

FCC and ISED Test Report

Apple Inc
Model: A2686

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: BCGA2686 IC: 579C-A2686

COMMERCIAL-IN-CONFIDENCE

Document 75954423-16 Issue 01

SIGNATURE

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| NAME | JOB TITLE | RESPONSIBLE FOR | ISSUE DATE |
|---------------|---------------------|----------------------|------------------|
| Steven Wwhite | Key Account Manager | Authorised Signatory | 04 November 2022 |

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

ENGINEERING STATEMENT

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

| RESPONSIBLE FOR | NAME | DATE | SIGNATURE |
|-------------------|-----------------|------------------|---------------------------------------|
| Report Generation | Hollie Marshall | 04 November 2022 | A handwritten signature in black ink. |

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory ISED Accreditation
12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15E: 2020, ISED RSS-247: Issue 2 (2017-02) and ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02) for the tests detailed in section 1.3.



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1 Report Summary

1.1 Report Modification Record

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

| Issue | Description of Change | Date of Issue |
|-------|-----------------------|---------------|
| 1 | First Issue | 04-Nov-2022 |

Table 1

1.2 Introduction

| | |
|-------------------------------|--|
| Applicant | Apple Inc |
| Manufacturer | Apple Inc |
| Model Number(s) | A2686 |
| Serial Number(s) | XVFXG6M544, F4W3G4XCD4 and FP3F23QFHX |
| Hardware Version(s) | REV 1.0 |
| Software Version(s) | 22A12310t, 22A12310t and 22A12310s |
| Number of Samples Tested | 3 |
| Test Specification/Issue/Date | FCC 47 CFR Part 15E: 2020 ISED RSS-247: Issue 2 (2017-02) ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02) |
| Order Number | 0540246998 |
| Start of Test | 19-June-2022 |
| Finish of Test | 27-October-2022 |
| Name of Engineer(s) | Ian Hart, Daniel Cameron, Colin Brain, Thomas Randall and Danial Shafique |
| 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 | 15.407 (b) and 15.209 | 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 (EUT) 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:

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

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

Core 0 + Core 1 (TxBF) – iPA 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) |
|--------------|-----------------------|-----------------|---------------------------|
| Core 0 | 5150 to 5250 | 0.15 | 1.20 |
| | 5725 to 5820 | 0.88 | 1.30 |
| Core 1 | 5150 to 5250 | 6.25 | 1.20 |
| | 5725 to 5820 | 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: A2686, Serial Number: F4W3G4XCD4 | | | |
| 0 | As supplied by the customer | Not Applicable | Not Applicable |
| Model: A2686, Serial Number: XVFHG6M544 | | | |
| 0 | As supplied by the customer | Not Applicable | Not Applicable |
| Model: A2686, Serial Number: FP3F23QFHX | | | |
| 0 | As supplied by the customer | Not Applicable | Not Applicable |

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 | | |
| Emission Bandwidth | Daniel Cameron | UKAS |
| Maximum Conducted Output Power | Daniel Cameron | UKAS |
| Maximum Conducted Power Spectral Density | Daniel Cameron | 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 | Ian Hart | UKAS |
| Authorised Band Edges | Ian Hart | UKAS |
| Spurious Radiated Emissions | Colin Brain, Thomas Randall and Danial Shafique | 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

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

2.1.3 Date of Test

19-June -2022 to 25-October-2022

2.1.4 Test Method

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

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

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

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

2.1.5 Environmental Conditions

| | |
|---------------------|---------|
| Ambient Temperature | 21.3 °C |
| Relative Humidity | 40.5 % |

2.1.6 Test Results

NarrowBand

iPA - SISO

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dB μ V/m) | Average Level (dB μ V/m) |
|--------|---------------|------|-------------|--------------------|---------------------------|---------------------------|------------------------------|
| Static | GFSK | 1 | DH5 | 5162 | 5150 | 56.04 | 43.57 |
| Static | $\pi/4$ DQPSK | 1 | 4-DH5 | 5162 | 5150 | 55.58 | 43.51 |
| Static | $\pi/4$ DQPSK | 1 | 8-DH5 | 5162 | 5150 | 55.93 | 43.53 |
| Static | GFSK | 1 | DH5 | 5245 | 5350 | 56.93 | 44.60 |
| Static | $\pi/4$ DQPSK | 1 | 4-DH5 | 5245 | 5350 | 56.56 | 44.67 |
| Static | $\pi/4$ DQPSK | 1 | 8-DH5 | 5245 | 5350 | 56.27 | 44.63 |

Table 7 - Restricted Band Edge Results

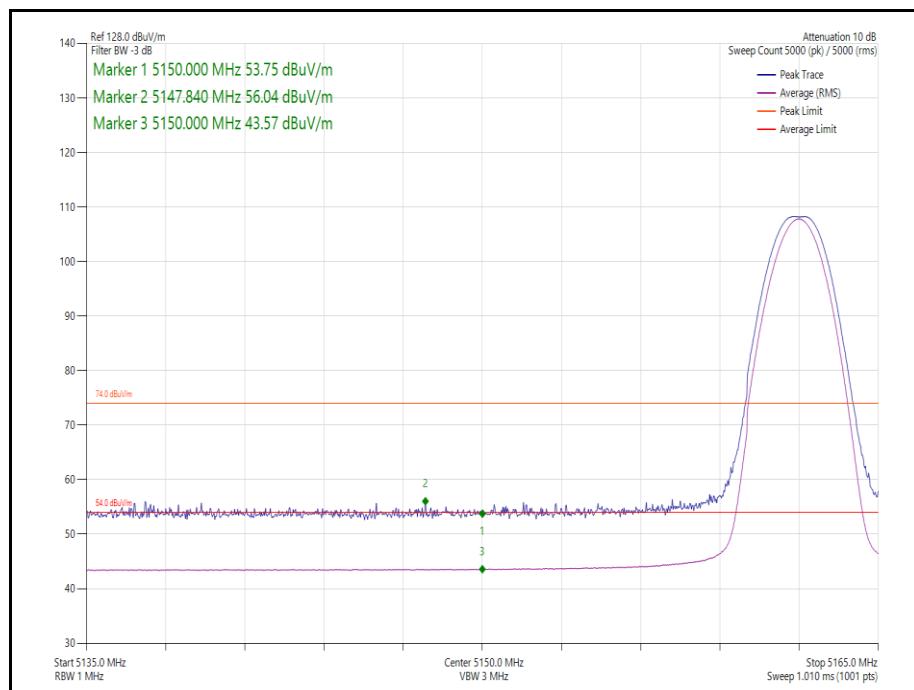


Figure 1 - Static - GFSK/DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

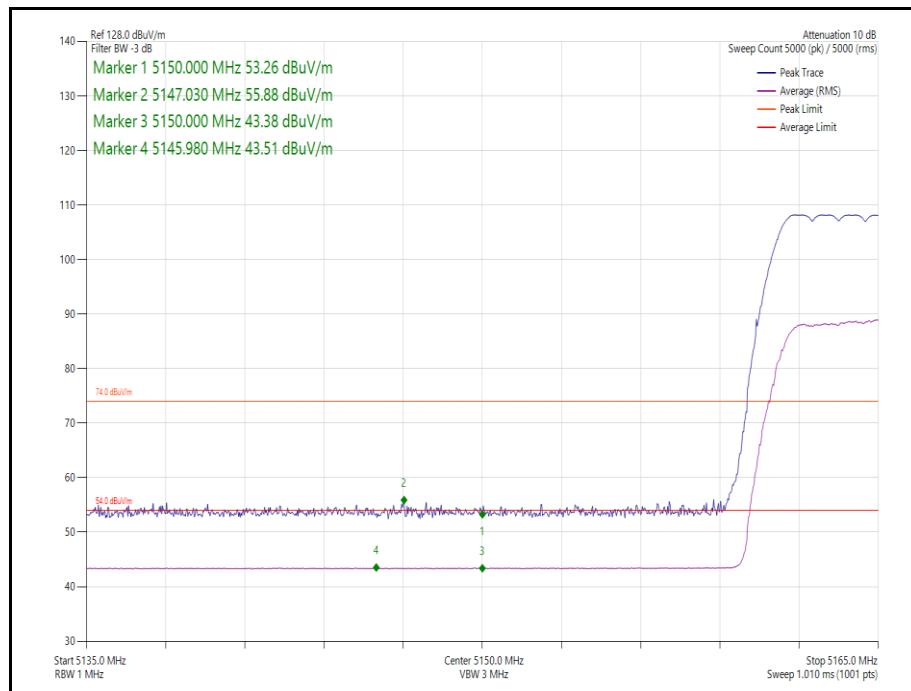


Figure 2 - Static - $\pi/4$ DQPSK/4-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

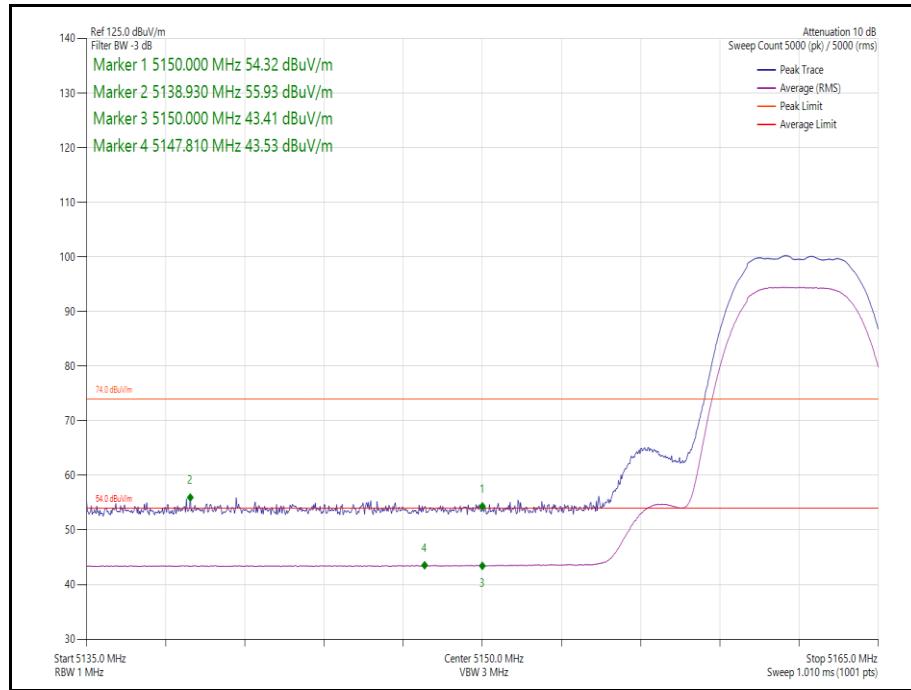


Figure 3 - Static - $\pi/4$ DQPSK/8-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

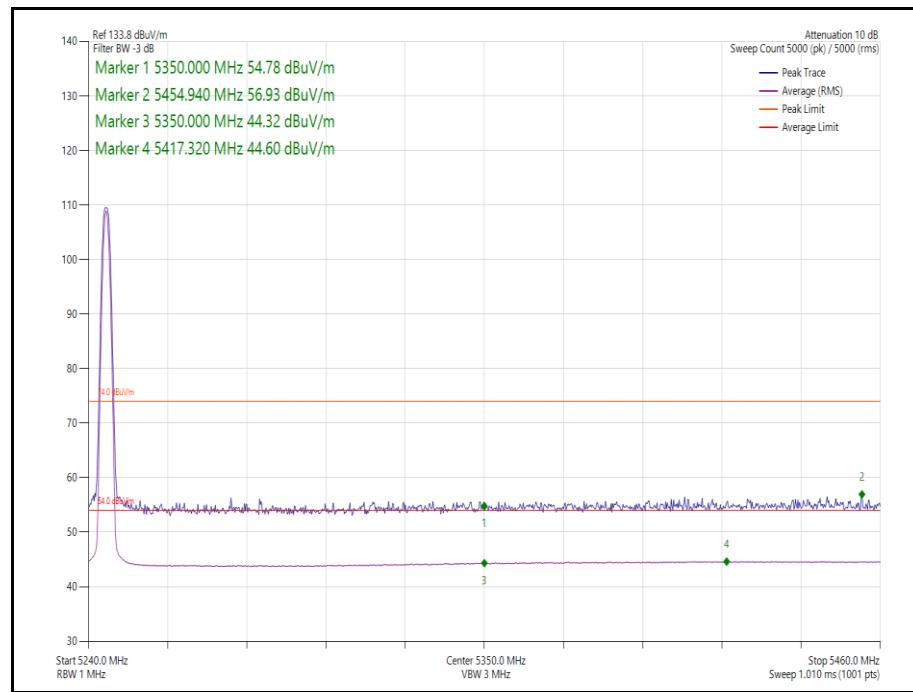


Figure 4 - Static - GFSK/DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

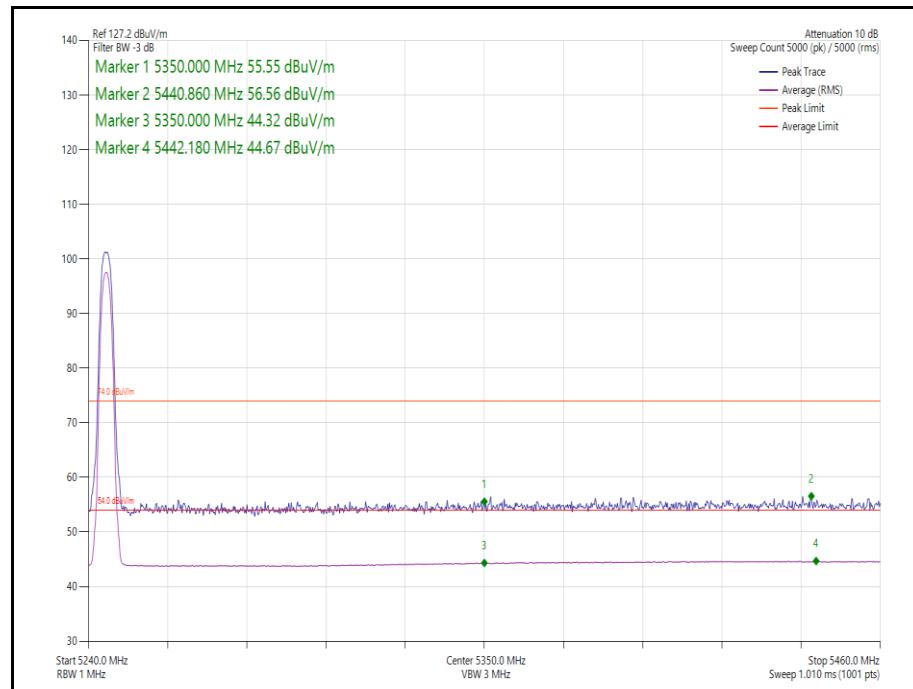


Figure 5 - Static - $\pi/4$ DQPSK/4-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

