

FCC and ISED Test Report

Apple Inc
Model: A3143



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

TUV SUD Limited
Digitally signed by
TUV SUD Limited
Date: 2024.11.25
08:09:52 Z

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

FCC ID: BCGA3143 IC: 579C-A3143

COMMERCIAL-IN-CONFIDENCE

Document 75961400-14 Issue 01

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior Engineer	Authorised Signatory	25 November 2024

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	25 November 2024	

FCC Accreditation 553713/UK2026 Concorde Park, Fareham Test Laboratory
ISED Accreditation 28798/UK0003 Concorde Park, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C: 2023, ISED RSS-247: Issue 3 (2023-08) and ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02) for the tests detailed in section 1.3.



DISCLAIMER AND COPYRIGHT

This non-binding report has been prepared by TUV SUD with all reasonable skill and care. The document is confidential to the potential Client and TUV SUD. No part of this document may be reproduced without the prior written approval of TUV SUD. © 2024 TUV SUD. This report relates only to the actual item/items tested.

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).

TUV SUD
is a trading name of TUV SUD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TUV SUD Ltd is a
TUV SUD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuvsud.com/en

TUV SUD
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom



Contents

1	Report Summary	2
1.1	Report Modification Record.....	2
1.2	Introduction.....	2
1.3	Brief Summary of Results	3
1.4	Product Information	4
1.5	Deviations from the Standard.....	5
1.6	Identification of the EUT	5
1.7	EUT Modification Record	6
1.8	Test Location	7
2	Test Details	8
2.1	Restricted Band Edges.....	8
2.2	Emission Bandwidth	53
2.3	Maximum Conducted Output Power	159
2.4	Authorised Band Edges	181
2.5	Spurious Radiated Emissions	199
2.6	Power Spectral Density	216
3	Measurement Uncertainty	228



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	25-November-2024

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
EUT/Sample Identification	Refer to section 1.6
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2023 ISED RSS-247: Issue 3 (2023-08) ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02)
Start of Test	22-July-2024
Finish of Test	05-November-2024
Name of Engineer(s)	Colin Brain, Jamal Imoro Abubakar, Manohar Thota, Marius Vasii, David Hill, Mahmud Bari Chowdhury, Elliot Callender, Ian Hart, Ioan-Alexandru Bogatu, Morsalin Hossain, Thomas Randall and Tony Baby
Related Document(s)	ANSI C63.4 (2014) ANSI C63.10 (2020) KDB 662911 D01 v02r01



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C, 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 Bluetooth LE/HDR						
-	15.203	-	-	Antenna Requirement	N/T	The device complies with the provisions of this section, as it uses permanently attached integral antennas.
2.1	15.205	3.3	8.10	Restricted Band Edges	Pass	ANSI C63.10 (2020)
2.2	15.247 (a)(2)	5.2	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2020)
2.3	15.247 (b)	5.4	6.12	Maximum Conducted Output Power	Pass	ANSI C63.10 (2020) KDB 662911 D01 v02r01
2.4	15.247 (d)	5.5	-	Authorised Band Edges	Pass	ANSI C63.10 (2020)
2.5	15.209 and 15.247 (d)	3.3 and 5.5	6.13 and 8.9	Spurious Radiated Emissions	Pass	ANSI C63.4 (2014) ANSI C63.10 (2020)
2.6	15.247 (e)	5.2	6.12	Power Spectral Density	Pass	ANSI C63.10 (2020) KDB 662911 D01 v02r01

Table 2



1.4 Product Information

1.4.1 Technical Description

The equipment under test (EUT) was a desktop computer.

1.4.2 Test Modes

The EUT's 2.4 GHz Bluetooth radio supports SISO (Single Input/Single Output) operation on three different cores (Core 0, Core 1, and Core 2). It also supports MIMO (Multiple Input/Multiple Output) beamforming operation on Core 0 + Core 1. The EUT supports HDR4 (4-DH5), HDR8 (8-DH5), LE1M and LE2M.

Core 0 + Core 1 also operate at two power settings: low power "iPA" and high power "ePA", with Core 2 only supporting the lower power mode. The EUT uses different output powers per core dependent on how many cores are used.

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

SISO modes:

- HDR4 - iPA - Core 1
- HDR8 - iPA - Core 1
- LE1M - iPA - Core 1
- LE2M - iPA - Core 1
- HDR4 - iPA - Core 2
- HDR8 - iPA - Core 2
- LE1M - iPA - Core 2
- LE2M - iPA - Core 2
- HDR4 - ePA - Core 1
- HDR8 - ePA - Core 1
- LE1M - ePA - Core 1
- LE2M - ePA - Core 1

MIMO modes:

- HDR4 - iPA - Core 0 + Core 1
- HDR8 - iPA - Core 0 + Core 1
- LE1M - iPA - Core 0 + Core 1
- LE2M - iPA - Core 0 + Core 1
- HDR4 - ePA - Core 0 + Core 1
- HDR8 - ePA - Core 0 + Core 1
- LE1M - ePA - Core 0 + Core 1
- LE2M - ePA - Core 0 + Core 1

Spurious Radiated Emissions tests were performed, with the EUT set to operate at maximum output power, in the following modes. As this was deemed to be worst case with respect to power and PSD.

SISO modes:

- LE1M - iPA - Core 2

MIMO modes:

- LE1M - iPA - Core 0 + Core 1
- LE1M - ePA - Core 0 + Core 1



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 tests the EUT was put into a continuous transmit/receive test mode with the chipset manufacturer's test commands to ensure the measured signals were representative.

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	0.07	0.71
Core 1	2400 to 2480	1.55	0.71
Dedicated Core 2	2400 to 2480	1.07	0.71

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: A3143			
Serial Number	Hardware Version	Software Version	Firmware
C3QWHF6CNX	REV1.0	24A62400u	22.1.65.459
P44KN4197F	REV1.0	24A62401d	22.1.65.459
GCRYK43TX1V	REV1.0	24A62401d	22.1.65.459
NTP2P9W067	REV1.0	24A62401d	22.1.65.459
VCXLW6763J	REV1.0	24A62401d	22.1.65.459

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: A3143, Serial Number: P44KN4197F			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3143, Serial Number: C3QWHF6CNX			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3143, Serial Number: GCYK43TX1V			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3143, Serial Number: NTP2P9W067			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3143, Serial Number: VCXLW6763J			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 5



1.8 Test Location

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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 2.4 GHz Bluetooth LE/HDR		
Restricted Band Edges	Colin Brain, Jamal Imoro Abubakar, Manohar Thota and Marius Vasii	UKAS
Emission Bandwidth	David Hill and Mahmud Bari Chowdhury	UKAS
Maximum Conducted Output Power	David Hill and Mahmud Bari Chowdhury	UKAS
Authorised Band Edges	Colin Brain, Jamal Imoro Abubakar, Manohar Thota and Marius Vasii	UKAS
Spurious Radiated Emissions	Elliot Callender, Ian Hart, Ioan-Alexandru Bogatu, Morsalin Hossain, Thomas Randall and Tony Baby	UKAS
Power Spectral Density	David Hill and Mahmud Bari Chowdhury	UKAS

Table 6

Office Address:

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



2 Test Details

2.1 Restricted Band Edges

2.1.1 Specification Reference

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

2.1.2 Equipment Under Test and Modification State

A3143, S/N: P44KN4197F - Modification State 0
A3143, S/N: GCYK43TX1V - Modification State 0

2.1.3 Date of Test

22-July-2024 to 24-July-2024

2.1.4 Test Method

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

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

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

2.1.5 Environmental Conditions

Ambient Temperature	20.5 - 22.8 °C
Relative Humidity	42.4 - 51.2 %

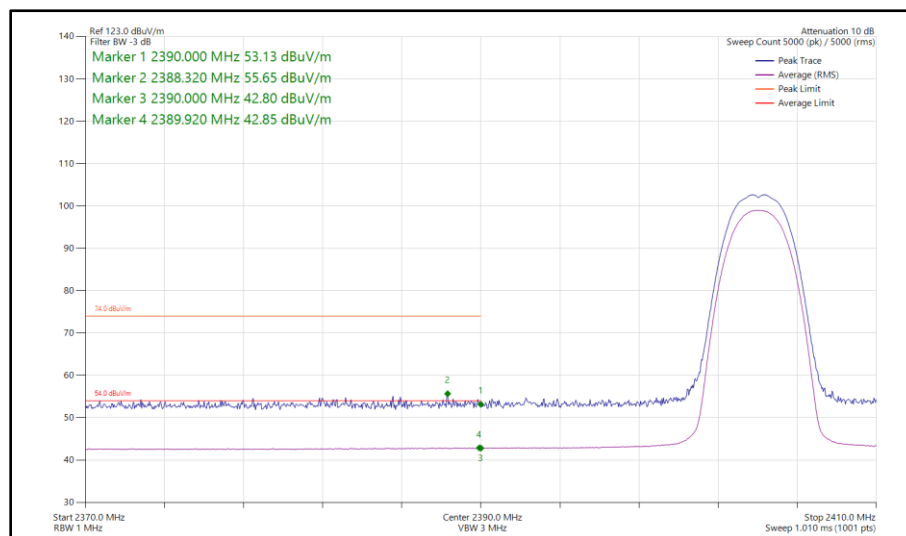
2.1.6 Test Results

2.4 GHz Bluetooth LE/HDR

iPA - Core 0 (SISO)

Mode	Packet Type	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	HDR4	2404	2390	55.65	42.85
Static	HDR8	2404	2390	55.40	43.04
Static	LE1M	2402	2390	55.41	43.33
Static	LE2M	2402	2390	55.00	43.46
Static	HDR4	2476	2483.5	53.51	41.73
Static	HDR8	2476	2483.5	54.05	42.57
Static	LE1M	2478	2483.5	54.31	42.35
Static	LE1M	2480	2483.5	54.12	42.57
Static	LE2M	2478	2483.5	54.58	42.71
Static	LE2M	2480	2483.5	55.16	44.63

Table 7 - SISO Restricted Band Edge Results



**Figure 1 - Bluetooth HDR4, SISO, Core 0 - 2404 MHz
Band Edge Frequency 2390 MHz**

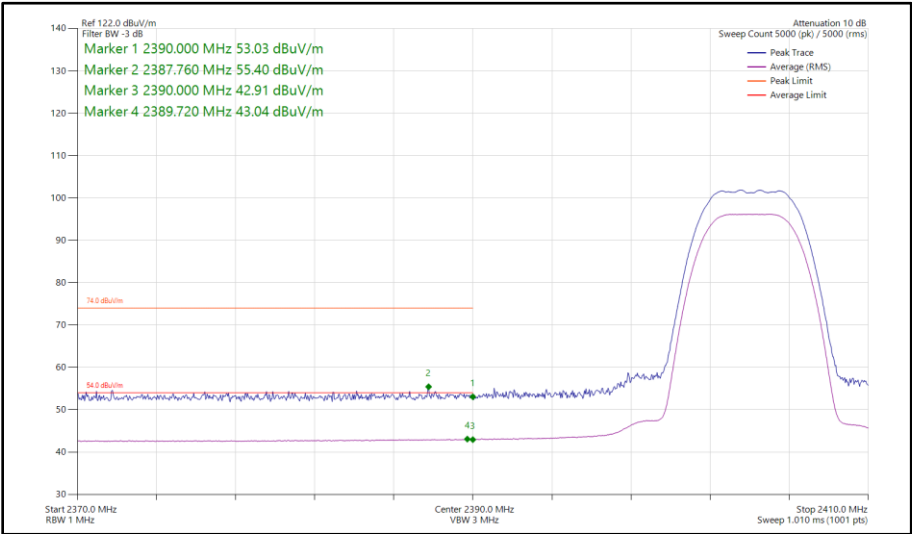


Figure 2 - Bluetooth HDR8, SISO, Core 0 - 2404 MHz
Band Edge Frequency 2390 MHz

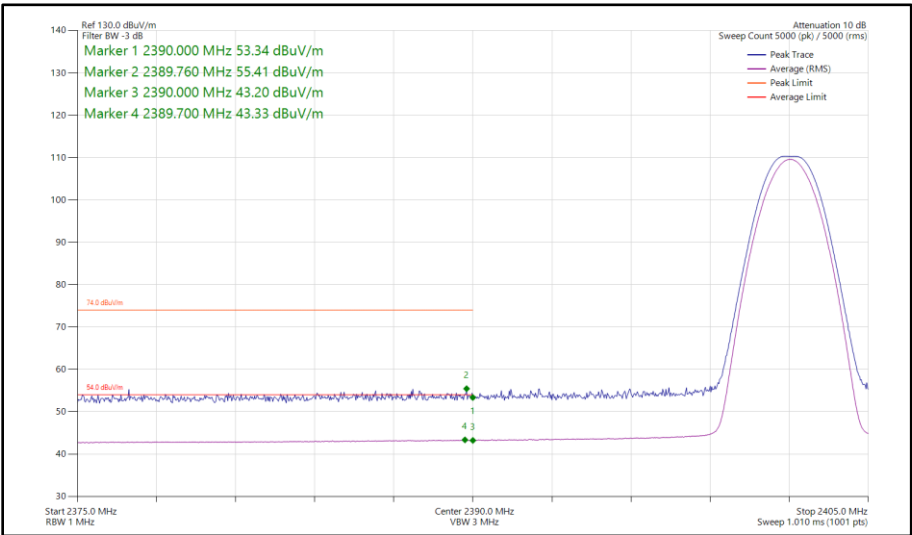
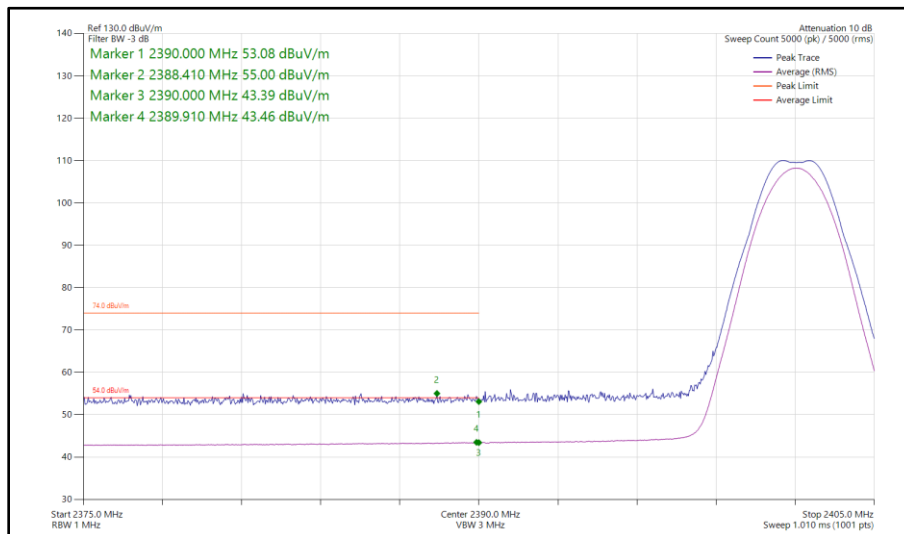
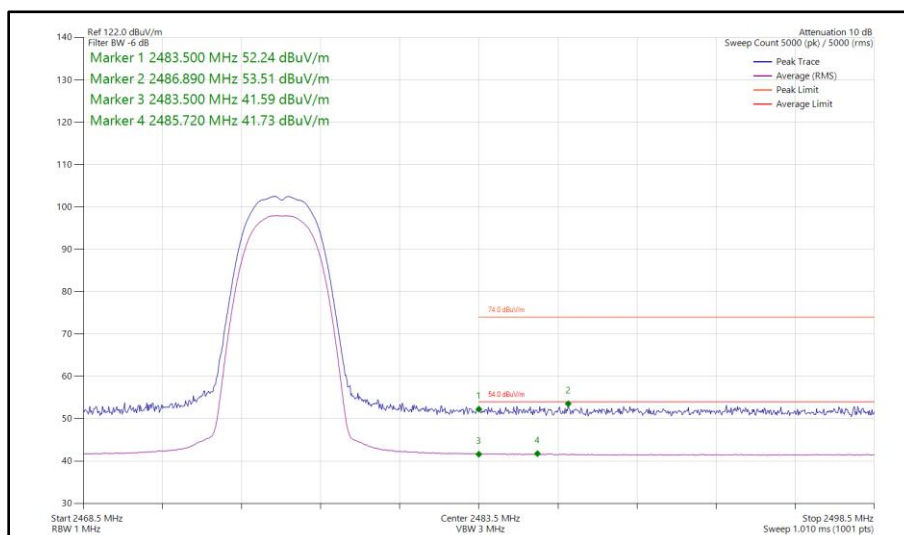


