FCC and ISED Test Report

Apple Inc
Model: A2874

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

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

FCC ID: BCGA2874 IC: 579C-A2874

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Document 75957630-25 Issue 01

SIGNATURE			
Ryan Henley			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Ryan Henley	Business Development Manager	Authorised Signatory	18 April 2023

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

ENGINEERING STATEMENT

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

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Report Generation	Lauren Walters	18 April 2023	

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

ISED Accreditation
12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

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

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Contents

1 Report Summary

1.1 Report Modification Record

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

Issue	Description of Change	Date of Issue
1	First Issue	18-April-2023

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
Model Number(s)	A2874
Serial Number(s)	PNYQPYL91C and K9XHGCT7D9
Hardware Version(s)	REV 1.0
Software Version(s)	22E31550w and 22E31550w
Number of Samples Tested	2
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	12-January-2023
Finish of Test	19-March-2023
Name of Engineer(s)	Thomas Biddlecombe, Ioan-Alexandru Bogatu, Akil Rajendran Bhaskaran Nair, Nicolae Mihailiuc, Morsalin Hossain, James Woods, Colin Brain, Thomas Randall, Ian Hart, Danial Shafique and Elliot Callender
Related Document(s)	ANSI C63.10 (2020) ANSI C63.10 (2013) KDB 662911 D01 v02r01 ANSI C63.4 (2014)

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	3.3	8.10	Restricted Band Edges	Pass	
2.2	15.247 (a)(2)	5.2	6.7	Emission Bandwidth	Pass	
2.3	15.247 (b)	5.4	6.12	Maximum Conducted Output Power	Pass	
2.4	15.247 (d)	5.5	-	Authorised Band Edges	Pass	
2.5	15.209 and 15.247 (d)	3.3 and 5.5	6.13 and 8.9	Spurious Radiated Emissions	Pass	
2.6	15.247 (e)	5.2	6.12	Power Spectral Density	Pass	

Table 2

1.4 Product Information

1.4.1 Technical Description

The equipment under test (EUT) was an Apple desktop computer with Bluetooth® Low Energy, Thread and IEEE 802.11 a/b/g/n/ac/ax Wi-Fi capabilities in the 2.4 GHz, 5 GHz and 6 GHz bands.

1.4.2 Test Modes

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

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

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

SISO Modes (Core 1):

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

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

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

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

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	2.13	1.27
Core 1	2400 to 2480	3.60	1.32

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: A2874, Serial Number: K9XHGCT7D9			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2874, Serial Number: PNYQPYL91C			
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	Colin Brain, Thomas Randall, Ian Hart, Danial Shafique, Elliot Callender, Ioan-Alexandru Bogatu and James Woods	UKAS
Emission Bandwidth	Thomas Biddlecombe	UKAS
Maximum Conducted Output Power	Thomas Biddlecombe	UKAS
Authorised Band Edges	Colin Brain, Thomas Randall, Ian Hart, Danial Shafique, Elliot Callender, Ioan-Alexandru Bogatu and James Woods	UKAS
Spurious Radiated Emissions	Ioan-Alexandru Bogatu, Akil Rajendran Bhaskaran Nair, Nicolae Mihailiuc, Morsalin Hossain and James Woods	UKAS
Power Spectral Density	Thomas Biddlecombe	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

A2874, S/N: PNYQPYL91C - Modification State 0

2.1.3 Date of Test

12-January-2023 to 01-March-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	21.2 - 24.4 °C
Relative Humidity	32.9 - 46.0 %

2.1.6 Test Results

2.4 GHz WLAN

20 MHz Bandwidth - 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	58.36	50.43
802.11g	24 Mbps	-	-	2412	2390	66.00	51.27
802.11n HT20	MCS4	-	-	2412	2390	66.90	51.46
802.11ax HE20	MCS4x1	SU	-	2412	2390	66.18	51.39
802.11ax HE20	MCS9x1	106	53	2412	2390	67.87	46.66
802.11b	1 Mbps	-	-	2462	2483.5	58.45	50.14
802.11b	1 Mbps	-	-	2467	2483.5	59.38	51.18
802.11b	1 Mbps	-	-	2472	2483.5	58.05	51.02
802.11g	12 Mbps	-	-	2462	2483.5	65.33	51.30
802.11g	24 Mbps	-	-	2467	2483.5	64.72	51.32
802.11g	12 Mbps	-	-	2472	2483.5	66.07	51.38
802.11n HT20	MCS2	-	-	2462	2483.5	64.85	51.27
802.11n HT20	MCS2	-	-	2467	2483.5	62.89	51.28
802.11n HT20	MCS2	-	-	2472	2483.5	64.50	51.20
802.11ax HE20	MCS4x1	SU	-	2462	2483.5	65.30	51.08
802.11ax HE20	MCS9x1	106	54	2462	2483.5	68.68	48.97
802.11ax HE20	MCS4x1	SU	-	2467	2483.5	64.51	51.40
802.11ax HE20	MCS9x1	106	53	2467	2483.5	69.34	49.89
802.11ax HE20	MCS9x1	SU	-	2472	2483.5	66.05	51.38
802.11ax HE20	MCS9x1	106	54	2472	2483.5	69.39	49.56

Table 6 - SISO Restricted Band Edge Results

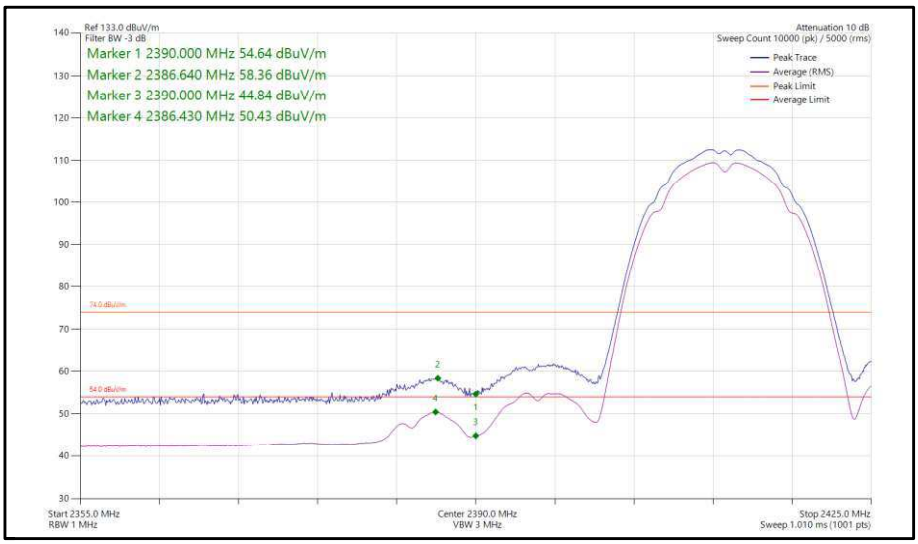

**Figure 1 - 802.11b, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2390 MHz**

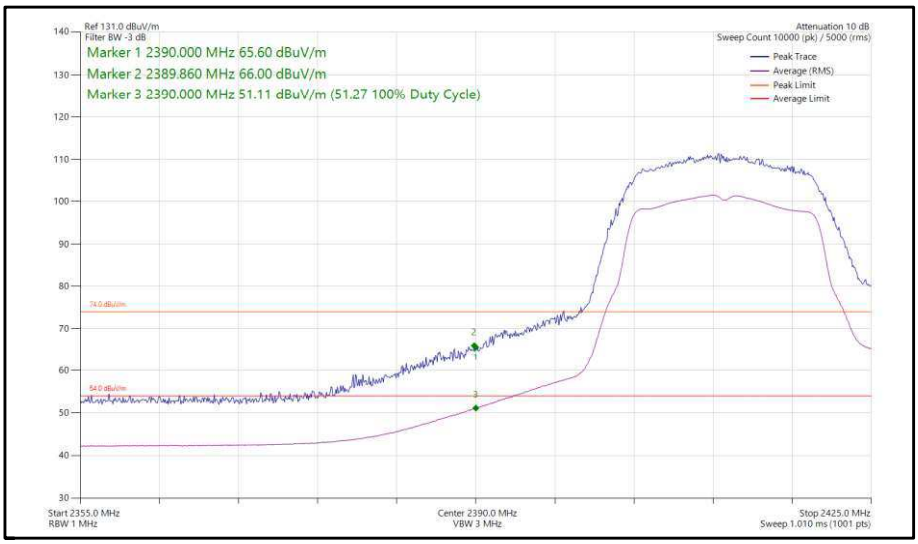

**Figure 2 - 802.11g, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2390 MHz**

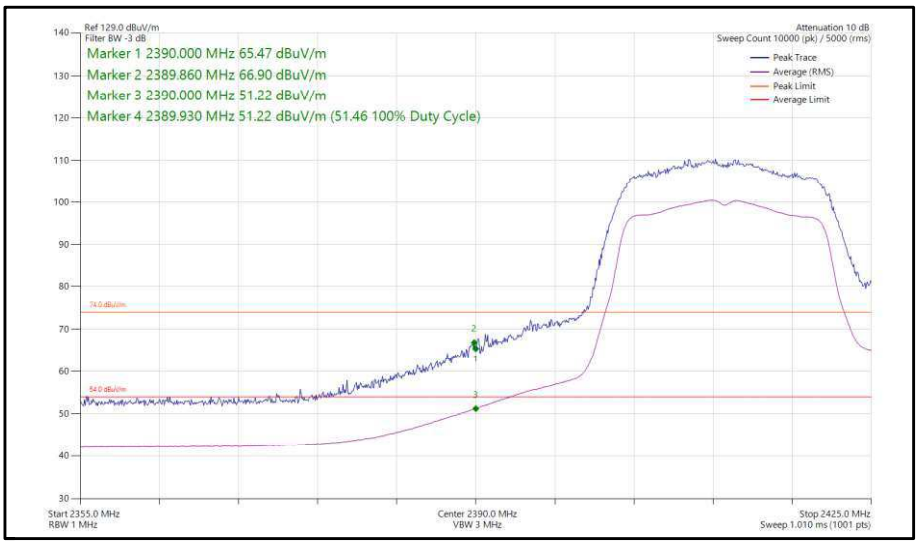

**Figure 3 - 802.11n, HT20, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2390 MHz**

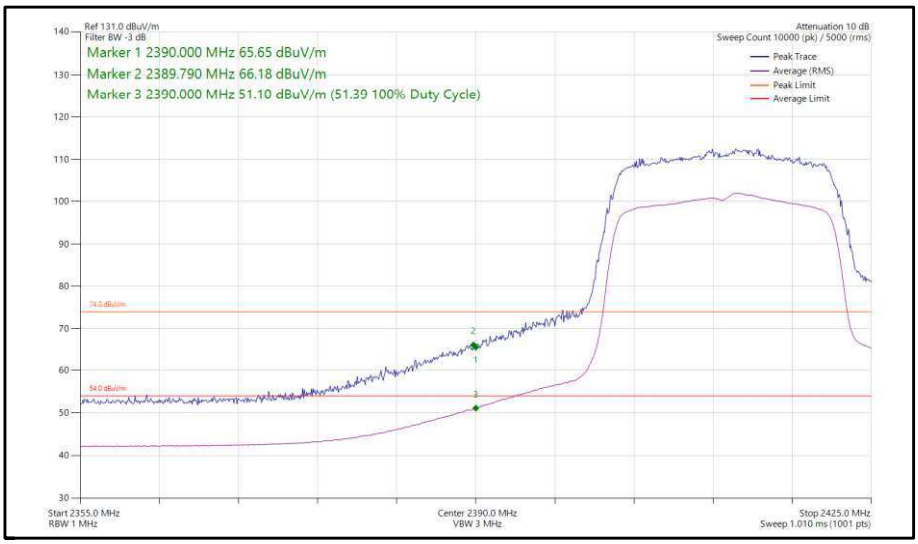

**Figure 4 - 802.11ax, HE20, SU, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2390 MHz**

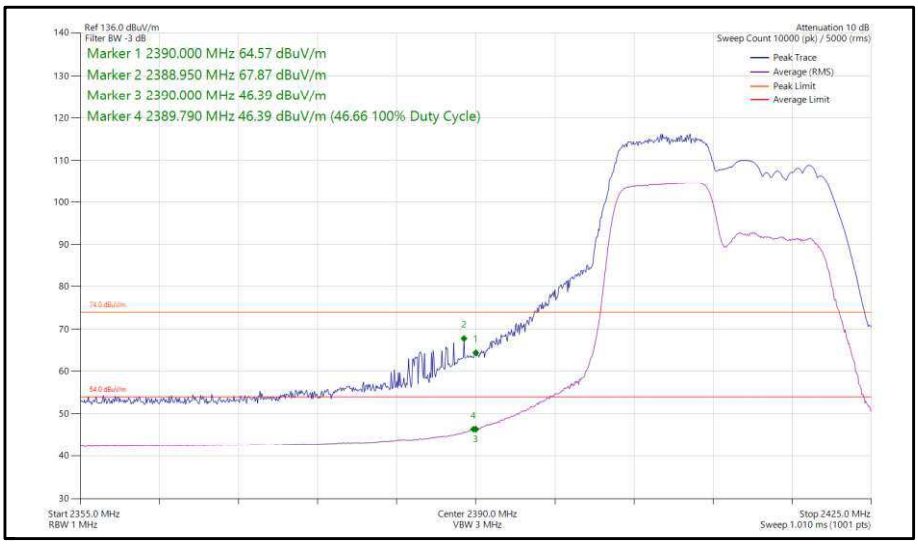

Figure 5 - 802.11ax, HE20, RU 106-53, SISO, Core 0 - 2412 MHz, Band Edge Frequency 2390 MHz

