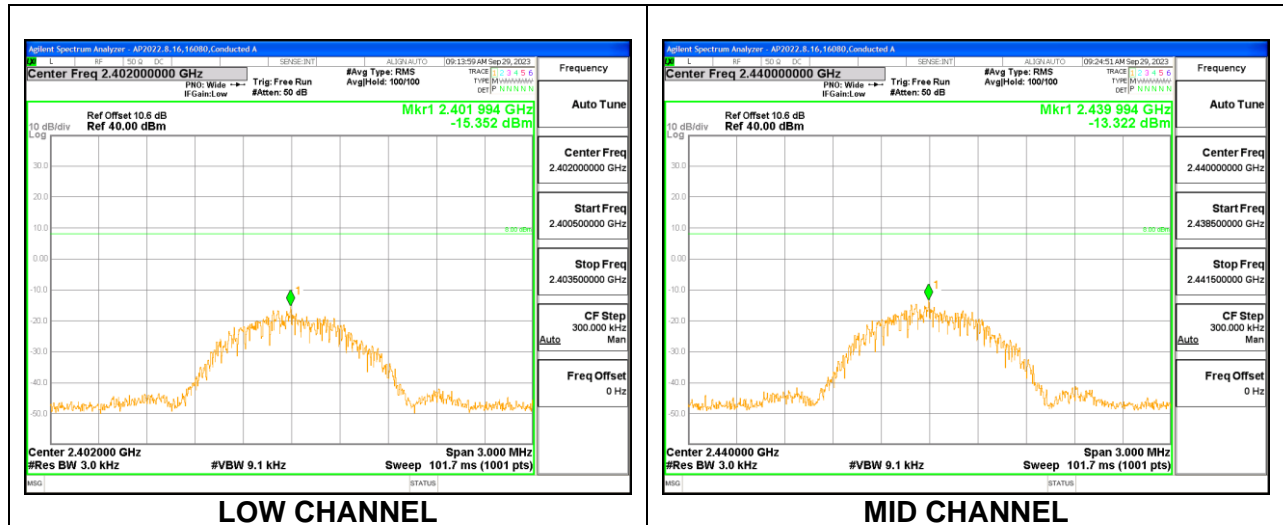
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### **RESULTS**

### 9.6.1. QUALCOMM RADIO

#### BLE (1Mbps):

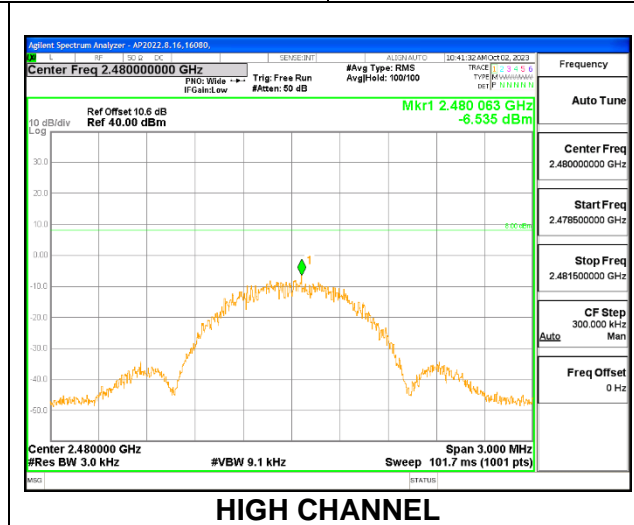
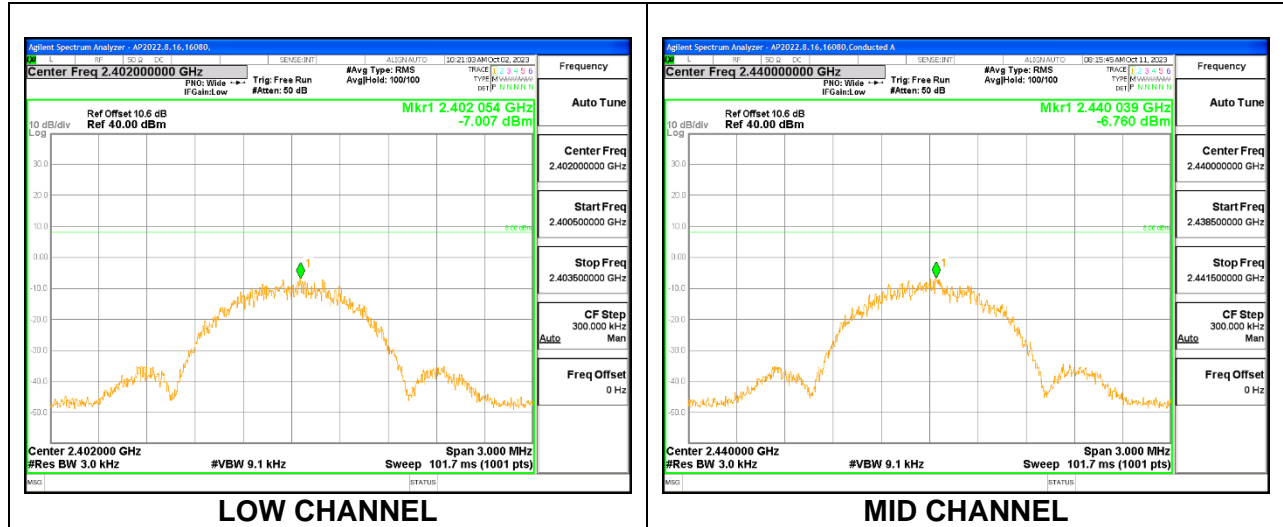
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-15.352	8	-23.352
Middle	2440	-13.322	8	-21.322
High	2480	-15.043	8	-23.043



