

**PART 90 MEASUREMENT REPORT**

**Applicant Name:**

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

**Date of Testing:**

10/1/2023 - 3/25/2024

**Test Report Issue Date:**

3/28/2024

**Test Site/Location:**

Element Materials Technology, Morgan Hill, CA, USA

**Test Report Serial No.:**

1C2311270066-14.BCG

<b>FCC ID:</b>	<b>BCGA2899</b>
<b>Applicant Name:</b>	<b>Apple Inc.</b>

**Application Type:**

Certification

**Model:**

A2899, A2900

**EUT Type:**

Tablet Device

**FCC Classification:**

PCS Licensed Transmitter (PCB)

**FCC Rule Part:**

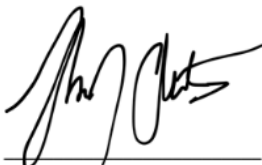
§2.1049, §90(S), §90(R)

**Test Procedure(s):**

ANSI C63.26-2015, TIA-603-E-2016, KDB 971168 D01 v03r01

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.




RJ Ortanez  
Executive Vice President

**Prepared by:** WKR0000006184


**Reviewed by:** WKR0000005805

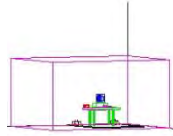


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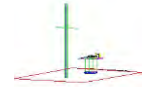
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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Measurement	OBW [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator		
LTE Band 26	1.4 MHz	QPSK	814.7 - 823.3	Conducted	1.1020	0.360	25.56	1M10G7W		
		16QAM	814.7 - 823.3	Conducted	1.1079	0.294	24.69	1M11D7W		
		64QAM	814.7 - 823.3	Conducted	1.1096	0.240	23.81	1M11D7W		
		256QAM	814.7 - 823.3	Conducted	1.1053	0.119	20.75	1M11D7W		
	3 MHz	QPSK	815.5 - 822.5	Conducted	2.7230	0.358	25.54	2M72G7W		
		16QAM	815.5 - 822.5	Conducted	2.7194	0.310	24.91	2M72D7W		
		64QAM	815.5 - 822.5	Conducted	2.7228	0.247	23.93	2M72D7W		
		256QAM	815.5 - 822.5	Conducted	2.7152	0.120	20.78	2M72D7W		
	5 MHz	QPSK	816.5 - 821.5	Conducted	4.5281	0.372	25.70	4M53G7W		
		16QAM	816.5 - 821.5	Conducted	4.5313	0.307	24.87	4M53D7W		
		64QAM	816.5 - 821.5	Conducted	4.5320	0.242	23.84	4M53D7W		
		256QAM	816.5 - 821.5	Conducted	4.5388	0.117	20.67	4M54D7W		
	10 MHz	QPSK	819.0	Conducted	9.0312	0.349	25.43	9M03G7W		
		16QAM	819.0	Conducted	9.0602	0.306	24.86	9M06D7W		
		64QAM	819.0	Conducted	9.0431	0.245	23.90	9M04D7W		
		256QAM	819.0	Conducted	8.9808	0.117	20.67	8M98D7W		
LTE Band 14	5 MHz	QPSK	790.5 - 795.5	ERP	4.5600	0.124	20.95	4M56G7W		
		16QAM	790.5 - 795.5	ERP	4.5548	0.107	20.30	4M55D7W		
		64QAM	790.5 - 795.5	ERP	4.5295	0.084	19.22	4M53D7W		
		256QAM	790.5 - 795.5	ERP	4.5253	0.040	15.99	4M53D7W		
	10 MHz	QPSK	793.0	ERP	9.0452	0.119	20.75	9M05G7W		
		16QAM	793.0	ERP	9.0352	0.106	20.26	9M04D7W		
		64QAM	793.0	ERP	9.0636	0.081	19.10	9M06D7W		
		256QAM	793.0	ERP	9.0137	0.040	15.99	9M01D7W		
NR Band n14	5 MHz	$\pi/2$ BPSK	790.5 - 795.5	ERP	4.4795	0.122	20.86	4M48G7W		
		QPSK	790.5 - 795.5	ERP	4.4876	0.122	20.86	4M49G7W		
		16QAM	790.5 - 795.5	ERP	4.4875	0.101	20.02	4M49D7W		
		64QAM	790.5 - 795.5	ERP	4.4930	0.069	18.42	4M49D7W		
		256QAM	790.5 - 795.5	ERP	4.5040	0.043	16.37	4M50D7W		
	10 MHz	$\pi/2$ BPSK	793.0	ERP	8.9329	0.121	20.81	8M93G7W		
		QPSK	793.0	ERP	9.2984	0.118	20.73	9M30G7W		
		16QAM	793.0	ERP	9.3255	0.099	19.96	9M33D7W		
		64QAM	793.0	ERP	9.3153	0.067	18.26	9M32D7W		
		256QAM	793.0	ERP	9.3262	0.041	16.16	9M33D7W		
		NR Band n26	5 MHz	$\pi/2$ BPSK	816.5 - 821.5	Conducted	4.4786	0.371	25.69	4M48G7W
				QPSK	816.5 - 821.5	Conducted	4.4759	0.366	25.63	4M48G7W
16QAM	816.5 - 821.5			Conducted	4.4894	0.294	24.69	4M49D7W		
64QAM	816.5 - 821.5			Conducted	4.4969	0.202	23.06	4M50D7W		
256QAM	816.5 - 821.5			Conducted	4.4782	0.128	21.07	4M48D7W		
10 MHz	$\pi/2$ BPSK		819.0	Conducted	8.9287	0.359	25.55	8M93G7W		
	QPSK		819.0	Conducted	9.2961	0.361	25.57	9M30G7W		
	16QAM		819.0	Conducted	9.2918	0.310	24.91	9M29D7W		
		64QAM	819.0	Conducted	9.2992	0.205	23.11	9M30D7W		
		256QAM	819.0	Conducted	9.3107	0.132	21.20	9M31D7W		

### EUT Overview

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# 1.0 INTRODUCTION

## 1.1 Scope

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


## 1.2 Element Materials Technology Test Location

These measurement tests were conducted at the Element Materials Technology facility located at 18855 Adams Court, Morgan Hill, CA 95037. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

## 1.3 Test Facility / Accreditations

**Measurements were performed at Element Materials Technology located in Morgan Hill, CA 95037, U.S.A.**

- Element Materials Technology is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Washington DC LLC TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- Element Materials Technology facility is a registered (22831) test laboratory with the site description on file with ISED.
- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Agreements (MRAs).

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2899**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 90.

**Test Device Serial No.: HNV33MVH3W, WT2VX34FFH, GYFQLPC7HK, DLXH0A0008D0000FH4**

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (FR1), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, 802.11a/ax WIFI 6E, 802.15.4, Bluetooth (1x, EDR, LE1M, LE2M, HDR4, HDR8), NB UNII (1x, HDR4, HDR8), WPT

This device supports BT Beamforming

This device supports simultaneous transmission operations, which allows for multiple transmitters to transmit simultaneously on the same antenna. The table below shows all configurations possible.


Antenna	Simultaneous Tx Config	Wifi 2GHz	Bluetooth	Thread	Wifi 5GHz	Wifi 6GHz	NB UNII	LTE/FR1 NR	LTE/FR1 NR
		802.11 b/g/n/ax	BDR, EDR, HDR4/8, LE1/2M	802.15.4	802.11 a/n/ac/ax	802.11 a/ax	BDR, HDR4/8	MB/HB	UHB
Antenna 3b	Config 1	X	X	X	✓	X	X	✓	X
Antenna 3b	Config 2	X	X	X	X	✓	X	✓	X
Antenna 3b	Config 3	X	X	X	X	X	✓	✓	X
Antenna 3a	Config 4	✓	X	X	X	X	X	X	✓
Antenna 3a	Config 5	X	✓	X	X	X	X	X	✓
Antenna 3a	Config 6	X	X	✓	X	X	X	X	✓
Antenna 1a	Config 7	✓	X	X	X	X	X	X	✓
Antenna 1a	Config 8	X	✓	X	✓	X	X	X	✓
Antenna 1a	Config 9	X	X	✓	X	X	X	X	✓
Antenna 1b	Config 10	X	X	X	✓	X	X	✓	X
Antenna 1b	Config 11	X	X	X	X	✓	X	✓	X
Antenna 1b	Config 12	X	X	X	X	X	✓	✓	X

**Table 2-1. Simultaneous Transmission Configurations**

✓ = Support; ✗ = Not Support

#### Note:

- All the above simultaneous transmission configurations have been tested and the worst case configuration was found to be Config 8 and reported in RF Bluetooth and RF FCC Part 96 reports.
- Specific 2.4GHz Wi-Fi antenna that can only transmit simultaneously with 2.4GHz Bluetooth antenna is listed in the SAR test report. For BT (2.4GHz) in connected mode and Wi-Fi (2.4GHz) - Wi-Fi max power will not exceed minimum of (13.5dBm, SAR max cap, Reg max cap) power. For BT (2.4GHz) in disconnected mode and Wi-Fi (2.4GHz) - BT will be using iPA only and Wi-Fi max power will not exceed minimum of (SAR max cap, Reg max cap) power. Bluetooth can simultaneously transmit with IEEE 802.11a/n/ac/ax 5/6 GHz on separate antenna.

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### 2.3 Antenna Description

Following antenna gains provided by manufacturer were used for testing.


Band	Antenna Gain [dBi]	
	Antenna 4	Antenna 2
LTE Band 14	-2.6	-2.3
NR Band n14		
LTE Band 26	-2.1	-2.1
NR Band n26		

**Table 2-2. Highest Antenna Gain**

### 2.4 Test Support Equipment

1	Apple MacBook Pro	Model: A2141	S/N: C02H604EQ05D
	w/AC/DC Adapter	Model: A2166	S/N: C4H042705ZNPM0WA6
2	Apple USB-C Cable	Model: Spartan	S/N: GXK1336018XKTR024
3	USB-C Cable	Model: A246C	S/N: DWH80115BK826GV19
	w/ AC Adapter	Model: A2305	S/N: C4H95160004PF4F4V
4	Apple Pencil	Model: A2538	S/N: KJ26TCFXJW
5	DC Power Supply	Model: KPS3010D	S/N: N/A

**Table 2-3. Test Support Equipment**

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## 2.5 Test Configuration

The EUT was tested per the guidance of ANSI C63.26-2015, TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

For emissions from 1GHz – 18GHz, low, mid, and high channels were tested with highest power and worst case configuration. The emissions below 1GHz were tested with the highest transmitting power and the worst case channel.


The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape), and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

## 2.6 Software and Firmware

The test was conducted with firmware version 21E8197 installed on the EUT.

## 2.7 EMI Suppression Device(s)/Modifications

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

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## 3.0 DESCRIPTION OF TESTS

### 3.1 Evaluation Procedure

The measurement procedures described in the documents titled “American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services” (ANSI C63.26-2015 and TIA-603-E-2016) and “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

**Deviation from Measurement Procedure.....None**

### 3.2 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. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

For radiated spurious emissions measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

$$E_{[dB\mu V/m]} = \text{Measured amplitude level}_{[dBm]} + 107 + \text{Cable Loss}_{[dB]} + \text{Antenna Factor}_{[dB/m]}$$


And

$$\text{EIRP}_{[dBm]} = E_{[dB\mu V/m]} + 20\log D - 104.8; \text{ where } D \text{ is the measurement distance in meters.}$$

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014.

Per KDB 414788 D01 v01r01, radiated emission test sites other than open-field test sites (e.g., shielded anechoic chambers), may be employed for emission measurements below 30MHz if characterized so that the measurements correspond to those obtained at an open-field test site. To determine test site equivalency, a reference sample transmitting at 149kHz was measured on an open field test site (asphalt with no ground plane) and then measured in the 3m semi-anechoic chamber. A calibrated 60cm loop antenna was used while the reference device was rotated through the X, Y and Z axis in order to capture the worst case level. A maximum deviation of 2.77dB at 149kHz was measured when comparing the 3 meter semi-anechoic chamber to the open field site.

Radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI C63.26-2015 and TIA-603-E-2016.


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## 4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.23-2012. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty ( $\pm$ dB)
Conducted Bench Top Measurements	2.07
Radiated Disturbance (<30MHz)	4.12
Radiated Disturbance (30MHz-1GHz)	4.85
Radiated Disturbance (1-18GHz)	5.08

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## 5.0 TEST EQUIPMENT CALIBRATION DATA


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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	6/21/2023	Annual	6/21/2024	MY49430244
ESPEC	SU-241	Tabletop Temperature Chamber	11/17/2023	Annual	11/17/2024	92009574
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	3/30/2023	Annual	3/30/2024	00218555
Keysight Technology	N9040B	UXA Signal Analyzer	3/10/2023	Annual	3/10/2024	MY57212015
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	8/31/2023	Annual	8/31/2024	100052
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	5/11/2023	Annual	5/11/2024	101619
Rohde & Schwarz	ESW44	EMI Test Receiver	6/6/2023	Annual	6/6/2024	101668
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	6/22/2023	Annual	6/22/2024	102356
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	11/30/2023	Annual	11/30/2024	161616
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	12/27/2023	Annual	12/27/2024	164715
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	6/2/2023	Annual	6/2/2024	100050
Rohde & Schwarz	HFH2-Z2	Loop Antenna	5/1/2023	Annual	5/1/2024	100519
Rohde & Schwarz	FSW43	Signal Analyzer (2Hz-43.5GHz)	7/13/2023	Annual	7/13/2024	101261
Schwarzbeck	VULB 9162	Bilog Antenna (30MHz - 6GHz)	4/17/2023	Annual	4/17/2024	00304

**Table 5-1. Test Equipment List**

### 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.

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## 6.0 SAMPLE CALCULATIONS

### Emission Designator

#### $\pi/2$ BPSK / QPSK Modulation

**Emission Designator = 8M62G7W**

BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination of Any

#### QAM Modulation

**Emission Designator = 8M45D7W**

BW = 8.45 MHz

D = Amplitude/Angle Modulated


7 = Quantized/Digital Info

W = Combination of Any

### Spurious Radiated Emission

#### **Example: Spurious emission at 3700.40 MHz**

The receive spectrum analyzer reading at 3 meters with the EUT on the turntable was  $-81.0$  dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of  $-81.0$  dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3700.40 MHz. So 6.1 dB is added to the signal generator reading of  $-30.9$  dBm yielding  $-24.80$  dBm. The fundamental EIRP was 25.50 dBm so this harmonic was  $25.50$  dBm  $- (-24.80) = 50.3$  dBc.

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## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Apple Inc.  
 FCC ID: BCGA2899  
 FCC Classification: PCS Licensed Transmitter (PCB)  
 Mode(s): LTE/NR

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
<b>CONDUCTED</b>	Occupied Bandwidth	2.1049	N/A	N/A	Section 7.2
	Conducted Band Edge / Spurious Emissions (LTE Band 14)	2.1051, 90.543(e)	On all frequencies between 769-775 MHz and 799-805 MHz, attenuation by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.	PASS	Sections 7.3, 7.4
	Conducted Band Edge / Spurious Emissions (NR Band n14)		On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, attenuation by at least $43 + 10 \log(P)$ dB		
	Conducted Band Edge / Spurious Emissions (LTE Band 26)	2.1051, 90.691(a)	-13 dBm for all out-of-band emissions except -30 dBm at Band Edge and for all out-of-band emissions within 37.5kHz of Block Edge	PASS	Sections 7.3, 7.4
	Frequency Stability (LTE Band 14)	2.1055	Fundamental emissions stay within authorized frequency block over the temperature and voltage range as tested.	PASS	Section 7.8
	Frequency Stability (LTE Band 26)	90.213	< 2.5 ppm	PASS	Section 7.8
	Conducted Power	2.1046, 90.635	< 100 Watts	PASS	Section 7.5
	Effective Radiated Power (LTE Band 14)	90.542(a)(7)	< 3 Watts max. ERP	PASS	Section 7.6
	Effective Radiated Power (NR Band n14)			PASS	Section 7.6
	Effective Radiated Power (LTE Band 26)	22.913(a)(5)	< 7 Watts max. ERP	PASS	Section 7.6
<b>RADIATED</b>	Radiated Spurious Emissions (LTE Band 14)	2.1053, 90.543(e)	> $43 + 10 \log_{10}(P[\text{Watts}])$ for all out-of-band emissions except emissions in the 1559 - 1610MHz band are subject to a limit of -40dBm/MHz for wideband signals	PASS	Section 7.7
	Radiated Spurious Emissions (NR Band n14)			PASS	Section 7.7
	Radiated Spurious Emissions (LTE Band 26)	2.1053, 90.691(a)	-13 dBm for all out-of-band emissions except -30 dBm at Band Edge and for all out-of-band emissions within 37.5kHz of Block Edge	PASS	Section 7.7


Table 7-1. Summary of Test Results

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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**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 shown in Section 7.0 were taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
3. All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
4. For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is Element EMC Software Tool v1.1.
5. For radiated spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software's utilized are Element "Chamber Automation," Version 3.0.0.
6. All ports were investigated and for some test cases only the worst case data was reported.

<b>FCC ID:</b> BCGA2899	 <b>PART 90 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1C2311270066-14.BCG	<b>Test Dates:</b> 10/01/2023 - 3/25/2024	<b>EUT Type:</b> Tablet Device	Page 13 of 101

## 7.2 Occupied Bandwidth

§2.1049

### Test Overview

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

### Test Procedure Used

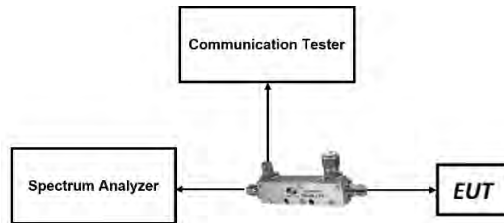
KDB 971168 D01 v03r01 – Section 4.2

### Test Settings

1. The signal analyzer’s automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW  $\geq 3 \times$  RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

### Test Setup


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



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

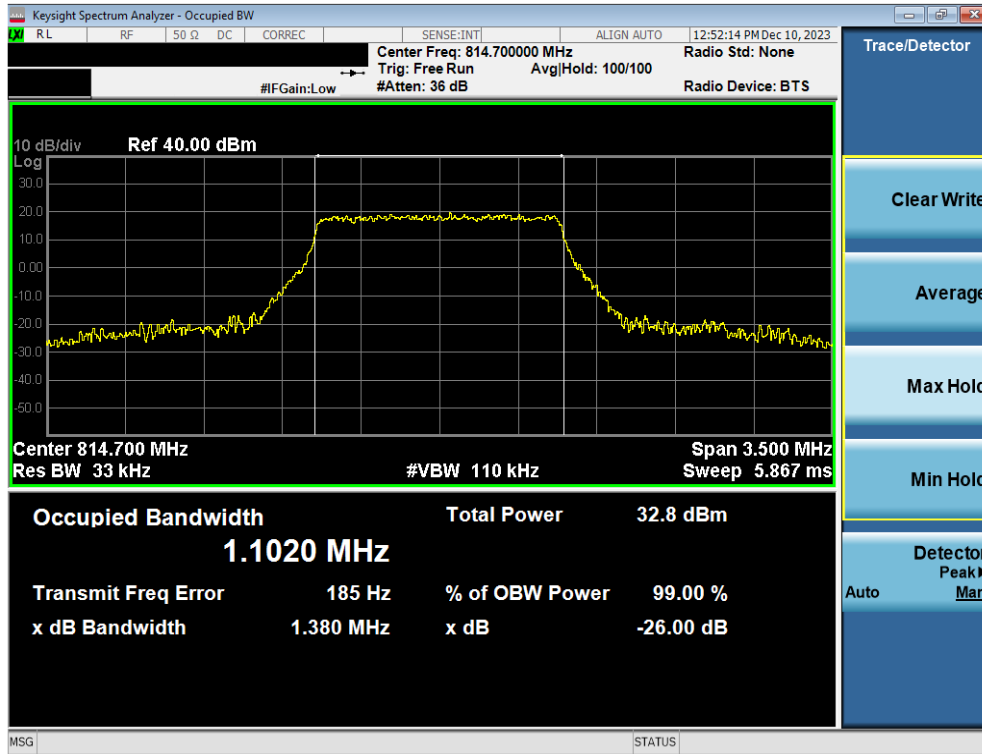
### Test Notes

None.

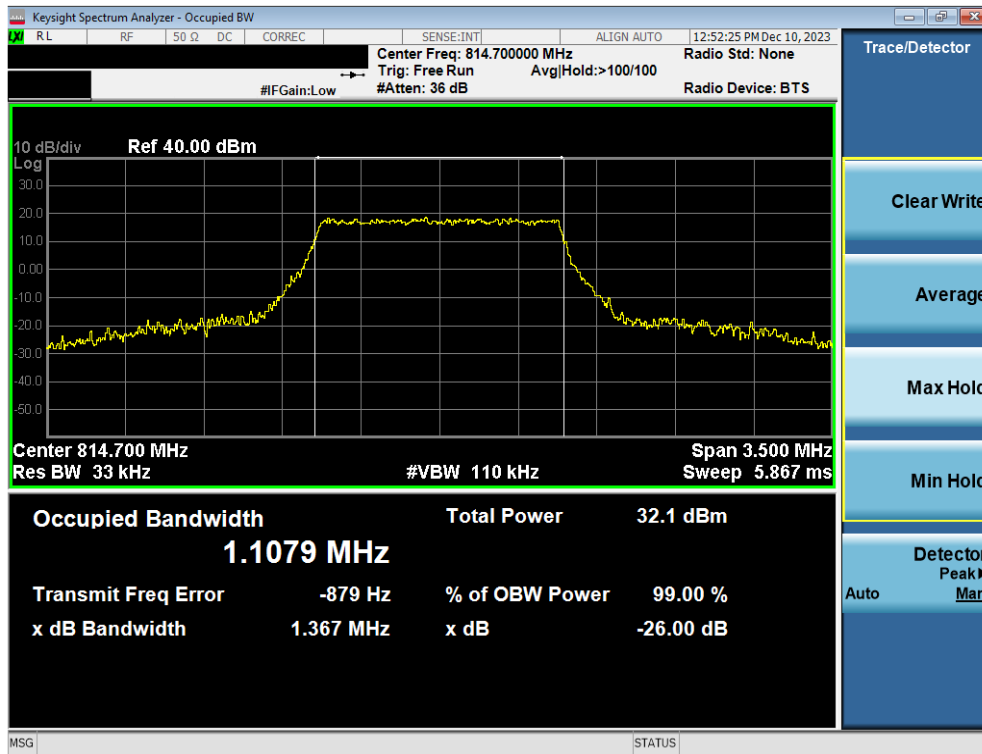
FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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## LTE Band 26

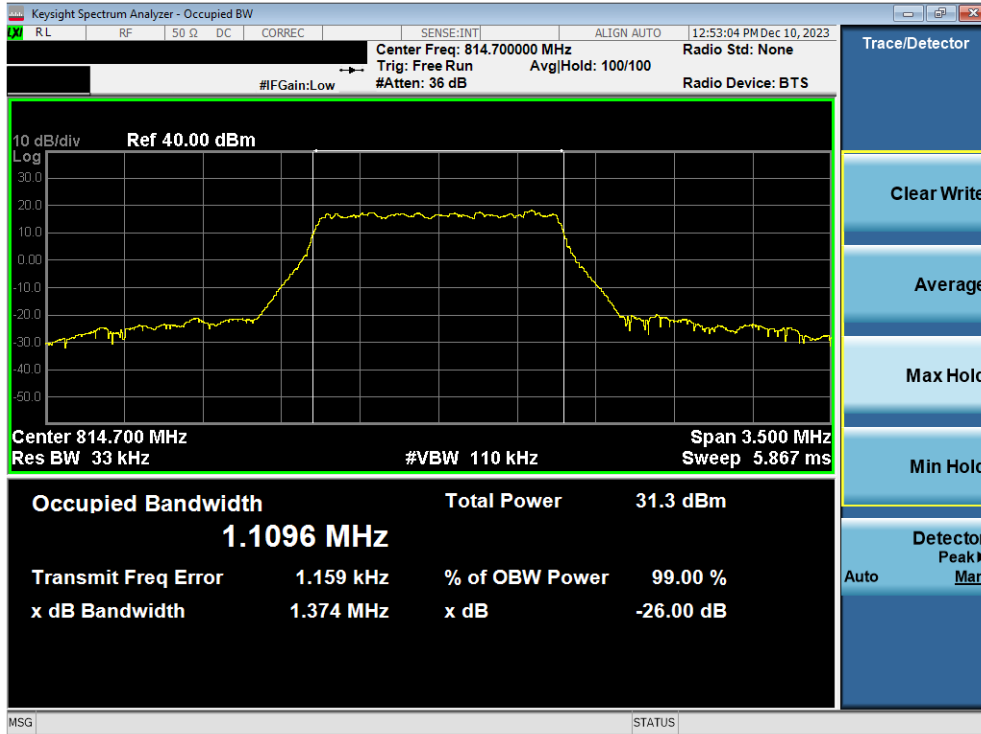


Plot 7-1. Occupied Bandwidth Plot (LTE Band 26 - 1.4MHz QPSK - Full RB)

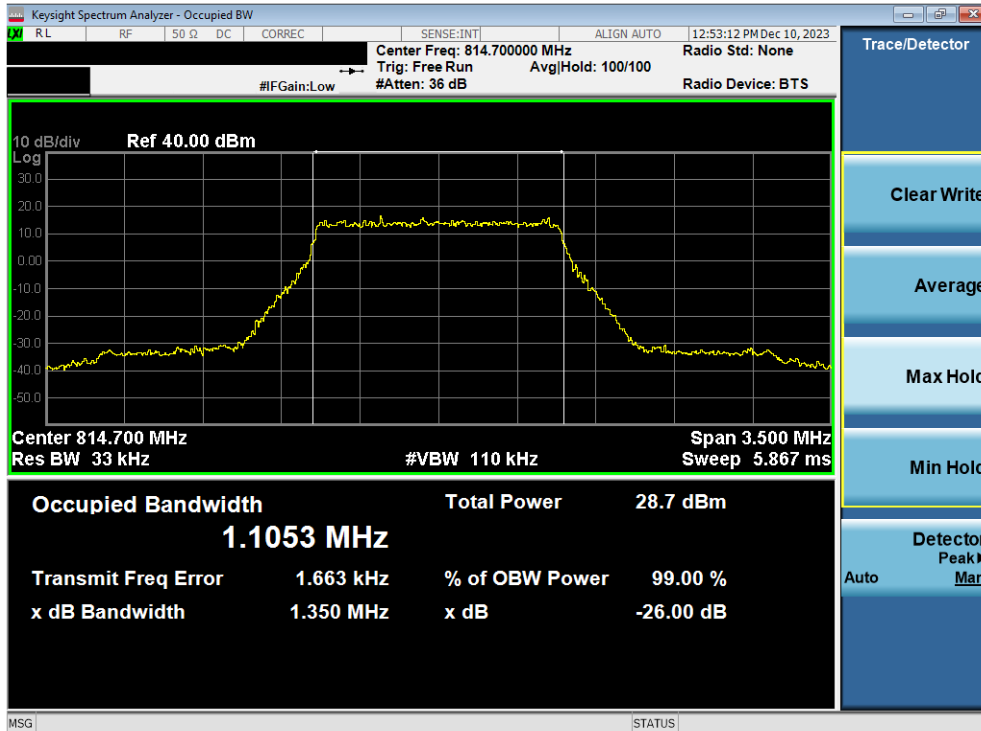


Plot 7-2. Occupied Bandwidth Plot (LTE Band 26 - 1.4MHz 16-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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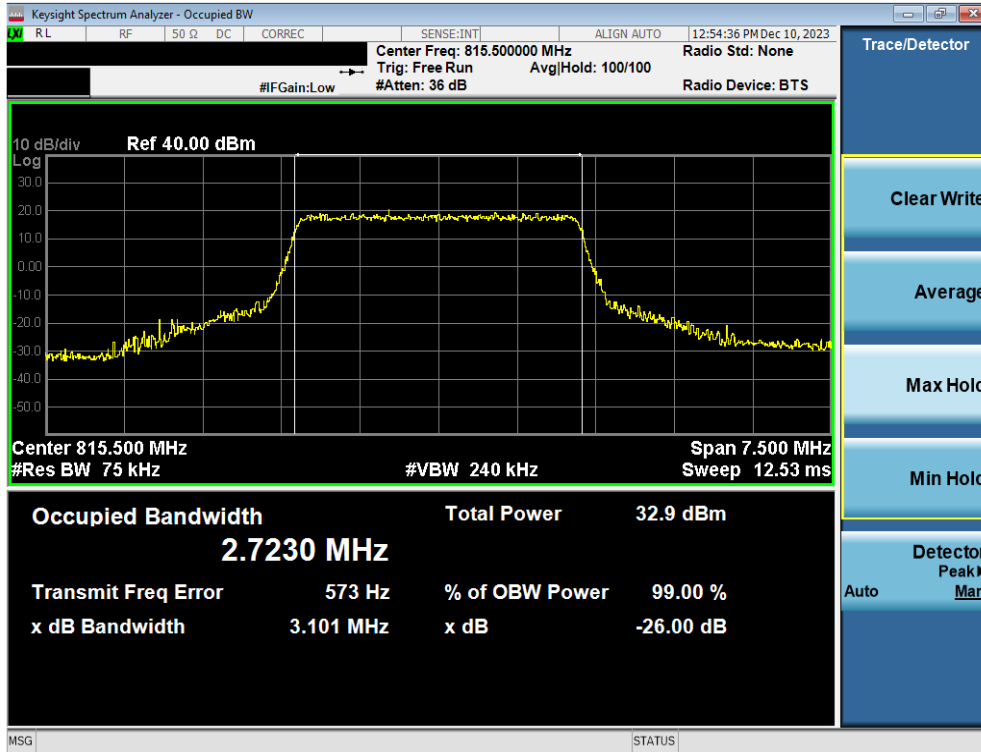
Plot 7-3. Occupied Bandwidth Plot (LTE Band 26 - 1.4MHz 64-QAM - Full RB)



