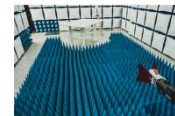




# Element Materials Technology

(formerly PCTEST)  
18855 Adams Court, Morgan Hill, CA 95037 USA  
Tel. 408.538.5600  
<http://www.element.com>



## MEASUREMENT REPORT FCC PART 15.407 Narrowband UNII BDR/HDR

**Applicant Name:**

Apple Inc.  
One Apple Park Way  
Cupertino, CA 95014  
United States

**Date of Testing:**

10/25/2024 - 1/16/2025

**Test Report Issue Date:**

1/24/2025

**Test Site/Location:**

Element Materials Technology Morgan Hill, CA, USA

**Test Report Serial No.:**

1C2410210074-08.BCG

**FCC ID:**

BCGA3268

**APPLICANT:**

Apple Inc.

**Application Type**

Certification

**Models:**

A3268

**EUT Type:**

Tablet Device

**Frequency Range:**

5162 – 5245MHz, 5733 – 5844MHz

**Modulation Type:**

GFSK,  $\pi/4$  DPQSK

**FCC Classification:**

Unlicensed National Information Infrastructure (UNII)

**FCC Rule Part(s):**

Part 15 Subpart E (15.407)

**Test Procedure(s):**

ANSI C63.10-2020, KDB 789033 D02 v02r01

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2020 and KDB 789033 D02 v02r01. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

RJ Ortanez  
Executive Vice President



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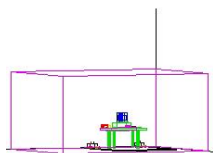
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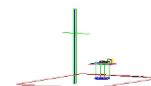
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## MEASUREMENT REPORT



UNII Band	Tx Frequency [MHz]	Mode	Power Scheme	SISO						TxBF	
				Antenna WF7a		Antenna WF2a		Antenna WF7b		Summed	
				Max. Power [mW]	Max. Power [dBm]	Max. Power [mW]	Max. Power [dBm]	Max. Power [mW]	Max. Power [dBm]	Max. Power [mW]	Max. Power [dBm]
1	5162 - 5245	NB UNII BDR	ePA	10.000	10.00	9.840	9.93	9.795	9.91	9.550	9.80
			iPA	3.917	5.93	2.891	4.61	3.467	5.40	7.079	8.50
		NB UNII HDR4	ePA	15.136	11.80	14.555	11.63	14.125	11.50	16.444	12.16
			iPA	1.250	0.97	0.951	-0.22	1.030	0.13	2.163	3.35
		NB UNII HDR8	ePA	15.849	12.00	19.231	12.84	13.243	11.22	29.992	14.77
			iPA	1.175	0.70	0.948	-0.23	1.067	0.28	2.223	3.47
3	5733 - 5844	NB UNII BDR	ePA	18.880	12.76	23.121	13.64	17.539	12.44	44.668	16.50
			iPA	4.426	6.46	3.236	5.10	3.802	5.80	7.464	8.73
		NB UNII HDR4	ePA	19.543	12.91	23.388	13.69	17.742	12.49	42.855	16.32
			iPA	1.309	1.17	1.107	0.44	1.213	0.84	2.421	3.84
		NB UNII HDR8	ePA	18.880	12.76	22.387	13.50	16.520	12.18	41.591	16.19
			iPA	1.371	1.37	1.057	0.24	1.259	1.00	2.455	3.90

### EUT Overview

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## 1.0 INTRODUCTION

### 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

### 1.2 Element Materials Technology Test Location

These measurement tests were conducted at the Element Materials Technology facility located at 18855 Adams Court, Morgan Hill, CA 95037. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

### 1.3 Test Facility / Accreditations

**Measurements were performed at Element Materials Technology located in Morgan Hill, CA 95037, U.S.A.**

- Element Materials Technology is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Washington DC LLC TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- Element Materials Technology facility is a registered (22831) test laboratory with the site description on file with ISED.
- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB# US0110) for ISED Canada as designed by NIST under the U.S. and Canada Mutual Recognition Agreements (MRAs)

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA3268**. The test data contained in this report pertains only to the emissions due to the EUT's Narrowband UNII transmitter.

- This Narrowband UNII module has been tested by manufacturer and the following were confirmed:
  - A) The hopping sequence is pseudorandom
  - B) The receiver input bandwidth equals the transmit bandwidth
  - C) The receiver hops in sequence with the transmit signal
  - D) Narrowband UNII can only hop within the same UNII band and cannot hop between bands

**Test Device Serial No.:** QCWY69QGC5, T2FHC6NW46, CJ2X56PPQJ, DQD9GW7HXXH, DLXHAC000010000RK4

### 2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, 802.11a/ax WIFI 6E, 802.15.4, Bluetooth (1x, EDR, LE1M, LE2M, HDR4, HDR8), NB UNII (1x, HDR4, HDR8), WPT.

This device supports BT Beamforming.

Band 1	Band 3
Frequency (MHz)	Frequency (MHz)
5162	5733
:	:
5204	5789
:	:
5245	5844

**Table 2-1. NB UNII BDR Frequency / Channel Operations**

#### Notes:

This device is capable of operating in hopping and non-hopping mode. The EUT can hop between different channels in the U-NII Band 1 and U-NII Band 3. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B)2)b) of KDB 789033 D02 v02r01 and ANSI C63.10-2020. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

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Measured Duty Cycles						
Band	Mode		Duty Cycle [%]			
			Antenna WF2a	Antenna WF7a	Antenna WF7b	TxBF
UNII-1	NB UNII BDR	ePA	100.0	100.0	100.0	100.0
		iPA	100.0	100.0	100.0	100.0
UNII-3		ePA	100.0	100.0	100.0	100.0
		iPA	100.0	100.0	100.0	100.0
UNII-1	NB UNII HDR4	ePA	100.0	100.0	100.0	100.0
		iPA	100.0	100.0	100.0	100.0
UNII-3		ePA	100.0	100.0	100.0	100.0
		iPA	100.0	100.0	100.0	100.0
UNII-1	NB UNII HDR8	ePA	100.0	100.0	100.0	100.0
		iPA	100.0	100.0	100.0	100.0
UNII-3		ePA	100.0	100.0	100.0	100.0
		iPA	100.0	100.0	100.0	100.0

**Table 2-2. Measured Duty Cycles**

TxBF = Antenna WF7a + Antenna WF2a

This device supports simultaneous transmission operations. The table below shows all configurations possible.

Antenna	Simultaneous Tx Config	Bluetooth 2.4GHz	Thread	WLAN	NB UNII	WIFI 5GHz	WIFI 6GHz
		BDR, EDR, HDR4/8, LE1/2M	802.15.4	802.11 b/g/n/ax	BDR, HDR4/8	802.11 a/n/ac/ax	802.11 a/ax
Ant WF7b	Config 1	✓	✗	✗	✗	✓	✗
Ant WF7b	Config 2	✓	✗	✗	✗	✗	✓
Ant WF7b	Config 3	✗	✓	✗	✗	✓	✗
Ant WF7b	Config 4	✗	✓	✗	✗	✗	✓
Ant WF7b	Config 5	✗	✗	✓	✓	✗	✗

**Table 2-3. Simultaneous Transmission Configurations**

✓ = Support; ✗ = Not Support

### **Note:**

All of the above simultaneous transmission configurations have been tested and the worst case configuration was found to be Config 1 and reported in RF Bluetooth and RF UNII test reports.

Specific 2.4 GHz Wi-Fi antenna that can only transmit simultaneously with 2.4 GHz Bluetooth antenna is listed in the SAR test report. For BT (2.4 GHz), in both connected and disconnected modes, and Wi-Fi (2.4 GHz) – Wi-Fi max power will not exceed minimum of (13.5dBm, SAR max cap, Reg max cap) power. Bluetooth can simultaneously transmit with IEEE 802.11a/n/ac/ax 5/6 GHz on separate antenna.

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## 2.3 Antenna Description

The following antenna gains provided by the manufacturer were used for testing.

Frequency [MHz]	Antenna Gain (dBi)		
	Antenna WF7a	Antenna WF2a	Antenna WF7b
5162 - 5245	0.9	0.7	0.0
5733 – 5844	1.7	2.2	1.5

**Table 2-4. Highest Antenna Gain**

## 2.4 Test Support Equipment

1	Apple MacBook Pro w/AC/DC Adapter	Model: Model:	A2141 A2166	S/N: S/N:	C02H604EQ05D C4H042705ZNP00WA6
2	Apple USB-C Cable	Model:	Spartan	S/N:	GXK1336018XKTR024
3	USB-C Cable w/ AC Adapter	Model: Model:	A246C A2305	S/N: S/N:	DWH80115BK826GV19 C4H95160004PF4F4V
4	Apple Pencil	Model:	A2538	S/N:	KJ26TCFXJW
5	DC Power Supply	Model:	KPS3010D	S/N:	N/A

**Table 2-5. Test Support Equipment List**

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## 2.5 Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2020 and KDB 789033 D02 v02r01. ANSI C63.10-2020 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups, and 7.2, 7.3, 7.4 and 7.5 for antenna port conducted emissions test setups.

There are two vendors of the WiFi/Bluetooth radio modules, variant 1 and variant 2. Both radio modules have the same mechanical outline, same on-board antenna matching circuit, identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances. The worst case configuration was found between the two variants. The EUT was also investigated with and without charger.

For emissions from 1GHz – 18GHz, low, mid, and high channels were tested with highest power and worst case configuration. The emissions below 1GHz and above 18GHz were tested with the highest transmitting power and the worst case channel.

The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape), and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

For AC line conducted and radiated test below 1GHz, following configurations were investigated and EUT powered by AC/DC adaptor was the worst case.

- EUT powered by AC/DC adaptor to USB-C cable with wire charger
- EUT powered by host PC via USB-C cable with wire charger

## 2.6 Software and Firmware

The test was conducted with firmware version 22D20 installed on the EUT.

## 2.7 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

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## 3.0 DESCRIPTION OF TESTS

### 3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2020) and the guidance provided in KDB 789033 D02 v02r01 were used in the measurement of the EUT.

Deviation from measurement procedure.....None

### 3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 7m x 3.66m x 2.7m shielded enclosure. The shielded enclosure is manufactured by AP Americas. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-6. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is EPCOS 2X60A Power Line Filter (100dB Attenuation, 14kHz-18GHz) and the two EPCOs 2X48A filters (100dB Minimum Insertion Loss, 14kHz - 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 7.8. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is Rohde & Schwarz EMC32, Version 10.50.40.

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### 3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

Per KDB 414788 D01 v01r01, radiated emission test sites other than open-field test sites (e.g., shielded anechoic chambers), may be employed for emission measurements below 30MHz if characterized so that the measurements correspond to those obtained at an open-field test site. To determine test site equivalency, a reference sample transmitting at 149kHz was measured on an open field test site (asphalt with no ground plane) and then measured in the 3m semi-anechoic chamber. A calibrated 60cm loop antenna was used while the reference device was rotated through the X, Y and Z axis in order to capture the worst case level. A maximum deviation of 2.77dB at 149kHz was measured when comparing the 3 meter semi-anechoic chamber to the open field site.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33 depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

### 3.4 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

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## 4.0 ANTENNA REQUIREMENTS

### Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antennas of the EUT are **permanently attached**.
- There are no provisions for connection to an external antenna.

### Conclusion:

The EUT complies with the requirement of §15.203.

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## 5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.23-2012. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty ( $\pm$ dB)
Conducted Bench Top Measurements	2.07
Line Conducted Disturbance	1.91
Radiated Disturbance (<30MHz)	4.12
Radiated Disturbance (30MHz - 1GHz)	4.85
Radiated Disturbance (1 - 18GHz)	5.08
Radiated Disturbance (>18GHz)	5.22

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## 6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance with the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Anritsu	ML2495A	Power Meter	7/8/2024	Annual	7/8/2025	1039008
Anritsu	MA2411B	Pulse Power Sensor	7/1/2024	Annual	7/1/2025	1911105
Anritsu	MA2411B	Pulse Power Sensor	10/21/2024	Annual	10/21/2025	1027293
ATM	180-442A-KF	20dB Nominal Gain Horn Antenna	3/14/2024	Annual	3/14/2025	T058701-01
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	4/9/2024	Annual	4/9/2025	00218555
Fairview Microwave/MCL	FMCA1975-36/BW-K10-2W44+	30MHz-40GHz RF Cable/Attenuator *	6/10/2024	Annual	6/10/2025	-
Keysight Technology	N9040B	UXA Signal Analyzer	5/28/2024	Annual	5/28/2025	MY57212015
Keysight Technology	N9030A	PXA Signal Analyzer	7/11/2024	Annual	7/11/2025	MY49430244
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	8/14/2024	Annual	8/14/2025	101648
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	5/29/2024	Annual	5/29/2025	101619
Rohde & Schwarz	ESW44	EMI Test Receiver	5/1/2024	Annual	5/1/2025	101867
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	7/3/2024	Annual	7/3/2025	102356
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	6/10/2024	Annual	6/10/2025	100057
Rohde & Schwarz	HFH2-Z2	Loop Antenna	6/21/2024	Annual	6/21/2025	100519
Rohde & Schwarz	ENV216	Two-Line V-Network	4/24/2024	Annual	4/24/2025	101364
Schwarzbeck	VULB 9162	Bilog Antenna (30MHz - 6GHz)	4/29/2024	Annual	4/29/2025	00304

**Table 6-1. Test Equipment List**

**Note:**

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.
2. \* Denotes passive equipment that have been internally verified/calibrated.

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## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Apple Inc.

FCC ID: BCGA3268

FCC Classification: Unlicensed National Information Infrastructure (UNII)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407	26dB Bandwidth	N/A	CONDUCTED	N/A	Section 7.2
15.407(e)	6dB Bandwidth	>500kHz(5725-5850MHz)		PASS	Section 7.3
2.1049	Occupied Bandwidth	N/A		N/A	Section 7.2, 7.3
15.407 (a.1.iv), (a.3.i)	Maximum Conducted Output Power	Maximum conducted powers must meet the limits detailed in 15.407 (a)		PASS	Section 7.4
15.407 (a.1.iv), (a.3.i)	Maximum Power Spectral Density	Maximum power spectral density must meet the limits detailed in 15.407 (a)		PASS	Section 7.5
15.407(b.1), (b.4)	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 15.407(b)	RADIATED	PASS	Section 7.6
15.205, 15.407(b.1), (b.4)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS	Section 7.6, 7.7
15.207	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits	AC LINE CONDUCTED	PASS	Section 7.8

**Table 7-1. Summary of Test Results**

#### Notes:

1. All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
2. The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
3. All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
4. For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is Element "Conducted Automation Software," Version 1.1.1.
5. For radiated band edge, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is Element "Chamber Automation," Version 3.1.0.

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## 7.2 26dB & 99% Bandwidth Measurement

\$2.1049; \$15.407

### Test Overview and Limit

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

### Test Procedure Used

ANSI C63.10-2020 – Subclause 12.5.2.  
KDB 789033 D02 v02r01 – Section C

### Test Settings

1. The signal analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to  $X = 26$ . The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = in the range of 1% to 5% of the emission bandwidth
3.  $VBW \geq 3 \times RBW$
4. Detector = Peak
5. Trace mode = max hold

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-1. Test Instrument & Measurement Setup**

### Test Notes

1. All antenna configs and power schemes were investigated and only the worst case is reported.
2. Low, mid and high channels were tested and tabular data has been reported. Only mid channel plots has been reported.

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## 7.2.1 Antenna WF7a 26dB & 99% Bandwidth Measurements

Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]
5162	1.0	NB UNII BDR	ePA	1.02	1.27
5204	1.0	NB UNII BDR	ePA	1.02	1.27
5245	1.0	NB UNII BDR	ePA	1.02	1.27
5162	4.0	NB UNII HDR4	ePA	2.35	2.80
5204	4.0	NB UNII HDR4	ePA	2.35	2.80
5245	4.0	NB UNII HDR4	ePA	2.36	2.80
5162	8.0	NB UNII HDR8	ePA	4.90	5.75
5204	8.0	NB UNII HDR8	ePA	4.90	5.75
5245	8.0	NB UNII HDR8	ePA	4.90	5.75

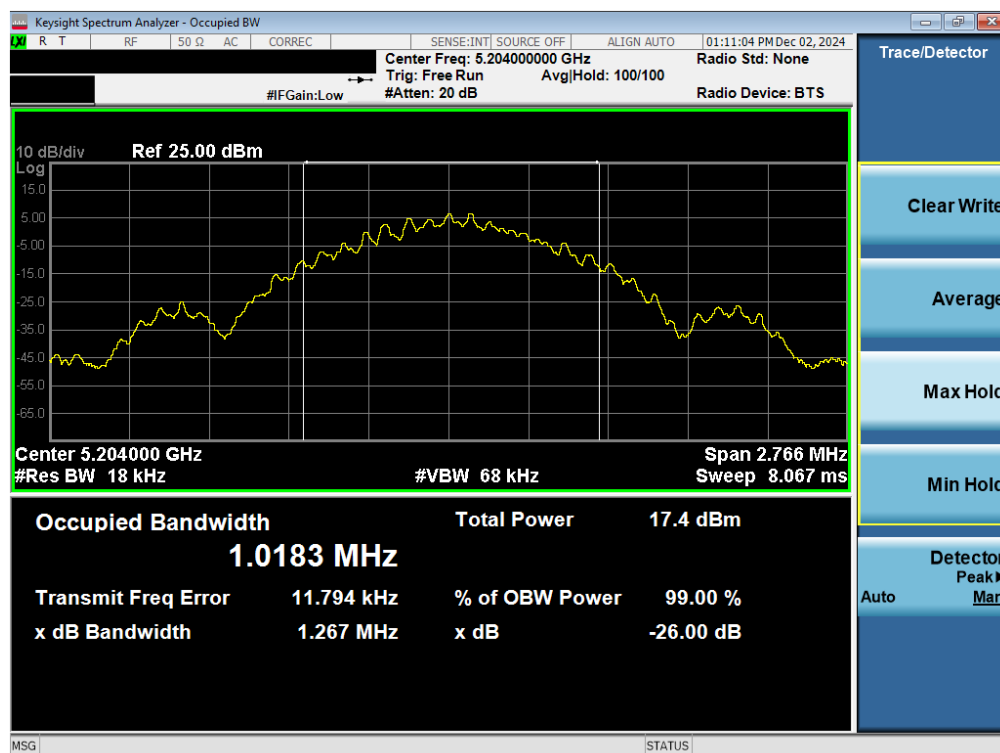
**Table 7-2. Conducted BW Measurements Antenna WF7a**

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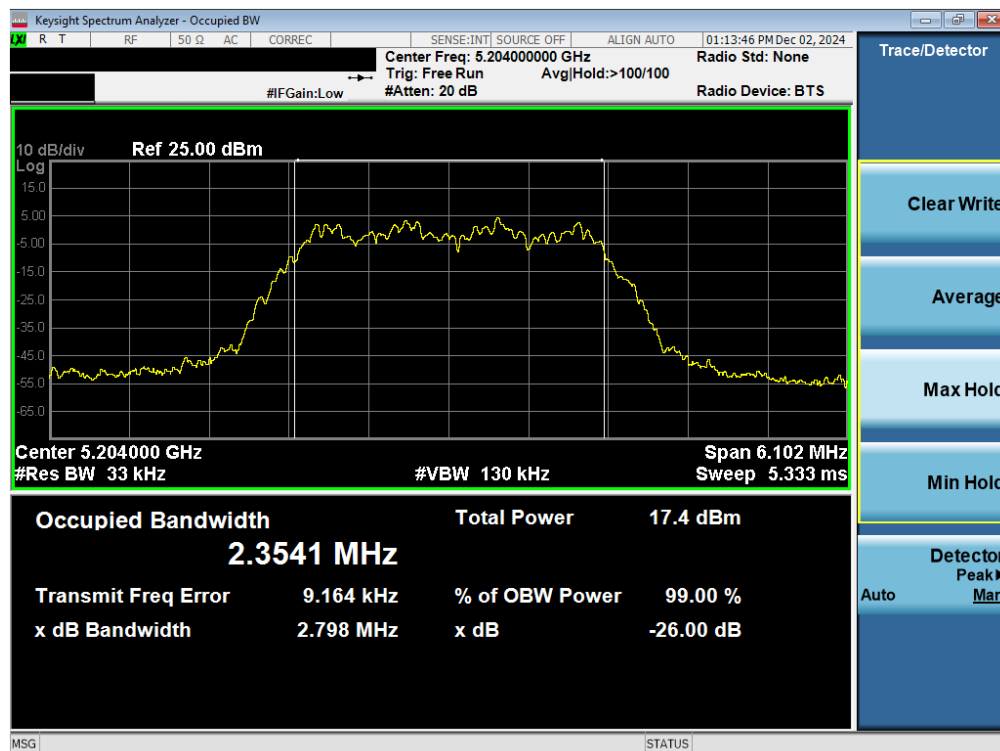
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Plot 7-1. 26dB BW & 99% OBW Antenna WF7a (NB UNII BDR, ePA- 5204MHz)

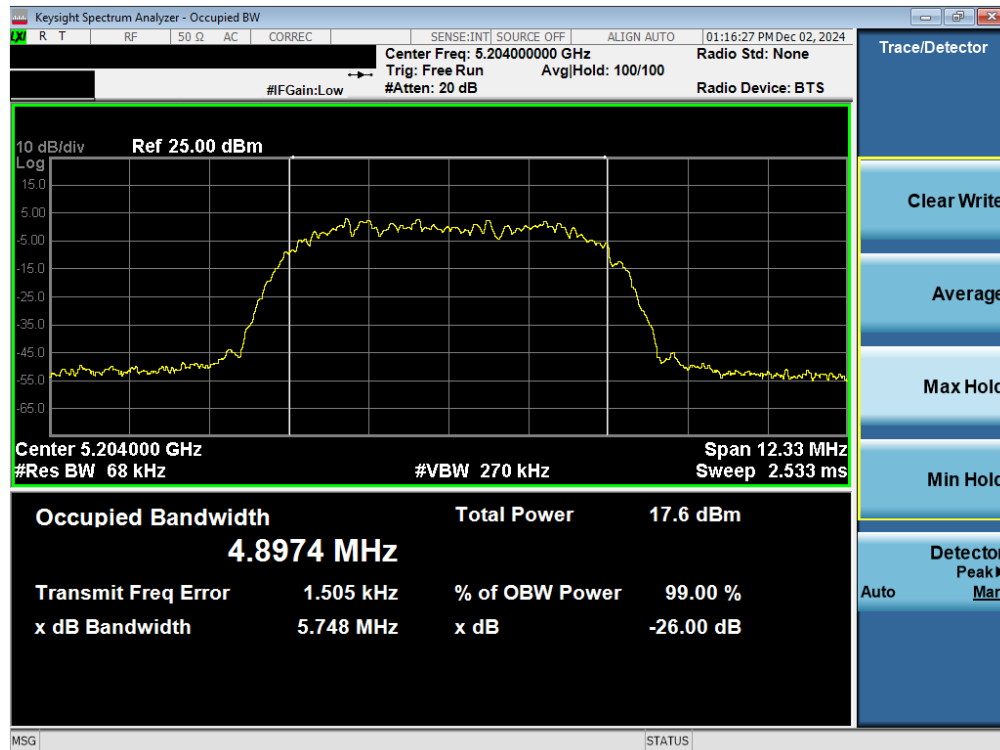


Plot 7-2. 26dB BW & 99% OBW Antenna WF7a (NB UNII HDR4, ePA- 5204MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-3. 26dB BW & 99% OBW Antenna WF7a (NB UNII HDR8, ePA- 5204MHz)

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## 7.2.2 Antenna WF2a 26dB & 99% Bandwidth Measurements

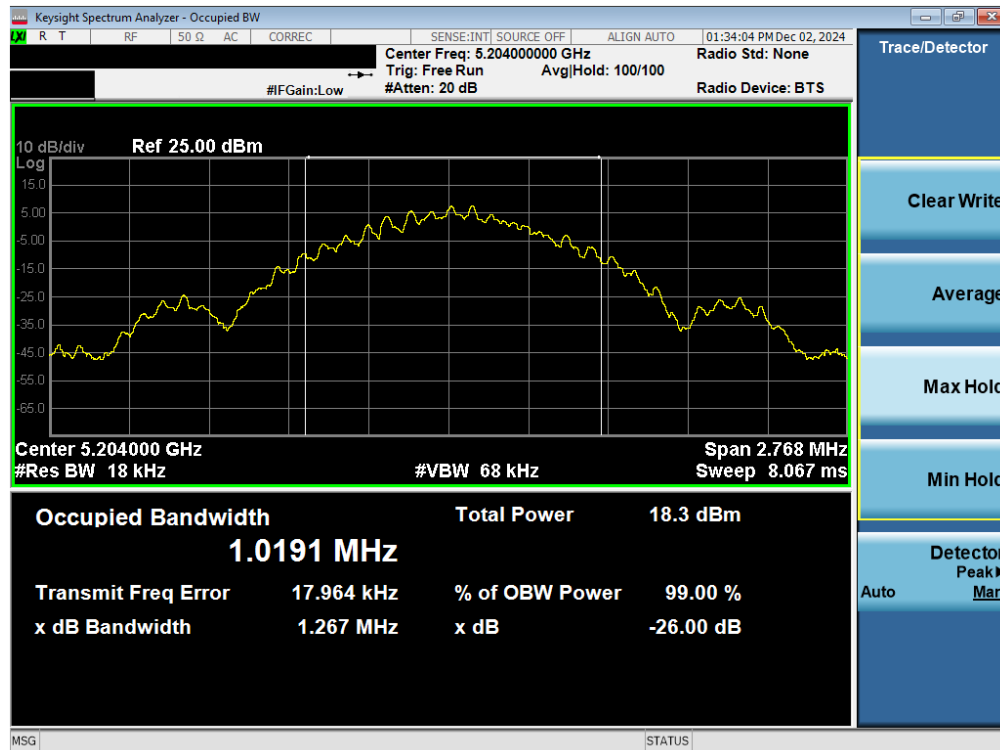
Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]
5162	1.0	NB UNII BDR	ePA	1.02	1.27
5204	1.0	NB UNII BDR	ePA	1.02	1.27
5245	1.0	NB UNII BDR	ePA	1.02	1.27
5162	4.0	NB UNII HDR4	ePA	2.34	2.79
5204	4.0	NB UNII HDR4	ePA	2.34	2.79
5245	4.0	NB UNII HDR4	ePA	2.34	2.79
5162	8.0	NB UNII HDR8	ePA	4.85	5.71
5204	8.0	NB UNII HDR8	ePA	4.85	5.71
5245	8.0	NB UNII HDR8	ePA	4.85	5.70

**Table 7-3. Conducted BW Measurements Antenna WF2a**

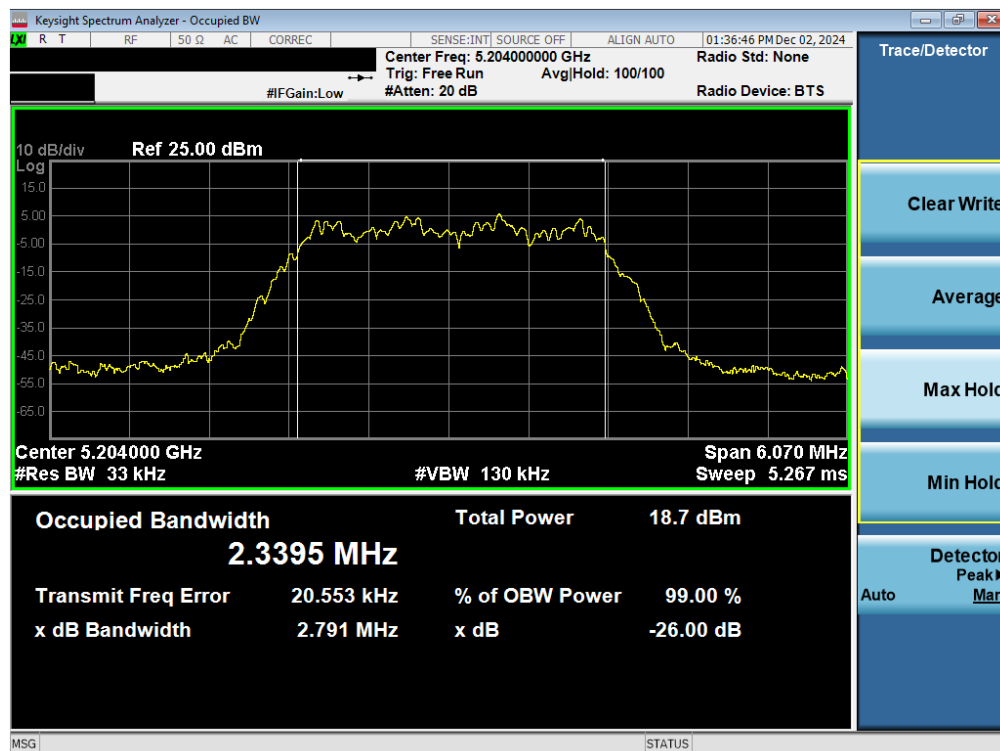
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-4. 26dB BW & 99% OBW Antenna WF2a (NB UNII BDR, ePA- 5204MHz)

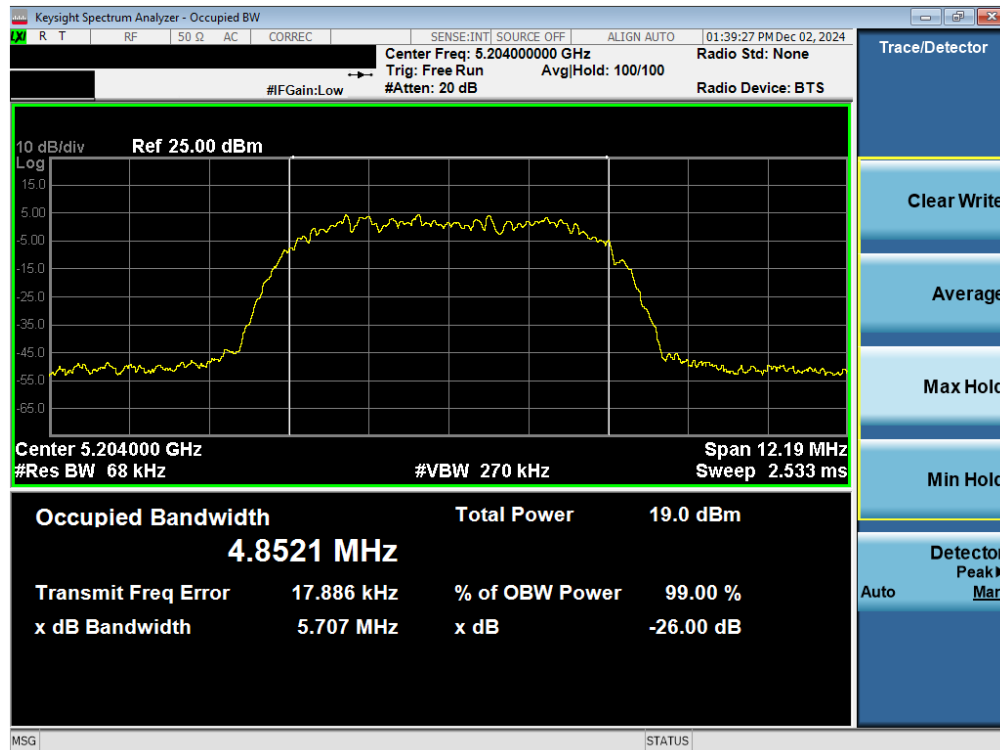


Plot 7-5. 26dB BW & 99% OBW Antenna WF2a (NB UNII HDR4, ePA- 5204MHz)

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Plot 7-6. 26dB BW & 99% OBW Antenna WF2a (NB UNII HDR8, ePA- 5204MHz)

