

FCC and ISED Test Report

Apple Inc
Model: A3137



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: BCGA3137

IC: 579C-A3137

COMMERCIAL-IN-CONFIDENCE

Document 75960487-15 Issue 01

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve White	Senior Technical Specialist	Authorised Signatory	23 August 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	23 August 2024	

FCC Accreditation

553713/UK2026 Concorde Park, Fareham Test Laboratory

ISED Accreditation

28798/UK0003 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: 2023, ISED RSS-247: Issue 3 (2023-08) and ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02) for the tests detailed in section 1.3.



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1 Report Summary

1.1 Report Modification Record

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

Issue	Description of Change	Date of Issue
1	First Issue	23-Aug-2024

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
EUT/Sample Identification	Refer to section 1.6
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2023 ISED RSS-247: Issue 3 (2023-08) ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02)
Start of Test	25-April-2024
Finish of Test	18-July-2024
Name of Engineer(s)	Ahmed Al Derdiri, Colin Brain, Ioan-Alexandru Bogatu, Morsalin Hossain, David Hill, Jayvir Makwana, Akhil Rajendran Bhaskaran Nair, James Woods, Manohar Thota and Vineeth Nagaraj
Related Document(s)	ANSI C63.10 (2020) 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 (2020)
2.2	15.247 (a)(2)	5.2	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2020)
2.3	15.247 (b)	5.4	6.12	Maximum Conducted Output Power	Pass	ANSI C63.10 (2020) KDB 662911 D01 v02r01
2.4	15.247 (d)	5.5	-	Authorised Band Edges	Pass	ANSI C63.10 (2020)
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 (2020)
2.6	15.247 (e)	5.2	6.12	Power Spectral Density	Pass	ANSI C63.10 (2020) KDB 662911 D01 v02r01

Table 2



1.4 Product Information

1.4.1 Technical Description

The equipment under test (EUT) was a desktop 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 SISO and MIMO. 802.11ax multi-user mode supports RU sizes of 26/52/106/242 subcarriers.

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 unless otherwise specified:

SISO Modes (Core 1):

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

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

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

*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 Setup

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	2.40	1.32
Core 1	2400 to 2480	2.60	1.37

Table 3

1.5 Deviations from the Standard

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

1.6 Identification of the EUT

The table below details identification of the EUT(s) that have been used to carry out the testing within this report.

Model: A3137			
Serial Number	Hardware Version	Software Version	Firmware
H6D001F73D	REV1.0	24A81452a	23.30.16
G5022YM6RR	REV1.0	24A81452a	23.30.16
FV5VYV72RL	REV1.0	24A81452a	23.30.16
LQ9QKVW0H6	REV1.0	24A81452a	23.30.16
M42K4610G2	REV1.0	24A81452a	23.30.16

Table 4

1.7 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: A3137, Serial Number: FV5VYV72RL			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3137, Serial Number: M42K4610G2			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3137, Serial Number: LQ9QKVW0H6			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3137, Serial Number: H6D001F73D			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3137, Serial Number: G5022YM6RR			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 5



1.8 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	Ahmed Al Derdiri, Colin Brain, Ioan-Alexandru Bogatu and Morsalin Hossain	UKAS
Emission Bandwidth	David Hill and Jayvir Makwana	UKAS
Maximum Conducted Output Power	Jayvir Makwana	UKAS
Authorised Band Edges	Ahmed Al Derdiri, Colin Brain, Ioan-Alexandru Bogatu and Morsalin Hossain	UKAS
Spurious Radiated Emissions	Akhil Rajendran Bhaskaran Nair, Ahmed Al Derdiri, Ioan-Alexandru Bogatu, James Woods, Manohar Thota and Vineeth Nagaraj	UKAS
Power Spectral Density	Jayvir Makwana	UKAS

Table 6

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

A3137, S/N: FV5VYV72RL - Modification State 0
A3137, S/N: LQ9QKVW0H6 - Modification State 0

2.1.3 Date of Test

25-April-2024 to 25-May-2024

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 dB μ V/m to μ V/m:
 $10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$.

2.1.5 Environmental Conditions

Ambient Temperature	22.7 - 23.8 °C
Relative Humidity	35.8 - 47.9 %



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	59.46	50.93
802.11b	1 Mbps	-	-	2417	2390	57.62	48.66
802.11g	12 Mbps	-	-	2412	2390	62.73	51.47
802.11g	24 Mbps	-	-	2417	2390	67.77	51.45
802.11g	54 Mbps	-	-	2422	2390	69.45	51.49
802.11g	54 Mbps	-	-	2427	2390	69.19	50.47
802.11n HT20	MCS 4	-	-	2412	2390	63.57	51.10
802.11n HT20	MCS 4	-	-	2417	2390	67.91	51.31
802.11n HT20	MCS 7	-	-	2422	2390	69.34	50.63
802.11n HT20	MCS 7	-	-	2427	2390	69.38	51.08
802.11n HT20	MCS 7	-	-	2432	2390	69.11	49.35
802.11ax HE20	MCS 2x1	SU	-	2412	2390	64.67	51.15
802.11ax HE20	MCS 9x1	106	54	2412	2390	68.45	47.68
802.11ax HE20	MCS 9x1	SU	-	2417	2390	69.31	48.97
802.11ax HE20	MCS 9x1	106	54	2417	2390	62.76	44.96
802.11ax HE20	MCS 9x1	SU	-	2422	2390	68.79	51.21
802.11ax HE20	MCS 4x1	SU	-	2427	2390	68.59	51.21
802.11ax HE20	MCS 9x1	SU	-	2432	2390	68.95	51.10
802.11b	1 Mbps	-	-	2462	2483.5	59.76	51.48
802.11b	1 Mbps	-	-	2467	2483.5	60.15	51.40
802.11b	1 Mbps	-	-	2472	2483.5	58.17	51.17
802.11g	54 Mbps	-	-	2447	2483.5	66.93	51.32
802.11g	24 Mbps	-	-	2452	2483.5	67.17	51.34
802.11g	54 Mbps	-	-	2457	2483.5	67.98	51.25
802.11g	24 Mbps	-	-	2462	2483.5	65.83	51.50
802.11g	24 Mbps	-	-	2467	2483.5	64.64	51.44
802.11g	24 Mbps	-	-	2472	2483.5	65.38	51.50
802.11n HT20	MCS 7	-	-	2447	2483.5	68.43	51.46
802.11n HT20	MCS 4	-	-	2452	2483.5	66.24	50.99
802.11n HT20	MCS 7	-	-	2457	2483.5	67.97	51.06
802.11n HT20	MCS 4	-	-	2462	2483.5	65.69	51.49
802.11n HT20	MCS 2	-	-	2467	2483.5	63.30	51.49
802.11n HT20	MCS 7	-	-	2472	2483.5	64.04	51.24
802.11ax HE20	MCS 4x1	SU	-	2447	2483.5	66.58	51.33
802.11ax HE20	MCS 9x1	SU	-	2452	2483.5	67.62	51.09
802.11ax HE20	MCS 4x1	SU	-	2457	2483.5	65.74	51.42
802.11ax HE20	MCS 9x1	106	54	2457	2483.5	69.29	46.94
802.11ax HE20	MCS 4x1	SU	-	2462	2483.5	64.48	51.49
802.11ax HE20	MCS 9x1	106	54	2462	2483.5	69.48	49.47
802.11ax HE20	MCS 9x1	SU	-	2467	2483.5	63.51	51.41
802.11ax HE20	MCS 9x1	106	54	2467	2483.5	66.27	51.46
802.11ax HE20	MCS 2x1	SU	-	2472	2483.5	64.79	51.38
802.11ax HE20	MCS 9x1	106	54	2472	2483.5	69.44	48.60

Table 7 - SISO Restricted Band Edge Results

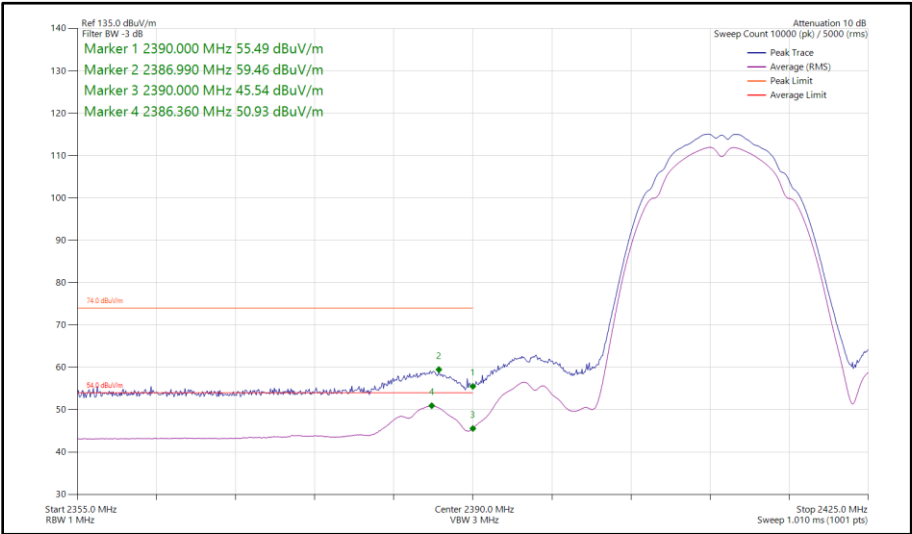


Figure 1 - 802.11b, SISO, Core 0 - 2412 MHz
Band Edge Frequency 2390 MHz

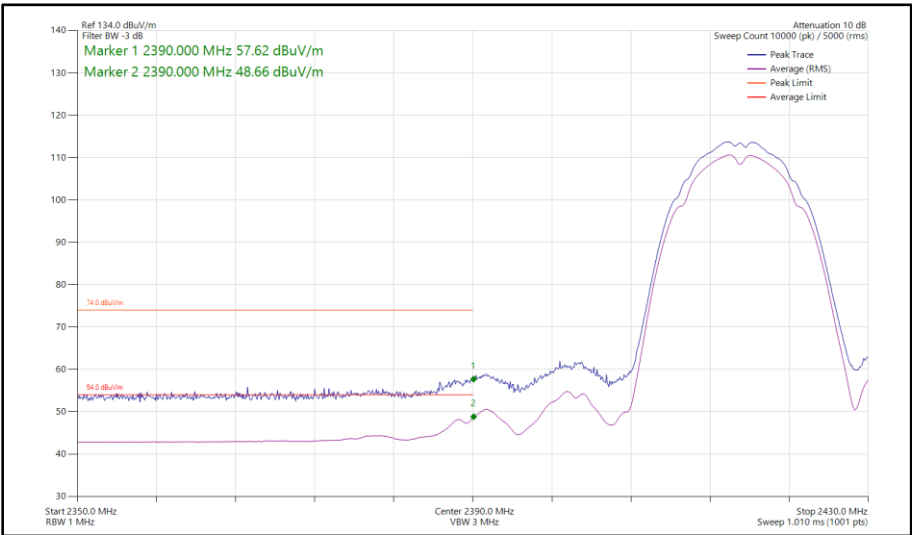
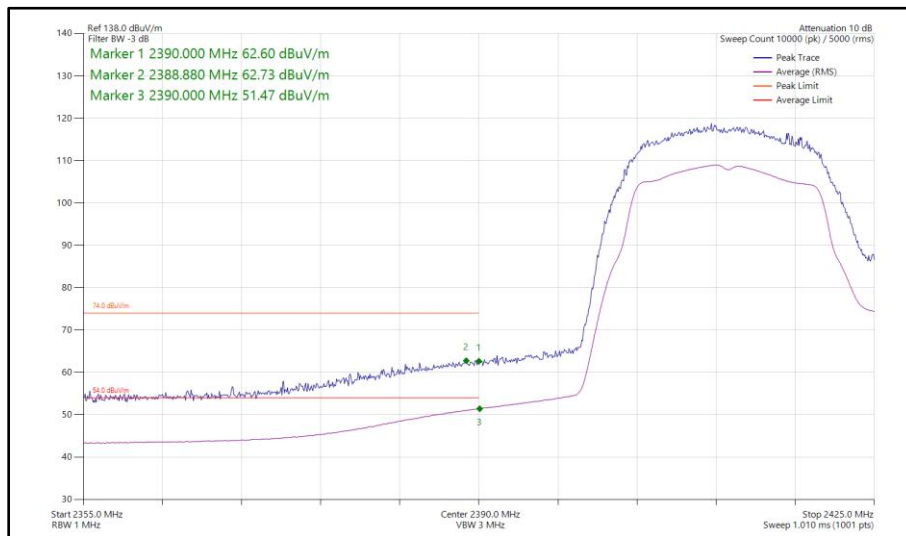
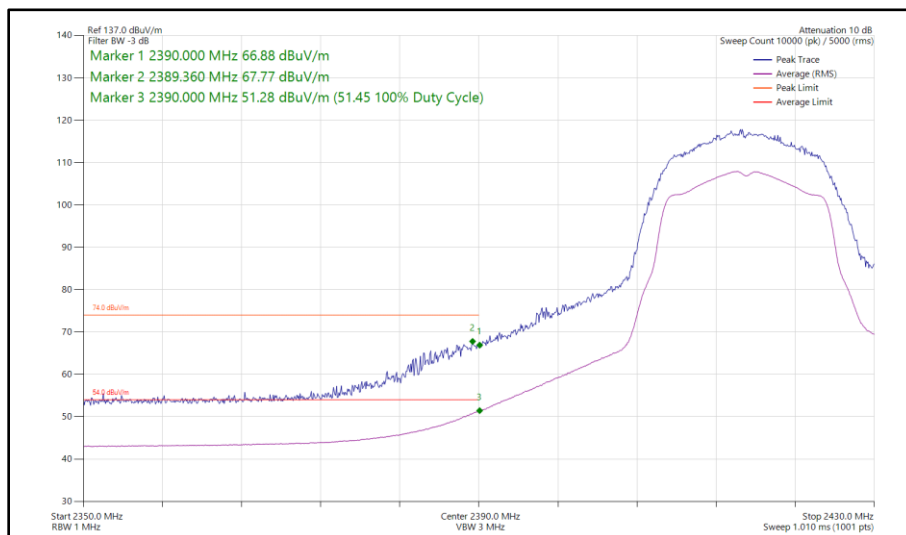


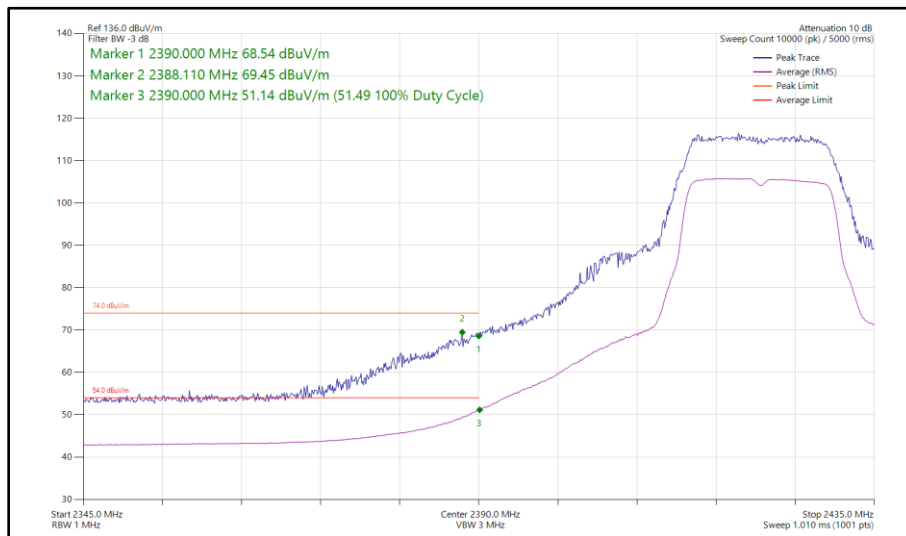
Figure 2 - 802.11b, SISO, Core 0 - 2417 MHz
Band Edge Frequency 2390 MHz