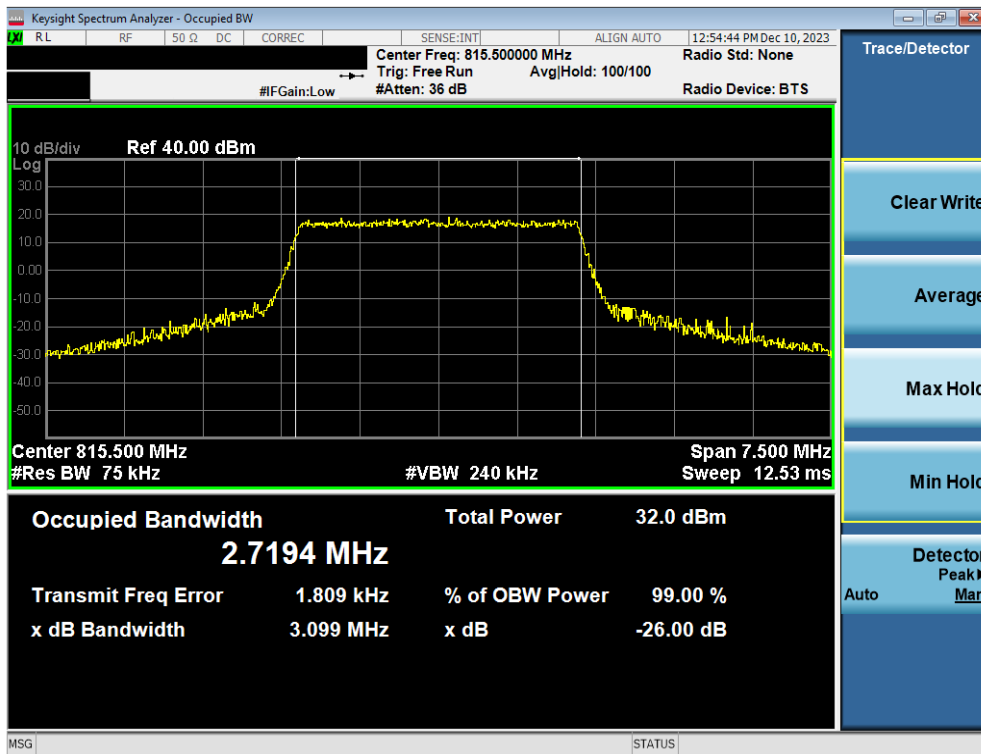
Plot 7-4. Occupied Bandwidth Plot (LTE Band 26 - 1.4MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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Plot 7-5. Occupied Bandwidth Plot (LTE Band 26 - 3MHz QPSK - Full RB)

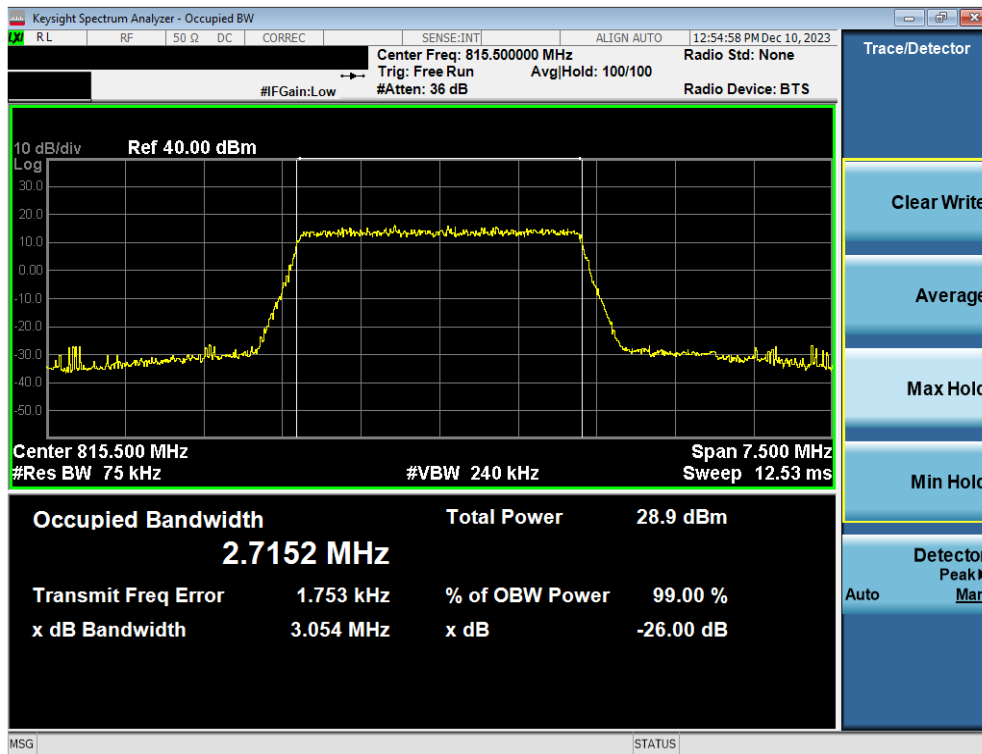


Plot 7-6. Occupied Bandwidth Plot (LTE Band 26 - 3MHz 16-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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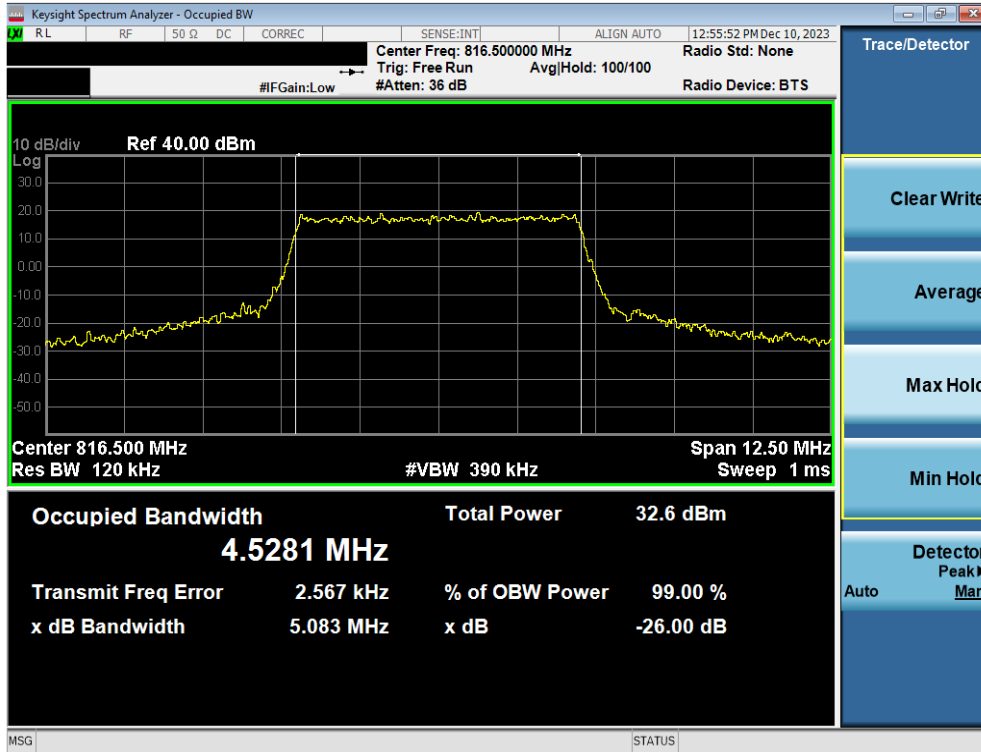


Plot 7-7. Occupied Bandwidth Plot (LTE Band 26 - 3MHz 64-QAM - Full RB)



Plot 7-8. Occupied Bandwidth Plot (LTE Band 26 - 3MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-9. Occupied Bandwidth Plot (LTE Band 26 - 5MHz QPSK - Full RB)

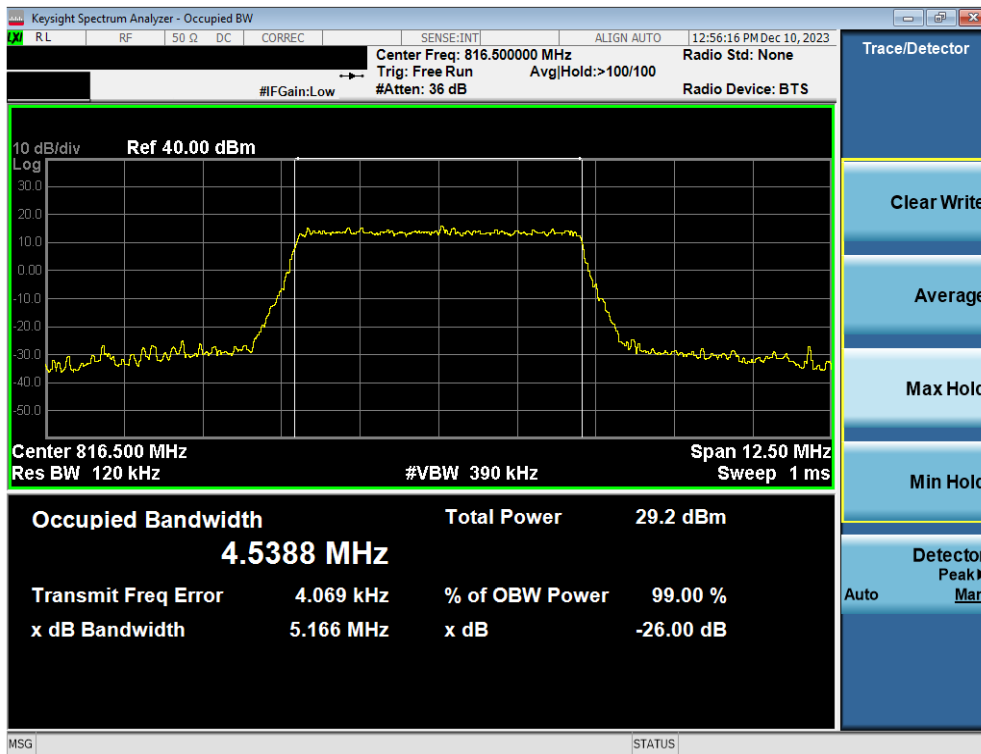


Plot 7-10. Occupied Bandwidth Plot (LTE Band 26 - 5MHz 16-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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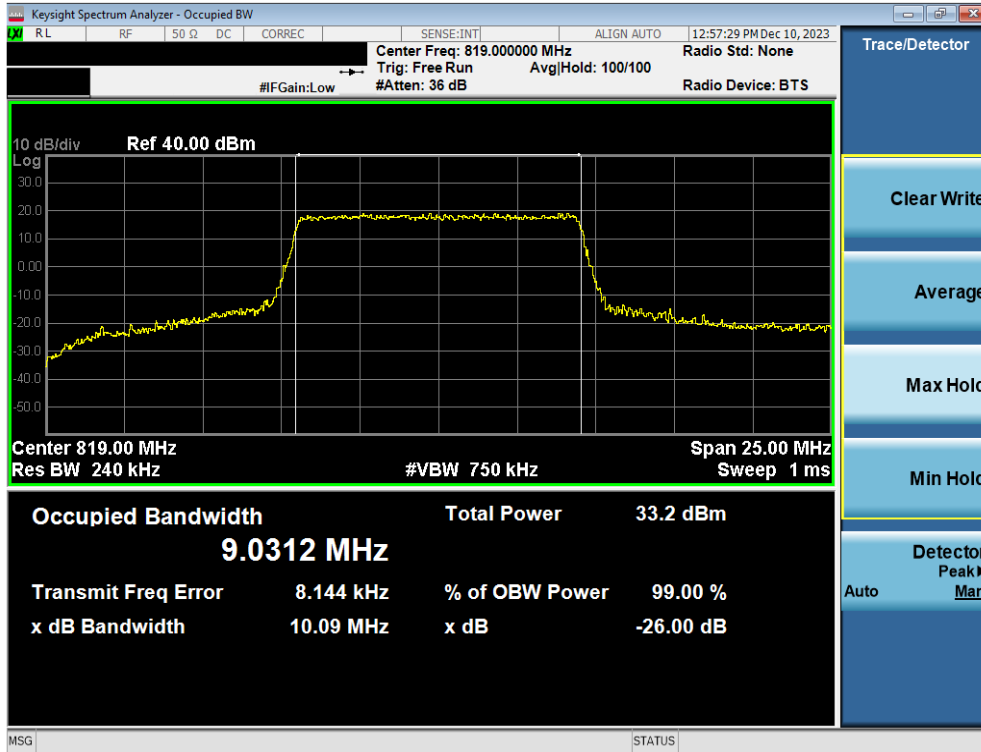


Plot 7-11. Occupied Bandwidth Plot (LTE Band 26 - 5MHz 64-QAM - Full RB)

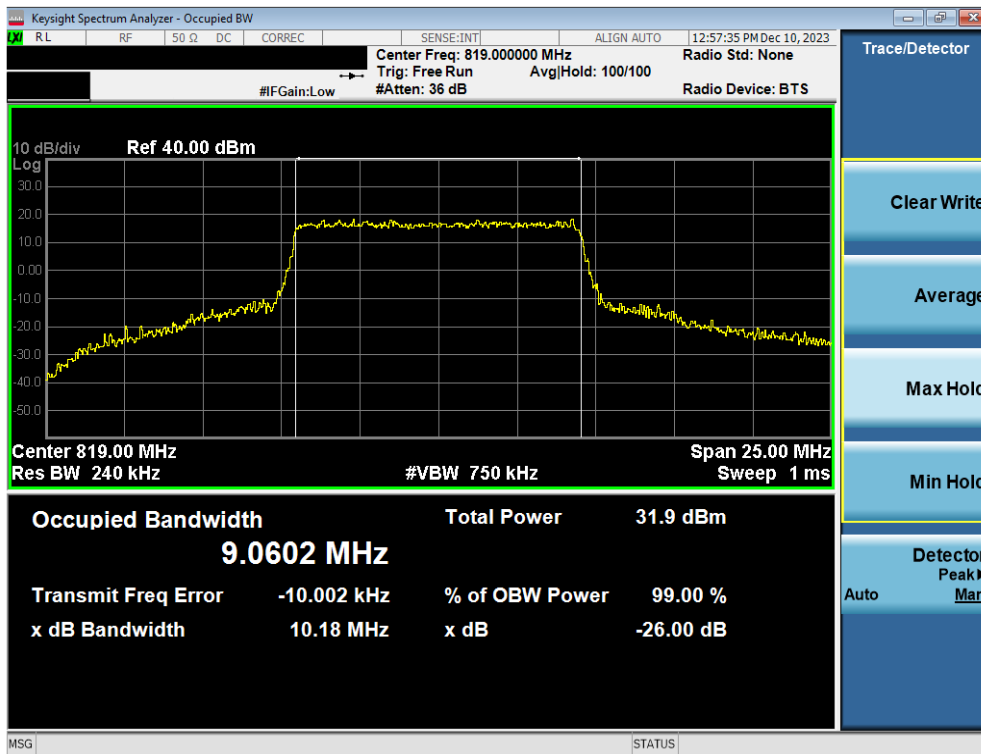


Plot 7-12. Occupied Bandwidth Plot (LTE Band 26 - 5MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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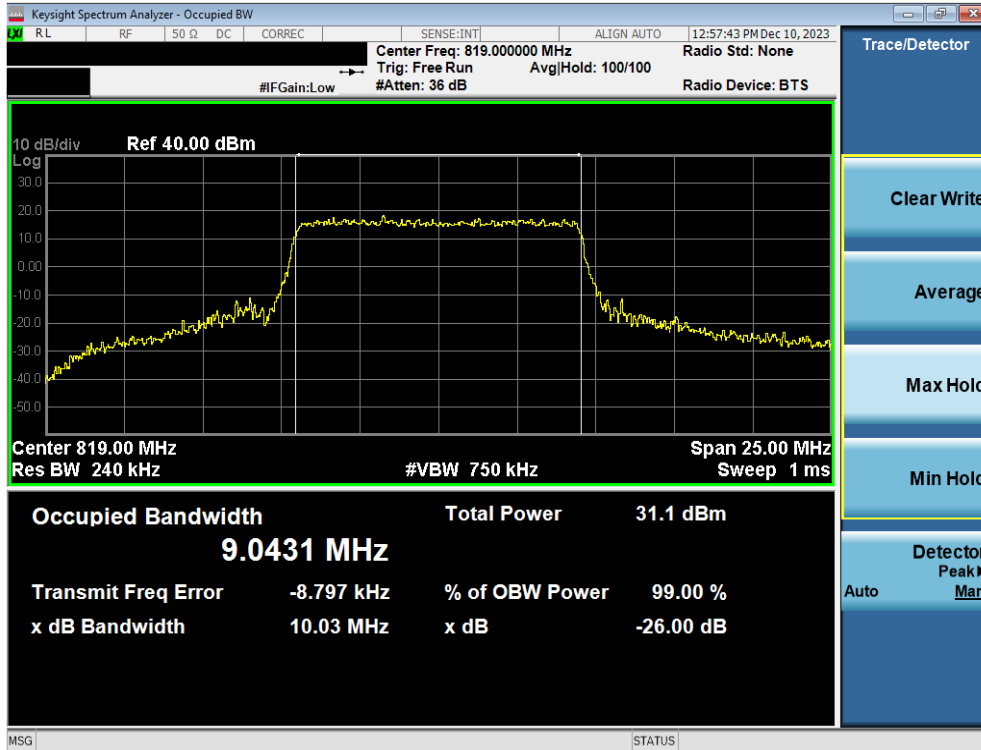


Plot 7-13. Occupied Bandwidth Plot (LTE Band 26 - 10MHz QPSK - Full RB)

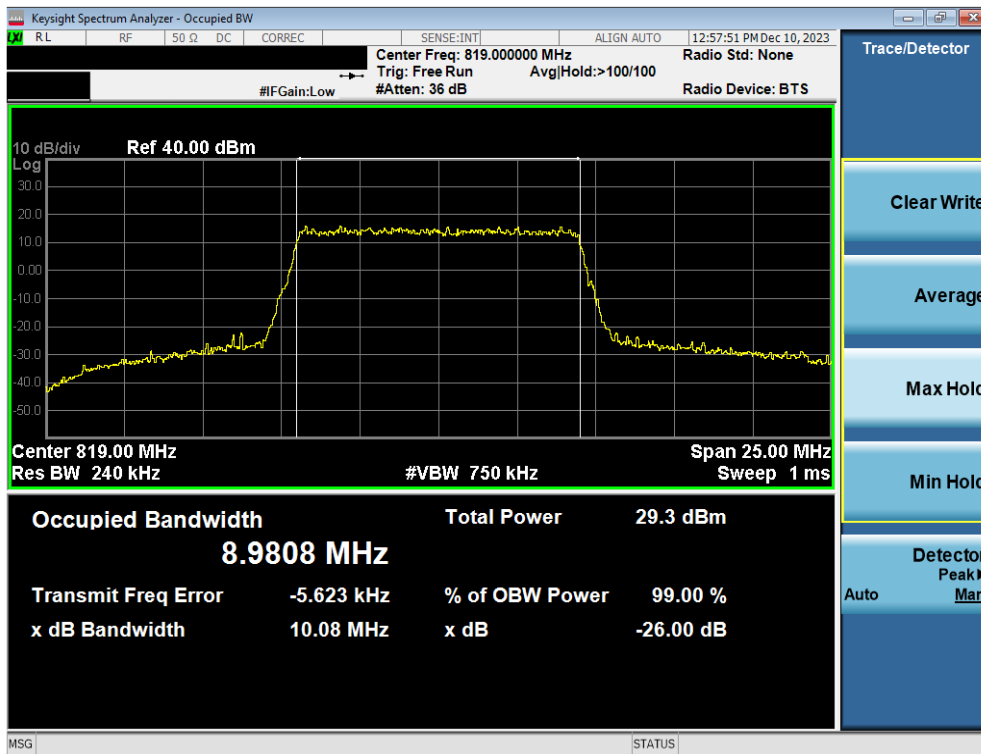


Plot 7-14. Occupied Bandwidth Plot (LTE Band 26 - 10MHz 16-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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Plot 7-15. Occupied Bandwidth Plot (LTE Band 26 - 10MHz 64-QAM - Full RB)



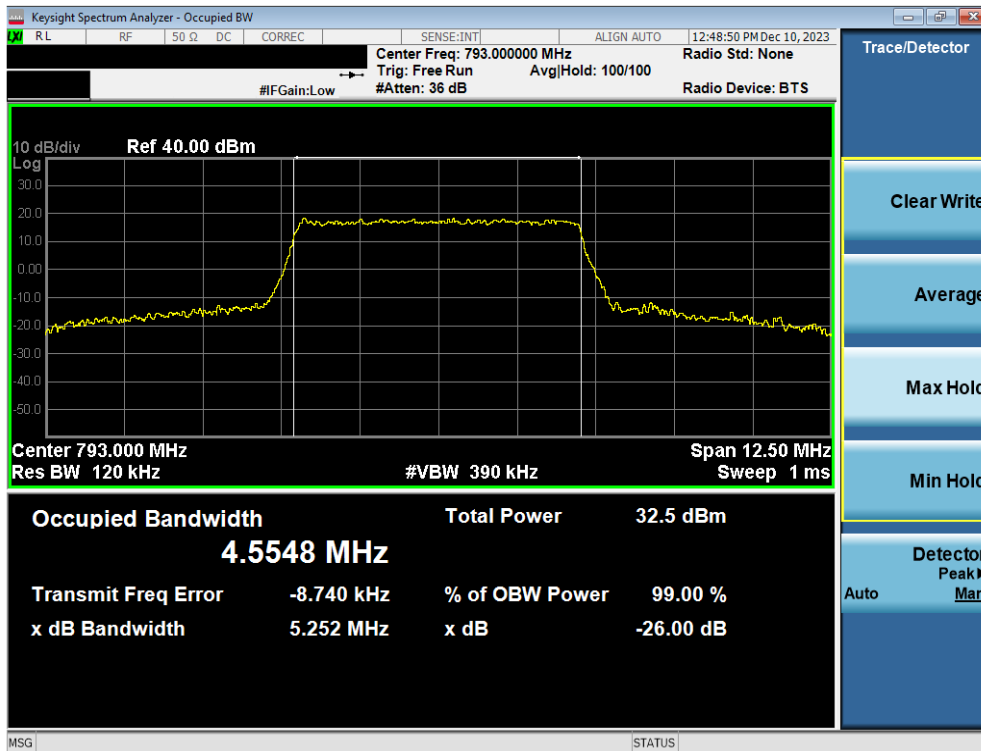
Plot 7-16. Occupied Bandwidth Plot (LTE Band 26 - 10MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	Page 22 of 101
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### LTE Band 14

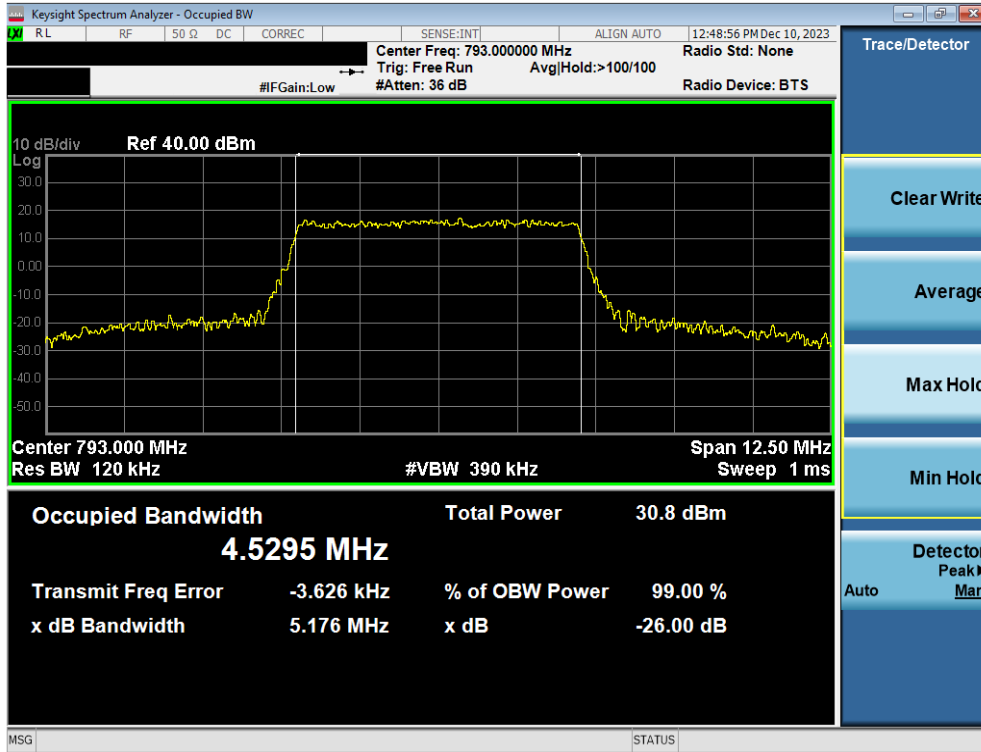


Plot 7-17. Occupied Bandwidth Plot (LTE Band 14 - 5MHz QPSK - Full RB)

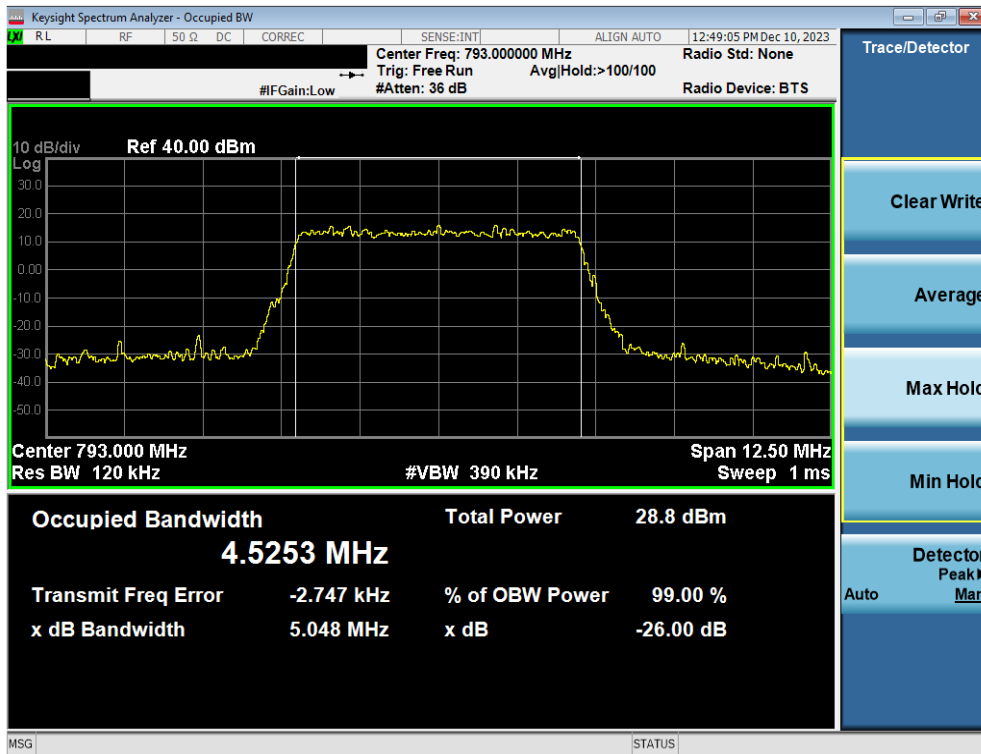


Plot 7-18. Occupied Bandwidth Plot (LTE Band 14 - 5MHz 16-QAM - Full RB)

