

TEST REPORT

Report Number: R15626916-E2

Applicant : Garmin International Inc.
1200 East 151st Street
Olathe, KS 66062-3426, USA

Model : A05001

FCC ID : IPH-05001

IC : 1792A-05001

EUT Description : Portable Digital Transceiver

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
ISED RSS-247 ISSUE 4
ISED RSS-GEN ISSUE 5 + A1 + A2

Date Of Issue:

2025-08-19

Prepared by:

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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2025-08-15	Initial Issue	Chandler Stanley
V2	2025-08-19	Revised EUT FW Version	Charles Moody

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Garmin International Inc.
1200 East 151st Street
Olathe, KS 66062-3426, USA

EUT DESCRIPTION: Portable Digital Transceiver

MODEL: A05001

SERIAL NUMBER: 3603763011 / 3603759933 / 3603763014

SAMPLE RECEIPT DATE: 2025-05-02, 2025-06-17, and 2025-06-27

DATE TESTED: 2025-05-05 to 2025-08-15

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 4	Complies
ISED RSS-GEN Issue 5 + A1 + A2	Complies

UL LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released
For UL LLC By:



Mike Antola
Senior Staff Engineer
Consumer, Medical and IT Segment
UL LLC

Prepared By:



Chandler Stanley
Engineer
Consumer, Medical and IT Segment
UL LLC

2. TEST RESULTS SUMMARY

This report contains info provided by the customer which can impact the validity of results. UL LLC 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/info provided by the customer:

- 1) Antenna gain and type (see section 6.3)
- 2) Worst-case data rates (see section 6.5)

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 6.3.1 (a)	6dB BW	Compliant	None.
15.247 (b) (3)	RSS-247 6.3.2	Output Power		
See Comment		Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	RSS-247 6.3.1 (b)	PSD	Compliant	None.
15.247 (d)	RSS-247 6.6	Conducted Spurious Emissions		
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions		
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions		

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024, 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 4.

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification # 0751.06, 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: 12 Laboratory Dr Durham, NC 27713, U.S.A	US0067	2180C	825374
<input checked="" type="checkbox"/>	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A		27265	

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	UNCERTAINTY
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	1.22%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	6.01 dB
Conducted Emissions (0.150-30MHz) - LISN	3.40 dB
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	1.70%
Time	3.39%

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 an portable digital transceiver with BT, BLE, 802.11b/g/n 2.4GHz WLAN, 802.11a 5GHz WLAN, LTE Cat M1, and Global Navigation Satellite System (GNSS) receiver. This report covers testing on the BLE and 2.4 GHz WLAN radios.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2472	802.11b	19.94	98.68
2412 - 2472	802.11g	23.25	211.35
2412 - 2472	802.11n HT20	23.46	221.82
2402 - 2480	BLE 1Mbps	3.54	2.26
2404 - 2478	BLE 2Mbps	3.19	2.08

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna's gain and type, as provided by the manufacturer are as follows:
The radio utilizes an inverted F antenna, with a maximum gain of 1.27 dBi.

6.4. SOFTWARE AND FIRMWARE

SW Ver 63.23

6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emissions were performed with the EUT set to transmit at the channel with highest PSD as worst-case scenario.

Apart from conducted power measurements for 2.4 WLAN, all other conducted measurements were taken at the mid channel power setting (highest) for all channels.

Power is not distributed equally among all channels and therefore radiated spurious emissions between 1GHz and 18GHz were performed on mid channel and the highest power low and high channel. Band edge scans were performed on all inner/outer channels up to mid channel power.

The fundamental of the EUT was investigated in three orthogonal axes, X, Y, and Z. The worst-case orientation was determined to be the X-orientation. Therefore, all testing was performed with the EUT in the X-orientation.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adaptor	Garmin/Phihong	AQ27A-59CFA	N/A	N/A
Laptop	Lenovo	T14	PF4FKVY8	N/A

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Proprietary	1	4 pin Proprietary	Non-Shielded	<3m	Used for charging only

TEST SETUP

EUT was configured using its own built-in push buttons prior to testing. A support laptop was connected to configure power settings prior to testing. For final emissions testing, the EUT was connected to AC mains.

SETUP DIAGRAMS

Please refer to R15626916-EP1 for setup diagrams

7. MEASUREMENT METHOD

On Time and Duty Cycle: ANSI C63.10-2020 Section 11.6

6 dB BW: ANSI C63.10-2020 Subclause -11.8.2

Occupied BW (99%): ANSI C63.10-2020 Section 6.9.3

Output Power: ANSI C63.10-2020 Subclause -11.9.1.2 Method PKPM1 Peak-reading power meter
ANSI C63.10-2020 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)

PSD: ANSI C63.10-2020 Subclause -11.10.2 Method PKPSD (peak PSD)

Conducted emissions non-restricted frequency bands: ANSI C63.10-2020 Subclause -11.11 and 6.10.4

Radiated emissions restricted frequency bands: ANSI C63.10-2020 Subclause -11.12.1 and 6.10.5

General radiated emissions: ANSI C63.10 Subclause - 6.3-6.6

AC Power-line conducted emissions: ANSI C63.10-2020, Section 6.2.

8. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
Conducted Room 1					
90411	Spectrum Analyzer	Keysight Technologies	N9030A	2024-08-01	2025-08-01
90416	Spectrum Analyzer	Keysight Technologies	N9030A	2025-7-31	2026-07-31
214284	Spectrum Analyzer	Rohde & Schwarz	FSW50	2025-03-14	2026-03-14
179892	Environmental Meter	Fisher Scientific	15-077-963	2024-08-12	2025-08-12
211055	Real-Time Peak Power Sensor 50MHz to 8GHz	Boonton	RTP5000	2024-07-31	2025-07-31
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16	NA	NA
Power Software	Boonton Power Analyzer	Boonton	Version 3.0.13.0	NA	NA
226561	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2025-04-01	2026-04-01

Test Equipment Used - Line-Conducted Emissions – Voltage (Morrisville – Conducted 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2025-04-17	2026-04-17
179892	Environmental Meter	Fisher Scientific	15-077-963	2024-08-12	2025-08-12
80391	LISN, 50-ohm/50-uH, 250uH 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50/250-25-2-01	2024-08-01	2025-08-01
75141	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2024-08-01	2025-08-01
52859	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2025-04-17	2026-04-17
236852	AC Power Source	California instruments	NA	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 1)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz					
65682	Active Loop Antenna	ETS-Lindgren	6502	2023-10-03	2025-10-03
30-1000 MHz					
90629	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2024-01-30	2026-01-30
1-18 GHz					
135143	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2024-02-07	2026-02-07
18-26.5 GHz					
91186	Horn Antenna, 18-26.5GHz	Antenna Research Associates	MWH-1826/B	2024-05-16	2026-05-16
Gain-Loss Chains					
91974	Gain-loss string: 0.009-30MHz	Various	Various	2025-05-31	2026-05-31
91976	Gain-loss string: 25-1000MHz	Various	Various	2025-05-31	2026-05-31
91979	Gain-loss string: 1-18GHz	Various	Various	2025-05-31	2026-05-31
135999	Gain-loss string: 18-40GHz	Various	Various	2025-05-31	2026-05-31
Receiver & Software					
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2024-08-29	2025-08-29
81018	Spectrum Analyzer	Agilent	E4446A	2024-07-31	2025-07-31
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
241205	Environmental Meter	Fisher Scientific	15-077-963	2023-09-05	2025-09-05

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 2)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
1-18 GHz					
88761	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2023-10-05	2025-10-05
Gain-Loss Chains					
91977	Gain-loss string: 1-18GHz	Various	Various	2025-05-31	2026-05-31
Receiver & Software					
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2025-07-29	2026-07-29
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
200540	Environmental Meter	Fisher Scientific	15-077-963	2023-07-19	2025-07-19

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
0.009-30MHz					
135144	Active Loop Antenna	ETS-Lindgren	6502	2024-10-02	2025-10-02
30-1000 MHz					
90628	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2024-01-02	2026-01-02
1-18 GHz					
206211	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2024-04-09	2026-04-09
18-26.5 GHz					
91186	Horn Antenna, 18-26.5GHz	Antenna Research Associates	MWH-1826/B	2024-05-16	2025-05-16
Gain-Loss Chains					
207638	Gain-loss string: 0.009-30MHz	Various	Various	2025-06-13	2026-06-13
207639	Gain-loss string: 25-1000MHz	Various	Various	2025-06-13	2026-06-13
207640	Gain-loss string: 1-18GHz	Various	Various	2025-06-13	2026-06-13
225795	Gain-loss string: 18-40GHz	Various	Various	2025-06-13	2026-06-13
Additional Equipment used					
241204	Environmental Meter	Fisher Scientific	15-077-963	2023-09-05	2025-09-05
Receiver & Software					
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2025-04-21	2026-04-21
81018	Spectrum Analyzer	Agilent	E4446A	2024-07-31	2025-07-31
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

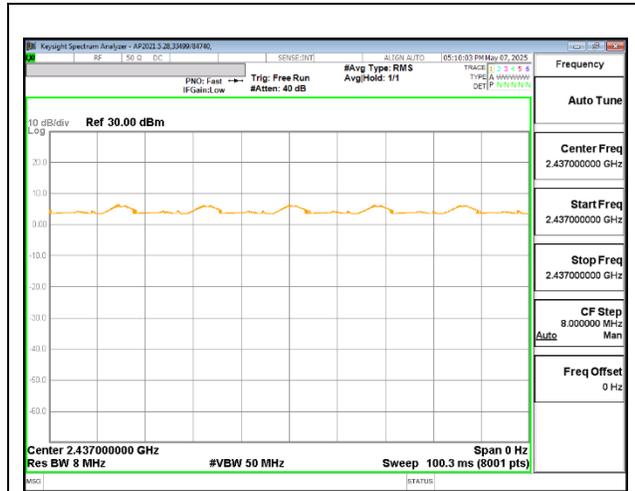
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.11b	100.000	100.000	1.000	100.00	0.00	0.010
802.11g	100.000	100.000	1.000	100.00	0.00	0.010
802.11n HT20	100.000	100.000	1.000	100.00	0.00	0.010
BLE 1 Mbps	100.000	100.000	1.000	100.00	0.00	0.010
BLE 2 Mbps	100.000	100.000	1.000	100.00	0.00	0.010

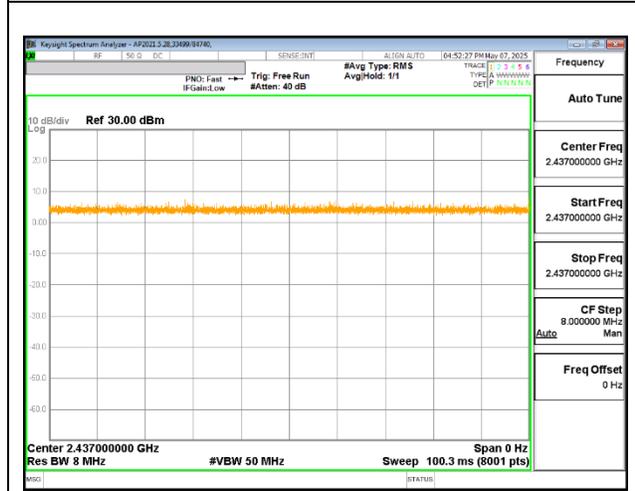
DUTY CYCLE PLOTS



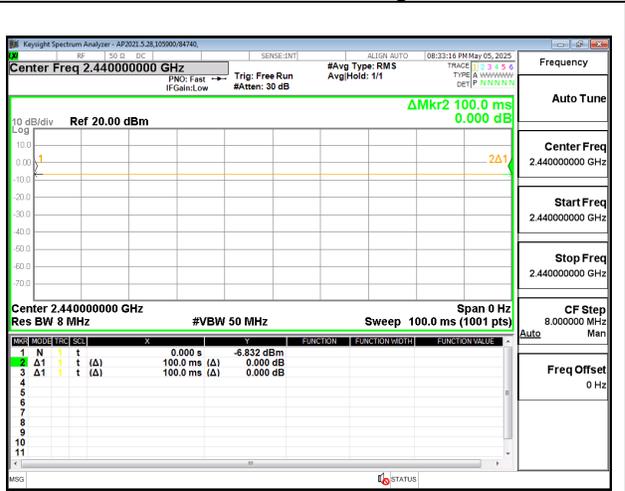
DUTY CYCLE 802.11b MODE



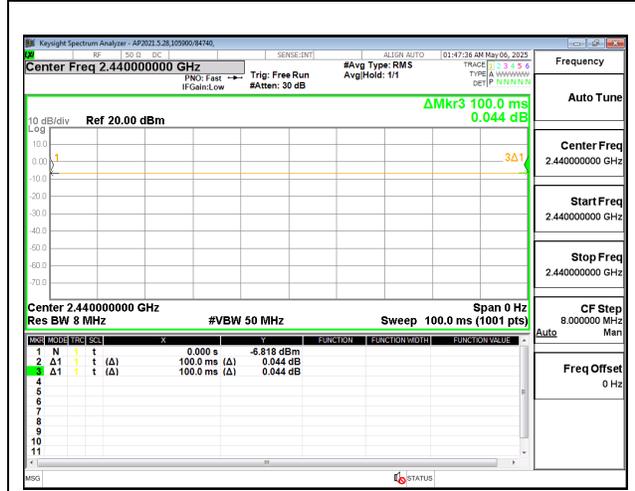
DUTY CYCLE 802.11g MODE



DUTY CYCLE 802.11nHT20 MODE



DUTY CYCLE BLE - 1Mbps MODE



DUTY CYCLE BLE - 2Mbps MODE



9.2. 99% BANDWIDTH

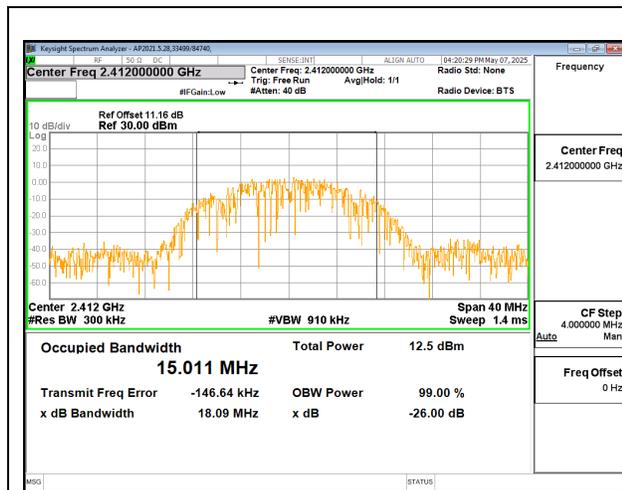
LIMITS

None; for reporting purposes only.

