FCC and ISED Test Report

Apple Inc
Model: A2786

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: BCGA2786 IC: 579C-A2786

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Document 75955426-08 Issue 01

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Steve Marshall	Senior Engineer	Authorised Signatory	06 March 2023

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
Report Generation	Lauren Walters	06 March 2023	

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: 2021, 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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Contents

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	06-March-2023

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
Model Number(s)	A2786
Serial Number(s)	L217XQ106H, GHX3XR3XF7 and C3Q0QNNQ4L
Hardware Version(s)	REV 1.0
Software Version(s)	22E51010k, 22E51010k and 22E71580u
Number of Samples Tested	3
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2021 ISED RSS-247: Issue 2 (02-2017) ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021)
Order Number	0540246998
Start of Test	07-November-2022
Finish of Test	14-February-2023
Name of Engineer(s)	Daniel Cameron, Thomas Biddlecombe, Thomas Randall, Colin Brain, Danial Shafique, Ian Hart, James Woods, Ioan-Alexandru Bogatu, Mohammad Malik, Elliot Callender, Taha Shafique, Faisal Malyar and Akhil Rajendran Bhaskaran Nair
Related Document(s)	ANSI C63.10 (2020) KDB 662911 D01 v02r01 ANSI C63.10 (2013) ANSI C63.4

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	3.3	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	15.209 and 15.247 (d)	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 was a tower configuration Apple computer, with Bluetooth® and IEEE 802.11 a/b/g/n/ac/ax Wi-Fi capabilities in the 2.4 GHz, 5 GHz and 6 GHz bands.

1.4.2 Test Modes

The EUT's 2.4 GHz 802.11 radio supports Single Input/Single Output (SISO) and 2x2 Multiple Input/Multiple Output (MIMO) Cyclic Delay Diversity (CDD) modes. It supports 802.11b and g for SISO and 802.11n and ax at 20 MHz channel bandwidths for SISO and MIMO. The EUT supports 802.11ax Single User (SU) and Multi-User (MU) with all Resource Unit (RU) sizes of 26/52/106/242.

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

Band edge testing was performed in all modes with multiple modulation types, with only the worst-case reported. After band edge and additional preliminary investigations were performed to find worst-case operation, the EUT was tested in the following transmit modes:

SISO Modes (Core 1):

- 802.11b 1 Mbps
- 802.11g 12 Mbps
- 802.11n HT20 MCS2
- 802.11ax HE20 MCS2x1 SU, RU26/52/106*

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

- 802.11n HT20 MCS2 CDD
- 802.11ax HE20 MCS2x1 CDD SU, RU26/52/106*

*Note: The RU offset for bottom and middle channels were placed in the lowest position and on the top channel, the offset was placed in the upper most position.

Reduced output power is used on the narrower RU26/52/106 size 802.11ax multi-user (MU) modes to meet PSD and Band Edge limits. Therefore, only single user (SU) modes are reported for output power tests since these are always worst-case. All SU and the above MU RU sizes are reported for PSD.

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 except, 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	2.99	0.70
Core 1	2400 to 2480	3.75	0.70

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: A2786, Serial Number: C3Q0QNNQ4L			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2786, Serial Number: L217XQ106H			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2786, Serial Number: GHX3XR3XF7			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 4

1.7 Test Location

TÜV SÜD conducted the following tests at our Concorde Park Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 2.4 GHz WLAN		
Restricted Band Edges	Thomas Randall, Colin Brain, Danial Shafique, Ian Hart, James Woods, Ioan-Alexandru Bogatu, and Mohammad Malik	UKAS
Emission Bandwidth	Thomas Biddlecombe and Daniel Cameron	UKAS
Maximum Conducted Output Power	Thomas Biddlecombe and Daniel Cameron	UKAS
Spurious Radiated Emissions	Elliot Callender, Mohammad Malik, and Akhil Rajendran Bhaskaran Nair	UKAS
Authorised Band Edges	Mohammad Malik, Elliot Callender, James Woods, Taha Shafique, Colin Brain, Ioan-Alexandru Bogatu, Ian Hart, and Faisal Malyar	UKAS
Power Spectral Density	Thomas Biddlecombe and Daniel Cameron	UKAS

Table 5

Office Address:

TÜV SÜD
Concorde Park
Concorde Way
Fareham
Hampshire
PO15 5FG
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-247, Clause 3.3
ISED RSS-GEN, Clause 8.10

2.1.2 Equipment Under Test and Modification State

A2786, S/N: GHX3XR3XF7 - Modification State 0

2.1.3 Date of Test

07-November-2022 to 08-December-2022

2.1.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.10.5 and 11.12.1.

Plots for average measurements were taken in accordance with ANSI C63.10, clause 11.12.2.5.2.

The following conversion can be applied to convert from dBµV/m to µV/m:
10^(Field Strength in dBµV/m/20).

2.1.5 Environmental Conditions

Ambient Temperature	19.8 - 23.4 °C
Relative Humidity	40.5 - 59.4 %

2.1.6 Test Results

2.4 GHz WLAN

20 MHz Bandwidth - Core 1 (SISO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBµV/m)	Average Level (dBuV/m)
802.11b	1 Mbps	-	-	2412	2390	59.40	51.41
802.11g	54 Mbps	-	-	2412	2390	65.61	51.28
802.11n HT20	MCS4	-	-	2412	2390	67.18	51.46
802.11ax HE20	MCS4x1	SU	-	2412	2390	68.14	51.23
802.11ax HE20	MCS9x1	106	53	2412	2390	67.86	51.09
802.11b	1 Mbps	-	-	2462	2483.5	59.53	51.31
802.11b	1 Mbps	-	-	2467	2483.5	58.78	51.32
802.11b	1 Mbps	-	-	2472	2483.5	58.55	50.97
802.11g	12 Mbps	-	-	2462	2483.5	64.47	51.46
802.11g	54 Mbps	-	-	2467	2483.5	64.12	51.19
802.11g	54 Mbps	-	-	2472	2483.5	67.88	51.42
802.11n HT20	MCS4	-	-	2462	2483.5	64.52	50.85
802.11n HT20	MCS4	-	-	2467	2483.5	64.39	50.84
802.11n HT20	MCS7	-	-	2472	2483.5	68.33	51.49
802.11ax HE20	MCS4x1	SU	-	2462	2483.5	67.17	51.29
802.11ax HE20	MCS9x1	106	54	2462	2483.5	69.16	51.13
802.11ax HE20	MCS4x1	SU	-	2467	2483.5	64.14	51.48
802.11ax HE20	MCS9x1	106	53	2467	2483.5	68.44	51.37
802.11ax HE20	MCS4x1	SU	-	2472	2483.5	65.37	51.49
802.11ax HE20	MCS9x1	52	40	2472	2483.5	69.36	50.06

Table 6 - SISO Restricted Band Edge Results

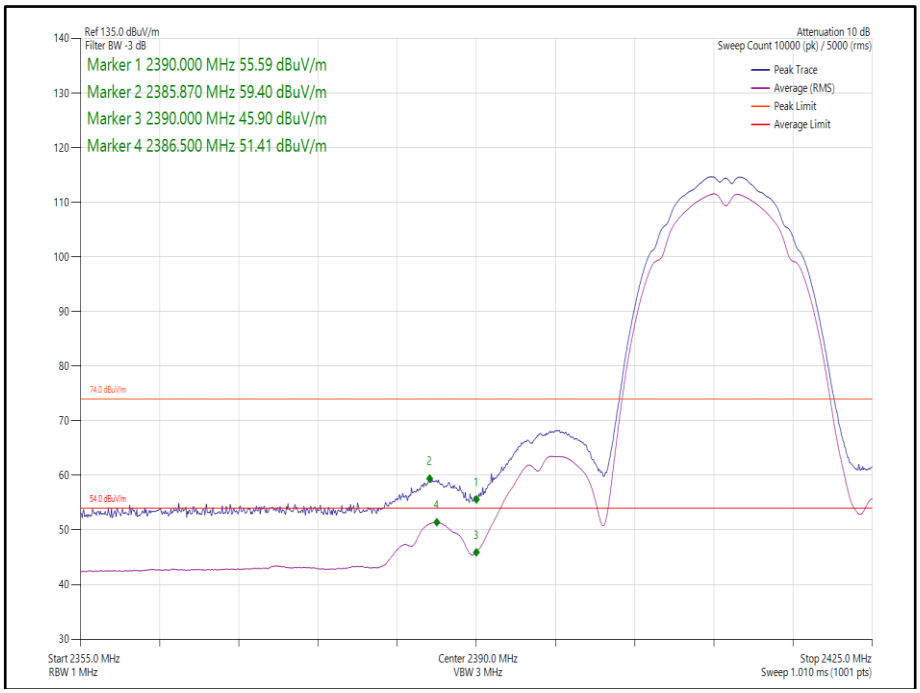

**Figure 1 - 802.11b, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**

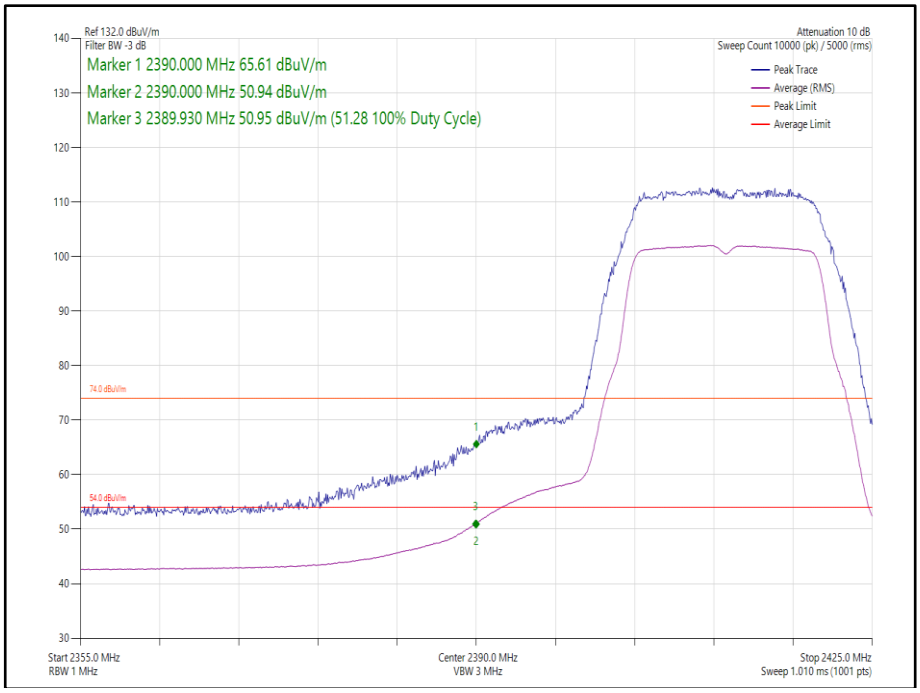

**Figure 2 - 802.11g, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**

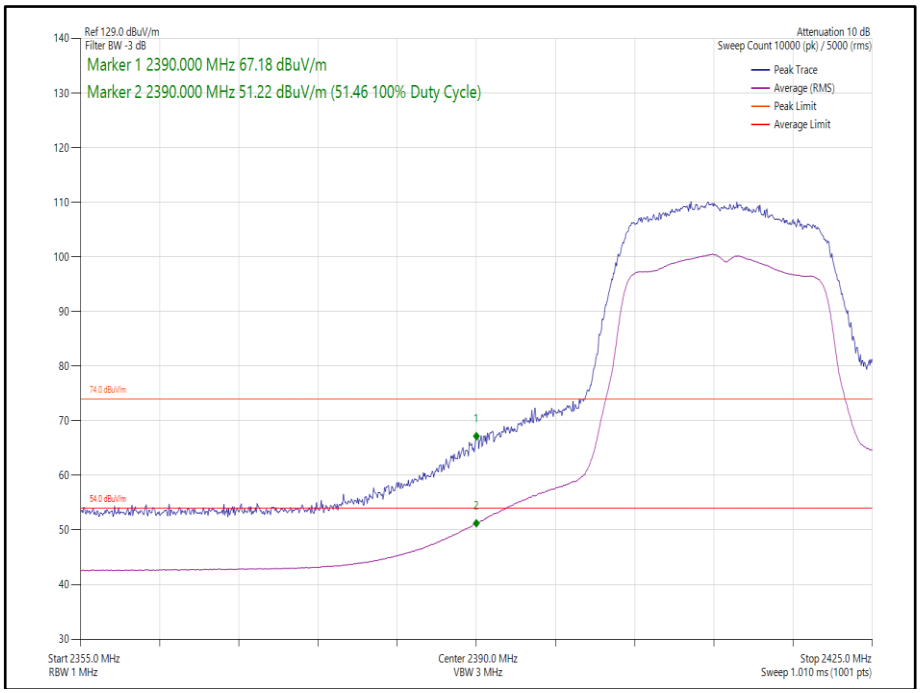

**Figure 3 - 802.11n, HT20, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**

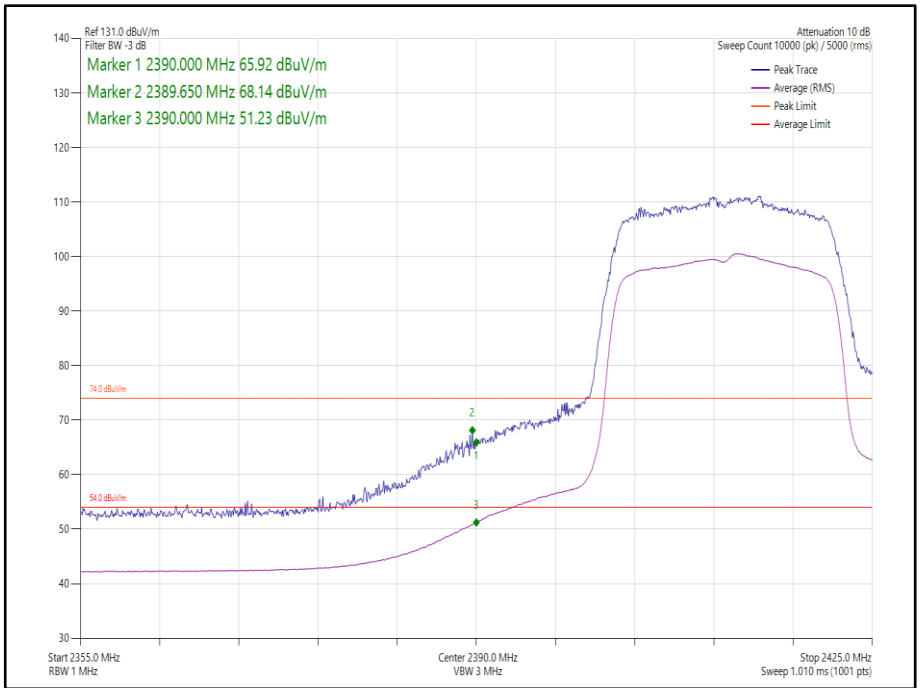

**Figure 4 - 802.11ax, HE20, SU, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**

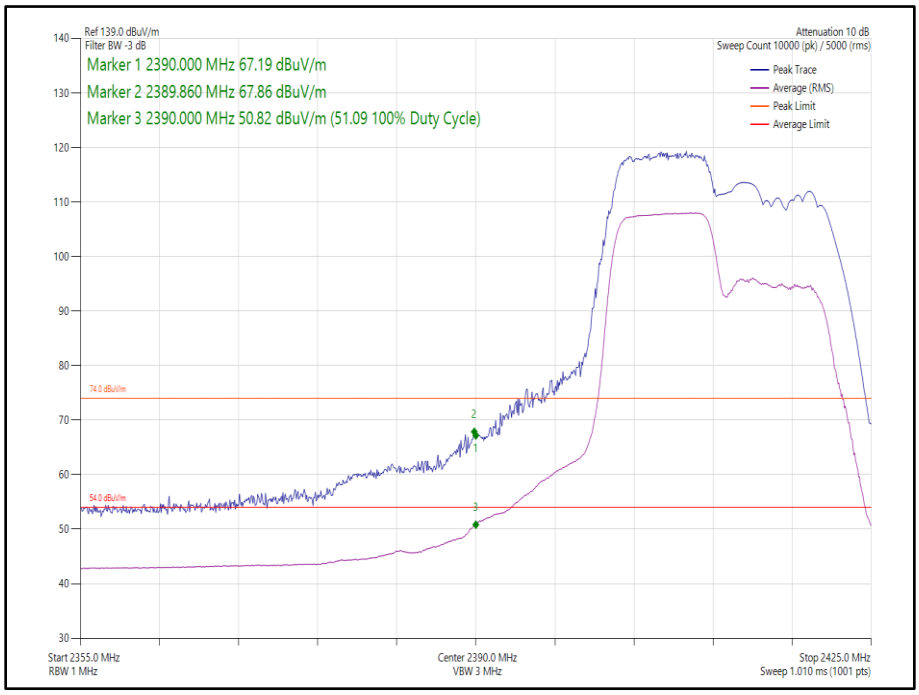

Figure 5 - 802.11ax, HE20, RU, 106-53, SISO, Core 1 - 2412 MHz, Band Edge Frequency 2390 MHz

