



## ELEMENT WASHINGTON DC LLC

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### PART 24 MEASUREMENT REPORT

**Applicant Name:**

Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052  
United States

**Date of Testing:**

12/3/2024 - 2/14/2025

**Test Report Issue Date:**

4/17/2025

**Test Site/Location:**

Element Lab., Columbia, MD, USA

**Test Report Serial No.:**

1M2411190103-02-R1.C3K

**FCC ID:**

C3K2114

**APPLICANT:**

Microsoft Corporation

**Application Type:**

Certification

**Model:**

2114

**EUT Type:**

Full Modular

**FCC Classification:**

PCS Licensed Transmitter (PCB)

**FCC Rule Part:**

24

**Test Procedure(s):**

ANSI C63.26-2015

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.

This revised Test Report (S/N: 1M2411190103-02-R1.C3K) supersedes and replaces the previously issued test report (S/N: 1M2411190103-02.C3K) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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



CERT #2041.01

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V11.2 09/11/2024

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Antenna-1						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
WCDMA	N/A	Spread Spectrum	1852.4 - 1907.6	1.469	31.67	4M17F9W
LTE Band 25/2	20 MHz	QPSK	1860 - 1905	1.494	31.74	18M0G7D
		16QAM	1860 - 1905	1.372	31.37	18M1W7D
	15 MHz	QPSK	1857.5 - 1907.5	1.581	31.99	13M5G7D
		16QAM	1857.5 - 1907.5	1.297	31.13	13M6W7D
	10 MHz	QPSK	1855 - 1910	1.598	32.03	9M02G7D
		16QAM	1855 - 1910	1.311	31.17	9M05W7D
	5 MHz	QPSK	1852.5 - 1912.5	1.574	31.97	4M54G7D
		16QAM	1852.5 - 1912.5	1.333	31.25	4M52W7D
	3 MHz	QPSK	1851.5 - 1913.5	1.553	31.91	2M71G7D
		16QAM	1851.5 - 1913.5	1.336	31.26	2M72W7D
	1.4 MHz	QPSK	1850.7 - 1914.3	1.554	31.91	1M11G7D
		16QAM	1850.7 - 1914.3	1.331	31.24	1M11W7D
NR Band n25/2	40 MHz	$\pi/2$ BPSK	1870 - 1895	1.710	32.33	38M7G7D
		QPSK	1870 - 1895	1.750	32.43	38M8G7D
		16QAM	1870 - 1895	1.334	31.25	38M7W7D
	35 MHz	$\pi/2$ BPSK	1867.5 - 1897.5	1.554	31.91	32M4G7D
		QPSK	1867.5 - 1897.5	1.580	31.99	33M7G7D
		16QAM	1867.5 - 1897.5	1.268	31.03	33M7W7D
	30 MHz	$\pi/2$ BPSK	1865 - 1900	1.660	32.20	28M7G7D
		QPSK	1865 - 1900	1.774	32.49	28M8G7D
		16QAM	1865 - 1900	1.380	31.40	28M8W7D
	25 MHz	$\pi/2$ BPSK	1862.5 - 1902.5	1.734	32.39	23M0G7D
		QPSK	1862.5 - 1902.5	1.738	32.40	23M9G7D
		16QAM	1862.5 - 1902.5	1.318	31.20	24M0W7D
	20 MHz	$\pi/2$ BPSK	1860 - 1905	1.718	32.35	18M0G7D
		QPSK	1860 - 1905	1.714	32.34	19M0G7D
		16QAM	1860 - 1905	1.285	31.09	19M1W7D
	15 MHz	$\pi/2$ BPSK	1857.5 - 1907.5	1.718	32.35	13M5G7D
		QPSK	1857.5 - 1907.5	1.746	32.42	14M2G7D
		16QAM	1857.5 - 1907.5	1.365	31.35	14M2W7D
	10 MHz	$\pi/2$ BPSK	1855 - 1910	1.706	32.32	9M01G7D
		QPSK	1855 - 1910	1.675	32.24	9M34G7D
		16QAM	1855 - 1910	1.312	31.18	9M35W7D
	5 MHz	$\pi/2$ BPSK	1852.5 - 1912.5	1.675	32.24	4M52G7D
		QPSK	1852.5 - 1912.5	1.679	32.25	4M52G7D
		16QAM	1852.5 - 1912.5	1.318	31.20	4M50W7D

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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 Test Location

Measurements were conducted at the Element laboratory(ies) indicated in Section 1.3 below. All measurement facilities are 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 lab located in Columbia, MD 21046, U.S.A.**

- Element Washington DC LLC is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- 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 Washington DC LLC facility is a registered (2451B) 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 Recognition Agreements (MRAs).

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Microsoft Corporation Full Modular FCC ID: C3K2114**. 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 24 and RSS-133.

**Test Device Serial No.:** 004400152020002 (EV2#37, EV2#47, EV2#48, EV2#41)

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1700/1900 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR (FR1)

### 2.3 Test Configuration

The EUT was tested per the guidance of ANSI C63.26-2015. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

### 2.4 Software and Firmware

Testing was performed on device(s) using software/firmware version 250129-XXX-de2e260-00452-1 installed on the EUT.

### 2.5 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 “American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services” (ANSI C63.26-2015) 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, the field strength conversion method is used per the formulas in Section 5.2.7 of ANSI C63.26-2015. 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. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 414788 D01 v01r01.

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

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## 4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{\text{CISPR}}$  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	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

**Table 4-1. Measurement Uncertainty Budget**

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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
-	LTX1	Licensed Transmitter Cable Set	4/2/2024	Annual	4/2/2025	LTX1
-	LTX2	Licensed Transmitter Cable Set	4/2/2024	Annual	4/2/2025	LTX2
-	LTX3	Licensed Transmitter Cable Set	4/2/2024	Annual	4/2/2025	LTX3
-	WL25-1	Conducted Cable Set (25GHz)	4/2/2024	Annual	4/2/2025	WL25-1
-	WL40-1	Conducted Cable Set (40GHz)	4/2/2024	Annual	4/2/2025	WL40-1
Agilent	N9020A	MXA Signal Analyzer	3/22/2024	Annual	3/22/2025	US46470561
Agilent	N9038A	MXE EMI Receiver	9/16/2024	Annual	9/16/2025	MY51210133
Agilent	N9030A	PXA Signal Analyzer (44GHz)	4/9/2024	Annual	4/9/2025	MY52350166
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6201381794
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6200901190
Emco	3115	Horn Antenna (1-18GHz)	6/7/2024	Biennial	6/7/2026	150693
Espec	ESK-2CA	Environmental Chamber	7/5/2023	Annual	7/5/2025	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/29/2023	Biennial	3/29/2025	128337
Keysight Technologies	N9030A	PXA Signal Analyzer (3Hz-26.5GHz)	8/26/2024	Annual	8/26/2025	MY54490576
Keysight Technologies	N9020A	MXA Signal Analyzer	4/11/2024	Annual	4/11/2025	MY54500644
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			102060
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	10/16/2024	Annual	10/16/2025	100342
Rohde & Schwarz	FSW67	Signal/ Spectrum Analyzer	2/15/2024	Annual	2/15/2025	103200
Sunol	DRH- 118	Horn Antenna (1-18GHz)	2/21/2024	Biennial	2/21/2026	A050307
Sunol	DRH- 118	Horn Antenna (1-18 GHz)	2/13/2024	Biennial	2/13/2026	A042511
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	9/11/2024	Biennial	9/11/2026	A051107

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

### Notes:

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

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## 6.0 SAMPLE EMISSION DESIGNATORS

### WCDMA Emission Designator

#### **Emission Designator = 4M16F9W**

WCDMA BW = 4.16 MHz  
 F = Frequency Modulation  
 9 = Composite Digital Info  
 W = Combination (Audio/Data)

### QPSK Modulation

#### **Emission Designator = 8M62G7D**

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

### QAM Modulation

#### **Emission Designator = 8M45W7D**

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

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## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Microsoft Corporation  
 FCC ID: C3K2114  
 FCC Classification: PCS Licensed Transmitter (PCB)  
 Mode(s): WCDMA/LTE/NR/ULCA

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
<b>CONDUCTED</b>	Transmitter Conducted Output Power	2.1046(a), 2.1046(c)	N/A	PASS	Section 7.2
	Equivalent Isotropic Radiated Power	24.232(c)	< 2 Watts max. EIRP	PASS	Section 7.2
	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3
	Conducted Band Edge / Spurious Emissions	2.1051, 24.238(a)	> 43 + 10log10(P[Watts]) at Band Edge and for all out-of-band emissions	PASS	Sections 7.4, 7.5
	Peak-to-Average Ratio	24.232(d)	≤ 13 dB	PASS	Section 7.6
	Frequency Stability	2.1055, 24.235	Fundamental emissions stay within authorized frequency block **Carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm	PASS	Section 7.8
<b>RADIATED</b>	Radiated Spurious Emissions	2.1053, 24.238(a)	≥ 43 + 10 log (P[Watts]) dB of attenuation below transmitter power **Spurious emissions from receivers shall not exceed the limits detailed in RSS-Gen(7.3)	PASS	Section 7.7

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

#### Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. 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) All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized is EMC Software Tool v2.3.0.

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## 7.2 Conducted Output Power Data and EIRP

### Test Overview

All emissions are measured with a callbox connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

### Test Procedure Used

ANSI C63.26-2015 – Section 5.2

### 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

1. Uplink carrier aggregation is only supported in this EUT while operating in Power Class 3.
2. Conducted power measurements were evaluated using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.
3. Conducted power was found to reduce for the higher order QAM modulations when compared to 16QAM. Due to this trend, only the worst-case QAM (16QAM) powers are included in this section.
4. EIRP is calculated using conducted power and antenna gain.
5. This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest powers are reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1".
6. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) 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.

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Power State	Band	Bandwidth (PCC + SCC)	PCC				SCC					ULCA Tx.	
			Modulatio	UL	UL	UL # RB	UL RB	Modulatio	UL	UL	UL # RB	UL RB	Power
Max	LTE B2	20MHz + 20MHz	QPSK	18700	1860.0	1	99	QPSK	18898	1879.8	1	0	24.90
				18900	1880.0	1	99		19098	1899.8	1	0	24.98
				19100	1900.0	1	0		18902	1880.2	1	99	23.37
			QPSK	18900	1880	100	0	QPSK	19098	1899.8	100	0	23.06
			16-QAM	18900	1880	100	0	16-QAM	19098	1899.8	100	0	22.01
			64-QAM	18900	1880	100	0	64-QAM	19098	1899.8	100	0	22.13
			256-QAM	18900	1880	100	0	256-QAM	19098	1899.8	100	0	20.12

Table 7-2. Conducted Output Power Data (ULCA Band 2 – Ant 1)

Frequency [MHz]	Mode	Conducted Power [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	24.14	7.50	31.64	1.458	33.01	-1.37
1880.00	WCDMA1900	24.01	7.50	31.51	1.415	33.01	-1.50
1907.60	WCDMA1900	24.17	7.50	31.67	1.469	33.01	-1.34

Table 7-3. Conducted Output Power Data and EIRP Data (WCDMA PCS – Ant 1)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	QPSK	26140	1860.0	1 / 50	24.24	7.50	31.74	1.494	33.01	-1.27
		26365	1882.5	1 / 0	24.04	7.50	31.54	1.425	33.01	-1.47
		26590	1905.0	1 / 0	24.05	7.50	31.55	1.427	33.01	-1.47
	16-QAM	26140	1860.0	1 / 50	23.87	7.50	31.37	1.372	33.01	-1.64
15 MHz	QPSK	26115	1857.5	1 / 0	24.49	7.50	31.99	1.582	33.01	-1.02
		26365	1882.5	1 / 37	24.19	7.50	31.69	1.477	33.01	-1.32
		26615	1907.5	1 / 37	24.00	7.50	31.50	1.413	33.01	-1.51
	16-QAM	26115	1857.5	1 / 74	23.63	7.50	31.13	1.297	33.01	-1.88
10 MHz	QPSK	26090	1855.0	1 / 0	24.53	7.50	32.03	1.598	33.01	-0.98
		26365	1882.5	1 / 49	24.09	7.50	31.59	1.442	33.01	-1.42
		26640	1910.0	1 / 25	24.18	7.50	31.68	1.471	33.01	-1.33
	16-QAM	26090	1855.0	1 / 25	23.67	7.50	31.17	1.311	33.01	-1.84
5 MHz	QPSK	26065	1852.5	1 / 0	24.47	7.50	31.97	1.574	33.01	-1.04
		26365	1882.5	1 / 0	23.99	7.50	31.49	1.410	33.01	-1.52
		26665	1912.5	1 / 12	24.30	7.50	31.80	1.515	33.01	-1.21
	16-QAM	26065	1852.5	1 / 12	23.75	7.50	31.25	1.333	33.01	-1.76
3 MHz	QPSK	26055	1851.5	1 / 7	24.41	7.50	31.91	1.553	33.01	-1.10
		26365	1882.5	1 / 7	24.13	7.50	31.63	1.454	33.01	-1.38
		26675	1913.5	1 / 0	24.29	7.50	31.79	1.509	33.01	-1.22
	16-QAM	26055	1851.5	1 / 14	23.76	7.50	31.26	1.336	33.01	-1.75
1.4 MHz	QPSK	26047	1850.7	1 / 3	24.41	7.50	31.91	1.554	33.01	-1.10
		26365	1882.5	1 / 3	24.25	7.50	31.75	1.496	33.01	-1.26
		26683	1914.3	1 / 0	24.15	7.50	31.65	1.461	33.01	-1.36
	16-QAM	26047	1850.7	1 / 3	23.74	7.50	31.24	1.331	33.01	-1.77

Table 7-4. Conducted Output Power Data and EIRP Data (LTE Band 25/2 – Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
40 MHz	$\pi/2$ BPSK	374000	1870.0	1 / 1	24.83	7.50	32.33	1.710	33.01	-0.68
		376500	1882.5	1 / 1	24.74	7.50	32.24	1.675	33.01	-0.77
		379000	1895.0	1 / 1	24.61	7.50	32.11	1.626	33.01	-0.90
	QPSK	374000	1870.0	1 / 1	24.93	7.50	32.43	1.750	33.01	-0.58
		376500	1882.5	1 / 1	24.72	7.50	32.22	1.667	33.01	-0.79
		379000	1895.0	1 / 1	24.70	7.50	32.20	1.660	33.01	-0.81
	16-QAM	374000	1870.0	1 / 1	23.75	7.50	31.25	1.334	33.01	-1.76
35 MHz	$\pi/2$ BPSK	373500	1867.5	1 / 1	24.38	7.50	31.88	1.542	33.01	-1.13
		376500	1882.5	1 / 186	24.34	7.50	31.84	1.526	33.01	-1.18
		379500	1897.5	1 / 94	24.41	7.50	31.91	1.554	33.01	-1.10
	QPSK	373500	1867.5	1 / 1	24.32	7.50	31.82	1.521	33.01	-1.19
		376500	1882.5	1 / 186	24.40	7.50	31.90	1.547	33.01	-1.11
		379500	1897.5	1 / 186	24.49	7.50	31.99	1.580	33.01	-1.02
	16-QAM	376500	1882.5	1 / 94	23.53	7.50	31.03	1.268	33.01	-1.98
30 MHz	$\pi/2$ BPSK	372000	1865.0	1 / 158	24.55	7.50	32.05	1.603	33.01	-0.96
		376500	1882.5	1 / 1	24.70	7.50	32.20	1.660	33.01	-0.81
		381000	1900.0	1 / 1	24.52	7.50	32.02	1.592	33.01	-0.99
	QPSK	372000	1865.0	1 / 1	24.99	7.50	32.49	1.774	33.01	-0.52
		376500	1882.5	1 / 1	24.75	7.50	32.25	1.679	33.01	-0.76
		381000	1900.0	1 / 1	24.62	7.50	32.12	1.629	33.01	-0.89
	16-QAM	372000	1865.0	1 / 1	23.90	7.50	31.40	1.380	33.01	-1.61
25 MHz	$\pi/2$ BPSK	372000	1862.5	1 / 1	24.89	7.50	32.39	1.734	33.01	-0.62
		376500	1882.5	1 / 1	24.68	7.50	32.18	1.652	33.01	-0.83
		381000	1902.5	1 / 1	24.50	7.50	32.00	1.585	33.01	-1.01
	QPSK	372000	1862.5	1 / 1	24.90	7.50	32.40	1.738	33.01	-0.61
		376500	1882.5	1 / 1	24.67	7.50	32.17	1.648	33.01	-0.84
		381000	1902.5	1 / 131	24.58	7.50	32.08	1.614	33.01	-0.93
	16-QAM	372000	1862.5	1 / 1	23.70	7.50	31.20	1.318	33.01	-1.81
20 MHz	$\pi/2$ BPSK	372000	1860.0	1 / 53	24.85	7.50	32.35	1.718	33.01	-0.66
		376500	1882.5	1 / 1	24.69	7.50	32.19	1.656	33.01	-0.82
		381000	1905.0	1 / 1	24.57	7.50	32.07	1.611	33.01	-0.94
	QPSK	372000	1860.0	1 / 53	24.84	7.50	32.34	1.714	33.01	-0.67
		376500	1882.5	1 / 104	24.62	7.50	32.12	1.629	33.01	-0.89
		381000	1905.0	1 / 1	24.61	7.50	32.11	1.626	33.01	-0.90
	16-QAM	381000	1905.0	1 / 1	23.59	7.50	31.09	1.285	33.01	-1.92
15 MHz	$\pi/2$ BPSK	371500	1857.5	1 / 77	24.85	7.50	32.35	1.718	33.01	-0.66
		376500	1882.5	1 / 77	24.60	7.50	32.10	1.622	33.01	-0.91
		381500	1907.5	1 / 1	24.52	7.50	32.02	1.592	33.01	-0.99
	QPSK	371500	1857.5	1 / 1	24.92	7.50	32.42	1.746	33.01	-0.59
		376500	1882.5	1 / 1	24.63	7.50	32.13	1.633	33.01	-0.88
		381500	1907.5	1 / 1	24.60	7.50	32.10	1.622	33.01	-0.91
	16-QAM	371500	1857.5	1 / 1	23.85	7.50	31.35	1.365	33.01	-1.66
10 MHz	$\pi/2$ BPSK	371000	1855.0	1 / 1	24.82	7.50	32.32	1.706	33.01	-0.69
		376500	1882.5	1 / 1	24.38	7.50	31.88	1.542	33.01	-1.13
		382000	1910.0	1 / 1	24.39	7.50	31.89	1.545	33.01	-1.12
	QPSK	371000	1855.0	1 / 26	24.74	7.50	32.24	1.675	33.01	-0.77
		376500	1882.5	1 / 1	24.36	7.50	31.86	1.535	33.01	-1.15
		382000	1910.0	1 / 26	24.39	7.50	31.89	1.545	33.01	-1.12
	16-QAM	371000	1855.0	1 / 1	23.68	7.50	31.18	1.312	33.01	-1.83
5 MHz	$\pi/2$ BPSK	370500	1852.5	1 / 1	24.74	7.50	32.24	1.675	33.01	-0.77
		376500	1882.5	1 / 23	24.50	7.50	32.00	1.585	33.01	-1.01
		382500	1912.5	1 / 1	24.27	7.50	31.77	1.503	33.01	-1.24
	QPSK	370500	1852.5	1 / 23	24.75	7.50	32.25	1.679	33.01	-0.76
		376500	1882.5	1 / 1	24.42	7.50	31.92	1.556	33.01	-1.09
		382500	1912.5	1 / 1	24.39	7.50	31.89	1.545	33.01	-1.12
	16-QAM	370500	1852.5	1 / 1	23.70	7.50	31.20	1.318	33.01	-1.81

**Table 7-5. Conducted Output Power Data and EIRP Data (NR Band n25/2 – Ant 1)**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## 7.3 Occupied Bandwidth

### Test Overview

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

### Test Procedure Used

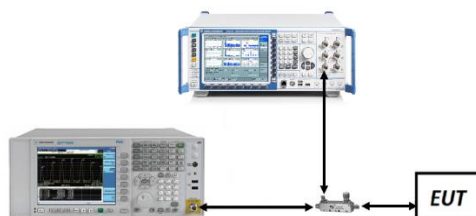
ANSI C63.26-2015 – Section 5.4.4

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

### Test Notes

None.

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Mode	Bandwidth	Modulation	OBW [MHz]
WCDMA-PCS	N/A	Spread Spectrum	4.171
LTE-B25-2	20MHz	QPSK	18.03
		16QAM	18.09
	15MHz	QPSK	13.52
		16QAM	13.56
	10MHz	QPSK	9.02
		16QAM	9.05
	5MHz	QPSK	4.54
		16QAM	4.52
	3MHz	QPSK	2.71
		16QAM	2.72
	1.4MHz	QPSK	1.11
		16QAM	1.11

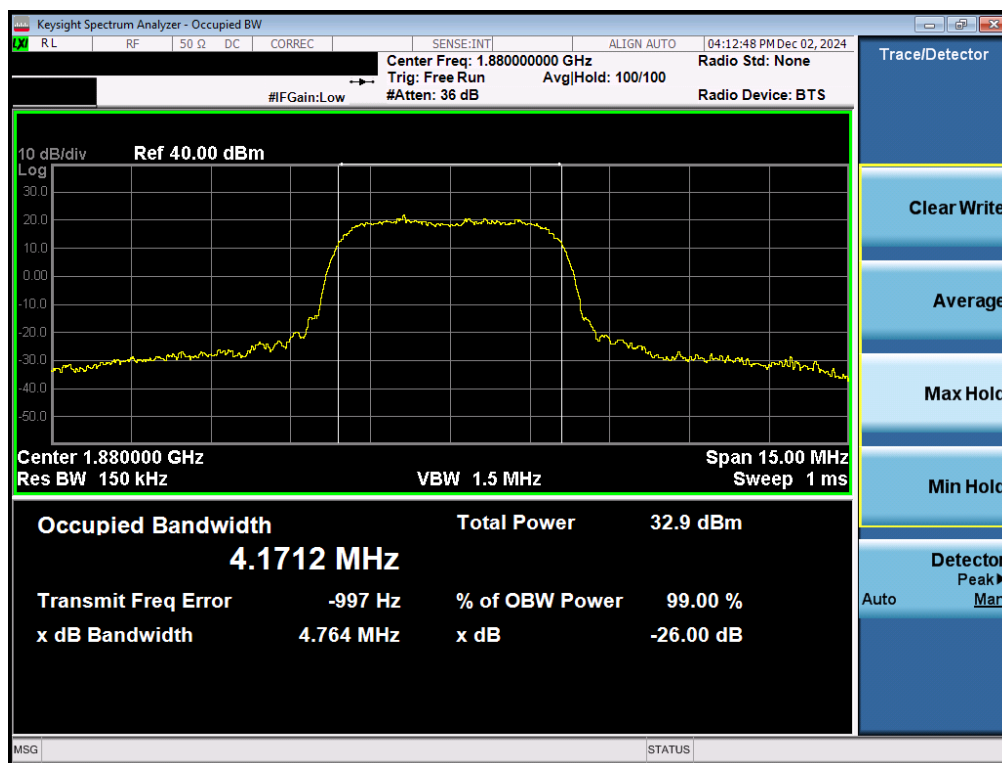
**Table 7-6. Occupied Bandwidth Test Results – Ant 1**

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n25	40MHz	BPSK	38.72
		QPSK	38.79
		16QAM	38.72
	35MHz	BPSK	32.42
		QPSK	33.70
		16QAM	33.72
	30MHz	BPSK	28.71
		QPSK	28.80
		16QAM	28.75
NR-n25-2	25MHz	BPSK	23.04
		QPSK	23.93
		16QAM	23.96
	20MHz	BPSK	18.03
		QPSK	18.97
		16QAM	19.07
	15MHz	BPSK	13.52
		QPSK	14.21
		16QAM	14.17
	10MHz	BPSK	9.01
		QPSK	9.34
		16QAM	9.35
	5MHz	BPSK	4.52
		QPSK	4.52
		16QAM	4.50

**Table 7-7. Occupied Bandwidth Test Results – Ant 1**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## WCDMA PCS – Ant 1

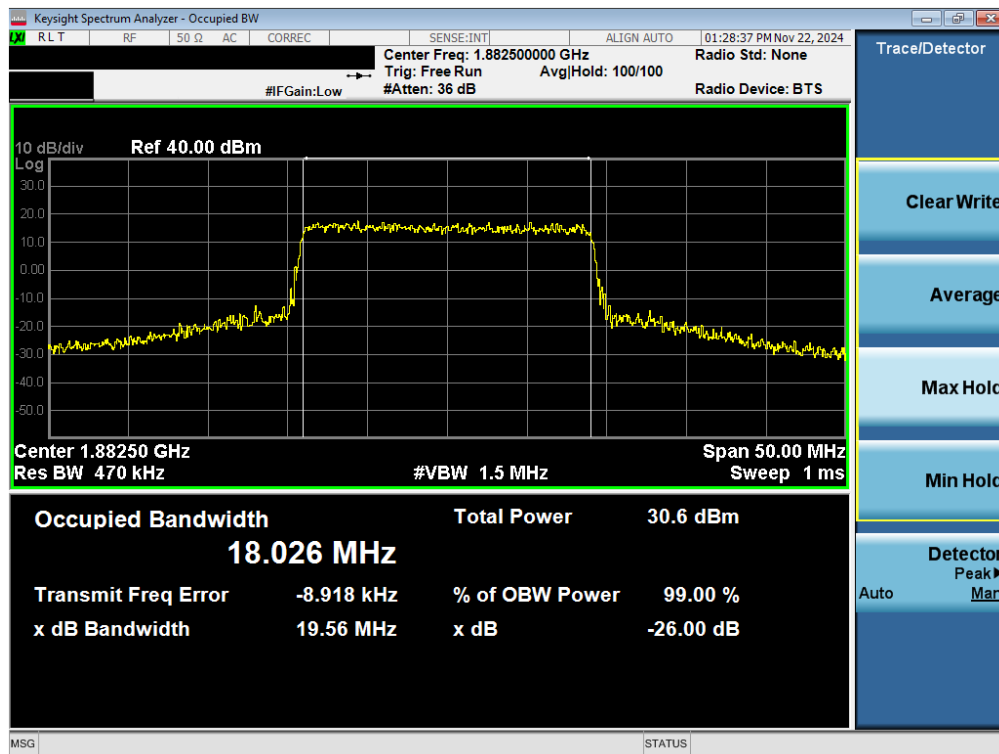


Plot 7-1. Occupied Bandwidth Plot (WCDMA, Ch. 9400 - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## LTE Band 25/2 – Ant 1

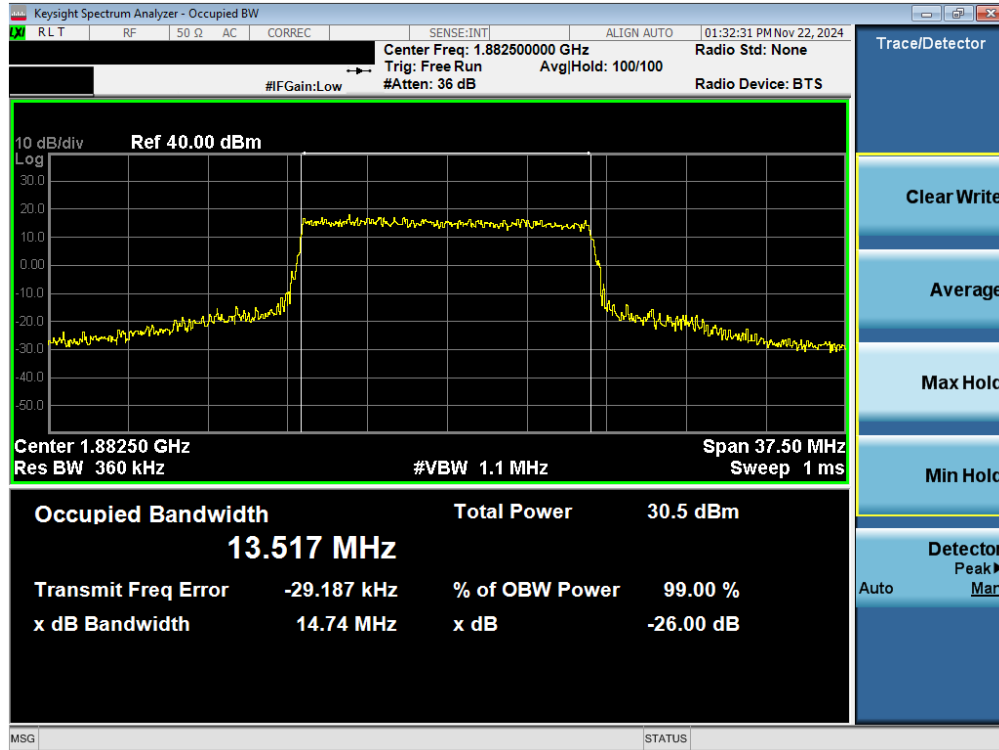


Plot 7-2. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz QPSK - Full RB - Ant 1)



Plot 7-3. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz 16-QAM - Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-4. Occupied Bandwidth Plot (LTE Band 25/2 - 15MHz QPSK - Full RB - Ant 1)



Plot 7-5. Occupied Bandwidth Plot (LTE Band 25/2 - 15MHz 16-QAM - Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-6. Occupied Bandwidth Plot (LTE Band 25/2 - 10MHz QPSK - Full RB - Ant 1)