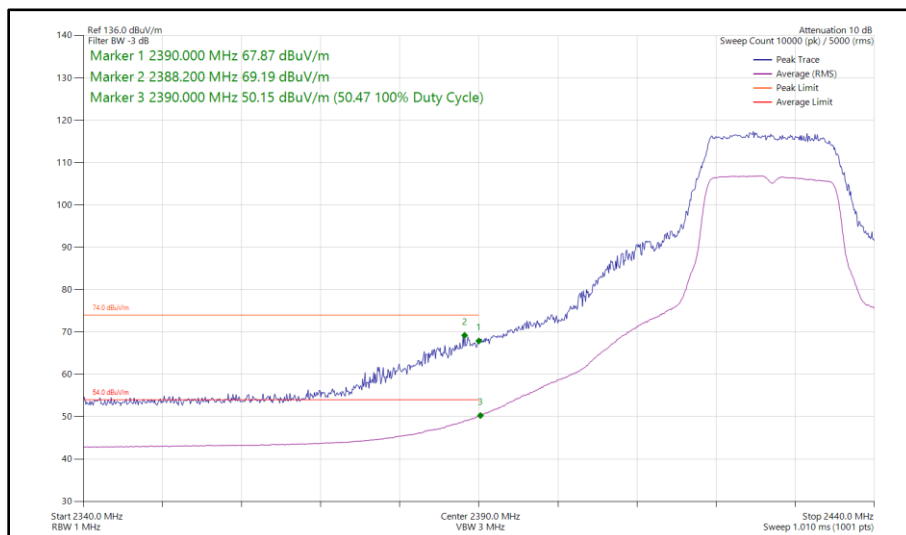
**Figure 3 - 802.11g, SISO, Core 0 - 2412 MHz
Band Edge Frequency 2390 MHz**



**Figure 4 - 802.11g, SISO, Core 0 - 2417 MHz
Band Edge Frequency 2390 MHz**



**Figure 5 - 802.11g, SISO, Core 0 - 2422 MHz
Band Edge Frequency 2390 MHz**



**Figure 6 - 802.11g, SISO, Core 0 - 2427 MHz
Band Edge Frequency 2390 MHz**

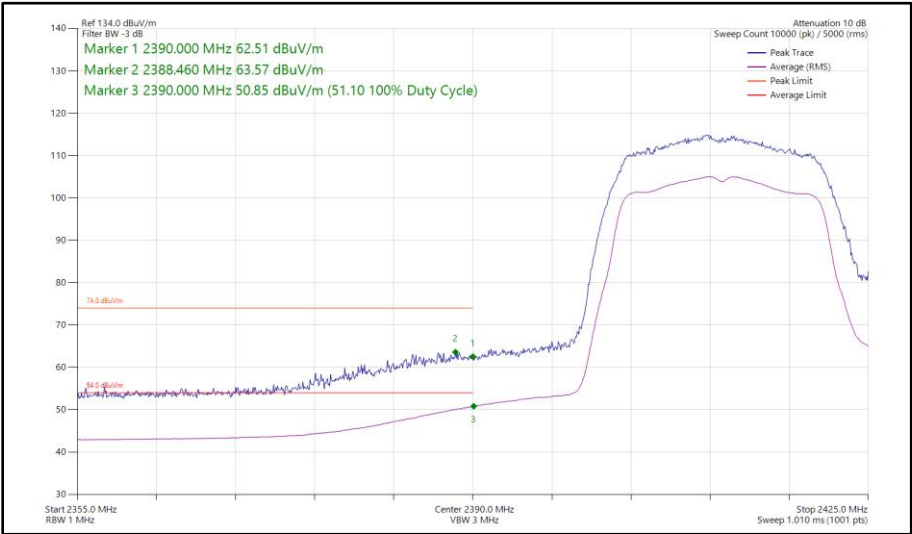


Figure 7 - 802.11n HT20, SISO, Core 0 - 2412 MHz
Band Edge Frequency 2390 MHz

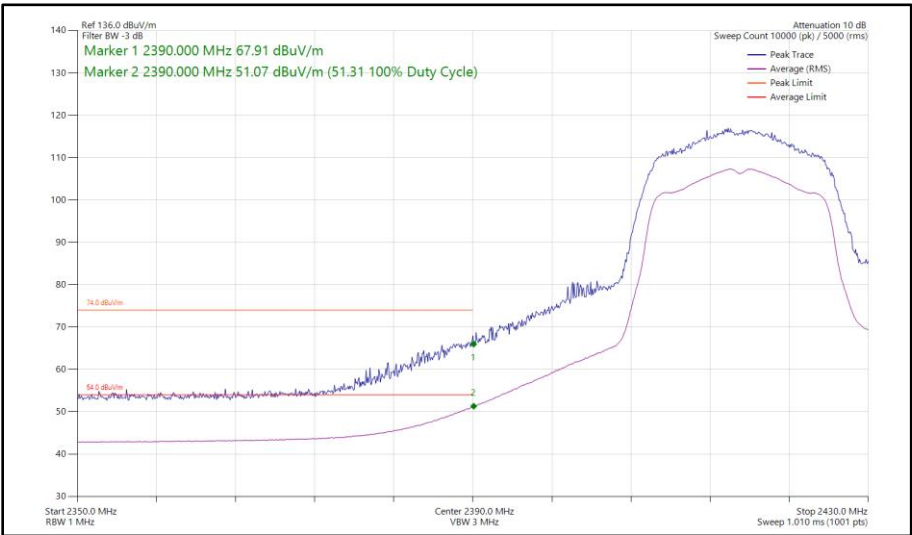


Figure 8 - 802.11n HT20, SISO, Core 0 - 2417 MHz
Band Edge Frequency 2390 MHz

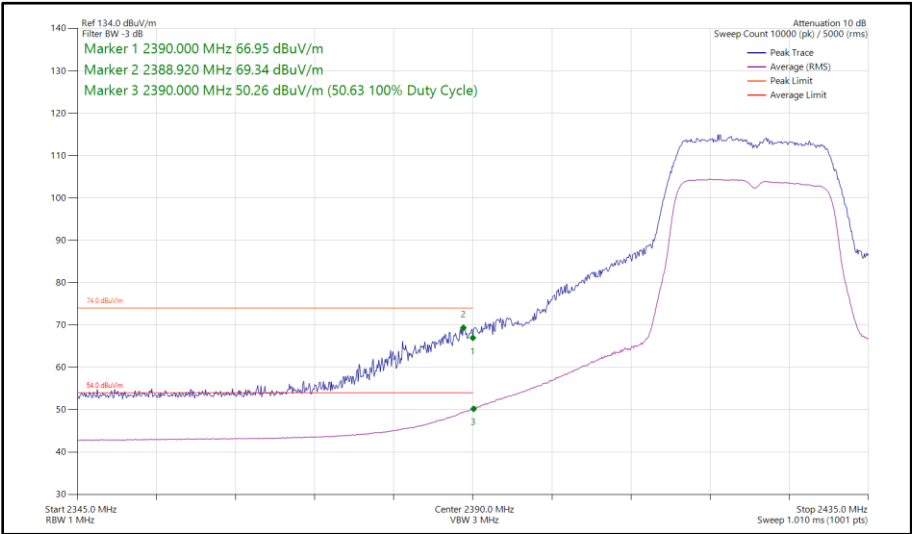


Figure 9 - 802.11n HT20, SISO, Core 0 - 2422 MHz
Band Edge Frequency 2390 MHz

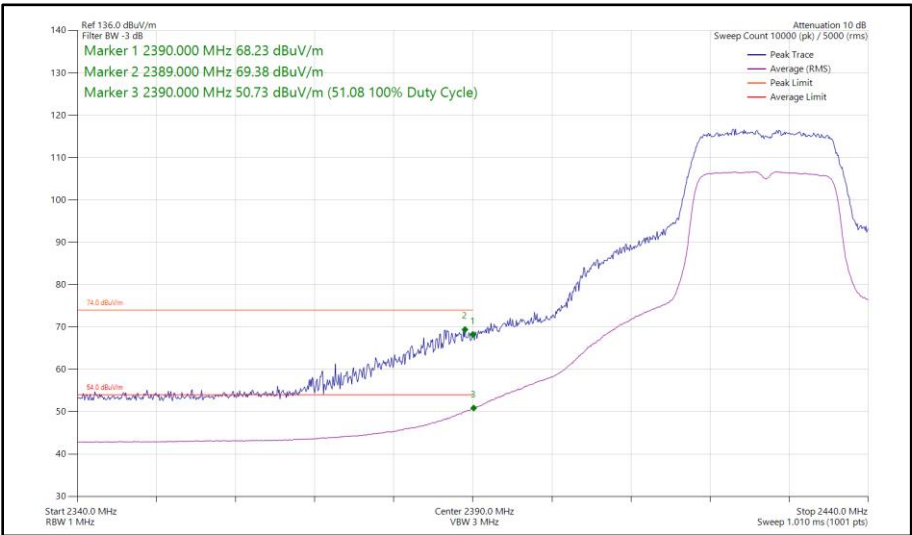
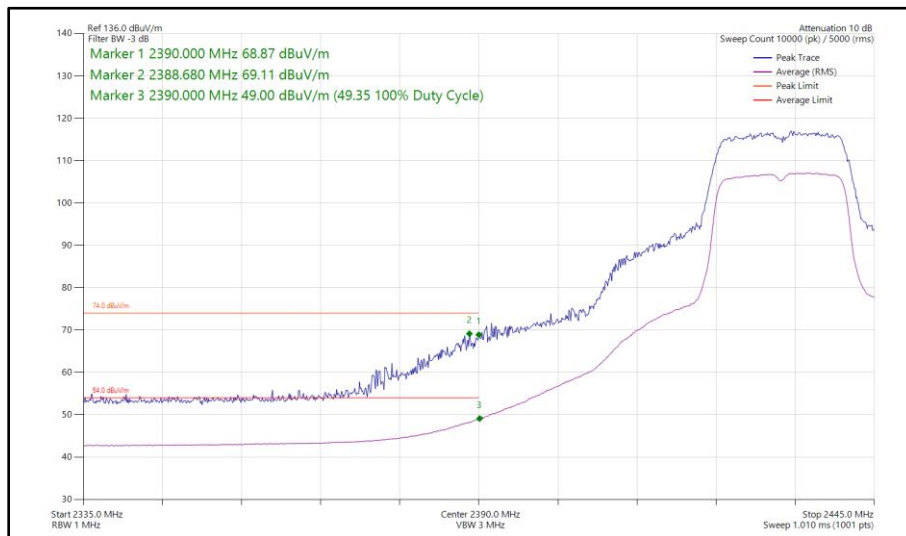
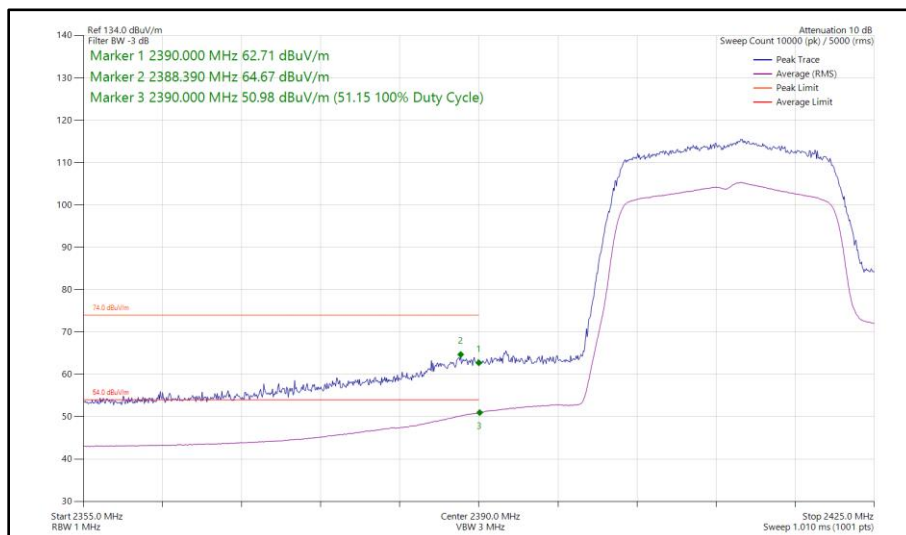


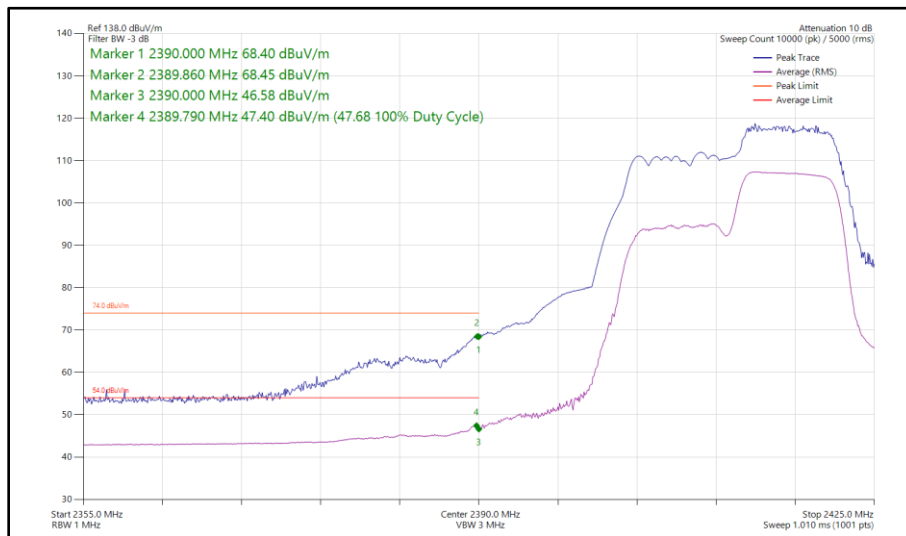
Figure 10 - 802.11n HT20, SISO, Core 0 - 2427 MHz
Band Edge Frequency 2390 MHz



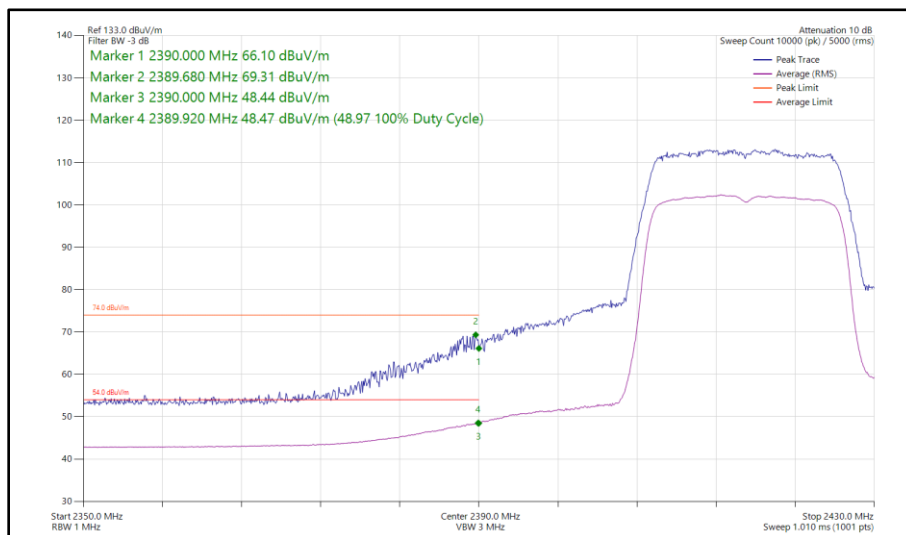
**Figure 11 - 802.11n HT20, SISO, Core 0 - 2432 MHz
Band Edge Frequency 2390 MHz**



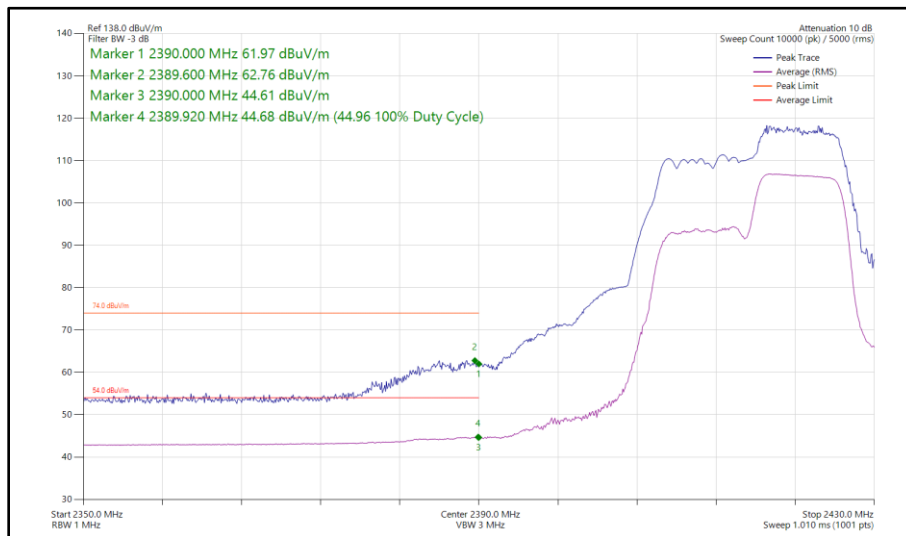
**Figure 12 - 802.11ax HE20, SU, SISO, Core 0 - 2412 MHz
Band Edge Frequency 2390 MHz**