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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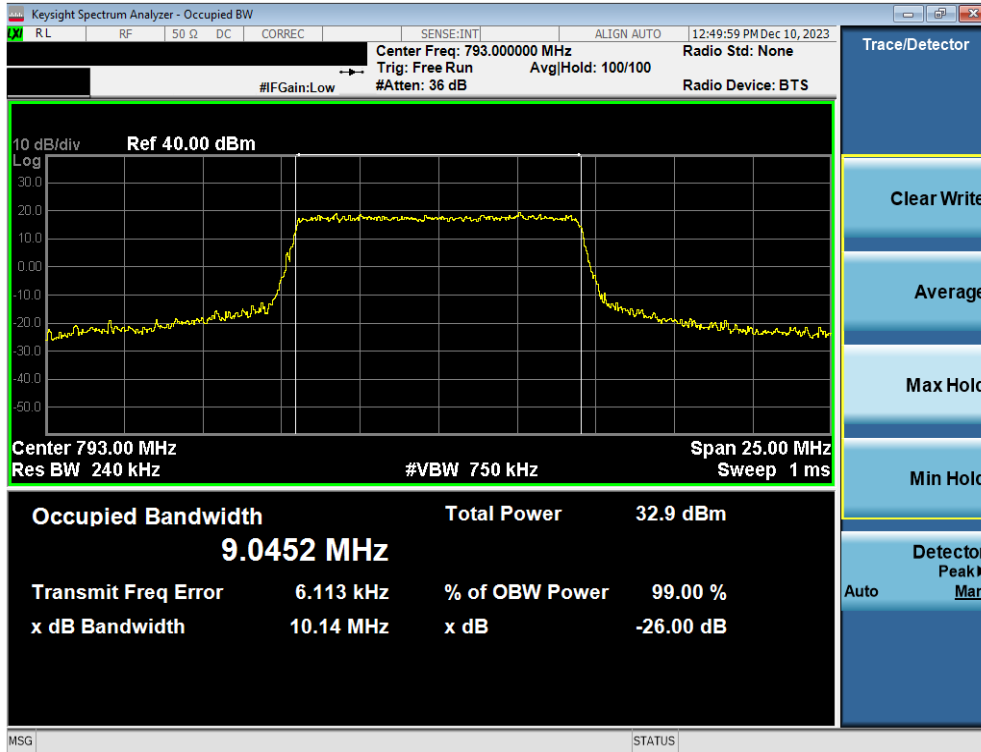
Plot 7-19. Occupied Bandwidth Plot (LTE Band 14 - 5MHz 64-QAM - Full RB)



Plot 7-20. Occupied Bandwidth Plot (LTE Band 14 - 5MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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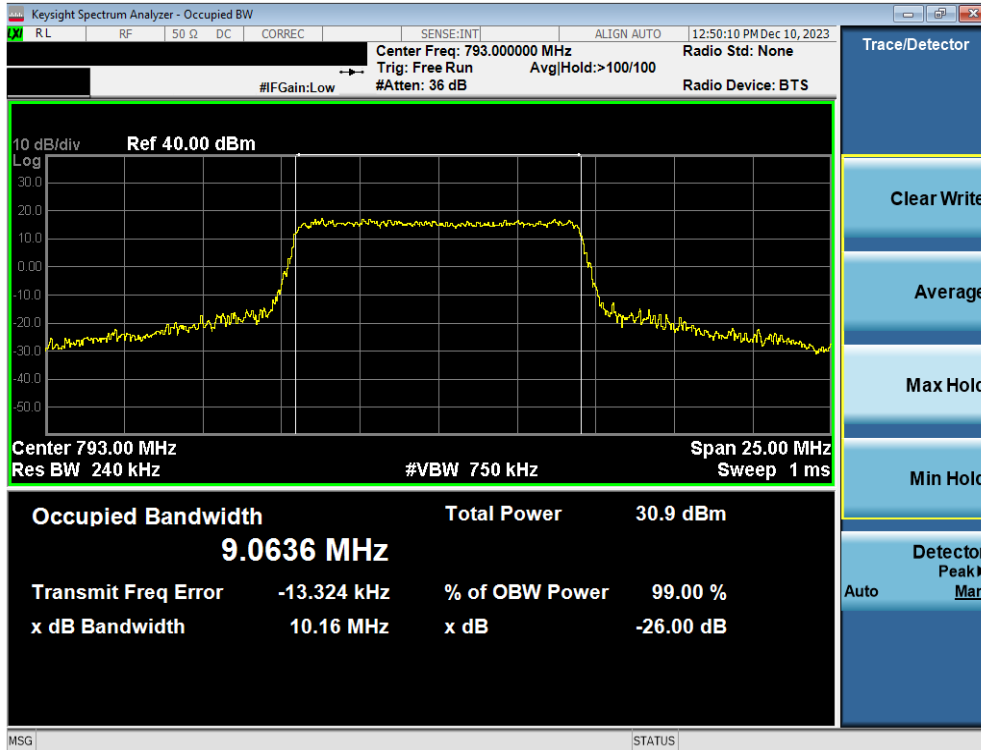


Plot 7-21. Occupied Bandwidth Plot (LTE Band 14 - 10MHz QPSK - Full RB)

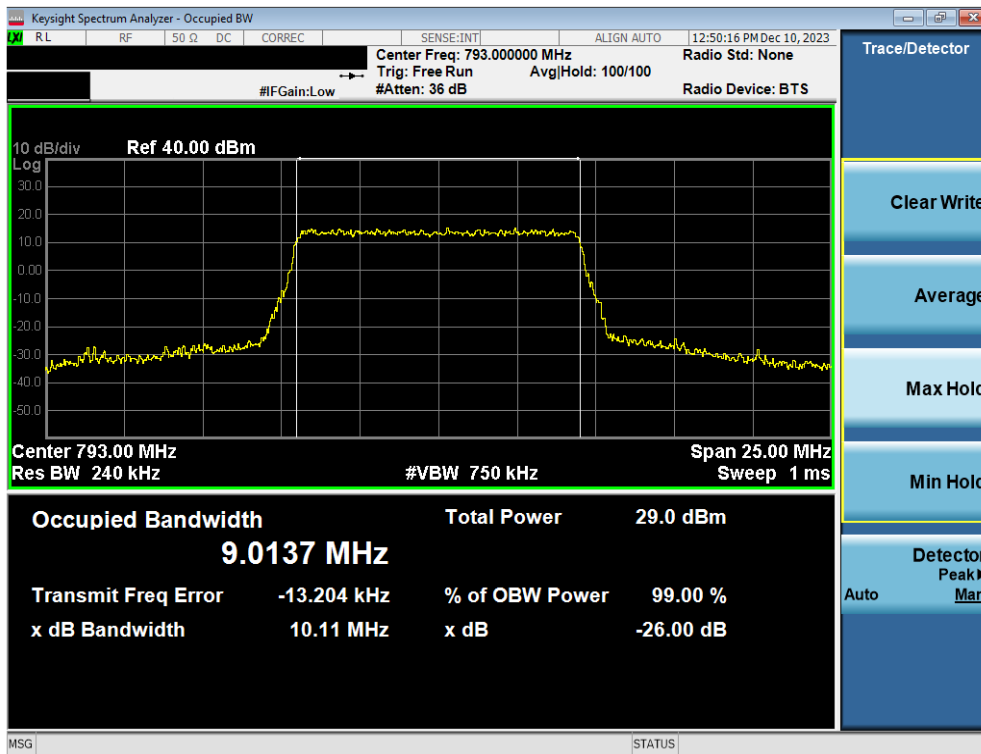


Plot 7-22. Occupied Bandwidth Plot (LTE Band 14 - 10MHz 16-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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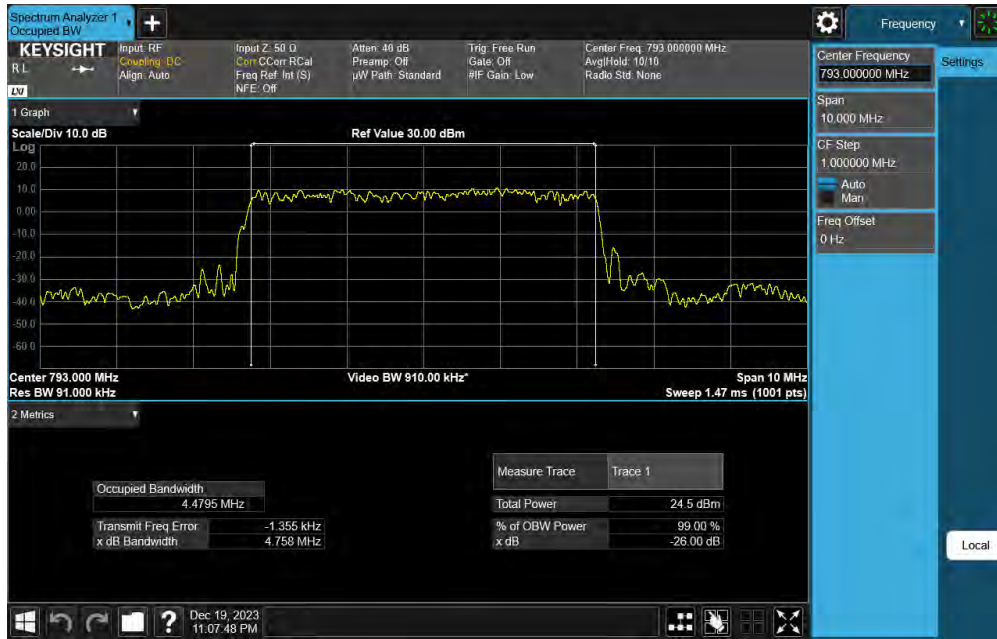
Plot 7-23. Occupied Bandwidth Plot (LTE Band 14 - 10MHz 64-QAM - Full RB)



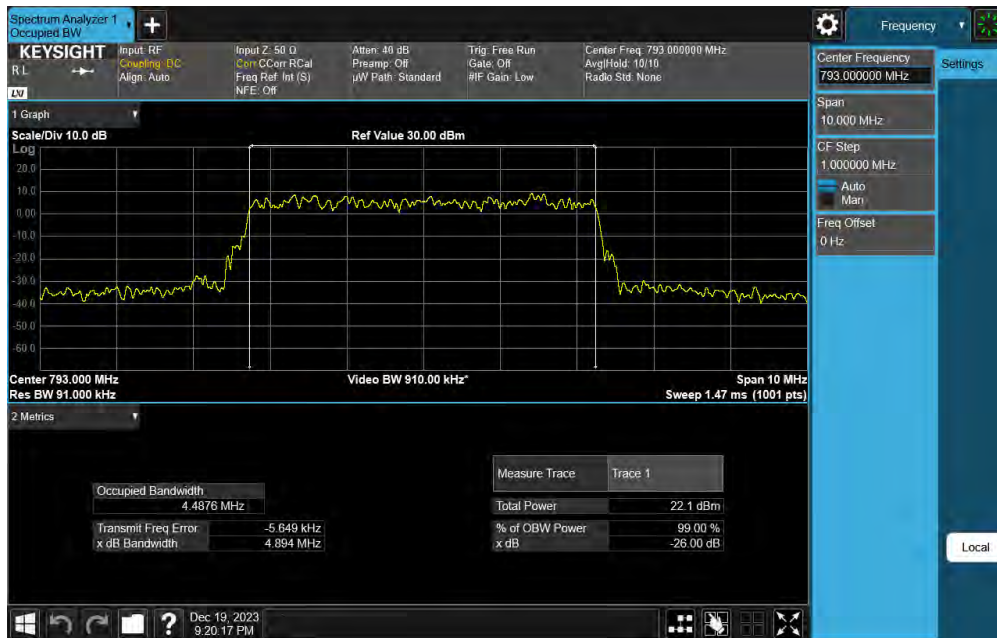
Plot 7-24. Occupied Bandwidth Plot (LTE Band 14 - 10MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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### NR Band n14

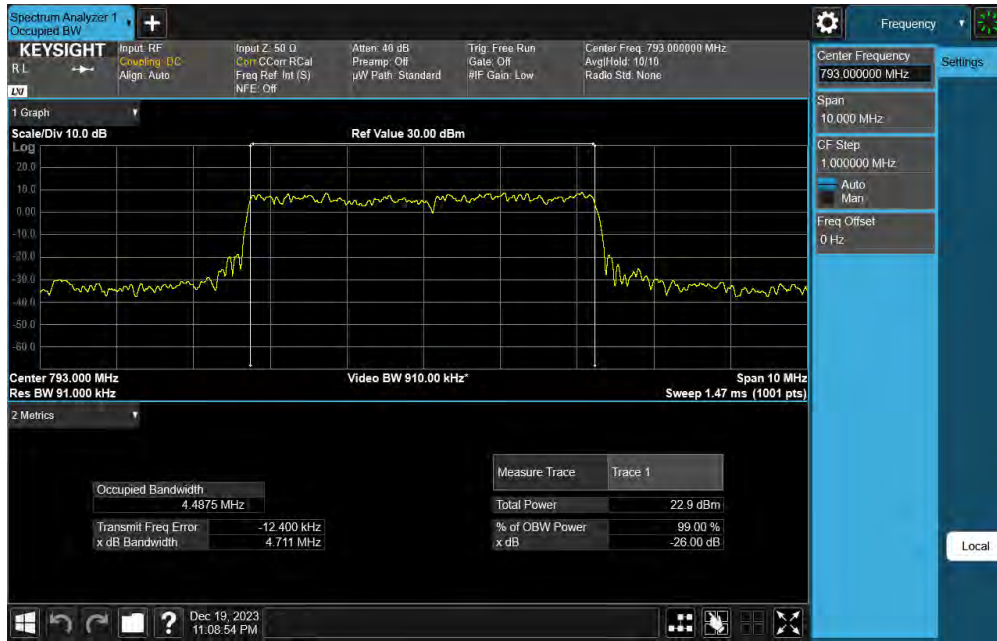


Plot 7-25. Occupied Bandwidth Plot (NR Band 14 - 5MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)



Plot 7-26. Occupied Bandwidth Plot (NR Band 14 - 5MHz CP-OFDM QPSK - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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Plot 7-27. Occupied Bandwidth Plot (NR Band 14 - 5MHz DFT-s-OFDM 16-QAM - Full RB)



Plot 7-28. Occupied Bandwidth Plot (NR Band 14 - 5MHz DFT-s-OFDM 64-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	Page 28 of 101
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Plot 7-29. Occupied Bandwidth Plot (NR Band 14 - 5MHz CP-OFDM 256-QAM - Full RB)



Plot 7-30. Occupied Bandwidth Plot (NR Band 14 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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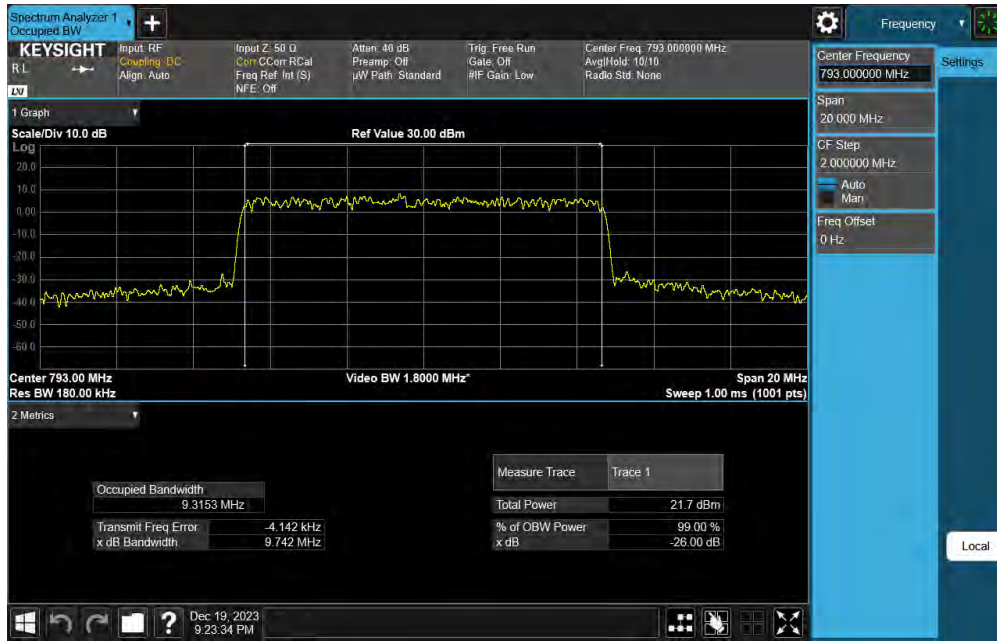


Plot 7-31. Occupied Bandwidth Plot (NR Band 14 - 10MHz CP-OFDM QPSK - Full RB)



Plot 7-32. Occupied Bandwidth Plot (NR Band 14 - 10MHz CP-OFDM 16-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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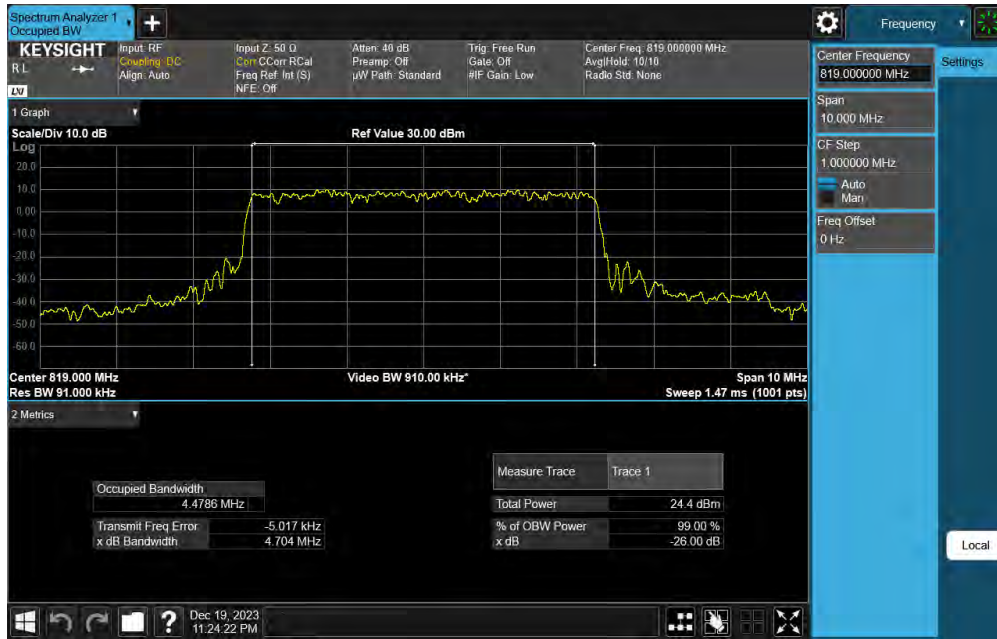
**Plot 7-33. Occupied Bandwidth Plot (NR Band 14 - 10MHz CP-OFDM 64-QAM - Full RB)**



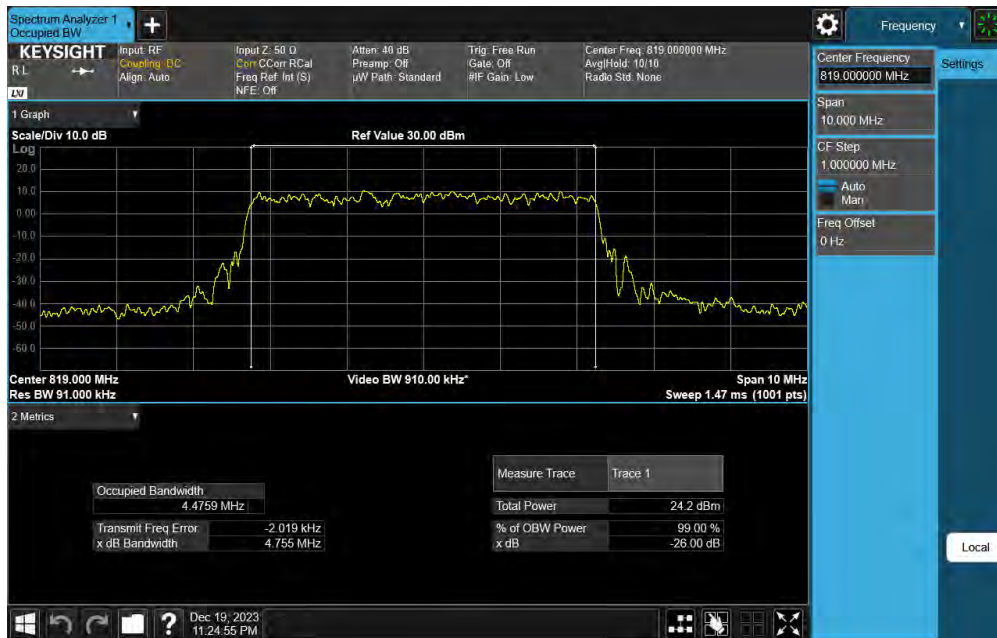
**Plot 7-34. Occupied Bandwidth Plot (NR Band 14 - 10MHz CP-OFDM 256-QAM - Full RB)**

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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NR Band n26



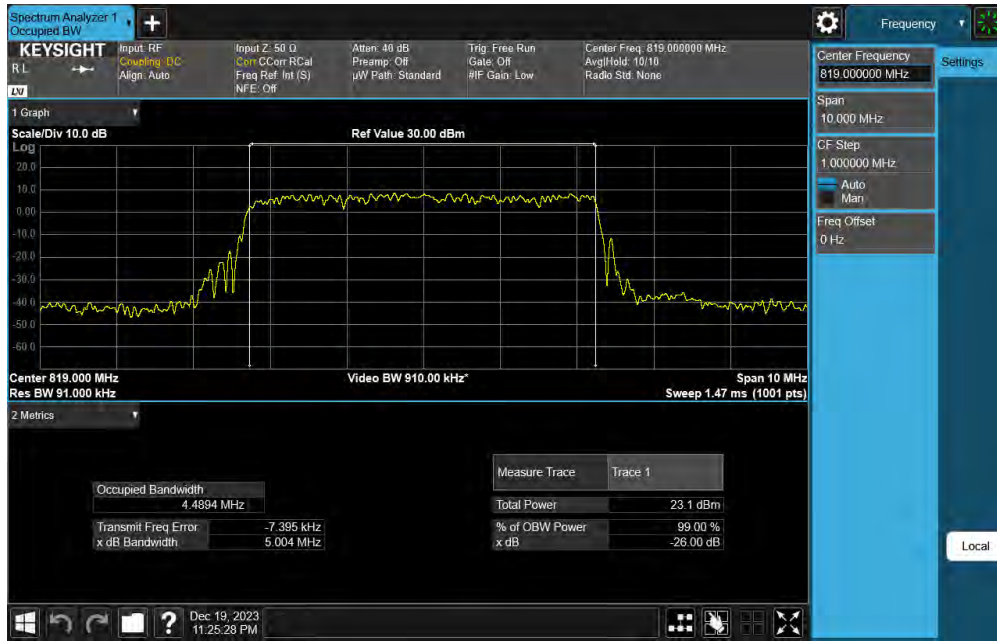
Plot 7-35. Occupied Bandwidth Plot (NR Band 26 - 5MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)



Plot 7-36. Occupied Bandwidth Plot (NR Band 26 - 5MHz DFT-s-OFDM QPSK - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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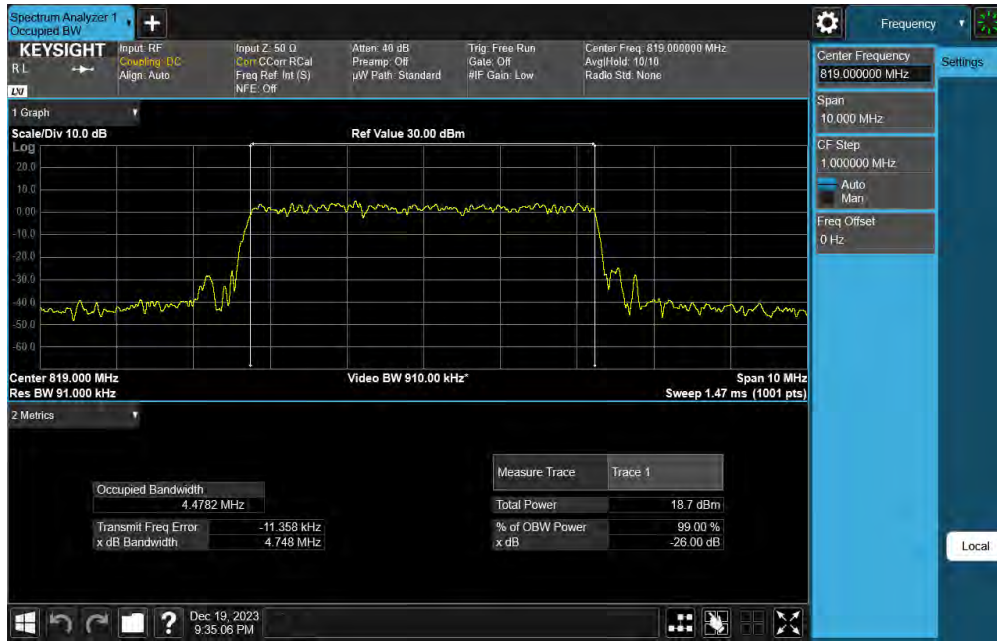


**Plot 7-37. Occupied Bandwidth Plot (NR Band 26 - 5MHz DFT-s-OFDM 16-QAM - Full RB)**



**Plot 7-38. Occupied Bandwidth Plot (NR Band 26 - 5MHz CP-OFDM 64-QAM - Full RB)**

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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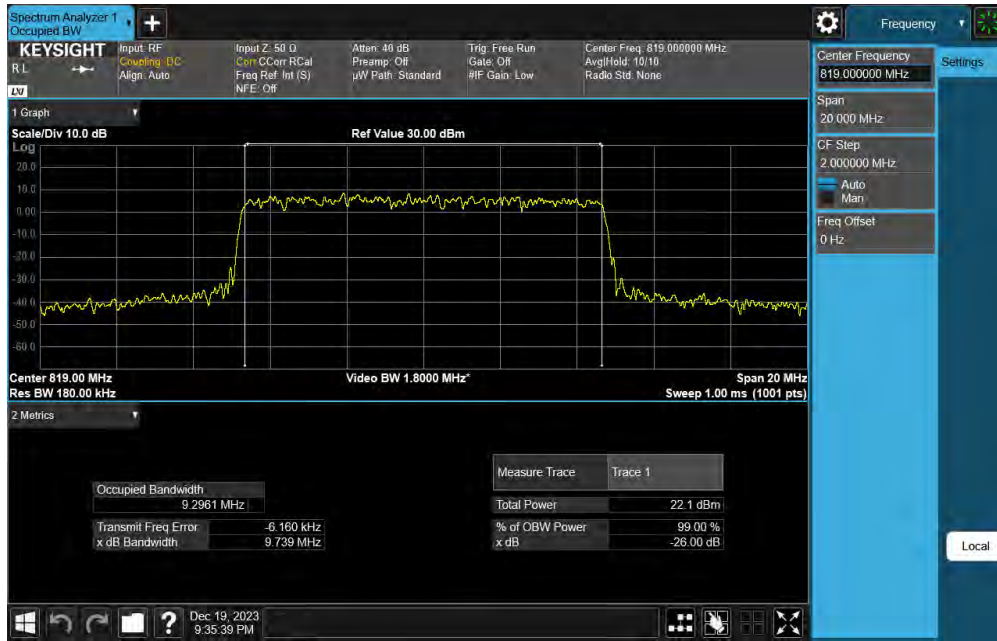


**Plot 7-39. Occupied Bandwidth Plot (NR Band 26 - 5MHz CP-OFDM 256-QAM - Full RB)**



**Plot 7-40. Occupied Bandwidth Plot (NR Band 26 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)**

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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**Plot 7-41. Occupied Bandwidth Plot (NR Band 26 - 10MHz CP-OFDM QPSK - Full RB)**



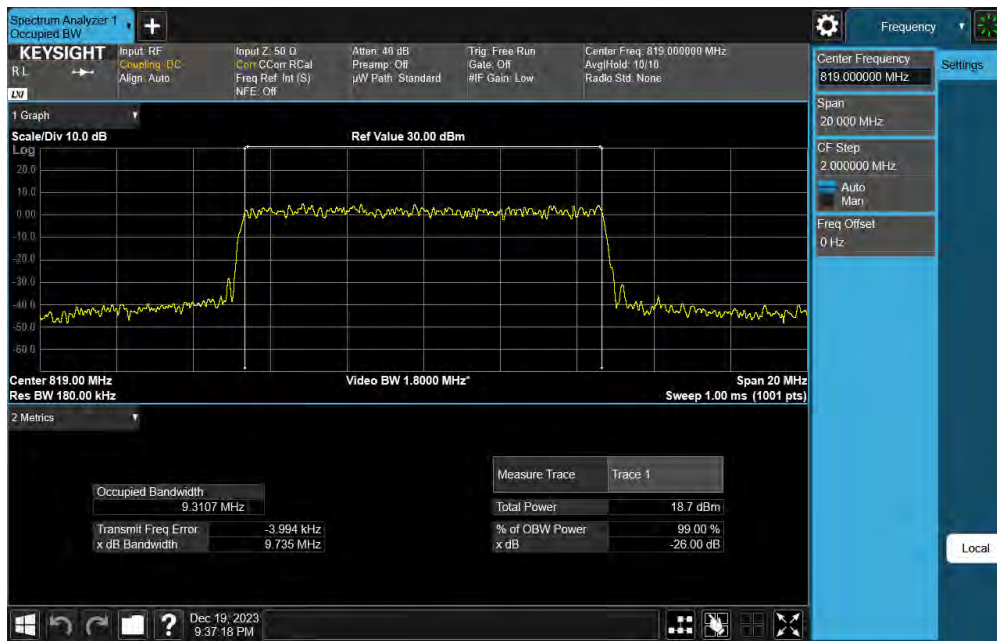
**Plot 7-42. Occupied Bandwidth Plot (NR Band 26 - 10MHz CP-OFDM 16-QAM - Full RB)**

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	Page 35 of 101
	EUT Type: Tablet Device	





Plot 7-43. Occupied Bandwidth Plot (NR Band 26 - 10MHz CP-OFDM 64-QAM - Full RB)



Plot 7-44. Occupied Bandwidth Plot (NR Band 26 - 10MHz CP-OFDM 256-QAM - Full RB)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-14.BCG	Test Dates: 10/01/2023 - 3/25/2024	EUT Type: Tablet Device
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### 7.3 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051 §90.691(a) §90.543(e)

#### Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. 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 maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation and all ports were investigated and the worst case configuration results are reported in this section.

