

FCC and ISED Test Report

Apple Inc
Model: A2787

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: BCGA2787

IC: 579C-A2787



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SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior Engineer	Authorised Signatory	13 March 2023

Signatures in this approval box have checked this document in line with the requirements of TUV SUD 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	13 March 2023	

FCC Accreditation

90987 Octagon House, Fareham Test Laboratory

ISED Accreditation

12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

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



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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	13-March-2023

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
Model Number(s)	A2787
Serial Number(s)	V32VYX9RJ6, C2VL734Q54 and CR6T255FVT
Hardware Version(s)	REV 1.0
Software Version(s)	22E51010k, 22E71580u and 22E51010k
Number of Samples Tested	3
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2021 ISED RSS-247: Issue 2 (02-2017) ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021)
Order Number	0540246998
Start of Test	08-November-2022
Finish of Test	13-February-2023
Name of Engineer(s)	Thomas Biddlecombe, Daniel Cameron, Colin Brain, James Woods, Danial Shafique, Thomas Randall, Elliot Callender, Nicolae Mihailiuc, Ian Hart, Akhil Rajendran Bhaskaran Nair, Mohammad Malik, Ioan-Alexandru Bogatu and Taha Shafique
Related Document(s)	ANSI C63.10 (2020) KDB 662911 D01 v02r01 ANSI C63.10 (2013) ANSI C63.4 (2014)



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C, ISSED RSS-247 and ISSED 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	
2.2	15.247 (a)(2)	5.2	6.7	Emission Bandwidth	Pass	
2.3	15.247 (b)	5.4	6.12	Maximum Conducted Output Power	Pass	
2.4	15.209 and 15.247 (d)	3.3 and 5.5	6.13 and 8.9	Spurious Radiated Emissions	Pass	
2.5	15.247 (d)	5.5	-	Authorised Band Edges	Pass	
2.6	15.247 (e)	5.2	6.12	Power Spectral Density	Pass	

Table 2



1.4 Product Information

1.4.1 Technical Description

The equipment under test was a rack mounted Apple computer, with Bluetooth® and IEEE 802.11 a/b/g/n/ac/ax Wi-Fi capabilities in the 2.4 GHz, 5 GHz and 6 GHz bands.

1.4.2 Test Modes

The EUT's 2.4 GHz 802.11 radio supports Single Input/Single Output (SISO) and 2x2 Multiple Input/Multiple Output (MIMO) Cyclic Delay Diversity (CDD) modes. It supports 802.11b and g for SISO and 802.11n and ax at 20 MHz channel bandwidths for SISO and MIMO. The EUT supports 802.11ax Single User (SU) and Multi-User (MU) with all Resource Unit (RU) sizes of 26/52/106/242.

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

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 transmit modes:

SISO Modes (Core 1):

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

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

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

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

Reduced output power is used on the narrower RU26/52/106 size 802.11ax multi-user (MU) modes to meet PSD and Band Edge limits. Therefore, only single user (SU) modes are reported for output power tests since these are always worst-case. All SU and the above MU RU sizes are reported for PSD.

1.4.3 Test Set-up

For conducted tests the EUT antennas were disconnected and replaced with U.FL to SMA test cables to enable conducted testing on each core. The loss of these test cables were known and compensated for in any conducted measurements.

For all tests except, the EUT was put into a continuous transmit test mode with the chipset manufacturer's test commands via a script running in the EUT's 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.

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	4.99	0.70
Core 1	2400 to 2480	4.65	0.70

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: A2787, Serial Number: CR6T255FVT			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2787, Serial Number: V32VYX9RJ6			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2787, Serial Number: C2VL734Q54			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 4



1.7 Test Location

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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 2.4 GHz WLAN		
Restricted Band Edges	Elliot Callender, Nicolae Mihailiuc, Ian Hart, Akhil Rajendran Bhaskaran Nair, Mohammad Malik, Ioan-Alexandru Bogatu and Taha Shafique	UKAS
Emission Bandwidth	Thomas Biddlecombe and Daniel Cameron	UKAS
Maximum Conducted Output Power	Thomas Biddlecombe and Daniel Cameron	UKAS
Spurious Radiated Emissions	James Woods, Danial Shafique, Colin Brain and Thomas Randall	UKAS
Authorised Band Edges	Elliot Callender, Nicolae Mihailiuc, Ian Hart, Akhil Rajendran Bhaskaran Nair, Mohammad Malik, Ioan-Alexandru Bogatu and Taha Shafique	UKAS
Power Spectral Density	Thomas Biddlecombe and Daniel Cameron	UKAS

Table 5

Office Address:

TÜV SÜD
Concorde Park
Concorde Way
Fareham
Hampshire
PO15 5FG
United Kingdom



2 Test Details

2.1 Restricted Band Edges

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.205
ISED RSS-247, Clause 3.3
ISED RSS-GEN, Clause 8.10

2.1.2 Equipment Under Test and Modification State

A2787, S/N: CR6T255FVT - Modification State 0

2.1.3 Date of Test

08-November-2022 to 08-December-2022

2.1.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.10.5 and 11.12.1.

Plots for average measurements were taken in accordance with ANSI C63.10, clause 11.12.2.5.2.

The following conversion can be applied to convert from dBμV/m to μV/m:
 $10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$.

2.1.5 Environmental Conditions

Ambient Temperature	19.8 - 22.5 °C
Relative Humidity	46.6 - 60.7 %



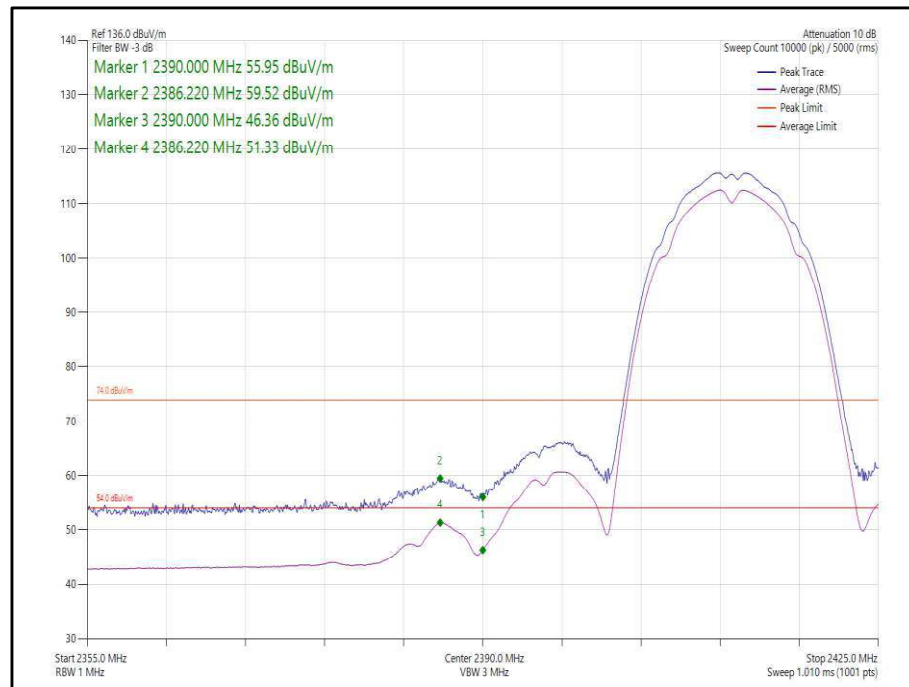
2.1.6 Test Results

2.4 GHz WLAN

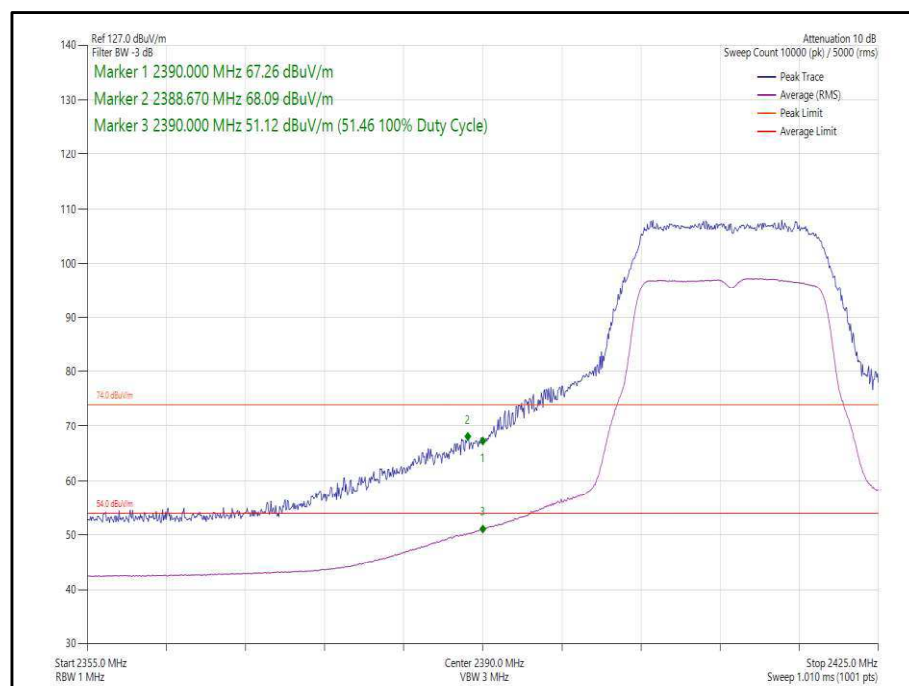
20 MHz Bandwidth - Core 0 (SISO)

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	59.52	51.33
802.11g	54 Mbps	-	-	2412	2390	68.09	51.46
802.11n, HT20	MCS7	-	-	2412	2390	66.75	51.48
802.11ax, HE20	MCS4x1	SU	-	2412	2390	66.25	51.00
802.11ax, HE20	MCS9x1	106	54	2412	2390	69.38	49.26
802.11b	1 Mbps	-	-	2462	2483.5	59.32	51.08
802.11b	1 Mbps	-	-	2467	2483.5	60.22	51.34
802.11b	1 Mbps	-	-	2472	2483.5	58.63	50.93
802.11g	12 Mbps	-	-	2462	2483.5	65.53	51.48
802.11g	54 Mbps	-	-	2467	2483.5	64.40	51.19
802.11g	24 Mbps	-	-	2472	2483.5	64.40	51.03
802.11n, HT20	MCS4	-	-	2462	2483.5	66.09	51.13
802.11n, HT20	MCS7	-	-	2467	2483.5	64.99	51.38
802.11n, HT20	MCS2	-	-	2472	2483.5	64.31	51.48
802.11ax, HE20	MCS9x1	SU	-	2462	2483.5	64.95	51.39
802.11ax, HE20	MCS9x1	106	54	2462	2483.5	69.02	49.78
802.11ax, HE20	MCS9x1	SU	-	2467	2483.5	64.63	51.14
802.11ax, HE20	MCS9x1	106	53	2467	2483.5	66.72	51.49
802.11ax, HE20	MCS9x1	SU	-	2472	2483.5	66.48	51.49
802.11ax, HE20	MCS9x1	26	0	2472	2483.5	69.42	48.82

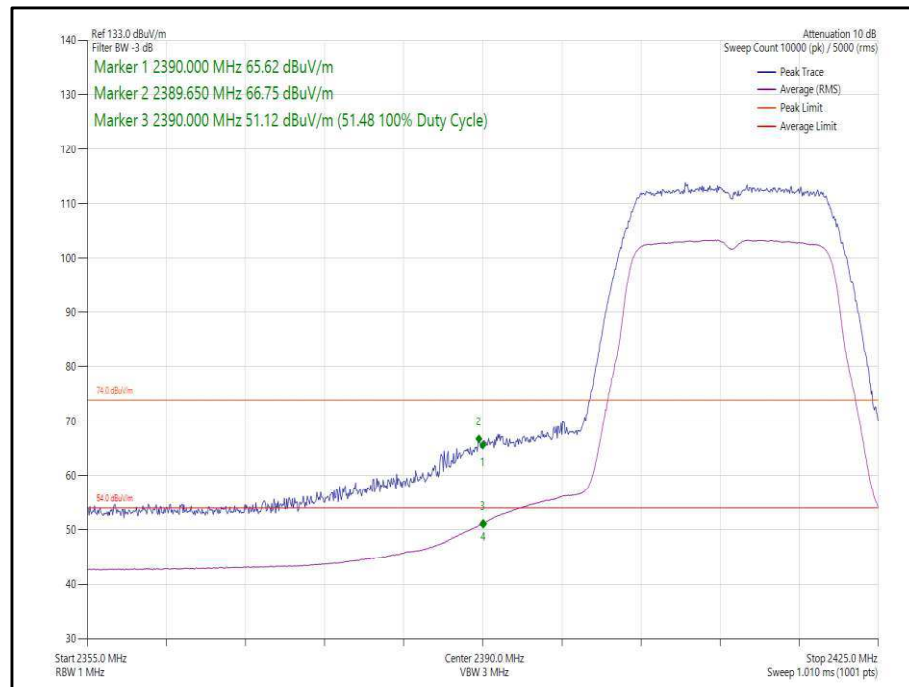
Table 6 - SISO Restricted Band Edge Results



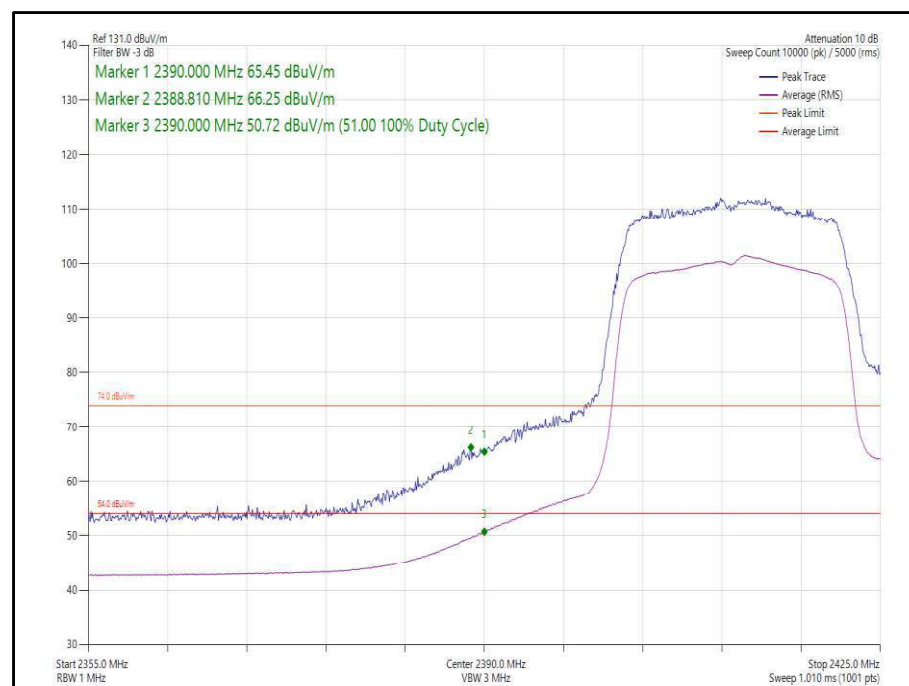
**Figure 1 - 802.11b, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2390 MHz**