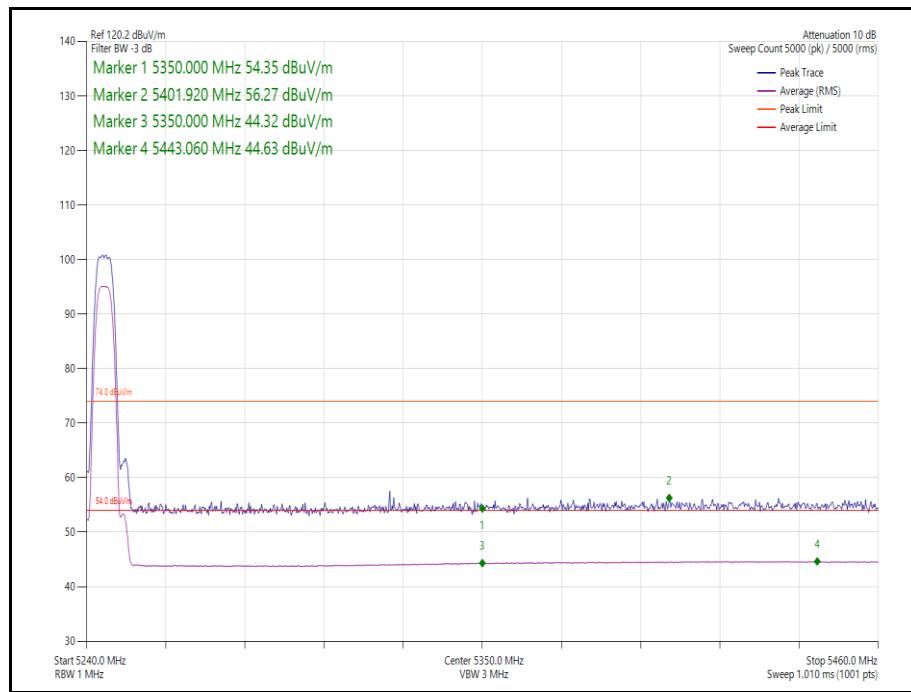


Figure 6 - Static - $\pi/4$ DQPSK/8-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

iPA – TXBF

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dB μ V/m) | Average Level (dB μ V/m) |
|--------|---------------|------|-------------|--------------------|---------------------------|---------------------------|------------------------------|
| Static | GFSK | 0-1 | DH5 | 5162 | 5150 | 56.0 | 43.99 |
| Static | $\pi/4$ DQPSK | 0-1 | 4-DH5 | 5162 | 5150 | 56.53 | 44.04 |
| Static | $\pi/4$ DQPSK | 0-1 | 8-DH5 | 5162 | 5150 | 55.98 | 44.03 |
| Static | GFSK | 0-1 | DH5 | 5245 | 5350 | 56.70 | 44.81 |
| Static | $\pi/4$ DQPSK | 0-1 | 4-DH5 | 5245 | 5350 | 56.83 | 44.84 |
| Static | $\pi/4$ DQPSK | 0-1 | 8-DH5 | 5245 | 5350 | 56.85 | 44.81 |

Table 8 - Restricted Band Edge Results

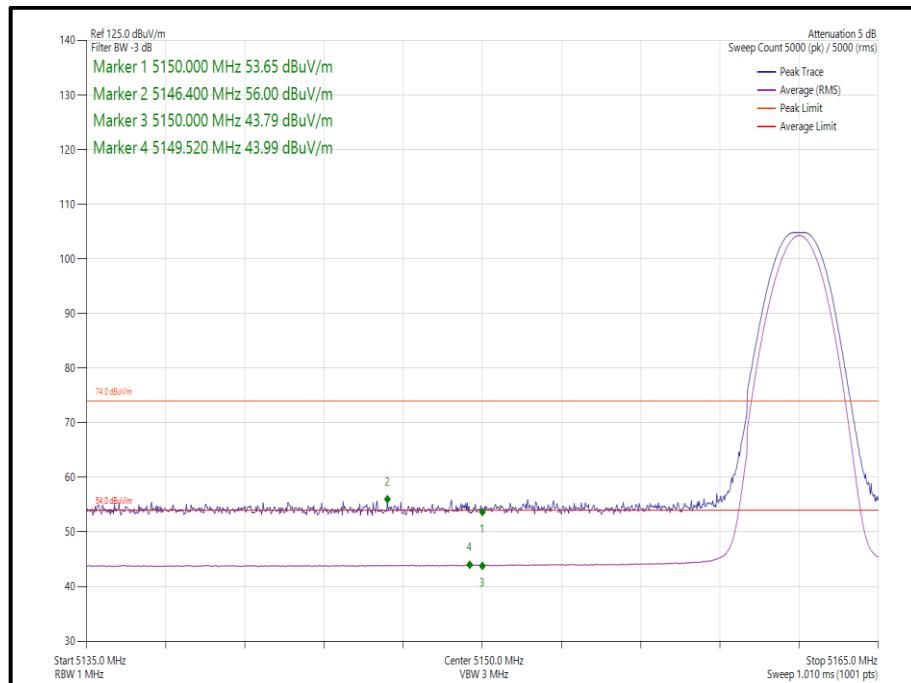


Figure 7 - Static - GFSK/DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

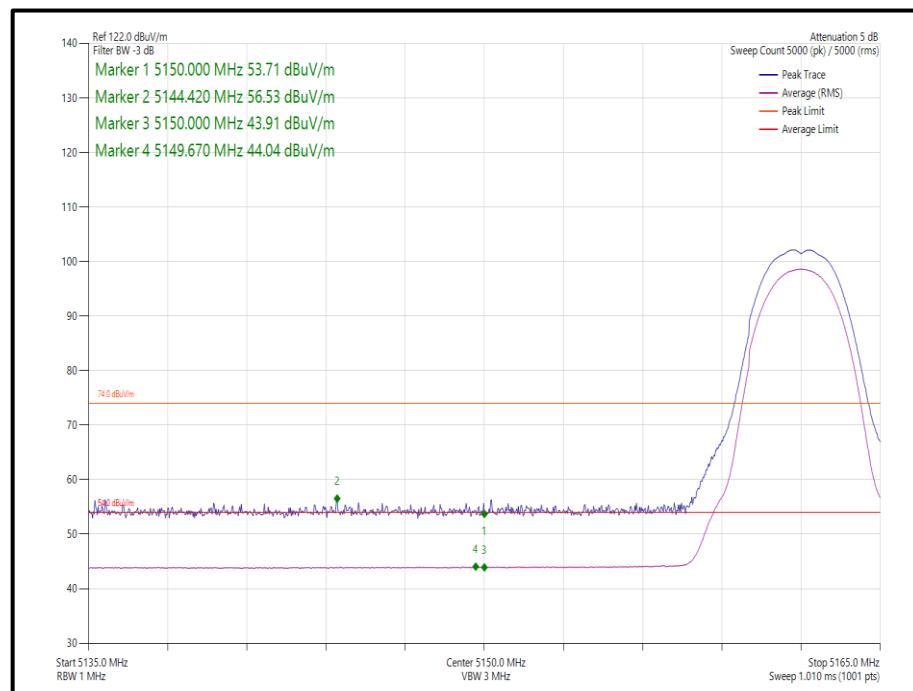


Figure 8 - Static - $\pi/4$ DQPSK/4-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

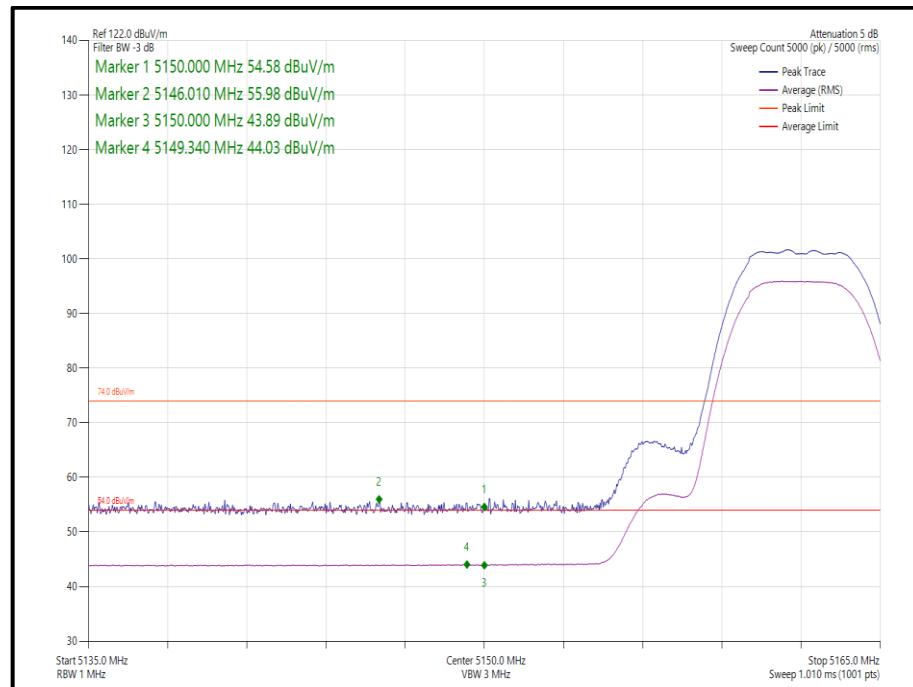


Figure 9 - Static - $\pi/4$ DQPSK/8-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

