

**MEASUREMENT REPORT**  
**Part 96 LTE**

**Applicant Name:**  
 Samsung Electronics Co., Ltd.  
 129, Samsung-ro,  
 Yeongtong-gu, Suwon-si  
 Gyeonggi-do, 16677, Korea


**Date of Testing:**  
 7/1/2019-7/29/2019  
**Test Site/Location:**  
 PCTEST Lab. Columbia, MD  
**Test Report Serial No.:**  
 1M1907220128-01.

**FCC ID:** A3LMT6402-48A  
**APPLICANT:** Samsung Electronics Co., Ltd.

**Application Type:** Certification  
**Model:** MT6402-48A  
**EUT Type:** Massive MIMO CBSD  
**FCC Classification:** Citizens Band Category B Devices (CBD)  
**FCC Rule Part(s):** 96  
**Test Procedure(s):** ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01, KDB 940660 D01 v01, KDB 662911 D01 v02r01

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §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


<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 1 of 172	

# TABLE OF CONTENTS

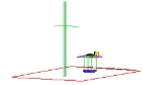
1.0	INTRODUCTION .....	4
1.1	Scope .....	4
1.2	PCTEST Test Location .....	4
1.3	Test Facility / Accreditations .....	4
2.0	PRODUCT INFORMATION .....	5
2.1	Equipment Description .....	5
2.2	Device Capabilities .....	5
2.3	Test Configuration .....	5
2.4	EMI Suppression Device(s)/Modifications .....	5
3.0	DESCRIPTION OF TESTS .....	6
3.1	Measurement Procedures .....	6
4.0	MEASUREMENT UNCERTAINTY .....	7
5.0	TEST EQUIPMENT CALIBRATION DATA .....	8
6.0	SAMPLE CALCULATIONS .....	9
7.0	TEST RESULTS .....	10
7.1	Summary .....	10
7.2	Occupied Bandwidth .....	12
7.3	Conducted Power Measurement and EIRP .....	25
7.4	Peak Power Spectral Density Measurement .....	63
7.5	Peak-Average Ratio .....	101
7.6	Spurious and Harmonic Emissions at Antenna Terminal .....	125
7.7	Band Edge Emissions at Antenna Terminal .....	130
7.8	Frequency Stability / Temperature Variation .....	169
8.0	CONCLUSION .....	172

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 2 of 172	



# MEASUREMENT REPORT

## FCC Part 96



Mode	FCC Rule Part	Tx Frequency (MHz)	Total Power		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)		
16-User Beam Mode 10MHz Total Bandwidth	96	3560 - 3690	26.730	44.27	8M98G7D	QPSK
	96	3560 - 3690	24.831	43.95	8M95W7D	16QAM
	96	3560 - 3690	26.607	44.25	9M45W7D	64QAM
	96	3560 - 3690	20.749	43.17	9M43W7D	256QAM
16-User Beam Mode 20MHz Total Bandwidth	96	3560 - 3690	50.350	47.02	17M9G7D	QPSK
	96	3560 - 3690	49.545	46.95	17M9W7D	16QAM
	96	3560 - 3690	52.481	47.20	17M9W7D	64QAM
	96	3560 - 3690	50.933	47.07	17M9W7D	256QAM
16-User Beam Mode 30MHz Total Bandwidth	96	3560 - 3690	76.560	48.84	28M8G7D	QPSK
	96	3560 - 3690	78.705	48.96	28M7W7D	16QAM
	96	3560 - 3690	74.473	48.72	28M8W7D	64QAM
	96	3560 - 3690	83.368	49.21	28M8W7D	256QAM
16-User Beam Mode 40MHz Total Bandwidth	96	3560 - 3690	110.408	50.43	37M7G7D	QPSK
	96	3560 - 3690	111.173	50.46	37M7W7D	16QAM
	96	3560 - 3690	111.173	50.46	37M7W7D	64QAM
	96	3560 - 3690	111.173	50.46	37M7W7D	256QAM
16-User Beam Mode 50MHz Total Bandwidth	96	3560 - 3690	123.880	50.93	48M2G7D	QPSK
	96	3560 - 3690	129.718	51.13	48M1W7D	16QAM
	96	3560 - 3690	131.522	51.19	48M2W7D	64QAM
	96	3560 - 3690	119.674	50.78	48M1W7D	256QAM
16-User Beam Mode 60MHz Total Bandwidth	96	3560 - 3690	160.694	52.06	57M5G7D	QPSK
	96	3560 - 3690	161.436	52.08	57M5W7D	16QAM
	96	3560 - 3690	160.694	52.06	57M5W7D	64QAM
	96	3560 - 3690	138.038	51.40	57M5W7D	256QAM

### EUT Overview (B48 LTE)

**Notes:**

EIRP levels shown in the table above are over the entire channel, they will appear on the Grant of Authorization.

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 3 of 172	

## 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.

### 1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

### 1.3 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is a CBRS Alliance (OnGo) Approved Test Lab
- PCTEST is a WinnForum Approved Test Lab
- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for CBRS Alliance Certification Test Plan and WinnForum Conformance and Performance Test Technical Standard.
- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 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 (2451B) test laboratory with the site description on file with ISED.

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 4 of 172	

## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Massive MIMO CBSD FCC ID: A3LMT6402-48A**. The test data contained in this report pertains only to the emissions due to the EUT's LTE Band 48 operation in the CBRS band. Per FCC Part 96, this device is evaluated under Citizens Band Category B Devices (CBD).

The EUT is a 64-port device which supports single, two, and three carrier configurations (1CC, 2CC, and 3CC). Each carrier operates using 10 or 20MHz bandwidth. It supports the following modulation schemes: QPSK, 16-QAM, 64-QAM and 256-QAM.

The EUT can operate with up to a maximum of 16 beams in the following modes:

1. User-Beam Operation:
  - a) 16-User Beam Mode :  
In this mode, all ports transmit at maximum power to form sixteen beams.
  - b) Single User Beam (UE0) Mode:  
All ports form one single user beam, and transmit power varies per port.
2. Common Beam Operation:  
This mode uses weighted beam forming technique. The transmit power per port is governed by a weighting factor.

**Test Device Serial No.:** S1904180020

### 2.2 Device Capabilities

This device contains the following capabilities: LTE B48

### 2.3 Test Configuration


The setup is as follows:

- a) The EUT ("MMU") and a Data Unit (DU) are each powered by 48V DC power supply.
- b) The DU is connected to a test laptop via an ethernet cable acting as backhaul.
- c) DU connects to the EUT through a fiber optic cable.
- d) An RF cable connects the signal analyzer and the EUT Ports for respective measurement.

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the antenna port conducted emissions tests.

### 2.4 EMI Suppression Device(s)/Modifications

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

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 5 of 172	

## 3.0 DESCRIPTION OF TESTS

### 3.1 Measurement Procedures

The following measurements were performed with the guidance described:

EIRP:

KDB 971168 D01 v03r01 – Section 5.2.2  
 KDB 662911 D01 v02r01 – Section E)1) In-Band Power Measurements

Power Spectral Density:

KDB 971168 D01 v03r01 – Section 5.3  
 KDB 662911 D01 v02r01 – Section E)2) In-Band Power Spectral Density (PSD) Measurements  
 b) Measure and sum spectral maxima across the outputs.  
 c) Measure and add 10 log(N<sub>ANT</sub>) dB

Conducted Spurious Emissions:

KDB 971168 D01 v03r01 – Section 6  
 KDB 662911 D01 v02r01 – Section E)3) Out-of-Band and Spurious Emission Measurements  
     a) Absolute Emission Limits  
         (iii) Measure and add 10 log(N<sub>ANT</sub>) dB

Peak-to-Average Ratio:


KDB 971168 D01 v03r01- Section 5.7

Occupied Bandwidth:

KDB 971168 D01 v03r01 – Section 4.3

Frequency Stability:

ANSI/TIA-603-E-2016

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 6 of 172	

## 4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{CISPR}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty ( $\pm$ dB)
Conducted RF Measurements	1.13

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 7 of 172	

## 5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	N9030A	PXA Signal Analyzer (44GHz)	6/12/2019	Annual	6/12/2020	MY52350166
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Espec	ESX-2CA	Environmental Chamber	6/3/2019	Annual	6/13/2020	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	4/19/2019	Annual	4/19/2020	11401010036
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Mini-Circuits	PWR-SEN-4RMS	USB Power Sensor	4/20/2019	Annual	4/20/2020	11210140001
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/25/2018	Annual	7/25/2019	102133
Seekonk	NC-100	Torque Wrench (8" lb)	5/10/2018	Biennial	5/10/2020	N/A
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	5/6/2019	Annual	5/6/2020	103200
Rohde & Schwarz	TS-PR1840	TSPR-1840 Amplifier	7/24/2019	Annual	7/24/2020	82738
Rohde & Schwarz	TC-TA18	Vivaldi Antenna	8/17/2018	Biennial	8/17/2020	101072
Rohde & Schwarz	180-442-KF	Horn (Small)	8/21/2018	Annual	8/21/2019	U157403-01

**Table 5-1. Test Equipment**

**Notes:**

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.
2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 8 of 172	



## 6.0 SAMPLE CALCULATIONS

### Emission Designator

#### QPSK Modulation


**Emission Designator = 8M62G7D**

- LTE BW = 8.62 MHz
- G = Phase Modulation
- 7 = Quantized/Digital Info
- D = Data transmission, telemetry, telecommand

#### QAM Modulation

**Emission Designator = 8M45W7D**

- LTE BW = 8.45 MHz
- W = Amplitude/Angle Modulated
- 7 = Quantized/Digital Info
- D = Data transmission, telemetry, telecommand

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 9 of 172	

## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Samsung Electronics Co., Ltd.  
 FCC ID: A3LMT6402-48A  
 FCC Classification: Citizens Band Category B Devices (CBD)  
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.2
2.1046 96.41(b)	Conducted Power and Equivalent Isotropic Radiated Power (EIRP)	47 dBm/10MHz (EIRP)		PASS	Section 7.3
2.1051 96.41(e)	Out of Band Emissions	-13 dBm/MHz at frequencies within 0-10MHz of channel edge  -25 dBm/MHz at frequencies greater than 10MHz above and below channel edge  -40 dBm/MHz at frequencies below 3530 MHz and above 3720 MHz		PASS	Section 7.6, 7.8
96.41(b)	Peak Power Spectral Density	37 dBm/MHz		PASS	Section 7.4
96.41(g)	Peak-Average Ratio	< 13 dB		PASS	Section 7.5
2.1055	Frequency Stability	Fundamental emissions stay within authorized frequency block		PASS	Section 7.9
96.39, 96.45	Additional Requirements for Category B CBSD's	Category B CBSD's must adhere to the requirements of 96.39 and 96.45 per KDB 940660		PASS	Refer to Supplemental Report

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

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 10 of 172	

**Notes:**

1. All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
2. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used to test the EUT at all frequencies of interest.
3. All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
4. For conducted spurious emissions, automated test software was used to measure certain emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "LTE Automation," Version 4.8.
5. This unit was tested while powered by an DC power source.

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 11 of 172	

## 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

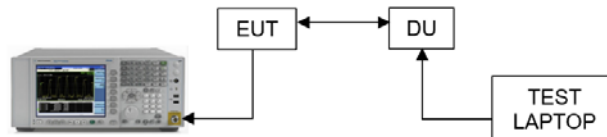
KDB 971168 D01 v03r01 – Section 4.2

#### Test Settings

1. The signal analyzer’s automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB 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 Setup

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



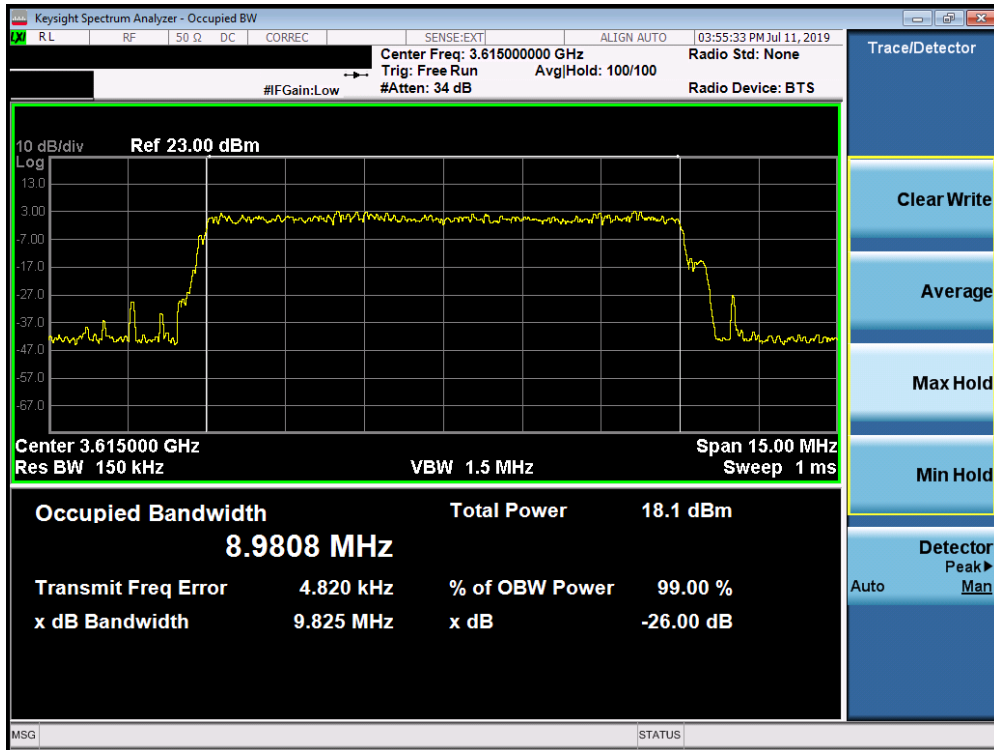
**Figure 7-1. Test Instrument & Measurement Setup**

#### Test Notes

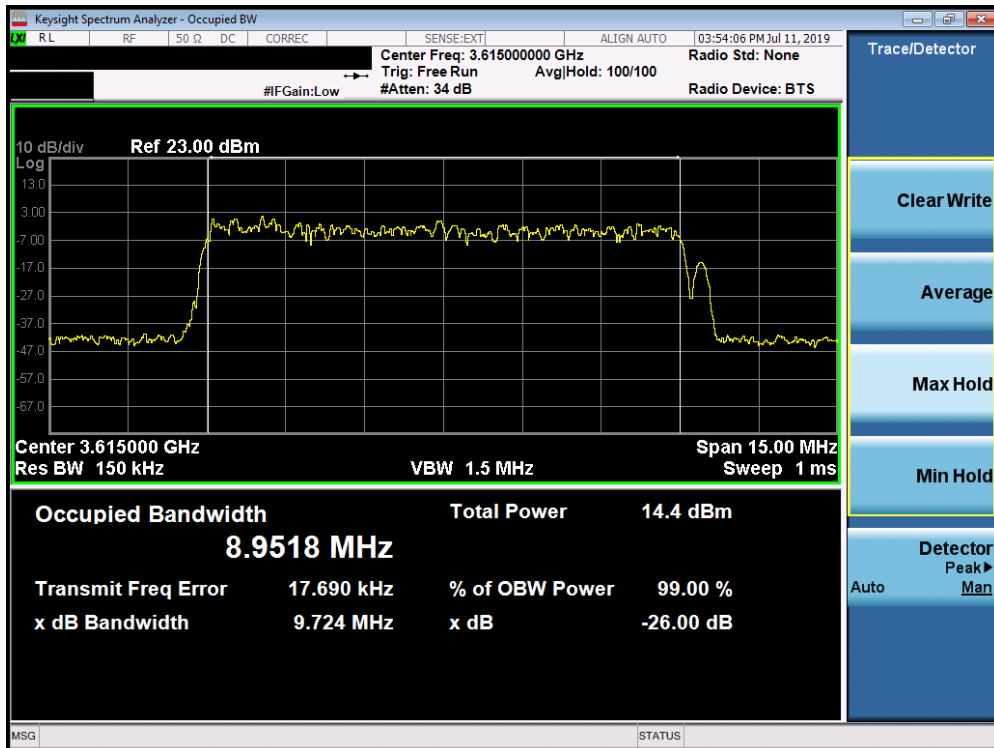
Occupied BW measurements were conducted for 16-User Beam, Single User Beam and Common Beam mode. The occupied bandwidth was not impacted by the selection of beam mode, so only the OBW of the 16-user beam mode was used as a representative set of data.

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 12 of 172

# 16-User Beam Mode 1CC - 10MHz Total Bandwidth Configuration

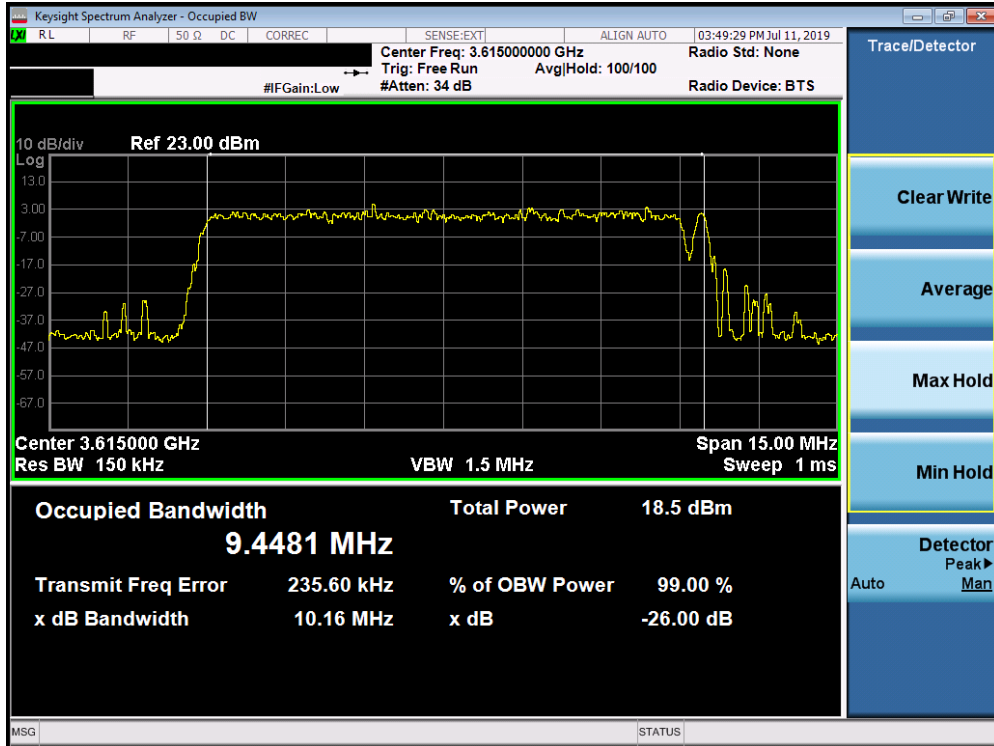


Plot 7-1. Occupied Bandwidth Plot (1CC Configuration - 10.0MHz Total Bandwidth QPSK)

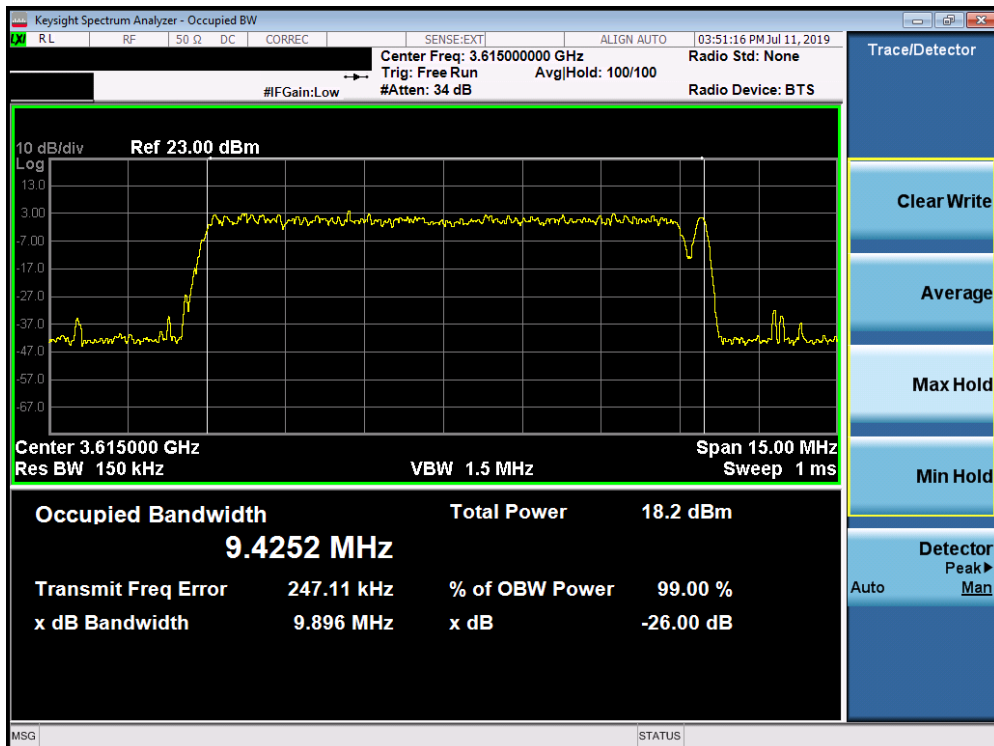


Plot 7-2. Occupied Bandwidth Plot(1CC Configuration - 10.0MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 13 of 172



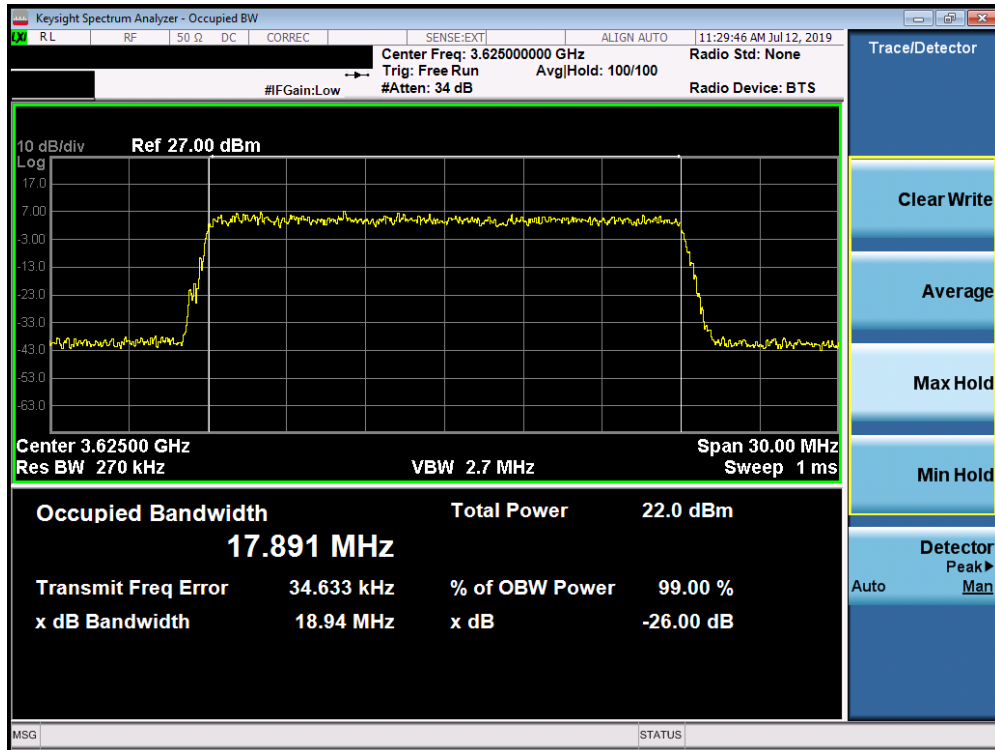
Plot 7-3. Occupied Bandwidth Plot(1CC Configuration - 10.0MHz Total Bandwidth 64QAM)



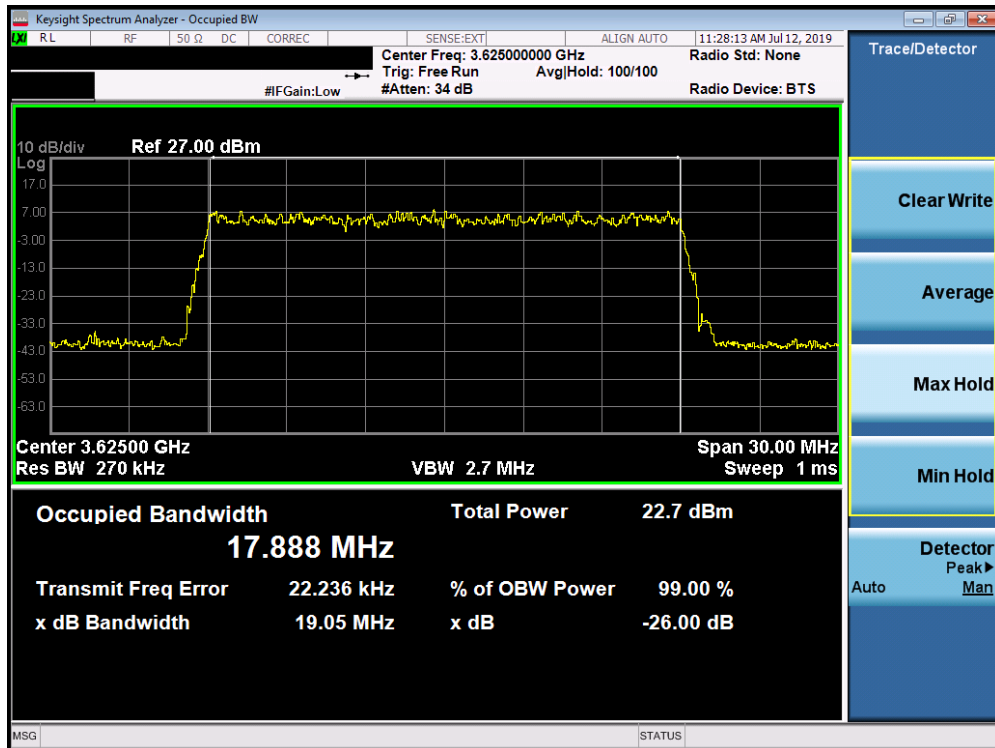
Plot 7-4. Occupied Bandwidth Plot(1CC Configuration - 10.0MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 14 of 172

# 16-User Beam Mode 1CC - 20MHz Total Bandwidth Configuration

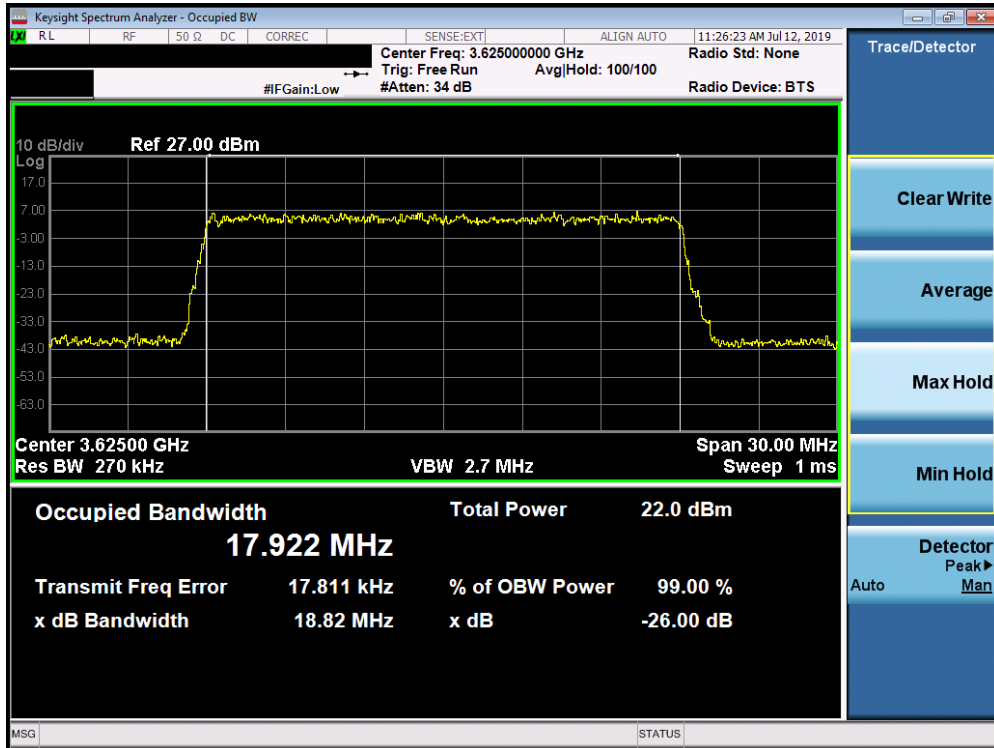


Plot 7-5. Occupied Bandwidth Plot (1CC Configuration - 20.0MHz Total Bandwidth QPSK)

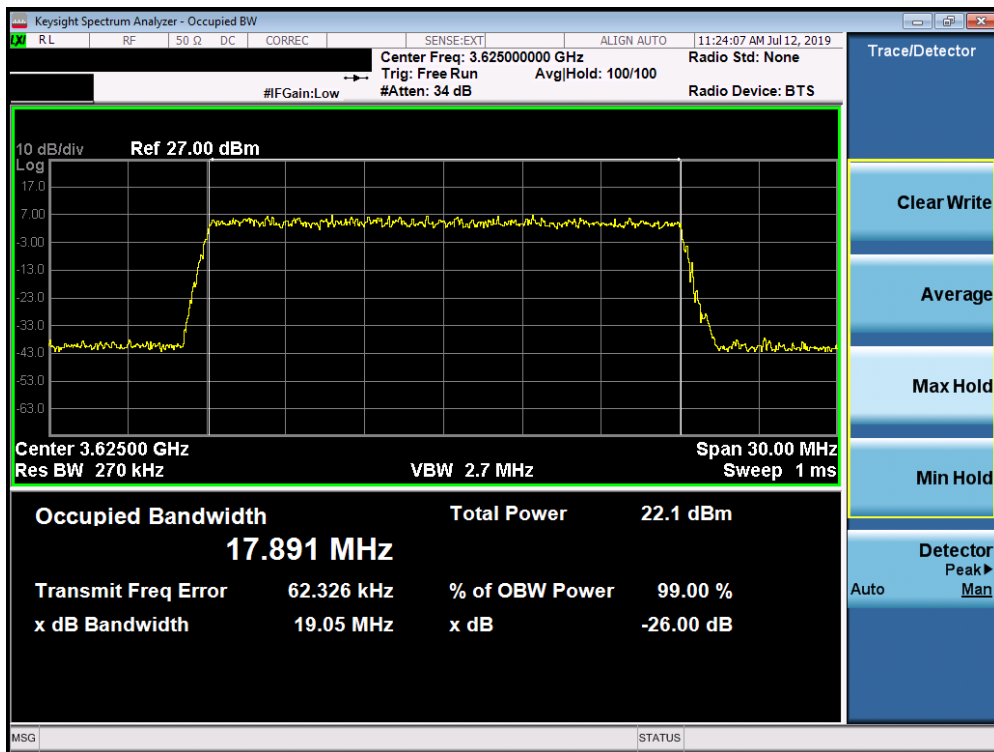


Plot 7-6. Occupied Bandwidth Plot(1CC Configuration - 20.0MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 15 of 172



Plot 7-7. Occupied Bandwidth Plot(1CC Configuration - 20.0MHz Total Bandwidth 64QAM)

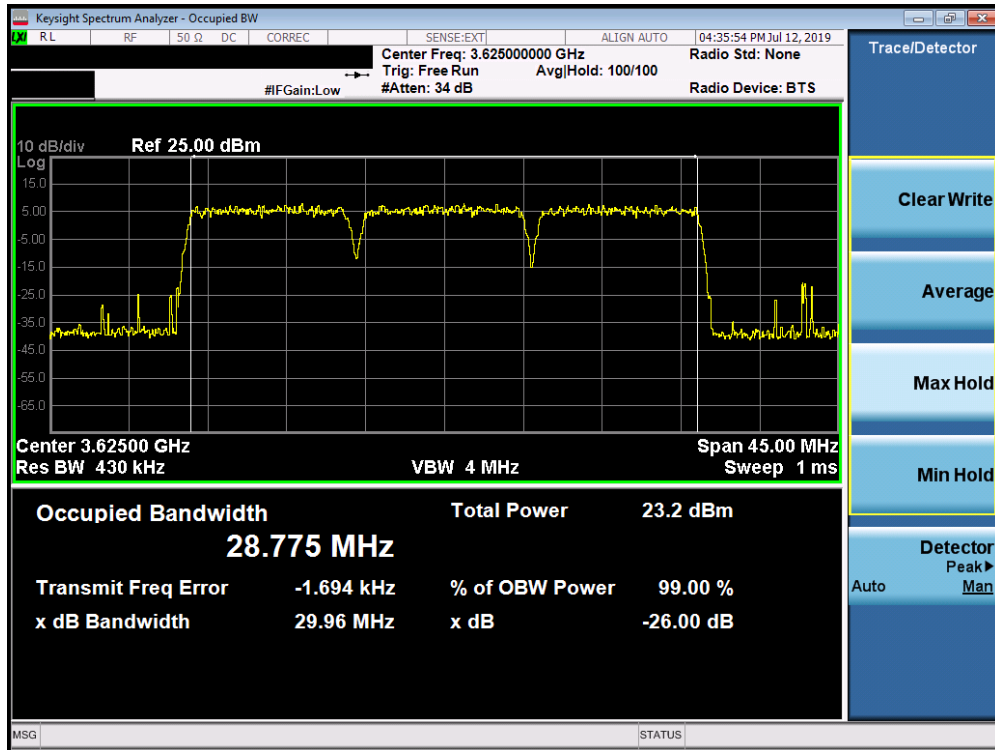


Plot 7-8. Occupied Bandwidth Plot(1CC Configuration - 20.0MHz Total Bandwidth 256QAM)

