

FCC and ISED Test Report

Apple Inc
Model: A2615

In accordance with FCC 47 CFR Part 15C, ISED
RSS-247 and ISED RSS-GEN (2.4 GHz WLAN)

Prepared for: Apple Inc, One Apple Park Way, Cupertino
California, 95014, USA

FCC ID: BCGA2615

IC: 579C-A2615

COMMERCIAL-IN-CONFIDENCE

Document 75952325-11 Issue 01



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SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior Engineer	Authorised Signatory	31 January 2022

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C, ISED RSS-247 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Faisal Malyar	31 January 2022	
Testing	Danial Shafique	31 January 2022	
Testing	Taha Shafique	31 January 2022	
Testing	Daniel Cameron	31 January 2022	
Testing	Jaiyanth Balendrarajah	31 January 2022	

FCC Accreditation

90987 Octagon House, Fareham Test Laboratory

ISED Accreditation

12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C: 2020, ISED RSS-247: Issue 2 (02-2017) and ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021) for the tests detailed in section 1.3.



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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	31-January-2022

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
Model Number(s)	A2615
Serial Number(s)	P1F4F29DL4 and PVW2DY4LFY
Hardware Version(s)	REV1.0
Software Version(s)	21B30220I
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2020, ISED RSS-247: Issue 2 (02-2017) ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021)
Order Number	0540220896
Date	25-May-2021
Date of Receipt of EUT	14-October-2021
Start of Test	14-October-2021
Finish of Test	28-January-2022
Name of Engineer(s)	Faisal Malyar, Danial Shafique, Taha Shafique, Daniel Cameron, and Jaiyanth Balendrarajah
Related Document(s)	ANSI C63.4 (2014) ANSI C63.10 (2013) KDB 662911 D01 v02r01



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C, ISED RSS-247 and ISED RSS-GEN is shown below.

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15C	RSS-247	RSS-GEN			
Configuration and Mode: 2.4 GHz WLAN						
-	15.203	-	-	Antenna Requirement	N/T	The device complies with the provisions of this section, as it uses permanently attached integral antennas.
2.1	15.205	-	8.10	Restricted Band Edges	Pass	
2.2	15.247 (a)(2)	5.2	6.7	Emission Bandwidth	Pass	
2.3	15.247 (b)	5.4	6.12	Maximum Conducted Output Power	Pass	
2.4	15.247 (d) and 15.209	3.3 and 5.5	6.13 and 8.9	Spurious Radiated Emissions	Pass	
2.5	15.247 (d)	5.5	-	Authorised Band Edges	Pass	
2.6	15.247 (e)	5.2	6.12	Power Spectral Density	Pass	

Table 2



1.4 Product Information

1.4.1 Technical Description

The Equipment under test (EUT) was a desktop computer with Bluetooth, Bluetooth Low Energy and 802.11 a/b/g/n/ac/ax capabilities in the 2.4 GHz and 5 GHz bands.

1.4.2 Test Modes

The EUT's 2.4 GHz 802.11 radio supports Single Input/Single Output (SISO) and 2x2 MIMO (Multiple Input/Multiple Output). It supports 802.11b and g for SISO and 802.11n and ax at 20 MHz channel bandwidths for SISO and MIMO. 802.11ax supports RU 26/52/106/242.

The EUT uses different output powers per core dependent on how many cores are used. It uses the same conducted power across all cores in any given mode, but due to the different antenna gains the radiated powers per core differs.

After preliminary investigations were performed, the EUT was therefore tested in the following worst-case modes:

SISO Modes (Core 0):

- 802.11b 1 Mbps
- 802.11g 12 Mbps
- 802.11n HT20 MCS2
- 802.11ax HE20 MCS2 SU, RU26-0 and RU26-8

2x2 MIMO Modes (Core 0 + Core 1):

- 802.11n HT20 MCS2 – CDD
- 802.11ax HE20 MCS2 CDD SU, RU26-0 and RU-26-8.

1.4.3 Test Set-up

For conducted tests the EUT antennas were disconnected and replaced with U.FL to SMA test cables to enable conducted testing on each core. The loss of these test cables were known and compensated for in any conducted measurements.

For all tests, the EUT was put into a continuous transmit test mode with the chipset manufacturer's test commands via a script running in the EUTs terminal application. The EUT then transmitted the required type of packeted 802.11 data frames of fixed length, containing the standard headers and with pseudo-random data content, ensuring the measured signals were representative and contained all the symbols at the highest power control level.

All testing was performed with the EUT powered via a 120 V AC, 60 Hz source.

1.4.4 Antenna Gain Table

Antenna Port	Frequency Range (MHz)	Peak Gain (dBi)	Conducted Cable Loss (dB)
Core 0	2400 to 2480	2.20	1.0
Core 1	2400 to 2480	1.40	1.0

Table 3



1.5 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.6 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Model: A2615, Serial Number: P1F4F29DL4			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2615, Serial Number: PVW2DY4LFY			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 4

1.7 Test Location

TÜV SÜD conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 2.4 GHz WLAN		
Restricted Band Edges	Faisal Malyar, Danial Shafique, Taha Shafique and Jaiyanth Balendrarajah	UKAS
Emission Bandwidth	Daniel Cameron	UKAS
Maximum Conducted Output Power	Daniel Cameron	UKAS
Spurious Radiated Emissions	Jaiyanth Balendrarajah, Taha Shafique, Danial Shafique and Faisal Malyar	UKAS
Authorised Band Edges	Faisal Malyar, Danial Shafique, Taha Shafique and Jaiyanth Balendrarajah	UKAS
Power Spectral Density	Daniel Cameron	UKAS

Table 5

Office Address:

TÜV SÜD
 Octagon House
 Concorde Way
 Fareham
 Hampshire
 PO15 5RL
 United Kingdom



2 Test Details

2.1 Restricted Band Edges

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.205
ISED RSS-GEN, Clause 8.10

2.1.2 Equipment Under Test and Modification State

A2615, S/N: P1F4F29DL4 - Modification State 0

2.1.3 Date of Test

14-October-2021 to 24-October-2021

2.1.4 Test Method

Restricted band edge measurements were performed, with the device operating in SISO and MIMO configurations, across the various modes supported by the device.

The measurements displayed within this report, have been limited to those modes which have been shown to be worst case. Further measurements are held on file by TÜV SÜD and are available if required.

2.1.5 Environmental Conditions

Ambient Temperature	19.4 - 24.5 °C
Relative Humidity	40.9 - 58.3 %



2.1.6 Test Results

2.4 GHz WLAN

Mode	Data Rate /MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBµV/m)	Average Level (dBµV/m)
802.11b, Core 0	1 Mbps	-	-	2412	2390.0	57.19	47.48
802.11b, Core 0	1 Mbps	-	-	2462	2483.5	54.90	43.32
802.11b, Core 0	1 Mbps	-	-	2467	2483.5	59.19	50.27
802.11b, Core 0	1 Mbps	-	-	2472	2483.5	58.07	50.57
802.11g, Core 0	12 Mbps	-	-	2412	2390.0	64.75	50.86
802.11g, Core 0	54 Mbps	-	-	2462	2483.5	65.64	50.63
802.11g, Core 0	12 Mbps	-	-	2467	2483.5	62.08	50.68
802.11g, Core 0	12 Mbps	-	-	2472	2483.5	61.37	50.47
802.11n HT20, Core 0	MCS4	-	-	2412	2390.0	64.84	50.97
802.11n HT20, Core 0	MCS4	-	-	2462	2483.5	65.24	50.11
802.11n HT20, Core 0	MCS7	-	-	2467	2483.5	67.12	50.58
802.11n HT20, Core 0	MCS7	-	-	2472	2483.5	62.65	50.63
802.11ax HE20, Core 0	MCS2	SU	-	2412	2390.0	64.98	50.60
802.11ax HE20, Core 0	MCS2	SU	-	2462	2483.5	64.04	50.25
802.11ax HE20, Core 0	MCS4	SU	-	2467	2483.5	63.24	50.88
802.11ax HE20, Core 0	MCS2	SU	-	2472	2483.5	65.36	50.70
802.11ax HE20, Core 0	MCS9	26	0	2412	2390.0	57.63	43.14
802.11ax HE20, Core 0	MCS9	26	8	2462	2483.5	55.10	43.32
802.11ax HE20, Core 0	MCS9	26	8	2467	2483.5	59.01	44.14
802.11ax HE20, Core 0	MCS9	26	8	2472	2483.5	68.85	47.85