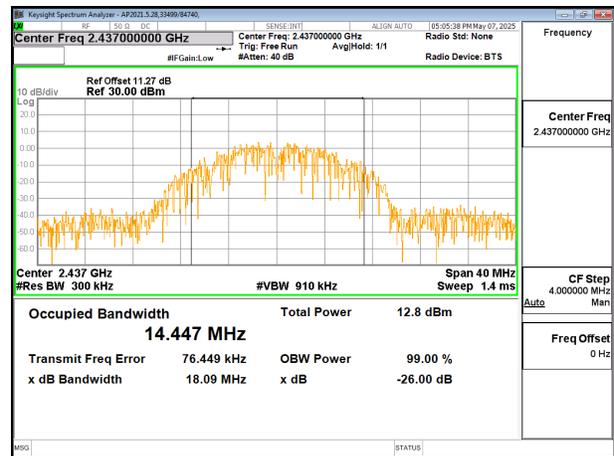
RESULTS

9.2.1. 802.11b MODE

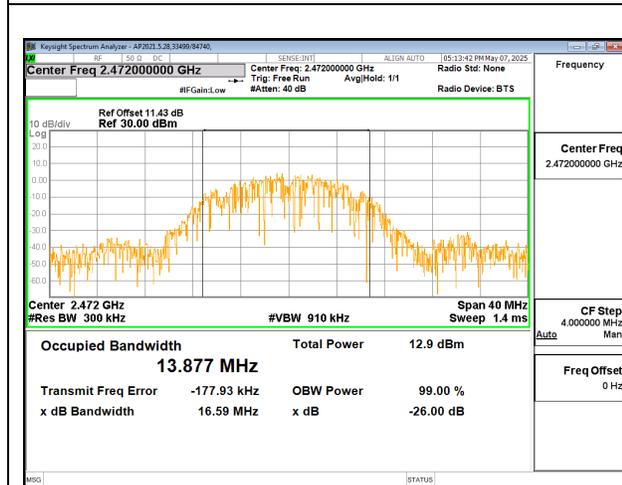
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	15.011
Mid 6	2437	14.447
High 13	2472	13.877



LOW CHANNEL 1



MID CHANNEL 6

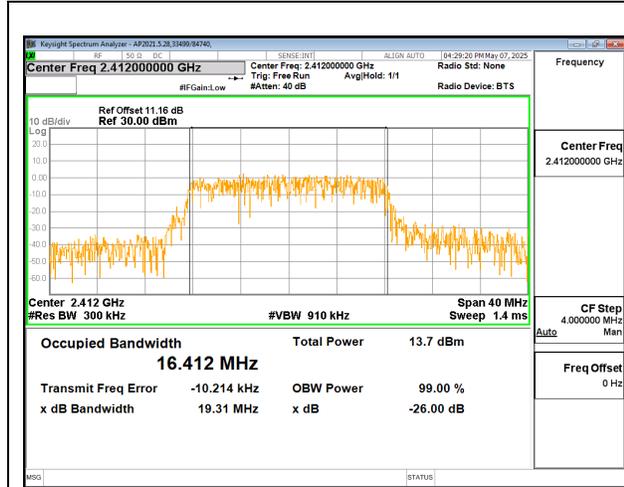


HIGH CHANNEL 13

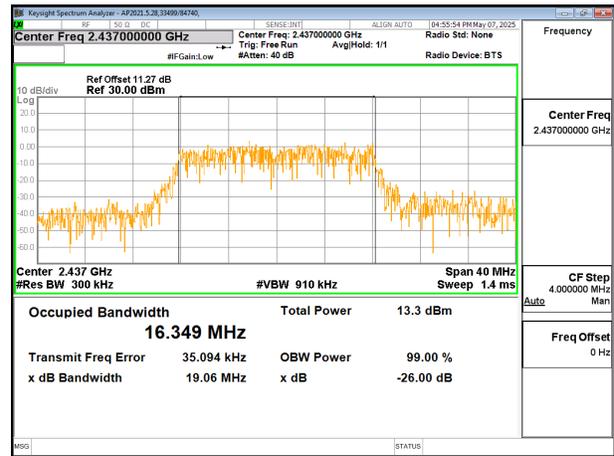
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9.2.2. 802.11g MODE

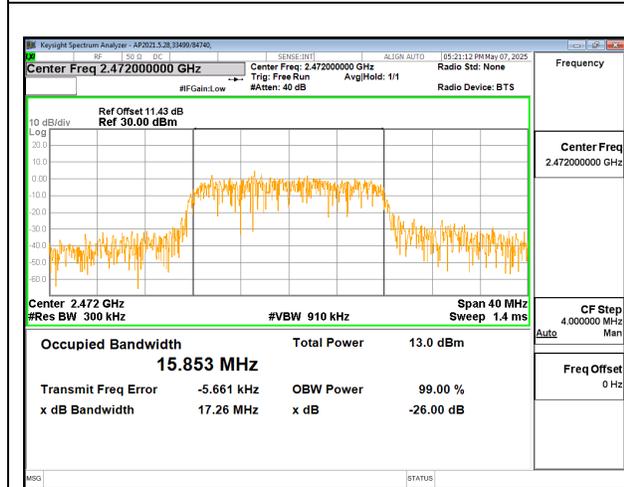
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	16.412
Mid 6	2437	16.349
High 13	2472	15.853



LOW CHANNEL 1



MID CHANNEL 6

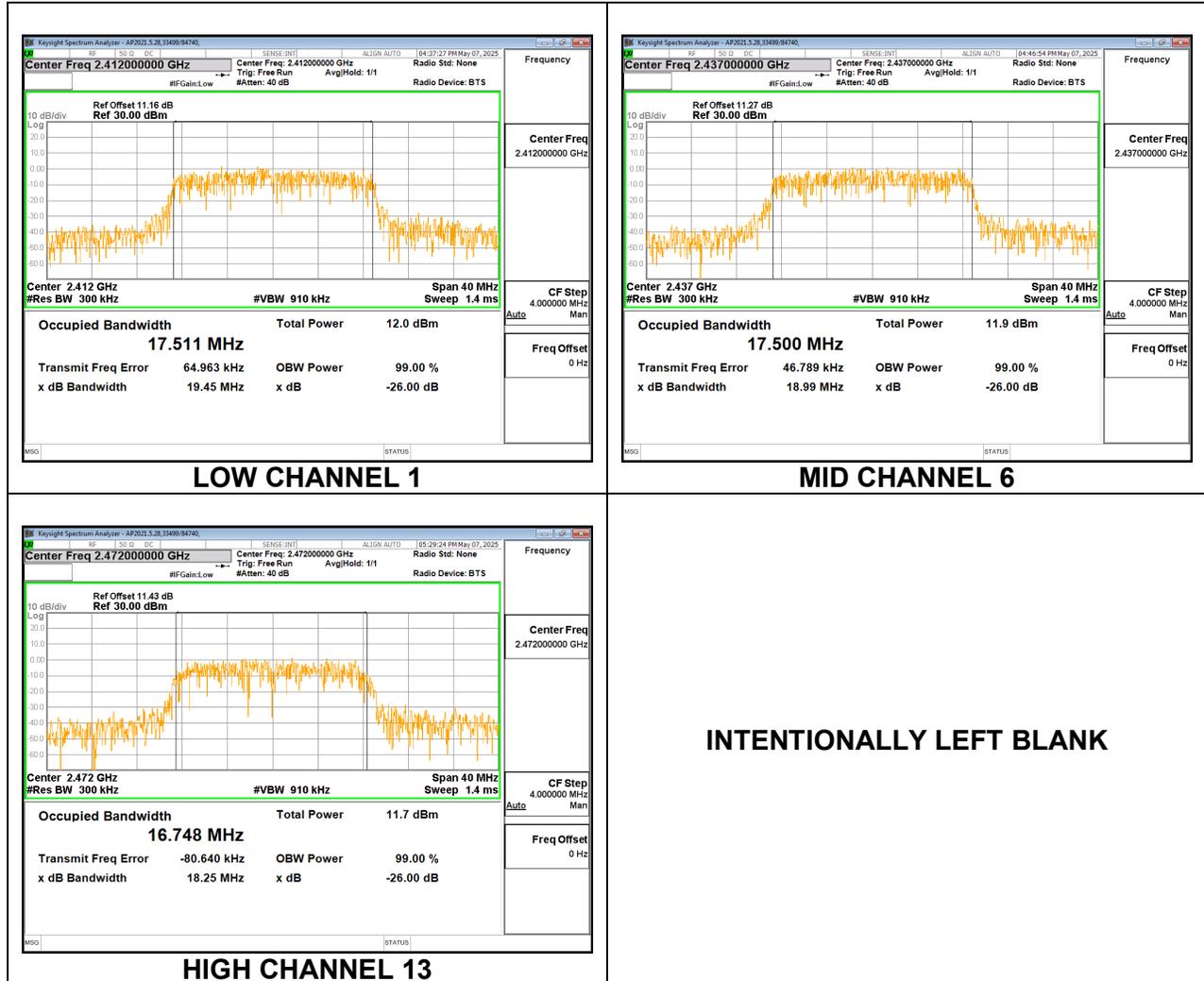


HIGH CHANNEL 13

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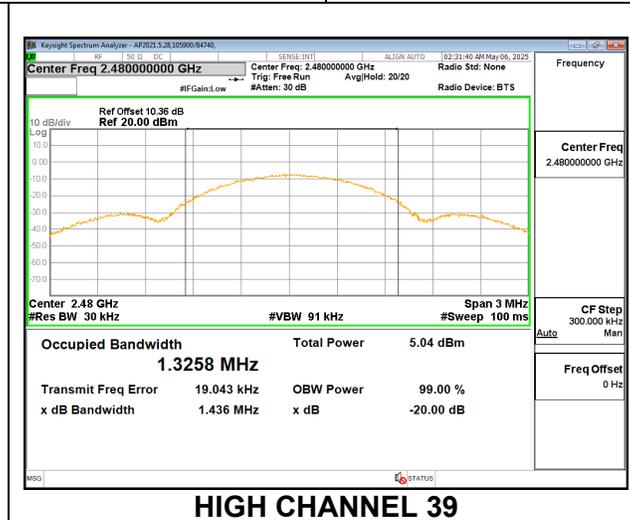
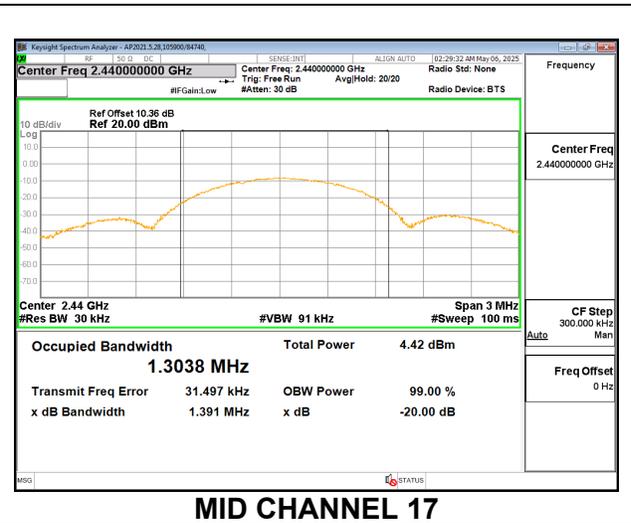
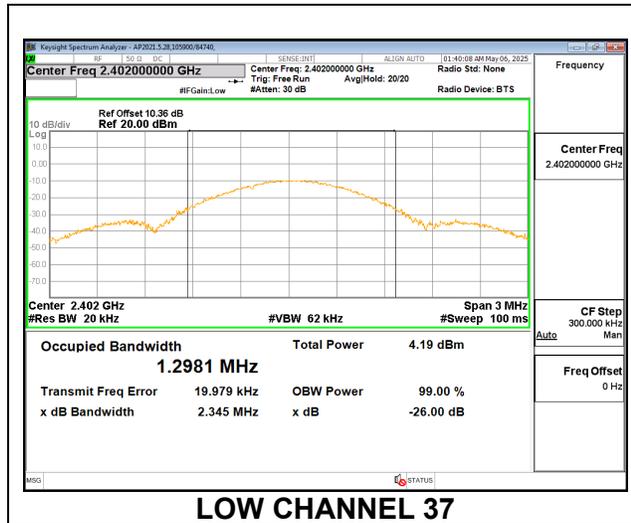
9.2.3. 802.11n HT20 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.511
Mid 6	2437	17.500
High 13	2472	16.748



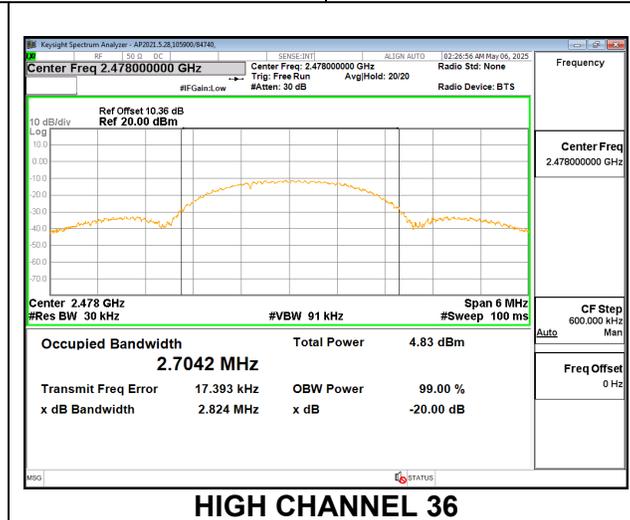
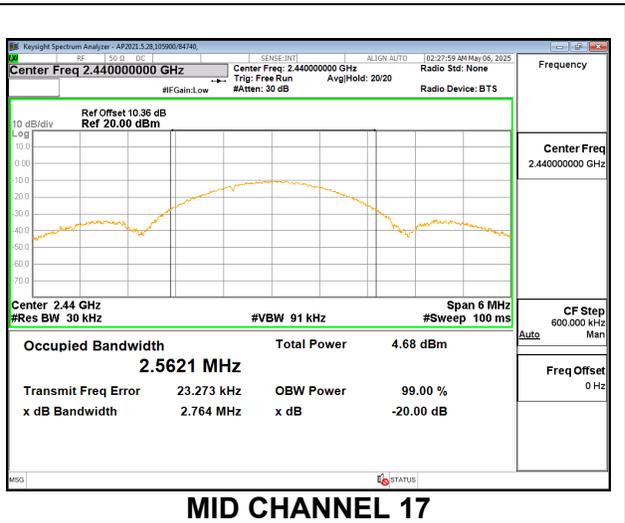
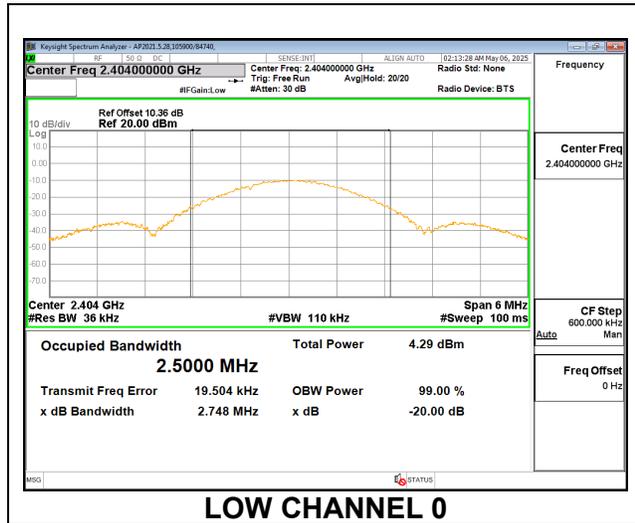
9.2.4. BLE (1Mbps)

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 37	2402	1.2981
Low 1	2404	1.3058
Middle 17	2440	1.3038
High 35	2476	1.3352
High 36	2478	1.3538
High 39	2480	1.3258



9.2.5. BLE (2Mbps)

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 0	2404	2.5000
Middle 17	2440	2.5621
High 35	2476	2.4723
High 36	2478	2.7042



9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)
 RSS-247 6.3.1 (a)

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

RESULTS

9.3.1. 802.11b MODE

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	8.72	0.5
Mid 6	2437	9.20	0.5
High 13	2472	8.12	0.5