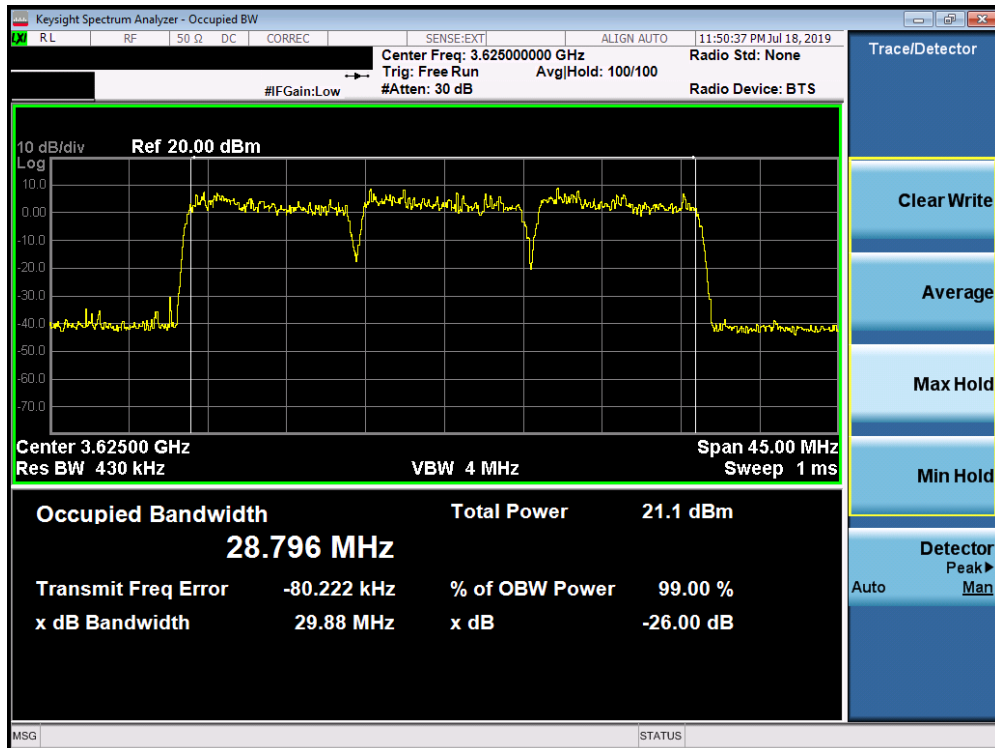
FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 16 of 172



# 16-User Beam Mode 3CC - 30MHz Total Bandwidth Configuration

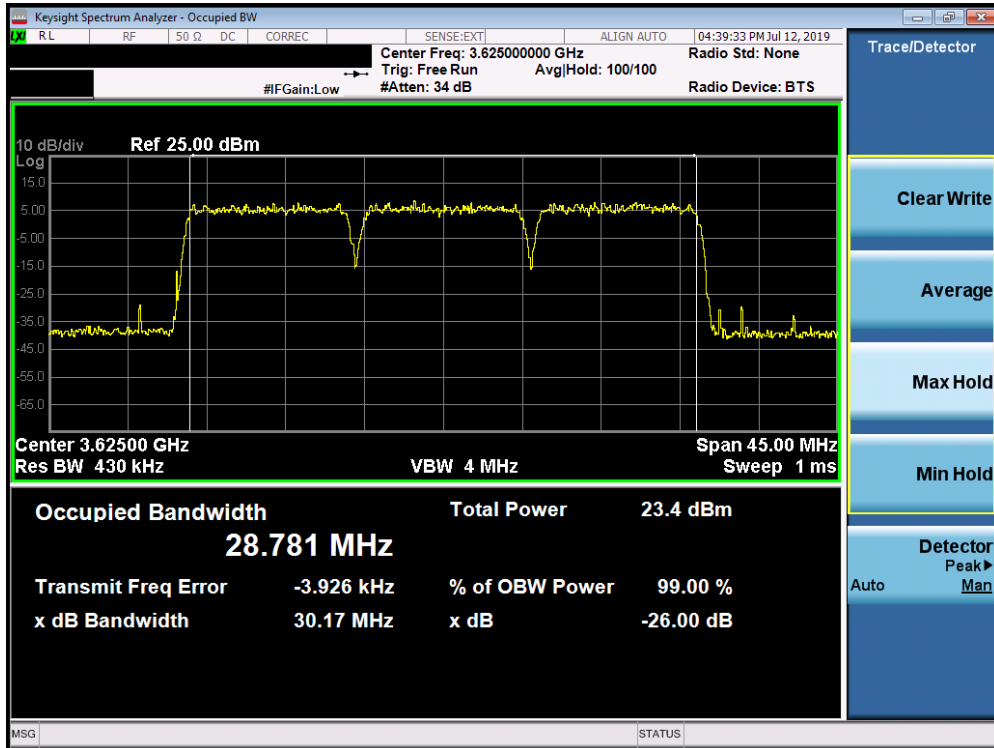


Plot 7-9. Occupied Bandwidth Plot (3CC Configuration - 30.0MHz Total Bandwidth QPSK)

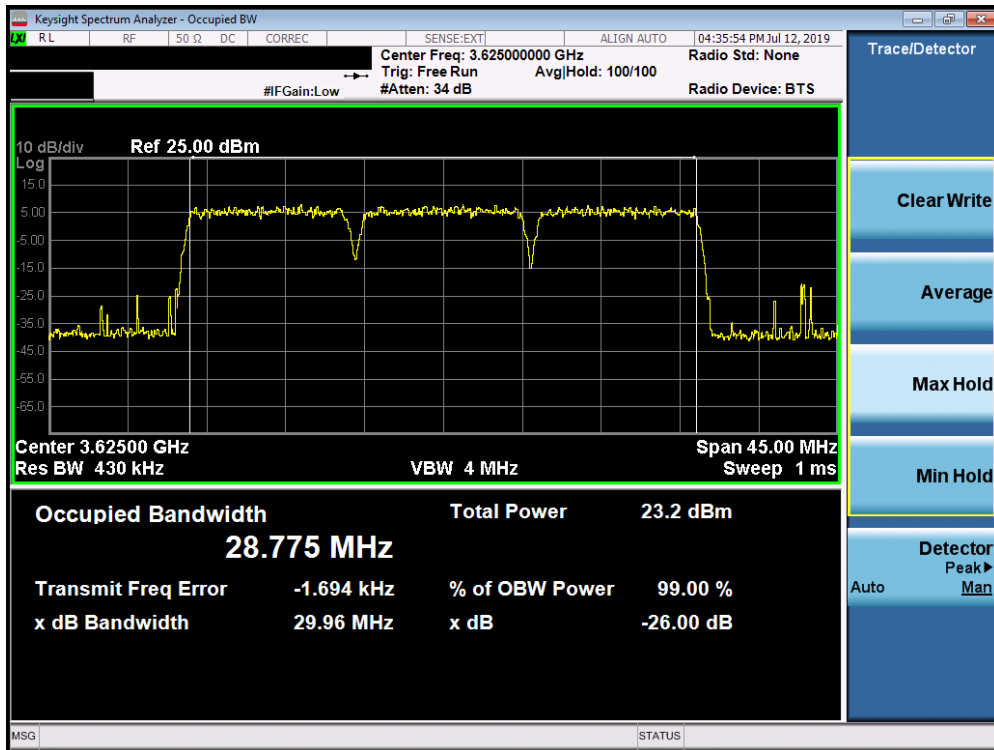


Plot 7-10. Occupied Bandwidth Plot(3CC Configuration - 30.0MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 17 of 172



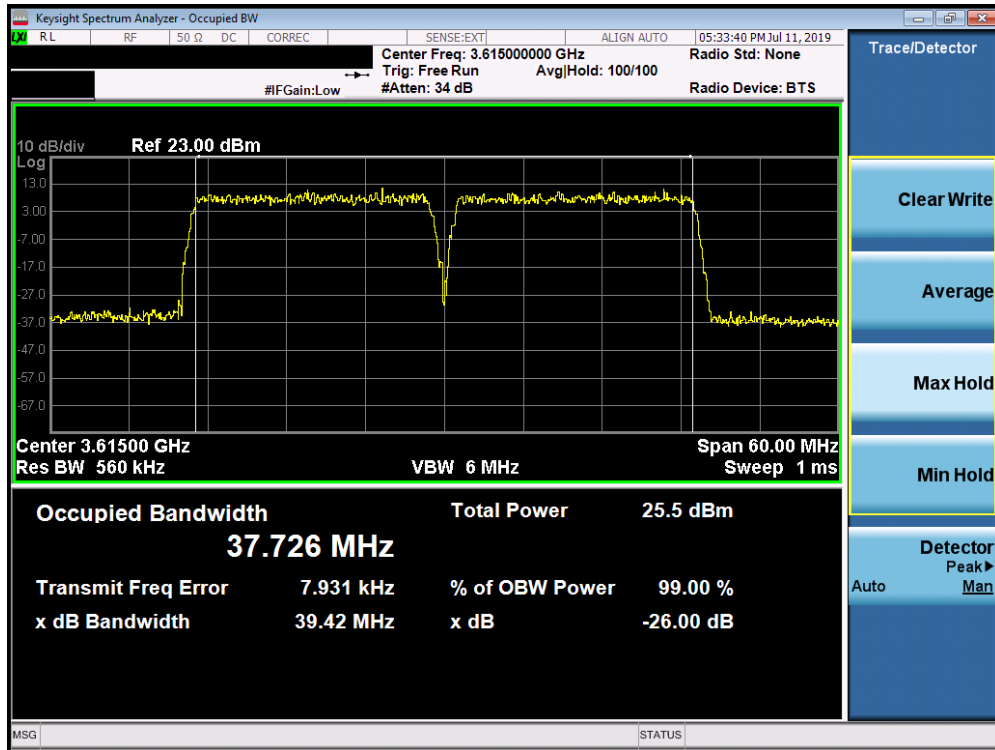
Plot 7-11. Occupied Bandwidth Plot(3CC Configuration - 30.0MHz Total Bandwidth 64QAM)



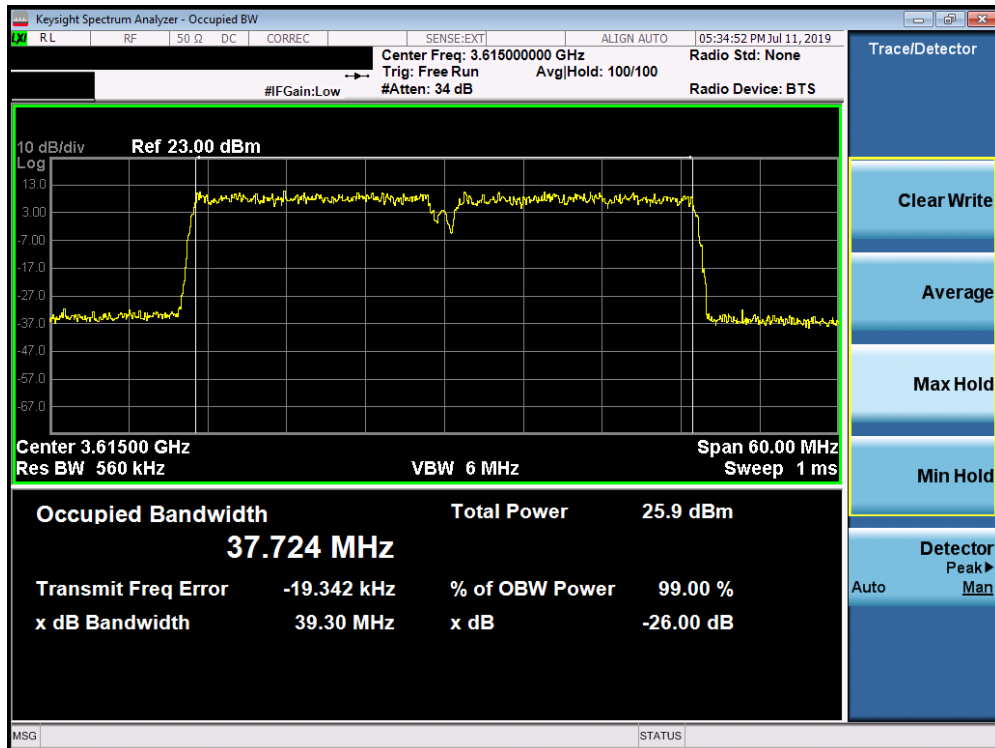
Plot 7-12. Occupied Bandwidth Plot(3CC Configuration - 30.0MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 18 of 172

# 16-User Beam Mode 2CC - 40MHz Total Bandwidth Configuration

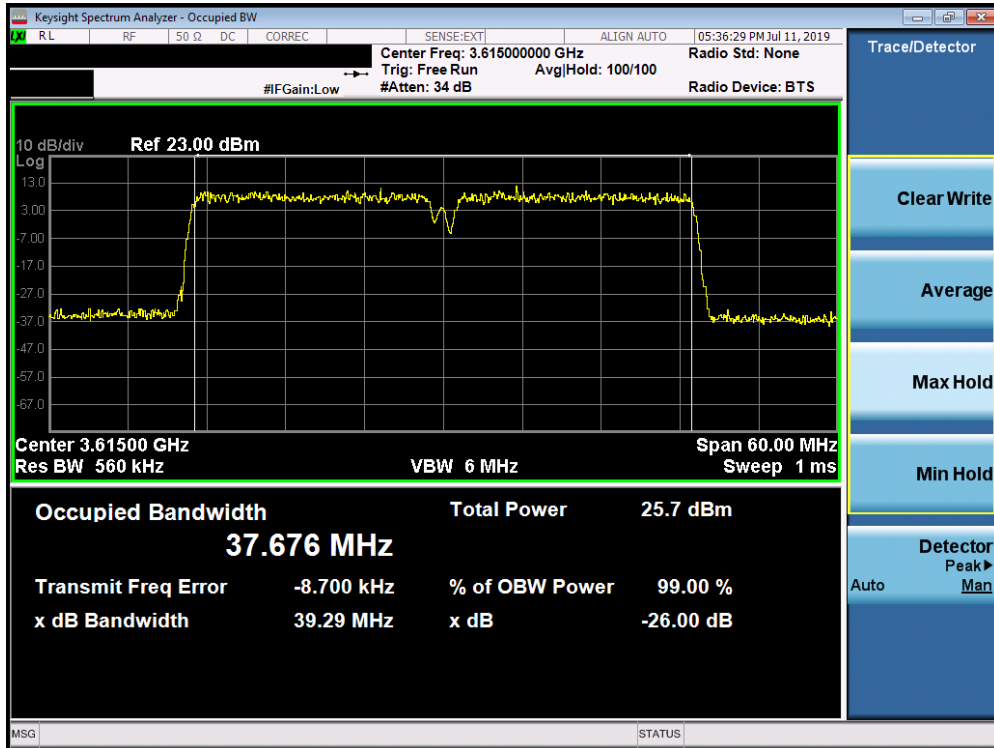


Plot 7-13. Occupied Bandwidth Plot (2CC Configuration - 40.0MHz Total Bandwidth QPSK)

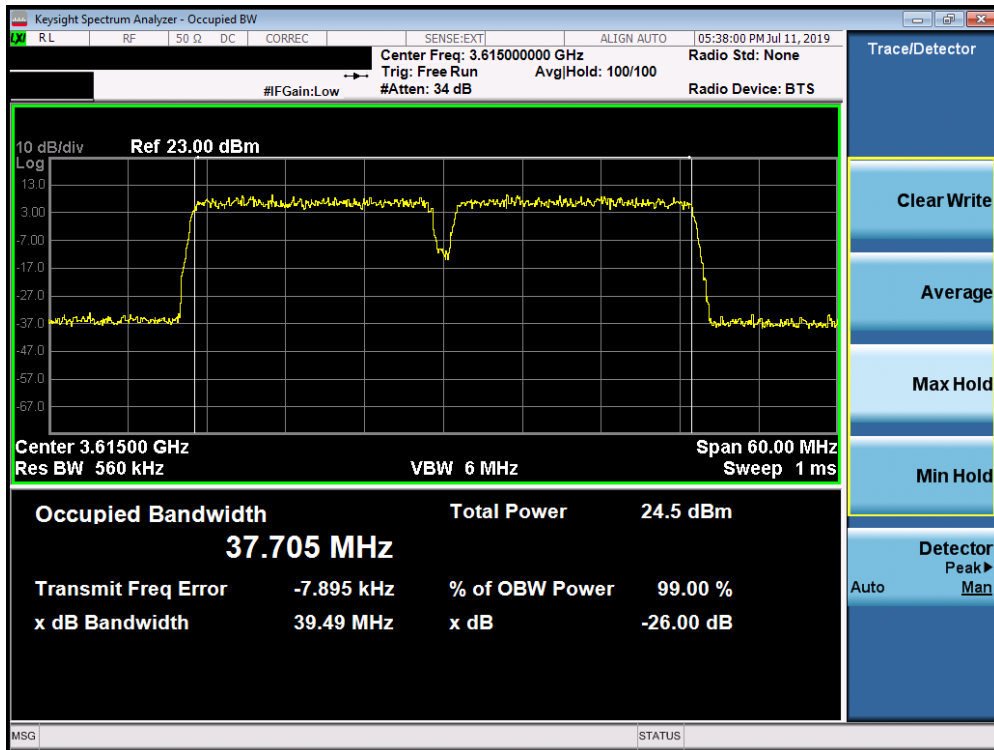


Plot 7-14. Occupied Bandwidth Plot(2CC Configuration - 40.0MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 19 of 172



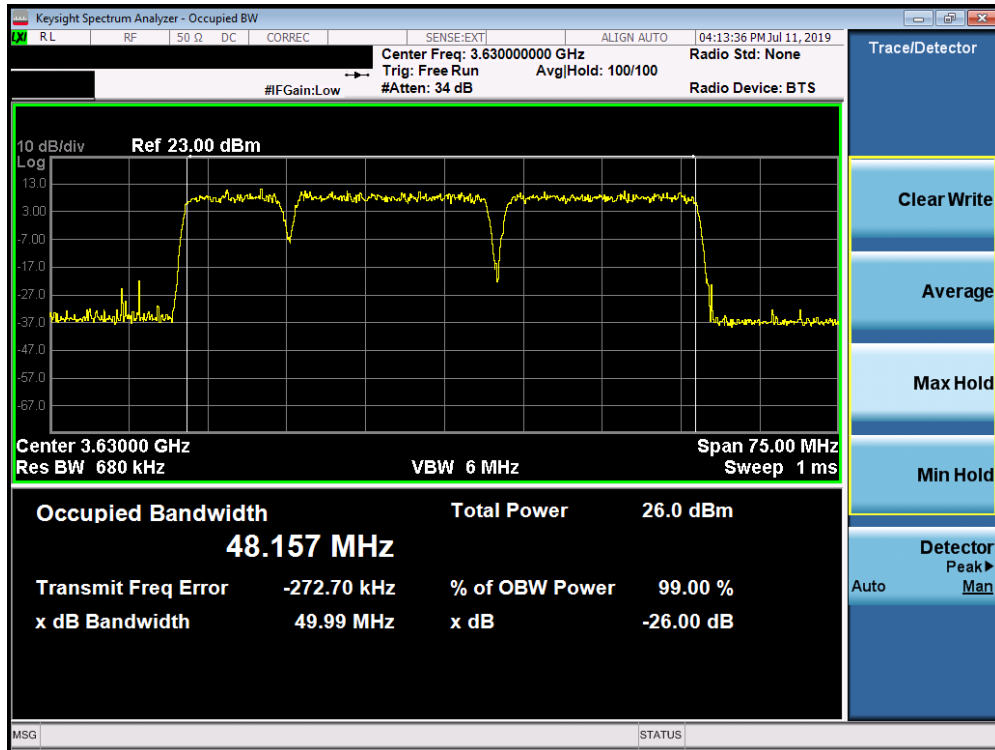
Plot 7-15. Occupied Bandwidth Plot(2CC Configuration - 40.0MHz Total Bandwidth 64QAM)



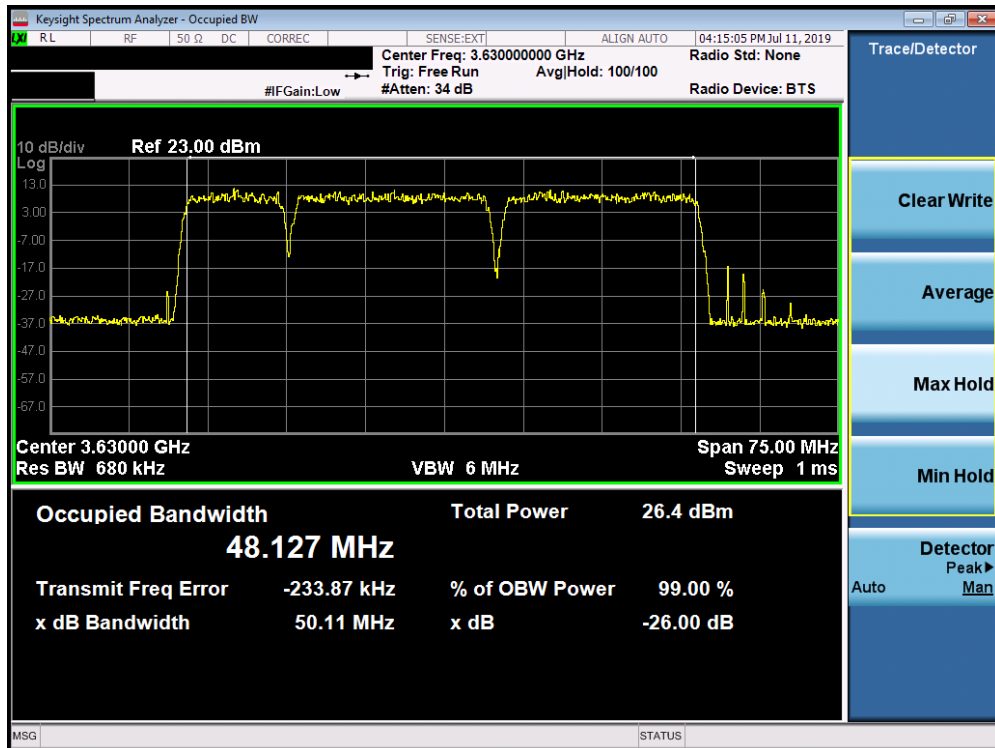
Plot 7-16. Occupied Bandwidth Plot(2CC Configuration - 40.0MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 20 of 172

# 16-User Beam Mode 3CC - 50MHz Total Bandwidth Configuration

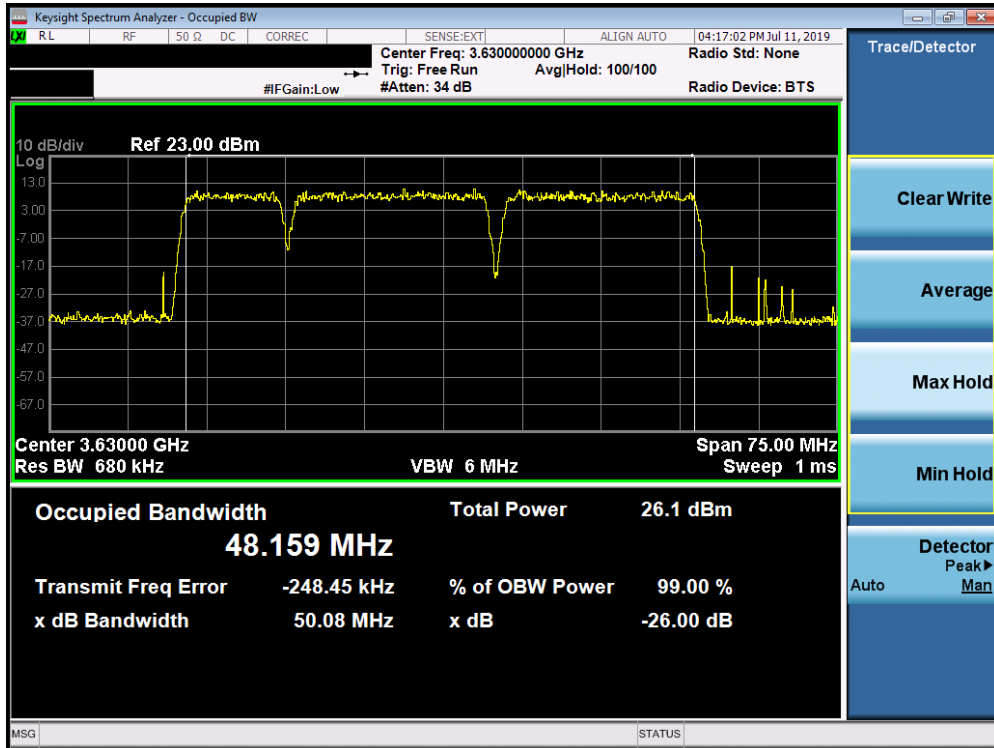


Plot 7-17. Occupied Bandwidth Plot (3CC Configuration - 50.0MHz Total Bandwidth QPSK)

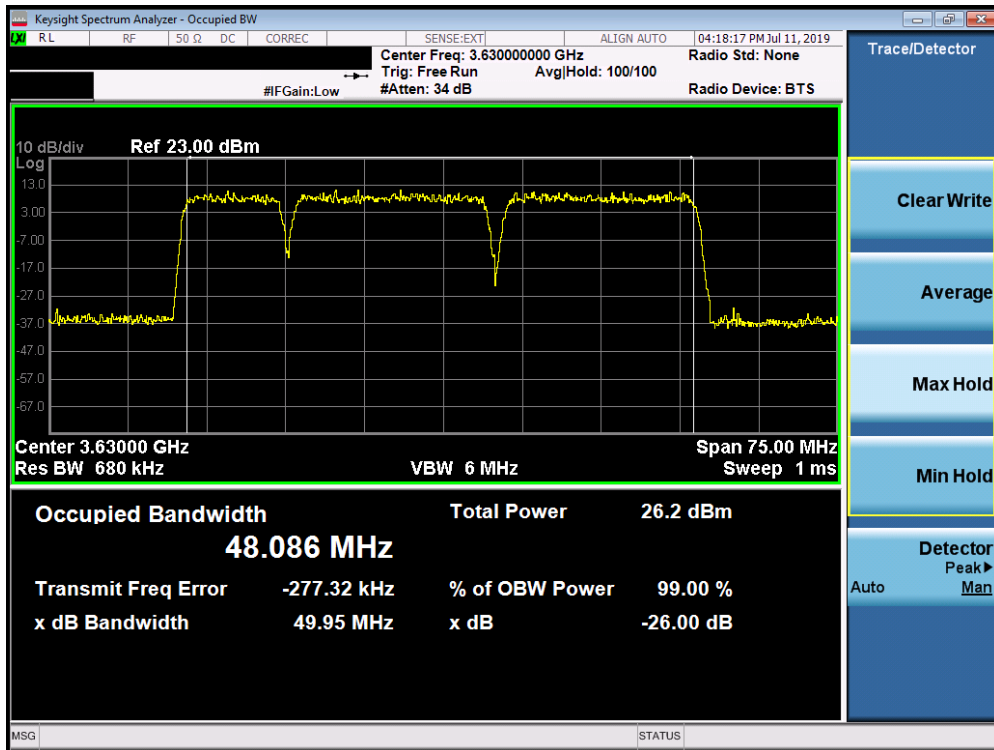


Plot 7-18. Occupied Bandwidth Plot(3CC Configuration - 50.0MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 21 of 172



Plot 7-19. Occupied Bandwidth Plot(3CC Configuration - 50.0MHz Total Bandwidth 64QAM)

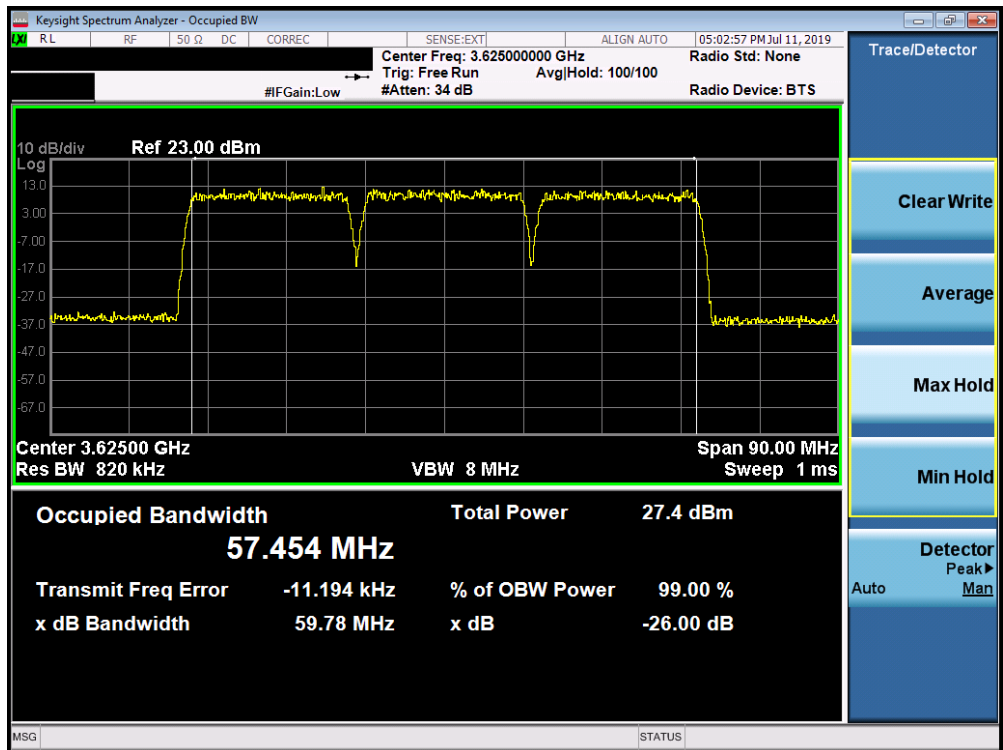


Plot 7-20. Occupied Bandwidth Plot(3CC Configuration - 50.0MHz Total Bandwidth 256QAM)

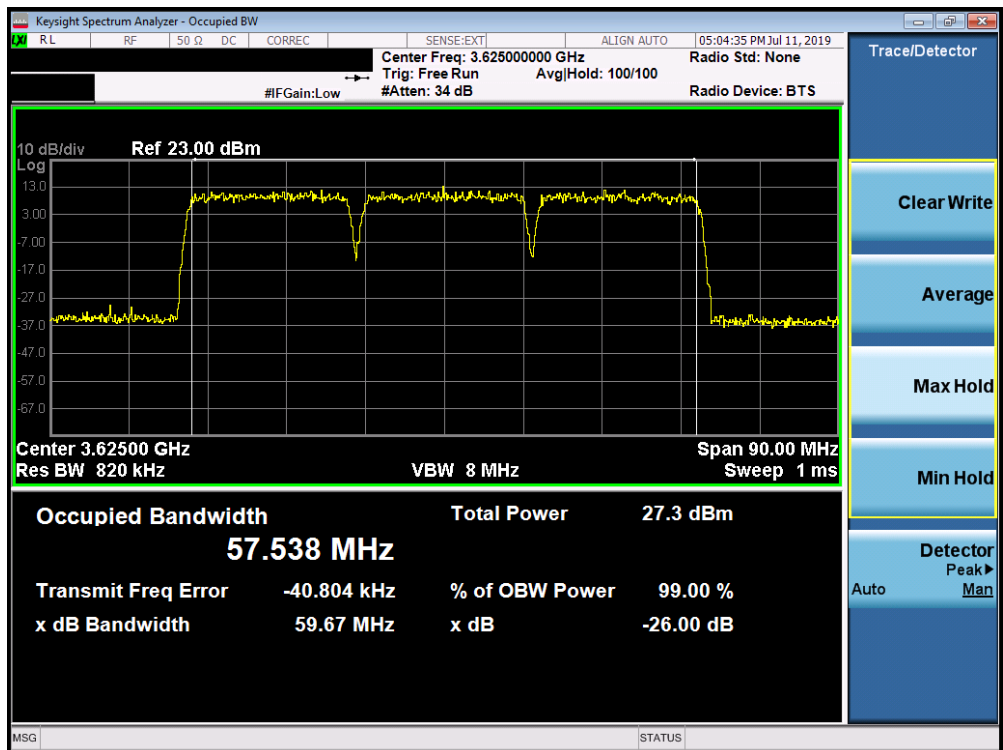
FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 22 of 172



# 16-User Beam Mode 3CC - 60MHz Total Bandwidth Configuration

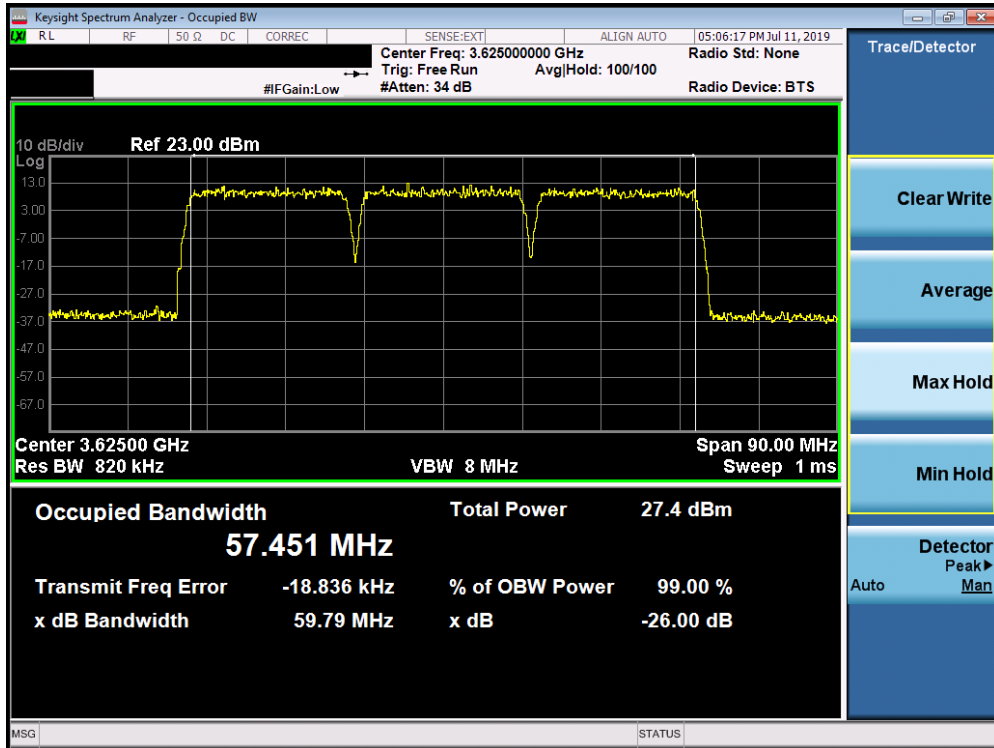


Plot 7-21. Occupied Bandwidth Plot (3CC Configuration - 60.0MHz Total Bandwidth QPSK)

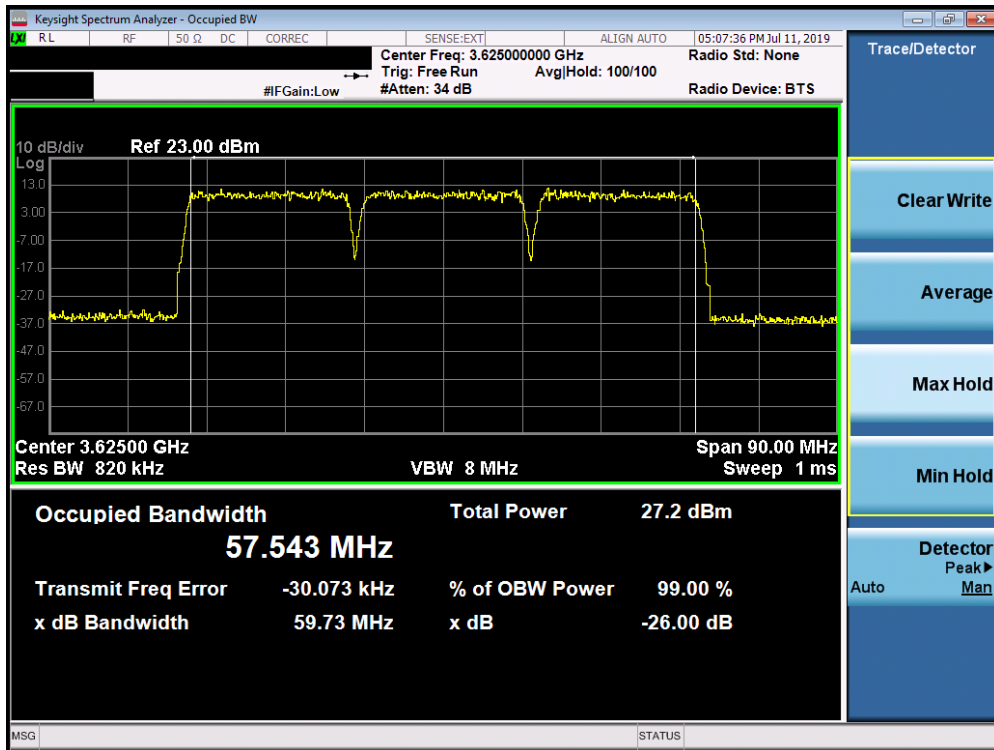


Plot 7-22. Occupied Bandwidth Plot(3CC Configuration - 60.0MHz Total Bandwidth 16QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 23 of 172



Plot 7-23. Occupied Bandwidth Plot(3CC Configuration - 60.0MHz Total Bandwidth 64QAM)



Plot 7-24. Occupied Bandwidth Plot(3CC Configuration - 60.0MHz Total Bandwidth 256QAM)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 24 of 172



### 7.3 Conducted Power Measurement and EIRP 2.1046, §96.41(b)

#### Test Overview

A transmitter port of EUT is connected to the input of a signal analyzer. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

#### Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.2

ANSI/TIA-603-E-2016 – Section 2.2.17

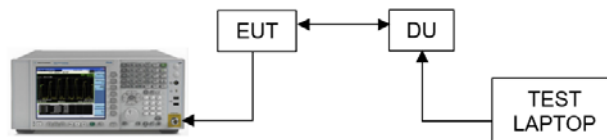
KDB 662911 D01 v02r01 – Section E)1) In-Band Power Measurements

#### Test Settings

1. Conducted power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW  $\geq 3 \times$  RBW
4. Span = 1.5 times the OBW
5. No. of sweep points  $\geq 2 \times$  span / RBW
6. Detector = RMS
7. Trigger Settings is set to "periodic" for signals with non-continuous operation with the sweep times set to "auto". Refer test note 3 for details.
8. The integration bandwidth was set equal to transmission bandwidth i.e. 20MHz for 1CC and 40MHz for 2CC measurements.
9. Trace mode = Trace-Averaging (RMS) set to average over 100 sweeps
10. The trace was allowed to stabilize

#### Test Setup

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



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

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 25 of 172

**Test Notes**

1. The port with highest power i.e. worst case port per modulation has been highlighted in the following power tables.
2. Both 16 and single user beam configurations were checked. 16 user beam power was found to be significantly higher than the single user beam, and hence was reported.
3. Periodic trigger was used with gating ON. Gate sweep time, Gate delay and gate length were set accordingly to capture ON time of the transmission.
4. MIMO Calculations are done considering output channel power for all ports and respective margins are calculated.
5. Consider the following factors for MIMO Power:
  - a) Conducted power for each port is measured in dBm.
  - b) Powers are summed up in linear using the measure-and-sum technique defined in KDB 971168 D01 v03r01-Section D.
  - c) Conducted power per port (dBm) is converted to a linear value (mW). A summation of linear powers for all 64 ports gives us the total MIMO conducted power in milliWatts (mW). We convert this back to logarithmic scale for further EIRP calculations.