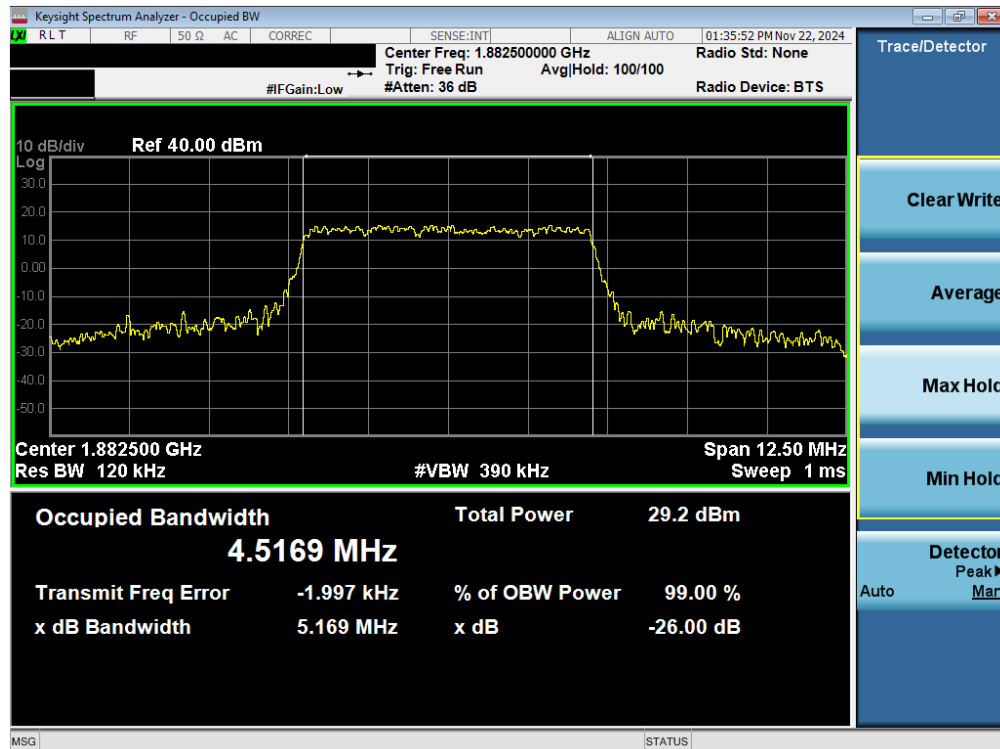


Plot 7-7. Occupied Bandwidth Plot (LTE Band 25/2 - 10MHz 16-QAM - Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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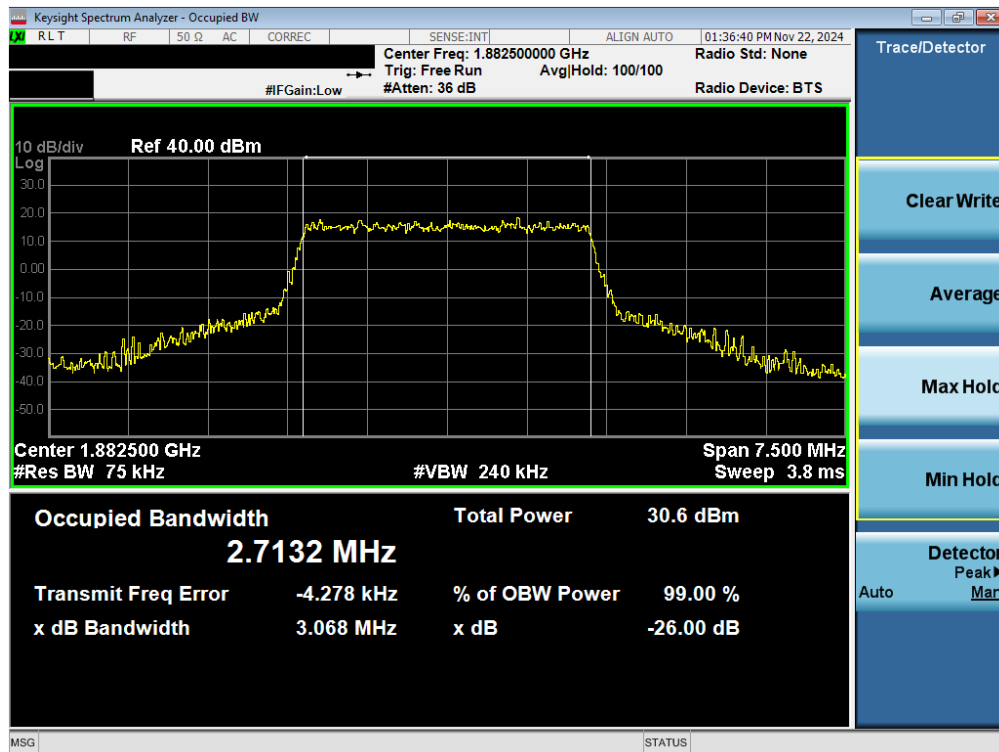


Plot 7-8. Occupied Bandwidth Plot (LTE Band 25/2 - 5MHz QPSK - Full RB - Ant 1)

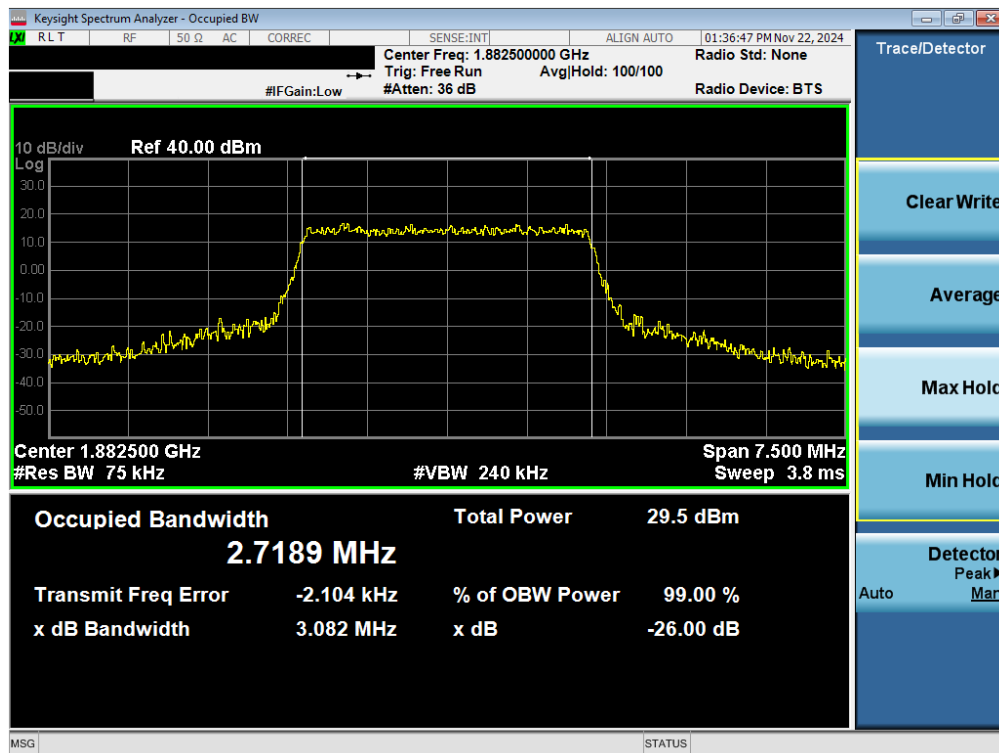


Plot 7-9. Occupied Bandwidth Plot (LTE Band 25/2 - 5MHz 16-QAM - Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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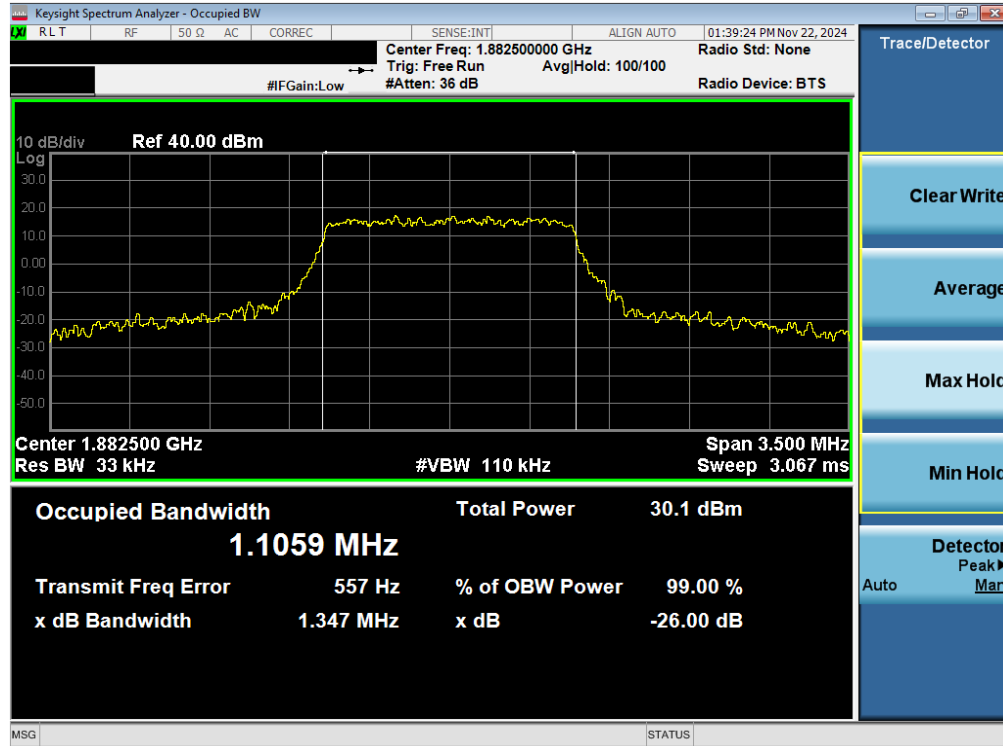


Plot 7-10. Occupied Bandwidth Plot (LTE Band 25/2 - 3MHz QPSK - Full RB - Ant 1)

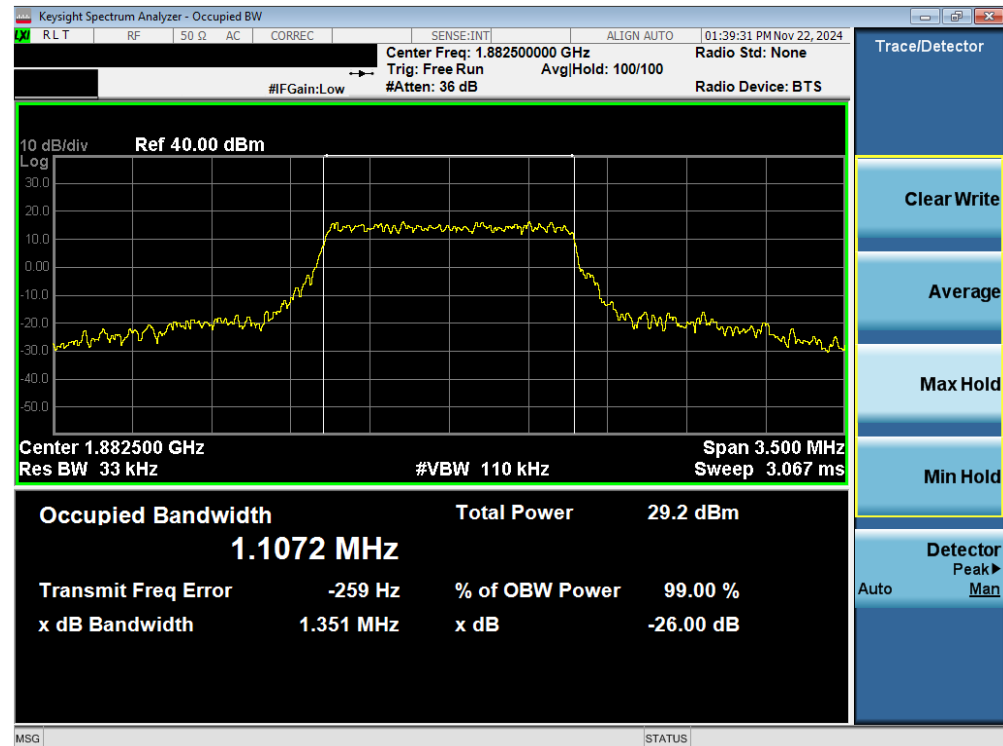


Plot 7-11. Occupied Bandwidth Plot (LTE Band 25/2 - 3MHz 16-QAM - Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 21 of 81



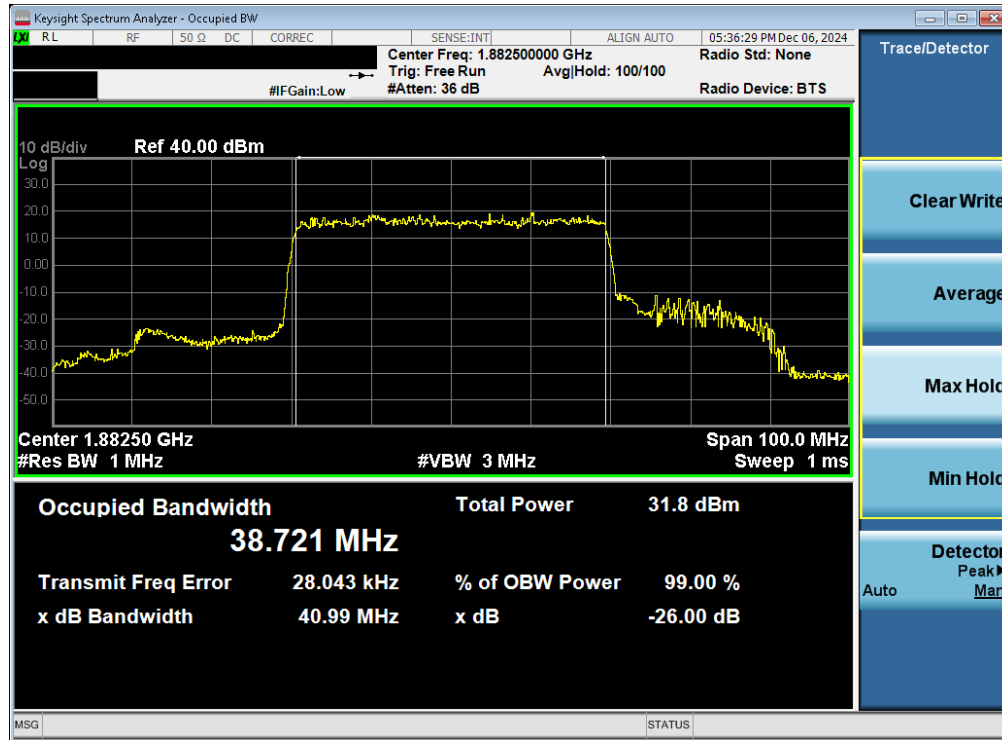
Plot 7-12. Occupied Bandwidth Plot (LTE Band 25/2 - 1.4MHz QPSK - Full RB - Ant 1)



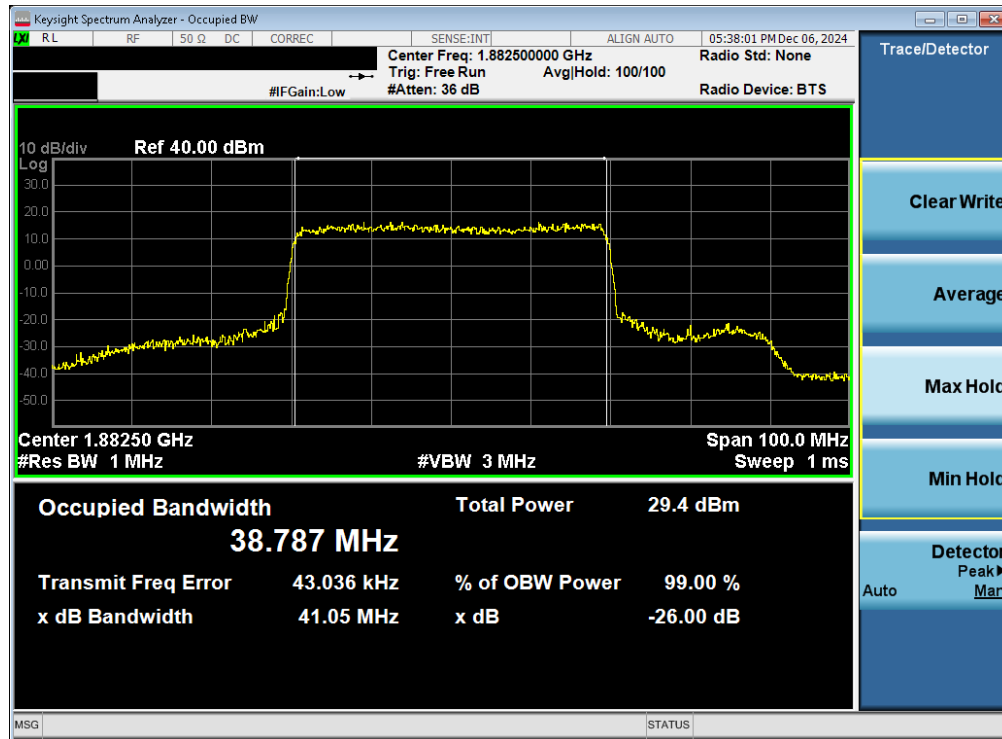
Plot 7-13. Occupied Bandwidth Plot (LTE Band 25/2 - 1.4MHz 16-QAM - Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## NR Band n25/2 – Ant 1

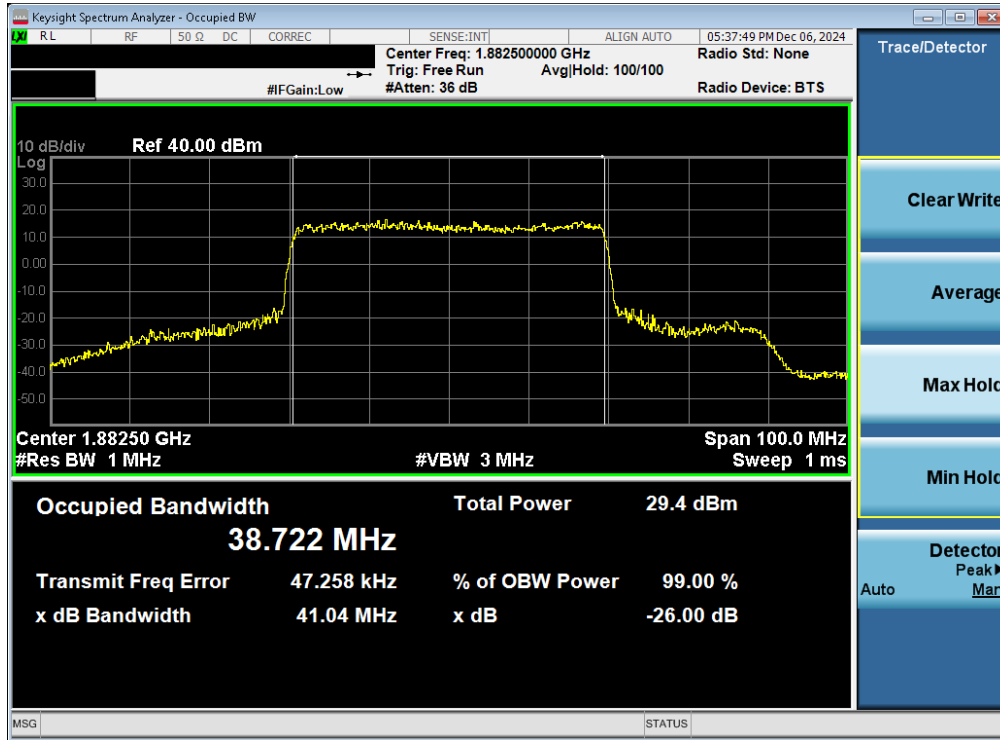


Plot 7-14. Occupied Bandwidth Plot (NR Band n25 - 40.0MHz DFT-s-OFDM BPSK - Full RB - ANT 1)

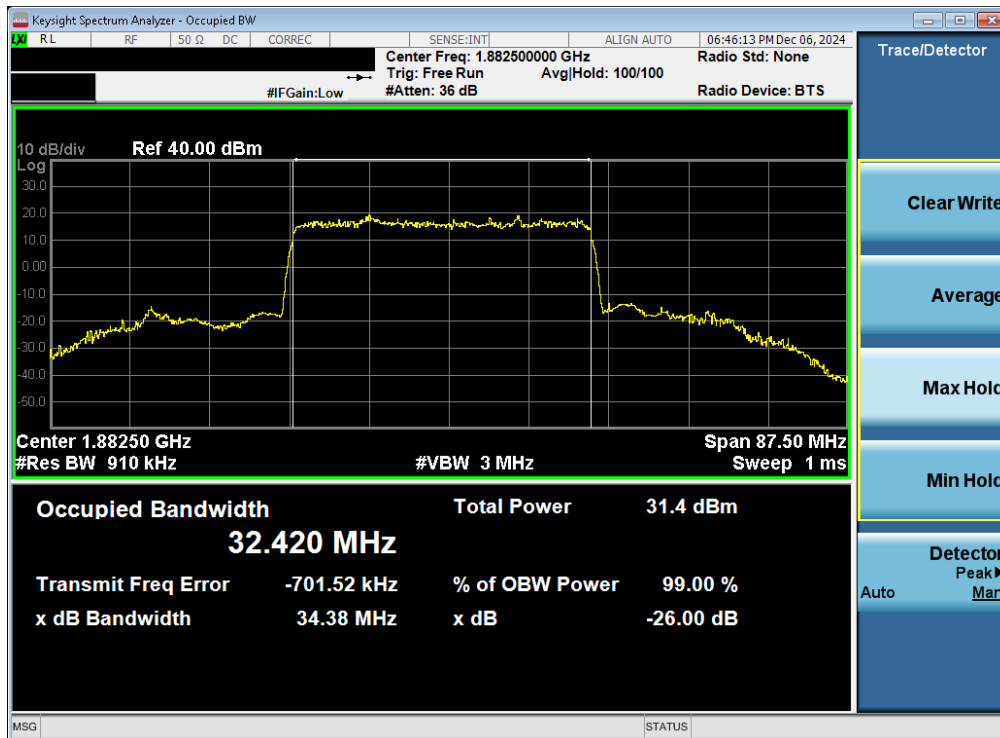


Plot 7-15. Occupied Bandwidth Plot (NR Band n25 - 40.0MHz CP-OFDM QPSK - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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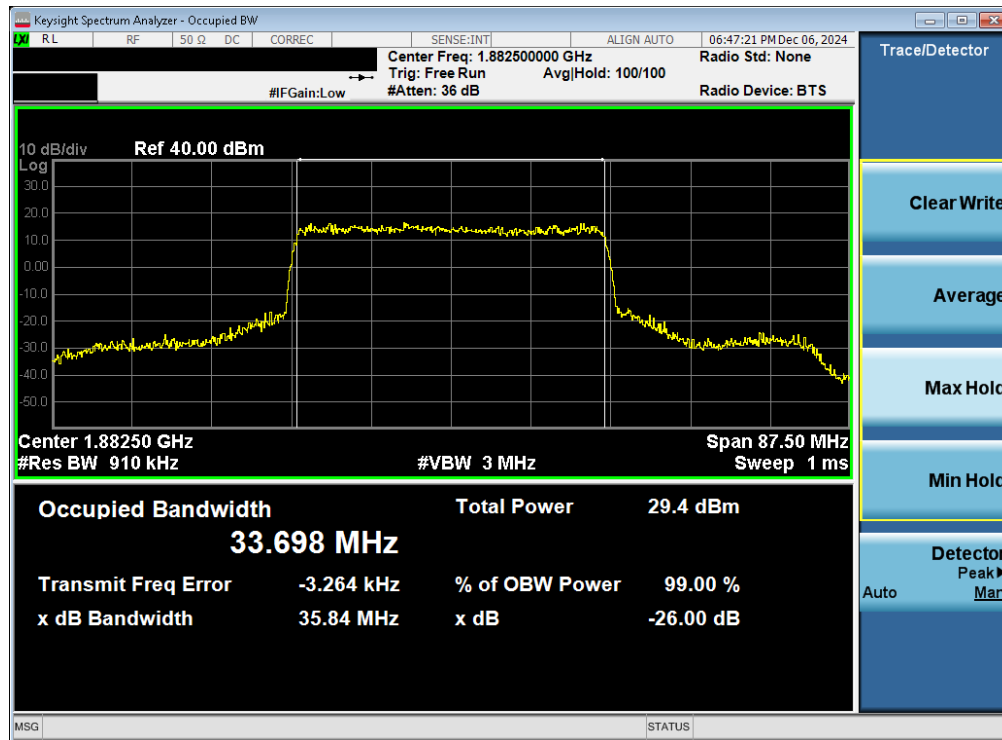
Plot 7-16. Occupied Bandwidth Plot (NR Band n25 - 40.0MHz CP-OFDM 16QAM - Full RB - ANT 1)



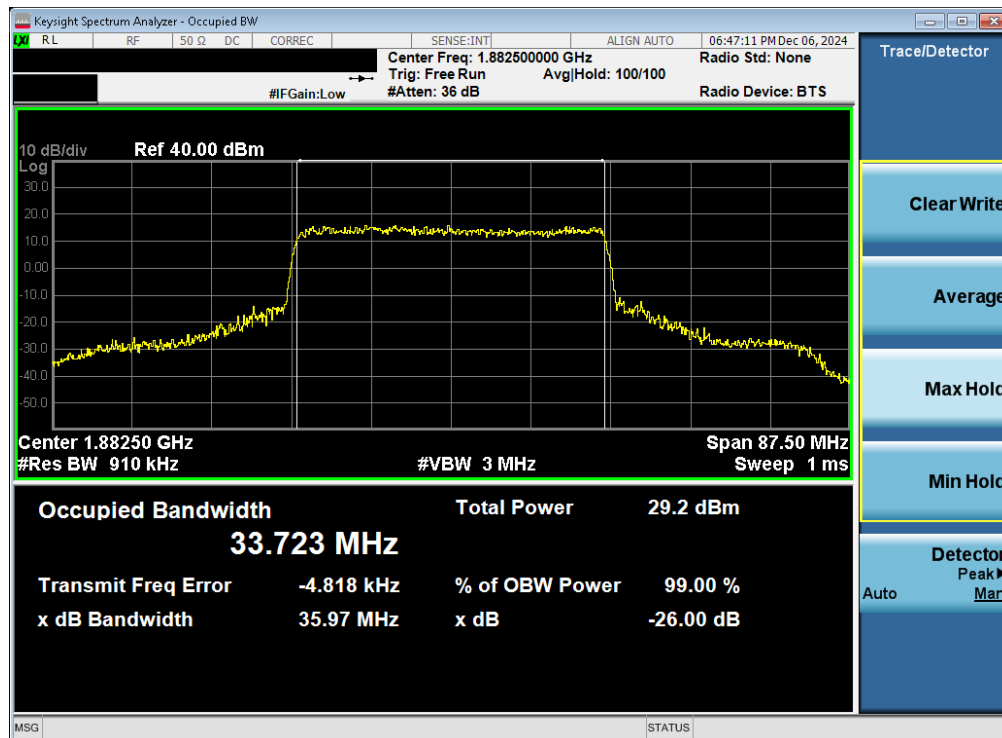
Plot 7-17. Occupied Bandwidth Plot (NR Band n25 - 35.0MHz DFT-s-OFDM BPSK - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 24 of 81



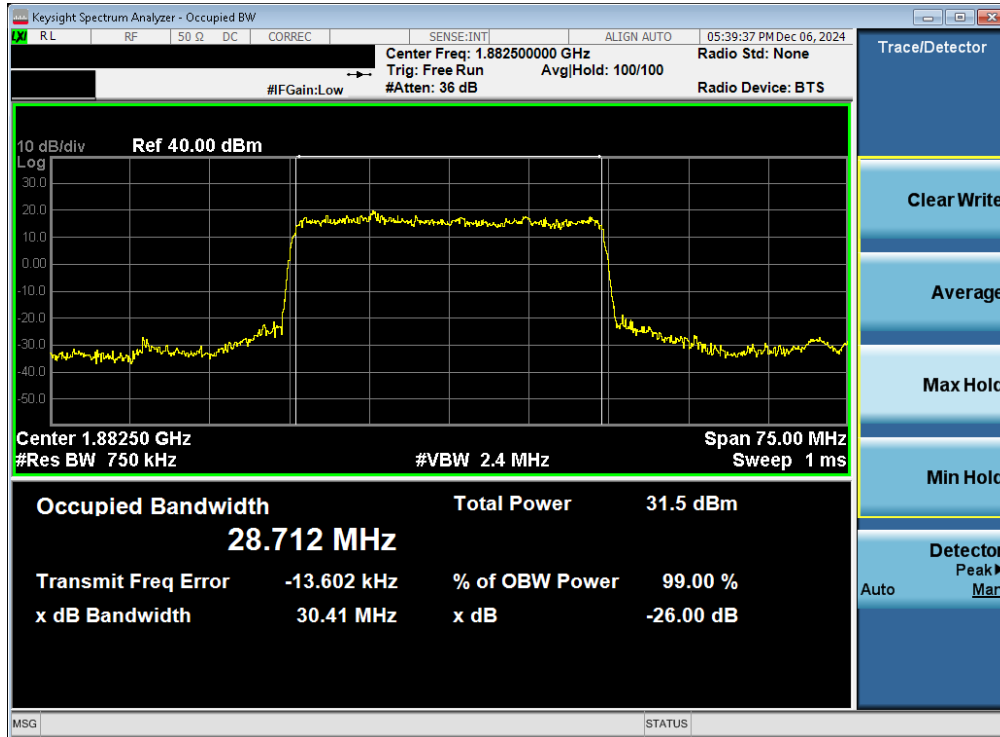


Plot 7-18. Occupied Bandwidth Plot (NR Band n25 - 35.0MHz CP-OFDM QPSK - Full RB - ANT 1)

