

FCC and ISED Test Report

Apple Inc
Model: A2686

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

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



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FCC ID: BCGA2686

IC: 579C-A2686

COMMERCIAL-IN-CONFIDENCE

Document 75954423-15 Issue 01

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Matthew Russell	Chief Engineer	Authorised Signatory	14 November 2022

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

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15E, 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	Hollie Marshall	14 November 2022	

FCC Accreditation

90987 Octagon House, Fareham Test Laboratory

ISED Accreditation

12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15E: 2020, ISED RSS-247: Issue 2 (2017-02) 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	14 November 2022

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
Model Number(s)	A2686
Serial Number(s)	XH696VW7R0, MH4Q7H6J93, LQ79GF24Q2, XVFXG6M544, FP3F23QFHX, D6N2NCP9W5 and QT9MT962VF
Hardware Version(s)	REV 1.0
Software Version(s)	22A12310t, 22A246, 22A285, 22A12310t, 22A12310s, 22A246 and 22C42a
Number of Samples Tested	6
Test Specification/Issue/Date	FCC 47 CFR Part 15E: 2020 ISED RSS-247: Issue 2 (2017-02) ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02)
Order Number	0540246998
Date of Receipt of EUT	05-April-2022
Start of Test	27-May-2022
Finish of Test	10-November-2022
Name of Engineer(s)	Faisal Malyar, Mohammad Malik, Mohamud Mohamud, Colin Brain, Thomas Randall, Danial Shafique, Ian Hart, Danial Shafique, Taha Shafique, Elliot Callender, Daniel Cameron, Stefan Gilfedder and Ioan-Alexandru Bogatu
Related Document(s)	KDB 662911 D01 v02r01 ANSI C63.10 (2013) ANSI C63.10 (2020) KDB 905462 D02 v02 KDB 789033 D02 v02r01



1.3 Brief Summary of Results

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

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	FCC Part 15E	RSS-247	RSS-GEN			
Configuration and Mode: 5 GHz WLAN						
-	15.203	-	-	Antenna Requirement	N/T	The device complies with the provisions of this section, as it uses permanently attached integral antennas.
2.1	15.205	-	8.10	Restricted Band Edges	Pass	
2.2	15.407 (a)	6.2	-	Maximum Conducted Output Power	Pass	
2.3	15.407 (a)	6.2	-	Maximum Conducted Power Spectral Density	Pass	
2.4	15.407 (a)	6.2	-	Emission Bandwidth	Pass	
2.5	15.407 (b)	6.2	-	Authorised Band Edges	Pass	
2.6	15.407 (b) and 15.209	6.2	6.13 and 8.9	Spurious Radiated Emissions	Pass	
2.7	15.407 (h)(2)(iii)(iv)	6.3.2(c)(d)(e)	-	Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Pass	
Configuration and Mode: 5 GHz WLAN - Client to Client						
2.7	15.407 (h)(2)(iii)(iv)	6.3.2(c)(d)(e)	-	Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Pass	

Table 2



1.4 Product Information

1.4.1 Technical Description

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

1.4.2 Test Modes

The EUT's 5 GHz 802.11 radio supported Single Input/Single Output (SISO) and 2x2 MIMO (Multiple Input/Multiple Output) modes. 802.11a supports 20 MHz bandwidth only. 802.11n supported 20 MHz and 40 MHz bandwidths, 802.11ac and ax supported 20 MHz, 40 MHz, 80 MHz and 160 MHz bandwidths.

802.11a mode supported SISO operation only. 802.11n, ac and ax supported SISO, Cyclic Delay Diversity (CDD) and Space Division Multiplexing (SDM) modes. The EUT supported 802.11ax Single User (SU) and Multi-User (MU-MIMO) with all Resource Unit (RU) sizes from 26 subcarriers, up to the maximum allowed, dependent on channel bandwidth other than in U-NII-2A and U-NII-2C where RU-26 is not supported.

The EUT uses different output powers per core dependent on how many cores are used. The EUT also uses different power tables for Cyclic Delay Diversity (CDD) and Space Division Multiplexing (SDM) modes. 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 differ.

US and CA country codes changed the power table used for U-NII band 1. Therefore U-NII-1 channels were tested using both power settings for each country's respective limits.

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

SISO Modes (Core 1 for U-NII-1 / 2A / 2C / 3):

- 802.11a – 12 Mbps
- 802.11n HT20 – MCS2
- 802.11n HT40 – MCS2
- 802.11ac VHT80 – MCS2x1
- 802.11ac VHT160 – MCS2x1
- 802.11ax HE20 SU – MCS2x1
- 802.11ax HE40 SU – MCS2x1
- 802.11ax HE80 SU – MCS2x1
- 802.11ax HE160 SU – MCS2x1
- 802.11ax HE20 MU RU26/52/106 – MCS2x1

2x2 MIMO Modes (Core 0+1 for U-NII-1 / 2A / 2C / 3):

- 802.11n HT20 - CDD (MCS2) and SDM (MCS10)
- 802.11n HT40 - CDD (MCS2), SDM (MCS10)
- 802.11ac VHT80 – CDD (MCS2x1), SDM (MCS2x2)
- 802.11ac VHT160 – CDD (MCS2x1), SDM (MCS2x2)
- 802.11ax HE20 SU – CDD (MCS2x1) and SDM (MCS2x2)
- 802.11ax HE40 SU – CDD (MCS2x1) and SDM (MCS2x2)
- 802.11ax HE80 SU – CDD (MCS2x1) and SDM (MCS2x2)
- 802.11ax HE160 SU – CDD (MCS2x1) and SDM (MCS2x2)
- 802.11ax HE20 MU RU26/52/106 – CDD (MCS2x1) and SDM (MCS2x2)

*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 were known and compensated for in any conducted measurements.

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

The test setup used for DFS is described in the test result section of the present document.

1.4.4 Antenna Gain Table

Antenna Port	Frequency Range (MHz)	Peak Gain (dBi)	Conducted Cable Loss (dB)
Core 0	5150 to 5250	6.25	1.20
	5250 to 5350	6.26	1.20
	5470 to 5725	6.52	1.20
	5725 to 5850	6.66	1.30
Core 1	5150 to 5250	0.15	1.20
	5250 to 5350	-0.04	1.20
	5470 to 5725	0.53	1.20
	5725 to 5850	0.88	1.30

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: A2686, Serial Number: MH4Q7H6J93			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2686, Serial Number: XH696VW7R0			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2686, Serial Number: LQ79GF24Q2			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2686, Serial Number: FP3F23QFHX			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2686, Serial Number: XVFXG6M544			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2686, Serial Number: D6N2NCP9W5			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2686, Serial Number: QT9MT962VF			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 4



1.7 Test Location

TÜV SÜD conducted the following tests at our Octagon House Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 5 GHz WLAN		
Restricted Band Edges	Faisal Malyar, Mohammad Malik, Mohamud Mohamud, Colin Brain, Thomas Randall, Danial Shafique, Ian Hart, Danial Shafique, Taha Shafique and Elliot Callender	UKAS
Maximum Conducted Output Power	Daniel Cameron	UKAS
Maximum Conducted Power Spectral Density	Daniel Cameron	UKAS
Emission Bandwidth	Daniel Cameron,	UKAS
Authorised Band Edges	Faisal Malyar, Mohammad Malik, Mohamud Mohamud, Colin Brain, Thomas Randall, Danial Shafique, Ian Hart, Danial Shafique, Taha Shafique and Elliot Callender	UKAS
Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Stefan Gilfedder	UKAS
Configuration and Mode: 5 GHz WLAN - Client to Client		
Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Stefan Gilfedder	UKAS

Table 5

Office Address:

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



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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 5 GHz WLAN		
Spurious Radiated Emissions	Ian Hart, Danial Shafique, Colin Brain, Thomas Randall and Ioan-Alexandru Bogatu	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 15E, Clause 15.205
ISED RSS-GEN, Clause 8.10

2.1.2 Equipment Under Test and Modification State

A2686, S/N: FP3F23QFHX - Modification State 0
A2686, S/N: XVFXG6M544 - Modification State 0
A2686, S/N: D6N2NCP9W5 - Modification State 0

2.1.3 Date of Test

27-May-2022 to 09-June-2022

2.1.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.10.5.

Restricted Band Edge measurements were performed with the device operating in SISO, MIMO and TxBF, across the various modes supported by the device.

The measurements displayed within this report have been limited to those modes which have been shown to be worst case.

Further measurements are held on file by TÜV SÜD and are available if required.

2.1.5 Environmental Conditions

Ambient Temperature	19.9 - 22.5 °C
Relative Humidity	40.3 - 56.6 %



2.1.6 Test Results

5 GHz WLAN

20 MHz Bandwidth (SISO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11a, Core 1	54 Mbps	-	-	5180	5150	67.11	51.23
802.11n HT20, Core 1	MCS 4	-	-	5180	5150	66.46	50.90
802.11ax HE20, Core 1	MCS 4x1	SU	-	5180	5150	66.05	50.89
802.11ax HE20, Core 1	MCS 11x1	26	0	5180	5150	55.92	44.04
802.11a, Core 1	24 Mbps	-	-	5320	5350	65.39	51.42
802.11n HT20, Core 1	MCS 7	-	-	5320	5350	69.33	51.36
802.11ax HE20, Core 1	MCS 4x1	SU	-	5320	5350	65.81	51.23
802.11ax HE20, Core1	MCS 11x1	52	40	5320	5350	57.51	45.83
802.11a, Core 1	24 Mbps	-	-	5500	5460	-	46.71
802.11n HT20, Core 1	MCS 2	-	-	5500	5460	-	47.21
802.11ax HE20, Core 1	MCS 2x1	SU	-	5500	5460	-	46.91
802.11ax HE20, Core 1	MCS 11x1	52	37	5500	5460	-	45.73