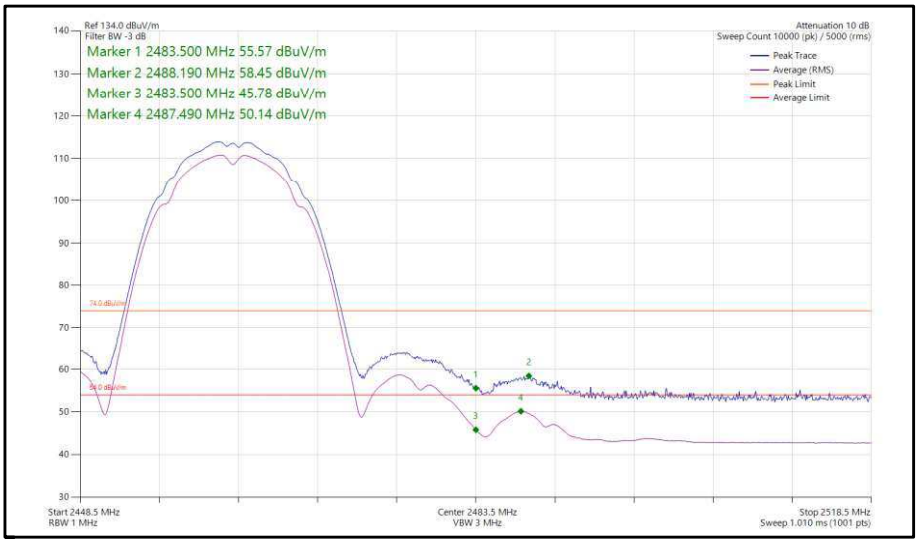

Figure 6 - 802.11b, SISO, Core 0 - 2462 MHz, Band Edge Frequency 2483.5 MHz

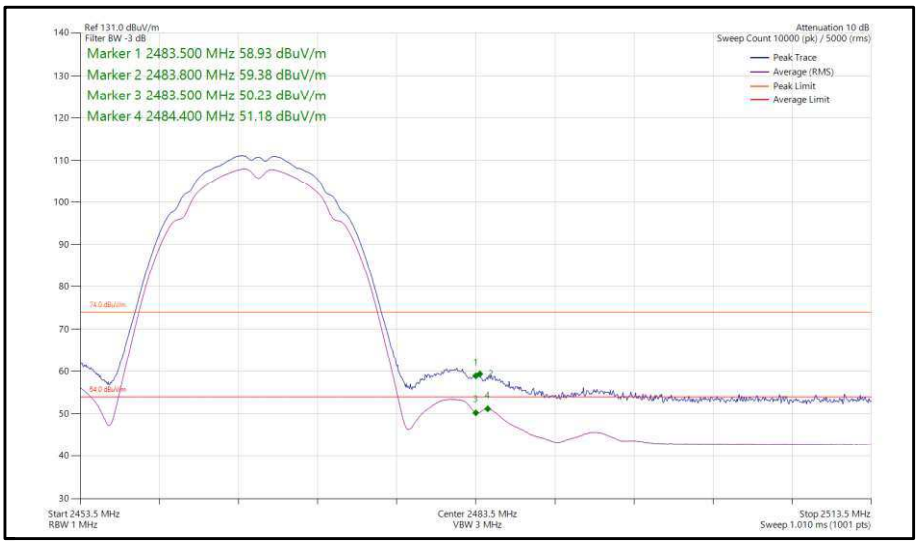

**Figure 7 - 802.11b, SISO, Core 0 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**

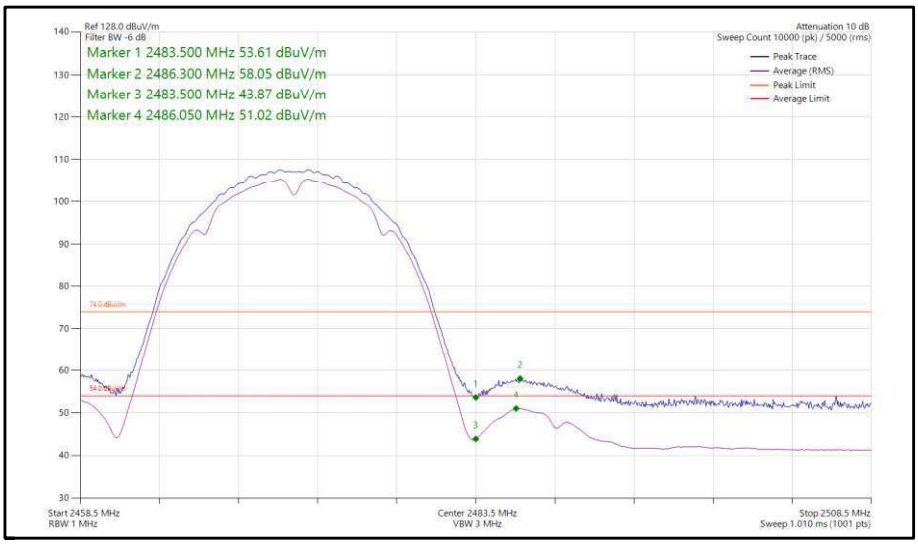

**Figure 8 - 802.11b, SISO, Core 0 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**

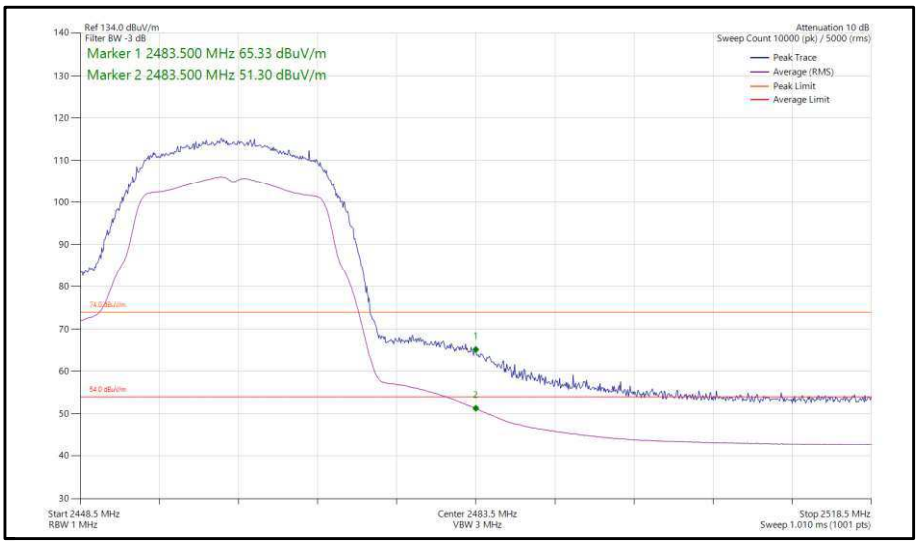

**Figure 9 - 802.11g, SISO, Core 0 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**

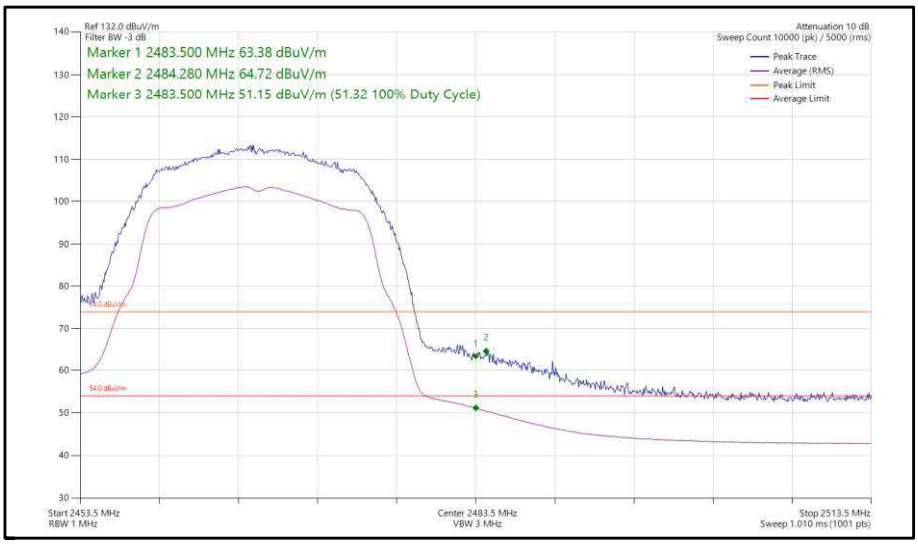

**Figure 10 - 802.11g, SISO, Core 0 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**

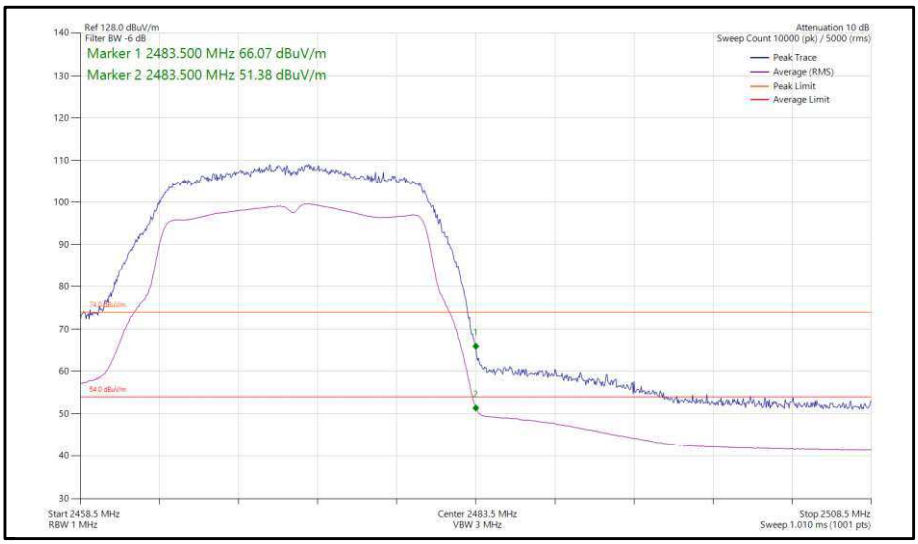

**Figure 11 - 802.11g, SISO, Core 0 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**

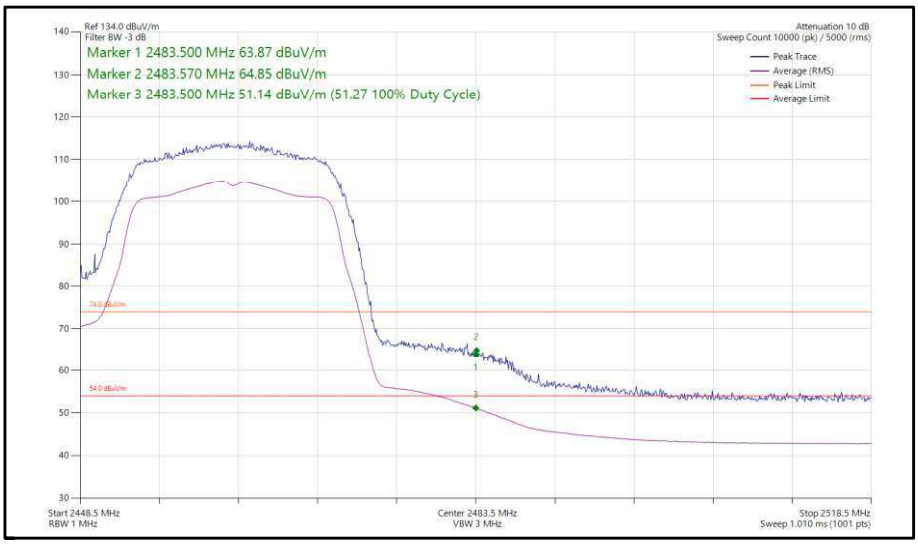

**Figure 12 - 802.11n, HT20, SISO, Core 0 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**

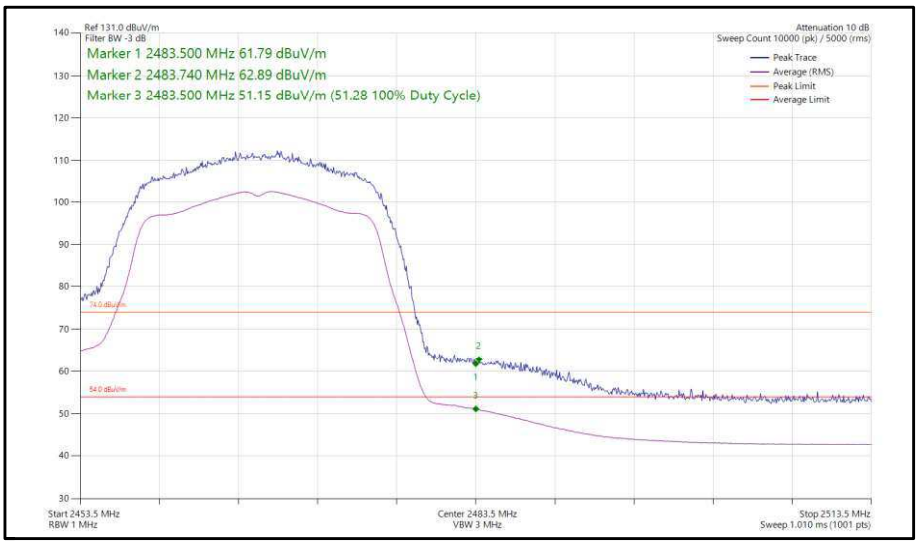

**Figure 13 - 802.11n, HT20, SISO, Core 0 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**

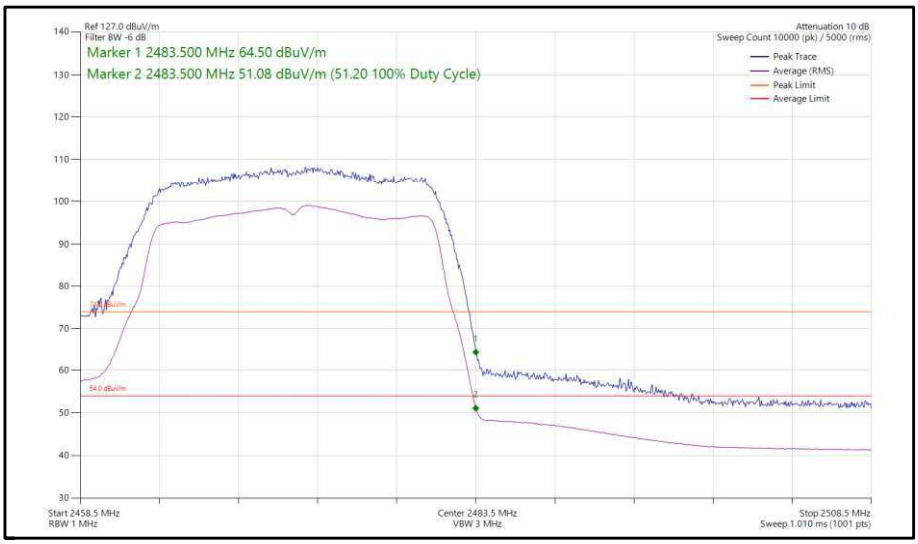

**Figure 14 - 802.11n, HT20, SISO, Core 0 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**

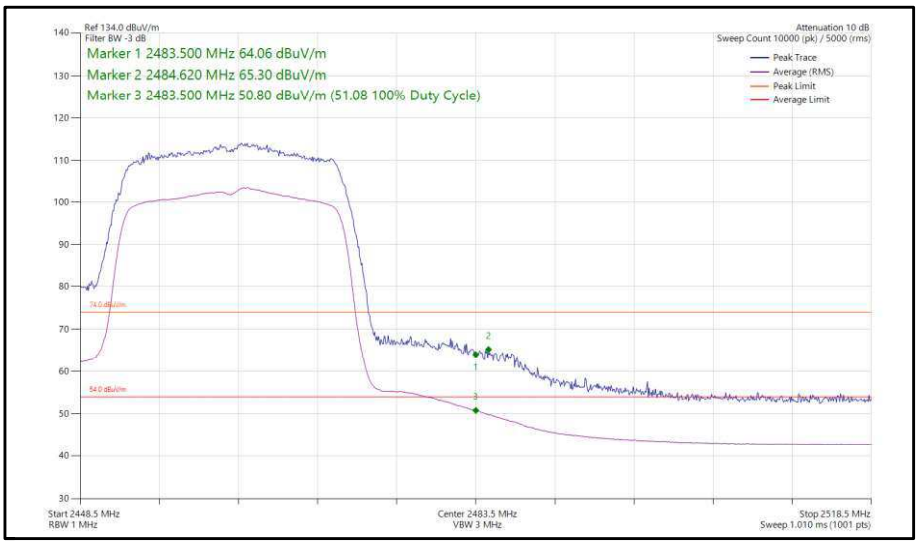

Figure 15 - 802.11ax, HE20, SU, SISO, Core 0 - 2462 MHz, Band Edge Frequency 2483.5 MHz

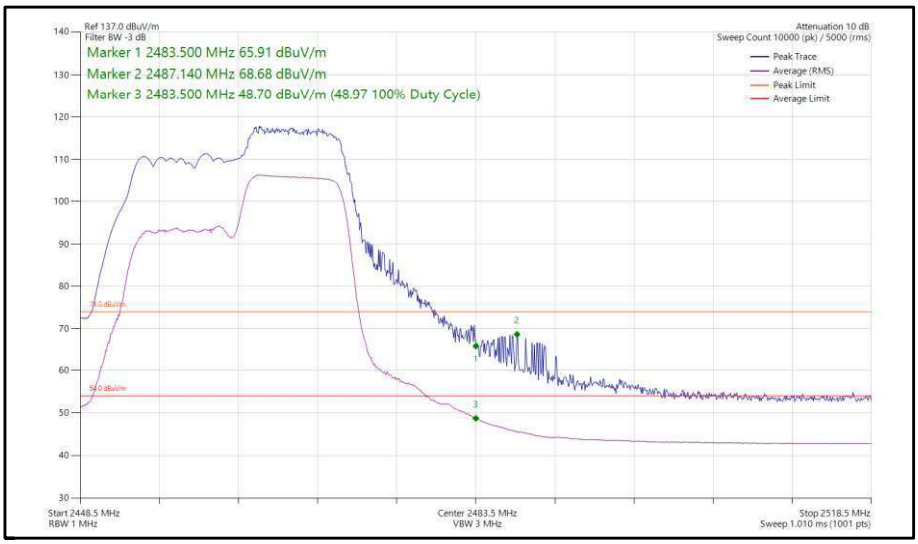

Figure 16 - 802.11ax, HE20, RU 106-54, SISO, Core 0 - 2462 MHz, Band Edge Frequency 2483.5 MHz

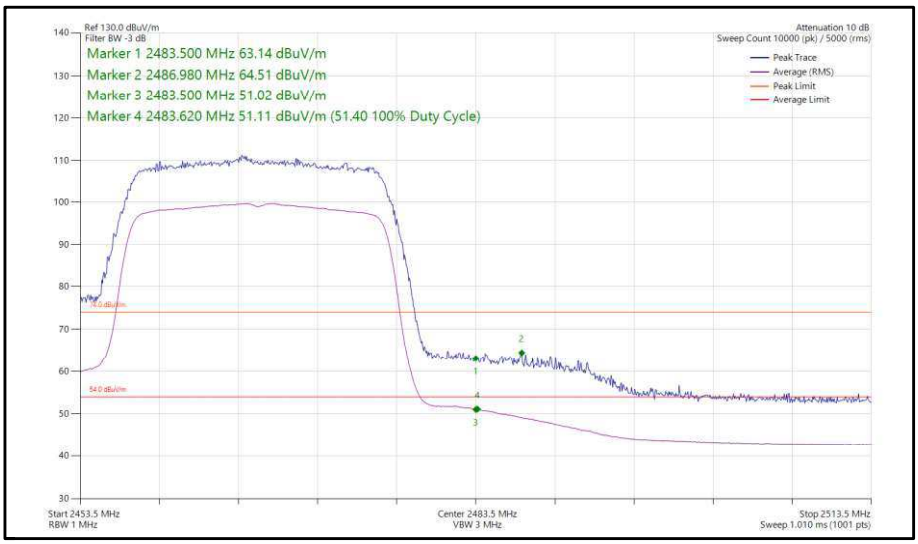

Figure 17 - 802.11ax, HE20, SU, SISO, Core 0 - 2467 MHz, Band Edge Frequency 2483.5 MHz

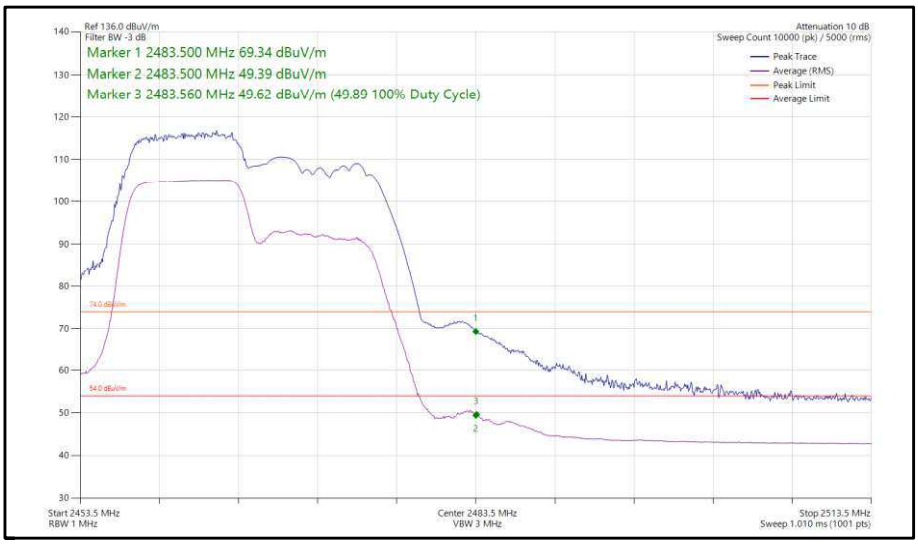

Figure 18 - 802.11ax, HE20, RU 106-53, SISO, Core 0 - 2467 MHz, Band Edge Frequency 2483.5 MHz