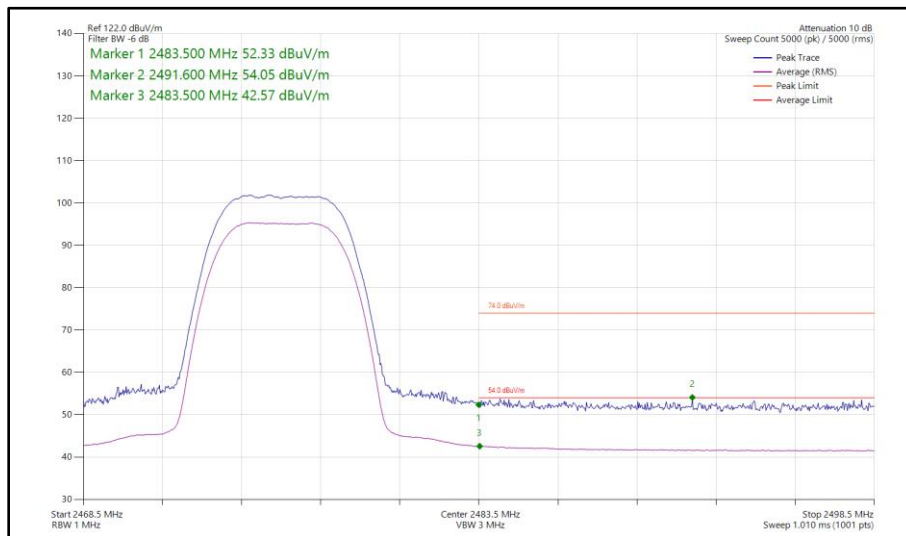
Figure 3 - Bluetooth LE1M, SISO, Core 0 - 2402 MHz
Band Edge Frequency 2390 MHz



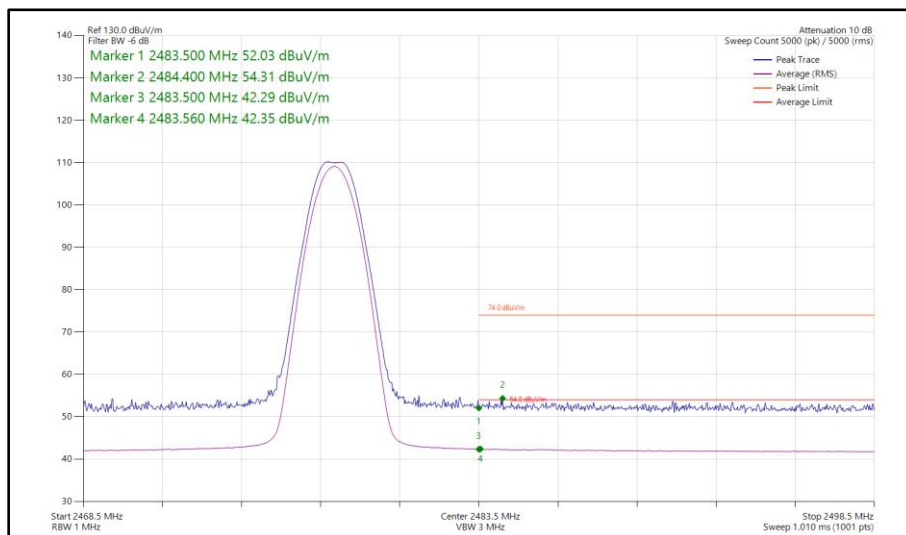
**Figure 4 - Bluetooth LE2M, SISO, Core 0 - 2402 MHz
Band Edge Frequency 2390 MHz**



**Figure 5 - Bluetooth HDR4, SISO, Core 0 - 2476 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 6 - Bluetooth HDR8, SISO, Core 0 - 2476 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 7 - Bluetooth LE1M, SISO, Core 0 - 2478 MHz
Band Edge Frequency 2483.5 MHz**

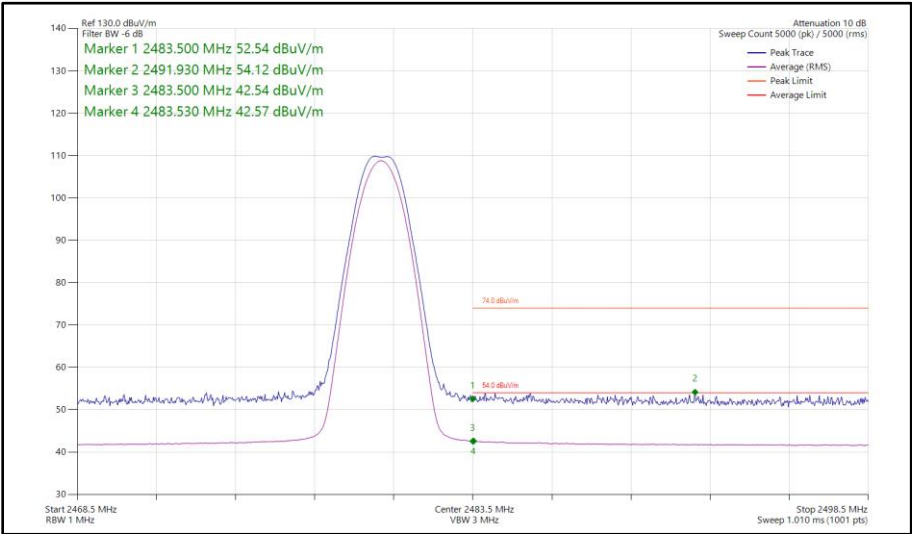


Figure 8 - Bluetooth LE1M, SISO, Core 0 - 2480 MHz
Band Edge Frequency 2483.5 MHz

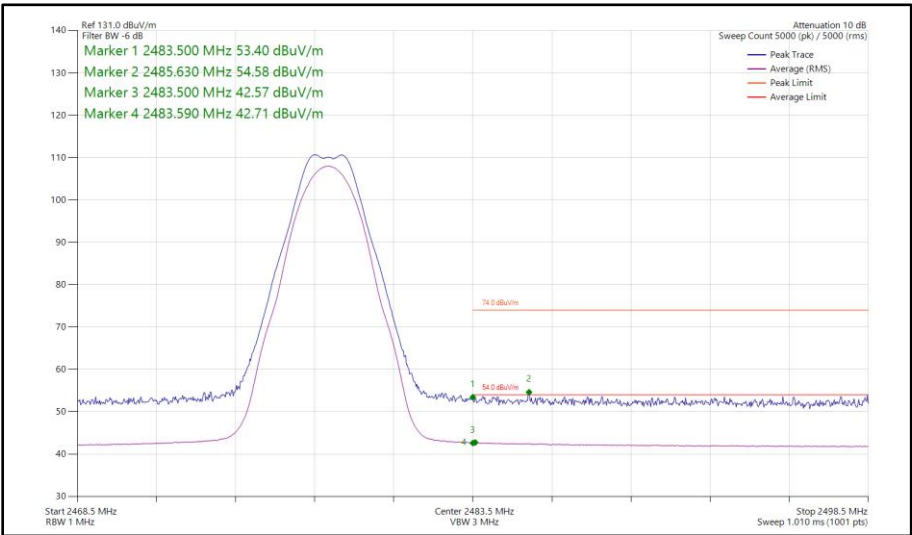
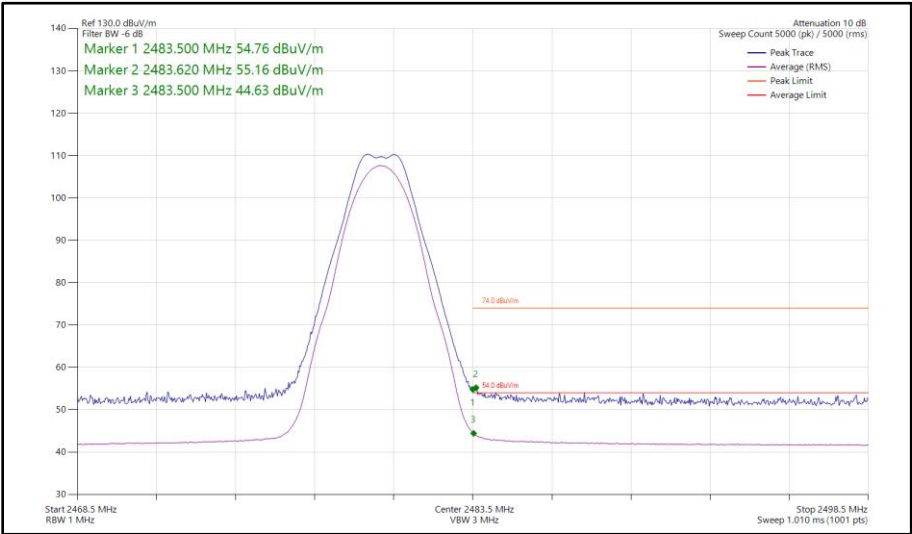


Figure 9 - Bluetooth LE2M, SISO, Core 0 - 2478 MHz
Band Edge Frequency 2483.5 MHz



**Figure 10 - Bluetooth LE2M, SISO, Core 0 - 2480 MHz
Band Edge Frequency 2483.5 MHz**



iPA - Core 1 (SISO)

Mode	Packet Type	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	HDR4	2404	2390	55.67	42.83
Static	HDR8	2404	2390	55.21	42.92
Static	LE1M	2402	2390	55.44	43.21
Static	LE2M	2402	2390	55.00	43.25
Static	HDR4	2476	2483.5	54.01	41.60
Static	HDR8	2476	2483.5	53.85	41.75
Static	LE1M	2478	2483.5	54.08	42.10
Static	LE1M	2480	2483.5	53.40	42.32
Static	LE2M	2478	2483.5	54.53	42.24
Static	LE2M	2480	2483.5	54.27	43.76

Table 8 - SISO Restricted Band Edge Results

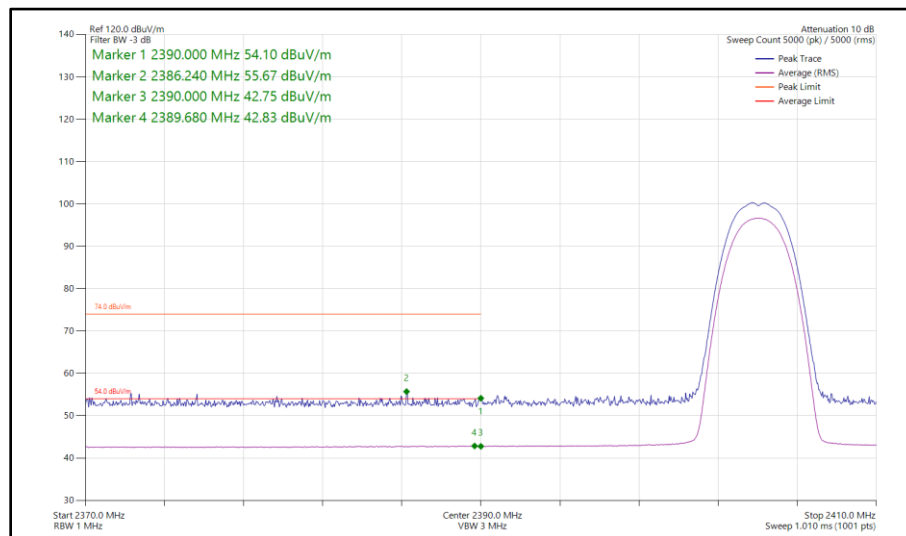


Figure 11 - Bluetooth HDR4, SISO, Core 1 - 2404 MHz
Band Edge Frequency 2390 MHz

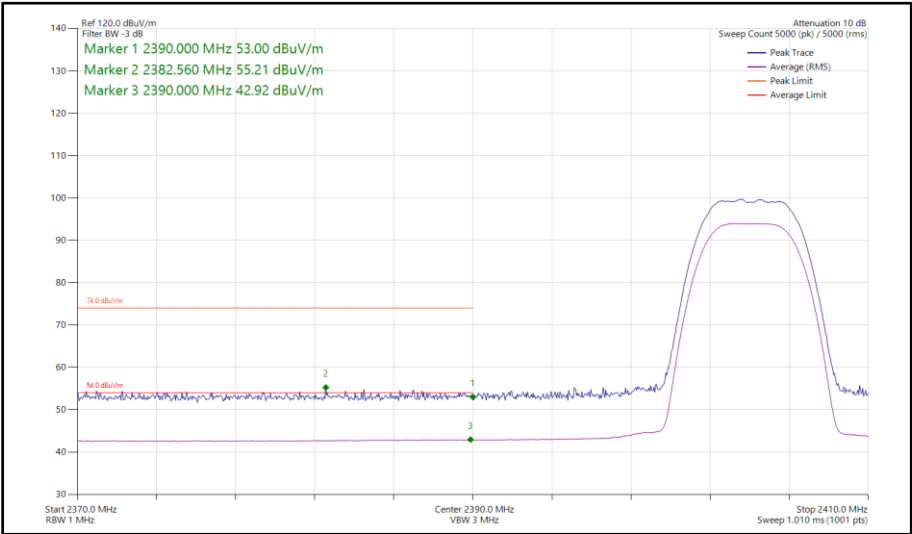


Figure 12 - Bluetooth HDR8, SISO, Core 1 - 2404 MHz
Band Edge Frequency 2390 MHz

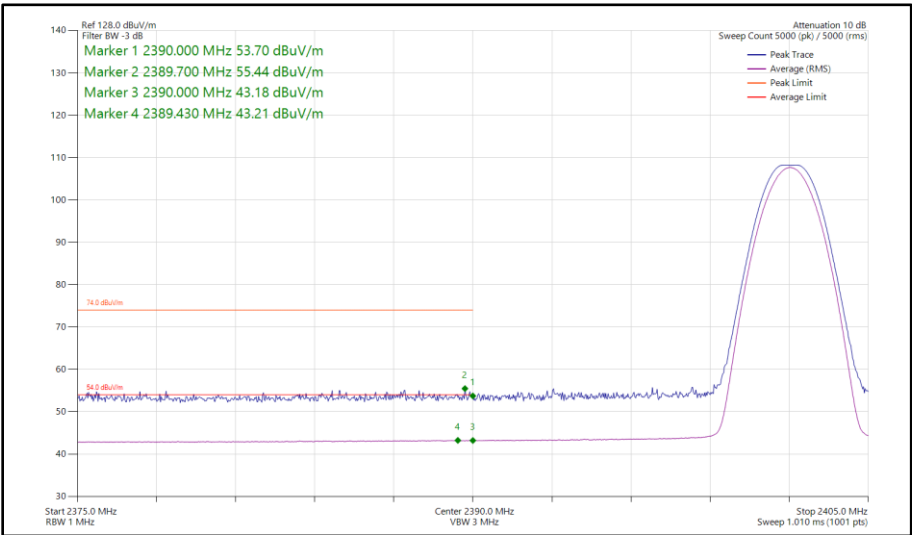
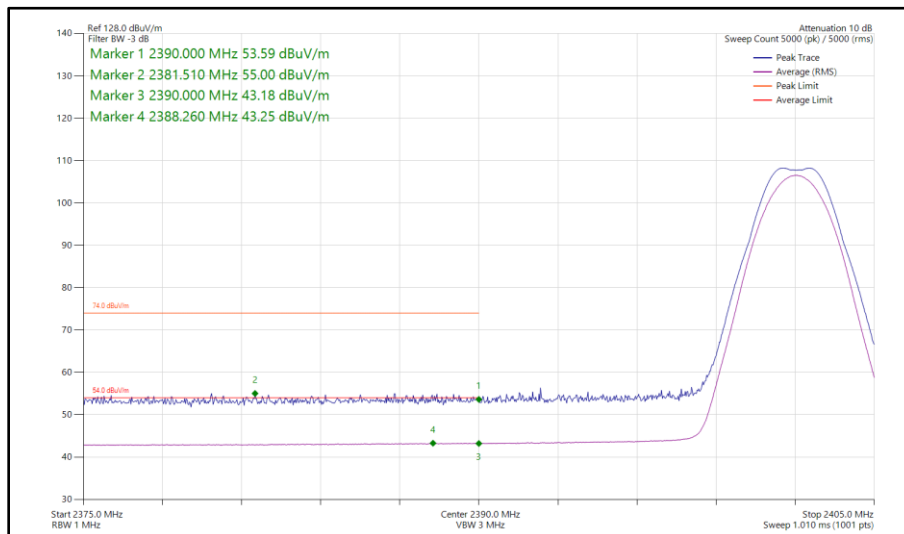
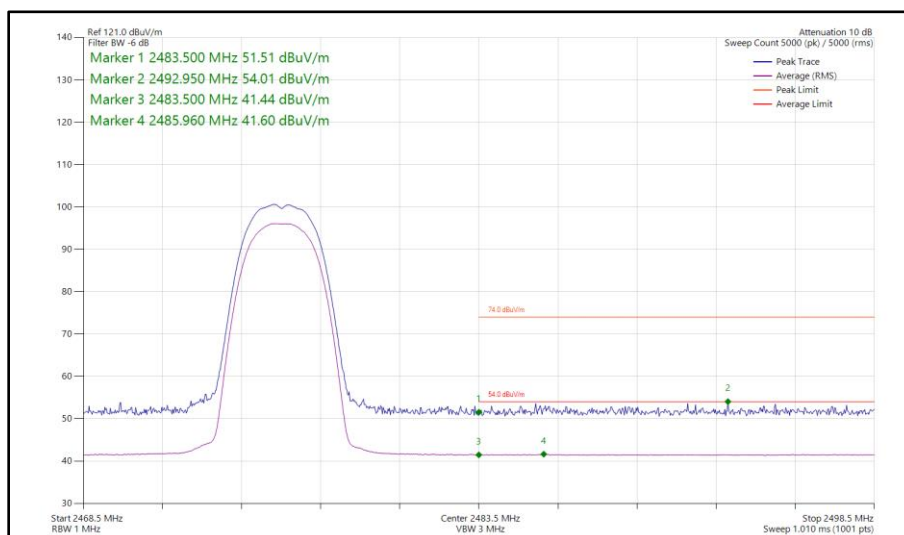


