FCC and ISED Test Report

Apple Inc
Model: A3114

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

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FCC ID: BCGA3114 IC: 579C-A3114

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Document 75959606-08 Issue 02

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Steven White	Senior Technical Specialist	Authorised Signatory	03 January 2024

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	03 January 2024	

FCC Accreditation
553713/UK2026 Concorde Park, Fareham Test Laboratory

ISED Accreditation
28798 Concorde Park, 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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TUV SUD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuvsud.com/en

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

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	08-Nov-2023
2	Update to sections 1.2, 1.6, 2.1 & 2.4	03-Jan-2024

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
Model Number(s)	A3114
Serial Number(s)	D93J4WJ66Y, F913QPYWR6, FWT64GMGVG, D2PK6WMH20, W5YWRJQHX1 and H7CF7HR6C2
Hardware Version(s)	REV 1.0
Software Version(s)	23A32771a
Number of Samples Tested	6
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)
Start of Test	25-September-2023
Finish of Test	12-December-2023
Name of Engineer(s)	Akhil Rajendran Bhaskaran Nair, Colin Brain, Ian Hart, Ioan-Alexandru Bogatu, Jamal Imoro Abubakar, Jonas Ayipah, Thomas Randall, Jayvir Makwana, David Hill, Ahmed Al Derdiri, James Woods, Michael Evans, Morsalin Hossain, Tony Baby, Manohar Thota and Nicolae Mihailiuc
Related Document(s)	ANSI C63.10 (2013) ANSI C63.4 (2014) 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	3.3	8.10	Restricted Band Edges	Pass	ANSI C63.10 (2013)
2.2	15.247 (a)(2)	5.2	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2013)
2.3	15.247 (b)	5.4	6.12	Maximum Conducted Output Power	Pass	KDB 662911 D01 v02r01 ANSI C63.10 (2013)
2.4	15.247 (d)	5.5	-	Authorised Band Edges	Pass	ANSI C63.10 (2013)
2.5	15.209 and 15.247 (d)	3.3 and 5.5	6.13 and 8.9	Spurious Radiated Emissions	Pass	ANSI C63.10 (2013) ANSI C63.4 (2014)
2.6	15.247 (e)	5.2	6.12	Power Spectral Density	Pass	KDB 662911 D01 v02r01 ANSI C63.10 (2013)

Table 2

1.4 Product Information

1.4.1 Technical Description

The equipment under test (EUT) was a portable laptop computer.

1.4.2 Test Modes

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

The EUT uses different output powers per core dependent on the transmit mode and how many cores are used. It uses the same 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 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.

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 was 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. 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	5.86	0.7
Core 1	2400 to 2480	5.42	0.7

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: A3114, Serial Number: D93J4WJ66Y			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3114, Serial Number: D2PK6WMH20			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3114, Serial Number: W5YWRJQHX1			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3114, Serial Number: H7CF7HR6C2			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3114, Serial Number: FWT64GMGVG			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3114, Serial Number: F913QPYWR6			
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	Akhil Rajendran Bhaskaran Nair, Colin Brain, Ian Hart, Ioan-Alexandru Bogatu, Jamal Imoro Abubakar, Jonas Ayipah and Thomas Randall	UKAS
Emission Bandwidth	Jayvir Makwana	UKAS
Maximum Conducted Output Power	Jayvir Makwana	UKAS
Authorised Band Edges	Ahmed Al Derdiri, Colin Brain, Dale Hills, Ioan-Alexandru Bogatu, James Woods, Michael Evans, Morsalin Hossain and Tony Baby	UKAS
Spurious Radiated Emissions	Ahmed Al Derdiri, Dale Hills, Manohar Thota, Michael Evans, Nicolae Mihailiuc and Tony Baby	UKAS
Power Spectral Density	Jayvir Makwana and David Hill	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

A3114, S/N: D2PK6WMH20 - Modification State 0
A3114, S/N: W5YWRJQHX1 - Modification State 0
A3114, S/N: H7CF7HR6C2 - Modification State 0

2.1.3 Date of Test

06-December-2023 to 12-December-2023

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	20.6 – 23.6
Relative Humidity	39.8 – 47.7

2.1.6 Test Results

2.4GHz WLAN

Core 0 (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	58.61	48.90
802.11g	12 Mbps	-	-	2412	2390	65.63	51.13
802.11n HT20	MCS2	-	-	2412	2390	65.33	51.14
802.11ax HE20	MCS9x1	SU	-	2412	2390	66.36	51.43
802.11ax HE20	MCS9x1	106	53	2412	2390	65.80	49.62
802.11b	1 Mbps	-	-	2462	2483.5	55.95	44.21
802.11b	1 Mbps	-	-	2467	2483.5	60.28	50.94
802.11b	1 Mbps	-	-	2472	2483.5	58.52	51.47
802.11g	54 Mbps	-	-	2462	2483.5	65.75	51.17
802.11g	12 Mbps	-	-	2467	2483.5	63.99	51.36
802.11g	54 Mbps	-	-	2472	2483.5	58.56	44.55
802.11n HT20	MCS7	-	-	2462	2483.5	66.63	51.13
802.11n HT20	MCS4	-	-	2467	2483.5	65.20	51.37
802.11n HT20	MCS4	-	-	2472	2483.5	58.84	44.90
802.11ax HE20	MCS4x1	SU	-	2462	2483.5	66.40	51.06
802.11ax HE20	MCS9x1	106	54	2462	2483.5	62.45	46.72
802.11ax HE20	MCS2x1	SU	-	2467	2483.5	62.33	51.15
802.11ax HE20	MCS9x1	106	54	2467	2483.5	64.73	49.42
802.11ax HE20	MCS2x1	SU	-	2472	2483.5	56.65	43.28
802.11ax HE20	MCS9x1	26	8	2472	2483.5	68.16	47.32

Table 6 - SISO Restricted Band Edge Results

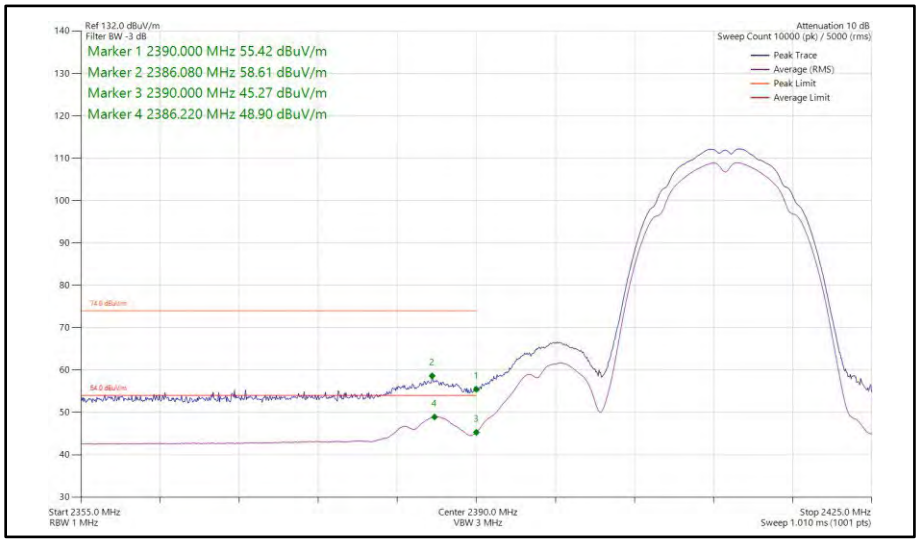

Figure 1- 802.11b, SISO, Core 0 - 2412 MHz Band Edge Frequency 2390 MHz

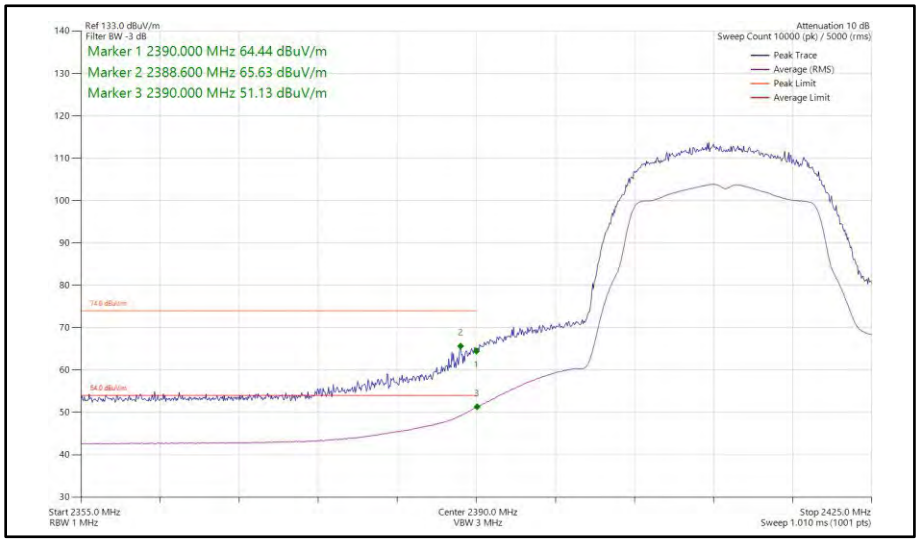

Figure 2 - 802.11g, SISO, Core 0 - 2412 MHz Band Edge Frequency 2390 MHz

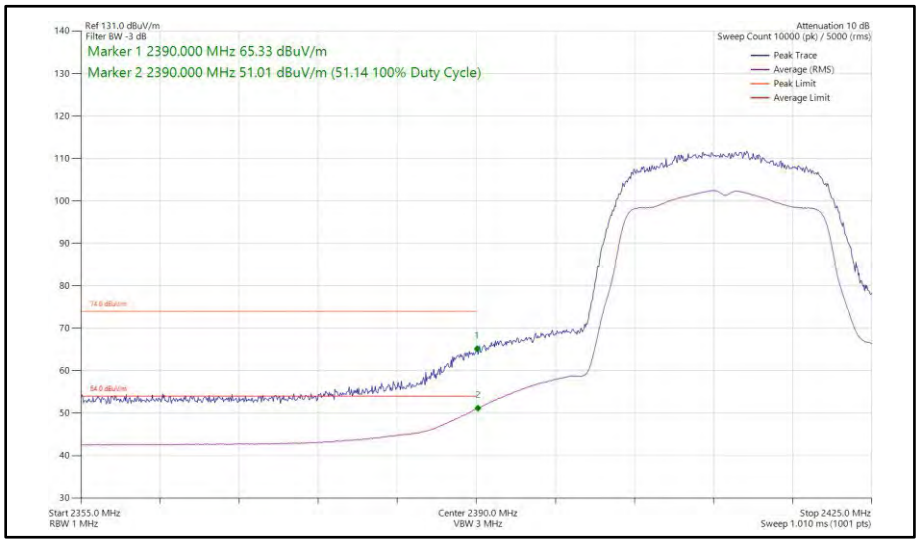

Figure 3- 802.11n HT20, SISO, Core 0 - 2412 MHz Band Edge Frequency 2390 MHz

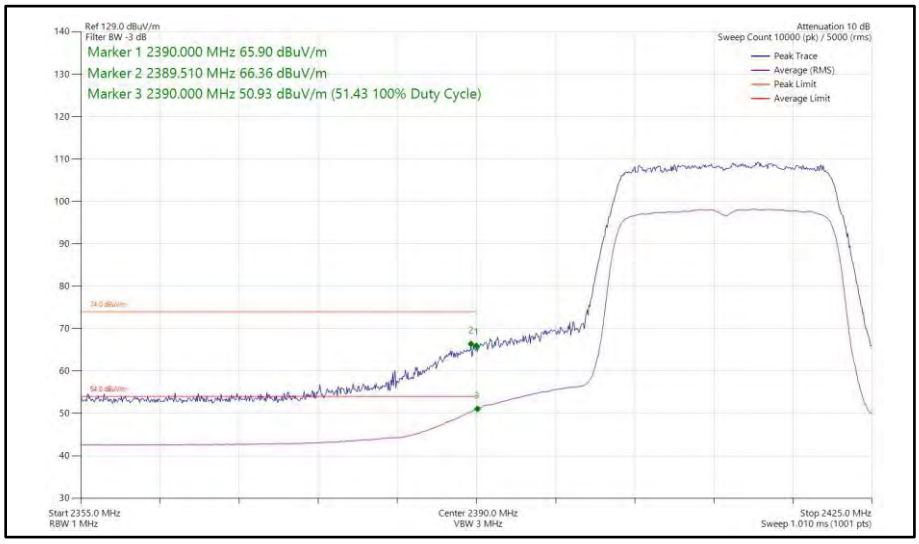

Figure 4 - 802.11ax HE20, SU, SISO, Core 0 - 2412 MHz Band Edge Frequency 2390 MHz

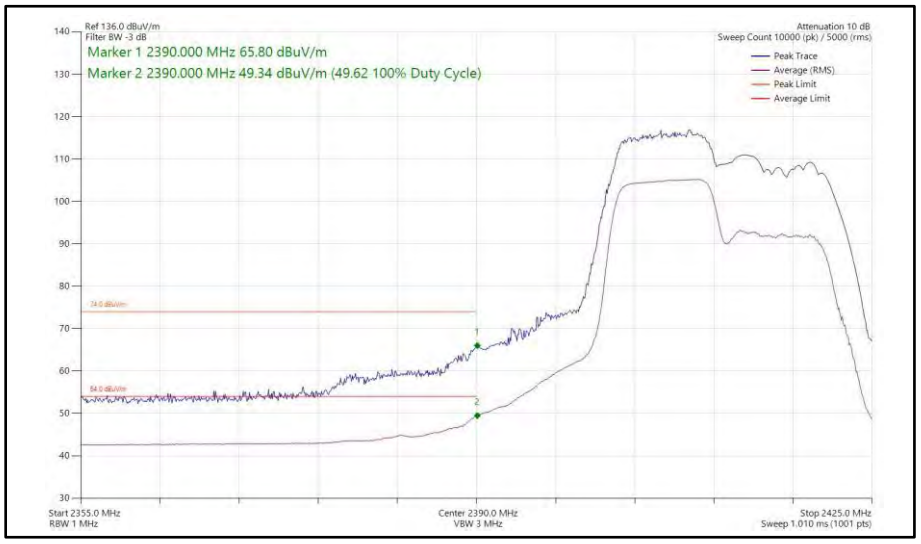

Figure 5 - 802.11ax HE20, RU 106-53, SISO, Core 0 - 2412 MHz Band Edge Frequency 2390 MHz

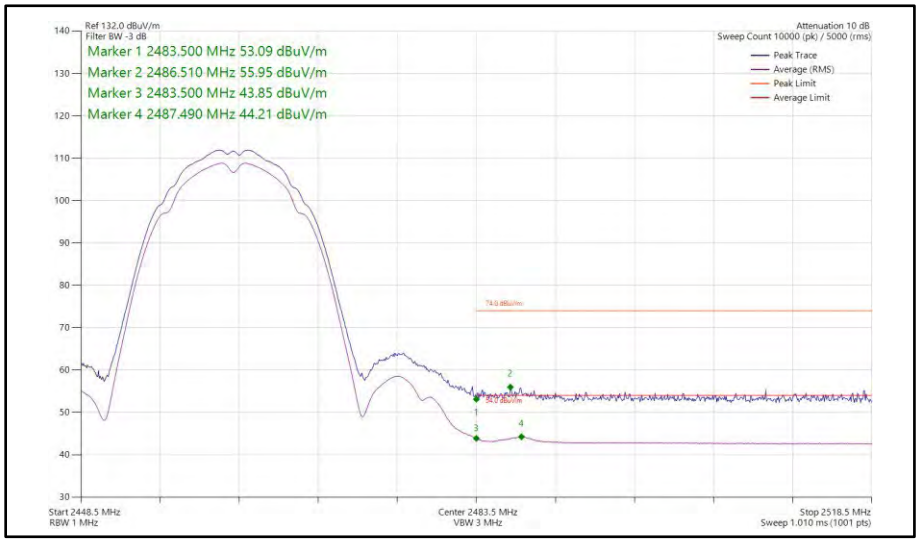

Figure 6 - 802.11b, SISO, Core 0 - 2462 MHz Band Edge Frequency 2483.5 MHz

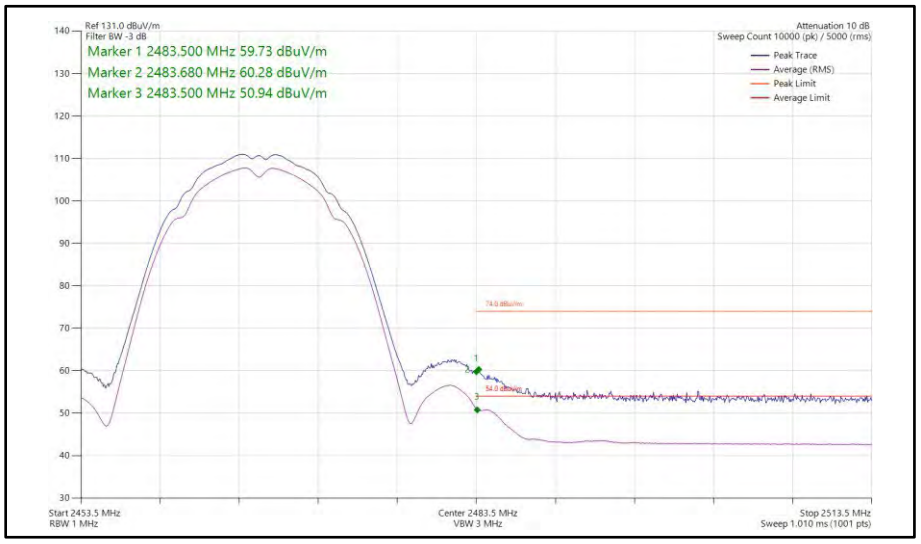

Figure 7- 802.11b, SISO, Core 0 - 2467 MHz Band Edge Frequency 2483.5 MHz

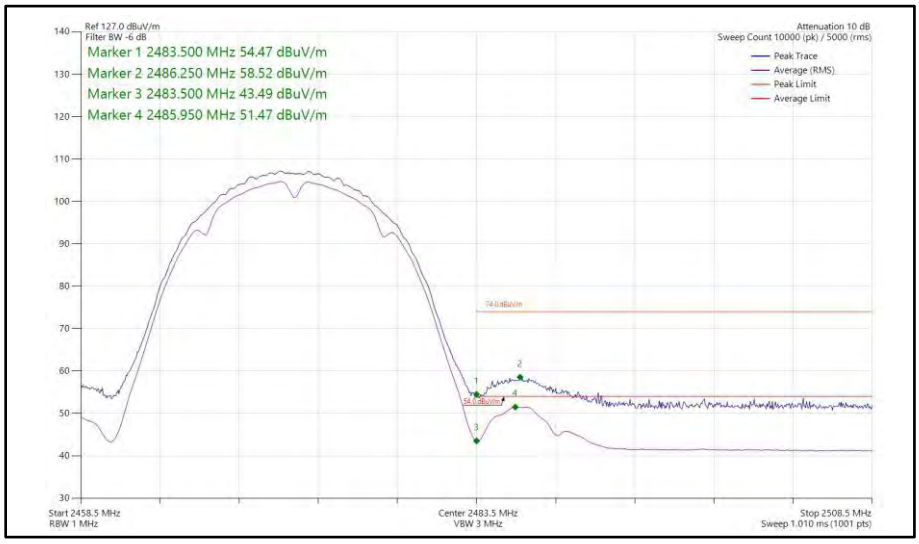

Figure 8- 802.11b, SISO, Core 0 - 2472 MHz Band Edge Frequency 2483.5 MHz

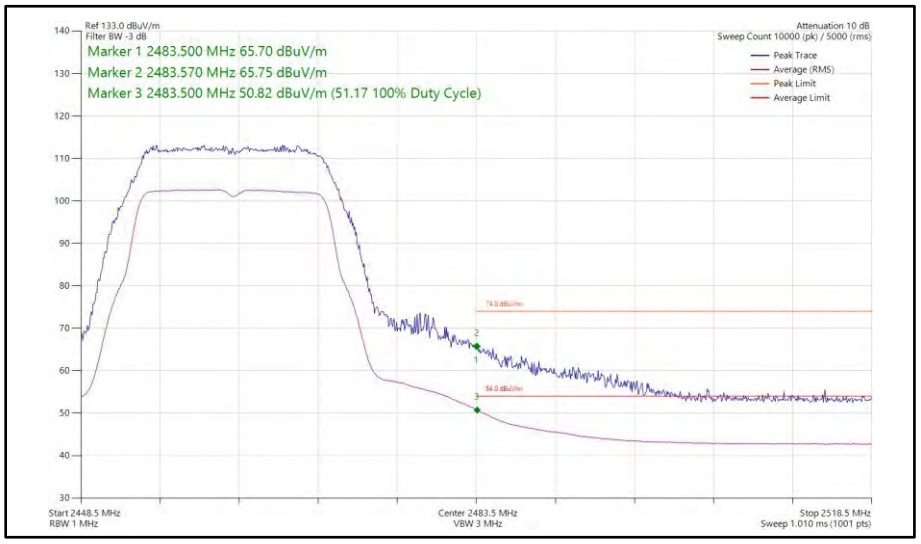

Figure 9- 802.11g, SISO, Core 0 - 2462 MHz Band Edge Frequency 2483.5 MHz

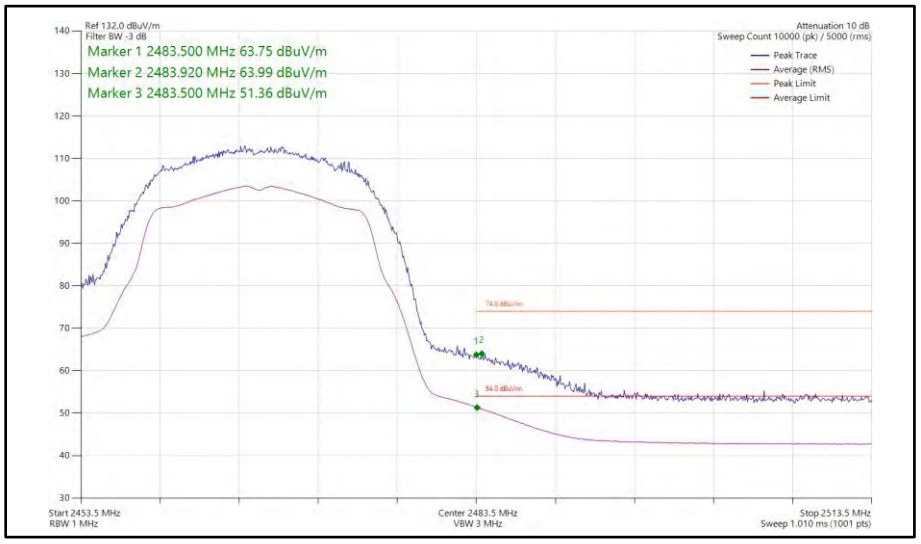

Figure 10- 802.11g, SISO, Core 0 - 2467 MHz Band Edge Frequency 2483.5 MHz

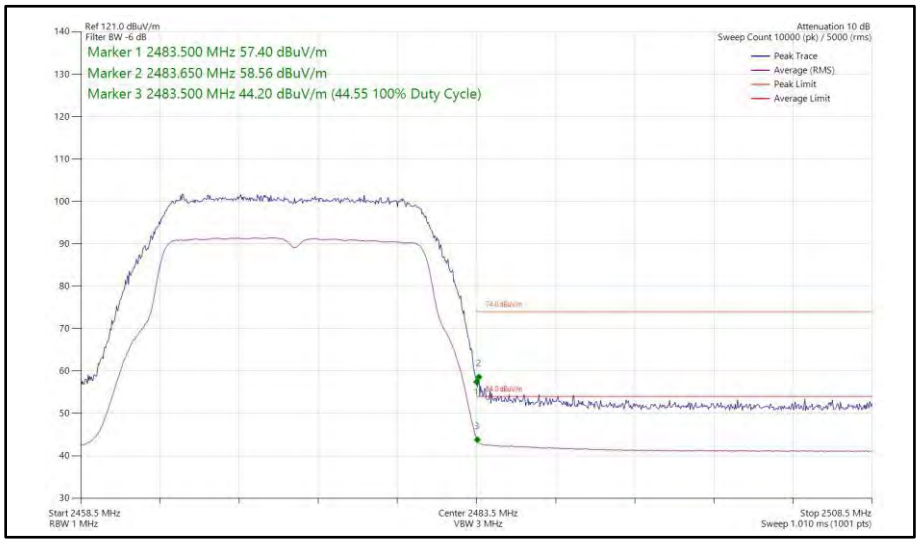

Figure 11- 802.11g, SISO, Core 0 - 2472 MHz Band Edge Frequency 2483.5 MHz

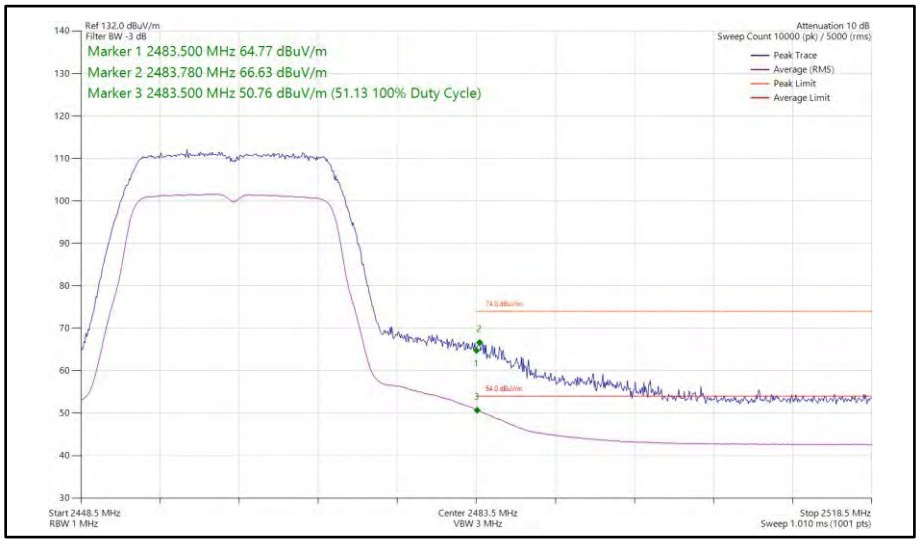

Figure 12- 802.11n HT20, SISO, Core 0 - 2462 MHz Band Edge Frequency 2483.5 MHz

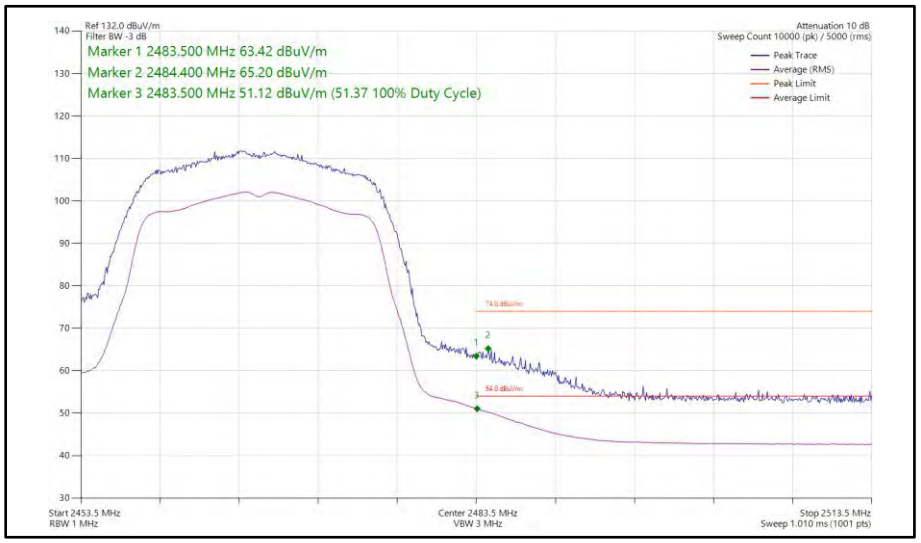

Figure 13- 802.11n HT20, SISO, Core 0 - 2467 MHz Band Edge Frequency 2483.5 MHz

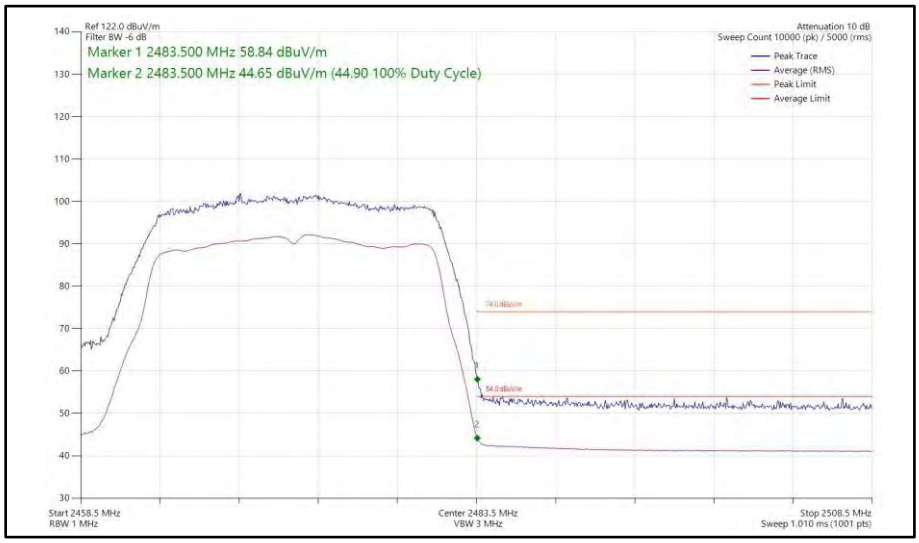

Figure 14- 802.11n HT20, SISO, Core 0 - 2472 MHz Band Edge Frequency 2483.5 MHz

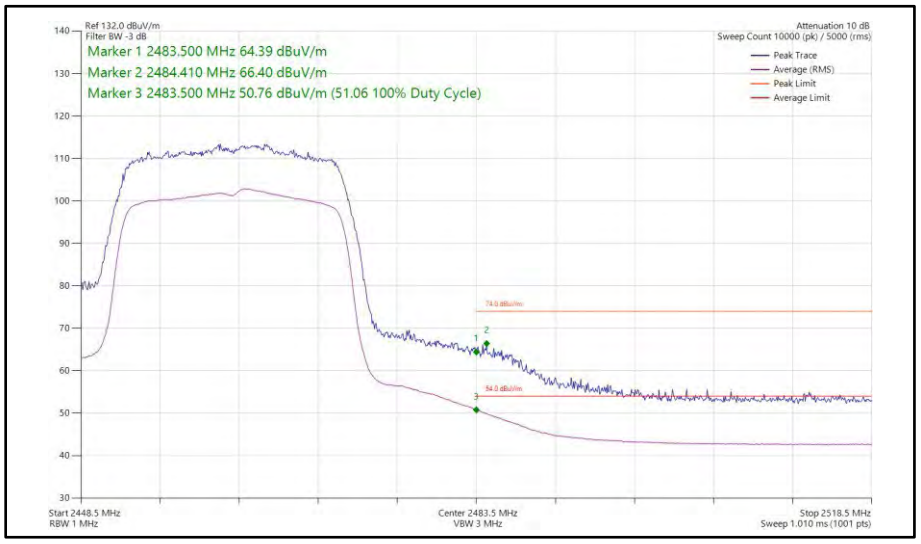

Figure 15- 802.11ax HE20, SU, SISO, Core 0 - 2462 MHz Band Edge Frequency 2483.5 MHz