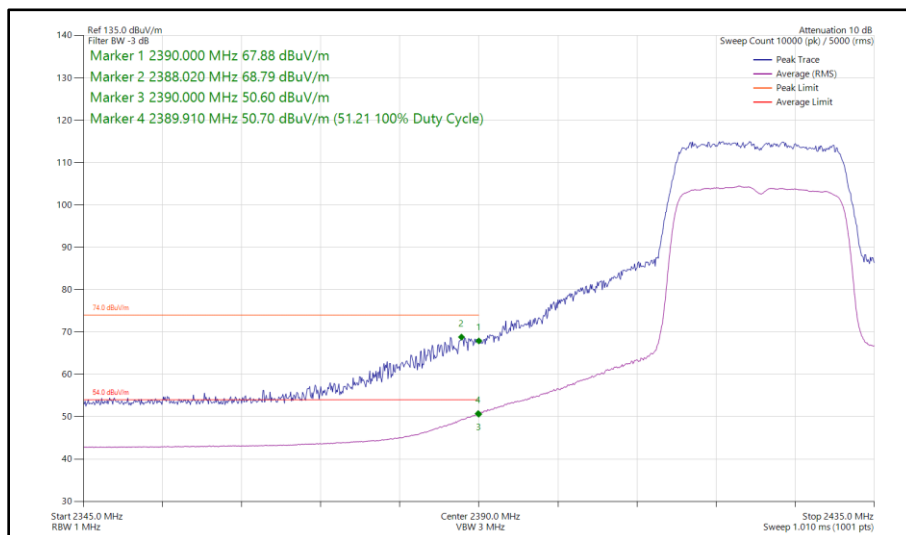
**Figure 13 - 802.11ax HE20, RU 106-54, SISO, Core 0 - 2412 MHz
Band Edge Frequency 2390 MHz**



**Figure 14 - 802.11ax HE20, SU, SISO, Core 0 - 2417 MHz
Band Edge Frequency 2390 MHz**



**Figure 15 - 802.11ax HE20, RU 106-54, SISO, Core 0 - 2417 MHz
Band Edge Frequency 2390 MHz**



**Figure 16 - 802.11ax HE20, SU, SISO, Core 0 - 2422 MHz
Band Edge Frequency 2390 MHz**

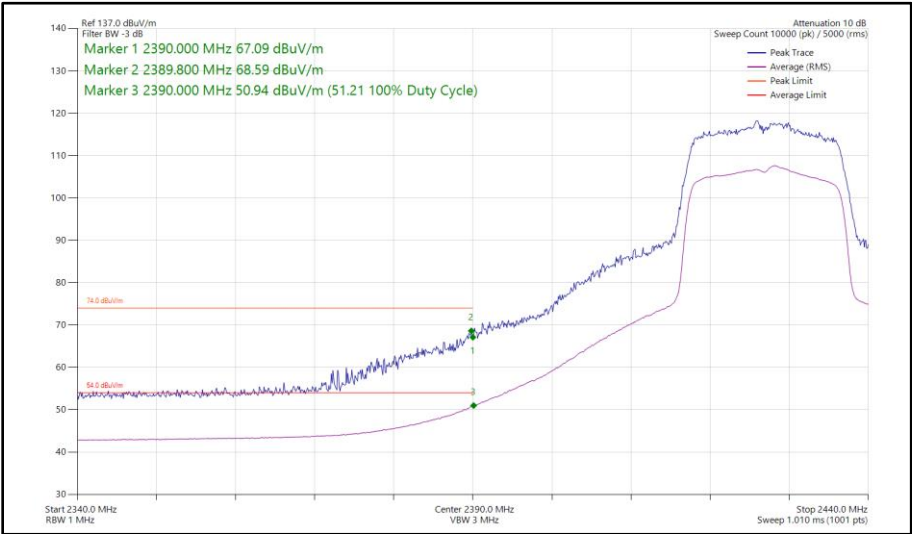


Figure 17 - 802.11ax HE20, SU, SISO, Core 0 - 2427 MHz
Band Edge Frequency 2390 MHz

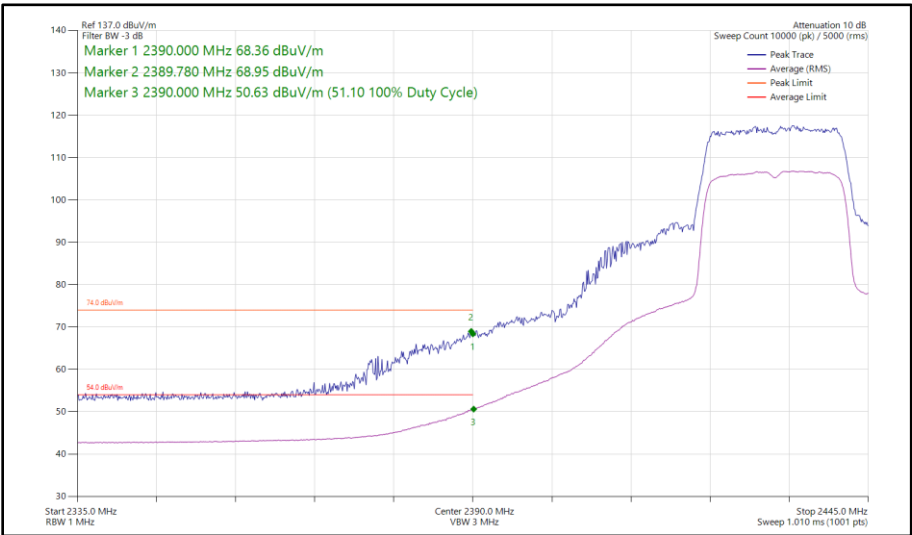
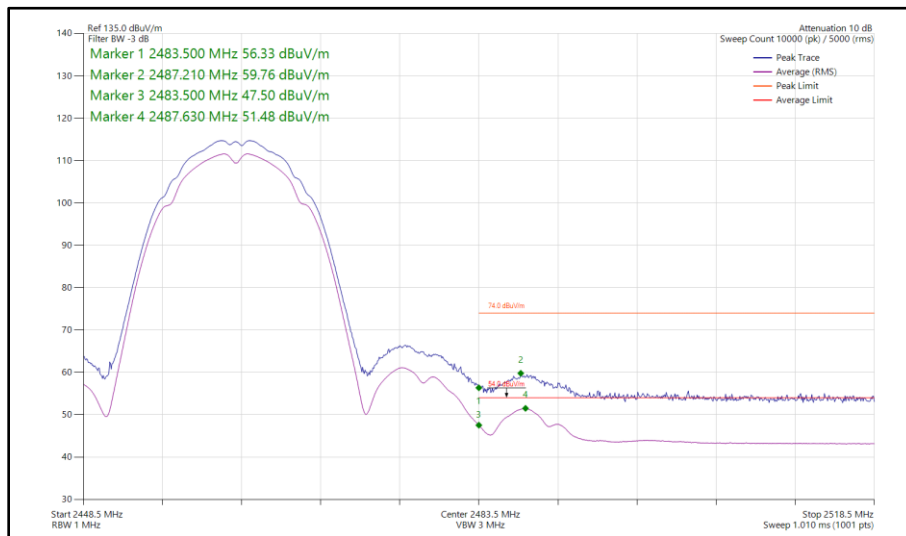
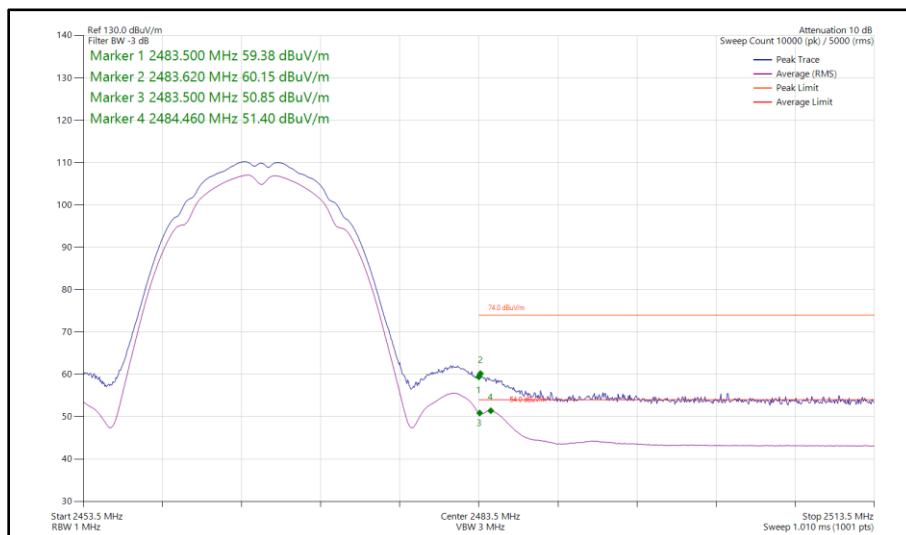


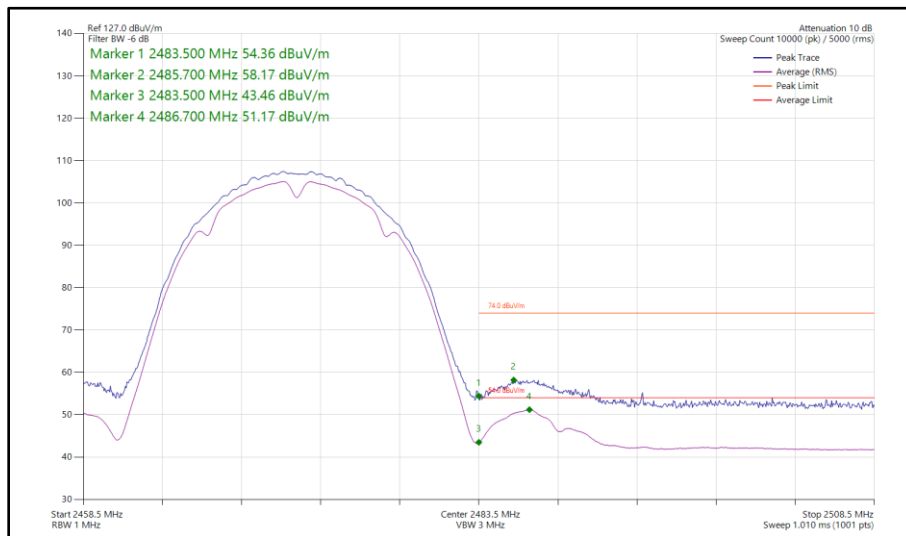
Figure 18 - 802.11ax HE20, SU, SISO, Core 0 - 2432 MHz
Band Edge Frequency 2390 MHz



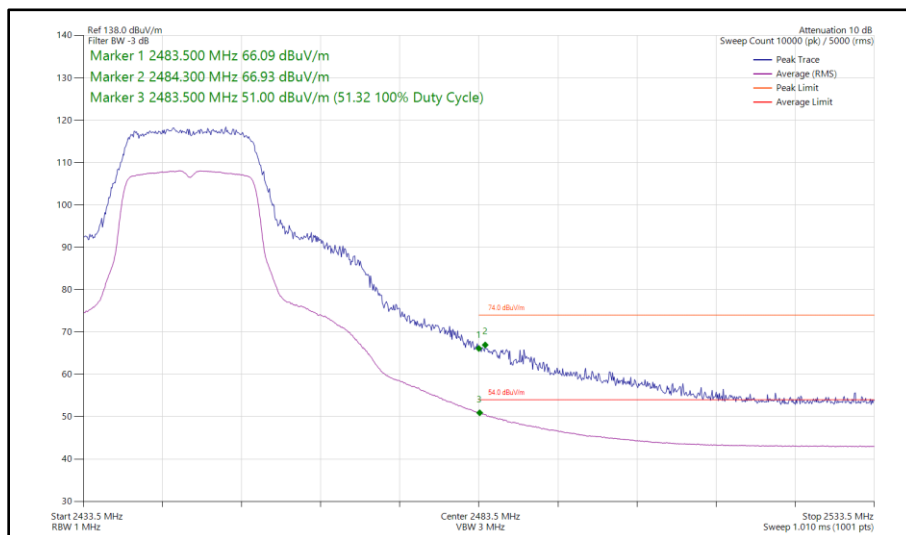
**Figure 19 - 802.11b, SISO, Core 0 - 2462 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 20 - 802.11b, SISO, Core 0 - 2467 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 21 - 802.11b, SISO, Core 0 - 2472 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 22 - 802.11g, SISO, Core 0 - 2447 MHz
Band Edge Frequency 2483.5 MHz**

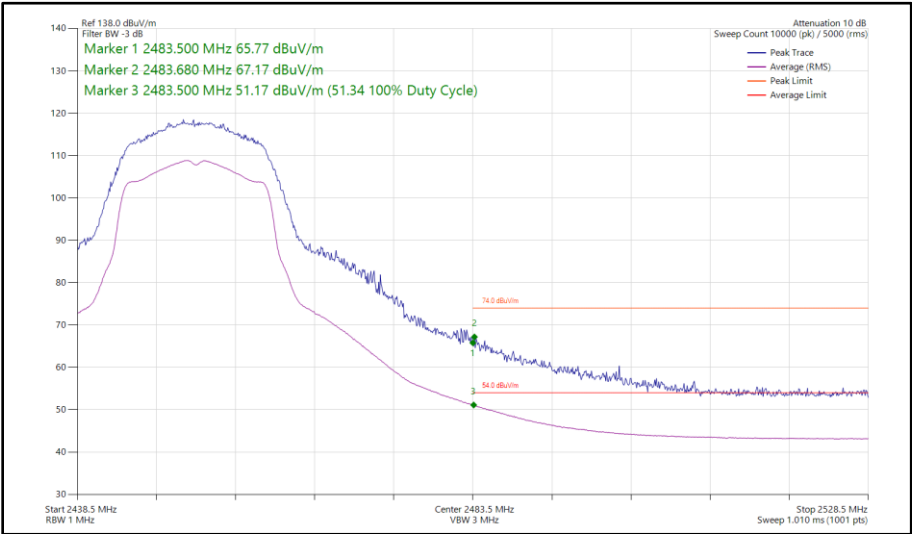


Figure 23 - 802.11g, SISO, Core 0 - 2452 MHz
Band Edge Frequency 2483.5 MHz

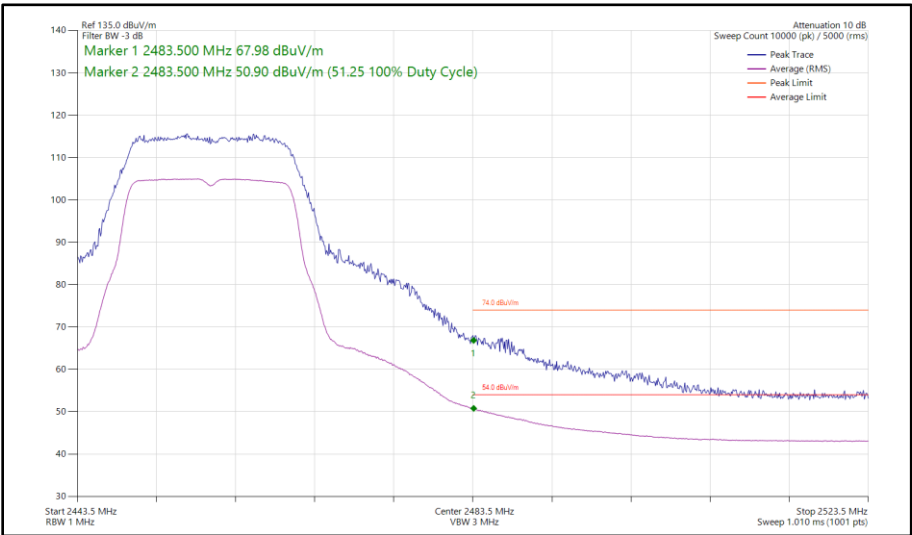
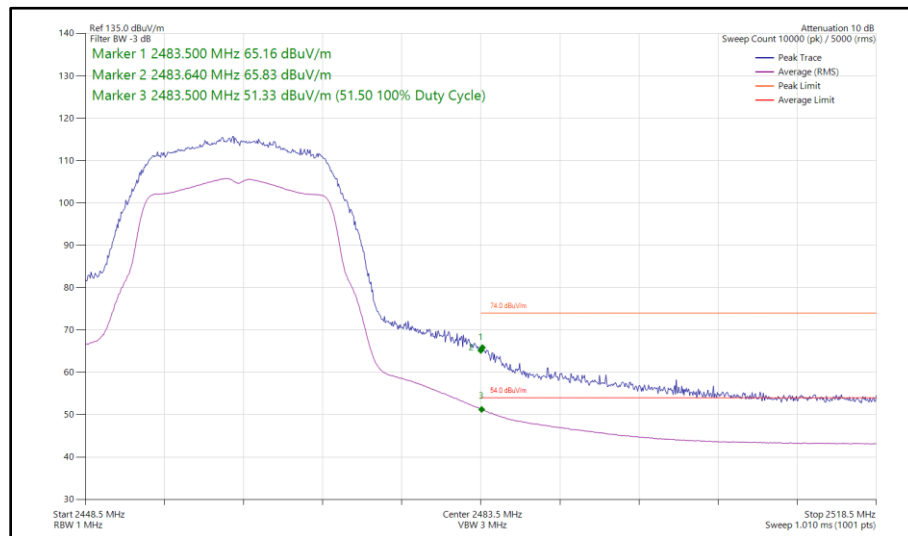
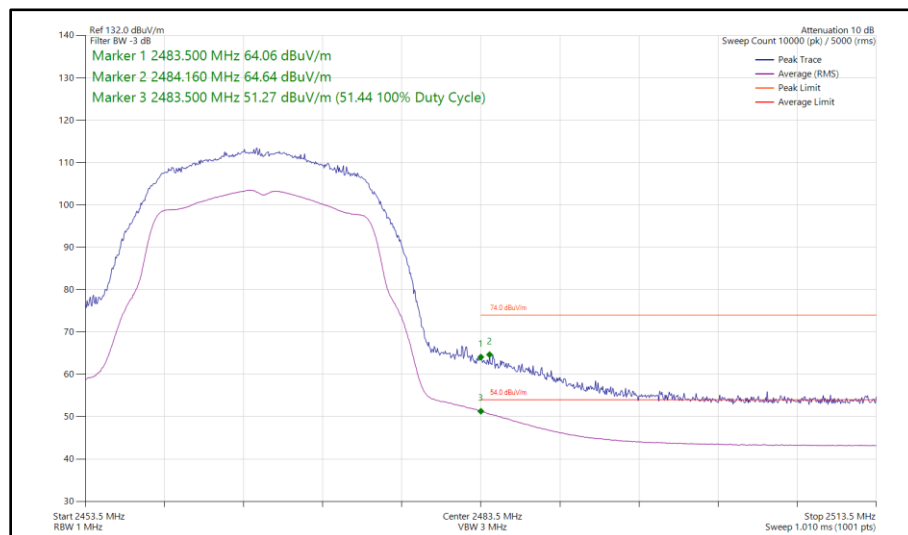


