

FCC and ISED Test Report

Apple Inc
Model: A3137



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

FCC ID: BCGA3137

IC: 579C-A3137

COMMERCIAL-IN-CONFIDENCE

Document 75960487-18 Issue 01

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
James O'Reilly	RF Engineer	Authorised Signatory	29 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 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	Lauren Walters	29 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 15E: 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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ACCREDITATION

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited). Results of tests covered by our Flexible UKAS Accreditation Schedule are marked FS (Flexible Scope).

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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	29 August 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 15E: 2023 ISED RSS-247: Issue 3 (2023-08) ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02)
Start of Test	26-April-2024
Finish of Test	24-July-2024
Name of Engineer(s)	Ahmed Al Derdiri, Ian Hart, Ioan-Alexandru Bogatu, Morsalin Hossain, Fedaa Hussein, Jayvir Makwana, Mahmud Bari Chowdhury, Mustafa Murad, Akhil Rajendran Bhaskaran Nair, Elliot Callender, James Woods, Manohar Thota, Vineeth Nagaraj and Stefan Gilfedder
Related Document(s)	ANSI C63.4 (2014) ANSI C63.10 (2020) KDB 662911 D01 v02r01 KDB 789033 D02 v02r01 KDB 905462 D02 v02 KDB 905462 D03 v01r02



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
	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	3.3	8.10	Restricted Band Edges	Pass	ANSI C63.10 (2020)
2.2	15.407 (a)	6.2	-	Emission Bandwidth	Pass	ANSI C63.10 (2020)
2.3	15.407 (a)	6.2	-	Maximum Conducted Output Power	Pass	ANSI C63.10 (2020) KDB 662911 D01 v02r01
2.4	15.407 (a)	6.2	-	Maximum Conducted Power Spectral Density	Pass	ANSI C63.10 (2020) KDB 662911 D01 v02r01
2.5	15.407 (b)	6.2	-	Authorised Band Edges	Pass	ANSI C63.10 (2020)
2.6	15.209 and 15.407 (b)	6.2	6.13 and 8.9	Spurious Radiated Emissions	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020)
2.7	15.407 (h)(2)(iii)(iv)	Clause 6.3.2(c)(d)(e)	-	Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Pass	KDB 905462 D02 v02 KDB 905462 D03 v01r02

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 5 GHz 802.11 radio supported SISO (Single Input/Single Output) and 2x2 MIMO (Multiple Input/Multiple Output) modes. 802.11a supports only 20 MHz bandwidth SISO operation. 802.11n supported 20 MHz and 40 MHz bandwidths. 802.11ac and ax supported 20 MHz, 40 MHz, 80 MHz and 160 MHz bandwidths. 802.11n, ac and ax supported SISO, Cyclic Delay Diversity (CDD) and Space Division Multiplexing (SDM) modes. 802.11n and ac also additionally support Transmit Beamforming (TxBF) mode on 20 MHz, 40 MHz, and 80 MHz bandwidths.

The EUT supported 802.11ax Single User (SU) and Multi-User (MU) 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), Space Division Multiplexing (SDM) and Transmit Beamforming (TxBF) 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.

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

SISO Modes (5150-5725 MHz: Core 1 / 5725-5850 MHz: Core 0):

- 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 + Core 1):

- 802.11n/ac (V)HT20 - CDD (MCS2), SDM (MCS10) and TxBF (MCS2x1)
- 802.11n/ac (V)HT40 - CDD (MCS2), SDM (MCS10) and TxBF (MCS2x1)
- 802.11ac VHT80 – CDD (MCS2x1), SDM (MCS2x2) and TxBF (MCS2x1)
- 802.11ac VHT160 – CDD (MCS2x1) and 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. HT (802.11n) modes were used for CDD and SDM and VHT (802.11ac) modes were used for TxBF.



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. 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	4.20	2.35
	5250 to 5350	4.50	2.38
	5470 to 5725	4.50	2.43
	5725 to 5850	4.60	2.26
Core 1	5150 to 5250	5.90	1.74
	5250 to 5350	6.30	1.72
	5470 to 5725	5.70	1.99
	5725 to 5850	4.00	2.10

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
DMKVPMJ9XD	REV1.0	24A81452a	23.10.787.0.41.51.135
H6D001F73D	REV1.0	24A81452a	23.30.16
G5022YM6RR	REV1.0	24A81452a	23.30.16
MHCWWV5343	REV1.0	24A240	23.10.849.0.41.51.149
FV5VYV72RL	REV1.0	24A81452a	23.30.16
LQ9QKVW0H6	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: LQ9QKVW0H6			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3137, Serial Number: DMKVPMJ9XD			
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: MHCWWV5343			
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: 5 GHz WLAN		
Restricted Band Edges	Ahmed Al Derdiri, Ian Hart, Ioan-Alexandru Bogatu and Morsalin Hossain	UKAS
Emission Bandwidth	Feda Hussein, Jayvir Makwana and Mahmud Bari Chowdhury	UKAS
Maximum Conducted Output Power	Feda Hussein, Jayvir Makwana, Mahmud Bari Chowdhury and Mustafa Murad	UKAS
Maximum Conducted Power Spectral Density	Feda Hussein, Jayvir Makwana, Mahmud Bari Chowdhury and Mustafa Murad	UKAS
Authorised Band Edges	Ahmed Al Derdiri, Ian Hart, Ioan-Alexandru Bogatu and Morsalin Hossain	UKAS
Spurious Radiated Emissions	Akhil Rajendran Bhaskaran Nair, Elliot Callender, Ioan-Alexandru Bogatu, James Woods, Manohar Thota, Morsalin Hossain and Vineeth Nagaraj	UKAS
Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Stefan Gilfedder	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-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

26-April-2024 to 24-July-2024

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	21.6 - 23.1 °C
Relative Humidity	35.8 - 49.5 %



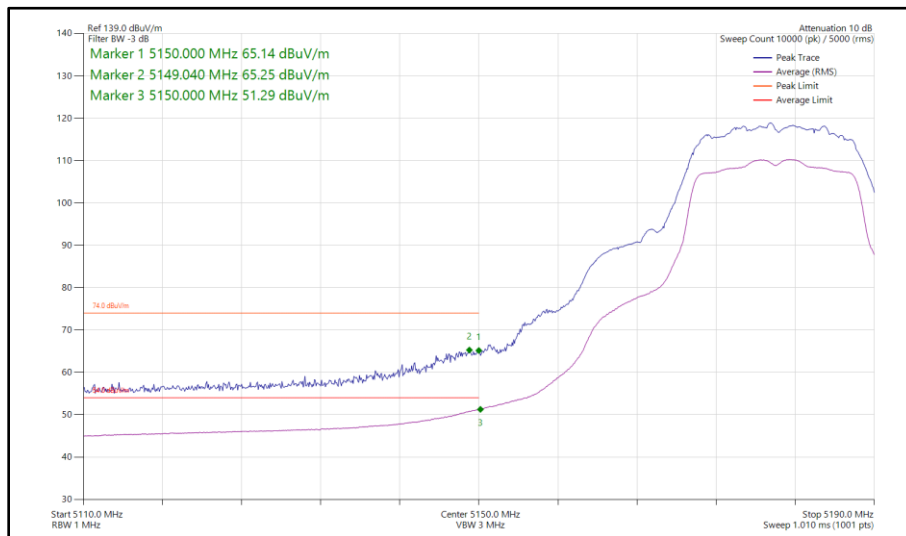
2.1.6 Test Results

5 GHz WLAN

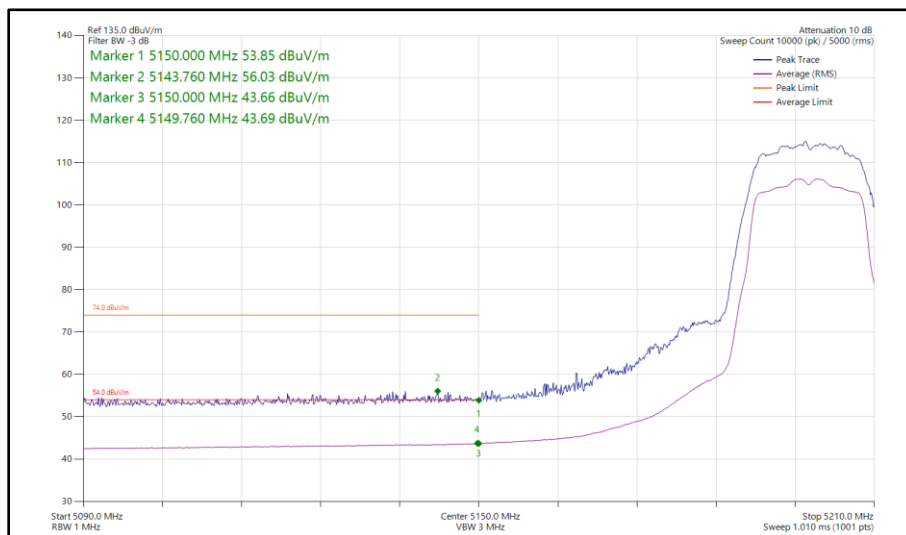
20 MHz Bandwidth - Core 0 (SISO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBuV/m)
802.11a	12 Mbps	-	-	5180	5150	65.25	51.29
802.11a	12 Mbps	-	-	5200	5150	56.03	43.69
802.11n HT20	MCS 7	-	-	5180	5150	69.45	49.06
802.11n HT20	MCS 2	-	-	5200	5150	55.48	43.74
802.11ax HE20	MCS 11x1	SU	-	5180	5150	69.37	49.56
802.11ax HE20	MCS 11x1	106	54	5180	5150	65.37	47.41
802.11ax HE20	MCS 2x1	SU	-	5200	5150	55.75	43.95
802.11ax HE20	MCS 11x1	106	53	5200	5150	54.28	42.85
802.11a	12 Mbps	-	-	5300	5350	56.50	43.92
802.11a	54 Mbps	-	-	5320	5350	68.65	51.42
802.11n HT20	MCS 2	-	-	5300	5350	55.83	43.92
802.11n HT20	MCS 2	-	-	5320	5350	65.11	51.29
802.11ax HE20	MCS 2x1	SU	-	5300	5350	55.63	43.89
802.11ax HE20	MCS 11x1	106	54	5300	5350	55.38	43.05
802.11ax HE20	MCS 2x1	SU	-	5320	5350	64.97	51.32
802.11ax HE20	MCS 11x1	106	54	5320	5350	62.73	47.42
802.11a	24 Mbps	-	-	5500	5460	63.41	46.87
802.11a	12 Mbps	-	-	5520	5460	56.53	43.69
802.11n HT20	MCS 7	-	-	5500	5460	63.10	44.96
802.11n HT20	MCS 2	-	-	5520	5460	55.67	43.89
802.11ax HE20	MCS 11x1	SU	-	5500	5460	62.65	44.86
802.11ax HE20	MCS 11x1	106	54	5500	5460	59.89	45.37
802.11ax HE20	MCS 2x1	SU	-	5520	5460	55.57	43.93
802.11ax HE20	MCS 11x1	106	53	5520	5460	54.79	43.27

Table 7 - SISO Restricted Band Edge Results



**Figure 1 - 802.11a, SISO, Core 0 - 5180 MHz
Band Edge Frequency 5150 MHz**



**Figure 2 - 802.11a, SISO, Core 0 - 5200 MHz
Band Edge Frequency 5150 MHz**

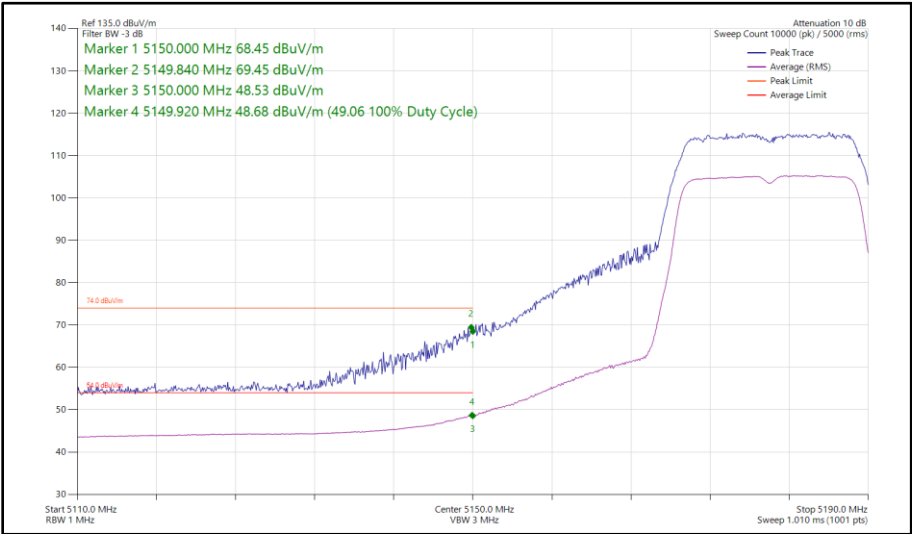


Figure 3 - 802.11n HT20, SISO, Core 0 - 5180 MHz
Band Edge Frequency 5150 MHz

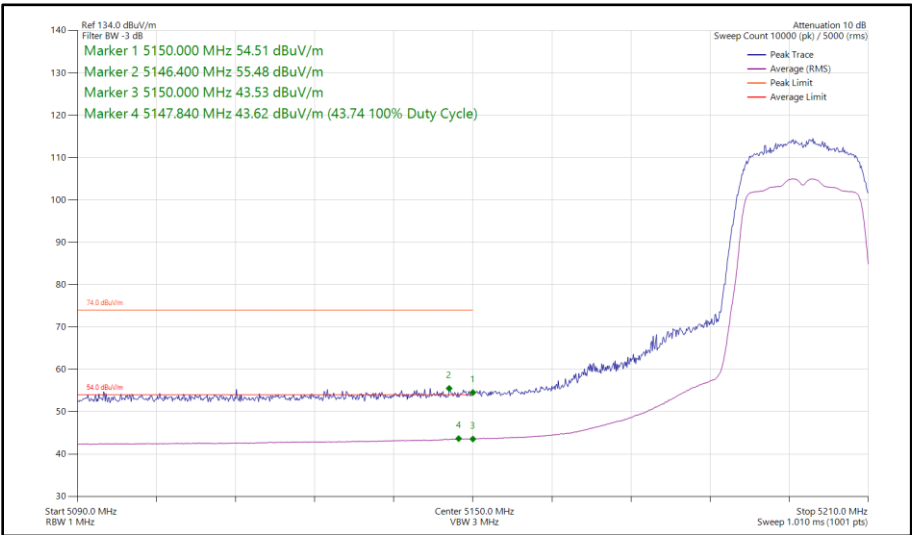
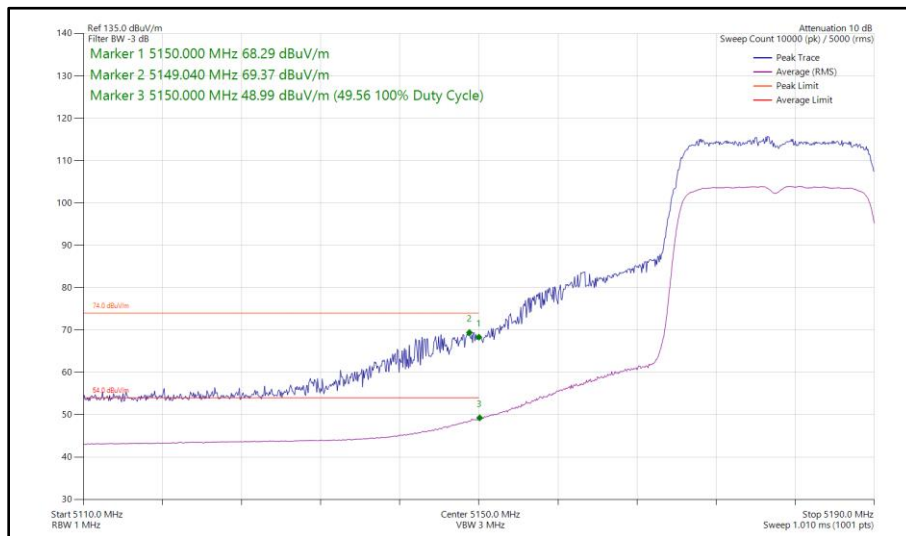
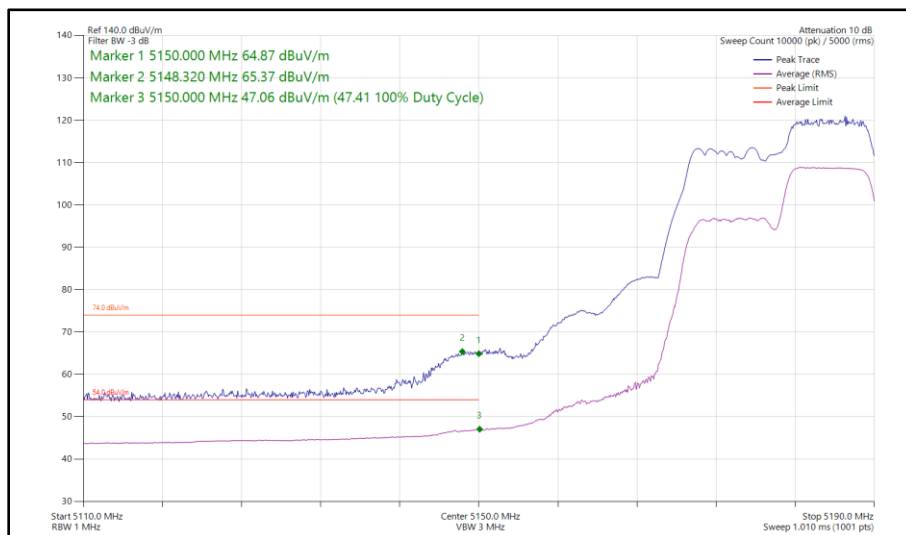