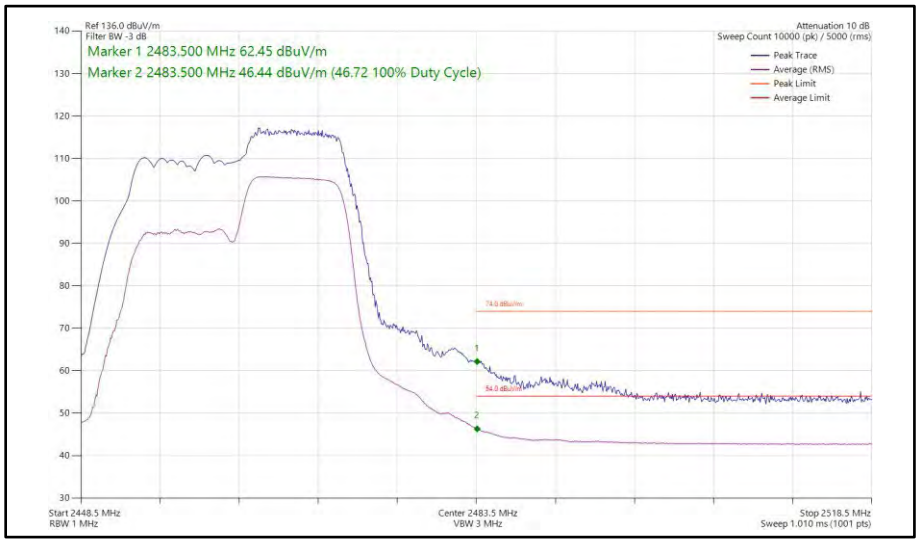

Figure 16- 802.11ax HE20, RU 106-54, SISO, Core 0 - 2462 MHz Band Edge Frequency 2483.5 MHz

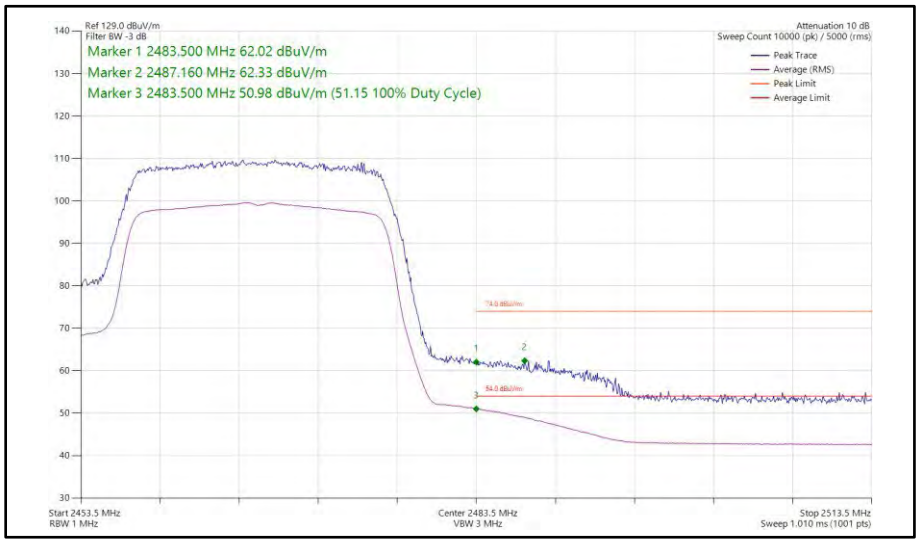

Figure 17- 802.11ax HE20, SU, SISO, Core 0 - 2467 MHz Band Edge Frequency 2483.5 MHz

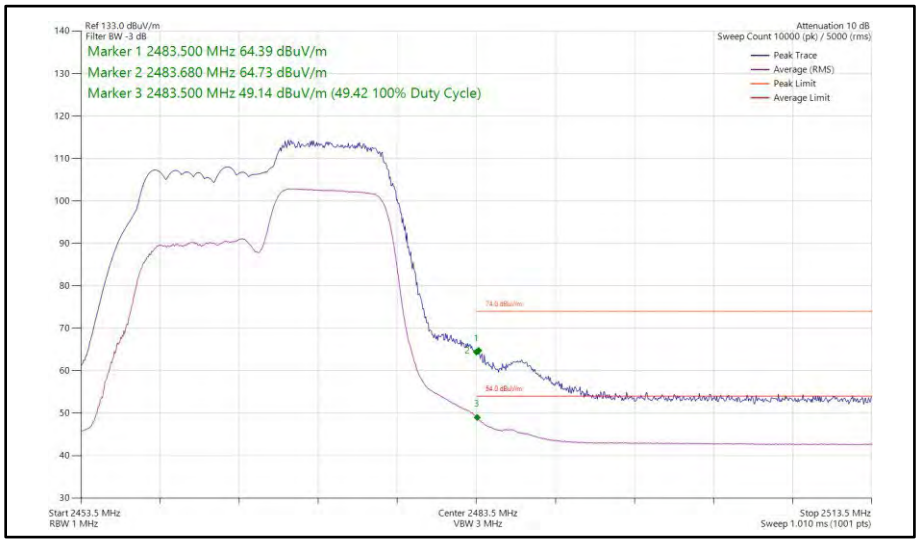

Figure 18- 802.11ax HE20, RU 106-54, SISO, Core 0 - 2467 MHz Band Edge Frequency 2483.5 MHz

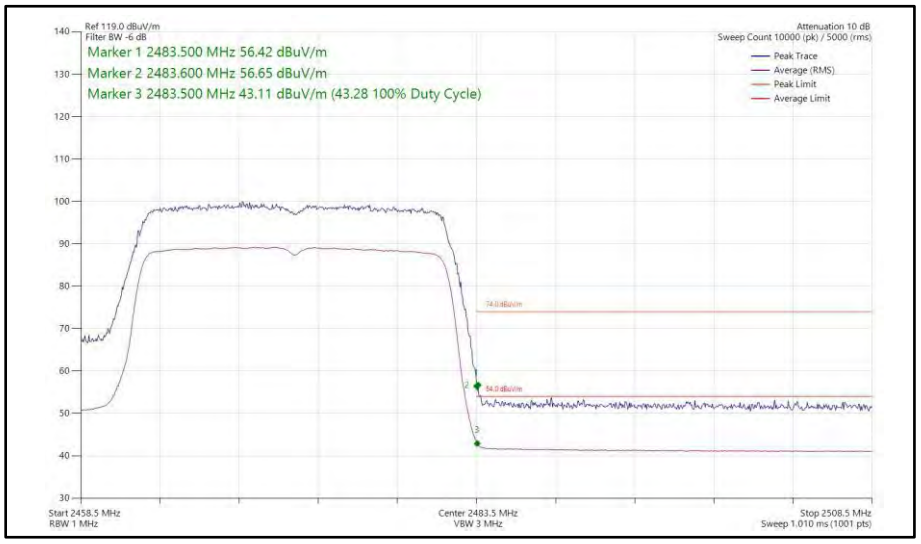

Figure 19- 802.11ax HE20, SU, SISO, Core 0 - 2472 MHz Band Edge Frequency 2483.5 MHz

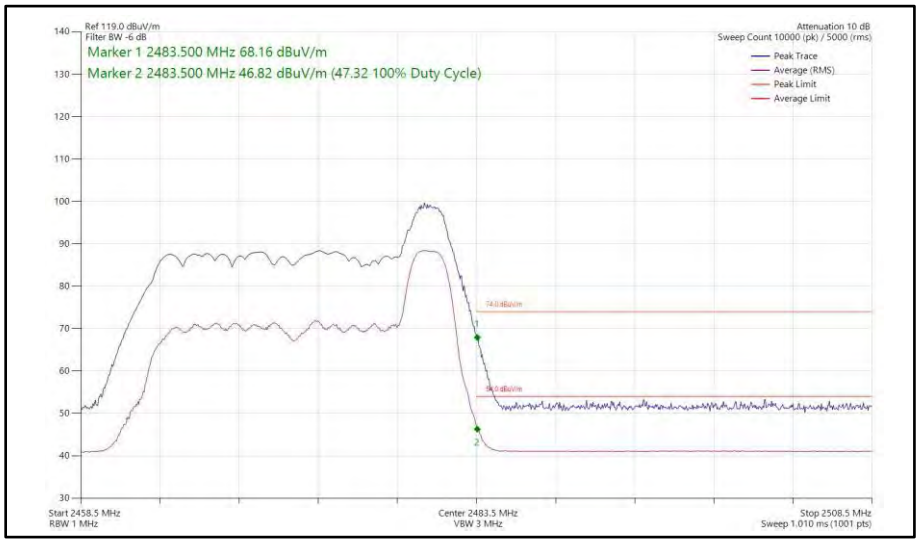

Figure 20- 802.11ax HE20, RU 26-8, SISO, Core 0 - 2472 MHz Band Edge Frequency 2483.5 MHz

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	57.04	46.72
802.11g	12 Mbps	-	-	2412	2390	64.10	49.69
802.11n HT20	MCS4	-	-	2412	2390	64.21	49.68
802.11ax HE20	MCS4x1	SU	-	2412	2390	64.45	49.64
802.11ax HE20	MCS9x1	106	53	2412	2390	63.82	47.73
802.11b	1 Mbps	-	-	2462	2483.5	56.11	44.16
802.11b	1 Mbps	-	-	2467	2483.5	59.32	50.64
802.11b	1 Mbps	-	-	2472	2483.5	58.28	51.09
802.11g	54 Mbps	-	-	2462	2483.5	64.98	50.57
802.11g	24 Mbps	-	-	2467	2483.5	64.70	51.50
802.11g	54 Mbps	-	-	2472	2483.5	58.74	44.69
802.11n HT20	MCS7	-	-	2462	2483.5	66.75	50.98
802.11n HT20	MCS7	-	-	2467	2483.5	64.94	51.27
802.11n HT20	MCS2	-	-	2472	2483.5	58.01	45.15
802.11ax HE20	MCS9x1	SU	-	2462	2483.5	64.91	50.87
802.11ax HE20	MCS9x1	106	54	2462	2483.5	61.55	46.08
802.11ax HE20	MCS4x1	SU	-	2467	2483.5	63.65	51.07
802.11ax HE20	MCS9x1	106	54	2467	2483.5	63.00	48.50
802.11ax HE20	MCS2x1	SU	-	2472	2483.5	57.79	43.21
802.11ax HE20	MCS9x1	52	40	2472	2483.5	68.63	47.92

Table 7 - SISO Restricted Band Edge Results

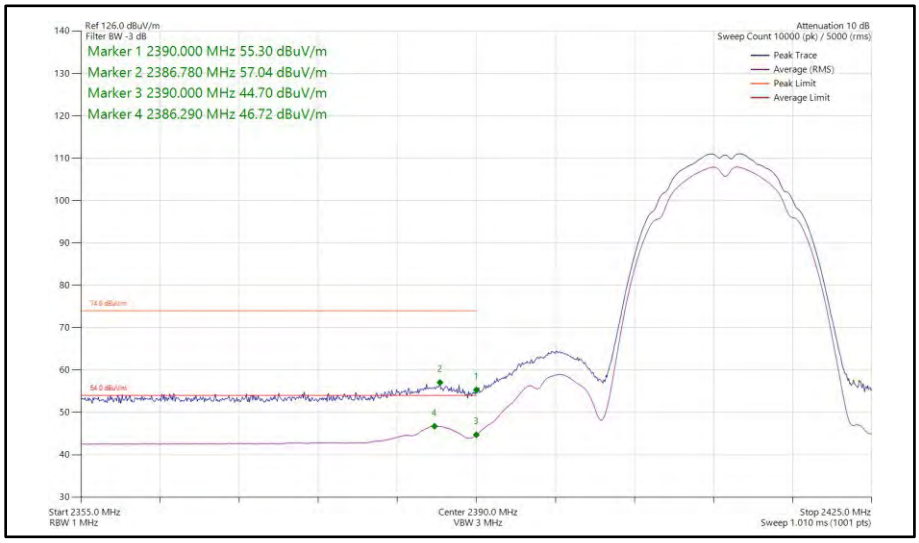

Figure 21- 802.11b, SISO, Core 1 - 2412 MHz Band Edge Frequency 2390 MHz

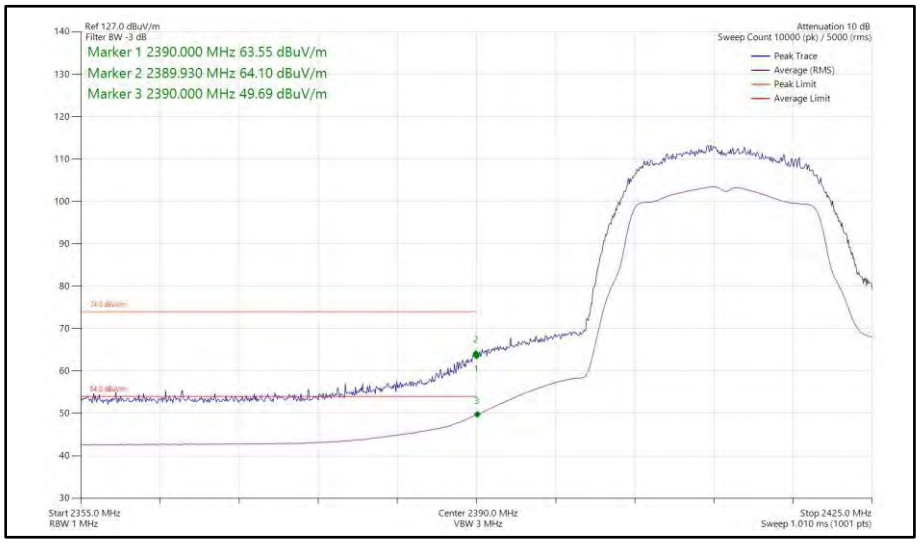

Figure 22- 802.11g, SISO, Core 1 - 2412 MHz Band Edge Frequency 2390 MHz

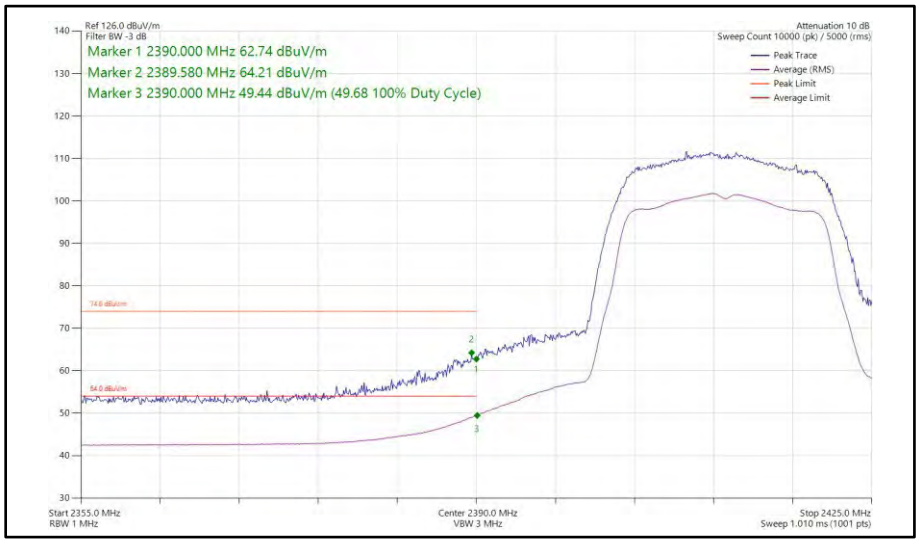

Figure 23- 802.11n HT20, SISO, Core 1 - 2412 MHz Band Edge Frequency 2390 MHz

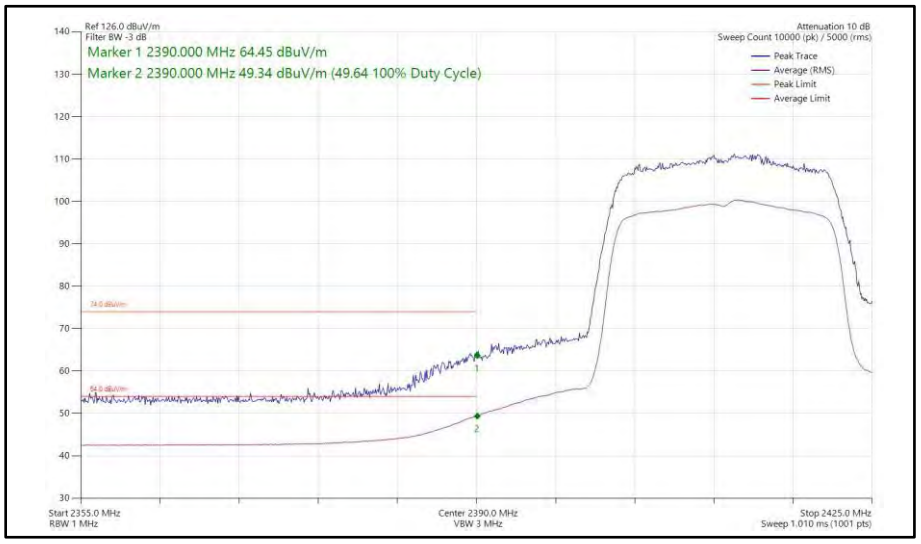

Figure 24- 802.11ax HE20, SU, SISO, Core 1 - 2412 MHz Band Edge Frequency 2390 MHz

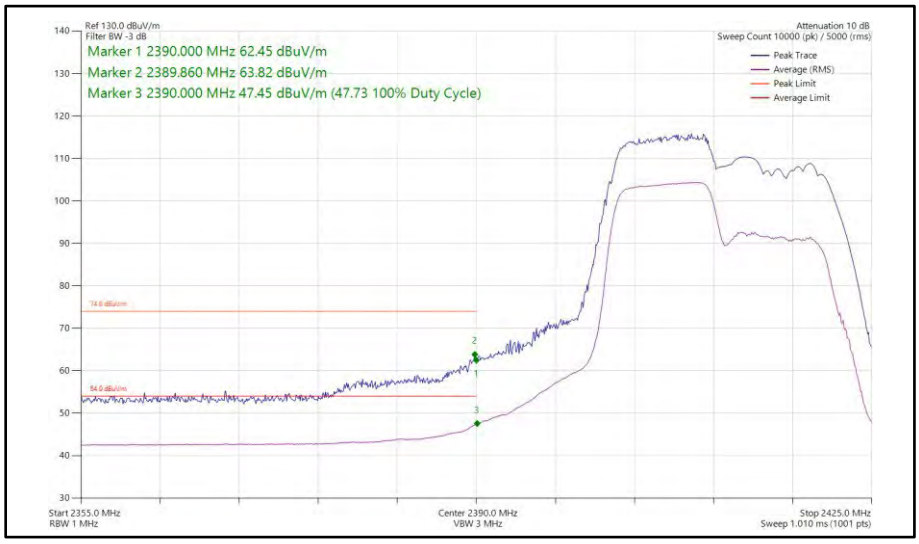

Figure 25 - 802.11ax HE20, RU 106-53, SISO, Core 1 - 2412 MHz Band Edge Frequency 2390 MHz