Table 6 - SISO Restricted Band Edge Results

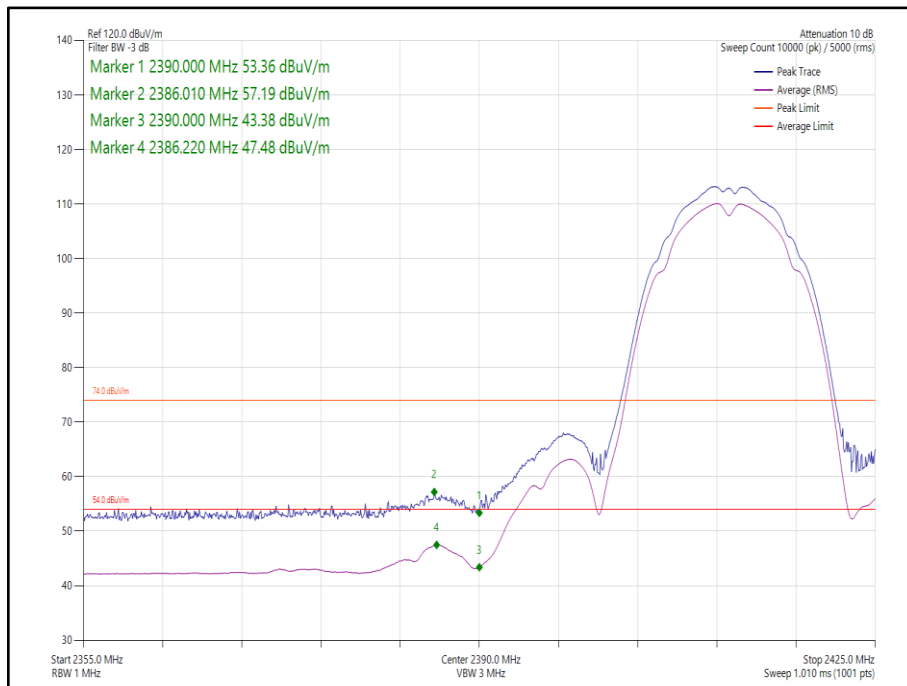


Figure 1 - 802.11b, Core 0 - 2412 MHz, Band Edge Frequency 2390.0 MHz

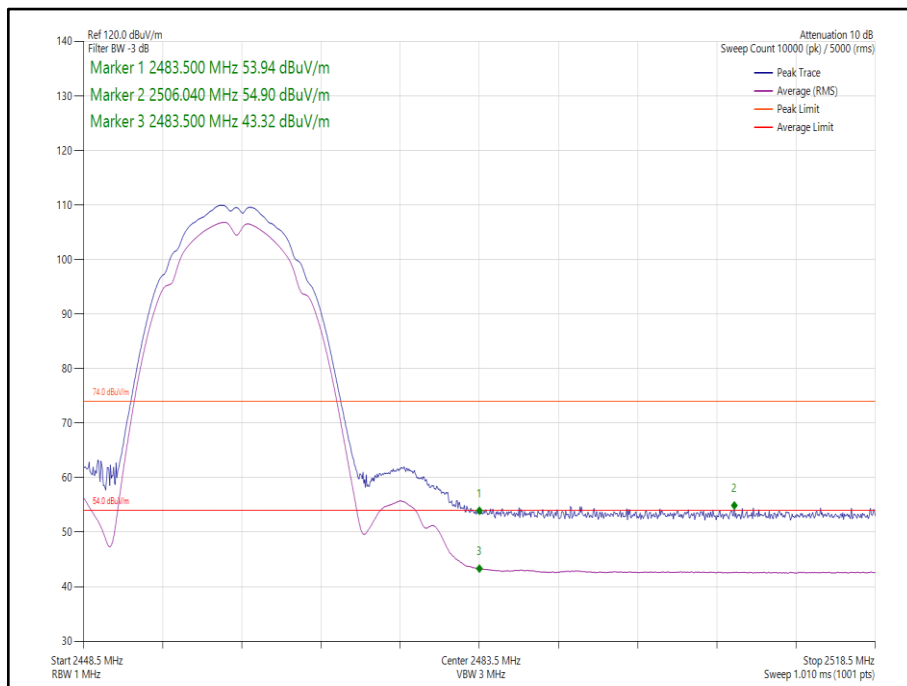


Figure 2 - 802.11b, Core 0 - 2462 MHz, Band Edge Frequency 2483.5 MHz

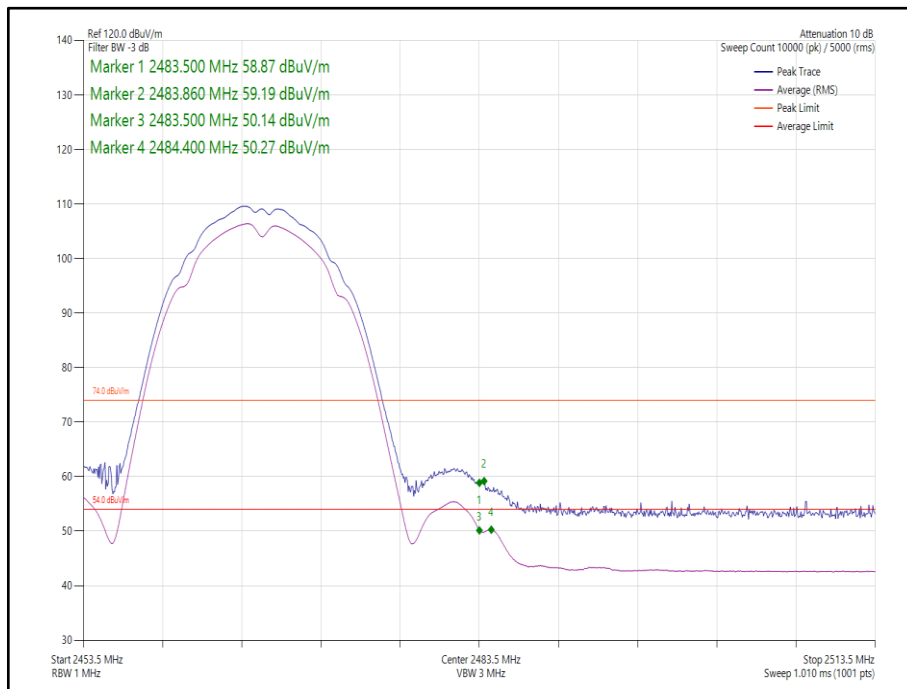


Figure 3 - 802.11b, Core 0 - 2467 MHz, Band Edge Frequency 2483.5 MHz

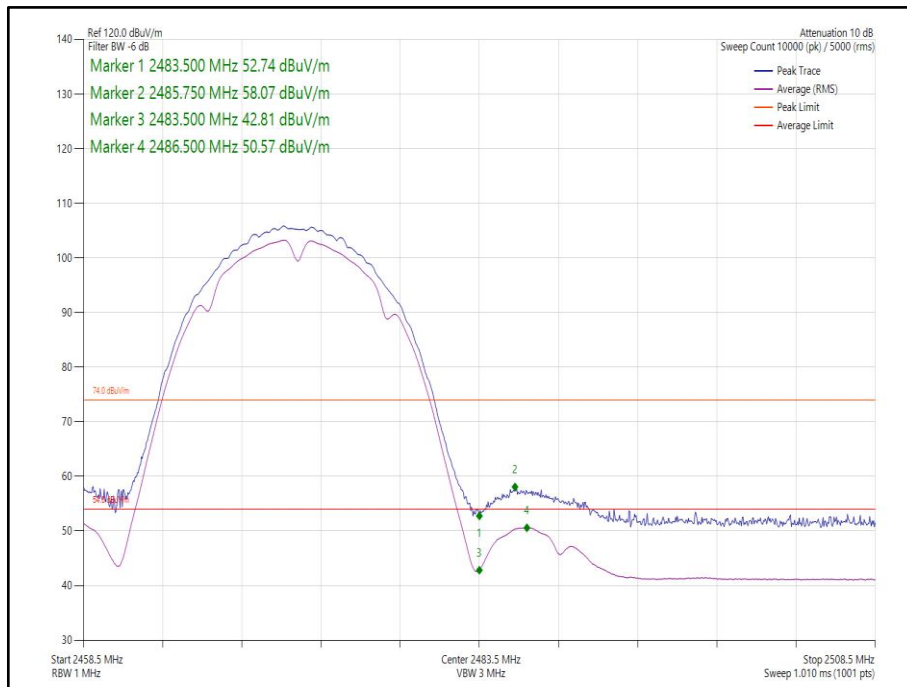


Figure 4 - 802.11b, Core 0 - 2472 MHz, Band Edge Frequency 2483.5 MHz

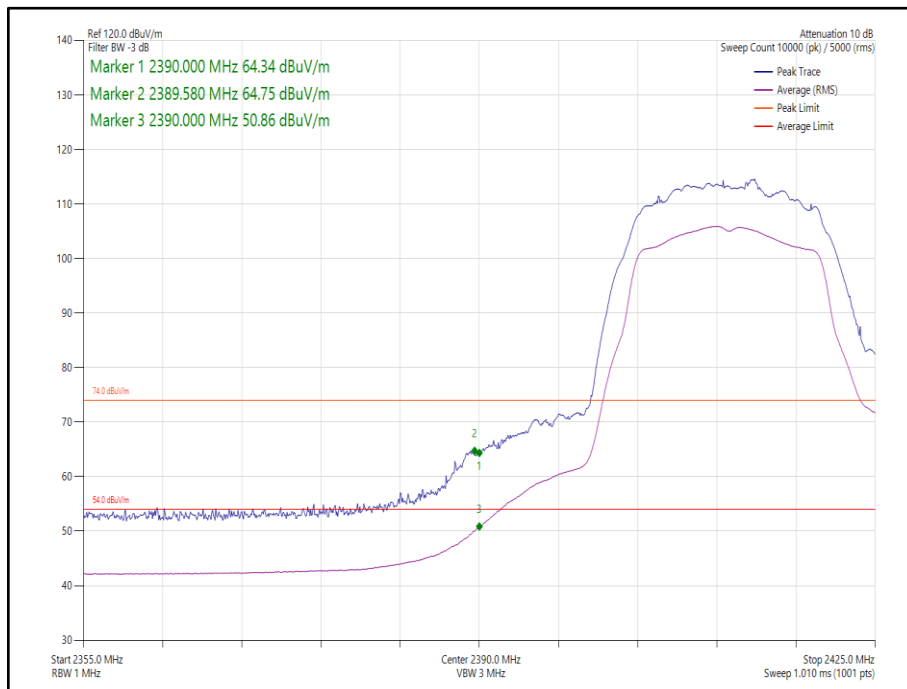


Figure 5 - 802.11g, Core 0 - 2412 MHz, Band Edge Frequency 2390.0 MHz

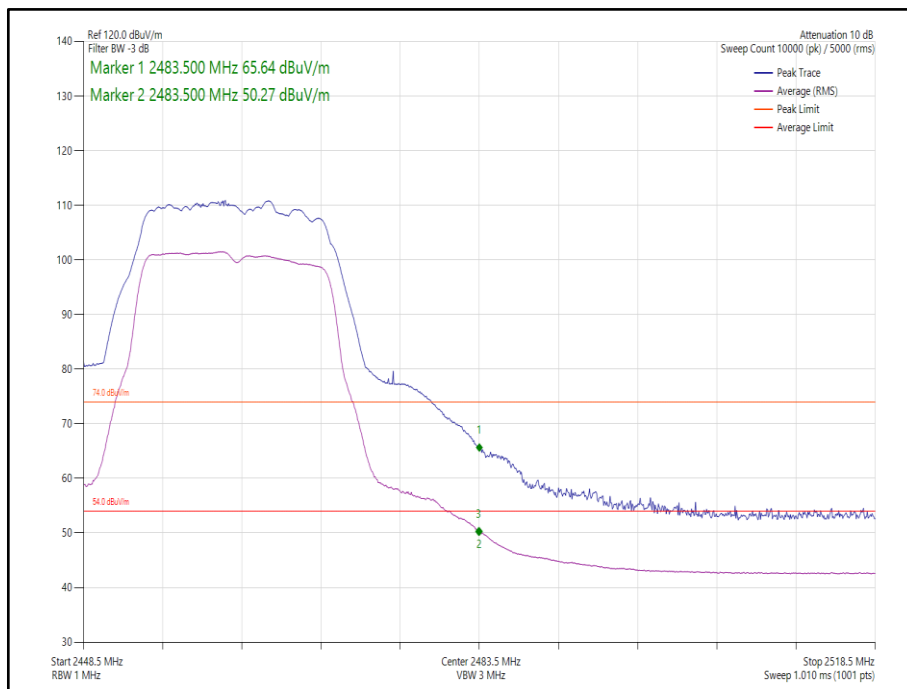


Figure 6 - 802.11g, Core 0 - 2462 MHz, Band Edge Frequency 2483.5 MHz

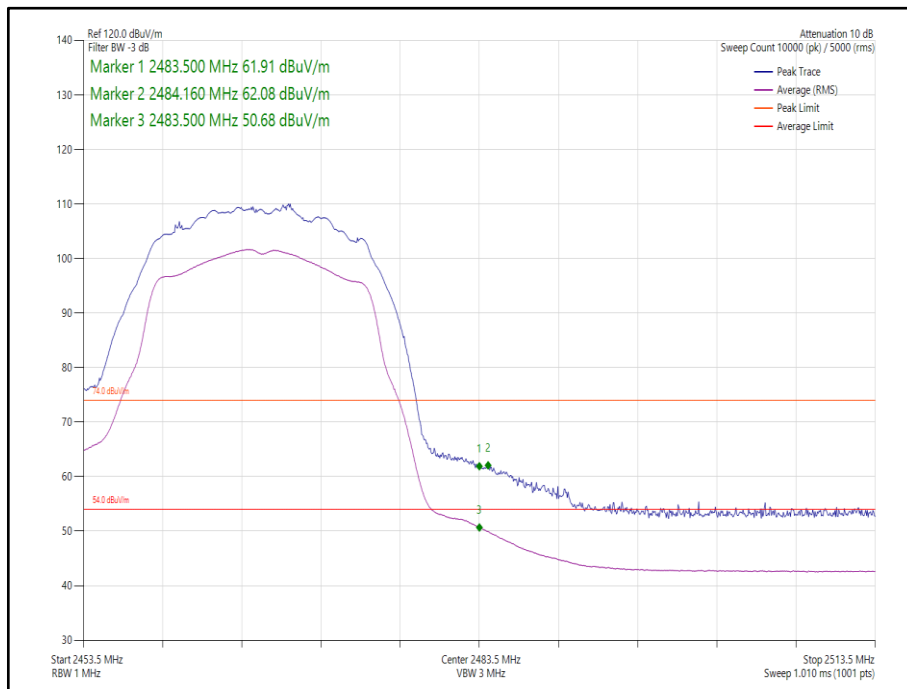


Figure 7 - 802.11g, Core 0 - 2467 MHz, Band Edge Frequency 2483.5 MHz

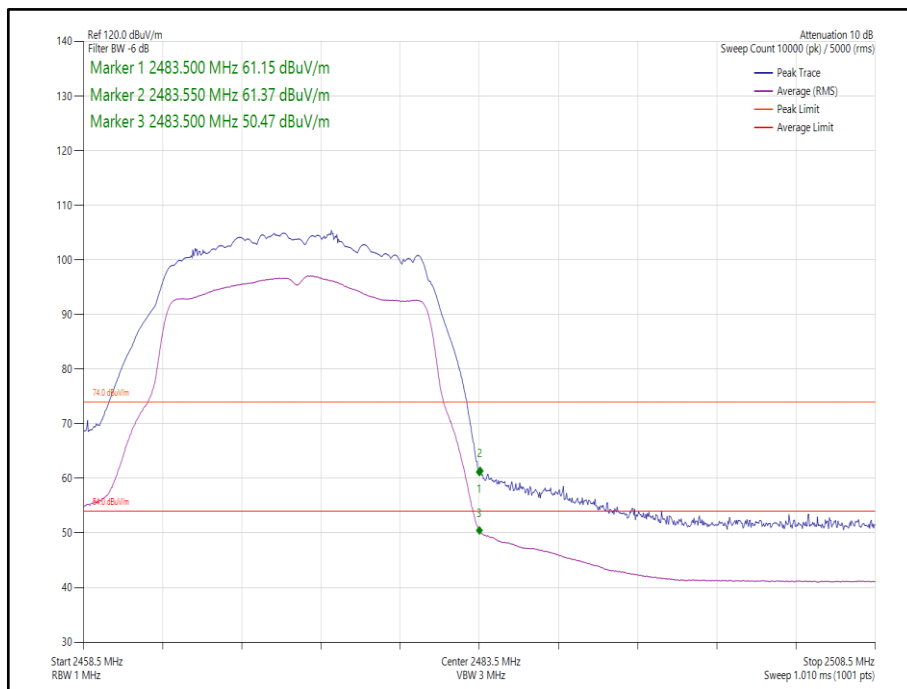


Figure 8 - 802.11g, Core 0 - 2472 MHz, Band Edge Frequency 2483.5 MHz

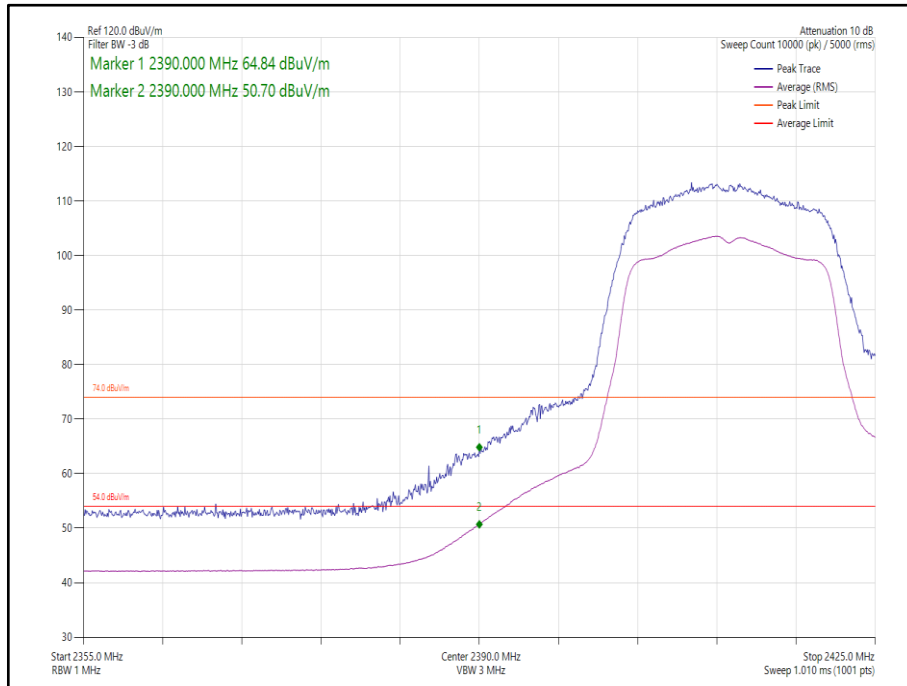


Figure 9 - 802.11n, HT20, Core 0 - 2412 MHz, Band Edge Frequency 2390 MHz

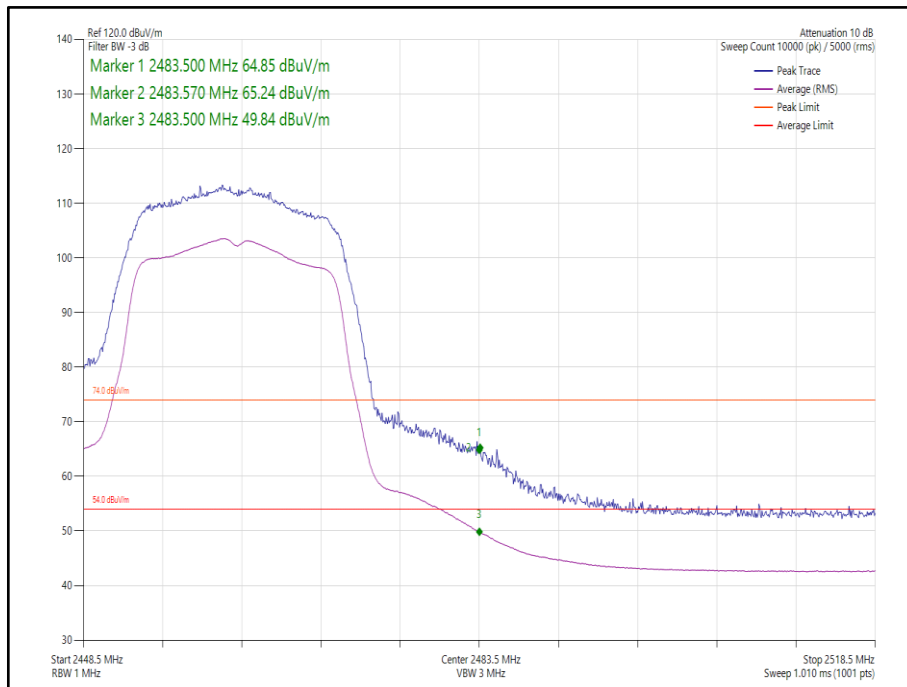


Figure 10 - 802.11n HT20, Core 0 - 2462 MHz, Band Edge Frequency 2483.5 MHz

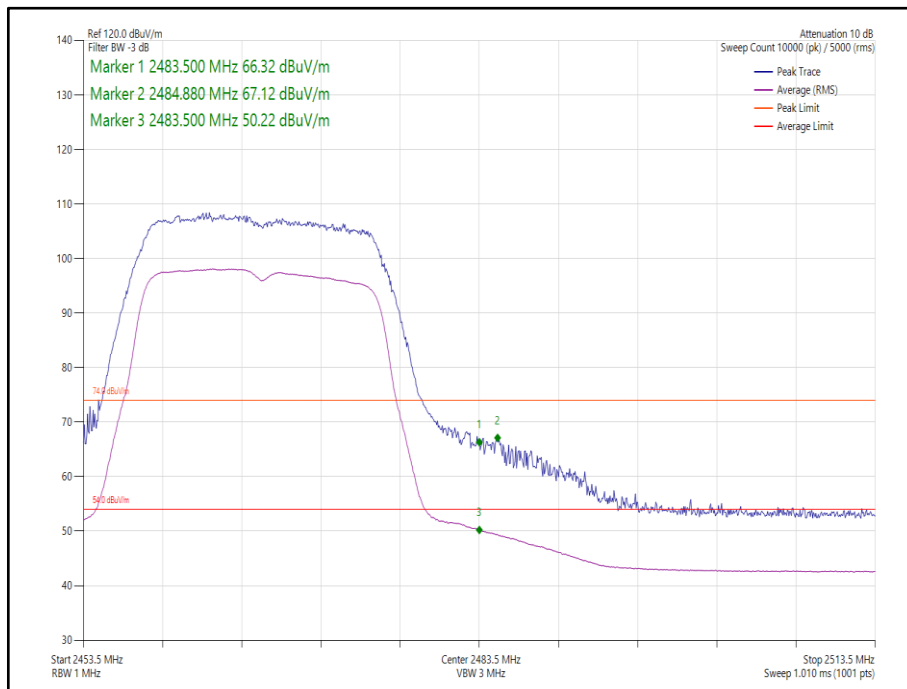