LOW CHANNEL 1



MID CHANNEL 6

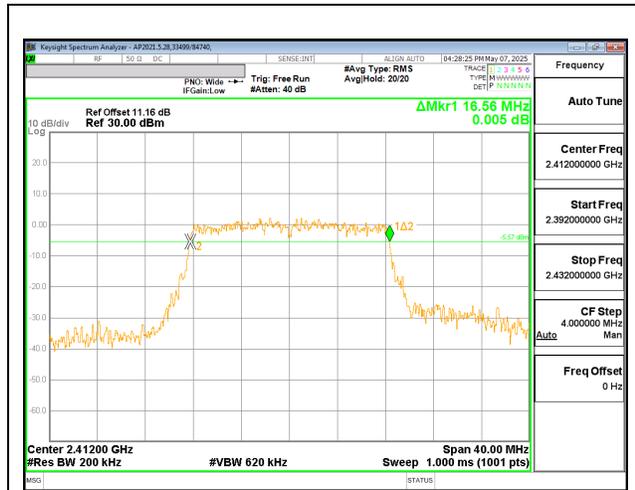


HIGH CHANNEL 13

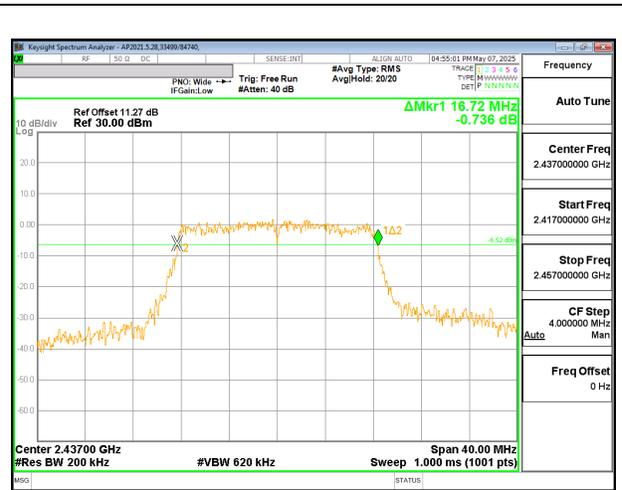
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9.3.2. 802.11g MODE

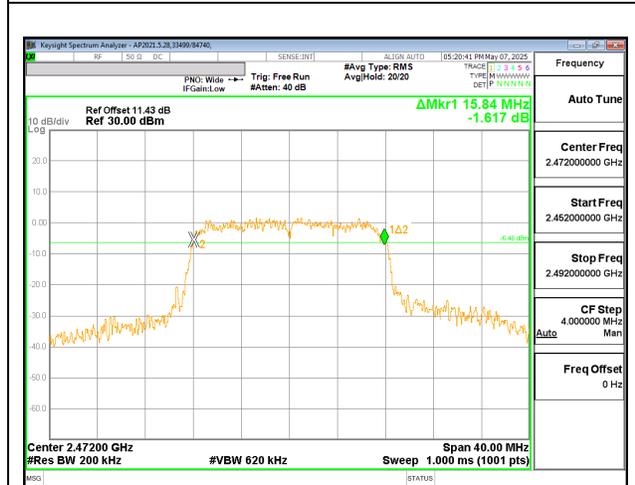
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	16.56	0.5
Mid 6	2437	16.72	0.5
High 13	2472	15.84	0.5



LOW CHANNEL 1



MID CHANNEL 6

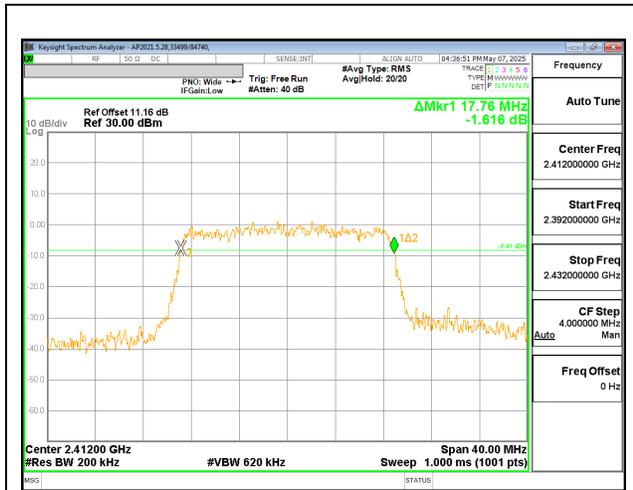


HIGH CHANNEL 13

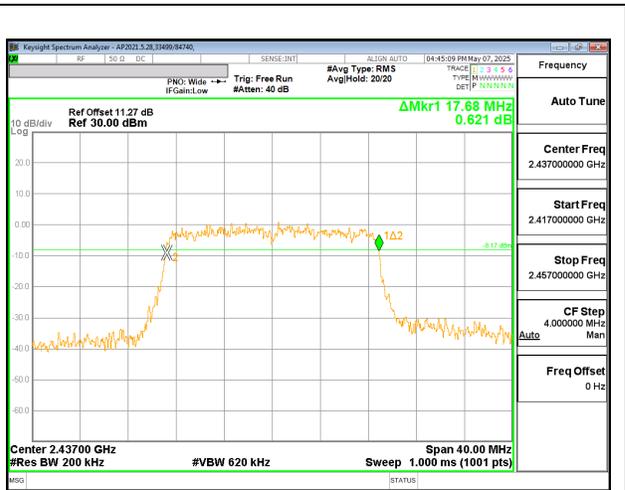
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9.3.3. 802.11n HT20 MODE

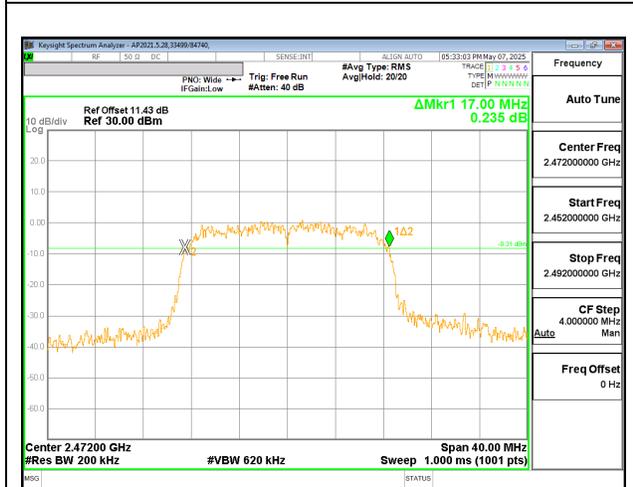
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	17.76	0.5
Mid 6	2437	17.68	0.5
High 13	2472	17.00	0.5



LOW CHANNEL 1



MID CHANNEL 6

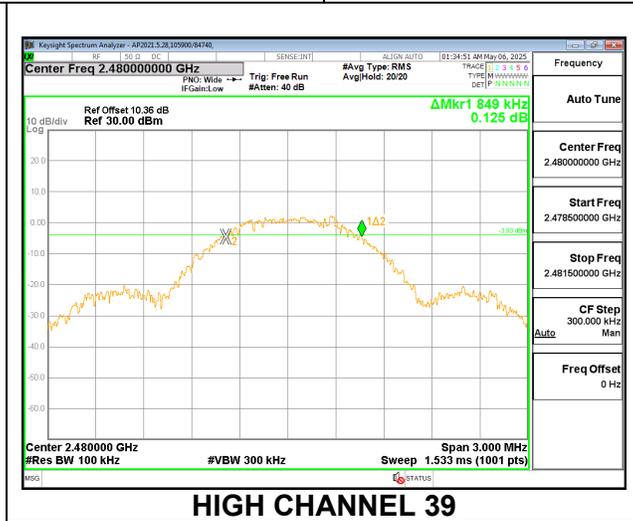
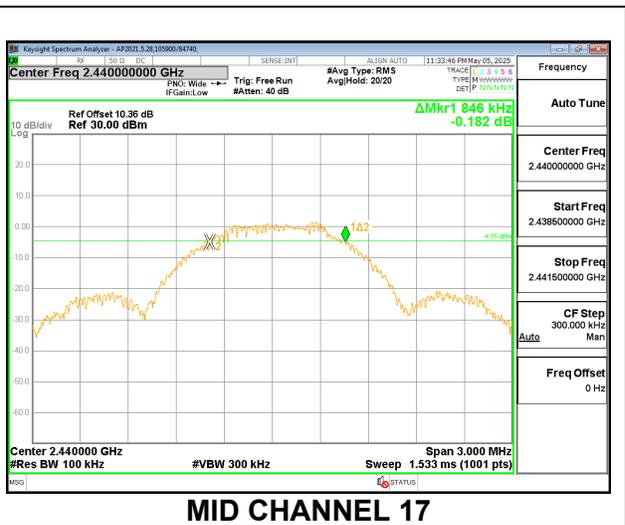
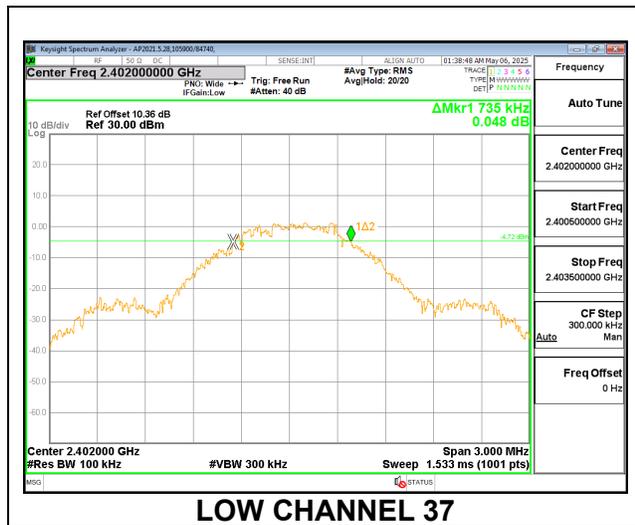


HIGH CHANNEL 13

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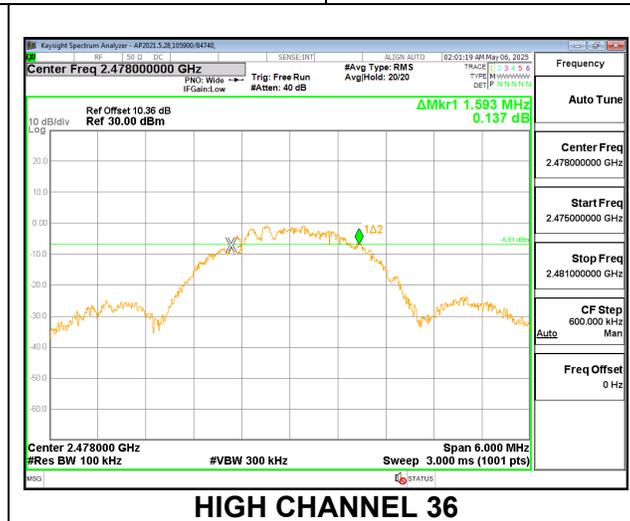
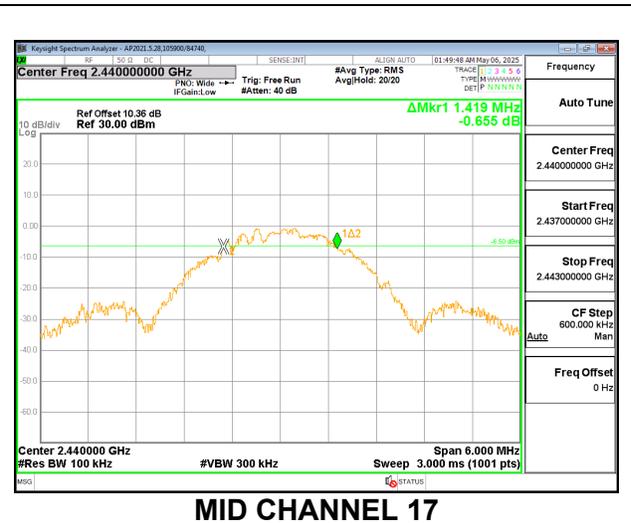
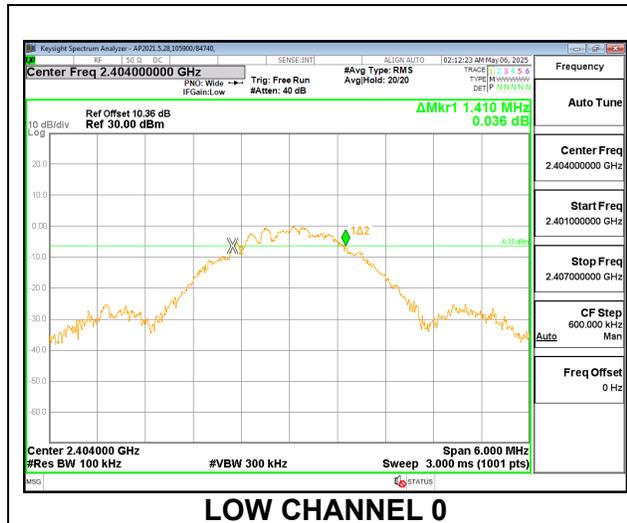
9.3.4. BLE (1Mbps)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 37	2402	0.7350	0.5
Low 1	2404	0.7800	0.5
Middle 17	2440	0.8460	0.5
High 35	2476	0.7950	0.5
High 36	2478	0.8220	0.5
High 39	2480	0.8490	0.5



9.3.5. BLE (2Mbps)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 0	2404	1.4100	0.5
Middle 17	2440	1.4190	0.5
High 35	2476	1.3260	0.5
High 36	2478	1.5930	0.5



9.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)
 RSS-247 6.3.2

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter.

For 2.4 WLAN, the cable assembly insertion loss of 10.80 dB (including 10 dB pad and 0.8 dB cable) was entered as an offset in the power meter.

For BLE, the cable assembly insertion loss of 10.36 dB (including 9.67 dB pad and 0.69 dB cable) was entered as an offset in the power meter.

The power output was measured on the EUT antenna port using an SMA cable and attenuator connected to a power meter via a wideband power sensor. Peak output power was read directly from power meter.

RESULTS

9.4.1. 802.11b MODE

Test Engineer:	104463/85502
Test Date:	2025-07-18 to 2025-07-22

Results

Channel	Frequency (MHz)	Measured Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	19.58	19.58	30.00	-10.42
Mid 6	2437	19.76	19.76	30.00	-10.24
High 11	2462	19.94	19.94	30.00	-10.06
High 12	2467	17.93	17.93	30.00	-12.07
High 13	2472	15.77	15.77	30.00	-14.23

9.4.2. 802.11g MODE

Test Engineer:	104463/85502
Test Date:	2025-07-18 to 2025-07-22

Channel	Frequency (MHz)	Measured Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	23.24	23.24	30.00	-6.76
Mid 6	2437	23.20	23.20	30.00	-6.80
High 10	2457	23.25	23.25	30.00	-6.75
High 11	2462	22.48	22.48	30.00	-7.52
High 12	2467	19.08	19.08	30.00	-10.92
High 13	2472	16.83	16.83	30.00	-13.17

9.4.3. 802.11n HT20 MODE

Test Engineer:	104463/85502
Test Date:	2025-07-18 to 2025-07-22

Results

Channel	Frequency (MHz)	Measured Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	23.46	23.46	30.00	-6.54
Mid 6	2437	23.41	23.41	30.00	-6.59
High 10	2457	23.04	23.04	30.00	-6.96
High 11	2462	21.51	21.51	30.00	-8.49
High 12	2467	19.73	19.73	30.00	-10.27
High 13	2472	18.34	18.34	30.00	-11.66

9.4.4. BLE (1Mbps)

Tested By:	104463/85502
Date:	2025-05-07

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low 37	2402	-1.610	30	-31.610
Low 1	2404	2.945	30	-27.055
Middle 17	2440	3.540	30	-26.460
High 35	2476	3.480	30	-26.520
High 36	2478	-1.330	30	-31.330
High 39	2480	-0.810	30	-30.810

9.4.5. BLE (2Mbps)

Tested By:	104463/85502
Date:	2025-05-07

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low 0	2404	2.310	30	-27.690
Middle 17	2440	3.190	30	-26.810
High 35	2476	2.970	30	-27.030
High 36	2478	-1.330	30	-31.330

9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for a gated average reading of power

For 2.4 WLAN, the cable assembly insertion loss of 10.80 dB (including 10 dB pad and 0.8 dB cable) was entered as an offset in the power meter.

For BLE, the cable assembly insertion loss of 10.36 dB (including 9.67 dB pad and 0.69 dB cable) was entered as an offset in the 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.