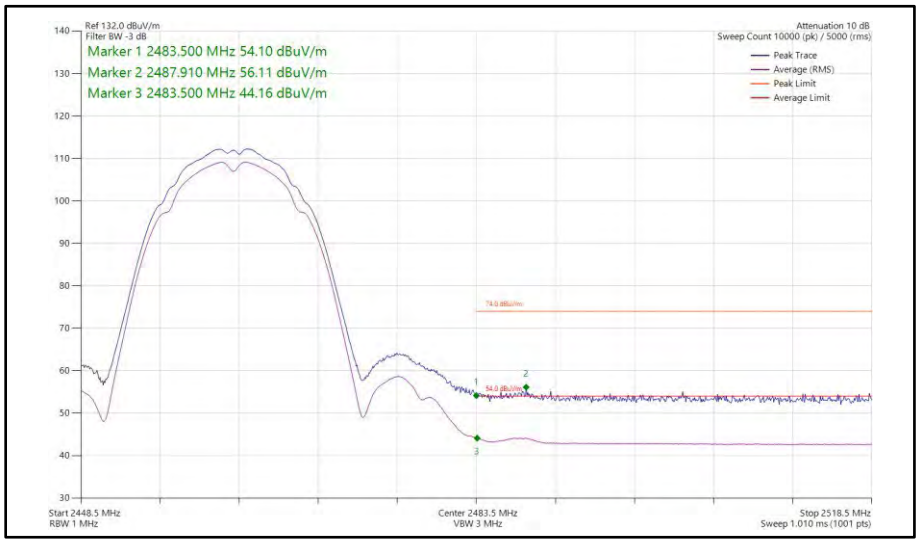

Figure 26 - 802.11b, SISO, Core 1 - 2462 MHz Band Edge Frequency 2483.5 MHz

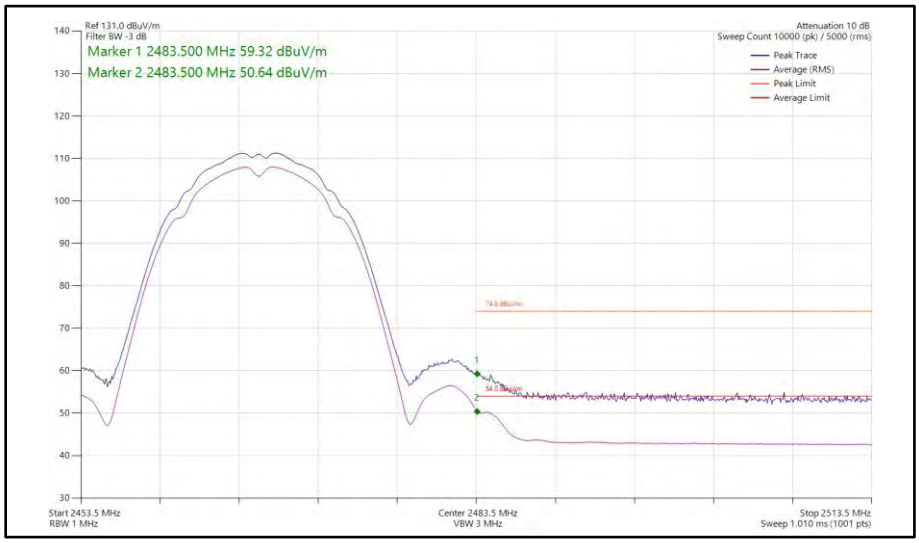

Figure 27 - 802.11b, SISO, Core 1 - 2467 MHz Band Edge Frequency 2483.5 MHz

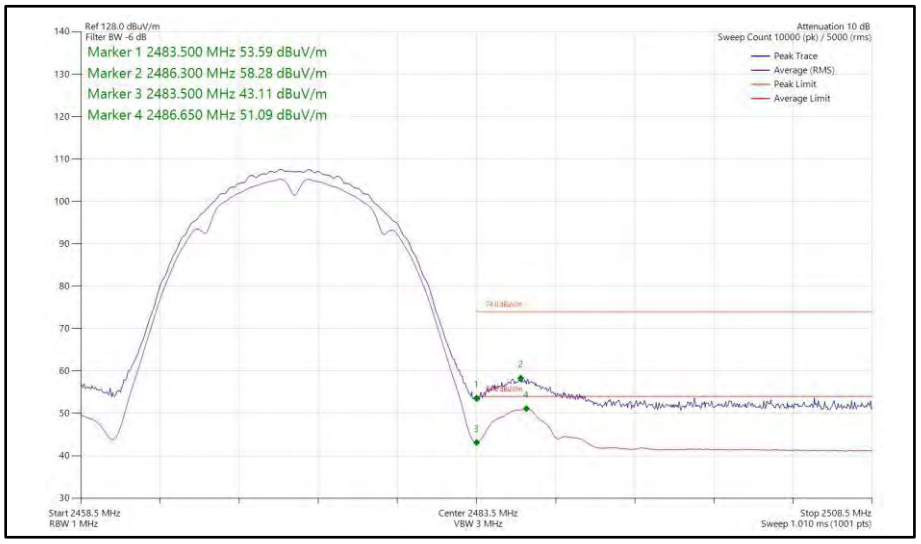

Figure 28 - 802.11b, SISO, Core 1 - 2472 MHz Band Edge Frequency 2483.5 MHz

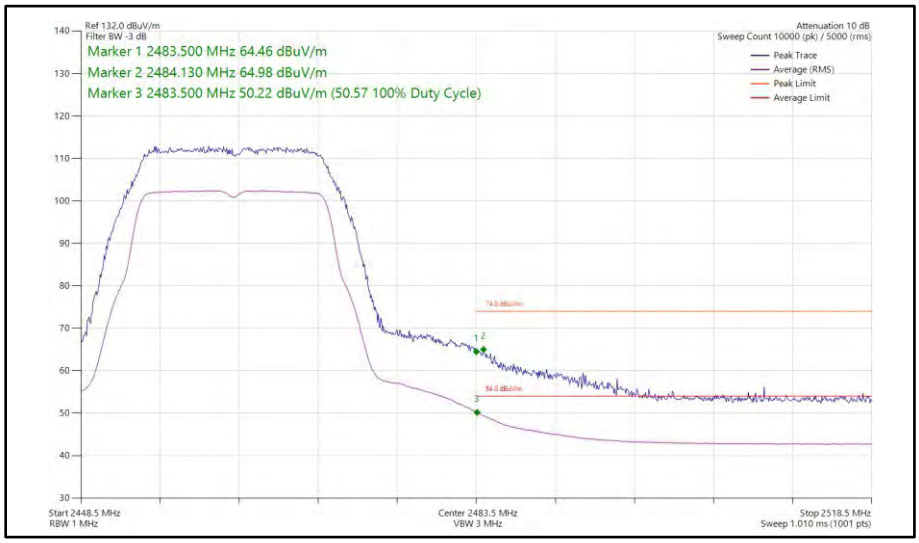

Figure 29 - 802.11g, SISO, Core 1 - 2462 MHz Band Edge Frequency 2483.5 MHz

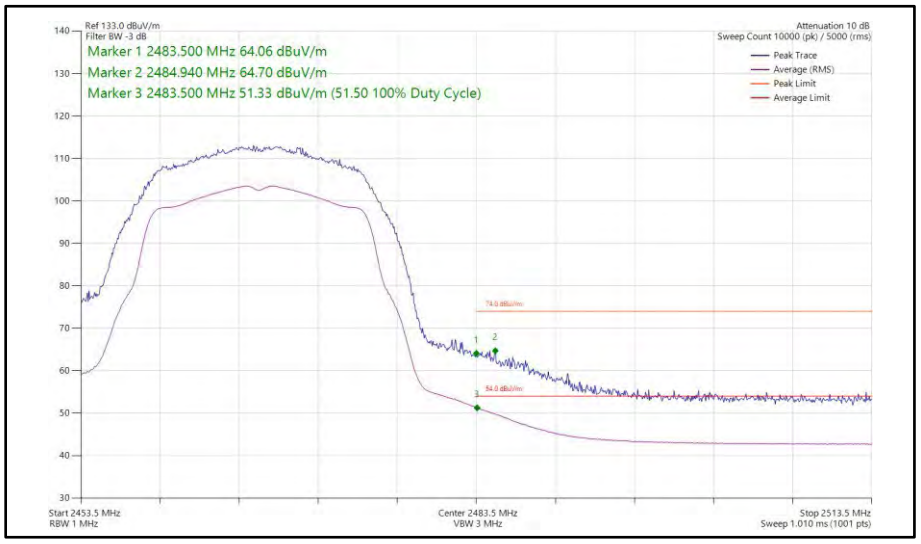

Figure 30 - 802.11g, SISO, Core 1 - 2467 MHz Band Edge Frequency 2483.5 MHz

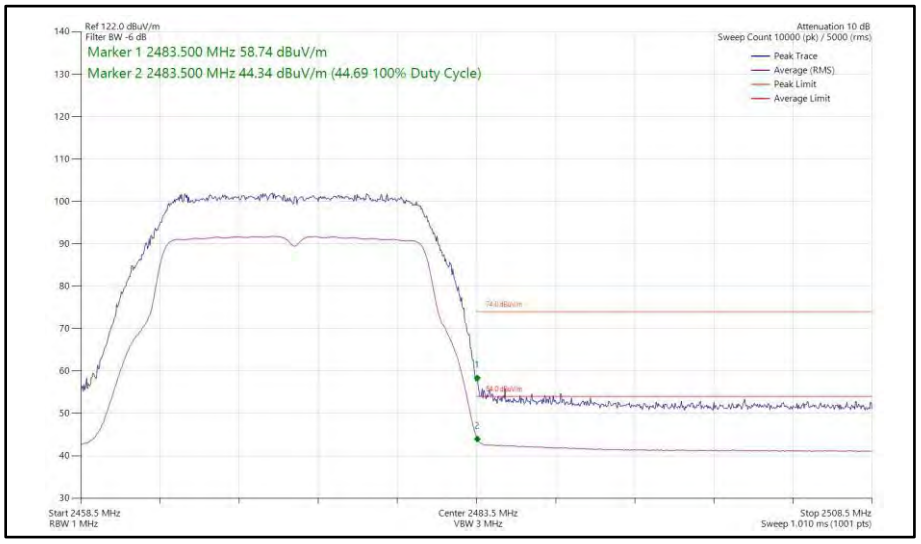

Figure 31 - 802.11g, SISO, Core 1 - 2472 MHz Band Edge Frequency 2483.5 MHz

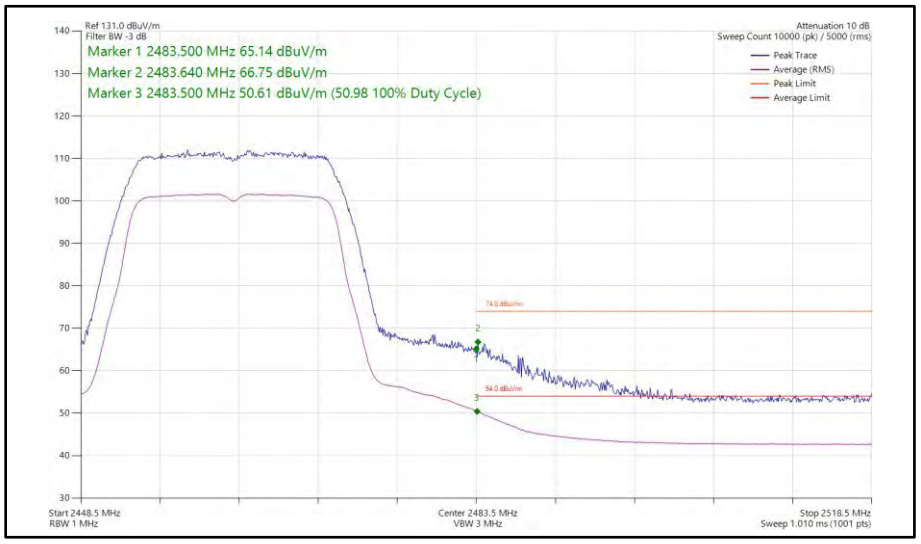

Figure 32 - 802.11n HT20, SISO, Core 1 - 2462 MHz Band Edge Frequency 2483.5 MHz

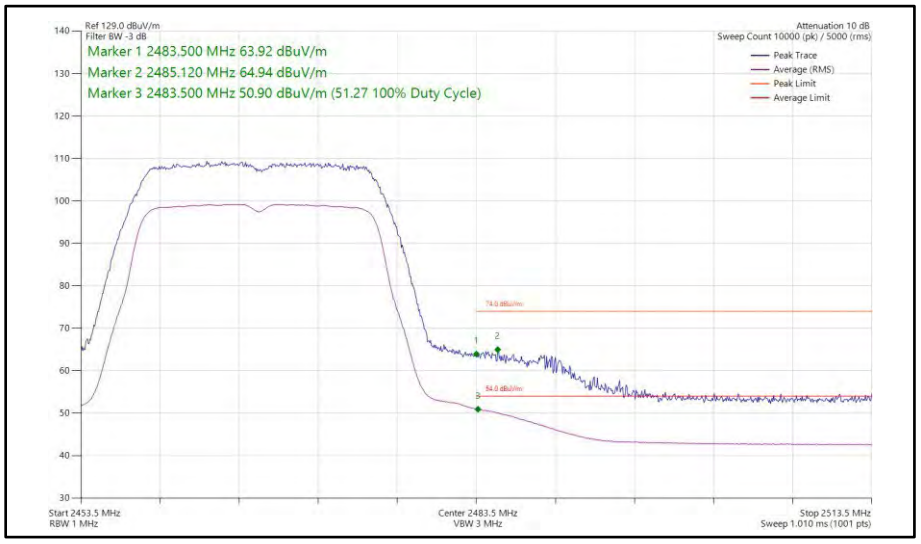

Figure 33- 802.11n HT20, SISO, Core 1 - 2467 MHz Band Edge Frequency 2483.5 MHz

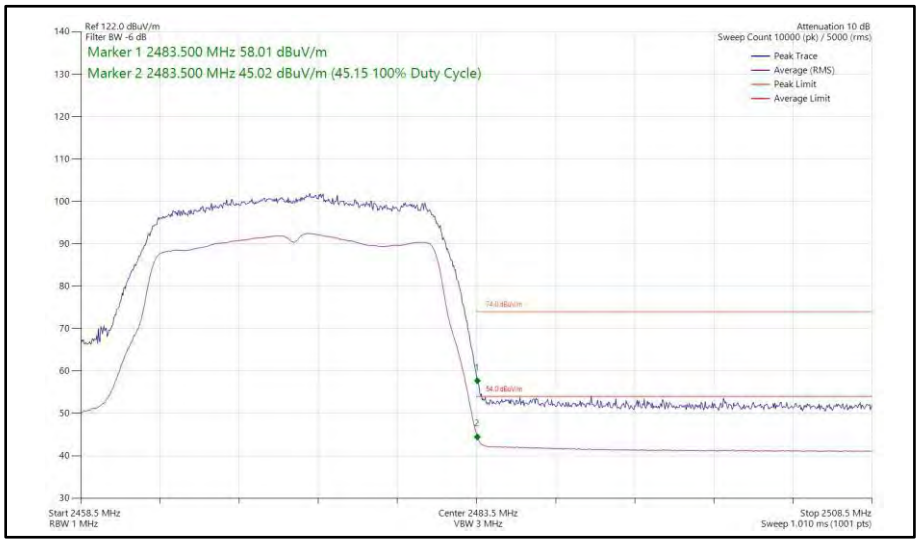

Figure 34 - 802.11n HT20, SISO, Core 1 - 2472 MHz Band Edge Frequency 2483.5 MHz

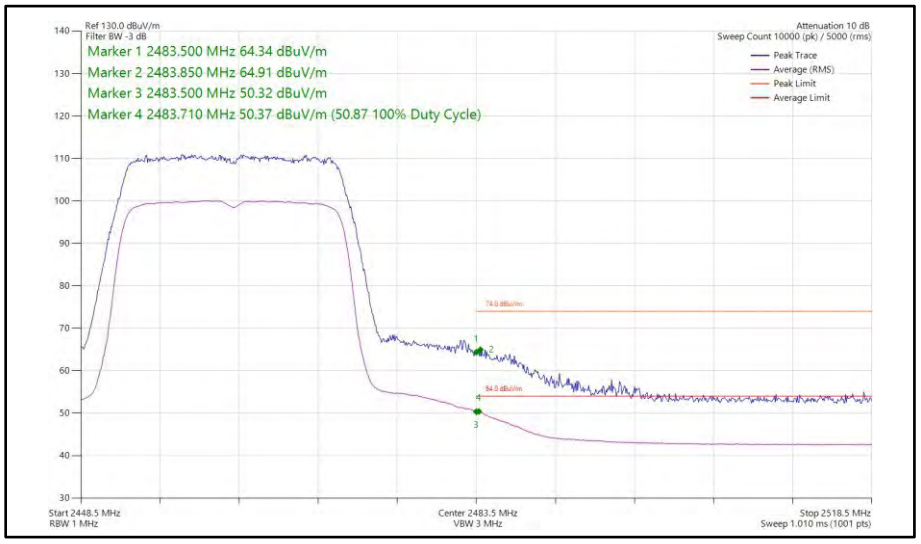

Figure 35 - 802.11ax HE20, SU, SISO, Core 1 - 2462 MHz Band Edge Frequency 2483.5 MHz

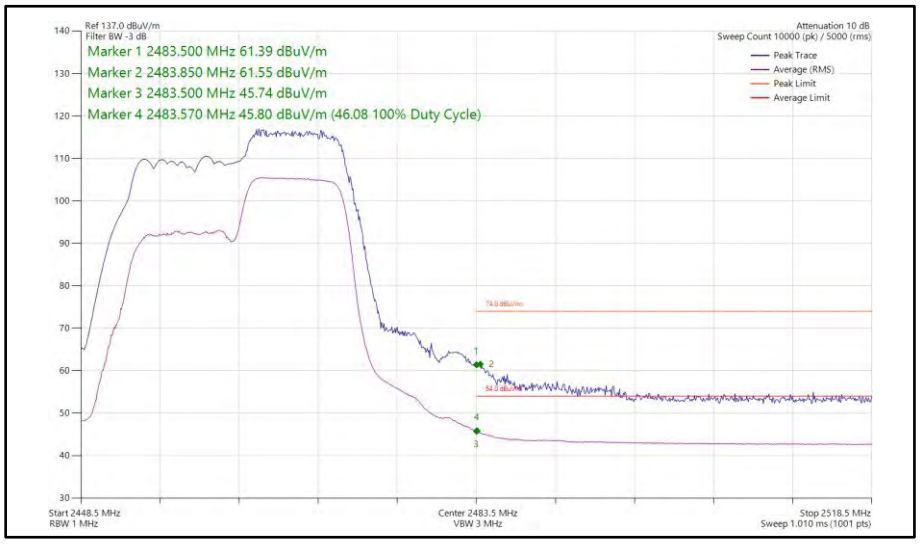

Figure 36 - 802.11ax HE20, RU 106-54, SISO, Core 1 - 2462 MHz Band Edge Frequency 2483.5 MHz

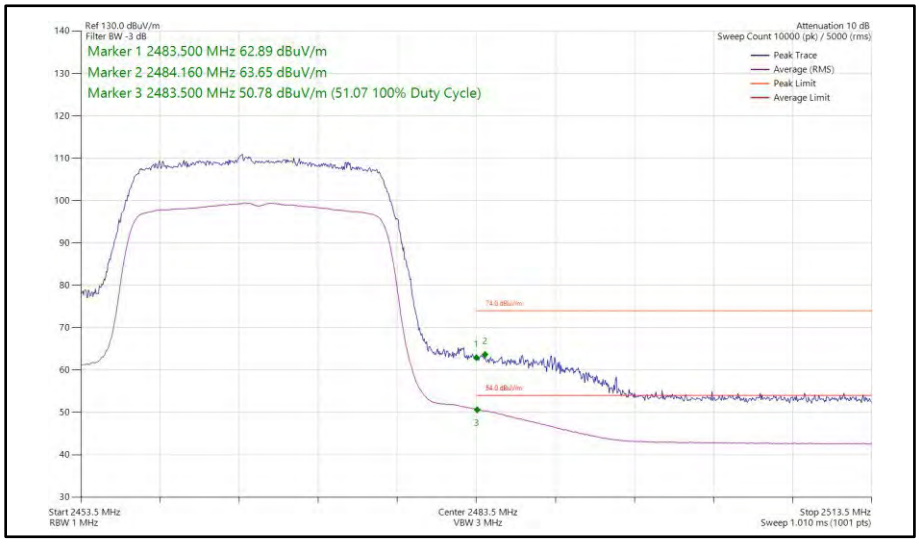

Figure 37 - 802.11ax HE20, SU, SISO, Core 1 - 2467 MHz Band Edge Frequency 2483.5 MHz

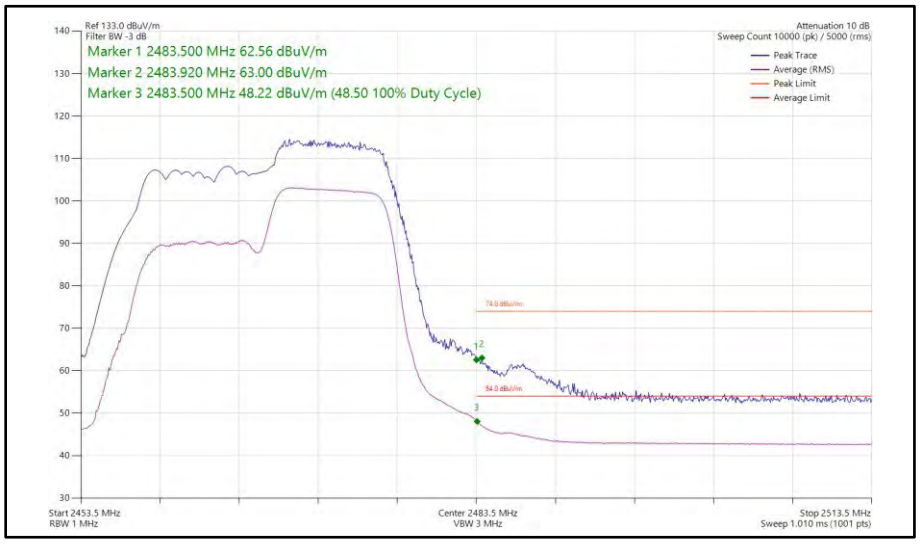

Figure 38 - 802.11ax HE20, RU 106-54, SISO, Core 1 - 2467 MHz Band Edge Frequency 2483.5 MHz

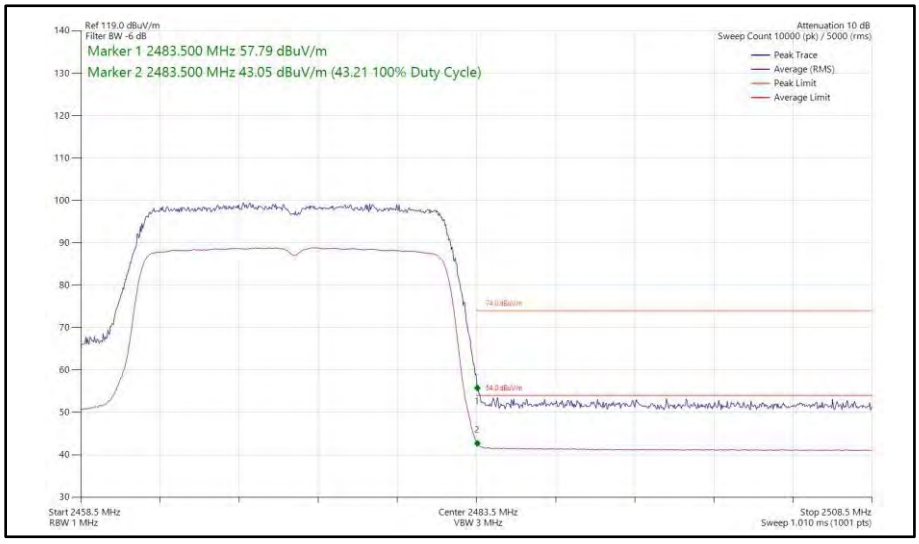

Figure 39 - 802.11ax HE20, SU, SISO, Core 1 - 2472 MHz Band Edge Frequency 2483.5 MHz

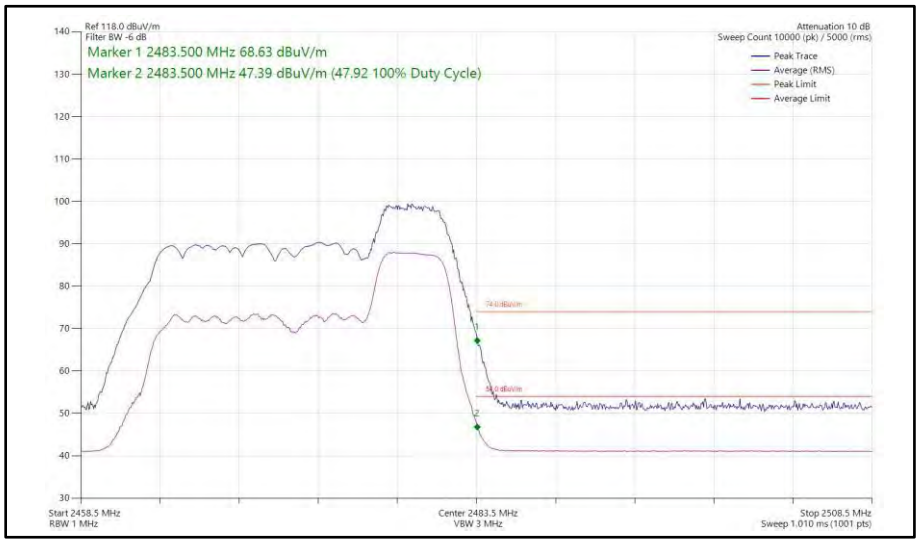

Figure 40 - 802.11ax HE20, RU 52-40, SISO, Core 1 - 2472 MHz Band Edge Frequency 2483.5 MHz

Core 0-1

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	MCS4	-	-	2412	2390	64.48	49.84
802.11ax HE20	MCS9x1	SU	-	2412	2390	67.10	50.60
802.11ax HE20	MCS9x1	106	54	2412	2390	69.42	50.60
802.11n HT20	MCS4	-	-	2462	2483.5	66.46	51.42
802.11n HT20	MCS7	-	-	2467	2483.5	66.17	51.47
802.11n HT20	MCS4	-	-	2472	2483.5	58.05	44.77
802.11ax HE20	MCS9x1	SU	-	2462	2483.5	65.22	51.26
802.11ax HE20	MCS9x1	106	54	2462	2483.5	64.67	49.05
802.11ax HE20	MCS4x1	SU	-	2467	2483.5	64.16	51.19
802.11ax HE20	MCS9x1	52	40	2467	2483.5	69.44	51.32
802.11ax HE20	MCS9x1	SU	-	2472	2483.5	61.81	43.30
802.11ax HE20	MCS9x1	26	8	2472	2483.5	69.42	49.47

Table 8 - CDD Restricted Band Edge Results

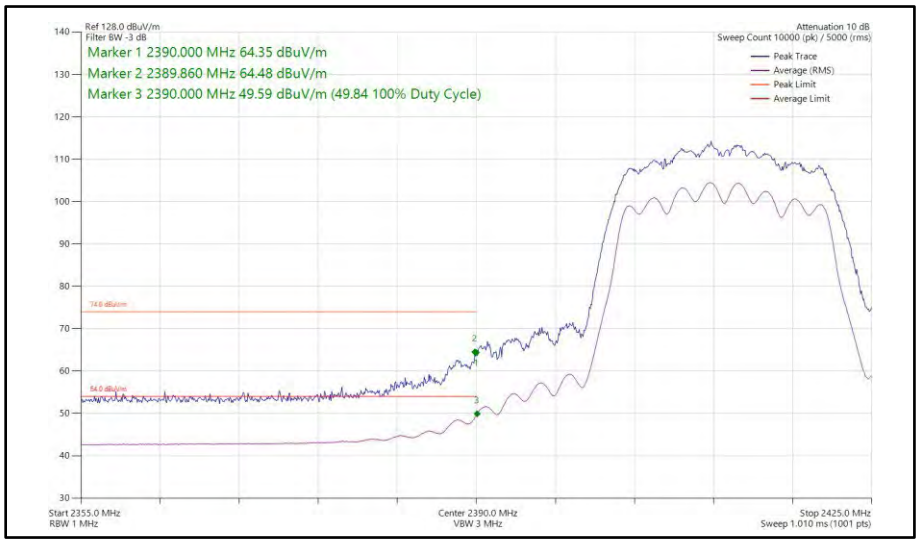

Figure 41 - 802.11n HT20, CDD, Core 0-1 - 2412 MHz Band Edge Frequency 2390 MHz

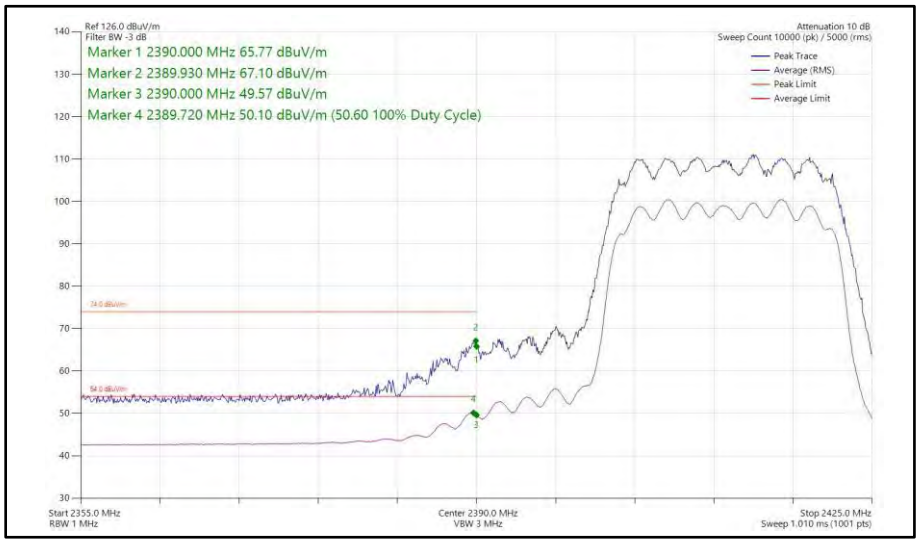

Figure 42 - 802.11ax HE20, SU, CDD, Core 0-1 - 2412 MHz Band Edge Frequency 2390 MHz

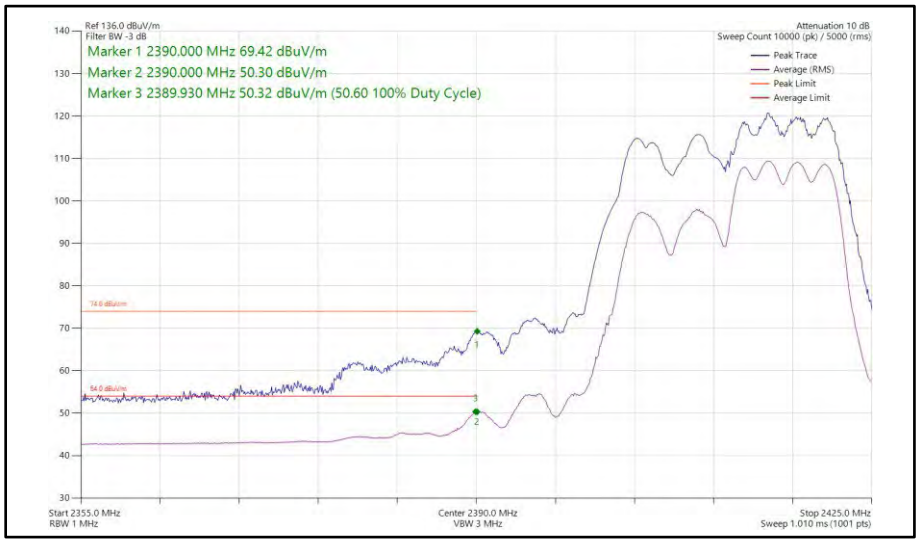

Figure 43 - 802.11ax HE20, RU 106-54, CDD, Core 0-1 - 2412 MHz Band Edge Frequency 2390 MHz

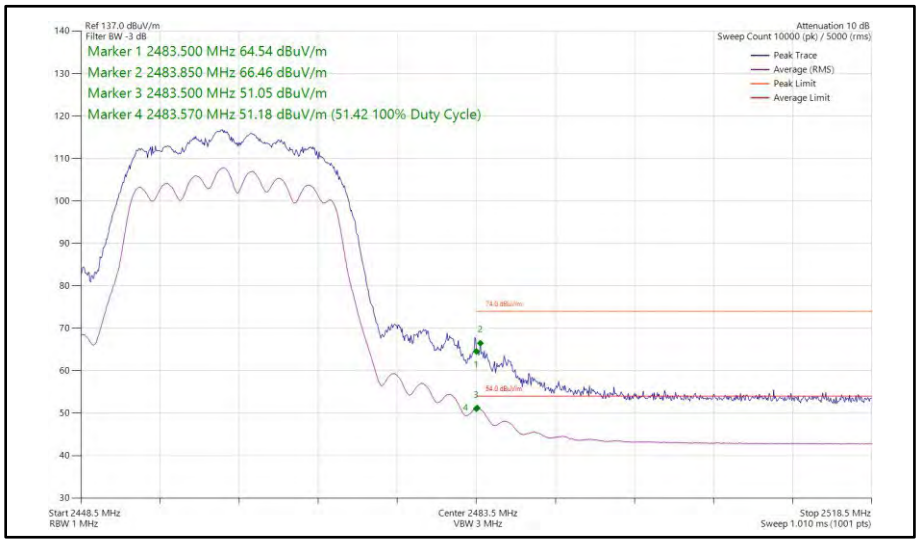

Figure 44 - 802.11n HT20, CDD, Core 0-1 - 2462 MHz Band Edge Frequency 2483.5 MHz

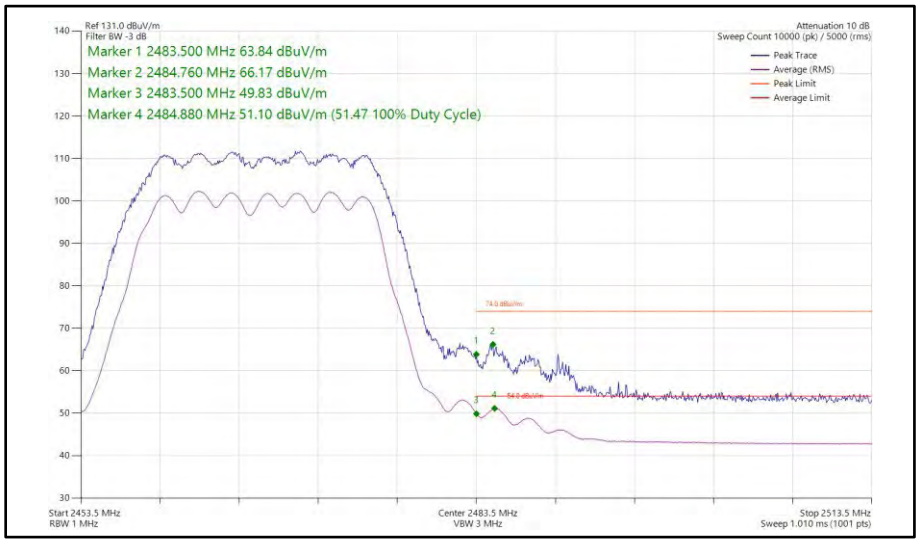

Figure 45 - 802.11n HT20, CDD, Core 0-1 - 2467 MHz Band Edge Frequency 2483.5 MHz

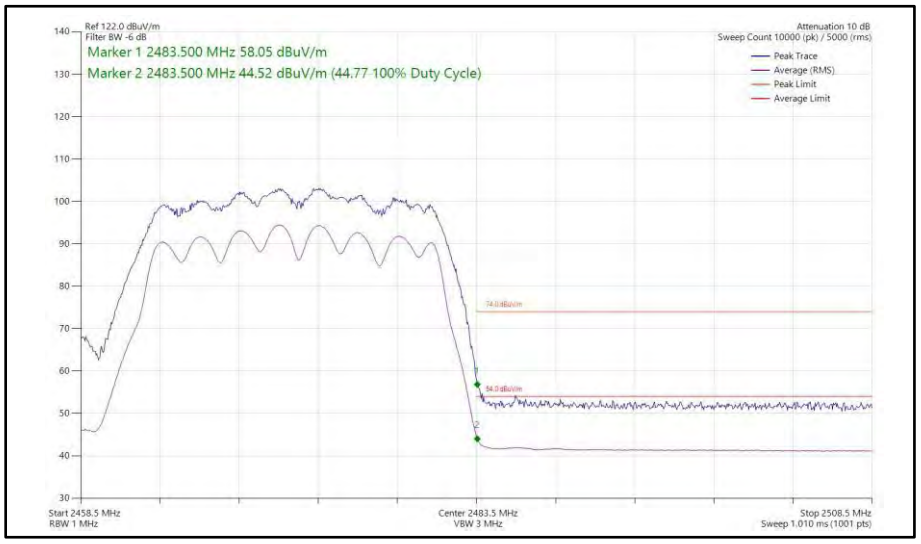

Figure 46 - 802.11n HT20, CDD, Core 0-1 - 2472 MHz Band Edge Frequency 2483.5 MHz

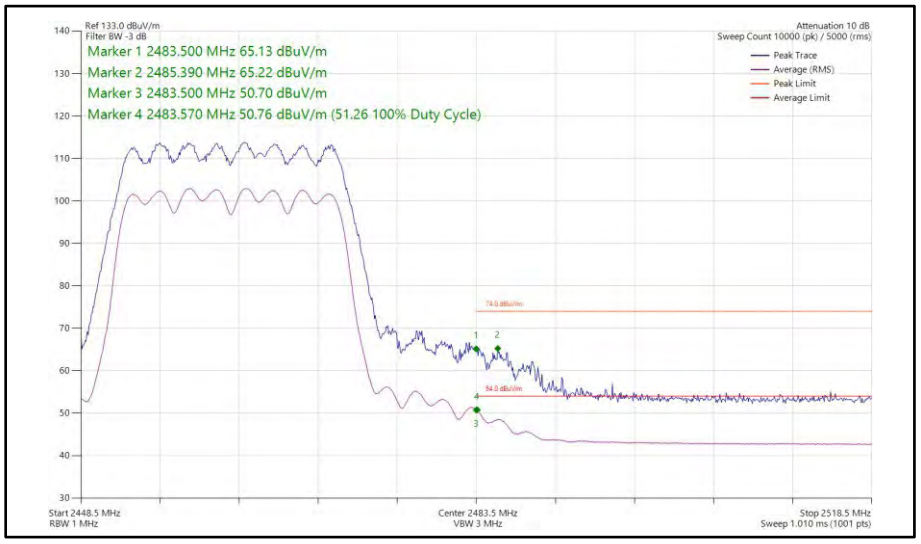

Figure 47 - 802.11ax HE20, SU, CDD, Core 0-1 - 2462 MHz Band Edge Frequency 2483.5 MHz

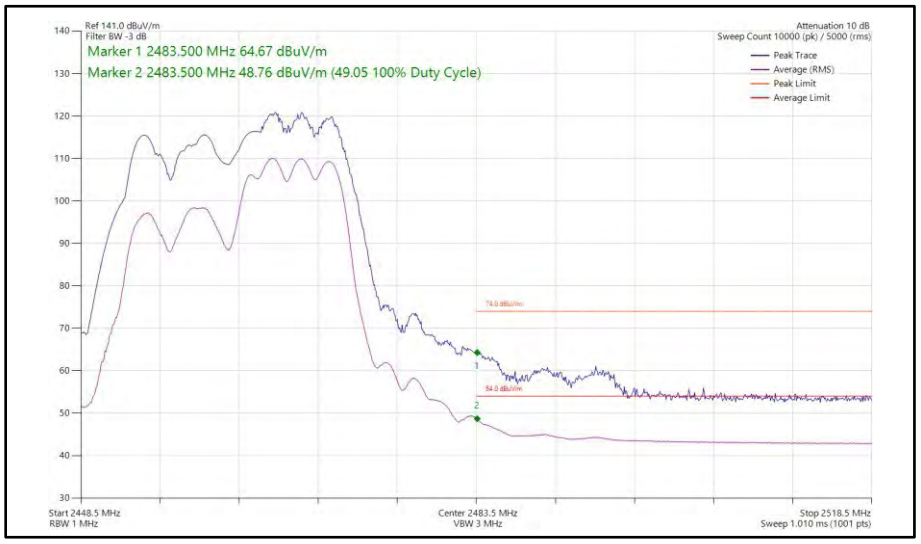

Figure 48 - 802.11ax HE20, RU 106-54, CDD, Core 0-1 - 2462 MHz Band Edge Frequency 2483.5 MHz

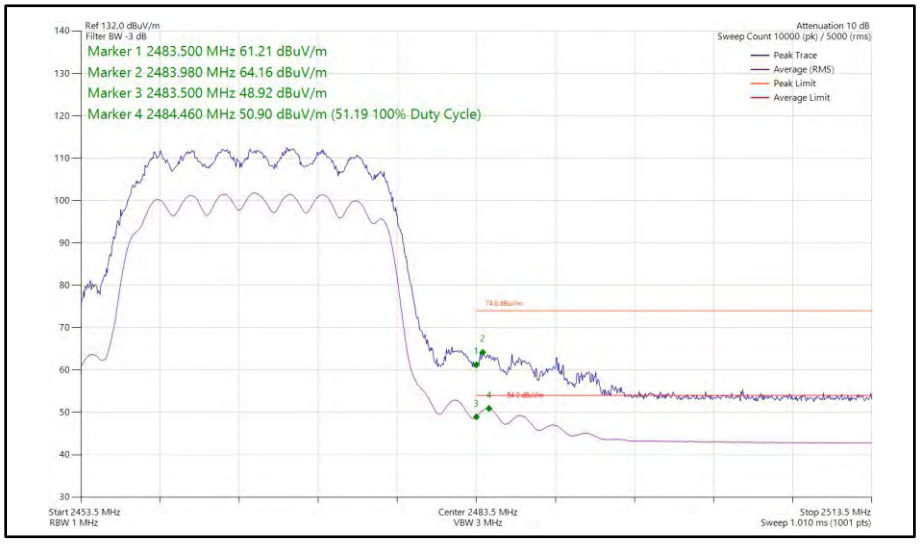

Figure 49 - 802.11ax HE20, SU, CDD, Core 0-1 - 2467 MHz Band Edge Frequency 2483.5 MHz