**The minimum permissible attenuation level of any spurious emission is  $43 + 10 \log_{10}(P_{[Watts]})$ , where P is the transmitter power in Watts.**

#### Test Procedure Used

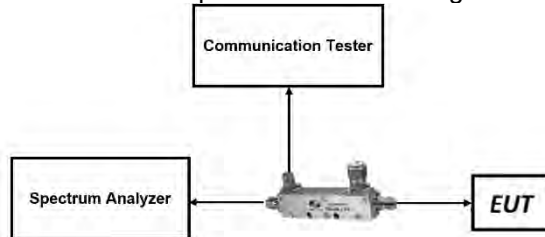
KDB 971168 D01 v03r01 – Section 6.0

#### Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 10GHz (separated into at least two plots per channel)
2. RBW  $\geq$  100kHz
3. VBW  $\geq$  3 x RBW
4. Detector = RMS
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

#### Test Setup


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



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

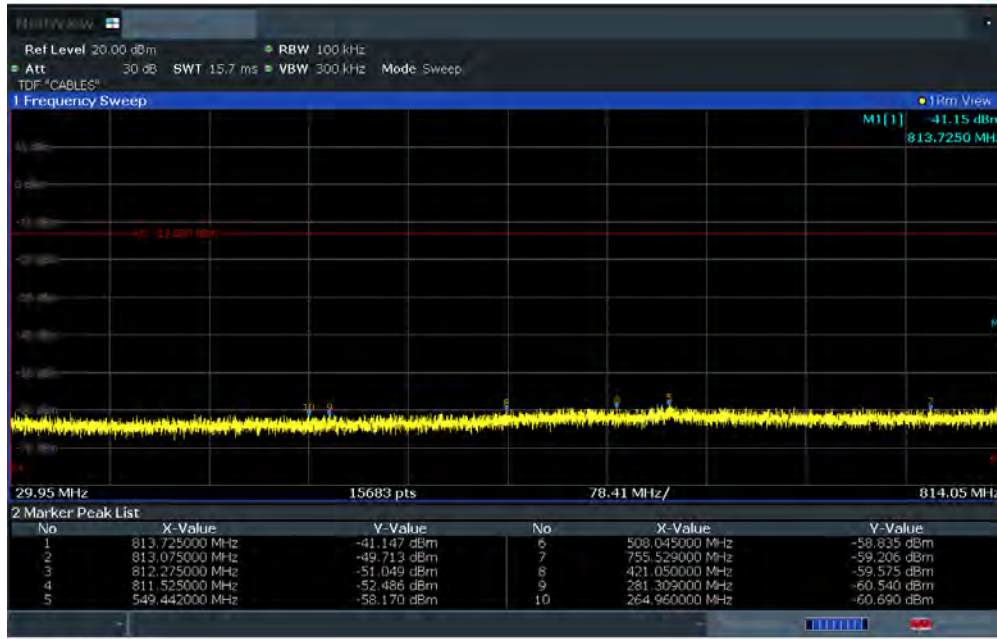
#### Test Notes

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for Part 90. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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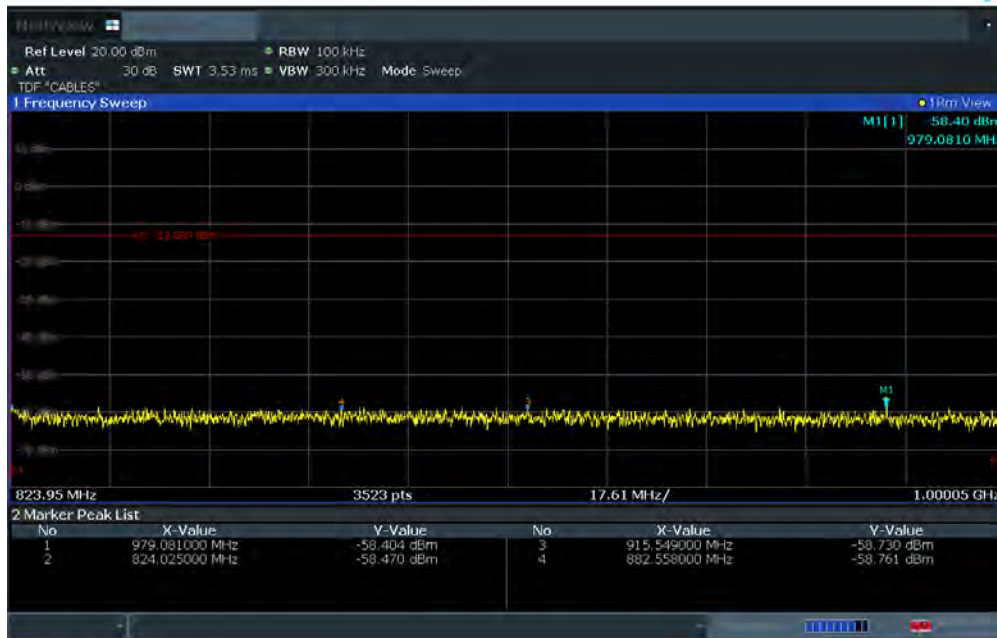
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# LTE Band 26



18:50:58 02.01.2024

Plot 7-45. Conducted Spurious Plot (LTE Band 26 - 5MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

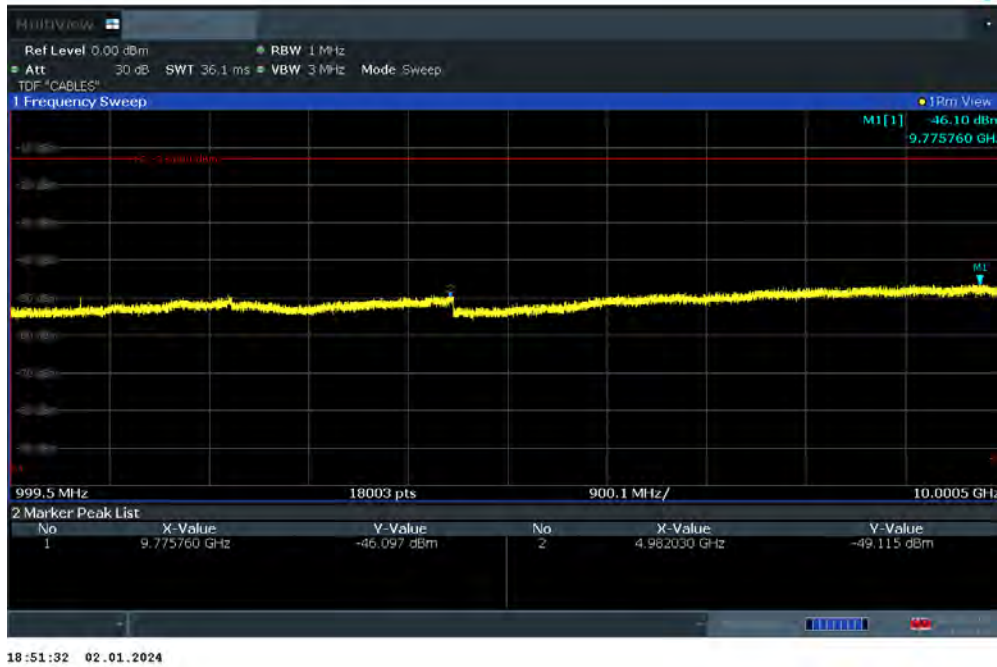


18:51:15 02.01.2024

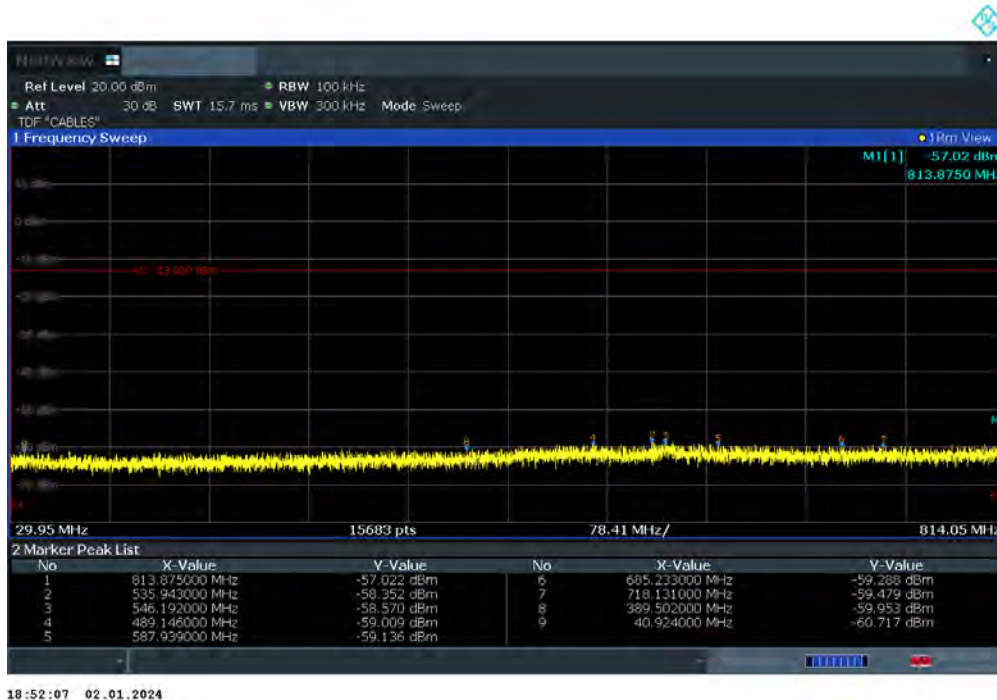
Plot 7-46. Conducted Spurious Plot (LTE Band 26 - 5MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

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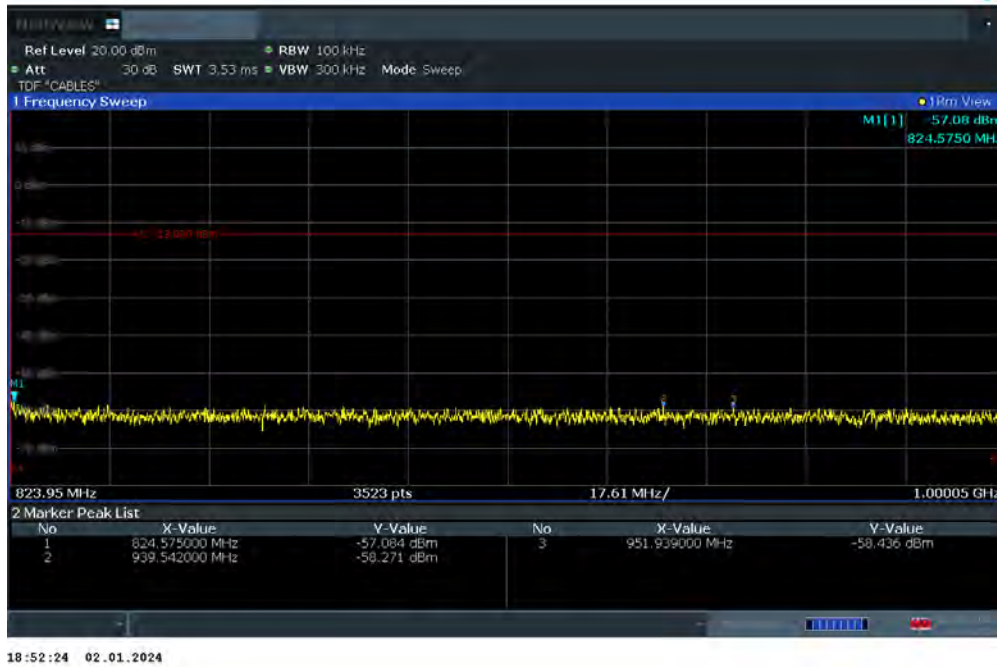
Plot 7-47. Conducted Spurious Plot (LTE Band 26 - 5MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



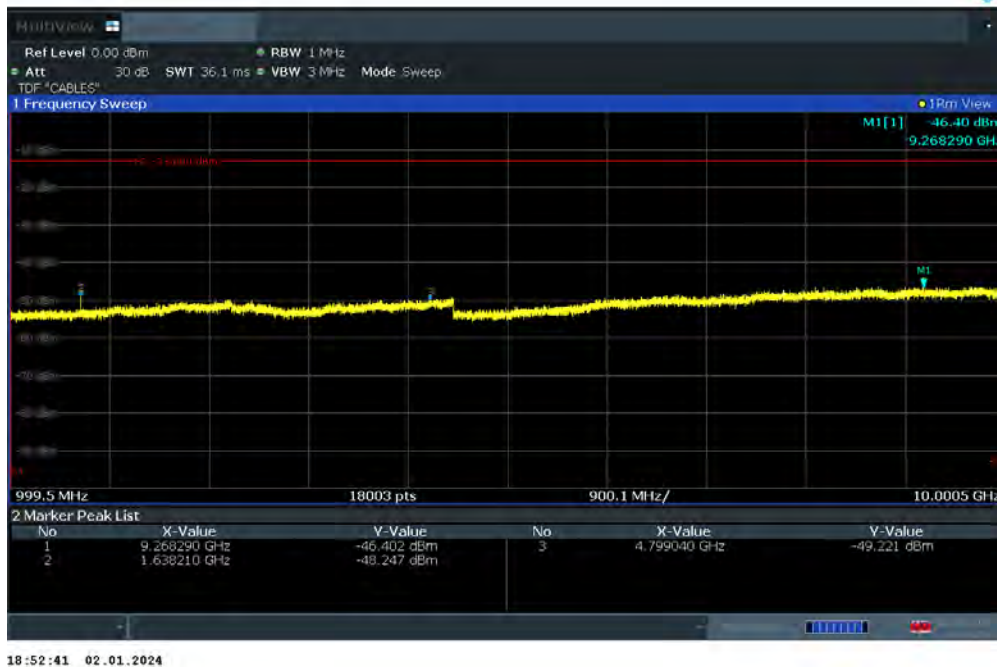
Plot 7-48. Conducted Spurious Plot (LTE Band 26 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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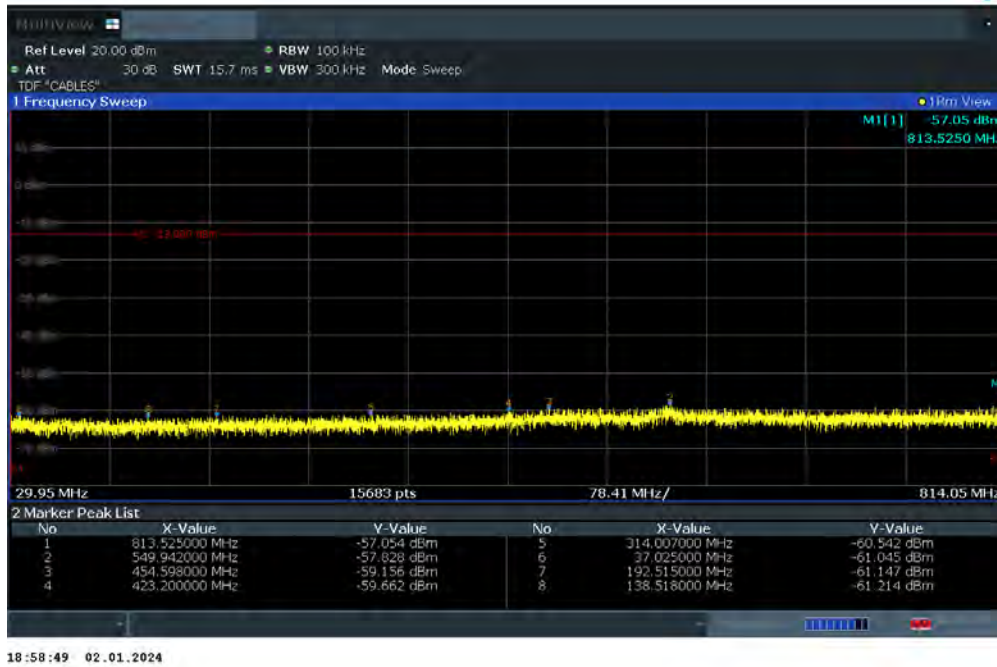
Plot 7-49. Conducted Spurious Plot (LTE Band 26 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 7-50. Conducted Spurious Plot (LTE Band 26 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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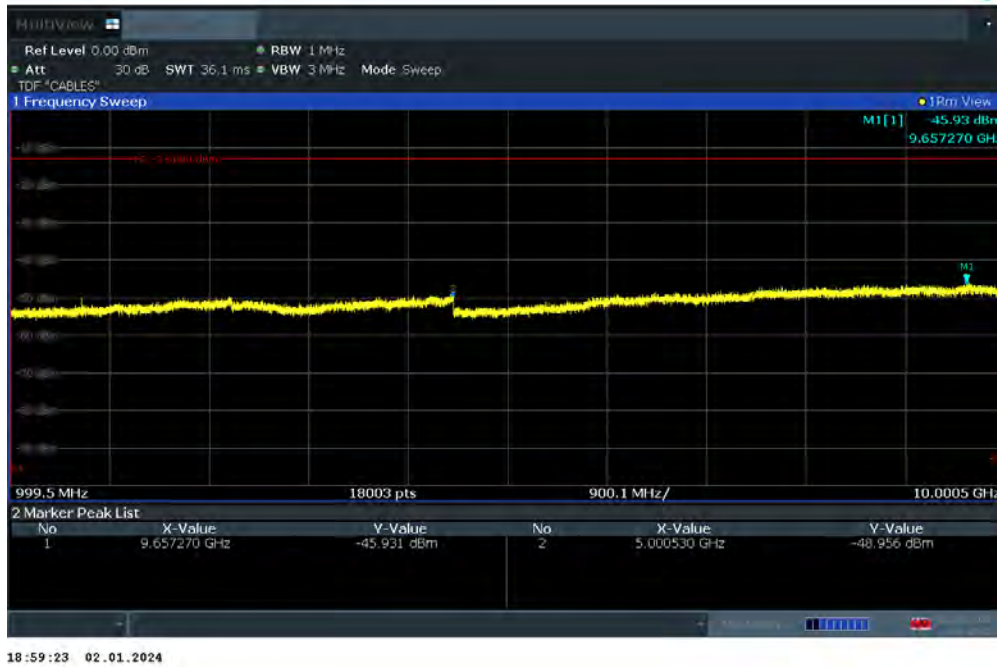


Plot 7-51. Conducted Spurious Plot (LTE Band 26 - 5MHz QPSK - RB Size 1, RB Offset 0 - High Channel)




Plot 7-52. Conducted Spurious Plot (LTE Band 26 - 5MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

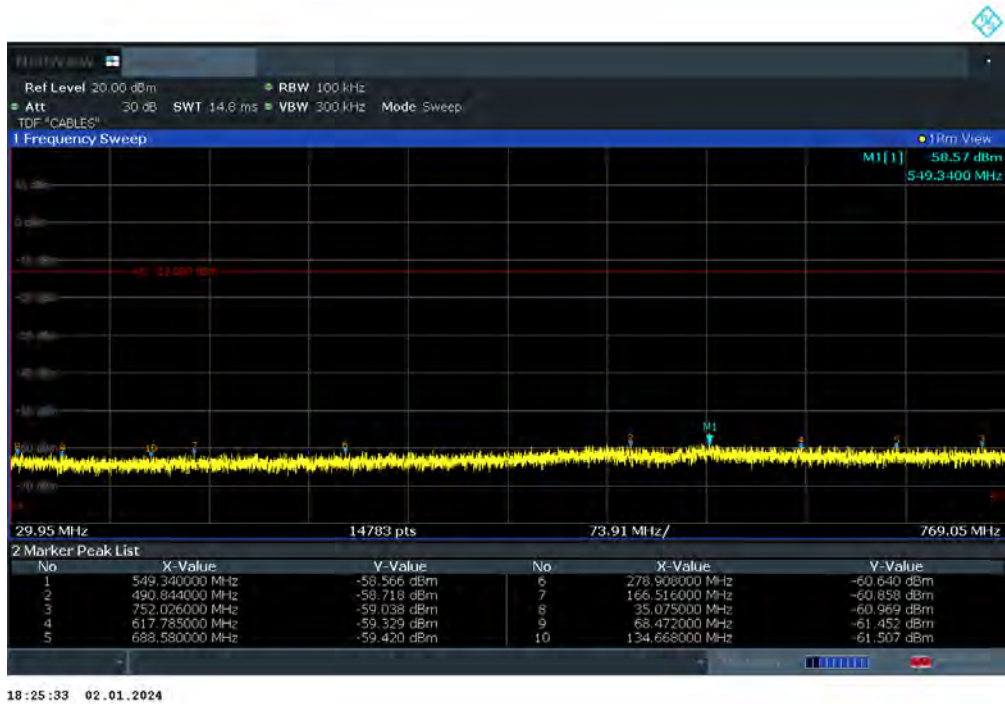
FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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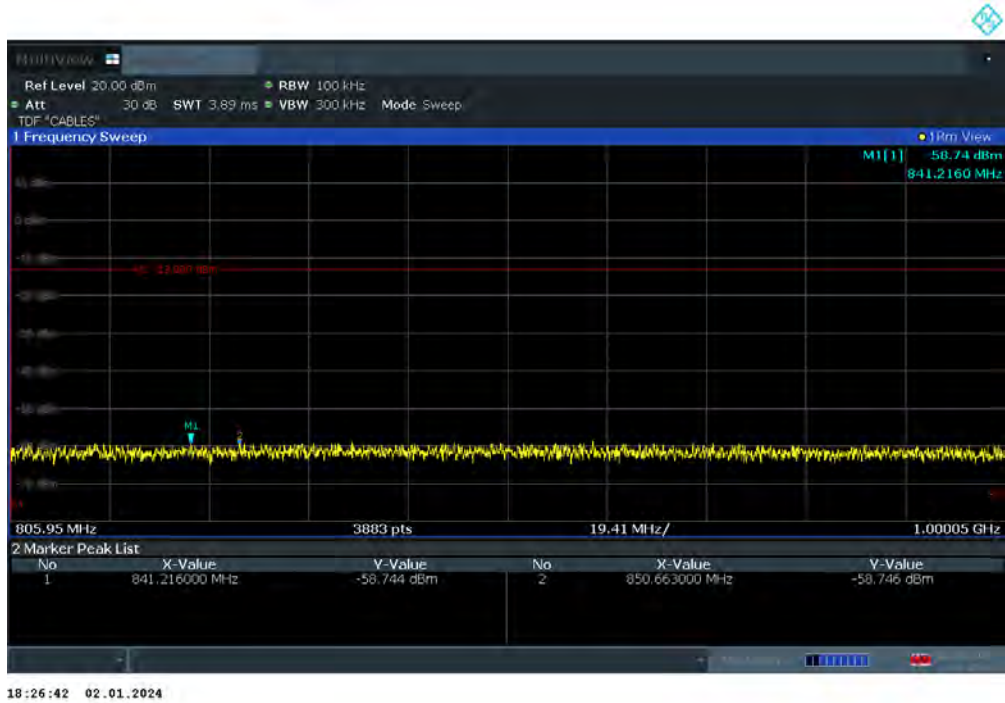
Plot 7-53. Conducted Spurious Plot (LTE Band 26 - 5MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCGA2899	 <b>PART 90 MEASUREMENT REPORT</b>		Approved by: Technical Manager
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# LTE Band 14

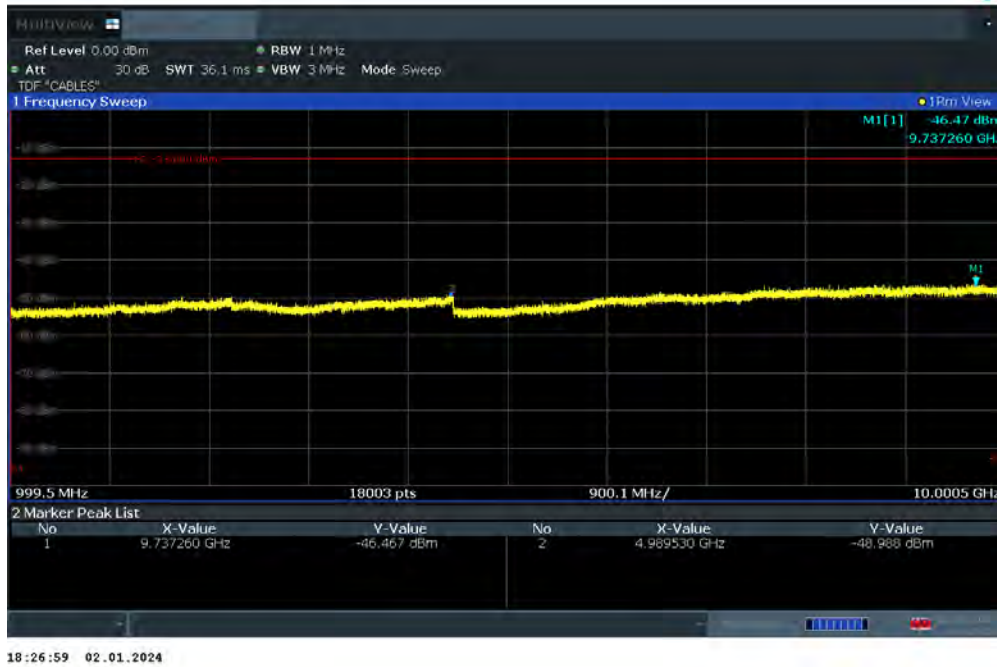


Plot 7-54. Conducted Spurious Plot (LTE Band 14 - 5MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