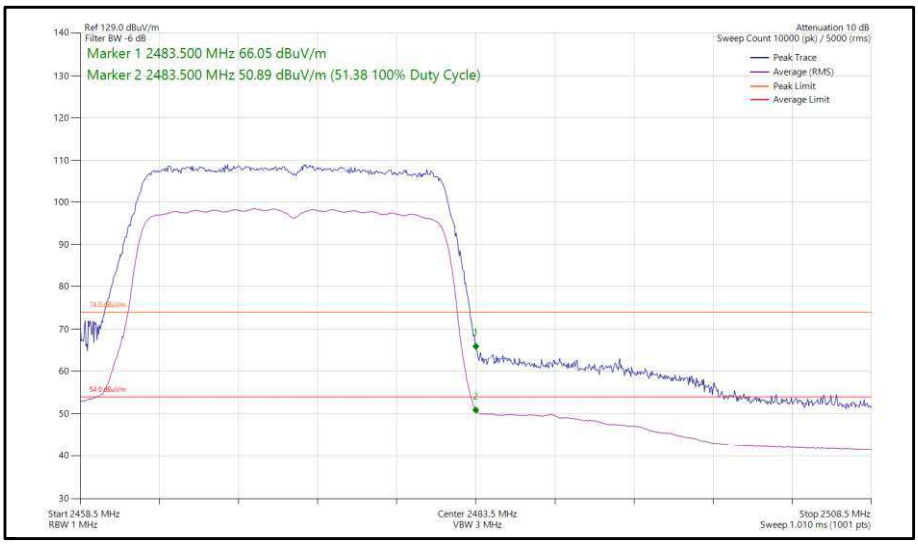

Figure 19 - 802.11ax, HE20, SU, SISO, Core 0 - 2472 MHz, Band Edge Frequency 2483.5 MHz

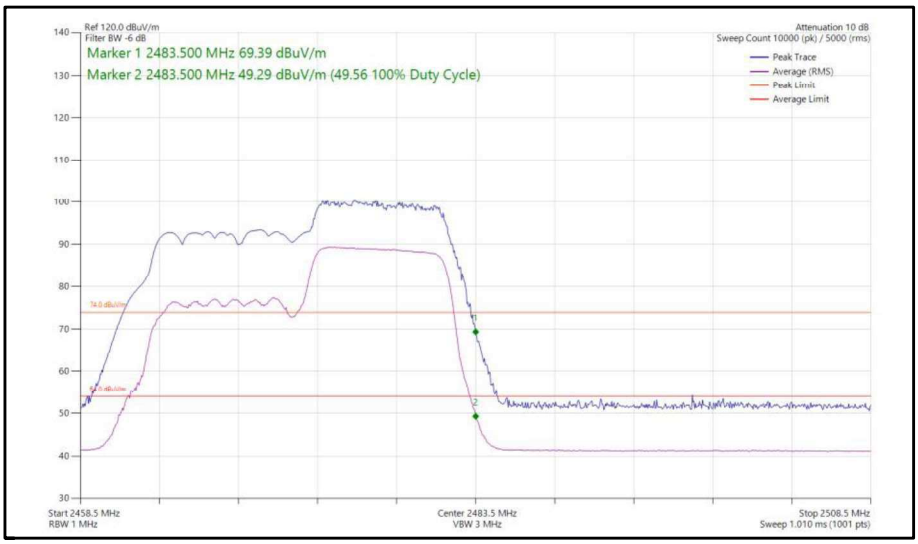

Figure 20 - 802.11ax, HE20, RU 106-54, SISO, Core 0 - 2472 MHz, Band Edge Frequency 2483.5 MHz

20 MHz Bandwidth - Core 1 (SISO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBµV/m)	Average Level (dBuV/m)
802.11b	1 Mbps	-	-	2412	2390	55.46	45.93
802.11g	54 Mbps	-	-	2412	2390	69.01	50.43
802.11n HT20	MCS7	-	-	2412	2390	69.22	47.99
802.11ax HE20	MCS9x1	SU	-	2412	2390	69.09	48.68
802.11ax HE20	MCS9x1	106	53	2412	2390	68.37	46.01
802.11b	1 Mbps	-	-	2462	2483.5	58.07	48.85
802.11b	1 Mbps	-	-	2467	2483.5	59.88	51.40
802.11b	1 Mbps	-	-	2472	2483.5	57.73	50.14
802.11g	12 Mbps	-	-	2462	2483.5	65.48	51.24
802.11g	24 Mbps	-	-	2467	2483.5	63.64	51.11
802.11g	24 Mbps	-	-	2472	2483.5	65.07	51.38
802.11n HT20	MCS7	-	-	2462	2483.5	67.67	51.25
802.11n HT20	MCS7	-	-	2467	2483.5	64.41	51.41
802.11n HT20	MCS7	-	-	2472	2483.5	63.30	51.29
802.11ax HE20	MCS4x1	SU	-	2462	2483.5	66.94	51.37
802.11ax HE20	MCS9x1	106	54	2462	2483.5	68.62	48.99
802.11ax HE20	MCS4x1	SU	-	2467	2483.5	64.65	51.37
802.11ax HE20	MCS9x1	106	54	2467	2483.5	68.24	51.47
802.11ax HE20	MCS9x1	SU	-	2472	2483.5	65.38	51.42
802.11ax HE20	MCS9x1	106	54	2472	2483.5	69.47	49.23

Table 7 - SISO Restricted Band Edge Results

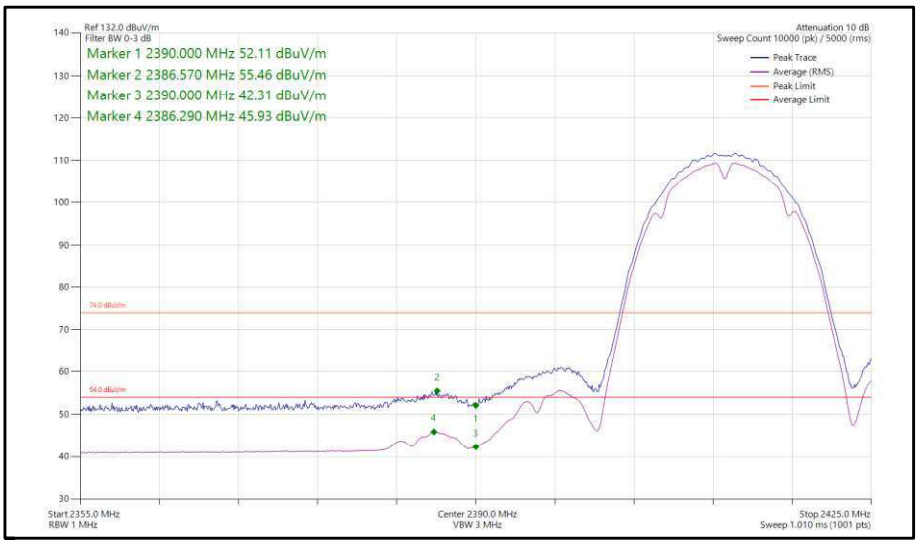

Figure 21 - 802.11b, SISO, Core 1 - 2412 MHz, Band Edge Frequency 2390 MHz

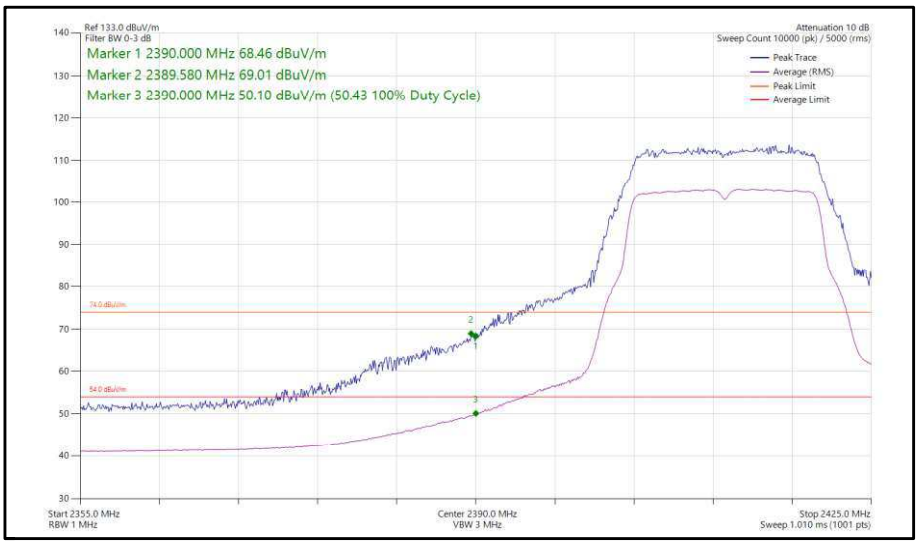

**Figure 22 - 802.11g, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**

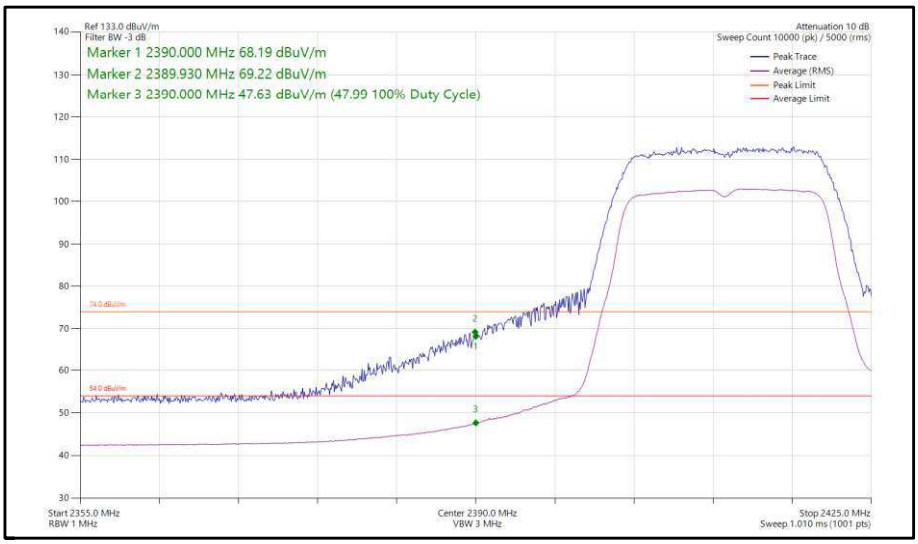

**Figure 23 - 802.11n, HT20, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**

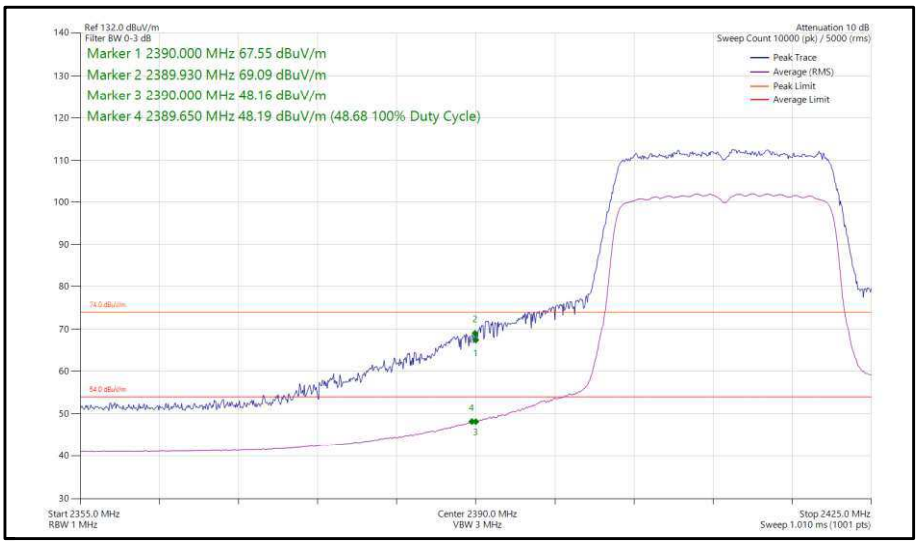

Figure 24 - 802.11ax, HE20, SU, SISO, Core 1 - 2412 MHz, Band Edge Frequency 2390 MHz

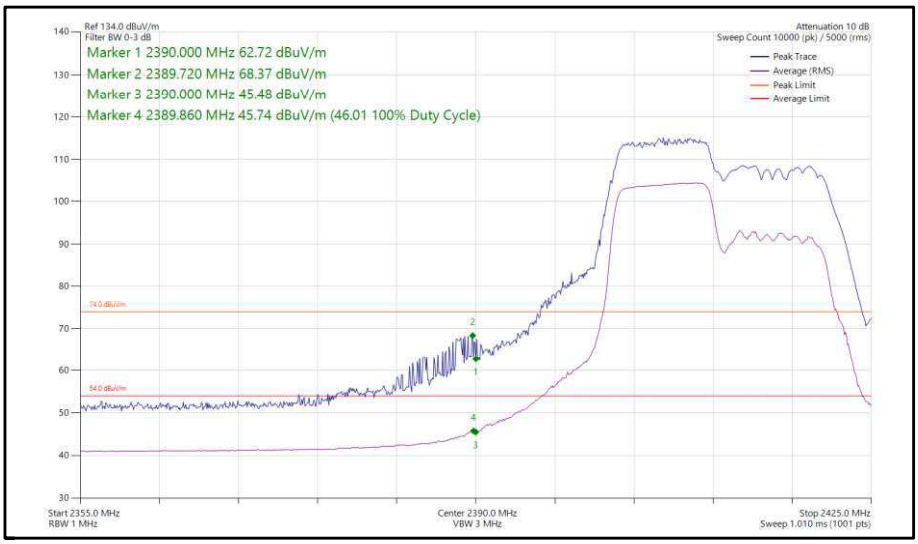

Figure 25 - 802.11ax, HE20, RU 106-53, SISO, Core 1 - 2412 MHz, Band Edge Frequency 2390 MHz