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### 7.2.3 Antenna WF7b 26dB & 99% Bandwidth Measurements

Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]
5162	1.0	NB UNII BDR	ePA	1.02	1.27
5204	1.0	NB UNII BDR	ePA	1.02	1.27
5245	1.0	NB UNII BDR	ePA	1.02	1.27
5162	4.0	NB UNII HDR4	ePA	2.35	2.80
5204	4.0	NB UNII HDR4	ePA	2.35	2.80
5245	4.0	NB UNII HDR4	ePA	2.35	2.80
5162	8.0	NB UNII HDR8	ePA	4.90	5.75
5204	8.0	NB UNII HDR8	ePA	4.90	5.75
5245	8.0	NB UNII HDR8	ePA	4.90	5.75

**Table 7-4. Conducted BW Measurements Antenna WF7b**

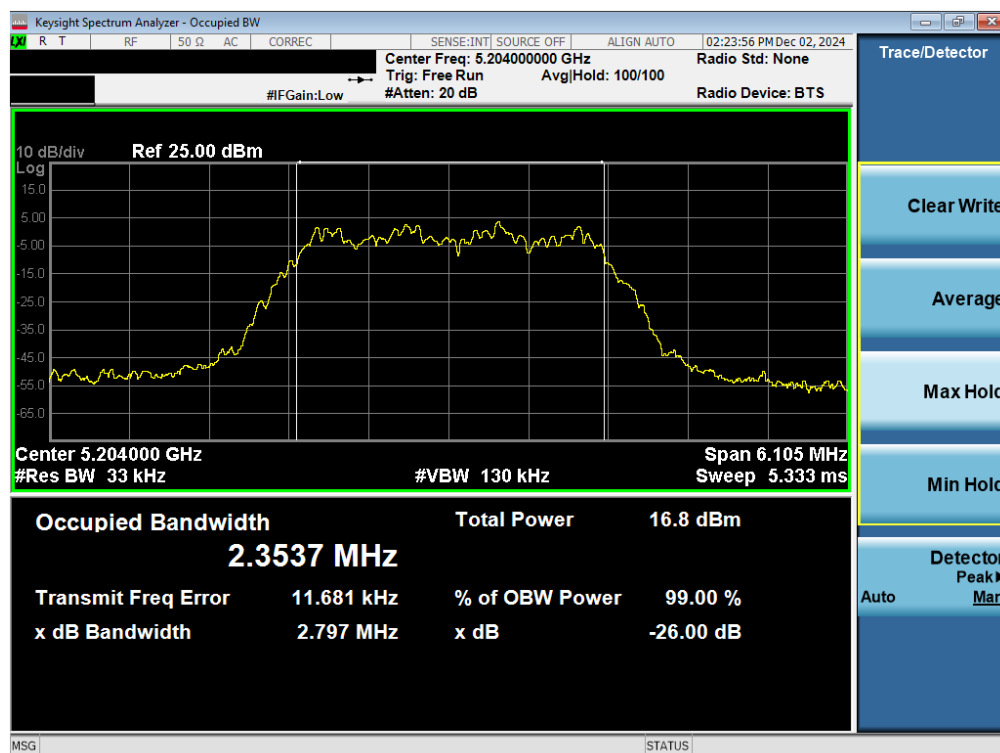
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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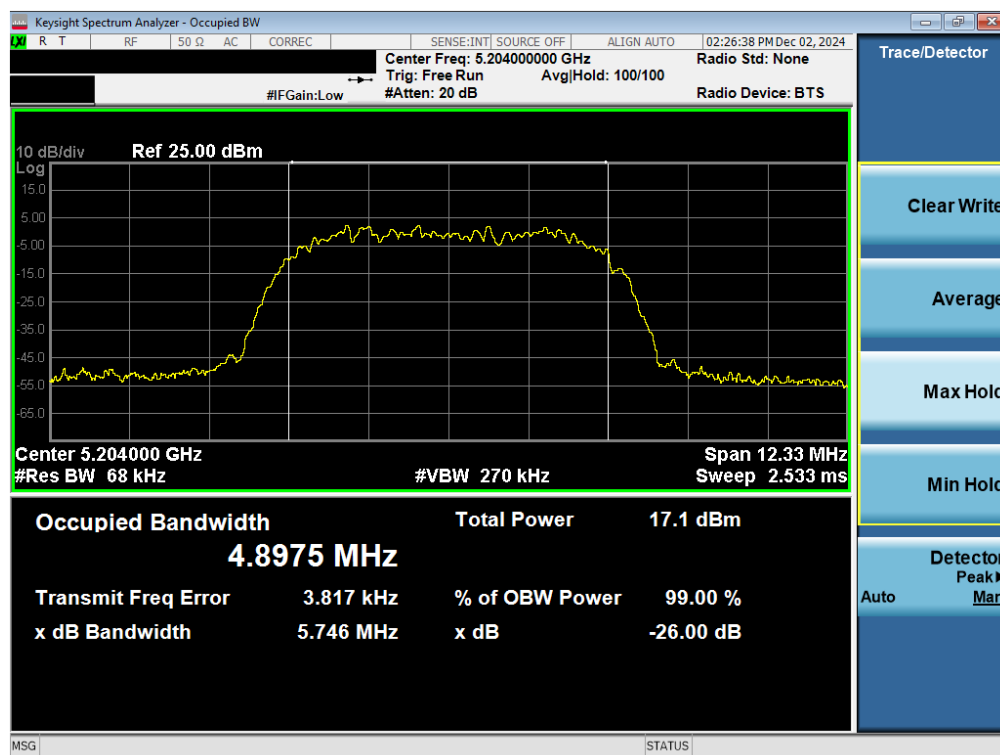
Plot 7-7. 26dB BW & 99% OBW Antenna WF7b (NB UNII BDR, ePA- 5204MHz)



Plot 7-8. 26dB BW & 99% OBW Antenna WF7b (NB UNII HDR4, ePA- 5204MHz)

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Plot 7-9. 26dB BW & 99% OBW Antenna WF7b (NB UNII HDR8, ePA- 5204MHz)

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## 7.3 6dB & 99% Bandwidth Measurement

\$2.1049; \$15.407 (e)

### Test Overview and Limit

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 6dB bandwidth.

***In the 5.725 – 5.850GHz band, the 6dB bandwidth must be  $\geq 500$  kHz.***

### Test Procedure Used

ANSI C63.10-2020 – Subclause 12.5.1.

KDB 789033 D02 v02r01 – Section C

### Test Settings

1. The signal analyzers' automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to  $X = 6$ . The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 100 kHz
3. VBW  $\geq 3 \times$  RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-2. Test Instrument & Measurement Setup**

### Test Notes

1. All antenna configurations and power schemes were investigated and only the worst case is reported.
2. Low, mid and high channels were tested and tabular data has been reported.

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### 7.3.1 Antenna WF7a 6dB & 99% Bandwidth Measurements

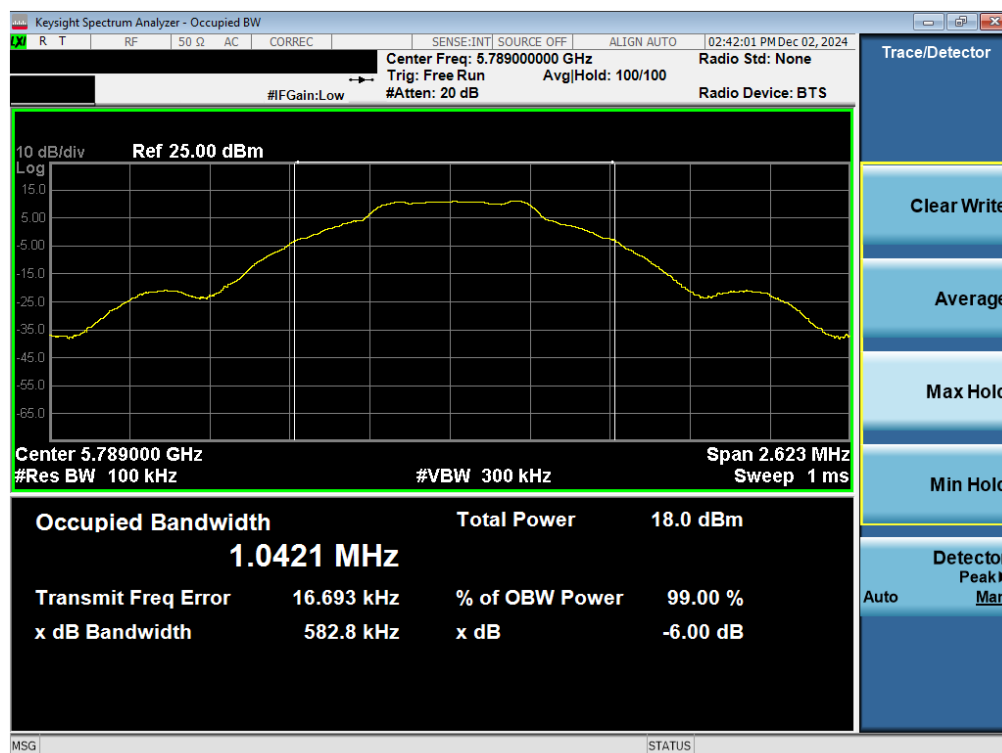
Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass / Fail
5733	1.0	NB UNII BDR	ePA	1.04	0.58	0.50	Pass
5789	1.0	NB UNII BDR	ePA	1.04	0.58	0.50	Pass
5844	1.0	NB UNII BDR	ePA	1.04	0.58	0.50	Pass
5733	4.0	NB UNII HDR4	ePA	2.38	2.17	0.50	Pass
5789	4.0	NB UNII HDR4	ePA	2.38	2.18	0.50	Pass
5844	4.0	NB UNII HDR4	ePA	2.38	2.17	0.50	Pass
5733	8.0	NB UNII HDR8	ePA	4.90	4.20	0.50	Pass
5789	8.0	NB UNII HDR8	ePA	4.90	4.21	0.50	Pass
5844	8.0	NB UNII HDR8	ePA	4.90	4.20	0.50	Pass

**Table 7-5. Conducted BW Measurements Antenna WF7a**

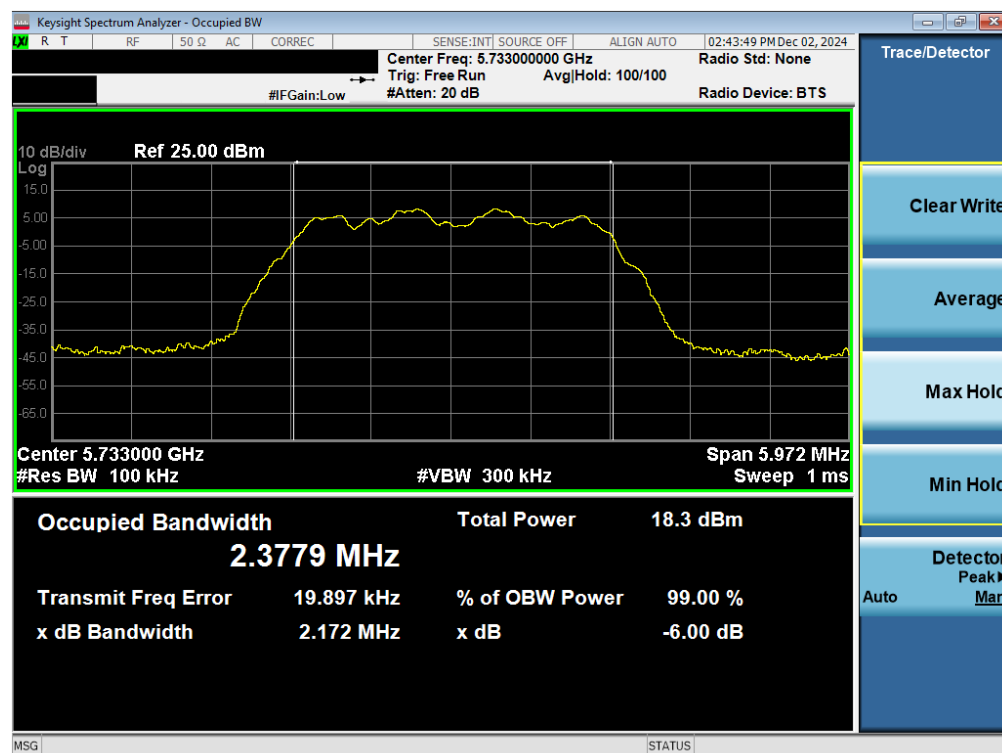
FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
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Plot 7-10. 6dB BW & 99% OBW Antenna WF7a (NB UNII BDR, 5789MHz)

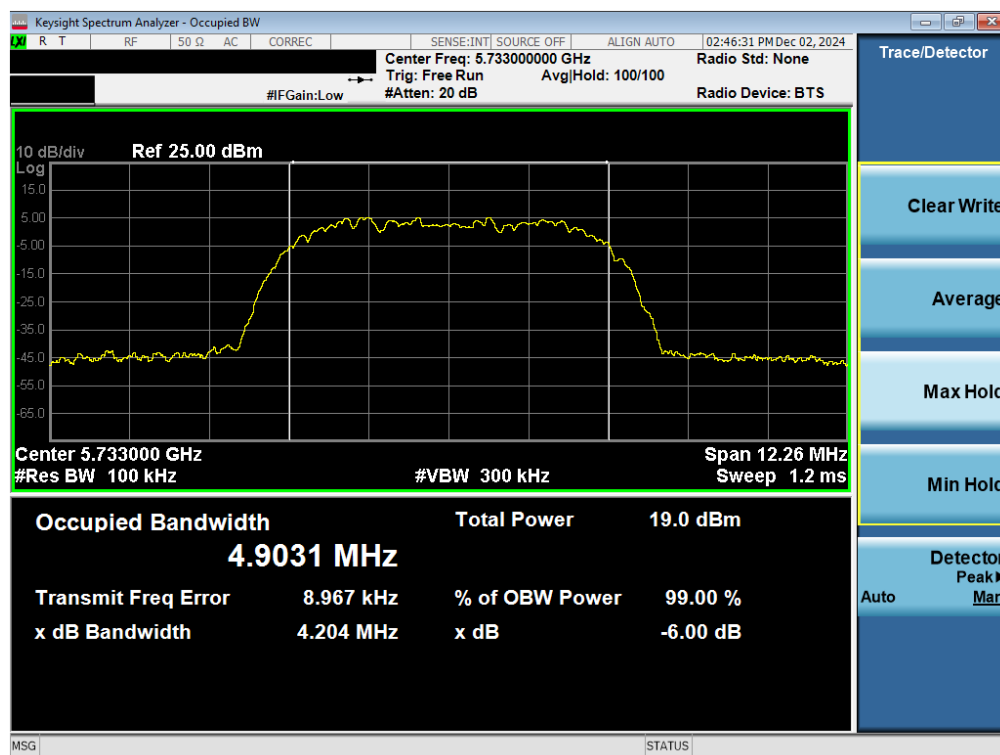


Plot 7-11. 6dB BW & 99% OBW Antenna WF7a (NB UNII HDR4, 5733MHz)

FCC ID: BCGA3268			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-12. 6dB BW & 99% OBW Antenna WF7a (NB UNII HDR8, 5733MHz)

FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
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### 7.3.2 Antenna WF2a 6dB & 99% Bandwidth Measurements

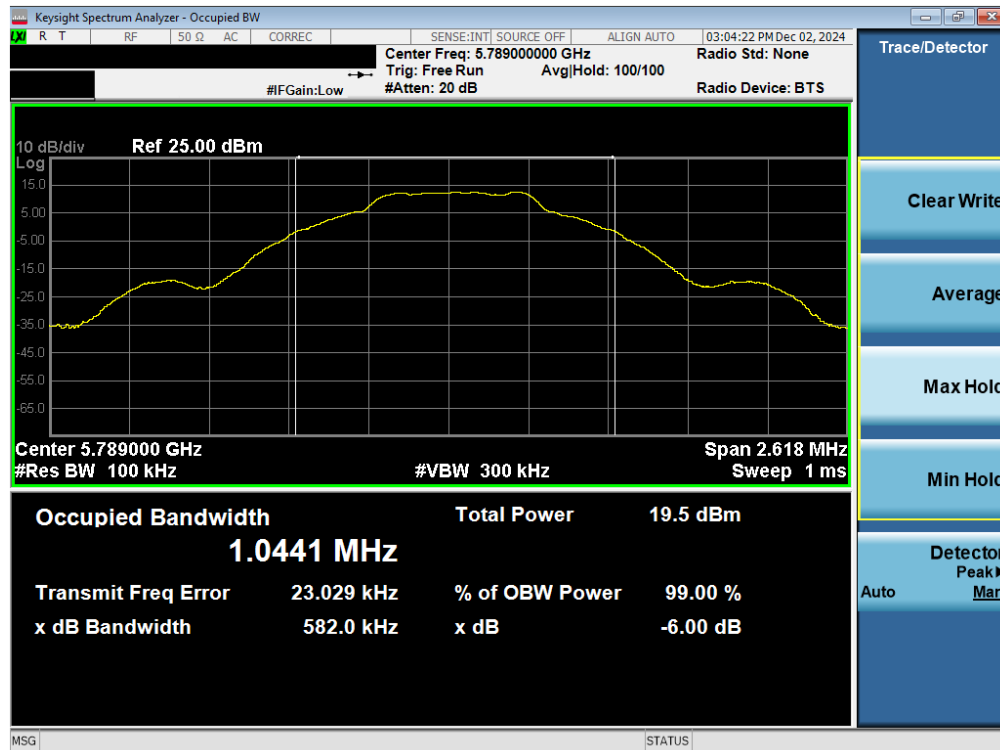
Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass / Fail
5733	1.0	NB UNII BDR	ePA	1.04	0.58	0.50	Pass
5789	1.0	NB UNII BDR	ePA	1.04	0.58	0.50	Pass
5844	1.0	NB UNII BDR	ePA	1.05	0.58	0.50	Pass
5733	4.0	NB UNII HDR4	ePA	2.37	2.16	0.50	Pass
5789	4.0	NB UNII HDR4	ePA	2.37	2.16	0.50	Pass
5844	4.0	NB UNII HDR4	ePA	2.37	2.16	0.50	Pass
5733	8.0	NB UNII HDR8	ePA	4.85	4.18	0.50	Pass
5789	8.0	NB UNII HDR8	ePA	4.86	4.18	0.50	Pass
5844	8.0	NB UNII HDR8	ePA	4.86	4.18	0.50	Pass

**Table 7-6. Conducted BW Measurements Antenna WF2a**

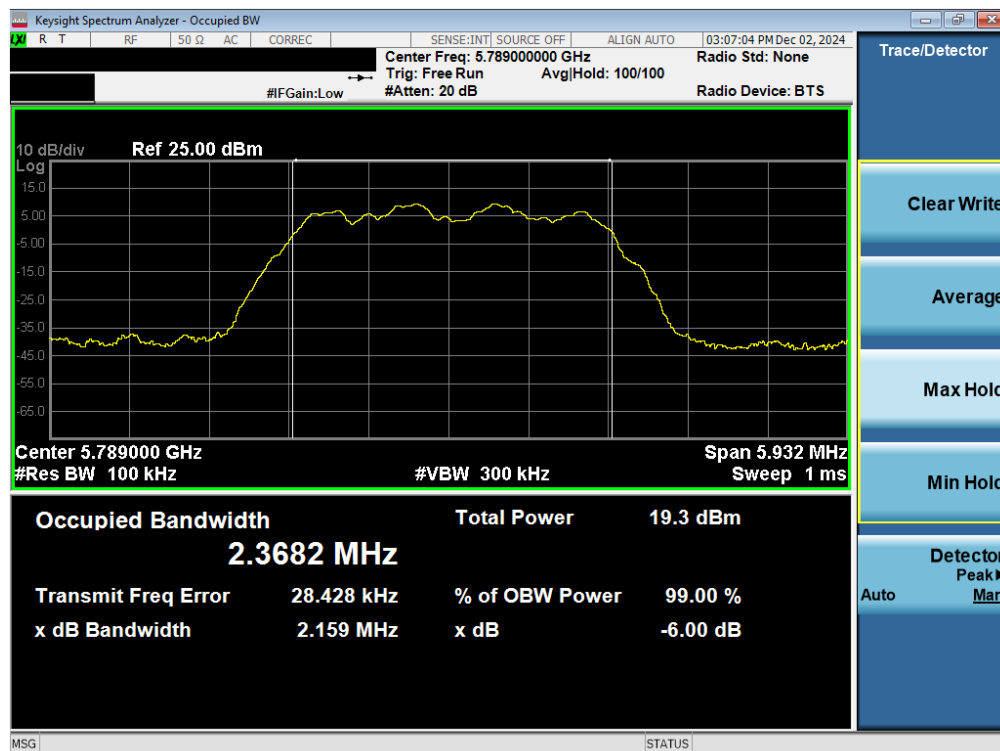
FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 29 of 144

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Plot 7-13. 6dB BW & 99% OBW Antenna WF2a (NB UNII BDR, 5789MHz)

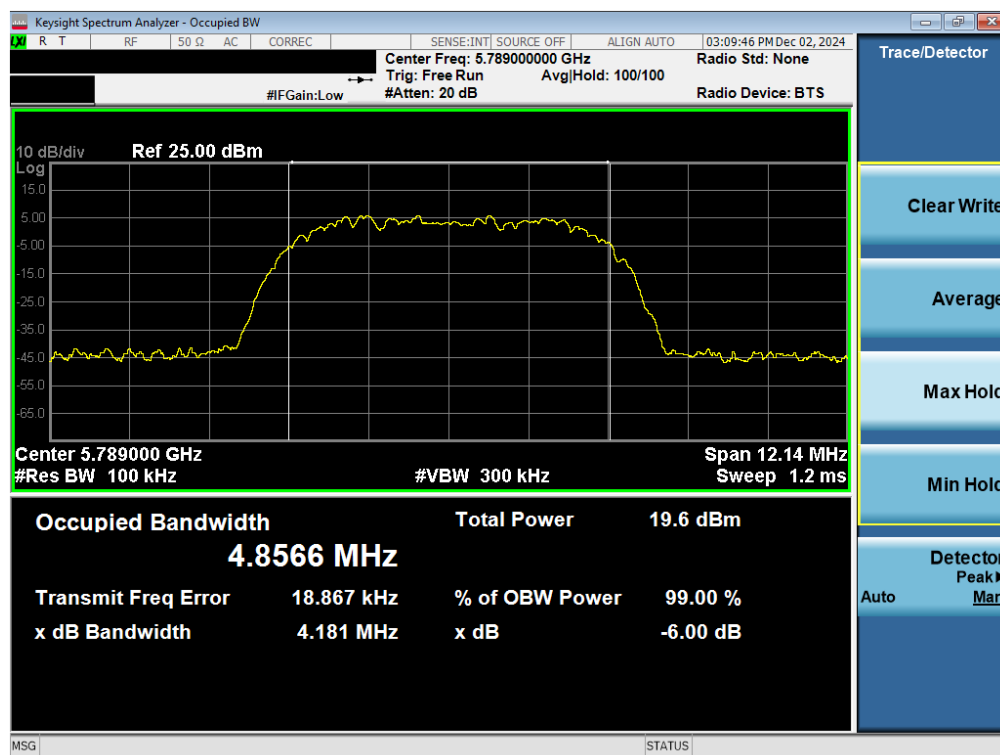


Plot 7-14. 6dB BW & 99% OBW Antenna WF2a (NB UNII HDR4, 5789MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-15. 6dB BW & 99% OBW Antenna WF2a (NB UNII HDR8, 5789MHz)

FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 31 of 144

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### 7.3.3 Antenna WF7b 6dB & 99% Bandwidth Measurements

Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass / Fail
5733	1.0	NB UNII BDR	ePA	1.04	0.58	0.50	Pass
5789	1.0	NB UNII BDR	ePA	1.04	0.58	0.50	Pass
5844	1.0	NB UNII BDR	ePA	1.04	0.58	0.50	Pass
5733	4.0	NB UNII HDR4	ePA	2.38	2.18	0.50	Pass
5789	4.0	NB UNII HDR4	ePA	2.38	2.17	0.50	Pass
5844	4.0	NB UNII HDR4	ePA	2.38	2.18	0.50	Pass
5733	8.0	NB UNII HDR8	ePA	4.90	4.20	0.50	Pass
5789	8.0	NB UNII HDR8	ePA	4.90	4.21	0.50	Pass
5844	8.0	NB UNII HDR8	ePA	4.90	4.21	0.50	Pass

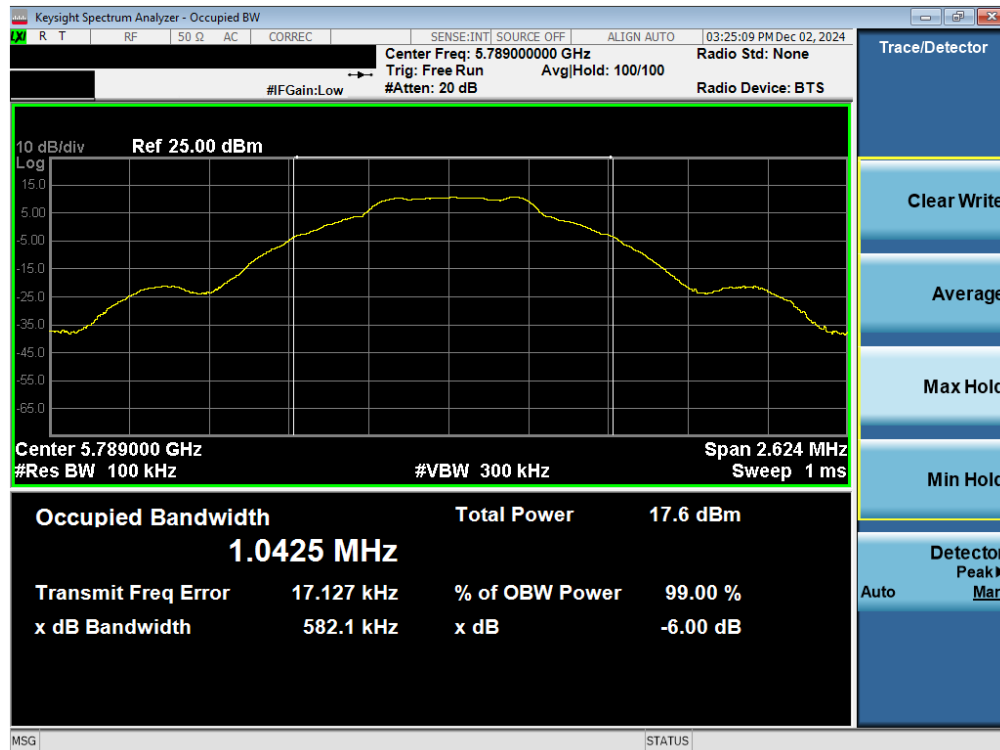
**Table 7-7. Conducted BW Measurements Antenna WF7b**

FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 32 of 144

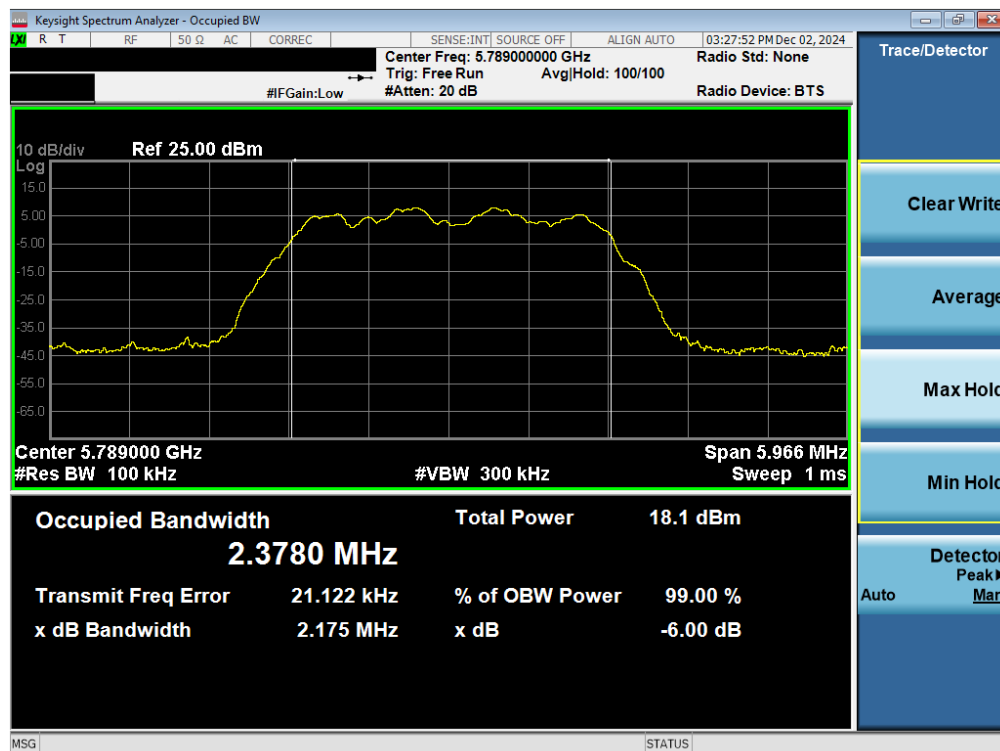
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Plot 7-16. 6dB BW & 99% OBW Antenna WF7b (NB UNII BDR, 5789MHz)



Plot 7-17. 6dB BW & 99% OBW Antenna WF7b (NB UNII HDR4, 5789MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-18. 6dB BW & 99% OBW Antenna WF7b (NB UNII HDR8, 5733MHz)

FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
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## 7.4 Conducted Output Power Measurement

§15.407(a.1.iv) §15.407(a.3.i)

### Test Overview and Limits

A transmitter antenna terminal of the EUT is connected to the input of an RF pulse power sensor. Measurement is made using a broadband average power meter while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies.

