

FCC and ISED Test Report

Apple Inc
Model: A2816

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

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



Add value.
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FCC ID: BCGA2816

IC: 579C-A2816

COMMERCIAL-IN-CONFIDENCE

Document 75954420-07 Issue 01

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Matthew Russell	Chief Engineer (RF)	Authorised Signatory	12 December 2022

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

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15E, ISED RSS-247 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Report Generation	Hollie Marshall	12 December 2022	

FCC Accreditation

90987 Octagon House, Fareham Test Laboratory

ISED Accreditation

12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

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



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1 Report Summary

1.1 Report Modification Record

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

Issue	Description of Change	Date of Issue
1	First Issue	12 December 2022

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
Model Number(s)	A2816
Serial Number(s)	Q64HTFJ22X, H12J4GXMVX and V712HT2WFF
Hardware Version(s)	REV 1.0
Software Version(s)	22A12320r
Number of Samples Tested	4
Test Specification/Issue/Date	FCC 47 CFR Part 15E: 2021 ISED RSS-247: Issue 2 (2017-02) ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02)
Order Number	0540246998
Start of Test	26-June-2022
Finish of Test	10-November-2022
Name of Engineer(s)	Taha Shafique, Thomas Randall, Thomas Biddlecombe, Mohammad Malik and Elliot Callender
Related Document(s)	KDB 662911 D01 v02r01 ANSI C63.10 (2013) ANSI C63.10 (2020)



1.3 Brief Summary of Results

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

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	FCC Part 15E	RSS-247	RSS-GEN			
Configuration and Mode: NarrowBand						
-	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	15.407 (a)	6.2	-	Emission Bandwidth	Pass	
2.3	15.407 (a)	6.2	-	Maximum Conducted Output Power	Pass	
2.4	15.407 (a)	6.2	-	Maximum Conducted Power Spectral Density	Pass	
2.5	15.407 (b)	6.2	-	Authorised Band Edges	Pass	
2.6	15.209 and 15.407 (b)	6.2	6.13 and 8.9	Spurious Radiated Emissions	Pass	

Table 2



1.4 Product Information

1.4.1 Technical Description

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

1.4.2 Test Setup

For conducted tests, a conducted test point was provided by the manufacturer via a UFL connector and cable. The loss of these test cables were known and compensated for in any conducted measurements.

For tests in SISO operation, conducted tests were performed on the core with the highest antenna gain as Core 0 and Core 1 are identical but with unequal antenna gains.

Narrowband was supported in the following frequency bands:

US: 5162-5245 MHz

US and Canada: 5733-5844 MHz

The following modes were supported:

BT Core 0 (SISO) – iPA BDR/HDR and ePA HDR

BT Core 1 (SISO) – iPA BDR/EDR and ePA HDR

BT Core 0 + BT Core 1 (TxBF) – iPA BDR and HDR and ePA HDR

For all tests, the EUT was put into a continuous transmit test mode with the manufacturer's test commands via a script running in the EUTs terminal application. The EUT then transmitted the required type of modulation/packet type on a static channel selected within the test script.

All testing was performed with the EUT powered via a 120 V AC, 60 Hz source.

1.4.3 Antenna Gain Table

Antenna Port	Frequency Range (MHz)	Peak Gain (dBi)	Conducted Cable Loss (dB)
BT Core 0	5150 to 5250	0.15	1.20
	5725 to 5850	0.88	1.30
BT Core 1	5150 to 5250	6.25	1.20
	5725 to 5850	6.66	1.30

Table 3

1.5 Deviations from the Standard

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



1.6 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Model: A2816, Serial Number: H12J4GXMVX			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2816, Serial Number: Q64HTFJ22X			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2816, Serial Number: V712HT2WFF			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2816, Serial Number: Q64HTFJ22X			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 4



1.7 Test Location

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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: NarrowBand		
Restricted Band Edges	Taha Shafique and Thomas Randall	UKAS
Emission Bandwidth	Thomas Biddlecombe	UKAS
Maximum Conducted Output Power	Thomas Biddlecombe	UKAS
Maximum Conducted Power Spectral Density	Thomas Biddlecombe	UKAS
Authorised Band Edges	Taha Shafique and Thomas Randall	UKAS

Table 5

Office Address:

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

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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: NarrowBand		
Restricted Band Edges	Taha Shafique and Thomas Randall	
Authorised Band Edges	Taha Shafique and Thomas Randall	
Spurious Radiated Emissions	Mohammad Malik and Elliot Callender	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

A2816, S/N: Q64HTFJ22X - Modification State 0
A2816, S/N: V712HT2WFF - Modification State 0

2.1.3 Date of Test

26-June-2022 to 26-October-2022

2.1.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.10.5.
As per ANSI C63.10 clause 6.10.5.2, this testing was performed with frequency hopping turned off.

Restricted Band Edge measurements were performed with the device operating in SISO and MIMO TxBF 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	22.3 - 25.0 °C
Relative Humidity	54.2 - 58.8 %

2.1.6 Test Results

Narrow Band

iPA - SISO

Mode	Modulation	Core	Packet Type	Tx Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	GFSK	1	DH5	5162	5150	55.14	43.18
Static	$\pi/4$ DQPSK	1	4-DH5	5162	5150	54.83	42.86
Static	$\pi/4$ DQPSK	1	8-DH5	5162	5150	54.95	42.98
Static	GFSK	1	DH5	5245	5350	56.46	44.42
Static	$\pi/4$ DQPSK	1	4-DH5	5245	5350	56.55	44.33
Static	$\pi/4$ DQPSK	1	8-DH5	5245	5350	56.71	44.31

Table 7 - Restricted Band Edge Results

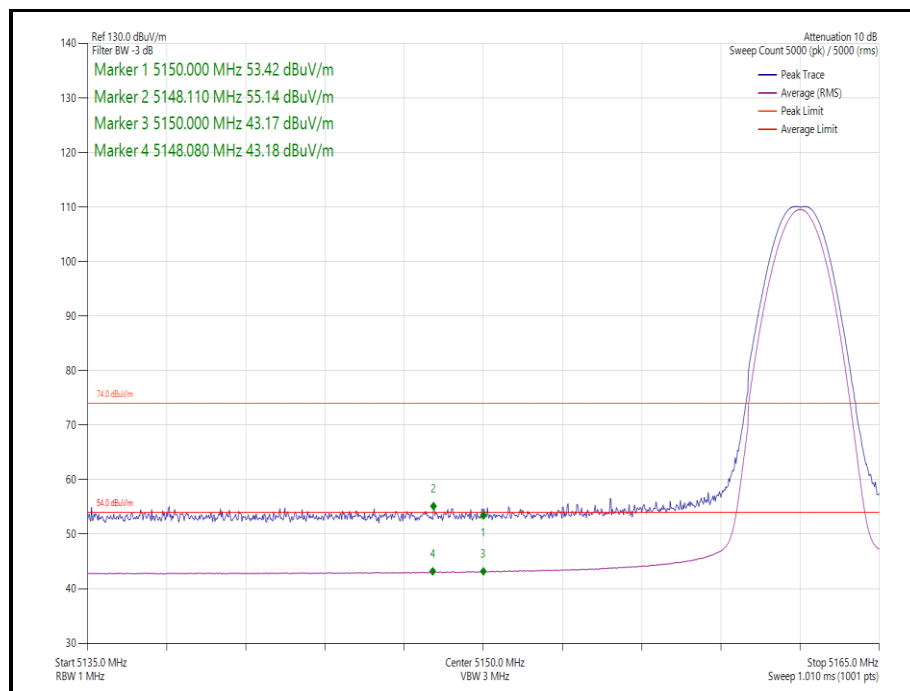


Figure 1 - Static - GFSK/DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

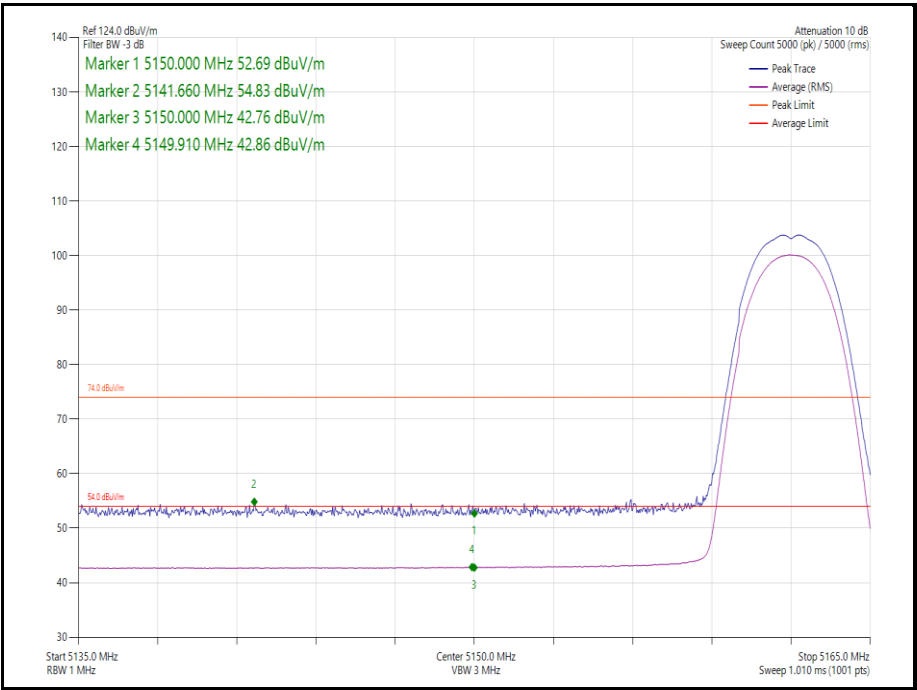


Figure 2 - Static - $\pi/4$ DQPSK/4-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

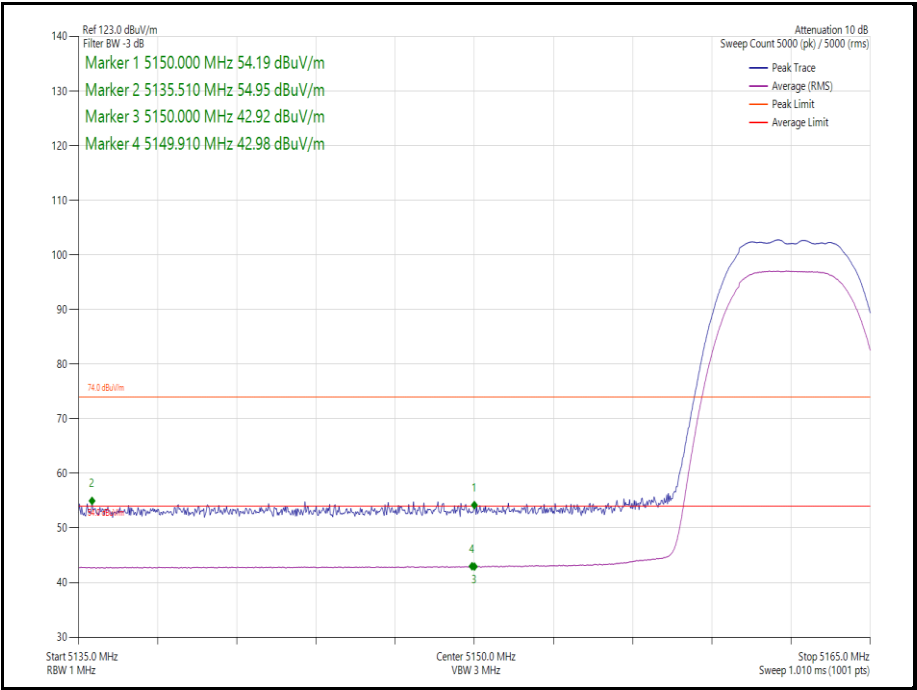


Figure 3 - Static - $\pi/4$ DQPSK/8-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

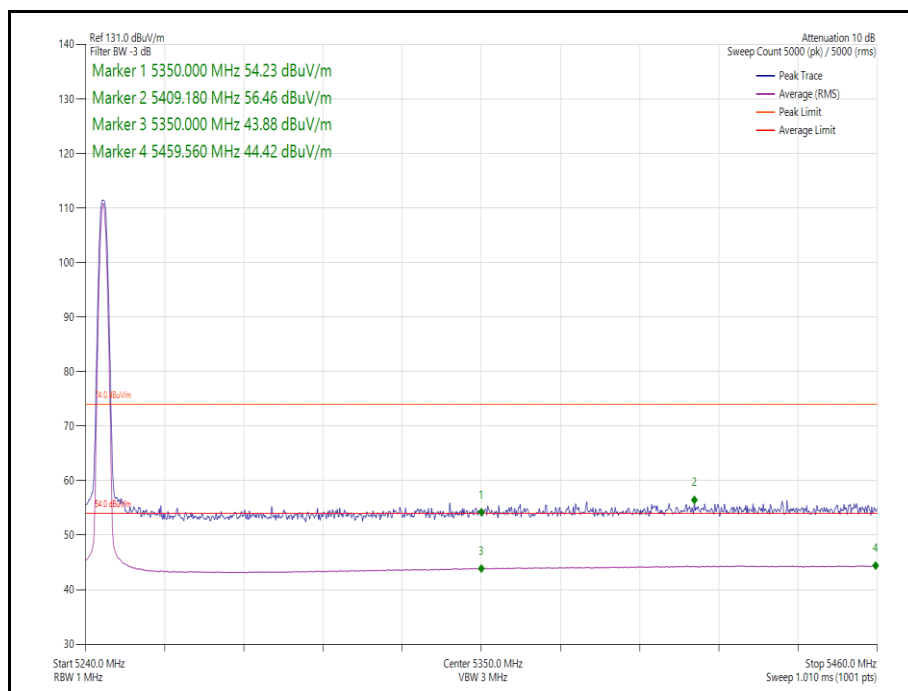


Figure 4 - Static - GFSK/DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

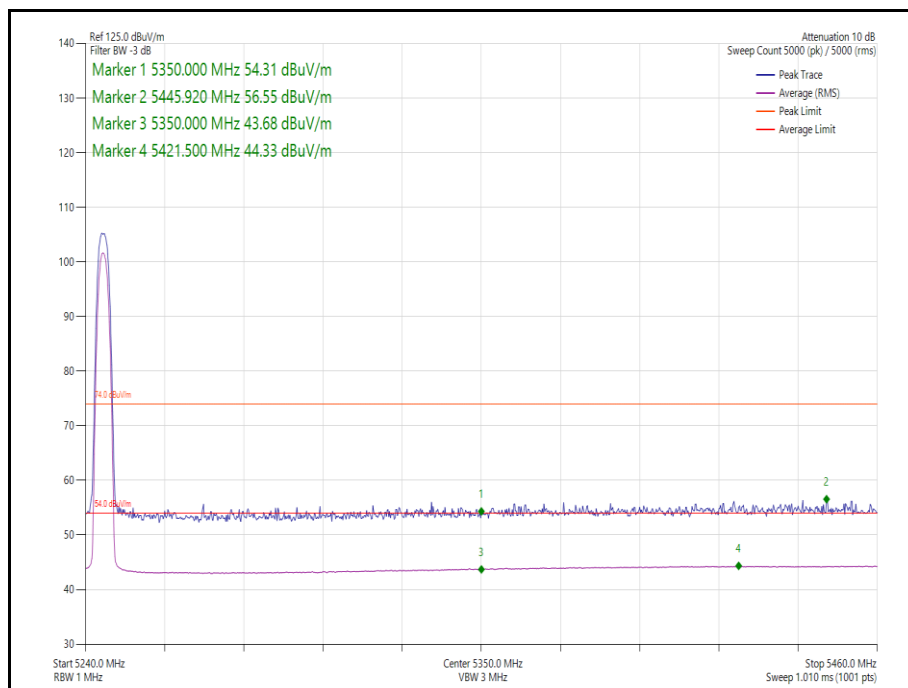


Figure 5 - Static - $\pi/4$ DQPSK/4-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

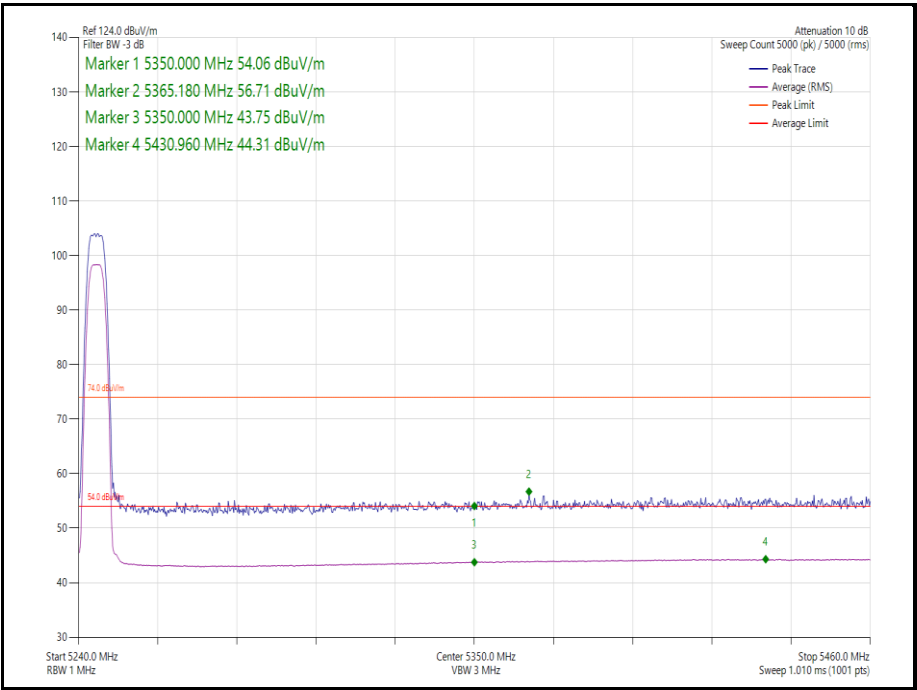


Figure 6 - Static - $\pi/4$ DQPSK/8-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

iPA - TXBF

Mode	Modulation	Core	Packet Type	Tx Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	GFSK	0-1	DH5	5162	5150	52.03	39.99
Static	$\pi/4$ DQPSK	0-1	4-DH5	5162	5150	51.71	39.94
Static	$\pi/4$ DQPSK	0-1	8-DH5	5162	5150	52.14	40.38
Static	GFSK	0-1	DH5	5245	5350	52.21	40.53
Static	$\pi/4$ DQPSK	0-1	4-DH5	5245	5350	52.26	40.55
Static	$\pi/4$ DQPSK	0-1	8-DH5	5245	5350	52.52	40.62