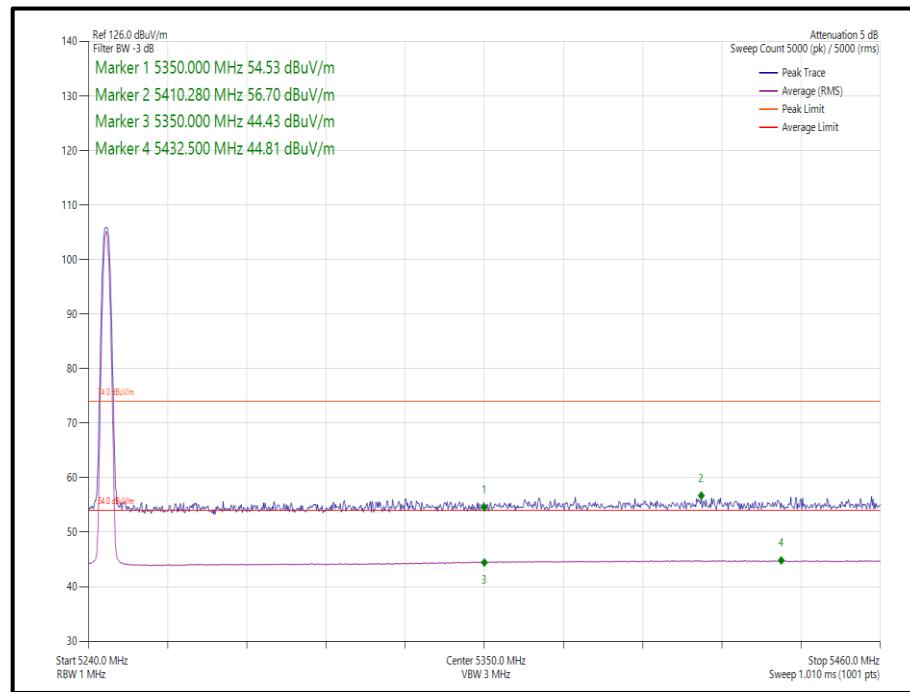


Figure 10 - Static - GFSK/DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

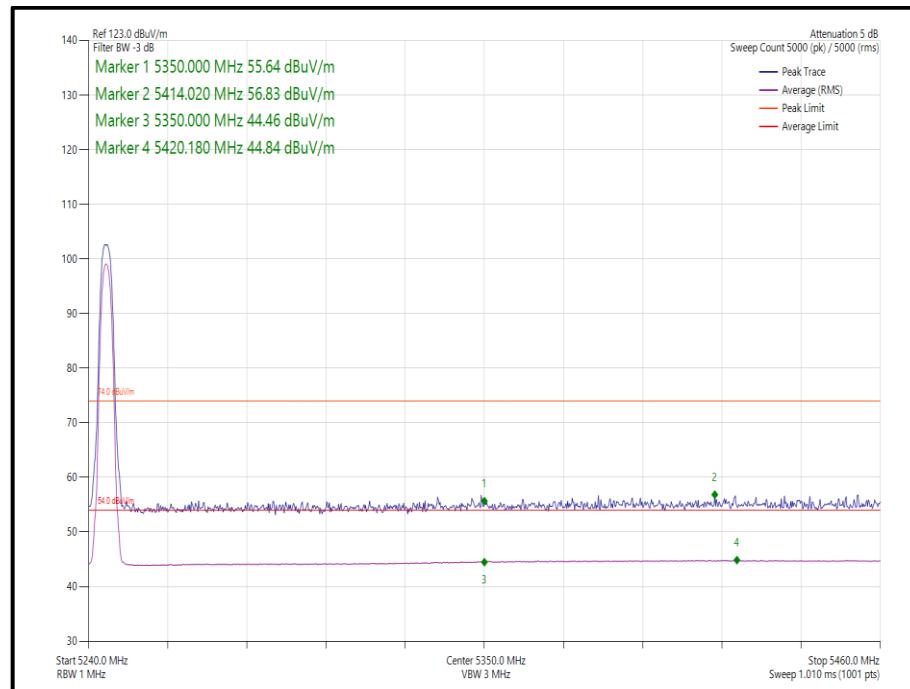


Figure 11 - Static - $\pi/4$ DQPSK/4-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

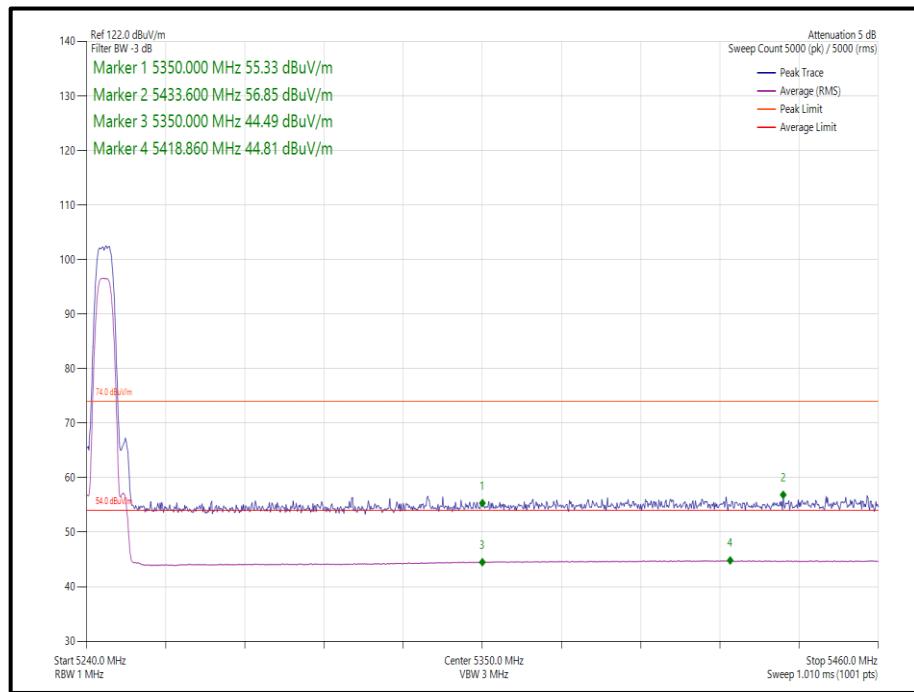


Figure 12 - Static - $\pi/4$ DQPSK/8-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

ePA - SISO

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dB μ V/m) | Average Level (dB μ V/m) |
|--------|---------------|------|-------------|--------------------|---------------------------|---------------------------|------------------------------|
| Static | $\pi/4$ DQPSK | 1 | 4-DH5 | 5162 | 5150 | 56.63 | 44.36 |
| Static | $\pi/4$ DQPSK | 1 | 8-DH5 | 5162 | 5150 | 56.56 | 45.22 |
| Static | $\pi/4$ DQPSK | 1 | 4-DH5 | 5245 | 5350 | 56.73 | 44.75 |
| Static | $\pi/4$ DQPSK | 1 | 8-DH5 | 5245 | 5350 | 56.64 | 44.75 |

Table 9 - Restricted Band Edge Results

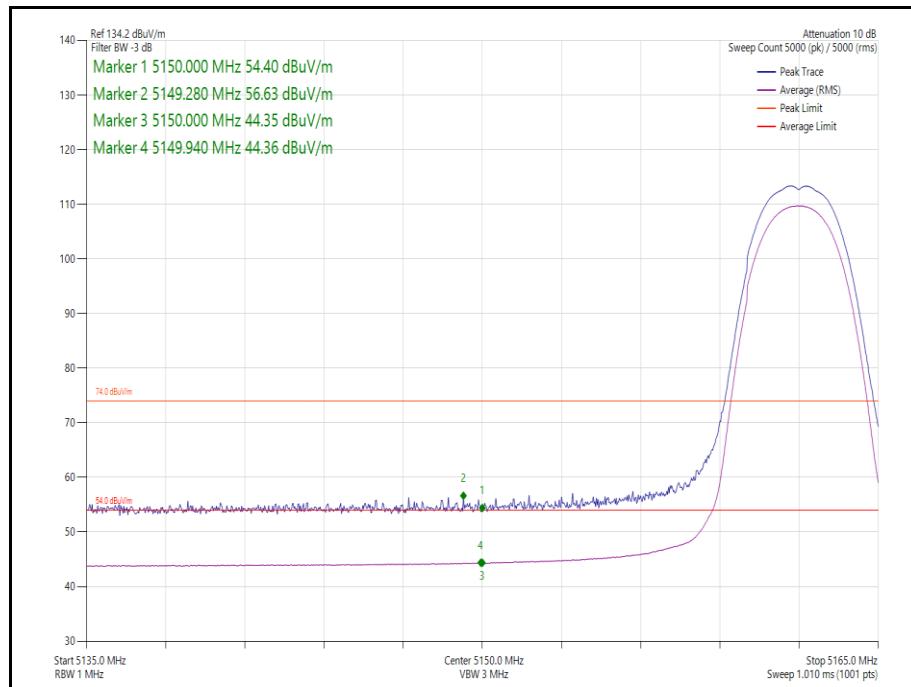


Figure 13 - Static - $\pi/4$ DQPSK/4-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

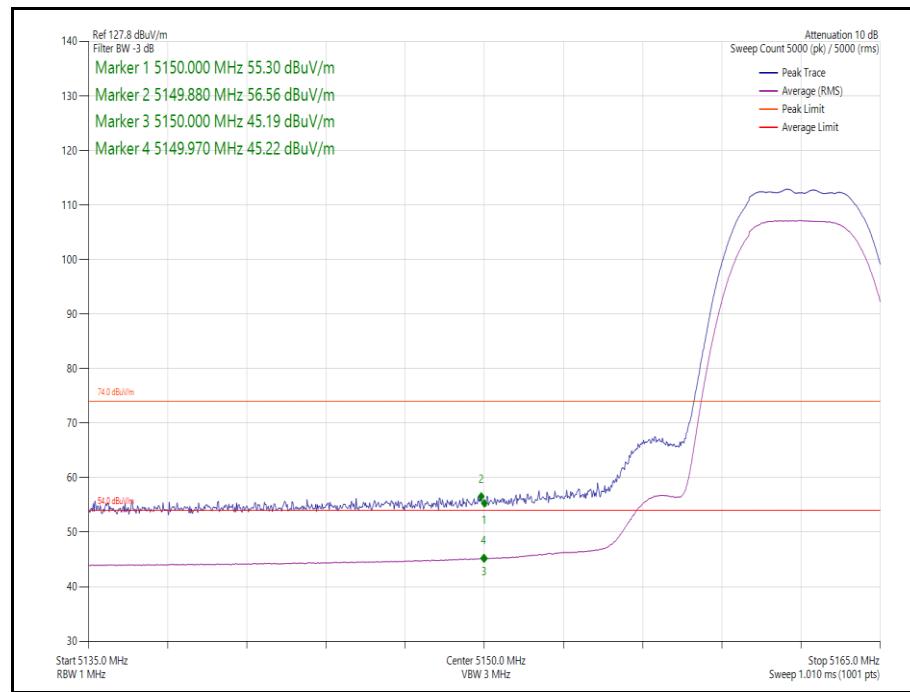


Figure 14 - Static - $\pi/4$ DQPSK/8-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

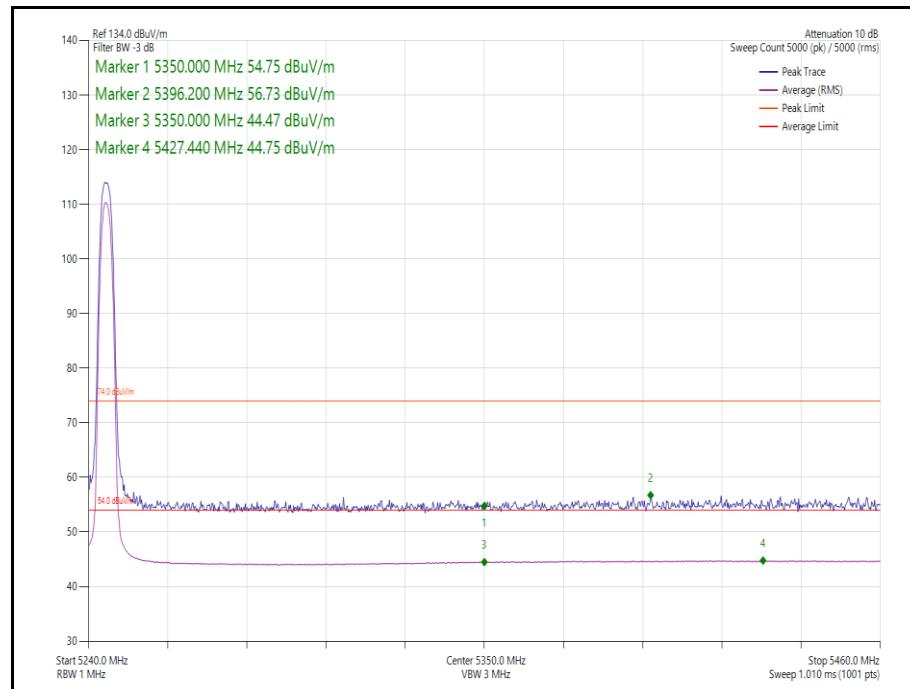


Figure 15 - Static - $\pi/4$ DQPSK/4-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

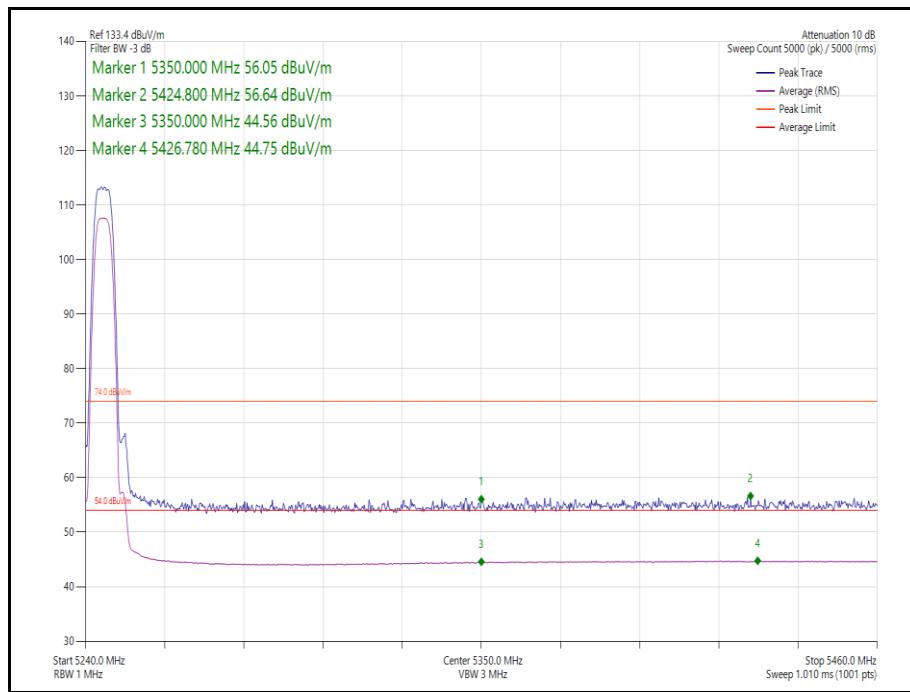


Figure 16 - Static - $\pi/4$ DQPSK/8-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

ePA - TXBF

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dB μ V/m) | Average Level (dB μ V/m) |
|--------|---------------|------|-------------|--------------------|---------------------------|---------------------------|------------------------------|
| Static | $\pi/4$ DQPSK | 0-1 | 4-DH5 | 5162 | 5150 | 55.96 | 44.19 |
| Static | $\pi/4$ DQPSK | 0-1 | 8-DH5 | 5162 | 5150 | 56.75 | 44.23 |
| Static | $\pi/4$ DQPSK | 0-1 | 4-DH5 | 5245 | 5350 | 57.62 | 44.88 |
| Static | $\pi/4$ DQPSK | 0-1 | 8-DH5 | 5245 | 5350 | 56.51 | 44.91 |