Figure 24 - 802.11g, SISO, Core 0 - 2457 MHz
Band Edge Frequency 2483.5 MHz



**Figure 25 - 802.11g, SISO, Core 0 - 2462 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 26 - 802.11g, SISO, Core 0 - 2467 MHz
Band Edge Frequency 2483.5 MHz**

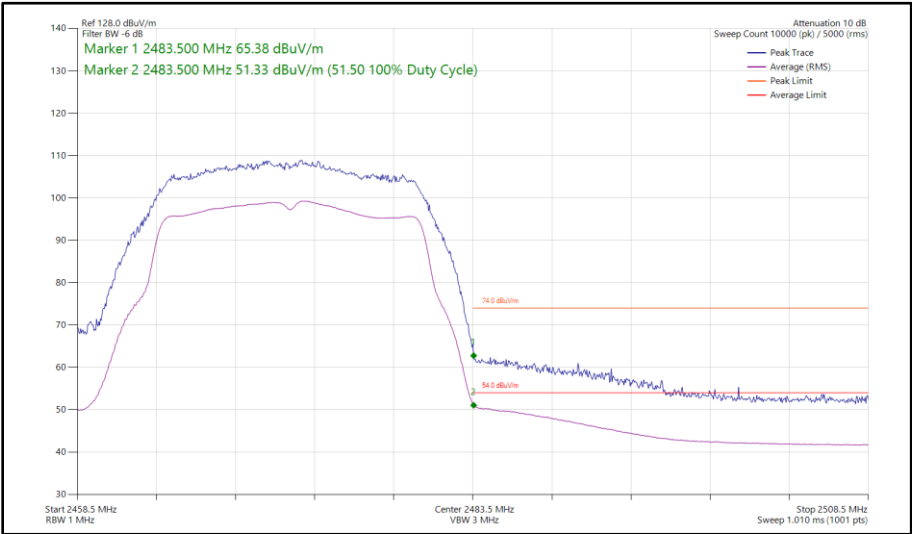


Figure 27 - 802.11g, SISO, Core 0 - 2472 MHz
Band Edge Frequency 2483.5 MHz

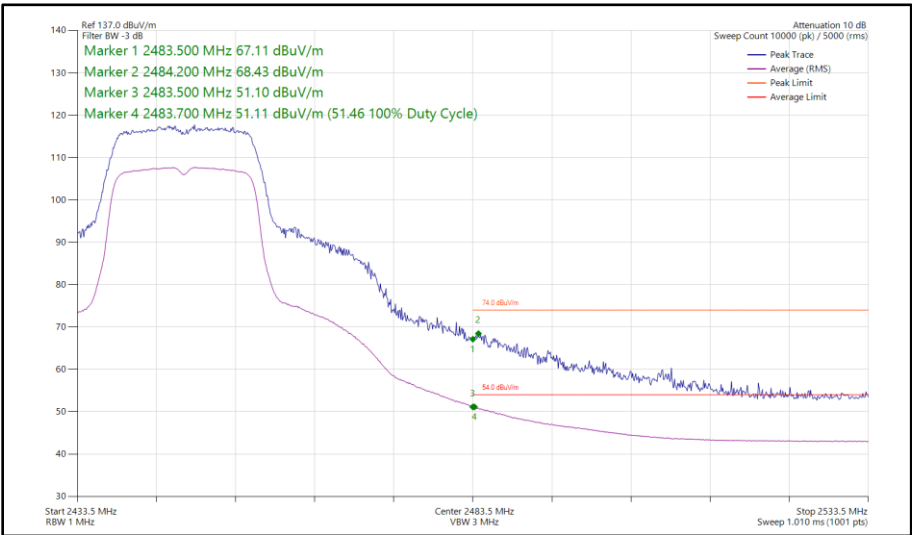


Figure 28 - 802.11n HT20, SISO, Core 0 - 2447 MHz
Band Edge Frequency 2483.5 MHz

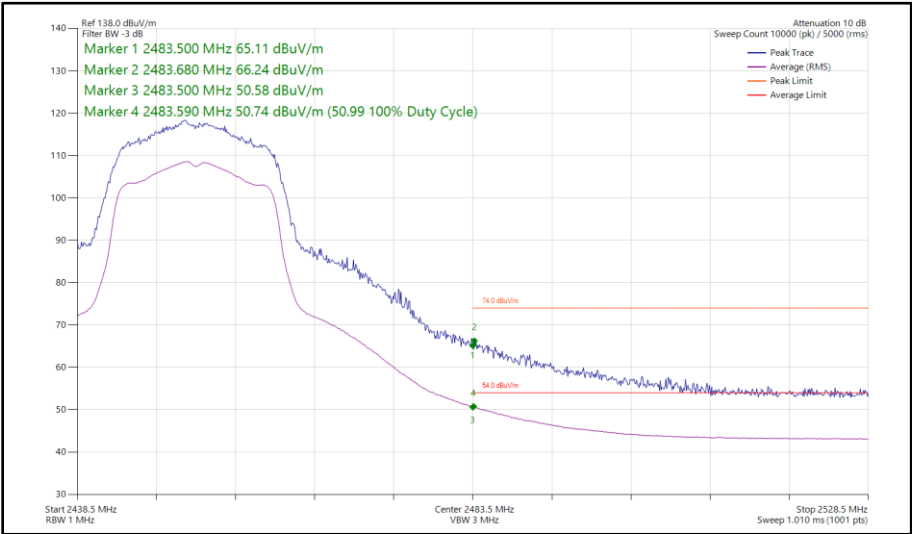


Figure 29 - 802.11n HT20, SISO, Core 0 - 2452 MHz
Band Edge Frequency 2483.5 MHz

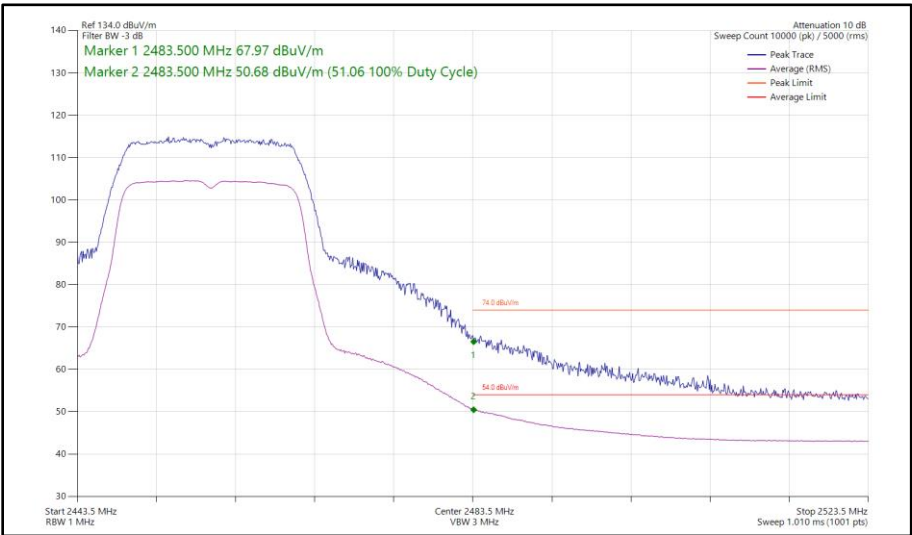


Figure 30 - 802.11n HT20, SISO, Core 0 - 2457 MHz
Band Edge Frequency 2483.5 MHz

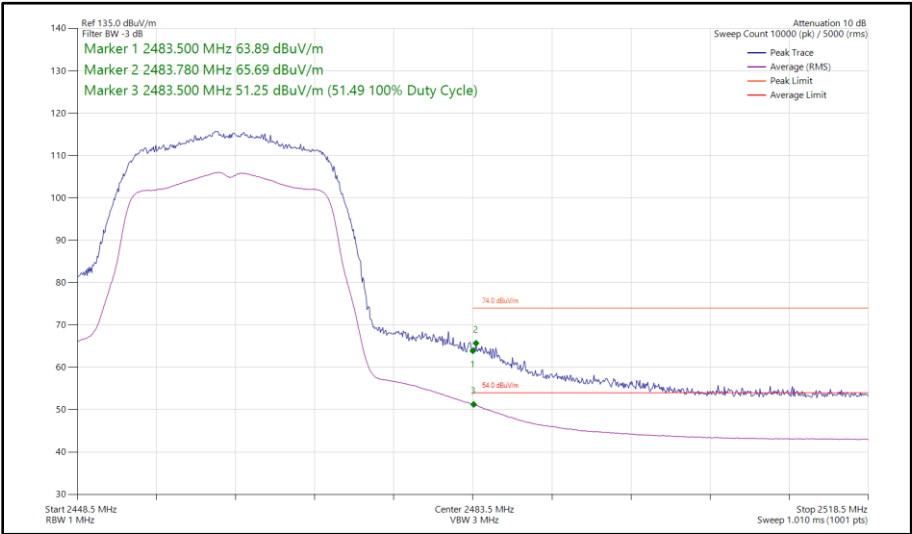


Figure 31 - 802.11n HT20, SISO, Core 0 - 2462 MHz
Band Edge Frequency 2483.5 MHz

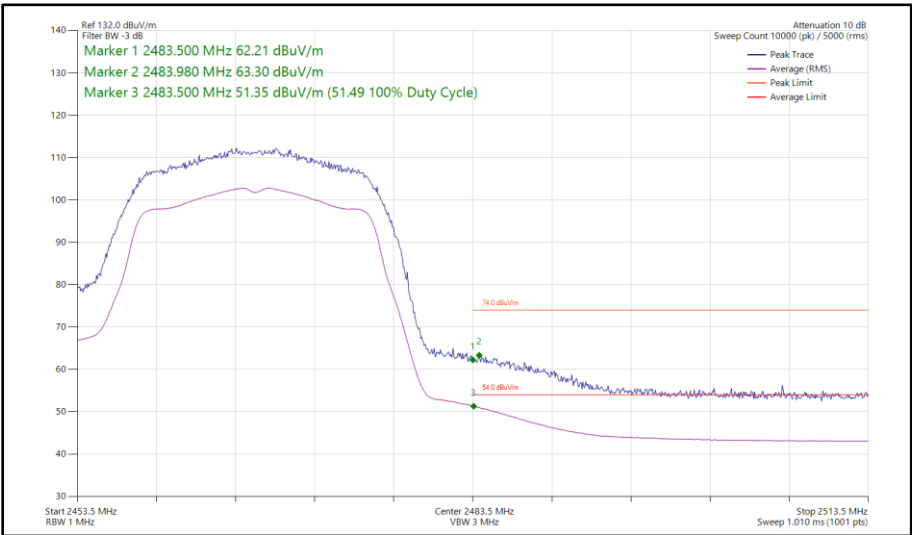
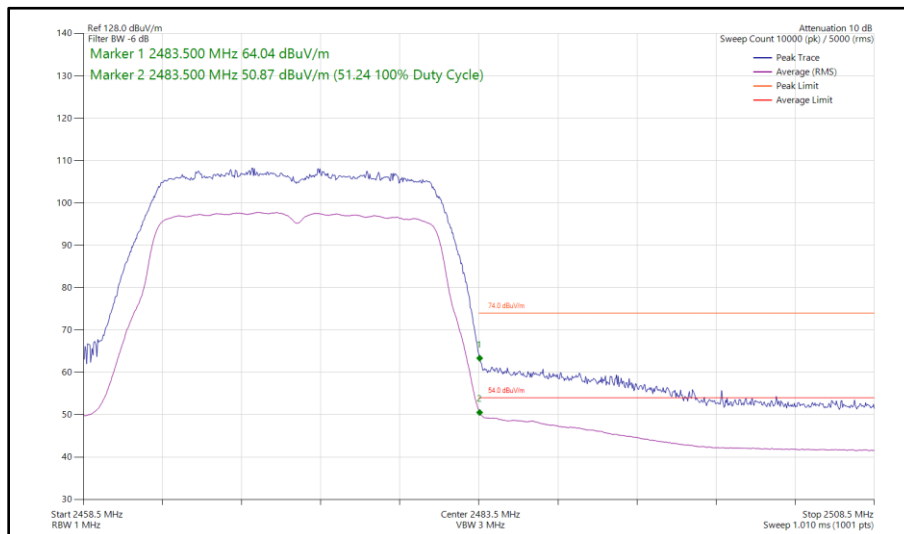
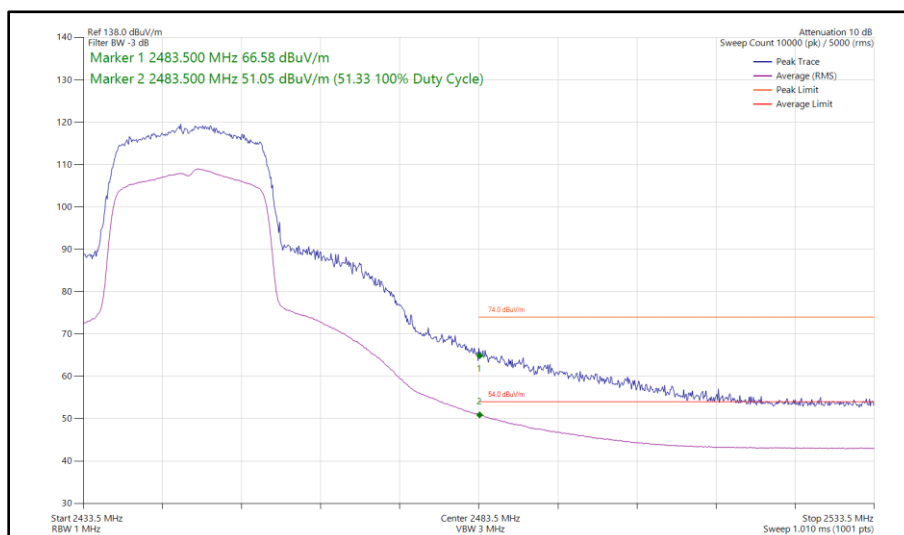


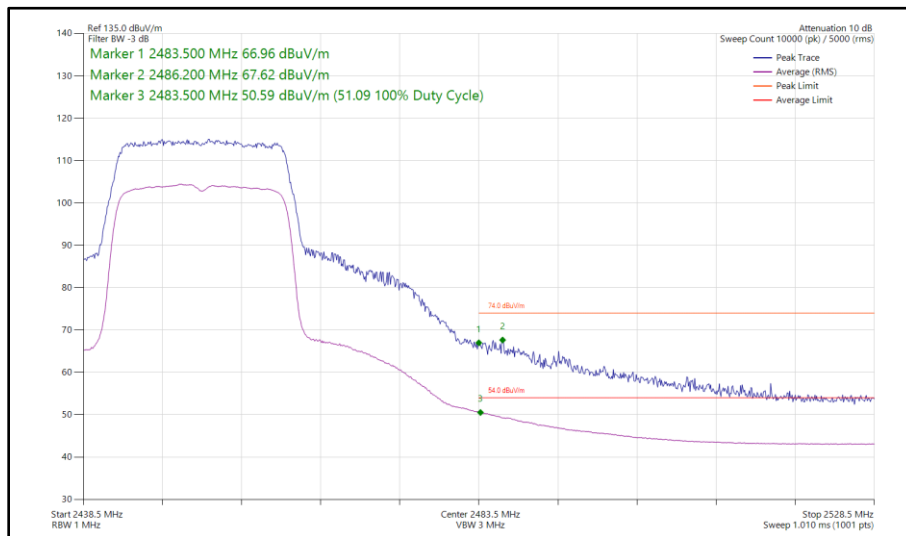
Figure 32 - 802.11n HT20, SISO, Core 0 - 2467 MHz
Band Edge Frequency 2483.5 MHz