Table 8 - Restricted Band Edge Results

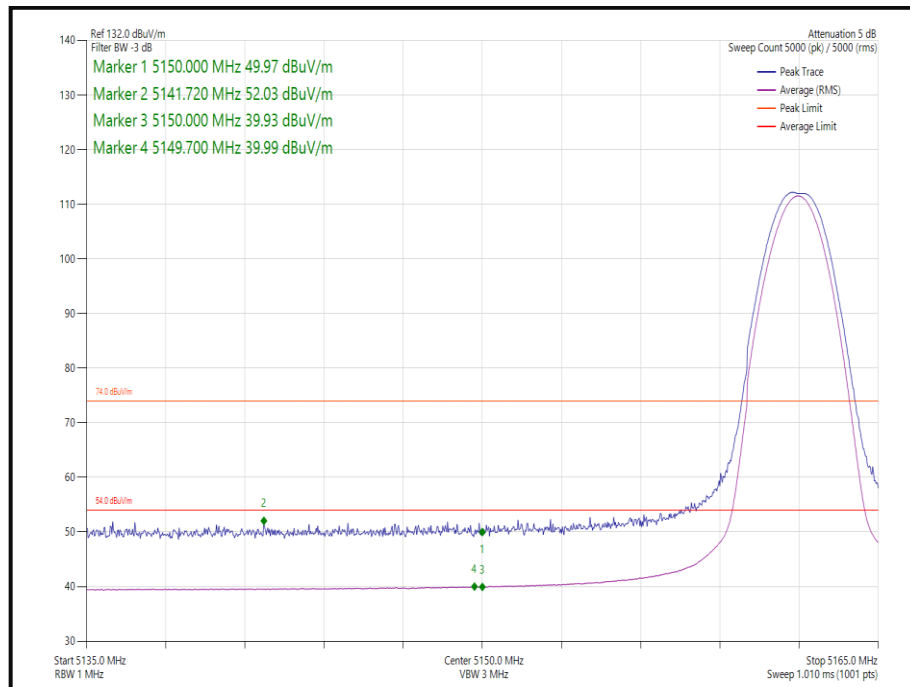


Figure 7 - Static - GFSK/DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

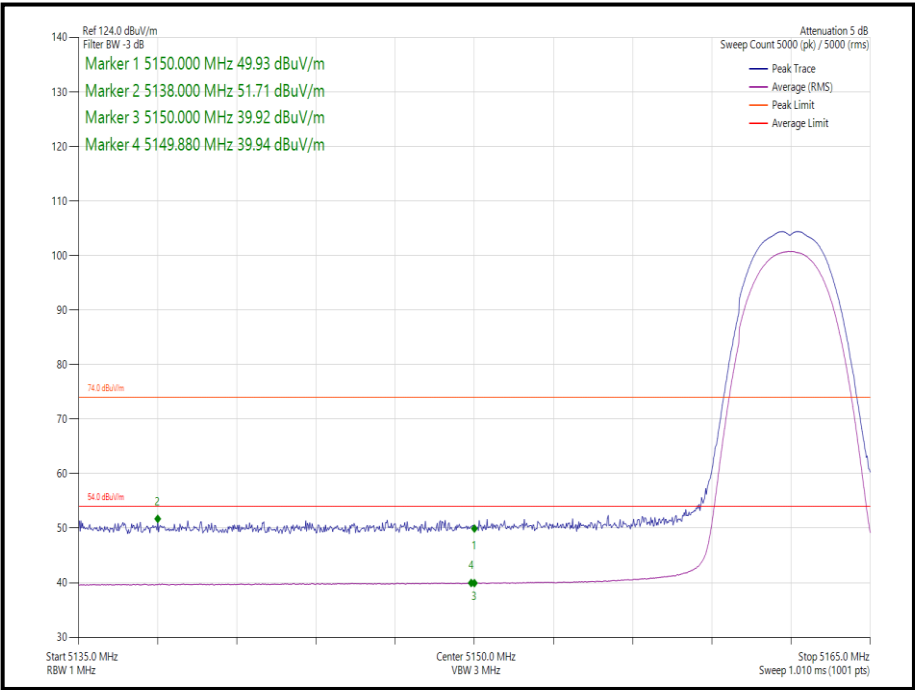


Figure 8 - Static - $\pi/4$ DQPSK/4-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

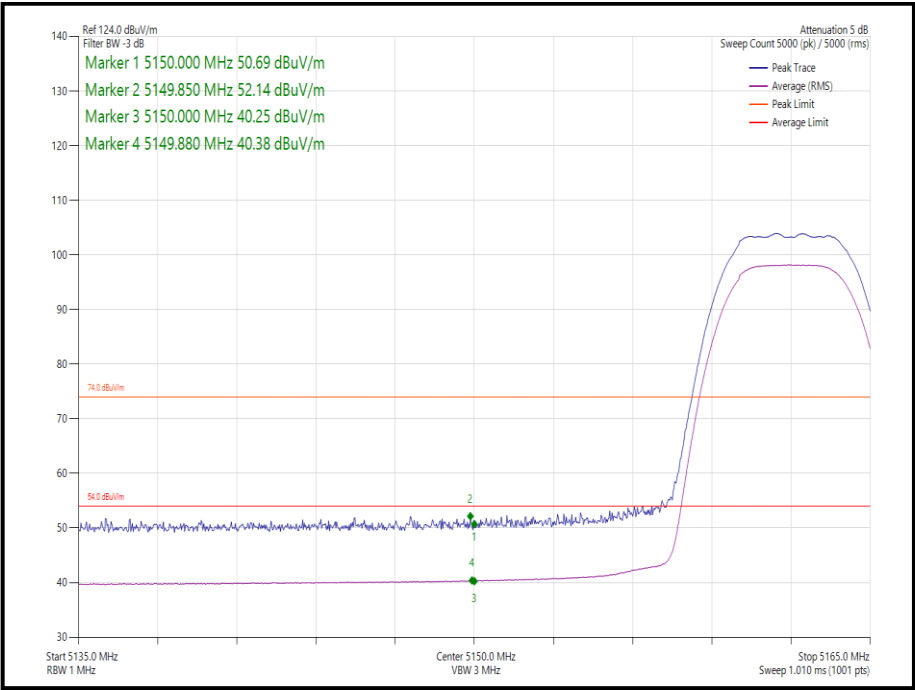


Figure 9 - Static - $\pi/4$ DQPSK/8-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

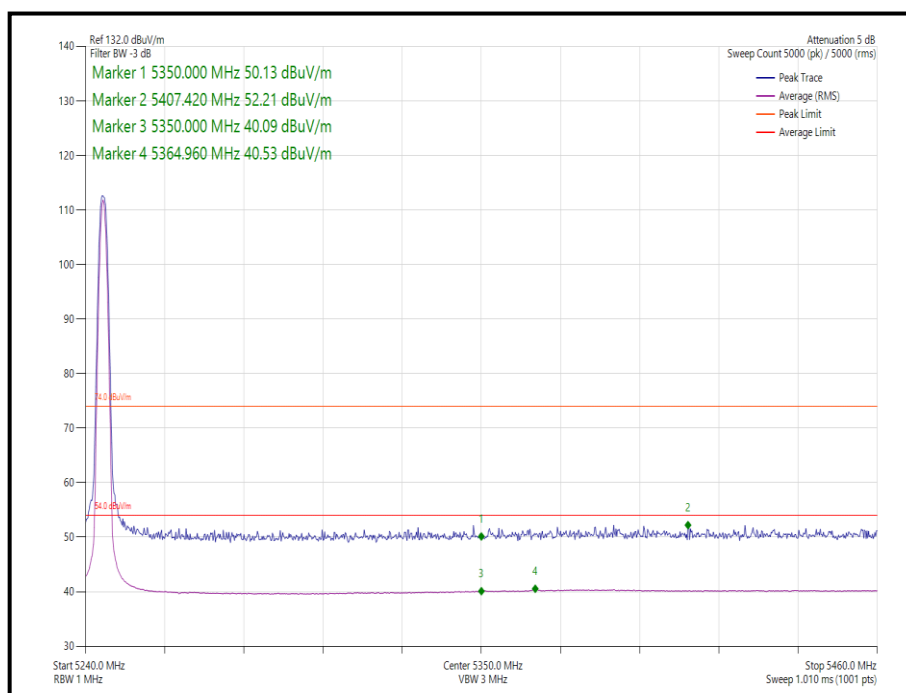


Figure 10 - Static - GFSK/DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

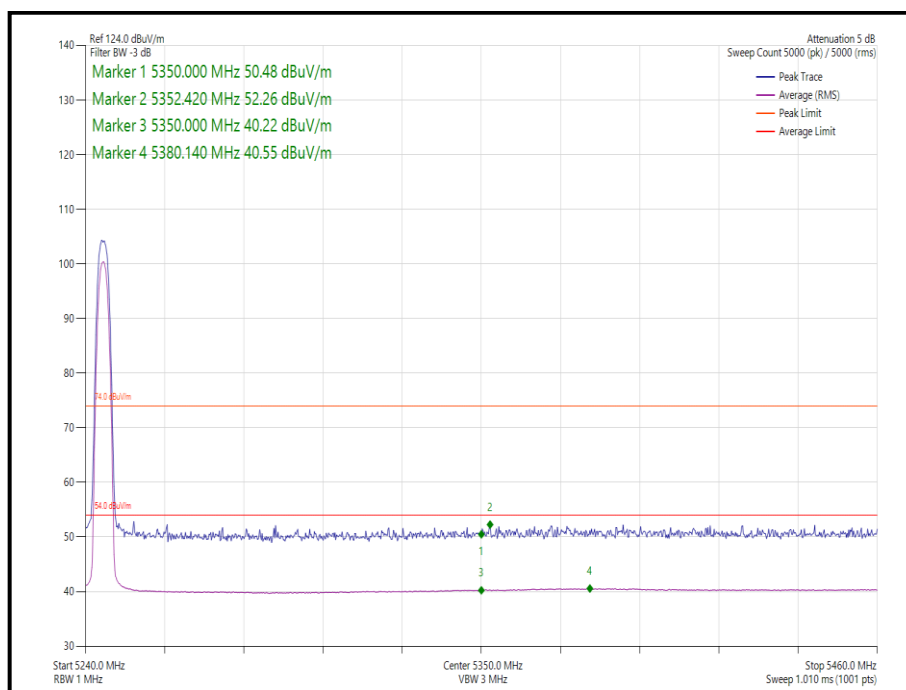


Figure 11 - Static - $\pi/4$ DQPSK/4-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

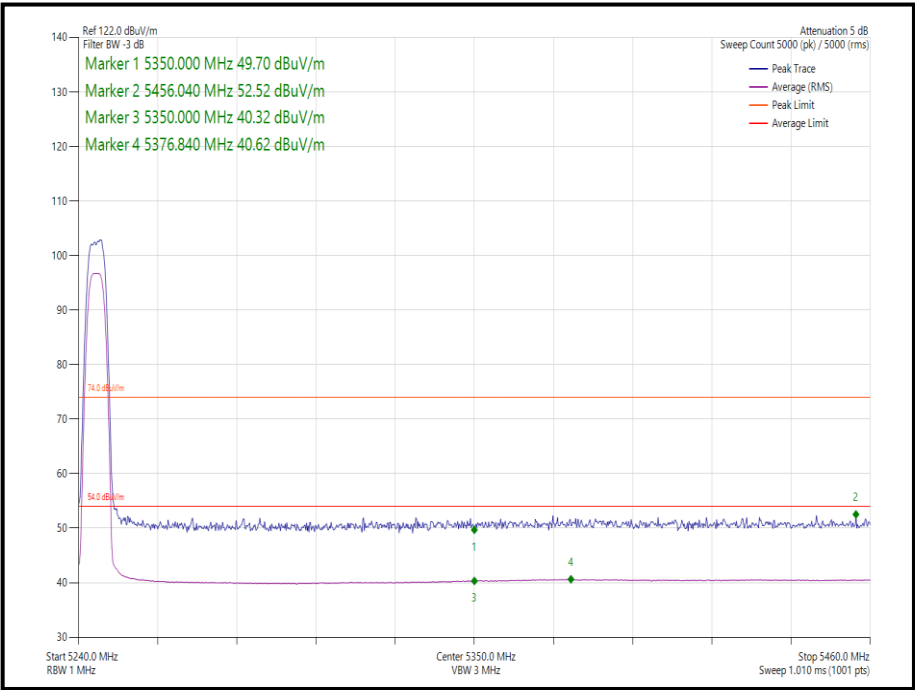


Figure 12 - Static - $\pi/4$ DQPSK/8-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

ePA - SISO

Mode	Modulation	Core	Packet Type	Tx Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	$\pi/4$ DQPSK	1	4-DH5	5162	5150	56.06	44.00
Static	$\pi/4$ DQPSK	1	8-DH5	5162	5150	56.05	44.74
Static	$\pi/4$ DQPSK	1	4-DH5	5245	5350	56.26	44.51
Static	$\pi/4$ DQPSK	1	8-DH5	5245	5350	57.19	44.48

Table 9 - Restricted Band Edge Results

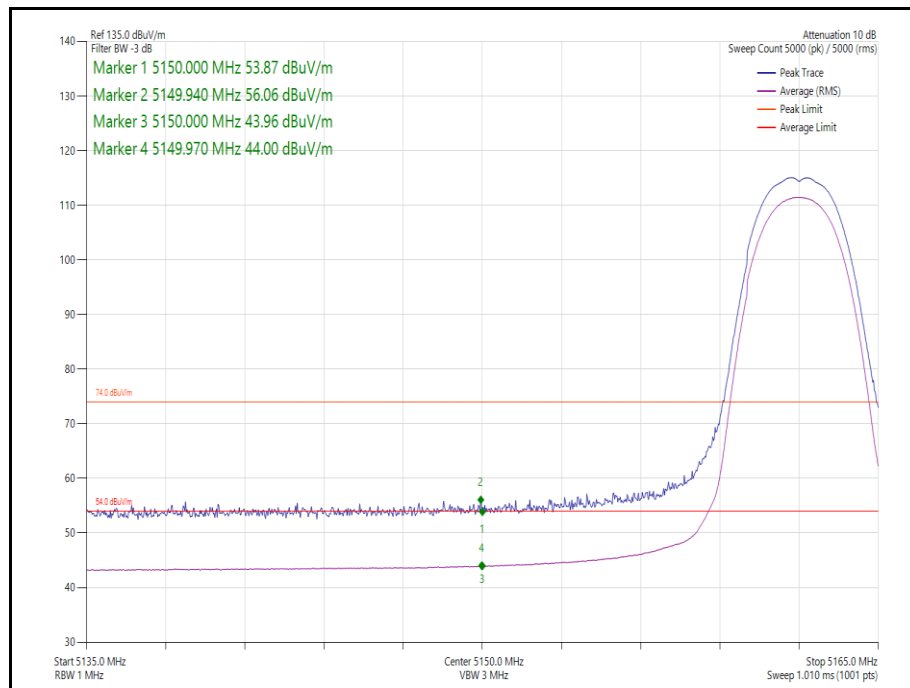


Figure 13 - Static - $\pi/4$ DQPSK/4-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

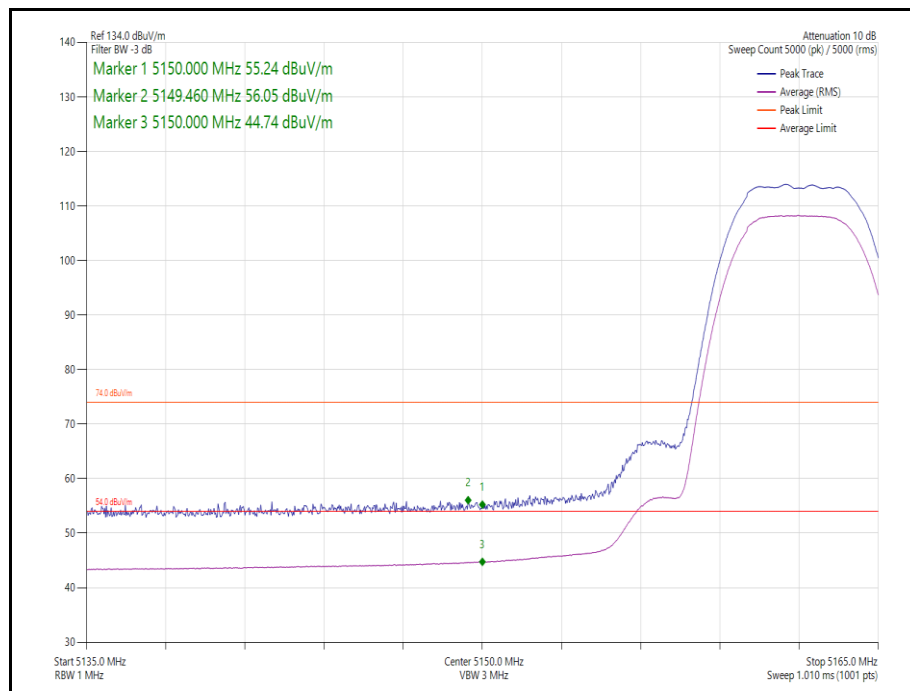


Figure 14 - Static - $\pi/4$ DQPSK/8-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

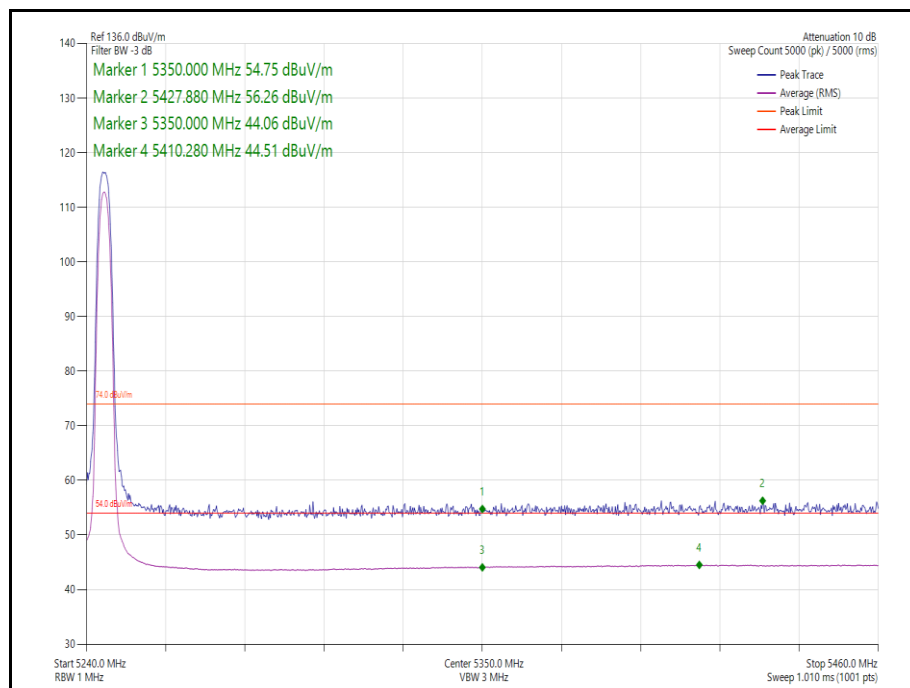


Figure 15 - Static - $\pi/4$ DQPSK/4-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