### 9.6.2. RIGHT NORDIC RADIO

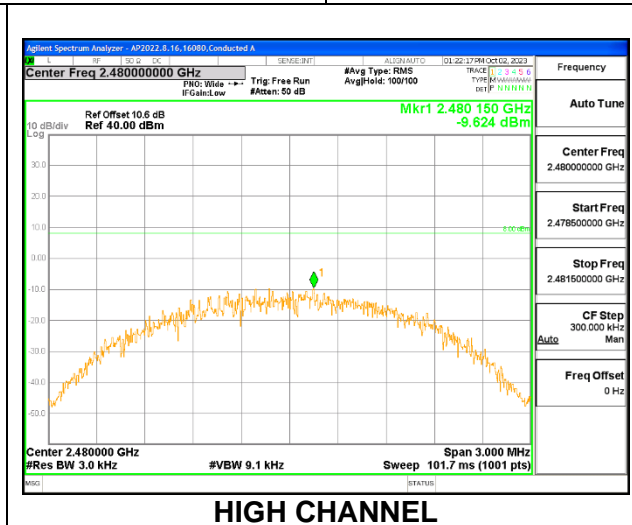
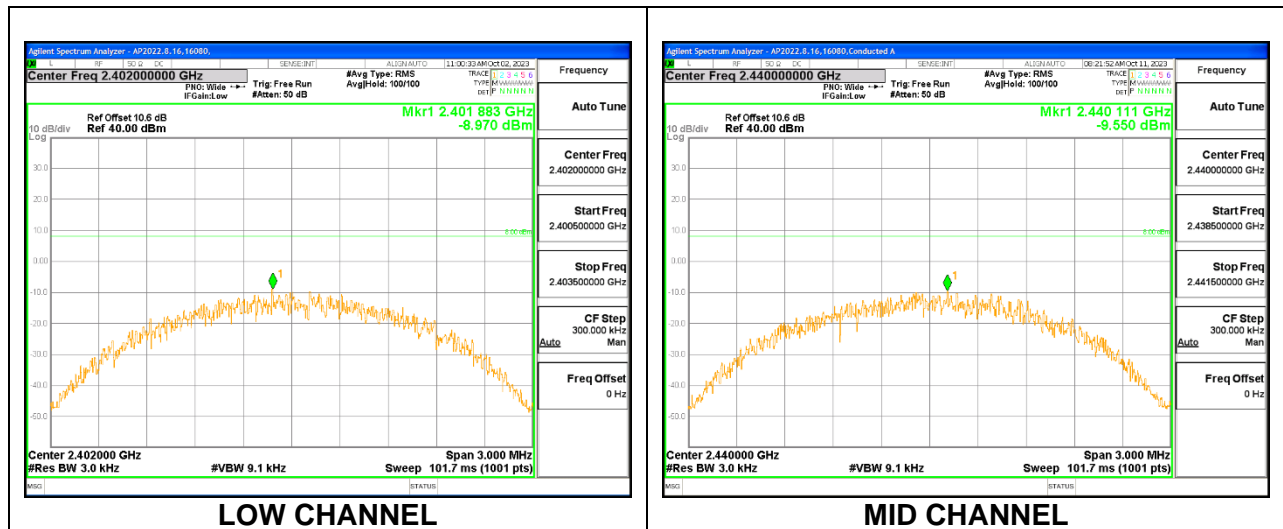
#### BLE (1Mbps):

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-7.007	8	-15.007
Middle	2440	-6.760	8	-14.760
High	2480	-6.535	8	-14.535



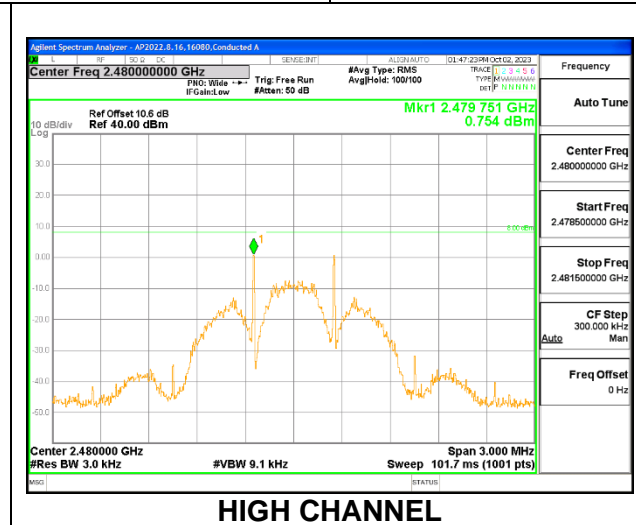
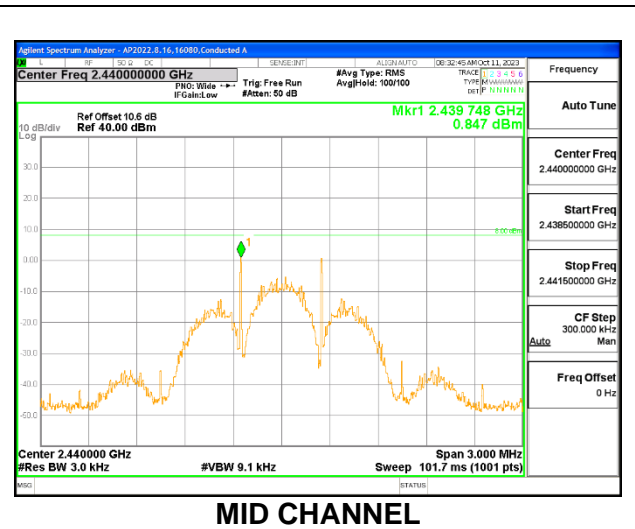
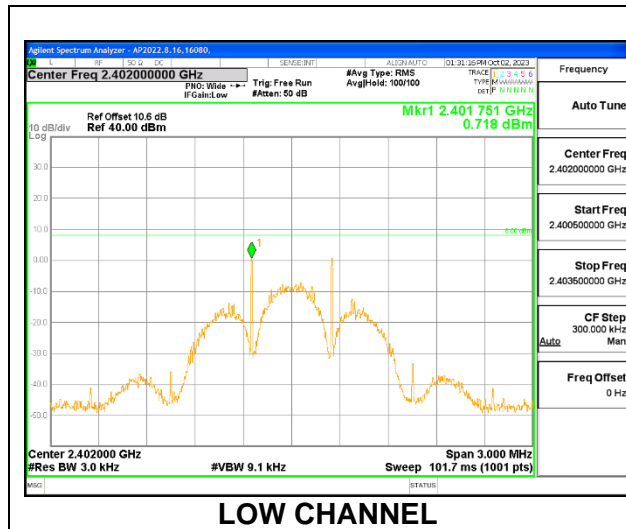
**BLE (2Mbps):**