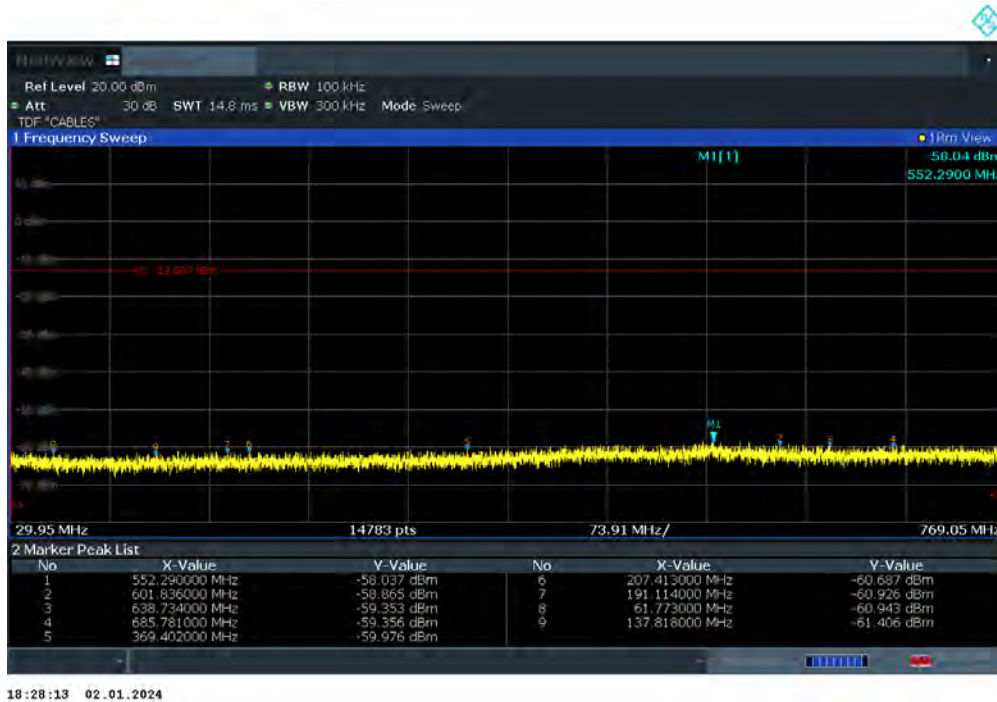


Plot 7-55. Conducted Spurious Plot (LTE Band 14 - 5MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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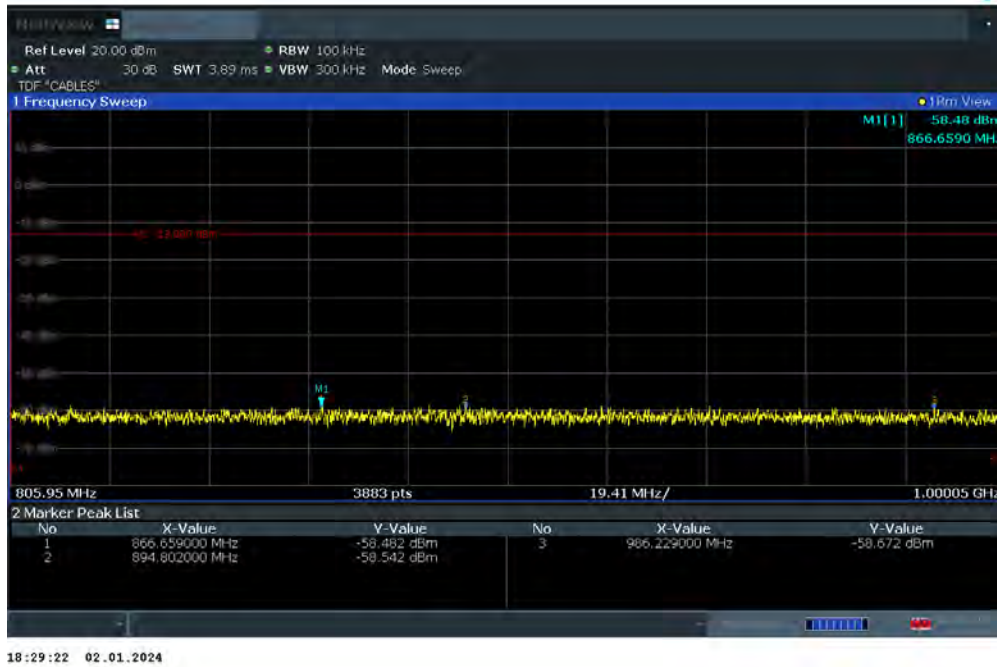
Plot 7-56. Conducted Spurious Plot (LTE Band 14 - 5MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



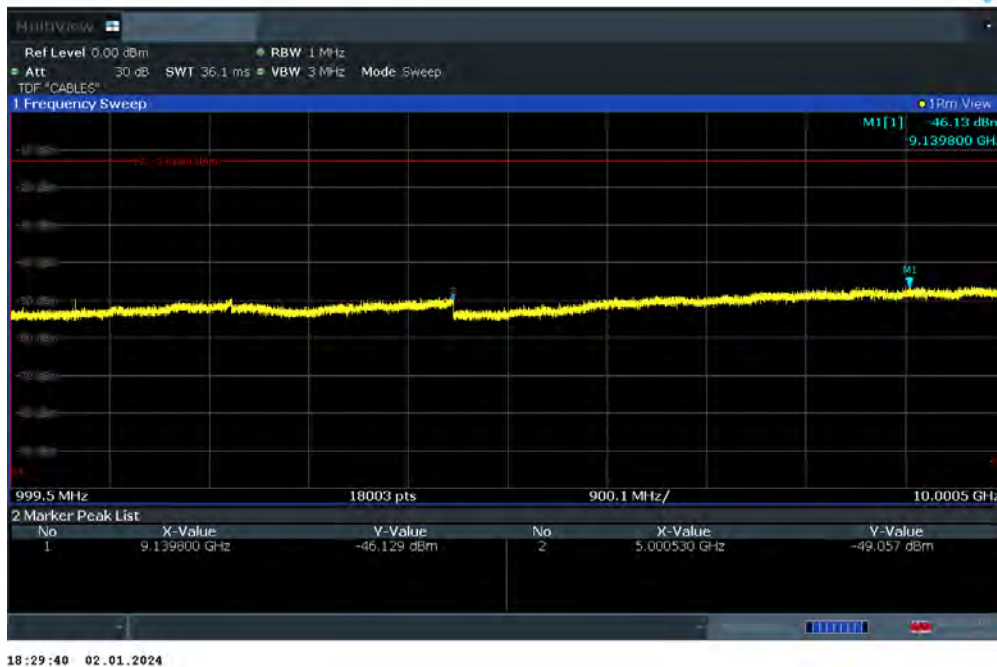
Plot 7-57. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-58. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

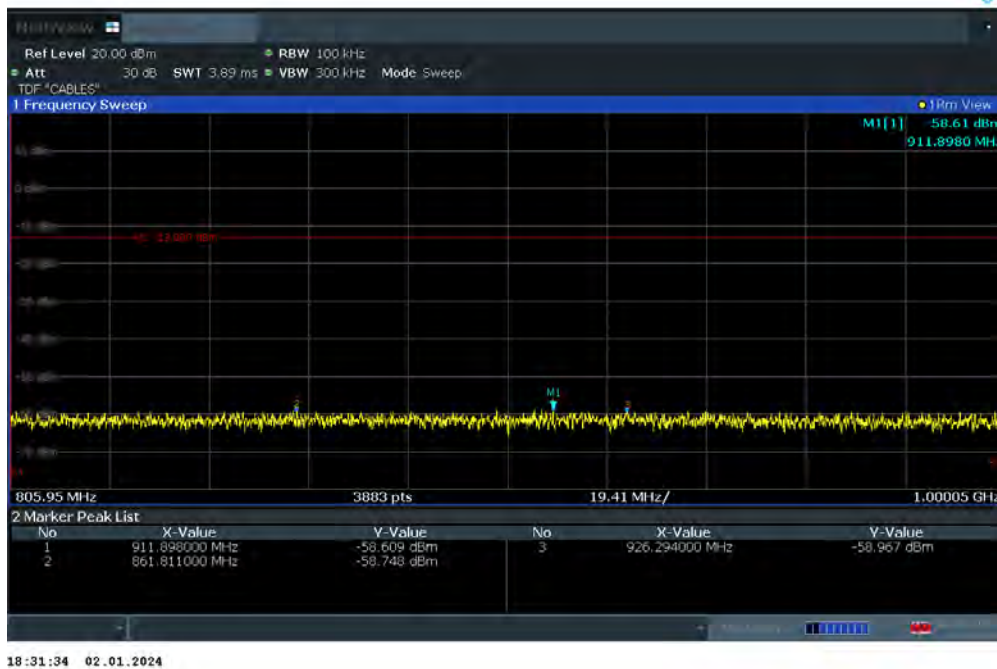


Plot 7-59. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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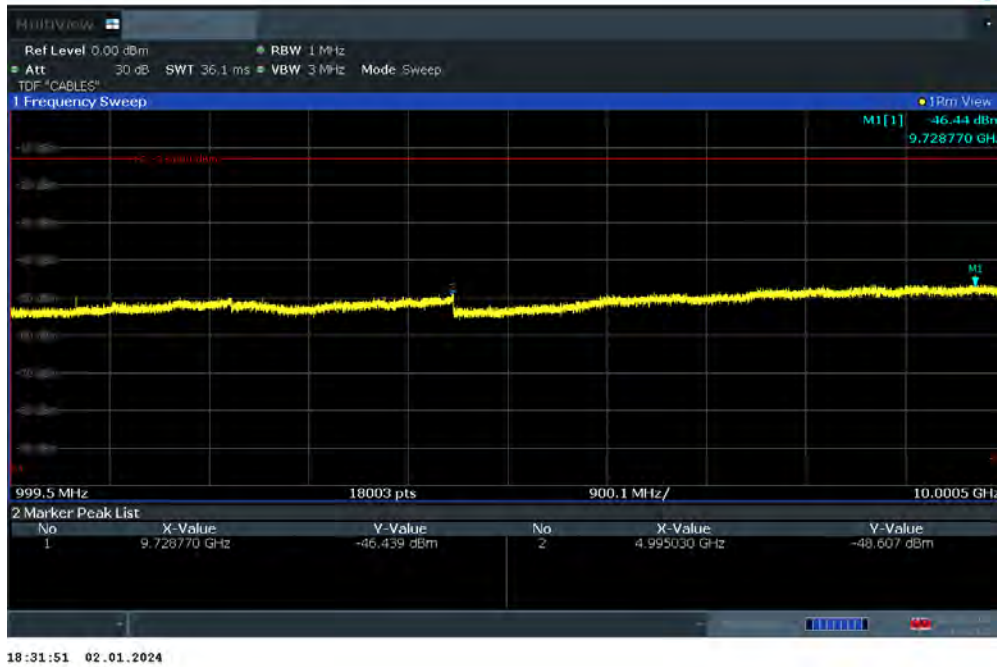
Plot 7-60. Conducted Spurious Plot (LTE Band 14 - 5MHz QPSK - RB Size 1, RB Offset 0 - High Channel)




Plot 7-61. Conducted Spurious Plot (LTE Band 14 - 5MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

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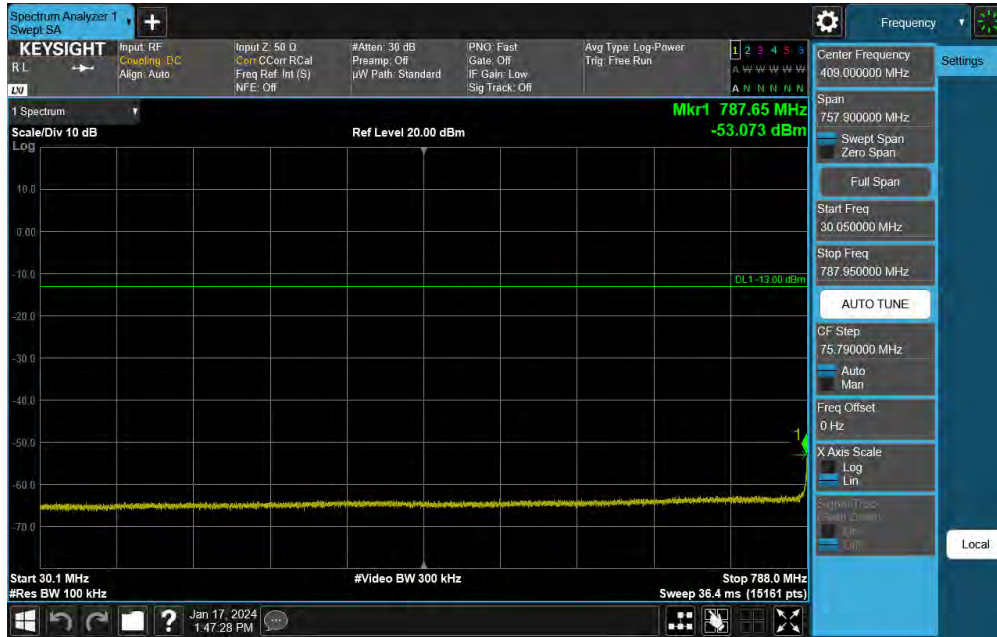




Plot 7-62. Conducted Spurious Plot (LTE Band 14 - 5MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCGA2899	 <b>PART 90 MEASUREMENT REPORT</b>		Approved by: Technical Manager
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## NR Band 14



Plot 7-63. Conducted Spurious Plot (NR Band 14 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-64. Conducted Spurious Plot (NR Band 14 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Low Channel)


FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-65. Conducted Spurious Plot (NR Band 14 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-66. Conducted Spurious Plot (NR Band 14 - 10MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Mid Channel)


FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-67. Conducted Spurious Plot (NR Band 14 - 10MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 7-68. Conducted Spurious Plot (NR Band 14 - 10MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Mid Channel)

<b>FCC ID:</b> BCGA2899	 <b>PART 90 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
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Plot 7-69. Conducted Spurious Plot (NR Band 14 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-70. Conducted Spurious Plot (NR Band 14 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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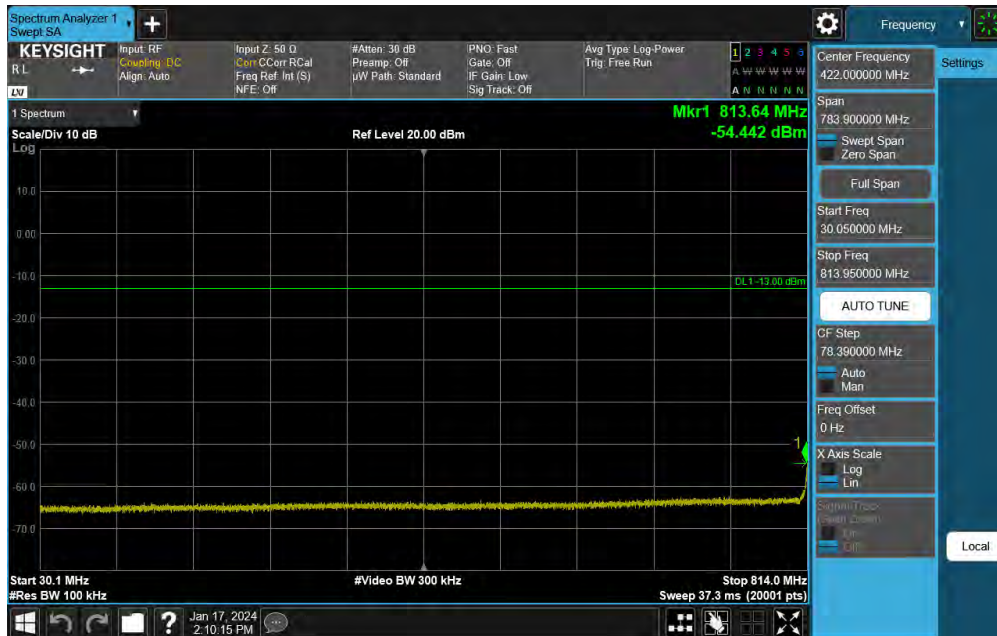


Plot 7-71. Conducted Spurious Plot (NR Band 14 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - High Channel)

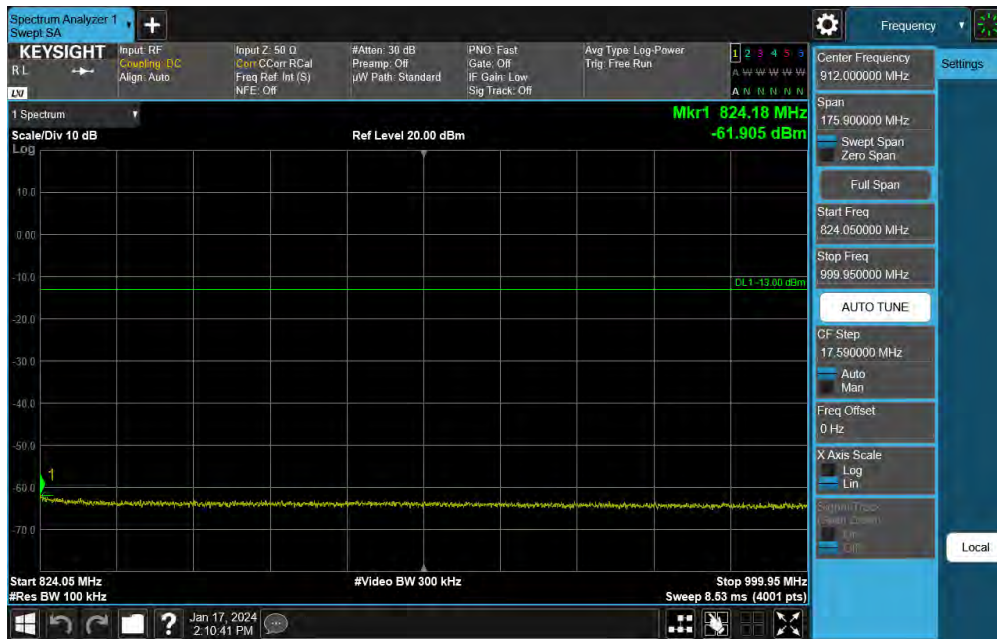
FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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## NR Band 26



Plot 7-72. Conducted Spurious Plot (NR Band 26 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-73. Conducted Spurious Plot (NR Band 26 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-74. Conducted Spurious Plot (NR Band 26 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-75. Conducted Spurious Plot (NR Band 26 - 10MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Mid Channel)


FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-76. Conducted Spurious Plot (NR Band 26 - 10MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Mid Channel)



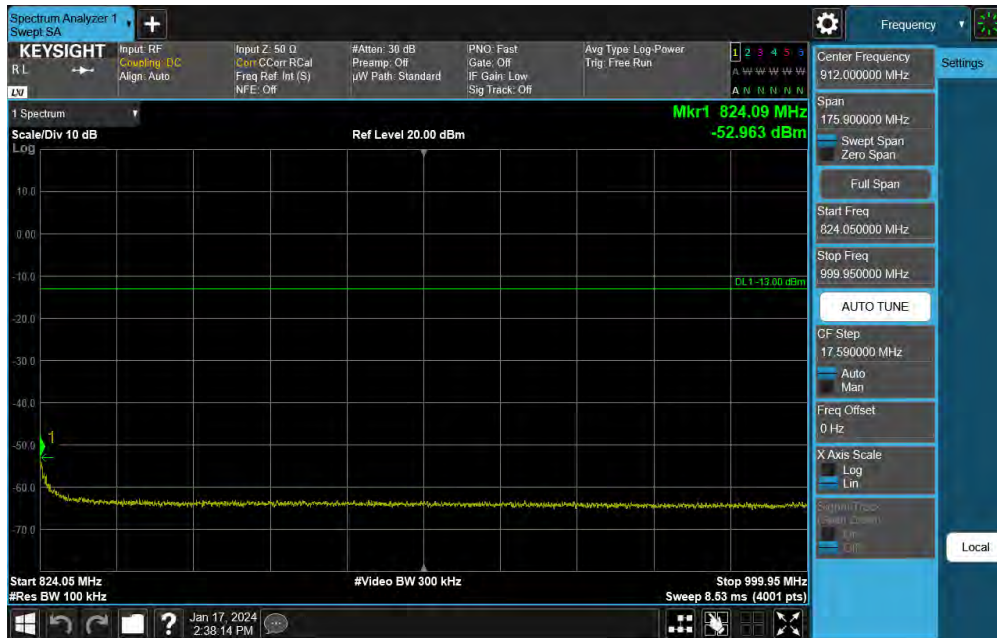
Plot 7-77. Conducted Spurious Plot (NR Band 26 - 10MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-78. Conducted Spurious Plot (NR Band 26 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - High Channel)




Plot 7-79. Conducted Spurious Plot (NR Band 26 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-80. Conducted Spurious Plot (NR Band 26 - 5MHz DFT-s-OFDM QPSK - RB Size 1, RB Offset 0 - High Channel)

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<b>Test Report S/N:</b> 1C2311270066-14.BCG	<b>Test Dates:</b> 10/01/2023 - 3/25/2024	<b>EUT Type:</b> Tablet Device	Page 57 of 101

## 7.4 Band Edge Emissions at Antenna Terminal

§2.1051 §90.691(a) §90.543(e)

### 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 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. All ports were tested and only the worst case data were reported.

***For LTE B26 operation under Part 90.691, the minimum permissible attenuation level of any spurious emission removed from the EA licensee's frequency block by greater than 37.5 kHz is  $43 + 10\log_{10}(P_{[Watts]})$ , where  $P$  is the transmitter power in Watts. The minimum permissible attenuation level of any spurious emission removed from the EA licensee's frequency block by up to and including 37.5 kHz is  $50 + 10\log_{10}(P_{[Watts]})$ , where  $P$  is the transmitter power in Watts.***

### Test Procedure Used

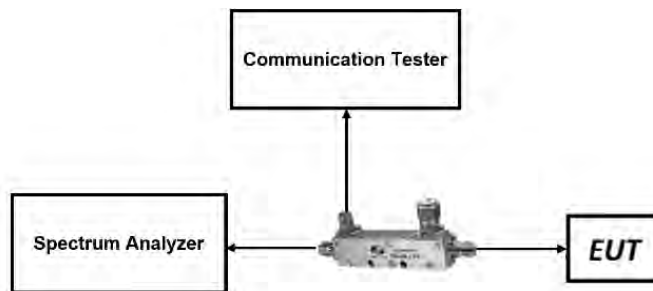
KDB 971168 D01 v03r01 – Section 6.0

### Test Settings


1. Span was set large enough so as to capture all out of band emissions near the band edge
2. RBW = 100 kHz
3. VBW = 300 kHz
4. Detector = RMS
5. Trace mode = trace average
6. Sweep time = auto couple
7. The trace was allowed to stabilize

### Test Setup

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



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


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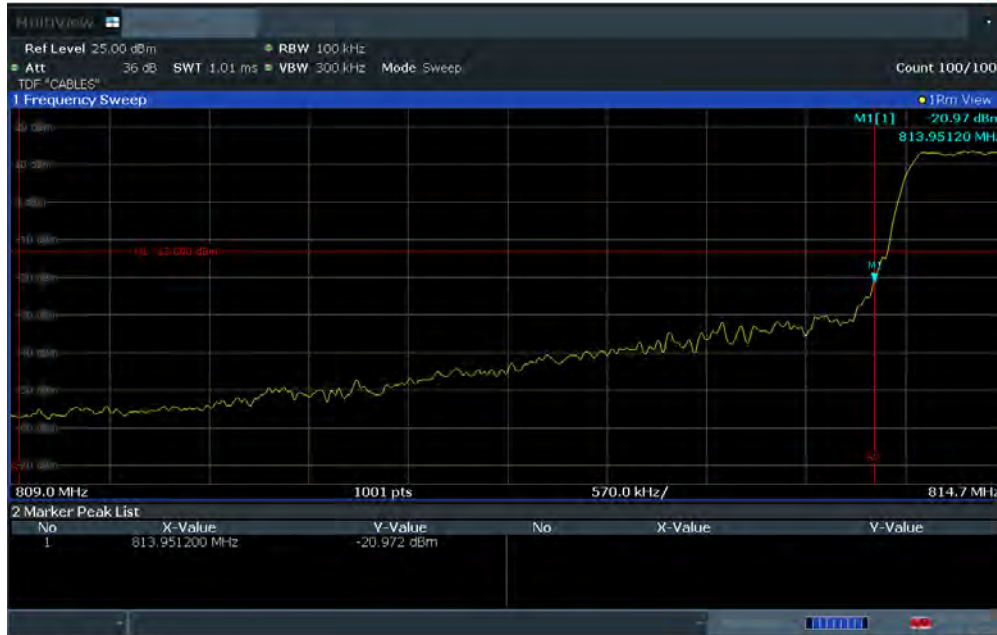
**Test Notes**

1. Per Part 90, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center.
2. For LTE Band 14 operation under Part 90.543, the power of any emission must be reduced below the mean output power (P) by at least  $43 + 10\log(P)$  dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.
3. Additionally, for LTE Band 14 and NR Band n14 operation, on all frequencies between 769-775 MHz and 799-805 MHz, the power of any emission shall be attenuated by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.

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# LTE Band 26



19:12:39 06.01.2024

**Plot 7-81. Channel Edge Plot (LTE Band 26 – 1.4MHz QPSK – Low Channel)**

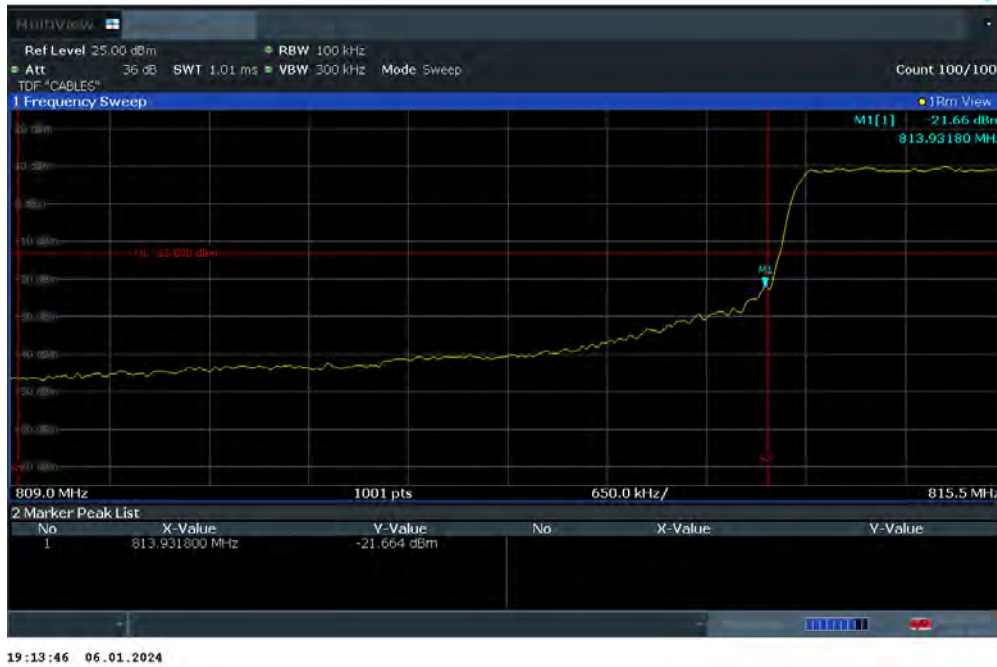


19:13:11 06.01.2024

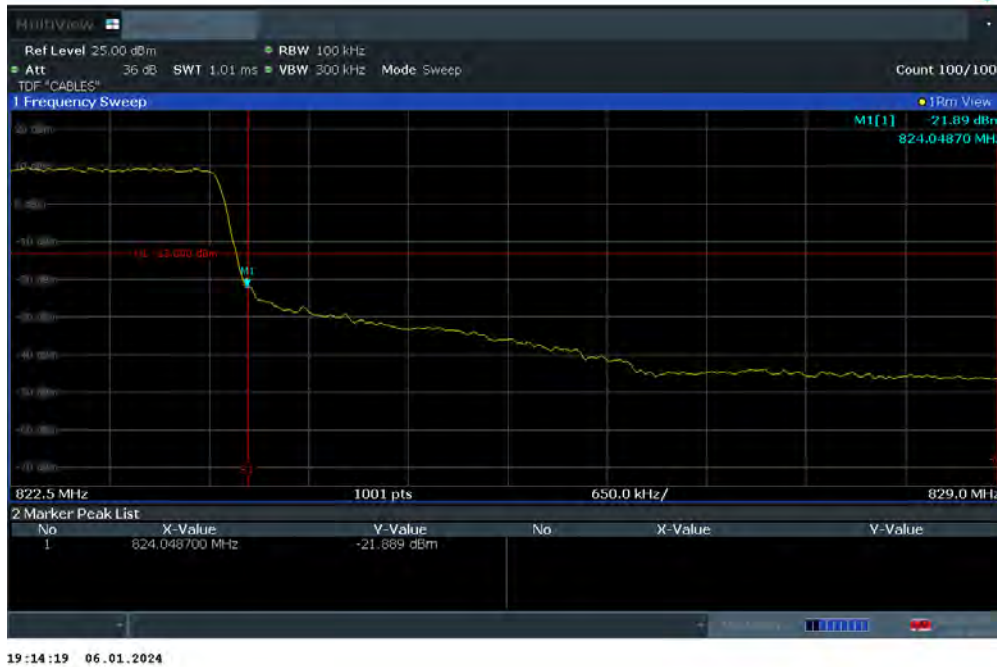
**Plot 7-82. Channel Edge Plot (LTE Band 26 – 1.4MHz QPSK – High Channel)**