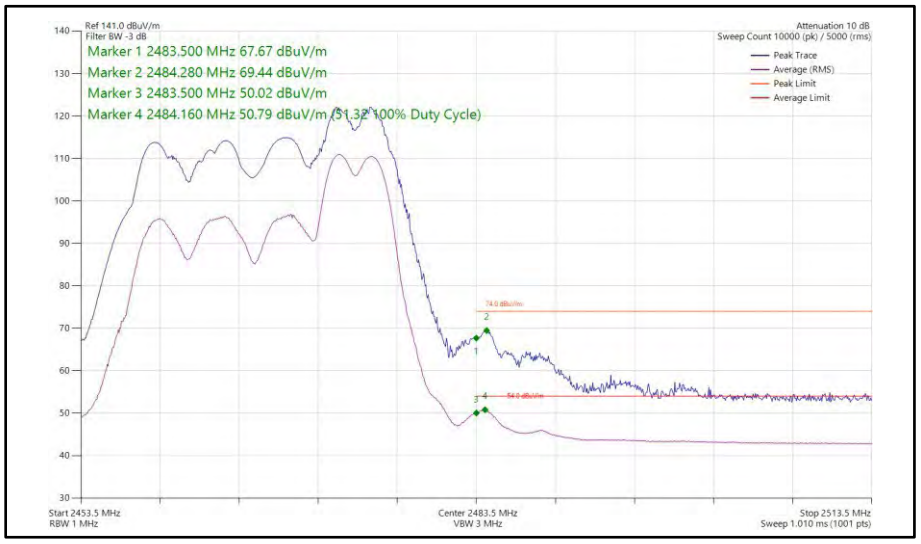

Figure 50 - 802.11ax HE20, RU 52-40, CDD, Core 0-1 - 2467 MHz Band Edge Frequency 2483.5 MHz

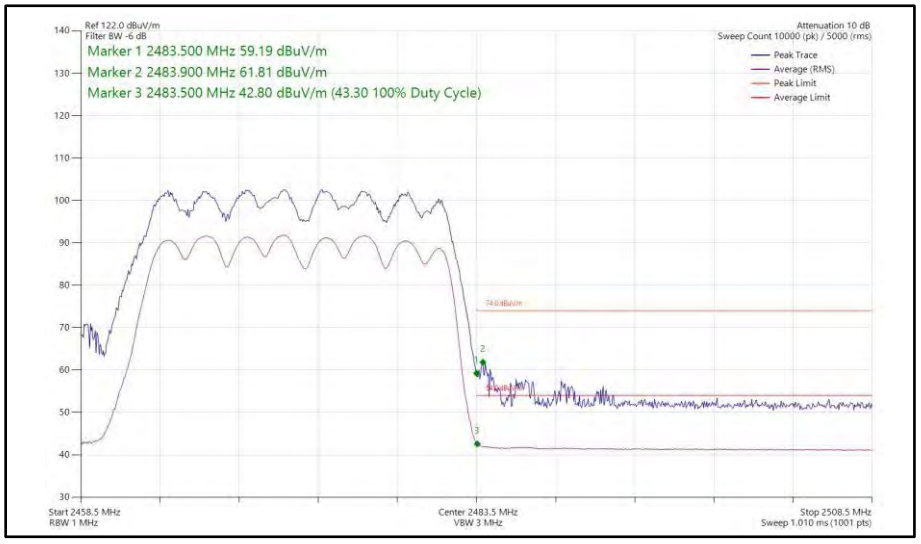

Figure 51 - 802.11ax HE20, SU, CDD, Core 0-1 - 2472 MHz Band Edge Frequency 2483.5 MHz

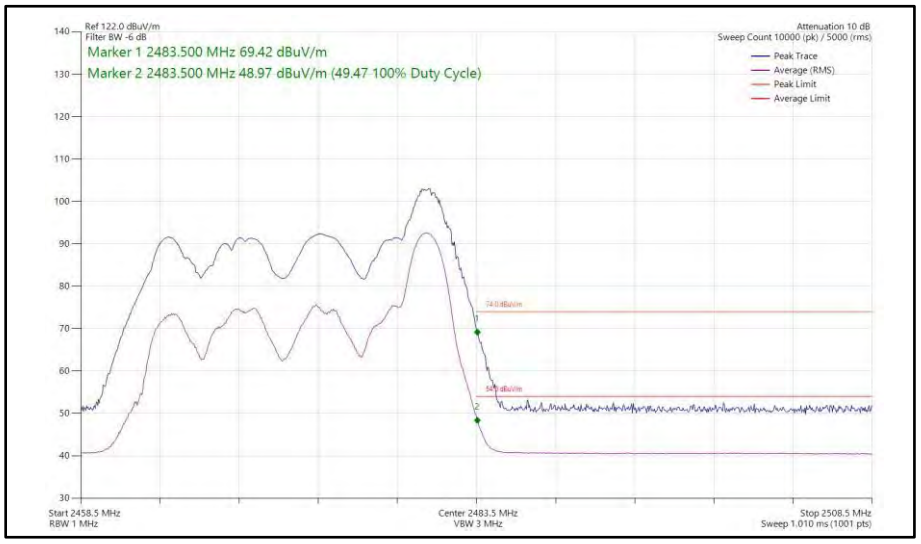

Figure 52 - 802.11ax HE20, RU 26-8, CDD, Core 0-1 - 2472 MHz Band Edge Frequency 2483.5 MHz

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 9

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 10

*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
Cable (18 GHz)	Rosenberger	LU7-071-1000	5096	12	24-Oct-2024
Emissions Software	TUV SUD	EmX V3.1.12	5125	-	Software
EMI Test Receiver	Rohde & Schwarz	ESW44	5911	12	05-May-2024
1500W (300V 12A) AC Power Supply	iTech	IT7324	5955	-	O/P Mon
5m Semi-Anechoic Chamber (Dual-Axis), Chamber 15	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	5996	12	05-Jun-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6007	12	05-Jun-2024
Cable (N to N 7m)	Junkosha	MWX221-07000NMSNMS/B	6016	12	05-Jun-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/B	6019	12	05-Jun-2024
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6140	12	26-Aug-2024
Digital Multimeter	Fluke	115	6147	12	16-Jun-2024
SAC Switch Unit	TUV SUD	TUV_SSU_001	6191	12	12-Dec-2023
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6315	12	04-Feb-2024
Humidity and Temperature Meter	R.S Components	1364	6486	12	18-Apr-2024

Table 11

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

A3114, S/N: F913QPYWR6 - Modification State 0

2.2.3 Date of Test

20-October-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	22.4 °C
Relative Humidity	55.5 %

2.2.6 Test Results

2.4 GHz WLAN

Protocol	6 dB Bandwidth (MHz)	
	Minimum	Maximum
802.11b	8.640	9.120
802.11g	15.300	16.200
802.11n HT20	15.240	17.040
802.11ax HE20 SU	18.720	19.080

Table 12 - 6 dB Bandwidth Summary Results - SISO

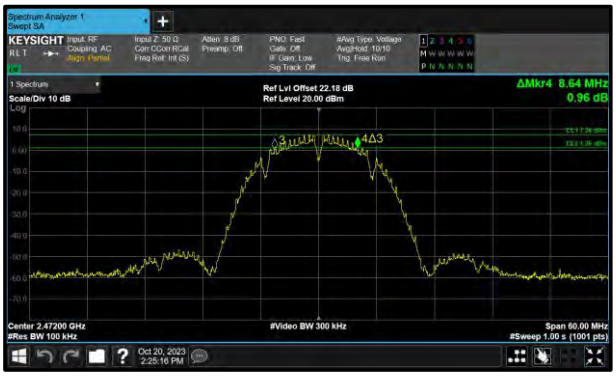

Figure 53 - 802.11b Minimum 6 dB EBW

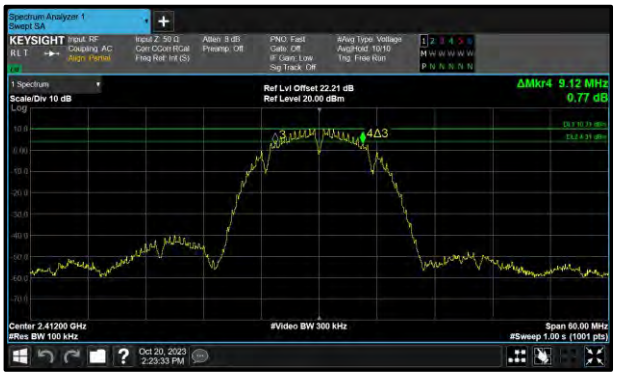

Figure 54 - 802.11b Maximum 6 dB EBW

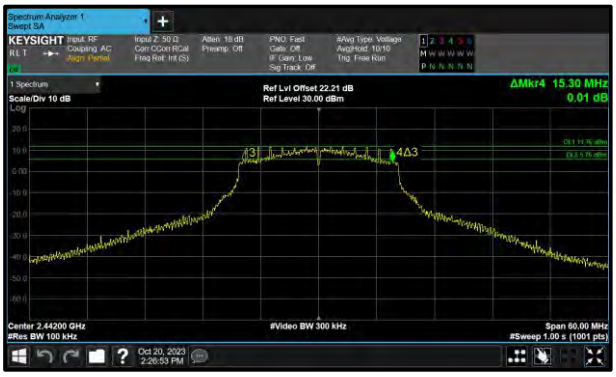

Figure 55 - 802.11g Minimum 6 dB EBW

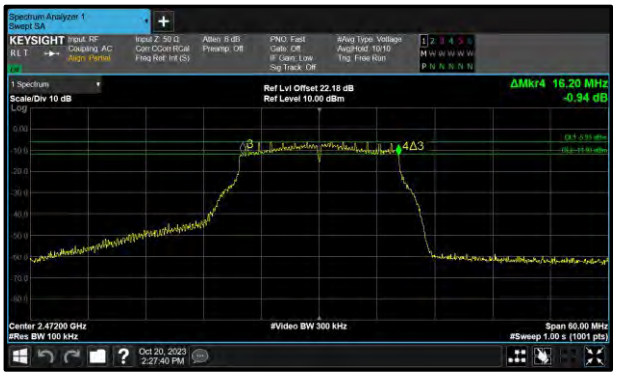

Figure 56 - 802.11g Maximum 6 dB EBW

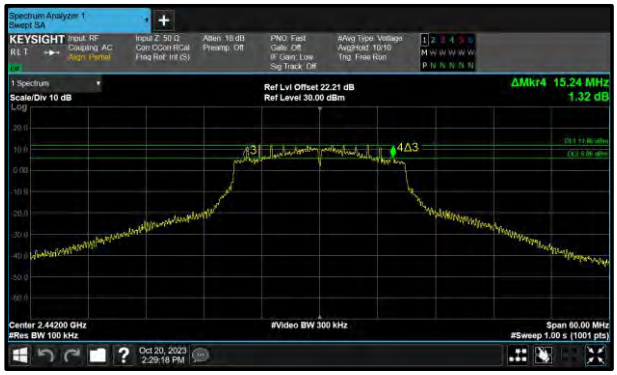

Figure 57 - 802.11n HT20 Minimum 6 dB EBW

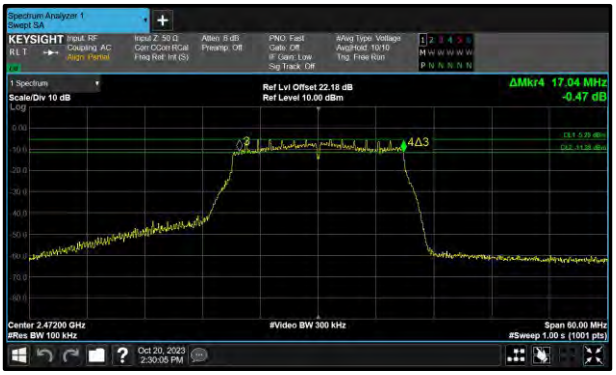

Figure 58 - 802.11n HT20 Maximum 6 dB EBW

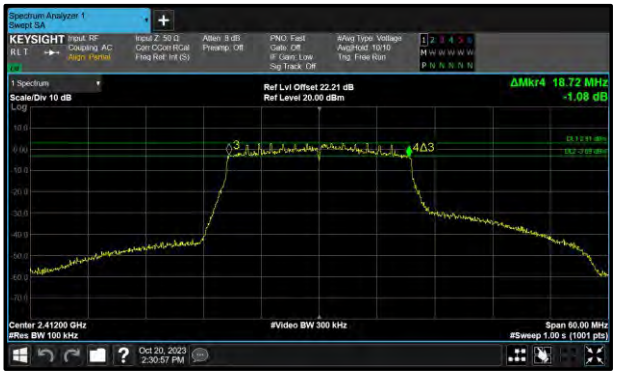

Figure 59 - 802.11ax HE20 SU Minimum 6 dB EBW

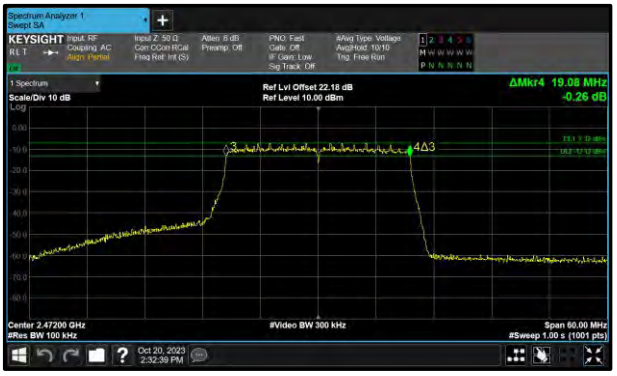

Figure 60 - 802.11ax HE20 SU Maximum 6 dB EBW

Protocol	6 dB Bandwidth (MHz)	
	Minimum	Maximum
802.11n HT20	15.240	17.400
802.11ax HE20 SU	17.940	19.080

Table 13 - 6 dB Bandwidth Summary Results - MIMO CDD

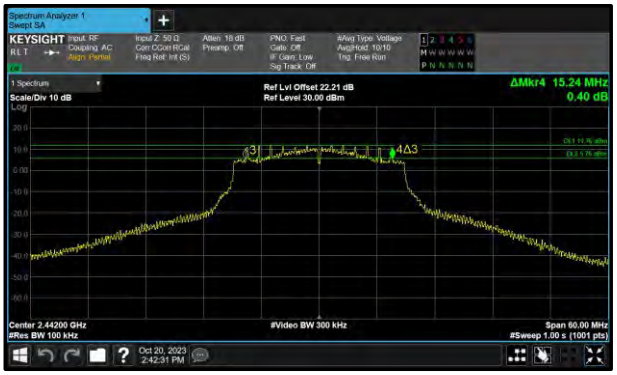

Figure 61 - 802.11n HT20 Minimum 6 dB EBW

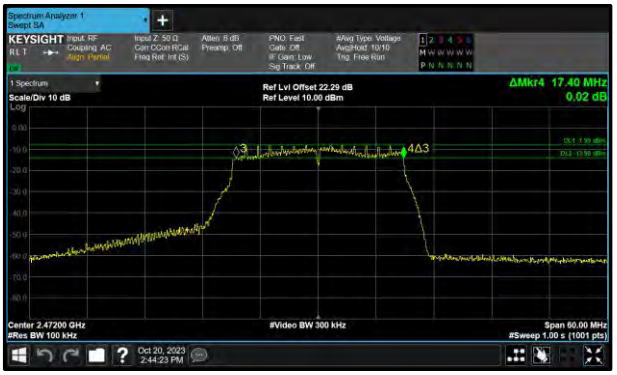

Figure 62 - 802.11n HT20 Maximum 6 dB EBW

Figure 63 - 802.11ax HE20 SU Minimum 6 dB EBW

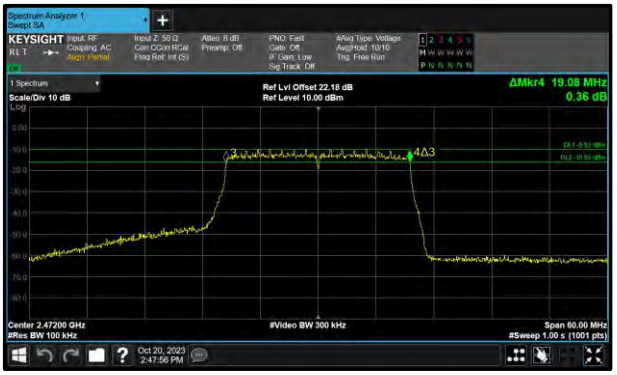

Figure 64 - 802.11ax HE20 SU Maximum 6 dB EBW

Protocol	99% Bandwidth (MHz)	
	Minimum	Maximum
802.11b	12.960	12.960
802.11g	16.440	16.620
802.11n HT20	17.640	17.700
802.11ax HE20 SU	18.960	18.960

Table 14 - 99% Bandwidth Summary Results - SISO

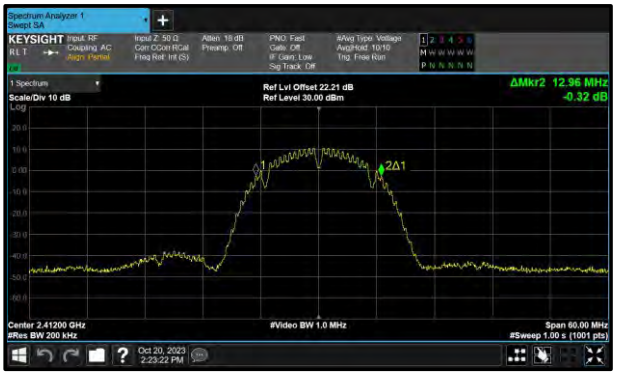

Figure 65 - 802.11b Minimum 99% OBW

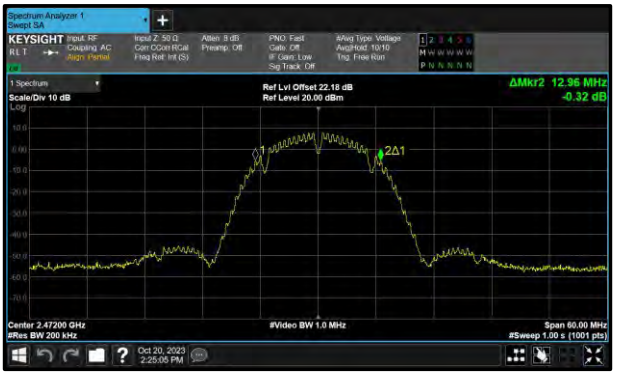

Figure 66 - 802.11b Maximum 99% OBW

Figure 67 - 802.11g Minimum 99% OBW

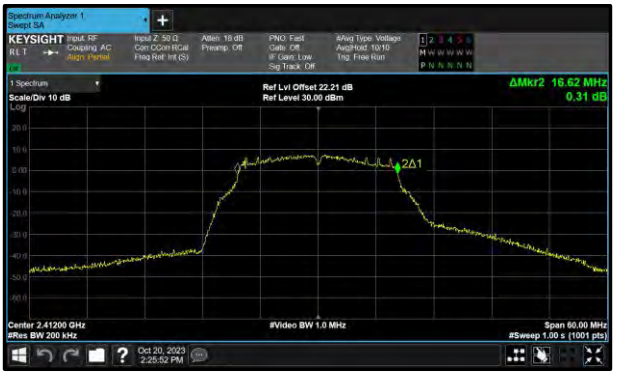

Figure 68 - 802.11g Maximum 99% OBW

Figure 69 - 802.11n HT20 Minimum 99% OBW

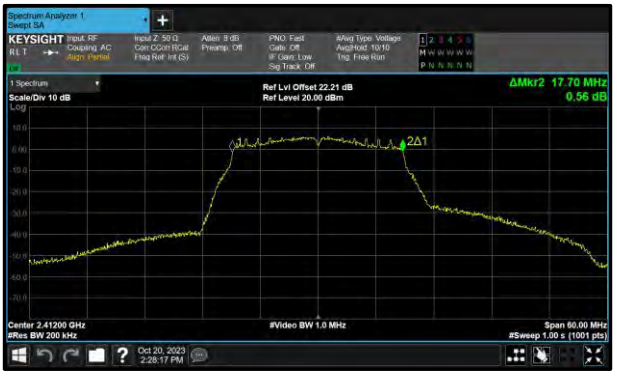

Figure 70 - 802.11n HT20 Maximum 99% OBW

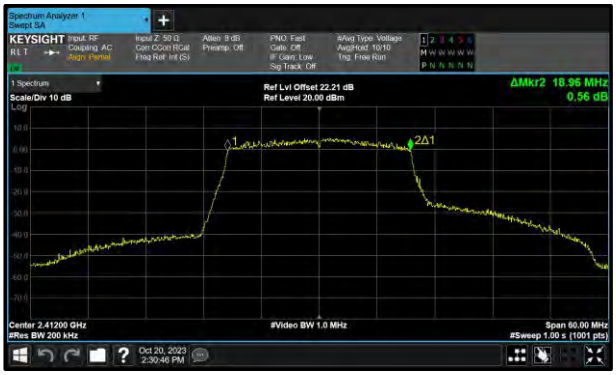

Figure 71 - 802.11ax HE20 SU Minimum 99% OBW

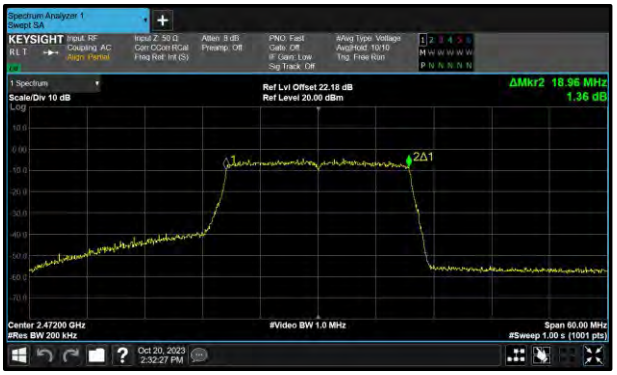

Figure 72 - 802.11ax HE20 SU Maximum 99% OBW

Protocol	99% Bandwidth (MHz)	
	Minimum	Maximum
802.11n HT20	17.580	17.760
802.11ax HE20 SU	18.960	19.020

Table 15 - 99% Bandwidth Summary Results - MIMO CDD

Figure 73 - 802.11n HT20 Minimum 99% OBW

Figure 74 - 802.11n HT20 Maximum 99% OBW

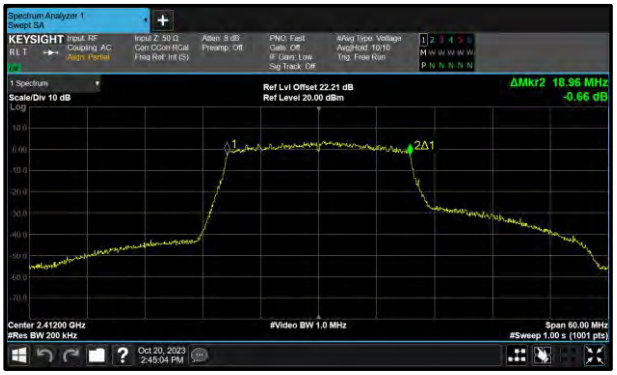

Figure 75 - 802.11ax HE20 SU Minimum 99% OBW

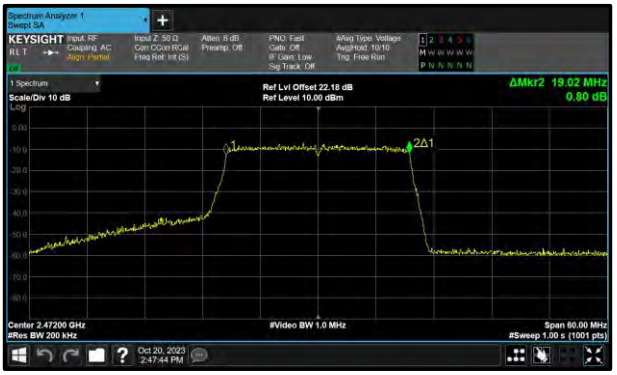

Figure 76 - 802.11ax HE20 SU Maximum 99% OBW

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	
2412	9.120	-	-	-	≥500.0
2442	9.120	-	-	-	≥500.0
2472	8.640	-	-	-	≥500.0

Table 16 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	12.960	-	-	-	-
2442	12.960	-	-	-	-
2472	12.960	-	-	-	-

Table 17 - 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):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	15.780	-	-	-	≥500.0
2442	15.300	-	-	-	≥500.0
2472	16.200	-	-	-	≥500.0

Table 18 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	16.620	-	-	-	-
2442	16.440	-	-	-	-
2472	16.500	-	-	-	-

Table 19 - 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):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	15.840	-	-	-	≥500.0
2442	15.240	-	-	-	≥500.0
2472	17.040	-	-	-	≥500.0

Table 20 - 6 dB Bandwidth Results

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

Table 21 - 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):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	18.720	-	-	-	≥500.0
2442	18.900	-	-	-	≥500.0
2472	19.080	-	-	-	≥500.0

Table 22 - 6 dB Bandwidth Results

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

Table 23 - 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:	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	16.080	16.140	-	-	≥500.0
2442	15.240	15.300	-	-	≥500.0
2472	17.340	17.400	-	-	≥500.0

Table 24 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	17.700	17.760	-	-	-
2442	17.640	17.580	-	-	-
2472	17.700	17.700	-	-	-

Table 25 - 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	18.960	17.940	-	-	≥500.0
2437	18.840	18.900	-	-	≥500.0
2472	19.080	19.080	-	-	≥500.0

Table 26 - 6 dB Bandwidth Results

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

Table 27 - 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
Digital Multimeter	Fluke	115	6145	12	15-Jun-2024
Humidity & Temperature meter	R.S Components	1364	6149	12	07-Jul-2024
MXA Signal Analyser	Keysight Technologies	N9020B	6417	24	26-Feb-2025
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6518	12	26-May-2024
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6529	12	09-Aug-2024
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6530	12	26-May-2024
AC Programmable Power Supply	iTech	IT7324	6662	-	O/P Mon

Table 28

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

A3114, S/N: F913QPYWR6 - Modification State 0

2.3.3 Date of Test

20-October-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	22.4 °C
Relative Humidity	55.5 %

2.3.6 Test Results

2.4 GHz WLAN

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):	5.86
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	18.79	-	-	-	-	30.00	-11.21
2442	18.82	-	-	-	-	30.00	-11.18
2472	15.56	-	-	-	-	30.00	-14.44

Table 29 - 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	18.79	-	-	-	-	30.00	-11.21	24.65	36.00	-11.35
2442	18.82	-	-	-	-	30.00	-11.18	24.68	36.00	-11.32
2472	15.56	-	-	-	-	30.00	-14.44	21.42	36.00	-14.58

Table 30 - 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 (%):	97.5
Data Rate:	12 Mbps	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	5.86
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	16.29	-	-	-	-	30.00	-13.71
2442	22.89	-	-	-	-	30.00	-7.11
2472	5.68	-	-	-	-	30.00	-24.32

Table 31 - 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	16.29	-	-	-	-	30.00	-13.71	22.15	36.00	-13.85
2442	22.89	-	-	-	-	30.00	-7.11	28.75	36.00	-7.25
2472	5.68	-	-	-	-	30.00	-24.32	11.54	36.00	-24.46

Table 32 - 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):	5.86
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	15.37	-	-	-	-	30.00	-14.63
2442	22.76	-	-	-	-	30.00	-7.24
2472	5.97	-	-	-	-	30.00	-24.03

Table 33 - 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	15.37	-	-	-	-	30.00	-14.63	21.23	36.00	-14.77
2442	22.76	-	-	-	-	30.00	-7.24	28.62	36.00	-7.38
2472	5.97	-	-	-	-	30.00	-24.03	11.83	36.00	-24.17

Table 34 - 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 (%):	95.7
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	5.86
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	13.79	-	-	-	-	30.00	-16.21
2442	22.81	-	-	-	-	30.00	-7.19
2472	4.23	-	-	-	-	30.00	-25.77

Table 35 - 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	13.79	-	-	-	-	30.00	-16.21	19.65	36.00	-16.35
2442	22.81	-	-	-	-	30.00	-7.19	28.67	36.00	-7.33
2472	4.23	-	-	-	-	30.00	-25.77	10.09	36.00	-25.91

Table 36 - 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 (%):	96.4
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	5.86
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	14.40	-	-	-	-	30.00	-15.60
2442	14.45	-	-	-	-	30.00	-15.55
2472	-4.66	-	-	-	-	30.00	-34.66

Table 37 - 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	14.40	-	-	-	-	30.00	-15.60	20.26	36.00	-15.74
2442	14.45	-	-	-	-	30.00	-15.55	20.31	36.00	-15.69
2472	-4.66	-	-	-	-	30.00	-34.66	1.20	36.00	-34.80

Table 38 - 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):	5.86
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	17.18	-	-	-	-	30.00	-12.82
2442	17.25	-	-	-	-	30.00	-12.75
2472	-2.30	-	-	-	-	30.00	-32.30

Table 39 - 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	17.18	-	-	-	-	30.00	-12.82	23.04	36.00	-12.96
2442	17.25	-	-	-	-	30.00	-12.75	23.11	36.00	-12.89
2472	-2.30	-	-	-	-	30.00	-32.30	3.56	36.00	-32.44

Table 40 - 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 (%):	97.7
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	5.86
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	17.40	-	-	-	-	30.00	-12.60
2442	20.36	-	-	-	-	30.00	-9.64
2472	-1.18	-	-	-	-	30.00	-31.18

Table 41 - 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	17.40	-	-	-	-	30.00	-12.60	23.26	36.00	-12.74
2442	20.36	-	-	-	-	30.00	-9.64	26.22	36.00	-9.78
2472	-1.18	-	-	-	-	30.00	-31.18	4.68	36.00	-31.32

Table 42 - 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:	802.11n HT20	Duty Cycle (%):	96.4
Modulation Coding Scheme:	MCS2	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	5.86
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	14.21	13.91	-	-	17.06	30.00	-12.94
2442	22.78	22.54	-	-	25.67	30.00	-4.33
2472	3.22	3.31	-	-	6.28	30.00	-23.72

Table 43 - 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	14.21	13.91	-	-	17.06	30.00	-12.94	22.92	36.00	-13.08
2442	22.78	22.54	-	-	25.67	30.00	-4.33	31.53	36.00	-4.47
2472	3.22	3.31	-	-	6.28	30.00	-23.72	12.14	36.00	-23.86

Table 44 - 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 (%):	95.6
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	5.86
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	12.40	12.28	-	-	15.35	30.00	-14.65
2437	22.78	22.55	-	-	25.68	30.00	-4.32
2472	1.71	1.56	-	-	4.64	30.00	-25.36

Table 45 - 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	12.40	12.28	-	-	15.35	30.00	-14.65	21.21	36.00	-14.79
2437	22.78	22.55	-	-	25.68	30.00	-4.32	31.54	36.00	-4.46
2472	1.71	1.56	-	-	4.64	30.00	-25.36	10.50	36.00	-25.50

Table 46 - 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 (%):	96.3
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	5.86
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	14.19	14.12	-	-	17.13	30.00	-12.87
2442	14.18	14.32	-	-	17.25	30.00	-12.75
2472	-6.26	-6.31	-	-	-3.28	30.00	-33.28

Table 47 - 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	14.19	14.12	-	-	17.13	30.00	-12.87	22.99	36.00	-13.01
2442	14.18	14.32	-	-	17.25	30.00	-12.75	23.11	36.00	-12.89
2472	-6.26	-6.31	-	-	-3.28	30.00	-33.28	2.58	36.00	-33.41

Table 48 - 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):	5.86
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	17.45	17.48	-	-	20.48	30.00	-9.52
2442	17.28	17.09	-	-	20.20	30.00	-9.80
2472	-3.69	-3.98	-	-	-0.83	30.00	-30.83

Table 49 - 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	17.45	17.48	-	-	20.48	30.00	-9.52	26.34	36.00	-9.66
2442	17.28	17.09	-	-	20.20	30.00	-9.80	26.06	36.00	-9.94
2472	-3.69	-3.98	-	-	-0.83	30.00	-30.83	5.03	36.00	-30.97

Table 50 - 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 (%):	97.7
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	5.86
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	16.87	16.57	-	-	19.72	30.00	-10.28
2442	20.27	20.26	-	-	23.25	30.00	-6.75
2472	-3.08	-3.49	-	-	-0.27	30.00	-30.27

Table 51 - 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	16.87	16.57	-	-	19.72	30.00	-10.28	25.58	36.00	-10.42
2442	20.27	20.26	-	-	23.25	30.00	-6.75	29.11	36.00	-6.89
2472	-3.08	-3.49	-	-	-0.27	30.00	-30.27	5.59	36.00	-30.41

Table 52 - 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
Digital Multimeter	Fluke	115	6145	12	15-Jun-2024
Humidity & Temperature meter	R.S Components	1364	6149	12	07-Jul-2024
MXA Signal Analyser	Keysight Technologies	N9020B	6417	24	26-Feb-2025
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6518	12	26-May-2024
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6529	12	09-Aug-2024
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6530	12	26-May-2024
USB Wideband Power Sensor	Boonton	RTP5008	6587	12	24-Apr-2024
USB Wideband Power Sensor	Boonton	RTP5008	6588	12	24-Apr-2024
AC Programmable Power Supply	iTech	IT7324	6662	-	O/P Mon

Table 53

O/P Mon – Output Monitored using calibrated equipment

2.4 Authorised Band Edges

2.4.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d)
ISED RSS-247, Clause 5.5

2.4.2 Equipment Under Test and Modification State

A3114, S/N: D2PK6WMH20 - Modification State 0
A3114, S/N: W5YWRJQHX1 - Modification State 0
A3114, S/N: H7CF7HR6C2 - Modification State 0

2.4.3 Date of Test

06-December-2023 to 12-December-2023

2.4.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.10.4.

