



MEASUREMENT REPORT

FCC Part 30 5G mmWave

Applicant Name:

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

Date of Testing:

12/15/2020-03/03/2021

Test Site/Location:

PCTEST Lab. Morgan Hill, CA, USA

Test Report Serial No.:

1C2101020005-06.BCG

FCC ID:

BCGA2379

APPLICANT:

Apple Inc.

Application Type:

Certification

Model:

A2379

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.

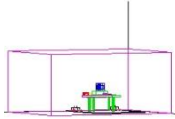

Randy Ortanez
President

FCC ID: BCGA2379	 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

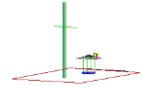
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Band	Tx Frequency [MHz]	Bandwidth [MHz]	CCs Active	Antenna Diversity	Waveform	Modulation	EIRP		Emission Designator
							Max Power [W]	Max Power [dBm]	
n261	27500 - 28350	50	1	SISO	CP-OFDM	QPSK	0.519	27.15	45M3G7W
						16QAM	0.427	26.30	45M2D7W
						64QAM	0.223	23.48	45M4D7W
				SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.865	29.37	45M4G7W
						QPSK	0.773	28.88	45M5G7W
						16QAM	0.578	27.62	45M6D7W
				MIMO	CP-OFDM	64QAM	0.346	25.39	45M5D7W
						QPSK	0.347	25.40	45M5G7W
						16QAM	0.376	25.75	45M3D7W
				SISO Dual Pol	DFT-s-OFDM	64QAM	0.234	23.70	45M2D7W
						$\pi/2$ BPSK	0.791	28.98	45M4G7W
						QPSK	0.802	29.04	45M4G7W
				SISO	CP-OFDM	16QAM	0.643	28.08	45M4D7W
						64QAM	0.362	25.59	45M3D7W
				SISO	DFT-s-OFDM	QPSK	0.135	21.29	95M4G7W
						16QAM	0.121	20.82	95M3D7W
				SISO	DFT-s-OFDM	64QAM	0.119	20.77	95M6D7W
				SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.126	21.01	95M0G7W
						QPSK	0.134	21.28	95M1G7W
				SISO	DFT-s-OFDM	16QAM	0.130	21.14	94M8D7W
						64QAM	0.147	21.66	94M8D7W
				MIMO	CP-OFDM	QPSK	0.082	19.15	94M8G7W
						16QAM	0.082	19.14	95M6D7W
				SISO Dual Pol	DFT-s-OFDM	64QAM	0.088	19.45	95M7D7W
						$\pi/2$ BPSK	0.240	23.81	95M5G7W
						QPSK	0.227	23.56	95M0G7W
				SISO	CP-OFDM	16QAM	0.238	23.77	95M4D7W
						64QAM	0.231	23.64	95M1D7W
				SISO	DFT-s-OFDM	QPSK	0.460	26.63	93M4G7W
						16QAM	0.317	25.01	93M3D7W
				SISO	DFT-s-OFDM	64QAM	0.257	24.10	93M3D7W
				SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.752	28.76	90M7G7W
						QPSK	0.766	28.84	91M1G7W
				MIMO	CP-OFDM	16QAM	0.590	27.71	91M0D7W
						64QAM	0.378	25.77	90M9D7W
				SISO Dual Pol	DFT-s-OFDM	QPSK	0.424	26.27	91M2G7W
						16QAM	0.424	26.27	90M7D7W
						64QAM	0.231	23.64	90M9D7W
				SISO	CP-OFDM	$\pi/2$ BPSK	1.081	30.34	90M9G7W
						QPSK	1.045	30.19	91M1G7W
				SISO	DFT-s-OFDM	16QAM	0.865	29.37	90M8D7W
						64QAM	0.481	26.82	90M6D7W
				SISO	CP-OFDM	QPSK	0.130	21.15	191MG7W
						16QAM	0.140	21.46	191MD7W
				SISO	DFT-s-OFDM	64QAM	0.124	20.94	191MD7W
						$\pi/2$ BPSK	0.125	20.97	190MG7W
				SISO	DFT-s-OFDM	QPSK	0.124	20.95	190MG7W
						16QAM	0.124	20.95	189MD7W
				MIMO	CP-OFDM	64QAM	0.121	20.82	189MD7W
						QPSK	0.077	18.84	192MG7W
				SISO Dual Pol	DFT-s-OFDM	16QAM	0.074	18.68	191MD7W
						64QAM	0.075	18.75	191MD7W
						$\pi/2$ BPSK	0.217	23.36	189MG7W
				SISO	CP-OFDM	QPSK	0.218	23.39	189MG7W
						16QAM	0.224	23.50	189MD7W
						64QAM	0.217	23.37	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	0.270	24.31	45M4G7W
						16QAM	0.262	24.18	45M2D7W
						64QAM	0.150	21.75	45M3D7W
				SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.641	28.07	45M5G7W
						QPSK	0.671	28.27	45M3G7W
						16QAM	0.453	26.56	45M6D7W
				MIMO	CP-OFDM	64QAM	0.252	24.02	45M6D7W
						QPSK	0.470	26.72	45M4G7W
						16QAM	0.481	26.82	45M3D7W
				SISO Dual Pol	DFT-s-OFDM	64QAM	0.264	24.21	45M4D7W
						$\pi/2$ BPSK	1.629	32.12	45M3G7W
						QPSK	1.459	31.64	45M5G7W
				SISO	CP-OFDM	16QAM	1.159	30.64	45M2D7W
						64QAM	0.673	28.28	45M3D7W
				SISO	DFT-s-OFDM	QPSK	0.128	21.07	94M7G7W
						16QAM	0.131	21.18	94M9D7W
						64QAM	0.079	18.98	94M8D7W
		50+50	2	SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.129	21.11	94M8G7W
						QPSK	0.131	21.18	94M7G7W
						16QAM	0.131	21.17	94M9D7W
				SISO	CP-OFDM	64QAM	0.127	21.05	94M8D7W
						QPSK	0.066	18.19	95M1G7W
						16QAM	0.065	18.16	95M2D7W
				MIMO	CP-OFDM	64QAM	0.069	18.38	95M2D7W
						$\pi/2$ BPSK	0.309	24.90	95M6G7W
				SISO Dual Pol	DFT-s-OFDM	QPSK	0.317	25.01	95M4G7W
						16QAM	0.370	25.68	95M0D7W
						64QAM	0.350	25.44	95M2D7W
		100	1	SISO	CP-OFDM	QPSK	0.245	23.90	93M0G7W
						16QAM	0.204	23.10	93M0D7W
						64QAM	0.144	21.57	93M1D7W
				SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.612	27.87	90M9G7W
						QPSK	0.582	27.65	90M9G7W
						16QAM	0.545	27.36	90M9D7W
				MIMO	CP-OFDM	64QAM	0.274	24.37	91M1D7W
						QPSK	0.306	24.86	93M3G7W
						16QAM	0.225	23.53	92M8D7W
				SISO Dual Pol	DFT-s-OFDM	64QAM	0.186	22.69	93M1D7W
						$\pi/2$ BPSK	1.321	31.21	90M7G7W
						QPSK	1.416	31.51	90M9G7W
				SISO	CP-OFDM	16QAM	1.138	30.56	91M1D7W
						64QAM	0.617	27.90	90M9D7W
				SISO	DFT-s-OFDM	QPSK	0.131	21.17	191MG7W
						16QAM	0.132	21.21	191MD7W
						64QAM	0.098	19.93	192MD7W
		100+100	2	SISO	DFT-s-OFDM	$\pi/2$ BPSK	0.136	21.33	189MG7W
						QPSK	0.133	21.25	190MG7W
						16QAM	0.134	21.26	189MD7W
				MIMO	CP-OFDM	64QAM	0.132	21.22	189MD7W
						QPSK	0.066	18.18	191MG7W
						16QAM	0.074	18.67	192MD7W
				SISO Dual Pol	DFT-s-OFDM	64QAM	0.068	18.33	191MD7W
						$\pi/2$ BPSK	0.224	23.50	189MG7W
						QPSK	0.229	23.59	189MG7W
						16QAM	0.230	23.61	189MD7W
						64QAM	0.224	23.50	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 ISSED Standards (RSS).
- PCTEST facility is a registered (22831) test laboratory with the site description on file with ISSED.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2379**. The test data contained in this report pertains only to the emissions due to the EUT's 5G mmWave function.

Test Device Serial No.: HQ6LP46QDR, QC72R7V911, HP4RVC4N45, T6P6XNJ2QP

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	160	32
Ant M2	36	164
Ant M3	168	40

Table 2-2. Band n261 Worst Case Beam IDs

Band n260		
Antenna	Peak Beam ID	Paired Beam ID
Ant M0	46	174
Ant M2	165	37
Ant M3	169	41

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.

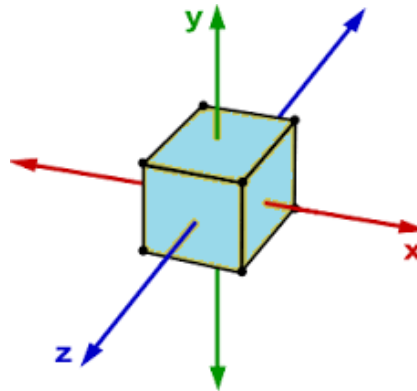


Figure 3-1. Rotation of the EUT Through Three Orthogonal Planes

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

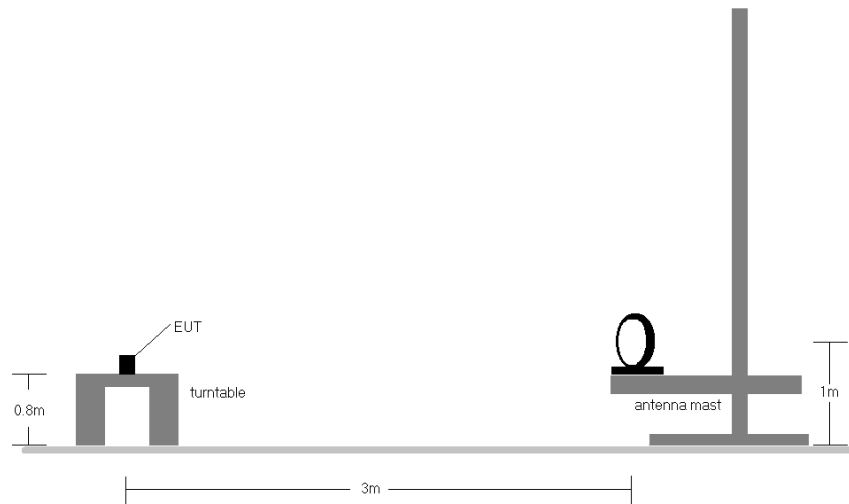


Figure 3-2. Test Site Diagram (9kHz - 30MHz)

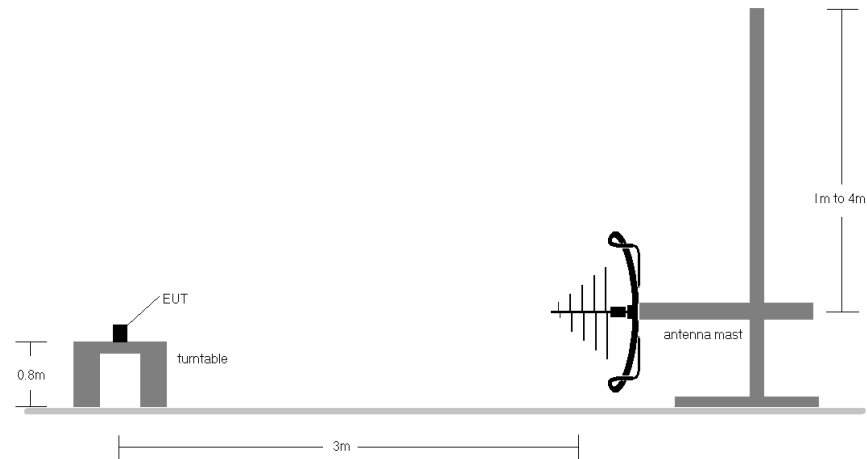


Figure 3-3. Test Site Diagram (30MHz - 1GHz)

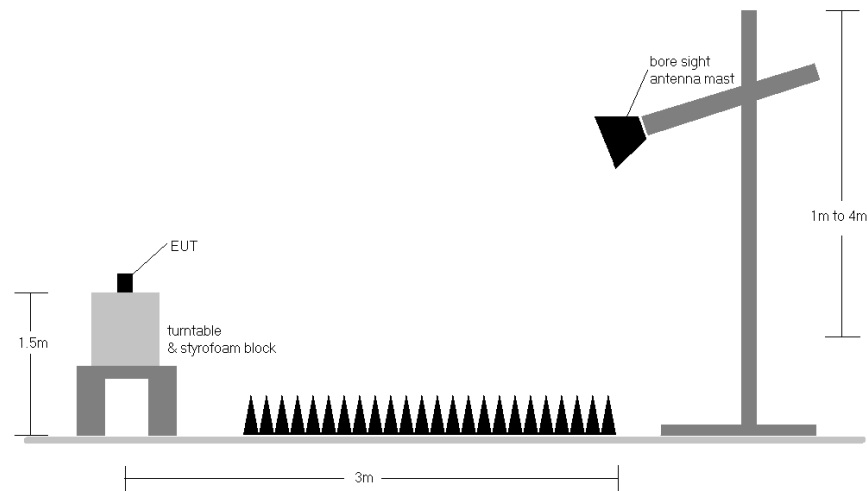


Figure 3-4. Test Site Diagram (1GHz - 18GHz)

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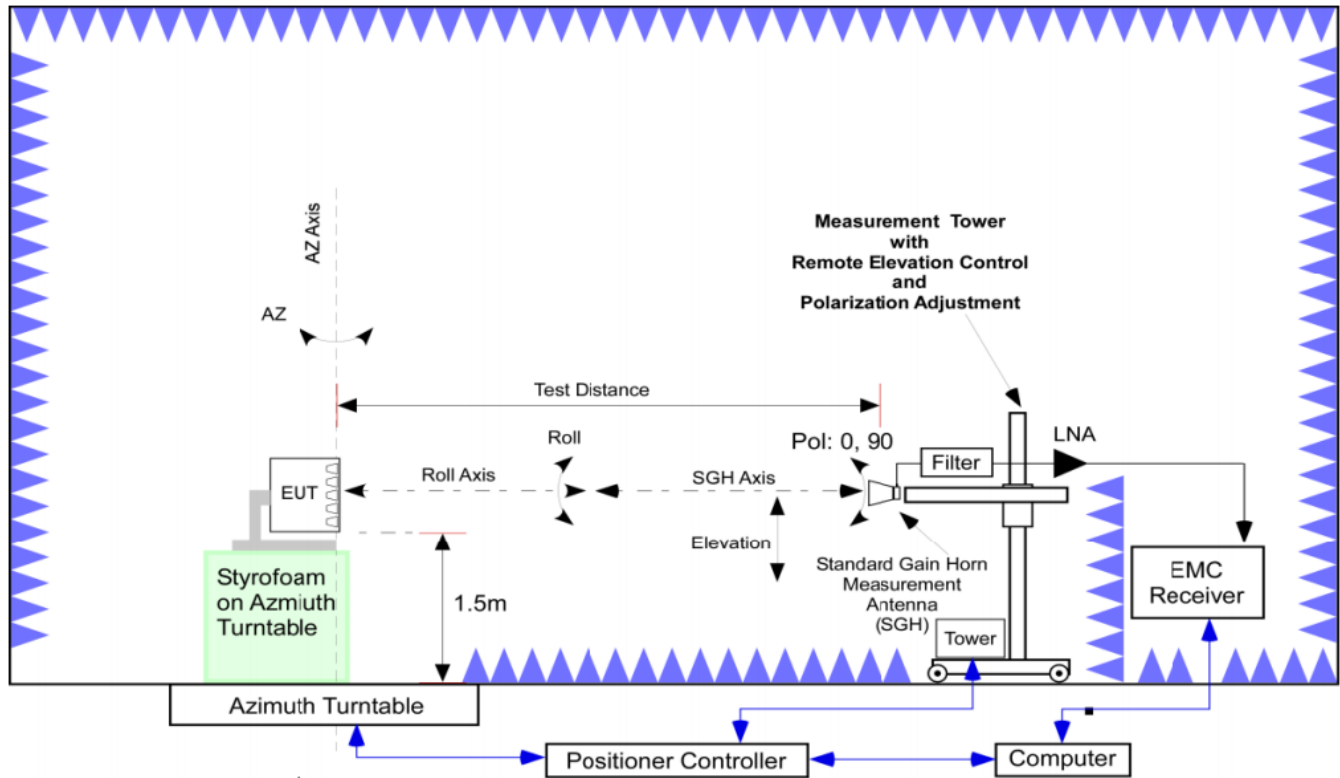