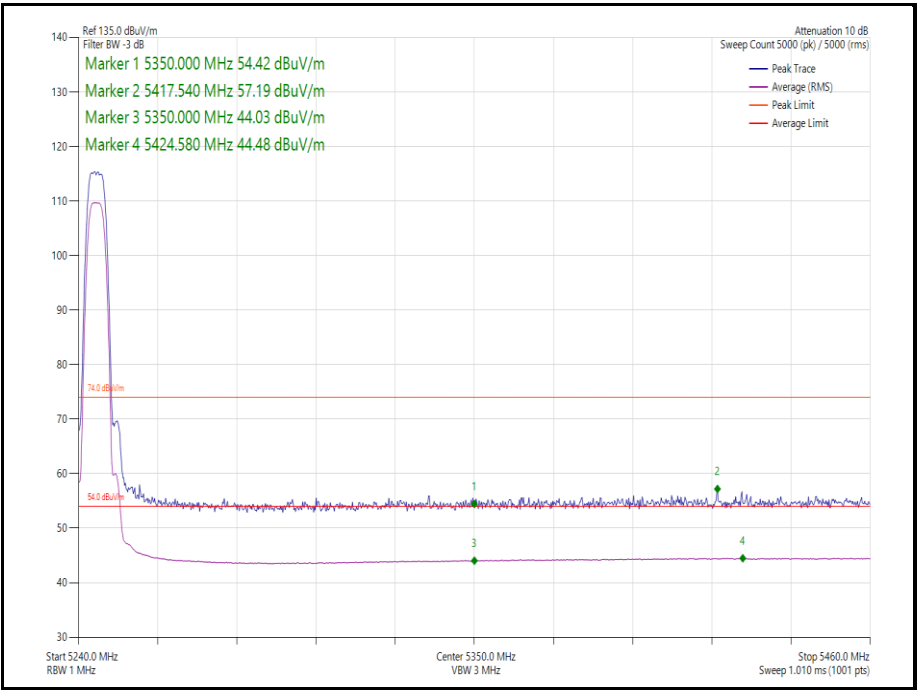


Figure 16 - Static - $\pi/4$ DQPSK/8-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

ePA - TXBF

Mode	Modulation	Core	Packet Type	Tx Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Static	$\pi/4$ DQPSK	0-1	4-DH5	5162	5150	52.23	40.46
Static	$\pi/4$ DQPSK	0-1	8-DH5	5162	5150	53.21	41.45
Static	$\pi/4$ DQPSK	0-1	4-DH5	5245	5350	53.58	40.82
Static	$\pi/4$ DQPSK	0-1	8-DH5	5245	5350	53.03	40.81

Table 10 - Restricted Band Edge Results

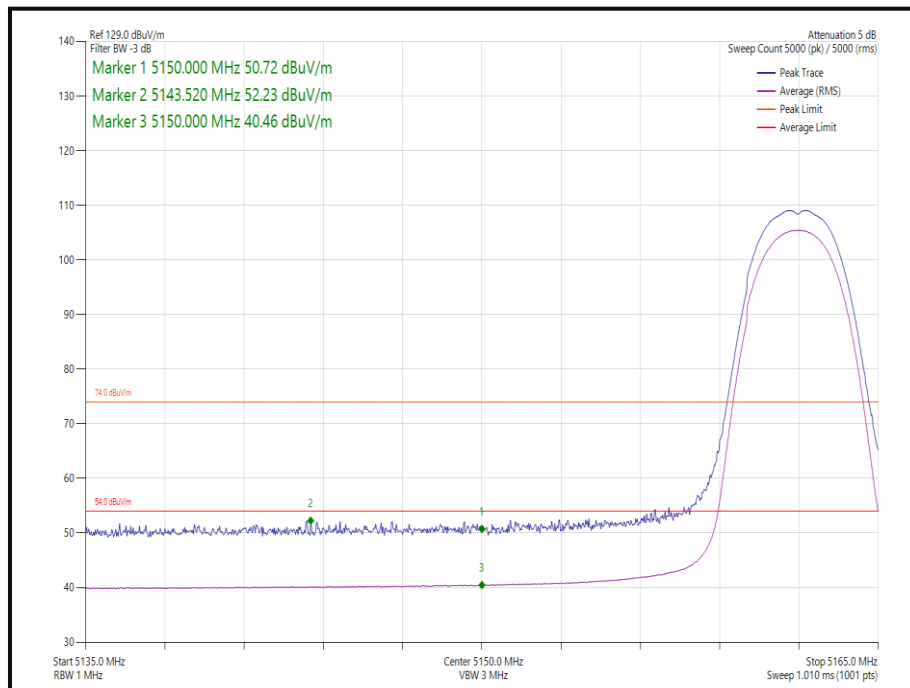


Figure 17 - Static - $\pi/4$ DQPSK/4-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

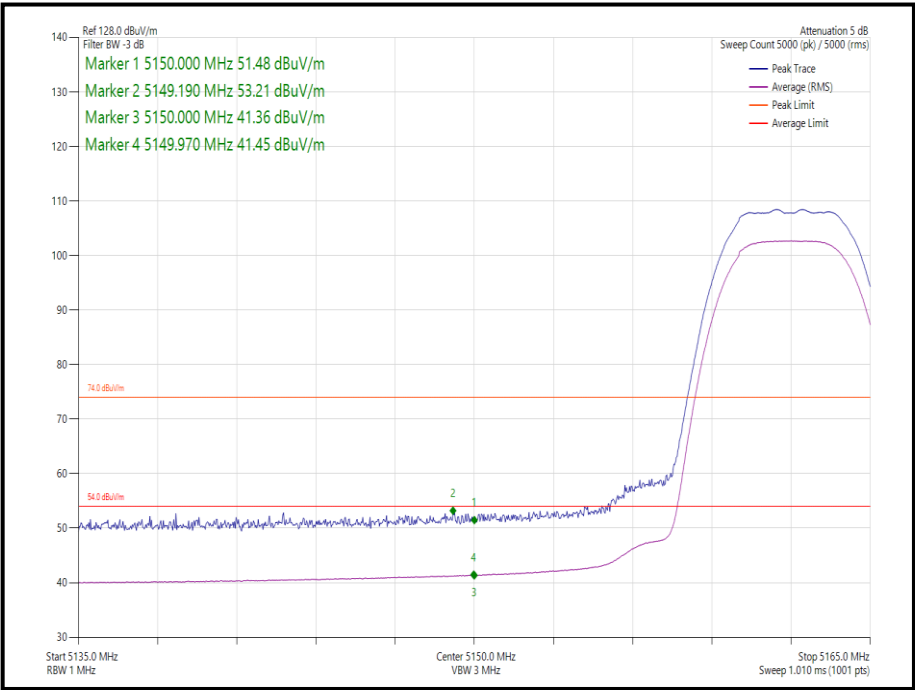


Figure 18 - Static - $\pi/4$ DQPSK/8-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

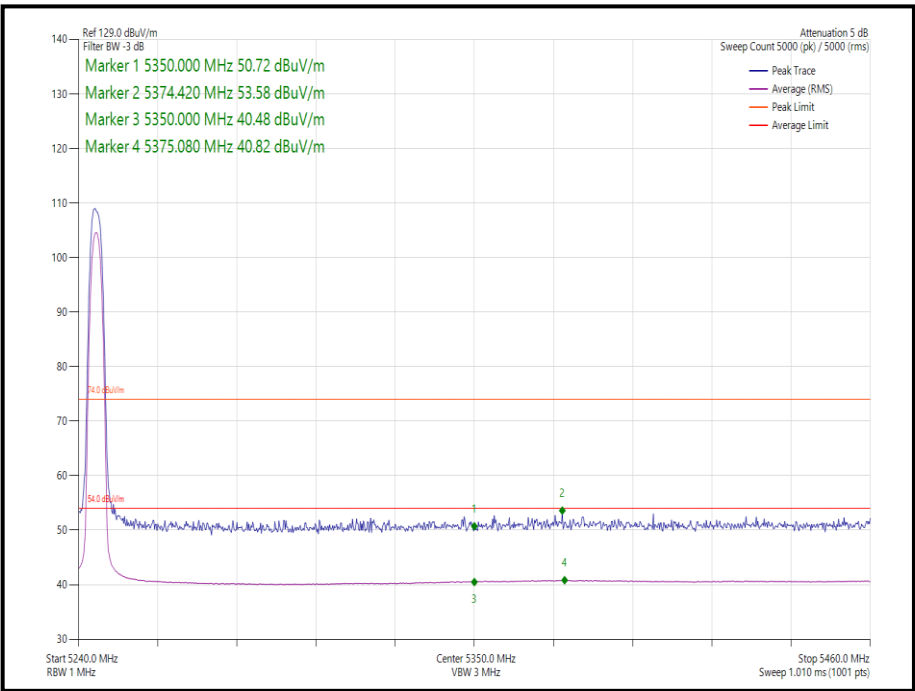


Figure 19 - Static - $\pi/4$ DQPSK/4-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

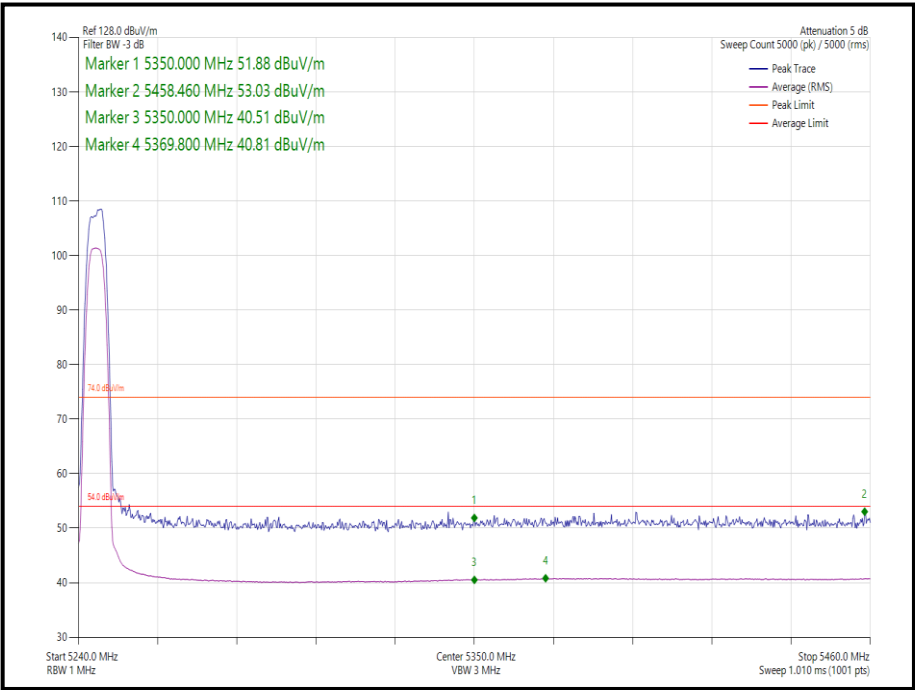


Figure 20 - Static - $\pi/4$ DQPSK/8-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

FCC 47 CFR Part 15, Limit Clause 15.205 and ISED RSS-GEN Limit Clause 8.10

	Peak (dBμV/m)	Average (dBμV/m)
Restricted Bands of Operation	74	54

Table 11 - Restricted Band Edge Limit Table



2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5 and RF Chamber 15.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Screened Room (5)	Rainford	Rainford	1545	36	15-Apr-2024
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Mast Controller	Maturo GmbH	NCD	4810	-	TU
Tilt Antenna Mast	Maturo GmbH	TAM 4.0-P	4811	-	TU
Antenna (DRG 1-10.5GHz)	Schwarzbeck	BBHA9120B	4848	12	28-May-2023
Preamplifier (30dB 1GHz to 18GHz)	Schwarzbeck	BBV 9718 C	5261	12	08-Apr-2023
Attenuator 5W 10dB DC-18GHz	Aaren	AT40A-4041-D18-10	5492	12	11-Apr-2023
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5513	12	12-Apr-2023
Cable (SMA to SMA, 2 m)	Junkosha	MWX221-02000AMSAMS/A	5517	12	12-Apr-2023
EMI Test Receiver	Rohde & Schwarz	ESW44	5911	12	24-Feb-2023
1500W (300V 12A) AC Power Supply	iTech	IT7324	5956	-	O/P Mon
5m Semi-Anechoic Chamber (Dual-Axis)	Albatross Projects	RF Chamber 15	5963	36	28-Apr-2025
Compact Antenna Mast	Maturo GmbH	CAM4.0-P	5964	-	TU
Tilt Antenna Mast	Maturo GmbH	BAM4.5-P	5967	-	TU
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5996	12	06-Jun-2023
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6007	12	06-Jun-2023
Cable (SMA to SMA 6.5m)	Junkosha	MWX221-06500AMSAMS/B	6014	12	07-Jun-2023
Horn Antenna (1-10 GHz)	Schwarzbeck	BBHA9120B	6140	12	21-Jun-2023
Digital Multimeter	Fluke	115	6147	12	16-Jun-2023
Humidity & Temperature meter	R.S Components	1364	6150	12	17-Jun-2023
SAC Switch Unit	TUV SUD	SSU003	6191	12	15-Jul-2023

Table 12

TU – Traceability Unscheduled

O/P Mon – Output Monitored using calibrated equipment



2.2 Emission Bandwidth

2.2.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.407 (a)
ISED RSS-247, Clause 6.2

2.2.2 Equipment Under Test and Modification State

A2816, S/N: H12J4GXMVX - Modification State 0

2.2.3 Date of Test

25-October-2022 to 10-November-2022

2.2.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 12.5.1 and 12.5.2 and ISED RSS-GEN, clause 4.6.1 and 4.6.2.

For modes of operation using multiple cores, measurements were made on each core but only the worst case results are reported. Worst case was considered as the narrowest results for 6 dB bandwidth and the widest result for 26 dB bandwidth and 99% occupied bandwidth.

2.2.5 Environmental Conditions

Ambient Temperature	22.8 - 23.3 °C
Relative Humidity	44.7 - 49.8 %



2.2.6 Test Results

Narrow Band

Test Configuration			
Frequency Range:	5.150-5.250 GHz	Band:	U-NII-1
Limit Clause(s):	-	Test Method(s):	C63.10 6.9.3 C63.10 12.5.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA $\pi/4$ DQPSK (4-DH5)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	B (Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	26 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5162	-	2.776	-	-	≥ 500.0
5204	-	2.768	-	-	≥ 500.0
5245	-	2.768	-	-	≥ 500.0

Table 13 - 26 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5162	-	2.336	-	-	-
5204	-	2.328	-	-	-
5245	-	2.328	-	-	-

Table 14 - 99% Bandwidth Results

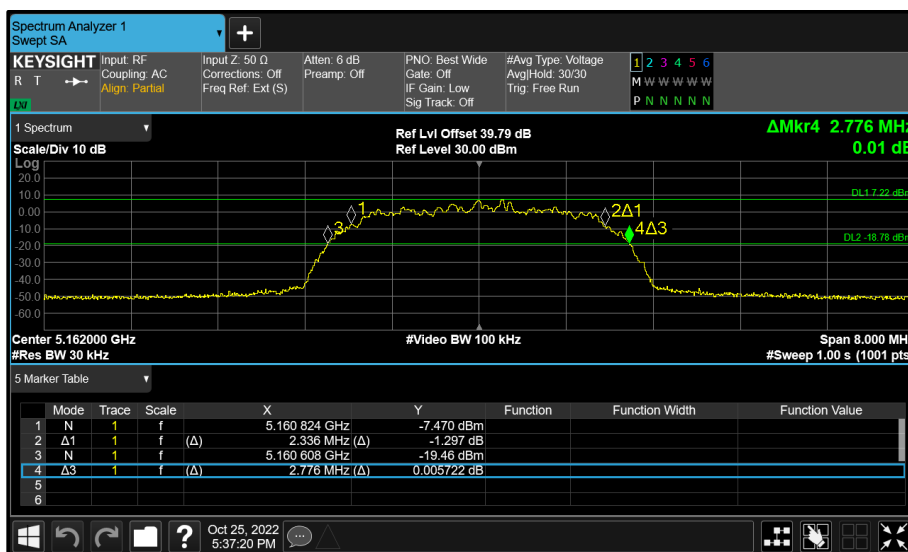


Figure 21 - Core 1 (B) 5162 MHz (CH12) 26 dB and 99% Bandwidth

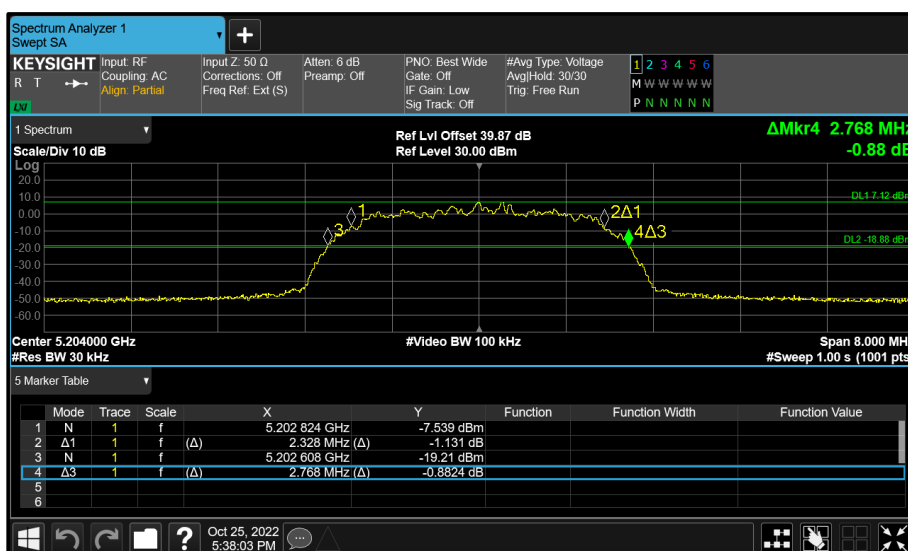


Figure 22 - Core 1 (B) 5204 MHz (CH54) 26 dB and 99% Bandwidth

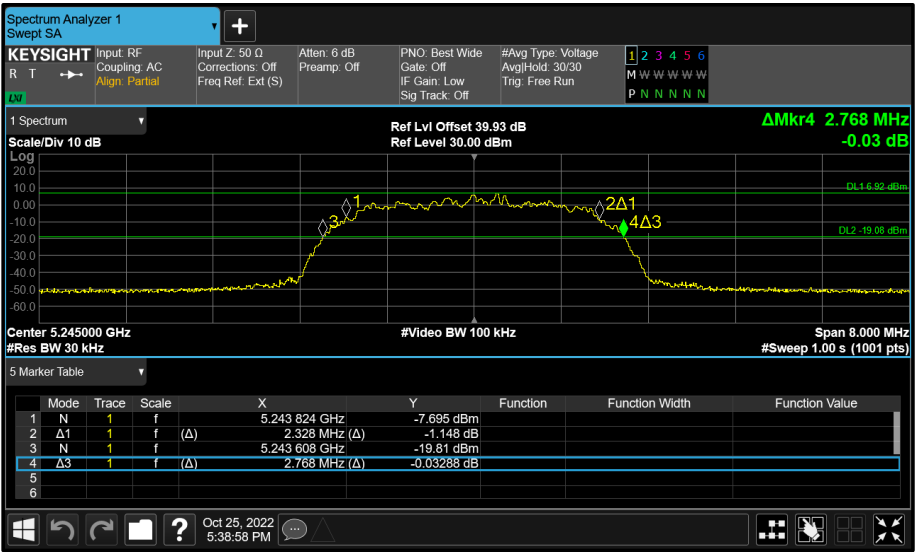


Figure 23 - Core 1 (B) 5245 MHz (CH95) 26 dB and 99% Bandwidth



Test Configuration			
Frequency Range:	5.150-5.250 GHz	Band:	U-NII-1
Limit Clause(s):	-	Test Method(s):	C63.10 6.9.3 C63.10 12.5.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA $\pi/4$ DQPSK (8-DH5)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	B (Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	26 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5162	-	5.325	-	-	≥ 500.0
5204	-	5.325	-	-	≥ 500.0
5245	-	5.310	-	-	≥ 500.0

Table 15 - 26 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5162	-	4.635	-	-	-
5204	-	4.650	-	-	-
5245	-	4.635	-	-	-