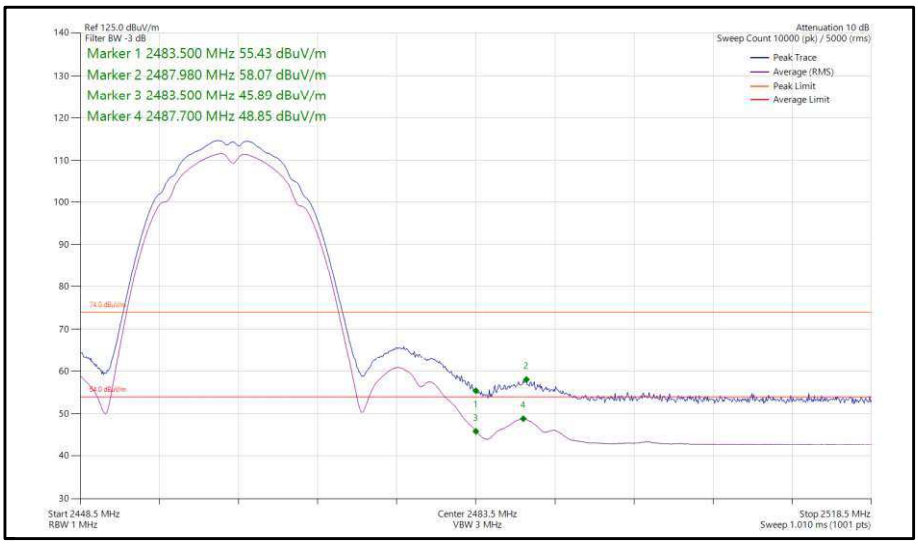

**Figure 26 - 802.11b, SISO, Core 1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**

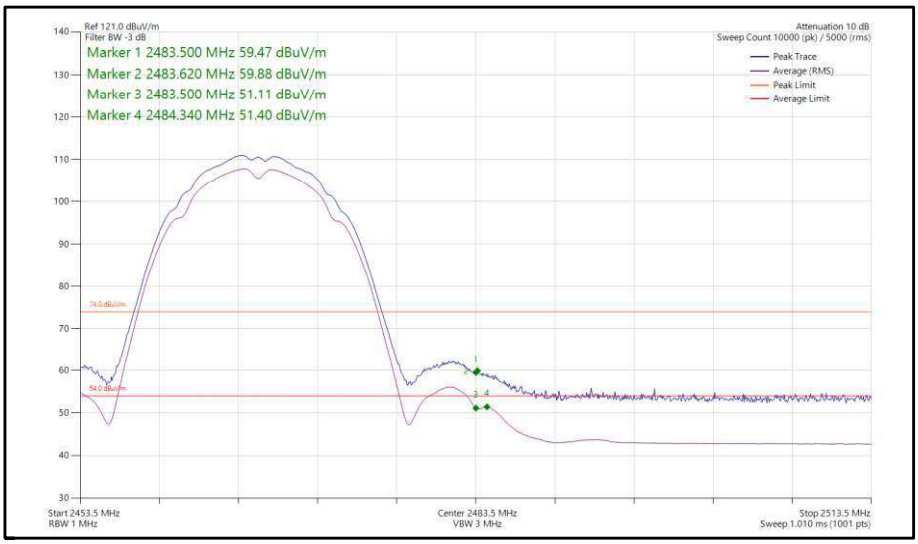

**Figure 27 - 802.11b, SISO, Core 1 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**

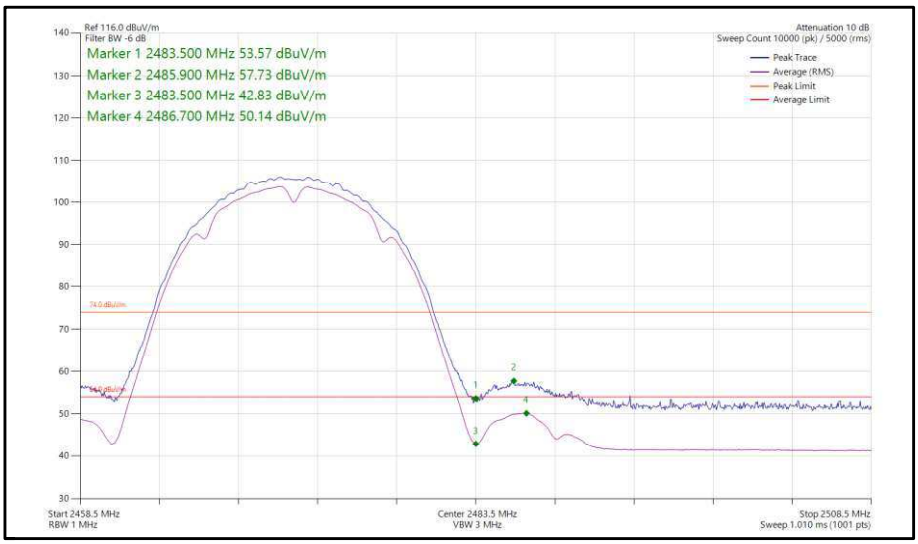

**Figure 28 - 802.11b, SISO, Core 1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**

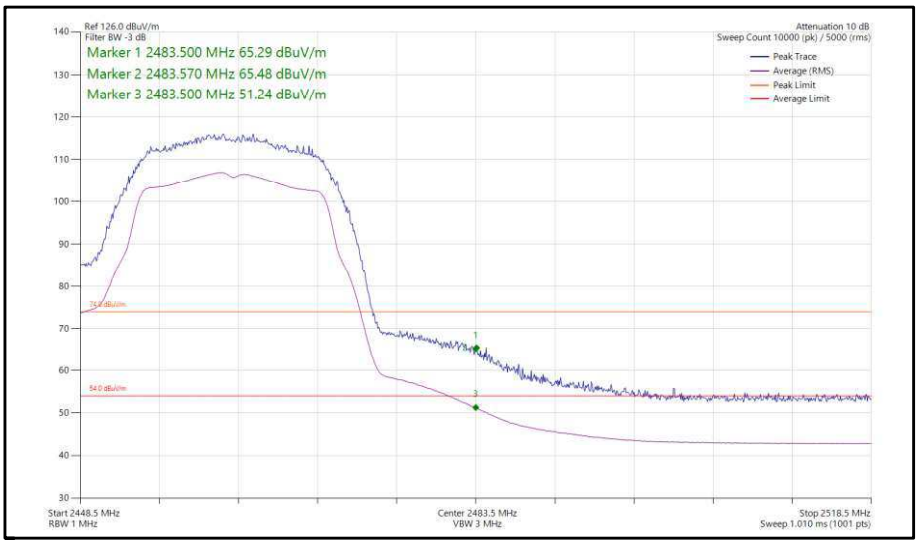

**Figure 29 - 802.11g, SISO, Core 1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**

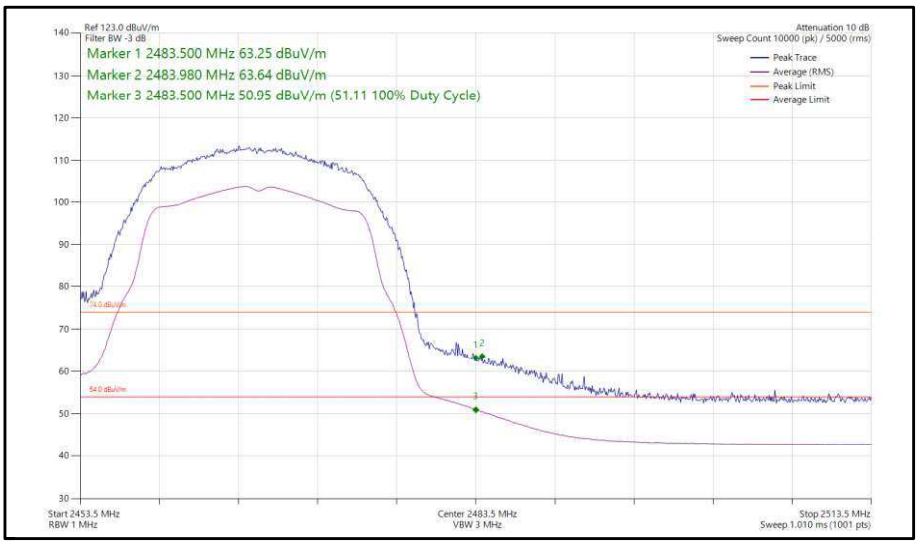

**Figure 30 - 802.11g, SISO, Core 1 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**

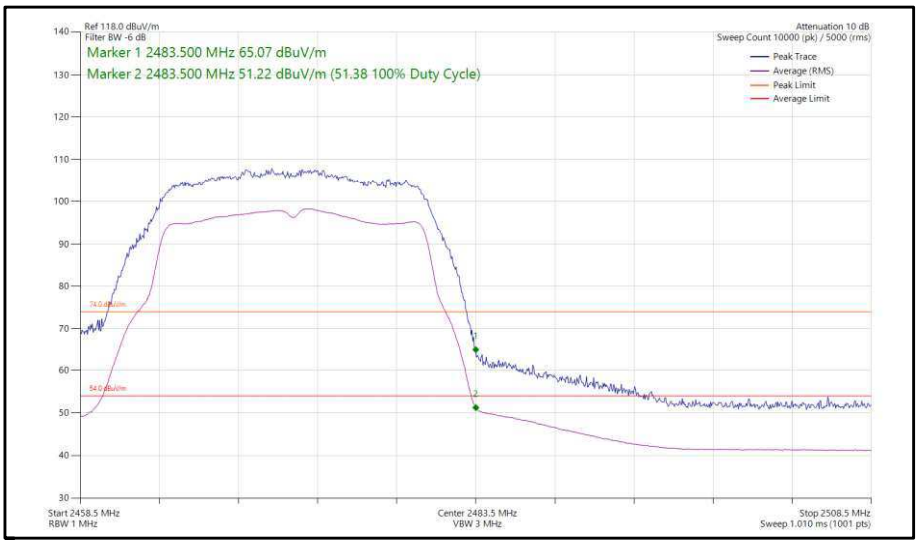

**Figure 31 - 802.11g, SISO, Core 1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**

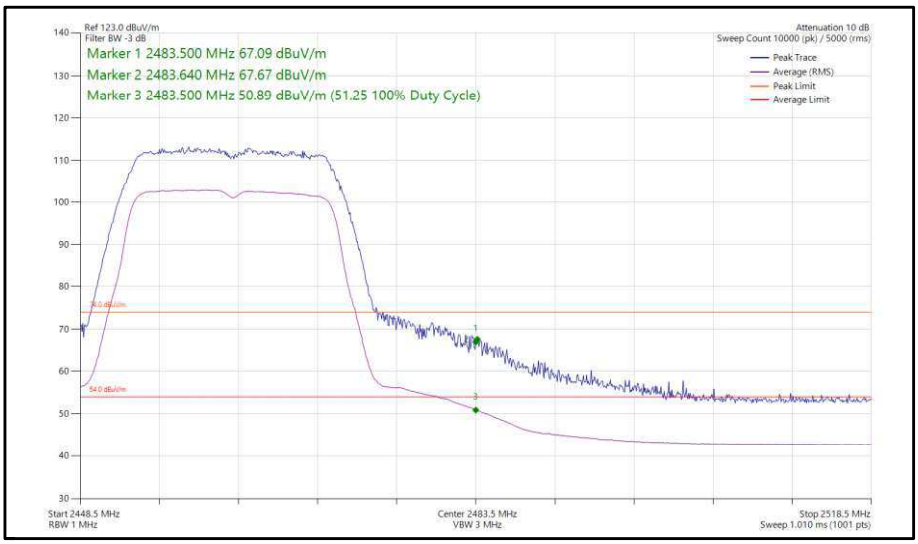

Figure 32 - 802.11n, HT20, SISO, Core 1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

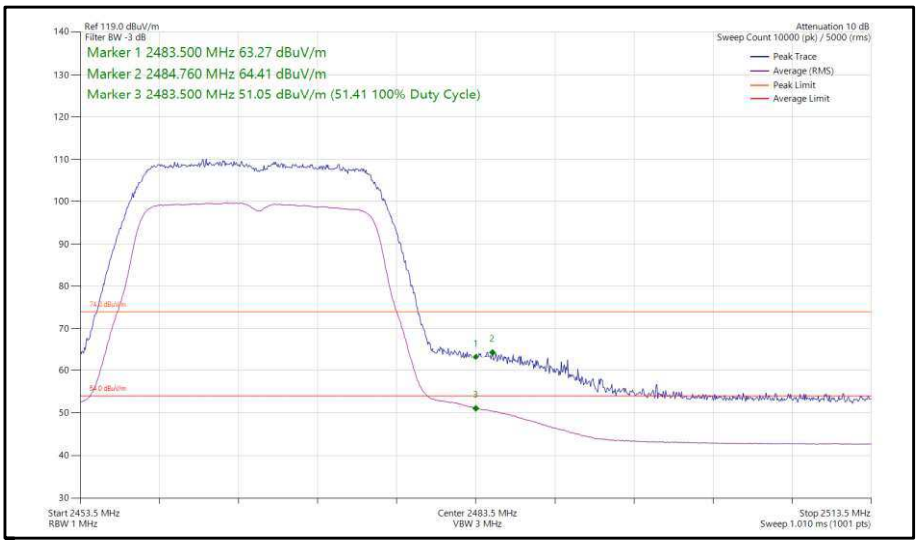

Figure 33 - 802.11n, HT20, SISO, Core 1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

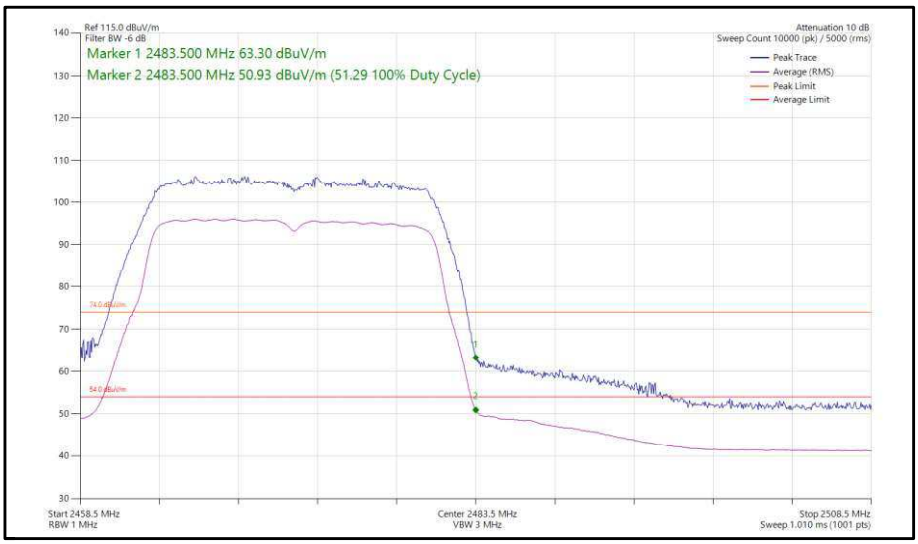

**Figure 34 - 802.11n, HT20, SISO, Core 1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**

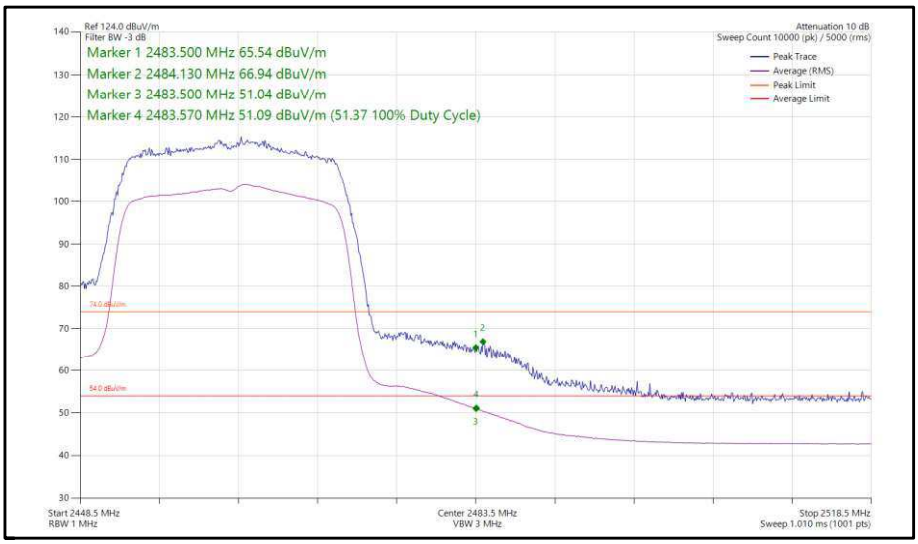

**Figure 35 - 802.11ax, HE20, SU, SISO, Core 1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**

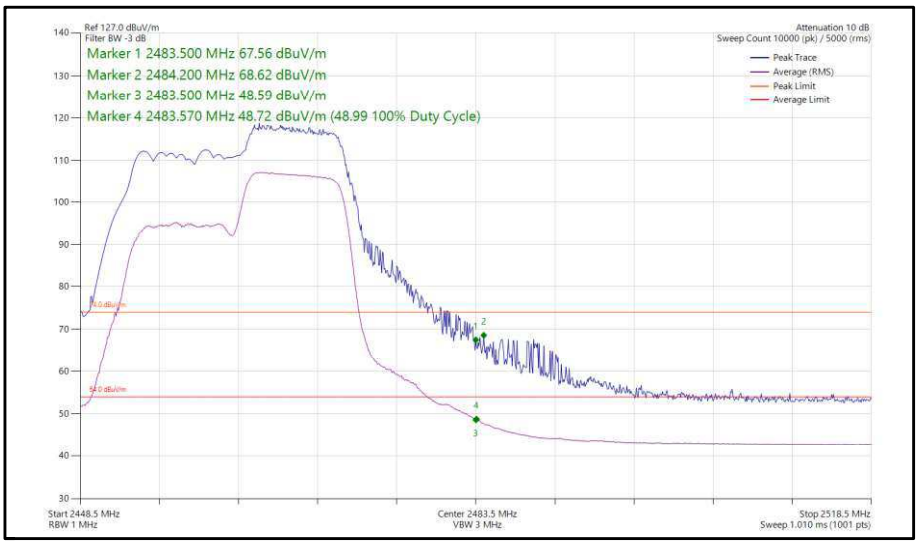

Figure 36 - 802.11ax, HE20, RU 106-54, SISO, Core 1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

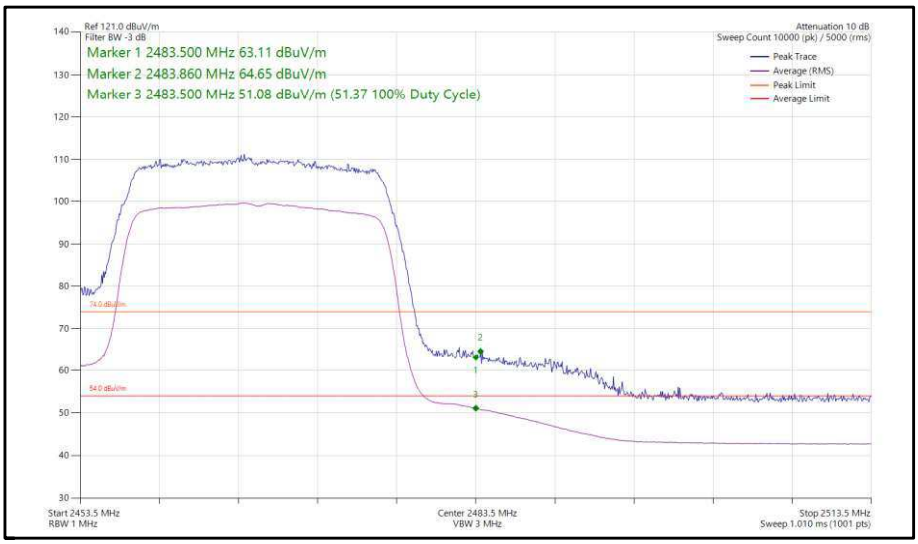

Figure 37 - 802.11ax, HE20, SU, SISO, Core 1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