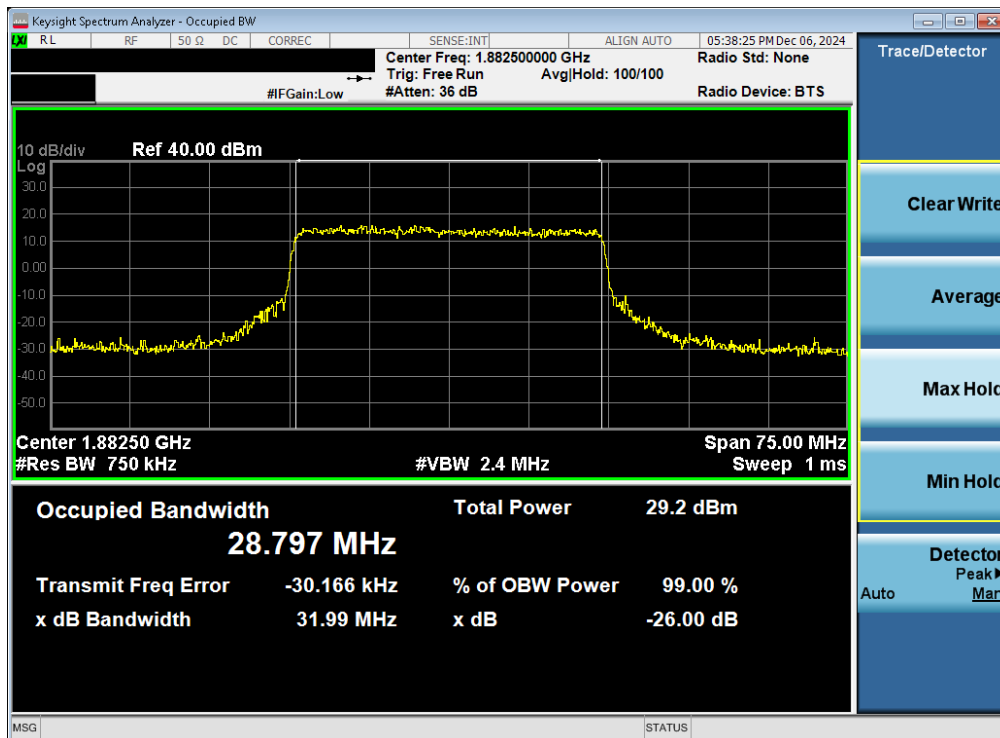


Plot 7-19. Occupied Bandwidth Plot (NR Band n25 - 35.0MHz CP-OFDM 16QAM - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 25 of 81

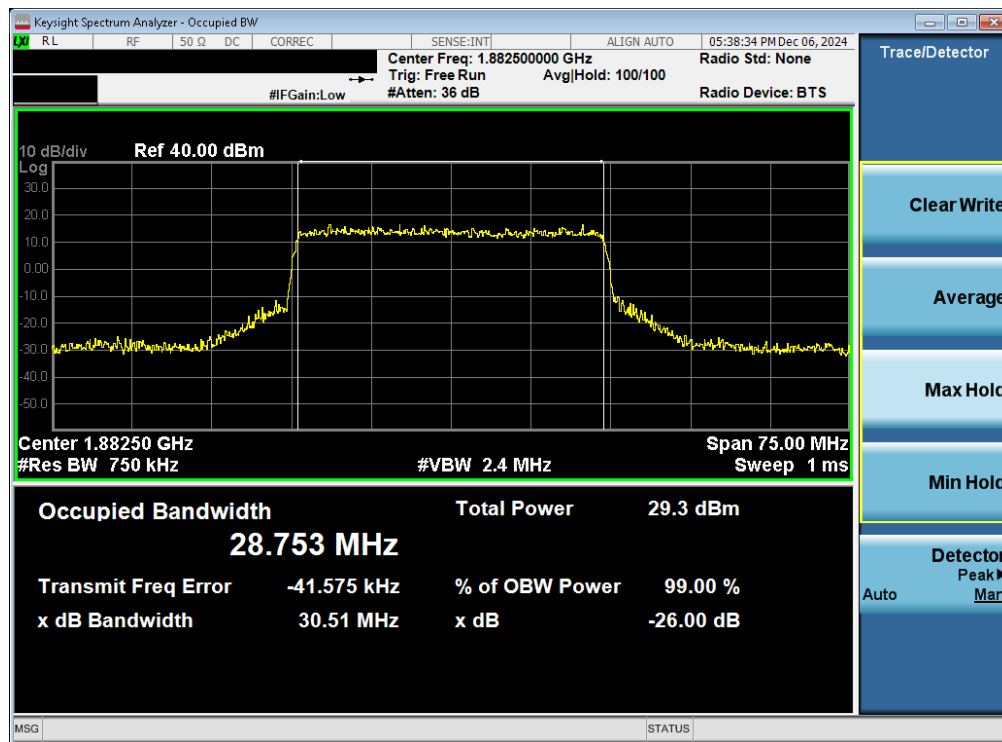


Plot 7-20. Occupied Bandwidth Plot (NR Band n25 - 30.0MHz DFT-s-OFDM BPSK - Full RB - ANT 1)

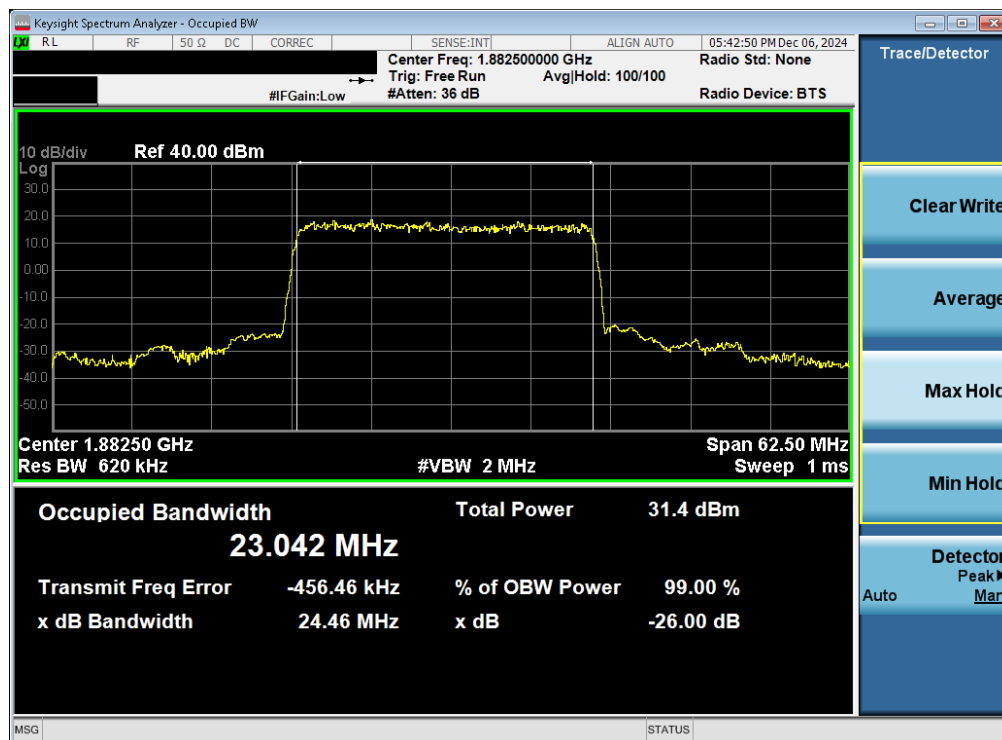


Plot 7-21. Occupied Bandwidth Plot (NR Band n25 - 30.0MHz CP-OFDM QPSK - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 26 of 81

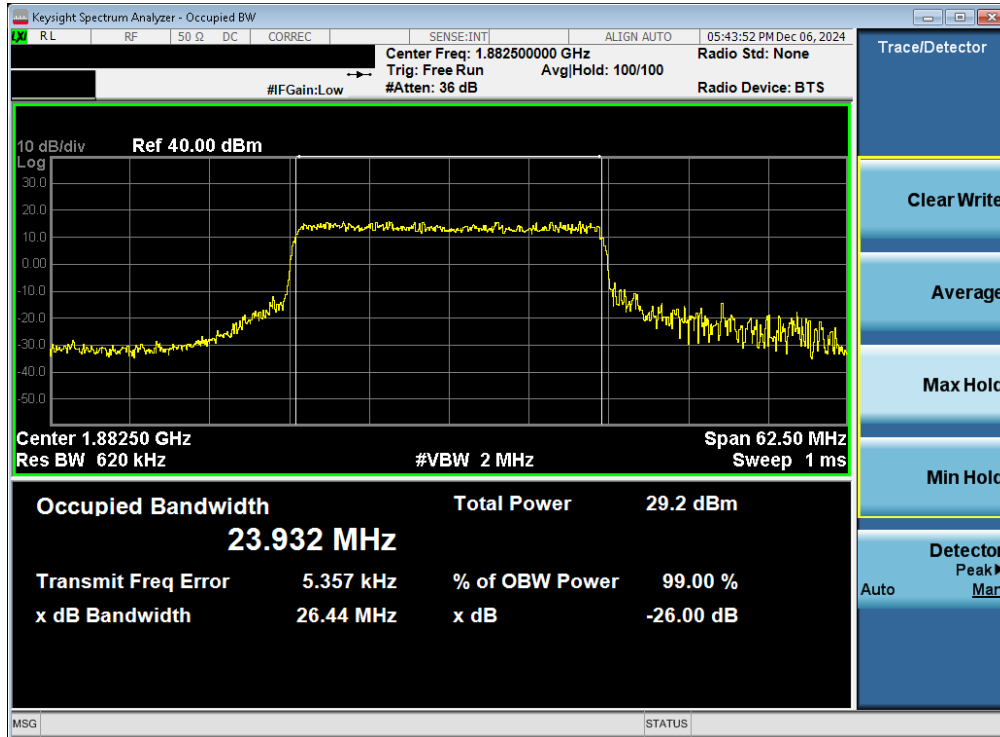


Plot 7-22. Occupied Bandwidth Plot (NR Band n25 - 30.0MHz CP-OFDM 16QAM - Full RB - ANT 1)

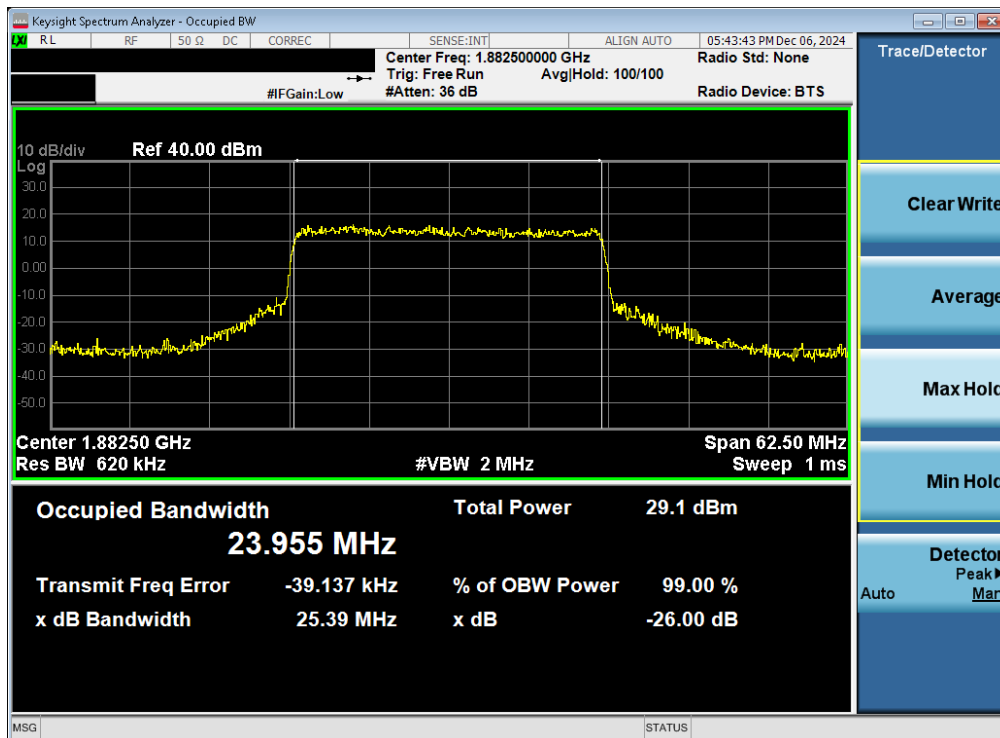


Plot 7-23. Occupied Bandwidth Plot (NR Band n25 - 25.0MHz DFT-s-OFDM BPSK - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 27 of 81

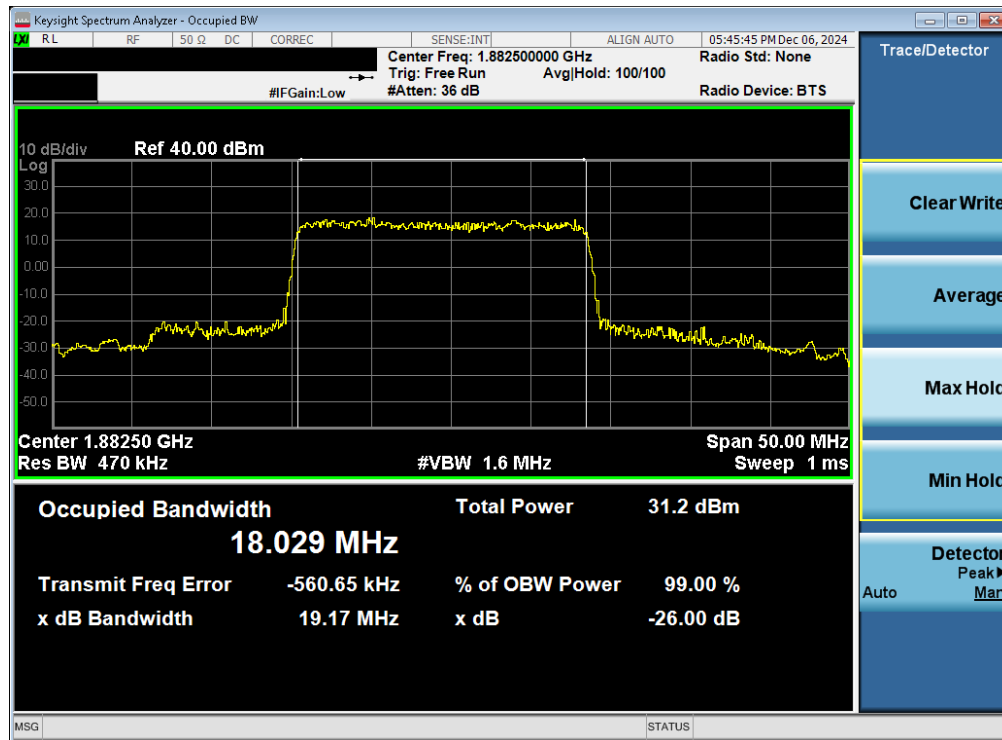


Plot 7-24. Occupied Bandwidth Plot (NR Band n25 - 25.0MHz CP-OFDM QPSK - Full RB - ANT 1)

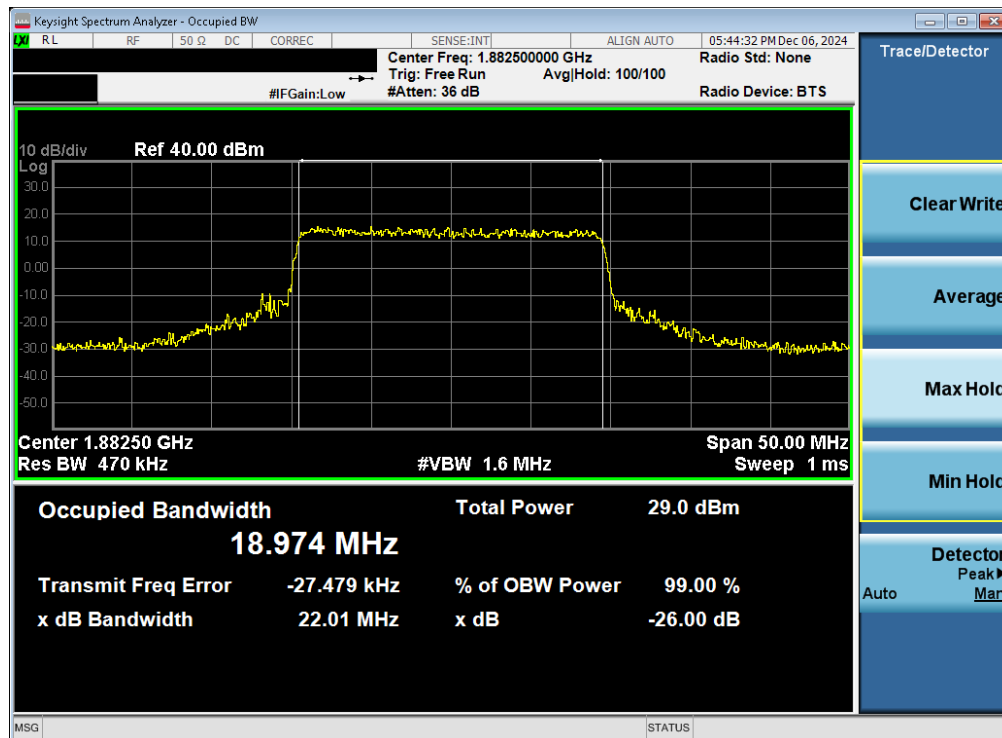


Plot 7-25. Occupied Bandwidth Plot (NR Band n25 - 25.0MHz CP-OFDM 16QAM - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 28 of 81

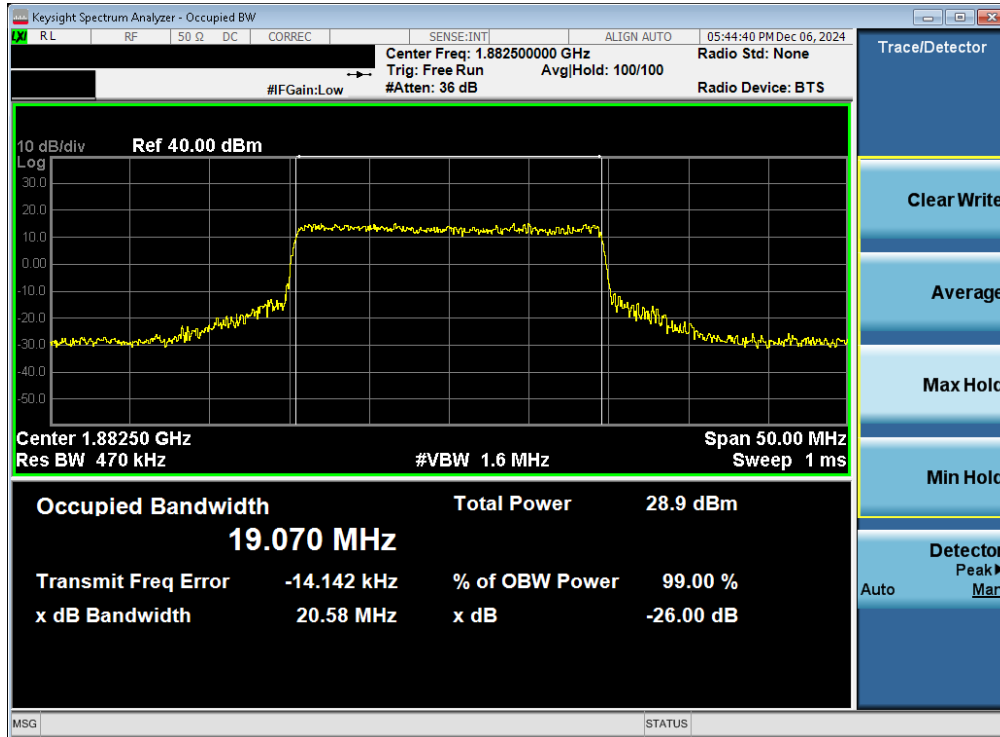


Plot 7-26. Occupied Bandwidth Plot (NR Band n25/2 - 20.0MHz DFT-s-OFDM BPSK - Full RB - ANT 1)

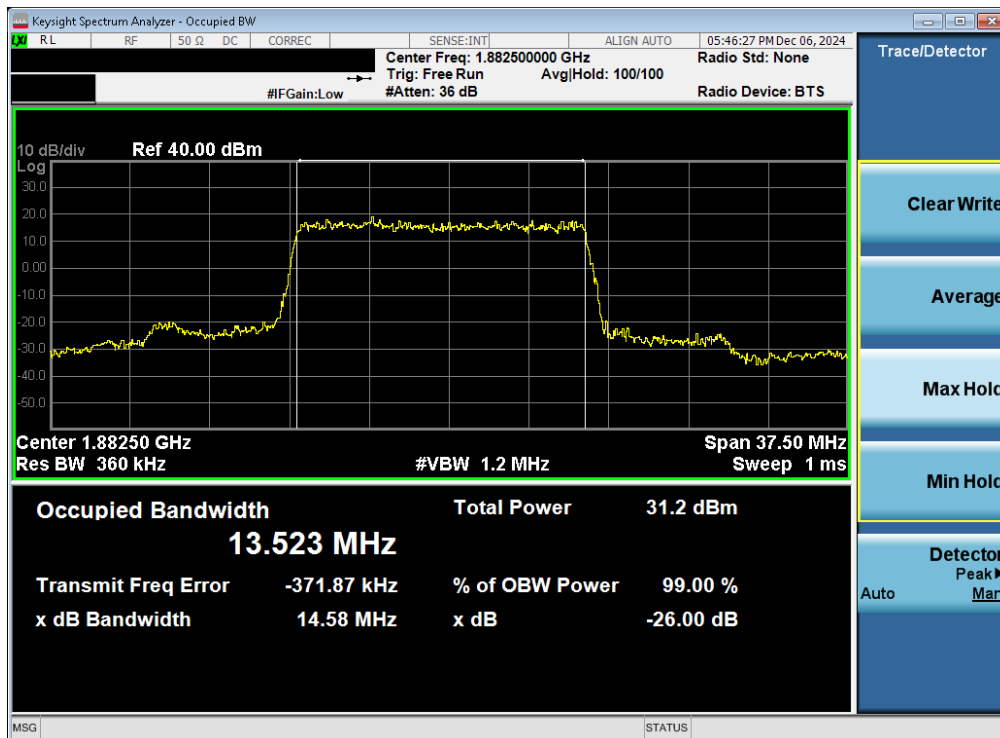


Plot 7-27. Occupied Bandwidth Plot (NR Band n25/2 - 20.0MHz CP-OFDM QPSK - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 29 of 81

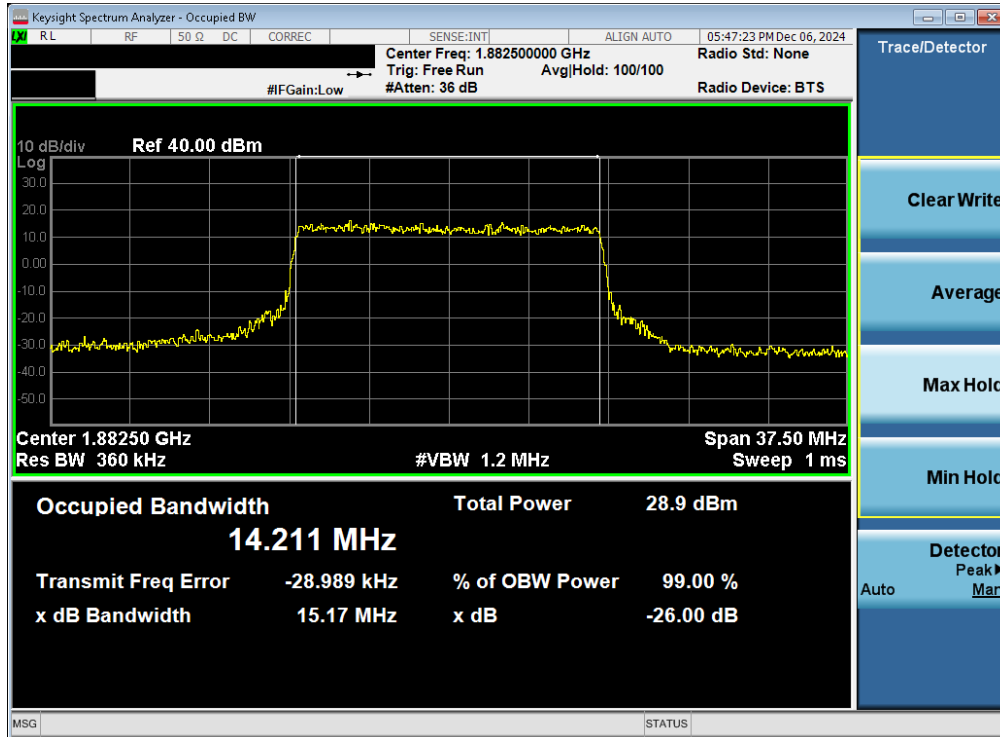


Plot 7-28. Occupied Bandwidth Plot (NR Band n25/2 - 20.0MHz CP-OFDM 16QAM - Full RB - ANT 1)

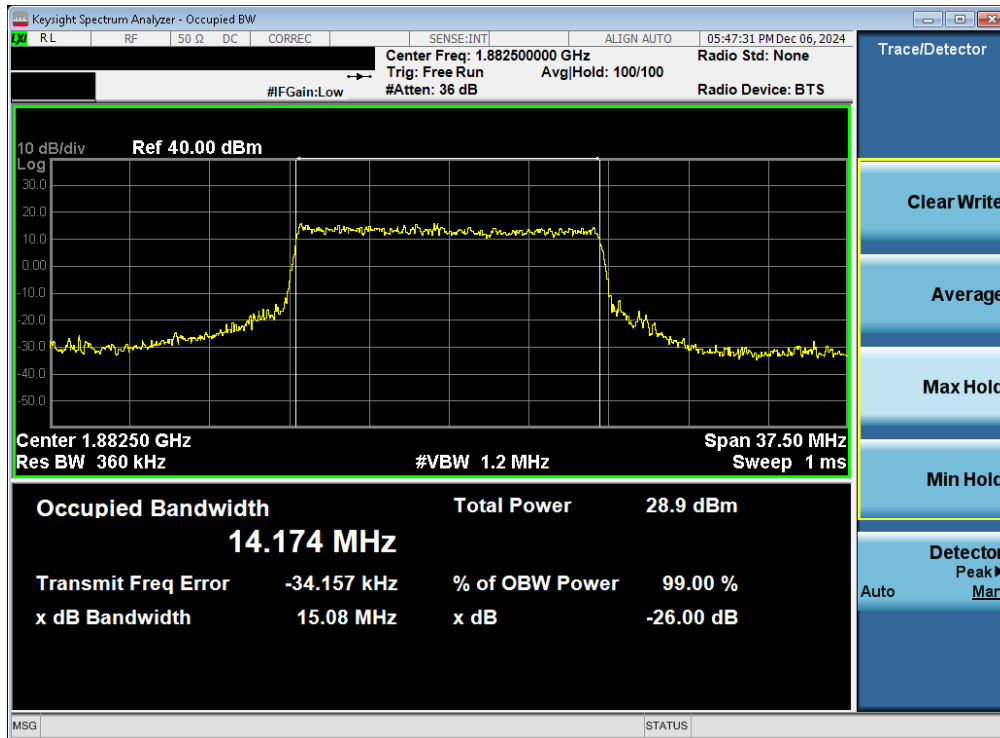


Plot 7-29. Occupied Bandwidth Plot (NR Band n25/2 - 15.0MHz DFT-s-OFDM BPSK - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 30 of 81

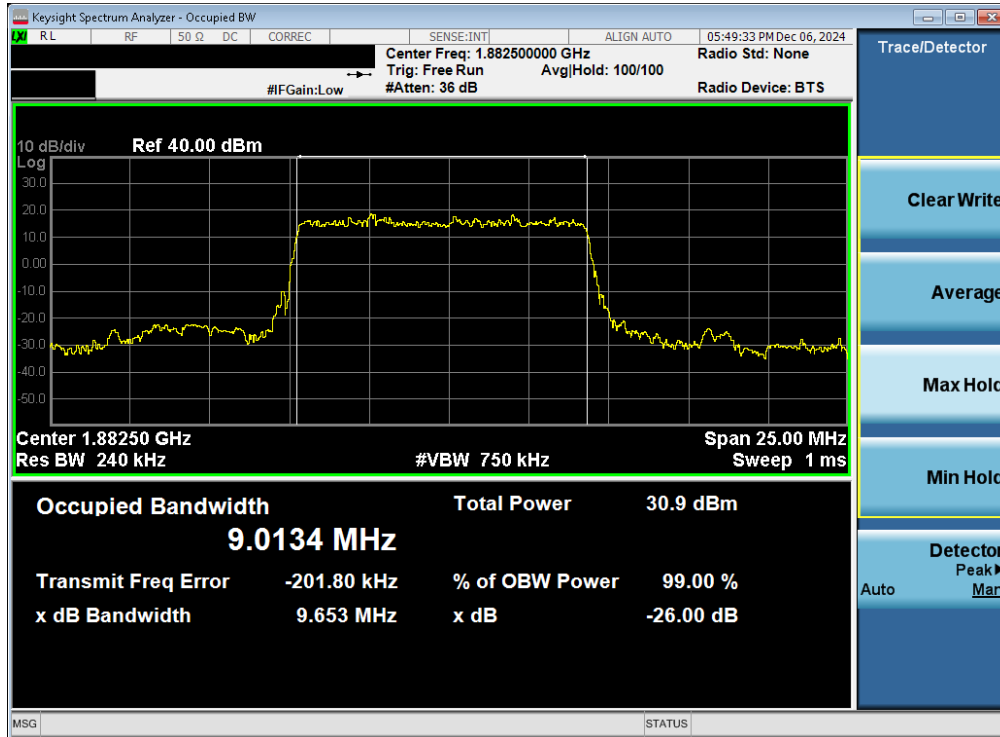


Plot 7-30. Occupied Bandwidth Plot (NR Band n25/2 - 15.0MHz CP-OFDM QPSK - Full RB - ANT 1)