Table 7 - SISO Restricted Band Edge Results

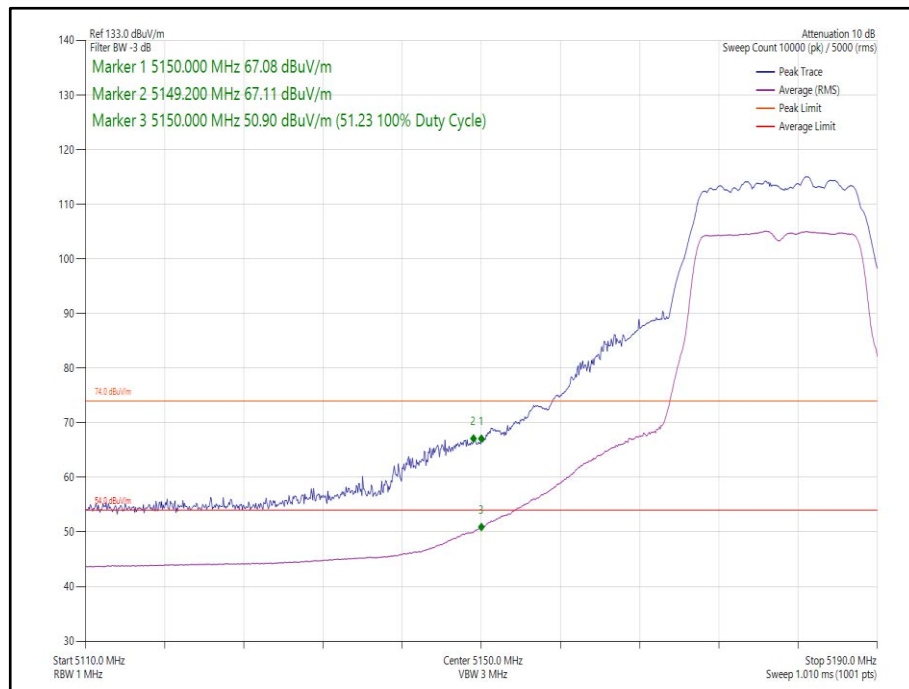


Figure 1 - 802.11a, Core 1 - 5180 MHz, Band Edge Frequency 5150 MHz

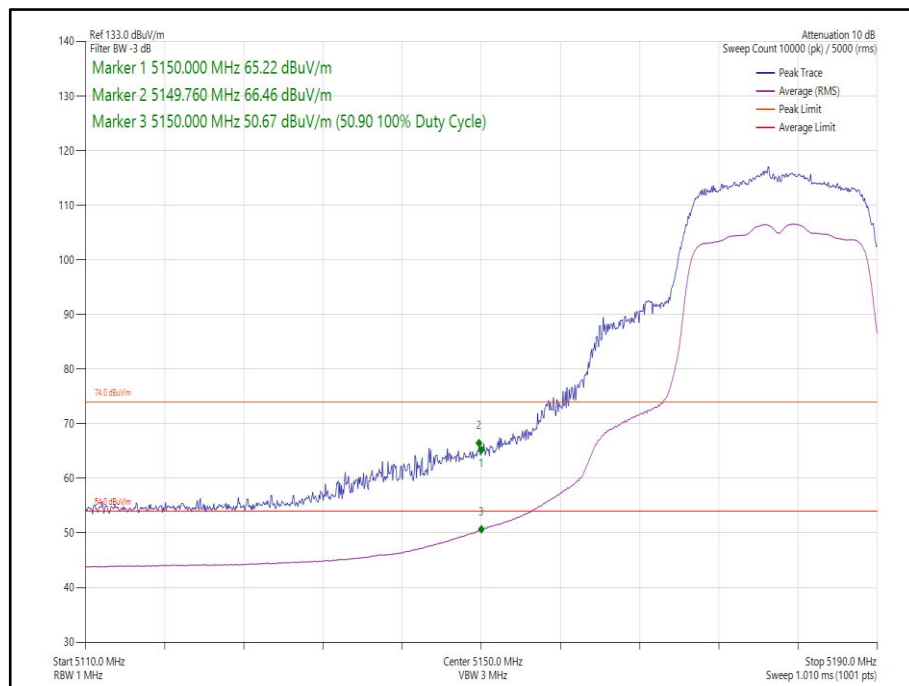


Figure 2 - 802.11n HT20, Core 1 - 5180 MHz, Band Edge Frequency 5150 MHz

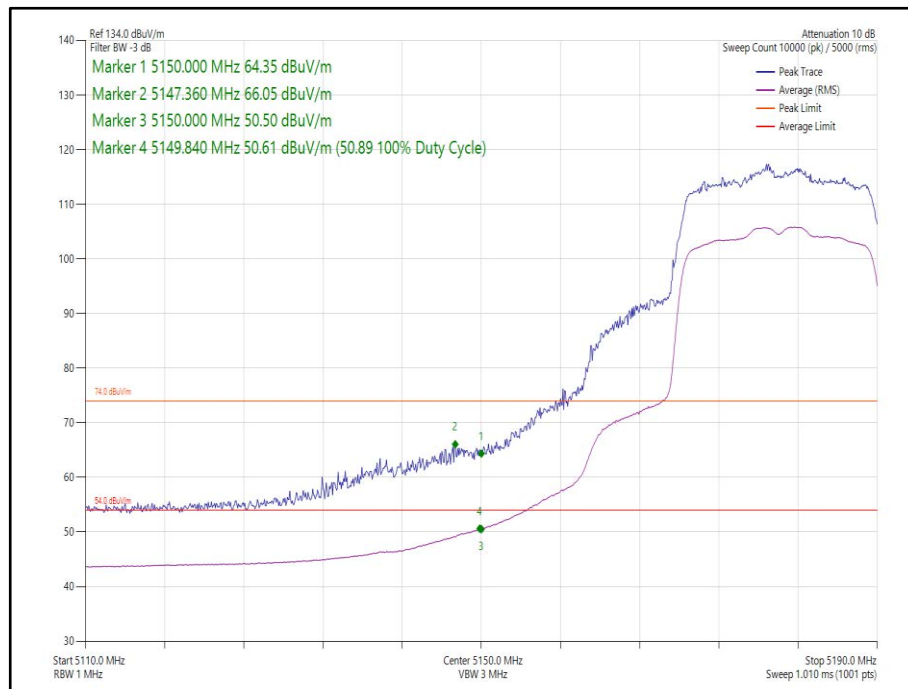


Figure 3 - 802.11ax HE20, Core 1, SU - 5180 MHz, Band Edge Frequency 5150 MHz

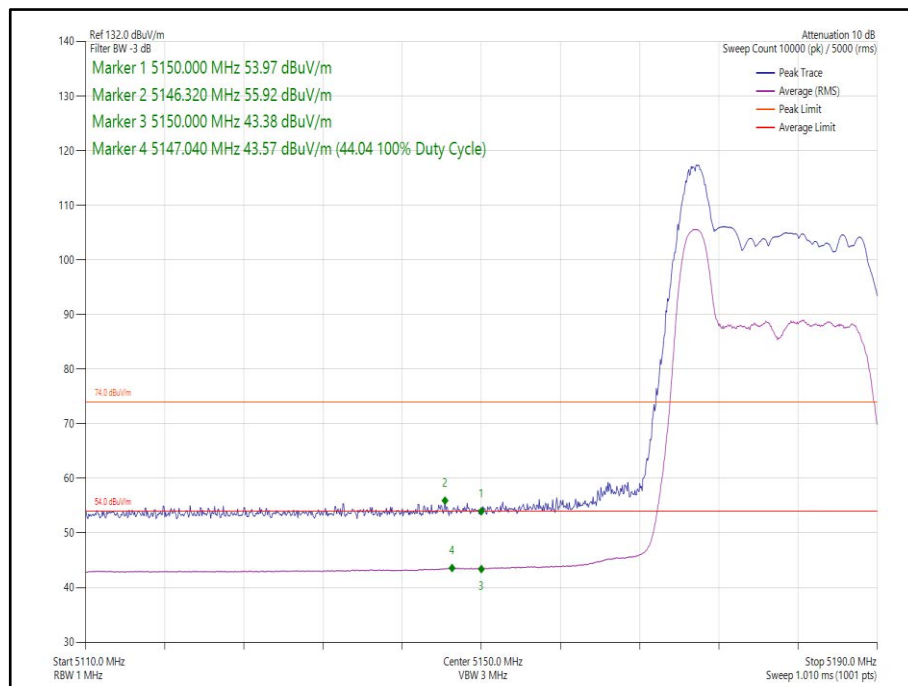


Figure 4 - 802.11ax HE20, Core 1, 26-0 - 5180 MHz, Band Edge Frequency 5150 MHz

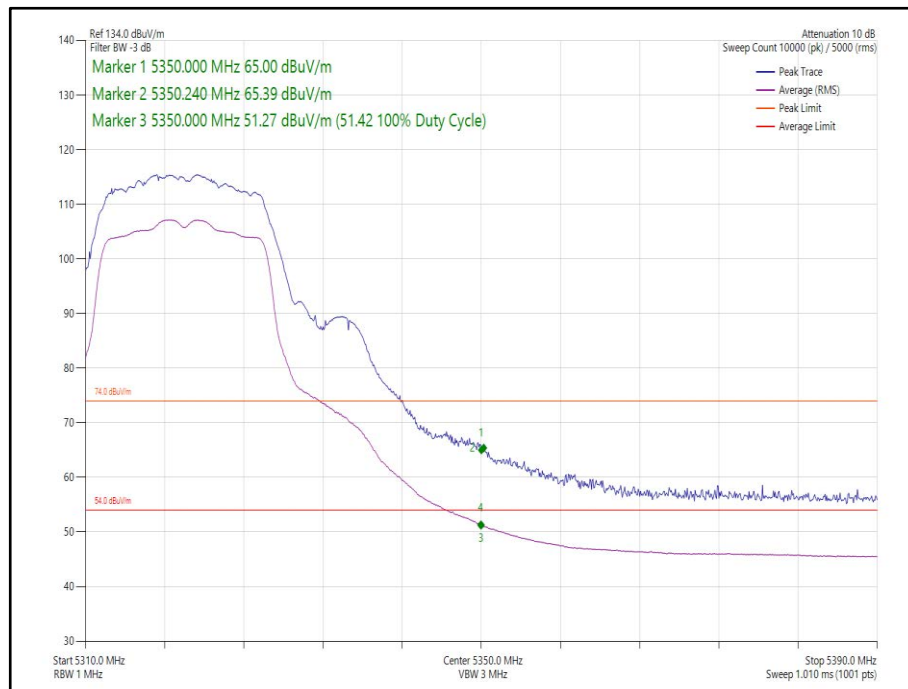


Figure 5 - 802.11a, Core 1 - 5320 MHz, Band Edge Frequency 5350 MHz

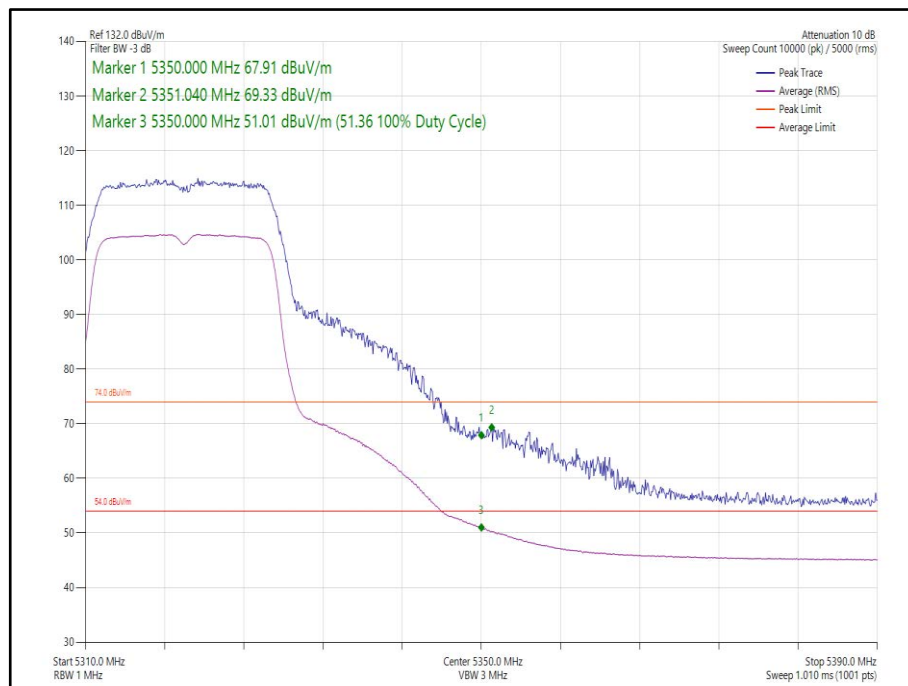


Figure 6 - 802.11n HT20, Core 1 - 5320 MHz, Band Edge Frequency 5350 MHz

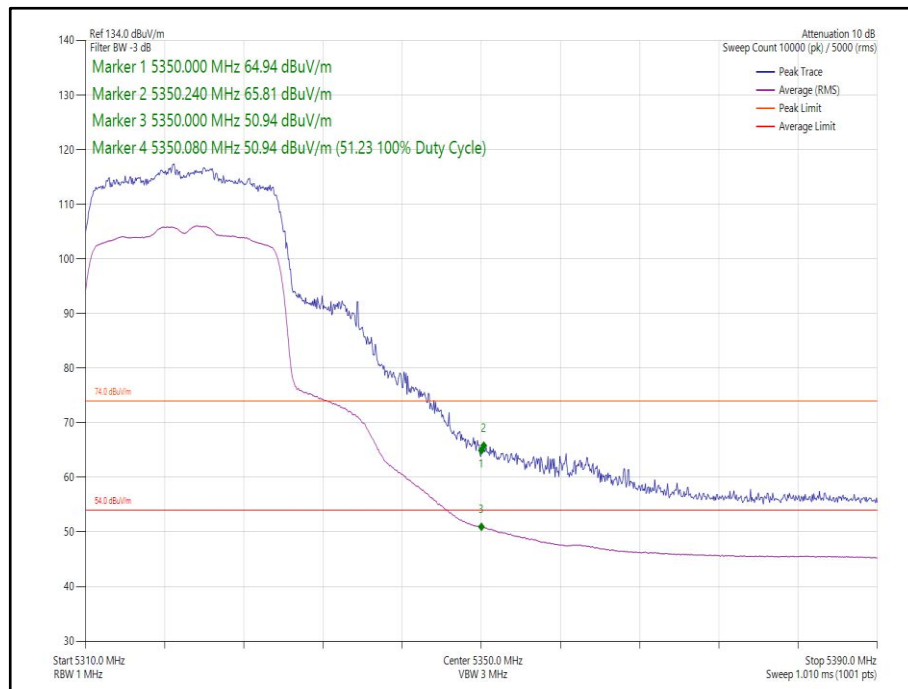


Figure 7 - 802.11ax HE20, Core 1, SU - 5320 MHz, Band Edge Frequency 5350 MHz

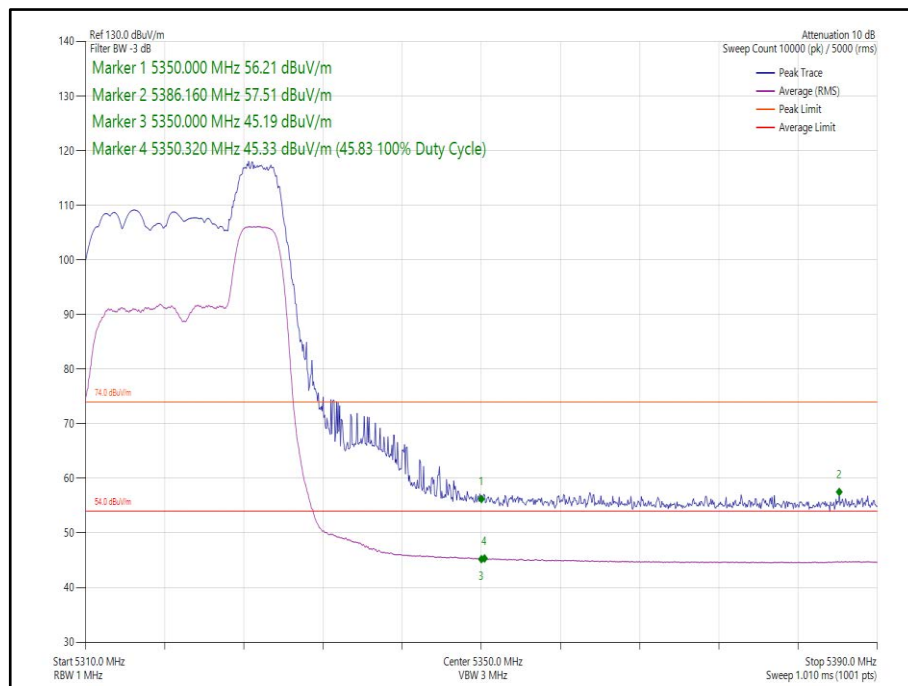


Figure 8 - 802.11ax HE20, Core 1, 52-40 - 5320 MHz, Band Edge Frequency 5350 MHz

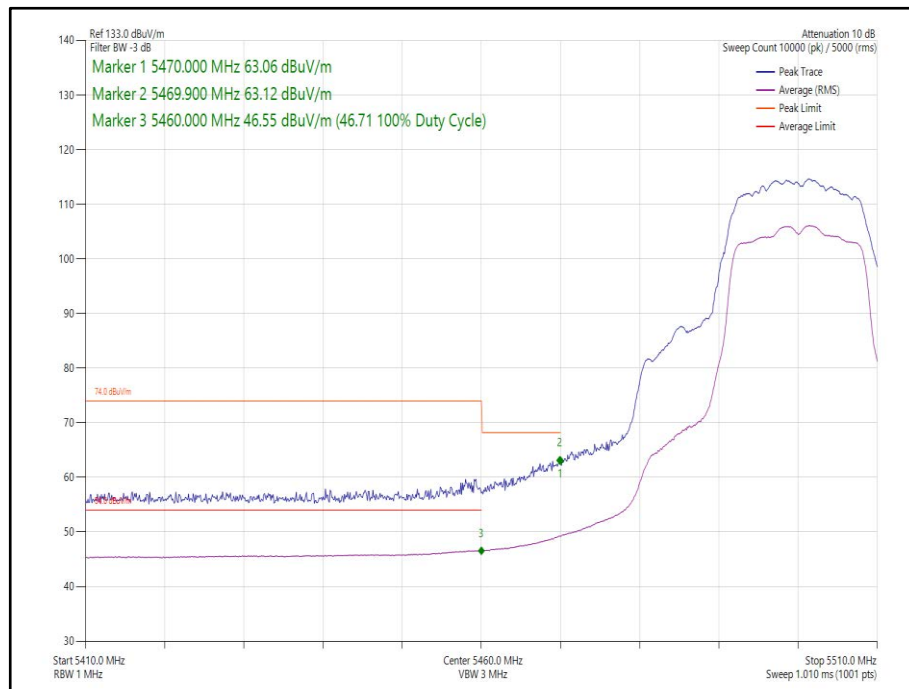


Figure 9 - 802.11a, Core 1 - 5500 MHz, Band Edge Frequency 5460 MHz

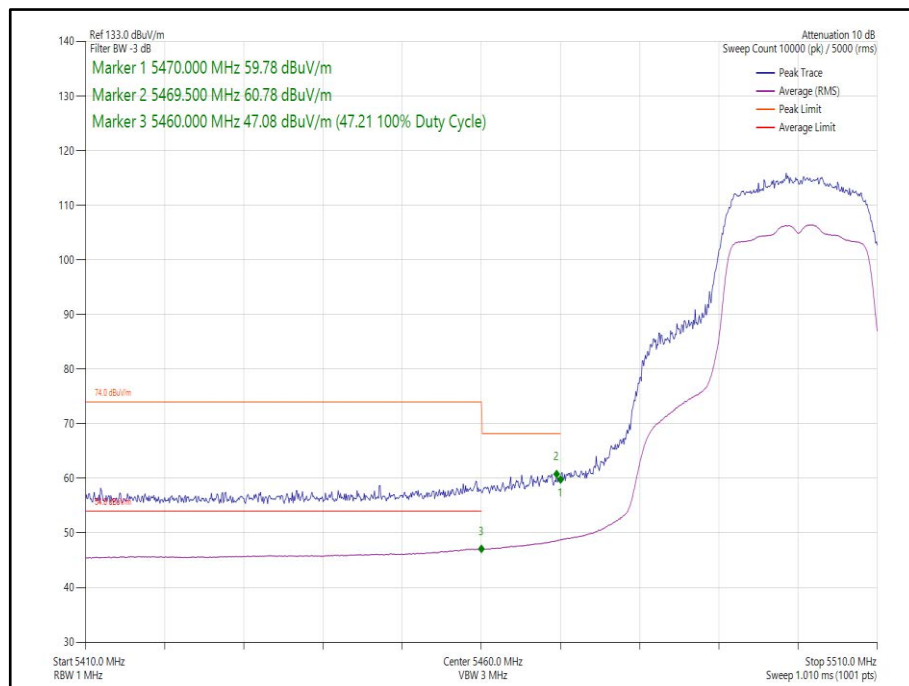


Figure 10 - 802.11n HT20, Core 1 - 5500 MHz, Band Edge Frequency 5460 MHz

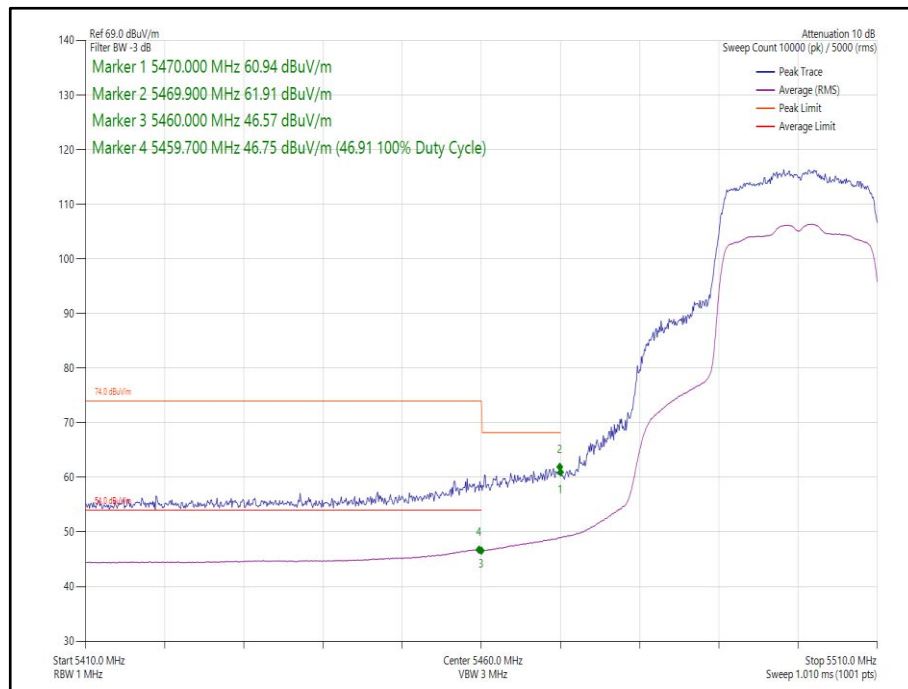


Figure 11 - 802.11ax HE20, Core 1, SU - 5500 MHz, Band Edge Frequency 5460 MHz

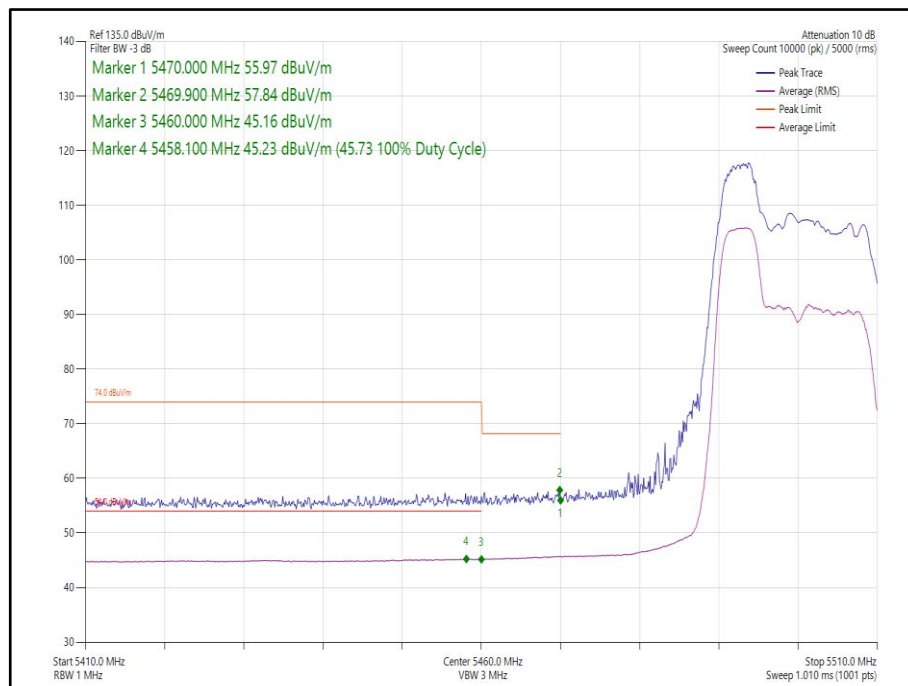


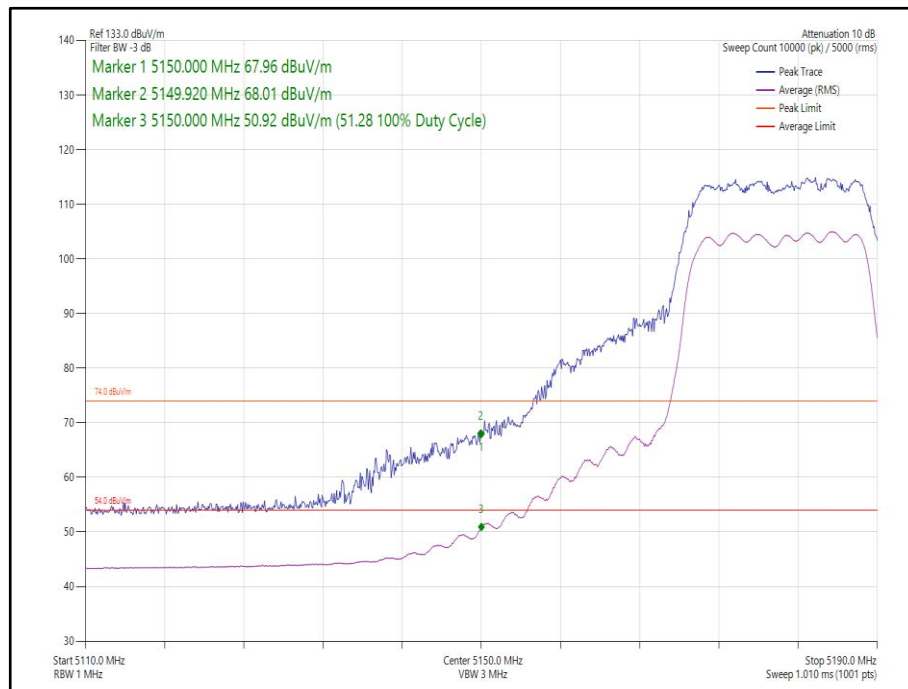
Figure 12 - 802.11ax HE20, Core 1, 52-37 - 5500 MHz, Band Edge Frequency 5460 MHz



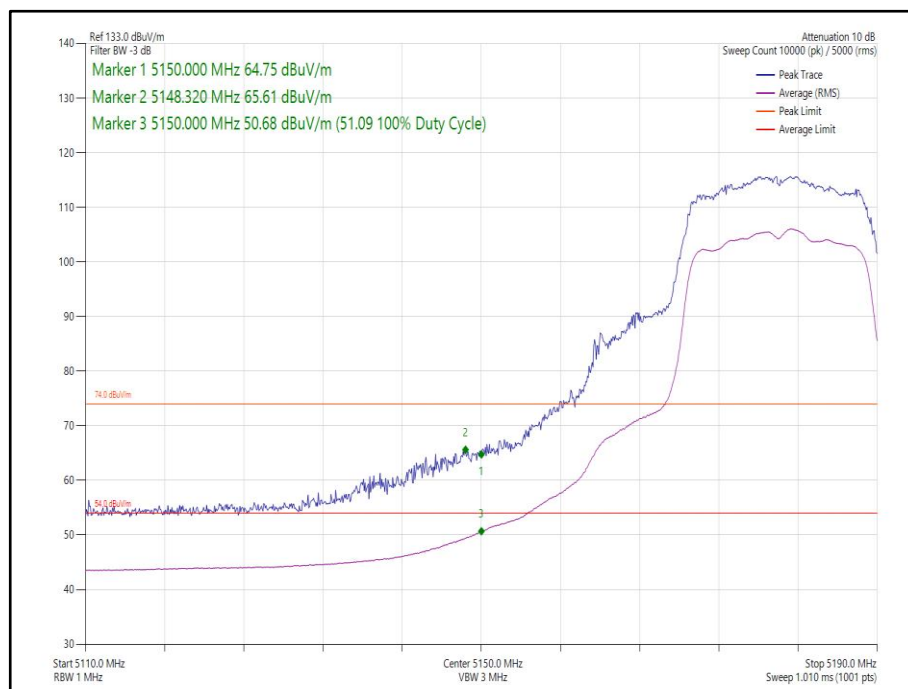
20 MHz Bandwidth (2TX MIMO)

Mode	Modulation Coding Scheme	Resource size	Resource Index	Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11n HT20 CDD, Cores 0-1	MCS 7	-	-	5180	5150	68.01	51.28
802.11n HT20 SDM, Cores 0-1	MCS 12	-	-	5180	5150	65.61	51.09
802.11ax HE20 CDD Cores 0-1	MCS 11x1	SU	-	5180	5150	68.69	51.25
802.11ax HE20 CDD, Cores 0-1	MCS 11x1	26	0	5180	5150	54.95	43.46
802.11ax HE20 SDM, Cores 0-1	MCS 4x2	SU	-	5180	5150	65.89	51.16
802.11ax HE20 SDM, Cores 0-1	MCS 11x2	26	0	5180	5150	55.39	43.81
802.11n HT20 CDD, Cores 0-1	MCS 4	-	-	5320	5350	65.66	50.96
802.11n HT20 SDM, Cores 0-1	MCS 12	-	-	5320	5350	66.92	51.49
802.11ax HE20 CDD, Cores 0-1	MCS 4x1	SU	-	5320	5350	65.08	51.01
802.11ax HE20 CDD, Cores 0-1	MCS 11x1	52	40	5320	5350	57.42	45.84
802.11ax HE20 SDM, Cores 0-1	MCS 11x2	SU	-	5320	5350	68.10	51.23
802.11ax HE20 SDM, Cores 0-1	MCS 11x2	52	40	5320	5350	58.30	45.70
802.11n HT20 CDD, Cores 0-1	MCS 2	-	-	5500	5460	-	46.91
802.11n HT20 SDM, Cores 0-1	MCS 10	-	-	5500	5460	-	47.07
802.11ax HE20 CDD, Cores 0-1	MCS 2x1	SU	-	5500	5460	-	47.78
802.11ax HE20 CDD, Cores 0-1	MCS 11x1	52	37	5500	5460	-	45.58
802.11ax HE20 SDM, Cores 0-1	MCS 2x2	SU	-	5500	5460	-	47.59
802.11ax HE20 SDM, Cores 0-1	MCS 11x2	52	37	5500	5460	-	45.63

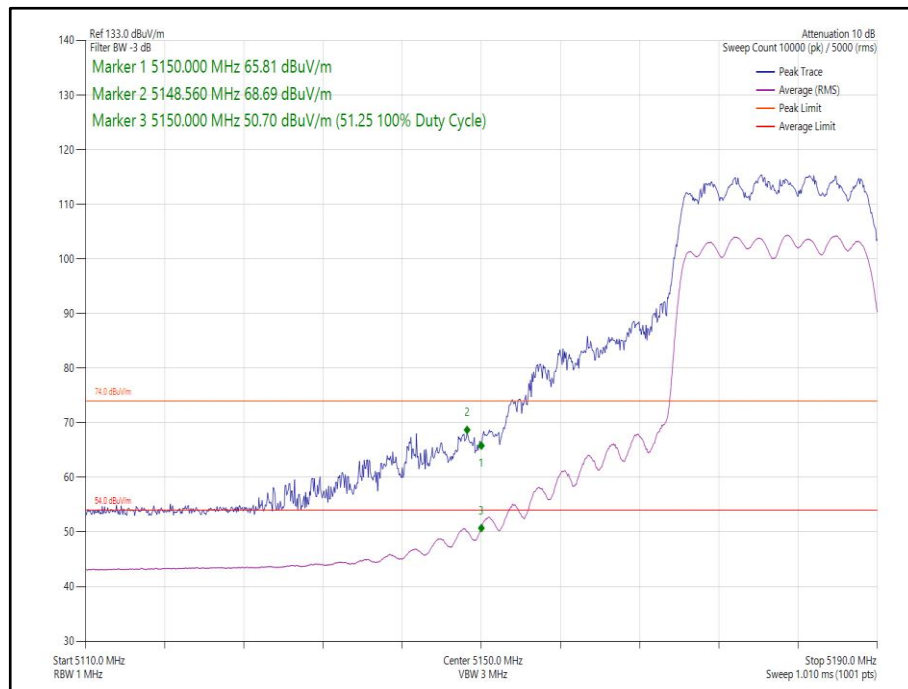
Table 8 - MIMO 2TX Restricted Band Edge Results



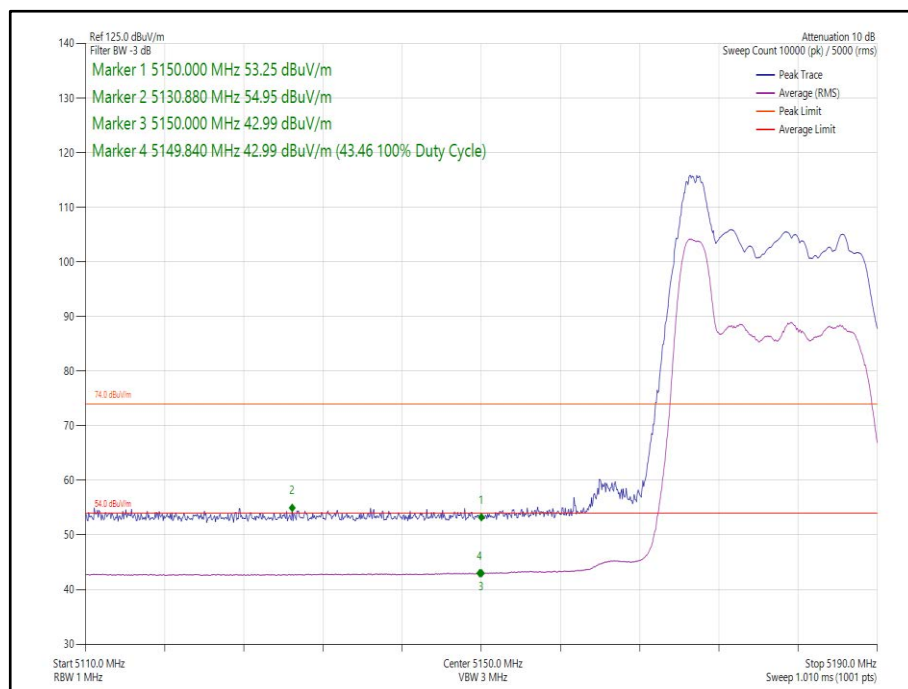
**Figure 13 - 802.11n HT20 CDD, Cores 0-1 - 5180 MHz,
Band Edge Frequency 5150 MHz**



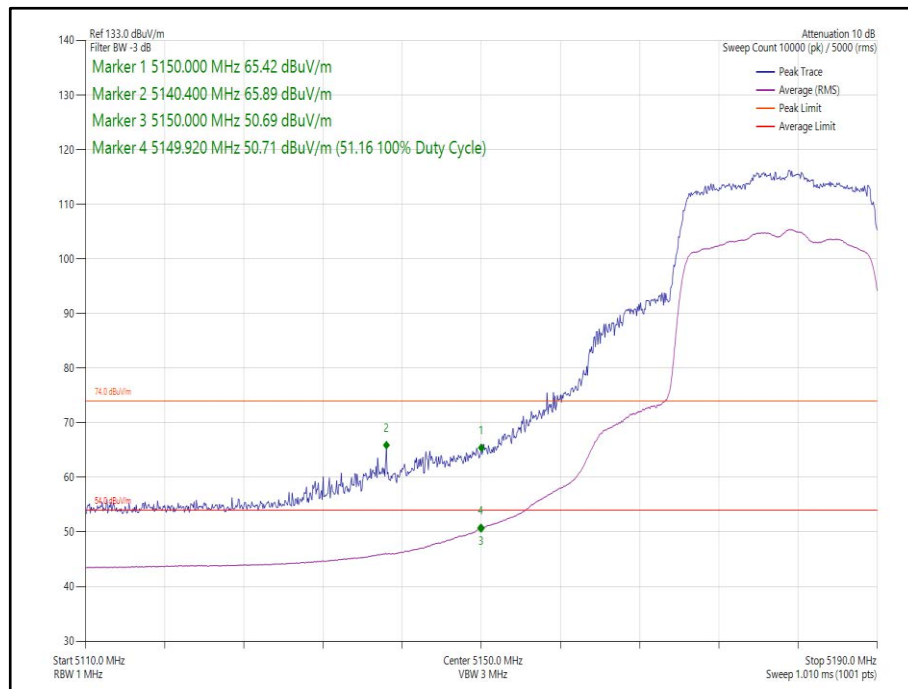
**Figure 14 - 802.11n HT20 SDM, Cores 0-1 - 5180 MHz
Band Edge Frequency 5150 MHz**



