

## TEST REPORT

### PART 96 MEASUREMENT REPORT

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

**Date of Testing:**  
 02/06/2023 – 03/07/2023  
**Test Site/Location:**  
 Element Lab., Suwon,  
 Yongin-si, Gyeonggi-do, Korea  
**Test Report Serial No.:**  
 8K23011901-00-R1.A3L

<b>FCC ID:</b>	<b>A3LRT4401-48A</b>
<b>APPLICANT:</b>	<b>Samsung Electronics Co., Ltd.</b>

**Application Type:** Class II Permissive Change  
**Model:** RT4401-48A  
**EUT Type:** RRU(RT4401)  
**FCC Classification:** Citizens Band Category B Devices (CBD)  
**FCC Rule Part(s):** 96  
**Test Procedure(s):** ANSI C63.26-2015, KDB 971168 D01 v03r01,  
 KDB 940660 D01 v03, 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.




Prepared by Jonathan Jang  
 Test Engineer





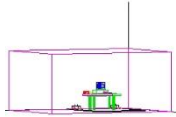
Reviewed by Charles.Shin  
 Technical Manager

<b>FCC ID:</b> A3LRT4401-48A	 <b>MEASUREMENT REPORT</b> (Class II Permissive Change)		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 8K23011901-00-R1.A3L	<b>Test Dates:</b> 02/06/2023 – 03/07/2023	<b>EUT Type:</b> RRU(RT4401)	Page 1 of 91

## TABLE OF CONTENTS

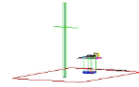
1.0	REVISION RECORD .....	4
2.0	INTRODUCTION .....	5
2.1	Scope .....	5
2.2	Element Test Location.....	5
2.3	Test Facility / Accreditation .....	5
3.0	PRODUCT INFORMATION.....	6
3.1	Equipment Description .....	6
3.2	Device Capabilities.....	6
3.3	Test Configuration .....	7
3.4	EMI Suppression Device(s)/Modifications .....	7
4.0	DESCRIPTION OF TESTS .....	8
4.1	Measurement Procedure.....	8
4.2	Radiated Spurious Emissions .....	9
4.3	Measurement Software .....	9
4.4	Environmental Conditions .....	9
5.0	MEASUREMENT UNCERTAINTY .....	10
6.0	TEST EQUIPMENT CALIBRATION DATA .....	11
7.0	SAMPLE CALCULATIONS .....	12
8.0	TEST RESULTS .....	13
8.1	Summary .....	13
8.2	Occupied Bandwidth .....	14
8.3	Power Spectral Density .....	19
8.4	Equivalent Isotropic Radiated Power (EIRP).....	29
8.5	Peak To Average Power Ratio (PAPR) .....	39
8.6	Channel Edge Emissions at Antenna Terminal .....	43
8.7	Spurious and Harmonic Emissions at Antenna Terminal .....	63
8.8	Radiated spurious emission .....	73
9.0	CONCLUSION.....	85
10.0	APPENDIX. A .....	86
10.1	Conducted Average Output Power.....	86

<b>FCC ID:</b> A3LRT4401-48A		<b>MEASUREMENT REPORT (Class II Permissive Change)</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 8K23011901-00-R1.A3L	<b>Test Dates:</b> 02/06/2023 – 03/07/2023	<b>EUT Type:</b> RRU(RT4401)	Page 2 of 91	



## MEASUREMENT REPORT

### FCC Rule Part 96





Mode	Total Bandwidth (MHz)	Tx Frequency (MHz)	Max. PSD (dBm/1MHz)	Max. EIRP (dBm/10MHz)	Max. EIRP /Entire Band Width (dBm)	Max. EIRP /Entire Band Width (W)	Emission Designator	Modulation
Multi-RAT_2C_ NR_20M+ LTE_5M	25	3550 - 3700	36.34	46.14	50.11	102.57	23M8G7D	QPSK
			36.46	46.47	49.57	90.57	23M9W7D	QAM
Multi-RAT_4C NR_20M+20M+ LTE_20M+20M	80		36.42	46.29	54.67	293.09	77M7G7D	QPSK
			36.51	46.45	54.62	289.73	77M6W7D	QAM
NR_3C 20M+20M+20M	60		36.34	46.14	52.90	194.98	58M0G7D	QPSK
			36.55	46.08	53.18	207.97	58M0W7D	QAM
NR_4C 20M+20M+20M +20M	80		36.42	46.37	54.55	285.10	77M8G7D	QPSK
			36.51	46.37	54.64	291.07	77M8W7D	QAM

#### EUT Overview



#### Notes:

Total Power shown in the table above are the Equivalent Isotropic Radiated Power that will appear on the Grant of Authorization.

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 3 of 91	

## 1.0 REVISION RECORD

Issue Number	Issued Date	Revision History
8K23011901-00.A3L	03/07/2023	Initial Issue
8K23011901-00-R1.A3L	03/14/2023	Revision due to updated EUT Overview table

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 8K23011901-00-R1.A3L	<b>Test Dates:</b> 02/06/2023 – 03/07/2023	<b>EUT Type:</b> RRU(RT4401)	Page 4 of 91	

## 2.0 INTRODUCTION

### 2.1 Scope

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



### 2.2 Element Test Location

These measurement tests were conducted at the Element Materials Technology Suwon. Ltd. facility located at (#1407) 13, Heungdeok 1-ro, Giheung-gu, Yongin-si, Gyeonggi-do 16954, Korea.

### 2.3 Test Facility / Accreditation

Measurements were performed at Element Materials Technology Suwon Lab located in Yongin-si, Gyeonggi, Korea.

- Element Materials Technology Suwon is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation(A2LA) with Certificate number 2041.04 for Specific Absorption Rate (SAR), where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Materials Technology Suwon facility is accredited, designated, and recognized in accordance with the provision of Radio Wave Act and International Standard ISO/IEC 17025:2017 under the National Radio Research Agency.
  - Designation Number / CABID: KR0169
  - Test Firm Registration Number of FCC: 417945
  - Test Firm Registration Number of IC: 26168

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 5 of 91

## 3.0 PRODUCT INFORMATION

### 3.1 Equipment Description



The Equipment Under Test (EUT) is the **Samsung Electronics Co., Ltd. RRU(RT4401) FCC ID: A3LRT4401-48A**. Per FCC Part 96, this device is evaluated under Citizens Band Category B Devices (CBD).

A class II permissive change on the original filing is being pursued to software modifications to add Radio Access Technology without hardware modification.

### 3.2 Device Capabilities

This device supports the following conditional features and filter information:

EUT Type:	RRU(RT4401)		
Model Name:	RT4401-48A		
Test Device Serial No:	S19A112801		
Device Capabilities:	LTE, 5G NR		
Operating Band/Frequency Range:	Band	Tx (Downlink)	Rx (Uplink)
	NR n48:	3550 MHz to 3700 MHz	3550 MHz to 3700 MHz
	LTE B48:	3550 MHz to 3700 MHz	3550 MHz to 3700 MHz
Supported Modulation:	QPSK, 16QAM, 64QAM, 256QAM		
Supported Number of Carriers and Channel Bandwidth:	# LTE: 5, 10, 15 and 20MHz bandwidth modes for TDD LTE B48 with up to 4CC aggregated BWs of Max 80MHz. # NR: 10, 20, 30 and 40MHz bandwidth modes with up to 2CC and 10 and 20MHz bandwidth modes for NR n48 with up to 4CC aggregated BWs of Max 80MHz. (NR 10/20M x 4C or NR 30/40M x 2C) # Multi-RAT: 5, 10, 15 and 20MHz bandwidth modes for LTE and 10, 20, 30 and 40MHz bandwidth modes for NR with up to 4CC aggregated BWs of Max 80MHz. (LTE 5/10/15/20M x 2C + NR 10/20M x 2C)		
Supported Configurations:	Single carrier, Multi-carrier, Multi-RAT		
Maximum Output Power:	Max 37 dBm/Path		
Number of Antenna ports	4		
Input Voltage:	-48 VDC, 90 – 260 VAC 50/60 Hz		
Antenna Gain:	Max. 17.7 dBi		

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 6 of 91

### 3.3 Test Configuration

The setup is as follows:

- The EUT "RT4401-48A is powered by a -48VDC power supply and the Radiated unwanted emission test case was additionally tested to 110VAC.
- The EUT is connected to a test laptop via an ethernet cable acting as backhaul.
- An RF cable connects the signal analyzer and the EUT Ports for respective measurement.

The EUT was tested per the guidance of ANSI C63.26-2015 and KDB 971168 D01 v03r01. See Section 8.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

The following information is about configurations of carrier frequency and output power per port declared by the manufacturer.



\* Abbreviations:

- 2C: Contiguous 2 carriers in multi-carrier operation
- 3C: Contiguous 3 carriers in multi-carrier operation
- 4C: Contiguous 4 carriers in multi-carrier operation
- NC: Non-contiguous carriers in multi-carrier operation

Supported carrier operation	Configuration	No. of Carrier	Total BW (MHz)	Carrier Frequency Configuration (MHz)			Rated Conducted Power (dBm/path)
				Lowest	Middle	Highest	
LTE and NR modes for Multi-RAT up to 4 CC aggregated BWs of max. 80MHz  LTE 5/10/15/20M x 2C + NR 10/20M x 2C	Multi-RAT_2C_NR_20M+ LTE_5M	2	25	3560.0 + 3572.5	3622.5 + 3635.0	3685.0 + 3697.5	31.9
	Multi-RAT_2NC_NR_20M+ LTE_5M			3560 + 3697.5			
	Multi-RAT_4C_NR_20M+20M+ LTE_20M+20M	4	80	3560.0 + 3580.0 + 3600.0 + 3620.0	3595.0 + 3615.0 + 3635.0 + 3655.0	3630.0 + 3650.0 + 3670.0 + 3690.0	37.0
	Multi-RAT_4NC_NR_20M+20M+ LTE_20M+20M			3560.0 + 3605.0 + 3645.0 + 3690.0			
10, 20, 30 and 40MHz Bandwidth modes for NR with up to 4CC aggregated BWs of max. 80MHz  NR 10/20M x 4C or NR 30/40M x 2C	n48_3C_20M+20M+20M	3	60	3560.0 + 3580.0 + 3600.0	3605.0 + 3625.0 + 3645.0	3650.0 + 3670.0 + 3690.0	35.7
	n48_3NC_20M+20M+20M			3560.0 + 3625.0 +3690.0			
	n48_4C_20M+20M+20M+20M	4	80	3560.0 + 3580.0 + 3600.0 + 3620.0	3595.0 + 3615.0 + 3635.0 + 3655.0	3630.0 + 3650.0 + 3670.0 + 3690.0	37.0
	n48_4NC_20M+20M+20M+20M			3560.0 + 3605.0 + 3645.0 + 3690.0			

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

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

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)			Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 7 of 91	

## 4.0 DESCRIPTION OF TESTS

### 4.1 Measurement Procedure

The measurement procedures described in the document titled “American National Standard for Compliance Testing of Transmitter Used in Licensed Radio Service” (ANSI C63.26-2015) and the guidance provided in KDB 971168 D01 v03r01, and KDB 662911 D01 v02r01 and KDB 940660 D01 v03 were used in the measurement of the EUT.

Occupied Bandwidth:

KDB 971168 D01 v03r01 – Section 4.3  
ANSI C63.26-2015 – Section 5.4.4

Modulation Characteristics:

ANSI C63.26 - Section 5.3

Conducted Power Measurement and EIRP and PSD

KDB 971168 D01 v03r01 – Section 5.3  
KDB 971168 D01 v03r01 – Section 5.4  
KDB 662911 D01 v02r01 – Section E)1) In-Band Power Measurements  
ANSI C63.26-2015 – Section 5.2.5  
ANSI C63.26-2015 – Section 5.2.4

Peak-to-Average Power Ratio:

KDB 971168 D01 v03r01 – Section 5.7  
ANSI C63.26-2015 – Section 5.2.3.4

Channel Edge Emissions at Antenna Terminal

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  $10 \log(N_{ANT})$  dB  
ANSI C63.26-2015 – Section 5.7

Spurious and Harmonic Emissions at Antenna Terminal



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  $10 \log(N_{ANT})$  dB  
ANSI C63.26-2015 – Section 5.7

Radiated unwanted emission

KDB 971168 D01 v03r01 – Section 7  
ANSI C63.26-2015 – Section 5.8

Frequency Stability / Temperature Variation

KDB 971168 D01 v03r01 – Section 9  
ANSI C63.26-2015 – Section 5.6

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 8 of 91



## 4.2 Radiated Spurious Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi- anechoic chamber which is shielded from any ambient interference.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. For frequencies above 1GHz, linearly polarized Vivaldi antennas were used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.



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

## 4.3 Measurement Software

Test item	Name	Version
Conducted Measurement	Node B automation	1.0

## 4.4 Environmental Conditions



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

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 8K23011901-00-R1.A3L	<b>Test Dates:</b> 02/06/2023 – 03/07/2023	<b>EUT Type:</b> RRU(RT4401)	Page 9 of 91	

## 5.0 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 Bench Top Measurements	1.37
Radiated Disturbance (<1GHz)	3.94
Radiated Disturbance (>1GHz)	4.75
Radiated Disturbance (>18GHz)	4.84

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 10 of 91

## 6.0 TEST EQUIPMENT CALIBRATION DATA



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

Manufacture	Model	Description	Cal Date	Cal interval	Cal Due	Serial Number
KEYSIGHT	N9030B	PXA Signal Analyzer	05/09/2022	Annual	05/08/2023	MY57142018
KEYSIGHT	N9020B	MXA Signal Analyzer	10/17/2022	Annual	10/16/2023	MY55470135
SUKSAN TECHNOLOGY	SE-CT-10	Temperature Chamber	07/05/2022	Annual	07/04/2023	191021
Rohde & Schwarz	FSW43	Signal & Spectrum Analyzer	07/05/2022	Annual	07/04/2023	101250
Rohde & Schwarz	ESW	EMI Test Receiver	07/04/2022	Annual	07/03/2023	101761
Rohde & Schwarz	TS-SFUNIT-Rx	Shielded Filter Unit	01/13/2023	Annual	01/12/2024	102151
Schwarzbeck	VULB9162	Broadband TRILOG Antenna	07/13/2021	Biennial	07/12/2023	9162-217
Sunol sciences	DRH-118	Horn Antenna	01/26/2023	Biennial	01/25/2025	A060215
NARDA	180-442A-KF	Horn Antenna	11/23/2022	Biennial	11/22/2024	T058701-03
Centric RF	C411-20	Attenuator	05/09/2022	Annual	05/08/2023	0001
Centric RF	C411-20	Attenuator	01/12/2023	Annual	01/11/2024	0002
Centric RF	C411-20	Attenuator	01/12/2023	Annual	01/11/2024	0003
Centric RF	C411-20	Attenuator	01/12/2023	Annual	01/11/2024	0004
Qualwave	QFA1820	Attenuator	07/28/2022	Annual	07/27/2023	22265102
Reachline	250W18NN-40	Attenuator	01/13/2023	Annual	01/12/2024	PK0293
Reachline	250W18NN-40	Attenuator	01/13/2023	Annual	01/12/2024	PK0294
Reachline	250W18NN-40	Attenuator	01/13/2023	Annual	01/12/2024	PK0295
Reachline	250W18NN-40	Attenuator	10/17/2022	Annual	10/16/2023	PK00419

**Table 6-1. 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. All testing was performed before the calibration due date.

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 11 of 91

## 7.0 SAMPLE CALCULATIONS

### Emission Designator

#### QPSK Modulation

**Emission Designator = 23M8G7D**

Occupied Bandwidth = 23.83 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

#### QAM Modulation



**Emission Designator = 23M9W7D**

Occupied Bandwidth = 23.85 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)	 <b>Approved by:</b> Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 12 of 91

## 8.0 TEST RESULTS

### 8.1 Summary



Company Name: SAMSUNG Electronics Co., Ltd.  
 FCC ID: A3LRT4401-48A  
 Type of Radio Equipment: Citizens Band Category B Devices (CBD)  
 Mode(s): LTE, 5G NR

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 8.2
2.1046 96.41(a)	Modulation Characteristics	Digital modulation		PASS	Note 4
2.1046 96.41(b)	Power Spectral Density (PSD)	37 dBm/MHz (PSD)		PASS	Section 8.4
2.1046 96.41(b)	Equivalent Isotropic Radiated Power (EIRP)	47 dBm/10MHz (EIRP)		PASS	Section 8.5
96.41(g)	Peak-Average Ratio	≤ 13 dB		PASS	Section 8.6
2.1051 96.41(e)	Out of Band Emissions	Within 0 MHz to 10 MHz above and below the assigned channel ≤ -13 dBm/MHz Greater than 10 MHz above and below the assigned channel ≤ -25 dBm/MHz Any emission below 3530 MHz and above 3720 MHz ≤ -40 dBm/MHz		PASS	Section 8.7
2.1055 96.41(e)	Frequency Stability	Fundamental emissions stay within authorized frequency block		PASS	Note 4
2.1051 96.41(e)	Radiated unwanted emission	< -40dBm/MHz	Radiated	PASS	Section 8.8

**Table 8-1. Summary of Test Results**

**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 analyzer plots were all taken with a correction table loaded into the analyzer.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4) This is a variant report for Channel Bandwidth and Radio Access Technology enabled by software without hardware change. The test item does not affect those operation. And it was performed in original report.
- 5) For Class II Permissive Change test, All mode tested for worst modulation in original test report.

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 13 of 91	

## 8.2 Occupied Bandwidth

### 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. All measured modes of operation were investigated, and the worst case configuration results are reported in this section.

### Test Procedure Used

ANSI C63.26 - Section 5.4.4  
KDB 971168 D01 v03r01 - Section 4.3

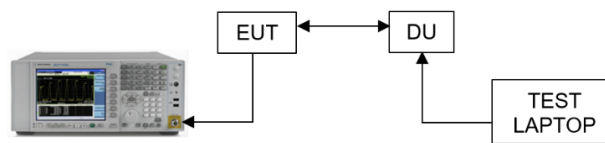
### Test Setting

The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The spectrum analyzer settings were as follows:

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW  $\geq$  3 x 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 8-1. Test Instrument & Measurement Setup**

### Limit

The occupied bandwidth shall not exceed the equipment's channel bandwidth, which is declared by the manufacturer.



FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 14 of 91

Channel	Port	OBW (MHz)	
		QPSK	16QAM
Low	0	23.75	23.80
	1	23.80	23.76
	2	23.77	23.77
	3	23.78	23.76
Middle	0	23.82	23.79
	1	23.79	23.83
	2	23.82	<b>23.85</b>
	3	<b>23.83</b>	23.81
High	0	23.83	23.79
	1	23.81	23.74
	2	23.76	23.80
	3	23.76	23.77

**Table 8-2. Occupied Bandwidth Summary Data (Multi-RAT\_2C\_NR\_20M + LTE\_5M)**

Channel	Port	OBW (MHz)	
		QPSK	16QAM
Low	0	77.52	77.49
	1	77.42	77.48
	2	77.54	77.43
	3	77.48	77.51
Middle	0	<b>77.71</b>	77.44
	1	77.51	77.49
	2	77.57	77.54
	3	77.53	<b>77.57</b>
High	0	77.40	77.57
	1	77.55	77.39
	2	77.48	77.45
	3	77.67	77.29

**Table 8-3. Occupied Bandwidth Summary Data (Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M)**



FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 15 of 91

Channel	Port	OBW (MHz)	
		QPSK	16QAM
Low	0	57.81	57.86
	1	57.89	57.86
	2	57.85	57.87
	3	57.78	57.86
Middle	0	<b>57.99</b>	57.90
	1	57.82	57.74
	2	57.96	57.90
	3	57.85	57.94
High	0	57.90	57.93
	1	57.92	<b>57.96</b>
	2	57.91	57.86
	3	57.88	57.86

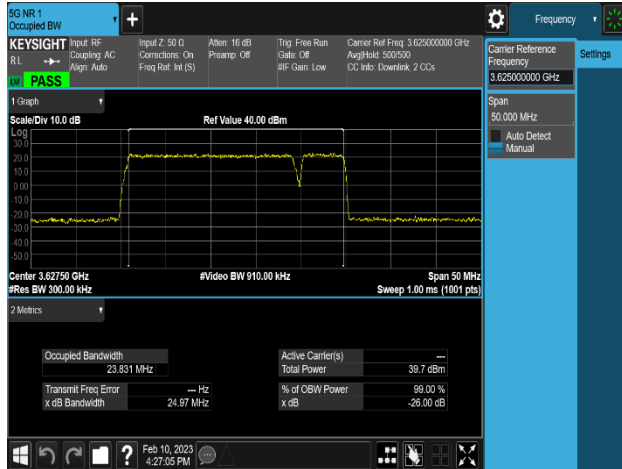
**Table 8-4. Occupied Bandwidth Summary Data (NR\_3C\_20M+20M+20M)**

Channel	Port	OBW (MHz)	
		QPSK	16QAM
Low	0	77.65	77.66
	1	77.60	77.63
	2	77.63	77.60
	3	77.75	77.69
Middle	0	77.66	77.66
	1	77.60	77.70
	2	77.60	77.68
	3	77.67	<b>77.76</b>
High	0	<b>77.76</b>	77.71
	1	77.65	77.72
	2	77.59	77.74
	3	77.70	77.64

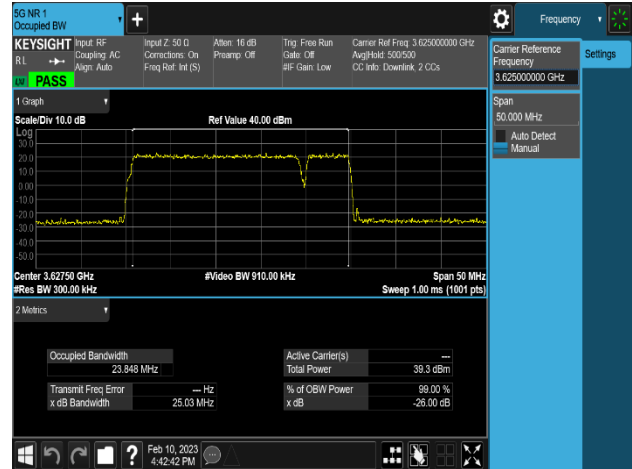
**Table 8-5. Occupied Bandwidth Summary Data (NR\_4C\_20M+20M+20M+20M)**

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 16 of 91

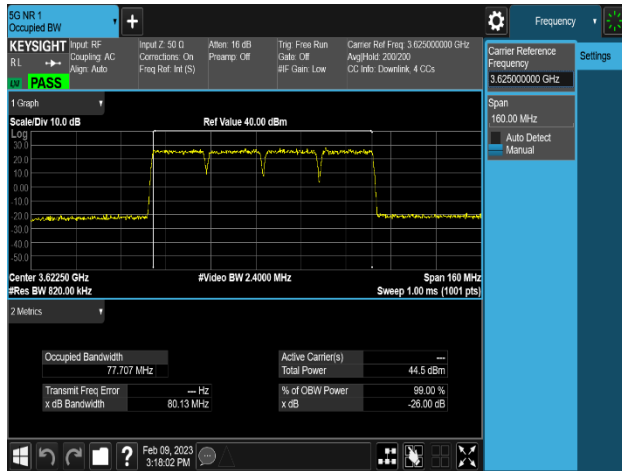




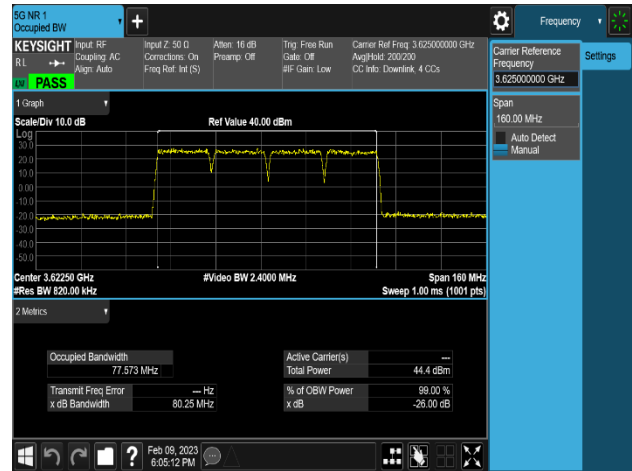
Plot 8-1. Occupied Bandwidth Plot  
(Multi-RAT\_2C\_NR\_20M+LTE\_5M\_QPSK – Mid Channel, Port 3)



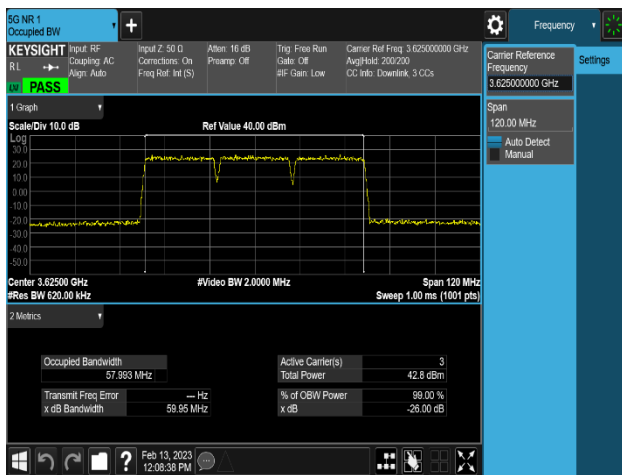
Plot 8-2. Occupied Bandwidth Plot  
(Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM – Mid Channel, Port 2)



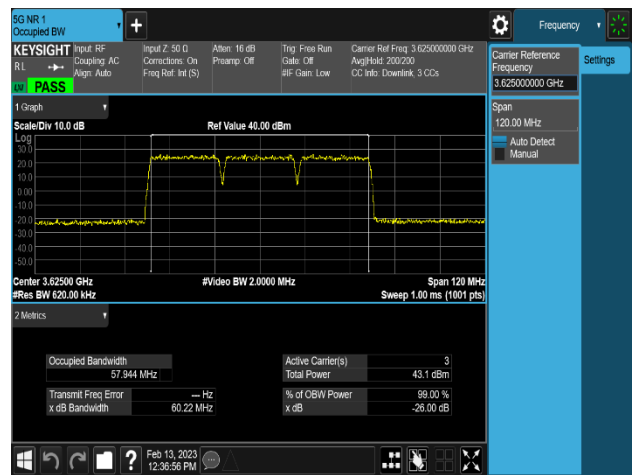
Plot 8-3. Occupied Bandwidth Plot  
(Multi-RAT\_4C NR\_20M+20M+LTE\_20M+20M\_QPSK – Mid Channel, Port 0)



Plot 8-4. Occupied Bandwidth Plot  
(Multi-RAT\_4C NR\_20M+20M+LTE\_20M+20M\_16QAM – Mid Channel, Port 3)

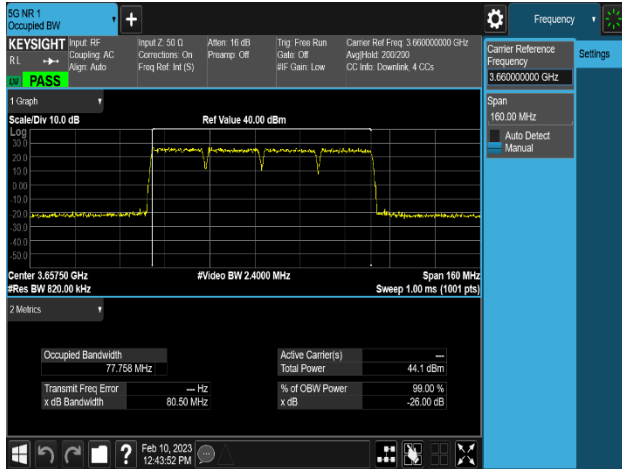


Plot 8-5. Occupied Bandwidth Plot  
(NR\_n48\_3C\_20M+20M+20M\_QPSK - Mid Channel, Port 0)

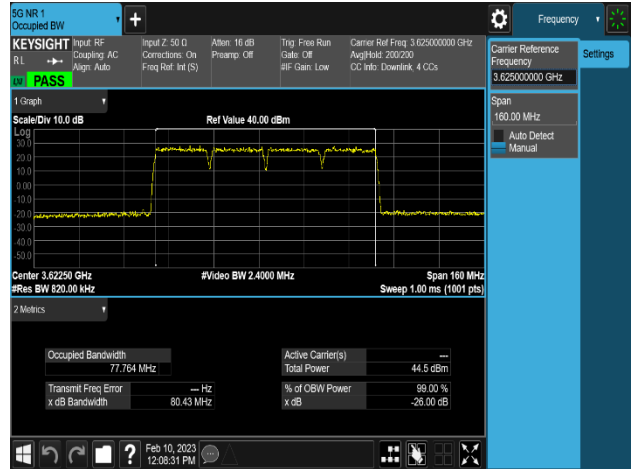


Plot 8-6. Occupied Bandwidth Plot  
(NR\_n48\_3C\_20M+20M+20M\_16QAM - Mid Channel, Port 3)

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 17 of 91



Plot 8-7. Occupied Bandwidth Plot  
(NR\_n48\_4C\_20M+20M+20M+20M\_QPSK - High Channel, Port 0)



Plot 8-8. Occupied Bandwidth Plot  
(NR\_n48\_4C\_20M+20M+20M+20M\_16QAM - Mid Channel, Port 3)

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 8K23011901-00-R1.A3L	<b>Test Dates:</b> 02/06/2023 – 03/07/2023	<b>EUT Type:</b> RRU(RT4401)		Page 18 of 91

### 8.3 Power Spectral Density

#### 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 Procedure Used

ANSI C63.26 - Section 5.2.4  
 ANSI C63.26 - Section 5.2.5  
 KDB 971168 D01 v03r01 - Section 5.3

ANSI C63.26 - Section 6.4.3.2.3  
 KDB 662911 D01 v02r01  
 - Section E)2) In-Band Power Spectral Density (PSD) Measurements  
 b) Measure and sum spectral maxima across the outputs.

#### Test Setting

The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The spectrum analyzer settings were as follows:

The PSD is measured following the same procedures described in 5.2.4.4 of ANSI C63.26 for measuring the total average power, but with the RBW set to the reference bandwidth specified by the applicable regulatory requirement, and by using the marker function to identify the maximum PSD instead of summing the power across the OBW. If the fundamental measurement condition cannot be realized, then one of the alternative procedures in 5.2.4.4.2 or 5.2.4.4.3 should be selected, based on whether the transmitter duty cycle is constant (variations  $\leq \pm 2\%$ ) or non-constant (variations  $> \pm 2\%$ ), respectively.



1. Conducted power measurements are performed using the signal analyzer's "SA mode" measurement capability for signals with continuous operation.
2. Set span to  $2 \times$  to  $3 \times$  the OBW.
3. Set RBW = 1 MHz (the reference bandwidth)
4. Set VBW  $\geq 3 \times$  RBW.
5. Set number of measurement points in sweep  $\geq 2 \times$  span / RBW.
6. Sweep time:
  - a) Set  $\geq$  auto-couple, and enable trace averaging, or
  - b) Set  $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$  and enable a single sweep (automation-compatible) measurement. The sweep time should never be faster than the auto-coupled sweep time.
7. Detector = power averaging (rms).
8. The trace was allowed to stabilize
9. Use the peak marker function to determine the maximum amplitude level. ( $=P_{\text{Meas}}$ )
10. The relevant equation for determining the maximum EIRP from the measured RF output power is given in

Equation as follows:

$$\text{EIRP} = P_{\text{Meas}} + G_T$$

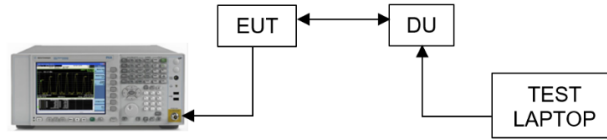
where

$G_T$ : gain of the transmitting antenna, in dBi (EIRP).

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 19 of 91

**Test Setup**

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



**Figure 8-2. Test Instrument & Measurement Setup**



**Limit**

Category B CBSD : 37 dBm/MHz

**Test Notes**

1. 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).
2. All modes of operation were investigated and the worst configuration result plots are reported in each Band width.
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. PSD per port (dBm/MHz) is converted to a linear value (mW). A summation of linear powers for all ports gives us the total MIMO conducted Power (mW). We convert this back to logarithmic scale for further PSD calculations.
5. Antenna Gains (dBi) provided by the client.
6. The EUT have multiple antennas transmitting correlated signals with the equal antenna gains and two outputs driving a cross-polarized antennas with  $N_{ANT}=2$ .  
Directional gain is to be computed as follows;  
\* Directional gain =  $G_{ANT} + 10 \log(N_{ANT})$  dBi
7. Worst e.i.r.p Case Scenario gain antenna was selected to perform all RF testing that can get maximum power setting. And high gain antenna power setting will be reduced according to difference value of antenna gain declared by applicant.
8. Applied antenna gain as below:

Bandwidth	Antenna gain (dBi)	Directional gain (dBi)
All Bandwidth	9.0	12.0



FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 20 of 91	

9. Sample Calculation:

Let us assume the following numbers:



- a) Total MIMO Conducted PSD as 271.83 mW
- b) Antenna Gain = 12.00 dBi

Factors		Value	Unit
Summed MIMO Conducted PSD (linear sum)		271.83	mW
Summed MIMO Conducted PSD (dBm)	= $10 * \log(271.83) =$	24.34	dBm/MHz
Antenna Gain		12.00	dB
<b>e.i.r.p PSD</b>		36.34	dBm/MHz
<b>Limit</b>		37.00	dBm/MHz
<b>Margin = Limit - e.i.r.p PSD</b>	= $36.34 - 37.00 =$	-0.66	dB

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 8K23011901-00-R1.A3L	<b>Test Dates:</b> 02/06/2023 – 03/07/2023	<b>EUT Type:</b> RRU(RT4401)	Page 21 of 91	



Low Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.35	18.31
	1	18.37	18.34
	2	18.20	18.23
	3	18.38	18.32
Total MIMO Conducted Power (mW/MHz)		271.83	270.42
Total MIMO Conducted Power (dBm/MHz)		24.34	24.32
Ant. Gain (dBi)		12.00	12.00
e.i.r.p PSD (dBm/MHz)		36.34	36.32
e.i.r.p PSD Limit(dBm/MHz)		37.00	37.00
Margin (dB)		-0.66	-0.68
Mid Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.32	18.34
	1	18.24	18.30
	2	18.28	18.17
	3	18.39	18.31
Total MIMO Conducted Power (mW/MHz)		270.88	268.99
Total MIMO Conducted Power (dBm/MHz)		24.33	24.30
Ant. Gain (dBi)		12.00	12.00
e.i.r.p PSD (dBm/MHz)		36.33	36.30
e.i.r.p PSD Limit(dBm/MHz)		37.00	37.00
Margin (dB)		-0.67	-0.70
High Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.16	<b>18.36</b>
	1	18.28	<b>18.46</b>
	2	18.29	<b>18.43</b>
	3	18.34	<b>18.51</b>
Total MIMO Conducted Power (mW/MHz)		268.51	<b>279.27</b>
Total MIMO Conducted Power (dBm/MHz)		24.29	<b>24.46</b>
Ant. Gain (dBi)		12.00	<b>12.00</b>
e.i.r.p PSD (dBm/MHz)		36.29	<b>36.46</b>
e.i.r.p PSD Limit(dBm/MHz)		37.00	<b>37.00</b>
Margin (dB)		-0.71	<b>-0.54</b>

**Table 8-6. Power Spectral Density Table (Multi-RAT\_2C\_NR\_20M+LTE\_5M)**

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 22 of 91	



Low Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.33	18.41
	1	18.37	18.46
	2	18.33	18.34
	3	18.45	18.55
Total MIMO Conducted Power (mW/MHz)		275.00	279.24
Total MIMO Conducted Power (dBm/MHz)		24.39	24.46
Ant. Gain (dBi)		12.00	12.00
e.i.r.p PSD (dBm/MHz)		36.39	36.46
e.i.r.p PSD Limit(dBm/MHz)		37.00	37.00
Margin (dB)		-0.61	-0.54
Mid Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.30	<b>18.35</b>
	1	18.42	<b>18.52</b>
	2	18.43	<b>18.47</b>
	3	18.46	<b>18.62</b>
Total MIMO Conducted Power (mW/MHz)		276.87	<b>282.71</b>
Total MIMO Conducted Power (dBm/MHz)		24.42	<b>24.51</b>
Ant. Gain (dBi)		12.00	<b>12.00</b>
e.i.r.p PSD (dBm/MHz)		36.42	<b>36.51</b>
e.i.r.p PSD Limit(dBm/MHz)		37.00	<b>37.00</b>
Margin (dB)		-0.58	<b>-0.49</b>
High Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.32	18.36
	1	18.43	18.37
	2	18.33	18.34
	3	18.31	18.35
Total MIMO Conducted Power (mW/MHz)		273.39	273.80
Total MIMO Conducted Power (dBm/MHz)		24.37	24.37
Ant. Gain (dBi)		12.00	12.00
e.i.r.p PSD (dBm/MHz)		36.37	36.37
e.i.r.p PSD Limit(dBm/MHz)		37.00	37.00
Margin (dB)		-0.63	-0.63