Figure 3-5. Test Site Diagram (Above 18GHz)

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

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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: BCGA2379
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	160		45.35
		Mid	27924.96	SISO	CP-OFDM	16QAM	160		45.22
		Mid	27924.96	SISO	CP-OFDM	64QAM	160		45.24
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	160		45.20
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	160		45.27
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	160		45.58
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	160		45.17
		Mid	27924.96	MIMO	CP-OFDM	QPSK	160	32	45.47
		Mid	27924.96	MIMO	CP-OFDM	16QAM	160	32	45.22
		Mid	27924.96	MIMO	CP-OFDM	64QAM	160	32	45.03
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	160	32	45.20
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	160	32	45.22
50+50	2	Mid	27924.96	SISO	CP-OFDM	QPSK	160		94.60
		Mid	27924.96	SISO	CP-OFDM	16QAM	160		94.54
		Mid	27924.96	SISO	CP-OFDM	64QAM	160		94.44
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	160		94.71
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	160		94.51
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	160		94.51
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	160		94.75
		Mid	27924.96	MIMO	CP-OFDM	QPSK	160	32	94.54
		Mid	27924.96	MIMO	CP-OFDM	16QAM	160	32	94.65
		Mid	27924.96	MIMO	CP-OFDM	64QAM	160	32	94.56
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	160	32	94.78
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	160	32	94.55
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	160	32	94.56
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	160	32	94.57

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	160		93.35
		Mid	27924.96	SISO	CP-OFDM	16QAM	160		93.13
		Mid	27924.96	SISO	CP-OFDM	64QAM	160		93.28
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	160		90.68
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	160		91.09
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	160		90.97
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	160		90.55
		Mid	27924.96	MIMO	CP-OFDM	QPSK	160	32	91.24
		Mid	27924.96	MIMO	CP-OFDM	16QAM	160	32	90.37
		Mid	27924.96	MIMO	CP-OFDM	64QAM	160	32	90.90
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	160	32	90.35
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	160	32	90.88
100+100	2	Mid	27924.96	SISO	CP-OFDM	QPSK	160		90.72
		Mid	27924.96	SISO	CP-OFDM	16QAM	160		90.72
		Mid	27924.96	SISO	CP-OFDM	64QAM	160		90.38
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	160		90.38
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	160		191.29
		Mid	27924.96	SISO	CP-OFDM	16QAM	160		190.84
		Mid	27924.96	SISO	CP-OFDM	64QAM	160		190.91
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	160		189.23
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	160		189.28
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	160		189.62
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	160		188.70
		Mid	27924.96	MIMO	CP-OFDM	QPSK	160	32	191.17
		Mid	27924.96	MIMO	CP-OFDM	16QAM	160	32	191.48
		Mid	27924.96	MIMO	CP-OFDM	64QAM	160	32	189.02
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	160	32	189.39
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	160	32	188.96
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	160	32	188.78
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	160	32	189.12

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	36		45.32
		Mid	27924.96	SISO	CP-OFDM	16QAM	36		45.14
		Mid	27924.96	SISO	CP-OFDM	64QAM	36		45.25
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	36		45.42
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	36		45.48
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	36		45.16
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	36		45.46
		Mid	27924.96	MIMO	CP-OFDM	QPSK	36	164	45.41
		Mid	27924.96	MIMO	CP-OFDM	16QAM	36	164	45.26
		Mid	27924.96	MIMO	CP-OFDM	64QAM	36	164	45.03
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	36	164	44.98
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	36	164	45.16
50+50	2	Mid	27924.96	SISO	CP-OFDM	QPSK	36		94.71
		Mid	27924.96	SISO	CP-OFDM	16QAM	36		94.54
		Mid	27924.96	SISO	CP-OFDM	64QAM	36		94.72
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	36		94.36
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	36		94.64
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	36		94.69
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	36		94.61
		Mid	27924.96	MIMO	CP-OFDM	QPSK	36	164	94.83
		Mid	27924.96	MIMO	CP-OFDM	16QAM	36	164	94.72
		Mid	27924.96	MIMO	CP-OFDM	64QAM	36	164	94.75
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	36	164	94.88
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	36	164	94.75
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	36	164	94.90
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	36	164	94.69

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	36		92.91
		Mid	27924.96	SISO	CP-OFDM	16QAM	36		93.07
		Mid	27924.96	SISO	CP-OFDM	64QAM	36		93.06
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	36		90.69
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	36		91.00
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	36		90.46
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	36		90.95
		Mid	27924.96	MIMO	CP-OFDM	QPSK	36	164	91.21
		Mid	27924.96	MIMO	CP-OFDM	16QAM	36	164	90.39
		Mid	27924.96	MIMO	CP-OFDM	64QAM	36	164	90.58
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	36	164	90.93
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	36	164	90.65
100+100	2	Mid	27924.96	SISO	CP-OFDM	QPSK	36		191.56
		Mid	27924.96	SISO	CP-OFDM	16QAM	36		190.97
		Mid	27924.96	SISO	CP-OFDM	64QAM	36		191.58
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	36		189.43
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	36		190.21
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	36		189.55
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	36		189.35
		Mid	27924.96	MIMO	CP-OFDM	QPSK	36	164	189.10
		Mid	27924.96	MIMO	CP-OFDM	16QAM	36	164	191.37
		Mid	27924.96	MIMO	CP-OFDM	64QAM	36	164	191.70
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	36	164	189.35
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	36	164	189.28
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	36	164	189.19
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	36	164	188.79

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

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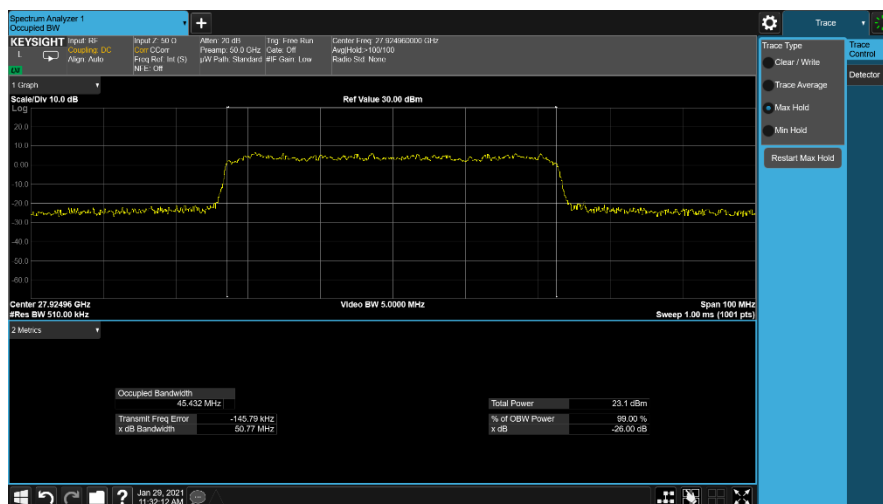
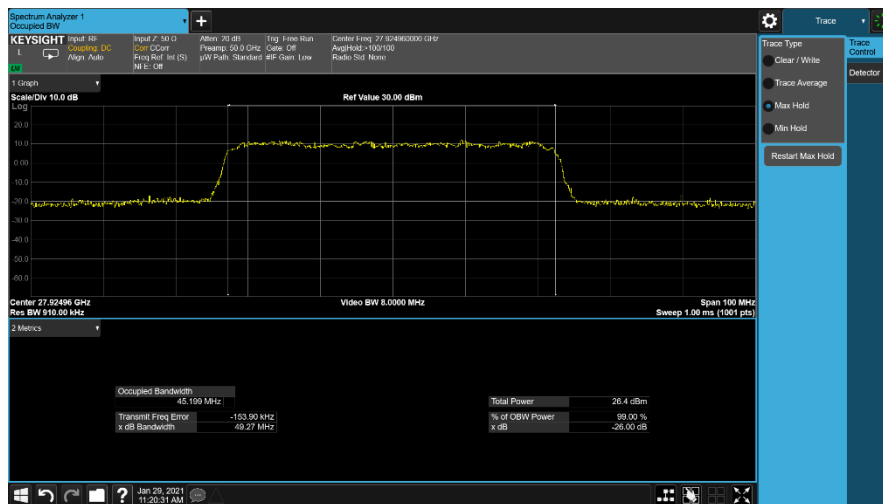
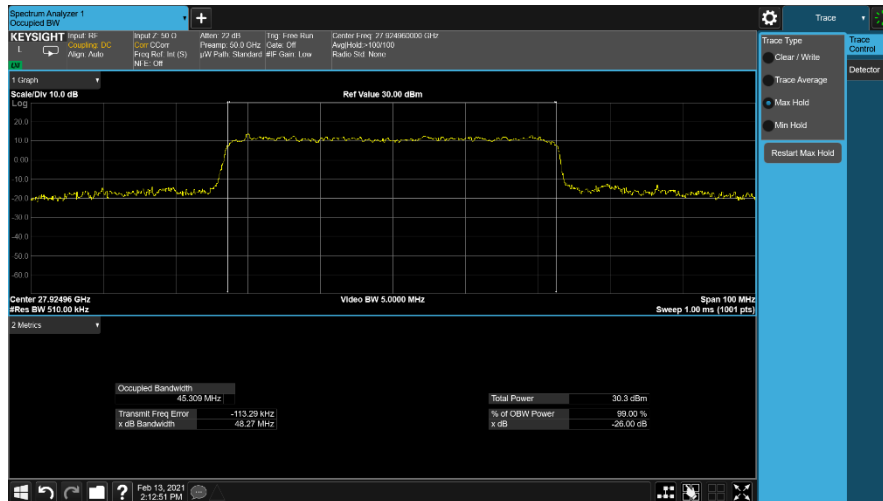
Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
50	1	Mid	27924.96	SISO	CP-OFDM	QPSK	168		45.31
		Mid	27924.96	SISO	CP-OFDM	16QAM	168		45.20
		Mid	27924.96	SISO	CP-OFDM	64QAM	168		45.43
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	168		45.35
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	168		45.22
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	168		45.17
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	168		45.07
		Mid	27924.96	MIMO	CP-OFDM	QPSK	168	40	45.14
		Mid	27924.96	MIMO	CP-OFDM	16QAM	168	40	45.35
		Mid	27924.96	MIMO	CP-OFDM	64QAM	168	40	45.24
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	168	40	45.40
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	168	40	45.43
50+50	2	Mid	27924.96	SISO	DFT-s-OFDM	16QAM	168	40	45.16
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	168	40	45.30
		Mid	27924.96	SISO	CP-OFDM	QPSK	168		95.38
		Mid	27924.96	SISO	CP-OFDM	16QAM	168		95.28
		Mid	27924.96	SISO	CP-OFDM	64QAM	168		95.61
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	168		95.04
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	168		95.11
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	168		94.78
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	168		94.84
		Mid	27924.96	MIMO	CP-OFDM	QPSK	168	40	94.24
		Mid	27924.96	MIMO	CP-OFDM	16QAM	168	40	95.57
		Mid	27924.96	MIMO	CP-OFDM	64QAM	168	40	95.74
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	168	40	95.49
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	168	40	94.99
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	168	40	95.38
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	168	40	95.08

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

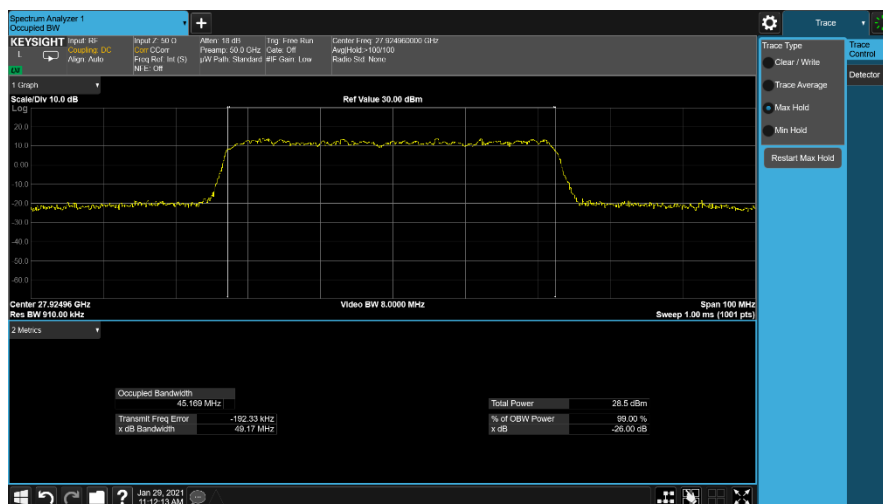
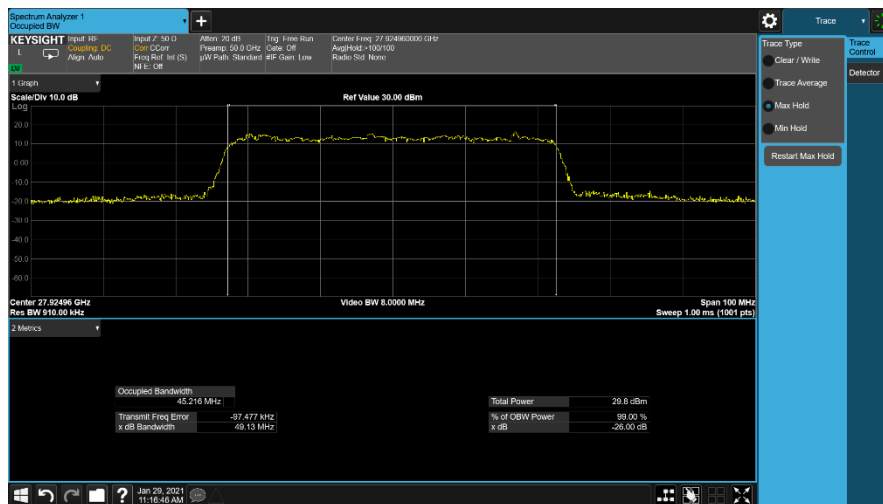
Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
100	1	Mid	27924.96	SISO	CP-OFDM	QPSK	168		93.21
		Mid	27924.96	SISO	CP-OFDM	16QAM	168		93.28
		Mid	27924.96	SISO	CP-OFDM	64QAM	168		92.91
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	168		90.59
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	168		90.63
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	168		90.40
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	168		90.64
		Mid	27924.96	MIMO	CP-OFDM	QPSK	168	40	90.63
		Mid	27924.96	MIMO	CP-OFDM	16QAM	168	40	90.72
		Mid	27924.96	MIMO	CP-OFDM	64QAM	168	40	90.57
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	168	40	90.86
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	168	40	91.09
100+100	2	Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	168	40	90.59
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	168	40	90.63
		Mid	27924.96	SISO	CP-OFDM	QPSK	168		191.49
		Mid	27924.96	SISO	CP-OFDM	16QAM	168		190.91
		Mid	27924.96	SISO	CP-OFDM	64QAM	168		191.56
		Mid	27924.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	168		190.07
		Mid	27924.96	SISO	DFT-s-OFDM	QPSK	168		189.49
		Mid	27924.96	SISO	DFT-s-OFDM	16QAM	168		189.71
		Mid	27924.96	SISO	DFT-s-OFDM	64QAM	168		189.56
		Mid	27924.96	MIMO	CP-OFDM	QPSK	168	40	192.09
		Mid	27924.96	MIMO	CP-OFDM	16QAM	168	40	191.21
		Mid	27924.96	MIMO	CP-OFDM	64QAM	168	40	191.80
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	168	40	189.44
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	QPSK	168	40	189.45
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	16QAM	168	40	189.21
		Mid	27924.96	SISO Dual Pol	DFT-s-OFDM	64QAM	168	40	188.97