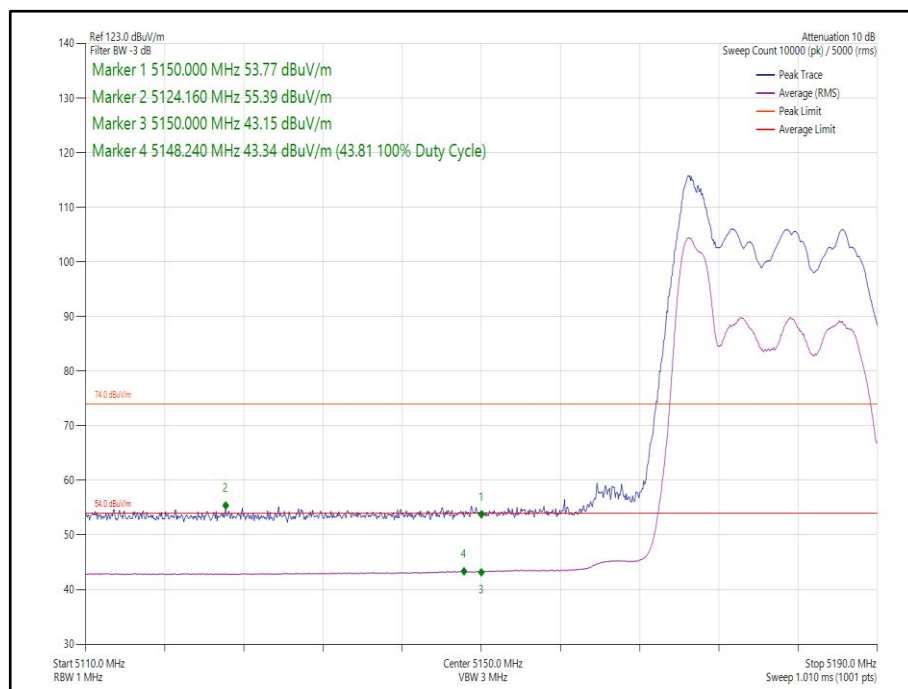
**Figure 15 - 802.11ax HE20 CDD, Cores 0-1 SU - 5180 MHz
Band Edge Frequency 5150 MHz**



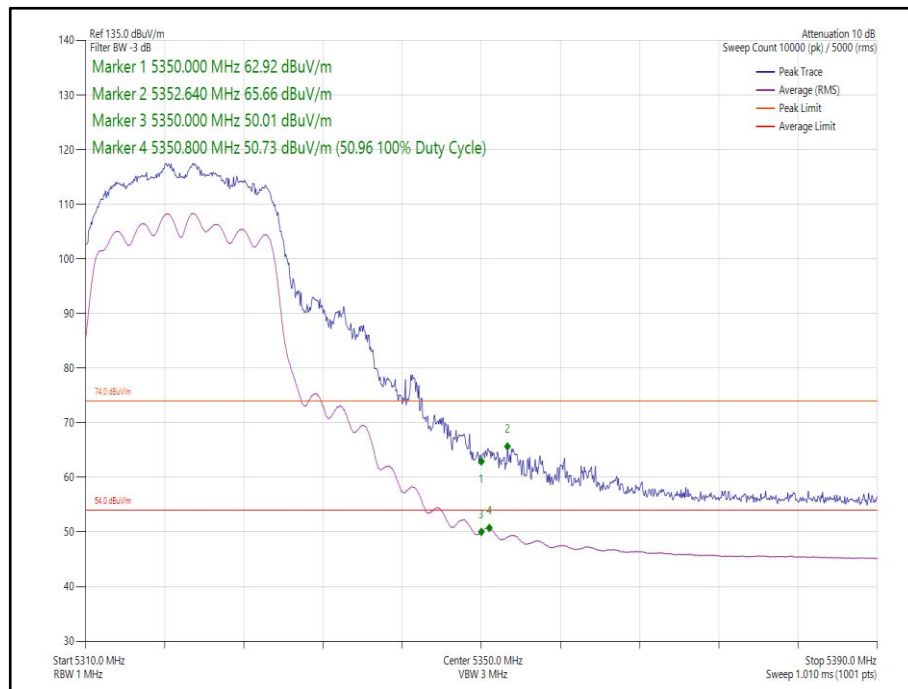
**Figure 16 - 802.11ax HE20 CDD, Cores 0-1, 26-0 - 5180 MHz
Band Edge Frequency 5150 MHz**



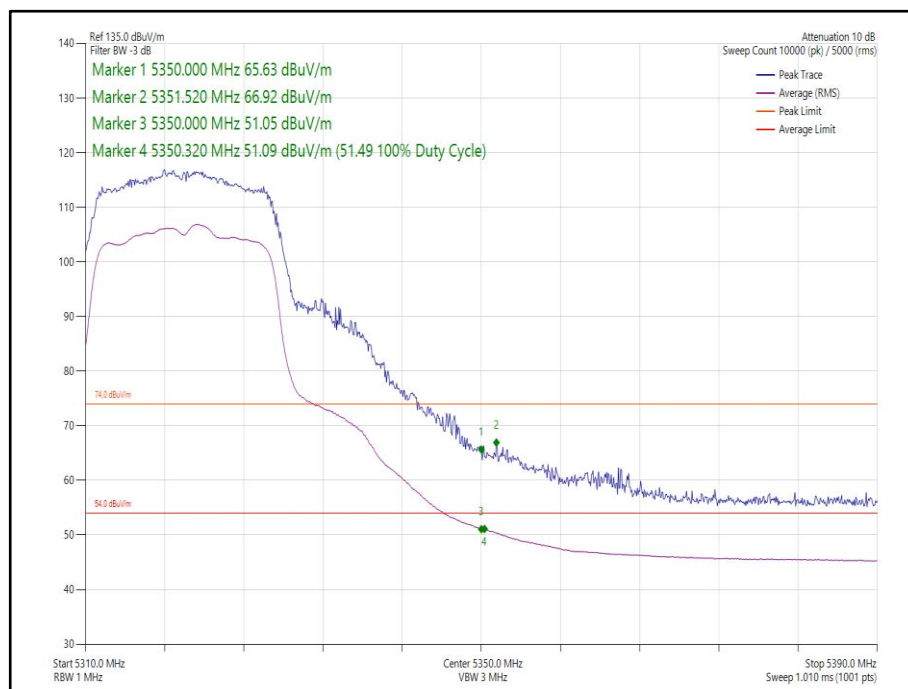
**Figure 17 - 802.11ax HE20 SDM, Cores 0-1, SU - 5180 MHz
Band Edge Frequency 5150 MHz**



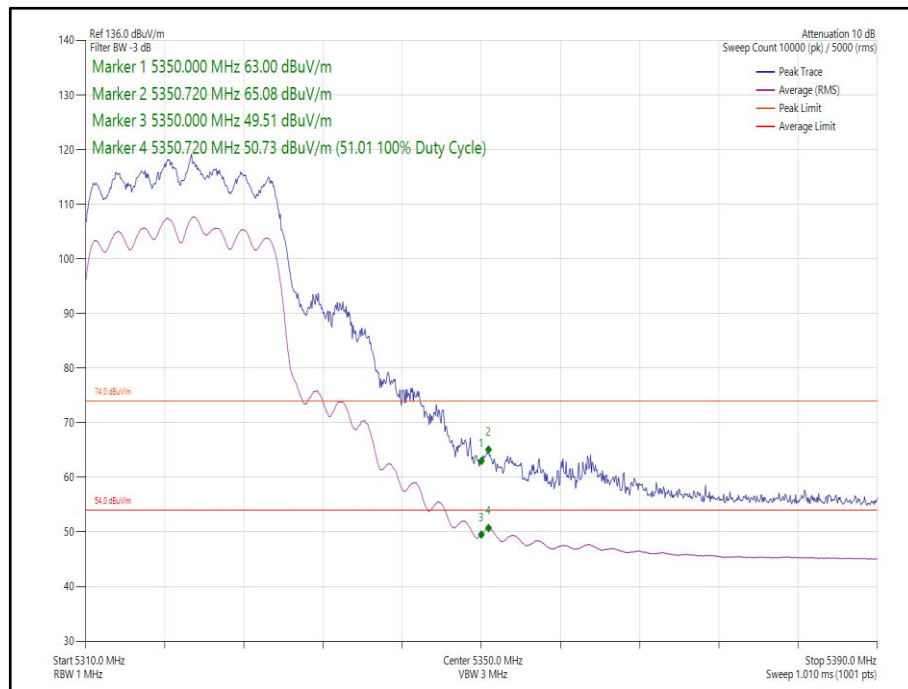
**Figure 18 - 802.11ax HE20 SDM, Cores 0-1, 26-0 - 5180 MHz
Band Edge Frequency 5150 MHz**



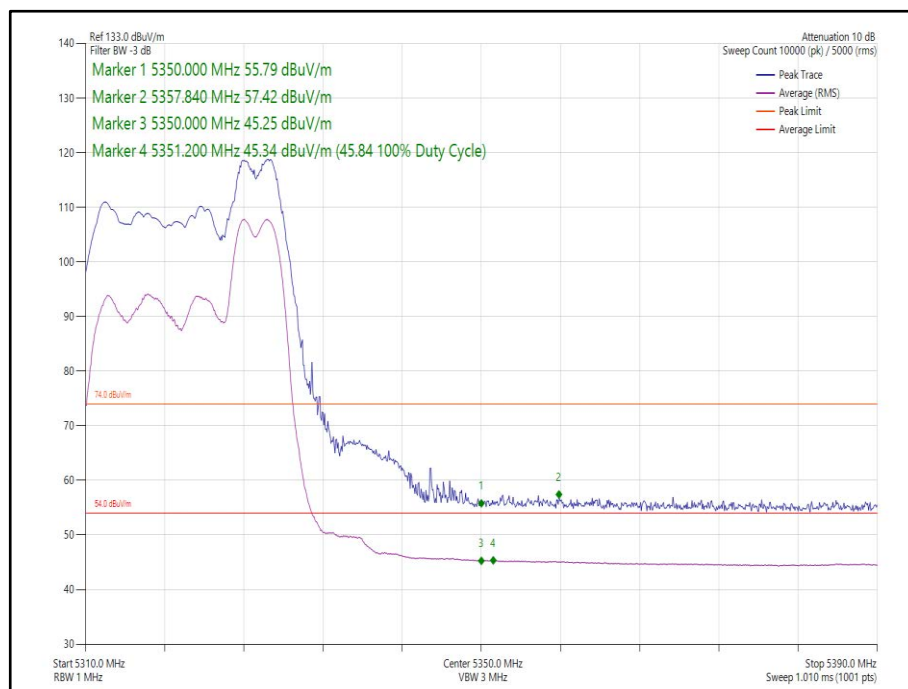
**Figure 19 - 802.11n HT20 CDD, Cores 0-1 - 5320 MHz
 Band Edge Frequency 5350 MHz**



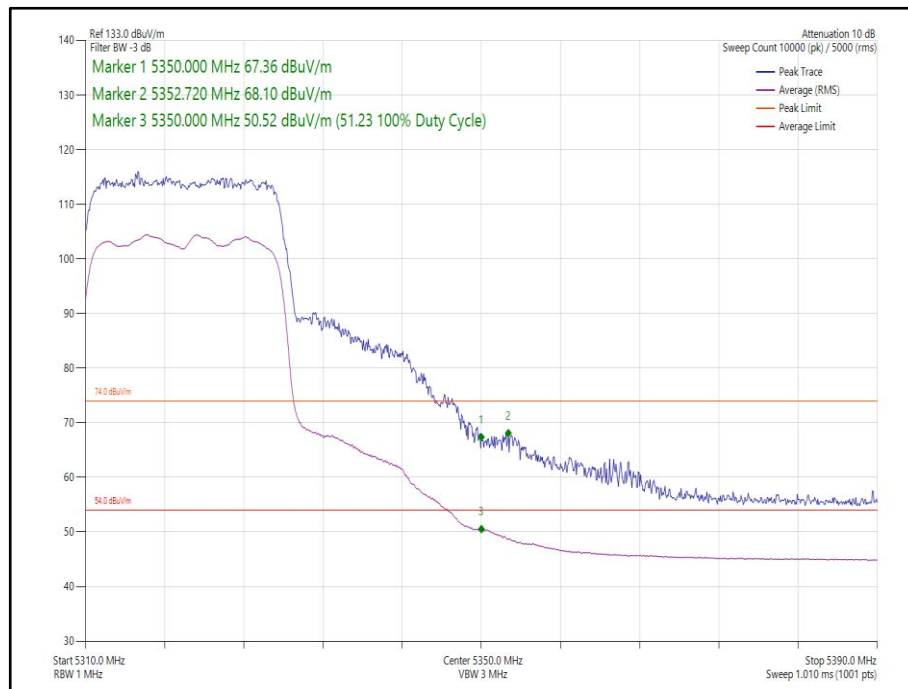
**Figure 20 - 802.11n HT20 SDM, Cores 0-1 - 5320 MHz
 Band Edge Frequency 5350 MHz**



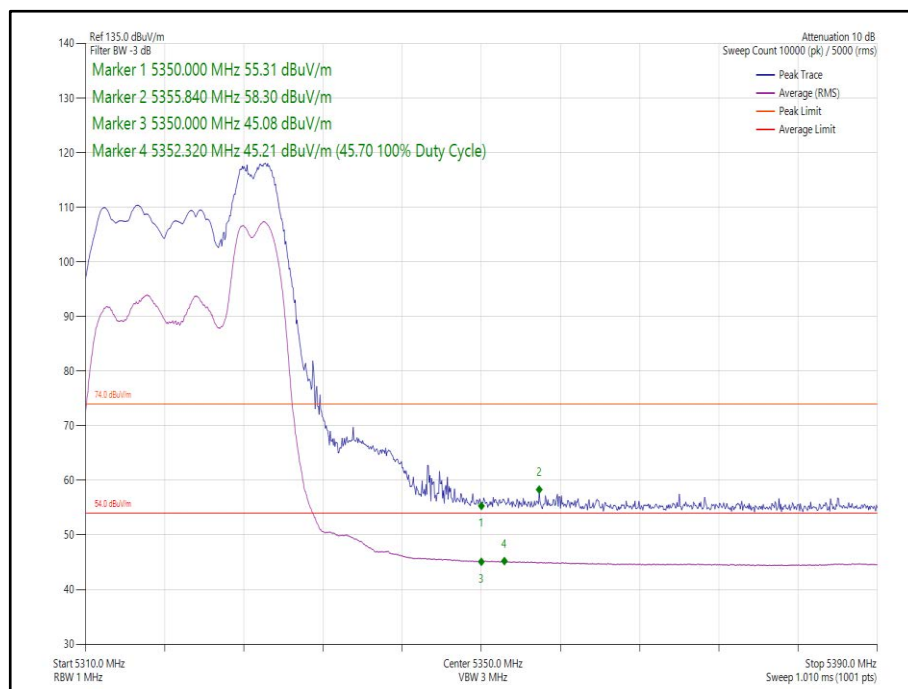
**Figure 21 - 802.11ax HE20 CDD, Cores 0-1, SU - 5320 MHz
Band Edge Frequency 5350 MHz**



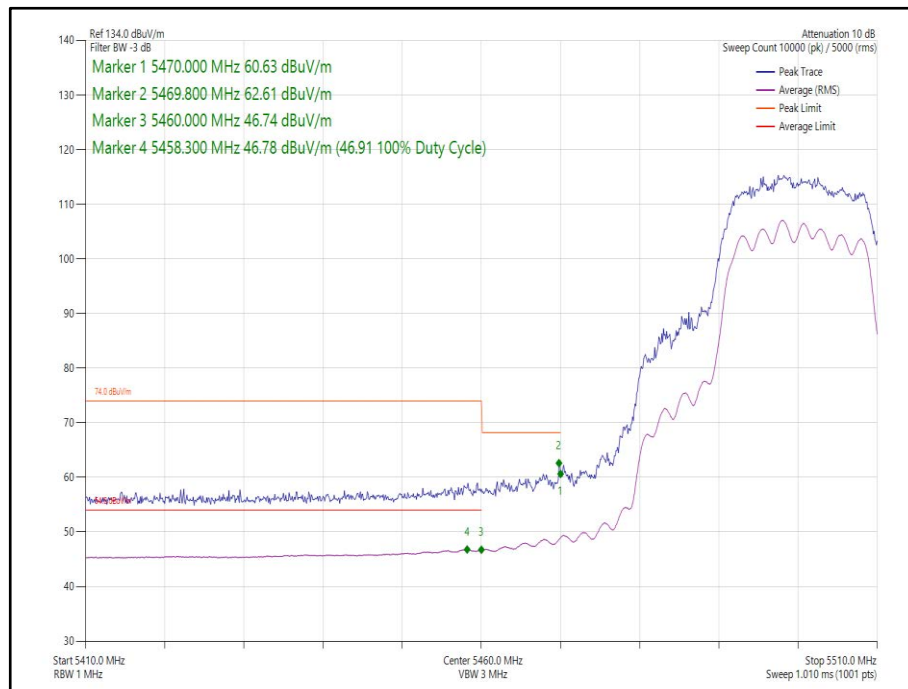
**Figure 22 - 802.11ax HE20 CDD, Cores 0-1, 52-40 - 5320 MHz
Band Edge Frequency 5350 MHz**



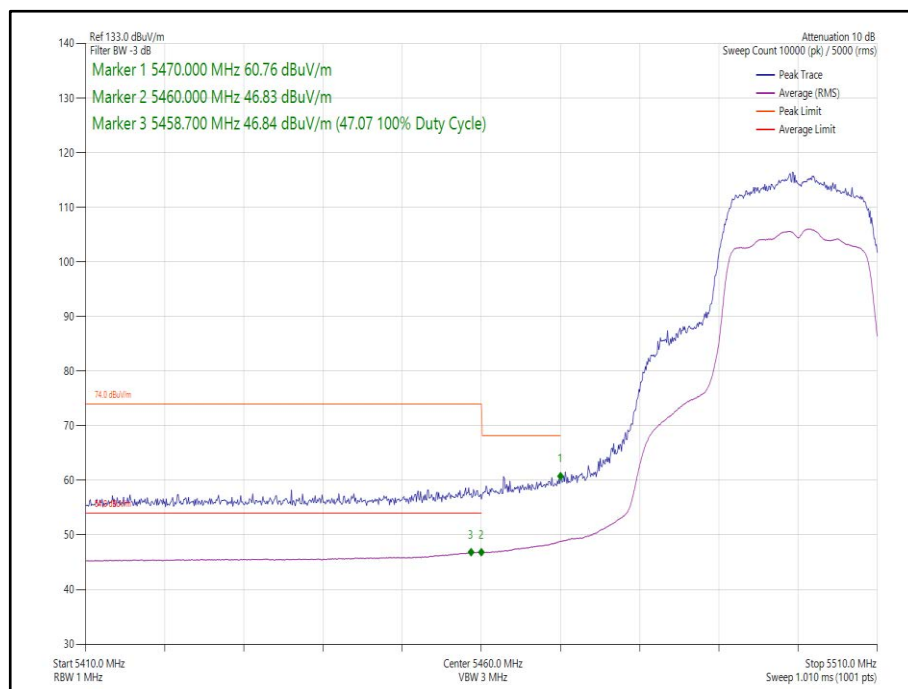
**Figure 23 - 802.11ax HE20 SDM, Cores 0-1, SU - 5320 MHz
Band Edge Frequency 5350 MHz**



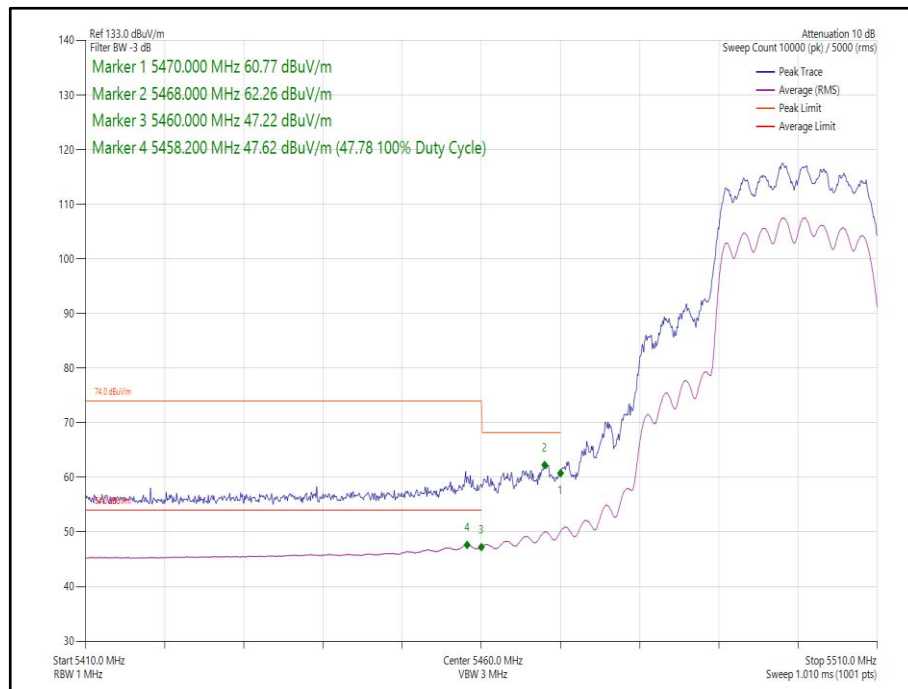
**Figure 24 - 802.11ax HE20 SDM, Cores 0-1, 52-40 - 5320 MHz
Band Edge Frequency 5350 MHz**



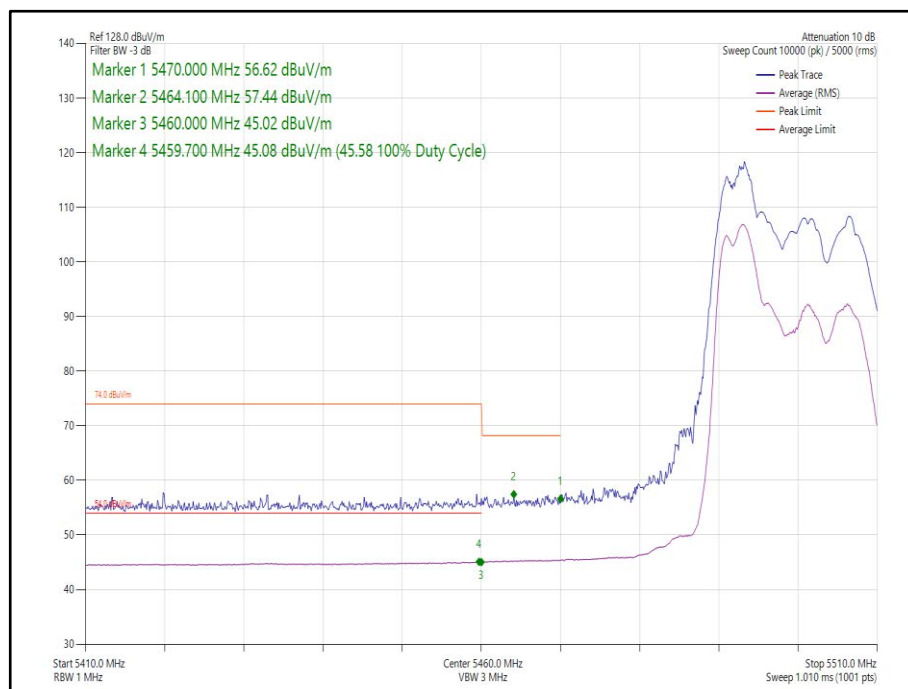
**Figure 25 - 802.11n HT20 CDD, Cores 0-1 - 5500 MHz
Band Edge Frequency 5460 MHz**