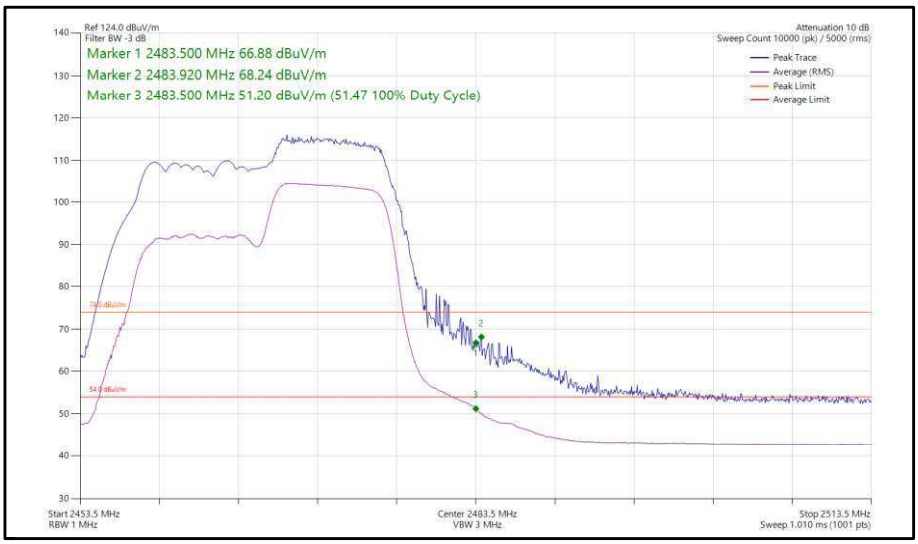

Figure 38 - 802.11ax, HE20, RU 106-54, SISO, Core 1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

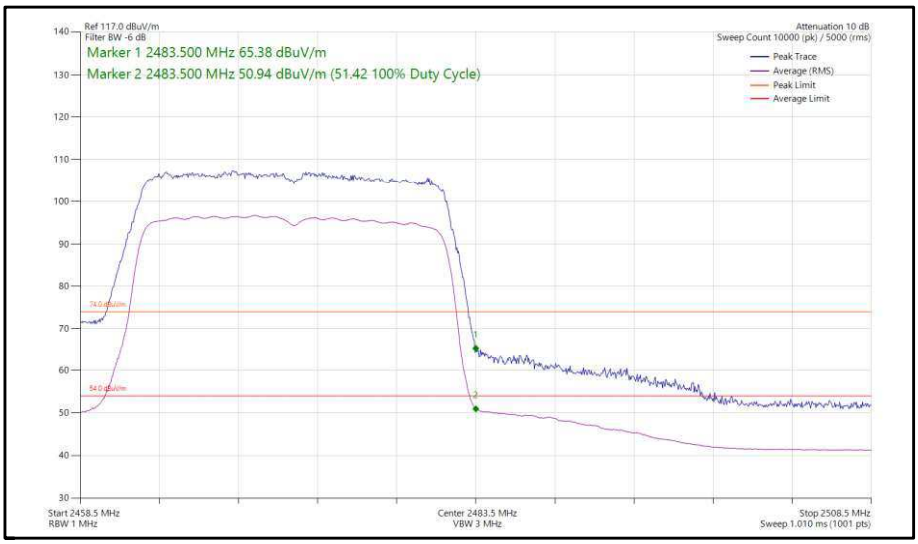

Figure 39 - 802.11ax, HE20, SU, SISO, Core 1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

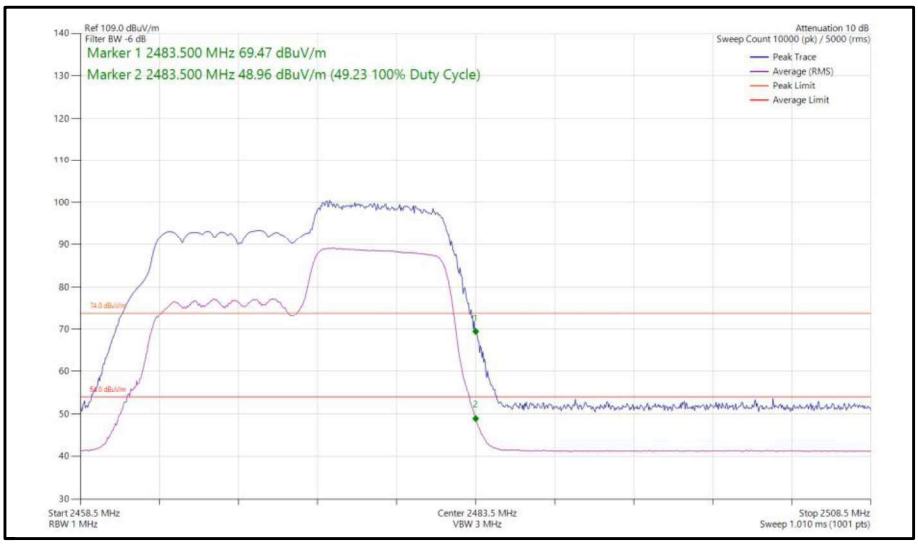

Figure 40 - 802.11ax, HE20, RU 106-54, SISO, Core 1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

20 MHz Bandwidth - Core 0-1 (CDD)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBµV/m)	Average Level (dBuV/m)
802.11n HT20	MCS4	-	-	2412	2390	65.89	51.36
802.11ax HE20	MCS4x1	SU	-	2412	2390	67.09	51.39
802.11ax HE20	MCS9x1	106	53	2412	2390	69.40	50.51
802.11n HT20	MCS4	-	-	2462	2483.5	66.77	51.43
802.11n HT20	MCS2	-	-	2467	2483.5	62.97	51.22
802.11n HT20	MCS4	-	-	2472	2483.5	64.68	51.27
802.11ax HE20	MCS4x1	SU	-	2462	2483.5	66.57	51.49
802.11ax HE20	MCS9x1	106	54	2462	2483.5	68.82	50.09
802.11ax HE20	MCS4x1	SU	-	2467	2483.5	64.38	51.12
802.11ax HE20	MCS9x1	106	54	2467	2483.5	65.27	51.37
802.11ax HE20	MCS9x1	SU	-	2472	2483.5	64.91	51.45
802.11ax HE20	MCS9x1	26	8	2472	2483.5	69.42	48.46

Table 8 - CDD Restricted Band Edge Results

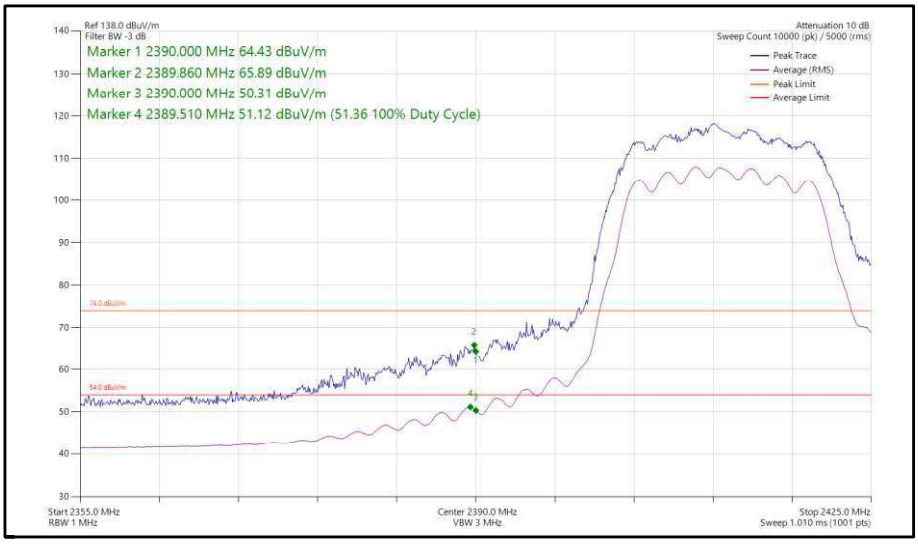

Figure 41 - 802.11n, HT20, CDD, Core 0-1 - 2412 MHz, Band Edge Frequency 2390 MHz

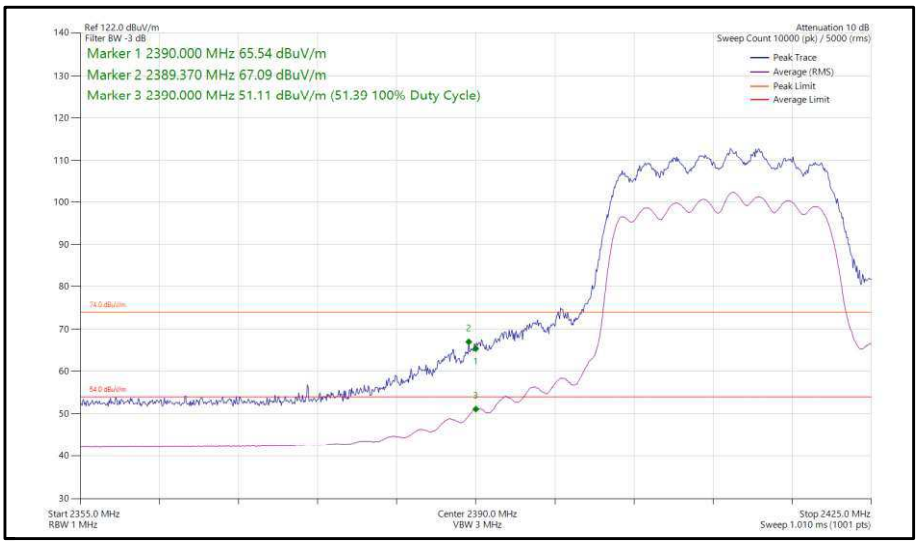

Figure 42 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2412 MHz, Band Edge Frequency 2390 MHz

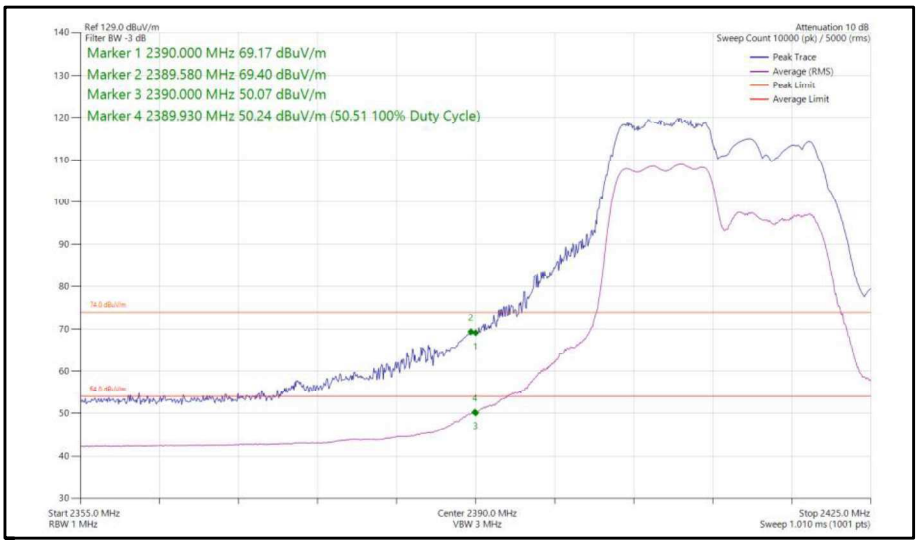

Figure 43 - 802.11ax, HE20, RU 106-53, CDD, Core 0-1 - 2412 MHz, Band Edge Frequency 2390 MHz

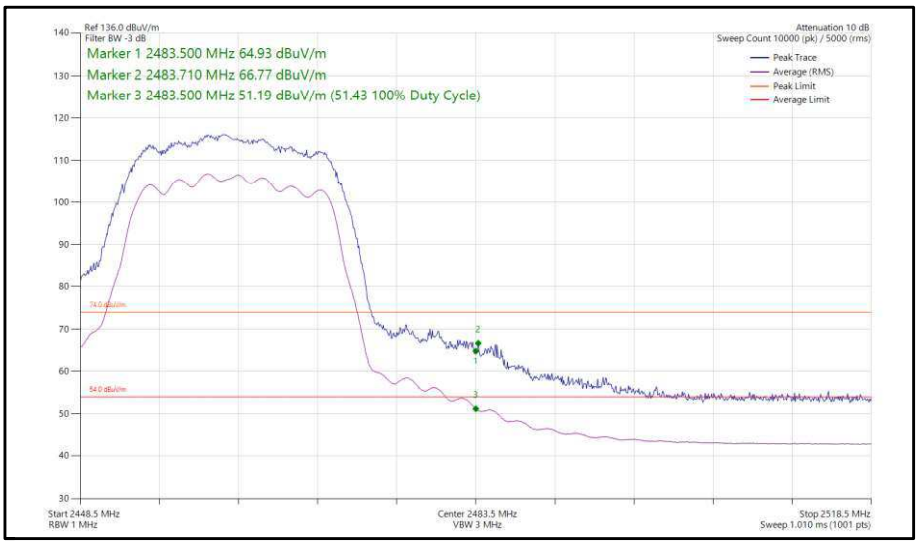

Figure 44 - 802.11n, HT20, CDD, Core 0-1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

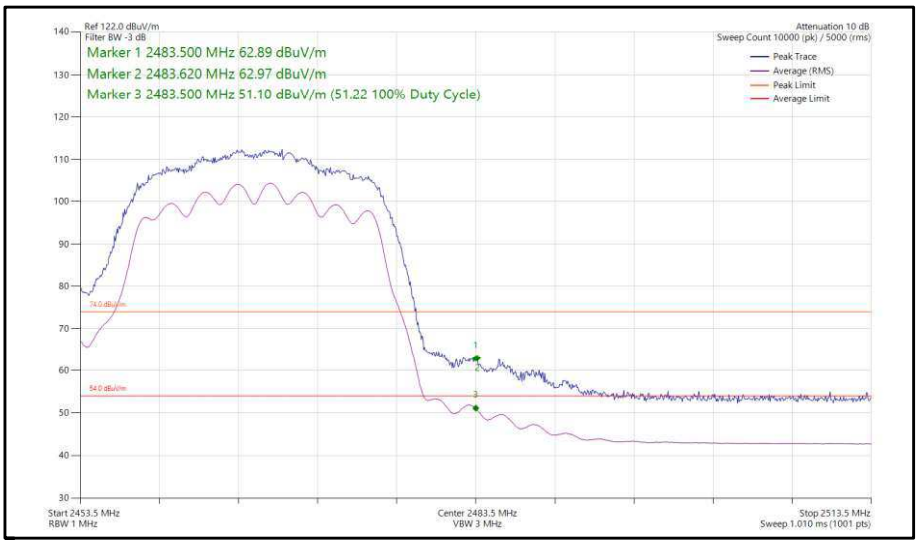

Figure 45 - 802.11n, HT20, CDD, Core 0-1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

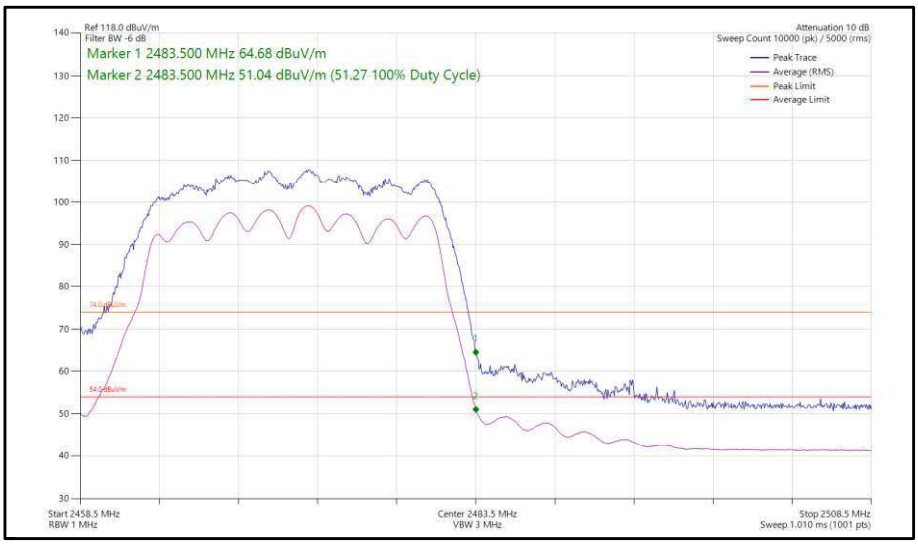

**Figure 46 - 802.11n, HT20, CDD, Core 0-1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**

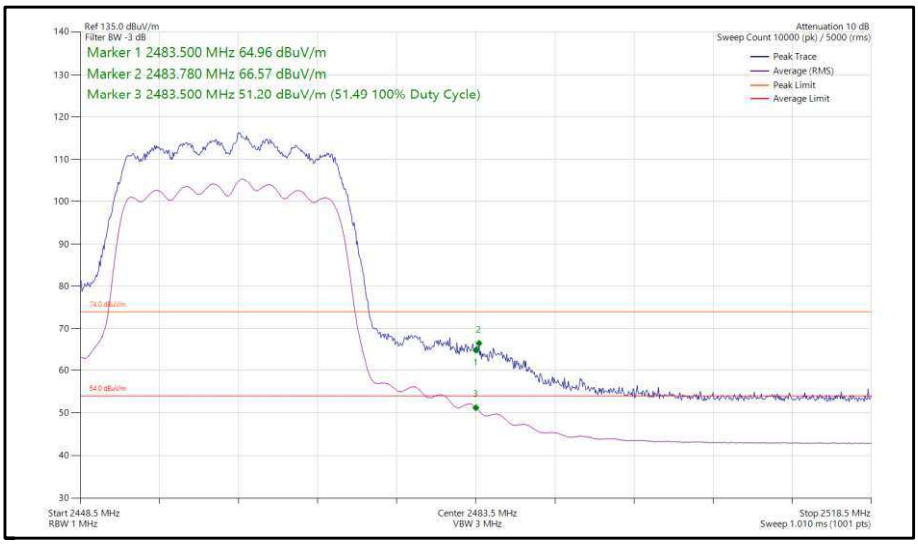

**Figure 47 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**

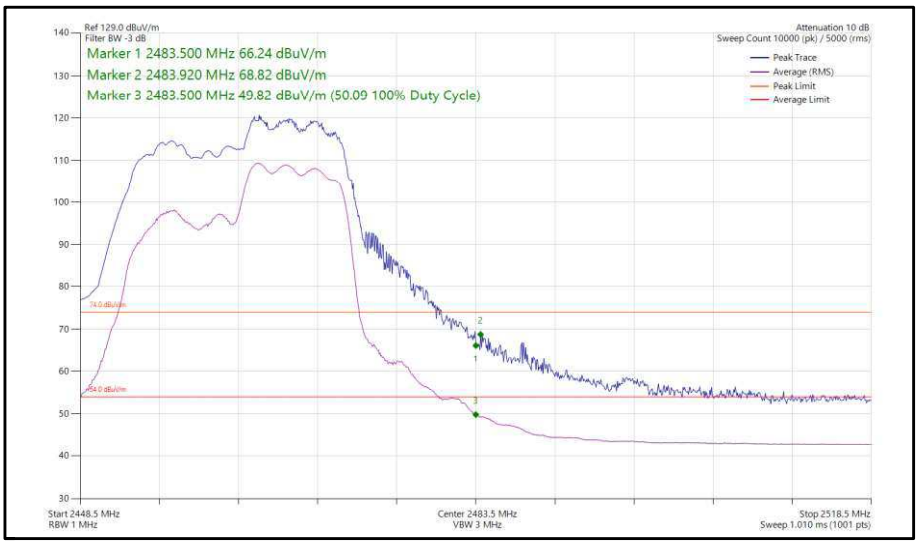

Figure 48 - 802.11ax, HE20, RU 106-54, CDD, Core 0-1 - 2462 MHz, Band Edge Frequency 2483.5 MHz