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

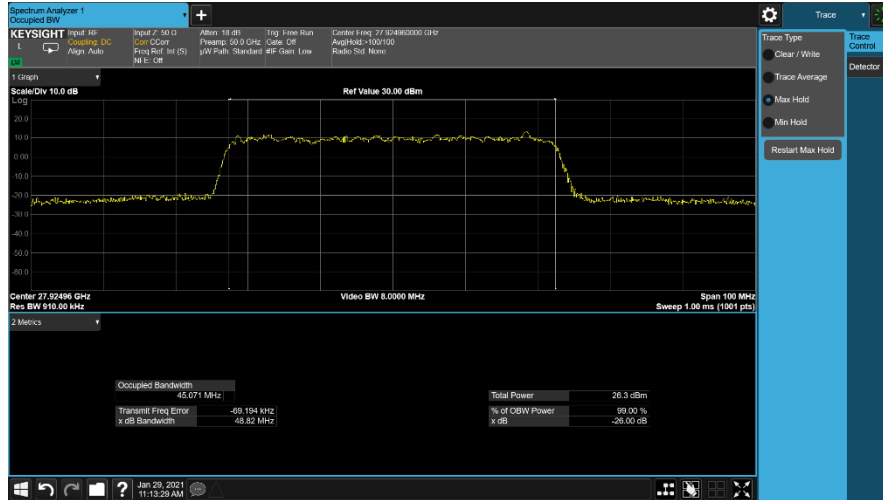
FCC ID: BCGA2379		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 19 of 201



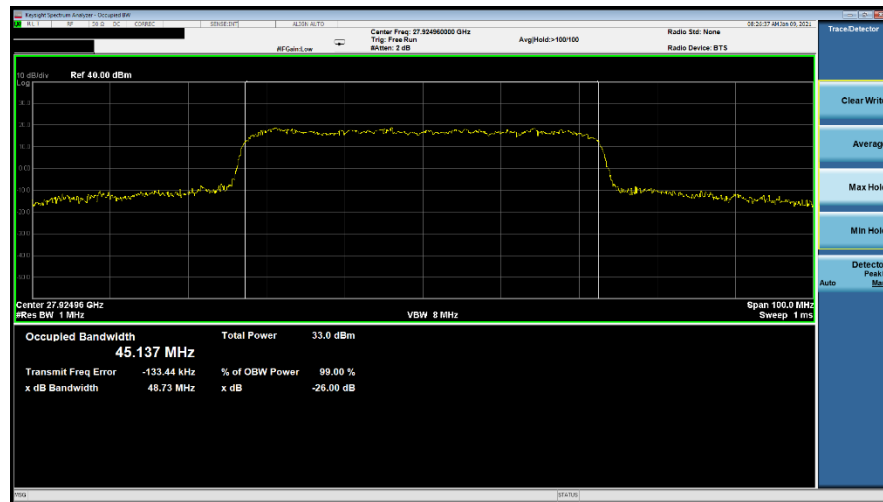
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 20 of 201



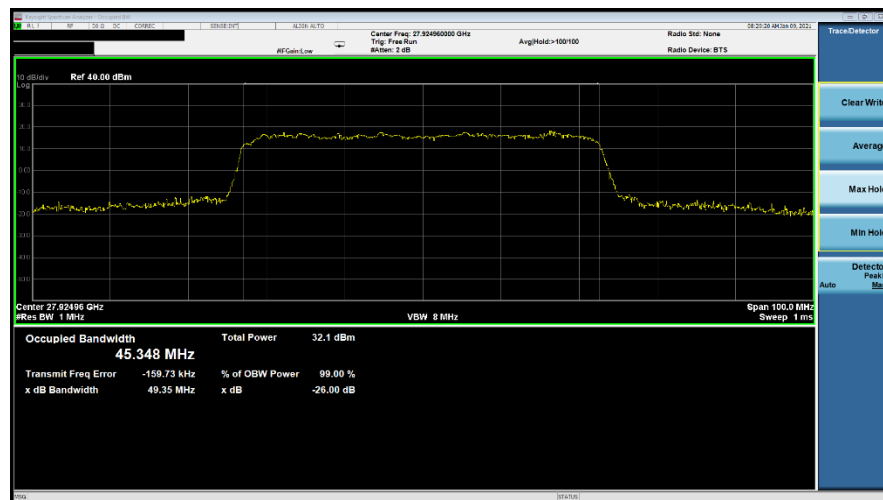
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 21 of 201



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

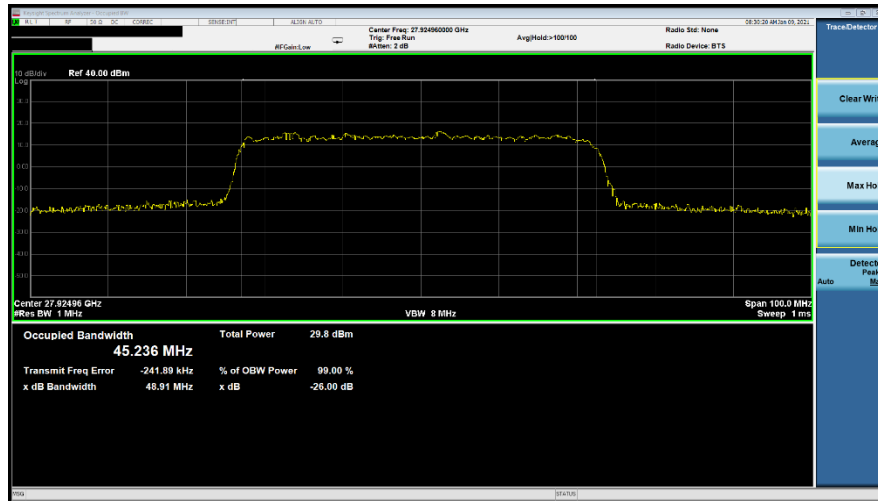


Plot 7-8. Ant M3 OBW (Band n261-50MHz-1CC MIMO CP-OFDM- QPSK - Mid Channel)

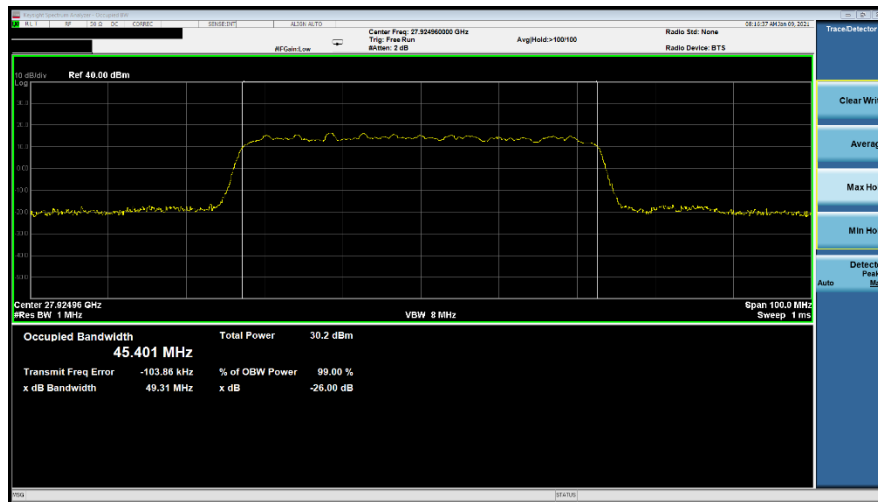


Plot 7-9. Ant M3 OBW (Band n261-50MHz-1CC MIMO CP-OFDM- 16QAM - Mid Channel)

FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	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)

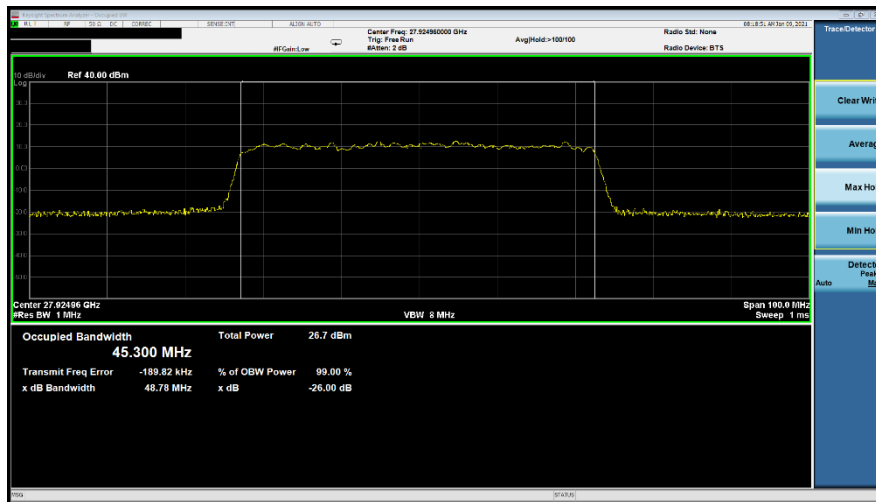


Plot 7-12. Ant M3 OBW (Band n261-50MHz-1CC SISO Dual Pol – QPSK – Mid Channel)

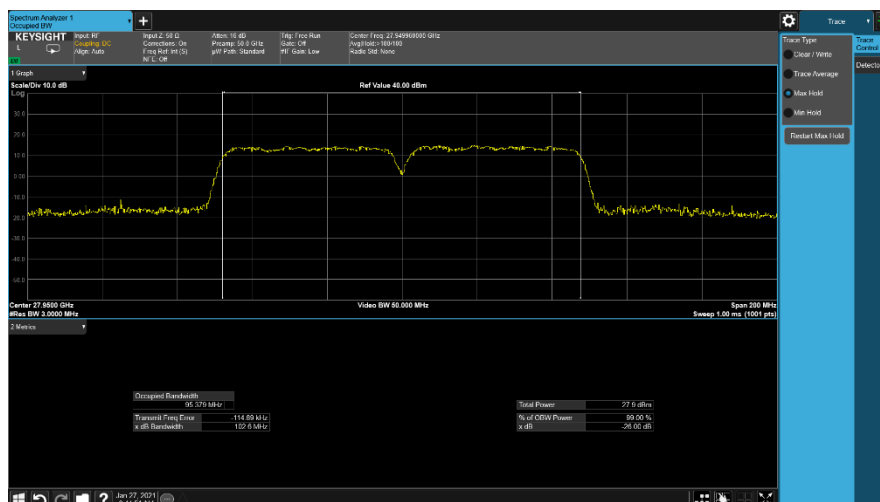
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 23 of 201



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

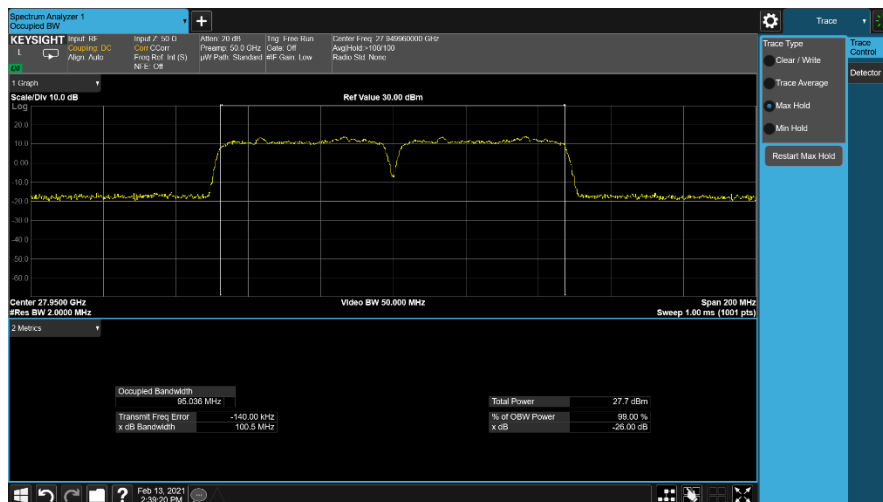
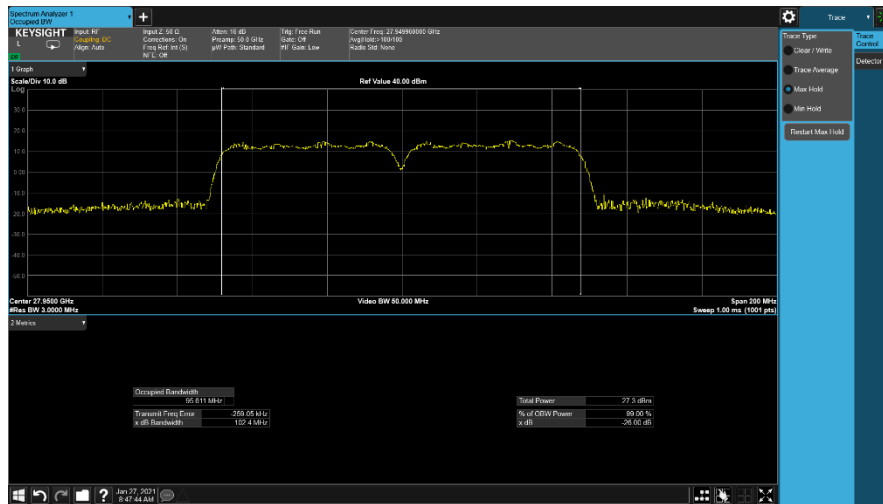
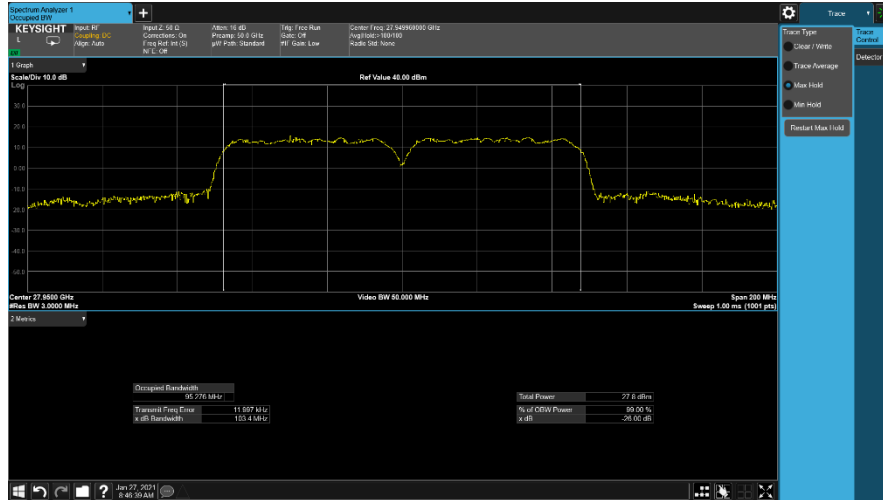