***In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (23.98dBm).***

***In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm).***

### Test Procedure Used

ANSI C63.10-2020 – Subclause 12.4.3.2 Method PM-G  
KDB 789033 D02 v02r01 – Section E)3)b) Method PM-G  
ANSI C63.10-2020 – Subclause 14.4 Measure-and-Sum Technique  
KDB 662911 v02r01 – Section E)1) Measure-and-Sum Technique

### Test Settings

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-3. Test Instrument & Measurement Setup**

### Test Notes

None

FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 35 of 144

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## Conducted Output Power Measurements

Frequency [MHz]	Detector	Mode	Power Scheme	Conducted Powers [dBm]	Conducted Power Limit [dBm]	Conducted Power Margin [dB]
5162	AVG	NB UNII BDR	ePA	9.76	23.98	-14.22
5204	AVG	NB UNII BDR	ePA	9.91	23.98	-14.07
5245	AVG	NB UNII BDR	ePA	10.00	23.98	-13.98
5162	AVG	NB UNII BDR	iPA	5.93	23.98	-18.05
5204	AVG	NB UNII BDR	iPA	5.86	23.98	-18.12
5245	AVG	NB UNII BDR	iPA	5.69	23.98	-18.29
5733	AVG	NB UNII BDR	ePA	12.56	30.00	-17.44
5789	AVG	NB UNII BDR	ePA	12.66	30.00	-17.34
5844	AVG	NB UNII BDR	ePA	12.76	30.00	-17.25
5733	AVG	NB UNII BDR	iPA	6.46	30.00	-23.54
5789	AVG	NB UNII BDR	iPA	6.12	30.00	-23.88
5844	AVG	NB UNII BDR	iPA	6.13	30.00	-23.87
5162	AVG	NB UNII HDR4	ePA	11.52	23.98	-12.46
5204	AVG	NB UNII HDR4	ePA	11.70	23.98	-12.29
5245	AVG	NB UNII HDR4	ePA	11.80	23.98	-12.18
5162	AVG	NB UNII HDR4	iPA	0.89	23.98	-23.09
5204	AVG	NB UNII HDR4	iPA	0.51	23.98	-23.47
5245	AVG	NB UNII HDR4	iPA	0.97	23.98	-23.01
5162	AVG	NB UNII HDR8	ePA	12.00	23.98	-11.98
5204	AVG	NB UNII HDR8	ePA	11.53	23.98	-12.45
5245	AVG	NB UNII HDR8	ePA	11.81	23.98	-12.17
5162	AVG	NB UNII HDR8	iPA	0.69	23.98	-23.30
5204	AVG	NB UNII HDR8	iPA	0.63	23.98	-23.36
5245	AVG	NB UNII HDR8	iPA	0.70	23.98	-23.28
5733	AVG	NB UNII HDR4	ePA	12.78	30.00	-17.22
5789	AVG	NB UNII HDR4	ePA	12.87	30.00	-17.13
5844	AVG	NB UNII HDR4	ePA	12.91	30.00	-17.09
5733	AVG	NB UNII HDR4	iPA	1.17	30.00	-28.83
5789	AVG	NB UNII HDR4	iPA	1.15	30.00	-28.85
5844	AVG	NB UNII HDR4	iPA	1.13	30.00	-28.87
5733	AVG	NB UNII HDR8	ePA	12.55	30.00	-17.45
5789	AVG	NB UNII HDR8	ePA	12.75	30.00	-17.25
5844	AVG	NB UNII HDR8	ePA	12.76	30.00	-17.24
5733	AVG	NB UNII HDR8	iPA	1.19	30.00	-28.81
5789	AVG	NB UNII HDR8	iPA	1.37	30.00	-28.63
5844	AVG	NB UNII HDR8	iPA	1.25	30.00	-28.75

**Table 7-8. Antenna WF7a Maximum Conducted Output Power**

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Frequency [MHz]	Detector	Mode	Power Scheme	Conducted Powers [dBm]	Conducted Power Limit [dBm]	Conducted Power Margin [dB]
5162	AVG	NB UNII BDR	ePA	9.75	23.98	-14.23
5204	AVG	NB UNII BDR	ePA	9.93	23.98	-14.05
5245	AVG	NB UNII BDR	ePA	9.89	23.98	-14.09
5162	AVG	NB UNII BDR	iPA	4.54	23.98	-19.44
5204	AVG	NB UNII BDR	iPA	4.61	23.98	-19.37
5245	AVG	NB UNII BDR	iPA	4.57	23.98	-19.41
5733	AVG	NB UNII BDR	ePA	12.81	30.00	-17.19
5789	AVG	NB UNII BDR	ePA	13.50	30.00	-16.50
5844	AVG	NB UNII BDR	ePA	13.64	30.00	-16.36
5733	AVG	NB UNII BDR	iPA	5.10	30.00	-24.90
5789	AVG	NB UNII BDR	iPA	4.99	30.00	-25.01
5844	AVG	NB UNII BDR	iPA	5.08	30.00	-24.92
5162	AVG	NB UNII HDR4	ePA	11.60	23.98	-12.38
5204	AVG	NB UNII HDR4	ePA	11.63	23.98	-12.35
5245	AVG	NB UNII HDR4	ePA	11.53	23.98	-12.45
5162	AVG	NB UNII HDR4	iPA	-0.42	23.98	-24.40
5204	AVG	NB UNII HDR4	iPA	-0.22	23.98	-24.20
5245	AVG	NB UNII HDR4	iPA	-0.28	23.98	-24.26
5162	AVG	NB UNII HDR8	ePA	12.64	23.98	-11.34
5204	AVG	NB UNII HDR8	ePA	12.84	23.98	-11.14
5245	AVG	NB UNII HDR8	ePA	12.56	23.98	-11.43
5162	AVG	NB UNII HDR8	iPA	-0.23	23.98	-24.21
5204	AVG	NB UNII HDR8	iPA	-0.47	23.98	-24.45
5245	AVG	NB UNII HDR8	iPA	-0.33	23.98	-24.31
5733	AVG	NB UNII HDR4	ePA	13.55	30.00	-16.45
5789	AVG	NB UNII HDR4	ePA	13.69	30.00	-16.31
5844	AVG	NB UNII HDR4	ePA	13.69	30.00	-16.31
5733	AVG	NB UNII HDR4	iPA	0.15	30.00	-29.85
5789	AVG	NB UNII HDR4	iPA	0.44	30.00	-29.56
5844	AVG	NB UNII HDR4	iPA	0.29	30.00	-29.71
5733	AVG	NB UNII HDR8	ePA	13.50	30.00	-16.50
5789	AVG	NB UNII HDR8	ePA	13.14	30.00	-16.87
5844	AVG	NB UNII HDR8	ePA	13.33	30.00	-16.67
5733	AVG	NB UNII HDR8	iPA	0.21	30.00	-29.80
5789	AVG	NB UNII HDR8	iPA	0.00	30.00	-30.00
5844	AVG	NB UNII HDR8	iPA	0.24	30.00	-29.76

**Table 7-9. Antenna WF2a Maximum Conducted Output Power**

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Frequency [MHz]	Detector	Mode	Power Scheme	Conducted Powers [dBm]	Conducted Power Limit [dBm]	Conducted Power Margin [dB]
5162	AVG	NB UNII BDR	ePA	9.83	23.98	-14.15
5204	AVG	NB UNII BDR	ePA	9.50	23.98	-14.48
5245	AVG	NB UNII BDR	ePA	9.91	23.98	-14.07
5162	AVG	NB UNII BDR	iPA	5.16	23.98	-18.82
5204	AVG	NB UNII BDR	iPA	5.32	23.98	-18.67
5245	AVG	NB UNII BDR	iPA	5.40	23.98	-18.58
5733	AVG	NB UNII BDR	ePA	12.44	30.00	-17.56
5789	AVG	NB UNII BDR	ePA	12.29	30.00	-17.71
5844	AVG	NB UNII BDR	ePA	12.05	30.00	-17.95
5733	AVG	NB UNII BDR	iPA	5.74	30.00	-24.26
5789	AVG	NB UNII BDR	iPA	5.80	30.00	-24.20
5844	AVG	NB UNII BDR	iPA	5.72	30.00	-24.28
5162	AVG	NB UNII HDR4	ePA	11.50	23.98	-12.48
5204	AVG	NB UNII HDR4	ePA	11.39	23.98	-12.59
5245	AVG	NB UNII HDR4	ePA	11.43	23.98	-12.55
5162	AVG	NB UNII HDR4	iPA	0.13	23.98	-23.85
5204	AVG	NB UNII HDR4	iPA	0.05	23.98	-23.93
5245	AVG	NB UNII HDR4	iPA	0.03	23.98	-23.95
5162	AVG	NB UNII HDR8	ePA	11.00	23.98	-12.98
5204	AVG	NB UNII HDR8	ePA	11.19	23.98	-12.79
5245	AVG	NB UNII HDR8	ePA	11.22	23.98	-12.77
5162	AVG	NB UNII HDR8	iPA	0.04	23.98	-23.94
5204	AVG	NB UNII HDR8	iPA	0.28	23.98	-23.70
5245	AVG	NB UNII HDR8	iPA	0.14	23.98	-23.84
5733	AVG	NB UNII HDR4	ePA	12.49	30.00	-17.51
5789	AVG	NB UNII HDR4	ePA	12.45	30.00	-17.55
5844	AVG	NB UNII HDR4	ePA	12.39	30.00	-17.61
5733	AVG	NB UNII HDR4	iPA	0.73	30.00	-29.27
5789	AVG	NB UNII HDR4	iPA	0.84	30.00	-29.16
5844	AVG	NB UNII HDR4	iPA	0.72	30.00	-29.28
5733	AVG	NB UNII HDR8	ePA	12.18	30.00	-17.83
5789	AVG	NB UNII HDR8	ePA	12.11	30.00	-17.89
5844	AVG	NB UNII HDR8	ePA	12.03	30.00	-17.97
5733	AVG	NB UNII HDR8	iPA	0.89	30.00	-29.12
5789	AVG	NB UNII HDR8	iPA	1.00	30.00	-29.00
5844	AVG	NB UNII HDR8	iPA	0.92	30.00	-29.08

**Table 7-10. Antenna WF7b Maximum Conducted Output Power**

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Frequency [MHz]	Detector	Mode	Power Scheme	Conducted Powers [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				Ant WF7a	Ant WF2a	Summed		
5162	AVG	NB UNII BDR	ePA	6.81	6.46	9.65	23.98	-14.33
5204	AVG	NB UNII BDR	ePA	6.51	6.70	9.62	23.98	-14.36
5245	AVG	NB UNII BDR	ePA	6.94	6.64	9.80	23.98	-14.18
5162	AVG	NB UNII BDR	iPA	5.90	4.82	8.40	23.98	-15.58
5204	AVG	NB UNII BDR	iPA	5.97	4.94	8.50	23.98	-15.48
5245	AVG	NB UNII BDR	iPA	5.71	5.00	8.38	23.98	-15.60
5733	AVG	NB UNII BDR	ePA	12.94	13.98	16.50	30.00	-13.50
5789	AVG	NB UNII BDR	ePA	12.73	13.55	16.17	30.00	-13.83
5844	AVG	NB UNII BDR	ePA	12.82	13.68	16.28	30.00	-13.72
5733	AVG	NB UNII BDR	iPA	6.29	5.06	8.73	30.00	-21.27
5789	AVG	NB UNII BDR	iPA	6.09	4.81	8.50	30.00	-21.50
5844	AVG	NB UNII BDR	iPA	6.23	4.85	8.61	30.00	-21.39
5162	AVG	NB UNII HDR4	ePA	9.10	8.88	12.00	23.98	-11.98
5204	AVG	NB UNII HDR4	ePA	9.19	8.94	12.08	23.98	-11.90
5245	AVG	NB UNII HDR4	ePA	9.28	9.02	12.16	23.98	-11.82
5162	AVG	NB UNII HDR4	iPA	0.52	-0.83	2.91	23.98	-21.07
5204	AVG	NB UNII HDR4	iPA	0.95	-0.35	3.35	23.98	-20.63
5245	AVG	NB UNII HDR4	iPA	0.53	-0.29	3.15	23.98	-20.83
5162	AVG	NB UNII HDR8	ePA	11.76	11.35	14.57	23.98	-9.41
5204	AVG	NB UNII HDR8	ePA	11.99	11.40	14.71	23.98	-9.27
5245	AVG	NB UNII HDR8	ePA	11.86	11.66	14.77	23.98	-9.21
5162	AVG	NB UNII HDR8	iPA	1.00	-0.14	3.47	23.98	-20.51
5204	AVG	NB UNII HDR8	iPA	0.71	-0.73	3.06	23.98	-20.92
5245	AVG	NB UNII HDR8	iPA	0.77	-0.02	3.40	23.98	-20.58
5733	AVG	NB UNII HDR4	ePA	12.92	13.67	16.32	30.00	-13.68
5789	AVG	NB UNII HDR4	ePA	12.32	13.51	15.97	30.00	-14.03
5844	AVG	NB UNII HDR4	ePA	12.38	13.69	16.09	30.00	-13.91
5733	AVG	NB UNII HDR4	iPA	0.82	0.36	3.61	30.00	-26.39
5789	AVG	NB UNII HDR4	iPA	1.15	0.48	3.84	30.00	-26.16
5844	AVG	NB UNII HDR4	iPA	1.13	0.19	3.69	30.00	-26.31
5733	AVG	NB UNII HDR8	ePA	12.61	13.46	16.07	30.00	-13.93
5789	AVG	NB UNII HDR8	ePA	12.65	13.31	16.00	30.00	-14.00
5844	AVG	NB UNII HDR8	ePA	12.67	13.62	16.19	30.00	-13.81
5733	AVG	NB UNII HDR8	iPA	1.22	0.42	3.85	30.00	-26.15
5789	AVG	NB UNII HDR8	iPA	1.31	0.42	3.90	30.00	-26.10
5844	AVG	NB UNII HDR8	iPA	1.30	0.09	3.75	30.00	-26.25

**Table 7-11. TxBF Maximum Conducted Output Power**

FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
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**Note:**

Per ANSI C63.10-2020 and KDB 662911 v02r01 Section E1), the conducted powers at and were first measured separately during TxBF transmission as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Per ANSI C63.10-2020 Section 14.6.3, the directional gain is calculated using the following formula, where  $G_N$  is the gain of the nth antenna and  $N_{ANT}$ , the total number of antennas used.

$$\text{Directional gain} = 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] \text{ dBi}$$

Per ANSI C63.10-2020 Section 14.6.3, the uncorrelated directional gain is calculated using the following formula, where  $G_N$  is the gain of the nth antenna and  $N_{ANT}$ , the total number of antennas used.

$$\text{Directional gain} = 10 \log[(10^{G_1/10} + 10^{G_2/10} + \dots + 10^{G_N/10}) / N_{ANT}] \text{ dBi}$$

**Sample TxBF Calculation:**

At 5162MHz, the average conducted output power was measured to be 6.81dBm for Antenna WF7a and 6.46dBm for Antenna WF2a.

$$\text{Antenna WF7a} + \text{Antenna WF2a} = \text{TxBF}$$

$$(6.81\text{dBm} + 6.46\text{dBm}) = (4.797\text{mW} + 4.426\text{mW}) = 9.223\text{mW} = 9.65\text{dBm}$$

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## 7.5 Maximum Power Spectral Density

§15.407(a.1.iv) §15.407(a.3.i)

### Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies. Method SA-1, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, was used to measure the power spectral density.

***In the 5.15 – 5.25GHz band, the maximum permissible power spectral density is 11dBm/MHz.***

***In the 5.725 – 5.850GHz band, the maximum permissible power spectral density is 30dBm/500kHz.***

### Test Procedure Used

ANSI C63.10-2020 – Subclause 12.4.2.2

KDB 789033 D02 v02r01 – Section F

ANSI C63.10-2020 – Subclause 14.5.2.2 Measure-and-Sum Technique

KDB 662911 v02r01 – Section E)2) Measure-and-Sum Technique

### Test Settings

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Set span to encompass the entire 99% OBW of the signal
3. RBW = 1MHz for U-NII 1, 500kHz for U-NII 3
4. VBW  $\geq$  3MHz for U-NII 1,  $\geq$  3 x RBW for U-NII 3
5. Number of sweep points  $\geq$  2 x (span/RBW)
6. Sweep time = auto
7. Detector = power averaging (RMS)
8. Trigger was set to free run for all modes
9. Trace was averaged over 100 sweeps
10. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-4. Test Instrument & Measurement Setup**

### Test Notes

1. Low, mid and high channels were tested and tabular data has been reported. Only mid channel plots have been reported.

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## 7.5.1 Antenna WF7a Power Spectral Density Measurements

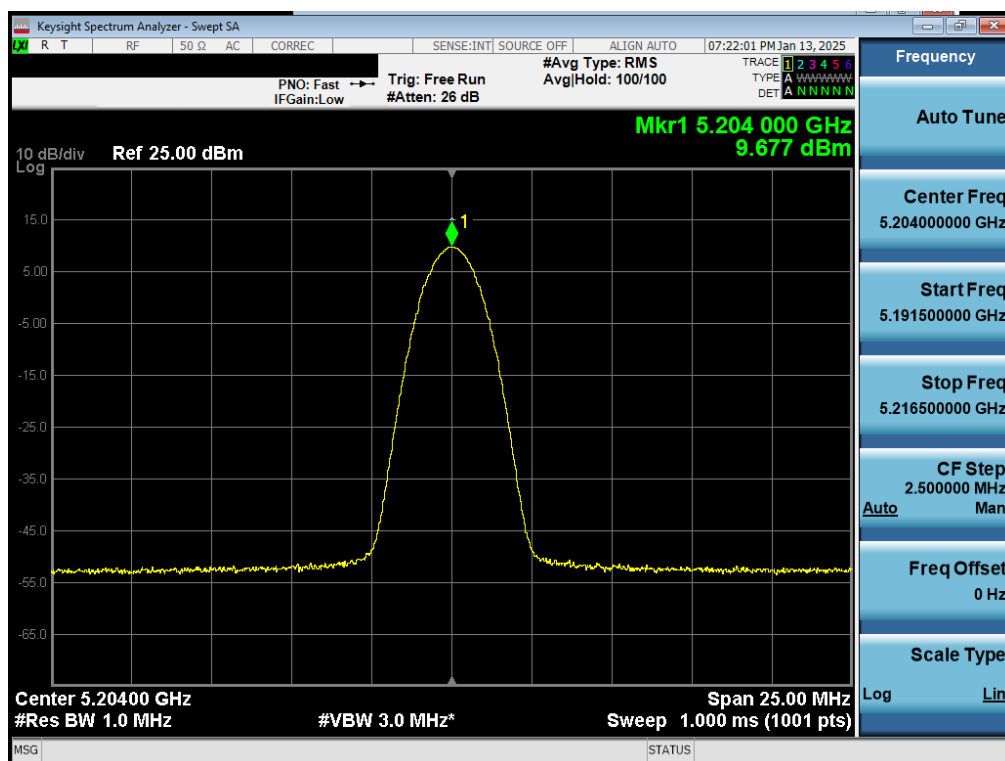
Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured Power Density [dBm/MHz]	Max Power Density [dBm/MHz]	Margin [dB]
5162	1.0	NB UNII BDR	ePA	9.75	11.00	-1.25
5204	1.0	NB UNII BDR	ePA	9.68	11.00	-1.32
5245	1.0	NB UNII BDR	ePA	9.65	11.00	-1.35
5162	1.0	NB UNII BDR	iPA	5.58	11.00	-5.42
5204	1.0	NB UNII BDR	iPA	5.76	11.00	-5.24
5245	1.0	NB UNII BDR	iPA	5.63	11.00	-5.37
5162	4.0	NB UNII HDR4	ePA	8.77	11.00	-2.23
5204	4.0	NB UNII HDR4	ePA	8.98	11.00	-2.02
5245	4.0	NB UNII HDR4	ePA	8.85	11.00	-2.16
5162	4.0	NB UNII HDR4	iPA	-1.42	11.00	-12.42
5204	4.0	NB UNII HDR4	iPA	-1.75	11.00	-12.75
5245	4.0	NB UNII HDR4	iPA	-1.32	11.00	-12.32
5162	8.0	NB UNII HDR8	ePA	6.46	11.00	-4.54
5204	8.0	NB UNII HDR8	ePA	5.94	11.00	-5.06
5245	8.0	NB UNII HDR8	ePA	6.62	11.00	-4.38
5162	8.0	NB UNII HDR8	iPA	-4.31	11.00	-15.31
5204	8.0	NB UNII HDR8	iPA	-3.96	11.00	-14.96
5245	8.0	NB UNII HDR8	iPA	-4.26	11.00	-15.26

**Table 7-12. Power Spectral Density Measurements Antenna WF7a**

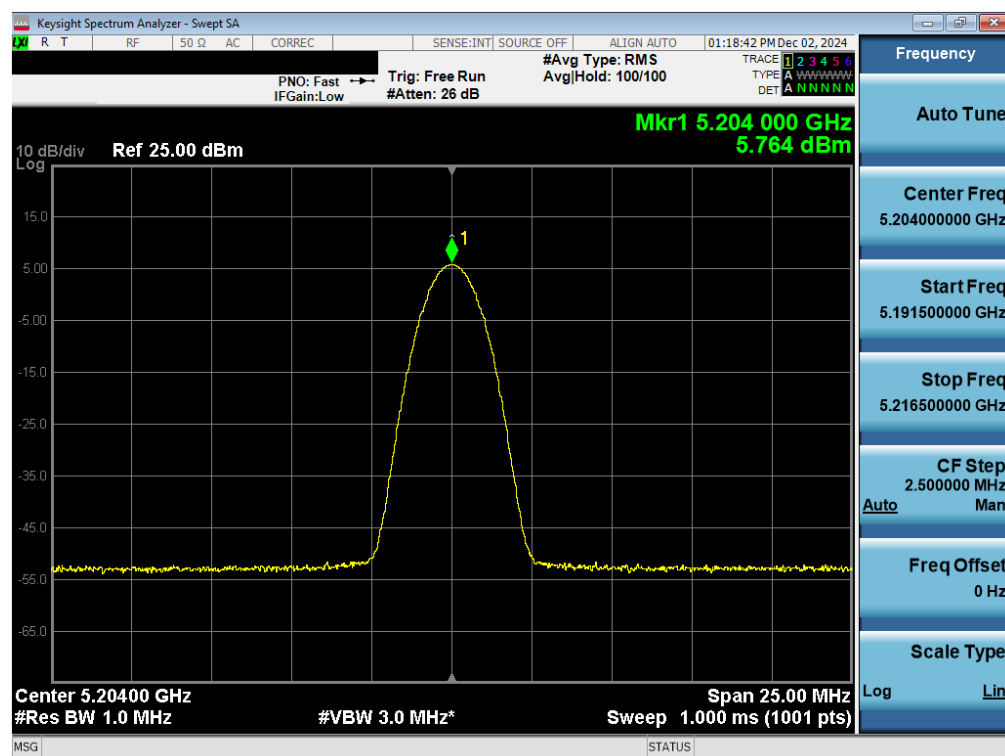
FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
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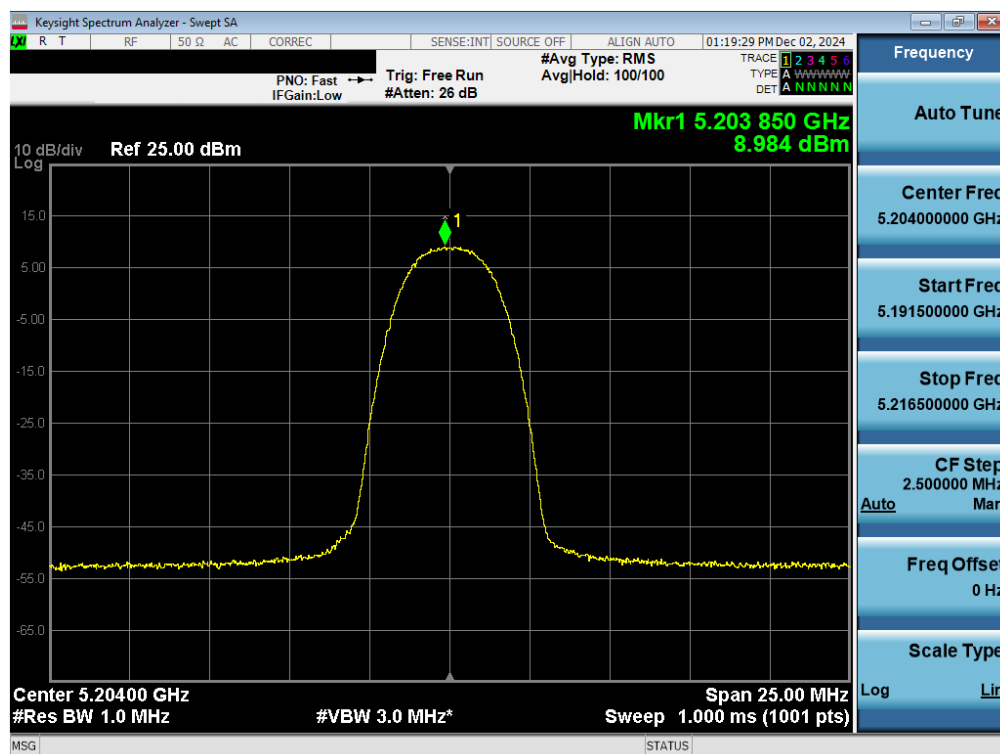
Plot 7-19. PSD Antenna WF7a (NB UNII BDR, ePA – 5204MHz)



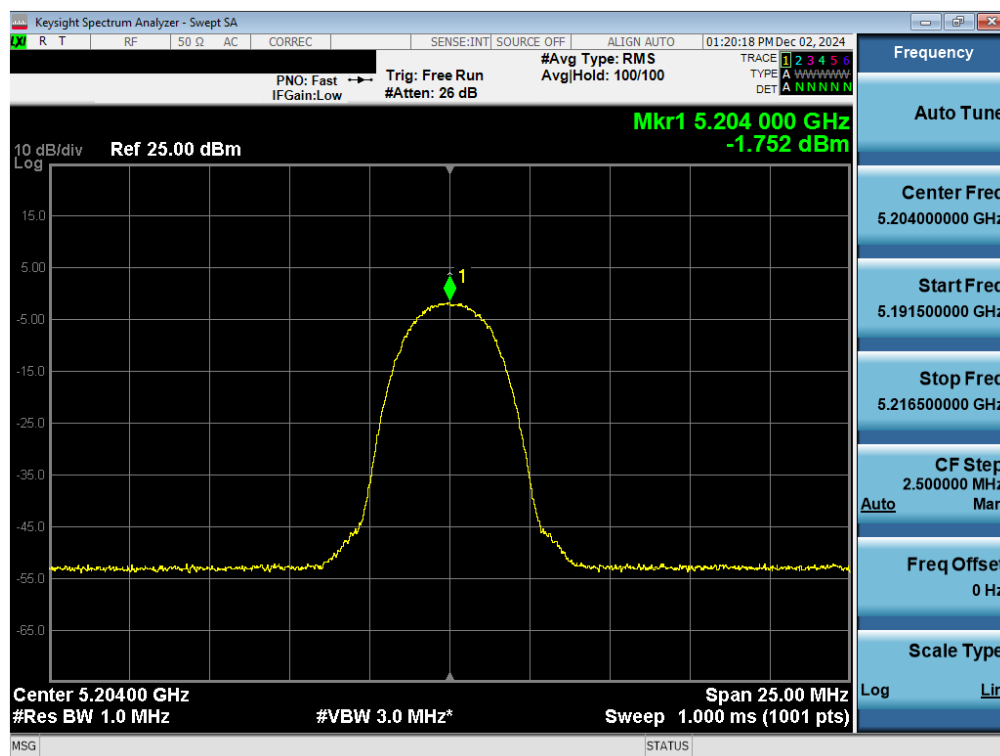
Plot 7-20. PSD Antenna WF7a (NB UNII BDR, iPA – 5204MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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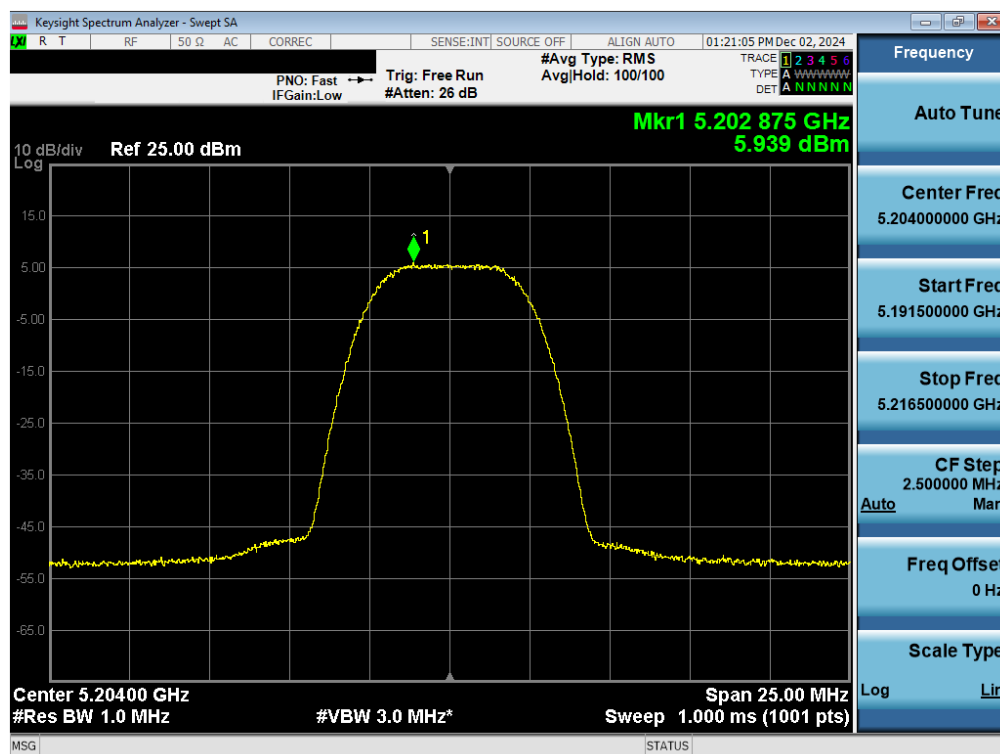
Plot 7-21. PSD Antenna WF7a (NB UNII HDR4, ePA – 5204MHz)



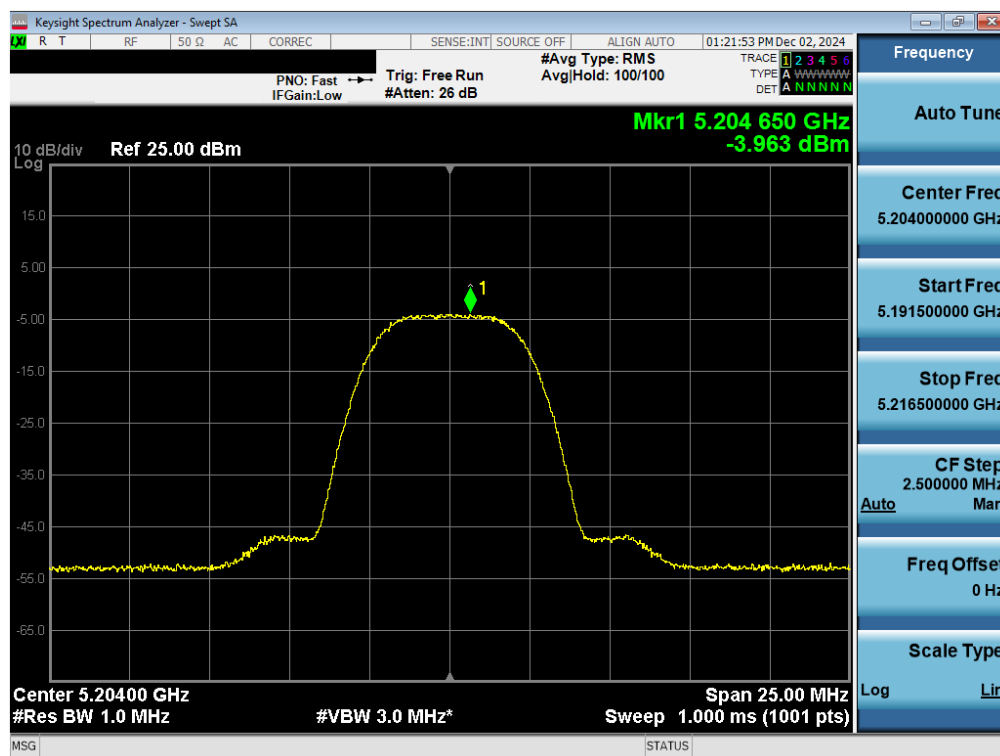
Plot 7-22. PSD Antenna WF7a (NB UNII HDR4, iPA – 5204MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-23. PSD Antenna WF7a (NB UNII HDR8, ePA – 5204MHz)