6. The total MIMO conducted power is measured for the signal with respect to the Occupied Bandwidth (OBW) in MHz. This value has to be scaled to per 10MHz in order to compare it with the FCC EIRP Limit defined in units dBm/10MHz. Scaling Factor (dB) =  $10 \cdot \log(10 \text{ MHz} / \text{Occupied Bandwidth in MHz})$

Sample Calculation for an Occupied Bandwidth = 20MHz is shown as follows:  
 Scaling Factor =  $10 \cdot \log(10 \text{ MHz} / 20 \text{ MHz}) = 10 \cdot \log(0.5) = -3.01 \text{ dB}$

7. 16- beam reduction:  
 The 16-beam reduction is applicable in the 16-User Beam operating mode of the EUT. It is a logarithmic factor applied to account for maximum 16 spatially separated beams operate simultaneously.  
 16-beam power reduction factor (dB) =  $10 \cdot \log(1 / 16) = -12.04 \text{ dB}$
8. Beamforming (BF) Gain:  
 This logarithmic factor accounts for the gain if two spatially different beams overlap in real-time.  
 BF Gain =  $10 \cdot \log(2) = 3.01 \text{ dB}$
9. Antenna Gains (dBi) are provided by the client.
10. Sample Calculation:  
 Let us assume the following numbers:
  - a. Total MIMO Conducted Power as 1500 milliWatts.
  - b. Occupied Bandwidth = 20 MHz
  - c. Antenna Gain = 23.5 dBi


Factors	Value	Unit
Total MIMO Conducted Power (linear sum)	1500	mW
Total MIMO Conducted Power (dBm)	$= 10 \cdot \log(1500) = 31.76$	dBm
Scaling Factor (OBW = 20 MHz)	$= 10 \cdot \log(10 / 20) = -3.01$	dB
<b>Applying Reductions:</b>		
Antenna Gain	$= 23.5$	dBi
16- Beam Reduction	$= 10 \cdot \log(1 / 16) = -12.04$	dB
BF Gain	$= 10 \cdot \log(2) = 3.01$	dB
<b>MIMO EIRP =</b>	<b>43.22</b>	<b>dBm/10MHz</b>
<b>Total MIMO Conducted Power + Scaling Factor + Antenna Gain + 16- Beam Reduction + BF Gain</b>		
<b>FCC EIRP Limit</b>	<b>47</b>	<b>dBm/10MHz</b>
<b>Margin = MIMO EIRP - FCC EIRP Limit</b>	$= 43.22 - 47 = -3.78$	<b>dB</b>

FCC ID: A3LMT6402-48A	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 26 of 172

## 16- User Beam Configuration (1CC – 10MHz Total Bandwidth)

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	11.88	11.57	11.87	10.79
1	12.07	11.75	12.04	10.97
2	11.88	11.57	11.86	10.79
3	11.67	11.35	11.64	10.57
4	11.92	11.61	11.89	10.83
5	12.07	11.75	12.04	10.97
6	11.46	11.19	11.48	10.41
7	11.55	11.24	11.53	10.46
8	11.66	11.31	11.63	10.53
9	11.87	11.54	11.84	10.76
10	11.84	11.52	11.81	10.74
11	11.56	11.25	11.54	10.47
12	11.90	11.57	11.86	10.79
13	11.58	11.27	11.55	10.49
14	11.73	11.42	11.71	10.64
15	11.53	11.22	11.51	10.44
16	11.79	11.47	11.76	10.69
17	11.92	11.58	11.90	10.80
18	11.90	11.56	11.87	10.78
19	11.79	11.47	11.76	10.69
20	12.01	11.69	11.98	10.91
21	11.78	11.45	11.75	10.67
22	11.59	11.29	11.58	10.51
23	11.62	11.30	11.60	10.53
24	11.78	11.47	11.76	10.69
25	11.86	11.54	11.83	10.77
26	11.71	11.36	11.66	10.59
27	11.50	11.19	11.48	10.41
28	11.64	11.32	11.61	10.54
29	11.83	11.51	11.80	10.70
30	11.79	11.49	11.77	10.69
31	11.54	11.23	11.52	10.45
32	11.68	11.36	11.65	10.58
33	11.89	11.57	11.86	10.79
34	11.78	11.46	11.78	10.72
35	11.60	11.28	11.59	10.52
36	11.73	11.41	11.70	10.63
37	12.12	11.80	12.09	11.02
38	11.87	11.55	11.85	10.75
39	11.54	11.22	11.52	10.44
40	11.65	11.41	11.70	10.63
41	11.96	11.64	11.93	10.86
42	11.51	11.19	11.48	10.41
43	11.73	11.42	11.70	10.64
44	11.67	11.35	11.64	10.57
45	11.82	11.50	11.79	10.72
46	11.74	11.43	11.72	10.65
47	11.56	11.22	11.54	10.47
48	11.60	11.26	11.57	10.51
49	11.79	11.48	11.77	10.70
50	11.63	11.31	11.60	10.53
51	11.67	11.34	11.64	10.57
52	11.79	11.47	11.76	10.66
53	11.62	11.30	11.59	10.51
54	11.55	11.23	11.52	10.45
55	11.62	11.30	11.60	10.53
56	11.63	11.31	11.60	10.53
57	11.77	11.45	11.74	10.68
58	11.66	11.34	11.63	10.56
59	11.75	11.42	11.71	10.64
60	11.67	11.35	11.64	10.57
61	11.88	11.57	11.85	10.79
62	11.71	11.39	11.68	10.61
63	11.76	11.47	11.76	10.69

**Table 7-2. 16-User Beam 1CC Low Channel Conducted Powers (LTE Band 48 – 10MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 27 of 172

Low Channel 1CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	955.115	887.542	950.005	741.733
Total MIMO Conducted Power (dBm)	29.80	29.48	29.78	28.70
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.27	43.95	44.25	43.17
FCC EIRP Limit (dBm/10MHz)	47.00	47.00	47.00	47.00
Margin (dB)	-2.73	-3.05	-2.75	-3.83

**Table 7-3. 16-User Beam 1CC Low Channel MIMO Power (LTE Band 48 – 10MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 28 of 172	

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	11.04	10.67	10.97	9.96
1	11.66	11.29	11.60	10.58
2	11.46	11.10	11.40	10.39
3	11.41	11.04	11.36	10.33
4	11.50	11.13	11.44	10.43
5	11.29	10.92	11.23	10.21
6	11.28	10.88	11.22	10.20
7	11.31	10.93	11.25	10.23
8	11.10	10.73	11.05	10.02
9	11.47	11.10	11.41	10.36
10	11.53	11.16	11.47	10.43
11	11.31	10.95	11.25	10.23
12	11.34	10.97	11.27	10.26
13	11.45	11.08	11.39	10.36
14	11.49	11.13	11.43	10.41
15	11.30	10.93	11.24	10.22
16	11.11	10.74	11.05	10.03
17	11.40	11.03	11.34	10.33
18	11.38	10.98	11.29	10.30
19	11.35	10.97	11.28	10.27
20	11.34	10.97	11.28	10.26
21	11.25	10.88	11.19	10.14
22	11.42	11.05	11.36	10.34
23	11.23	10.87	11.18	10.16
24	11.10	10.73	11.04	9.99
25	11.40	11.03	11.34	10.30
26	11.46	11.09	11.40	10.38
27	11.31	10.94	11.25	10.23
28	11.32	10.95	11.26	10.23
29	11.51	11.15	11.46	10.43
30	11.45	11.08	11.39	10.37
31	11.22	10.85	11.16	10.14
32	11.03	10.66	10.98	9.96
33	11.47	11.07	11.41	10.39
34	11.38	10.99	11.32	10.30
35	11.30	10.93	11.24	10.22
36	11.46	11.09	11.40	10.35
37	11.54	11.16	11.49	10.46
38	11.40	11.03	11.34	10.32
39	11.19	10.83	11.13	10.11
40	11.00	10.63	10.94	9.89
41	11.42	11.05	11.36	10.33
42	11.39	11.02	11.33	10.28
43	11.21	10.81	11.15	10.11
44	11.20	10.82	11.14	10.12
45	11.38	11.01	11.29	10.30
46	11.42	11.05	11.35	10.33
47	11.21	10.84	11.15	10.13
48	11.22	10.86	11.16	10.14
49	11.50	11.13	11.44	10.42
50	11.18	10.81	11.13	10.11
51	11.24	10.87	11.18	10.16
52	11.44	11.07	11.39	10.36
53	11.59	11.23	11.53	10.51
54	11.34	10.97	11.28	10.23
55	11.20	10.83	11.14	10.12
56	11.09	10.72	11.03	10.01
57	11.50	11.10	11.44	10.42
58	11.11	10.72	11.02	10.00
59	11.23	10.86	11.16	10.14
60	11.20	10.83	11.14	10.12
61	11.45	11.07	11.39	10.37
62	11.39	10.99	11.33	10.31
63	11.16	10.74	11.11	10.09

**Table 7-4. 16-User Beam 1CC Mid Channel Conducted Powers (LTE Band 48 – 10MHz)**

FCC ID: A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 29 of 172	

Mid Channel 1CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	869.531	797.456	856.936	677.121
Total MIMO Conducted Power (dBm)	29.39	29.02	29.33	28.31
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	43.86	43.49	43.80	42.78
FCC EIRP Limit (dBm/10MHz)	47.00	47.00	47.00	47.00
Margin (dB)	-3.14	-3.51	-3.20	-4.22

**Table 7-5. 16-User Beam 1CC Mid Channel MIMO Power (LTE Band 48 – 10MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 30 of 172	

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	11.04	10.71	11.05	9.91
1	11.48	11.15	11.49	10.35
2	11.26	10.90	11.24	10.13
3	11.30	10.96	11.30	10.14
4	11.36	11.03	11.37	10.23
5	11.50	11.17	11.51	10.38
6	11.49	11.16	11.50	10.33
7	11.44	11.12	11.46	10.29
8	11.28	10.95	11.29	10.12
9	11.41	11.08	11.42	10.27
10	11.39	11.06	11.40	10.26
11	11.24	10.91	11.25	10.11
12	11.52	11.20	11.54	10.39
13	11.24	10.91	11.25	10.12
14	11.56	11.24	11.58	10.43
15	11.32	10.99	11.33	10.19
16	11.35	11.02	11.36	10.22
17	11.37	11.04	11.38	10.24
18	11.33	10.99	11.33	10.19
19	11.40	11.07	11.40	10.26
20	11.36	11.03	11.37	10.23
21	11.39	11.06	11.40	10.26
22	11.32	11.00	11.33	10.19
23	11.23	10.90	11.25	10.11
24	11.25	10.93	11.26	10.12
25	11.56	11.23	11.57	10.43
26	11.44	11.11	11.42	10.28
27	11.34	10.98	11.34	10.20
28	11.55	11.21	11.56	10.42
29	11.68	11.32	11.69	10.55
30	11.41	11.06	11.41	10.28
31	11.22	10.89	11.23	10.06
32	11.13	10.80	11.14	10.00
33	11.48	11.14	11.49	10.36
34	11.53	11.20	11.55	10.37
35	11.41	11.08	11.42	10.26
36	11.56	11.23	11.57	10.42
37	11.41	11.09	11.42	10.28
38	11.55	11.22	11.56	10.42
39	11.35	11.03	11.36	10.22
40	11.10	10.77	11.12	9.98
41	11.16	10.83	11.17	10.03
42	11.26	10.93	11.27	10.13
43	11.17	10.85	11.18	10.04
44	11.55	11.22	11.56	10.42
45	11.48	11.15	11.50	10.36
46	11.47	11.15	11.48	10.34
47	11.15	10.79	11.16	10.02
48	11.08	10.74	11.10	9.95
49	11.33	10.97	11.31	10.17
50	11.67	11.32	11.67	10.54
51	11.48	11.15	11.49	10.36
52	11.29	10.96	11.30	10.13
53	11.39	11.05	11.40	10.24
54	11.64	11.31	11.66	10.51
55	11.41	11.08	11.42	10.28
56	11.32	10.99	11.33	10.19
57	11.47	11.15	11.48	10.31
58	11.64	11.31	11.65	10.50
59	11.30	10.97	11.31	10.17
60	11.47	11.14	11.48	10.34
61	11.42	11.10	11.44	10.29
62	11.35	11.02	11.36	10.23
63	11.15	10.82	11.16	10.02

**Table 7-6. 16-User Beam 1CC High Channel Conducted Powers (LTE Band 48 – 10MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 31 of 172	

High Channel 1CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	879.505	814.394	880.908	676.906
Total MIMO Conducted Power (dBm)	29.44	29.11	29.45	28.31
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	43.91	43.58	43.92	42.77
FCC EIRP Limit (dBm/10MHz)	47.00	47.00	47.00	47.00
Margin (dB)	-3.09	-3.42	-3.08	-4.23

Table 7-7. 16-User Beam 1CC High Channel MIMO Power (LTE Band 48 – 10MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 32 of 172



## 16- User Beam Configuration (1CC – 20MHz Total Bandwidth)



Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	14.53	14.41	14.70	14.49
1	14.85	14.79	15.08	14.87
2	14.56	14.78	14.79	14.61
3	14.88	14.40	14.60	14.45
4	14.35	14.38	14.68	14.51
5	14.78	14.67	14.94	14.79
6	14.27	14.21	14.45	14.77
7	14.31	14.05	14.38	14.24
8	14.53	14.38	14.65	14.48
9	14.73	14.54	14.86	14.66
10	14.56	14.48	14.73	14.58
11	14.40	14.24	14.50	14.38
12	14.55	14.39	14.66	14.61
13	14.41	14.39	14.67	14.48
14	14.34	14.43	14.67	14.51
15	13.85	14.17	14.40	14.25
16	14.55	14.35	14.66	14.36
17	14.35	14.32	14.59	14.39
18	14.62	14.54	14.74	14.54
19	14.48	14.37	14.67	14.47
20	14.56	14.45	14.72	14.55
21	14.31	14.14	14.43	14.23
22	14.51	14.40	14.69	14.54
23	14.50	14.65	14.66	14.51
24	14.69	14.61	14.81	14.64
25	14.76	14.59	14.89	14.74
26	14.46	14.36	14.63	14.95
27	14.41	14.27	14.51	14.37
28	14.44	14.30	14.55	14.38
29	14.55	14.55	14.81	14.61
30	14.31	14.37	14.64	14.49
31	14.12	14.39	14.67	14.55
32	14.35	14.15	14.42	14.99
33	14.52	14.49	14.81	14.63
34	14.70	14.52	14.77	14.56
35	14.57	14.47	14.73	14.52
36	14.57	14.41	14.68	14.47
37	14.55	14.48	14.76	14.58
38	14.77	14.74	14.98	14.84
39	14.38	14.31	14.54	14.48
40	14.58	14.39	14.70	14.54
41	14.69	14.55	14.82	14.72
42	14.36	14.24	14.53	14.33
43	14.61	14.42	14.71	14.51
44	14.38	14.48	14.49	14.32
45	14.47	14.53	14.73	14.53
46	14.47	14.50	14.80	14.50
47	13.91	14.19	14.46	14.19
48	14.50	14.37	14.61	14.40
49	14.56	14.54	14.80	14.81
50	14.50	14.40	14.67	14.58
51	14.45	14.36	14.63	14.51
52	14.30	14.17	14.46	14.29
53	14.46	14.29	14.58	14.37
54	14.43	14.60	14.61	14.62
55	14.55	14.51	14.71	14.62
56	14.57	14.39	14.69	14.57
57	14.57	14.43	14.70	14.53
58	14.54	14.47	14.71	14.27
59	14.52	14.31	14.62	14.48
60	14.50	14.34	14.61	14.46
61	14.47	14.53	14.73	14.57
62	14.39	14.42	14.72	14.58
63	14.24	14.49	14.79	14.72

Table 7-8. 16-User Beam 1CC Low Channel Conducted Powers (LTE Band 48 – 20MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 33 of 172

Low Channel 1CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	1798.509	1771.767	1877.520	1818.729
Total MIMO Conducted Power (dBm)	32.55	32.48	32.74	32.60
OBW (MHz)	17.89	17.88	17.92	17.89
Scaling factor (dB)	-2.53	-2.52	-2.53	-2.53
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.49	44.43	44.67	44.54
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.508	-2.571	-2.329	-2.460

**Table 7-9. 16-User Beam 1CC Low Channel MIMO Power (LTE Band 48 – 20MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 34 of 172	

Port #	QPSK	16-QAM	64-QAM	256-QAM
0	14.46	14.39	14.75	14.42
1	14.06	13.97	14.25	14.14
2	14.97	14.86	15.16	15.12
3	14.13	13.96	14.28	14.33
4	13.75	13.82	13.90	13.71
5	13.92	13.85	14.04	14.03
6	14.15	14.05	14.38	14.43
7	14.07	13.97	14.30	14.43
8	14.55	14.45	14.27	14.50
9	13.82	13.73	14.15	13.91
10	14.87	14.75	15.03	14.72
11	14.16	14.04	14.45	13.97
12	13.94	13.84	14.13	13.90
13	13.85	13.71	14.04	13.93
14	14.25	14.08	14.40	14.32
15	14.05	13.93	14.20	14.04
16	14.62	14.77	14.75	14.61
17	13.92	14.12	14.09	13.89
18	14.51	14.52	14.61	14.51
19	14.11	13.94	14.28	14.15
20	13.80	13.72	13.92	13.93
21	13.62	13.48	14.17	13.57
22	14.67	14.60	14.78	14.74
23	13.87	13.73	14.11	13.86
24	14.60	14.53	14.75	14.59
25	13.93	13.85	13.94	13.90
26	14.85	14.78	15.04	14.85
27	14.00	14.11	14.23	13.99
28	13.92	13.80	14.12	13.91
29	13.97	13.85	14.13	13.91
30	14.29	14.17	14.53	14.46
31	14.07	14.00	14.34	14.12
32	14.16	14.07	14.32	14.15
33	13.94	13.86	14.06	13.96
34	14.14	13.97	14.02	14.10
35	14.09	14.16	14.21	14.06
36	13.98	13.91	14.17	13.96
37	14.06	13.96	14.22	14.04
38	14.17	14.07	14.35	14.21
39	13.92	13.82	14.08	14.05
40	14.23	14.13	14.49	14.28
41	13.89	13.75	14.10	13.88
42	15.06	14.97	15.34	15.08
43	13.99	13.85	14.28	13.95
44	13.79	13.80	14.34	13.76
45	13.89	13.72	14.00	13.87
46	14.12	14.04	14.36	14.27
47	14.02	13.85	14.17	14.22
48	14.37	14.25	14.38	14.33
49	14.09	14.24	14.28	14.16
50	14.69	14.89	14.92	14.68
51	13.99	14.00	14.19	13.94
52	13.93	13.76	14.26	14.02
53	14.17	14.09	14.72	14.02
54	14.07	13.94	14.24	13.88
55	14.01	13.86	14.13	14.14
56	14.50	14.40	14.73	14.45
57	13.94	13.89	14.17	13.93
58	14.68	14.67	14.40	14.35
59	13.94	14.10	14.27	14.01
60	13.89	13.76	14.05	13.95
61	14.05	13.90	14.23	14.05
62	14.19	14.09	14.42	14.20
63	14.00	13.95	14.20	14.13

**Table 7-10. 16-User Beam 1CC Mid Channel Conducted Powers (LTE Band 48 – 20MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 35 of 172	

Mid Channel 1CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	1669.222	1642.330	1742.074	1676.837
Total MIMO Conducted Power (dBm)	32.23	32.15	32.41	32.24
OBW (MHz)	17.89	17.88	17.92	17.89
Scaling factor (dB)	-2.53	-2.52	-2.53	-2.53
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.17	44.10	44.35	44.19
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.832	-2.900	-2.654	-2.812

Table 7-11. 16-User Beam 1CC Mid Channel MIMO Power (LTE Band 48 – 20MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 36 of 172	

Port #	QPSK	16-QAM	64-QAM	256-QAM
0	13.96	13.86	13.96	13.97
1	14.72	14.63	14.90	14.71
2	14.00	13.97	14.17	14.05
3	14.39	14.21	14.51	14.36
4	15.07	14.92	15.30	15.13
5	14.57	14.52	14.80	14.65
6	14.56	14.37	14.28	14.60
7	14.02	14.18	14.35	14.21
8	14.40	14.30	14.56	14.39
9	14.84	14.61	15.02	14.82
10	14.05	13.98	14.21	14.06
11	14.10	14.01	14.36	14.24
12	15.10	14.99	15.31	15.06
13	14.49	14.48	14.77	14.57
14	14.02	14.18	14.31	14.17
15	14.08	14.24	14.37	14.28
16	14.31	14.21	14.50	14.27
17	14.75	14.66	14.94	14.82
18	13.85	13.80	14.00	13.84
19	14.34	14.20	14.49	14.33
20	15.16	15.09	15.28	15.13
21	14.83	14.75	15.04	14.83
22	14.35	14.28	14.38	14.39
23	14.19	14.30	14.41	14.32
24	14.89	14.77	14.96	14.84
25	14.90	14.78	15.06	14.89
26	14.50	14.38	14.61	14.17
27	14.33	14.26	14.54	14.40
28	14.88	14.79	15.09	14.94
29	15.18	15.10	15.34	15.18
30	14.42	14.38	14.66	14.52
31	14.18	14.27	14.45	14.38
32	14.08	13.95	14.24	14.03
33	15.00	14.83	15.12	14.89
34	14.13	14.00	14.01	14.16
35	14.09	14.01	14.21	14.18
36	15.26	15.15	15.45	15.25
37	14.62	14.50	14.77	14.61
38	14.45	14.28	14.52	14.39
39	14.23	14.30	14.52	14.40
40	14.08	14.01	13.56	14.13
41	14.45	14.35	14.62	14.44
42	13.90	13.80	14.13	13.92
43	14.23	14.13	14.40	14.19
44	15.02	14.88	15.20	14.99
45	14.84	14.75	15.00	14.82
46	14.26	14.12	14.38	14.24
47	13.98	13.89	14.16	14.10
48	13.93	13.81	14.09	13.93
49	14.52	14.40	14.64	14.54
50	14.22	14.12	14.35	14.15
51	14.40	14.26	14.57	14.37
52	15.00	14.83	15.10	14.93
53	14.72	14.60	14.83	14.63
54	14.37	14.52	14.63	14.48
55	14.28	14.48	14.61	14.56
56	14.43	14.44	14.98	14.79
57	14.78	14.61	14.89	14.73
58	14.10	14.02	14.34	14.19
59	14.46	14.33	14.61	14.31
60	15.13	14.98	15.14	14.94
61	14.80	14.70	14.99	14.84
62	14.44	14.39	14.67	14.45
63	14.17	14.28	14.37	14.30

**Table 7-12. 16-User Beam 1CC High Channel Conducted Powers (LTE Band 48 – 20MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 37 of 172

High Channel 1CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	1796.267	1765.772	1864.342	1805.712
Total MIMO Conducted Power (dBm)	32.54	32.47	32.71	32.57
OBW (MHz)	17.89	17.88	17.92	17.89
Scaling factor (dB)	-2.53	-2.52	-2.53	-2.53
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.49	44.41	44.64	44.51
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.514	-2.585	-2.360	-2.491

Table 7-13. 16-User Beam 1CC High Channel MIMO Power (LTE Band 48 – 20MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 38 of 172	

## 16- User Beam Configuration (3CC – 30MHz Total Bandwidth)

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	16.71	16.97	16.99	16.86
1	16.66	16.72	16.48	17.00
2	16.39	16.47	16.23	16.78
3	16.25	16.38	16.14	16.62
4	16.36	16.51	16.27	16.78
5	16.63	16.80	16.56	16.97
6	16.07	16.17	15.93	16.47
7	16.01	16.07	15.83	16.40
8	16.28	16.42	16.18	16.63
9	16.52	16.67	16.43	16.93
10	16.35	16.45	16.21	16.72
11	16.14	16.26	16.02	16.53
12	16.25	16.32	16.08	16.65
13	16.26	16.32	16.08	16.59
14	16.34	16.49	16.25	16.69
15	16.08	16.24	16.00	16.47
16	16.35	16.52	16.28	16.77
17	16.17	16.26	16.02	16.60
18	16.34	16.44	16.20	16.68
19	16.33	16.47	16.23	16.66
20	16.32	16.40	16.16	16.65
21	16.06	16.18	15.94	16.38
22	16.34	16.47	16.23	16.74
23	16.34	16.50	16.26	16.73
24	16.50	16.67	16.43	16.85
25	16.48	16.54	16.30	16.89
26	16.24	16.29	16.05	16.61
27	16.13	16.23	15.99	16.48
28	16.16	16.25	16.01	16.50
29	16.46	16.62	16.38	16.85
30	16.29	16.43	16.19	16.66
31	16.29	16.39	16.15	16.71
32	16.04	16.14	15.90	16.47
33	16.39	16.45	16.21	16.73
34	16.38	16.46	16.22	16.71
35	16.38	16.51	16.27	16.78
36	16.35	16.50	16.26	16.74
37	16.45	16.62	16.38	16.80
38	16.57	16.67	16.43	16.98
39	16.11	16.17	15.93	16.48
40	16.36	16.50	16.26	16.75
41	16.49	16.64	16.40	16.89
42	16.15	16.25	16.01	16.48
43	16.36	16.48	16.24	16.71
44	16.08	16.15	15.91	16.47
45	16.31	16.37	16.13	16.73
46	16.47	16.62	16.38	16.90
47	16.14	16.30	16.06	16.48
48	16.31	16.48	16.24	16.64
49	16.41	16.50	16.26	16.73
50	16.29	16.39	16.15	16.69
51	16.29	16.43	16.19	16.68
52	16.03	16.11	15.87	16.38
53	16.21	16.33	16.09	16.56
54	16.26	16.39	16.15	16.60
55	16.39	16.55	16.31	16.78
56	16.38	16.55	16.31	16.75
57	16.29	16.35	16.11	16.71
58	16.28	16.33	16.09	16.71
59	16.24	16.34	16.10	16.58
60	16.22	16.31	16.07	16.55
61	16.42	16.58	16.34	16.74
62	16.38	16.52	16.28	16.78
63	16.41	16.57	16.27	16.80

Table 7-14. 16-User Beam 3CC Low Channel Conducted Powers (LTE Band 48 – 30MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 39 of 172

Low Channel 3CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	2737.573	2813.423	2664.376	2981.073
Total MIMO Conducted Power (dBm)	34.37	34.49	34.26	34.74
OBW (MHz)	28.78	28.71	28.78	28.85
Scaling factor (dB)	-4.59	-4.58	-4.59	-4.60
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.25	44.38	44.13	44.61
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.747	-2.619	-2.866	-2.389

Table 7-15. 16-User Beam 3CC Low Channel MIMO Power (LTE Band 48 – 30MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 40 of 172	



Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	15.80	15.92	15.66	16.15
1	16.41	16.57	16.23	16.75
2	16.30	16.44	16.14	16.69
3	16.26	16.35	16.15	16.63
4	16.36	16.43	16.27	16.78
5	16.07	16.12	16.00	16.50
6	16.07	16.19	15.93	16.47
7	16.14	16.30	15.96	16.53
8	15.93	16.01	15.83	16.28
9	16.24	16.31	16.15	16.65
10	16.34	16.46	16.20	16.71
11	16.12	16.22	16.00	16.51
12	16.10	16.25	15.93	16.50
13	16.20	16.36	16.02	16.53
14	16.33	16.40	16.24	16.68
15	16.15	16.21	16.07	16.54
16	15.95	16.00	15.88	16.37
17	16.26	16.39	16.11	16.69
18	16.17	16.29	16.03	16.51
19	16.10	16.18	16.00	16.43
20	16.17	16.31	16.01	16.50
21	16.09	16.19	15.97	16.41
22	16.21	16.30	16.10	16.61
23	16.04	16.10	15.96	16.43
24	15.86	15.91	15.79	16.21
25	16.14	16.30	15.96	16.55
26	16.25	16.42	16.06	16.62
27	16.12	16.24	15.98	16.47
28	16.08	16.21	15.93	16.42
29	16.26	16.32	16.18	16.65
30	16.29	16.37	16.19	16.66
31	16.07	16.19	15.93	16.49
32	15.89	16.01	15.75	16.32
33	16.25	16.41	16.07	16.59
34	16.23	16.37	16.07	16.56
35	16.16	16.25	16.05	16.56
36	16.24	16.31	16.15	16.63
37	16.33	16.38	16.26	16.68
38	16.23	16.35	16.09	16.64
39	15.96	16.12	15.78	16.33
40	15.85	15.93	15.75	16.24
41	16.27	16.34	16.18	16.67
42	16.23	16.35	16.09	16.56
43	16.06	16.16	15.94	16.41
44	16.05	16.20	15.88	16.44
45	16.24	16.40	16.06	16.66
46	16.20	16.27	16.11	16.63
47	15.96	16.02	15.88	16.30
48	15.96	16.01	15.89	16.29
49	16.29	16.42	16.14	16.61
50	15.96	16.08	15.82	16.36
51	16.09	16.17	15.99	16.48
52	16.27	16.41	16.11	16.62
53	16.38	16.48	16.26	16.73
54	16.15	16.24	16.04	16.49
55	15.96	16.02	15.88	16.35
56	15.84	15.89	15.77	16.21
57	16.34	16.50	16.16	16.76
58	15.96	16.13	15.77	16.39
59	16.09	16.21	15.95	16.43
60	15.98	16.11	15.83	16.31
61	16.24	16.30	16.16	16.56
62	16.22	16.30	16.12	16.62
63	15.93	16.05	15.79	16.32