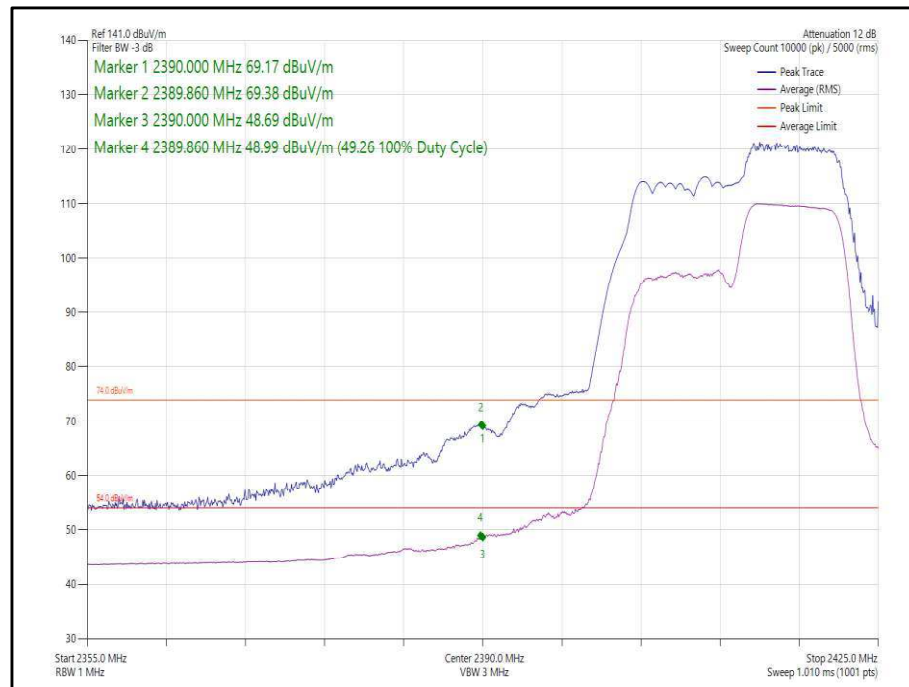
**Figure 2 - 802.11g, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2390 MHz**



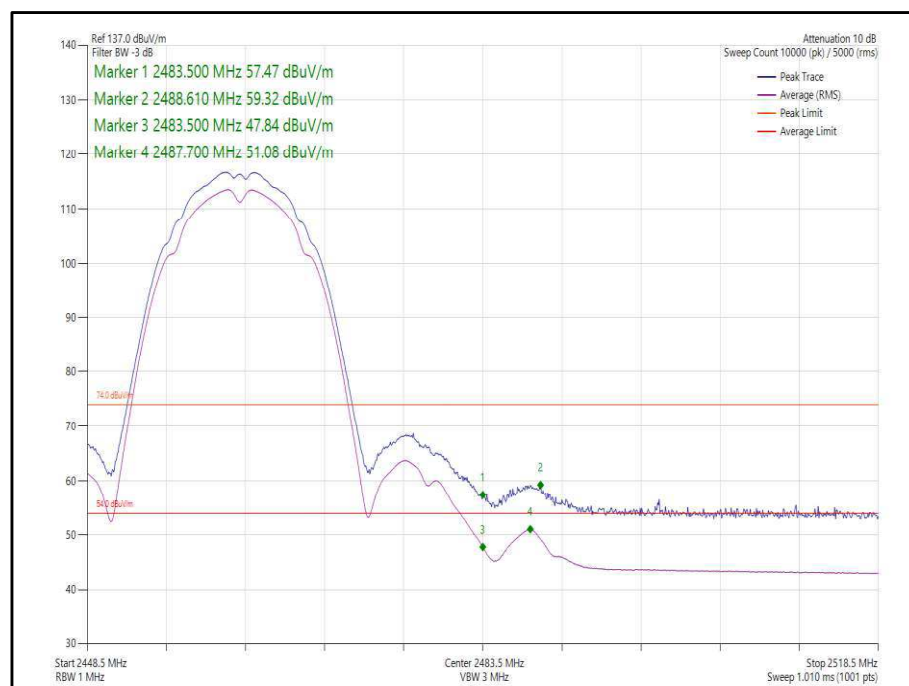
**Figure 3 - 802.11n, HT20, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2390 MHz**



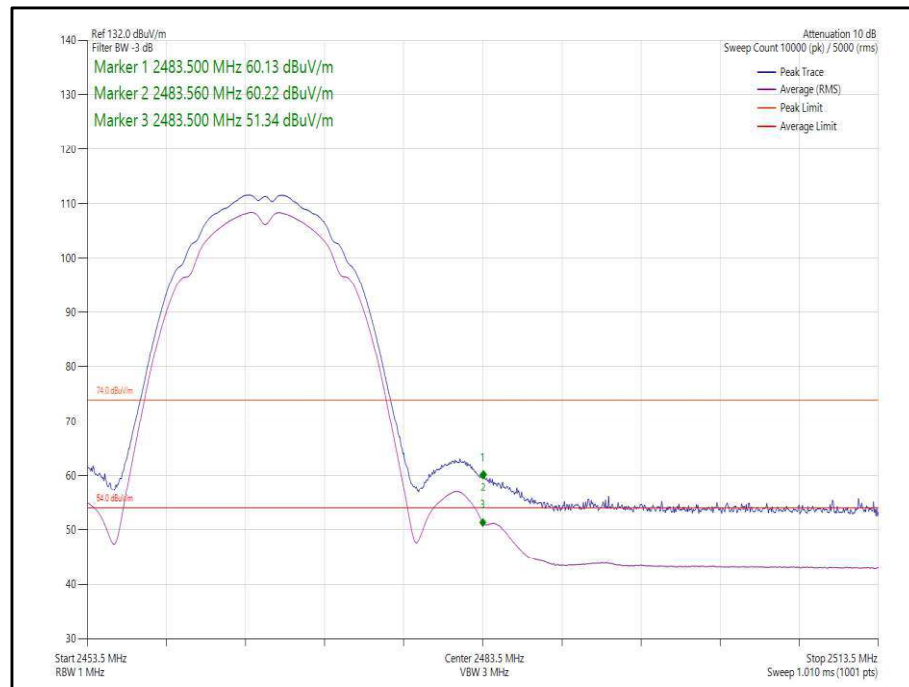
**Figure 4 - 802.11ax, HE20, SU, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2390 MHz**



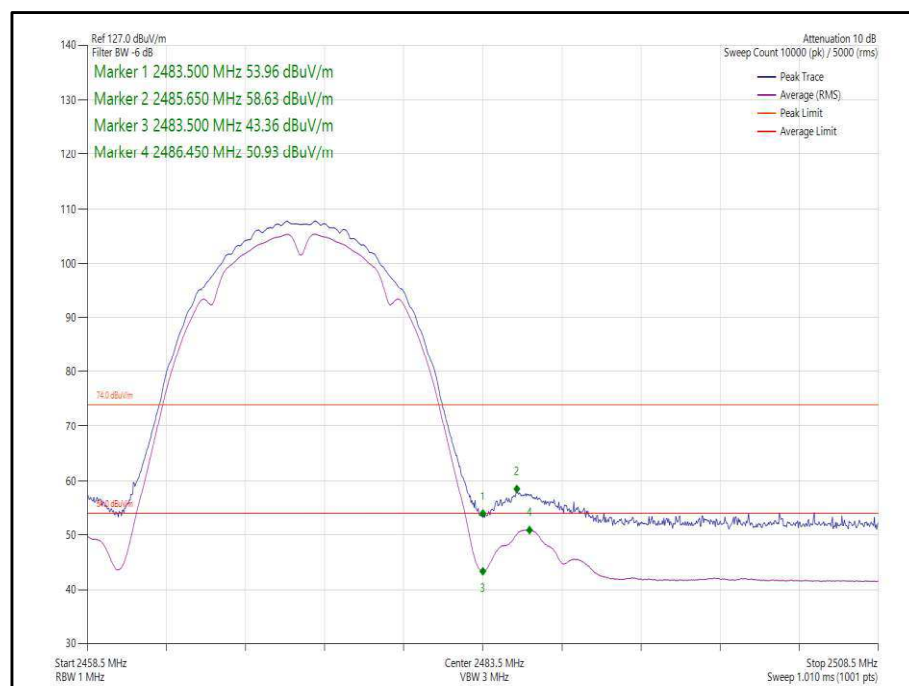
**Figure 5 - 802.11ax, HE20, RU 106-54, SISO, Core 0 - 2412 MHz,
Band Edge Frequency 2390 MHz**



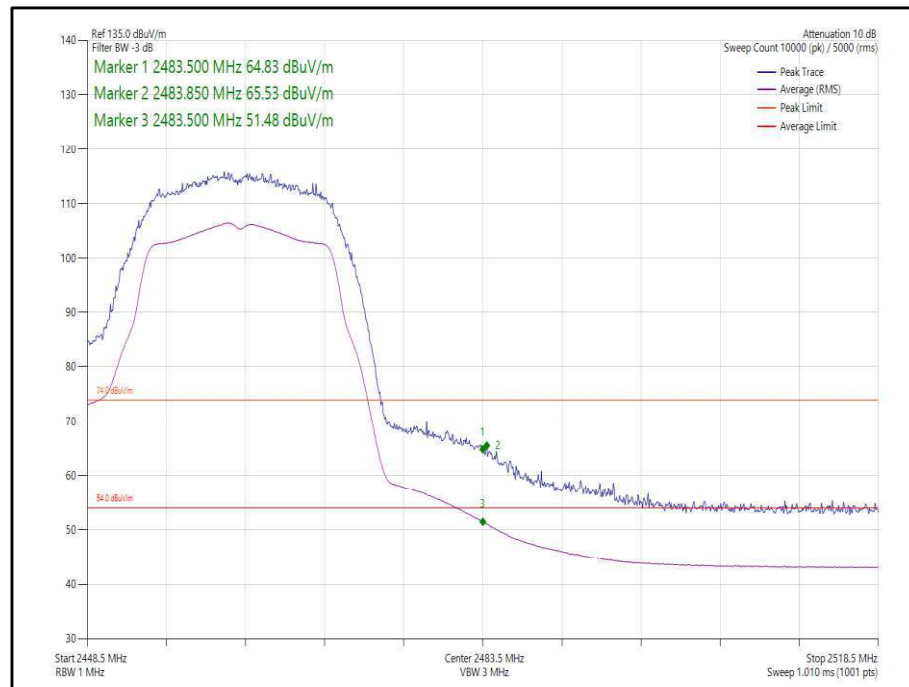
**Figure 6 - 802.11b, SISO, Core 0 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



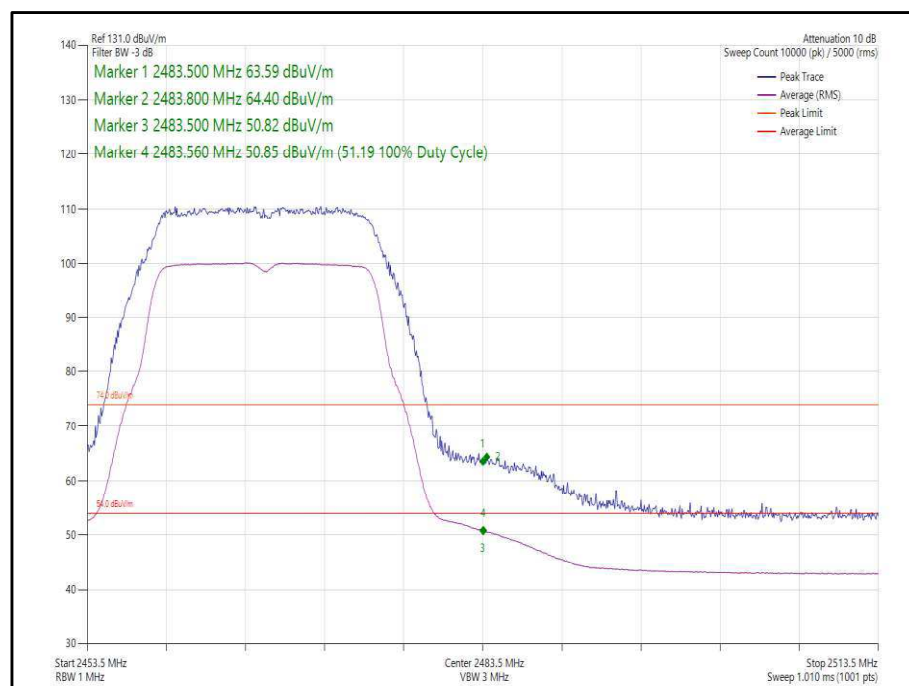
**Figure 7 - 802.11b, SISO, Core 0 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**



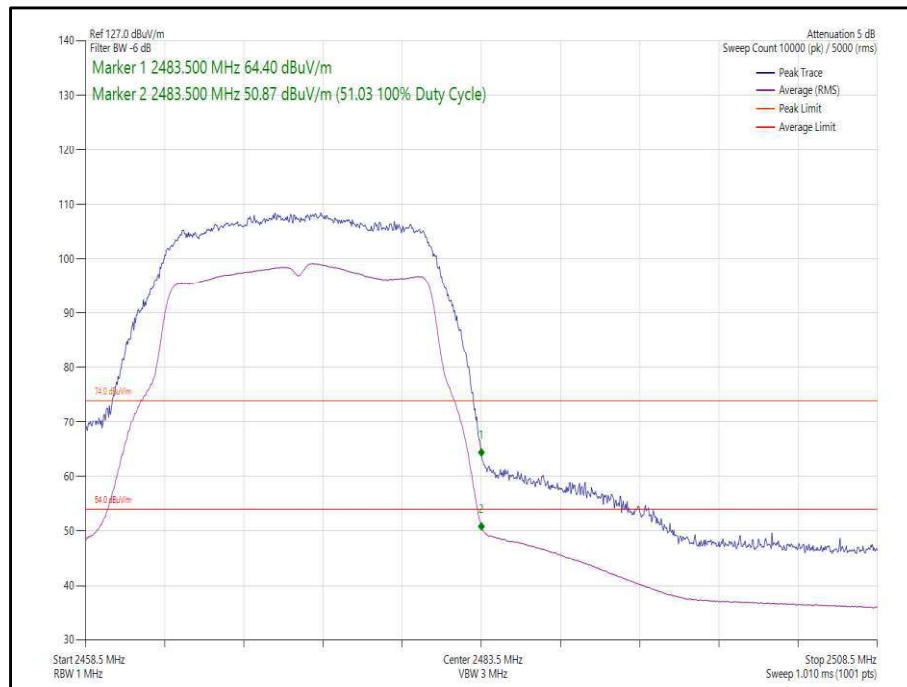
**Figure 8 - 802.11b, SISO, Core 0 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**