Plot 7-24. PSD Antenna WF7a (NB UNII HDR8, iPA – 5204MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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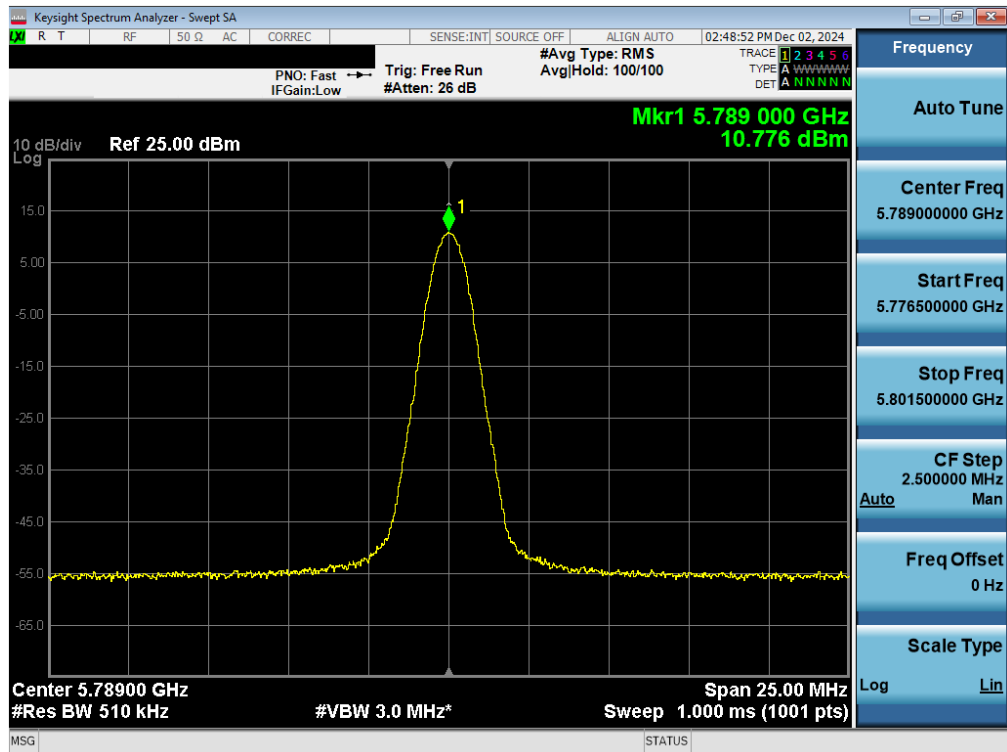
Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured Power Density [dBm/500kHz]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
5733	1.0	NB UNII BDR	ePA	11.16	30.00	-18.84
5789	1.0	NB UNII BDR	ePA	10.78	30.00	-19.22
5844	1.0	NB UNII BDR	ePA	11.35	30.00	-18.65
5733	1.0	NB UNII BDR	iPA	5.23	30.00	-24.78
5789	1.0	NB UNII BDR	iPA	4.85	30.00	-25.15
5844	1.0	NB UNII BDR	iPA	5.21	30.00	-24.79
5733	4.0	NB UNII HDR4	ePA	6.67	30.00	-23.33
5789	4.0	NB UNII HDR4	ePA	6.65	30.00	-23.35
5844	4.0	NB UNII HDR4	ePA	8.12	30.00	-21.88
5733	4.0	NB UNII HDR4	iPA	-3.49	30.00	-33.49
5789	4.0	NB UNII HDR4	iPA	-4.03	30.00	-34.03
5844	4.0	NB UNII HDR4	iPA	-3.81	30.00	-33.81
5733	8.0	NB UNII HDR8	ePA	3.99	30.00	-26.01
5789	8.0	NB UNII HDR8	ePA	3.88	30.00	-26.12
5844	8.0	NB UNII HDR8	ePA	4.36	30.00	-25.64
5733	8.0	NB UNII HDR8	iPA	-6.81	30.00	-36.81
5789	8.0	NB UNII HDR8	iPA	-6.62	30.00	-36.62
5844	8.0	NB UNII HDR8	iPA	-6.44	30.00	-36.44

**Table 7-13. Power Spectral Density Measurements Antenna WF7a**

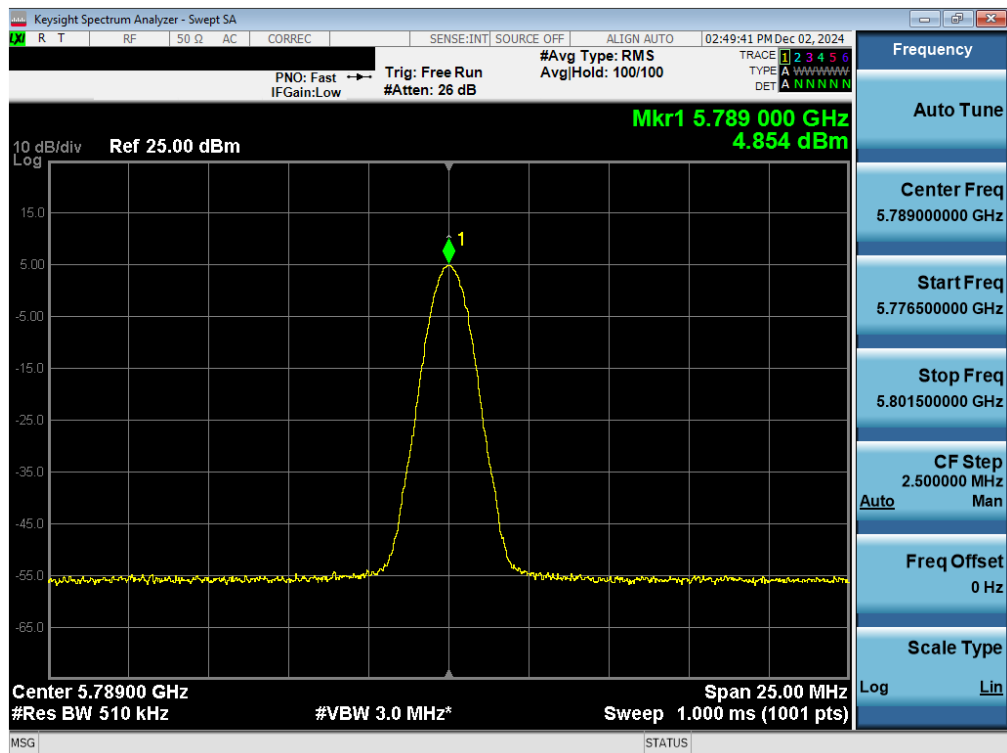
FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 46 of 144

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Plot 7-25. PSD Antenna WF7a (NB UNII BDR, ePA – 5789MHz)

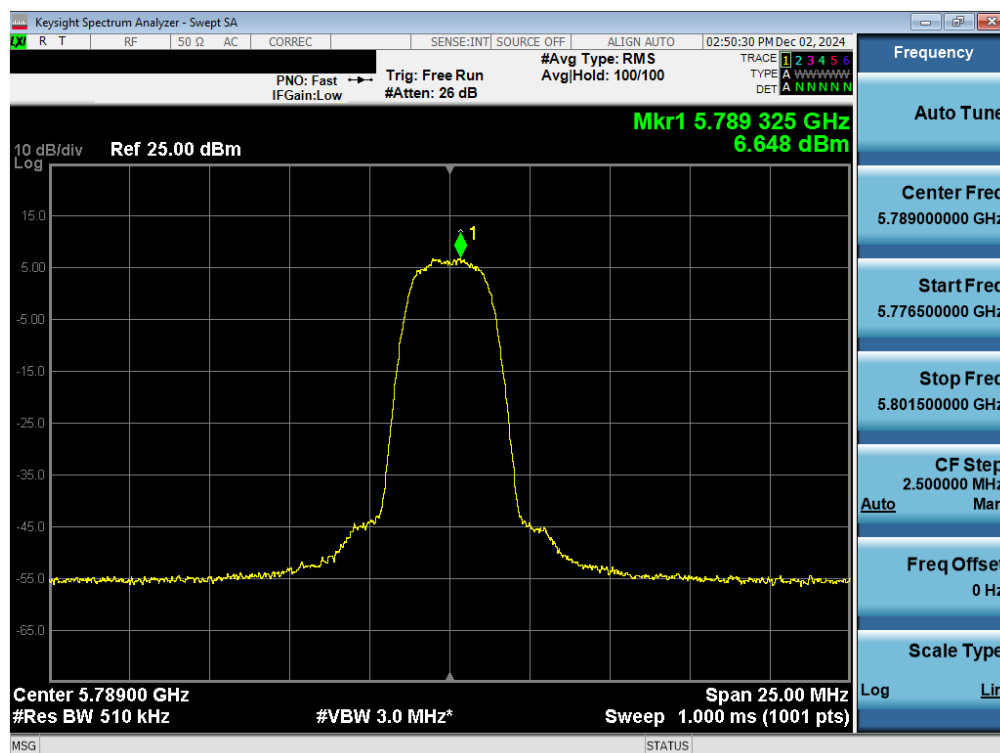


Plot 7-26. PSD Antenna WF7a (NB UNII BDR, iPA – 5789MHz)

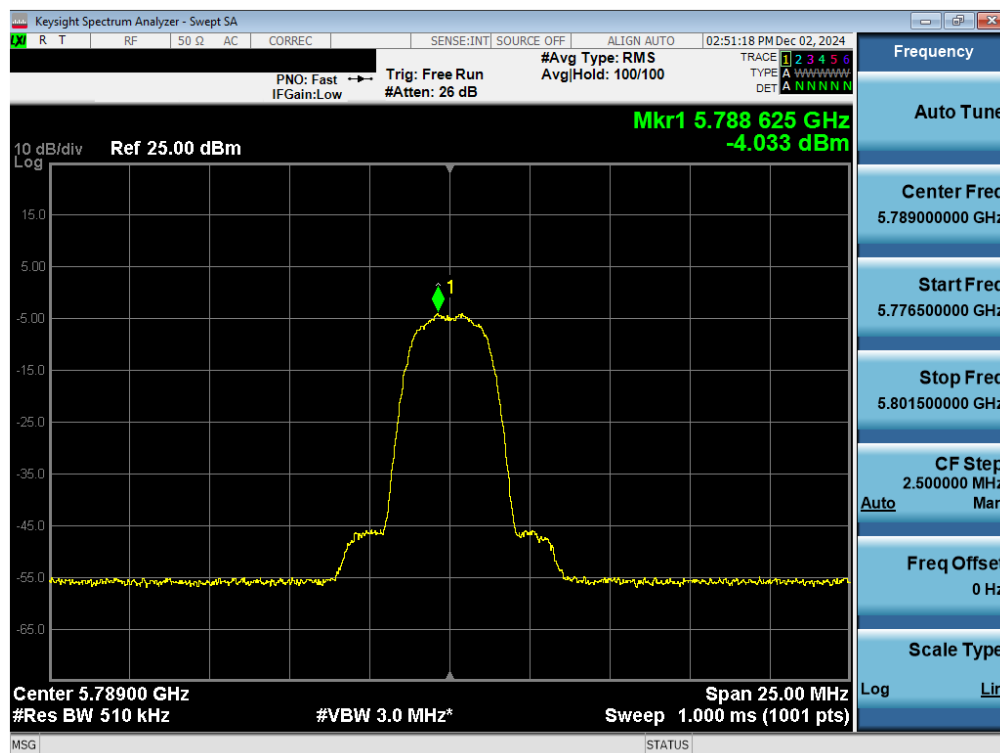
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 47 of 144

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Plot 7-27. PSD Antenna WF7a (NB UNII HDR4, ePA – 5789MHz)



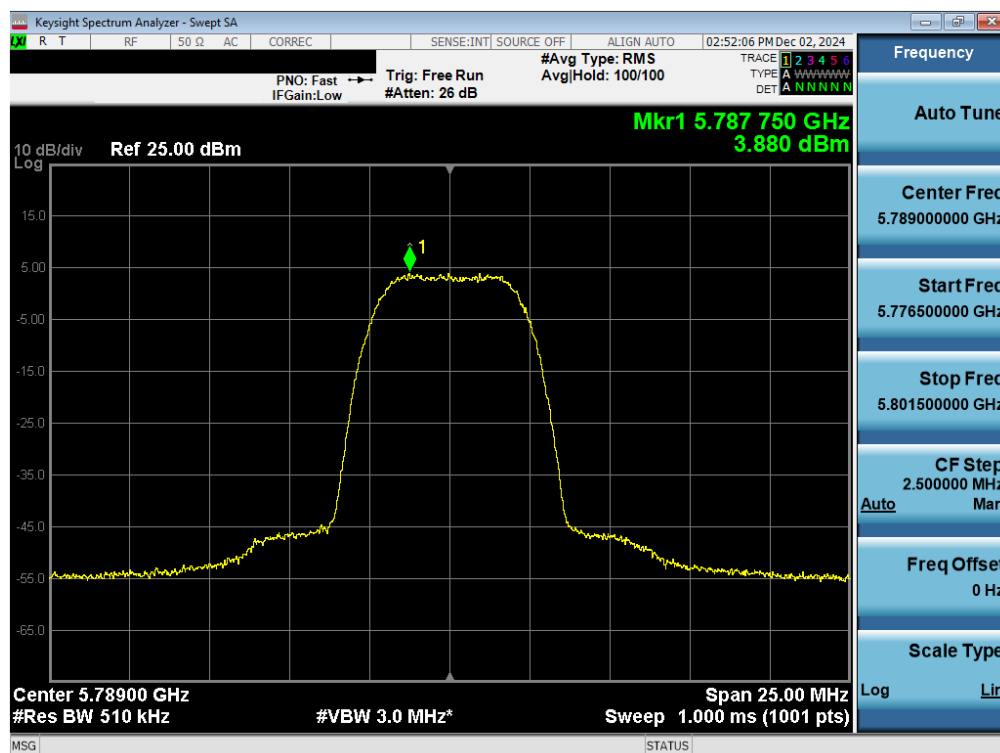
Plot 7-28. PSD Antenna WF7a (NB UNII HDR4, iPA – 5789MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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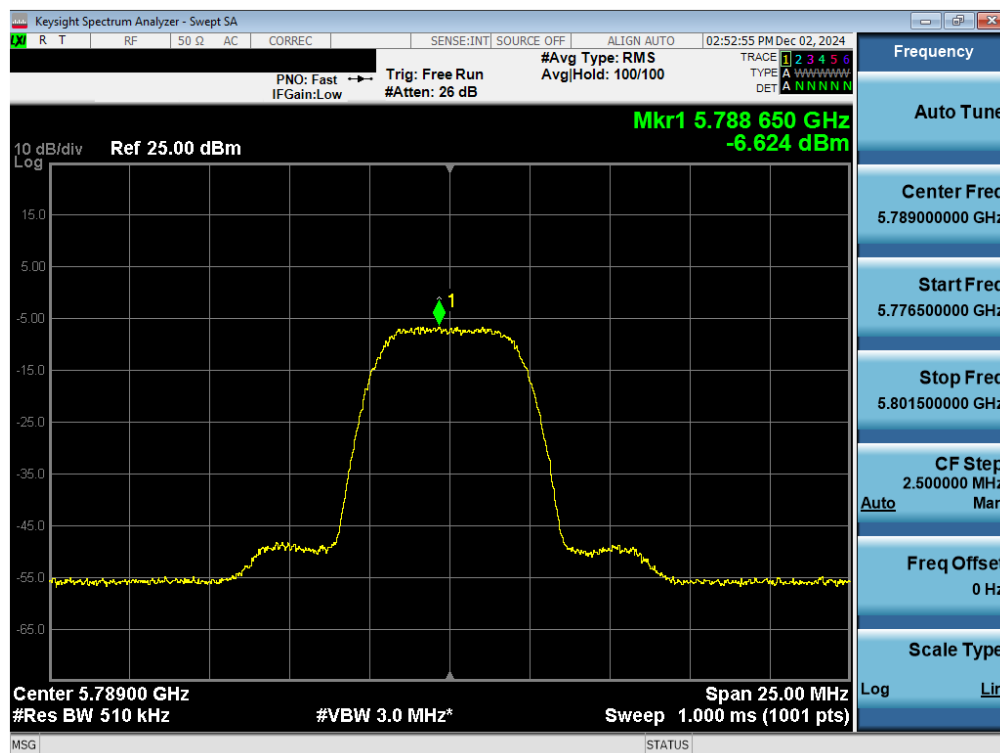
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Plot 7-29. PSD Antenna WF7a (NB UNII HDR8, ePA – 5789MHz)



Plot 7-30. PSD Antenna WF7a (NB UNII HDR8, iPA – 5789MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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## 7.5.2 Antenna WF2a Power Spectral Density Measurements

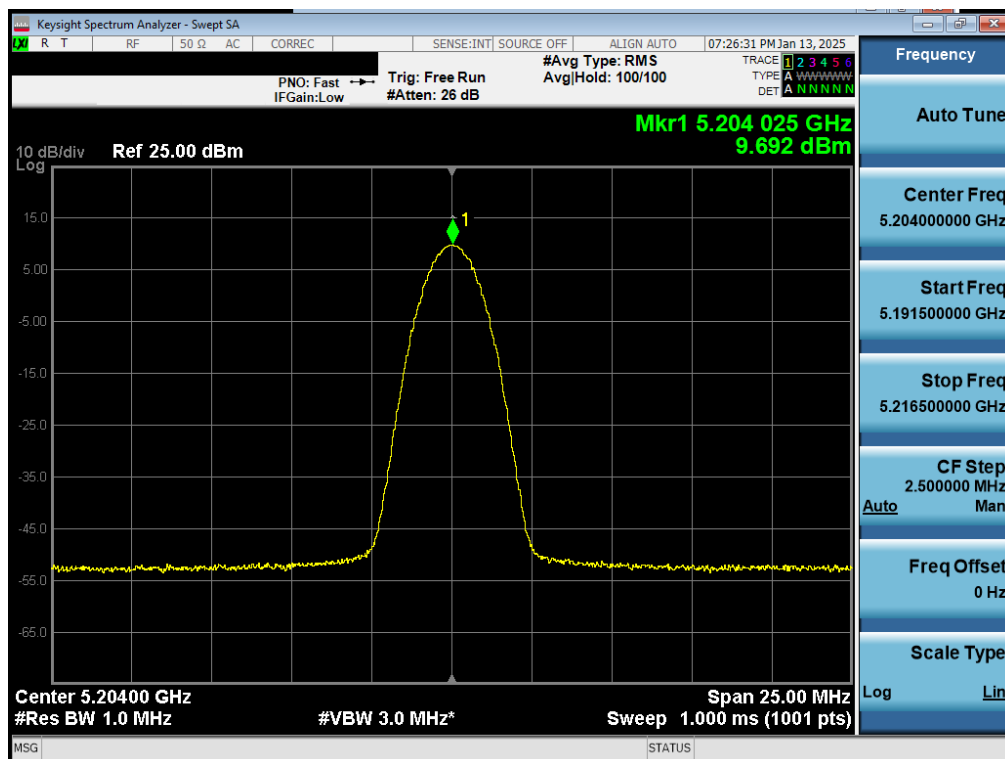
Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured Power Density [dBm/MHz]	Max Power Density [dBm/MHz]	Margin [dB]
5162	1.0	NB UNII BDR	ePA	9.44	11.00	-1.56
5204	1.0	NB UNII BDR	ePA	9.69	11.00	-1.31
5245	1.0	NB UNII BDR	ePA	9.90	11.00	-1.10
5162	1.0	NB UNII BDR	iPA	3.76	11.00	-7.25
5204	1.0	NB UNII BDR	iPA	4.01	11.00	-6.99
5245	1.0	NB UNII BDR	iPA	4.24	11.00	-6.76
5162	4.0	NB UNII HDR4	ePA	10.01	11.00	-0.99
5204	4.0	NB UNII HDR4	ePA	10.12	11.00	-0.88
5245	4.0	NB UNII HDR4	ePA	10.37	11.00	-0.63
5162	4.0	NB UNII HDR4	iPA	-3.68	11.00	-14.68
5204	4.0	NB UNII HDR4	iPA	-3.46	11.00	-14.46
5245	4.0	NB UNII HDR4	iPA	-3.32	11.00	-14.32
5162	8.0	NB UNII HDR8	ePA	7.39	11.00	-3.61
5204	8.0	NB UNII HDR8	ePA	7.33	11.00	-3.67
5245	8.0	NB UNII HDR8	ePA	7.47	11.00	-3.53
5162	8.0	NB UNII HDR8	iPA	-5.34	11.00	-16.34
5204	8.0	NB UNII HDR8	iPA	-6.08	11.00	-17.08
5245	8.0	NB UNII HDR8	iPA	-6.04	11.00	-17.04

**Table 7-14. Power Spectral Density Measurements Antenna WF2a**

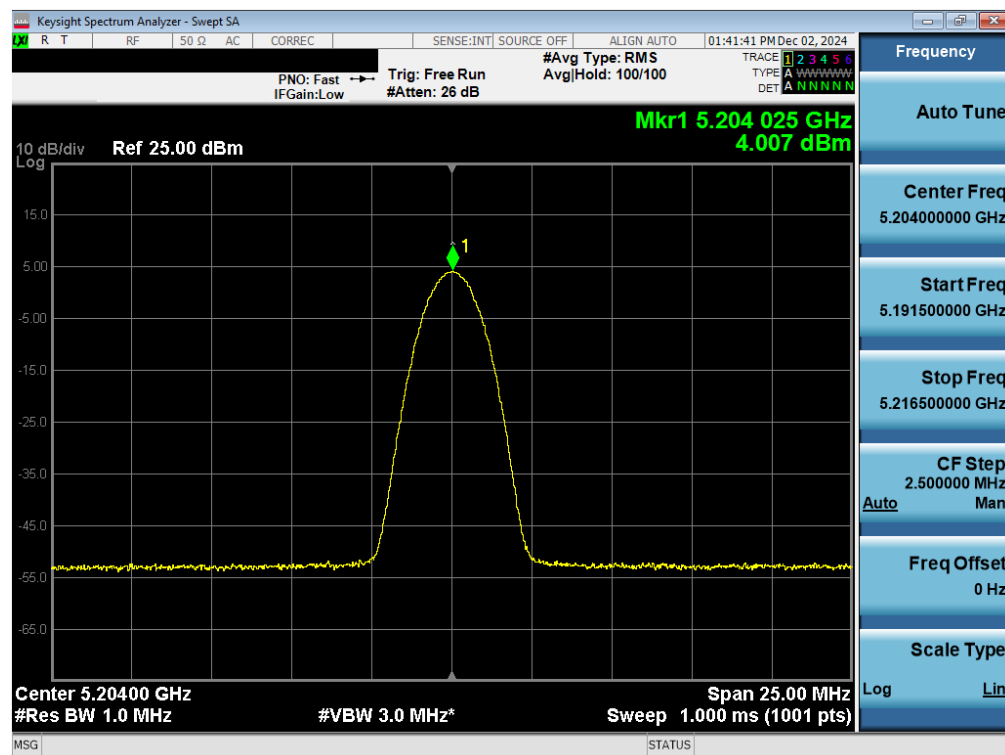
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 50 of 144

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Plot 7-31. PSD Antenna WF2a (NB UNII BDR, ePA – 5204MHz)

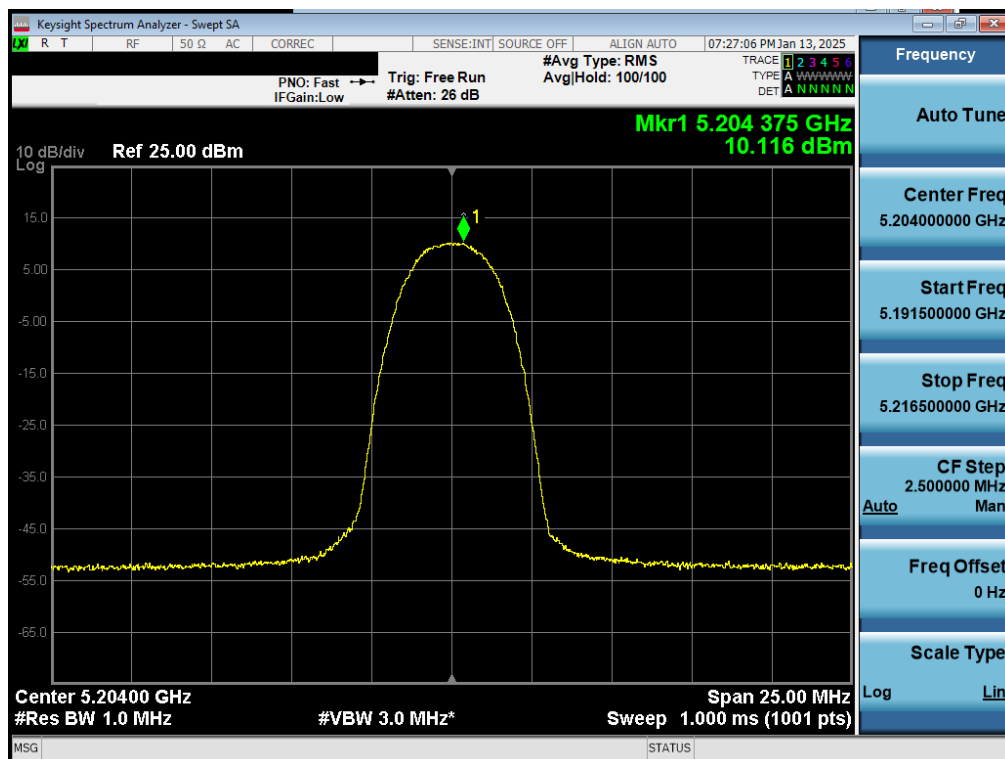


Plot 7-32. PSD Antenna WF2a (NB UNII BDR, iPA – 5204MHz)

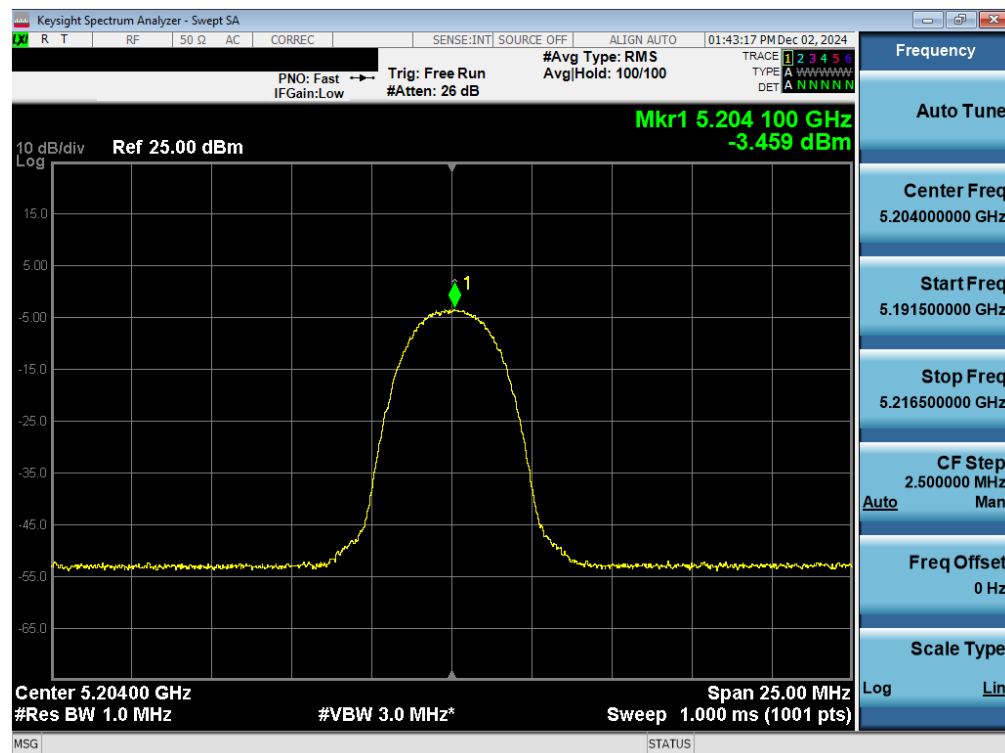
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 51 of 144

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Plot 7-33. PSD Antenna WF2a (NB UNII HDR4, ePA – 5204MHz)

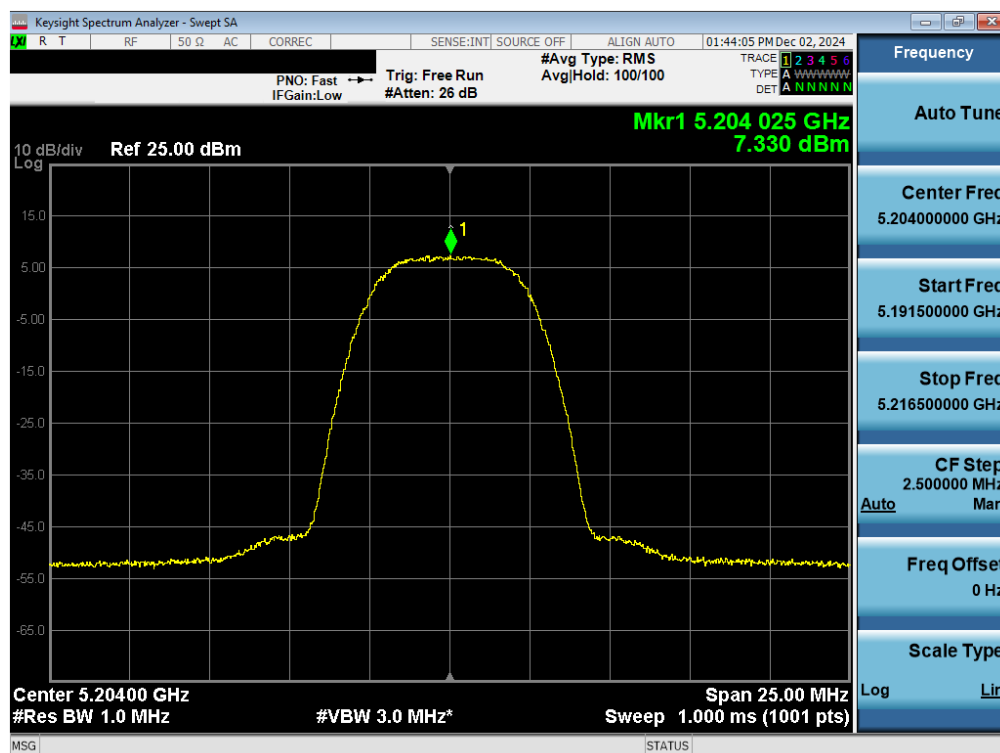


Plot 7-34. PSD Antenna WF2a (NB UNII HDR4, iPA – 5204MHz)

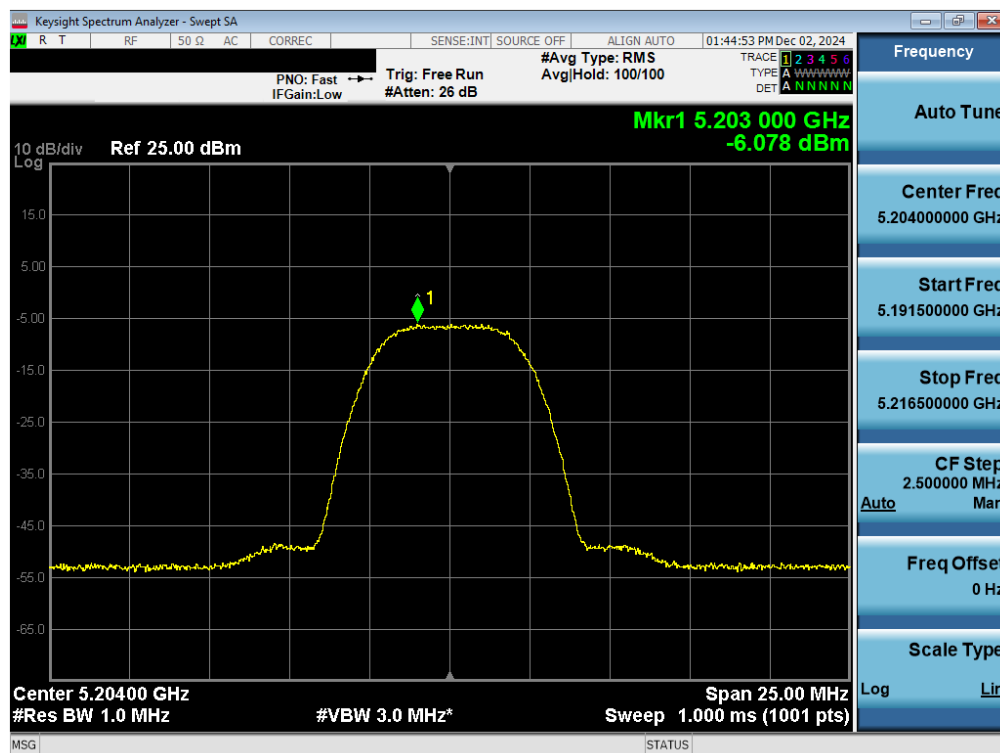
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 52 of 144