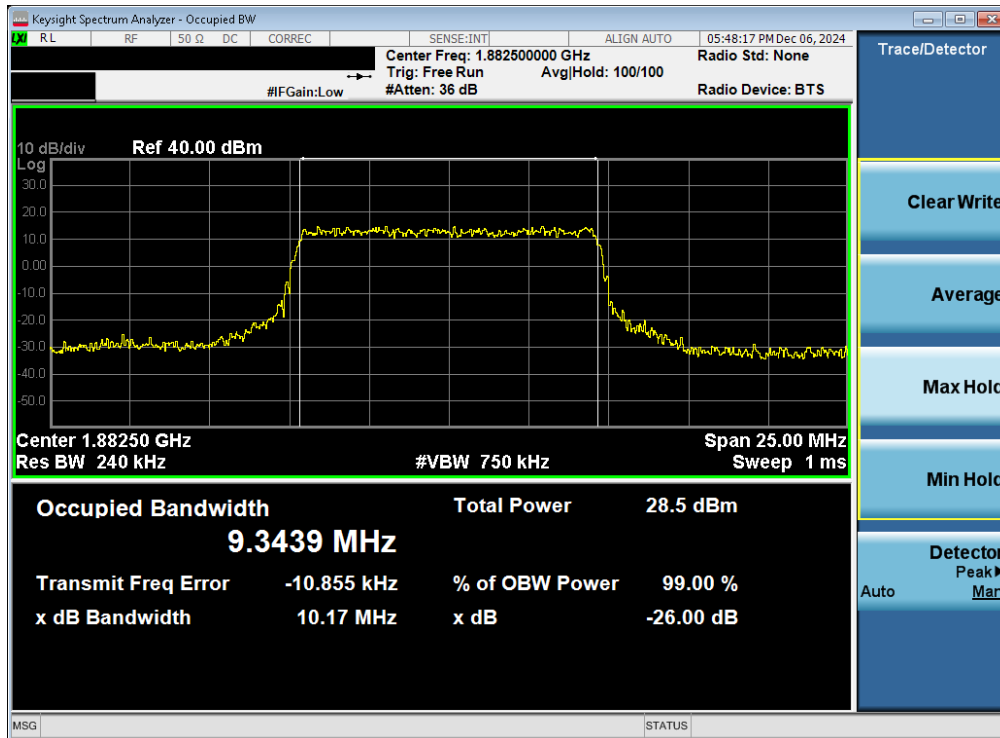


Plot 7-31. Occupied Bandwidth Plot (NR Band n25/2 - 15.0MHz CP-OFDM 16QAM - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 31 of 81



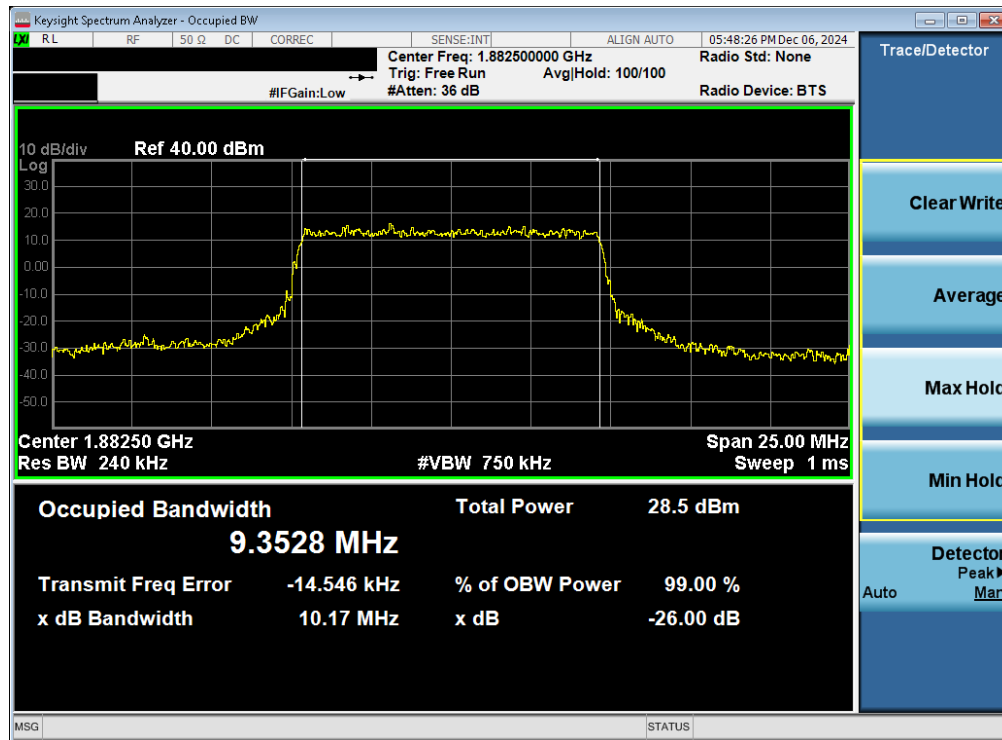
Plot 7-32. Occupied Bandwidth Plot (NR Band n25/2 - 10.0MHz DFT-s-OFDM BPSK - Full RB - ANT 1)



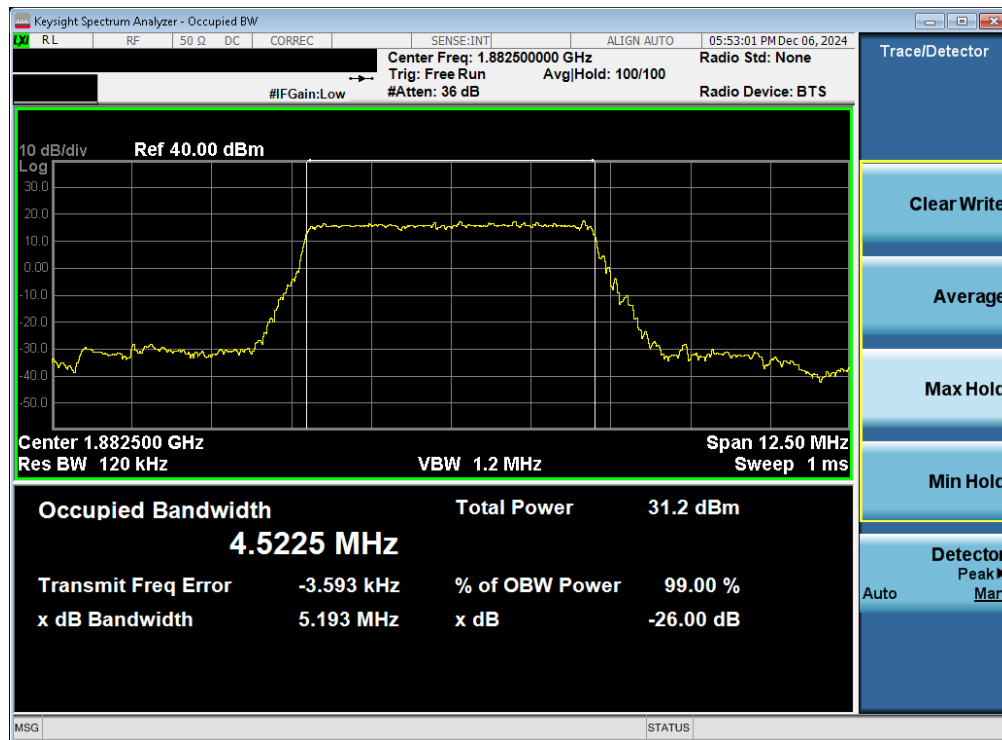
Plot 7-33. Occupied Bandwidth Plot (NR Band n25/2 - 10.0MHz CP-OFDM QPSK - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 32 of 81



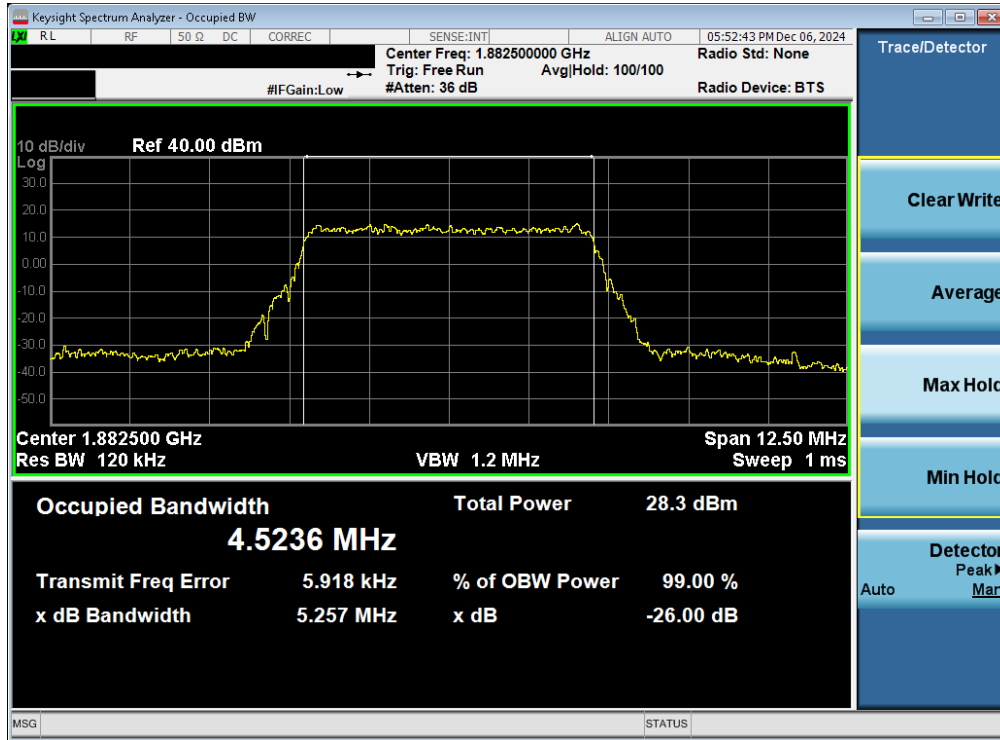


Plot 7-34. Occupied Bandwidth Plot (NR Band n25/2 - 10.0MHz CP-OFDM 16QAM - Full RB - ANT 1)

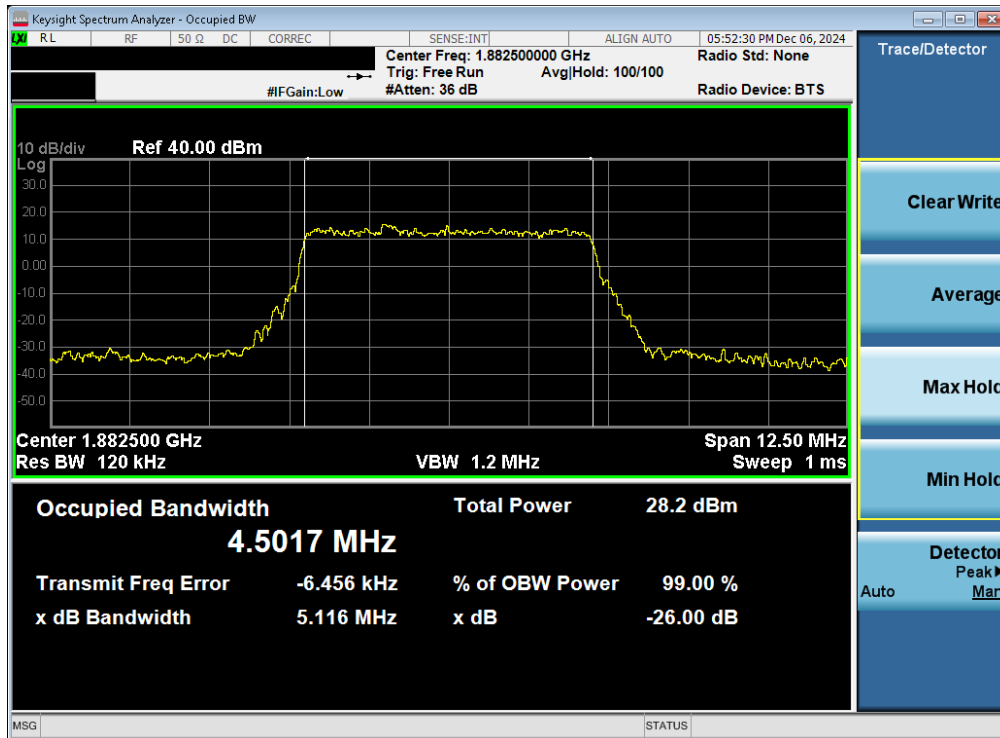


Plot 7-35. Occupied Bandwidth Plot (NR Band n25/2 - 5.0MHz DFT-s-OFDM BPSK - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 33 of 81



Plot 7-36. Occupied Bandwidth Plot (NR Band n25/2 - 5.0MHz CP-OFDM QPSK - Full RB - ANT 1)



Plot 7-37. Occupied Bandwidth Plot (NR Band n25/2 - 5.0MHz CP-OFDM 16QAM - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 34 of 81

## 7.4 Spurious and Harmonic Emissions at Antenna Terminal

### 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 were investigated and the worst-case configuration results are reported in this section.

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

### Test Procedure Used

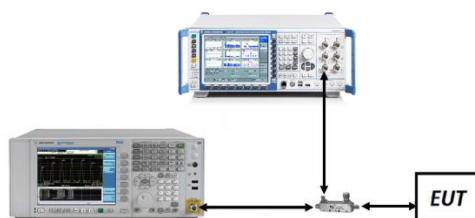
ANSI C63.26-2015 – Section 5.7.4

### Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 20GHz (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

### Test Setup

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



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

### Test Notes

1. Per Part 24, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz.
2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) 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.

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
WCDMA-PCS	5MHz	Low	30.0 - 1845.0	-37.28	-13	-24.28
		Low	1910.0 - 10000.0	-47.20	-13	-34.20
		Low	10000.0 - 20000.0	-62.23	-13	-49.23
		Mid	30.0 - 1850.0	-53.72	-13	-40.72
		Mid	1910.0 - 10000.0	-47.10	-13	-34.10
		Mid	10000.0 - 20000.0	-62.31	-13	-49.31
		High	30.0 - 1850.0	-53.80	-13	-40.80
		High	1915.0 - 10000.0	-40.20	-13	-27.20
		High	10000.0 - 20000.0	-62.48	-13	-49.48
LTE-B25-2	20MHz	Low	30.0 - 1849.0	-48.00	-13	-35.00
		Low	1915.0 - 10000.0	-44.24	-13	-31.24
		Low	10000.0 - 20000.0	-56.61	-13	-43.61
		Mid	30.0 - 1850.0	-48.99	-13	-35.99
		Mid	1915.0 - 10000.0	-44.68	-13	-31.68
		Mid	10000.0 - 20000.0	-56.46	-13	-43.46
		High	30.0 - 1850.0	-48.99	-13	-35.99
		High	1916.0 - 10000.0	-44.53	-13	-31.53
		High	10000.0 - 20000.0	-56.63	-13	-43.63
ULCA LTE-B2	20+20MHz	Low	30.0 - 1849.0	-51.09	-13	-38.09
		Low	1915.0 - 10000.0	-47.03	-13	-34.03
		Low	10000.0 - 20000.0	-62.69	-13	-49.68
		Mid	30.0 - 1850.0	-49.90	-13	-36.90
		Mid	1915.0 - 10000.0	-47.32	-13	-34.32
		Mid	10000.0 - 20000.0	-62.70	-13	-49.70
		High	30.0 - 1850.0	-51.03	-13	-38.03
		High	1916.0 - 10000.0	-47.21	-13	-34.21
		High	10000.0 - 20000.0	-62.32	-13	-49.32

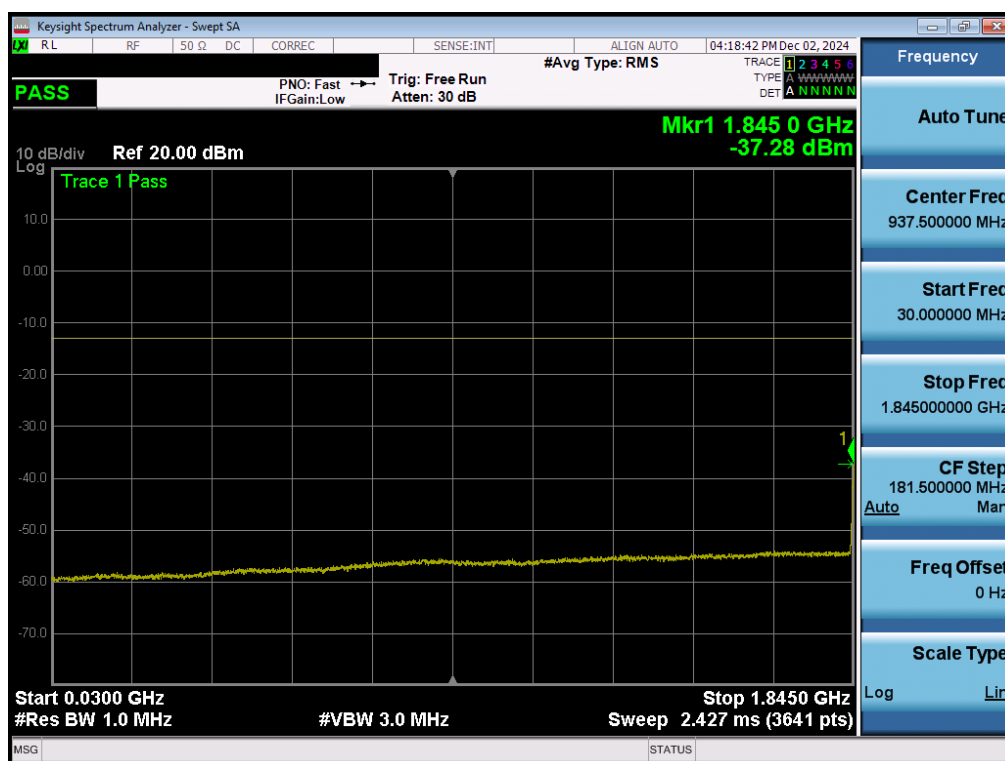
Table 7-8. Conducted Spurious Emission Test Results – Ant 1

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n25-2	40MHz	Low	30.0 - 1849.0	-51.81	-13	-38.81
		Low	1915.0 - 10000.0	-46.13	-13	-33.13
		Low	10000.0 - 20000.0	-60.83	-13	-47.83
		Mid	30.0 - 1850.0	-51.04	-13	-38.04
		Mid	1915.0 - 10000.0	-46.23	-13	-33.23
		Mid	10000.0 - 20000.0	-60.79	-13	-47.79
		High	30.0 - 1850.0	-50.49	-13	-37.49
		High	1916.0 - 10000.0	-46.37	-13	-33.37
		High	10000.0 - 20000.0	-60.66	-13	-47.66

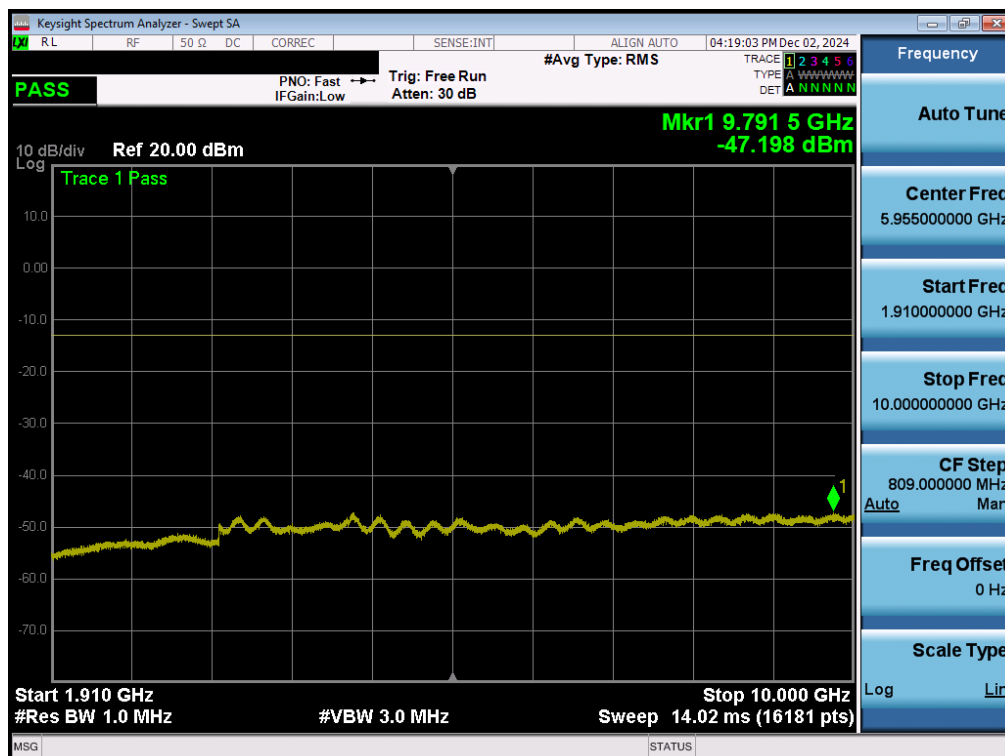
Table 7-9. Conducted Spurious Emission Test Results – Ant 1

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## WCDMA PCS – Ant 1

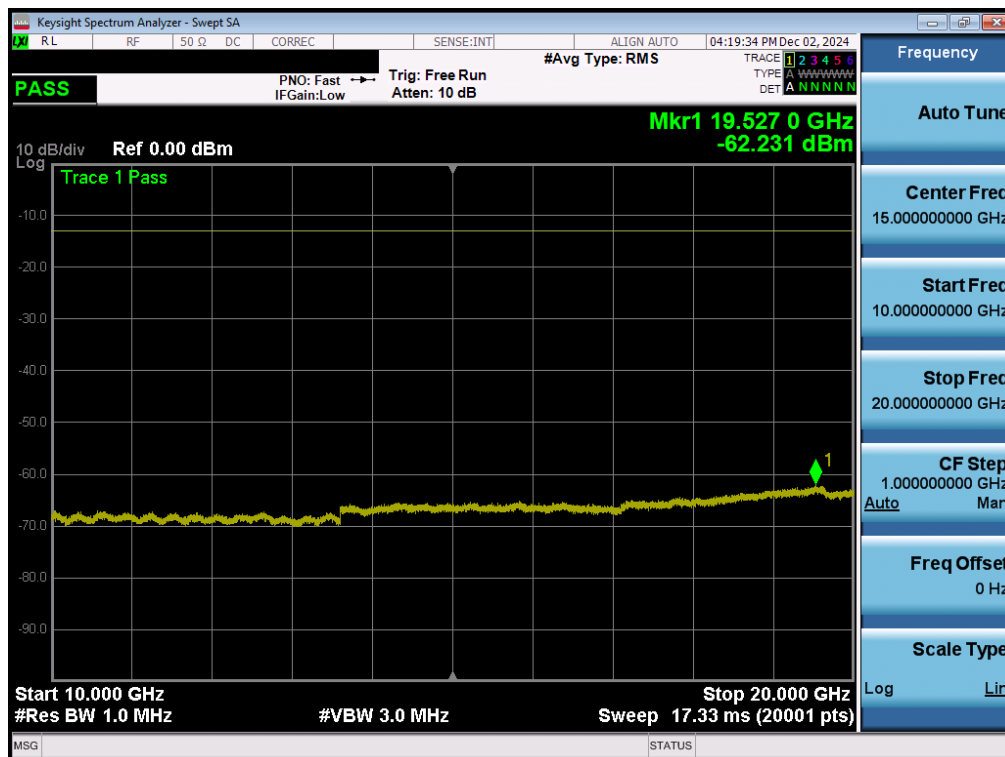


Plot 7-38. Conducted Spurious Plot (WCDMA Ch. 9262 - Ant 1)



Plot 7-39. Conducted Spurious Plot (WCDMA Ch. 9262 - Ant 1)

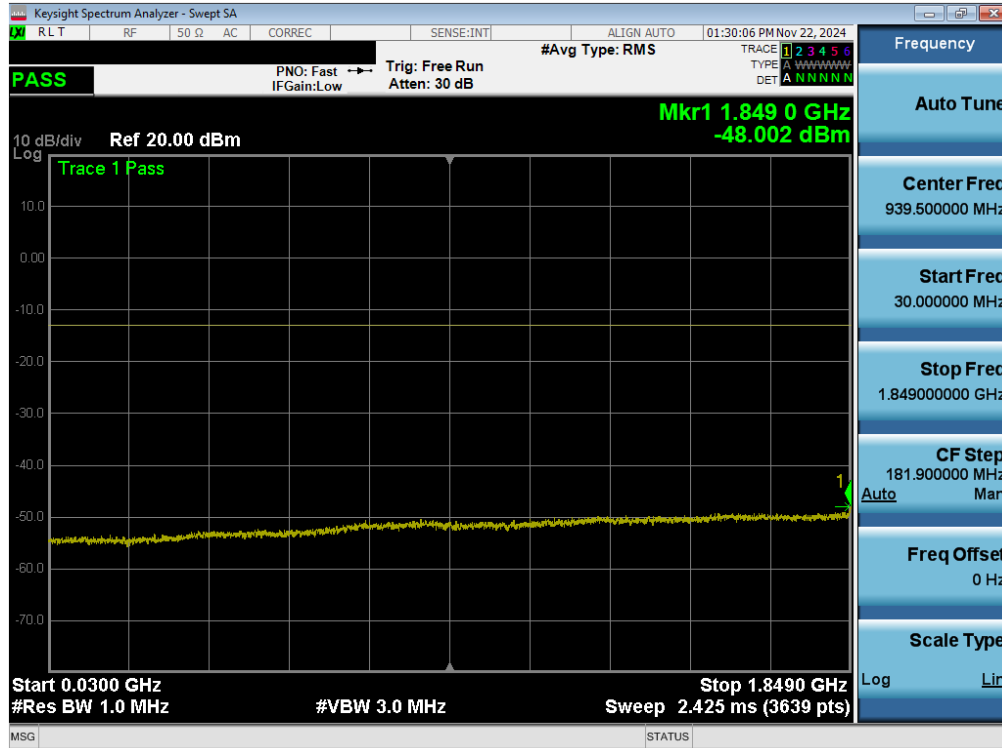
FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 37 of 81



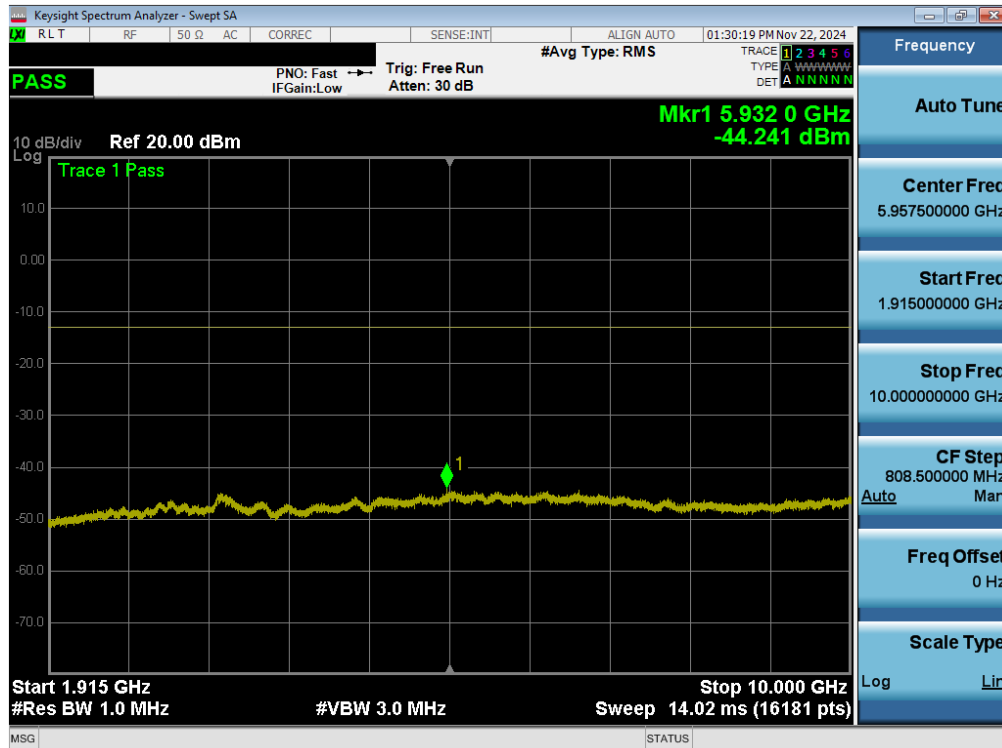
Plot 7-40. Conducted Spurious Plot (WCDMA Ch. 9262 - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 38 of 81