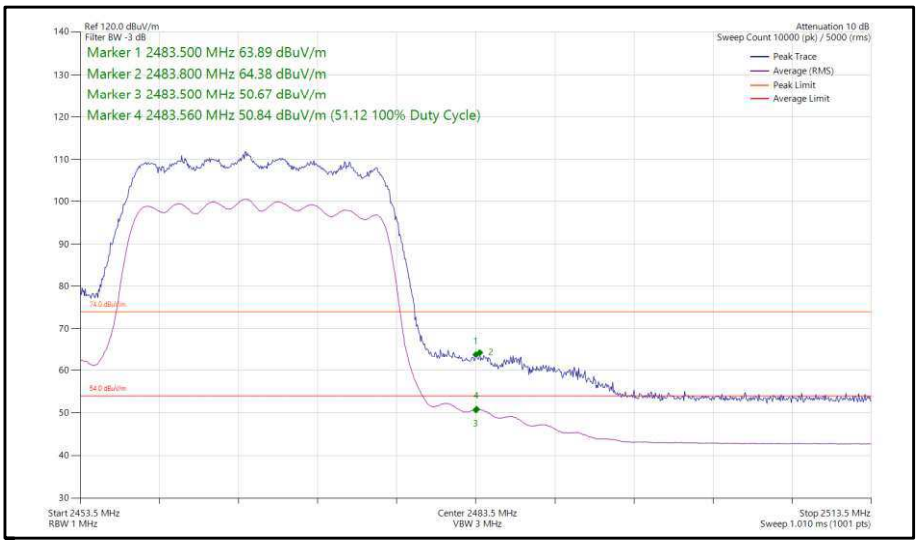

Figure 49 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

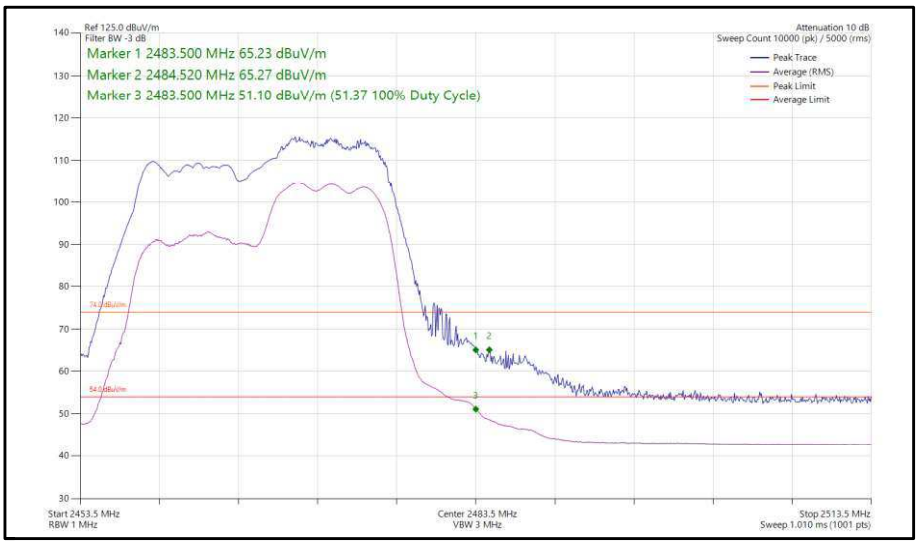

Figure 50 - 802.11ax, HE20, RU 106-54, CDD, Core 0-1 - 2467 MHz, Band Edge Frequency 2483.5 MHz

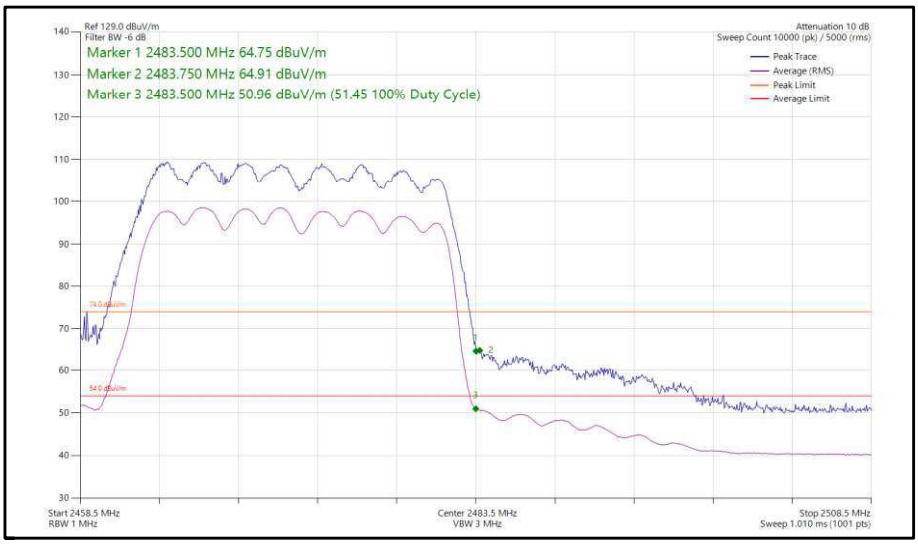

Figure 51 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

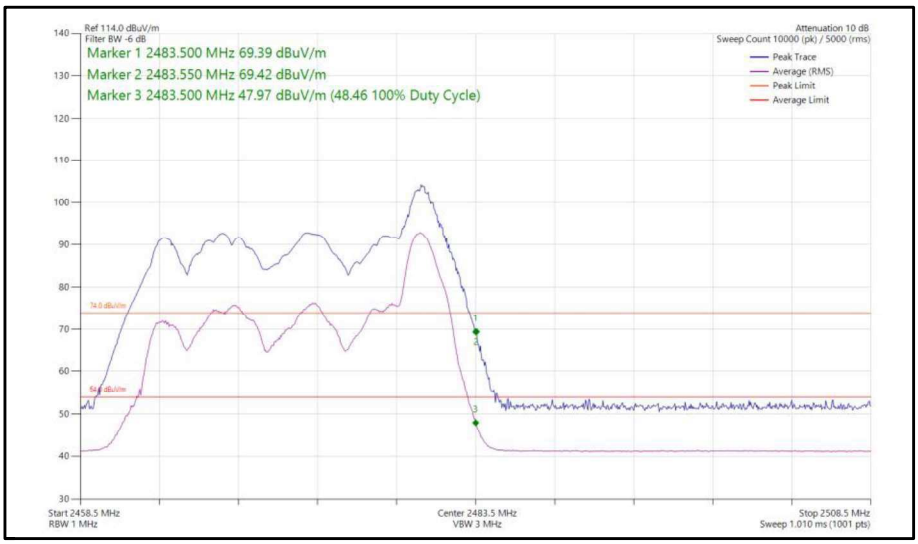

Figure 52 - 802.11ax, HE20, RU 26-8, CDD, Core 0-1 - 2472 MHz, Band Edge Frequency 2483.5 MHz

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 14.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Emissions Software	TUV SUD	EmX V3.1.10	5125	-	Software
1500W (300V 12A) AC Power Supply	iTech	IT7324	5955	-	O/P Mon
1500W (300V 12A) AC Power Supply	iTech	IT7324	5956	-	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
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5997	12	06-Jun-2023
Cable (SMA to SMA 6.5m)	Junkosha	MWX221-06500AMSAMS/B	6003	12	07-Jun-2023
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6008	12	06-Jun-2023
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6141	12	21-Jun-2023
SAC Switch Unit	TUV SUD	TUV_SSU_001	6144	12	05-Dec-2023
Digital Multimeter	Fluke	115	6145	12	17-Jun-2023
Humidity & Temperature meter	R.S Components	1364	6149	12	17-Jun-2023

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

A2874, S/N: K9XHGCT7D9 - Modification State 0

2.2.3 Date of Test

09-March-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	21.8 °C
Relative Humidity	32.6 %

2.2.6 Test Results

2.4 GHz WLAN

Protocol	6 dB Bandwidth (MHz)	
	Minimum	Maximum
802.11b	9.120	9.120
802.11g	15.240	16.440
802.11n HT20	15.240	17.460
802.11ax HE20 SU	18.540	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

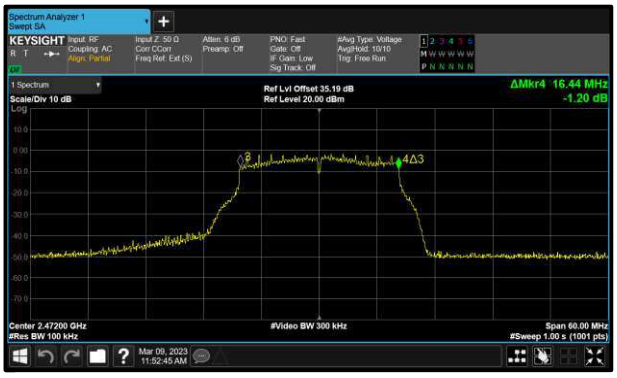

Figure 56 - 802.11g Maximum 6 dB EBW

Figure 57 - 802.11n HT20 Minimum 6 dB EBW

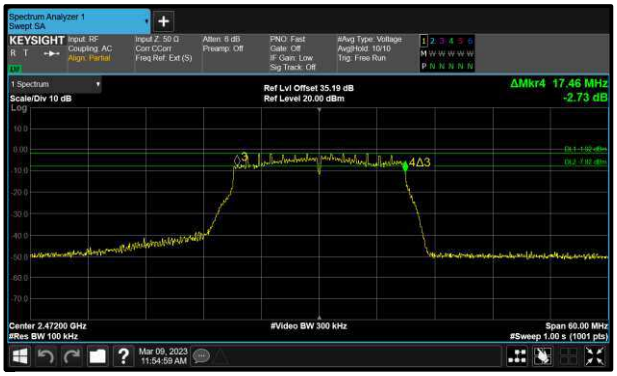

Figure 58 - 802.11n HT20 Maximum 6 dB EBW

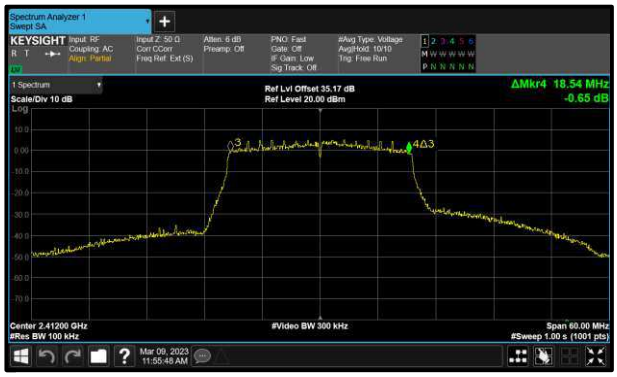

Figure 59 - 802.11ax HE20 SU Minimum 6 dB EBW

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	18.240	19.080

Table 13 - 6 dB Bandwidth Summary Results - MIMO CDD

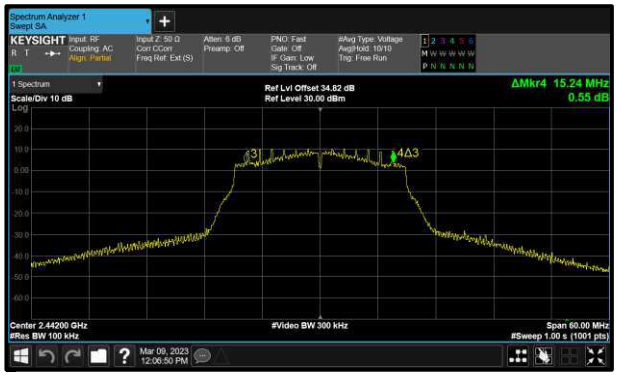

Figure 61 - 802.11n HT20 Minimum 6 dB EBW

Figure 62 - 802.11n HT20 Maximum 6 dB EBW

Figure 63 - 802.11ax HE20 SU Minimum 6 dB EBW

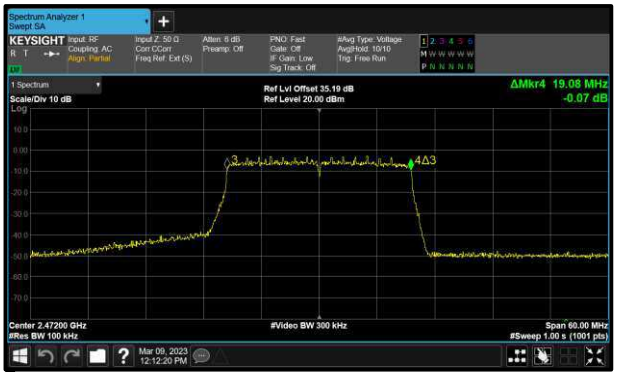

Figure 64 - 802.11ax HE20 SU Maximum 6 dB EBW

Protocol	99% Bandwidth (MHz)	
	Minimum	Maximum
802.11b	12.900	12.960
802.11g	16.380	16.620
802.11n HT20	17.520	17.700
802.11ax HE20 SU	18.960	19.020

Table 14 - 99% Bandwidth Summary Results - SISO

Figure 65 - 802.11b Minimum 99% OBW

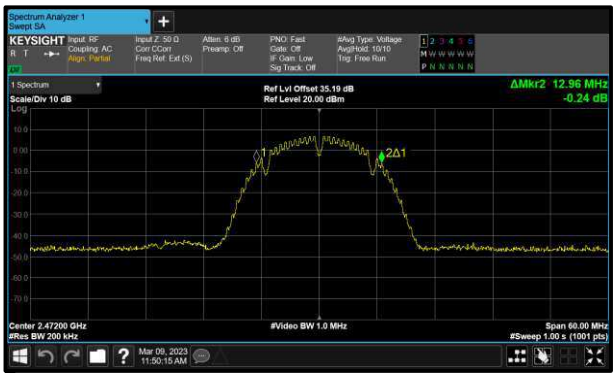

Figure 66 - 802.11b Maximum 99% OBW

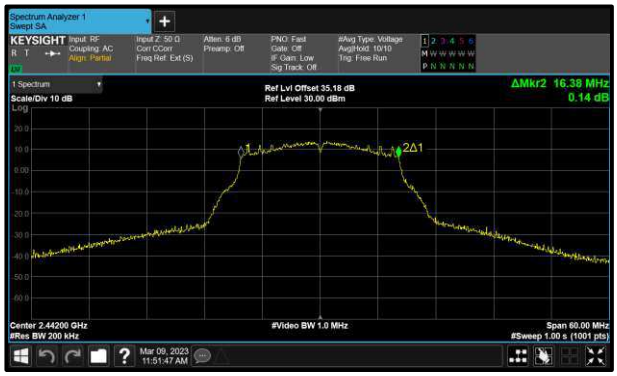

Figure 67 - 802.11g Minimum 99% OBW

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	17.520	17.760
802.11ax HE20 SU	18.900	18.960