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Plot 7-35. PSD Antenna WF2a (NB UNII HDR8, ePA – 5204MHz)



Plot 7-36. PSD Antenna WF2a (NB UNII HDR8, iPA – 5204MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 53 of 144

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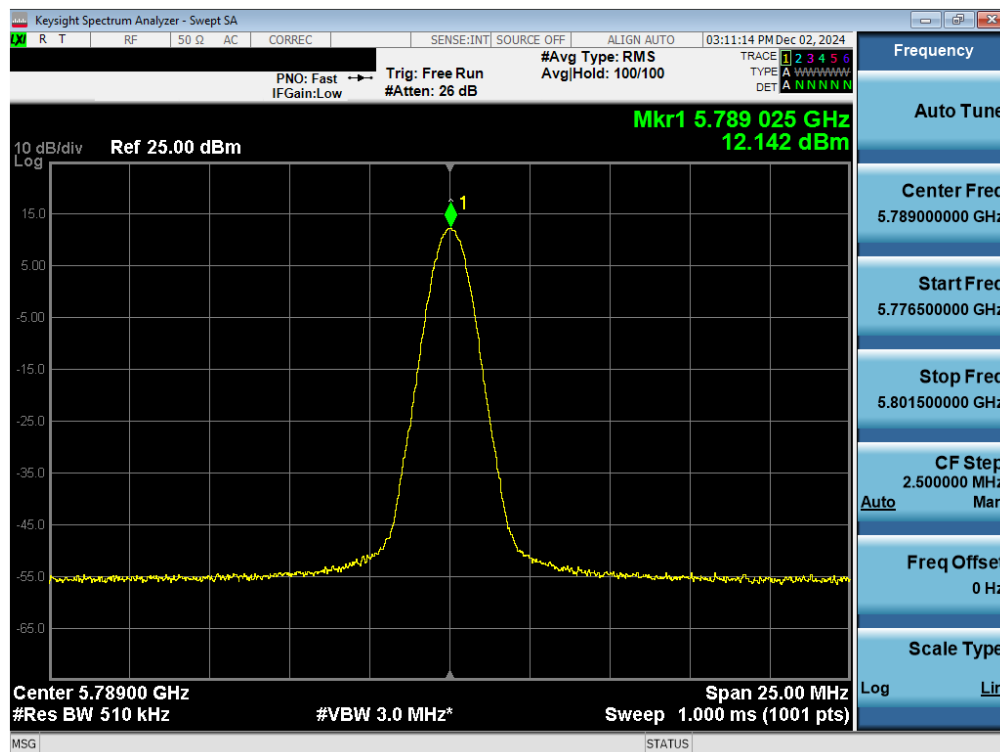
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Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured Power Density [dBm/500kHz]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
5733	1.0	NB UNII BDR	ePA	12.45	30.00	-17.55
5789	1.0	NB UNII BDR	ePA	12.14	30.00	-17.86
5844	1.0	NB UNII BDR	ePA	12.39	30.00	-17.61
5733	1.0	NB UNII BDR	iPA	3.99	30.00	-26.02
5789	1.0	NB UNII BDR	iPA	3.72	30.00	-26.28
5844	1.0	NB UNII BDR	iPA	3.75	30.00	-26.25
5733	4.0	NB UNII HDR4	ePA	8.38	30.00	-21.62
5789	4.0	NB UNII HDR4	ePA	8.36	30.00	-21.64
5844	4.0	NB UNII HDR4	ePA	8.12	30.00	-21.89
5733	4.0	NB UNII HDR4	iPA	-5.43	30.00	-35.43
5789	4.0	NB UNII HDR4	iPA	-4.88	30.00	-34.88
5844	4.0	NB UNII HDR4	iPA	-4.71	30.00	-34.71
5733	8.0	NB UNII HDR8	ePA	5.28	30.00	-24.72
5789	8.0	NB UNII HDR8	ePA	4.51	30.00	-25.49
5844	8.0	NB UNII HDR8	ePA	5.09	30.00	-24.91
5733	8.0	NB UNII HDR8	iPA	-7.97	30.00	-37.97
5789	8.0	NB UNII HDR8	iPA	-8.29	30.00	-38.29
5844	8.0	NB UNII HDR8	iPA	-7.70	30.00	-37.70

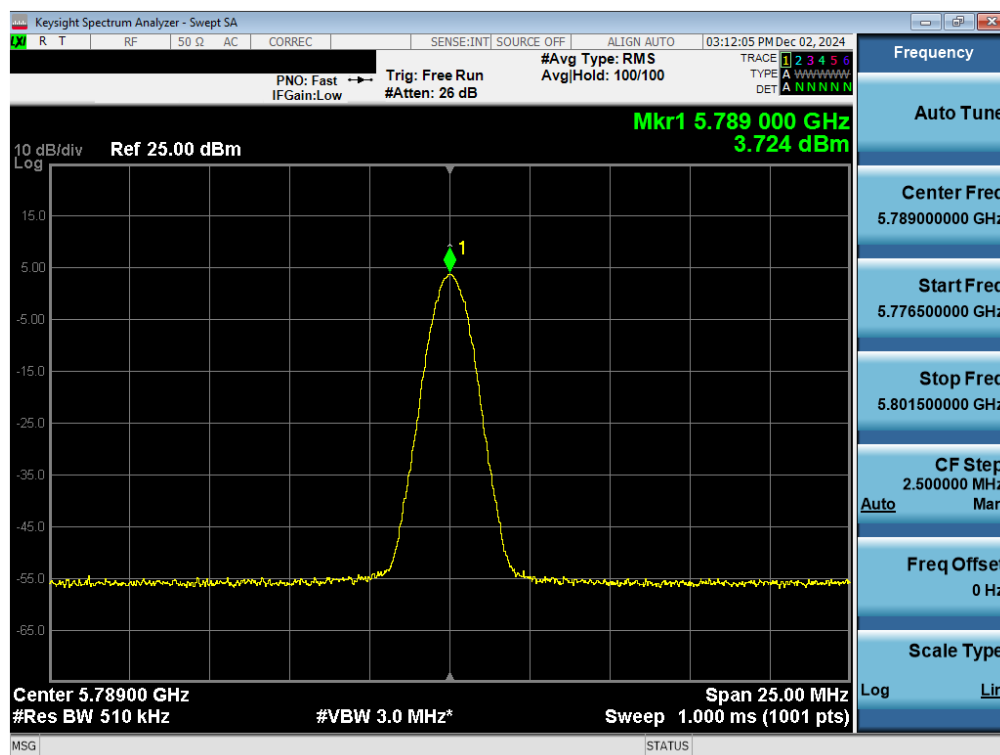
**Table 7-15. Power Spectral Density Measurements Antenna WF2a**

FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 54 of 144

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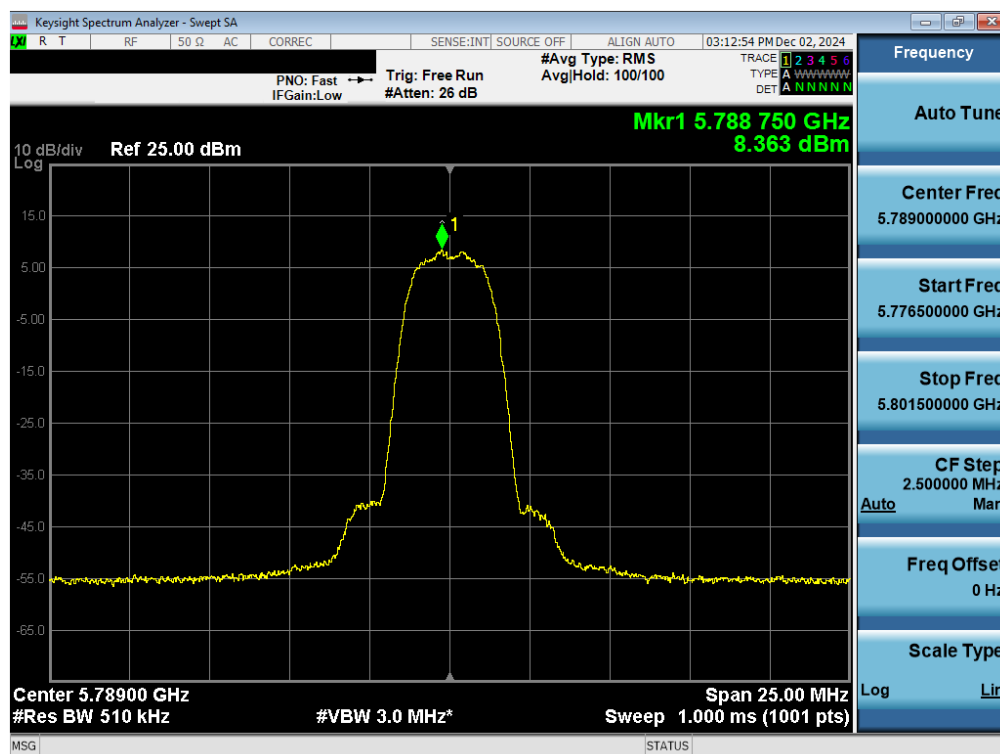
Plot 7-37. PSD Antenna WF2a (NB UNII BDR, ePA – 5789MHz)



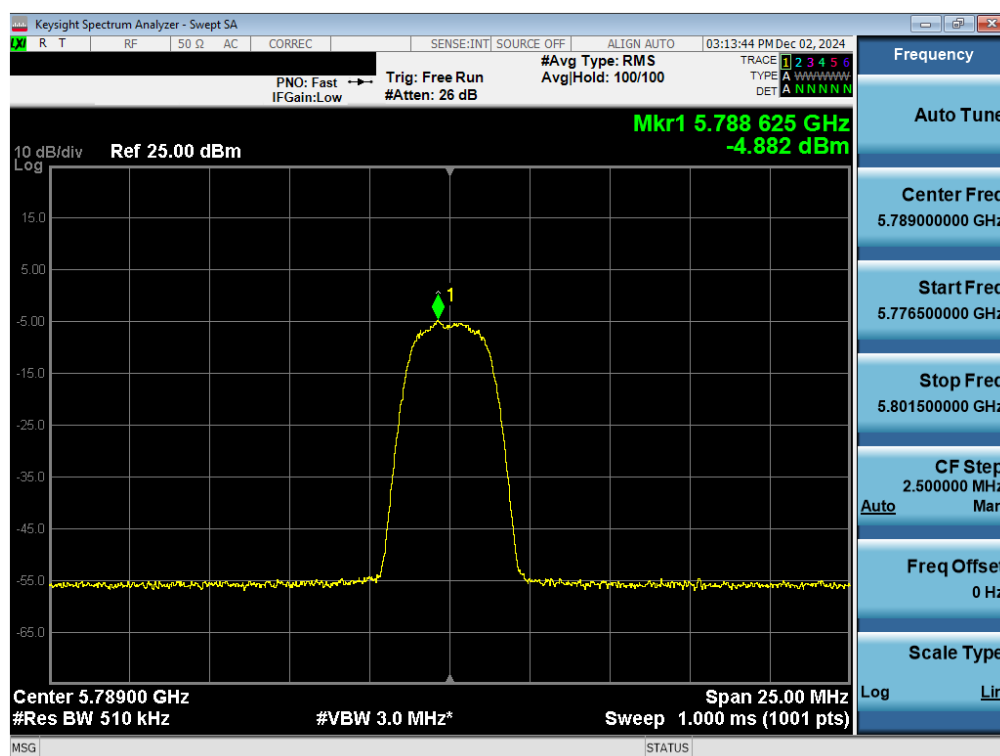
Plot 7-38. PSD Antenna WF2a (NB UNII BDR, iPA – 5789MHz)

FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 55 of 144

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Plot 7-39. PSD Antenna WF2a (NB UNII HDR4, ePA – 5789MHz)

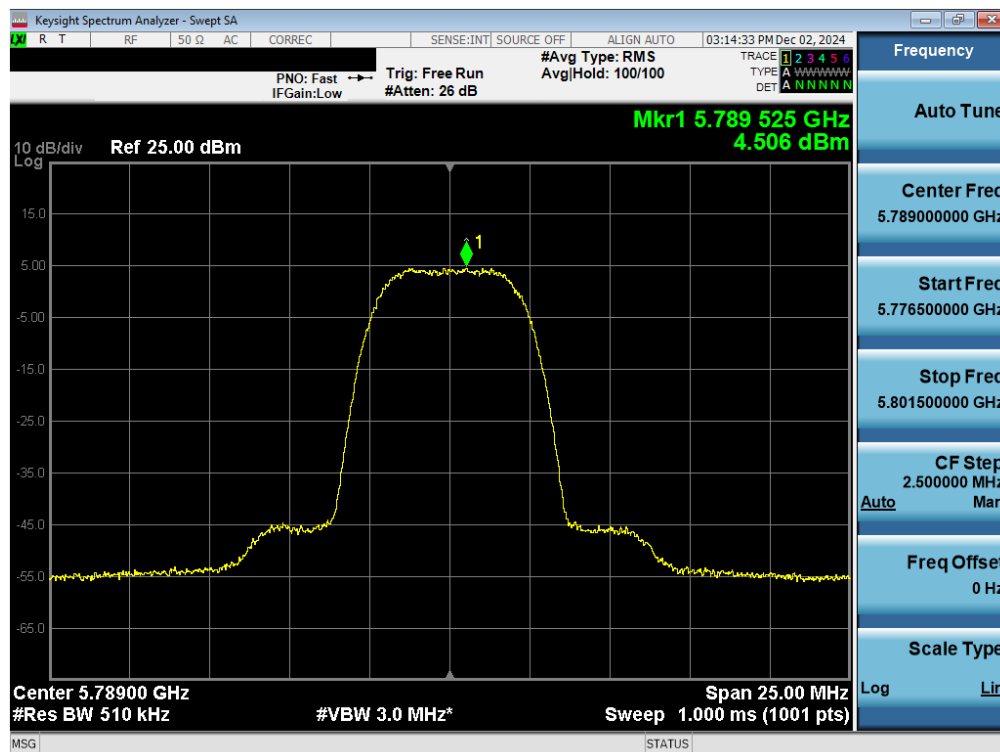


Plot 7-40. PSD Antenna WF2a (NB UNII HDR4, iPA – 5789MHz)

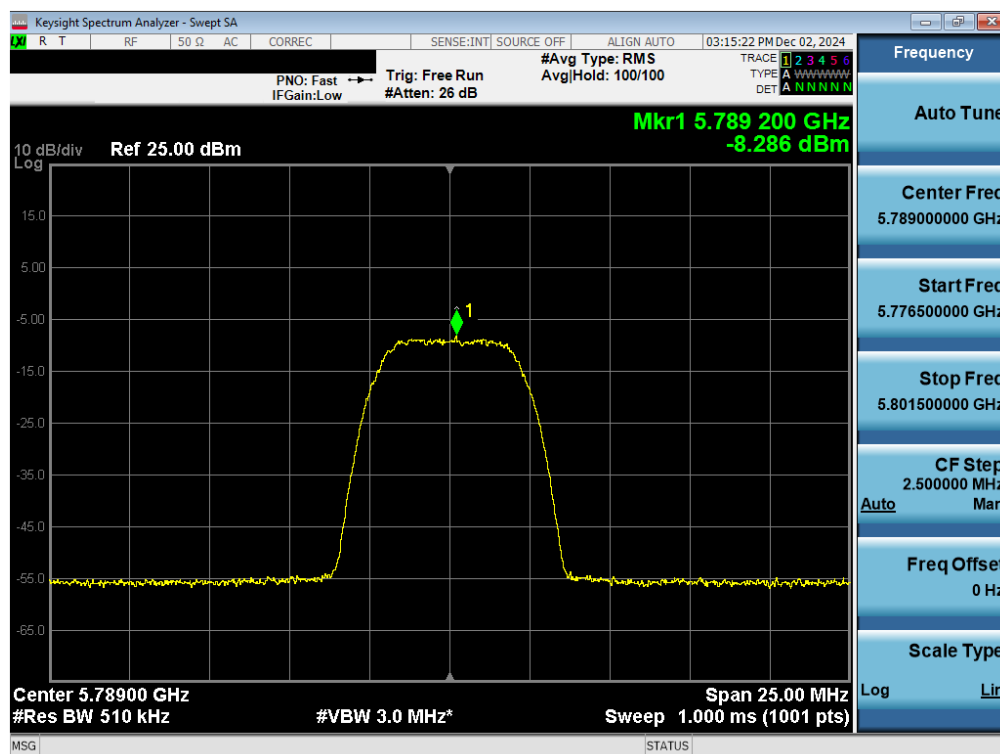
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 56 of 144

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Plot 7-41. PSD Antenna WF2a (NB UNII HDR8, ePA – 5789MHz)



Plot 7-42. PSD Antenna WF2a (NB UNII HDR8, iPA – 5789MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 57 of 144

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### 7.5.3 Antenna WF7b Power Spectral Density Measurements

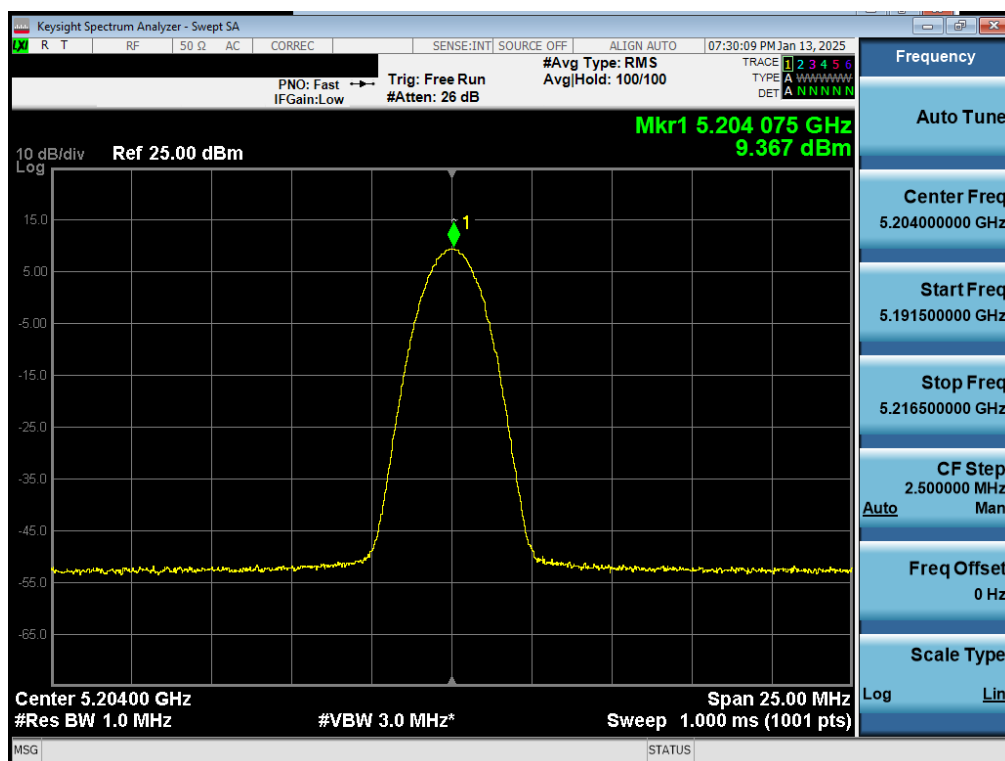
Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured Power Density [dBm/MHz]	Max Power Density [dBm/MHz]	Margin [dB]
5162	1.0	NB UNII BDR	ePA	9.55	11.00	-1.45
5204	1.0	NB UNII BDR	ePA	9.37	11.00	-1.63
5245	1.0	NB UNII BDR	ePA	10.12	11.00	-0.88
5162	1.0	NB UNII BDR	iPA	4.06	11.00	-6.94
5204	1.0	NB UNII BDR	iPA	4.46	11.00	-6.54
5245	1.0	NB UNII BDR	iPA	4.92	11.00	-6.08
5162	4.0	NB UNII HDR4	ePA	7.77	11.00	-3.23
5204	4.0	NB UNII HDR4	ePA	8.00	11.00	-3.00
5245	4.0	NB UNII HDR4	ePA	8.13	11.00	-2.87
5162	4.0	NB UNII HDR4	iPA	-3.94	11.00	-14.94
5204	4.0	NB UNII HDR4	iPA	-3.70	11.00	-14.70
5245	4.0	NB UNII HDR4	iPA	-2.82	11.00	-13.82
5162	8.0	NB UNII HDR8	ePA	4.97	11.00	-6.03
5204	8.0	NB UNII HDR8	ePA	5.10	11.00	-5.90
5245	8.0	NB UNII HDR8	ePA	4.97	11.00	-6.03
5162	8.0	NB UNII HDR8	iPA	-6.48	11.00	-17.48
5204	8.0	NB UNII HDR8	iPA	-6.35	11.00	-17.35
5245	8.0	NB UNII HDR8	iPA	-6.07	11.00	-17.07

**Table 7-16. Power Spectral Density Measurements Antenna WF7b**

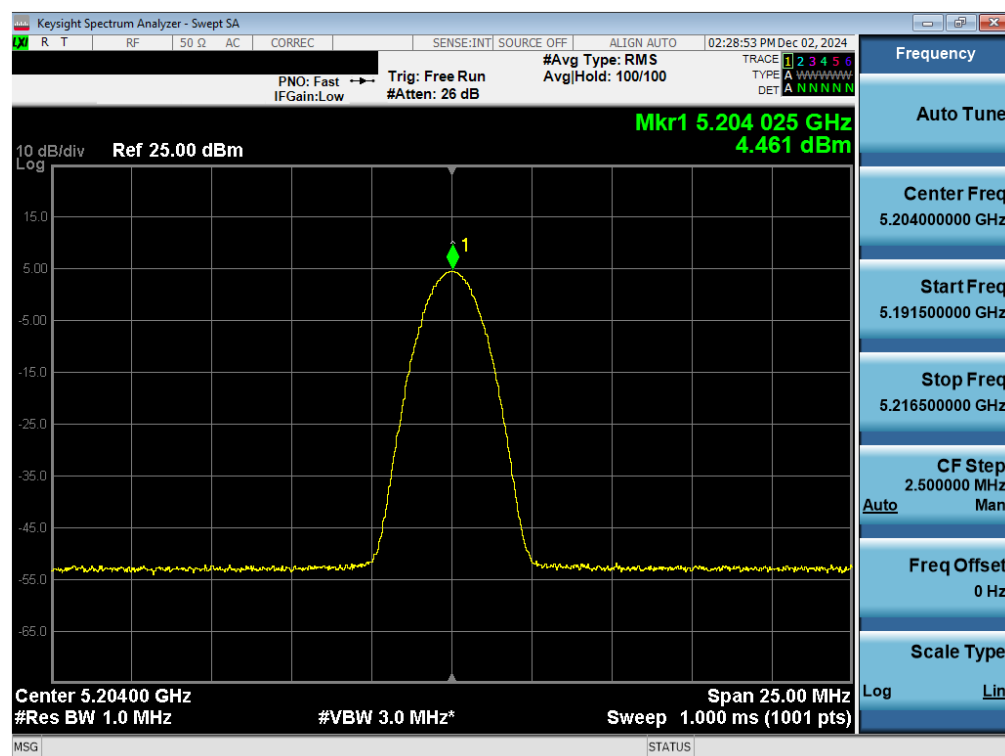
FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 58 of 144

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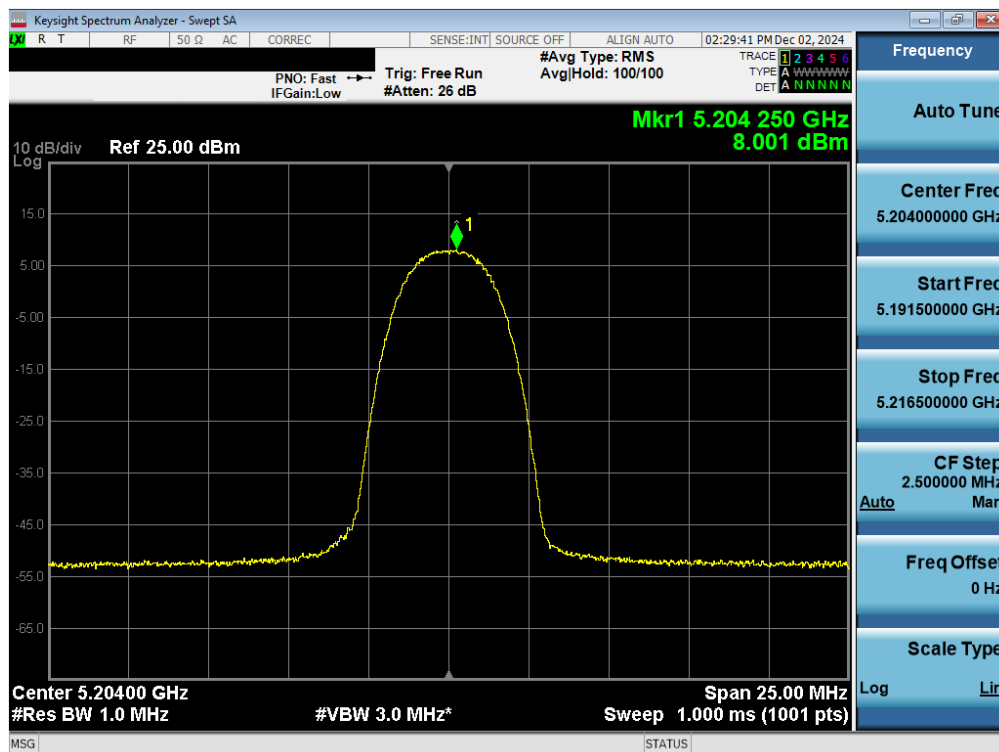
Plot 7-43. PSD Antenna WF7b (NB UNII BDR, ePA – 5204MHz)



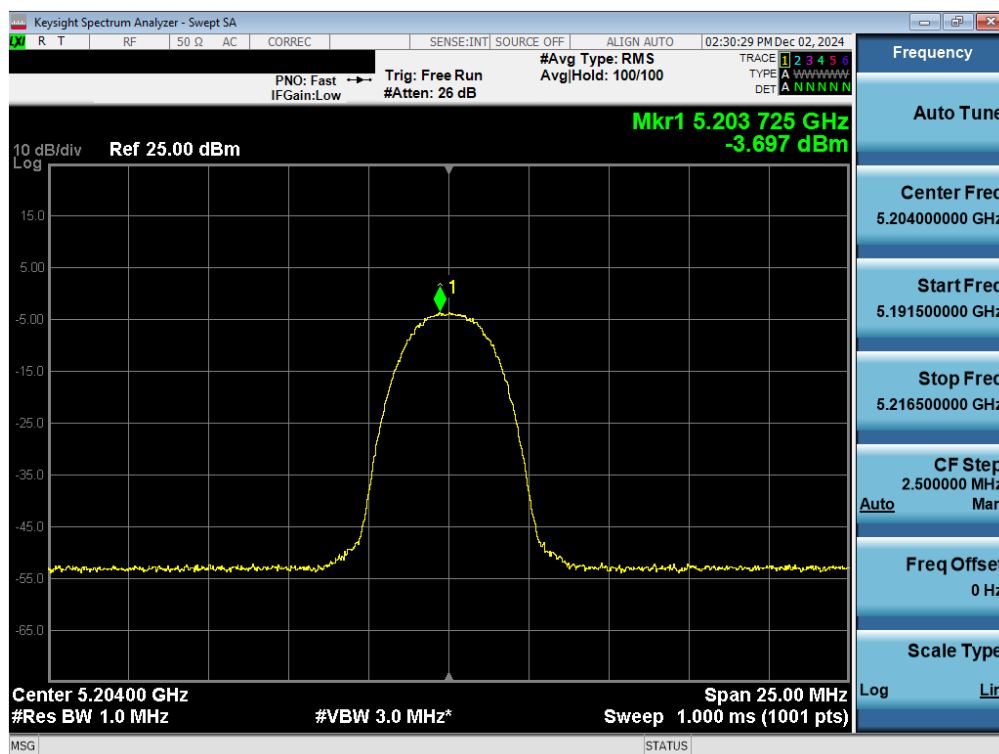
Plot 7-44. PSD Antenna WF7b (NB UNII BDR, iPA – 5204MHz)

FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 59 of 144

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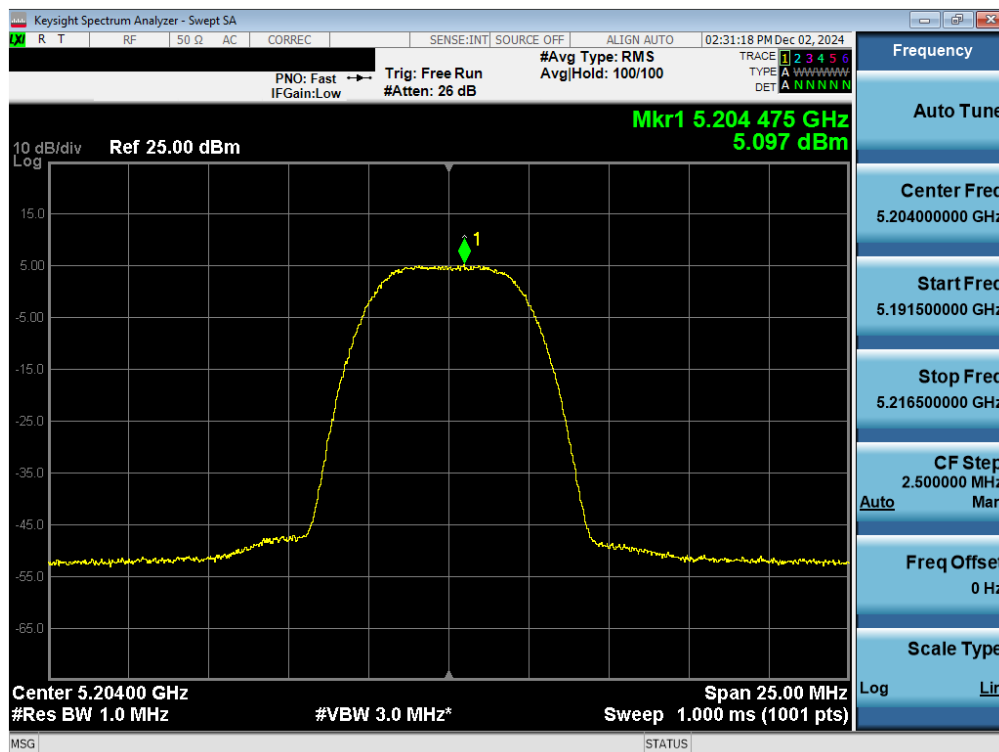
Plot 7-45. PSD Antenna WF7b (NB UNII HDR4, ePA – 5204MHz)