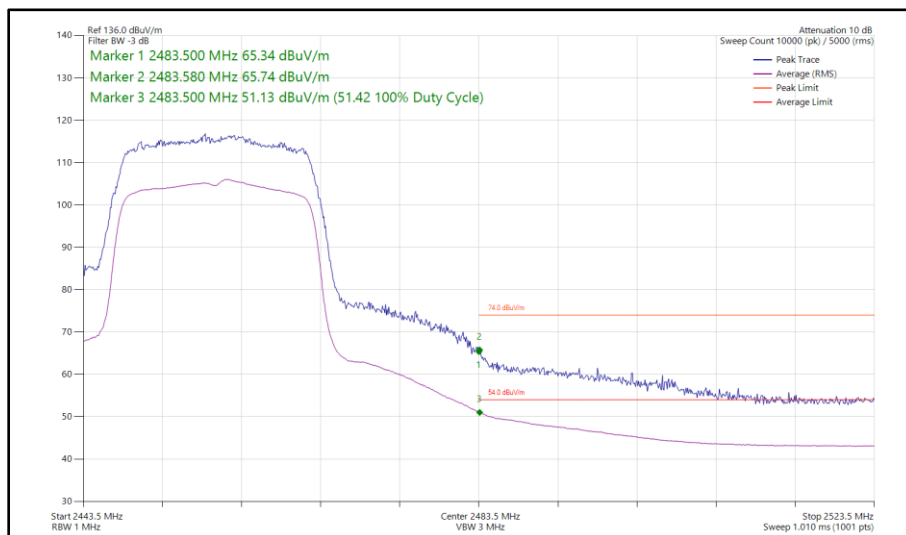
**Figure 33 - 802.11n HT20, SISO, Core 0 - 2472 MHz
Band Edge Frequency 2483.5 MHz**



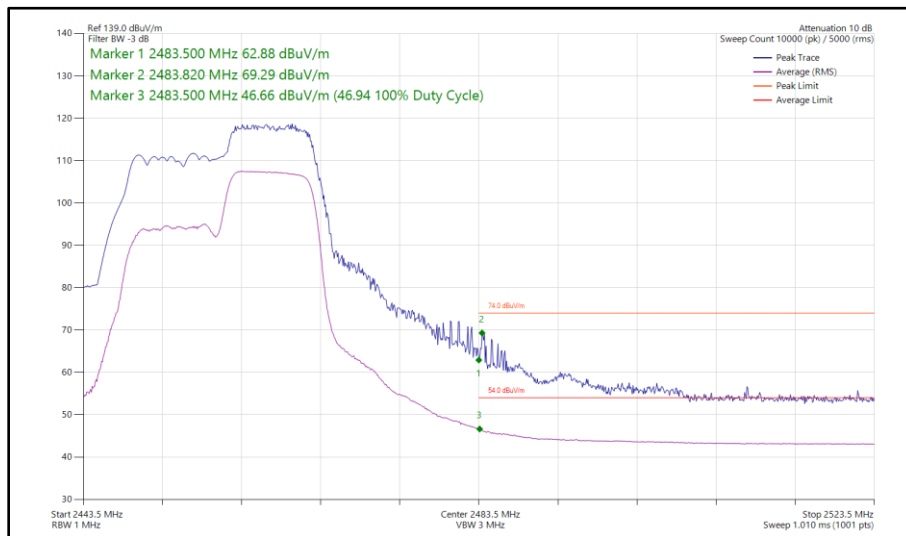
**Figure 34 - 802.11ax HE20, SU, SISO, Core 0 - 2447 MHz
Band Edge Frequency 2483.5 MHz**



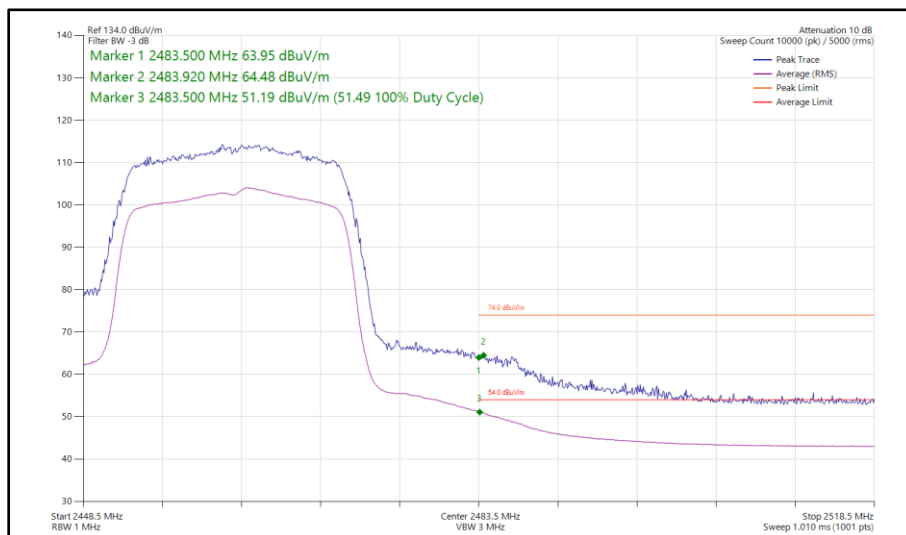
**Figure 35 - 802.11ax HE20, SU, SISO, Core 0 - 2452 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 36 - 802.11ax HE20, SU, SISO, Core 0 - 2457 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 37 - 802.11ax HE20, RU 106-54, SISO, Core 0 - 2457 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 38 - 802.11ax HE20, SU, SISO, Core 0 - 2462 MHz
Band Edge Frequency 2483.5 MHz**

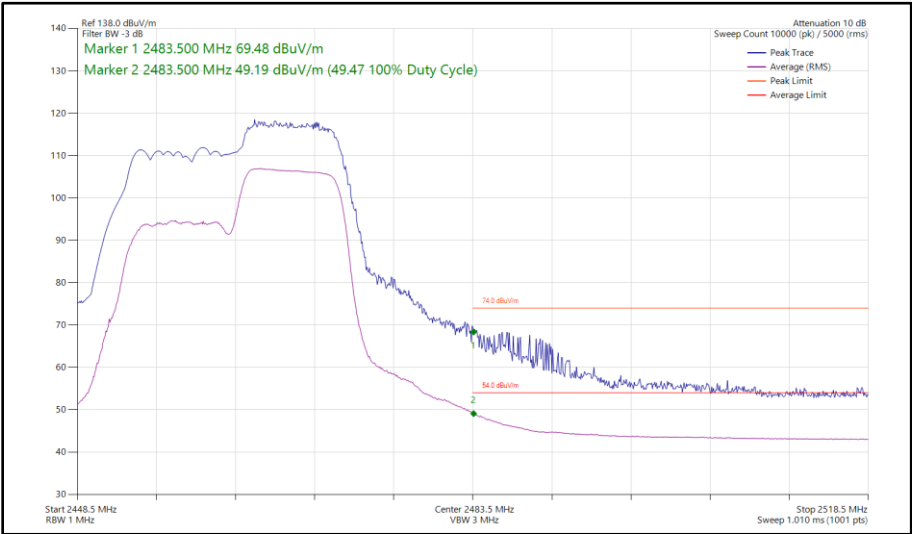


Figure 39 - 802.11ax HE20, RU 106-54, SISO, Core 0 - 2462 MHz
Band Edge Frequency 2483.5 MHz

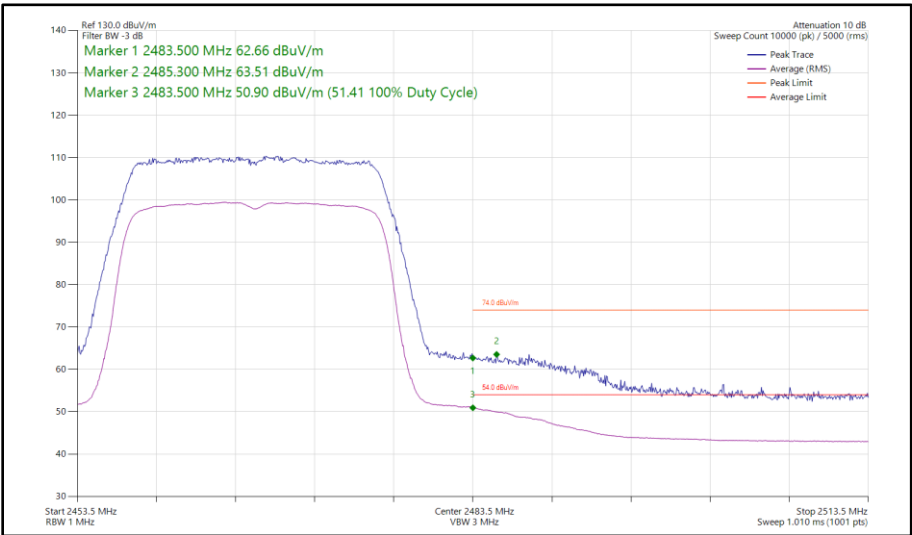
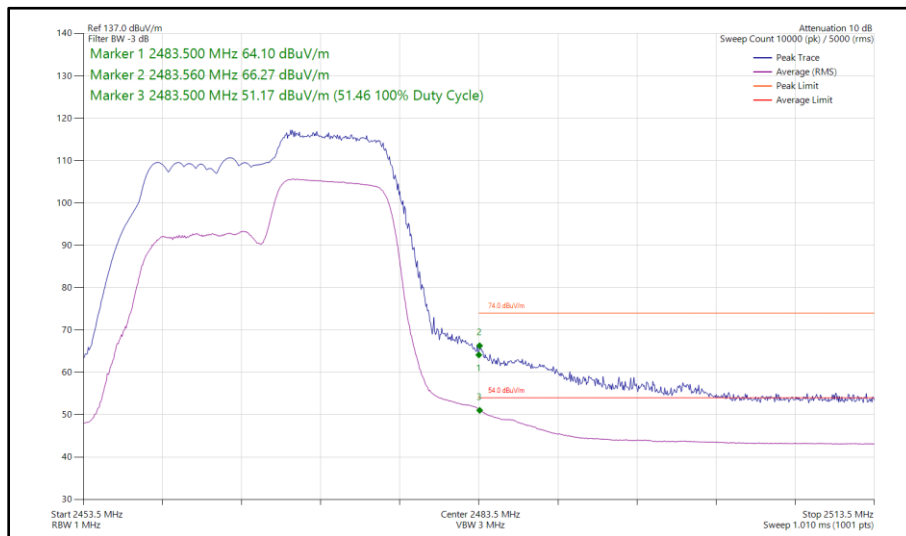
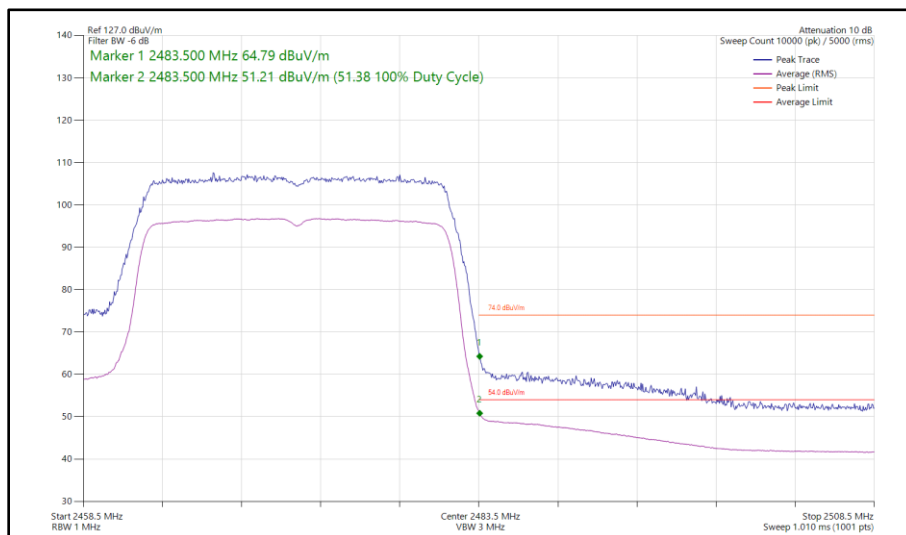


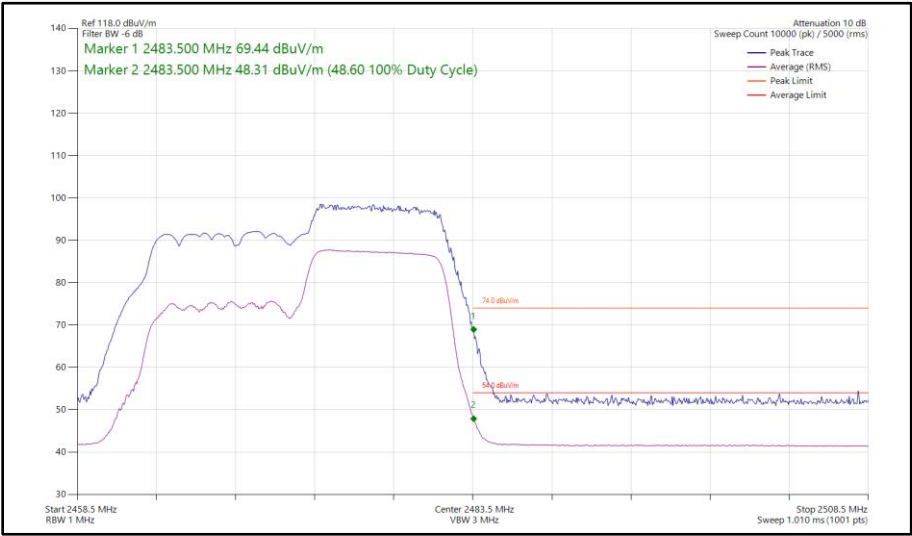
Figure 40 - 802.11ax HE20, SU, SISO, Core 0 - 2467 MHz
Band Edge Frequency 2483.5 MHz



**Figure 41 - 802.11ax HE20, RU 106-54, SISO, Core 0 - 2467 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 42 - 802.11ax HE20, SU, SISO, Core 0 - 2472 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 43 - 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 (dBμV/m)
802.11b	1 Mbps	-	-	2412	2390	59.08	50.96
802.11b	1 Mbps	-	-	2417	2390	59.06	50.00
802.11g	54 Mbps	-	-	2412	2390	69.48	50.64
802.11g	54 Mbps	-	-	2417	2390	69.40	50.77
802.11g	54 Mbps	-	-	2422	2390	69.27	50.89
802.11g	54 Mbps	-	-	2427	2390	68.92	50.63
802.11n HT20	MCS 4	-	-	2412	2390	64.02	51.34
802.11n HT20	MCS 7	-	-	2417	2390	69.41	50.77
802.11n HT20	MCS 7	-	-	2422	2390	69.35	50.56
802.11n HT20	MCS 7	-	-	2427	2390	69.01	49.27
802.11n HT20	MCS 7	-	-	2432	2390	69.33	48.94
802.11ax HE20	MCS 2x1	SU	-	2412	2390	65.10	51.38
802.11ax HE20	MCS 9x1	106	53	2412	2390	69.50	48.25
802.11ax HE20	MCS 2x1	SU	-	2417	2390	63.86	51.17
802.11ax HE20	MCS 9x1	106	53	2417	2390	67.69	46.15
802.11ax HE20	MCS 9x1	SU	-	2422	2390	69.27	51.07
802.11ax HE20	MCS 9x1	SU	-	2427	2390	69.49	49.79
802.11ax HE20	MCS 9x1	SU	-	2432	2390	68.76	50.24
802.11b	1 Mbps	-	-	2462	2483.5	58.46	49.16
802.11b	1 Mbps	-	-	2467	2483.5	59.95	51.48
802.11b	1 Mbps	-	-	2472	2483.5	58.52	51.16
802.11g	54 Mbps	-	-	2447	2483.5	67.35	50.01
802.11g	54 Mbps	-	-	2452	2483.5	68.21	51.47
802.11g	54 Mbps	-	-	2457	2483.5	69.09	50.49
802.11g	24 Mbps	-	-	2462	2483.5	67.19	51.35
802.11g	54 Mbps	-	-	2467	2483.5	66.15	51.21
802.11g	54 Mbps	-	-	2472	2483.5	65.56	51.49
802.11n HT20	MCS 7	-	-	2447	2483.5	69.39	50.83
802.11n HT20	MCS 7	-	-	2452	2483.5	69.28	50.11
802.11n HT20	MCS 7	-	-	2457	2483.5	69.49	48.66
802.11n HT20	MCS 2	-	-	2462	2483.5	65.16	51.09
802.11n HT20	MCS 7	-	-	2467	2483.5	67.55	51.24
802.11n HT20	MCS 2	-	-	2472	2483.5	64.91	51.35
802.11ax HE20	MCS 9x1	SU	-	2447	2483.5	69.50	50.93
802.11ax HE20	MCS 4x1	SU	-	2452	2483.5	67.61	51.48
802.11ax HE20	MCS 2x1	SU	-	2457	2483.5	68.06	50.99
802.11ax HE20	MCS 9x1	106	54	2457	2483.5	66.75	45.37
802.11ax HE20	MCS 4x1	SU	-	2462	2483.5	68.92	51.26
802.11ax HE20	MCS 9x1	106	54	2462	2483.5	69.28	49.79
802.11ax HE20	MCS 9x1	SU	-	2467	2483.5	66.31	51.40
802.11ax HE20	MCS 9x1	106	54	2467	2483.5	66.83	51.26
802.11ax HE20	MCS 9x1	SU	-	2472	2483.5	67.52	51.41
802.11ax HE20	MCS 9x1	26	0	2472	2483.5	69.31	48.29