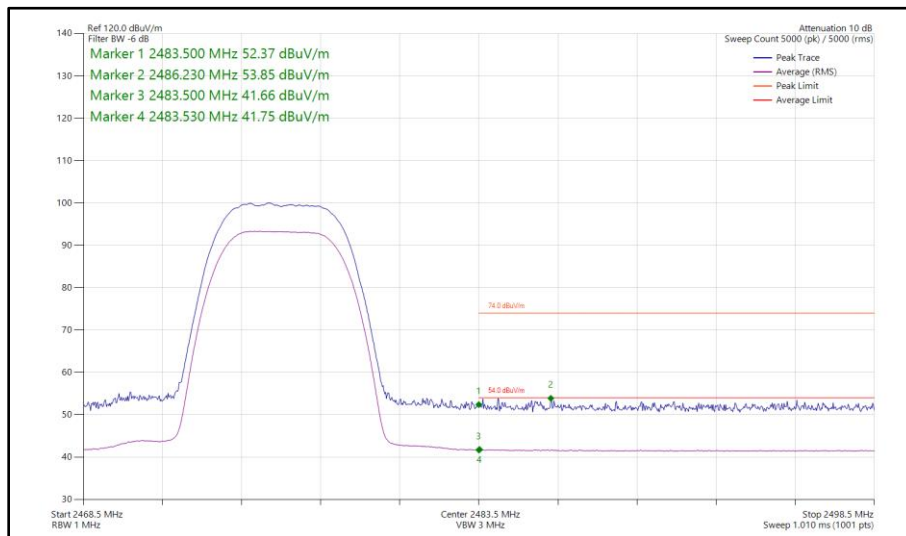
Figure 13 - Bluetooth LE1M, SISO, Core 1 - 2402 MHz
Band Edge Frequency 2390 MHz



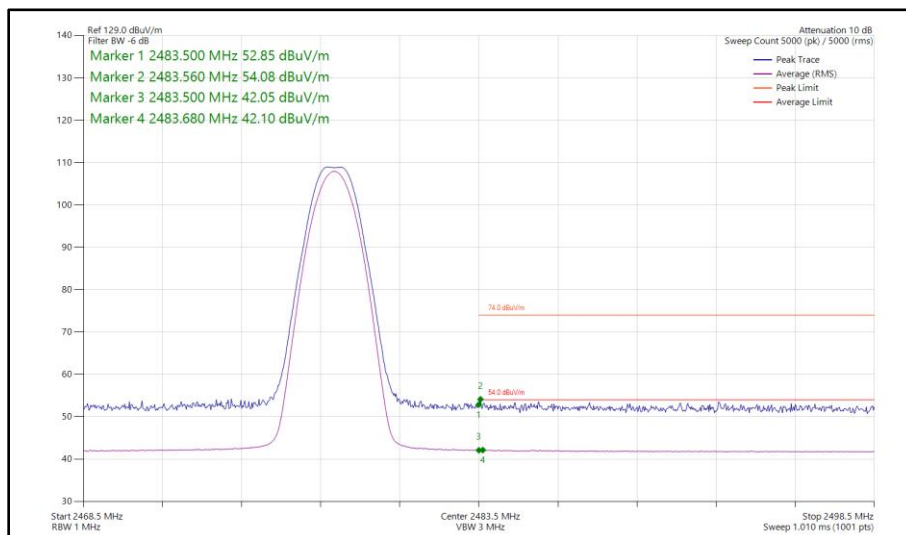
**Figure 14 - Bluetooth LE2M, SISO, Core 1 - 2402 MHz
Band Edge Frequency 2390 MHz**



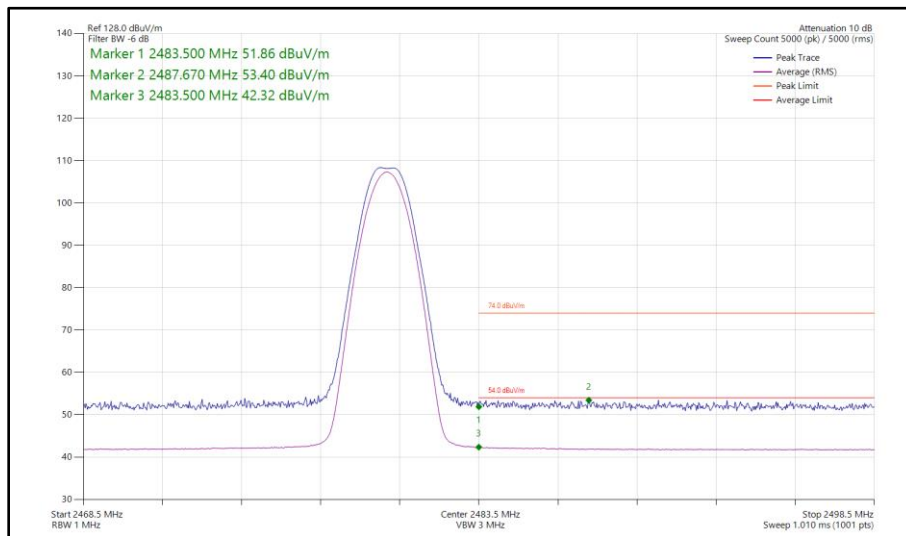
**Figure 15 - Bluetooth HDR4, SISO, Core 1 - 2476 MHz
Band Edge Frequency 2483.5 MHz**



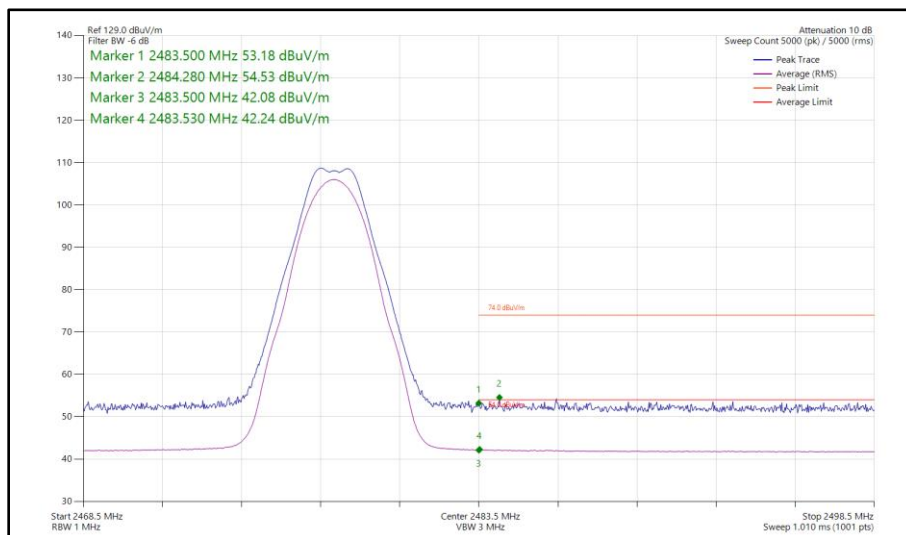
**Figure 16 - Bluetooth HDR8, SISO, Core 1 - 2476 MHz
Band Edge Frequency 2483.5 MHz**



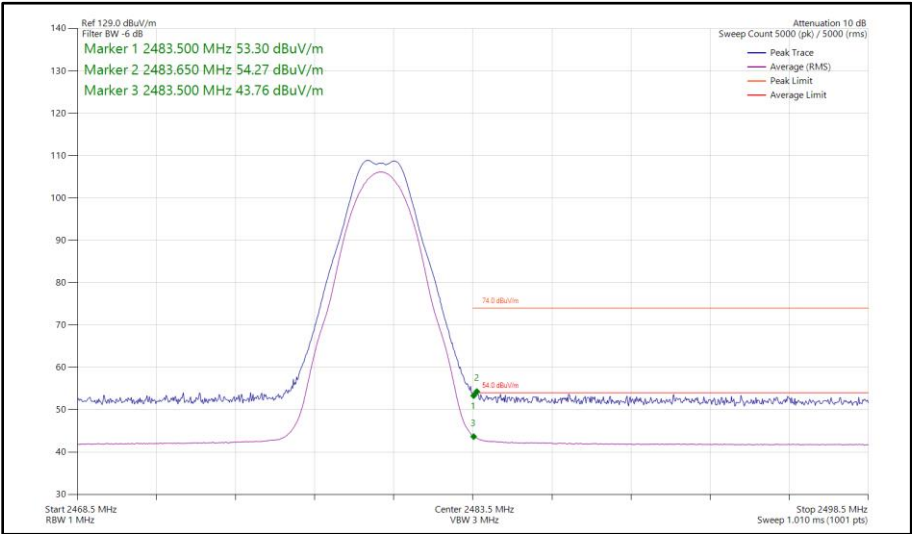
**Figure 17 - Bluetooth LE1M, SISO, Core 1 - 2478 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 18 - Bluetooth LE1M, SISO, Core 1 - 2480 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 19 - Bluetooth LE2M, SISO, Core 1 - 2478 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 20 - Bluetooth LE2M, SISO, Core 1 - 2480 MHz
Band Edge Frequency 2483.5 MHz**



iPA - Core 2 (SISO)

Mode	Packet Type	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	HDR4	2404	2390	55.01	42.87
Static	HDR8	2404	2390	54.66	42.93
Static	LE1M	2402	2390	55.31	42.92
Static	LE2M	2402	2390	54.63	42.95
Static	HDR4	2476	2483.5	53.82	41.60
Static	HDR8	2476	2483.5	53.70	41.97
Static	LE1M	2478	2483.5	53.58	41.67
Static	LE1M	2480	2483.5	53.92	41.99
Static	LE2M	2478	2483.5	53.79	41.77
Static	LE2M	2480	2483.5	57.66	48.19