RESULTS

9.5.1. 802.11b MODE

Test Engineer:	104463/85502
Test Date:	2025-07-18 to 2025-07-22

Channel	Frequency (MHz)	Power (dBm)
Low 1	2412	17.23
Mid 6	2437	17.40
High 11	2462	17.61
High 12	2467	15.40
High 13	2472	13.07

9.5.2. 802.11g MODE

Test Engineer:	104463/85502
Test Date:	2025-07-18 to 2025-07-22

Channel	Frequency (MHz)	Power (dBm)
Low 1	2412	18.11
Mid 6	2437	18.24
High 10	2457	18.35
High 11	2462	16.94
High 12	2467	12.90
High 13	2472	10.32

9.5.3. 802.11n HT20 MODE

Test Engineer:	104463/85502
Test Date:	2025-07-18 to 2025-07-22

Channel	Frequency (MHz)	Power (dBm)
Low 1	2412	18.01
Mid 6	2437	18.29
High 10	2457	17.80
High 11	2462	15.29
High 12	2467	13.36
High 13	2472	11.84

9.5.4. BLE (1Mbps)

Tested By:	104463/85502
Date:	2025-05-07

Channel	Frequency (MHz)	AV power (dBm)
Low 37	2402	-1.282
Low 1	2404	2.700
Middle 17	2440	3.294
High 35	2476	3.227
High 36	2478	-0.996
High 39	2480	-0.493

9.5.5. BLE (2Mbps)

Tested By:	104463/85502
Date:	2025-05-07

Channel	Frequency (MHz)	AV power (dBm)
Low 0	2404	2.572
Middle 17	2440	2.936
High 35	2476	3.247
High 36	2478	-0.963

9.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)
 RSS-247 6.3.1 (b)

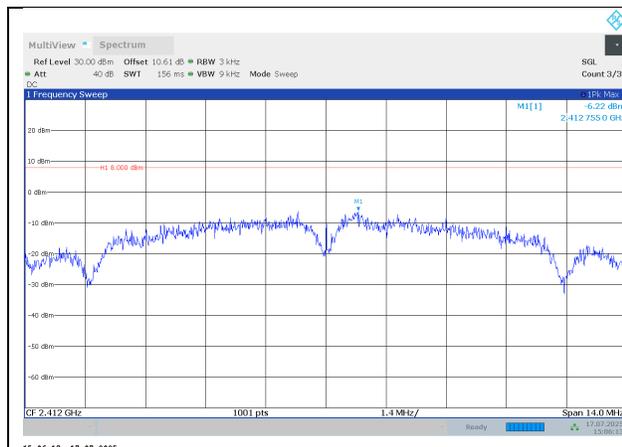
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

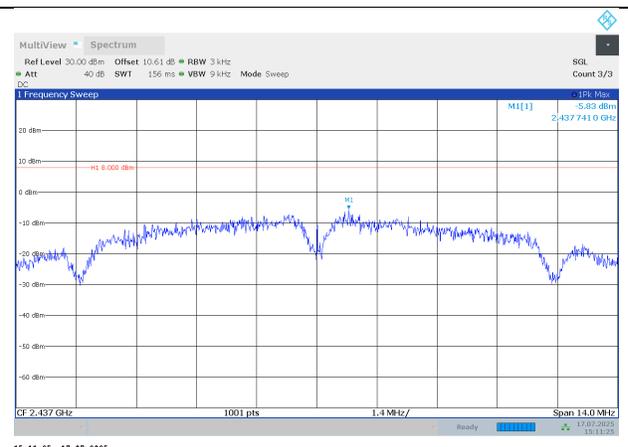
9.6.1. 802.11b MODE

PSD Results

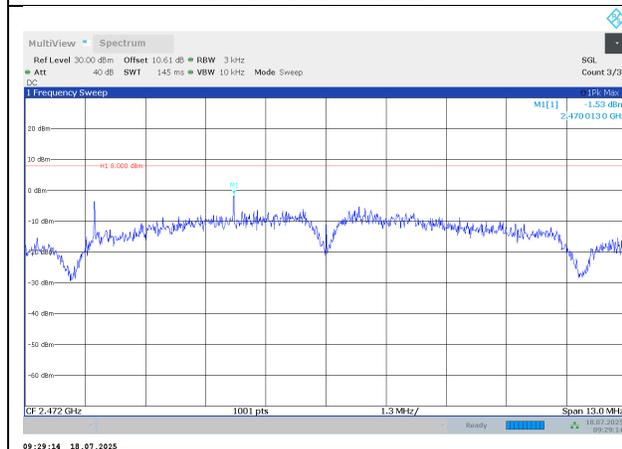
Channel	Frequency (MHz)	Meas. (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low 1	2412	-6.220	-6.22	8.0	-14.2
Mid 6	2437	-5.830	-5.83	8.0	-13.8
High 13	2472	-1.530	-1.53	8.0	-9.5



LOW CHANNEL 1



MID CHANNEL 6



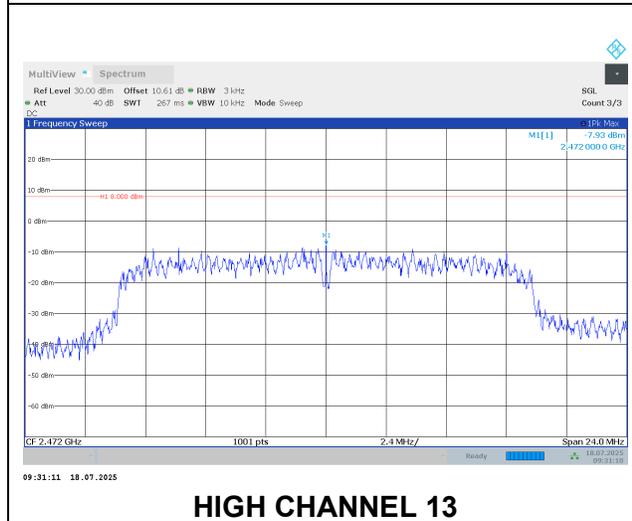
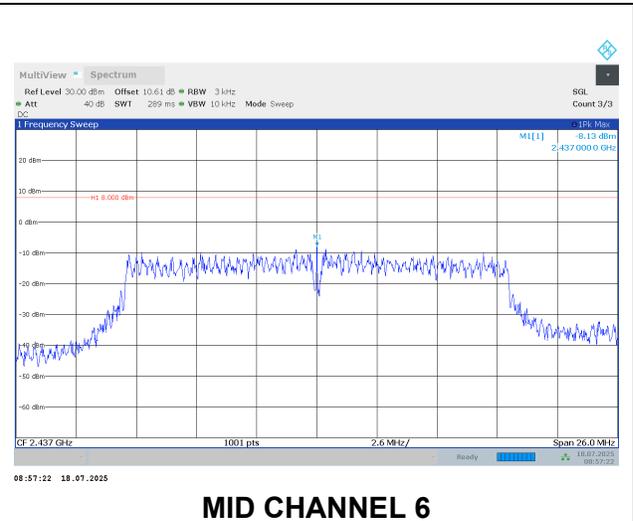
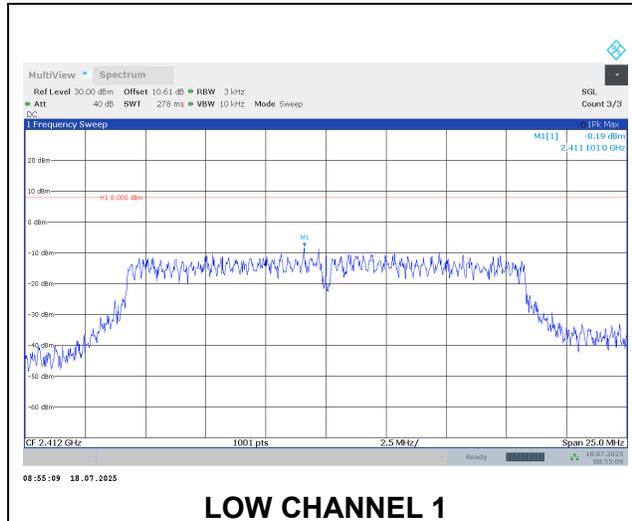
HIGH CHANNEL 13

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9.6.2. 802.11g MODE

PSD Results

Channel	Frequency (MHz)	Meas. (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low 1	2412	-8.190	-8.19	8.0	-16.2
Mid 6	2437	-8.130	-8.13	8.0	-16.1
High 13	2472	-7.930	-7.93	8.0	-15.9

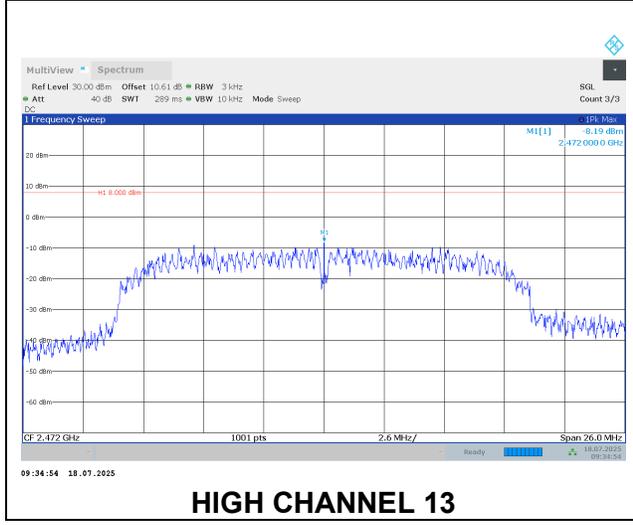
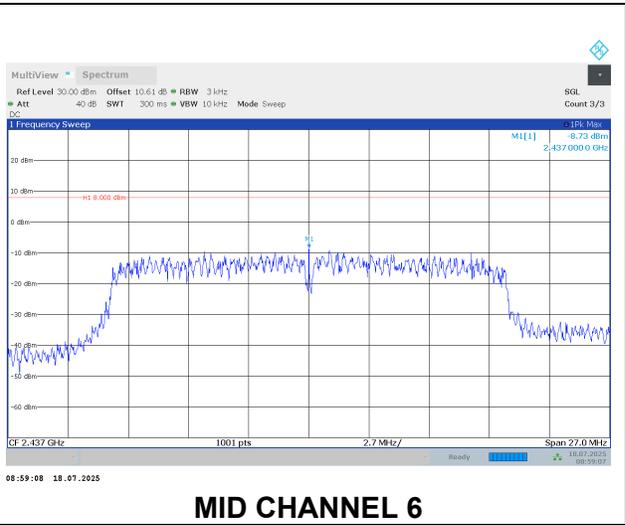
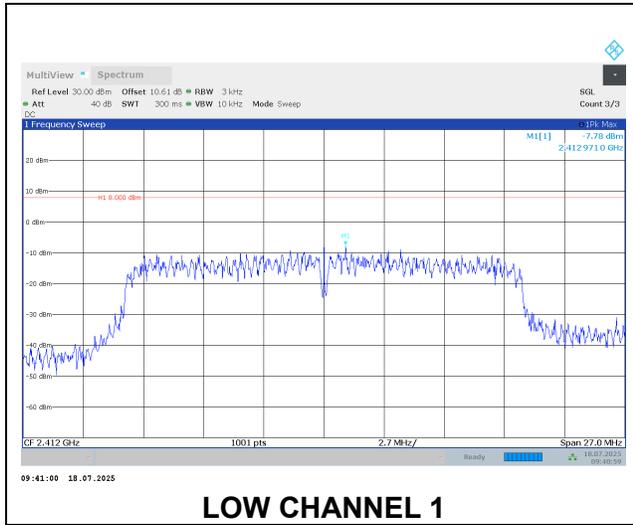


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9.6.3. 802.11n HT20 MODE

PSD Results

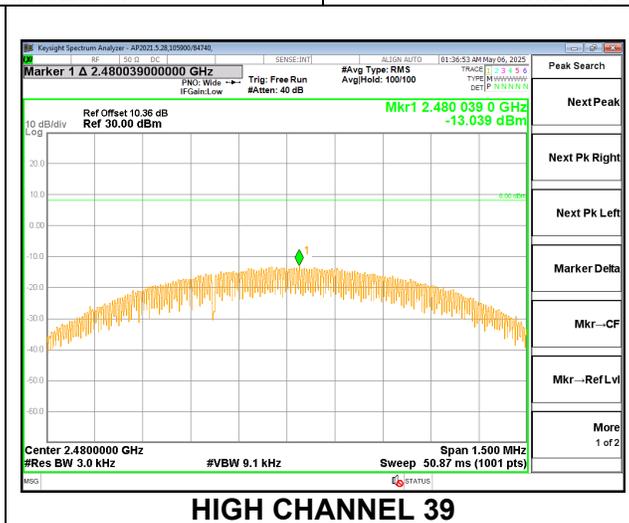
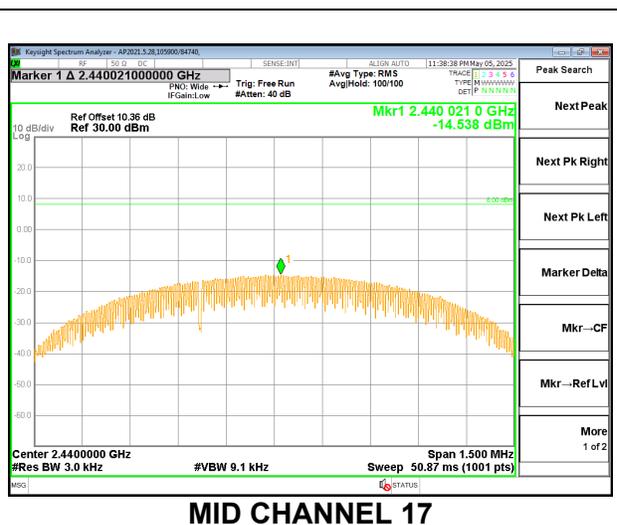
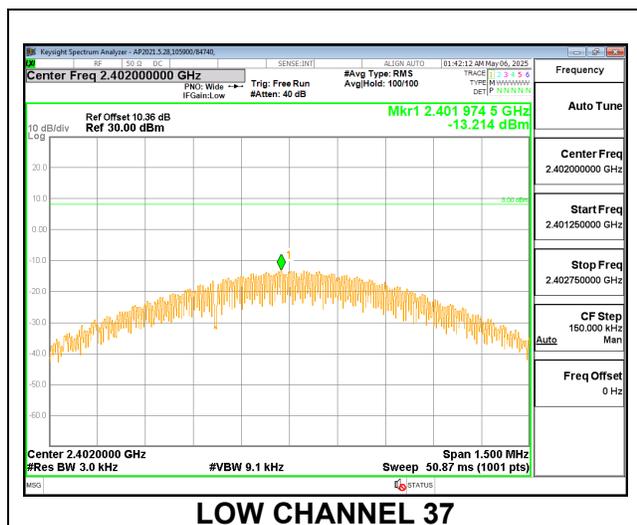
Channel	Frequency (MHz)	Meas. (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low 1	2412	-7.780	-7.78	8.0	-15.8
Mid 6	2437	-8.730	-8.73	8.0	-16.7
High 13	2472	-8.190	-8.19	8.0	-16.2