**Table 8-7. Power Spectral Density Table (Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M)**

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 23 of 91	

Low Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.26	18.34
	1	18.35	18.49
	2	18.25	18.42
	3	18.42	18.51
Total MIMO Conducted Power (mW/MHz)		271.51	279.13
Total MIMO Conducted Power (dBm/MHz)		24.34	24.46
Ant. Gain (dBi)		12.00	12.00
e.i.r.p PSD (dBm/MHz)		36.34	36.46
e.i.r.p PSD Limit(dBm/MHz)		37.00	37.00
Margin (dB)		-0.66	-0.54
Mid Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.31	18.58
	1	18.32	18.38
	2	18.28	18.68
	3	18.32	18.41
Total MIMO Conducted Power (mW/MHz)		270.90	284.07
Total MIMO Conducted Power (dBm/MHz)		24.33	24.53
Ant. Gain (dBi)		12.00	12.00
e.i.r.p PSD (dBm/MHz)		36.33	36.53
e.i.r.p PSD Limit(dBm/MHz)		37.00	37.00
Margin (dB)		-0.67	-0.47
High Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.26	<b>18.44</b>
	1	18.35	<b>18.51</b>
	2	18.31	<b>18.59</b>
	3	18.33	<b>18.57</b>
Total MIMO Conducted Power (mW/MHz)		271.05	<b>284.92</b>
Total MIMO Conducted Power (dBm/MHz)		24.33	<b>24.55</b>
Ant. Gain (dBi)		12.00	<b>12.00</b>
e.i.r.p PSD (dBm/MHz)		36.33	<b>36.55</b>
e.i.r.p PSD Limit(dBm/MHz)		37.00	<b>37.00</b>
Margin (dB)		-0.67	<b>-0.45</b>



**Table 8-8. Power Spectral Density Table (NR\_3C\_ 20M+20M+20M)**

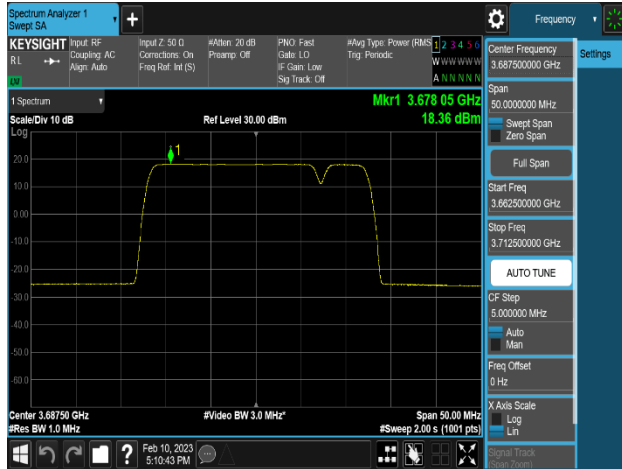
FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 24 of 91



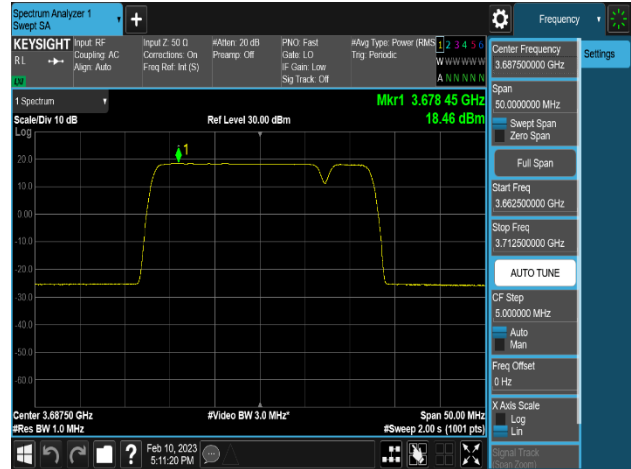
Low Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.22	<b>18.45</b>
	1	18.28	<b>18.47</b>
	2	18.19	<b>18.47</b>
	3	18.35	<b>18.57</b>
Total MIMO Conducted Power (mW/MHz)		267.93	<b>282.49</b>
Total MIMO Conducted Power (dBm/MHz)		24.28	<b>24.51</b>
Ant. Gain (dBi)		12.00	<b>12.00</b>
e.i.r.p PSD (dBm/MHz)		36.28	<b>36.51</b>
e.i.r.p PSD Limit(dBm/MHz)		37.00	<b>37.00</b>
Margin (dB)		-0.72	<b>-0.49</b>
Mid Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.23	18.33
	1	18.38	18.37
	2	18.44	18.44
	3	18.52	18.51
Total MIMO Conducted Power (mW/MHz)		276.41	277.47
Total MIMO Conducted Power (dBm/MHz)		24.42	24.43
Ant. Gain (dBi)		12.00	12.00
e.i.r.p PSD (dBm/MHz)		36.42	36.43
e.i.r.p PSD Limit(dBm/MHz)		37.00	37.00
Margin (dB)		-0.58	<b>-0.57</b>
High Channel	Port	QPSK	16QAM
Conducted Power (dBm/MHz)	0	18.29	18.30
	1	18.28	18.39
	2	18.31	18.28
	3	18.29	18.51
Total MIMO Conducted Power (mW/MHz)		269.94	274.87
Total MIMO Conducted Power (dBm/MHz)		24.31	24.39
Ant. Gain (dBi)		12.00	12.00
e.i.r.p PSD (dBm/MHz)		36.31	36.39
e.i.r.p PSD Limit(dBm/MHz)		37.00	37.00
Margin (dB)		-0.69	<b>-0.61</b>

**Table 8-9. Power Spectral Density Table (NR\_4C\_20M+20M+20M+20M)**

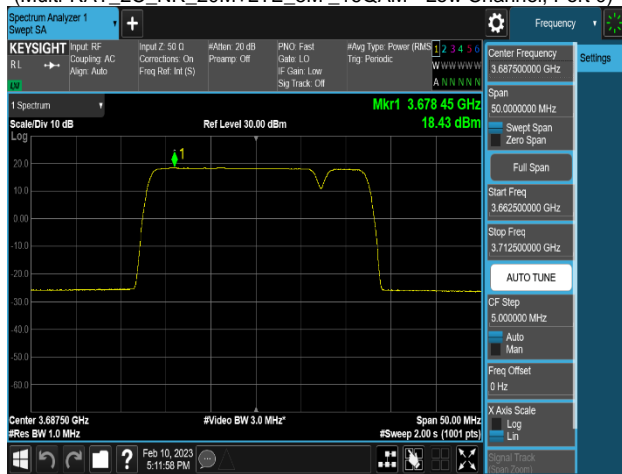
FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 25 of 91



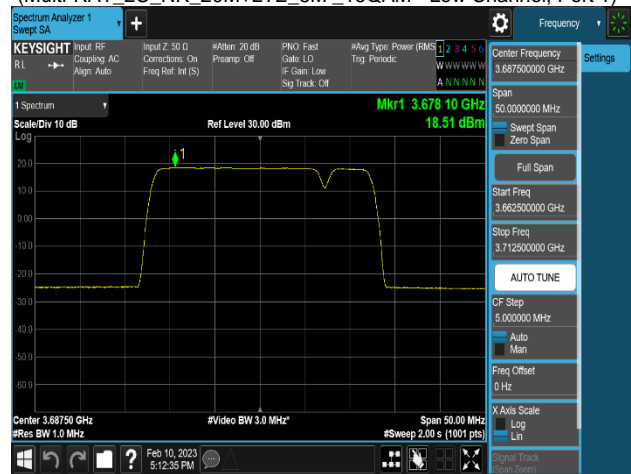
Plot 8-9. Power Spectral Density Plot  
(Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM - Low Channel, Port 0)



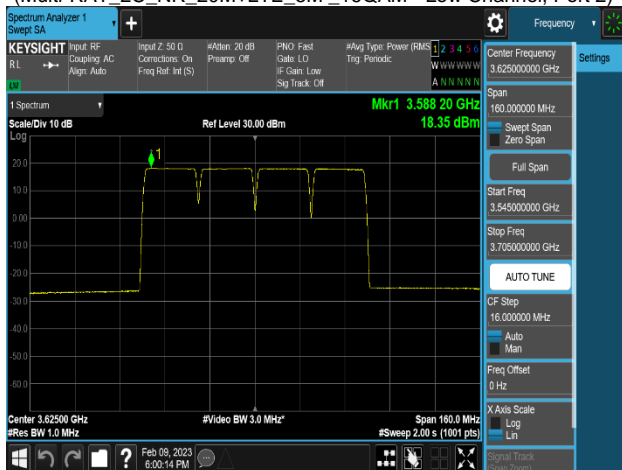
Plot 8-10. Power Spectral Density Plot  
(Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM - Low Channel, Port 1)



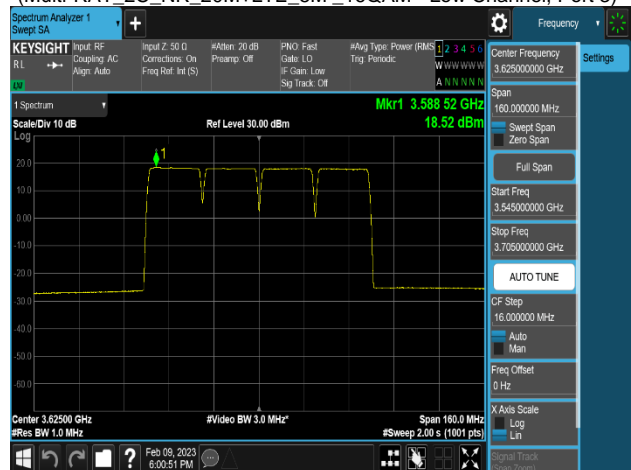
Plot 8-11. Power Spectral Density Plot  
(Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM - Low Channel, Port 2)



Plot 8-12. Power Spectral Density Plot  
(Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM - Low Channel, Port 3)

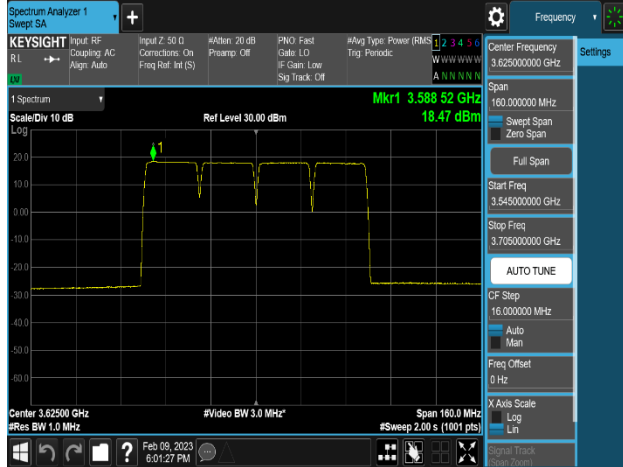


Plot 8-13. Power Spectral Density Plot  
(Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_16QAM - Mid Channel, Port 0)

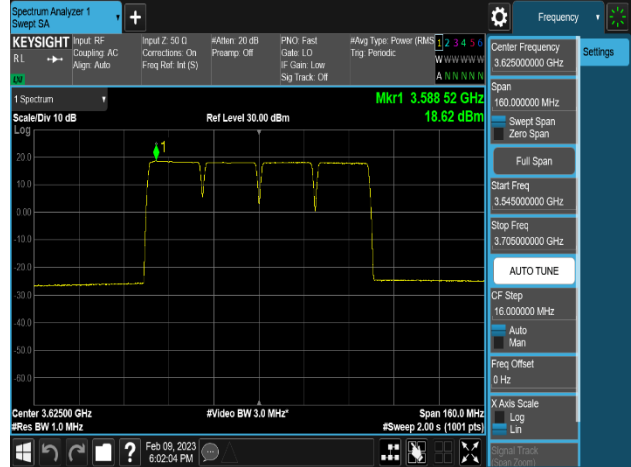


Plot 8-14. Power Spectral Density Plot  
(Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_16QAM - Mid Channel, Port 1)

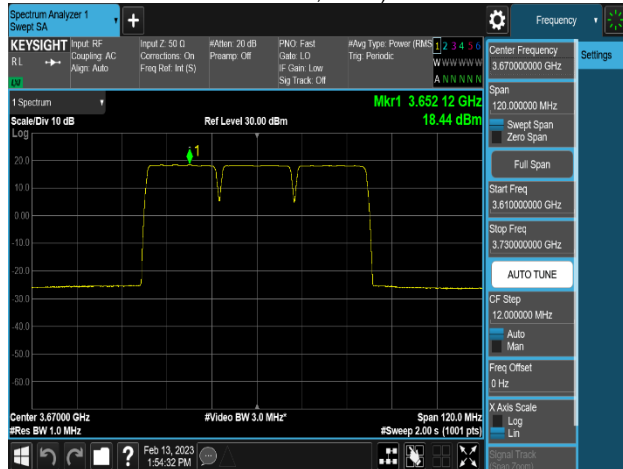
FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 8K23011901-00-R1.A3L	<b>Test Dates:</b> 02/06/2023 – 03/07/2023	<b>EUT Type:</b> RRU(RT4401)		Page 26 of 91



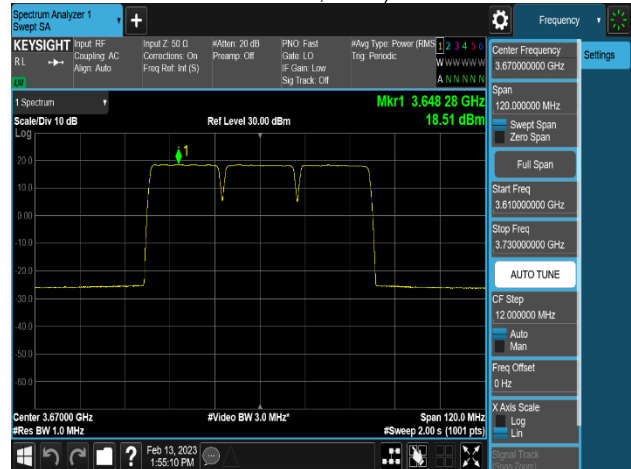
Plot 8-15. Power Spectral Density Plot  
(Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_16QAM - Mid Channel, Port 2)



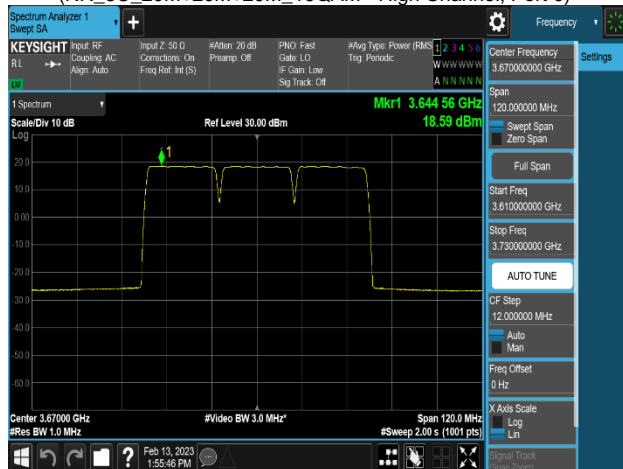
Plot 8-16. Power Spectral Density Plot  
(Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_16QAM - Mid Channel, Port 3)



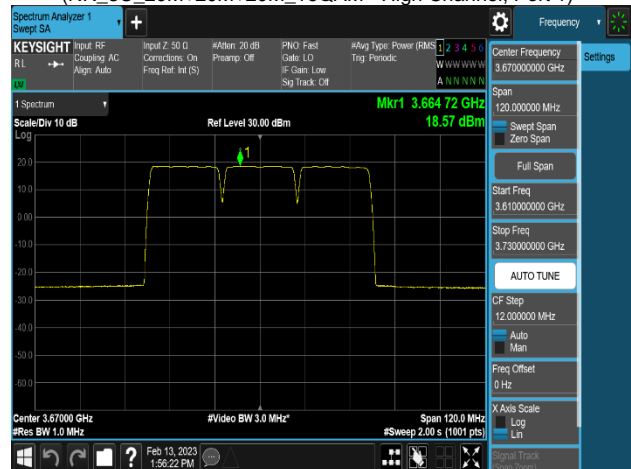
Plot 8-17. Power Spectral Density Plot  
(NR\_3C\_20M+20M+20M\_16QAM - High Channel, Port 0)



Plot 8-18. Power Spectral Density Plot  
(NR\_3C\_20M+20M+20M\_16QAM - High Channel, Port 1)

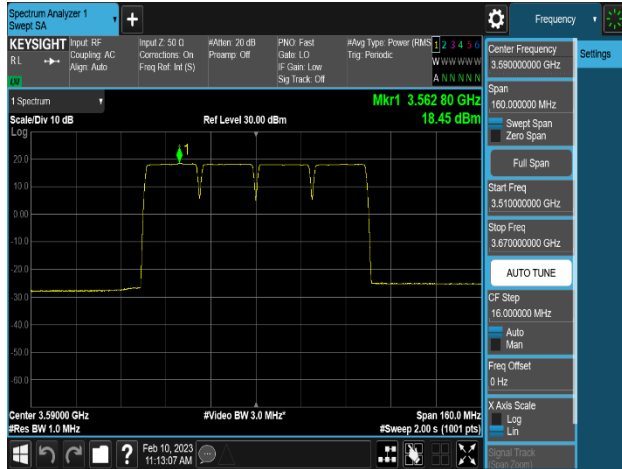


Plot 8-19. Power Spectral Density Plot  
(NR\_3C\_20M+20M+20M\_16QAM - High Channel, Port 2)