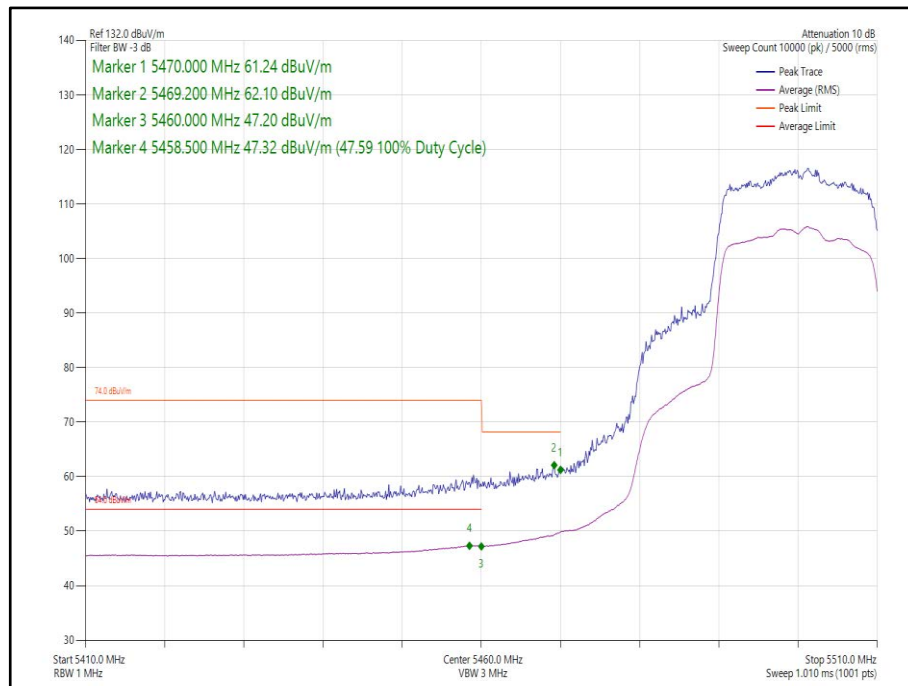
**Figure 26 - 802.11n HT20 SDM, Cores 0-1 - 5500 MHz
Band Edge Frequency 5460 MHz**



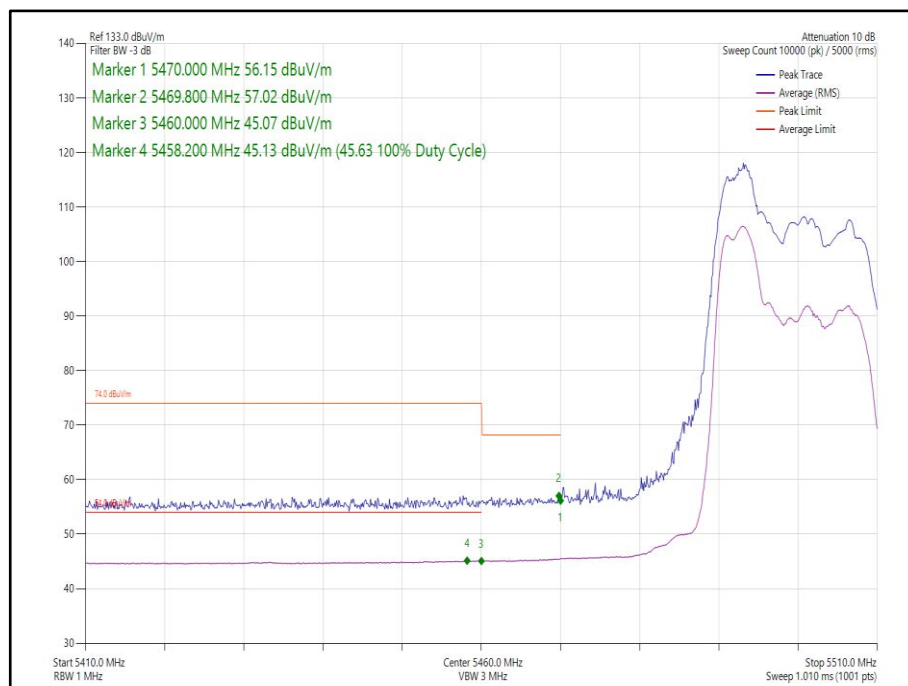
**Figure 27 - 802.11ax HE20 CDD, Cores 0-1, SU- 5500 MHz
Band Edge Frequency 5460 MHz**



**Figure 28 - 802.11ax HE20 CDD, Cores 0-1, 52-37 - 5500 MHz
Band Edge Frequency 5460 MHz**



**Figure 29 - 802.11ax HE20 SDM, Cores 0-1, SU- 5500 MHz
Band Edge Frequency 5460 MHz**



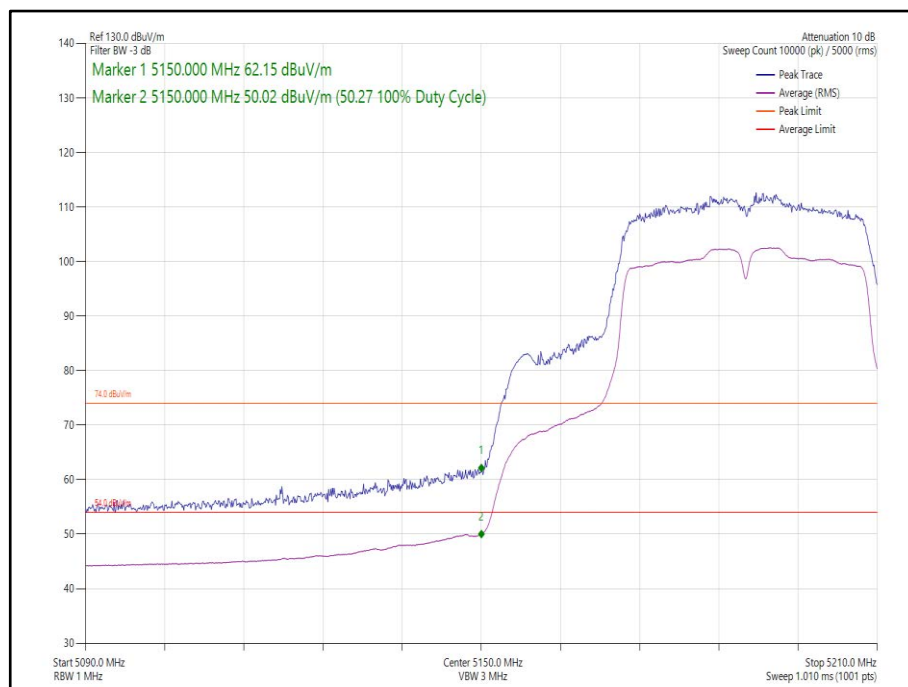
**Figure 30 - 802.11ax HE20 SDM, Cores 0-1, 52-37 - 5500 MHz
Band Edge Frequency 5460 MHz**



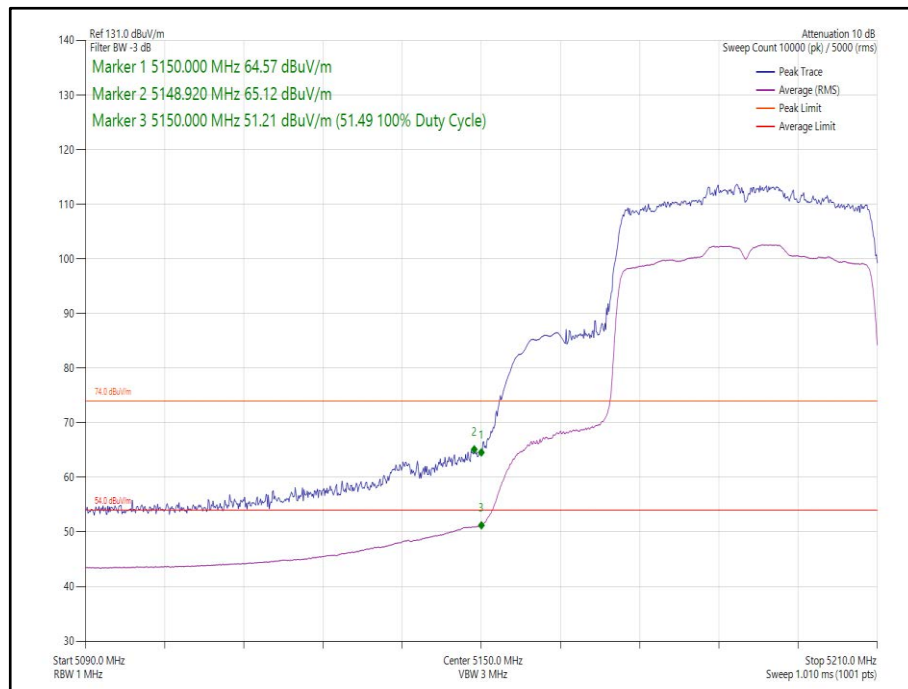
40 MHz Bandwidth (SISO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11n HT40, Core 1	MCS 2	-	-	5190	5150	62.15	50.27
802.11ax HE40, Core 1	MCS 4x1	SU	-	5190	5150	65.12	51.49
802.11ax HE40, Core 1	MCS 11x1	26	0	5190	5150	55.22	44.01
802.11n HT40, Core 1	MCS 2	-	-	5310	5350	64.42	50.91
802.11ax HE40, Core 1	MCS 4x1	SU	-	5310	5350	66.42	51.30
802.11ax HE40, Core 1	MCS 11x1	52	44	5310	5350	68.11	45.93
802.11n HT40, Core 1	MCS 7	-	-	5510	5460	-	49.05
802.11ax HE40, Core 1	MCS 11x1	SU	-	5510	5460	-	48.85
802.11ax HE40, Core 1	MCS 11x1	52	37	5510	5460	-	45.07

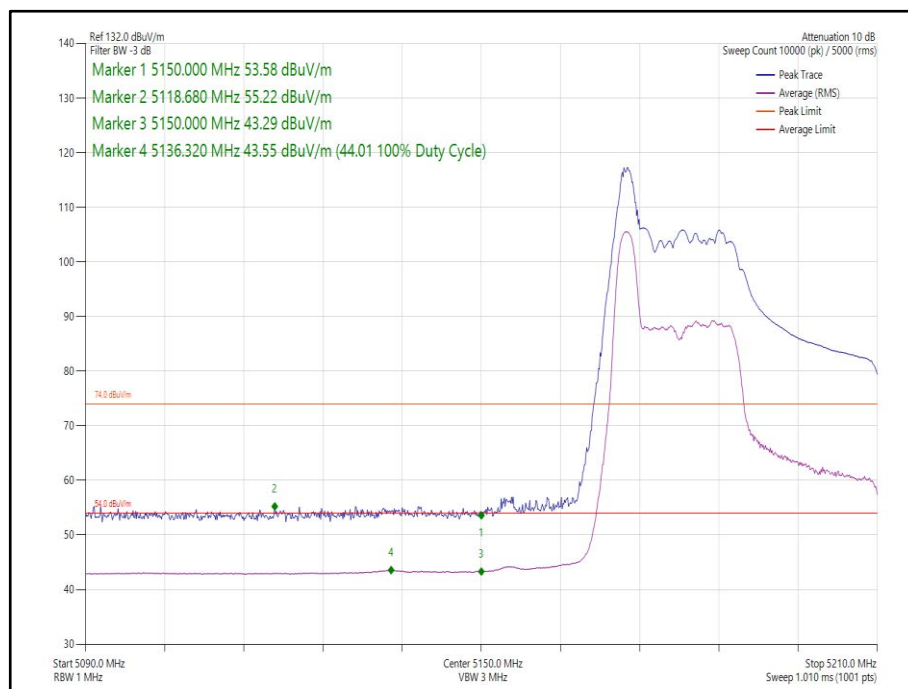
Table 9 - SISO Restricted Band Edge Results



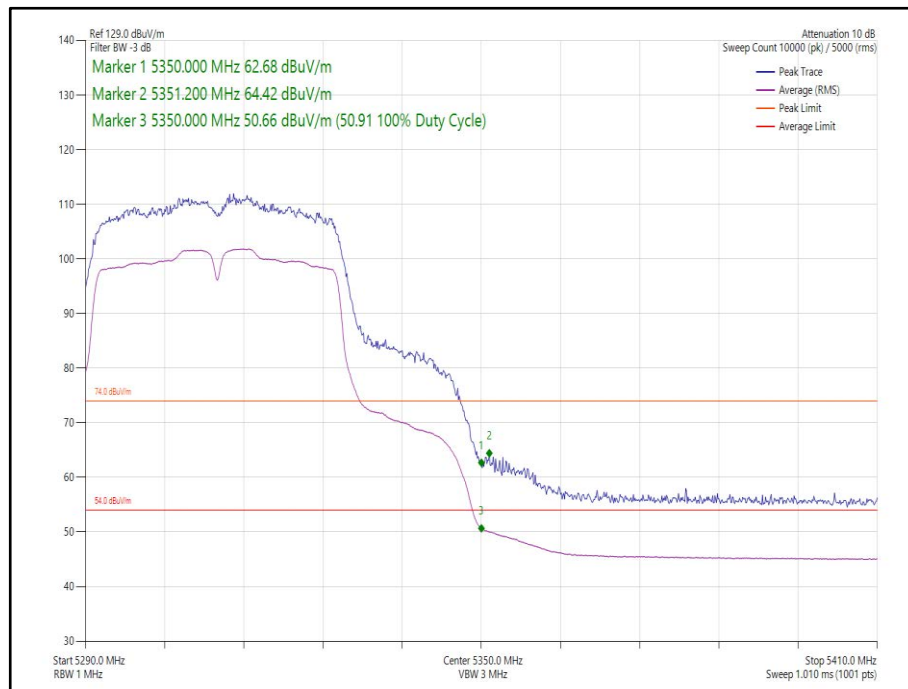
**Figure 31 - 802.11n HT40, Core 1 - 5190 MHz
Band Edge Frequency 5150 MHz**



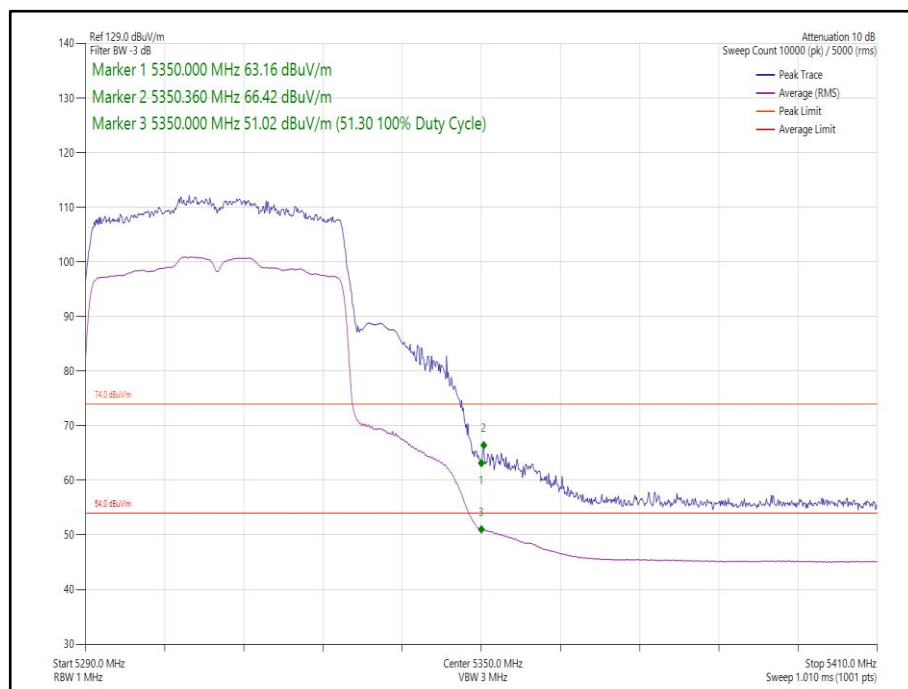
**Figure 32 - 802.11ax HE40, Core 1, SU - 5190 MHz
Band Edge Frequency 5150 MHz**



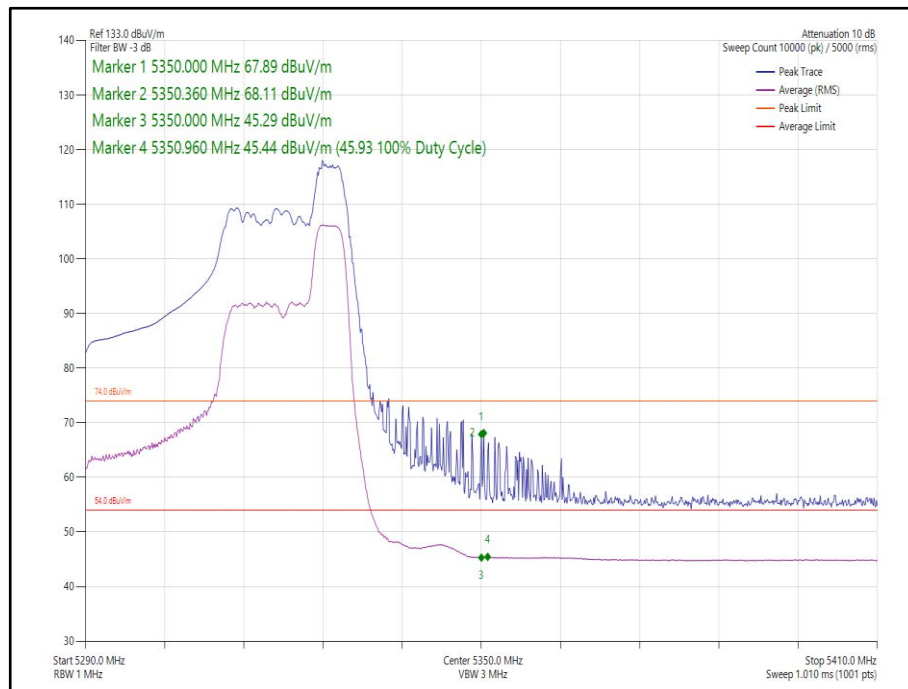
**Figure 33 - 802.11ax HE40, Core 1, 26-0 - 5190 MHz
Band Edge Frequency 5150 MHz**



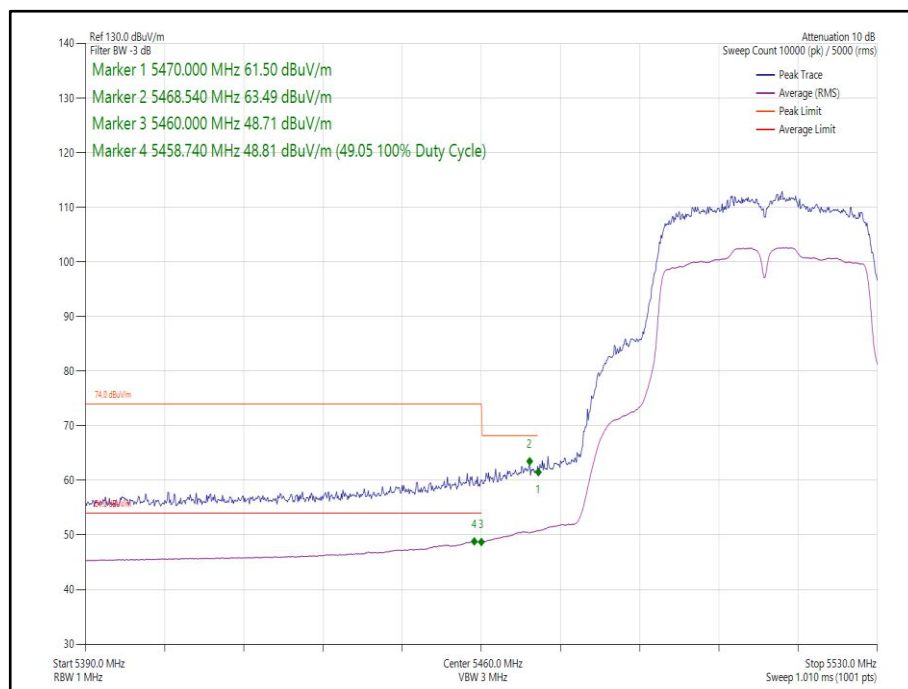
**Figure 34 - 802.11n HT40, Core 1 - 5310 MHz
Band Edge Frequency 5350 MHz**



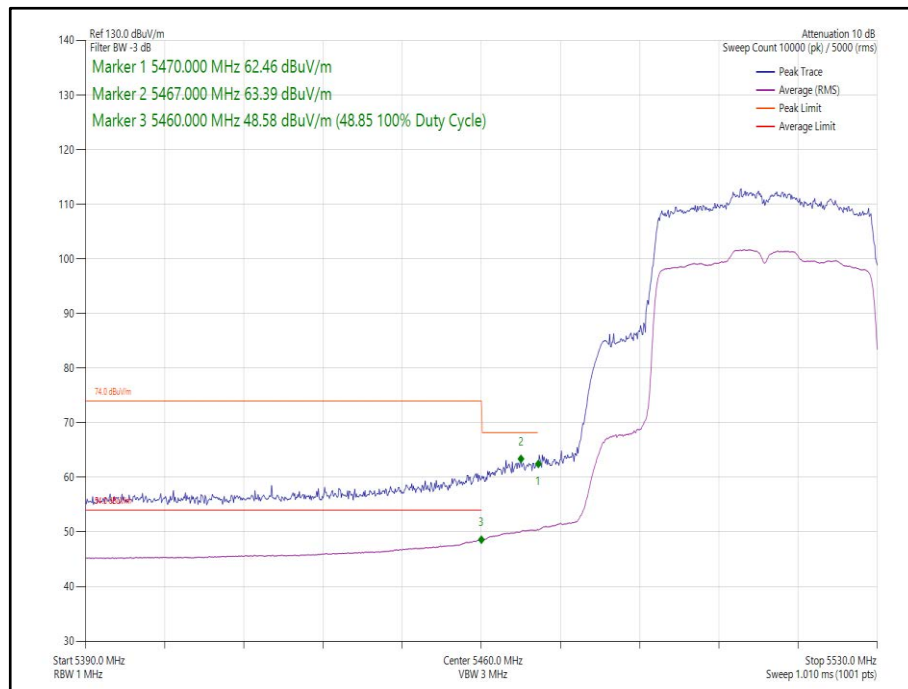
**Figure 35 - 802.11ax HE40, Core 1, SU - 5310 MHz
Band Edge Frequency 5350 MHz**