Table 8 - SISO Restricted Band Edge Results

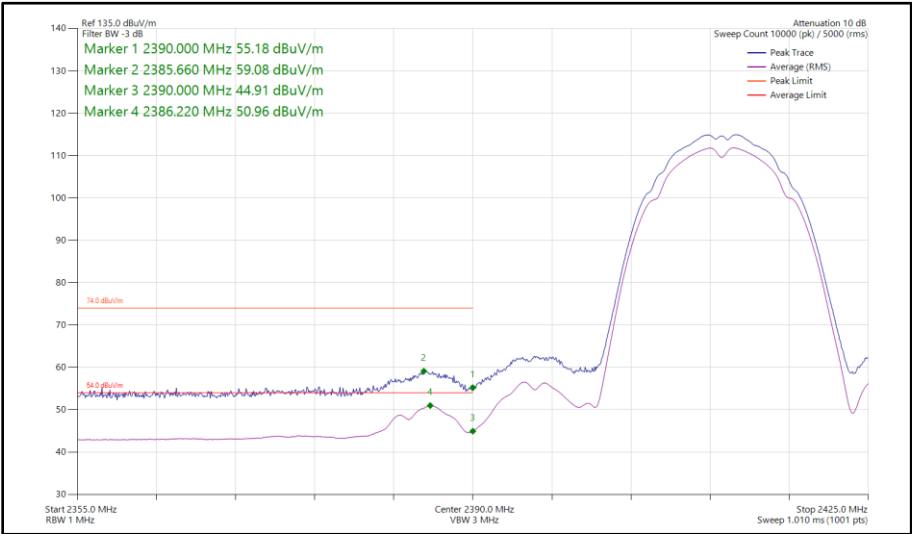


Figure 44 - 802.11b, SISO, Core 1 - 2412 MHz
Band Edge Frequency 2390 MHz

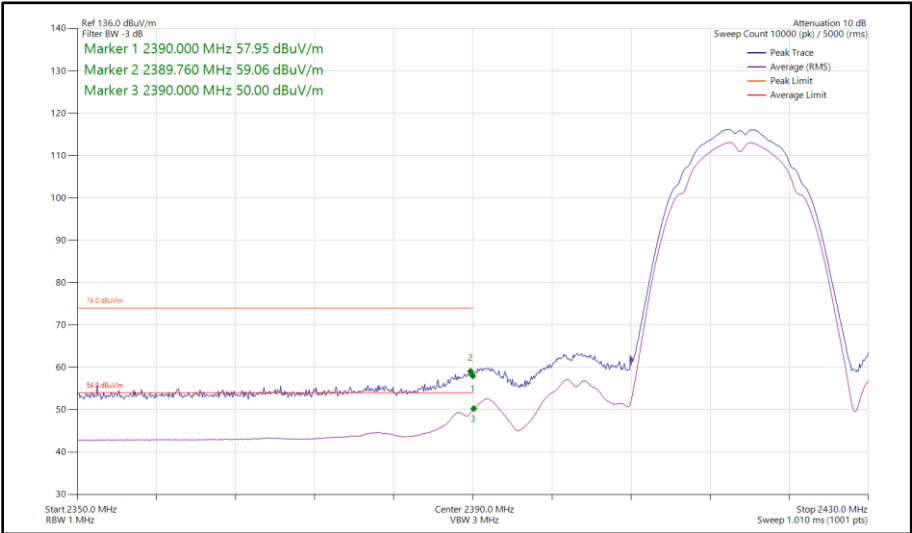
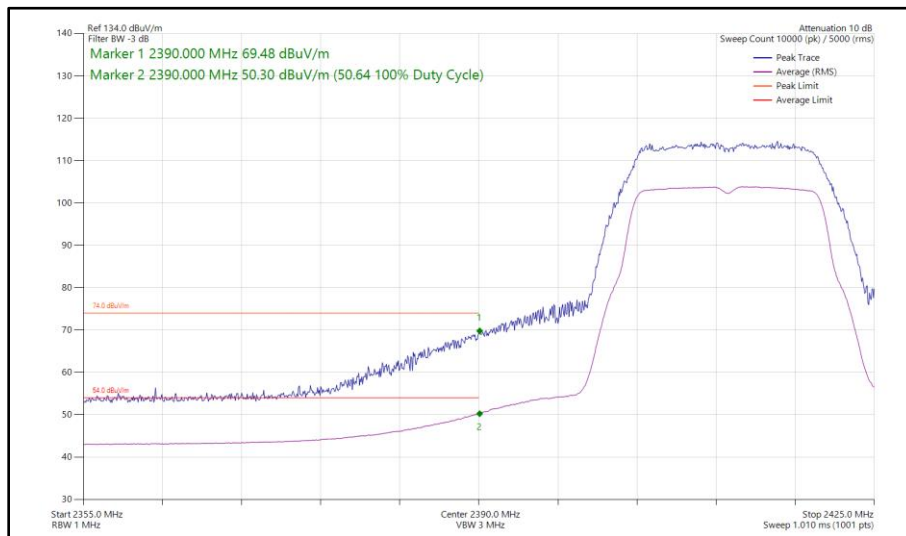
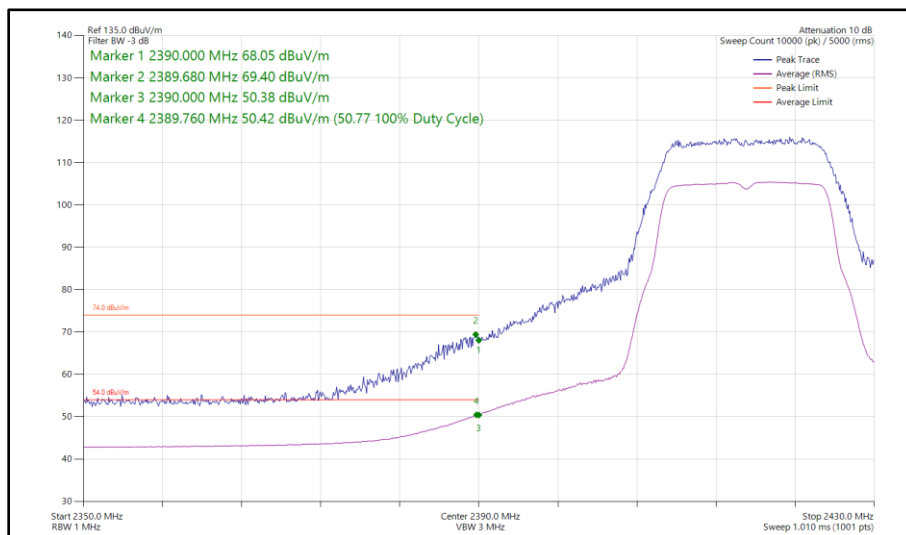


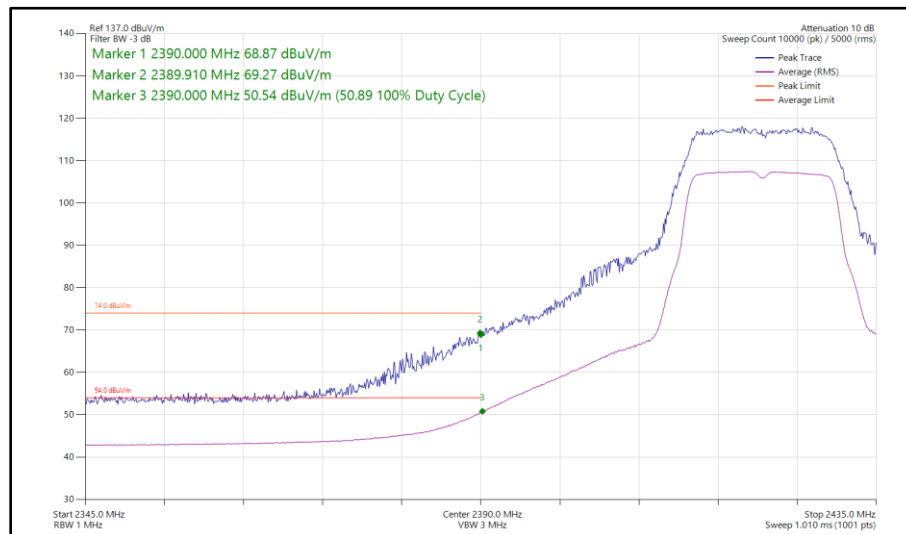
Figure 45 - 802.11b, SISO, Core 1 - 2417 MHz
Band Edge Frequency 2390 MHz



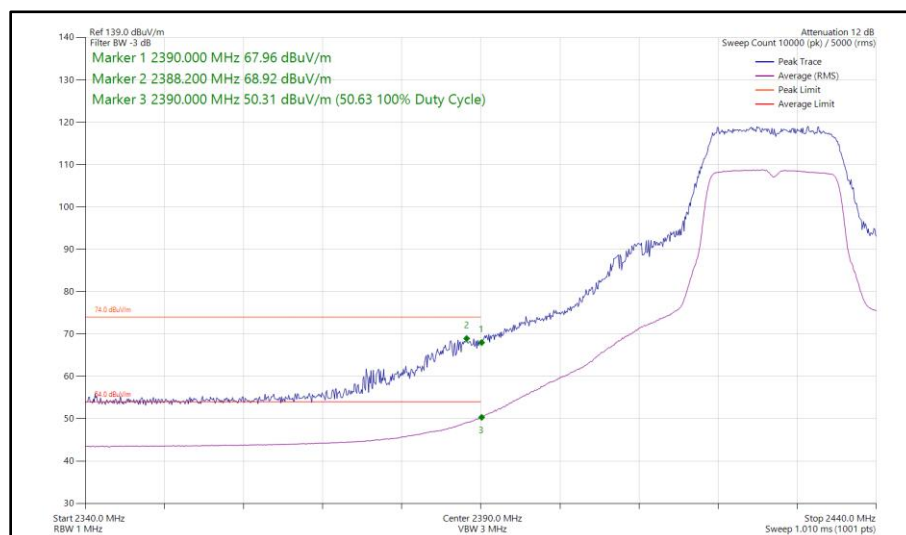
**Figure 46 - 802.11g, SISO, Core 1 - 2412 MHz
Band Edge Frequency 2390 MHz**



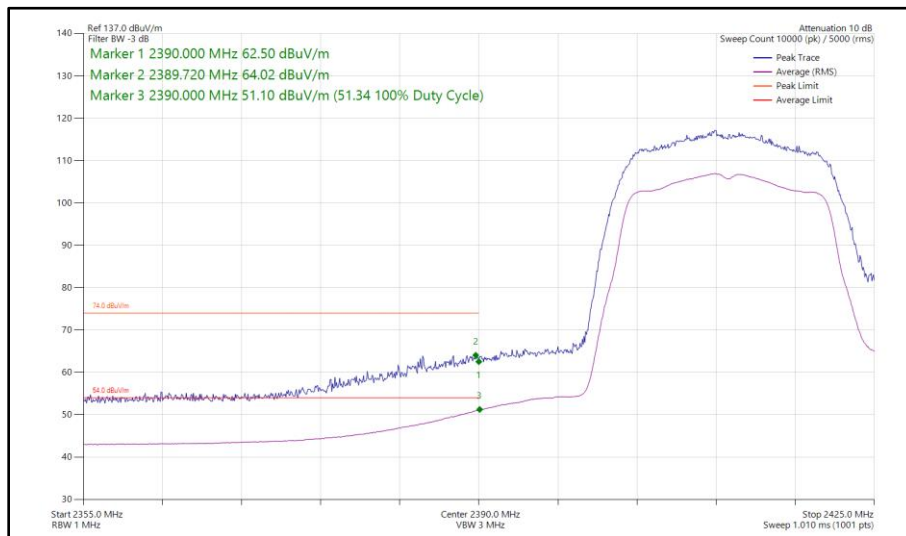
**Figure 47 - 802.11g, SISO, Core 1 - 2417 MHz
Band Edge Frequency 2390 MHz**



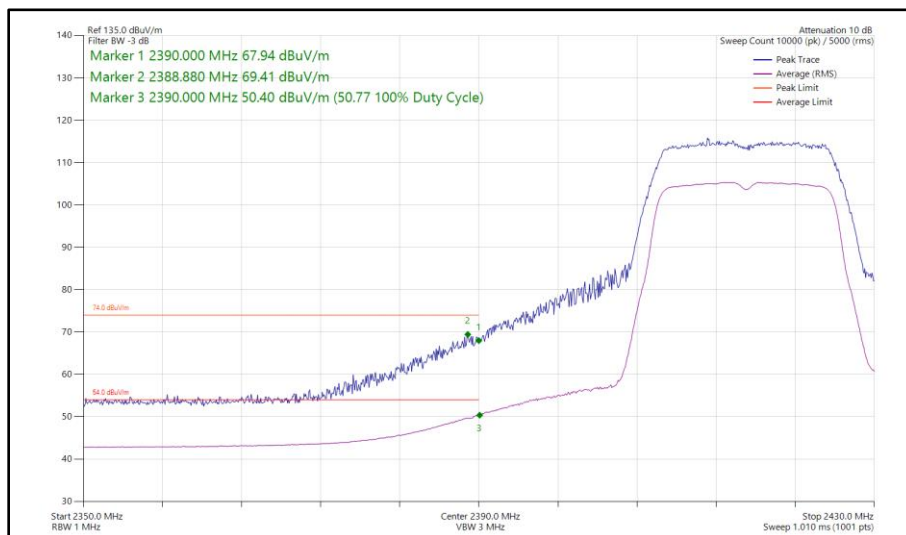
**Figure 48 - 802.11g, SISO, Core 1 - 2422 MHz
Band Edge Frequency 2390 MHz**