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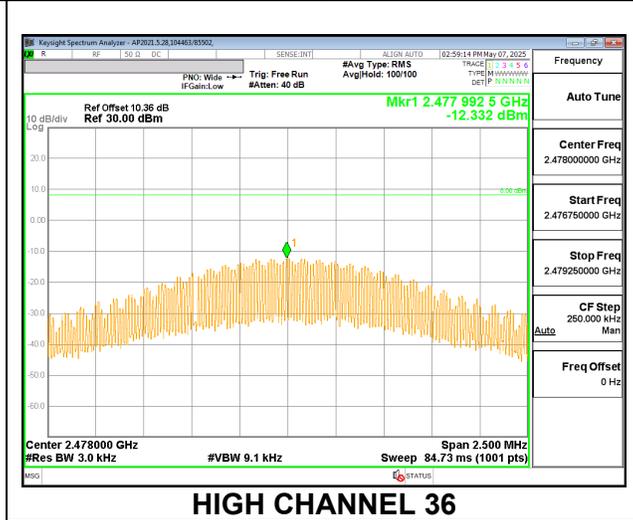
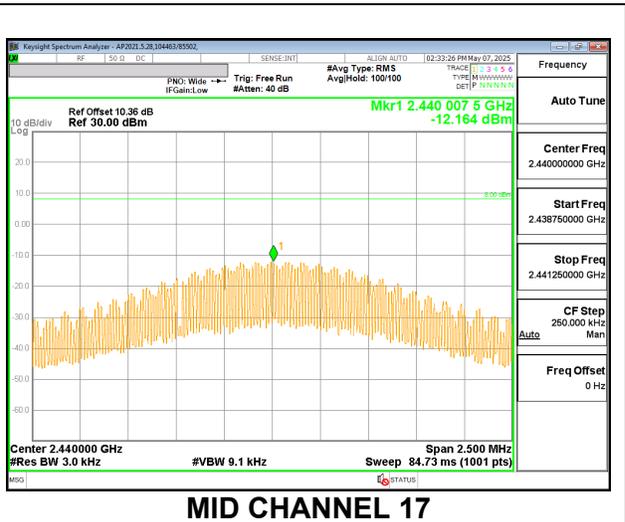
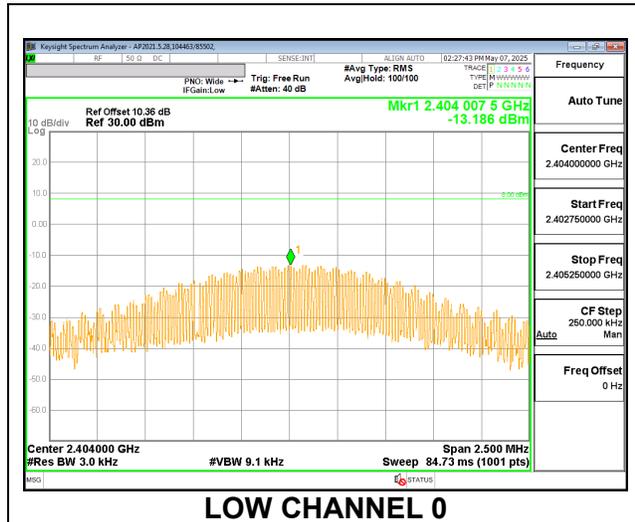
9.6.4. BLE (1Mbps)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 37	2402	-13.214	8	-21.21
Low 1	2404	-15.052	8	-23.05
Middle 17	2440	-14.538	8	-22.54
High 35	2476	-13.916	8	-21.92
High 36	2478	-18.603	8	-26.60
High 39	2480	-13.039	8	-21.04



9.6.5. BLE (2Mbps)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 0	2404	-13.186	8	-21.19
Middle 17	2440	-12.164	8	-20.16
High 35	2476	-12.695	8	-20.70
High 36	2478	-12.332	8	-20.33



9.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

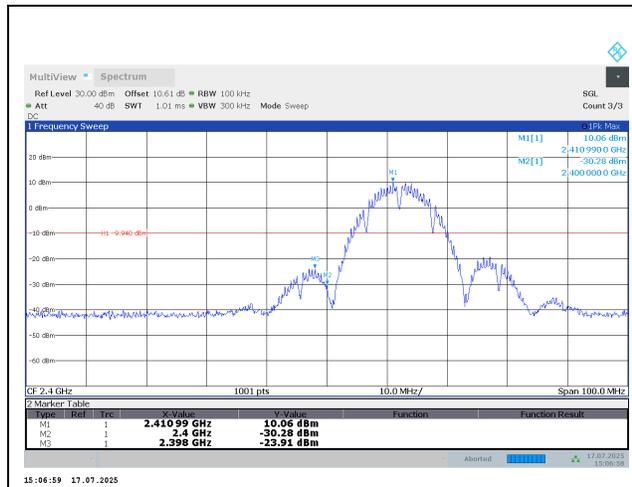
FCC §15.247 (d)
RSS-247 6.6

PROCEDURE

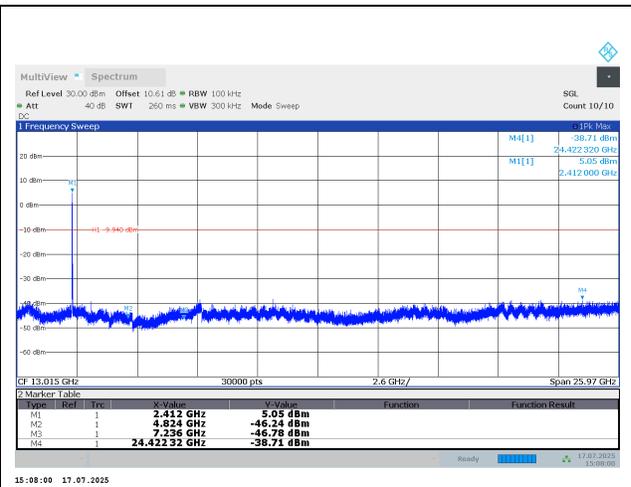
Output power was measured based on the use of peak measurement, therefore the required attenuation is -20 dBc.

RESULTS

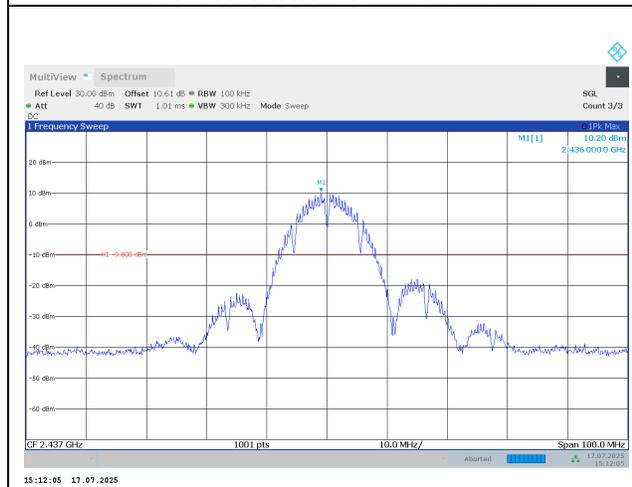
9.7.1. 802.11b MODE



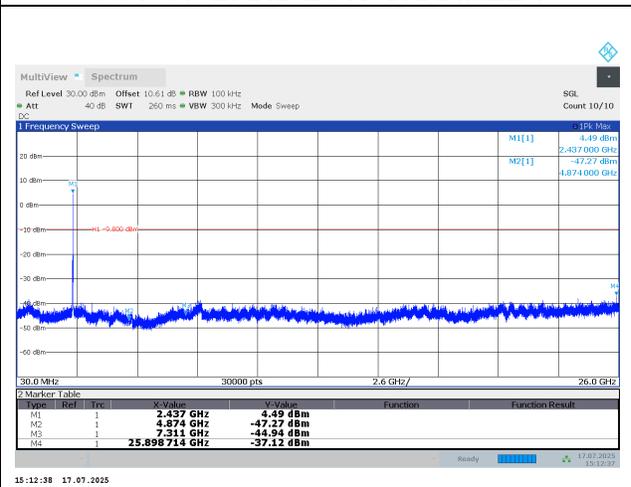
LOW CHANNEL 1 BANDEDGE



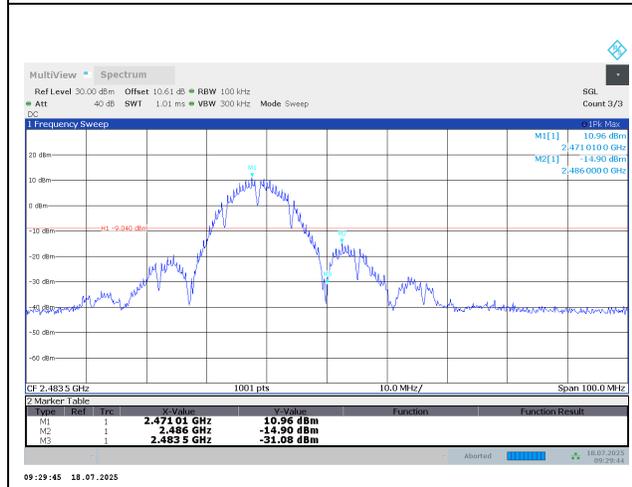
OUT-OF-BAND LOW CHANNEL 1



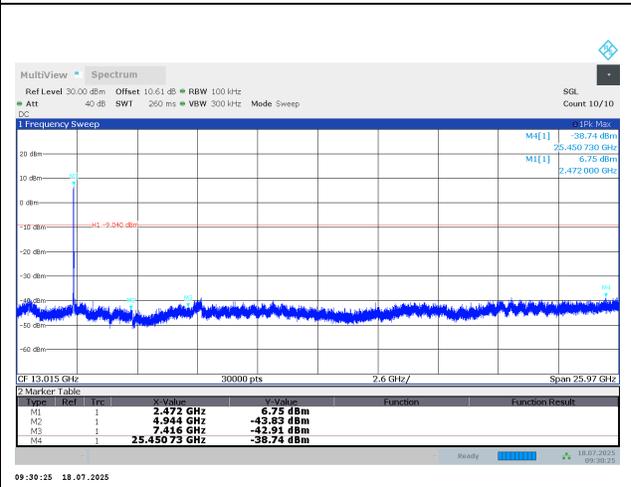
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

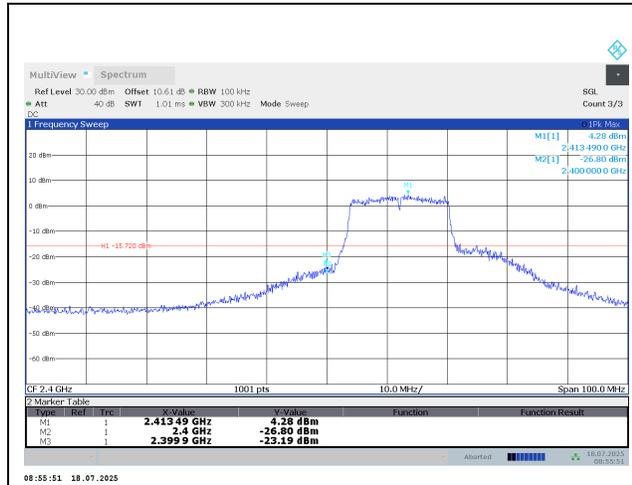


HIGH CHANNEL 13 BANDEDGE

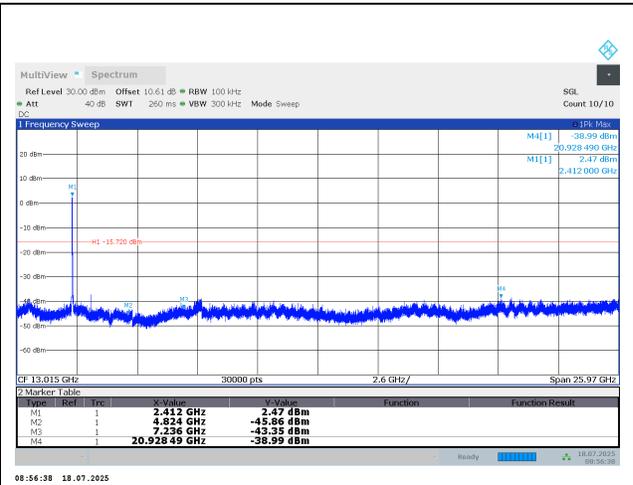


OUT-OF-BAND HIGH CHANNEL 13

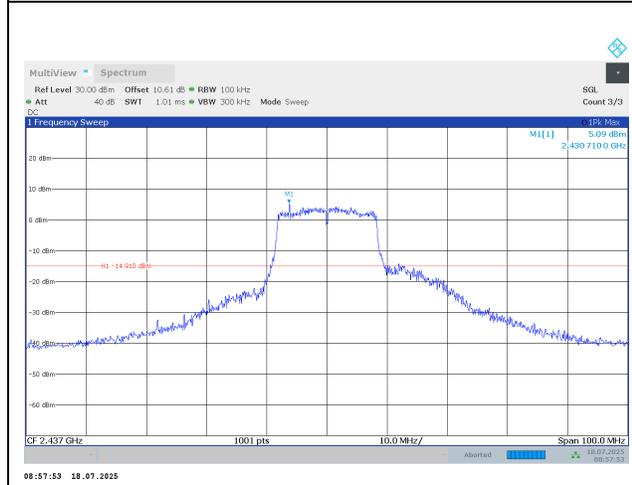
9.7.2. 802.11g MODE



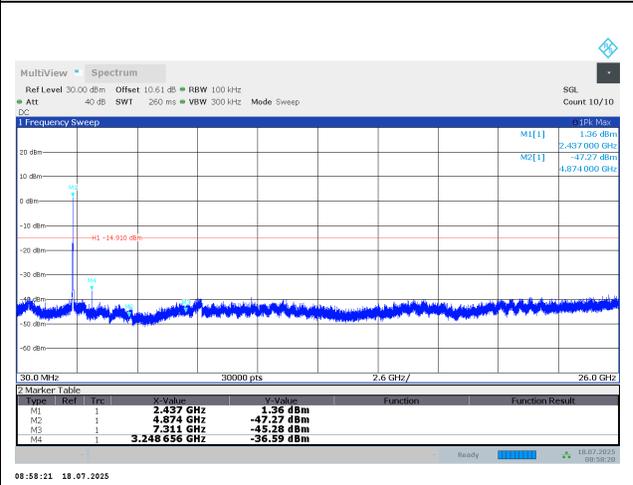
LOW CHANNEL 1 BANDEDGE



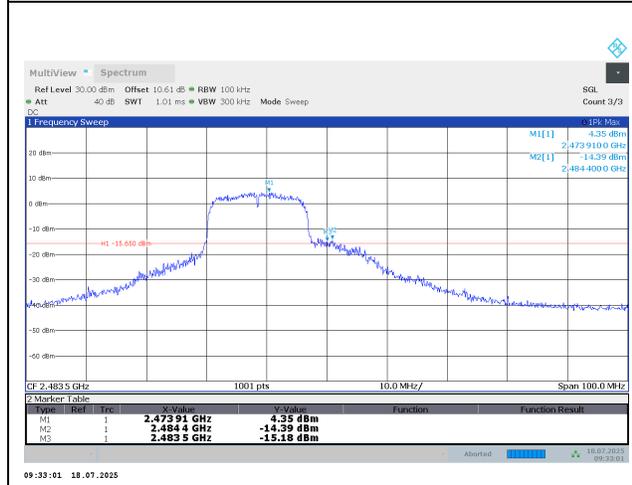
OUT-OF-BAND LOW CHANNEL 1



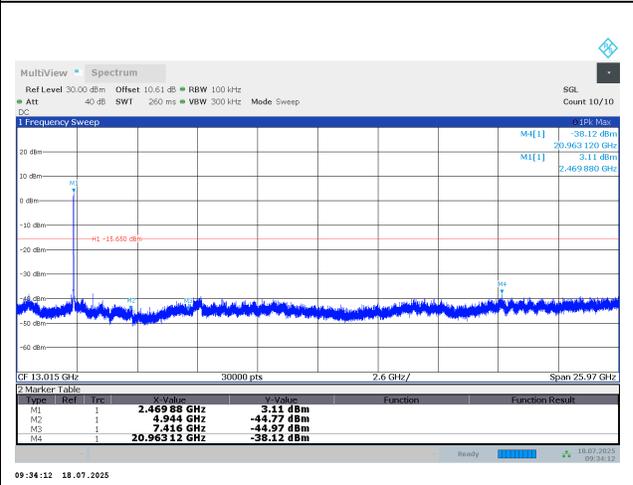
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