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-8.970	8	-16.970
Middle	2440	-9.550	8	-17.550
High	2480	-9.624	8	-17.624



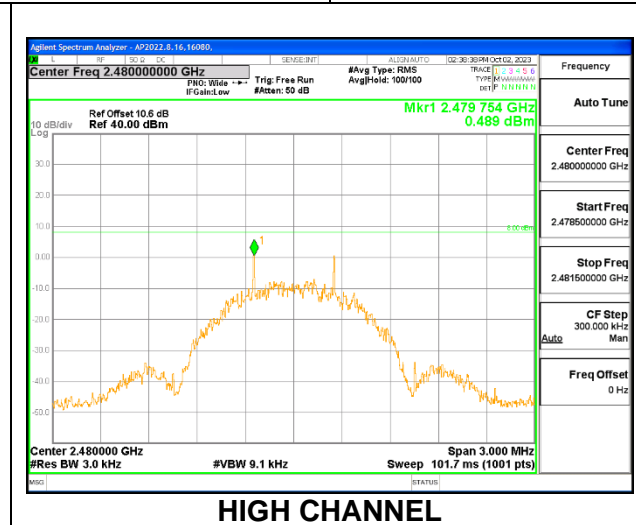
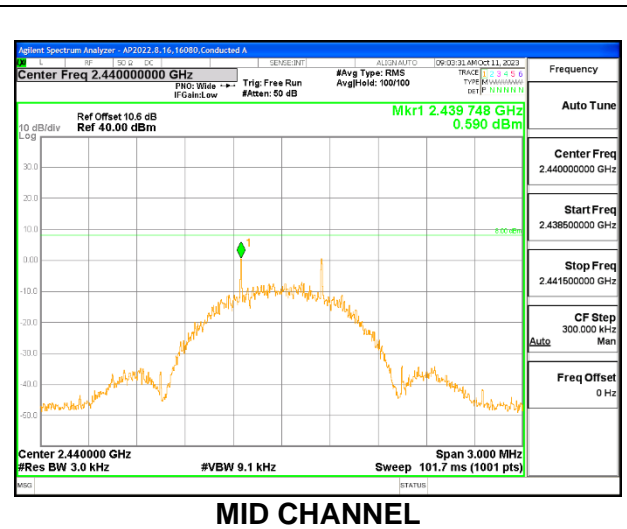
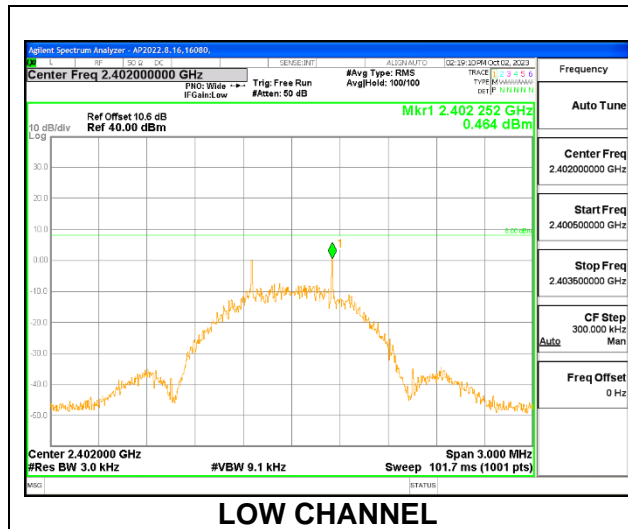
**BLE (125kbps):**

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	0.72	8	-7.28
Middle	2440	0.85	8	-7.15
High	2480	0.75	8	-7.25



**BLE (500kpbs):**

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	0.464	8	-7.536
Middle	2440	0.590	8	-7.410
High	2480	0.489	8	-7.511



## **9.7. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

FCC §15.247 (d)

RSS-247 5.5

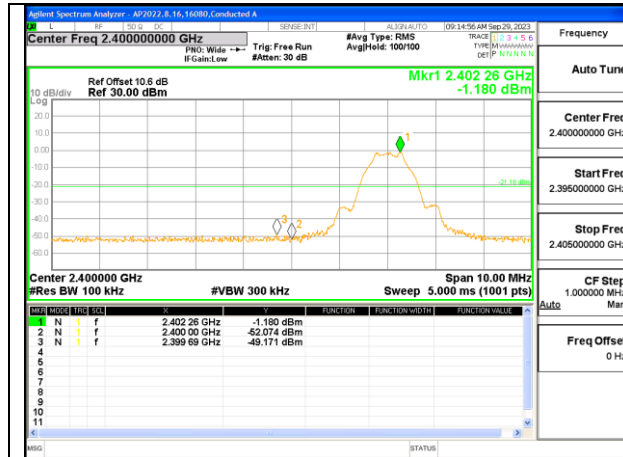
Output power was measured based on the use of a peak measurement; therefore the required attenuation is 20 dB.