**Figure 49 - 802.11g, SISO, Core 1 - 2427 MHz
Band Edge Frequency 2390 MHz**



**Figure 50 - 802.11n HT20, SISO, Core 1 - 2412 MHz
Band Edge Frequency 2390 MHz**



**Figure 51 - 802.11n HT20, SISO, Core 1 - 2417 MHz
Band Edge Frequency 2390 MHz**

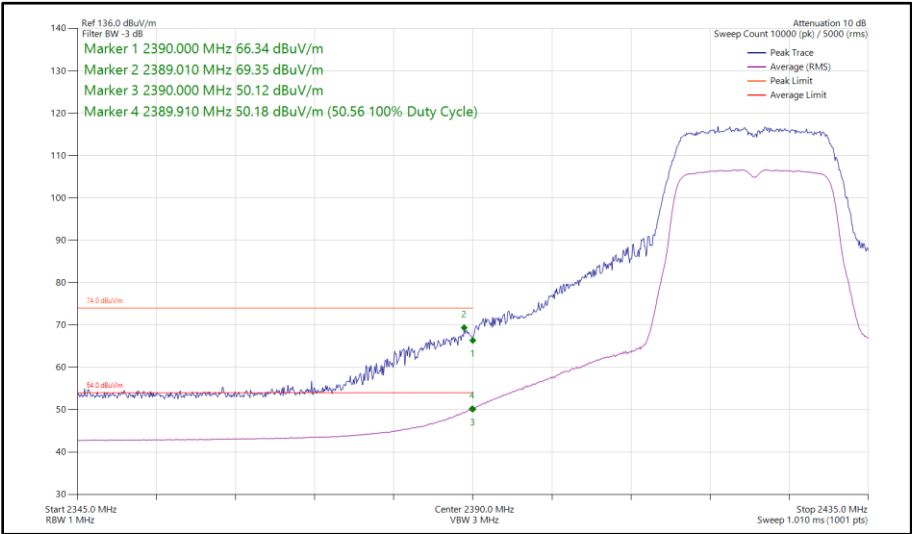


Figure 52 - 802.11n HT20, SISO, Core 1 - 2422 MHz
Band Edge Frequency 2390 MHz

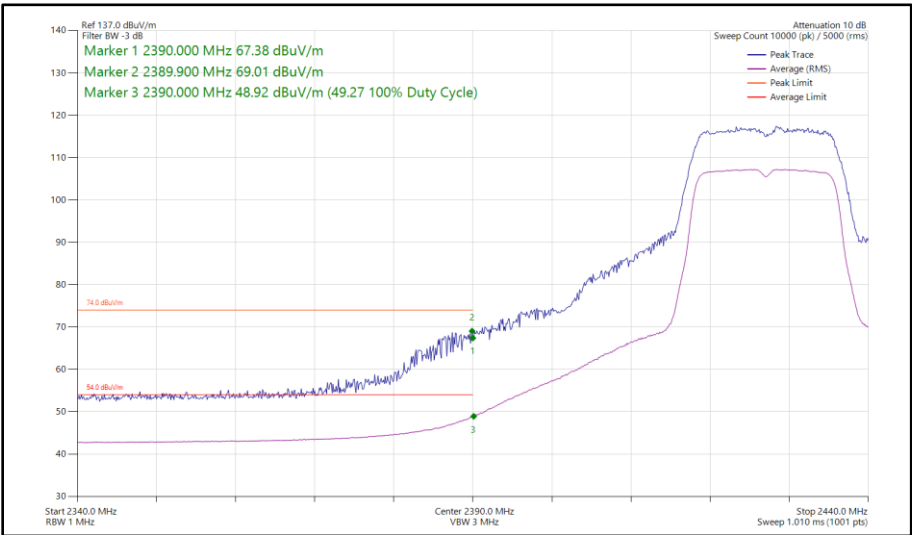
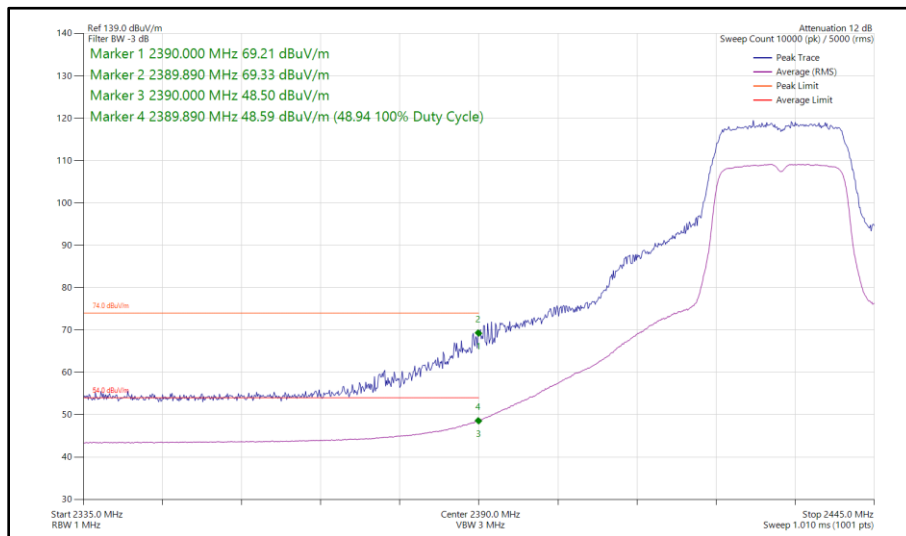
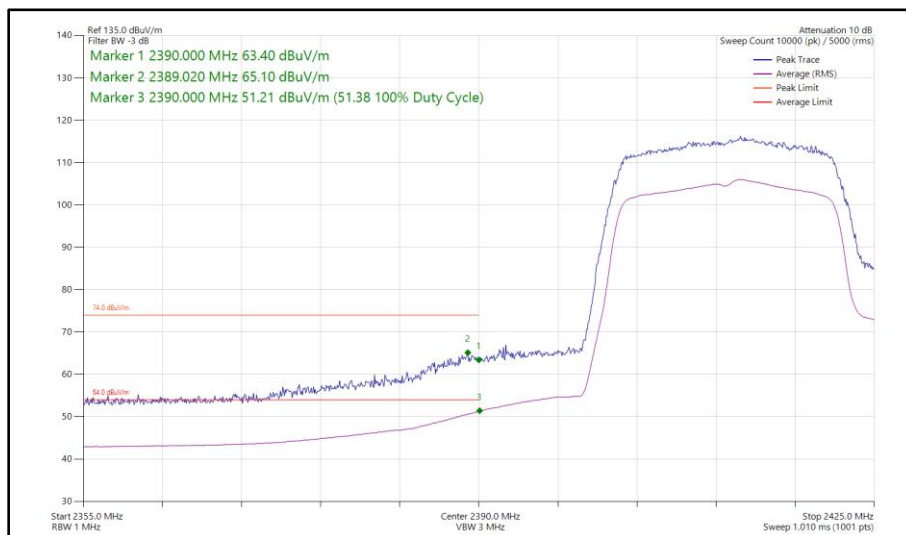


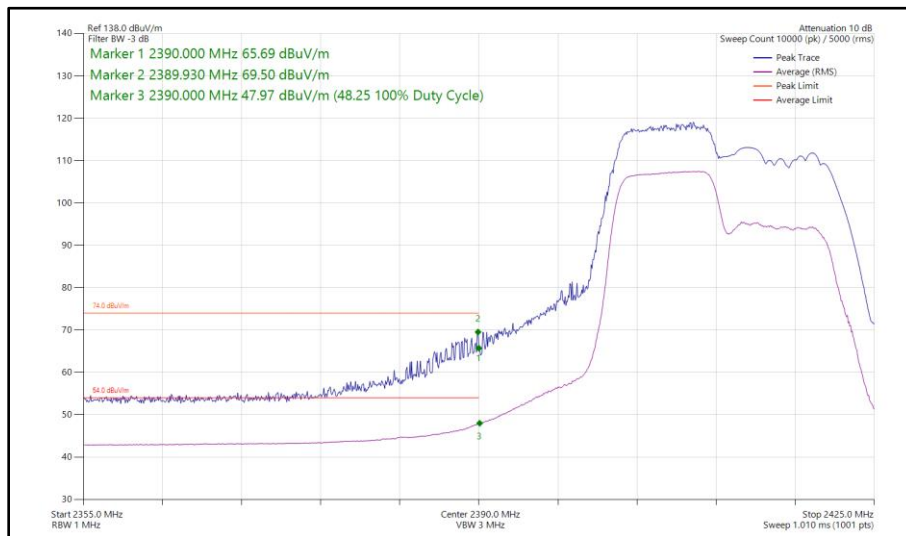
Figure 53 - 802.11n HT20, SISO, Core 1 - 2427 MHz
Band Edge Frequency 2390 MHz



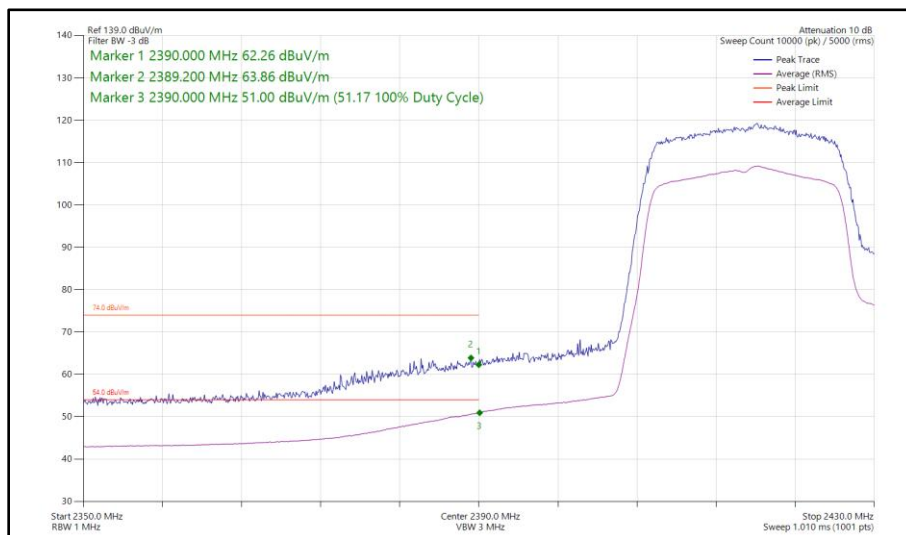
**Figure 54 - 802.11n HT20, SISO, Core 1 - 2432 MHz
Band Edge Frequency 2390 MHz**



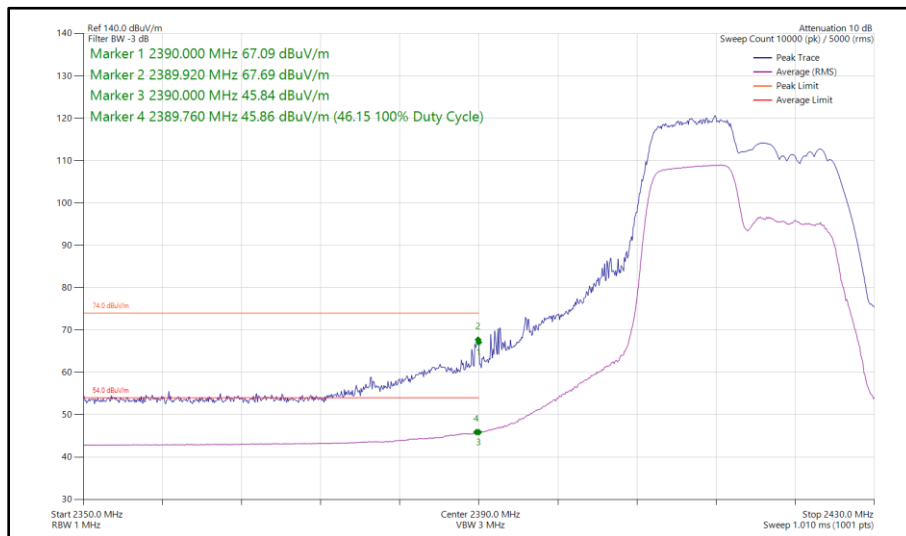
**Figure 55 - 802.11ax HE20, SU, SISO, Core 1 - 2412 MHz
Band Edge Frequency 2390 MHz**



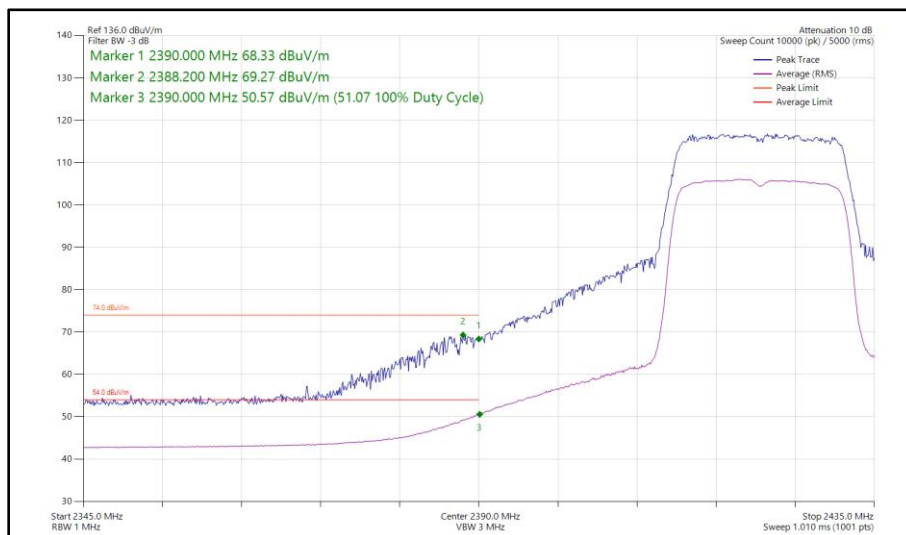
**Figure 56 - 802.11ax HE20, RU 106-53, SISO, Core 1 - 2412 MHz
Band Edge Frequency 2390 MHz**



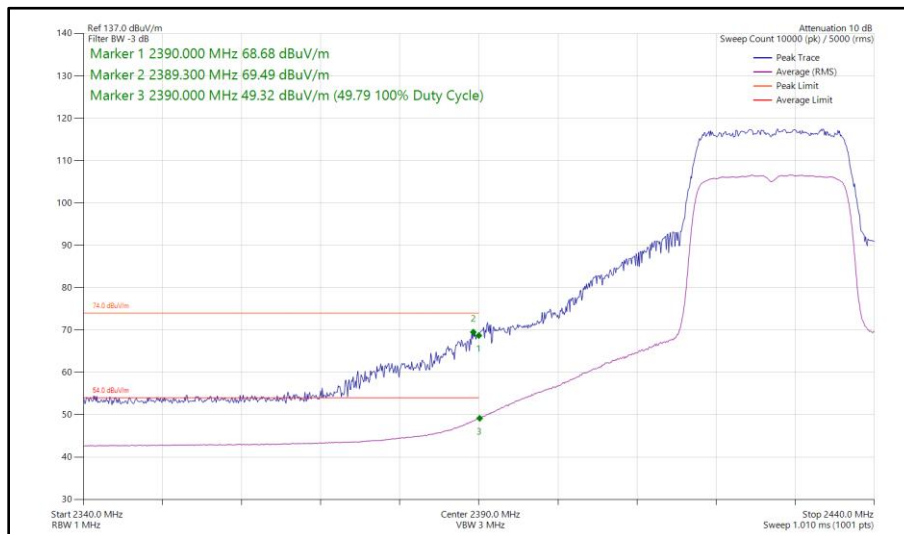
**Figure 57 - 802.11ax HE20, SU, SISO, Core 1 - 2417 MHz
Band Edge Frequency 2390 MHz**



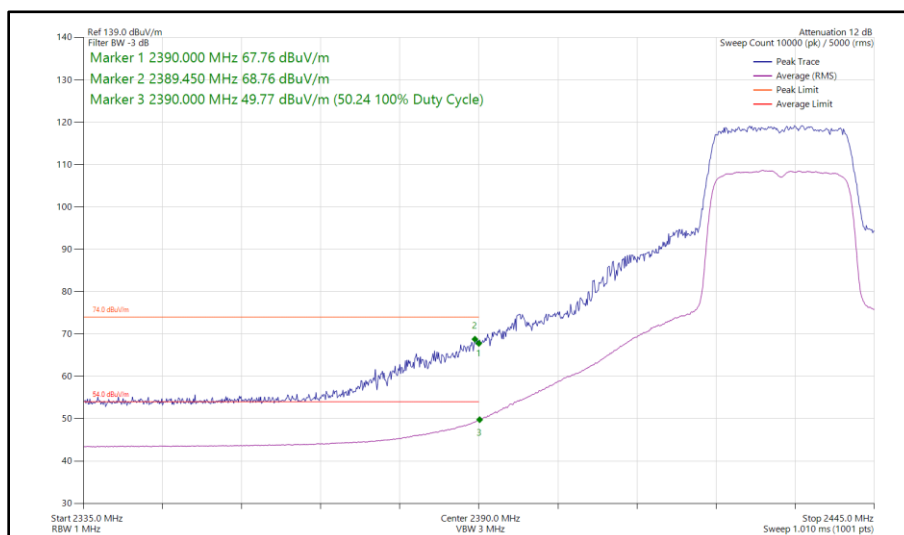
**Figure 58 - 802.11ax HE20, RU 106-53, SISO, Core 1 - 2417 MHz
Band Edge Frequency 2390 MHz**



