

MEASUREMENT REPORT

FCC PART 15.407 / ISSED RSS-248 Narrowband (NB) UNII 6GHz

Applicant Name:

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

Date of Testing:

5/12/2025 - 08/13/2025

Test Report Issue Date:

9/11/2025

Test Site/Location:

Element Materials Technology, Morgan Hill, CA, USA

Test Report Serial No.:

1C2505120065-10.BCG

FCC ID:	BCGA3416
IC:	579C-A3416
APPLICANT:	Apple Inc.

Application Type

Certification

Models/HVIN:

A3416

EUT Type:

Head Mounted Device

Frequency Range:

6108 – 6420 MHz

Modulation Type:

GFSK, $\pi/4$ DQPSK

FCC Classification:

15E 6 GHZ Very Low Power Device (6VL)

FCC Rule Part (s):

Part 15 Subpart E (15.407)

ISED Specification:

RSS-248 Issue 3

Test Procedure(s):

ANSI C63.10-2020, KDB 789033 D02 v02r01,
KDB 987594 D01 v03r01, KDB 987594 D02 v03
KDB 987594 D04 v03, KDB 987594 D03 v03r04

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, KDB 789033 D02 v02r01 and KDB 987594 D02 v03. 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



FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 1 of 136

V 10.6 10/27/2023

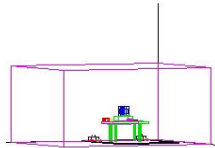
TABLE OF CONTENTS

1.0	INTRODUCTION	4
1.1	Scope.....	4
1.2	Element Materials Technology Test Location	4
1.3	Test Facility / Accreditations.....	4
2.0	PRODUCT INFORMATION	5
2.1	Equipment Description	5
2.2	Device Capabilities.....	5
2.3	Antenna Description.....	6
2.4	Test Support Equipment.....	7
2.5	Test Configuration.....	7
2.6	Software and Firmware	7
2.7	EMI Suppression Device(s)/Modifications.....	7
3.0	DESCRIPTION OF TESTS	8
3.1	Evaluation Procedure	8
3.2	AC Line Conducted Emissions	8
3.3	Radiated Emissions.....	9
3.4	Environmental Conditions.....	9
4.0	ANTENNA REQUIREMENTS	10
5.0	MEASUREMENT UNCERTAINTY	11
6.0	TEST EQUIPMENT CALIBRATION DATA.....	12
7.0	TEST RESULTS	13
7.1	Summary.....	13
7.2	26dB & 99% Bandwidth Measurement	14
7.3	Conducted Output Power and Max EIRP Measurement	39
7.4	Maximum Power Spectral Density	42
7.5	In-Band Emissions	67
7.6	Contention Based Protocol.....	93
7.7	Transmit Power Control (TPC)	99
7.8	Radiated Spurious Emission – Above 1GHz.....	103
7.9	Radiated Spurious Emissions – Below 1GHz	122
7.10	AC Line Conducted Emissions Measurement.....	128
8.0	CONCLUSION.....	136

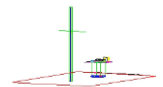
FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 2 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.



MEASUREMENT REPORT



UNII Band	Tx Frequency (MHz)	Mode	Max. e.i.r.p. [mW]	Max. e.i.r.p. [dBm]
5	6108-6420	NB UNII BDR	0.081	-10.91
		NB UNII LE1M	0.079	-11.05
		NB UNII LE2M	0.081	-10.91
		NB UNII HDR4	0.142	-8.47
		NB UNII HDR8	0.256	-5.92
		NB UNII HDRp4	0.143	-8.44
		NB UNII HDRp8	0.249	-6.04

FCC EUT Overview

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 3 of 136

V 10.6 10/27/2023

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)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 4 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Head Mounted Device FCC ID: BCGA3416** and **IC: 579C-A3416**. 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:
 - The hopping sequence is pseudorandom
 - The receiver input bandwidth equals the transmit bandwidth
 - The receiver hops in sequence with the transmit signal
 - Narrowband UNII can only hop within the same UNII band and cannot hop between bands

Test Device Serial No.: LT7N2M6T39, MWY725700W, DQC74D2TM4, L3RQV9RL7H, J11HFR000020000VL9, FG2HHTK269, H7WLXFJFJC, H7WLXFJFJC

2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, LE1M, LE2M, HDR4, HDR8), NB UNII (1x, LE1M, LE2M, HDR4, HDR8, HDRp4, HDRp8).

Channels below 6108 MHz in the UNII-5 band are disabled in the US and its territories.

Band 5
Frequency (MHz)
6108
:
6264
:
6420

Table 2-1. NB BDR/LE/HDR 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 5. 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:

Measured Duty Cycles					
Mode	Frequency (MHz)	NB UNII_R		NB UNII_L	
		Duty Cycle [%]	DCCF [dB]	Duty Cycle [%]	DCCF [dB]
NB UNII GFSK	6108 - 6420	100.00	0.00	100.00	0.00
NB UNII LE1M		89.80	0.91	89.80	0.91
NB UNII LE2M		73.70	2.64	73.70	2.64
NB UNII HDR4		100.00	0.00	100.00	0.00
NB UNII HDR8		100.00	0.00	100.00	0.00
NB UNII HDRp4		100.00	0.00	100.00	0.00
NB UNII HDRp8		100.00	0.00	100.00	0.00

Table 2-2. Measured Duty Cycles

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 5 of 136

V 10.6 10/27/2023

Notes:

1. This device supports simultaneous transmission feature, which allows multiple radios to transmit simultaneously at the same antenna. The table below shows supported configuration.

Simultaneous Tx Config	Antenna	WLAN	Bluetooth 2.4GHz	WIFI 5GHz	NB UNII
		802.11 b/g/n/ax	BDR/EDR/HDR4/HDR8 LE1/2M	802.11 a/n/ac/ax	BDR/LE1/2M/HDR4/HDR8
Config 1	Ant1	✓	✗	✓	✗
Config 2	Ant1	✗	✓	✓	✗
Config 3	Ant2	✓	✗	✓	✗
Config 4	Ant2	✗	✓	✓	✗
Config 5	NB UNII_L	✗	✓	✗	✓

Table 2-3. Simultaneous Transmission Configurations

✓ = Support; ✗ = NOT Support

Note:

All the above simultaneous transmission configurations have been tested and the worst-case configuration was found to be Config 5 and reported in the RF NB UNII 5GHz & RF BTLE Test Reports.

2.3 Antenna Description

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

Frequency [MHz]	Antenna Gain (dBi)	
	NB UNII_R	NB UNII_L
6108-6175	1.9	1.9
6176-6300	2.2	2.2
6301-6420	2.4	2.4

Table 2-4. Highest Antenna Gain

Frequency [MHz]	Antenna Gain (dBi)	
	NB UNII_R	NB UNII_L
6108-6175	0.1	0.1
6176-6300	0.9	0.9
6301-6420	0.9	0.9

Table 2-5. Lowest Antenna Gain

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 6 of 136

V 10.6 10/27/2023

2.4 Test Support Equipment

1	Apple Macbook Pro	Model:	A2141	S/N:	C02H604EQ05D
	w/ AD/DC Adapter	Model:	A2166	S/N:	C4H042705ZNPM0WA6
2	Apple USB-C Cable	Model:	Chimp	S/N:	909208
3	Right Temple with USB	Model:	N/A	S/N:	HTFGR8000DR000020R
	Left Temple	Model:	N/A	S/N:	HTFH3W0008A00002GY
	Headband	Model:	N/A	S/N:	GKNH59000BV0000215
4	Light Seal	Model:	N/A	S/N:	GKNH4L000KM00008SC
	Light Seal Padding	Model:	N/A	S/N:	GKNH48002G50000G1D
5	EUT Power Pack	Model:	N/A	S/N:	HTHF3V0009H00001MV
6	Apple Airpod (Right)	Model:	A3047	S/N:	H5RHCP0080K
	Apple Airpod (Left)	Model:	A3048	S/N:	H5RHCP008SF
	Apple Airpod Charging Case	Model:	A2968	S/N:	F0G4GPHGWP
7	Dev Board Peer Device (Right)	Model: A3063	N/A	S/N:	H5RH5V001AK0000Q4M
	Dev Board Peer Device (Left)	Model: A3064	N/A	S/N:	H5RH5V001AA0000Q4M

Table 2-6. Test Support Equipment List

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 two orthogonal planes of 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 Power Pack to Magnetic Charging Cable.
- EUT powered by host PC via USB-C Power Pack to Magnetic Charging Cable.

2.6 Software and Firmware

The test was conducted with firmware version 23.1.91.307 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.

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 7 of 136

V 10.6 10/27/2023

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 7.10. 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.

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 8 of 136

V 10.6 10/27/2023

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).

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 9 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

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.

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 10 of 136

V 10.6 10/27/2023

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_{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

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 11 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

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
Keysight Technology	N9030A	3Hz-26.5GHz PXA Signal Analyzer	10/31/2024	Annual	10/31/2025	MY55330128
Anritsu	ML2496A	Power Meter	2/10/2025	Annual	2/10/2026	1306009
Anritsu	MA2411B	Pulse Power Sensor	9/5/2024	Annual	9/5/2025	1726262
Anritsu	MA2411B	Pulse Power Sensor	10/21/2024	Annual	10/21/2025	1027293
ATM	180-422-KF	20dB Nominal Gain Horn Antenna	3/24/2025	Annual	3/24/2026	T058601-03
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	4/16/2025	Annual	4/16/2026	00218555
Keysight Technology	N9040B	UXA Signal Analyzer	6/9/2025	Annual	6/9/2026	MY57212015
Mini-Circuits	FLC-1.5FT-SMSM+	30MHz-27GHz Conducted Cable w/Attenuator*	6/17/2025	Annual	6/17/2026	16113316
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	8/14/2024	Annual	8/14/2025	101648
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	5/20/2025	Annual	5/20/2026	101619
Rohde & Schwarz	ESW44	EMI Test Receiver	5/13/2025	Annual	5/13/2026	101867
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	11/15/2024	Annual	11/15/2025	102326
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	6/3/2025	Annual	6/3/2026	100052
Rohde & Schwarz	HFH2-Z2	Loop Antenna	5/12/2025	Annual	5/12/2026	100546
Rohde & Schwarz	ENV216	Two-Line V-Network	4/25/2025	Annual	4/25/2026	101364
Schwarzbeck	VULB 9162	Bilog Antenna (30MHz - 6GHz)	5/7/2025	Annual	5/7/2026	00304
Rohde & Schwarz	SMW200A	Vector Signal Generator	3/10/2025	Annual	3/10/2026	110589
Mini-Circuits	ZN2PD-9G	Power Splitter*	8/16/2024	Annual	8/16/2025	SF456200530

Table 6-1. Test Equipment List

Note:

- 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.
- * Denotes passive equipment that has been internally verified/calibrated.

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 12 of 136

V 10.6 10/27/2023

7.0 TEST RESULTS

7.1 Summary

Company Name: Apple Inc.
 FCC ID: BCGA3416
 IC: 579C-A3416
 FCC Classification: 15E 6 GHZ Very Low Power Device (6VL)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049, 15.407	RSS-Gen [6.7] RSS-248 [4.4]	Occupied Bandwidth/ 26dB Bandwidth	99% of the occupied bandwidth of any channel must be contained within each of it respective U-NII sub bands < 320MHz (5.925 – 7.125GHz)	CONDUCTED	PASS	Section 7.2
15.407 (a)(9)	RSS-248 [4.5.6]	Maximum EIRP	< 14dBm over the frequency band of operation for Very Low Power		PASS	Section 7.3
15.407 (a)(9)	RSS-248 [4.5.6]	Maximum Power Spectral Density	< -5dBm/MHz e.i.r.p for Very Low Power		PASS	Section 7.4
15.407(b)(7)	RSS-248 [4.6.2]	In-Band Emissions	EUT must meet the limits detailed in 15.407(b)(7) and RSS-248 [4.6.2] b)		PASS	Section 7.5
15.407(d)(6)	RSS-248 [4.7]	Contention Based Protocol	EUT must detect AWGN signal with 90% (or better) certainty		PASS	Section 7.6
15.407(d)(10)	RSS-248[4.6]	Transmit Power Control	EUT must employ a TPC mechanism to operate 6dB below the maximum EIRP PSD value of -5 dBm/MHz		PASS	Section 7.7
15.407(b)(6)	RSS-248 [4.6.2]	Undesirable Emissions	< -27dBm/MHz e.i.r.p. outside of the 5.925 – 7.125GHz band	RADIATED	PASS	Section 7.8
15.205, 15.209 15.407(b)(6)	RSS-248 [4.6.2] RSS-Gen [8.9]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9])		PASS	Section 7.8, Section 7.9
15.207	RSS-Gen [8.8]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 (RSS-Gen [8.8]) limits	AC LINE CONDUCTED	PASS	Section 7.10

Table 7-1. Summary of Test Results

Notes:

- All channels, modes, and modulations/data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 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.
- 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.
- 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 1.4.0.
- For radiated testing, 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 3.4.2.

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 13 of 136

V 10.6 10/27/2023

7.2 26dB & 99% Bandwidth Measurement

§2.1049; §15.407; RSS-Gen [6.7], RSS-248 [4.4]

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

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 = approximately 1% 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.

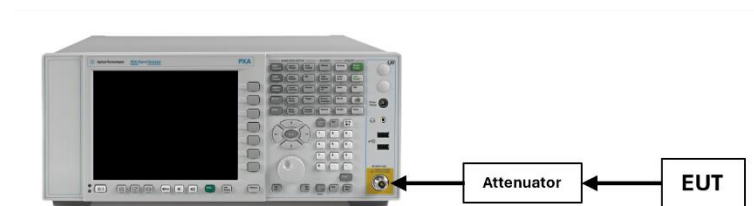


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 14 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

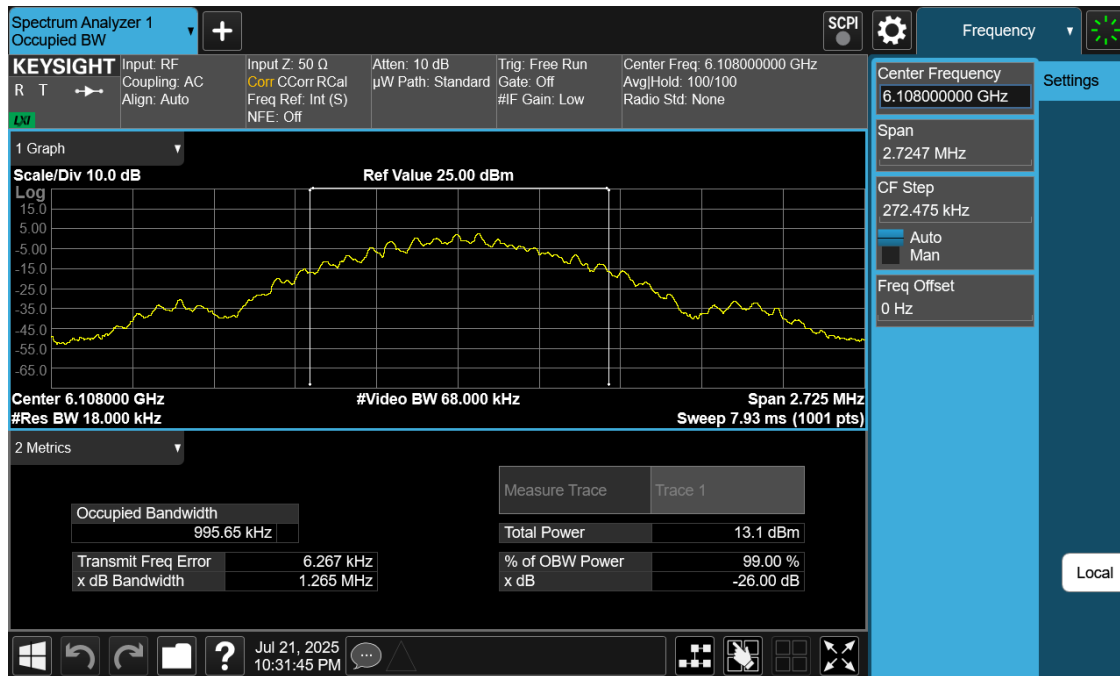
7.2.1 NB UNII_R 26dB & 99% Bandwidth Measurements

Frequency [MHz]	Data Rate [Mbps]	Mode	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]	Maximum Bandwidth Limit [MHz]	Pass / Fail
6108	1.0	NB UNII BDR	1.00	1.27	320	Pass
6264	1.0	NB UNII BDR	1.00	1.27	320	Pass
6420	1.0	NB UNII BDR	0.99	1.26	320	Pass
6108	1.0	NB UNII LE1M	1.06	1.35	320	Pass
6264	1.0	NB UNII LE1M	1.06	1.35	320	Pass
6420	1.0	NB UNII LE1M	1.07	1.35	320	Pass
6108	2.0	NB UNII LE2M	2.07	2.53	320	Pass
6264	2.0	NB UNII LE2M	2.07	2.53	320	Pass
6420	2.0	NB UNII LE2M	2.08	2.53	320	Pass
6108	4.0	NB UNII HDR4	2.38	2.73	320	Pass
6264	4.0	NB UNII HDR4	2.38	2.72	320	Pass
6420	4.0	NB UNII HDR4	2.38	2.72	320	Pass
6108	8.0	NB UNII HDR8	4.74	5.43	320	Pass
6264	8.0	NB UNII HDR8	4.74	5.43	320	Pass
6420	8.0	NB UNII HDR8	4.75	5.44	320	Pass
6108	4.0	NB UNII HDRp4	2.39	2.81	320	Pass
6264	4.0	NB UNII HDRp4	2.39	2.81	320	Pass
6420	4.0	NB UNII HDRp4	2.40	2.82	320	Pass
6108	8.0	NB UNII HDRp8	4.78	5.57	320	Pass
6264	8.0	NB UNII HDRp8	4.77	5.57	320	Pass
6420	8.0	NB UNII HDRp8	4.79	5.61	320	Pass

Table 7-2. Conducted BW Measurements NB UNII_R

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 15 of 136

V 10.6 10/27/2023



Plot 7-1. 26dB BW & 99% OBW (NB UNII_R BDR – 6108MHz)



Plot 7-2. 26dB BW & 99% OBW (NB UNII_R BDR – 6264MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 16 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.



FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 18 of 136



Plot 7-7. 26dB BW & 99% OBW (NB UNII_R LE2M – 6108MHz)

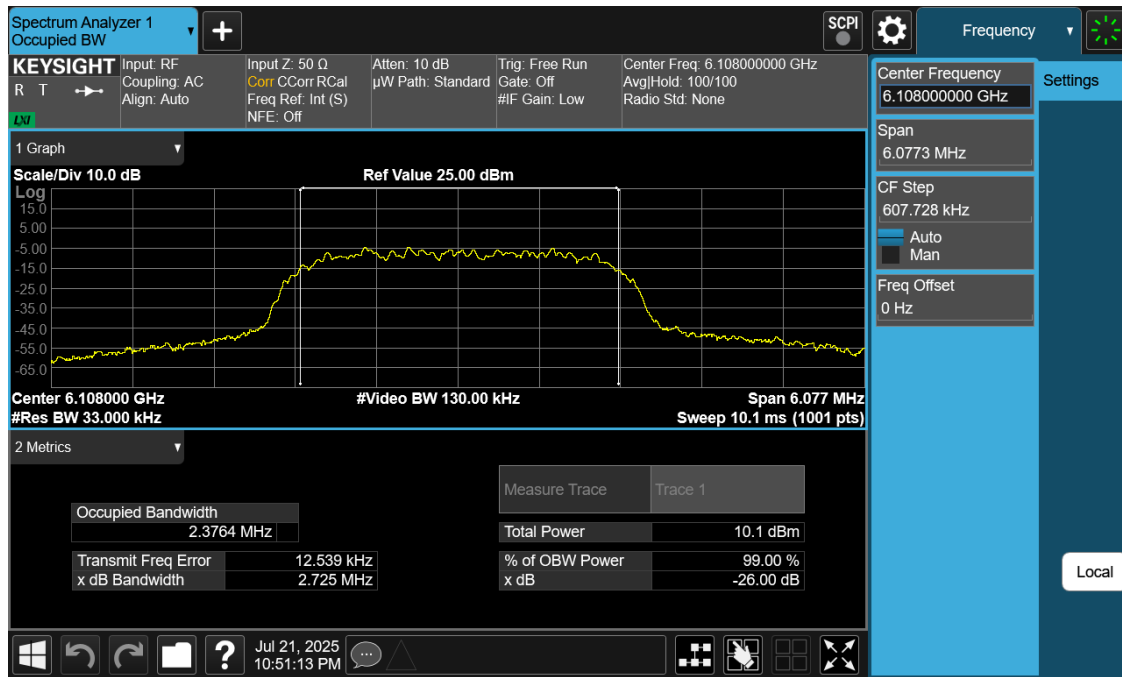


Plot 7-8. 26dB BW & 99% OBW (NB UNII_R LE2M – 6264MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 19 of 136



Plot 7-9. 26dB BW & 99% OBW (NB UNII_R LE2M – 6420MHz)

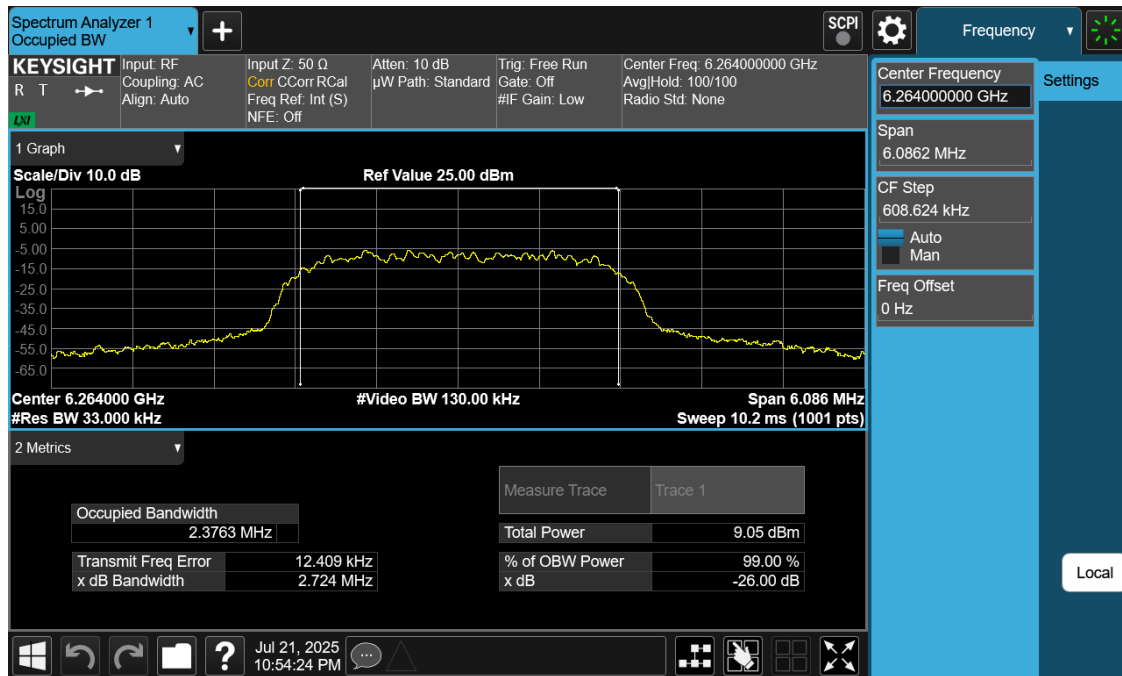


Plot 7-10. 26dB BW & 99% OBW (NB UNII_R HDR4 – 6108MHz)

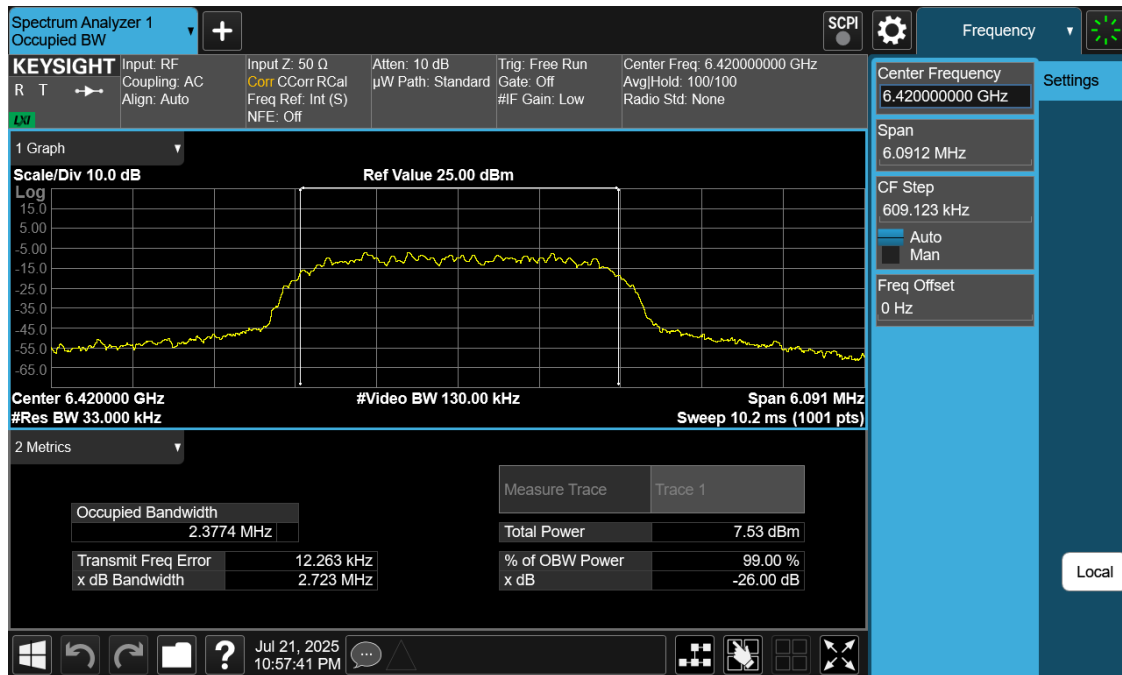
FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 20 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

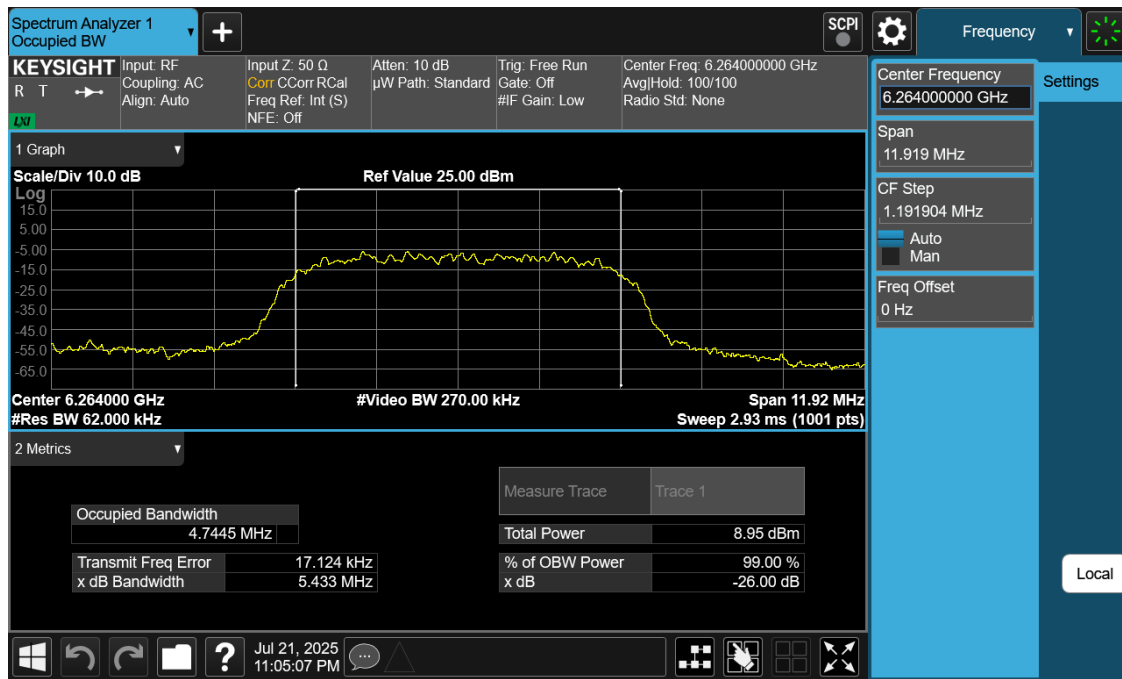
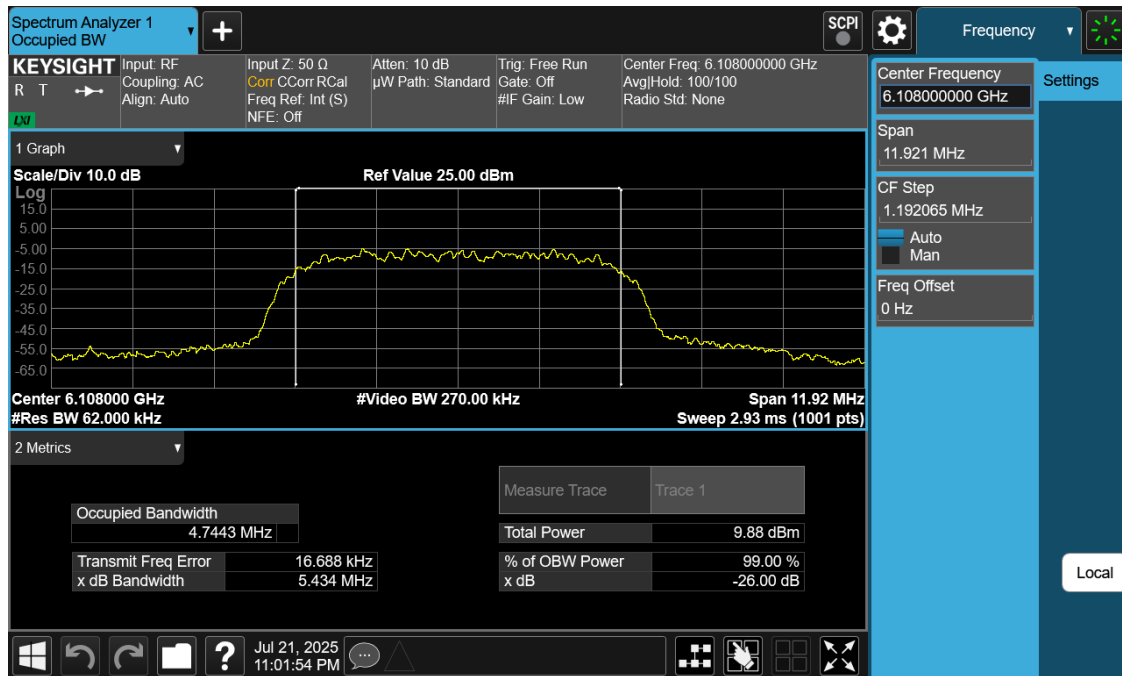


Plot 7-11. 26dB BW & 99% OBW (NB UNII_R HDR4 – 6264MHz)

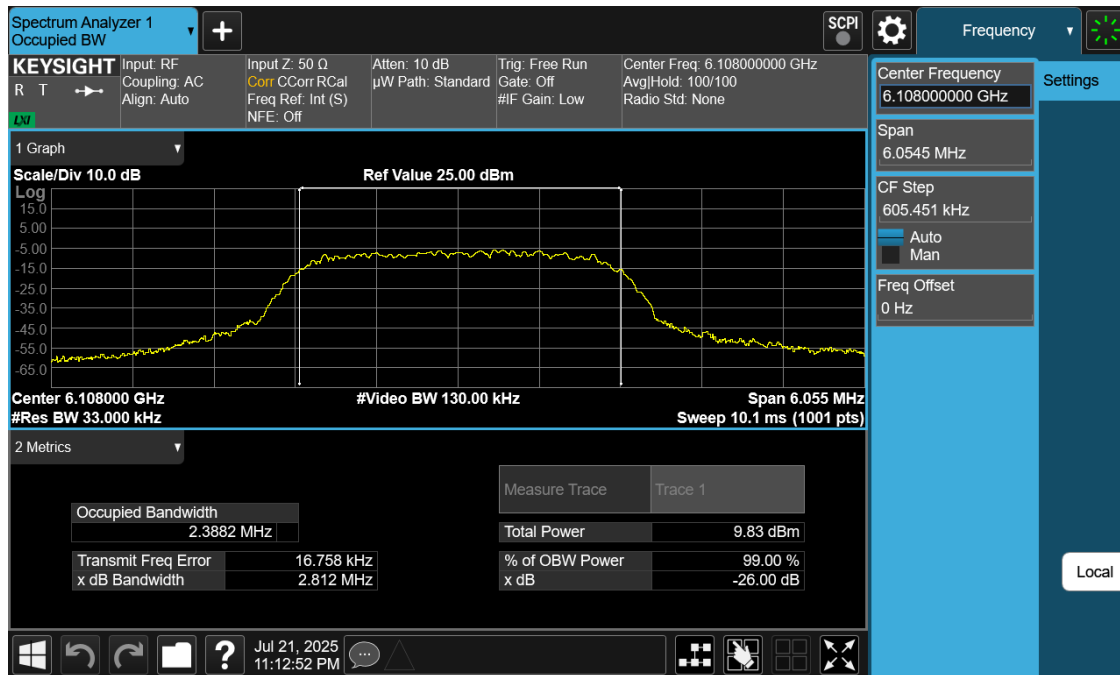
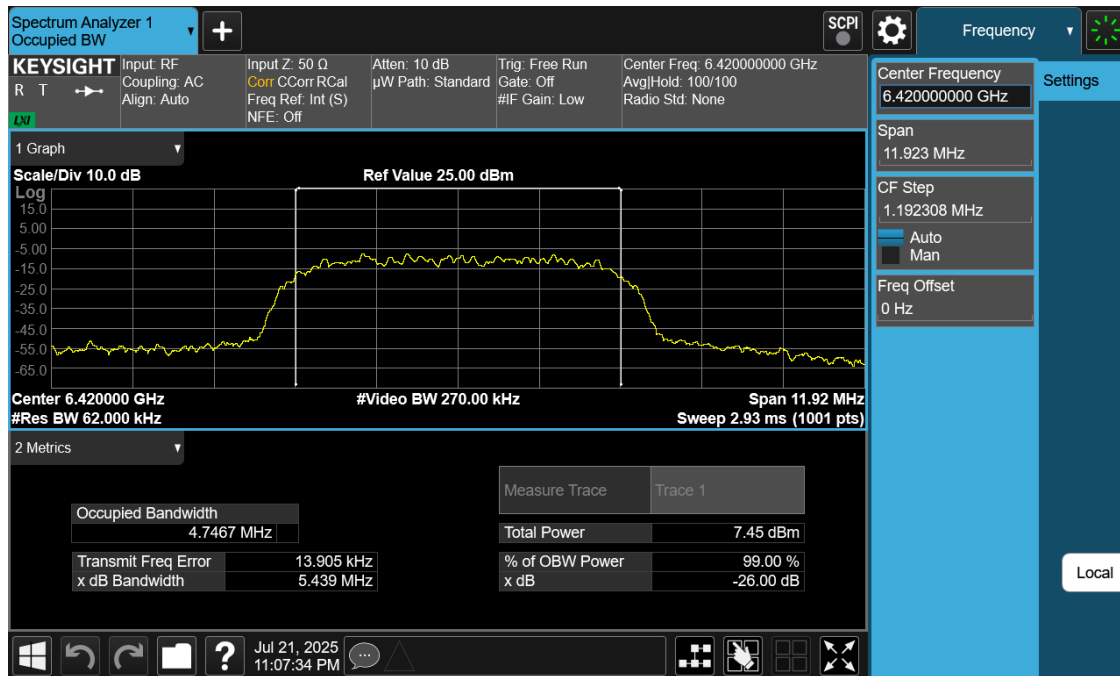


Plot 7-12. 26dB BW & 99% OBW (NB UNII_R HDR4 – 6420MHz)

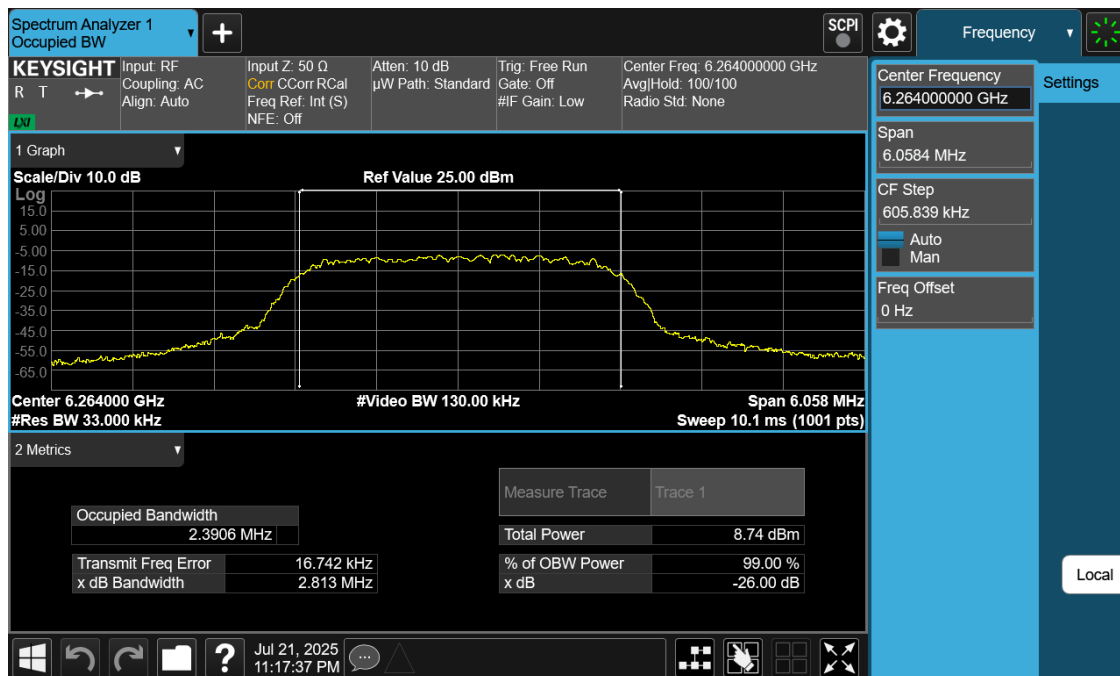
FCC ID: BCGA3416 IC: 579C-A3416	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 21 of 136



FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 22 of 136



FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 23 of 136

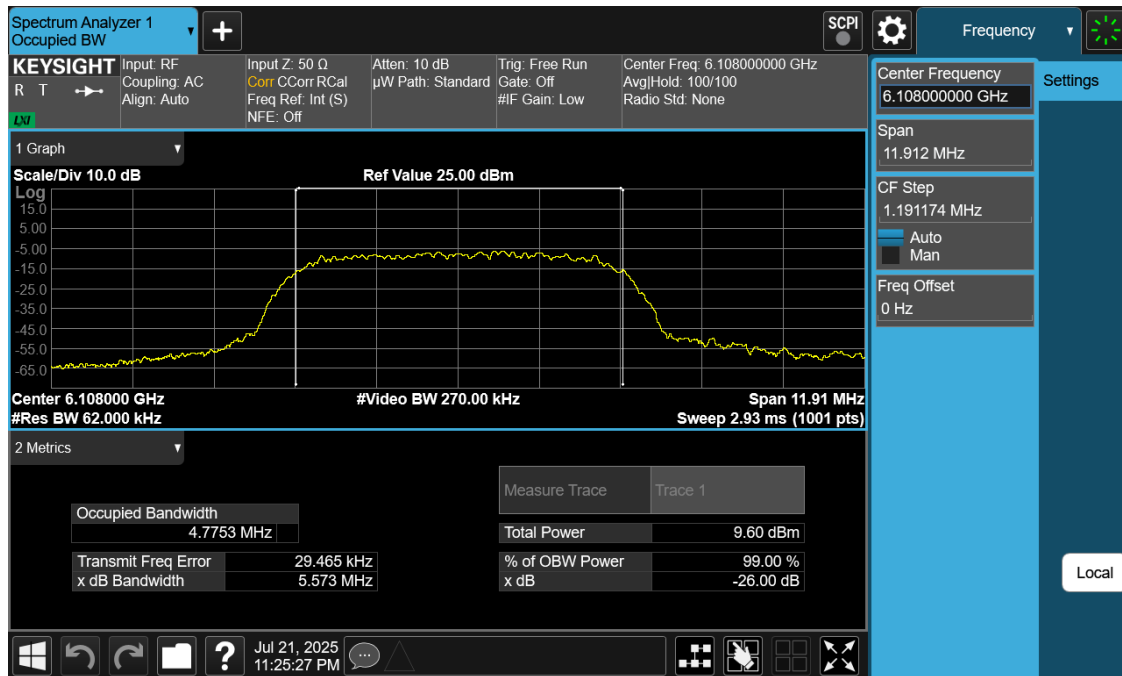


Plot 7-17. 26dB BW & 99% OBW (NB UNII_R HDRp4 – 6264MHz)

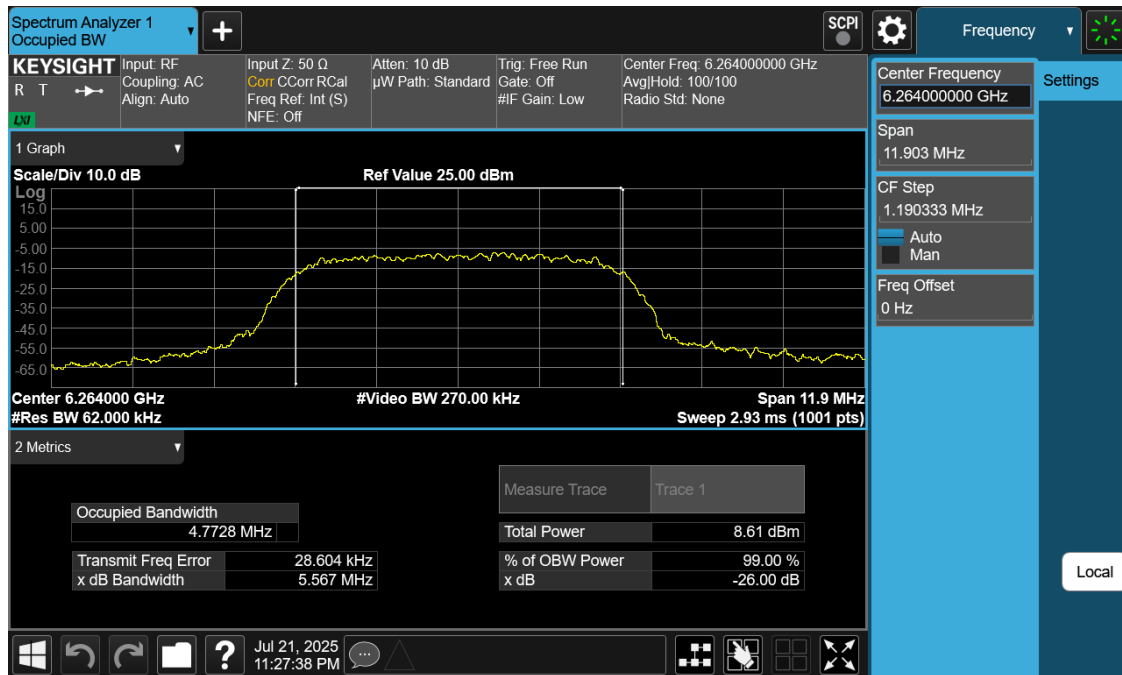


Plot 7-18. 26dB BW & 99% OBW (NB UNII_R HDRp4 – 6420MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 24 of 136



Plot 7-19. 26dB BW & 99% OBW (NB UNII_R HDRp8 – 6108MHz)

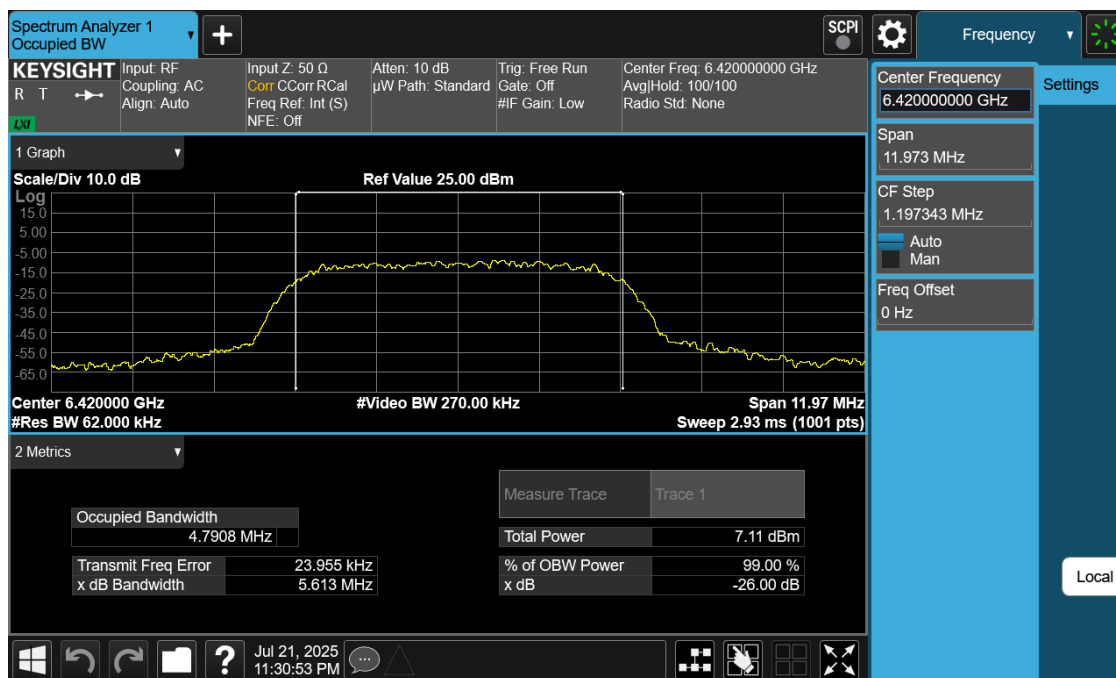


Plot 7-20. 26dB BW & 99% OBW (NB UNII_R HDRp8 – 6264MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 25 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.



Plot 7-21. 26dB BW & 99% OBW (NB UNII_R HDRp8 – 6420MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 26 of 136

V 10.6 10/27/2023

7.2.2 NB UNII_L 26dB & 99% Bandwidth Measurements

Frequency [MHz]	Data Rate [Mbps]	Mode	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]	Maximum Bandwidth Limit [MHz]	Pass / Fail
6108	1.0	NB UNII BDR	1.00	1.27	320	Pass
6264	1.0	NB UNII BDR	1.00	1.27	320	Pass
6420	1.0	NB UNII BDR	1.01	1.27	320	Pass
6108	1.0	NB UNII LE1M	1.07	1.35	320	Pass
6264	1.0	NB UNII LE1M	1.06	1.35	320	Pass
6420	1.0	NB UNII LE1M	1.07	1.35	320	Pass
6108	2.0	NB UNII LE2M	2.07	2.52	320	Pass
6264	2.0	NB UNII LE2M	2.07	2.53	320	Pass
6420	2.0	NB UNII LE2M	2.08	2.53	320	Pass
6108	4.0	NB UNII HDR4	2.38	2.73	320	Pass
6264	4.0	NB UNII HDR4	2.38	2.73	320	Pass
6420	4.0	NB UNII HDR4	2.38	2.73	320	Pass
6108	8.0	NB UNII HDR8	4.75	5.44	320	Pass
6264	8.0	NB UNII HDR8	4.75	5.44	320	Pass
6420	8.0	NB UNII HDR8	4.75	5.44	320	Pass
6108	4.0	NB UNII HDRp4	2.40	2.82	320	Pass
6264	4.0	NB UNII HDRp4	2.40	2.81	320	Pass
6420	4.0	NB UNII HDRp4	2.40	2.82	320	Pass
6108	8.0	NB UNII HDRp8	4.79	5.61	320	Pass
6264	8.0	NB UNII HDRp8	4.79	5.61	320	Pass
6420	8.0	NB UNII HDRp8	4.80	5.62	320	Pass

Table 7-3. Conducted BW Measurements NB UNII_L

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 27 of 136

V 10.6 10/27/2023



Plot 7-22. 26dB BW & 99% OBW (NB UNII_L BDR – 6108MHz)



Plot 7-23. 26dB BW & 99% OBW (NB UNII_L BDR – 6264MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 28 of 136

V 10.6 10/27/2023

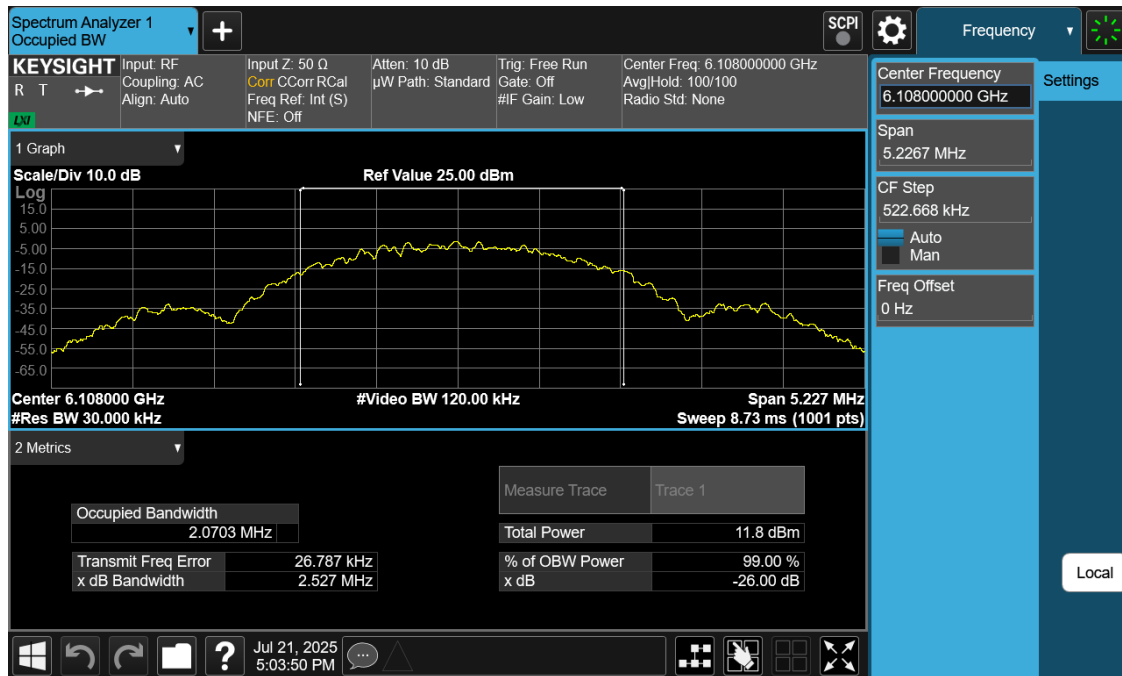
Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.



FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 29 of 136



FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 30 of 136



Plot 7-28. 26dB BW & 99% OBW (NB UNII_L LE2M – 6108MHz)

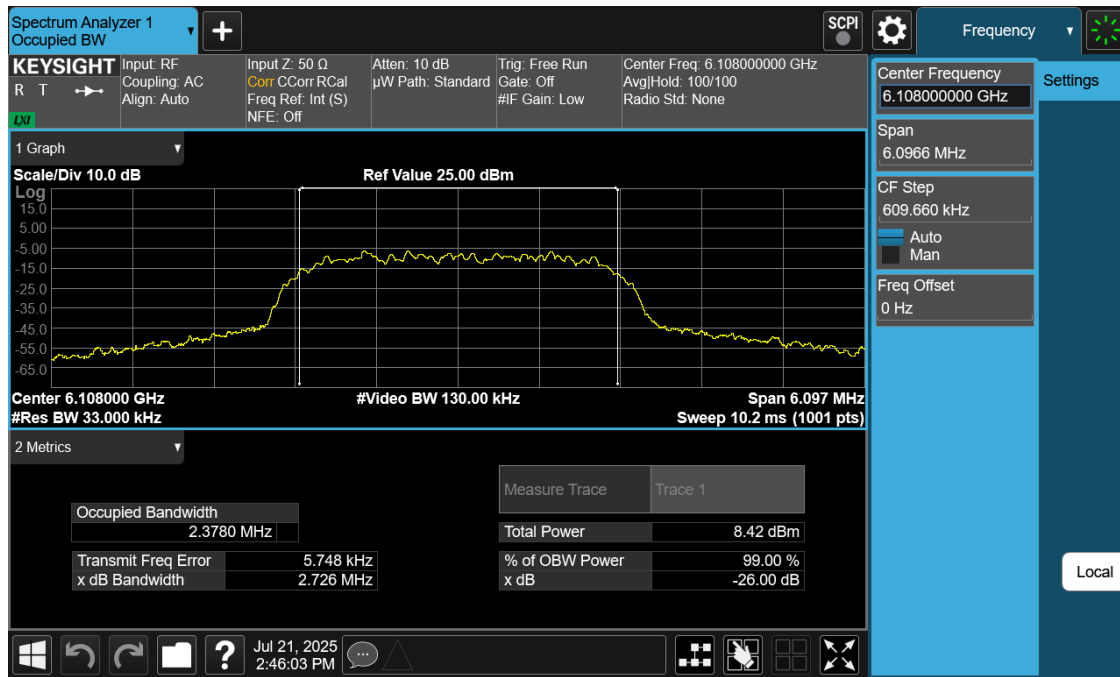


Plot 7-29. 26dB BW & 99% OBW (NB UNII_L LE2M – 6264MHz)

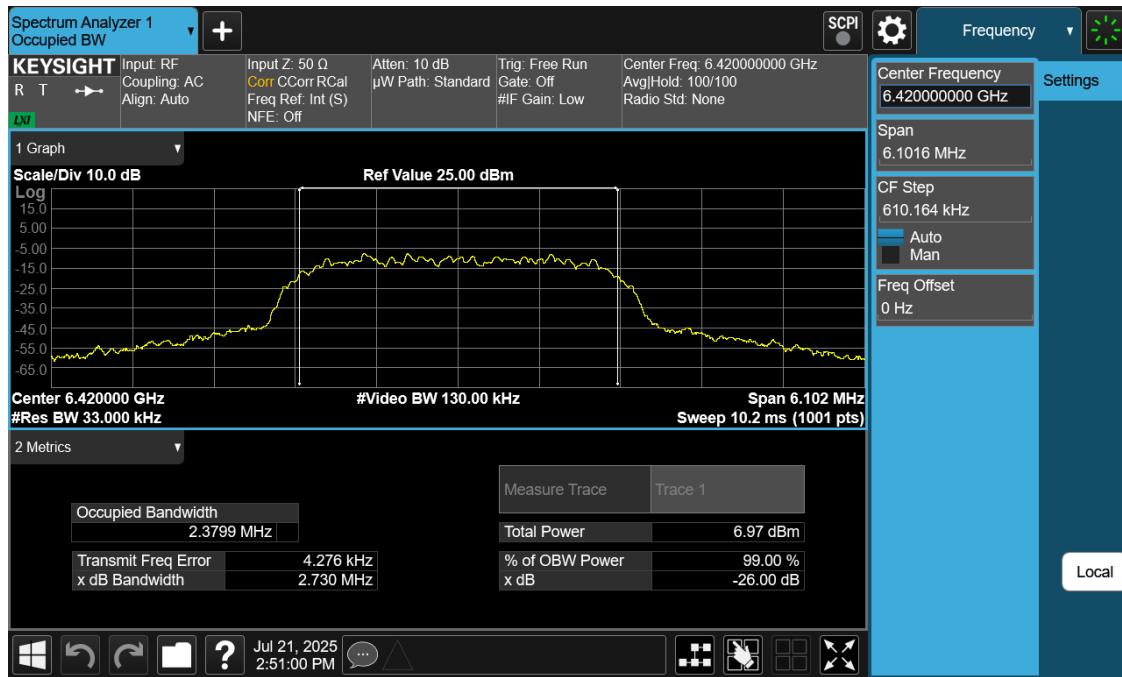
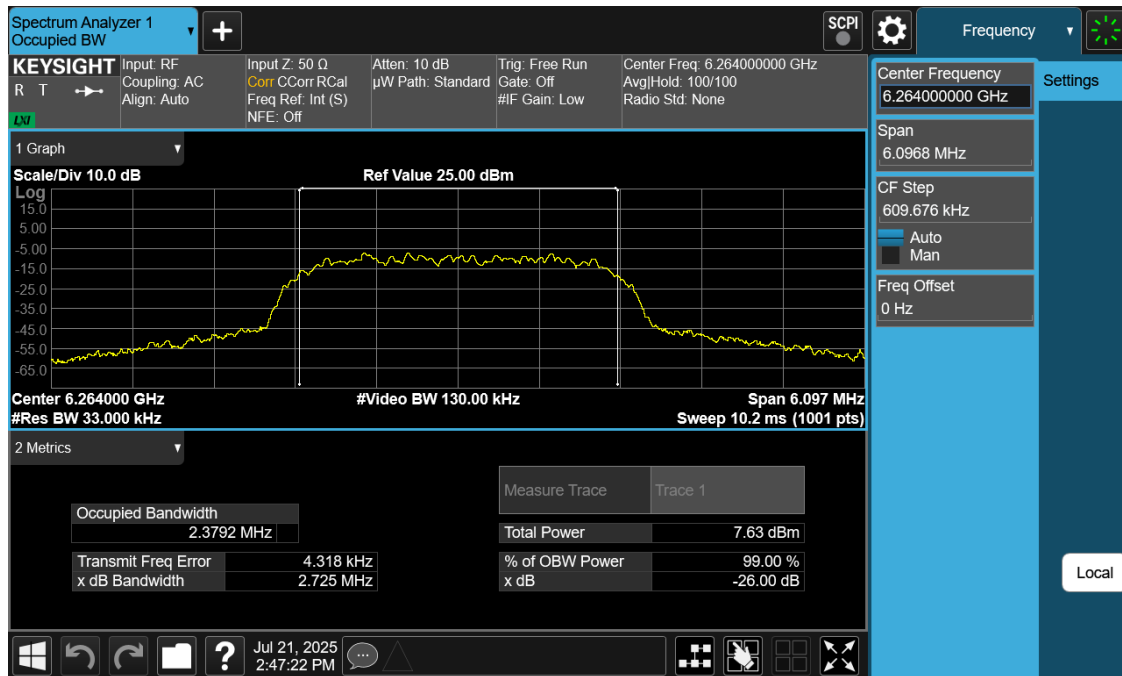
FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 31 of 136

V 10.6 10/27/2023

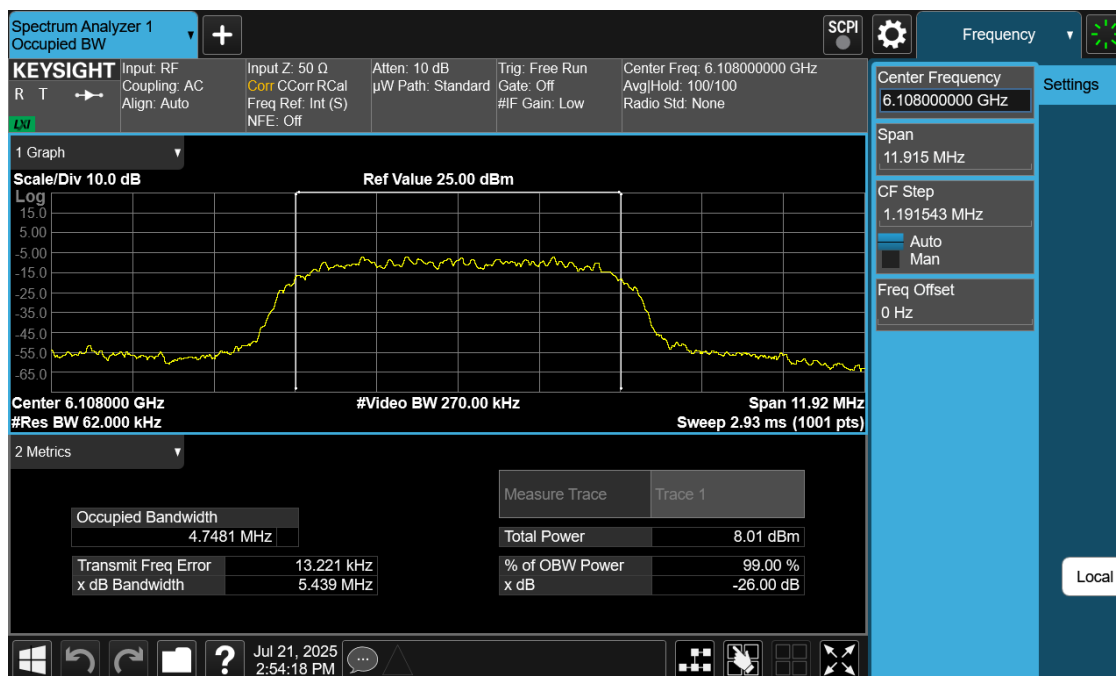
Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.



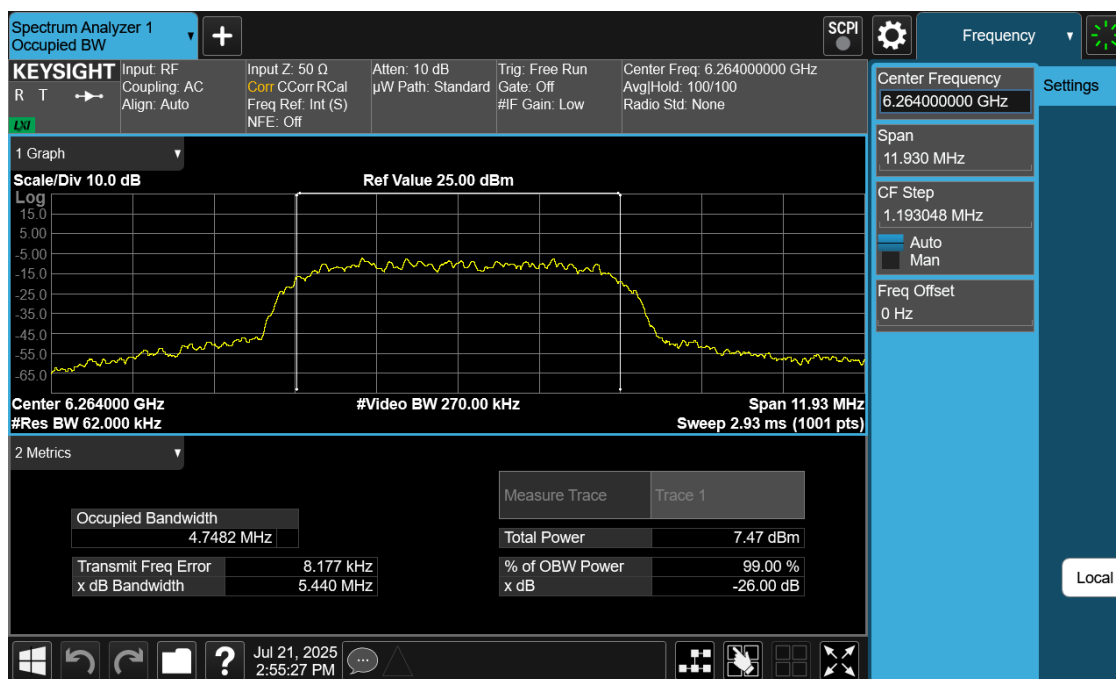
FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 32 of 136



FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 33 of 136



Plot 7-34. 26dB BW & 99% OBW (NB UNII_L HDR8 – 6108MHz)

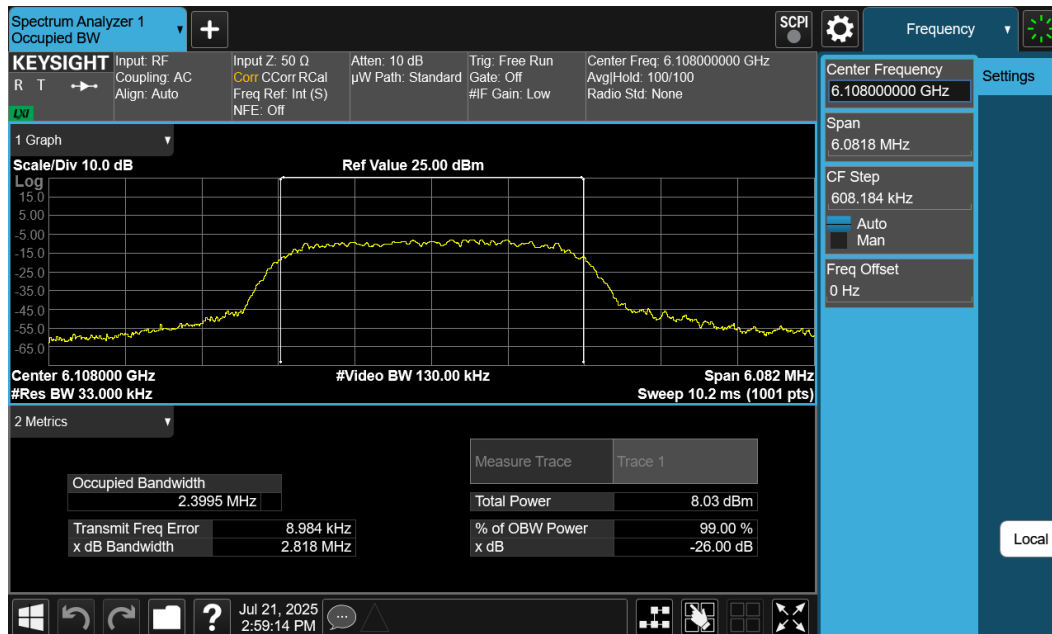
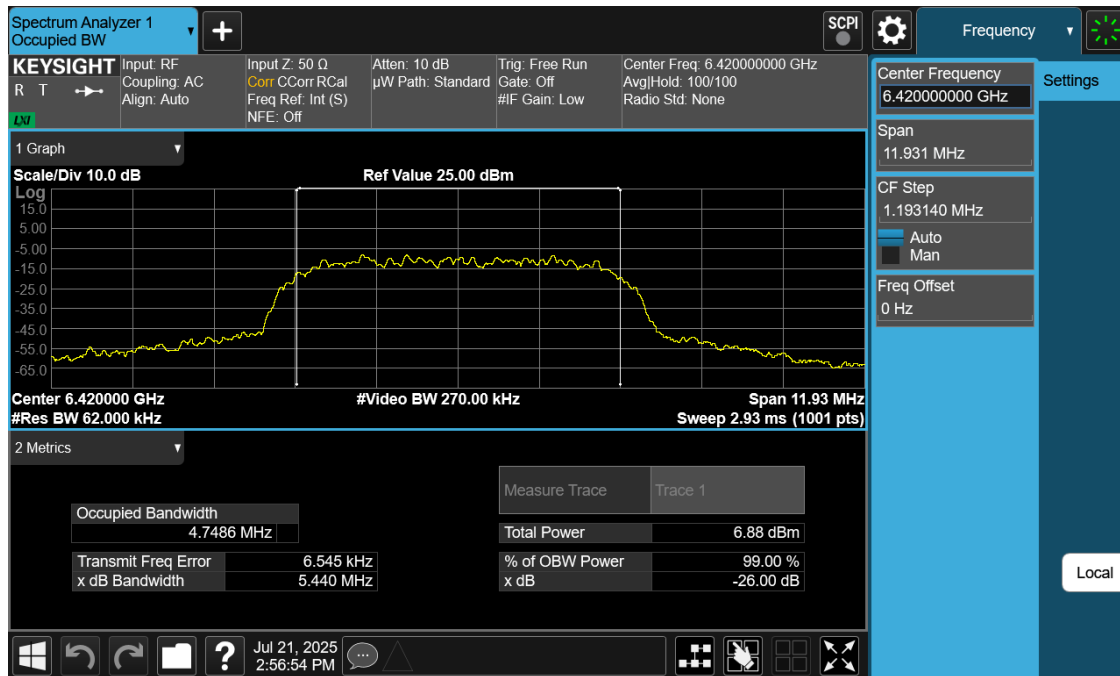


Plot 7-35. 26dB BW & 99% OBW (NB UNII_L HDR8 – 6264MHz)

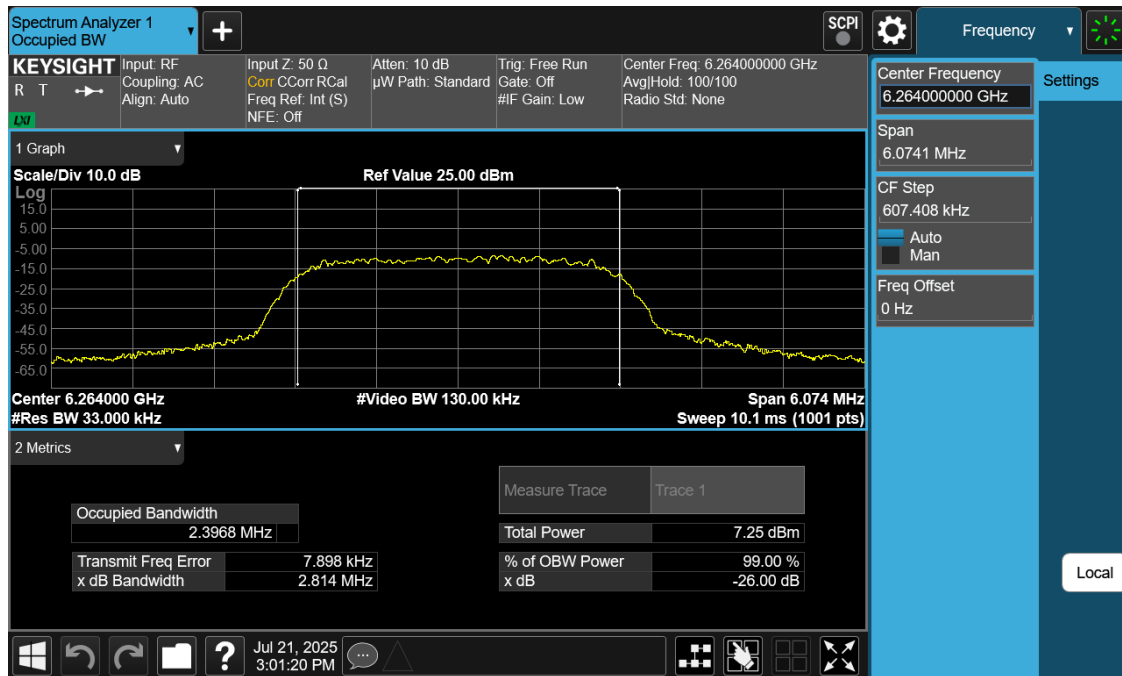
FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 34 of 136

V 10.6 10/27/2023

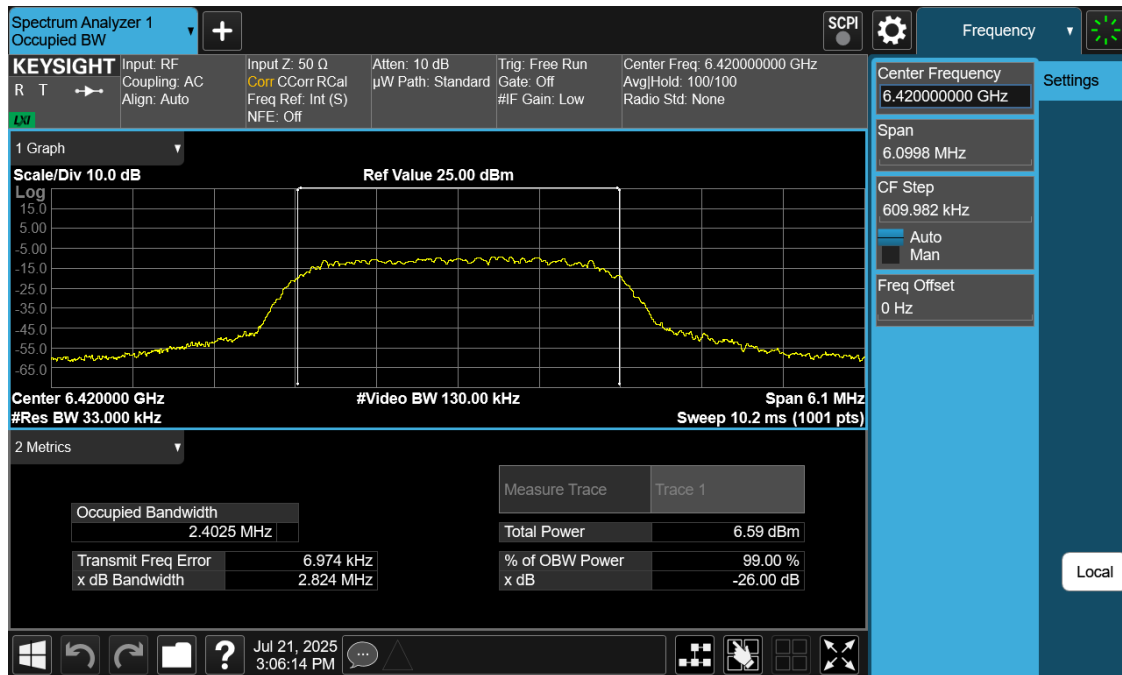
Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.



FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 35 of 136

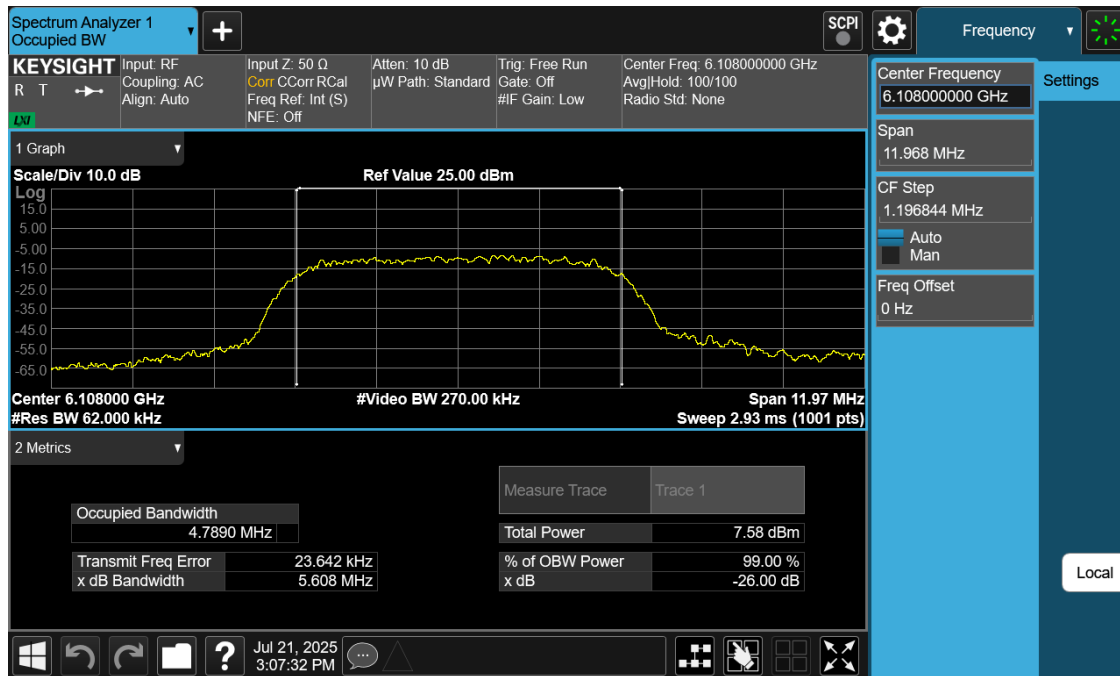


Plot 7-38. 26dB BW & 99% OBW (NB UNII_L HDRp4 – 6264MHz)

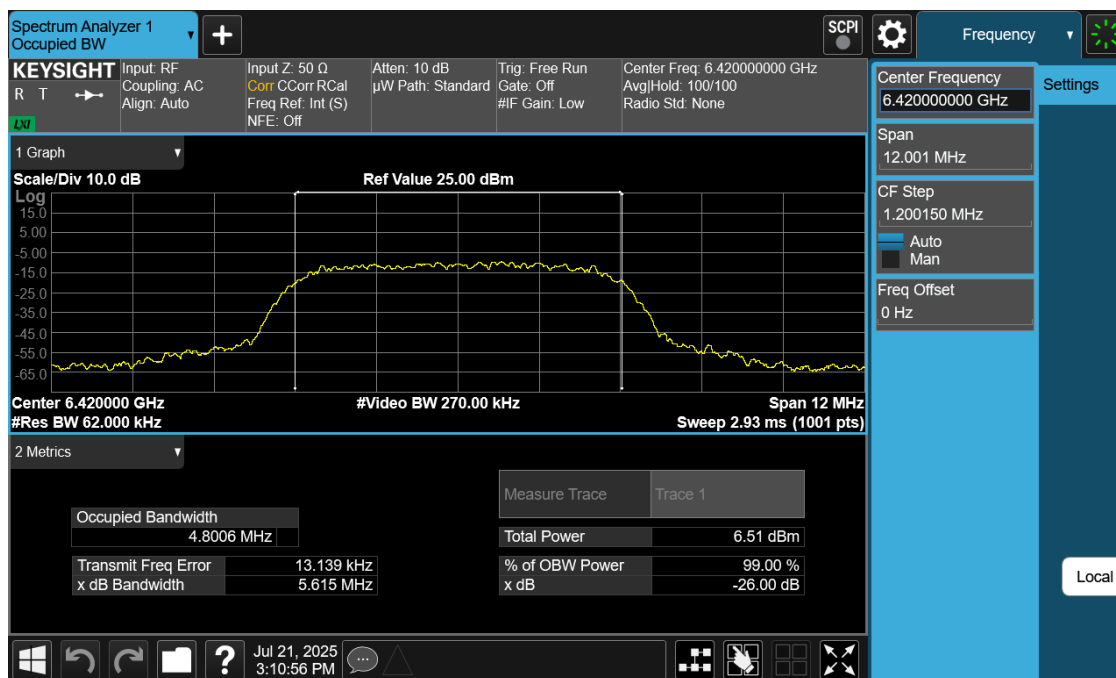


Plot 7-39. 26dB BW & 99% OBW (NB UNII_L HDRp4 – 6420MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 36 of 136



FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 37 of 136



Plot 7-42. 26dB BW & 99% OBW (NB UNII_L HDRp8 – 6420MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 38 of 136

V 10.6 10/27/2023

7.3 Conducted Output Power and Max EIRP Measurement

§15.407(a.9); RSS-248 [4.5.6]

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 5.925 – 7.125GHz band, the maximum e.i.r.p. over the frequency band of operation must not exceed 14dBm for Very Low Power (VLP) devices.

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

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 7-2. Test Instrument & Measurement Setup

Test Notes

None

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 39 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

7.3.1 Conducted Output Power Measurements

Frequency [MHz]	Data Rate [Mbps]	Mode	Conducted Powers [dBm]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
6108	1.0	NB UNII BDR	-9.01	-1.90	-10.91	14.00	-24.91
6264	1.0	NB UNII BDR	-9.38	-2.20	-11.58	14.00	-25.58
6420	1.0	NB UNII BDR	-9.00	-2.40	-11.40	14.00	-25.40
6108	1.0	NB UNII LE1M	-9.15	-1.90	-11.05	14.00	-25.05
6264	1.0	NB UNII LE1M	-9.34	-2.20	-11.54	14.00	-25.54
6420	1.0	NB UNII LE1M	-9.21	-2.40	-11.61	14.00	-25.61
6108	2.0	NB UNII LE2M	-9.01	-1.90	-10.91	14.00	-24.91
6264	2.0	NB UNII LE2M	-9.15	-2.20	-11.35	14.00	-25.35
6420	2.0	NB UNII LE2M	-9.05	-2.40	-11.45	14.00	-25.45
6108	4.0	NB UNII HDR4	-6.57	-1.90	-8.47	14.00	-22.47
6264	4.0	NB UNII HDR4	-6.54	-2.20	-8.74	14.00	-22.74
6420	4.0	NB UNII HDR4	-6.55	-2.40	-8.95	14.00	-22.95
6108	8.0	NB UNII HDR8	-4.02	-1.90	-5.92	14.00	-19.92
6264	8.0	NB UNII HDR8	-4.03	-2.20	-6.23	14.00	-20.23
6420	8.0	NB UNII HDR8	-4.13	-2.40	-6.53	14.00	-20.53
6108	4.0	NB UNII HDRp4	-6.54	-1.90	-8.44	14.00	-22.44
6264	4.0	NB UNII HDRp4	-6.59	-2.20	-8.79	14.00	-22.79
6420	4.0	NB UNII HDRp4	-6.61	-2.40	-9.01	14.00	-23.01
6108	8.0	NB UNII HDRp8	-4.16	-1.90	-6.06	14.00	-20.06
6264	8.0	NB UNII HDRp8	-4.08	-2.20	-6.28	14.00	-20.28
6420	8.0	NB UNII HDRp8	-4.20	-2.40	-6.60	14.00	-20.60

Table 7-4. NB UNII_R Maximum Conducted Output Power

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 40 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.

Frequency [MHz]	Data Rate [Mbps]	Mode	Conducted Powers [dBm]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
6108	1.0	NB UNII BDR	-9.14	-1.90	-11.04	14.00	-25.04
6264	1.0	NB UNII BDR	-9.20	-2.20	-11.40	14.00	-25.40
6420	1.0	NB UNII BDR	-9.19	-2.40	-11.59	14.00	-25.59
6108	1.0	NB UNII LE1M	-9.19	-1.90	-11.09	14.00	-25.09
6264	1.0	NB UNII LE1M	-9.29	-2.20	-11.49	14.00	-25.49
6420	1.0	NB UNII LE1M	-9.40	-2.40	-11.80	14.00	-25.80
6108	2.0	NB UNII LE2M	-9.25	-1.90	-11.15	14.00	-25.15
6264	2.0	NB UNII LE2M	-9.22	-2.20	-11.42	14.00	-25.42
6420	2.0	NB UNII LE2M	-9.41	-2.40	-11.81	14.00	-25.81
6108	4.0	NB UNII HDR4	-6.58	-1.90	-8.48	14.00	-22.48
6264	4.0	NB UNII HDR4	-6.51	-2.20	-8.71	14.00	-22.71
6420	4.0	NB UNII HDR4	-6.63	-2.40	-9.03	14.00	-23.03
6108	8.0	NB UNII HDR8	-4.07	-1.90	-5.97	14.00	-19.97
6264	8.0	NB UNII HDR8	-4.11	-2.20	-6.31	14.00	-20.31
6420	8.0	NB UNII HDR8	-4.23	-2.40	-6.63	14.00	-20.63
6108	4.0	NB UNII HDRp4	-6.64	-1.90	-8.54	14.00	-22.54
6264	4.0	NB UNII HDRp4	-6.56	-2.20	-8.76	14.00	-22.76
6420	4.0	NB UNII HDRp4	-6.71	-2.40	-9.11	14.00	-23.11
6108	8.0	NB UNII HDRp8	-4.14	-1.90	-6.04	14.00	-20.04
6264	8.0	NB UNII HDRp8	-4.25	-2.20	-6.45	14.00	-20.45
6420	8.0	NB UNII HDRp8	-4.07	-2.40	-6.47	14.00	-20.47

Table 7-5. NB UNII_L Maximum Conducted Output Power

Sample e.i.r.p. Calculation:

At 6108 MHz for NB UNII_R BDR, the average conducted output power was measured to be -9.01 dBm with antenna gain of -1.90 dBi.

$$\text{e.i.r.p. (dBm)} = \text{Conducted Power (dBm)} + \text{Ant gain (dBi)}$$

$$-9.01 \text{ dBm} + (-1.90 \text{ dBi}) = -10.91 \text{ dBm}$$

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 41 of 136

V 10.6 10/27/2023

7.4 Maximum Power Spectral Density

§15.407(a.9); RSS-248 [4.5.6]

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 5.925 – 7.125GHz band, the maximum permissible power spectral density must not exceed -5 dBm e.i.r.p in any 1-megahertz band for Very Low Power (VLP) devices.

Test Procedure Used

ANSI C63.10-2020 – Section 12.4.2.2

KDB 789033 D02 v02r01 – Section F

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
4. VBW $\geq$ 3MHz
5. Number of sweep points $\geq 2 \times$ (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.

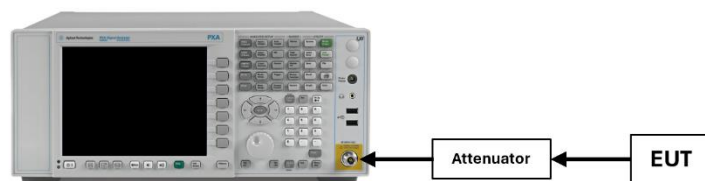


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

The duty cycle correction factor (DCCF) has been applied as an amplitude offset in the spectrum analyzer to ensure the required correction is accurately reflected in the measured Power Spectral Density (PSD). The offset value is indicated on each PSD plot.

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 42 of 136

V 10.6 10/27/2023

7.4.1 Power Spectral Density Measurements

Frequency [MHz]	Data Rate [Mbps]	Mode	Measured Power Density [dBm/MHz]	Antenna Gain [dBi]	e.i.r.p. Density [dBm/MHz]	Max Permissible Power Density [dBm/MHz]	Margin [dB]	Verdict
6108	1.0	NB UNII BDR	-10.92	-1.90	-12.82	-5.00	-7.82	PASS
6264	1.0	NB UNII BDR	-11.46	-2.20	-13.66	-5.00	-8.66	PASS
6420	1.0	NB UNII BDR	-10.79	-2.40	-13.19	-5.00	-8.19	PASS
6108	1.0	NB UNII LE1M	-11.15	-1.90	-13.05	-5.00	-8.05	PASS
6264	1.0	NB UNII LE1M	-11.48	-2.20	-13.68	-5.00	-8.68	PASS
6420	1.0	NB UNII LE1M	-11.33	-2.40	-13.73	-5.00	-8.73	PASS
6108	2.0	NB UNII LE2M	-11.37	-1.90	-13.27	-5.00	-8.27	PASS
6264	2.0	NB UNII LE2M	-12.30	-2.20	-14.50	-5.00	-9.50	PASS
6420	2.0	NB UNII LE2M	-12.13	-2.40	-14.53	-5.00	-9.53	PASS
6108	4.0	NB UNII HDR4	-11.01	-1.90	-12.91	-5.00	-7.91	PASS
6264	4.0	NB UNII HDR4	-11.19	-2.20	-13.39	-5.00	-8.39	PASS
6420	4.0	NB UNII HDR4	-11.10	-2.40	-13.50	-5.00	-8.50	PASS
6108	8.0	NB UNII HDR8	-11.30	-1.90	-13.20	-5.00	-8.20	PASS
6264	8.0	NB UNII HDR8	-11.60	-2.20	-13.80	-5.00	-8.80	PASS
6420	8.0	NB UNII HDR8	-11.50	-2.40	-13.90	-5.00	-8.90	PASS
6108	4.0	NB UNII HDRp4	-11.01	-1.90	-12.91	-5.00	-7.91	PASS
6264	4.0	NB UNII HDRp4	-11.24	-2.20	-13.44	-5.00	-8.44	PASS
6420	4.0	NB UNII HDRp4	-11.11	-2.40	-13.51	-5.00	-8.51	PASS
6108	8.0	NB UNII HDRp8	-11.38	-1.90	-13.28	-5.00	-8.28	PASS
6264	8.0	NB UNII HDRp8	-11.69	-2.20	-13.89	-5.00	-8.89	PASS
6420	8.0	NB UNII HDRp8	-11.62	-2.40	-14.02	-5.00	-9.02	PASS

Table 7-6. NB UNII_R Power Spectral Density Measurements

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 43 of 136

V 10.6 10/27/2023



Plot 7-43. PSD (NB UNII_R BDR – 6108MHz)

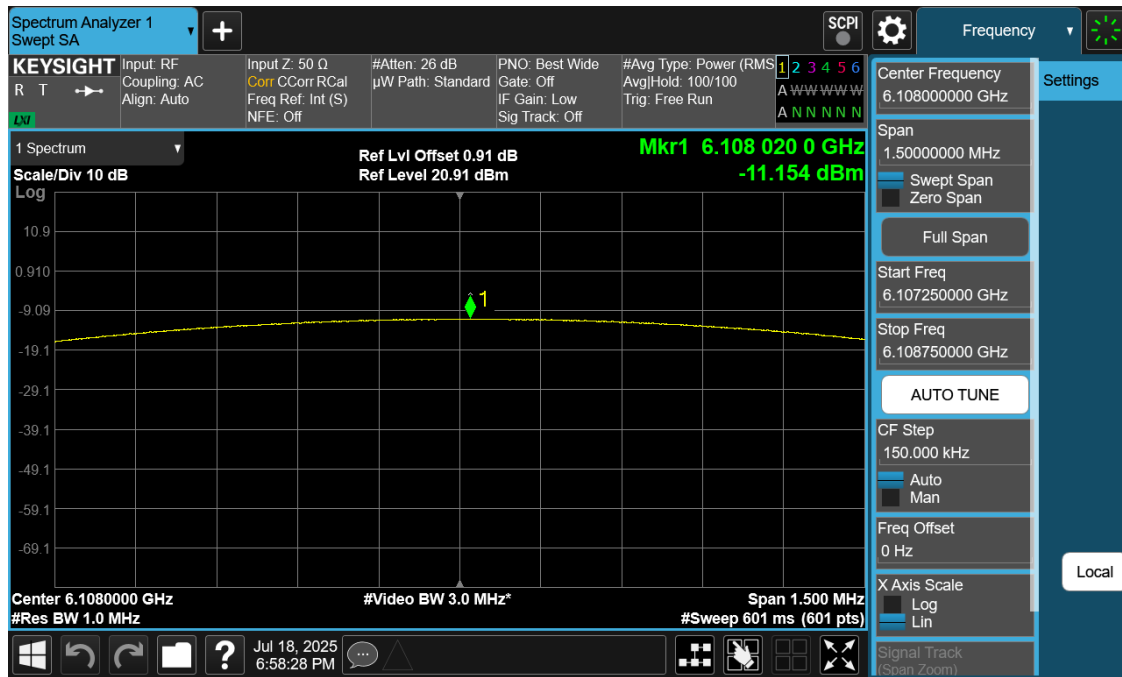


Plot 7-44. PSD (NB UNII_R BDR – 6264MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 44 of 136

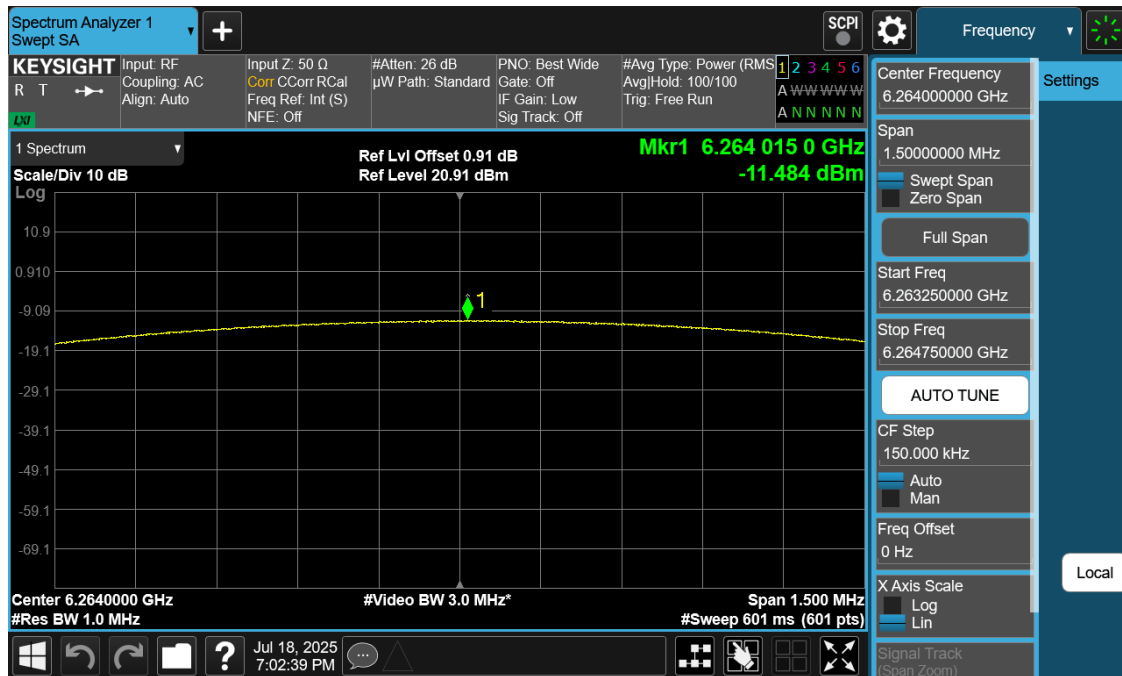


Plot 7-45. PSD (NB UNII_R BDR – 6420MHz)

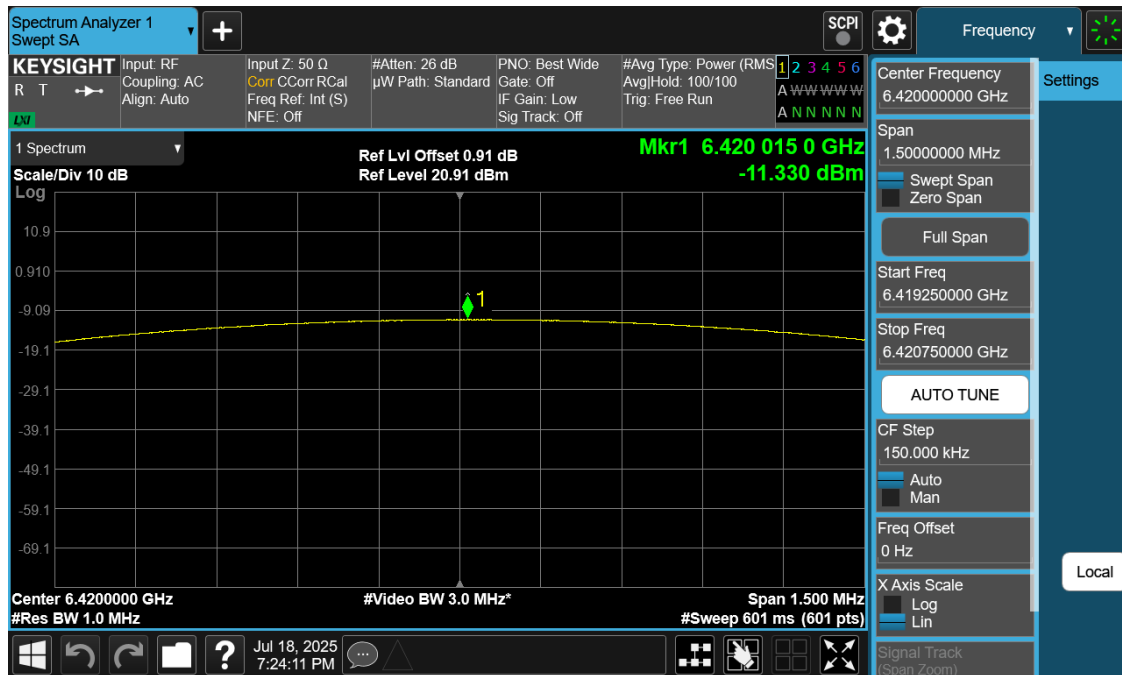


Plot 7-46. PSD (NB UNII_R LE1M – 6108MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 45 of 136