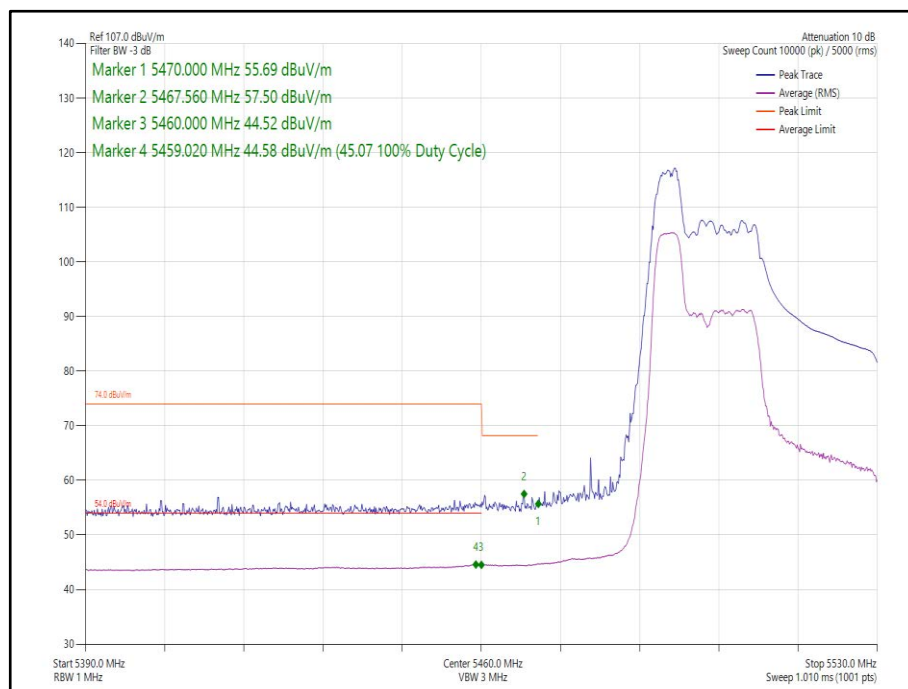
**Figure 36 - 802.11ax HE40, Core 1, 52-44 - 5310 MHz
Band Edge Frequency 5350 MHz**



**Figure 37 - 802.11n HT40, Core 1 - 5510 MHz
Band Edge Frequency 5460 MHz**



**Figure 38 - 802.11ax HE40, Core 1, SU - 5510 MHz
Band Edge Frequency 5460 MHz**



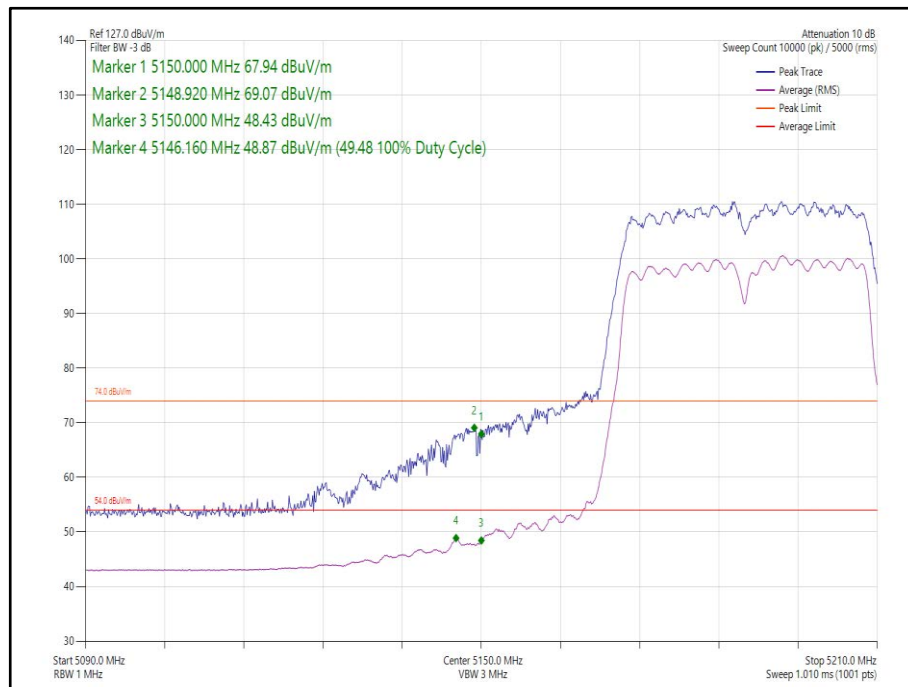
**Figure 39 - 802.11ax HE40, Core 1, 52-37- 5510 MHz
Band Edge Frequency 5460 MHz**



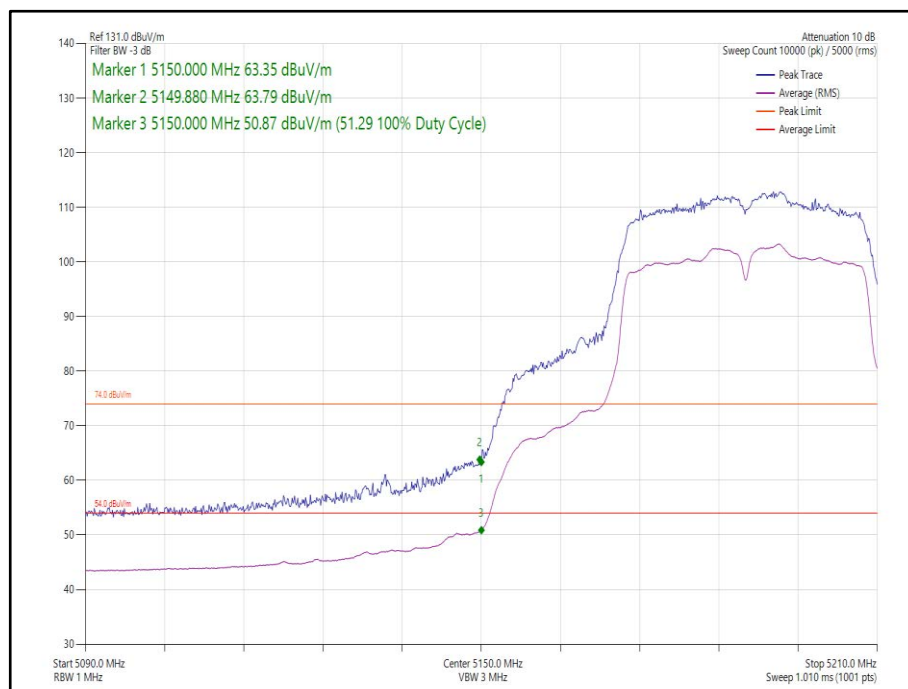
40 MHz Bandwidth (2TX MIMO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11n HT40 CDD, Cores 0-1	MCS 7	-	-	5190	5150	69.07	49.48
802.11n HT40 SDM, Cores 0-1	MCS 10	-	-	5190	5150	63.79	51.29
802.11ax HE40 CDD, Cores 0-1	MCS 4x1	SU	-	5190	5150	64.34	51.45
802.11ax HE40 CDD, Cores 0-1	MCS 11x1	26	0	5190	5150	55.55	43.73
802.11ax HE40 SDM, Cores 0-1	MCS 4x2	SU	-	5190	5150	64.53	51.28
802.11ax HE40 SDM, Cores 0-1	MCS 11x2	26	0	5190	5150	55.32	43.77
802.11n HT40 CDD, Cores 0-1	MCS 4	-	-	5310	5350	64.73	51.19
802.11n HT40 SDM, Cores 0-1	MCS 12	-	-	5310	5350	64.98	51.40
802.11ax HE40 CDD, Cores 0-1	MCS 2x1	SU	-	5310	5350	64.01	51.32
802.11ax HE40 CDD, Cores 0-1	MCS 11x1	52	44	5310	5350	62.00	45.18
802.11ax HE40 SDM, Cores 0-1	MCS 4x2	SU	-	5310	5350	64.85	51.35
802.11ax HE40 SDM, Cores 0-1	MCS 11x2	52	44	5310	5350	64.76	45.94
802.11n HT40 CDD, Cores 0-1	MCS 4	-	-	5510	5460	-	48.94
802.11n HT40 SDM, Cores 0-1	MCS 10	-	-	5510	5460	-	48.45
802.11ax HE40 CDD, Cores 0-1	MCS 2x1	SU	-	5510	5460	-	49.38
802.11ax HE40 CDD, Cores 0-1	MCS 11x1	52	37	5510	5460	-	45.65
802.11ax HE40 SDM, Cores 0-1	MCS 2x2	SU	-	5510	5460	-	48.91
802.11ax HE40 SDM, Cores 0-1	MCS 11x2	52	37	5510	5460	-	45.60

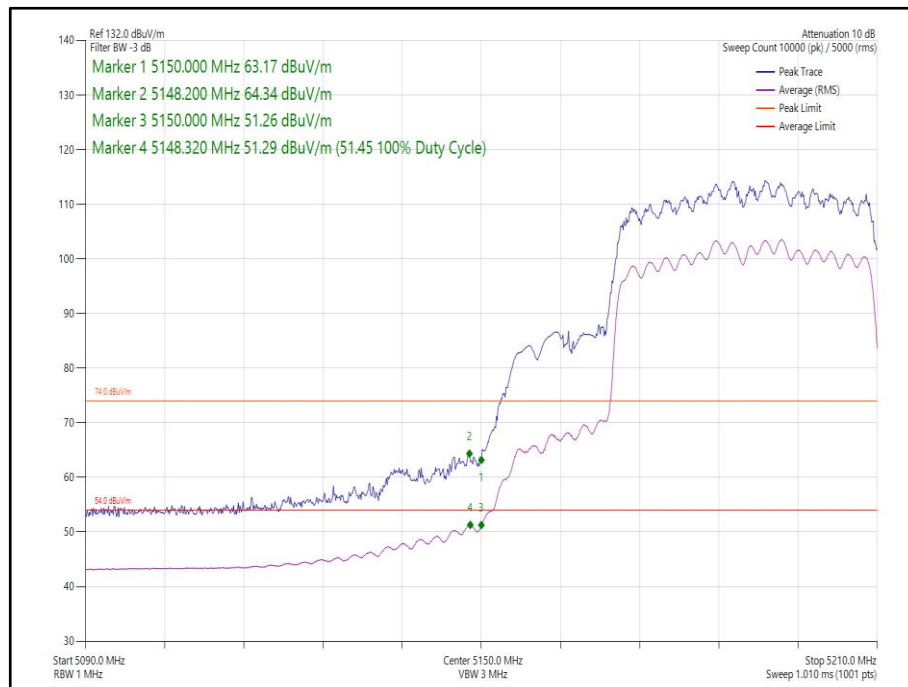
Table 10 - MIMO 2TX Restricted Band Edge Results



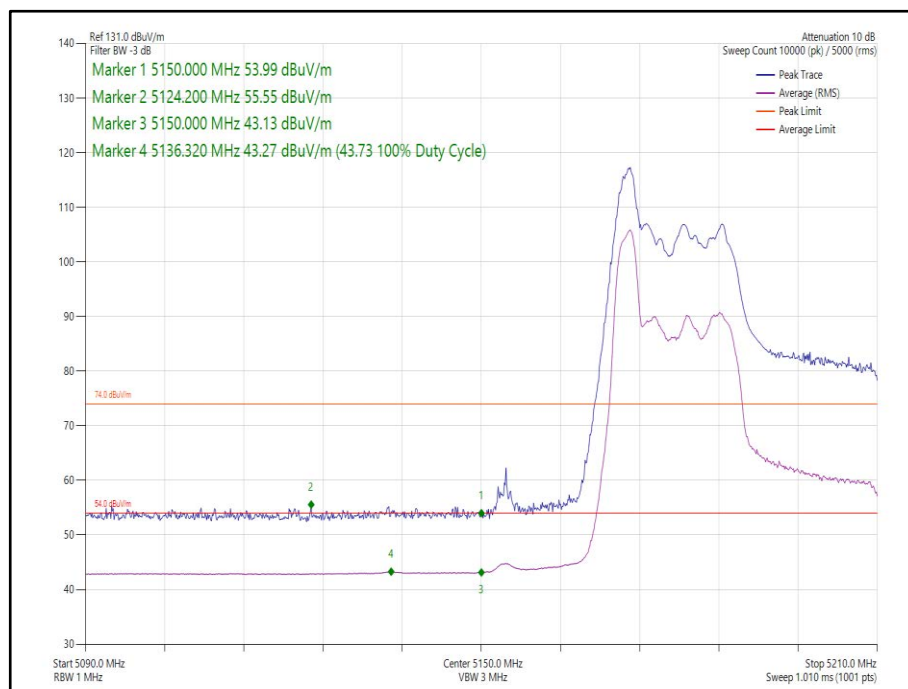
**Figure 40 - 802.11n HT40 CDD Cores 0-1 - 5190 MHz
Band Edge Frequency 5150 MHz**



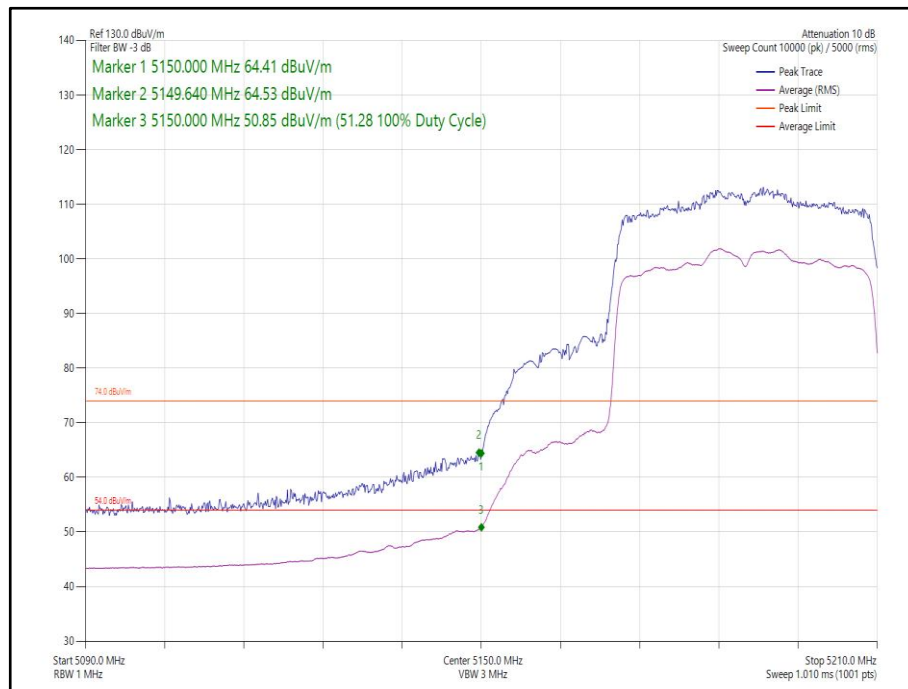
**Figure 41 - 802.11n HT40 SDM Cores 0-1 - 5190 MHz
Band Edge Frequency 5150 MHz**



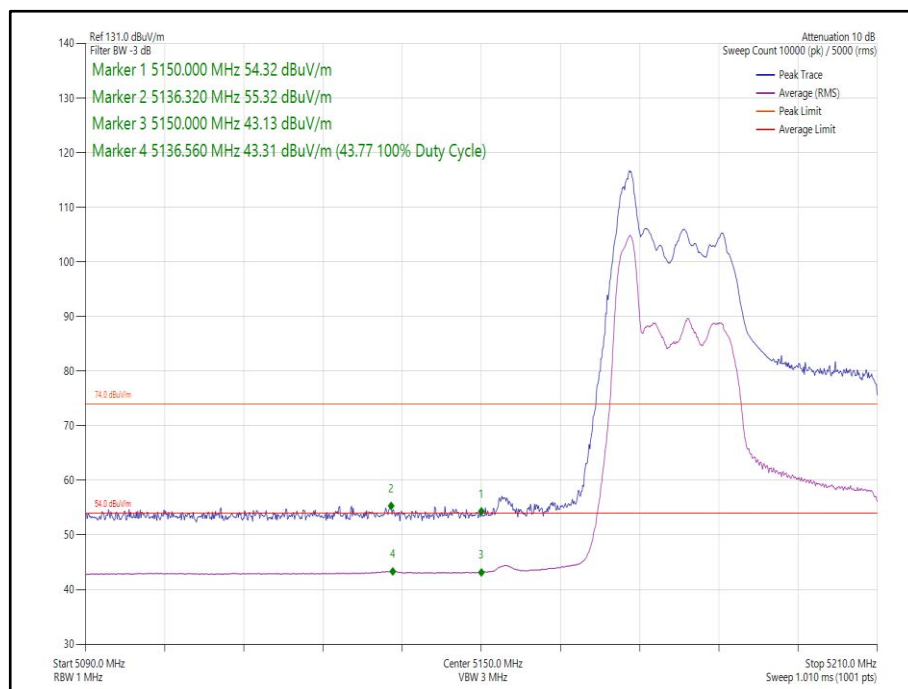
**Figure 42 - 802.11ax HE40 CDD, Cores 0-1, SU - 5190 MHz
Band Edge Frequency 5150 MHz**



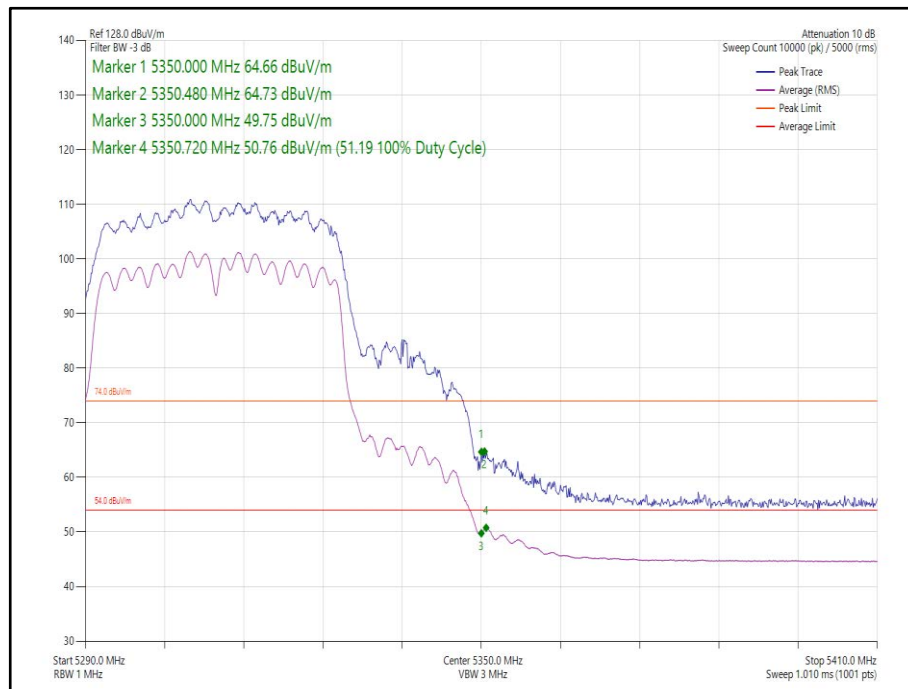
**Figure 43 - 802.11ax HE40 CDD, Cores 0-1, 26-0 - 5190 MHz
Band Edge Frequency 5150 MHz**



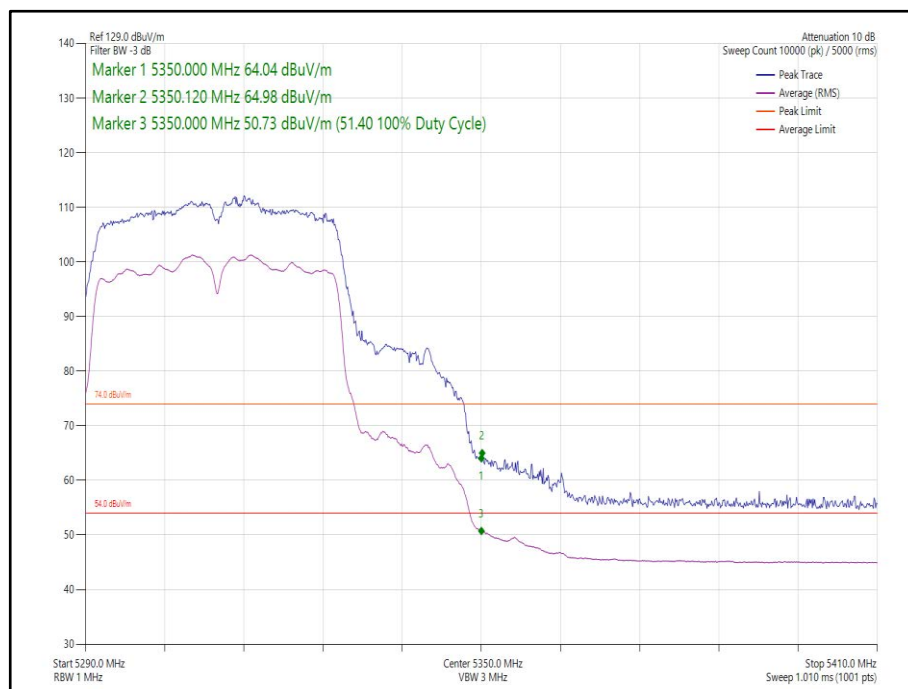
**Figure 44 - 802.11ax HE40 SDM, Cores 0-1, SU - 5190 MHz
Band Edge Frequency 5150 MHz**



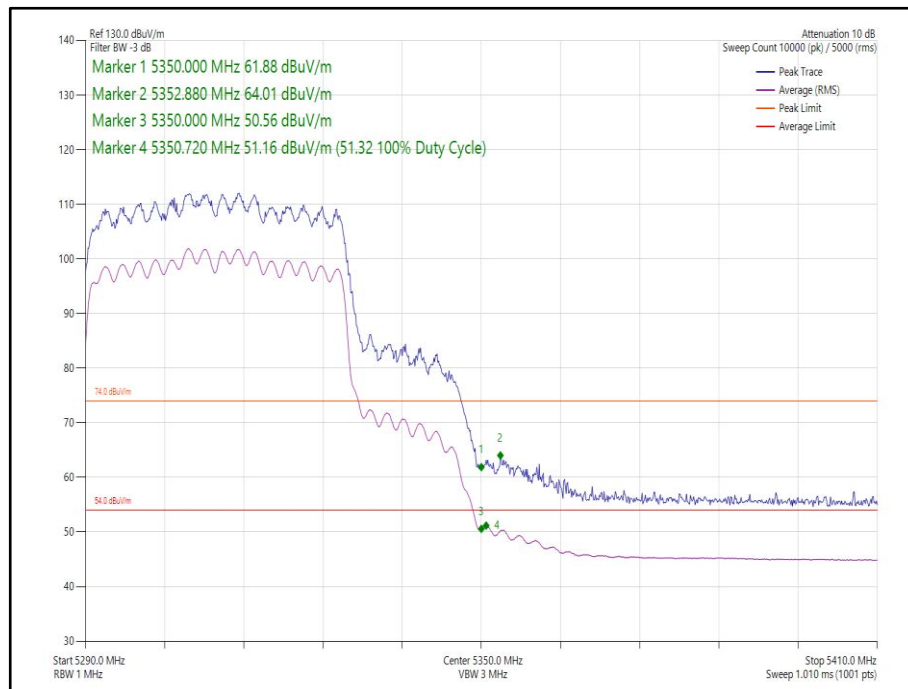
**Figure 45 - 802.11ax HE40 SDM, Cores 0-1, 26-0 - 5190 MHz
Band Edge Frequency 5150 MHz**



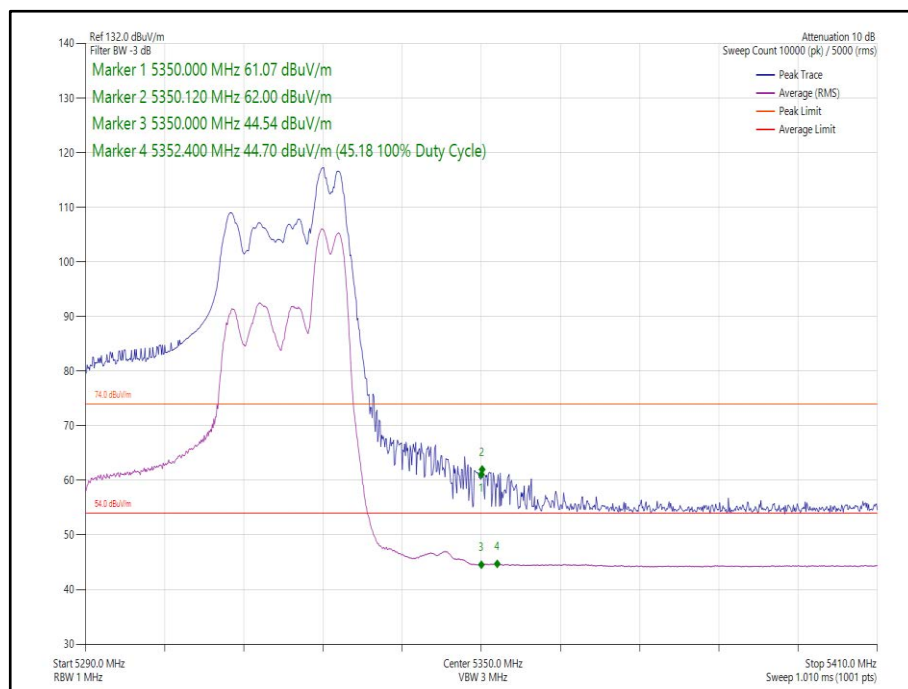
**Figure 46 - 802.11n HT40 CDD, Cores 0-1 - 5310 MHz
Band Edge Frequency 5350 MHz**