**Figure 59 - 802.11ax HE20, SU, SISO, Core 1 - 2422 MHz
Band Edge Frequency 2390 MHz**



**Figure 60 - 802.11ax HE20, SU, SISO, Core 1 - 2427 MHz
Band Edge Frequency 2390 MHz**



**Figure 61 - 802.11ax HE20, SU, SISO, Core 1 - 2432 MHz
Band Edge Frequency 2390 MHz**

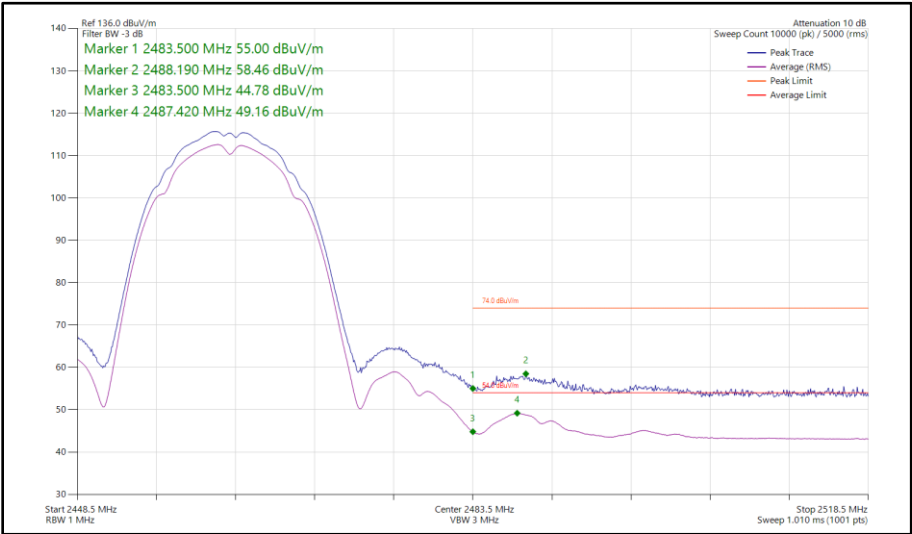


Figure 62 - 802.11b, SISO, Core 1 - 2462 MHz
Band Edge Frequency 2483.5 MHz

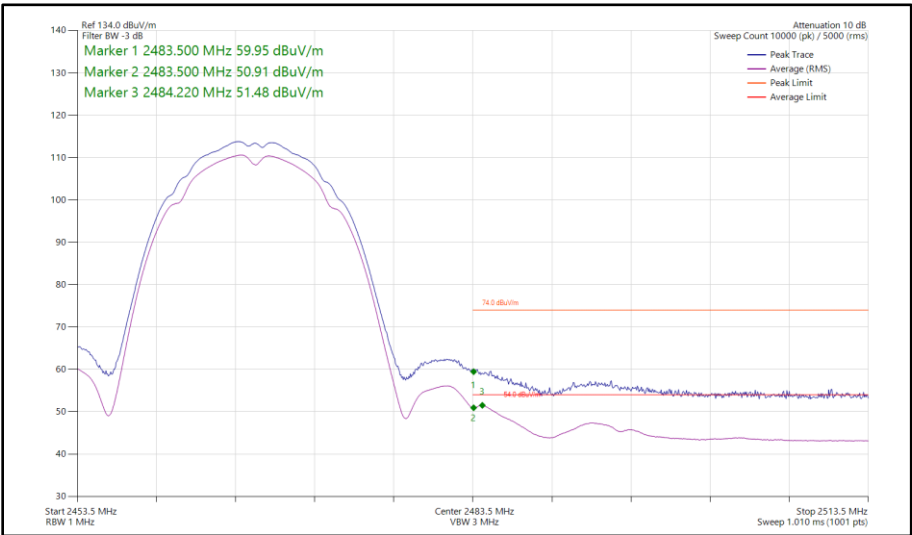
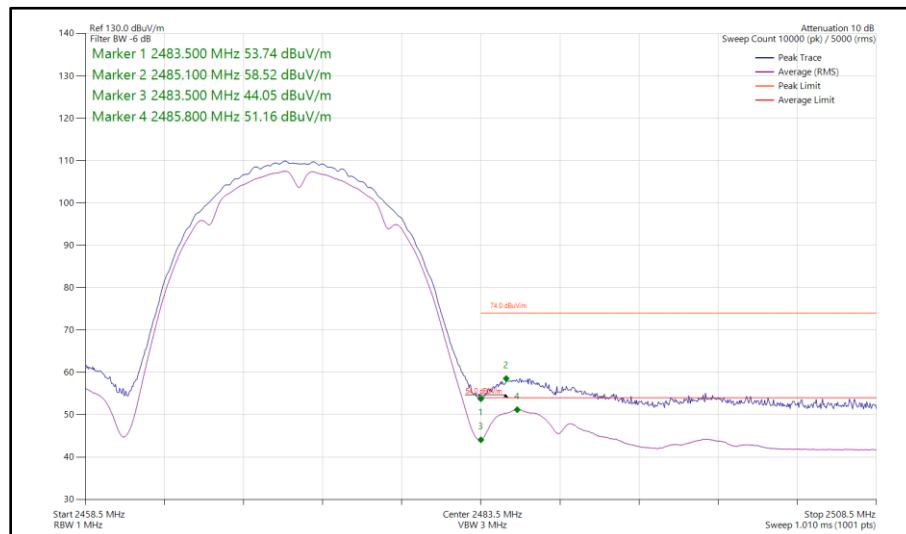
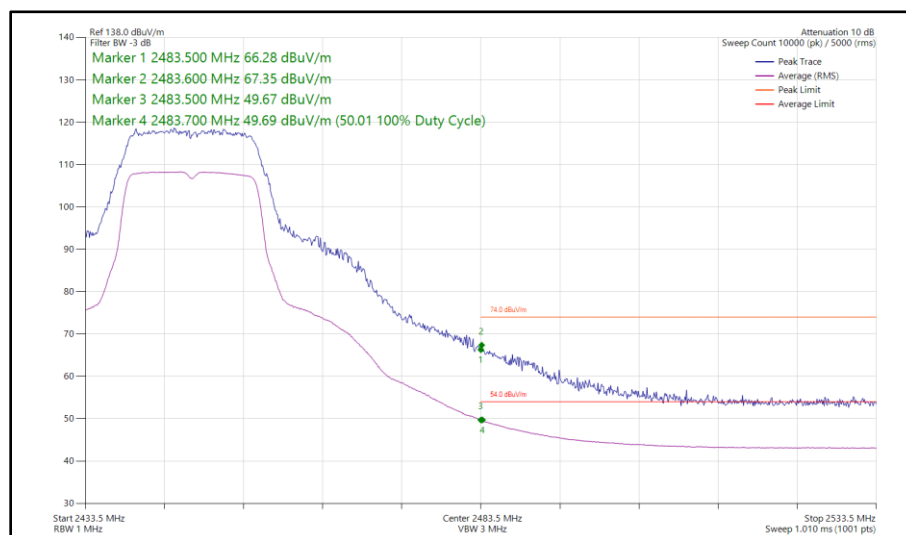


Figure 63 - 802.11b, SISO, Core 1 - 2467 MHz
Band Edge Frequency 2483.5 MHz



**Figure 64 - 802.11b, SISO, Core 1 - 2472 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 65 - 802.11g, SISO, Core 1 - 2447 MHz
Band Edge Frequency 2483.5 MHz**

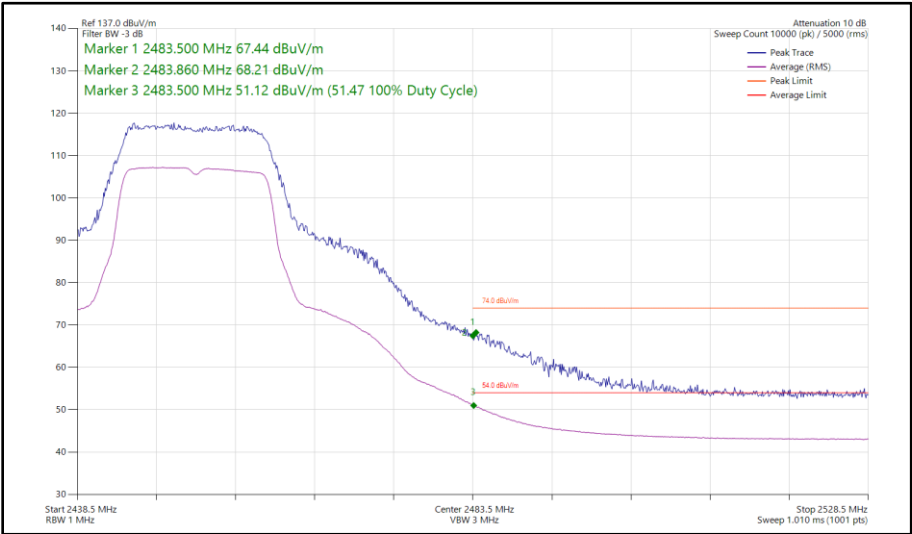


Figure 66 - 802.11g, SISO, Core 1 - 2452 MHz
Band Edge Frequency 2483.5 MHz

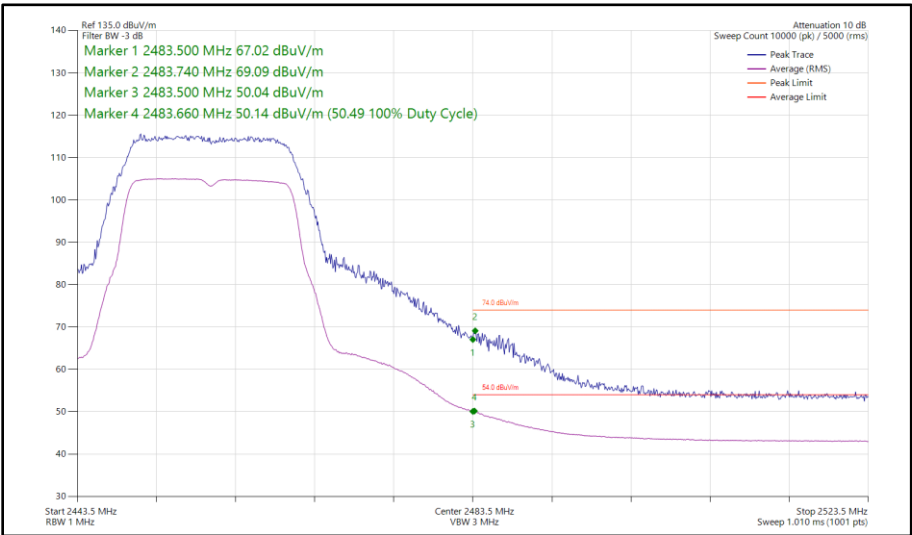
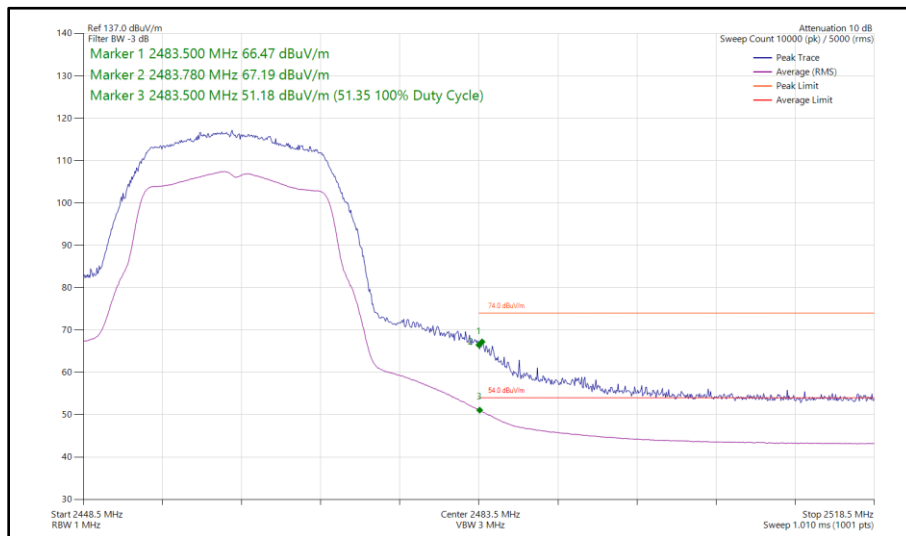
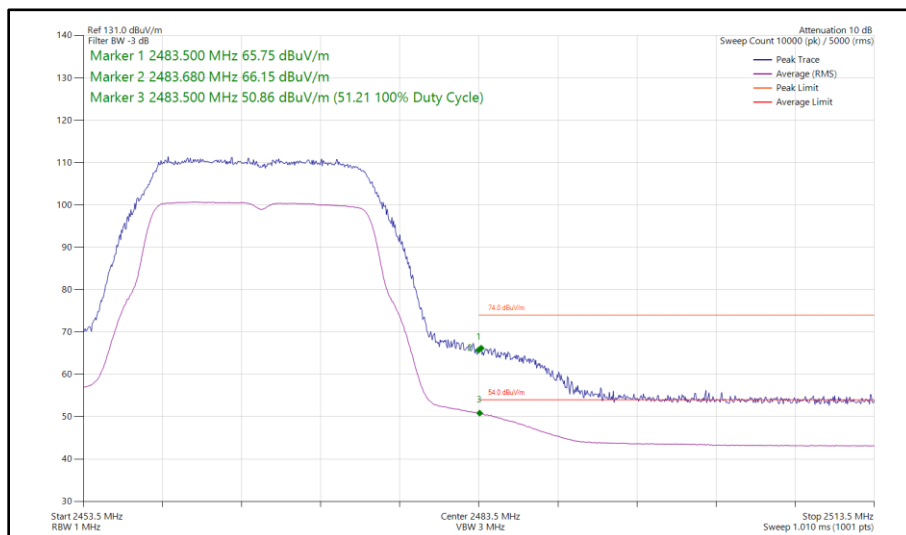


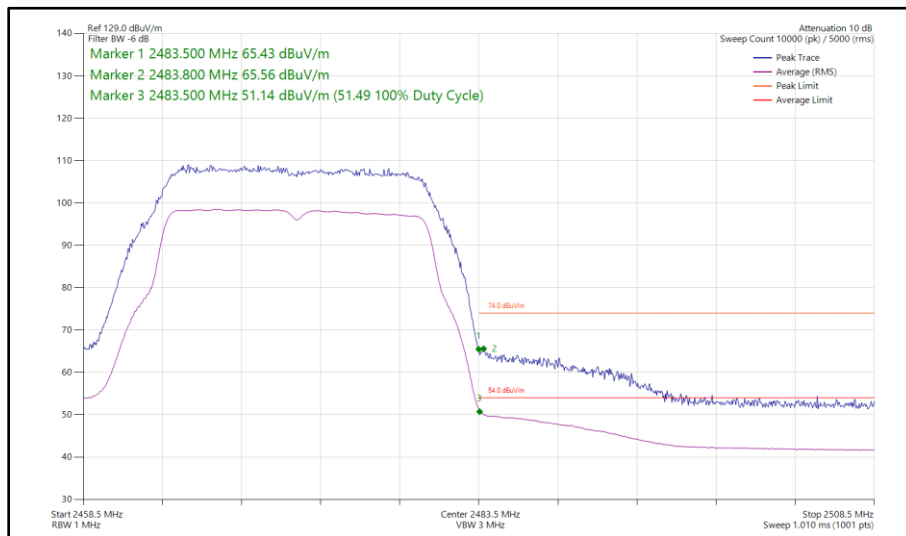
Figure 67 - 802.11g, SISO, Core 1 - 2457 MHz
Band Edge Frequency 2483.5 MHz



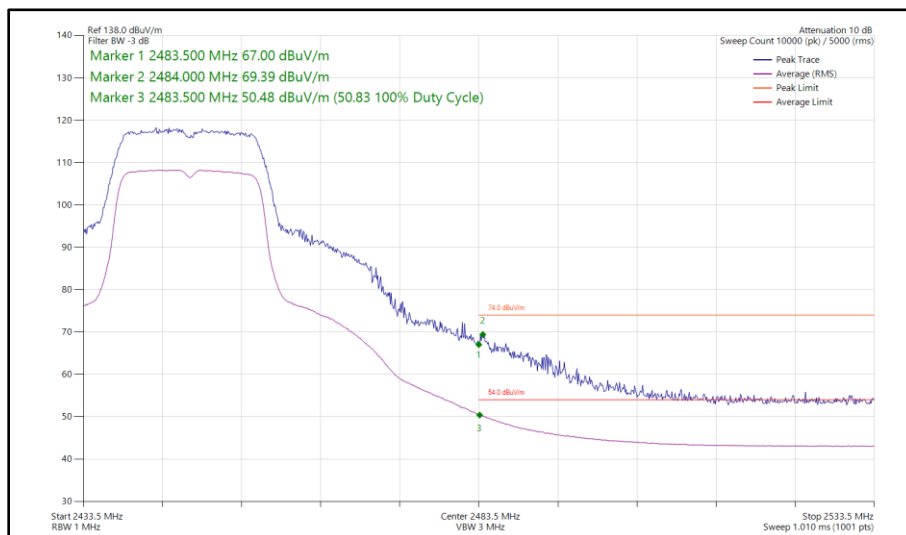
**Figure 68 - 802.11g, SISO, Core 1 - 2462 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 69 - 802.11g, SISO, Core 1 - 2467 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 70 - 802.11g, SISO, Core 1 - 2472 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 71 - 802.11n HT20, SISO, Core 1 - 2447 MHz
Band Edge Frequency 2483.5 MHz**