Table 16 - 99% Bandwidth Results

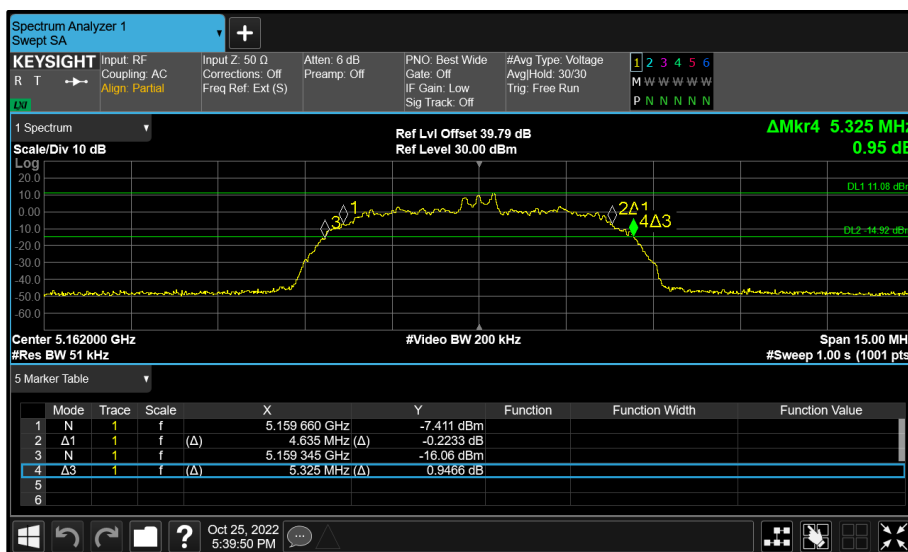


Figure 24 - Core 1 (B) 5162 MHz (CH12) 26 dB and 99% Bandwidth

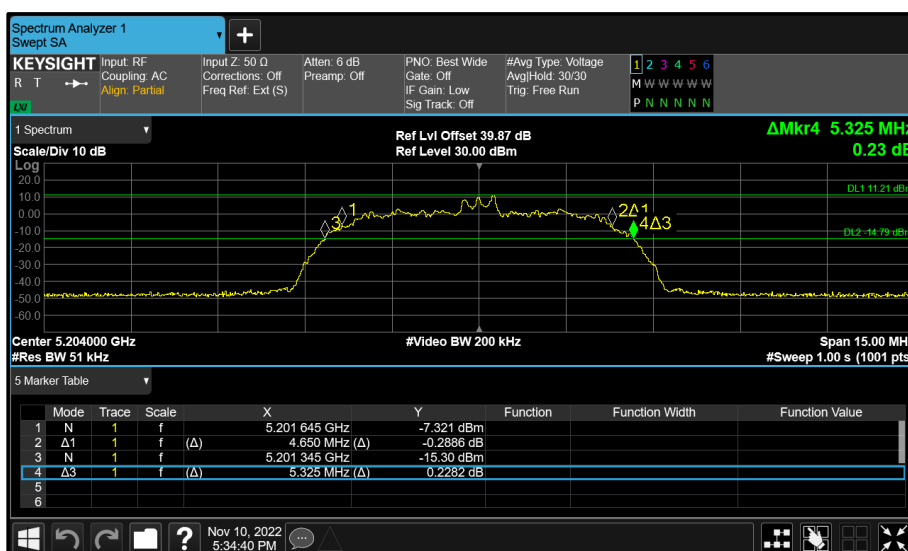


Figure 25 - Core 1 (B) 5204 MHz (CH54) 26 dB and 99% Bandwidth

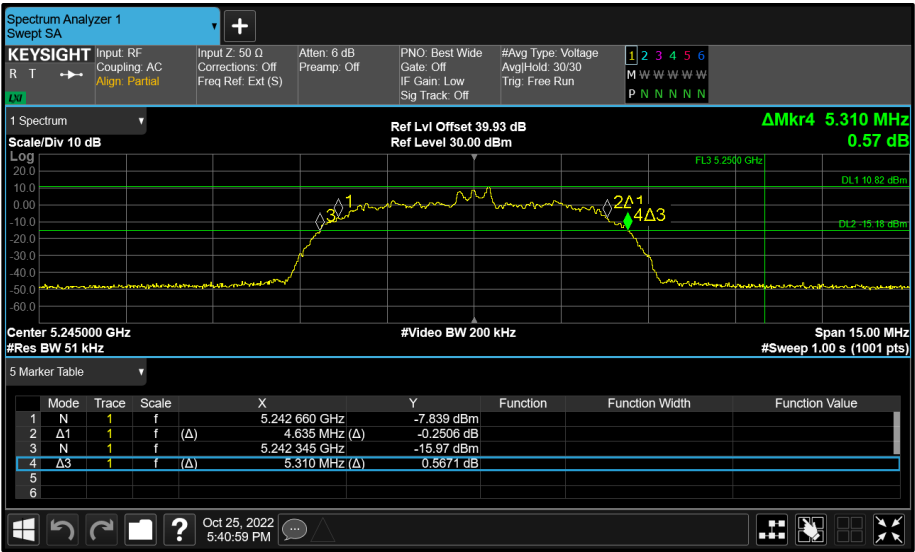


Figure 26 - Core 1 (B) 5245 MHz (CH95) 26 dB and 99% Bandwidth



Test Configuration			
Frequency Range:	5.150-5.250 GHz	Band:	U-NII-1
Limit Clause(s):	-	Test Method(s):	C63.10 6.9.3 C63.10 12.5.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA $\pi/4$ DQPSK (4-DH5)	Duty Cycle (%):	-
Antenna Configuration:	Beamforming	DCCF (dB):	-
Active Port(s):	A+B (Core 0 + Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	26 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5162	2.776	2.776	-	-	≥ 500.0
5204	2.776	2.760	-	-	≥ 500.0
5245	2.768	2.760	-	-	≥ 500.0

Table 17 - 26 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5162	2.328	2.336	-	-	-
5204	2.336	2.336	-	-	-
5245	2.336	2.336	-	-	-

Table 18 - 99% Bandwidth Results

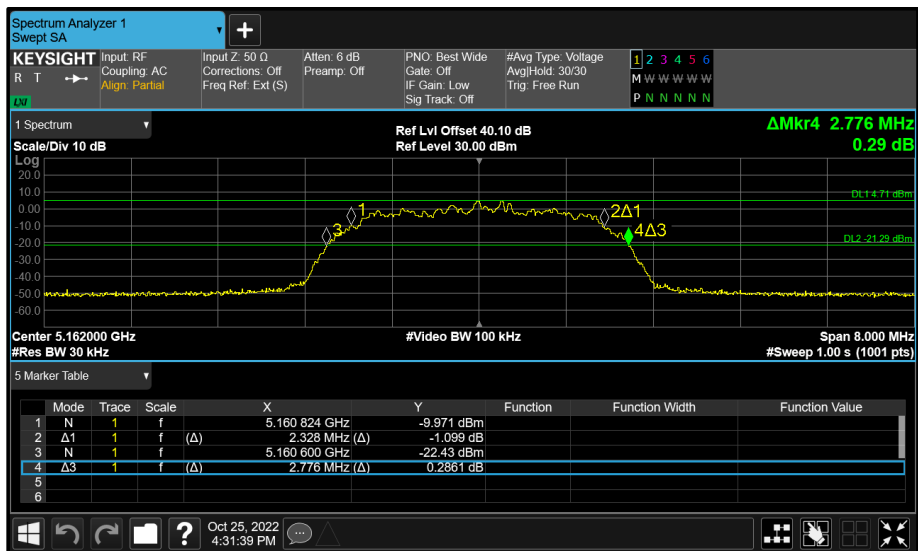


Figure 27 - Core 0 (A) 5162 MHz (CH12) 26 dB and 99% Bandwidth

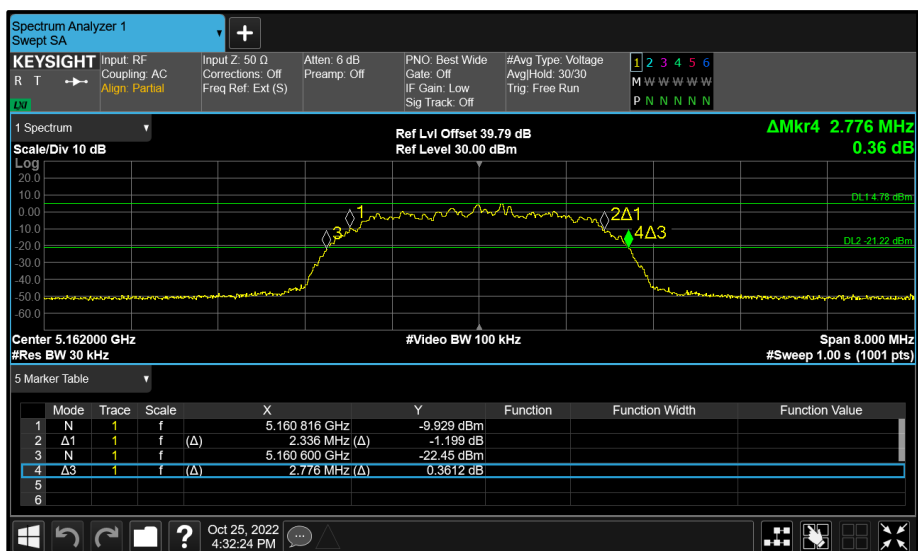


Figure 28 - Core 1 (B) 5162 MHz (CH12) 26 dB and 99% Bandwidth

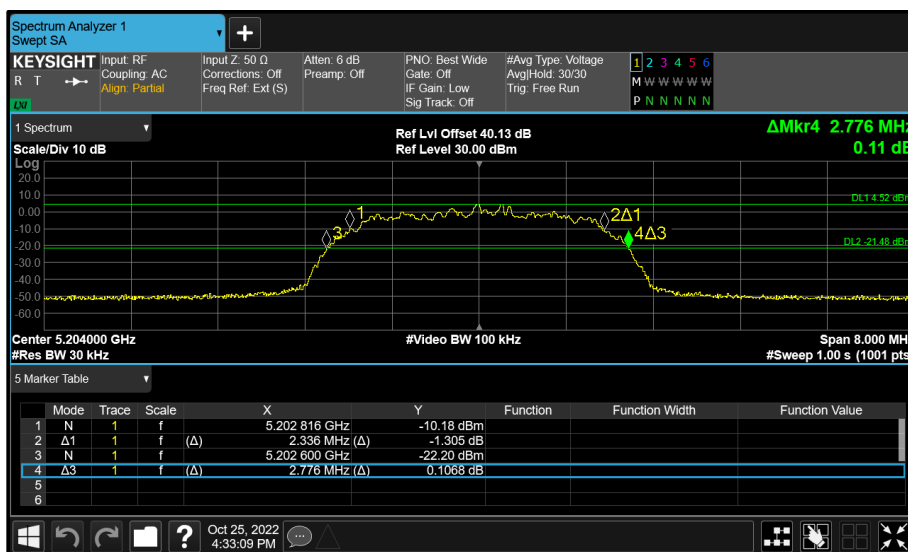


Figure 29 - Core 0 (A) 5204 MHz (CH54) 26 dB and 99% Bandwidth

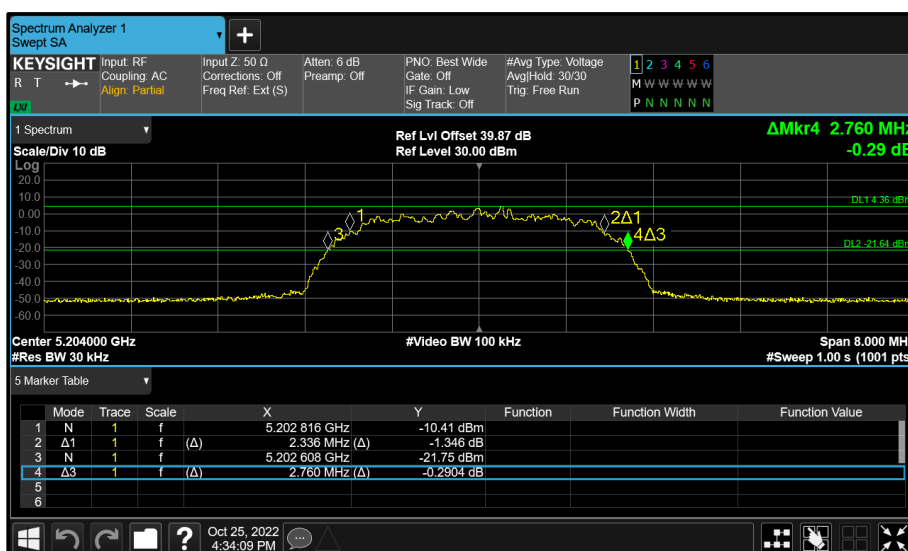


Figure 30 - Core 1 (B) 5204 MHz (CH54) 26 dB and 99% Bandwidth

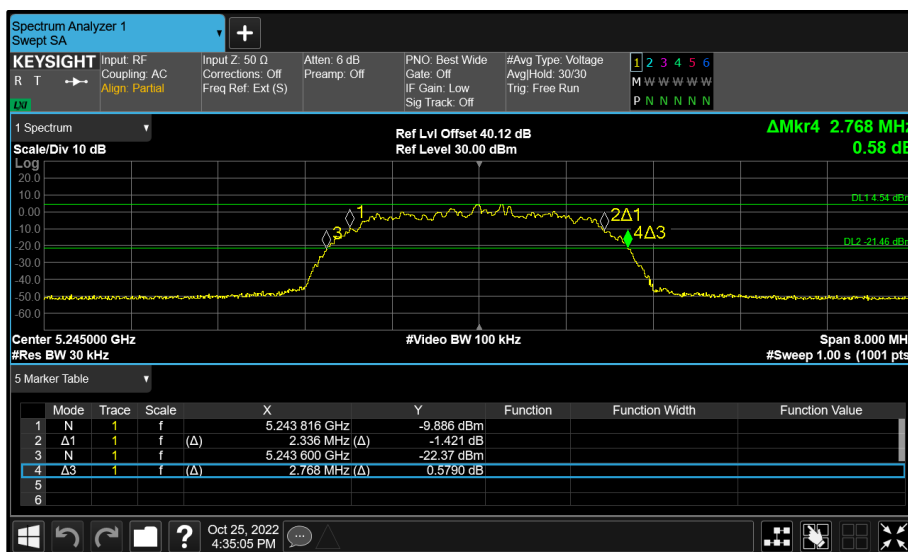


Figure 31 - Core 0 (A) 5245 MHz (CH95) 26 dB and 99% Bandwidth

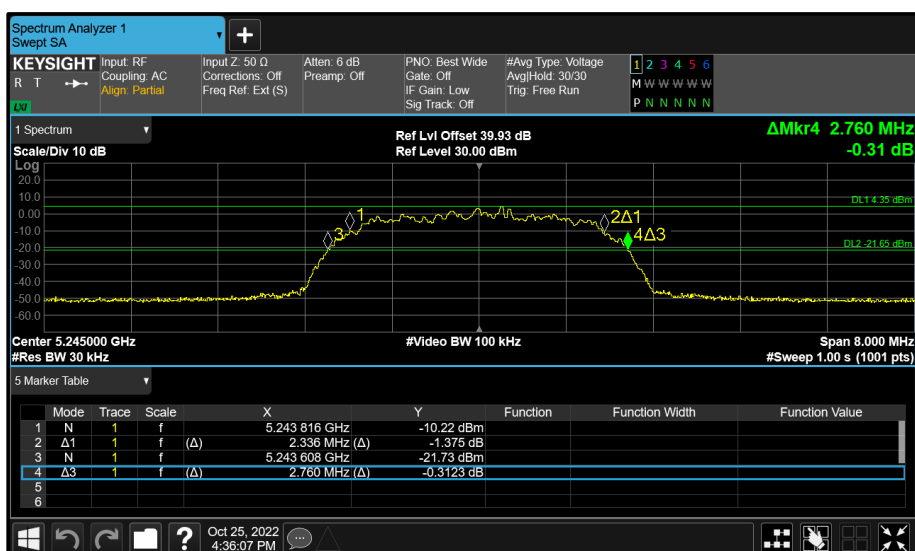


Figure 32 - Core 1 (B) 5245 MHz (CH95) 26 dB and 99% Bandwidth



Test Configuration			
Frequency Range:	5.150-5.250 GHz	Band:	U-NII-1
Limit Clause(s):	-	Test Method(s):	C63.10 6.9.3 C63.10 12.5.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA $\pi/4$ DQPSK (8-DH5)	Duty Cycle (%):	-
Antenna Configuration:	Beamforming	DCCF (dB):	-
Active Port(s):	A+B (Core 0 + Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	26 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5162	5.310	5.325	-	-	≥ 500.0
5204	5.310	5.325	-	-	≥ 500.0
5245	5.310	5.325	-	-	≥ 500.0

Table 19 - 26 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5162	4.635	4.635	-	-	-
5204	4.635	4.635	-	-	-
5245	4.620	4.635	-	-	-