**Table 7-16. 16-User Beam 3CC Mid Channel Conducted Powers (LTE Band 48 – 30MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 41 of 172	

Mid Channel 3CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	2630.339	2695.323	2555.318	2867.403
Total MIMO Conducted Power (dBm)	34.20	34.31	34.07	34.57
OBW (MHz)	28.78	28.71	28.78	28.85
Scaling factor (dB)	-4.59	-4.58	-4.59	-4.60
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.08	44.19	43.95	44.44
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.921	-2.805	-3.048	-2.558

Table 7-17. 16-User Beam 3CC Mid Channel MIMO Power (LTE Band 48 – 30MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 42 of 172

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	15.31	15.43	15.17	15.72
1	15.74	15.90	15.56	16.16
2	15.61	15.75	15.45	15.98
3	15.66	15.75	15.55	16.05
4	15.73	15.80	15.64	16.07
5	15.79	15.84	15.72	16.12
6	15.79	15.91	15.65	16.15
7	15.78	15.94	15.60	16.15
8	15.62	15.70	15.52	16.03
9	15.69	15.76	15.60	16.04
10	15.71	15.83	15.57	16.10
11	15.56	15.66	15.44	15.93
12	15.79	15.94	15.62	16.15
13	15.50	15.66	15.32	15.93
14	15.91	15.98	15.82	16.32
15	15.68	15.74	15.60	16.05
16	15.70	15.75	15.63	16.04
17	15.74	15.87	15.59	16.07
18	15.63	15.75	15.49	16.05
19	15.66	15.74	15.56	16.09
20	15.70	15.84	15.54	16.13
21	15.74	15.84	15.62	16.18
22	15.62	15.71	15.51	15.98
23	15.55	15.61	15.47	15.92
24	15.52	15.57	15.45	15.93
25	15.81	15.97	15.63	16.16
26	15.74	15.91	15.55	16.13
27	15.66	15.78	15.52	16.07
28	15.82	15.95	15.67	16.24
29	15.94	16.00	15.86	16.31
30	15.76	15.84	15.66	16.15
31	15.58	15.70	15.44	15.92
32	15.50	15.62	15.36	15.83
33	15.77	15.93	15.59	16.19
34	15.89	16.03	15.73	16.32
35	15.78	15.87	15.67	16.14
36	15.85	15.92	15.76	16.22
37	15.71	15.76	15.64	16.12
38	15.89	16.01	15.75	16.24
39	15.63	15.79	15.45	16.02
40	15.46	15.54	15.36	15.83
41	15.52	15.59	15.43	15.88
42	15.61	15.73	15.47	16.04
43	15.53	15.63	15.41	15.94
44	15.91	16.06	15.74	16.28
45	15.85	16.01	15.67	16.19
46	15.76	15.83	15.67	16.09
47	15.41	15.47	15.33	15.83
48	15.33	15.38	15.26	15.76
49	15.63	15.76	15.48	16.07
50	15.96	16.08	15.82	16.32
51	15.84	15.92	15.74	16.21
52	15.63	15.77	15.47	16.04
53	15.69	15.79	15.57	16.10
54	15.96	16.05	15.85	16.38
55	15.68	15.74	15.60	16.05
56	15.58	15.63	15.51	15.97
57	15.82	15.98	15.64	16.16
58	16.00	16.17	15.81	16.33
59	15.67	15.79	15.53	16.09
60	15.76	15.89	15.61	16.19
61	15.72	15.78	15.64	16.16
62	15.69	15.77	15.59	16.05
63	15.43	15.55	15.29	15.80

**Table 7-18. 16-User Beam 3CC High Channel Conducted Powers (LTE Band 48 – 30MHz)**

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 43 of 172	

High Channel 3CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	2376.645	2435.410	2308.812	2597.060
Total MIMO Conducted Power (dBm)	33.76	33.87	33.63	34.14
OBW (MHz)	28.78	28.71	28.78	28.85
Scaling factor (dB)	-4.59	-4.58	-4.59	-4.60
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	43.64	43.75	43.51	44.01
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-3.361	-3.246	-3.488	-2.988

Table 7-19. 16-User Beam 3CC High Channel MIMO Power (LTE Band 48 – 30MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 44 of 172	

## 16- User Beam Configuration (2CC – 40MHz Total Bandwidth)

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	17.90	17.88	18.22	17.76
1	18.26	18.24	18.59	18.11
2	17.98	17.96	18.26	17.91
3	18.33	18.31	18.63	18.15
4	17.81	17.79	18.06	17.62
5	18.13	18.11	18.37	17.99
6	17.61	17.59	17.88	17.43
7	17.70	17.68	17.98	17.61
8	17.91	17.89	18.23	17.83
9	18.18	18.16	18.44	18.10
10	17.99	17.97	18.29	17.92
11	17.79	17.77	18.07	17.64
12	17.91	17.89	18.18	17.81
13	17.76	17.74	18.10	17.60
14	17.78	17.76	18.10	17.66
15	17.30	17.28	17.58	17.19
16	18.01	17.99	18.26	17.93
17	17.73	17.71	17.97	17.54
18	18.01	17.99	18.34	17.87
19	17.91	17.89	18.25	17.83
20	17.93	17.91	18.27	17.85
21	17.72	17.70	18.07	17.55
22	17.93	17.91	18.20	17.75
23	17.87	17.85	18.15	17.78
24	18.10	18.08	18.42	18.02
25	18.18	18.16	18.44	18.11
26	17.91	17.89	18.21	17.73
27	17.87	17.85	18.19	17.68
28	17.79	17.77	18.12	17.65
29	17.89	17.87	18.17	17.73
30	17.70	17.68	18.00	17.58
31	17.50	17.48	17.75	17.39
32	17.80	17.78	18.04	17.72
33	17.95	17.93	18.28	17.88
34	18.09	18.07	18.43	17.91
35	17.94	17.92	18.21	17.84
36	17.99	17.97	18.27	17.83
37	17.99	17.97	18.31	17.87
38	18.23	18.21	18.49	18.12
39	17.77	17.75	18.07	17.69
40	17.93	17.91	18.21	17.86
41	18.12	18.10	18.39	17.97
42	17.80	17.78	18.14	17.62
43	17.96	17.94	18.28	17.77
44	17.72	17.70	18.00	17.58
45	17.86	17.84	18.11	17.71
46	17.85	17.83	18.09	17.77
47	17.36	17.34	17.69	17.26
48	17.93	17.91	18.27	17.79
49	17.95	17.93	18.30	17.78
50	17.86	17.84	18.13	17.68
51	17.80	17.78	18.08	17.71
52	17.74	17.72	18.06	17.66
53	17.91	17.89	18.23	17.84
54	17.89	17.87	18.22	17.74
55	17.93	17.91	18.21	17.79
56	17.96	17.94	18.26	17.86
57	18.00	17.98	18.25	17.84
58	17.91	17.89	18.15	17.79
59	17.93	17.91	18.26	17.83
60	17.89	17.87	18.23	17.82
61	17.85	17.83	18.20	17.67
62	17.84	17.82	18.11	17.65
63	17.67	17.65	17.95	17.53

Table 7-20. 16-User Beam 2CC Low Channel Conducted Powers (LTE Band 48 – 40MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 45 of 172

Low Channel 2CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	3938.421	3920.325	4215.659	3825.367
Total MIMO Conducted Power (dBm)	35.95	35.93	36.25	35.83
OBW (MHz)	37.73	37.72	37.68	37.71
Scaling factor (dB)	-5.77	-5.77	-5.76	-5.76
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.66	44.64	44.96	44.53
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.344	-2.364	-2.043	-2.468

Table 7-21. 16-User Beam 2CC Low Channel MIMO Power (LTE Band 48 – 40MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 46 of 172	

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	17.81	17.66	17.87	17.62
1	17.42	17.23	17.49	17.22
2	18.26	18.09	18.37	18.14
3	17.41	17.29	17.46	17.18
4	17.10	17.00	17.19	16.86
5	17.25	17.17	17.35	17.06
6	17.39	17.24	17.52	17.16
7	17.36	17.17	17.50	17.22
8	17.83	17.72	17.86	17.70
9	17.17	17.07	17.19	17.04
10	18.20	18.05	18.23	18.08
11	17.45	17.32	17.47	17.25
12	17.20	17.02	17.27	17.05
13	17.10	16.91	17.16	16.89
14	17.59	17.49	17.72	17.42
15	17.40	17.31	17.51	17.24
16	17.98	17.90	18.05	17.85
17	17.20	17.04	17.24	16.96
18	17.80	17.65	17.83	17.61
19	17.44	17.33	17.56	17.31
20	17.15	16.98	17.28	17.02
21	16.98	16.85	17.12	16.76
22	17.96	17.84	18.02	17.73
23	17.15	17.06	17.22	17.01
24	17.95	17.87	18.06	17.82
25	17.26	17.07	17.31	17.14
26	18.20	18.00	18.29	17.97
27	17.35	17.20	17.42	17.11
28	17.28	17.12	17.34	17.09
29	17.22	17.13	17.35	17.01
30	17.53	17.42	17.64	17.36
31	17.36	17.21	17.43	17.20
32	17.44	17.29	17.48	17.31
33	17.29	17.10	17.32	17.17
34	17.47	17.30	17.59	17.24
35	17.38	17.26	17.51	17.23
36	17.24	17.14	17.38	17.03
37	17.31	17.23	17.37	17.14
38	17.52	17.37	17.55	17.36
39	17.28	17.09	17.30	17.15
40	17.52	17.41	17.59	17.40
41	17.17	17.07	17.23	16.97
42	18.41	18.26	18.54	18.18
43	17.32	17.19	17.43	17.08
44	17.03	16.85	17.10	16.84
45	17.18	16.99	17.22	16.98
46	17.47	17.37	17.50	17.34
47	17.38	17.29	17.50	17.23
48	17.62	17.54	17.75	17.43
49	17.44	17.28	17.58	17.22
50	18.05	17.90	18.11	17.82
51	17.28	17.17	17.35	17.14
52	17.21	17.04	17.32	17.08
53	17.52	17.39	17.57	17.40
54	17.40	17.28	17.49	17.20
55	17.27	17.18	17.38	17.08
56	17.75	17.67	17.82	17.60
57	17.28	17.09	17.35	17.07
58	18.03	17.83	18.06	17.86
59	17.30	17.15	17.37	17.15
60	17.18	17.09	17.24	17.06
61	17.33	17.25	17.46	17.10
62	17.54	17.45	17.65	17.30
63	17.33	17.25	17.40	17.14

**Table 7-22. 16-User Beam 2CC Mid Channel Conducted Powers (LTE Band 48 – 40MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 47 of 172

Mid Channel 2CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	3579.150	3471.230	3645.964	3436.680
Total MIMO Conducted Power (dBm)	35.54	35.40	35.62	35.36
OBW (MHz)	37.73	37.72	37.68	37.71
Scaling factor (dB)	-5.77	-5.77	-5.76	-5.76
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.24	44.11	44.33	44.07
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.760	-2.892	-2.673	-2.933

Table 7-23. 16-User Beam 2CC Mid Channel MIMO Power (LTE Band 48 – 40MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 48 of 172



Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	17.40	17.42	17.18	17.37
1	18.17	18.20	18.27	18.16
2	17.45	17.52	17.44	17.46
3	17.85	17.86	17.83	17.91
4	18.42	18.47	18.45	18.50
5	17.91	17.97	17.90	18.01
6	17.95	18.04	18.03	17.98
7	17.46	17.56	17.55	17.45
8	17.85	17.84	17.94	17.92
9	18.29	18.27	18.39	18.37
10	17.51	17.50	17.53	17.54
11	17.45	17.43	17.52	17.50
12	18.44	18.47	18.45	18.44
13	17.88	17.90	17.93	17.87
14	17.43	17.52	17.49	17.51
15	17.50	17.57	17.59	17.59
16	17.76	17.79	17.74	17.86
17	18.14	18.14	18.17	18.16
18	17.23	17.22	17.32	17.26
19	17.80	17.88	17.89	17.87
20	18.51	18.60	18.51	18.52
21	18.17	18.27	18.16	18.22
22	17.74	17.76	17.82	17.80
23	17.54	17.57	17.63	17.63
24	18.33	18.40	18.43	18.43
25	18.35	18.36	18.34	18.34
26	17.95	18.00	17.93	17.93
27	17.67	17.70	17.70	17.70
28	18.32	18.34	18.33	18.34
29	18.63	18.72	18.68	18.72
30	17.87	17.94	17.93	17.94
31	17.64	17.67	17.73	17.67
32	17.43	17.43	17.53	17.46
33	18.34	18.33	18.33	18.33
34	17.52	17.60	17.59	17.53
35	17.48	17.57	17.49	17.54
36	18.64	18.74	18.69	18.72
37	18.08	18.10	18.14	18.18
38	17.80	17.79	17.89	17.83
39	17.57	17.55	17.67	17.56
40	17.47	17.50	17.49	17.54
41	17.80	17.82	17.79	17.88
42	17.34	17.43	17.32	17.37
43	17.68	17.75	17.71	17.73
44	18.47	18.50	18.49	18.47
45	18.28	18.28	18.37	18.27
46	17.71	17.70	17.78	17.79
47	17.43	17.51	17.46	17.52
48	17.39	17.48	17.39	17.49
49	17.87	17.97	17.86	17.89
50	17.56	17.58	17.64	17.59
51	17.79	17.82	17.88	17.86
52	18.46	18.53	18.56	18.47
53	18.07	18.08	18.09	18.12
54	17.71	17.76	17.74	17.77
55	17.67	17.74	17.74	17.76
56	17.78	17.81	17.79	17.88
57	18.22	18.25	18.27	18.21
58	17.55	17.54	17.62	17.53
59	17.91	17.94	18.01	17.94
60	18.59	18.61	18.58	18.61
61	18.15	18.24	18.13	18.24
62	17.78	17.85	17.81	17.85
63	17.56	17.59	17.59	17.59

**Table 7-24. 16-User Beam 2CC High Channel Conducted Powers (LTE Band 48 – 40MHz)**

FCC ID: A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 49 of 172	

High Channel 2CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	3934.149	3971.115	3970.303	3973.562
Total MIMO Conducted Power (dBm)	35.95	35.99	35.99	35.99
OBW (MHz)	37.73	37.72	37.68	37.71
Scaling factor (dB)	-5.77	-5.77	-5.76	-5.76
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.65	44.69	44.70	44.70
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.349	-2.308	-2.303	-2.303

Table 7-25. 16-User Beam 2CC High Channel MIMO Power (LTE Band 48 – 40MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 50 of 172	

## 16- User Beam Configuration (3CC – 50MHz Total Bandwidth)

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	18.35	18.62	18.63	18.22
1	18.70	18.96	18.99	18.56
2	18.50	18.72	18.83	18.41
3	18.74	19.02	19.01	18.63
4	18.21	18.45	18.52	18.15
5	18.58	18.81	18.90	18.53
6	18.02	18.22	18.37	17.94
7	18.20	18.39	18.56	18.11
8	18.42	18.72	18.67	18.29
9	18.69	19.00	18.93	18.62
10	18.51	18.81	18.76	18.40
11	18.23	18.54	18.47	18.14
12	18.40	18.66	18.69	18.32
13	18.19	18.46	18.47	18.04
14	18.25	18.45	18.60	18.12
15	17.78	18.00	18.11	17.69
16	18.52	18.78	18.81	18.46
17	18.13	18.42	18.39	18.08
18	18.46	18.76	18.71	18.32
19	18.42	18.63	18.76	18.27
20	18.44	18.64	18.79	18.29
21	18.14	18.33	18.50	17.98
22	18.34	18.61	18.62	18.26
23	18.37	18.63	18.66	18.28
24	18.61	18.83	18.94	18.48
25	18.70	18.98	18.97	18.63
26	18.32	18.56	18.63	18.21
27	18.27	18.53	18.56	18.14
28	18.24	18.51	18.52	18.10
29	18.32	18.52	18.67	18.23
30	18.17	18.39	18.50	18.06
31	17.98	18.24	18.27	17.92
32	18.31	18.60	18.57	18.26
33	18.47	18.77	18.72	18.33
34	18.50	18.71	18.84	18.35
35	18.43	18.63	18.78	18.35
36	18.42	18.61	18.78	18.33
37	18.46	18.73	18.74	18.33
38	18.71	19.01	18.96	18.64
39	18.28	18.59	18.52	18.17
40	18.45	18.71	18.74	18.36
41	18.56	18.83	18.84	18.48
42	18.21	18.41	18.56	18.06
43	18.36	18.58	18.69	18.23
44	18.17	18.43	18.46	18.08
45	18.30	18.59	18.56	18.24
46	18.36	18.66	18.61	18.31
47	17.85	18.06	18.19	17.71
48	18.38	18.58	18.73	18.23
49	18.37	18.56	18.73	18.21
50	18.27	18.54	18.55	18.19
51	18.30	18.56	18.59	18.21
52	18.25	18.47	18.58	18.12
53	18.43	18.71	18.70	18.30
54	18.33	18.57	18.64	18.19
55	18.38	18.60	18.71	18.29
56	18.45	18.71	18.74	18.34
57	18.43	18.69	18.72	18.37
58	18.38	18.68	18.63	18.33
59	18.42	18.68	18.71	18.28
60	18.41	18.68	18.69	18.26
61	18.26	18.46	18.61	18.10
62	18.24	18.46	18.57	18.16
63	18.12	18.38	18.41	18.03

Table 7-26. 16-User Beam 3CC Low Channel Conducted Powers (LTE Band 48 – 50MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 51 of 172

Low Channel 3CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	4382.008	4641.988	4695.412	4277.184
Total MIMO Conducted Power (dBm)	36.42	36.67	36.72	36.31
OBW (MHz)	48.16	48.13	48.16	48.09
Scaling factor (dB)	-6.83	-6.82	-6.83	-6.82
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.06	44.31	44.36	43.96
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.941	-2.688	-2.641	-3.040

Table 7-27. 16-User Beam 3CC Low Channel MIMO Power (LTE Band 48 – 50MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 52 of 172	

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	18.26	18.55	18.31	18.11
1	17.86	18.16	17.90	17.72
2	18.66	19.00	18.66	18.47
3	17.87	18.15	17.93	17.70
4	17.52	17.84	17.54	17.30
5	17.66	17.99	17.67	17.43
6	17.77	18.13	17.75	17.57
7	17.73	18.10	17.70	17.54
8	18.31	18.57	18.39	18.16
9	17.66	17.91	17.75	17.45
10	18.23	18.49	18.31	18.06
11	17.94	18.19	18.03	17.75
12	17.64	17.94	17.68	17.44
13	17.55	17.84	17.60	17.42
14	17.97	18.33	17.95	17.82
15	17.80	18.14	17.80	17.61
16	18.42	18.72	18.46	18.20
17	17.67	17.94	17.74	17.44
18	18.28	18.54	18.36	18.14
19	17.83	18.18	17.82	17.70
20	17.53	17.89	17.51	17.40
21	17.35	17.72	17.32	17.23
22	18.41	18.70	18.46	18.21
23	17.59	17.89	17.63	17.40
24	18.35	18.69	18.35	18.20
25	17.72	18.00	17.78	17.51
26	18.62	18.94	18.64	18.45
27	17.79	18.09	17.83	17.64
28	17.73	18.02	17.78	17.59
29	17.60	17.96	17.58	17.41
30	17.93	18.27	17.93	17.76
31	17.80	18.10	17.84	17.58
32	17.91	18.18	17.98	17.68
33	17.77	18.03	17.85	17.63
34	17.86	18.21	17.85	17.73
35	17.76	18.12	17.74	17.56
36	17.61	17.98	17.58	17.42
37	17.76	18.05	17.81	17.61
38	18.00	18.26	18.08	17.79
39	17.77	18.02	17.86	17.60
40	17.96	18.26	18.00	17.77
41	17.62	17.91	17.67	17.42
42	18.79	19.15	18.77	18.66
43	17.72	18.06	17.72	17.57
44	17.47	17.77	17.51	17.28
45	17.65	17.92	17.72	17.43
46	17.95	18.21	18.03	17.72
47	17.77	18.12	17.76	17.63
48	18.00	18.36	17.98	17.87
49	17.81	18.18	17.78	17.69
50	18.50	18.79	18.55	18.30
51	17.72	18.02	17.76	17.53
52	17.61	17.95	17.61	17.46
53	17.98	18.26	18.04	17.83
54	17.82	18.14	17.84	17.68
55	17.67	18.01	17.67	17.48
56	18.19	18.49	18.23	18.02
57	17.72	18.02	17.76	17.50
58	18.51	18.77	18.59	18.28
59	17.74	18.04	17.78	17.60
60	17.63	17.92	17.68	17.50
61	17.71	18.07	17.69	17.59
62	17.94	18.28	17.94	17.74
63	17.77	18.07	17.81	17.58

**Table 7-28. 16-User Beam 3CC Mid Channel Conducted Powers (LTE Band 48 – 50MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 53 of 172

Mid Channel 3CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	3944.392	4236.333	3971.927	3788.965
Total MIMO Conducted Power (dBm)	35.96	36.27	35.99	35.79
OBW (MHz)	48.16	48.13	48.16	48.09
Scaling factor (dB)	-6.83	-6.82	-6.83	-6.82
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	43.60	43.92	43.63	43.43
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-3.398	-3.085	-3.368	-3.566

Table 7-29. 16-User Beam 3CC Mid Channel MIMO Power (LTE Band 48 – 50MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 54 of 172	

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	17.92	18.10	17.84	17.74
1	18.70	18.89	18.61	18.51
2	17.90	18.09	17.81	17.71
3	18.41	18.61	18.31	18.21
4	18.99	19.08	19.00	18.90
5	18.43	18.51	18.45	18.35
6	18.51	18.64	18.48	18.38
7	17.93	18.11	17.85	17.75
8	18.31	18.50	18.22	18.12
9	18.75	18.94	18.66	18.56
10	17.96	18.16	17.86	17.76
11	17.98	18.07	17.99	17.89
12	18.92	19.00	18.94	18.84
13	18.42	18.55	18.39	18.29
14	17.93	18.08	17.88	17.78
15	17.99	18.15	17.93	17.83
16	18.22	18.41	18.13	18.03
17	18.71	18.84	18.68	18.58
18	17.75	17.87	17.73	17.63
19	18.26	18.46	18.16	18.06
20	18.97	19.06	18.98	18.88
21	18.72	18.80	18.74	18.64
22	18.30	18.43	18.27	18.17
23	18.01	18.10	18.02	17.92
24	18.79	18.97	18.71	18.61
25	18.80	18.99	18.71	18.61
26	18.51	18.70	18.42	18.32
27	18.24	18.32	18.26	18.16
28	18.84	19.02	18.76	18.66
29	19.17	19.36	19.08	18.98
30	18.37	18.56	18.28	18.18
31	18.13	18.33	18.03	17.93
32	17.89	17.98	17.90	17.80
33	18.79	18.87	18.81	18.71
34	18.08	18.21	18.05	17.95
35	17.96	18.09	17.93	17.83
36	19.18	19.30	19.16	19.06
37	18.58	18.78	18.48	18.38
38	18.29	18.38	18.30	18.20
39	18.03	18.11	18.05	17.95
40	17.92	18.05	17.89	17.79
41	18.33	18.42	18.34	18.24
42	17.90	18.08	17.82	17.72
43	18.25	18.44	18.16	18.06
44	18.99	19.18	18.90	18.80
45	18.81	18.99	18.73	18.63
46	18.17	18.36	18.08	17.98
47	17.91	18.10	17.82	17.72
48	17.91	18.11	17.81	17.71
49	18.42	18.51	18.43	18.33
50	18.12	18.20	18.14	18.04
51	18.26	18.39	18.23	18.13
52	18.92	19.12	18.82	18.72
53	18.52	18.61	18.53	18.43
54	18.24	18.32	18.26	18.16
55	18.19	18.32	18.16	18.06
56	18.26	18.35	18.27	18.17
57	18.76	18.94	18.68	18.58
58	18.05	18.24	17.96	17.86
59	18.39	18.58	18.30	18.20
60	19.04	19.24	18.94	18.84
61	18.71	18.80	18.72	18.62
62	18.35	18.43	18.37	18.27
63	18.08	18.21	18.05	17.95

**Table 7-30. 16-User Beam 3CC High Channel Conducted Powers (LTE Band 48 – 50MHz)**

<b>FCC ID:</b> A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 55 of 172	

High Channel 3CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	4421.218	4571.539	4375.941	4276.333
Total MIMO Conducted Power (dBm)	36.46	36.60	36.41	36.31
OBW (MHz)	48.16	48.13	48.16	48.09
Scaling factor (dB)	-6.83	-6.82	-6.83	-6.82
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.10	44.25	44.05	43.96
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.902	-2.754	-2.947	-3.040

Table 7-31. 16-User Beam 3CC High Channel MIMO Power (LTE Band 48 – 50MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 56 of 172



## 16- User Beam Configuration (3CC – 60MHz Total Bandwidth)

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	19.10	19.18	19.02	18.85
1	19.46	19.50	19.34	19.20
2	19.18	19.24	19.08	18.97
3	19.53	19.64	19.48	19.30
4	19.01	19.14	18.98	18.83
5	19.33	19.48	19.32	19.16
6	18.81	18.89	18.73	18.61
7	18.90	18.94	18.78	18.69
8	19.11	19.23	19.07	18.86
9	19.38	19.51	19.35	19.19
10	19.19	19.27	19.11	18.96
11	18.99	19.09	18.93	18.78
12	19.11	19.16	19.00	18.91
13	18.96	19.00	18.84	18.69
14	18.98	19.11	18.95	18.73
15	18.50	18.64	18.48	18.29
16	19.21	19.36	19.20	19.03
17	18.93	19.00	18.84	18.76
18	19.21	19.29	19.13	18.95
19	19.11	19.23	19.07	18.84
20	19.13	19.19	19.03	18.86
21	18.92	19.02	18.86	18.64
22	19.13	19.24	19.08	18.93
23	19.07	19.21	19.05	18.86
24	19.30	19.45	19.29	19.05
25	19.38	19.42	19.26	19.19
26	19.11	19.14	18.98	18.88
27	19.07	19.15	18.99	18.82
28	18.99	19.06	18.90	18.73
29	19.09	19.23	19.07	18.88
30	18.90	19.02	18.86	18.67
31	18.70	18.78	18.62	18.52
32	19.00	19.08	18.92	18.83
33	19.15	19.19	19.03	18.89
34	19.29	19.35	19.19	19.02
35	19.14	19.25	19.09	18.94
36	19.19	19.32	19.16	18.98
37	19.19	19.34	19.18	18.94
38	19.43	19.51	19.35	19.24
39	18.97	19.01	18.85	18.74
40	19.13	19.25	19.09	18.92
41	19.32	19.45	19.29	19.12
42	19.00	19.08	18.92	18.73
43	19.16	19.26	19.10	18.91
44	18.92	18.97	18.81	18.71
45	19.06	19.10	18.94	18.88
46	19.05	19.18	19.02	18.88
47	18.56	18.70	18.54	18.30
48	19.13	19.28	19.12	18.86
49	19.15	19.22	19.06	18.87
50	19.06	19.14	18.98	18.86
51	19.00	19.12	18.96	18.79
52	18.94	19.00	18.84	18.69
53	19.11	19.21	19.05	18.86
54	19.09	19.20	19.04	18.83
55	19.13	19.27	19.11	18.92
56	19.16	19.31	19.15	18.93
57	19.20	19.24	19.08	19.02
58	19.11	19.14	18.98	18.94
59	19.13	19.21	19.05	18.87
60	19.09	19.16	19.00	18.82
61	19.05	19.19	19.03	18.77
62	19.04	19.16	19.00	18.84
63	18.87	18.95	18.79	18.66

Table 7-32. 16-User Beam 3CC Low Channel Conducted Powers (LTE Band 48 – 60MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 57 of 172

Low Channel 3CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	5191.850	5306.098	5114.171	4929.527
Total MIMO Conducted Power (dBm)	37.15	37.25	37.09	36.93
OBW (MHz)	57.45	57.54	57.45	57.54
Scaling factor (dB)	-7.59	-7.60	-7.59	-7.60
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.03	44.12	43.96	43.80
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.971	-2.883	-3.036	-3.203

Table 7-33. 16-User Beam 3CC Low Channel MIMO Power (LTE Band 48 – 60MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 58 of 172

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	18.8	18.99	18.87	18.61
1	18.39	18.62	18.45	18.19
2	19.37	19.58	19.48	19.22
3	18.54	18.70	18.63	18.37
4	18.09	18.23	18.23	17.97
5	18.28	18.40	18.43	18.17
6	18.60	18.79	18.72	18.46
7	18.47	18.70	18.58	18.32
8	18.96	19.11	19.03	18.77
9	18.16	18.30	18.29	18.03
10	19.23	19.42	19.32	19.06
11	18.56	18.73	18.67	18.41
12	18.37	18.59	18.49	18.23
13	18.29	18.52	18.34	18.08
14	18.60	18.74	18.67	18.41
15	18.39	18.52	18.50	18.24
16	18.95	19.07	19.09	18.83
17	18.33	18.53	18.48	18.22
18	18.91	19.10	18.97	18.71
19	18.47	18.62	18.52	18.26
20	18.14	18.35	18.19	17.93
21	18.26	18.43	18.30	18.04
22	19.07	19.23	19.19	18.93
23	18.28	18.41	18.39	18.13
24	18.94	19.06	19.01	18.75
25	18.29	18.52	18.42	18.16
26	19.19	19.43	19.28	19.02
27	18.34	18.53	18.41	18.15
28	18.25	18.45	18.31	18.05
29	18.41	18.54	18.52	18.26
30	18.74	18.89	18.83	18.57
31	18.47	18.66	18.61	18.35
32	18.57	18.76	18.72	18.46
33	18.28	18.51	18.34	18.08
34	18.50	18.71	18.55	18.29
35	18.49	18.65	18.61	18.35
36	18.41	18.55	18.52	18.26
37	18.50	18.62	18.57	18.31
38	18.51	18.70	18.64	18.38
39	18.25	18.48	18.34	18.08
40	18.63	18.78	18.74	18.48
41	18.30	18.44	18.42	18.16
42	19.40	19.59	19.45	19.19
43	18.35	18.52	18.42	18.16
44	18.24	18.46	18.35	18.09
45	18.29	18.52	18.43	18.17
46	18.46	18.60	18.61	18.35
47	18.35	18.48	18.41	18.15
48	18.81	18.93	18.86	18.60
49	18.43	18.63	18.47	18.21
50	19.02	19.21	19.14	18.88
51	18.39	18.54	18.50	18.24
52	18.34	18.55	18.41	18.15
53	18.51	18.68	18.58	18.32
54	18.43	18.59	18.49	18.23
55	18.44	18.57	18.55	18.29
56	18.94	19.06	19.03	18.77
57	18.29	18.52	18.43	18.17
58	19.02	19.26	19.17	18.91
59	18.27	18.46	18.33	18.07
60	18.29	18.49	18.34	18.08
61	18.46	18.59	18.50	18.24
62	18.53	18.68	18.65	18.39
63	18.36	18.55	18.47	18.21

**Table 7-34. 16-User Beam 3CC Mid Channel Conducted Powers (LTE Band 48 – 60MHz)**

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 59 of 172	

Mid Channel 3CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	4578.498	4767.546	4679.499	4407.572
Total MIMO Conducted Power (dBm)	36.61	36.78	36.70	36.44
OBW (MHz)	57.45	57.54	57.45	57.54
Scaling factor (dB)	-7.59	-7.60	-7.59	-7.60
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	43.48	43.65	43.58	43.31
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-3.517	-3.347	-3.422	-3.689

Table 7-35. 16-User Beam 3CC Mid Channel MIMO Power (LTE Band 48 – 60MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 60 of 172	

Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0	18.97	19.15	19.10	18.91
1	19.72	19.91	19.84	18.19
2	19.00	19.10	19.12	19.22
3	19.38	19.47	19.49	18.37
4	20.17	19.89	19.39	17.97
5	19.68	19.84	19.91	18.17
6	19.62	19.77	19.80	18.46
7	19.03	19.14	19.16	18.32
8	19.40	19.51	19.52	18.77
9	19.84	19.67	19.96	18.03
10	19.04	19.17	19.15	19.06
11	19.20	19.33	19.42	18.41
12	20.21	19.97	19.44	18.23
13	19.55	19.74	19.73	18.08
14	19.06	19.16	19.22	18.41
15	19.11	19.20	19.26	18.24
16	19.31	19.41	19.43	18.83
17	19.81	19.89	19.99	18.22
18	18.92	19.07	19.11	18.71
19	19.33	19.52	19.44	18.26
20	20.26	19.39	19.48	17.93
21	19.94	19.73	19.14	18.04
22	19.41	19.56	19.59	18.93
23	19.29	19.42	19.51	18.13
24	19.90	19.88	19.03	18.75
25	19.90	19.96	19.02	18.16
26	19.50	19.65	19.62	19.02
27	19.44	19.57	19.67	18.15
28	19.89	19.48	19.83	18.05
29	20.18	19.67	19.87	18.26
30	19.42	19.52	19.54	18.57
31	19.17	19.26	19.28	18.35
32	19.18	19.26	19.40	18.46
33	20.11	19.68	19.87	18.08
34	19.19	19.28	19.37	18.29
35	19.15	19.23	19.33	18.35
36	20.33	19.97	19.86	18.26
37	19.61	19.76	19.72	18.31
38	19.55	19.66	19.77	18.38
39	19.34	19.51	19.57	18.08
40	19.14	19.23	19.32	18.48
41	19.55	19.64	19.77	18.16
42	18.91	19.01	19.04	19.19
43	19.23	19.32	19.35	18.16
44	20.02	19.31	19.76	18.09
45	19.85	19.93	19.98	18.17
46	19.26	19.42	19.38	18.35
47	18.98	19.17	19.10	18.15
48	18.92	19.12	19.03	18.60
49	19.62	19.77	19.84	18.21
50	19.33	19.49	19.56	18.88
51	19.46	19.55	19.64	18.24
52	19.99	19.87	19.56	18.15
53	19.82	19.97	19.64	18.32
54	19.48	19.61	19.71	18.23
55	19.34	19.52	19.52	18.29
56	19.53	19.72	19.75	18.77
57	19.79	19.89	19.92	18.17
58	19.10	19.19	19.22	18.91
59	19.46	19.54	19.58	18.07
60	20.12	19.93	19.78	18.08
61	19.90	19.88	19.73	18.24
62	19.55	19.66	19.78	18.39
63	19.23	19.40	19.41	18.21

**Table 7-36. 16-User Beam 3CC High Channel Conducted Powers (LTE Band 48 – 60MHz)**

FCC ID: A3LMT6402-48A		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 61 of 172

High Channel 3CC	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO Conducted Power (mW)	5740.388	5766.878	5742.684	4412.765
Total MIMO Conducted Power (dBm)	37.59	37.61	37.59	36.45
OBW (MHz)	57.45	57.54	57.45	57.54
Scaling factor (dB)	-7.59	-7.60	-7.59	-7.60
Ant. Gain(dBi)	23.50	23.50	23.50	23.50
16 beam reduction (dB)	-12.04	-12.04	-12.04	-12.04
BF Gain (dB)	3.01	3.01	3.01	3.01
MIMO EIRP (dBm/10 MHz)	44.47	44.48	44.47	43.32
FCC EIRP Limit (dBm/10MHz)	47.0	47.0	47.0	47.0
Margin (dB)	-2.534	-2.521	-2.533	-3.684

Table 7-37. 16-User Beam 3CC High Channel MIMO Power (LTE Band 48 – 60MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 62 of 172

## 7.4 Peak Power Spectral Density Measurement §96.41(b)

### Test Overview and Limit

The peak power density is measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated and the worst case configuration results are reported in this section.