Table 15 - 99% Bandwidth Summary Results - MIMO CDD

Figure 73 - 802.11n HT20 Minimum 99% OBW

Figure 74 - 802.11n HT20 Maximum 99% OBW

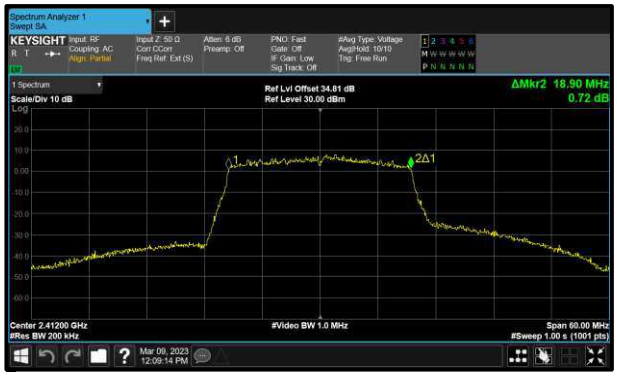

Figure 75 - 802.11ax HE20 SU Minimum 99% OBW

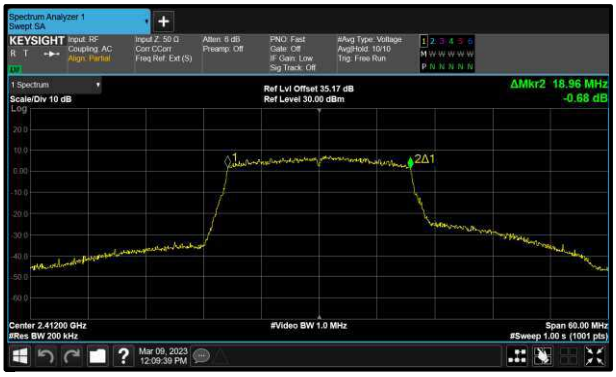

Figure 76 - 802.11ax HE20 SU Maximum 99% OBW

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

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	-	9.120	-	≥500.0
2442	-	-	9.120	-	≥500.0
2472	-	-	9.120	-	≥500.0

Table 16 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	-	12.900	-	-
2442	-	-	12.900	-	-
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):	C (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	-	15.780	-	≥500.0
2442	-	-	15.240	-	≥500.0
2472	-	-	16.440	-	≥500.0

Table 18 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	-	16.620	-	-
2442	-	-	16.380	-	-
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):	C (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	-	16.680	-	≥500.0
2442	-	-	15.240	-	≥500.0
2472	-	-	17.460	-	≥500.0

Table 20 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	-	17.700	-	-
2442	-	-	17.520	-	-
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):	C (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	-	18.540	-	≥500.0
2442	-	-	18.960	-	≥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	-	-	19.020	-	-

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):	B+C (Core 0 + Core 1)	Active Chain(s):	0+1

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	16.440	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	-	17.520	17.520	-	-
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):	B+C (Core 0 + Core 1)	Active Chain(s):	0+1

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	18.240	18.240	-	≥500.0
2442	-	18.960	19.020	-	≥500.0
2472	-	19.020	19.080	-	≥500.0

Table 26 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2412	-	18.900	18.960	-	-
2442	-	18.960	18.900	-	-
2472	-	18.960	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
Hygrometer	Rotronic	I-1000	3068	12	21-Sep-2023
Multi-GNSS Simulator (GPS)	Spirent	GSS6700	4596	12	22-Aug-2023
AC Programmable Power Supply	iTech	IT7324	5225	-	O/P Mon
MXA Signal Analyser	Keysight Technologies	N9020B	5529	24	13-Dec-2024
Signal Conditioning Unit	TUV SUD	SPECTRUM SCU001	5546	12	06-Apr-2023
Digital Multimeter	Fluke	115	6145	12	17-Jun-2023

Table 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

A2874, S/N: K9XHGCT7D9 - Modification State 0

2.3.3 Date of Test

09-March-2023

2.3.4 Test Method

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

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

2.3.5 Environmental Conditions

Ambient Temperature	21.8 °C
Relative Humidity	32.6 %

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):	3.60
Active Port(s):	C (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	-	18.81	-	-	30.00	-11.19
2442	-	-	18.78	-	-	30.00	-11.22
2472	-	-	14.95	-	-	30.00	-15.05

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	-	-	18.81	-	-	30.00	-11.19	22.41	36.00	-13.59
2442	-	-	18.78	-	-	30.00	-11.22	22.38	36.00	-13.62
2472	-	-	14.95	-	-	30.00	-15.05	18.55	36.00	-17.45

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 (%):	97.6
Data Rate:	12 Mbps	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.60
Active Port(s):	C (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	-	17.37	-	-	30.00	-12.63
2442	-	-	22.21	-	-	30.00	-7.79
2472	-	-	9.73	-	-	30.00	-20.27

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	-	-	17.37	-	-	30.00	-12.63	20.97	36.00	-15.03
2442	-	-	22.21	-	-	30.00	-7.79	25.81	36.00	-10.19
2472	-	-	9.73	-	-	30.00	-20.27	13.33	36.00	-22.67

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):	3.60
Active Port(s):	C (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	-	16.98	-	-	30.00	-13.02
2442	-	-	22.43	-	-	30.00	-7.57
2472	-	-	9.49	-	-	30.00	-20.51

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	-	-	16.98	-	-	30.00	-13.02	20.58	36.00	-15.42
2442	-	-	22.43	-	-	30.00	-7.57	26.03	36.00	-9.97
2472	-	-	9.49	-	-	30.00	-20.51	13.09	36.00	-22.91

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 (%):	95.8
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.60
Active Port(s):	C (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	-	16.20	-	-	30.00	-13.80
2442	-	-	22.28	-	-	30.00	-7.72
2472	-	-	8.81	-	-	30.00	-21.19

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	-	-	16.20	-	-	30.00	-13.80	19.80	36.00	-16.20
2442	-	-	22.28	-	-	30.00	-7.72	25.88	36.00	-10.12
2472	-	-	8.81	-	-	30.00	-21.19	12.41	36.00	-23.59

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 (%):	96.5
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.60
Active Port(s):	C (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	-	14.36	-	-	30.00	-15.64
2442	-	-	14.34	-	-	30.00	-15.66
2472	-	-	-1.44	-	-	30.00	-31.44

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	-	-	14.36	-	-	30.00	-15.64	17.96	36.00	-18.04
2442	-	-	14.34	-	-	30.00	-15.66	17.94	36.00	-18.06
2472	-	-	-1.44	-	-	30.00	-31.44	2.16	36.00	-33.84

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 (%):	96.4
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.60
Active Port(s):	C (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	-	17.17	-	-	30.00	-12.83
2442	-	-	17.19	-	-	30.00	-12.81
2472	-	-	1.31	-	-	30.00	-28.69

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	-	-	17.17	-	-	30.00	-12.83	20.77	36.00	-15.23
2442	-	-	17.19	-	-	30.00	-12.81	20.79	36.00	-15.21
2472	-	-	1.31	-	-	30.00	-28.69	4.91	36.00	-31.09

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 (%):	97.8
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	3.60
Active Port(s):	C (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	∑		
2412	-	-	18.41	-	-	30.00	-11.59
2442	-	-	20.38	-	-	30.00	-9.62
2472	-	-	1.90	-	-	30.00	-28.10

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	-	-	18.41	-	-	30.00	-11.59	22.01	36.00	-13.99
2442	-	-	20.38	-	-	30.00	-9.62	23.98	36.00	-12.02
2472	-	-	1.90	-	-	30.00	-28.10	5.50	36.00	-30.50

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 (%):	96.5
Modulation Coding Scheme:	MCS2	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	3.60
Active Port(s):	B+C (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	-	16.39	16.42	-	19.41	30.00	-10.59
2442	-	22.36	21.41	-	24.90	30.00	-5.10
2472	-	8.61	8.67	-	11.64	30.00	-18.36

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	-	16.39	16.42	-	19.41	30.00	-10.59	23.01	36.00	-12.99
2442	-	22.36	21.41	-	24.90	30.00	-5.10	28.50	36.00	-7.50
2472	-	8.61	8.67	-	11.64	30.00	-18.36	15.24	36.00	-20.76

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 (%):	95.8
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	3.60
Active Port(s):	B+C (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	-	15.76	15.91	-	18.85	30.00	-11.15
2442	-	22.15	21.41	-	24.80	30.00	-5.20
2472	-	8.45	8.32	-	11.38	30.00	-18.62

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	-	15.76	15.91	-	18.85	30.00	-11.15	22.45	36.00	-13.55
2442	-	22.15	21.41	-	24.80	30.00	-5.20	28.40	36.00	-7.60
2472	-	8.45	8.32	-	11.38	30.00	-18.62	14.98	36.00	-21.02

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 (%):	96.5
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	3.60
Active Port(s):	B+C (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	-	14.38	13.93	-	17.17	30.00	-12.83
2442	-	14.42	14.48	-	17.46	30.00	-12.54
2472	-	-0.39	0.24	-	2.93	30.00	-27.07

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	-	14.38	13.93	-	17.17	30.00	-12.83	20.77	36.00	-15.23
2442	-	14.42	14.48	-	17.46	30.00	-12.54	21.06	36.00	-14.94
2472	-	-0.39	0.24	-	2.93	30.00	-27.07	6.53	36.00	-29.47

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):	3.60
Active Port(s):	B+C (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	-	17.31	17.11	-	20.22	30.00	-9.78
2442	-	17.16	16.73	-	19.96	30.00	-10.04
2472	-	1.00	0.87	-	3.94	30.00	-26.06

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	-	17.31	17.11	-	20.22	30.00	-9.78	23.82	36.00	-12.18
2442	-	17.16	16.73	-	19.96	30.00	-10.04	23.56	36.00	-12.44
2472	-	1.00	0.87	-	3.94	30.00	-26.06	7.54	36.00	-28.46

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 (%):	97.8
Modulation Coding Scheme:	MCS2x1	DCCF (dB):	-
Antenna Configuration:	MIMO CDD	Peak Antenna Gain (dBi):	3.60
Active Port(s):	B+C (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	-	17.48	17.27	-	20.38	30.00	-9.62
2442	-	20.22	20.10	-	23.17	30.00	-6.83
2472	-	2.78	2.68	-	5.73	30.00	-24.27

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	-	17.48	17.27	-	20.38	30.00	-9.62	23.98	36.00	-12.02
2442	-	20.22	20.10	-	23.17	30.00	-6.83	26.77	36.00	-9.23
2472	-	2.78	2.68	-	5.73	30.00	-24.27	9.33	36.00	-26.67

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
Hygrometer	Rotronic	I-1000	3068	12	21-Sep-2023
AC Programmable Power Supply	iTech	IT7324	5225	-	O/P Mon
Signal Conditioning Unit	TUV SUD	SPECTRUM SCU001	5546	12	06-Apr-2023
USB Power Sensor	Boonton	RTP5008	5821	12	06-Apr-2023
USB Power Sensor	Boonton	RTP5008	5831	12	06-Apr-2023
Digital Multimeter	Fluke	115	6145	12	17-Jun-2023

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

A2874, S/N: PNYQPYL91C - Modification State 0

2.4.3 Date of Test

12-January-2023 to 01-February-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	21.2 - 24.4 °C
Relative Humidity	25.4 - 46.0 %

2.4.6 Test Results

2.4 GHz WLAN

20 MHz Bandwidth - 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	-53.23
802.11g	24 Mbps	-	-	2412	2400	-34.70
802.11n HT20	MCS4	-	-	2412	2400	-34.52
802.11ax HE20	MCS9x1	SU	-	2412	2400	-35.83
802.11ax HE20	MCS9x1	106	53	2412	2400	-37.08

Table 54 - SISO Authorised Band Edge Results

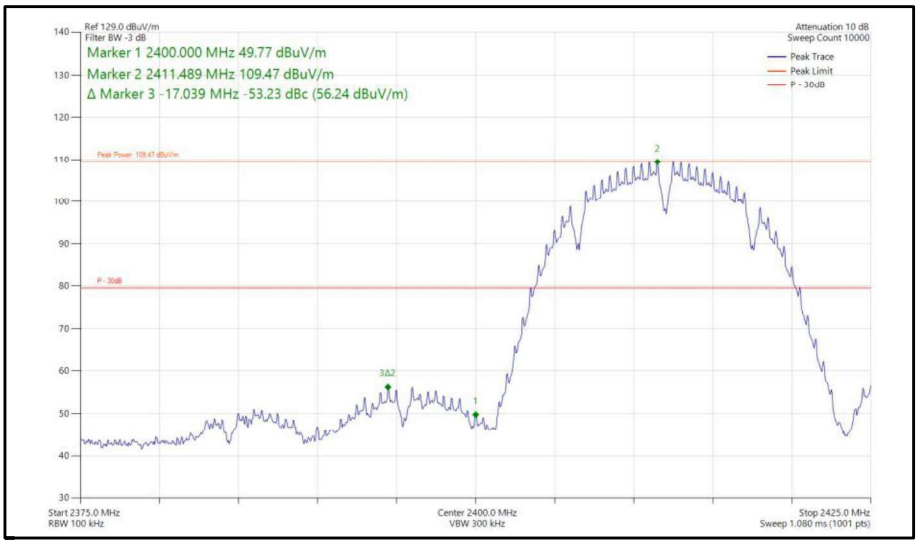

Figure 77 - 802.11b, SISO, Core 0 - 2412 MHz, Band Edge Frequency 2400 MHz

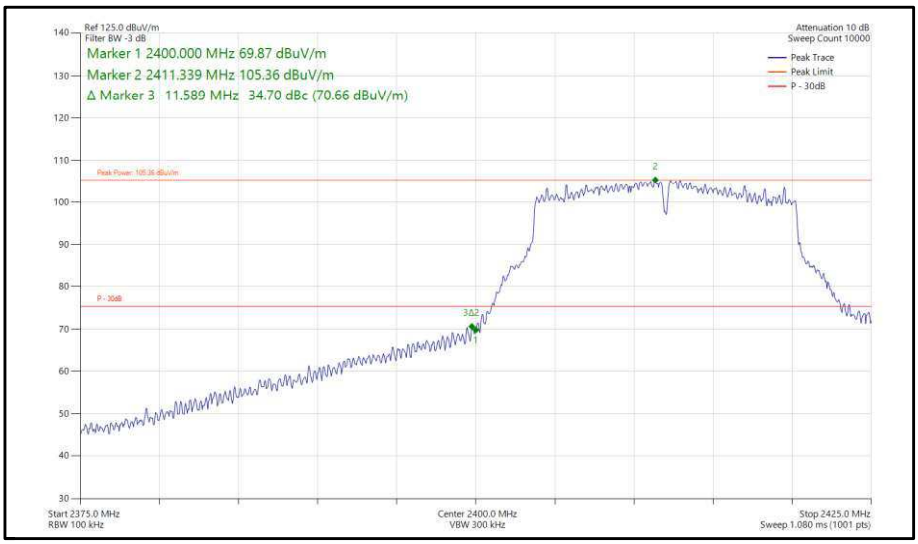

**Figure 78 - 802.11g, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2400 MHz**

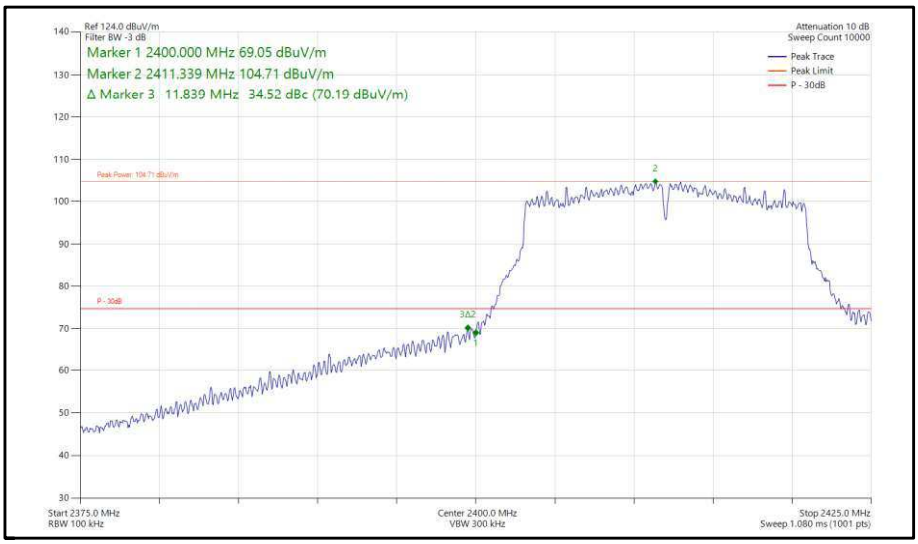

**Figure 79 - 802.11n, HT20, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2400 MHz**

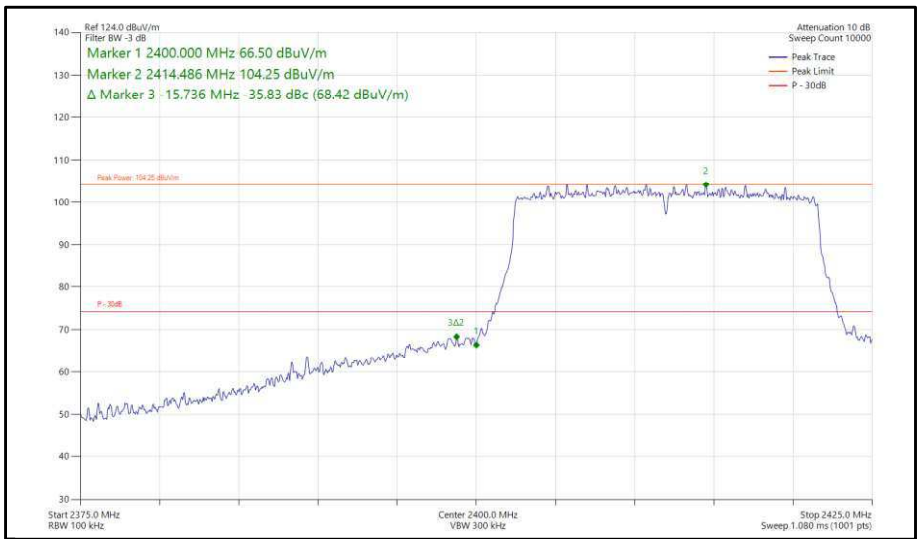

Figure 80 - 802.11ax, HE20, SU, SISO, Core 0 - 2412 MHz, Band Edge Frequency 2400 MHz