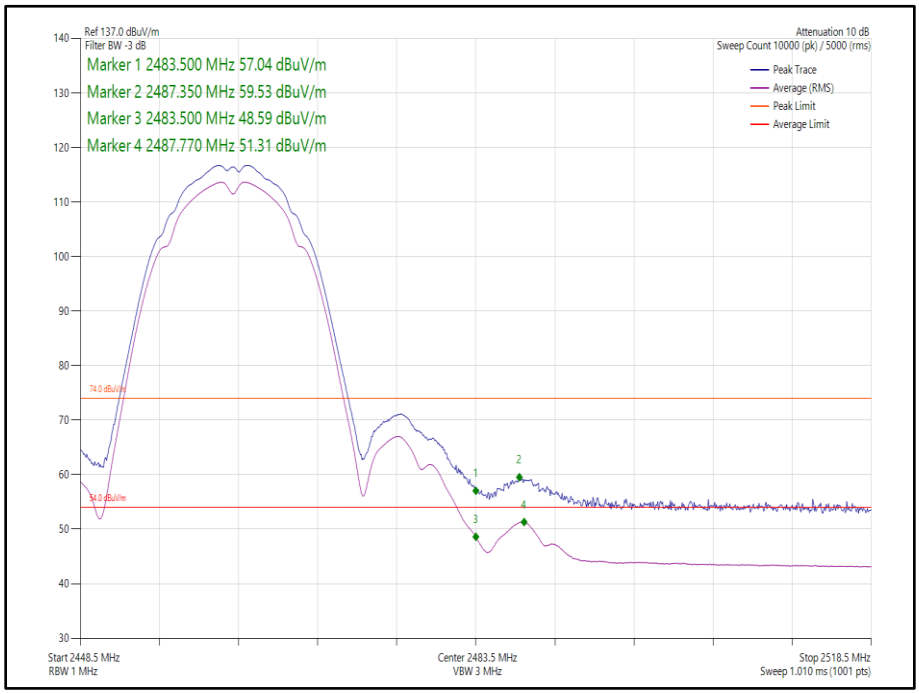

Figure 6 - 802.11b, SISO, Core 1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