**The maximum permissible power spectral density is 37 dBm in any 1 MHz band.**

### Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.2.2

ANSI/TIA-603-E-2016 – Section 2.2.17

KDB 662911 D01 v02r01

– Section E)2) In-Band Power Spectral Density (PSD) Measurements

b) Measure and sum spectral maxima across the outputs.

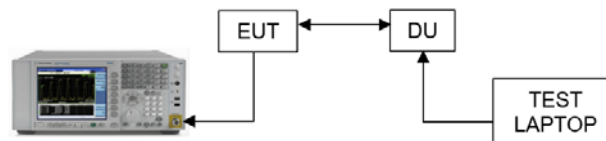
c) Measure and add 10 log(NANT) dB

### Test Settings

1. Analyzer was set to center frequency of the B48 Channel.
2. RBW = 1 MHz
3. VBW = 3 MHz
4. Detector = Average (RMS) and Trace mode = Clear write  
Refer test note 5 for additional details.
5. Sweep time = 1 second.  
Refer test note 5 for additional details.
6. Number of points > 2\*Span/RBW
7. The trace was allowed to stabilize

### Test Setup

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



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

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 63 of 172

**Test Notes**

1. The channel power measurements are done with a Reference Level offset at 0.55 dB which consists of the test jig used in the measurement path. Additional corrections were added for the cable, connectors and attenuators used in the measurement.
2. The port with highest power i.e. worst case port per modulation has been highlighted in the following tables.
3. 16QAM was observed to be the worst case modulation. The port producing the highest PPSD includes other supported modulation schemes for comparison.
4. The 16 User Beam configuration has the highest power amongst all modes. PSDs for this mode were found to be the worst case. The 16-User Beam PSD MIMO calculation and plots are included in the report.
5. 16 User Beam PSDs were found to be higher with 1CC compared to 2CC and 3CC so 1CC was determined to be the worst case for PSD. Both 10MHz and 20MHz 1CC configurations were checked with 20MHz being the worst case and therefore reported.
6. Consider the following factors for MIMO Power Spectral Density:  
The power spectral density is measured as dBm / MHz, with the resolution bandwidth of 1 MHz. PSDs are summed up in linear using the measure-and-sum technique defined in KDB 971168 D01 v03r01-Section E) 2).
7. PSD per port (dBm / MHz) is converted to a linear value (mW). A summation of linear powers for all 64 ports gives us the total MIMO conducted PSD (mW). We convert this back to logarithmic scale for further PSD calculations.
8. 16- beam reduction:  
The 16-beam reduction is applicable in the 16-User Beam operating mode of the EUT. It is a logarithmic factor applied to account for maximum 16 spatially separated beams operate simultaneously.  
16-beam power reduction factor (dB) =  $10 * \log (1 / 16) = -12.04 \text{ dB}$
9. Beamforming (BF) Gain:  
This logarithmic factor accounts for the gain if two spatially different beams overlap in real-time.  
BF Gain =  $10 * \log (2) = 3.01 \text{ dB}$
10. Antenna Gains (dBi) are provided by the client.
11. Sample Calculation:  
Let us assume the following numbers:
  - a. Total MIMO PSD = 15 dBm / MHz.
  - b. Antenna Gain = 23.5 dBi

	<b>Factors</b>	<b>Value</b>	<b>Unit</b>
<b>Total MIMO PSD</b>		15	dBm /MHz
Applying Reductions:			
Antenna Gain		23.5	dBi
16 - Beam Reduction	$= 10 * \log (1 / 16)$	-12.04	dB
	$= =$		
BF Gain	$= 10 * \log ( 2 ) =$	3.01	dB
<b>Total MIMO Radiated PSD</b>	$=$	29.47	dBm/ MHz
$= \text{Total MIMO PSD} + \text{Antenna Gain} +$ $16 + \text{Beam Reduction} + \text{BF Gain}$			
FCC PSD Limit		37	dBm/ MHz
<b>Margin = FCC EIRP Limit – MIMO EIRP</b>	$= 29.47-37$	-7.53	dB

<b>FCC ID:</b> A3LMT6402-48A	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1907220128-01.	<b>Test Dates:</b> 7/1/2019-7/29/2019	<b>EUT Type:</b> Massive MIMO CBSD	Page 64 of 172



Port #	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)
0		3.75		
1		4.04		
2		4.22		
3		4.11		
4		4.24		
5		3.79		
6		4.20		
7		3.96		
8		3.95		
9		3.84		
10	2.84	4.42	2.98	2.81
11		4.24		
12		4.17		
13		3.85		
14		4.22		
15		3.74		
16		3.85		
17		4.01		
18		4.16		
19		3.94		
20		3.96		
21		3.68		
22		4.23		
23		3.80		
24		3.83		
25		3.95		
26		4.41		
27		3.78		
28		4.00		
29		4.07		
30		4.29		
31		3.93		
32		3.77		
33		3.80		
34		4.33		
35		4.05		
36		4.12		
37		3.87		
38		4.34		
39		3.86		
40		3.61		
41		3.72		
42		4.40		
43		3.90		
44		3.86		
45		3.75		
46		4.27		
47		3.73		
48		3.81		
49		4.03		
50		4.06		
51		3.90		
52		4.07		
53		3.98		
54		4.26		
55		3.90		
56		3.85		
57		3.81		
58		4.29		
59		3.79		
60		3.78		
61		3.99		
62		4.12		
63		3.67		

**Table 7-38. 16-User Beam 1CC Mid Channel Peak Power Spectral Density (LTE Band 48 – 20MHz)**

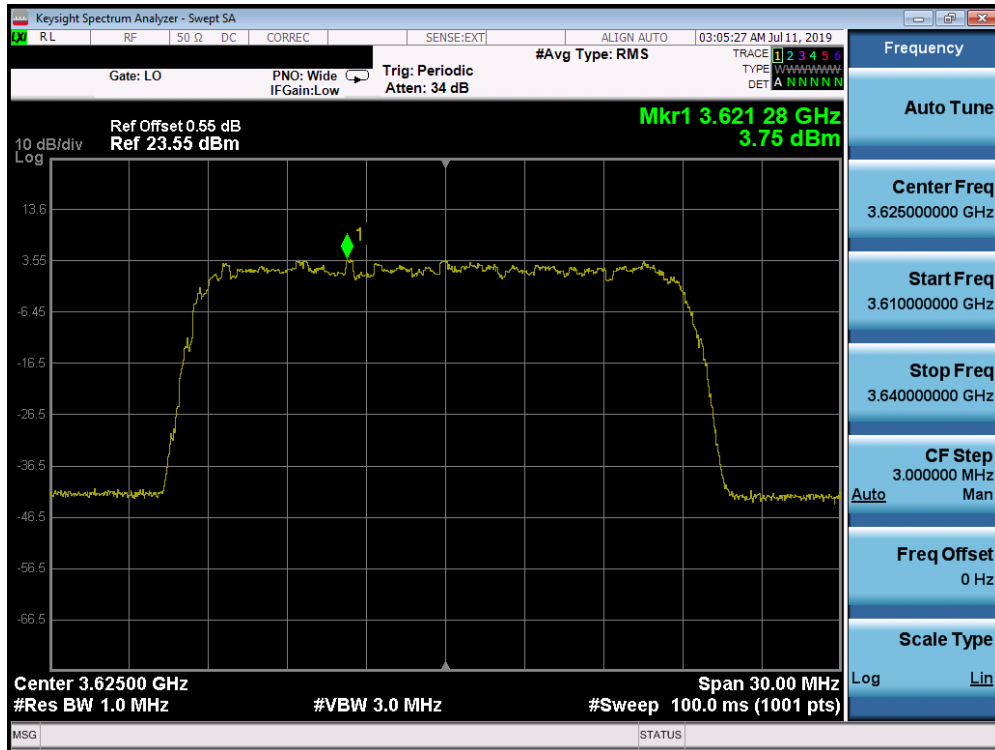
FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 65 of 172	

Mid Channel 1CC 20MHz	QPSK	16-QAM	64-QAM	256-QAM
Total MIMO PSD (mW/MHz)	64.92	160.55	64.99	64.91
Total MIMO PSD (dBm/MHz)	18.12	22.06	18.13	18.12
Ant. Gain (dBi)	23.50	23.50	23.50	23.50
16-beam Multiplexing Reduction(dB)	-12.04	-12.04	-12.04	-12.04
Beamforming Gain (dB)	3.01	3.01	3.01	3.01
Total MIMO Radiated PSD (dBm/MHz)	32.59	36.53	32.60	32.59
FCC Maximum PSD Limit (dBm/MHz)	37.00	37.00	37.00	37.00
Margin (dB)	-4.41	-0.47	-4.40	-4.41

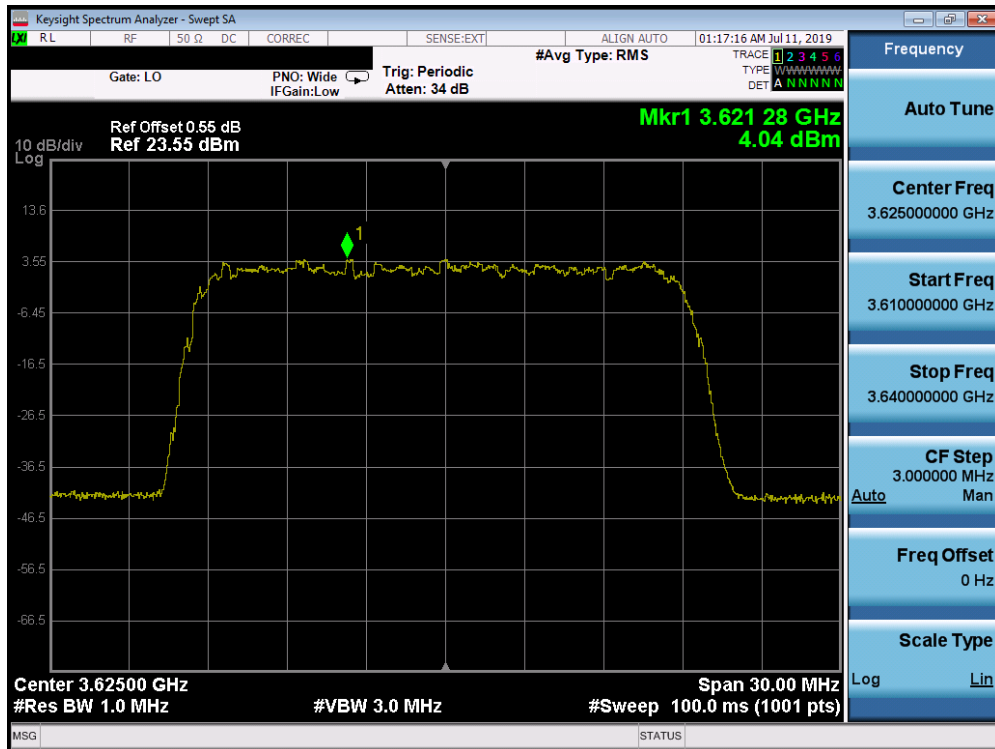
Table 7-39. 16-User Beam 1CC Mid Channel MIMO Peak Power Spectral Density (LTE Band 48 – 20MHz)

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD	Page 66 of 172	

### 16- User Beam 1CC Mid Channel

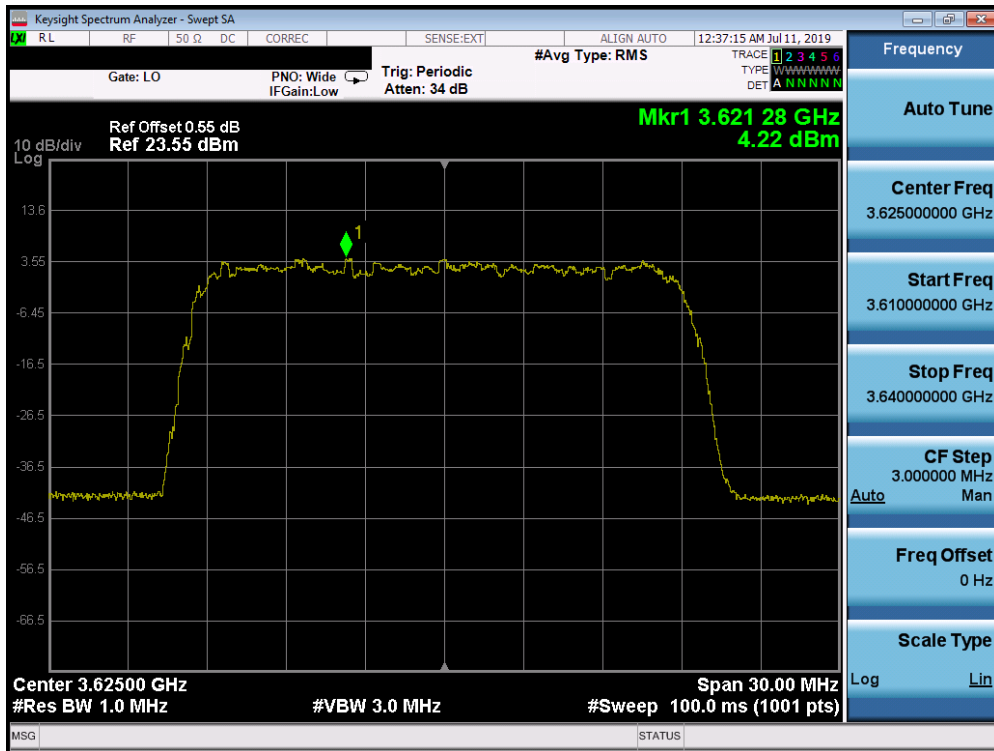


Plot 7-25. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 00

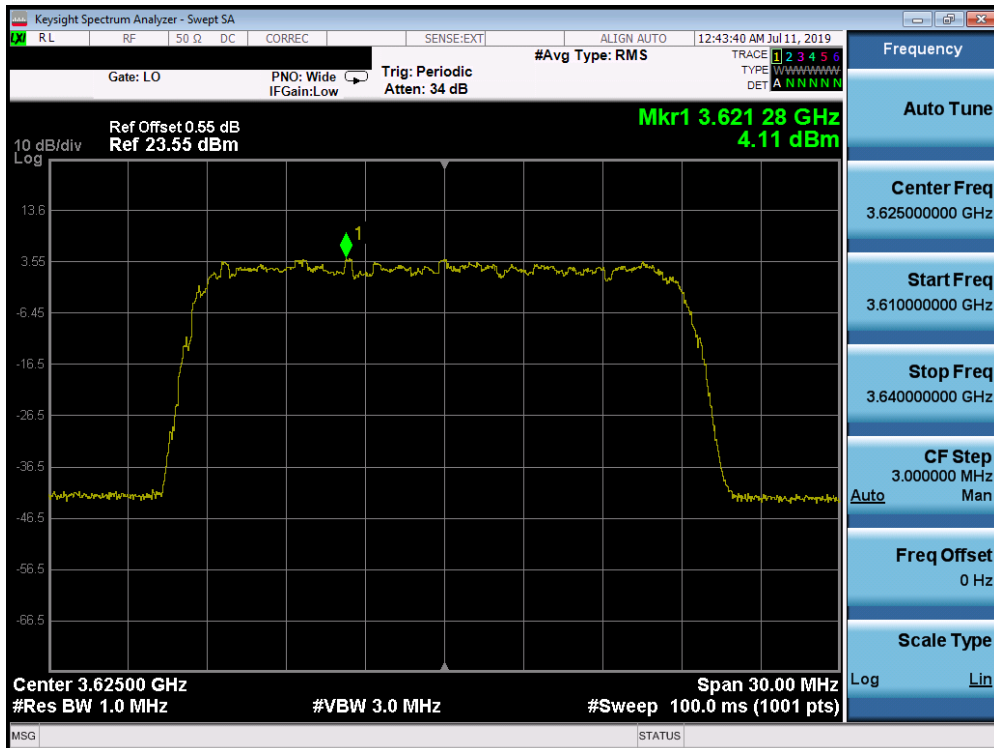


Plot 7-26. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 01

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 67 of 172

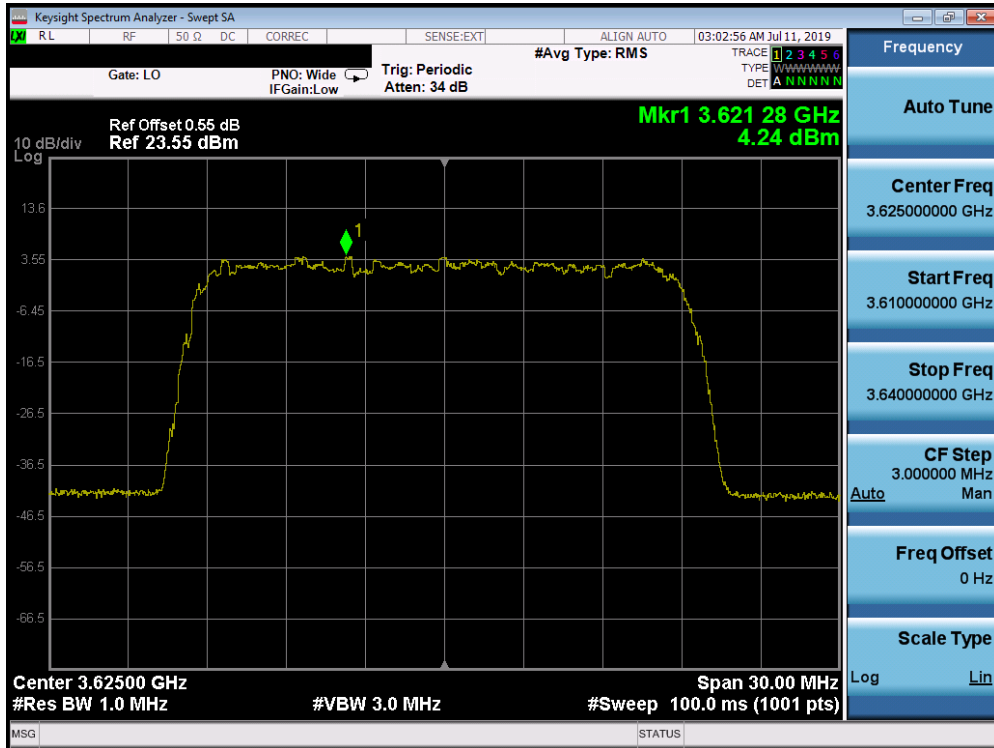


Plot 7-27. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 02

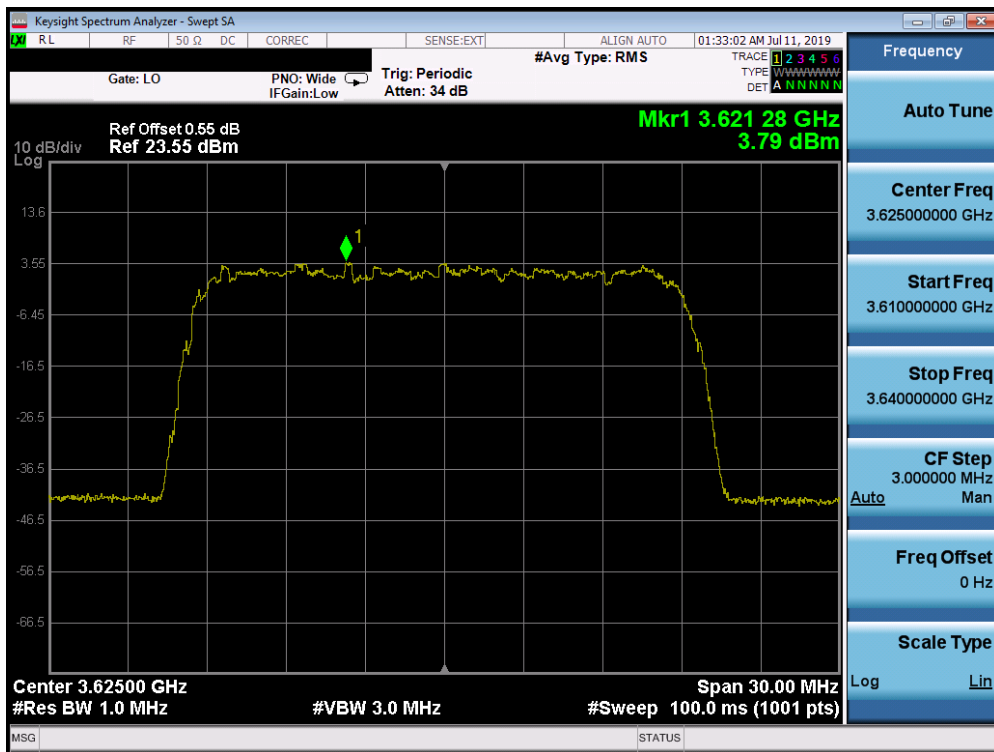


Plot 7-28. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 03

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 68 of 172

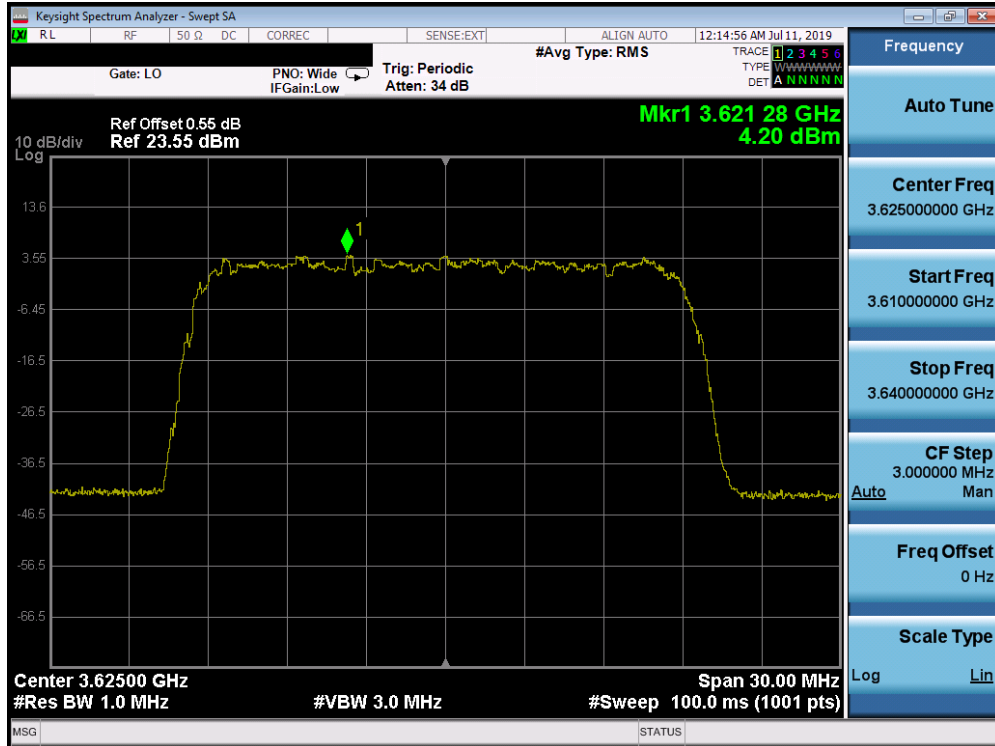


Plot 7-29. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 04

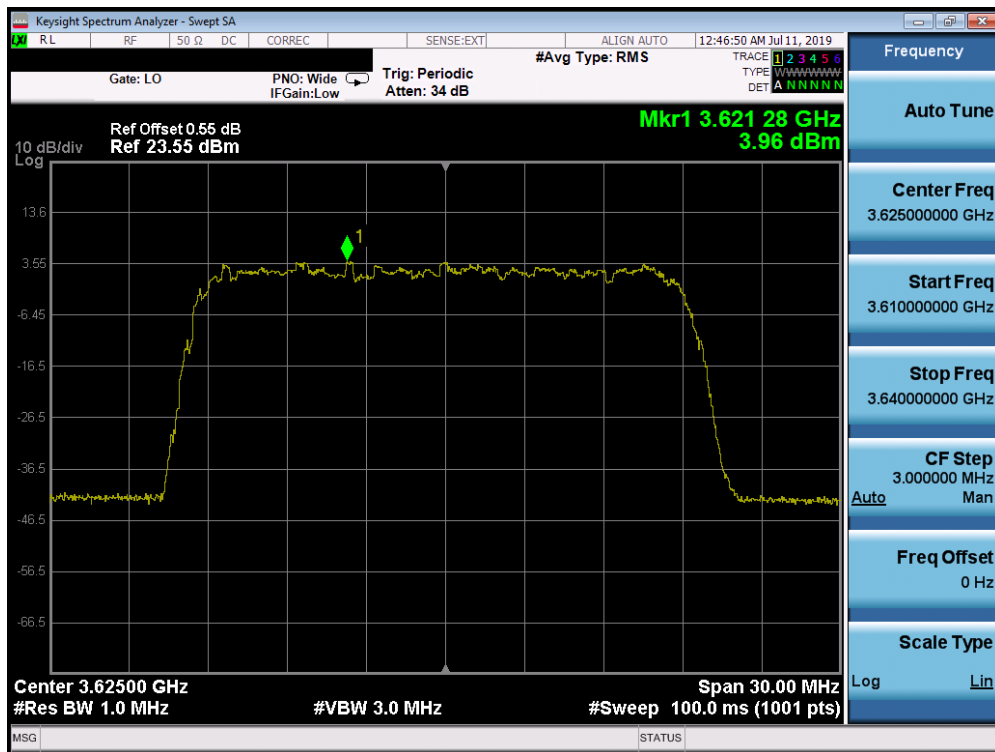


Plot 7-30. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 05

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 69 of 172

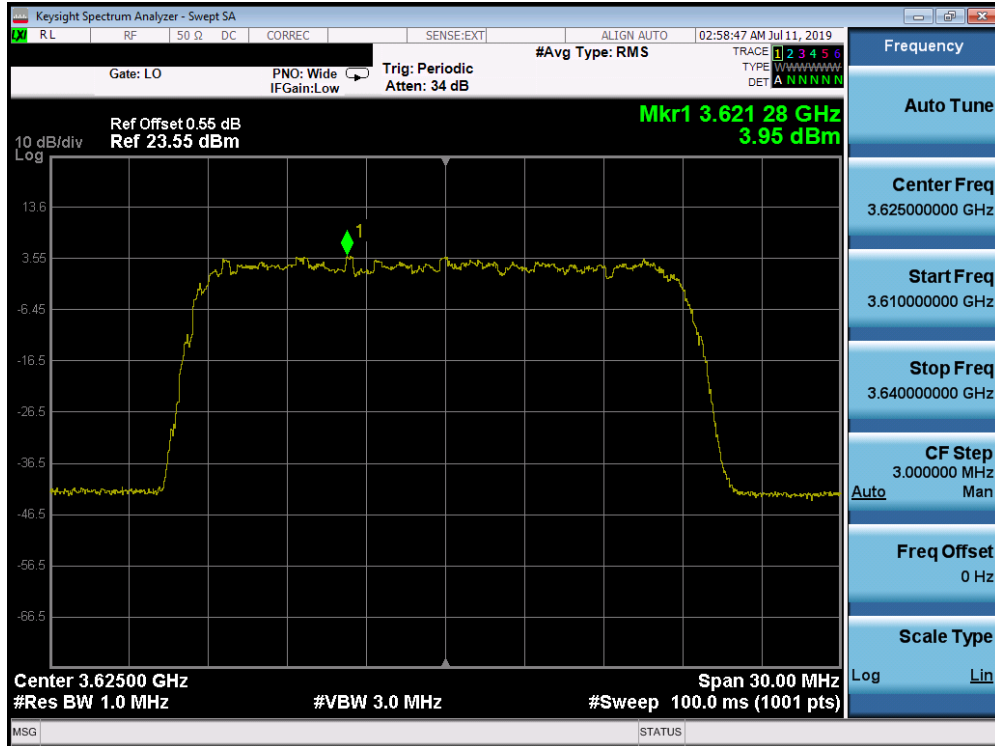


Plot 7-31. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 06

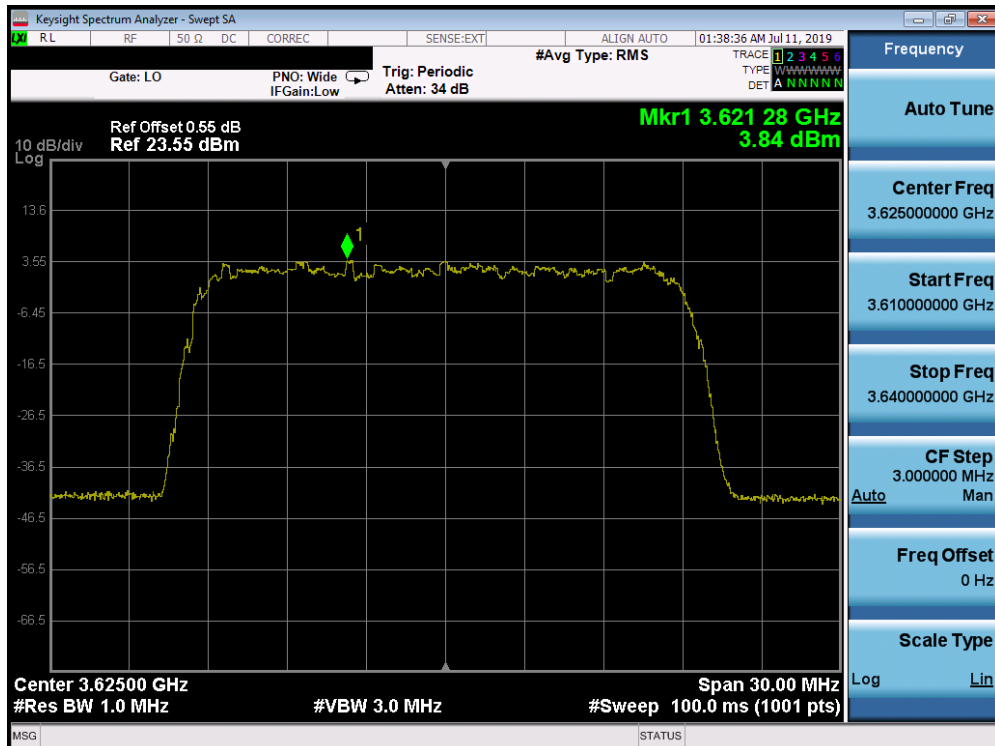


Plot 7-32. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 07

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 70 of 172

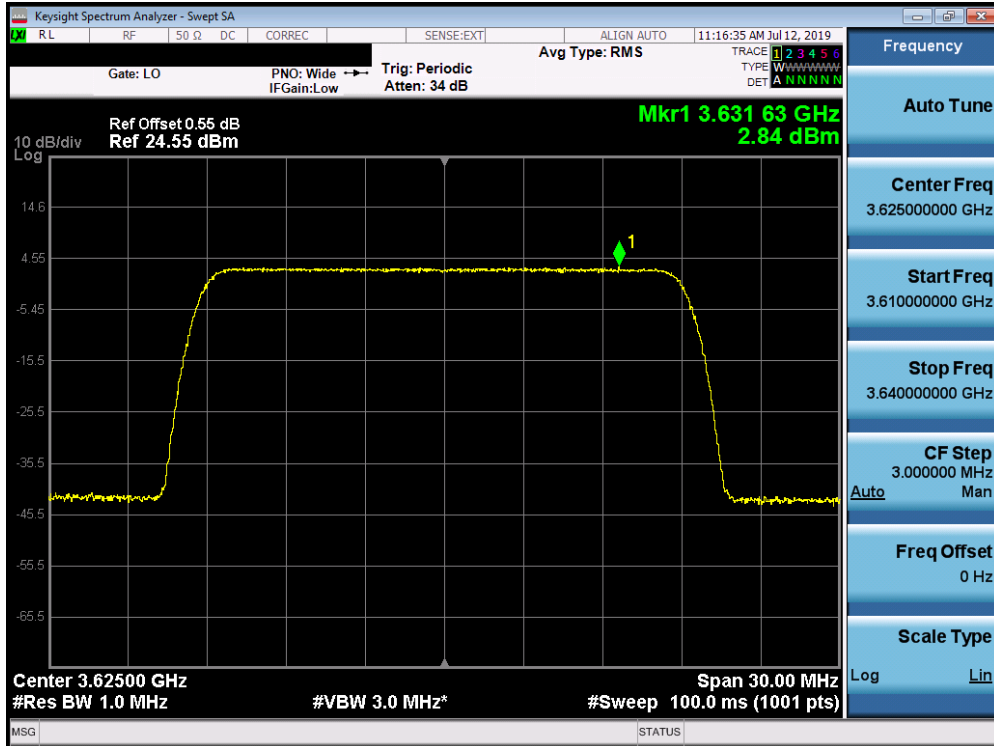


Plot 7-33. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 08

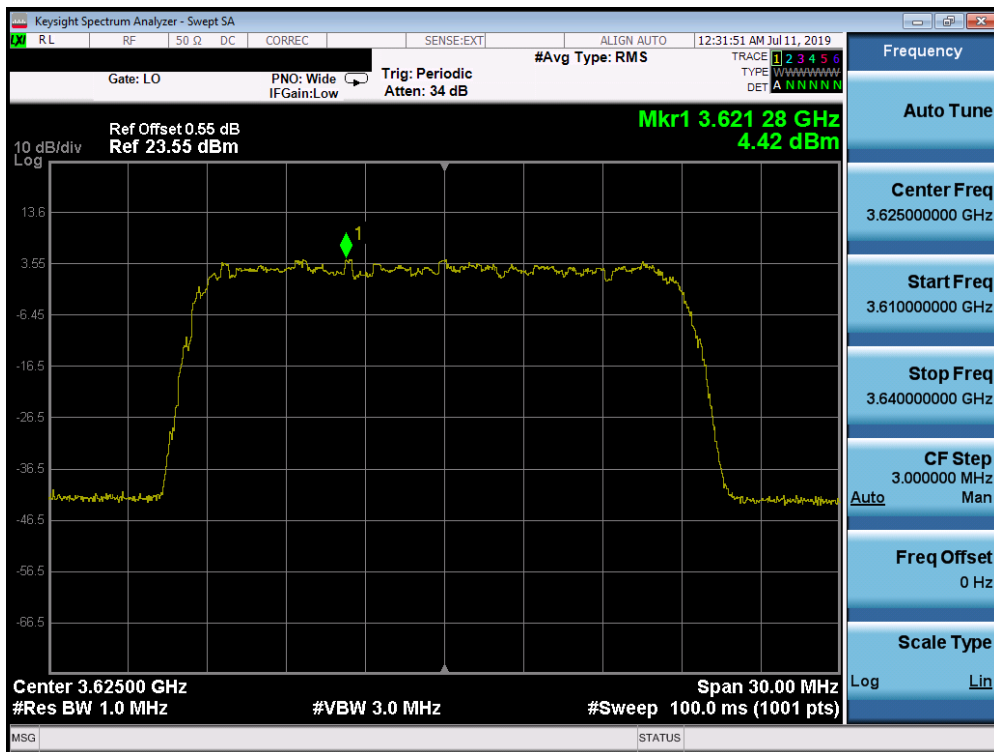


Plot 7-34. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 09

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 71 of 172



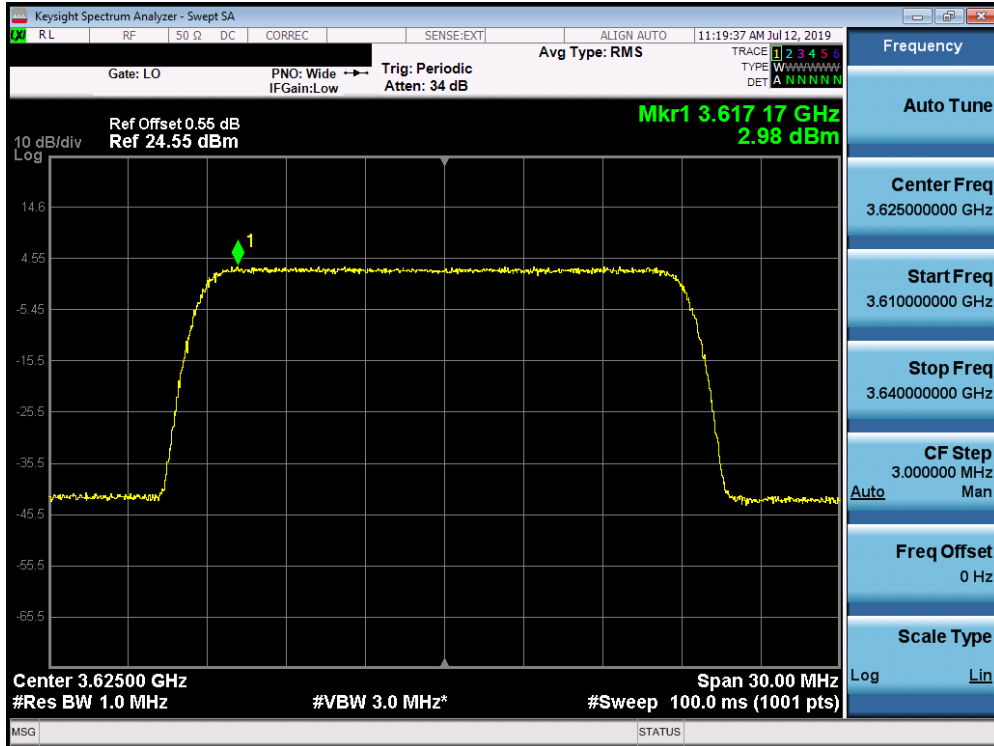
Plot 7-35. Peak Power Spectral Density Plot (1CC– 20.0MHz QPSK- Mid Channel) Port 10