Plot 7-14. Ant M3 OBW (Band n261-50MHz-1CC SISO Dual Pol – 64QAM – Mid Channel)

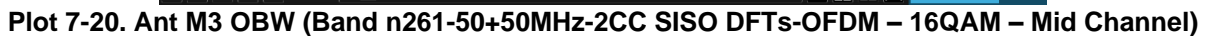
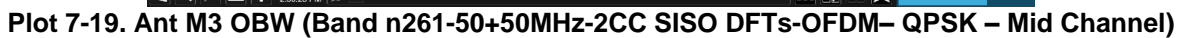


Plot 7-15. Ant M3 OBW (Band n261-50+50MHz-2CC SISO CP-OFDM– QPSK – Mid Channel)

FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 24 of 201



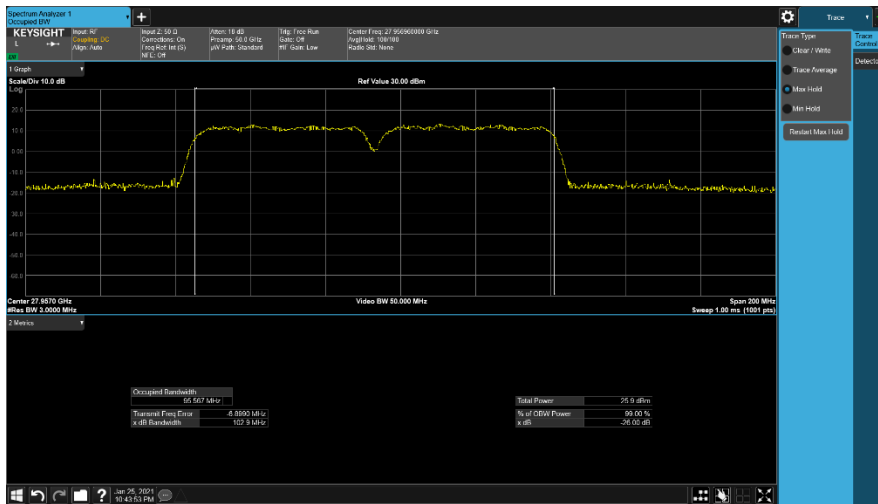
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 25 of 201



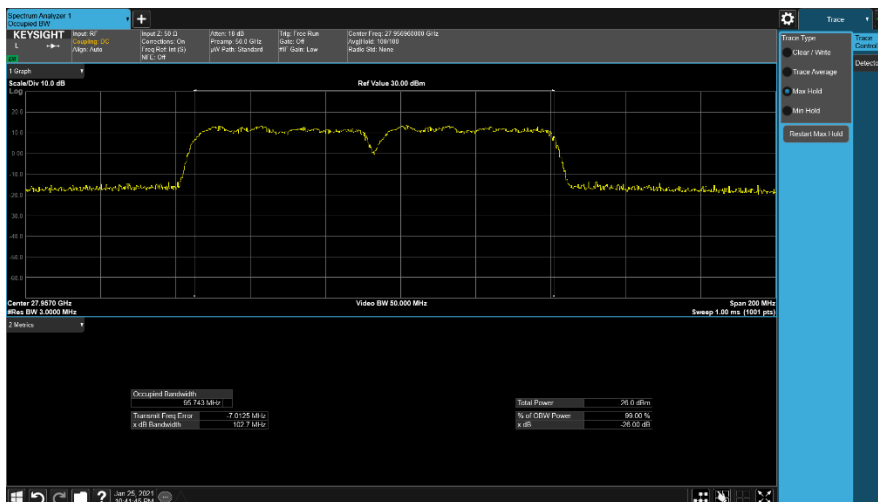
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Plot 7-22. Ant M3 OBW (Band n261-50+50MHz-2CC MIMO CP-OFDM– QPSK – Mid Channel)

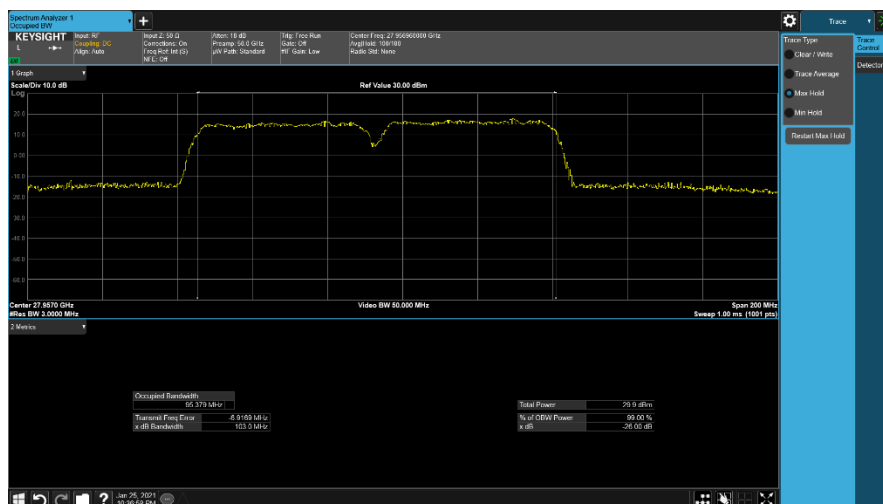
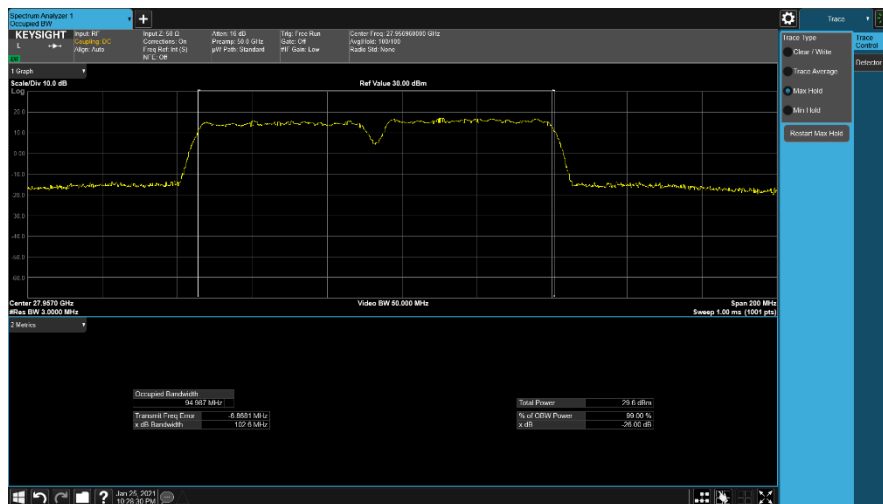
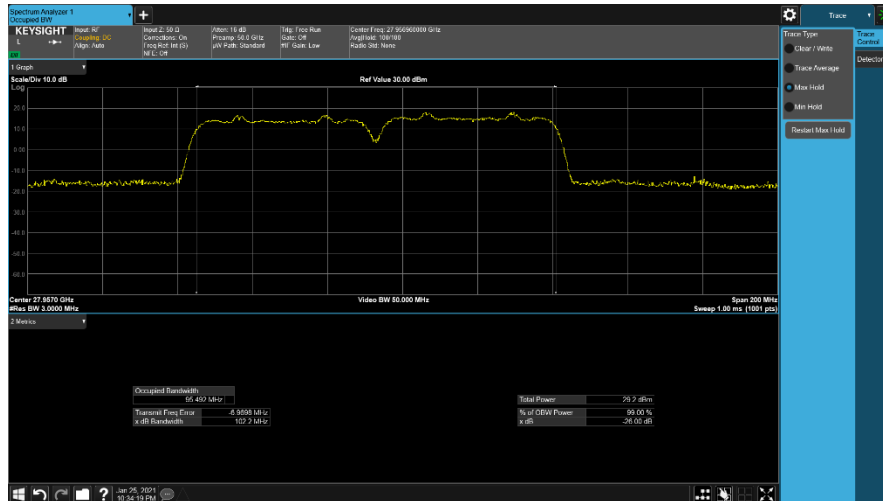


Plot 7-23. Ant M3 OBW (Band n261-50+50MHz-2CC MIMO CP-OFDM– 16QAM – Mid Channel)

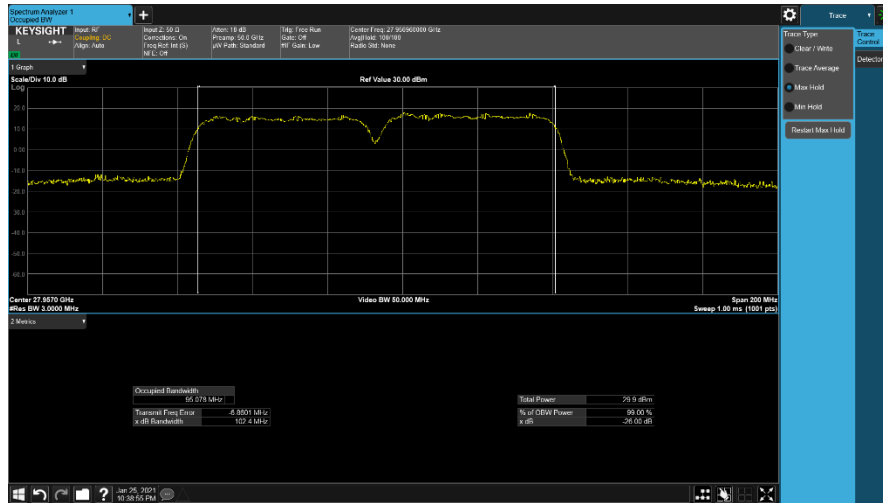


Plot 7-24. Ant M3 OBW (Band n261-50+50MHz-2CC MIMO CP-OFDM– 64QAM – Mid Channel)

FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 27 of 201

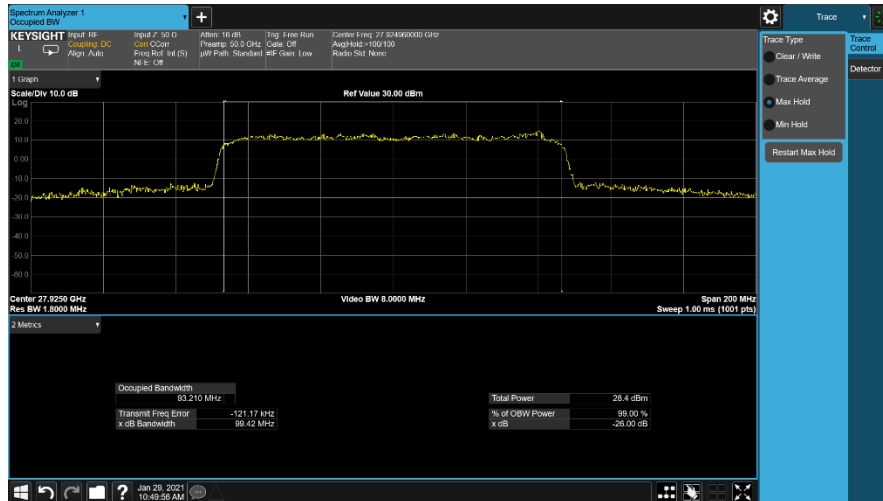


FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 28 of 201

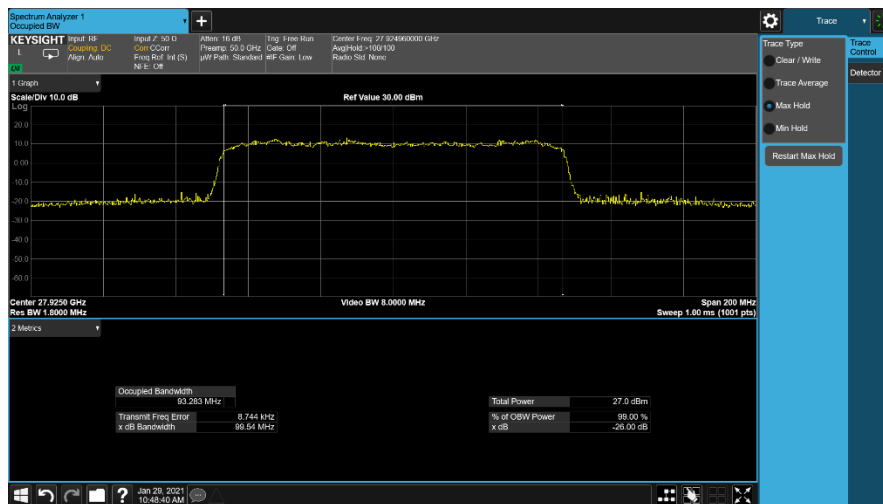


Plot 7-28. Ant M3 OBW (Band n261-50+50MHz-2CC SISO Dual Pol – 64QAM – Mid Channel)

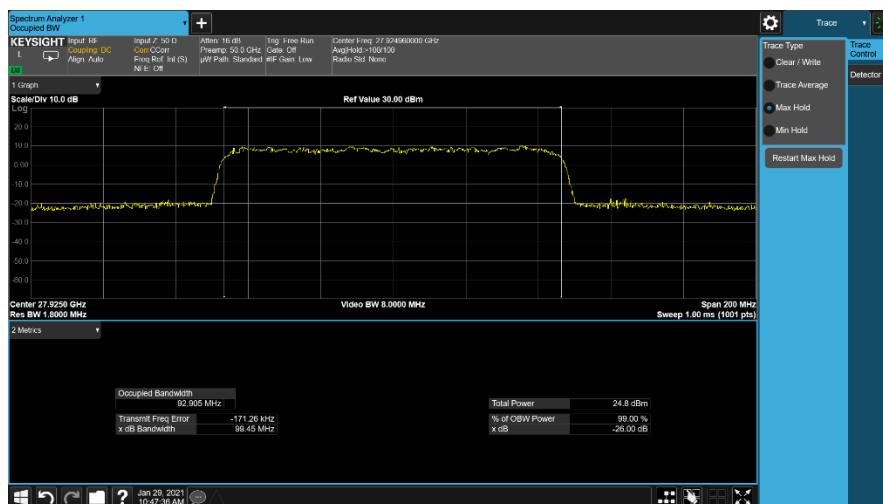
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 29 of 201



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

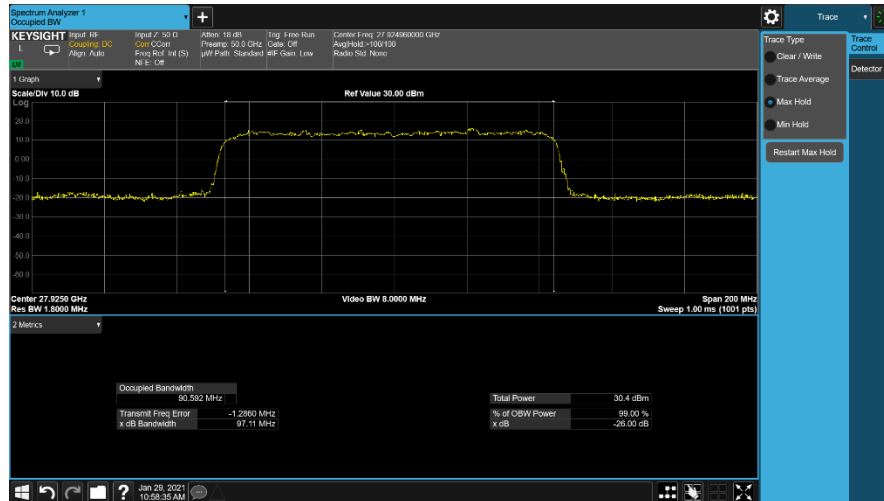


Plot 7-30. Ant M3 OBW (Band n261-100MHz-1CC SISO CP-OFDM- 16QAM – Mid Channel)