Table 10 - Restricted Band Edge Results

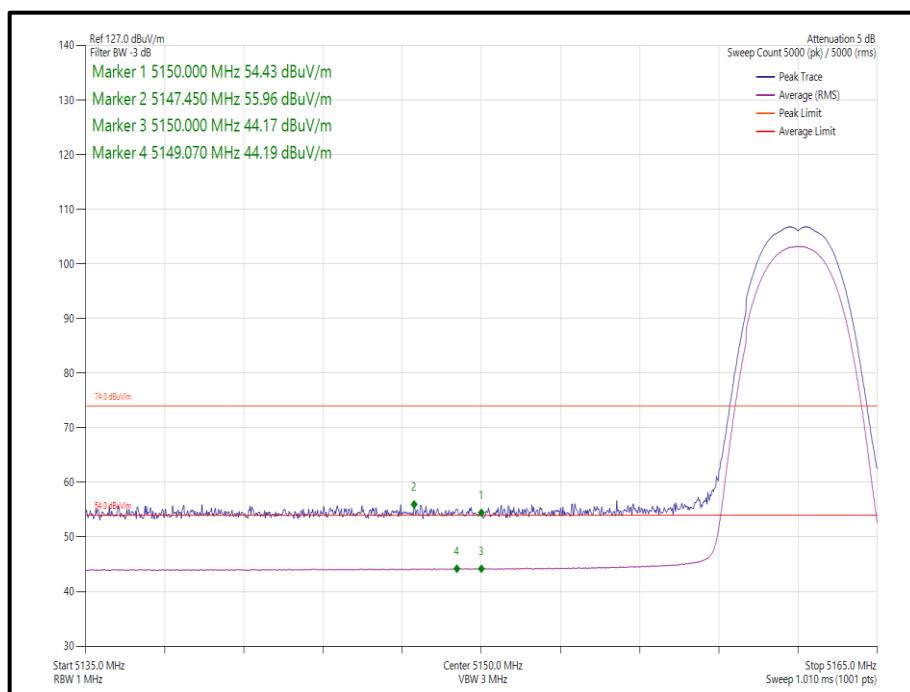


Figure 17 - Static - $\pi/4$ DQPSK/4-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

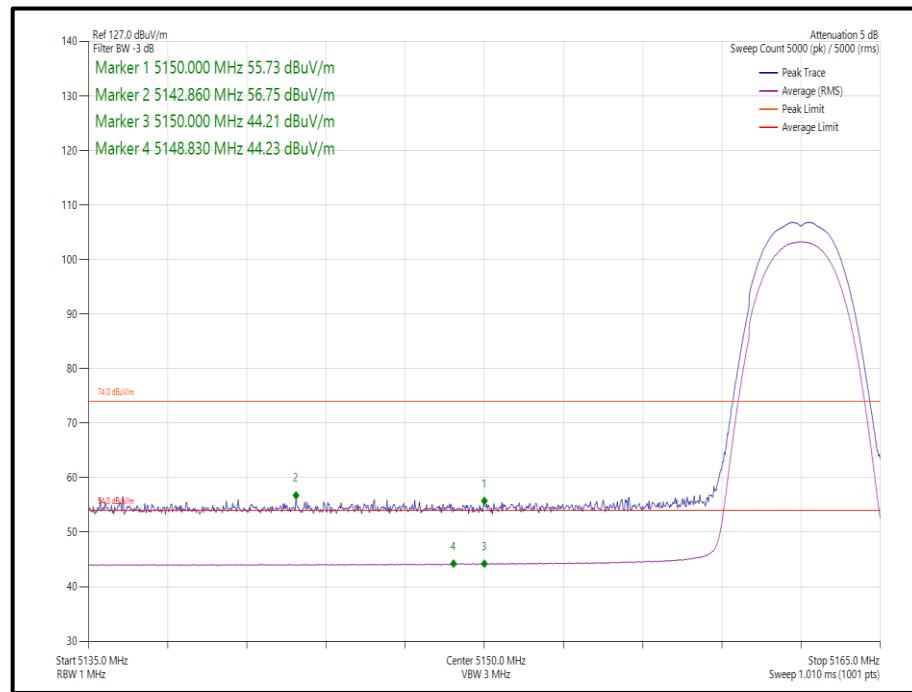


Figure 18 - Static - $\pi/4$ DQPSK/8-DH5 - 5162 MHz - Band Edge Frequency 5150 MHz

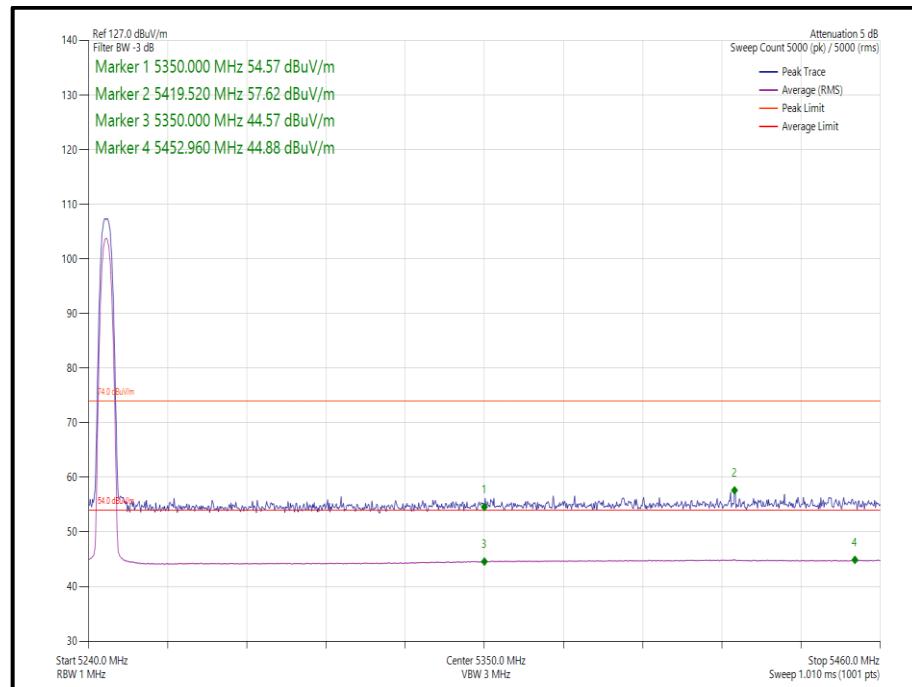


Figure 19 - Static - $\pi/4$ DQPSK/4-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

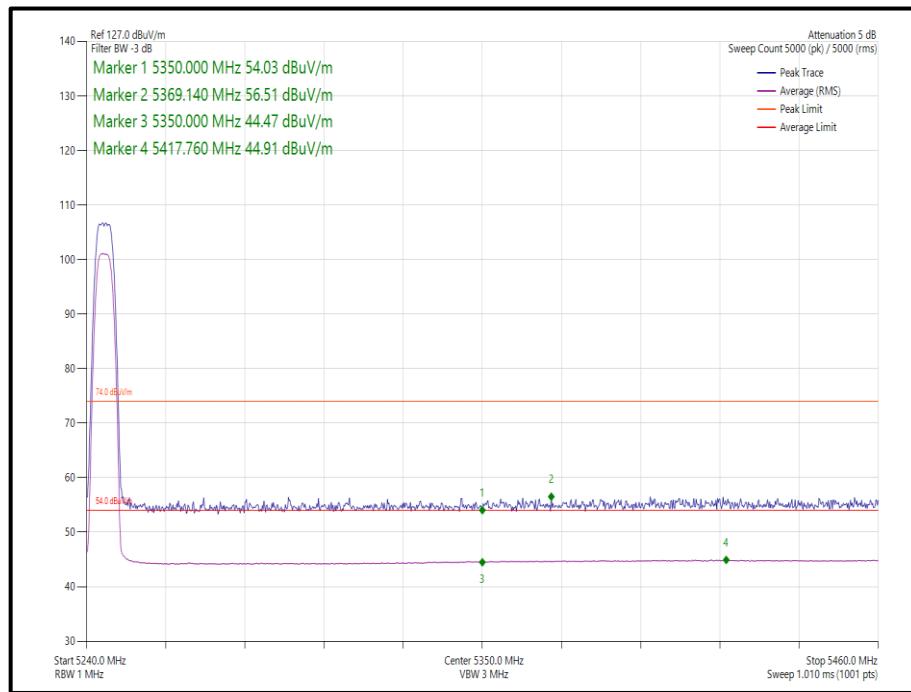


Figure 20 - Static - $\pi/4$ DQPSK/8-DH5 - 5245 MHz - Band Edge Frequency 5350 MHz

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 RF Chamber 14.

| Instrument | Manufacturer | Type No | TE No | Calibration Period (months) | Calibration Expires |
|--------------------------------------|----------------------|----------------------|-------|-----------------------------|---------------------|
| EMI Test Receiver | Rohde & Schwarz | ESW44 | 5912 | 12 | 17-Feb-2023 |
| 5m Semi-Anechoic Chamber (Dual-Axis) | Albatross Projects | RF Chamber 14 | 5958 | 36 | 26-Apr-2025 |
| 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 |
| Turntable | Maturo GmbH | TT1.5SI | 5968 | - | TU |
| 10dB/5W Attenuator | Aaren | AT40A-404-D18-10 | 5486 | 12 | 12-May-2023 |
| Pre Amp 1 - 26.5 GHz | Agilent Technologies | 8449B | 5445 | 12 | 11-April-2023 |
| Cable (SMA to SMA 1m) | Junkosha | MWX221-01000AMSAMS/A | 5997 | 12 | 06-Jun-2023 |
| Cable (SMA to SMA 1m) | Junkosha | MWX221-01000AMSAMS/A | 6008 | 12 | 06-Jun-2023 |
| Horn Antenna (1-10 GHz) | Schwarzbeck | BBHA9120B | 5215 | 12 | 28-May-2023 |
| Horn Antenna (1-10 GHz) | Schwarzbeck | BBHA9120B | 6141 | 12 | 21-Jun-2023* |
| SAC Switch Unit | TUV SUD | SSU001 | 6144 | 12 | 07-Jul-2023* |
| Humidity & Temperature meter | R.S Components | 1364 | 6150 | 12 | 17-Jun-2023 |

Table 12

TU - Traceability Unscheduled

*Equipment was only employed during its calibration period.



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

A2686, S/N: F4W3G4XCD4 - Modification State 0

2.2.3 Date of Test

23-October-2022 to 27-October-2022

2.2.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 12.4.2, KDB 789033 D02 v02r01 II.C.2. and ISED RSS-GEN, clause 6.7.