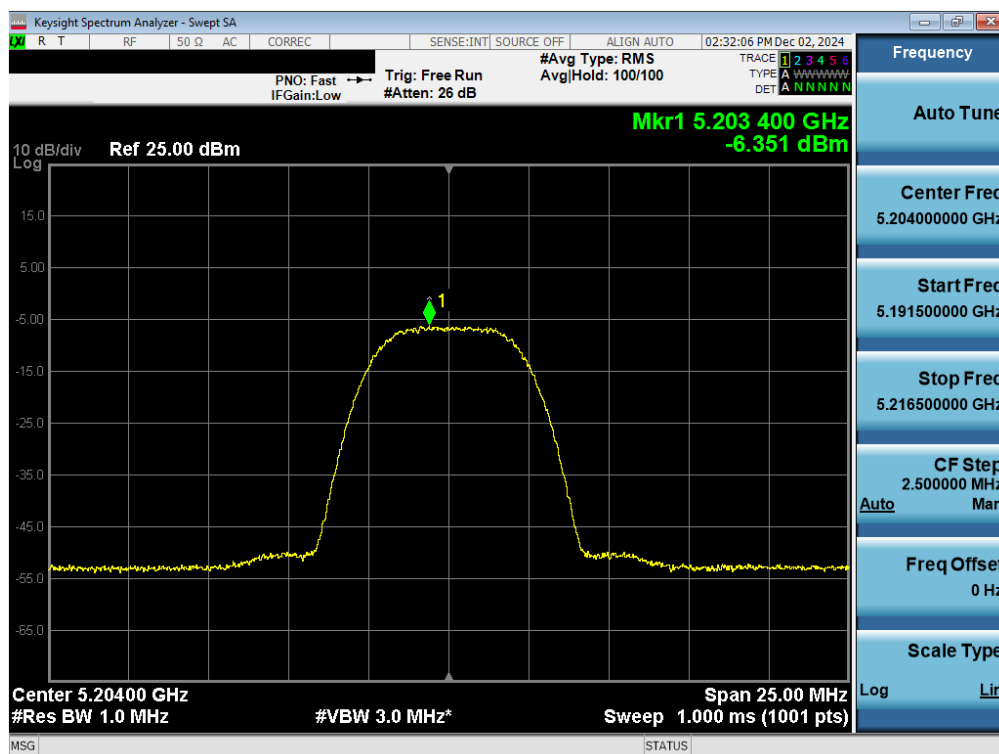
Plot 7-46. PSD Antenna WF7b (NB UNII HDR4, iPA – 5204MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 60 of 144

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Plot 7-47. PSD Antenna WF7b (NB UNII HDR8, ePA – 5204MHz)



Plot 7-48. PSD Antenna WF7b (NB UNII HDR8, iPA – 5204MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 61 of 144

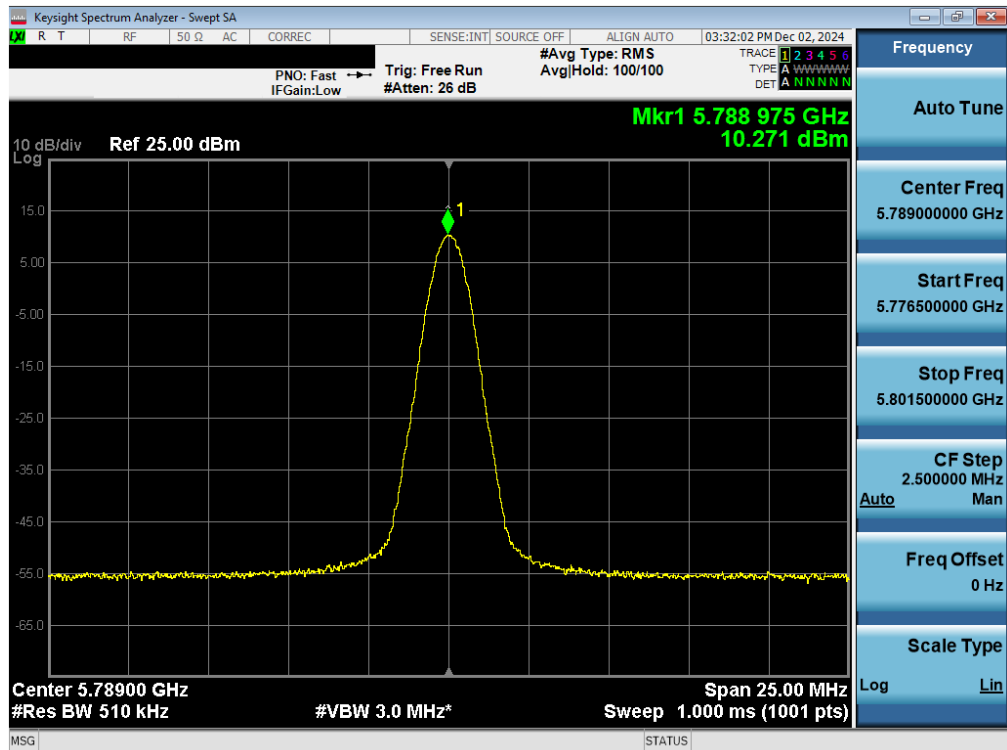
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Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Measured Power Density [dBm/500kHz]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
5733	1.0	NB UNII BDR	ePA	11.04	30.00	-18.96
5789	1.0	NB UNII BDR	ePA	10.27	30.00	-19.73
5844	1.0	NB UNII BDR	ePA	10.16	30.00	-19.84
5733	1.0	NB UNII BDR	iPA	4.07	30.00	-25.93
5789	1.0	NB UNII BDR	iPA	3.59	30.00	-26.41
5844	1.0	NB UNII BDR	iPA	3.63	30.00	-26.37
5733	4.0	NB UNII HDR4	ePA	6.70	30.00	-23.30
5789	4.0	NB UNII HDR4	ePA	6.82	30.00	-23.19
5844	4.0	NB UNII HDR4	ePA	6.54	30.00	-23.46
5733	4.0	NB UNII HDR4	iPA	-6.00	30.00	-36.00
5789	4.0	NB UNII HDR4	iPA	-5.95	30.00	-35.95
5844	4.0	NB UNII HDR4	iPA	-5.33	30.00	-35.33
5733	8.0	NB UNII HDR8	ePA	3.18	30.00	-26.82
5789	8.0	NB UNII HDR8	ePA	3.22	30.00	-26.78
5844	8.0	NB UNII HDR8	ePA	3.57	30.00	-26.43
5733	8.0	NB UNII HDR8	iPA	-7.91	30.00	-37.91
5789	8.0	NB UNII HDR8	iPA	-7.81	30.00	-37.81
5844	8.0	NB UNII HDR8	iPA	-7.33	30.00	-37.33

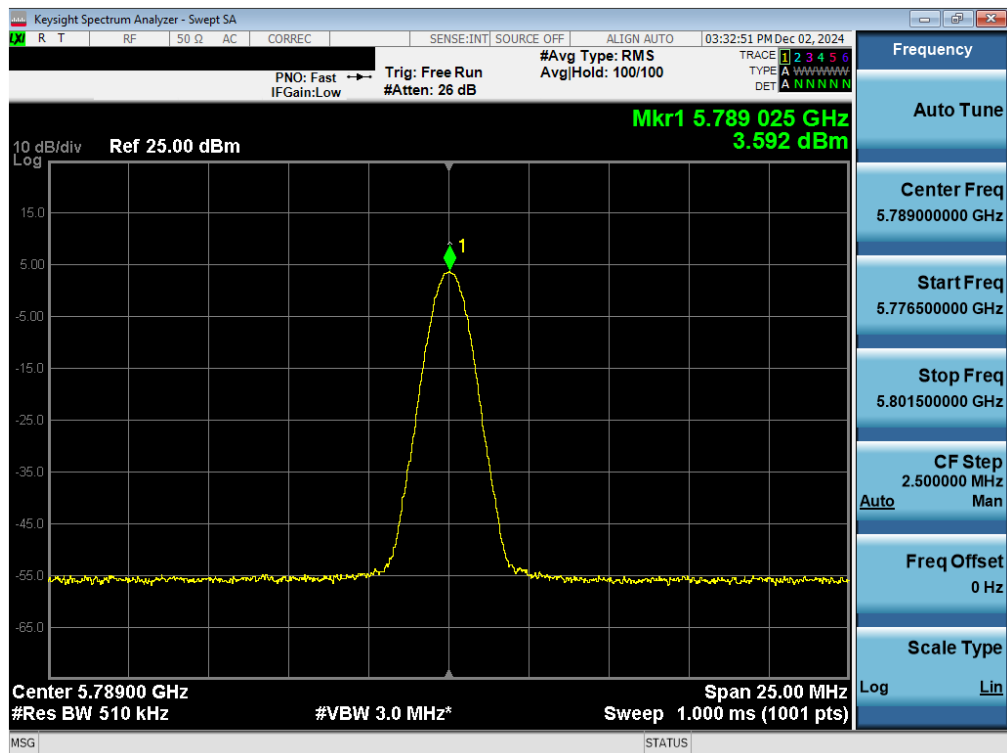
**Table 7-17. Power Spectral Density Measurements Antenna WF7b**

FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 62 of 144

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Plot 7-49. PSD Antenna WF7b (NB UNII BDR, ePA – 5789MHz)

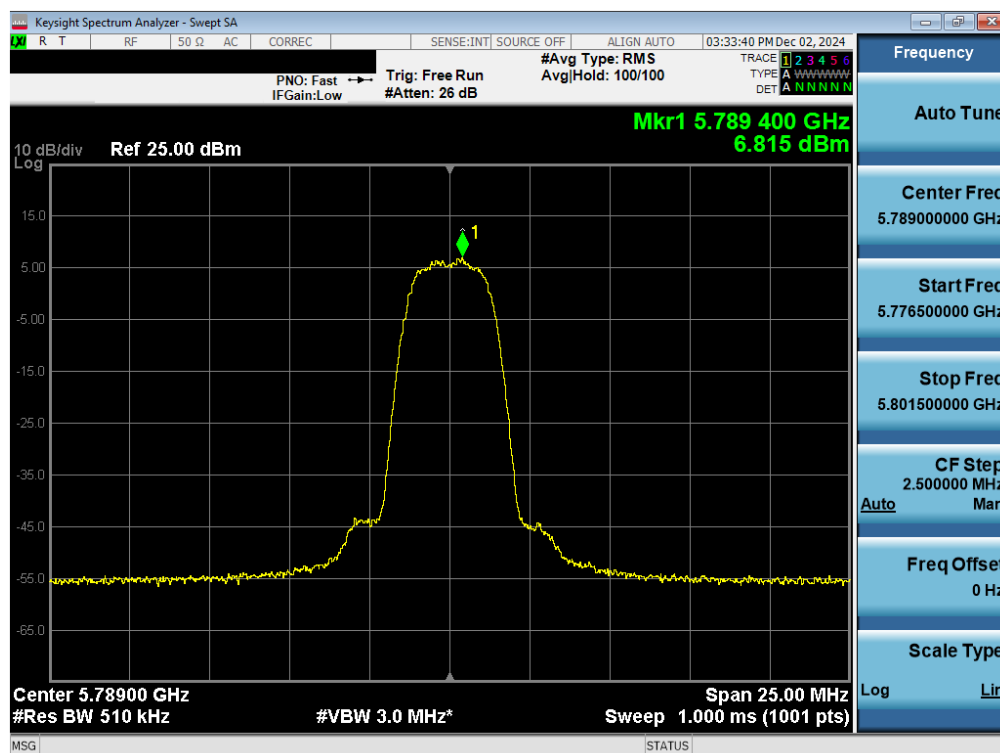


Plot 7-50. PSD Antenna WF7b (NB UNII BDR, iPA – 5789MHz)

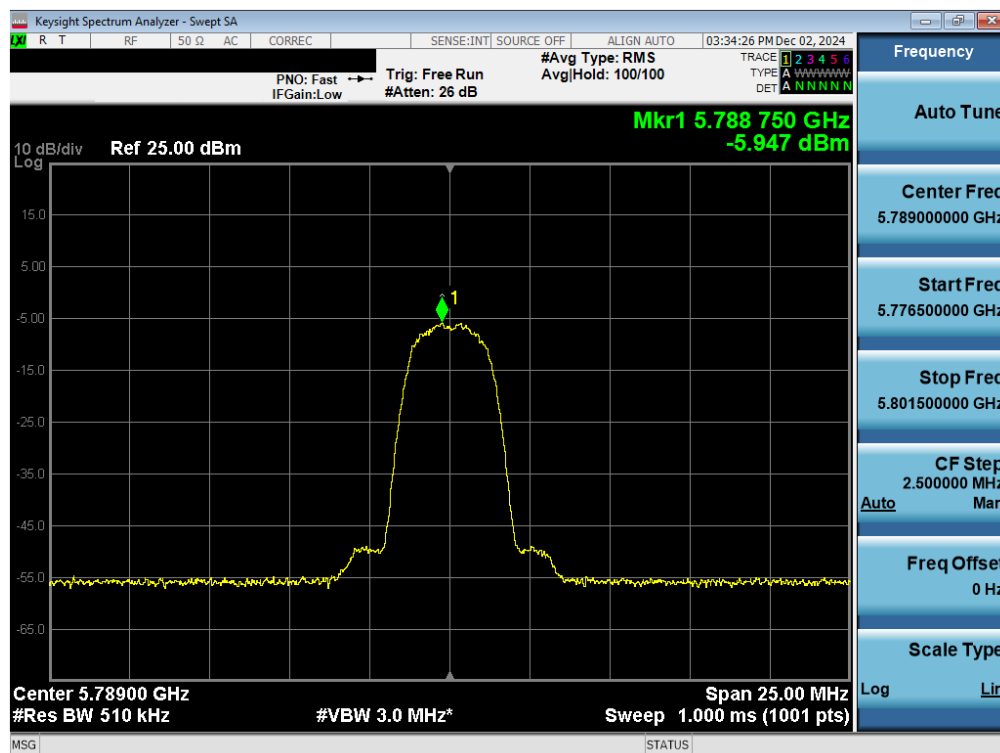
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 63 of 144

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Plot 7-51. PSD Antenna WF7b (NB UNII HDR4, ePA – 5789MHz)



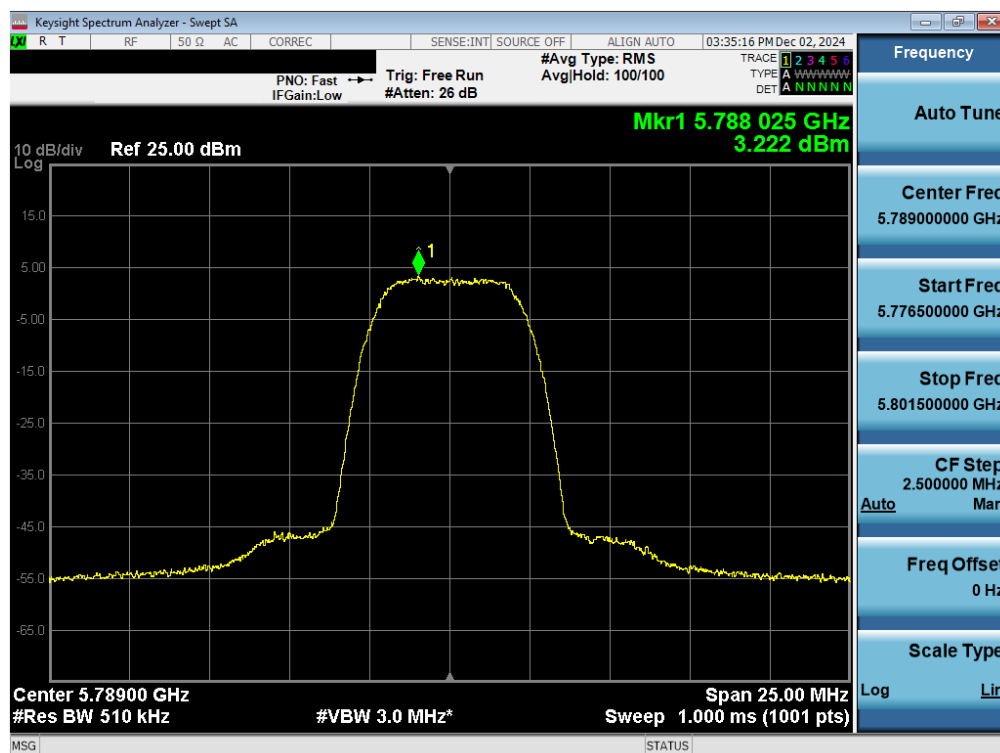
Plot 7-52. PSD Antenna WF7b (NB UNII HDR4, iPA – 5789MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 64 of 144

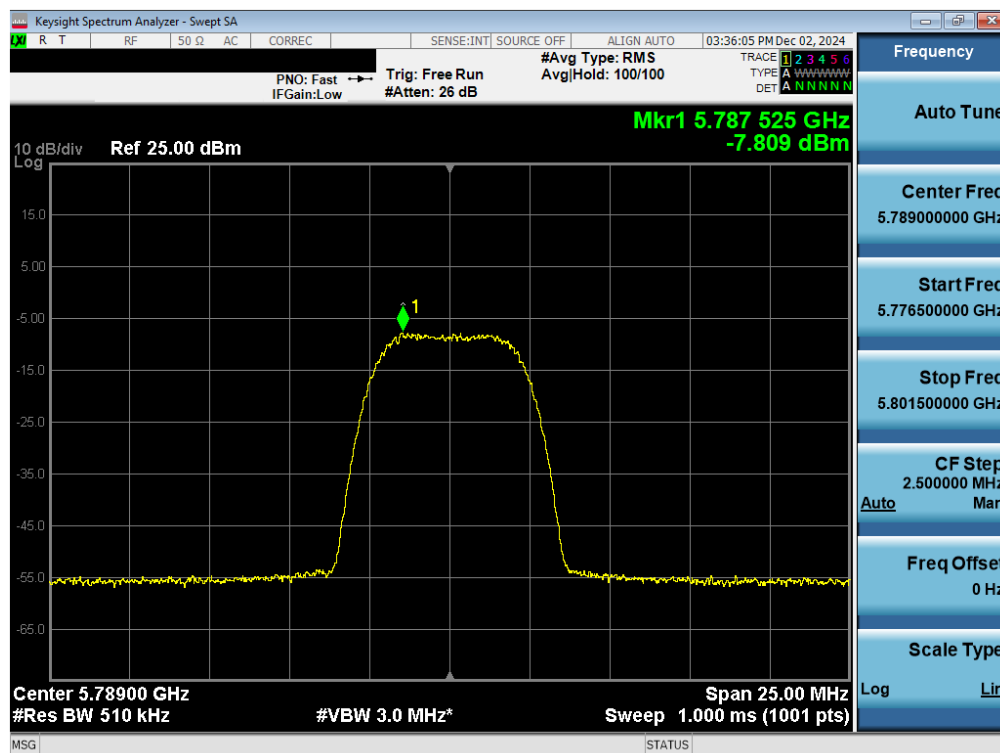
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Plot 7-53. PSD Antenna WF7b (NB UNII HDR8, ePA – 5789MHz)



Plot 7-54. PSD Antenna WF7b (NB UNII HDR8, iPA – 5789MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 65 of 144

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## 7.5.4 TxBF Power Spectral Density Measurements

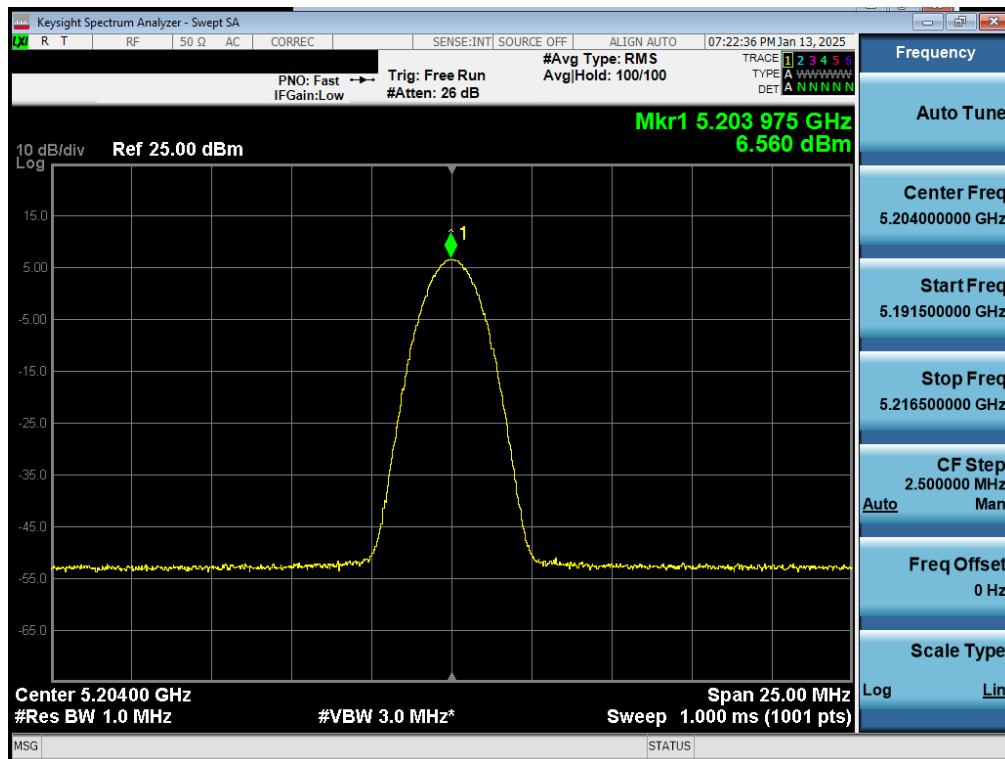
Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Antenna WF7a Power Density [dBm/MHz]	Antenna WF2a Power Density [dBm/MHz]	Summed Power Density [dBm/MHz]	Max Power Density [dBm/MHz]	Margin [dB]
5162	1.0	NB UNII BDR	ePA	6.73	6.19	9.48	11.00	-1.52
5204	1.0	NB UNII BDR	ePA	6.56	6.11	9.35	11.00	-1.65
5245	1.0	NB UNII BDR	ePA	6.67	6.29	9.49	11.00	-1.51
5162	1.0	NB UNII BDR	iPA	5.61	4.15	7.95	11.00	-3.05
5204	1.0	NB UNII BDR	iPA	5.83	4.44	8.20	11.00	-2.80
5245	1.0	NB UNII BDR	iPA	5.67	4.71	8.22	11.00	-2.78
5162	4.0	NB UNII HDR4	ePA	6.46	6.06	9.28	11.00	-1.72
5204	4.0	NB UNII HDR4	ePA	6.16	6.06	9.12	11.00	-1.88
5245	4.0	NB UNII HDR4	ePA	6.46	6.26	9.37	11.00	-1.63
5162	4.0	NB UNII HDR4	iPA	-1.51	-3.49	0.62	11.00	-10.38
5204	4.0	NB UNII HDR4	iPA	-1.12	-3.04	1.03	11.00	-9.97
5245	4.0	NB UNII HDR4	iPA	-1.79	-2.94	0.68	11.00	-10.32
5162	8.0	NB UNII HDR8	ePA	6.35	7.30	9.86	11.00	-1.14
5204	8.0	NB UNII HDR8	ePA	6.16	7.19	9.72	11.00	-1.28
5245	8.0	NB UNII HDR8	ePA	6.77	7.50	10.16	11.00	-0.84
5162	8.0	NB UNII HDR8	iPA	-4.67	-5.15	-1.89	11.00	-12.89
5204	8.0	NB UNII HDR8	iPA	-4.18	-5.78	-1.90	11.00	-12.90
5245	8.0	NB UNII HDR8	iPA	-4.30	-5.64	-1.91	11.00	-12.91

**Table 7-18. Power Spectral Density Measurements TxBF**

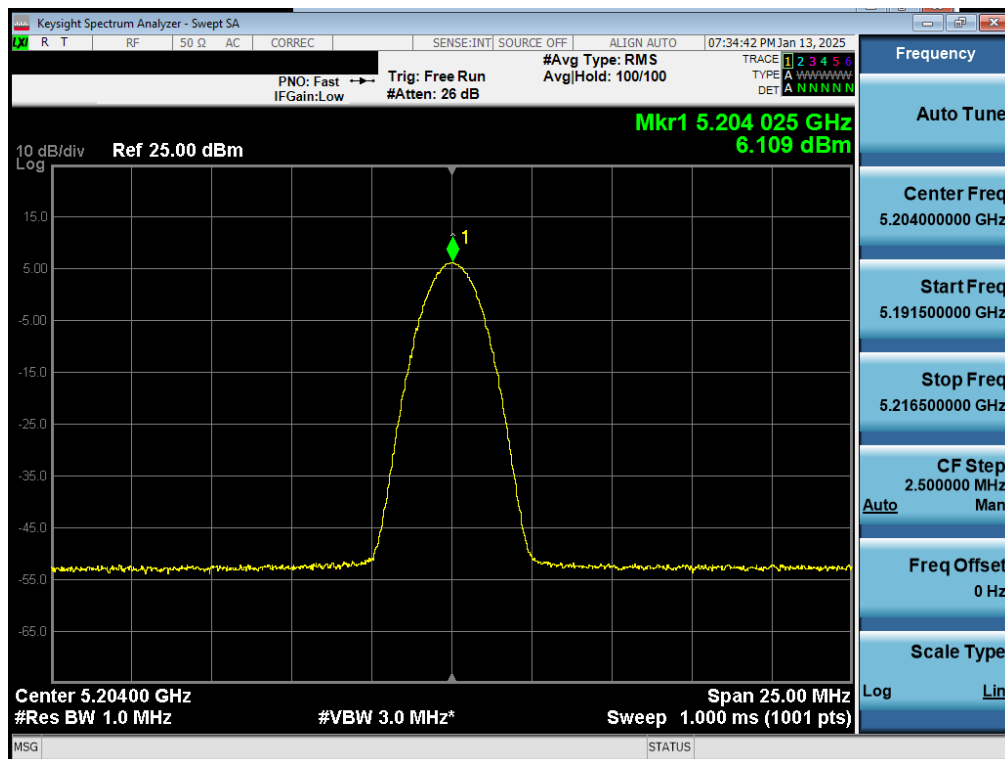
FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 66 of 144

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Plot 7-55. PSD TxBF Antenna WF7a (NB UNII BDR, ePA – 5204MHz)

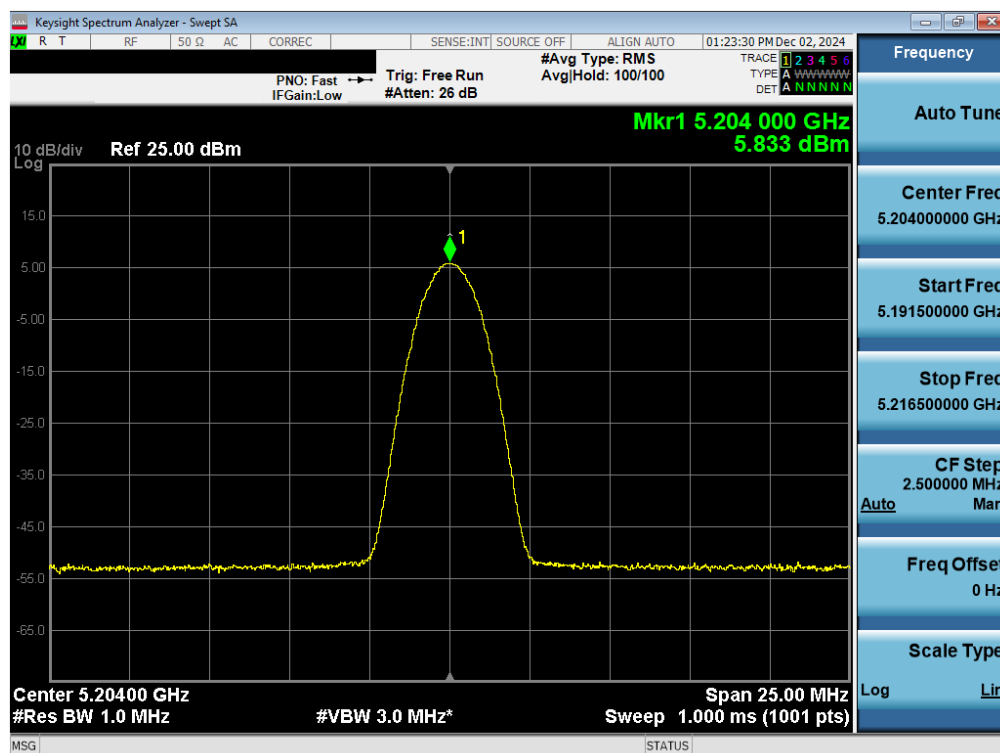


Plot 7-56. PSD TxBF Antenna WF2a (NB UNII BDR, ePA – 5204MHz)

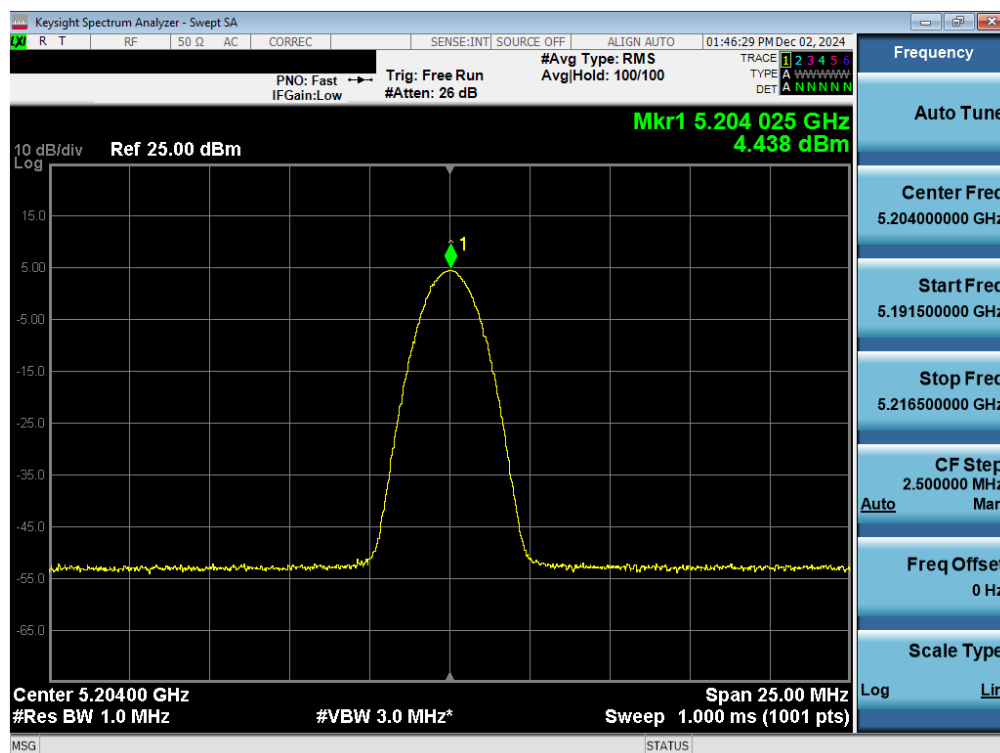
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 67 of 144

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Plot 7-57. PSD TxBF Antenna WF7a (NB UNII BDR, iPA – 5204MHz)