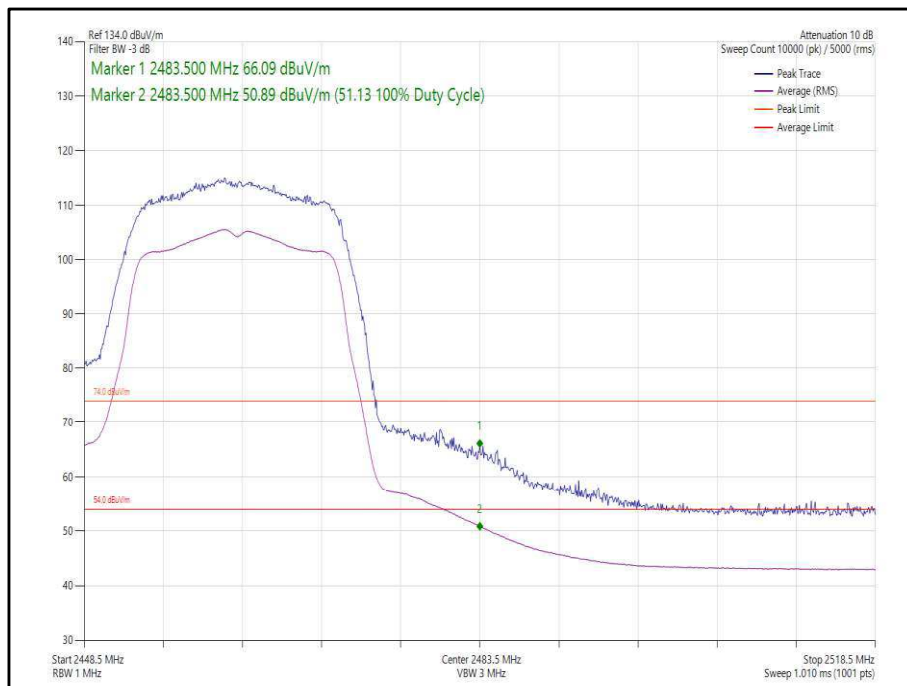
**Figure 9 - 802.11g, SISO, Core 0 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



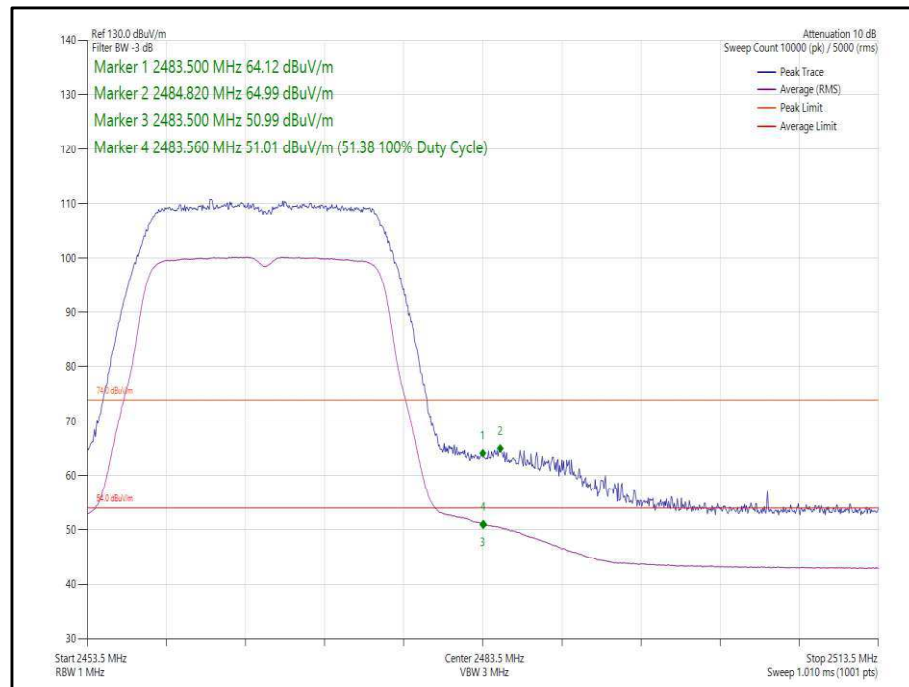
**Figure 10 - 802.11g, SISO, Core 0 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**



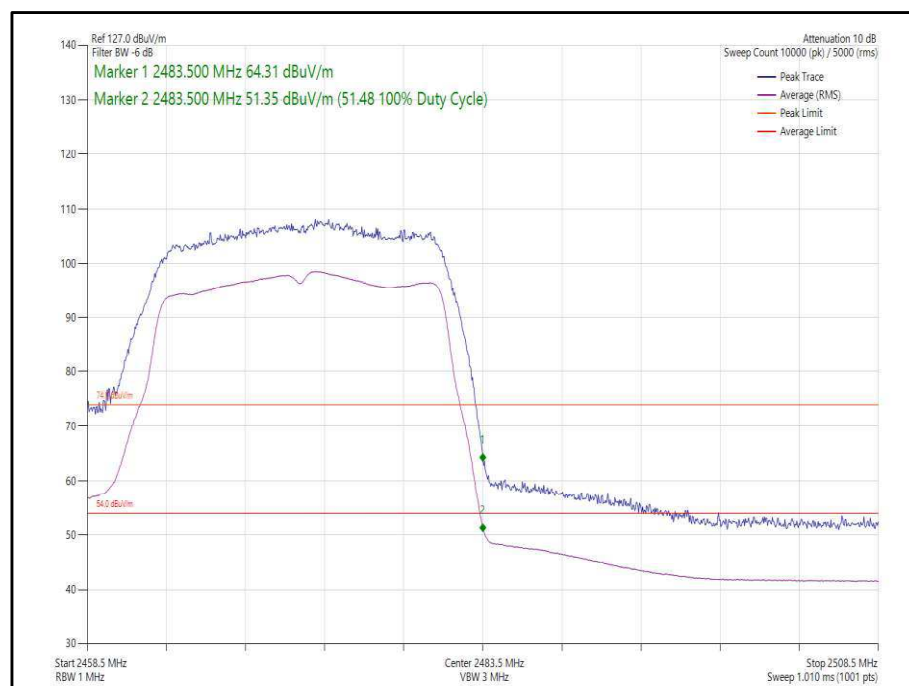
**Figure 11 - 802.11g, SISO, Core 0 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**



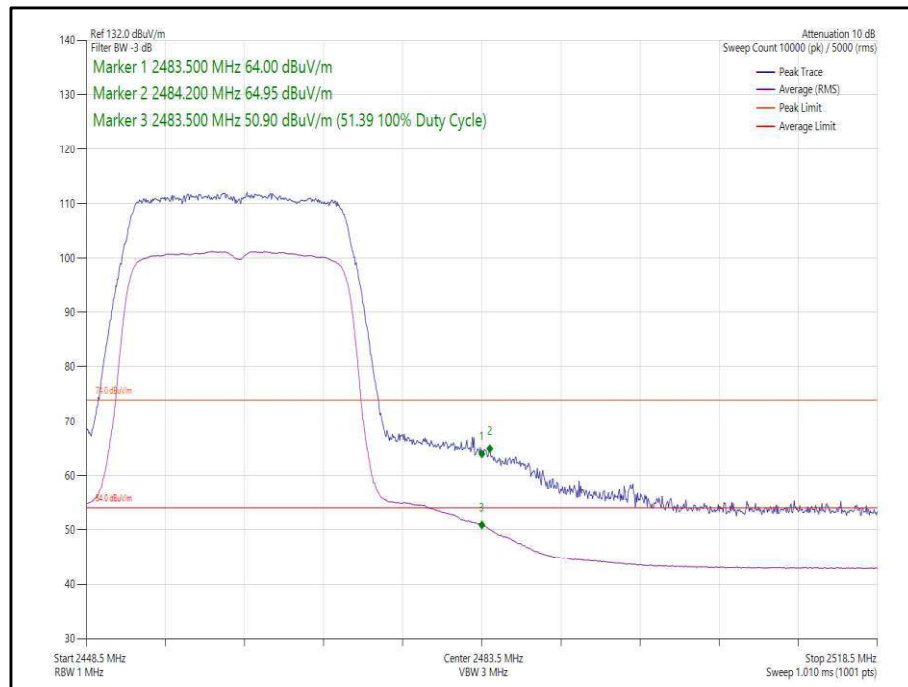
**Figure 12 - 802.11n, HT20, SISO, Core 0 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



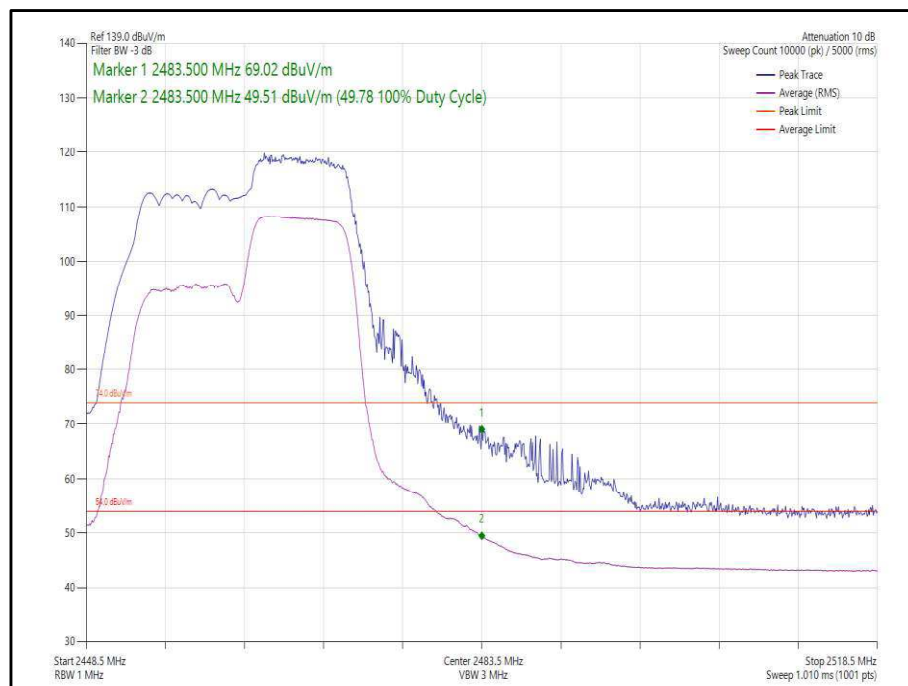
**Figure 13 - 802.11n, HT20, SISO, Core 0 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**



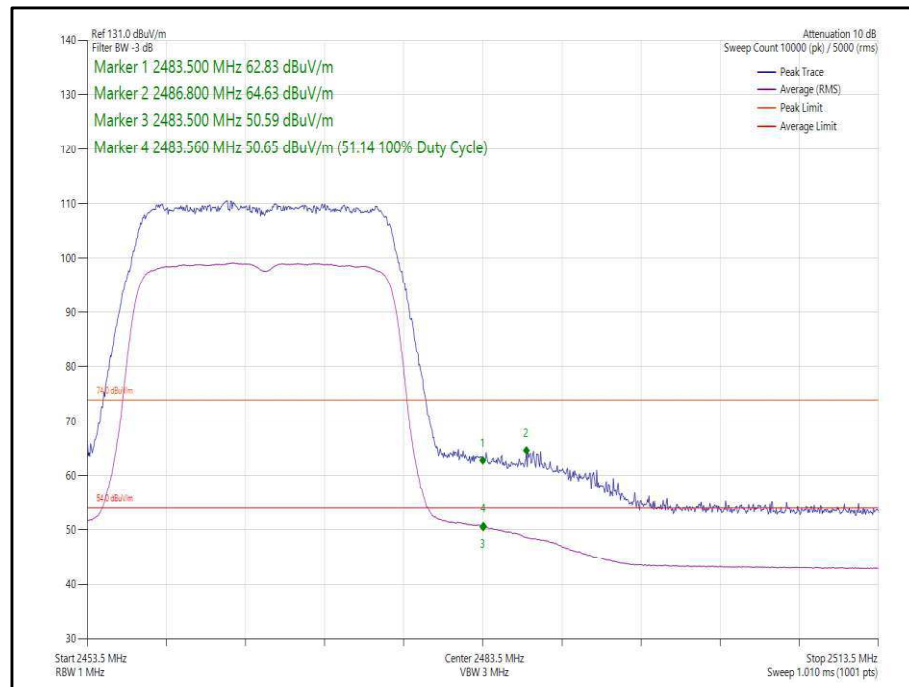
**Figure 14 - 802.11n, HT20, SISO, Core 0 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**



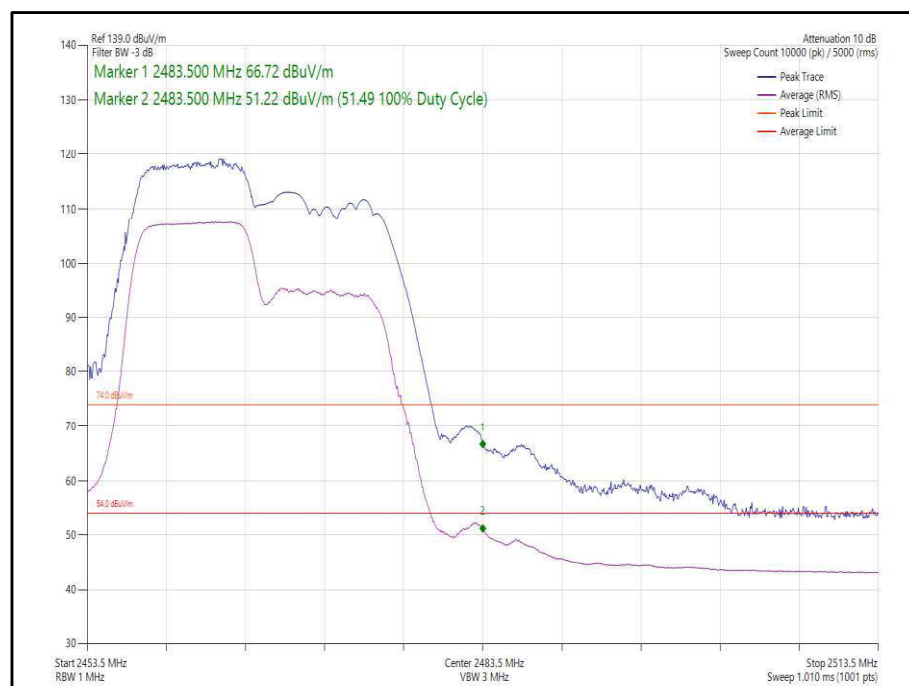
**Figure 15 - 802.11ax, HE20, SU, SISO Core 0 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



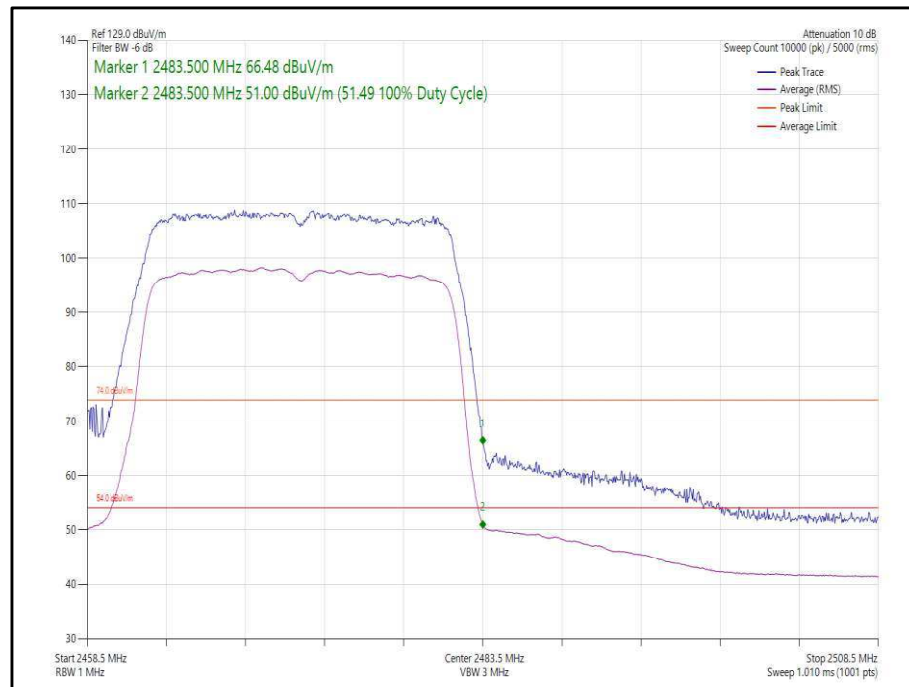
**Figure 16 - 802.11ax, HE20, RU 106-54, SISO, Core 0 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