Table 9 - SISO Restricted Band Edge Results

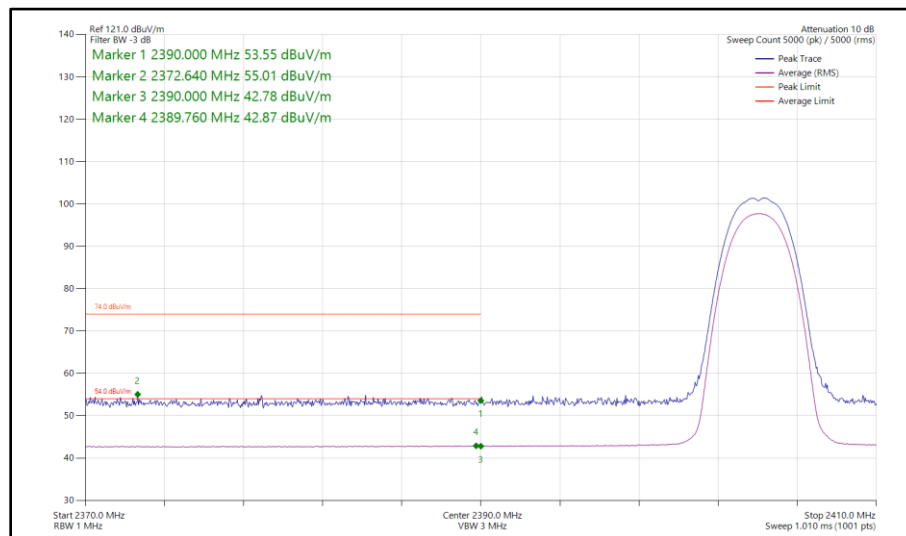


Figure 21 - Bluetooth HDR4, SISO, Core 2 - 2404 MHz
Band Edge Frequency 2390 MHz

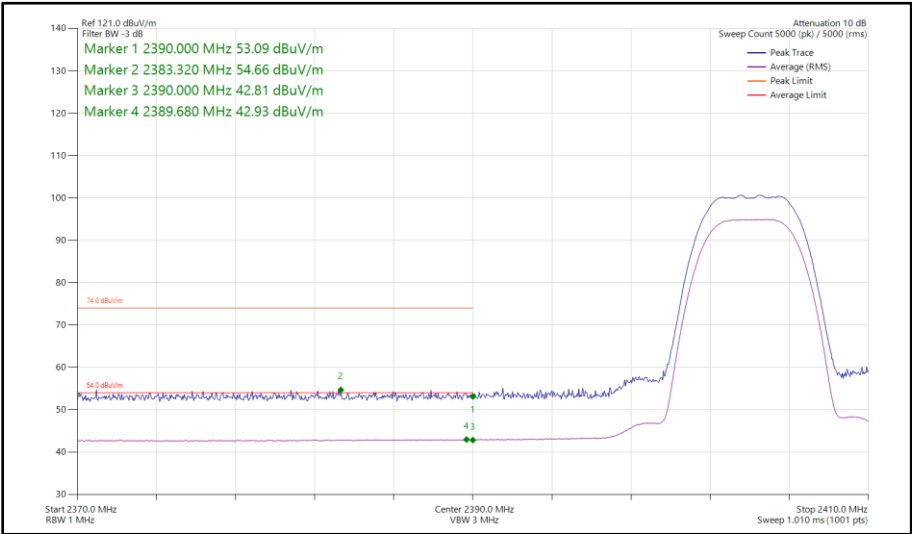


Figure 22 - Bluetooth HDR8, SISO, Core 2 - 2404 MHz
Band Edge Frequency 2390 MHz

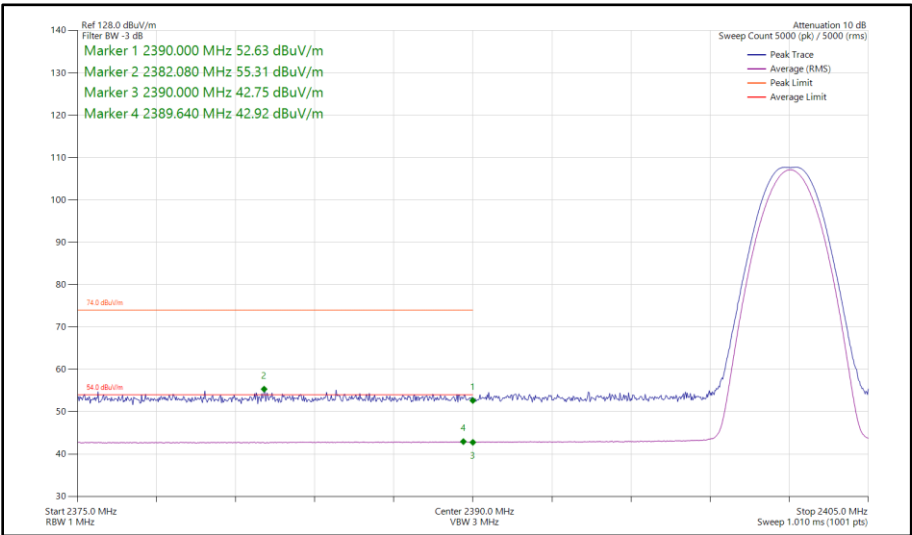
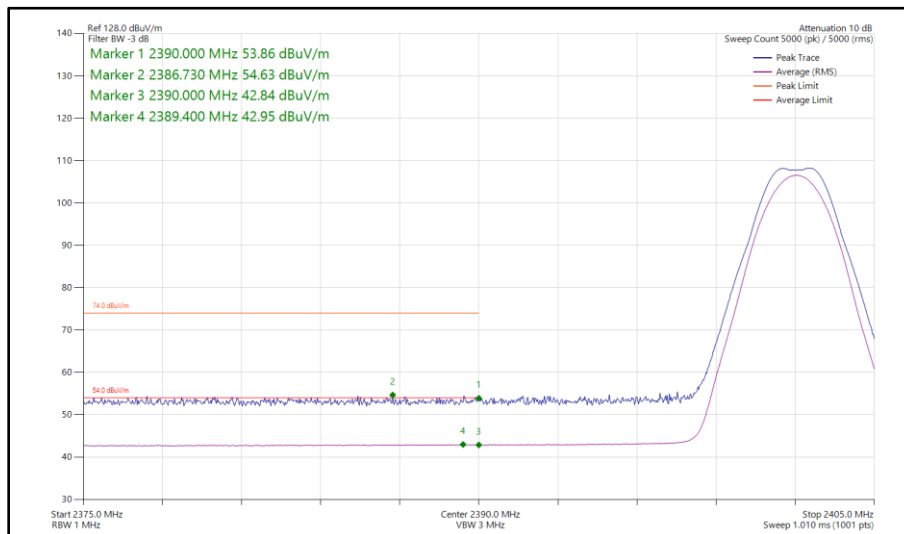
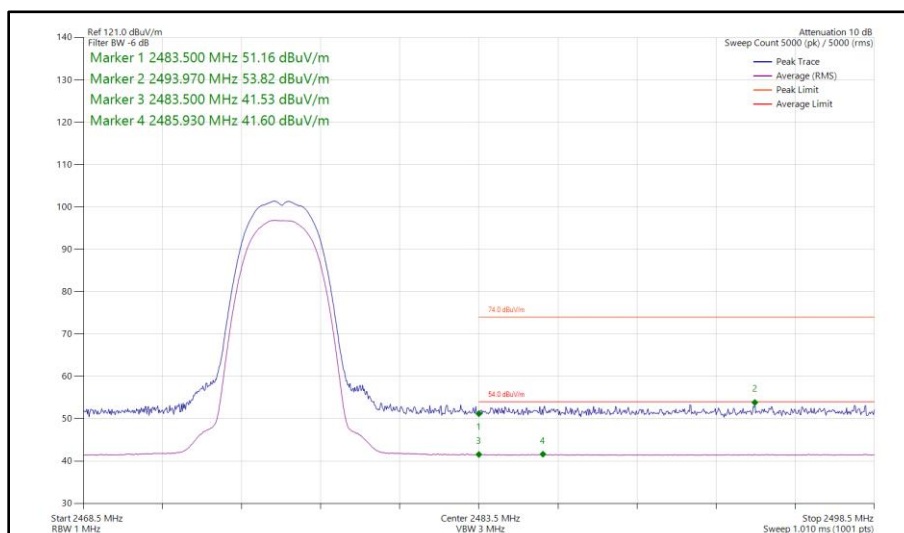


Figure 23 - Bluetooth LE1M, SISO, Core 2 - 2402 MHz
Band Edge Frequency 2390 MHz



**Figure 24 - Bluetooth LE2M, SISO, Core 2 - 2402 MHz
Band Edge Frequency 2390 MHz**



**Figure 25 - Bluetooth HDR4, SISO, Core 2 - 2476 MHz
Band Edge Frequency 2483.5 MHz**

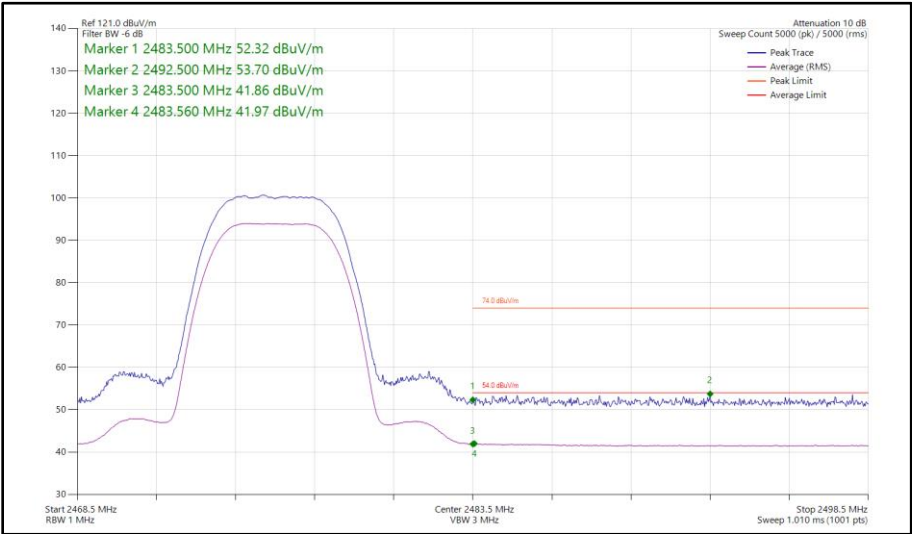


Figure 26 - Bluetooth HDR8, SISO, Core 2 - 2476 MHz
Band Edge Frequency 2483.5 MHz

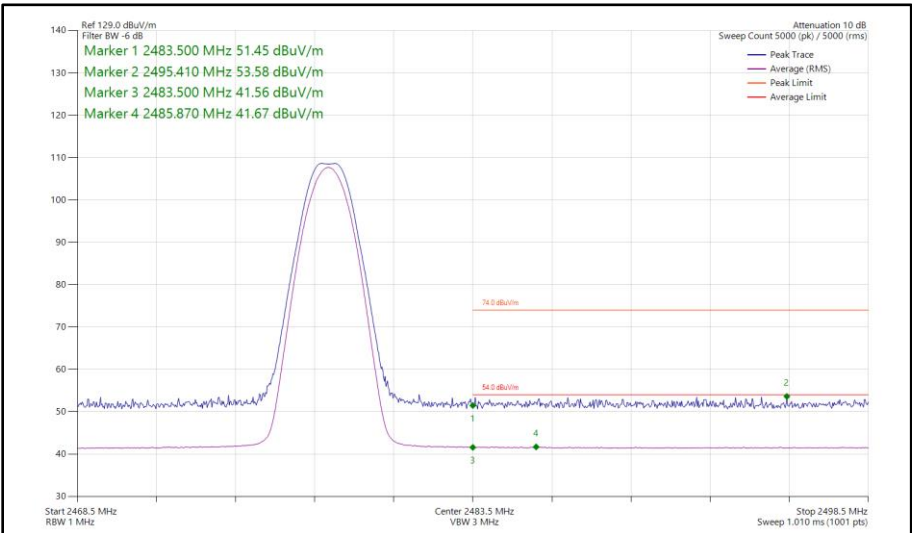


Figure 27 - Bluetooth LE1M, SISO, Core 2 - 2478 MHz
Band Edge Frequency 2483.5 MHz

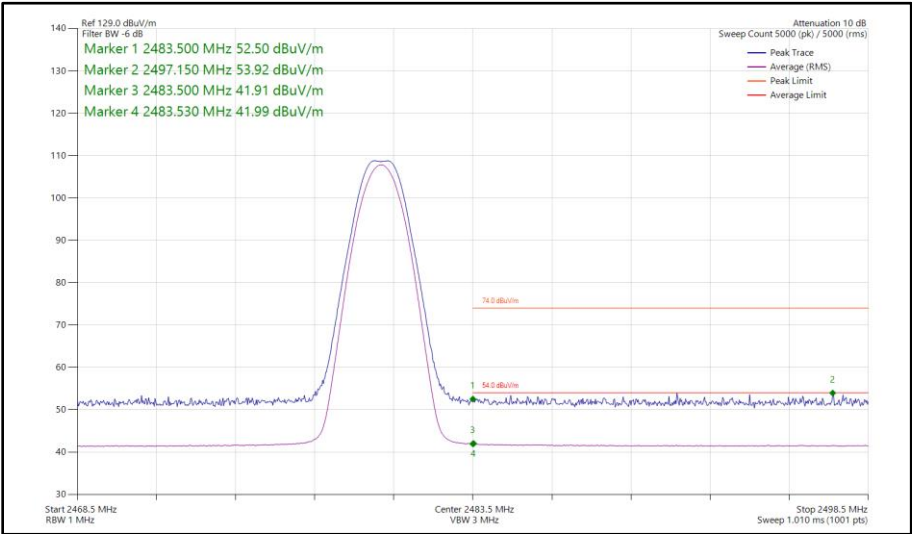


Figure 28 - Bluetooth LE1M, SISO, Core 2 - 2480 MHz
Band Edge Frequency 2483.5 MHz

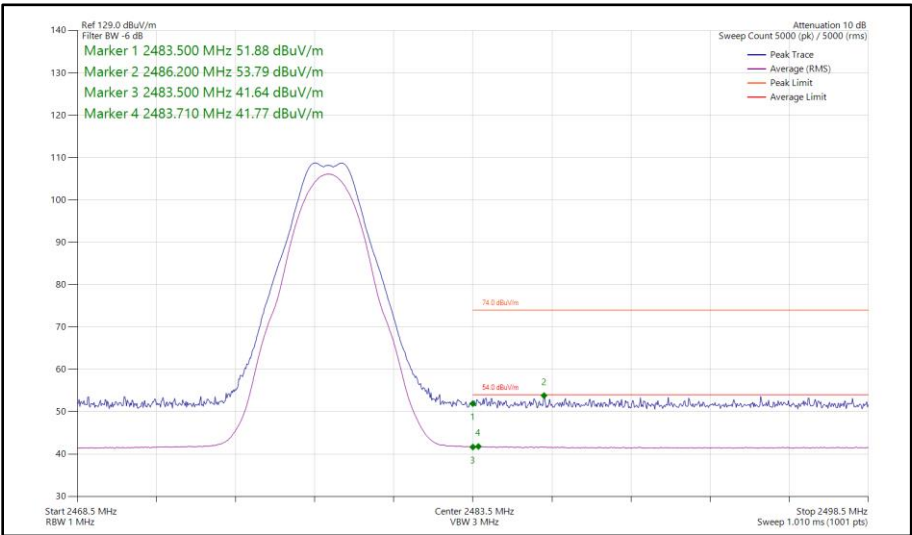
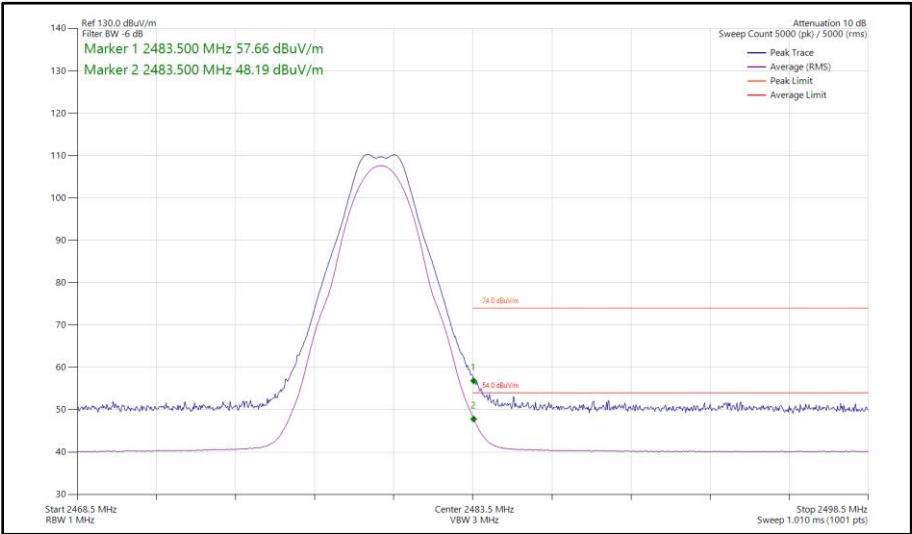


Figure 29 - Bluetooth LE2M, SISO, Core 2 - 2478 MHz
Band Edge Frequency 2483.5 MHz



**Figure 30 - Bluetooth LE2M, SISO, Core 2 - 2480 MHz
Band Edge Frequency 2483.5 MHz**



iPA - Core 0 - Core 1 (MIMO)

Mode	Packet Type	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	HDR4	2404	2390	55.38	42.82
Static	HDR8	2404	2390	54.85	42.95
Static	LE1M	2402	2390	55.31	43.21
Static	LE2M	2402	2390	55.07	43.24
Static	HDR4	2476	2483.5	53.72	41.77
Static	HDR8	2476	2483.5	54.68	42.77
Static	LE1M	2478	2483.5	54.00	42.50
Static	LE1M	2480	2483.5	54.93	43.00
Static	LE2M	2478	2483.5	54.58	42.73
Static	LE2M	2480	2483.5	55.64	45.02

Table 10 - MIMO Restricted Band Edge Results

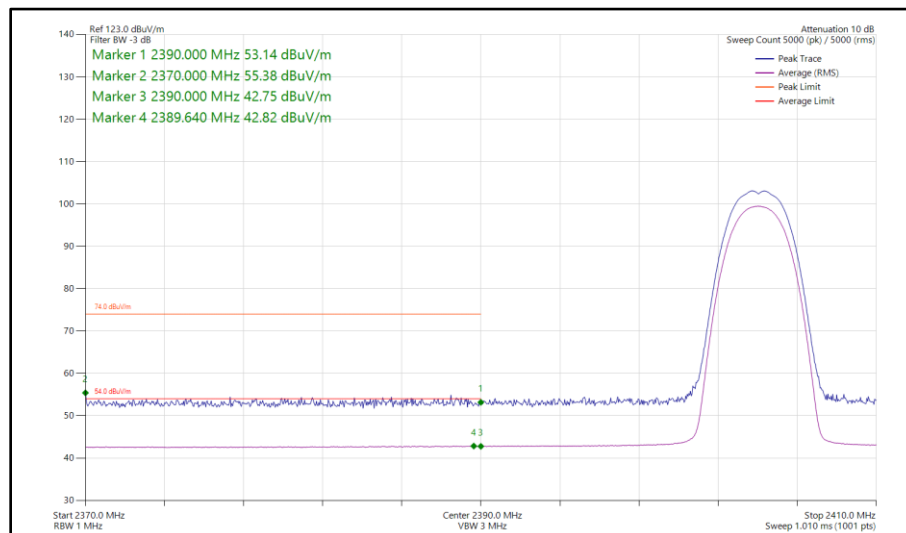


Figure 31 - Bluetooth HDR4, MIMO, Core 0 - Core 1 - 2404 MHz
Band Edge Frequency 2390 MHz

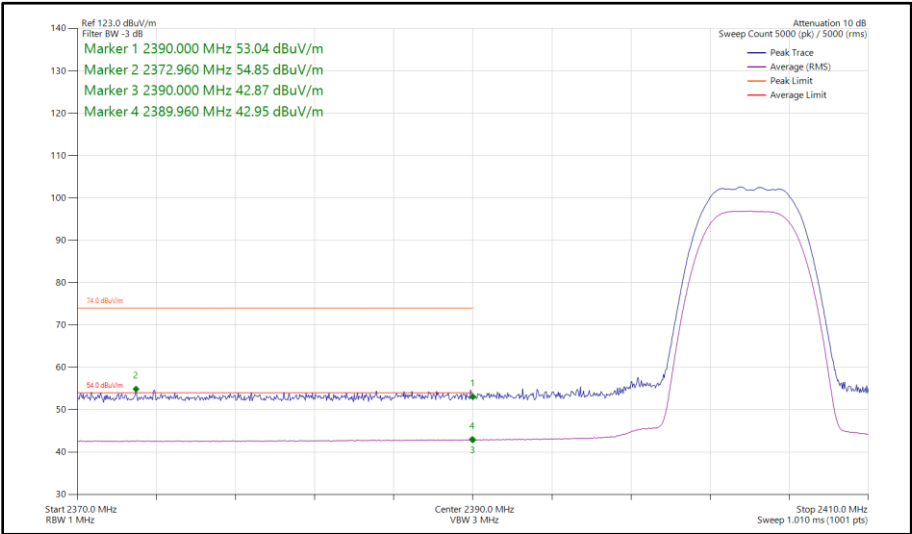


Figure 32 - Bluetooth HDR8, MIMO, Core 0 - Core 1 - 2404 MHz
Band Edge Frequency 2390 MHz