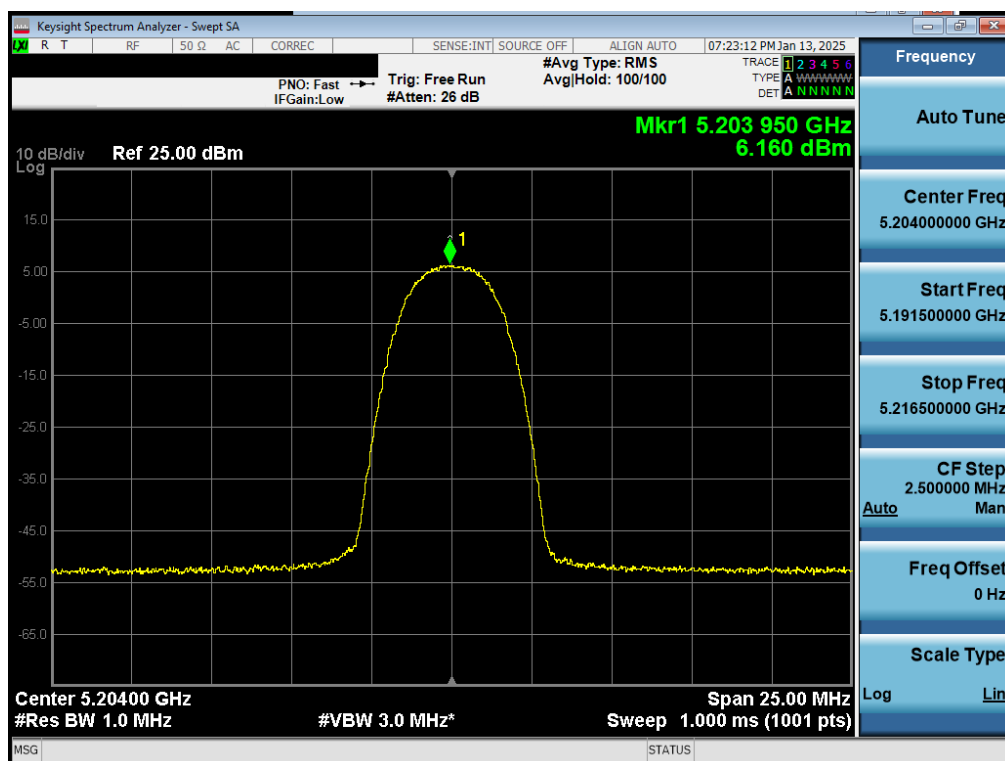


Plot 7-58. PSD TxBF Antenna WF2a (NB UNII BDR, iPA – 5204MHz)

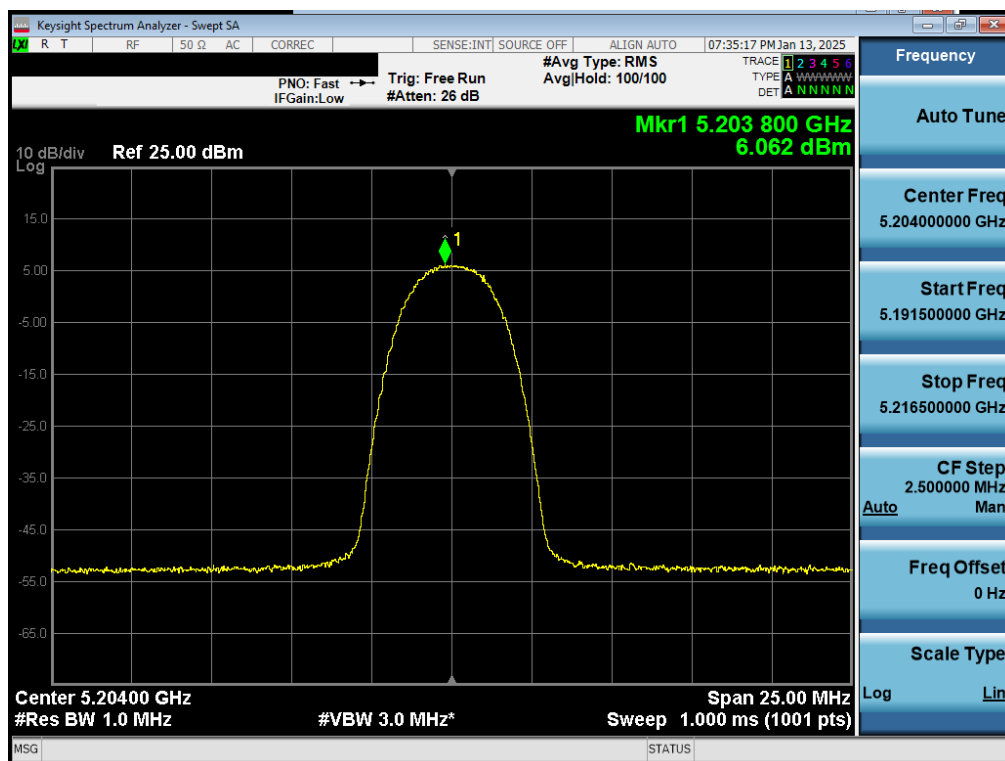
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 68 of 144

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Plot 7-59. PSD TxBF Antenna WF7a (NB UNII HDR4, ePA - 5204MHz)

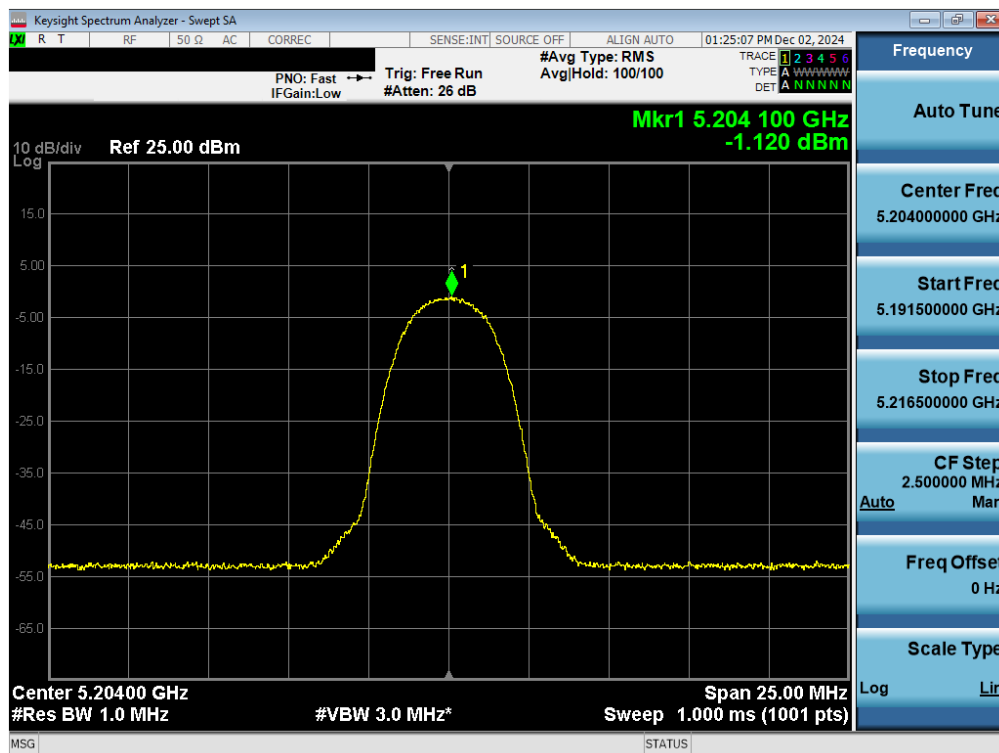


Plot 7-60. PSD TxBF Antenna WF2a (NB UNII HDR4, ePA - 5204MHz)

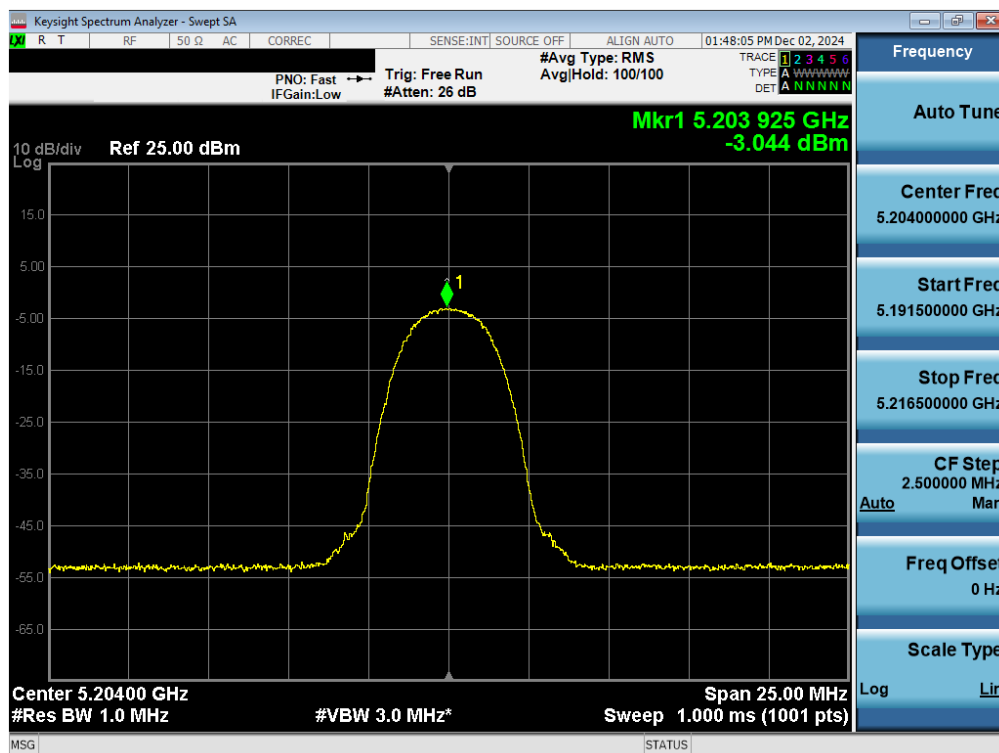
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 69 of 144

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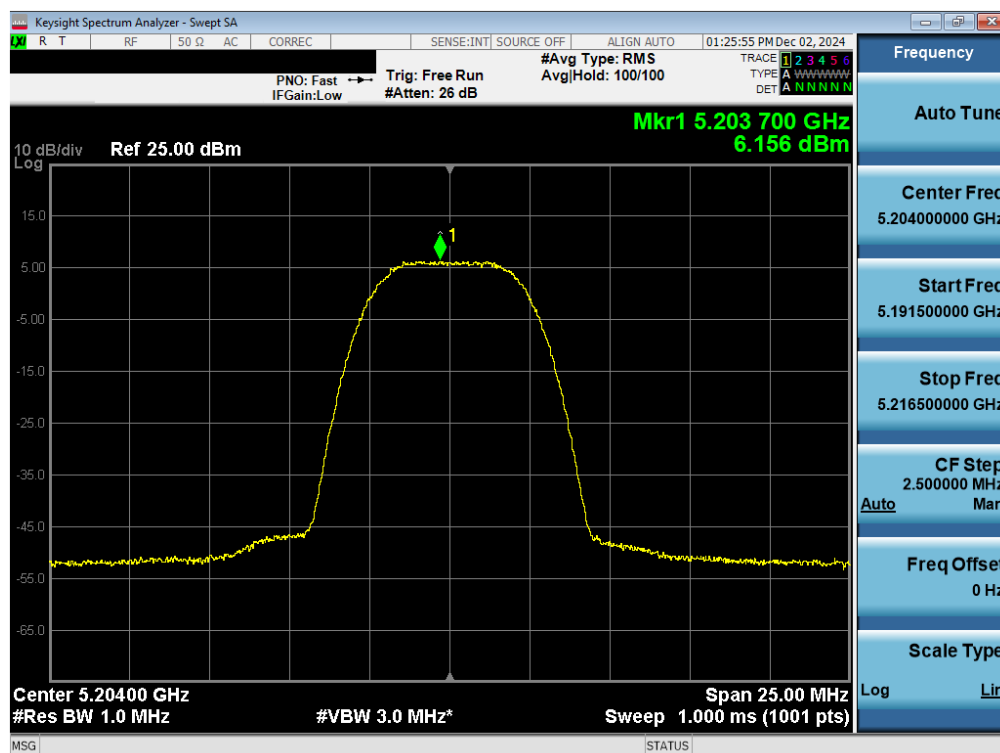
Plot 7-61. PSD TxBF Antenna WF7a (NB UNII HDR4, iPA – 5204MHz)



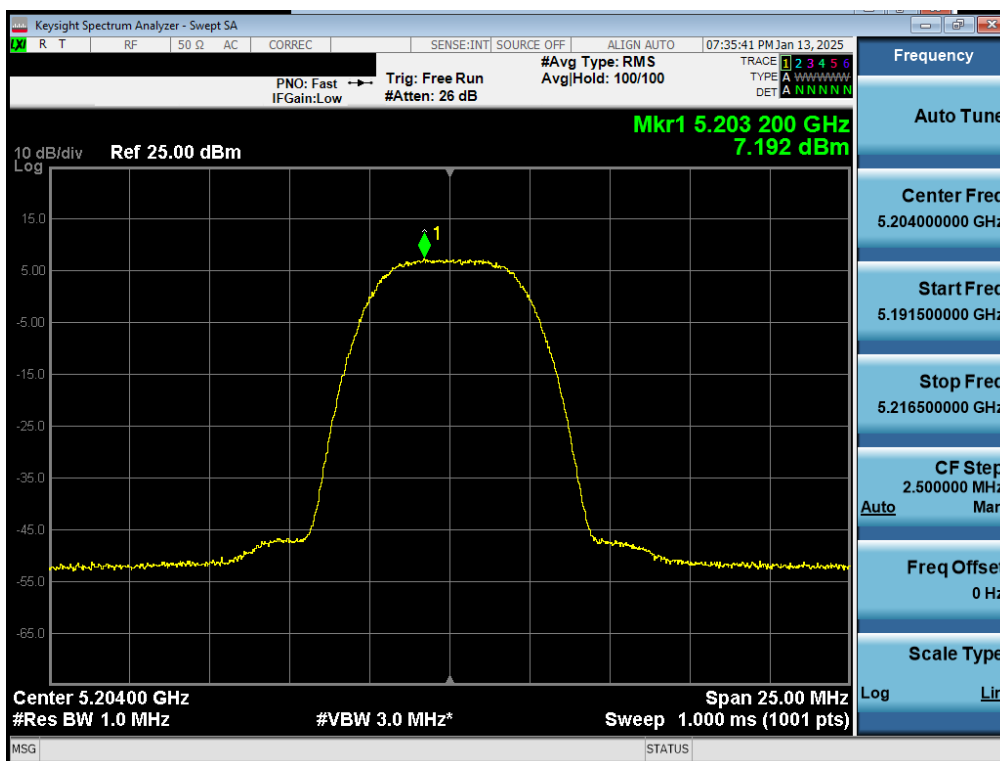
Plot 7-62. PSD TxBF Antenna WF2a (NB UNII HDR4, iPA – 5204MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 70 of 144

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Plot 7-63. PSD TxBF Antenna WF7a (NB UNII HDR8, ePA – 5204MHz)

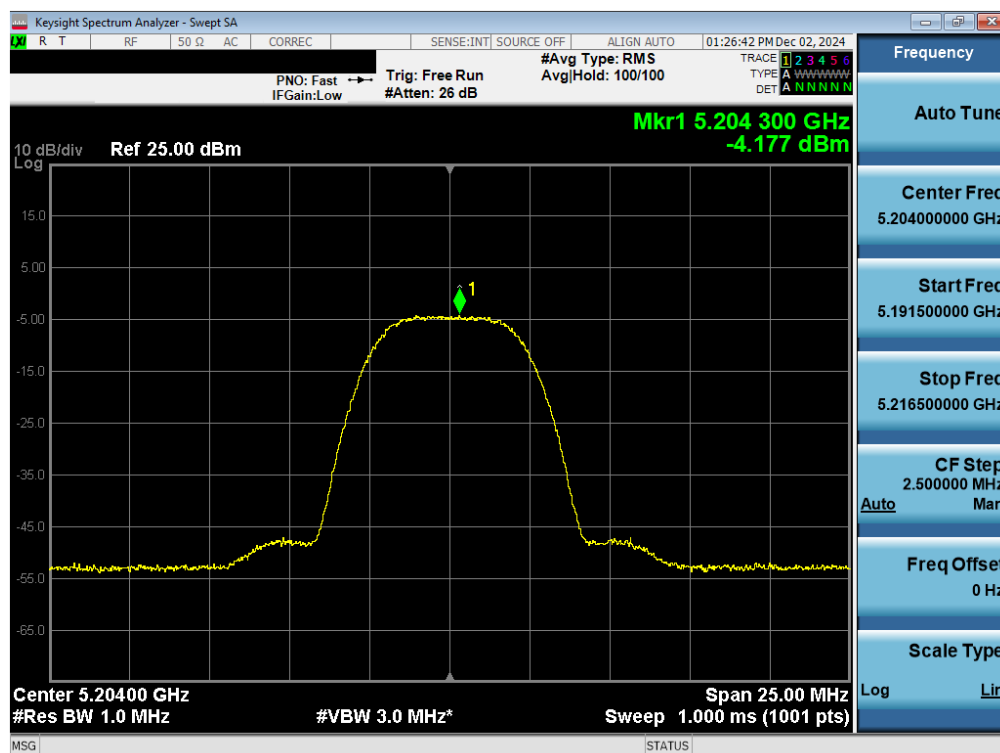


Plot 7-64. PSD TxBF Antenna WF2a (NB UNII HDR8, ePA – 5204MHz)

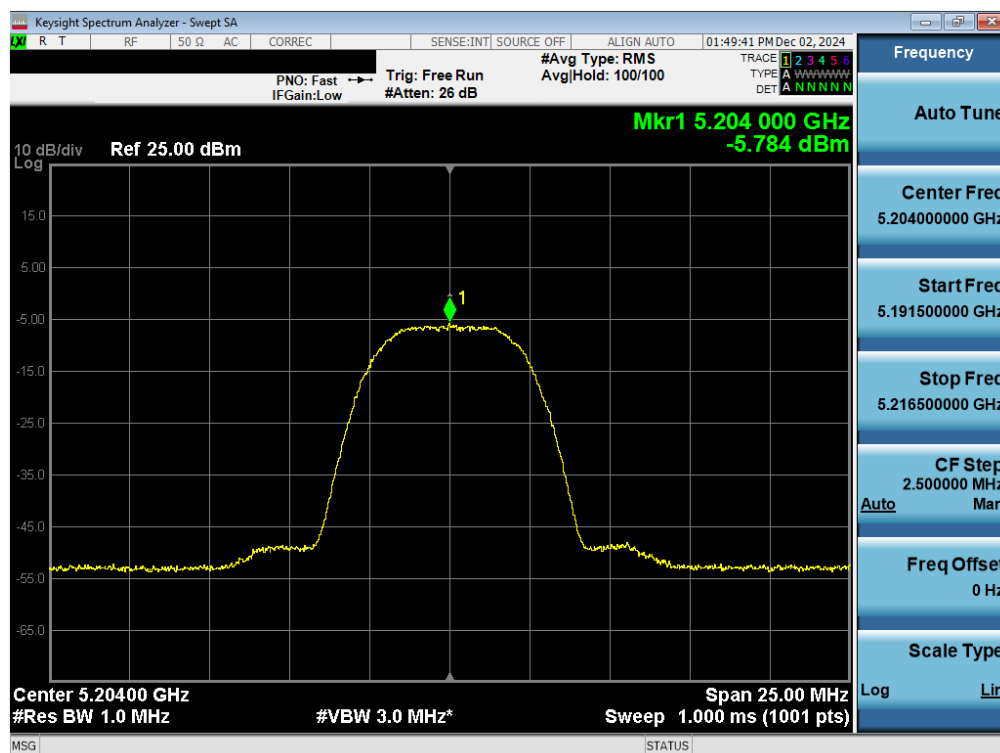
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2410210074-08.BCG	Test Dates: 10/25/2024 - 1/16/2025	EUT Type: Tablet Device	Page 71 of 144

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Plot 7-65. PSD TxBF Antenna WF7a (NB UNII HDR8, iPA – 5204MHz)



Plot 7-66. PSD TxBF Antenna WF2a (NB UNII HDR8, iPA – 5204MHz)

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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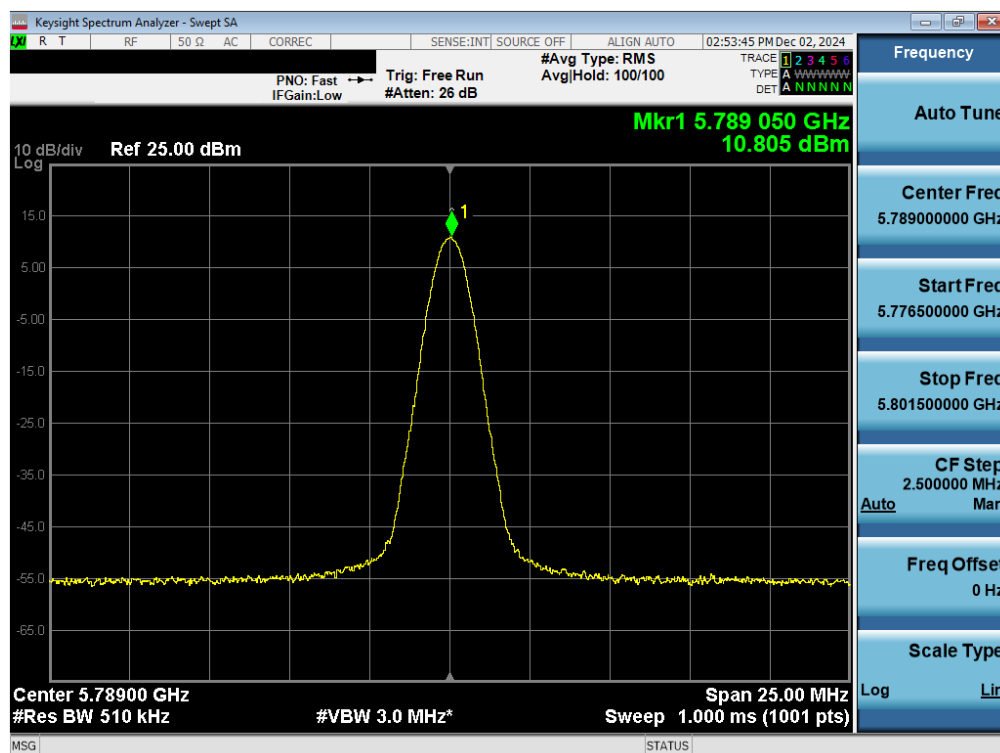
Frequency [MHz]	Data Rate [Mbps]	Mode	Power Scheme	Antenna WF7a Power Density [dBm/500kHz]	Antenna WF2a Power Density [dBm/500kHz]	Summed Power Density [dBm/500kHz]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
5733	1.0	NB UNII BDR	ePA	11.61	12.40	15.03	30.00	-14.97
5789	1.0	NB UNII BDR	ePA	10.81	12.27	14.61	30.00	-15.39
5844	1.0	NB UNII BDR	ePA	11.33	12.58	15.01	30.00	-14.99
5733	1.0	NB UNII BDR	iPA	4.75	4.24	7.51	30.00	-22.49
5789	1.0	NB UNII BDR	iPA	4.82	3.70	7.30	30.00	-22.70
5844	1.0	NB UNII BDR	iPA	5.52	3.82	7.76	30.00	-22.24
5733	4.0	NB UNII HDR4	ePA	7.35	8.77	11.13	30.00	-18.87
5789	4.0	NB UNII HDR4	ePA	6.32	8.06	10.29	30.00	-19.71
5844	4.0	NB UNII HDR4	ePA	6.95	8.48	10.79	30.00	-19.21
5733	4.0	NB UNII HDR4	iPA	-3.80	-5.44	-1.53	30.00	-31.53
5789	4.0	NB UNII HDR4	iPA	-3.98	-6.11	-1.91	30.00	-31.91
5844	4.0	NB UNII HDR4	iPA	-3.95	-5.08	-1.47	30.00	-31.47
5733	8.0	NB UNII HDR8	ePA	4.05	5.28	7.72	30.00	-22.28
5789	8.0	NB UNII HDR8	ePA	3.80	4.67	7.27	30.00	-22.73
5844	8.0	NB UNII HDR8	ePA	4.31	4.92	7.64	30.00	-22.36
5733	8.0	NB UNII HDR8	iPA	-6.84	-7.65	-4.21	30.00	-34.21
5789	8.0	NB UNII HDR8	iPA	-6.75	-7.81	-4.24	30.00	-34.24
5844	8.0	NB UNII HDR8	iPA	-6.87	-8.14	-4.44	30.00	-34.44

**Table 7-19. Power Spectral Density Measurements TxBF**

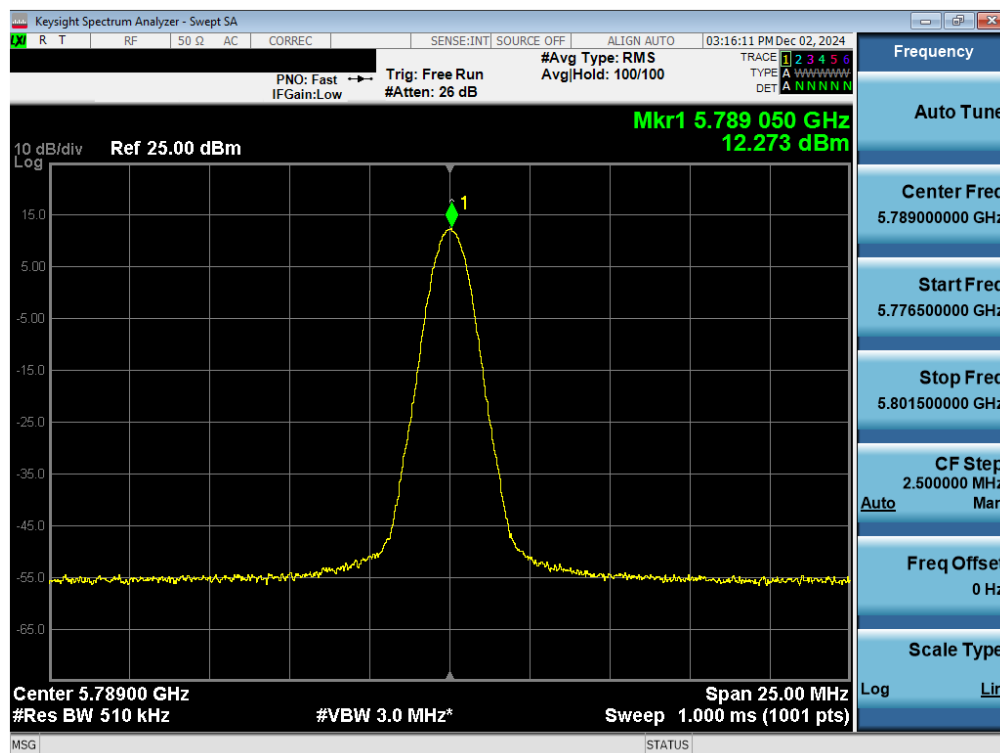
FCC ID: BCGA3268	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
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Plot 7-67. PSD TxBF Antenna WF7a (NB UNII BDR, ePA – 5789MHz)

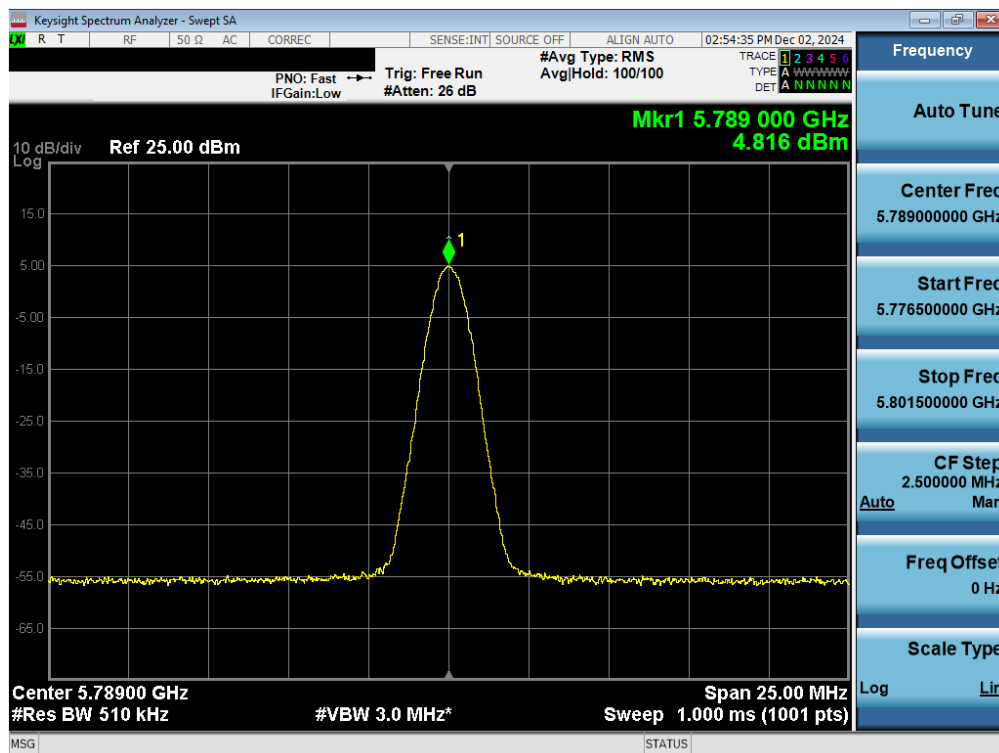


Plot 7-68. PSD TxBF Antenna WF2a (NB UNII BDR, ePA – 5789MHz)

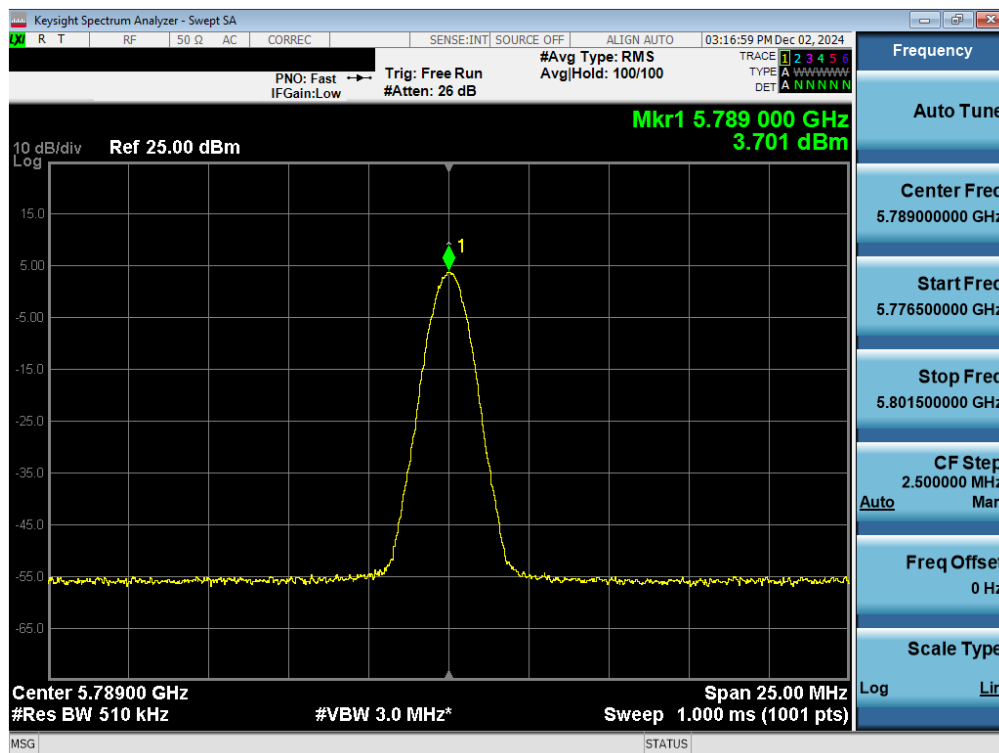
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-69. PSD TxBF Antenna WF7a (NB UNII BDR, iPA – 5789MHz)