## LTE Band 25/2 – Ant 1

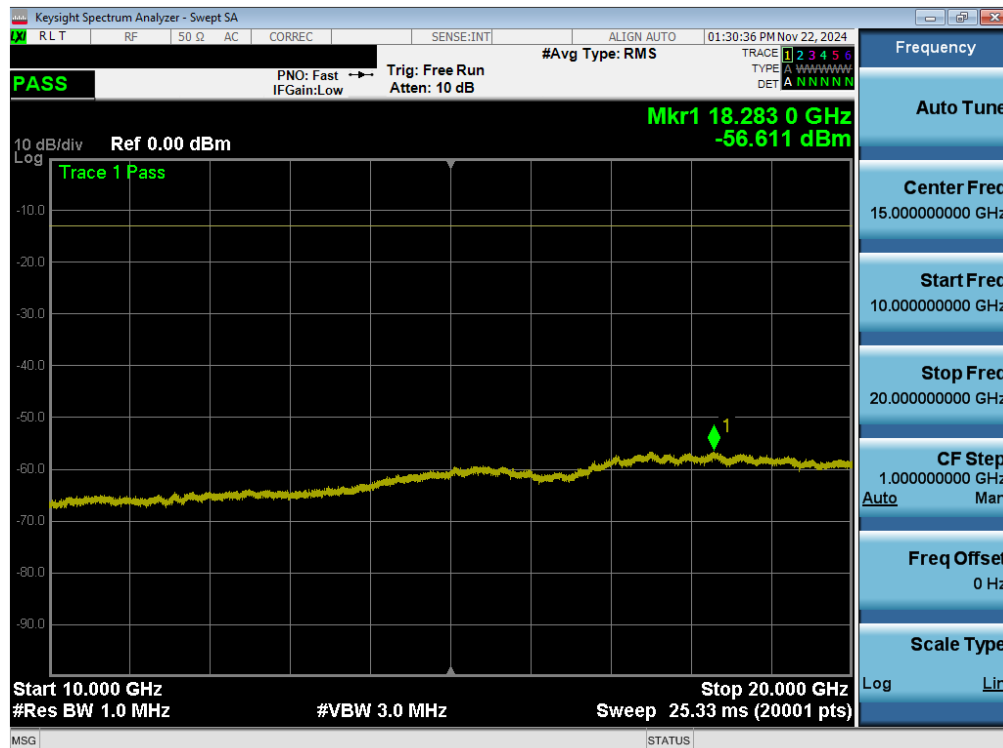


Plot 7-41. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Low Channel - Ant 1)



Plot 7-42. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Low Channel - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 39 of 81

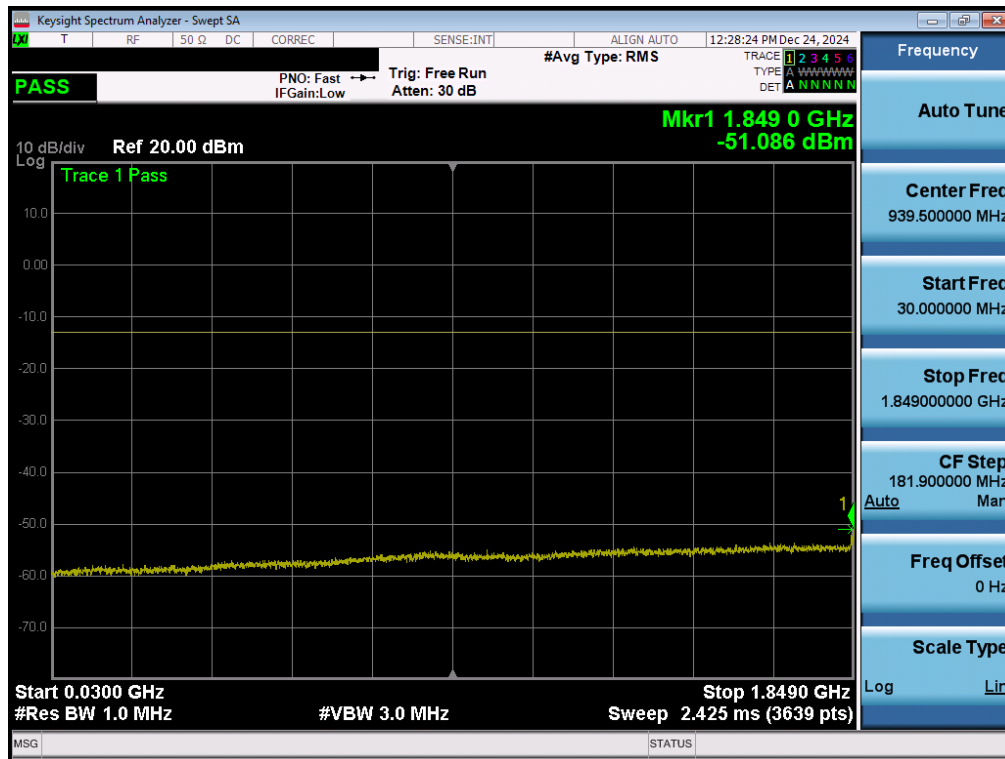


Plot 7-43. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Low Channel - Ant 1)

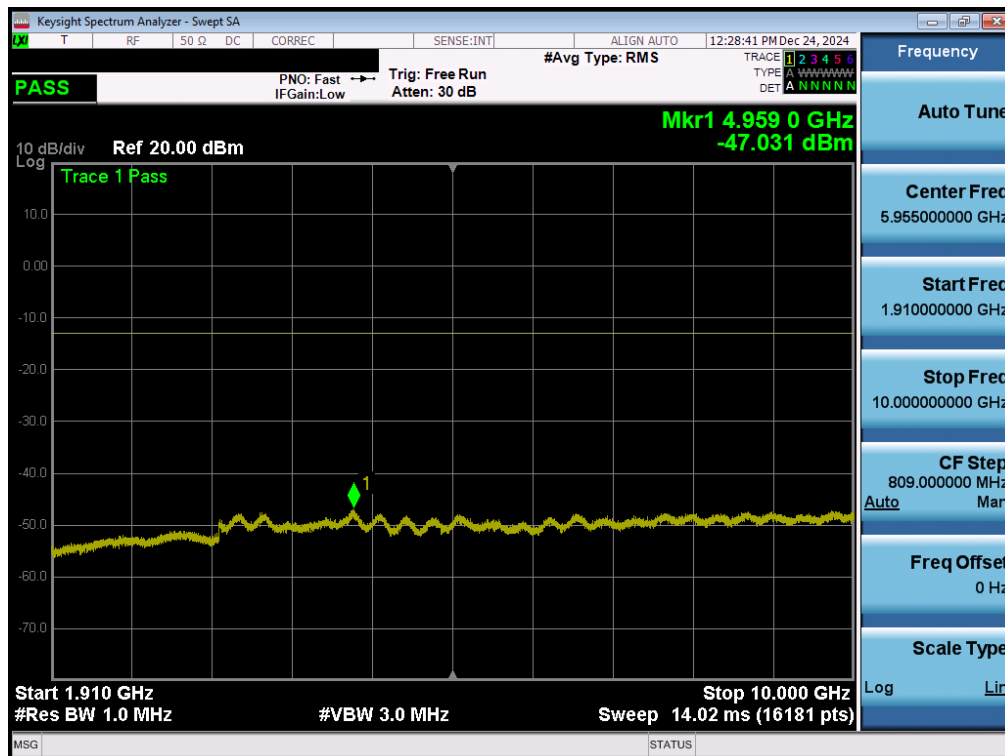
FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 40 of 81



## ULCA LTE Band 2 – Ant 1

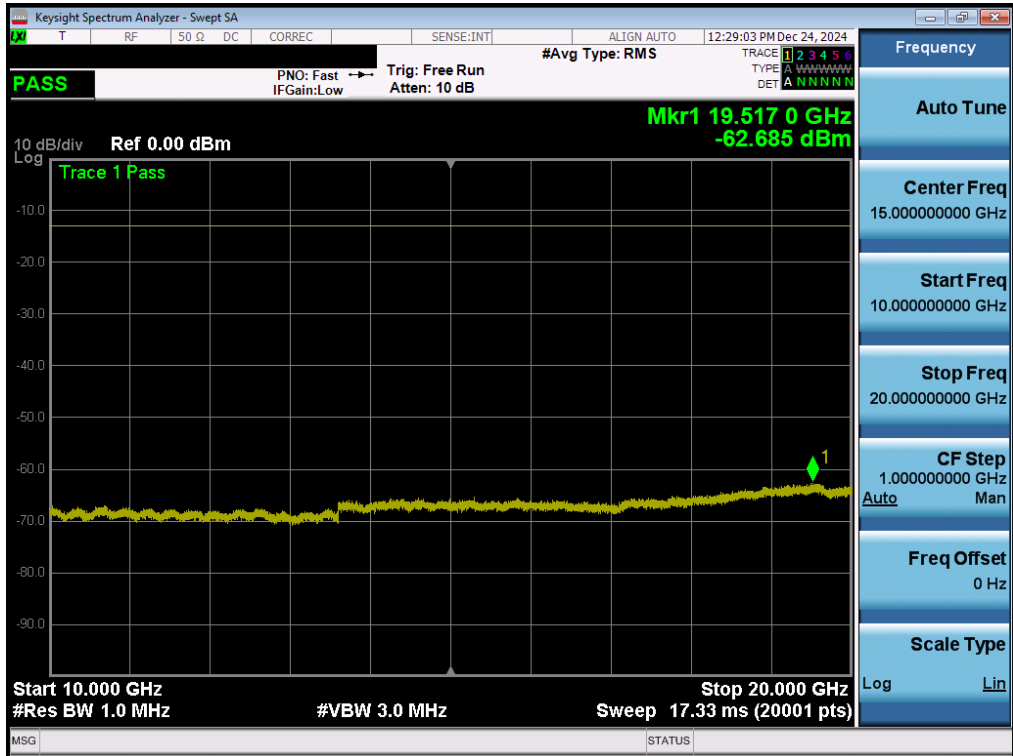


Plot 7-44. Conducted Spurious Plot (ULCA LTE Band 2 - 20+20MHz QPSK – PCC 1/99 SCC 1/0 - Low Channel - Ant 1)



Plot 7-45. Conducted Spurious Plot (ULCA LTE Band 2 - 20+20MHz QPSK – PCC 1/99 SCC 1/0 - Low Channel - Ant 1)

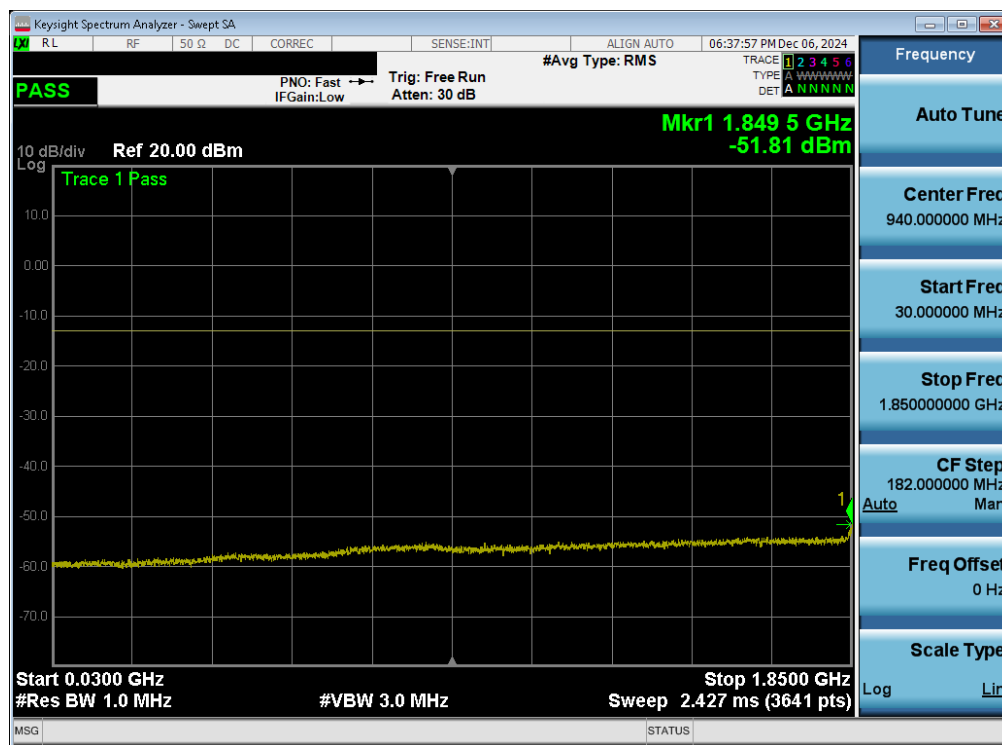
FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 41 of 81



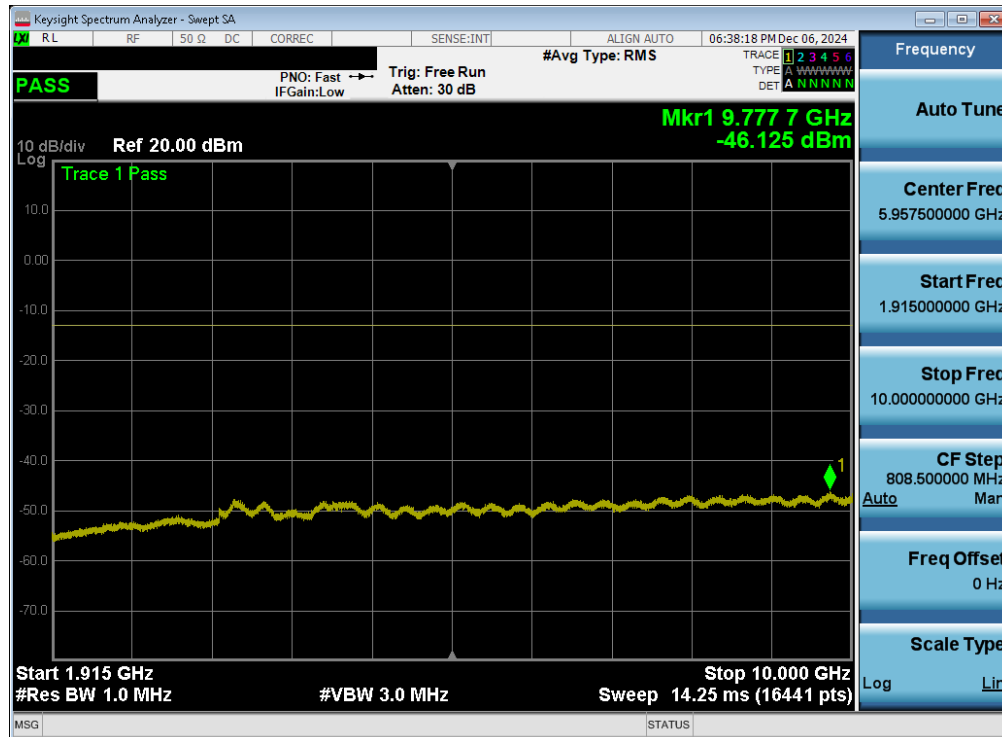
Plot 7-46. Conducted Spurious Plot (ULCA LTE Band 2 - 20+20MHz QPSK – PCC 1/99 SCC 1/0 - Low Channel - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## NR Band n25/2 – Ant 1

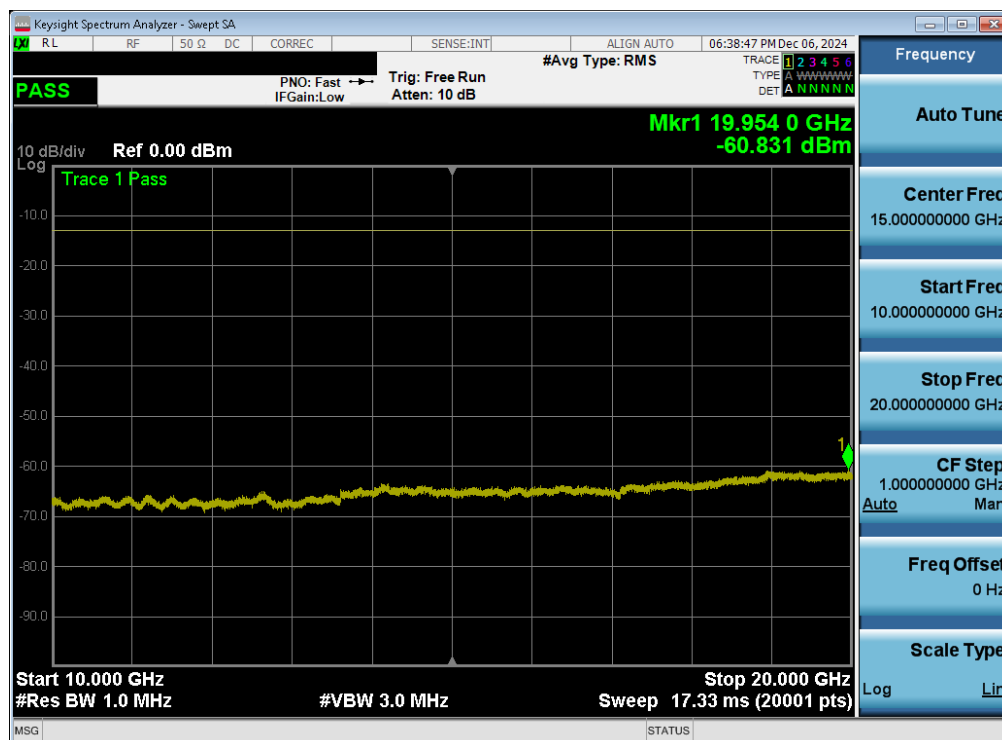


Plot 7-47. Conducted Spurious Plot (NR Band n25/2 -40.0MHz - 1RB - Low Channel - Ant 1)



Plot 7-48. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - Low Channel - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 43 of 81



Plot 7-49. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - Low Channel - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 44 of 81

## 7.5 Band Edge Emissions at Antenna Terminal

### Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at 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.

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

### Test Procedure Used

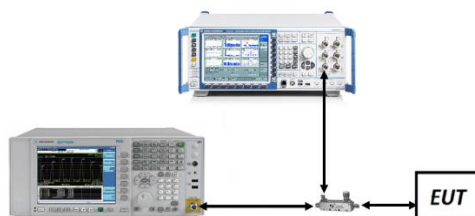
ANSI C63.26-2015 – Section 5.7.3

### Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW  $\geq 1\%$  of the emission bandwidth
4. VBW  $\geq 3 \times$  RBW
5. Detector = RMS
6. Number of sweep points  $\geq 2 \times$  Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

### Test Setup

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



**Figure 7-4. Test Instrument & Measurement Setup**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## Test Notes

1. Per 24.238(b), 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 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 frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) 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.

<b>FCC ID:</b> C3K2114	<b>PART 24 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2411190103-02-R1.C3K	<b>Test Dates:</b> 12/3/2024 - 2/14/2025	<b>EUT Type:</b> Full Modular	Page 46 of 81

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
WCDMA-PCS	5MHz	Low	Band Edge	-21.51	-13	-8.51
		Low	Extended	-27.03	-13	-14.03
		High	Band Edge	-22.02	-13	-9.02
		High	Extended	-26.08	-13	-13.08
LTE-B25-2	20MHz	Low	Band Edge	-27.89	-13	-14.89
		Low	Extended	-22.08	-13	-9.08
		High [B2]	Band Edge	-29.32	-13	-16.32
		High [B25]	Band Edge	-27.10	-13	-14.10
		High [B2]	Extended	-24.36	-13	-11.36
		High [B25]	Extended	-20.69	-13	-7.69
	15MHz	Low	Band Edge	-28.12	-13	-15.12
		Low	Extended	-20.92	-13	-7.92
		High [B2]	Band Edge	-30.95	-13	-17.94
		High [B25]	Band Edge	-29.51	-13	-16.51
		High [B2]	Extended	-24.33	-13	-11.33
		High [B25]	Extended	-21.24	-13	-8.24
	10MHz	Low	Band Edge	-26.75	-13	-13.75
		Low	Extended	-19.15	-13	-6.15
		High [B2]	Band Edge	-29.43	-13	-16.43
		High [B25]	Band Edge	-26.33	-13	-13.33
		High [B2]	Extended	-22.38	-13	-9.38
		High [B25]	Extended	-20.28	-13	-7.28
	5MHz	Low	Band Edge	-25.25	-13	-12.25
		Low	Extended	-22.78	-13	-9.78
		High [B2]	Band Edge	-24.57	-13	-11.57
		High [B25]	Band Edge	-22.99	-13	-9.99
		High [B2]	Extended	-24.63	-13	-11.63
		High [B25]	Extended	-19.28	-13	-6.28
	3MHz	Low	Band Edge	-23.59	-13	-10.59
		Low	Extended	-27.86	-13	-14.86
		High [B2]	Band Edge	-23.12	-13	-10.12
		High [B25]	Band Edge	-21.57	-13	-8.56
		High [B2]	Extended	-28.17	-13	-15.17
		High [B25]	Extended	-15.74	-13	-2.74
	1.4MHz	Low	Band Edge	-24.72	-13	-11.72
		Low	Extended	-23.25	-13	-10.25
		High [B2]	Band Edge	-24.56	-13	-11.56
		High [B25]	Band Edge	-23.37	-13	-10.37
		High [B2]	Extended	-22.61	-13	-9.61
		High [B25]	Extended	-22.18	-13	-9.18
ULCA LTE-B2	20+20MHz	Low	Band Edge	-16.02	-13	-3.02
		Low	Extended	-27.86	-13	-14.86
		High	Band Edge	-15.81	-13	-2.81
		High	Extended	-18.31	-13	-5.31

**Table 7-10. Conducted Band Edge Test Results– Ant 1**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 47 of 81

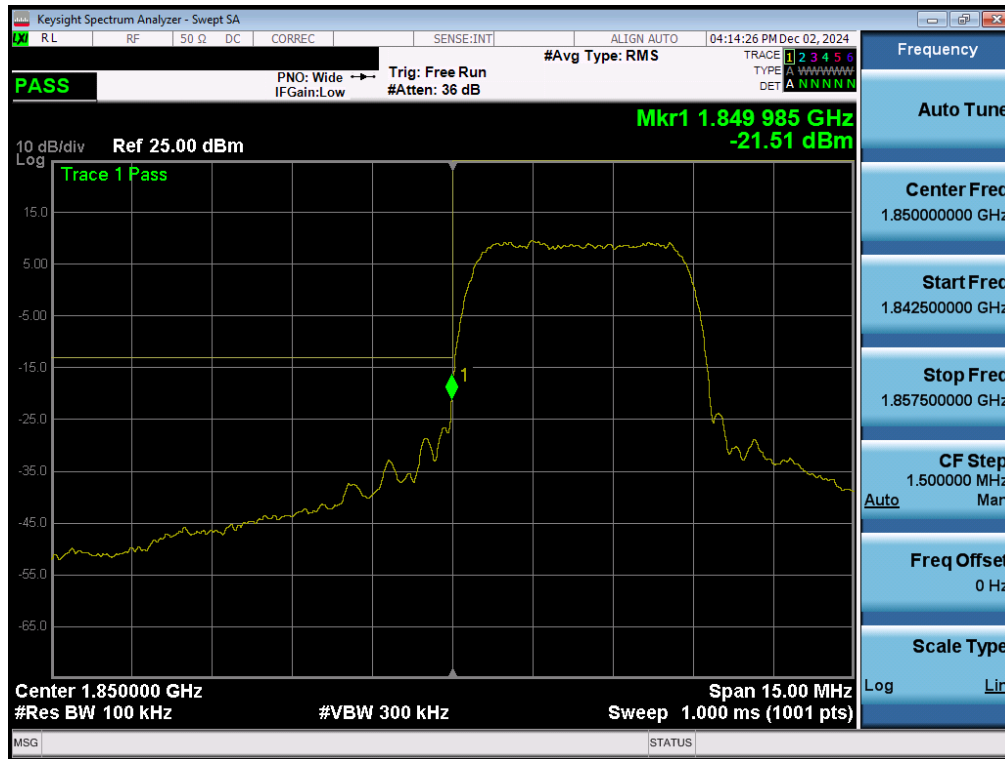
Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n25-2	40MHz	Low	Band Edge	-29.98	-13	-16.98
		Low	Extended	-30.11	-13	-17.11
		High [n25]	Band Edge	-26.41	-13	-13.41
		High [n25]	Extended	-28.20	-13	-15.20
	35MHz	Low	Band Edge	-31.01	-13	-18.01
		Low	Extended	-29.70	-13	-16.70
		High [n25]	Band Edge	-28.89	-13	-15.89
		High [n25]	Extended	-27.12	-13	-14.12
	30MHz	Low	Band Edge	-26.78	-13	-13.78
		Low	Extended	-24.51	-13	-11.51
		High [n25]	Band Edge	-28.81	-13	-15.81
		High [n25]	Extended	-24.38	-13	-11.38
	25MHz	Low	Band Edge	-27.72	-13	-14.72
		Low	Extended	-23.65	-13	-10.65
		High [n25]	Band Edge	-28.92	-13	-15.92
		High [n25]	Extended	-24.06	-13	-11.06
	20MHz	Low	Band Edge	-27.03	-13	-14.03
		Low	Extended	-20.79	-13	-7.79
		High [n2]	Band Edge	-28.43	-13	-15.43
		High [n25]	Band Edge	-27.62	-13	-14.62
		High [n2]	Extended	-22.80	-13	-9.80
		High [n25]	Extended	-23.02	-13	-10.02
	15MHz	Low	Band Edge	-26.30	-13	-13.30
		Low	Extended	-20.05	-13	-7.05
		High [n2]	Band Edge	-29.98	-13	-16.98
		High [n25]	Band Edge	-29.22	-13	-16.22
		High [n2]	Extended	-23.68	-13	-10.68
		High [n25]	Extended	-22.36	-13	-9.36
	10MHz	Low	Band Edge	-24.65	-13	-11.65
		Low	Extended	-16.03	-13	-3.03
		High [n2]	Band Edge	-27.48	-13	-14.48
		High [n25]	Band Edge	-20.00	-13	-7.00
		High [n2]	Extended	-20.39	-13	-7.39
		High [n25]	Extended	-14.72	-13	-1.72
	5MHz	Low	Band Edge	-25.69	-13	-12.69
		Low	Extended	-31.15	-13	-18.15
		High [n2]	Band Edge	-23.27	-13	-10.27
		High [n25]	Band Edge	-21.75	-13	-8.75
		High [n2]	Extended	-28.70	-13	-15.70
		High [n25]	Extended	-24.51	-13	-11.51

**Table 7-11. Conducted Band Edge Test Results– Ant 1**

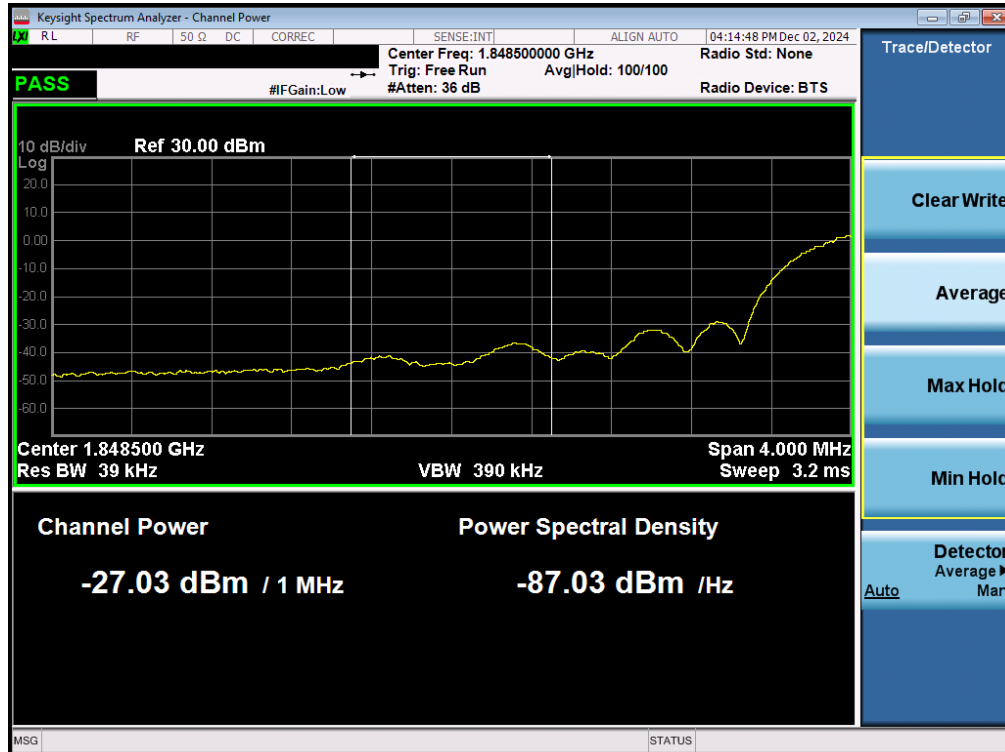
FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 48 of 81



## WCDMA PCS – Ant 1



Plot 7-50. Lower Band Edge Plot (WCDMA PCS – Ch. 9262 - Ant 1)