Table 20 - 99% Bandwidth Results

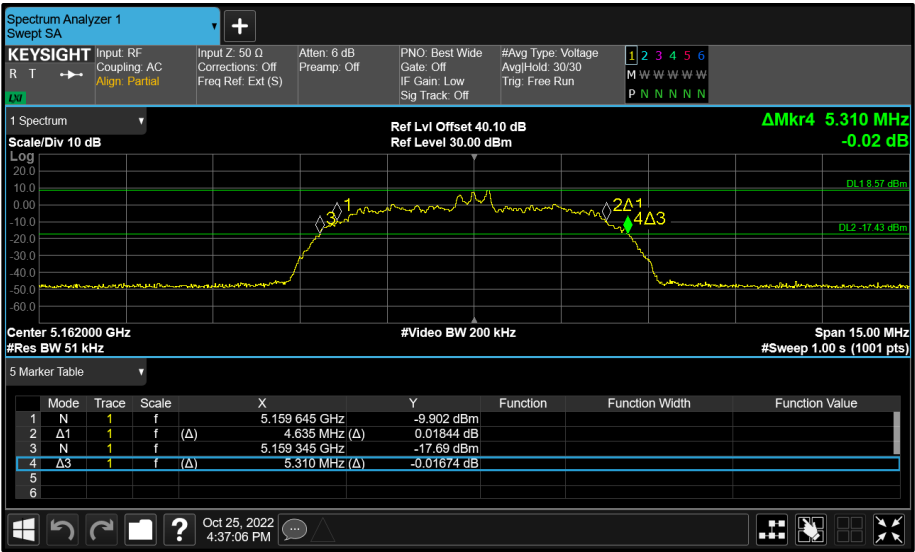


Figure 33 - Core 0 (A) 5162 MHz (CH12) 26 dB and 99% Bandwidth

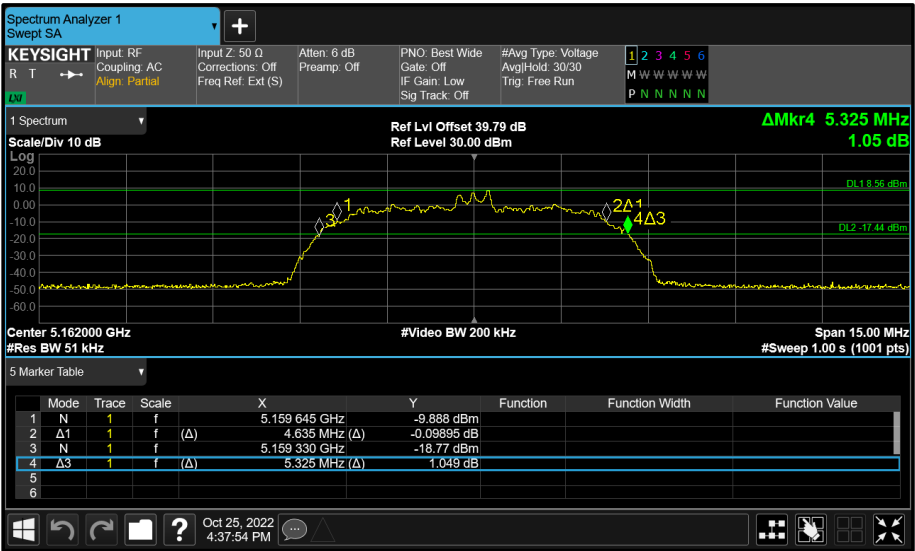


Figure 34 - Core 1 (B) 5162 MHz (CH12) 26 dB and 99% Bandwidth

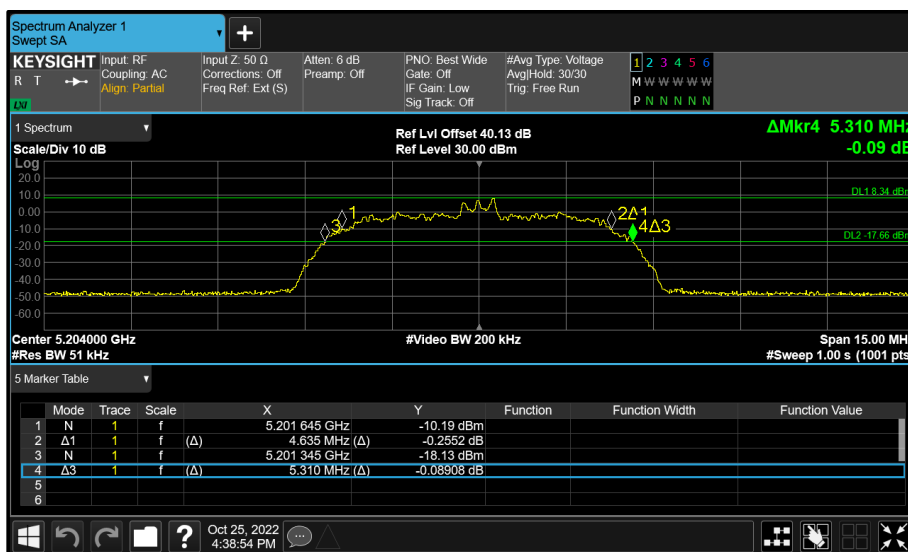


Figure 35 - Core 0 (A) 5204 MHz (CH54) 26 dB and 99% Bandwidth

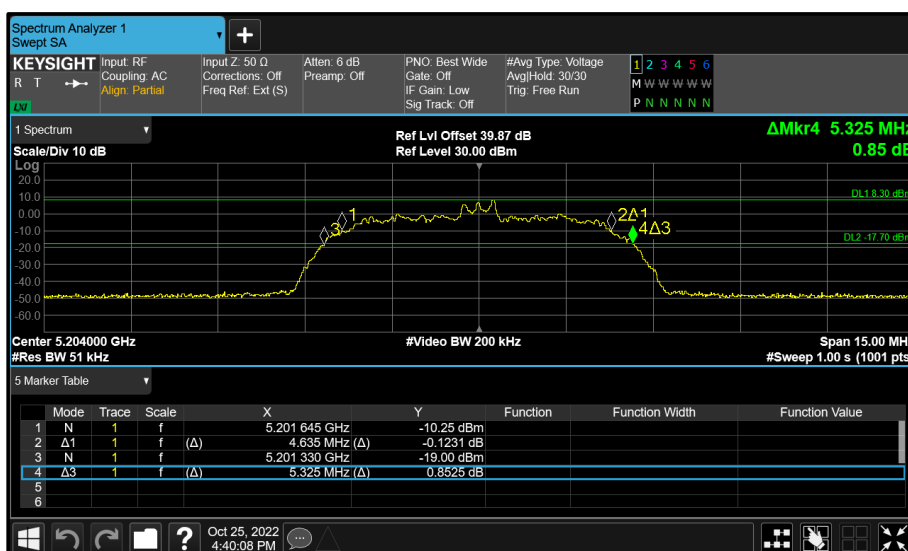


Figure 36 - Core 1 (B) 5204 MHz (CH54) 26 dB and 99% Bandwidth

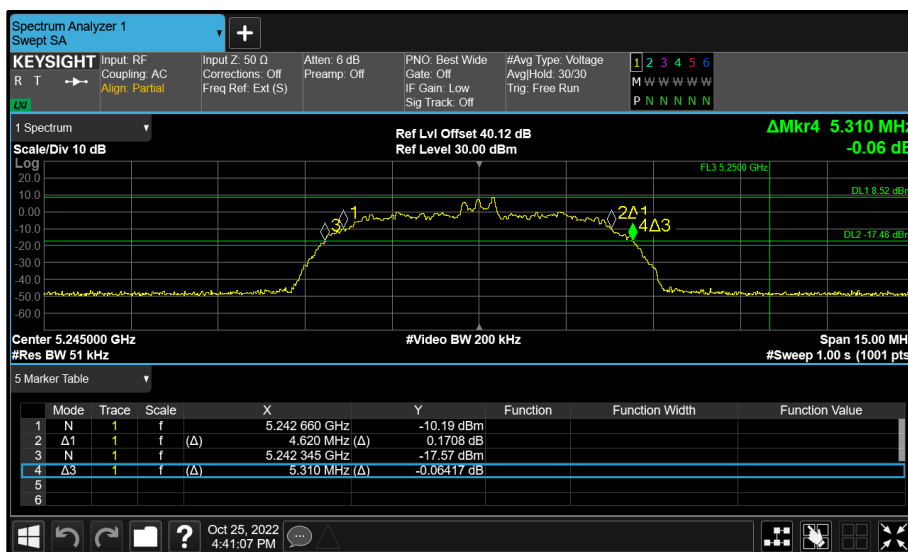


Figure 37 - Core 0 (A) 5245 MHz (CH95) 26 dB and 99% Bandwidth

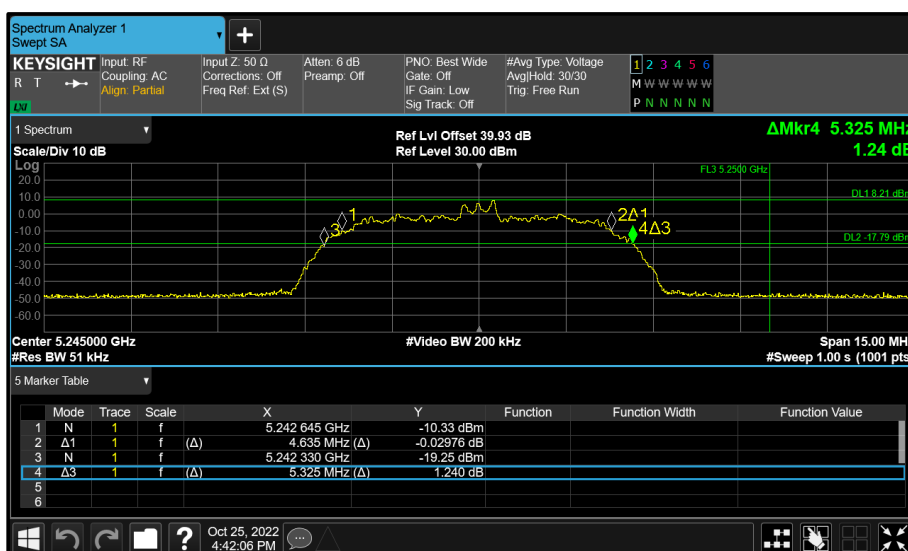


Figure 38 - Core 1 (B) 5245 MHz (CH95) 26 dB and 99% Bandwidth



Test Configuration			
Frequency Range:	5.725-5.850 GHz	Band:	U-NII-3
Limit Clause(s):	15.407(e) RSS-247 6.2.4.1	Test Method(s):	C63.10 6.9.3 789033 D02 v02r01 II.C.2.
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA $\pi/4$ DQPSK (4-DH5)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	B (Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5733	-	1.896	-	-	≥ 500.0
5789	-	1.896	-	-	≥ 500.0
5844	-	1.896	-	-	≥ 500.0

Table 21 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5733	-	2.336	-	-	-
5789	-	2.328	-	-	-
5844	-	2.328	-	-	-

Table 22 - 99% Bandwidth Results

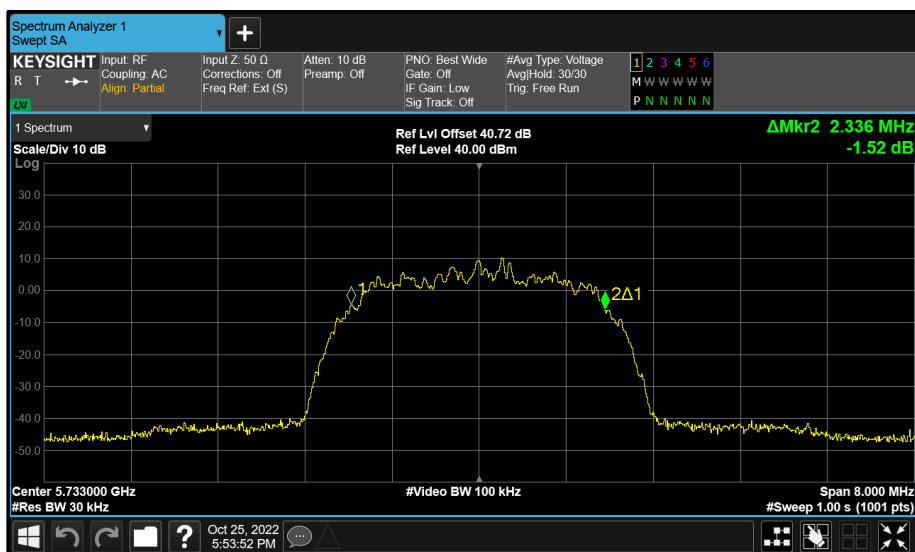


Figure 39 - Core 1 (B) 5733 MHz (CH8) 99% Bandwidth

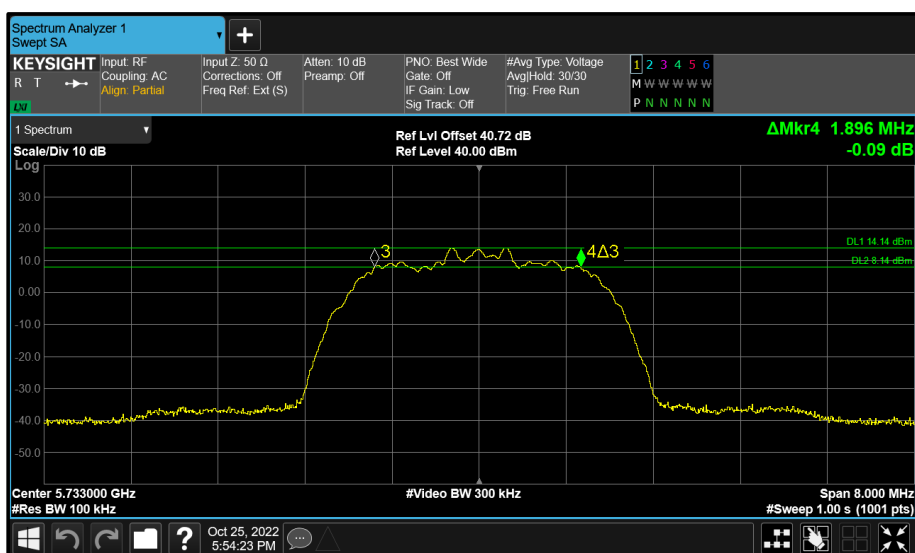


Figure 40 - Core 1 (B) 5733 MHz (CH8) 6 dB Bandwidth

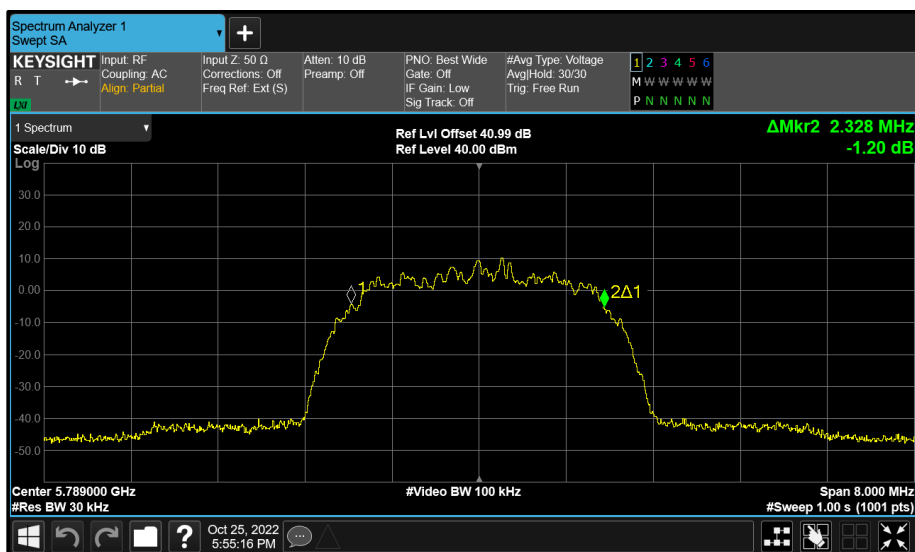


Figure 41 - Core 1 (B) 5789 MHz (CH64) 99% Bandwidth

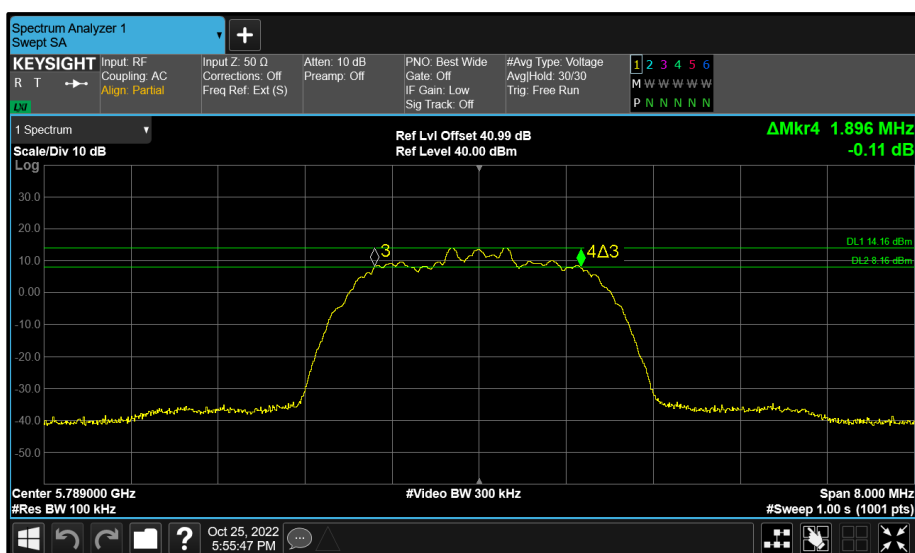


Figure 42 - Core 1 (B) 5789 MHz (CH64) 6 dB Bandwidth

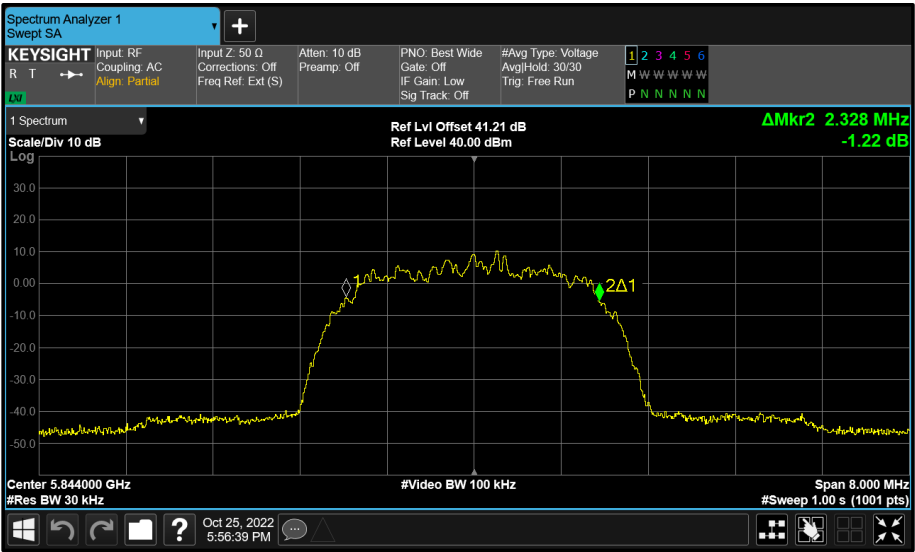


Figure 43 - Core 1 (B) 5844 MHz (CH119) 99% Bandwidth

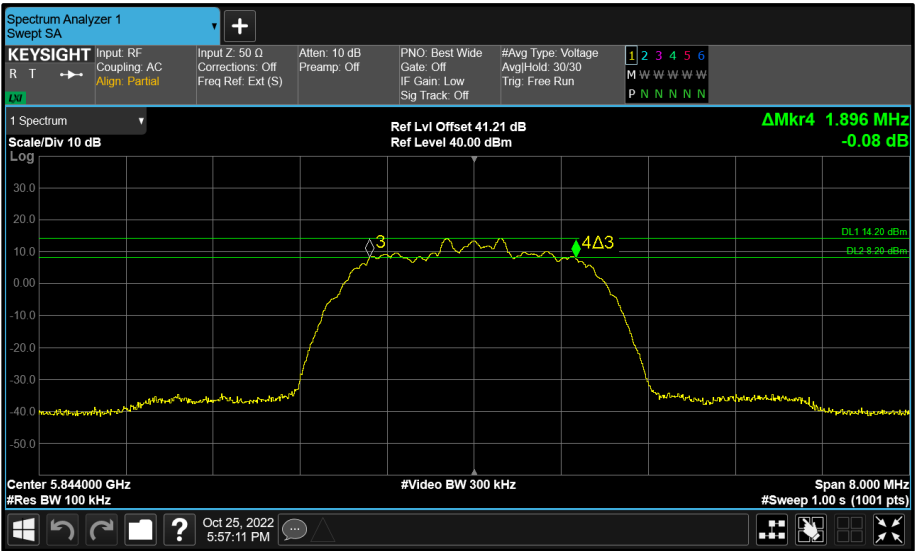


Figure 44 - Core 1 (B) 5844 MHz (CH119) 6 dB Bandwidth



Test Configuration			
Frequency Range:	5.725-5.850 GHz	Band:	U-NII-3
Limit Clause(s):	15.407(e) RSS-247 6.2.4.1	Test Method(s):	C63.10 6.9.3 789033 D02 v02r01 II.C.2.
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA $\pi/4$ DQPSK (8-DH5)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	B (Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5733	-	1.005	-	-	≥ 500.0
5789	-	1.005	-	-	≥ 500.0
5844	-	1.005	-	-	≥ 500.0

Table 23 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5733	-	4.620	-	-	-
5789	-	4.620	-	-	-
5844	-	4.620	-	-	-