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 23.0 - 23.6 °C

Relative Humidity 59.4 - 62.4 %



2.2.6 Test Results

NarrowBand

| Test Configuration | | | |
|--------------------------|-----------------|-----------------|----------------------|
| Frequency Range: | 5.150-5.250 GHz | Band: | U-NII-1 |
| Limit Clause(s): | - | Test Method(s): | Refer to Test Method |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|------------------------|-----------------------|--------------------------|---|
| Mode: | ePA π/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 | - | 2.768 | - | - | ≥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 | - | 2.328 | - | - | - |
| 5204 | - | 2.328 | - | - | - |
| 5245 | - | 2.328 | - | - | - |

Table 14 - 99% Bandwidth Results

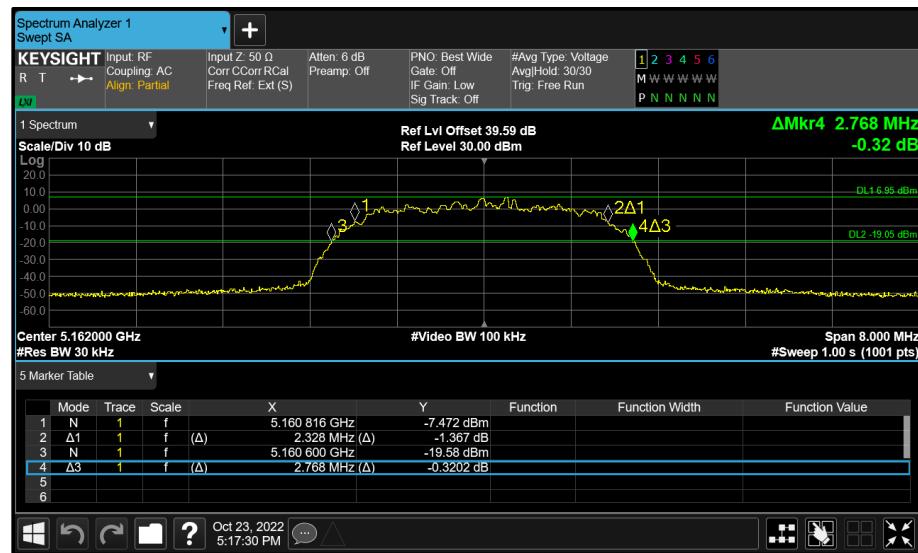


Figure 21 - Core 1 (B) 5162 MHz (CH12) 26 dB and 99% Bandwidth

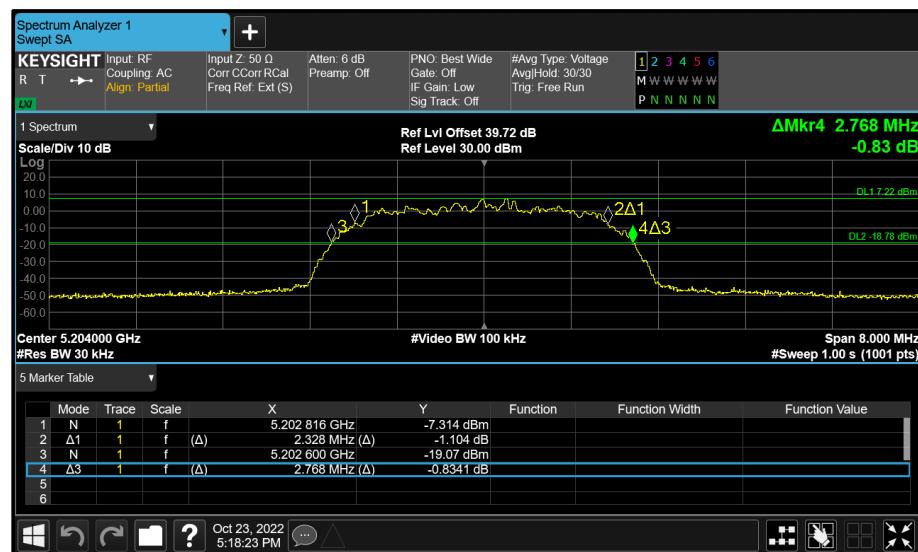


Figure 22 - Core 1 (B) 5204 MHz (CH54) 26 dB and 99% Bandwidth

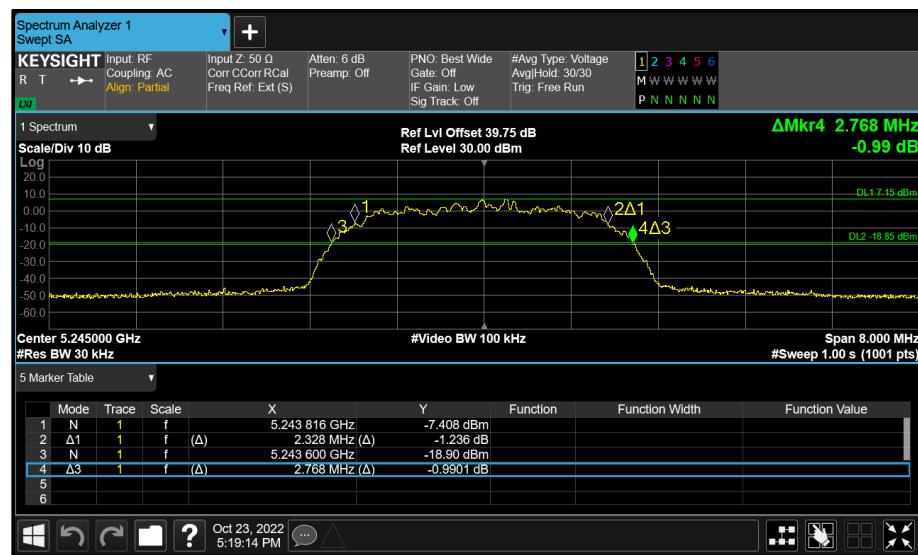


Figure 23 - Core 1 (B) 5245 MHz (CH95) 26 dB and 99% Bandwidth



| Test Configuration | | | |
|--------------------------|-----------------|-----------------|----------------------|
| Frequency Range: | 5.150-5.250 GHz | Band: | U-NII-1 |
| Limit Clause(s): | - | Test Method(s): | Refer to Test Method |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|------------------------|-----------------------|--------------------------|---|
| Mode: | ePA π/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 | - | 5.325 | - | - | ≥500.0 |

Table 15 - 26 dB Bandwidth Results

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

Table 16 - 99% Bandwidth Results

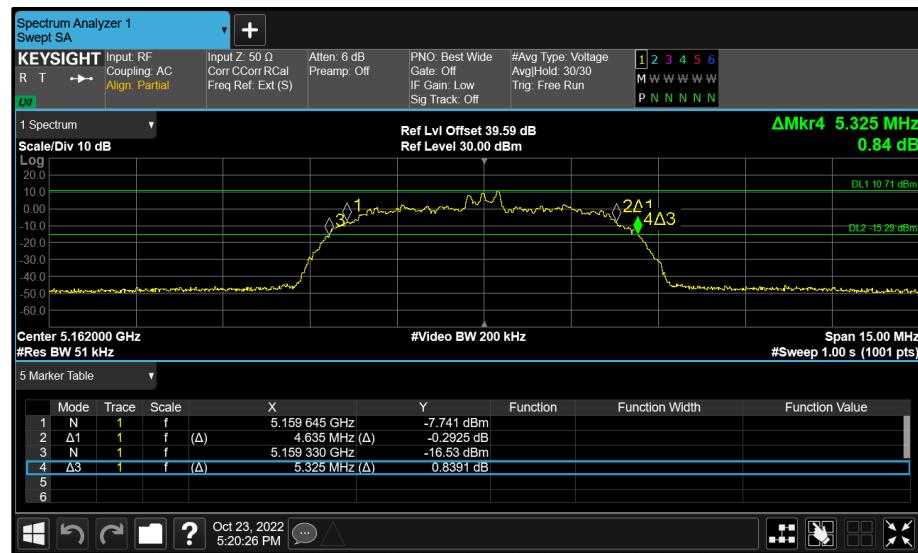


Figure 24 - Core 1 (B) 5162 MHz (CH12) 26 dB and 99% Bandwidth

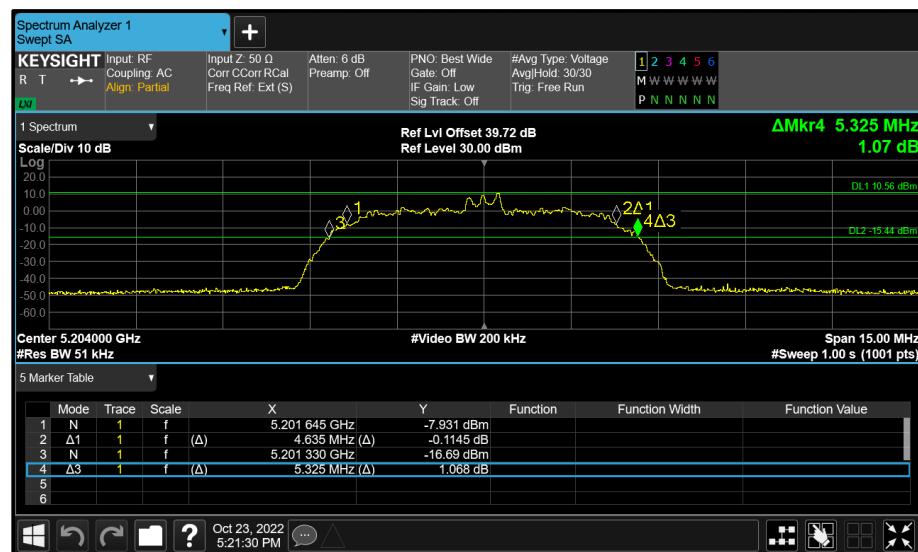


Figure 25 - Core 1 (B) 5204 MHz (CH54) 26 dB and 99% Bandwidth

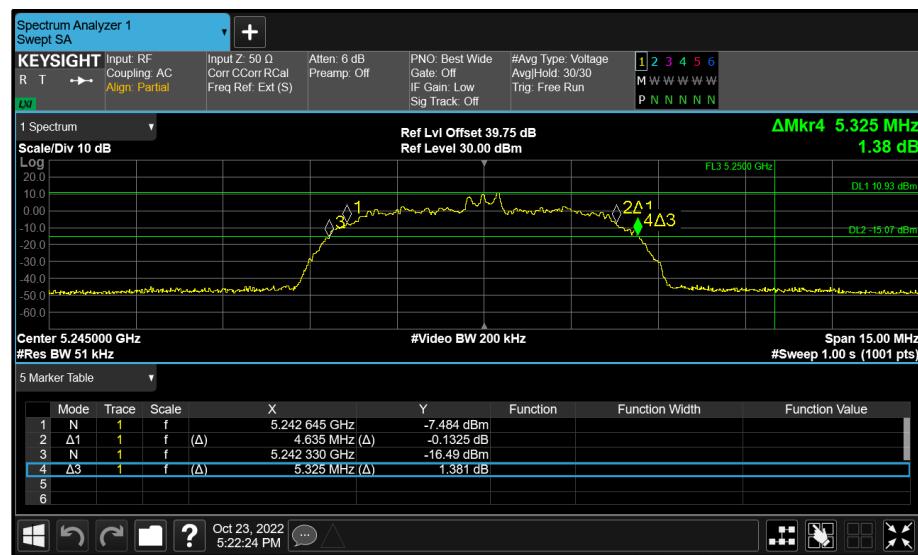


Figure 26 - Core 1 (B) 5245 MHz (CH95) 26 dB and 99% Bandwidth



| Test Configuration | | | |
|--------------------------|-----------------|-----------------|----------------------|
| Frequency Range: | 5.150-5.250 GHz | Band: | U-NII-1 |
| Limit Clause(s): | - | Test Method(s): | Refer to Test Method |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|------------------------|-----------------------|--------------------------|---|
| Mode: | ePA π/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 | 2.768 | 2.792 | - | - | ≥500.0 |
| 5204 | 2.792 | 2.776 | - | - | ≥500.0 |
| 5245 | 2.768 | 2.784 | - | - | ≥500.0 |

Table 17 - 26 dB Bandwidth Results

| Test Frequency (MHz) | 99% Bandwidth (MHz) | | | | Limit (kHz) |
|----------------------|---------------------|-------|---|---|-------------|
| | A | B | C | D | |
| 5162 | 2.344 | 2.344 | - | - | - |
| 5204 | 2.344 | 2.344 | - | - | - |
| 5245 | 2.344 | 2.344 | - | - | - |