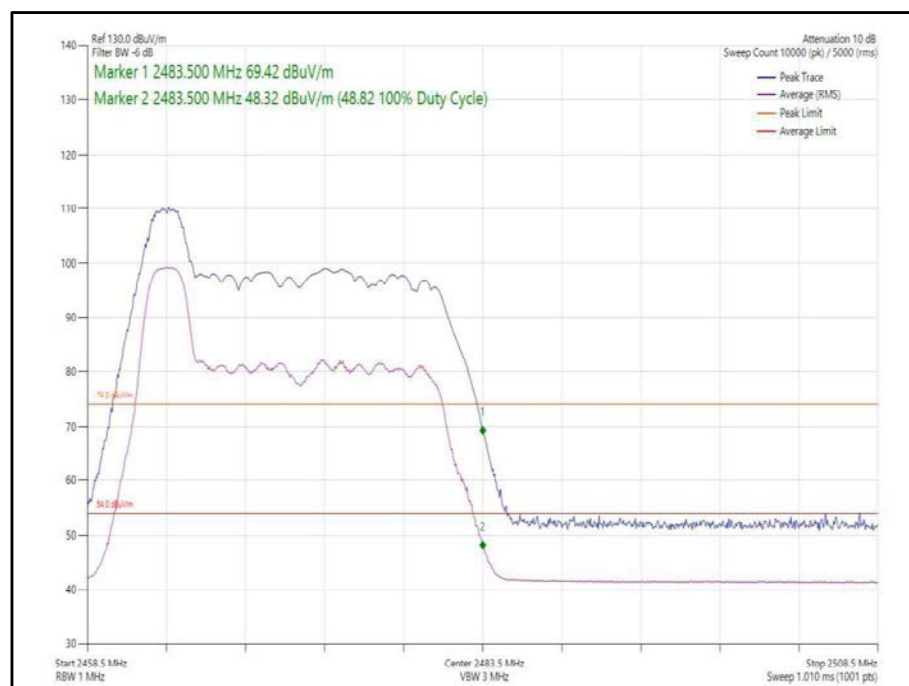
**Figure 17 - 802.11ax, HE20, SU, SISO, Core 0 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**



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



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



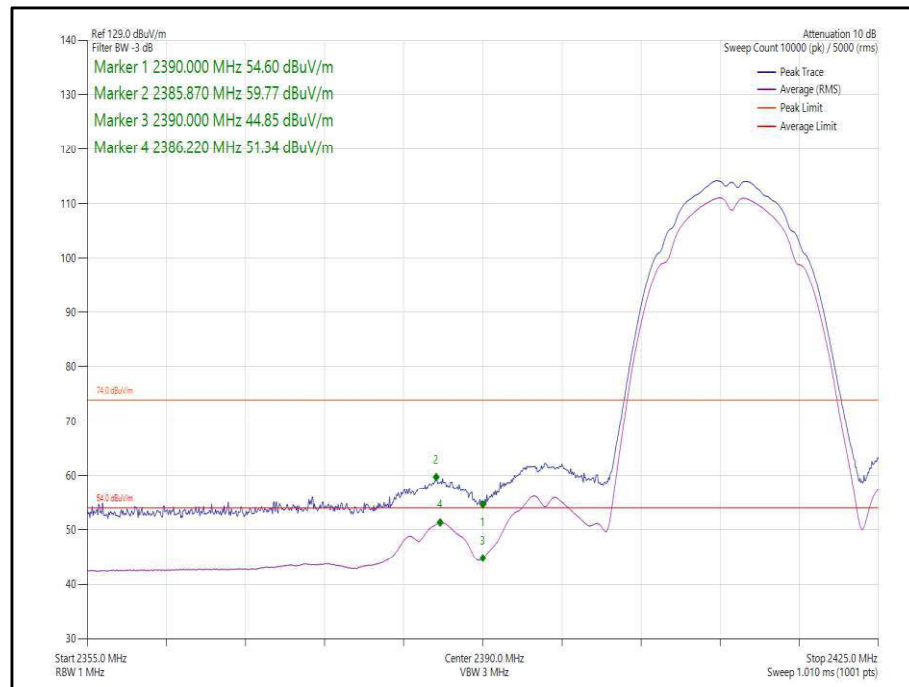
**Figure 20 - 802.11ax, HE20, RU 26-0, SISO, Core 0 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**



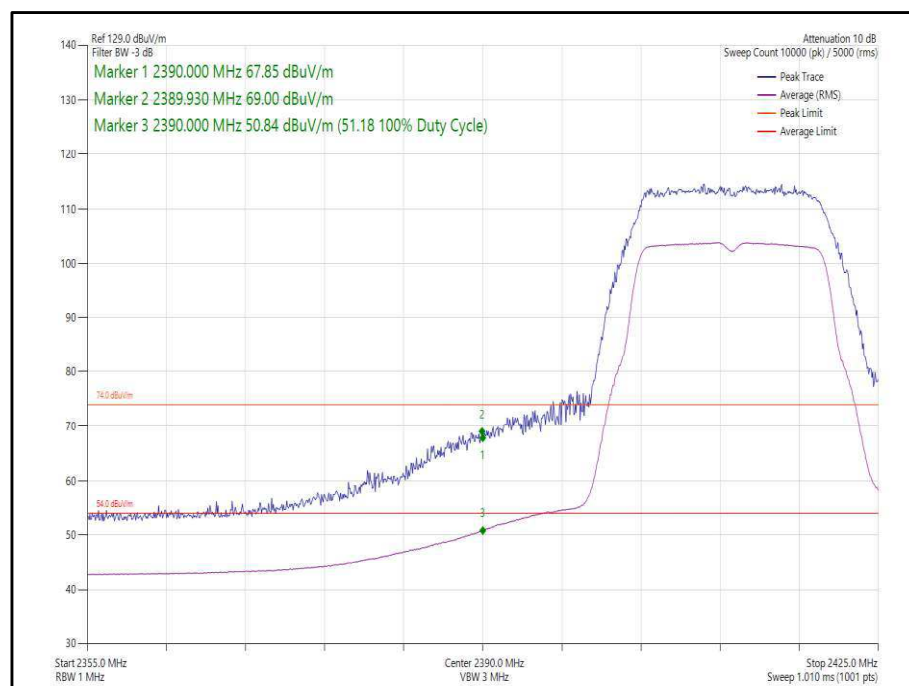
20 MHz Bandwidth - Core 1 (SISO)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBuV/m)
802.11b	1 Mbps	-	-	2412	2390	59.77	51.34
802.11g	54 Mbps	-	-	2412	2390	69.00	51.18
802.11n, HT20	MCS4	-	-	2412	2390	67.17	51.13
802.11ax, HE20	MCS4x1	SU	-	2412	2390	66.41	51.35
802.11ax, HE20	MCS9x1	106	53	2412	2390	69.36	48.87
802.11b	1 Mbps	-	-	2462	2483.5	59.26	50.11
802.11b	1 Mbps	-	-	2467	2483.5	60.69	51.28
802.11b	1 Mbps	-	-	2472	2483.5	58.93	51.20
802.11g	12 Mbps	-	-	2462	2483.5	65.29	51.34
802.11g	24 Mbps	-	-	2467	2483.5	65.00	51.39
802.11g	24 Mbps	-	-	2472	2483.5	63.89	51.42
802.11n, HT20	MCS7	-	-	2462	2483.5	67.26	51.46
802.11n, HT20	MCS7	-	-	2467	2483.5	65.20	51.49
802.11n, HT20	MCS2	-	-	2472	2483.5	65.39	51.49
802.11ax, HE20	MCS2x1	SU	-	2462	2483.5	64.73	51.13
802.11ax, HE20	MCS9x1	106	53	2462	2483.5	69.25	51.00
802.11ax, HE20	MCS4x1	SU	-	2467	2483.5	64.48	51.44
802.11ax, HE20	MCS9x1	106	54	2467	2483.5	63.36	51.03
802.11ax, HE20	MCS4x1	SU	-	2472	2483.5	66.38	51.36
802.11ax, HE20	MCS9x1	26	8	2472	2483.5	69.44	48.61

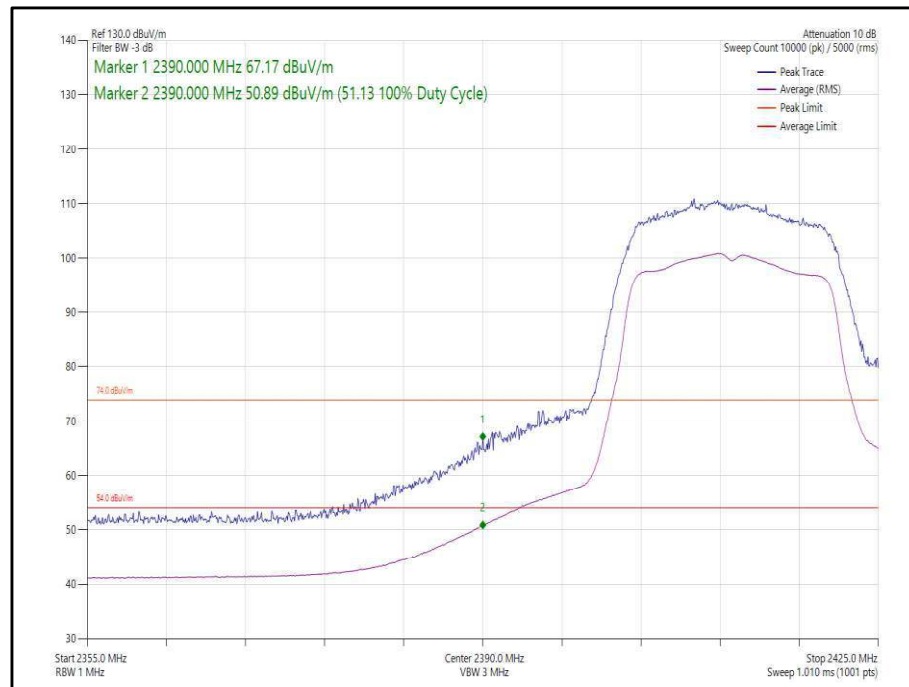
Table 7 - SISO Restricted Band Edge Results



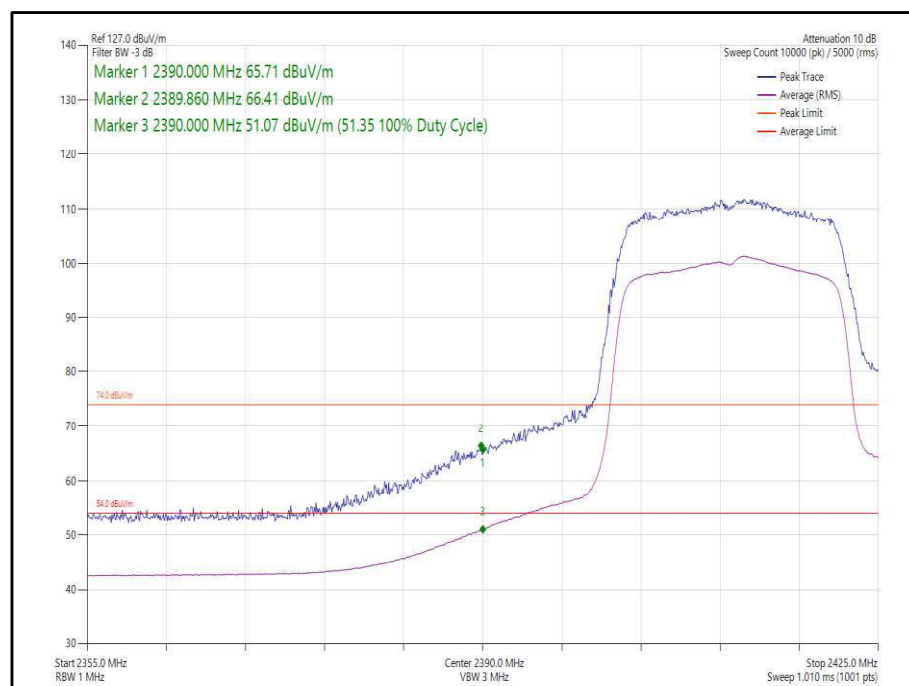
**Figure 21 - 802.11b, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**



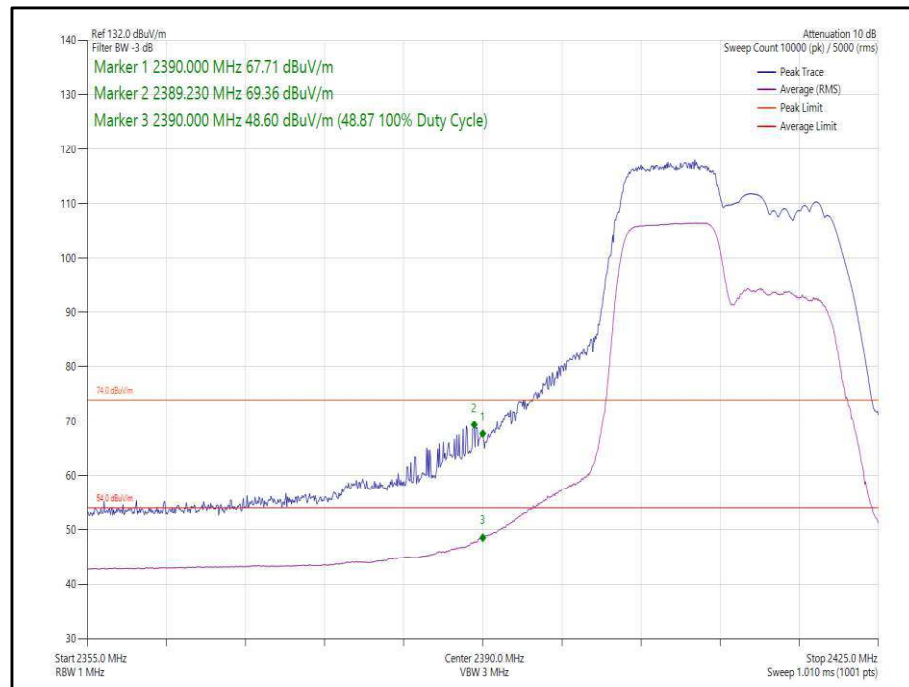
**Figure 22 - 802.11g, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**