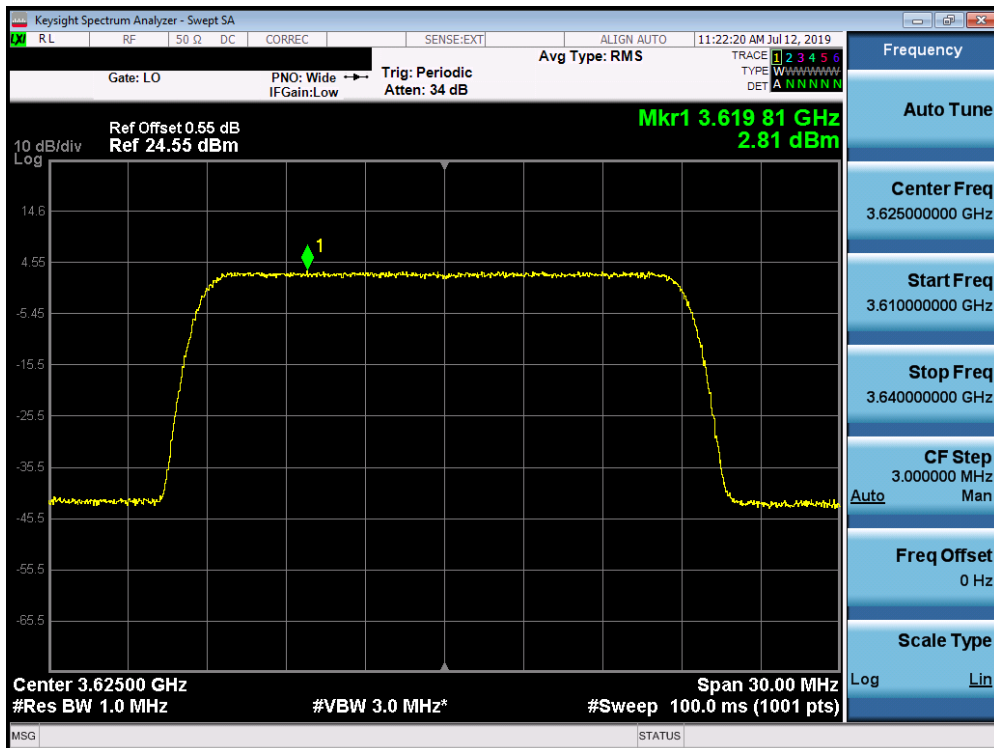
Plot 7-36. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 10

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 72 of 172



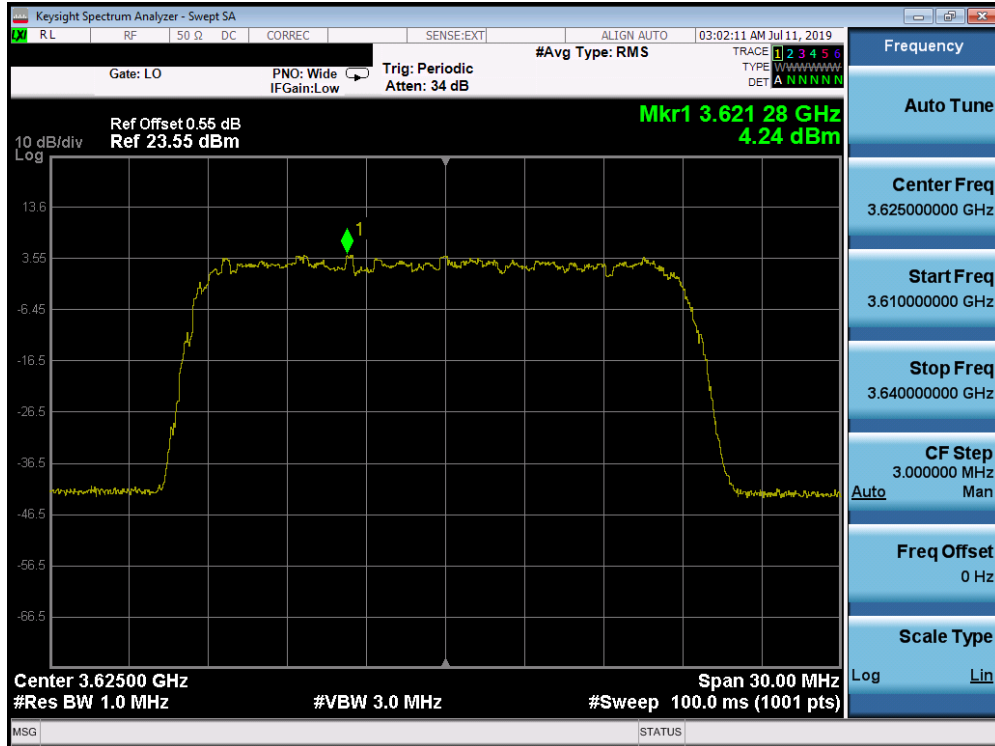


Plot 7-37. Peak Power Spectral Density Plot (1CC– 20.0MHz 64QAM- Mid Channel) Port 10

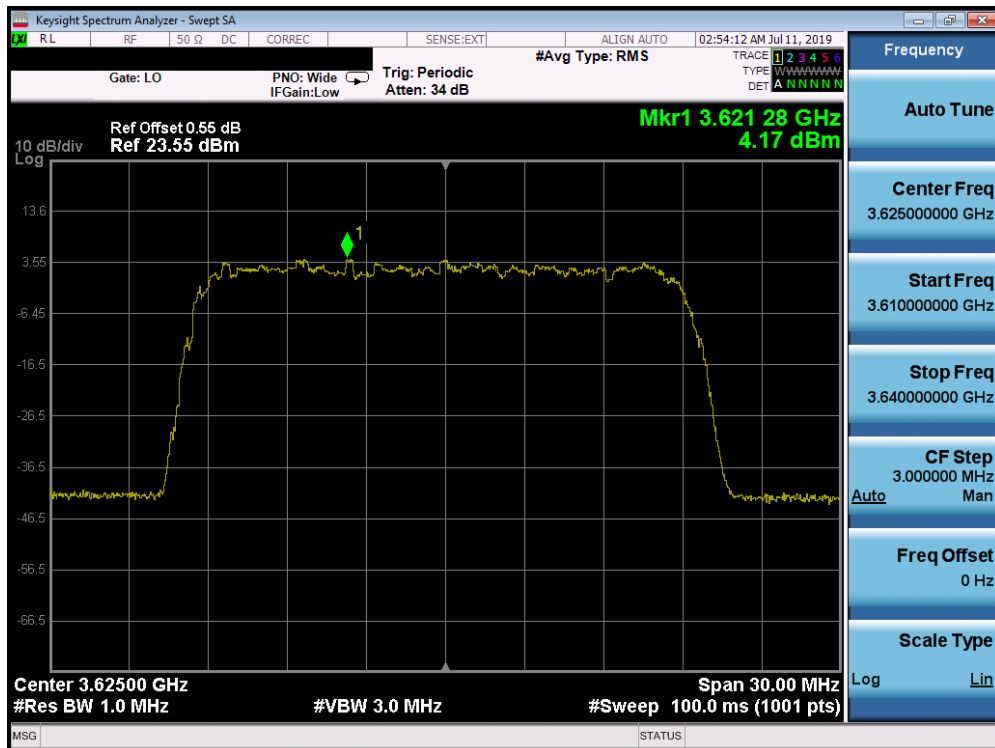


Plot 7-38. Peak Power Spectral Density Plot (1CC– 20.0MHz 256QAM- Mid Channel) Port 10

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 73 of 172

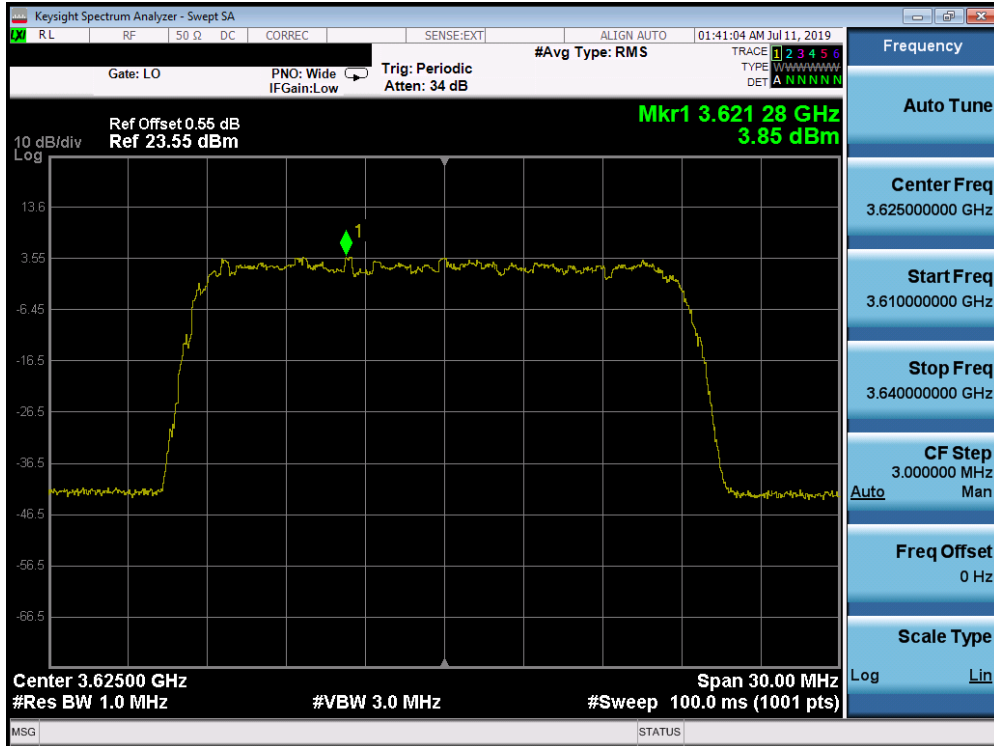


Plot 7-39. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 11

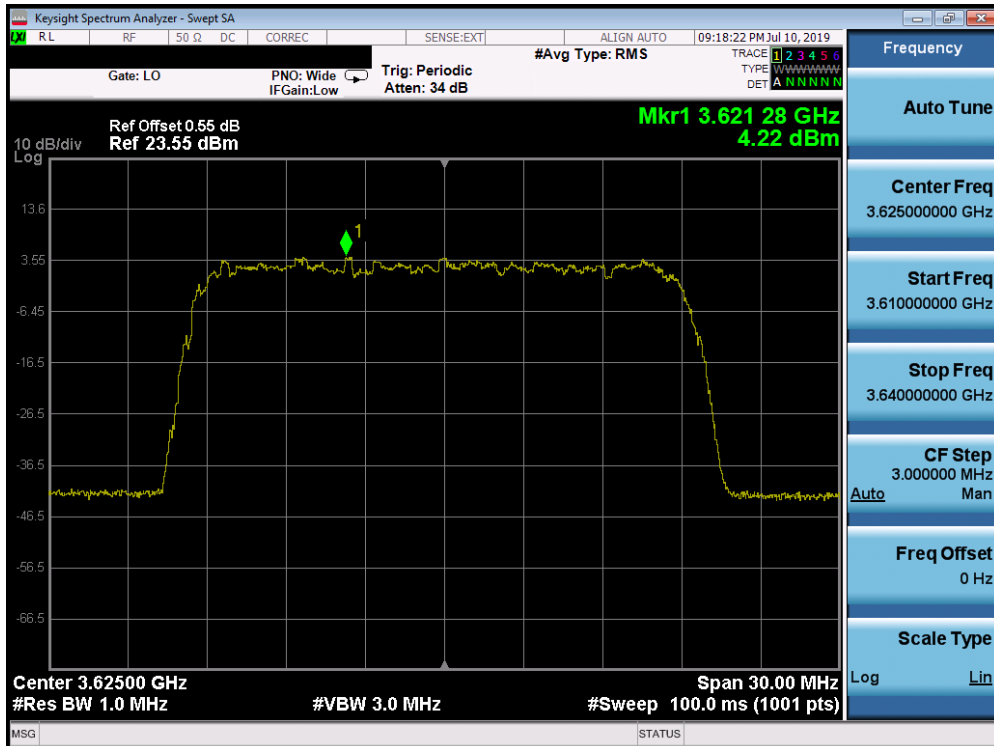


Plot 7-40. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 12

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 74 of 172

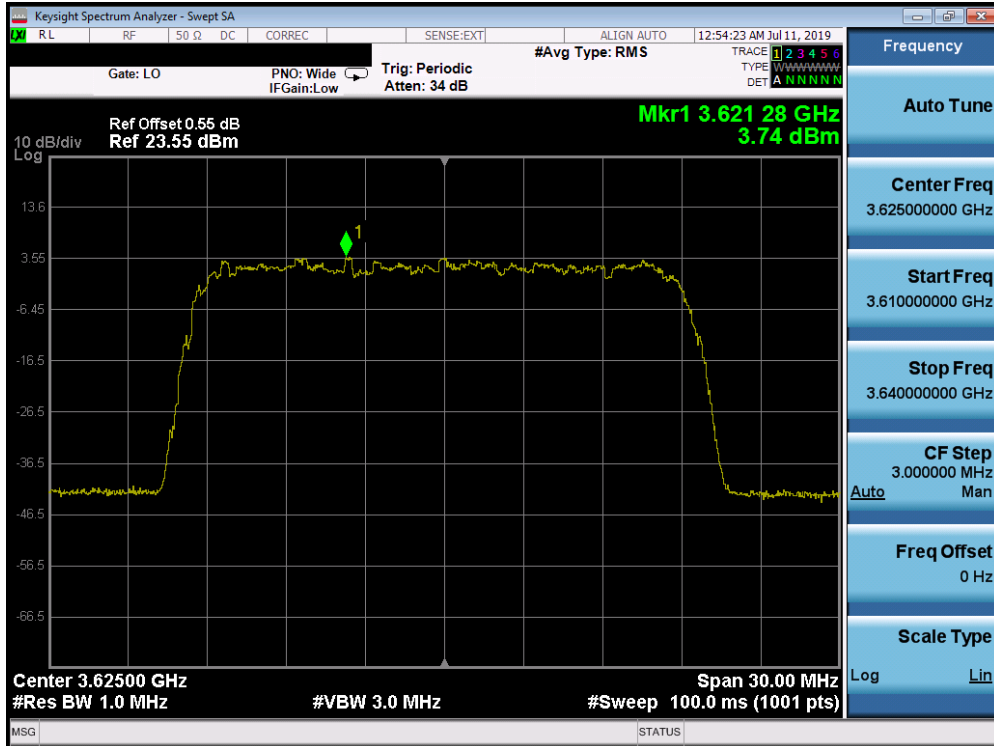


Plot 7-41. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 13

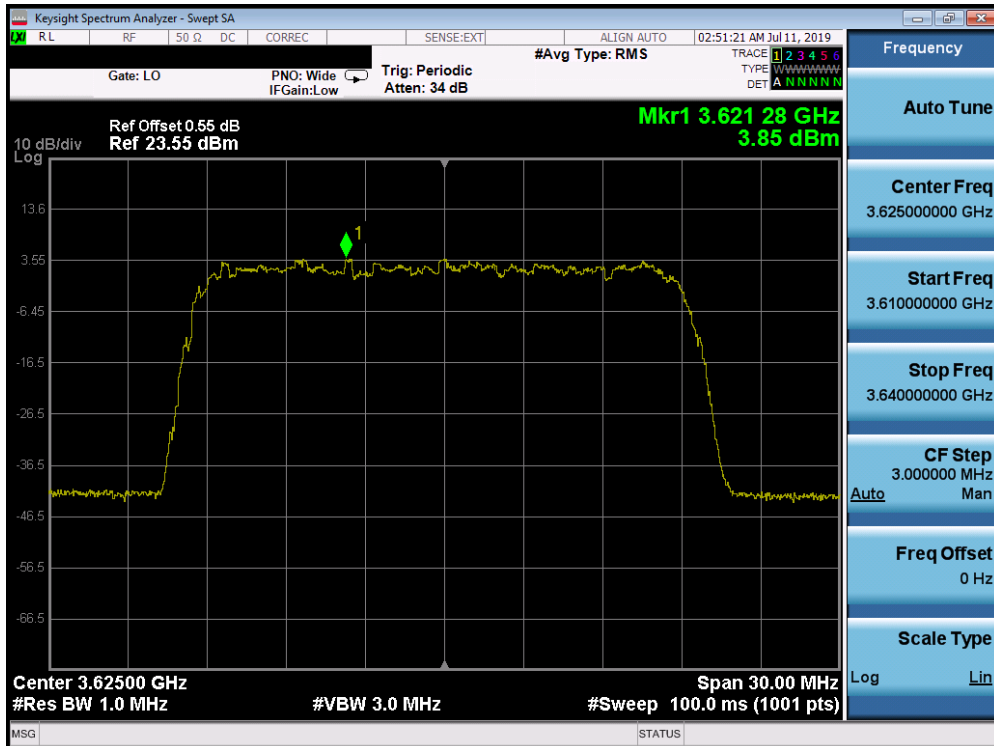


Plot 7-42. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 14

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 75 of 172

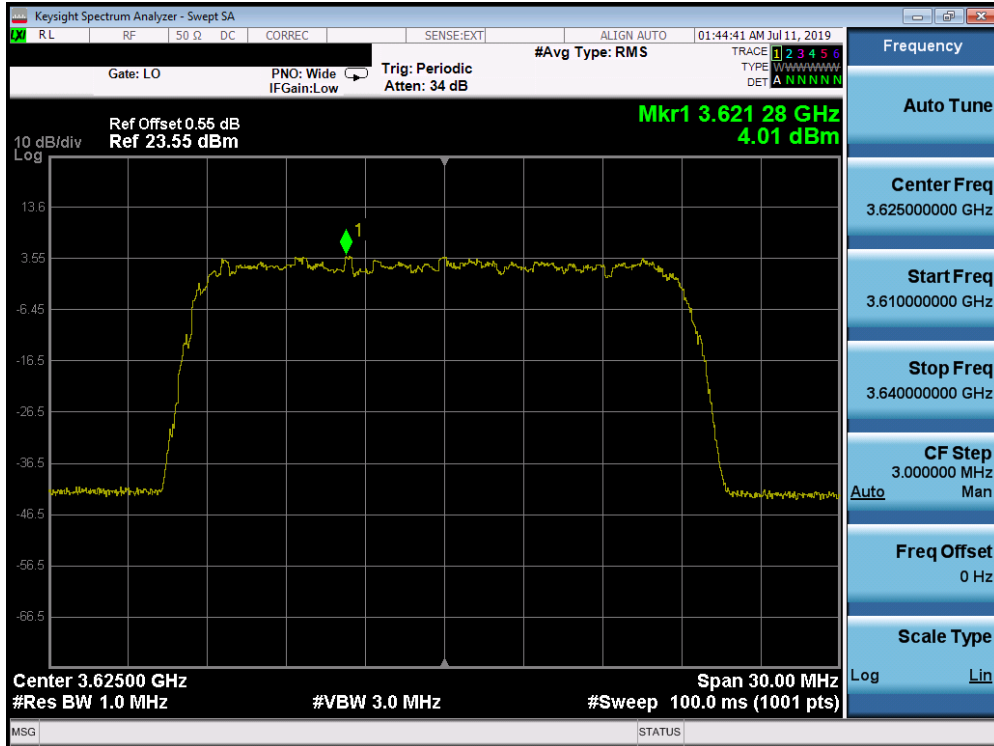


Plot 7-43. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 15

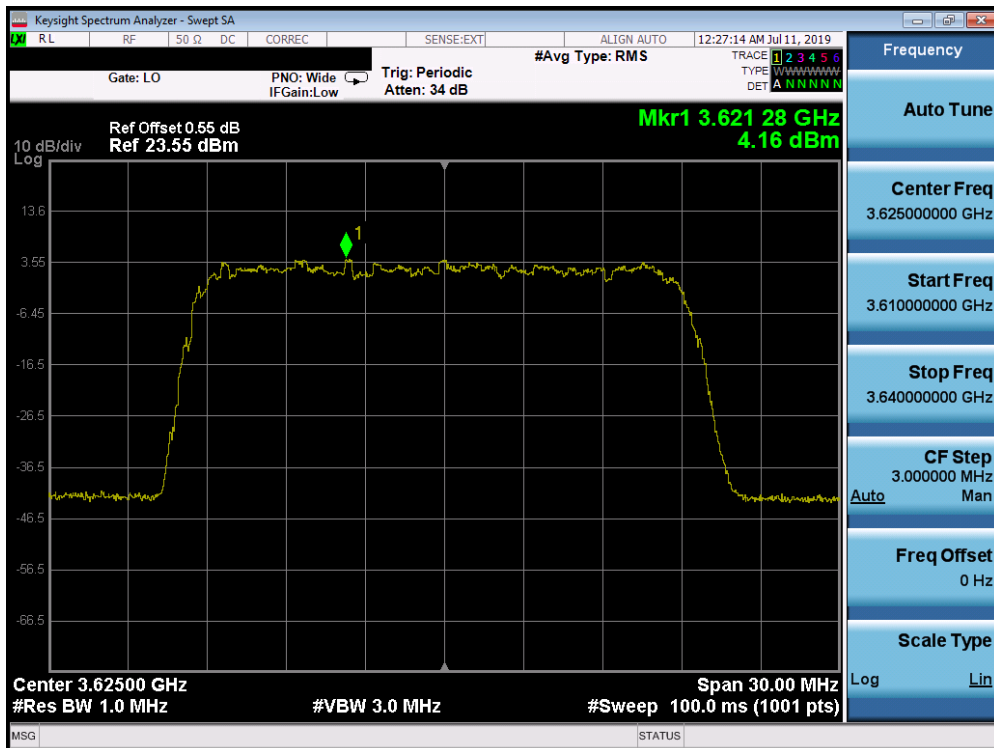


Plot 7-44. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 16

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 76 of 172

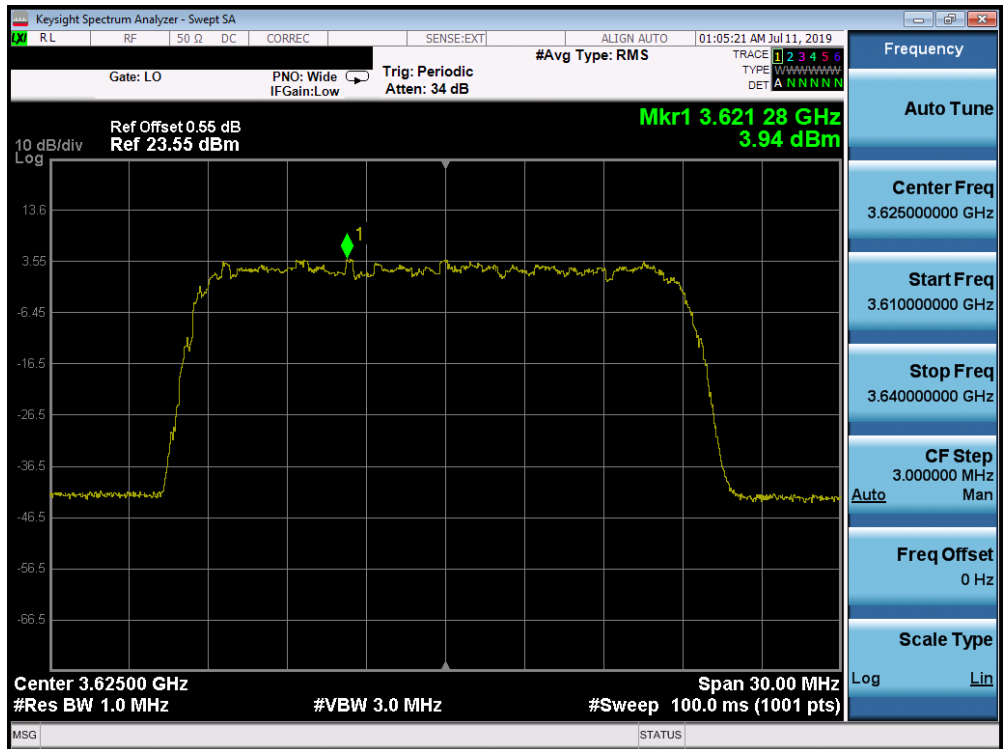


Plot 7-45. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 17

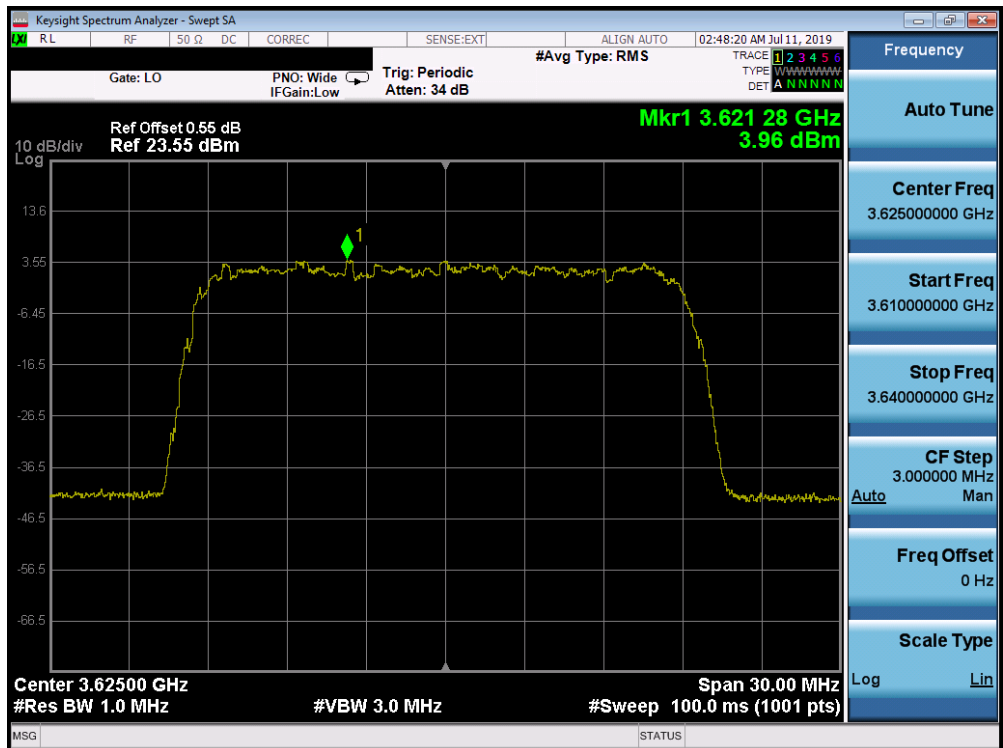


Plot 7-46. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 18


FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 77 of 172

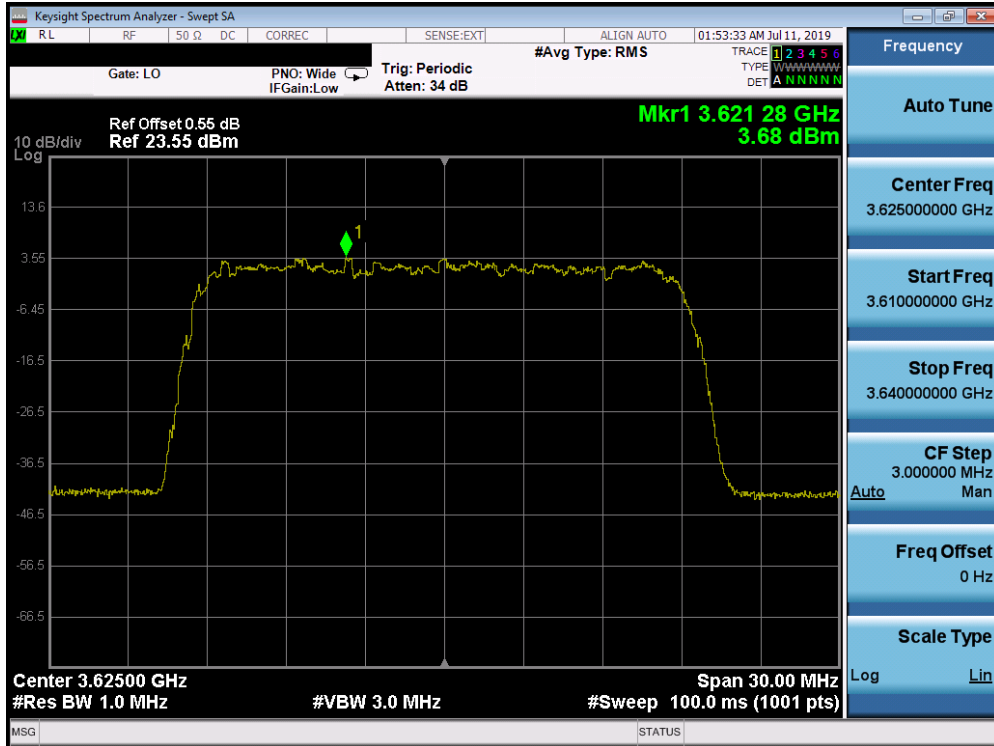


Plot 7-47. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 19

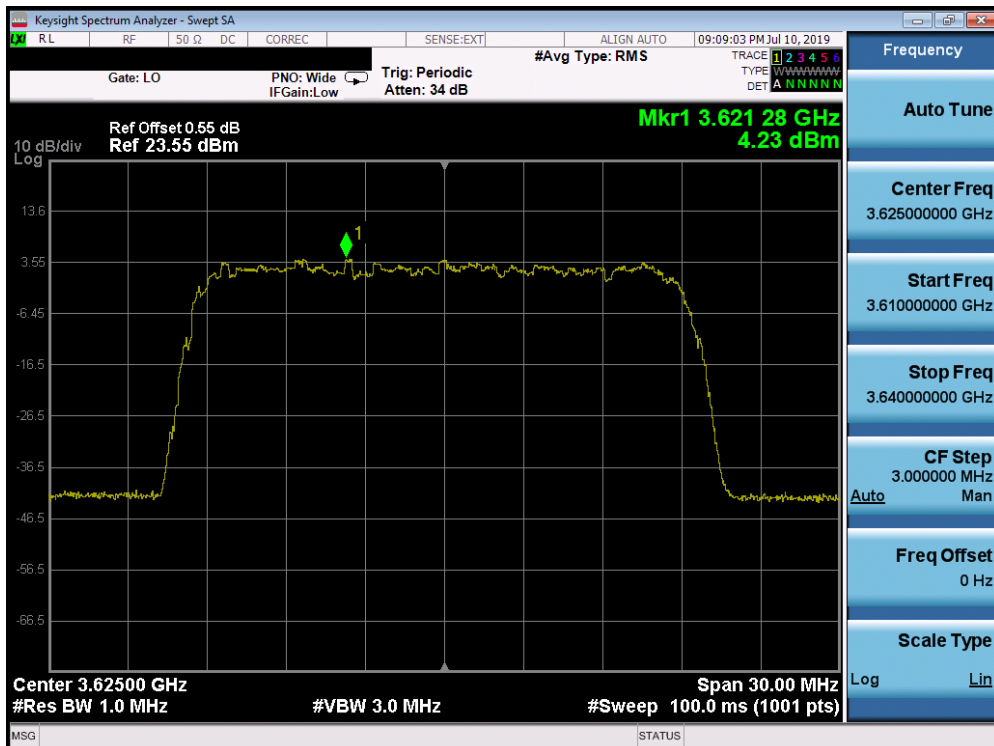


Plot 7-48. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 20

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 78 of 172



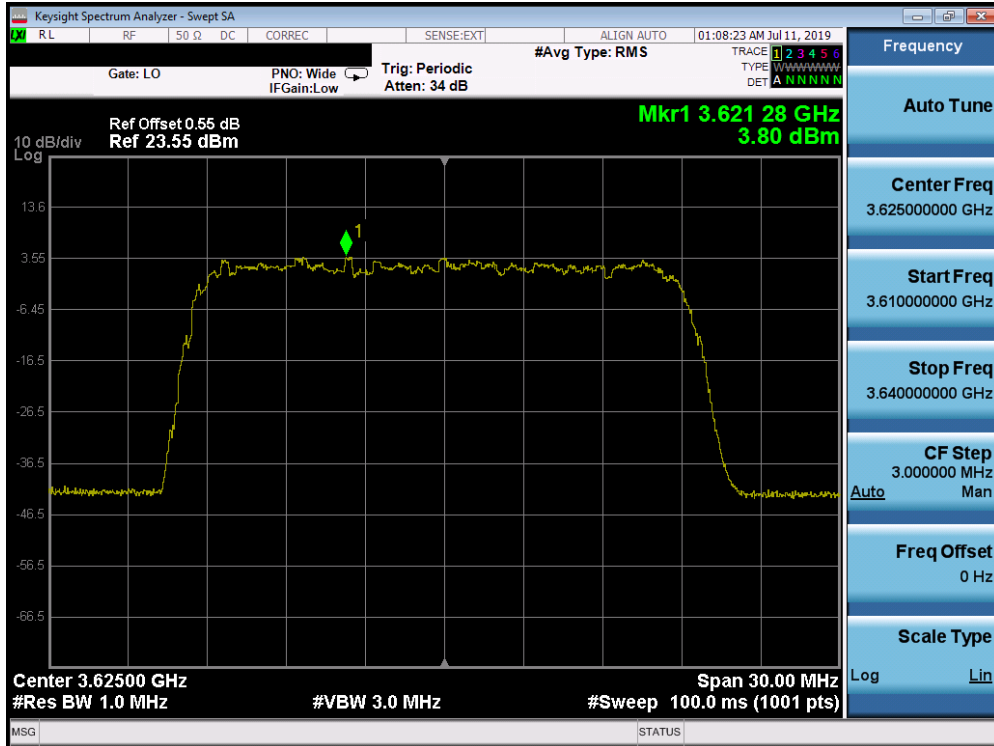
Plot 7-49. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 21