Table 18 - 99% Bandwidth Results

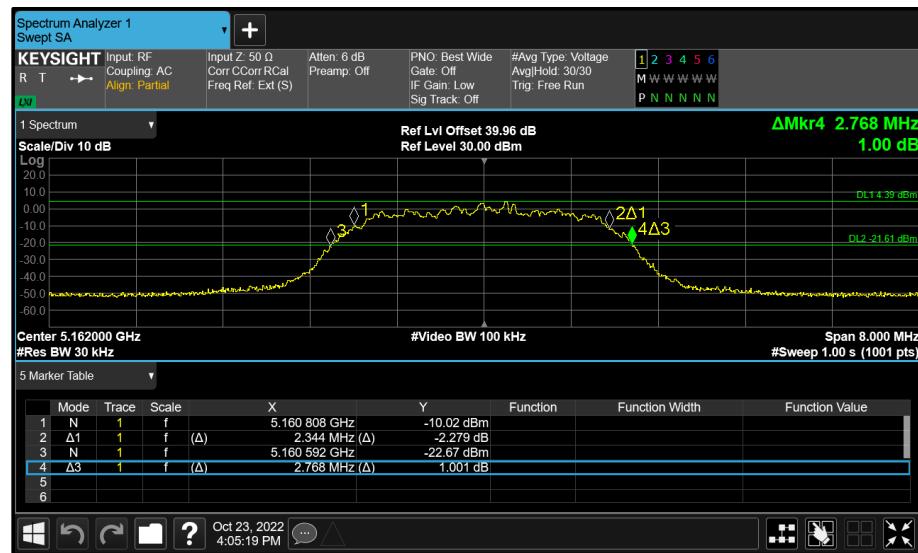


Figure 27 - Core 0 (A) 5162 MHz (CH12) 26 dB and 99% Bandwidth

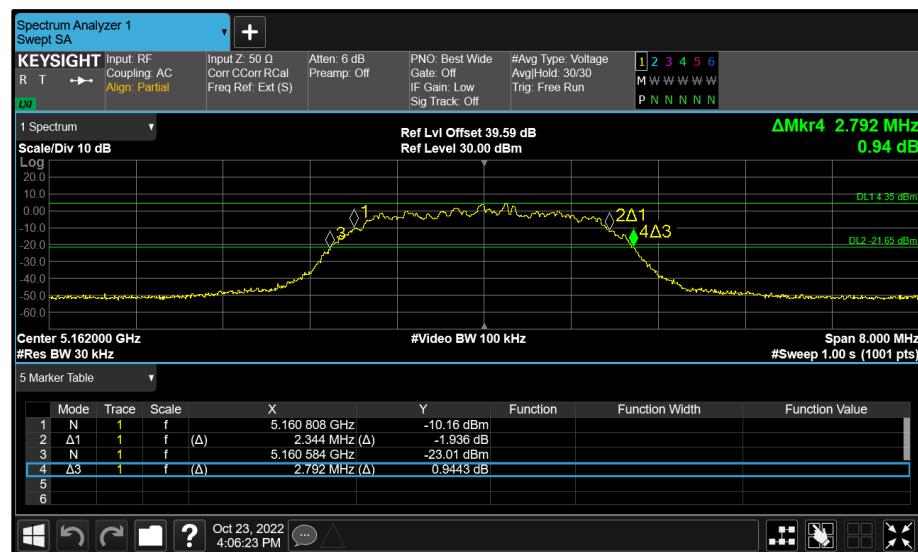


Figure 28 - Core 1 (B) 5162 MHz (CH12) 26 dB and 99% Bandwidth

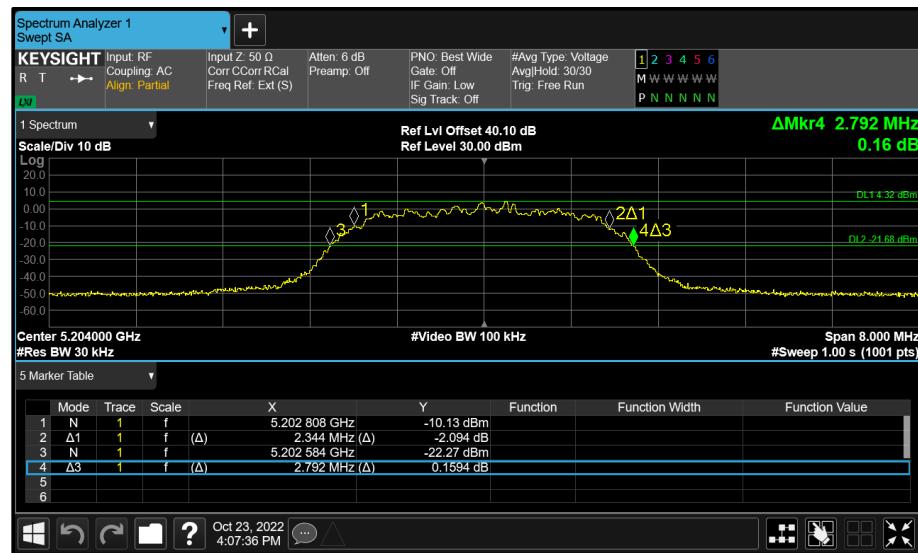


Figure 29 - Core 0 (A) 5204 MHz (CH54) 26 dB and 99% Bandwidth

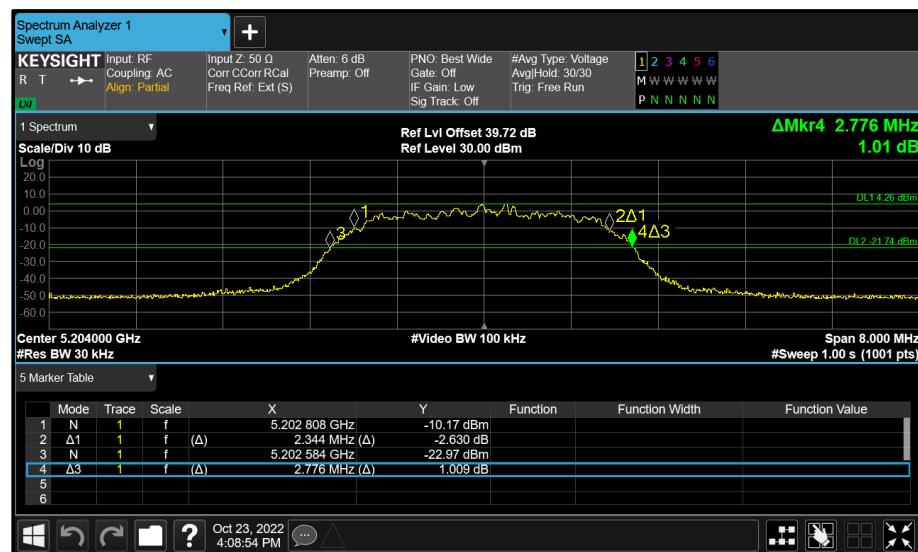


Figure 30 - Core 1 (B) 5204 MHz (CH54) 26 dB and 99% Bandwidth

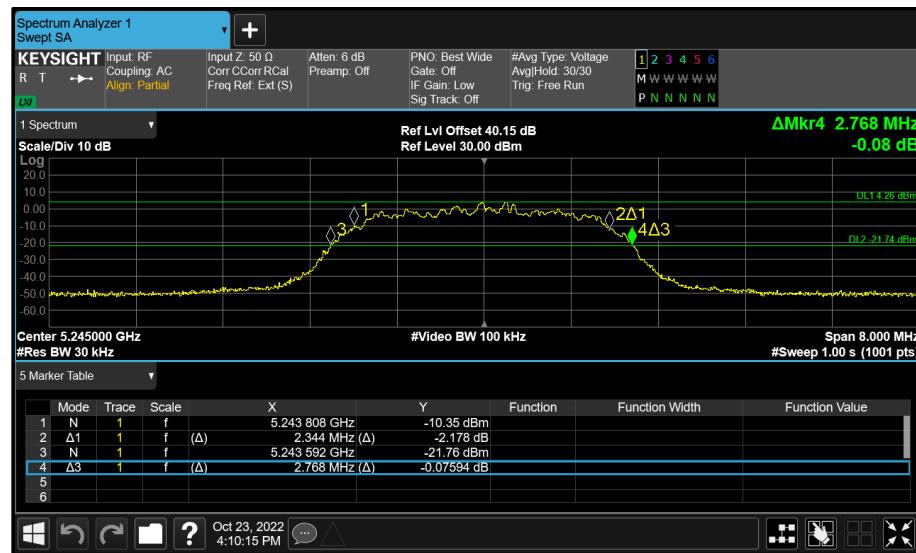


Figure 31 - Core 0 (A) 5245 MHz (CH95) 26 dB and 99% Bandwidth

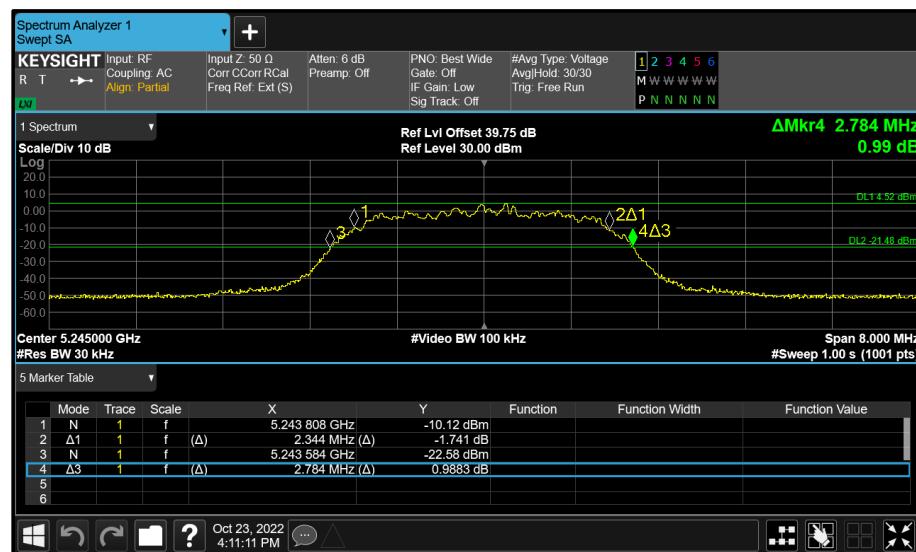


Figure 32 - Core 1 (B) 5245 MHz (CH95) 26 dB and 99% Bandwidth



| Test Configuration | | | |
|--------------------------|-----------------|-----------------|----------------------|
| Frequency Range: | 5.150-5.250 GHz | Band: | U-NII-1 |
| Limit Clause(s): | - | Test Method(s): | Refer to Test Method |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|------------------------|-----------------------|--------------------------|---|
| Mode: | ePA π/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 | 5.340 | 5.325 | - | - | ≥500.0 |
| 5204 | 5.325 | 5.325 | - | - | ≥500.0 |
| 5245 | 5.325 | 5.340 | - | - | ≥500.0 |

Table 19 - 26 dB Bandwidth Results

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

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

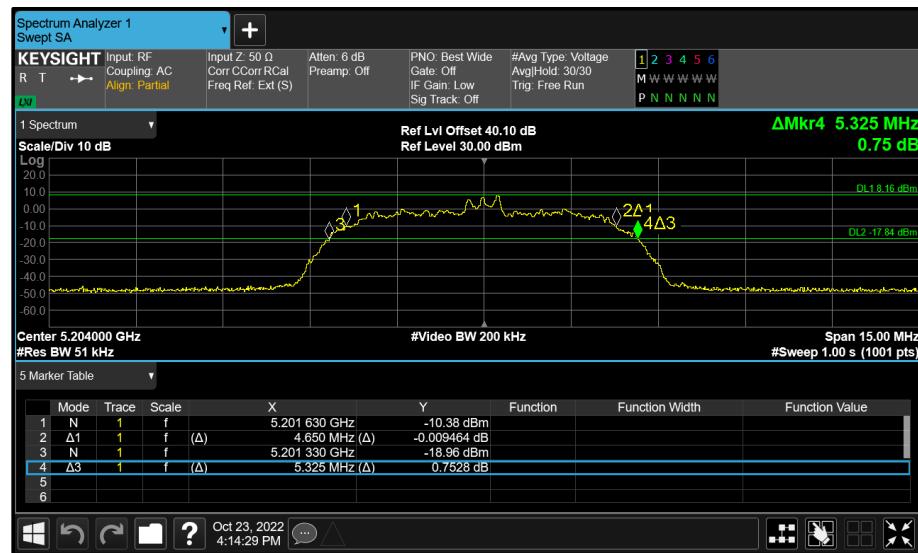


Figure 35 - Core 0 (A) 5204 MHz (CH54) 26 dB and 99% Bandwidth



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

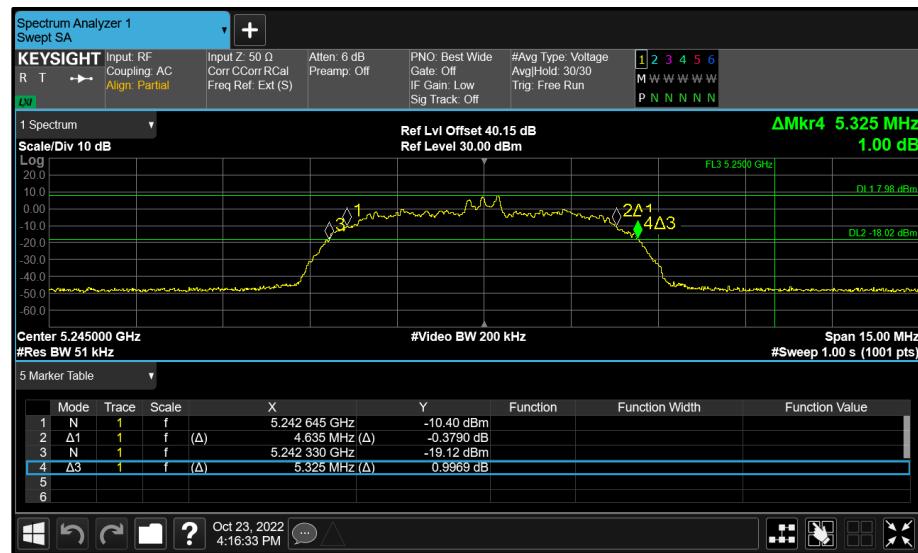


Figure 37 - Core 0 (A) 5245 MHz (CH95) 26 dB and 99% Bandwidth

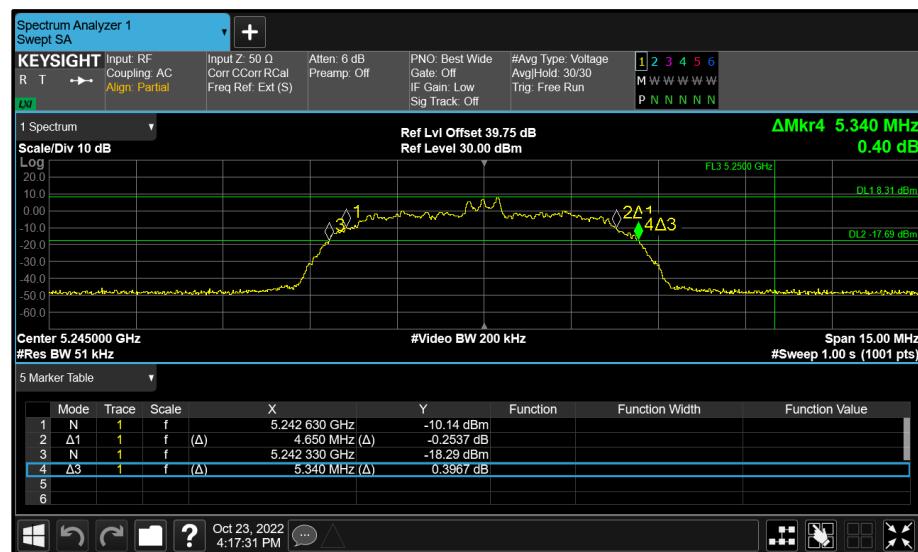


Figure 38 - Core 1 (B) 5245 MHz (CH95) 26 dB and 99% Bandwidth



| 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): | Refer to Test Method |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|------------------------|-----------------------|--------------------------|---|
| Mode: | ePA π/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 | - | 1.888 | - | - | ≥500.0 |
| 5789 | - | 1.888 | - | - | ≥500.0 |
| 5844 | - | 1.888 | - | - | ≥500.0 |