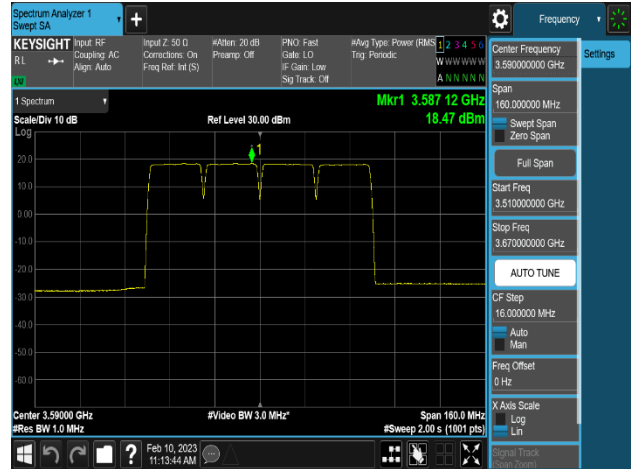


Plot 8-20. Power Spectral Density Plot  
(NR\_3C\_20M+20M+20M\_16QAM - High Channel, Port 3)

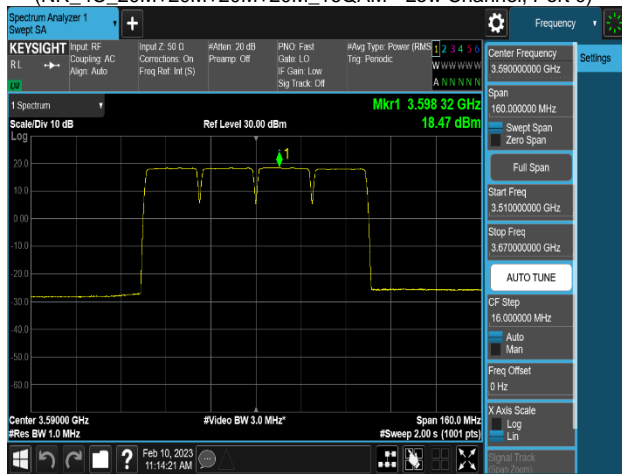
FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 8K23011901-00-R1.A3L	<b>Test Dates:</b> 02/06/2023 – 03/07/2023	<b>EUT Type:</b> RRU(RT4401)		Page 27 of 91



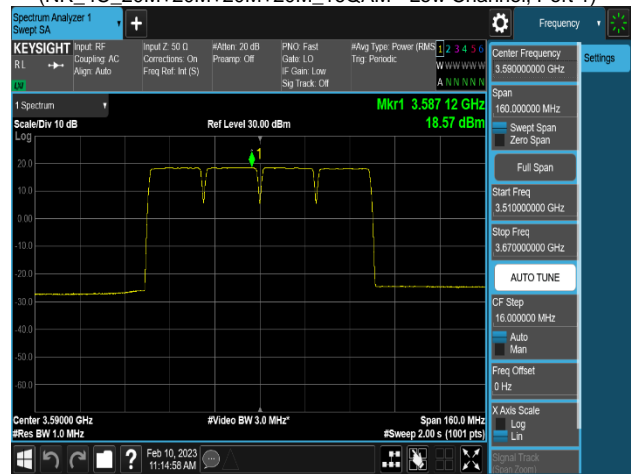
Plot 8-21. Power Spectral Density Plot (NR\_4C\_20M+20M+20M+20M\_16QAM - Low Channel, Port 0)



Plot 8-22. Power Spectral Density Plot (NR\_4C\_20M+20M+20M+20M\_16QAM - Low Channel, Port 1)



Plot 8-23. Power Spectral Density Plot (NR\_4C\_20M+20M+20M+20M\_16QAM - Low Channel, Port 2)



Plot 8-24. Power Spectral Density Plot (NR\_4C\_20M+20M+20M+20M\_16QAM - Low Channel, Port 3)

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		<b>Approved by:</b> Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 28 of 91

## 8.4 Equivalent Isotropic Radiated Power (EIRP)

### 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 Description

KDB 971168 D01 v03r01 – Section 5.4

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

ANSI C63.26-2015 – Section 5.2.4

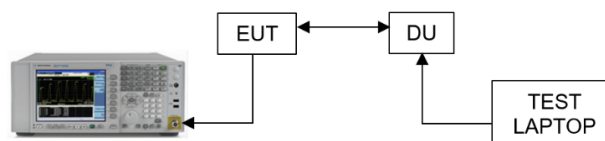
ANSI C63.26 - Section 5.2.5

The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The spectrum analyzer settings were as follows:

1. Conducted power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. IBW = 10 MHz (the reference bandwidth)
3. RBW = 1 ~ 5% of the expected OBW
4. VBW  $\geq 3 \times$  RBW
5. Span = 2 ~ 3 x OBW
6. No. of sweep points  $\geq 2 \times$  span / RBW
7. Detector = RMS
8. Trace mode = Trace-Averaging (RMS) set to average over 100 sweeps
9. The trace was allowed to stabilize

### Test Setup



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



**Figure 8-3. Test Instrument & Measurement Setup**

### Limit



Category B CBSD: 47dBm/10 MHz

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 29 of 91

**Note**

1. 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.
2. For Multi carriers, conducted power for each carrier is measured to compare the 1st carrier result and the result of 2nd carrier. After compared, worst measured value is listed on report.
3. MIMO Calculations are done considering output channel power for all ports and respective margins are calculated according to procedures in section 6.4 of ANSI C63.26 and section D of KDB 971168 D01 v03r01.
4. All modes of operation were investigated and the worst configuration result plots are reported in each RF bandwidth.
5. Consider the following factors for MIMO Power:
  - c) Conducted power for each port is measured in dBm.
  - d) Powers are summed up in linear using the measure-and-sum technique defined in KDB 971168 D01 v03r01- Section D.
  - e) Conducted power per port (dBm) is converted to a linear value (mW). A summation of linear powers for all ports gives us the total MIMO conducted power in milliWatts (mW).
6. Antenna Gains (dBi) control value provided by the client.
7. The EUT have multiple antennas transmitting correlated signals with the equal antenna gains and two outputs driving a cross-polarized antennas with  $N_{ANT}=2$ .  
Directional gain is to be computed as follows;  
\* Directional gain =  $G_{ANT} + 10 \log(N_{ANT})$  dBi
8. Worst e.i.r.p Case Scenario gain antenna was selected to perform all RF testing that can get maximum power setting. And high gain antenna power setting will be reduced according to difference value of antenna gain declared by applicant.
9. Applied antenna gain as below:

Bandwidth	Antenna gain (dBi)	Directional gain (dBi)
All Bandwidth	9.0	12.0



FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 30 of 91	

10. Sample Calculation:

Let us assume the following numbers:



- a) Total MIMO Conducted Power as 2375.68 mW
- b) Antenna Gain = 12.00 dBi

Factors		Value	Unit
Summed MIMO Conducted Power (linear sum)		2375.68	mW
Summed MIMO Conducted Power (dBm)	= $10 * \log(2375.68) =$	33.76	dBm/10MHz
Antenna Gain		12.00	dBi
<b>e.i.r.p</b>		45.76	dBm/10MHz
<b>Limit</b>		47.00	dBm/10 MHz
<b>Margin = Limit - e.i.r.p</b>	= $45.76 - 47.00 =$	-1.24	dB

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 31 of 91	

Low Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	27.55	27.77
	1	27.47	27.77
	2	27.68	27.64
	3	28.21	27.89
Total MIMO Conducted Power (mW/10MHz)		2375.68	2392.76
Total MIMO Conducted Power (dBm/10MHz)		33.76	33.79
Ant. Gain (dBi)		12.00	12.00
e.i.r.p (dBm/10MHz)		45.76	45.79
e.i.r.p Limit(dBm/10MHz)		47.00	47.00
Margin (dB)		-1.24	-1.21
Mid Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	28.46	28.56
	1	28.15	28.48
	2	27.90	28.32
	3	27.95	28.42
Total MIMO Conducted Power (mW/10MHz)		2594.92	2796.72
Total MIMO Conducted Power (dBm/10MHz)		34.14	34.47
Ant. Gain (dBi)		12.00	12.00
e.i.r.p (dBm/10MHz)		46.14	46.47
e.i.r.p Limit(dBm/10MHz)		47.00	47.00
Margin (dB)		-0.86	-0.53
High Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	26.86	27.06
	1	27.27	27.32
	2	27.52	27.42
	3	27.86	27.50
Total MIMO Conducted Power (mW/10MHz)		2194.50	2162.09
Total MIMO Conducted Power (dBm/10MHz)		33.41	33.35
Ant. Gain (dBi)		12.00	12.00
e.i.r.p (dBm/10MHz)		45.41	45.35
e.i.r.p Limit(dBm/10MHz)		47.00	47.00
Margin (dB)		-1.59	-1.65



**Table 8-10. Equivalent Isotropic Radiated Power Table (Multi-RAT\_2C\_NR\_20M+ LTE\_5M)**

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 32 of 91





Low Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	28.16	27.89
	1	27.99	28.21
	2	28.13	28.39
	3	28.16	28.63
Total MIMO Conducted Power (mW/10MHz)		2588.91	2697.09
Total MIMO Conducted Power (dBm/10MHz)		34.13	34.31
Ant. Gain (dBi)		12.00	12.00
e.i.r.p (dBm/10MHz)		46.13	46.31
e.i.r.p Limit(dBm/10MHz)		47.00	47.00
Margin (dB)		-0.87	-0.69
Mid Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	28.37	28.57
	1	28.31	28.17
	2	28.12	28.39
	3	27.98	28.58
Total MIMO Conducted Power (mW/10MHz)		2641.40	2786.94
Total MIMO Conducted Power (dBm/10MHz)		34.22	34.45
Ant. Gain (dBi)		12.00	12.00
e.i.r.p (dBm/10MHz)		46.22	46.45
e.i.r.p Limit(dBm/10MHz)		47.00	47.00
Margin (dB)		-0.78	-0.55
High Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	28.35	28.05
	1	28.34	28.24
	2	28.22	28.28
	3	28.16	28.15
Total MIMO Conducted Power (mW/10MHz)		2684.63	2631.18
Total MIMO Conducted Power (dBm/10MHz)		34.29	34.20
Ant. Gain (dBi)		12.00	12.00
e.i.r.p (dBm/10MHz)		46.29	46.20
e.i.r.p Limit(dBm/10MHz)		47.00	47.00
Margin (dB)		-0.71	-0.80

**Table 8-11. Equivalent Isotropic Radiated Power Table (Multi-RAT\_4C NR\_20M+20M+LTE\_20M+20M)**

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 33 of 91



Low Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	27.92	27.82
	1	27.87	27.96
	2	27.73	28.05
	3	27.72	27.98
Total MIMO Conducted Power (mW/10MHz)		2416.28	2496.84
Total MIMO Conducted Power (dBm/10MHz)		33.83	33.97
Ant. Gain (dBi)		12.00	12.00
e.i.r.p (dBm/10MHz)		45.83	45.97
e.i.r.p Limit(dBm/10MHz)		47.00	47.00
Margin (dB)		-1.17	-1.03
Mid Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	27.09	27.47
	1	27.34	27.43
	2	27.62	28.25
	3	27.74	28.35
Total MIMO Conducted Power (mW/10MHz)		2226.07	2464.08
Total MIMO Conducted Power (dBm/10MHz)		33.48	33.92
Ant. Gain (dBi)		12.00	12.00
e.i.r.p (dBm/10MHz)		45.48	45.92
e.i.r.p Limit(dBm/10MHz)		47.00	47.00
Margin (dB)		-1.52	-1.08
High Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	<b>28.10</b>	28.29
	1	<b>28.10</b>	28.25
	2	<b>28.14</b>	27.86
	3	<b>28.15</b>	27.81
Total MIMO Conducted Power (mW/10MHz)		<b>2596.07</b>	2557.76
Total MIMO Conducted Power (dBm/10MHz)		<b>34.14</b>	34.08
Ant. Gain (dBi)		<b>12.00</b>	12.00
e.i.r.p (dBm/10MHz)		<b>46.14</b>	46.08
e.i.r.p Limit(dBm/10MHz)		<b>47.00</b>	47.00
Margin (dB)		<b>-0.86</b>	-0.92

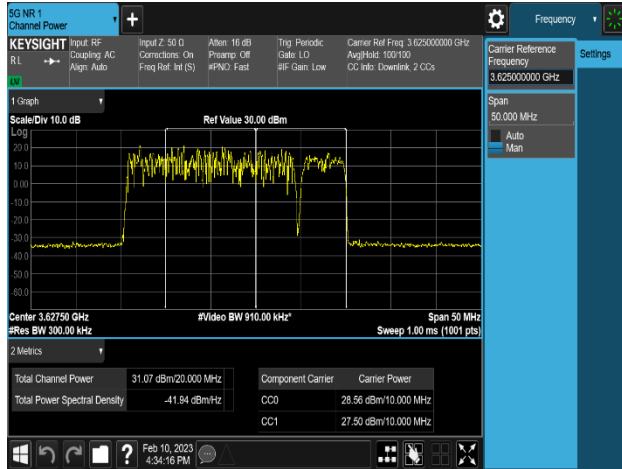
**Table 8-12. Equivalent Isotropic Radiated Power Table (NR\_3C\_20M+20M+20M)**

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 34 of 91

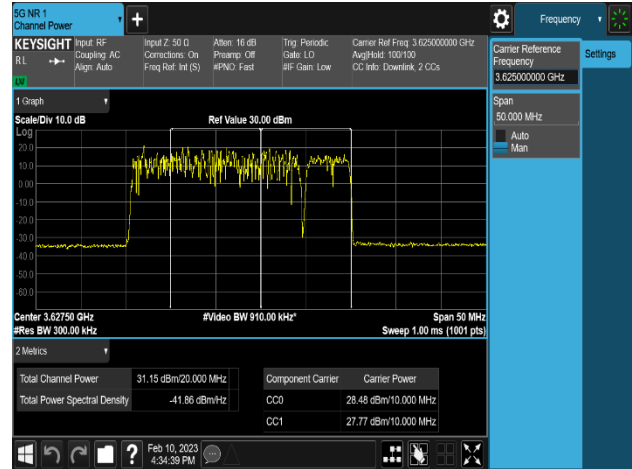
Low Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	28.20	28.32
	1	28.17	28.15
	2	28.11	28.13
	3	28.16	28.17
Total MIMO Conducted Power (mW/10MHz)		2618.62	2638.61
Total MIMO Conducted Power (dBm/10MHz)		34.18	34.21
Ant. Gain (dBi)		12.00	12.00
e.i.r.p (dBm/10MHz)		46.18	46.21
e.i.r.p Limit(dBm/10MHz)		47.00	47.00
Margin (dB)		-0.82	-0.79
Mid Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	28.18	28.23
	1	28.14	28.21
	2	28.04	28.25
	3	28.10	28.15
Total MIMO Conducted Power (mW/10MHz)		2591.74	2648.96
Total MIMO Conducted Power (dBm/10MHz)		34.14	34.23
Ant. Gain (dBi)		12.00	12.00
e.i.r.p (dBm/10MHz)		46.14	46.23
e.i.r.p Limit(dBm/10MHz)		47.00	47.00
Margin (dB)		-0.86	-0.77
High Channel	Port	QPSK	16QAM
Conducted Power (dBm/10MHz)	0	<b>28.23</b>	28.35
	1	<b>28.33</b>	28.30
	2	<b>28.40</b>	28.27
	3	<b>28.42</b>	28.46
Total MIMO Conducted Power (mW/10MHz)		<b>2732.90</b>	2732.88
Total MIMO Conducted Power (dBm/10MHz)		<b>34.37</b>	34.37
Ant. Gain (dBi)		<b>12.00</b>	12.00
e.i.r.p (dBm/10MHz)		<b>46.37</b>	46.37
e.i.r.p Limit(dBm/10MHz)		<b>47.00</b>	47.00
Margin (dB)		<b>-0.63</b>	-0.63

**Table 8-13. Equivalent Isotropic Radiated Power Table (NR\_4C\_20M+20M+20M+20M)**

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 35 of 91



Plot 8-25. Equivalent Isotropic Radiated Power Plot (Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM - Mid Channel, Port 0)



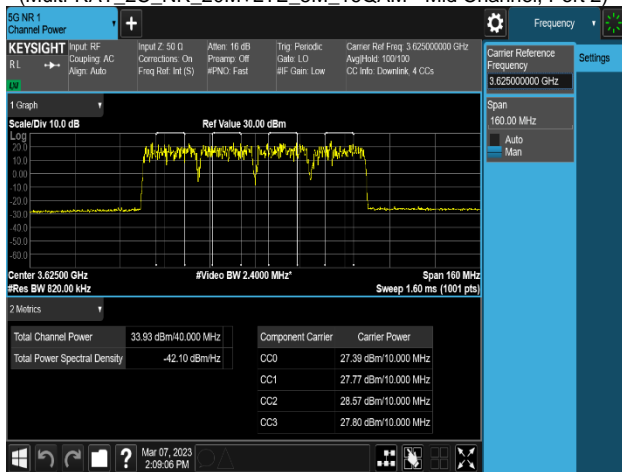
Plot 8-26. Equivalent Isotropic Radiated Power Plot (Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM - Mid Channel, Port 1)



Plot 8-27. Equivalent Isotropic Radiated Power Plot (Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM - Mid Channel, Port 2)



Plot 8-28. Equivalent Isotropic Radiated Power Plot (Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM - Mid Channel, Port 3)

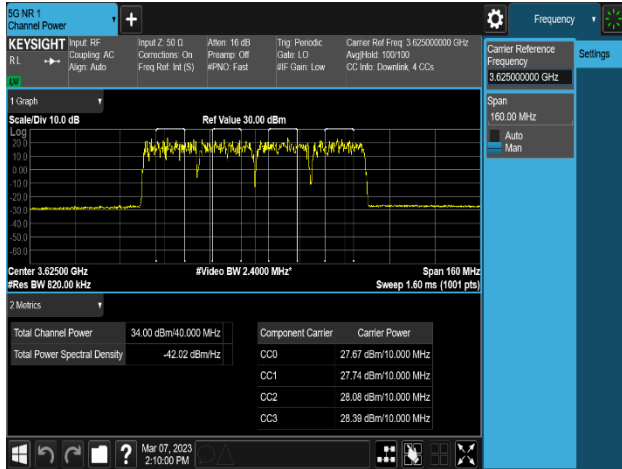


Plot 8-29. Equivalent Isotropic Radiated Power Plot (Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_16QAM - Mid Channel, Port 0)