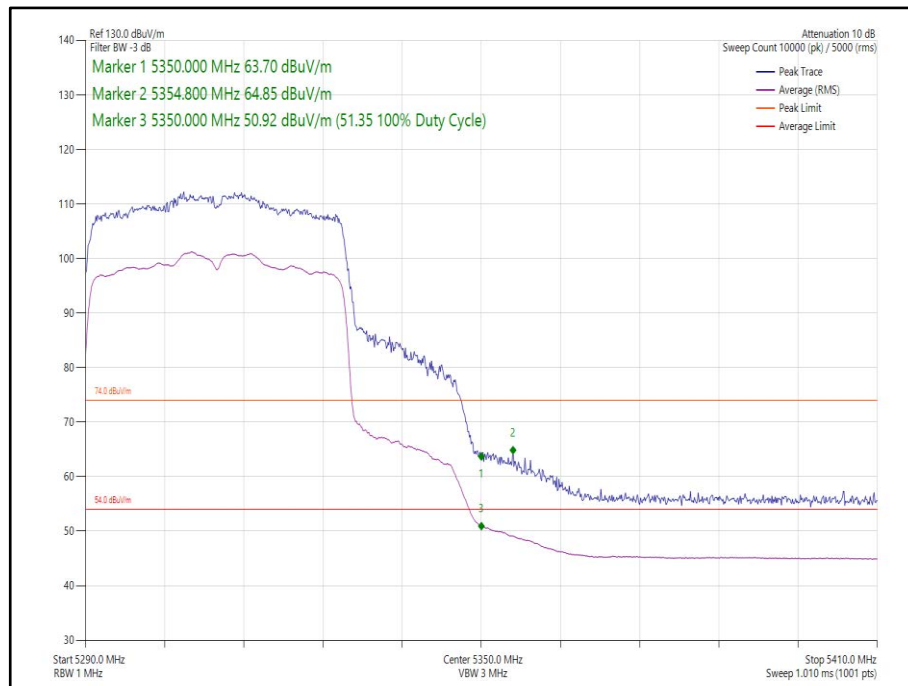
**Figure 47 - 802.11n HT40 SDM, Cores 0-1 - 5310 MHz
Band Edge Frequency 5350 MHz**



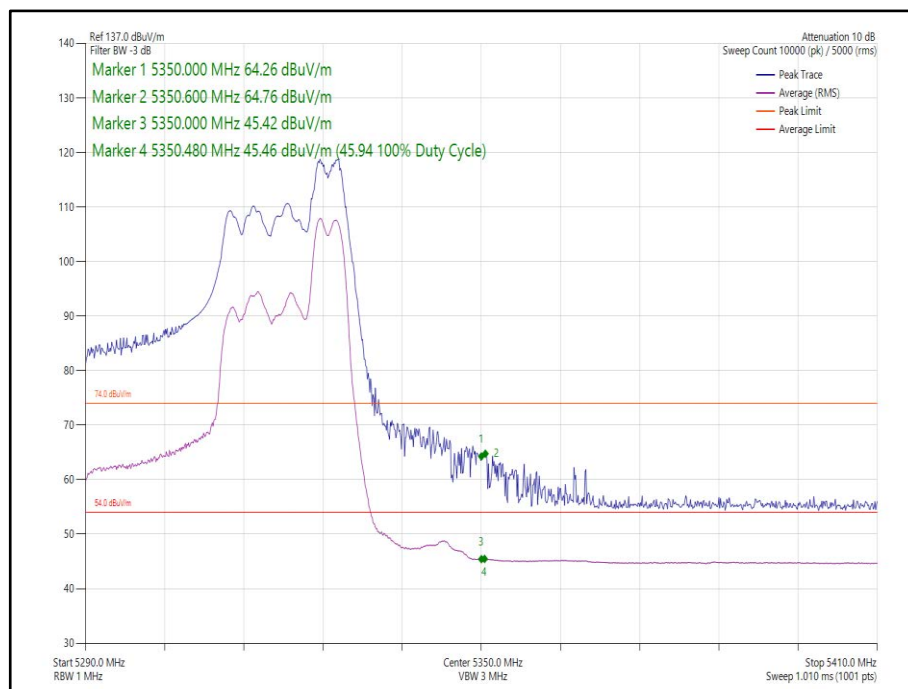
**Figure 48 - 802.11ax HE40 CDD, Cores 0-1, SU - 5310 MHz
Band Edge Frequency 5350 MHz**



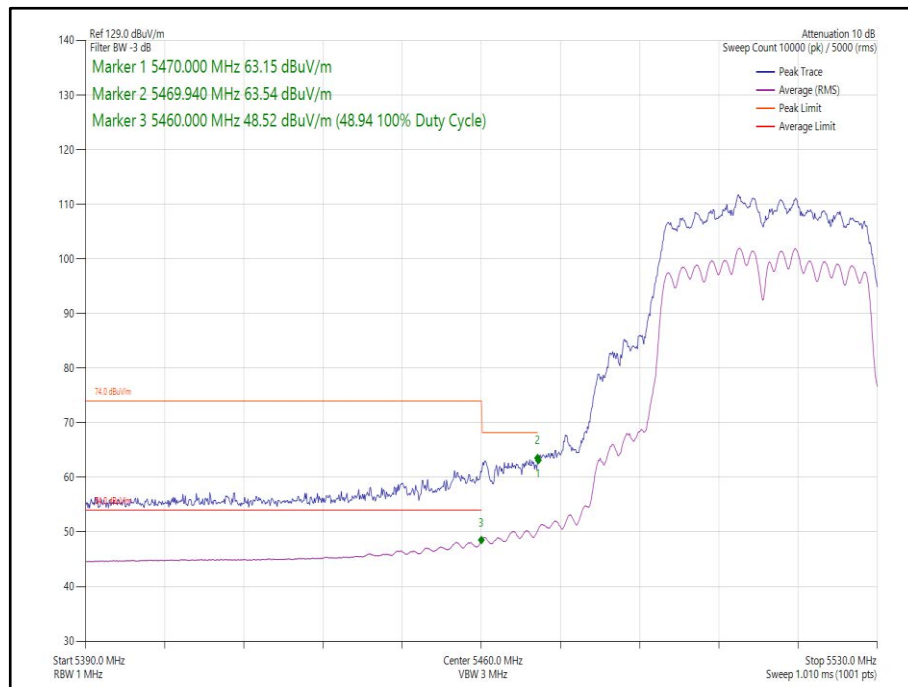
**Figure 49 - 802.11ax HE40 CDD, Cores 0-1, 52-44 - 5310 MHz
Band Edge Frequency 5350 MHz**



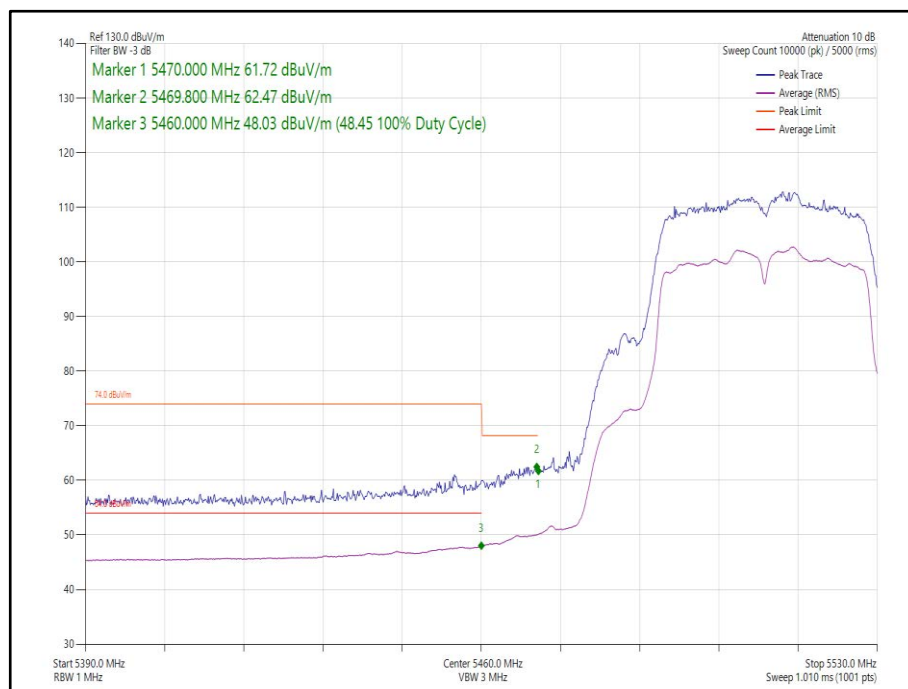
**Figure 50 - 802.11ax HE40 SDM, Cores 0-1, SU - 5310 MHz
Band Edge Frequency 5350 MHz**



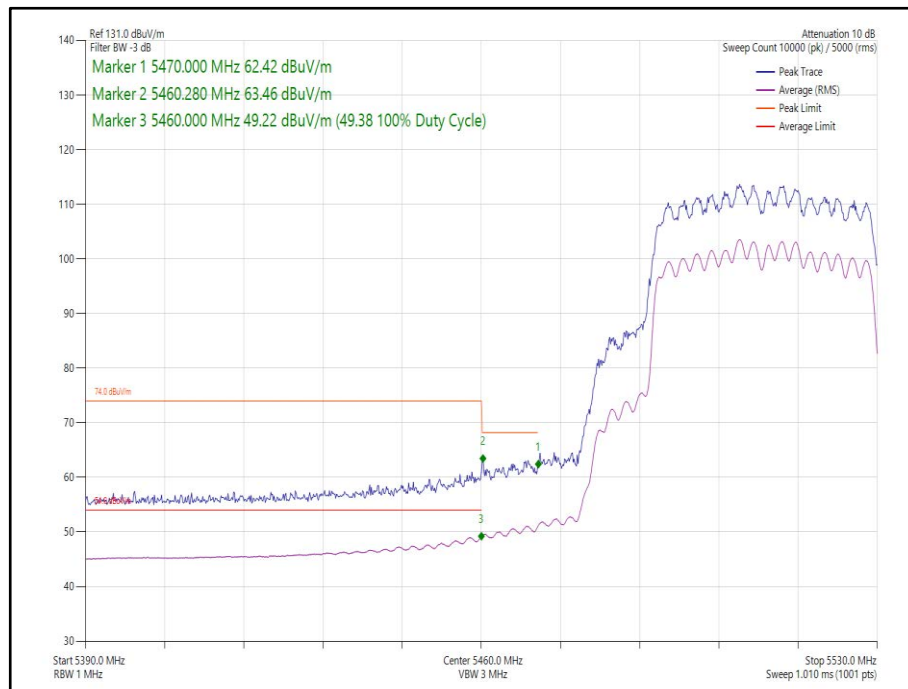
**Figure 51 - 802.11ax HE40 SDM, Cores 0-1, 52-44 5310 MHz
Band Edge Frequency 5350 MHz**



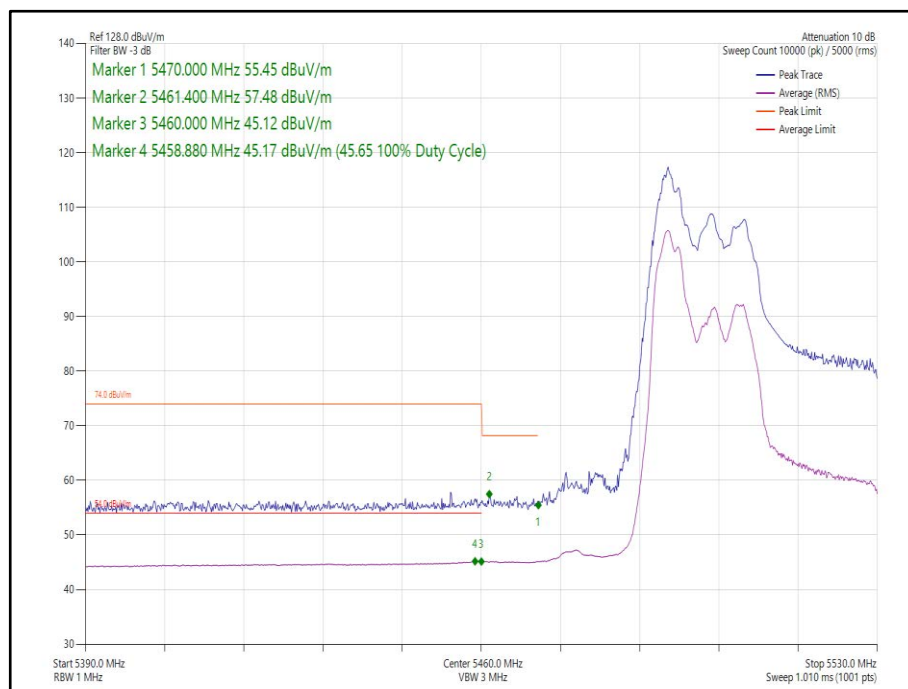
**Figure 52 - 802.11n HT40 CDD, Cores 0-1 - 5510 MHz
Band Edge Frequency 5460 MHz**



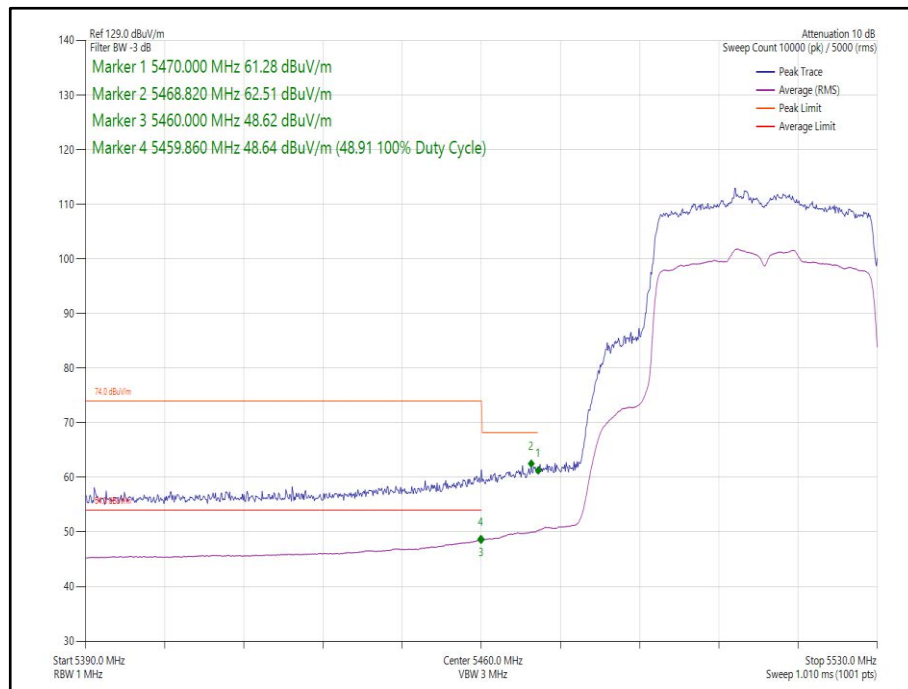
**Figure 53 - 802.11n HT40 SDM, Cores 0-1 - 5510 MHz
Band Edge Frequency 5460 MHz**



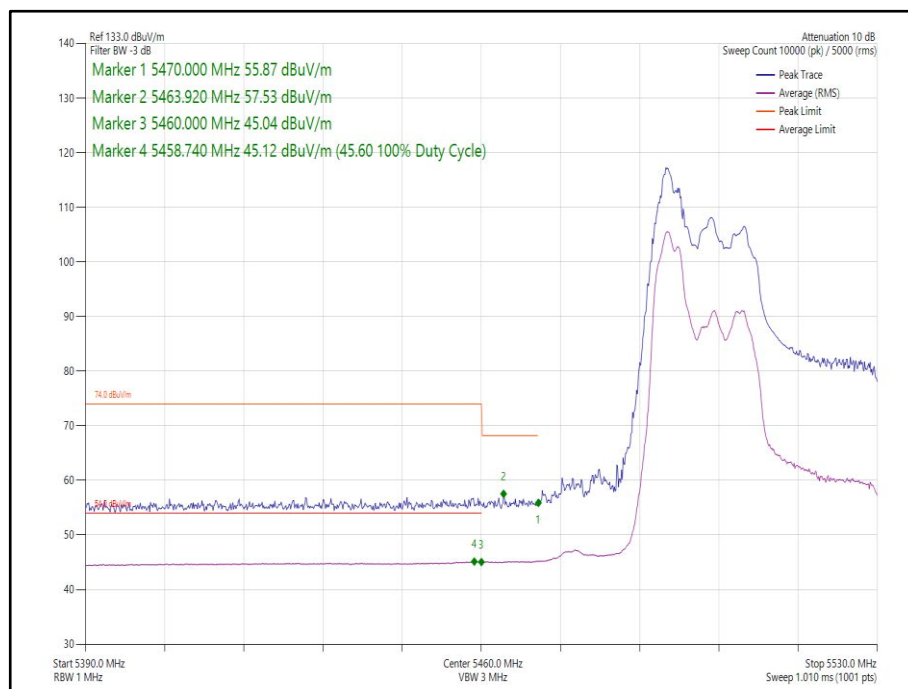
**Figure 54 - 802.11ax HE40 CDD, Cores 0-1, SU - 5510 MHz
Band Edge Frequency 5460 MHz**



**Figure 55 - 802.11ax HE40 CDD, Cores 0-1, 52-37 - 5510 MHz
Band Edge Frequency 5460 MHz**



**Figure 56 - 802.11ax HE40 SDM, Cores 0-1, SU - 5510 MHz
Band Edge Frequency 5460 MHz**



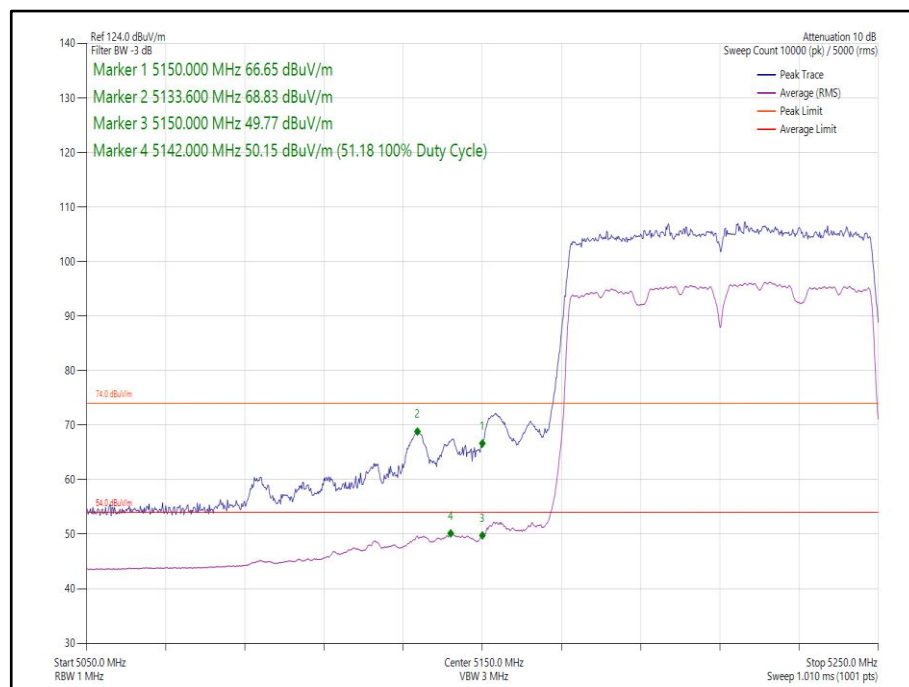
**Figure 57 - 802.11ax HE40 SDM, Cores 0-1, 52-37 - 5510 MHz
Band Edge Frequency 5460 MHz**



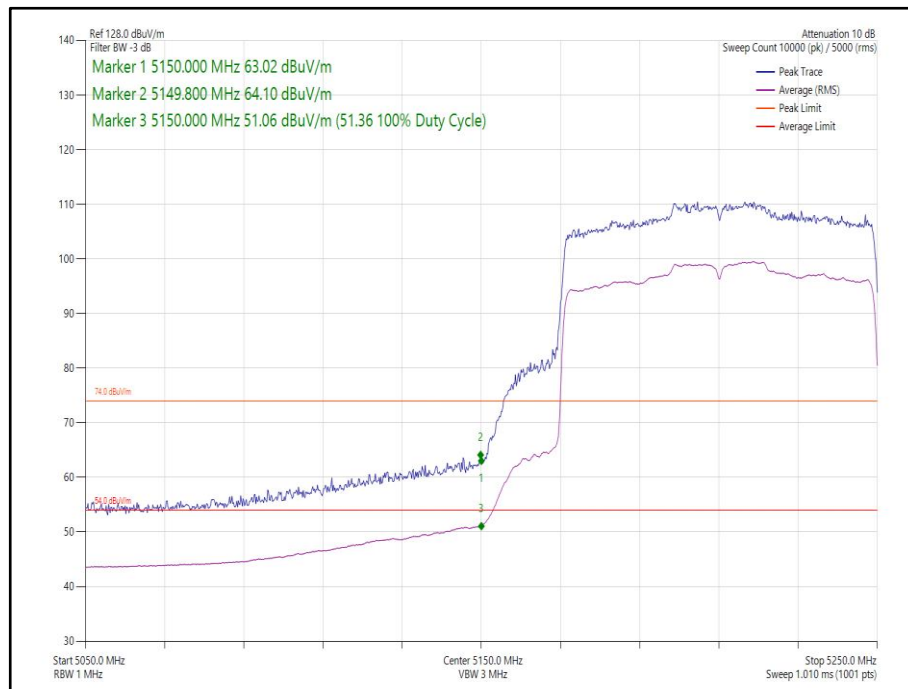
80 MHz Bandwidth (SISO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11ac VHT80, Core 1	MCS 8x1	-	-	5210	5150	68.83	51.18
802.11ax HE80, Core 1	MCS 4x1	SU	-	5210	5150	64.10	51.36
802.11ax HE80, Core 1	MCS 11x1	26	0	5210	5150	56.71	45.62
802.11ac VHT80, Core 1	MCS 4x1	-	-	5290	5350	63.89	51.44
802.11ax HE80, Core 1	MCS 2x1	SU	-	5290	5350	63.21	51.40
802.11ax HE80, Core 1	MCS 11x1	52	52	5290	5350	68.75	47.15
802.11ac VHT80, Core 1	MCS 4x1	-	-	5530	5460	-	51.11
802.11ax HE80, Core 1	MCS 4x1	SU	-	5530	5460	-	51.05
802.11ax HE80, Core 1	MCS 11x1	52	37	5530	5460	-	46.10