Table 21 - 6 dB Bandwidth Results

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

Table 22 - 99% Bandwidth Results



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

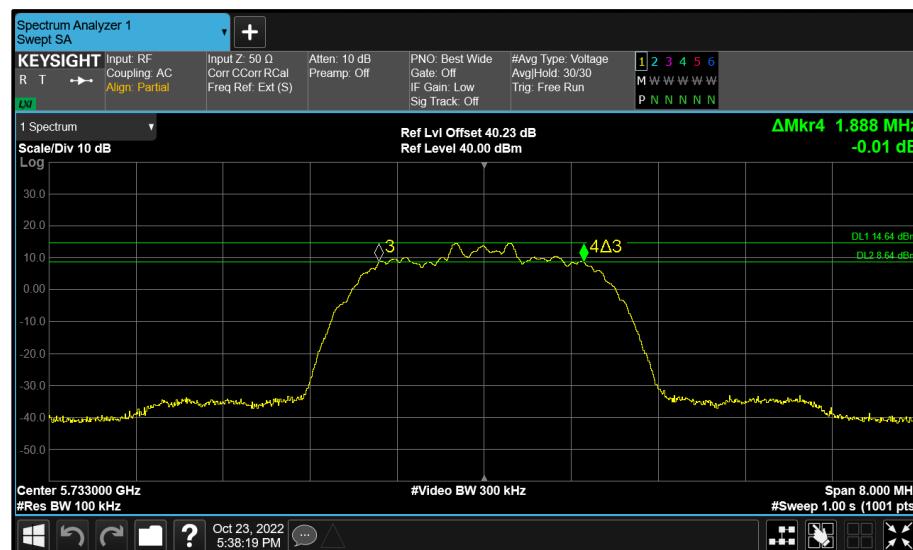


Figure 40 - Core 1 (B) 5733 MHz (CH8) 6 dB Bandwidth



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

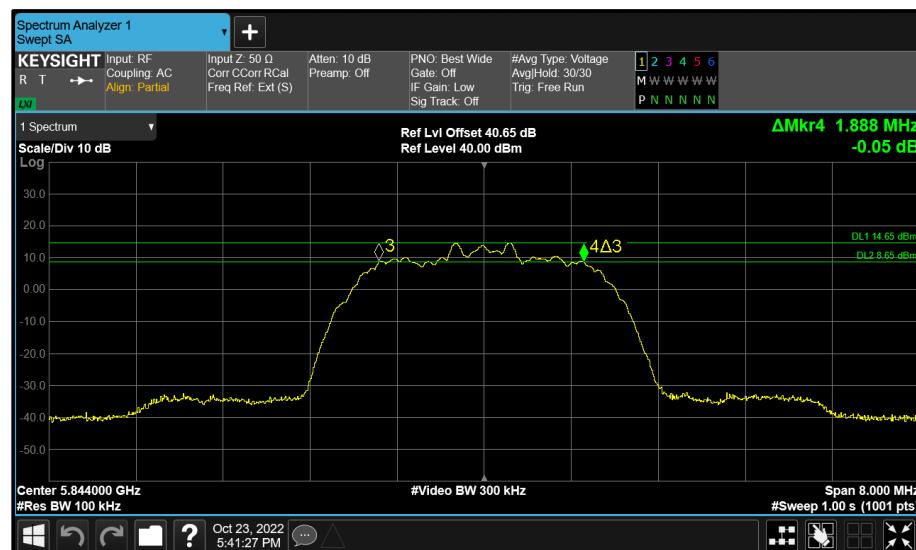


Figure 44 - Core 1 (B) 5844 MHz (CH119) 6 dB Bandwidth



| 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): | Refer to Test Method |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|------------------------|-----------------------|--------------------------|---|
| Mode: | ePA π/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 | - | 1.035 | - | - | ≥500.0 |
| 5844 | - | 0.960 | - | - | ≥500.0 |

Table 23 - 6 dB Bandwidth Results

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

Table 24 - 99% Bandwidth Results



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

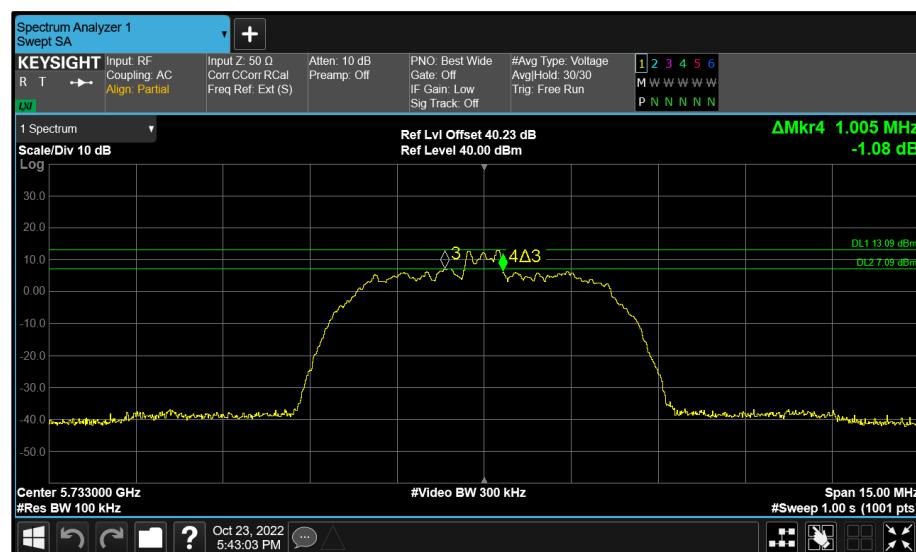


Figure 46 - Core 1 (B) 5733 MHz (CH8) 6 dB Bandwidth



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

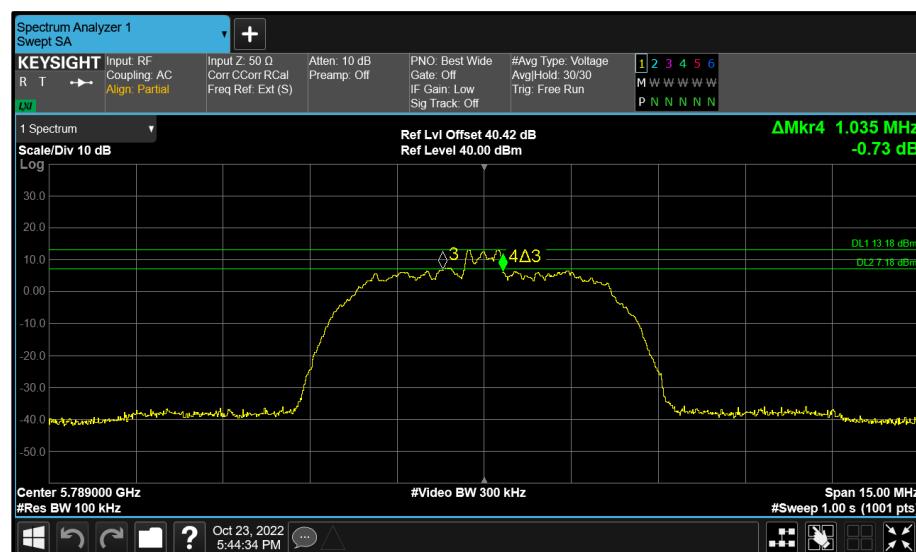


Figure 48 - Core 1 (B) 5789 MHz (CH64) 6 dB Bandwidth



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

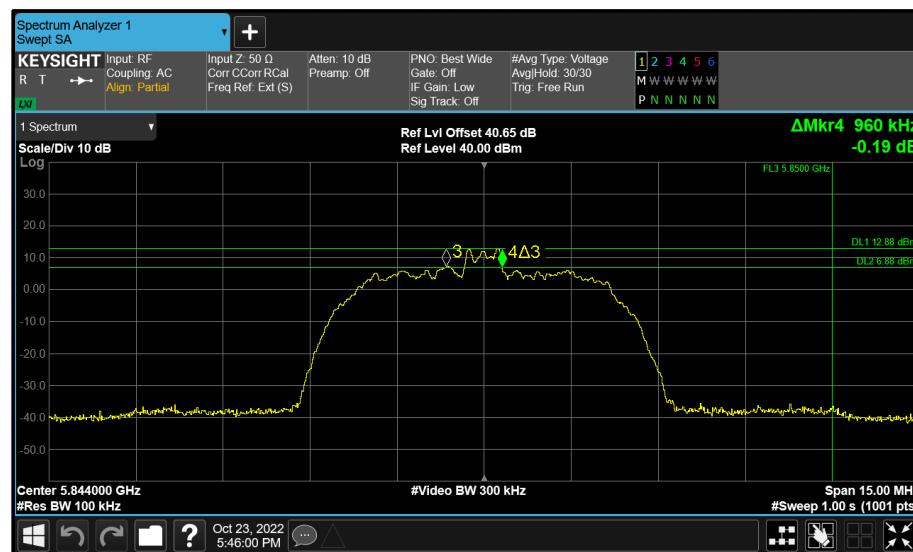


Figure 50 - Core 1 (B) 5844 MHz (CH119) 6 dB Bandwidth



| 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): | Refer to Test Method |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|------------------------|-----------------------|--------------------------|---|
| Mode: | ePA π/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 | 1.880 | - | - | ≥500.0 |
| 5789 | 1.896 | 1.888 | - | - | ≥500.0 |
| 5844 | 1.888 | 1.888 | - | - | ≥500.0 |