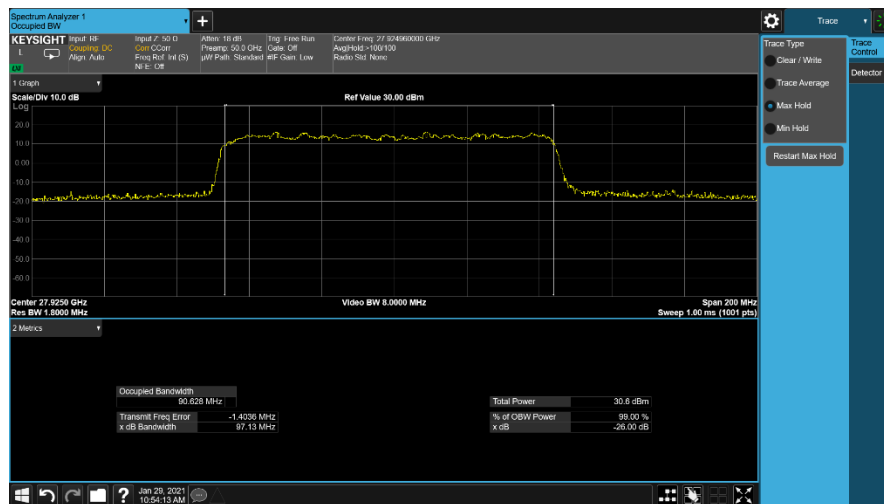


Plot 7-31. Ant M3 OBW (Band n261-100MHz-1CC SISO CP-OFDM - 64QAM – Mid Channel)

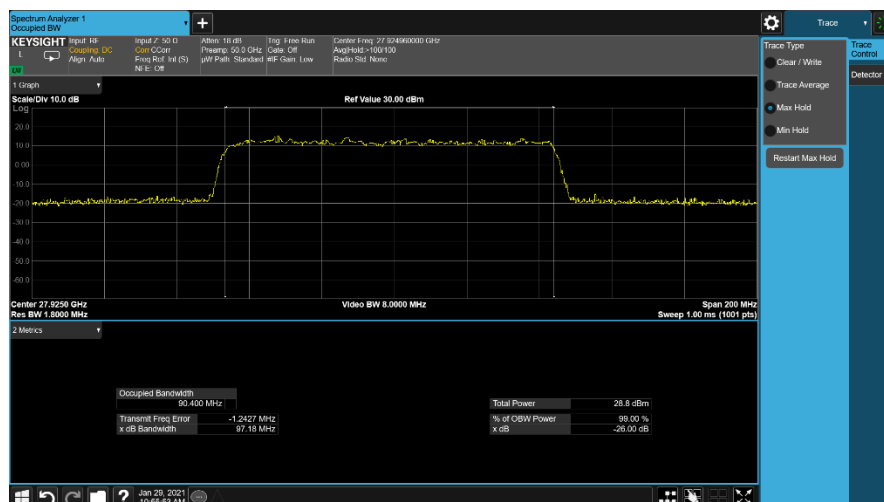
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 30 of 201



Plot 7-32. Ant M3 OBW (Band n261-100MHz-1CC SISO DFTs-OFDM- pi/2-BPSK – Mid Channel)



Plot 7-33. Ant M3 OBW (Band n261-100MHz-1CC SISO DFTs-OFDM- QPSK – Mid Channel)



Plot 7-34. Ant M3 OBW (Band n261-100MHz-1CC SISO DFTs-OFDM - 16QAM – Mid Channel)

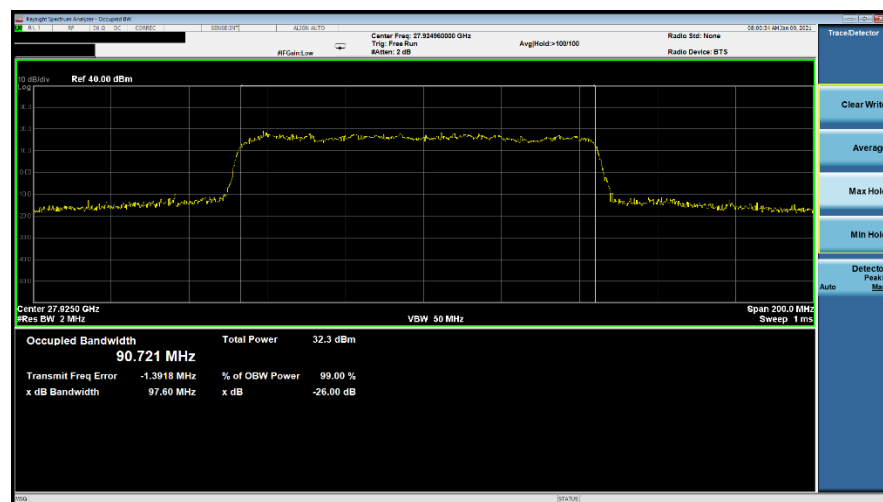
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 31 of 201



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

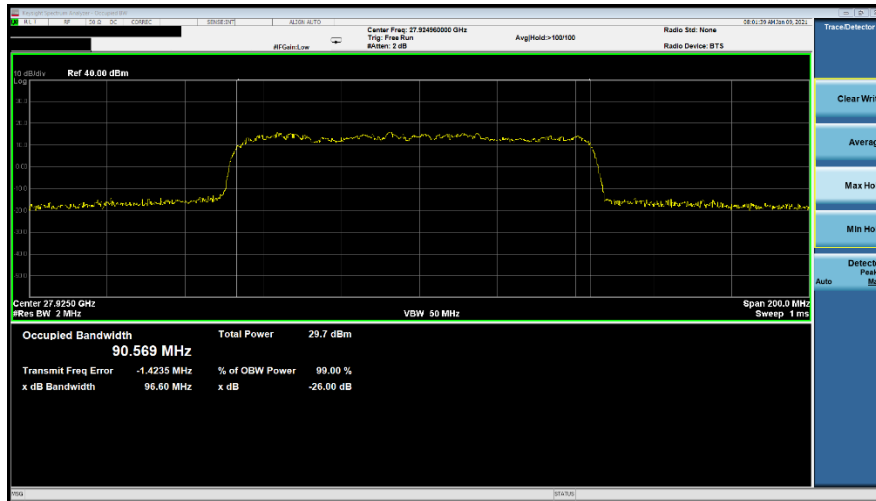


Plot 7-36. Ant M3 OBW (Band n261-100MHz-1CC MIMO CP-OFDM- QPSK – Mid Channel)

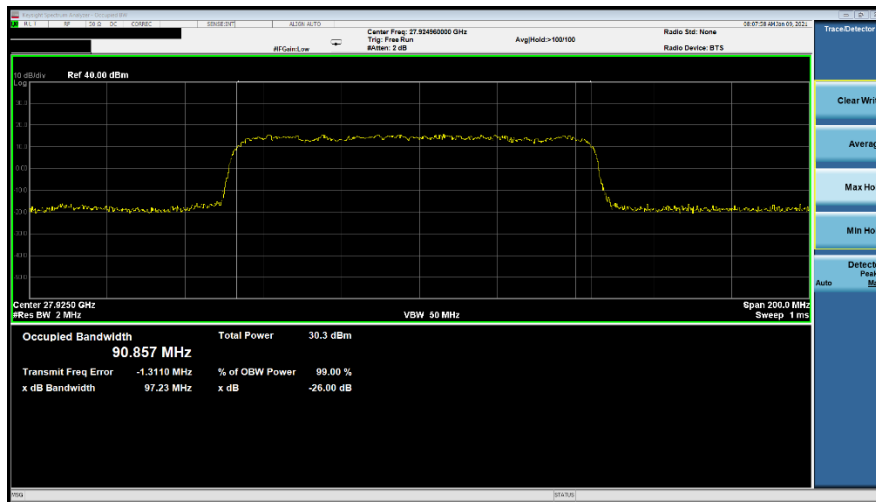


Plot 7-37. Ant M3 OBW (Band n261-100MHz-1CC MIMO CP-OFDM- 16QAM – Mid Channel)

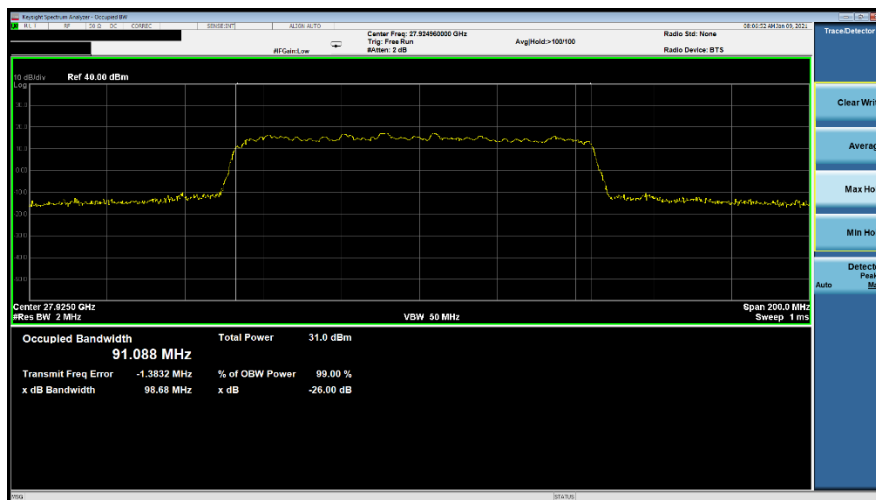
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 32 of 201



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

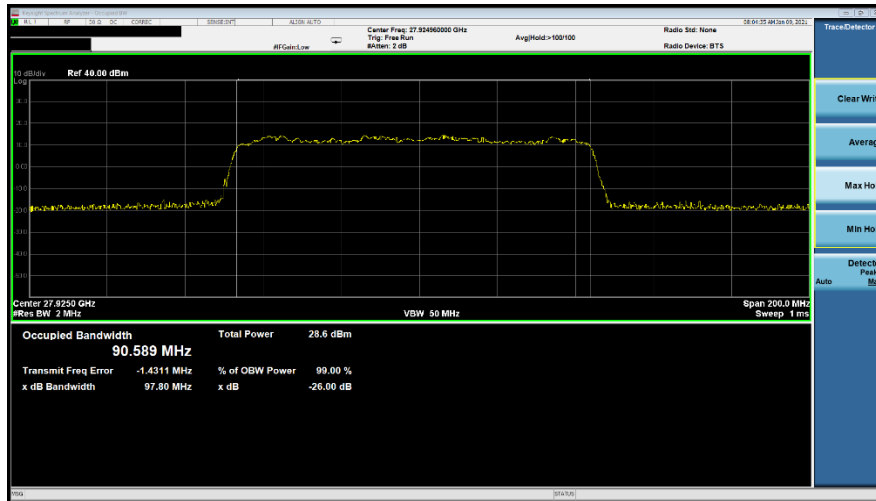


Plot 7-39. Ant M3 OBW (Band n261-100MHz-1CC SISO Dual Pol – pi/2-BPSK – Mid Channel)

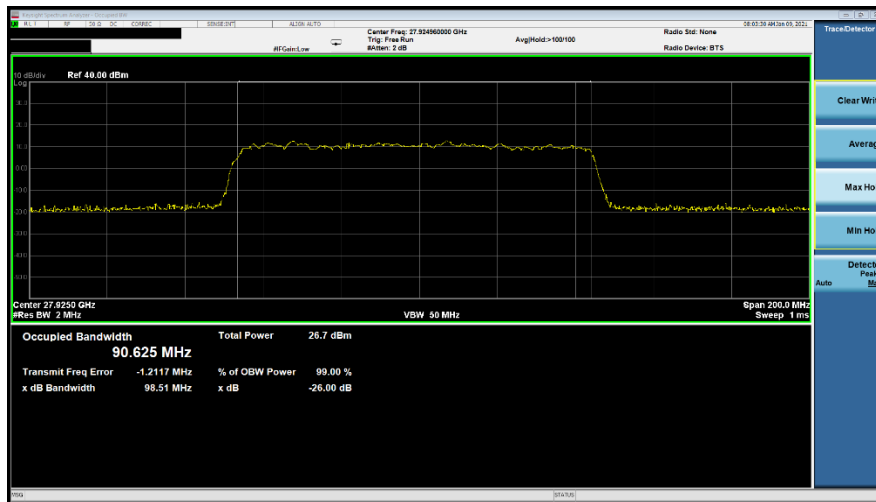


Plot 7-40. Ant M3 OBW (Band n261-100MHz-1CC SISO Dual Pol – QPSK – Mid Channel)

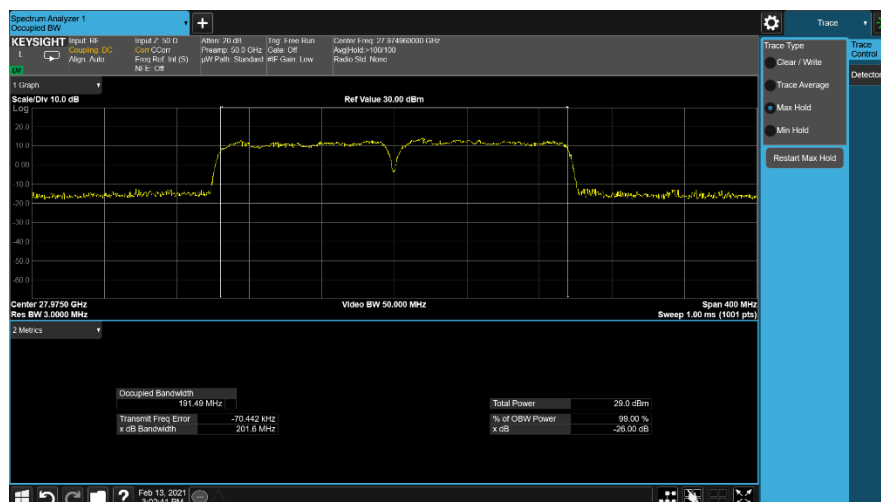
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 33 of 201



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

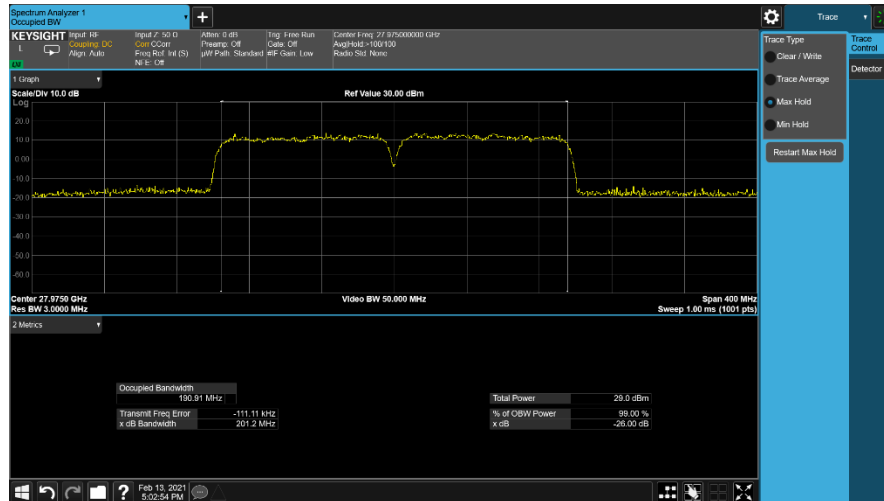


Plot 7-42. Ant M3 OBW (Band n261-100MHz-1CC SISO Dual Pol – 64QAM – Mid Channel)