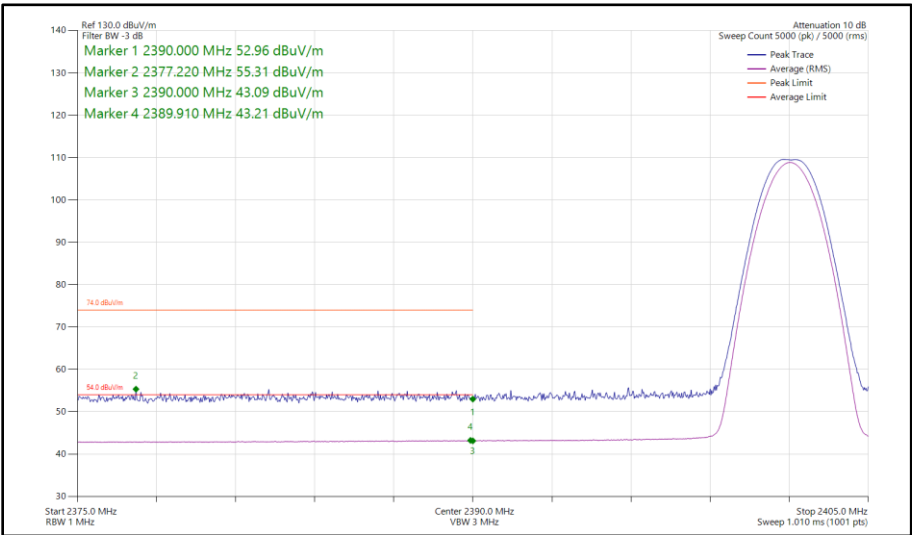
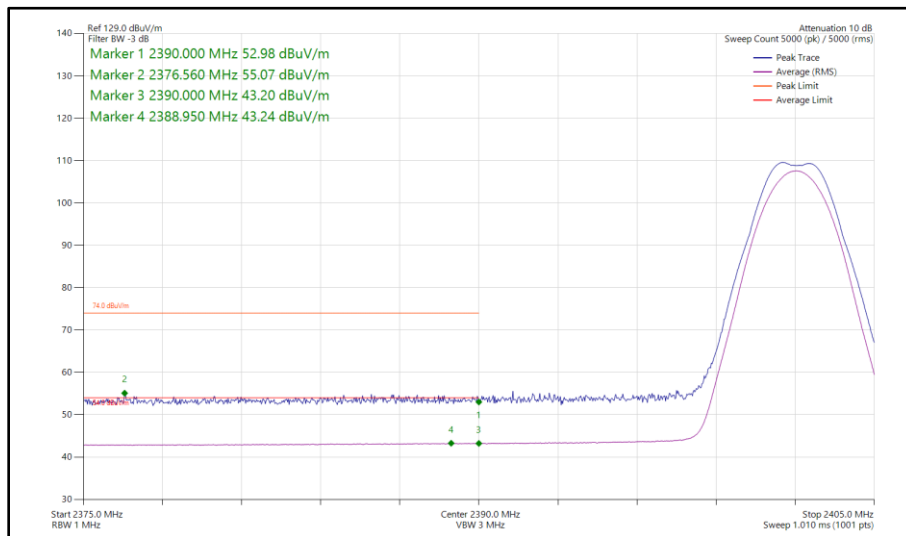
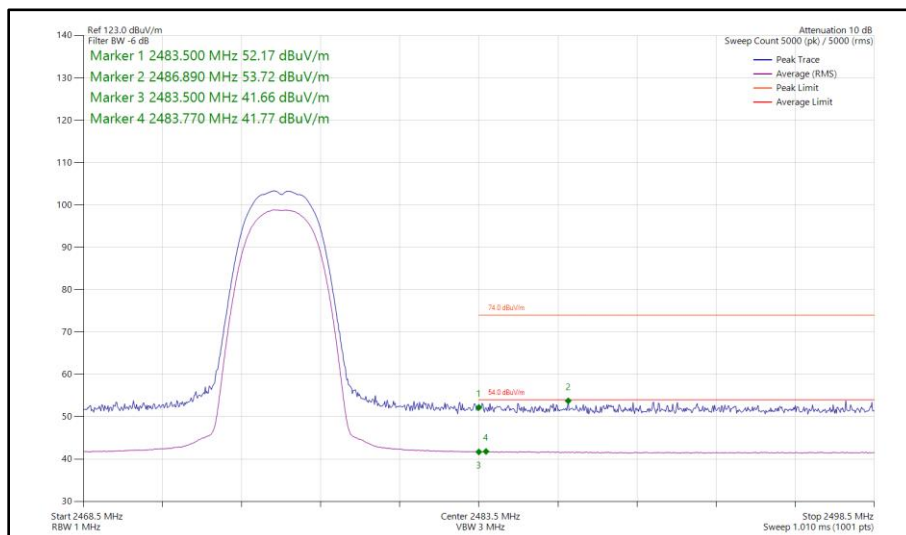


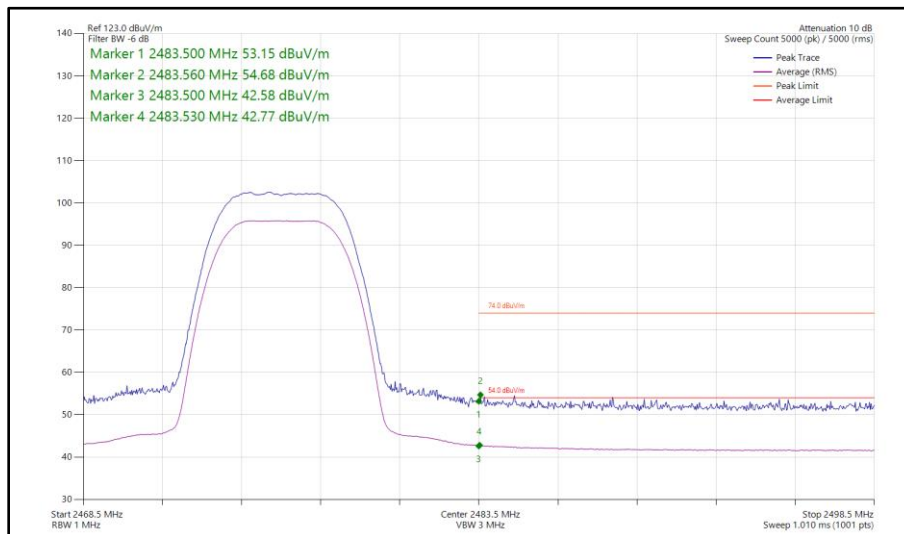
Figure 33 - Bluetooth LE1M, MIMO, Core 0 - Core 1 - 2402 MHz
Band Edge Frequency 2390 MHz



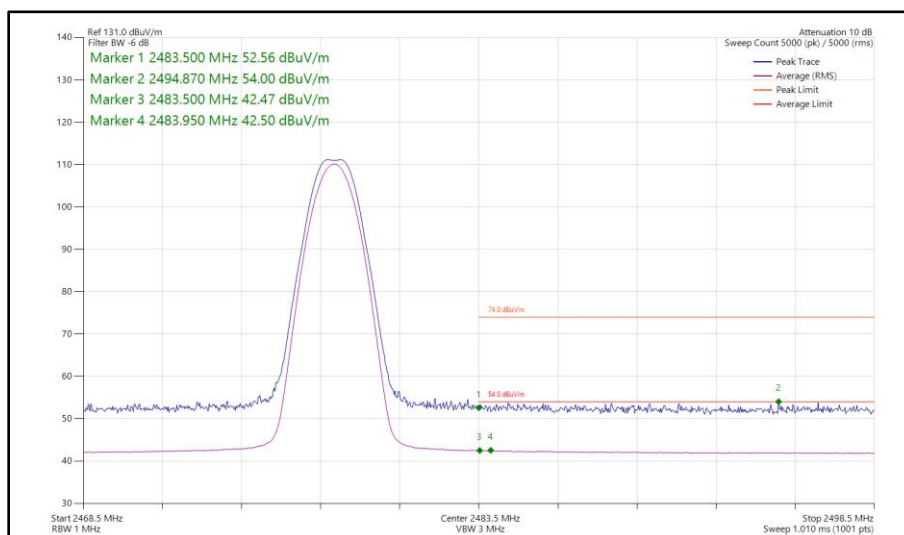
**Figure 34 - Bluetooth LE2M, MIMO, Core 0 - Core 1 - 2402 MHz
Band Edge Frequency 2390 MHz**



**Figure 35 - Bluetooth HDR4, MIMO, Core 0 - Core 1 - 2476 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 36 - Bluetooth HDR8, MIMO, Core 0 - Core 1 - 2476 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 37 - Bluetooth LE1M, MIMO, Core 0 - Core 1 - 2478 MHz
Band Edge Frequency 2483.5 MHz**

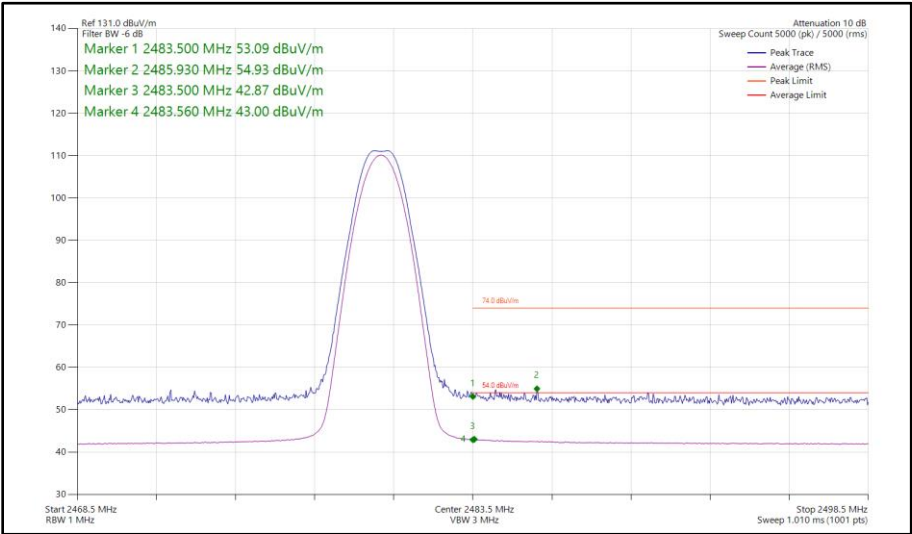


Figure 38 - Bluetooth LE1M, MIMO, Core 0 - Core 1 - 2480 MHz
Band Edge Frequency 2483.5 MHz

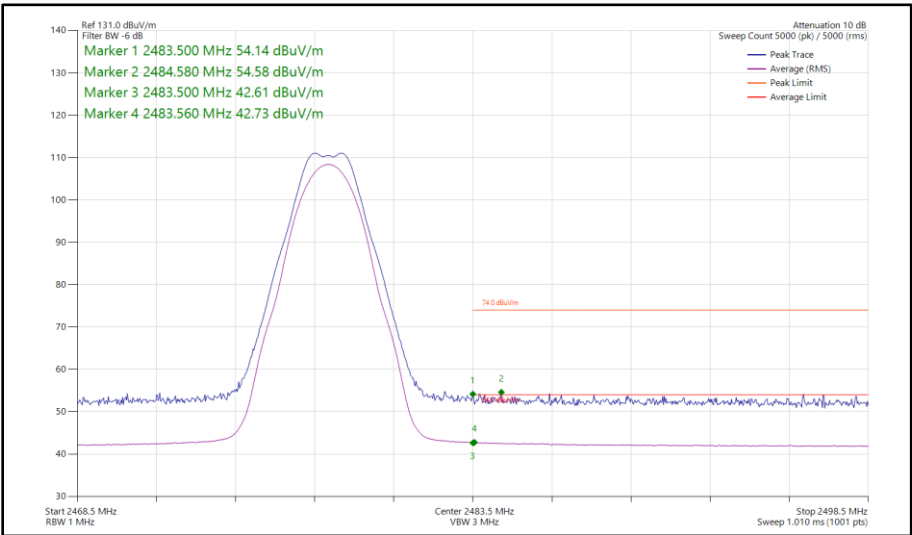
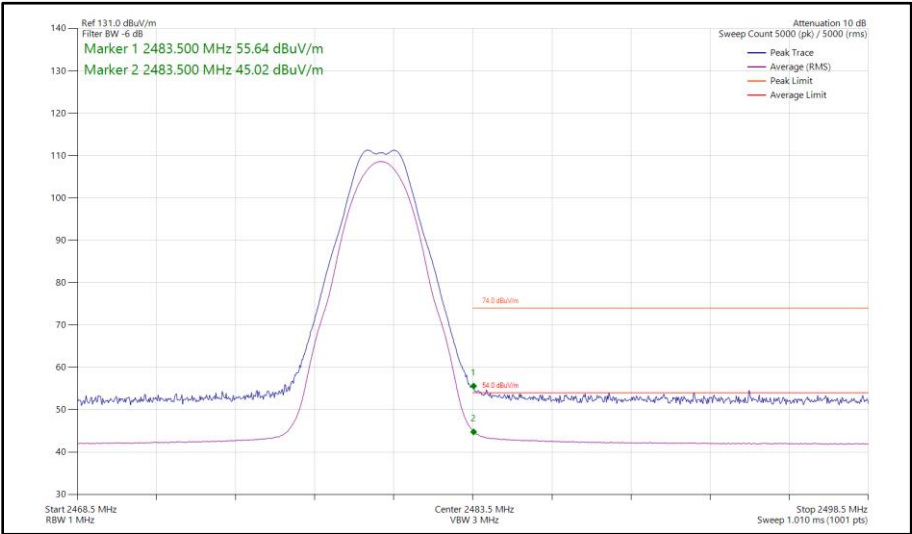


Figure 39 - Bluetooth LE2M, MIMO, Core 0 - Core 1 - 2478 MHz
Band Edge Frequency 2483.5 MHz



**Figure 40 - Bluetooth LE2M, MIMO, Core 0 - Core 1 - 2480 MHz
Band Edge Frequency 2483.5 MHz**



ePA - Core 0 (SISO)

Mode	Packet Type	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	HDR4	2404	2390	55.69	43.87
Static	HDR8	2404	2390	56.83	45.31
Static	LE1M	2402	2390	57.39	44.81
Static	LE2M	2402	2390	56.76	45.35
Static	HDR4	2476	2483.5	55.14	43.99
Static	HDR8	2476	2483.5	60.09	49.24
Static	LE1M	2478	2483.5	56.47	44.72
Static	LE1M	2480	2483.5	56.03	45.46
Static	LE2M	2478	2483.5	56.18	45.18
Static	LE2M	2480	2483.5	60.35	49.47