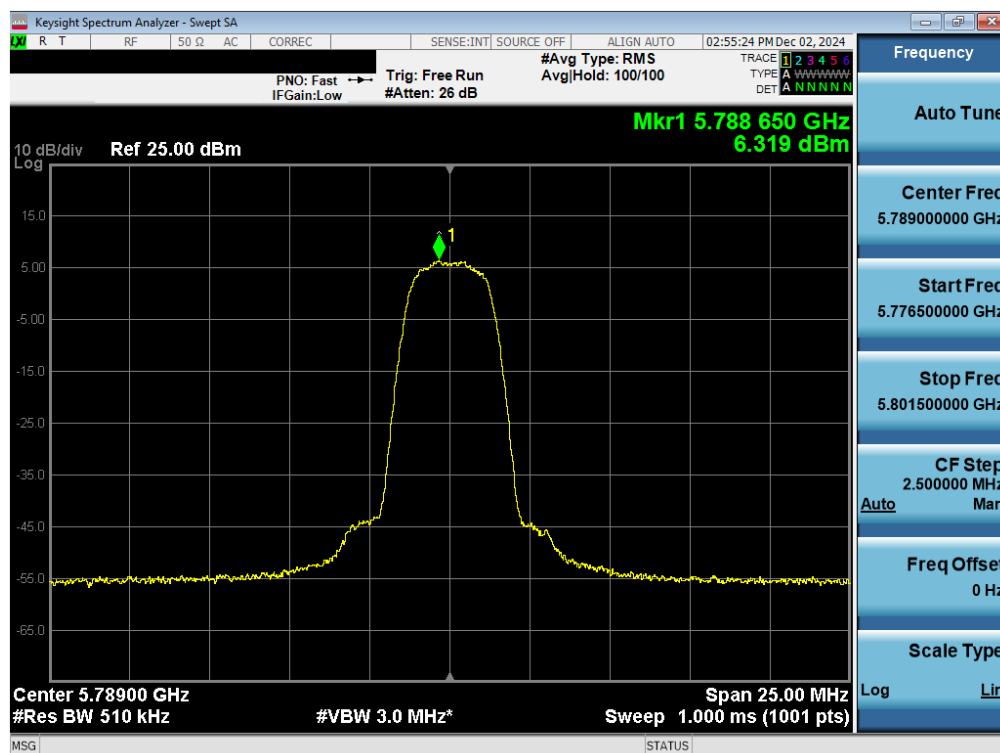


Plot 7-70. PSD TxBF Antenna WF2a (NB UNII BDR, iPA – 5789MHz)

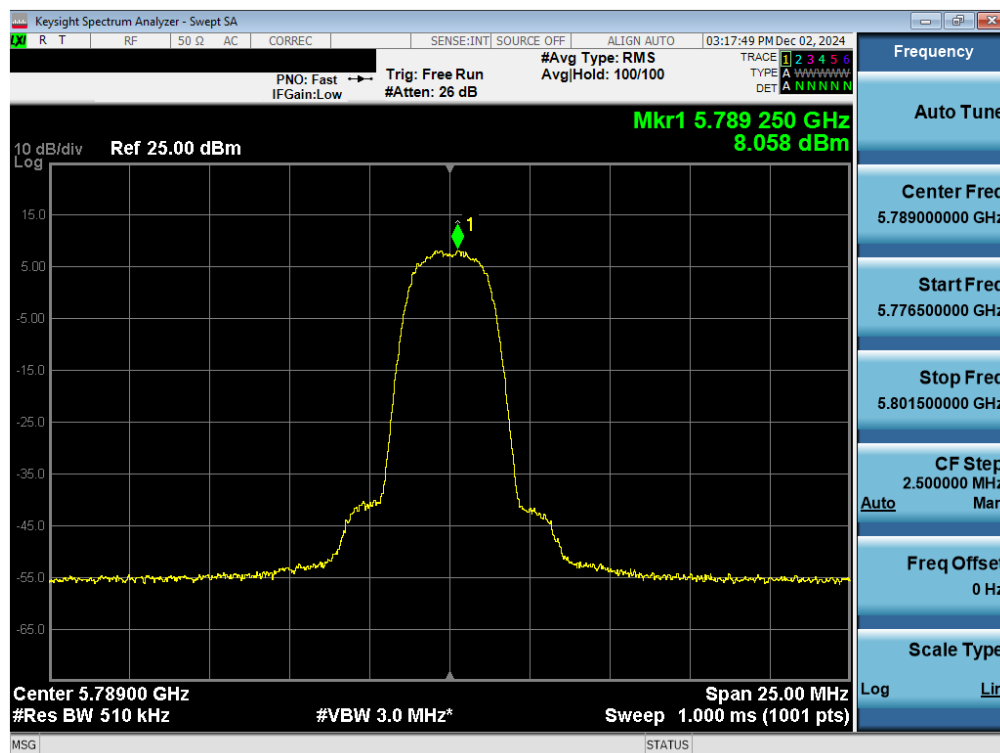
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-71. PSD TxBF Antenna WF7a (NB UNII HDR4, ePA – 5789MHz)

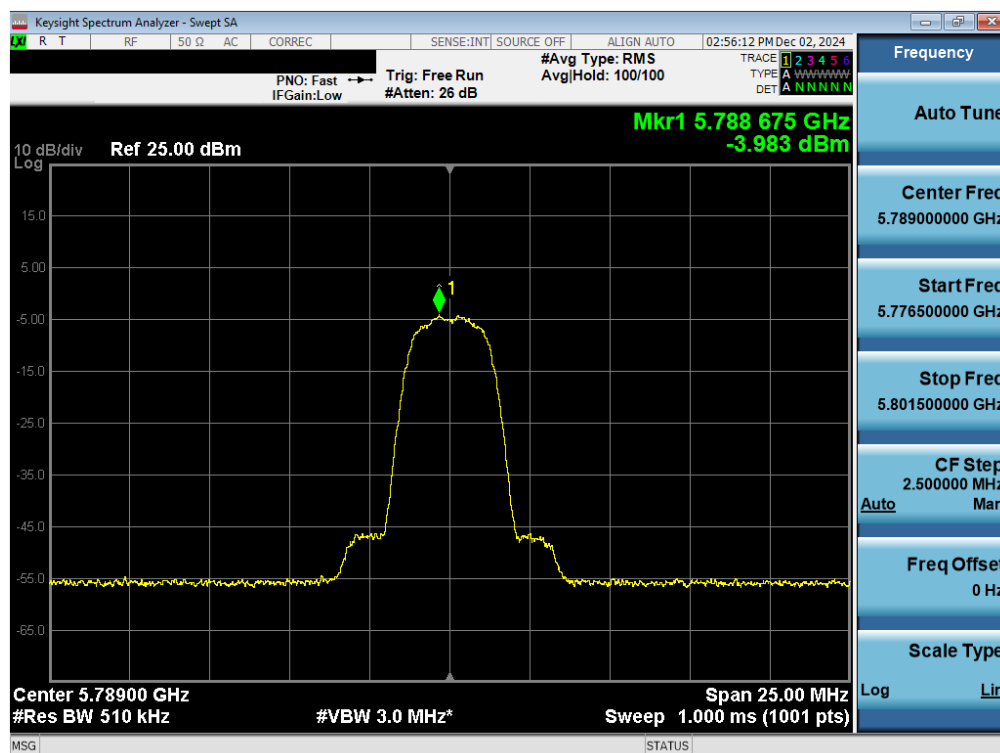


Plot 7-72. PSD TxBF Antenna WF2a (NB UNII HDR4, ePA – 5789MHz)

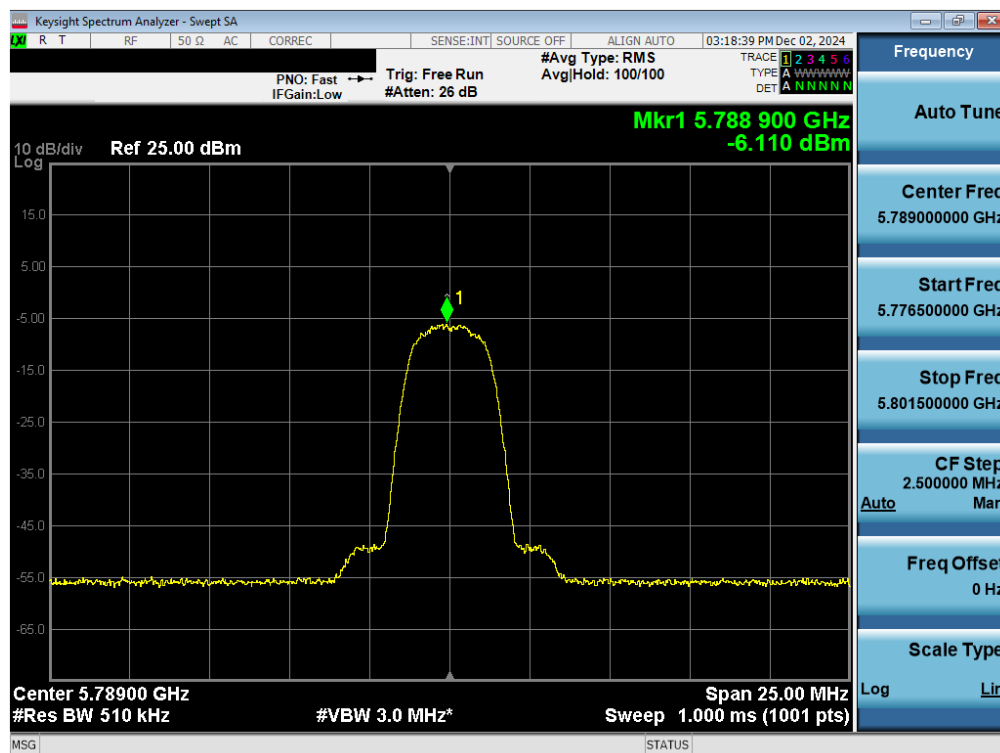
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-73. PSD TxBF Antenna WF7a (NB UNII HDR4, iPA – 5789MHz)

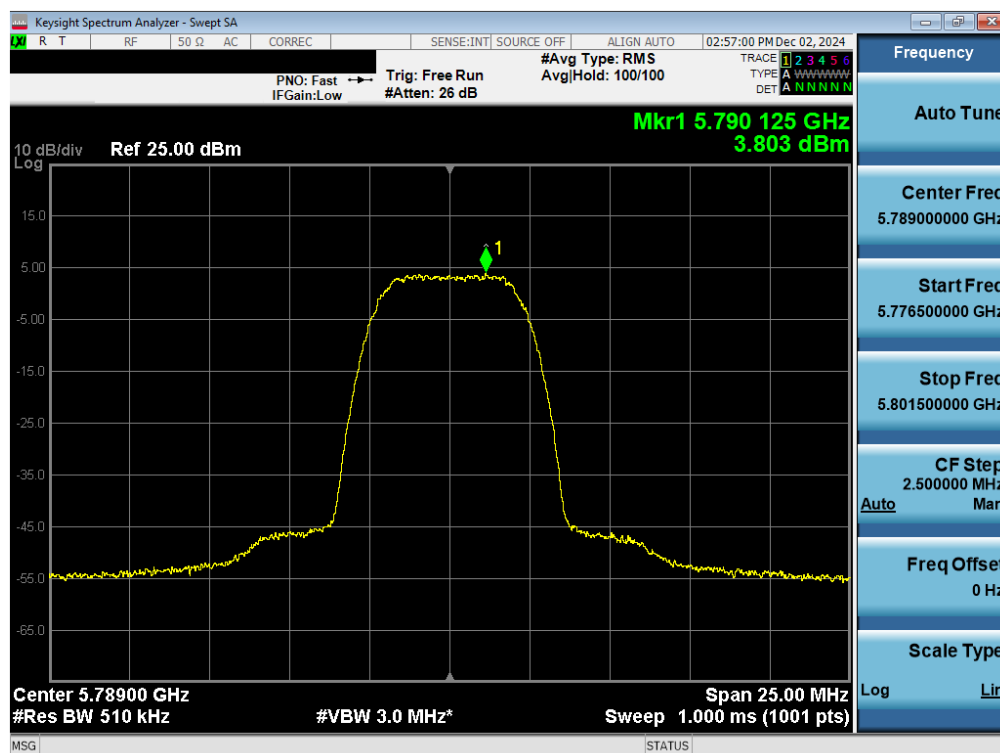


Plot 7-74. PSD TxBF Antenna WF2a (NB UNII HDR4, iPA – 5789MHz)

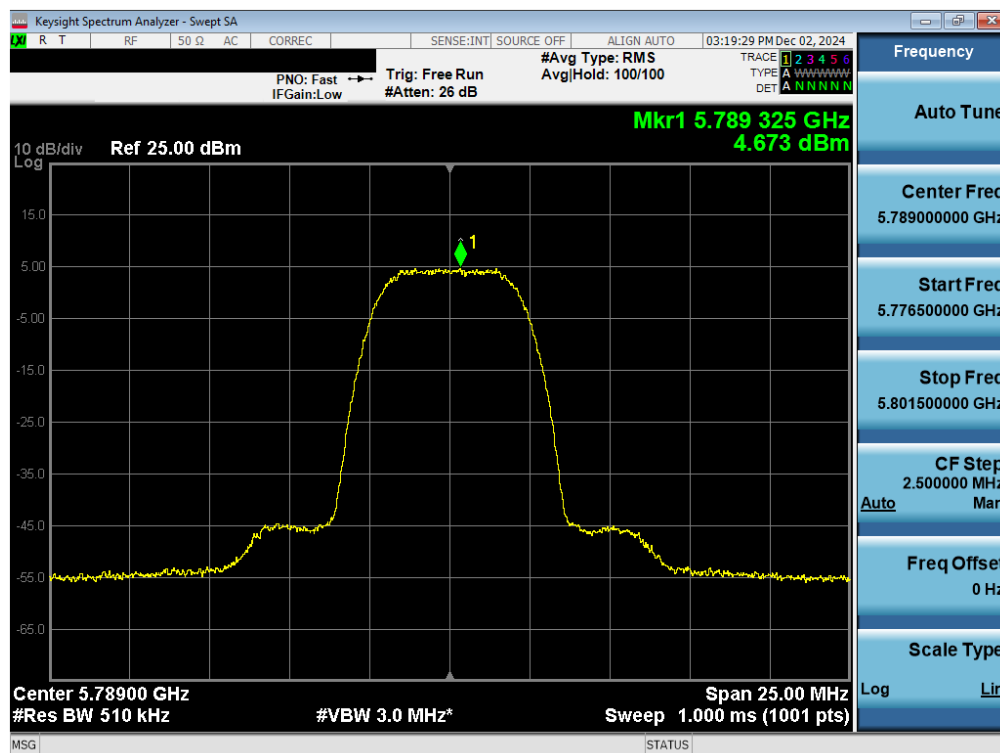
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-75. PSD TxBF Antenna WF7a (NB UNII HDR8, ePA – 5789MHz)

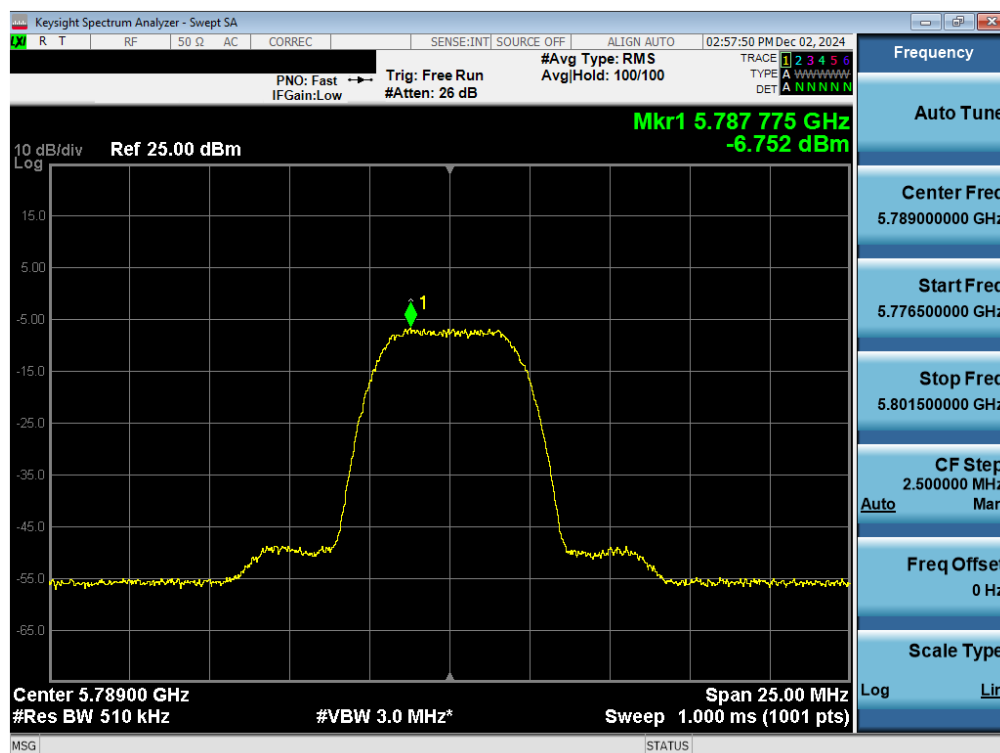


Plot 7-76. PSD TxBF Antenna WF7a (NB UNII HDR8, ePA – 5789MHz)

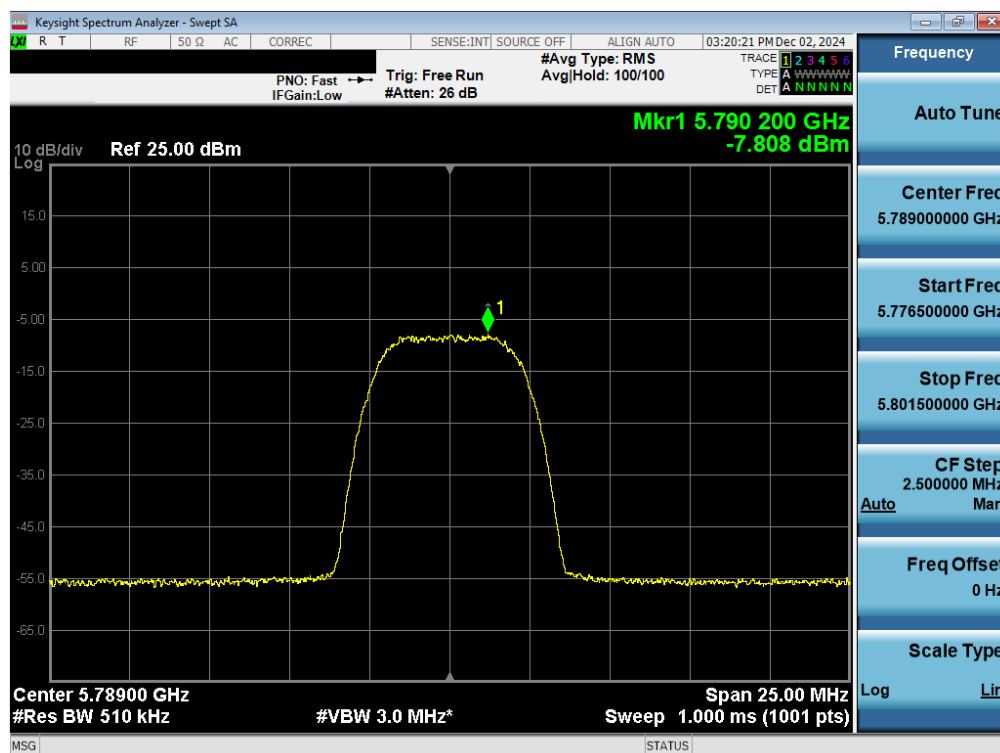
FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-77. PSD TxBF Antenna WF7a (NB UNII HDR8, iPA – 5789MHz)



Plot 7-78. PSD TxBF Antenna WF2a (NB UNII HDR8, iPA – 5789MHz)

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## 7.6 Radiated Spurious Emission – Above 1GHz

§15.407(b) §15.205 §15.209

### Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies. All channels and power schemes were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

***For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.25 GHz band shall not exceed an EIRP of -27 dBm/MHz.***

***For transmitters operating in the 5.725 – 5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.***

***All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 7-20 per Section 15.209.***

Frequency	Field Strength [ $\mu$ V/m]	Measured Distance [Meters]
Above 960.0 MHz	500	3

**Table 7-20. Radiated Limits**

### Test Procedures Used

ANSI C63.10-2020 – Subclauses 12.7.7, 12.7.6

KDB 789033 D02 v02r01 – Section G

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## Test Settings

### Average Field Strength Measurements

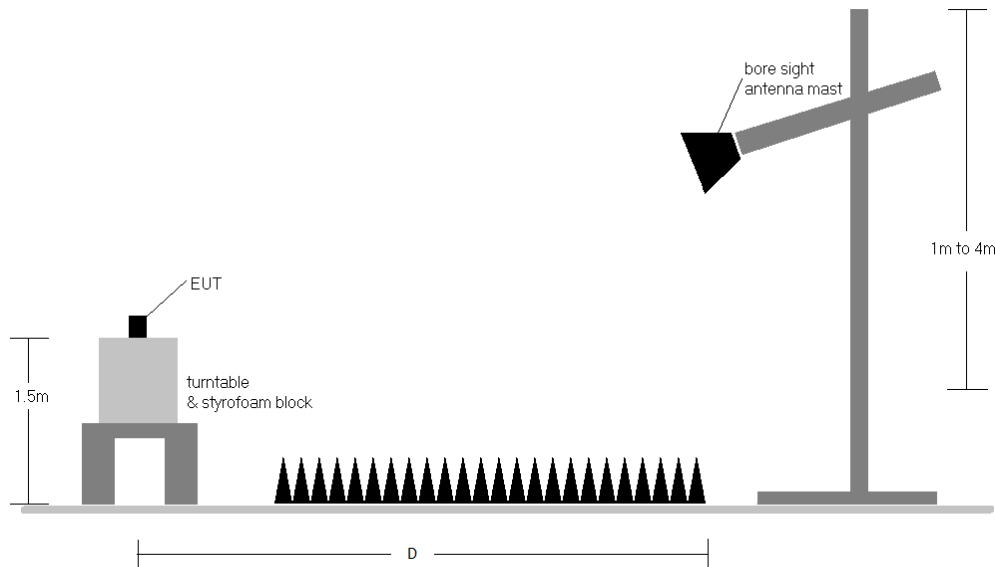
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be  $\geq 2 \times \text{span/RBW}$ )
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

### Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

## Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-5. Test Instrument & Measurement Setup**

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## Test Notes

1. All emissions that lie in the restricted bands (denoted by a \* next to the frequency) specified in §15.205 are below the limit shown in Table 7-20.
2. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-20. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dB $\mu$ V/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dB $\mu$ V/m.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. This unit was tested with its standard battery.
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas.
6. D is the measurement test distance and emissions 1-18GHz were measured at a 3 meters test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
7. The “-” shown in the following RSE tables are used to denote a noise floor measurement.
8. Dedicated antenna does not support TxBF configuration.
9. All supported antenna configurations, modulations and power schemes have been tested on the unit and only the worst case per antenna is reported.

## Sample Calculations

### Determining Spurious Emissions Levels

- Field Strength Level [dB $\mu$ V/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB] – Preamplifier Gain [dB]
- Margin [dB] = Field Strength Level [dB $\mu$ V/m] – Limit [dB $\mu$ V/m]

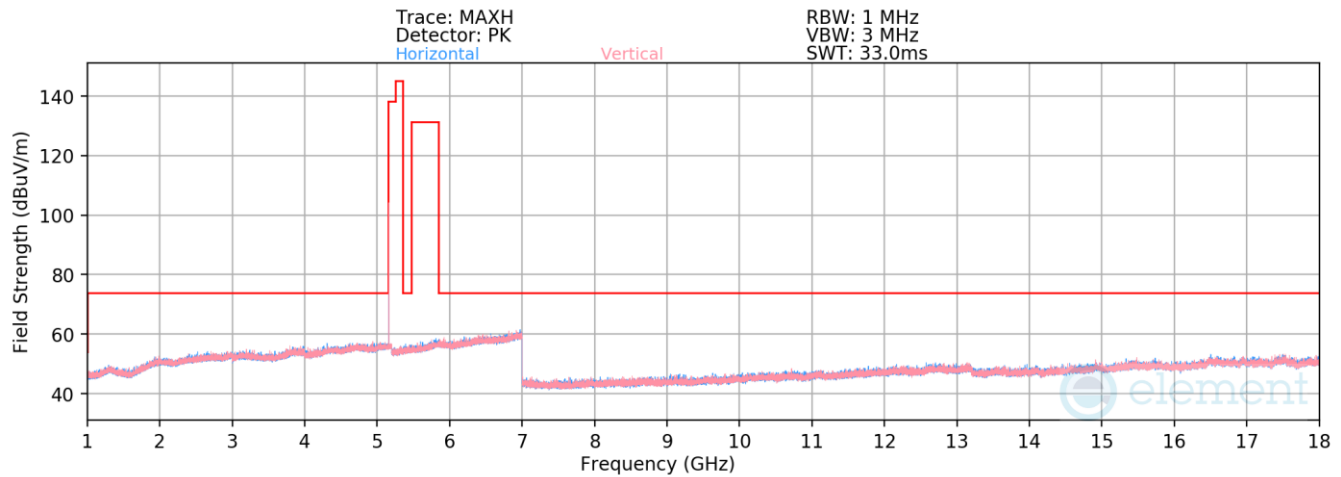
### Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 7.6.3 was calculated using the formula:  
Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

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## 7.6.1 Antenna WF7b Radiated Spurious Emission (1-18GHz)



**Plot 7-79. Radiated Spurious Emissions 1-18GHz Antenna WF7b (NB UNII BDR ePA – 5162MHz)**

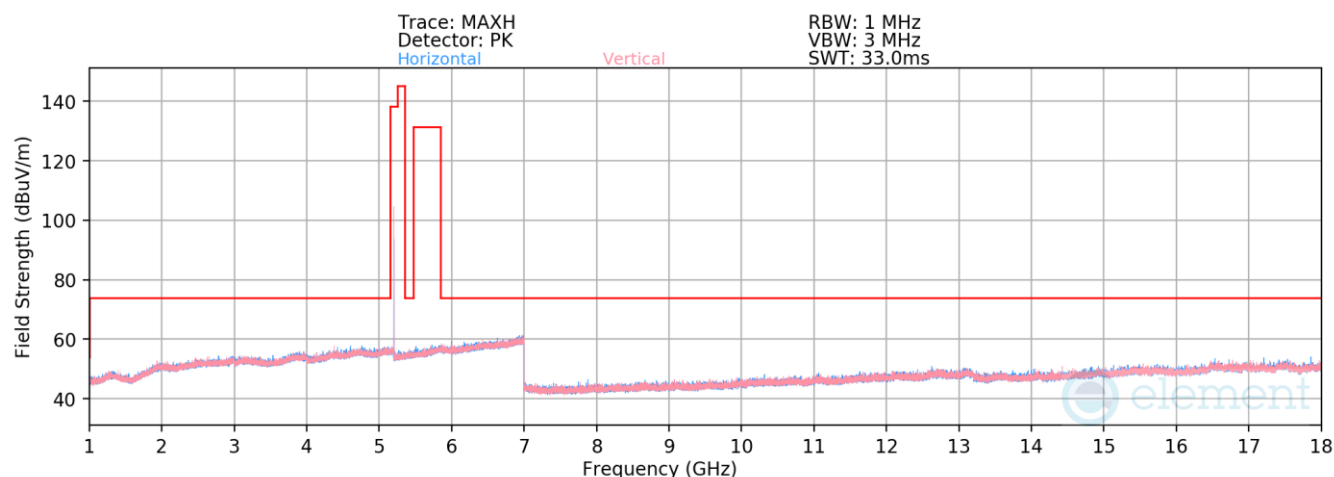
Mode:	BDR
Data Rate:	1Mbps
Power Scheme:	ePA
Distance of Measurements:	3 Meters
Operating Frequency:	5162MHz

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBuV/m]	Limit [dBuV/m]	Margin [dB]
	10324.00	Peak	V	237	143	-67.56	8.59	48.03	68.23	-20.20
*	15486.00	Average	V	-	-	-80.55	13.98	40.43	53.98	-13.55
*	15486.00	Peak	V	-	-	-69.31	13.86	51.55	73.98	-22.43

**Table 7-21. Radiated Spurious Emissions Measurements Antenna WF7b**

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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**Plot 7-80. Radiated Spurious Emissions 1-18GHz Antenna WF7b (NB UNII BDR ePA – 5204MHz)**

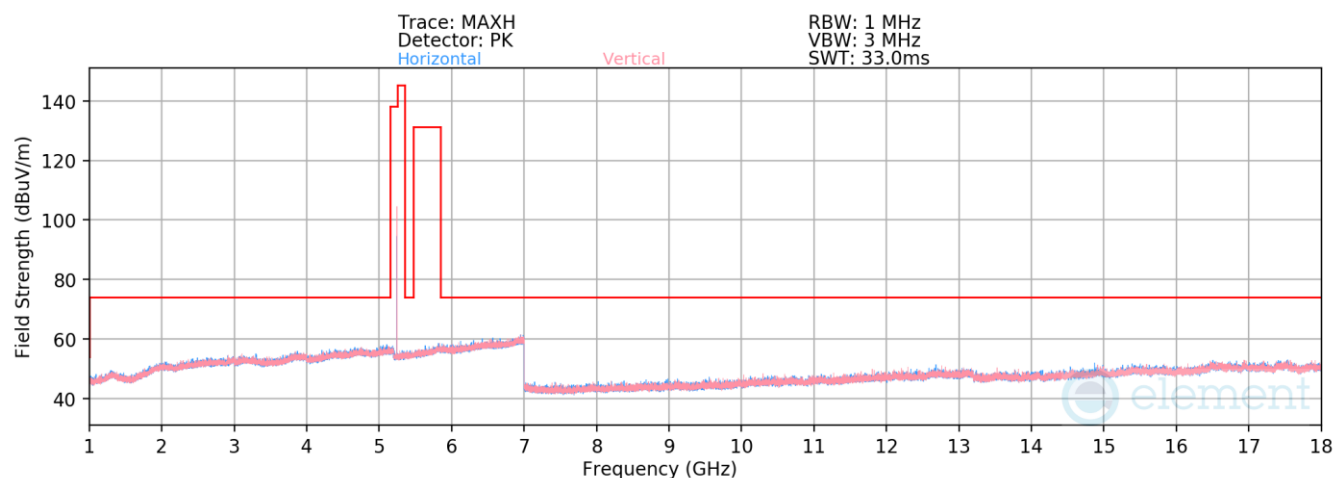
Mode: BDR  
Data Rate: 1Mbps  
Power Scheme: ePA  
Distance of Measurements: 3 Meters  
Operating Frequency: 5204MHz

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
10408.00	Peak	V	236	141	-65.42	8.63	50.20	68.23	-18.03
* 15612.00	Average	H	-	-	-80.72	14.17	40.45	53.98	-13.53
* 15612.00	Peak	H	-	-	-69.81	14.17	51.36	73.98	-22.62

**Table 7-22. Radiated Spurious Emissions Measurements Antenna WF7b**

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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**Plot 7-81. Radiated Spurious Emissions 1-18GHz Antenna WF7b (NB UNII BDR ePA – 5245MHz)**

Mode:	BDR
Data Rate:	1Mbps
Power Scheme:	ePA
Distance of Measurements:	3 Meters
Operating Frequency:	5245MHz

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBuV/m]	Limit [dBuV/m]	Margin [dB]
	10490.00	Peak	V	259	51	-67.22	8.75	48.53	68.23	-19.70
*	15735.00	Average	V	-	-	-80.15	13.44	40.30	53.98	-13.68
*	15735.00	Peak	V	-	-	-69.11	13.44	51.33	73.98	-22.65

**Table 7-23. Radiated Spurious Emissions Measurements Antenna WF7b**

FCC ID: BCGA3268		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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