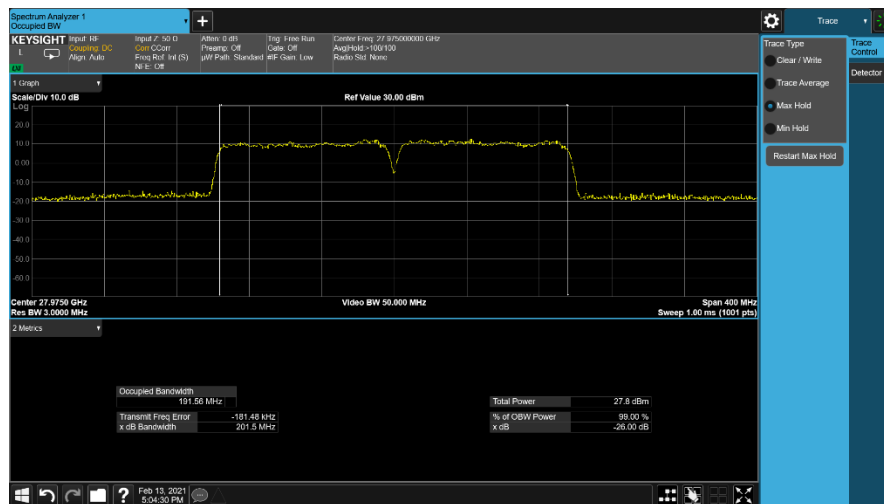


Plot 7-43. Ant M3 OBW (Band n261-100+100MHz-2CC SISO CP-OFDM– QPSK – Mid Channel)

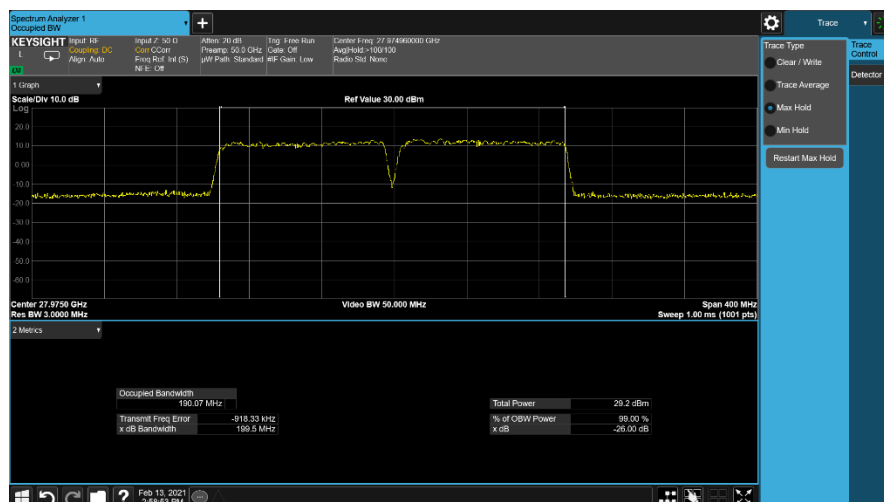
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 34 of 201



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)

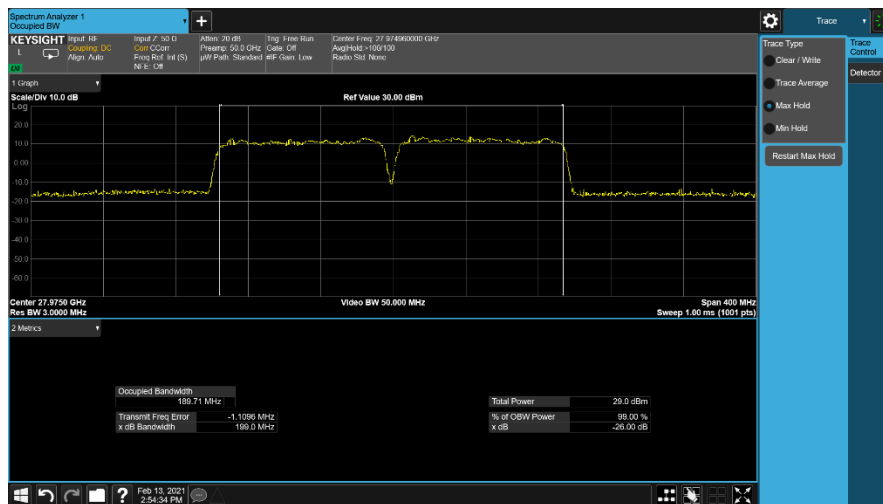


Plot 7-46. Ant M3 OBW (Band n261-100+100MHz-2CC SISO DFTs-OFDM– pi/2-BPSK – Mid Channel)

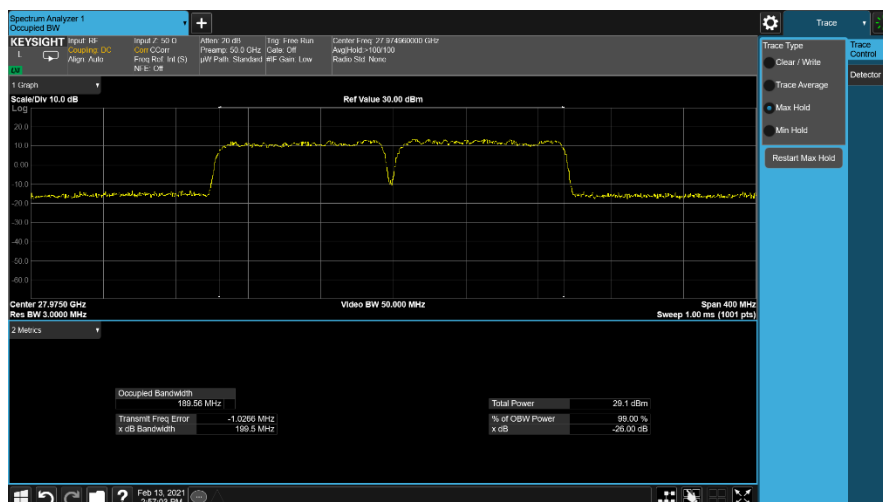
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 35 of 201



Plot 7-47. Ant M3 OBW (Band n261-100+100MHz-2CC SISO DFTs-OFDM- QPSK – Mid Channel)

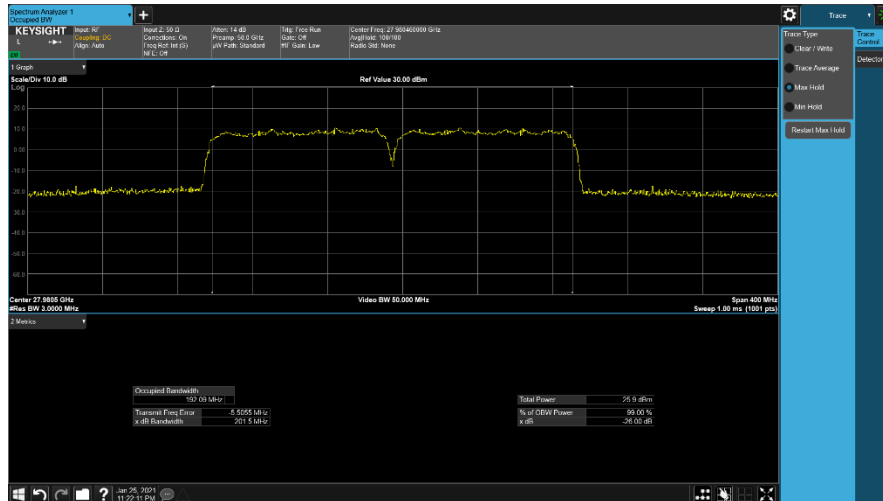


Plot 7-48. Ant M3 OBW (Band n261-100+100MHz-2CC SISO DFTs-OFDM – 16QAM – Mid Channel)

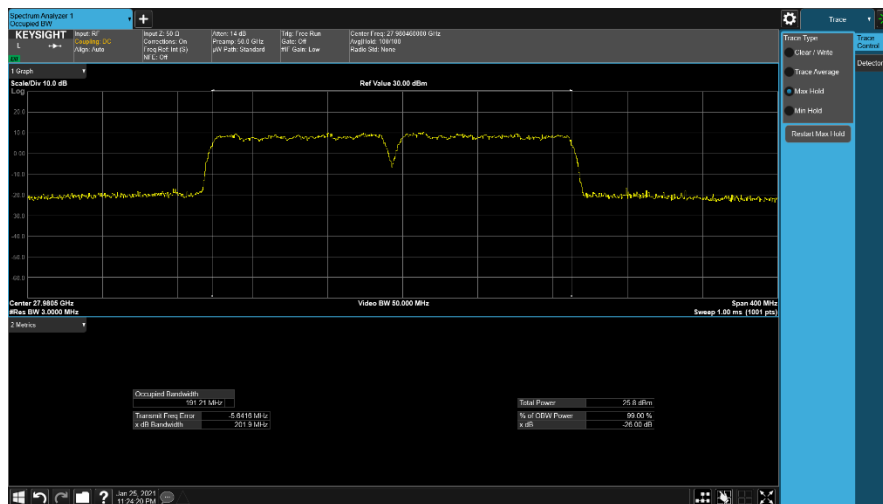


Plot 7-49. Ant M3 OBW (Band n261-100+100MHz-2CC SISO DFTs-OFDM –64QAM – Mid Channel)

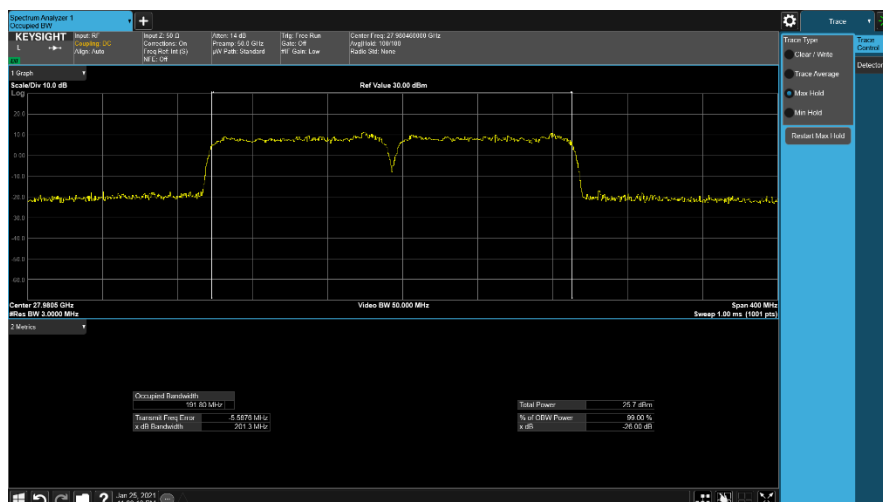
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 36 of 201



Plot 7-50. Ant M3 OBW (Band n261-100+100MHz-2CC MIMO CP-OFDM– QPSK – Mid Channel)

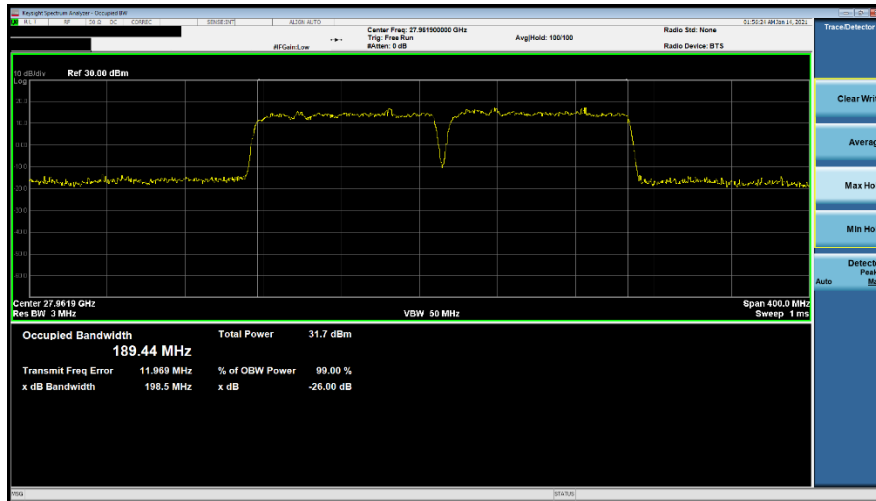


Plot 7-51. Ant M3 OBW (Band n261-100+100MHz-2CC MIMO CP-OFDM– 16QAM – Mid Channel)

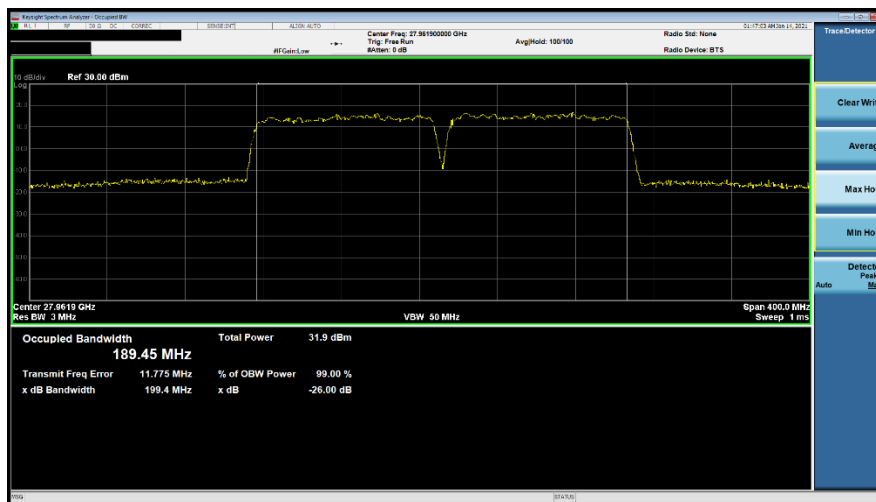


Plot 7-52. Ant M3 OBW (Band n261-100+100MHz-2CC MIMO CP-OFDM– 64QAM – Mid Channel)

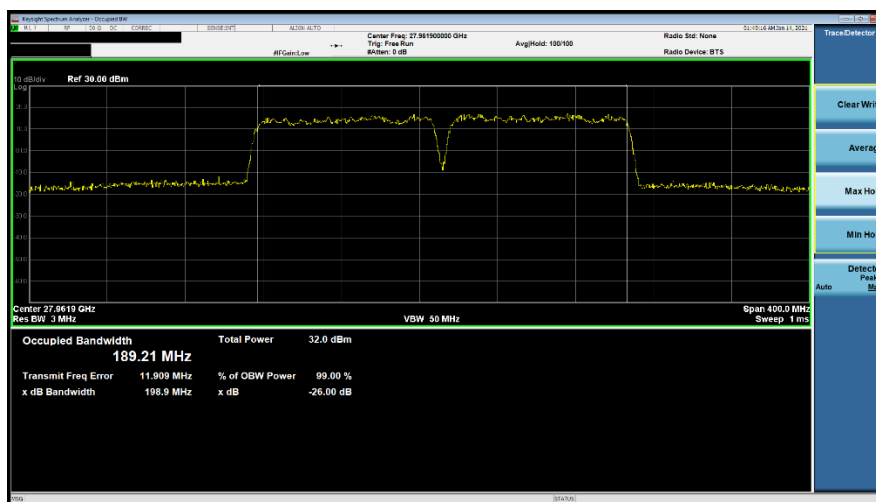
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 37 of 201