Table 11 - SISO Restricted Band Edge Results

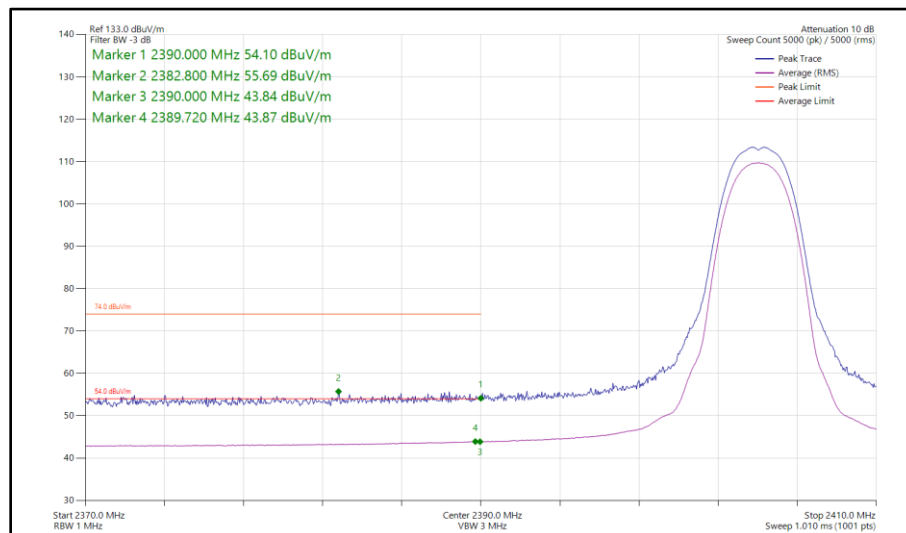
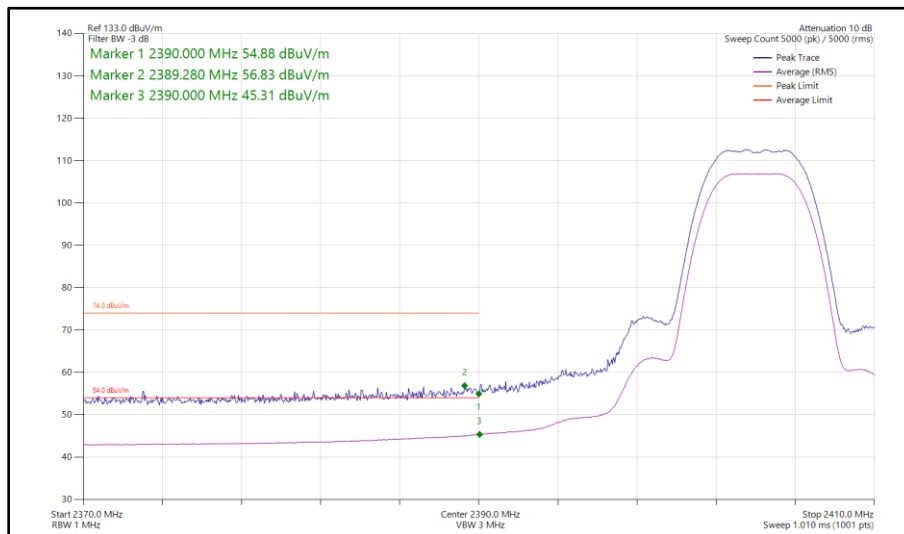
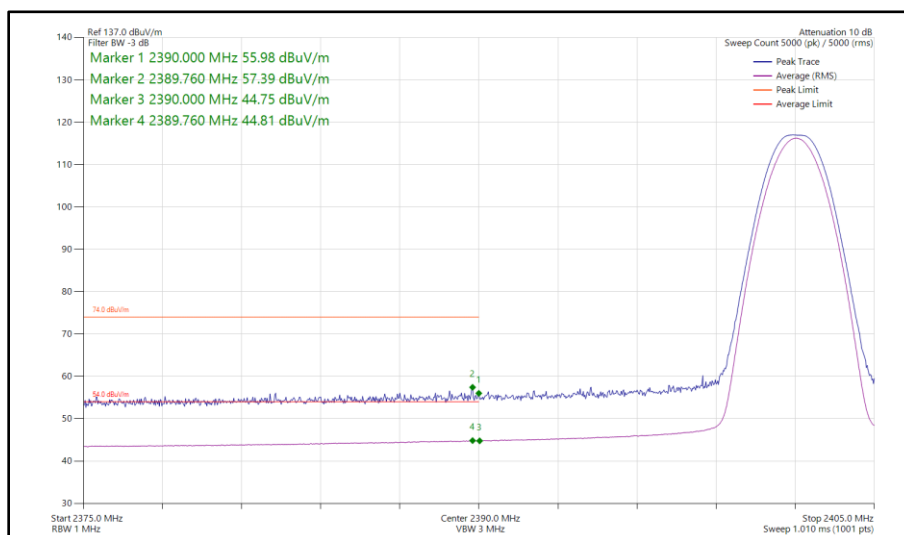


Figure 41 - Bluetooth HDR4, SISO, Core 0 - 2404 MHz
Band Edge Frequency 2390 MHz



**Figure 42 - Bluetooth HDR8, SISO, Core 0 - 2404 MHz
Band Edge Frequency 2390 MHz**



**Figure 43 - Bluetooth LE1M, SISO, Core 0 - 2402 MHz
Band Edge Frequency 2390 MHz**

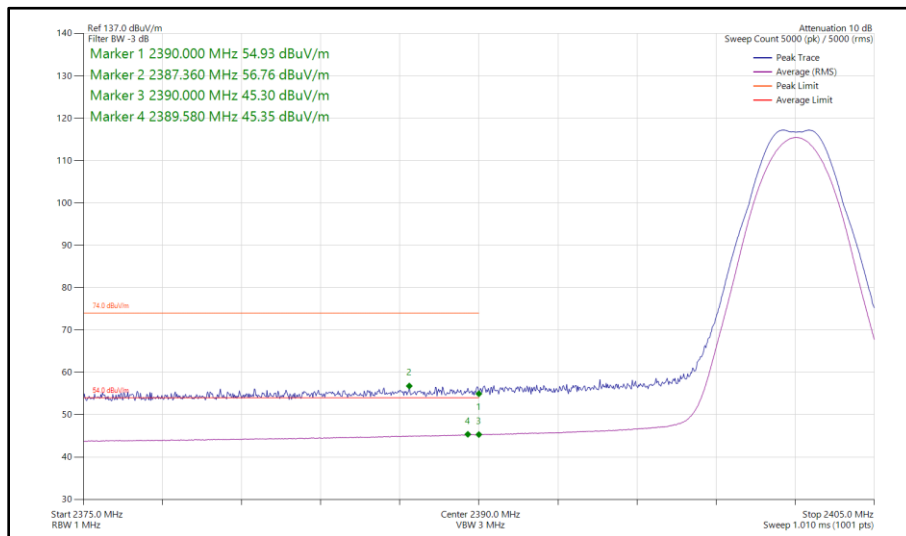


Figure 44 - Bluetooth LE2M, SISO, Core 0 - 2402 MHz
Band Edge Frequency 2390 MHz

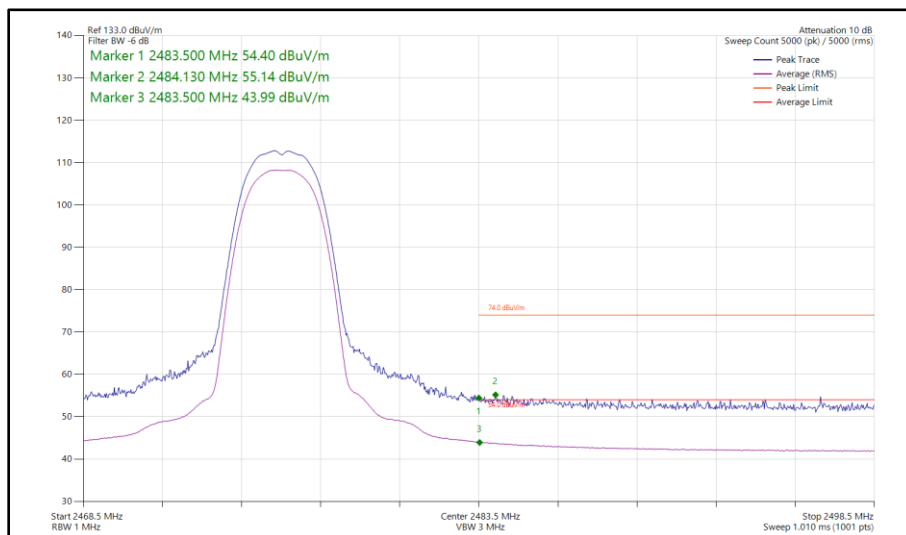
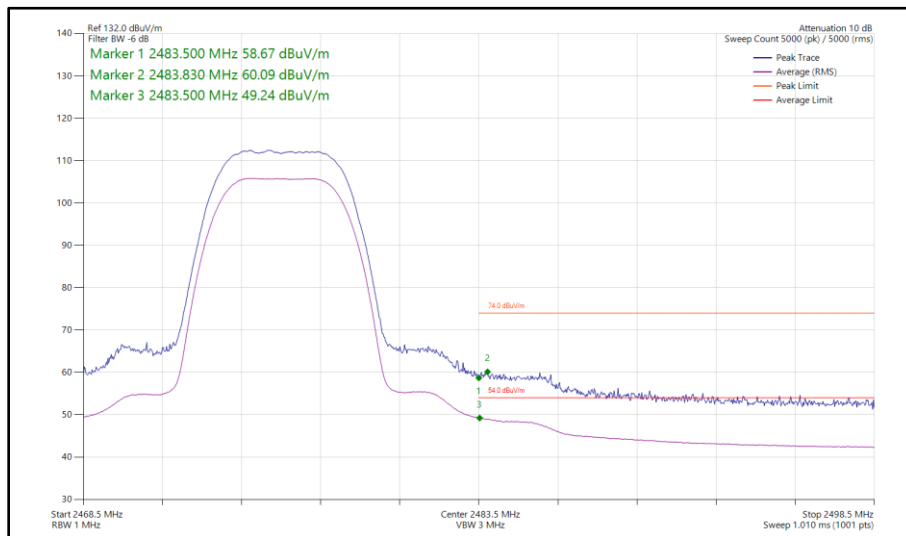
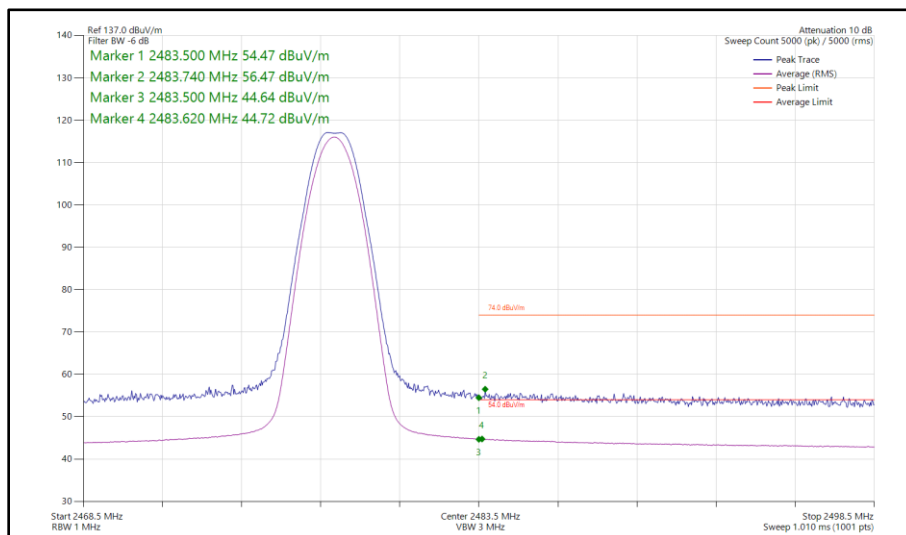


Figure 45 - Bluetooth HDR4, SISO, Core 0 - 2476 MHz
Band Edge Frequency 2483.5 MHz



**Figure 46 - Bluetooth HDR8, SISO, Core 0 - 2476 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 47 - Bluetooth LE1M, SISO, Core 0 - 2478 MHz
Band Edge Frequency 2483.5 MHz**

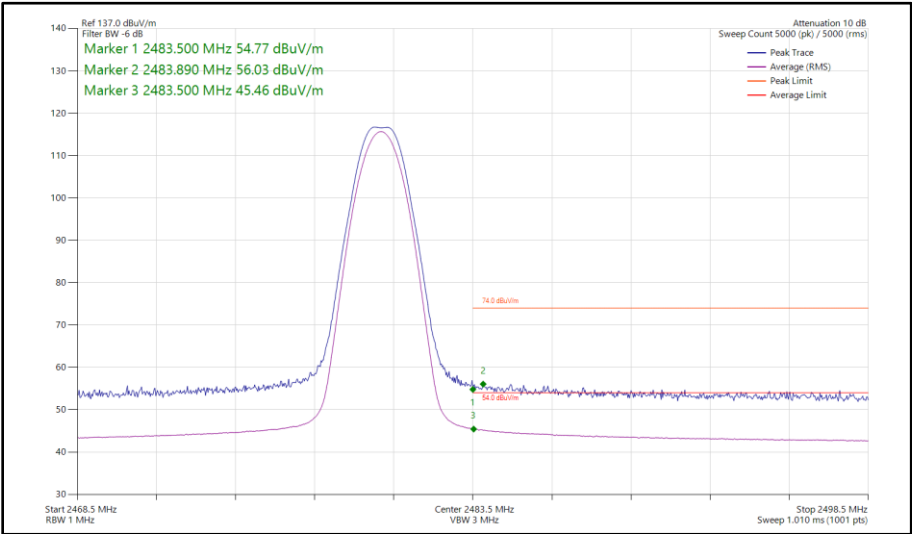


Figure 48 - Bluetooth LE1M, SISO, Core 0 - 2480 MHz
Band Edge Frequency 2483.5 MHz

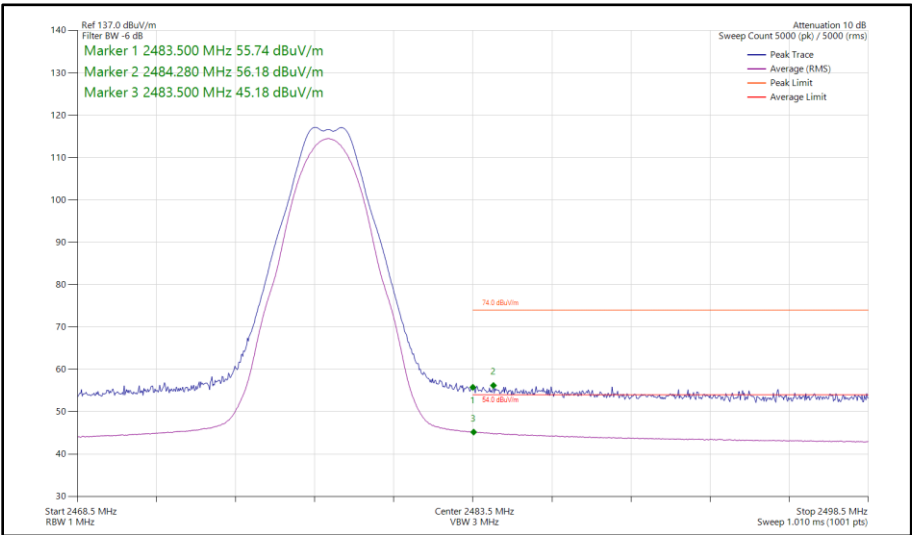
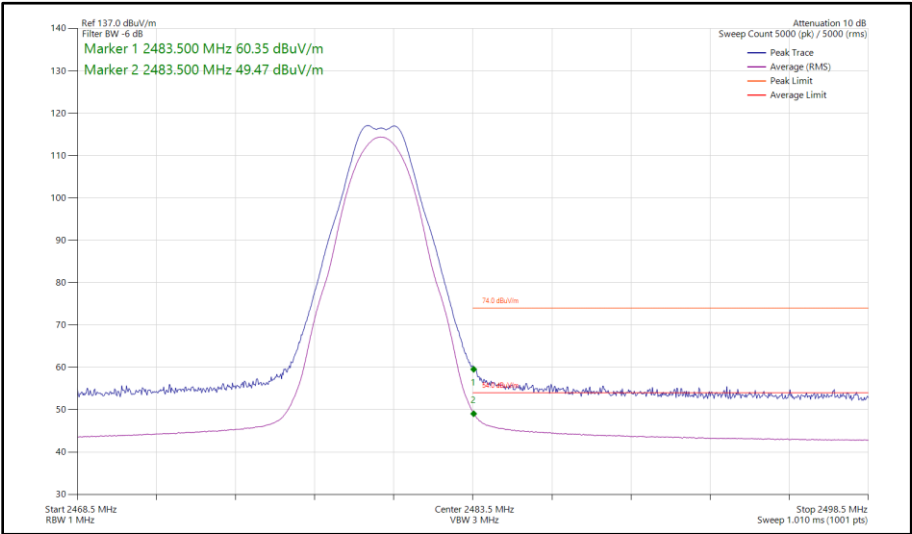


Figure 49 - Bluetooth LE2M, SISO, Core 0 - 2478 MHz
Band Edge Frequency 2483.5 MHz



**Figure 50 - Bluetooth LE2M, SISO, Core 0 - 2480 MHz
Band Edge Frequency 2483.5 MHz**



ePA - Core 1 (SISO)

Mode	Packet Type	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	HDR4	2404	2390	55.27	43.39
Static	HDR8	2404	2390	55.33	44.18
Static	LE1M	2402	2390	56.62	44.67
Static	LE2M	2402	2390	55.82	44.38
Static	HDR4	2476	2483.5	54.49	42.63
Static	HDR8	2476	2483.5	56.84	45.05
Static	LE1M	2478	2483.5	55.05	43.88
Static	LE1M	2480	2483.5	56.08	44.94
Static	LE2M	2478	2483.5	55.58	44.26
Static	LE2M	2480	2483.5	58.91	49.07