2.4.5 Environmental Conditions

Ambient Temperature	20.6 – 23.6
Relative Humidity	39.8 – 47.7

2.4.6 Test Results

2.4 GHz WLAN

Core 0 (SISO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
802.11b	1 Mbps	-	-	2412	2400	-47.22
802.11g	54 Mbps	-	-	2412	2400	-38.97
802.11n HT20	MCS7	-	-	2412	2400	-39.75
802.11ax HE20	MCS9x1	SU	-	2412	2400	-39.99
802.11ax HE20	MCS9x1	106	53	2412	2400	-40.73

Table 54 - SISO Authorised Band Edge Results

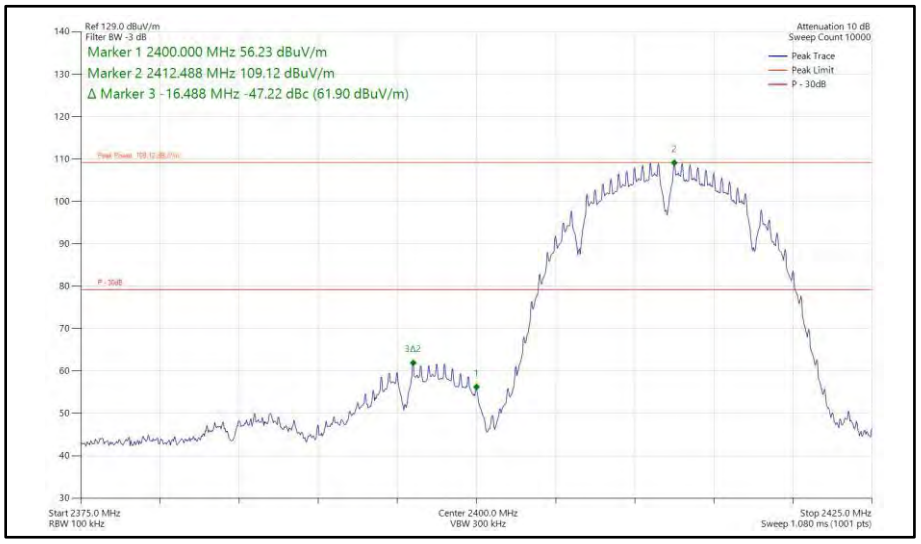

Figure 77 - 802.11b, SISO, Core 0 - 2412 MHz Band Edge Frequency 2400 MHz

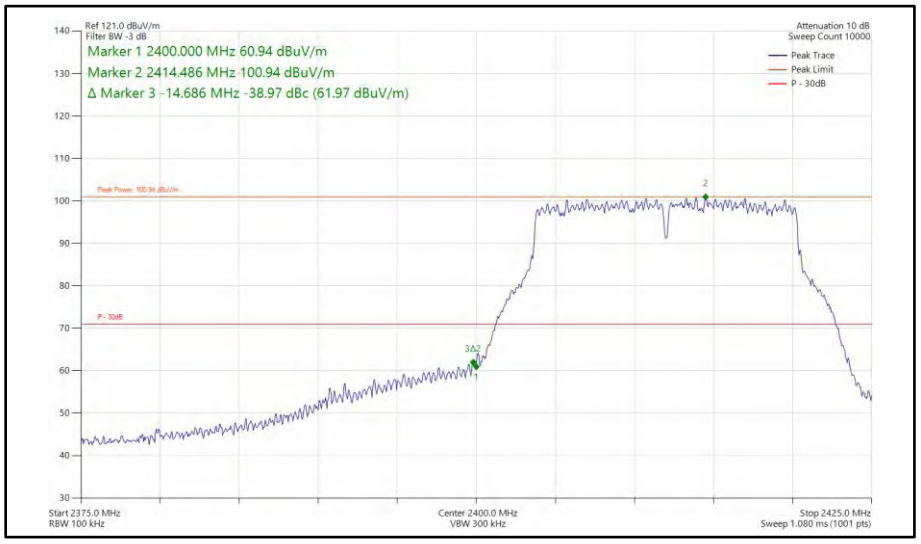

Figure 78 - 802.11g, SISO, Core 0 - 2412 MHz Band Edge Frequency 2400 MHz

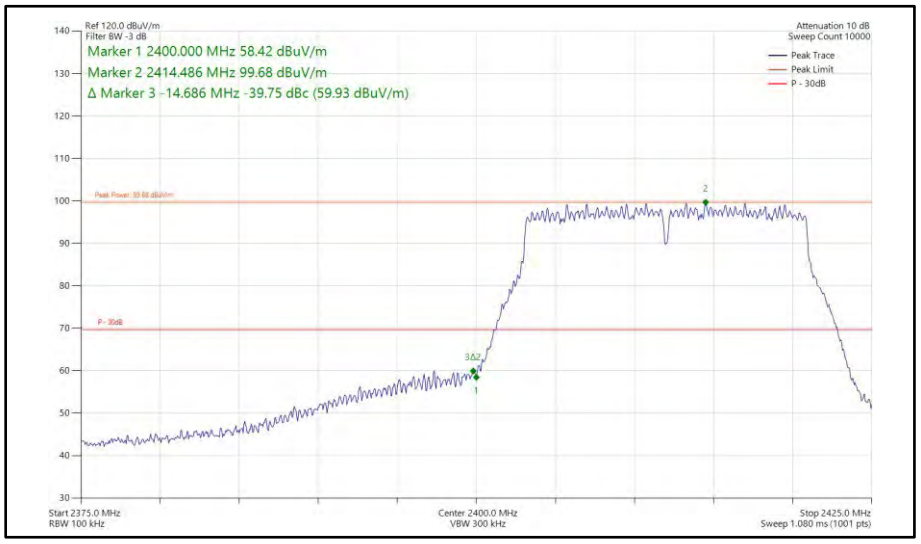

Figure 79 - 802.11n HT20, SISO, Core 0 - 2412 MHz Band Edge Frequency 2400 MHz

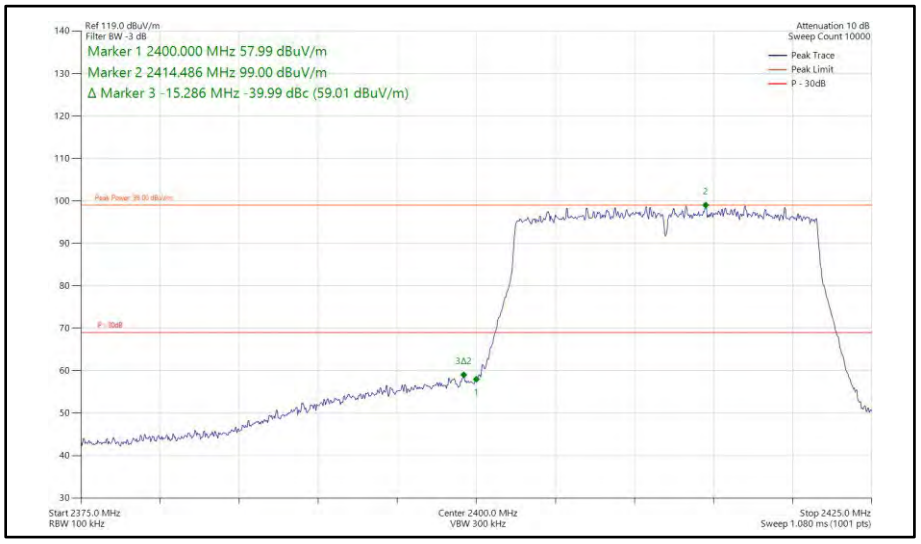

Figure 80 - 802.11ax HE20, SU, SISO, Core 0 - 2412 MHz Band Edge Frequency 2400 MHz

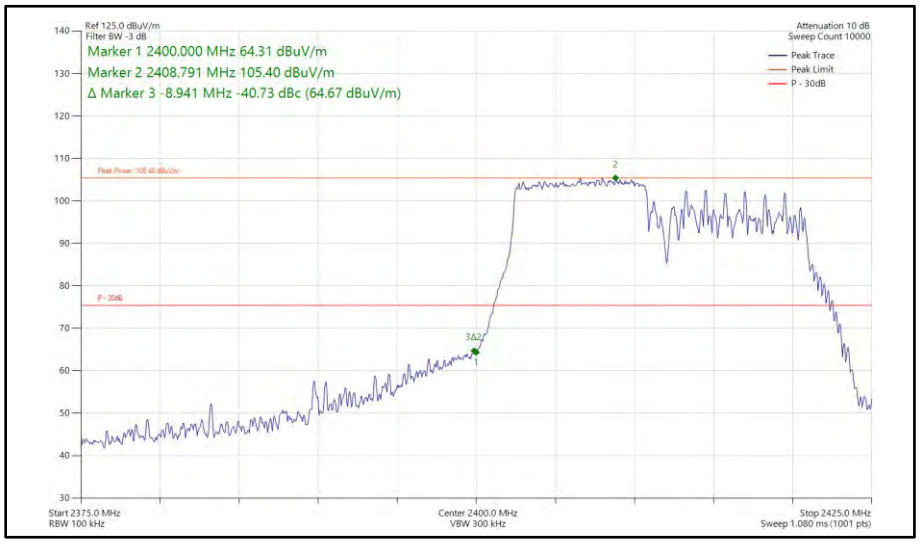

Figure 81 - 802.11ax HE20, RU 106-53, SISO, Core 0 - 2412 MHz Band Edge Frequency 2400 MHz

Core 1 (SISO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
802.11b	1 Mbps	-	-	2412	2400	-48.51
802.11g	54 Mbps	-	-	2412	2400	-39.96
802.11n HT20	MCS7	-	-	2412	2400	-40.42
802.11ax HE20	MCS9x1	SU	-	2412	2400	-41.29
802.11ax HE20	MCS9x1	106	53	2412	2400	-42.80

Table 55 - SISO Authorised Band Edge Results

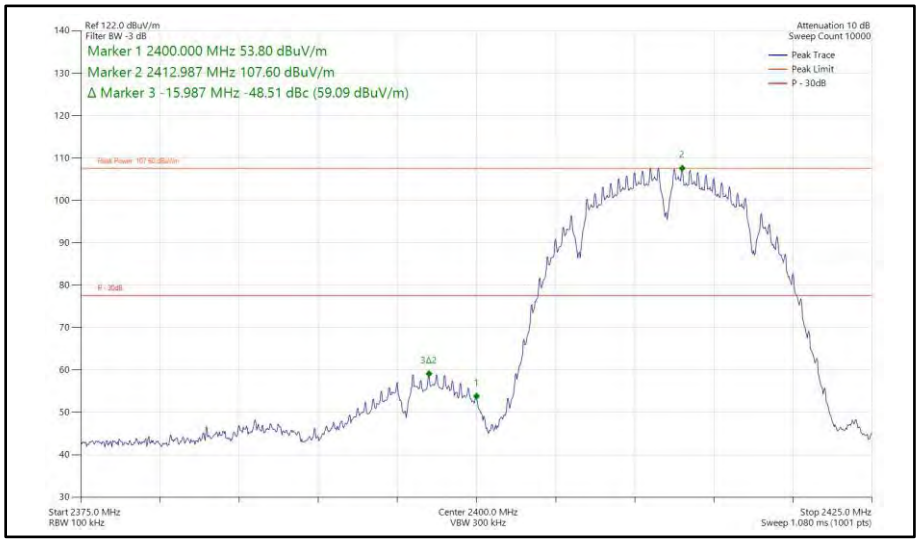

Figure 82 - 802.11b, SISO, Core 1 - 2412 MHz Band Edge Frequency 2400 MHz

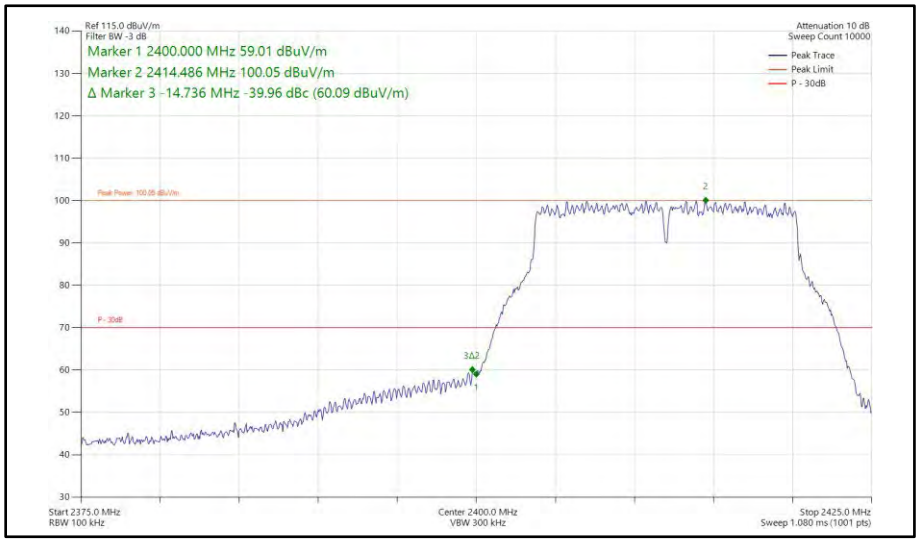

Figure 83 - 802.11g, SISO, Core 1 - 2412 MHz Band Edge Frequency 2400 MHz

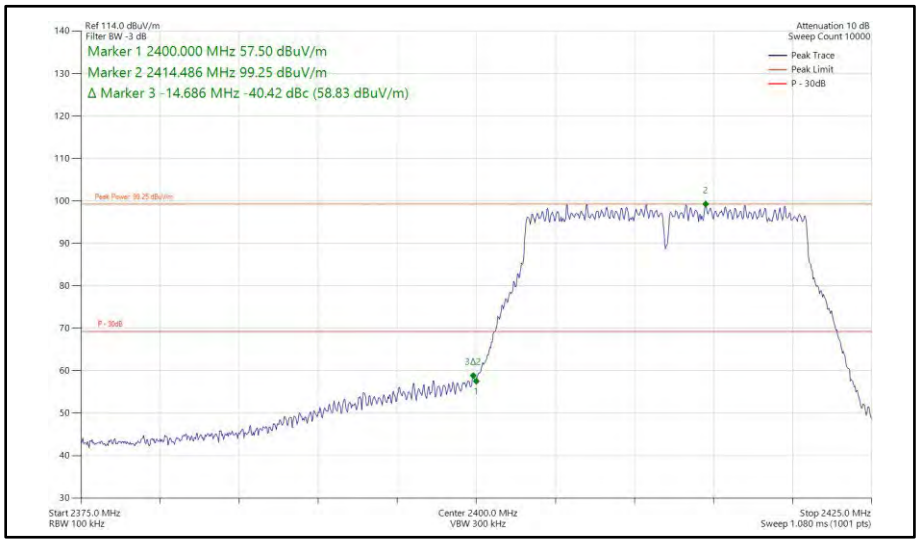

Figure 84 - 802.11n HT20, SISO, Core 1 - 2412 MHz Band Edge Frequency 2400 MHz

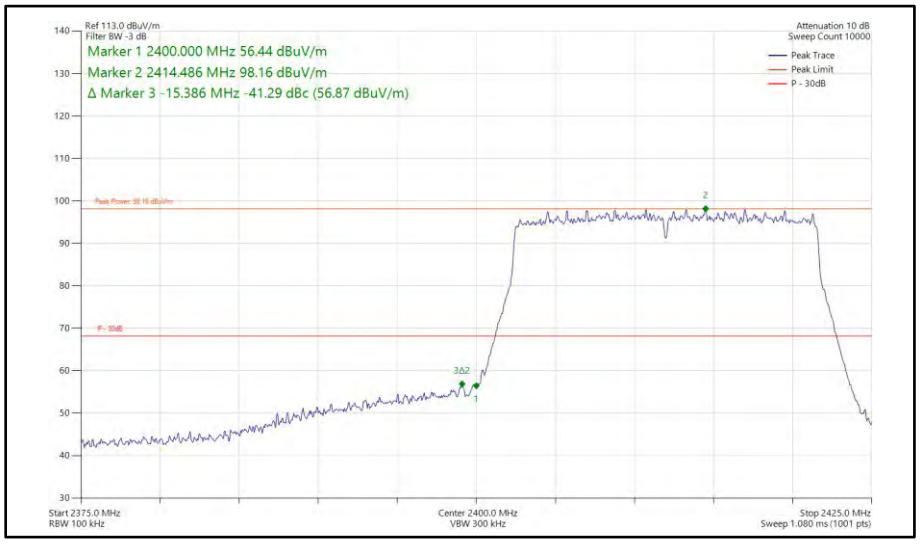

Figure 85 - 802.11ax HE20, SU, SISO, Core 1 - 2412 MHz Band Edge Frequency 2400 MHz

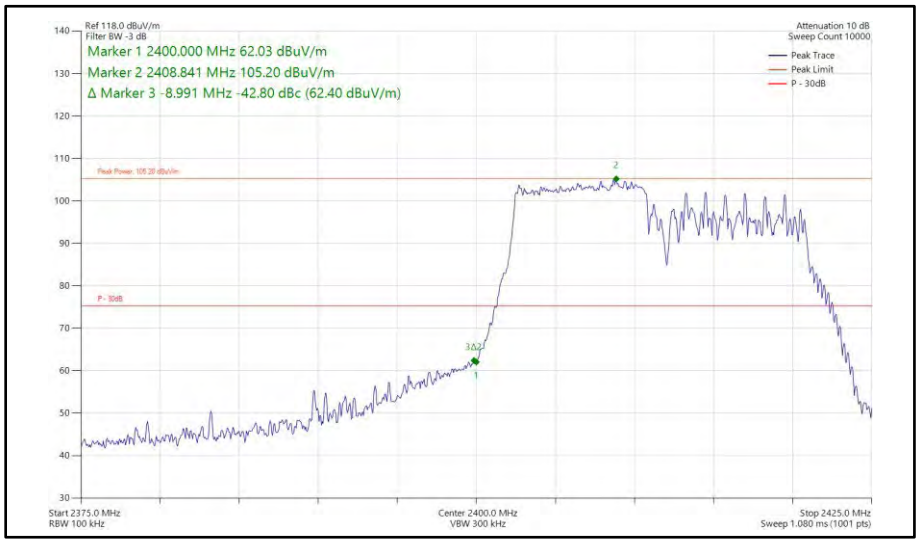

Figure 86 - 802.11ax HE20, RU 106-53, SISO, Core 1 - 2412 MHz Band Edge Frequency 2400 MHz

Core 0-1

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
802.11n HT20	MCS7	-	-	2412	2400	-42.69
802.11ax HE20	MCS9x1	SU	-	2412	2400	-41.73
802.11ax HE20	MCS9x1	106	54	2412	2400	-43.06

Table 56 - CDD Authorised Band Edge Results

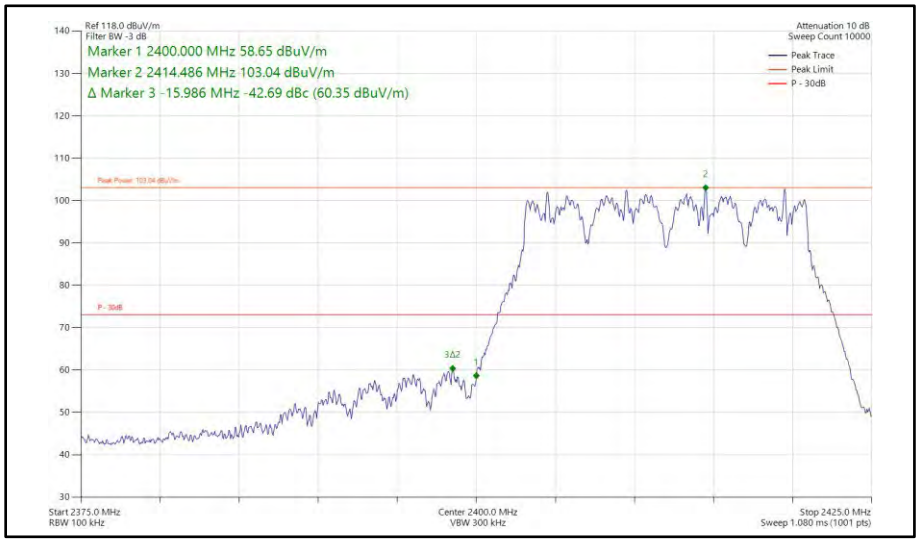

Figure 87 - 802.11n HT20, CDD, Core 0-1 - 2412 MHz Band Edge Frequency 2400 MHz

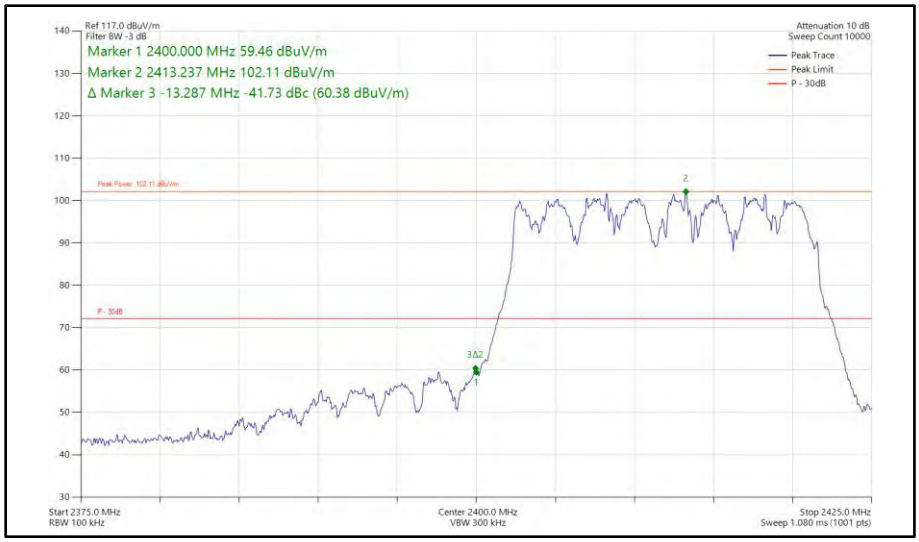

Figure 88 - 802.11ax HE20, SU, CDD, Core 0-1 - 2412 MHz Band Edge Frequency 2400 MHz

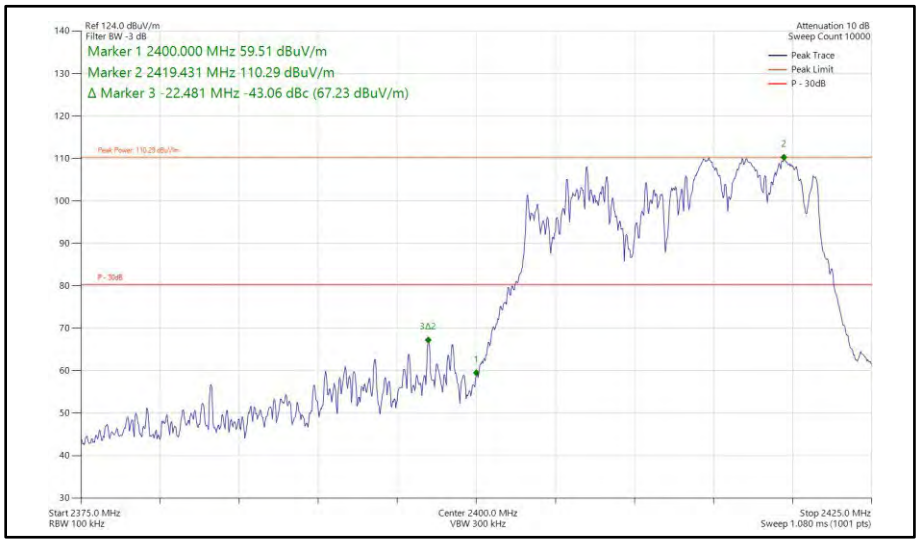

Figure 89 - 802.11ax HE20, RU 106-54, CDD, Core 0-1 - 2412 MHz Band Edge Frequency 2400 MHz

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

ISED RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

2.4.7 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
Cable (18 GHz)	Rosenberger	LU7-071-1000	5096	12	24-Oct-2024
Emissions Software	TUV SUD	EmX V3.1.12	5125	-	Software
EMI Test Receiver	Rohde & Schwarz	ESW44	5911	12	05-May-2024
1500W (300V 12A) AC Power Supply	iTech	IT7324	5955	-	O/P Mon
5m Semi-Anechoic Chamber (Dual-Axis), Chamber 15	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	5996	12	05-Jun-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6007	12	05-Jun-2024
Cable (N to N 7m)	Junkosha	MWX221-07000NMSNMS/B	6016	12	05-Jun-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/B	6019	12	05-Jun-2024
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6140	12	26-Aug-2024
Digital Multimeter	Fluke	115	6147	12	16-Jun-2024
SAC Switch Unit	TUV SUD	TUV_SSU_001	6191	12	12-Dec-2023
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6315	12	04-Feb-2024
Humidity and Temperature Meter	R.S Components	1364	6486	12	18-Apr-2024

Table 57

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

2.5 Spurious Radiated Emissions

2.5.1 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

2.5.2 Equipment Under Test and Modification State

A3114, S/N: D93J4WJ66Y - Modification State 0

2.5.3 Date of Test

25-September-2023 to 04-October-2023

2.5.4 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.

As the EUT was considered mobile/portable and therefore reasonable to be used in multiple planes, pre-scans were performed with the EUT orientated in X, Y and Z planes with reference to the ground plane.

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 (2442MHz) 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.

2.5.5 Example Test Setup Diagram

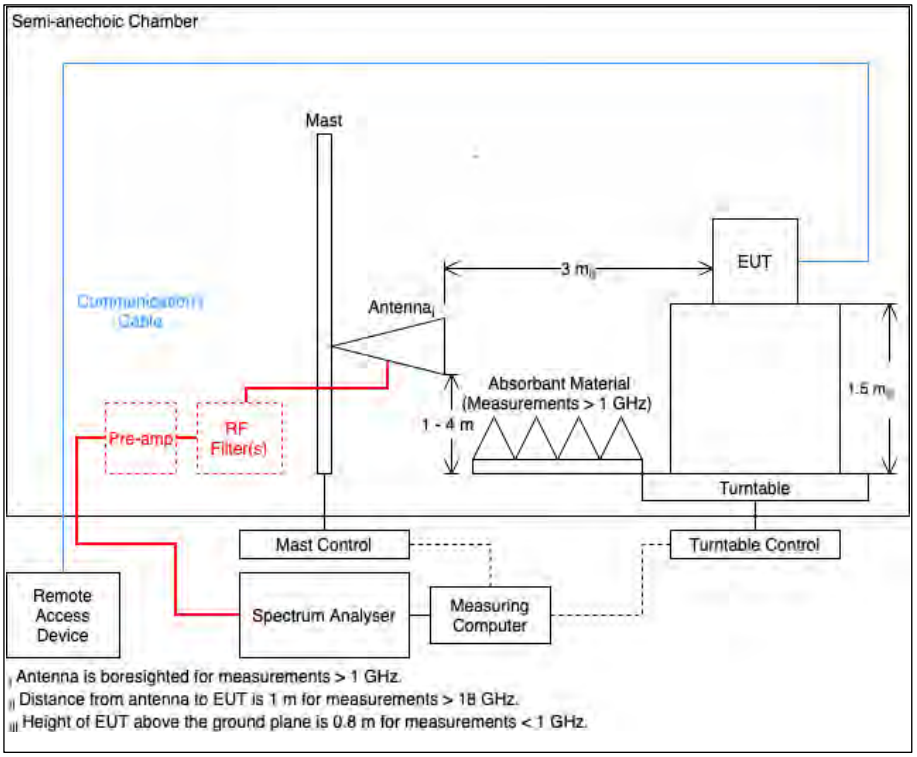

Figure 90

2.5.6 Environmental Conditions

Ambient Temperature	22.0 - 23.3 °C
Relative Humidity	36.9 - 55.4 %

2.5.7 Test Results

2.4 GHz WLAN

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

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

*No emissions found within 10 dB of the limit.