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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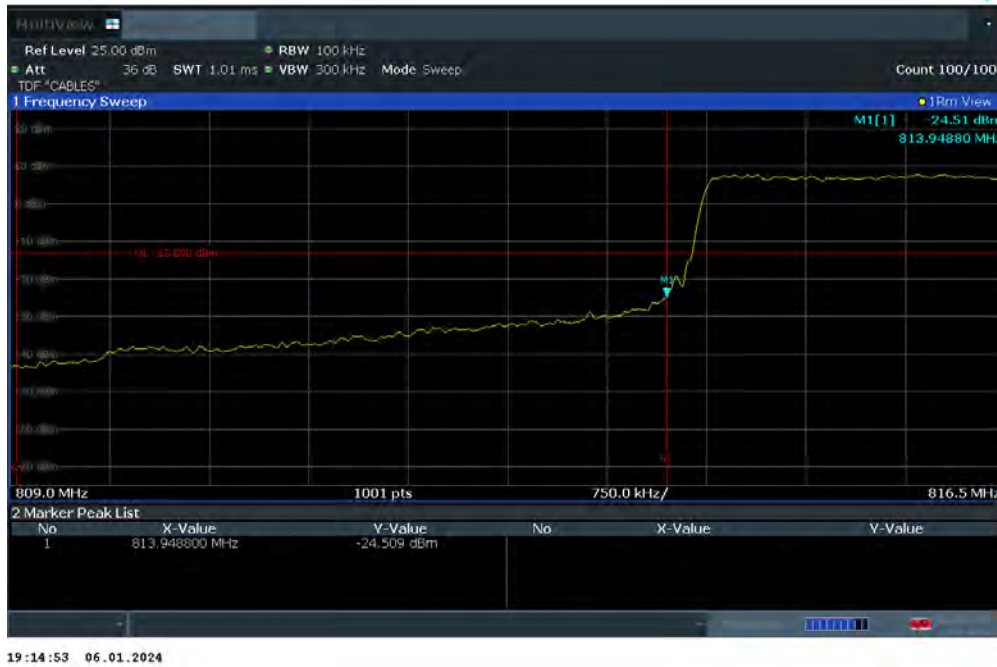
**Plot 7-83. Channel Edge Plot (LTE Band 26 - 3MHz QPSK – Low Channel)**



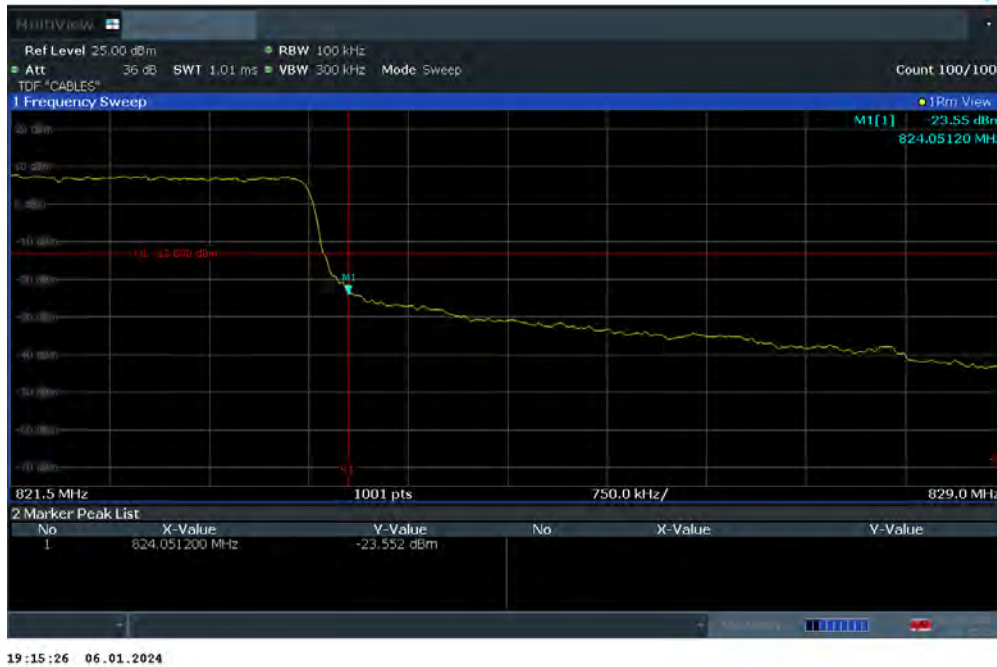
**Plot 7-84. Channel Edge Plot (LTE Band 26 - 3MHz QPSK – High Channel)**

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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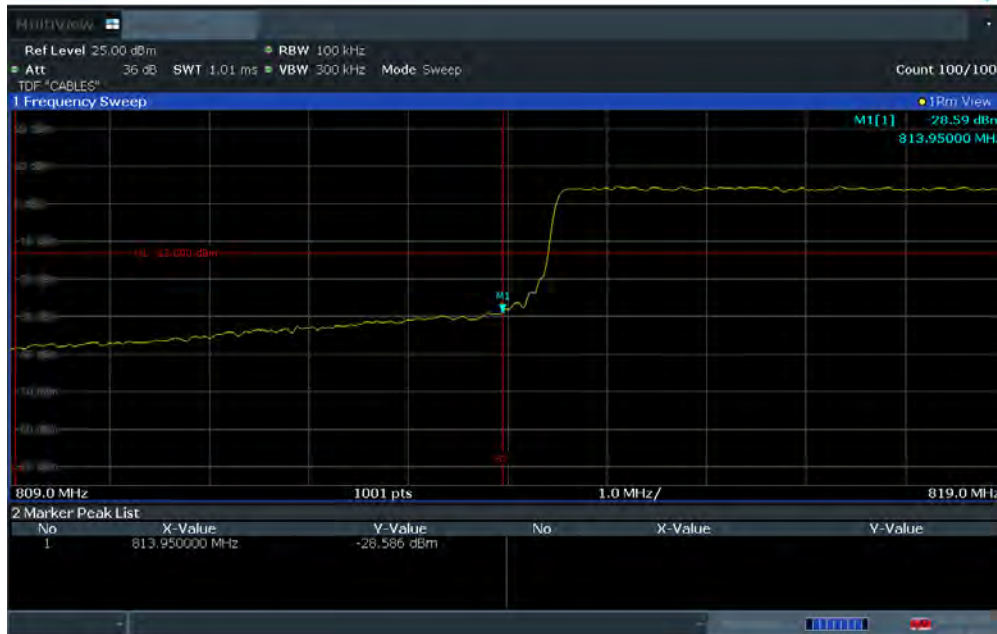


**Plot 7-85. Channel Edge Plot (LTE Band 26 - 5MHz QPSK – Low Channel)**



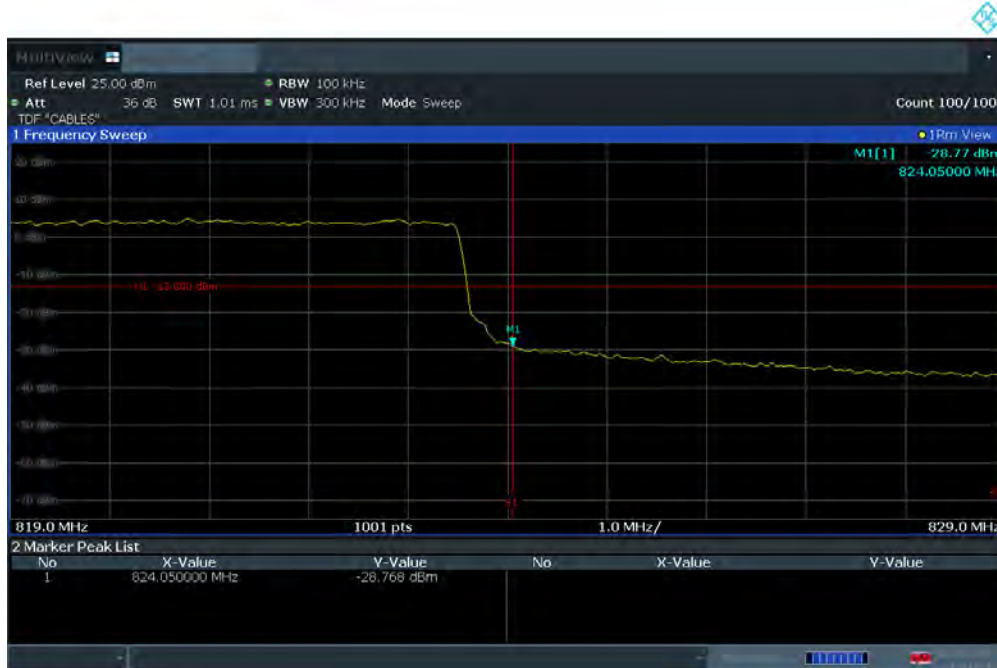
**Plot 7-86. Channel Edge Plot (LTE Band 26 - 5MHz QPSK – High Channel)**

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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19:16:01 06.01.2024

**Plot 7-87. Channel Edge Plot (LTE Band 26 - 10MHz QPSK – Low Channel)**



19:16:19 06.01.2024

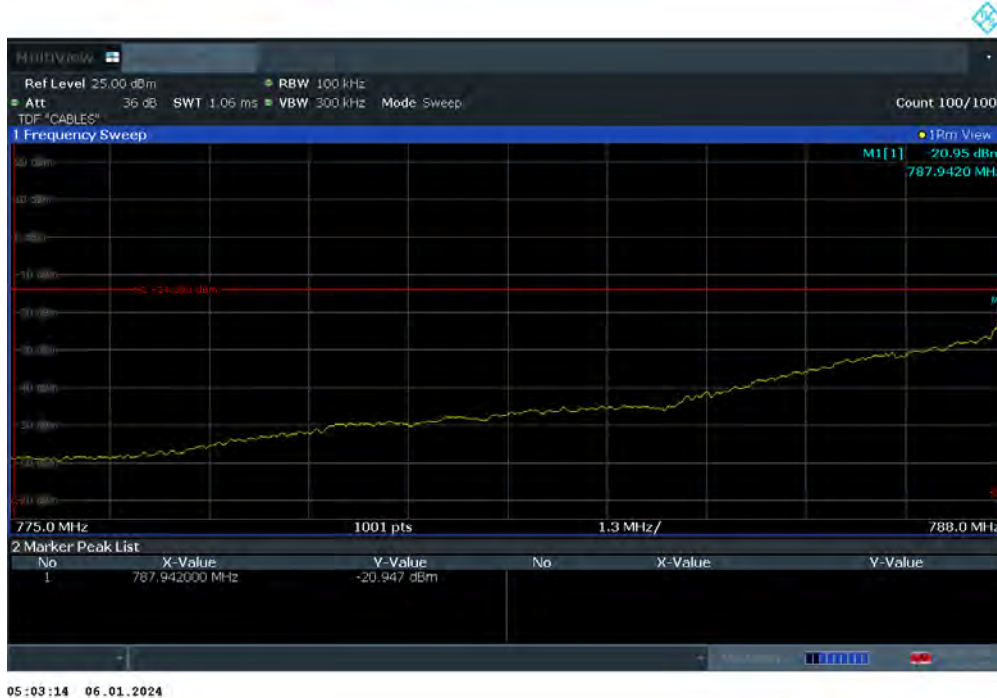
**Plot 7-88. Channel Edge Plot (LTE Band 26 - 10MHz QPSK – High Channel)**

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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# LTE Band 14



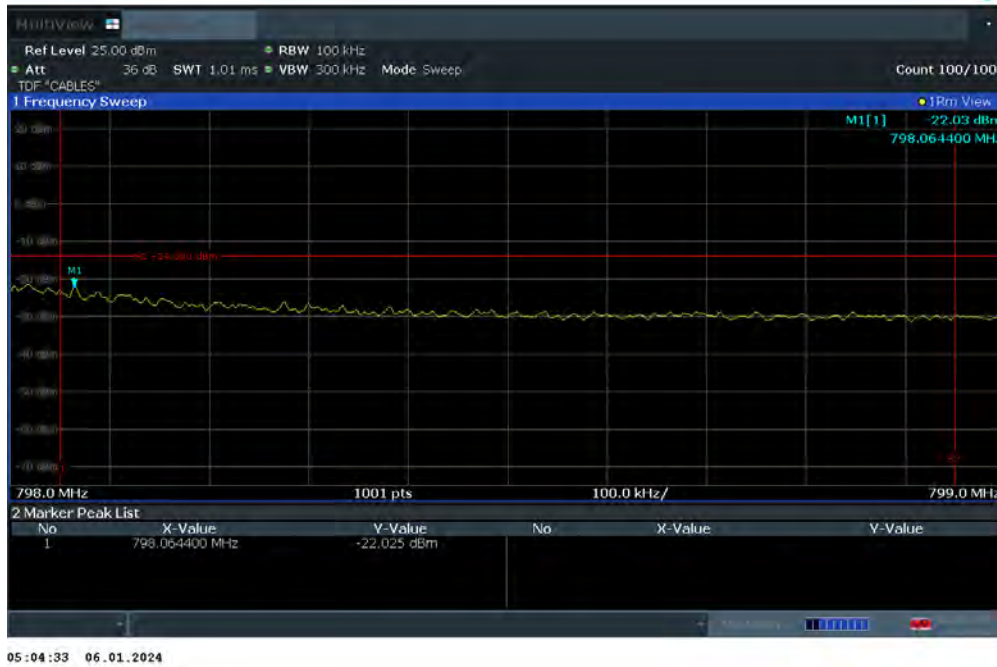
**Plot 7-89. Lower Band Edge Plot (LTE Band 14 - 5MHz QPSK – RB Size 25)**



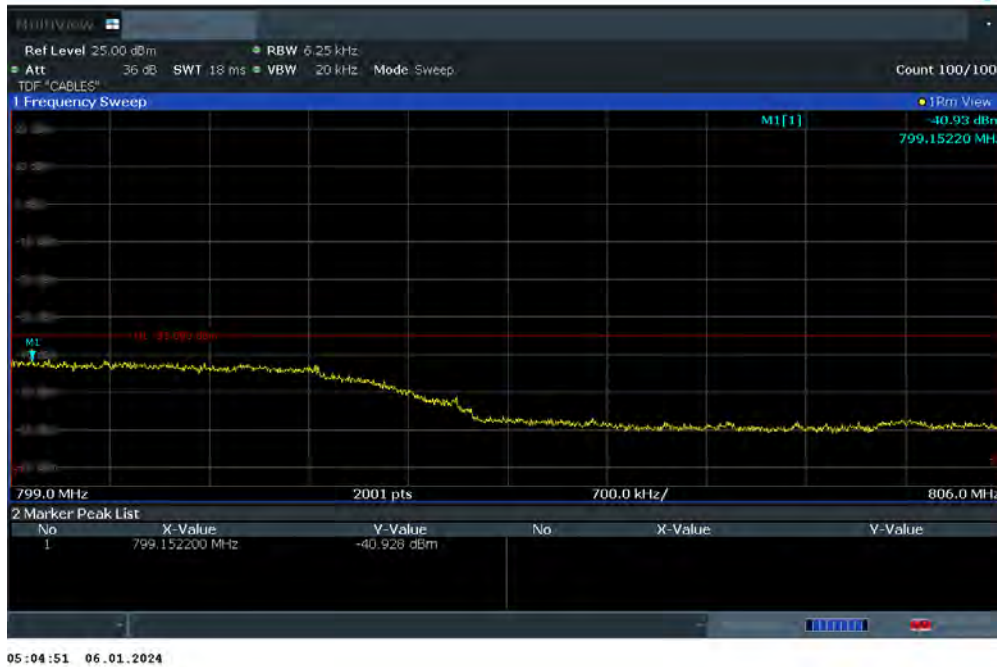
**Plot 7-90. Lower Emission Mask Plot (LTE Band 14 - 5MHz QPSK – RB Size 25)**

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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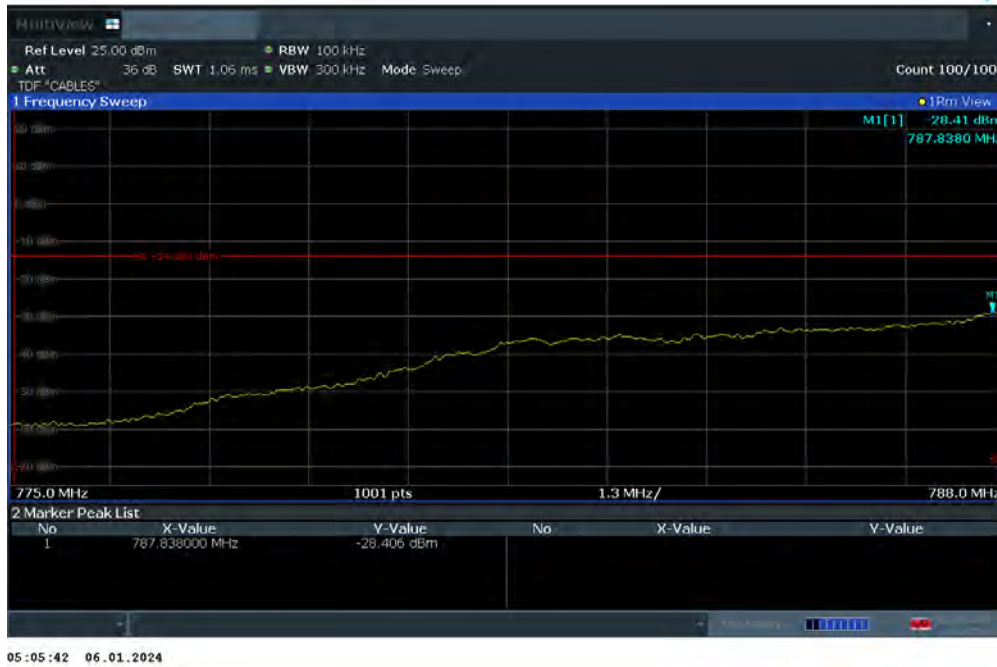
Plot 7-91. Upper Band Edge Plot (LTE Band 14 - 5MHz QPSK – RB Size 25)



Plot 7-92. Upper Emission Mask Plot (LTE Band 14 - 5MHz QPSK – RB Size 25)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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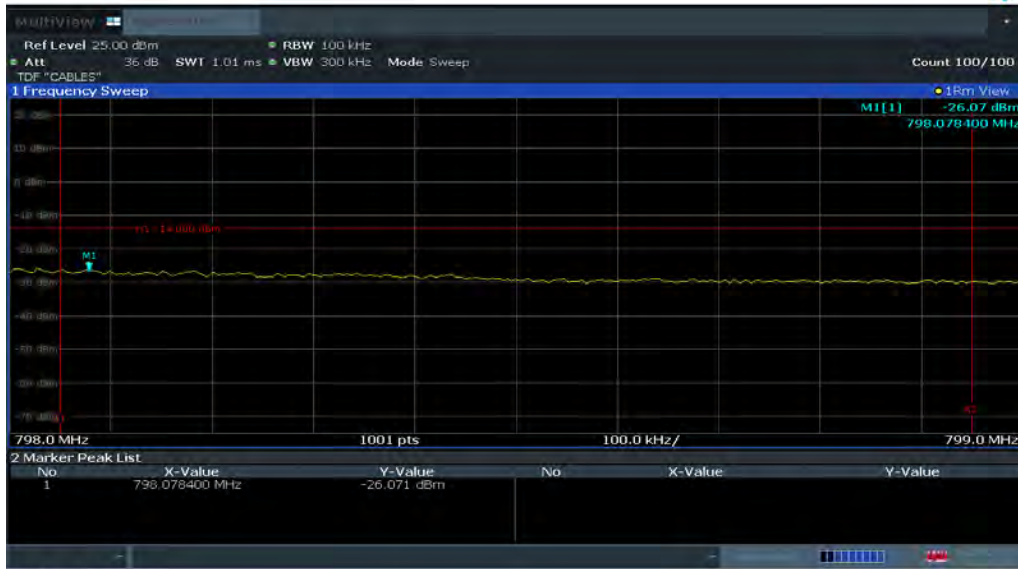
Plot 7-93. Lower Band Edge Plot (LTE Band 14 - 10MHz QPSK – RB Size 50)



Plot 7-94. Lower Emission Mask Plot (LTE Band 14 - 10MHz QPSK – RB Size 50)

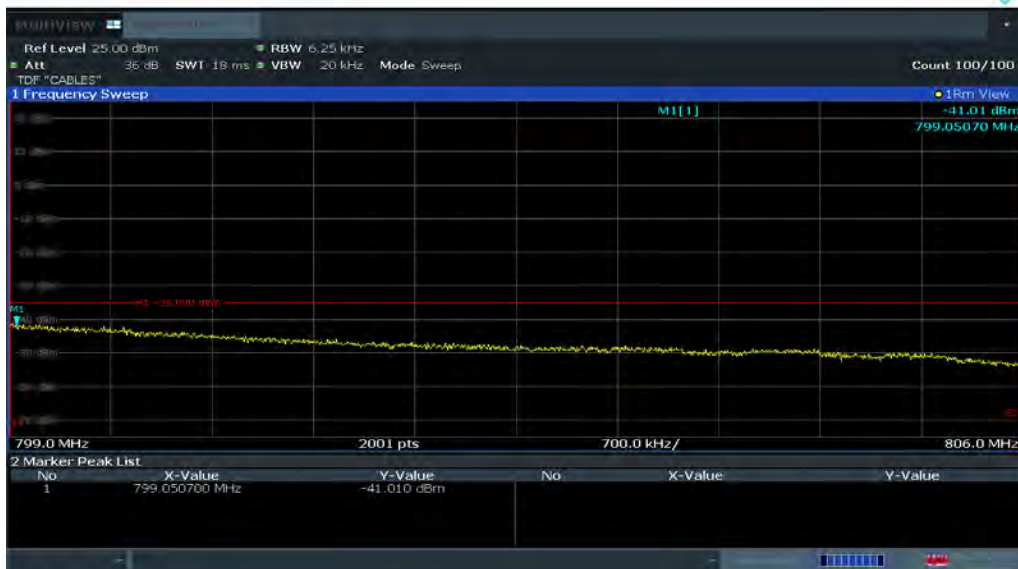
FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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05:06:00 06.01.2024

Plot 7-95. Upper Band Edge Plot (LTE Band 14 - 10MHz QPSK – RB Size 50)



05:06:17 06.01.2024

Plot 7-96. Upper Emission Mask Plot (LTE Band 14 - 10MHz QPSK – RB Size 50)

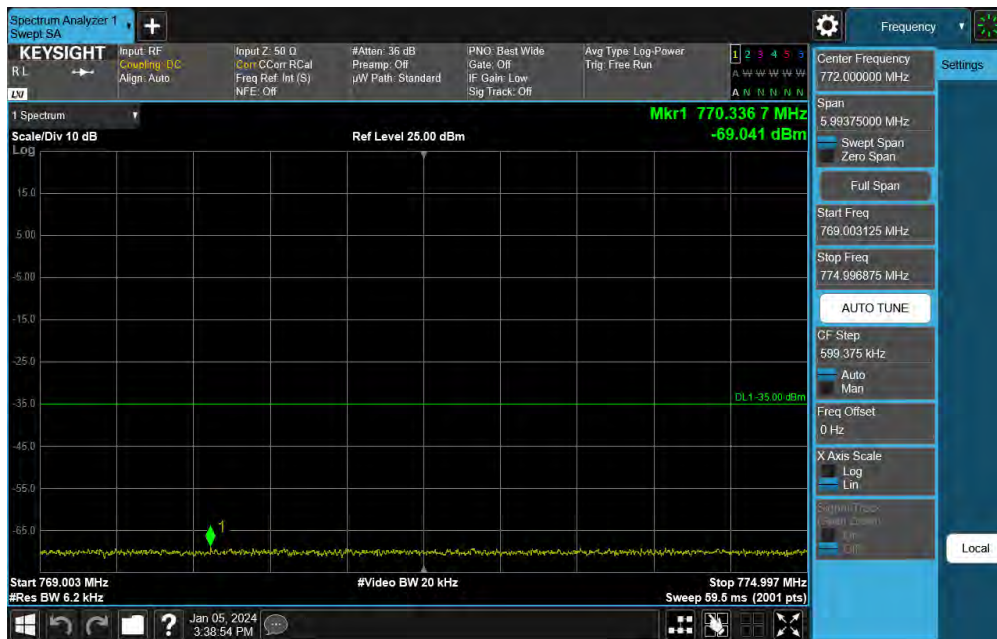
FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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## NR Band n14



Plot 7-97. Lower Band Edge Plot (NR Band n14 - 5MHz DFT-s-OFDM  $\pi/2$  BPSK – RB Size 25)



Plot 7-98. Lower Emission Mask Plot (NR Band n14 - 5MHz DFT-s-OFDM QPSK – RB Size 25)

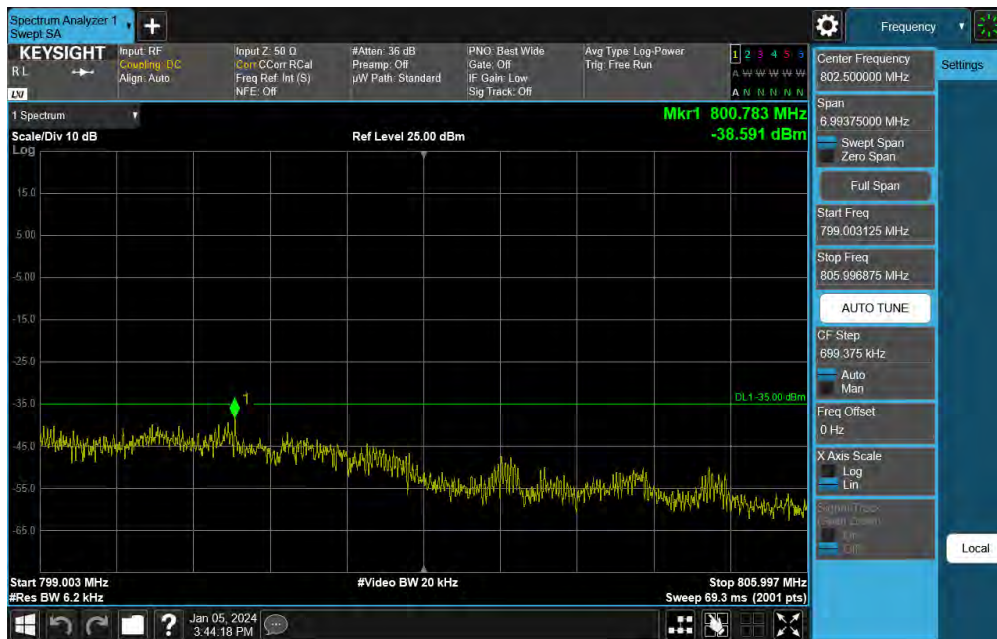
FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-99. Upper Band Edge Plot (NR Band n14 - 5MHz DFT-s-OFDM QPSK – RB Size 25)



Plot 7-100. Upper Emission Mask Plot (NR Band n14 - 5MHz DFT-s-OFDM  $\pi/2$  BPSK – RB Size 25)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-101. Lower Band Edge Plot (NR Band n14 - 10MHz QPSK – RB Size 50)



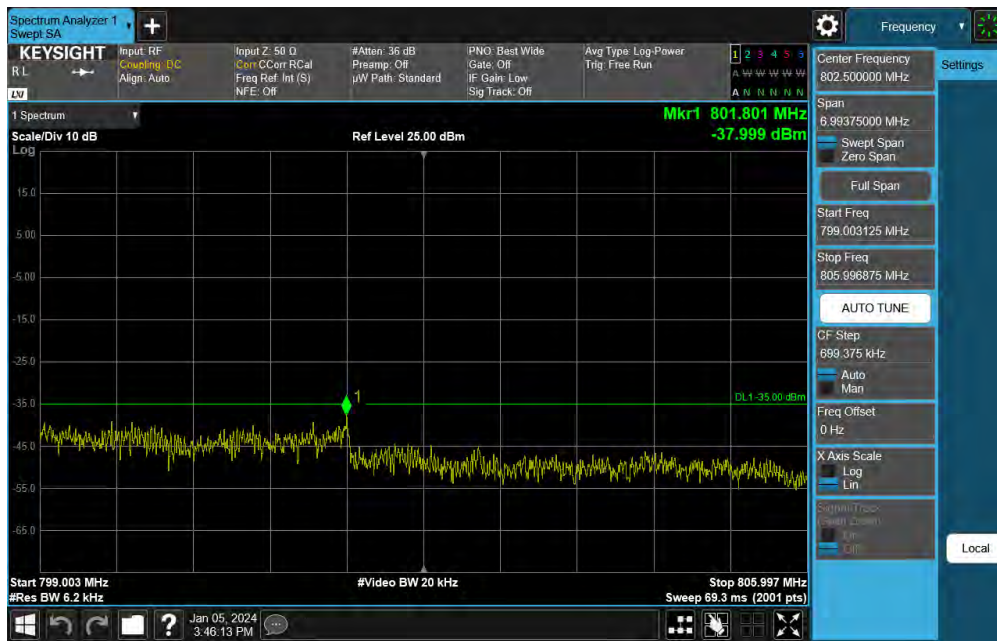
Plot 7-102. Lower Emission Mask Plot (NR Band n14 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK – RB Size 50)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-103. Upper Band Edge Plot (NR Band n14 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK – RB Size 50)



Plot 7-104. Upper Emission Mask Plot (NR Band n14 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK – RB Size 50)

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NR Band n26



Plot 7-105. Lower Band Edge Plot (NR Band n26 - 5MHz DFT-s-OFDM QPSK – Low Channel)

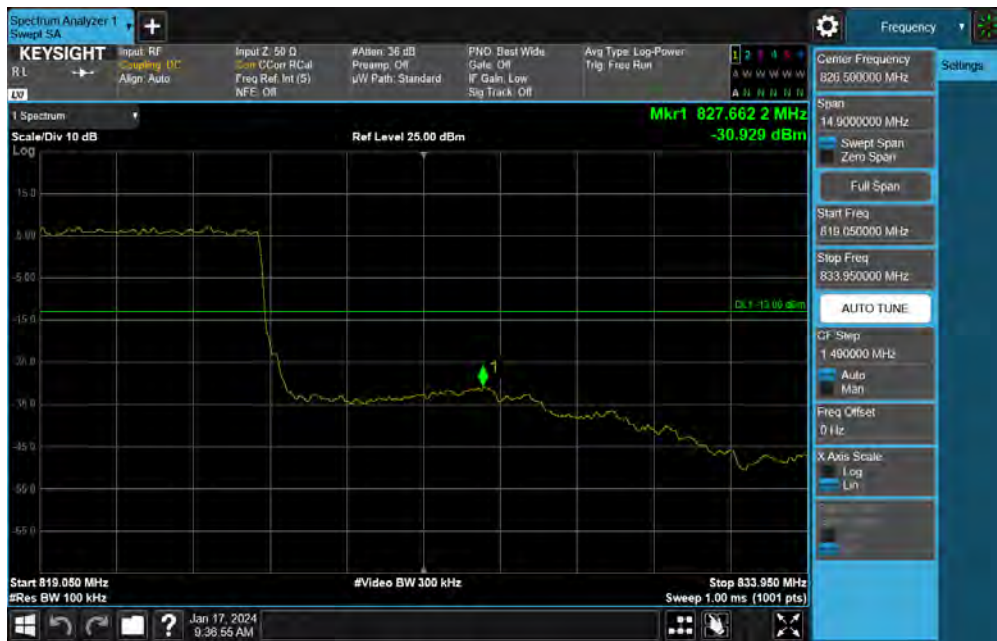


Plot 7-106. Upper Band Edge Plot (NR Band n26 - 5MHz DFT-s-OFDM QPSK – High Channel)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-107. Lower Band Edge Plot (NR Band n26 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK – Low Channel)



Plot 7-108. Upper Band Edge Plot (NR Band n26 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK – High Channel)

FCC ID: BCGA2899	PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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	EUT Type: Tablet Device	

## 7.5 Conducted Power Output Data

§2.1046 §90.635

### Test Overview

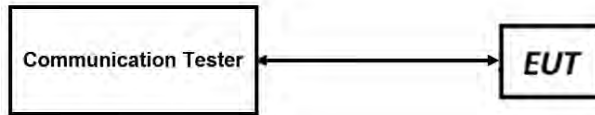
Conducted power measurements are performed to measure the average output power of the EUT. The averaging is to be performed only over duration of active transmissions at maximum output power level. The average measurements do not include averaging over periods when the transmitter is quiescent or when operating at reduced power level.