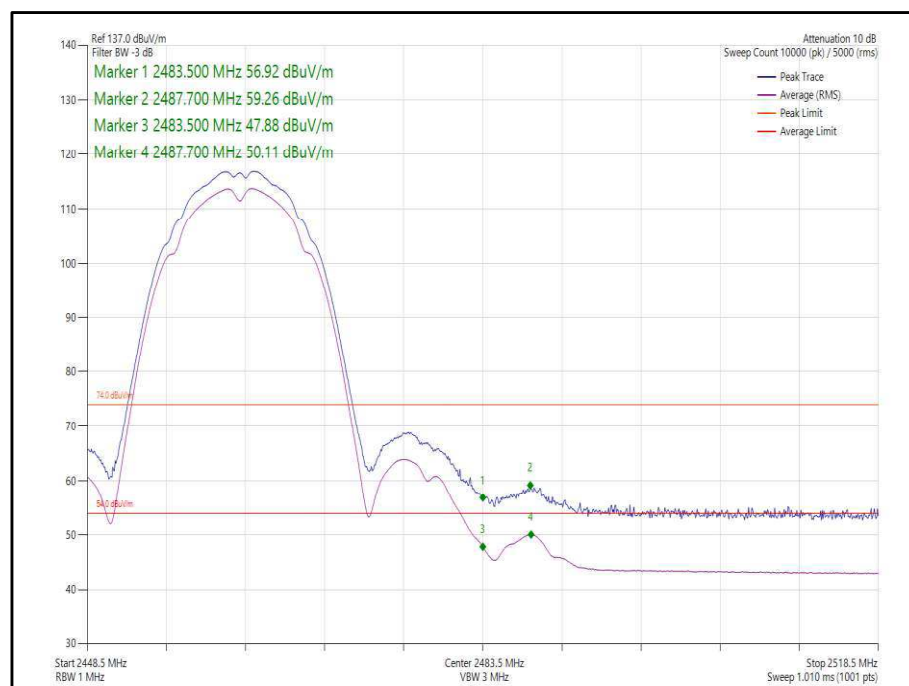
**Figure 23 - 802.11n, HT20, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**



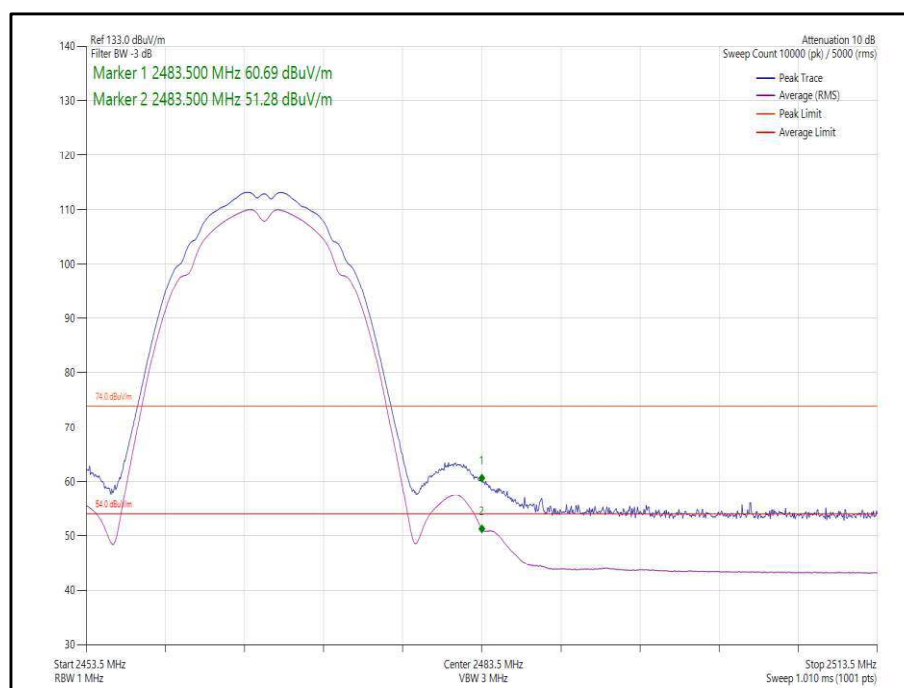
**Figure 24 - 802.11ax, HE20, SU, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**



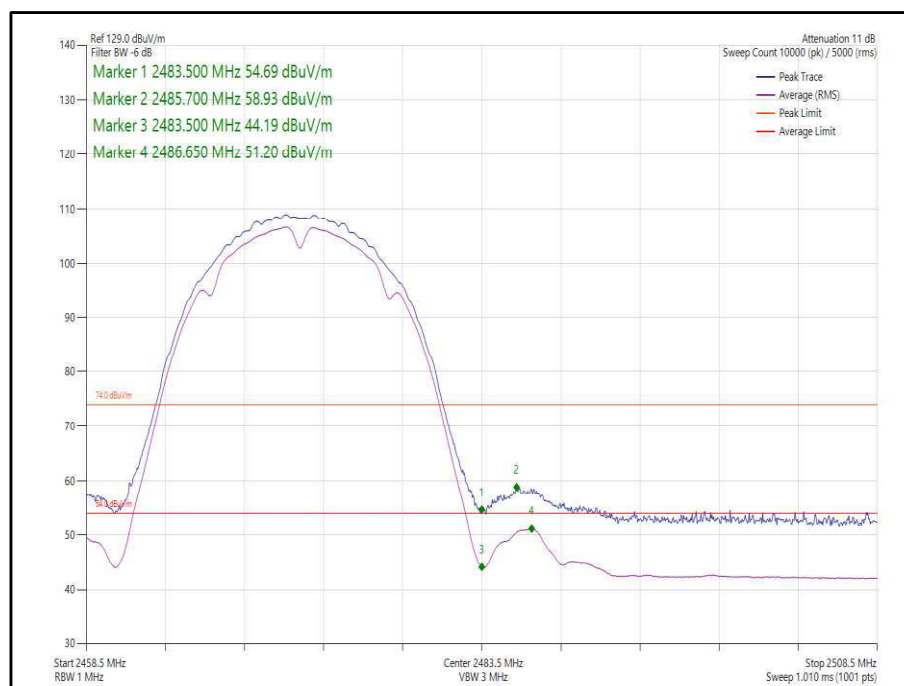
**Figure 25 - 802.11ax, HE20, RU 106-53, SISO, Core 1 - 2412 MHz,
Band Edge Frequency 2390 MHz**



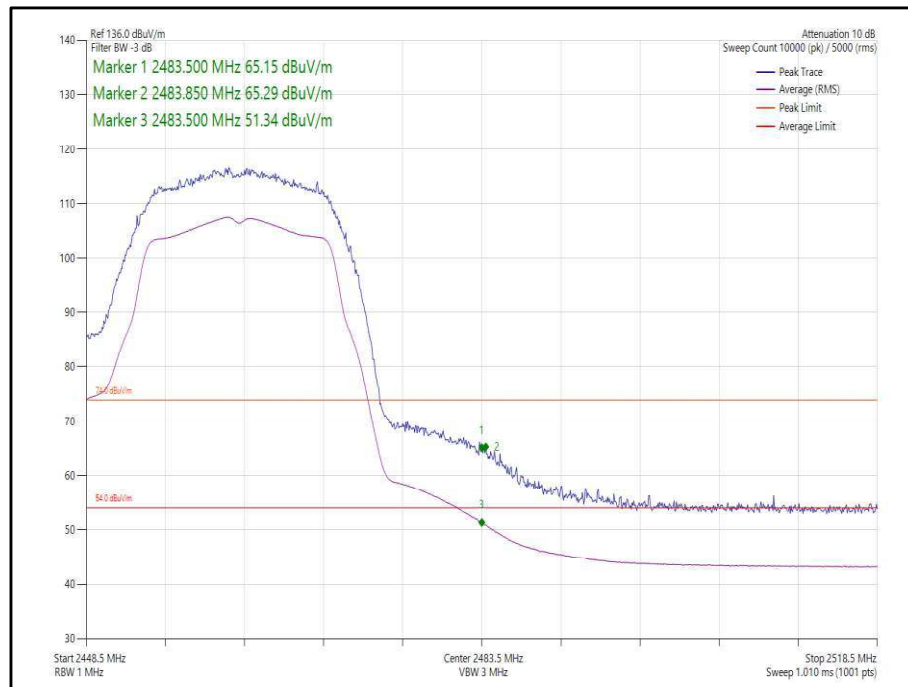
**Figure 26 - 802.11b, SISO, Core 1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



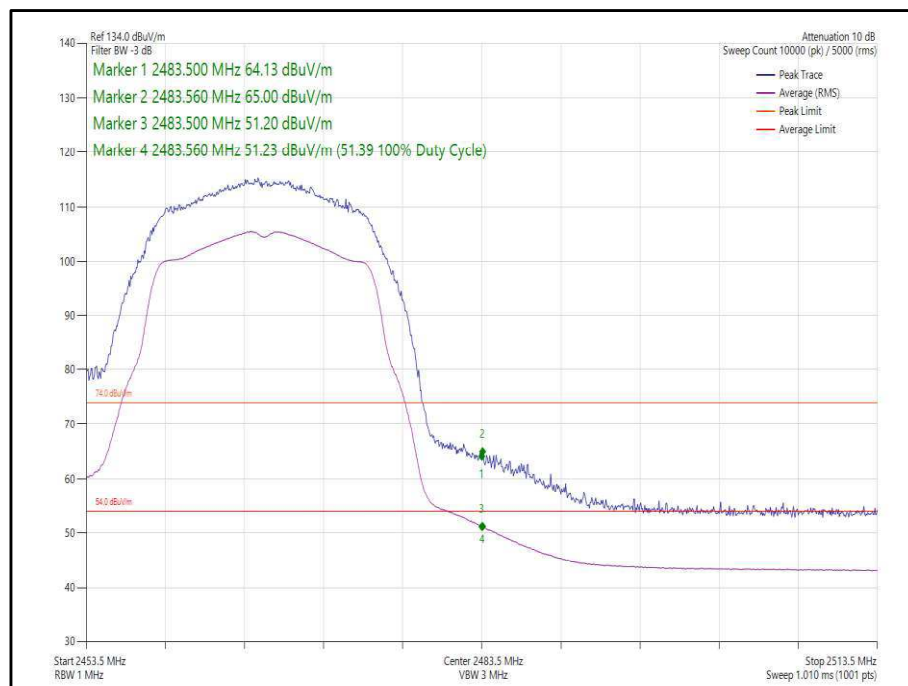
**Figure 27 - 802.11b, SISO, Core 1 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**



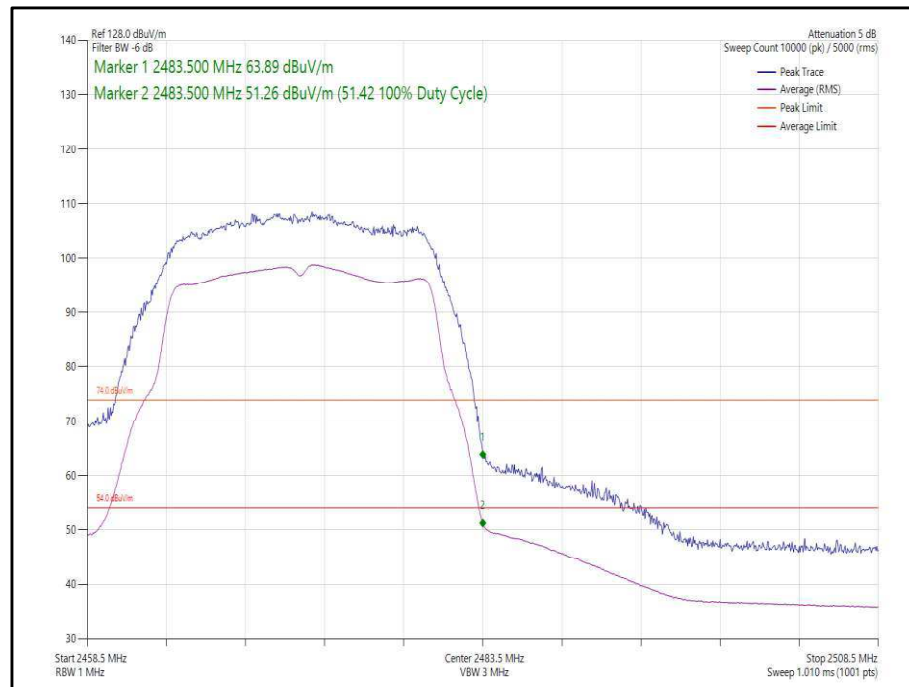
**Figure 28 - 802.11b, SISO, Core 1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**



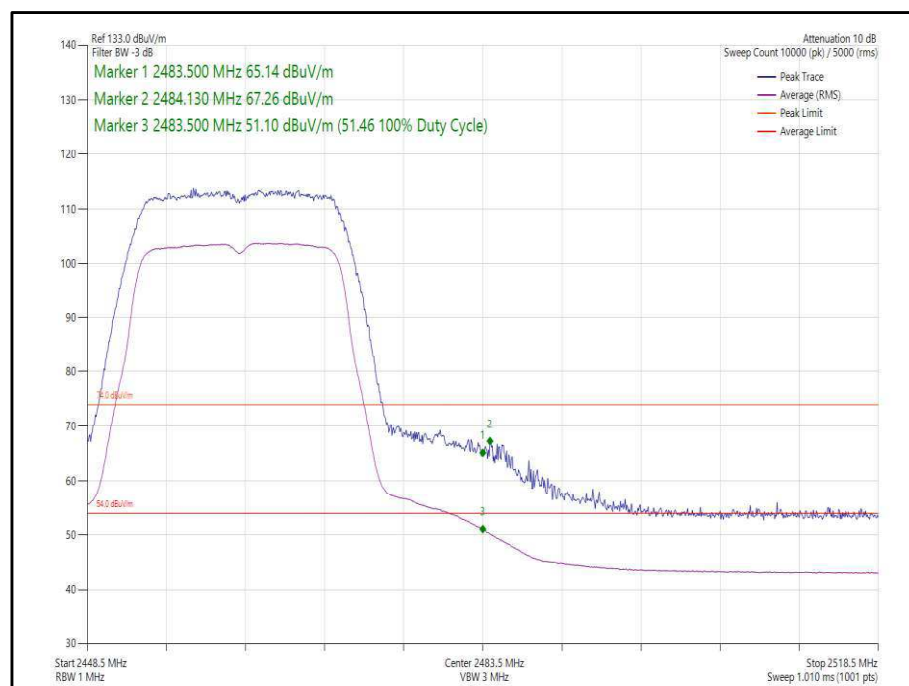
**Figure 29 - 802.11g, SISO, Core 1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