Table 24 - 99% Bandwidth Results

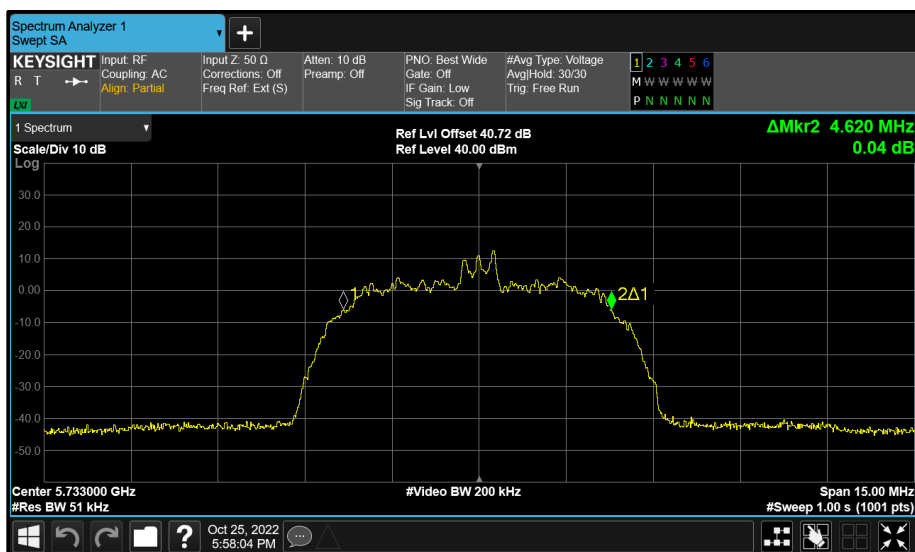


Figure 45 - Core 1 (B) 5733 MHz (CH8) 99% Bandwidth

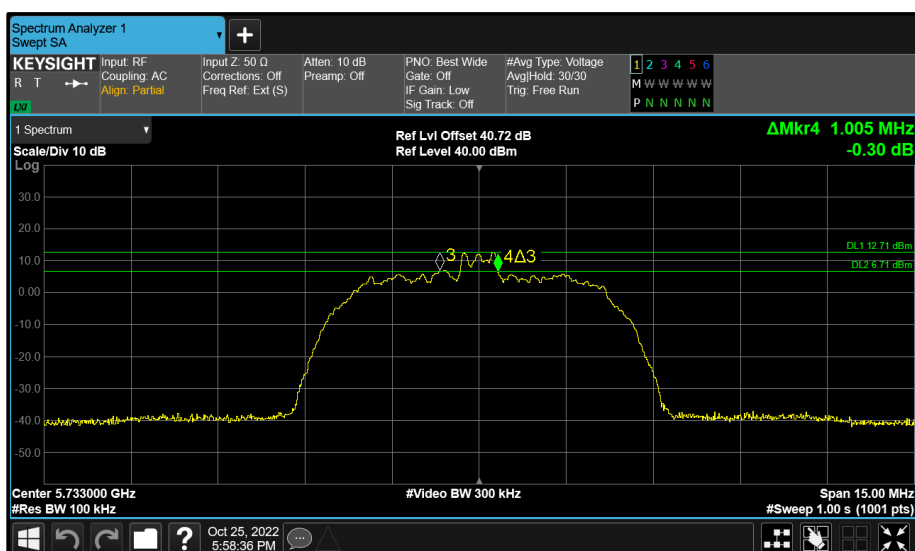


Figure 46 - Core 1 (B) 5733 MHz (CH8) 6 dB Bandwidth

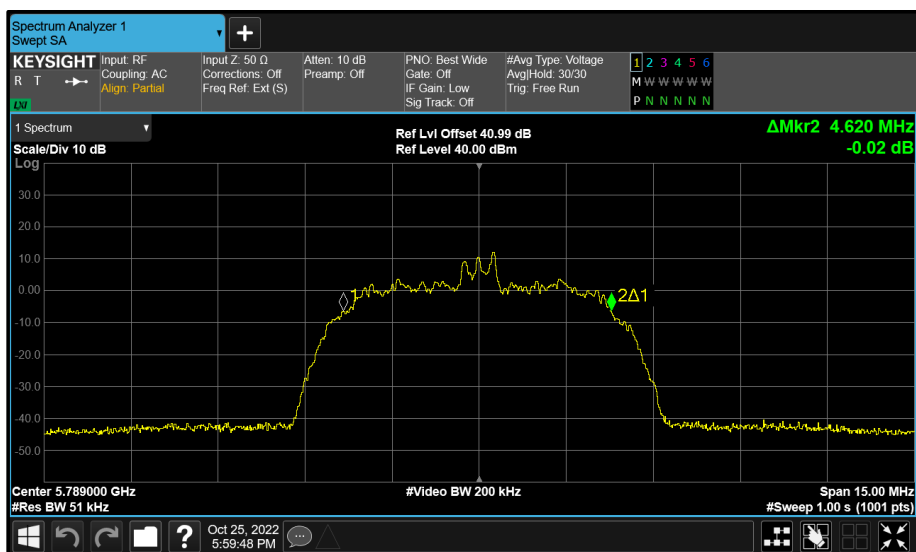


Figure 47 - Core 1 (B) 5789 MHz (CH64) 99% Bandwidth

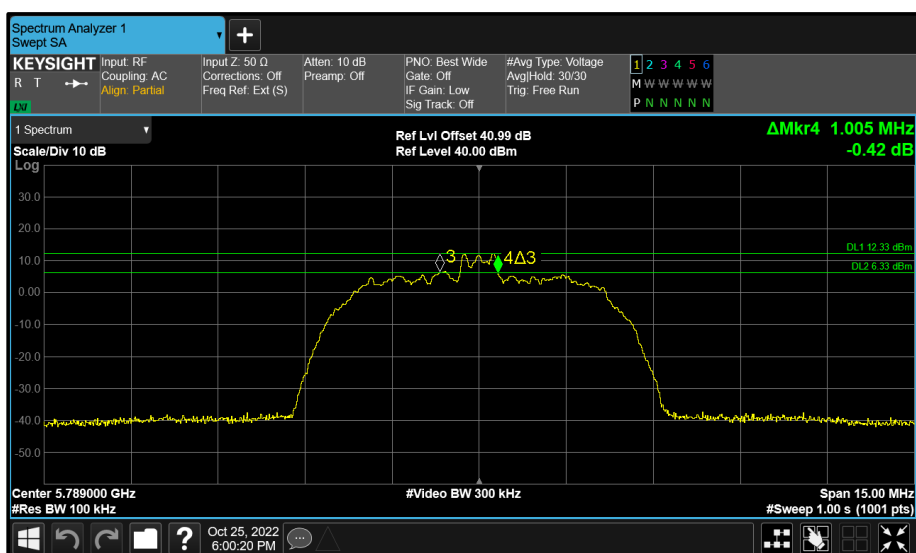


Figure 48 - Core 1 (B) 5789 MHz (CH64) 6 dB Bandwidth

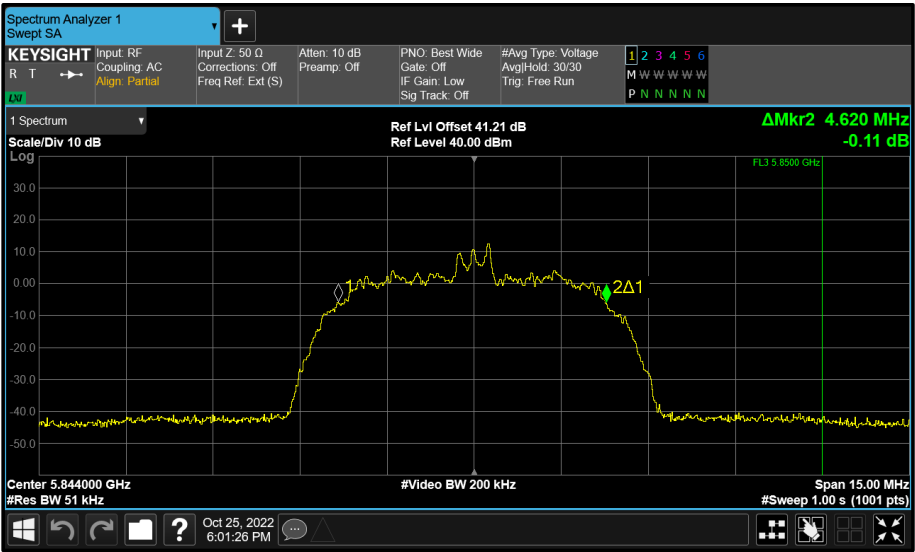


Figure 49 - Core 1 (B) 5844 MHz (CH119) 99% Bandwidth

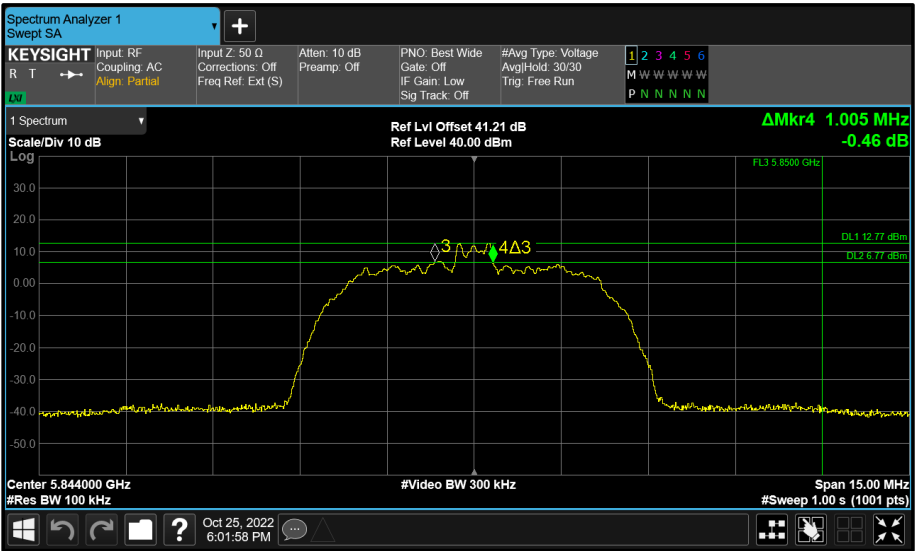


Figure 50 - Core 1 (B) 5844 MHz (CH119) 6 dB Bandwidth



Test Configuration			
Frequency Range:	5.725-5.850 GHz	Band:	U-NII-3
Limit Clause(s):	15.407(e) RSS-247 6.2.4.1	Test Method(s):	C63.10 6.9.3 789033 D02 v02r01 II.C.2.
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA $\pi/4$ DQPSK (4-DH5)	Duty Cycle (%):	-
Antenna Configuration:	Beamforming	DCCF (dB):	-
Active Port(s):	A+B (Core 0 + Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5733	1.896	1.896	-	-	≥ 500.0
5789	1.896	1.888	-	-	≥ 500.0
5844	1.896	1.896	-	-	≥ 500.0

Table 25 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5733	2.328	2.336	-	-	-
5789	2.328	2.336	-	-	-
5844	2.336	2.336	-	-	-