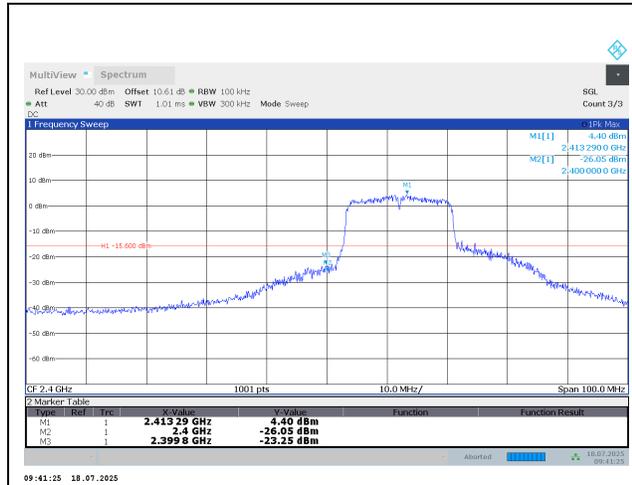


HIGH CHANNEL 13 BANDEDGE

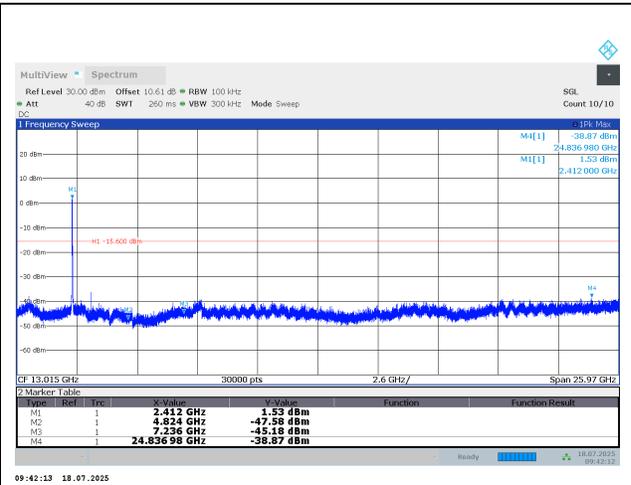


OUT-OF-BAND HIGH CHANNEL 13

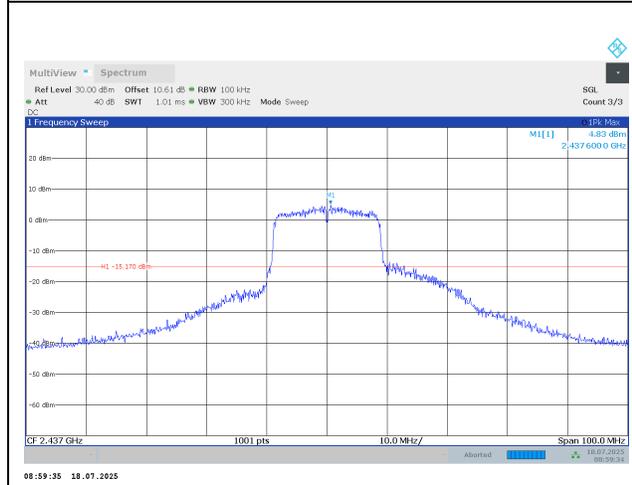
9.7.3. 802.11n HT20 MODE



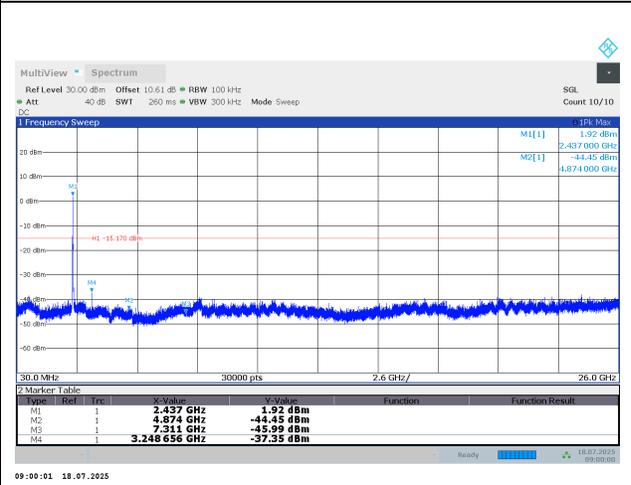
LOW CHANNEL 1 BANDEDGE



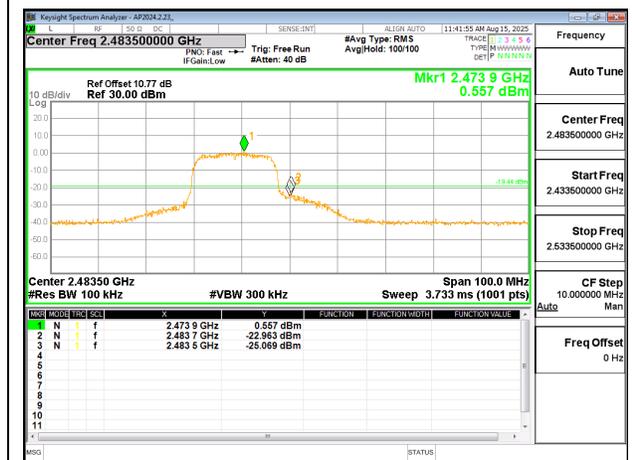
OUT-OF-BAND LOW CHANNEL 1



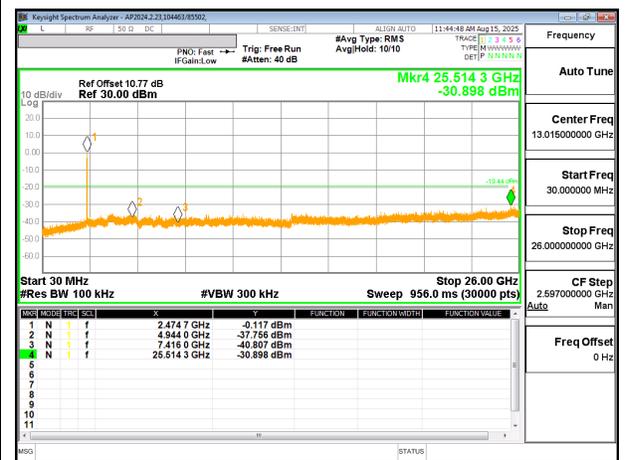
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL 13 BANDEDGE

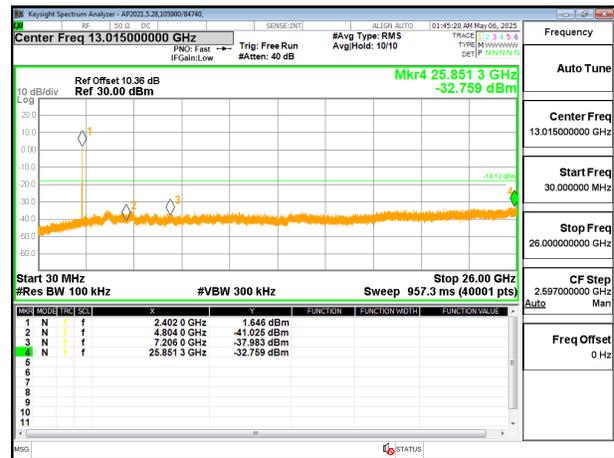


OUT-OF-BAND HIGH CHANNEL 13

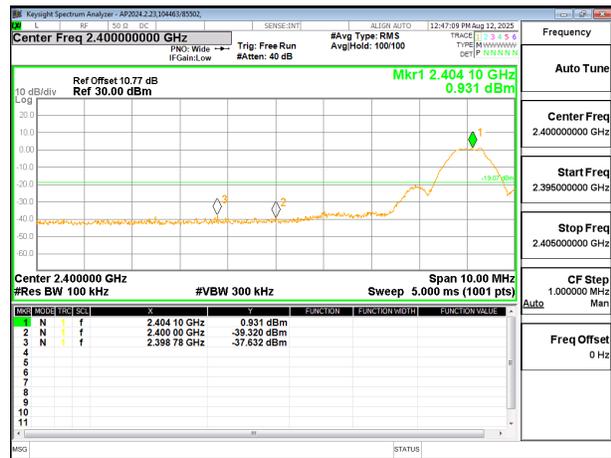
9.7.1. BLE (1Mbps)



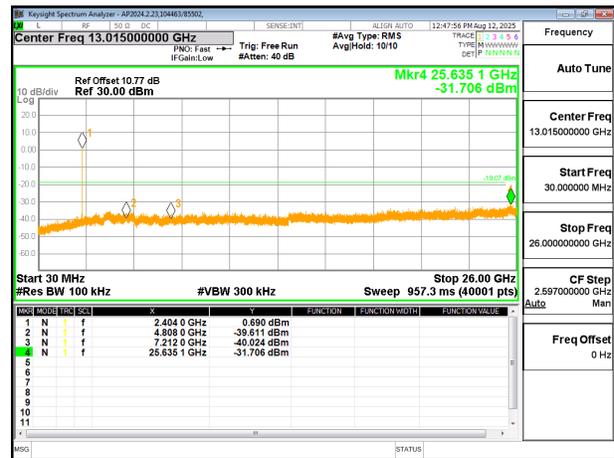
LOW CHANNEL 37 BANDEDGE



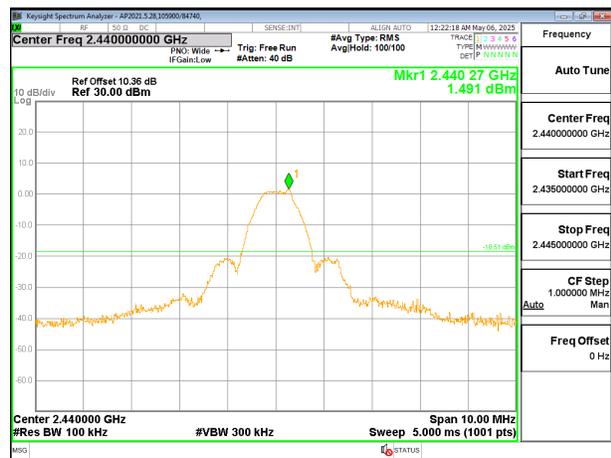
OUT-OF-BAND LOW CHANNEL 37



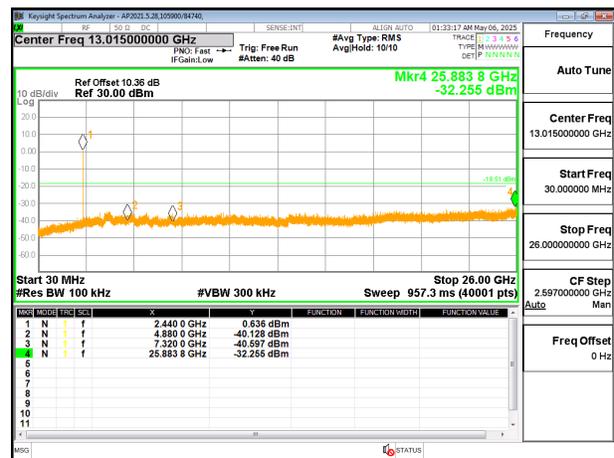
LOW CHANNEL 0 BANDEDGE



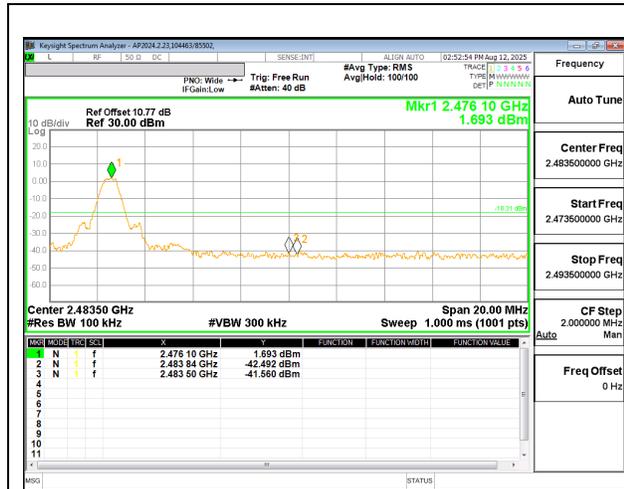
OUT-OF-BAND LOW CHANNEL 0



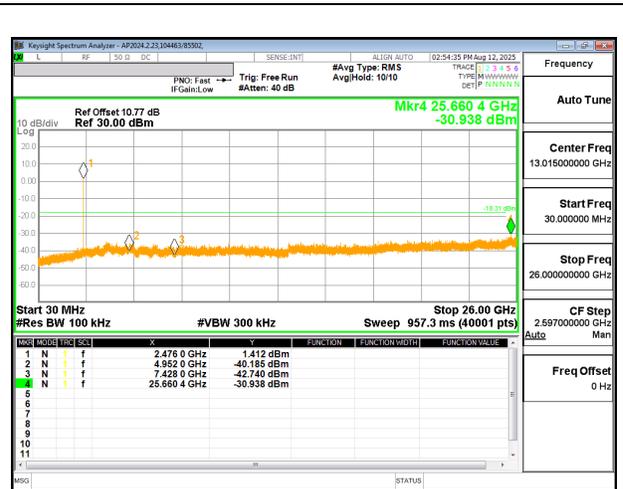
MID CHANNEL 17 IN-BAND REFERENCE LEVEL



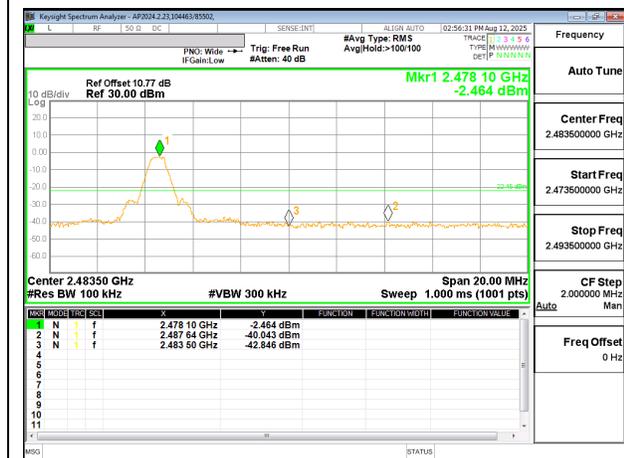
OUT-OF-BAND MID CHANNEL 17



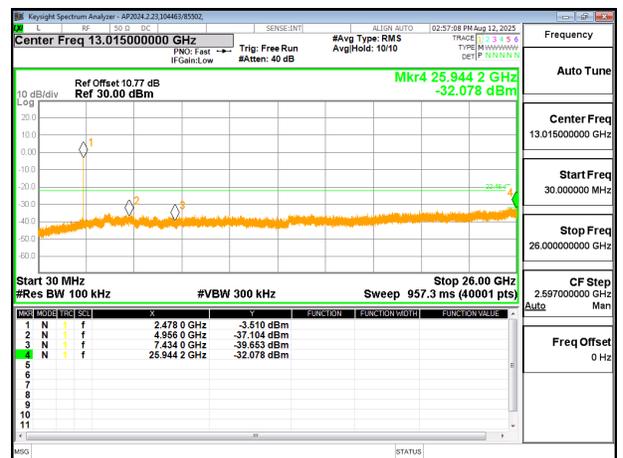
HIGH CHANNEL 35 BANDEDGE



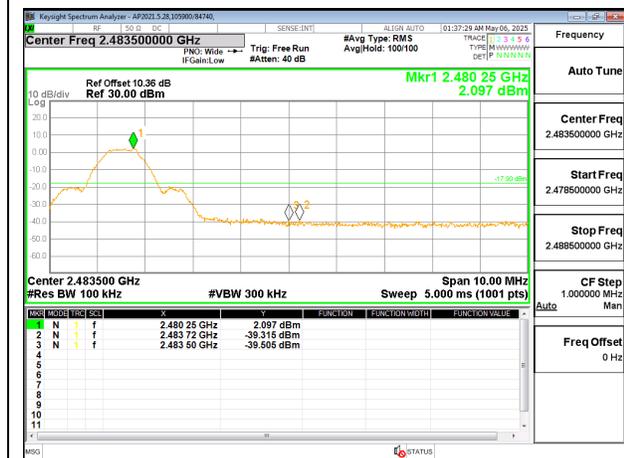
OUT-OF-BAND HIGH CHANNEL 35



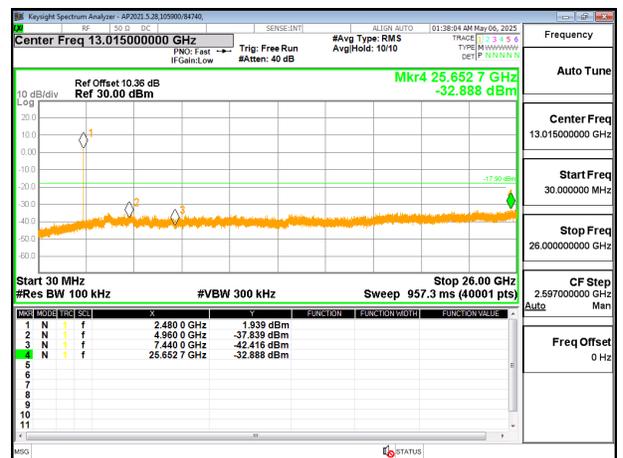
HIGH CHANNEL 36 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 36