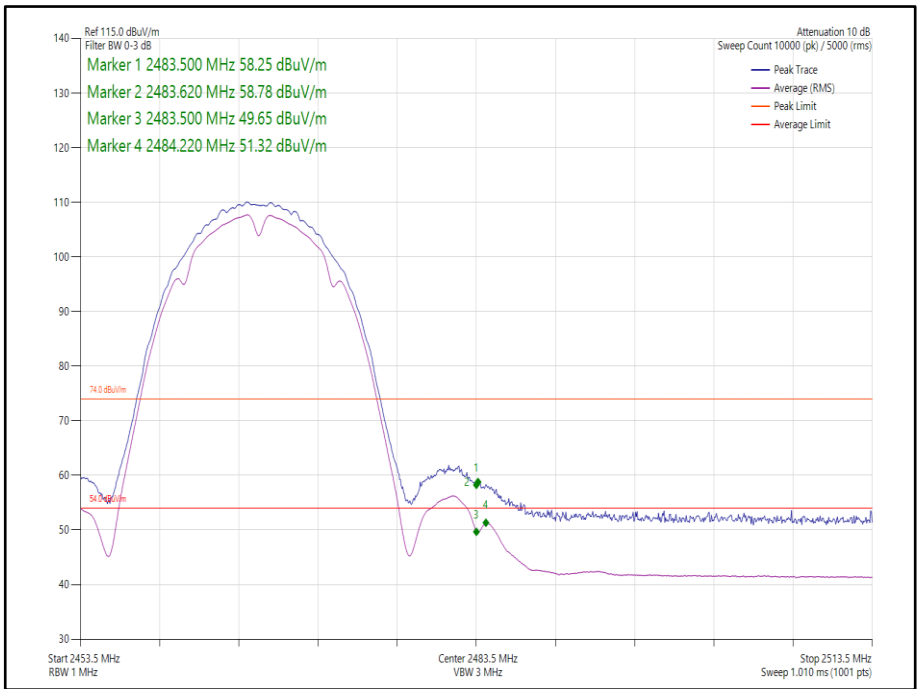

**Figure 7 - 802.11b, SISO, Core 1 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**

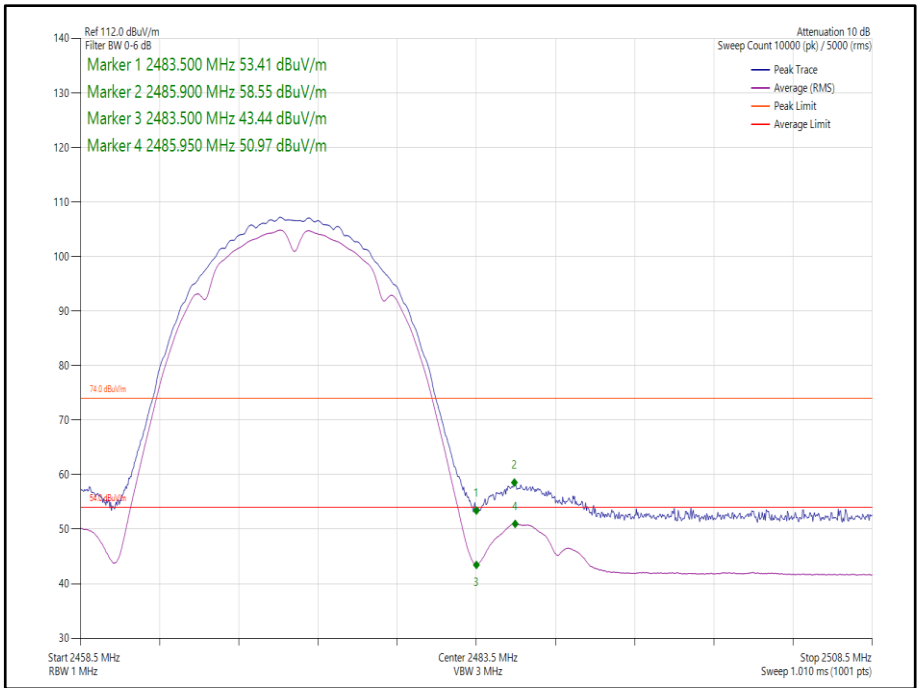

**Figure 8 - 802.11b, SISO, Core 1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**

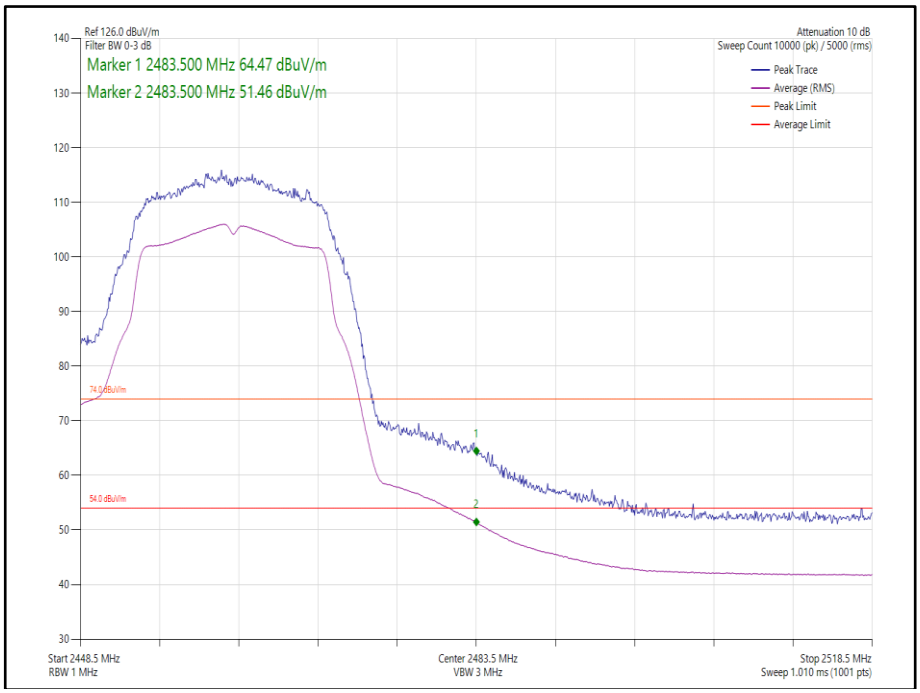

**Figure 9 - 802.11g, SISO, Core 1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**

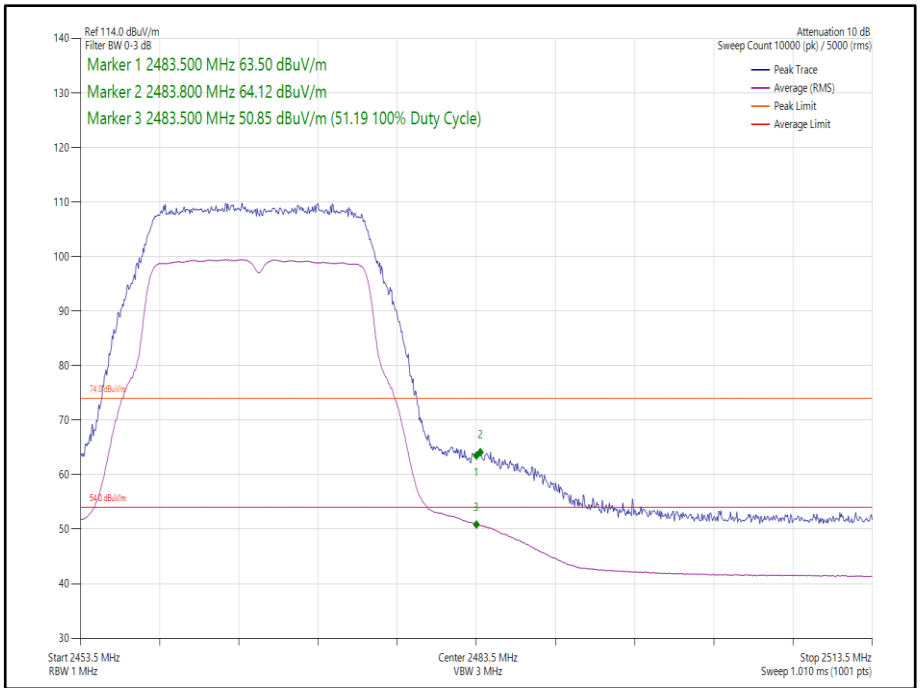

**Figure 10 - 802.11g, SISO, Core 1 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**

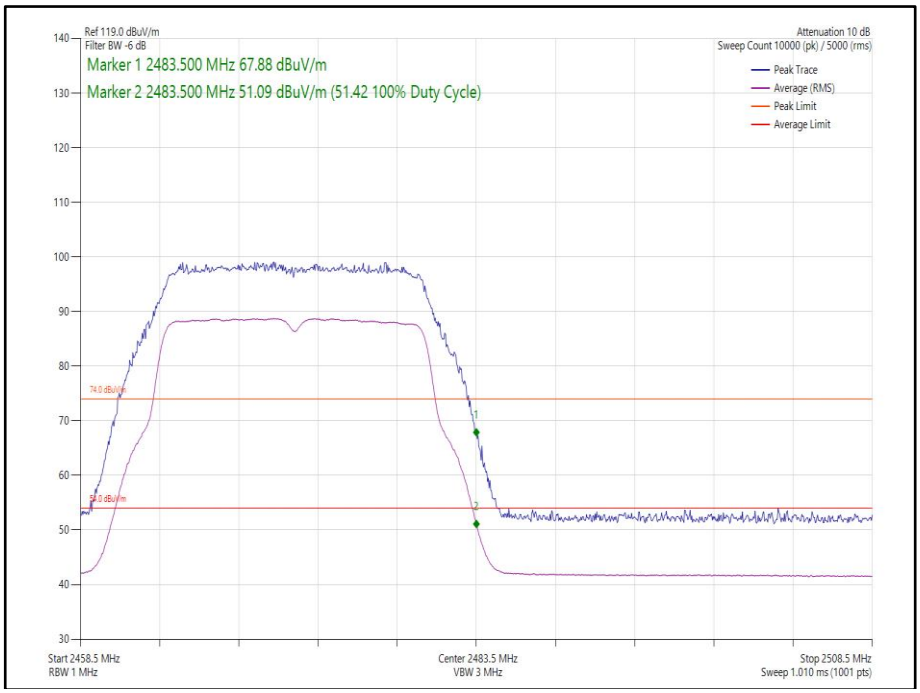

**Figure 11 - 802.11g, SISO, Core 1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**

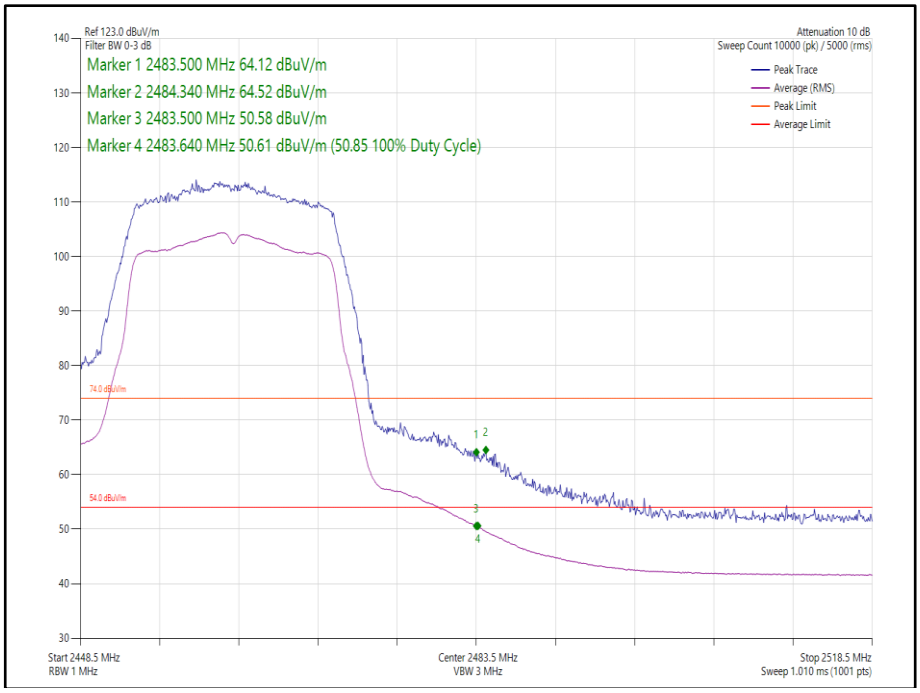

**Figure 12 - 802.11n, HT20, SISO, Core 1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**

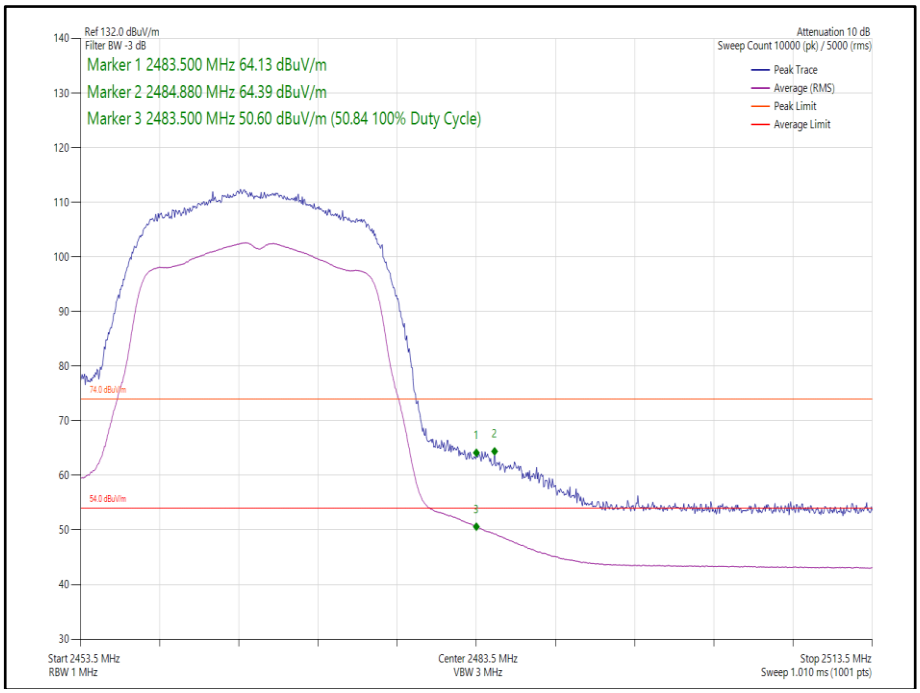

Figure 13 - 802.11n, HT20, SISO, Core 1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

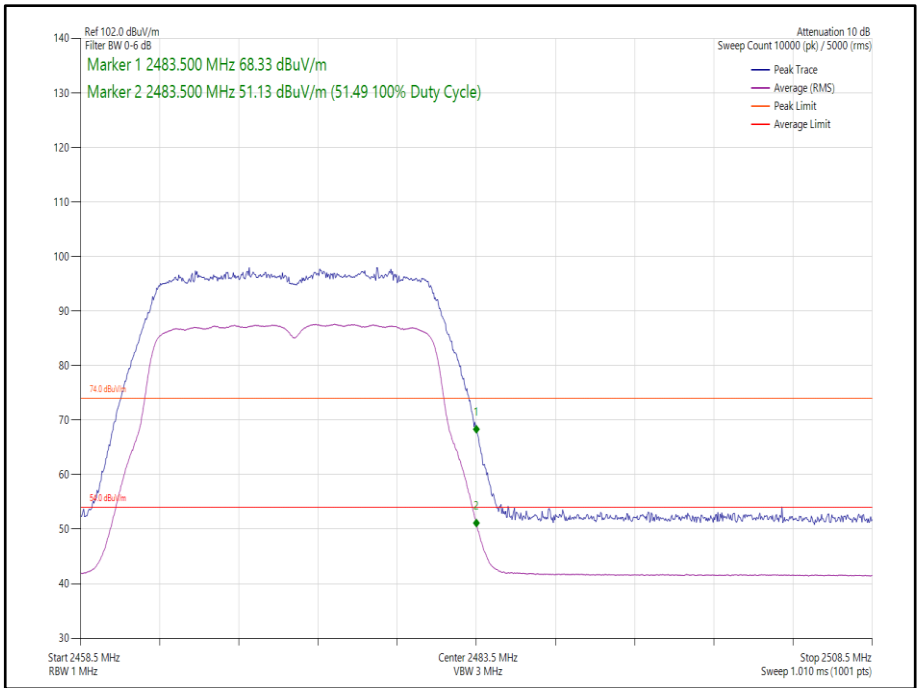

Figure 14 - 802.11n, HT20, SISO, Core 1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

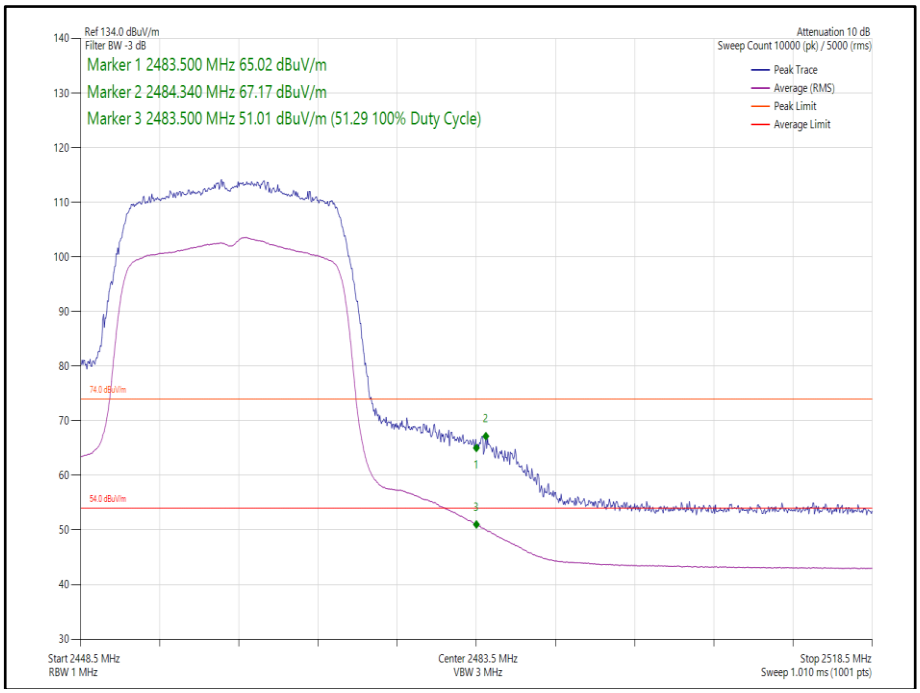

Figure 15 - 802.11ax, HE20, SU, SISO, Core 1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

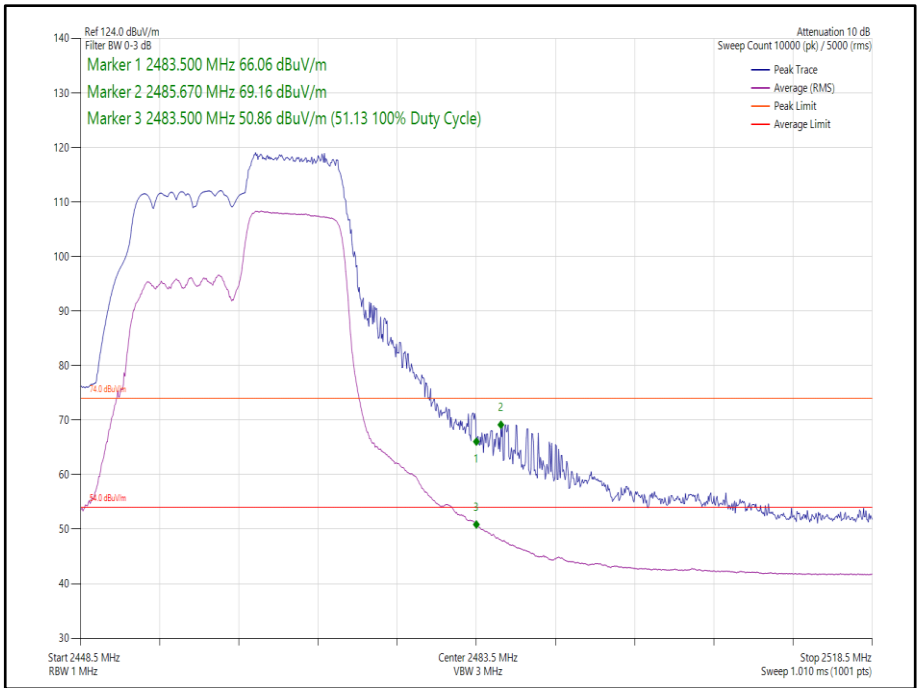

Figure 16 - 802.11ax, HE20, RU, 106-54, SISO, Core 1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

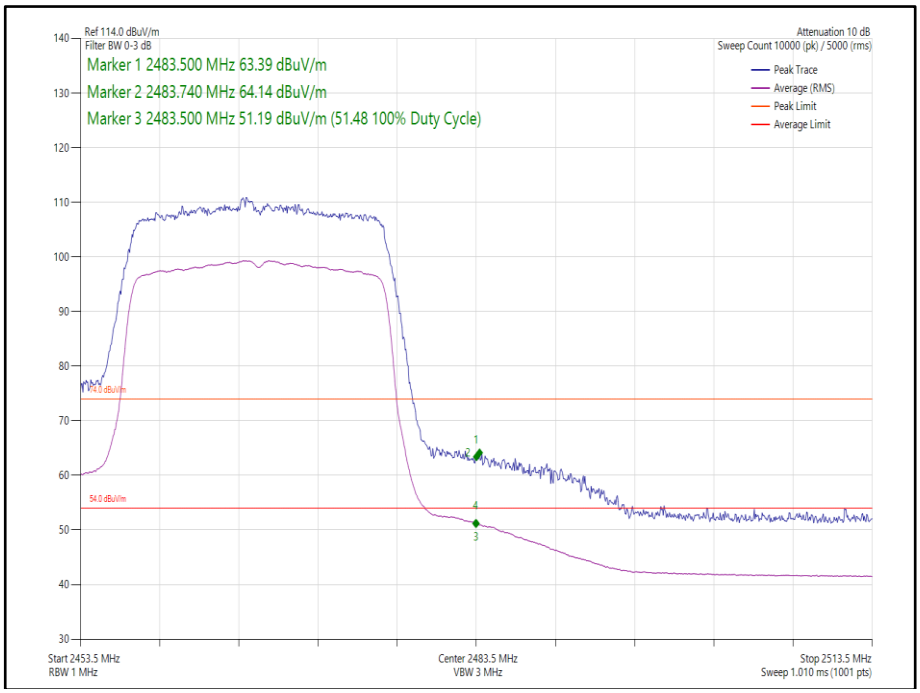

Figure 17 - 802.11ax, HE20, SU, SISO, Core 1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

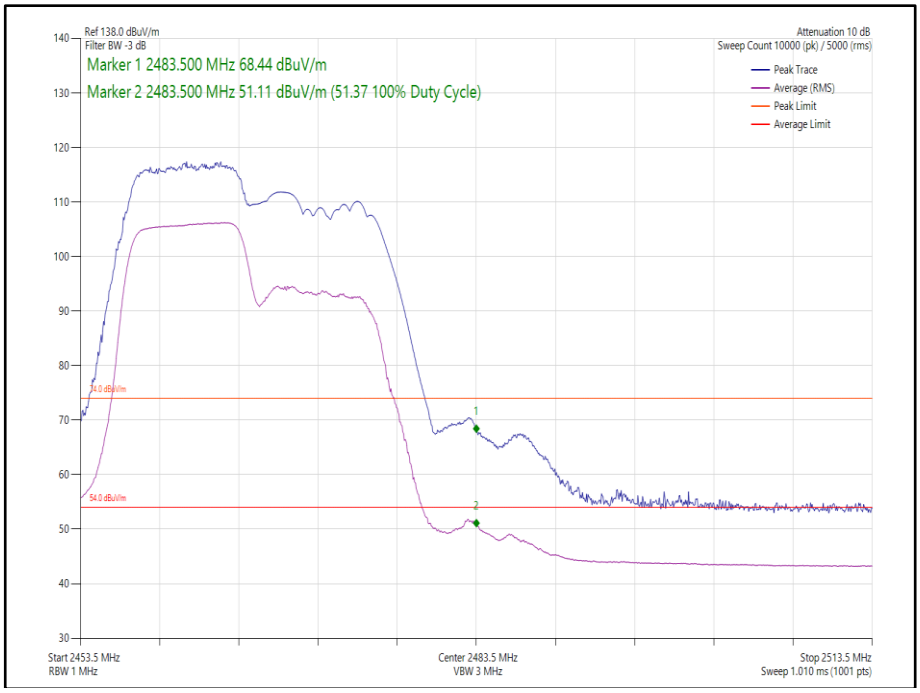

Figure 18 - 802.11ax, HE20, RU, 106-53, SISO, Core 1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

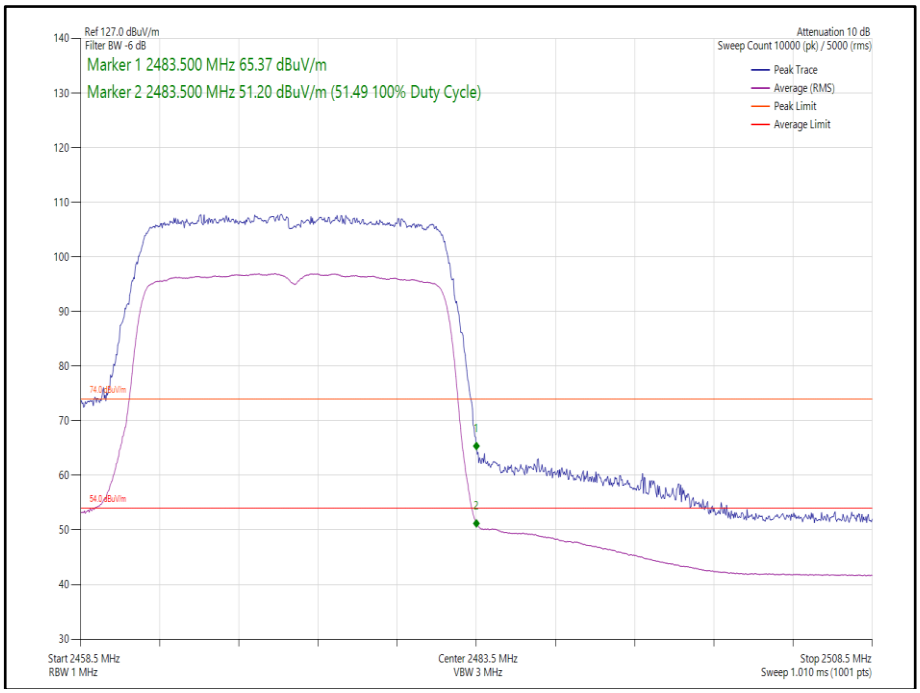

Figure 19 - 802.11ax, HE20, SU, SISO, Core 1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