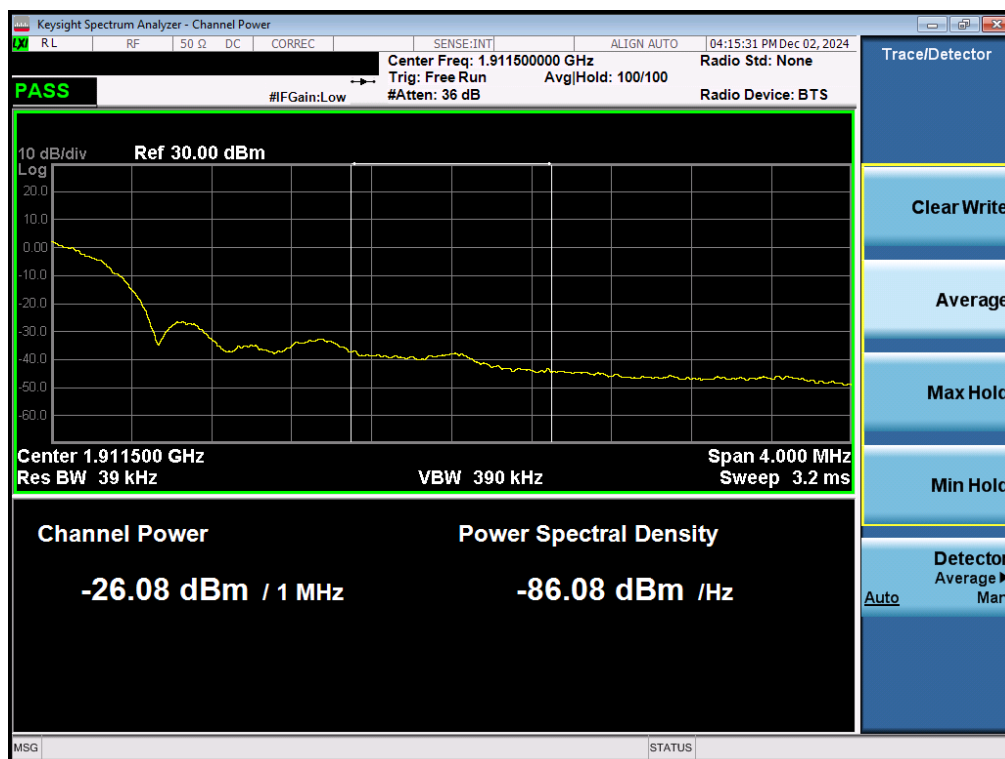


Plot 7-51. Extended Lower Band Edge Plot (WCDMA PCS – Ch. 9262 - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 49 of 81



Plot 7-52. Upper Band Edge Plot (WCDMA PCS – Ch. 9538 - Ant 1)



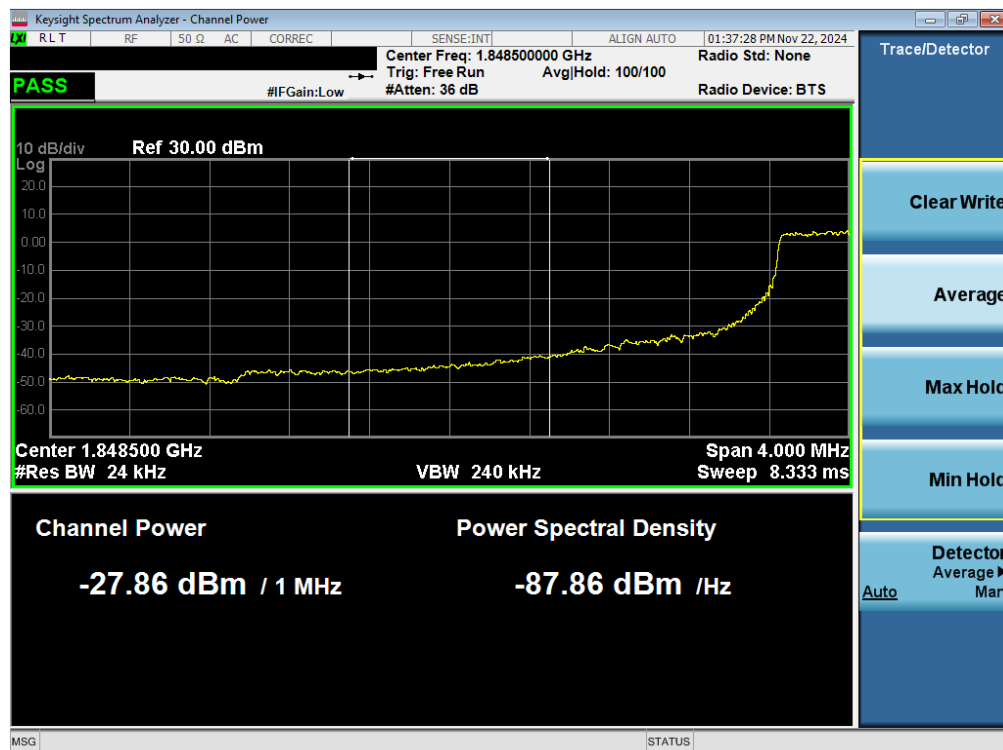
Plot 7-53. Extended Upper Band Edge Plot (WCDMA PCS – Ch. 9538 - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 50 of 81

## LTE Band 25/2 – Ant 1



Plot 7-54. Lower Band Edge Plot (LTE Band 25/2 - 3MHz QPSK – Full RB - Ant 1)

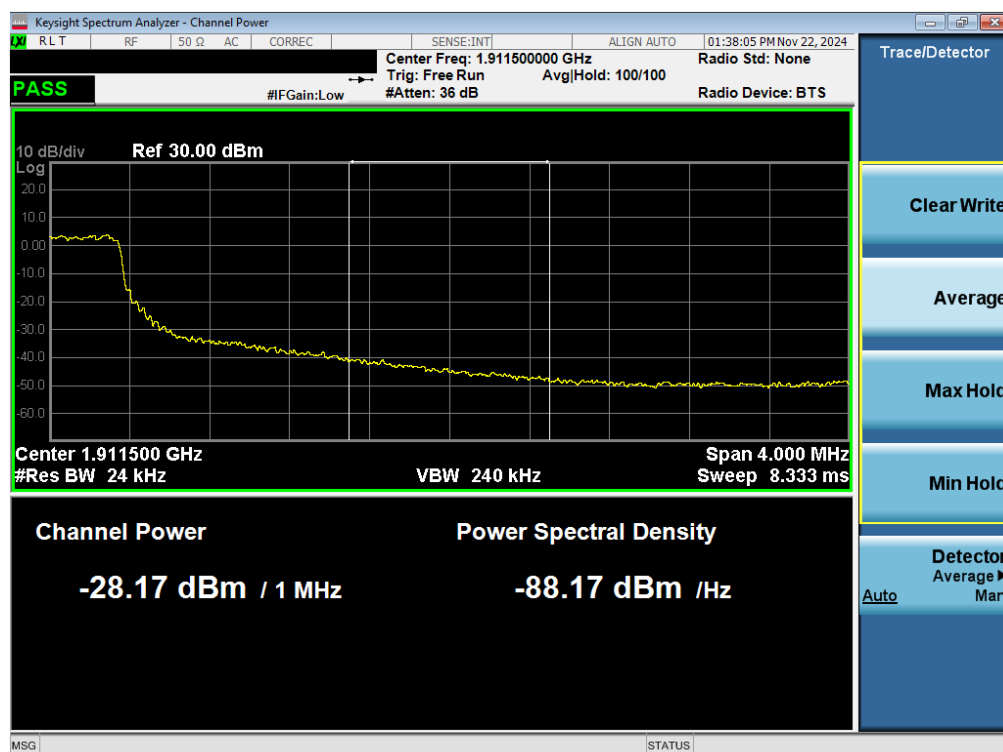


Plot 7-55. Extended Lower Band Edge Plot (LTE Band 25/2 - 3MHz QPSK – Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-56. Upper Band Edge Plot (LTE Band 2 - 3MHz QPSK – Full RB - Ant 1)

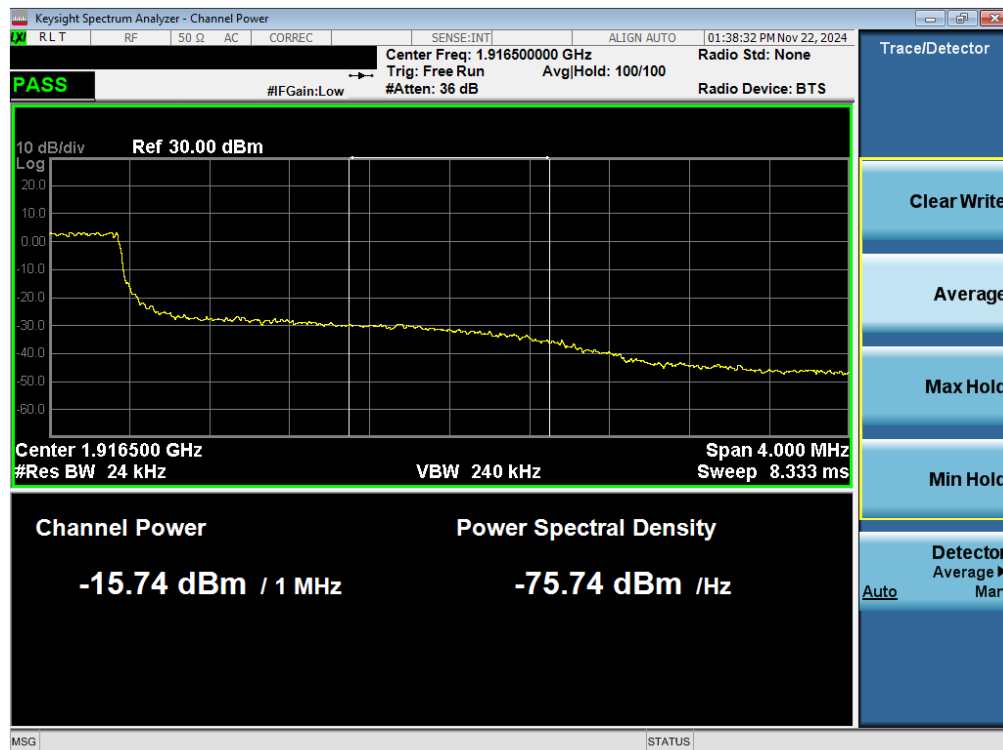


Plot 7-57. Extended Upper Band Edge Plot (LTE Band 2 - 3MHz QPSK – Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 52 of 81



Plot 7-58. Upper Band Edge Plot (LTE Band 25 - 3MHz QPSK – Full RB - Ant 1)



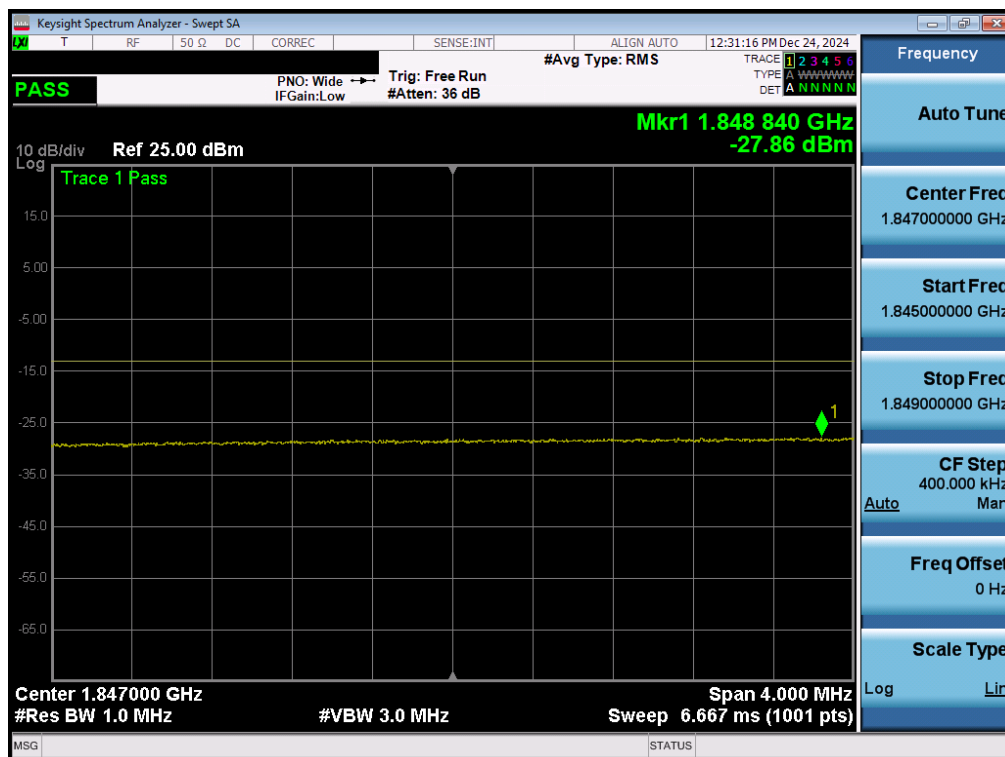
Plot 7-59. Extended Upper Band Edge Plot (LTE Band 25 - 3MHz QPSK – Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 53 of 81

## ULCA LTE Band 2 – Ant 1

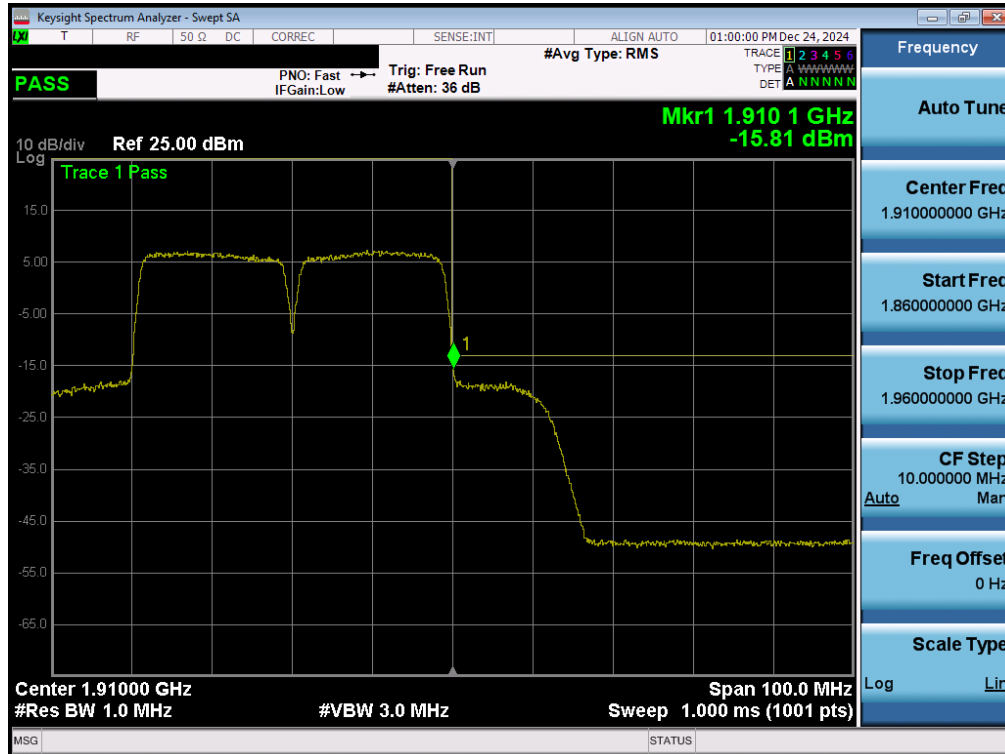


Plot 7-60. Lower Band Edge Plot (ULCA LTE Band 2 – 20+20MHz QPSK – Full RB - Ant 1)

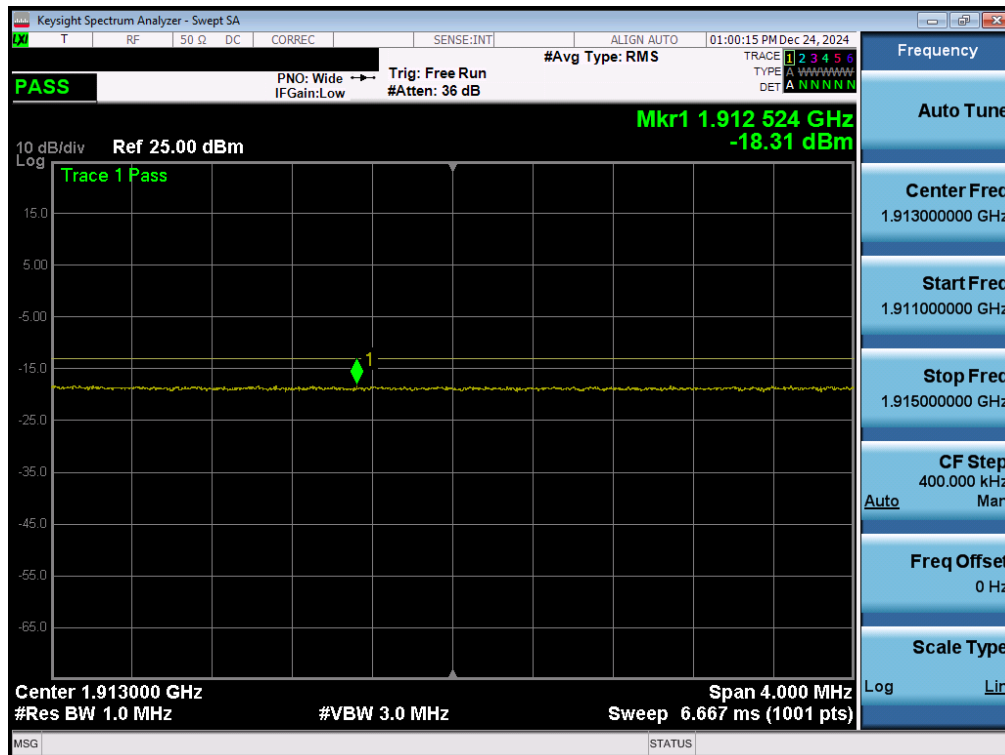


Plot 7-61. Extended Lower Band Edge Plot (ULCA LTE Band 2 – 20+20MHz QPSK – Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 54 of 81



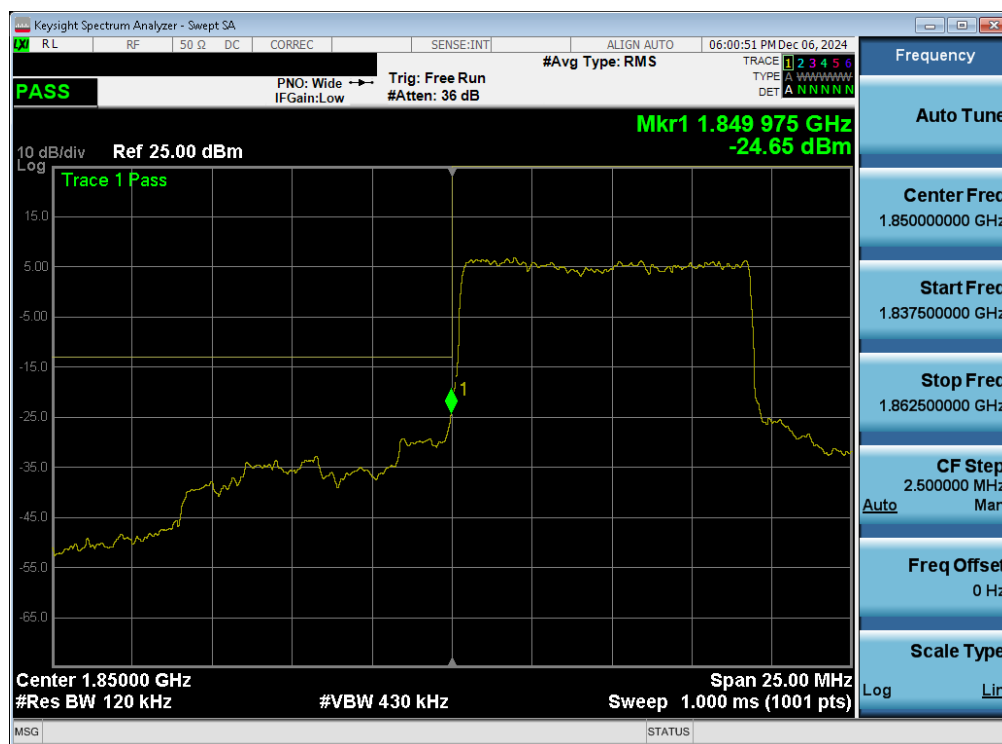
Plot 7-62. Upper Band Edge Plot (ULCA LTE Band 2 - 20+20MHz QPSK – Full RB - Ant 1)



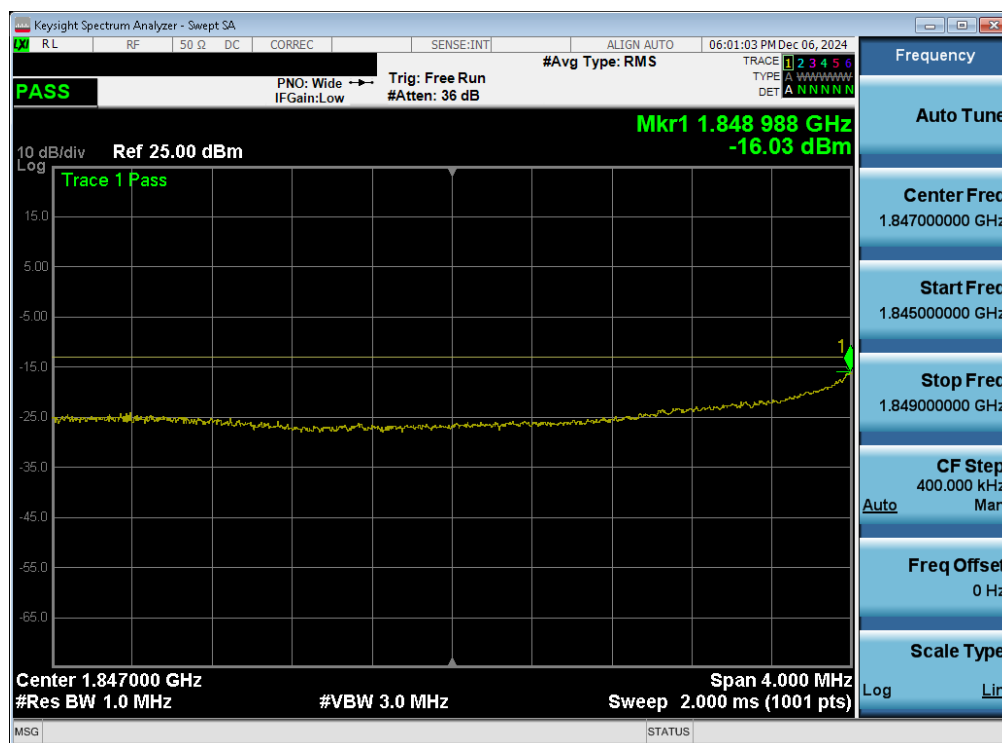
Plot 7-63. Extended Upper Band Edge Plot (ULCA LTE Band 2 - 20+20MHz QPSK – Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 55 of 81

## NR Band n25/2 – Ant 1



Plot 7-64. Lower Band Edge Plot (NR Band n25/2 - 10MHz QPSK – Full RB - Ant 1)



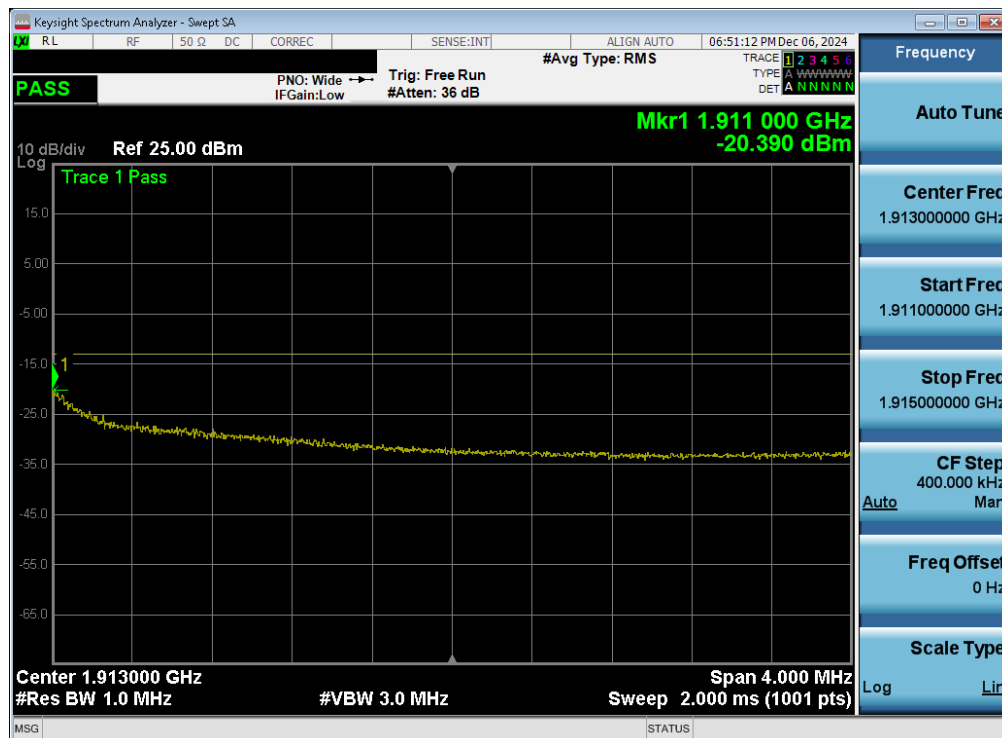
Plot 7-65. Extended Lower Band Edge Plot (NR Band n25/2 - 10MHz QPSK – Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 56 of 81



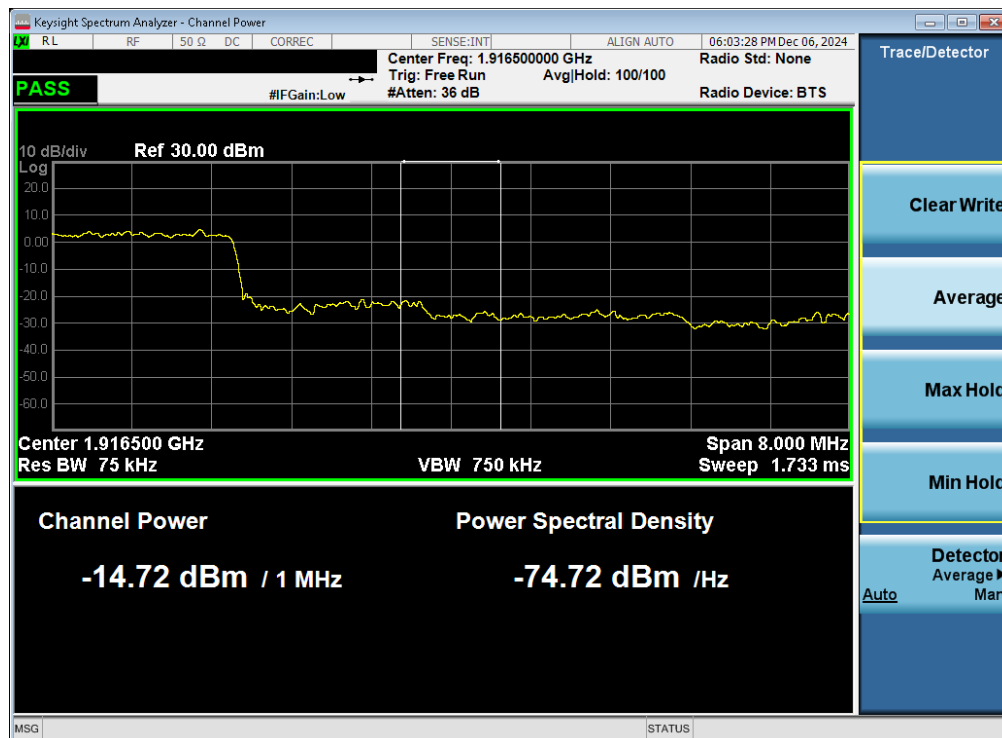


Plot 7-66. Upper Band Edge Plot (NR Band n2 - 10MHz QPSK – Full RB - Ant 1)



Plot 7-67. Extended Upper Band Edge Plot (NR Band n2 - 10MHz QPSK – Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## 7.6 Peak-Average Ratio

### Test Overview

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

***The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.***

### Test Procedure Used

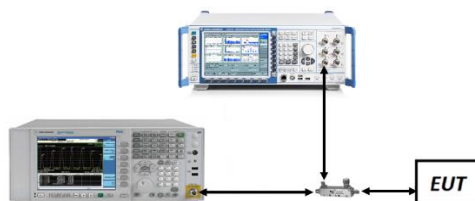
ANSI C63.26-2015 – Section 5.2.3.4

### Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW  $\geq$  OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

### Test Setup

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



**Figure 7-5. Test Instrument & Measurement Setup**

### Test Notes

For the QAM modulations, 256QAM was found to have the worst-case peak-to-average ratio so it is the only QAM measurement included in this section.