HIGH CHANNEL 39 BANDEDGE

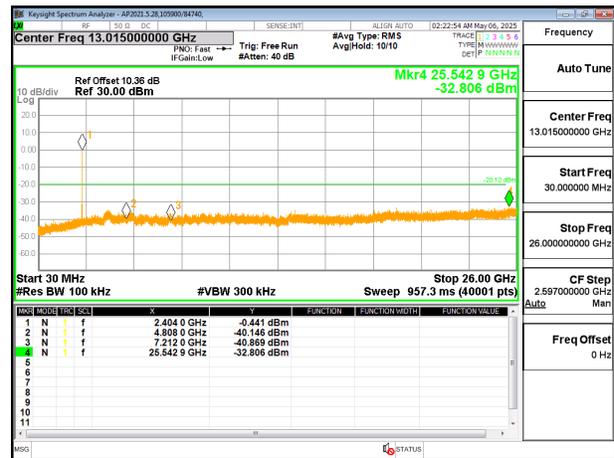


OUT-OF-BAND HIGH CHANNEL 39

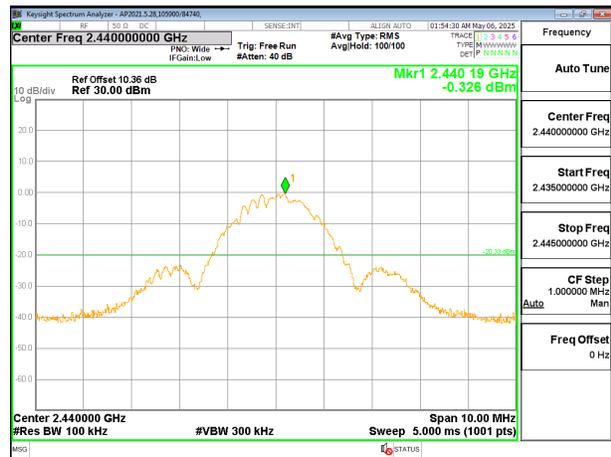
9.7.2. BLE (2Mbps)



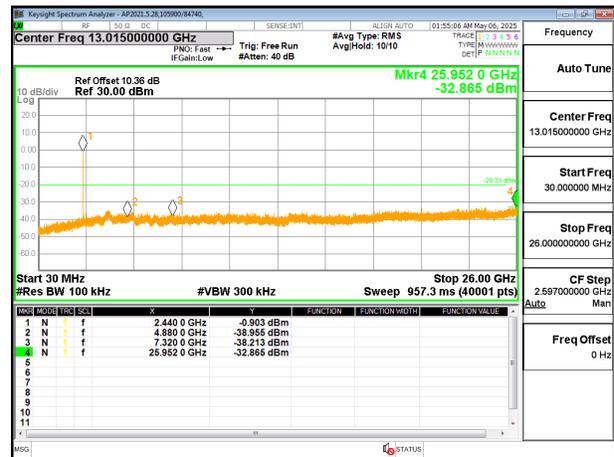
LOW CHANNEL 0 BANDEDGE



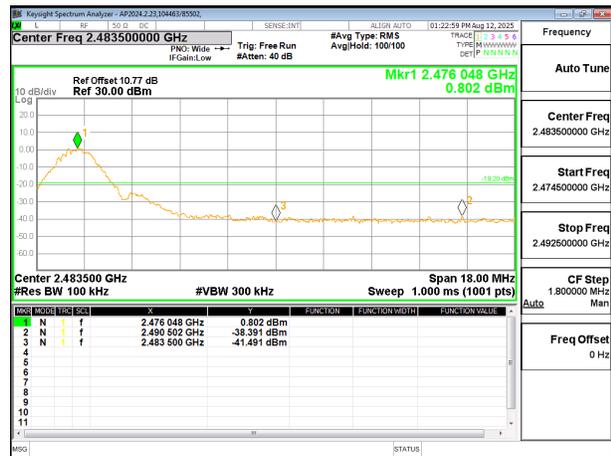
OUT-OF-BAND LOW CHANNEL 0



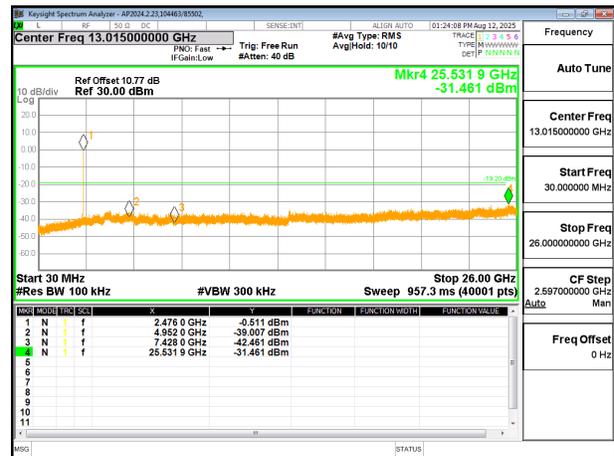
MID CHANNEL 17 IN-BAND REFERENCE LEVEL



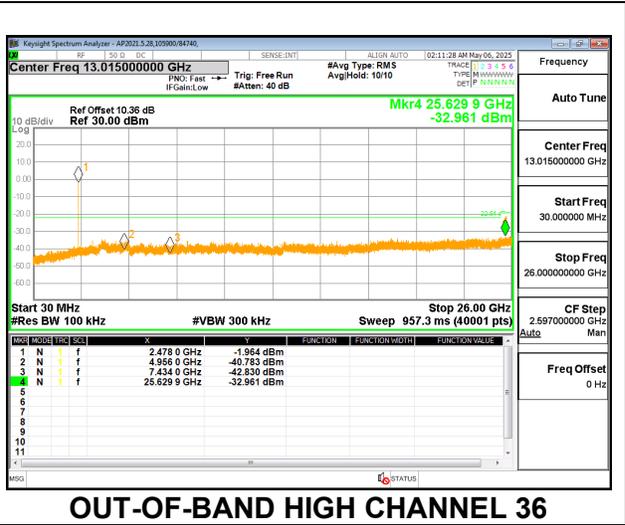
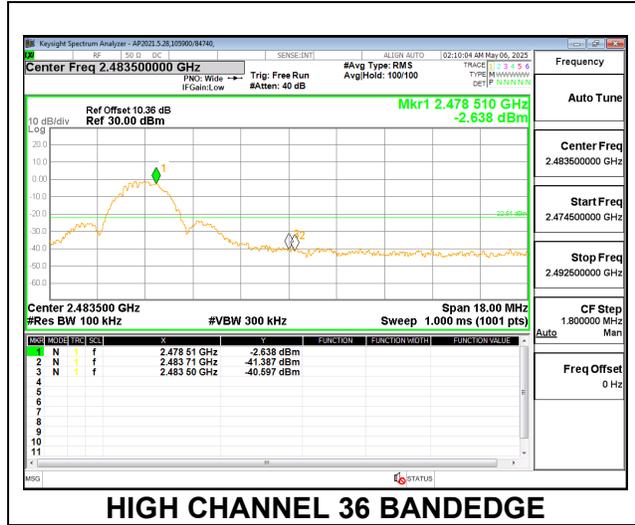
OUT-OF-BAND MID CHANNEL 17



HIGH CHANNEL 35 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 35



10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

RSS-GEN Clause 8.9 and 8.10

Frequency Range (kHz)	Field Strength Limit (uA/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	6.37/F(kHz) @ 300 m	-
0.490-1.705	63.7/F(kHz) @ 30 m	-
1.705 - 30	0.08 @ 30m	-
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak or average (9-90kHz and 110-490kHz).

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to low, middle, and high channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest PSD was tested.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

3D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel).

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

KDB 414788 Open Field Site (OFS) and Chamber Correlation Justification

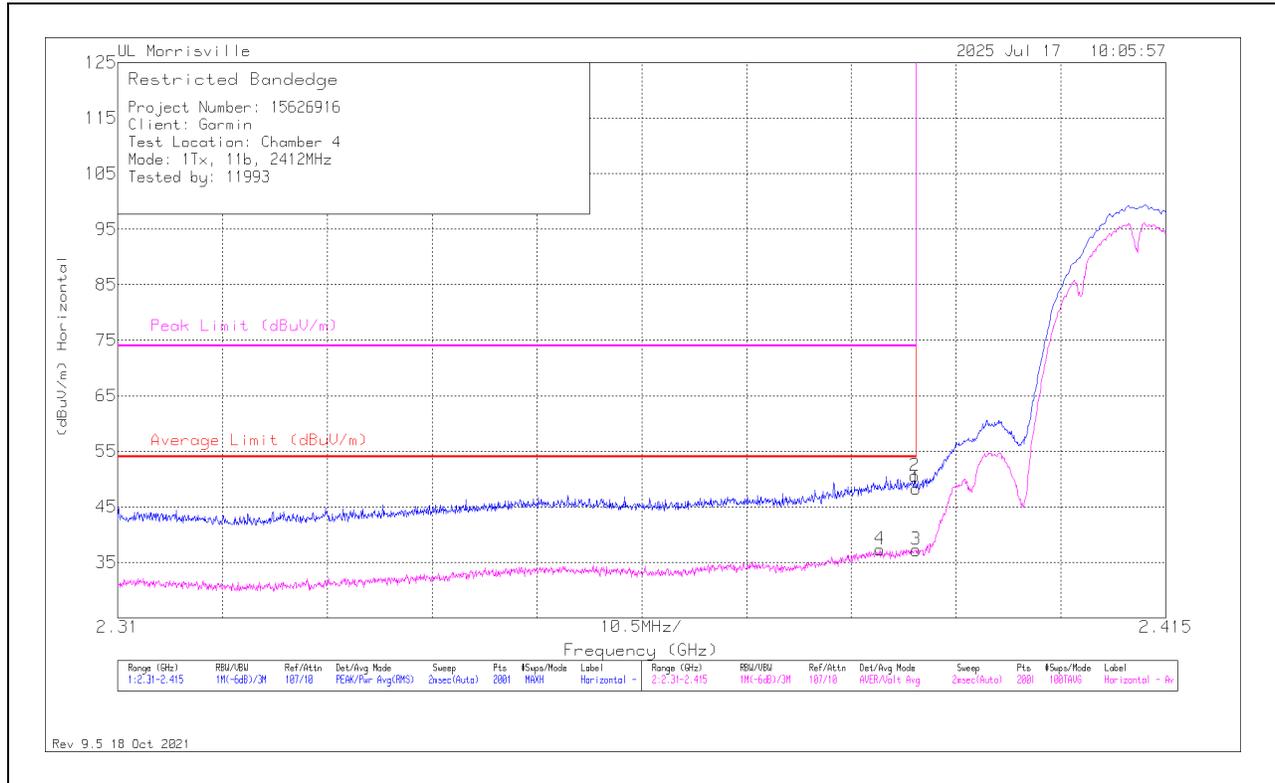
OFS and chamber correlation testing had been performed and chamber measured test result is the worst-case test result.

10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

BANDEDGE (LOW CHANNEL, CH 1)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	39.23	Pk	32	-23	48.23	-	-	74	-25.77	47	117	H
2	* ** 2.38985	41.55	Pk	32	-23	50.55	-	-	74	-23.45	47	117	H
3	* ** 2.38996	28.23	ADV	32	-23	37.23	54	-16.77	-	-	47	117	H
4	* ** 2.38634	28.23	ADV	32	-22.9	37.33	54	-16.67	-	-	47	117	H

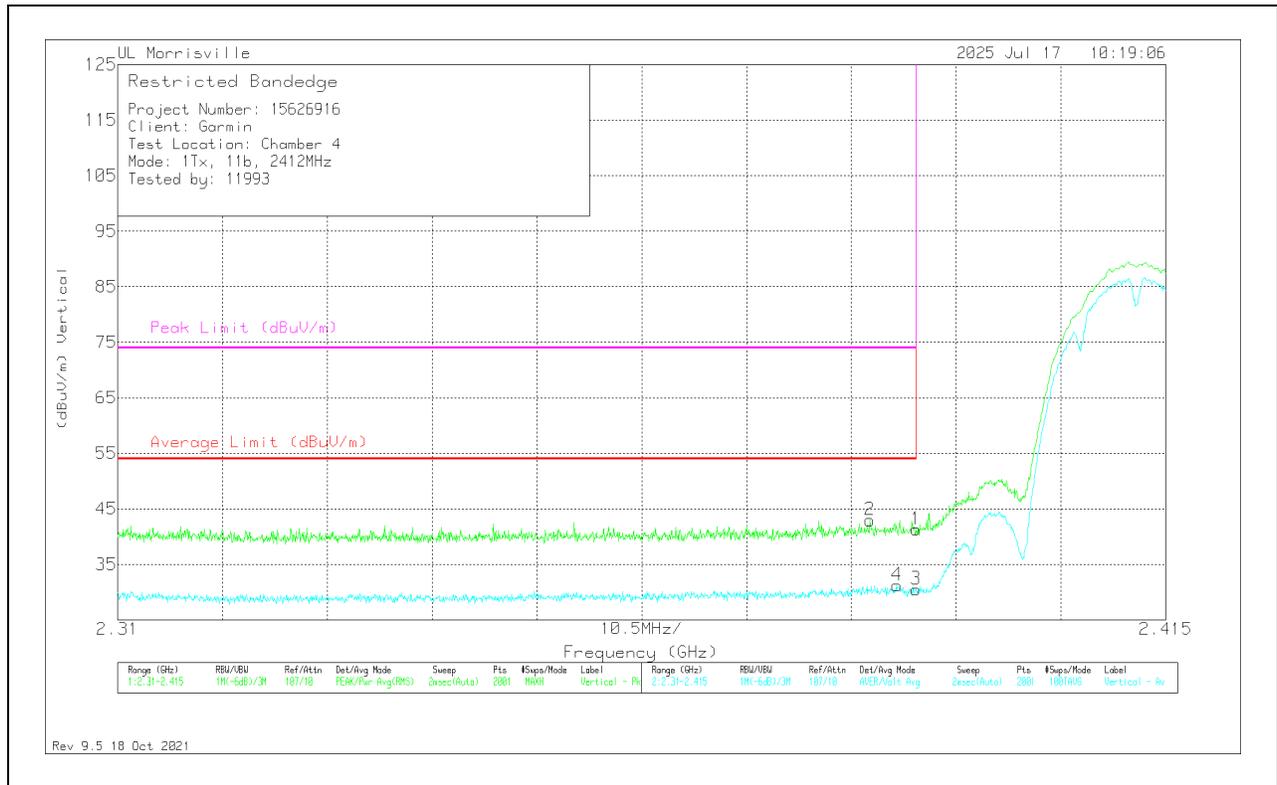
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