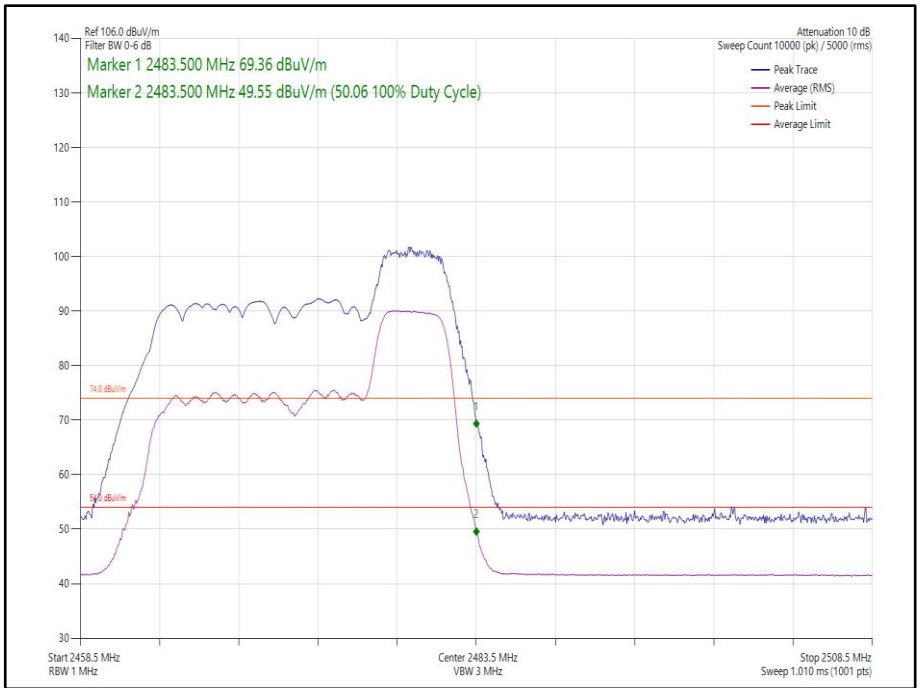

Figure 20 - 802.11ax, HE20, RU, 52-40, SISO, Core 1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

20 MHz Bandwidth - Core 0-1 (CDD)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBµV/m)	Average Level (dBuV/m)
802.11n HT20	MCS2	-	-	2412	2390	65.75	51.41
802.11ax HE20	MCS4x1	SU	-	2412	2390	67.96	51.44
802.11ax HE20	MCS9x1	106	53	2412	2390	67.78	51.19
802.11n HT20	MCS7	-	-	2462	2483.5	67.20	51.42
802.11n HT20	MCS7	-	-	2467	2483.5	65.32	51.40
802.11n HT20	MCS4	-	-	2472	2483.5	65.39	51.46
802.11ax HE20	MCS9x1	SU	-	2462	2483.5	66.67	51.37
802.11ax HE20	MCS9x1	106	54	2462	2483.5	68.24	51.25
802.11ax HE20	MCS9x1	SU	-	2467	2483.5	63.86	51.43
802.11ax HE20	MCS9x1	52	37	2467	2483.5	68.96	51.33
802.11ax HE20	MCS2x1	SU	-	2472	2483.5	64.83	51.47
802.11ax HE20	MCS9x1	106	53	2472	2483.5	68.89	50.51

Table 7 - CDD Restricted Band Edge Results

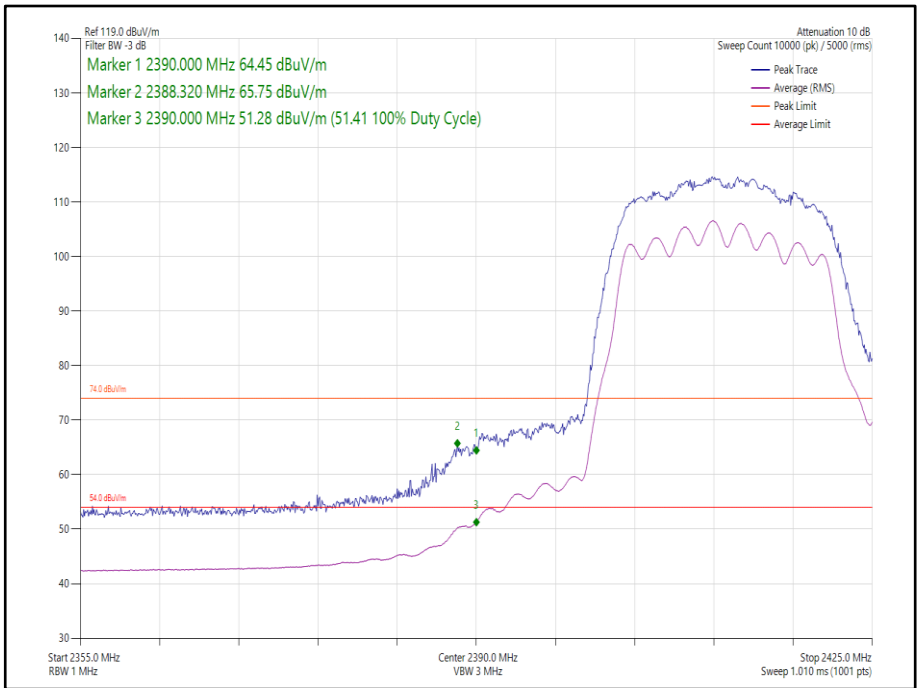

Figure 21 - 802.11n, HT20, CDD, Core 0-1 - 2412 MHz, Band Edge Frequency 2390 MHz

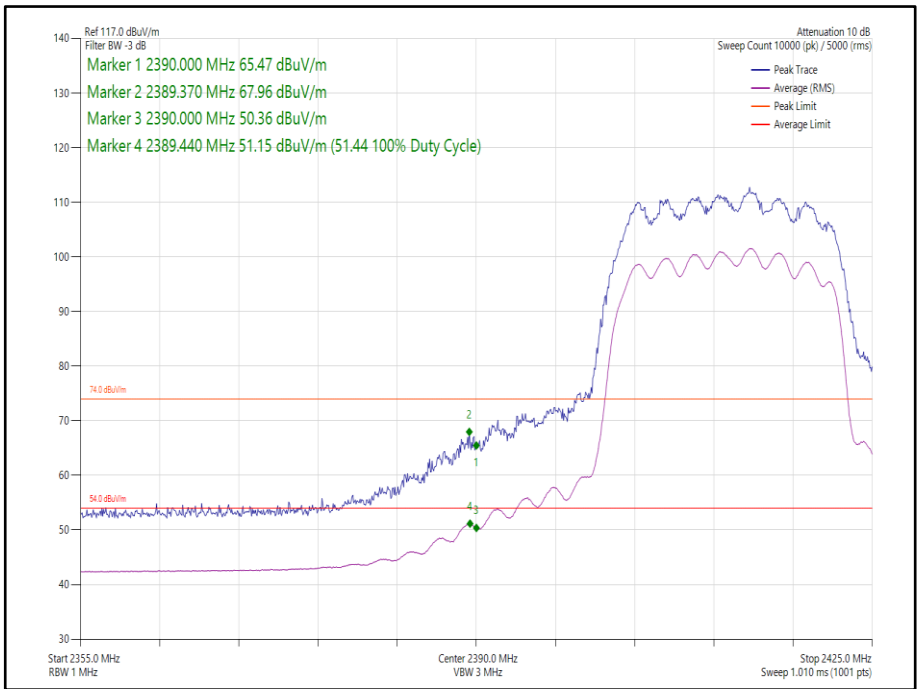

Figure 22 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2412 MHz, Band Edge Frequency 2390 MHz

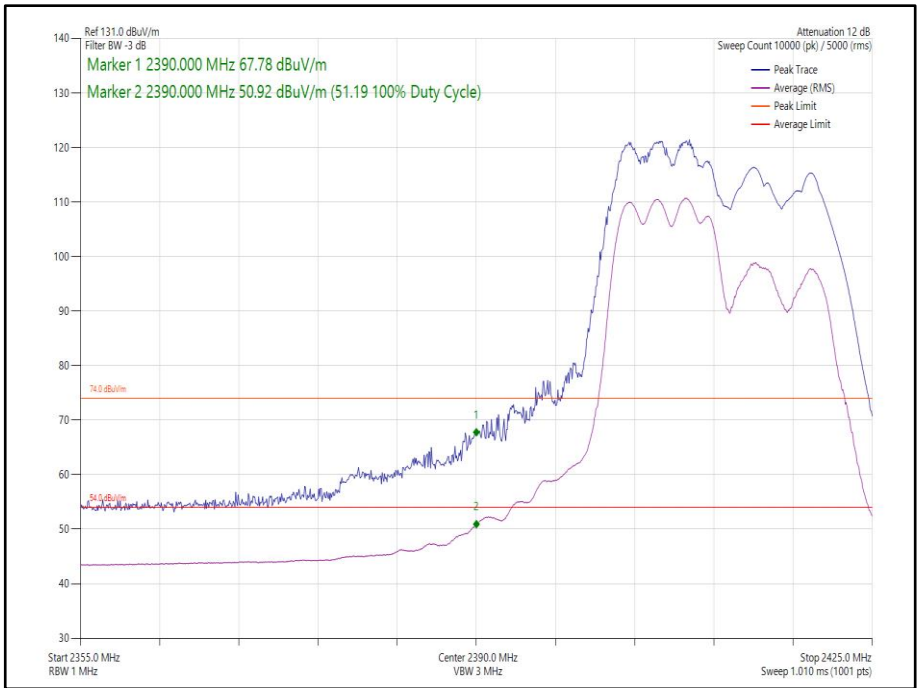

Figure 23 - 802.11ax, HE20, RU, 106-53, CDD, Core 0-1 - 2412 MHz, Band Edge Frequency 2390 MHz

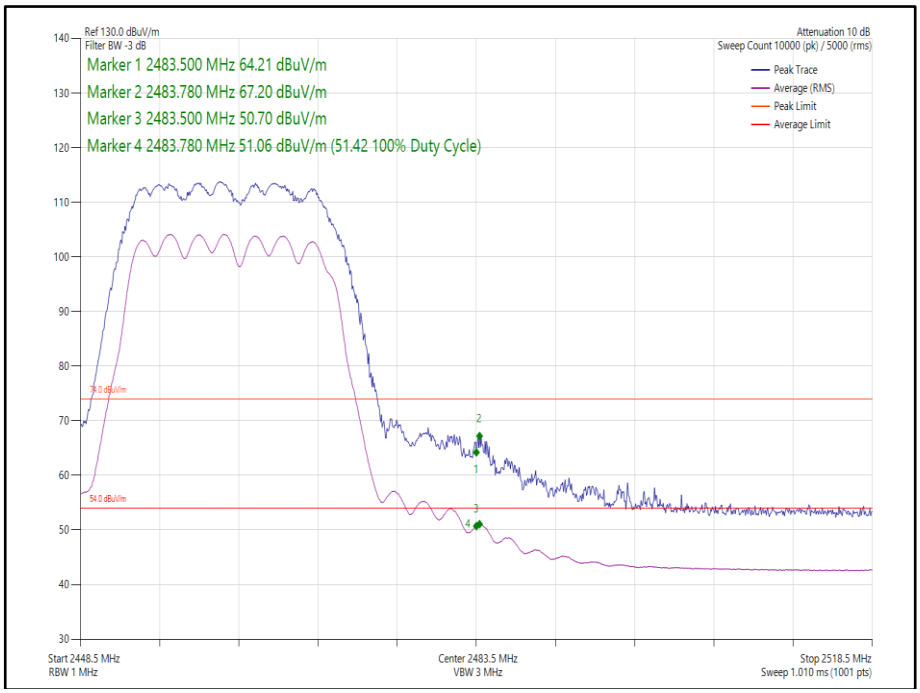

Figure 24 - 802.11n, HT20, CDD, Core 0-1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

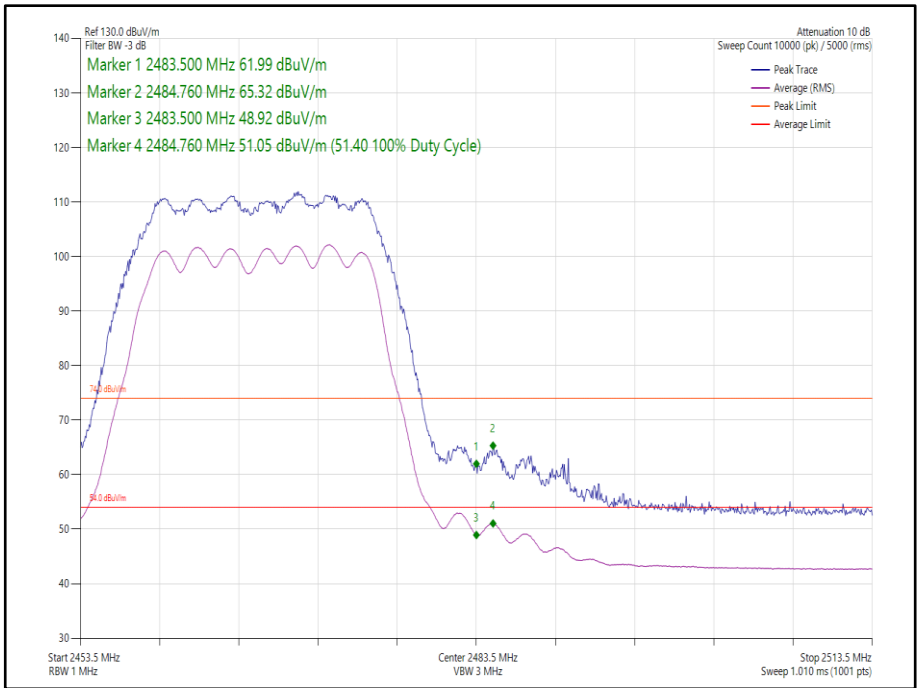

Figure 25 - 802.11n, HT20, CDD, Core 0-1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