Table 26 - 99% Bandwidth Results

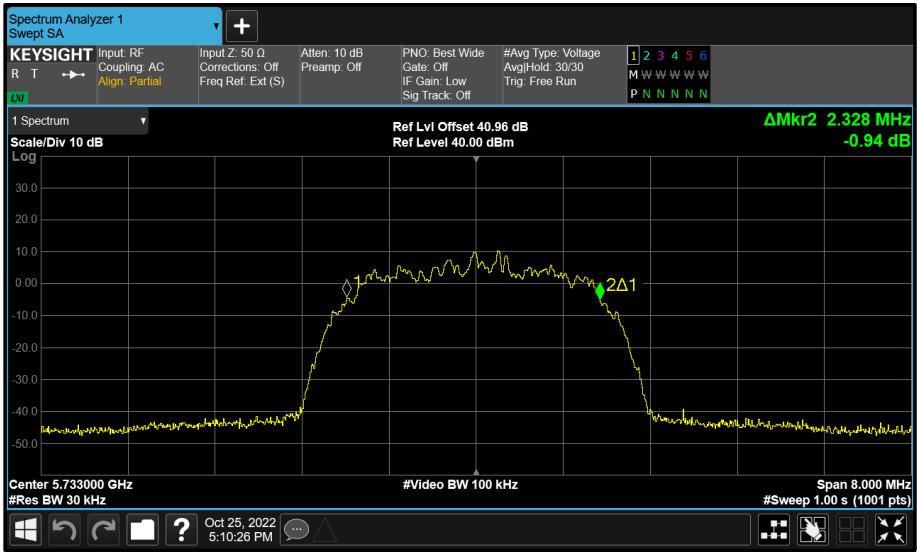


Figure 51 - Core 0 (A) 5733 MHz (CH8) 99% Bandwidth

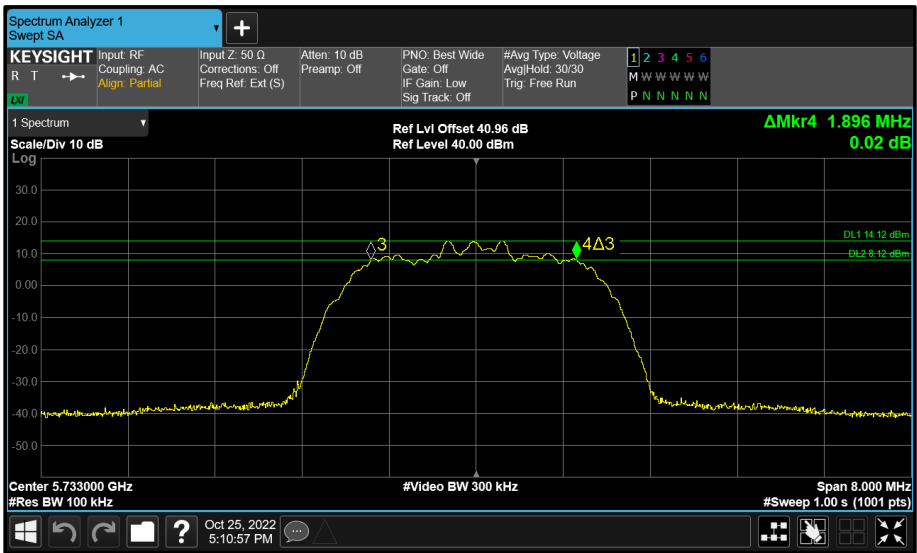


Figure 52 - Core 0 (A) 5733 MHz (CH8) 6 dB Bandwidth

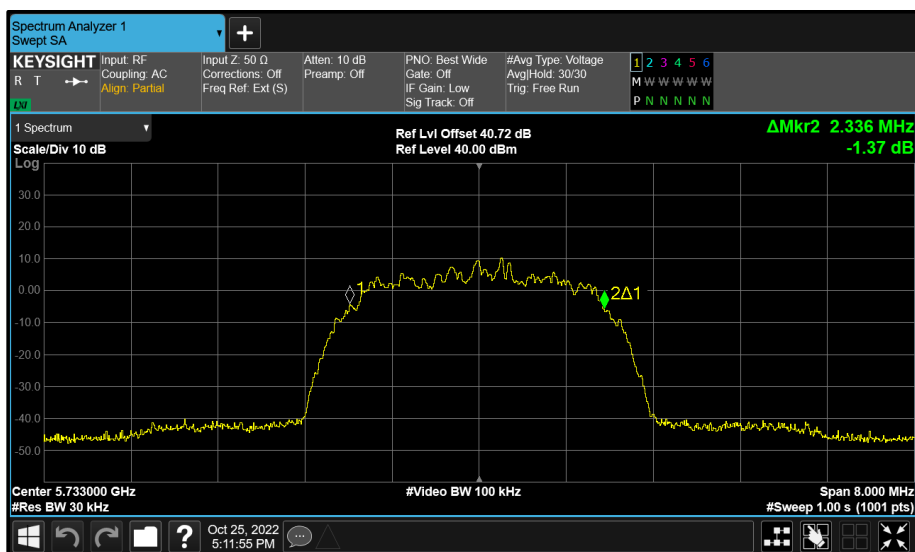


Figure 53 - Core 1 (B) 5733 MHz (CH8) 99% Bandwidth

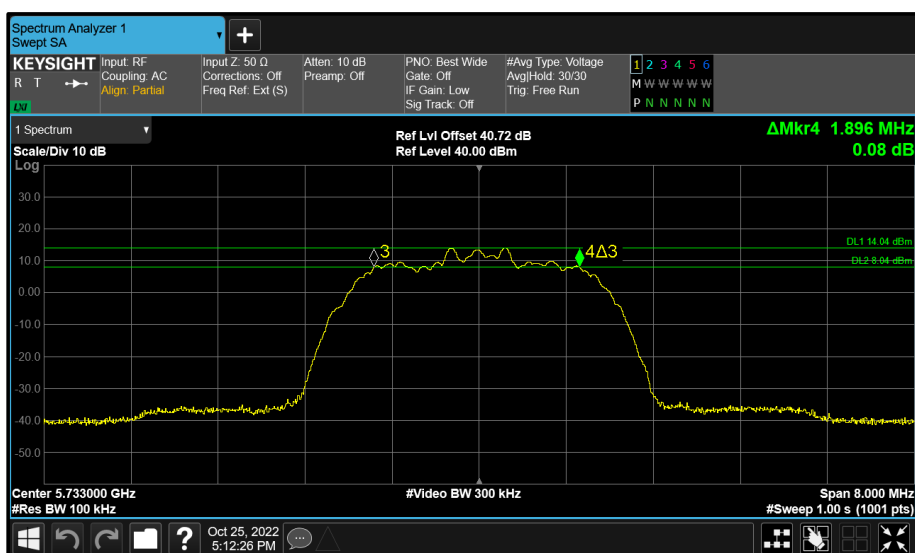


Figure 54 - Core 1 (B) 5733 MHz (CH8) 6 dB Bandwidth

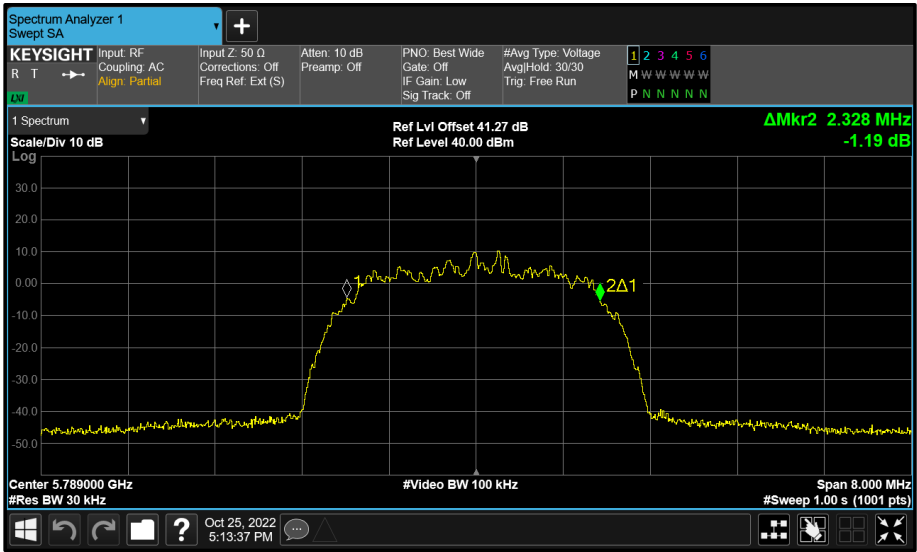


Figure 55 - Core 0 (A) 5789 MHz (CH64) 99% Bandwidth

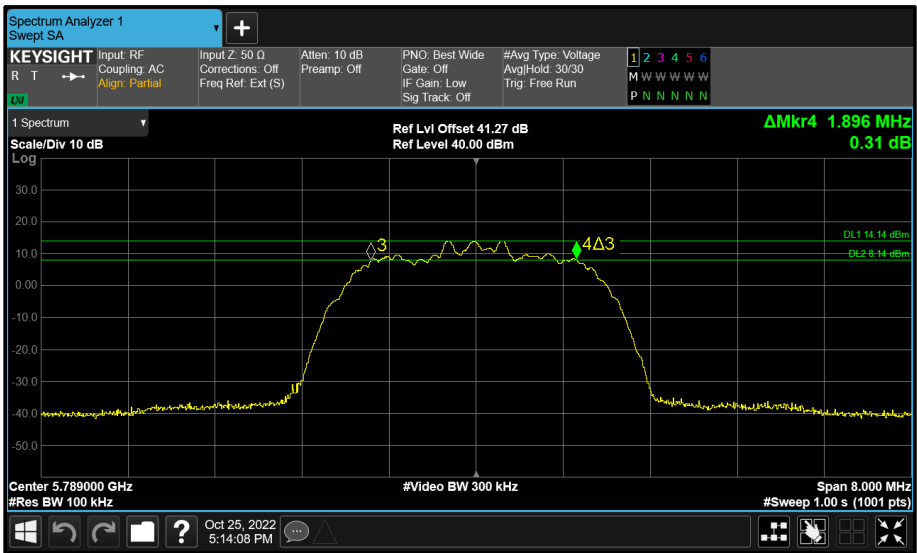


Figure 56 - Core 0 (A) 5789 MHz (CH64) 6 dB Bandwidth

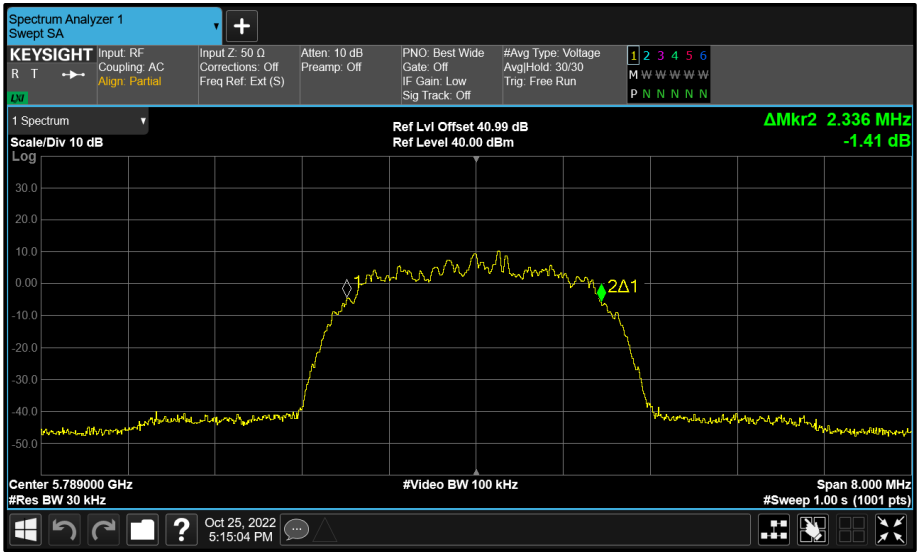


Figure 57 - Core 1 (B) 5789 MHz (CH64) 99% Bandwidth

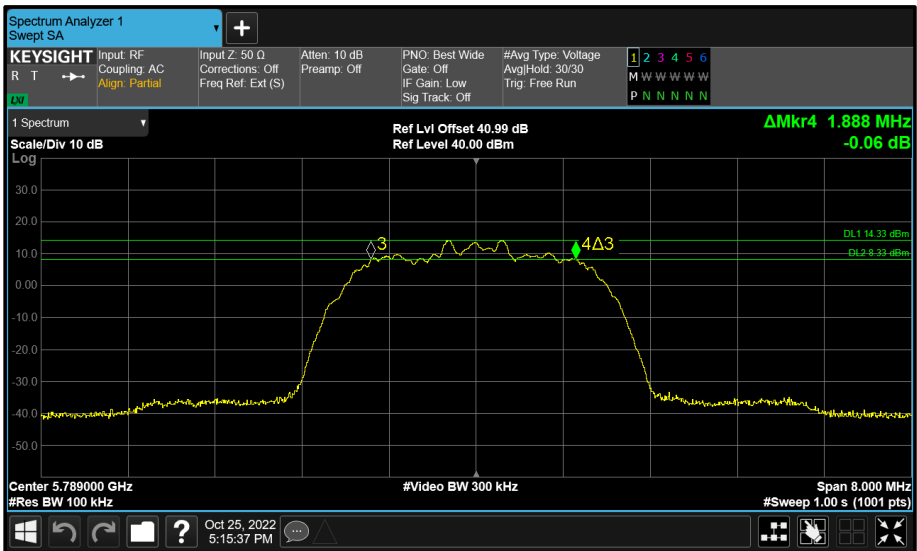


Figure 58 - Core 1 (B) 5789 MHz (CH64) 6 dB Bandwidth

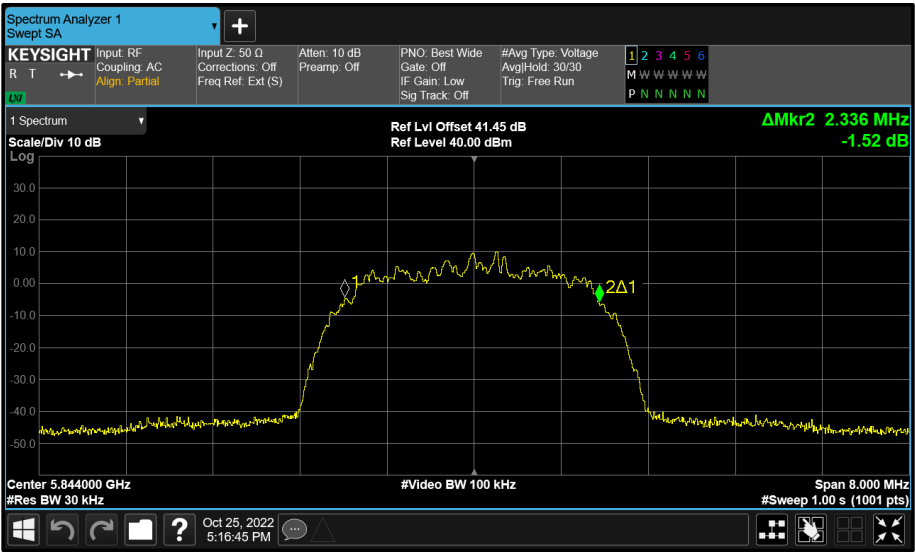


Figure 59 - Core 0 (A) 5844 MHz (CH119) 99% Bandwidth

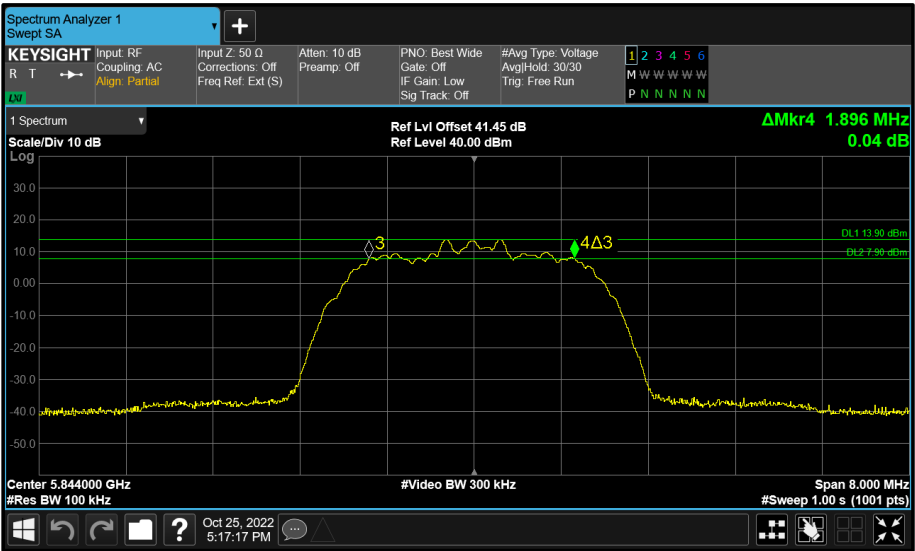


Figure 60 - Core 0 (A) 5844 MHz (CH119) 6 dB Bandwidth

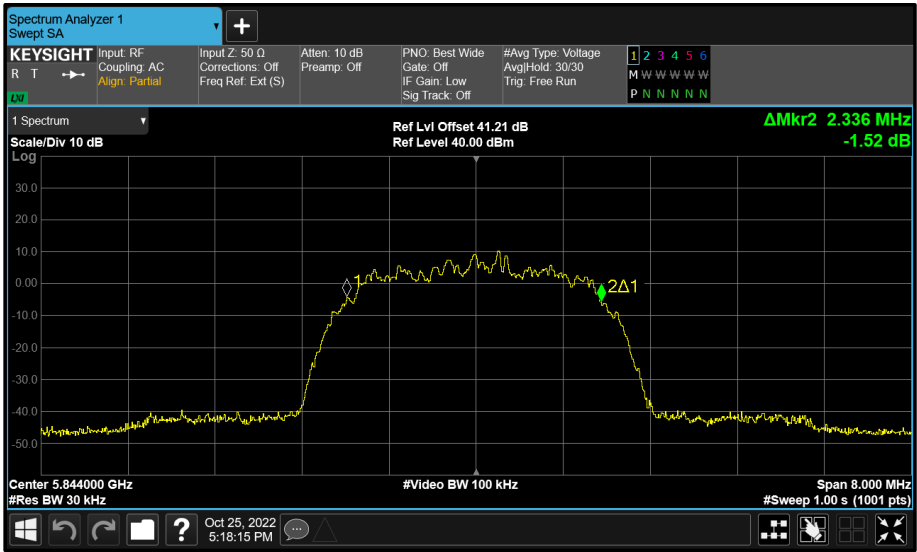


Figure 61 - Core 1 (B) 5844 MHz (CH119) 99% Bandwidth

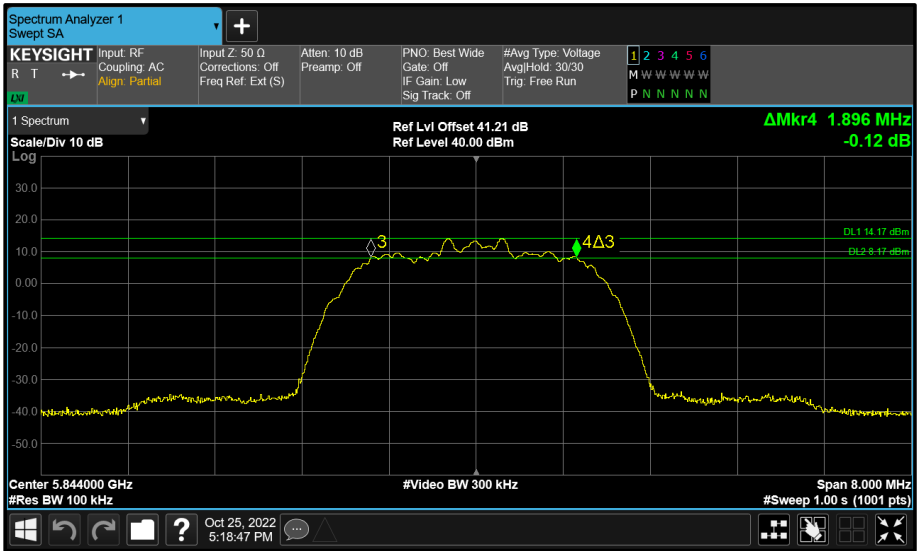


Figure 62 - Core 1 (B) 5844 MHz (CH119) 6 dB Bandwidth



Test Configuration			
Frequency Range:	5.725-5.850 GHz	Band:	U-NII-3
Limit Clause(s):	15.407(e) RSS-247 6.2.4.1	Test Method(s):	C63.10 6.9.3 789033 D02 v02r01 II.C.2.
Additional Reference(s):	-		

DUT Configuration			
Mode:	ePA $\pi/4$ DQPSK (8-DH5)	Duty Cycle (%):	-
Antenna Configuration:	Beamforming	DCCF (dB):	-
Active Port(s):	A+B (Core 0 + Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5733	1.020	1.020	-	-	≥ 500.0
5789	1.020	1.005	-	-	≥ 500.0
5844	1.020	1.020	-	-	≥ 500.0

Table 27 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5733	4.635	4.635	-	-	-
5789	4.635	4.635	-	-	-
5844	4.635	4.635	-	-	-