Table 12 - SISO Restricted Band Edge Results

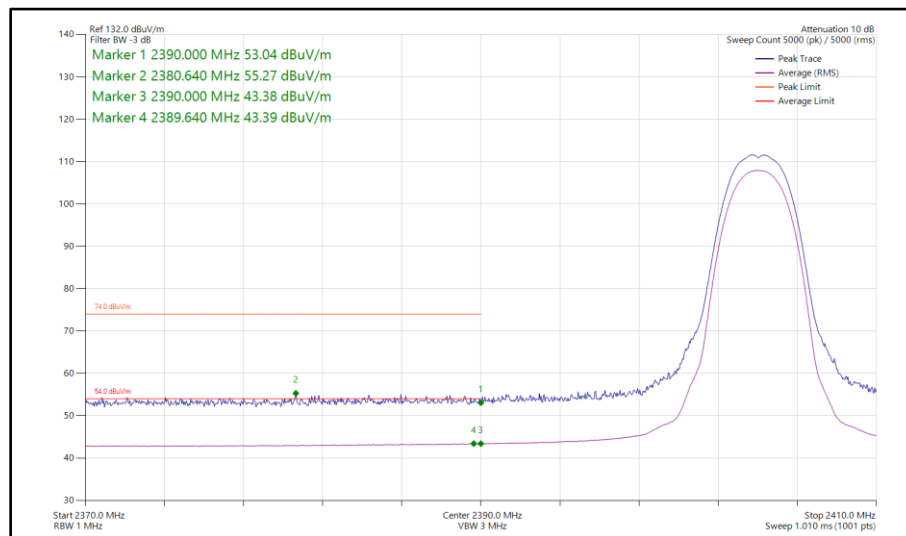
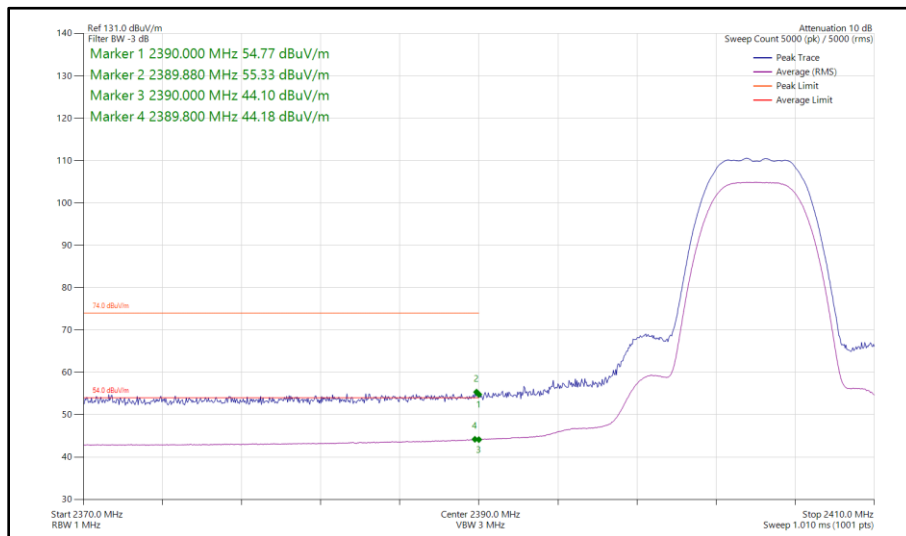
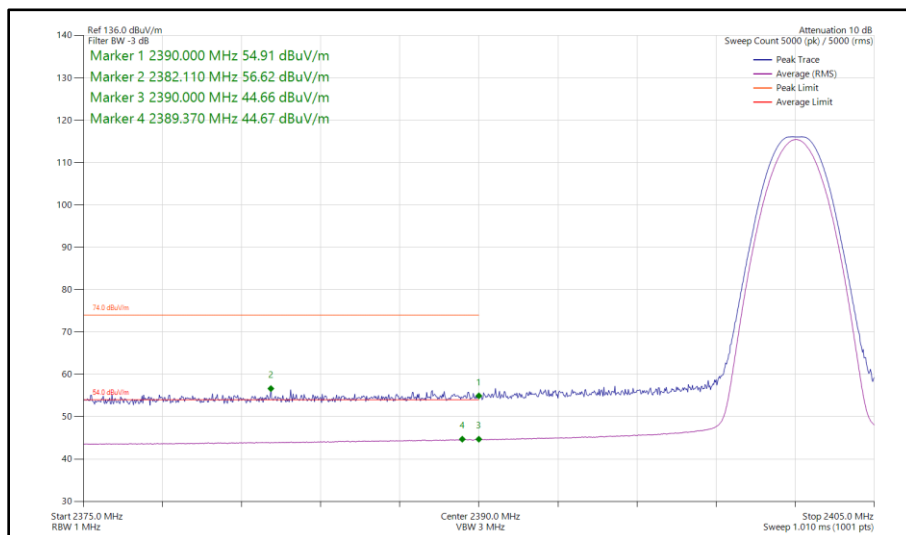


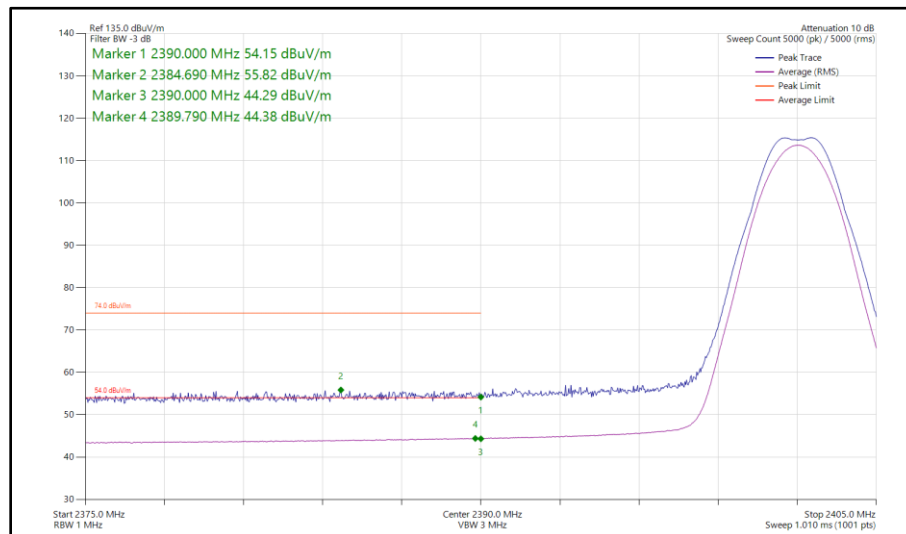
Figure 51 - Bluetooth HDR4, SISO, Core 1 - 2404 MHz
Band Edge Frequency 2390 MHz



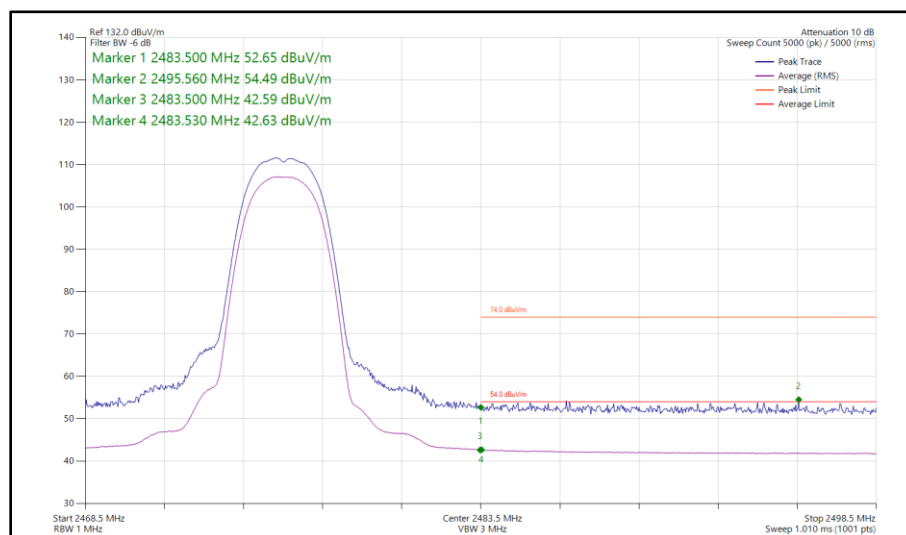
**Figure 52 - Bluetooth HDR8, SISO, Core 1 - 2404 MHz
Band Edge Frequency 2390 MHz**



**Figure 53 - Bluetooth LE1M, SISO, Core 1 - 2402 MHz
Band Edge Frequency 2390 MHz**



**Figure 54 - Bluetooth LE2M, SISO, Core 1 - 2402 MHz
Band Edge Frequency 2390 MHz**



**Figure 55 - Bluetooth HDR4, SISO, Core 1 - 2476 MHz
Band Edge Frequency 2483.5 MHz**

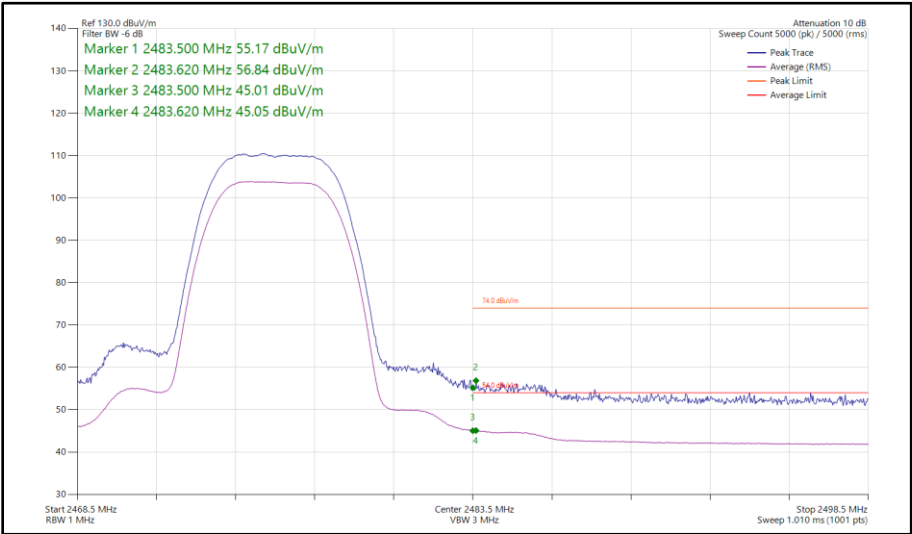


Figure 56 - Bluetooth HDR8, SISO, Core 1 - 2476 MHz
Band Edge Frequency 2483.5 MHz

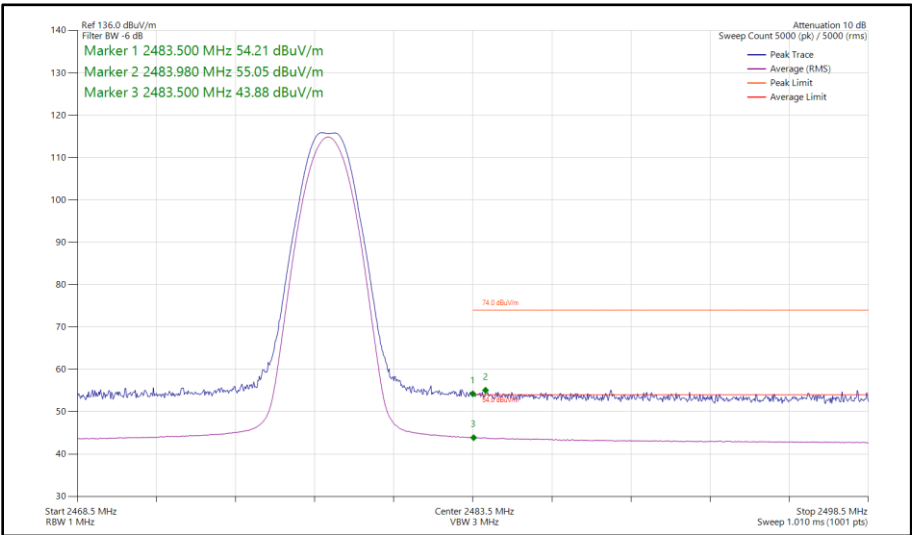


Figure 57 - Bluetooth LE1M, SISO, Core 1 - 2478 MHz
Band Edge Frequency 2483.5 MHz

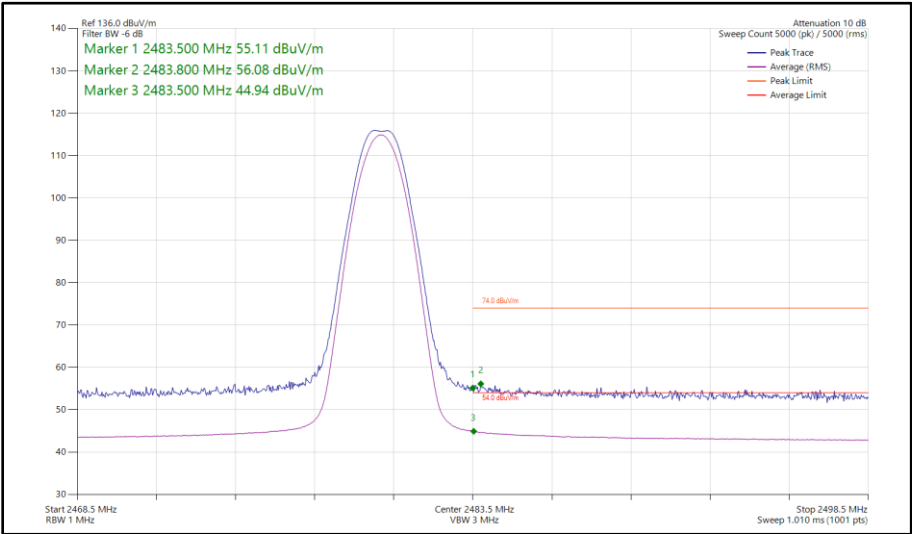


Figure 58 - Bluetooth LE1M, SISO, Core 1 - 2480 MHz
Band Edge Frequency 2483.5 MHz

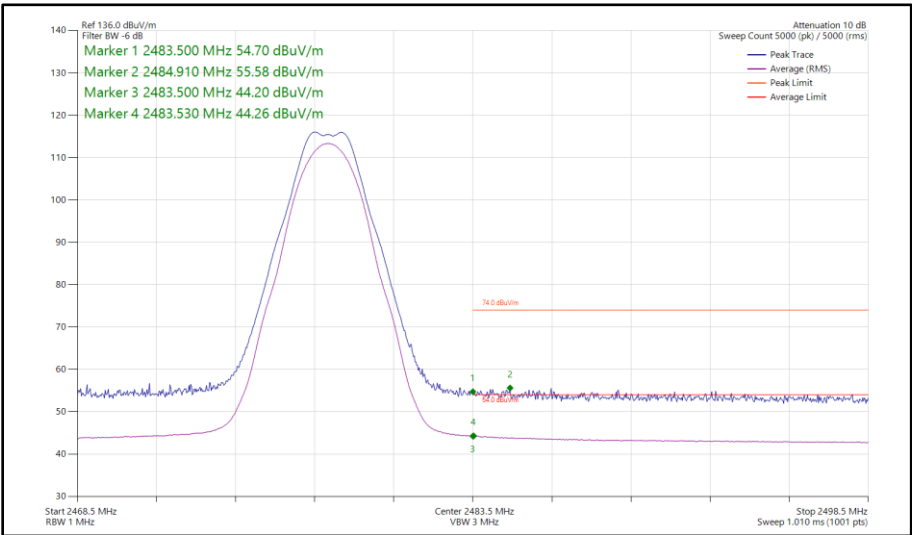
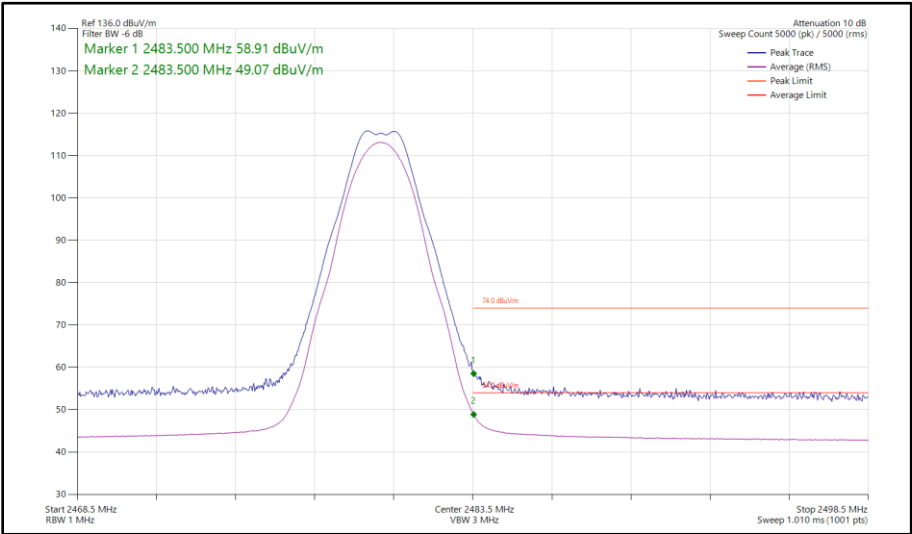


Figure 59 - Bluetooth LE2M, SISO, Core 1 - 2478 MHz
Band Edge Frequency 2483.5 MHz