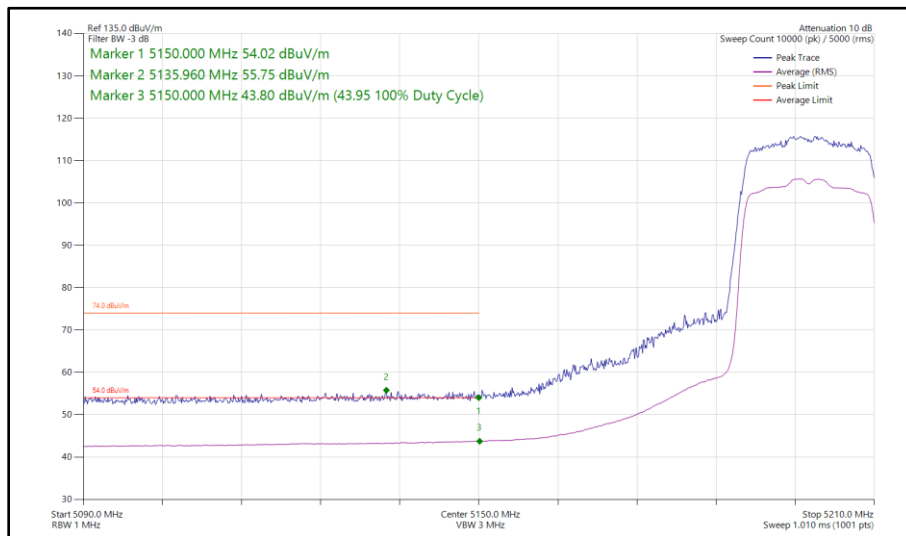
Figure 4 - 802.11n HT20, SISO, Core 0 - 5200 MHz
Band Edge Frequency 5150 MHz



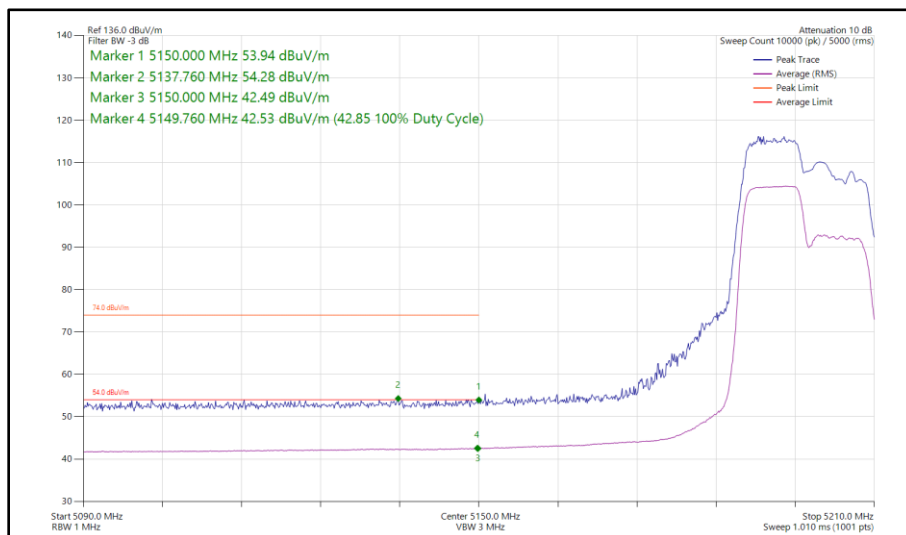
**Figure 5 - 802.11ax HE20, SU, SISO, Core 0 - 5180 MHz
Band Edge Frequency 5150 MHz**



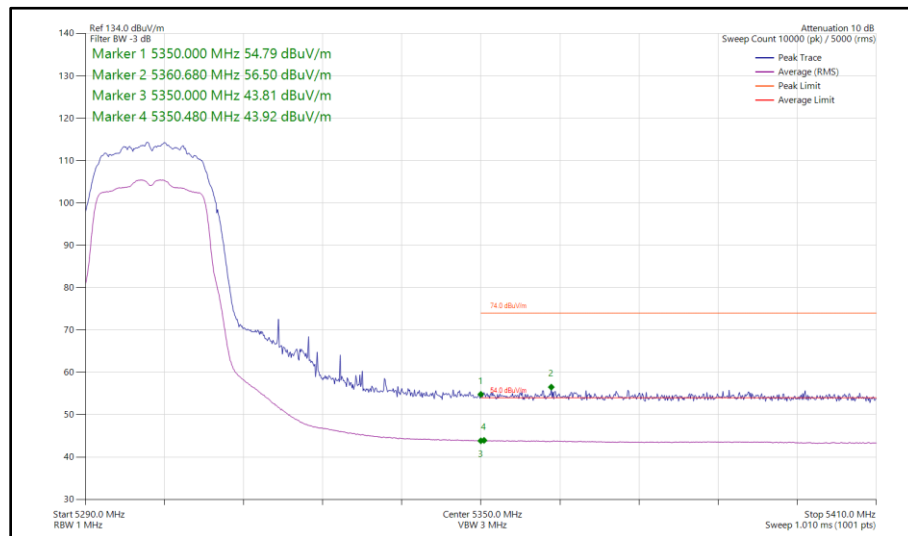
**Figure 6 - 802.11ax HE20, RU 106-54, SISO, Core 0 - 5180 MHz
Band Edge Frequency 5150 MHz**



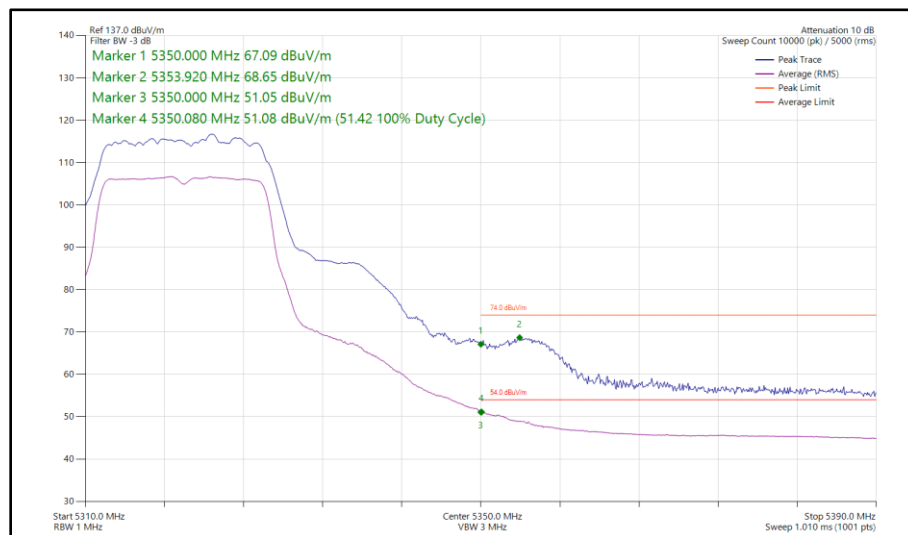
**Figure 7 - 802.11ax HE20, SU, SISO, Core 0 - 5200 MHz
Band Edge Frequency 5150 MHz**



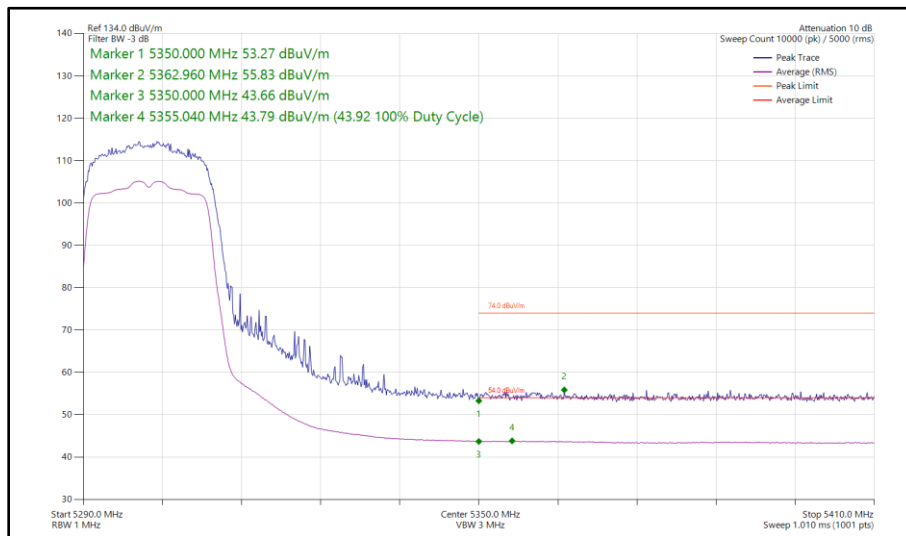
**Figure 8 - 802.11ax HE20, RU 106-53, SISO, Core 0 - 5200 MHz
Band Edge Frequency 5150 MHz**



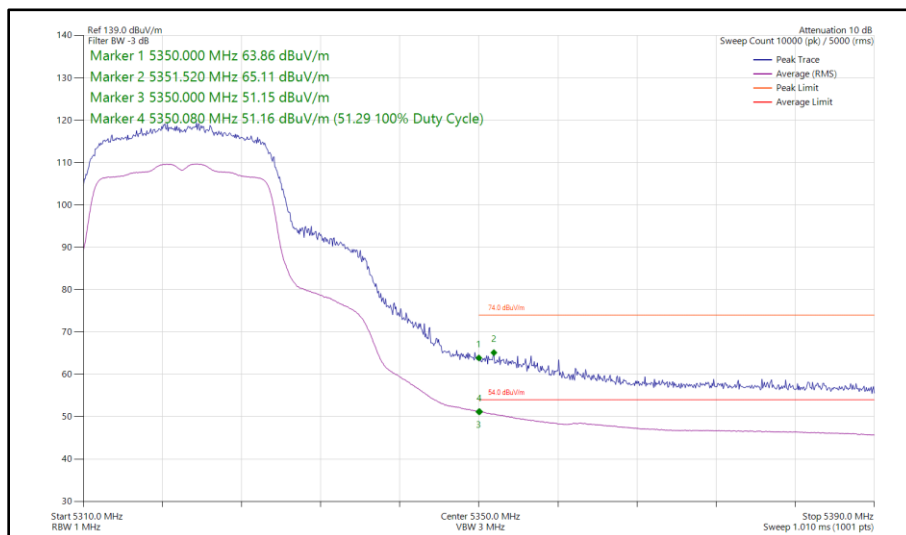
**Figure 9 - 802.11a, SISO, Core 0 - 5300 MHz
Band Edge Frequency 5350 MHz**



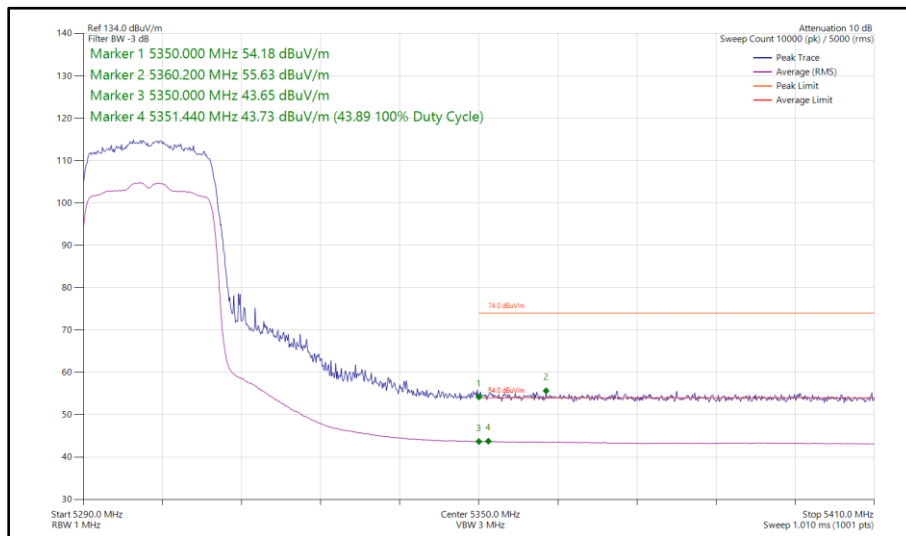
**Figure 10 - 802.11a, SISO, Core 0 - 5320 MHz
Band Edge Frequency 5350 MHz**