### **RESULTS**

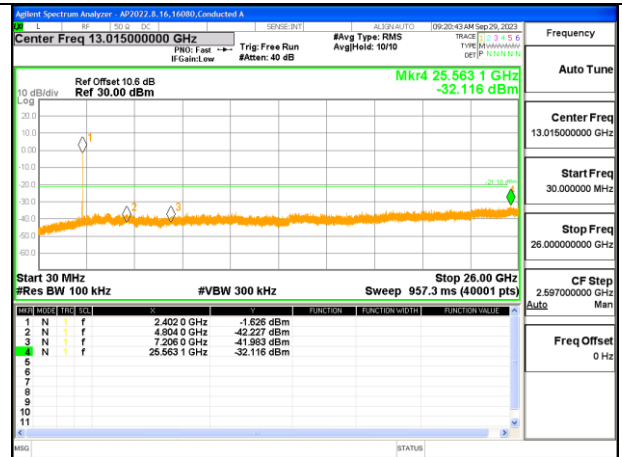


### 9.7.1. QUALCOMM RADIO

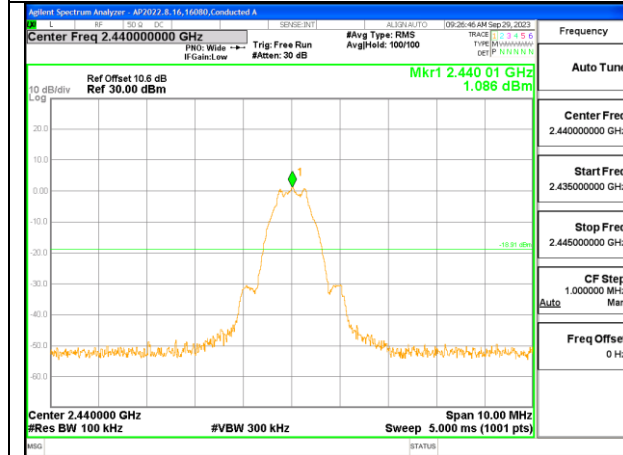
#### BLE (1Mbps):



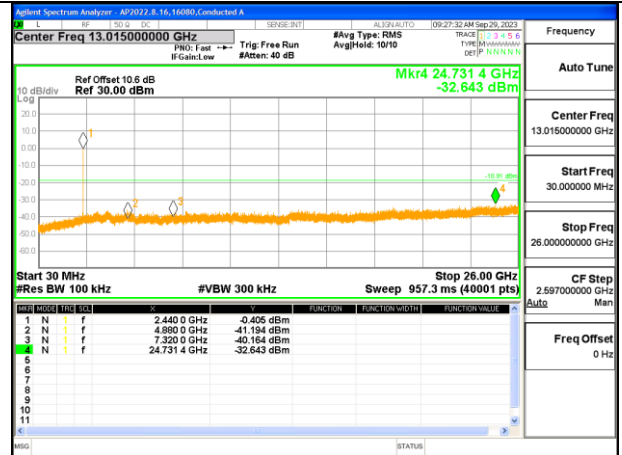
**LOW CHANNEL BANDEDGE**



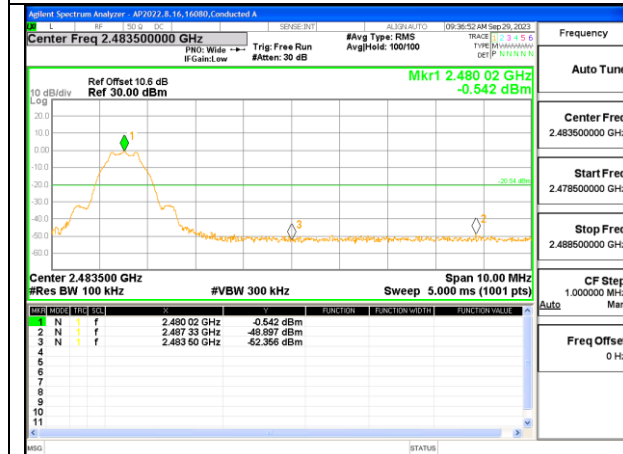
**OUT-OF-BAND LOW CHANNEL**



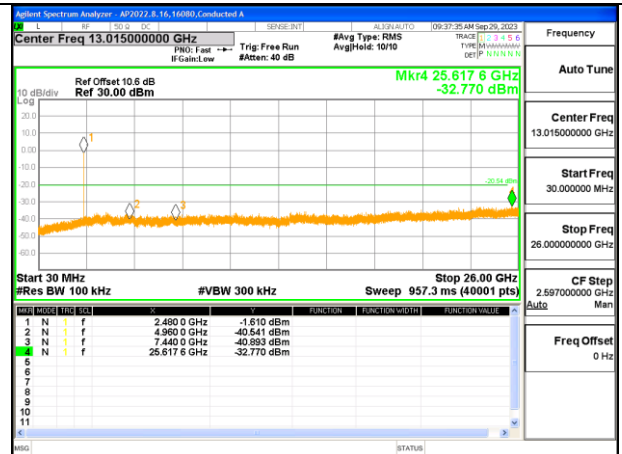
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**