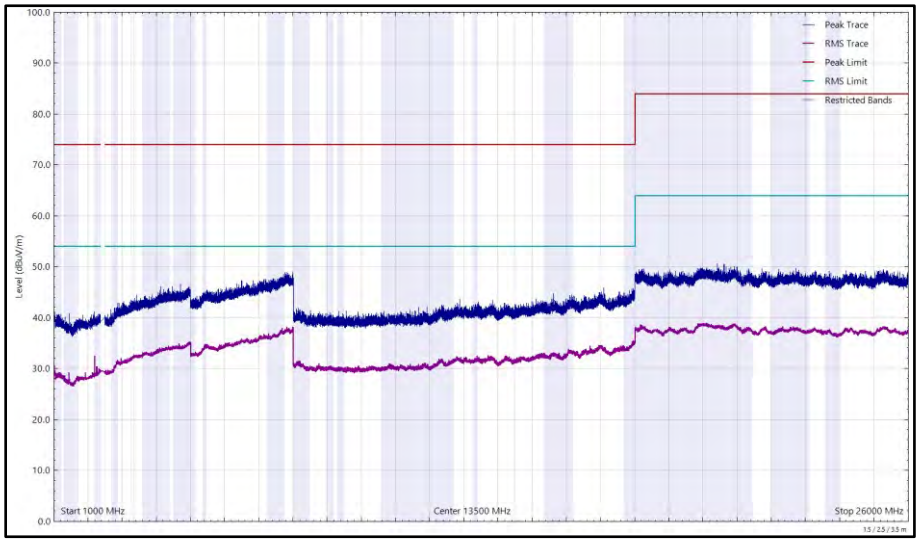

Figure 91 - 2412 MHz (CH1), 802.11b, Core 0, 1 GHz to 26 GHz, Horizontal

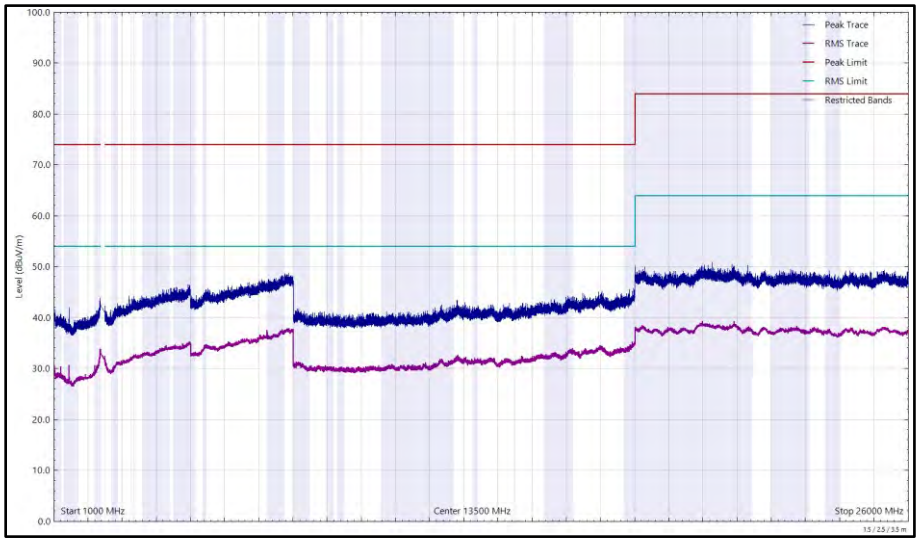

Figure 92 - 2412 MHz (CH1), 802.11b, Core 0, 1 GHz to 26 GHz, Vertical

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

Table 59 - 2442 MHz (CH7), 802.11b, Core 0, 30 MHz to 26 GHz

*No emissions found within 10 dB of the limit.

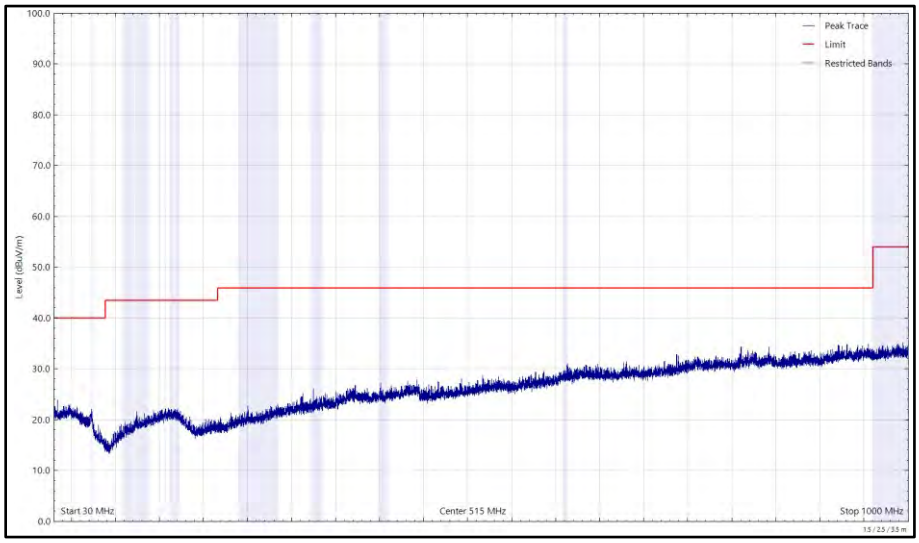

Figure 93 - 2442 MHz (CH7), 802.11b, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

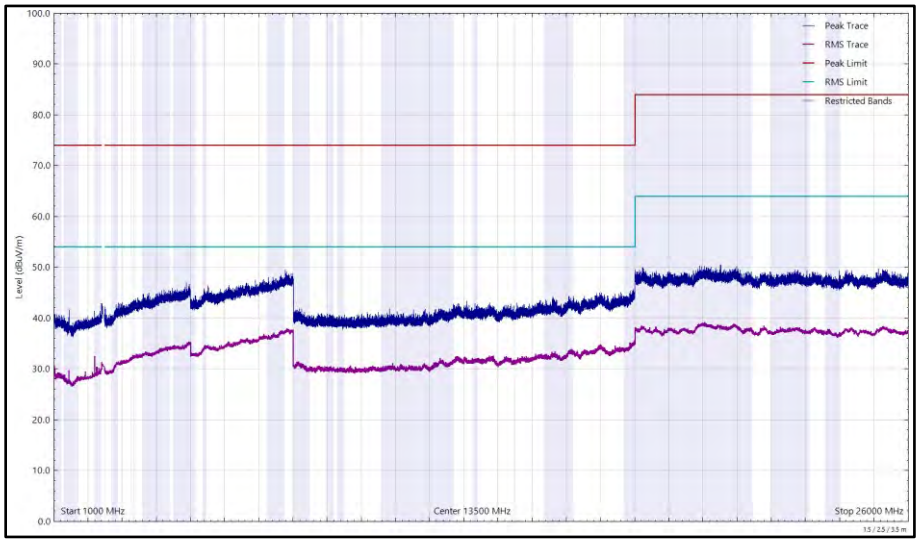

Figure 94 - 2442 MHz (CH7), 802.11b, Core 0, 1 GHz to 26 GHz, Horizontal

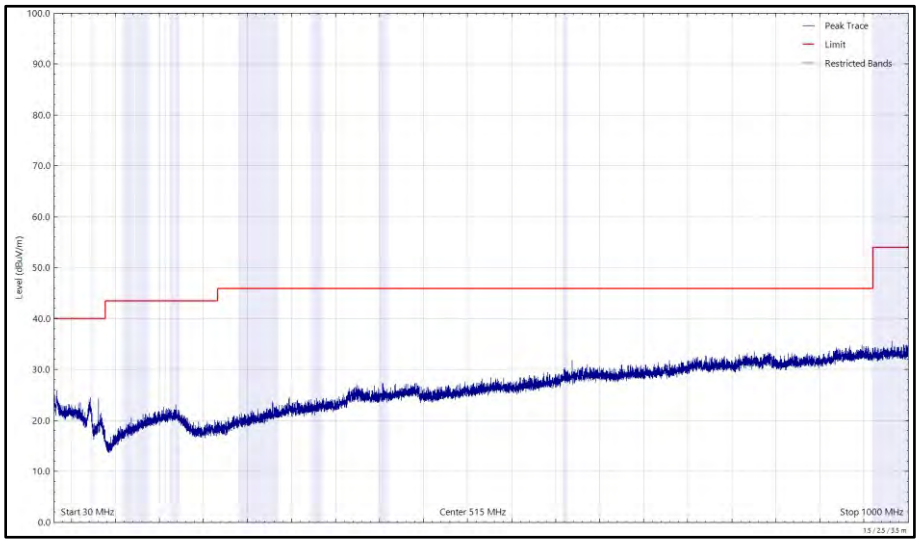

Figure 95 - 2442 MHz (CH7), 802.11b, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

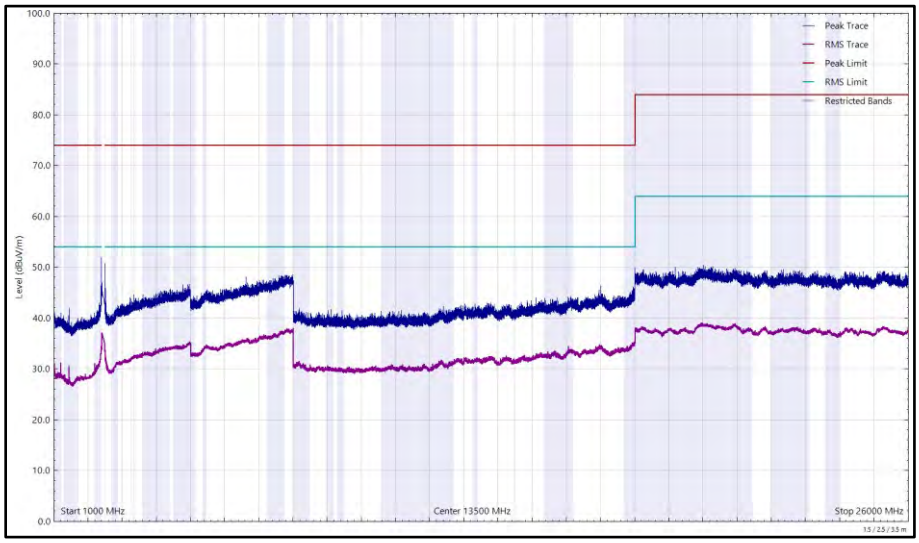

Figure 96 - 2442 MHz (CH7), 802.11b, Core 0, 1 GHz to 26 GHz, Vertical

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

Table 60 - 2472 MHz (CH13), 802.11b, Core 0, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

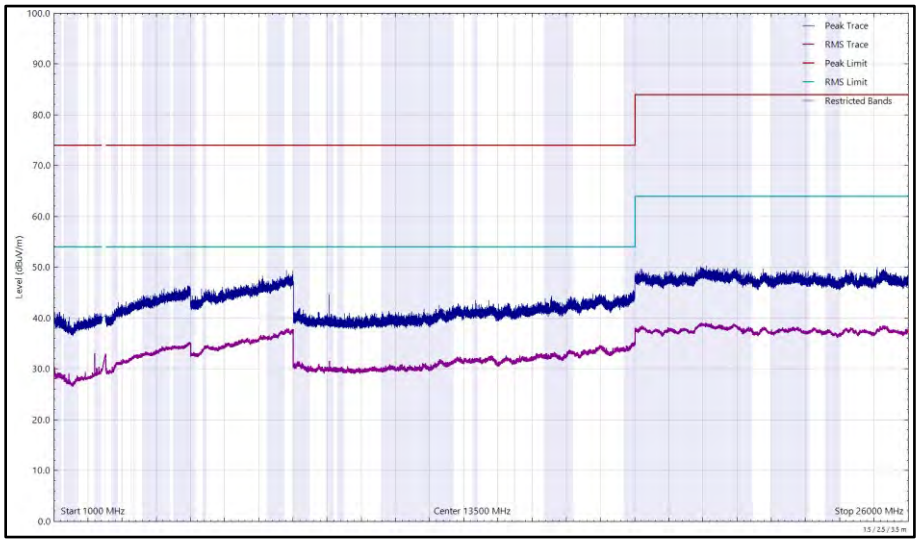

Figure 97 - 2472 MHz (CH13), 802.11b, Core 0, 1 GHz to 26 GHz, Horizontal

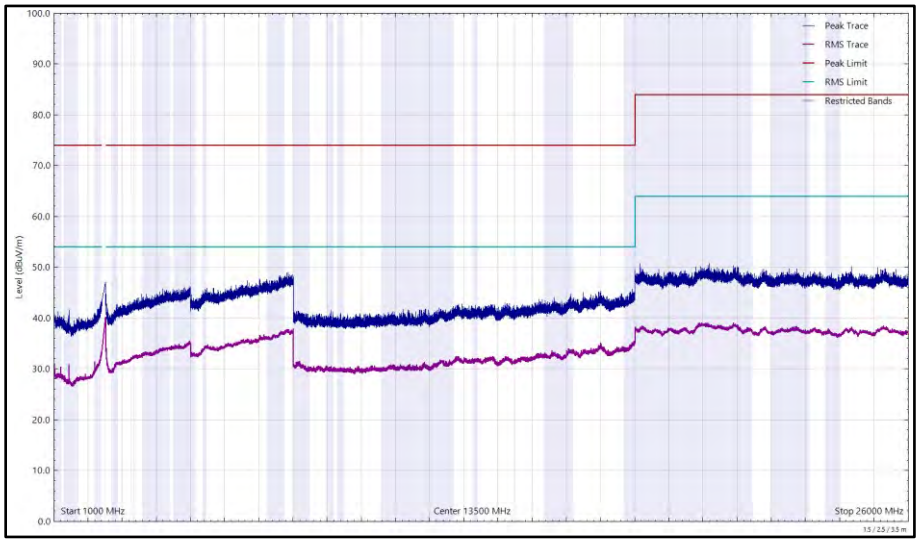

Figure 98 - 2472 MHz (CH13), 802.11b, Core 0, 1 GHz to 26 GHz, Vertical

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

Table 61 - 2412 MHz (CH1), 802.11b, Core 1, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

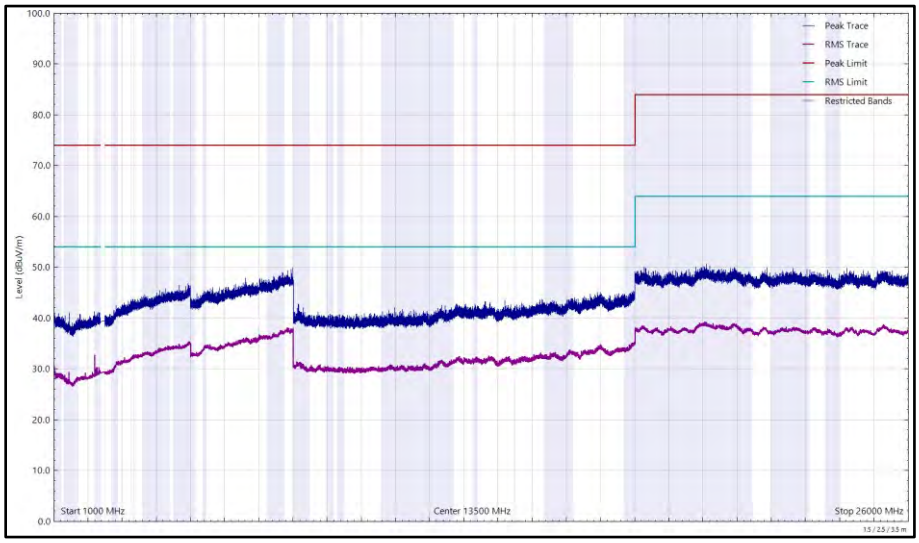

Figure 99 - 2412 MHz (CH1), 802.11b, Core 1, 1 GHz to 26 GHz, Horizontal

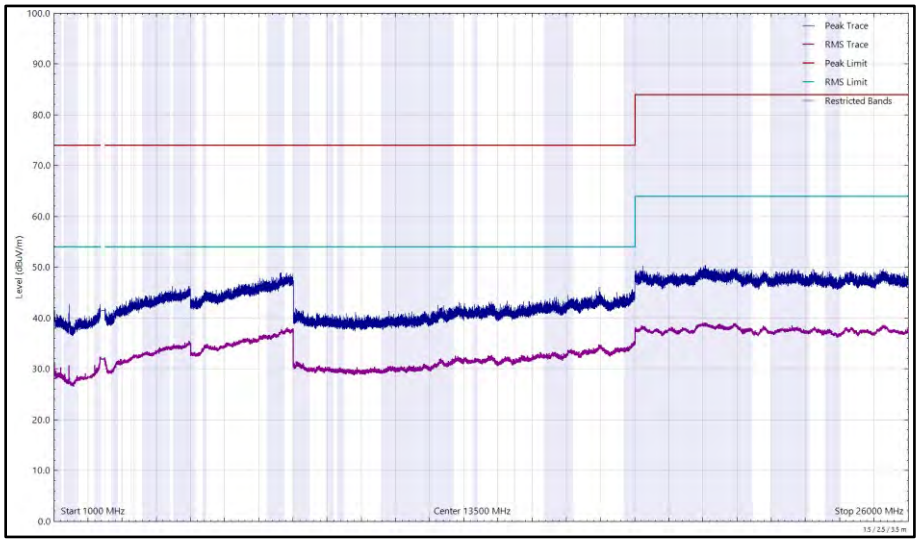

Figure 100 - 2412 MHz (CH1), 802.11b, Core 1, 1 GHz to 26 GHz, Vertical

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

Table 62 - 2442 MHz (CH7), 802.11b, Core 1, 30 MHz to 26 GHz

*No emissions found within 10 dB of the limit.

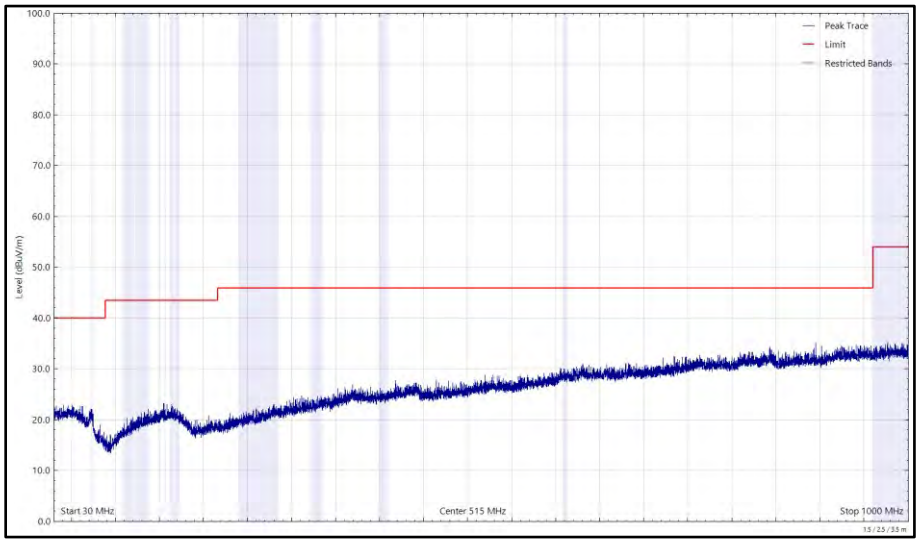

Figure 101 - 2442 MHz (CH7), 802.11b, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

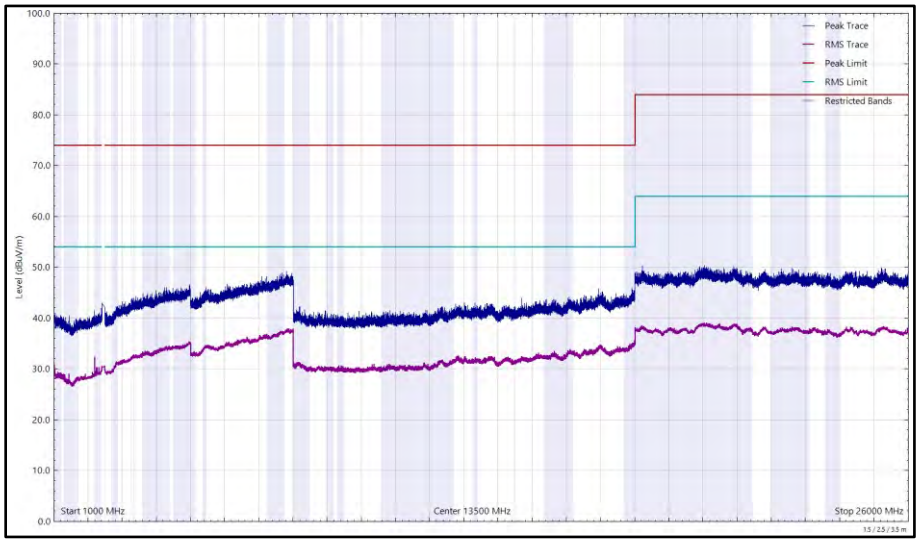

Figure 102 - 2442 MHz (CH7), 802.11b, Core 1, 1 GHz to 26 GHz, Horizontal

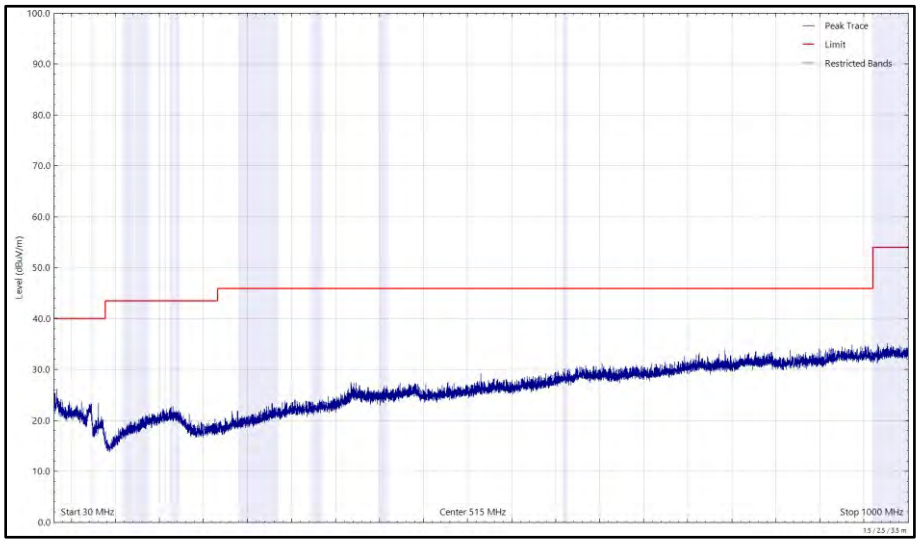

Figure 103 - 2442 MHz (CH7), 802.11b, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

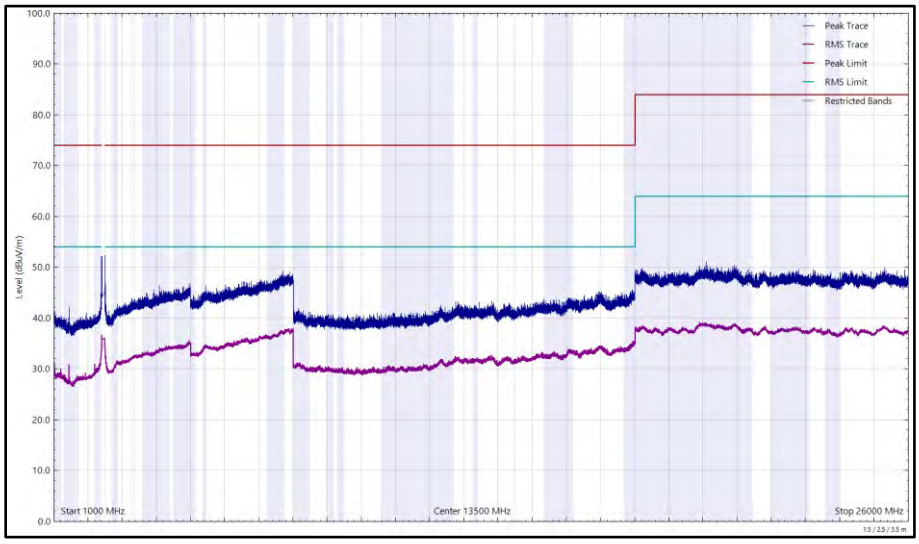

Figure 104 - 2442 MHz (CH7), 802.11b, Core 1, 1 GHz to 26 GHz, Vertical

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

Table 63 - 2472 MHz (CH13), 802.11b, Core 1, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

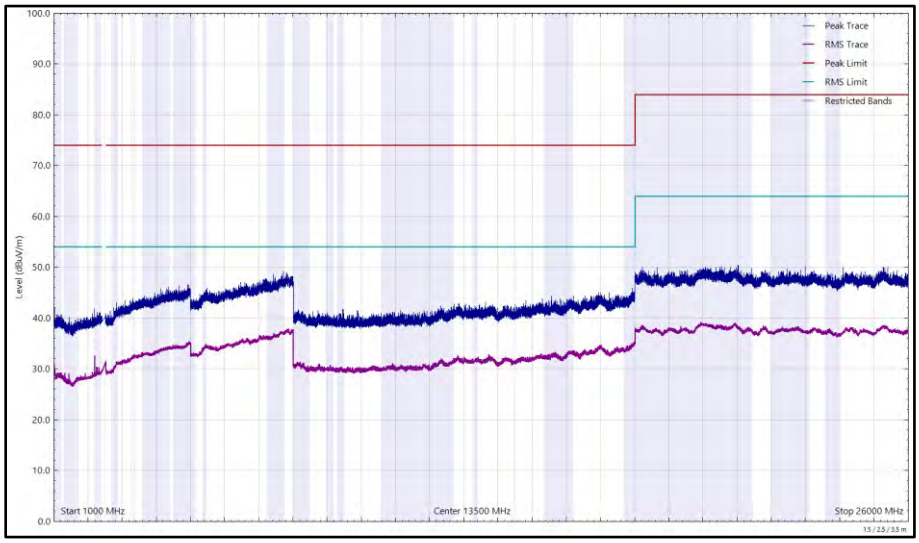

Figure 105 - 2472 MHz (CH13), 802.11b, Core 1, 1 GHz to 26 GHz, Horizontal

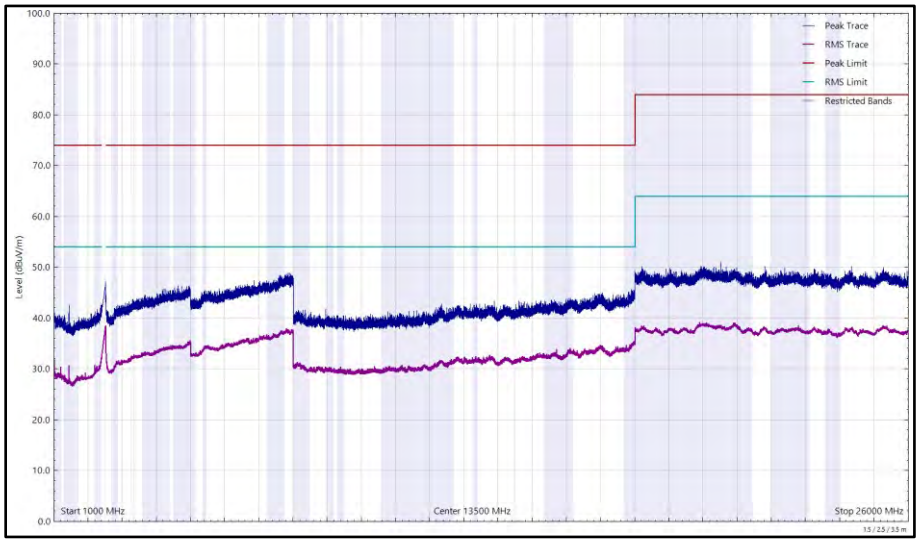

Figure 106 - 2472 MHz (CH13), 802.11b, Core 1, 1 GHz to 26 GHz, Vertical

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

Table 64 - 2412 MHz (CH1), 802.11g, Core 0, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

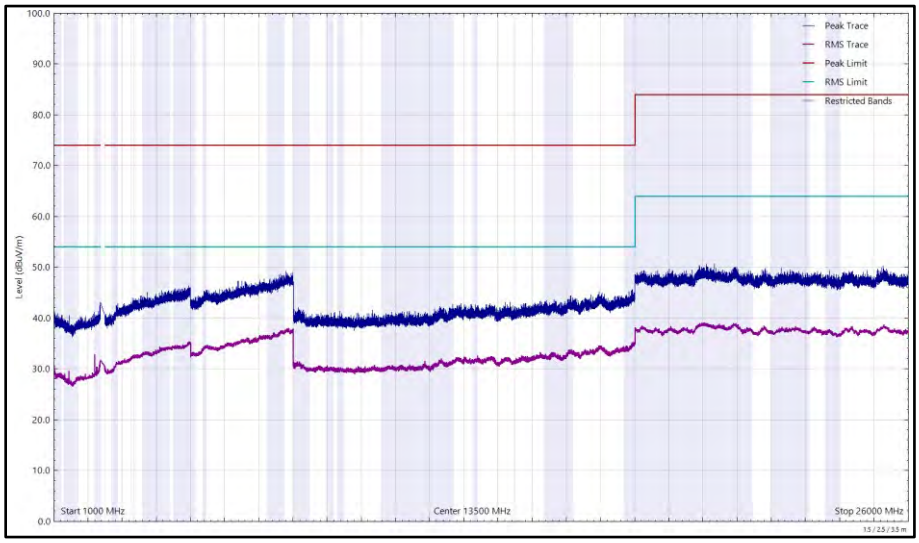

Figure 107 - 2412 MHz (CH1), 802.11g, Core 0, 1 GHz to 26 GHz, Horizontal

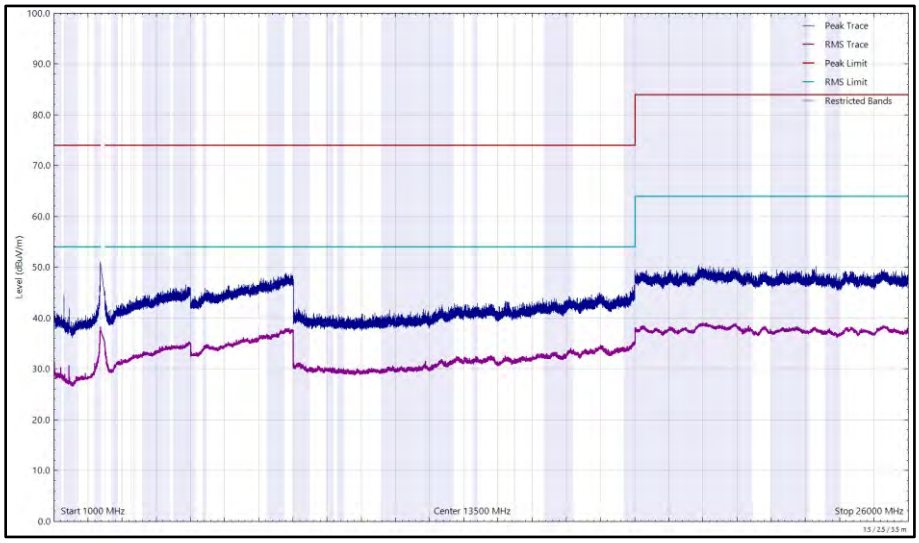

Figure 108 - 2412 MHz (CH1), 802.11g, Core 0, 1 GHz to 26 GHz, Vertical

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2379.408	37.17	54.00	-16.83	RMS	343	273	Vertical
2491.591	38.31	54.00	-15.69	RMS	342	372	Vertical
2491.675	56.60	74.00	-17.40	Peak	342	372	Vertical

Table 65 - 2442 MHz (CH7), 802.11g, Core 0, 30 MHz to 26 GHz

No other emissions found within 10 dB of the limit.