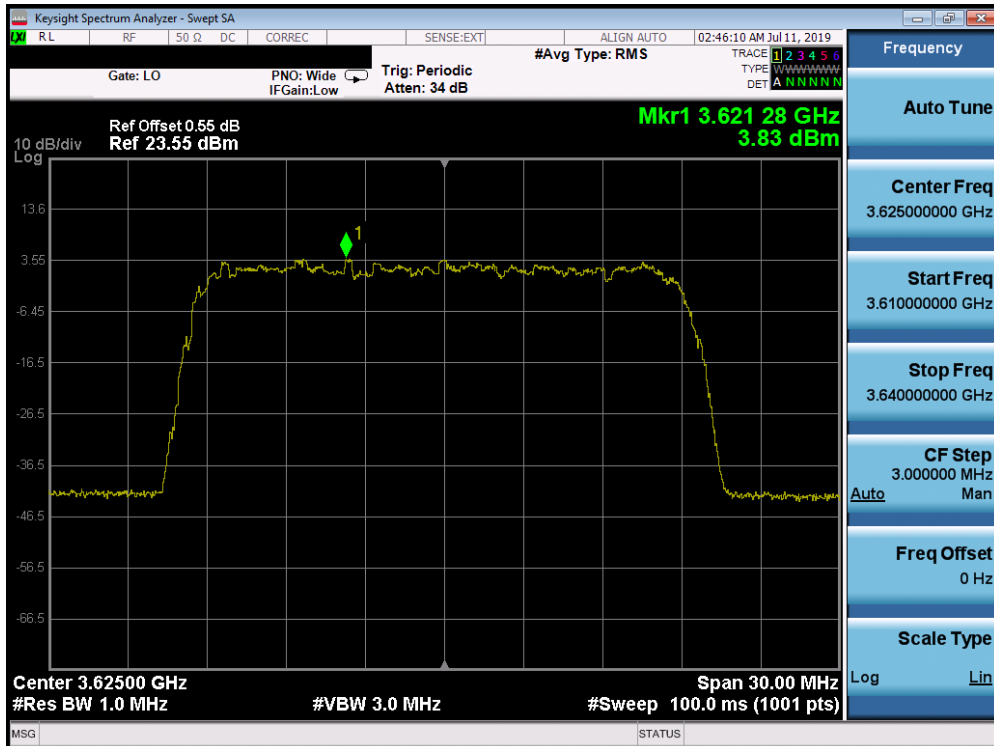
Plot 7-50. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 22

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 79 of 172





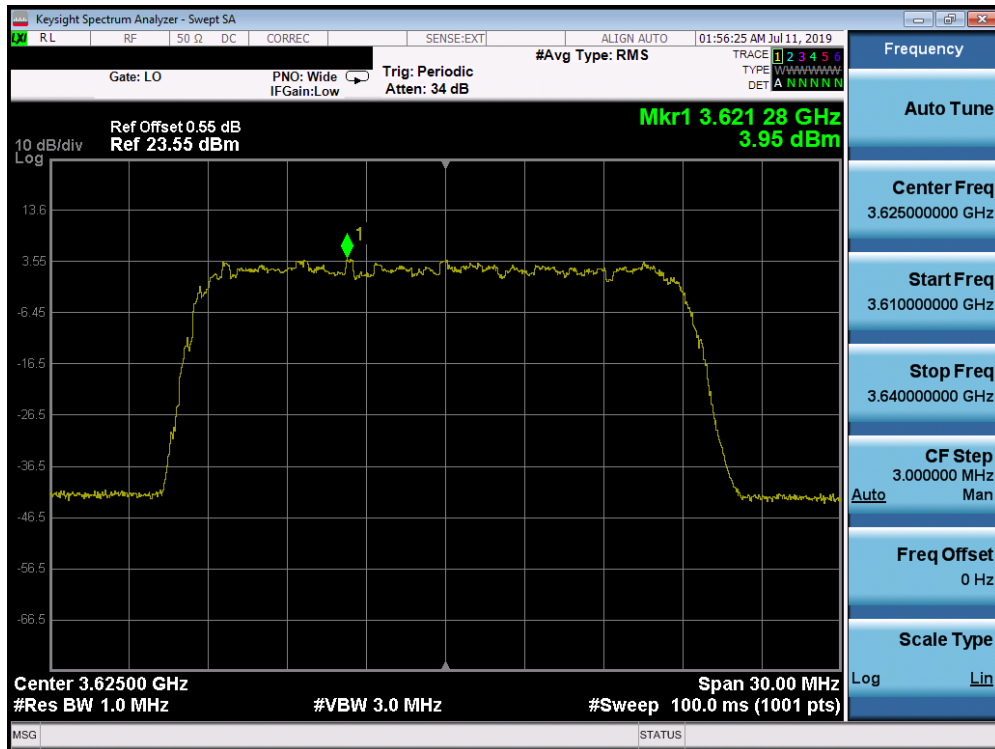
Plot 7-51. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 23



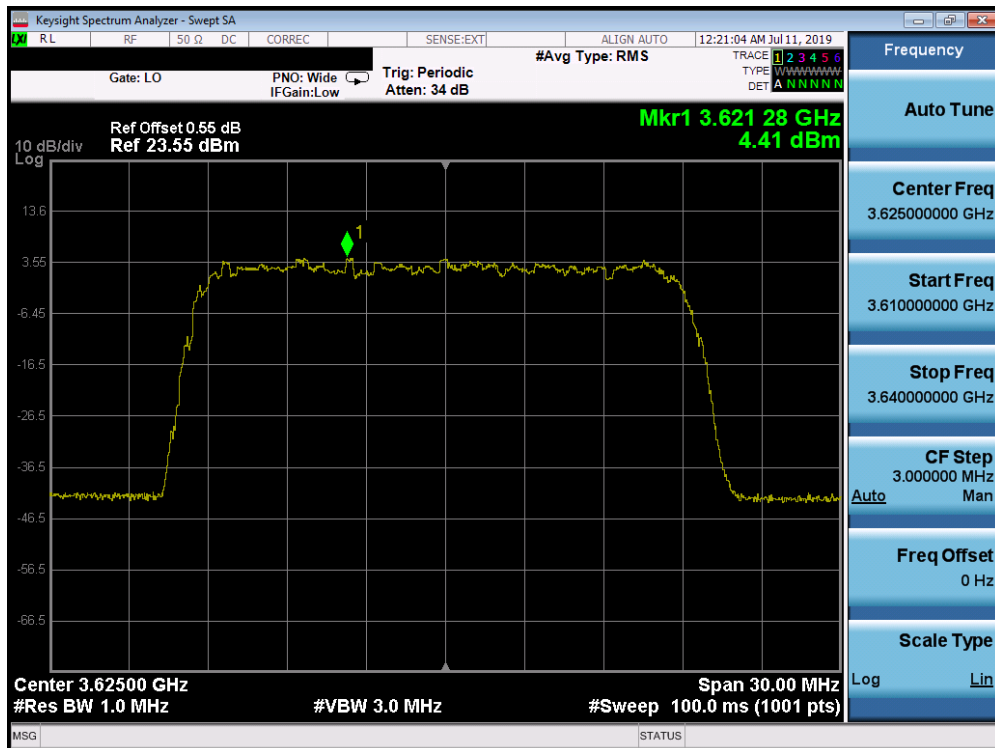
Plot 7-52. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 24