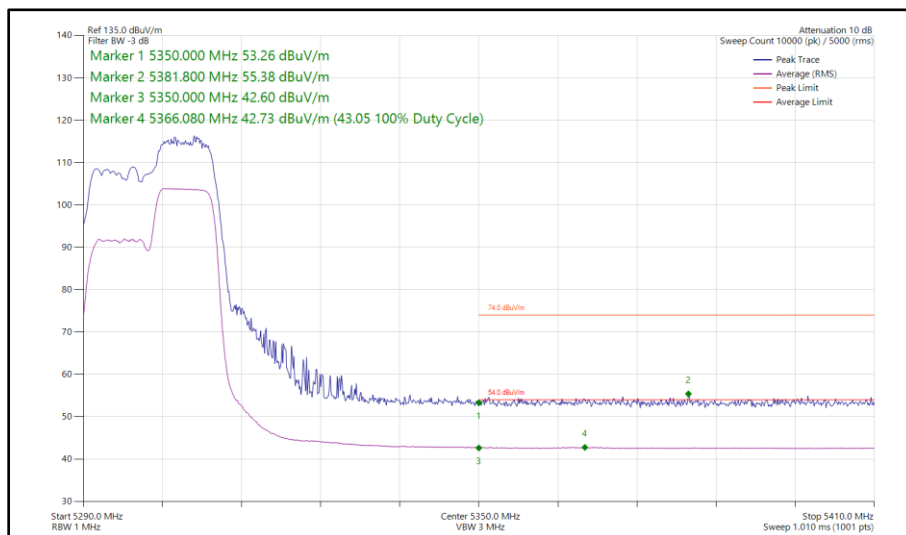
**Figure 11 - 802.11n HT20, SISO, Core 0 - 5300 MHz
Band Edge Frequency 5350 MHz**



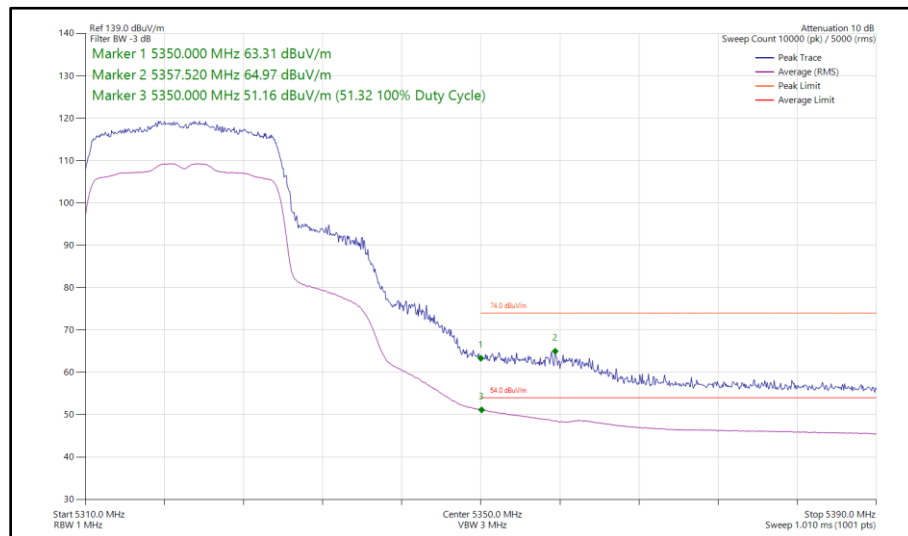
**Figure 12 - 802.11n HT20, SISO, Core 0 - 5320 MHz
Band Edge Frequency 5350 MHz**



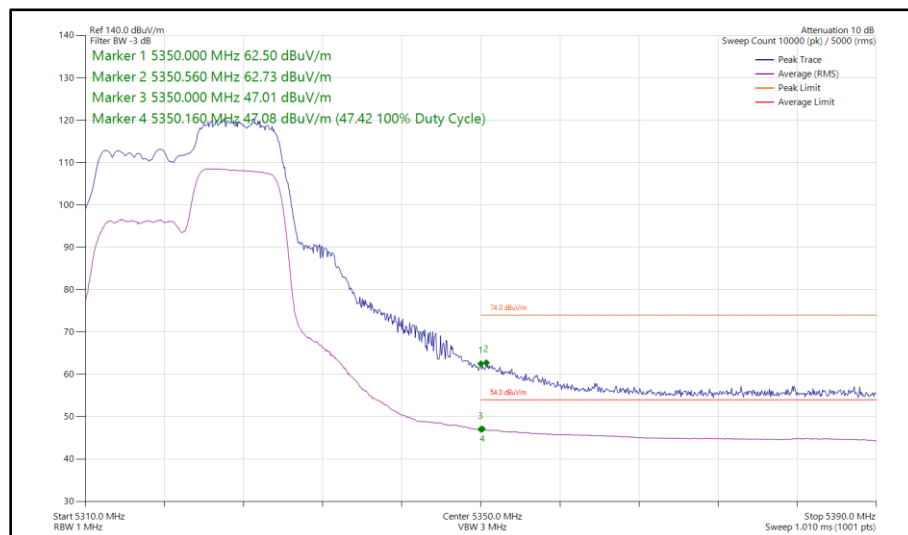
**Figure 13 - 802.11ax HE20, SU, SISO, Core 0 - 5300 MHz
Band Edge Frequency 5350 MHz**



**Figure 14 - 802.11ax HE20, RU 106-54, SISO, Core 0 - 5300 MHz
Band Edge Frequency 5350 MHz**



**Figure 15 - 802.11ax HE20, SU, SISO, Core 0 - 5320 MHz
Band Edge Frequency 5350 MHz**



**Figure 16 - 802.11ax HE20, RU 106-54, SISO, Core 0 - 5320 MHz
Band Edge Frequency 5350 MHz**

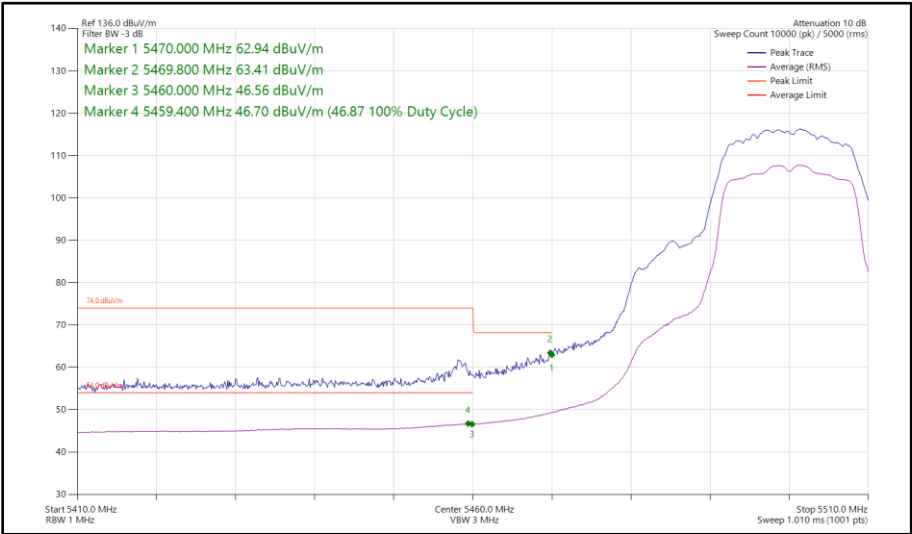


Figure 17 - 802.11a, SISO, Core 0 - 5500 MHz
Band Edge Frequency 5460 MHz

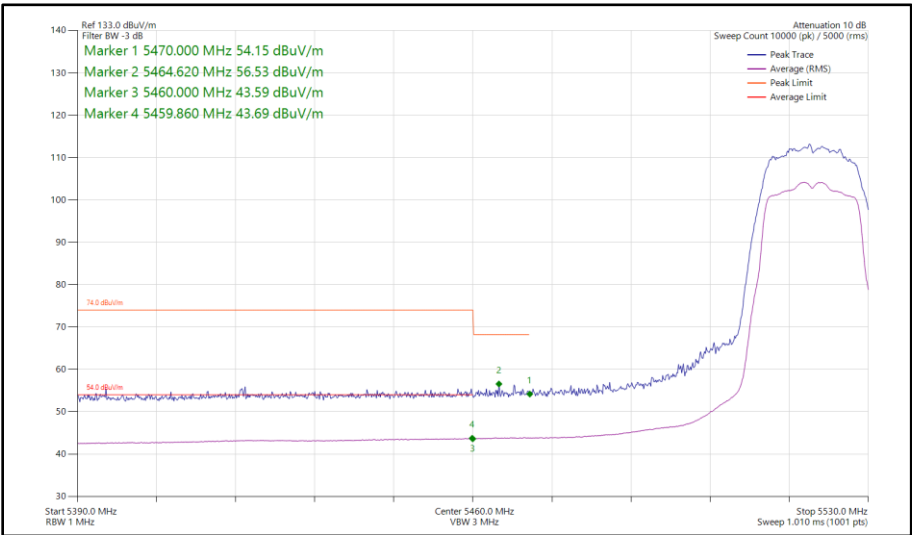


Figure 18 - 802.11a, SISO, Core 0 - 5520 MHz
Band Edge Frequency 5460 MHz

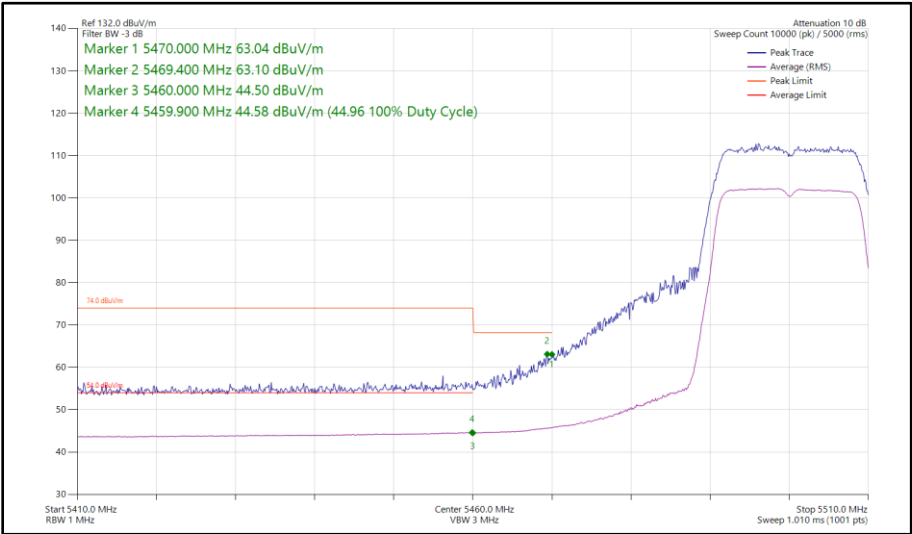


Figure 19 - 802.11n HT20, SISO, Core 0 - 5500 MHz
Band Edge Frequency 5460 MHz

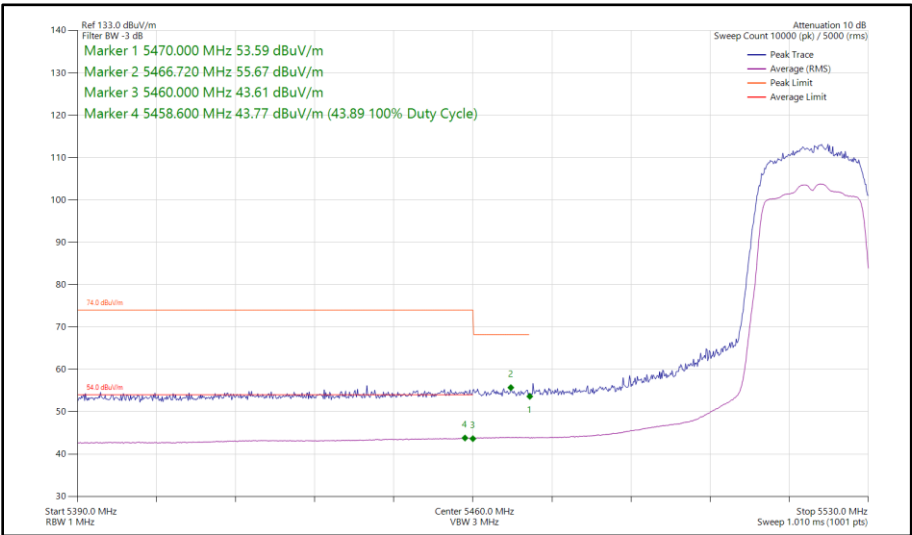
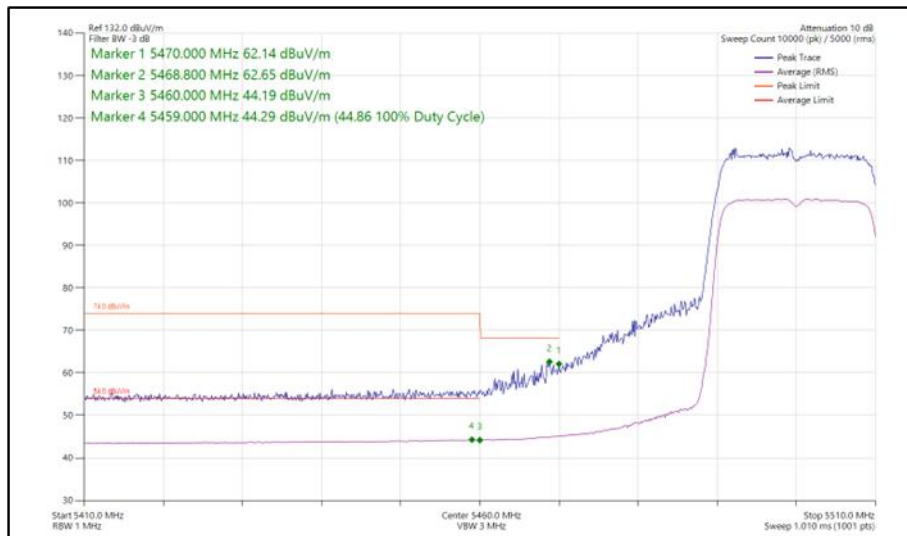
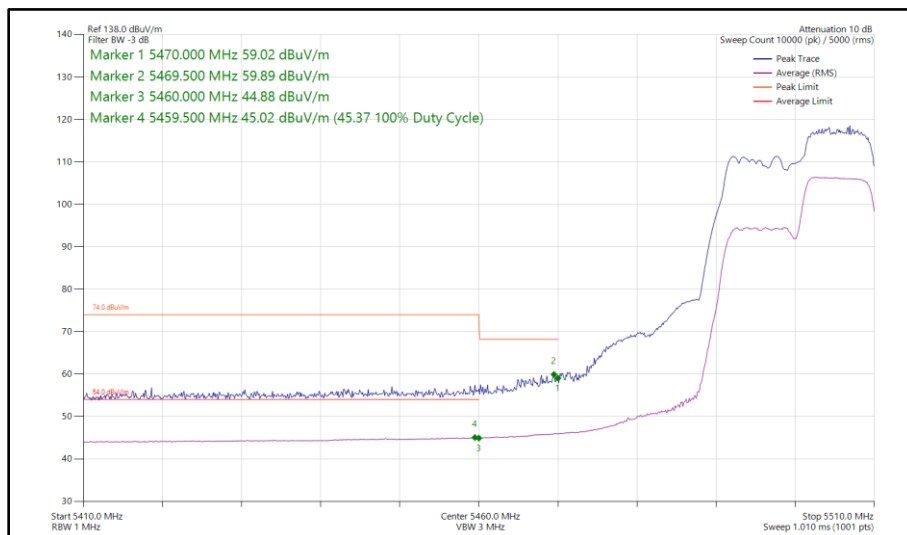