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 59 of 81

Mode	Bandwidth	Modulation	Average Power [dBm]	PAR at 0.1% [dB]	PAR Limit [dB]	Margin [dB]
WCDMA-PCS	N/A	Spread Spectrum	23.98	2.85	13	-10.15
LTE-B25-2	20MHz	QPSK	23.03	4.91	13	-8.09
		256QAM	19.06	6.73	13	-6.27
	15MHz	QPSK	23.03	4.88	13	-8.12
		256QAM	19.05	6.65	13	-6.35
	10MHz	QPSK	23.18	4.98	13	-8.02
		256QAM	19.17	6.67	13	-6.33
	5MHz	QPSK	23.12	4.83	13	-8.17
		256QAM	19.16	6.66	13	-6.34
	3MHz	QPSK	23.14	4.66	13	-8.34
		256QAM	19.14	6.68	13	-6.32
	1.4MHz	QPSK	23.09	4.97	13	-8.03
		256QAM	19.11	6.64	13	-6.36

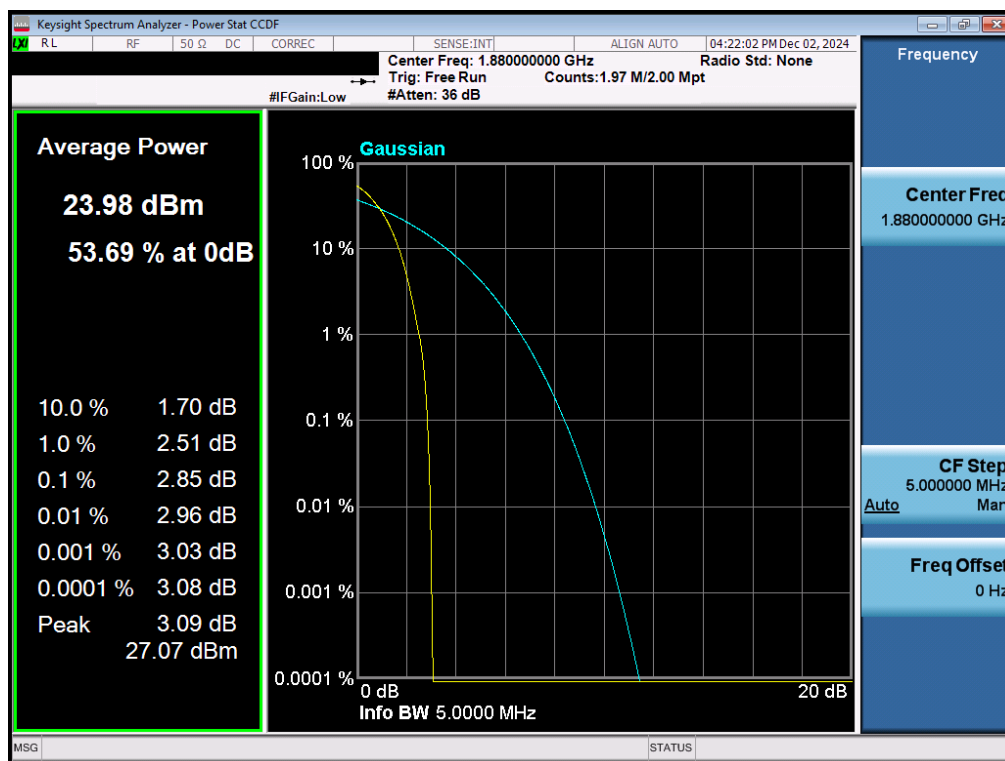
Table 7-12. PAR Test Results – Ant 1

Mode	Bandwidth	Modulation	Average Power [dBm]	PAR at 0.1% [dB]	PAR Limit [dB]	Margin [dB]
NR-n25	40MHz	BPSK	23.79	4.07	13	-8.93
		QPSK	21.20	6.69	13	-6.31
		256QAM	17.80	8.37	13	-4.63
	35MHz	BPSK	23.76	3.77	13	-9.23
		QPSK	21.25	6.63	13	-6.37
		256QAM	17.74	8.29	13	-4.71
	30MHz	BPSK	23.80	4.09	13	-8.91
		QPSK	21.27	6.58	13	-6.42
		256QAM	17.74	8.31	13	-4.69
	25MHz	BPSK	23.79	4.12	13	-8.88
		QPSK	21.28	6.53	13	-6.47
		256QAM	17.74	8.58	13	-4.42
NR-n25-2	20MHz	BPSK	23.83	4.05	13	-8.95
		QPSK	21.28	6.60	13	-6.40
		256QAM	17.78	8.34	13	-4.66
	15MHz	BPSK	23.83	4.05	13	-8.95
		QPSK	21.28	6.57	13	-6.43
		256QAM	17.72	8.42	13	-4.58
	10MHz	BPSK	23.71	3.93	13	-9.07
		QPSK	21.18	6.64	13	-6.36
		256QAM	17.60	8.60	13	-4.40
	5MHz	BPSK	23.70	3.78	13	-9.22
		QPSK	21.18	6.44	13	-6.56
		256QAM	17.63	8.36	13	-4.64

Table 7-13. PAR Test Results – Ant 1

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 60 of 81

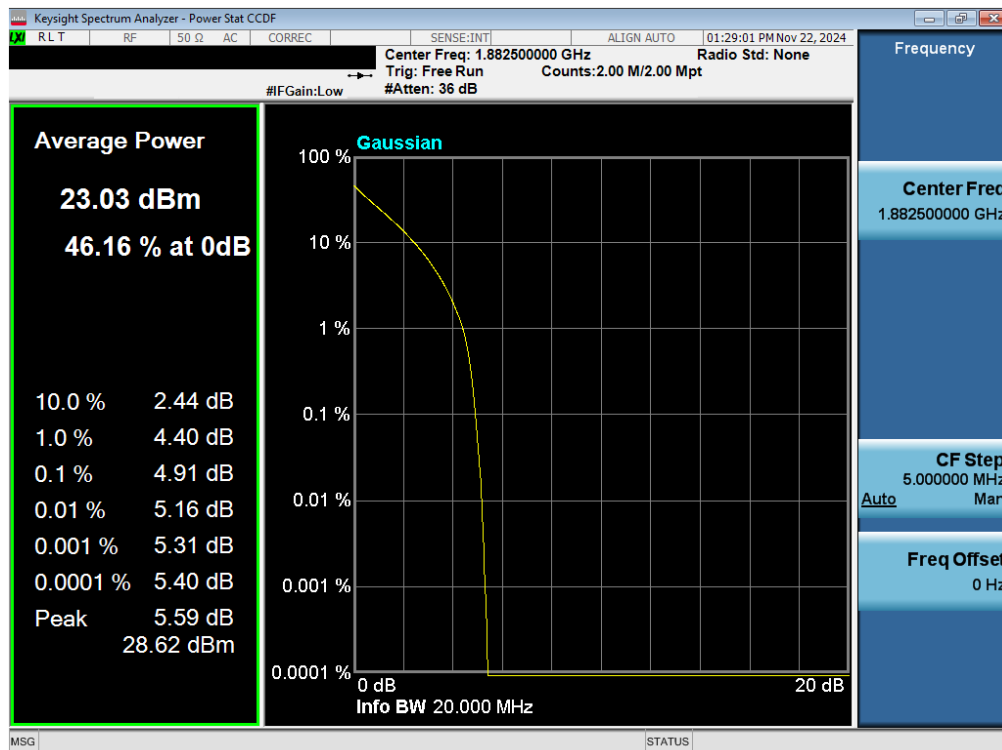
## WCDMA PCS – Ant 1



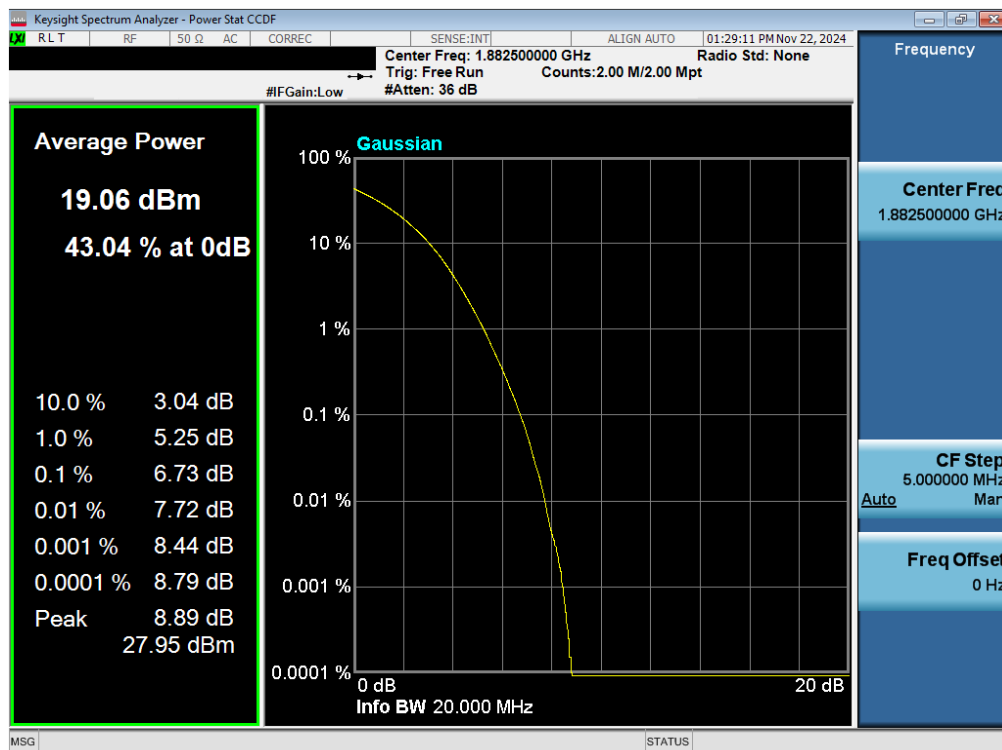
Plot 7-70. PAR Plot (WCDMA, Ch. 9400 - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 61 of 81

## LTE Band 25/2 – Ant 1



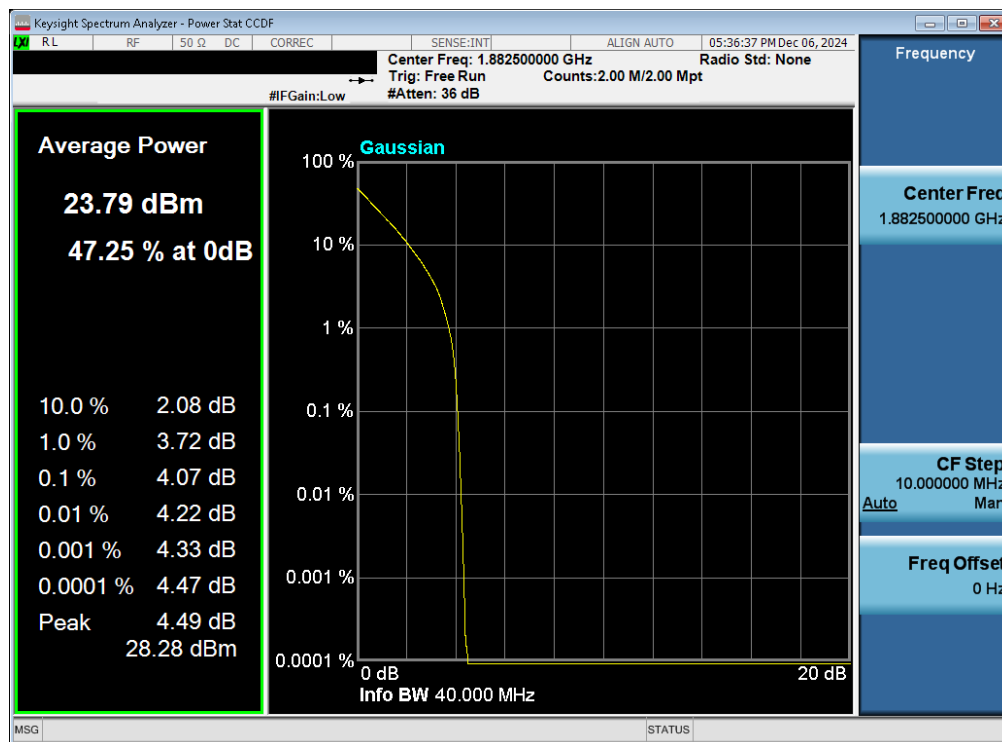
Plot 7-71. PAR Plot (LTE Band 25/2 - 20MHz QPSK - Full RB - Ant 1)



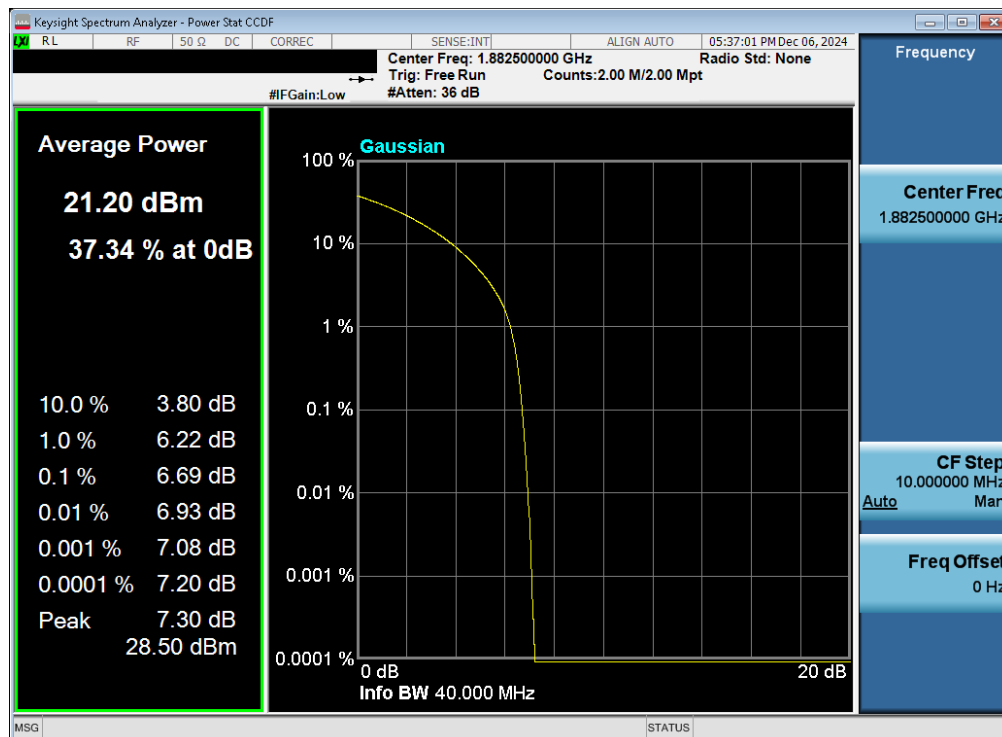
Plot 7-72. PAR Plot (LTE Band 25/2 - 20MHz 256-QAM - Full RB - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## NR Band n25/2 – Ant 1

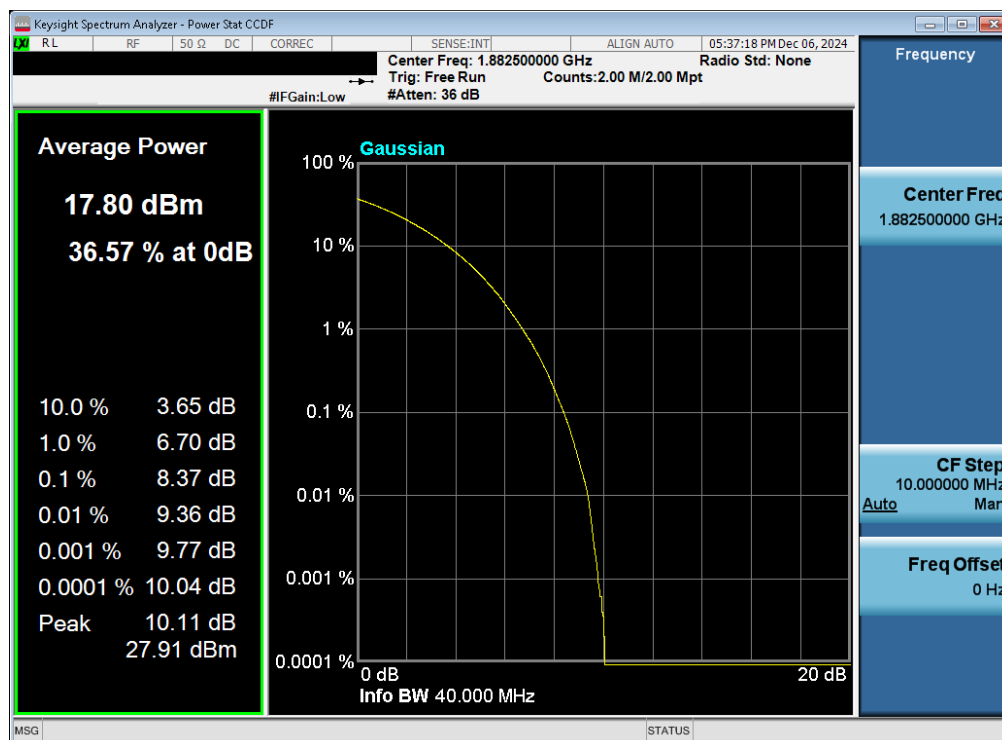


Plot 7-73. PAR Plot (NR Band n25/2 - 40.0MHz DFT-s-OFDM BPSK - Full RB - ANT 1)



Plot 7-74. PAR Plot (NR Band n25/2 - 40.0MHz CP-OFDM QPSK - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-75. PAR Plot (NR Band n25/2 - 40.0MHz CP-OFDM 256-QAM - Full RB - ANT 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## 7.7 Radiated Spurious Emissions Measurements

### Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using hybrid (biconical/log) antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

### Test Procedures Used

ANSI C63.26-2015 – Section 5.5.4

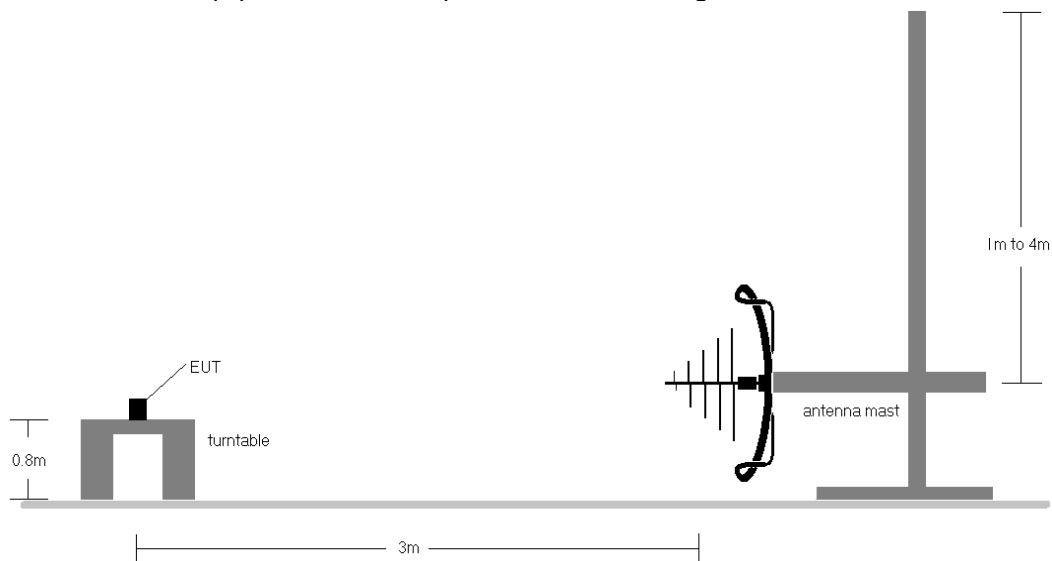
### Test Settings

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

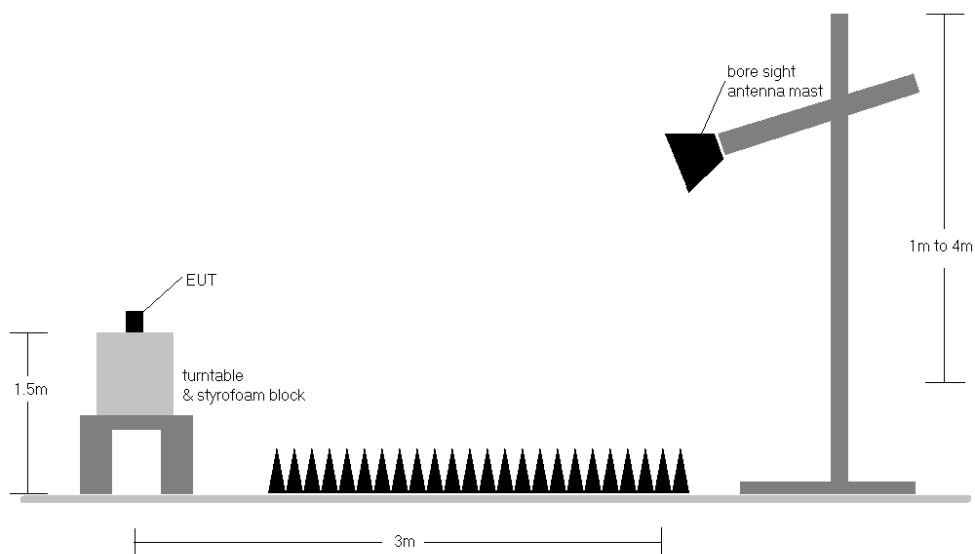
FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 65 of 81

## 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**

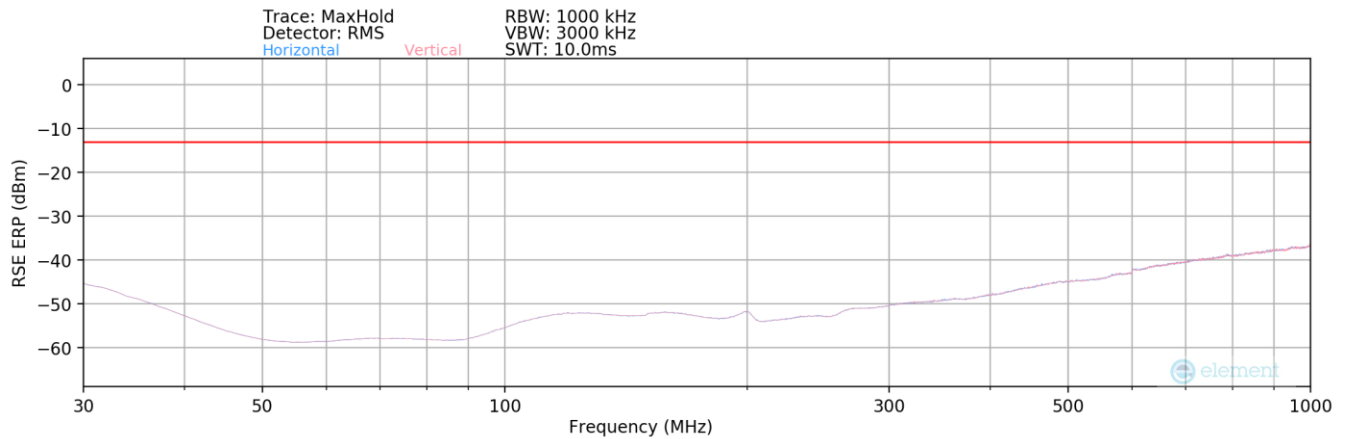
FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## Test Notes

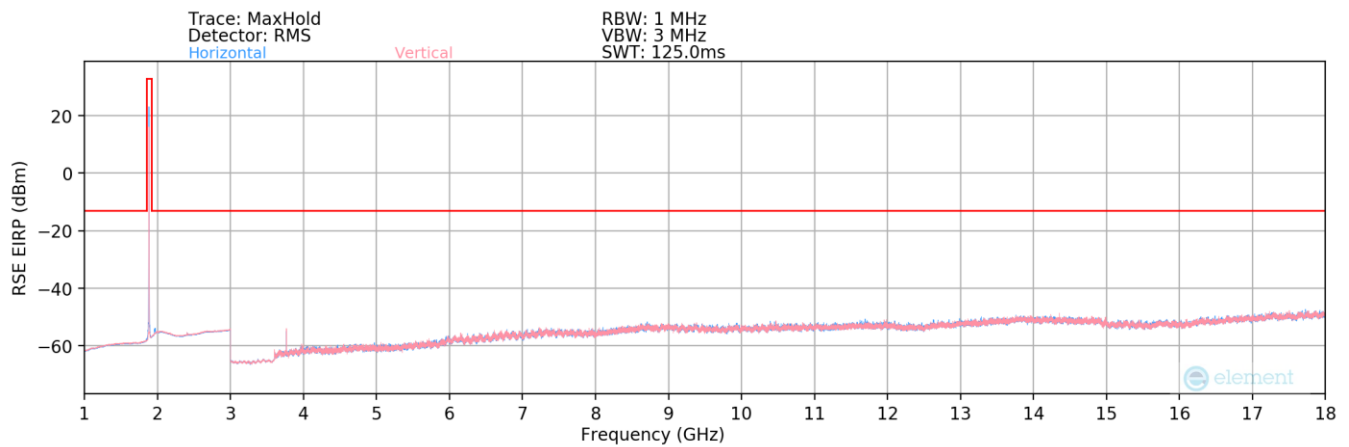
- 1) Field strengths are calculated using the Measurement quantity conversions in ANSI C63.26-2015 Section 5.2.7:
  - a)  $E(\text{dB}\mu\text{V/m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
  - b)  $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V/m}) + 20\log D - 104.8$ ; where D is the measurement distance in meters.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest powers are reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1".
- 3) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst-case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 4) This unit was tested using a power supply.
- 5) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 6) Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 7) The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 8) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) 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.
- 9) Spurious emission in EN-DC Operating mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor) has been checked and was found to not to be the worst case. Spurious emissions from the NR carrier device are subject to the rules under which the NR carrier operates. Spurious emissions caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates.

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## LTE Band 25/2 – Ant 1



**Plot 7-76. Radiated Spurious Plot Below 1GHz (LTE Band 25/2 - Ant 1)**



**Plot 7-77. Radiated Spurious Plot Above 1GHz (LTE Band 25/2 - Ant 1)**

Bandwidth (MHz):	20
Frequency (MHz):	1882.5
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
377.00	H	-	-	-91.57	22.73	38.16	-59.24	-13.00	-46.24

**Table 7-14. Radiated Spurious Data (LTE Band 25/2 – Mid Channel - Ant 1)**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT				Approved by: Technical Manager
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Bandwidth (MHz):	20
Frequency (MHz):	1860
RB / Offset:	1 / 50

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]
3720.00	H	238	241	-69.63	1.10	38.47	-56.78	-13.00	-43.78
5580.00	H	-	-	-79.02	4.26	32.24	-63.02	-13.00	-50.02
7440.00	H	-	-	-79.37	9.31	36.94	-58.32	-13.00	-45.32
9300.00	H	-	-	-80.12	11.83	38.71	-56.55	-13.00	-43.55

**Table 7-15. Radiated Spurious Data (LTE Band 25/2 – Low Channel - Ant 1)**

Bandwidth (MHz):	20
Frequency (MHz):	1882.5
RB / Offset:	1 / 50

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]
3765.00	H	196	236	-66.46	0.99	41.53	-53.73	-13.00	-40.73
5647.50	H	-	-	-78.63	4.53	32.90	-62.36	-13.00	-49.36
7530.00	H	-	-	-79.49	9.56	37.07	-58.18	-13.00	-45.18
9412.50	H	-	-	-81.13	12.18	38.05	-57.20	-13.00	-44.20

**Table 7-16. Radiated Spurious Data (LTE Band 25/2 – Mid Channel - Ant 1)**

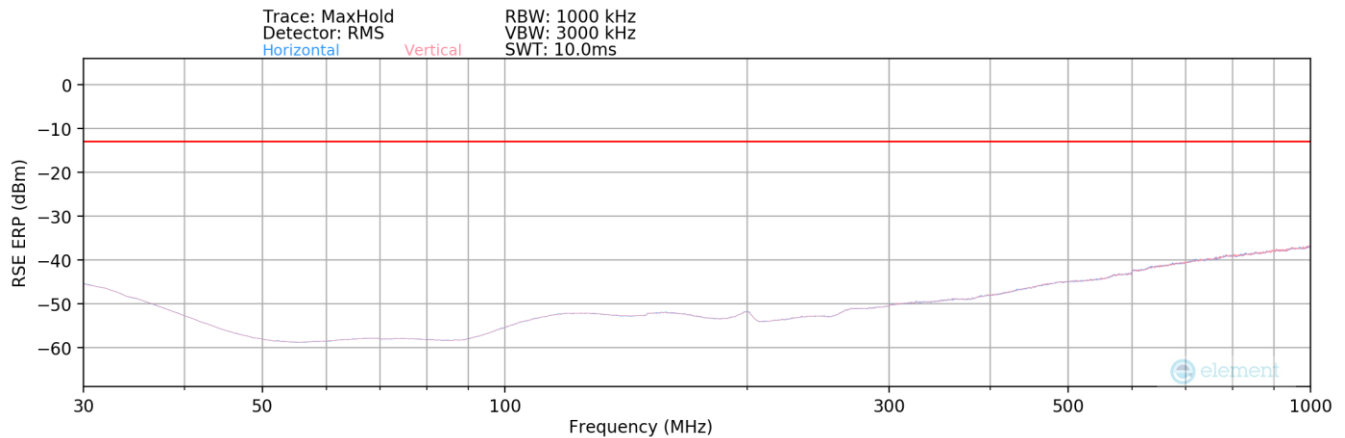
Bandwidth (MHz):	20
Frequency (MHz):	1905
RB / Offset:	1 / 50

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]
3810.00	H	153	242	-68.88	0.96	39.08	-56.18	-13.00	-43.18
5715.00	H	-	-	-78.50	4.47	32.97	-62.29	-13.00	-49.29
7620.00	H	-	-	-79.92	9.58	36.66	-58.59	-13.00	-45.59
9525.00	H	-	-	-81.02	11.91	37.89	-57.37	-13.00	-44.37