Figure 11 - 802.11n HT20, Core 0 - 2467 MHz, Band Edge Frequency 2483.5 MHz

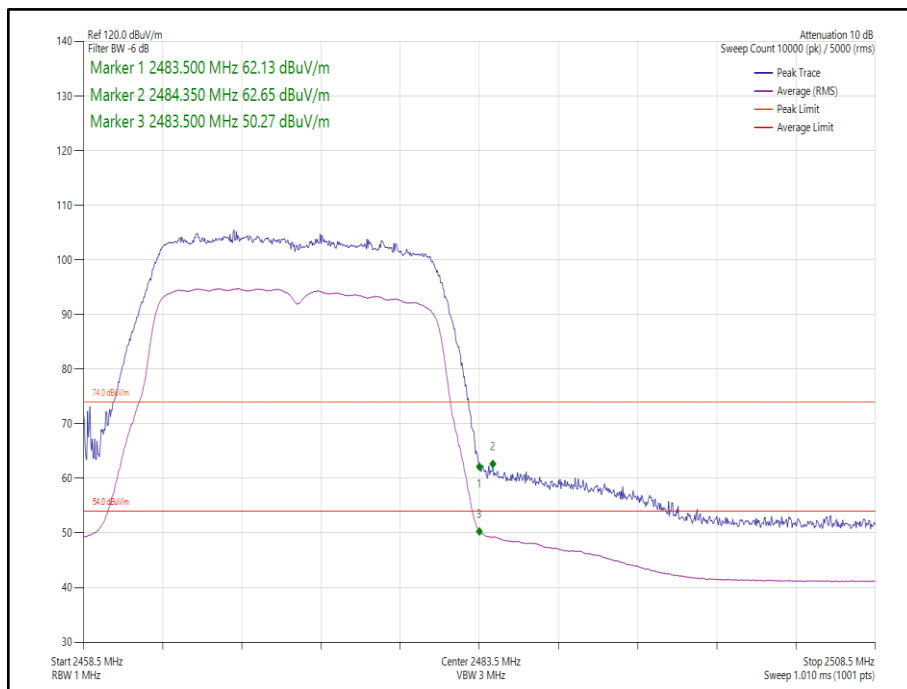


Figure 12 - 802.11n HT20, Core 0 - 2472 MHz, Band Edge Frequency 2483.5 MHz

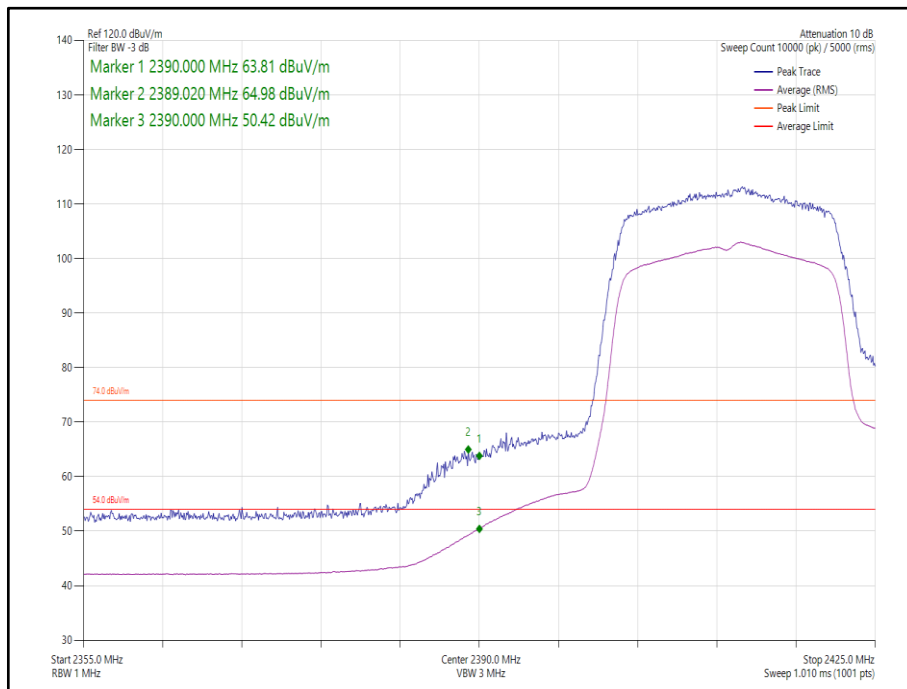


Figure 13 - 802.11ax HE20, Core 0, SU - 2412 MHz, Band Edge Frequency 2390 MHz

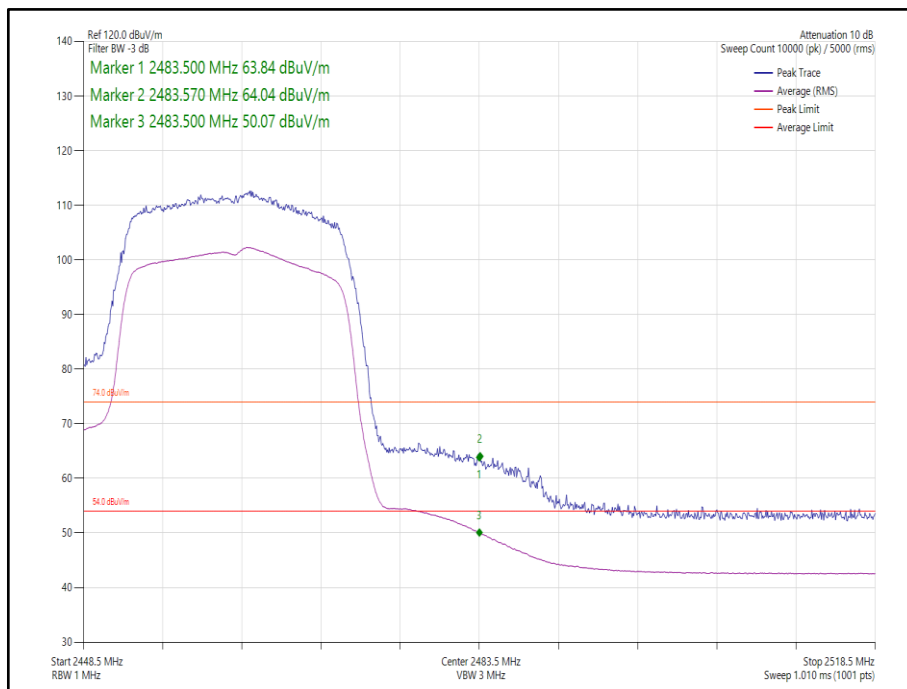


Figure 14 - 802.11ax HE20, Core 0, SU - 2462 MHz, Band Edge Frequency 2483.5 MHz

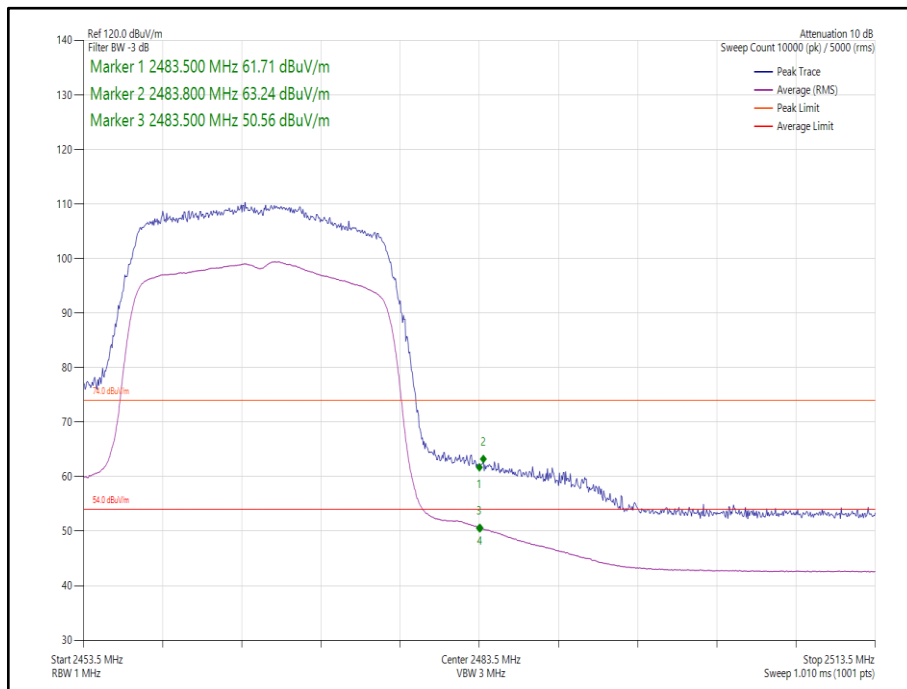


Figure 15 - 802.11ax HE20, Core 0, SU - 2467 MHz, Band Edge Frequency 2483.5 MHz

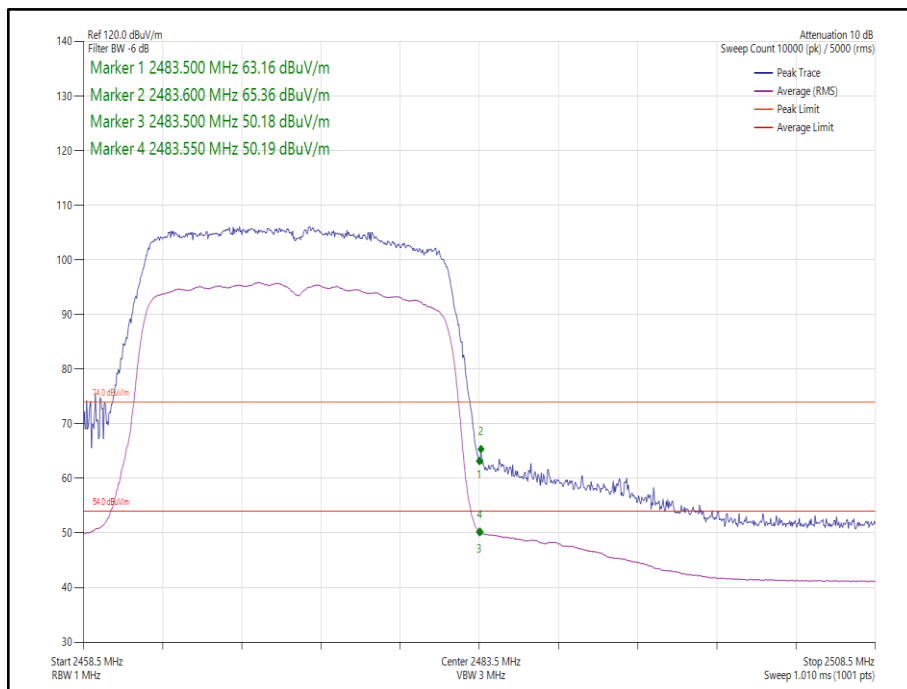


Figure 16 - 802.11ax HE20, Core 0, SU - 2472 MHz, Band Edge Frequency 2483.5 MHz

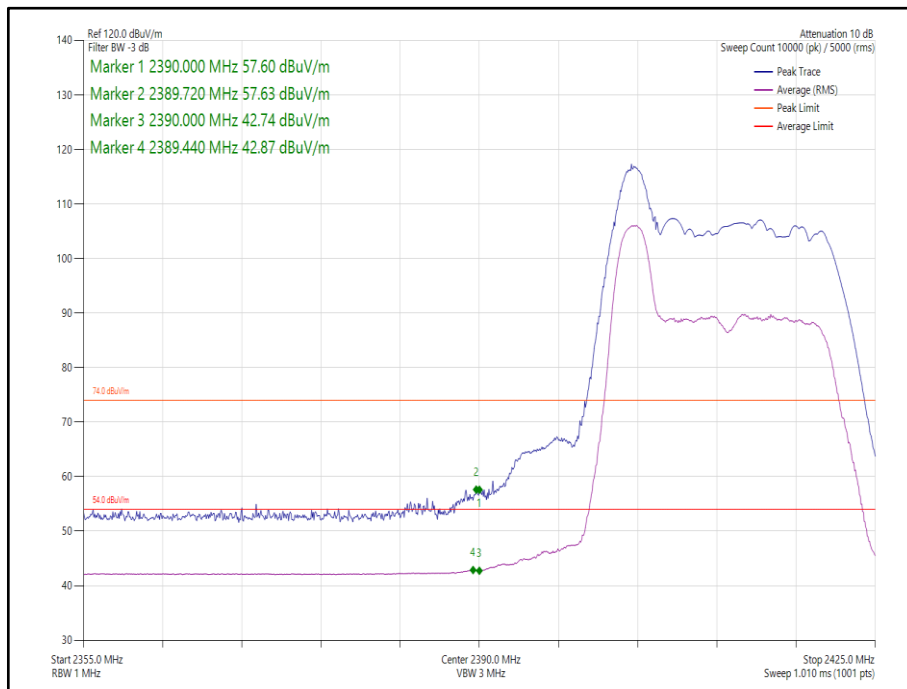


Figure 17 - 802.11ax HE20, Core 0, 26-0 - 2412 MHz, Band Edge Frequency 2390 MHz

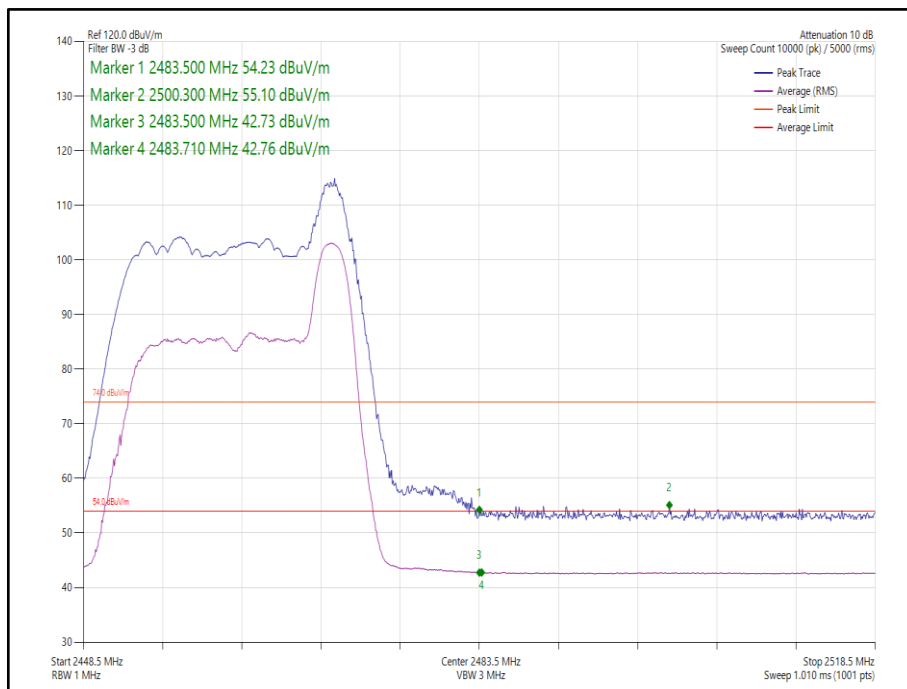


Figure 18 - 802.11ax HE20, Core 0, 26-8 - 2462 MHz, Band Edge Frequency 2483.5 MHz

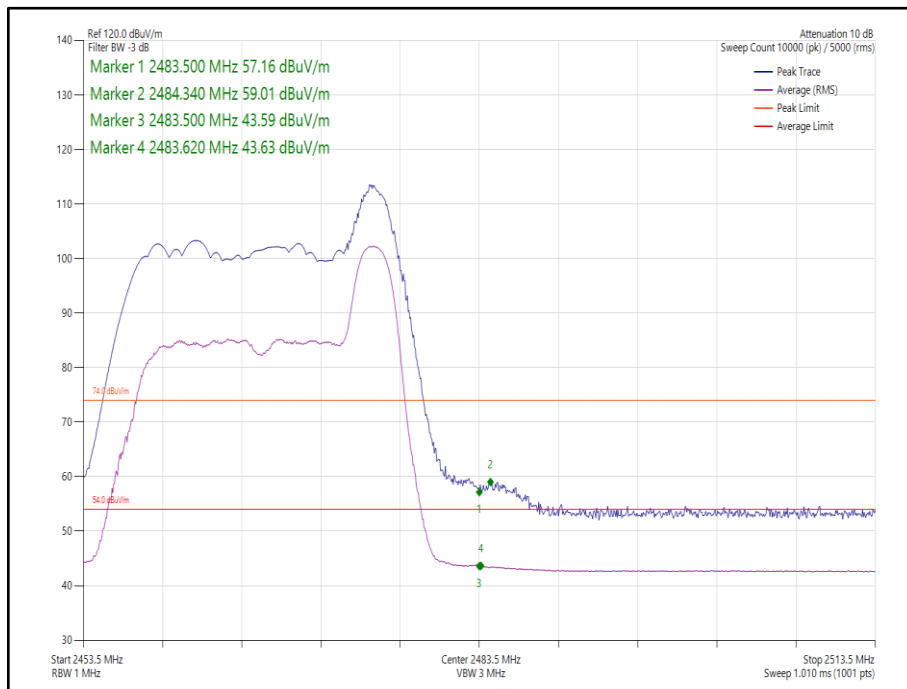


Figure 19 - 802.11ax HE20, Core 0, 26-8 - 2467 MHz, Band Edge Frequency 2483.5 MHz

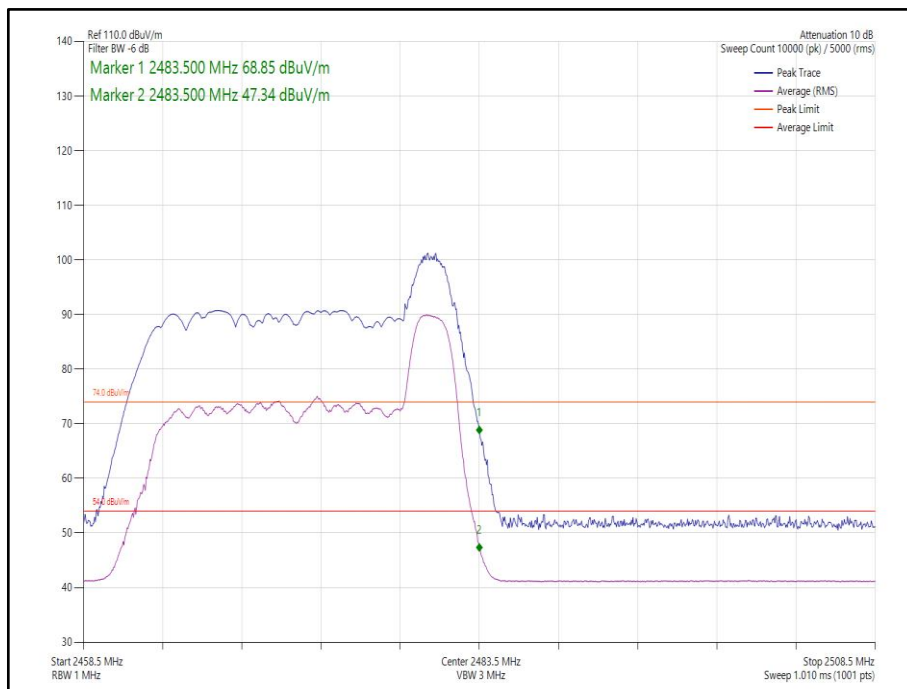


Figure 20 - 802.11ax HE20, Core 0, 26-8 - 2472 MHz, Band Edge Frequency 2483.5 MHz



Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dB μ V/m)	Average Level (dB μ V/m)
802.11n HT20, Core 0-1	MCS7	-	-	2412	2390.0	67.21	50.97
802.11n HT20, Core 0-1	MCS7	-	-	2462	2483.5	68.91	51.00
802.11n HT20, Core 0-1	MCS7	-	-	2467	2483.5	66.62	50.54
802.11n HT20, Core 0-1	MCS7	-	-	2472	2483.5	66.84	50.96
802.11ax HE20, Core 0-1	MCS9	SU	-	2412	2390.0	65.58	50.05
802.11ax HE20, Core 0-1	MCS9	26	0	2412	2390.0	57.16	43.19
802.11ax HE20, Core 0-1	MCS9	SU	-	2462	2483.5	68.29	50.34
802.11ax HE20, Core 0-1	MCS9	26	8	2462	2483.5	55.63	43.51
802.11ax HE20, Core 0-1	MCS9	SU	-	2467	2483.5	66.25	50.12
802.11ax HE20, Core 0-1	MCS9	26	8	2467	2483.5	60.75	44.46
802.11ax HE20, Core 0-1	MCS9	SU	-	2472	2483.5	66.98	50.71
802.11ax HE20, Core 0-1	MCS9	26	8	2472	2483.5	68.79	47.91

Table 7 – MIMO 2TX Restricted Band Edge Results

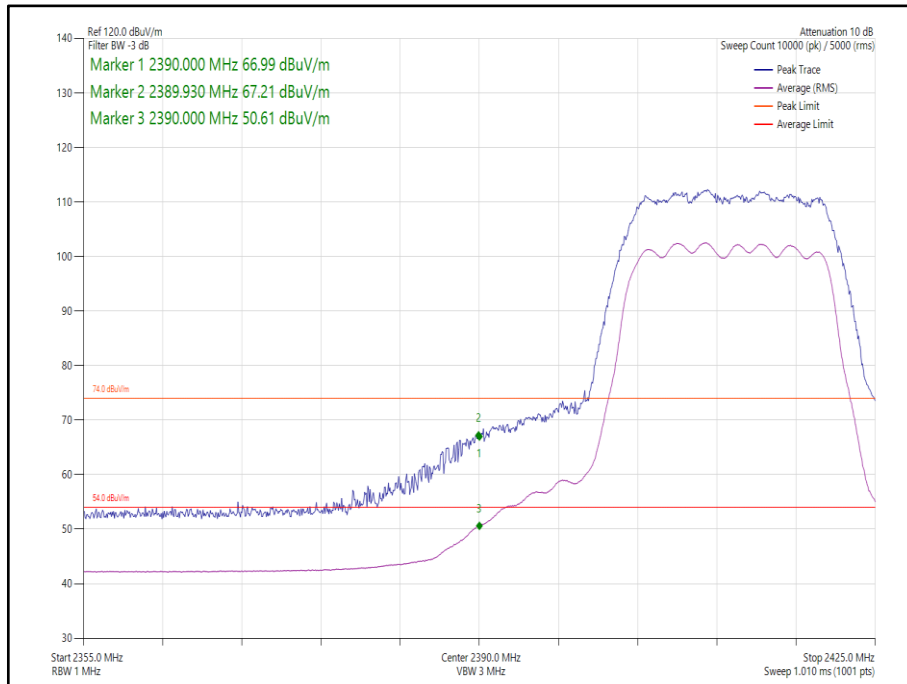


Figure 21 - 802.11n HT20, Core 0-1 - 2412 MHz, Band Edge Frequency 2390 MHz

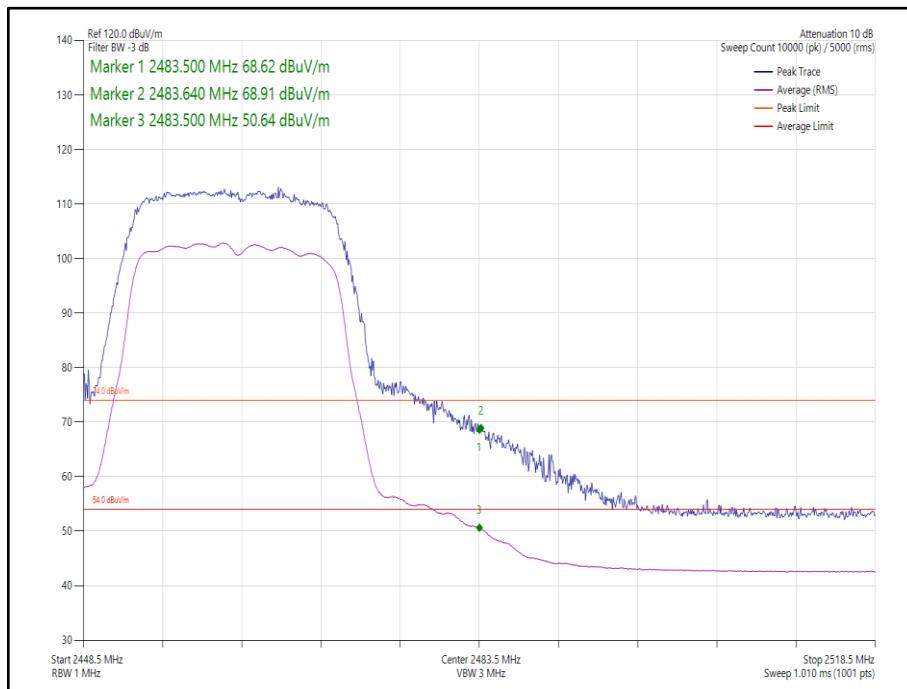


Figure 22 - 802.11n HT20, Core 0-1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

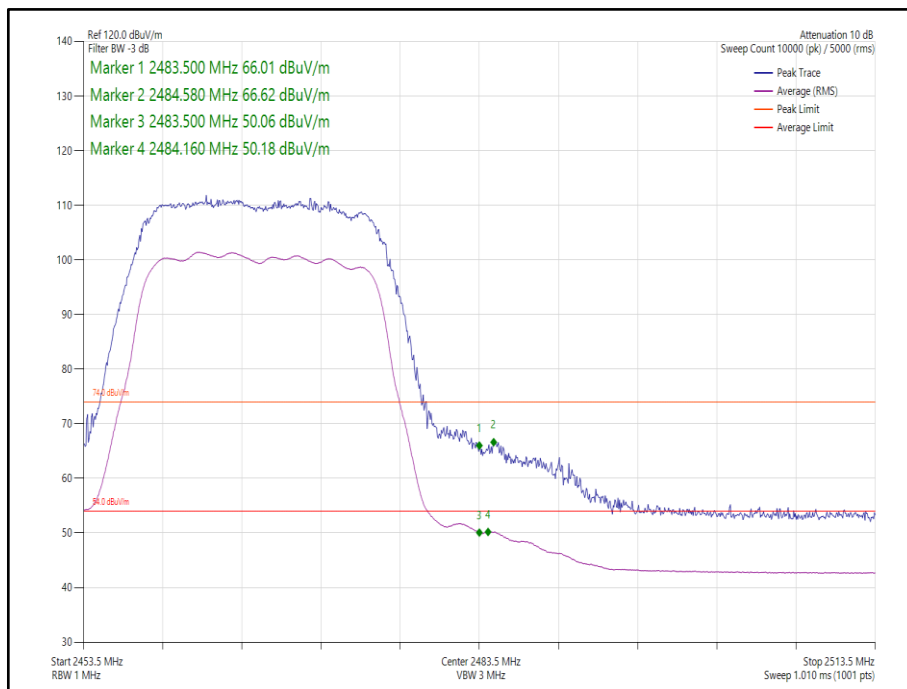


Figure 23 - 802.11n HT20, Core 0-1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

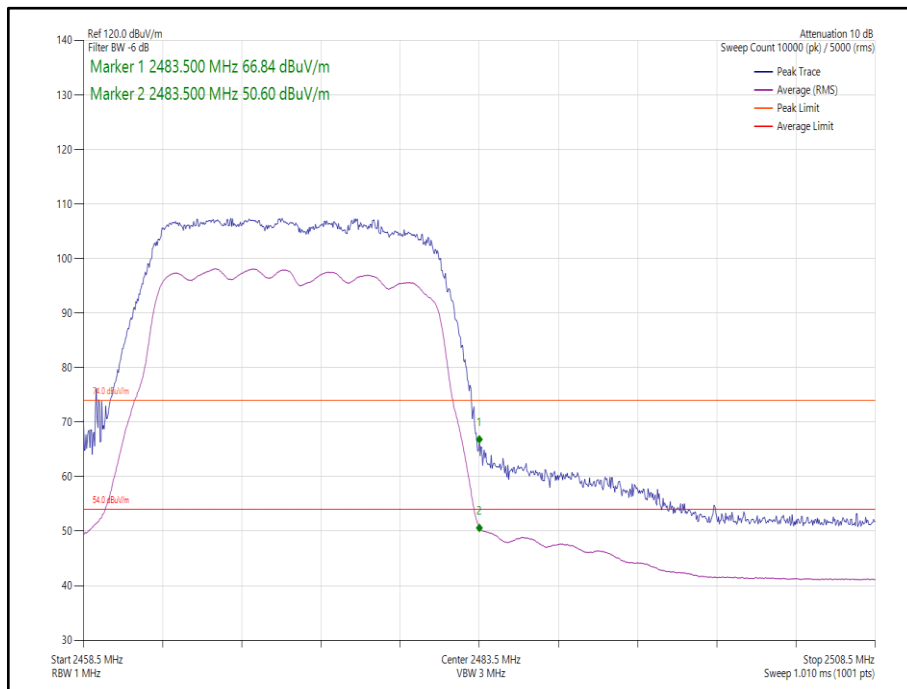


Figure 24 - 802.11n HT20, Core 0-1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

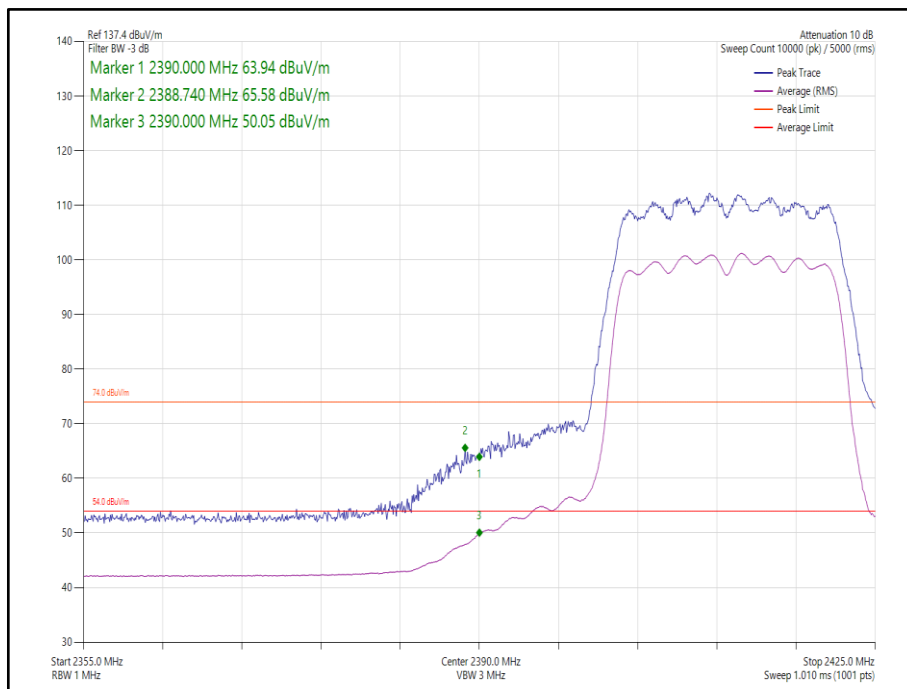


Figure 25 - 802.11ax HE20, Core 0-1, SU - 2412 MHz, Band Edge Frequency 2390 MHz

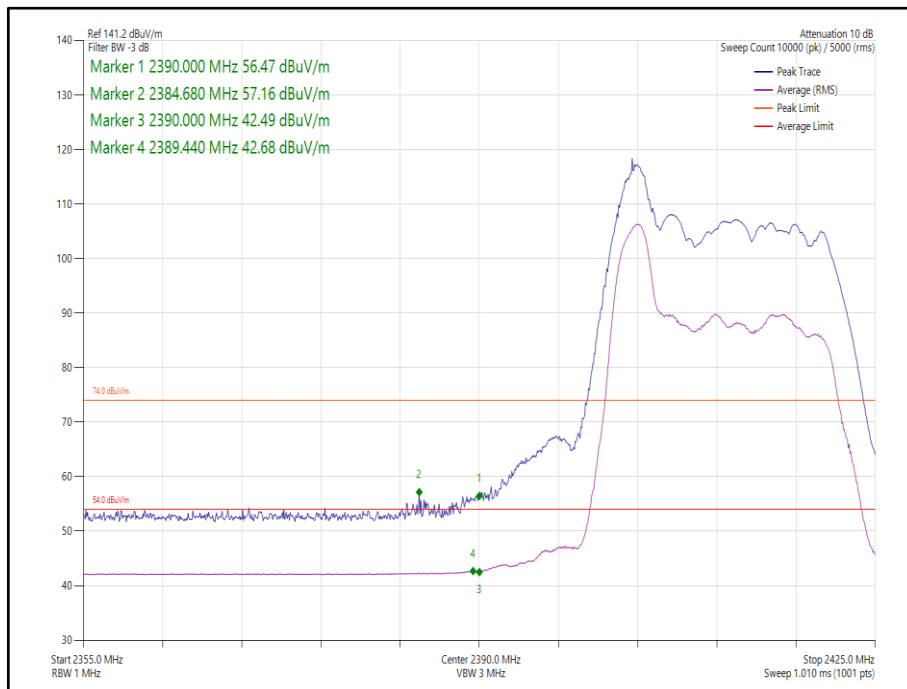


Figure 26 - 802.11ax HE20, Core 0-1, 26-0 - 2412 MHz, Band Edge Frequency 2390 MHz

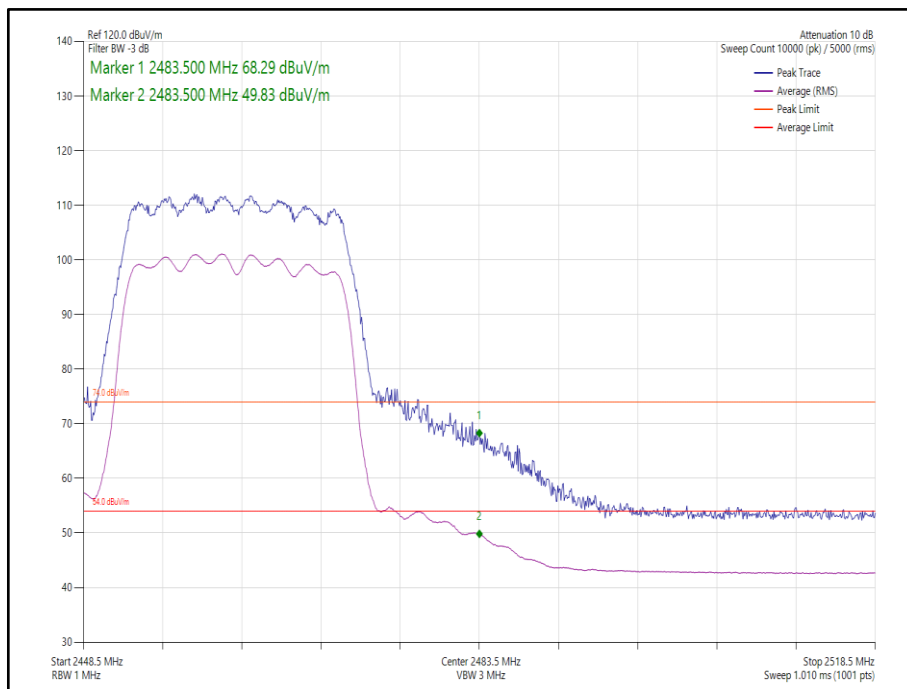


Figure 27 - 802.11ax HE20, Core 0-1, SU - 2462 MHz, Band Edge Frequency 2483.5 MHz

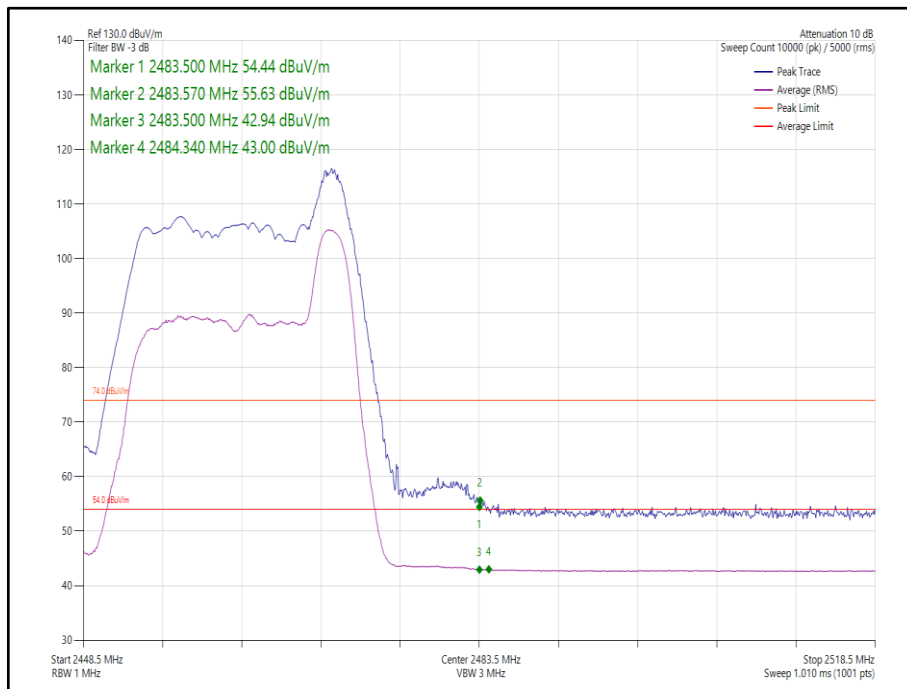


Figure 28 - 802.11ax HE20, Core 0-1, 26-8 - 2462 MHz, Band Edge Frequency 2483.5 MHz