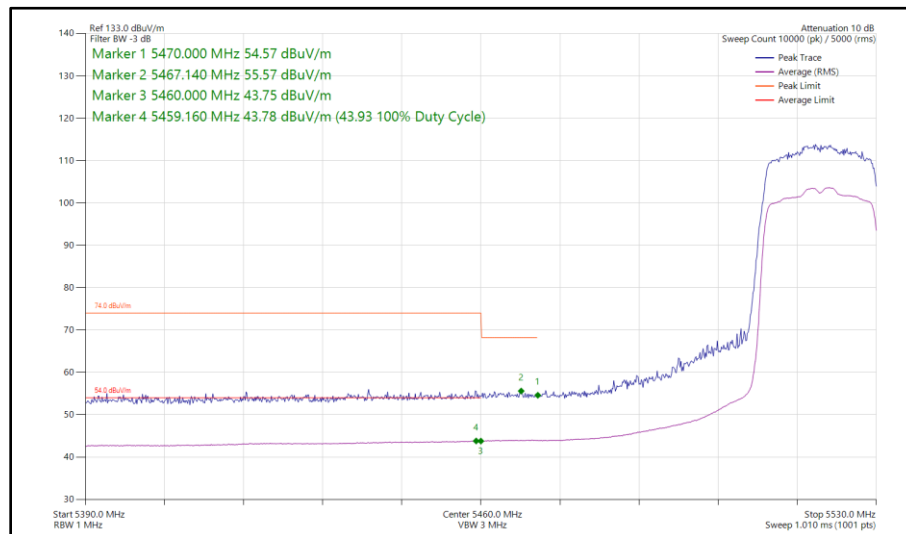
Figure 20 - 802.11n HT20, SISO, Core 0 - 5520 MHz
Band Edge Frequency 5460 MHz



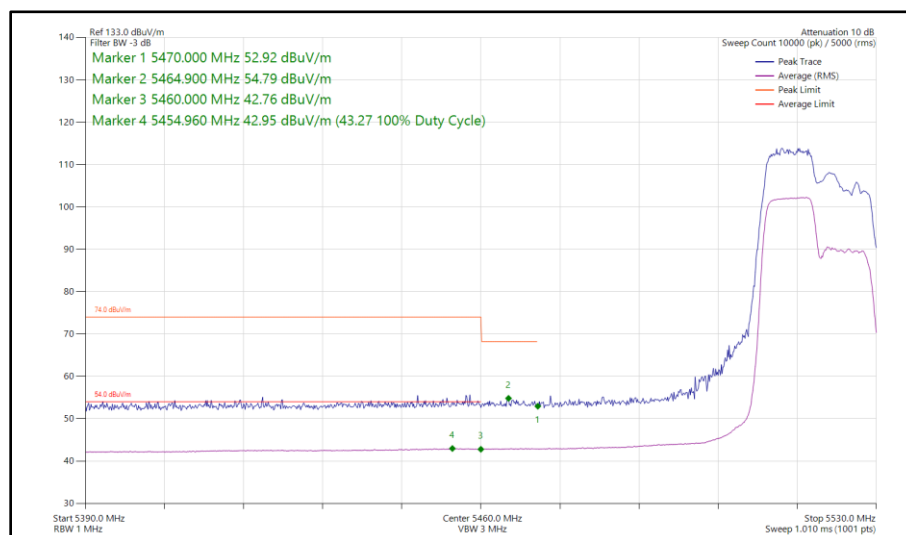
**Figure 21 - 802.11ax HE20, SU, SISO, Core 0 - 5500 MHz
Band Edge Frequency 5460 MHz**



**Figure 22 - 802.11ax HE20, RU 106-54, SISO, Core 0 - 5500 MHz
Band Edge Frequency 5460 MHz**



**Figure 23 - 802.11ax HE20, SU, SISO, Core 0 - 5520 MHz
Band Edge Frequency 5460 MHz**



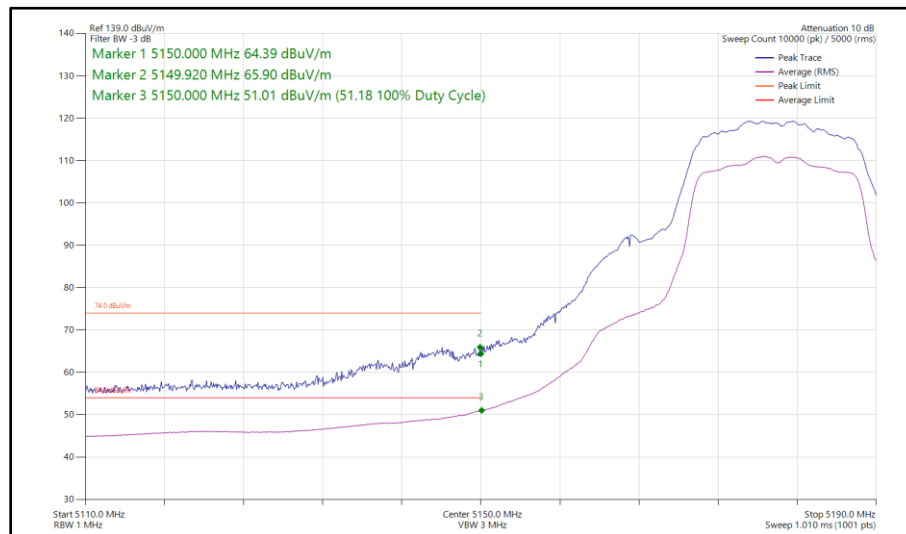
**Figure 24 - 802.11ax HE20, RU 106-53, SISO, Core 0 - 5520 MHz
Band Edge Frequency 5460 MHz**



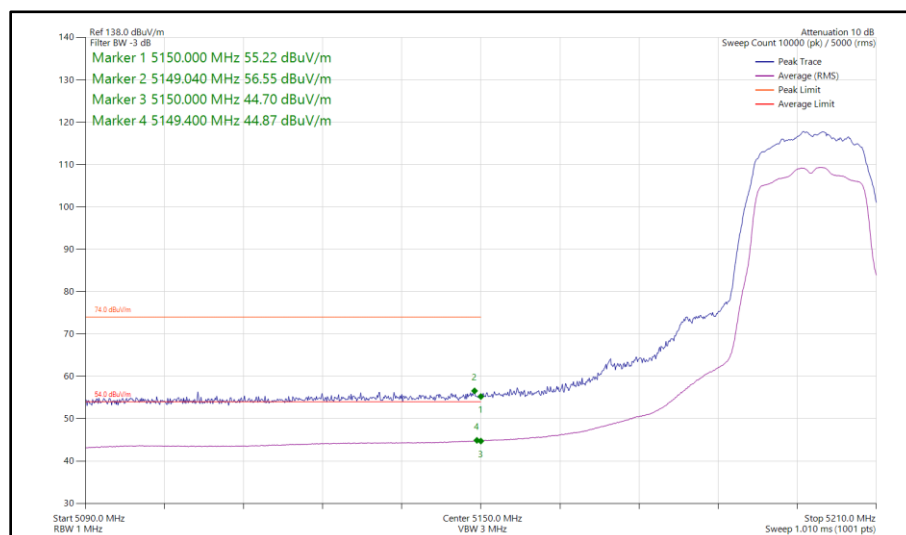
20 MHz Bandwidth - Core 1 (SISO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11a	24 Mbps	-	-	5180	5150	65.90	51.18
802.11a	12 Mbps	-	-	5200	5150	56.55	44.87
802.11n HT20	MCS 4	-	-	5180	5150	66.44	50.80
802.11n HT20	MCS 2	-	-	5200	5150	56.89	44.68
802.11ax HE20	MCS 4x1	SU	-	5180	5150	65.92	51.31
802.11ax HE20	MCS 11x1	106	53	5180	5150	66.73	48.68
802.11ax HE20	MCS 2x1	SU	-	5200	5150	56.58	45.04
802.11ax HE20	MCS 11x1	106	53	5200	5150	57.15	43.95
802.11a	12 Mbps	-	-	5300	5350	57.15	45.17
802.11a	24 Mbps	-	-	5320	5350	66.69	51.39
802.11n HT20	MCS 2	-	-	5300	5350	56.44	44.78
802.11n HT20	MCS 2	-	-	5320	5350	63.85	51.23
802.11ax HE20	MCS 2x1	SU	-	5300	5350	57.34	45.37
802.11ax HE20	MCS 11x1	106	54	5300	5350	55.82	44.09
802.11ax HE20	MCS 11x1	SU	-	5320	5350	69.35	49.05
802.11ax HE20	MCS 11x1	106	53	5320	5350	65.07	49.03
802.11a	54 Mbps	-	-	5500	5460	63.30	46.96
802.11a	12 Mbps	-	-	5520	5460	57.64	45.36
802.11n HT20	MCS 2	-	-	5500	5460	63.46	49.18
802.11n HT20	MCS 2	-	-	5520	5460	57.35	45.07
802.11ax HE20	MCS 2x1	SU	-	5500	5460	63.58	49.63
802.11ax HE20	MCS 11x1	106	53	5500	5460	63.17	47.31
802.11ax HE20	MCS 2x1	SU	-	5520	5460	57.25	45.37
802.11ax HE20	MCS 11x1	106	53	5520	5460	55.59	44.06

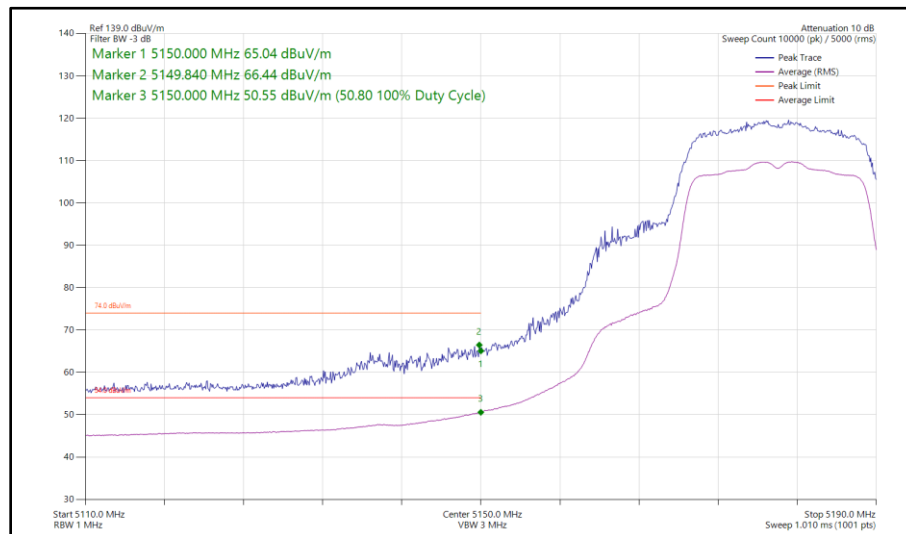
Table 8 - SISO Restricted Band Edge Results



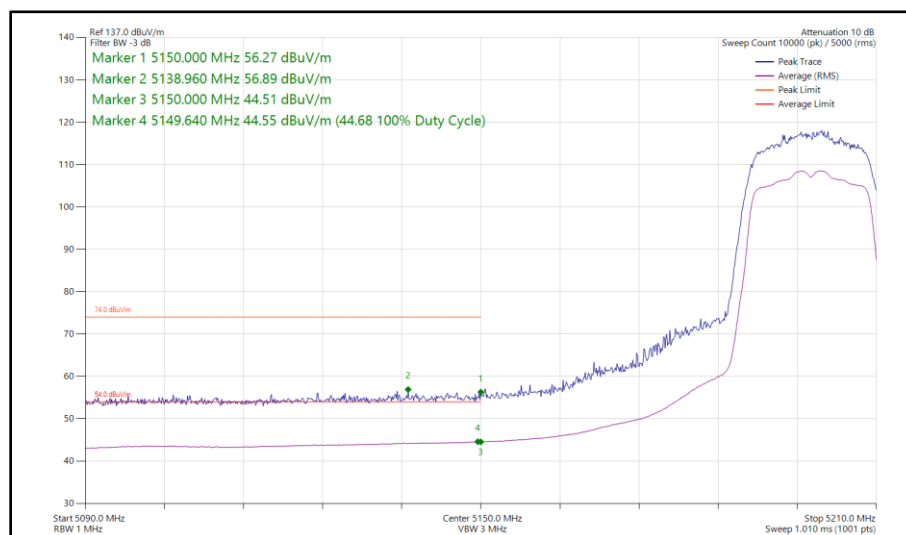
**Figure 25 - 802.11a, SISO, Core 1 - 5180 MHz
Band Edge Frequency 5150 MHz**



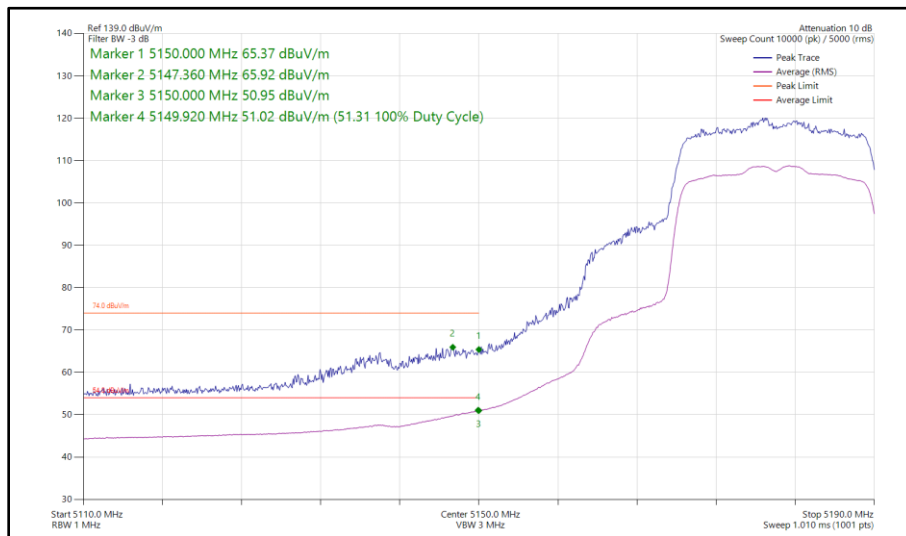
**Figure 26 - 802.11a, SISO, Core 1 - 5200 MHz
Band Edge Frequency 5150 MHz**



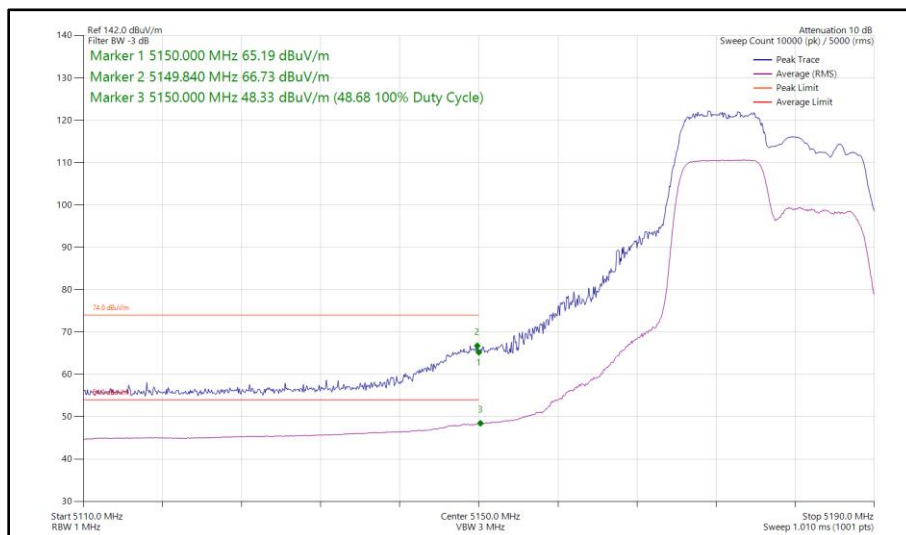
**Figure 27 - 802.11n HT20, SISO, Core 1 - 5180 MHz
Band Edge Frequency 5150 MHz**