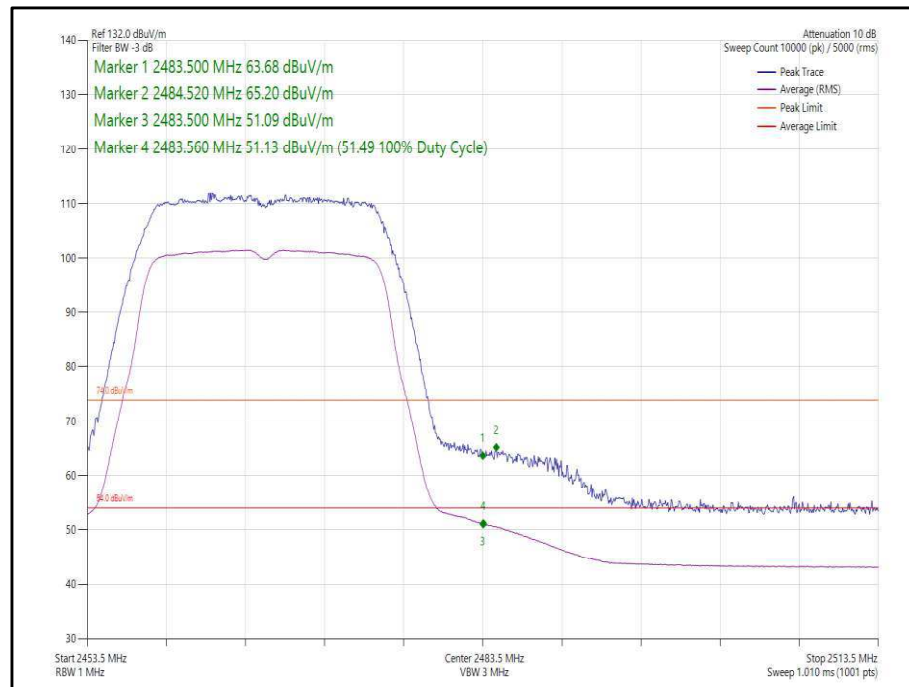
**Figure 30 - 802.11g, SISO, Core 1 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**



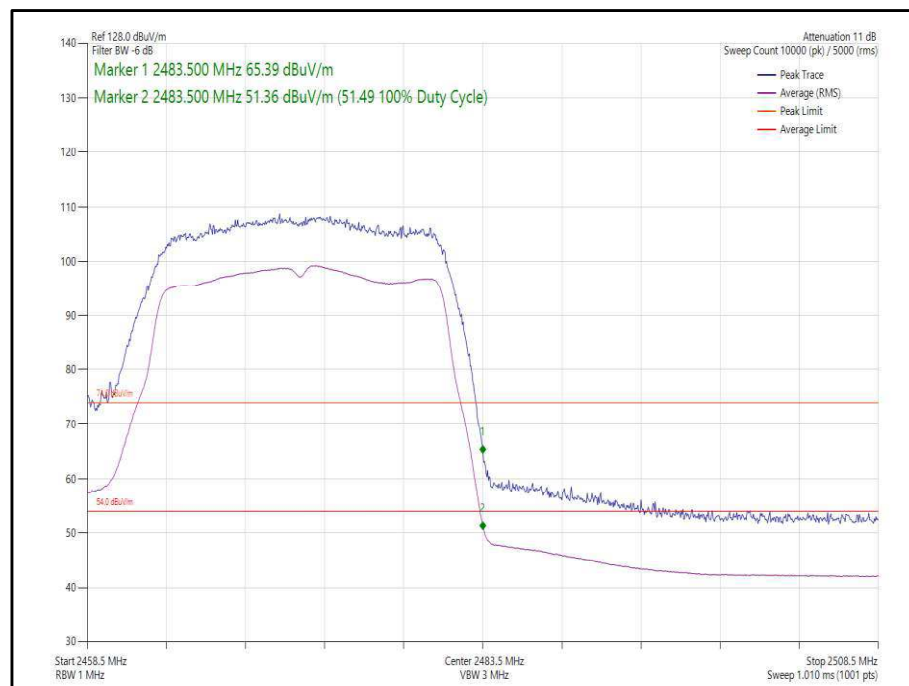
**Figure 31 - 802.11g, SISO, Core 1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**



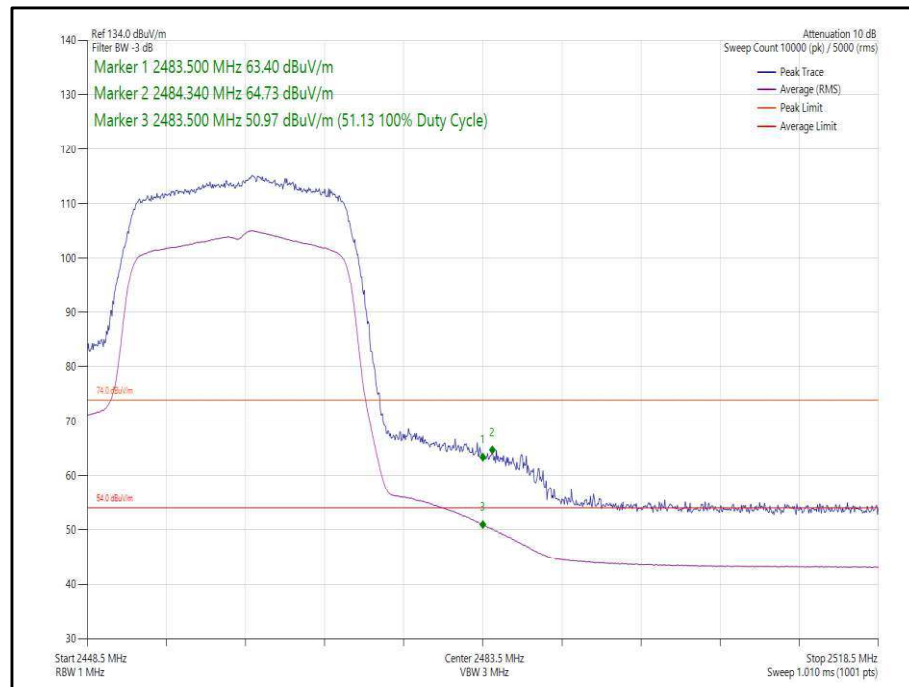
**Figure 32 - 802.11n, HT20, SISO, Core 1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



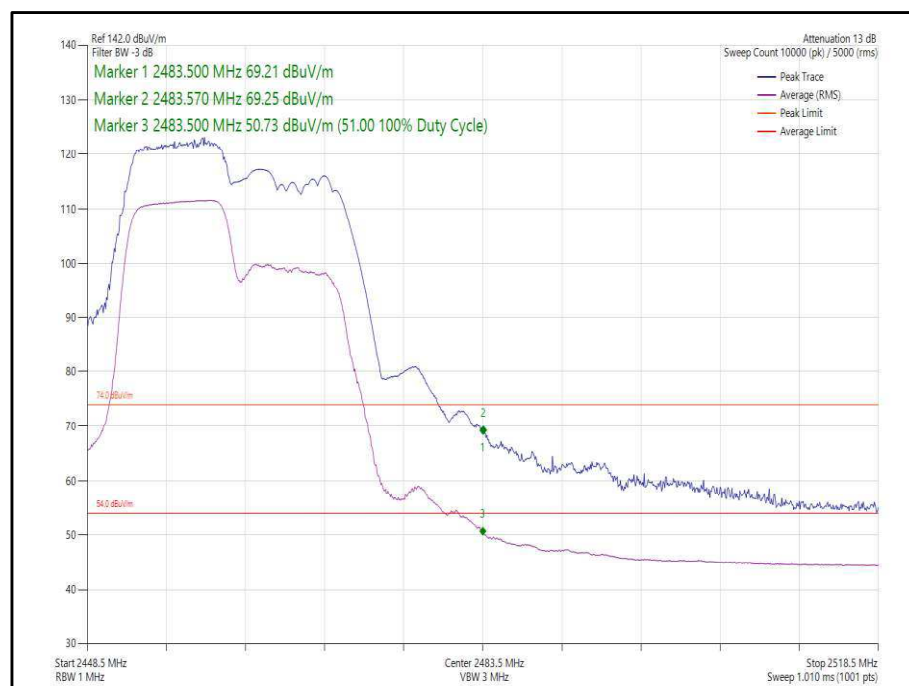
**Figure 33 - 802.11n, HT20, SISO, Core 1 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**



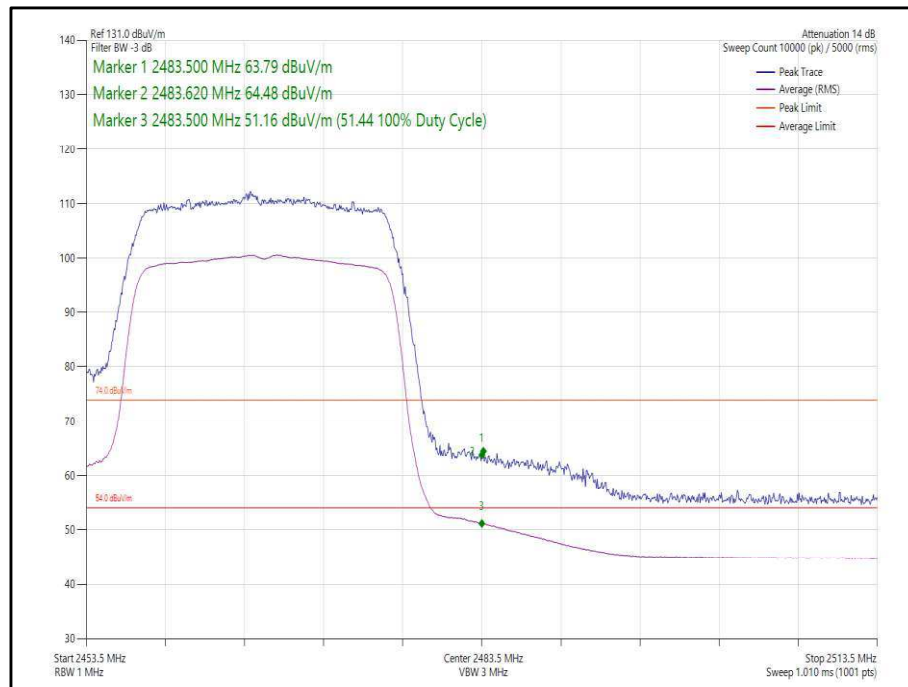
**Figure 34 - 802.11n, HT20, SISO, Core 1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**



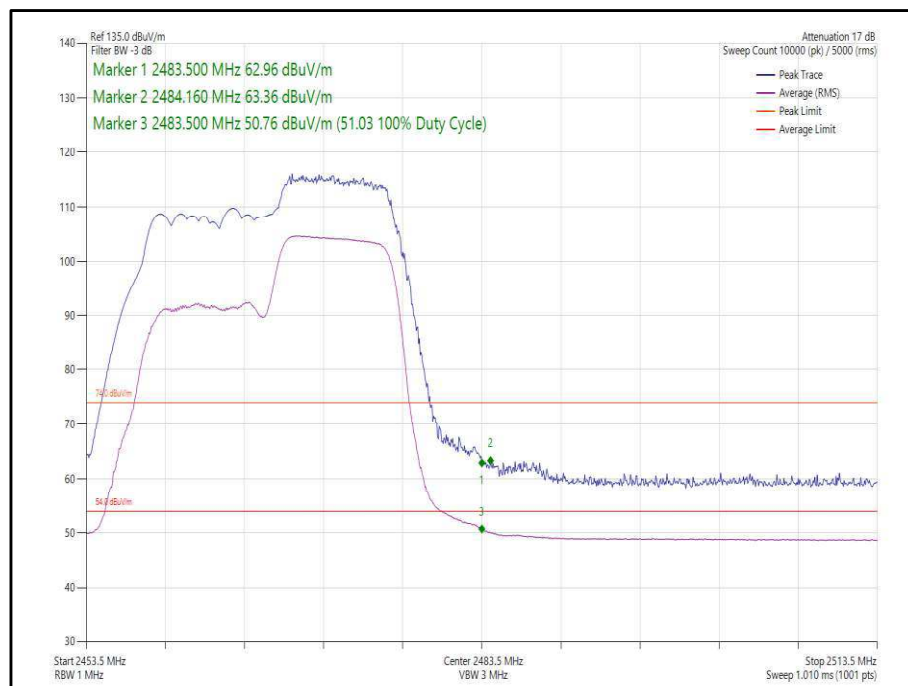
**Figure 35 - 802.11ax, HE20, SU, SISO, Core 1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



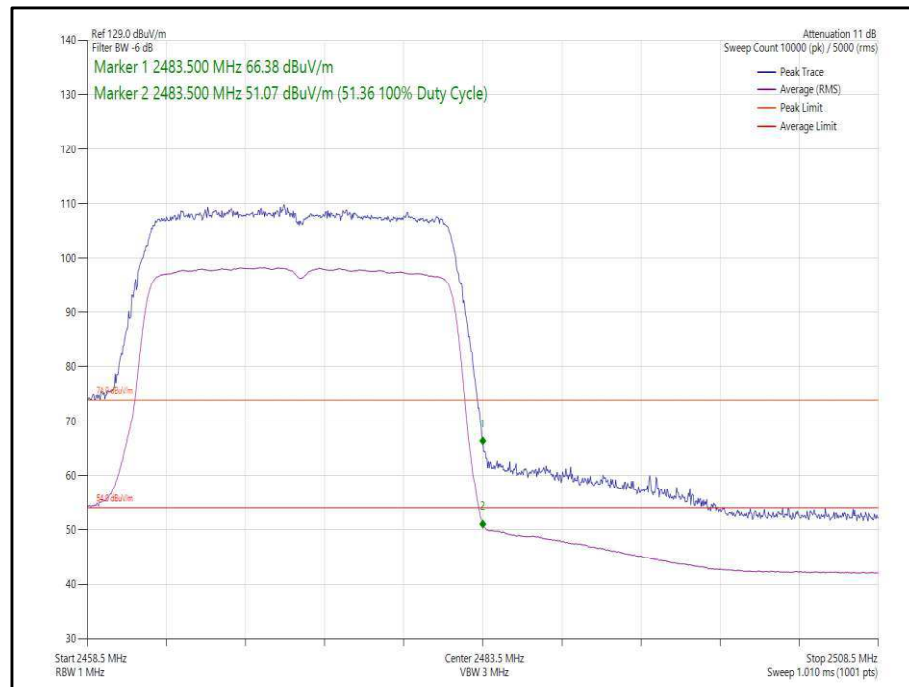
**Figure 36 - 802.11ax, HE20, RU 106-53, SISO, Core 1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



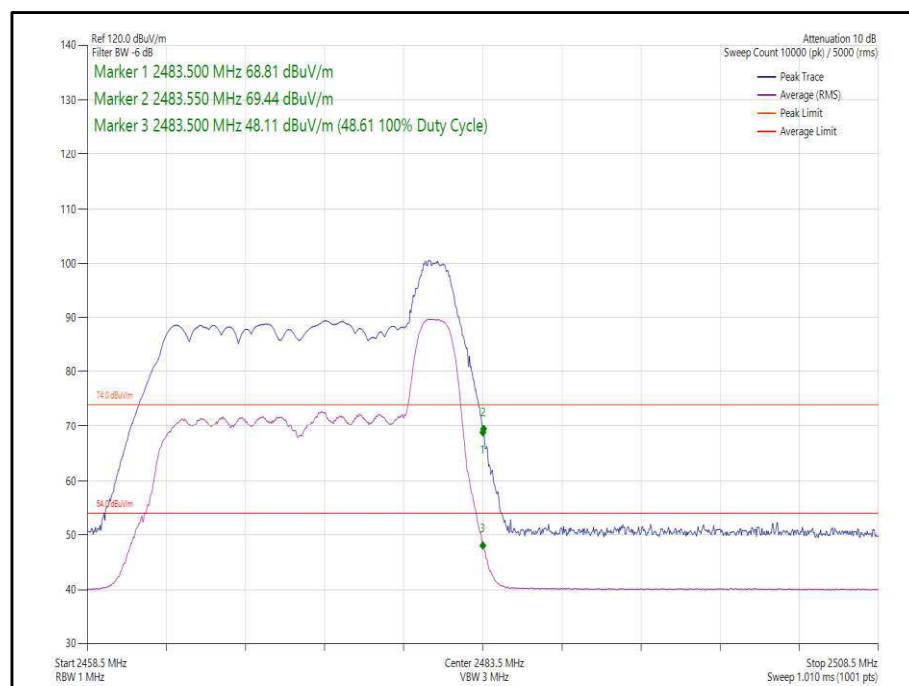
**Figure 37 - 802.11ax, HE20, SU, SISO, Core 1 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**