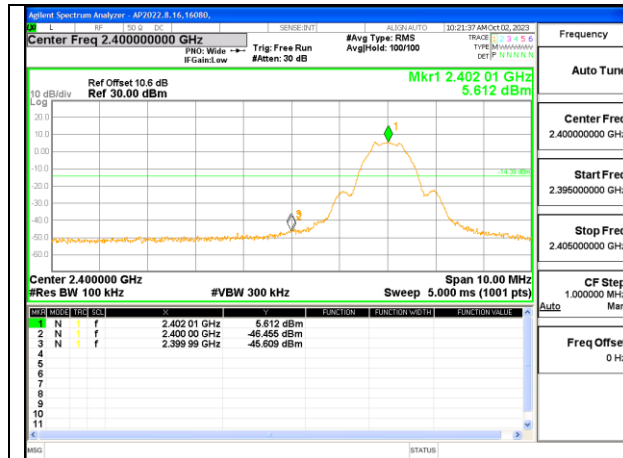
**HIGH CHANNEL BANDEDGE**



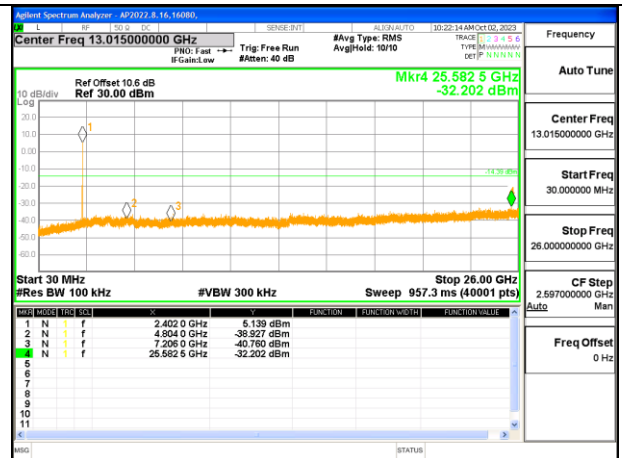
**OUT-OF-BAND HIGH CHANNEL**

## 9.7.2. RIGHT NORDIC RADIO

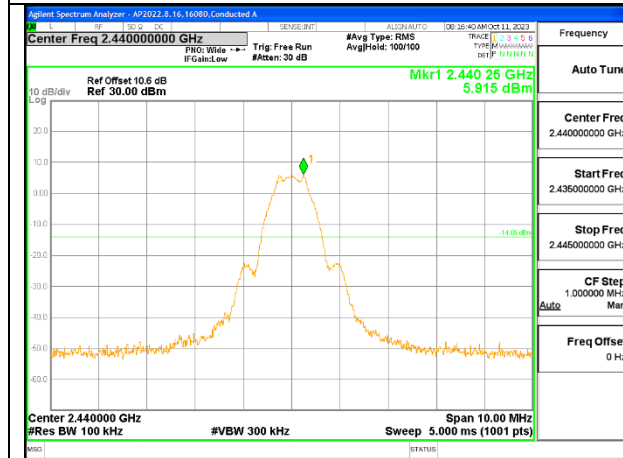
### BLE (1Mbps):



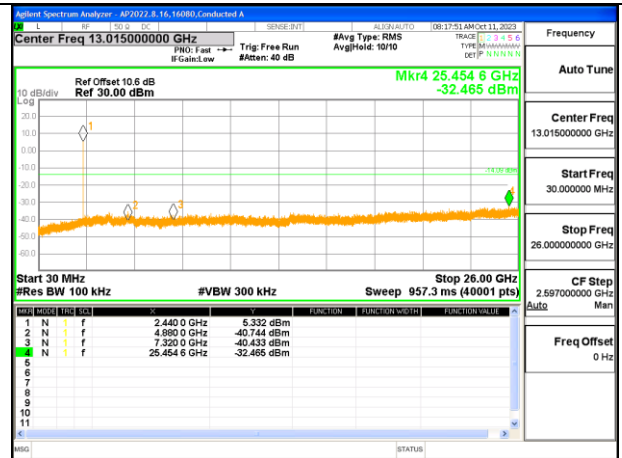
LOW CHANNEL BANDEDGE



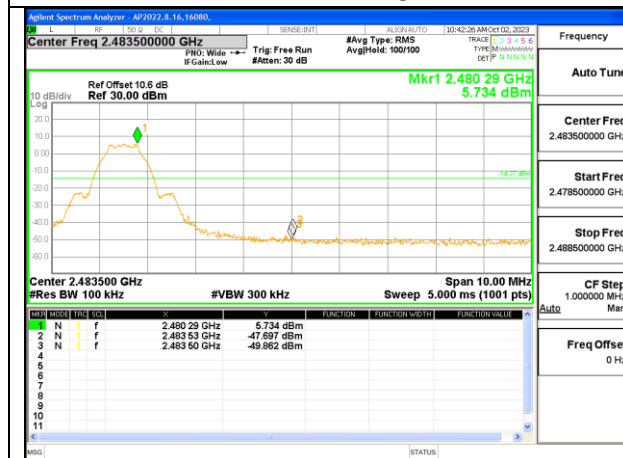
OUT-OF-BAND LOW CHANNEL



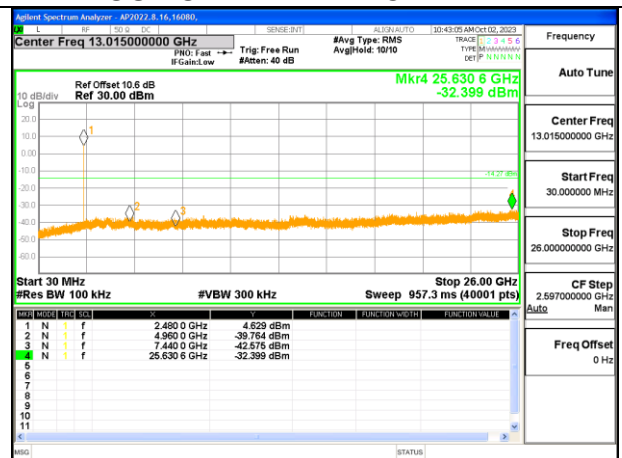
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

