



## PART 27 MEASUREMENT REPORT

**Applicant Name:**

Telit Communications S.p.A  
Viale Stazione di Prosecco 5/b  
34010, Trieste, Italy

**Date of Testing:**

5/12- 6/1/2021

**Test Site/Location:**

PCTEST Lab. Columbia, MD, USA

**Test Report Serial No.:**

1M2106040065-06.RI7

**FCC ID:**

**RI7LE910CXWWX**

**APPLICANT:**

**Telit Communications S.p.A**

**Application Type:**

Certification

**Model:**

LE910C4-WWX

**Additional Model (s):**

LE910C1-WWX

**EUT Type:**

Data Terminal Module

**FCC Classification:**

PCS Licensed Transmitter (PCB)

**FCC Rule Part:**

27

**Test Procedure(s):**

ANSI C63.26-2015, ANSI/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.

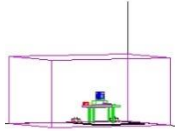
  
 Randy Ortanez  
 President


|                                         |                                                                                                                       |                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   |  <b>PART 27 MEASUREMENT REPORT</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                                                                                         | EUT Type:<br>Data Terminal Module |
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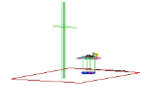
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# MEASUREMENT REPORT

## FCC Part 27



| Mode        | Bandwidth | Modulation | Tx Frequency Range [MHz] | ERP            |                  | Emission Designator |
|-------------|-----------|------------|--------------------------|----------------|------------------|---------------------|
|             |           |            |                          | Max. Power [W] | Max. Power [dBm] |                     |
| LTE Band 8  | 3 MHz     | QPSK       | 899                      | 0.139          | 21.44            | 2M73G7D             |
|             |           | 16QAM      | 899                      | 0.117          | 20.70            | 2M73W7D             |
|             | 1.4 MHz   | QPSK       | 898.2 - 899.8            | 0.143          | 21.55            | 1M11G7D             |
|             |           | 16QAM      | 898.2 - 899.8            | 0.112          | 20.50            | 1M11W7D             |
| LTE Band 12 | 10 MHz    | QPSK       | 704.0 - 711.0            | 0.157          | 21.97            | 9M04G7D             |
|             |           | 16QAM      | 704.0 - 711.0            | 0.124          | 20.92            | 9M04W7D             |
|             | 5 MHz     | QPSK       | 701.5 - 713.5            | 0.152          | 21.82            | 4M57G7D             |
|             |           | 16QAM      | 701.5 - 713.5            | 0.116          | 20.64            | 4M53W7D             |
|             | 3 MHz     | QPSK       | 700.5 - 714.5            | 0.150          | 21.75            | 2M72G7D             |
|             |           | 16QAM      | 700.5 - 714.5            | 0.122          | 20.85            | 2M72W7D             |
|             | 1.4 MHz   | QPSK       | 699.7 - 715.3            | 0.154          | 21.88            | 1M11G7D             |
|             |           | 16QAM      | 699.7 - 715.3            | 0.123          | 20.91            | 1M11W7D             |
| LTE Band 13 | 10 MHz    | QPSK       | 782.0                    | 0.167          | 22.23            | 9M01G7D             |
|             |           | 16QAM      | 782.0                    | 0.131          | 21.17            | 9M04W7D             |
|             | 5 MHz     | QPSK       | 779.5 - 784.5            | 0.166          | 22.21            | 4M55G7D             |
|             |           | 16QAM      | 779.5 - 784.5            | 0.133          | 21.25            | 4M54W7D             |

Overview Table (<1GHz Bands)

| Mode      | Bandwidth | Modulation      | Tx Frequency Range [MHz] | EIRP           |                  | Emission Designator |
|-----------|-----------|-----------------|--------------------------|----------------|------------------|---------------------|
|           |           |                 |                          | Max. Power [W] | Max. Power [dBm] |                     |
| WCDMA1700 | -         | Spread Spectrum | 1712.4 - 1752.6          | 0.412          | 26.15            | 4M14F9W             |

| Mode       | Bandwidth | Modulation | Tx Frequency Range [MHz] | EIRP           |                  | Emission Designator |
|------------|-----------|------------|--------------------------|----------------|------------------|---------------------|
|            |           |            |                          | Max. Power [W] | Max. Power [dBm] |                     |
| LTE Band 4 | 20 MHz    | QPSK       | 1720.0 - 1745.0          | 0.372          | 25.71            | 17M9G7D             |
|            |           | 16QAM      | 1720.0 - 1745.0          | 0.306          | 24.85            | 17M9W7D             |
|            | 15 MHz    | QPSK       | 1717.5 - 1747.5          | 0.387          | 25.88            | 13M4G7D             |
|            |           | 16QAM      | 1717.5 - 1747.5          | 0.308          | 24.89            | 13M5W7D             |
|            | 10 MHz    | QPSK       | 1715.0 - 1750.0          | 0.370          | 25.68            | 9M01G7D             |
|            |           | 16QAM      | 1715.0 - 1750.0          | 0.293          | 24.66            | 9M01W7D             |
|            | 5 MHz     | QPSK       | 1712.5 - 1752.5          | 0.348          | 25.41            | 4M58G7D             |
|            |           | 16QAM      | 1712.5 - 1752.5          | 0.282          | 24.50            | 4M53W7D             |
|            | 3 MHz     | QPSK       | 1711.5 - 1753.5          | 0.367          | 25.65            | 2M72G7D             |
|            |           | 16QAM      | 1711.5 - 1753.5          | 0.293          | 24.67            | 2M72W7D             |
|            | 1.4 MHz   | QPSK       | 1710.7 - 1754.3          | 0.361          | 25.58            | 1M11G7D             |
|            |           | 16QAM      | 1710.7 - 1754.3          | 0.288          | 24.59            | 1M11W7D             |

Overview Table (>1GHz Bands)

|                                         |                                                                                                                       |                                   |                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   |  <b>PART 27 MEASUREMENT REPORT</b> |                                   | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                                                                                         | EUT Type:<br>Data Terminal Module | Page 3 of 111                     |

## 1.0 INTRODUCTION

### 1.1 Scope

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

### 1.2 PCTEST Test Location

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

### 1.3 Test Facility / Accreditations

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

- PCTEST is 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.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISSED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISSED.

|                                                |                                                                                                                                                                                                                      |                                          |                                          |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|
| FCC ID: RI7LE910CXWWX                          |  <b>PCTEST</b><br>Proud to be part of  element | <b>PART 27 MEASUREMENT REPORT</b>        | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2106040065-06.RI7 | <b>Test Dates:</b><br>5/12- 6/1/2021                                                                                                                                                                                 | <b>EUT Type:</b><br>Data Terminal Module | Page 4 of 111                            |

## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Telit Communications S.p.A Data Terminal Module** **FCC ID: RI7LE910CXWWX**. 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 27.

This FCC and IC ID covers operations for two different versions of this module. The LE910C4-WWX is the Cat. 4 LTE version module and the LE910C1-WWX is the Cat. 1 LTE version of this module. Cat. 1 and Cat. 4 LTE only differ in the speed/throughput and have not been noted to have any impact on the RF itself. Both modules were investigated and the LE910C4-WWX was tested fully to represent both versions of the module.

**Test Device Serial No.:** 96014, 95001

### 2.2 Device Capabilities

This device contains the following capabilities:

GSM/GPRS/EDGE, WCDMA/HSPA, LTE

### 2.3 Test Configuration

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

### 2.4 Software and Firmware

The test was conducted with firmware version M0F.503003 for LE910C4-WWX and M0F.103003 for LE910C1-WWX 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 document titled “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/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.

### 3.2 Radiated Power and 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 wooden turntable 80cm above the ground plane and 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. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer “Channel Power” function with the integration band set to the emissions’ occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v03r01.

Per the guidance of ANSI/TIA-603-E-2016, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

Where,  $P_d$  is the dipole equivalent power,  $P_g$  is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to  $P_g \text{ [dBm]} - \text{cable loss [dB]}$ .

For fundamental radiated power measurements, the guidance of KDB 971168 D01 v03r01 is used to record the EUT power level that is subsequently matched via the aforementioned substitution method given in ANSI/TIA-603-E-2016.

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.

|                                         |                                                                                                                       |                                   |                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
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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                             |

|                                         |                                                                                                                       |                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|
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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 |
|-----------------------|------------|----------------------------------|------------|--------------|------------|---------------|
| -                     | AP1        | EMC Cable and Switch System      | 3/9/2021   | Annual       | 3/9/2022   | AP1           |
| -                     | ETS        | EMC Cable and Switch System      | 3/4/2021   | Annual       | 3/4/2022   | ETS           |
| -                     | LTX4       | Licensed Transmitter Cable Set   | 3/12/2021  | Annual       | 3/12/2022  | LTX4          |
| -                     | LTX5       | Licensed Transmitter Cable Set   | 3/3/2021   | Annual       | 3/3/2022   | LTX5          |
| Agilent               | E5515C     | Wireless Communications Test Set | N/A        |              |            | GB45360985    |
| Anritsu               | MT8820C    | Radio Communication Analyzer     | N/A        |              |            | 6201300731    |
| Anritsu               | MT8821C    | Radio Communication Analyzer     | N/A        |              |            | 6201381794    |
| Emco                  | 3115       | Horn Antenna (1-18GHz)           | 6/18/2020  | Biennial     | 6/18/2022  | 9704-5182     |
| Emco                  | 3116       | Horn Antenna (18 - 40GHz)        | 8/7/2018   | Triennial    | 8/7/2021   | 9203-2178     |
| ETS Lindgren          | 3164-08    | Quad Ridge Horn Antenna          | 3/12/2020  | Biennial     | 3/12/2022  | 128337        |
| Keysight Technologies | N9020A     | MXA Signal Analyzer              | 9/22/2020  | Annual       | 9/22/2021  | MY54500644    |
| Keysight Technologies | N9030A     | PXA Signal Analyzer              | 10/16/2020 | Annual       | 10/16/2021 | MY54490576    |
| Mini-Circuits         | SSG-4000HP | Synthesized Signal Generator     | N/A        |              |            | 11403100002   |
| Rohde & Schwarz       | CMU200     | Base Station Simulator           | N/A        |              |            | 836536/0005   |
| Rohde & Schwarz       | CMW500     | Radio Communication Tester       | N/A        |              |            | 112347        |
| Rohde & Schwarz       | ESU26      | EMI Test Receiver (26.5GHz)      | 7/15/2020  | Annual       | 7/15/2021  | 100342        |
| Rohde & Schwarz       | ESU40      | EMI Test Receiver (40GHz)        | 9/9/2020   | Annual       | 9/9/2021   | 100348        |
| Rohde & Schwarz       | ESW44      | EMI Test Receiver 2Hz to 44 GHz  | 1/21/2021  | Annual       | 1/21/2022  | 101716        |
| Sunol                 | JB5        | Bi-Log Antenna (30M - 5GHz)      | 7/27/2020  | Biennial     | 7/27/2022  | A051107       |

**Table 5-1. Summary of Test Results**

### 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 CALCULATIONS

### Emission Designator

#### QPSK Modulation

**Emission Designator = 8M62G7D**

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

#### QAM Modulation

**Emission Designator = 8M45W7D**

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

### Spurious Radiated Emission – LTE Band

#### **Example: Middle Channel LTE Mode 2<sup>nd</sup> Harmonic (1564 MHz)**

The average 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 1564 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80).

|                                                |                                                                                                                                   |                                          |                                          |
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| <b>Test Report S/N:</b><br>1M2106040065-06.RI7 | <b>Test Dates:</b><br>5/12- 6/1/2021                                                                                              | <b>EUT Type:</b><br>Data Terminal Module | Page 9 of 111                            |

## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Telit Communications S.p.A  
 FCC ID: RI7LE910CXWWX  
 FCC Classification: PCS Licensed Transmitter (PCB)  
 Mode(s): WCDMA/LTE

| Test Condition | Test Description                                                                               | FCC Part Section(s)       | Test Limit                                                                                                                                      | Test Result | Reference         |
|----------------|------------------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------|
| CONDUCTED      | Transmitter Conducted Output Power/<br>Effective Radiated Power<br>(LTE Band 8)                | 2.1046, 27.1507(a)(4)     | < 3 Watts max. ERP                                                                                                                              | PASS        | Section 7.2       |
|                | Transmitter Conducted Output Power/<br>Effective Radiated Power<br>(LTE Band 12)               | 2.1046, 27.50(c)(10)      |                                                                                                                                                 | PASS        | Section 7.2       |
|                | Transmitter Conducted Output Power/<br>Effective Radiated Power<br>(LTE Band 13)               | 2.1046, 27.50(b)(10)      |                                                                                                                                                 | PASS        | Section 7.2       |
|                | Transmitter Conducted Output Power/<br>Equivalent Isotropic Radiated Power<br>(WCDMA / Band 4) | 2.1046, 27.50(d)(4)       | < 1 Watts max. EIRP                                                                                                                             | PASS        | Section 7.2       |
|                | Occupied Bandwidth                                                                             | 2.1049                    | N/A                                                                                                                                             | PASS        | Section 7.3       |
|                | Conducted Band Edge / Spurious<br>Emissions                                                    | 2.1051, 27.1509(a), 27.53 | > 43 + 10log10(P[Watts]) at Band Edge and for all out-of-band emissions                                                                         | PASS        | Sections 7.4, 7.5 |
|                | Peak-Average Ratio                                                                             | 27.1507(d), 27.50(d)(5)   | < 13 dB                                                                                                                                         | PASS        | Section 7.6       |
|                | Frequency Stability                                                                            | 2.1055, 27.54             | Occupied bandwidth remains within authorized frequency block range                                                                              | PASS        | Section 7.8       |
| RADIATED       | Radiated Spurious Emissions<br>(LTE Band 13)                                                   | 2.1053, 27.53(f)          | For all emissions in the band 1559 - 1610 MHz:<br>< -70 dBW/MHz (for wideband signals)<br>< -80 dBW (for discrete emissions less than 700Hz BW) | PASS        | Section 7.7       |
|                | Radiated Spurious Emissions                                                                    | 2.1053, 27.1509(a), 27.53 | > 43 + 10 log10 (P[Watts]) for all out-of-band emissions                                                                                        | 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 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 PCTEST EMC Software Tool V1.1.

|                                         |                                                                                                                       |                                   |                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   |  <b>PART 27 MEASUREMENT REPORT</b> |                                   | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                                                                                         | EUT Type:<br>Data Terminal Module | Page 10 of 111                    |

## 7.2 Transmitter Conducted Output Power/ Effective Radiated Power

### Test Overview

The transmitter conducted output power is a measure of the total average power contained within an allocated channel bandwidth. 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 5.2.4.2

### Test Settings

All conducted powers were measured using the R&S CMW500's Channel Measurement function.

### 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

The Maximum Effective Isotropic Radiated Power (EIRP) is calculated by adding the declared maximum antenna gain(dBi)

$$\text{EIRP} = \text{Conducted Power(dBm)} + \text{Antenna Gain(dBi)}$$

The Maximum Equivalent Radiated Power (ERP) is calculated from the Maximum Effective Isotropic Radiated Power (EIRP) by subtracting 2.15dB

$$\text{ERP} = \text{EIRP} - 2.15\text{dB}$$

|                                                |                                              |                                          |                                          |
|------------------------------------------------|----------------------------------------------|------------------------------------------|------------------------------------------|
| FCC ID: RI7LE910CXWWX                          | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b>        | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2106040065-06.RI7 | <b>Test Dates:</b><br>5/12- 6/1/2021         | <b>EUT Type:</b><br>Data Terminal Module | Page 11 of 111                           |

| 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       | 20050   | 1720.0          | 1 / 50         | 23.45                 | 2.26           | 25.71      | 0.372        | 30.00            | -4.29       |
|           |            | 20175   | 1732.5          | 1 / 50         | 23.25                 | 2.26           | 25.51      | 0.355        | 30.00            | -4.49       |
|           |            | 20300   | 1745.0          | 1 / 50         | 23.34                 | 2.26           | 25.59      | 0.363        | 30.00            | -4.41       |
|           | 16-QAM     | 20050   | 1720.0          | 1 / 50         | 22.59                 | 2.26           | 24.85      | 0.306        | 30.00            | -5.15       |
|           |            | 20175   | 1732.5          | 1 / 50         | 22.24                 | 2.26           | 24.49      | 0.282        | 30.00            | -5.51       |
|           |            | 20300   | 1745.0          | 1 / 50         | 22.33                 | 2.26           | 24.59      | 0.288        | 30.00            | -5.41       |
| 15 MHz    | QPSK       | 20025   | 1717.5          | 1 / 37         | 23.23                 | 2.26           | 25.49      | 0.354        | 30.00            | -4.51       |
|           |            | 20175   | 1732.5          | 1 / 37         | 23.62                 | 2.26           | 25.88      | 0.387        | 30.00            | -4.12       |
|           |            | 20325   | 1747.5          | 1 / 37         | 23.08                 | 2.26           | 25.33      | 0.341        | 30.00            | -4.67       |
|           | 16-QAM     | 20025   | 1717.5          | 1 / 37         | 22.20                 | 2.26           | 24.46      | 0.279        | 30.00            | -5.54       |
|           |            | 20175   | 1732.5          | 1 / 37         | 22.63                 | 2.26           | 24.89      | 0.308        | 30.00            | -5.11       |
|           |            | 20325   | 1747.5          | 1 / 37         | 22.19                 | 2.26           | 24.45      | 0.278        | 30.00            | -5.55       |
| 10 MHz    | QPSK       | 20000   | 1715.0          | 1 / 25         | 23.12                 | 2.26           | 25.38      | 0.345        | 30.00            | -4.62       |
|           |            | 20175   | 1732.5          | 1 / 25         | 23.42                 | 2.26           | 25.68      | 0.370        | 30.00            | -4.32       |
|           |            | 20350   | 1750.0          | 1 / 25         | 23.08                 | 2.26           | 25.34      | 0.342        | 30.00            | -4.66       |
|           | 16-QAM     | 20000   | 1715.0          | 1 / 25         | 22.24                 | 2.26           | 24.50      | 0.282        | 30.00            | -5.50       |
|           |            | 20175   | 1732.5          | 1 / 25         | 22.41                 | 2.26           | 24.66      | 0.293        | 30.00            | -5.34       |
|           |            | 20350   | 1750.0          | 1 / 25         | 22.04                 | 2.26           | 24.30      | 0.269        | 30.00            | -5.70       |
| 5 MHz     | QPSK       | 19975   | 1712.5          | 1 / 12         | 23.10                 | 2.26           | 25.36      | 0.343        | 30.00            | -4.64       |
|           |            | 20175   | 1732.5          | 1 / 12         | 23.15                 | 2.26           | 25.41      | 0.348        | 30.00            | -4.59       |
|           |            | 20375   | 1752.5          | 1 / 12         | 23.00                 | 2.26           | 25.26      | 0.335        | 30.00            | -4.74       |
|           | 16-QAM     | 19975   | 1712.5          | 1 / 12         | 22.23                 | 2.26           | 24.49      | 0.281        | 30.00            | -5.51       |
|           |            | 20175   | 1732.5          | 1 / 12         | 22.24                 | 2.26           | 24.50      | 0.282        | 30.00            | -5.50       |
|           |            | 20375   | 1752.5          | 1 / 12         | 21.99                 | 2.26           | 24.25      | 0.266        | 30.00            | -5.75       |
| 3 MHz     | QPSK       | 19965   | 1711.5          | 1 / 0          | 23.29                 | 2.26           | 25.54      | 0.358        | 30.00            | -4.46       |
|           |            | 20175   | 1732.5          | 1 / 7          | 23.39                 | 2.26           | 25.65      | 0.367        | 30.00            | -4.35       |
|           |            | 20385   | 1753.5          | 1 / 7          | 23.24                 | 2.26           | 25.50      | 0.355        | 30.00            | -4.50       |
|           | 16-QAM     | 19965   | 1711.5          | 1 / 0          | 22.16                 | 2.26           | 24.42      | 0.277        | 30.00            | -5.58       |
|           |            | 20175   | 1732.5          | 1 / 14         | 22.42                 | 2.26           | 24.67      | 0.293        | 30.00            | -5.33       |
|           |            | 20385   | 1753.5          | 1 / 7          | 22.16                 | 2.26           | 24.42      | 0.277        | 30.00            | -5.58       |
| 1.4 MHz   | QPSK       | 19957   | 1710.7          | 1 / 0          | 23.09                 | 2.26           | 25.35      | 0.343        | 30.00            | -4.65       |
|           |            | 20175   | 1732.5          | 1 / 0          | 23.32                 | 2.26           | 25.58      | 0.361        | 30.00            | -4.42       |
|           |            | 20393   | 1754.3          | 1 / 3          | 22.99                 | 2.26           | 25.25      | 0.335        | 30.00            | -4.75       |
|           | 16-QAM     | 19957   | 1710.7          | 1 / 0          | 22.15                 | 2.26           | 24.41      | 0.276        | 30.00            | -5.59       |
|           |            | 20175   | 1732.5          | 1 / 5          | 22.33                 | 2.26           | 24.59      | 0.288        | 30.00            | -5.41       |
|           |            | 20393   | 1754.3          | 1 / 5          | 21.95                 | 2.26           | 24.21      | 0.264        | 30.00            | -5.79       |