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



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



**Figure 40 - 802.11ax, HE20, RU 26-8, SISO, Core 1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**

20 MHz Bandwidth - Core 0-1 (CDD)

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11n, HT20	MCS4	-	-	2412	2390	67.13	51.39
802.11ax, HE20	MCS2x1	SU	-	2412	2390	65.91	51.36
802.11ax, HE20	MCS9x1	106	54	2412	2390	69.27	51.20
802.11n, HT20	MCS4	-	-	2462	2483.5	65.35	51.36
802.11n, HT20	MCS2	-	-	2467	2483.5	63.77	51.30
802.11n, HT20	MCS4	-	-	2472	2483.5	64.52	51.46
802.11ax, HE20	MCS2x1	SU	-	2462	2483.5	65.63	51.31
802.11ax, HE20	MCS9x1	106	54	2462	2483.5	67.51	51.47
802.11ax, HE20	MCS4x1	SU	-	2467	2483.5	64.68	51.30
802.11ax, HE20	MCS9x1	106	54	2467	2483.5	68.47	51.49
802.11ax, HE20	MCS4x1	SU	-	2472	2483.5	65.35	51.49
802.11ax, HE20	MCS9x1	106	53	2472	2483.5	69.48	49.79

Table 8 - CDD Restricted Band Edge Results

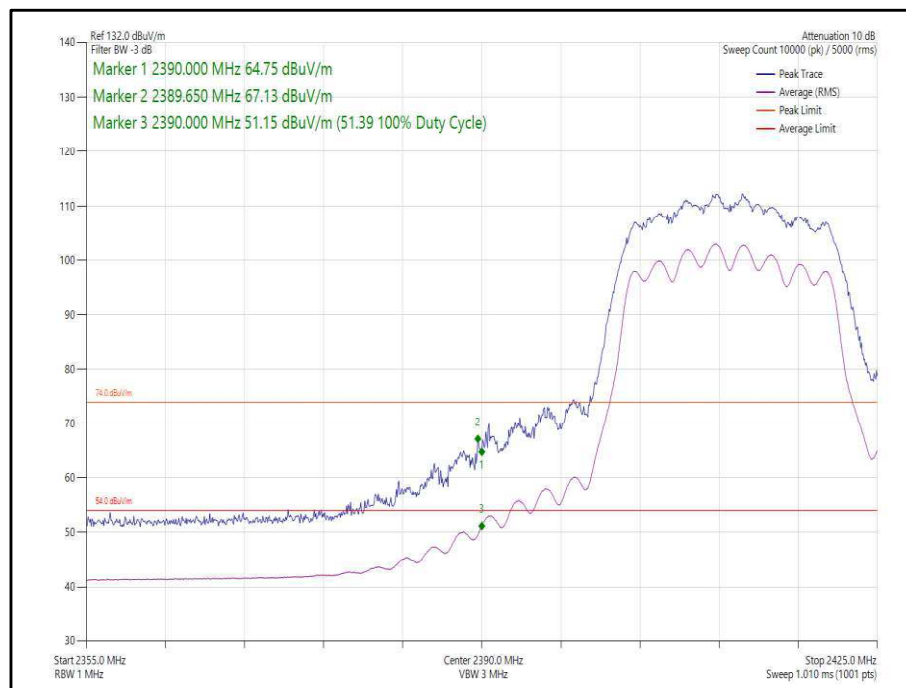
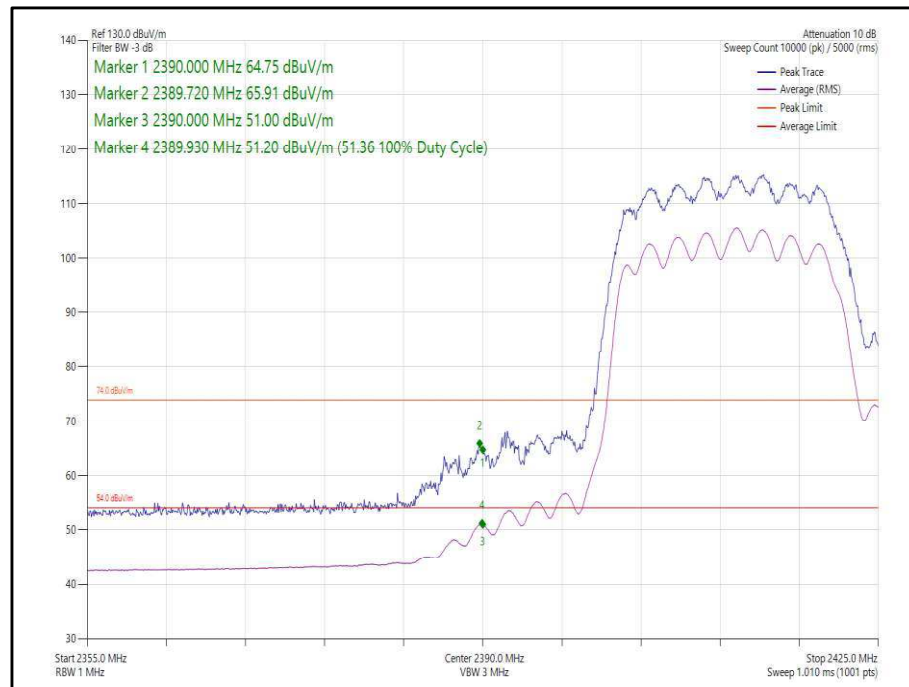
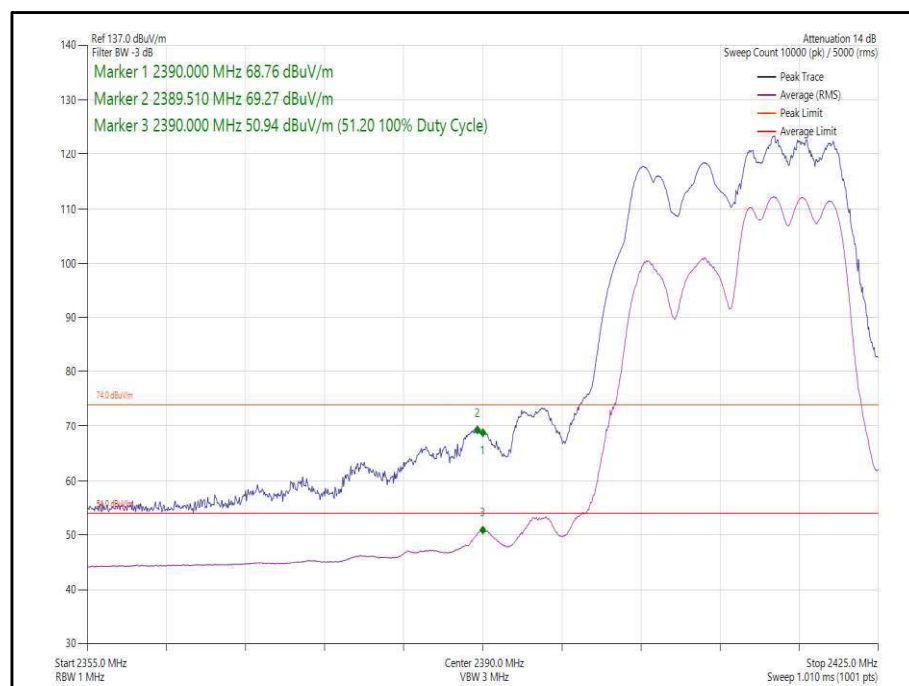


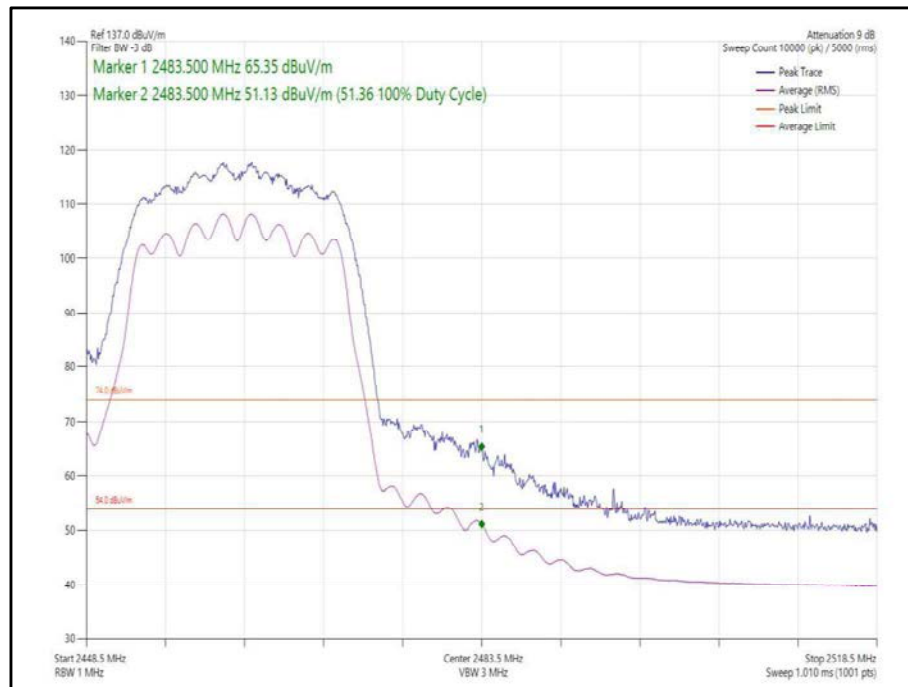
Figure 41 - 802.11n, HT20, CDD, Core 0-1 - 2412 MHz,
Band Edge Frequency 2390 MHz



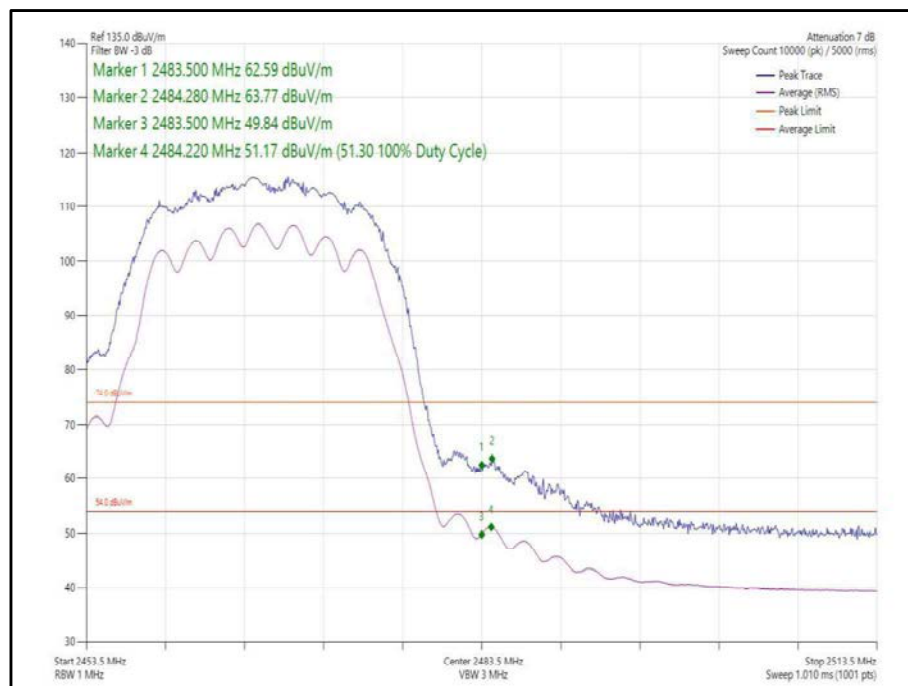
**Figure 42 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2412 MHz,
Band Edge Frequency 2390 MHz**



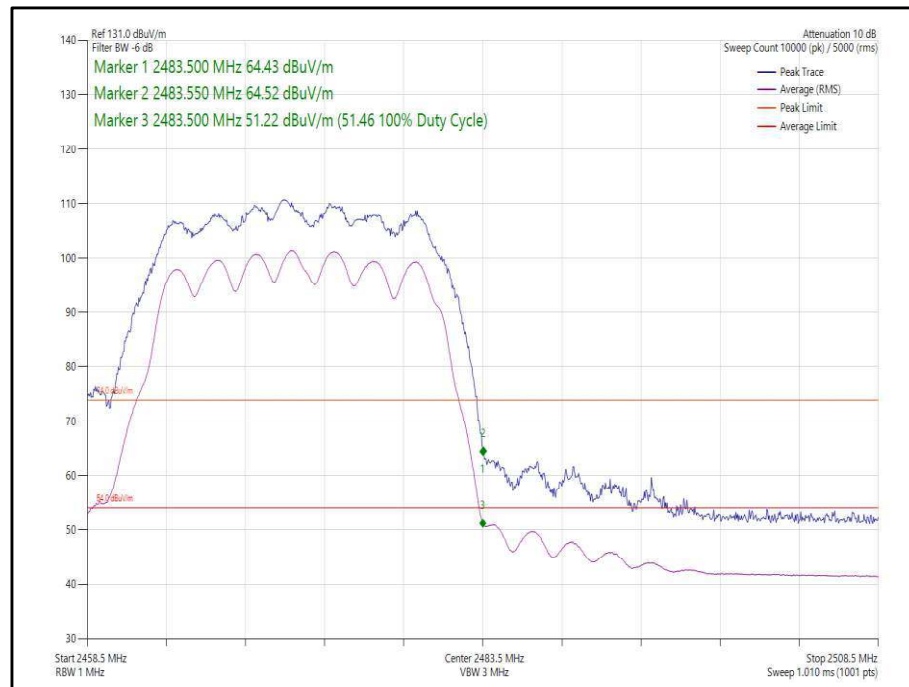
**Figure 43 - 802.11ax, HE20, RU 106-54, CDD, Core 0-1 - 2412 MHz,
Band Edge Frequency 2390 MHz**