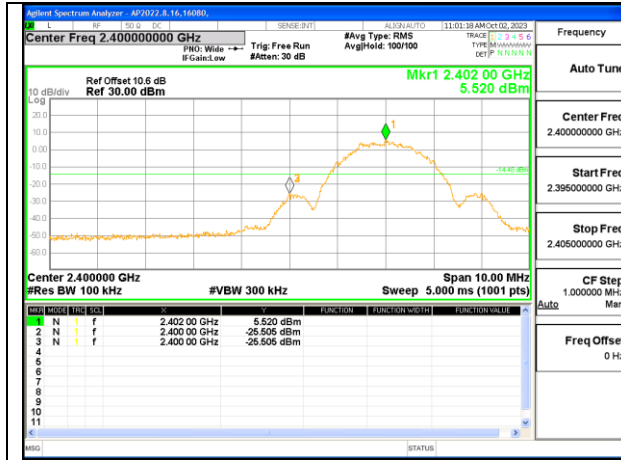


HIGH CHANNEL BANDEDGE

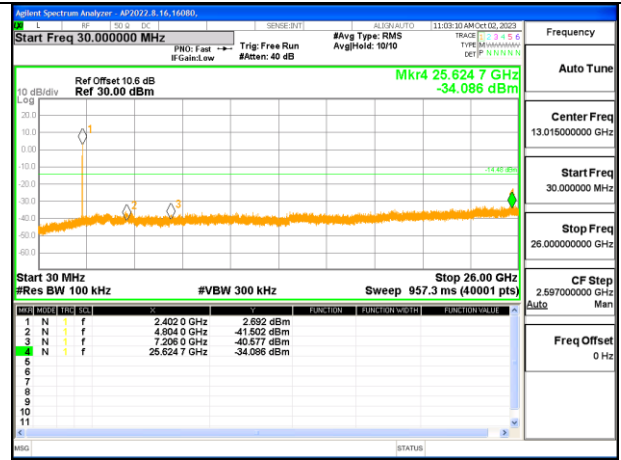


OUT-OF-BAND HIGH CHANNEL

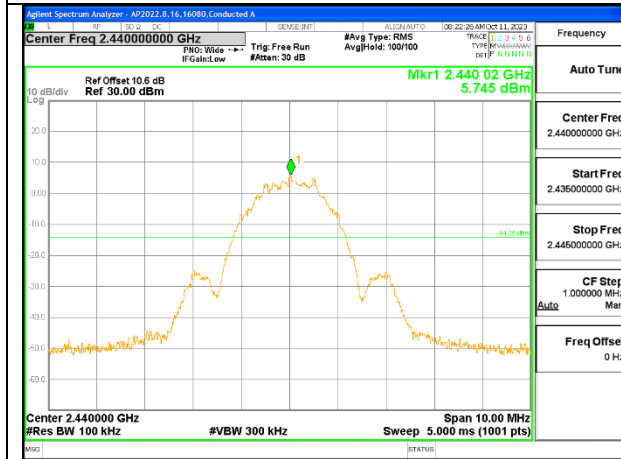
**BLE (2Mbps):**



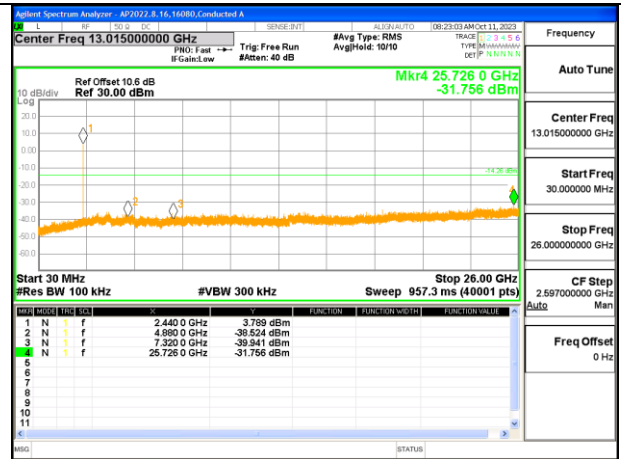
**LOW CHANNEL BANDEDGE**



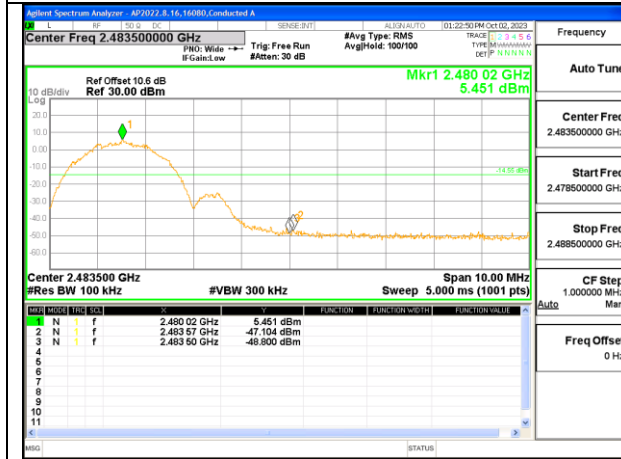
**OUT-OF-BAND LOW CHANNEL**



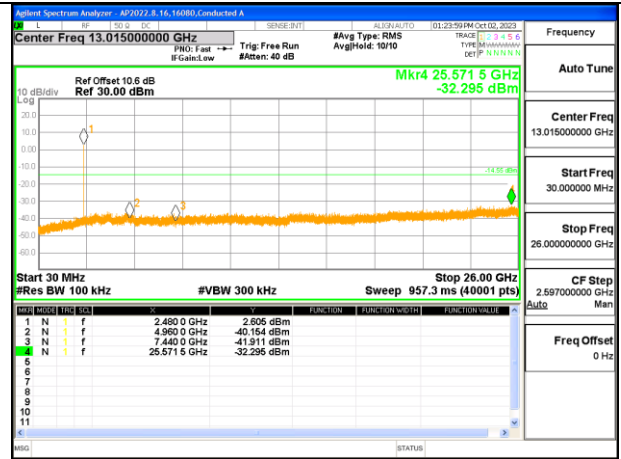
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**