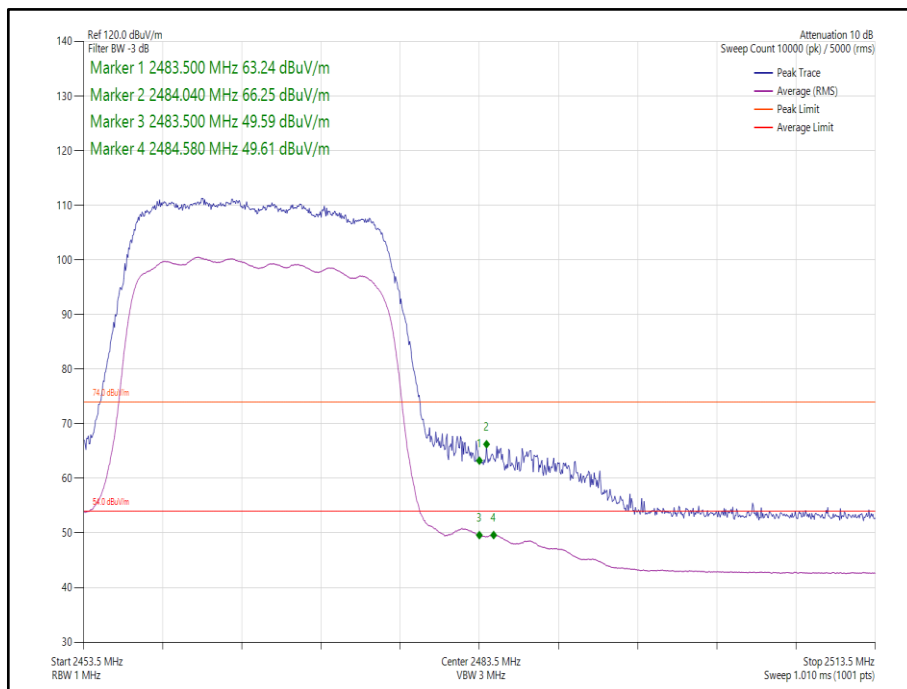


Figure 29 - 802.11ax HE20, Core 0-1, SU - 2467 MHz, Band Edge Frequency 2483.5 MHz

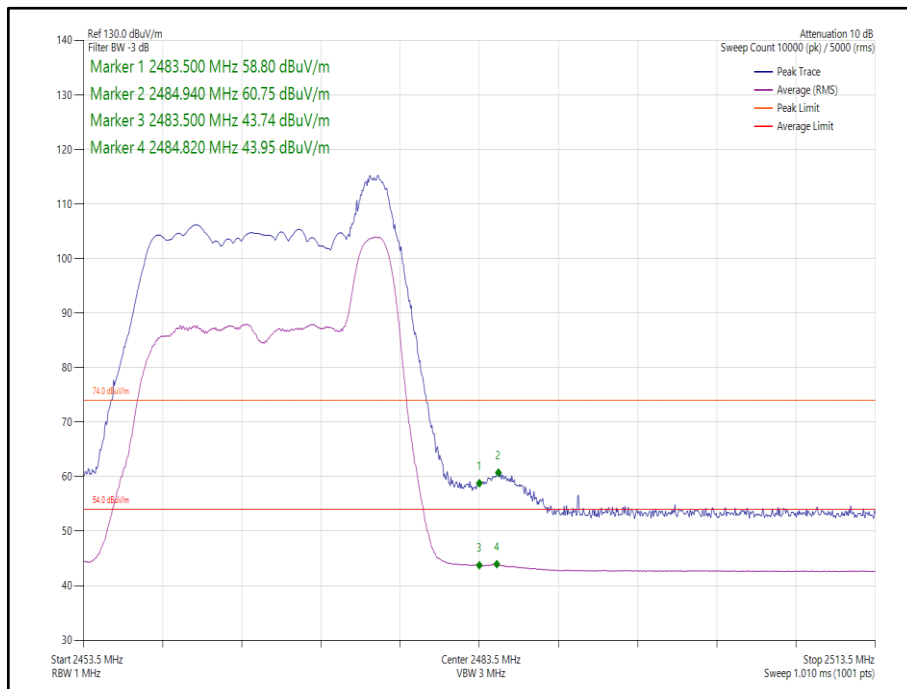


Figure 30 - 802.11ax HE20, Core 0-1, 26-8 - 2467 MHz, Band Edge Frequency 2483.5 MHz

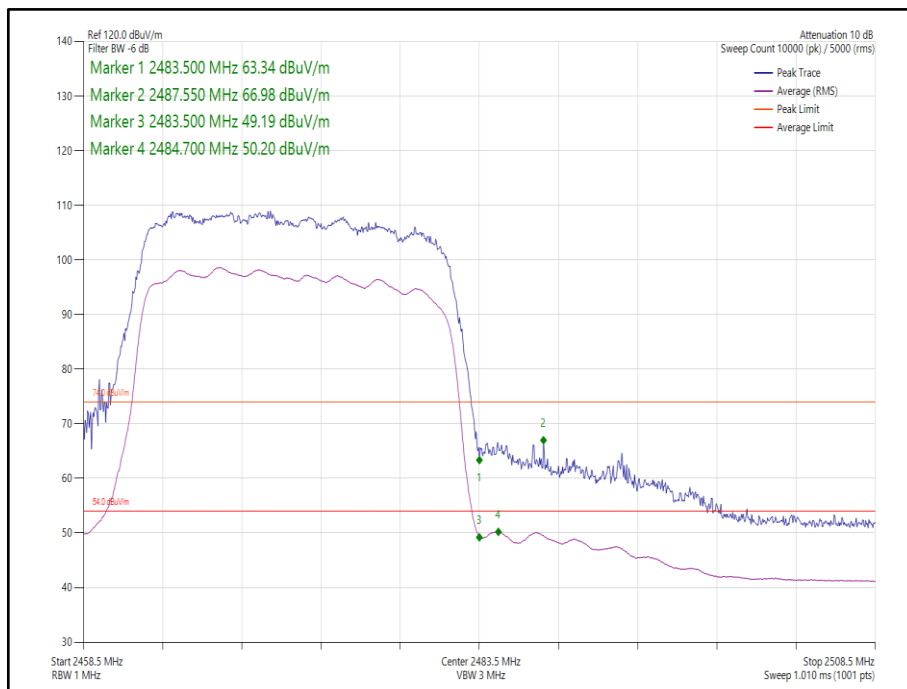


Figure 31 - 802.11ax HE20, Core 0-1, SU - 2472 MHz, Band Edge Frequency 2483.5 MHz

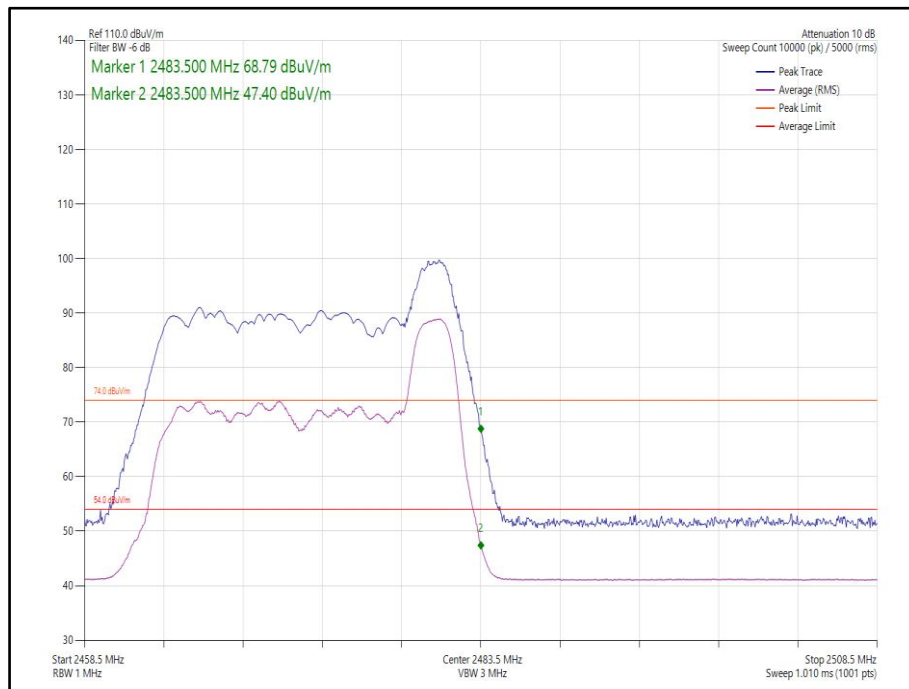


Figure 32 - 802.11ax HE20, Core 0-1, 26-8 - 2472 MHz, Band Edge Frequency 2483.5 MHz



FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 8

ISED RSS-GEN, Limit Clause 8.9

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960*	500

Table 9

*Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.



2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Multimeter	Iso-tech	IDM101	2421	12	28-Oct-2021
EMI Test Receiver	Rohde & Schwarz	ESW44	5084	12	08-Mar-2022
Emissions Software	TUV SUD	EmX V2.1.11	5125	-	Software
Screened Room (11)	Rainford	Rainford	5136	36	01-Nov-2021
Mast	Maturo	TAM 4.0-P	5158	-	TU
Mast and Turntable Controller	Maturo	Maturo NCD	5159	-	TU
Turntable	Maturo	TT 15WF	5160	-	TU
Horn Antenna (1-10GHz)	Schwarzbeck	BBHA 9120 B	5215	12	01-Apr-2022
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5518	12	09-Apr-2022
8m N Type Cable	Junkosha	MWX221-08000NMSNMS/B	5522	12	24-Mar-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5604	12	22-Sep-2022

Table 10

TU - Traceability Unscheduled



2.2 Emission Bandwidth

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (a)(2)
ISED RSS-247, Clause 5.2
ISED RSS-GEN, Clause 6.7

2.2.2 Equipment Under Test and Modification State

A2615, S/N: PVW2DY4LFY - Modification State 0

2.2.3 Date of Test

10-January-2022 to 11-January-2022

2.2.4 Test Method

This test was performed in accordance with ANSI C63.10, clauses 6.9.3 and 11.8.1.

For modes of operation using multiple cores, measurements were made on each core but only the worst case results are reported. Worst case was considered as the narrowest results for 6 dB bandwidth and the widest result for 26 dB bandwidth and 99% occupied bandwidth.

2.2.5 Environmental Conditions

Ambient Temperature	21.1 - 22.5 °C
Relative Humidity	33.5 - 45.1 %



2.2.6 Test Results

2.4 GHz WLAN

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11b	Duty Cycle (%):	-
Data Rate:	1 Mbps	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	6 dB Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	8.600	-	-	-	8.600	≥500.0
2442	8.120	-	-	-	8.120	≥500.0
2472	8.640	-	-	-	8.640	≥500.0

Table 11 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	12.800	-	-	-	12.800	-
2442	12.720	-	-	-	12.720	-
2472	12.840	-	-	-	12.840	-