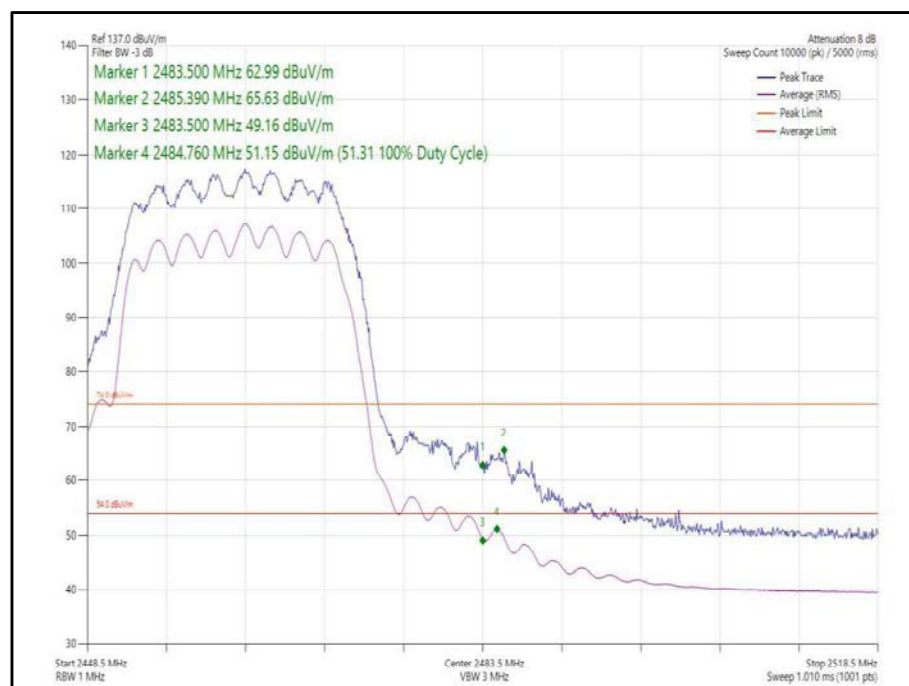
**Figure 44 - 802.11n, HT20, CDD, Core 0-1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



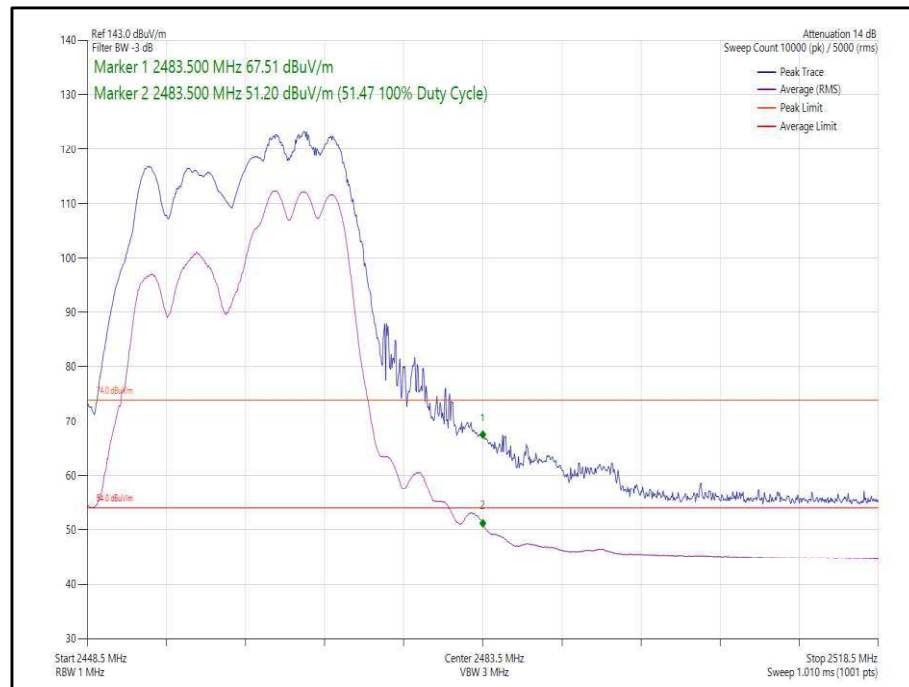
**Figure 45 - 802.11n, HT20, CDD, Core 0-1 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**



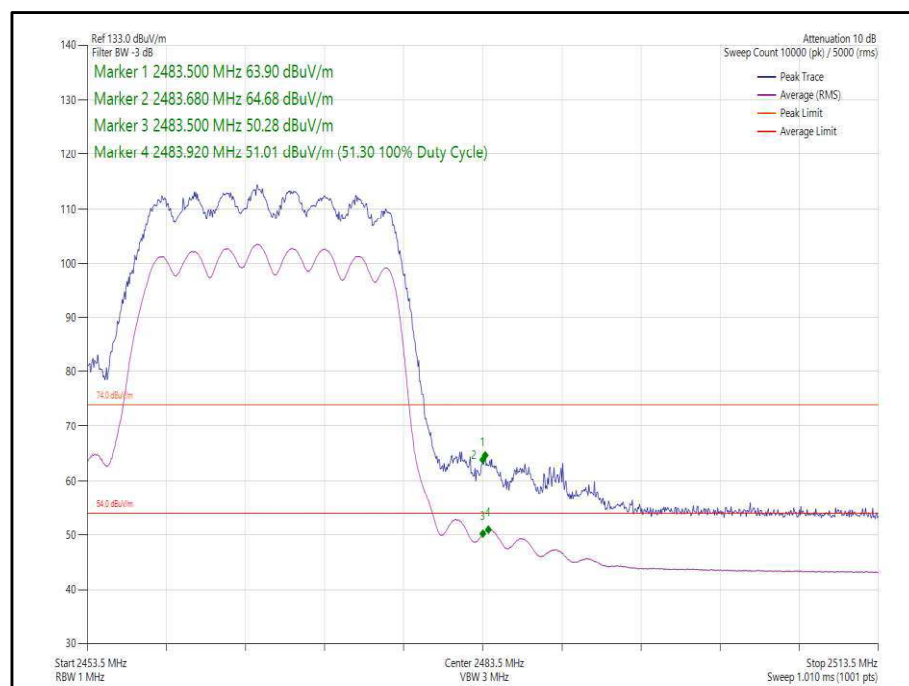
**Figure 46 - 802.11n, HT20, CDD, Core 0-1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**



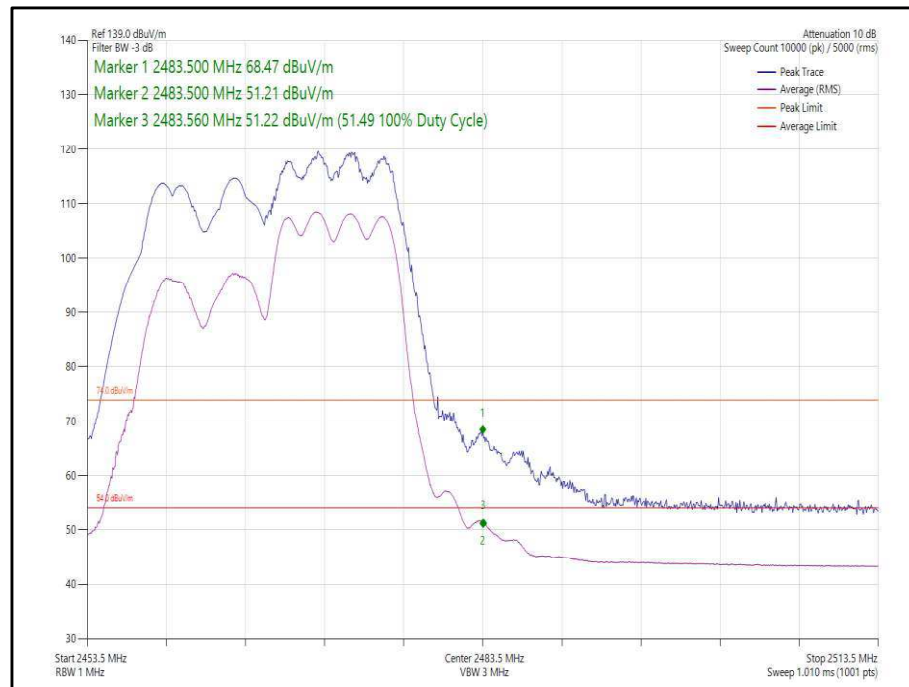
**Figure 47 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



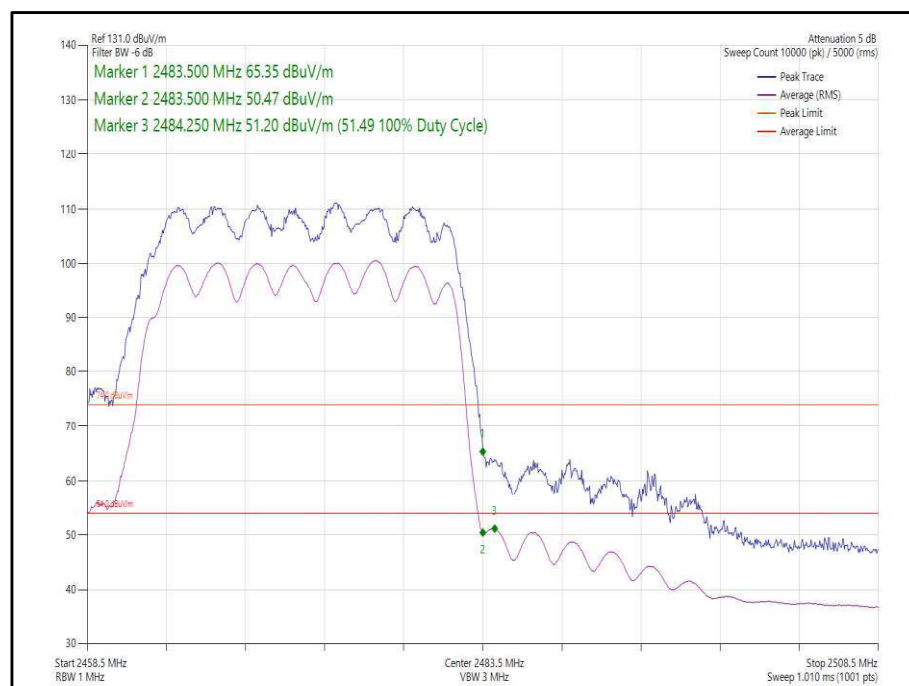
**Figure 48 - 802.11ax, HE20, RU 106-54, CDD, Core 0-1 - 2462 MHz,
Band Edge Frequency 2483.5 MHz**



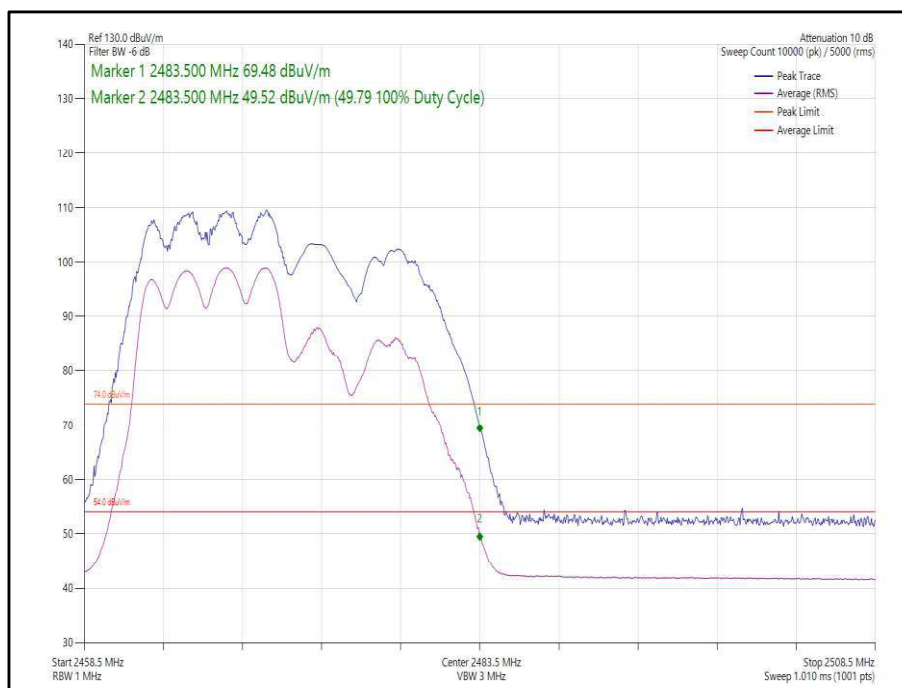
**Figure 49 - 802.11ax, HE20, SU, CDD, Core 0-1 - 2467 MHz,
Band Edge Frequency 2483.5 MHz**



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



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



**Figure 52 - 802.11ax, HE20, RU 106-53, CDD, Core 0-1 - 2472 MHz,
Band Edge Frequency 2483.5 MHz**



FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 9

ISED RSS-GEN, Limit Clause 8.9

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960*	500

Table 10

*Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.



2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Chamber 14.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Emissions Software	TUV SUD	EmX V3.1.10	5125	-	Software
EMI Test Receiver	Rohde & Schwarz	ESW44	5912	12	17-Feb-2023
1500W (300V 12A) AC Power Supply	iTech	IT7324	5956	-	O/P Mon
5m Semi-Anechoic Chamber (Dual-Axis)	Albatross Projects	RF Chamber 14	5958	36	26-Apr-2025
Compact Antenna Mast	Maturo Gmbh	CAM4.0-P	5859	-	TU
Mast & Turntable Controller	Maturo Gmbh	FCU3.0	5960	-	TU
Tilt Antenna Mast	Maturo Gmbh	BAM4.5-P	5961	-	TU
Turntable	Maturo Gmbh	TT1.5SI	5962	-	TU
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5997	12	06-Jun-2023
Cable (SMA to SMA 6.5m)	Junkosha	MWX221-06500AMSAMS/B	6003	12	07-Jun-2023
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6008	12	06-Jun-2023
Cable (N to N 1m)	Junkosha	MWX221-01000AMSAMS/B	6009	12	07-Jun-2023
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6141	12	21-Jun-2023
SAC Switch Unit	TUV SUD	TUV_SSU_001	6144	12	05-Dec-2023
Digital Multimeter	Fluke	115	6145	12	17-Jun-2023
Humidity & Temperature meter	R.S Components	1364	6149	12	17-Jun-2023

Table 11

TU - Traceability Unscheduled

O/P Mon - Output Monitored using calibrated equipment



2.2 Emission Bandwidth

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (a)(2)
ISED RSS-247, Clause 5.2
ISED RSS-GEN, Clause 6.7

2.2.2 Equipment Under Test and Modification State

A2787, S/N: V32VYX9RJ6 - Modification State 0

2.2.3 Date of Test

22-January-2023 to 13-February-2023

2.2.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.8.1 for 6 dB BW and 6.9.3 for 99% occupied bandwidth measurements.

2.2.5 Environmental Conditions

Ambient Temperature	21.3 - 21.7 °C
Relative Humidity	23.6 - 33.0 %

2.2.6 Test Results

2.4 GHz WLAN

SISO Protocol	6 dB Bandwidth (MHz)	
	Minimum	Maximum
802.11b	8.640	9.120
802.11g	15.240	16.380
802.11n HT20	15.240	17.400
802.11ax HE20 SU	18.780	19.080

Table 12 - 6 dB Bandwidth Summary Results - SISO



Figure 53 - 802.11b Minimum 6 dB EBW



Figure 54 - 802.11b Maximum 6 dB EBW



Figure 55 - 802.11g Minimum 6 dB EBW



Figure 56 - 802.11g Maximum 6 dB EBW



Figure 57 - 802.11n HT20 Minimum 6 dB EBW



Figure 58 - 802.11n HT20 Maximum 6 dB EBW



Figure 59 - 802.11ax HE20 SU Minimum 6 dB
EBW



Figure 60 - 802.11ax HE20 SU Maximum 6 dB
EBW