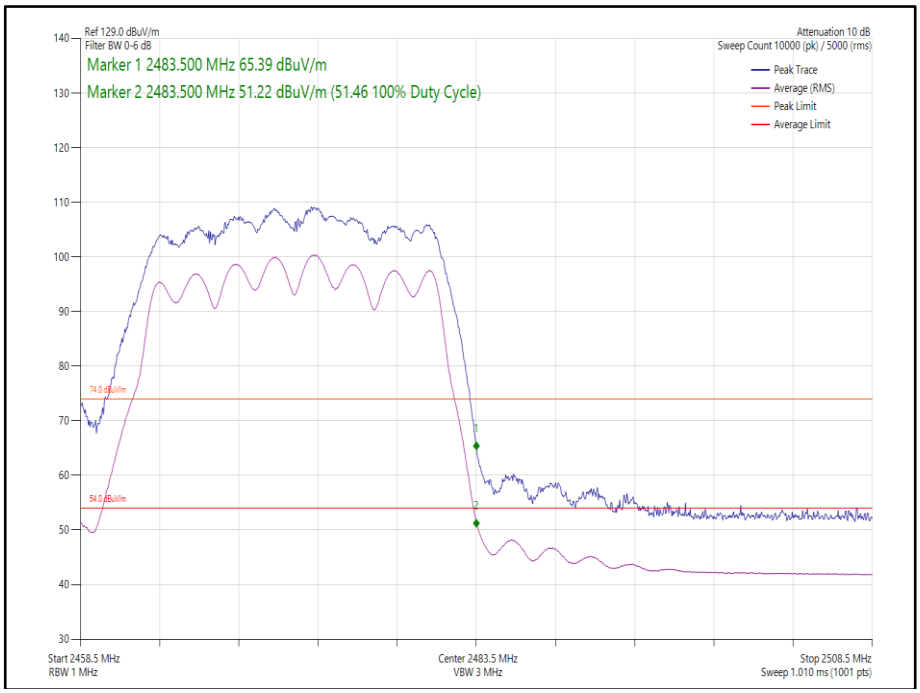

Figure 26 - 802.11n, HT20, CDD, Core 0-1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

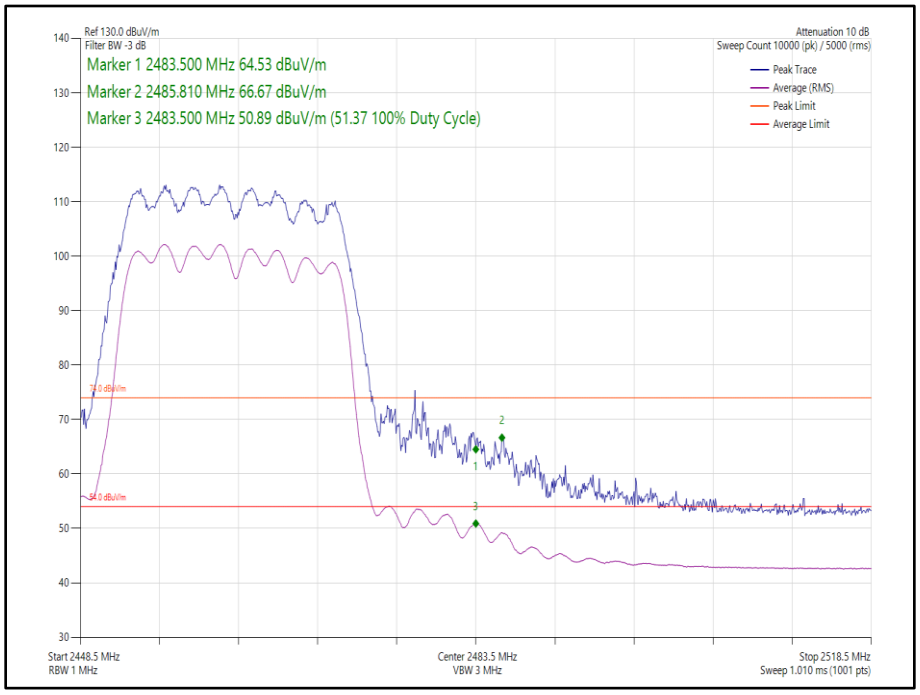

Figure 27 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

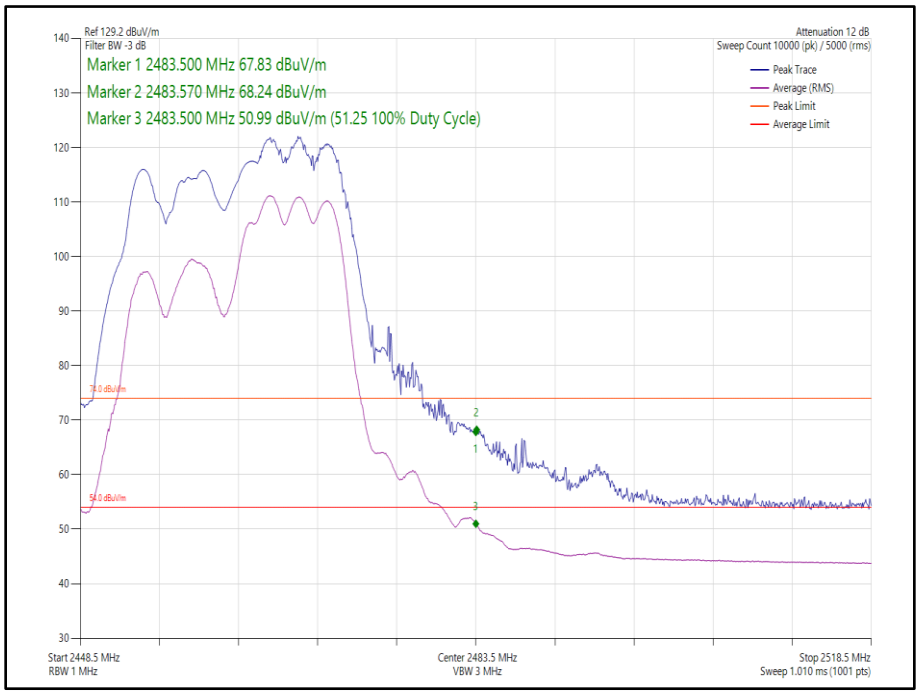

Figure 28 - 802.11ax, HE20, RU, 106-54, CDD, Core 0-1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

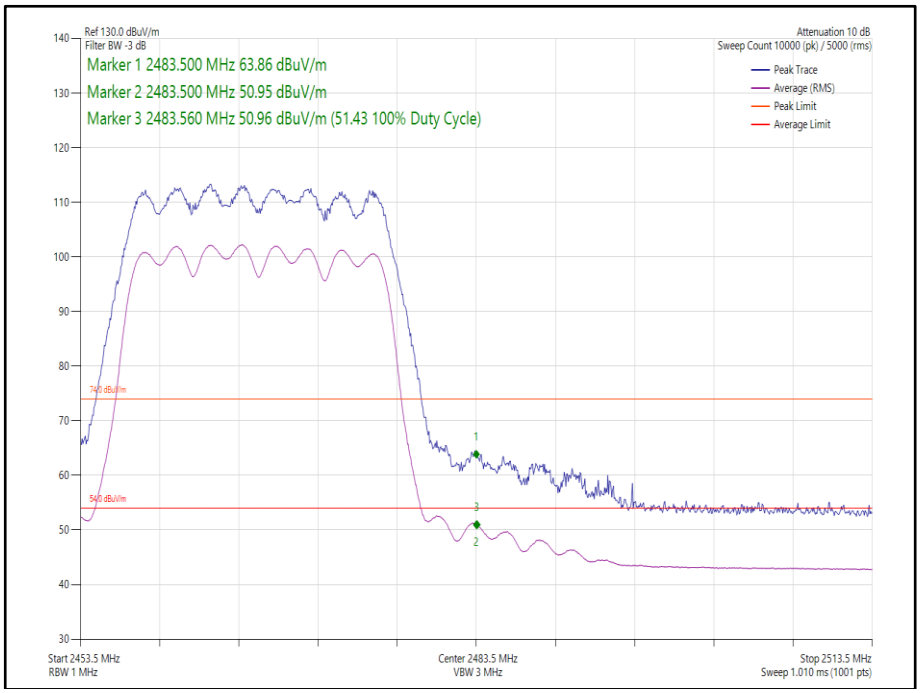

Figure 29 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

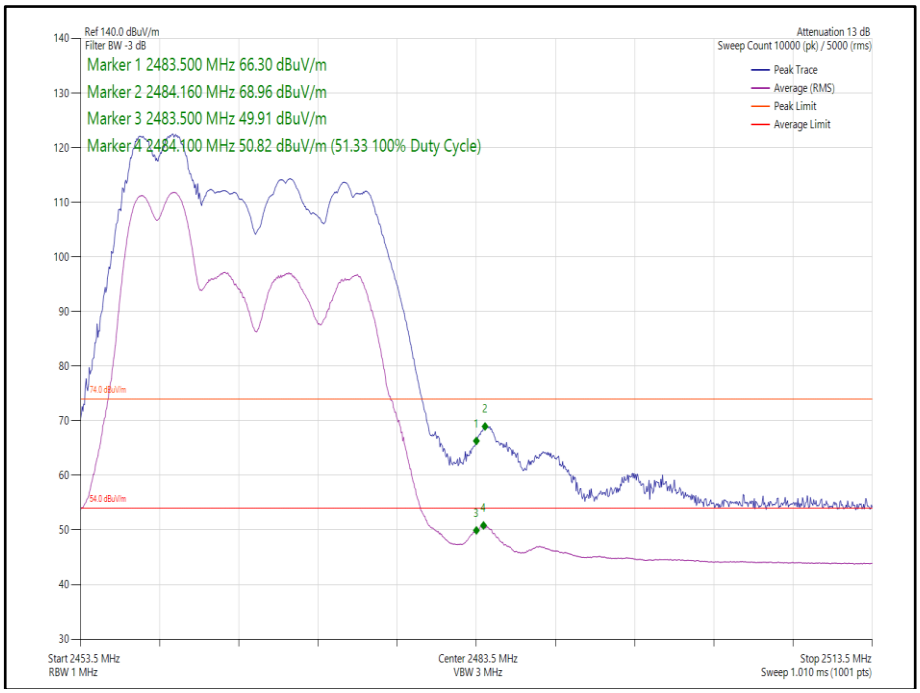

Figure 30 - 802.11ax, HE20, RU, 52-37, CDD, Core 0-1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

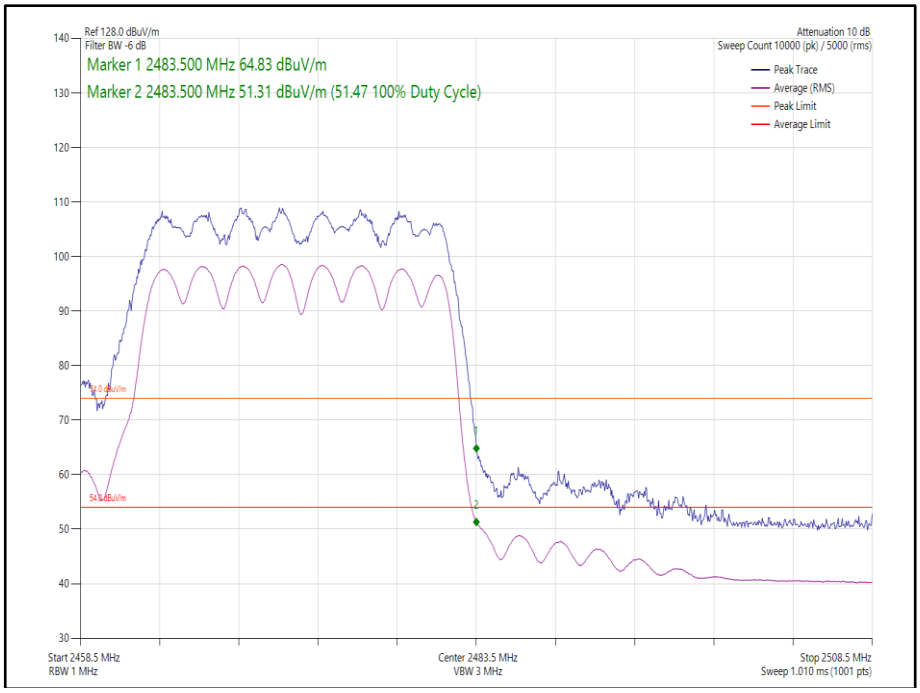

Figure 31 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

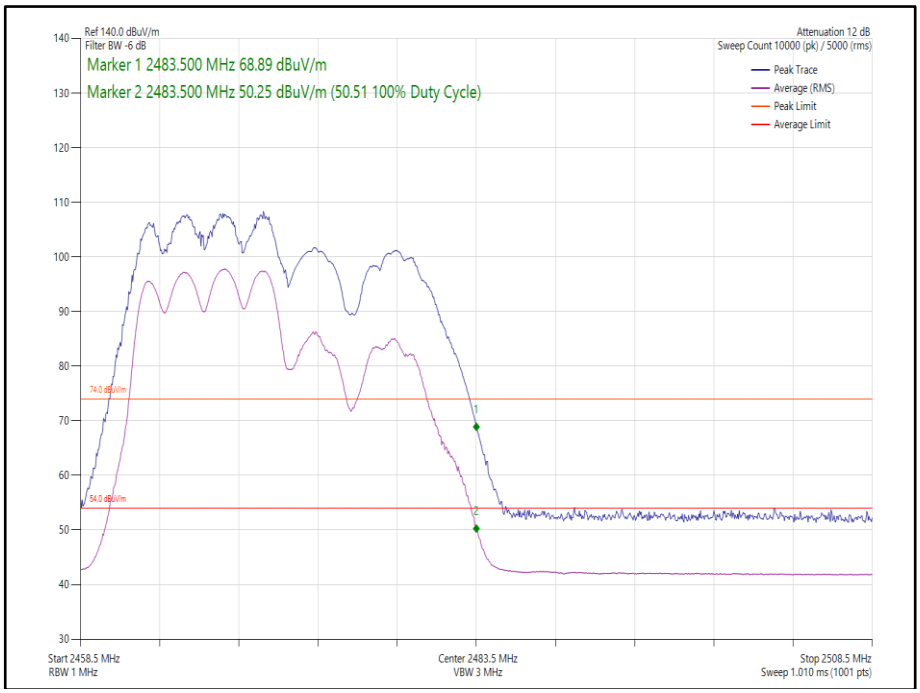

Figure 32 - 802.11ax, HE20, RU, 106-53, CDD, Core 0-1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength (µV/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 (µV/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 15.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Emissions Software	TUV SUD	EmX V3.1.10	5125	-	Software
Cable (18GHz)	Junkosha	MWX221-04000NMSNMS/B	5262	12	04-Aug-2023
Cable (18 GHz)	Junkosha	MWX221-04000NMSNMS/B	5263	12	28-Feb-2023
EMI Test Receiver	Rohde & Schwarz	ESW44	5911	12	24-Feb-2023
1500W (300V 12A) AC Power Supply	iTech	IT7324	5956	-	O/P Mon
5m Semi-Anechoic Chamber (Dual-Axis)	Albatross Projects	RF Chamber 15	5963	36	28-Apr-2025
Compact Antenna Mast	Maturo Gmbh	CAM4.0-P	5964	-	TU
Mast & Turntable Controller	Maturo Gmbh	FCU3.0	5966	-	TU
Tilt Antenna Mast	Maturo Gmbh	BAM4.5-P	5967	-	TU
Turntable	Maturo Gmbh	TT1.5SI	5968	-	TU
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6018	12	06-Jun-2023
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6142	12	26-Jun-2023
Multimeter	Fluke	56601818WS	6147	12	16-Jun-2023
Humidity & Temperature meter	R.S Components	1364	6150	12	17-Jun-2023
SAC Switch Unit	TUV SUD	TUV_SSU_001	6190	12	16-Dec-2023
Cable (SMA to SMA 20cm)	TUV SUD	MH-FH 8-18	6220	12	10-Aug-2023

Table 10

TU - Traceability Unscheduled
O/P Mon - Output Monitored using calibrated equipment

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

A2786, S/N: L217XQ106H - Modification State 0

2.2.3 Date of Test

20-January-2023 to 08-February-2023

2.2.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.8.1 for 6 dB BW and 6.9.3 for 99% occupied bandwidth measurements.