**Table 7-2. EIRP Data (LTE Band 4)**

| Bandwidth | Modulation | Channel | Frequency [MHz] | RB Size/Offset | Conducted Power [dBm] | Ant Gain [dBi] | ERP [dBm] | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|-----------|------------|---------|-----------------|----------------|-----------------------|----------------|-----------|-------------|-----------------|-------------|
| 3 MHz     | QPSK       | 21640   | 899.0           | 1 / 8          | 23.52                 | 0.07           | 21.44     | 0.139       | 34.77           | -13.33      |
|           | 16-QAM     | 21640   | 899.0           | 1 / 8          | 22.78                 | 0.07           | 20.70     | 0.117       | 34.77           | -14.07      |
| 1.4 MHz   | QPSK       | 21632   | 898.2           | 1 / 0          | 23.63                 | 0.07           | 21.55     | 0.143       | 34.77           | -13.22      |
|           |            | 21640   | 899.0           | 1 / 3          | 23.62                 | 0.07           | 21.54     | 0.143       | 34.77           | -13.23      |
|           |            | 21648   | 899.8           | 1 / 0          | 23.39                 | 0.07           | 21.31     | 0.135       | 34.77           | -13.46      |
|           | 16-QAM     | 21632   | 898.2           | 1 / 0          | 22.54                 | 0.07           | 20.46     | 0.111       | 34.77           | -14.31      |
|           |            | 21640   | 899.0           | 1 / 3          | 22.56                 | 0.07           | 20.48     | 0.112       | 34.77           | -14.29      |
|           |            | 21648   | 899.8           | 1 / 0          | 22.58                 | 0.07           | 20.50     | 0.112       | 34.77           | -14.27      |

**Table 7-3. ERP Data (LTE Band 8)**

|                                         |                                                                                                                       |                                   |                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   |  <b>PART 27 MEASUREMENT REPORT</b> |                                   | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                                                                                         | EUT Type:<br>Data Terminal Module | Page 12 of 111                    |

| Bandwidth | Modulation | Channel | Frequency [MHz] | RB Size/Offset | Conducted Power [dBm] | Ant Gain [dBi] | ERP [dBm] | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|-----------|------------|---------|-----------------|----------------|-----------------------|----------------|-----------|-------------|-----------------|-------------|
| 10 MHz    | QPSK       | 23060   | 704.0           | 1 / 25         | 23.46                 | 0.41           | 21.72     | 0.149       | 34.77           | -13.05      |
|           |            | 23095   | 707.5           | 1 / 25         | 23.71                 | 0.41           | 21.97     | 0.157       | 34.77           | -12.80      |
|           |            | 23130   | 711.0           | 1 / 25         | 23.37                 | 0.41           | 21.63     | 0.146       | 34.77           | -13.14      |
|           | 16-QAM     | 23060   | 704.0           | 1 / 25         | 22.34                 | 0.41           | 20.61     | 0.115       | 34.77           | -14.17      |
|           |            | 23095   | 707.5           | 1 / 25         | 22.65                 | 0.41           | 20.92     | 0.124       | 34.77           | -13.85      |
|           |            | 23130   | 711.0           | 1 / 25         | 22.30                 | 0.41           | 20.56     | 0.114       | 34.77           | -14.21      |
| 5 MHz     | QPSK       | 23035   | 701.5           | 1 / 12         | 23.18                 | 0.41           | 21.44     | 0.139       | 34.77           | -13.33      |
|           |            | 23095   | 707.5           | 1 / 12         | 23.56                 | 0.41           | 21.82     | 0.152       | 34.77           | -12.95      |
|           |            | 23155   | 713.5           | 1 / 12         | 23.18                 | 0.41           | 21.44     | 0.139       | 34.77           | -13.33      |
|           | 16-QAM     | 23035   | 701.5           | 1 / 12         | 22.31                 | 0.41           | 20.57     | 0.114       | 34.77           | -14.20      |
|           |            | 23095   | 707.5           | 1 / 12         | 22.37                 | 0.41           | 20.63     | 0.116       | 34.77           | -14.14      |
|           |            | 23155   | 713.5           | 1 / 12         | 22.38                 | 0.41           | 20.64     | 0.116       | 34.77           | -14.13      |
| 3 MHz     | QPSK       | 23025   | 700.5           | 1 / 7          | 23.43                 | 0.41           | 21.69     | 0.148       | 34.77           | -13.08      |
|           |            | 23095   | 707.5           | 1 / 7          | 23.49                 | 0.41           | 21.75     | 0.150       | 34.77           | -13.02      |
|           |            | 23165   | 714.5           | 1 / 7          | 23.25                 | 0.41           | 21.52     | 0.142       | 34.77           | -13.25      |
|           | 16-QAM     | 23025   | 700.5           | 1 / 7          | 22.40                 | 0.41           | 20.66     | 0.116       | 34.77           | -14.11      |
|           |            | 23095   | 707.5           | 1 / 7          | 22.59                 | 0.41           | 20.85     | 0.122       | 34.77           | -13.92      |
|           |            | 23165   | 714.5           | 1 / 7          | 22.34                 | 0.41           | 20.60     | 0.115       | 34.77           | -14.17      |
| 1.4 MHz   | QPSK       | 23017   | 699.7           | 1 / 3          | 23.62                 | 0.41           | 21.88     | 0.154       | 34.77           | -12.89      |
|           |            | 23095   | 707.5           | 1 / 0          | 23.30                 | 0.41           | 21.56     | 0.143       | 34.77           | -13.21      |
|           |            | 23173   | 715.3           | 1 / 3          | 23.25                 | 0.41           | 21.51     | 0.142       | 34.77           | -13.26      |
|           | 16-QAM     | 23017   | 699.7           | 1 / 3          | 22.65                 | 0.41           | 20.91     | 0.123       | 34.77           | -13.86      |
|           |            | 23095   | 707.5           | 1 / 0          | 22.21                 | 0.41           | 20.47     | 0.111       | 34.77           | -14.30      |
|           |            | 23173   | 715.3           | 1 / 3          | 22.42                 | 0.41           | 20.68     | 0.117       | 34.77           | -14.09      |

Table 7-4. ERP Data (LTE Band 12)

| Bandwidth | Modulation | Channel | Frequency [MHz] | RB Size/Offset | Conducted Power [dBm] | Ant Gain [dBi] | ERP [dBm] | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|-----------|------------|---------|-----------------|----------------|-----------------------|----------------|-----------|-------------|-----------------|-------------|
| 10 MHz    | QPSK       | 23230   | 782.0           | 1 / 25         | 23.52                 | 0.86           | 22.23     | 0.167       | 34.77           | -12.54      |
|           | 16-QAM     | 23230   | 782.0           | 1 / 25         | 22.46                 | 0.86           | 21.17     | 0.131       | 34.77           | -13.60      |
| 5 MHz     | QPSK       | 23205   | 779.5           | 1 / 12         | 23.49                 | 0.86           | 22.21     | 0.166       | 34.77           | -12.56      |
|           |            | 23230   | 782.0           | 1 / 12         | 23.49                 | 0.86           | 22.20     | 0.166       | 34.77           | -12.57      |
|           |            | 23255   | 784.5           | 1 / 12         | 23.17                 | 0.86           | 21.89     | 0.154       | 34.77           | -12.88      |
|           | 16-QAM     | 23205   | 779.5           | 1 / 12         | 22.54                 | 0.86           | 21.25     | 0.133       | 34.77           | -13.52      |
|           |            | 23230   | 782.0           | 1 / 12         | 22.51                 | 0.86           | 21.22     | 0.132       | 34.77           | -13.55      |
|           |            | 23255   | 784.5           | 1 / 12         | 22.29                 | 0.86           | 21.00     | 0.126       | 34.77           | -13.77      |

Table 7-5. ERP Data (LTE Band 13)

|                                         |                                                                                                                       |                                   |                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   |  <b>PART 27 MEASUREMENT REPORT</b> |                                   | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                                                                                         | EUT Type:<br>Data Terminal Module | Page 13 of 111                    |

| Mode             | Channel | Frequency [MHz] | Conducted Power [dBm] | Ant Gain [dBi] | EIRP [dBm] | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|------------------|---------|-----------------|-----------------------|----------------|------------|--------------|------------------|-------------|
| WCDMA (RMC)      | 1312    | 1712.4          | 23.50                 | 2.26           | 25.76      | 0.377        | 30.00            | -4.24       |
|                  | 1413    | 1732.6          | 23.43                 | 2.26           | 25.69      | 0.371        | 30.00            | -4.31       |
|                  | 1513    | 1752.6          | 23.54                 | 2.26           | 25.80      | 0.380        | 30.00            | -4.20       |
| WCDMA (AMR)      | 1312    | 1712.4          | 23.62                 | 2.26           | 25.88      | 0.387        | 30.00            | -4.12       |
|                  | 1413    | 1732.6          | 23.67                 | 2.26           | 25.93      | 0.392        | 30.00            | -4.07       |
|                  | 1513    | 1752.6          | 23.89                 | 2.26           | 26.15      | 0.412        | 30.00            | -3.85       |
| HSDPA (Subtest1) | 1312    | 1712.4          | 22.81                 | 2.26           | 25.07      | 0.321        | 30.00            | -4.93       |
|                  | 1413    | 1732.6          | 22.70                 | 2.26           | 24.96      | 0.313        | 30.00            | -5.04       |
|                  | 1513    | 1752.6          | 22.72                 | 2.26           | 24.98      | 0.315        | 30.00            | -5.02       |
| HSDPA (Subtest2) | 1312    | 1712.4          | 22.79                 | 2.26           | 25.05      | 0.320        | 30.00            | -4.95       |
|                  | 1413    | 1732.6          | 22.69                 | 2.26           | 24.95      | 0.312        | 30.00            | -5.05       |
|                  | 1513    | 1752.6          | 22.68                 | 2.26           | 24.94      | 0.312        | 30.00            | -5.06       |
| HSDPA (Subtest3) | 1312    | 1712.4          | 22.20                 | 2.26           | 24.46      | 0.279        | 30.00            | -5.54       |
|                  | 1413    | 1732.6          | 22.18                 | 2.26           | 24.44      | 0.278        | 30.00            | -5.56       |
|                  | 1513    | 1752.6          | 22.08                 | 2.26           | 24.34      | 0.272        | 30.00            | -5.66       |
| HSDPA (Subtest4) | 1312    | 1712.4          | 22.14                 | 2.26           | 24.40      | 0.275        | 30.00            | -5.60       |
|                  | 1413    | 1732.6          | 22.08                 | 2.26           | 24.34      | 0.272        | 30.00            | -5.66       |
|                  | 1513    | 1752.6          | 21.97                 | 2.26           | 24.23      | 0.265        | 30.00            | -5.77       |
| HSUPA (Subtest1) | 1312    | 1712.4          | 22.43                 | 2.26           | 24.69      | 0.294        | 30.00            | -5.31       |
|                  | 1413    | 1732.6          | 22.58                 | 2.26           | 24.84      | 0.305        | 30.00            | -5.16       |
|                  | 1513    | 1752.6          | 22.68                 | 2.26           | 24.94      | 0.312        | 30.00            | -5.06       |
| HSUPA (Subtest2) | 1312    | 1712.4          | 21.82                 | 2.26           | 24.08      | 0.256        | 30.00            | -5.92       |
|                  | 1413    | 1732.6          | 21.79                 | 2.26           | 24.05      | 0.254        | 30.00            | -5.95       |
|                  | 1513    | 1752.6          | 21.85                 | 2.26           | 24.11      | 0.258        | 30.00            | -5.89       |
| HSUPA (Subtest3) | 1312    | 1712.4          | 21.81                 | 2.26           | 24.07      | 0.255        | 30.00            | -5.93       |
|                  | 1413    | 1732.6          | 21.76                 | 2.26           | 24.02      | 0.252        | 30.00            | -5.98       |
|                  | 1513    | 1752.6          | 21.48                 | 2.26           | 23.74      | 0.236        | 30.00            | -6.26       |
| HSUPA (Subtest4) | 1312    | 1712.4          | 21.97                 | 2.26           | 24.23      | 0.265        | 30.00            | -5.77       |
|                  | 1413    | 1732.6          | 22.21                 | 2.26           | 24.47      | 0.280        | 30.00            | -5.53       |
|                  | 1513    | 1752.6          | 22.24                 | 2.26           | 24.50      | 0.282        | 30.00            | -5.50       |
| HSUPA (Subtest5) | 1312    | 1712.4          | 22.92                 | 2.26           | 25.18      | 0.329        | 30.00            | -4.82       |
|                  | 1413    | 1732.6          | 22.91                 | 2.26           | 25.17      | 0.329        | 30.00            | -4.83       |
|                  | 1513    | 1752.6          | 22.78                 | 2.26           | 25.04      | 0.319        | 30.00            | -4.96       |

**Table 7-6. EIRP Data (WCDMA AWS)**

|                                                |                                                                                                                                   |                                          |                                          |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|
| <b>FCC ID:</b> RI7LE910CXWWX                   | <br><small>Proud to be part of element</small> | <b>PART 27 MEASUREMENT REPORT</b>        | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2106040065-06.R17 | <b>Test Dates:</b><br>5/12- 6/1/2021                                                                                              | <b>EUT Type:</b><br>Data Terminal Module | Page 14 of 111                           |

## 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

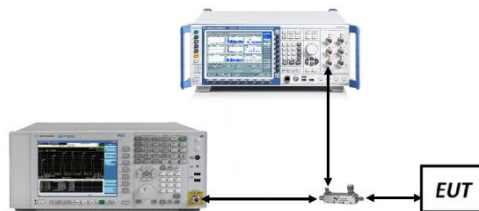
KDB 971168 D01 v03r01 – Section 4.2

### 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.



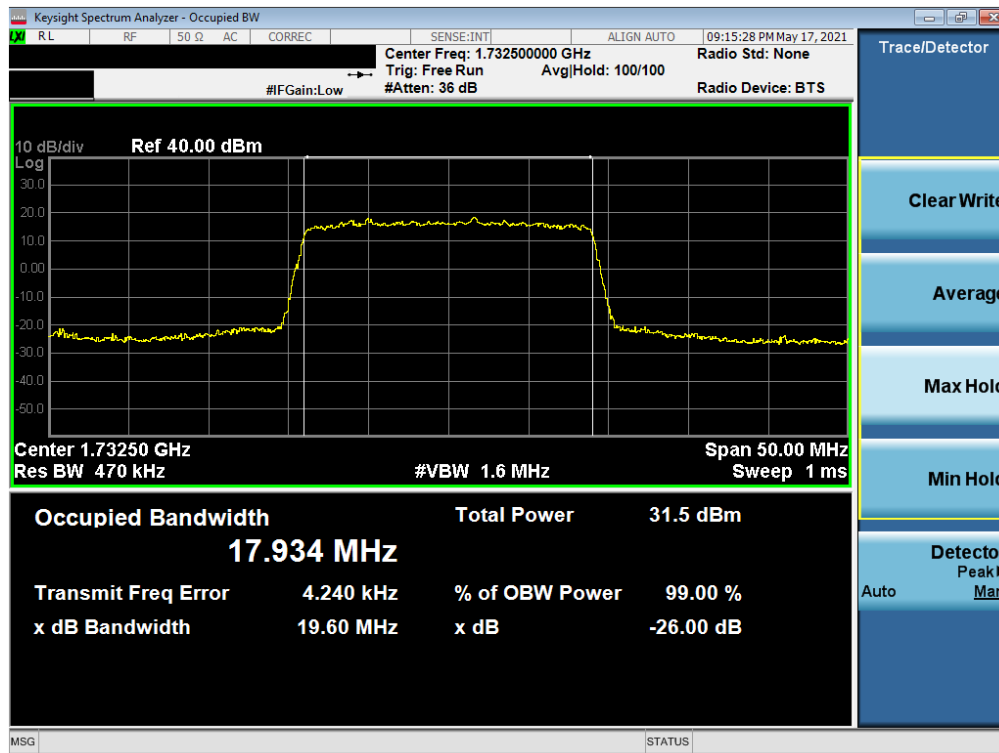
**Figure 7-2. Test Instrument & Measurement Setup**

### Test Notes

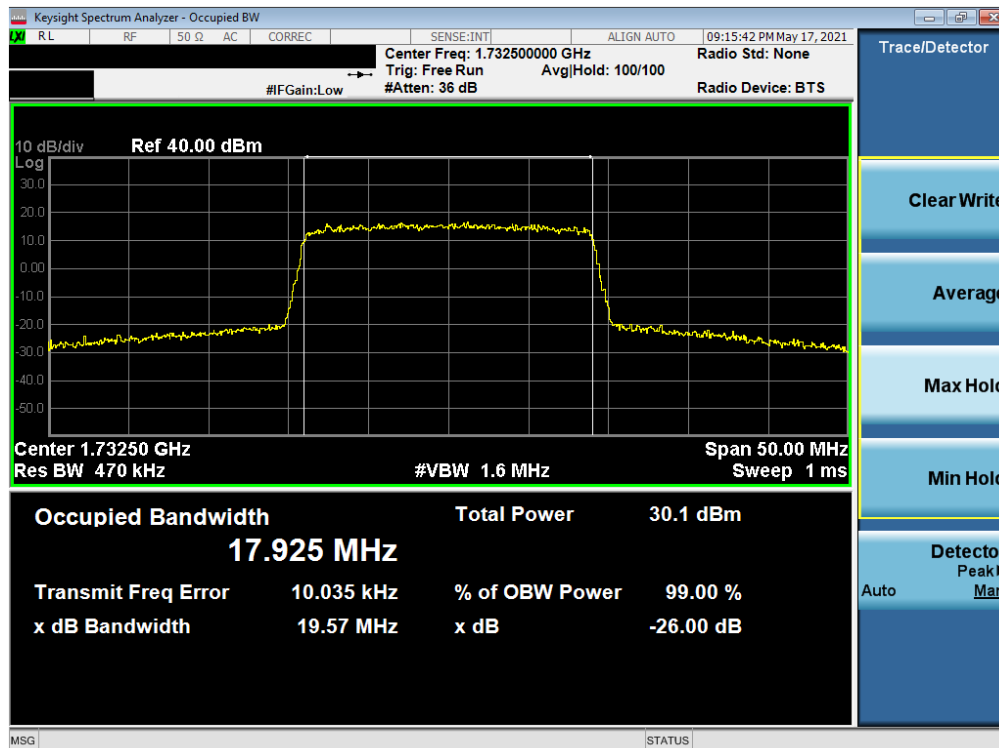
None.

|                                                |                                              |                                          |                                          |
|------------------------------------------------|----------------------------------------------|------------------------------------------|------------------------------------------|
| FCC ID: RI7LE910CXWWX                          | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b>        | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2106040065-06.RI7 | <b>Test Dates:</b><br>5/12- 6/1/2021         | <b>EUT Type:</b><br>Data Terminal Module | Page 15 of 111                           |

## LTE Band 4

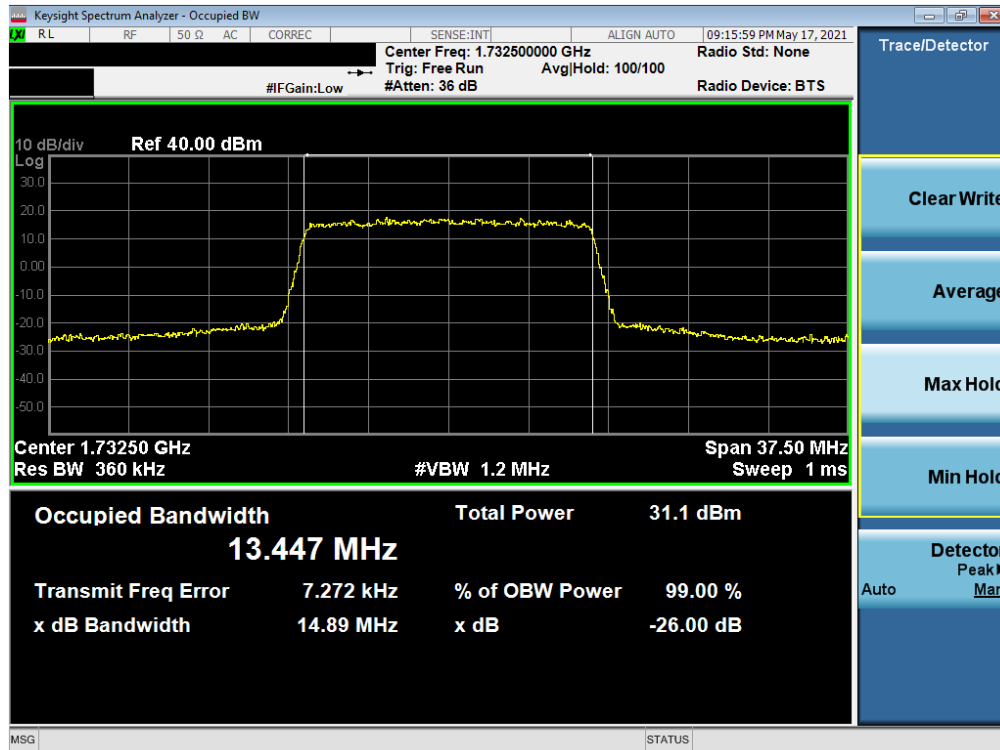


Plot 7-1. Occupied Bandwidth Plot (LTE Band 4 - 20MHz QPSK - Full RB)

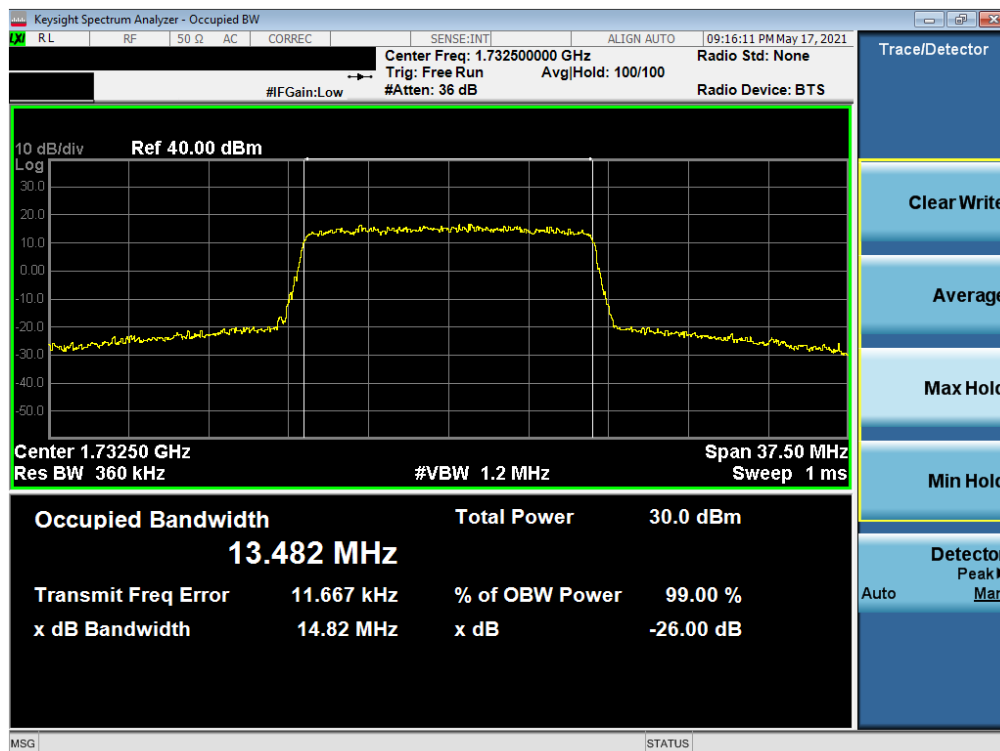


Plot 7-2. Occupied Bandwidth Plot (LTE Band 4 - 20MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 16 of 111                    |



Plot 7-3. Occupied Bandwidth Plot (LTE Band 4 - 15MHz QPSK - Full RB)



Plot 7-4. Occupied Bandwidth Plot (LTE Band 4 - 15MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 17 of 111                    |

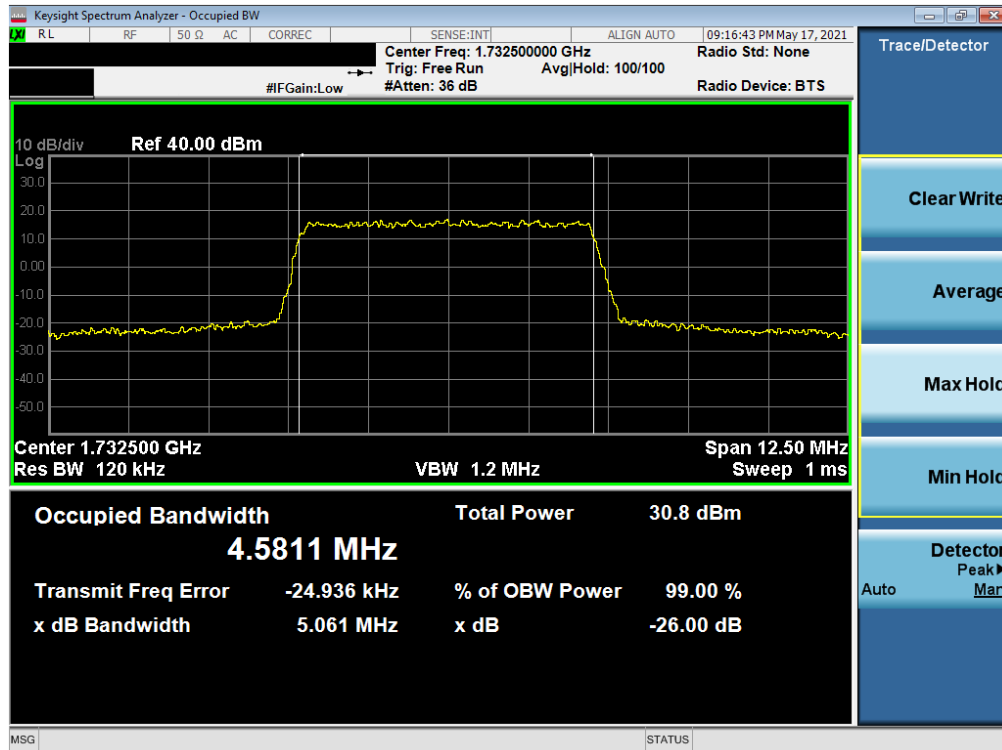


Plot 7-5. Occupied Bandwidth Plot (LTE Band 4 - 10MHz QPSK - Full RB)

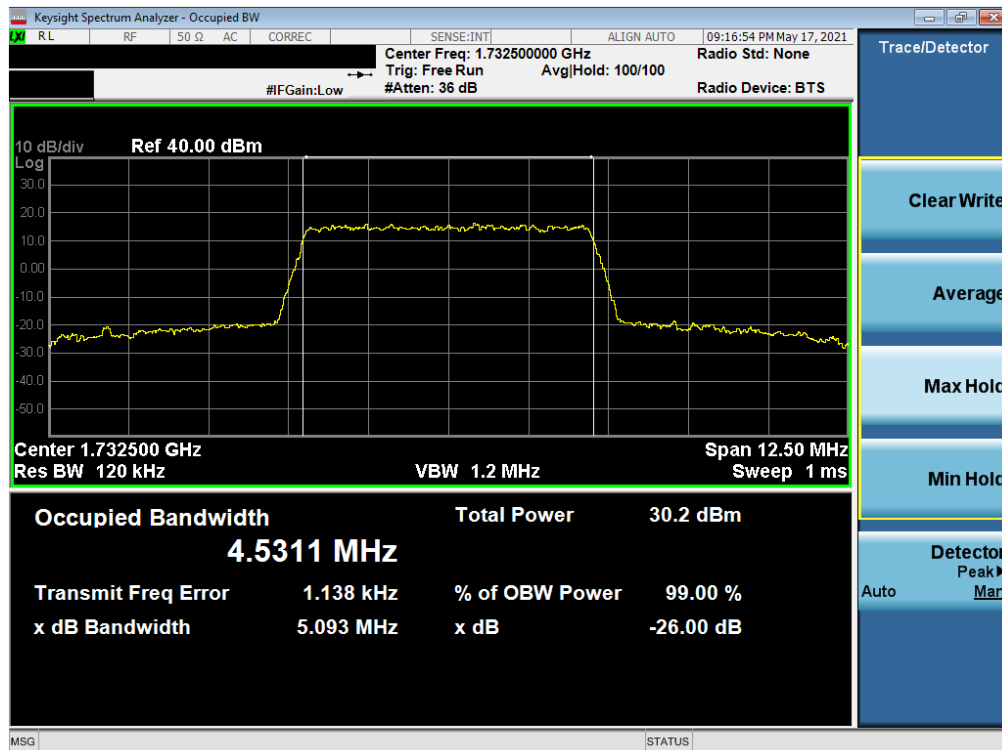


Plot 7-6. Occupied Bandwidth Plot (LTE Band 4 - 10MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 18 of 111                    |

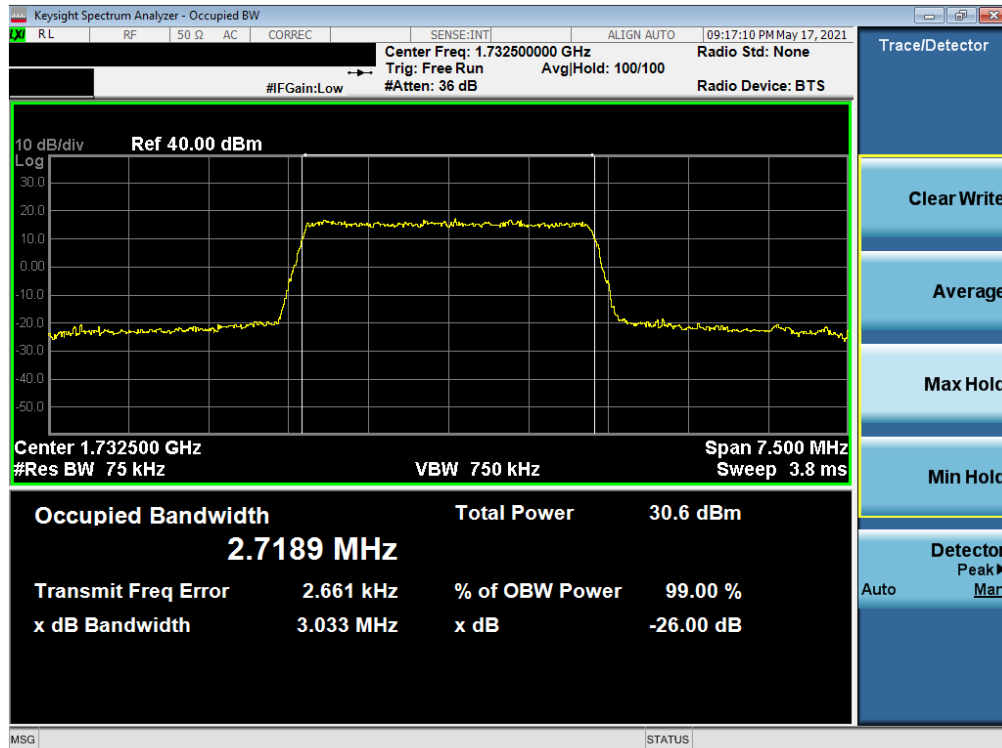


Plot 7-7. Occupied Bandwidth Plot (LTE Band 4 - 5MHz QPSK - Full RB)

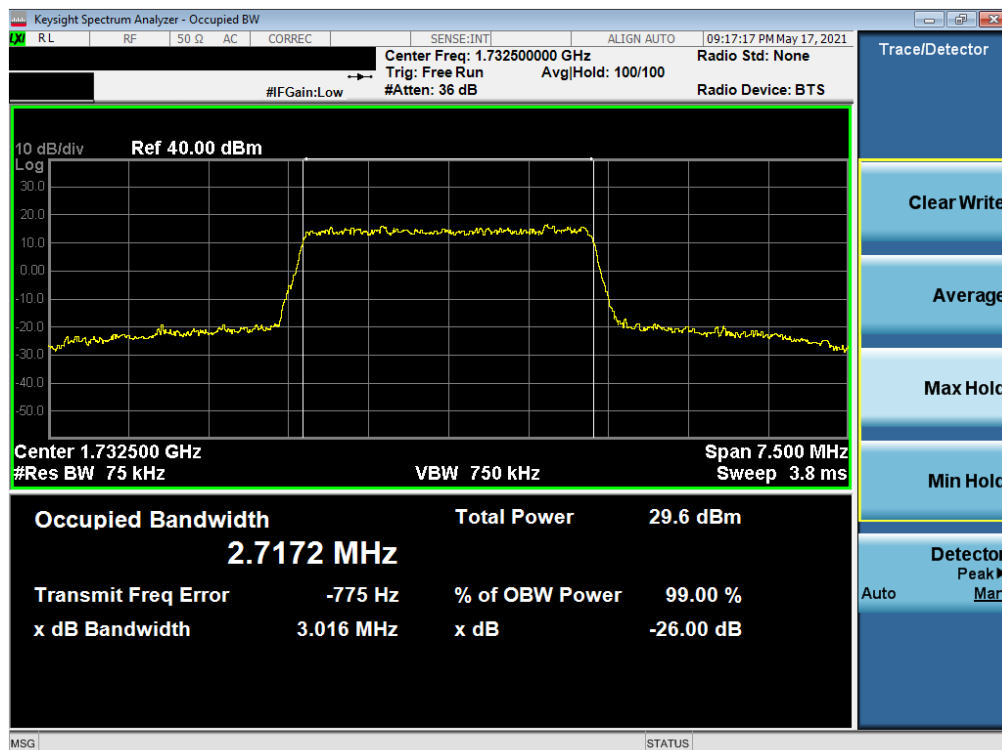


Plot 7-8. Occupied Bandwidth Plot (LTE Band 4 - 5MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 19 of 111                    |

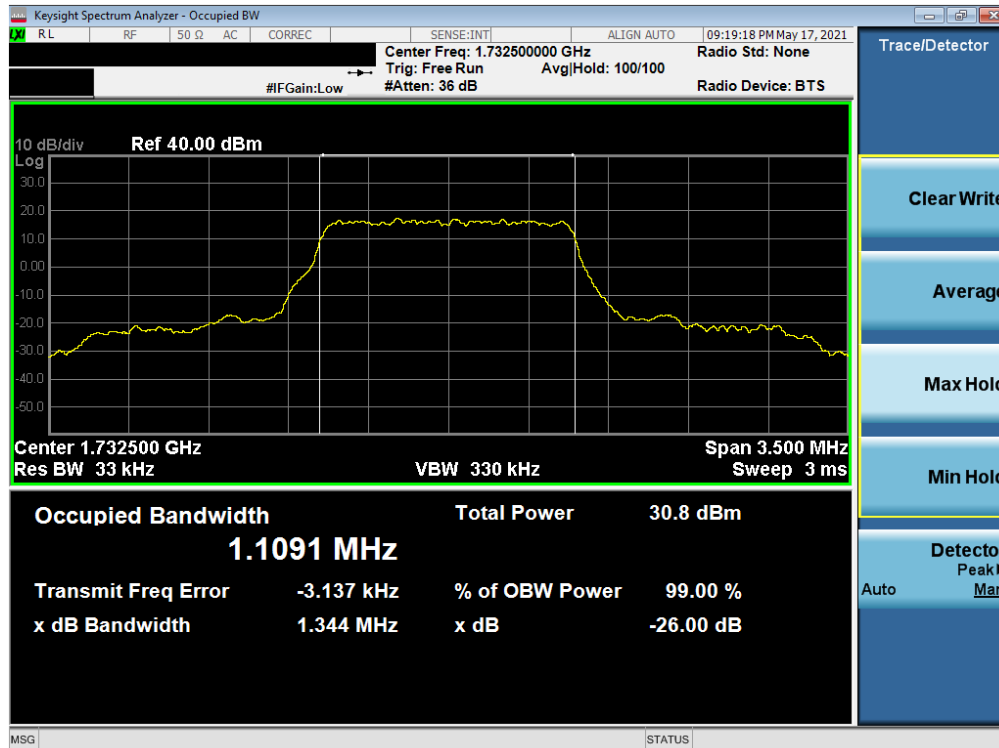


Plot 7-9. Occupied Bandwidth Plot (LTE Band 4 - 3MHz QPSK - Full RB)

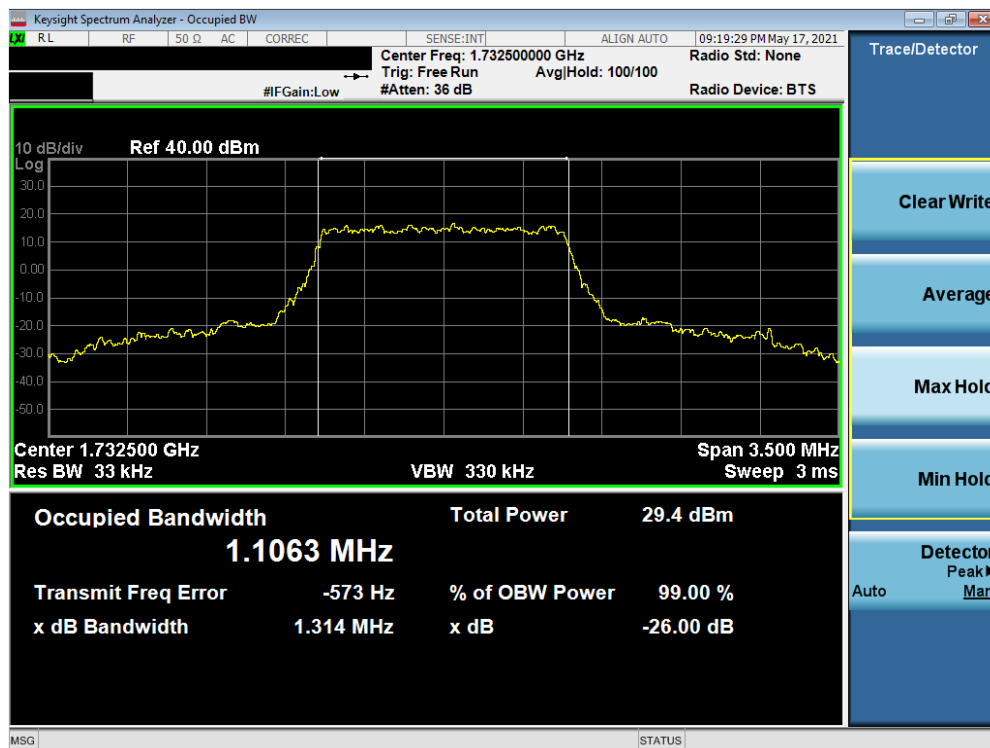


Plot 7-10. Occupied Bandwidth Plot (LTE Band 4 - 3MHz 16-QAM - Full RB)

|                                         |                                              |                                   |  |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|--|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module |  | Page 20 of 111                    |



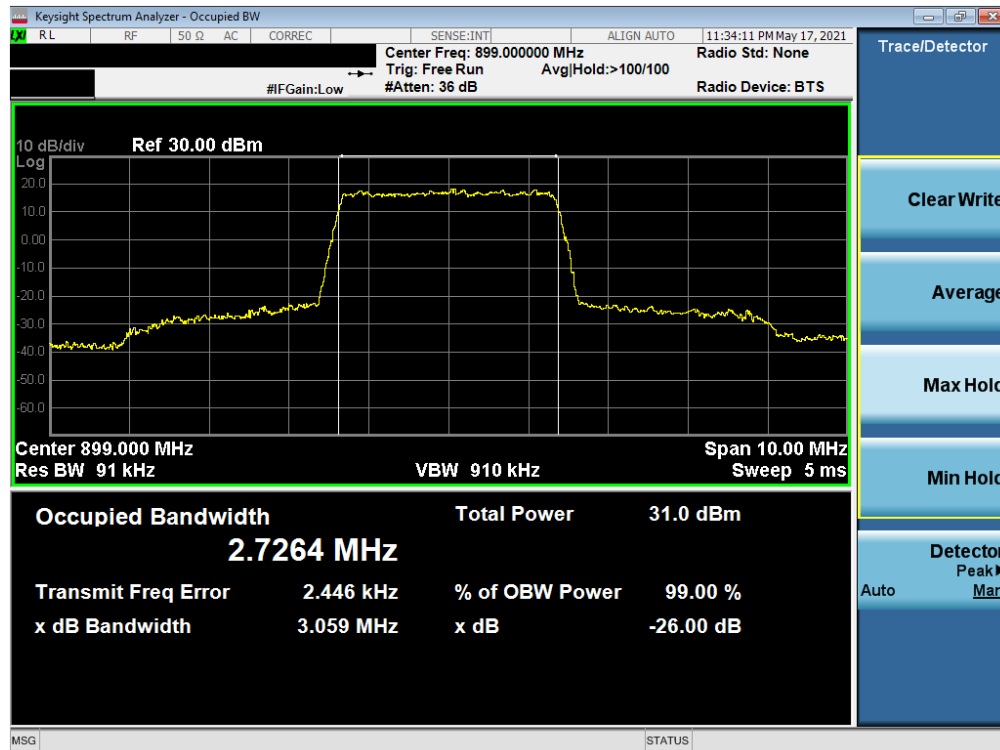
Plot 7-11. Occupied Bandwidth Plot (LTE Band 4 - 1.4MHz QPSK - Full RB)



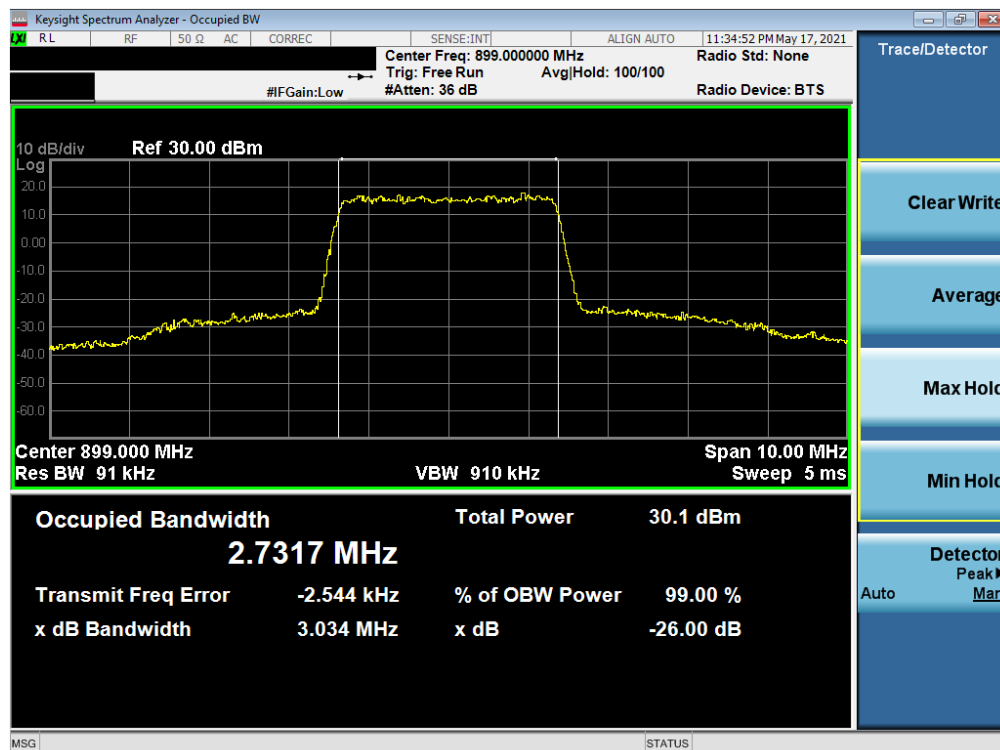
Plot 7-12. Occupied Bandwidth Plot (LTE Band 4 - 1.4MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 21 of 111                    |

## LTE Band 8

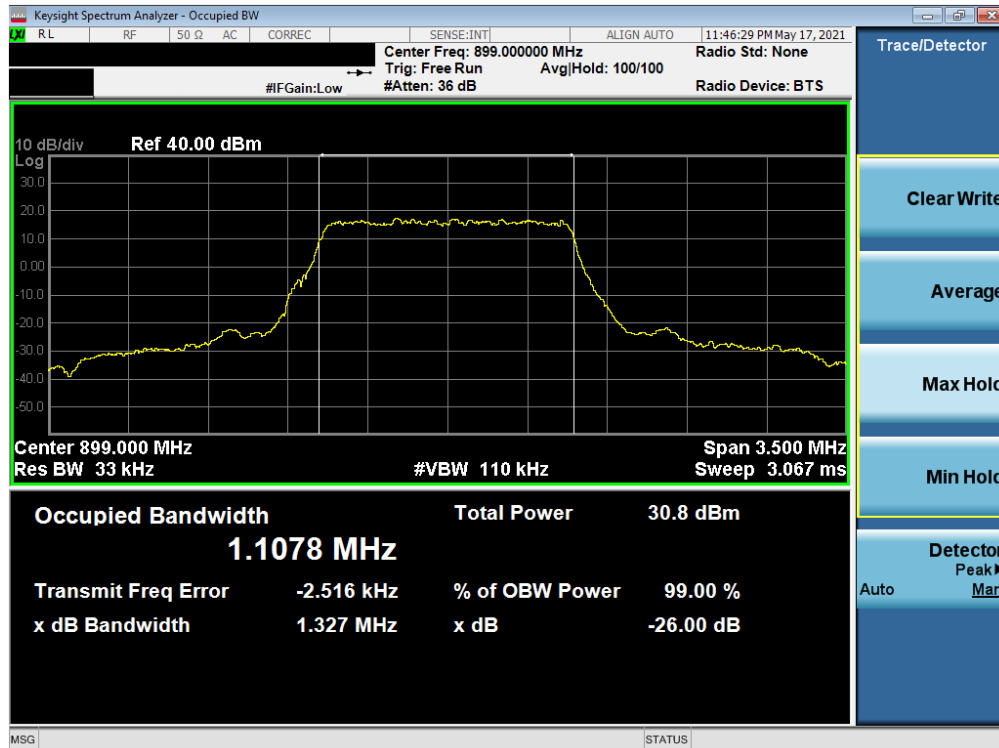


Plot 7-13. Occupied Bandwidth Plot (LTE Band 8 - 3MHz QPSK - Full RB)

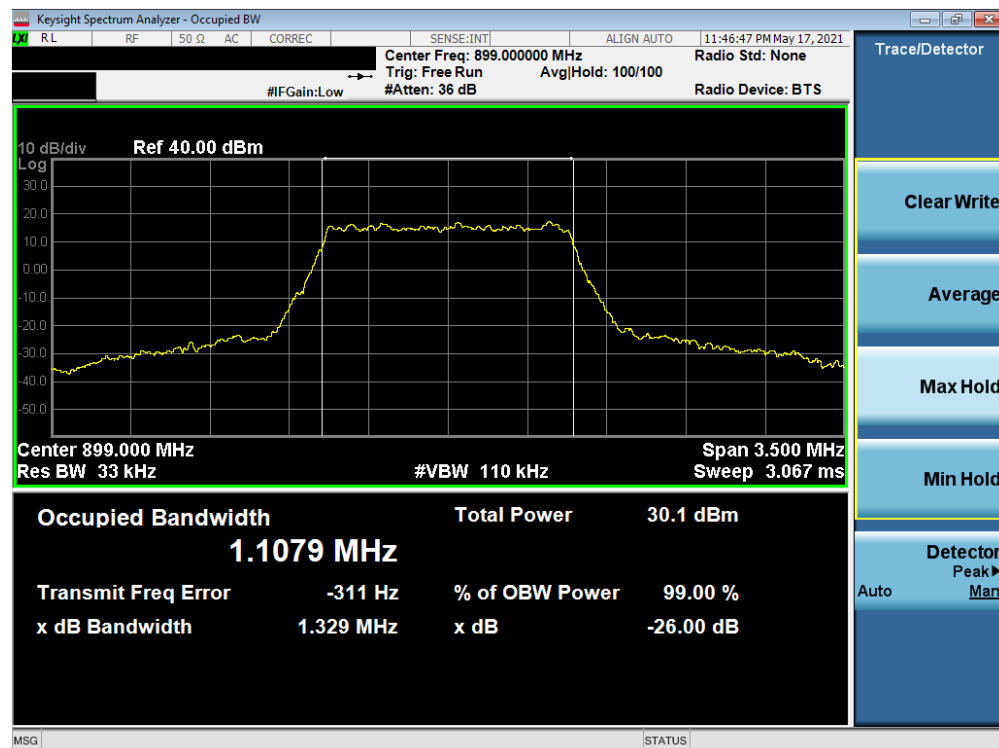


Plot 7-14. Occupied Bandwidth Plot (LTE Band 8 - 3MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 22 of 111                    |



Plot 7-15. Occupied Bandwidth Plot (LTE Band 8 - 1.4MHz QPSK - Full RB)



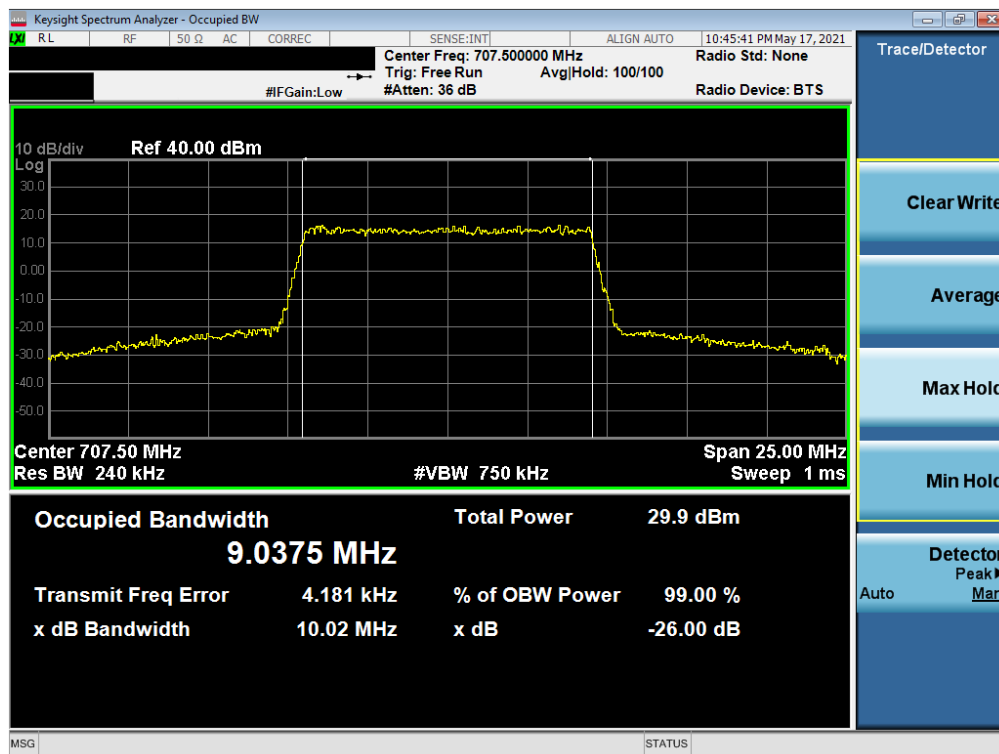
Plot 7-16. Occupied Bandwidth Plot (LTE Band 8 - 1.4MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 23 of 111                    |

## LTE Band 12

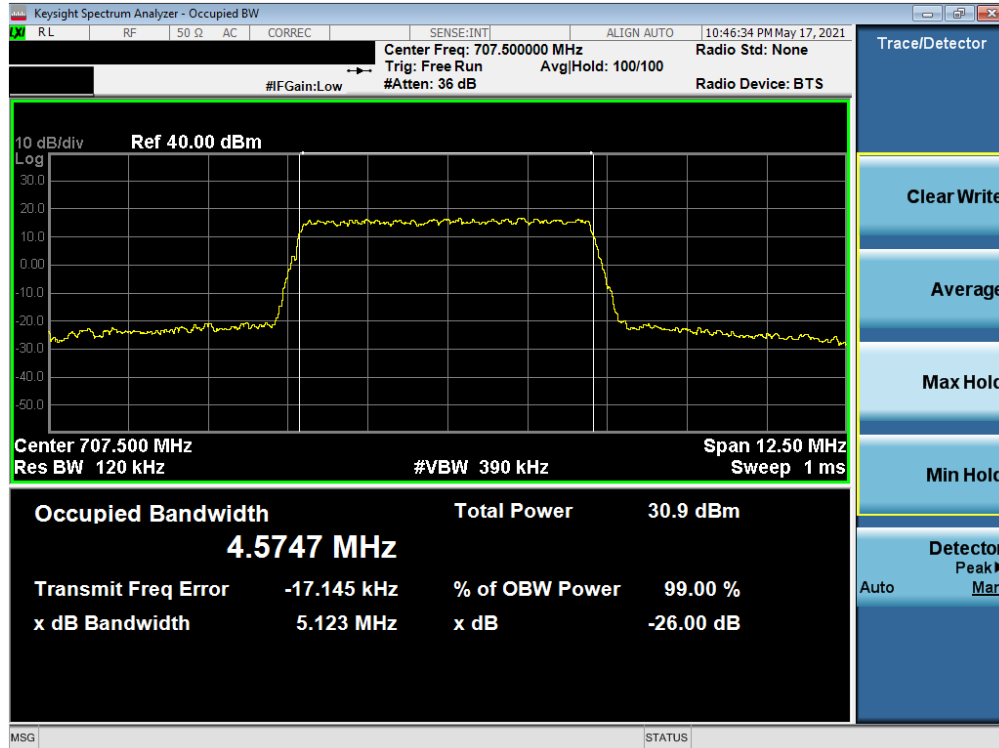


Plot 7-17. Occupied Bandwidth Plot (LTE Band 12 - 10MHz QPSK - Full RB)

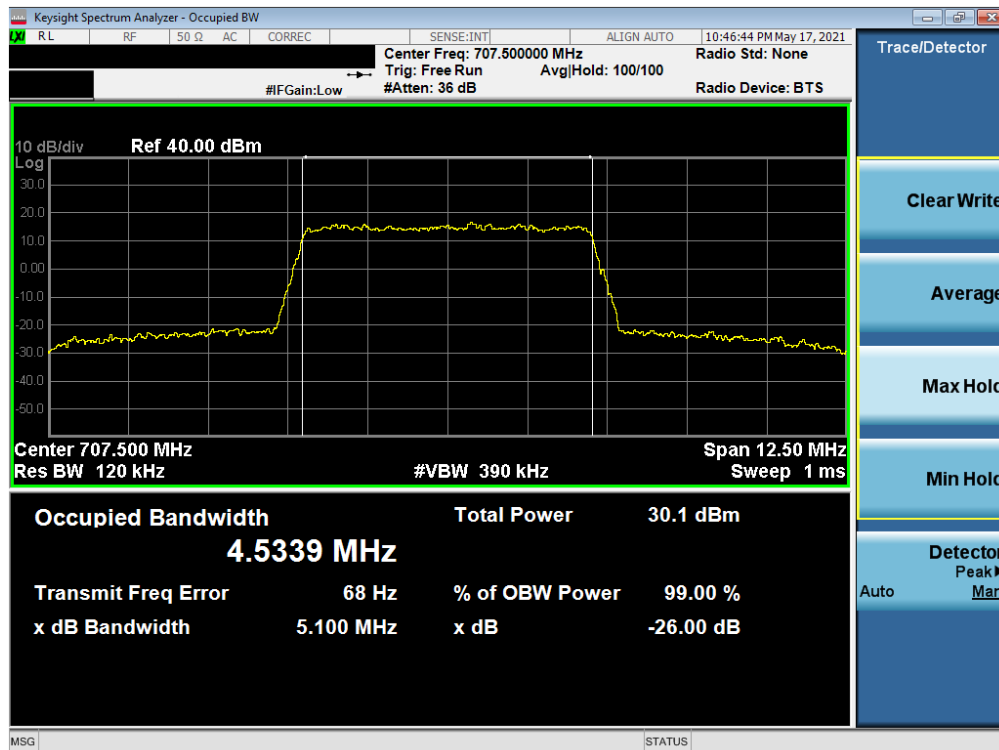


Plot 7-18. Occupied Bandwidth Plot (LTE Band 12 - 10MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 24 of 111                    |



Plot 7-19. Occupied Bandwidth Plot (LTE Band 12 - 5MHz QPSK - Full RB)

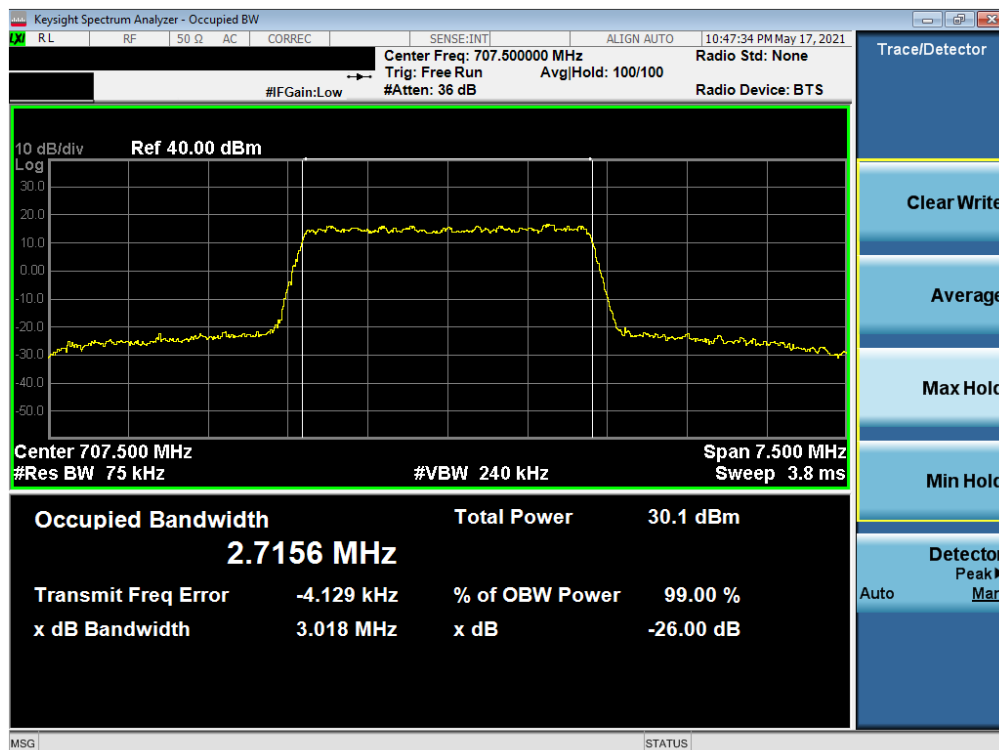


Plot 7-20. Occupied Bandwidth Plot (LTE Band 12 - 5MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 25 of 111                    |

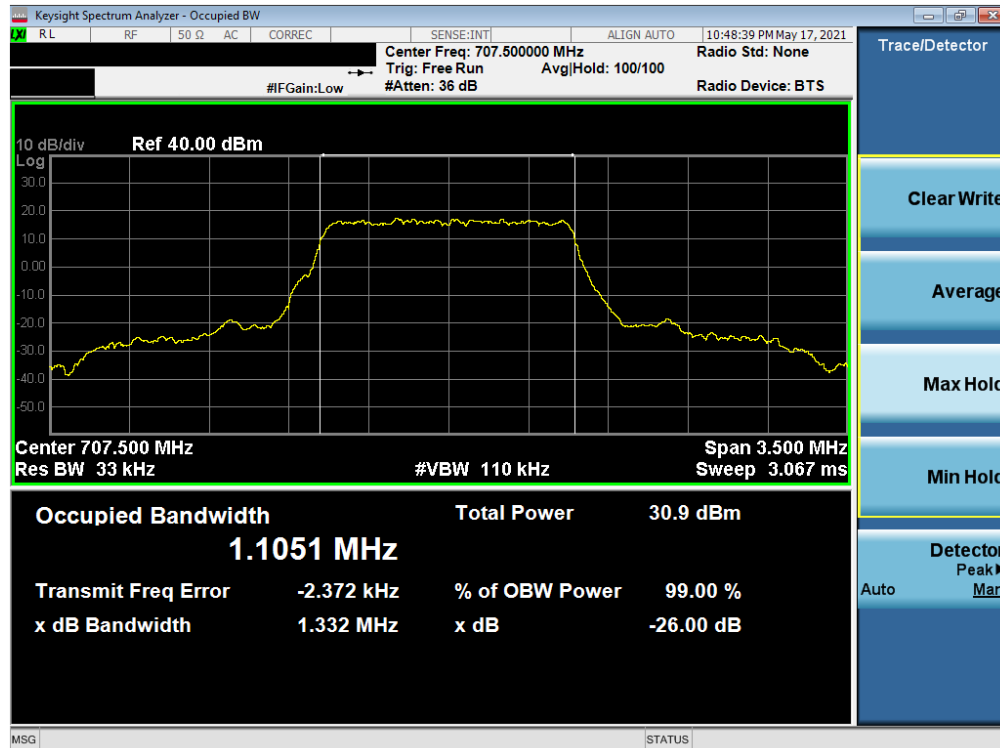


Plot 7-21. Occupied Bandwidth Plot (LTE Band 12 - 3MHz QPSK - Full RB)

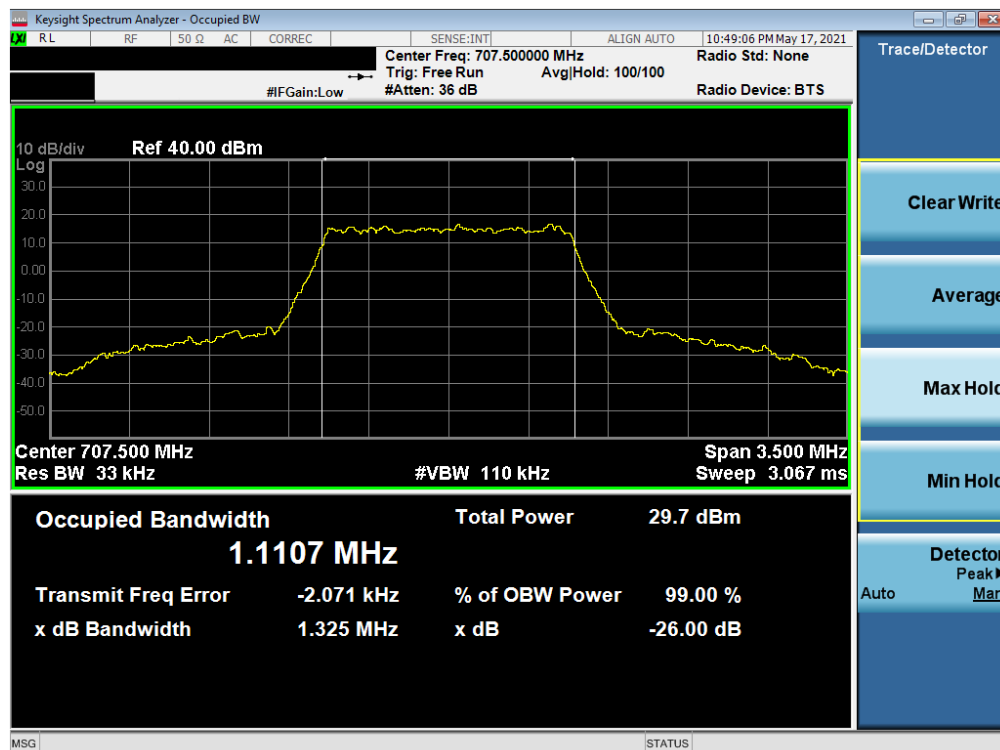


Plot 7-22. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 26 of 111                    |



Plot 7-23. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz QPSK - Full RB)



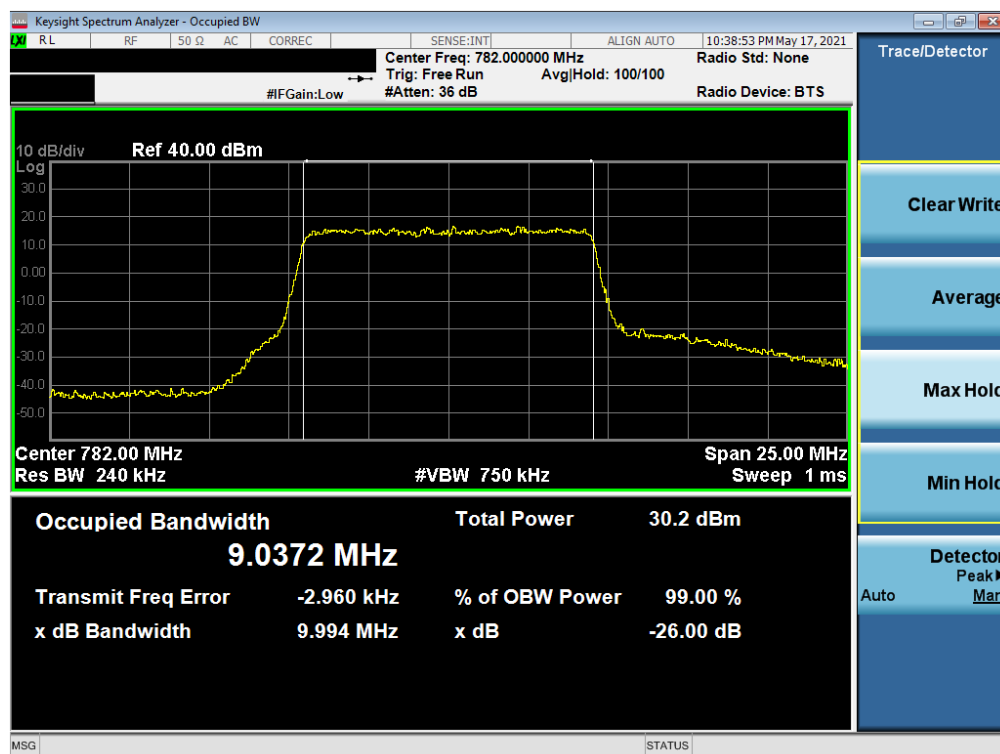
Plot 7-24. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 27 of 111                    |

## LTE Band 13

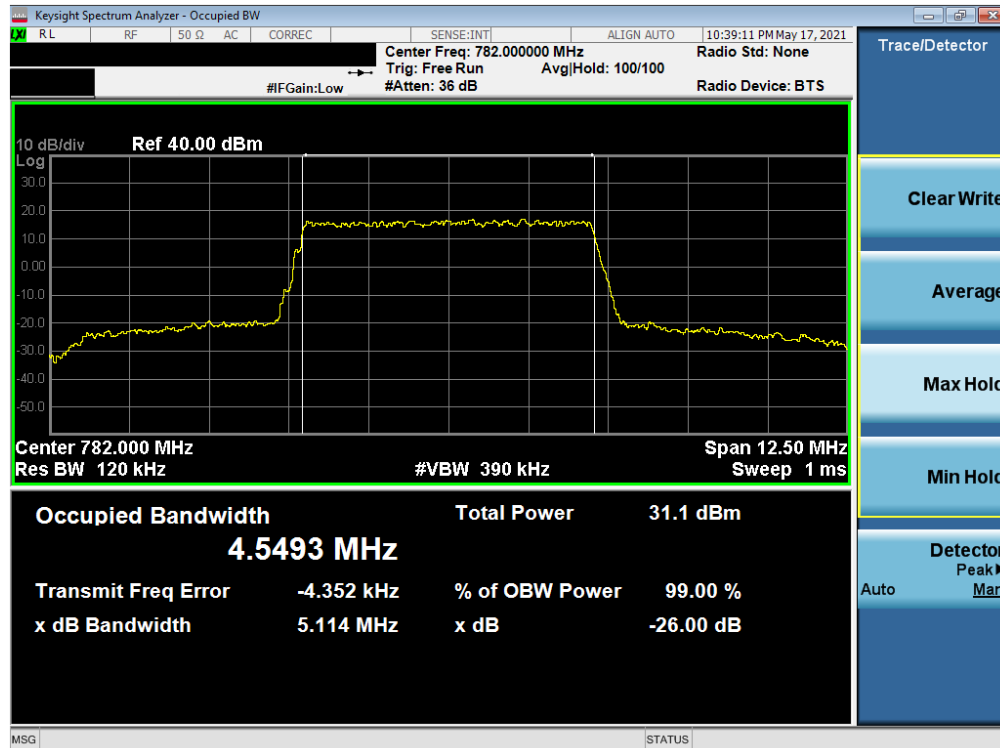


Plot 7-25. Occupied Bandwidth Plot (LTE Band 13 - 10MHz QPSK - Full RB)

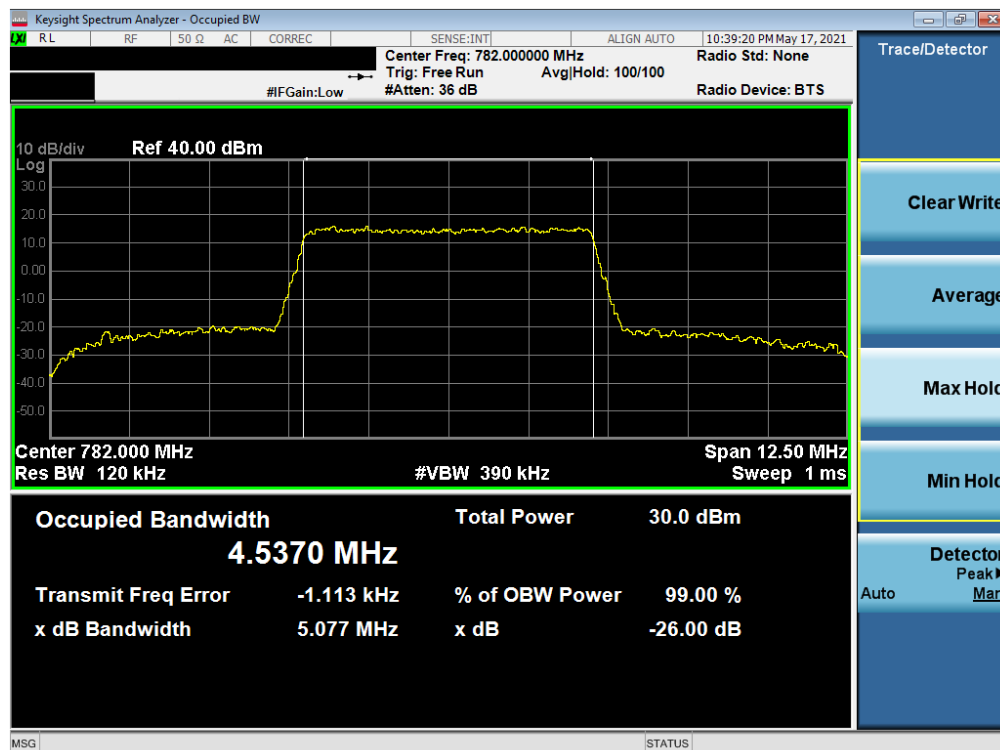


Plot 7-26. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 28 of 111                    |



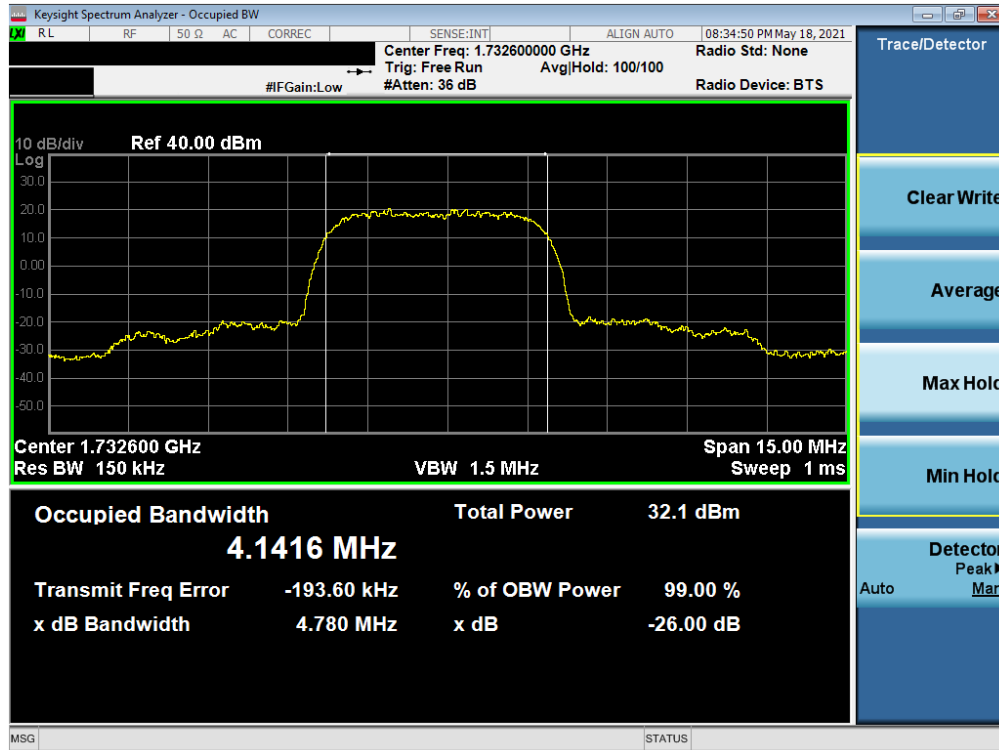
Plot 7-27. Occupied Bandwidth Plot (LTE Band 13 - 5MHz QPSK - Full RB)



Plot 7-28. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 29 of 111                    |

## WCDMA AWS



Plot 7-29. Occupied Bandwidth Plot (WCDMA, Ch. 1413)

|                                         |                                              |                                   |  |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|--|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module |  | Page 30 of 111                    |

## 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

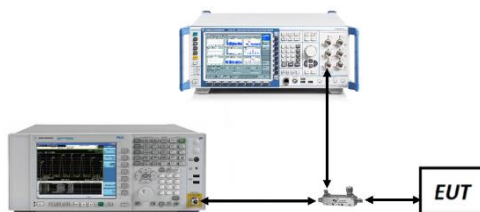
KDB 971168 D01 v03r01 – Section 6.0

### Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 18GHz (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.



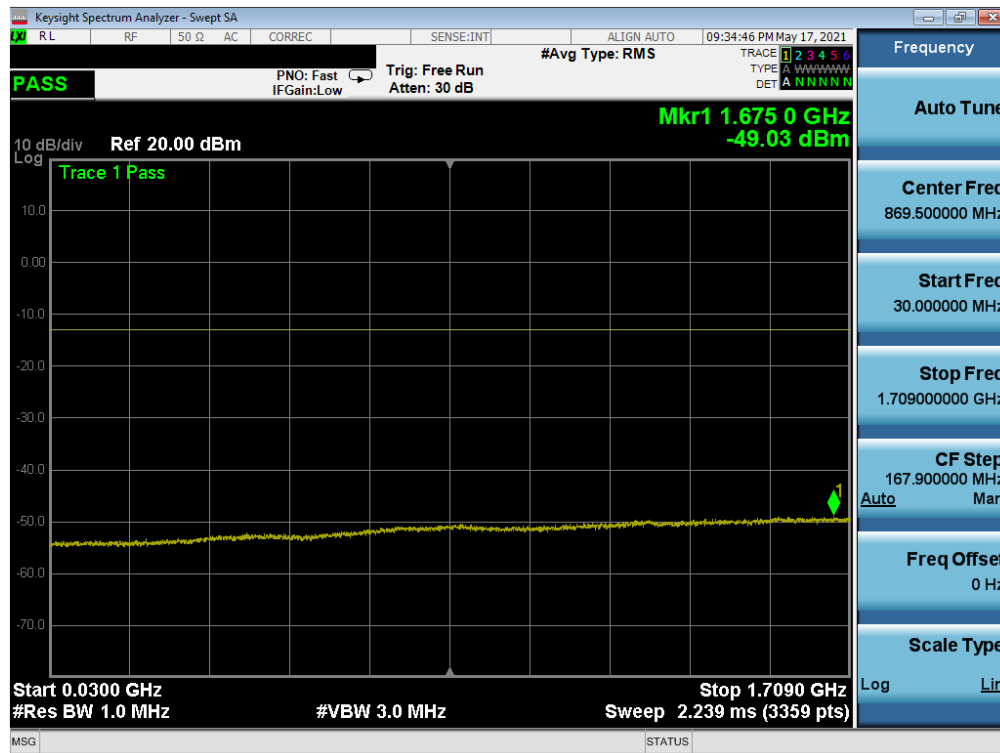
**Figure 7-3. Test Instrument & Measurement Setup**

### Test Notes

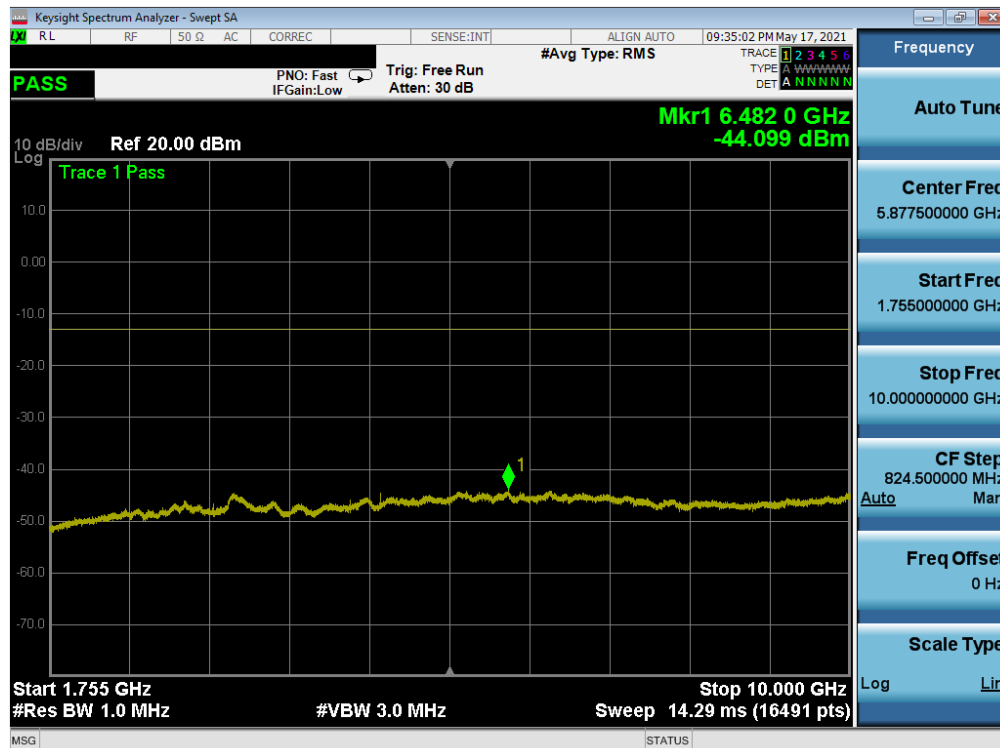
Per Part 27 and RSS-139, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth 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: RI7LE910CXWWX                          | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b>        | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2106040065-06.R17 | <b>Test Dates:</b><br>5/12- 6/1/2021         | <b>EUT Type:</b><br>Data Terminal Module | Page 31 of 111                           |

## LTE Band 4

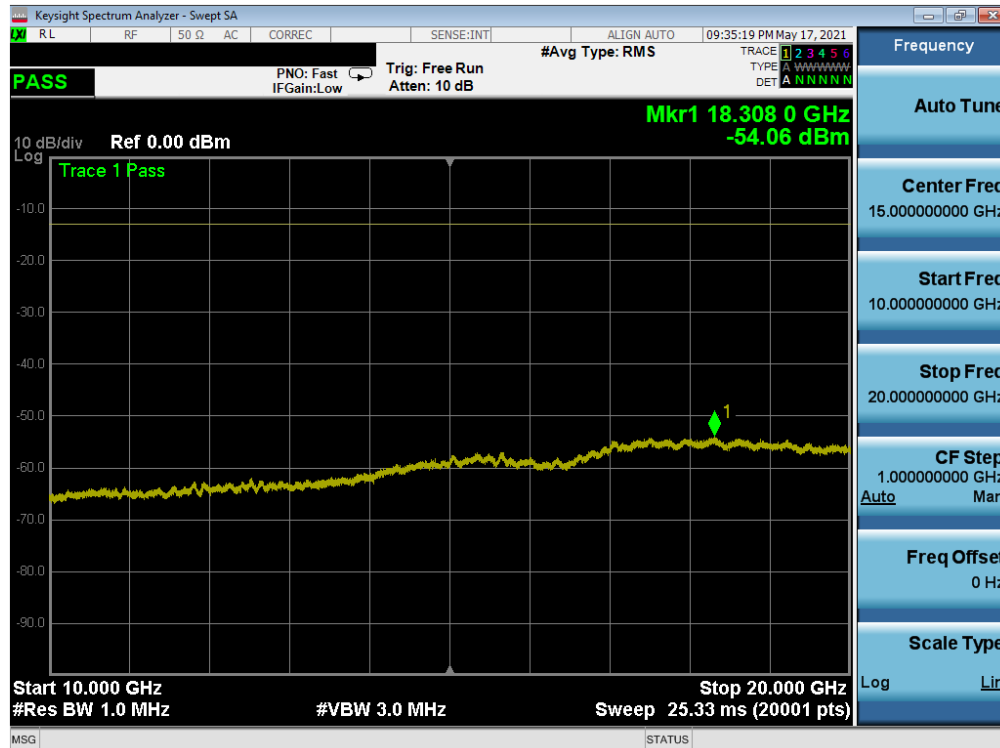


Plot 7-30. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - 1 RB - Low Channel)

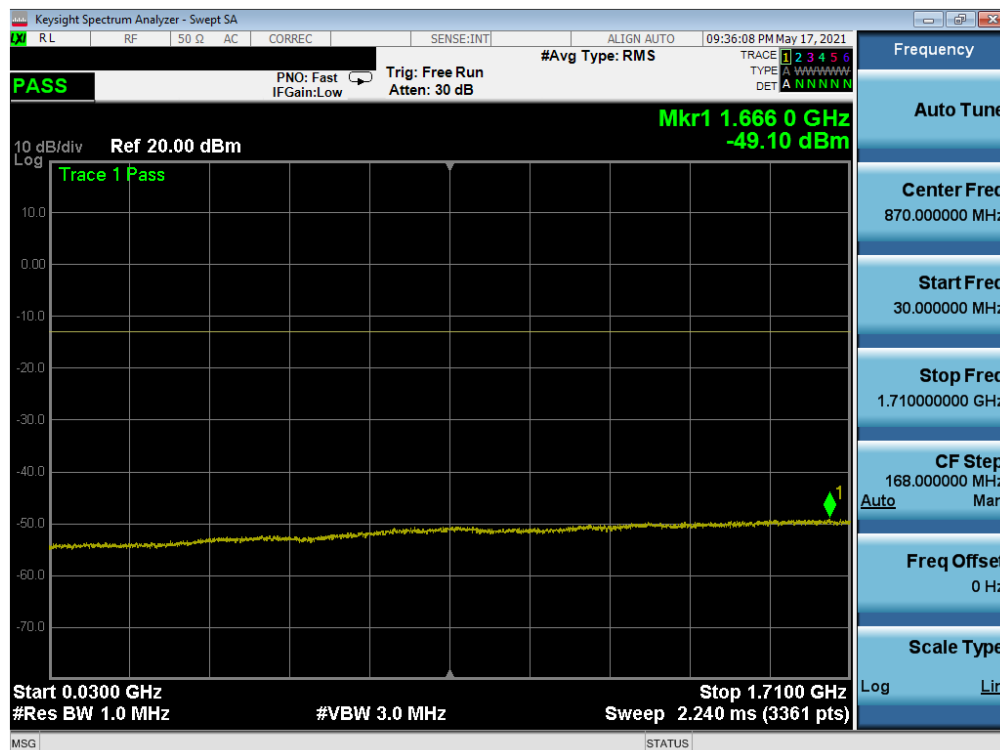


Plot 7-31. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - 1 RB - Low Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 32 of 111                    |

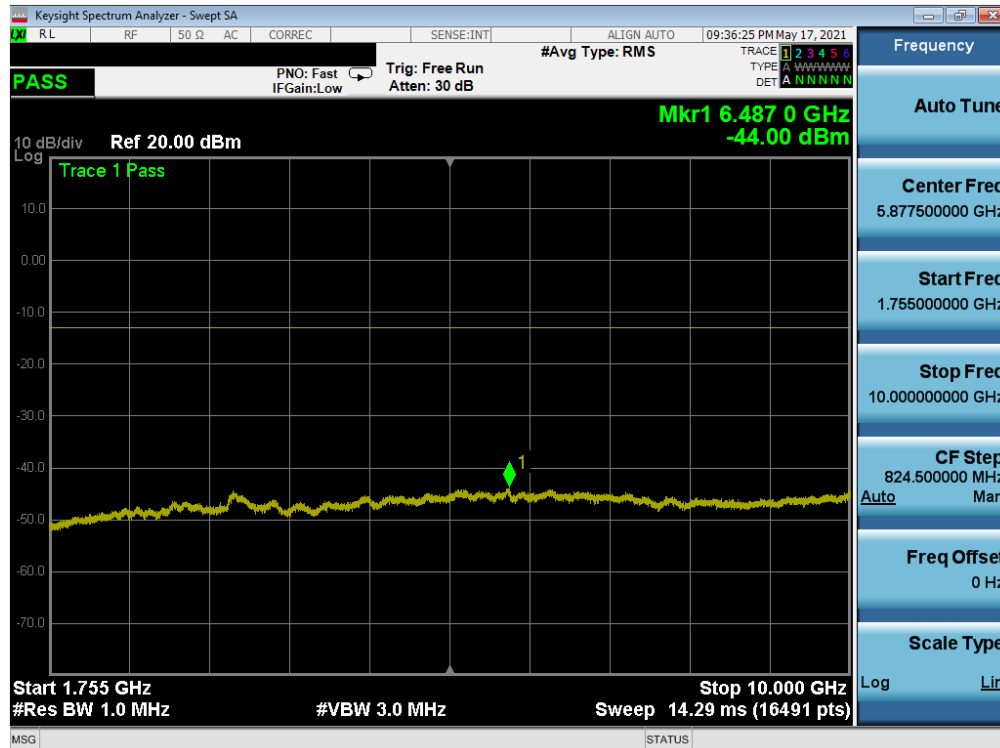


Plot 7-32. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - 1 RB - Low Channel)

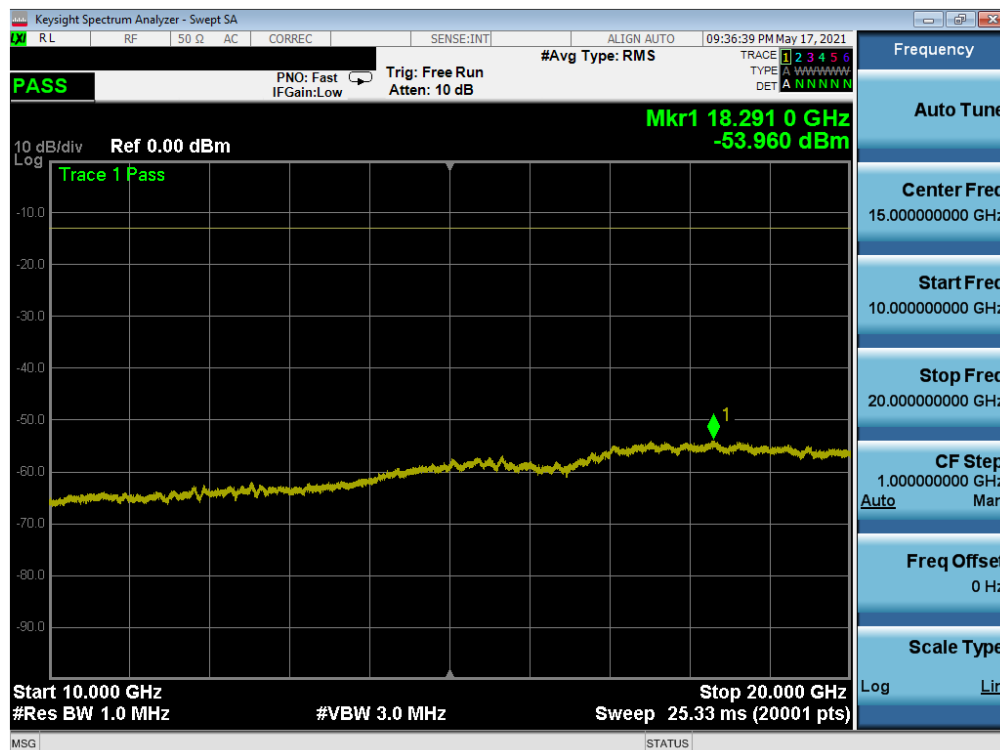


Plot 7-33. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - 1 RB - Mid Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 33 of 111                    |



Plot 7-34. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - 1 RB - Mid Channel)

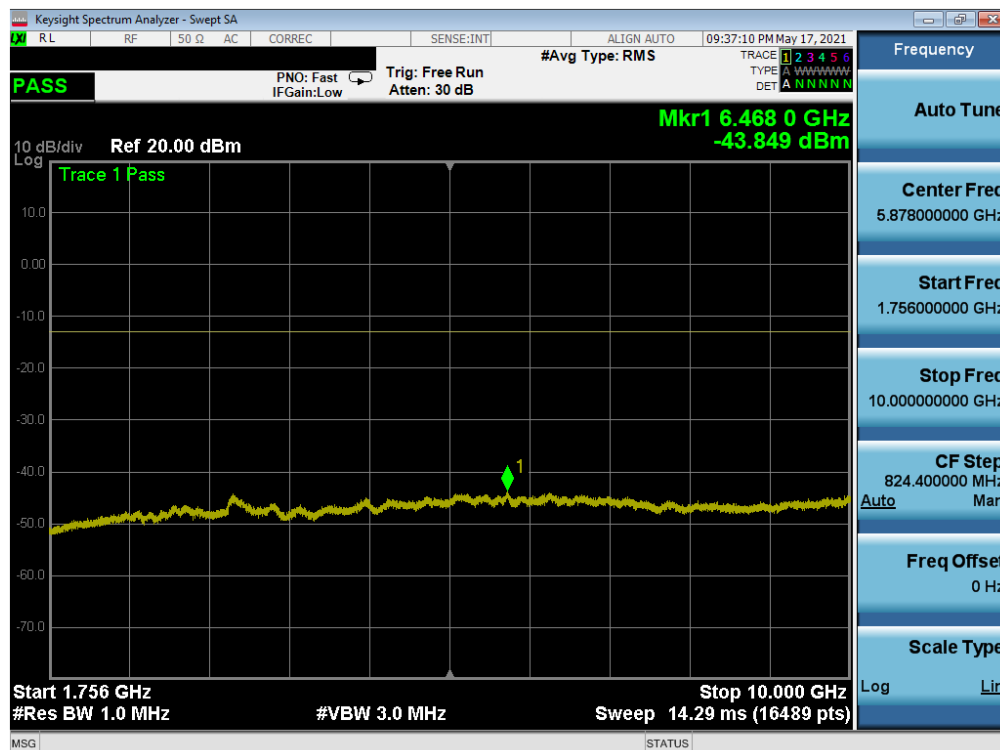


Plot 7-35. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - 1 RB - Mid Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 34 of 111                    |

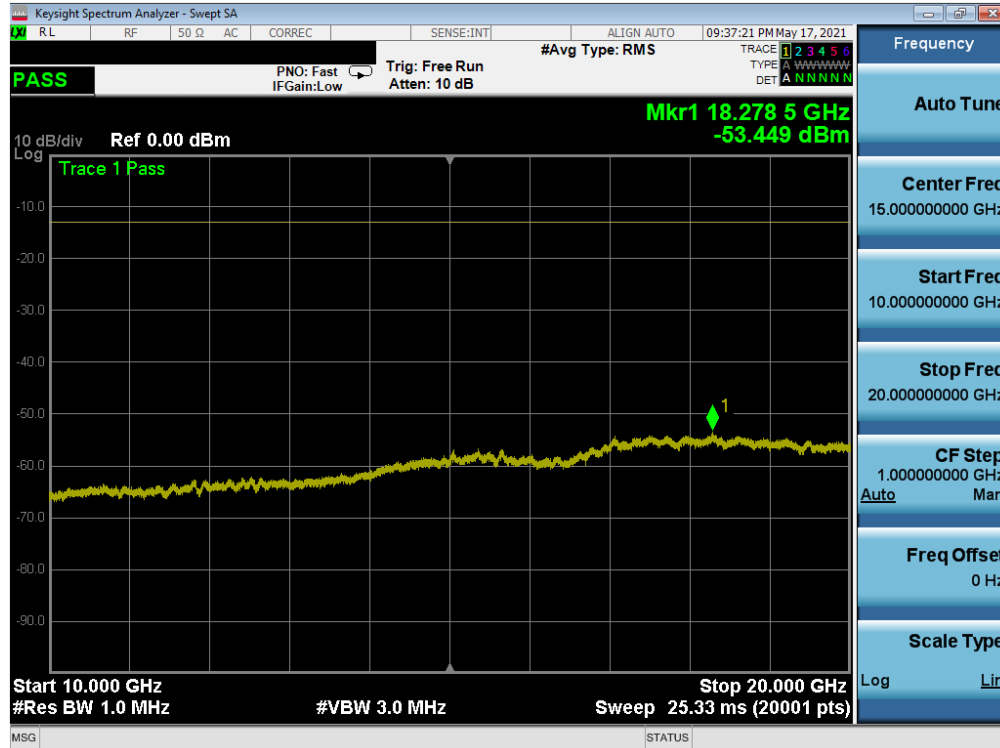


Plot 7-36. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - 1 RB - High Channel)



Plot 7-37. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - 1 RB - High Channel)

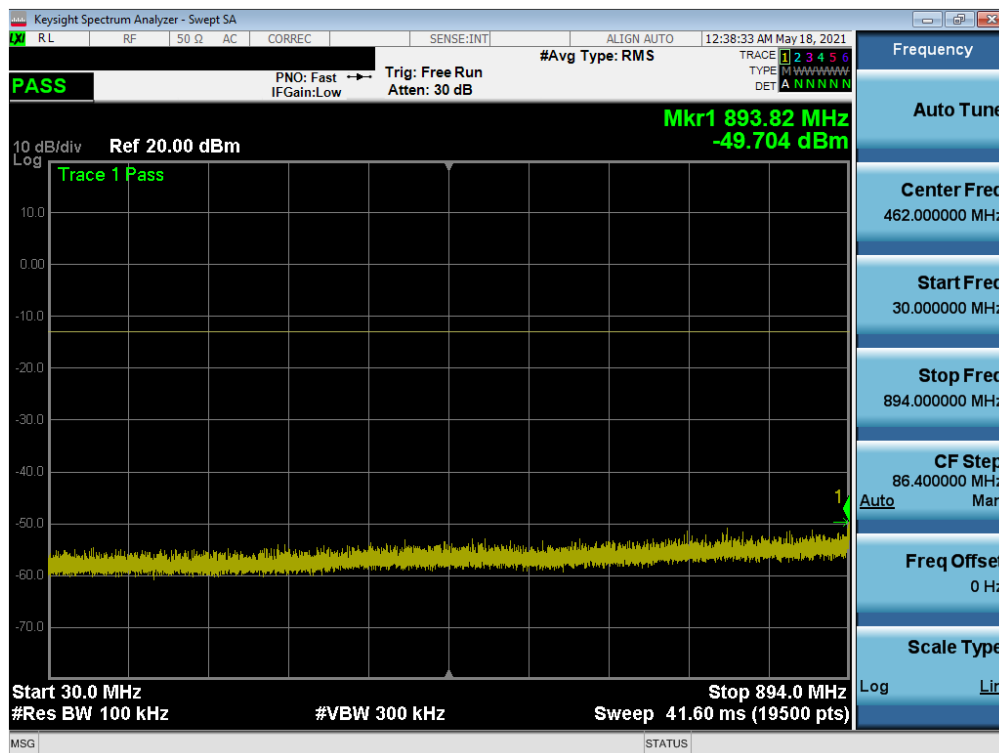
|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 35 of 111                    |



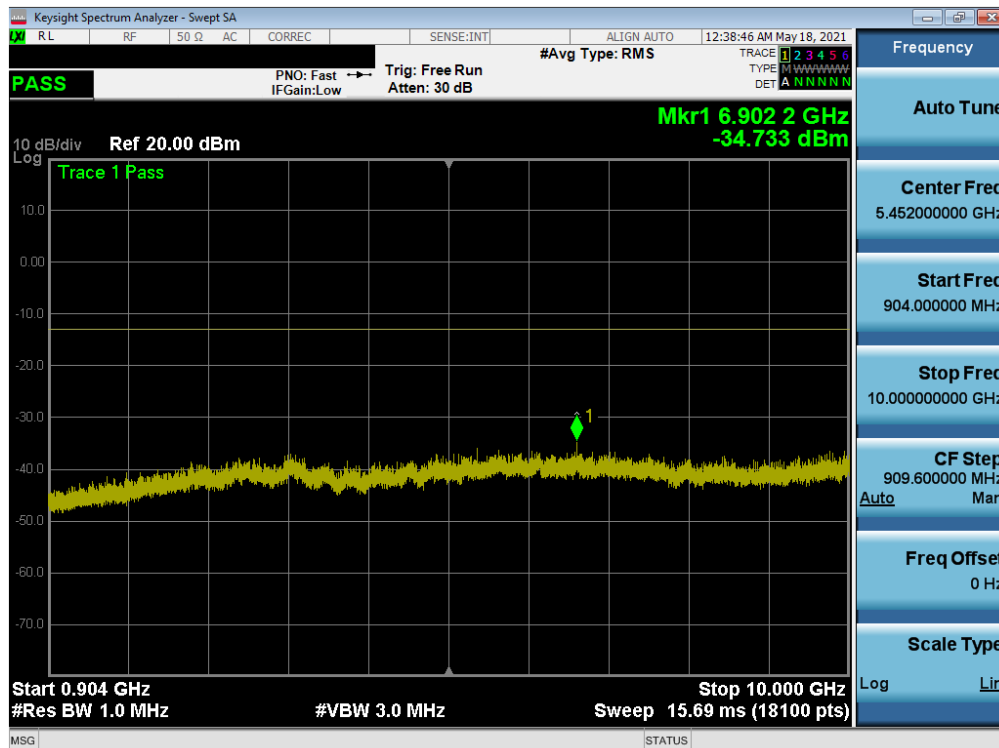
Plot 7-38. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - 1 RB - High Channel)

|                                         |                                   |                                   |                                   |
|-----------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PART 27 MEASUREMENT REPORT</b> |                                   | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021     | EUT Type:<br>Data Terminal Module | Page 36 of 111                    |

## LTE BAND 8

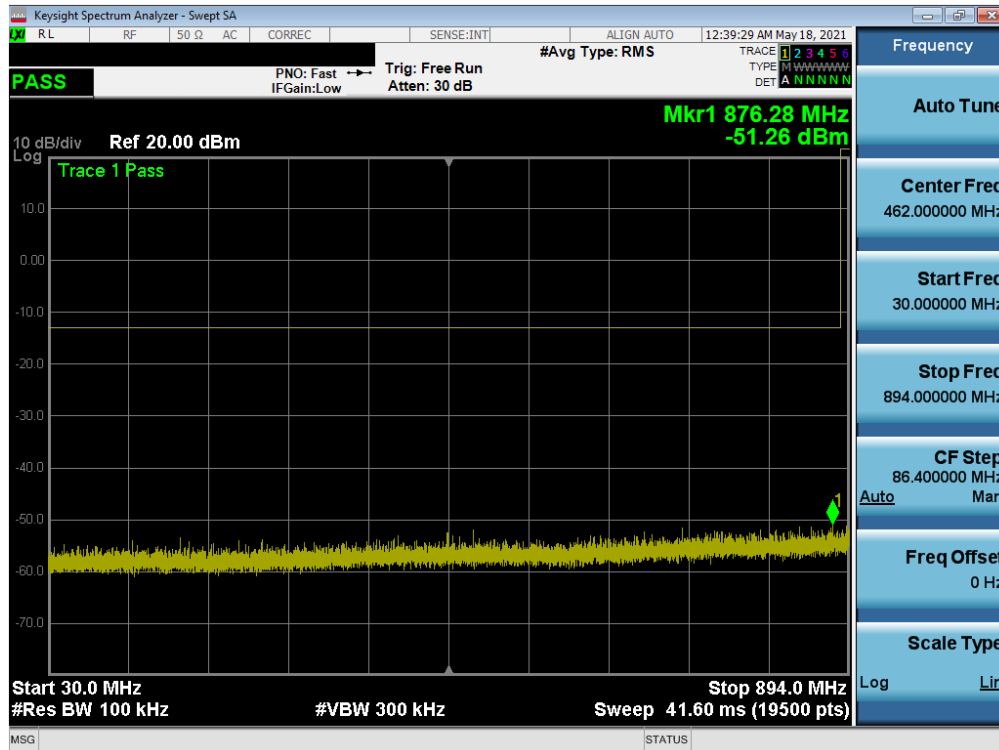


Plot 7-39. Conducted Spurious Plot (LTE BAND 8 – 1.4MHz QPSK - 1 RB - Low Channel)

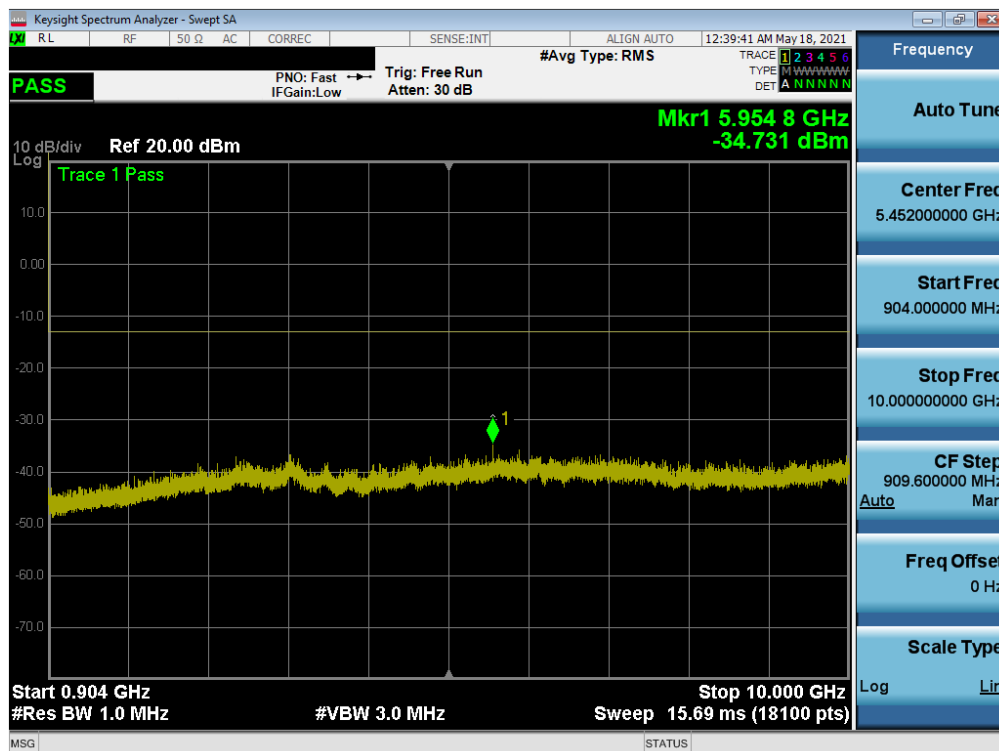


Plot 7-40. Conducted Spurious Plot (LTE BAND 8 – 1.4MHz QPSK - 1 RB - Low Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 37 of 111                    |

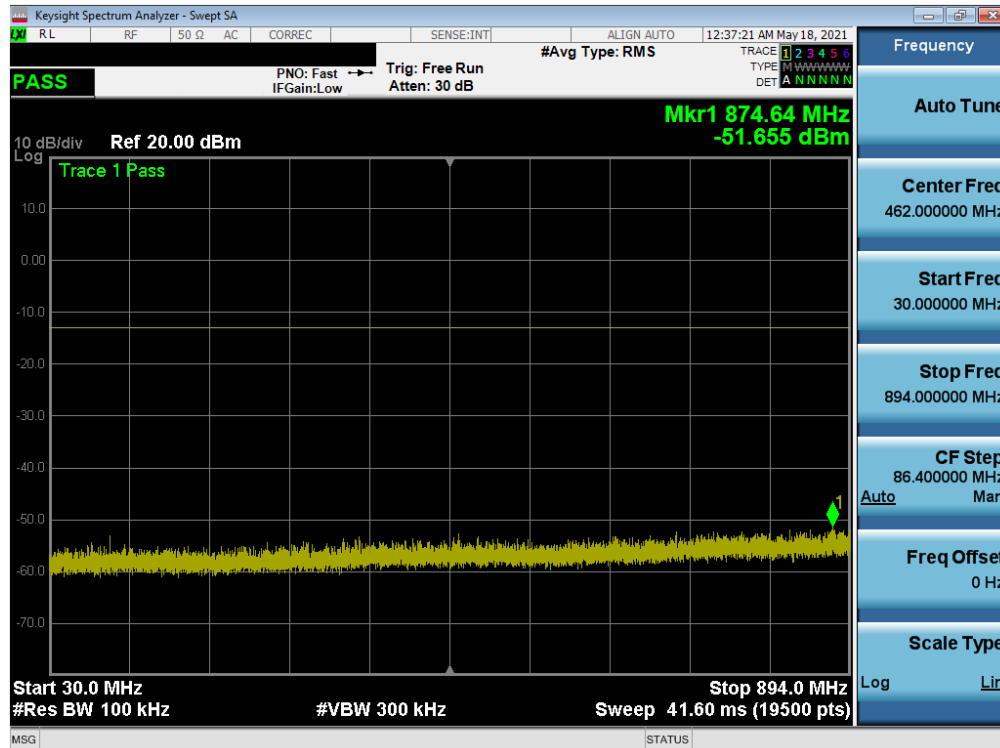


Plot 7-41. Conducted Spurious Plot (LTE BAND 8 - 3MHz QPSK - 1 RB - Mid Channel)

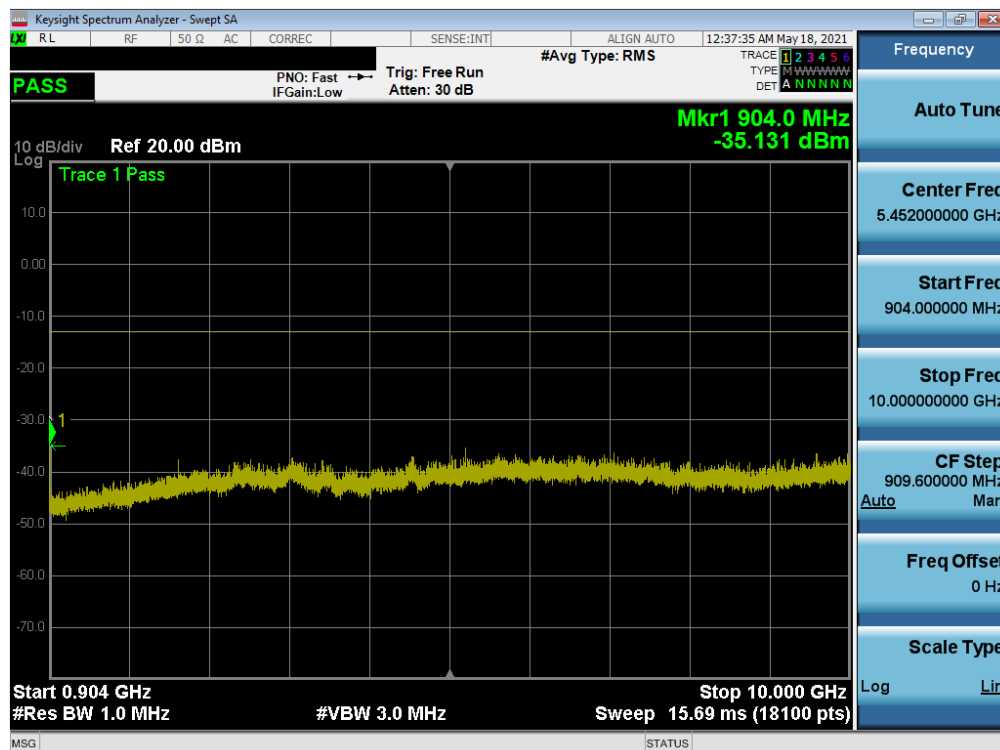


Plot 7-42. Conducted Spurious Plot (LTE BAND 8 - 3MHz QPSK - 1 RB - Mid Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 38 of 111                    |



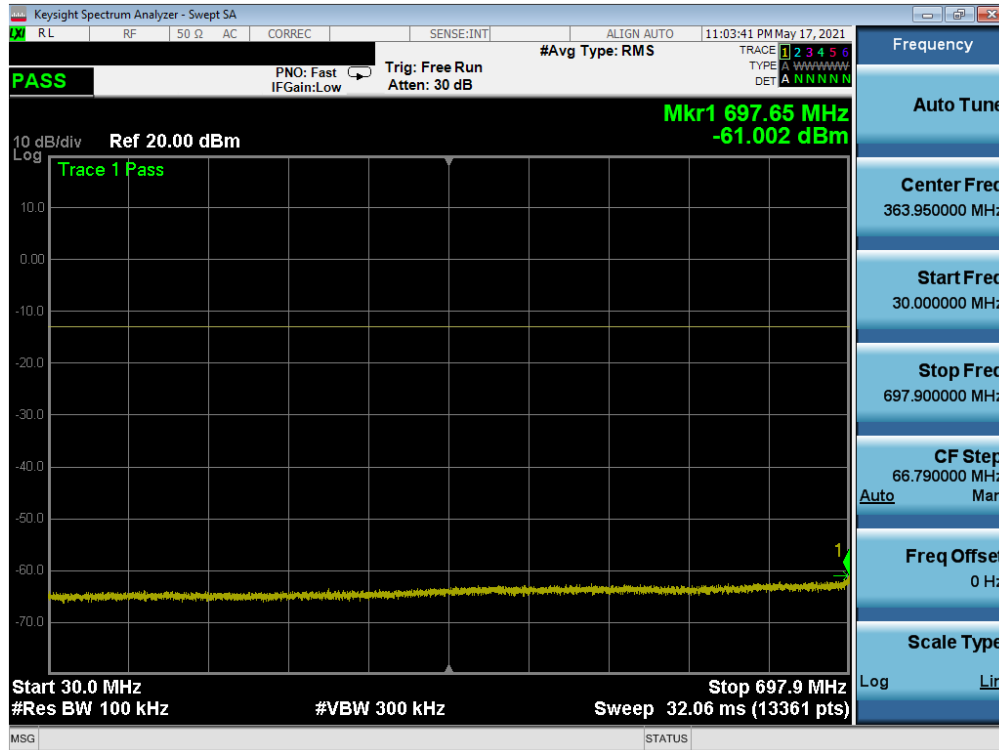
Plot 7-43. Conducted Spurious Plot (LTE BAND 8 – 1.4MHz QPSK - 1 RB - High Channel)



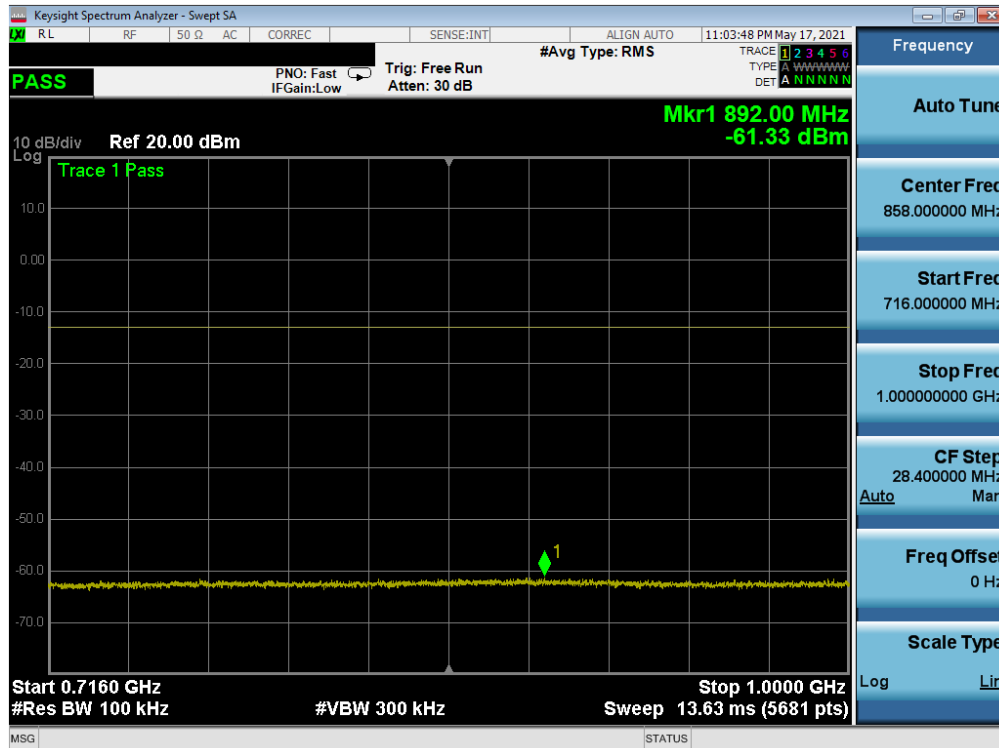
Plot 7-44. Conducted Spurious Plot (LTE BAND 8 – 1.4MHz QPSK - 1 RB - High Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 39 of 111                    |

## LTE Band 12

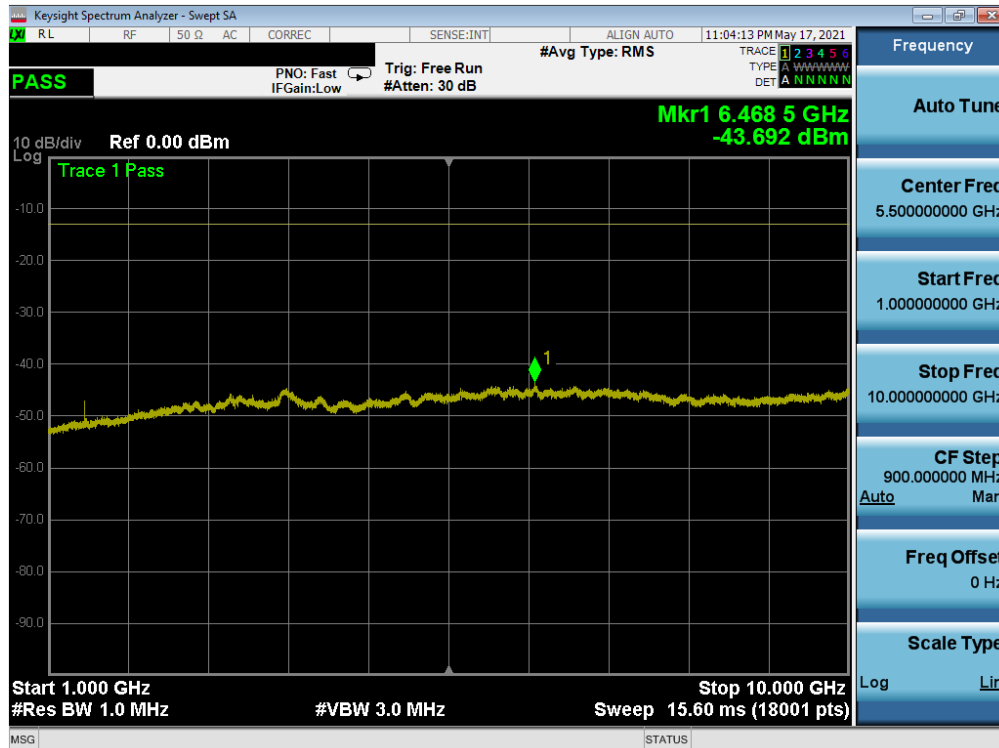


Plot 7-45. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Low Channel)

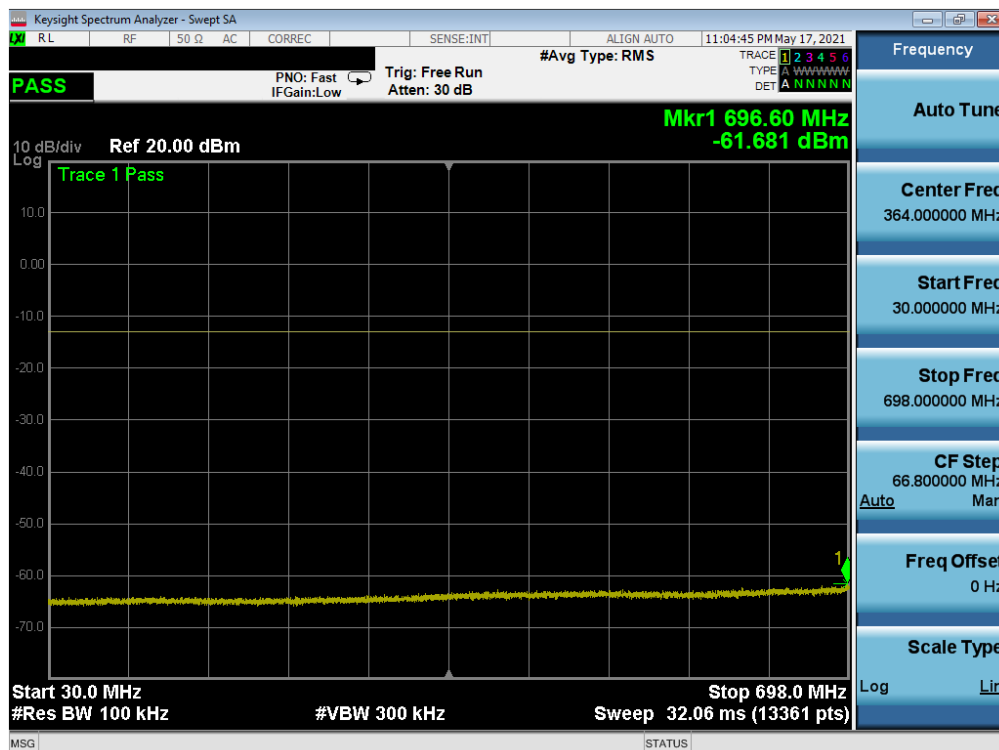


Plot 7-46. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Low Channel)

|                                         |                                              |                                   |  |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|--|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module |  | Page 40 of 111                    |

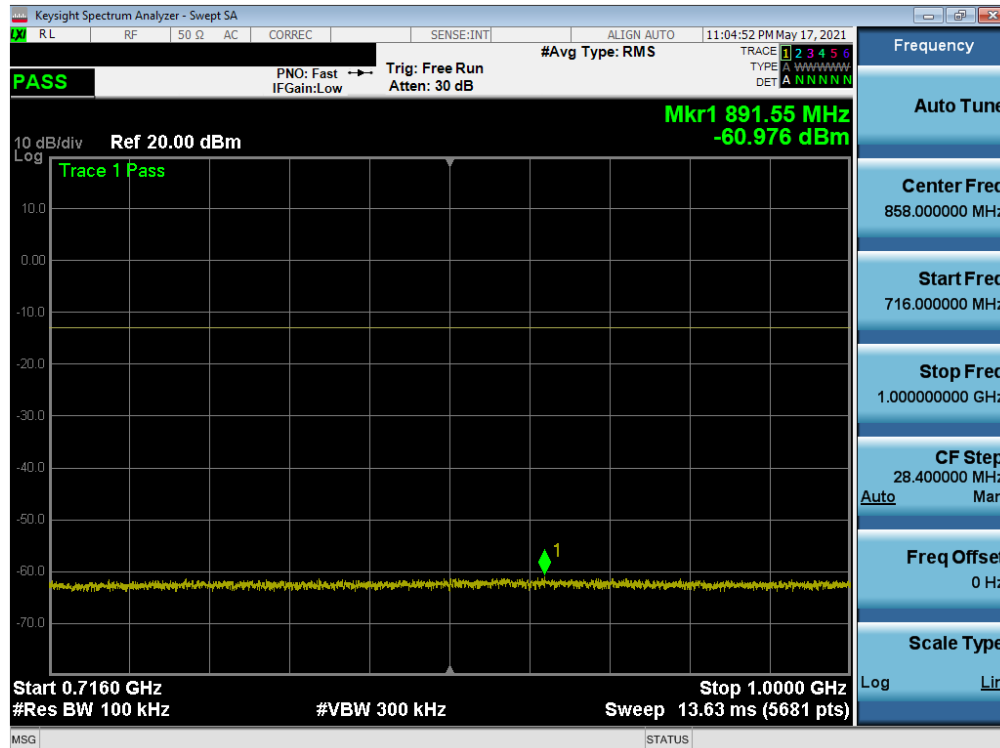


Plot 7-47. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Low Channel)

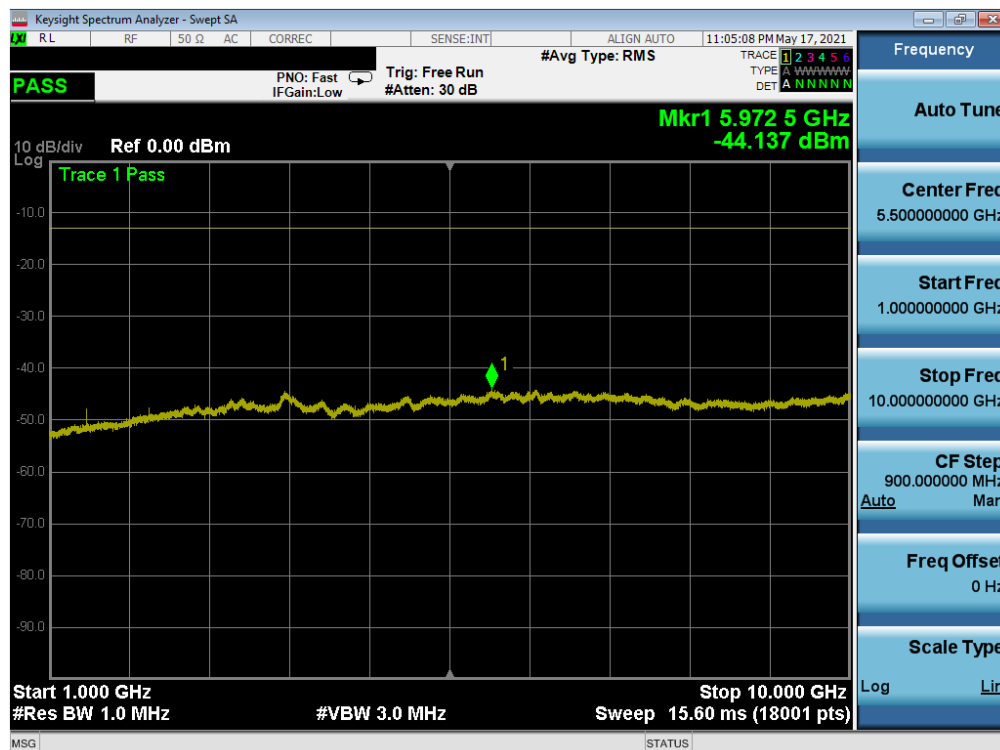


Plot 7-48. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Mid Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 41 of 111                    |