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

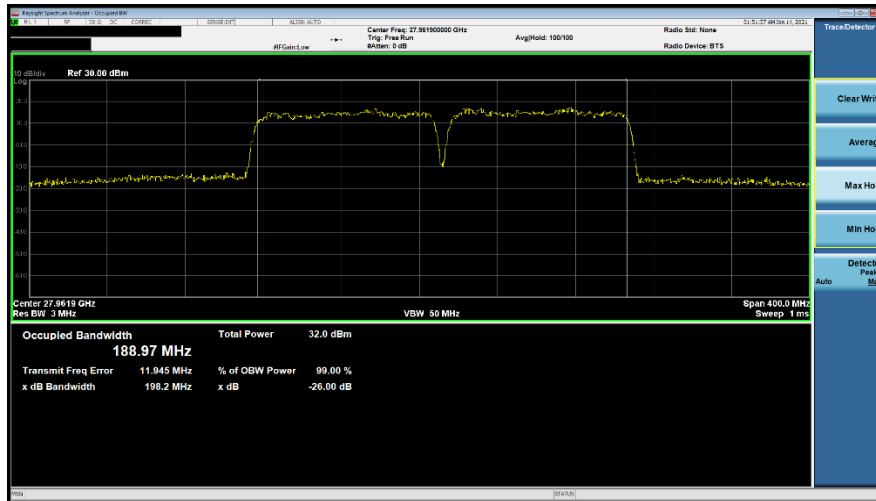


Plot 7-54. Ant M3 OBW (Band n261-100+100MHz-2CC SISO Dual Pol – QPSK – Mid Channel)



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

FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 38 of 201



Plot 7-56. Ant M3 OBW (Band n261-100+100MHz-2CC SISO Dual Pol – 64QAM – Mid Channel)

FCC ID: BCGA2379	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 39 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	46		45.36
		Mid	38499.96	SISO	CP-OFDM	16QAM	46		45.25
		Mid	38499.96	SISO	CP-OFDM	64QAM	46		45.27
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	46		45.16
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	46		45.35
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	46		45.55
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	46		45.10
		Mid	38499.96	MIMO	CP-OFDM	QPSK	46	174	45.42
		Mid	38499.96	MIMO	CP-OFDM	16QAM	46	174	45.26
		Mid	38499.96	MIMO	CP-OFDM	64QAM	46	174	45.26
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	46	174	44.87
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	46	174	45.24
50+50	2	Mid	38499.96	SISO	DFT-s-OFDM	16QAM	46	174	45.08
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	46	174	44.94
		Mid	38499.96	SISO	CP-OFDM	QPSK	46		94.58
		Mid	38499.96	SISO	CP-OFDM	16QAM	46		94.89
		Mid	38499.96	SISO	CP-OFDM	64QAM	46		94.79
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	46		94.56
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	46		94.71
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	46		94.87
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	46		94.84
		Mid	38499.96	MIMO	CP-OFDM	QPSK	46	174	94.68
		Mid	38499.96	MIMO	CP-OFDM	16QAM	46	174	94.57
		Mid	38499.96	MIMO	CP-OFDM	64QAM	46	174	94.54
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	46	174	94.56
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	46	174	94.37
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	46	174	94.60
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	46	174	94.56

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	46		92.74
		Mid	38499.96	SISO	CP-OFDM	16QAM	46		92.69
		Mid	38499.96	SISO	CP-OFDM	64QAM	46		93.09
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	46		90.54
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	46		90.85
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	46		90.63
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	46		90.49
		Mid	38499.96	MIMO	CP-OFDM	QPSK	46	174	93.14
		Mid	38499.96	MIMO	CP-OFDM	16QAM	46	174	92.82
		Mid	38499.96	MIMO	CP-OFDM	64QAM	46	174	92.91
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	46	174	90.26
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	46	174	90.08
100+100	2	Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	46	174	90.64
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	46	174	90.20
		Mid	38499.96	SISO	CP-OFDM	QPSK	46		191.53
		Mid	38499.96	SISO	CP-OFDM	16QAM	46		191.57
		Mid	38499.96	SISO	CP-OFDM	64QAM	46		191.29
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	46		189.74
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	46		190.13
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	46		189.65
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	46		189.30
		Mid	38499.96	MIMO	CP-OFDM	QPSK	46	174	191.65
		Mid	38499.96	MIMO	CP-OFDM	16QAM	46	174	191.33
		Mid	38499.96	MIMO	CP-OFDM	64QAM	46	174	191.87
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	46	174	189.45
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	46	174	188.00
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	46	174	189.75
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	46	174	189.59

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

FCC ID: BCGA2379		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	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	165		45.28
		Mid	38499.96	SISO	CP-OFDM	16QAM	165		45.06
		Mid	38499.96	SISO	CP-OFDM	64QAM	165		45.16
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	165		45.28
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	165		45.24
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	165		45.13
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	165		45.22
		Mid	38499.96	MIMO	CP-OFDM	QPSK	165	37	45.32
		Mid	38499.96	MIMO	CP-OFDM	16QAM	165	37	45.33
		Mid	38499.96	MIMO	CP-OFDM	64QAM	165	37	45.42
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	165	37	45.30
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	165	37	45.49
50+50	2	Mid	38499.96	SISO	CP-OFDM	QPSK	165		94.45
		Mid	38499.96	SISO	CP-OFDM	16QAM	165		94.19
		Mid	38499.96	SISO	CP-OFDM	64QAM	165		94.35
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	165		94.79
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	165		94.67
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	165		94.76
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	165		94.63
		Mid	38499.96	MIMO	CP-OFDM	QPSK	165	37	94.80
		Mid	38499.96	MIMO	CP-OFDM	16QAM	165	37	94.77
		Mid	38499.96	MIMO	CP-OFDM	64QAM	165	37	94.99
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	165	37	94.76
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	165	37	95.00
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	165	37	94.51
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	165	37	95.03

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	165		92.91
		Mid	38499.96	SISO	CP-OFDM	16QAM	165		92.77
		Mid	38499.96	SISO	CP-OFDM	64QAM	165		92.80
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	165		90.59
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	165		90.63
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	165		90.88
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	165		90.27
		Mid	38499.96	MIMO	CP-OFDM	QPSK	165	37	93.33
		Mid	38499.96	MIMO	CP-OFDM	16QAM	165	37	92.81
		Mid	38499.96	MIMO	CP-OFDM	64QAM	165	37	92.71
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	165	37	90.56
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	165	37	90.77
100+100	2	Mid	38499.96	SISO	CP-OFDM	QPSK	165		191.39
		Mid	38499.96	SISO	CP-OFDM	16QAM	165		191.66
		Mid	38499.96	SISO	CP-OFDM	64QAM	165		191.02
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	165		189.47
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	165		189.16
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	165		189.09
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	165		189.58
		Mid	38499.96	MIMO	CP-OFDM	QPSK	165	37	190.68
		Mid	38499.96	MIMO	CP-OFDM	16QAM	165	37	191.97
		Mid	38499.96	MIMO	CP-OFDM	64QAM	165	37	191.70
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	165	37	189.49
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	165	37	188.98
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	165	37	188.93
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	165	37	188.65

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

FCC ID: BCGA2379	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 41 of 201

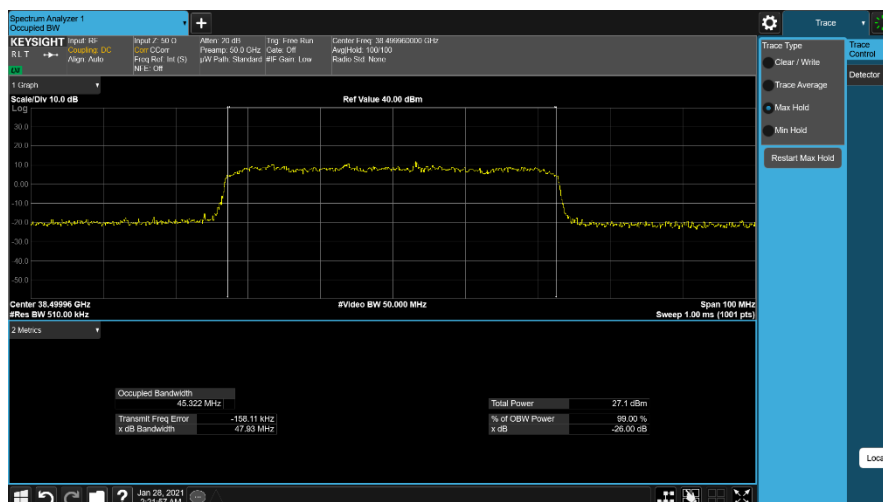
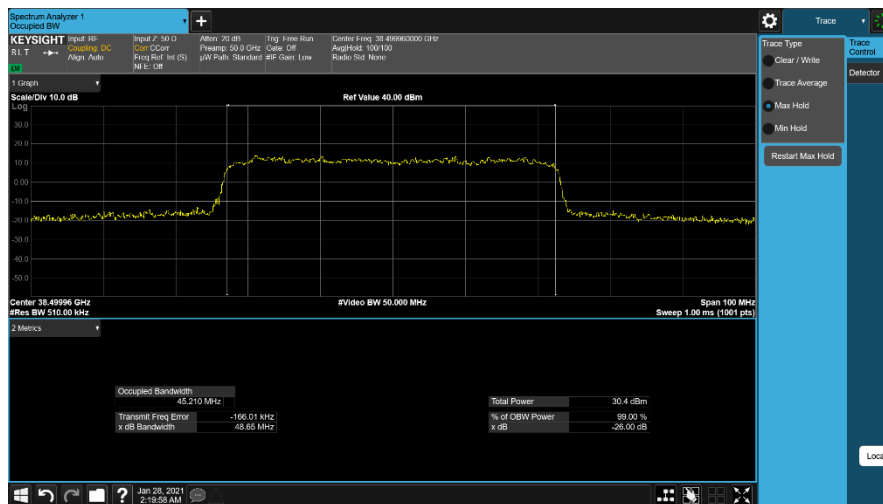
Bandwidth [MHz]	CCs Active	Channel	Frequency [MHz]	Antenna Diversity	Waveform	Modulation	Peak Beam ID	Paired Beam ID	OBW [MHz]
50	1	Mid	38499.96	SISO	CP-OFDM	QPSK	169		45.22
		Mid	38499.96	SISO	CP-OFDM	16QAM	169		45.21
		Mid	38499.96	SISO	CP-OFDM	64QAM	169		45.32
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	169		45.49
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	169		45.33
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	169		45.28
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	169		45.56
		Mid	38499.96	MIMO	CP-OFDM	QPSK	169	41	45.30
		Mid	38499.96	MIMO	CP-OFDM	16QAM	169	41	45.12
		Mid	38499.96	MIMO	CP-OFDM	64QAM	169	41	45.18
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	169	41	45.29
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	169	41	45.19
50+50	2	Mid	38499.96	SISO	CP-OFDM	QPSK	169		94.75
		Mid	38499.96	SISO	CP-OFDM	16QAM	169		94.90
		Mid	38499.96	SISO	CP-OFDM	64QAM	169		94.77
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	169		94.63
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	169		94.52
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	169		94.47
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	169		94.61
		Mid	38499.96	MIMO	CP-OFDM	QPSK	169	41	95.09
		Mid	38499.96	MIMO	CP-OFDM	16QAM	169	41	95.16
		Mid	38499.96	MIMO	CP-OFDM	64QAM	169	41	95.24
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	169	41	95.58
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	169	41	95.36
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	169	41	94.96
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	169	41	95.18

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	169		92.98
		Mid	38499.96	SISO	CP-OFDM	16QAM	169		92.98
		Mid	38499.96	SISO	CP-OFDM	64QAM	169		92.87
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	169		90.94
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	169		90.87
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	169		90.75
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	169		91.14
		Mid	38499.96	MIMO	CP-OFDM	QPSK	169	41	93.28
		Mid	38499.96	MIMO	CP-OFDM	16QAM	169	41	92.67
		Mid	38499.96	MIMO	CP-OFDM	64QAM	169	41	93.09
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	169	41	90.67
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	169	41	90.88
100+100	2	Mid	38499.96	SISO	DFT-s-OFDM	16QAM	169	41	91.09
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	169	41	90.92
		Mid	38499.96	SISO	CP-OFDM	QPSK	169		191.56
		Mid	38499.96	SISO	CP-OFDM	16QAM	169		191.08
		Mid	38499.96	SISO	CP-OFDM	64QAM	169		192.35
		Mid	38499.96	SISO	DFT-s-OFDM	$\pi/2$ BPSK	169		189.68
		Mid	38499.96	SISO	DFT-s-OFDM	QPSK	169		190.06
		Mid	38499.96	SISO	DFT-s-OFDM	16QAM	169		189.53
		Mid	38499.96	SISO	DFT-s-OFDM	64QAM	169		189.87
		Mid	38499.96	MIMO	CP-OFDM	QPSK	169	41	191.78
		Mid	38499.96	MIMO	CP-OFDM	16QAM	169	41	191.90
		Mid	38499.96	MIMO	CP-OFDM	64QAM	169	41	191.38
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	$\pi/2$ BPSK	169	41	189.72
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	QPSK	169	41	188.89
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	16QAM	169	41	189.47
		Mid	38499.96	SISO Dual Pol	DFT-s-OFDM	64QAM	169	41	189.20

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

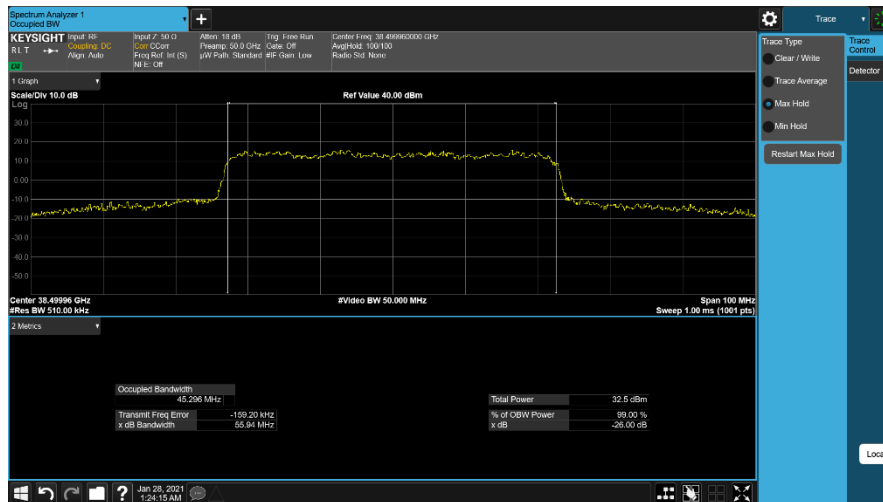
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Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 42 of 201



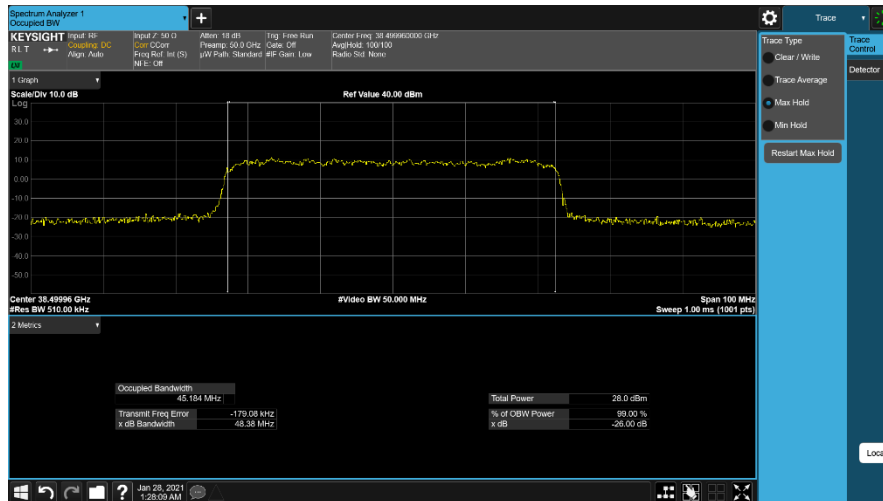
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Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 43 of 201