### Test Procedures Used

KDB 971168 D01 v03r01

### Test Setup


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



**Figure 7-4. Conducted Power Measurement Setup**

### Test Notes

1. The EUT was tested in all possible test configurations. The worst case emissions are reported with the EUT modulations and channel bandwidth configurations shown in the tables below.

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### Antenna 4

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [W]	Conducted Power Limit [dBm]	Margin [dB]
1.4 MHz	QPSK	26697	814.7	1 / 5	25.44	0.350	50.00	-24.56
		26783	823.3	1 / 3	<b>25.56</b>	0.360	50.00	-24.44
	16-QAM	26697	814.7	1 / 0	24.69	0.294	50.00	-25.31
	64-QAM	26697	814.7	1 / 3	23.81	0.240	50.00	-26.19
	256-QAM	26697	814.7	1 / 0	20.75	0.119	50.00	-29.25
3 MHz	QPSK	26705	815.5	1 / 0	<b>25.54</b>	0.358	50.00	-24.46
		26775	822.5	1 / 0	25.49	0.354	50.00	-24.51
	16-QAM	26775	822.5	1 / 0	24.91	0.310	50.00	-25.09
	64-QAM	26705	815.5	1 / 7	23.93	0.247	50.00	-26.07
	256-QAM	26705	815.5	1 / 0	20.78	0.120	50.00	-29.22
5 MHz	QPSK	26715	816.5	1 / 0	<b>25.70</b>	0.372	50.00	-24.30
		26765	821.5	1 / 0	25.44	0.350	50.00	-24.56
	16-QAM	26715	816.5	1 / 0	24.87	0.307	50.00	-25.13
	64-QAM	26715	816.5	1 / 0	23.84	0.242	50.00	-26.16
	256-QAM	26715	816.5	1 / 0	20.67	0.117	50.00	-29.33
10 MHz	QPSK	26740	819.0	1 / 25	<b>25.43</b>	0.349	50.00	-24.57
	16-QAM	26740	819.0	1 / 49	24.86	0.306	50.00	-25.14
	64-QAM	26740	819.0	1 / 25	23.90	0.245	50.00	-26.10
	256-QAM	26740	819.0	1 / 0	20.67	0.117	50.00	-29.33

Table 7-2. Conducted Output Data (LTE Band 26)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [W]	Conducted Power Limit [dBm]	Margin [dB]
5 MHz	$\pi/2$ BPSK	163300	816.5	1 / 23	25.49	0.354	50.00	-24.51
		163800	819.0	1 / 1	25.58	0.362	50.00	-24.42
		164300	821.5	1 / 23	<b>25.69</b>	0.370	50.00	-24.31
	QPSK	163300	816.5	1 / 1	<b>25.63</b>	0.365	50.00	-24.37
		163800	819.0	1 / 1	25.59	0.362	50.00	-24.41
		164300	821.5	1 / 1	25.57	0.361	50.00	-24.43
	16-QAM	163300	816.5	1 / 23	24.69	0.295	50.00	-25.31
	64-QAM	163300	816.5	1 / 12	23.06	0.202	50.00	-26.94
256-QAM	164300	821.5	1 / 23	21.07	0.128	50.00	-28.93	
10 MHz	$\pi/2$ BPSK	163800	819.0	1 / 1	<b>25.55</b>	0.359	50.00	-24.45
	QPSK	163800	819.0	1 / 1	<b>25.57</b>	0.361	50.00	-24.43
	16-QAM	163800	819.0	1 / 50	24.91	0.310	50.00	-25.09
	64-QAM	163800	819.0	1 / 25	23.11	0.205	50.00	-26.89
	256-QAM	163800	819.0	1 / 25	21.20	0.132	50.00	-28.80

Table 7-3. Conducted Output Data (NR Band n26)

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## Antenna 2

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [W]	Conducted Power Limit [dBm]	Margin [dB]
1.4 MHz	QPSK	26697	814.7	1 / 0	24.36	0.273	50.00	-25.64
		26783	823.3	1 / 3	<b>24.66</b>	0.292	50.00	-25.34
	16-QAM	26783	823.3	1 / 5	23.83	0.242	50.00	-26.17
	64-QAM	26697	814.7	1 / 0	22.72	0.187	50.00	-27.28
		26783	823.3	1 / 0	22.72	0.187	50.00	-27.28
256-QAM	26783	823.3	1 / 5	19.72	0.094	50.00	-30.28	
3 MHz	QPSK	26705	815.5	1 / 0	24.38	0.274	50.00	-25.62
		26775	822.5	1 / 7	<b>24.56</b>	0.286	50.00	-25.44
	16-QAM	26775	822.5	1 / 7	23.90	0.245	50.00	-26.10
	64-QAM	26775	822.5	1 / 0	22.86	0.193	50.00	-27.14
	256-QAM	26775	822.5	1 / 0	19.90	0.098	50.00	-30.10
5 MHz	QPSK	26715	816.5	1 / 0	<b>24.66</b>	0.292	50.00	-25.34
		26765	821.5	1 / 0	24.51	0.282	50.00	-25.49
	16-QAM	26765	821.5	1 / 0	23.88	0.244	50.00	-26.12
	64-QAM	26765	821.5	1 / 0	22.80	0.191	50.00	-27.20
	256-QAM	26765	821.5	1 / 0	19.73	0.094	50.00	-30.27
10 MHz	QPSK	26740	819.0	1 / 0	<b>24.52</b>	0.283	50.00	-25.48
	16-QAM	26740	819.0	1 / 25	23.82	0.241	50.00	-26.18
	64-QAM	26740	819.0	1 / 49	22.80	0.191	50.00	-27.20
	256-QAM	26740	819.0	1 / 0	19.69	0.093	50.00	-30.31

Table 7-4. Conducted Output Data (LTE Band 26)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [W]	Conducted Power Limit [dBm]	Margin [dB]
5 MHz	$\pi/2$ BPSK	163300	816.5	1 / 1	24.62	0.290	50.00	-25.38
		163800	819.0	1 / 1	<b>24.69</b>	0.294	50.00	-25.31
		164300	821.5	1 / 1	24.59	0.288	50.00	-25.41
	QPSK	163300	816.5	1 / 1	<b>24.68</b>	0.294	50.00	-25.32
		163800	819.0	1 / 12	24.57	0.286	50.00	-25.43
		164300	821.5	1 / 1	24.58	0.287	50.00	-25.42
	16-QAM	163300	816.5	1 / 12	24.01	0.252	50.00	-25.99
64-QAM	164300	821.5	1 / 12	22.22	0.167	50.00	-27.78	
256-QAM	163300	816.5	1 / 12	20.08	0.102	50.00	-29.92	
10 MHz	$\pi/2$ BPSK	163800	819.0	1 / 1	<b>24.65</b>	0.292	50.00	-25.35
	QPSK	163800	819.0	1 / 1	<b>24.58</b>	0.287	50.00	-25.42
	16-QAM	163800	819.0	1 / 1	23.73	0.236	50.00	-26.27
	64-QAM	163800	819.0	1 / 50	22.21	0.166	50.00	-27.79
	256-QAM	163800	819.0	1 / 1	20.15	0.103	50.00	-29.85

Table 7-5. Conducted Output Data (NR Band n26)

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## 7.6 Radiated Power (ERP) §90.542(a)(7)

### Test Overview

Effective Radiated Power (ERP) measurements are calculated by adding highest antenna gain to maximum measured conducted output power. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

### Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1  
ANSI C63.26-2015  
TIA-603-E-2016 – Section 2.2.17

### Test Settings

The relevant equation for determining the ERP from the conducted RF output power measured is:

$$ERP = P_{Meas} - LC + GT$$

Where:

ERP = Effective Radiated Power (expressed in the same units as P<sub>Meas</sub>, typically dBW or dBm)

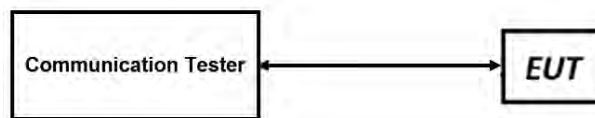
P<sub>Meas</sub> = measured transmitter output power or PSD, in dBW or dBm

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB


GT = gain of the transmitting antenna, in dBd (ERP)

### Test Setup

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




**Figure 7-5. ERP Measurement Setup**

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**Test Notes**

- 1) The worst case emissions are reported with the modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The Level (dBm) readings in the table were taken with a correction table loaded into the base station simulator. The correction table was used to account for the signal attenuation in the connecting cable between the transmitter and antenna.
- 4) The Ant. Gains (GT) are listed in dBi.

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### Antenna 4

Bandwidth	Mod.	Frequency [MHz]	Ant. Gain [dBi]	RB Size/Offset	Conducted Power [dBm]	ERP [dBm]	ERP [W]	ERP Limit [dBm]	Margin [dB]
5 MHz	QPSK	790.5	-2.60	1 / 0	25.69	20.94	0.124	34.77	-13.83
		793.0	-2.60	1 / 0	25.70	<b>20.95</b>	0.124	34.77	-13.82
		795.5	-2.60	1 / 0	25.62	20.87	0.122	34.77	-13.90
	16-QAM	793.0	-2.60	1 / 0	25.05	20.30	0.107	34.77	-14.47
	64-QAM	793.0	-2.60	1 / 0	23.97	19.22	0.084	34.77	-15.55
	256-QAM	793.0	-2.60	1 / 0	20.74	15.99	0.040	34.77	-18.78
10 MHz	QPSK	793.0	-2.60	1 / 0	25.50	<b>20.75</b>	0.119	34.77	-14.02
	16-QAM	793.0	-2.60	1 / 49	25.01	20.26	0.106	34.77	-14.51
	64-QAM	793.0	-2.60	1 / 0	23.85	19.10	0.081	34.77	-15.67
	256-QAM	793.0	-2.60	1 / 0	20.74	15.99	0.040	34.77	-18.78

Table 7-6. Conducted Output Data (LTE Band 14)

Bandwidth	Mod.	Frequency [MHz]	Ant. Gain [dBi]	RB Size/Offset	Conducted Power [dBm]	ERP [dBm]	ERP [W]	ERP Limit [dBm]	Margin [dB]
5 MHz	π/2 BPSK	790.5	-2.60	1 / 23	25.51	20.76	0.119	34.77	-14.01
		793.0	-2.60	1 / 12	25.61	<b>20.86</b>	0.122	34.77	-13.92
		795.5	-2.60	1 / 1	25.58	20.83	0.121	34.77	-13.94
	QPSK	790.5	-2.60	1 / 1	25.53	20.78	0.120	34.77	-13.99
		793.0	-2.60	1 / 12	25.60	20.85	0.122	34.77	-13.92
		795.5	-2.60	1 / 12	25.61	<b>20.86</b>	0.122	34.77	-13.91
	16-QAM	790.5	-2.60	1 / 12	24.77	20.02	0.100	34.77	-14.75
	64-QAM	790.5	-2.60	1 / 1	23.17	18.42	0.069	34.77	-16.35
	256-QAM	793.0	-2.60	1 / 1	21.12	16.37	0.043	34.77	-18.40
π/2 BPSK	793.0	-2.60	1 / 25	25.56	<b>20.81</b>	0.121	34.77	-13.96	
10 MHz	QPSK	793.0	-2.60	1 / 1	25.48	<b>20.73</b>	0.118	34.77	-14.04
	16-QAM	793.0	-2.60	1 / 1	24.71	19.96	0.099	34.77	-14.81
	64-QAM	793.0	-2.60	1 / 50	23.01	18.26	0.067	34.77	-16.51
	256-QAM	793.0	-2.60	1 / 50	20.91	16.16	0.041	34.77	-18.61

Table 7-7. Conducted Output Data (NR Band n14)

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## Antenna 2

Bandwidth	Mod.	Frequency [MHz]	Ant. Gain [dBi]	RB Size/Offset	Conducted Power [dBm]	ERP [dBm]	ERP [W]	ERP Limit [dBm]	Margin [dB]	
5 MHz	QPSK	790.5	-2.30	1 / 0	24.67	20.22	0.105	34.77	-14.55	
		793.0	-2.30	1 / 0	24.70	<b>20.25</b>	0.106	34.77	-14.52	
		795.5	-2.30	1 / 0	24.62	20.17	0.104	34.77	-14.60	
	16-QAM	793.0	-2.30	1 / 0	24.04	19.59	0.091	34.77	-15.18	
		64-QAM	795.5	-2.30	1 / 0	22.93	18.48	0.070	34.77	-16.29
		256-QAM	790.5	-2.30	1 / 12	19.72	15.27	0.034	34.77	-19.50
10 MHz	QPSK	793.0	-2.30	1 / 25	24.60	<b>20.15</b>	0.104	34.77	-14.62	
	16-QAM	793.0	-2.30	1 / 25	23.89	19.44	0.088	34.77	-15.33	
	64-QAM	793.0	-2.30	1 / 25	22.85	18.40	0.069	34.77	-16.37	
	256-QAM	793.0	-2.30	1 / 25	19.86	15.41	0.035	34.77	-19.36	

Table 7-8. Conducted Output Data (LTE Band 14)

Bandwidth	Mod.	Frequency [MHz]	Ant. Gain [dBi]	RB Size/Offset	Conducted Power [dBm]	ERP [dBm]	ERP [W]	ERP Limit [dBm]	Margin [dB]
5 MHz	$\pi/2$ BPSK	790.5	-2.30	1 / 1	24.54	<b>20.09</b>	0.102	34.77	-14.68
		793.0	-2.30	1 / 12	24.45	20.00	0.100	34.77	-14.77
		795.5	-2.30	1 / 12	24.45	20.00	0.100	34.77	-14.77
	QPSK	790.5	-2.30	1 / 12	24.58	<b>20.13</b>	0.103	34.77	-14.64
		793.0	-2.30	1 / 12	24.43	19.98	0.100	34.77	-14.79
		795.5	-2.30	1 / 1	24.43	19.98	0.100	34.77	-14.79
	16-QAM	793.0	-2.30	1 / 1	23.47	19.02	0.080	34.77	-15.75
64-QAM	790.5	-2.30	1 / 12	22.18	17.73	0.059	34.77	-17.04	
256-QAM	790.5	-2.30	1 / 23	19.88	15.43	0.035	34.77	-19.34	
10 MHz	$\pi/2$ BPSK	793.0	-2.30	1 / 1	24.58	<b>20.13</b>	0.103	34.77	-14.65
	QPSK	793.0	-2.30	1 / 25	24.57	<b>20.12</b>	0.103	34.77	-14.65
	16-QAM	793.0	-2.30	1 / 1	23.75	19.30	0.085	34.77	-15.48
	64-QAM	793.0	-2.30	1 / 1	22.28	17.83	0.061	34.77	-16.94
	256-QAM	793.0	-2.30	1 / 25	19.87	15.42	0.035	34.77	-19.35

Table 7-9. Conducted Output Data (NR Band n14)

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## 7.7 Radiated Spurious Emissions

§2.1053 §90.691(a) §90.543(e)

### Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in KDB 971168 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized broadband hybrid antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed while the EUT is operating at maximum power and at the appropriate frequencies.

### Test Procedures Used


KDB 971168 D01 v03r01 – Section 5.8

ANSI C63.26-2015

TIA-603-E-2016 – Section 2.2.12

### Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW  $\geq$  3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points  $\geq$  2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

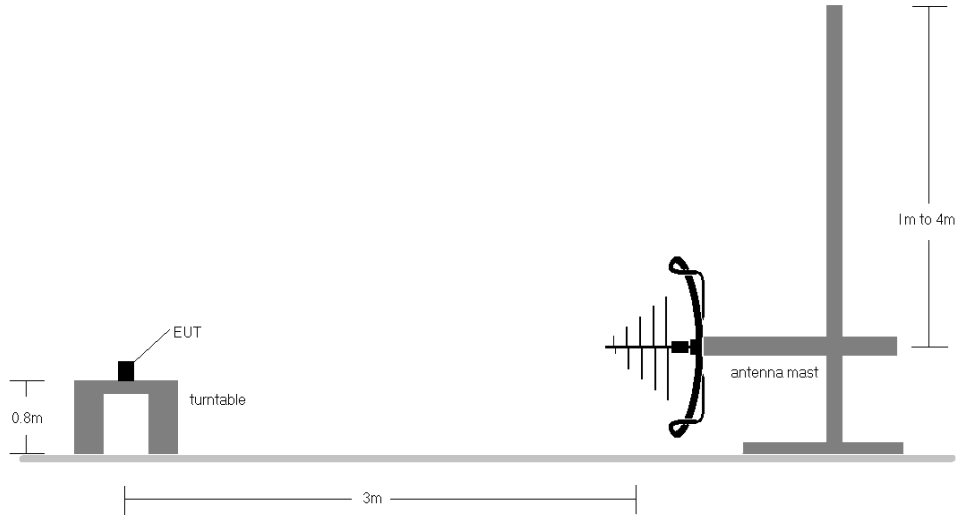
FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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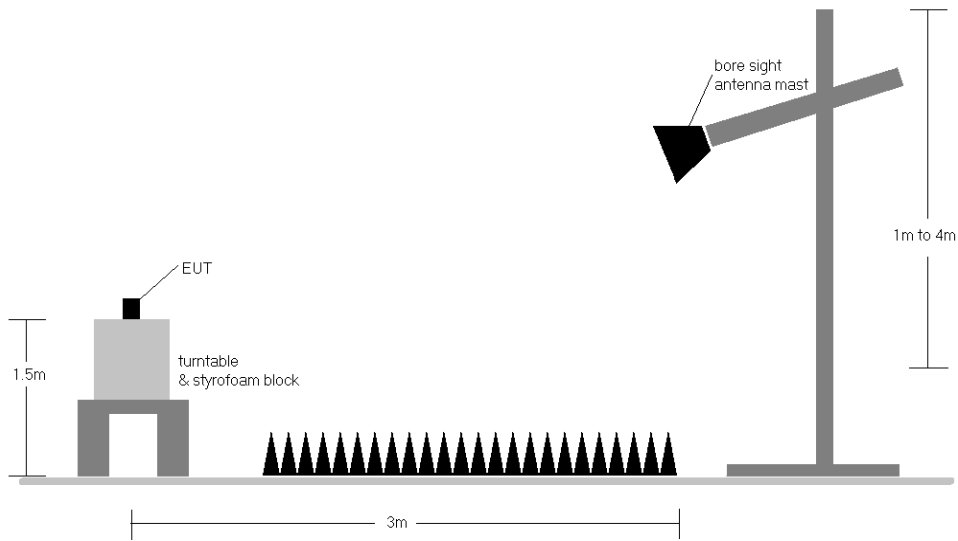


**Test Setup**


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



**Figure 7-6. Test Instrument & Measurement Setup < 1GHz**




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

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**Test Notes**

1. Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
  - a.  $E(\text{dB}\mu\text{V}/\text{m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
  - b.  $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V}/\text{m}) + 20\log D - 104.8$ ; where D is the measurement distance in meters.
2. The device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with 1 RB.
3. This unit was tested with its standard battery.
4. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
5. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

<b>FCC ID:</b> BCGA2899	 <b>PART 90 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
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## 7.7.1 Antenna 4 – Radiated Spurious Emission Measurements

### LTE Band 26

Bandwidth (MHz):	5
Frequency (MHz):	816.5
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1633.0	H	-	-	-73.37	-5.19	28.44	-66.79	-13.00	-53.79
2449.5	H	-	-	-73.86	-0.66	32.48	-62.75	-13.00	-49.75
3266.0	H	-	-	-75.47	1.27	32.80	-62.43	-13.00	-49.43

Table 7-10. Antenna 4 Radiated Spurious Data (LTE Band 26 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	819.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 25


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1638.0	H	-	-	-73.16	-5.16	28.68	-66.55	-13.00	-53.55
2457.0	H	-	-	-73.41	-0.69	32.90	-62.33	-13.00	-49.33
3276.0	H	-	-	-75.31	1.39	33.08	-62.15	-13.00	-49.15

Table 7-11. Antenna 4 Radiated Spurious Data (LTE Band 26 – Mid Channel)

Bandwidth (MHz):	5
Frequency (MHz):	821.5
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1643.0	H	-	-	-73.03	-5.13	28.84	-66.39	-13.00	-53.39
2464.5	H	-	-	-73.23	-0.71	33.06	-62.17	-13.00	-49.17
3286.0	H	-	-	-75.38	1.53	33.15	-62.08	-13.00	-49.08

Table 7-12. Antenna 4 Radiated Spurious Data (LTE Band 26 – High Channel)

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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## LTE Band 14

Bandwidth (MHz):	5
Frequency (MHz):	790.5
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1581.0	H	-	-	-72.81	-5.38	28.81	-66.42	-40.00	-26.42
2371.5	H	-	-	-74.10	-0.28	32.62	-62.61	-13.00	-49.61
3162.0	H	-	-	-75.33	0.96	32.63	-62.60	-13.00	-49.60

Table 7-13. Antenna 4 Radiated Spurious Data (LTE Band 14 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	793.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 25


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1586.0	H	-	-	-72.91	-5.39	28.70	-66.53	-40.00	-26.53
2379.0	H	-	-	-74.20	-0.30	32.50	-62.73	-13.00	-49.73
3172.0	H	-	-	-75.36	0.88	32.52	-62.71	-13.00	-49.71

Table 7-14. Antenna 4 Radiated Spurious Data (LTE Band 14 – Mid Channel)

Bandwidth (MHz):	5
Frequency (MHz):	795.5
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1591.0	H	-	-	-72.87	-5.39	28.74	-66.49	-40.00	-26.49
2386.5	H	-	-	-74.30	-0.35	32.35	-62.88	-13.00	-49.88
3182.0	H	-	-	-75.45	0.82	32.37	-62.86	-13.00	-49.86

Table 7-15. Antenna 4 Radiated Spurious Data (LTE Band 14 – High Channel)

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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## NR Band n14

Bandwidth (MHz):	5
Frequency (MHz):	790.5
Modulation Signal:	QPSK
RB / Offset:	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1581.0	H	-	-	-75.24	-5.17	26.59	-68.64	-40.00	-28.64
2371.5	H	-	-	-76.17	-0.18	30.65	-64.58	-13.00	-51.58
3162.0	H	-	-	-76.40	1.32	31.92	-63.31	-13.00	-50.31

Table 7-16. Antenna 4 Radiated Spurious Data (NR Band n14 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	793.0
Modulation Signal:	QPSK
RB / Offset:	1 / 25


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1586.0	H	-	-	-75.04	-5.17	26.79	-68.44	-40.00	-28.44
2379.0	H	-	-	-76.10	-0.15	30.75	-64.48	-13.00	-51.48
3172.0	H	-	-	-76.63	1.35	31.72	-63.51	-13.00	-50.51

Table 7-17. Antenna 4 Radiated Spurious Data (NR Band n14 – Mid Channel)

Bandwidth (MHz):	5
Frequency (MHz):	795.5
Modulation Signal:	QPSK
RB / Offset:	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1591.0	H	-	-	-75.11	-5.16	26.73	-68.50	-40.00	-28.50
2386.5	H	-	-	-76.02	-0.14	30.84	-64.39	-13.00	-51.39
3182.0	H	-	-	-76.40	1.29	31.89	-63.34	-13.00	-50.34

Table 7-18. Antenna 4 Radiated Spurious Data (NR Band n14 – High Channel)

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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## NR Band n26

Bandwidth (MHz):	5
Frequency (MHz):	816.5
Modulation Signal:	QPSK
RB / Offset:	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1633.0	H	-	-	-72.02	-5.49	29.50	-65.76	-13.00	-52.76
2449.5	H	-	-	-73.85	-0.70	32.45	-62.81	-13.00	-49.81
3266.0	H	-	-	-75.13	1.07	32.94	-62.32	-13.00	-49.32

Table 7-19. Antenna 4 Radiated Spurious Data (NR Band n26 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	819.0
Modulation Signal:	QPSK
RB / Offset:	1 / 25


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1638.0	H	-	-	-72.06	-5.53	29.41	-65.85	-13.00	-52.85
2457.0	H	-	-	-73.75	-0.70	32.55	-62.71	-13.00	-49.71
3276.0	H	-	-	-75.34	1.21	32.88	-62.38	-13.00	-49.38

Table 7-20. Antenna 4 Radiated Spurious Data (NR Band n26 – Mid Channel)

Bandwidth (MHz):	5
Frequency (MHz):	821.5
Modulation Signal:	QPSK
RB / Offset:	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1643.0	H	-	-	-72.08	-5.49	29.43	-65.83	-13.00	-52.83
2464.5	H	-	-	-74.20	-0.63	32.17	-63.09	-13.00	-50.09
3286.0	H	-	-	-75.08	1.21	33.14	-62.12	-13.00	-49.12

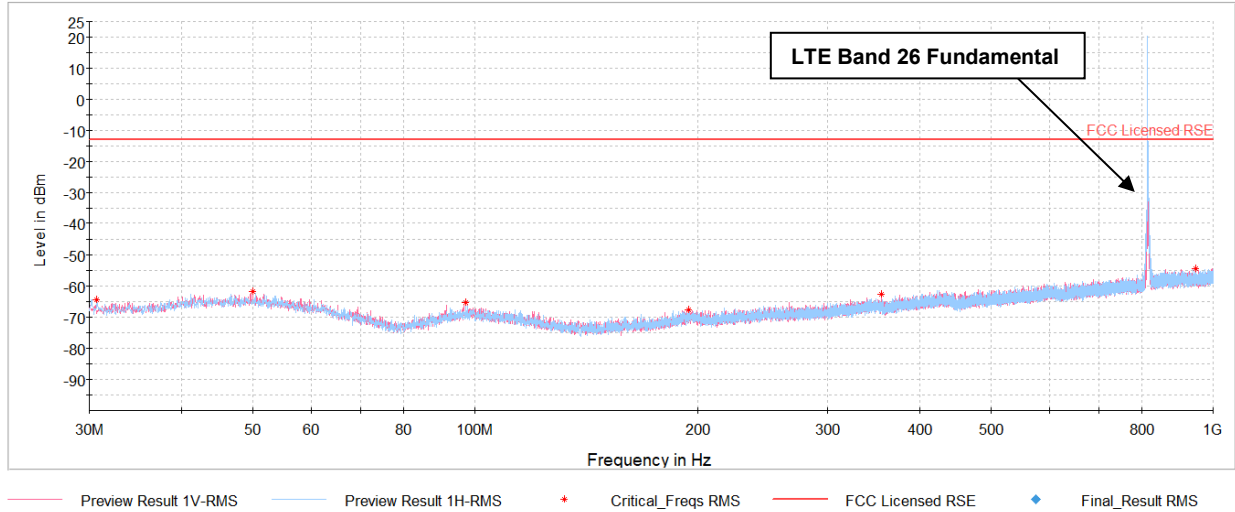
Table 7-21. Antenna 4 Radiated Spurious Data (NR Band n26 – High Channel)