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 80 of 172





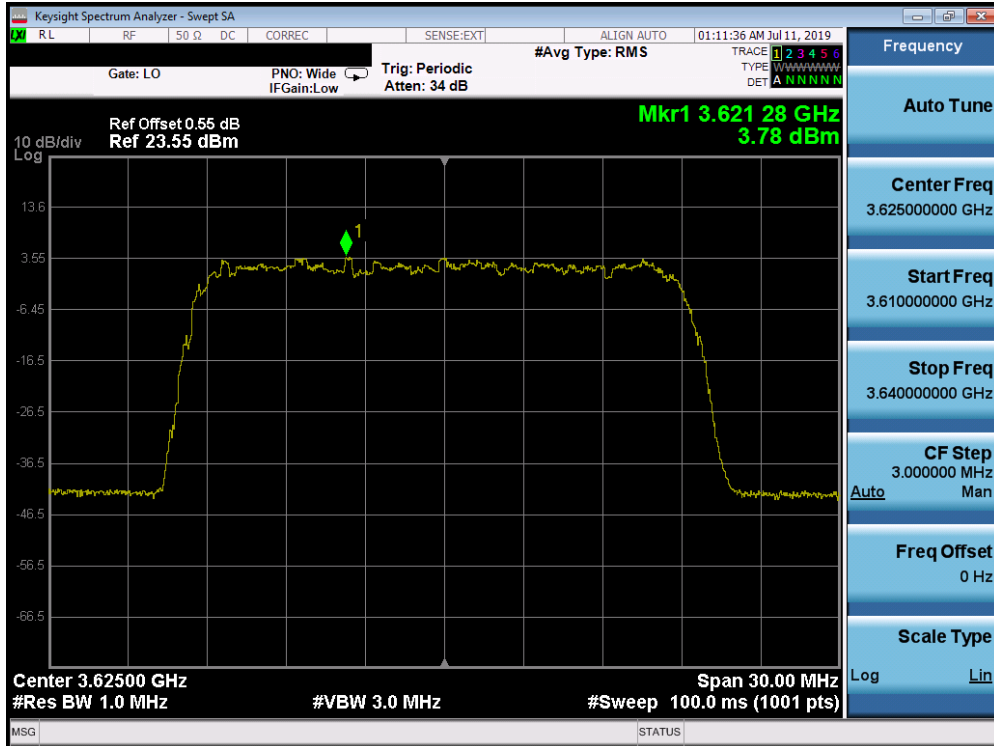


Plot 7-53. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 25

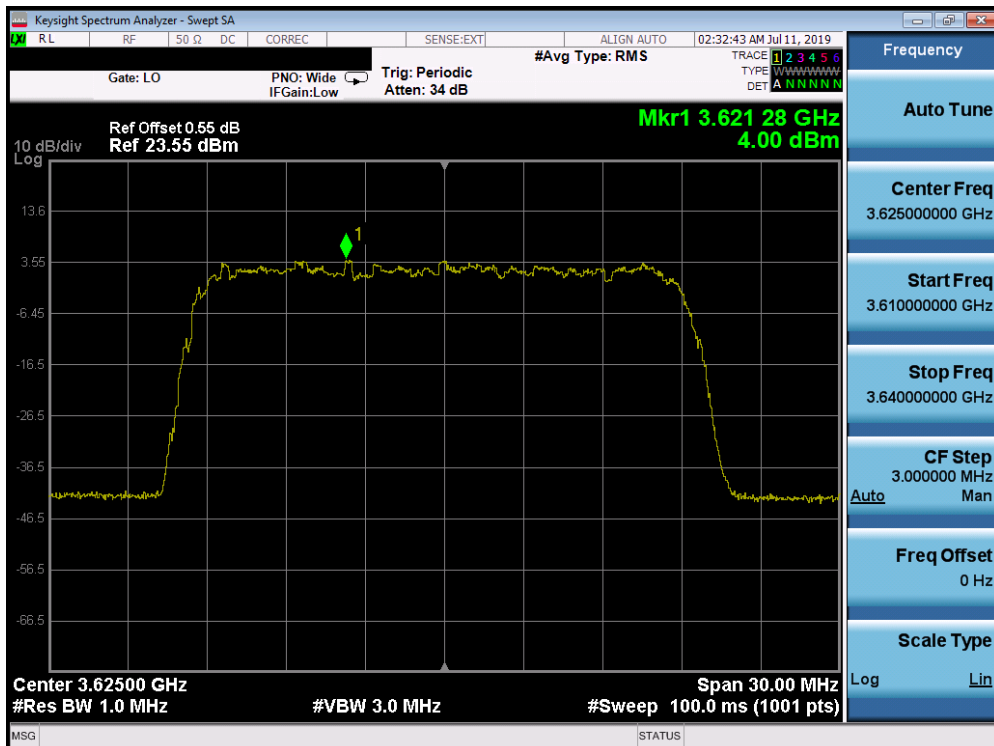


Plot 7-54. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 26

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 81 of 172

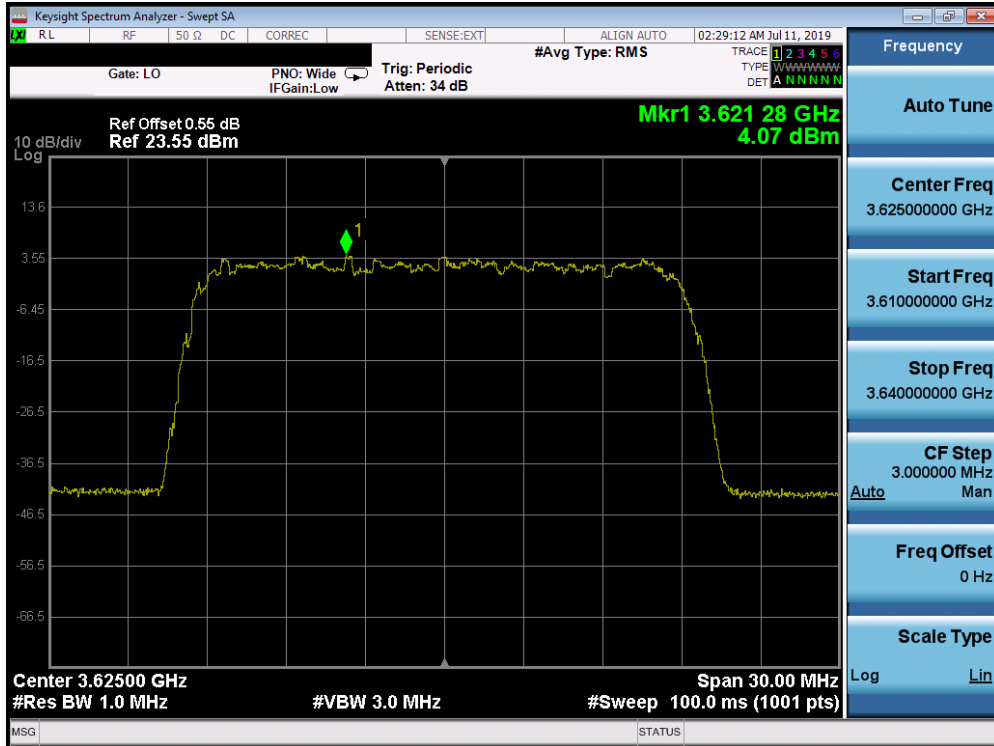


Plot 7-55. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 27

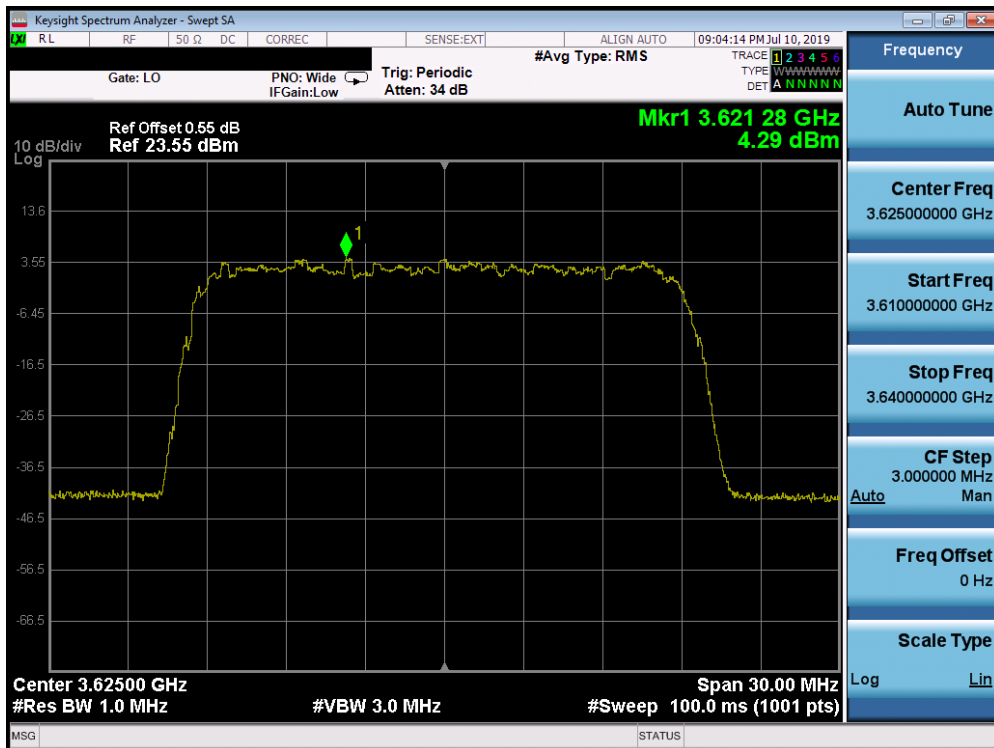


Plot 7-56. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 28

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 82 of 172

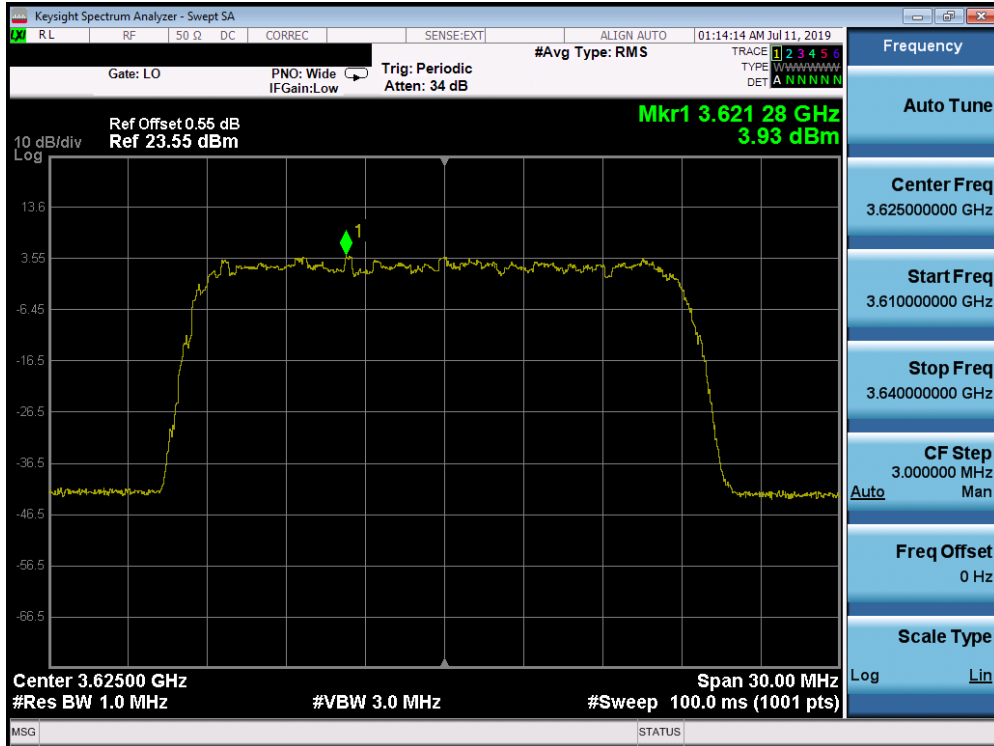


Plot 7-57. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 29

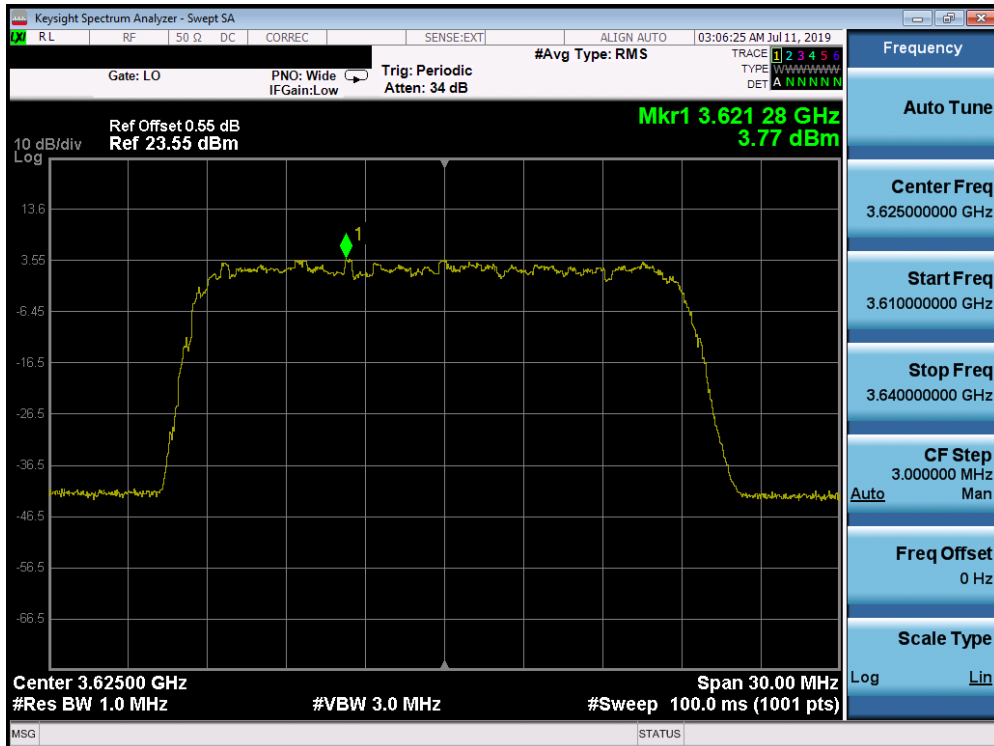


Plot 7-58. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 30

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 83 of 172

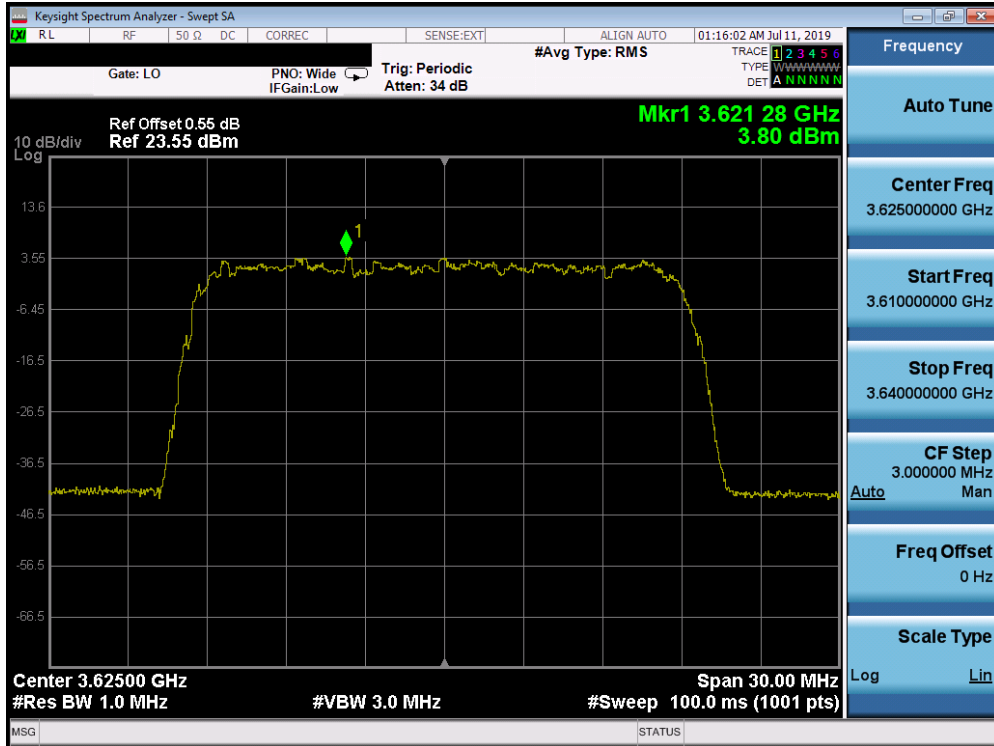


Plot 7-59. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 31

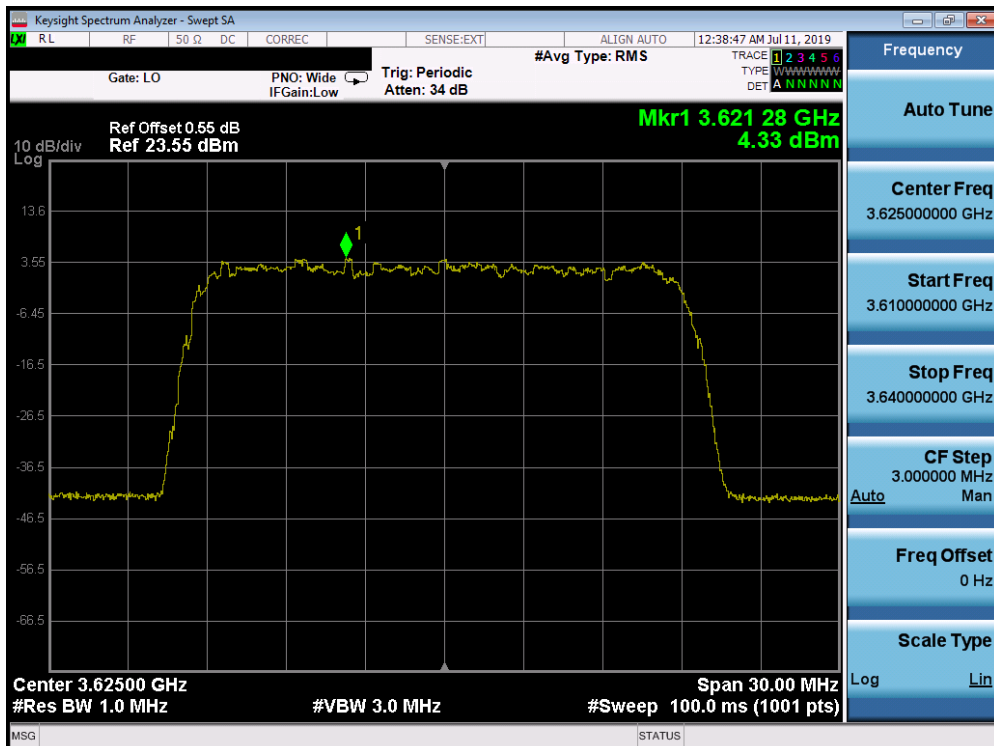


Plot 7-60. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 32

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 84 of 172

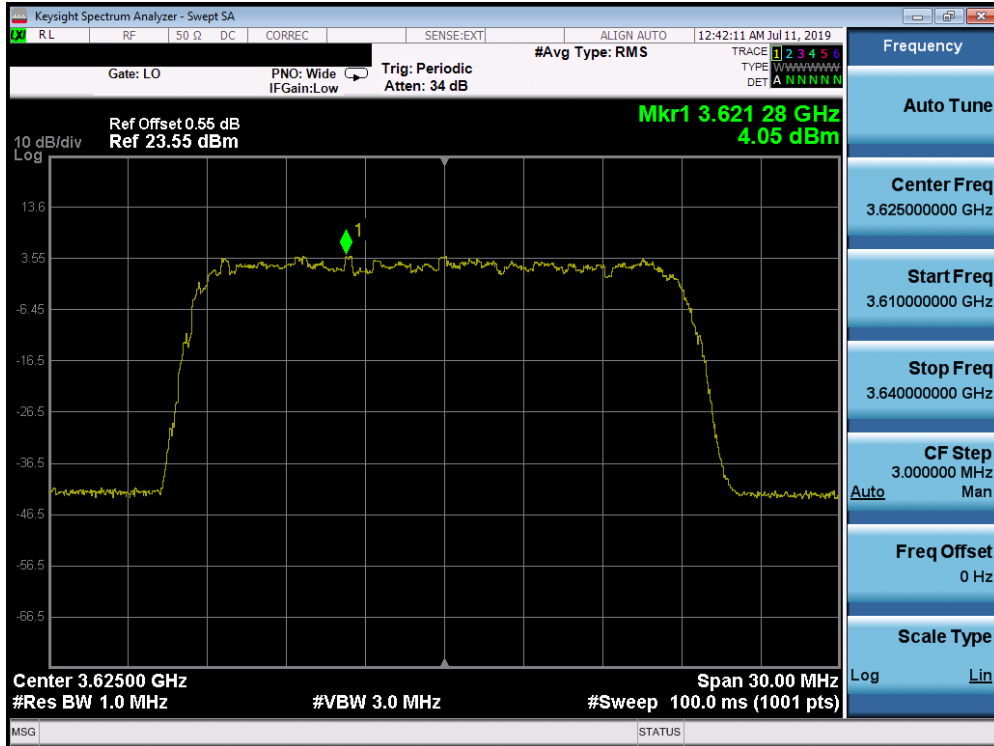


Plot 7-61. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 33

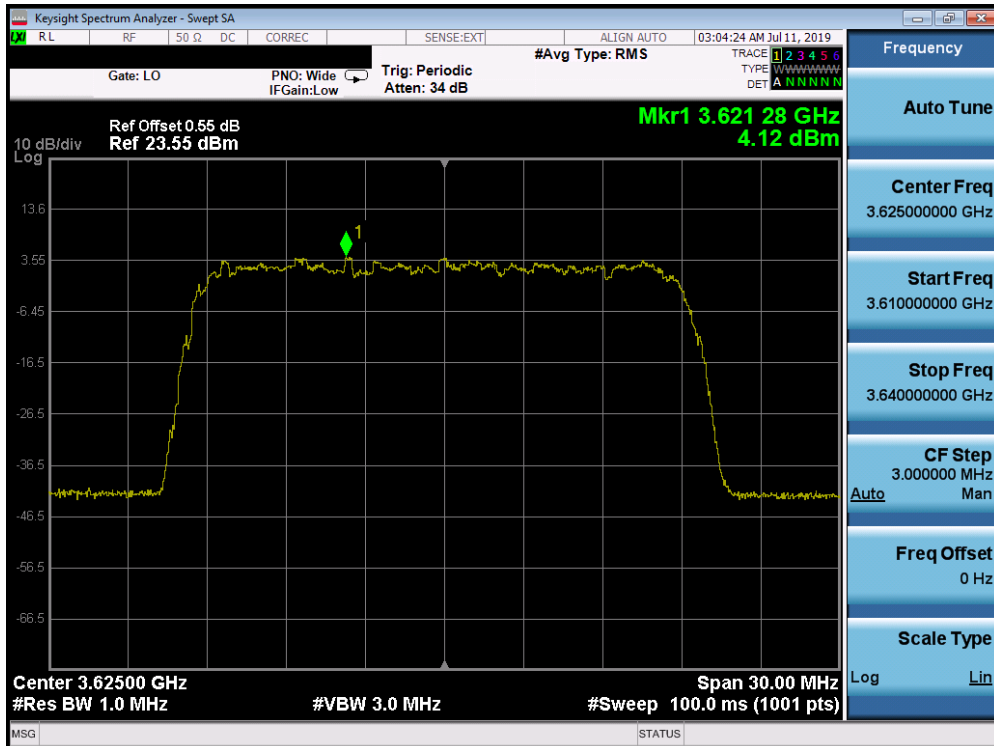


Plot 7-62. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 34

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 85 of 172

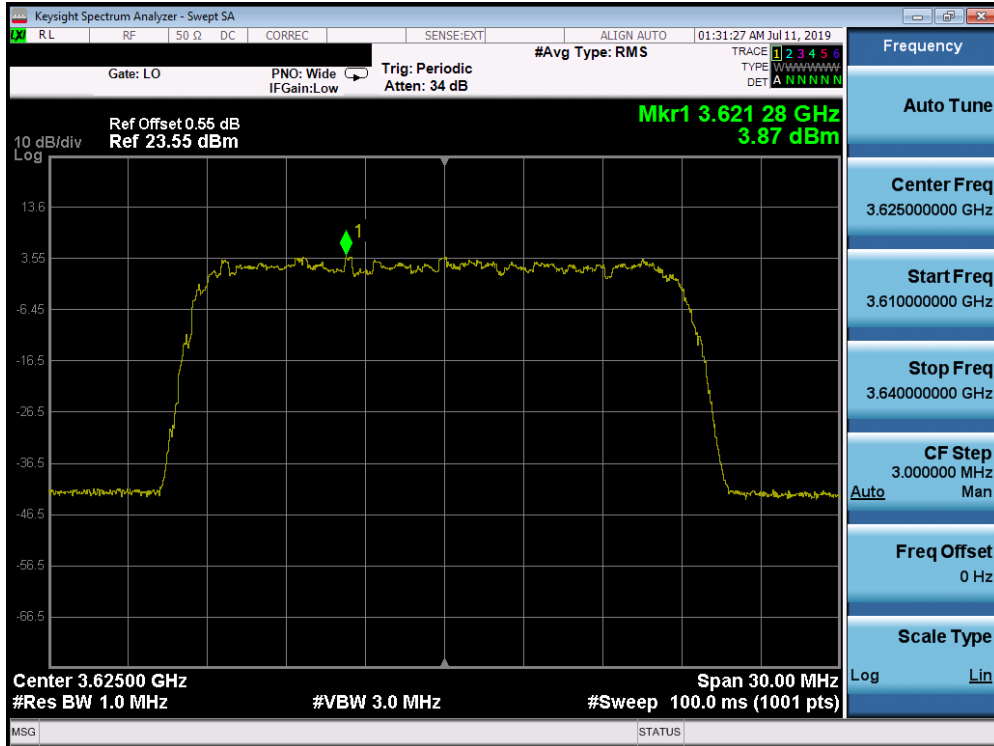


Plot 7-63. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 35

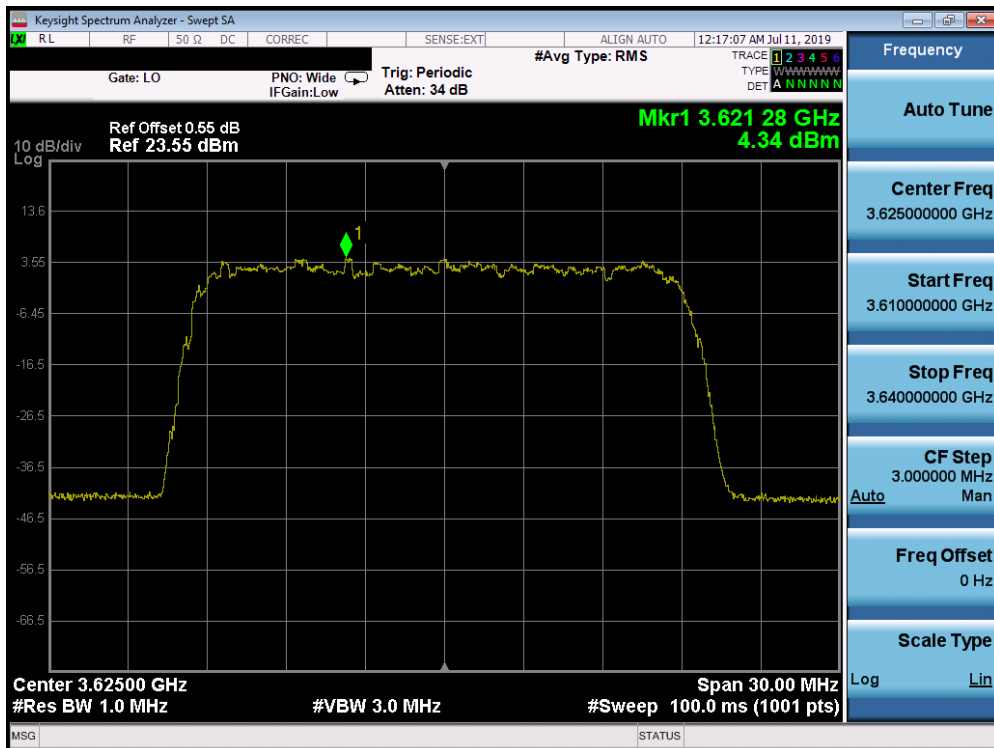


Plot 7-64. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 36

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 86 of 172



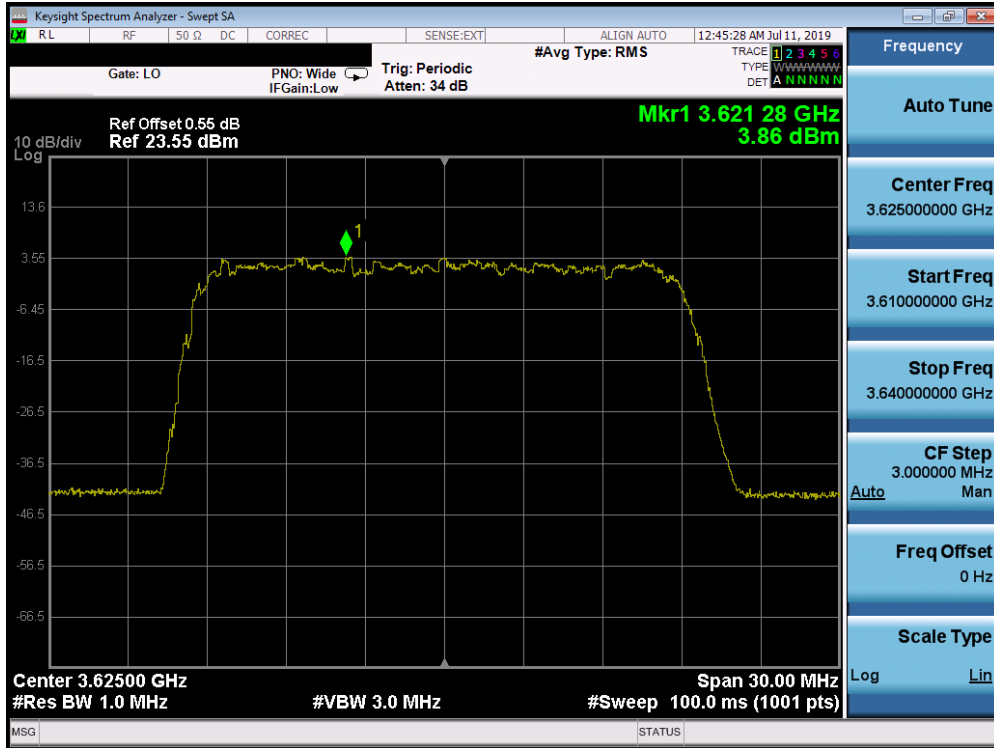
Plot 7-65. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 37



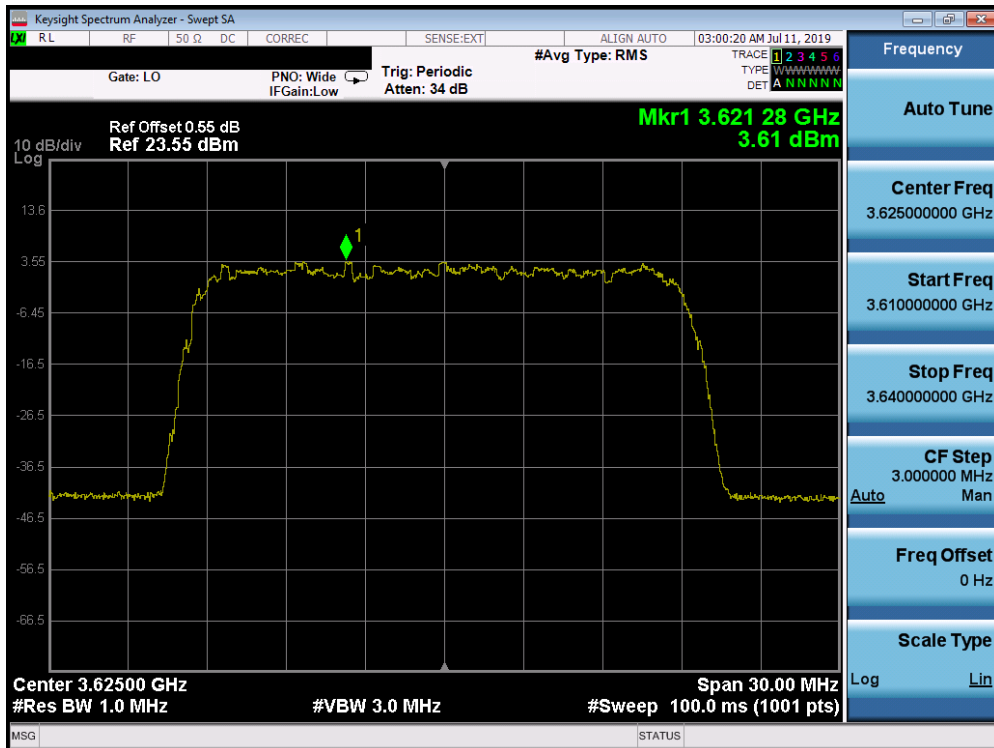
Plot 7-66. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 38

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 87 of 172





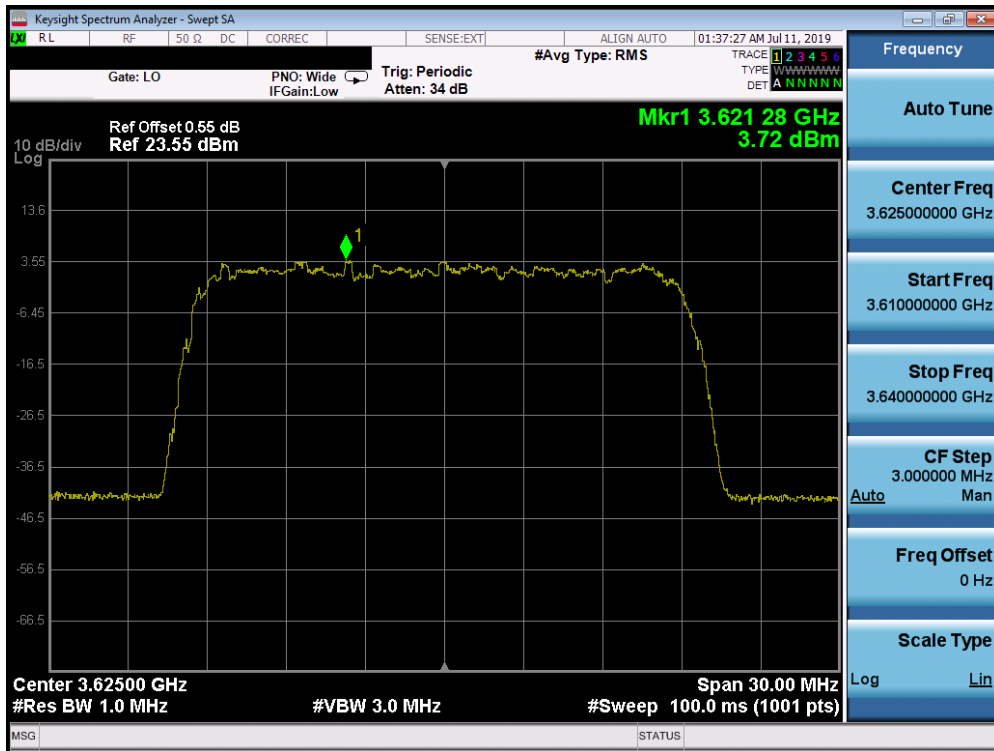
Plot 7-67. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 39



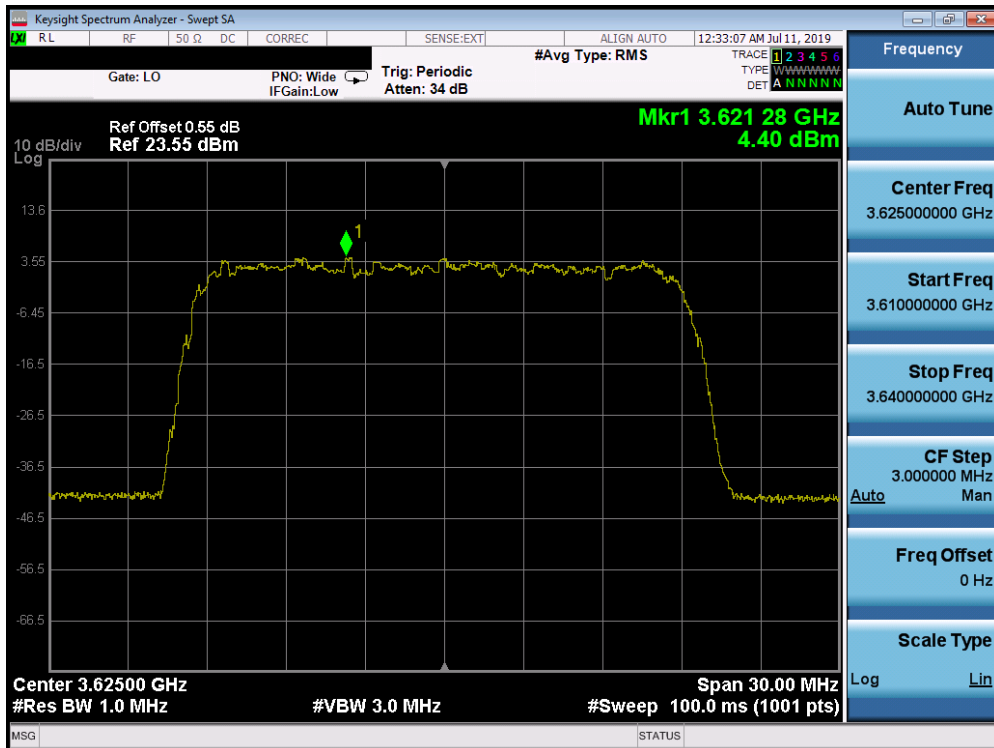
Plot 7-68. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 40

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 88 of 172



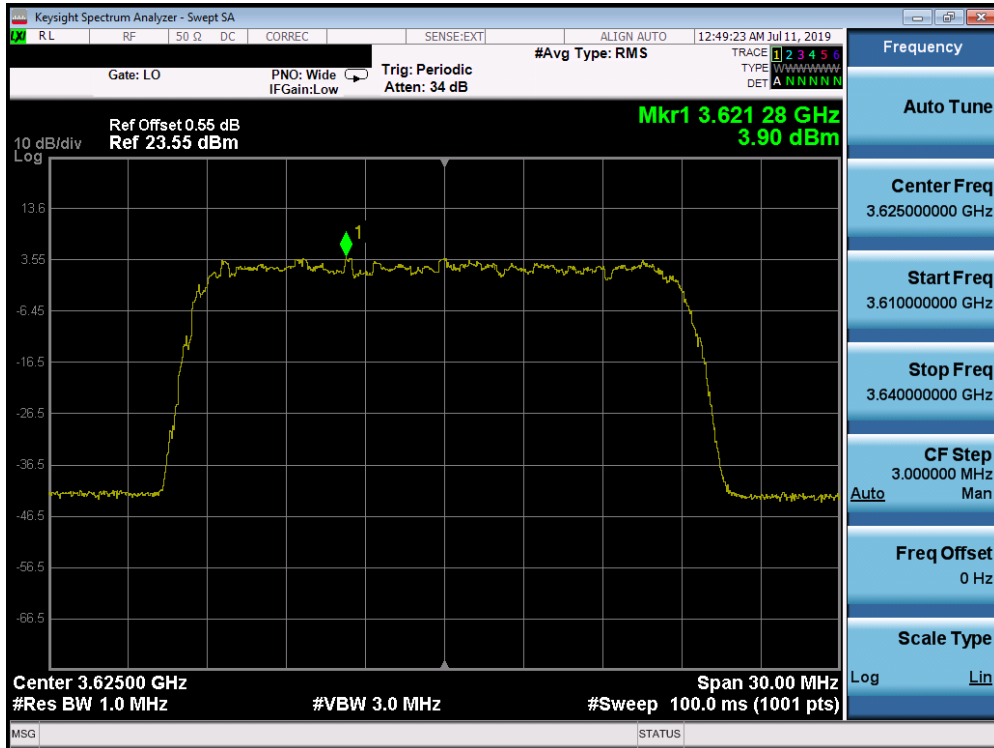


Plot 7-69. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 41

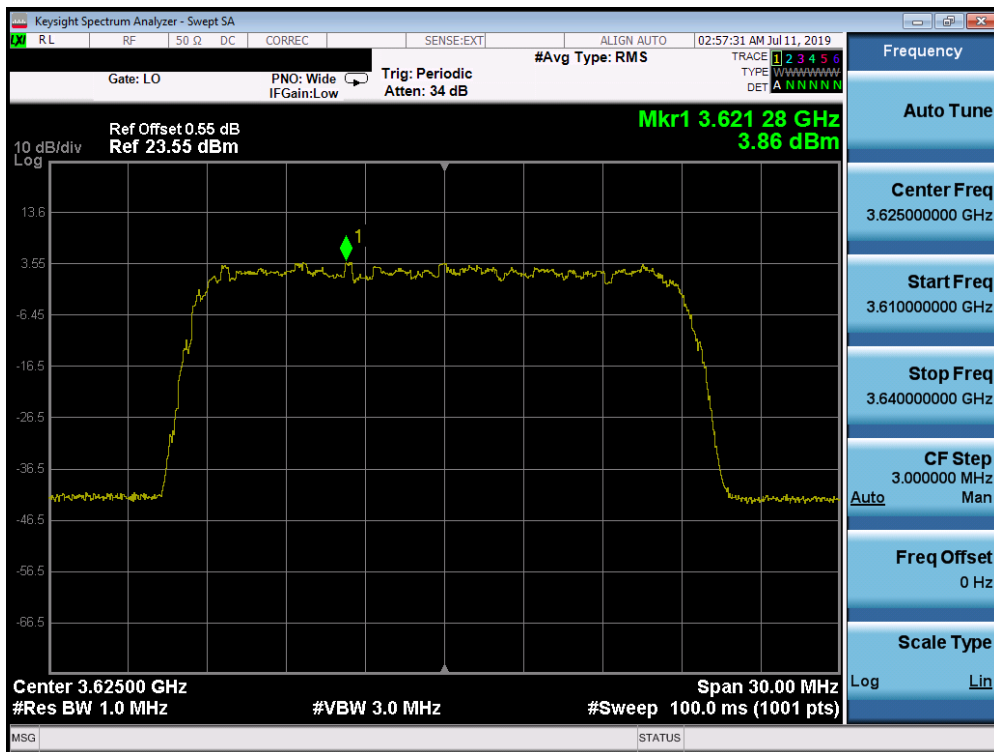


Plot 7-70. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 42

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBS		Page 89 of 172

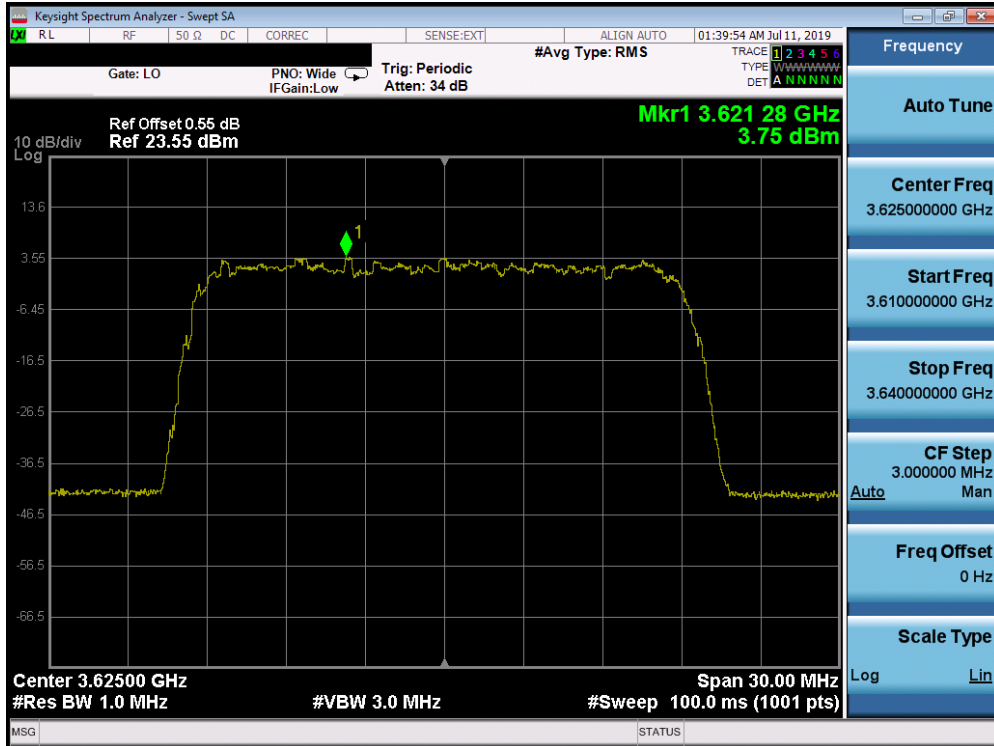


Plot 7-71. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 43

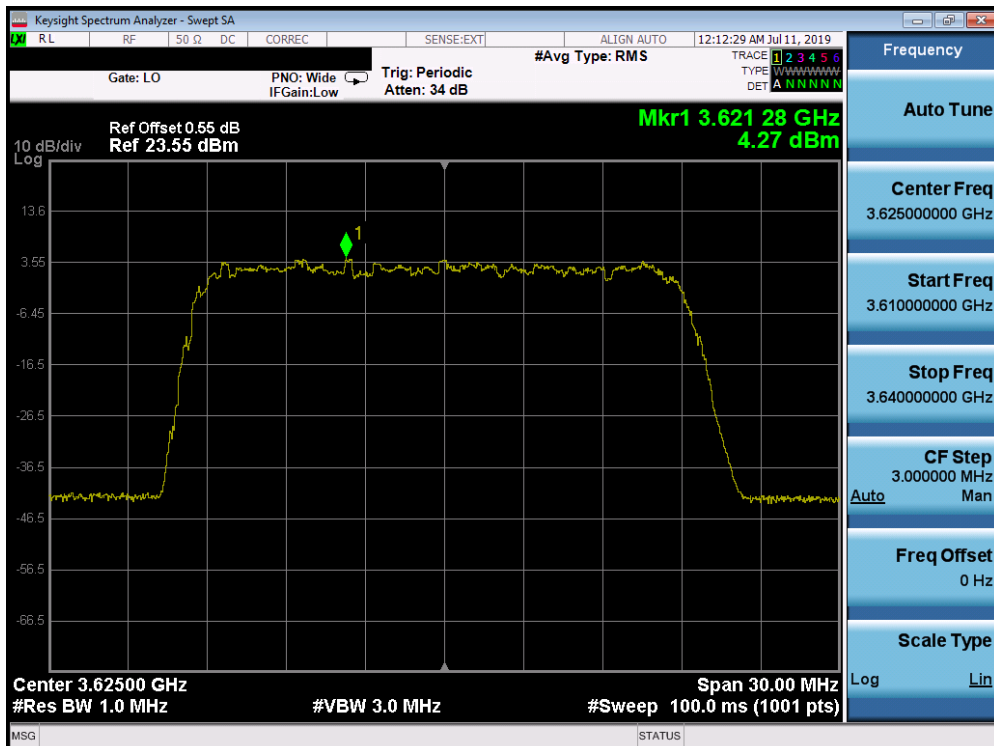


Plot 7-72. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 44

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 90 of 172

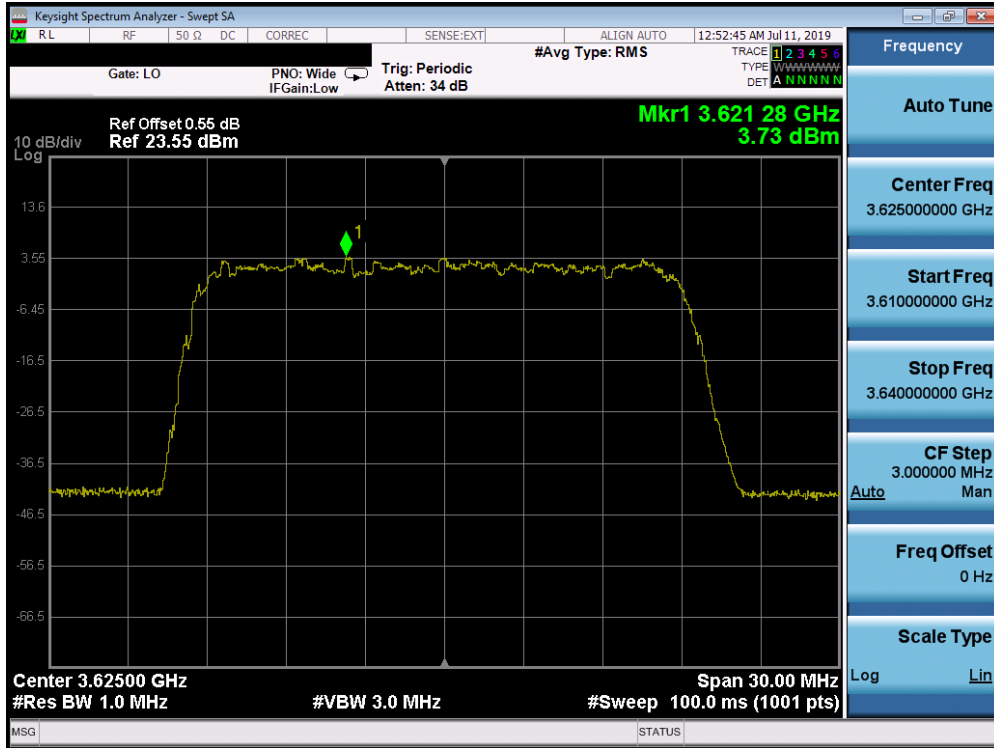


Plot 7-73. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 45

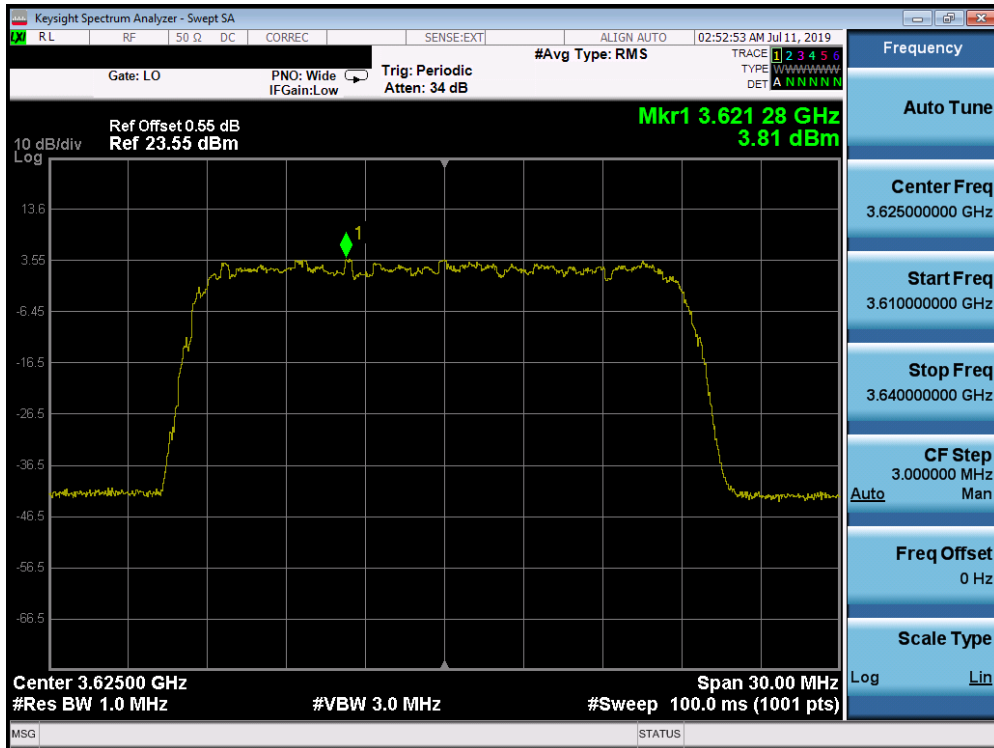


Plot 7-74. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 46

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 91 of 172

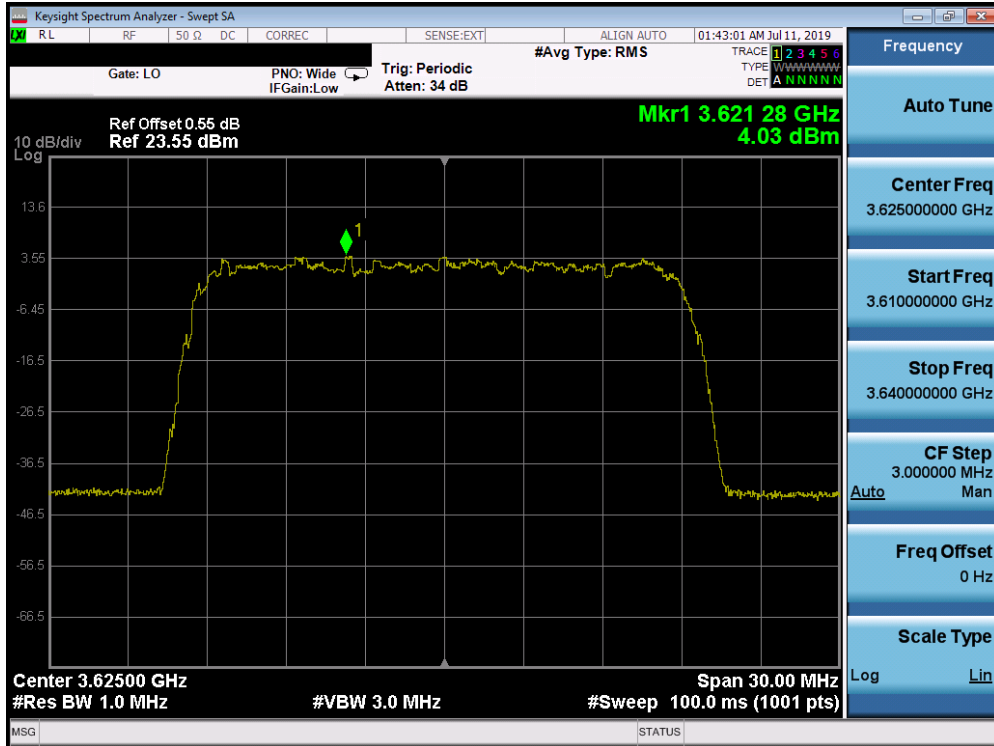


Plot 7-75. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 47

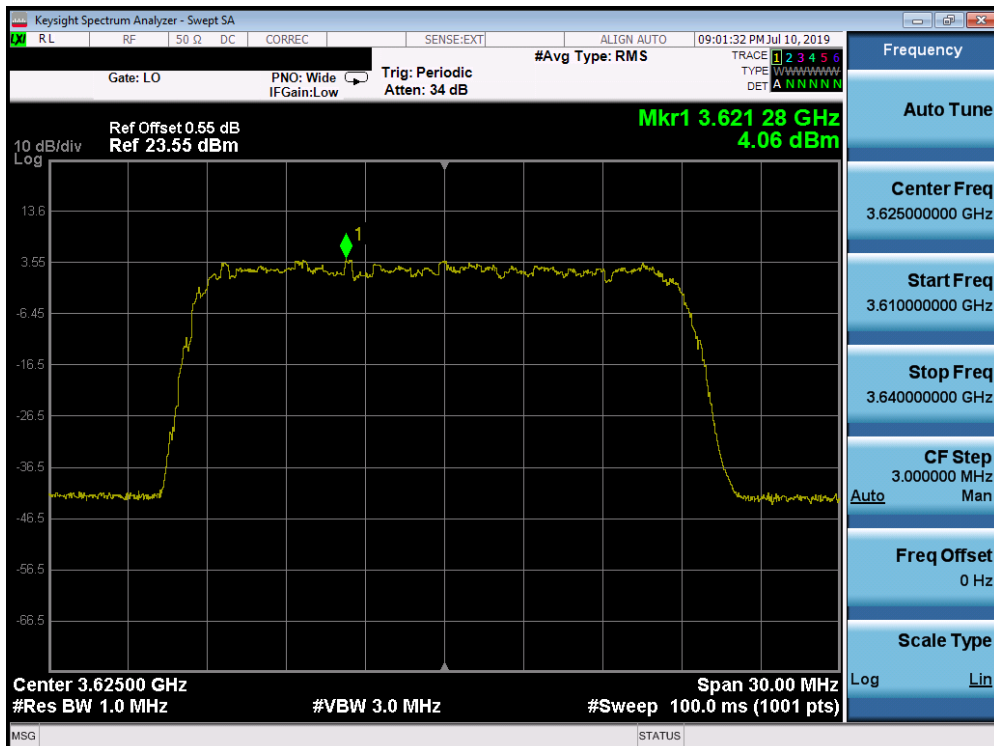


Plot 7-76. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 48

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 92 of 172



Plot 7-77. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 49



Plot 7-78. Peak Power Spectral Density Plot (1CC– 20.0MHz 16QAM- Mid Channel) Port 50

FCC ID: A3LMT6402-48A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1907220128-01.	Test Dates: 7/1/2019-7/29/2019	EUT Type: Massive MIMO CBSD		Page 93 of 172