Table 12 - 99% Bandwidth Results

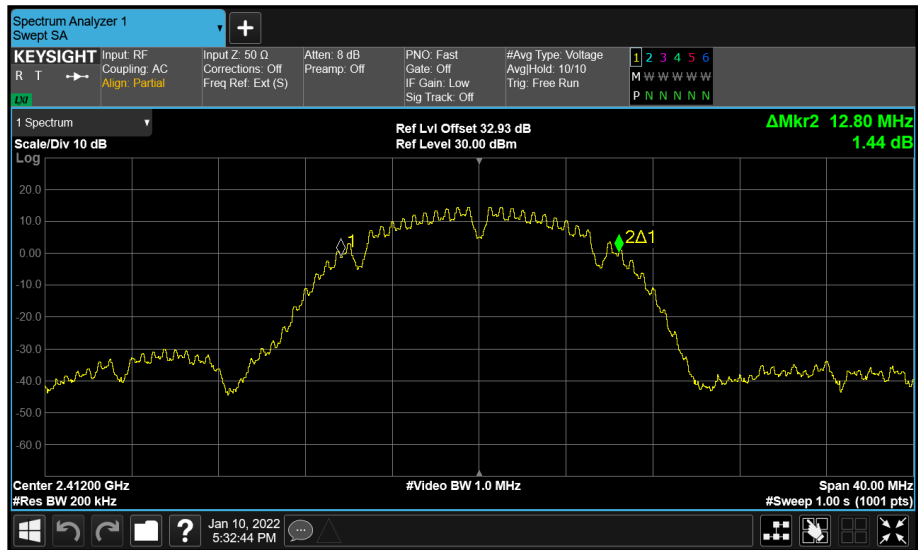


Figure 33 - Core 0 (A) 2412 MHz (CH1) 99% Bandwidth

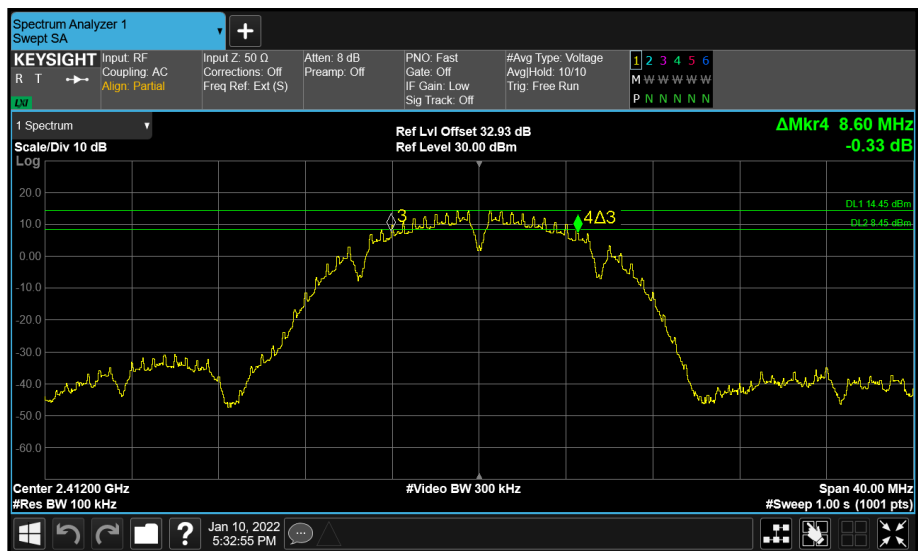


Figure 34 - Core 0 (A) 2412 MHz (CH1) 6 dB Bandwidth

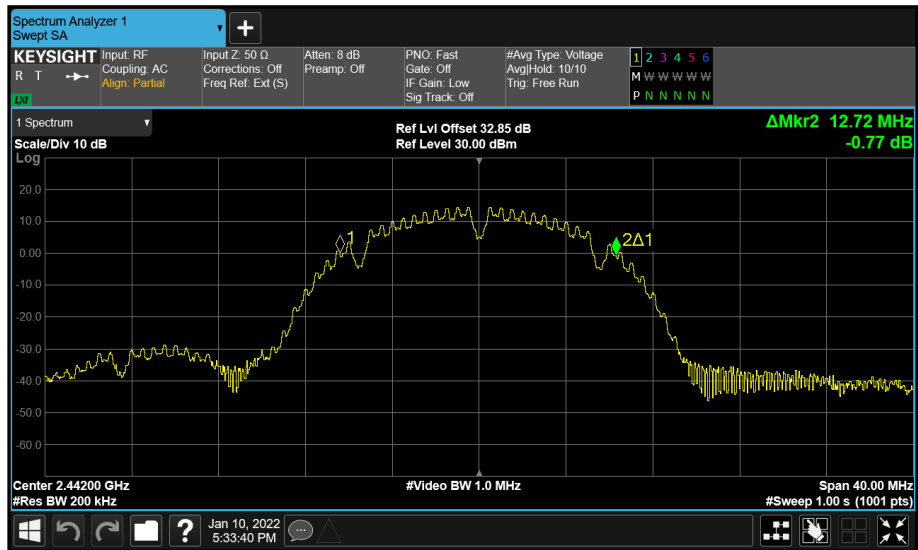


Figure 35 - Core 0 (A) 2442 MHz (CH7) 99% Bandwidth

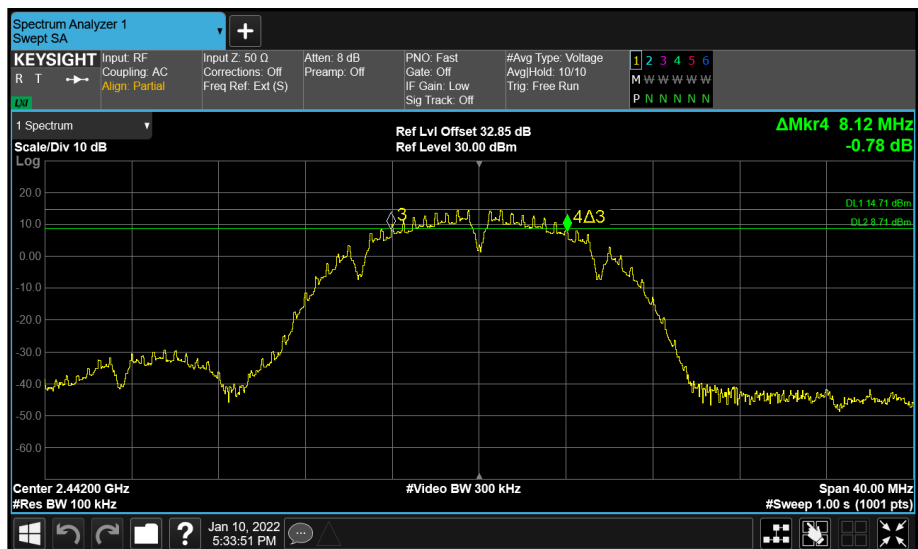


Figure 36 - Core 0 (A) 2442 MHz (CH7) 6 dB Bandwidth

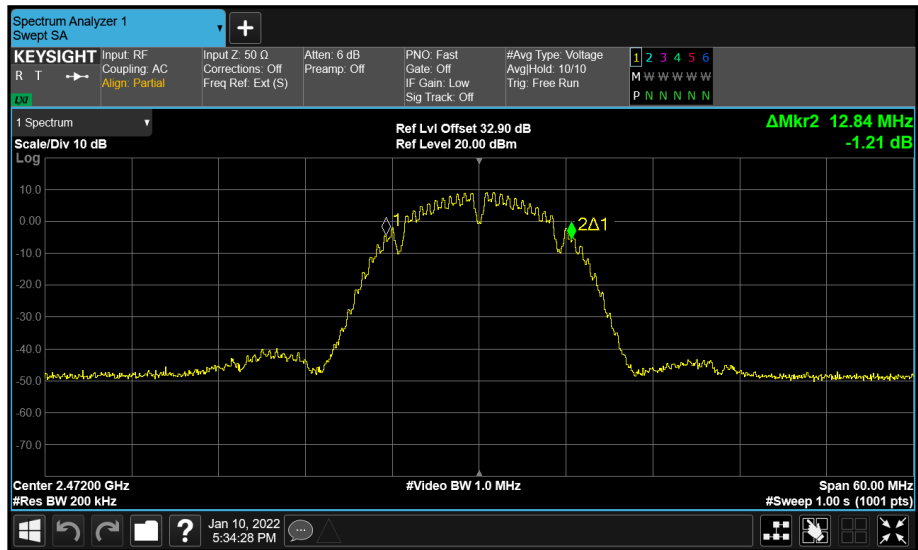


Figure 37 - Core 0 (A) 2472 MHz (CH13) 99% Bandwidth

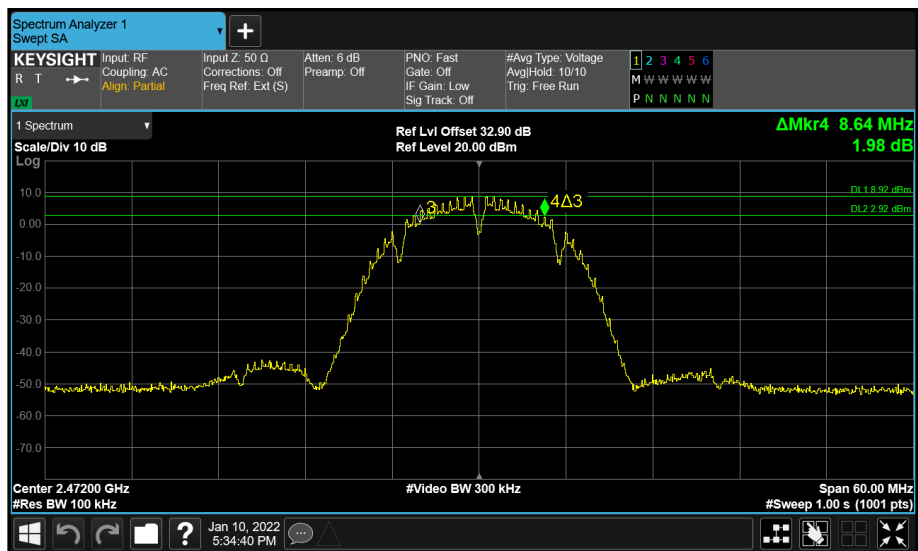


Figure 38 - Core 0 (A) 2472 MHz (CH13) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11g	Duty Cycle (%):	-
Data Rate:	12 Mbps	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	6 dB Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	15.300	-	-	-	15.300	≥500.0
2442	15.240	-	-	-	15.240	≥500.0
2472	15.840	-	-	-	15.840	≥500.0

Table 13 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	16.620	-	-	-	16.620	-
2442	16.320	-	-	-	16.320	-
2472	16.500	-	-	-	16.500	-

Table 14 - 99% Bandwidth Results

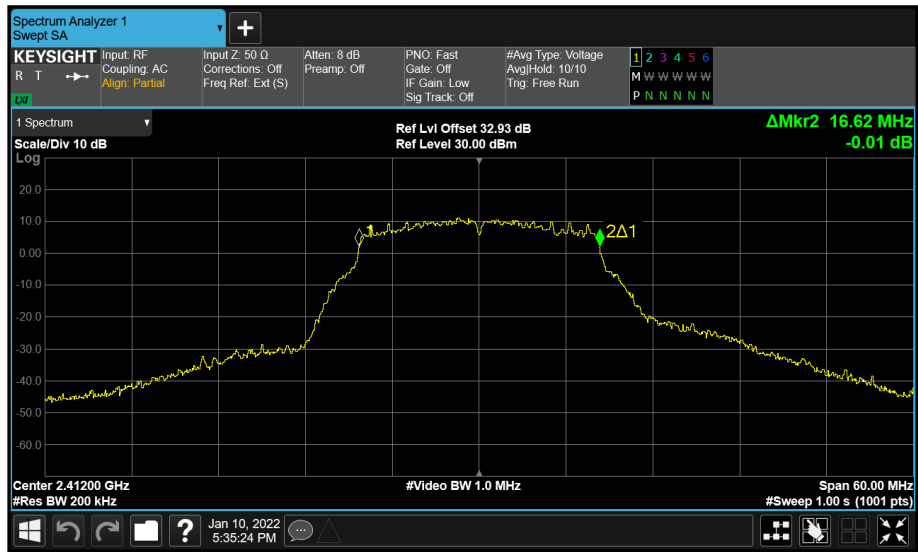


Figure 39 - Core 0 (A) 2412 MHz (CH1) 99% Bandwidth

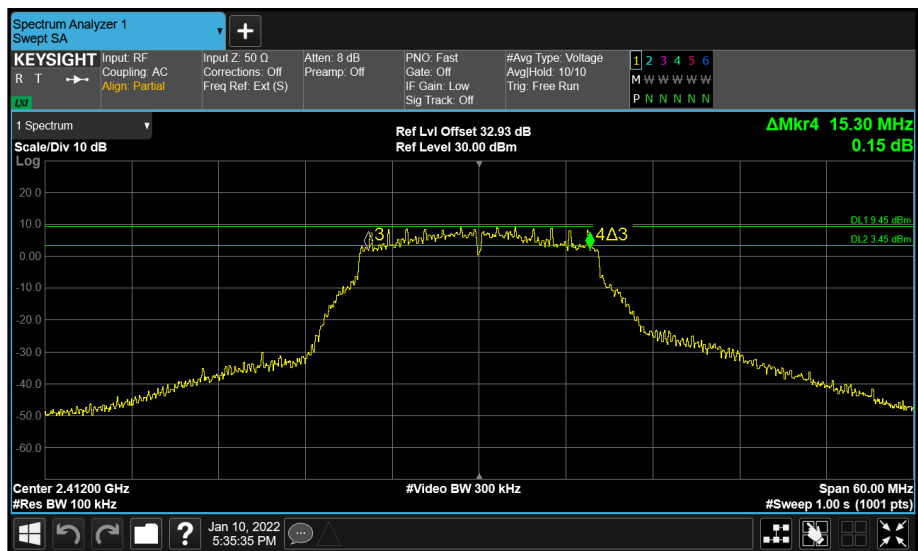


Figure 40 - Core 0 (A) 2412 MHz (CH1) 6 dB Bandwidth

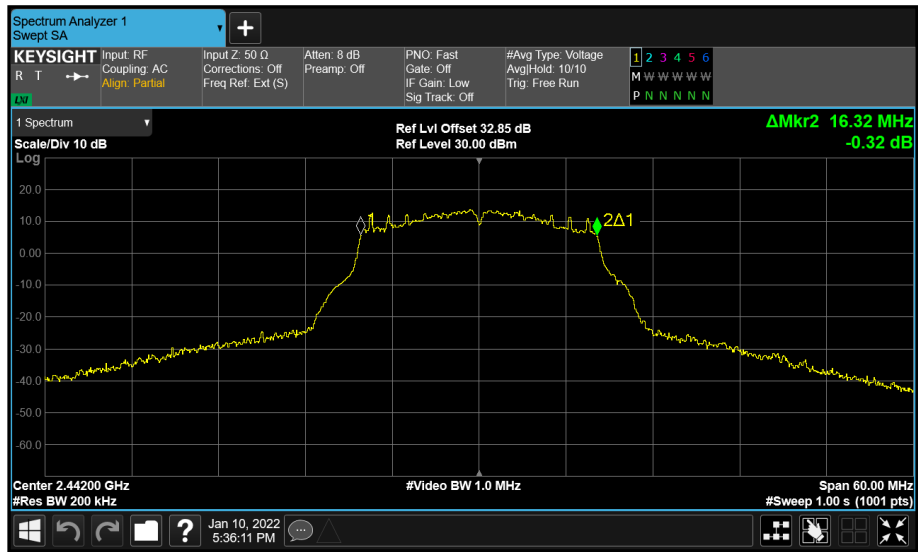


Figure 41 - Core 0 (A) 2442 MHz (CH7) 99% Bandwidth

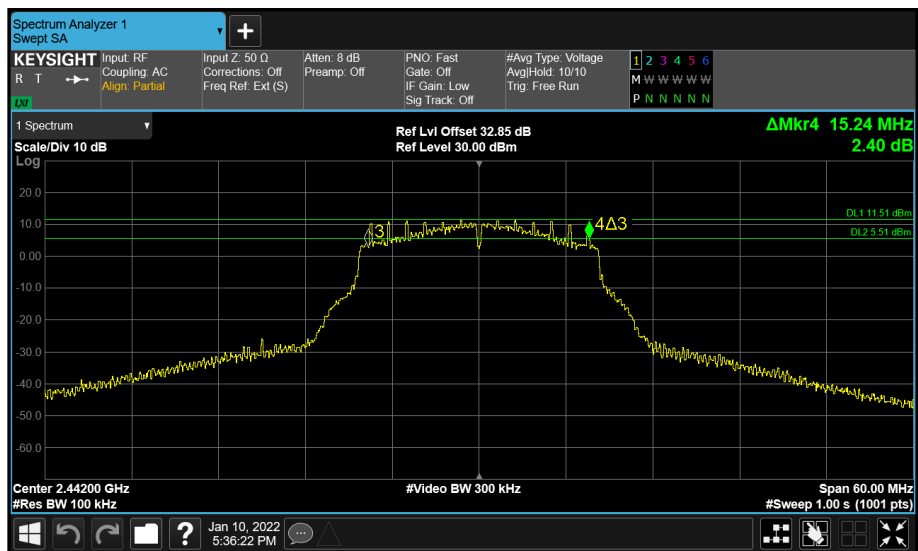


Figure 42 - Core 0 (A) 2442 MHz (CH7) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11n HT20	Duty Cycle (%):	-
Modulation Coding Scheme:	MCS2	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	6 dB Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	17.340	-	-	-	17.340	≥500.0
2442	15.300	-	-	-	15.300	≥500.0
2472	17.340	-	-	-	17.340	≥500.0

Table 15 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	17.760	-	-	-	17.760	-
2442	17.520	-	-	-	17.520	-
2472	17.700	-	-	-	17.700	-