VERTICAL RESULT

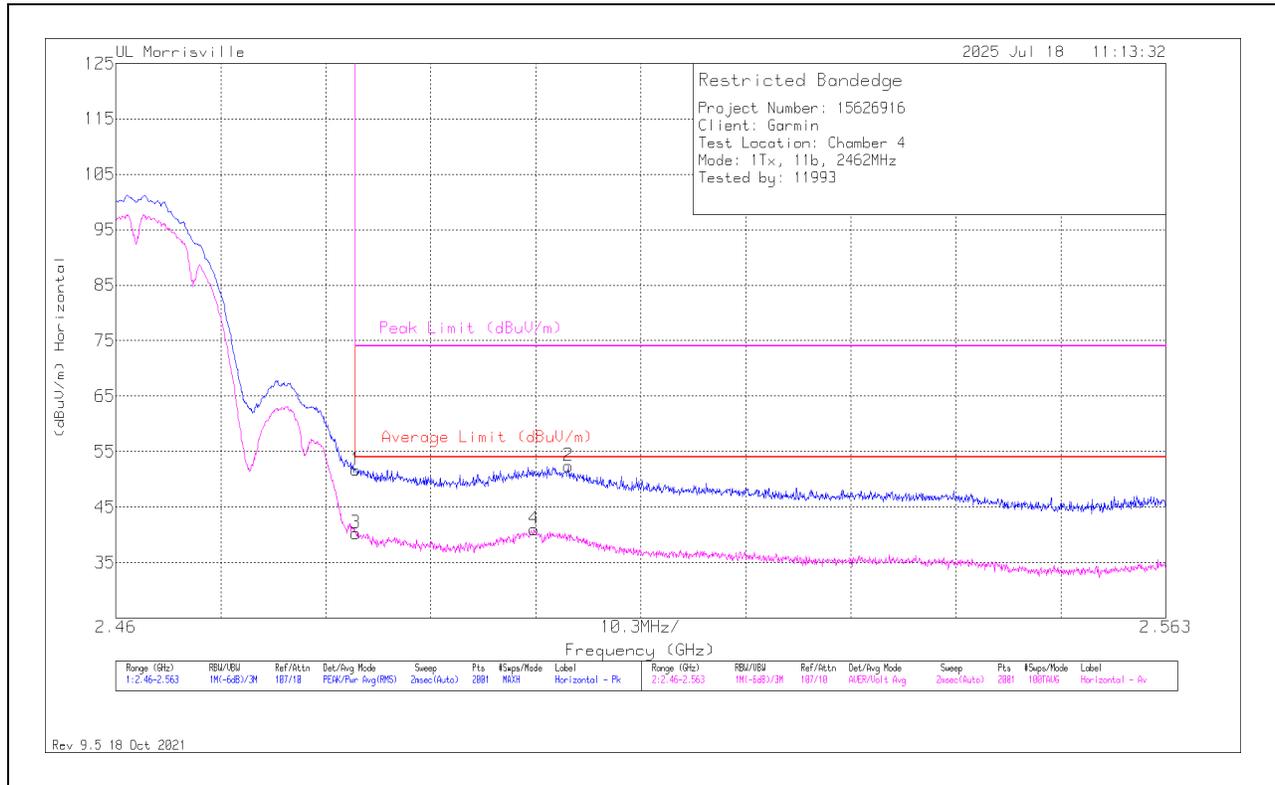


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.38996	32.28	Pk	32	-23	41.28	-	-	74	-32.72	100	106	V
2	*** 2.38534	33.86	Pk	32	-22.9	42.96	-	-	74	-31.04	100	106	V
3	*** 2.38996	21.49	ADV	32	-23	30.49	54	-23.51	-	-	100	106	V
4	*** 2.38807	22.11	ADV	32	-22.9	31.21	54	-22.79	-	-	100	106	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 ADV - Linear Voltage Average

BANDEDGE (HIGH CHANNEL, CH 11)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	42.61	Pk	32.3	-23.2	51.71	-	-	74	-22.29	347	330	H
2	** 2.50439	42.18	Pk	32.4	-22.2	52.38	-	-	74	-21.62	347	330	H
3	* ** 2.48354	31.19	ADV	32.3	-23.2	40.29	54	-13.71	-	-	347	330	H
4	** 2.50105	31.1	ADV	32.4	-22.5	41	54	-13	-	-	347	330	H

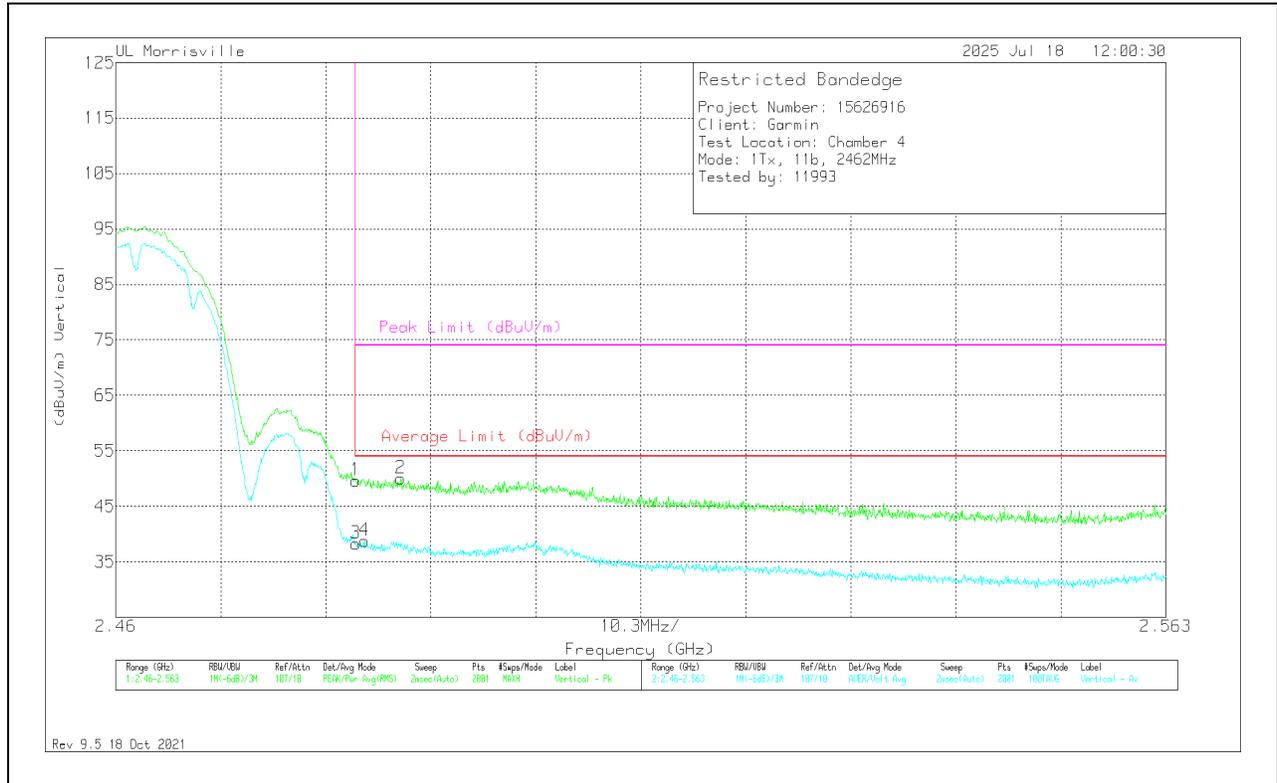
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

VERTICAL RESULT

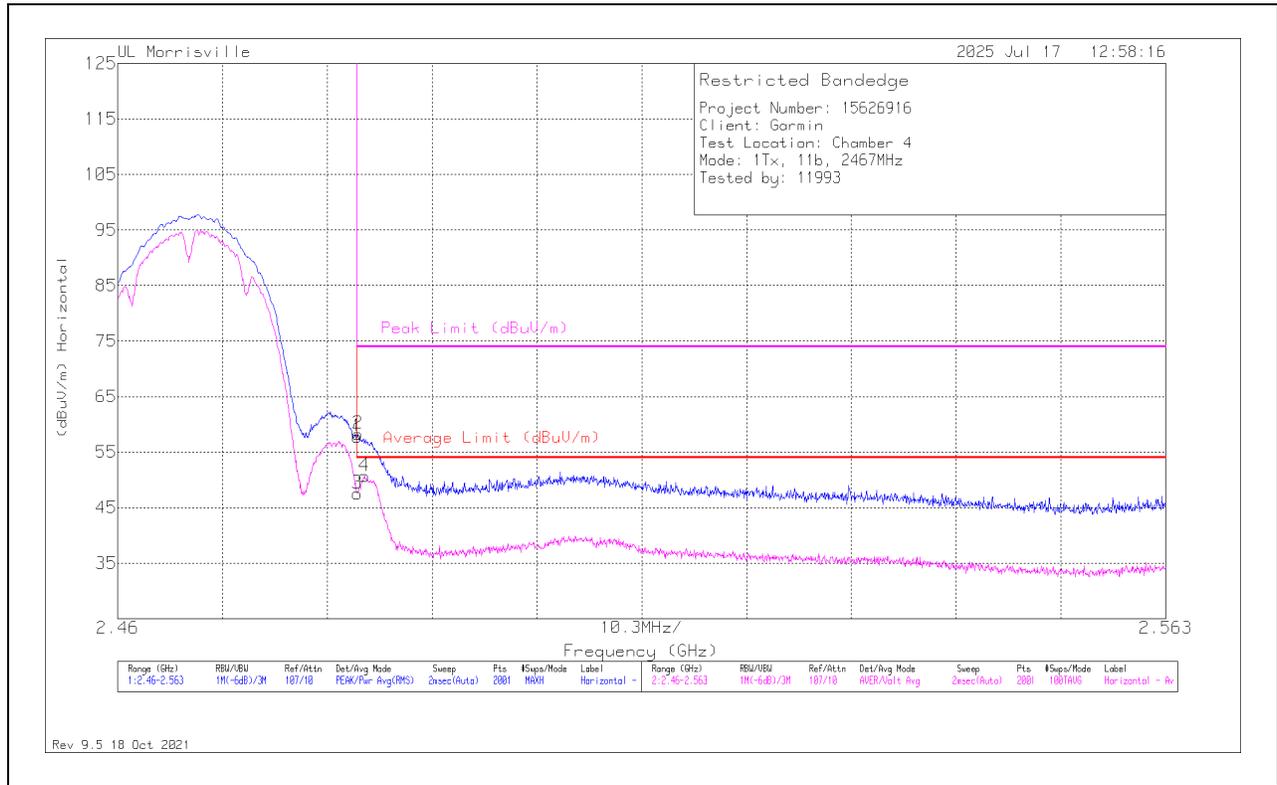


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	40.52	Pk	32.3	-23.2	49.62	-	-	74	-24.38	242	293	V
2	* ** 2.48796	41.16	Pk	32.4	-23.5	50.06	-	-	74	-23.94	242	293	V
3	* ** 2.48354	29.12	ADV	32.3	-23.2	38.22	54	-15.78	-	-	242	293	V
4	* ** 2.48441	29.65	ADV	32.3	-23.2	38.75	54	-15.25	-	-	242	293	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 ADV - Linear Voltage Average

BANDEGE (HIGH CHANNEL, CH 12)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.48354	48.7	Pk	32.3	-23.2	57.8	-	-	74	-16.2	275	115	H
2	*** 2.48359	49.2	Pk	32.3	-23.2	58.3	-	-	74	-15.7	275	115	H
3	*** 2.48354	38.45	ADV	32.3	-23.2	47.55	54	-6.45	-	-	275	115	H
4	*** 2.48426	41.59	ADV	32.3	-23.2	50.69	54	-3.31	-	-	275	115	H

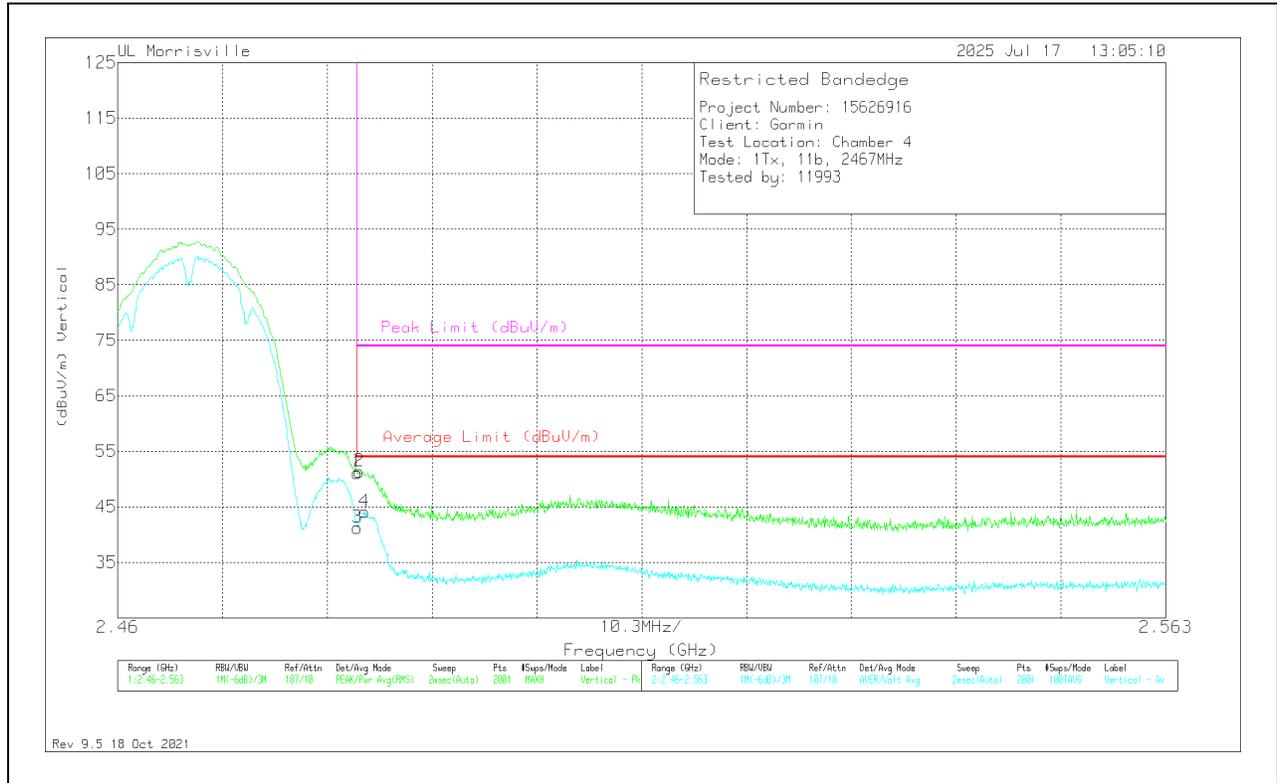
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	42.03	Pk	32.3	-23.2	51.13	-	-	74	-22.87	194	384	V
2	* ** 2.48374	42.26	Pk	32.3	-23.2	51.36	-	-	74	-22.64	194	384	V
3	* ** 2.48354	32.15	ADV	32.3	-23.2	41.25	54	-12.75	-	-	194	384	V
4	* ** 2.48426	35	ADV	32.3	-23.2	44.1	54	-9.9	-	-	194	384	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 ADV - Linear Voltage Average