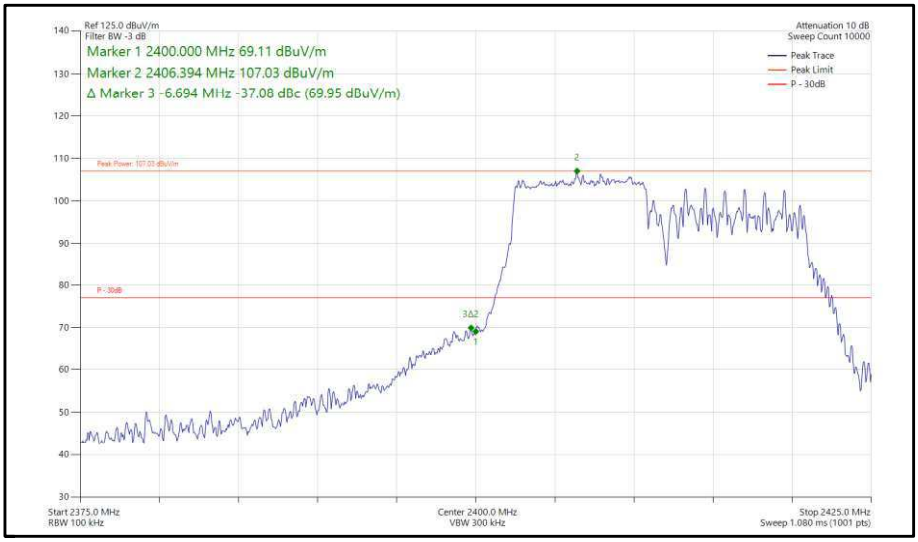

Figure 81 - 802.11ax, HE20, RU 106-53, SISO, Core 0 - 2412 MHz, Band Edge Frequency 2400 MHz

20 MHz Bandwidth - 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	-53.45
802.11g	24 Mbps	-	-	2412	2400	-35.81
802.11n HT20	MCS7	-	-	2412	2400	-35.20
802.11ax HE20	MCS4x1	SU	-	2412	2400	-34.55
802.11ax HE20	MCS9x1	106	53	2412	2400	-37.12

Table 55 - SISO Authorised Band Edge Results

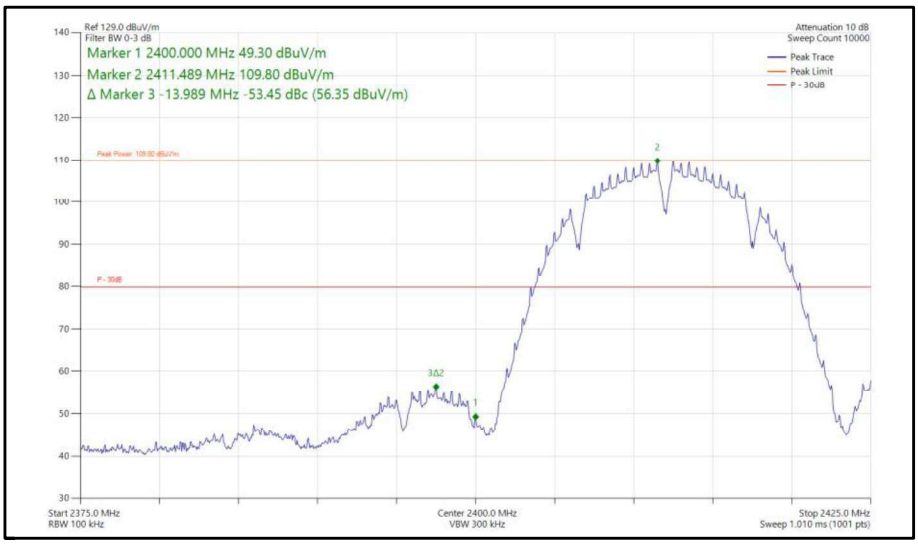

Figure 82 - 802.11b, SISO, Core 1 - 2412 MHz, Band Edge Frequency 2400 MHz

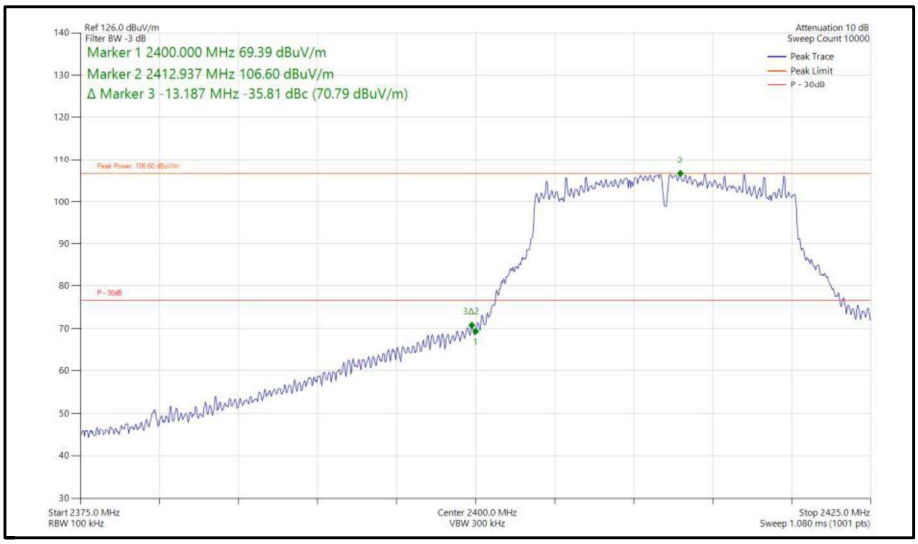

Figure 83 - 802.11g, SISO, Core 1 - 2412 MHz, Band Edge Frequency 2400 MHz

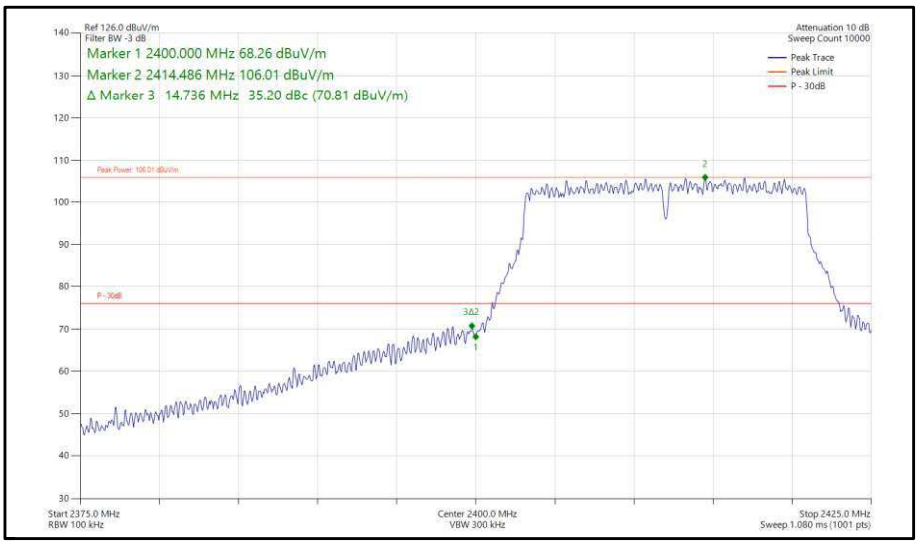

**Figure 84 - 802.11n, HT20, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2400 MHz**

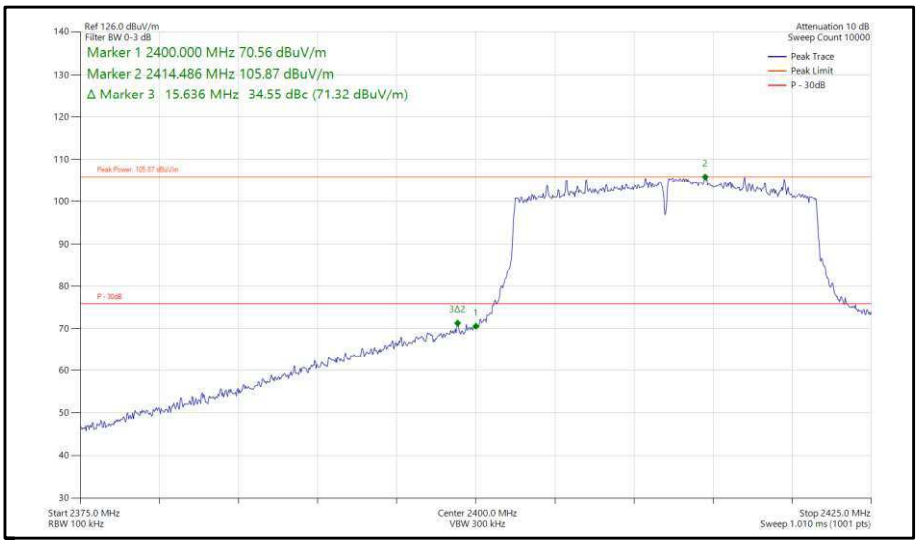

**Figure 85 - 802.11ax, HE20, SU, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2400 MHz**

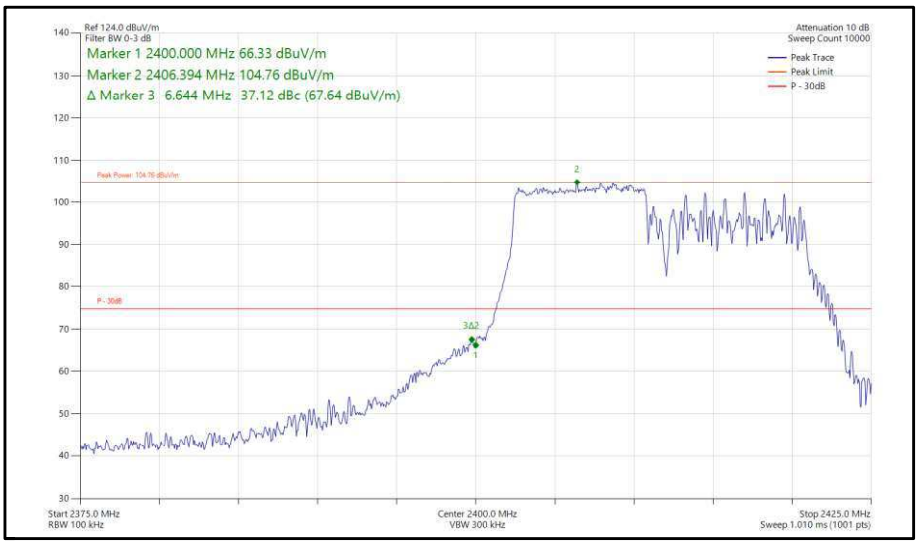

Figure 86 - 802.11ax, HE20, RU 106-53, SISO, Core 1 - 2412 MHz, Band Edge Frequency 2400 MHz

20 MHz Bandwidth - Core 0-1 (CDD)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
802.11n HT20	MCS7	-	-	2412	2400	-34.66
802.11ax HE20	MCS9x1	SU	-	2412	2400	-34.77
802.11ax HE20	MCS9x1	106	53	2412	2400	-36.81

Table 56 - CDD Authorised Band Edge Results

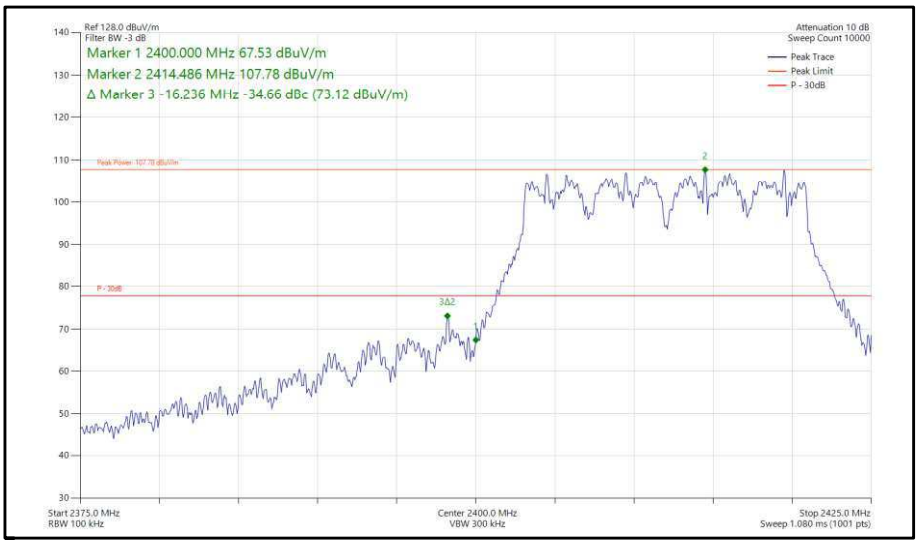

Figure 87 - 802.11n, HT20, CDD, Core 0-1 - 2412 MHz, Band Edge Frequency 2400 MHz

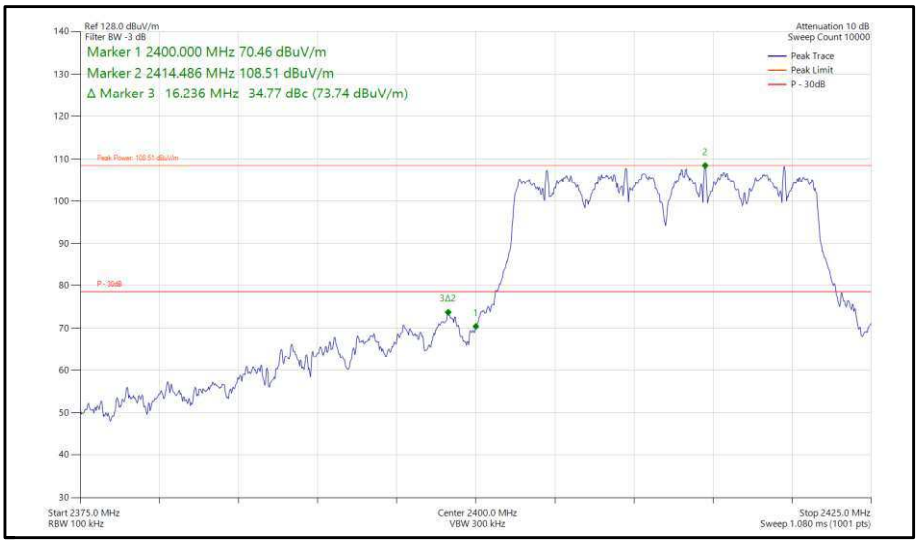

Figure 88 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2412 MHz, Band Edge Frequency 2400 MHz

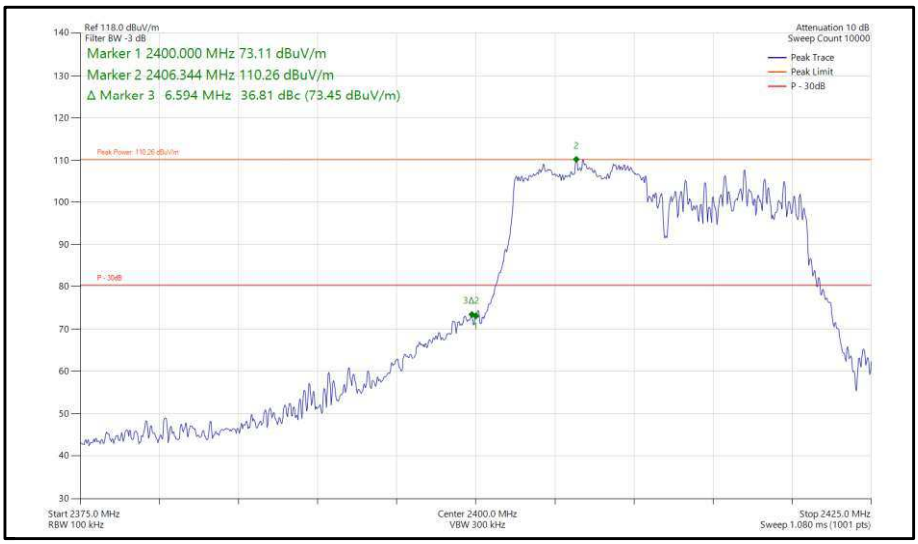

Figure 89 - 802.11ax, HE20, RU 106-53, CDD, Core 0-1 - 2412 MHz, Band Edge Frequency 2400 MHz

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 14.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Emissions Software	TUV SUD	EmX V3.1.10	5125	-	Software
1500W (300V 12A) AC Power Supply	iTech	IT7324	5956	-	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
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5997	12	06-Jun-2023
Cable (SMA to SMA 6.5m)	Junkosha	MWX221-06500AMSAMS/B	6003	12	07-Jun-2023
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6008	12	06-Jun-2023
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6141	12	21-Jun-2023
SAC Switch Unit	TUV SUD	TUV_SSU_001	6144	12	5-Dec-2023
Digital Multimeter	Fluke	115	6145	12	17-Jun-2023
Humidity & Temperature meter	R.S Components	1364	6150	12	17-Jun-2023

Table 57

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