2.2.5 Environmental Conditions

Ambient Temperature	22.7 °C
Relative Humidity	28.0 %

2.2.6 Test Results

2.4 GHz WLAN

Protocol	6 dB Bandwidth (MHz)	
	Minimum	Maximum
802.11b	8.640	8.640
802.11g	15.300	16.500
802.11n HT20	15.300	17.280
802.11ax HE20 SU	18.960	19.140

Table 11 - 6 dB Bandwidth Summary Results – SISO

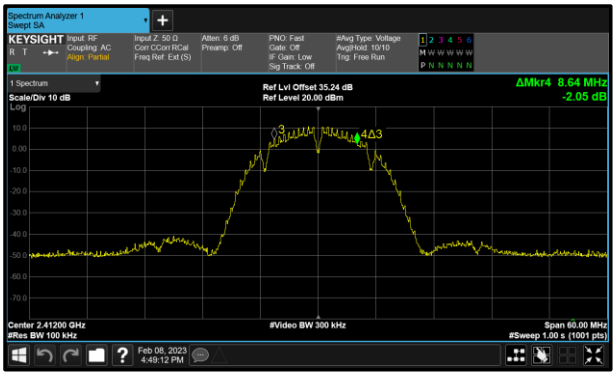

Figure 33 - 802.11b Minimum 6 dB EBW

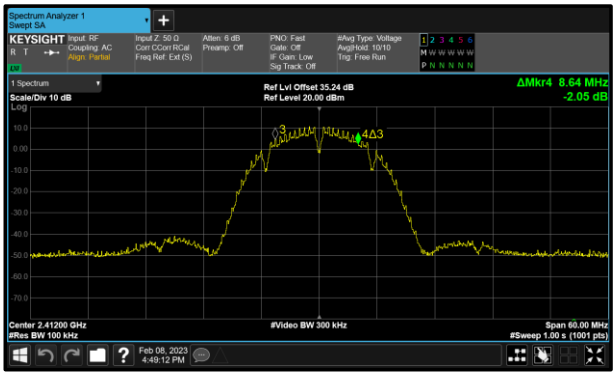

Figure 34 - 802.11b Maximum 6 dB EBW

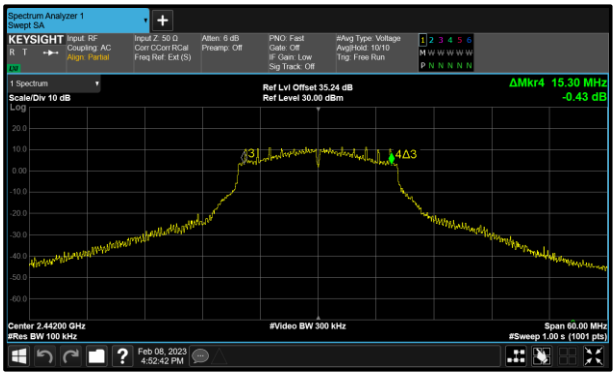

Figure 35 - 802.11g Minimum 6 dB EBW

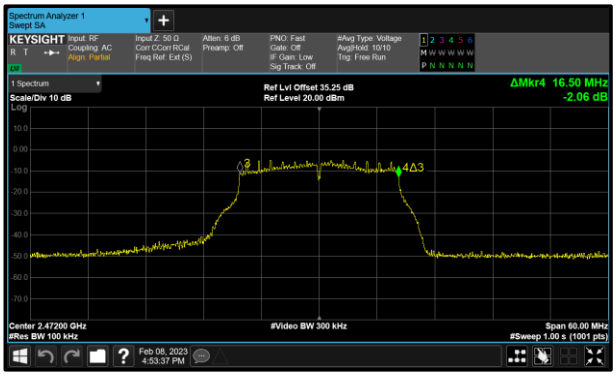

Figure 36 - 802.11g Maximum 6 dB EBW

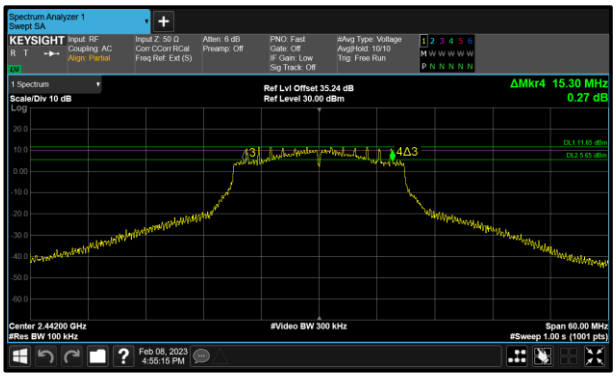

Figure 37 - 802.11n HT20 Minimum 6 dB EBW

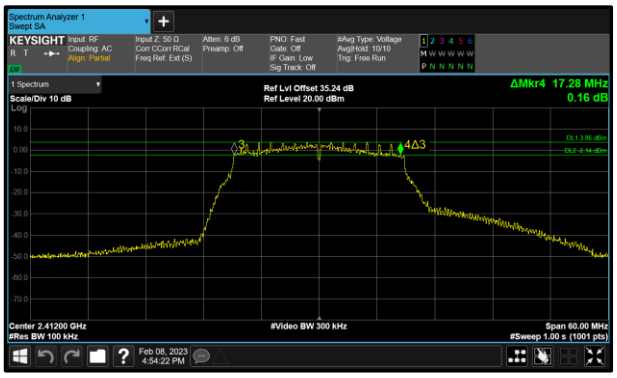

Figure 38 - 802.11n HT20 Maximum 6 dB EBW

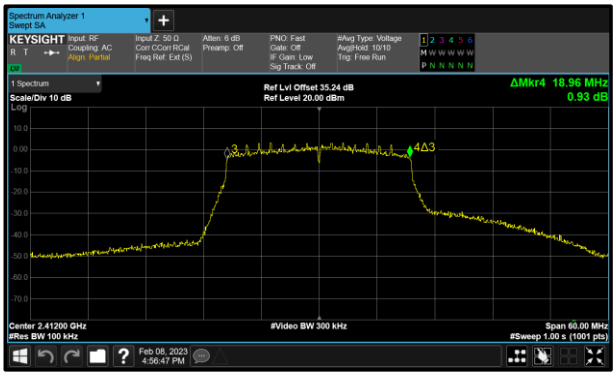

Figure 39 - 802.11ax HE20 SU Minimum 6 dB EBW

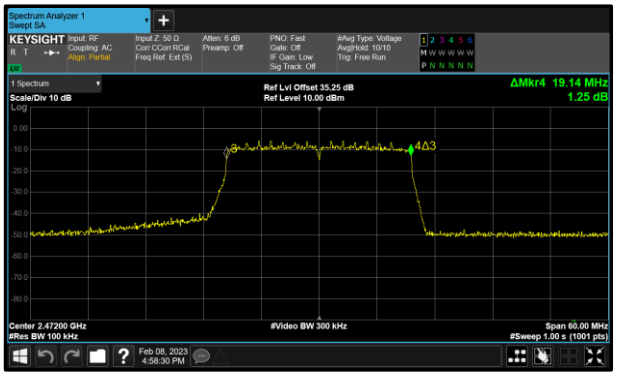

Figure 40 - 802.11ax HE20 SU Maximum 6 dB EBW

Protocol	99% Bandwidth (MHz)	
	Minimum	Maximum
802.11b	12.900	13.020
802.11g	16.380	16.860
802.11n HT20	17.580	17.820
802.11ax HE20 SU	18.900	18.960

Table 12 - 99% Bandwidth Summary Results - SISO

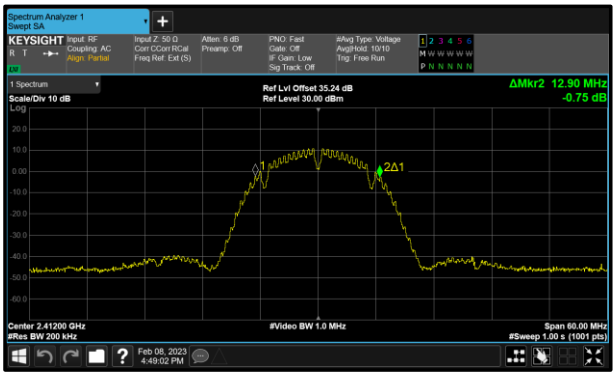

Figure 41 - 802.11b Minimum 99% OBW

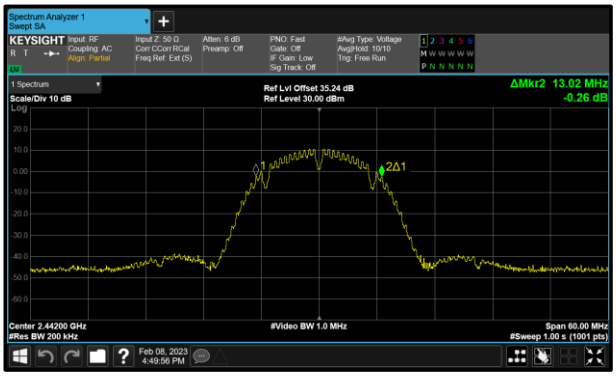

Figure 42 - 802.11b Maximum 99% OBW

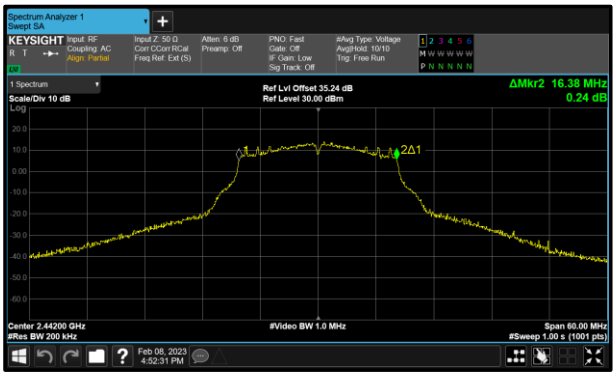

Figure 43 - 802.11g Minimum 99% OBW

Figure 44 - 802.11g Maximum 99% OBW

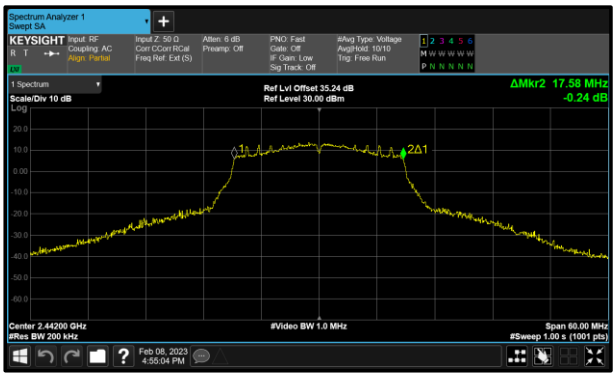

Figure 45 - 802.11n HT20 Minimum 99% OBW

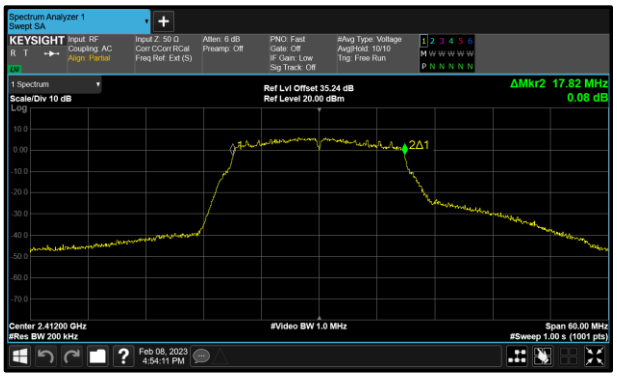

Figure 46 - 802.11n HT20 Maximum 99% OBW

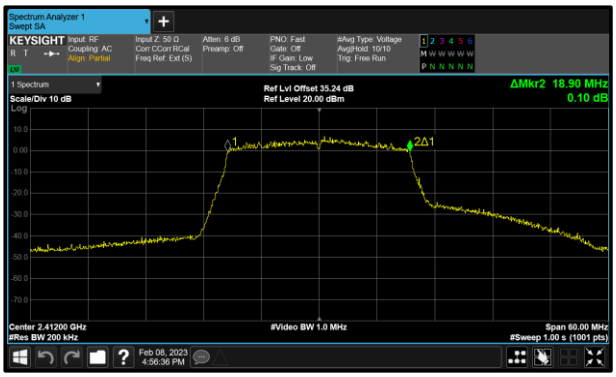

Figure 47 - 802.11ax HE20 SU Minimum 99% OBW

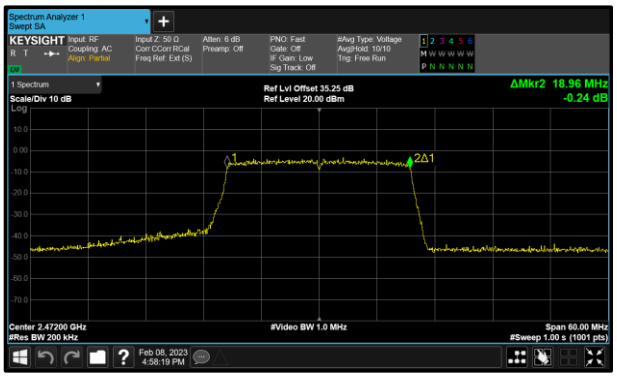

Figure 48 - 802.11ax HE20 SU Maximum 99% OBW

Protocol	6 dB Bandwidth (MHz)	
	Minimum	Maximum
802.11n HT20	15.300	17.400
802.11ax HE20 SU	18.360	19.020