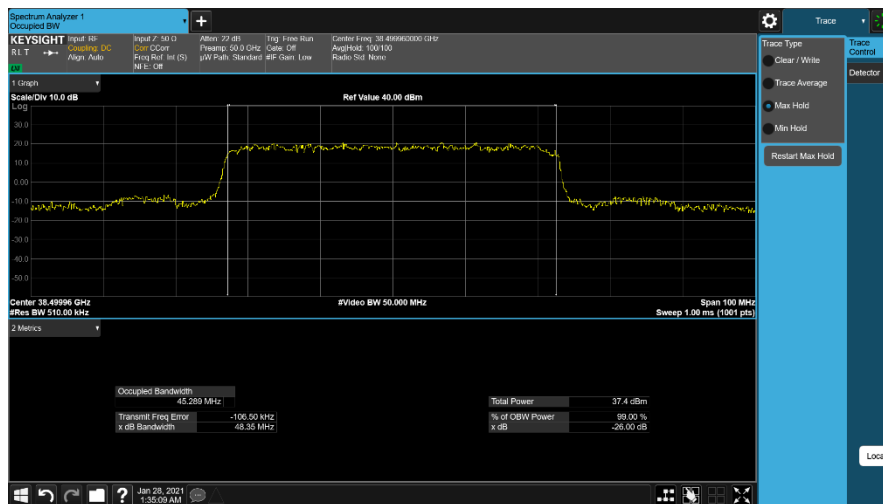
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Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 44 of 201



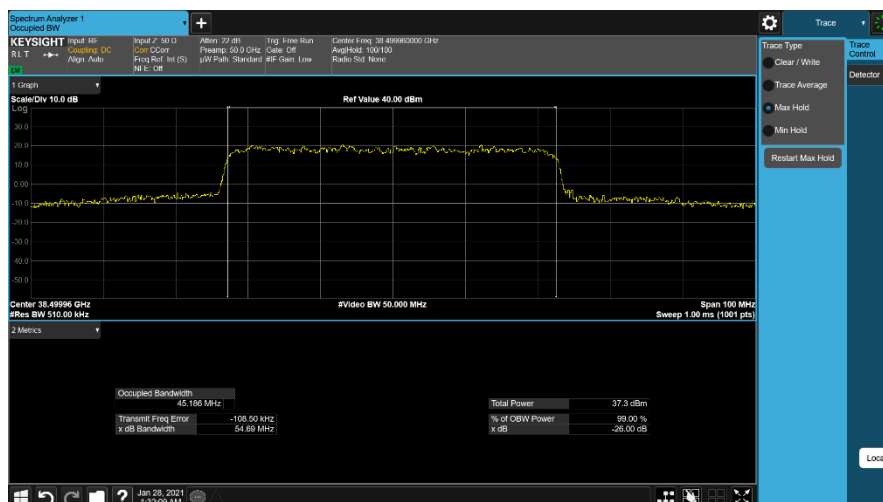
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Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 45 of 201



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

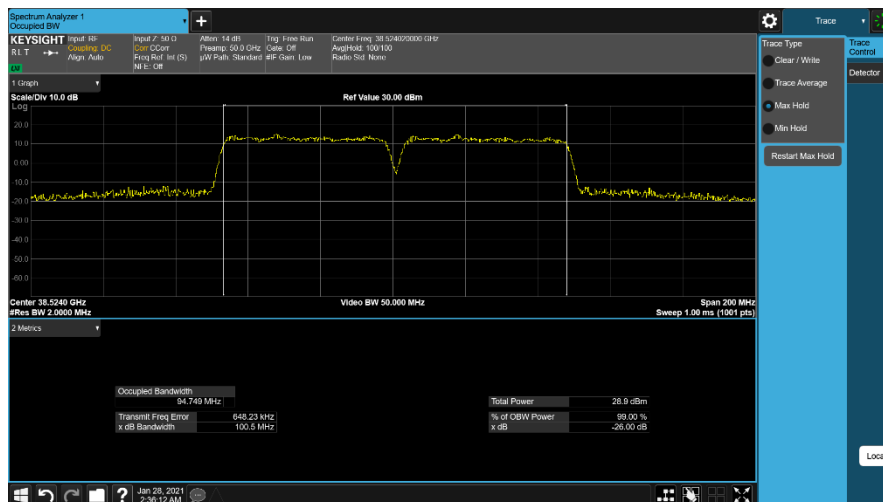


Plot 7-67. Ant M3 OBW (Band n260-50MHz-1CC SISO Dual Pol – pi/2-BPSK – Mid Channel)

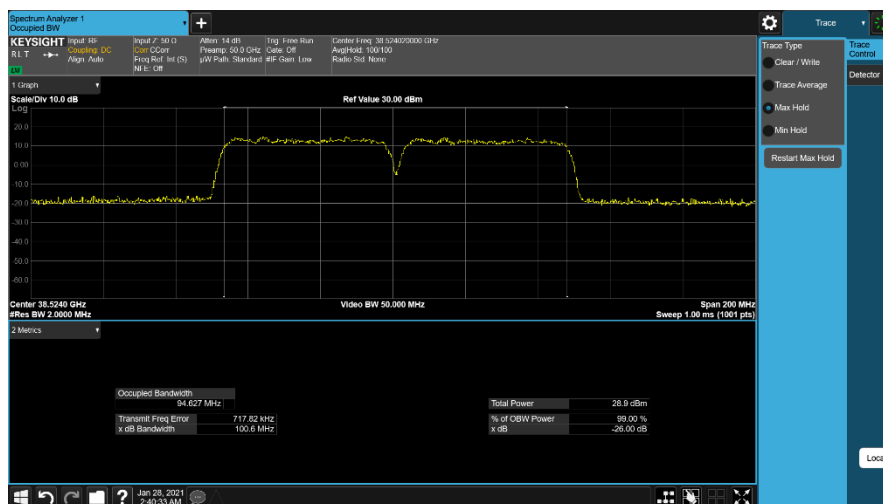
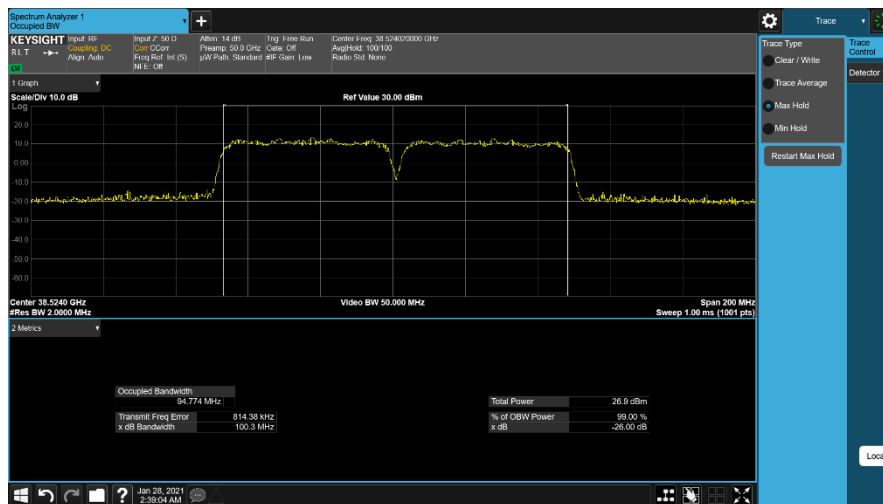
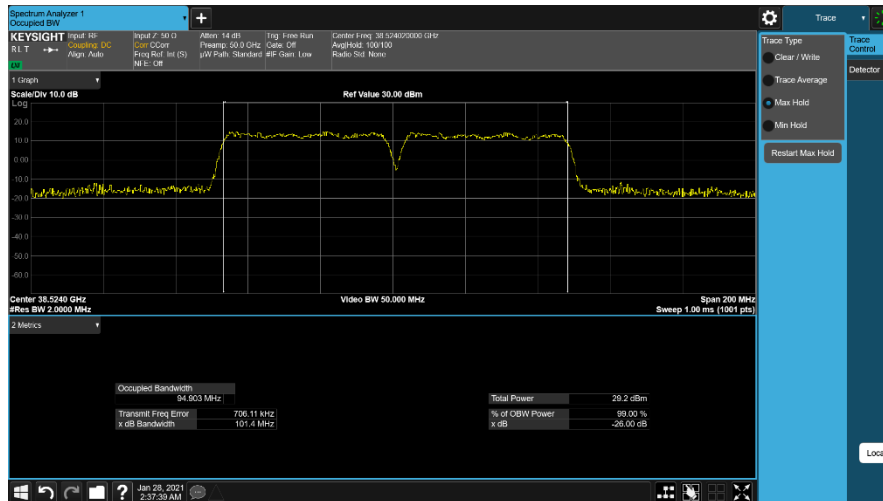


Plot 7-68. Ant M3 OBW (Band n260-50MHz-1CC SISO Dual Pol – QPSK – Mid Channel)

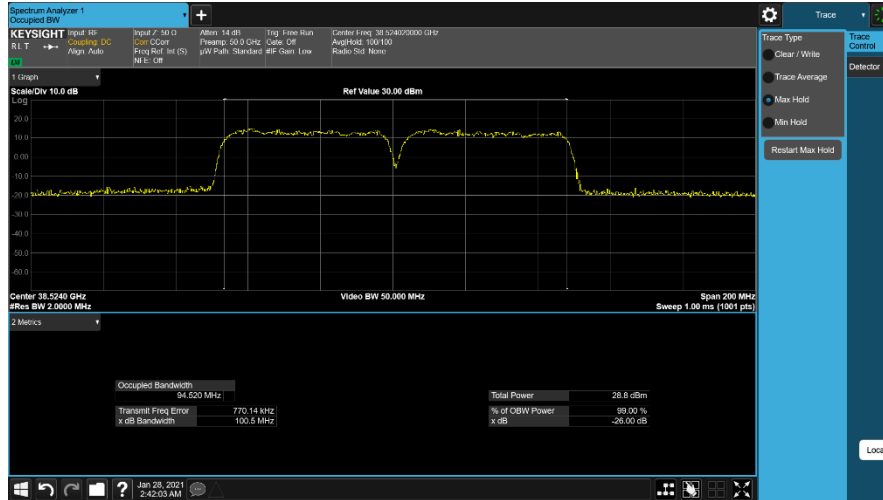
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Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 46 of 201



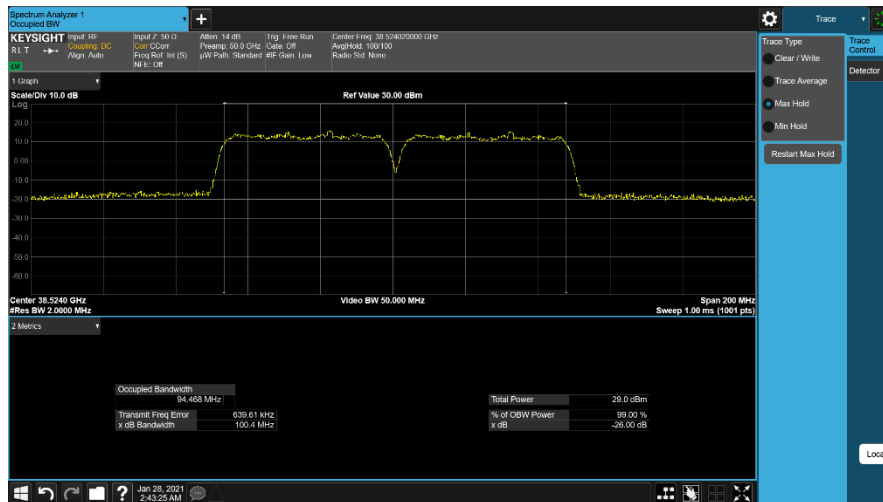
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 47 of 201



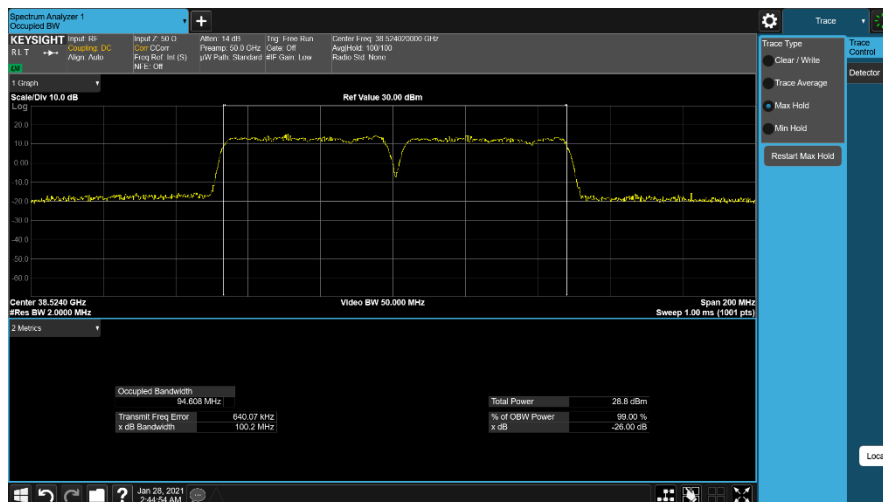
FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 48 of 201



Plot 7-75. Ant M3 OBW (Band n260-50+50MHz-2CC SISO DFTs-OFDM-QPSK - Mid Channel)



Plot 7-76. Ant M3 OBW (Band n260-50+50MHz-2CC SISO DFTs-OFDM-16QAM - Mid Channel)



Plot 7-77. Ant M3 OBW (Band n260-50+50MHz-2CC SISO DFTs-OFDM-64QAM - Mid Channel)

FCC ID: BCGA2379	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 49 of 201

Spectrum Analyzer 1
Decomposed (dB)

KEYSIGHT

Input 1: Input RF, Coupling: 0dB, Att: 0.0dB, Noise: 10.0dB, Freq: 38.5276 GHz, Span: 50.0 MHz, Ref: 38.00 dBm, Video BW: 50.000 MHz

1 Graph
Scale/Div 10.0 dB

Ref Value 38.00 dBm

Center 38.5276 GHz
Video BW 50.000 MHz

Span 200 MHz
Sweep 1.00 MHz (100% pts)

2 Monitors

Decomposed Bandwidth		Total Power	
Bandwidth	95.150 MHz	Total Power	26.8 dBm
Bandwidth	2.0754 MHz	% of CWW Power	99.00 %
Bandwidth	107.4 MHz	dB	-26.00 dB

Spectrum Analyzer 1
 Unoccupied ETV
KEYSIGHT
 Input RF: 38.5275 GHz
 Span: 200 MHz
 Center Freq: 38.5275 GHz
 Span: 200 MHz
 Resol: 100 kHz
 Video BW: 50.000 MHz
 Scale/Div: 10.0 dB
 Rel Value: 30.00 dBm
 Center: 38.5275 GHz
 Span: 200 MHz
 Sweep: 1.00 ms (100% pts)

Occupied Bandwidth		Total Power	
Occupied Bandwidth	95.718 MHz	Total Power	27.6 dBm
Transmit Power Error	-2.4075 MHz	% of Occupied Power	99.0%
Occupied Bandwidth	122.5 MHz	% dB	-26.00 dB

FCC ID: BCGA2379	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2101020005-06.BCG	Test Dates: 12/15/2020-03/03/2021	EUT Type: Tablet Device	Page 50 of 201