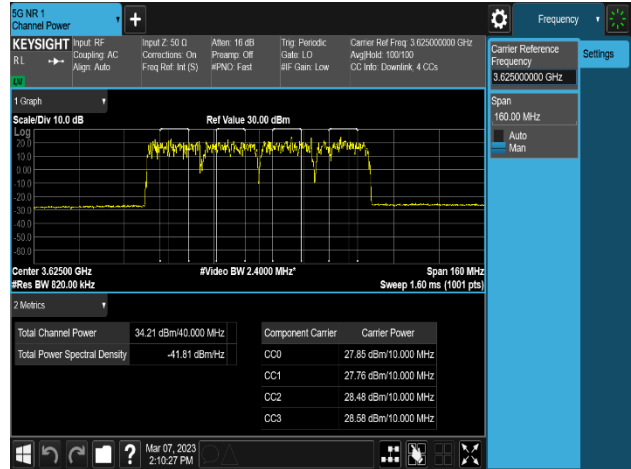


Plot 8-30. Equivalent Isotropic Radiated Power Plot (Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_16QAM - Mid Channel, Port 1)

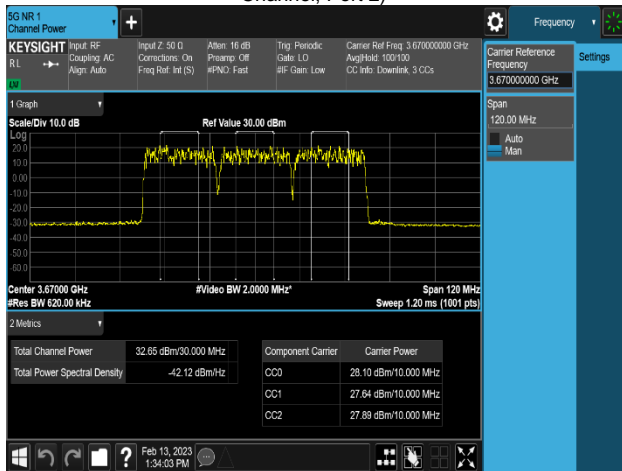
FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 36 of 91



Plot 8-31. Equivalent Isotropic Radiated Power Plot  
(Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_16QAM - Mid Channel, Port 2)



Plot 8-32. Equivalent Isotropic Radiated Power Plot  
(Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_16QAM - Mid Channel, Port 3)



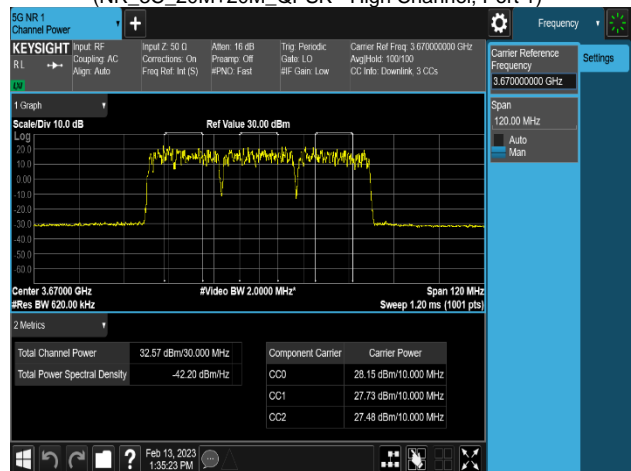
Plot 8-33. Equivalent Isotropic Radiated Power Plot  
(NR\_3C\_20M+20M\_QPSK - High Channel, Port 0)



Plot 8-34. Equivalent Isotropic Radiated Power Plot  
(NR\_3C\_20M+20M\_QPSK - High Channel, Port 1)

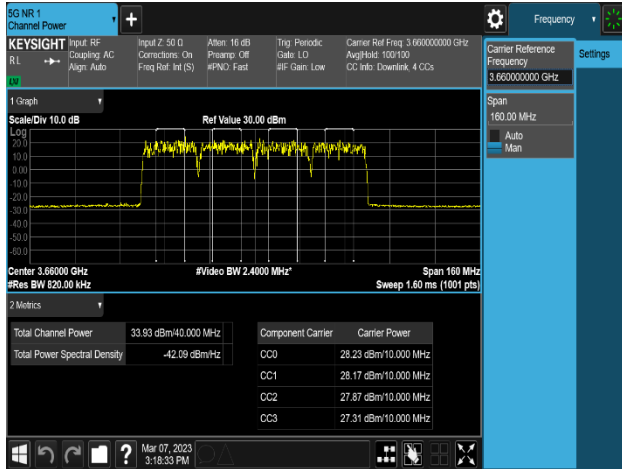


Plot 8-35. Equivalent Isotropic Radiated Power Plot  
(NR\_3C\_20M+20M+20M\_QPSK - High Channel, Port 2)

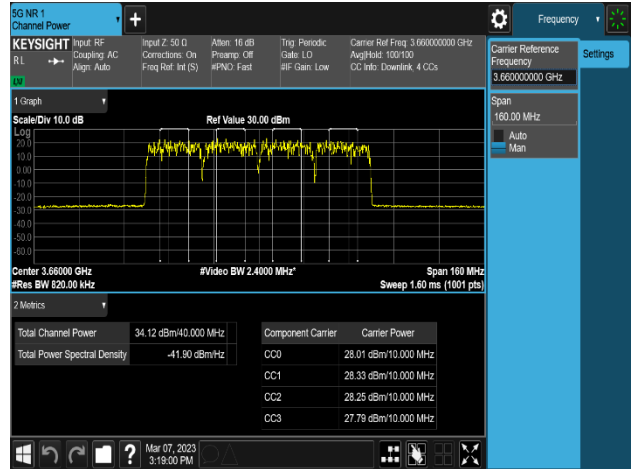


Plot 8-36. Equivalent Isotropic Radiated Power Plot  
(NR\_3C\_20M+20M+20M\_QPSK - High Channel, Port 3)

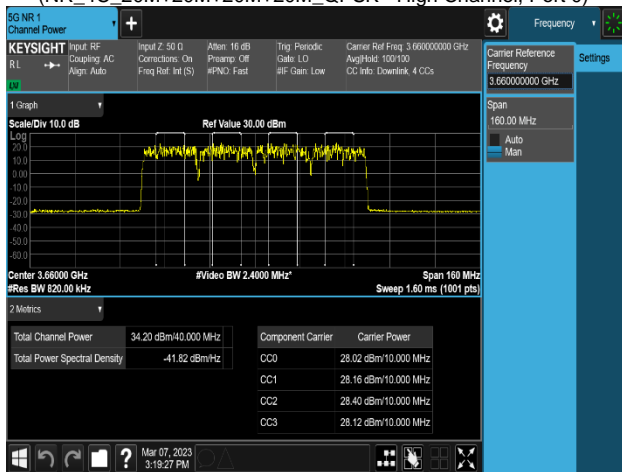
FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 37 of 91



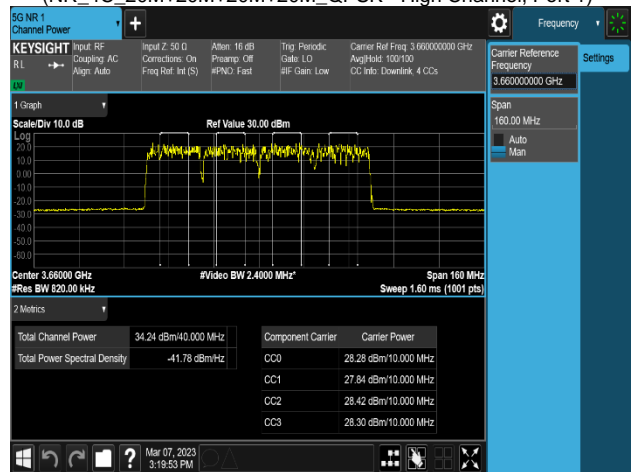
Plot 8-37. Equivalent Isotropic Radiated Power Plot (NR\_4C\_20M+20M+20M+20M\_QPSK - High Channel, Port 0)



Plot 8-38. Equivalent Isotropic Radiated Power Plot (NR\_4C\_20M+20M+20M+20M\_QPSK - High Channel, Port 1)



Plot 8-39. Equivalent Isotropic Radiated Power Plot (NR\_4C\_20M+20M+20M+20M\_QPSK - High Channel, Port 2)



Plot 8-40. Equivalent Isotropic Radiated Power Plot (NR\_4C\_20M+20M+20M+20M\_QPSK - High Channel, Port 3)

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 38 of 91

## 8.5 Peak To Average Power Ratio (PAPR)

### Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

### Test Procedure Used

ANSI C63.26 - Section 5.2.3.4.  
KDB 971168 D01 v03r01 - Section 5.7

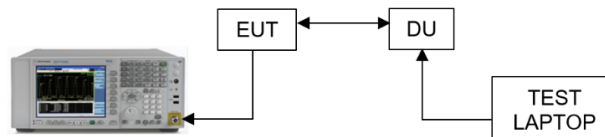
### Test Setting

The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The spectrum analyzer settings were as follows:

1. The signal analyzer's CCDF function is enabled.
2. Frequency = carrier center frequency
3. Measurement BW  $\geq$  OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed.  
For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.

### Test Setup



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



**Figure 8-4. Test Instrument & Measurement Setup**

### Limit

Peak-to-average power ratio (PAPR) limit shall not exceed 13 dB for more than 0.1% of the time.



FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 39 of 91

Channel	Port	PAPR (dB)		Limit (dB)
		QPSK	16QAM	
Low	0	8.24	8.31	≤ 13
	1	8.24	8.33	≤ 13
	2	8.25	8.33	≤ 13
	3	8.22	8.30	≤ 13
Middle	0	8.31	8.29	≤ 13
	1	8.34	8.33	≤ 13
	2	8.34	8.34	≤ 13
	3	8.32	8.33	≤ 13
High	0	8.32	8.27	≤ 13
	1	8.31	8.25	≤ 13
	2	8.31	8.32	≤ 13
	3	8.30	<b>8.35</b>	≤ 13

**Table 8-14. Peak To Average Power Ratio Summary Data (Multi-RAT\_2C\_NR\_20M+LTE\_5M)**

Channel	Port	PAPR (dB)		Limit (dB)
		QPSK	16QAM	
Low	0	8.30	8.33	≤ 13
	1	8.28	8.30	≤ 13
	2	8.31	8.32	≤ 13
	3	8.32	8.31	≤ 13
Middle	0	8.14	8.33	≤ 13
	1	8.12	8.18	≤ 13
	2	8.14	8.19	≤ 13
	3	8.10	8.17	≤ 13
High	0	8.36	<b>8.39</b>	≤ 13
	1	8.31	8.33	≤ 13
	2	8.33	8.35	≤ 13
	3	8.35	8.38	≤ 13

**Table 8-15. Peak To Average Power Ratio Summary Data (Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M)**

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 40 of 91





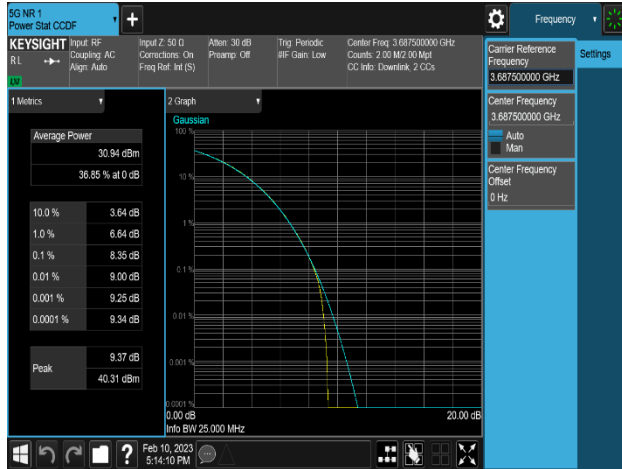
Channel	Port	PAPR (dB)		Limit (dB)
		QPSK	16QAM	
Low	0	8.73	8.76	≤ 13
	1	8.79	8.76	≤ 13
	2	8.73	8.76	≤ 13
	3	8.71	8.81	≤ 13
Middle	0	8.76	8.77	≤ 13
	1	8.82	8.79	≤ 13
	2	8.81	8.83	≤ 13
	3	8.78	8.79	≤ 13
High	0	<b>8.88</b>	8.80	≤ 13
	1	8.79	8.78	≤ 13
	2	8.85	8.81	≤ 13
	3	8.84	8.79	≤ 13

Table 8-16. Peak To Average Power Ratio Summary Data (NR\_3C\_20M+20M+20M)

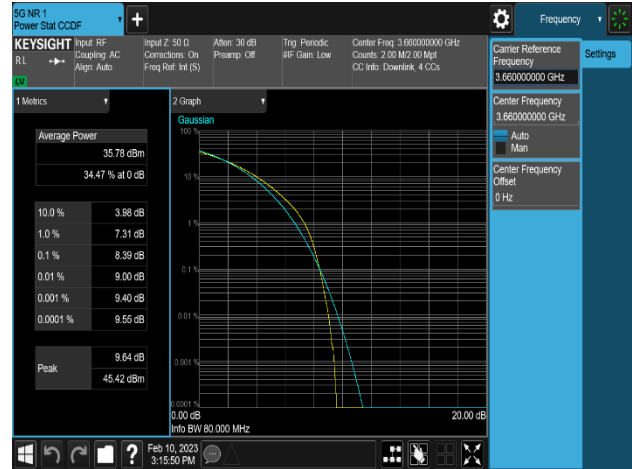
Channel	Port	PAPR (dB)		Limit (dB)
		QPSK	16QAM	
Low	0	8.43	8.32	≤ 13
	1	8.41	8.31	≤ 13
	2	<b>8.45</b>	8.35	≤ 13
	3	8.43	8.33	≤ 13
Middle	0	8.20	8.25	≤ 13
	1	8.19	8.25	≤ 13
	2	8.18	8.26	≤ 13
	3	8.20	8.24	≤ 13
High	0	8.42	8.40	≤ 13
	1	8.38	8.37	≤ 13
	2	8.38	8.37	≤ 13
	3	8.41	8.38	≤ 13

Table 8-17. Peak To Average Power Ratio Summary Data (NR\_4C\_20M+20M+20M+20M)

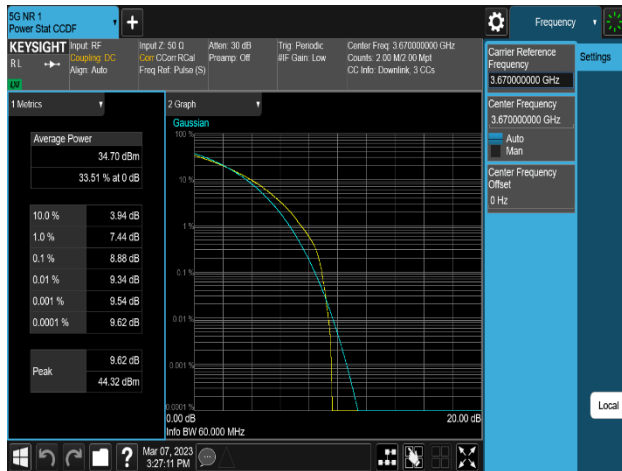
FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 41 of 91



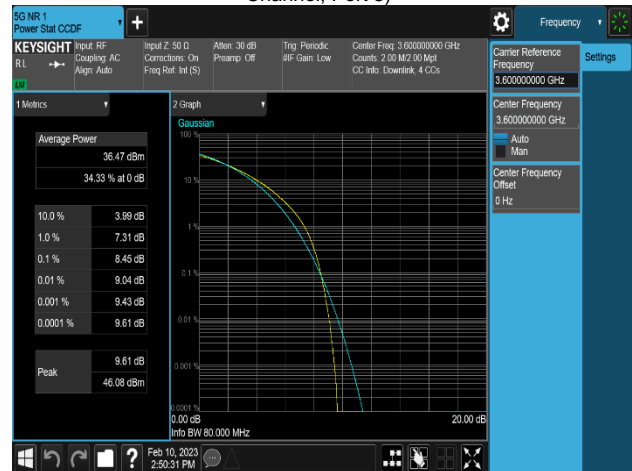
Plot 8-41. Peak To Average Power Ratio Plot (Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM - High Channel, Port 3)



Plot 8-42. Peak To Average Power Ratio Plot (Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_16QAM - High Channel, Port 3)



Plot 8-43. Peak To Average Power Ratio Plot (NR\_3C\_20M+20M+20M\_QPSK - High Channel, Port 0)



Plot 8-44. Peak To Average Power Ratio Plot (NR\_4C\_20M+20M+20M+20M\_QPSK - Low Channel, Port 2)

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 8K23011901-00-R1.A3L	<b>Test Dates:</b> 02/06/2023 – 03/07/2023	<b>EUT Type:</b> RRU(RT4401)		Page 42 of 91

## 8.6 Channel Edge Emissions at Antenna Terminal

### Test Overview

All out of band emissions are 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 to determine the worst case configuration. All modes of operation were investigated, and the worst case configuration results are reported in this section.

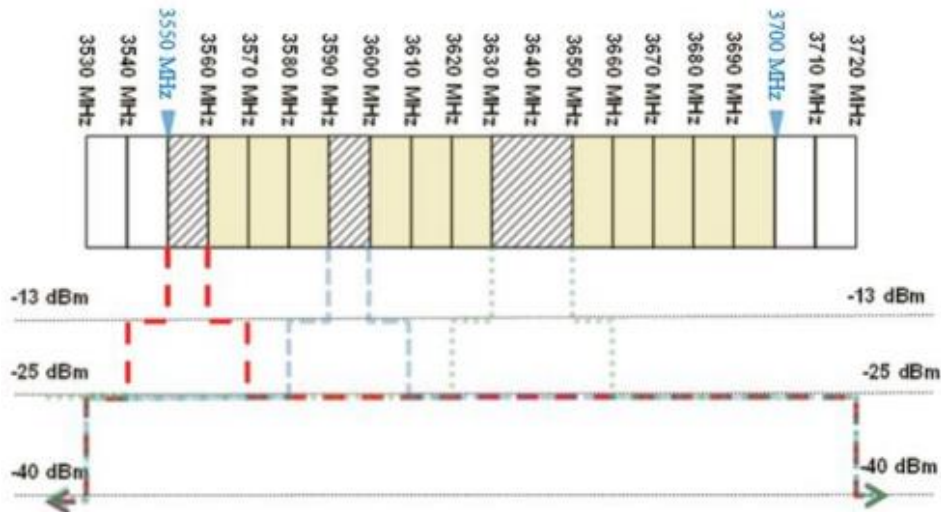
### Test Procedure Used

ANSI C63.26 - Section 5.2.3.4.  
 KDB 971168 D01 v03r01 - Section 5.7  
 KDB 662911 D01 v02r01 - Section E)3)



### Test Setting

1. Start and stop frequency were set such that the Channel Edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the Channel Edge
3. RBW: 1% of fundamental for measurements within 1 MHz immediately outside the authorized channel  
 1 MHz for beyond 1 MHz outside the authorized channel.
4. VBW  $\geq 3 \times$  RBW
5. Detector = RMS
6. Number of sweep points  $\geq 2 \times$  Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

### Limit

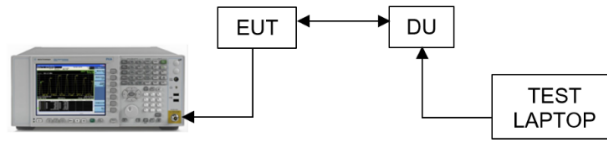


- Within 0 MHz to 10 MHz above and below the assigned channel  $\leq -13$  dBm/MHz
- Greater than 10 MHz above and below the assigned channel  $\leq -25$  dBm/MHz
- Any emission below 3530 MHz and above 3720 MHz  $\leq -40$  dBm/MHz

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 43 of 91

**Test Setup**

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





**Figure 8-5. Test Instrument & Measurement Setup**

**Test Notes**



1. All modes of operation were investigated and the worst configuration result plots are reported in each RF bandwidth.
2. When detected Emission, this value has been applied as reference offset in the spectrum analyzer.  
  