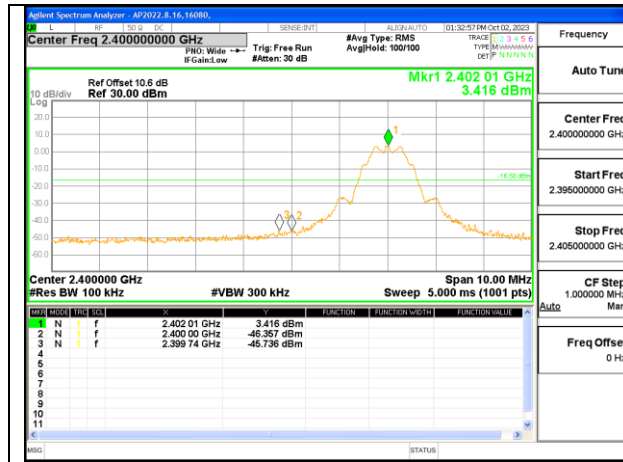


**HIGH CHANNEL BANDEDGE**

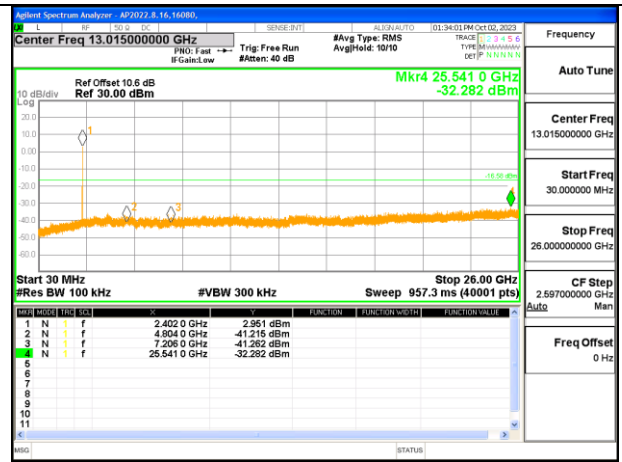


**OUT-OF-BAND HIGH CHANNEL**

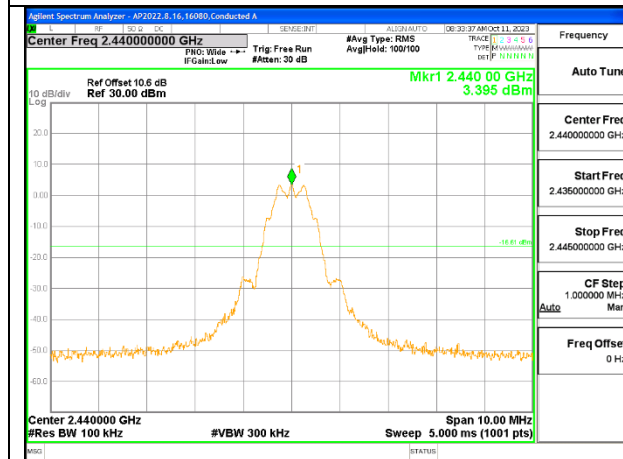
**BLE (125kbps):**



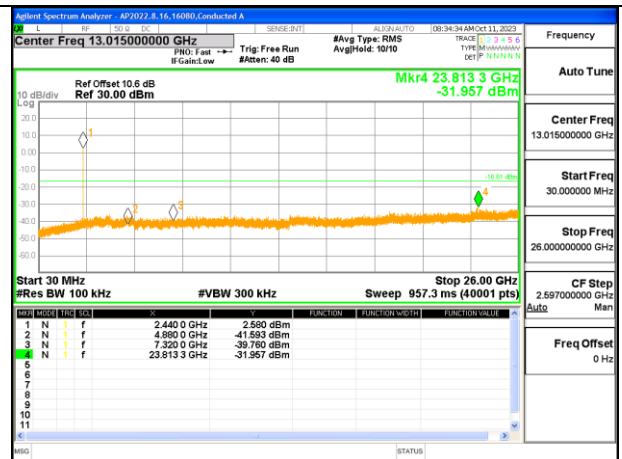
**LOW CHANNEL BANDEDGE**



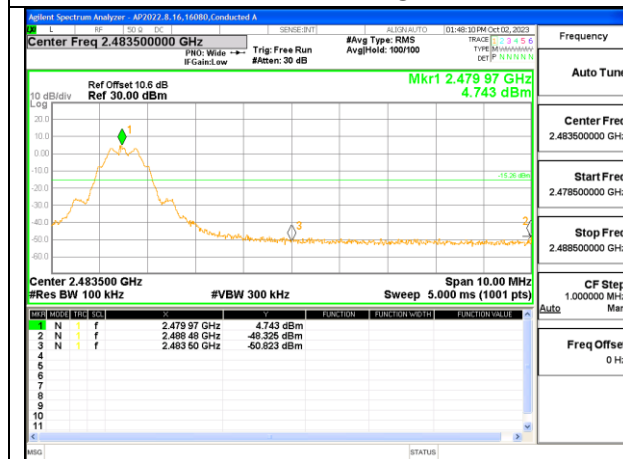
**OUT-OF-BAND LOW CHANNEL**



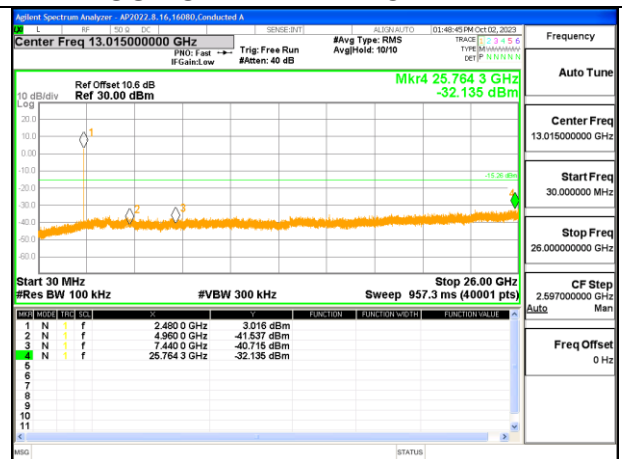
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**