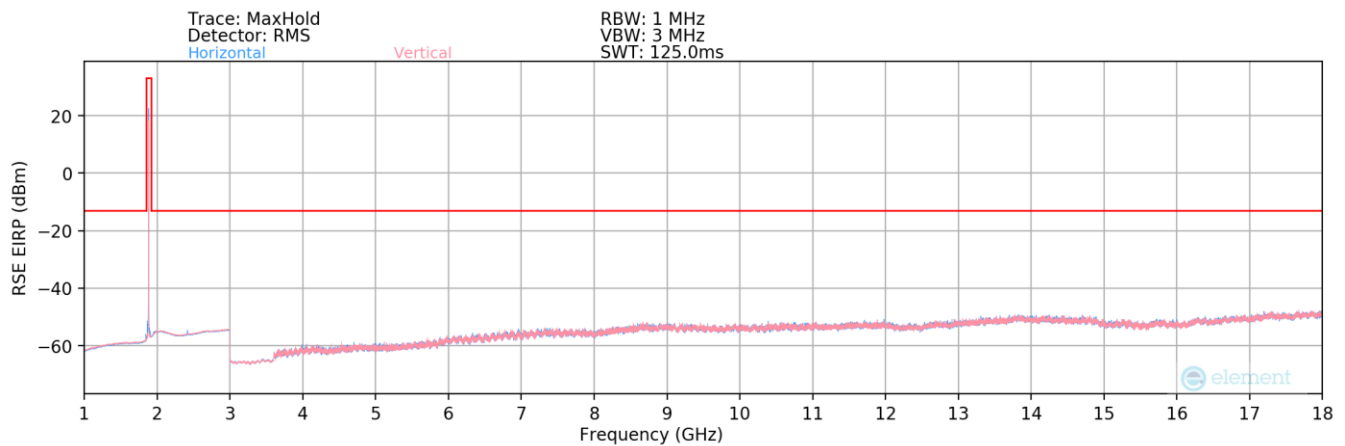
**Table 7-17. Radiated Spurious Data (LTE Band 25/2 – High Channel - Ant 1)**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 69 of 81

## NR Band n25/2 – Ant 1



**Plot 7-78. Radiated Spurious Plot Below 1GHz (NR Band n25/2 – Ant 1)**



**Plot 7-79. Radiated Spurious Plot Above 1GHz (NR Band n25/2 – Ant 1)**

Bandwidth (MHz):	40
Frequency (MHz):	1882.5
RB / Offset:	1 / 108

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
333.00	H	-	-	-108.86	21.82	19.96	-77.45	-13.00	-64.45

**Table 7-18. Radiated Spurious Data (NR Band n25/2 – Mid Channel – Ant 1)**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT						Approved by: Technical Manager
Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular				Page 70 of 81	

Bandwidth (MHz):	40
Frequency (MHz):	1870
RB / Offset:	1 / 108

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]
3740.00	H	-	-	-77.67	0.95	30.28	-64.98	-13.00	-51.98
5610.00	H	-	-	-78.42	4.36	32.94	-62.32	-13.00	-49.32
7480.00	H	-	-	-79.23	9.18	36.95	-58.31	-13.00	-45.31

**Table 7-19. Radiated Spurious Data (NR Band n25/2 – Low Channel - Ant 1)**

Bandwidth (MHz):	40
Frequency (MHz):	1882.5
RB / Offset:	1 / 108

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]
3765.00	H	242	30	-76.78	0.99	31.21	-64.05	-13.00	-51.05
5647.50	H	246	43	-76.78	4.53	34.75	-60.51	-13.00	-47.51
7530.00	H	-	-	-78.66	9.56	37.90	-57.35	-13.00	-44.35
9412.50	H	-	-	-79.63	12.18	39.55	-55.70	-13.00	-42.70
11295.00	H	-	-	-80.78	12.85	39.07	-56.19	-13.00	-43.19

**Table 7-20. Radiated Spurious Data (NR Band n25/2 – Mid Channel - Ant 1)**

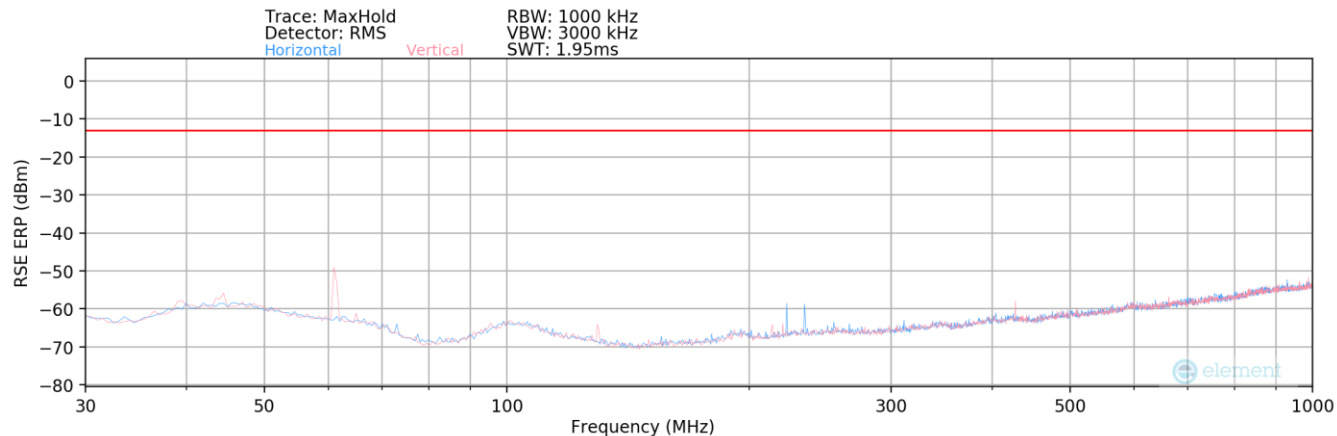
Bandwidth (MHz):	40
Frequency (MHz):	1895
RB / Offset:	1 / 108

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]
3790.00	H	204	340	-77.94	1.02	30.08	-65.17	-13.00	-52.17
5685.00	H	-	-	-78.66	4.42	32.76	-62.50	-13.00	-49.50
7580.00	H	-	-	-79.44	9.67	37.23	-58.03	-13.00	-45.03
9475.00	H	-	-	-79.88	11.88	39.00	-56.26	-13.00	-43.26

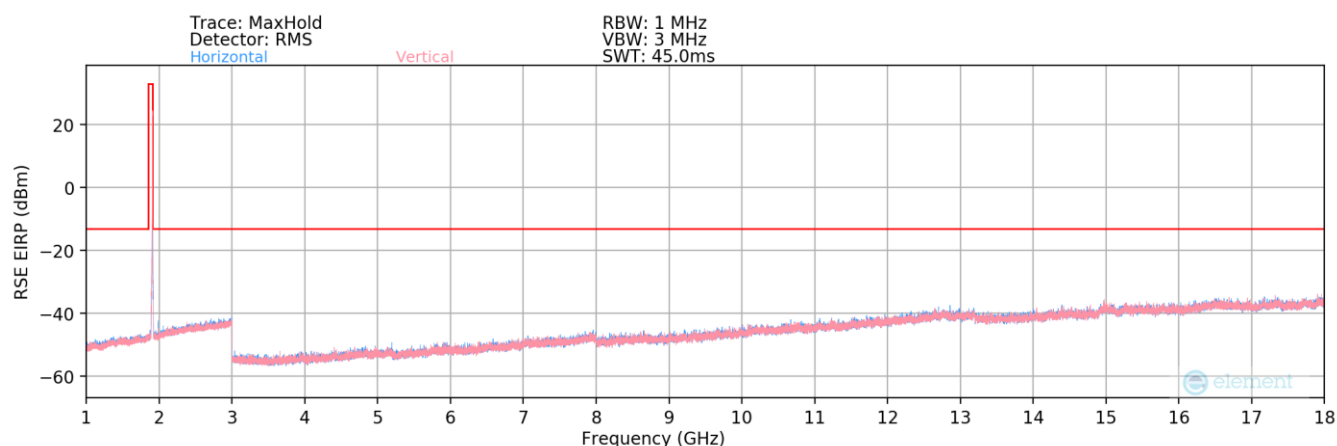
**Table 7-21. Radiated Spurious Data (NR Band n25/2 – High Channel - Ant 1)**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## WCDMA PCS – Ant 1



**Plot 7-80. Radiated Spurious Plot Below 1GHz (WCDMA PCS – Ant 1)**



**Plot 7-81. Radiated Spurious Plot Above 1GHz (WCDMA PCS – Ant 1)**

Mode:	WCDMA RMC
Channel:	9400
Frequency (MHz):	1880

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
60.00	V	-	-	-84.18	-12.62	10.20	-87.20	-13.00	-74.20

**Table 7-22. Radiated Spurious Data (WCDMA PCS – Mid Channel – Ant 1)**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT				Approved by: Technical Manager
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Mode:	WCDMA RMC
Channel:	9262
Frequency (MHz):	1852.4

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]
3704.80	H	103	321	-73.53	7.71	41.18	-54.08	-13.00	-41.08
5557.20	H	-	-	-81.36	11.42	37.06	-58.20	-13.00	-45.20
7409.60	H	-	-	-81.83	15.03	40.20	-55.06	-13.00	-42.06
9262.00	H	-	-	-83.34	17.49	41.15	-54.10	-13.00	-41.10

Table 7-23. Radiated Spurious Data (WCDMA PCS – Low Channel - Ant 1)

Mode:	WCDMA RMC
Channel:	9400
Frequency (MHz):	1880

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]
3760.00	H	135	325	-76.57	7.92	38.35	-56.91	-13.00	-43.91
5640.00	H	-	-	-81.32	11.47	37.15	-58.11	-13.00	-45.11
7520.00	H	-	-	-82.18	15.64	40.46	-54.80	-13.00	-41.80
9400.00	H	-	-	-83.32	17.72	41.40	-53.86	-13.00	-40.86

Table 7-24. Radiated Spurious Data (WCDMA PCS – Mid Channel - Ant 1)

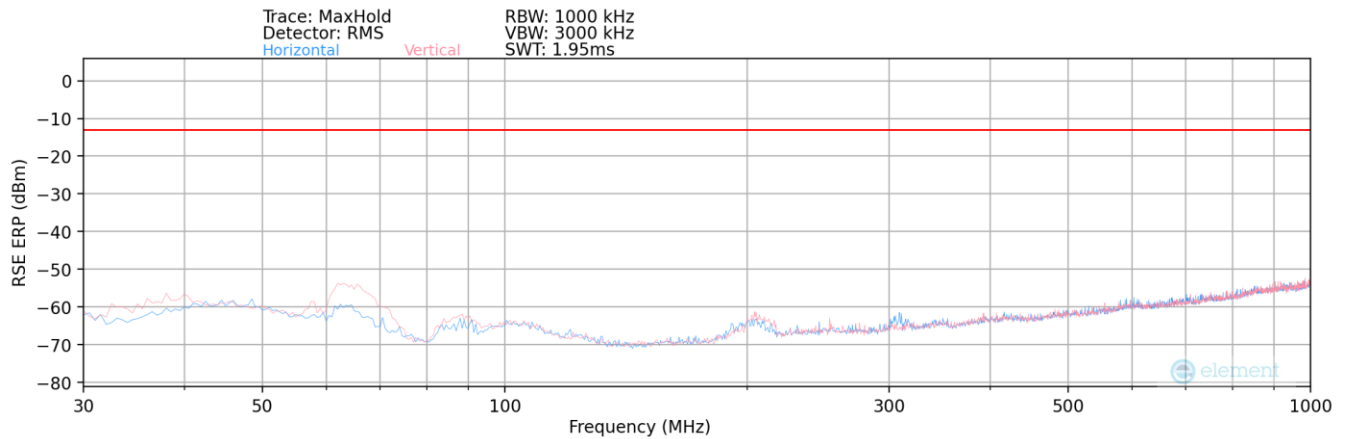
Mode:	WCDMA RMC
Channel:	9538
Frequency (MHz):	1907.6

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]
3815.20	H	218	49	-79.23	7.99	35.76	-59.49	-13.00	-46.49
5722.80	H	-	-	-81.10	11.54	37.44	-57.82	-13.00	-44.82
7630.40	H	-	-	-82.40	15.70	40.30	-54.96	-13.00	-41.96
9538.00	H	-	-	-83.08	18.28	42.20	-53.05	-13.00	-40.05

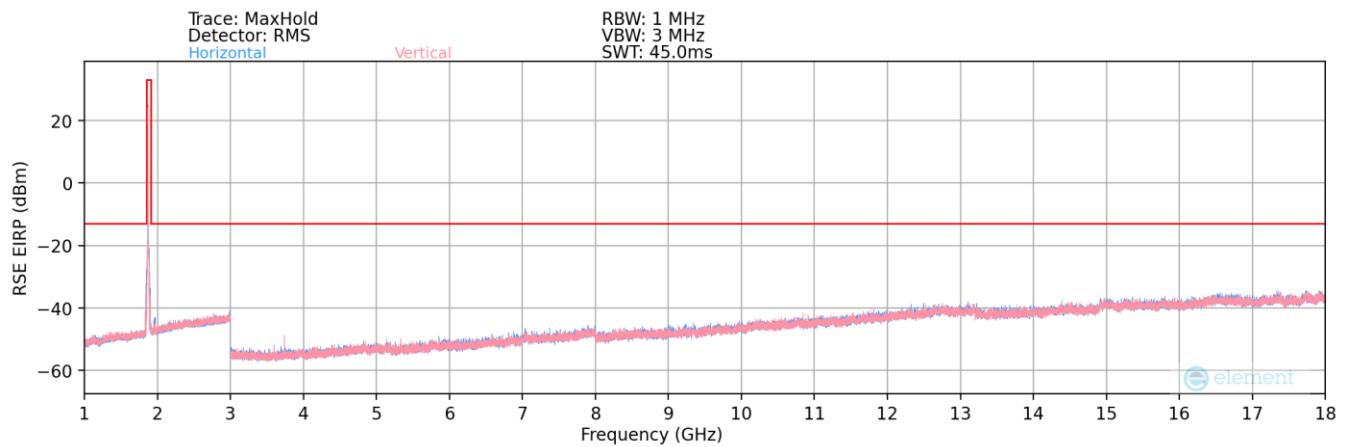
Table 7-25. Radiated Spurious Data (WCDMA PCS – High Channel - Ant 1)

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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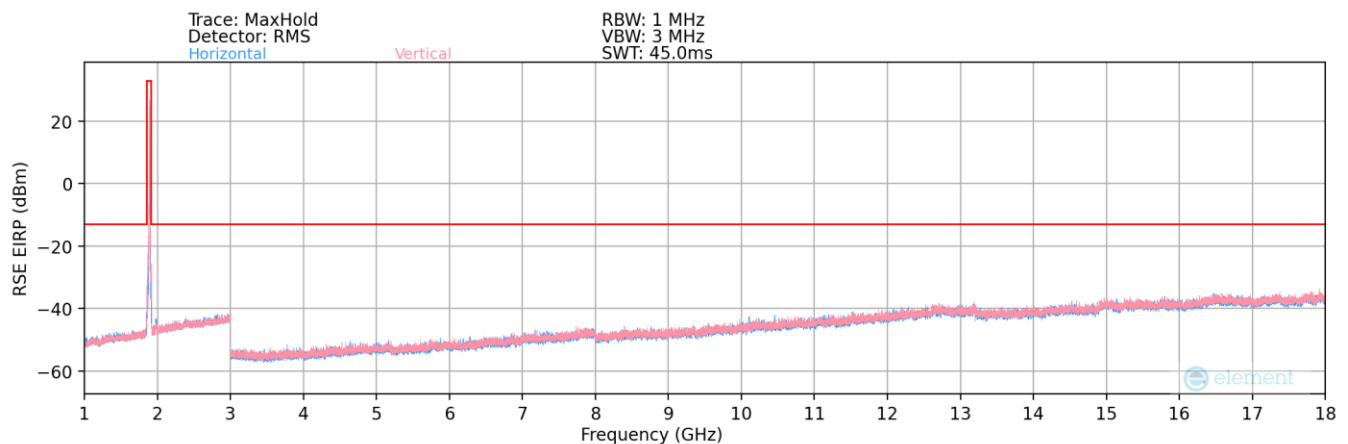
## ULCA LTE Band 2 – Ant 1



**Plot 7-82. Radiated Spurious Plot Below 1GHz (ULCA LTE Band 2 - Ant 1)**

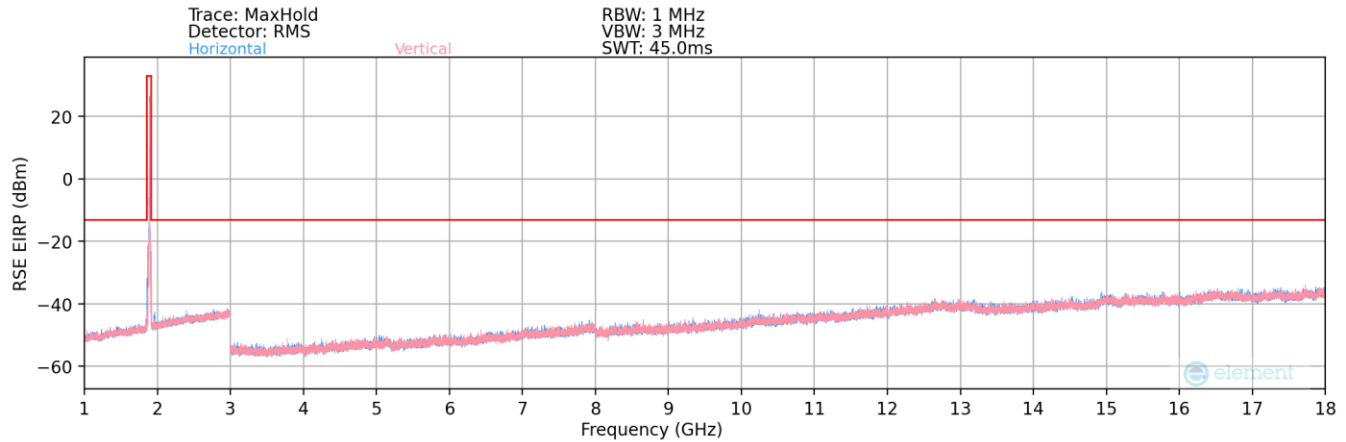


**Plot 7-83. Radiated Spurious Plot Above 1GHz (ULCA LTE Band 2 – Low Channel – Ant 1)**



**Plot 7-84. Radiated Spurious Plot Above 1GHz (ULCA LTE Band 2 – Mid Channel – Ant 1)**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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**Plot 7-85. Radiated Spurious Plot Above 1GHz (ULCA LTE Band 2 – High Channel – Ant 1)**

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	1880
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	1899.8
SCC RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
63.89	H	145	58	-64.34	-13.64	29.02	-68.39	-13.00	-55.39
206.64	H	145	204	-69.02	-13.97	24.01	-73.40	-13.00	-60.40
307.64	H	-	-	-73.28	-11.16	22.56	-74.84	-13.00	-61.84
422.02	H	-	-	-74.09	-7.86	25.05	-72.36	-13.00	-59.36
475.72	H	-	-	-74.67	-7.24	25.09	-72.32	-13.00	-59.32

**Table 7-26. Radiated Spurious Data (ULCA LTE Band 2 – Mid Channel - Ant 1)**

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	1860
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	1860
SCC RB / Offset:	1 / 0

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]
3720.00	H	139	173	-74.27	7.65	40.38	-54.88	-13.00	-41.88
5580.00	H	-	-	-81.17	11.46	37.29	-57.97	-13.00	-44.97
7440.00	H	-	-	-82.05	15.33	40.28	-54.98	-13.00	-41.98
9300.00	H	-	-	-83.08	17.79	41.71	-53.55	-13.00	-40.55

**Table 7-27. Radiated Spurious Data (ULCA LTE Band 2 – Low Channel - Ant 1)**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	1880
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	1899.8
SCC RB / Offset:	1 / 0

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]
3760.00	H	151	238	-73.88	7.92	41.04	-54.22	-13.00	-41.22
5640.00	H	-	-	-81.94	11.47	36.53	-58.73	-13.00	-45.73
7520.00	H	-	-	-82.26	15.64	40.38	-54.88	-13.00	-41.88
9400.00	H	-	-	-83.07	17.72	41.65	-53.61	-13.00	-40.61

**Table 7-28. Radiated Spurious Data (ULCA LTE Band 2 – Mid Channel - Ant 1)**

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	1900
PCC RB / Offset:	1 / 0
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	1900
SCC RB / Offset:	1 / 99

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]
3800.00	H	326	46	-74.93	8.21	40.28	-54.98	-13.00	-41.98
5700.00	H	-	-	-80.99	11.02	37.03	-58.22	-13.00	-45.22
7600.00	H	-	-	-82.17	15.46	40.29	-54.96	-13.00	-41.96
9500.00	H	-	-	-83.15	18.13	41.98	-53.28	-13.00	-40.28

**Table 7-29. Radiated Spurious Data (ULCA LTE Band 2 – High Channel - Ant 1)**

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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## 7.8 Frequency Stability / Temperature Variation

### Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. 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 Part 24, 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 – Section 5.6

### 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

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

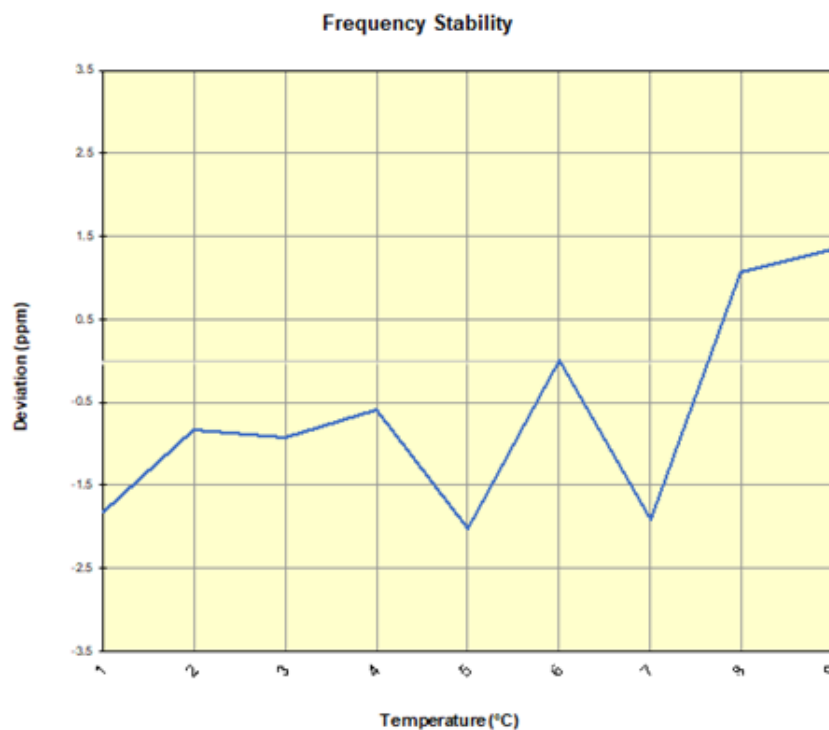
### Test Notes

None

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LTE Band 25/2					
Operating Frequency (Hz):			1,882,500,000		
Ref. Voltage (VDC):			3.85		
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	- 30	1,882,502,463	-3,431	-0.0001823
		- 20	1,882,504,331	-1,563	-0.0000830
		- 10	1,882,504,153	-1,741	-0.0000925
		0	1,882,504,778	-1,116	-0.0000593
		+ 10	1,882,502,099	-3,795	-0.0002016
		+ 20 (Ref)	1,882,505,894	0	0.0000000
		+ 30	1,882,502,304	-3,590	-0.0001907
		+ 40	1,882,507,912	2,018	0.0001072
		+ 50	1,882,508,434	2,540	0.0001349
Battery Endpoint	2.80	+ 20	1,882,506,370	476	0.0000253

Table 7-30. LTE Band 25/2 Frequency Stability Data

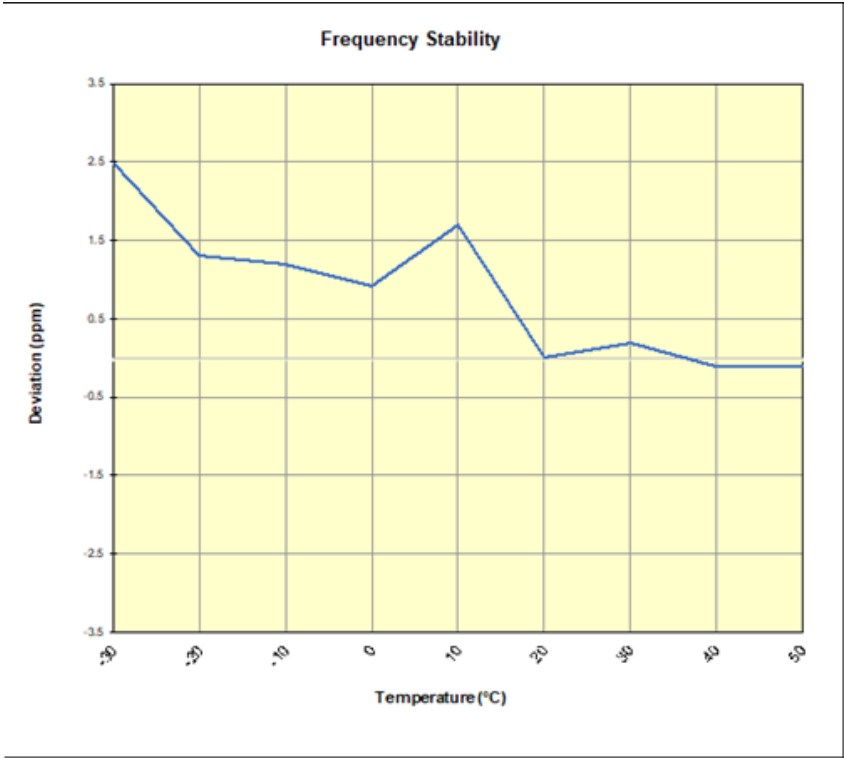


Plot 7-86. LTE Band 25/2 Frequency Stability Chart

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n25/2					
		Operating Frequency (Hz):		1,882,500,000	
		Ref. Voltage (VDC):		3.85	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	- 30	1,882,496,237	4,672	0.0002482
		- 20	1,882,494,022	2,456	0.0001305
		- 10	1,882,493,804	2,239	0.0001189
		0	1,882,493,301	1,735	0.0000922
		+ 10	1,882,494,777	3,212	0.0001706
		+ 20 (Ref)	1,882,491,566	0	0.0000000
		+ 30	1,882,491,913	348	0.0000185
		+ 40	1,882,491,352	-213	-0.0000113
		+ 50	1,882,491,354	-211	-0.0000112
Battery Endpoint	2.80	+ 20	1,882,489,418	-2,147	-0.0001141

Table 7-31. NR Band n25/2 Frequency Stability Data

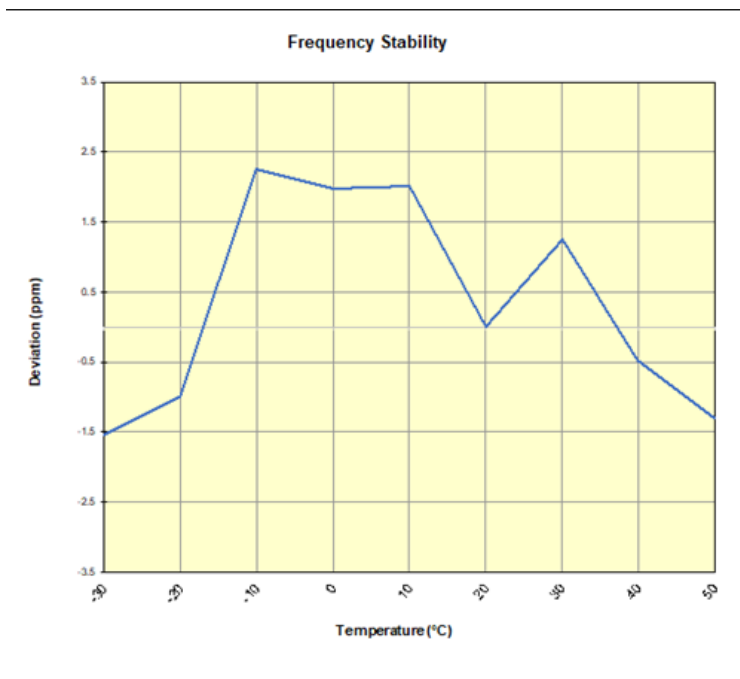


Plot 7-87. NR Band n25/2 Frequency Stability Chart

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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WCDMA PCS					
			Operating Frequency (Hz):	1,880,000,000	
			Ref. Voltage (VDC):	3.85	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	- 30	1,879,961,131	-2,883	-0.0001534
		- 20	1,879,962,135	-1,880	-0.0001000
		- 10	1,879,968,242	4,227	0.0002249
		0	1,879,967,721	3,706	0.0001971
		+ 10	1,879,967,783	3,768	0.0002004
		+ 20 (Ref)	1,879,964,015	0	0.0000000
		+ 30	1,879,966,367	2,353	0.0001252
		+ 40	1,879,963,129	-885	-0.0000471
		+ 50	1,879,961,571	-2,444	-0.0001300
Battery Endpoint	2.80	+ 20	1,879,960,719	-3,296	-0.0001753

Table 7-32. WCDMA PCS Frequency Stability Data



Plot 7-88. WCDMA PCS Frequency Stability Chart

FCC ID: C3K2114	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Microsoft Corporation Full Modular FCC ID: C3K2114** complies with all the requirements of Part 24 of the FCC rules.

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Test Report S/N: 1M2411190103-02-R1.C3K	Test Dates: 12/3/2024 - 2/14/2025	EUT Type: Full Modular	Page 81 of 81