 Duty cycle correction factor was added to spectrum analyzer.  
 Duty cycle = transmit on-time / transmitter period = 3.72 ms / 5.00 ms = 0.74  
 Duty cycle correction factor =  $10 \cdot \log(1/\text{duty cycle}) = 10 \cdot \log(1/0.74) = 1.28 \text{ dB}$
3. Per Section 96.41(e)(3)—resolution bandwidth 1% of fundamental for measurements within 1 MHz immediately outside the authorized channel; and 1 MHz for beyond 1 MHz outside the authorized channel.
4. The limits were adjusted by a factor of  $[-10 \cdot \log(n)] \text{ dB}$  to account for the device operation as a n port MIMO transmitter, as per FCC KDB 622911. MIMO Factor calculation as below:
5. When the channel edge detect with a margin of under 1dB to Limit, That used to integration method was performed using the spectrum analyzer’s band power functions. The spectrum analyzer marker was placed at one-half of the RBW away from the band edge. The integration value was set to a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter.

Frequency range	Basic Limit (dBm/MHz)	MIMO Factor (dB)	Adjusted limit (dBm)
		4T	4T
0 MHz to 10 MHz above and below the assigned channel	-13.00	6.02	- 19.02
10 MHz above and below the assigned channel	-25.00	6.02	- 31.02
below 3530 MHz and above 3720 MHz	-40.00	6.02	- 46.02

Note: Adjusted limit (dBm/MHz) = Basic limit (dBm/1MHz) - MIMO Factor



FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 44 of 91

Channel	Port	Measured Range (GHz)	Max. Value (dBm)		Limit (dBm)	Worst Margin(dB)
			QPSK	16QAM		
Low	0	3.530 to 3.540	-38.28	-38.33	-31.02	-7.26
	0	3.540 to 3.549	-32.88	-33.16	-19.02	-13.86
	0	3.549 to 3.550	-25.99	-26.43	-19.02	-6.97
	0	3.575 to 3.576	-35.85	-35.89	-19.02	-16.83
	0	3.576 to 3.585	-31.36	-31.64	-19.02	-12.34
	0	3.585 to 3.720	-37.37	-38.40	-31.02	-6.35
	1	3.530 to 3.540	-38.01	-38.14	-31.02	-6.99
	1	3.540 to 3.549	-32.99	-32.24	-19.02	-13.22
	1	3.549 to 3.550	-26.02	-25.95	-19.02	-6.93
	1	3.575 to 3.576	-35.86	-36.41	-19.02	-16.83
	1	3.576 to 3.585	-31.77	-31.43	-19.02	-12.41
	1	3.585 to 3.720	-37.93	-39.33	-31.02	-6.91
	2	3.530 to 3.540	-38.86	-38.80	-31.02	-7.78
	2	3.540 to 3.549	-33.02	-32.90	-19.02	-13.88
	2	3.549 to 3.550	-26.44	-26.57	-19.02	-7.42
	2	3.575 to 3.576	-36.10	-36.05	-19.02	-17.03
	2	3.576 to 3.585	-32.14	-31.32	-19.02	-12.30
	2	3.585 to 3.720	-39.17	-38.79	-31.02	-7.77
	3	3.530 to 3.540	-37.75	-37.77	-31.02	-6.73
	3	3.540 to 3.549	-32.44	-32.62	-19.02	-13.42
3	3.549 to 3.550	-26.45	-26.28	-19.02	-7.26	
3	3.575 to 3.576	-34.54	-35.69	-19.02	-15.52	
3	3.576 to 3.585	-30.54	-30.55	-19.02	-11.52	
3	3.585 to 3.720	-36.72	-37.46	-31.02	-5.70	
Middle	0	3.530 to 3.6025	-36.78	-36.86	-31.02	-5.76
	0	3.6025 to 3.6115	-33.14	-32.41	-19.02	-13.39
	0	3.6115 to 3.6125	-26.11	-25.24	-19.02	-6.22
	0	3.6375 to 3.6385	-36.53	-37.27	-19.02	-17.51
	0	3.6385 to 3.6475	-31.61	-32.68	-19.02	-12.59
	0	3.6475 to 3.720	-37.05	-39.27	-31.02	-6.03
	1	3.530 to 3.6025	-37.13	-36.92	-31.02	-5.90
	1	3.6025 to 3.6115	-33.84	-33.12	-19.02	-14.10
	1	3.6115 to 3.6125	-26.29	-25.32	-19.02	-6.30
	1	3.6375 to 3.6385	-35.93	-36.58	-19.02	-16.91
	1	3.6385 to 3.6475	-31.68	-31.62	-19.02	-12.60
	1	3.6475 to 3.720	-38.06	-38.83	-31.02	-7.04



FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 45 of 91	

	2	3.530 to 3.6025	-37.01	-36.72	-31.02	-5.70
	2	3.6025 to 3.6115	-33.58	-31.90	-19.02	-12.88
	2	3.6115 to 3.6125	-26.20	-25.20	-19.02	-6.18
	2	3.6375 to 3.6385	-37.24	-36.85	-19.02	-17.83
	2	3.6385 to 3.6475	-32.98	-32.37	-19.02	-13.35
	2	3.6475 to 3.720	-38.34	-38.97	-31.02	-7.32
	3	3.530 to 3.6025	-35.61	-35.80	-31.02	-4.59
	3	3.6025 to 3.6115	-32.15	-32.75	-19.02	-13.13
	3	3.6115 to 3.6125	-25.04	-24.17	-19.02	-5.15
	3	3.6375 to 3.6385	-36.20	-36.44	-19.02	-17.18
	3	3.6385 to 3.6475	-31.23	-31.58	-19.02	-12.21
	3	3.6475 to 3.720	-36.65	-37.25	-31.02	-5.63
High	0	3.530 to 3.665	-36.43	<b>-36.09</b>	-31.02	-5.07
	0	3.665 to 3.674	-33.40	<b>-32.61</b>	-19.02	-13.59
	0	3.674 to 3.675	-26.75	<b>-23.18</b>	-19.02	<b>-4.16</b>
	0	3.700 to 3.701	-36.66	<b>-37.36</b>	-19.02	-17.63
	0	3.701 to 3.710	-31.92	<b>-32.57</b>	-19.02	-12.90
	0	3.710 to 3.720	-44.18	<b>-43.99</b>	-31.02	-12.97
	1	3.530 to 3.665	-36.62	-36.89	-31.02	-5.60
	1	3.665 to 3.674	-33.17	-33.04	-19.02	-14.02
	1	3.674 to 3.675	-25.26	-23.70	-19.02	-4.68
	1	3.700 to 3.701	-36.58	-37.54	-19.02	-17.56
	1	3.701 to 3.710	-32.76	-32.86	-19.02	-13.74
	1	3.710 to 3.720	-43.43	-43.38	-31.02	-12.36
	2	3.530 to 3.665	-36.93	-36.68	-31.02	-5.66
	2	3.665 to 3.674	-33.06	-34.17	-19.02	-14.04
	2	3.674 to 3.675	-23.60	-24.20	-19.02	-4.58
	2	3.700 to 3.701	-37.53	-36.91	-19.02	-17.89
	2	3.701 to 3.710	-32.92	-32.82	-19.02	-13.80
	2	3.710 to 3.720	-44.39	-44.15	-31.02	-13.13
	3	3.530 to 3.665	-35.61	-35.30	-31.02	-4.28
	3	3.665 to 3.674	-32.96	-32.79	-19.02	-13.77
	3	3.674 to 3.675	-24.43	-23.58	-19.02	-4.56
	3	3.700 to 3.701	-36.59	-36.63	-19.02	-17.56
	3	3.701 to 3.710	-31.67	-32.17	-19.02	-12.64
	3	3.710 to 3.720	-43.13	-43.55	-31.02	-12.11

**Table 8-18. Channel Edge Emission Summary Data (Multi-RAT\_2C\_NR\_20M+LTE\_5M)**



FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 46 of 91

Channel	Port	Measured Range (GHz)	Max. Value (dBm)		Limit (dBm)	Worst Margin(dB)
			QPSK	16QAM		
Low	0	3.530 to 3.540	-37.68	-37.91	-31.02	-6.66
	0	3.540 to 3.549	-31.72	-31.90	-19.02	-12.70
	0	3.549 to 3.550	-32.88	-33.31	-19.02	-13.86
	0	3.630 to 3.631	-32.11	-32.41	-19.02	-13.09
	0	3.631 to 3.640	-33.04	-33.47	-19.02	-14.02
	0	3.640 to 3.720	-35.05	-35.48	-31.02	-4.03
	1	3.530 to 3.540	-37.68	-37.37	-31.02	-6.35
	1	3.540 to 3.549	-32.42	-33.75	-19.02	-13.40
	1	3.549 to 3.550	-32.38	-33.57	-19.02	-13.36
	1	3.630 to 3.631	-31.95	-32.78	-19.02	-12.93
	1	3.631 to 3.640	-33.06	-34.11	-19.02	-14.04
	1	3.640 to 3.720	-35.59	-36.58	-31.02	-4.57
	2	3.530 to 3.540	-38.58	-38.42	-31.02	-7.40
	2	3.540 to 3.549	-32.94	-33.60	-19.02	-13.92
	2	3.549 to 3.550	-34.06	-34.16	-19.02	-15.04
	2	3.630 to 3.631	-32.67	-33.12	-19.02	-13.65
	2	3.631 to 3.640	-33.97	-34.30	-19.02	-14.95
	2	3.640 to 3.720	-35.38	-36.62	-31.02	-4.36
	3	3.530 to 3.540	-37.57	-37.46	-31.02	-6.44
	3	3.540 to 3.549	-32.07	-32.52	-19.02	-13.05
3	3.549 to 3.550	-32.89	-32.78	-19.02	-13.76	
3	3.630 to 3.631	-31.72	-31.90	-19.02	-12.70	
3	3.631 to 3.640	-32.62	-33.45	-19.02	-13.60	
3	3.640 to 3.720	-35.10	-35.73	-31.02	-4.08	
Middle	0	3.530 to 3.575	<b>-33.40</b>	-33.90	-31.02	-2.38
	0	3.575 to 3.584	<b>-32.12</b>	-32.27	-19.02	-13.10
	0	3.584 to 3.585	<b>-33.30</b>	-33.08	-19.02	-14.06
	0	3.665 to 3.666	<b>-32.62</b>	-33.18	-19.02	-13.60
	0	3.666 to 3.675	<b>-34.83</b>	-33.92	-19.02	-14.90
	0	3.675 to 3.720	<b>-35.93</b>	-36.35	-31.02	-4.91
	1	3.530 to 3.575	-34.51	-34.55	-31.02	-3.49
	1	3.575 to 3.584	-31.22	-33.06	-19.02	-12.20
	1	3.584 to 3.585	-33.25	-33.38	-19.02	-14.23
	1	3.665 to 3.666	-32.87	-33.19	-19.02	-13.85
	1	3.666 to 3.675	-34.65	-34.40	-19.02	-15.38
	1	3.675 to 3.720	-36.31	-37.03	-31.02	-5.29

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 47 of 91



	2	3.530 to 3.575	-34.71	-33.96	-31.02	-2.94
	2	3.575 to 3.584	-32.31	-32.29	-19.02	-13.27
	2	3.584 to 3.585	-33.09	-33.64	-19.02	-14.07
	2	3.665 to 3.666	-33.50	-33.13	-19.02	-14.11
	2	3.666 to 3.675	-32.94	-34.29	-19.02	-13.92
	2	3.675 to 3.720	-35.88	-36.69	-31.02	-4.86
	3	3.530 to 3.575	-33.54	-33.44	-31.02	-2.42
	3	3.575 to 3.584	-31.07	-31.36	-19.02	-12.05
	3	3.584 to 3.585	-32.34	-32.31	-19.02	-13.29
	3	3.665 to 3.666	-31.79	-32.18	-19.02	-12.77
	3	3.666 to 3.675	-32.94	-34.53	-19.02	-13.92
	3	3.675 to 3.720	-35.01	-35.55	-31.02	-3.99
High	0	3.530 to 3.610	-34.85	-35.16	-31.02	-3.83
	0	3.610 to 3.619	-31.01	-31.89	-19.02	-11.99
	0	3.619 to 3.620	-32.53	-32.49	-19.02	-13.47
	0	3.700 to 3.701	-33.11	-32.99	-19.02	-13.97
	0	3.701 to 3.710	-35.17	-34.61	-19.02	-15.59
	0	3.710 to 3.720	-43.42	-43.13	-31.02	-12.11
	1	3.530 to 3.610	-35.09	-35.40	-31.02	-4.07
	1	3.610 to 3.619	-32.32	-33.52	-19.02	-13.30
	1	3.619 to 3.620	-32.08	-32.13	-19.02	-13.06
	1	3.700 to 3.701	-32.68	-33.52	-19.02	-13.66
	1	3.701 to 3.710	-34.88	-34.46	-19.02	-15.44
	1	3.710 to 3.720	-42.16	-43.00	-31.02	-11.14
	2	3.530 to 3.610	-35.44	-36.15	-31.02	-4.42
	2	3.610 to 3.619	-31.32	-33.65	-19.02	-12.30
	2	3.619 to 3.620	-32.78	-33.24	-19.02	-13.76
	2	3.700 to 3.701	-33.28	-33.62	-19.02	-14.26
	2	3.701 to 3.710	-34.41	-34.82	-19.02	-15.39
	2	3.710 to 3.720	-43.15	-43.60	-31.02	-12.13
	3	3.530 to 3.610	-34.27	-34.20	-31.02	-3.18
	3	3.610 to 3.619	-31.02	-31.60	-19.02	-12.00
	3	3.619 to 3.620	-32.15	-32.11	-19.02	-13.09
3	3.700 to 3.701	-32.47	-32.68	-19.02	-13.45	
3	3.701 to 3.710	-34.49	-33.72	-19.02	-14.70	
3	3.710 to 3.720	-43.01	-43.15	-31.02	-11.99	

**Table 8-19. Channel Edge Emission Summary Data (Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M)**

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 48 of 91	





Channel	Port	Measured Range (GHz)	Max. Value (dBm)		Limit (dBm)	Worst Margin(dB)
			QPSK	16QAM		
Low	0	3.530 to 3.540	-38.11	-38.03	-31.02	-7.01
	0	3.540 to 3.549	-31.28	-31.11	-19.02	-12.09
	0	3.549 to 3.550	-34.15	-34.56	-19.02	-15.13
	0	3.610 to 3.611	-32.86	-33.36	-19.02	-13.84
	0	3.611 to 3.620	-32.25	-32.11	-19.02	-13.09
	0	3.620 to 3.720	-35.52	-35.36	-31.02	-4.34
	1	3.530 to 3.540	-37.86	-37.63	-31.02	-6.61
	1	3.540 to 3.549	-32.70	-31.75	-19.02	-12.73
	1	3.549 to 3.550	-35.10	-35.22	-19.02	-16.08
	1	3.610 to 3.611	-34.06	-33.83	-19.02	-14.81
	1	3.611 to 3.620	-32.86	-32.56	-19.02	-13.54
	1	3.620 to 3.720	-36.27	-35.79	-31.02	-4.77
	2	3.530 to 3.540	-38.69	-38.47	-31.02	-7.45
	2	3.540 to 3.549	-32.77	-32.93	-19.02	-13.75
	2	3.549 to 3.550	-35.35	-35.42	-19.02	-16.33
	2	3.610 to 3.611	-33.87	-33.62	-19.02	-14.60
	2	3.611 to 3.620	-33.33	-32.68	-19.02	-13.66
	2	3.620 to 3.720	-37.14	-36.56	-31.02	-5.54
	3	3.530 to 3.540	-37.55	-37.50	-31.02	-6.48
	3	3.540 to 3.549	-31.68	-32.55	-19.02	-12.66
3	3.549 to 3.550	-33.83	-33.90	-19.02	-14.81	
3	3.610 to 3.611	-32.50	-32.95	-19.02	-13.48	
3	3.611 to 3.620	-32.06	-31.99	-19.02	-12.97	
3	3.620 to 3.720	-35.19	-35.57	-31.02	-4.17	
Middle	0	3.530 to 3.585	-34.19	-33.88	-31.02	-2.86
	0	3.585 to 3.594	-32.10	-31.24	-19.02	-12.22
	0	3.594 to 3.595	-34.02	-34.23	-19.02	-15.00
	0	3.655 to 3.656	-33.88	-33.71	-19.02	-14.69
	0	3.656 to 3.665	-32.90	-31.67	-19.02	-12.65
	0	3.665 to 3.720	-37.12	-34.96	-31.02	-3.94
	1	3.530 to 3.585	-35.20	-34.79	-31.02	-3.77
	1	3.585 to 3.594	-33.19	-31.96	-19.02	-12.94
	1	3.594 to 3.595	-34.36	-34.92	-19.02	-15.34
	1	3.655 to 3.656	-33.51	-34.09	-19.02	-14.49
	1	3.656 to 3.665	-33.83	-32.63	-19.02	-13.61
	1	3.665 to 3.720	-37.05	-36.71	-31.02	-5.69



FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 49 of 91	

	2	3.530 to 3.585	-34.50	-34.86	-31.02	-3.48
	2	3.585 to 3.594	-32.12	-32.34	-19.02	-13.10
	2	3.594 to 3.595	-34.84	-34.27	-19.02	-15.25
	2	3.655 to 3.656	-34.34	-34.19	-19.02	-15.17
	2	3.656 to 3.665	-32.26	-32.50	-19.02	-13.24
	2	3.665 to 3.720	-38.00	-35.74	-31.02	-4.72
	3	3.530 to 3.585	<b>-33.72</b>	-34.06	-31.02	<b>-2.70</b>
	3	3.585 to 3.594	<b>-31.56</b>	-31.74	-19.02	-12.54
	3	3.594 to 3.595	<b>-33.67</b>	-33.87	-19.02	-14.65
	3	3.655 to 3.656	<b>-32.76</b>	-33.27	-19.02	-13.73
	3	3.656 to 3.665	<b>-31.72</b>	-32.73	-19.02	-12.70
	3	3.665 to 3.720	<b>-36.37</b>	-36.32	-31.02	-5.30
High	0	3.530 to 3.630	-34.83	-34.41	-31.02	-3.39
	0	3.630 to 3.639	-31.08	-32.28	-19.02	-12.06
	0	3.639 to 3.640	-33.10	-33.63	-19.02	-14.08
	0	3.700 to 3.701	-33.86	-33.90	-19.02	-14.84
	0	3.701 to 3.710	-33.52	-33.11	-19.02	-14.09
	0	3.710 to 3.720	-43.74	-43.54	-31.02	-12.52
	1	3.530 to 3.630	-34.85	-34.99	-31.02	-3.83
	1	3.630 to 3.639	-30.83	-31.05	-19.02	-11.81
	1	3.639 to 3.640	-33.52	-33.46	-19.02	-14.44
	1	3.700 to 3.701	-34.40	-33.78	-19.02	-14.76
	1	3.701 to 3.710	-32.00	-32.13	-19.02	-12.98
	1	3.710 to 3.720	-42.85	-42.54	-31.02	-11.52
	2	3.530 to 3.630	-35.39	-35.33	-31.02	-4.31
	2	3.630 to 3.639	-32.50	-31.55	-19.02	-12.53
	2	3.639 to 3.640	-33.47	-33.43	-19.02	-14.41
	2	3.700 to 3.701	-34.46	-34.21	-19.02	-15.19
	2	3.701 to 3.710	-33.37	-32.95	-19.02	-13.93
	2	3.710 to 3.720	-43.46	-43.27	-31.02	-12.25
	3	3.530 to 3.630	-34.04	-34.13	-31.02	-3.02
	3	3.630 to 3.639	-32.07	-31.41	-19.02	-12.39
	3	3.639 to 3.640	-32.84	-32.82	-19.02	-13.80
3	3.700 to 3.701	-33.47	-33.25	-19.02	-14.23	
3	3.701 to 3.710	-33.04	-32.31	-19.02	-13.29	
3	3.710 to 3.720	-42.74	-42.38	-31.02	-11.36	

**Table 8-20. Channel Edge Emission Summary Data (NR\_3C\_20M+20M+20M)**



FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 50 of 91	

Channel	Port	Measured Range (GHz)	Max. Value (dBm)		Limit (dBm)	Worst Margin(dB)
			QPSK	16QAM		
Low	0	3.530 to 3.540	-37.65	-37.76	-31.02	-6.63
	0	3.540 to 3.549	-30.58	-31.52	-19.02	-11.56
	0	3.549 to 3.550	-32.52	-33.01	-19.02	-13.50
	0	3.630 to 3.639	-31.78	-31.59	-19.02	-12.57
	0	3.639 to 3.640	-31.76	-31.83	-19.02	-12.74
	0	3.640 to 3.720	-35.51	-35.02	-31.02	-4.00
	1	3.530 to 3.540	-37.28	-37.21	-31.02	-6.19
	1	3.540 to 3.549	-32.17	-31.93	-19.02	-12.91
	1	3.549 to 3.550	-33.33	-33.21	-19.02	-14.19
	1	3.630 to 3.639	-31.98	-31.88	-19.02	-12.86
	1	3.639 to 3.640	-30.83	-30.68	-19.02	-11.66
	1	3.640 to 3.720	-33.77	-36.00	-31.02	-2.75
	2	3.530 to 3.540	-38.35	-38.23	-31.02	-7.21
	2	3.540 to 3.549	-31.40	-31.98	-19.02	-12.38
	2	3.549 to 3.550	-33.51	-33.85	-19.02	-14.49
	2	3.630 to 3.639	-32.56	-32.03	-19.02	-13.01
	2	3.639 to 3.640	-31.65	-31.79	-19.02	-12.63
	2	3.640 to 3.720	-34.25	-34.98	-31.02	-3.23
	3	3.530 to 3.540	-37.33	-37.25	-31.02	-6.23
	3	3.540 to 3.549	-31.96	-31.72	-19.02	-12.70
3	3.549 to 3.550	-32.10	-32.64	-19.02	-13.07	
3	3.630 to 3.639	-31.51	-31.42	-19.02	-12.40	
3	3.639 to 3.640	-31.05	-30.67	-19.02	-11.65	
3	3.640 to 3.720	-34.28	-34.67	-31.02	-3.26	
Middle	0	3.530 to 3.575	-33.23	-32.89	-31.02	-1.87
	0	3.575 to 3.584	-30.72	-31.45	-19.02	-11.70
	0	3.584 to 3.585	-32.38	-33.27	-19.02	-13.36
	0	3.665 to 3.674	-32.03	-32.51	-19.02	-13.01
	0	3.674 to 3.675	-32.05	-33.06	-19.02	-13.03
	0	3.675 to 3.720	-35.87	-35.81	-31.02	-4.79
	1	3.530 to 3.575	-33.88	-33.55	-31.02	-2.53
	1	3.575 to 3.584	-31.72	-31.47	-19.02	-12.45
	1	3.584 to 3.585	-32.11	-32.93	-19.02	-13.08
	1	3.665 to 3.674	-32.49	-32.31	-19.02	-13.29
	1	3.674 to 3.675	-32.69	-31.94	-19.02	-12.92
	1	3.675 to 3.720	-36.66	-36.53	-31.02	-5.51

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 51 of 91	



	2	3.530 to 3.575	-34.14	-34.44	-31.02	-3.12
	2	3.575 to 3.584	-32.59	-32.07	-19.02	-13.05
	2	3.584 to 3.585	-33.03	-33.65	-19.02	-14.01
	2	3.665 to 3.674	-31.95	-32.77	-19.02	-12.92
	2	3.674 to 3.675	-33.15	-34.32	-19.02	-14.13
	2	3.675 to 3.720	-35.06	-36.33	-31.02	-4.04
	3	3.530 to 3.575	-33.11	<b>-32.62</b>	-31.02	<b>-1.60</b>
	3	3.575 to 3.584	-31.76	<b>-30.64</b>	-19.02	-11.62
	3	3.584 to 3.585	-32.28	<b>-32.33</b>	-19.02	-13.26
	3	3.665 to 3.674	-32.11	<b>-31.94</b>	-19.02	-12.92
	3	3.674 to 3.675	-32.82	<b>-32.85</b>	-19.02	-13.80
	3	3.675 to 3.720	-35.66	<b>-35.89</b>	-31.02	-4.64
High	0	3.530 to 3.610	-33.38	-34.30	-31.02	-2.36
	0	3.610 to 3.619	-30.62	-32.35	-19.02	-11.60
	0	3.619 to 3.620	-31.72	-31.92	-19.02	-12.70
	0	3.700 to 3.701	-32.47	-32.99	-19.02	-13.45
	0	3.701 to 3.710	-32.21	-33.35	-19.02	-13.19
	0	3.710 to 3.720	-43.35	-43.55	-31.02	-12.33
	1	3.530 to 3.610	-35.04	-34.01	-31.02	-2.99
	1	3.610 to 3.619	-31.74	-32.30	-19.02	-12.72
	1	3.619 to 3.620	-32.51	-31.73	-19.02	-12.71
	1	3.700 to 3.701	-32.94	-32.79	-19.02	-13.76
	1	3.701 to 3.710	-34.04	-32.74	-19.02	-13.72
	1	3.710 to 3.720	-42.34	-42.50	-31.02	-11.32
	2	3.530 to 3.610	-33.83	-34.12	-31.02	-2.81
	2	3.610 to 3.619	-31.78	-32.00	-19.02	-12.76
	2	3.619 to 3.620	-32.02	-32.85	-19.02	-13.00
	2	3.700 to 3.701	-32.87	-33.43	-19.02	-13.84
	2	3.701 to 3.710	-31.65	-33.54	-19.02	-12.63
	2	3.710 to 3.720	-42.89	-43.05	-31.02	-11.87
	3	3.530 to 3.610	-33.75	-34.10	-31.02	-2.73
	3	3.610 to 3.619	-30.56	-32.14	-19.02	-11.54
3	3.619 to 3.620	-31.70	-31.76	-19.02	-12.68	
3	3.700 to 3.701	-32.34	-32.59	-19.02	-13.32	
3	3.701 to 3.710	-31.66	-32.34	-19.02	-12.64	
3	3.710 to 3.720	-42.36	-42.79	-31.02	-11.34	

**Table 8-21. Channel Edge Emission Summary (NR\_4C\_20M+20M+20M+20M)**



FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 52 of 91

Channel	Port	Measured Range (GHz)	Max. Value (dBm)	Limit (dBm)	Worst Margin(dB)
			QPSK		
Middle	0	3.530 to 3.540	-49.13	-31.02	-18.11
	0	3.540 to 3.549	-35.76	-19.02	-16.74
	0	3.549 to 3.550	-38.86	-19.02	-19.84
	0	3.570 to 3.571	-36.60	-19.02	-17.58
	0	3.571 to 3.580	-34.73	-19.02	-15.71
	0	3.580 to 3.685	-36.73	-31.02	-5.71
	0	3.685 to 3.694	-33.64	-19.02	-14.62
	0	3.694 to 3.695	-45.38	-19.02	-26.36
	0	3.700 to 3.701	-44.60	-19.02	-25.58
	0	3.701 to 3.710	-34.27	-19.02	-15.25
	0	3.710 to 3.720	-47.70	-31.02	-16.68
	1	3.530 to 3.540	-47.38	-31.02	-16.36
	1	3.540 to 3.549	-36.43	-19.02	-17.41
	1	3.549 to 3.550	-39.07	-19.02	-20.05
	1	3.570 to 3.571	-40.36	-19.02	-21.34
	1	3.571 to 3.580	-35.12	-19.02	-16.10
	1	3.580 to 3.685	-37.14	-31.02	-6.12
	1	3.685 to 3.694	-35.37	-19.02	-16.35
	1	3.694 to 3.695	-44.18	-19.02	-25.16
	1	3.700 to 3.701	-48.51	-19.02	-29.49
	1	3.701 to 3.710	-36.71	-19.02	-17.69
	1	3.710 to 3.720	-46.65	-31.02	-15.63
	2	3.530 to 3.540	-49.90	-31.02	-18.88
	2	3.540 to 3.549	-35.19	-19.02	-16.17
	2	3.549 to 3.550	-38.60	-19.02	-19.58
	2	3.570 to 3.571	-39.75	-19.02	-20.73
	2	3.571 to 3.580	-34.38	-19.02	-15.36
	2	3.580 to 3.685	-37.33	-31.02	-6.31
	2	3.685 to 3.694	-34.96	-19.02	-15.93
	2	3.694 to 3.695	-47.39	-19.02	-28.37
	2	3.700 to 3.701	-44.80	-19.02	-25.78
	2	3.701 to 3.710	-36.48	-19.02	-17.46
	2	3.710 to 3.720	-47.59	-31.02	-16.57
	3	3.530 to 3.540	<b>-49.13</b>	-31.02	-18.11
	3	3.540 to 3.549	<b>-35.39</b>	-19.02	-16.37
	3	3.549 to 3.550	<b>-38.79</b>	-19.02	-19.77
3	3.570 to 3.571	<b>-37.37</b>	-19.02	-18.35	
3	3.571 to 3.580	<b>-33.70</b>	-19.02	-14.68	
3	3.580 to 3.685	<b>-35.71</b>	-31.02	<b>-4.69</b>	
3	3.685 to 3.694	<b>-34.53</b>	-19.02	-15.51	
3	3.694 to 3.695	<b>-42.81</b>	-19.02	-23.79	
3	3.700 to 3.701	<b>-44.51</b>	-19.02	-25.48	
3	3.701 to 3.710	<b>-35.22</b>	-19.02	-16.20	
3	3.710 to 3.720	<b>-47.25</b>	-31.02	-16.23	

**Table 8-22. Channel Edge Emission Summary Data (Multi-RAT\_2NC\_NR\_20M+LTE\_5M)**



FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 53 of 91

Channel	Port	Measured Range (GHz)	Max. Value (dBm)	Limit (dBm)	Worst Margin(dB)
			QPSK		
Middle	0	3.530 to 3.540	-46.83	-31.02	-15.81
	0	3.540 to 3.549	-35.08	-19.02	-16.06
	0	3.549 to 3.550	-40.60	-19.02	-21.58
	0	3.570 to 3.571	-40.61	-19.02	-21.59
	0	3.571 to 3.580	-34.61	-19.02	-15.59
	0	3.580 to 3.585	-35.52	-31.02	-4.50
	0	3.585 to 3.594	-34.42	-19.02	-15.40
	0	3.594 to 3.595	-40.42	-19.02	-21.40
	0	3.615 to 3.616	-39.20	-19.02	-20.18
	0	3.616 to 3.625	-33.07	-19.02	-14.05
	0	3.625 to 3.634	-34.95	-19.02	-15.93
	0	3.634 to 3.635	-38.78	-19.02	-19.76
	0	3.655 to 3.656	-40.29	-19.02	-21.27
	0	3.656 to 3.665	-35.63	-19.02	-16.61
	0	3.665 to 3.670	-36.93	-31.02	-5.91
	0	3.670 to 3.679	-36.80	-19.02	-17.78
	0	3.679 to 3.680	-41.30	-19.02	-22.28
	0	3.700 to 3.701	-41.83	-19.02	-22.81
	0	3.701 to 3.710	-34.06	-19.02	-15.04
	0	3.710 to 3.720	-46.02	-31.02	-15.00
	1	3.530 to 3.540	-45.10	-31.02	-14.08
	1	3.540 to 3.549	-35.55	-19.02	-16.53
	1	3.549 to 3.550	-41.48	-19.02	-22.46
	1	3.570 to 3.571	-39.76	-19.02	-20.74
	1	3.571 to 3.580	-35.68	-19.02	-16.66
	1	3.580 to 3.585	-37.20	-31.02	-6.18
	1	3.585 to 3.594	-35.72	-19.02	-16.70
	1	3.594 to 3.595	-39.73	-19.02	-20.71
	1	3.615 to 3.616	-39.65	-19.02	-20.63
	1	3.616 to 3.625	-34.32	-19.02	-15.30
	1	3.625 to 3.634	-35.39	-19.02	-16.37
	1	3.634 to 3.635	-38.48	-19.02	-19.46
	1	3.655 to 3.656	-41.38	-19.02	-22.36
	1	3.656 to 3.665	-36.08	-19.02	-17.06
	1	3.665 to 3.670	-37.09	-31.02	-6.07
	1	3.670 to 3.679	-36.60	-19.02	-17.58
	1	3.679 to 3.680	-42.13	-19.02	-23.11
	1	3.700 to 3.701	-41.51	-19.02	-22.48
	1	3.701 to 3.710	-37.46	-19.02	-18.44
	1	3.710 to 3.720	-44.26	-31.02	-13.24
	2	3.530 to 3.540	-47.37	-31.02	-16.35
	2	3.540 to 3.549	-35.95	-19.02	-16.93
2	3.549 to 3.550	-41.85	-19.02	-22.83	
2	3.570 to 3.571	-41.66	-19.02	-22.64	
2	3.571 to 3.580	-35.18	-19.02	-16.16	
2	3.580 to 3.585	-36.49	-31.02	-5.47	
2	3.585 to 3.594	-34.64	-19.02	-15.62	



FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 54 of 91	

2	3.594 to 3.595	-41.22	-19.02	-22.20
2	3.615 to 3.616	-39.35	-19.02	-20.33
2	3.616 to 3.625	-34.63	-19.02	-15.61
2	3.625 to 3.634	-35.34	-19.02	-16.32
2	3.634 to 3.635	-40.68	-19.02	-21.66
2	3.655 to 3.656	-42.13	-19.02	-23.11
2	3.656 to 3.665	-36.73	-19.02	-17.71
2	3.665 to 3.670	-37.58	-31.02	-6.56
2	3.670 to 3.679	-36.95	-19.02	-17.93
2	3.679 to 3.680	-41.50	-19.02	-22.48
2	3.700 to 3.701	-44.02	-19.02	-25.00
2	3.701 to 3.710	-37.52	-19.02	-18.50
2	3.710 to 3.720	-45.63	-31.02	-14.61
3	3.530 to 3.540	<b>-46.97</b>	-31.02	-15.95
3	3.540 to 3.549	<b>-35.13</b>	-19.02	-16.11
3	3.549 to 3.550	<b>-40.37</b>	-19.02	-21.35
3	3.570 to 3.571	<b>-41.20</b>	-19.02	-22.18
3	3.571 to 3.580	<b>-34.18</b>	-19.02	-15.16
3	3.580 to 3.585	<b>-35.05</b>	-31.02	<b>-4.03</b>
3	3.585 to 3.594	<b>-33.31</b>	-19.02	-14.29
3	3.594 to 3.595	<b>-40.58</b>	-19.02	-21.56
3	3.615 to 3.616	<b>-40.30</b>	-19.02	-21.28
3	3.616 to 3.625	<b>-33.17</b>	-19.02	-14.15
3	3.625 to 3.634	<b>-35.14</b>	-19.02	-16.12
3	3.634 to 3.635	<b>-40.09</b>	-19.02	-21.07
3	3.655 to 3.656	<b>-40.78</b>	-19.02	-21.76
3	3.656 to 3.665	<b>-35.16</b>	-19.02	-16.14
3	3.665 to 3.670	<b>-36.22</b>	-31.02	-5.20
3	3.670 to 3.679	<b>-35.76</b>	-19.02	-16.74
3	3.679 to 3.680	<b>-41.60</b>	-19.02	-22.58
3	3.700 to 3.701	<b>-42.03</b>	-19.02	-23.01
3	3.701 to 3.710	<b>-37.02</b>	-19.02	-18.00
3	3.710 to 3.720	<b>-45.46</b>	-31.02	-14.44