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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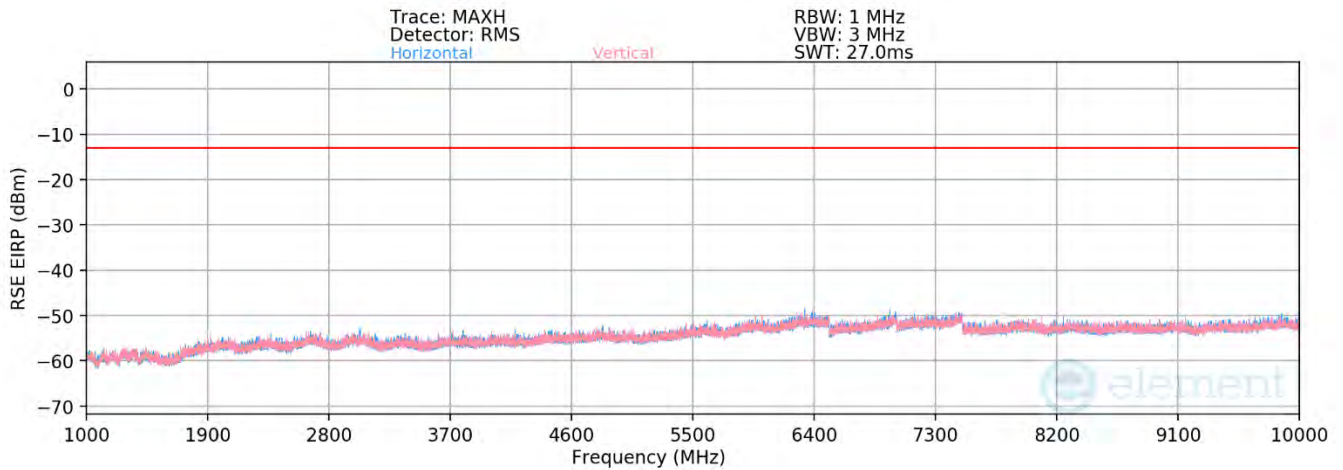
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## 7.7.2 Antenna 2 – Radiated Spurious Emission Measurements


### LTE Band 26



**Plot 7-109. Antenna 2 Radiated Spurious Plot Below 1GHz (LTE Band 26)**



**Plot 7-110. Antenna 2 Radiated Spurious Plot Above 1GHz (LTE Band 26)**

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Bandwidth (MHz):	5
Frequency (MHz):	816.5
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1633.0	H	-	-	-73.47	-5.19	28.34	-66.89	-13.00	-53.89
2449.5	H	-	-	-73.82	-0.66	32.52	-62.71	-13.00	-49.71
3266.0	H	-	-	-75.60	1.27	32.67	-62.56	-13.00	-49.56

Table 7-22. Antenna 2 Radiated Spurious Data (LTE Band 26 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	819.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 25


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1638.0	H	-	-	-73.41	-5.16	28.43	-66.80	-13.00	-53.80
2457.0	H	-	-	-73.65	-0.69	32.66	-62.57	-13.00	-49.57
3276.0	H	-	-	-75.61	1.39	32.78	-62.45	-13.00	-49.45

Table 7-23. Antenna 2 Radiated Spurious Data (LTE Band 26 – Mid Channel)

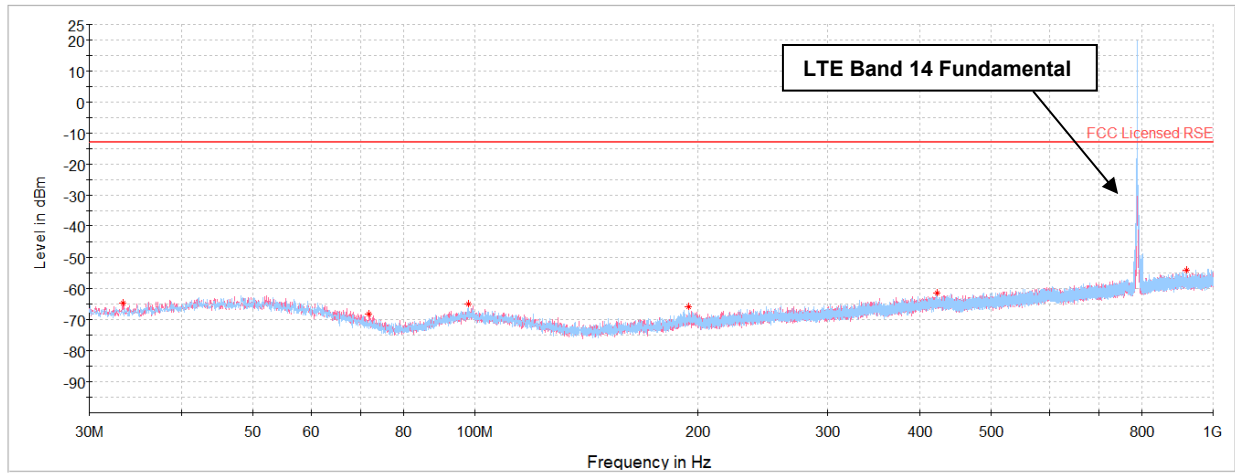
Bandwidth (MHz):	5
Frequency (MHz):	821.5
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1643.0	H	-	-	-73.33	-5.13	28.54	-66.69	-13.00	-53.69
2464.5	H	-	-	-73.45	-0.71	32.84	-62.39	-13.00	-49.39
3286.0	H	-	-	-75.32	1.53	33.21	-62.02	-13.00	-49.02

Table 7-24. Antenna 2 Radiated Spurious Data (LTE Band 26 – High Channel)

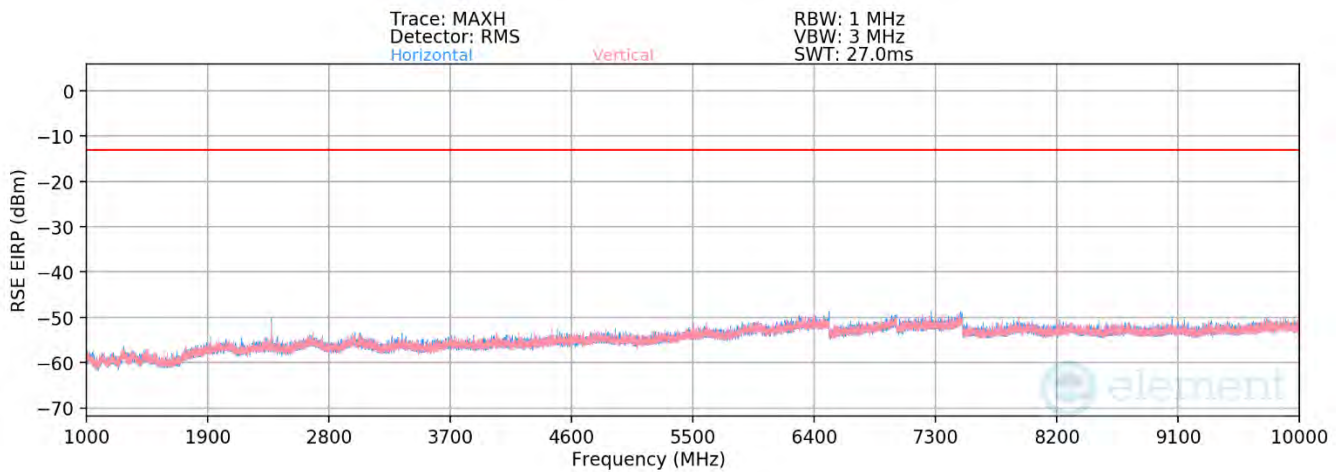
FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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# LTE Band 14




Preview Result 1V-RMS    Preview Result 1H-RMS    Critical\_Freqs RMS    FCC Licensed RSE    Final\_Result RMS

**Plot 7-111. Antenna 2 Radiated Spurious Plot Below 1GHz (LTE Band 14)**



**Plot 7-112. Antenna 2 Radiated Spurious Plot Above 1GHz (LTE Band 14)**

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Bandwidth (MHz):	5
Frequency (MHz):	790.5
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1581.0	H	-	-	-72.94	-5.38	28.68	-66.55	-40.00	-26.55
2371.5	V	250	182	-67.41	-0.28	39.31	-55.92	-13.00	-42.92
3162.0	H	-	-	-75.31	0.96	32.65	-62.58	-13.00	-49.58
3952.5	H	-	-	-76.59	2.54	32.95	-62.28	-13.00	-49.28
4743.0	H	-	-	-77.86	4.60	33.74	-61.49	-13.00	-48.49

Table 7-25. Antenna 2 Radiated Spurious Data (LTE Band 14 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	793.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 25


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1586.0	H	-	-	-72.69	-5.39	28.92	-66.31	-40.00	-26.31
2379.0	V	257	183	-67.62	-0.30	39.08	-56.15	-13.00	-43.15
3172.0	H	-	-	-75.58	0.88	32.30	-62.93	-13.00	-49.93
3965.0	H	-	-	-76.65	2.59	32.94	-62.29	-13.00	-49.29
4758.0	H	-	-	-77.98	4.75	33.77	-61.46	-13.00	-48.46

Table 7-26. Antenna 2 Radiated Spurious Data (LTE Band 14 – Mid Channel)

Bandwidth (MHz):	5
Frequency (MHz):	795.5
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

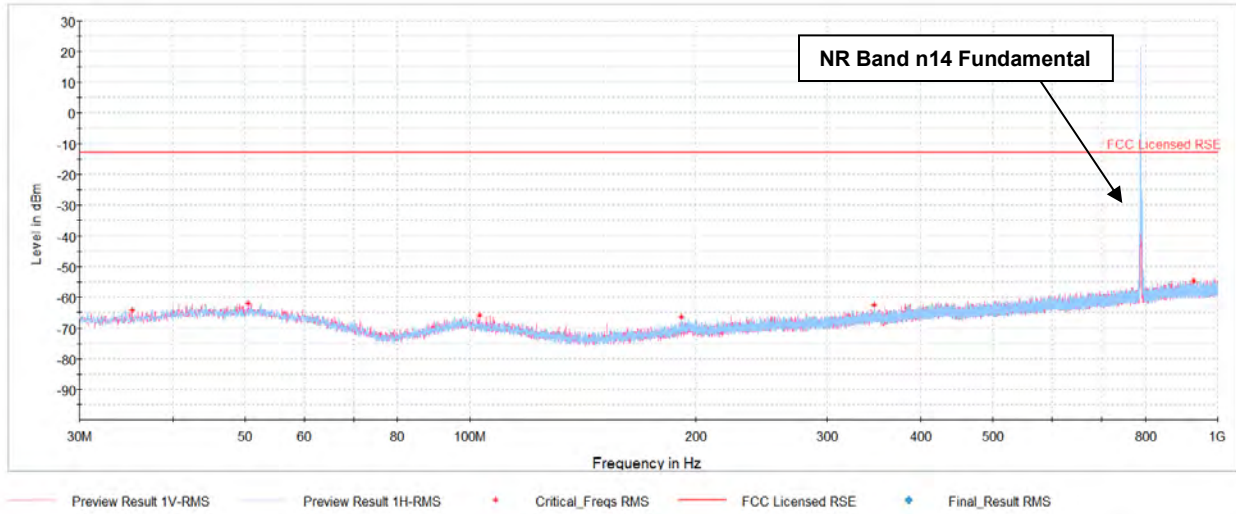
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1591.0	H	-	-	-72.85	-5.39	28.76	-66.47	-40.00	-26.47
2386.5	V	236	175	-67.57	-0.35	39.08	-56.15	-13.00	-43.15
3182.0	H	-	-	-75.47	0.82	32.35	-62.88	-13.00	-49.88
3977.5	H	-	-	-76.38	2.64	33.26	-61.97	-13.00	-48.97
4773.0	H	-	-	-77.92	4.88	33.96	-61.27	-13.00	-48.27

Table 7-27. Antenna 2 Radiated Spurious Data (LTE Band 14 – High Channel)

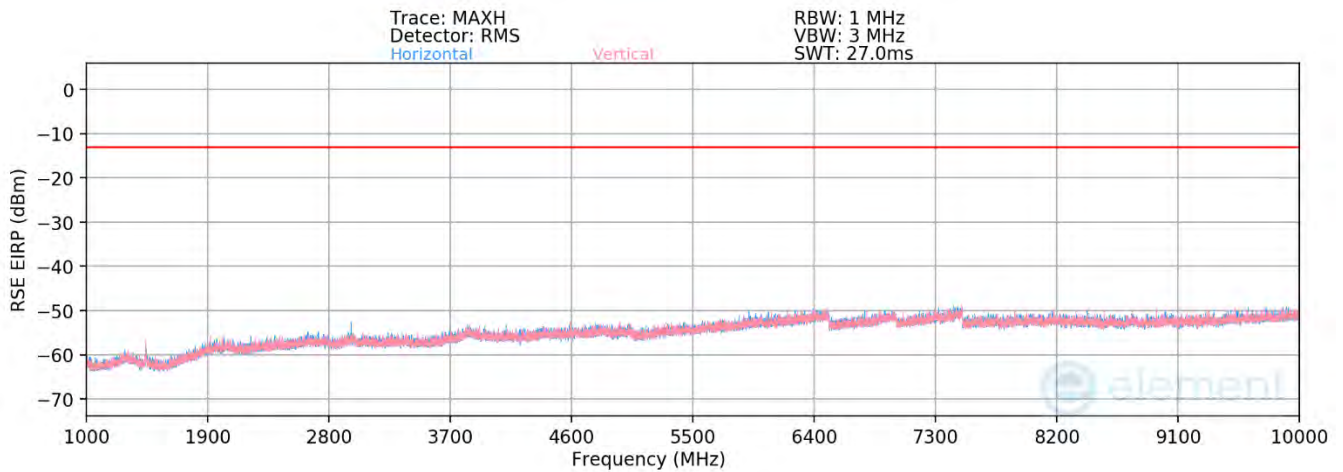
FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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## NR Band n14



**Plot 7-113. Antenna 4 Radiated Spurious Plot Below 1GHz (NR Band n14)**



**Plot 7-114. Antenna 4 Radiated Spurious Plot Above 1GHz (NR Band n14)**

FCC ID: BCGA2899	 PART 90 MEASUREMENT REPORT	Approved by: Technical Manager
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Bandwidth (MHz):	5
Frequency (MHz):	790.5
Modulation Signal:	QPSK
RB / Offset:	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1581.0	H	-	-	-75.29	-5.17	26.54	-68.69	-40.00	-28.69
2371.5	H	-	-	-76.10	-0.18	30.72	-64.51	-13.00	-51.51
3162.0	H	-	-	-76.22	1.32	32.10	-63.13	-13.00	-50.13

Table 7-28. Antenna 2 Radiated Spurious Data (NR Band n14 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	793.0
Modulation Signal:	QPSK
RB / Offset:	1 / 25


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1586.0	H	-	-	-75.19	-5.17	26.64	-68.59	-40.00	-28.59
2379.0	H	-	-	-75.87	-0.15	30.98	-64.25	-13.00	-51.25
3172.0	H	-	-	-76.33	1.35	32.02	-63.21	-13.00	-50.21

Table 7-29. Antenna 2 Radiated Spurious Data (NR Band n14 – Mid Channel)

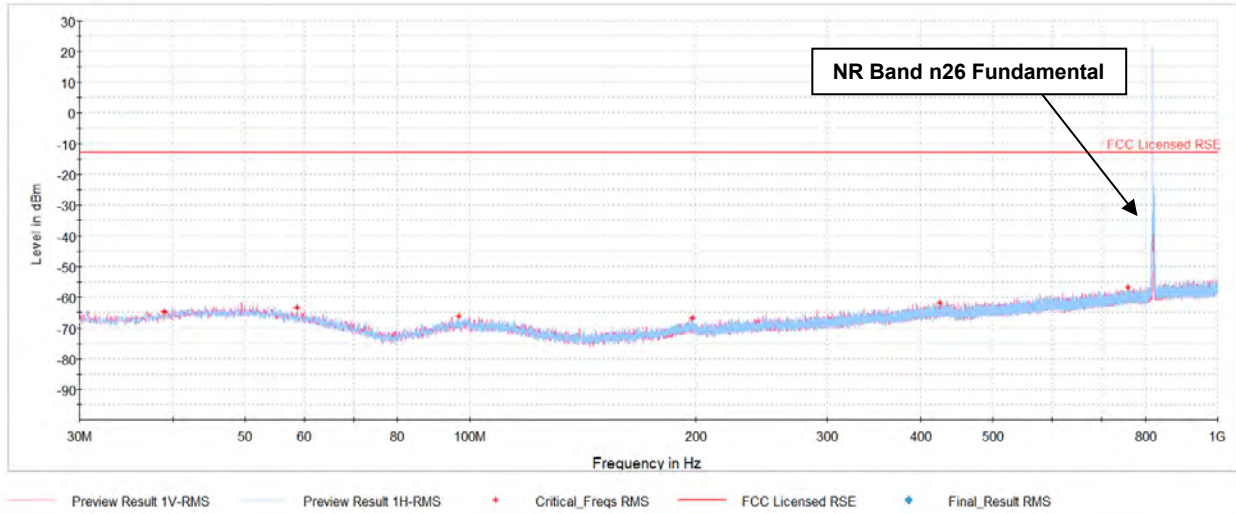
Bandwidth (MHz):	5
Frequency (MHz):	795.5
Modulation Signal:	QPSK
RB / Offset:	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1591.0	H	-	-	-75.00	-5.16	26.84	-68.39	-40.00	-28.39
2386.5	H	-	-	-75.83	-0.14	31.03	-64.20	-13.00	-51.20
3182.0	H	-	-	-76.17	1.29	32.12	-63.11	-13.00	-50.11

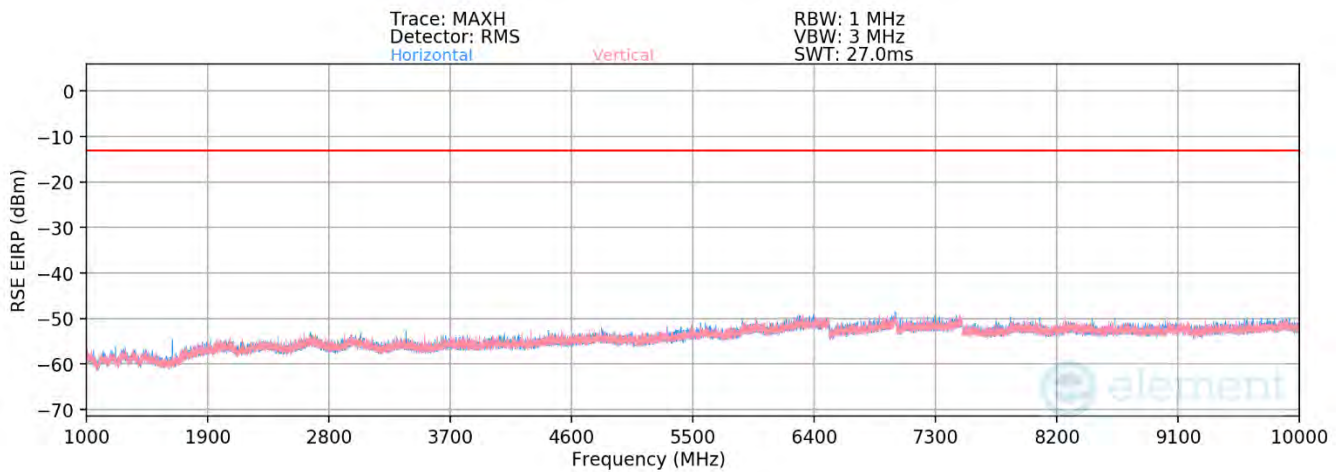
Table 7-30. Antenna 2 Radiated Spurious Data (NR Band n14 – High Channel)

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## NR Band n26



**Plot 7-115. Antenna 2 Radiated Spurious Plot Below 1GHz (NR Band n26)**



**Plot 7-116. Antenna 2 Radiated Spurious Plot Above 1GHz (NR Band n26)**

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Bandwidth (MHz):	5
Frequency (MHz):	816.5
Modulation Signal:	QPSK
RB / Offset:	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1633.0	H	187	152	-68.07	-5.49	33.44	-61.81	-13.00	-48.81
2449.5	H	-	-	-73.95	-0.70	32.35	-62.91	-13.00	-49.91
3266.0	H	-	-	-75.36	1.07	32.71	-62.55	-13.00	-49.55
4082.5	H	-	-	-76.57	3.14	33.57	-61.69	-13.00	-48.69

Table 7-31. Antenna 2 Radiated Spurious Data (NR Band n26 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	819.0
Modulation Signal:	QPSK
RB / Offset:	1 / 25


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1638.0	H	174	155	-66.48	-5.49	35.03	-60.23	-13.00	-47.23
2457.0	H	-	-	-73.97	-0.70	32.33	-62.92	-13.00	-49.92
3276.0	H	-	-	-75.23	1.21	32.98	-62.28	-13.00	-49.28
4095.0	H	-	-	-76.88	3.16	33.28	-61.98	-13.00	-48.98

Table 7-32. Antenna 2 Radiated Spurious Data (NR Band n26 – Mid Channel)

Bandwidth (MHz):	5
Frequency (MHz):	821.5
Modulation Signal:	QPSK
RB / Offset:	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1643.0	H	249	182	-66.90	-5.49	34.61	-60.65	-13.00	-47.65
2464.5	H	-	-	-74.08	-0.63	32.29	-62.97	-13.00	-49.97
3286.0	H	-	-	-75.24	1.21	32.97	-62.28	-13.00	-49.28
4107.5	H	-	-	-76.79	3.16	33.37	-61.88	-13.00	-48.88

Table 7-33. Antenna 2 Radiated Spurious Data (NR Band n26 – High Channel)

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## 7.8 Frequency Stability / Temperature Variation

~~§2.1055~~ §90.213

### Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015 and TIA-603-E-2016. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

***For Band 26, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Band 14 the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.***

### Test Procedure Used

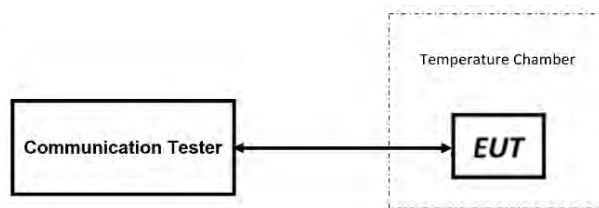
ANSI C63.26-2015

TIA-603-E-2016

### Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.


### Test Setup



**Figure 7-8. Test Instrument & Measurement Setup**

### Test Notes

All ports were tested and only the worst case data were reported.


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### Frequency Stability / Temperature Variation

LTE Band 26					
		Operating Frequency (GHz):		0.819	
		Ref. Voltage (VDC):		3.80	
		Deviation Limit:		± 0.00025% or 2.5 ppm	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (GHz)	Freq. Dev. (GHz)	Deviation (%)
100 %	3.80	-30	0.819000046	0.000000017	0.000002076
		-20	0.819000053	0.000000024	0.000002930
		-10	0.819000072	0.000000043	0.000005250
		0	0.818999996	-0.000000033	-0.000004029
		+ 10	0.819000002	-0.000000027	-0.000003297
		+20 (Ref)	0.819000029	0.000000000	0.000000000
		+ 30	0.819000060	0.000000031	0.000003785
		+ 40	0.819000000	-0.000000029	-0.000003541
		+ 50	0.819000061	0.000000032	0.000003907
Battery Endpoint	3.40	+ 20	0.819000072	0.000000043	0.000005250

Table 7-34. LTE Band 26 Frequency Stability Data

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LTE Band 14				
		Operating Band Lower Boundary (GHz)	0.788	
		Ref. Voltage (VDC):	3.80	
Voltage (%)	Power (VDC)	Temp (°C)	Measured Freq. (GHz)	Freq. Delta from Operating Range (GHz)
100 %	3.80	-30	0.788377452	-0.000377452
		-20	0.788378772	-0.000378772
		-10	0.788378629	-0.000378629
		0	0.788378561	-0.000378561
		+ 10	0.788377009	-0.000377009
		+20 (Ref)	0.788377121	-0.000377121
		+ 30	0.788376469	-0.000376469
		+ 40	0.788378651	-0.000378651
Battery Endpoint	3.40	+ 20	0.788378642	-0.000378642

Table 7-35. LTE Band 14 Lower Boundary Frequency Stability Data

LTE Band 14				
		Operating Band Upper Boundary (GHz)	0.798	
		Ref. Voltage (VDC):	3.80	
Voltage (%)	Power (VDC)	Temp (°C)	Measured Freq. (GHz)	Freq. Delta from Operating Range (GHz)
100 %	3.80	-30	0.797675341	-0.000324659
		-20	0.797674237	-0.000325763
		-10	0.797678659	-0.000321341
		0	0.797675309	-0.000324691
		+ 10	0.797678621	-0.000321379
		+20 (Ref)	0.797679648	-0.000320352
		+ 30	0.797677542	-0.000322458
		+ 40	0.797679672	-0.000320328
Battery Endpoint	3.40	+ 20	0.797677589	-0.000322411

Table 7-36. LTE Band 14 Upper Boundary Frequency Stability Data


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NR Band n14				
Operating Band Lower Boundary (GHz)		0.788		
Ref. Voltage (VDC):		3.80		
Voltage (%)	Power (VDC)	Temp (°C)	Measured Freq. (GHz)	Freq. Delta from Operating Range (GHz)
100 %	3.80	-30	0.788475647	-0.000475647
		-20	0.788477356	-0.000477356
		-10	0.788478356	-0.000478356
		0	0.788475235	-0.000475235
		+ 10	0.788476346	-0.000476346
		+20 (Ref)	0.788478567	-0.000478567
		+ 30	0.788476346	-0.000476346
		+ 40	0.788471212	-0.000471212
		+ 50	0.788473123	-0.000473123
Battery Endpoint	3.40	+ 20	0.788475126	-0.000475126

Table 7-37. NR Band n14 Lower Boundary Frequency Stability Data


NR Band n14				
Operating Band Upper Boundary (GHz)		0.798		
Ref. Voltage (VDC):		3.80		
Voltage (%)	Power (VDC)	Temp (°C)	Measured Freq. (GHz)	Freq. Delta from Operating Range (GHz)
100 %	3.80	-30	0.797893124	-0.000106876
		-20	0.797891226	-0.000108774
		-10	0.797891258	-0.000108742
		0	0.797892109	-0.000107891
		+ 10	0.797893129	-0.000106871
		+20 (Ref)	0.797894124	-0.000105876
		+ 30	0.797894125	-0.000105875
		+ 40	0.797895127	-0.000104873
		+ 50	0.797896142	-0.000103858
Battery Endpoint	3.40	+ 20	0.797895123	-0.000104877

Table 7-38. NR Band n14 Upper Boundary Frequency Stability Data

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NR Band n26					
		Operating Frequency (GHz):		0.819	
		Ref. Voltage (VDC):		3.80	
		Deviation Limit:		± 0.00025% or 2.5 ppm	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (GHz)	Freq. Dev. (GHz)	Deviation (%)
100 %	3.80	-30	0.819000004	-0.000000018	-0.000002198
		-20	0.819000045	0.000000023	0.000002808
		-10	0.819000053	0.000000031	0.000003785
		0	0.819000047	0.000000025	0.000003053
		+ 10	0.819000008	-0.000000014	-0.000001709
		+20 (Ref)	0.819000022	0.000000000	0.000000000
		+ 30	0.819000005	-0.000000017	-0.000002076
		+ 40	0.819000046	0.000000024	0.000002930
		+ 50	0.819000053	0.000000031	0.000003785
Battery Endpoint	3.40	+ 20	0.819000042	0.000000020	0.000002442

Table 7-39. NR Band n26 Frequency Stability Data

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## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Apple Tablet Device FCC ID: BCGA2899** complies with all the requirements of Part 90 of the FCC rules.

<b>FCC ID:</b> BCGA2899	 <b>PART 90 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1C2311270066-14.BCG	<b>Test Dates:</b> 10/01/2023 - 3/25/2024	<b>EUT Type:</b> Tablet Device	Page 101 of 101

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