Table 16 - 99% Bandwidth Results

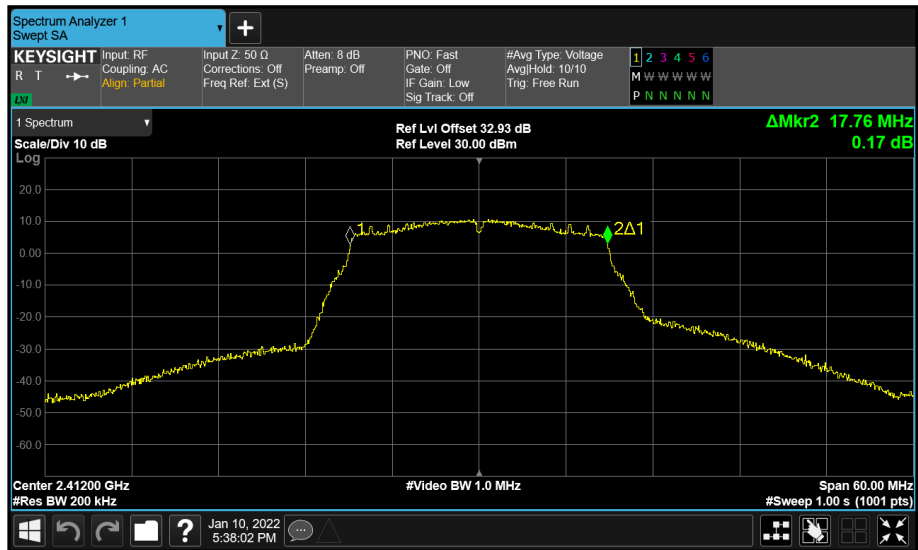


Figure 45 - Core 0 (A) 2412 MHz (CH1) 99% Bandwidth

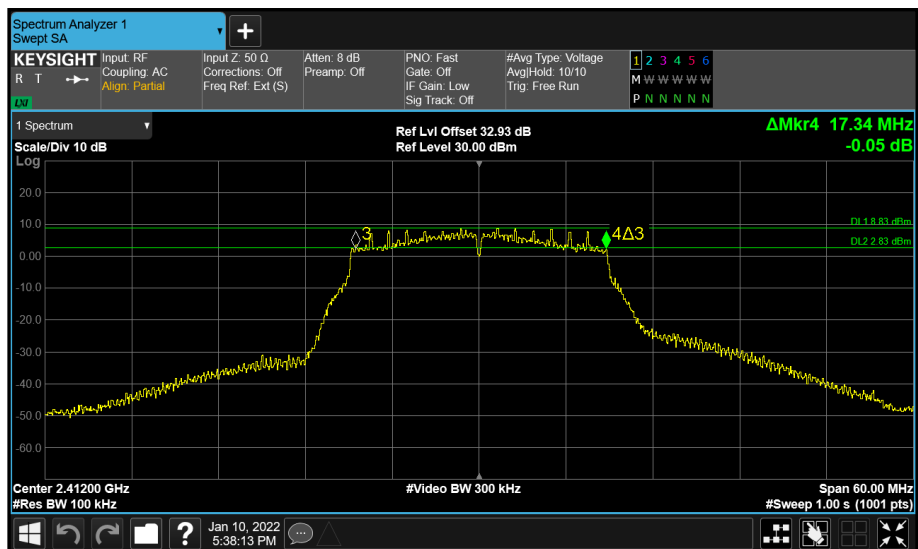


Figure 46 - Core 0 (A) 2412 MHz (CH1) 6 dB Bandwidth

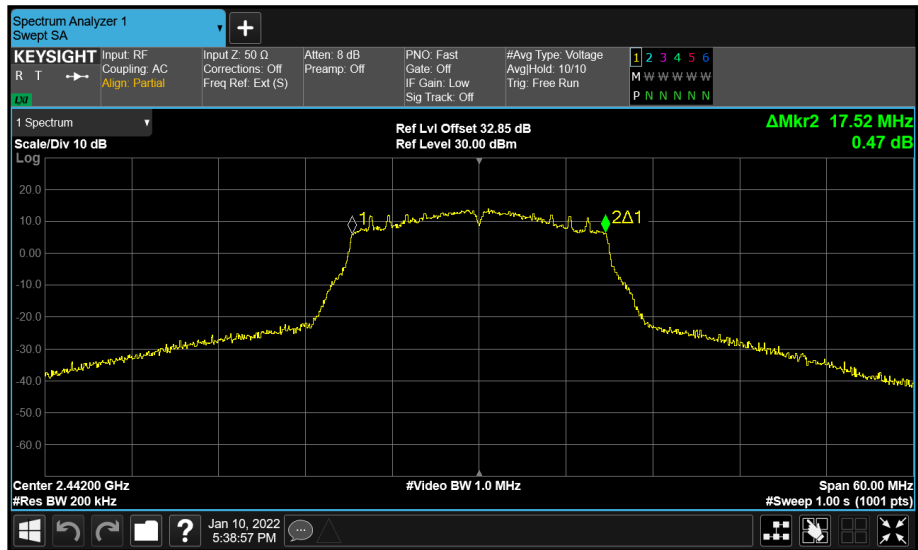


Figure 47 - Core 0 (A) 2442 MHz (CH7) 99% Bandwidth

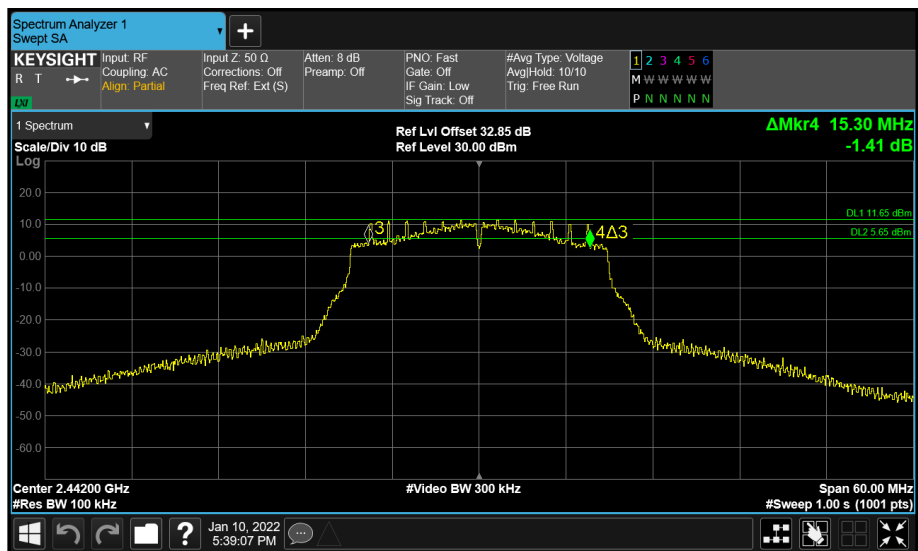


Figure 48 - Core 0 (A) 2442 MHz (CH7) 6 dB Bandwidth

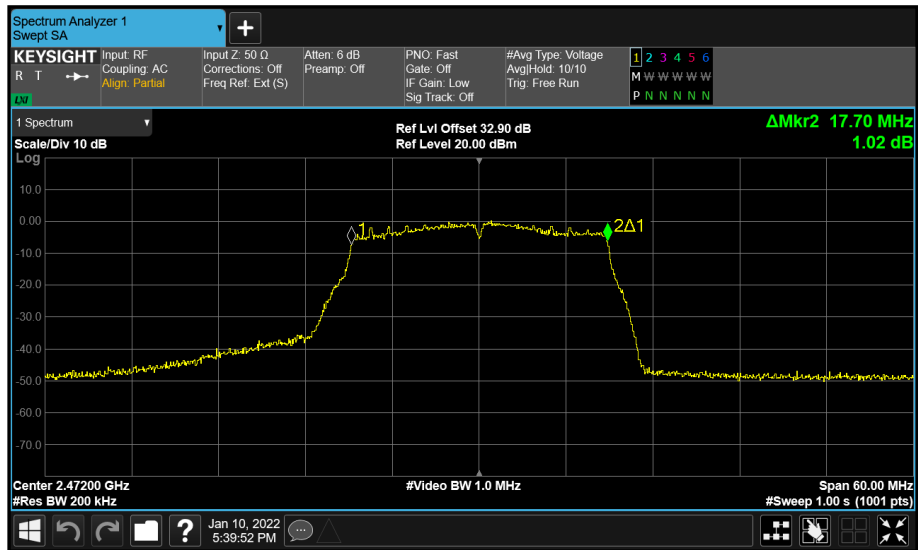


Figure 49 - Core 0 (A) 2472 MHz (CH13) 99% Bandwidth

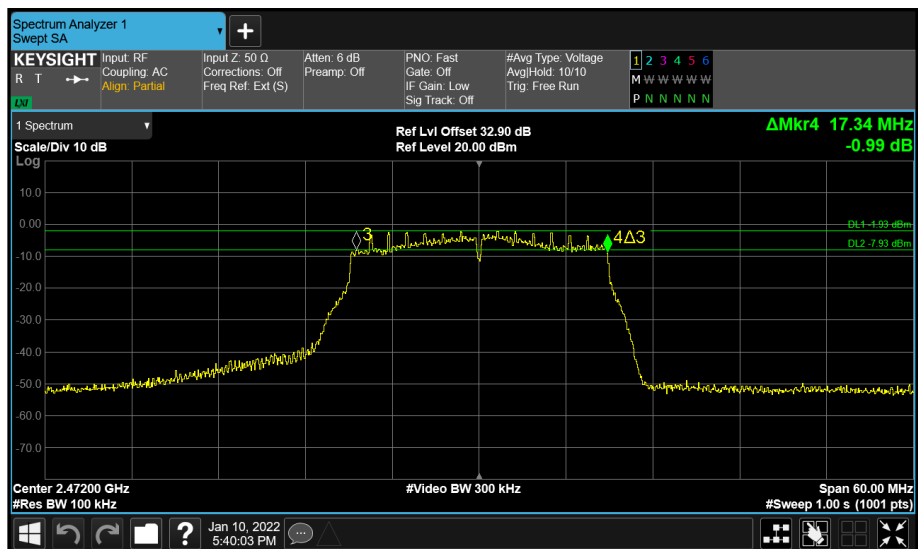


Figure 50 - Core 0 (A) 2472 MHz (CH13) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11n HT20	Duty Cycle (%):	-
Modulation Coding Scheme:	MCS2	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	-
Active Port(s):	A+B (Core 0 + Core 1)	Active Chain(s):	0+1

Test Frequency (MHz)	6 dB Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	17.040	16.680	-	-	16.680	≥500.0
2442	15.240	15.300	-	-	15.240	≥500.0
2472	17.280	17.340	-	-	17.280	≥500.0

Table 17 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	17.760	17.700	-	-	17.700	-
2442	17.520	17.520	-	-	17.520	-
2472	17.640	17.700	-	-	17.640	-

Table 18 - 99% Bandwidth Results

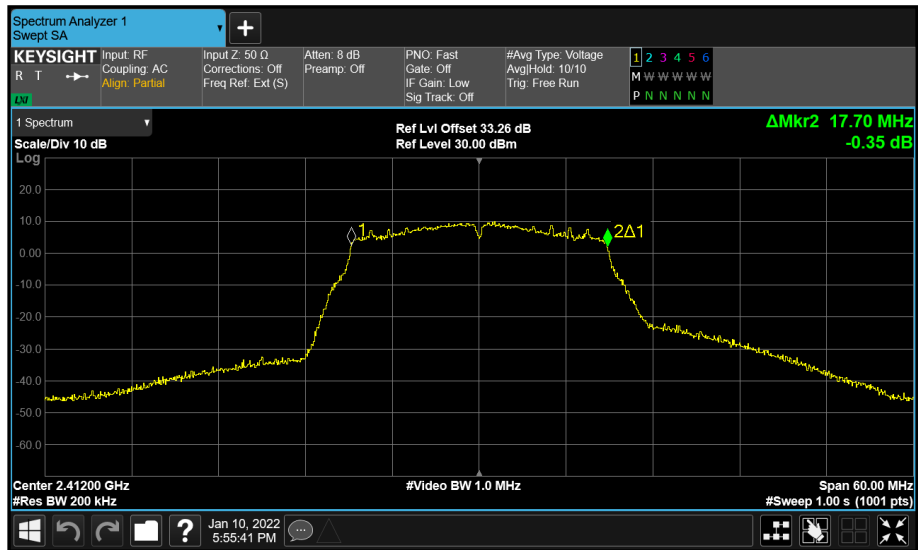


Figure 53 - Core 1 (B) 2412 MHz (CH1) 99% Bandwidth

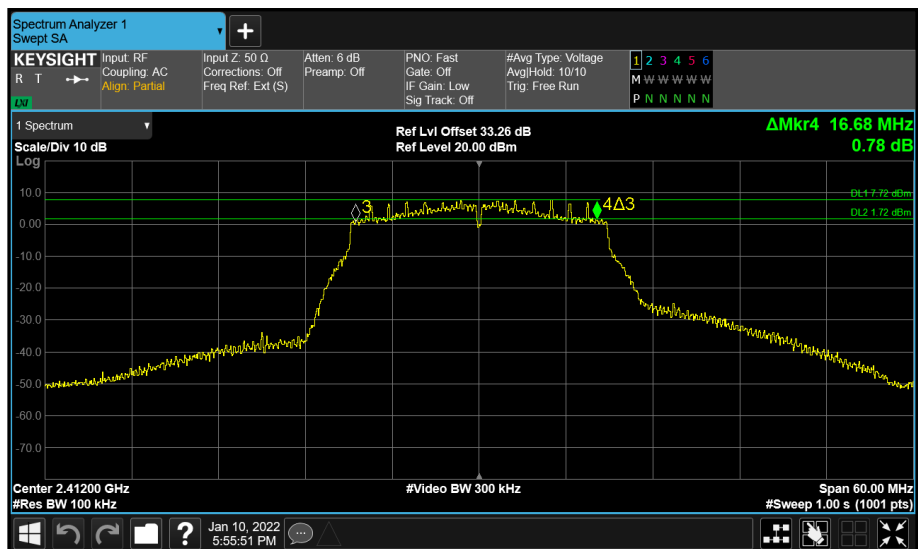


Figure 54 - Core 1 (B) 2412 MHz (CH1) 6 dB Bandwidth

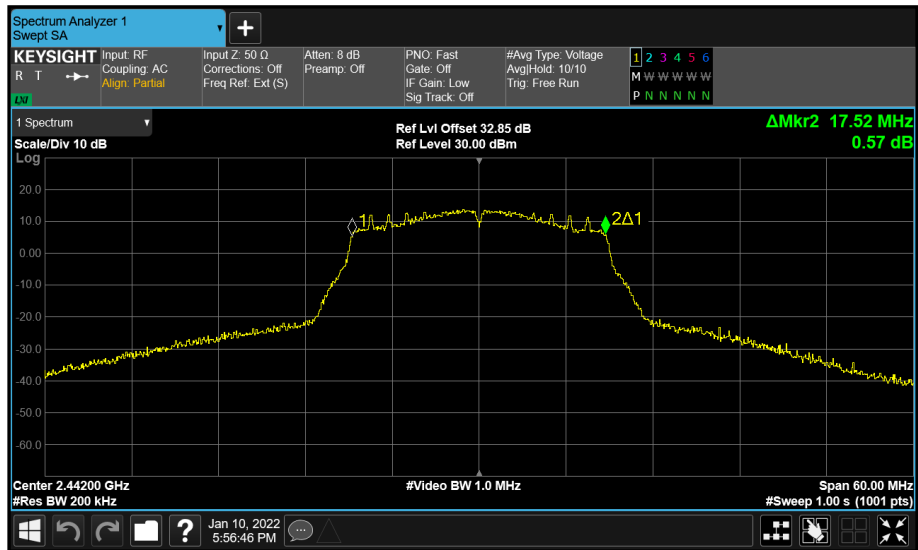


Figure 55 - Core 0 (A) 2442 MHz (CH7) 99% Bandwidth

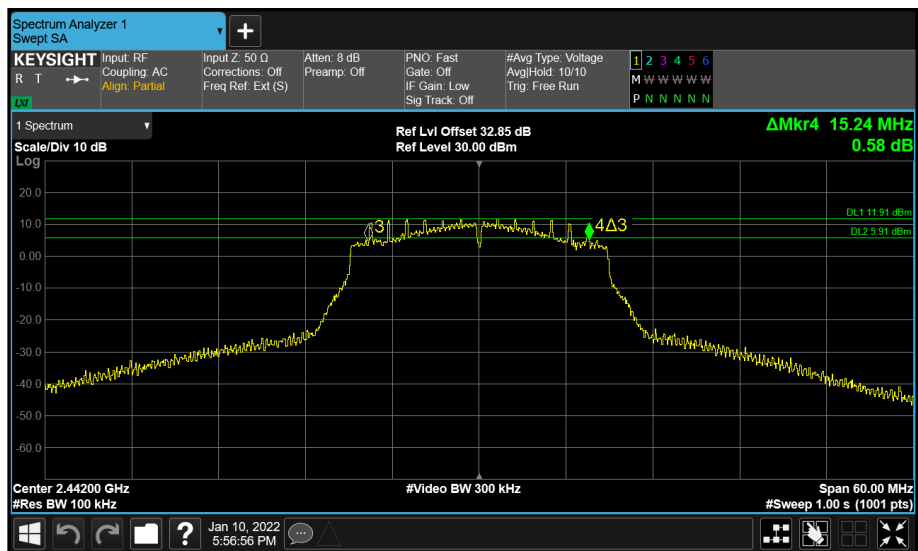


Figure 56 - Core 0 (A) 2442 MHz (CH7) 6 dB Bandwidth

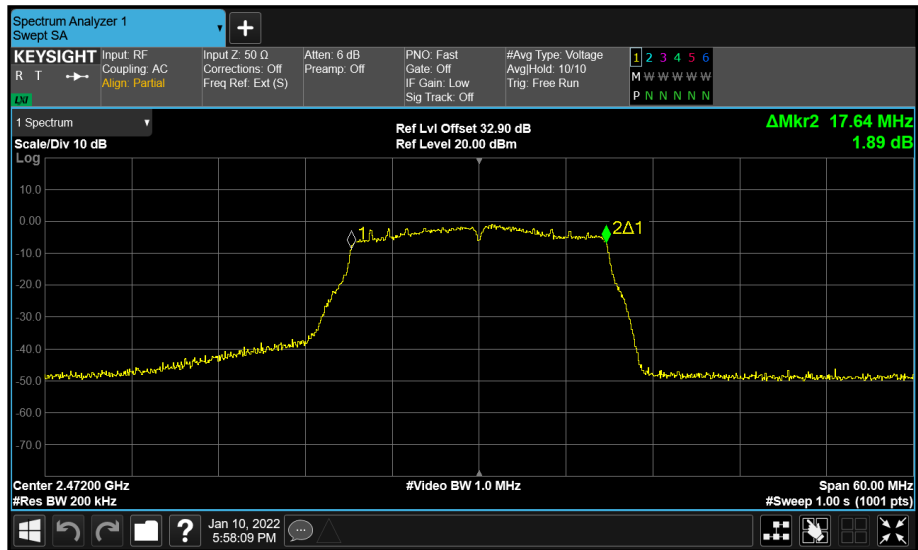


Figure 59 - Core 0 (A) 2472 MHz (CH13) 99% Bandwidth

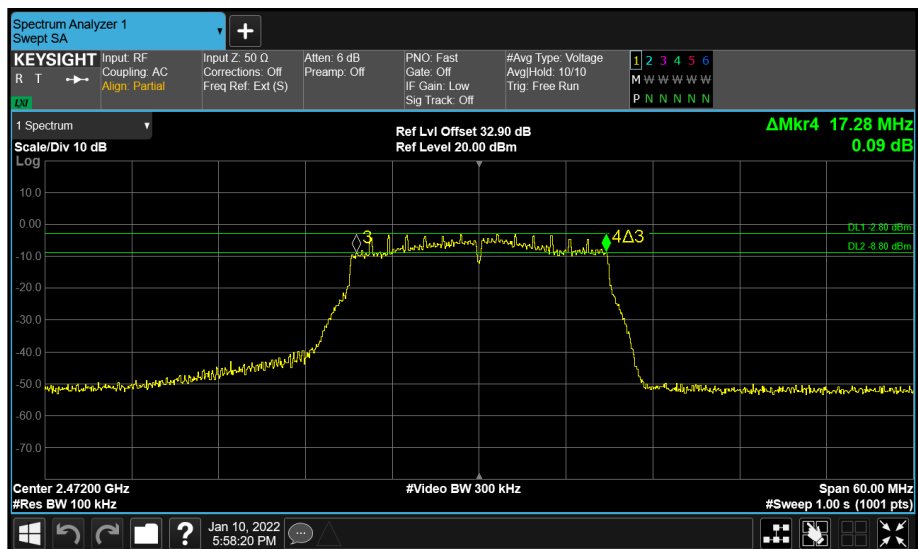


Figure 60 - Core 0 (A) 2472 MHz (CH13) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11ax HE20 SU	Duty Cycle (%):	-
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	6 dB Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	17.760	-	-	-	17.760	≥500.0
2442	18.480	-	-	-	18.480	≥500.0
2472	18.900	-	-	-	18.900	≥500.0

Table 19 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	18.900	-	-	-	18.900	-
2442	18.840	-	-	-	18.840	-
2472	18.900	-	-	-	18.900	-