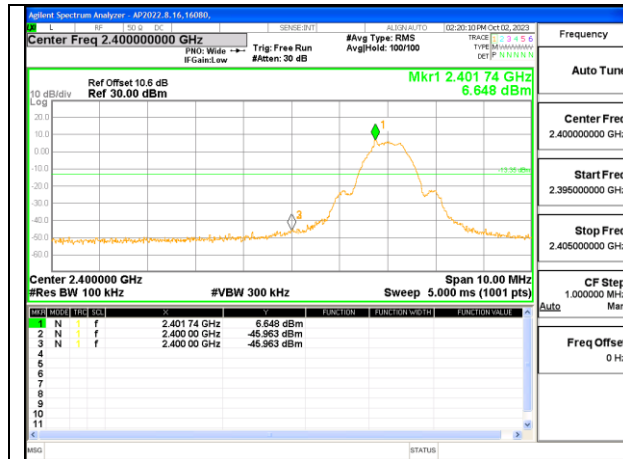


**HIGH CHANNEL BANDEDGE**

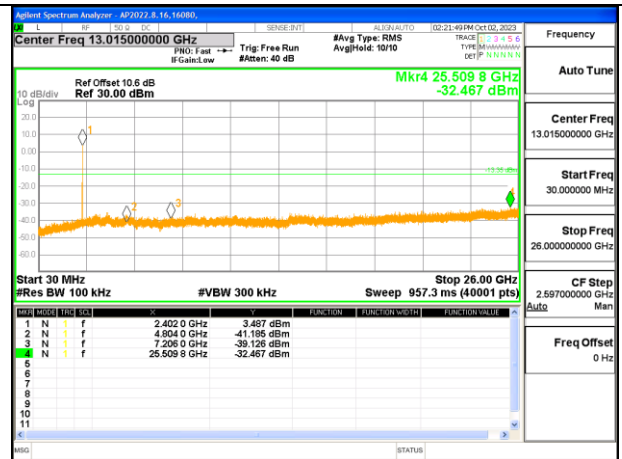


**OUT-OF-BAND HIGH CHANNEL**

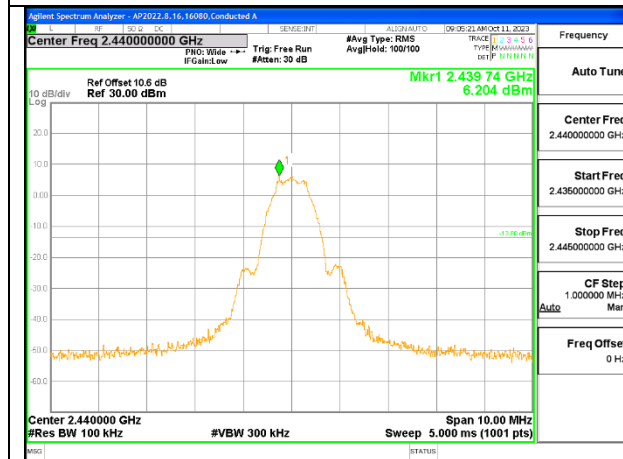
**BLE (500kbps):**



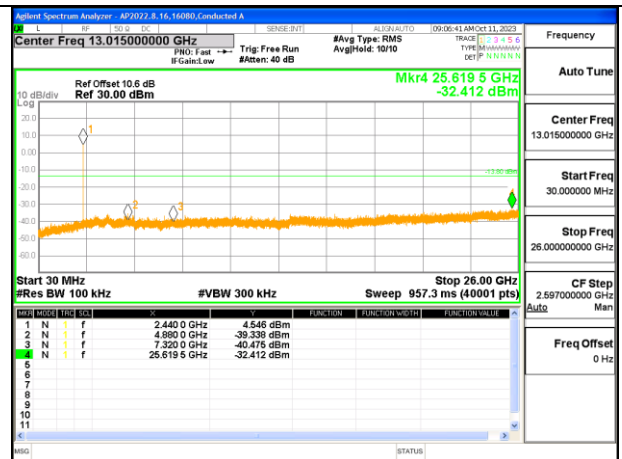
**LOW CHANNEL BANDEDGE**



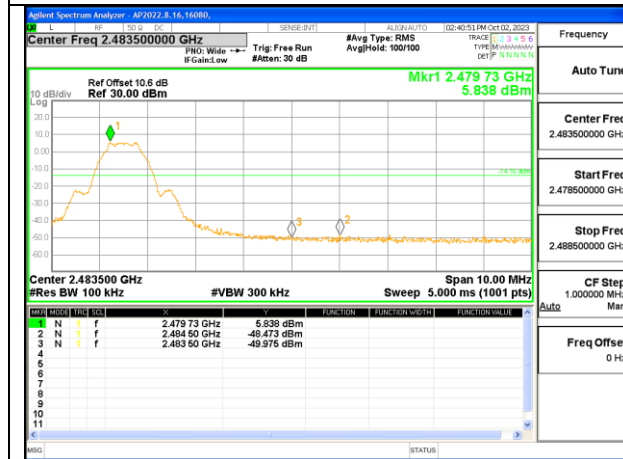
**OUT-OF-BAND LOW CHANNEL**



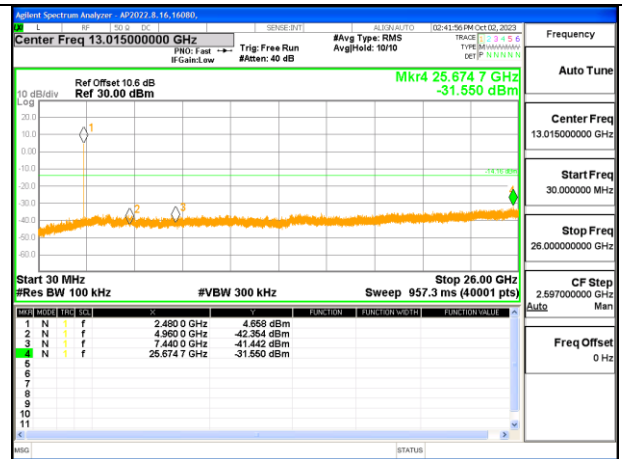
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**



**HIGH CHANNEL BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL**