



MEASUREMENT REPORT

FCC Part 30 5G mmWave

Applicant Name:

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

Date of Testing:

12/15/2020-03/09/2021

Test Site/Location:

PCTEST Lab. Morgan Hill, CA, USA

Test Report Serial No.:

1C2101020002-06.BCG

FCC ID:

BCGA2301

APPLICANT:

Apple Inc.

Application Type:

Certification

Model:

A2301

EUT Type:

Tablet Device

FCC Classification:

Part 30 Mobile Transmitter (5GM)

FCC Rule Part(s):


30

Test Procedure(s):

ANSI C63.26-2015, KDB 971168 D01 v03r01,
KDB 842590 D01 v01r01

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 §2.947. 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.

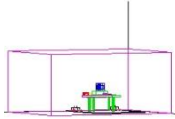

Randy Ortanez
President

FCC ID: BCGA2301	 PCTEST Proud to be part of  element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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T A B L E O F C O N T E N T S

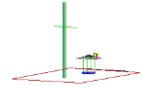
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Band	Tx Frequency [MHz]	Bandwidth [MHz]	CCs Active	Antenna Diversity	Waveform	Modulation	EIRP		Emission Designator
							Max Power [W]	Max Power [dBm]	
n261	27500 - 28350	50	1	SISO	CP-OFDM	QPSK	0.574	27.59	45M3G7W
						16QAM	0.406	26.09	45M2D7W
						64QAM	0.223	23.49	45M3D7W
				SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.794	29.00	45M3G7W
						QPSK	0.798	29.02	45M4G7W
						16QAM	0.653	28.15	45M4D7W
			2	MIMO	CP-OFDM	64QAM	0.460	26.63	45M6D7W
						QPSK	0.412	26.15	45M5G7W
						16QAM	0.413	26.16	45M2D7W
				SISO Dual Pol	DFT-s-OFDM	64QAM	0.265	24.24	45M3D7W
						$\pi/2$ BPSK	1.288	31.10	45M0G7W
						QPSK	1.279	31.07	45M4G7W
	27500 - 28350	50+50	1	SISO	CP-OFDM	16QAM	0.968	29.86	45M2D7W
						64QAM	0.755	28.78	45M3D7W
						QPSK	0.164	22.14	94M8G7W
			2	SISO	DFT-s-OFDM	16QAM	0.165	22.18	94M5D7W
						64QAM	0.196	22.92	94M5D7W
						$\pi/2$ BPSK	0.136	21.33	94M8G7W
			2	SISO	DFT-s-OFDM	QPSK	0.157	21.95	95M0G7W
						16QAM	0.162	22.09	95M0D7W
						64QAM	0.136	21.33	95M2D7W
			2	MIMO	CP-OFDM	QPSK	0.104	20.17	95M2G7W
						16QAM	0.125	20.98	95M5D7W
						64QAM	0.087	19.40	95M2D7W
			2	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	0.288	24.60	95M6G7W
						QPSK	0.298	24.74	95M2G7W
						16QAM	0.286	24.57	95M2D7W
	27500 - 28350	100	1	SISO	CP-OFDM	64QAM	0.304	24.83	95M7D7W
						QPSK	0.518	27.14	93M1G7W
						16QAM	0.403	26.05	93M0D7W
			2	SISO	DFT-s-OFDM	64QAM	0.258	24.11	93M0D7W
						$\pi/2$ BPSK	0.899	29.54	90M6G7W
						QPSK	0.766	28.84	90M8G7W
			2	MIMO	CP-OFDM	16QAM	0.723	28.59	90M5D7W
						64QAM	0.446	26.49	90M8D7W
				SISO Dual Pol	DFT-s-OFDM	QPSK	0.456	26.59	92M9G7W
						16QAM	0.413	26.16	93M2D7W
						64QAM	0.237	23.74	93M3D7W
	27500 - 28350	100+100	1	SISO	CP-OFDM	$\pi/2$ BPSK	1.282	31.08	90M9G7W
						QPSK	1.213	30.84	90M9G7W
						16QAM	1.052	30.22	90M7D7W
			2	SISO	DFT-s-OFDM	64QAM	0.667	28.24	91M0D7W
						QPSK	0.149	21.74	191M7W
						16QAM	0.144	21.59	191MD7W
			2	SISO	DFT-s-OFDM	64QAM	0.138	21.41	192MD7W
						$\pi/2$ BPSK	0.140	21.46	189MG7W
						QPSK	0.150	21.76	189MG7W
			2	MIMO	CP-OFDM	16QAM	0.140	21.46	189MD7W
						64QAM	0.151	21.80	189MD7W
						QPSK	0.121	20.84	192MG7W
			2	SISO Dual Pol	DFT-s-OFDM	16QAM	0.121	20.82	192MD7W
						64QAM	0.117	20.69	192MD7W
						$\pi/2$ BPSK	0.321	25.06	190MG7W
						QPSK	0.327	25.14	190MG7W
						16QAM	0.327	25.14	190MD7W
						64QAM	0.327	25.14	189MD7W

EUT Overview (Band n261)

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Band	Tx Frequency [MHz]	Bandwidth [MHz]	CCs Active	Antenna Diversity	Waveform	Modulation	EIRP		Emission Designator
							Max Power [W]	Max Power [dBm]	
n260	37000-40000	50	1	SISO	CP-OFDM	QPSK	0.251	23.99	45M3G7W
						16QAM	0.194	22.87	45M3D7W
						64QAM	0.135	21.29	45M3D7W
				SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.439	26.42	45M4G7W
						QPSK	0.488	26.88	45M3G7W
						16QAM	0.310	24.91	45M4D7W
				MIMO	CP-OFDM	64QAM	0.193	22.85	45M5D7W
						QPSK	0.234	23.69	45M3G7W
						16QAM	0.234	23.69	45M2D7W
				SISO Dual Pol	DFT-s-OFDM	64QAM	0.125	20.98	45M2D7W
						$\pi/2$ BPSK	1.358	31.33	45M4G7W
						QPSK	1.303	31.15	45M6G7W
				50+50	2	16QAM	1.030	30.13	45M4D7W
						64QAM	0.684	28.35	45M5D7W
						QPSK	0.108	20.34	94M7G7W
				SISO	CP-OFDM	16QAM	0.119	20.76	95M0D7W
						64QAM	0.077	18.88	96M3D7W
				SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.110	20.42	94M9G7W
						QPSK	0.111	20.44	95M3G7W
						16QAM	0.108	20.35	95M2D7W
				MIMO	CP-OFDM	64QAM	0.105	20.23	95M2D7W
						QPSK	0.053	17.25	95M5G7W
						16QAM	0.056	17.46	95M3D7W
				SISO Dual Pol	DFT-s-OFDM	64QAM	0.056	17.52	95M0D7W
						$\pi/2$ BPSK	0.293	24.67	95M0G7W
						QPSK	0.303	24.81	95M1G7W
				100	1	16QAM	0.321	25.06	95M1D7W
						64QAM	0.331	25.20	94M8D7W
						QPSK	0.179	22.54	93M2G7W
				SISO	CP-OFDM	16QAM	0.197	22.94	93M1D7W
						64QAM	0.148	21.69	93M3D7W
				SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.481	26.82	90M7G7W
						QPSK	0.478	26.79	90M8G7W
						16QAM	0.349	25.43	90M9D7W
				MIMO	CP-OFDM	64QAM	0.201	23.03	90M8D7W
						QPSK	0.244	23.88	93M1G7W
						16QAM	0.195	22.91	92M8D7W
				SISO Dual Pol	DFT-s-OFDM	64QAM	0.131	21.17	93M1D7W
						$\pi/2$ BPSK	1.274	31.05	90M7G7W
						QPSK	1.216	30.85	91M3G7W
	37000-40000	100+100	2	SISO	CP-OFDM	16QAM	1.064	30.27	90M9D7W
						64QAM	0.533	27.27	90M8D7W
				SISO	DFT-s-OFDM	QPSK	0.123	20.90	192MG7W
						16QAM	0.110	20.40	191MD7W
				SISO	CP-OFDM	64QAM	0.069	18.40	192MD7W
						$\pi/2$ BPSK	0.110	20.42	190MG7W
				MIMO	CP-OFDM	QPSK	0.111	20.46	190MG7W
						16QAM	0.110	20.43	190MD7W
						64QAM	0.113	20.54	190MD7W
				SISO Dual Pol	DFT-s-OFDM	QPSK	0.049	16.93	191MG7W
						16QAM	0.049	16.86	192MD7W
						64QAM	0.053	17.24	192MD7W
				SISO	CP-OFDM	$\pi/2$ BPSK	0.185	22.67	189MG7W
						QPSK	0.185	22.68	190MG7W
						16QAM	0.188	22.75	189MD7W
				SISO Dual Pol	DFT-s-OFDM	64QAM	0.182	22.61	189MD7W

EUT Overview (Band n260)

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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 PCTEST Test Location

These measurement tests were conducted at the PCTEST 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 PCTEST located in Morgan Hill, CA 95037, U.S.A.

- PCTEST 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.
- PCTEST 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).
- PCTEST facility is a registered (22831) test laboratory with the site description on file with ISED.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2301**. The test data contained in this report pertains only to the emissions due to the EUT's 5G mmWave function.

Test Device Serial No.: W65J2KCJGF, KTPQM4KX6D, VHCV3CQMFD, F07K6YN2YV, LJF33Q2FR

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (FR1/FR2), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE1M, LE2M, HDR4, HDR8), WPT

The EUT supports up to 2CC for UL and for each CC, the EUT supports both 50MHz bandwidth and 100MHz bandwidth. The EUT supports a subcarrier spacing (SCS) of 120kHz with two Waveforms, CP-OFDM and DFT-s-OFDM, with $\pi/2$ BPSK, QPSK, 16-QAM, and 64-QAM modulations. CP-OFDM is not supporting $\pi/2$ BPSK modulation.

EUT supports both CP-OFDM and DFTs-OFDM waveforms. Below are the possible FR2 configurations. Throughout the report "SISO Dual Pol" term is used for MIMO DFTs-OFDM configuration.

FR2 Configurations		SISO CP-OFDM			SISO DFTs-OFDM			MIMO CP-OFDM			SISO Dual Pol (MIMO DFTs-OFDM)		
		Ant M0	Ant M2	Ant M3	Ant M0	Ant M2	Ant M3	Ant M3	Ant M3	Ant M3	Ant M0	Ant M2	Ant M3
n261	27.5-28.35 GHz	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
n260	37-40 GHz	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 2-1. FR2 Configurations

✓ = Support ; ✗ = NOT Support

SISO = Single Input Single Output

MIMO = Multiple Input Multiple Output

CP-OFDM = Cyclic Prefix – Orthogonal Frequency Division Multiplexing

DFTs-OFDM = Discrete Fourier Transform Spread – Orthogonal Frequency Division Multiplexing

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2.3 Antenna Description

The EUT contains three patch antennas, referred to herein as Ant M0, Ant M2, and Ant M3. Different Beam IDs are supported, each corresponding to a different position in space for each antenna. OEM provided Beam IDs using EIRP Simulation that yields highest EIRP for each antenna per FR2 band. Below are the worst case Beam IDs per manufacturer.

Band n261		
Antenna	Peak Beam ID	Paired Beam ID
Ant M0	33	161
Ant M2	22	150
Ant M3	39	167

Table 2-2. Band n261 Worst Case Beam IDs

Band n260		
Antenna	Peak Beam ID	Paired Beam ID
Ant M0	45	173
Ant M2	39	167
Ant M3	43	171

Table 2-3. Band n260 Worst Case Beam IDs

2.4 Test Support Equipment

1	Apple MacBook w/AC/DC Adapter	Model: A2141 Model: A2166	S/N: C02DV7VKMD6T S/N: N/A
2	Apple USB-C Cable	Model: Chimp	S/N: 420A57
3	USB-C Cable w/ AC/DC Adapter	Model: A146 Model: A2305	S/N: N/A S/N: N/A
4	Apple Pencil	Model: N/A	S/N: GQXYGSXBJKM9

Table 2-4. Test Support Equipment List

2.5 Test Configuration

The EUT was tested per the guidance of KDB 842590 D01 v01r01 and ANSI C63.26-2015. See Section 7.0 of this test report for a description of the radiated tests.

During testing, non-signalling standalone mode was used to operate the transmitter. Peak Beam ID was used for SISO operation and MIMO operation was achieved by enabling two Beam IDs at the same time, one Peak Beam ID and one corresponding Paired Beam ID, as provided in Section 2.3. Worst case Beam IDs yielding highest EIRP was used for all testing provided in this report.

2.6 Software and Firmware

The test was conducted with firmware version 18E20700y installed on the EUT.

2.7 EMI Suppression Device(s)/Modifications

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

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3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

The measurement procedures described in the document titled "American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services" (ANSI C63.26-2015) and the guidance provided in KDB 842590 D01 v01r01 were used in the measurement of the EUT.

3.2 Radiated Power and Radiated Spurious Emissions

§30.202, §30.203

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements from 30MHz - 18GHz, when necessary for radiated emissions measurements in the spurious domain. 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. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m for measurements above 1GHz.

Radiated power (EIRP) measurements and radiated spurious emissions above 18GHz were performed in a Shielded Anechoic Chamber conforming to the site validation requirements of CISPR 16-1-4 (Figure 3-5). Radiated spurious emission measurements from 9kHz - 18GHz were performed in a semi anechoic chamber (SAC) conforming to the site validation requirements of CISPR 16-1-4 (Figure 3-2, Figure 3-3, and Figure 3-4). A positioner was used to manipulate the EUT through several positions in space by rotating about the roll axis as shown in the figure below. The positioner was mounted on top of a turntable bringing the total EUT height to 1.5m.

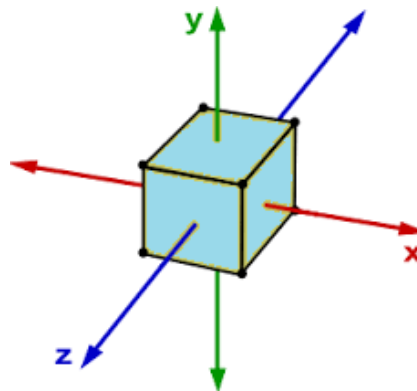


Figure 3-1. Rotation of the EUT Through Three Orthogonal Planes

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 (Figure 3-2) 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.

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Test Site Diagrams

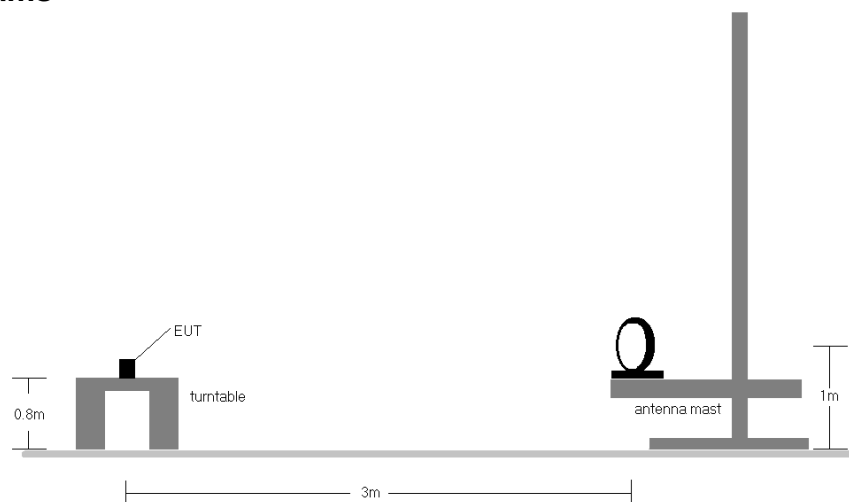


Figure 3-2. Test Site Diagram (9kHz - 30MHz)

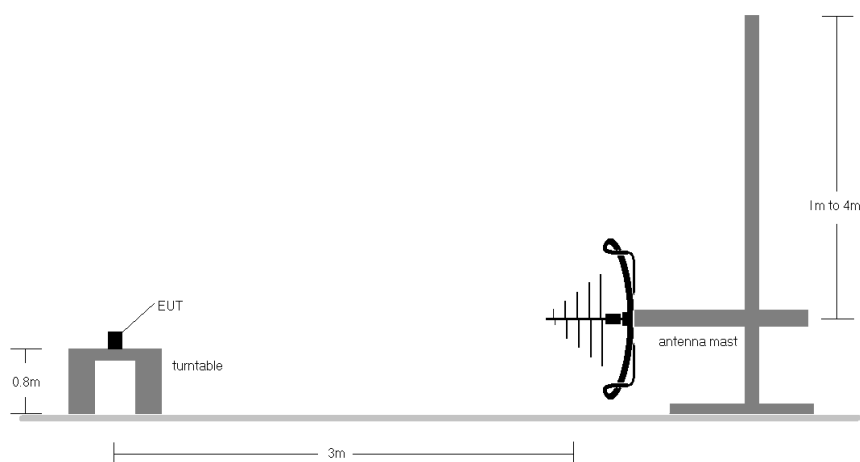


Figure 3-3. Test Site Diagram (30MHz - 1GHz)

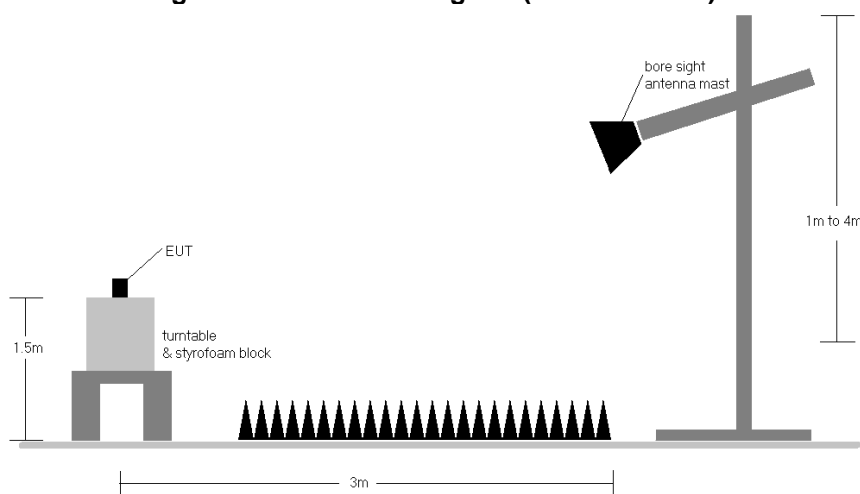


Figure 3-4. Test Site Diagram (1GHz - 18GHz)

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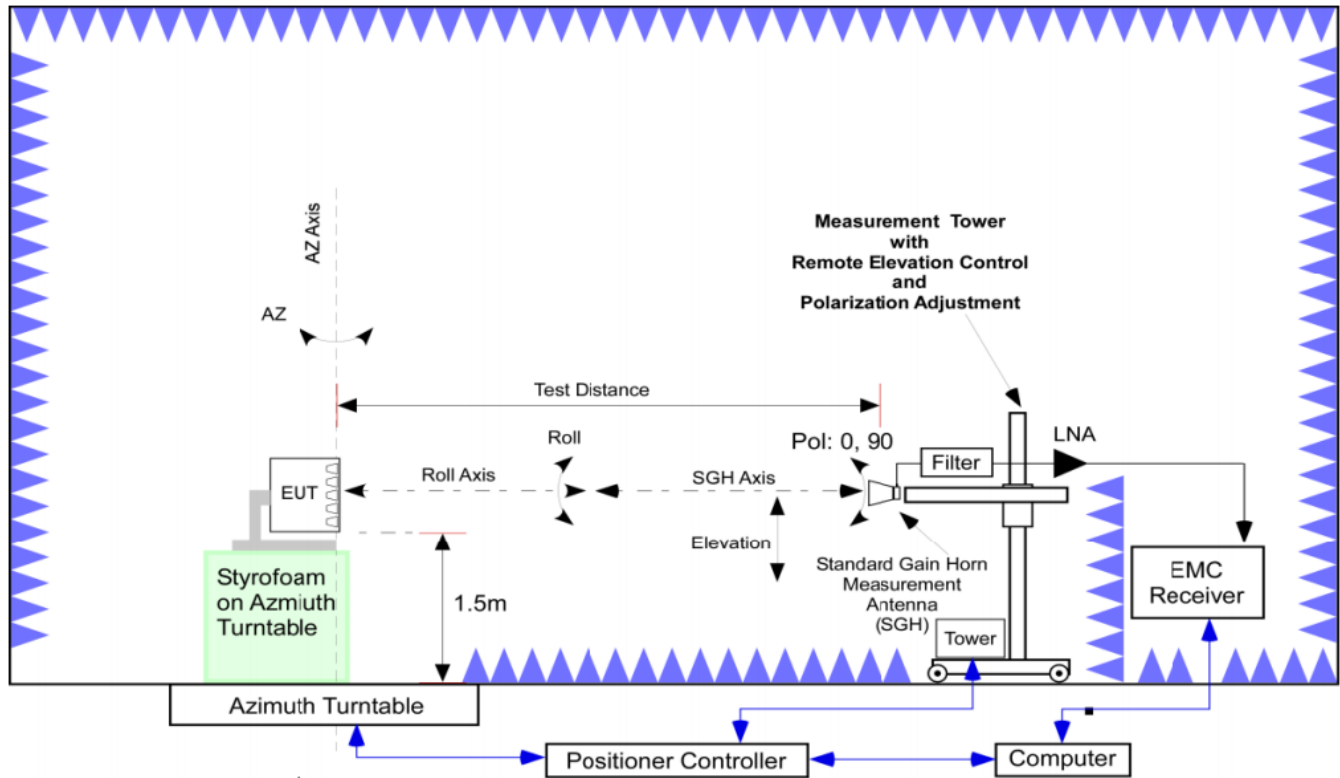


Figure 3-5. Test Site Diagram (Above 18GHz)

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable. The measurement antenna is in the far field of the EUT per formula $2D^2/\lambda$ where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT. In this case, "D" is the largest dimension of the measurement antenna. The EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

Frequency Range (GHz)	Wavelength (cm)	Farfield Distance (m)	Measurement Distance (m)
18-40	0.750	0.65	1.00
40-60	0.500	0.99	1.00
60-90	0.333	0.71	1.00
90-140	0.214	0.54	1.00
140-200	0.150	0.32	1.00

Table 3-1. Far-Field Distance & Measurement Distance per Frequency Range

FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst case polarization/positioning.

The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration bandwidth set to the emissions' occupied bandwidth. The EIRP is calculated from the raw power level measured with the spectrum analyzer using the formulas shown below.

Effective Isotropic Radiated Power Sample Calculation

For Effective Isotropic Radiated Power (EIRP) measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

$$\begin{aligned} \text{Field Strength [dB}\mu\text{V/m]} &= \text{Measured amplitude level}_{[\text{dBm}]} + \text{Antenna Factor}_{[\text{dB/m}]} + \text{Cable Loss}_{[\text{dB}]} + 107; \\ &= -32.74 \text{ dBm} + 40.7 \text{ dB/m} + 8.78 \text{ dB} + 107 = 123.74 \text{ dB}\mu\text{V/m} \\ \text{e.i.r.p. [dBm]} &= \text{Field Strength}_{[\text{dB}\mu\text{V/m}]} + 20\log_{10}(D) - 104.8; \\ &= 123.74 - 104.8 \\ &= 18.94 \text{ dBm} \end{aligned}$$

Where D is the measurement distance in meters and D=1m in above example.

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4.0 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)
Radiated Disturbance (<30MHz)	4.06
Radiated Disturbance (30MHz-1GHz)	4.30
Radiated Disturbance (1GHz-18GHz)	4.78
Radiated Disturbance (>18GHz)	4.37

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5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to an accredited ISO/IEC 17025 calibration facility. Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	3/4/2020	Annual	3/4/2021	MY49430244
ATM	180-442A-KF	20dB Nominal Gain Horn Antenna	8/11/2020	Annual	8/11/2021	T058701-01
ATM	180-442A-KF	20dB Nominal Gain Horn Antenna	12/1/2020	Annual	12/1/2021	T058701-02
ESPEC	SU-241	Tabletop Temperature Chamber	9/28/2020	Annual	9/28/2021	92009574
ETS-Lindgren	3142E	BiConiLog Antenna (30MHz - 6GHz)	9/15/2020	Annual	9/15/2021	208204
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	4/21/2020	Annual	4/21/2021	205956
Eravant	SAR-2309-19-S2	WR-19 Horn Antenna, 23 dBi Gain (40-60 GHz)	10/1/2020	Annual	10/1/2021	07040-01
Eravant	SAR-2309-12-S2	WR-12 Horn Antenna, 23 dBi Gain (60-90 GHz)	10/1/2020	Annual	10/1/2021	01686-06
Eravant	SAR-2309-08-S2	WR-08 Horn Antenna, 23 dBi Gain (90-140 GHz)	10/1/2020	Annual	10/1/2021	01719-01
Eravant	SAR-2309-05-S2	WR-05 Horn Antenna, 23 dBi Gain (140-220 GHz)	10/1/2020	Annual	10/1/2021	01672-01
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	7/15/2020	Annual	7/15/2021	102356
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	12/3/2020	Annual	12/3/2021	101648
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	4/3/2020	Annual	4/3/2021	100052
Rohde & Schwarz	FSW43	Signal and Spectrum Analyzer	9/15/2020	Annual	9/15/2021	104092
Rohde & Schwarz	ESW44	EMI Test Receiver	8/7/2020	Annual	8/7/2021	101668
Rohde & Schwarz	HFH2-Z2	Loop Antenna	3/12/2020	Annual	3/12/2021	100546
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Antenna (400MHz-18GHz)	10/2/2020	Annual	10/2/2021	101063
Virginia Diodes Inc	SAX 459	SAX Module (40-60 GHz)	11/4/2020	Biennial	11/4/2022	SAX 459
Virginia Diodes Inc	SAX 461	SAX Module (60-90 GHz)	10/30/2020	Biennial	10/30/2022	SAX 461
Virginia Diodes Inc	SAX 462	SAX Module (90-140 GHz)	10/30/2020	Biennial	10/30/2022	SAX 462
Virginia Diodes Inc	SAX 463	SAX Module (140-220 GHz)	11/4/2020	Biennial	11/4/2022	SAX 463

Table 5-1. Test Equipment List

Notes:

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.

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6.0 SAMPLE CALCULATIONS

Emission Designator

$\pi/2$ BPSK/ QPSK Modulation

BW = 95.4MHz
Emission Designator = 95M4G7W

G = Phase Modulation
 7 = Quantized/Digital Info
 W = Combination of Any

QAM Modulation

BW = 192.1MHz
Emission Designator = 192MD7W

D = Amplitude/Angle Modulated
 7 = Quantized/Digital Info
 W = Combination of Any

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7.0 TEST RESULTS

7.1 Summary

Company Name: Apple Inc.
FCC ID: BCGA2301
FCC Classification: Part 30 Mobile Transmitter (5GM)
Mode(s): TDD

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	RADIATED	N/A	Section 7.2
2.1046, 30.202	Equivalent Isotropic Radiated Power	43dBm		PASS	Section 7.3
2.1051, 30.203	Spurious Emissions	-13dBm/MHz for all out-of-band emissions		PASS	Section 7.4
2.1051, 30.203	Out-of-Band Emissions at the Band Edge	-13dBm/MHz for all out-of-band emissions, -5dBm/MHz from the band edge up to 10% of the channel BW		PASS	Section 7.5
2.1055	Frequency Stability	Fundamental emissions stay within authorized frequency block over the temperature and voltage range as tested		PASS	Section 7.6

Table 7-1. Summary of Radiated Test Results

Notes:

- 1) All modes of operation and modulations were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) Per 2.1057(a)(2), spurious emissions were investigated up to 100GHz for n261 and up to 200GHz for n260.
- 3) The radiated RF output power and all out-of-band emissions in the spurious domain are evaluated to the EIRP limits.
- 4) "CC" refers to "Component Carriers".
- 5) OEM provided worst Beam IDs using EIRP Simulation that yields highest EIRP were used for testing
- 6) All testing was performed using non-signaling standalone mode at continuous Tx operation (100% duty cycle).
- 7) The CP-OFDM and DFT-s-OFDM Waveforms were investigated fully for each test type and only the worst case data is included.
- 8) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, antenna factor, and distance correction.

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7.2 Occupied Bandwidth

\$2.1049

Test Overview

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

ANSI C63.26-2015 Section 5.4.3
 KDB 842590 D01 v01r01 Section 4.3

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

Test Notes

1. The EUT supports CP-OFDM and DFT-s-OFDM waveforms. All configurations were investigated and tabular data has been reported for all three antennas (M0, M2, M3).
2. Due to similar occupied bandwidth results between all three antennas, only Ant M3 occupied bandwidth plots have been included in this section.
3. The EUT and measurement equipment were set up as shown in the diagram in Figure 3-5.

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Band n261

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
50	1	Mid	27924.96	SISO	CP-OFDM	QPSK	33		45.28
		Mid	27924.96	SISO	CP-OFDM	16QAM	33		45.24
		Mid	27924.96	SISO	CP-OFDM	64QAM	33		45.31
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	33		45.24
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	33		45.32
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	33		45.11
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	33		45.11
		Mid	27924.96	MIMO	CP-OFDM	QPSK	33	161	45.38
		Mid	27924.96	MIMO	CP-OFDM	16QAM	33	161	45.18
		Mid	27924.96	MIMO	CP-OFDM	64QAM	33	161	45.12
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	33	161	45.01
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	33	161	45.15
50+50	2	Mid	27924.96	SISO	CP-OFDM	QPSK	33		94.40
		Mid	27924.96	SISO	CP-OFDM	16QAM	33		94.29
		Mid	27924.96	SISO	CP-OFDM	64QAM	33		94.16
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	33		94.40
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	33		94.18
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	33		94.44
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	33		94.30
		Mid	27924.96	MIMO	CP-OFDM	QPSK	33	161	94.63
		Mid	27924.96	MIMO	CP-OFDM	16QAM	33	161	94.68
		Mid	27924.96	MIMO	CP-OFDM	64QAM	33	161	94.87
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	33	161	94.43
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	33	161	94.43
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	33	161	94.59
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	33	161	94.53

Table 7-2. Ant M0 Occupied Bandwidth (Band n261 - 50MHz/50+50MHz)

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
100	1	Mid	27924.96	SISO	CP-OFDM	QPSK	33		93.07
		Mid	27924.96	SISO	CP-OFDM	16QAM	33		92.98
		Mid	27924.96	SISO	CP-OFDM	64QAM	33		92.98
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	33		90.64
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	33		90.76
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	33		90.46
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	33		90.62
		Mid	27924.96	MIMO	CP-OFDM	QPSK	33	161	92.91
		Mid	27924.96	MIMO	CP-OFDM	16QAM	33	161	93.20
		Mid	27924.96	MIMO	CP-OFDM	64QAM	33	161	92.88
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	33	161	90.54
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	33	161	90.85
100+100	2	Mid	27924.96	SISO	CP-OFDM	QPSK	33		190.74
		Mid	27924.96	SISO	CP-OFDM	16QAM	33		191.08
		Mid	27924.96	SISO	CP-OFDM	64QAM	33		190.64
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	33		189.20
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	33		188.78
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	33		188.65
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	33		188.90
		Mid	27924.96	MIMO	CP-OFDM	QPSK	33	161	191.68
		Mid	27924.96	MIMO	CP-OFDM	16QAM	33	161	191.49
		Mid	27924.96	MIMO	CP-OFDM	64QAM	33	161	191.61
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	33	161	189.48
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	33	161	189.21
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	33	161	189.05
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	33	161	189.27

Table 7-3. Ant M0 Occupied Bandwidth (Band n261 - 100MHz/100+100MHz)

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Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
50	1	Mid	27924.96	SISO	CP-OFDM	QPSK	22		45.29
		Mid	27924.96	SISO	CP-OFDM	16QAM	22		45.11
		Mid	27924.96	SISO	CP-OFDM	64QAM	22		45.17
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	22		45.07
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	22		45.35
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	22		45.33
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	22	150	45.19
		Mid	27924.96	MIMO	CP-OFDM	QPSK	22		45.08
		Mid	27924.96	MIMO	CP-OFDM	16QAM	22		45.19
		Mid	27924.96	MIMO	CP-OFDM	64QAM	22		45.22
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	22		45.00
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	22		45.41
50+50	2	Mid	27924.96	SISO	CP-OFDM	QPSK	22		94.81
		Mid	27924.96	SISO	CP-OFDM	16QAM	22		94.45
		Mid	27924.96	SISO	CP-OFDM	64QAM	22		94.54
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	22		94.78
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	22		94.71
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	22		94.82
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	22	150	94.55
		Mid	27924.96	MIMO	CP-OFDM	QPSK	22		94.84
		Mid	27924.96	MIMO	CP-OFDM	16QAM	22		94.60
		Mid	27924.96	MIMO	CP-OFDM	64QAM	22		94.64
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	22		95.59
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	22		95.24
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	22	150	95.20
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	22	150	95.67

Table 7-4. Ant M2 Occupied Bandwidth (Band n261 - 50MHz/50+50MHz)

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
100	1	Mid	27924.96	SISO	CP-OFDM	QPSK	22		93.13
		Mid	27924.96	SISO	CP-OFDM	16QAM	22		92.79
		Mid	27924.96	SISO	CP-OFDM	64QAM	22		93.00
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	22		90.04
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	22		90.78
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	22		90.40
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	22	150	90.35
		Mid	27924.96	MIMO	CP-OFDM	QPSK	22		92.81
		Mid	27924.96	MIMO	CP-OFDM	16QAM	22		93.05
		Mid	27924.96	MIMO	CP-OFDM	64QAM	22		93.09
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	22		90.89
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	22		90.87
100+100	2	Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	22	150	90.46
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	22	150	90.97
		Mid	27924.96	SISO	CP-OFDM	QPSK	22		190.97
		Mid	27924.96	SISO	CP-OFDM	16QAM	22		191.00
		Mid	27924.96	SISO	CP-OFDM	64QAM	22		191.63
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	22		189.23
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	22		189.19
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	22	150	188.79
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	22		189.09
		Mid	27924.96	MIMO	CP-OFDM	QPSK	22		191.19
		Mid	27924.96	MIMO	CP-OFDM	16QAM	22		191.30
		Mid	27924.96	MIMO	CP-OFDM	64QAM	22		191.35
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	22	150	189.55
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	22	150	188.87
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	22	150	188.96
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	22	150	189.25

Table 7-5. Ant M2 Occupied Bandwidth (Band n261 - 100MHz/100+100MHz)

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Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
50	1	Mid	27924.96	SISO	CP-OFDM	QPSK	39		45.26
		Mid	27924.96	SISO	CP-OFDM	16QAM	39		45.22
		Mid	27924.96	SISO	CP-OFDM	64QAM	39		45.17
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	39		45.30
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	39		45.44
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	39		45.40
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	39		45.64
		Mid	27924.96	MIMO	CP-OFDM	QPSK	39	167	45.53
		Mid	27924.96	MIMO	CP-OFDM	16QAM	39	167	45.16
		Mid	27924.96	MIMO	CP-OFDM	64QAM	39	167	45.33
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	39	167	44.95
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	39	167	45.38
50+50	2	Mid	27924.96	SISO	CP-OFDM	QPSK	39		94.38
		Mid	27924.96	SISO	CP-OFDM	16QAM	39		94.53
		Mid	27924.96	SISO	CP-OFDM	64QAM	39		94.44
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	39		94.84
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	39		95.00
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	39		95.05
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	39		95.18
		Mid	27924.96	MIMO	CP-OFDM	QPSK	39	167	95.18
		Mid	27924.96	MIMO	CP-OFDM	16QAM	39	167	95.52
		Mid	27924.96	MIMO	CP-OFDM	64QAM	39	167	95.18
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	39	167	94.63
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	39	167	94.72
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	39	167	94.27
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	39	167	94.43

Table 7-6. Ant M3 Occupied Bandwidth (Band n261 - 50MHz/50+50MHz)

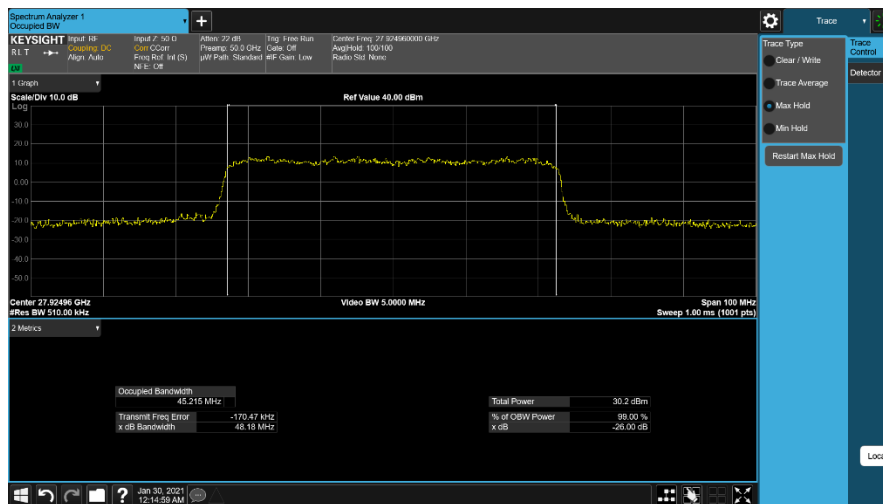
Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
100	1	Mid	27924.96	SISO	CP-OFDM	QPSK	39		93.12
		Mid	27924.96	SISO	CP-OFDM	16QAM	39		92.97
		Mid	27924.96	SISO	CP-OFDM	64QAM	39		93.05
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	39		90.35
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	39		90.84
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	39		90.52
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	39		90.82
		Mid	27924.96	MIMO	CP-OFDM	QPSK	39	167	92.91
		Mid	27924.96	MIMO	CP-OFDM	16QAM	39	167	92.87
		Mid	27924.96	MIMO	CP-OFDM	64QAM	39	167	93.25
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	39	167	90.64
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	39	167	90.60
100+100	2	Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	39	167	90.46
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	39	167	90.62
		Mid	27924.96	SISO	CP-OFDM	QPSK	39		191.42
		Mid	27924.96	SISO	CP-OFDM	16QAM	39		191.47
		Mid	27924.96	SISO	CP-OFDM	64QAM	39		191.23
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	39		189.43
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	39		189.03
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	39		189.05
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	39		189.33
		Mid	27924.96	MIMO	CP-OFDM	QPSK	39	167	192.07
		Mid	27924.96	MIMO	CP-OFDM	16QAM	39	167	191.82
		Mid	27924.96	MIMO	CP-OFDM	64QAM	39	167	191.14
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	39	167	189.27
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	39	167	190.02
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	39	167	189.72
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	39	167	189.15

Table 7-7. Ant M3 Occupied Bandwidth (Band n261 - 100MHz/100+100MHz)

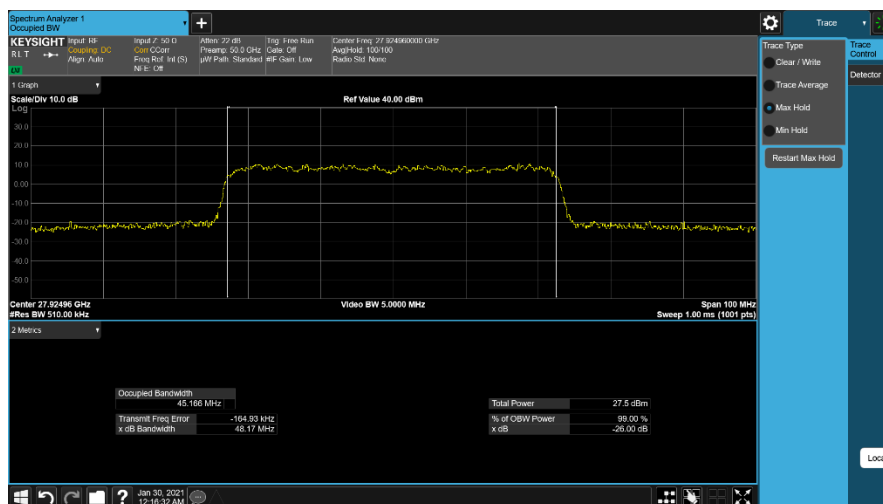
FCC ID: BCGA2301	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 19 of 201



Plot 7-1. Ant M3 OBW (Band n261-50MHz-1CC SISO CP-OFDM- QPSK – Mid Channel)

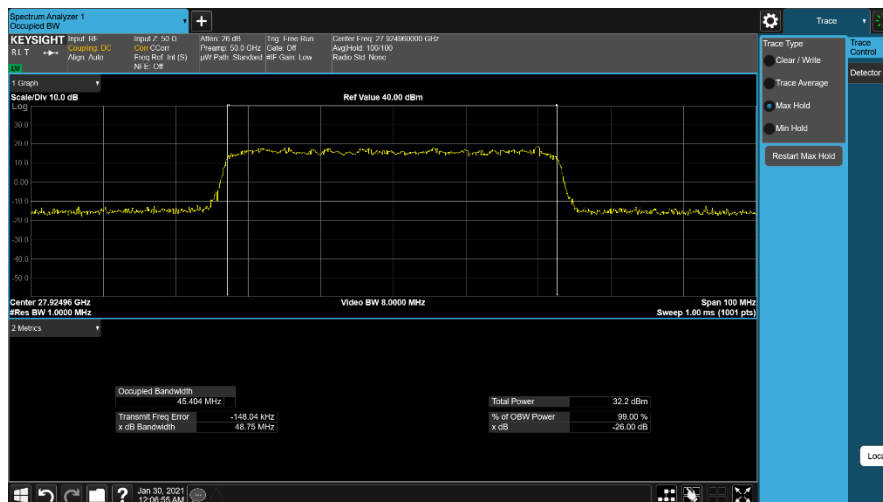
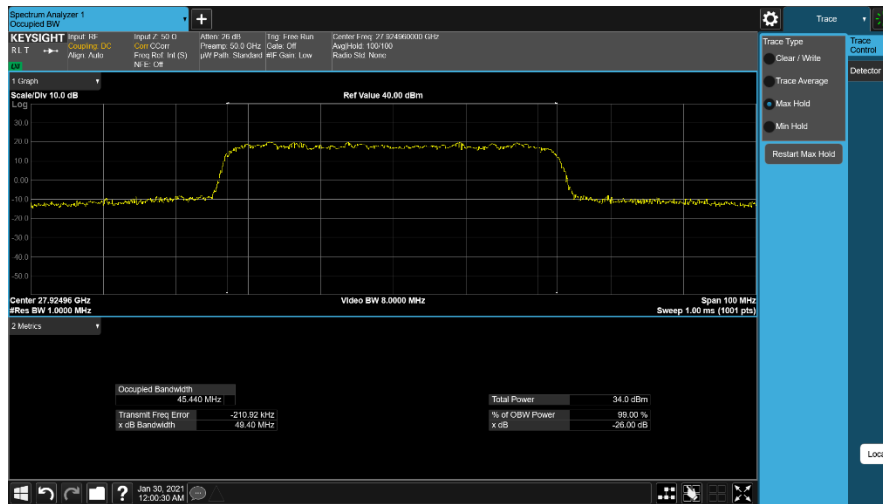
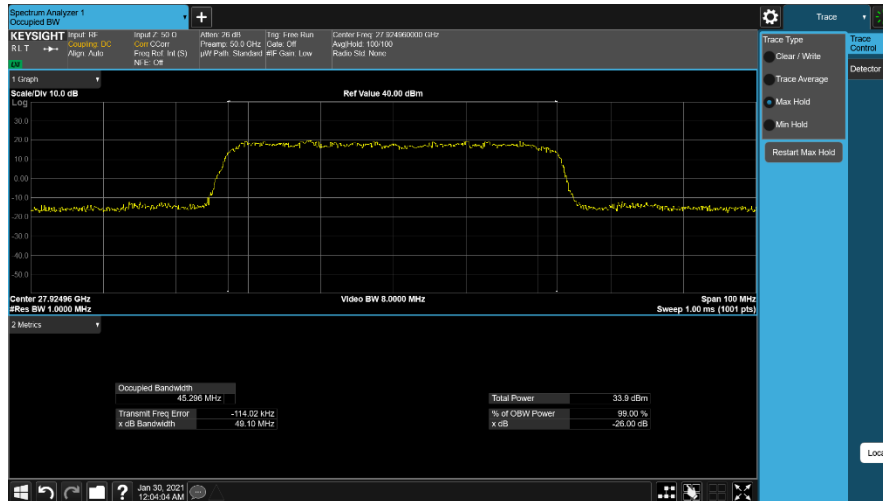


Plot 7-2. Ant M3 OBW (Band n261-50MHz-1CC SISO CP-OFDM- 16QAM – Mid Channel)

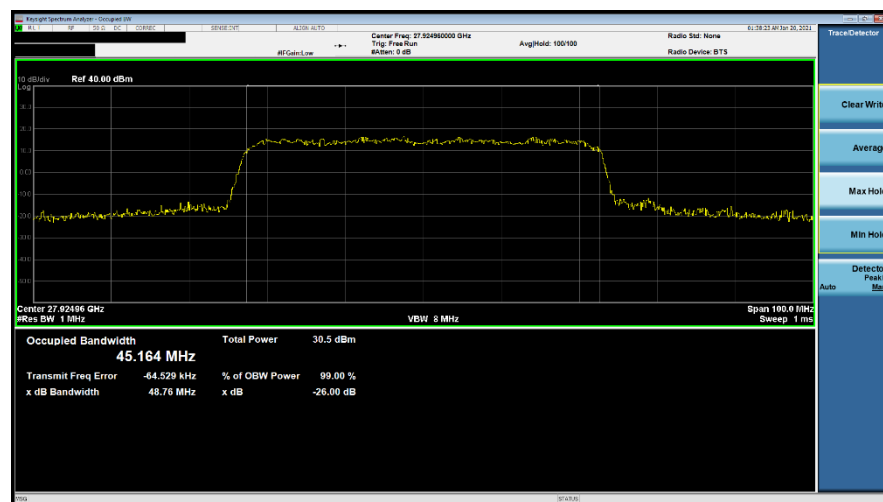
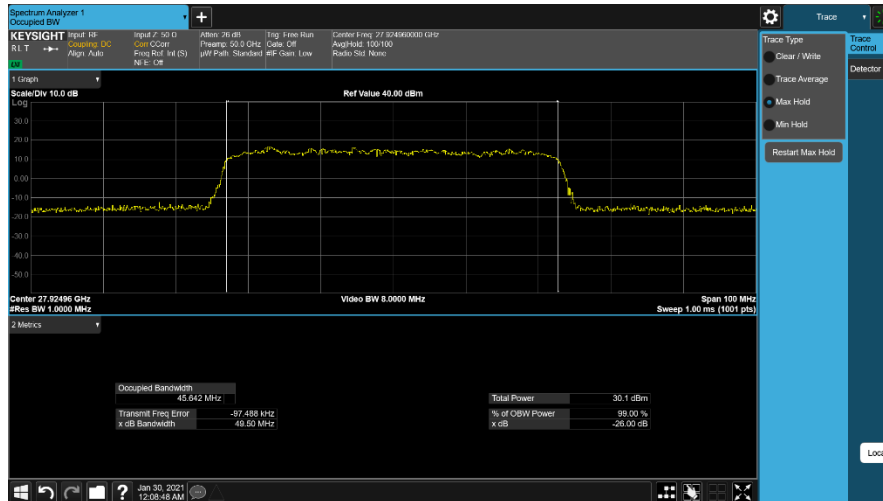


Plot 7-3. Ant M3 OBW (Band n261-50MHz-1CC SISO CP-OFDM – 64QAM – Mid Channel)

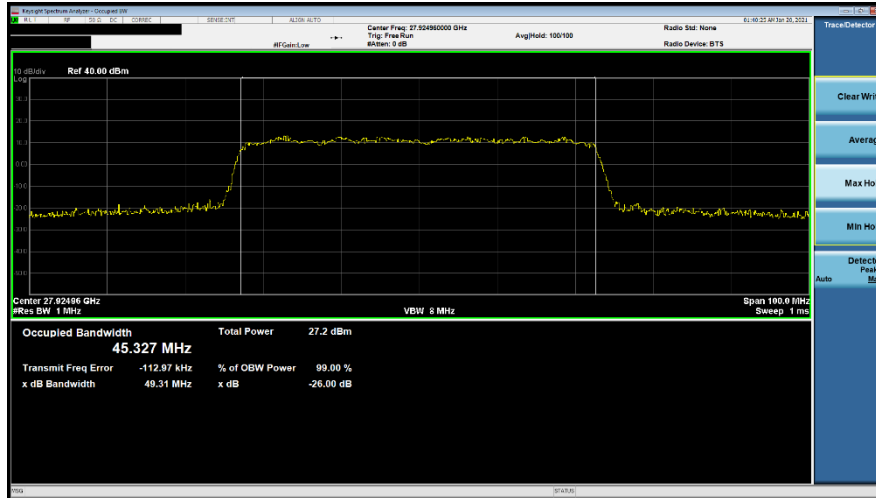
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 20 of 201



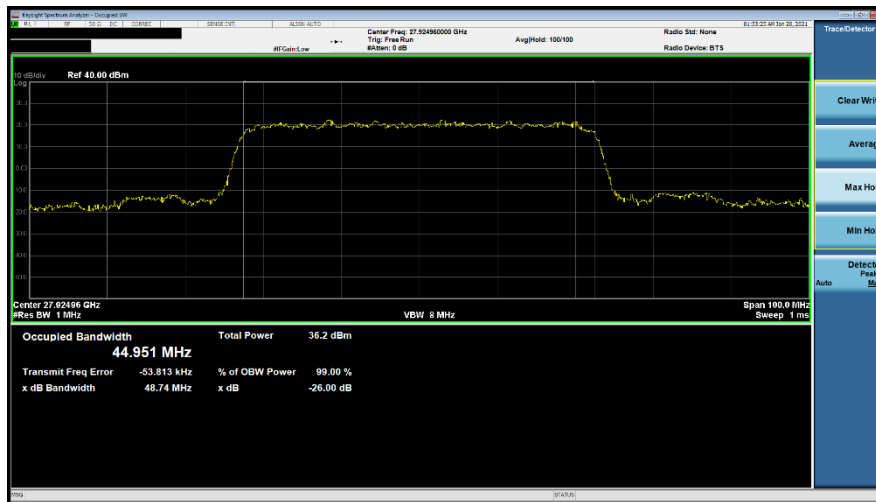
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 21 of 201



FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 22 of 201



Plot 7-10. Ant M3 OBW (Band n261-50MHz-1CC MIMO CP-OFDM– 64QAM – Mid Channel)

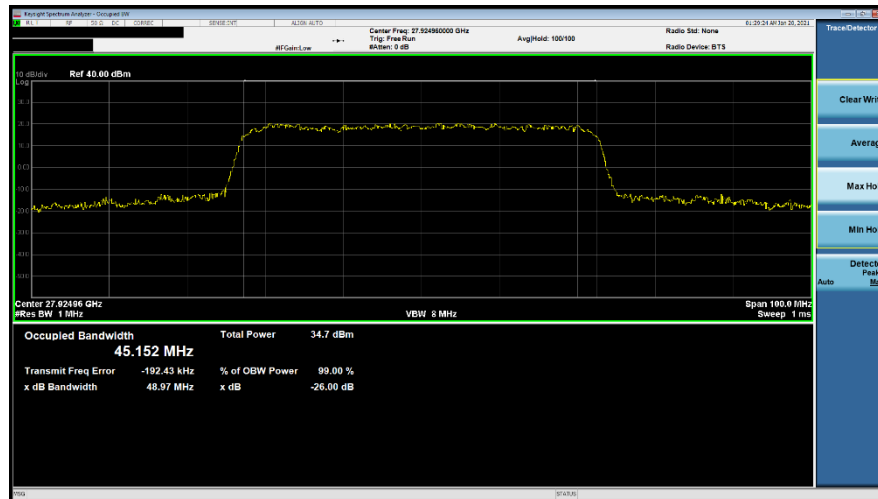


Plot 7-11. Ant M3 OBW (Band n261-50MHz-1CC SISO Dual Pol – $\pi/2$ BPSK – Mid Channel)

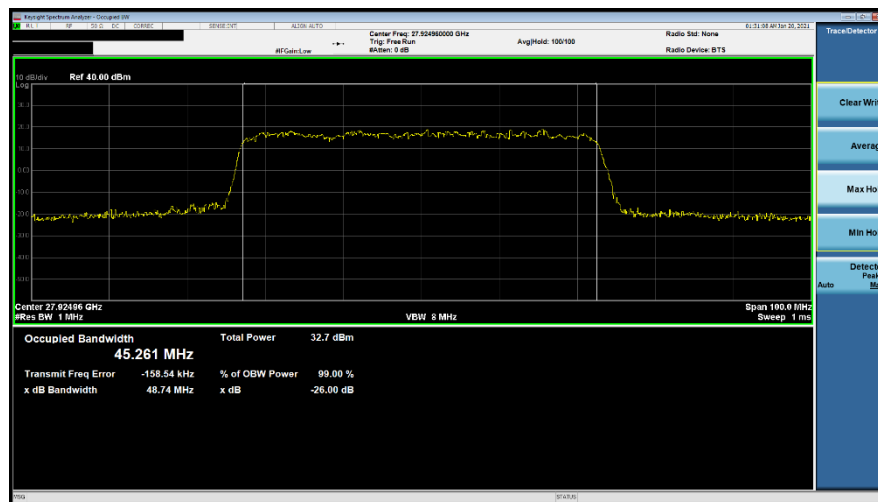


Plot 7-12. Ant M3 OBW (Band n261-50MHz-1CC SISO Dual Pol – QPSK – Mid Channel)

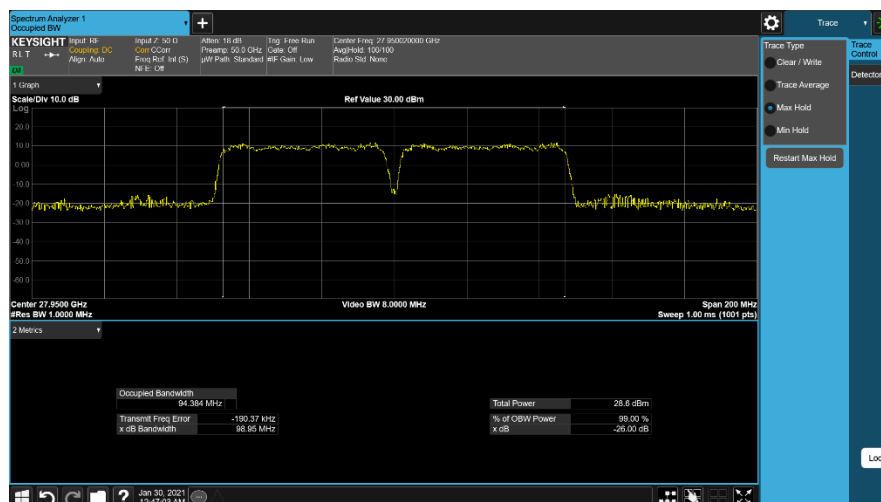
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 23 of 201



Plot 7-13. Ant M3 OBW (Band n261-50MHz-1CC SISO Dual Pol – 16QAM– Mid Channel)

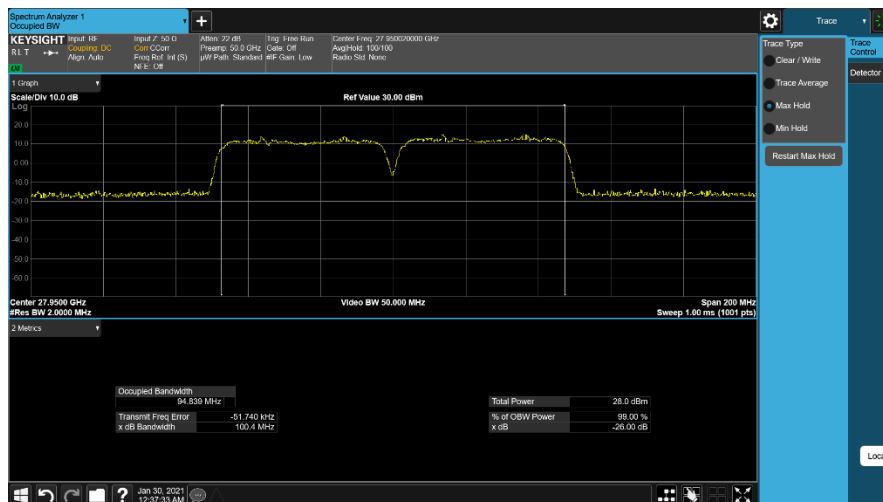
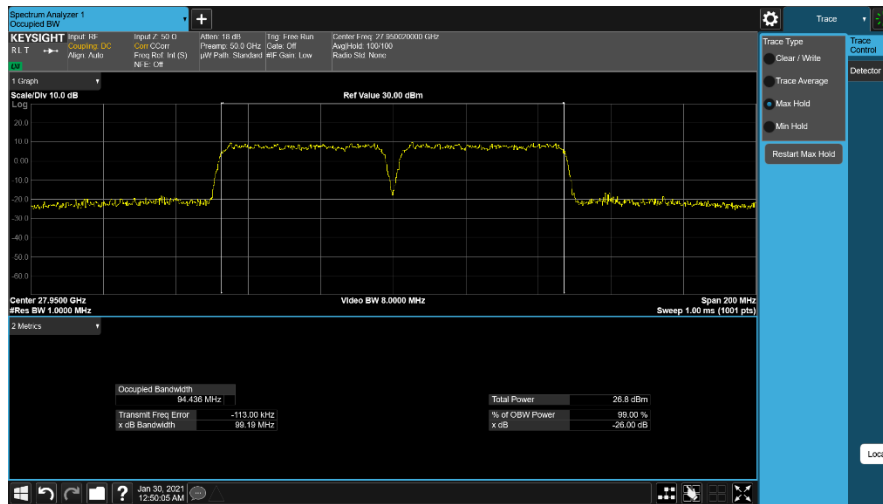


Plot 7-14. Ant M3 OBW (Band n261-50MHz-1CC SISO Dual Pol – 64QAM – Mid Channel)

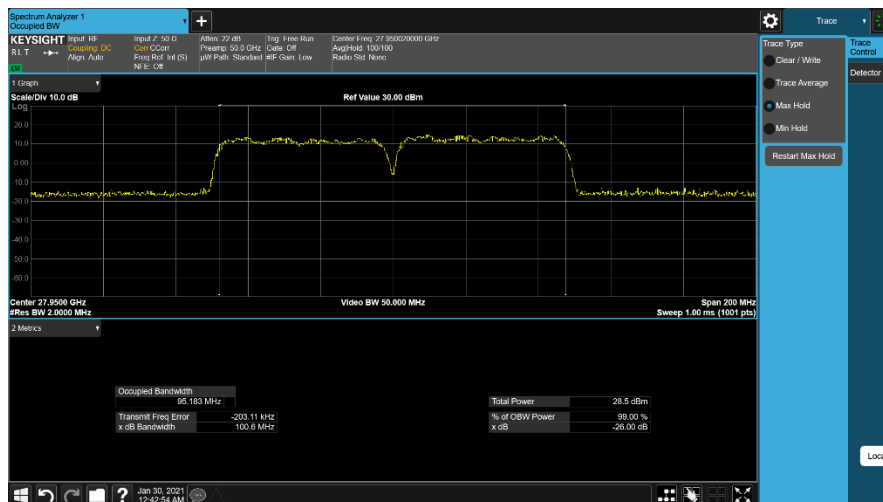
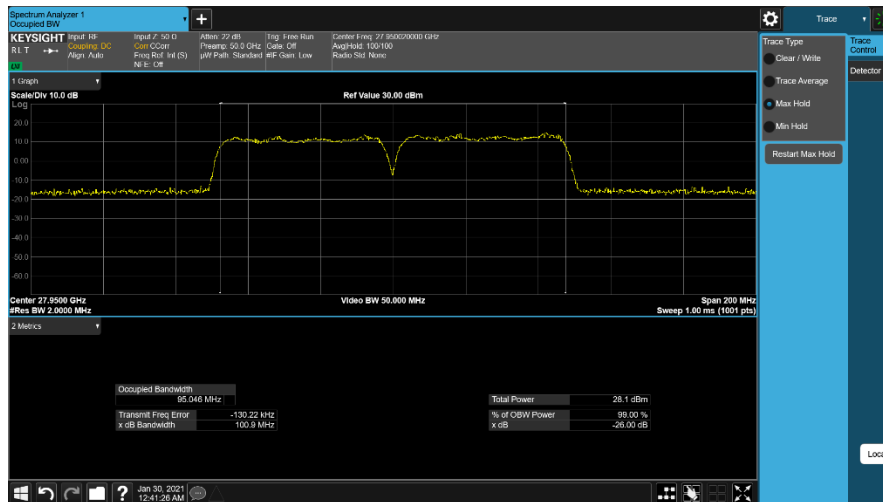


Plot 7-15. Ant M3 OBW (Band n261-50+50MHz-2CC SISO CP-OFDM– QPSK – Mid Channel)

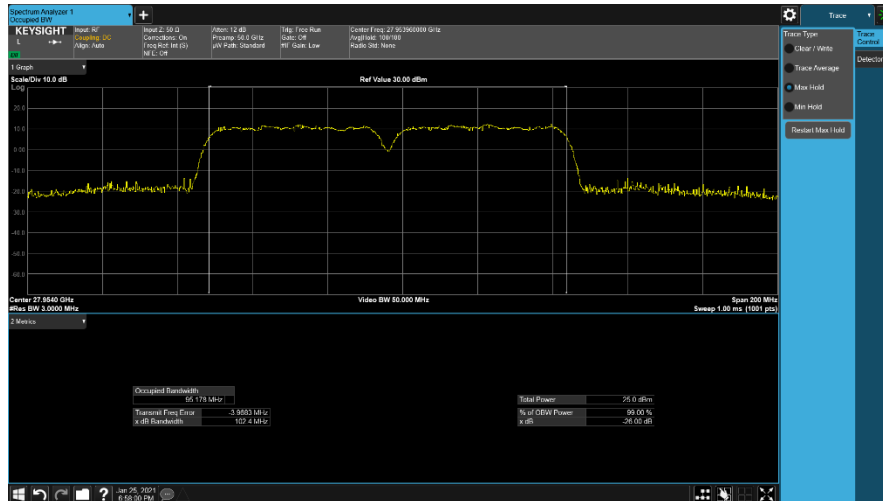
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 24 of 201



FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 25 of 201



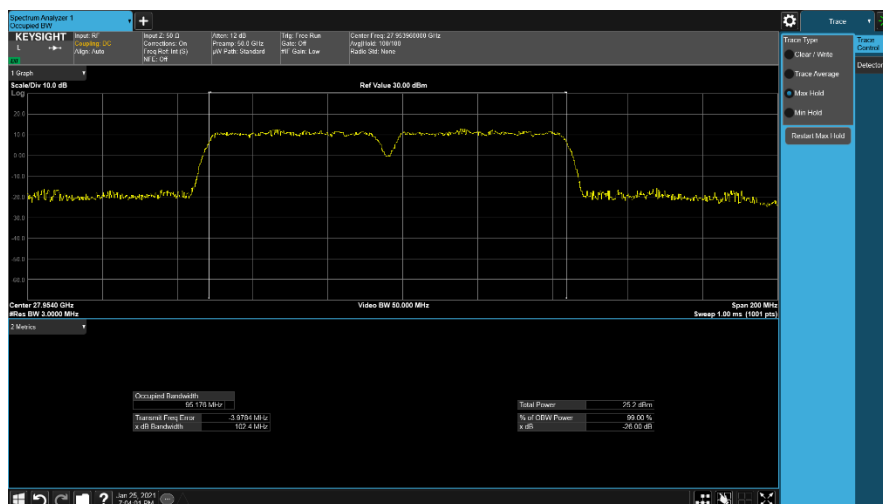
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 26 of 201



Plot 7-22. Ant M3 OBW (Band n261-50+50MHz-2CC MIMO CP-OFDM– QPSK – Mid Channel)

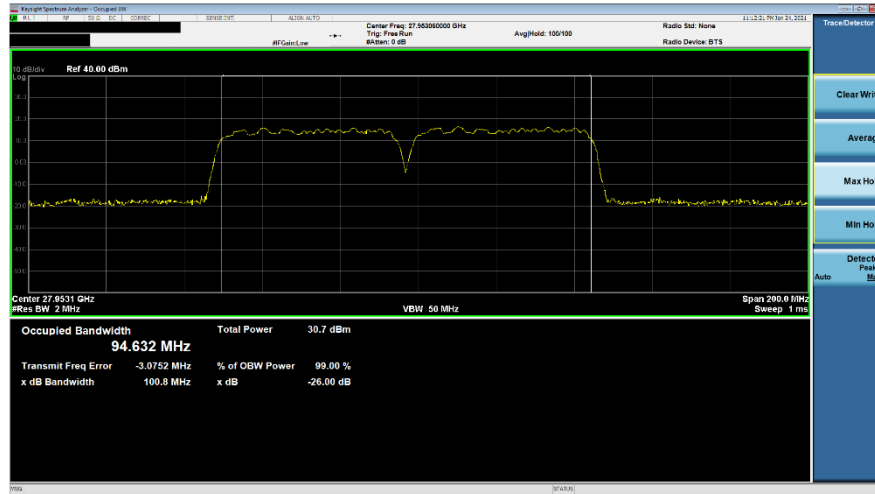


Plot 7-23. Ant M3 OBW (Band n261-50+50MHz-2CC MIMO CP-OFDM– 16QAM – Mid Channel)



Plot 7-24. Ant M3 OBW (Band n261-50+50MHz-2CC MIMO CP-OFDM– 64QAM – Mid Channel)

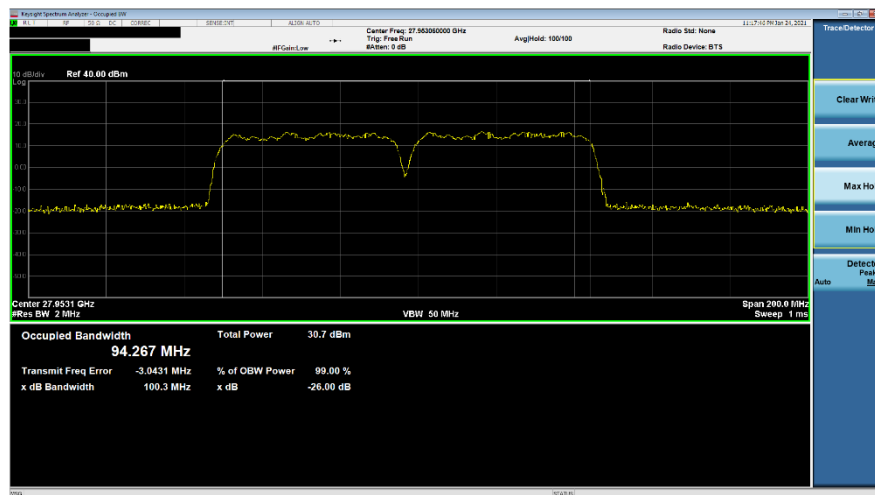
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 27 of 201



Plot 7-25. Ant M3 OBW (Band n261-50+50MHz-2CC SISO Dual Pol – $\pi/2$ BPSK – Mid Channel)

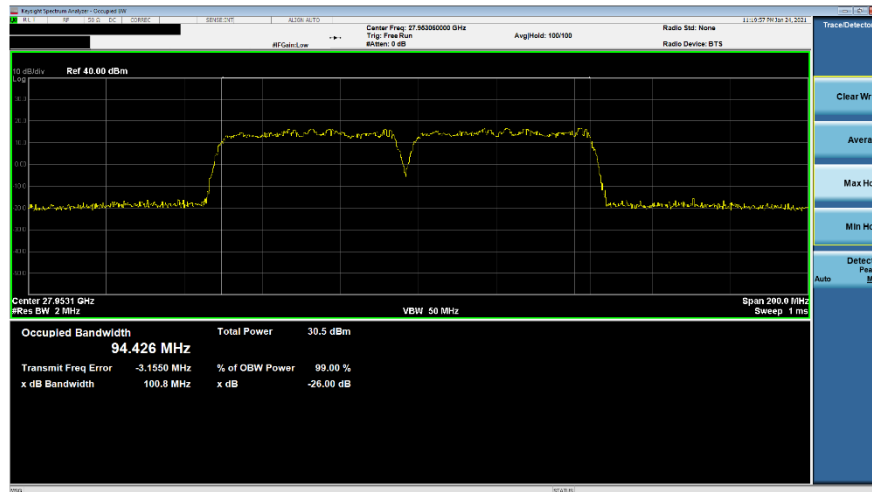


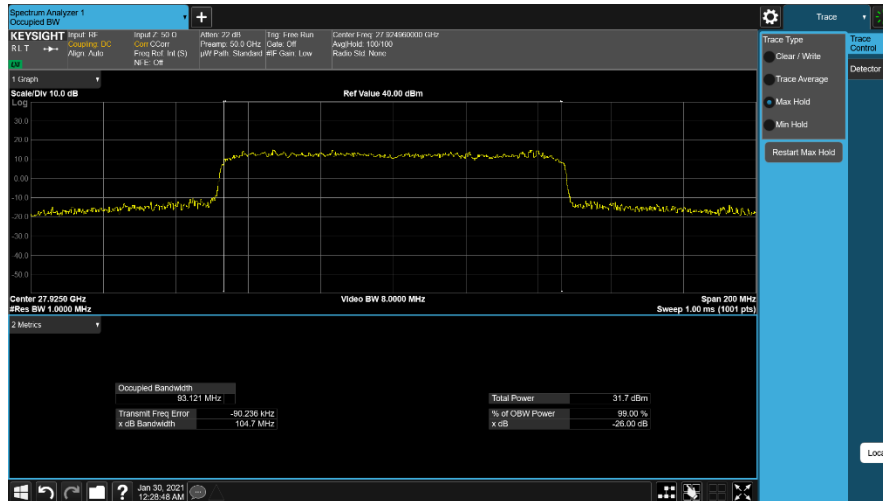
Plot 7-26. Ant M3 OBW (Band n261-50+50MHz-2CC SISO Dual Pol – QPSK – Mid Channel)



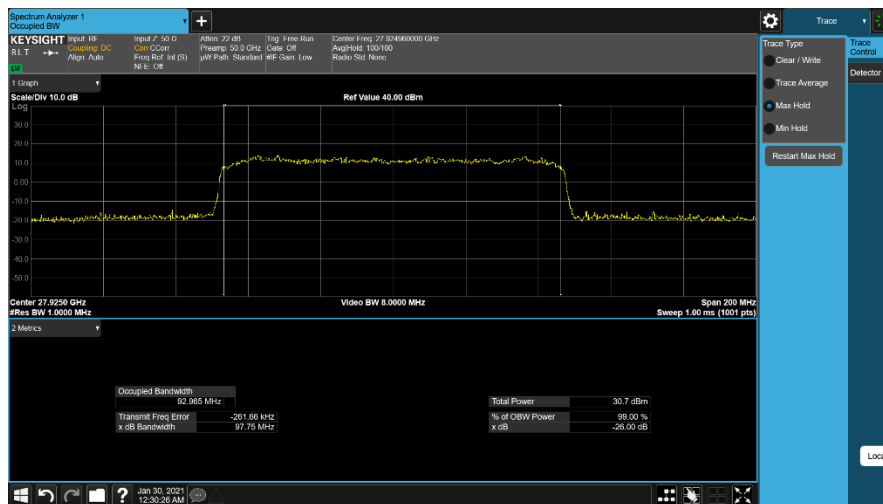
Plot 7-27. Ant M3 OBW (Band n261-50+50MHz-2CC SISO Dual Pol – 16QAM– Mid Channel)

FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 28 of 201

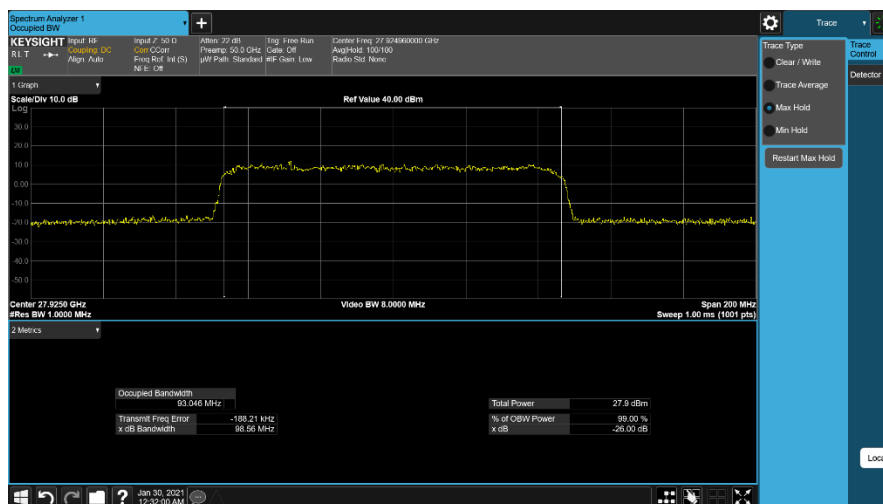




Plot 7-29. Ant M3 OBW (Band n261-100MHz-1CC SISO CP-OFDM– QPSK – Mid Channel)

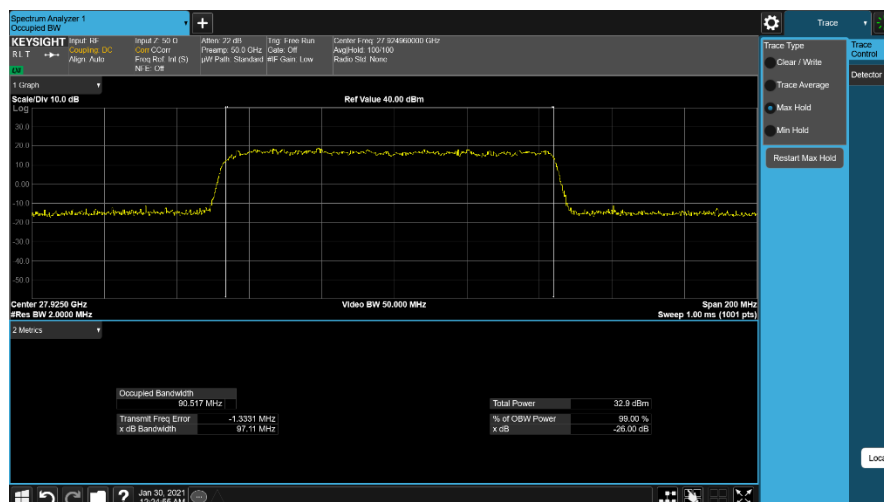
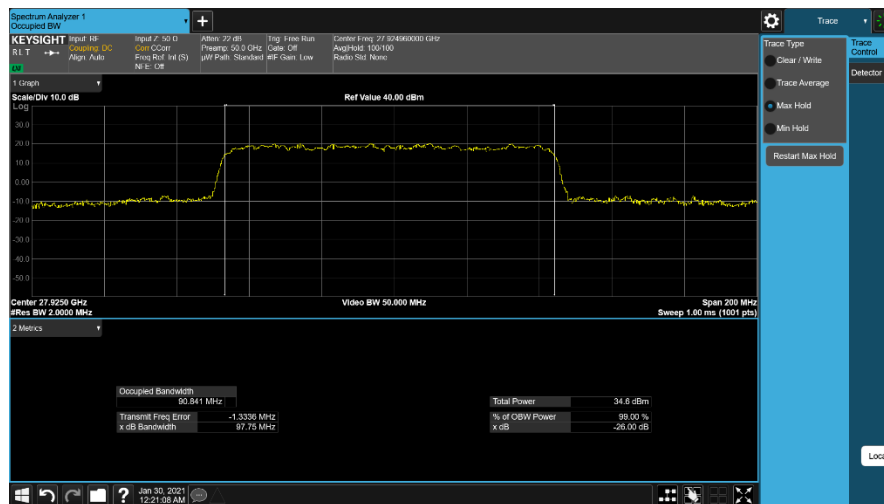
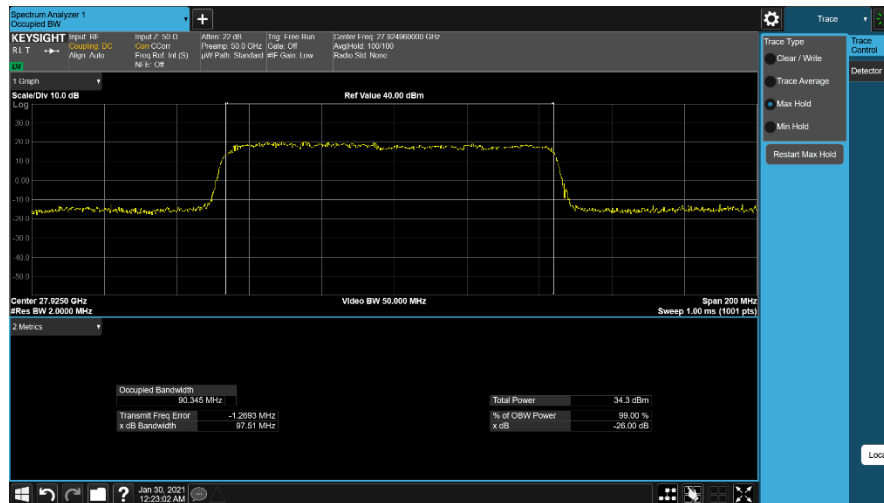


Plot 7-30. Ant M3 OBW (Band n261-100MHz-1CC SISO CP-OFDM– 16QAM – Mid Channel)



Plot 7-31. Ant M3 OBW (Band n261-100MHz-1CC SISO CP-OFDM – 64QAM – Mid Channel)

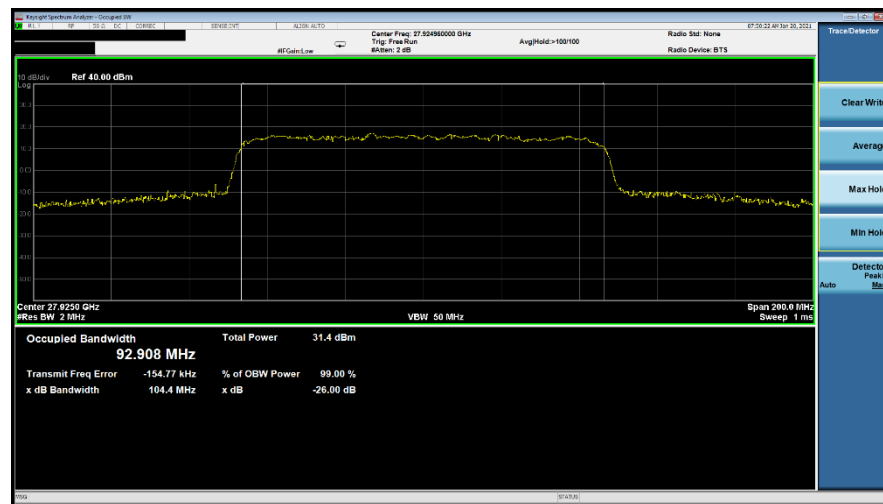
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 30 of 201



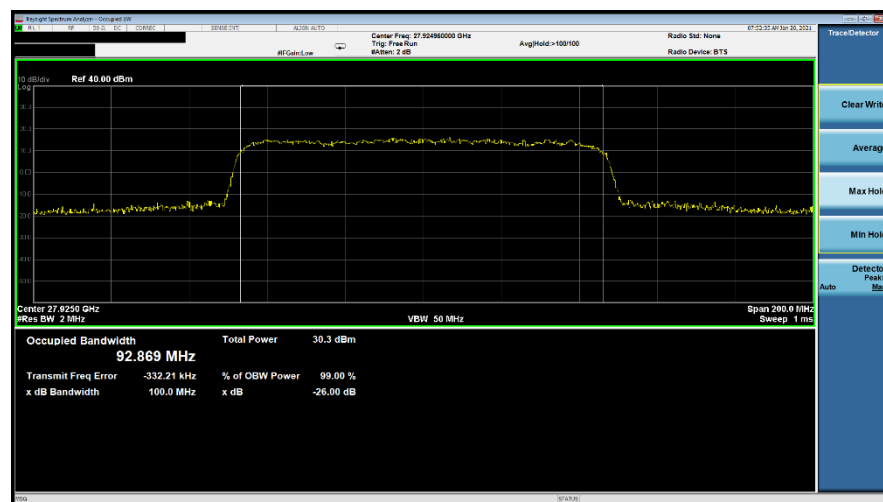
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 31 of 201



Plot 7-35. Ant M3 OBW (Band n261-100MHz-1CC SISO DFTs-OFDM -64QAM – Mid Channel)

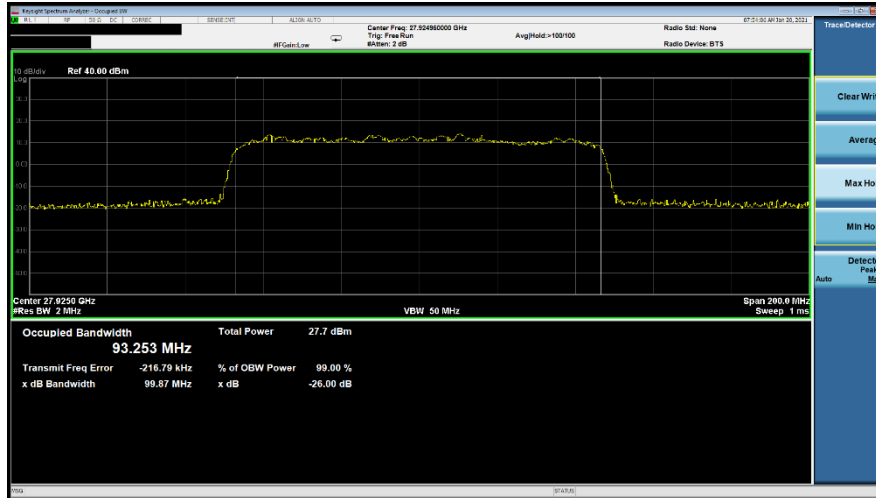


Plot 7-36. Ant M3 OBW (Band n261-100MHz-1CC MIMO CP-OFDM- QPSK – Mid Channel)

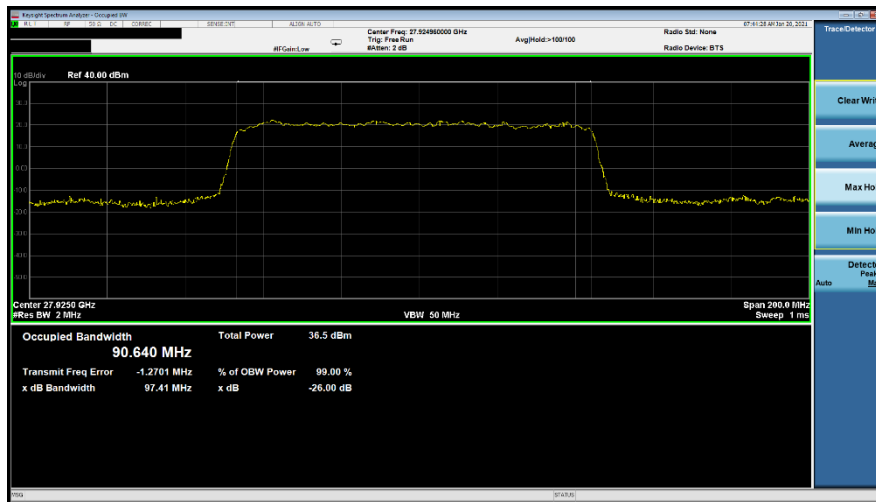


Plot 7-37. Ant M3 OBW (Band n261-100MHz-1CC MIMO CP-OFDM- 16QAM – Mid Channel)

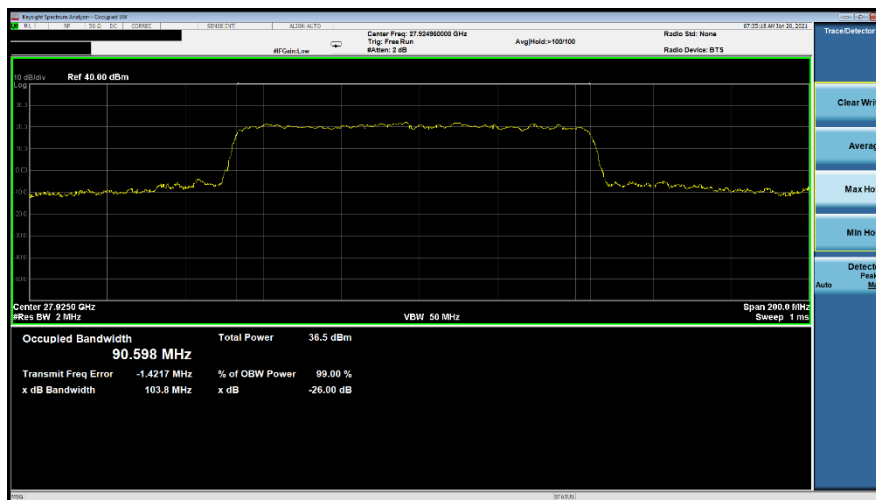
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 32 of 201



Plot 7-38. Ant M3 OBW (Band n261-100MHz-1CC MIMO CP-OFDM– 64QAM – Mid Channel)

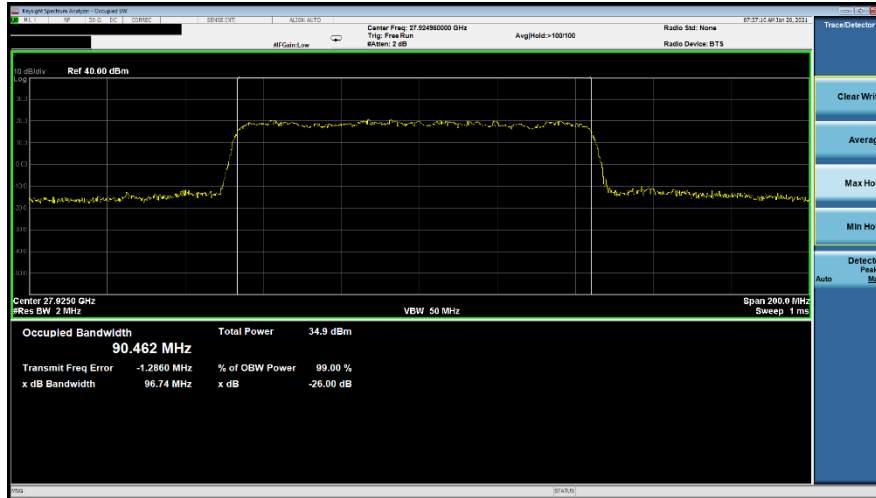


Plot 7-39. Ant M3 OBW (Band n261-100MHz-1CC SISO Dual Pol – $\pi/2$ BPSK – Mid Channel)

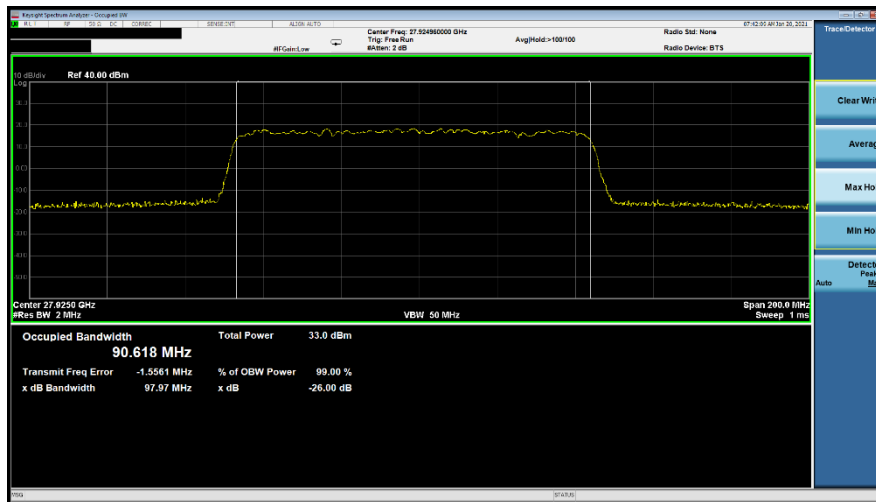


Plot 7-40. Ant M3 OBW (Band n261-100MHz-1CC SISO Dual Pol – QPSK – Mid Channel)

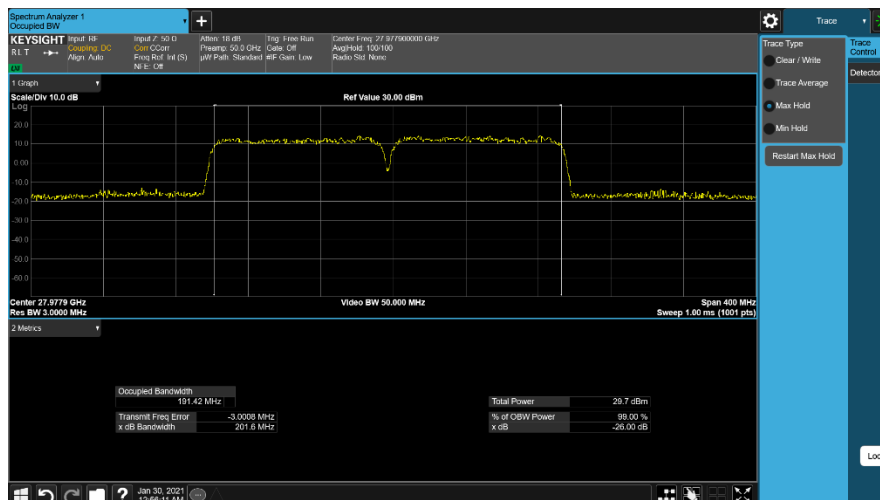
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 33 of 201



Plot 7-41. Ant M3 OBW (Band n261-100MHz-1CC SISO Dual Pol – 16QAM– Mid Channel)

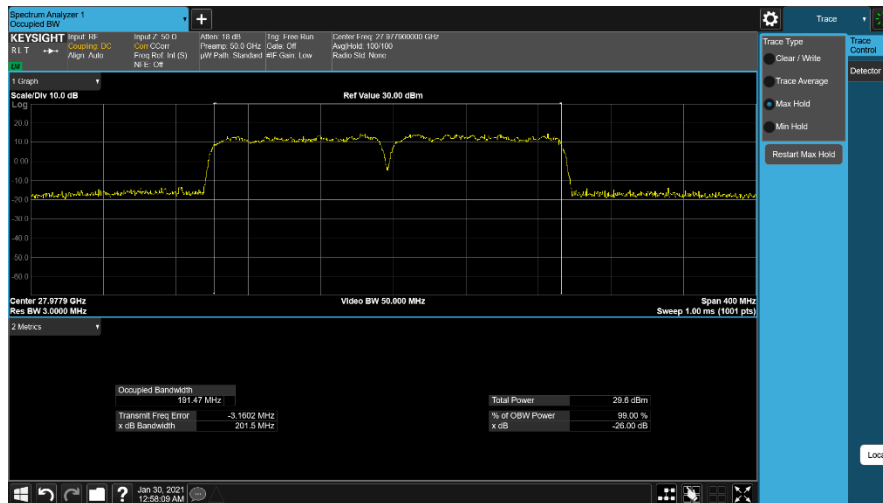


Plot 7-42. Ant M3 OBW (Band n261-100MHz-1CC SISO Dual Pol – 64QAM – Mid Channel)

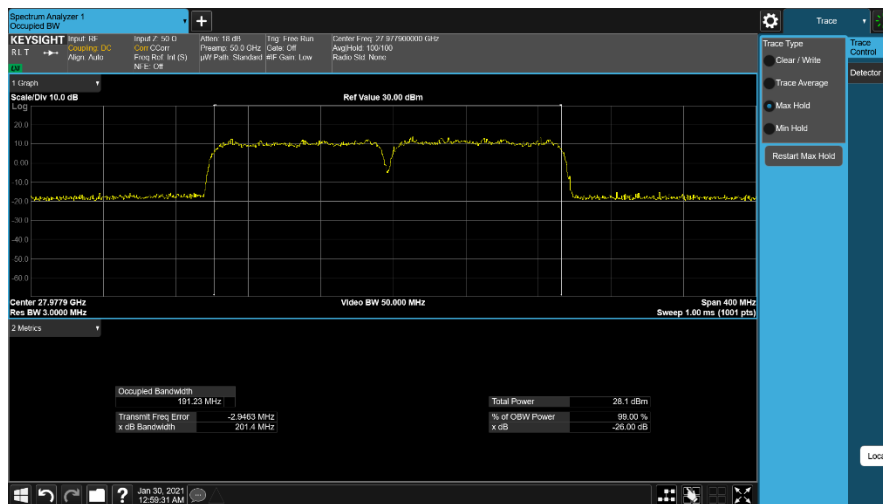


Plot 7-43. Ant M3 OBW (Band n261-100+100MHz-2CC SISO CP-OFDM– QPSK – Mid Channel)

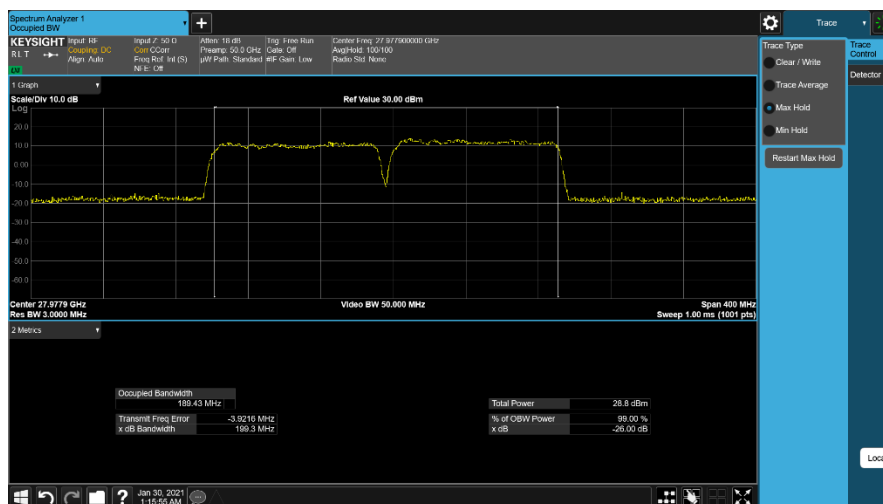
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 34 of 201



Plot 7-44. Ant M3 OBW (Band n261-100+100MHz-2CC SISO CP-OFDM– 16QAM – Mid Channel)

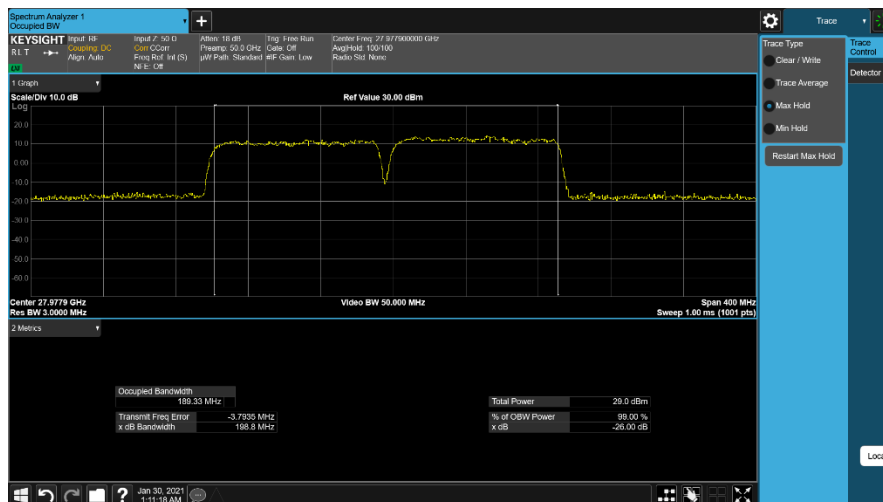
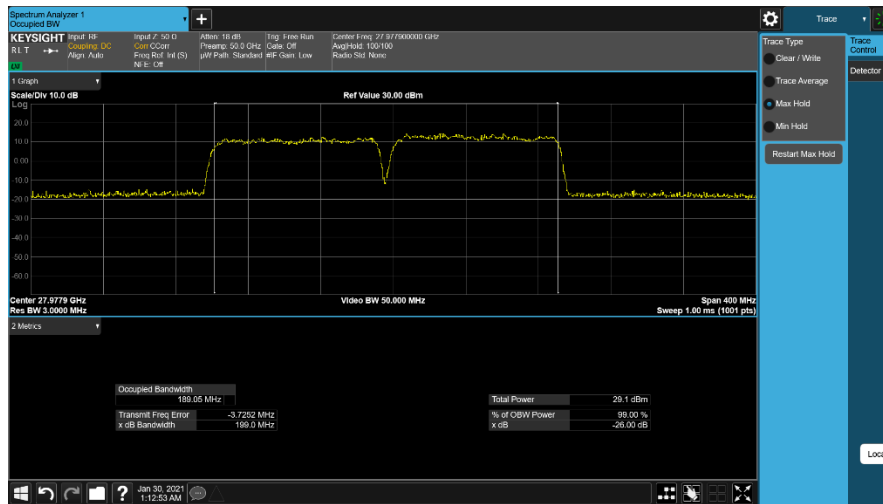
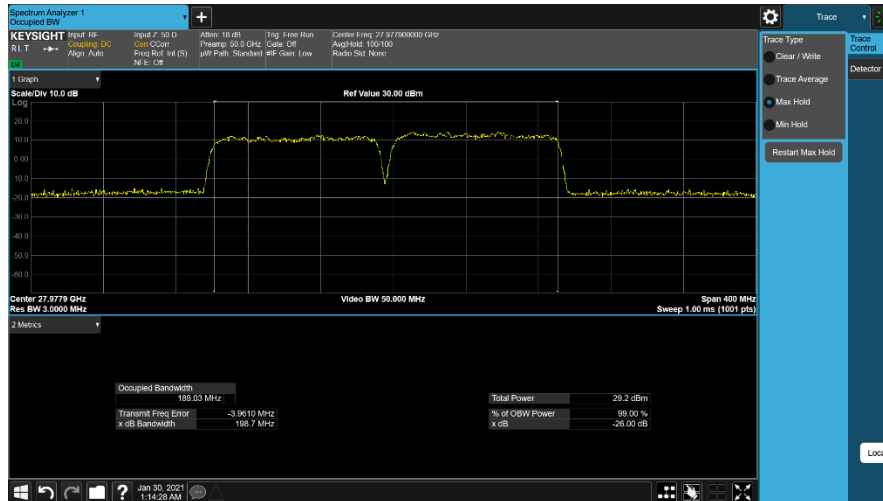


Plot 7-45. Ant M3 OBW (Band n261-100+100MHz-2CC SISO CP-OFDM – 64QAM – Mid Channel)

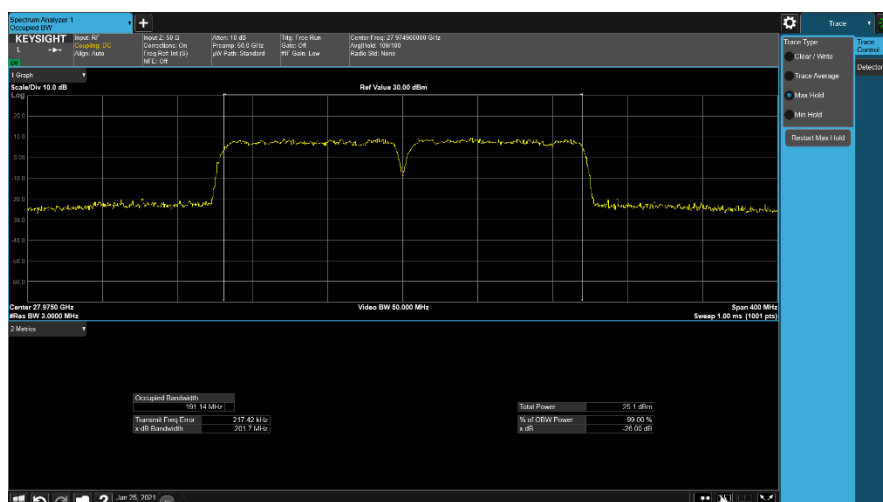
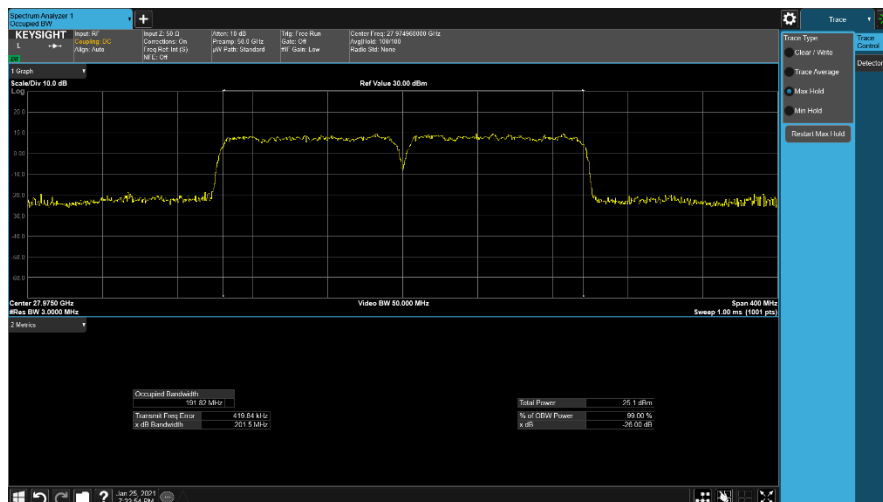
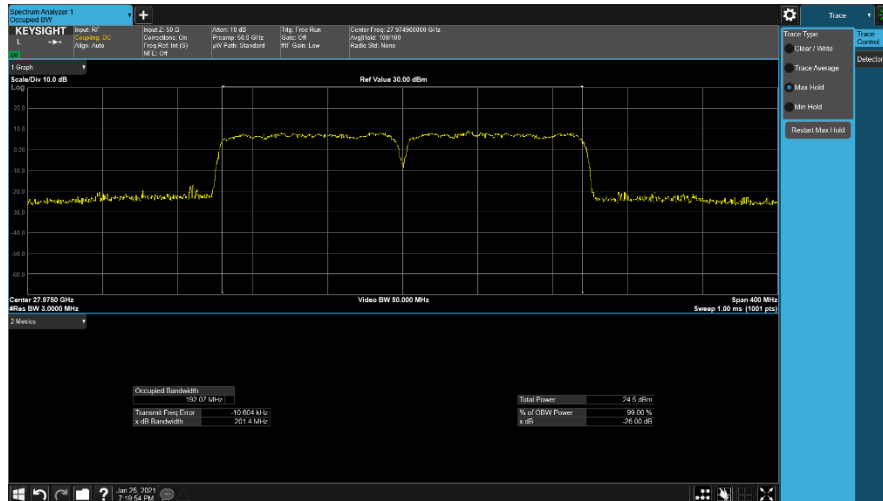


Plot 7-46. Ant M3 OBW (Band n261-100+100MHz-2CC SISO DFTs-OFDM– π/2 BPSK – Mid Channel)

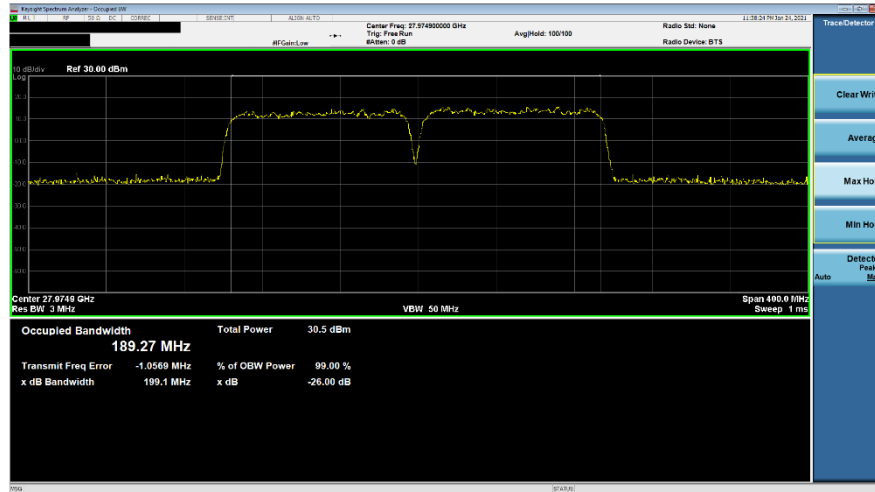
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 35 of 201



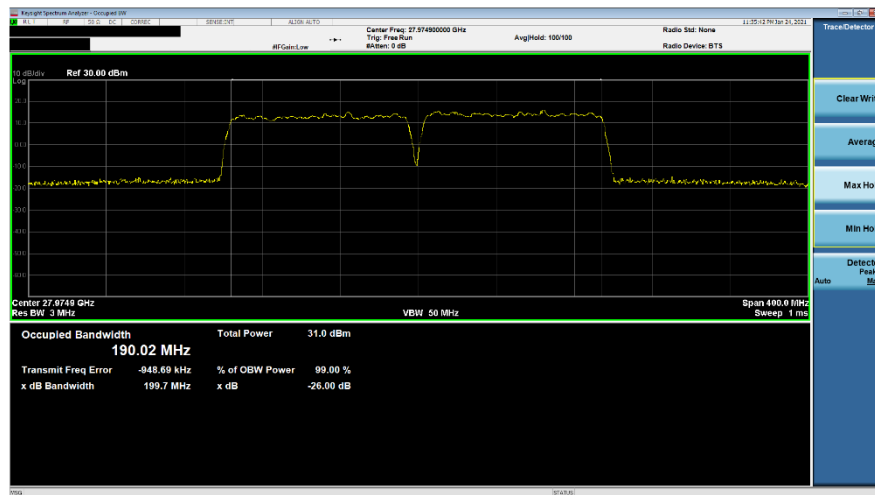
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 36 of 201



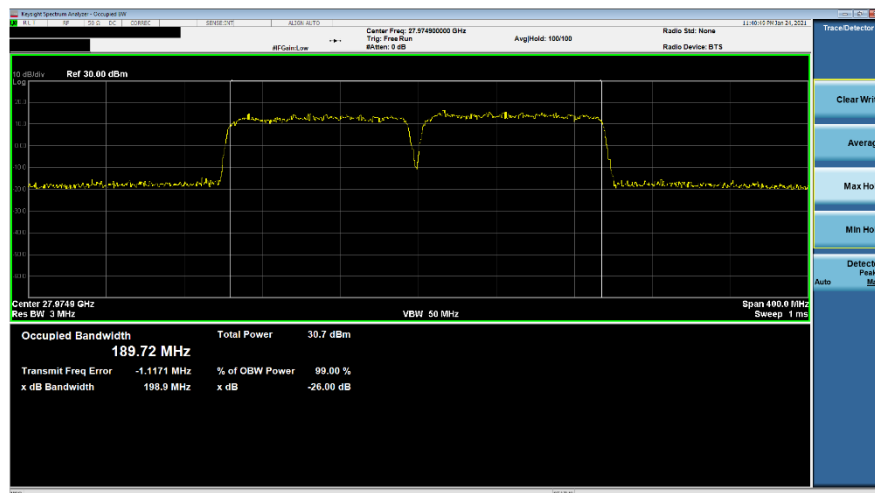
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 37 of 201



Plot 7-53. Ant M3 OBW (Band n261-100+100MHz-2CC SISO Dual Pol – $\pi/2$ BPSK – Mid Channel)

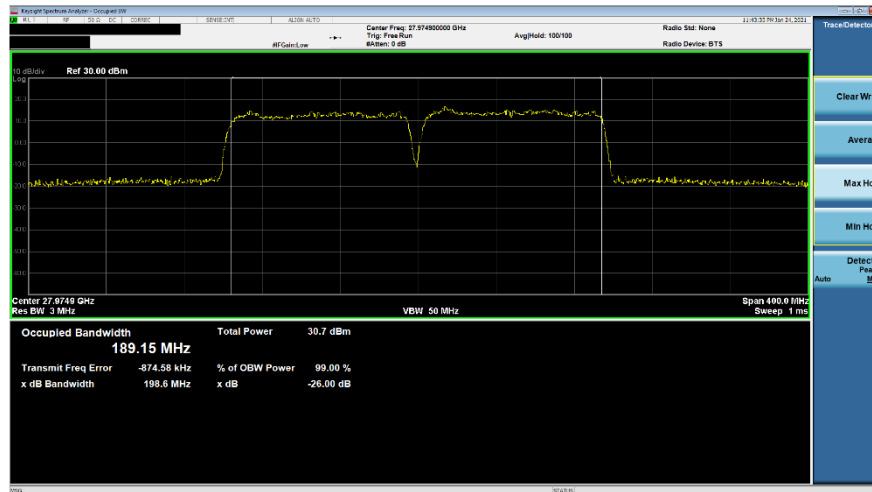


Plot 7-54. Ant M3 OBW (Band n261-100+100MHz-2CC SISO Dual Pol – QPSK – Mid Channel)



Plot 7-55. Ant M3 OBW (Band n261-100+100MHz-2CC SISO Dual Pol – 16QAM– Mid Channel)

FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 38 of 201



Band n260

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
50	1	Mid	38499.96	SISO	CP-OFDM	QPSK	45		45.28
		Mid	38499.96	SISO	CP-OFDM	16QAM	45		45.20
		Mid	38499.96	SISO	CP-OFDM	64QAM	45		45.19
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	45		45.00
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	45		45.33
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	45		45.19
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	45		45.45
		Mid	38499.96	MIMO	CP-OFDM	QPSK	45	173	45.29
		Mid	38499.96	MIMO	CP-OFDM	16QAM	45	173	45.12
		Mid	38499.96	MIMO	CP-OFDM	64QAM	45	173	45.21
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	45	173	45.39
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	45	173	45.64
50+50	2	Mid	38499.96	SISO	DFT-s-OFDM	16QAM	45	173	45.37
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	45	173	45.45
		Mid	38499.96	SISO	CP-OFDM	QPSK	45		94.64
		Mid	38499.96	SISO	CP-OFDM	16QAM	45		94.62
		Mid	38499.96	SISO	CP-OFDM	64QAM	45		94.75
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	45		94.75
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	45		94.22
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	45		94.44
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	45		94.62
		Mid	38499.96	MIMO	CP-OFDM	QPSK	45	173	94.31
		Mid	38499.96	MIMO	CP-OFDM	16QAM	45	173	94.56
		Mid	38499.96	MIMO	CP-OFDM	64QAM	45	173	94.66
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	45	173	94.25
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	45	173	94.50
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	45	173	94.08
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	45	173	93.85

Table 7-8. Ant M0 Occupied Bandwidth (Band n260 - 50MHz/50+50MHz)

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
100	1	Mid	38499.96	SISO	CP-OFDM	QPSK	45		93.07
		Mid	38499.96	SISO	CP-OFDM	16QAM	45		92.53
		Mid	38499.96	SISO	CP-OFDM	64QAM	45		92.57
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	45		90.54
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	45		90.82
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	45		90.90
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	45		90.80
		Mid	38499.96	MIMO	CP-OFDM	QPSK	45	173	92.87
		Mid	38499.96	MIMO	CP-OFDM	16QAM	45	173	92.73
		Mid	38499.96	MIMO	CP-OFDM	64QAM	45	173	93.07
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	45	173	90.28
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	45	173	90.98
100+100	2	Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	45	173	90.29
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	45	173	90.54
		Mid	38499.96	SISO	CP-OFDM	QPSK	45		191.52
		Mid	38499.96	SISO	CP-OFDM	16QAM	45		191.32
		Mid	38499.96	SISO	CP-OFDM	64QAM	45		191.90
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	45		189.74
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	45		190.07
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	45		189.46
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	45		189.51
		Mid	38499.96	MIMO	CP-OFDM	QPSK	45	173	191.39
		Mid	38499.96	MIMO	CP-OFDM	16QAM	45	173	191.16
		Mid	38499.96	MIMO	CP-OFDM	64QAM	45	173	191.61
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	45	173	189.28
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	45	173	189.64
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	45	173	189.34
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	45	173	189.07

Table 7-9. Ant M0 Occupied Bandwidth (Band n260 - 100MHz/100+100MHz)

FCC ID: BCGA2301		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device		Page 40 of 201

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
50	1	Mid	38499.96	SISO	CP-OFDM	QPSK	39		45.34
		Mid	38499.96	SISO	CP-OFDM	16QAM	39		45.29
		Mid	38499.96	SISO	CP-OFDM	64QAM	39		45.27
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	39		45.35
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	39		45.26
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	39		45.11
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	39		45.21
		Mid	38499.96	MIMO	CP-OFDM	QPSK	39	167	45.20
		Mid	38499.96	MIMO	CP-OFDM	16QAM	39	167	45.23
		Mid	38499.96	MIMO	CP-OFDM	64QAM	39	167	45.20
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	39	167	45.40
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	39	167	45.48
50+50	2	Mid	38499.96	SISO	CP-OFDM	QPSK	39		94.74
		Mid	38499.96	SISO	CP-OFDM	16QAM	39		95.05
		Mid	38499.96	SISO	CP-OFDM	64QAM	39		96.34
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	39		94.93
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	39		95.30
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	39		95.20
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	39		95.17
		Mid	38499.96	MIMO	CP-OFDM	QPSK	39	167	94.63
		Mid	38499.96	MIMO	CP-OFDM	16QAM	39	167	94.74
		Mid	38499.96	MIMO	CP-OFDM	64QAM	39	167	94.73
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	39	167	94.34
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	39	167	95.12
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	39	167	94.48
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	39	167	94.56

Table 7-10. Ant M2 Occupied Bandwidth (Band n260 - 50MHz/50+50MHz)

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
100	1	Mid	38499.96	SISO	CP-OFDM	QPSK	39		93.22
		Mid	38499.96	SISO	CP-OFDM	16QAM	39		93.12
		Mid	38499.96	SISO	CP-OFDM	64QAM	39		93.26
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	39		90.65
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	39		90.67
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	39		90.54
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	39		90.56
		Mid	38499.96	MIMO	CP-OFDM	QPSK	39	167	93.07
		Mid	38499.96	MIMO	CP-OFDM	16QAM	39	167	92.84
		Mid	38499.96	MIMO	CP-OFDM	64QAM	39	167	92.65
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	39	167	90.73
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	39	167	91.30
100+100	2	Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	39	167	90.93
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	39	167	90.83
		Mid	38499.96	SISO	CP-OFDM	QPSK	39		191.92
		Mid	38499.96	SISO	CP-OFDM	16QAM	39		191.10
		Mid	38499.96	SISO	CP-OFDM	64QAM	39		191.04
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	39		189.26
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	39		189.15
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	39		189.56
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	39		189.06
		Mid	38499.96	MIMO	CP-OFDM	QPSK	39	167	191.31
		Mid	38499.96	MIMO	CP-OFDM	16QAM	39	167	191.55
		Mid	38499.96	MIMO	CP-OFDM	64QAM	39	167	191.49
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	39	167	188.52
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	39	167	188.46
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	39	167	188.76
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	39	167	188.41

Table 7-11. Ant M2 Occupied Bandwidth (Band n260 - 100MHz/100+100MHz)

FCC ID: BCGA2301	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 41 of 201

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
50	1	Mid	38499.96	SISO	CP-OFDM	QPSK	43		45.22
		Mid	38499.96	SISO	CP-OFDM	16QAM	43		45.13
		Mid	38499.96	SISO	CP-OFDM	64QAM	43		45.24
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	43		45.23
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	43		45.33
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	43		45.43
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	43		45.46
		Mid	38499.96	MIMO	CP-OFDM	QPSK	43	171	45.33
		Mid	38499.96	MIMO	CP-OFDM	16QAM	43	171	45.18
		Mid	38499.96	MIMO	CP-OFDM	64QAM	43	171	45.23
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	43	171	45.35
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	43	171	45.38
50+50	2	Mid	38499.96	SISO	CP-OFDM	QPSK	43		94.56
		Mid	38499.96	SISO	CP-OFDM	16QAM	43		94.31
		Mid	38499.96	SISO	CP-OFDM	64QAM	43		94.57
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	43		94.36
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	43		94.48
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	43		94.93
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	43		94.44
		Mid	38499.96	MIMO	CP-OFDM	QPSK	43	171	95.52
		Mid	38499.96	MIMO	CP-OFDM	16QAM	43	171	95.30
		Mid	38499.96	MIMO	CP-OFDM	64QAM	43	171	95.04
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	43	171	95.05
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	43	171	94.69
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	43	171	95.07
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	43	171	94.78

Table 7-12. Ant M3 Occupied Bandwidth (Band n260 - 50MHz/50+50MHz)

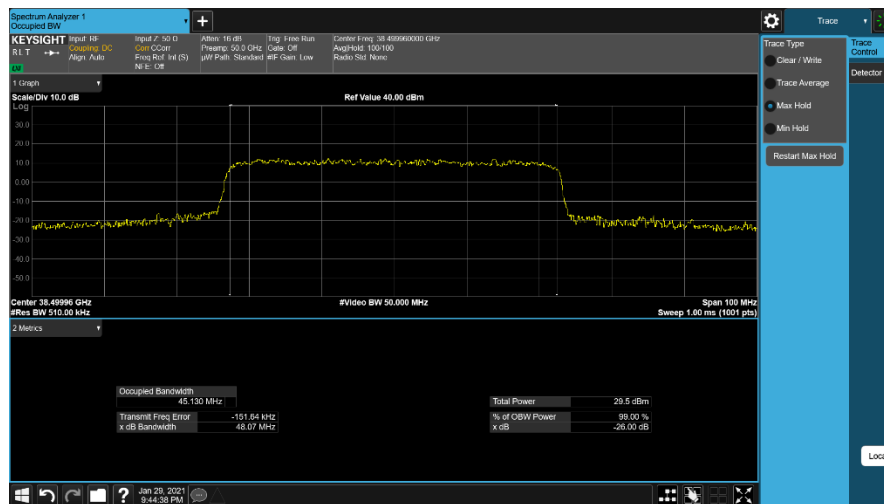
Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
100	1	Mid	38499.96	SISO	CP-OFDM	QPSK	43		92.81
		Mid	38499.96	SISO	CP-OFDM	16QAM	43		92.99
		Mid	38499.96	SISO	CP-OFDM	64QAM	43		92.87
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	43		89.96
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	43		90.68
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	43		90.48
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	43		90.78
		Mid	38499.96	MIMO	CP-OFDM	QPSK	43	171	93.03
		Mid	38499.96	MIMO	CP-OFDM	16QAM	43	171	92.85
		Mid	38499.96	MIMO	CP-OFDM	64QAM	43	171	92.69
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	43	171	90.42
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	43	171	90.55
100+100	2	Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	43	171	90.46
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	43	171	90.60
		Mid	38499.96	SISO	CP-OFDM	QPSK	43		191.20
		Mid	38499.96	SISO	CP-OFDM	16QAM	43		190.79
		Mid	38499.96	SISO	CP-OFDM	64QAM	43		191.09
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	43		189.90
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	43		190.08
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	43		189.90
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	43		190.05
		Mid	38499.96	MIMO	CP-OFDM	QPSK	43	171	191.21
		Mid	38499.96	MIMO	CP-OFDM	16QAM	43	171	190.86
		Mid	38499.96	MIMO	CP-OFDM	64QAM	43	171	191.05
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	43	171	189.12
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	43	171	189.12
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	43	171	188.95
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	43	171	189.02

Table 7-13. Ant M3 Occupied Bandwidth (Band n260 - 100MHz/100+100MHz)

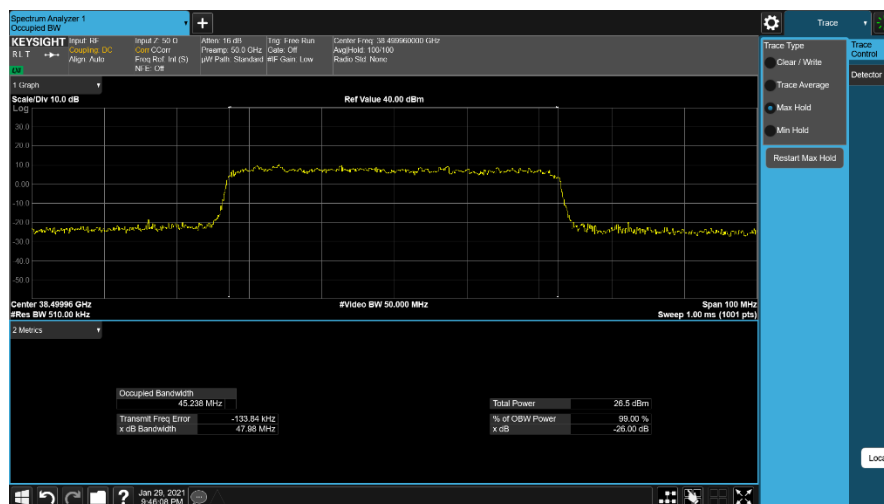
FCC ID: BCGA2301		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device		Page 42 of 201



Plot 7-57. Ant M3 OBW (Band n260-50MHz-1CC SISO CP-OFDM- QPSK – Mid Channel)



Plot 7-58. Ant M3 OBW (Band n260-50MHz-1CC SISO CP-OFDM- 16QAM – Mid Channel)

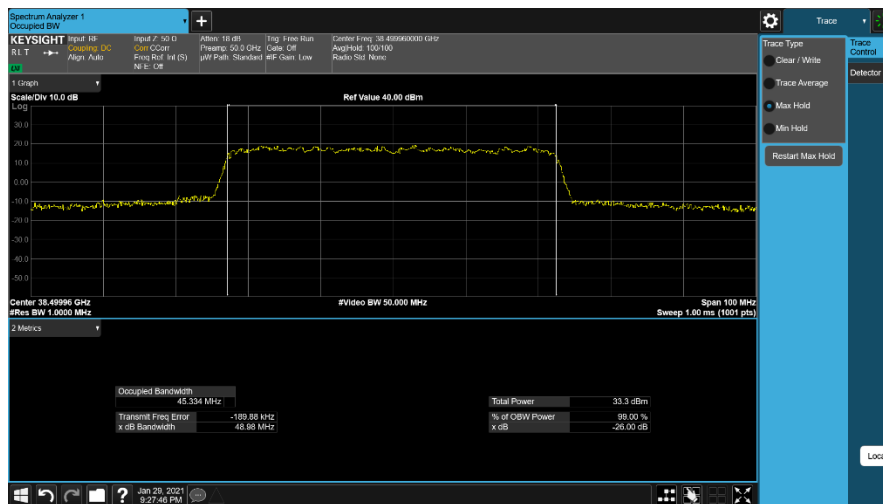


Plot 7-59. Ant M3 OBW (Band n260-50MHz-1CC SISO CP-OFDM – 64QAM – Mid Channel)

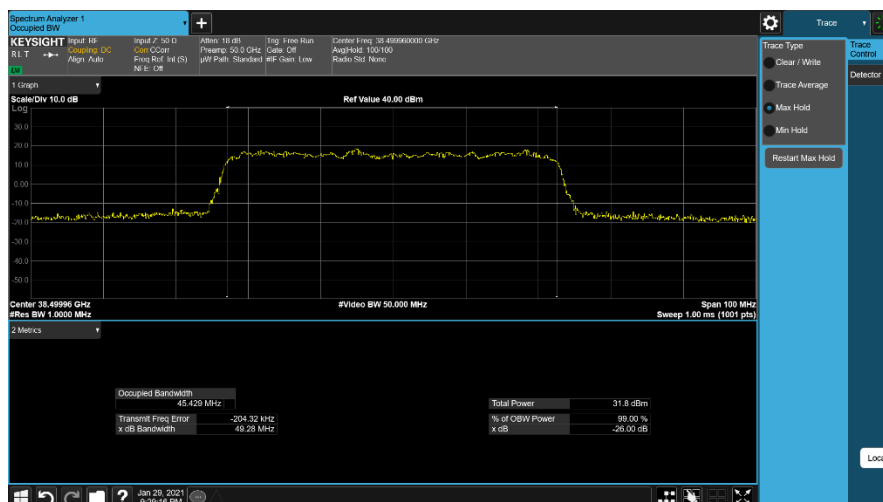
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 43 of 201



Plot 7-60. Ant M3 OBW (Band n260-50MHz-1CC SISO DFTs-OFDM– $\pi/2$ BPSK – Mid Channel)

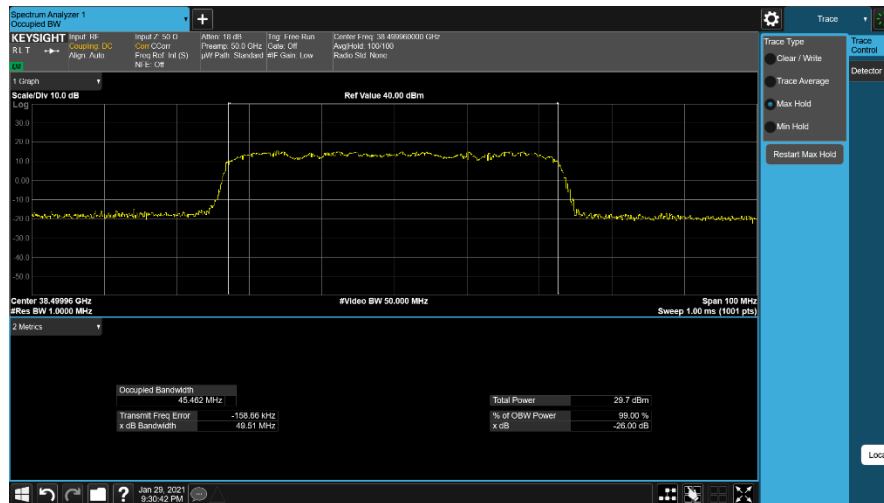


Plot 7-61. Ant M3 OBW (Band n260-50MHz-1CC SISO DFTs-OFDM– QPSK – Mid Channel)

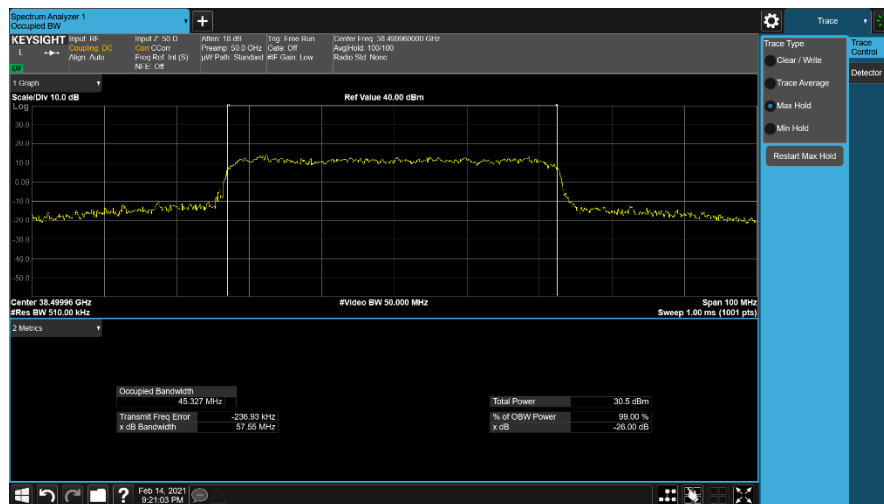


Plot 7-62. Ant M3 OBW (Band n260-50MHz-1CC SISO DFTs-OFDM – 16QAM – Mid Channel)

FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 44 of 201



Plot 7-63. Ant M3 OBW (Band n260-50MHz-1CC SISO DFTs-OFDM -64QAM - Mid Channel)



Plot 7-64. Ant M3 OBW (Band n260-50MHz-1CC MIMO CP-OFDM- QPSK - Mid Channel)

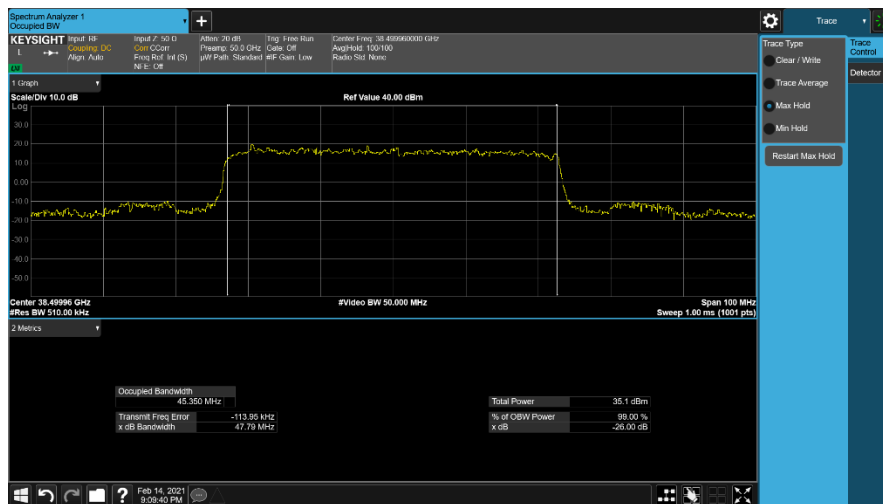


Plot 7-65. Ant M3 OBW (Band n260-50MHz-1CC MIMO CP-OFDM- 16QAM - Mid Channel)

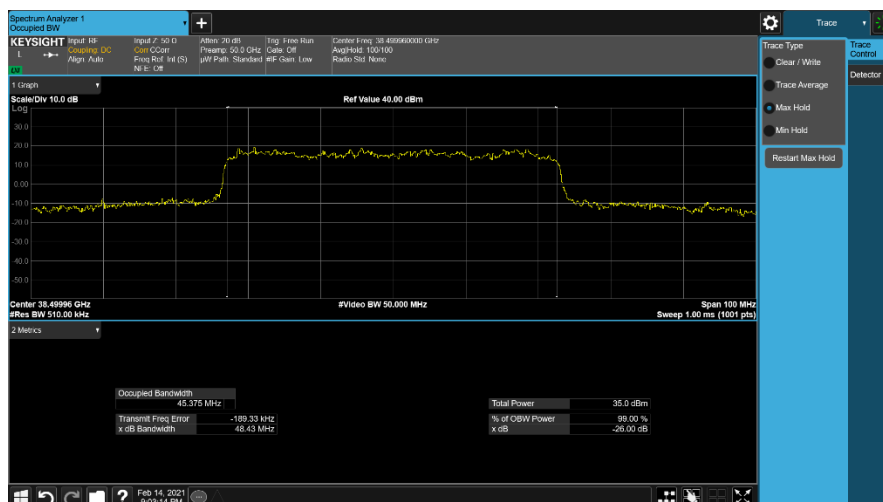
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 45 of 201



Plot 7-66. Ant M3 OBW (Band n260-50MHz-1CC MIMO CP-OFDM– 64QAM – Mid Channel)

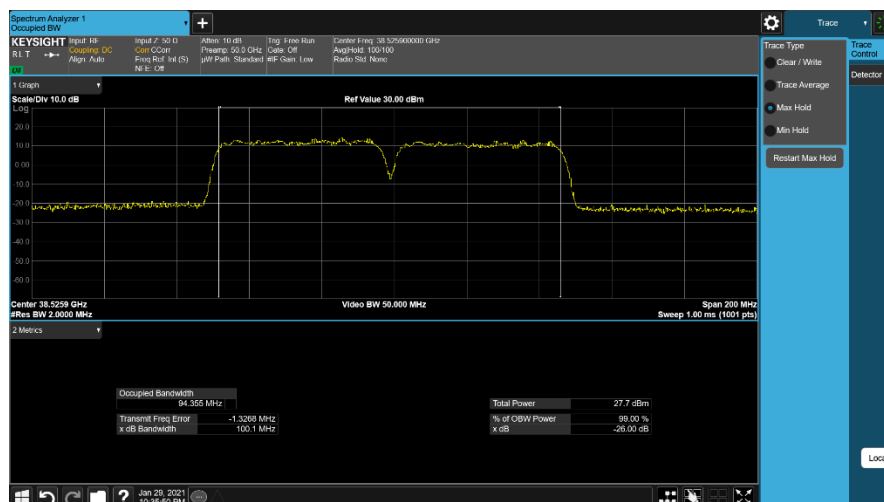
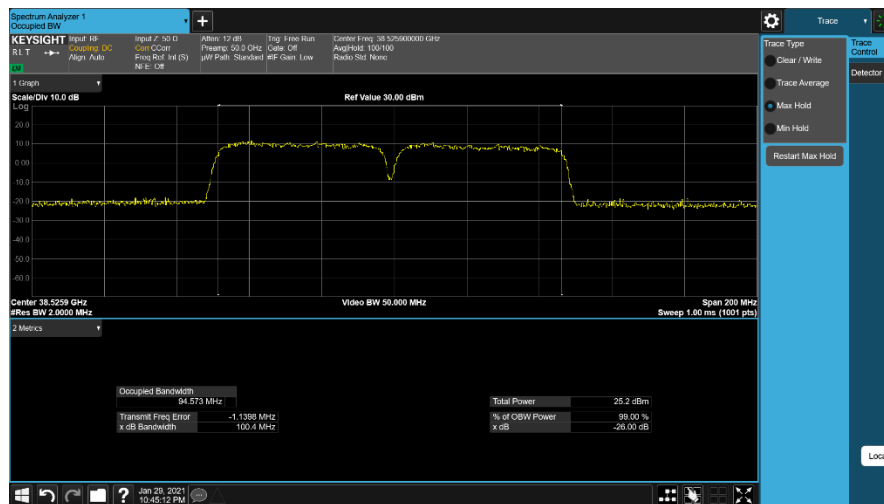
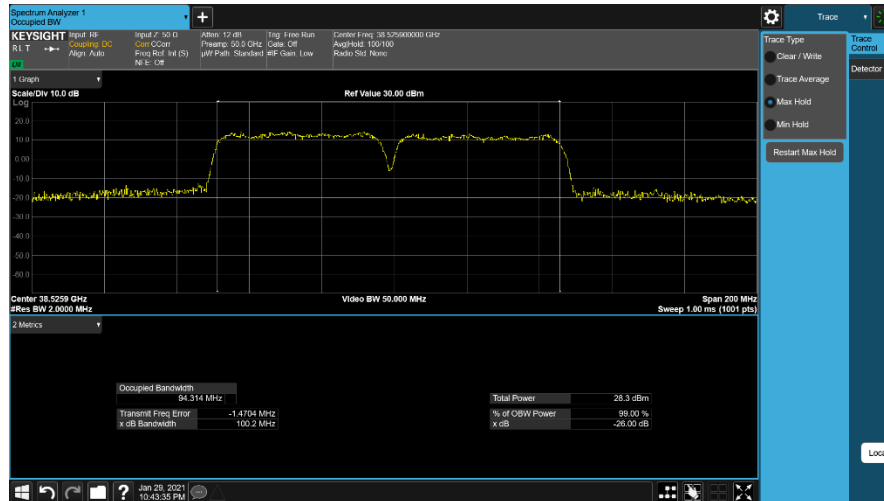


Plot 7-67. Ant M3 OBW (Band n260-50MHz-1CC SISO Dual Pol – $\pi/2$ BPSK – Mid Channel)

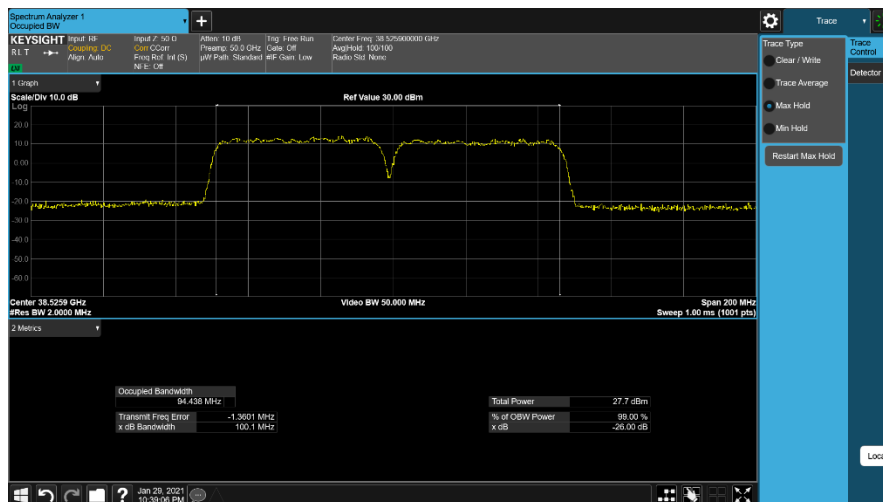
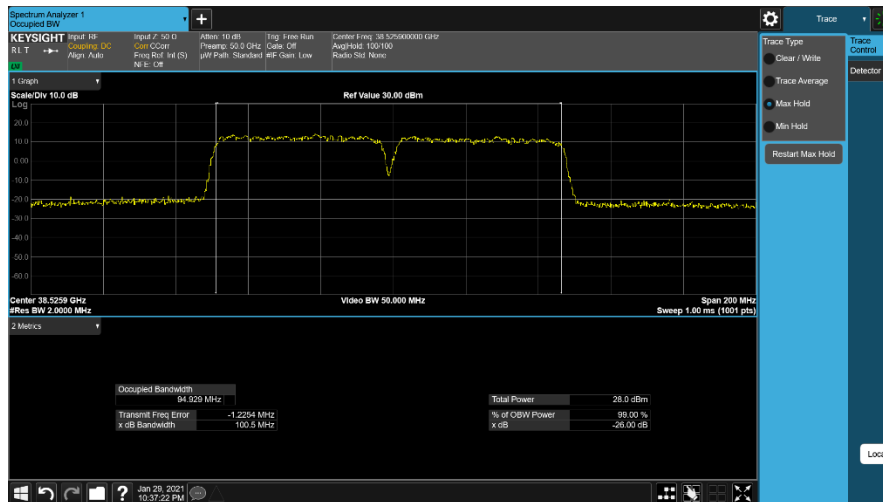


Plot 7-68. Ant M3 OBW (Band n260-50MHz-1CC SISO Dual Pol – QPSK – Mid Channel)

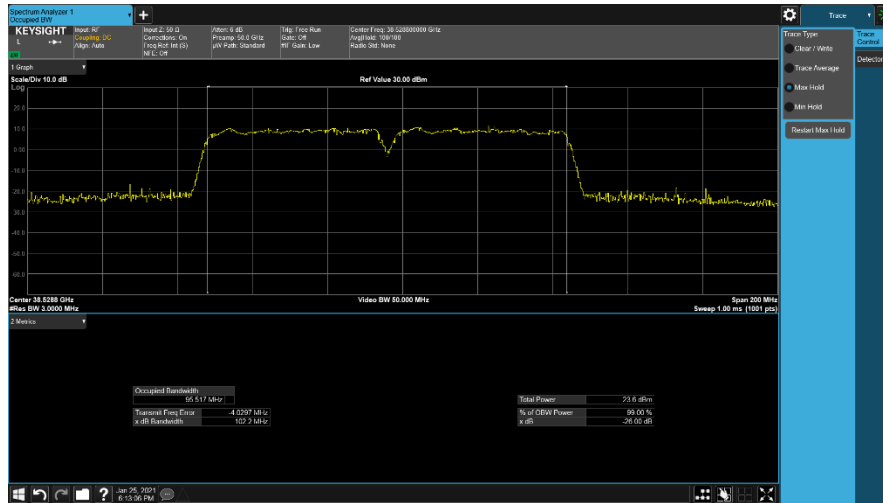
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 46 of 201



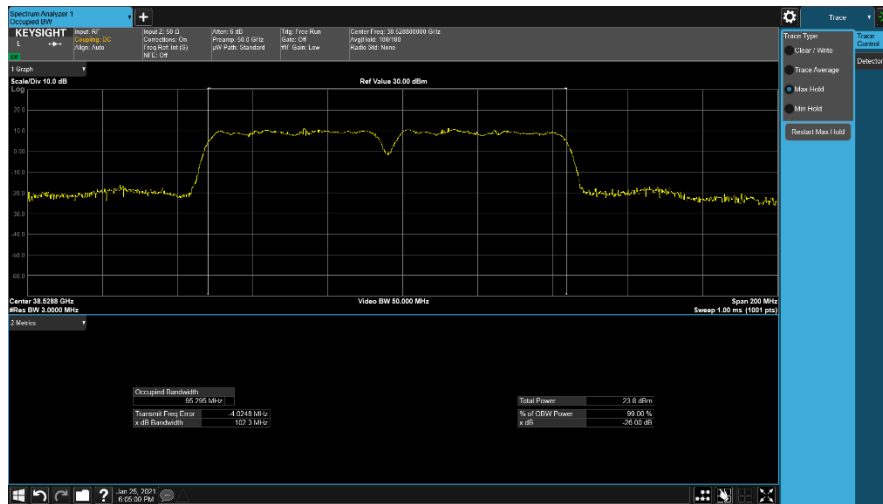
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 48 of 201



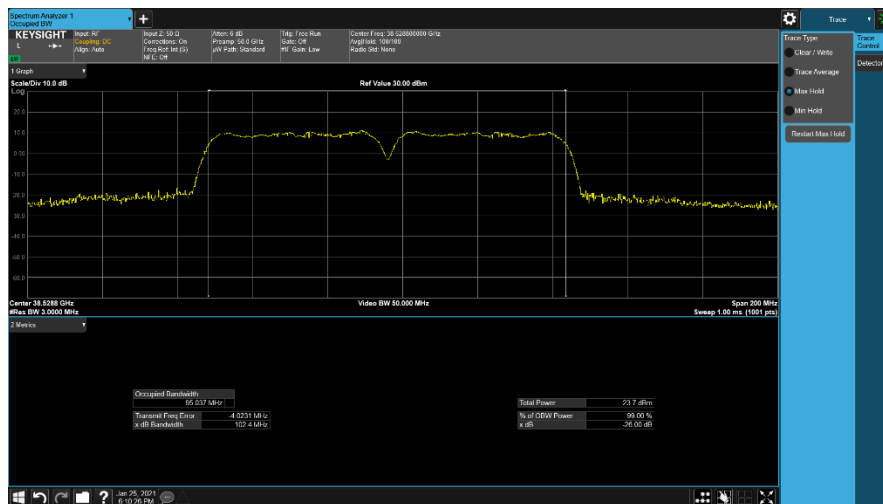
FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 49 of 201



Plot 7-78. Ant M3 OBW (Band n260-50+50MHz-2CC MIMO CP-OFDM– QPSK – Mid Channel)



Plot 7-79. Ant M3 OBW (Band n260-50+50MHz-2CC MIMO CP-OFDM– 16QAM – Mid Channel)



Plot 7-80. Ant M3 OBW (Band n260-50+50MHz-2CC MIMO CP-OFDM– 64QAM – Mid Channel)

FCC ID: BCGA2301	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020002-06.BCG	Test Dates: 12/15/2020-03/09/2021	EUT Type: Tablet Device	Page 50 of 201