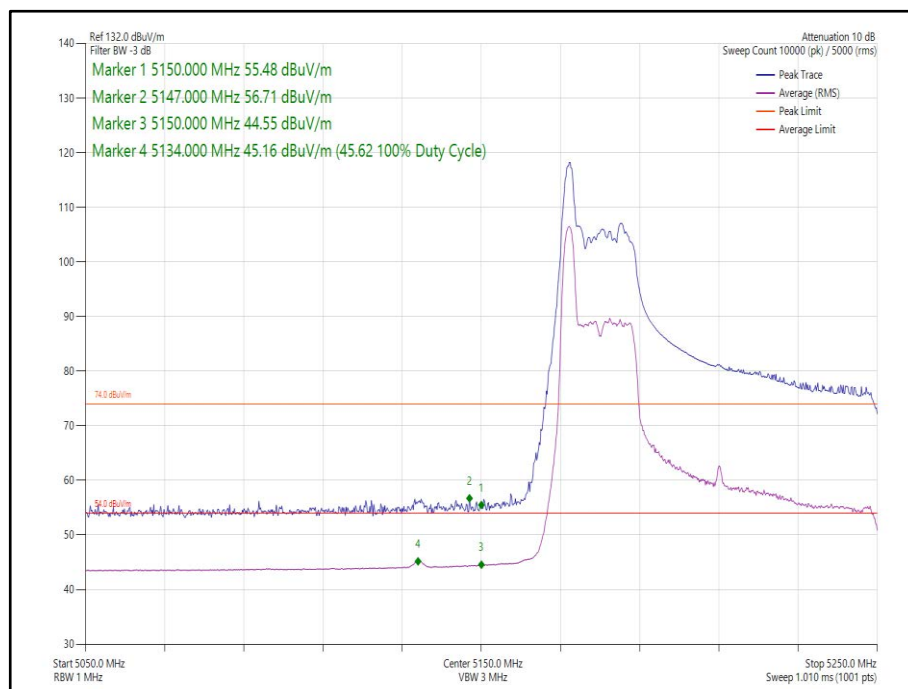
Table 11 - SISO Restricted Band Edge Results



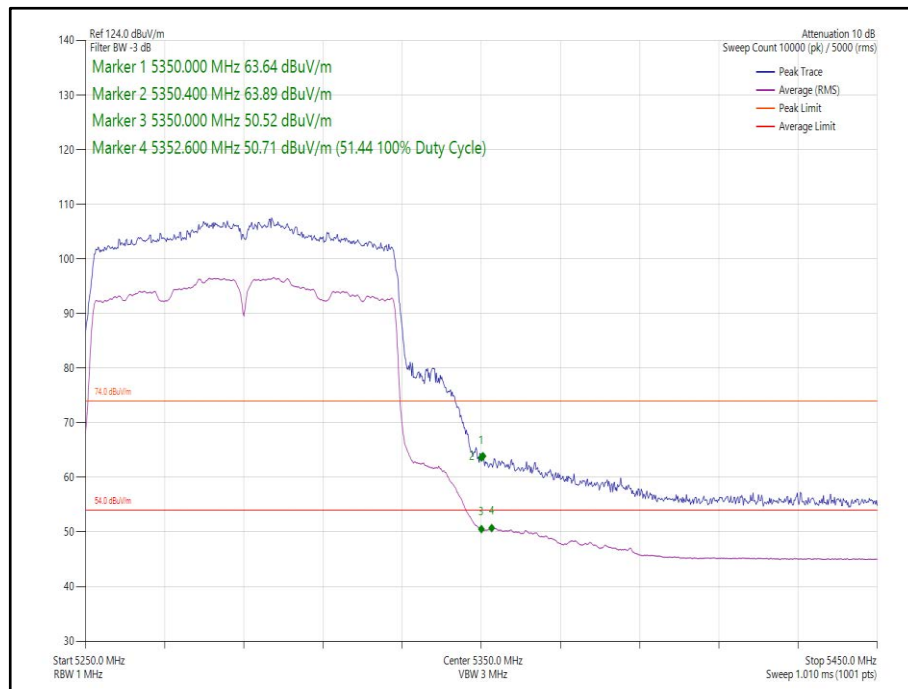
**Figure 58 - 802.11ac VHT80, Core 1 - 5210 MHz
Band Edge Frequency 5150 MHz**



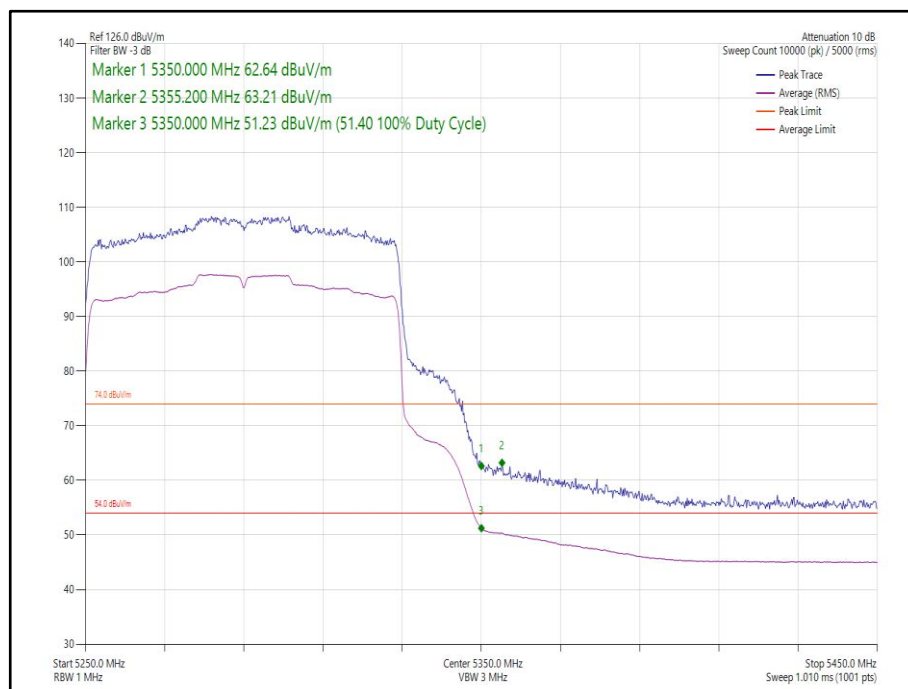
**Figure 59 - 802.11ax HE80, Core 1, SU - 5210 MHz
Band Edge Frequency 5150 MHz**



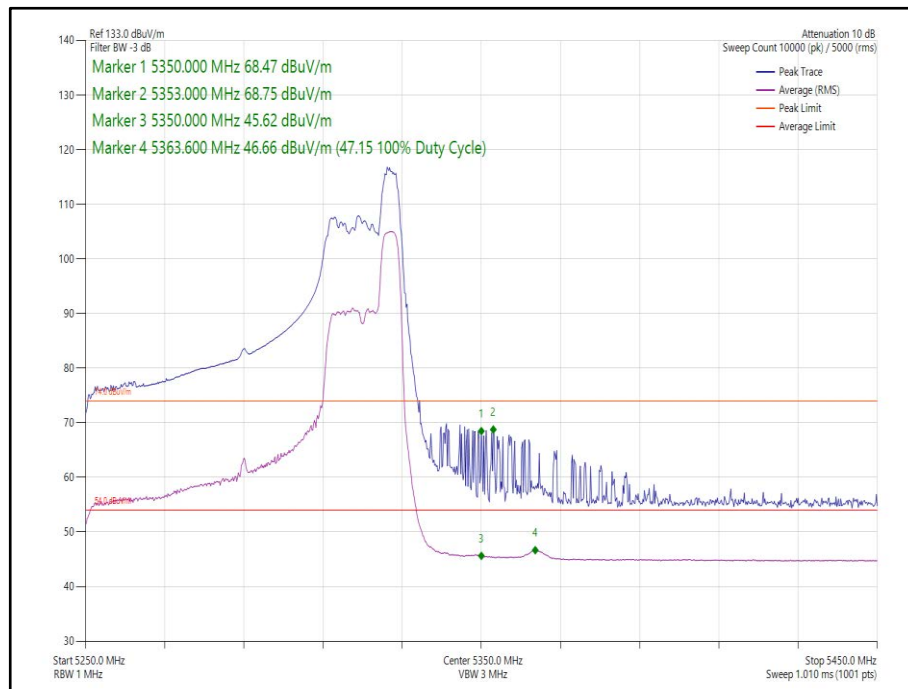
**Figure 60 - 802.11ax HE80, Core 1, 26-0 - 5210 MHz
Band Edge Frequency 5150 MHz**



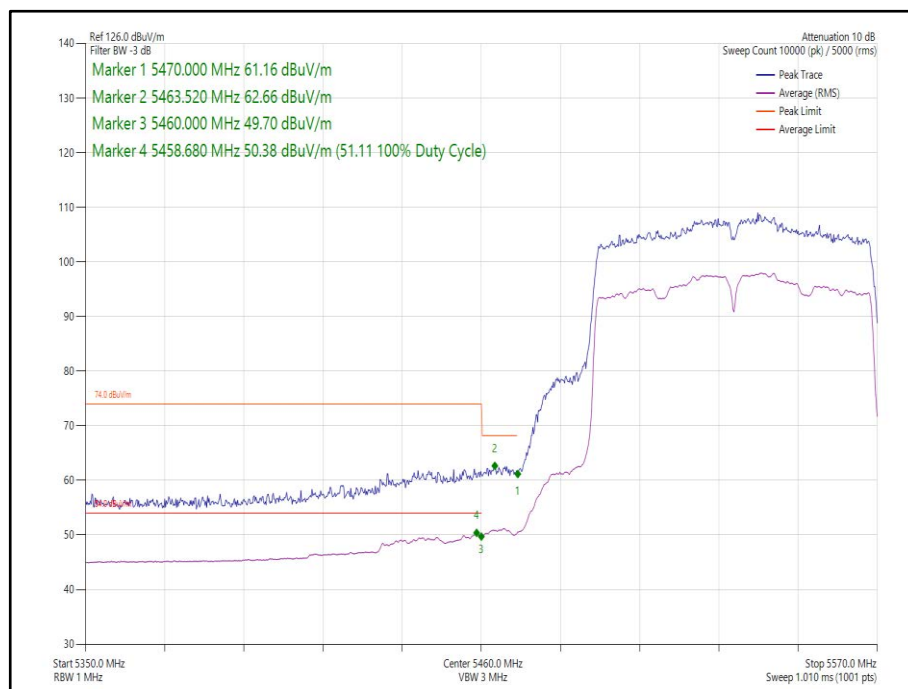
**Figure 61 - 802.11ac VHT80, Core 1 - 5290 MHz
Band Edge Frequency 5350 MHz**



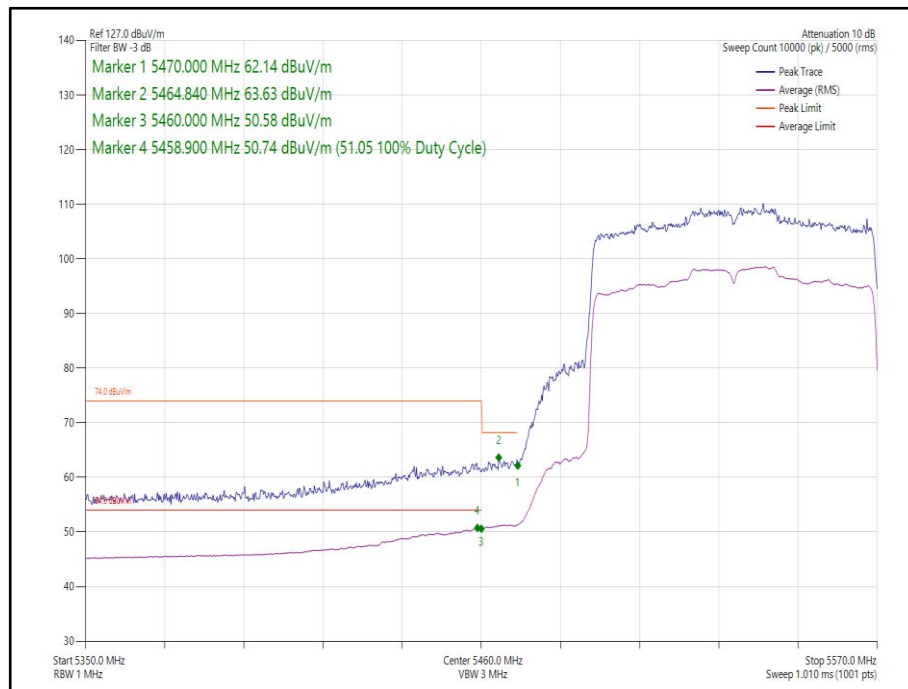
**Figure 62 - 802.11ax HE80, Core 1, SU - 5290 MHz
Band Edge Frequency 5350 MHz**



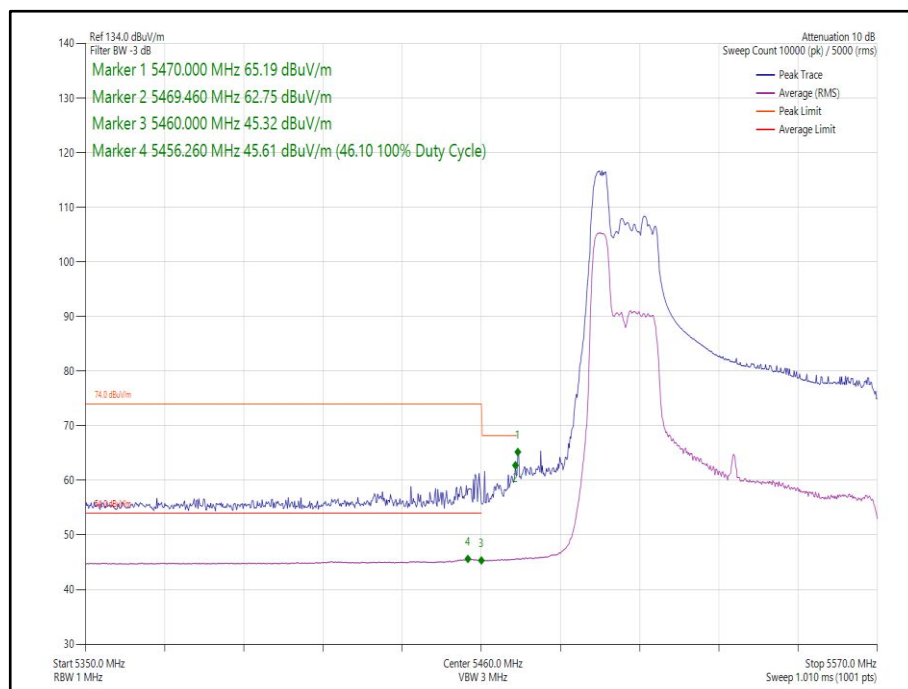
**Figure 63 - 802.11ax HE80, Core 1, 52-52 - 5290 MHz
Band Edge Frequency 5350 MHz**



**Figure 64 - 802.11ac VHT80, Core 1 - 5530 MHz
Band Edge Frequency 5460 MHz**



**Figure 65 - 802.11ax HE80, Core 1, SU - 5530 MHz
Band Edge Frequency 5490 MHz**



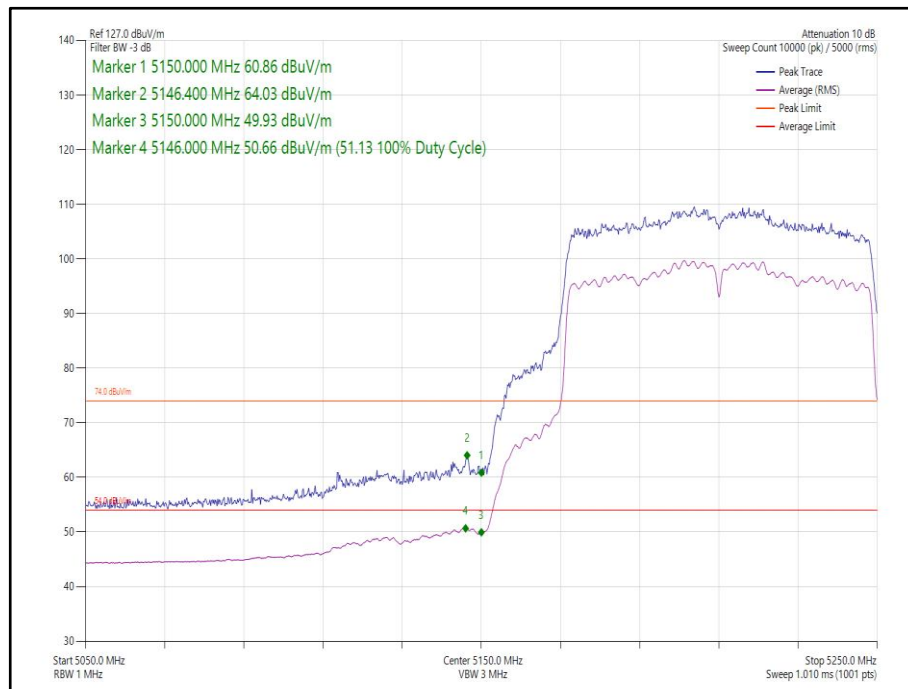
**Figure 66 - 802.11ax HE80, Core 1, 52-37 - 5530 MHz
Band Edge Frequency 5350 MHz**



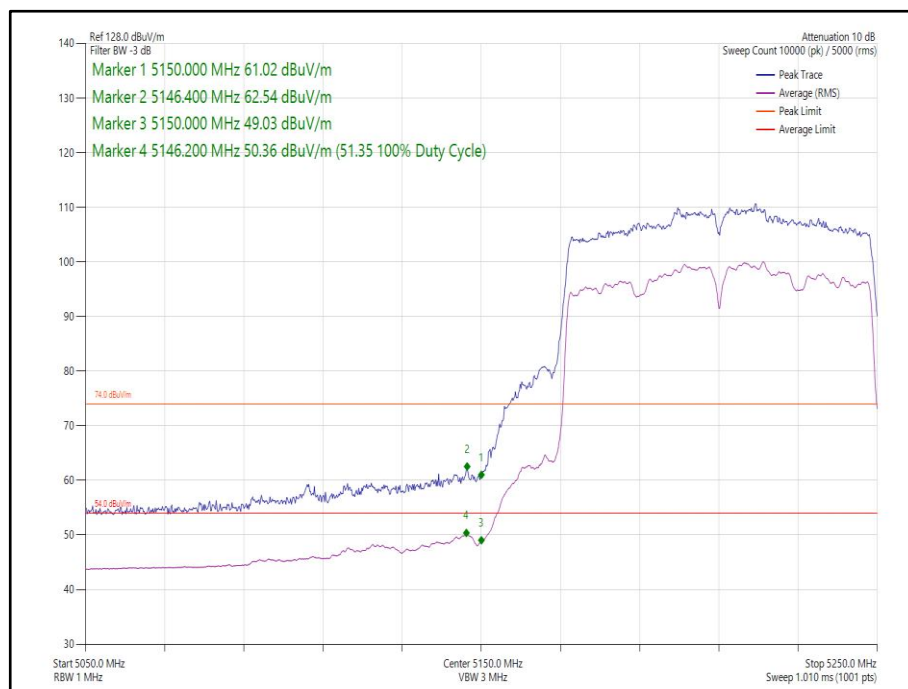
80 MHz Bandwidth (2TX MIMO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11ac VHT80 CDD, Cores 0-1	MCS 2x1	-	-	5210	5150	64.03	51.13
802.11ac VHT80 SDM, Cores 0-1	MCS 4x2	-	-	5210	5150	62.54	51.35
802.11ax HE80 CDD, Cores 0-1	MCS 11x1	SU	-	5210	5150	68.34	51.02
802.11ax HE80 CDD, Cores 0-1	MCS 11x1	26	0	5210	5150	57.82	46.09
802.11ax HE80 SDM, Cores 0-1	MCS 4x2	SU	-	5210	5150	63.68	51.35
802.11ax HE80 SDM, Cores 0-1	MCS 11x2	26	0	5210	5150	60.44	46.28
802.11ac VHT80 CDD, Cores 0-1	MCS 4x1	-	-	5290	5350	63.70	51.45
802.11ac VHT80 SDM, Cores 0-1	MCS 2x2	-	-	5290	5350	63.43	51.45
802.11ax HE80 CDD, Cores 0-1	MCS 2x1	SU	-	5290	5350	50.99	51.27
802.11ax HE80 CDD, Cores 0-1	MCS 11x1	52	52	5290	5350	67.90	48.43
802.11ax HE80 SDM, Cores 0-1	MCS 4x2	SU	-	5290	5350	64.31	51.41
802.11ax HE80 SDM, Cores 0-1	MCS 11x2	52	52	5290	5350	68.82	49.18
802.11ac VHT80 CDD, Cores 0-1	MCS 8x1	-	-	5530	5460	66.41	51.39
802.11ac VHT80 SDM, Cores 0-1	MCS 2x2	-	-	5530	5460	-	50.89
802.11ax HE80 CDD, Cores 0-1	MCS 2x1	SU	-	5530	5460	63.37	51.26
802.11ax HE80 CDD, Cores 0-1	MCS 11x1	52	37	5530	5460	65.36	48.61
802.11ax HE80 SDM, Cores 0-1	MCS 2x2	SU	-	5530	5460	-	50.71
802.11ax HE80 SDM, Cores 0-1	MCS 11x2	52	37	5530	5460	-	48.34

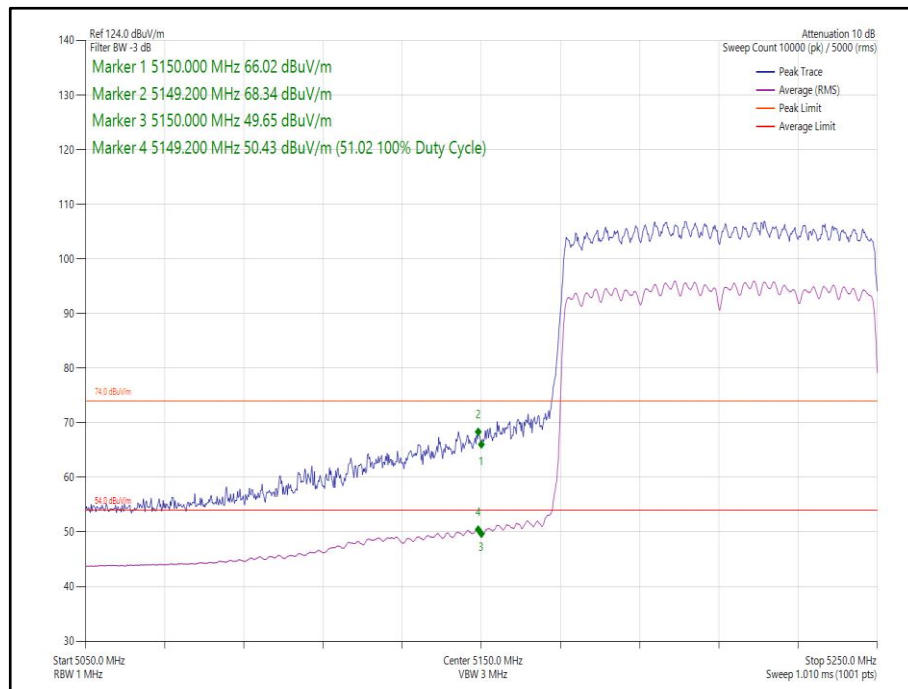
Table 12 - MIMO 2TX Restricted Band Edge Results