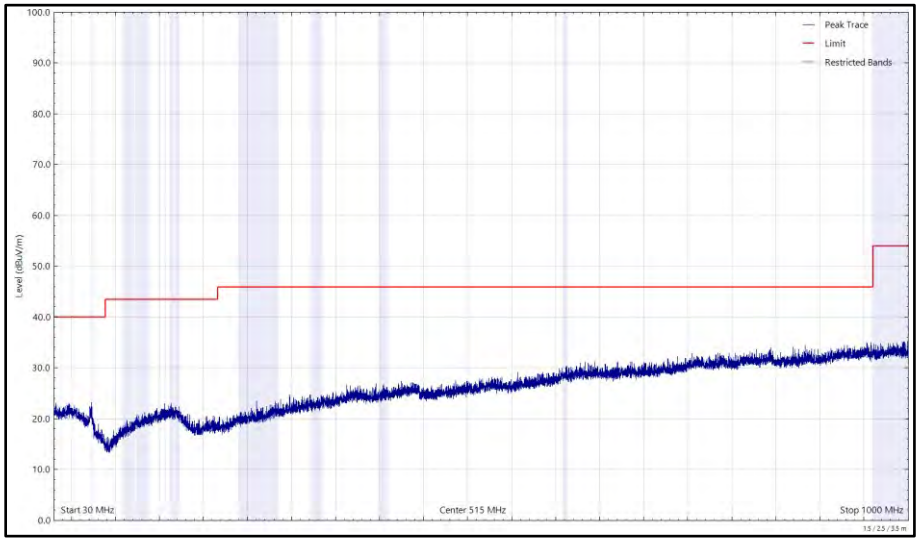

Figure 109 - 2442 MHz (CH7), 802.11g, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

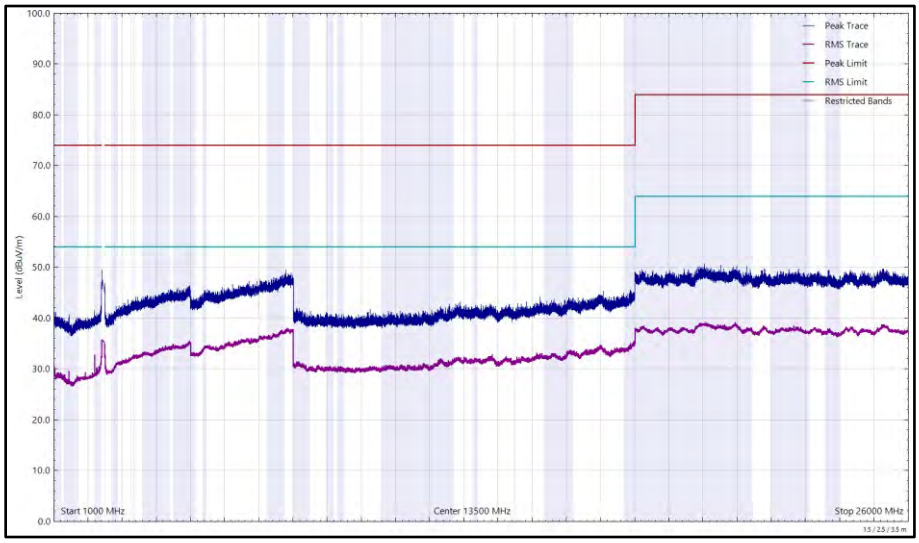

Figure 110 - 2442 MHz (CH7), 802.11g, Core 0, 1 GHz to 26 GHz, Horizontal

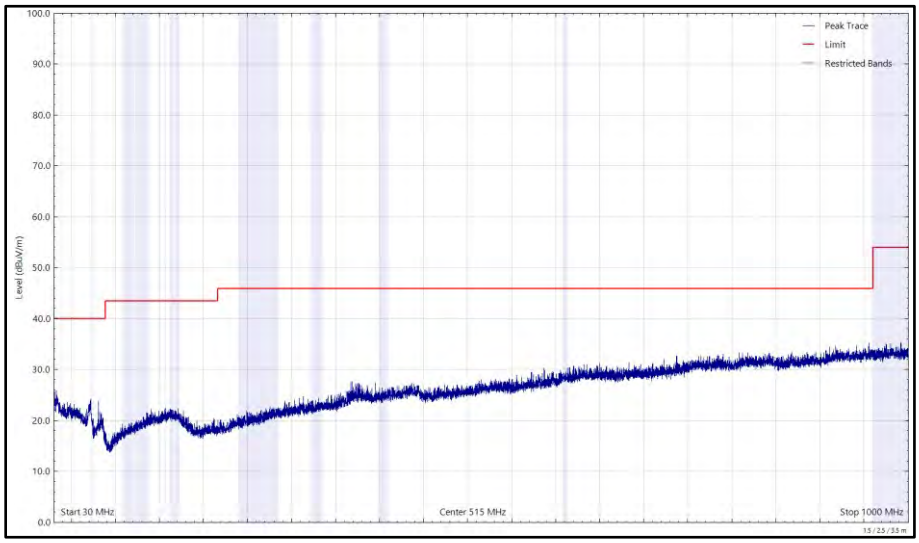

Figure 111 - 2442 MHz (CH7), 802.11g, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

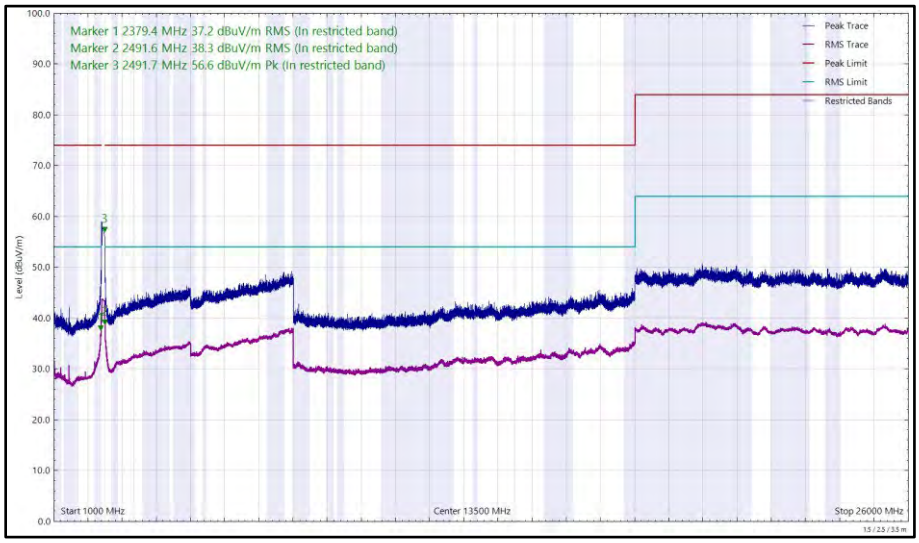

Figure 112 - 2442 MHz (CH7), 802.11g, Core 0, 1 GHz to 26 GHz, Vertical

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

Table 66 - 2472 MHz (CH13), 802.11g, Core 0, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

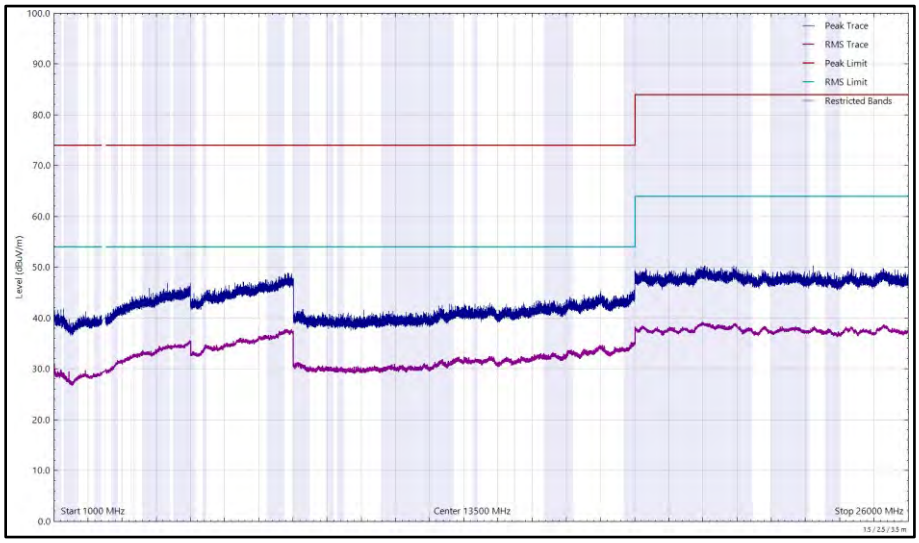

Figure 113 - 2472 MHz (CH13), 802.11g, Core 0, 1 GHz to 26 GHz, Horizontal

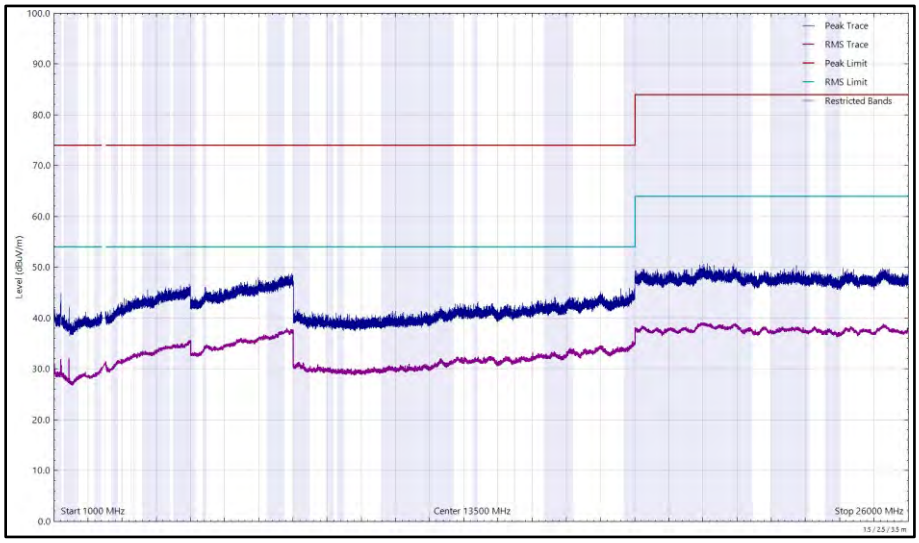

Figure 114 - 2472 MHz (CH13), 802.11g, Core 0, 1 GHz to 26 GHz, Vertical

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

Table 67 - 2412 MHz (CH1), 802.11g, Core 1, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

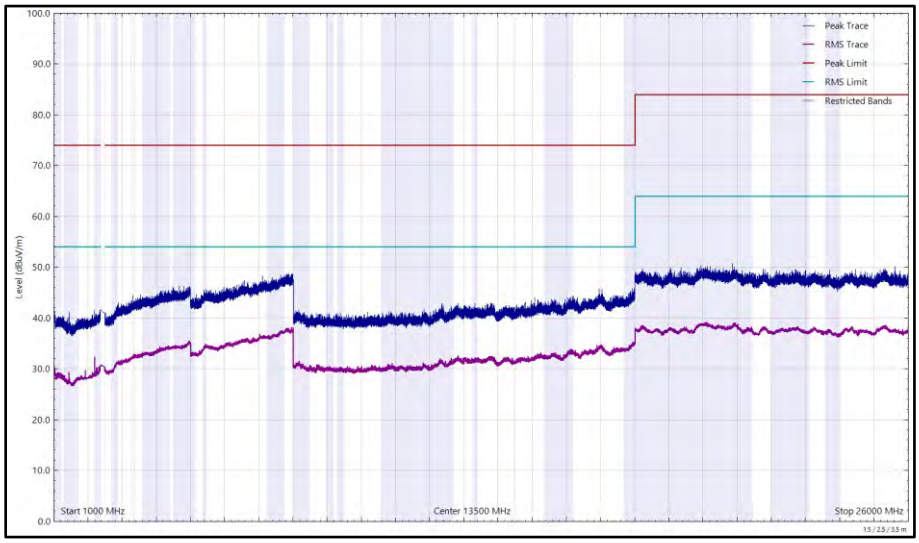

Figure 115 - 2412 MHz (CH1), 802.11g, Core 1, 1 GHz to 26 GHz, Horizontal

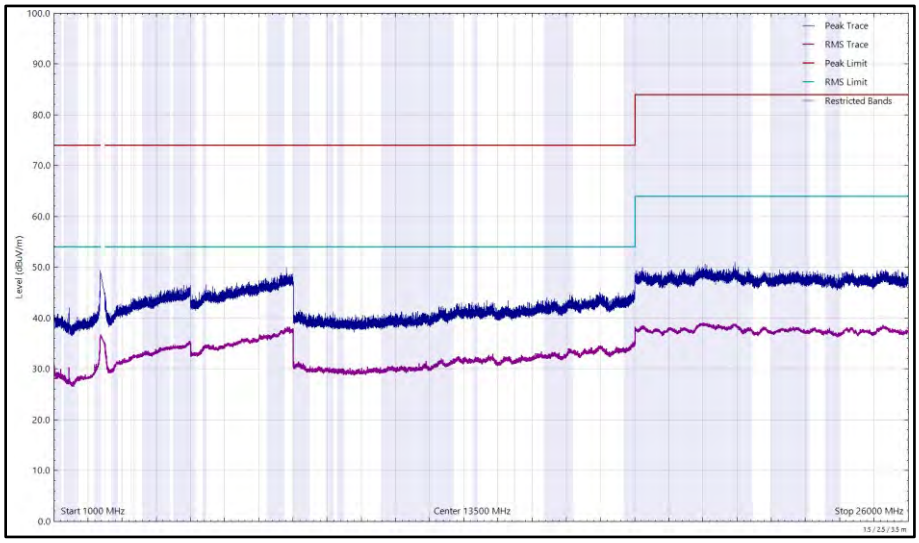

Figure 116 - 2412 MHz (CH1), 802.11g, Core 1, 1 GHz to 26 GHz, Vertical

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2490.620	38.16	54.00	-15.84	RMS	3	292	Vertical
2490.833	56.56	74.00	-17.44	Peak	3	292	Vertical

Table 68 - 2442 MHz (CH7), 802.11g, Core 1, 30 MHz to 26 GHz

No other emissions found within 10 dB of the limit.

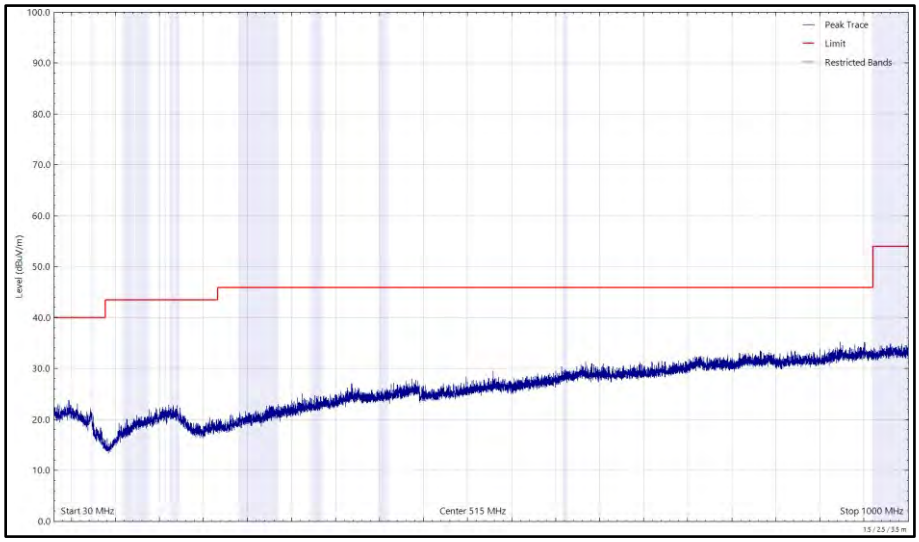

Figure 117 - 2442 MHz (CH7), 802.11g, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

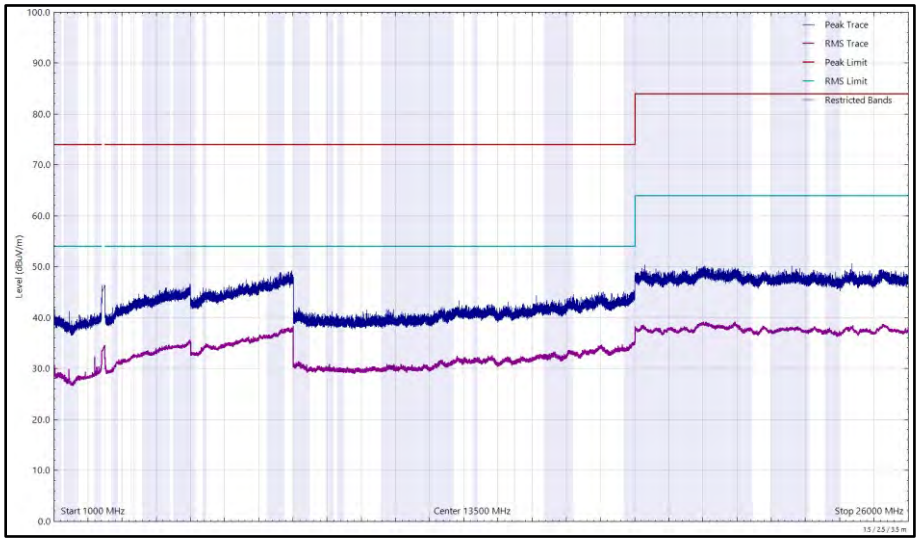

Figure 118 - 2442 MHz (CH7), 802.11g, Core 1, 1 GHz to 26 GHz, Horizontal

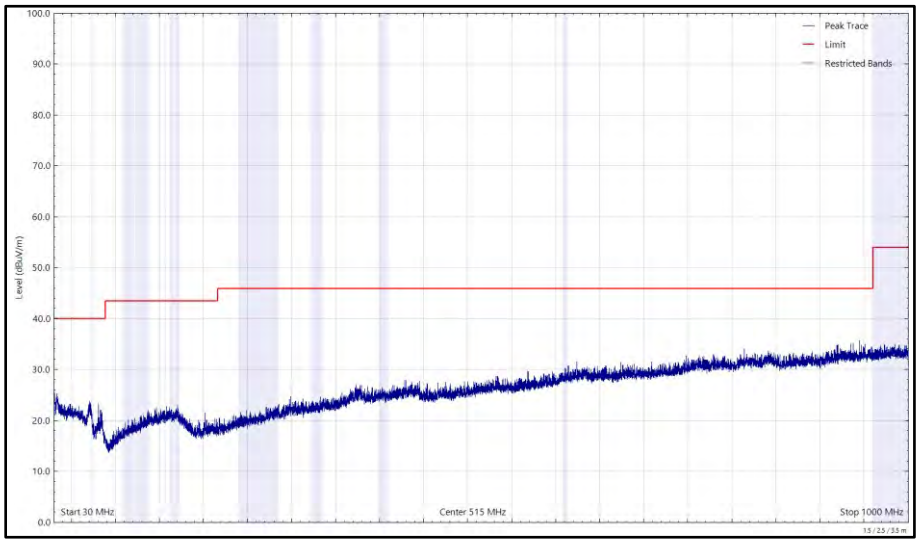

Figure 119 - 2442 MHz (CH7), 802.11g, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

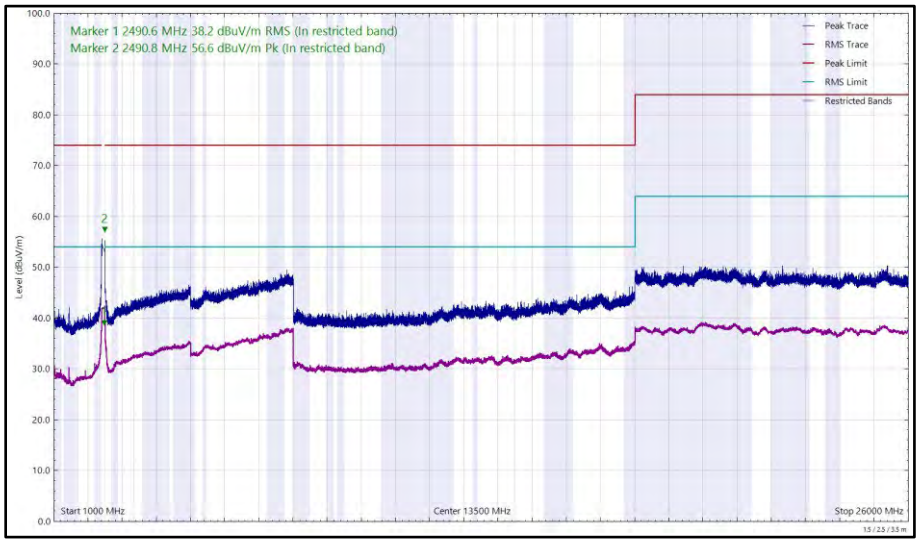

Figure 120 - 2442 MHz (CH7), 802.11g, Core 1, 1 GHz to 26 GHz, Vertical

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

Table 69 - 2472 MHz (CH13), 802.11g, Core 1, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

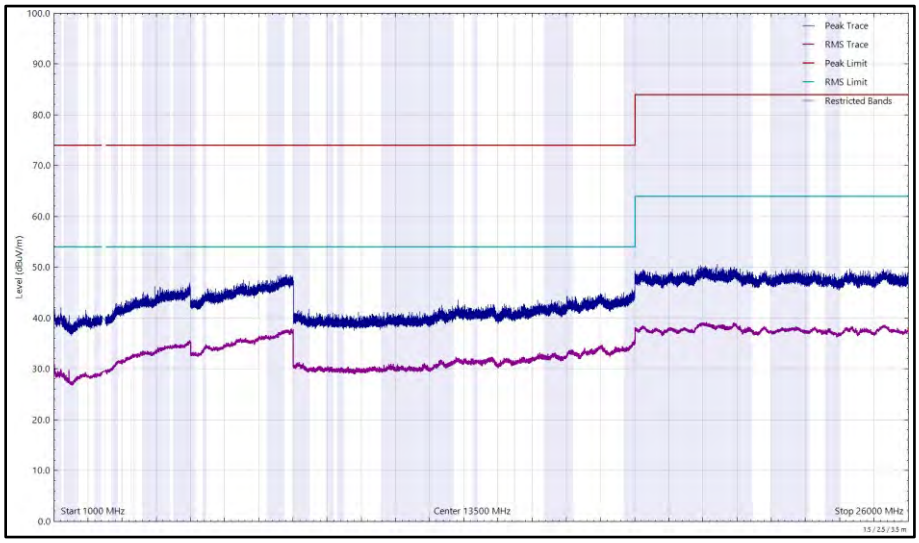

Figure 121 - 2472 MHz (CH13), 802.11g, Core 1, 1 GHz to 26 GHz, Horizontal

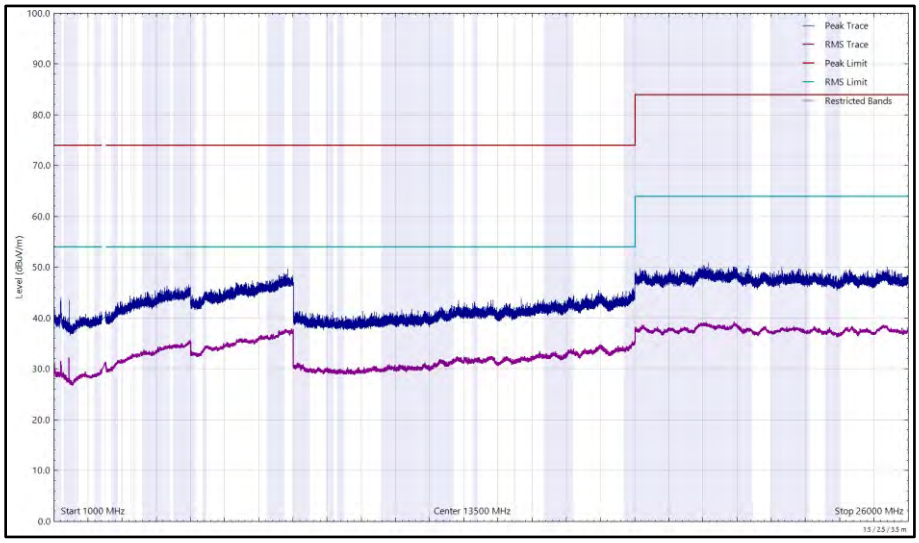

Figure 122 - 2472 MHz (CH13), 802.11g, Core 1, 1 GHz to 26 GHz, Vertical

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

Table 70 - 2412 MHz (CH1), HT20, CDD, Core 0 + Core 1, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

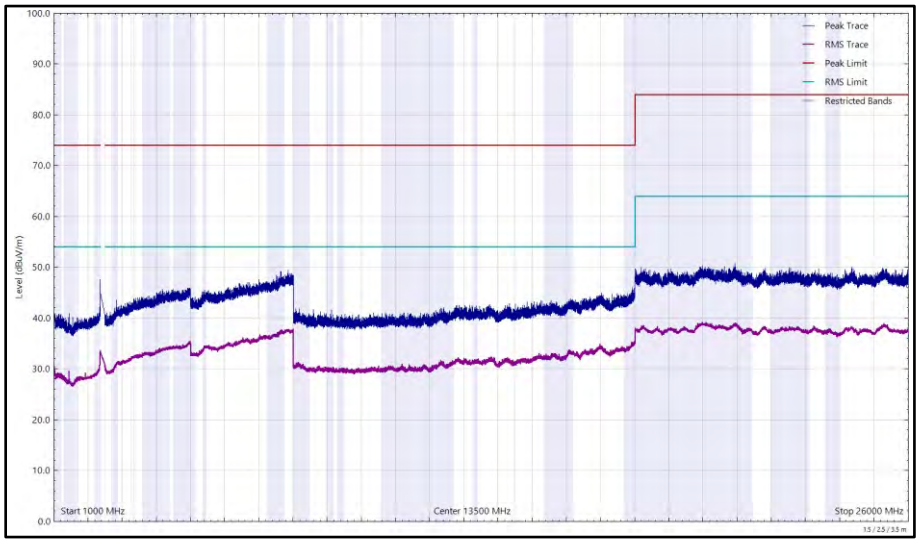

Figure 123 - 2412 MHz (CH1), HT20, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Horizontal

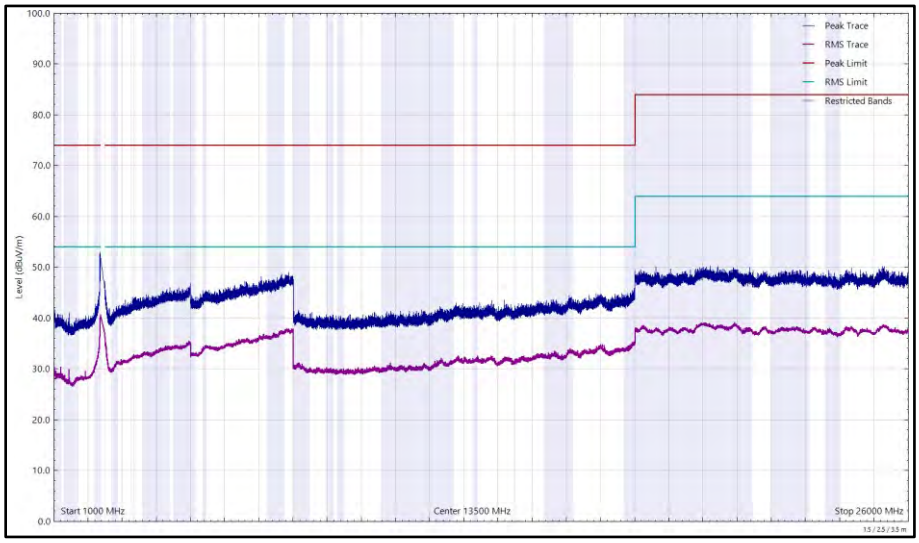

Figure 124 - 2412 MHz (CH1), HT20, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Vertical

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
2484.967	44.69	54.00	-9.31	RMS	7	395	Vertical

Table 71 - 2442 MHz (CH7), HT20, CDD, Core 0 + Core 1, 30 MHz to 26 GHz

No other emissions found within 10 dB of the limit.