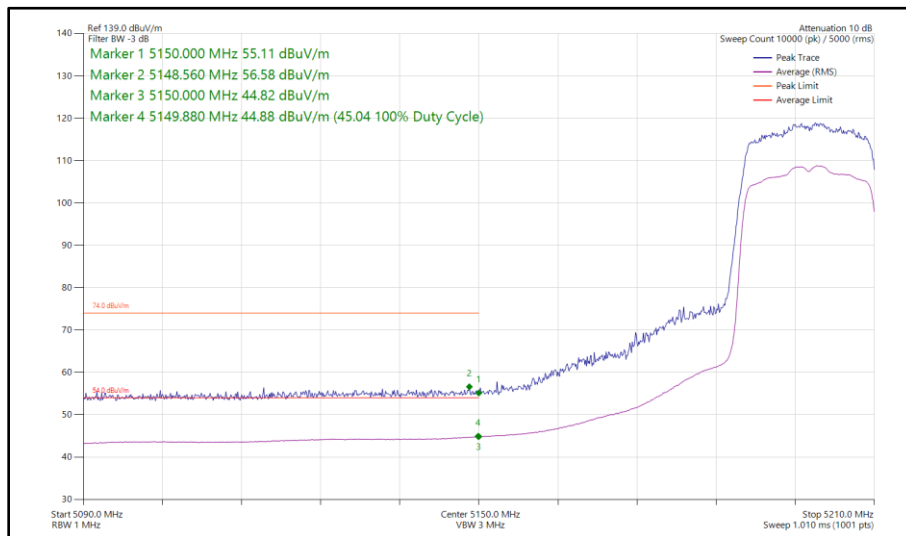
**Figure 28 - 802.11n HT20, SISO, Core 1 - 5200 MHz
Band Edge Frequency 5150 MHz**



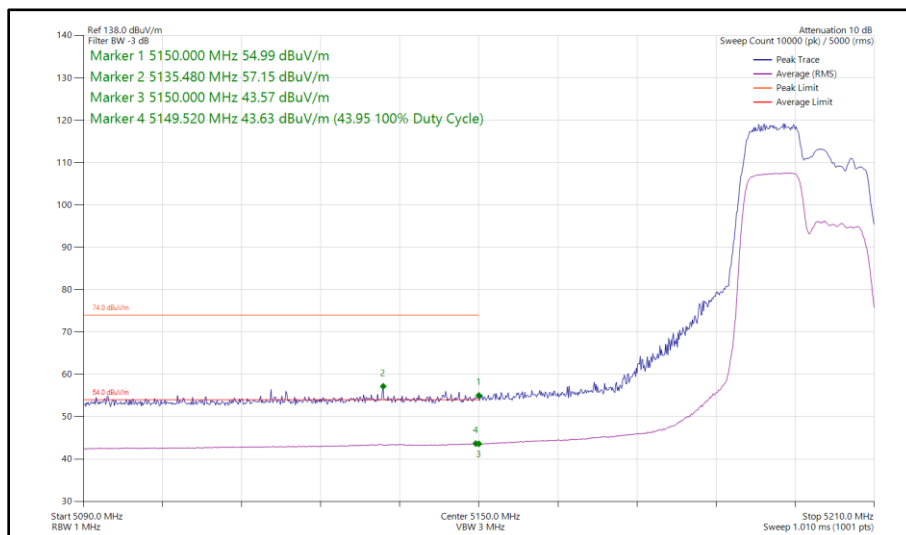
**Figure 29 - 802.11ax HE20, SU, SISO, Core 1 - 5180 MHz
Band Edge Frequency 5150 MHz**



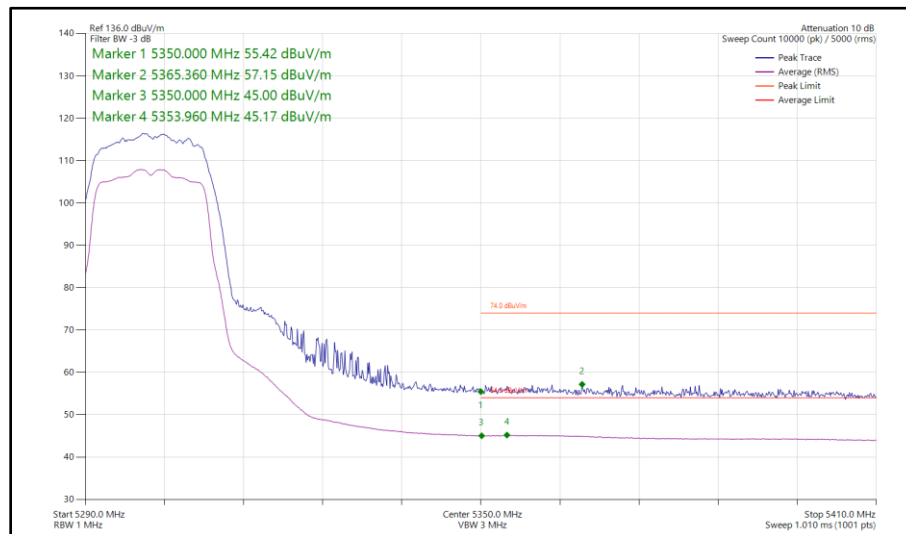
**Figure 30 - 802.11ax HE20, RU 106-53, SISO, Core 1 - 5180 MHz
Band Edge Frequency 5150 MHz**



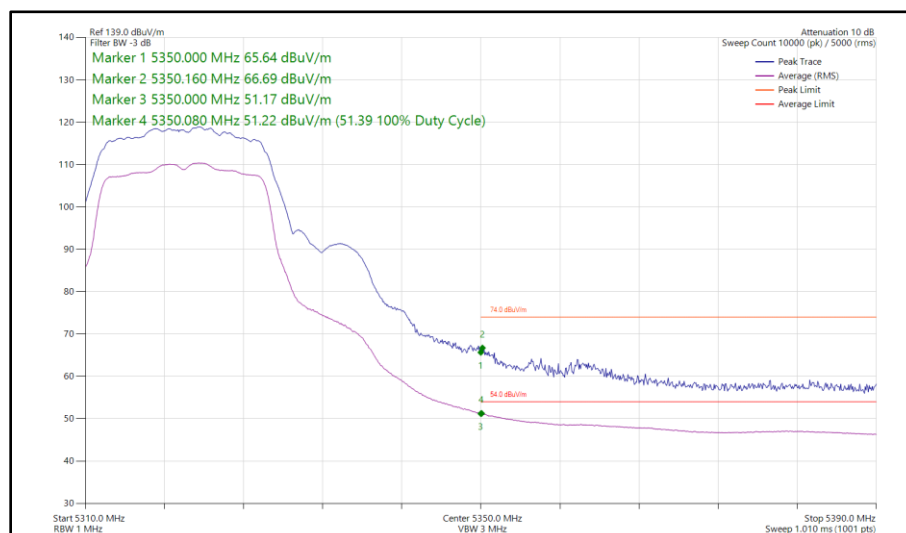
**Figure 31 - 802.11ax HE20, SU, SISO, Core 1 - 5200 MHz
Band Edge Frequency 5150 MHz**



**Figure 32 - 802.11ax HE20, RU 106-53, SISO, Core 1 - 5200 MHz
Band Edge Frequency 5150 MHz**



**Figure 33 - 802.11a, SISO, Core 1 - 5300 MHz
Band Edge Frequency 5350 MHz**



**Figure 34 - 802.11a, SISO, Core 1 - 5320 MHz
Band Edge Frequency 5350 MHz**

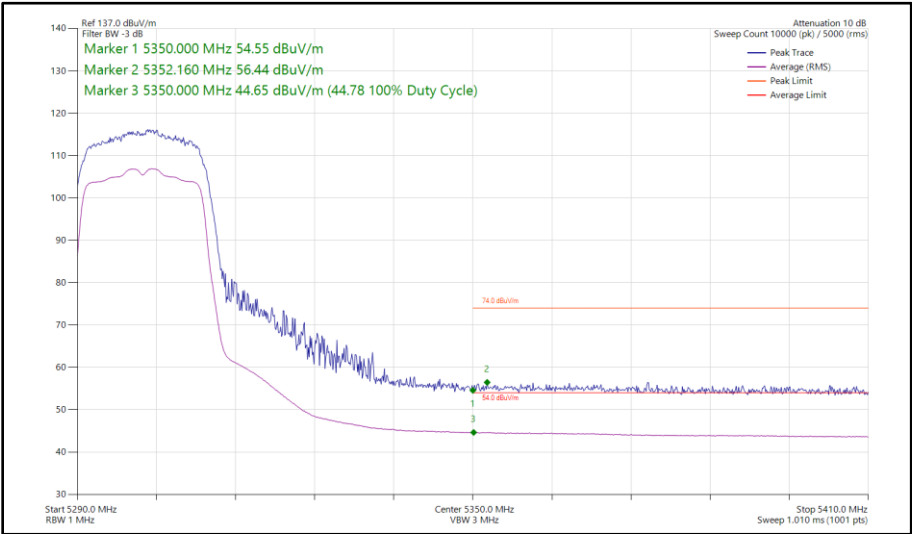


Figure 35 - 802.11n HT20, SISO, Core 1 - 5300 MHz
Band Edge Frequency 5350 MHz

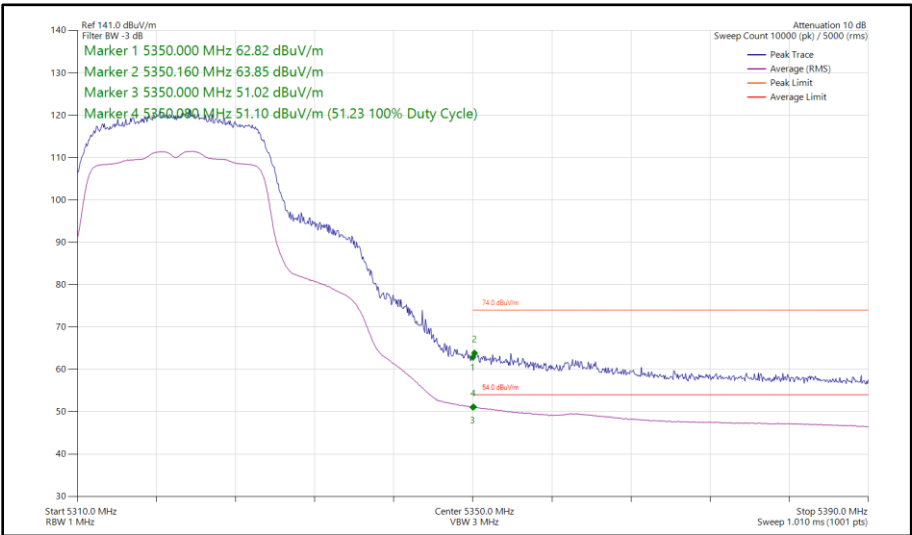
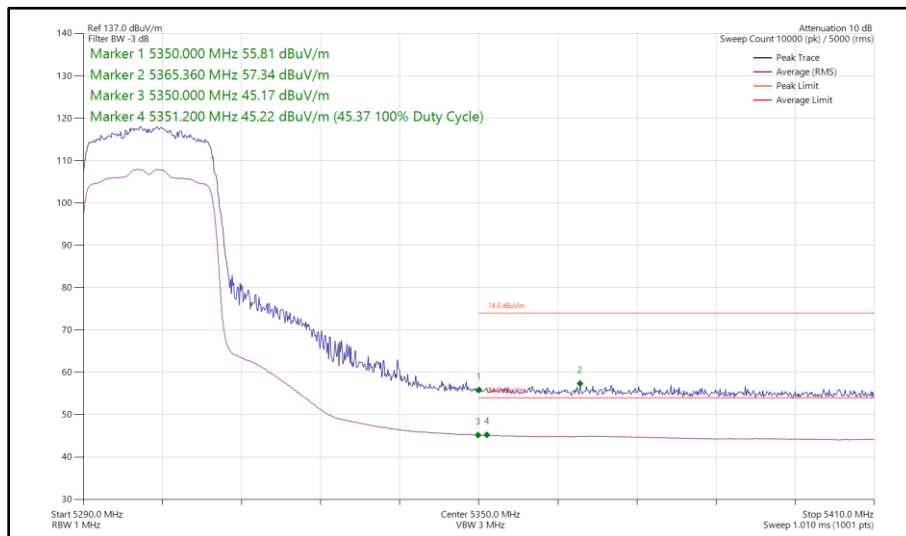
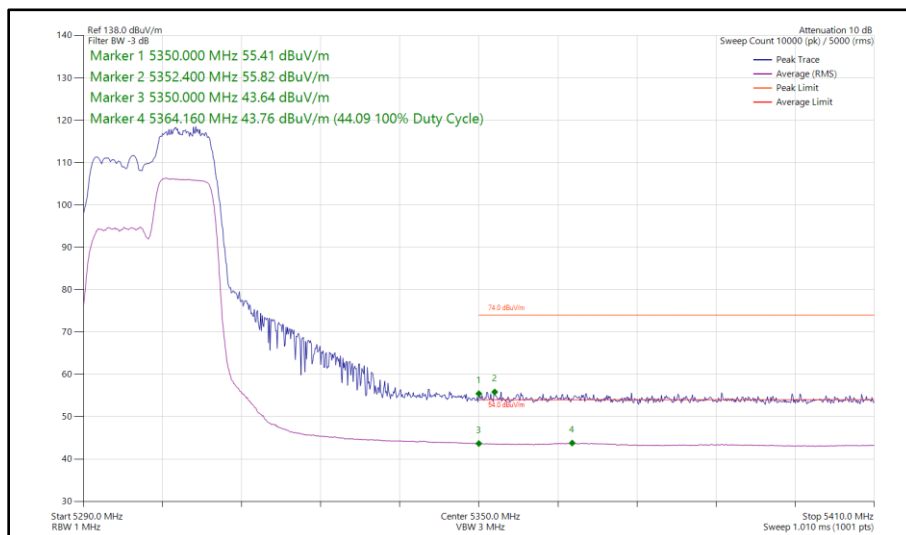


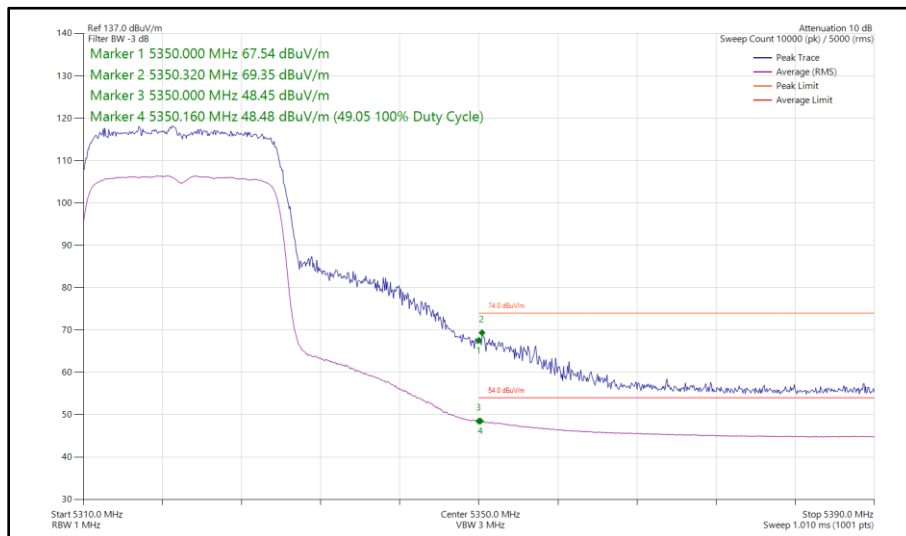
Figure 36 - 802.11n HT20, SISO, Core 1 - 5320 MHz
Band Edge Frequency 5350 MHz