**Figure 60 - Bluetooth LE2M, SISO, Core 1 - 2480 MHz
Band Edge Frequency 2483.5 MHz**

ePA - Core 0 - Core 1 (MIMO)

Mode	Packet Type	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	HDR4	2404	2390	54.93	43.52
Static	HDR8	2404	2390	56.36	44.46
Static	LE1M	2402	2390	55.63	44.26
Static	LE2M	2402	2390	56.08	44.55
Static	HDR4	2476	2483.5	56.07	44.29
Static	HDR8	2476	2483.5	60.53	49.18
Static	LE1M	2478	2483.5	56.11	44.72
Static	LE1M	2480	2483.5	56.88	45.94
Static	LE2M	2478	2483.5	56.40	45.39
Static	LE2M	2480	2483.5	59.95	49.72

Table 13 - MIMO Restricted Band Edge Results

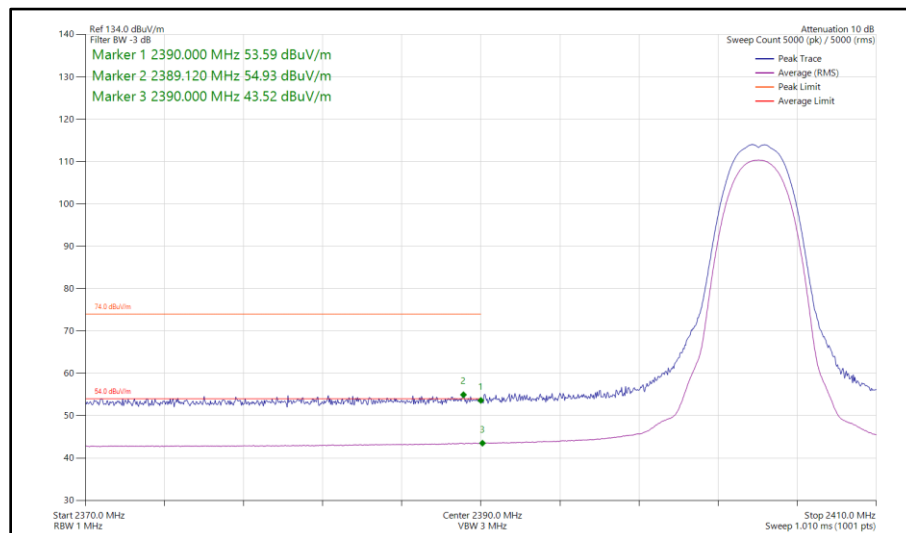


Figure 61 - Bluetooth HDR4, MIMO, Core 0 - Core 1 - 2404 MHz
Band Edge Frequency 2390 MHz

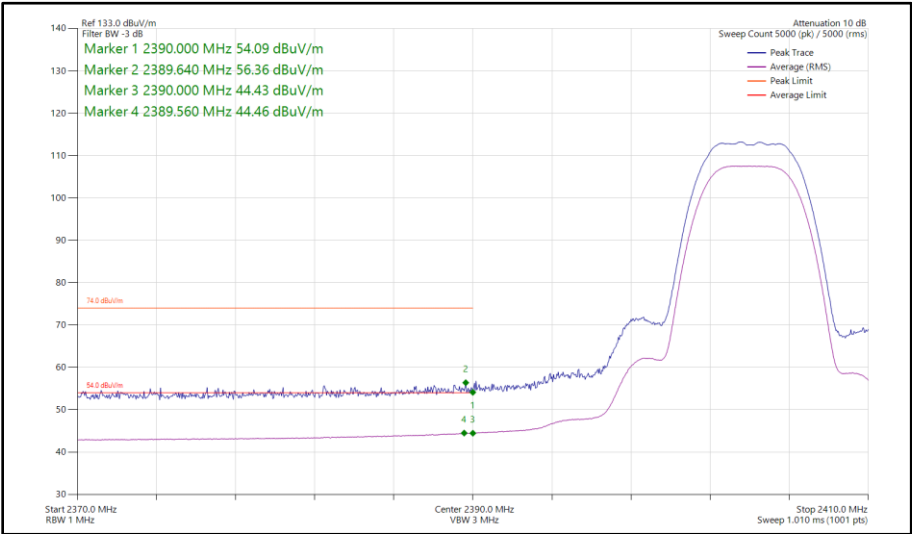


Figure 62 - Bluetooth HDR8, MIMO, Core 0 - Core 1 - 2404 MHz
Band Edge Frequency 2390 MHz

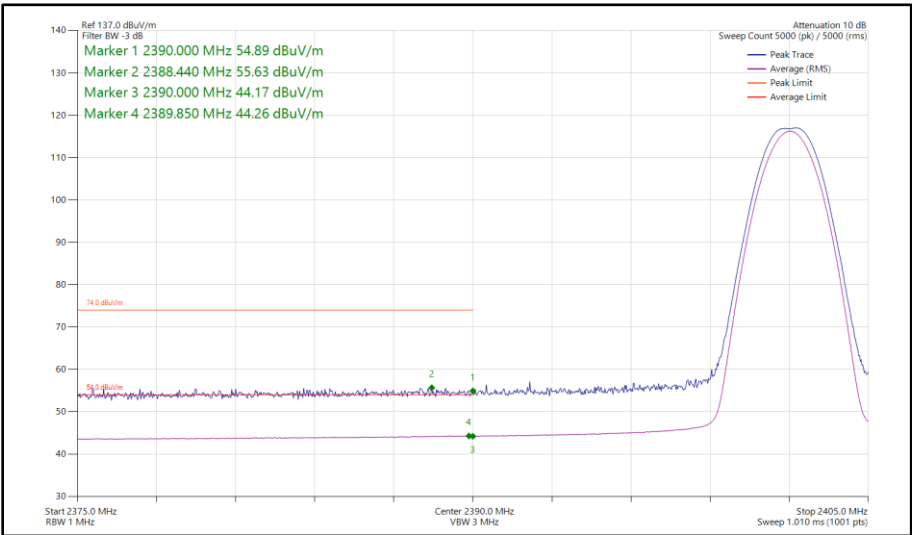
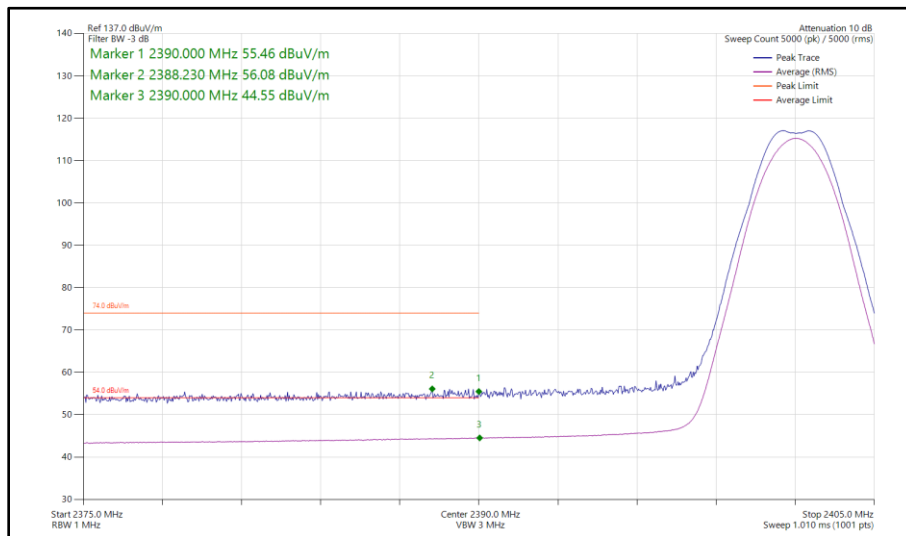
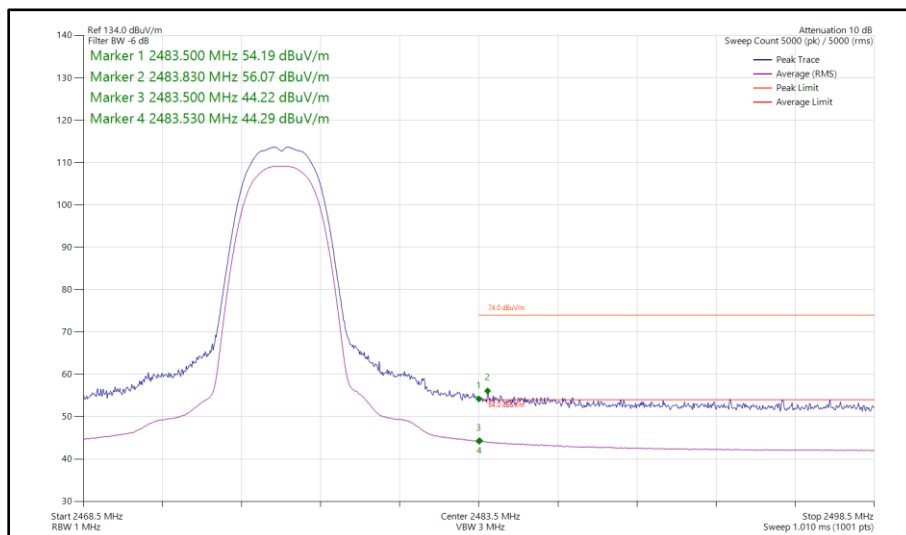


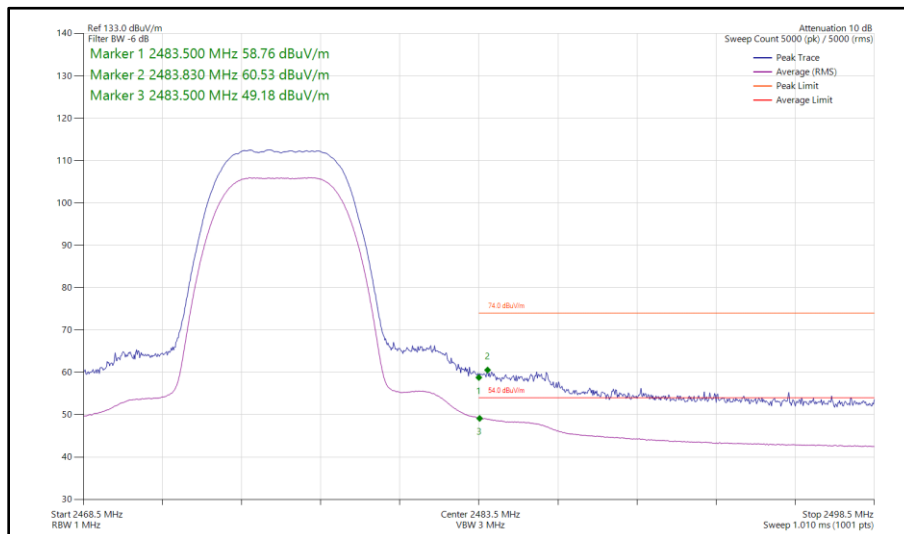
Figure 63 - Bluetooth LE1M, MIMO, Core 0 - Core 1 - 2402 MHz
Band Edge Frequency 2390 MHz



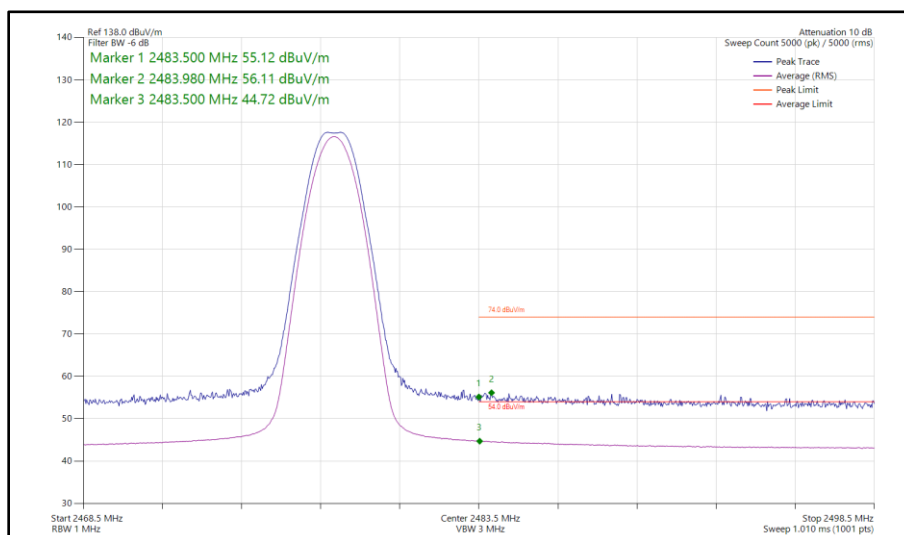
**Figure 64 - Bluetooth LE2M, MIMO, Core 0 - Core 1 - 2402 MHz
Band Edge Frequency 2390 MHz**



**Figure 65 - Bluetooth HDR4, MIMO, Core 0 - Core 1 - 2476 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 66 - Bluetooth HDR8, MIMO, Core 0 - Core 1 - 2476 MHz
Band Edge Frequency 2483.5 MHz**



**Figure 67 - Bluetooth LE1M, MIMO, Core 0 - Core 1 - 2478 MHz
Band Edge Frequency 2483.5 MHz**

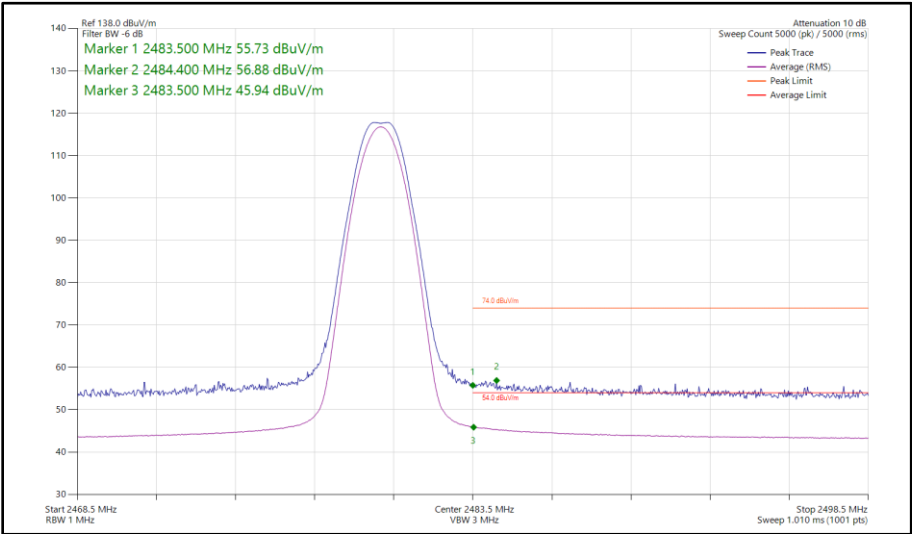


Figure 68 - Bluetooth LE1M, MIMO, Core 0 - Core 1 - 2480 MHz
Band Edge Frequency 2483.5 MHz

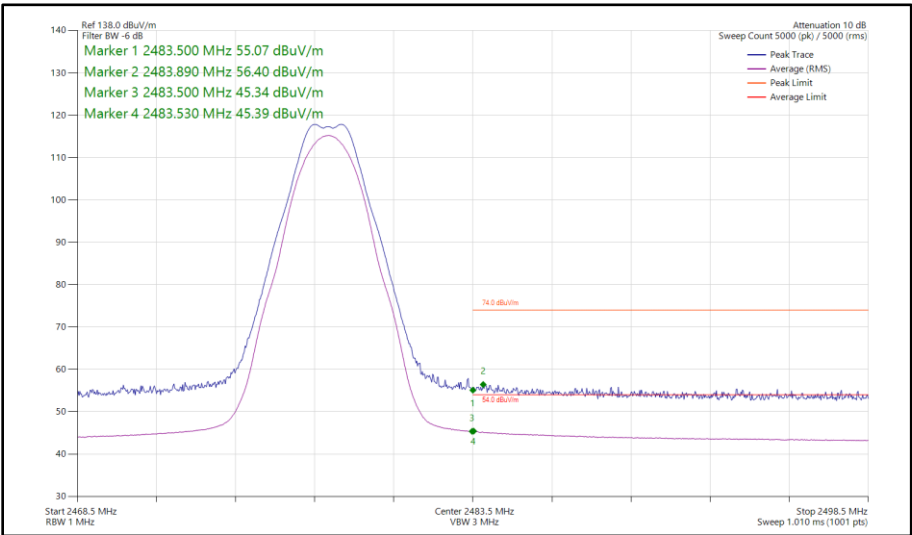


Figure 69 - Bluetooth LE2M, MIMO, Core 0 - Core 1 - 2478 MHz
Band Edge Frequency 2483.5 MHz