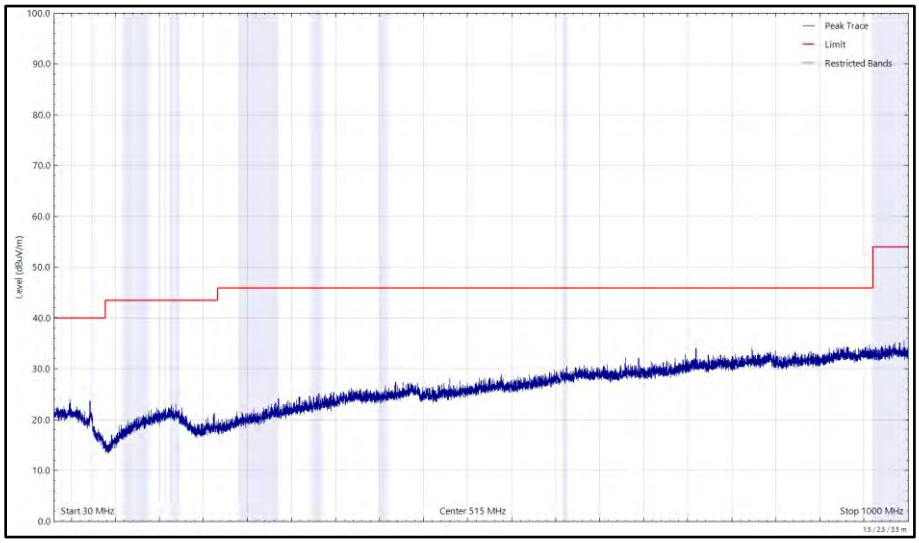

Figure 125 - 2442 MHz (CH7), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

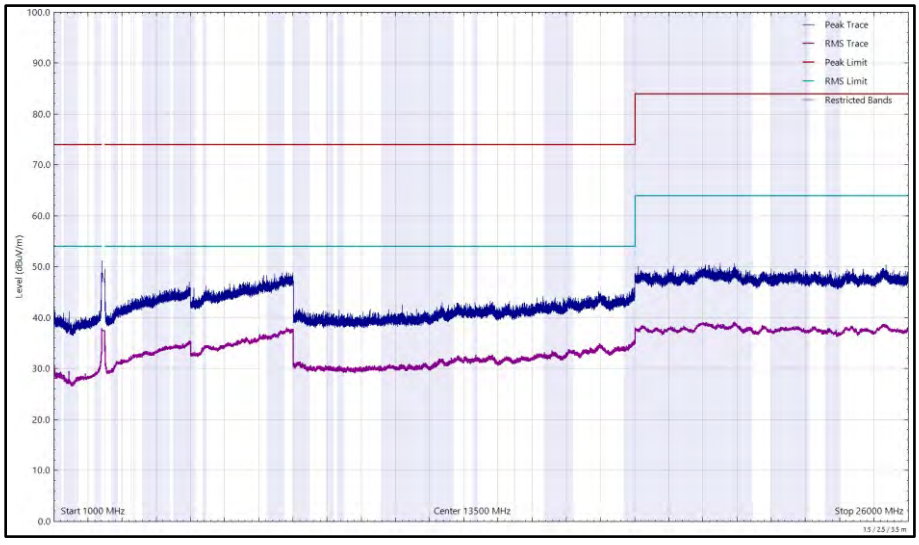

Figure 126 - 2442 MHz (CH7), HT20, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Horizontal

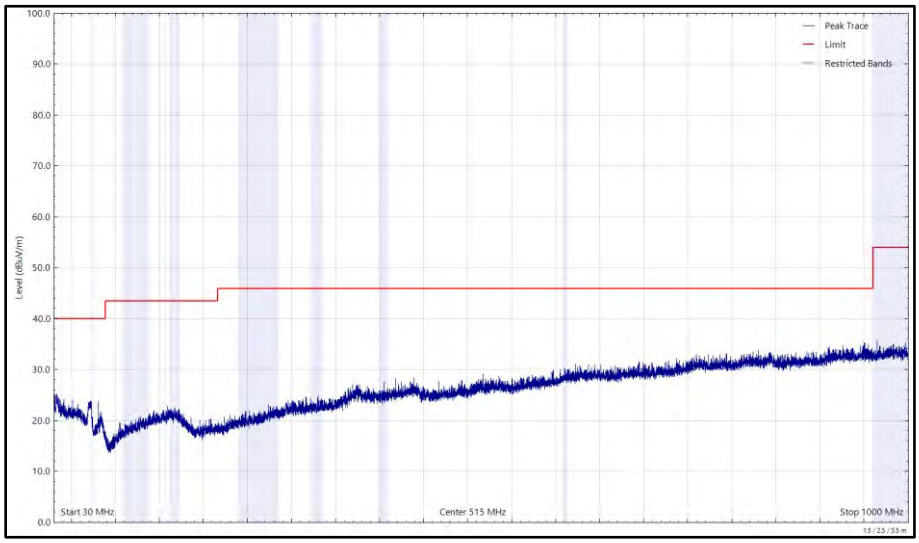

Figure 127 - 2442 MHz (CH7), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

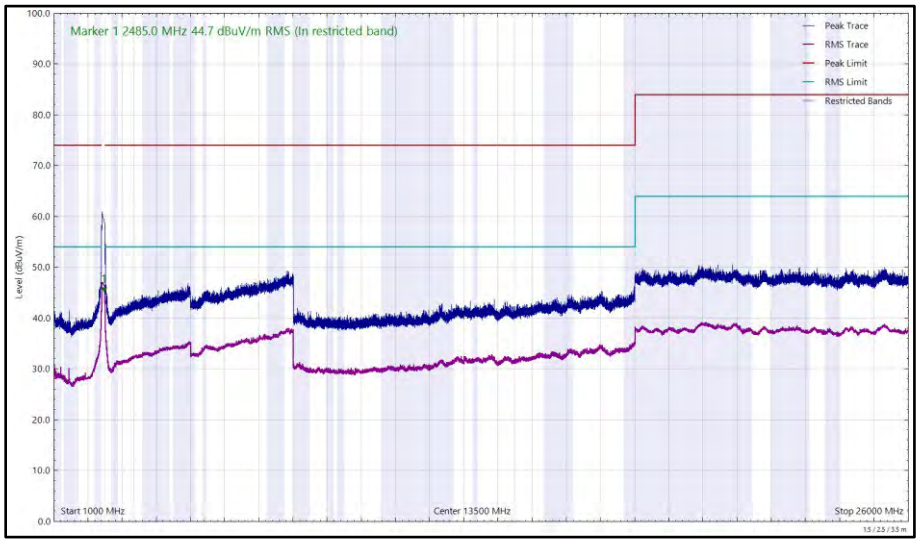

Figure 128 - 2442 MHz (CH7), HT20, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Vertical

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

Table 72 - 2472 MHz (CH13), HT20, CDD, Core 0 + Core 1, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

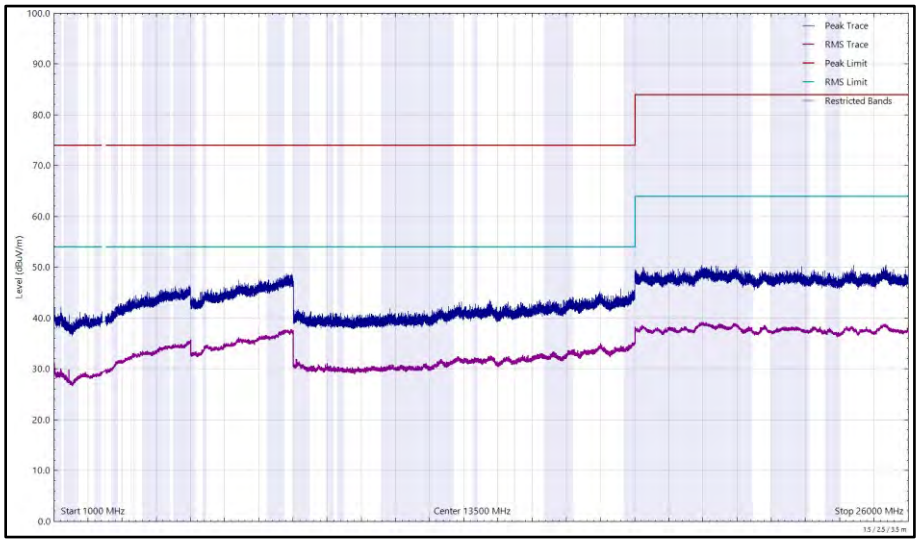

Figure 129 - 2472 MHz (CH13), HT20, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Horizontal

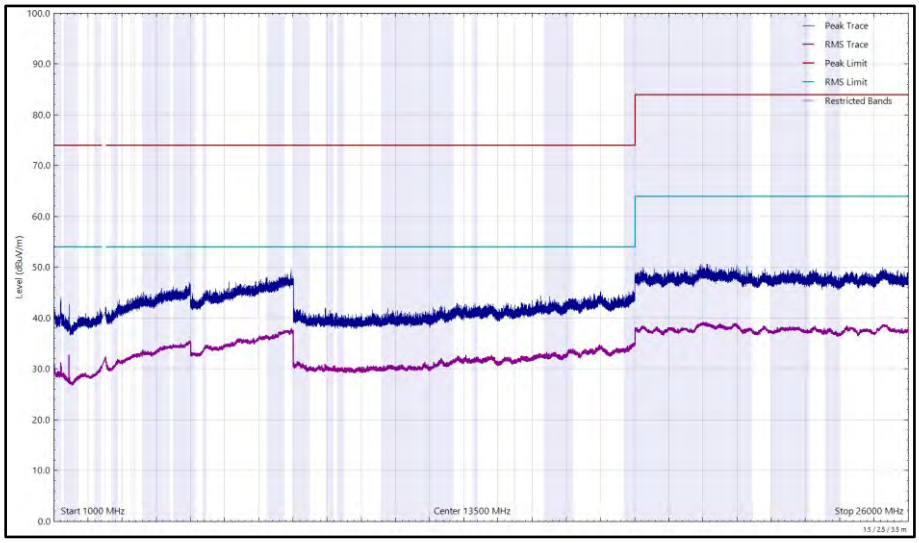

Figure 130 - 2472 MHz (CH13), HT20, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Vertical

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

Table 73 - 2412 MHz (CH1), HE20, RU26-0, CDD, Core 0 + Core 1, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

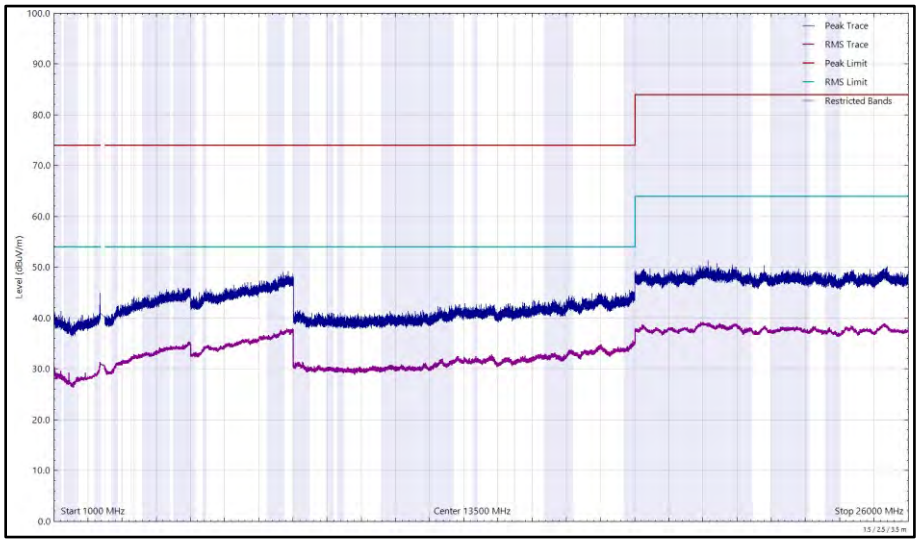

Figure 131 - 2412 MHz (CH1), HE20, RU26-0, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Horizontal

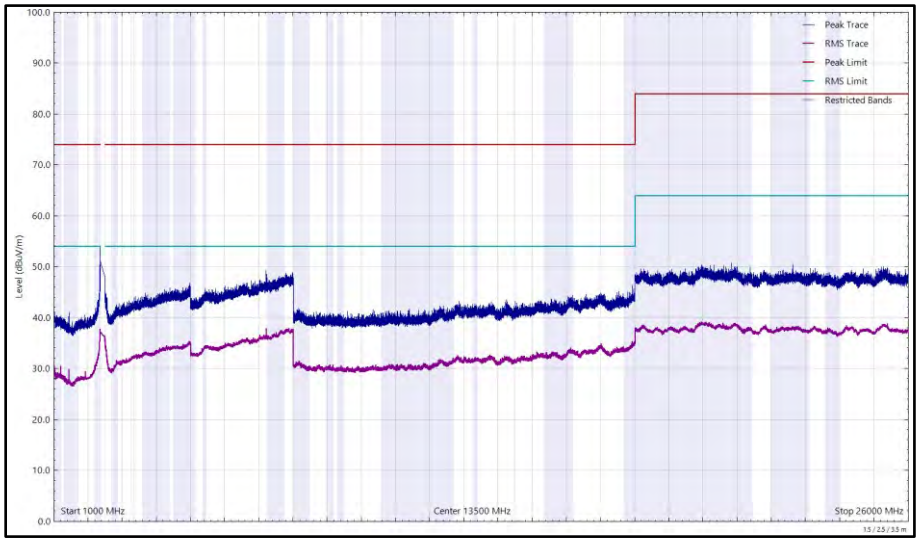

Figure 132 - 2412 MHz (CH1), HE20, RU26-0, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Vertical

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

Table 74 - 2442 MHz (CH7), HE20, RU26-0, CDD, Core 0 + Core 1, 30 MHz to 26 GHz

*No emissions found within 10 dB of the limit.

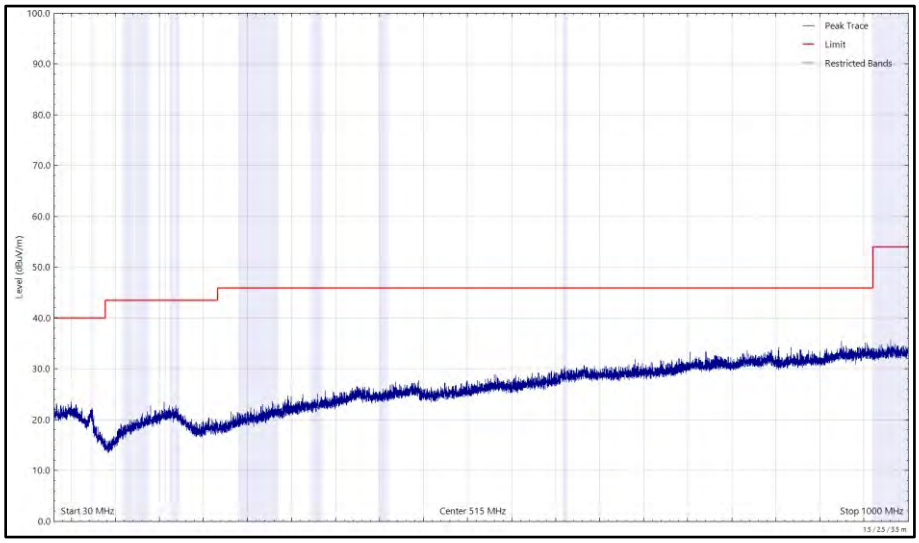

Figure 133 - 2442 MHz (CH7), HE20, RU26-0, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

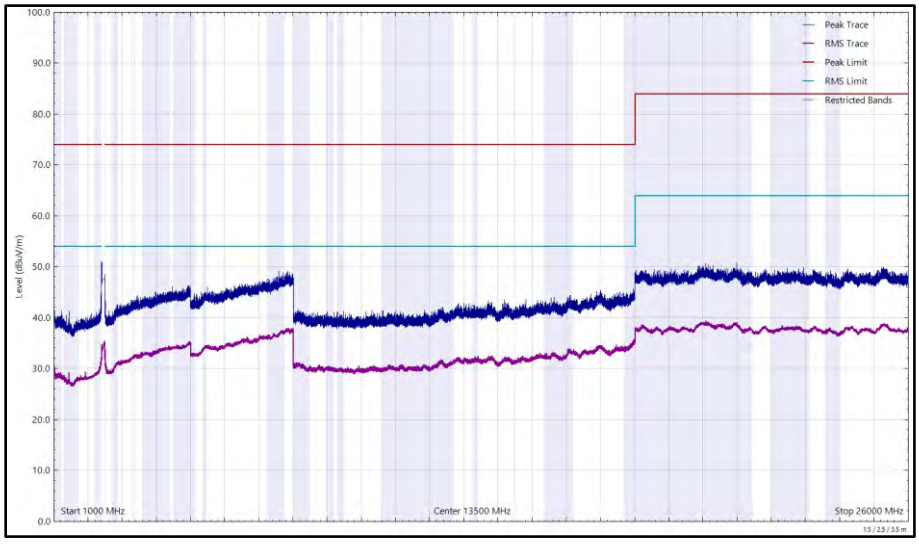

Figure 134 - 2442 MHz (CH7), HE20, RU26-0, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Horizontal

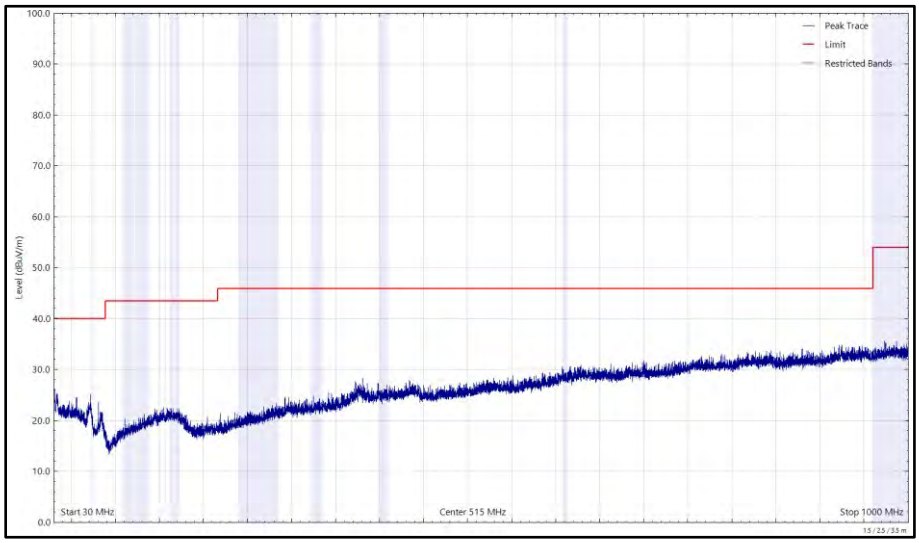

Figure 135 - 2442 MHz (CH7), HE20, RU26-0, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

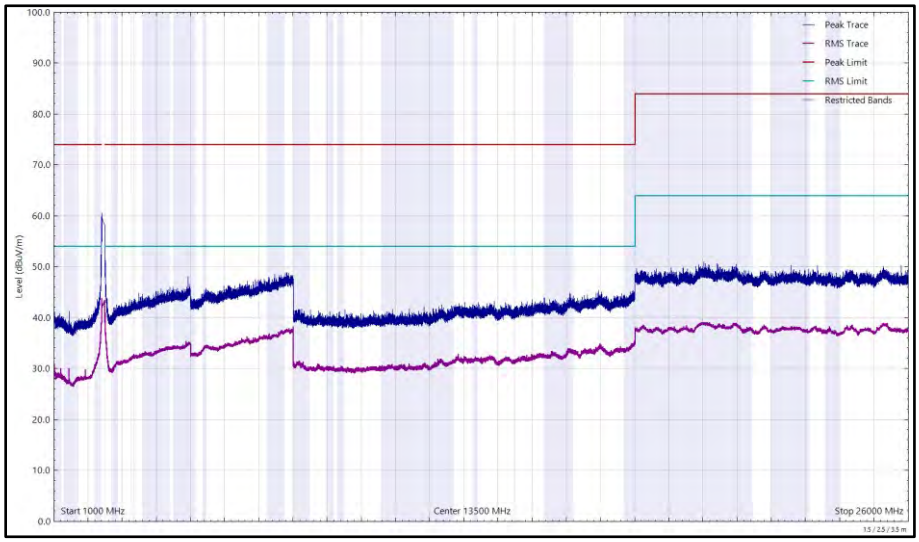

Figure 136 - 2442 MHz (CH7), HE20, RU26-0, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Vertical

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

Table 75 - 2472 MHz (CH13), HE20, RU26-0, CDD, Core 0 + Core 1, 1 GHz to 26 GHz

*No emissions found within 10 dB of the limit.

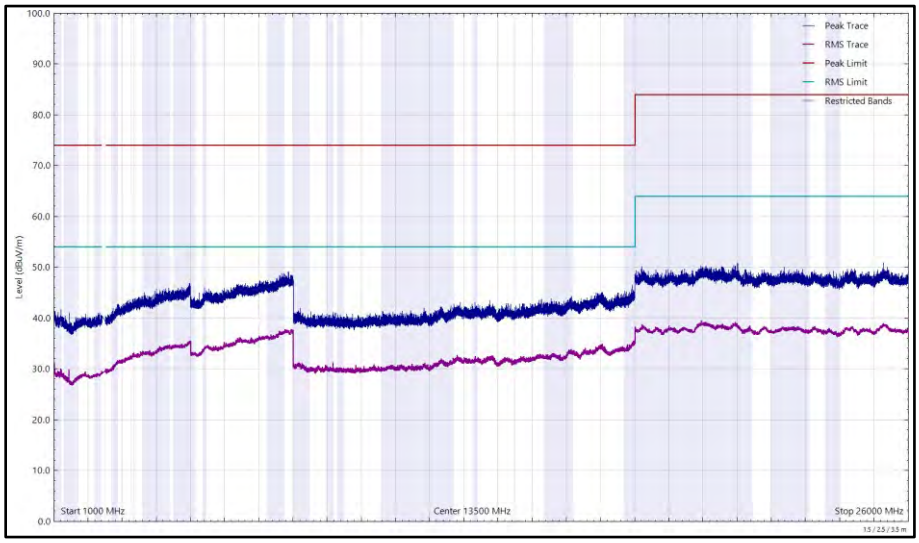

Figure 137 - 2472 MHz (CH13), HE20, RU26-0, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Horizontal

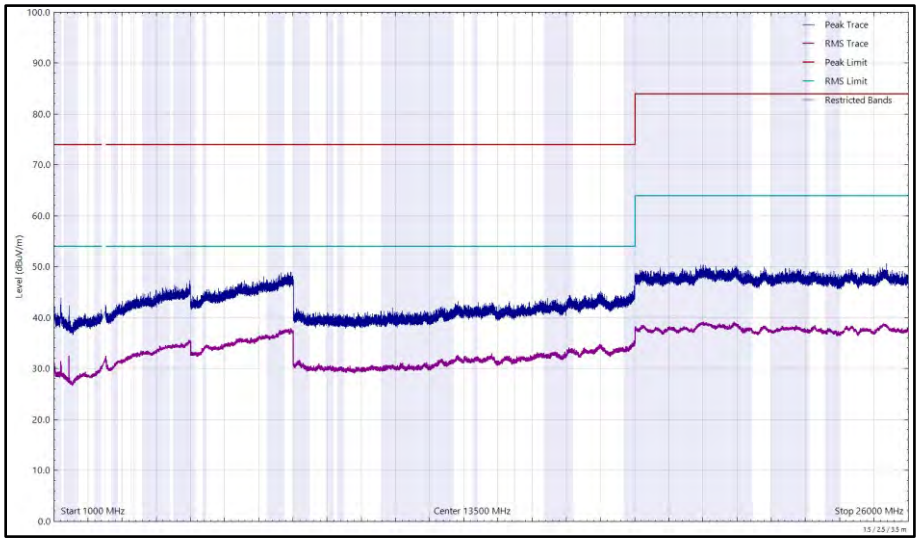

Figure 138 - 2472 MHz (CH13), HE20, RU26-0, CDD, Core 0 + Core 1, 1 GHz to 26 GHz, Vertical

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

ISED RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in RSS-GEN, clause 8.10, must also comply with the radiated emission limits specified in RSS-GEN clause 8.9.

2.5.8 Test Location and Test Equipment Used

This test was carried out in RF Chamber 14, RF Chamber 15 and RF Chamber 16.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Cable (18 GHz)	Rosenberger	LU7-071-1000	5096	12	24-Oct-2024
Emissions Software	TUV SUD	EmX V3.1.12	5125	-	Software
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5516	12	24-Oct-2024
EMI Test Receiver	Rohde & Schwarz	ESW44	5911	12	05-May-2024
EMI Test Receiver	Rohde & Schwarz	ESW44	5912	12	17-Apr-2024
Test Receiver	Rohde & Schwarz	ESW44	5914	12	24-Feb-2024
Cable (K Type 2m)	Junkosha	MWX241-02000KMSKMS/B	5935	12	05-Jun-2024
TRILOG Super Broadband Test Antenna	Schwarzbeck	VULB 9168	5944	24	03-Feb-2024
1500W (300V 12A) AC Power Supply	iTech	IT7324	5955	-	O/P Mon
1500W (300V 12A) AC Power Supply	iTech	IT7324	5956	-	O/P Mon
1500W (300V 12A) AC Power Supply	iTech	IT7324	5957	-	O/P Mon
5m Semi-Anechoic Chamber (Dual-Axis)	Albatross Projects	RF Chamber 14	5958	36	26-Apr-2025
Compact Antenna Mast	Maturo Gmbh	CAM4.0-P	5959	-	TU
Mast & Turntable Controller	Maturo Gmbh	FCU3.0	5960	-	TU
Tilt Antenna Mast	Maturo Gmbh	BAM4.5-P	5961	-	TU
Turntable	Maturo Gmbh	TT1.5SI	5962	-	TU
5m Semi-Anechoic Chamber (Dual-Axis), Chamber 15	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
3m Semi-Anechoic Chamber, Chamber16	Albatross Projects	RF Chamber 16	5972	36	24-May-2025
Mast & Turntable Controller	Maturo Gmbh	FCU3.0	5973	-	TU
Tilt Antenna Mast	Maturo Gmbh	BAM4.5-P	5974	-	TU
Turntable	Maturo Gmbh	TT1.5SI	5975	-	TU
Cable (SMA to SMA 6.5m)	Junkosha	MWX221-06500AMSAMS/B	6003	12	05-Jun-2024
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6007	12	05-Jun-2024
Cable (N to N 7m)	Junkosha	MWX221-07000NMSNMS/B	6016	12	05-Jun-2024
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6140	12	26-Aug-2024

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6141	12	26-Aug-2024
Digital Multimeter	Fluke	115	6145	12	15-Jun-2024
Digital Multimeter	Fluke	115	6146	12	15-Jun-2024
Digital Multimeter	Fluke	115	6147	12	16-Jun-2024
Humidity & Temperature meter	R.S Components	1364	6148	12	21-Jul-2024
Humidity & Temperature meter	R.S Components	1364	6149	12	07-Jul-2024
Double Ridge Active Horn Antenna (18-40 GHz)	Com-Power	AHA-840	6187	24	02-Jun-2024
SAC Switch Unit	TUV SUD	TUV_SSU_001	6191	12	12-Dec-2023
Pre Amp 8 - 18 GHz	Wright Technologies	APS06 0061	6200	12	14-Jul-2024
Attenuator 4dB	Pasternack	PE7074-4	6203	24	16-Jul-2024
EMI Test Receiver	Rohde & Schwarz	ESW44	6294	12	03-Nov-2023
USB Spectrum Analyser	Signal Hound	SA124B	6297	-	TU
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6315	12	04-Feb-2024
Cable (SMA to SMA 8m)	Junkosha	MWX221-08000AMSAMS/B	6318	12	04-Feb-2024
Humidity and Temperature Meter	R.S Components	1364	6346	12	28-Feb-2024
SAC Switch Unit	TUV SUD	TUV_SSU_001	6349	12	31-Mar-2024
8 GHz High Pass Filter	Wainwright	WHKX 7150 8000 18000 50SS	6427	12	24-Jul-2024
DRG Horn Antenna	Schwarzbeck	HWRD750	6458	12	09-Jul-2024
Humidity and Temperature Meter	R.S Components	1364	6486	12	18-Apr-2024
Coax cable sma to sma with N-Type adapter	TUV SUD	N/A	6637	12	24-Jul-2024

Table 76

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

2.6 Power Spectral Density

2.6.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (e)
ISED RSS-247, Clause 5.2
ISED RSS-GEN, Clause 6.12

2.6.2 Equipment Under Test and Modification State

A3114, S/N: F913QPYWR6 - Modification State 0
A3114, S/N: FWT64GMGVG - Modification State 0

2.6.3 Date of Test

20-October-2023 to 24-October-2023

2.6.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.10.5.

Where the EUT duty cycle was < 98 % and repeatable within 2 %, the spectrum analyser was set to trace (power) averaging and a duty cycle correction was added as calculated in the result tables below (Method AVGPSD-2).

MIMO output port summing was performed in accordance with KDB 662911 D01 E)2)b).

2.6.5 Environmental Conditions

Ambient Temperature	22.4 °C
Relative Humidity	51.5 - 55.5 %

2.6.6 Test Results

2.4 GHz WLAN

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	-		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11b	Duty Cycle (%):	99.4
Data Rate:	1 Mbps	DCCF (dB):	0.03
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	100.0	2.22	-	-	-	-	8.00	-5.78
2442	100.0	2.08	-	-	-	-	8.00	-5.92
2472	100.0	-0.95	-	-	-	-	8.00	-8.95

Table 77 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	-		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11g	Duty Cycle (%):	97.5
Data Rate:	12 Mbps	DCCF (dB):	0.11
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	100.0	-2.18	-	-	-	-	8.00	-10.18
2442	100.0	4.67	-	-	-	-	8.00	-3.33
2472	100.0	-13.12	-	-	-	-	8.00	-21.12

Table 78 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	-		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11n HT20	Duty Cycle (%):	96.5
Modulation Coding Scheme:	MCS2	DCCF (dB):	0.16
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	100.0	-3.37	-	-	-	-	8.00	-11.37
2442	100.0	4.33	-	-	-	-	8.00	-3.67
2472	100.0	-13.00	-	-	-	-	8.00	-21.00

Table 79 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	-		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11ax HE20 SU	Duty Cycle (%):	95.7
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	0.19
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	100.0	-5.80	-	-	-	-	8.00	-13.80
2442	100.0	3.41	-	-	-	-	8.00	-4.59
2472	100.0	-16.21	-	-	-	-	8.00	-24.21

Table 80 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	-		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11ax HE20 RU26	Duty Cycle (%):	96.4
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	0.16
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	100.0	1.83	-	-	-	-	8.00	-6.17
2442	100.0	1.66	-	-	-	-	8.00	-6.34
2472	100.0	-17.38	-	-	-	-	8.00	-25.38

Table 81 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	-		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11ax HE20 RU52	Duty Cycle (%):	96.3
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	0.16
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	100.0	2.13	-	-	-	-	8.00	-5.87
2442	100.0	1.85	-	-	-	-	8.00	-6.15
2472	100.0	-17.62	-	-	-	-	8.00	-25.62

Table 82 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	-		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11ax HE20 RU106	Duty Cycle (%):	97.7
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	0.10
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	100.0	-0.83	-	-	-	-	8.00	-8.83
2442	100.0	2.16	-	-	-	-	8.00	-5.84
2472	100.0	-19.36	-	-	-	-	8.00	-27.36

Table 83 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	662911 D01 v02r01 E)2)b)		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11n HT20	Duty Cycle (%):	96.4
Modulation Coding Scheme:	MCS2	DCCF (dB):	0.16
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)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	3.0	-18.20	-16.64	-	-	-14.34	5.35	-19.69
2442	3.0	-8.93	-8.15	-	-	-5.51	5.35	-10.86
2472	3.0	-29.06	-28.07	-	-	-25.52	5.35	-30.87

Table 84 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	662911 D01 v02r01 E)2)b)		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11ax HE20 SU	Duty Cycle (%):	95.7
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	0.19
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)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	3.0	-19.95	-20.14	-	-	-17.03	5.35	-22.38
2437	3.0	-9.11	-9.01	-	-	-6.05	5.35	-11.40
2472	3.0	-30.71	-31.43	-	-	-28.04	5.35	-33.39

Table 85 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	662911 D01 v02r01 E)2)b)		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11ax HE20 RU26	Duty Cycle (%):	96.5
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	0.15
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)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	3.0	-11.63	-11.79	-	-	-8.70	5.35	-14.05
2442	3.0	-11.66	-12.33	-	-	-8.97	5.35	-14.32
2472	3.0	-32.88	-32.99	-	-	-29.93	5.35	-35.28

Table 86 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	662911 D01 v02r01 E)2)b)		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11ax HE20 RU52	Duty Cycle (%):	96.3
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	0.16
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)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	3.0	-9.52	-9.73	-	-	-6.61	5.35	-11.96
2442	3.0	-8.56	-10.86	-	-	-6.55	5.35	-11.90
2472	3.0	-31.84	-31.61	-	-	-28.71	5.35	-34.06

Table 87 - Maximum Power Spectral Density Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 5.2 b)	Test Method(s):	C63.10 11.10.5
Additional Reference(s):	662911 D01 v02r01 E)2)b)		
Note(s):	DCCF was added to the spectrum analyser reference level offset.		

DUT Configuration			
Mode:	802.11ax HE20 RU106	Duty Cycle (%):	97.7
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	0.10
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)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	∑		
2412	3.0	-14.13	-14.06	-	-	-11.08	5.35	-16.43
2442	3.0	-10.86	-10.88	-	-	-7.86	5.35	-13.21
2472	3.0	-33.82	-33.66	-	-	-30.73	5.35	-36.08

Table 88 - Maximum Power Spectral Density Results

FCC 47 CFR Part 15, Limit Clause 15.247 (e)

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

ISED RSS-247, Limit Clause 5.2(b)

The transmitter 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.

2.6.7 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
1500VA AC Power Supply	iTech	IT7324	5907	-	O/P Mon
MXA Signal Analyser	Keysight Technologies	N9020B	5919	24	13-Mar-2024
Digital Multimeter	Fluke	115	6145	12	15-Jun-2024
Humidity & Temperature meter	R.S Components	1364	6149	12	07-Jul-2024
MXA Signal Analyser	Keysight Technologies	N9020B	6417	24	26-Feb-2025
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6518	12	26-May-2024
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6519	12	17-May-2024
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6529	12	09-Aug-2024
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6530	12	26-May-2024
AC Programmable Power Supply	iTech	IT7324	6662	-	O/P Mon

Table 89

O/P Mon – Output Monitored using calibrated equipment

3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Restricted Band Edges	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Emission Bandwidth	± 545.65 kHz
Maximum Conducted Output Power	± 1.38 dB
Authorised Band Edges	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Spurious Radiated Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Power Spectral Density	± 1.49 dB

Table 90

Measurement Uncertainty Decision Rule – Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2021, Clause 4.4.3 (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.