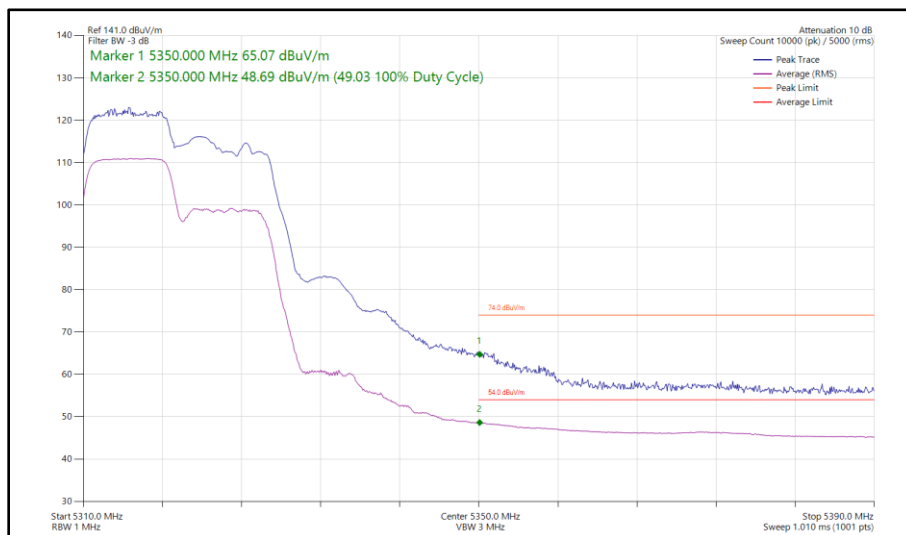
**Figure 37 - 802.11ax HE20, SU, SISO, Core 1 - 5300 MHz
Band Edge Frequency 5350 MHz**



**Figure 38 - 802.11ax HE20, RU 106-54, SISO, Core 1 - 5300 MHz
Band Edge Frequency 5350 MHz**



**Figure 39 - 802.11ax HE20, SU, SISO, Core 1 - 5320 MHz
Band Edge Frequency 5350 MHz**



**Figure 40 - 802.11ax HE20, RU 106-53, SISO, Core 1 - 5320 MHz
Band Edge Frequency 5350 MHz**

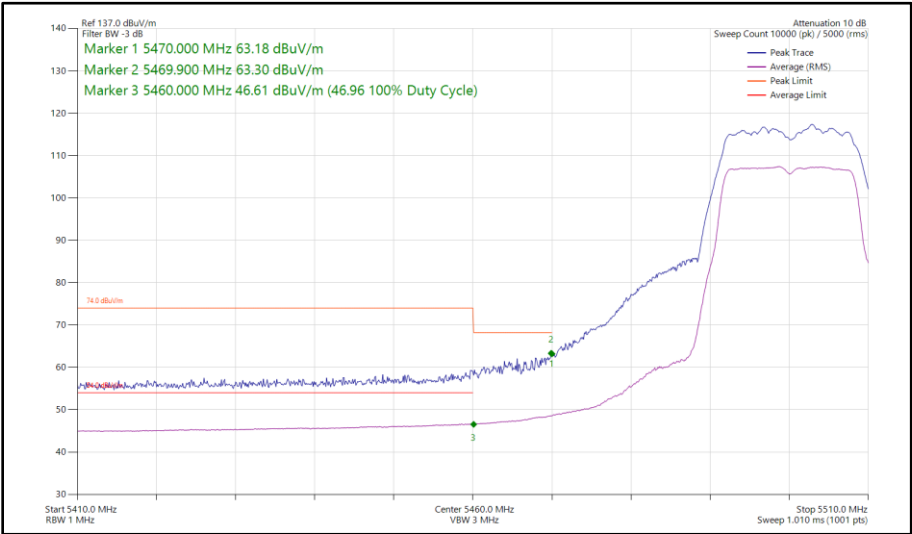


Figure 41 - 802.11a, SISO, Core 1 - 5500 MHz
Band Edge Frequency 5460 MHz

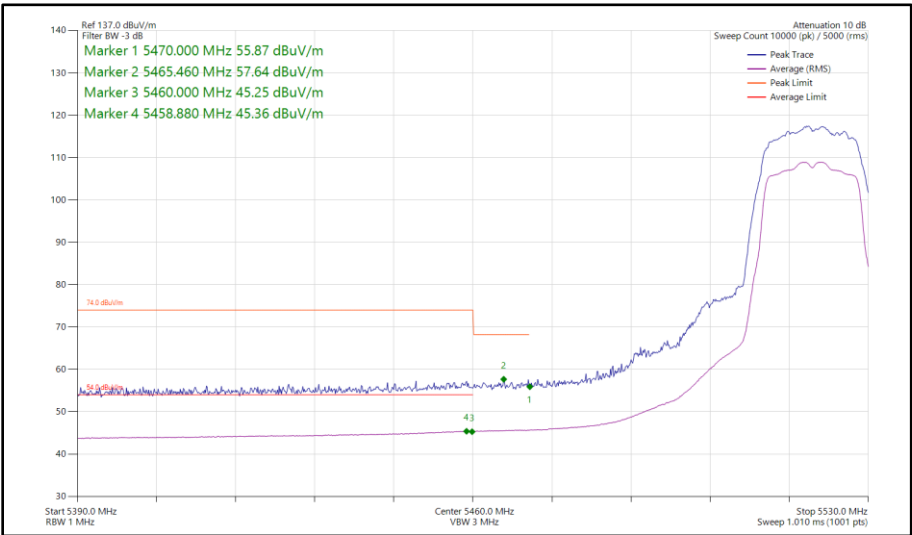
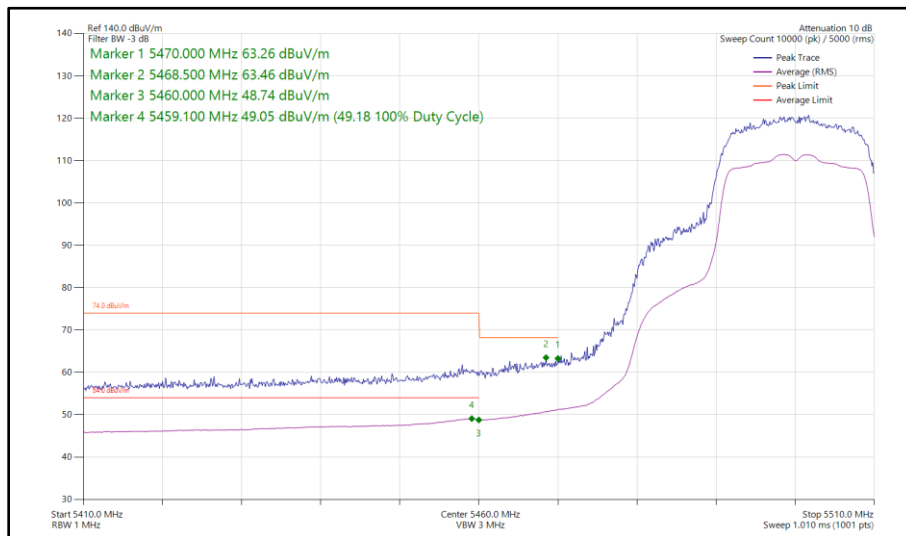
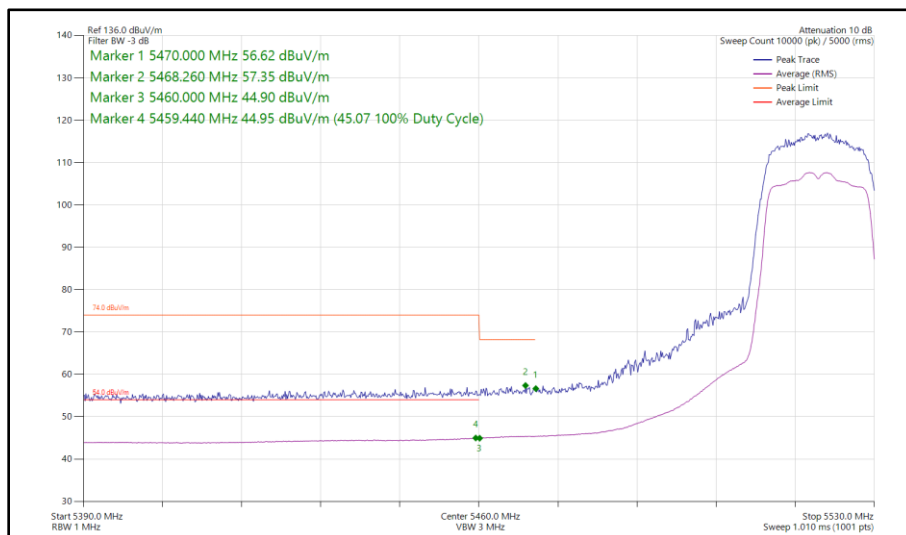


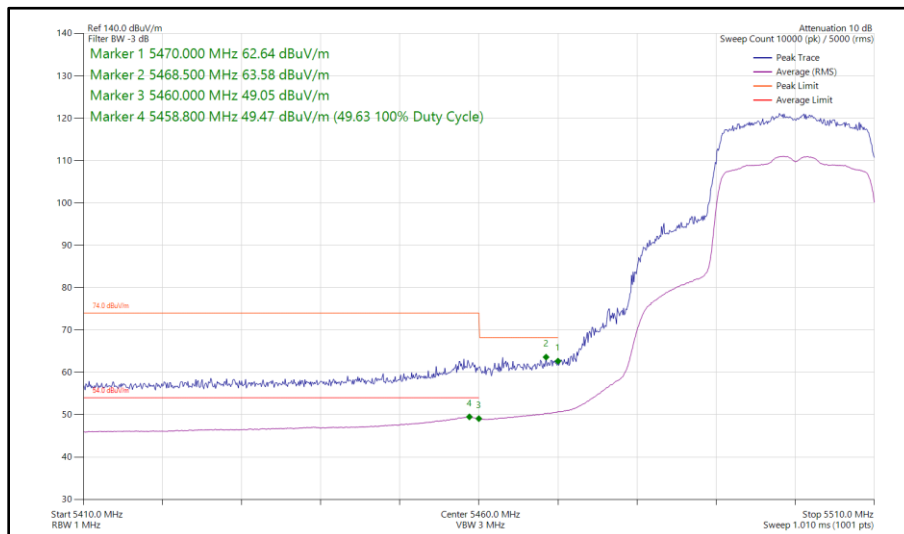
Figure 42 - 802.11a, SISO, Core 1 - 5520 MHz
Band Edge Frequency 5460 MHz



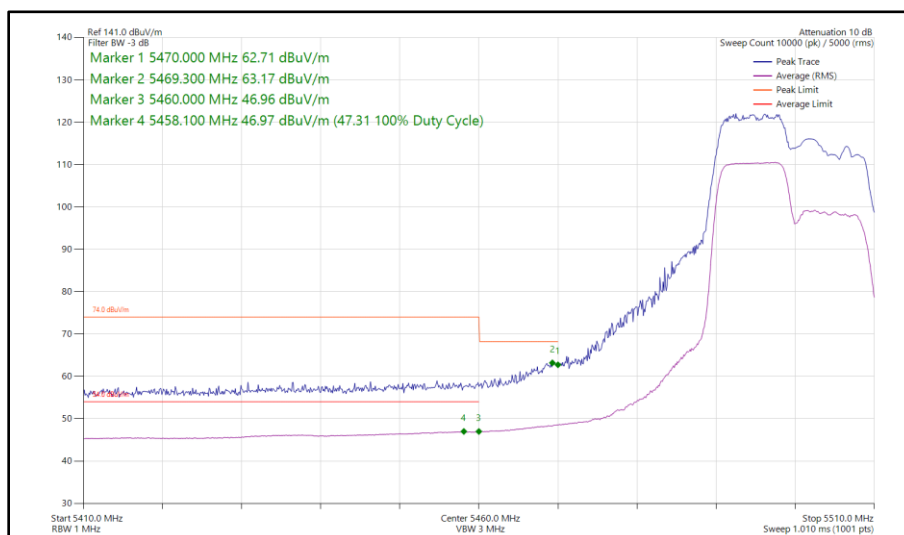
**Figure 43 - 802.11n HT20, SISO, Core 1 - 5500 MHz
Band Edge Frequency 5460 MHz**



**Figure 44 - 802.11n HT20, SISO, Core 1 - 5520 MHz
Band Edge Frequency 5460 MHz**



**Figure 45 - 802.11ax HE20, SU, SISO, Core 1 - 5500 MHz
Band Edge Frequency 5460 MHz**



**Figure 46 - 802.11ax HE20, RU 106-53, SISO, Core 1 - 5500 MHz
Band Edge Frequency 5460 MHz**

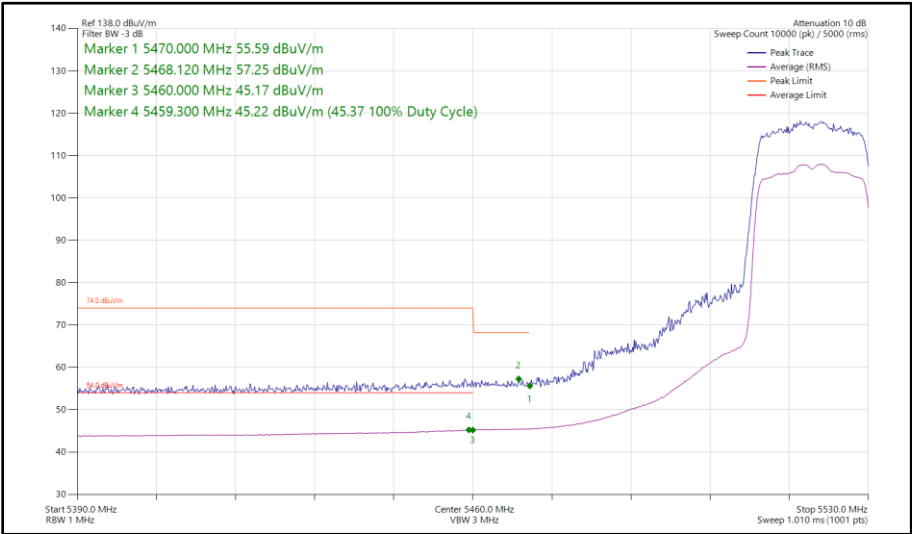


Figure 47 - 802.11ax HE20, SU, SISO, Core 1 - 5520 MHz
Band Edge Frequency 5460 MHz