**Table 8-23. Channel Edge Emission Summary Data (Multi-RAT\_4NC\_NR\_20M+20M+LTE\_20M+20M)**

FCC ID: A3LRT4401-48A		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 55 of 91	



Channel	Port	Measured Range (GHz)	Max. Value (dBm)	Limit (dBm)	Worst Margin(dB)
			QPSK		
Middle	0	3.530 to 3.540	-45.97	-31.02	-14.95
	0	3.540 to 3.549	-35.20	-19.02	-16.18
	0	3.549 to 3.550	-40.67	-19.02	-21.65
	0	3.570 to 3.571	-39.53	-19.02	-20.51
	0	3.571 to 3.580	-36.01	-19.02	-16.99
	0	3.580 to 3.605	-33.45	-31.02	-2.43
	0	3.605 to 3.614	-33.32	-19.02	-14.30
	0	3.614 to 3.615	-38.85	-19.02	-19.83
	0	3.635 to 3.636	-37.94	-19.02	-18.92
	0	3.636 to 3.645	-33.05	-19.02	-14.03
	0	3.645 to 3.670	-33.74	-31.02	-2.72
	0	3.670 to 3.679	-34.95	-19.02	-15.93
	0	3.679 to 3.680	-40.28	-19.02	-21.26
	0	3.700 to 3.701	-40.92	-19.02	-21.90
	0	3.701 to 3.710	-35.14	-19.02	-16.12
	0	3.710 to 3.720	-46.16	-31.02	-15.14
	1	3.530 to 3.540	-43.97	-31.02	-12.95
	1	3.540 to 3.549	-35.24	-19.02	-16.22
	1	3.549 to 3.550	-39.67	-19.02	-20.65
	1	3.570 to 3.571	-41.62	-19.02	-22.59
	1	3.571 to 3.580	-36.33	-19.02	-17.31
	1	3.580 to 3.605	-33.94	-31.02	-2.92
	1	3.605 to 3.614	-32.71	-19.02	-13.69
	1	3.614 to 3.615	-37.71	-19.02	-18.69
	1	3.635 to 3.636	-38.45	-19.02	-19.43
	1	3.636 to 3.645	-33.79	-19.02	-14.77
	1	3.645 to 3.670	-34.82	-31.02	-3.80
	1	3.670 to 3.679	-34.62	-19.02	-15.60
	1	3.679 to 3.680	-39.94	-19.02	-20.92
	1	3.700 to 3.701	-40.86	-19.02	-21.84
	1	3.701 to 3.710	-35.57	-19.02	-16.55
	1	3.710 to 3.720	-44.67	-31.02	-13.65
	2	3.530 to 3.540	-48.27	-31.02	-17.25
	2	3.540 to 3.549	-35.11	-19.02	-16.09
	2	3.549 to 3.550	-41.67	-19.02	-22.65
	2	3.570 to 3.571	-41.03	-19.02	-22.01
	2	3.571 to 3.580	-35.34	-19.02	-16.32
	2	3.580 to 3.605	-33.39	-31.02	-2.37
	2	3.605 to 3.614	-33.12	-19.02	-14.10
	2	3.614 to 3.615	-37.29	-19.02	-18.27
	2	3.635 to 3.636	-39.42	-19.02	-20.40
	2	3.636 to 3.645	-33.70	-19.02	-14.68
	2	3.645 to 3.670	-34.27	-31.02	-3.25
	2	3.670 to 3.679	-34.82	-19.02	-15.80
	2	3.679 to 3.680	-40.93	-19.02	-21.91
	2	3.700 to 3.701	-41.01	-19.02	-21.99
	2	3.701 to 3.710	-34.62	-19.02	-15.60

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 56 of 91	





2	3.710 to 3.720	-45.67	-31.02	-14.65
3	3.530 to 3.540	<b>-46.68</b>	-31.02	-15.66
3	3.540 to 3.549	<b>-33.93</b>	-19.02	-14.91
3	3.549 to 3.550	<b>-40.26</b>	-19.02	-21.24
3	3.570 to 3.571	<b>-40.37</b>	-19.02	-21.35
3	3.571 to 3.580	<b>-34.32</b>	-19.02	-15.30
3	3.580 to 3.605	<b>-33.19</b>	-31.02	<b>-2.17</b>
3	3.605 to 3.614	<b>-33.02</b>	-19.02	-14.00
3	3.614 to 3.615	<b>-38.09</b>	-19.02	-19.07
3	3.635 to 3.636	<b>-39.33</b>	-19.02	-20.30
3	3.636 to 3.645	<b>-32.83</b>	-19.02	-13.81
3	3.645 to 3.670	<b>-34.15</b>	-31.02	-3.13
3	3.670 to 3.679	<b>-34.50</b>	-19.02	-15.48
3	3.679 to 3.680	<b>-41.59</b>	-19.02	-22.57
3	3.700 to 3.701	<b>-41.45</b>	-19.02	-22.43
3	3.701 to 3.710	<b>-36.06</b>	-19.02	-17.04
3	3.710 to 3.720	<b>-45.58</b>	-31.02	-14.56

**Table 8-24. Channel Edge Emission Summary Data (NR\_3NC\_20M+20M+20M)**



FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT (Class II Permissive Change)</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 8K23011901-00-R1.A3L	<b>Test Dates:</b> 02/06/2023 – 03/07/2023	<b>EUT Type:</b> RRU(RT4401)	Page 57 of 91	

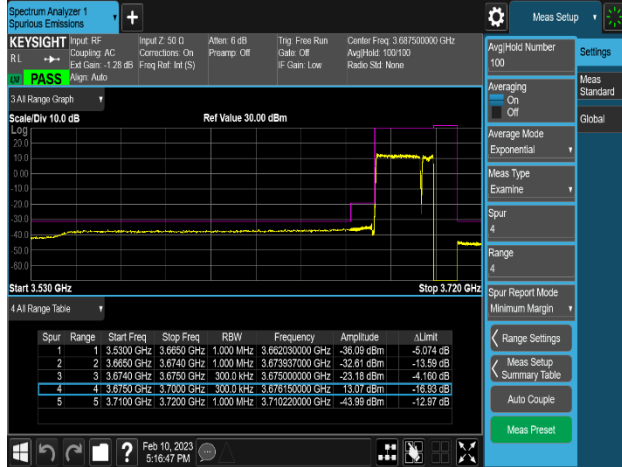
Channel	Port	Measured Range (GHz)	Max. Value (dBm)	Limit (dBm)	Worst Margin(dB)
			QPSK		
Middle	0	3.530 to 3.540	-48.35	-31.02	-17.33
	0	3.540 to 3.549	-36.59	-19.02	-17.57
	0	3.549 to 3.550	-37.93	-19.02	-18.91
	0	3.570 to 3.571	-38.76	-19.02	-19.74
	0	3.571 to 3.580	-34.55	-19.02	-15.53
	0	3.580 to 3.585	-35.01	-31.02	-3.99
	0	3.585 to 3.594	-33.72	-19.02	-14.70
	0	3.594 to 3.595	-37.29	-19.02	-18.27
	0	3.615 to 3.616	-37.78	-19.02	-18.76
	0	3.616 to 3.625	-33.67	-19.02	-14.65
	0	3.625 to 3.634	-33.04	-19.02	-14.02
	0	3.634 to 3.635	-37.67	-19.02	-18.65
	0	3.655 to 3.656	-40.08	-19.02	-21.06
	0	3.656 to 3.665	-34.16	-19.02	-15.14
	0	3.665 to 3.670	-35.38	-31.02	-4.36
	0	3.670 to 3.679	-34.25	-19.02	-15.23
	0	3.679 to 3.680	-40.70	-19.02	-21.68
	0	3.700 to 3.701	-41.03	-19.02	-22.01
	0	3.701 to 3.710	-35.62	-19.02	-16.60
	0	3.710 to 3.720	-46.80	-31.02	-15.78
	1	3.530 to 3.540	<b>-45.92</b>	-31.02	-14.90
	1	3.540 to 3.549	<b>-35.53</b>	-19.02	-16.51
	1	3.549 to 3.550	<b>-41.59</b>	-19.02	-22.57
	1	3.570 to 3.571	<b>-39.90</b>	-19.02	-20.88
	1	3.571 to 3.580	<b>-34.32</b>	-19.02	-15.30
	1	3.580 to 3.585	<b>-36.38</b>	-31.02	-5.36
	1	3.585 to 3.594	<b>-33.85</b>	-19.02	-14.83
	1	3.594 to 3.595	<b>-40.01</b>	-19.02	-20.99
	1	3.615 to 3.616	<b>-39.44</b>	-19.02	-20.42
	1	3.616 to 3.625	<b>-34.84</b>	-19.02	-15.82
	1	3.625 to 3.634	<b>-33.45</b>	-19.02	-14.43
	1	3.634 to 3.635	<b>-38.35</b>	-19.02	-19.33
	1	3.655 to 3.656	<b>-40.01</b>	-19.02	-20.99
	1	3.656 to 3.665	<b>-32.92</b>	-19.02	-13.90
	1	3.665 to 3.670	<b>-34.79</b>	-31.02	<b>-3.77</b>
	1	3.670 to 3.679	<b>-33.42</b>	-19.02	-14.40
1	3.679 to 3.680	<b>-40.50</b>	-19.02	-21.48	
1	3.700 to 3.701	<b>-41.39</b>	-19.02	-22.37	
1	3.701 to 3.710	<b>-35.66</b>	-19.02	-16.64	
1	3.710 to 3.720	<b>-44.56</b>	-31.02	-13.54	
2	3.530 to 3.540	-46.90	-31.02	-15.88	
2	3.540 to 3.549	-34.82	-19.02	-15.80	
2	3.549 to 3.550	-40.36	-19.02	-21.34	
2	3.570 to 3.571	-40.55	-19.02	-21.53	
2	3.571 to 3.580	-34.56	-19.02	-15.54	
2	3.580 to 3.585	-35.95	-31.02	-4.93	
2	3.585 to 3.594	-33.67	-19.02	-14.65	

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 58 of 91	

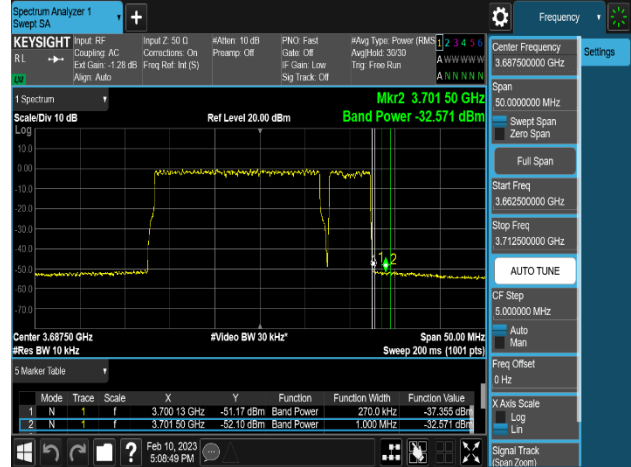
2	3.594 to 3.595	-40.65	-19.02	-21.63
2	3.615 to 3.616	-39.46	-19.02	-20.44
2	3.616 to 3.625	-33.57	-19.02	-14.55
2	3.625 to 3.634	-33.93	-19.02	-14.91
2	3.634 to 3.635	-39.68	-19.02	-20.66
2	3.655 to 3.656	-40.69	-19.02	-21.67
2	3.656 to 3.665	-34.27	-19.02	-15.25
2	3.665 to 3.670	-36.44	-31.02	-5.42
2	3.670 to 3.679	-34.03	-19.02	-15.01
2	3.679 to 3.680	-41.46	-19.02	-22.44
2	3.700 to 3.701	-43.11	-19.02	-24.09
2	3.701 to 3.710	-36.06	-19.02	-17.04
2	3.710 to 3.720	-45.89	-31.02	-14.87
3	3.530 to 3.540	-46.89	-31.02	-15.87
3	3.540 to 3.549	-33.09	-19.02	-14.07
3	3.549 to 3.550	-40.21	-19.02	-21.19
3	3.570 to 3.571	-40.98	-19.02	-21.96
3	3.571 to 3.580	-33.52	-19.02	-14.50
3	3.580 to 3.585	-35.10	-31.02	-4.08
3	3.585 to 3.594	-33.57	-19.02	-14.55
3	3.594 to 3.595	-41.16	-19.02	-22.13
3	3.615 to 3.616	-38.09	-19.02	-19.07
3	3.616 to 3.625	-33.65	-19.02	-14.63
3	3.625 to 3.634	-32.75	-19.02	-13.73
3	3.634 to 3.635	-37.98	-19.02	-18.96
3	3.655 to 3.656	-38.73	-19.02	-19.71
3	3.656 to 3.665	-33.67	-19.02	-14.65
3	3.665 to 3.670	-35.04	-31.02	-4.02
3	3.670 to 3.679	-33.37	-19.02	-14.35
3	3.679 to 3.680	-39.23	-19.02	-20.21
3	3.700 to 3.701	-40.47	-19.02	-21.45
3	3.701 to 3.710	-35.80	-19.02	-16.78
3	3.710 to 3.720	-45.90	-31.02	-14.88

**Table 8-25. Channel Edge Emission Summary Data (NR\_4NC\_20M+20M+20M+20M)**

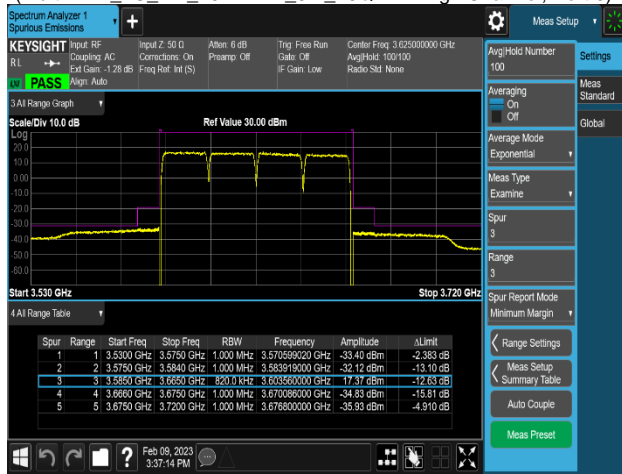
FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)	Page 59 of 91	



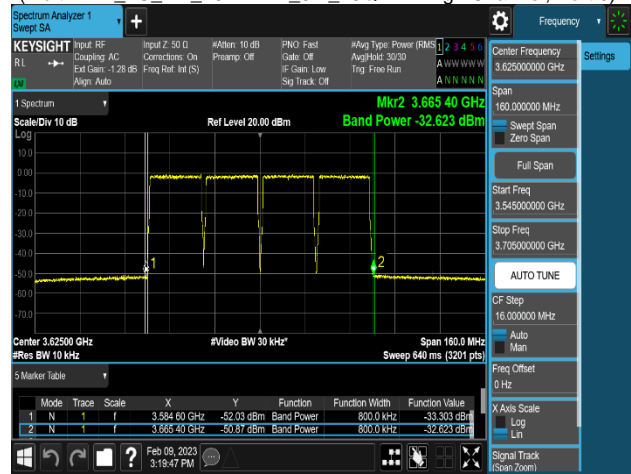
Plot 8-45. Channel Edge Emission Plot (Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM– High Channel, Port 0)



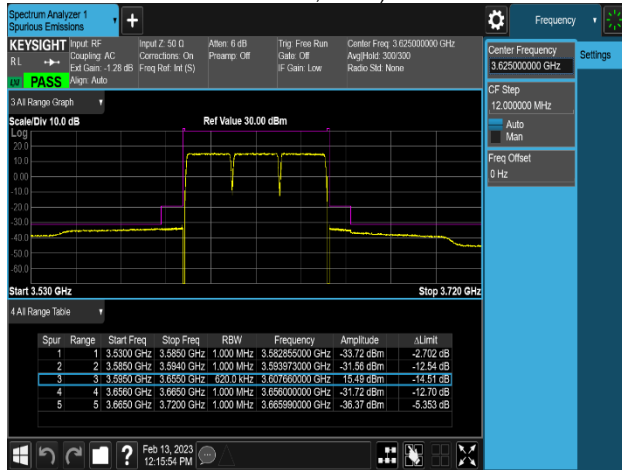
Plot 8-46. Channel Edge Emission integration method Plot (Multi-RAT\_2C\_NR\_20M+LTE\_5M\_16QAM– High Channel, Port 0)



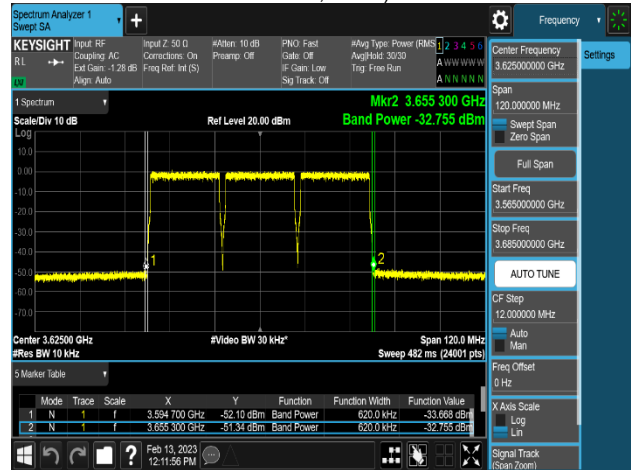
Plot 8-47. Channel Edge Emission Plot (Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_QPSK – Mid Channel, Port 0)



Plot 8-48. Channel Edge Emission integration method Plot (Multi-RAT\_4C\_NR\_20M+20M+LTE\_20M+20M\_QPSK – Mid Channel, Port 0)



Plot 8-49. Channel Edge Emission Plot (NR\_3C\_20M+20M+20M\_QPSK– Mid Channel, Port 3)



Plot 8-50. Channel Edge Emission integration method Plot (NR\_3C\_20M+20M+20M\_QPSK– Mid Channel, Port 3)

FCC ID: A3LRT4401-48A		<b>MEASUREMENT REPORT</b> (Class II Permissive Change)		Approved by: Technical Manager
Test Report S/N: 8K23011901-00-R1.A3L	Test Dates: 02/06/2023 – 03/07/2023	EUT Type: RRU(RT4401)		Page 60 of 91