Table 13 - 6 dB Bandwidth Summary Results - MIMO CDD

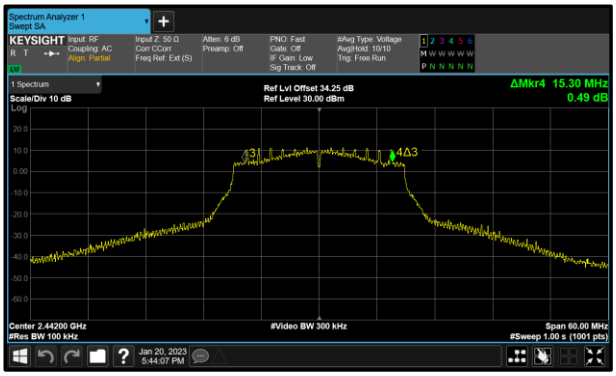

Figure 49 - 802.11n HT20 Minimum 6 dB EBW

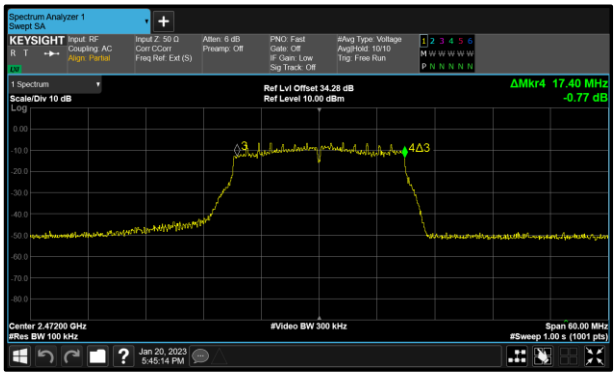

Figure 50 - 802.11n HT20 Maximum 6 dB EBW

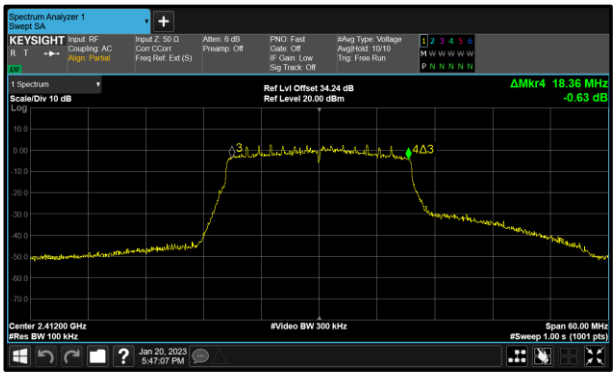

Figure 51 - 802.11ax HE20 SU Minimum 6 dB EBW

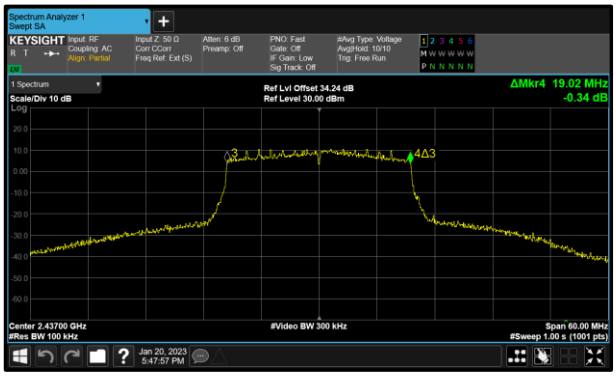

Figure 52 - 802.11ax HE20 SU Maximum 6 dB EBW

Protocol	99% Bandwidth (MHz)	
	Minimum	Maximum
802.11n HT20	17.580	17.880
802.11ax HE20 SU	18.900	19.020

Table 14 - 99% Bandwidth Summary Results - MIMO CDD

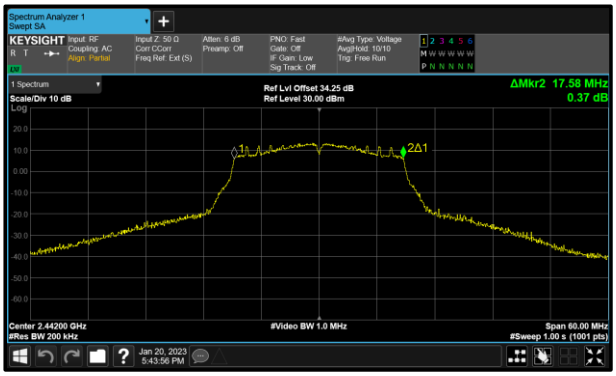

Figure 53 - 802.11n HT20 Minimum 99% OBW

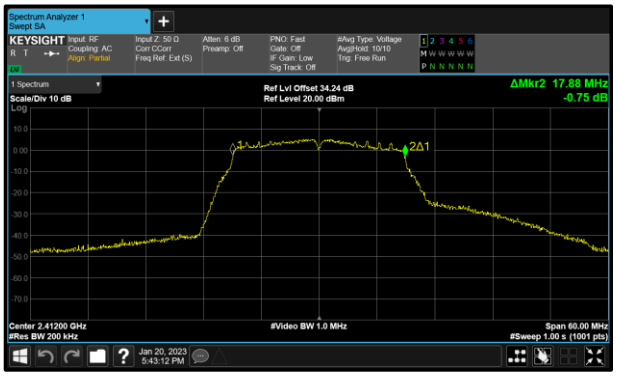

Figure 54 - 802.11n HT20 Maximum 99% OBW

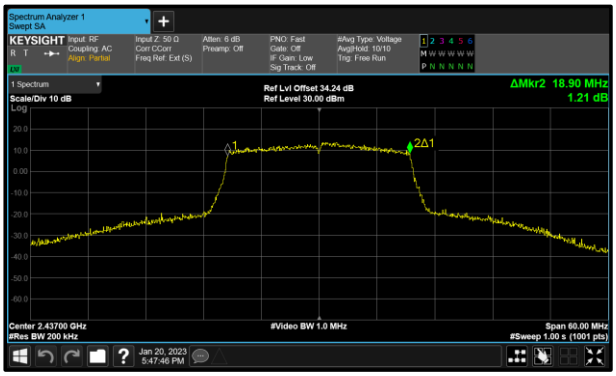

Figure 55 - 802.11ax HE20 SU Minimum 99% OBW

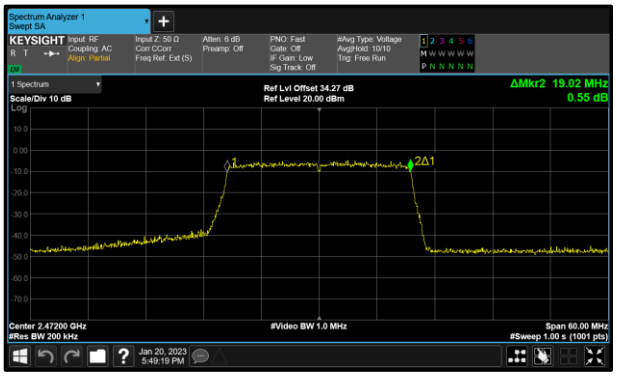

Figure 56 - 802.11ax HE20 SU Maximum 99% OBW

SISO

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):	B (Core 1)	Active Chain(s):	1

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

Table 15 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	12.900	-	-	-
2442	-	13.020	-	-	-
2472	-	13.020	-	-	-

Table 16 - 99% Bandwidth Results

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):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	16.440	-	-	≥500.0
2442	-	15.300	-	-	≥500.0
2472	-	16.500	-	-	≥500.0

Table 17 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	16.860	-	-	-
2442	-	16.380	-	-	-
2472	-	16.560	-	-	-

Table 18 - 99% Bandwidth Results

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):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	17.280	-	-	≥500.0
2442	-	15.300	-	-	≥500.0
2472	-	17.100	-	-	≥500.0

Table 19 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	17.820	-	-	-
2442	-	17.580	-	-	-
2472	-	17.700	-	-	-

Table 20 - 99% Bandwidth Results

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):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	18.960	-	-	≥500.0
2442	-	18.960	-	-	≥500.0
2472	-	19.140	-	-	≥500.0

Table 21 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	18.900	-	-	-
2442	-	18.900	-	-	-
2472	-	18.960	-	-	-

Table 22 - 99% Bandwidth Results

MIMO CDD

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	
2412	16.980	17.040	-	-	≥500.0
2442	15.300	15.300	-	-	≥500.0
2472	17.400	17.400	-	-	≥500.0

Table 23 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	17.820	17.880	-	-	-
2442	17.580	17.580	-	-	-
2472	17.760	17.700	-	-	-

Table 24 - 99% Bandwidth Results

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	
2412	18.780	18.360	-	-	≥500.0
2437	19.020	18.780	-	-	≥500.0
2472	19.020	19.020	-	-	≥500.0

Table 25 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	18.960	18.960	-	-	-
2437	18.900	18.960	-	-	-
2472	18.960	19.020	-	-	-

Table 26 - 99% Bandwidth Results

FCC 47 CFR Part 15, Limit Clause 15.247(a)(2) and ISED RSS-247, Clause 5.2(a)

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

2.2.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 14.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Hygrometer	Rotronic	I-1000	3068	12	21-Sep-2023
Multi-GNSS Simulator (GPS)	Spirent	GSS6700	4596	12	22-Aug-2023
AC Programmable Power Supply	iTech	IT7324	5225	-	O/P Mon
MXA Signal Analyser	Keysight Technologies	N9020B	5529	24	13-Dec-2024
Signal Conditioning Unit	TUV SUD	SPECTRUM SCU001	5546	12	06-Apr-2023
Digital Multimeter	Fluke	115	6145	12	17-Jun-2023

Table 27

O/P Mon - Output Monitored using calibrated equipment

2.3 Maximum Conducted Output Power

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (b)
ISED RSS-247, Clause 5.4
ISED RSS-GEN, Clause 6.12

2.3.2 Equipment Under Test and Modification State

A2786, S/N: L217XQ106H - Modification State 0

2.3.3 Date of Test

20-January-2023 to 08-February-2023

2.3.4 Test Method

The test was performed in accordance with ANSI C63.10 clause 11.9.2.3.2 Method AVGPM-G.

MIMO output port summing was performed in accordance with KDB 662911 D01. For the CDD results, the Directional Gain was calculated in accordance with clause F)2)f)(ii) using the calculations from F)2)f)(i) with worst-case individual gain and an array gain of zero.

2.3.5 Environmental Conditions

Ambient Temperature	21.7 - 22.7 °C
Relative Humidity	26.6 - 28.0 %

2.3.6 Test Results

2.4 GHz WLAN

SISO

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11b	Duty Cycle (%):	99.4
Data Rate:	1 Mbps	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.75
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	18.82	-	-	-	30.00	-11.18
2442	-	18.79	-	-	-	30.00	-11.21
2472	-	14.79	-	-	-	30.00	-15.21

Table 28 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	-	18.82	-	-	-	30.00	-11.18	22.57	36.00	-13.43
2442	-	18.79	-	-	-	30.00	-11.21	22.54	36.00	-13.46
2472	-	14.79	-	-	-	30.00	-15.21	18.54	36.00	-17.46

Table 29 - ISED Maximum Conducted (average) Output Power Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11g	Duty Cycle (%):	97.6
Data Rate:	12 Mbps	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.75
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	15.47	-	-	-	30.00	-14.53
2442	-	22.27	-	-	-	30.00	-7.73
2472	-	6.50	-	-	-	30.00	-23.50

Table 30 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	-	15.47	-	-	-	30.00	-14.53	19.22	36.00	-16.78
2442	-	22.27	-	-	-	30.00	-7.73	26.02	36.00	-9.98
2472	-	6.50	-	-	-	30.00	-23.50	10.25	36.00	-25.75

Table 31 - ISED Maximum Conducted (average) Output Power Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11n HT20	Duty Cycle (%):	96.5
Modulation Coding Scheme:	MCS2	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.75
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	15.16	-	-	-	30.00	-14.84
2442	-	22.30	-	-	-	30.00	-7.70
2472	-	6.50	-	-	-	30.00	-23.50

Table 32 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	-	15.16	-	-	-	30.00	-14.84	18.91	36.00	-17.09
2442	-	22.30	-	-	-	30.00	-7.70	26.05	36.00	-9.95
2472	-	6.50	-	-	-	30.00	-23.50	10.25	36.00	-25.75

Table 33 - ISED Maximum Conducted (average) Output Power Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11ax HE20 SU	Duty Cycle (%):	95.8
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.75
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	13.98	-	-	-	30.00	-16.02
2442	-	22.34	-	-	-	30.00	-7.66
2472	-	5.81	-	-	-	30.00	-24.19

Table 34 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	-	13.98	-	-	-	30.00	-16.02	17.73	36.00	-18.27
2442	-	22.34	-	-	-	30.00	-7.66	26.09	36.00	-9.91
2472	-	5.81	-	-	-	30.00	-24.19	9.56	36.00	-26.44

Table 35 - ISED Maximum Conducted (average) Output Power Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11ax HE20 RU26	Duty Cycle (%):	96.6
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.75
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	11.80	-	-	-	30.00	-18.20
2442	-	14.29	-	-	-	30.00	-15.71
2472	-	-6.40	-	-	-	30.00	-36.40

Table 36 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	-	11.80	-	-	-	30.00	-18.20	15.55	36.00	-20.45
2442	-	14.29	-	-	-	30.00	-15.71	18.04	36.00	-17.96
2472	-	-6.40	-	-	-	30.00	-36.40	-2.65	36.00	-38.65

Table 37 - ISED Maximum Conducted (average) Output Power Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11ax HE20 RU52	Duty Cycle (%):	96.3
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.75
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	11.92	-	-	-	30.00	-18.08
2442	-	17.17	-	-	-	30.00	-12.83
2472	-	-4.71	-	-	-	30.00	-34.71

Table 38 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	-	11.92	-	-	-	30.00	-18.08	15.67	36.00	-20.33
2442	-	17.17	-	-	-	30.00	-12.83	20.92	36.00	-15.08
2472	-	-4.71	-	-	-	30.00	-34.71	-0.96	36.00	-36.96

Table 39 - ISED Maximum Conducted (average) Output Power Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	802.11ax HE20 RU106	Duty Cycle (%):	97.9
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.75
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	11.65	-	-	-	30.00	-18.35
2442	-	20.15	-	-	-	30.00	-9.85
2472	-	-2.85	-	-	-	30.00	-32.85

Table 40 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	-	11.65	-	-	-	30.00	-18.35	15.40	36.00	-20.60
2442	-	20.15	-	-	-	30.00	-9.85	23.90	36.00	-12.10
2472	-	-2.85	-	-	-	30.00	-32.85	0.90	36.00	-35.10

Table 41 - ISED Maximum Conducted (average) Output Power Results

MIMO CDD

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	662911 D01 v02r01 F)2)f)(i), 662911 D01 v02r01 E)1)		

DUT Configuration			
Mode:	802.11n HT20	Duty Cycle (%):	96.5
Modulation Coding Scheme:	MCS2	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	3.75
Active Port(s):	A+B (Core 0 + Core 1)	Active Chain(s):	0+1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	14.93	14.50	-	-	17.73	30.00	-12.27
2442	22.15	21.73	-	-	24.96	30.00	-5.04
2472	4.90	4.25	-	-	7.58	30.00	-22.42

Table 42 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	14.93	14.50	-	-	17.73	30.00	-12.27	21.48	36.00	-14.52
2442	22.15	21.73	-	-	24.96	30.00	-5.04	28.71	36.00	-7.29
2472	4.90	4.25	-	-	7.58	30.00	-22.42	11.33	36.00	-24.67

Table 43 - ISED Maximum Conducted (average) Output Power Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	662911 D01 v02r01 F)2)f)(i), 662911 D01 v02r01 E)1)		

DUT Configuration			
Mode:	802.11ax HE20 SU	Duty Cycle (%):	95.8
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	3.75
Active Port(s):	A+B (Core 0 + Core 1)	Active Chain(s):	0+1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	14.00	13.55	-	-	16.79	30.00	-13.21
2437	22.39	21.70	-	-	25.07	30.00	-4.93
2472	4.35	4.29	-	-	7.33	30.00	-22.67