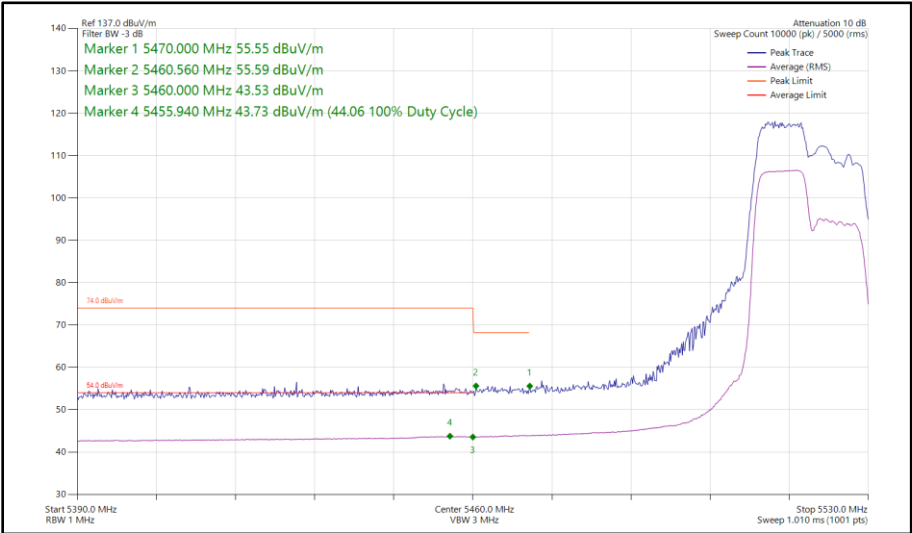
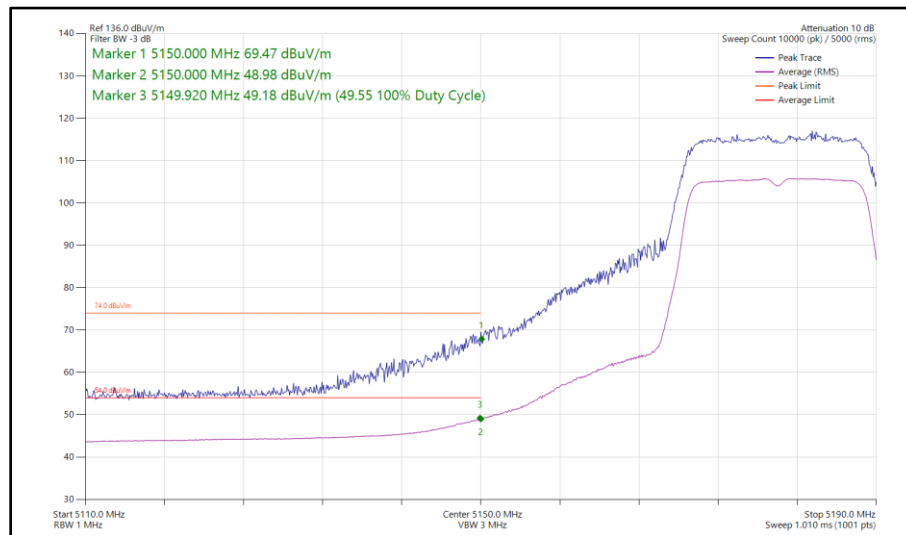


Figure 48 - 802.11ax HE20, RU 106-53, SISO, Core 1 - 5520 MHz
Band Edge Frequency 5460 MHz

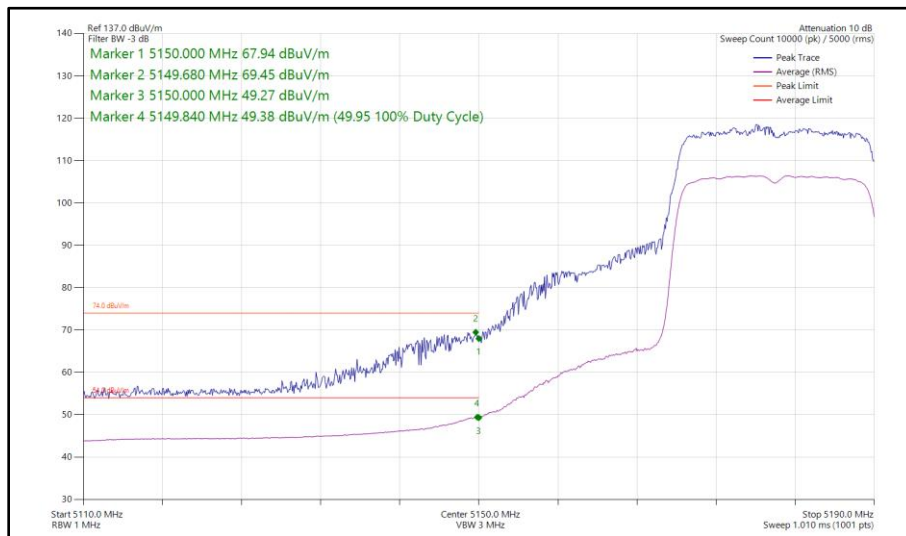
20 MHz Bandwidth - Core 0 - Core 1 (CDD)

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 HT20	MCS 7	-	-	5180	5150	69.47	49.55
802.11ax HE20	MCS 11x1	SU	-	5180	5150	69.45	49.95
802.11ax HE20	MCS 11x1	106	53	5180	5150	64.95	48.20
802.11n HT20	MCS 4	-	-	5320	5350	67.72	51.41
802.11ax HE20	MCS 2x1	SU	-	5320	5350	65.44	51.46
802.11ax HE20	MCS 11x1	106	54	5320	5350	64.60	48.76
802.11n HT20	MCS 4	-	-	5500	5460	63.70	48.04
802.11ax HE20	MCS 4x1	SU	-	5500	5460	63.66	48.31
802.11ax HE20	MCS 11x1	106	54	5500	5460	63.15	47.00

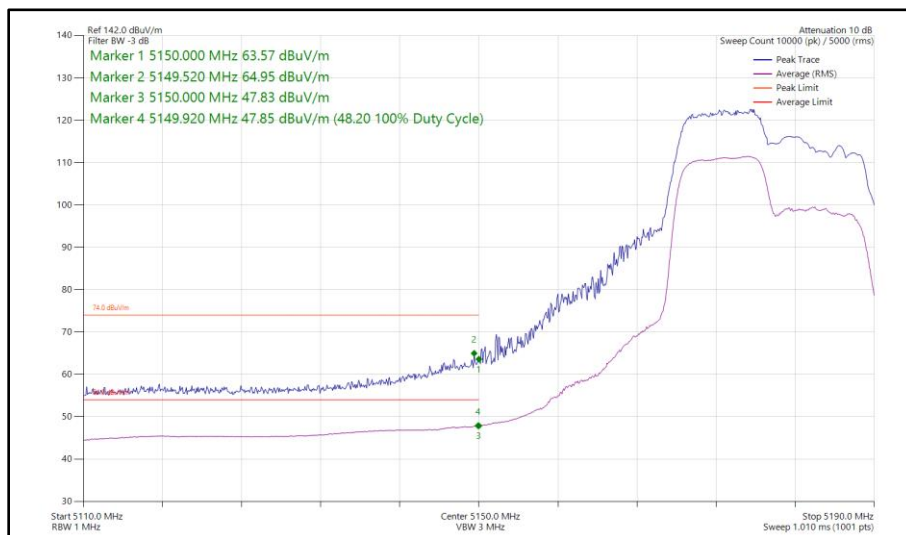
Table 9 - CDD Restricted Band Edge Results



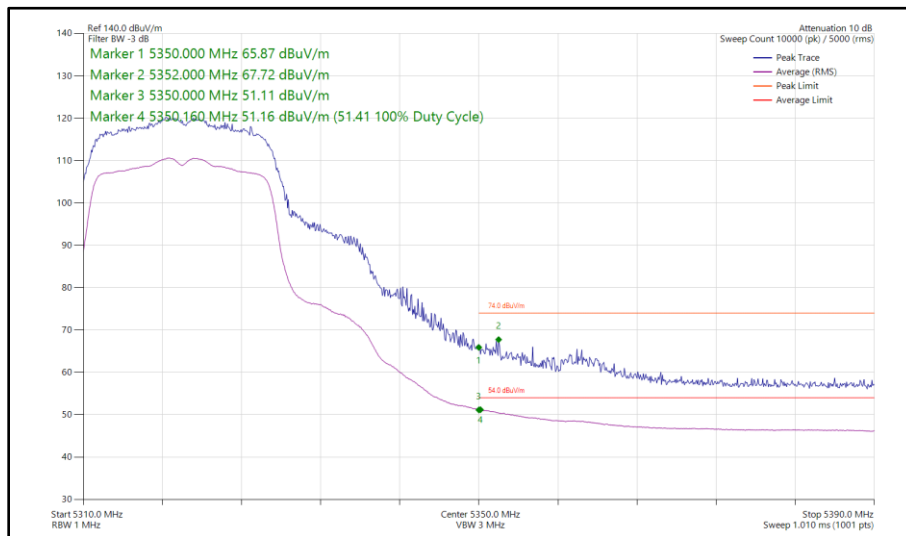
**Figure 49 - 802.11n HT20, CDD, Core 0 - Core 1 - 5180 MHz
Band Edge Frequency 5150 MHz**



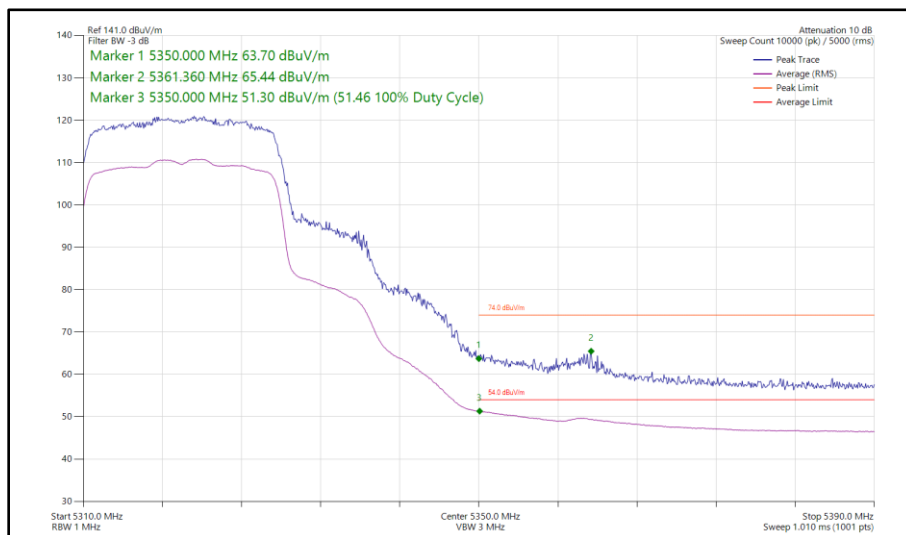
**Figure 50 - 802.11ax HE20, SU, CDD, Core 0 - Core 1 - 5180 MHz
Band Edge Frequency 5150 MHz**



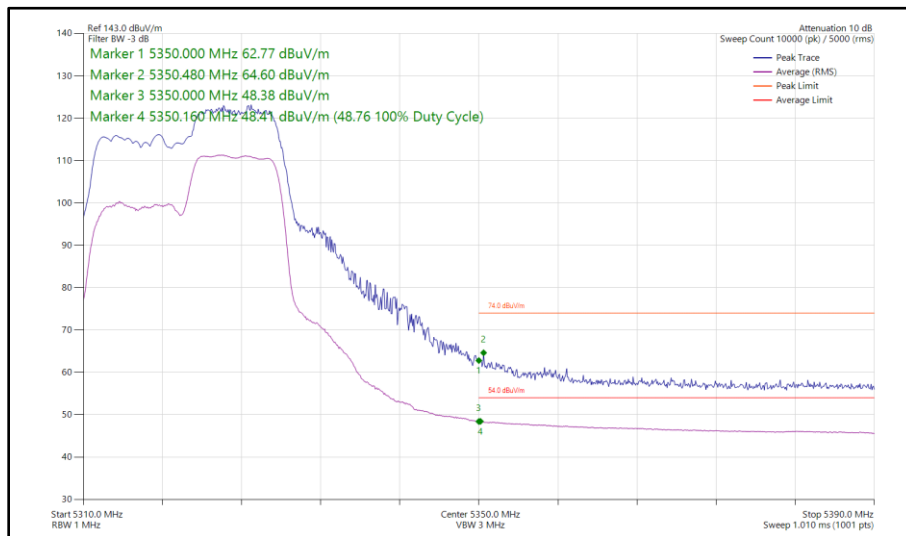
**Figure 51 - 802.11ax HE20, RU 106-53, CDD, Core 0 - Core 1 - 5180 MHz
Band Edge Frequency 5150 MHz**



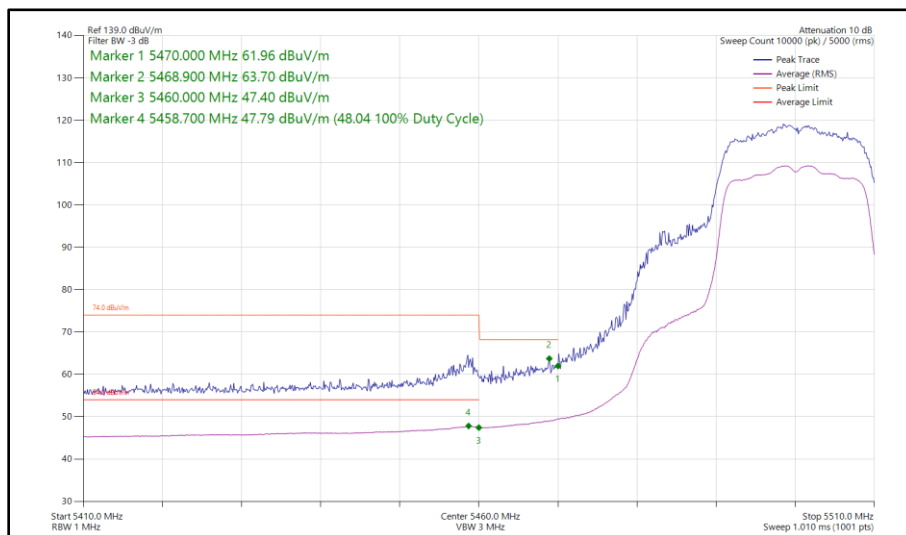
**Figure 52 - 802.11n HT20, CDD, Core 0 - Core 1 - 5320 MHz
Band Edge Frequency 5350 MHz**



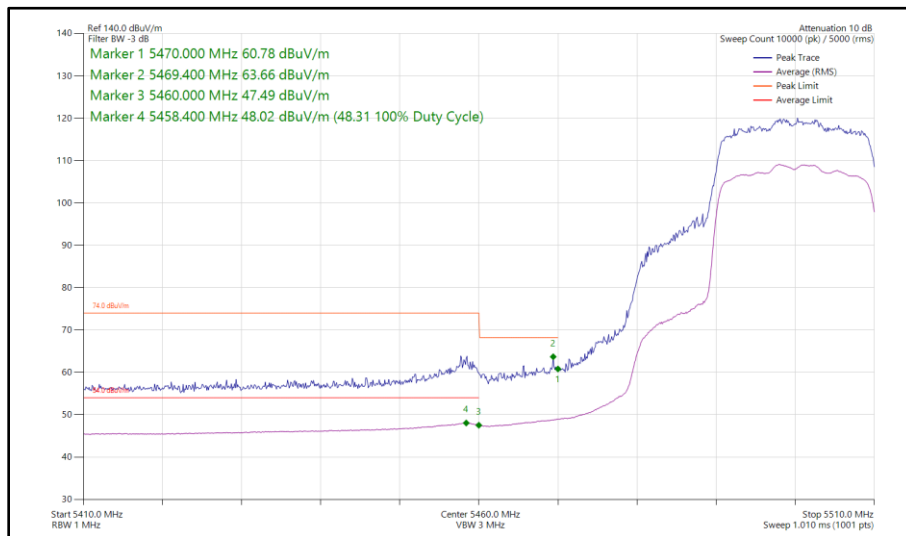
**Figure 53 - 802.11ax HE20, SU, CDD, Core 0 - Core 1 - 5320 MHz
Band Edge Frequency 5350 MHz**