Plot 7-47. PSD (NB UNII_R LE1M – 6264MHz)

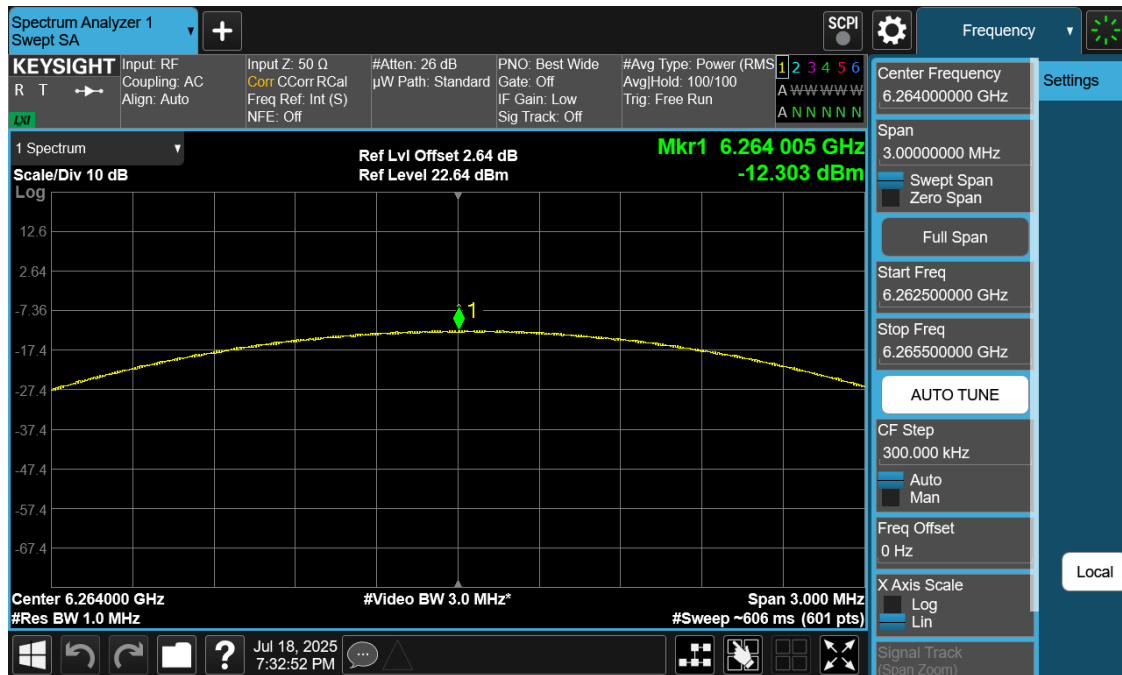


Plot 7-48. PSD (NB UNII_R LE1M – 6420MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 46 of 136

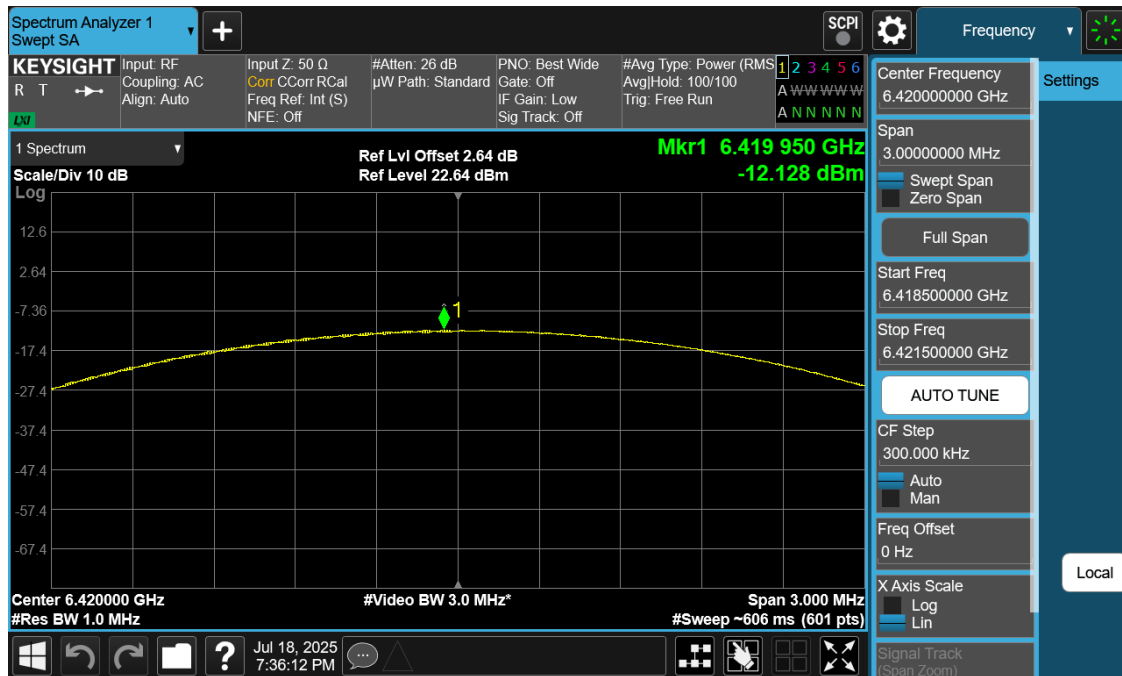


Plot 7-49. PSD (NB UNII_R LE2M – 6108MHz)

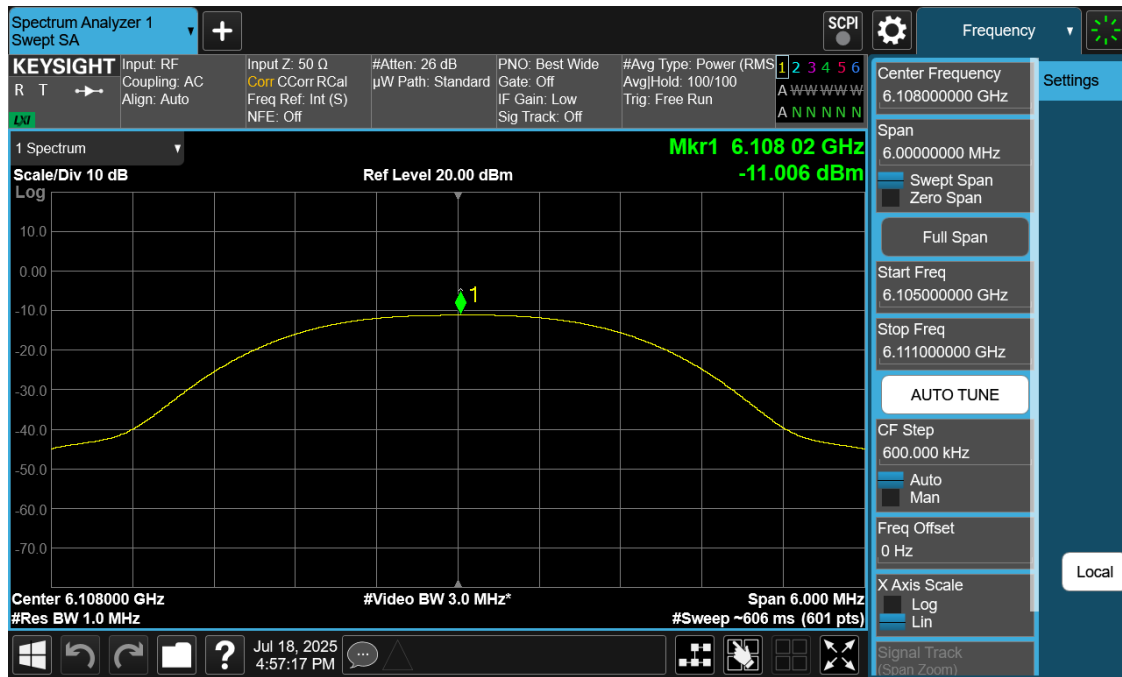


Plot 7-50. PSD (NB UNII_R LE2M – 6264MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 47 of 136



Plot 7-51. PSD (NB UNII_R LE2M – 6420MHz)

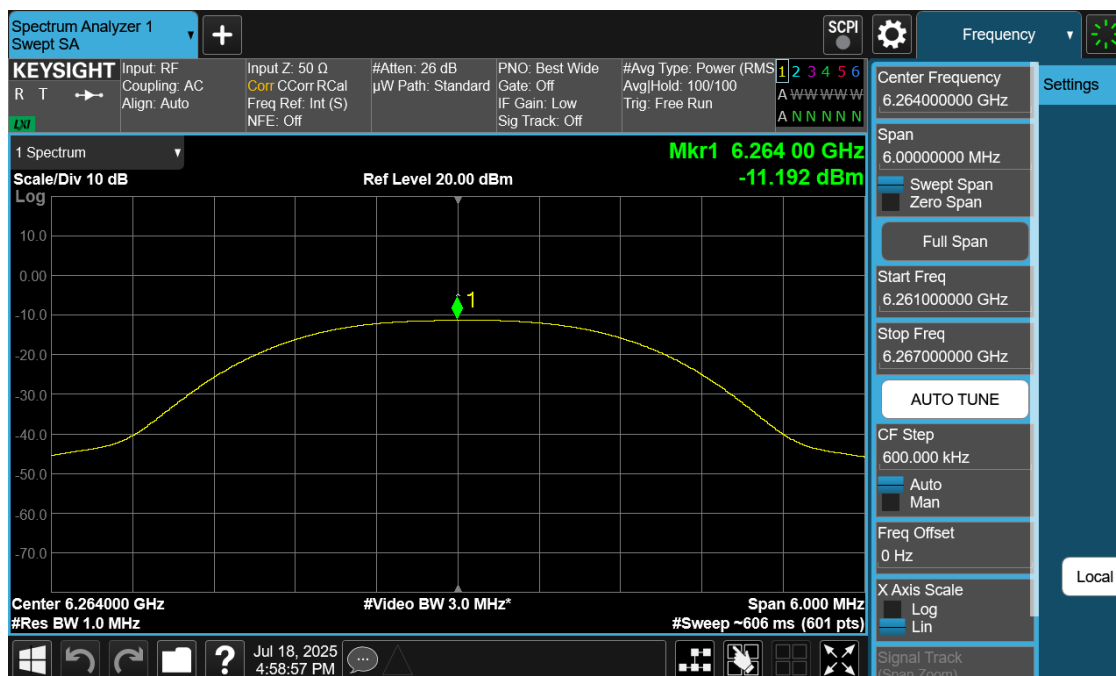


Plot 7-52. PSD (NB UNII_R HDR4 – 6108MHz)

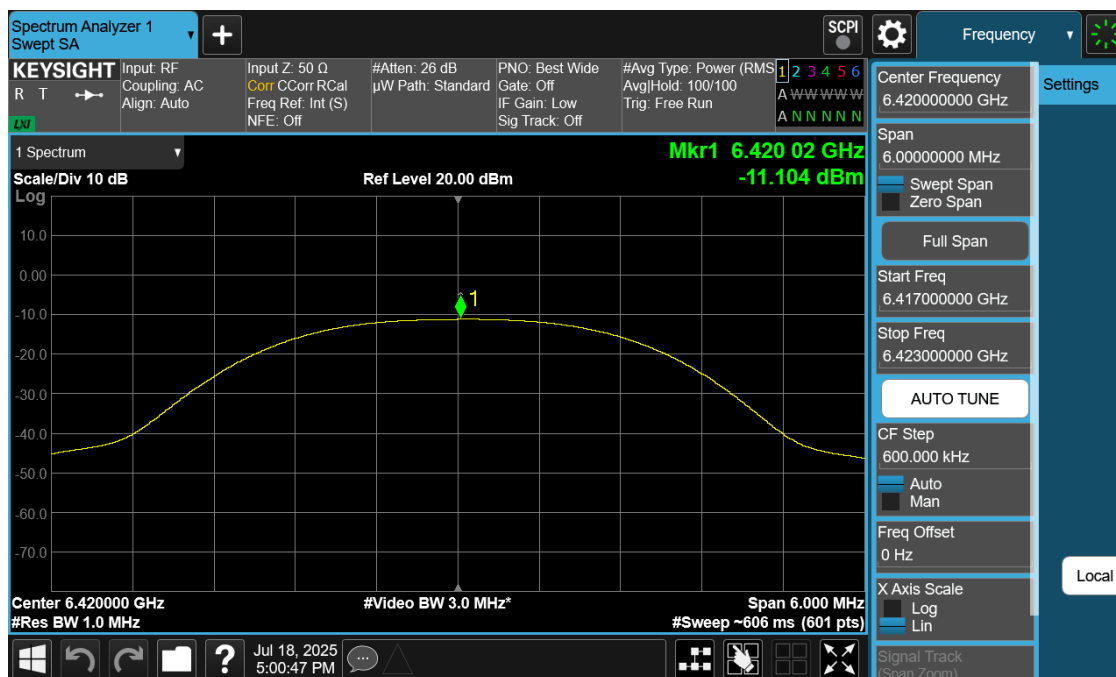
FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 48 of 136

V 10.6 10/27/2023

Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from Element Materials Technology. If you have any questions about this or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact ct.info@element.com.



Plot 7-53. PSD (NB UNII_R HDR4 – 6264MHz)



Plot 7-54. PSD (NB UNII_R HDR4 – 6420MHz)

FCC ID: BCGA3416 IC: 579C-A3416		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2505120065-10.BCG	Test Dates: 5/12/2025 - 08/13/2025	EUT Type: Head Mounted Device	Page 49 of 136