Table 28 - 99% Bandwidth Results

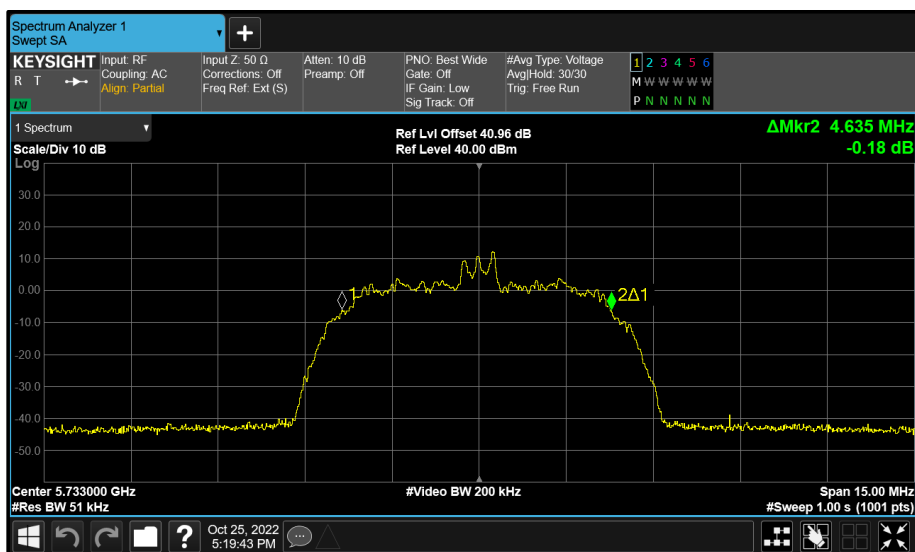


Figure 63 - Core 0 (A) 5733 MHz (CH8) 99% Bandwidth

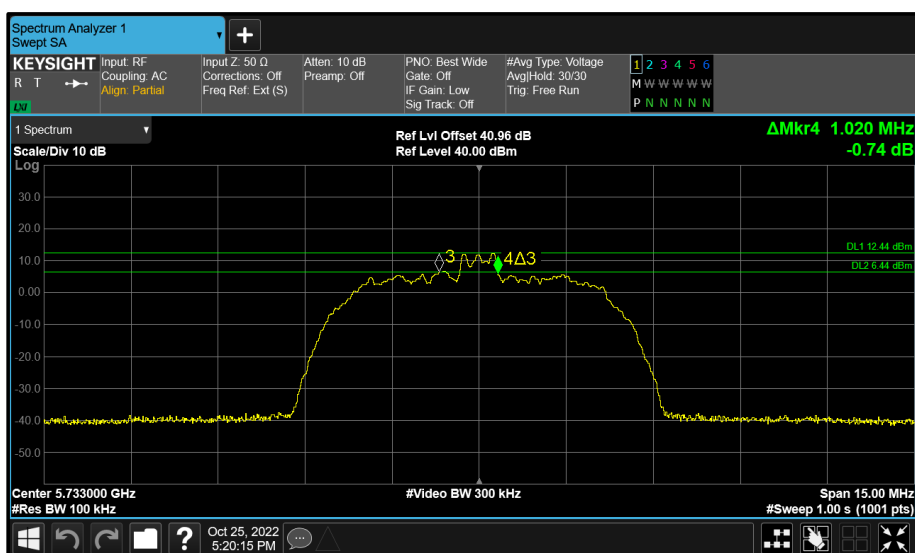


Figure 64 - Core 0 (A) 5733 MHz (CH8) 6 dB Bandwidth

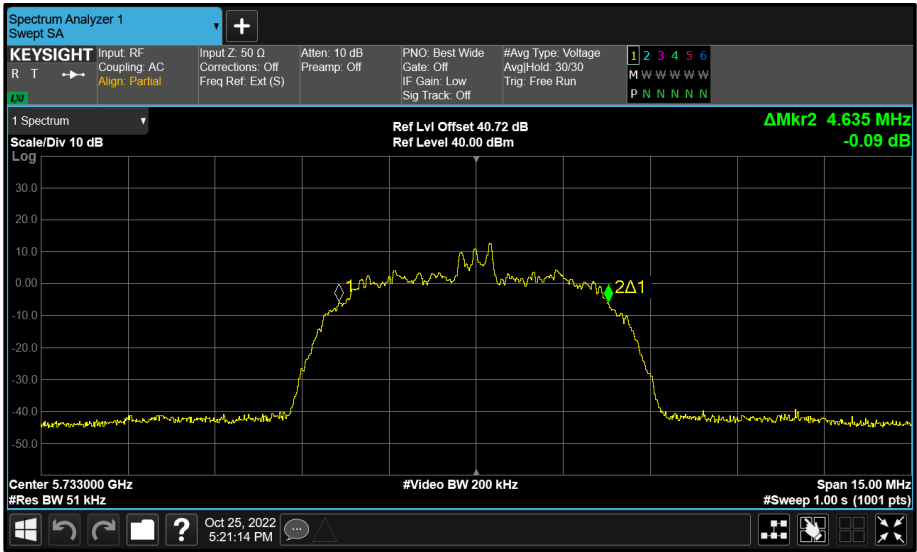


Figure 65 - Core 1 (B) 5733 MHz (CH8) 99% Bandwidth

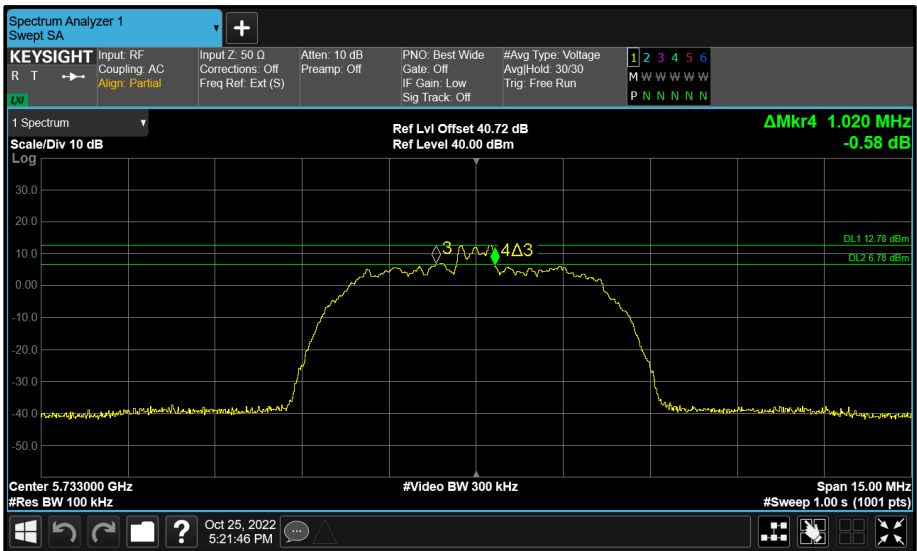


Figure 66 - Core 1 (B) 5733 MHz (CH8) 6 dB Bandwidth

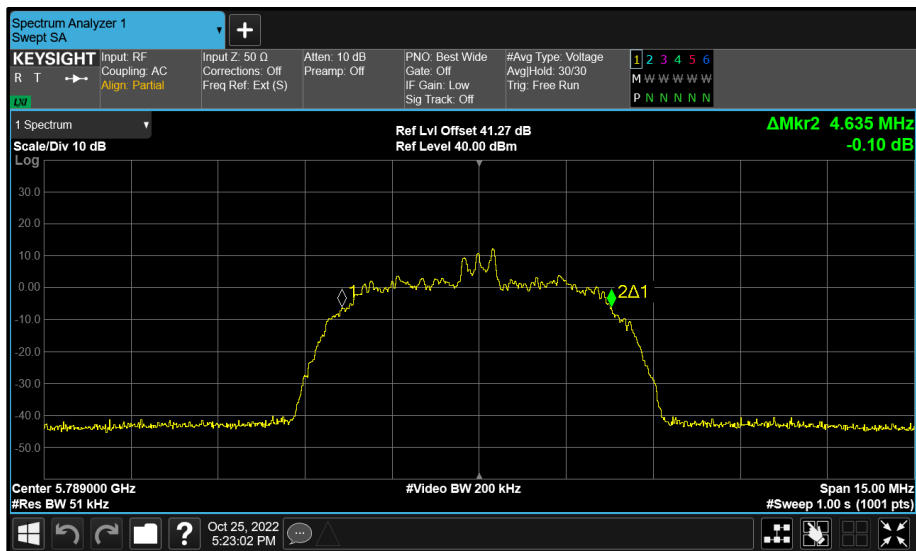


Figure 67 - Core 0 (A) 5789 MHz (CH64) 99% Bandwidth

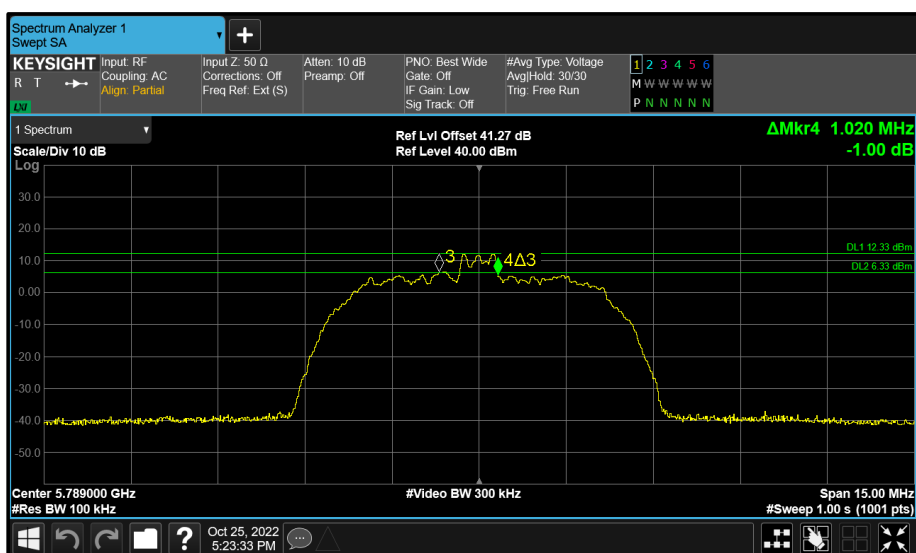


Figure 68 - Core 0 (A) 5789 MHz (CH64) 6 dB Bandwidth

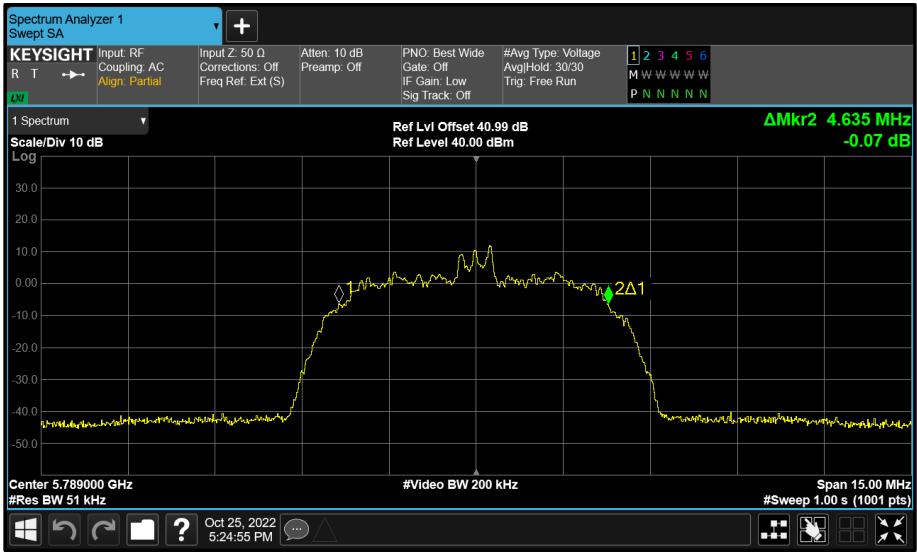


Figure 69 - Core 1 (B) 5789 MHz (CH64) 99% Bandwidth

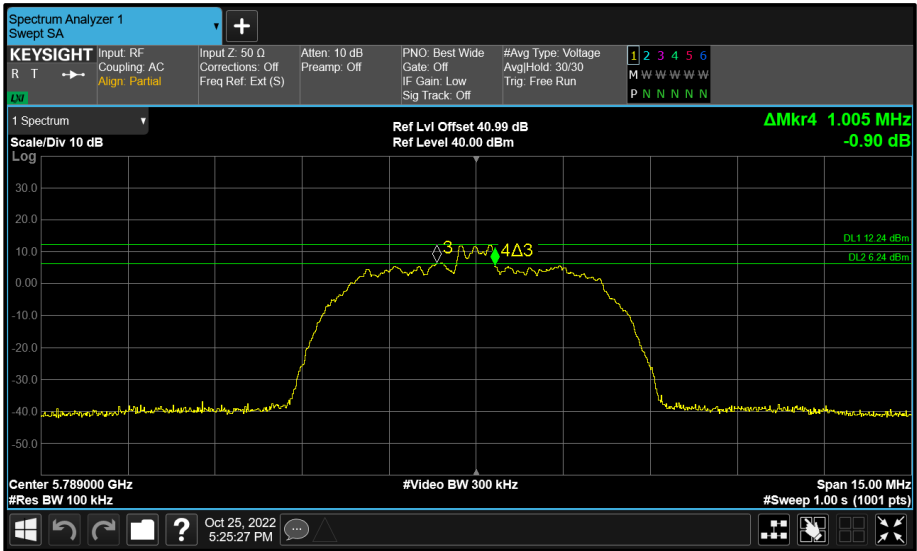


Figure 70 - Core 1 (B) 5789 MHz (CH64) 6 dB Bandwidth

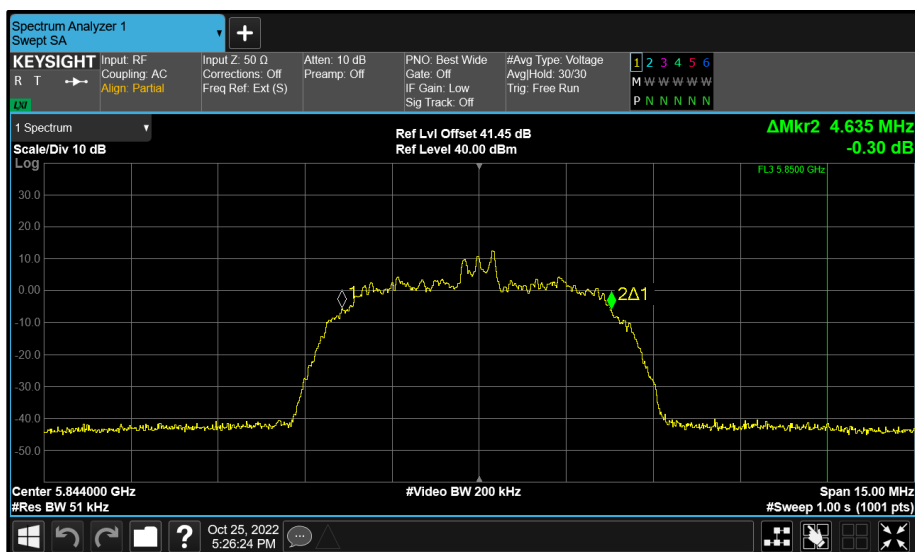


Figure 71 - Core 0 (A) 5844 MHz (CH119) 99% Bandwidth

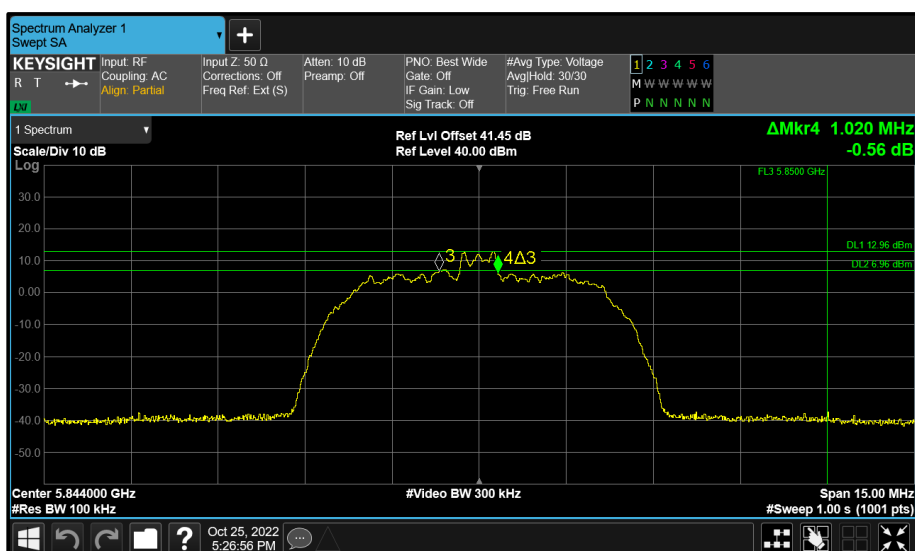


Figure 72 - Core 0 (A) 5844 MHz (CH119) 6 dB Bandwidth

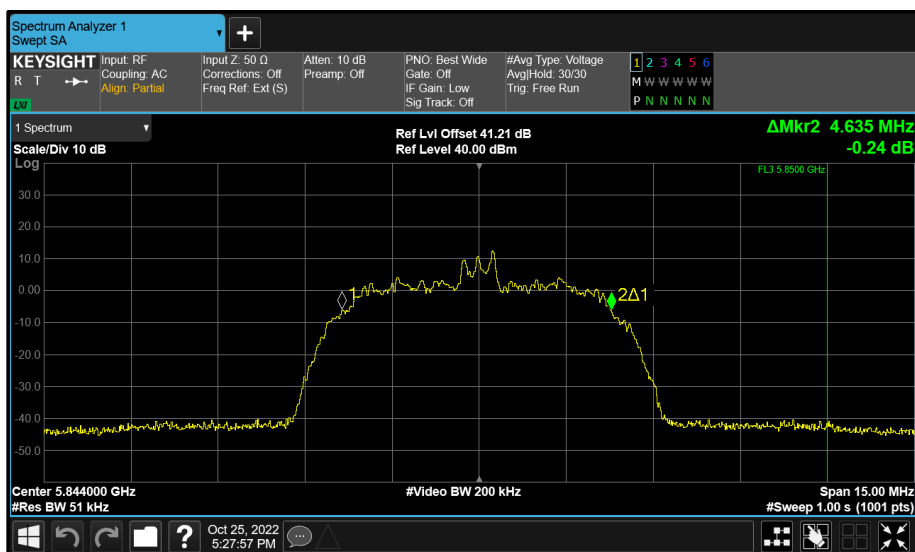


Figure 73 - Core 1 (B) 5844 MHz (CH119) 99% Bandwidth

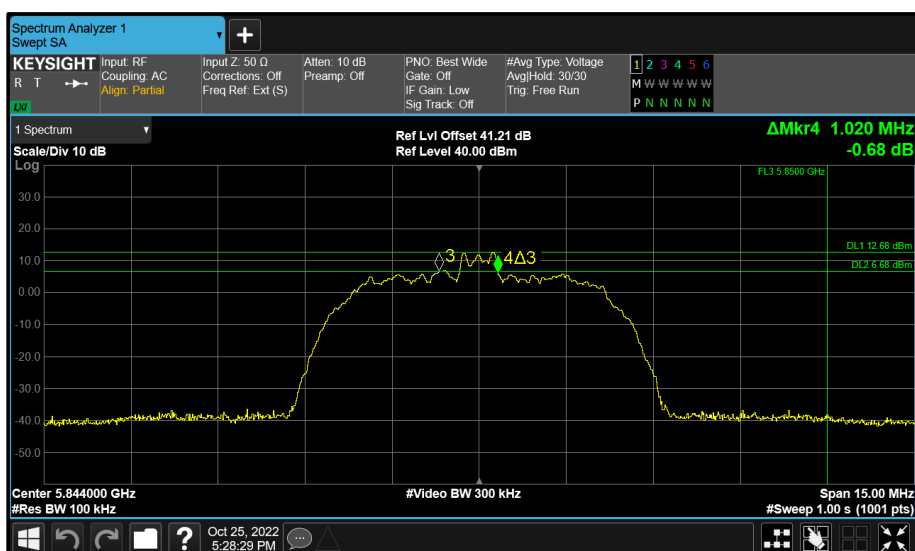


Figure 74 - Core 1 (B) 5844 MHz (CH119) 6 dB Bandwidth



Test Configuration			
Frequency Range:	5.150-5.250 GHz	Band:	U-NII-1
Limit Clause(s):	-	Test Method(s):	C63.10 6.9.3 C63.10 12.5.1
Additional Reference(s):	-		

DUT Configuration			
Mode:	iPA GFSK (DH5)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	B (Core 1)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	26 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5162	-	1.248	-	-	≥500.0
5204	-	1.248	-	-	≥500.0
5245	-	1.248	-	-	≥500.0

Table 29 - 26 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
5162	-	0.992	-	-	-
5204	-	0.992	-	-	-
5245	-	0.992	-	-	-

Table 30 - 99% Bandwidth Results

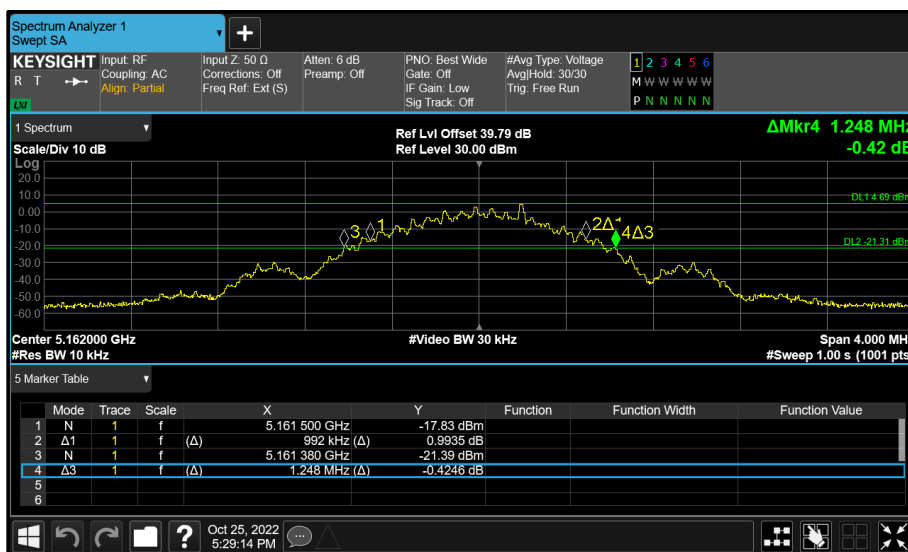


Figure 75 - Core 1 (B) 5162 MHz (CH12) 26 dB and 99% Bandwidth

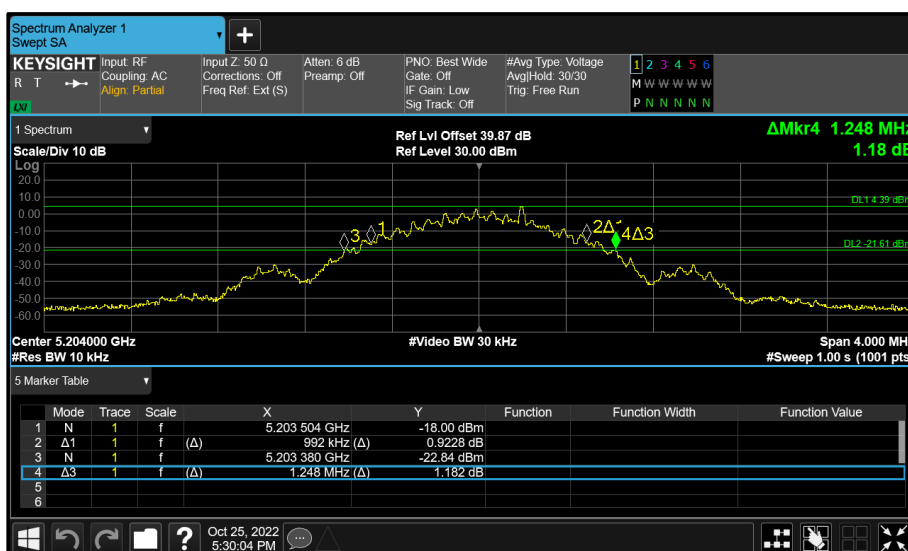


Figure 76 - Core 1 (B) 5204 MHz (CH54) 26 dB and 99% Bandwidth

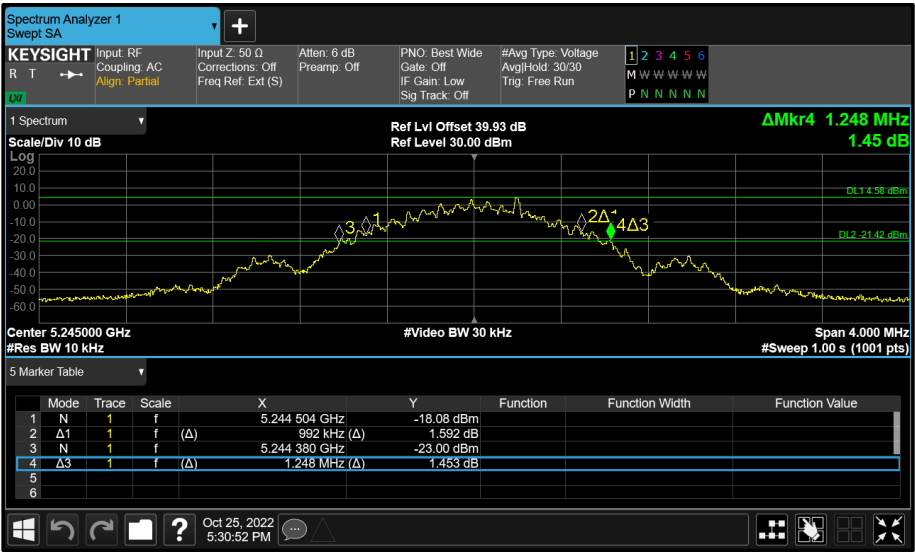


Figure 77 - Core 1 (B) 5245 MHz (CH95) 26 dB and 99% Bandwidth