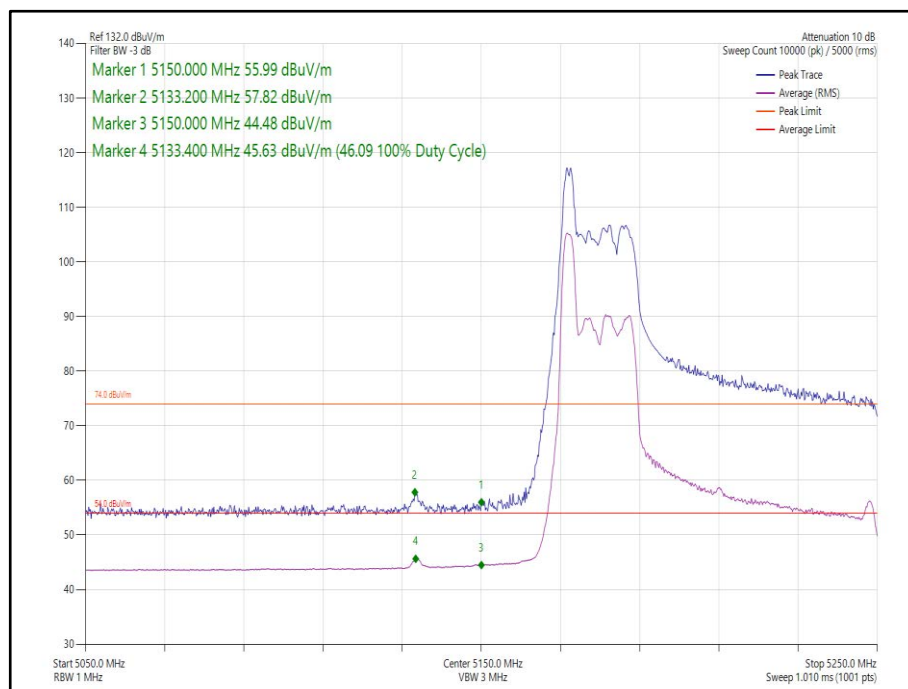
**Figure 67 - 802.11ac VHT80 CDD, Cores 0-1- 5210 MHz
Band Edge Frequency 5150 MHz**



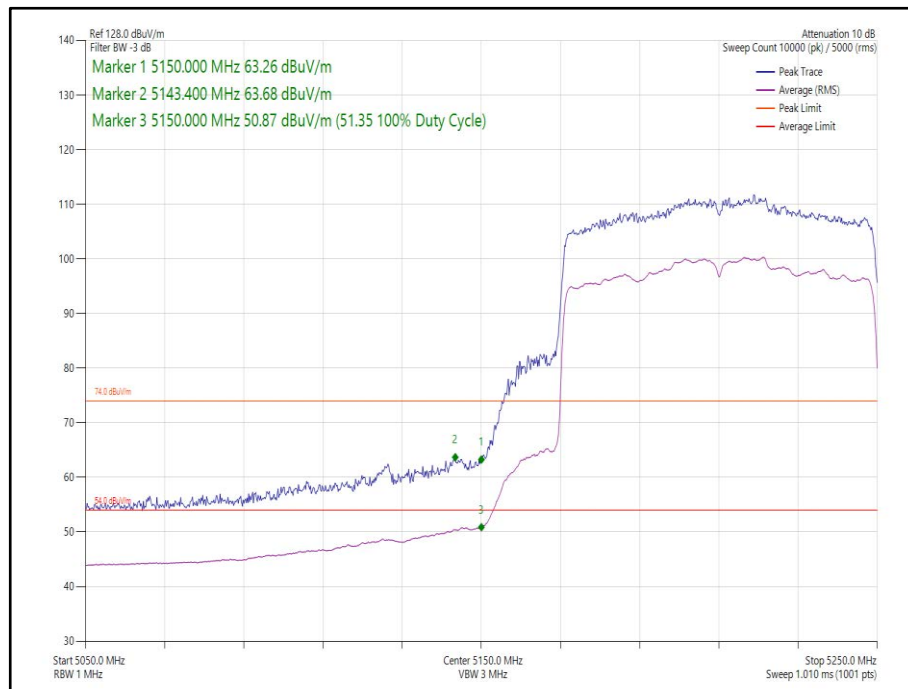
**Figure 68 - 802.11ac VHT80 SDM, Cores 0-1- 5210 MHz
Band Edge Frequency 5150 MHz**



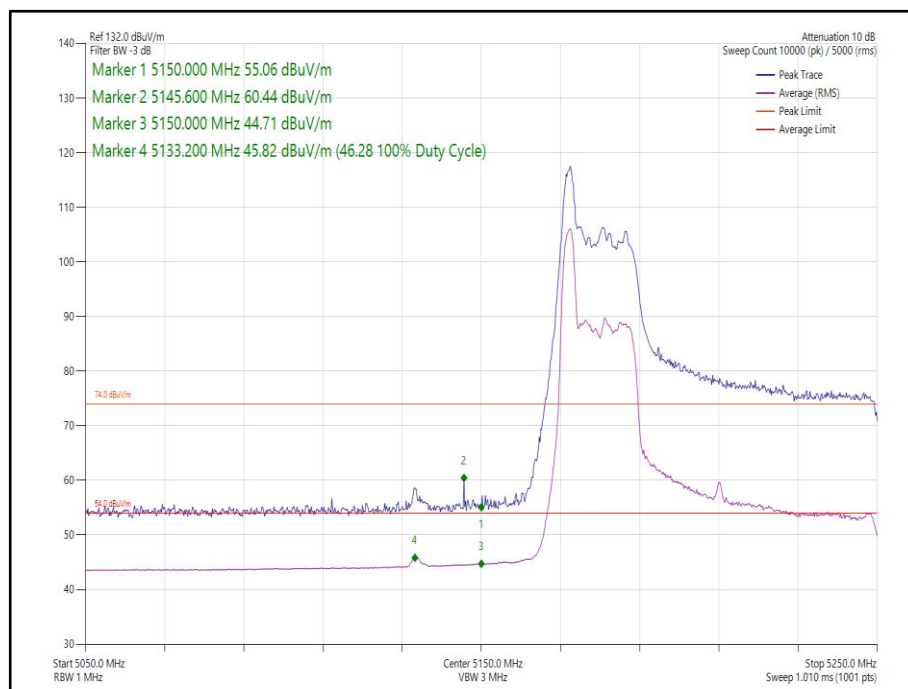
**Figure 69 - 802.11ax HE80 CDD, Cores 0-1, SU - 5210 MHz
Band Edge Frequency 5150 MHz**



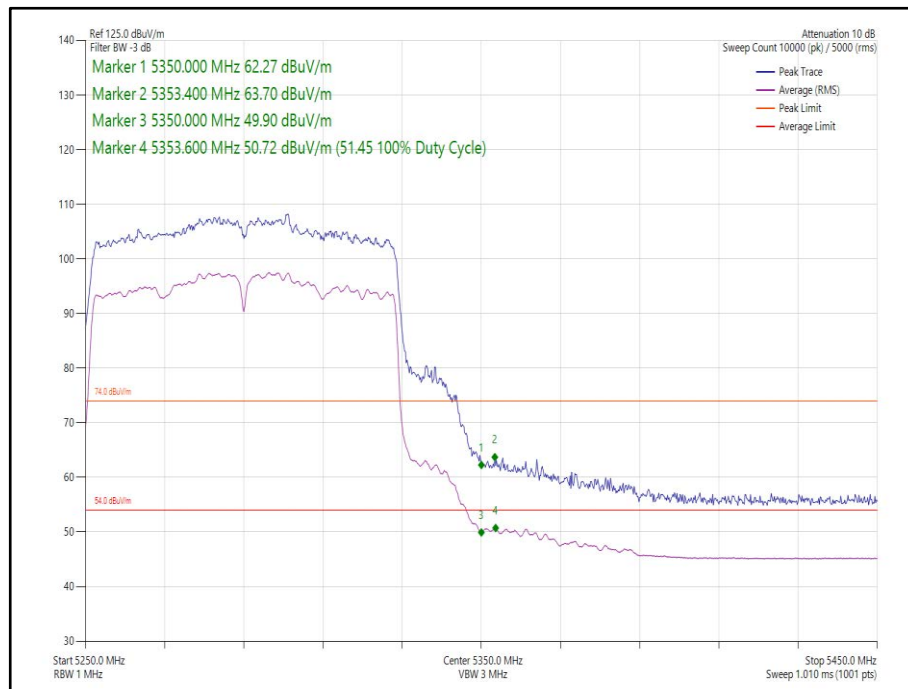
**Figure 70 - 802.11ax HE80 CDD, Cores 0-1, 26-0 - 5210 MHz
Band Edge Frequency 5150 MHz**



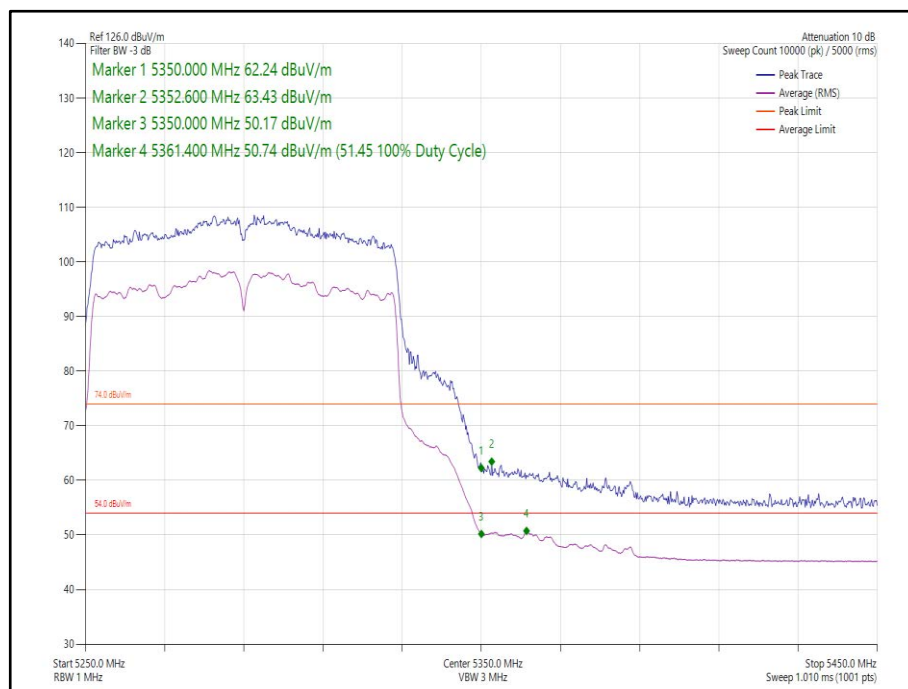
**Figure 71 - 802.11ax HE80 SDM, Cores 0-1, SU - 5210 MHz
Band Edge Frequency 5150 MHz**



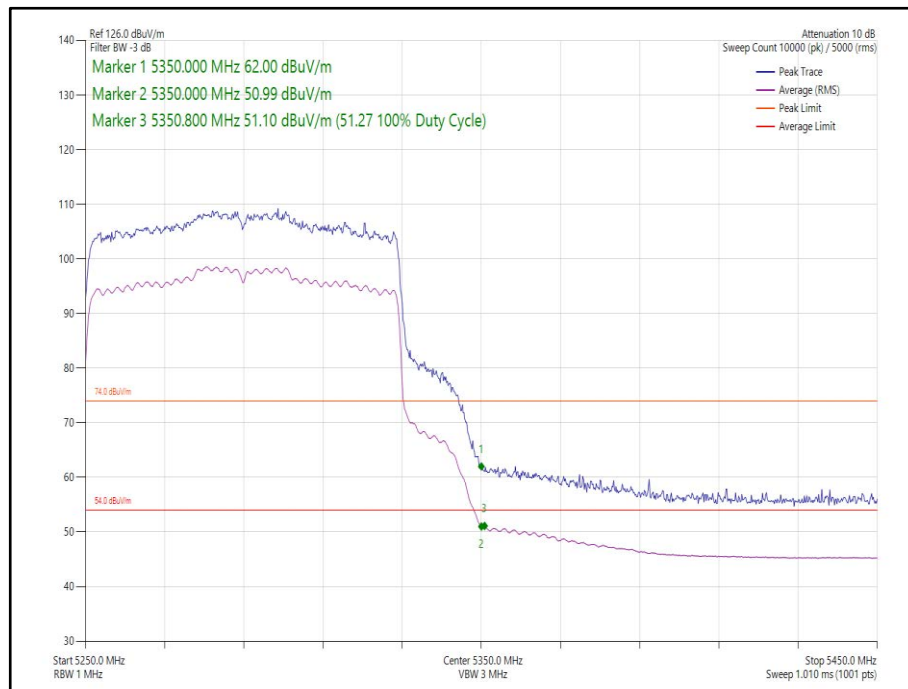
**Figure 72 - 802.11ax HE80 SDM, Cores 0-1, 26-0 - 5210 MHz
Band Edge Frequency 5150 MHz**



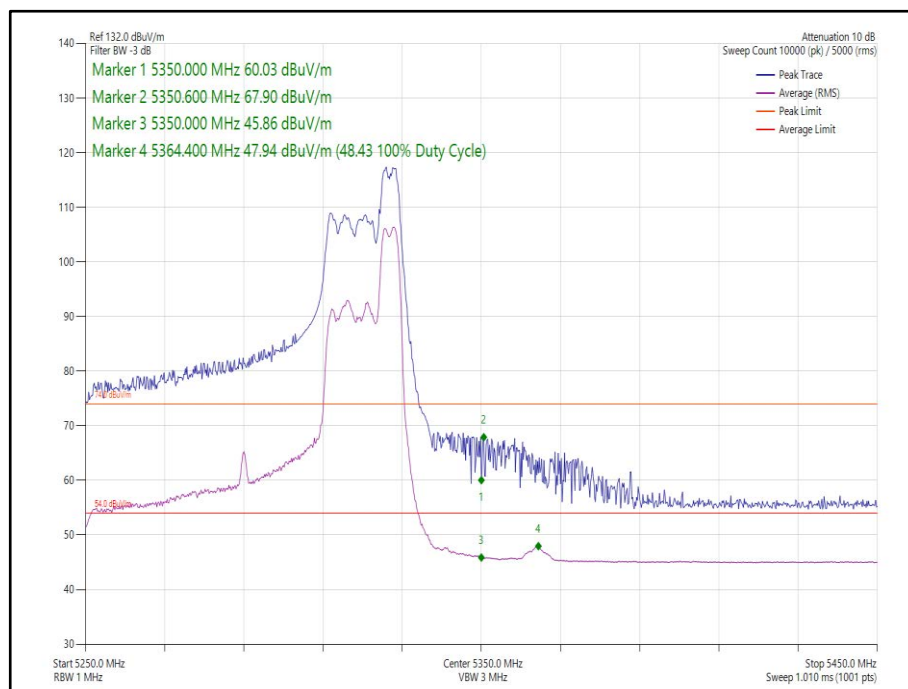
**Figure 73 - 802.11ac VHT80 CDD, Cores 0-1- 5290 MHz
Band Edge Frequency 5350 MHz**



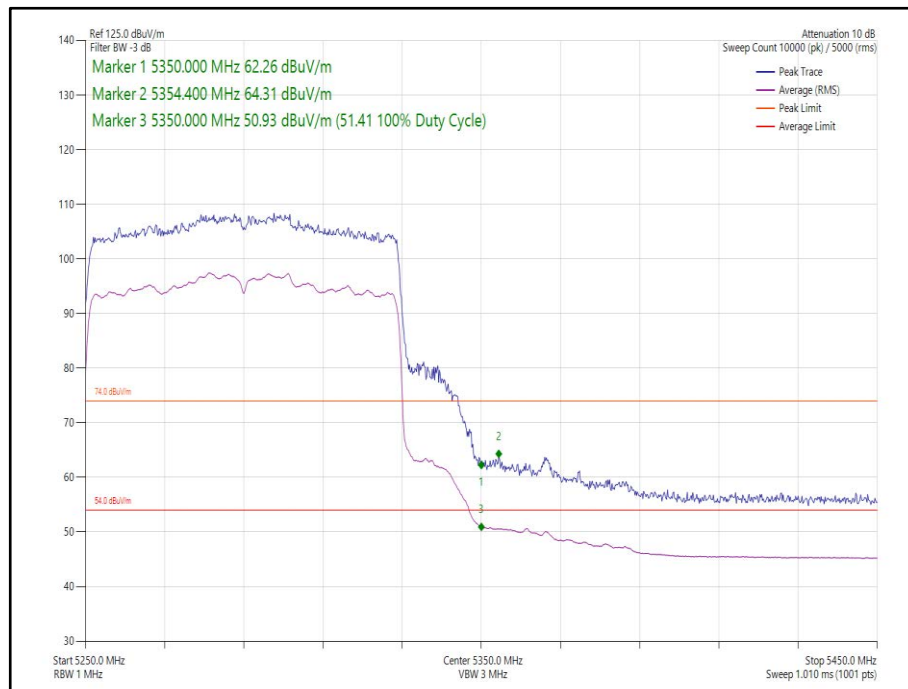
**Figure 74 - 802.11ac VHT80 SDM, Cores 0-1- 5290 MHz
Band Edge Frequency 5350 MHz**



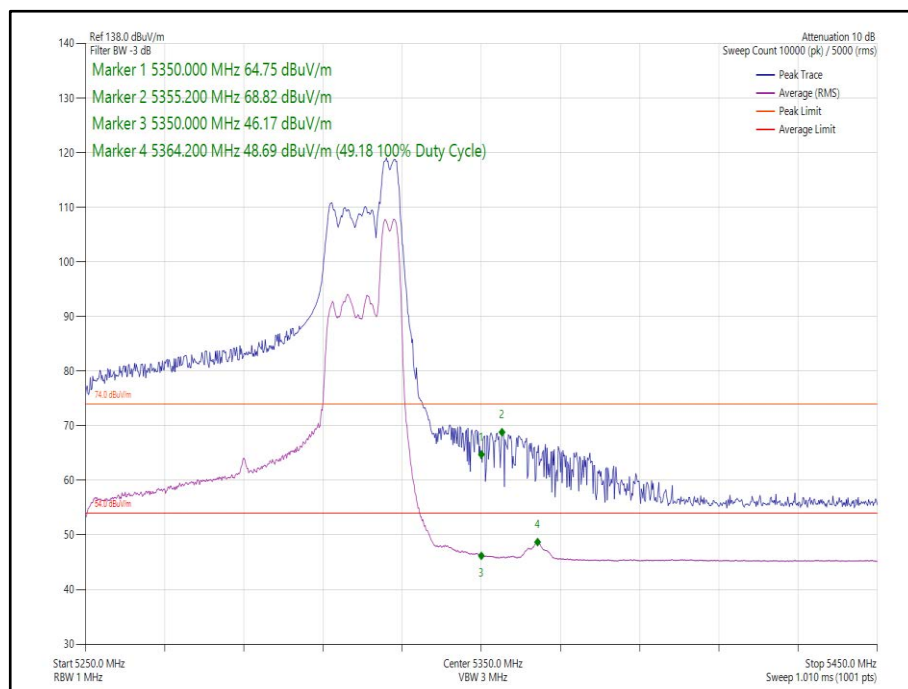
**Figure 75 - 802.11ax HE80 CDD, Cores 0-1, SU - 5290 MHz
Band Edge Frequency 5350 MHz**



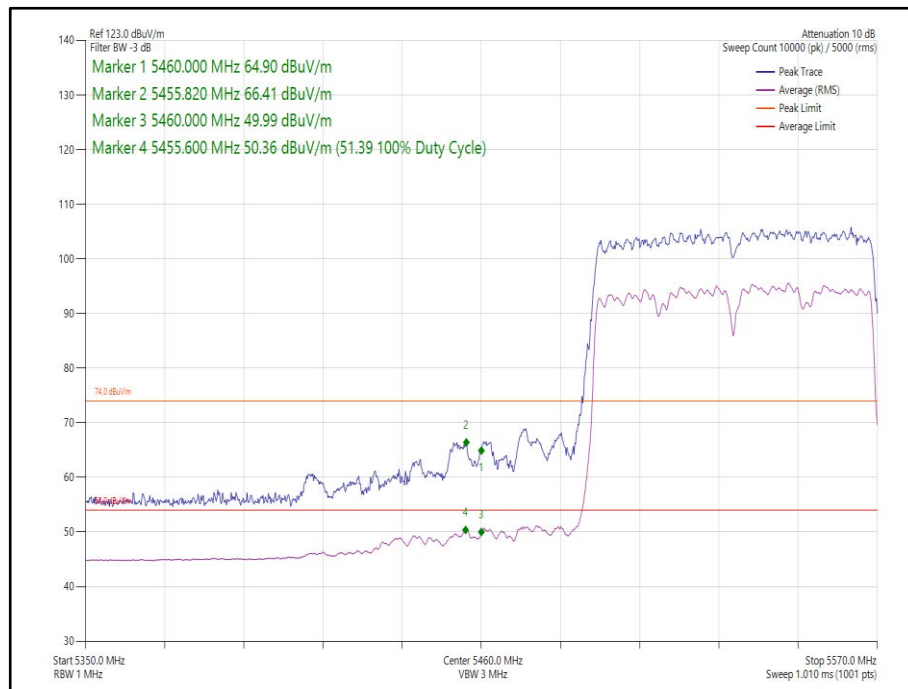
**Figure 76 - 802.11ax HE80 CDD, Cores 0-1, 52-52- 5290 MHz
Band Edge Frequency 5350 MHz**



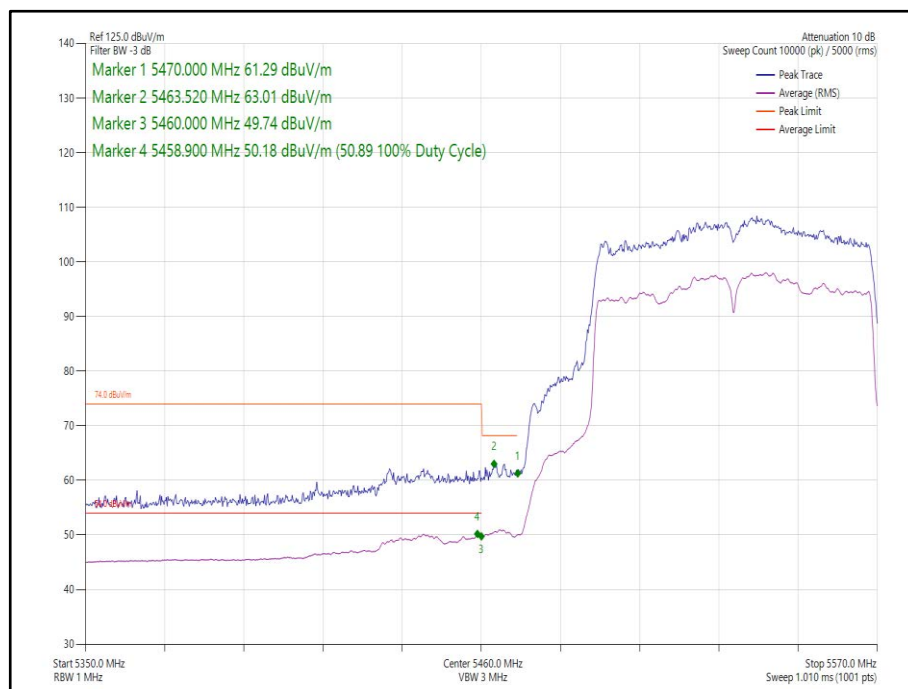
**Figure 77 - 802.11ax HE80 SDM, Cores 0-1, SU - 5290 MHz
Band Edge Frequency 5350 MHz**



**Figure 78 - 802.11ax HE80 SDM, Cores 0-1, 52-52- 5290 MHz
Band Edge Frequency 5350 MHz**



**Figure 79 - 802.11ac VHT80 CDD, Cores 0-1- 5530 MHz
Band Edge Frequency 5460 MHz**



**Figure 80 - 802.11ac VHT80 SDM, Cores 0-1- 5530 MHz
Band Edge Frequency 5460 MHz**