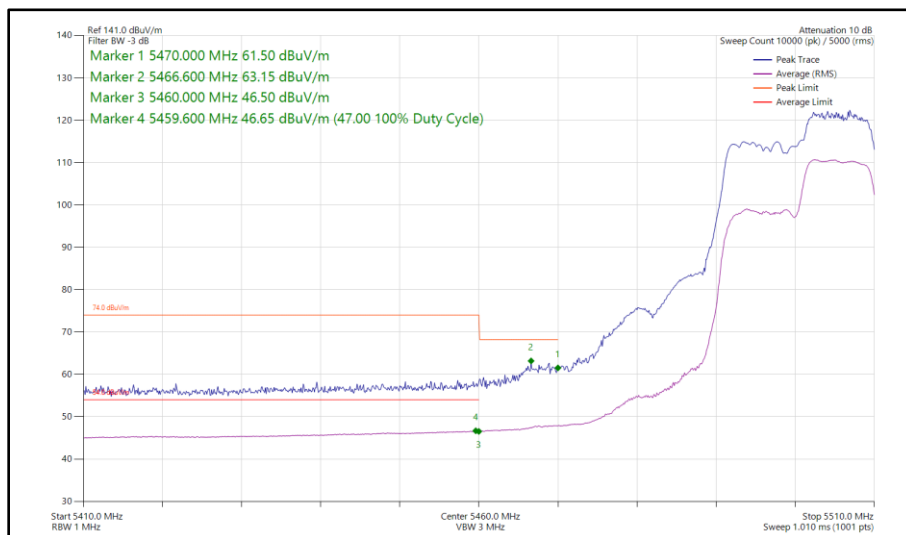
**Figure 54 - 802.11ax HE20, RU 106-54, CDD, Core 0 - Core 1 - 5320 MHz
Band Edge Frequency 5350 MHz**



**Figure 55 - 802.11n HT20, CDD, Core 0 - Core 1 - 5500 MHz
Band Edge Frequency 5460 MHz**



**Figure 56 - 802.11ax HE20, SU, CDD, Core 0 - Core 1 - 5500 MHz
Band Edge Frequency 5460 MHz**

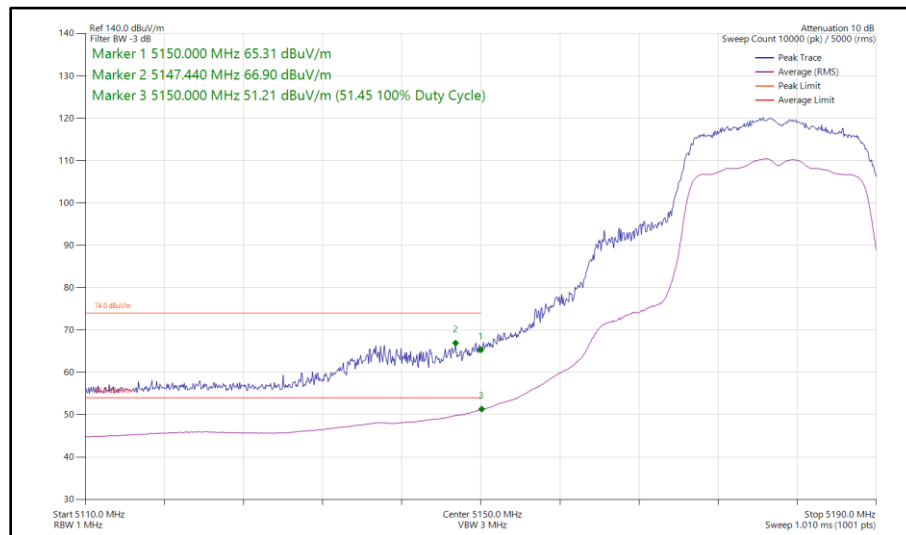


**Figure 57 - 802.11ax HE20, RU 106-54, CDD, Core 0 - Core 1 - 5500 MHz
Band Edge Frequency 5460 MHz**

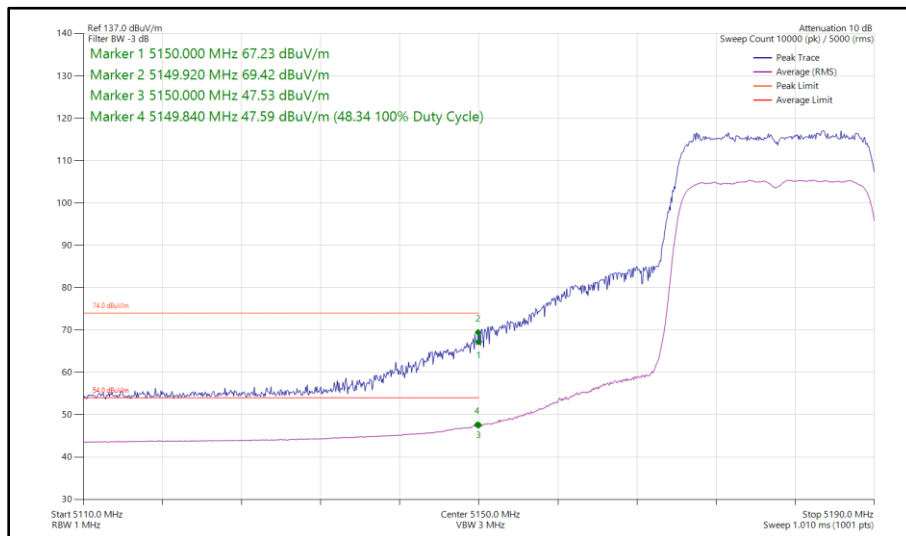
20 MHz Bandwidth - Core 0 - Core 1 (SDM)

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 HT20	MCS 4	-	-	5180	5150	66.90	51.45
802.11ax HE20	MCS 11x2	SU	-	5180	5150	69.42	48.34
802.11ax HE20	MCS 11x2	106	53	5180	5150	64.34	47.98
802.11n HT20	MCS 7	-	-	5320	5350	69.21	51.13
802.11ax HE20	MCS 2x2	SU	-	5320	5350	65.04	51.28
802.11ax HE20	MCS 11x2	106	54	5320	5350	64.70	48.49
802.11n HT20	MCS 2	-	-	5500	5460	63.37	48.88
802.11ax HE20	MCS 2x2	SU	-	5500	5460	63.26	49.16
802.11ax HE20	MCS 11x2	106	53	5500	5460	62.40	46.97

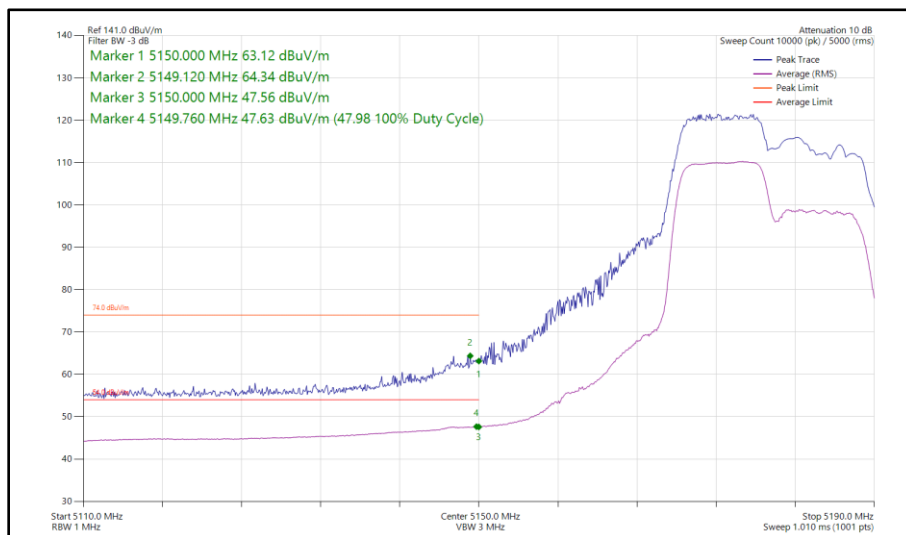
Table 10 - SDM Restricted Band Edge Results



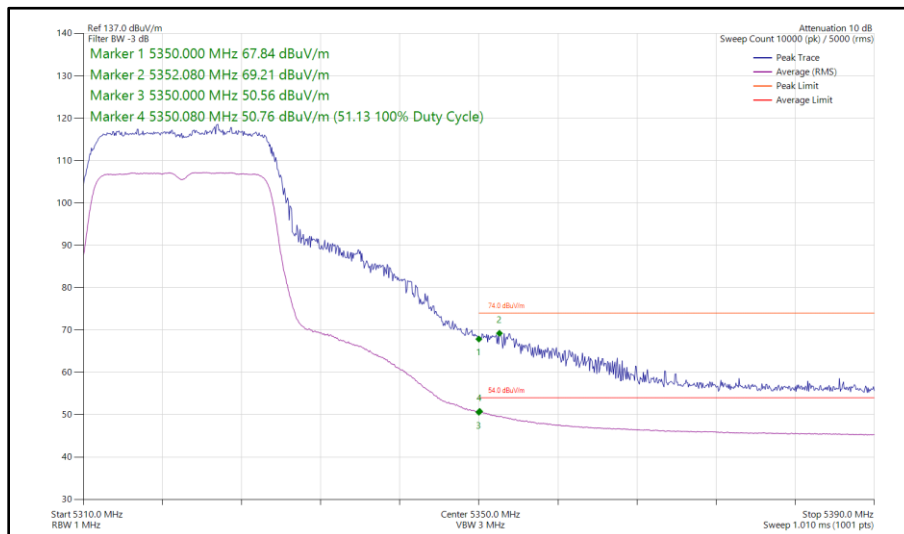
**Figure 58 - 802.11n HT20, SDM, Core 0 - Core 1 - 5180 MHz
Band Edge Frequency 5150 MHz**



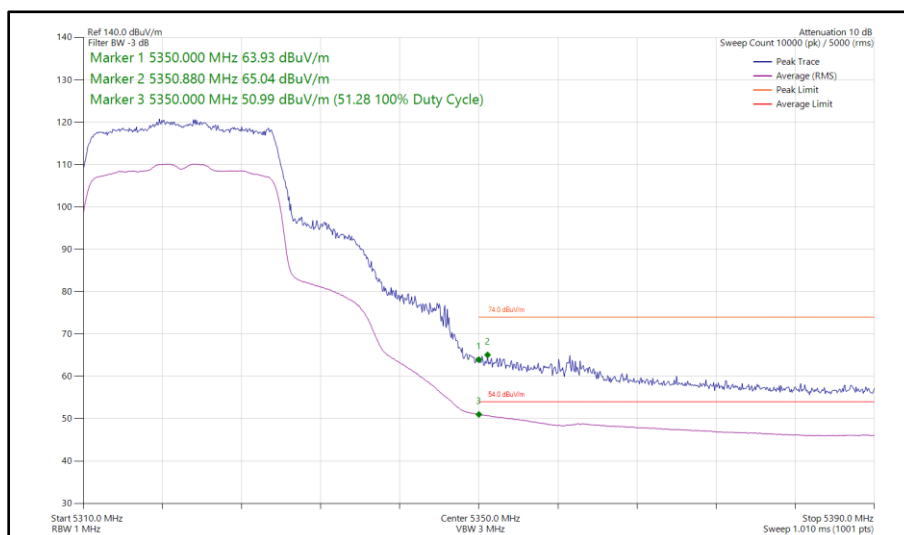
**Figure 59 - 802.11ax HE20, SU, SDM, Core 0 - Core 1 - 5180 MHz
Band Edge Frequency 5150 MHz**



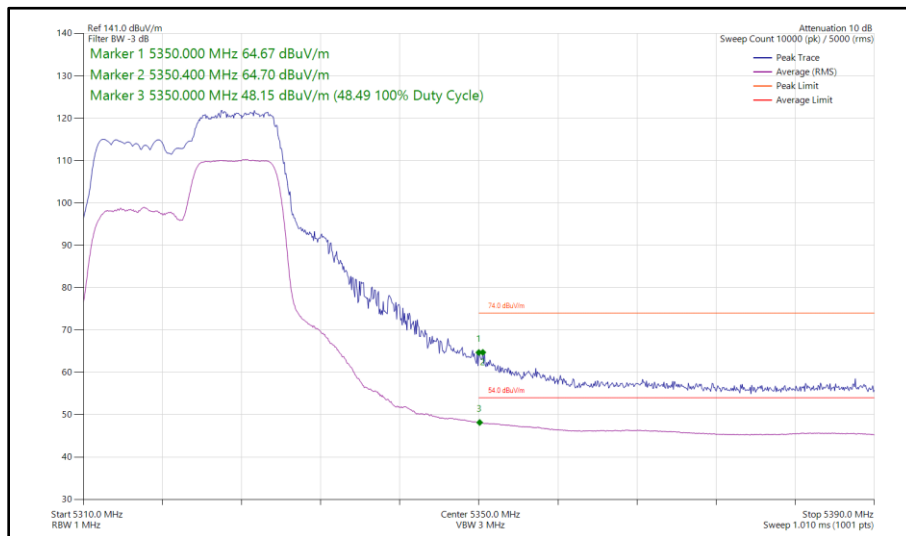
**Figure 60 - 802.11ax HE20, RU 106-53, SDM, Core 0 - Core 1 - 5180 MHz
Band Edge Frequency 5150 MHz**



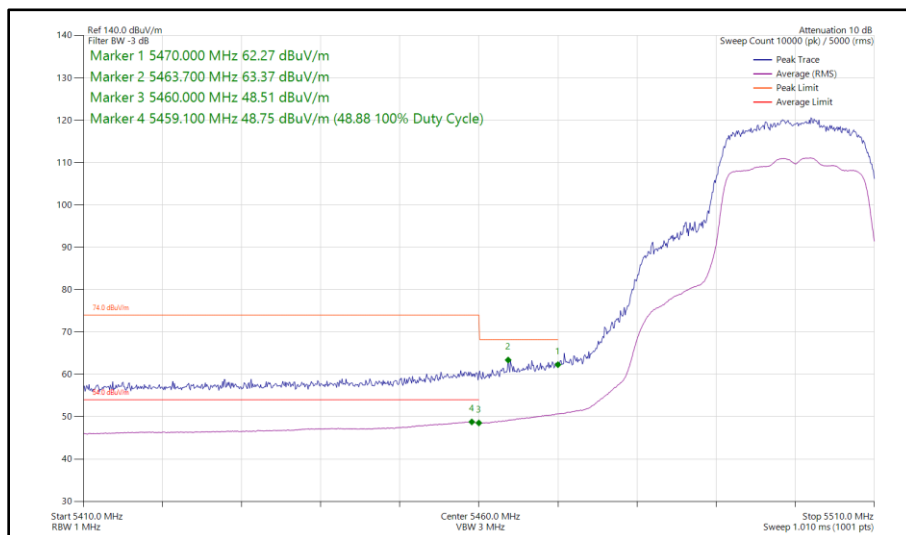
**Figure 61 - 802.11n HT20, SDM, Core 0 - Core 1 - 5320 MHz
Band Edge Frequency 5350 MHz**



**Figure 62 - 802.11ax HE20, SU, SDM, Core 0 - Core 1 - 5320 MHz
Band Edge Frequency 5350 MHz**



**Figure 63 - 802.11ax HE20, RU 106-54, SDM, Core 0 - Core 1 - 5320 MHz
Band Edge Frequency 5350 MHz**



**Figure 64 - 802.11n HT20, SDM, Core 0 - Core 1 - 5500 MHz
Band Edge Frequency 5460 MHz**