Table 25 - 6 dB Bandwidth Results

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

Table 26 - 99% Bandwidth Results



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

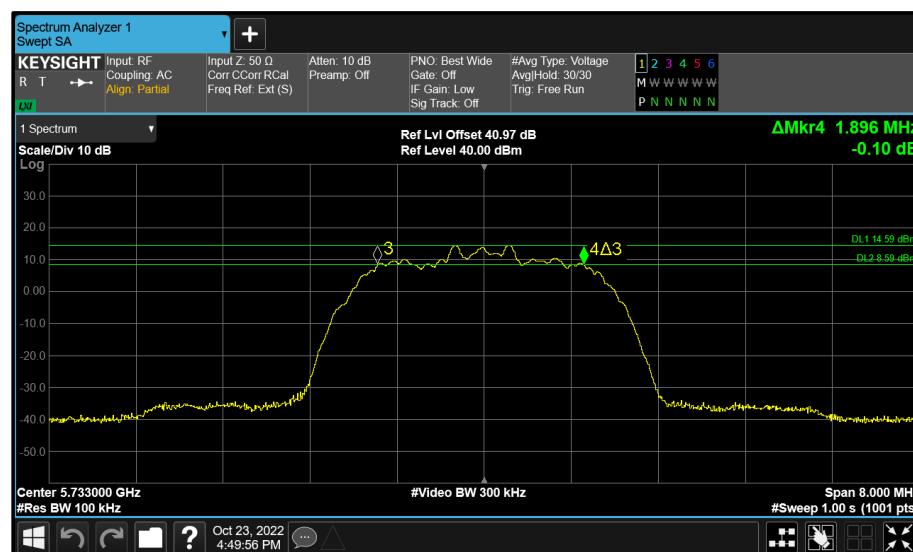


Figure 52 - Core 0 (A) 5733 MHz (CH8) 6 dB Bandwidth



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

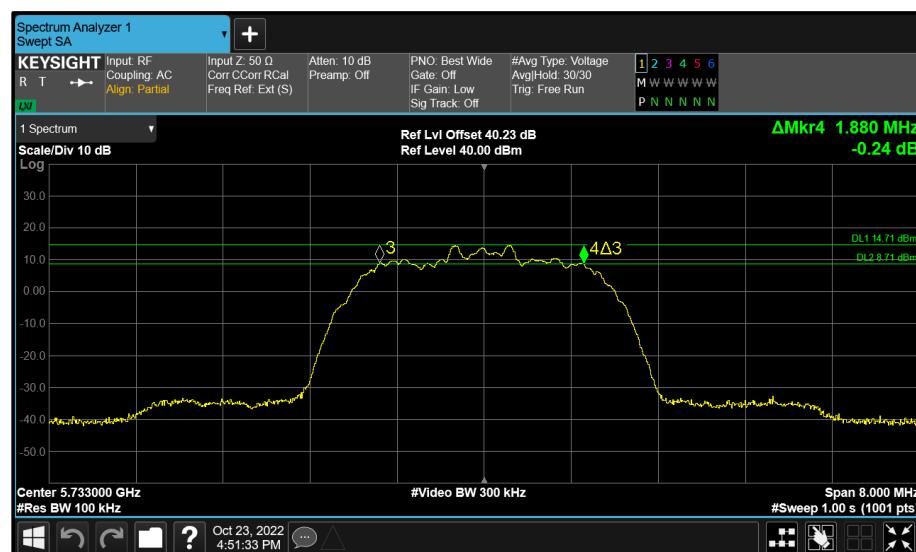


Figure 54 - Core 1 (B) 5733 MHz (CH8) 6 dB Bandwidth



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

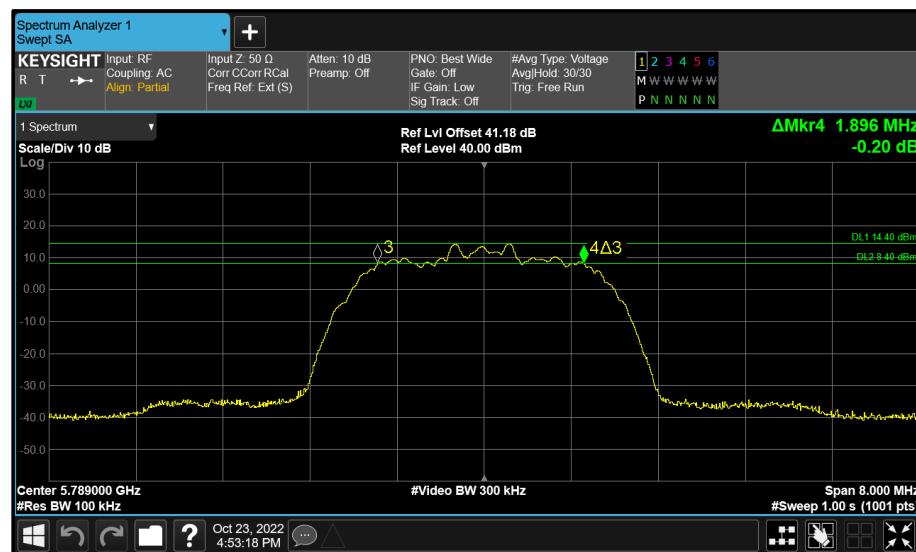


Figure 56 - Core 0 (A) 5789 MHz (CH64) 6 dB Bandwidth



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

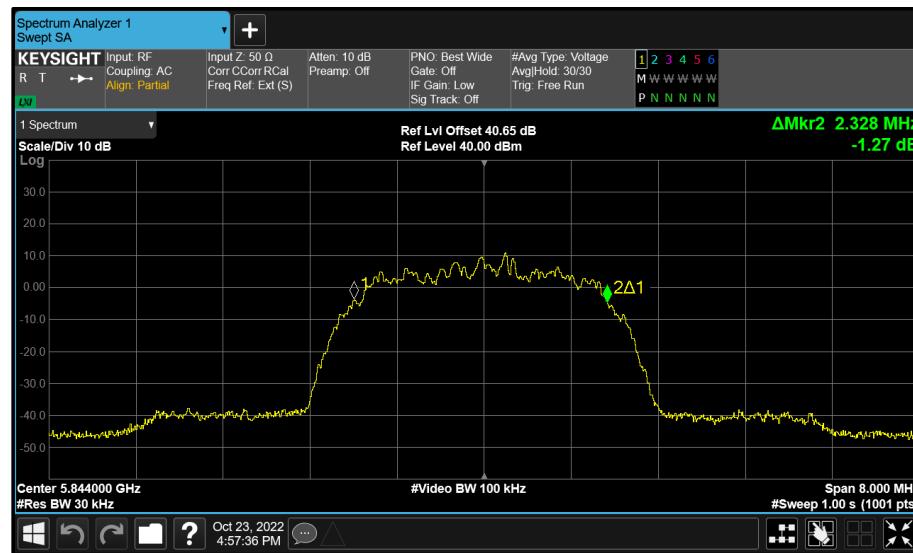


Figure 61 - Core 1 (B) 5844 MHz (CH119) 99% Bandwidth

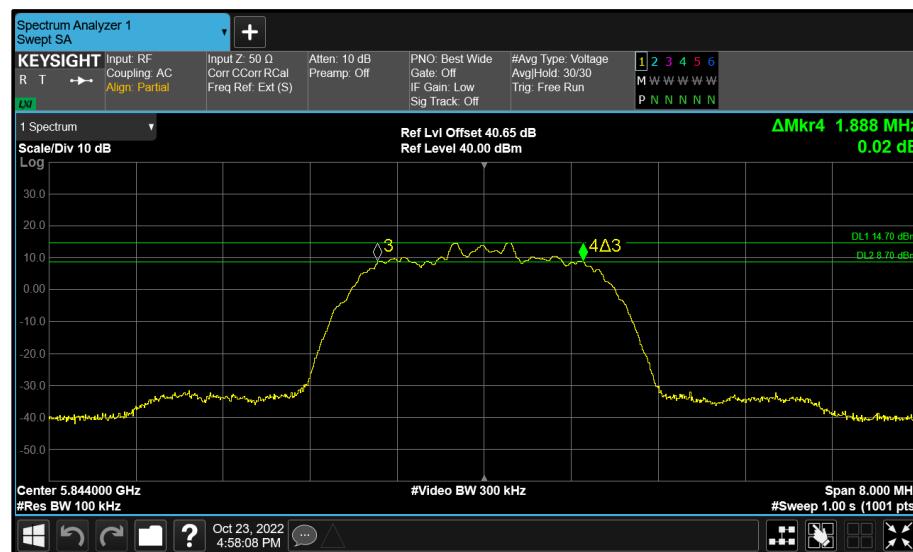


Figure 62 - Core 1 (B) 5844 MHz (CH119) 6 dB Bandwidth



| 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): | Refer to Test Method |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|------------------------|-----------------------|--------------------------|---|
| Mode: | ePA π/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 | 0.960 | 1.005 | - | - | ≥500.0 |
| 5789 | 1.005 | 1.020 | - | - | ≥500.0 |
| 5844 | 1.005 | 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 | 4.650 | - | - | - |
| 5789 | 4.635 | 4.650 | - | - | - |
| 5844 | 4.650 | 4.650 | - | - | - |

Table 28 - 99% Bandwidth Results



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

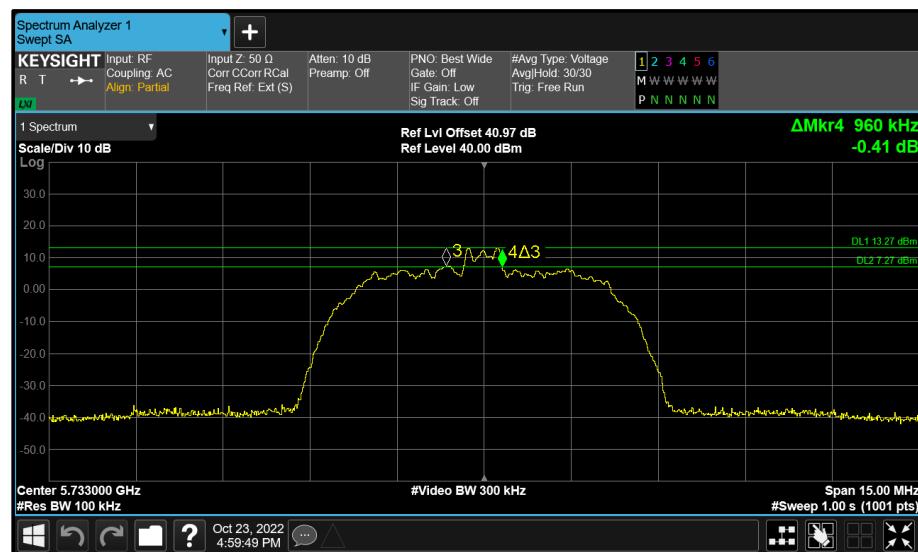


Figure 64 - Core 0 (A) 5733 MHz (CH8) 6 dB Bandwidth



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

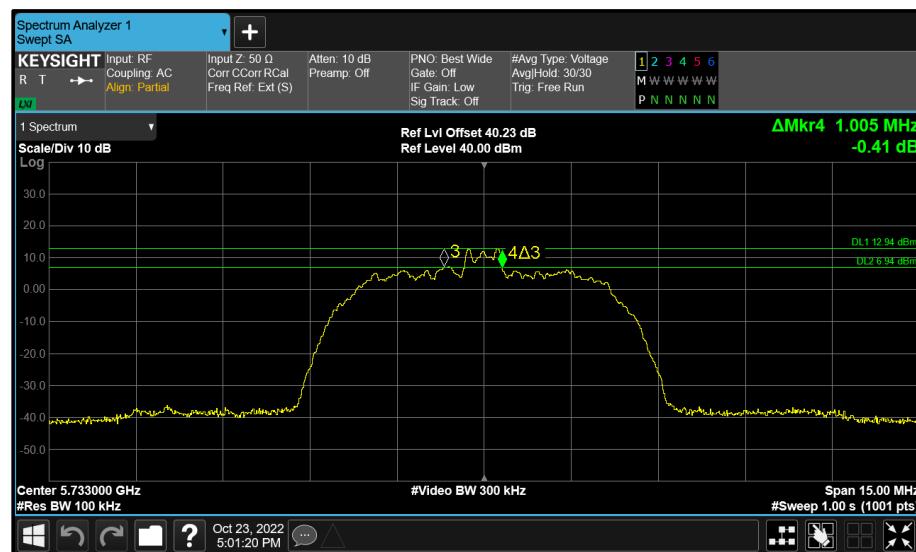


Figure 66 - Core 1 (B) 5733 MHz (CH8) 6 dB Bandwidth



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

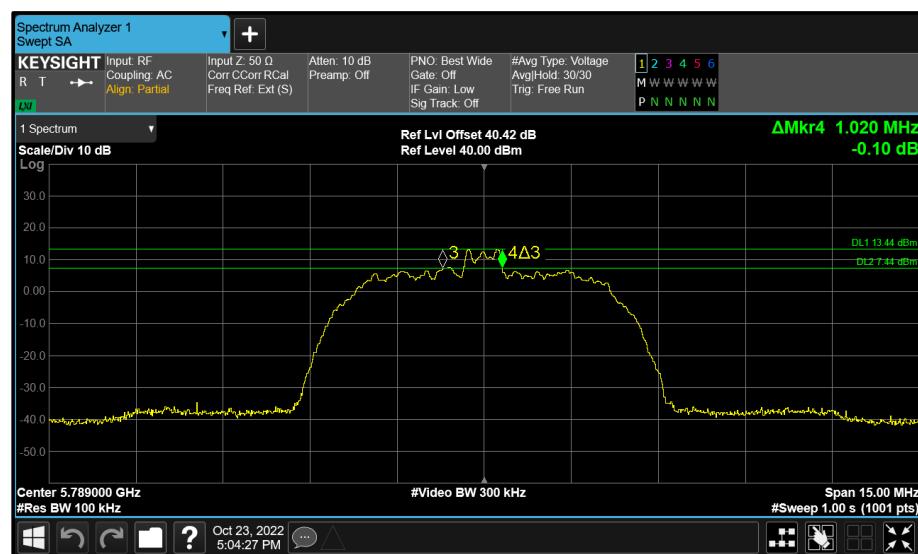


Figure 70 - Core 1 (B) 5789 MHz (CH64) 6 dB Bandwidth



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): | Refer to Test Method |
| 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 | - | 0.996 | - | - | - |
| 5204 | - | 0.996 | - | - | - |
| 5245 | - | 0.992 | - | - | - |

Table 30 - 99% Bandwidth Results

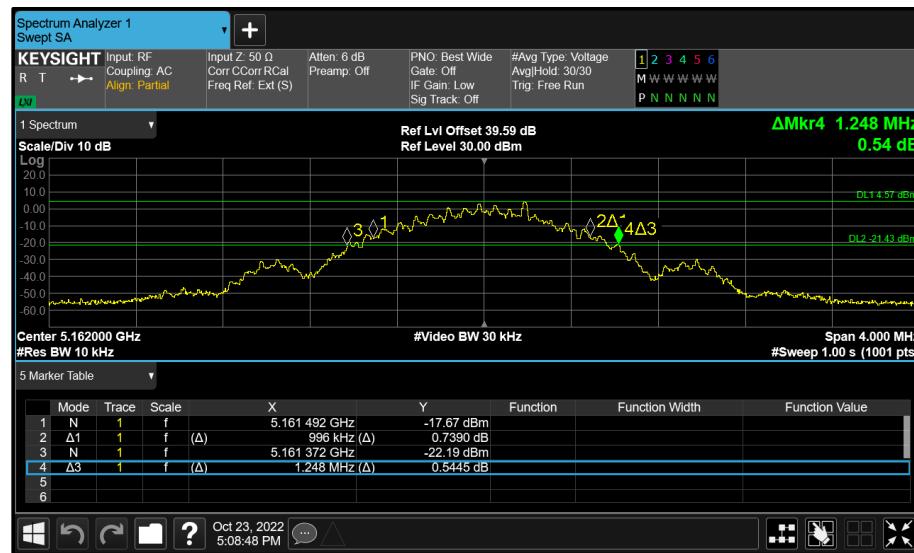


Figure 75 - Core 1 (B) 5162 MHz (CH12) 26 dB and 99% Bandwidth



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