Table 20 - 99% Bandwidth Results

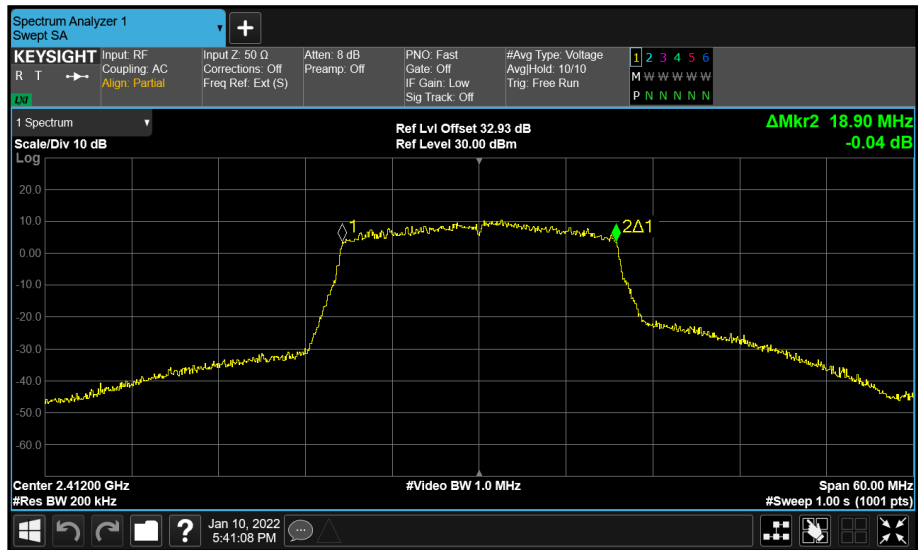


Figure 63 - Core 0 (A) 2412 MHz (CH1) 99% Bandwidth

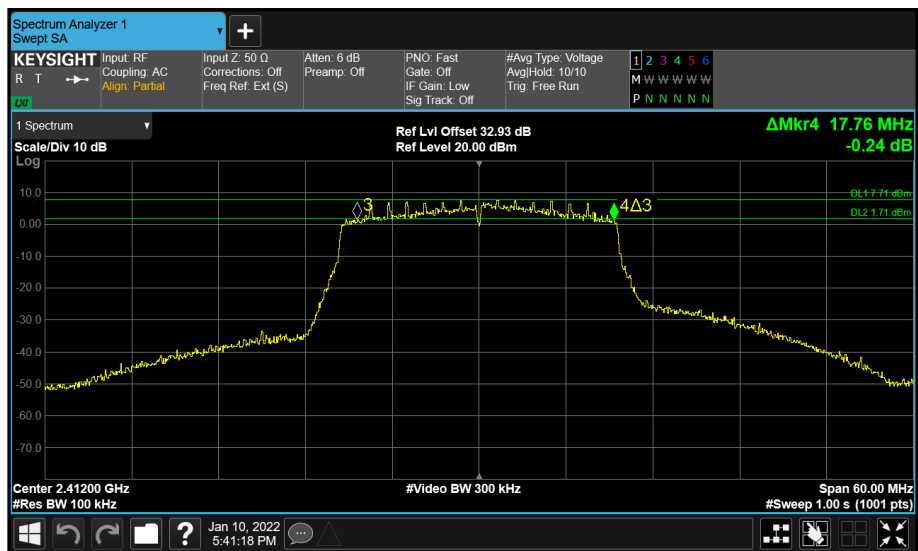


Figure 64 - Core 0 (A) 2412 MHz (CH1) 6 dB Bandwidth

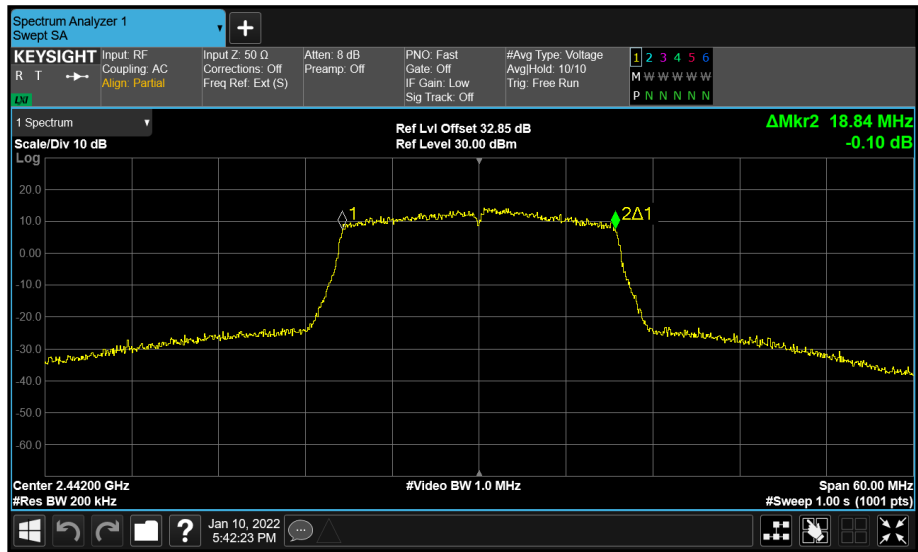


Figure 65 - Core 0 (A) 2442 MHz (CH7) 99% Bandwidth

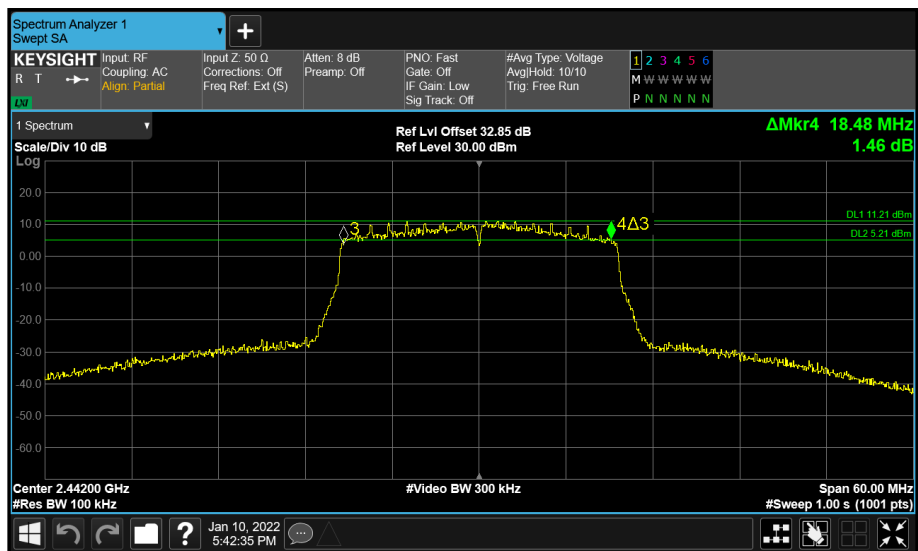


Figure 66 - Core 0 (A) 2442 MHz (CH7) 6 dB Bandwidth

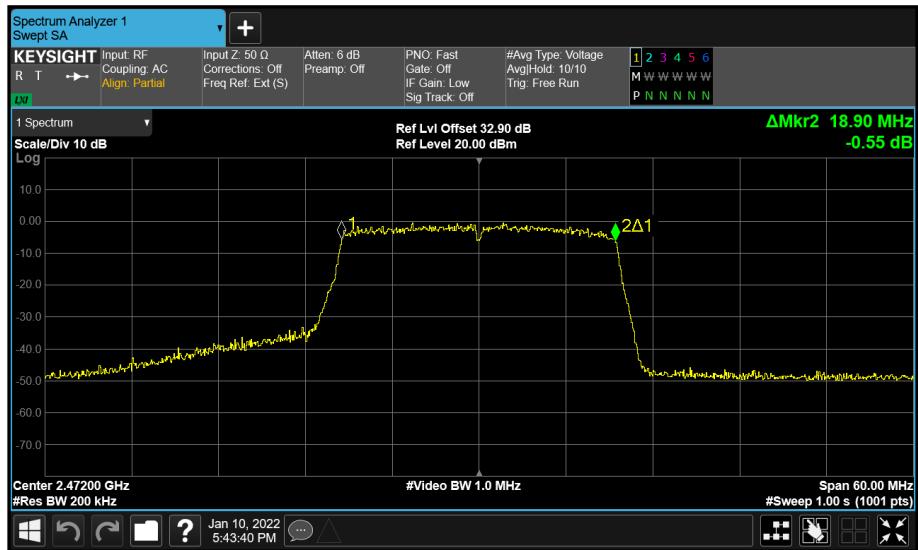


Figure 67 - Core 0 (A) 2472 MHz (CH13) 99% Bandwidth

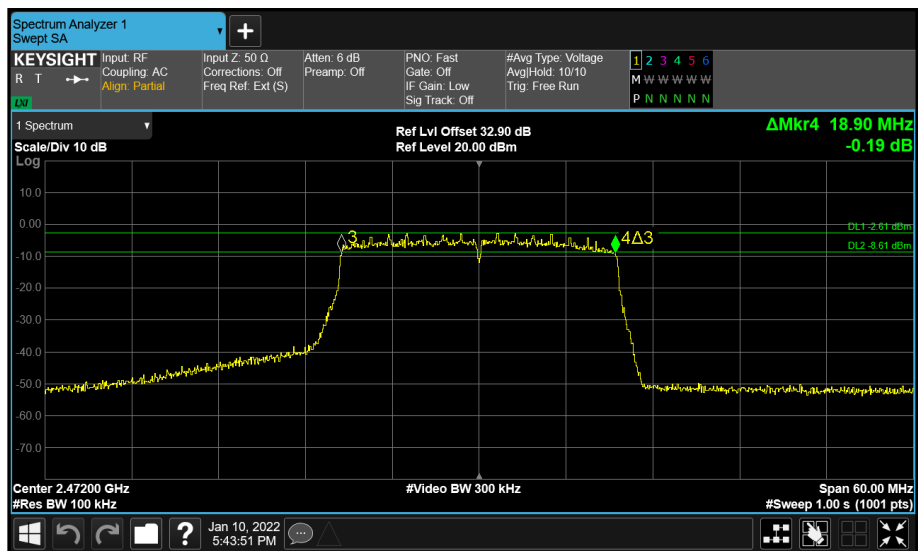


Figure 68 - Core 0 (A) 2472 MHz (CH13) 6 dB Bandwidth



Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 5.2 a)	Test Method(s):	C63.10 6.9.3 C63.10 11.8.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11ax HE20 SU	Duty Cycle (%):	-
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	-
Active Port(s):	A+B (Core 0 + Core 1)	Active Chain(s):	0+1

Test Frequency (MHz)	6 dB Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	17.280	17.160	-	-	17.160	≥500.0
2442	18.900	18.900	-	-	18.900	≥500.0
2472	18.720	18.960	-	-	18.720	≥500.0

Table 21 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (kHz)
	A	B	C	D	Minimum	
2412	18.840	18.900	-	-	18.840	-
2442	18.840	18.840	-	-	18.840	-
2472	18.900	18.900	-	-	18.900	-

Table 22 - 99% Bandwidth Results

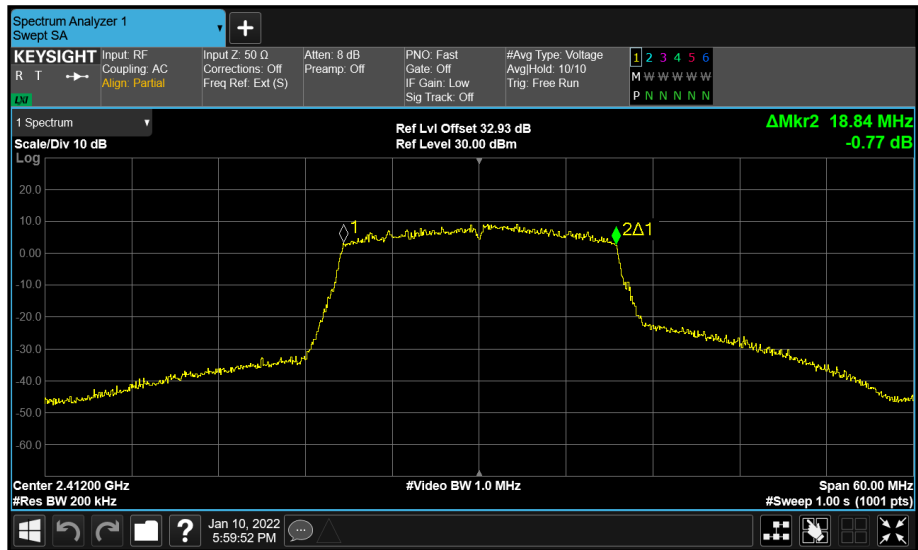


Figure 69 - Core 0 (A) 2412 MHz (CH1) 99% Bandwidth

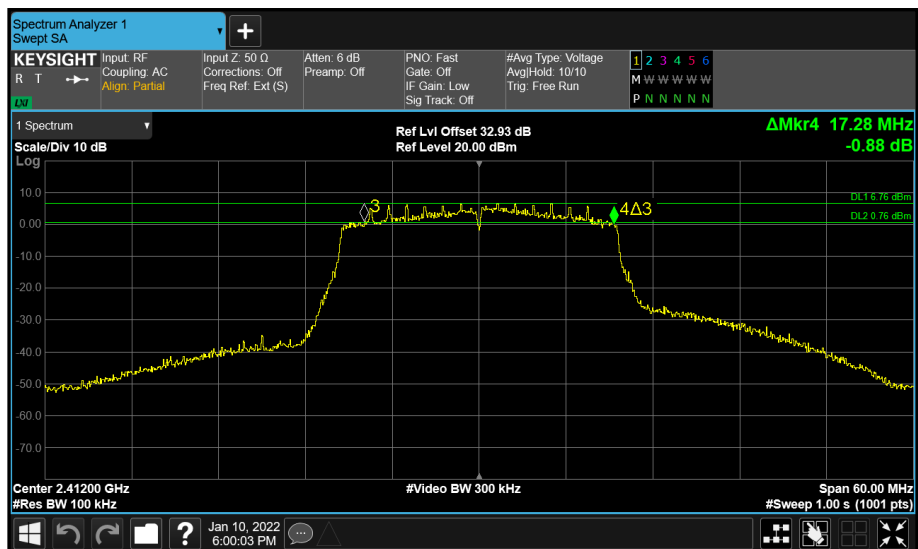


Figure 70 - Core 0 (A) 2412 MHz (CH1) 6 dB Bandwidth

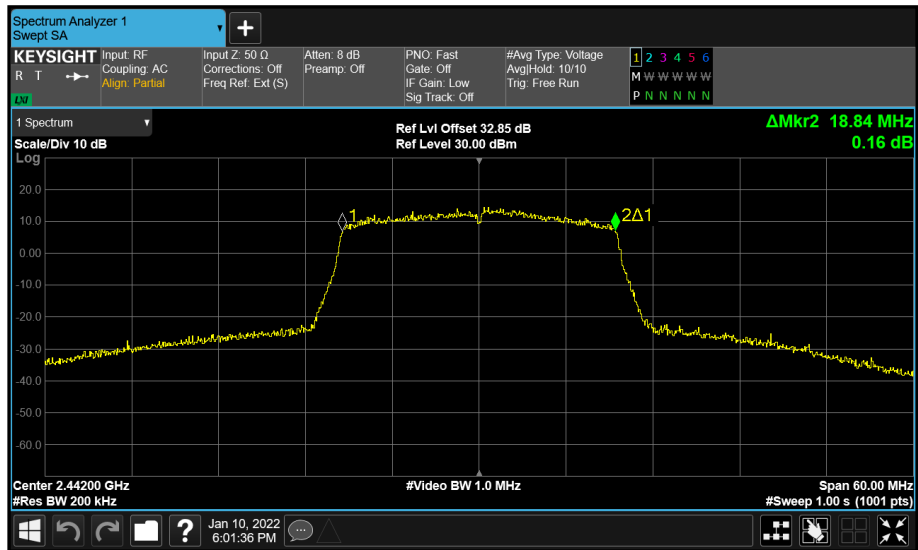


Figure 73 - Core 0 (A) 2442 MHz (CH7) 99% Bandwidth

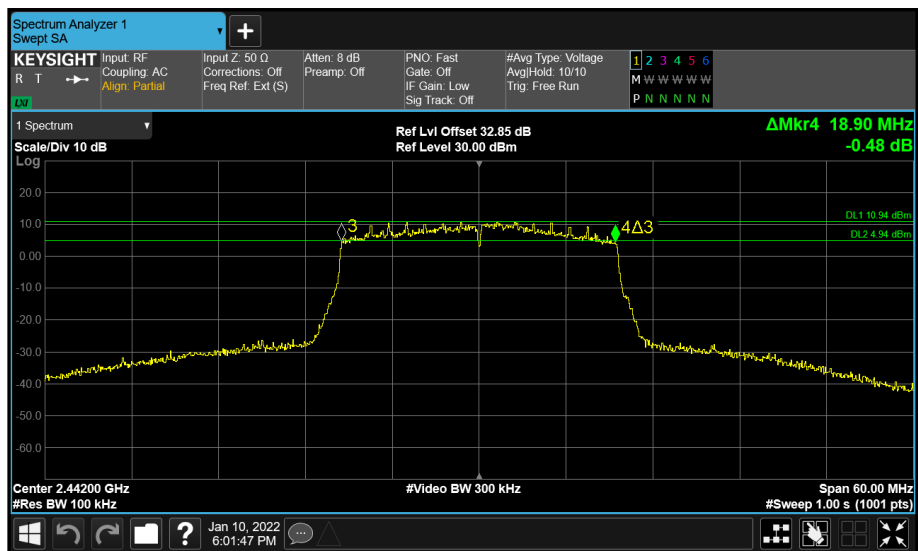


Figure 74 - Core 0 (A) 2442 MHz (CH7) 6 dB Bandwidth