Table 44 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	14.00	13.55	-	-	16.79	30.00	-13.21	20.54	36.00	-15.46
2437	22.39	21.70	-	-	25.07	30.00	-4.93	28.82	36.00	-7.18
2472	4.35	4.29	-	-	7.33	30.00	-22.67	11.08	36.00	-24.92

Table 45 - ISED Maximum Conducted (average) Output Power Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	662911 D01 v02r01 F)2)f)(i), 662911 D01 v02r01 E)1)		

DUT Configuration			
Mode:	802.11ax HE20 RU26	Duty Cycle (%):	96.6
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	3.75
Active Port(s):	A+B (Core 0 + Core 1)	Active Chain(s):	0+1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	11.34	11.12	-	-	14.23	30.00	-15.77
2442	14.18	13.98	-	-	17.09	30.00	-12.91
2472	-7.83	-8.21	-	-	-5.01	30.00	-35.01

Table 46 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	11.34	11.12	-	-	14.23	30.00	-15.77	17.98	36.00	-18.02
2442	14.18	13.98	-	-	17.09	30.00	-12.91	20.84	36.00	-15.16
2472	-7.83	-8.21	-	-	-5.01	30.00	-35.01	-1.26	36.00	-37.26

Table 47 - ISED Maximum Conducted (average) Output Power Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	662911 D01 v02r01 F)2)f)(i), 662911 D01 v02r01 E)1)		

DUT Configuration			
Mode:	802.11ax HE20 RU52	Duty Cycle (%):	96.3
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	3.75
Active Port(s):	A+B (Core 0 + Core 1)	Active Chain(s):	0+1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	11.38	11.16	-	-	14.28	30.00	-15.72
2442	17.45	17.09	-	-	20.28	30.00	-9.72
2472	-6.71	-7.08	-	-	-3.88	30.00	-33.88

Table 48 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	11.38	11.16	-	-	14.28	30.00	-15.72	18.03	36.00	-17.97
2442	17.45	17.09	-	-	20.28	30.00	-9.72	24.03	36.00	-11.97
2472	-6.71	-7.08	-	-	-3.88	30.00	-33.88	-0.13	36.00	-36.13

Table 49 - ISED Maximum Conducted (average) Output Power Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 5.4 d)	Test Method(s):	C63.10 11.9.2.3.2
Additional Reference(s):	662911 D01 v02r01 F)2)f)(i), 662911 D01 v02r01 E)1)		

DUT Configuration			
Mode:	802.11ax HE20 RU106	Duty Cycle (%):	97.9
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	3.75
Active Port(s):	A+B (Core 0 + Core 1)	Active Chain(s):	0+1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	11.43	11.47	-	-	14.46	30.00	-15.54
2442	20.46	19.92	-	-	23.19	30.00	-6.81
2472	-4.24	-4.57	-	-	-1.39	30.00	-31.39

Table 50 - FCC Maximum Conducted (average) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	∑					
2412	11.43	11.47	-	-	14.46	30.00	-15.54	18.21	36.00	-17.79
2442	20.46	19.92	-	-	23.19	30.00	-6.81	26.94	36.00	-9.06
2472	-4.24	-4.57	-	-	-1.39	30.00	-31.39	2.36	36.00	-33.64

Table 51 - ISED Maximum Conducted (average) Output Power Results

FCC 47 CFR Part 15, Limit Clause 15.247 (b)(3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

ISED RSS-247, Limit Clause 5.4 (d)

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e) of the specification.

2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 14.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Hygrometer	Rotronic	I-1000	3068	12	21-Sep-2023
AC Programmable Power Supply	iTech	IT7324	5225	-	O/P Mon
Signal Conditioning Unit	TUV SUD	SPECTRUM SCU001	5546	12	06-Apr-2023
USB Power Sensor	Boonton	RTP5008	5820	12	06-Apr-2023
USB Power Sensor	Boonton	RTP5008	5831	12	06-Apr-2023
Digital Multimeter	Fluke	115	6145	12	17-Jun-2023

Table 52

O/P Mon - Output Monitored using calibrated equipment

2.4 Spurious Radiated Emissions

2.4.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.209 and 15.247 (d)
ISED RSS-247, Clause 3.3 and 5.5
ISED RSS-GEN, Clause 6.13 and 8.9

2.4.2 Equipment Under Test and Modification State

A2786, S/N: C3Q0QNNQ4L - Modification State 0

2.4.3 Date of Test

02-February-2023 to 14-February-2023

2.4.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.5 and 6.6.

For frequencies > 1 GHz, plots for average measurements were taken in accordance with ANSI C63.10, clause 11.12.2.5.2.

The EUT was placed on the non-conducting platform in a manner typical of a normal installation.

Ports on the EUT were terminated with loads as described in ANSI C63.4 clause 6.2.4. For EUT's with multiple connectors of the same type, additional interconnecting cables were connected, and pre-scans performed to determine whether the level of the emissions were increased by >2 dB.

In the 30 MHz to 1 GHz range pre-scans were only performed on the mid channel (2437 MHz) only.

The plots shown are the characterisation of the EUT. The limits on the plots represent the most stringent case for restricted bands, (74/54 dBuV/m) when compared to 20 dBc outside restricted bands. The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10 dB of the limits shown on the plots, further investigation was carried out and reported in results tables.

The following conversion can be applied to convert from dBµV/m to µV/m:
10^(Field Strength in dBµV/m/20).

Above 18 GHz, the measurement distance was reduced to 1 m. The limit line was increased by 20*LOG(3/1) = 9.54 dB.

At a measurement distance of 1 meter the limit line was increased by 20*LOG(3/1) = 9.54 dB.

Where formal measurements have been necessary, the results have been presented in the emissions table.

2.4.5 Test Setup Diagram

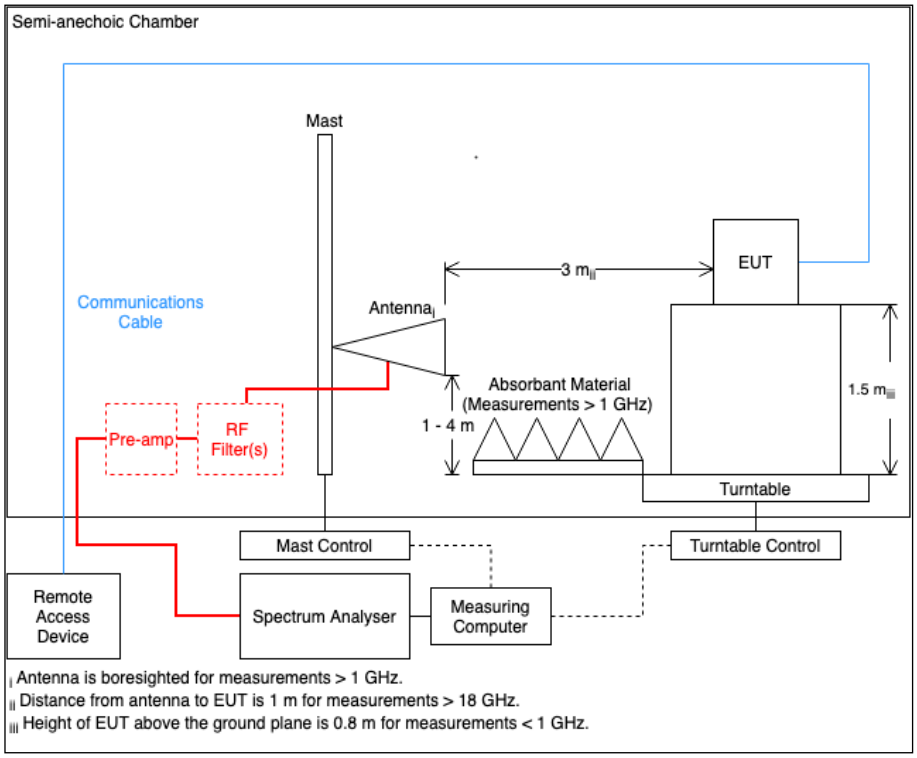

Figure 57

2.4.6 Environmental Conditions

Ambient Temperature	21.8 - 22.8 °C
Relative Humidity	39.5 - 42.6 %

2.4.7 Test Results

2.4 GHz WLAN

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 53 - 2412 MHz (CH1), 802.11b, Core 0, 1 to 26 GHz

*No emissions found within 10 dB of the limit.

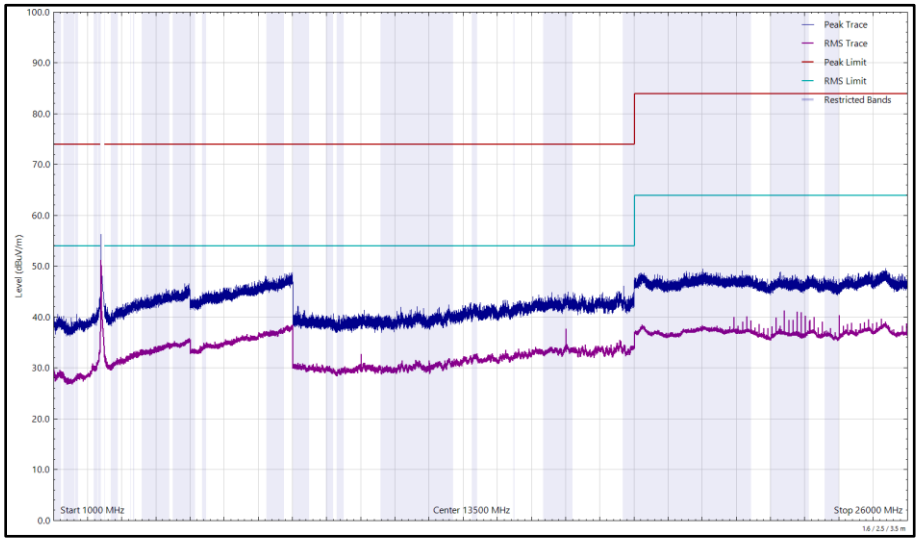

Figure 58 - 2412 MHz (CH1), 802.11b, Core 0, 1 GHz to 26 GHz, Horizontal

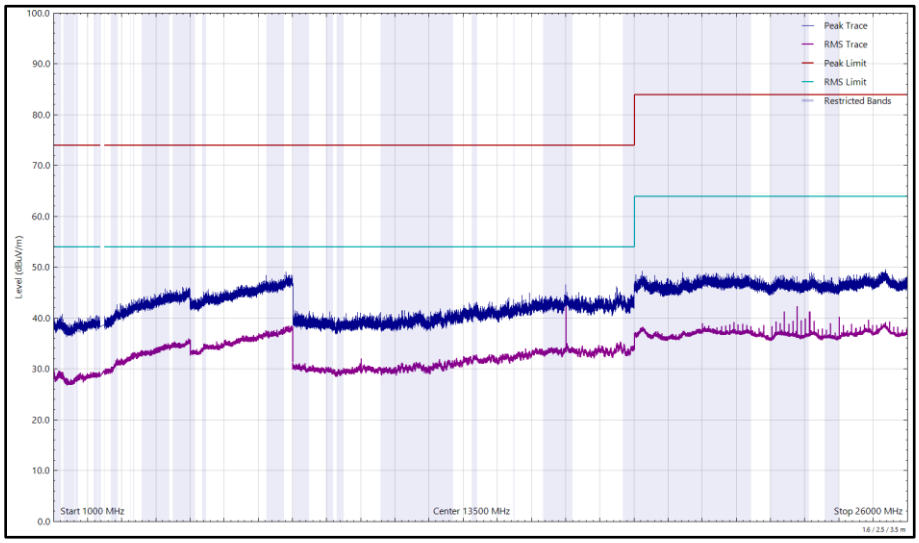

Figure 59 - 2412 MHz (CH1), 802.11b, Core 0, 1 GHz to 26 GHz, Vertical

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 54 - 2437 MHz (CH6), 802.11b, Core 0, 30 MHz to 26 GHz

*No emissions found within 10 dB of the limit.

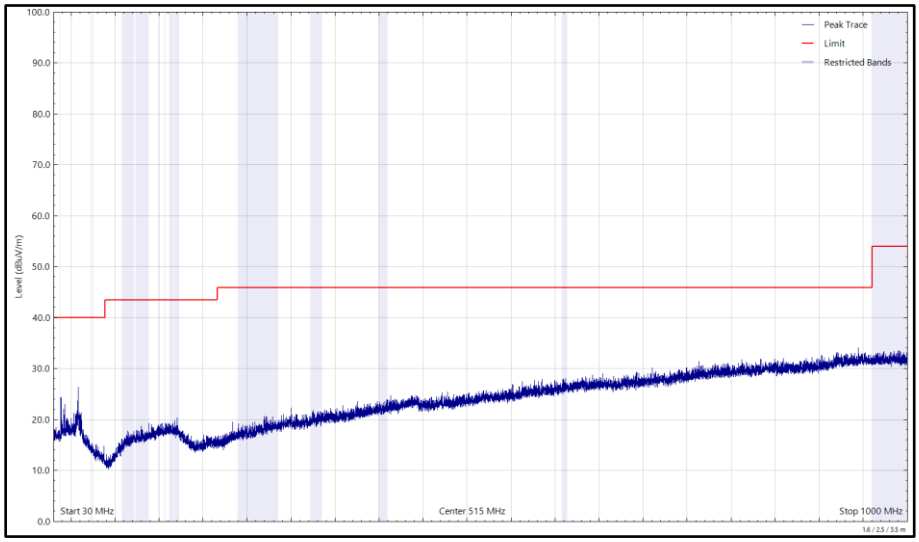

Figure 60 - 2437 MHz (CH6), 802.11b, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

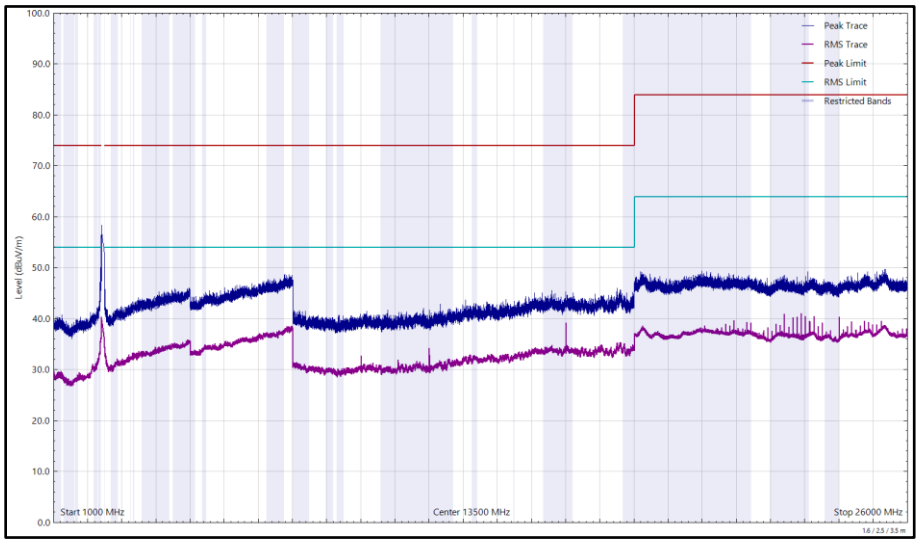

Figure 61 - 2437 MHz (CH6), 802.11b, Core 0, 1 GHz to 26 GHz, Horizontal