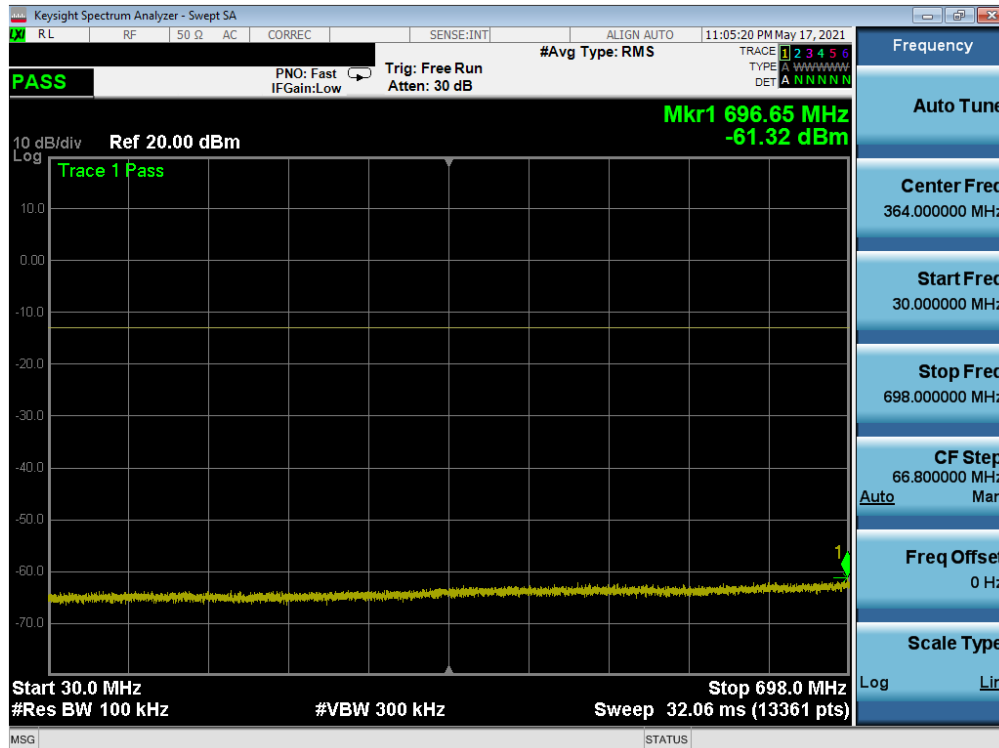


Plot 7-49. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Mid Channel)

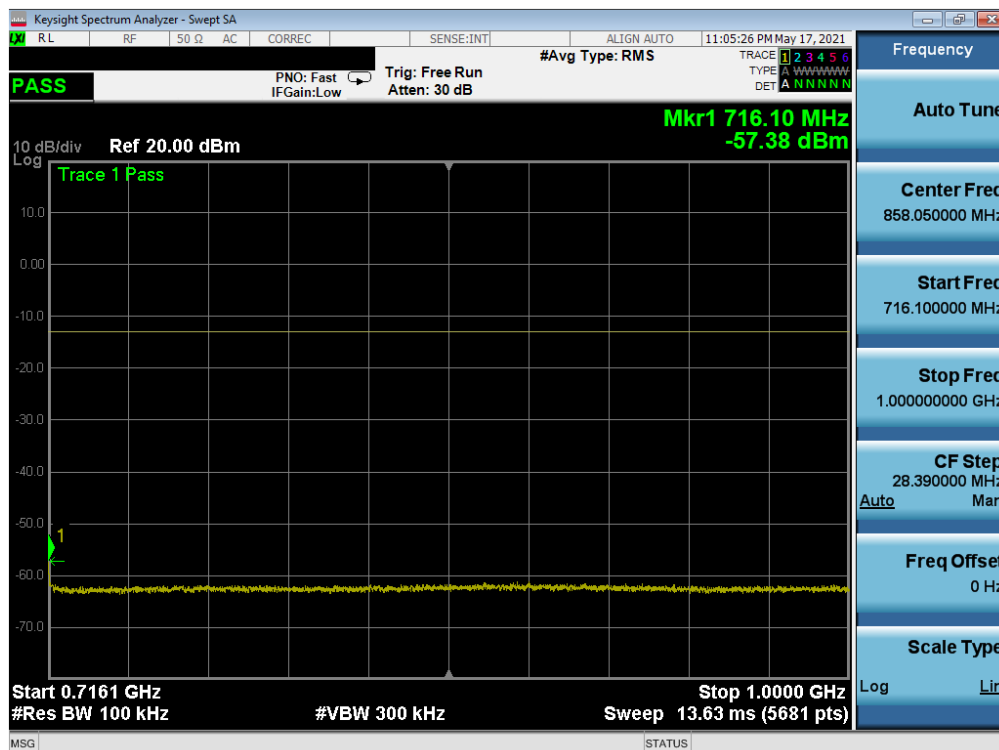


Plot 7-50. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Mid Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 42 of 111                    |

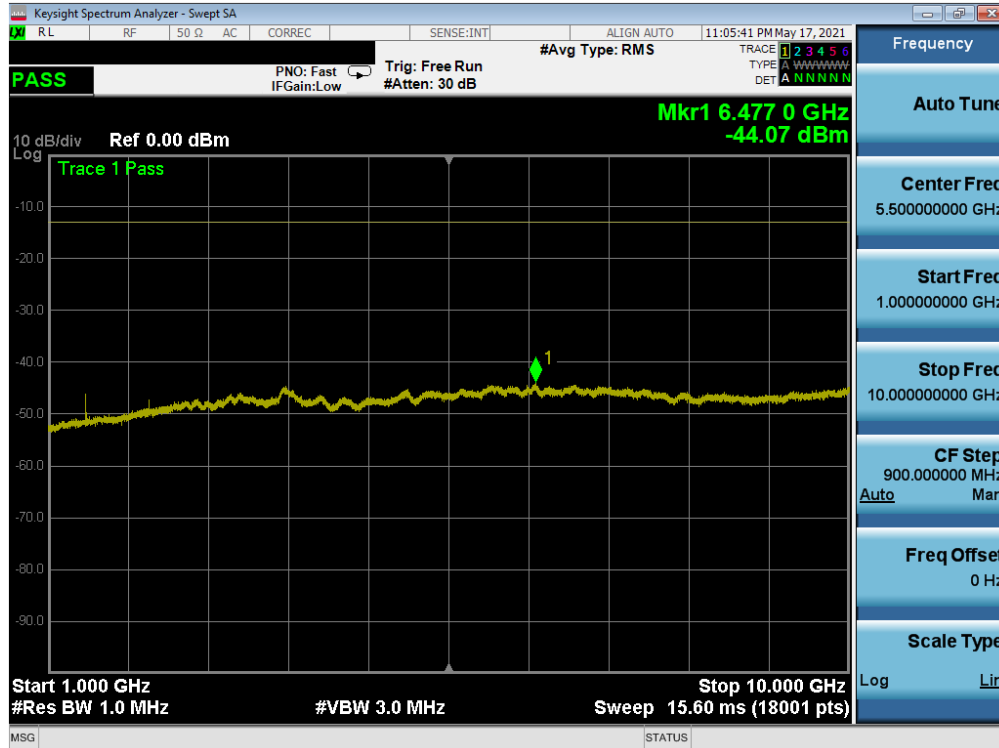


Plot 7-51. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - High Channel)



Plot 7-52. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - High Channel)

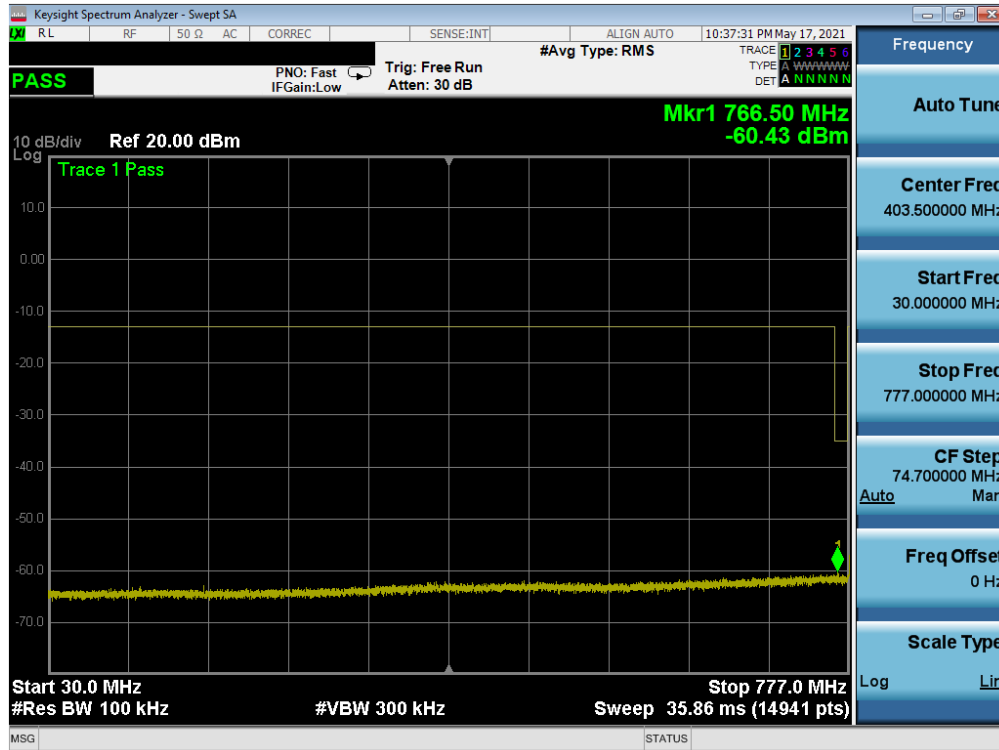
|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 43 of 111                    |



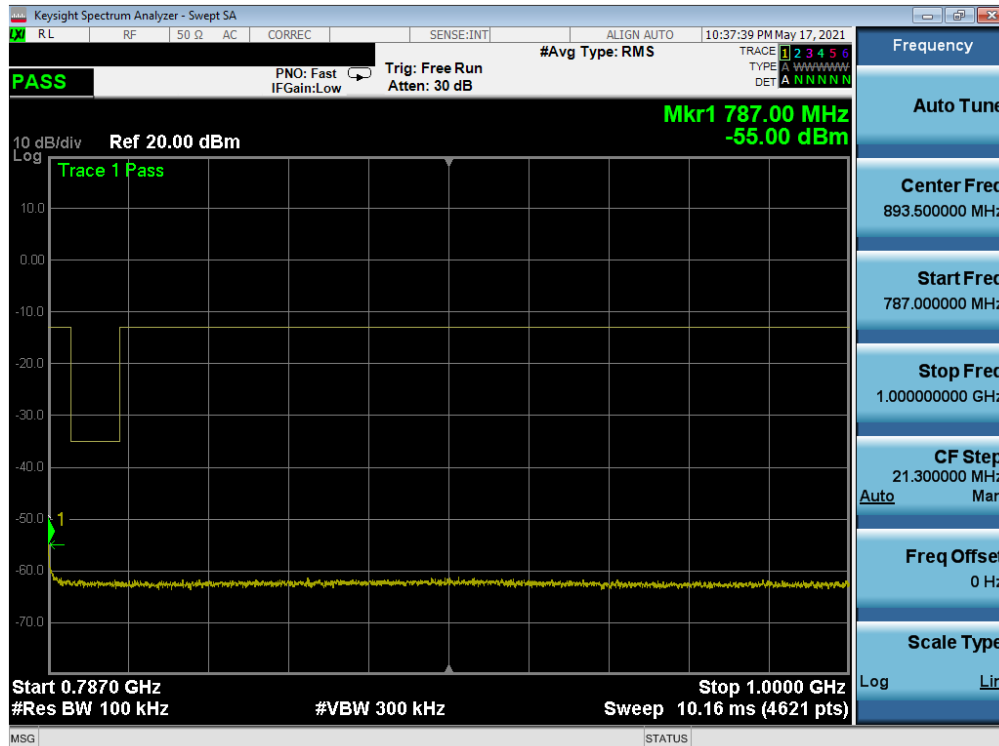
Plot 7-53. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - High Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 44 of 111                    |

## LTE Band 13

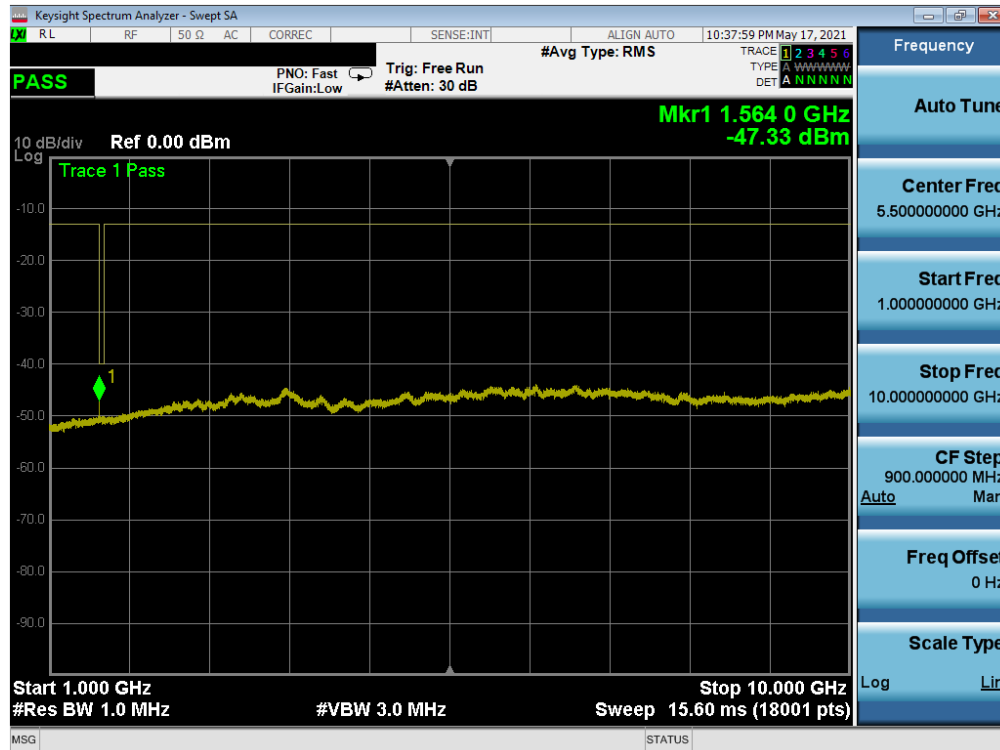


Plot 7-54. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - 1 RB)



Plot 7-55. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - 1 RB)

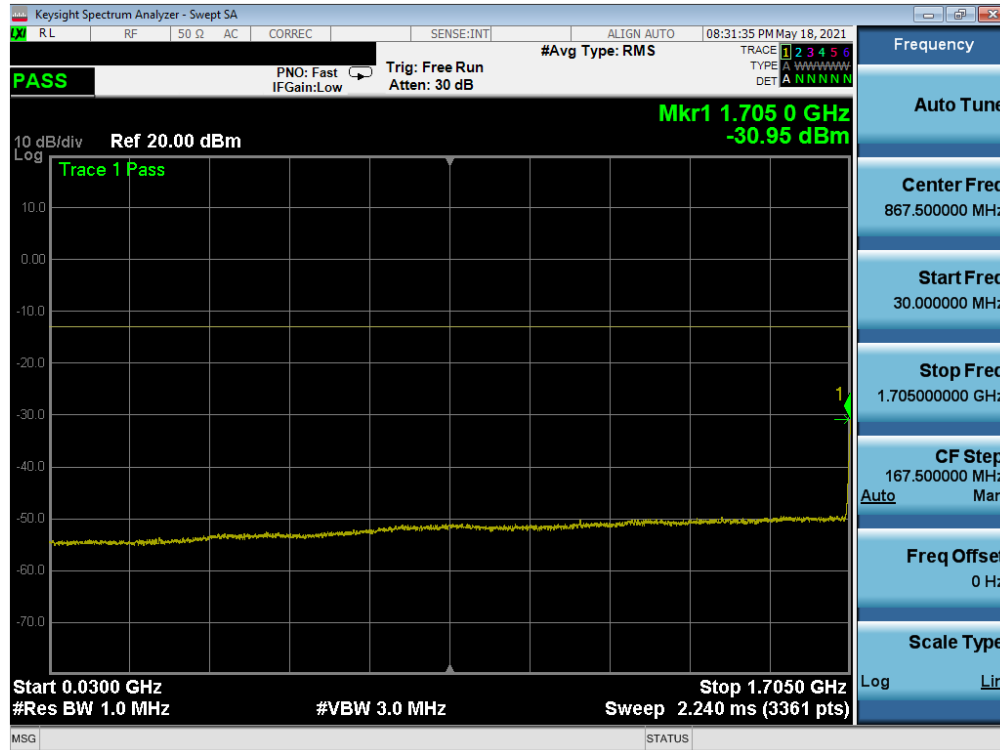
|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 45 of 111                    |



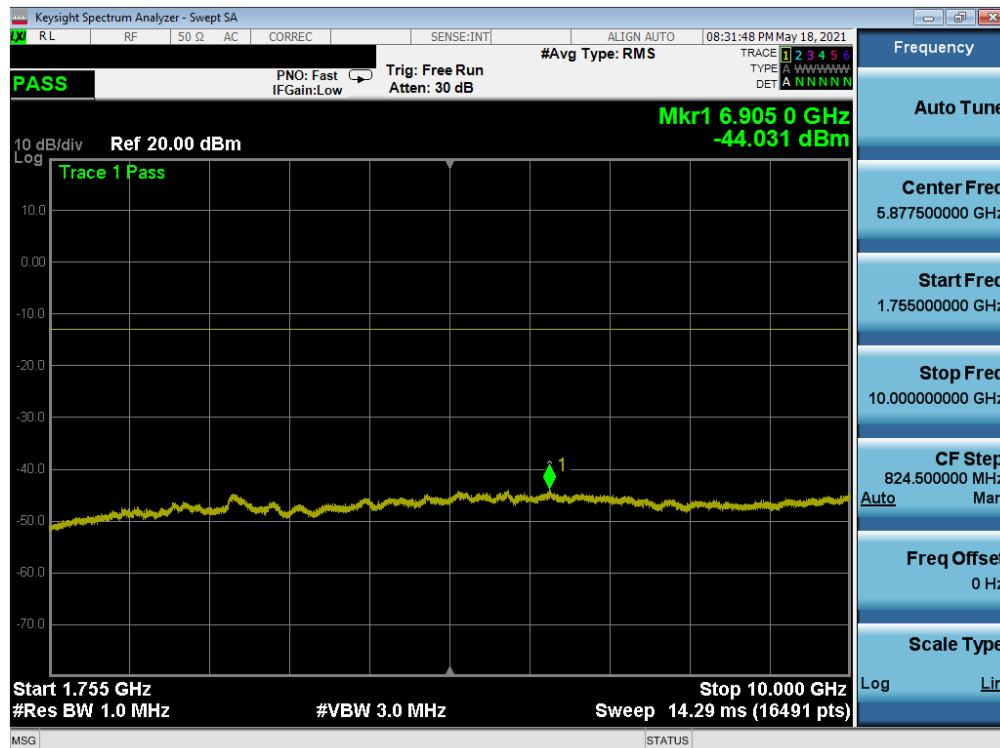
Plot 7-56. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - 1 RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 46 of 111                    |

## WCDMA AWS

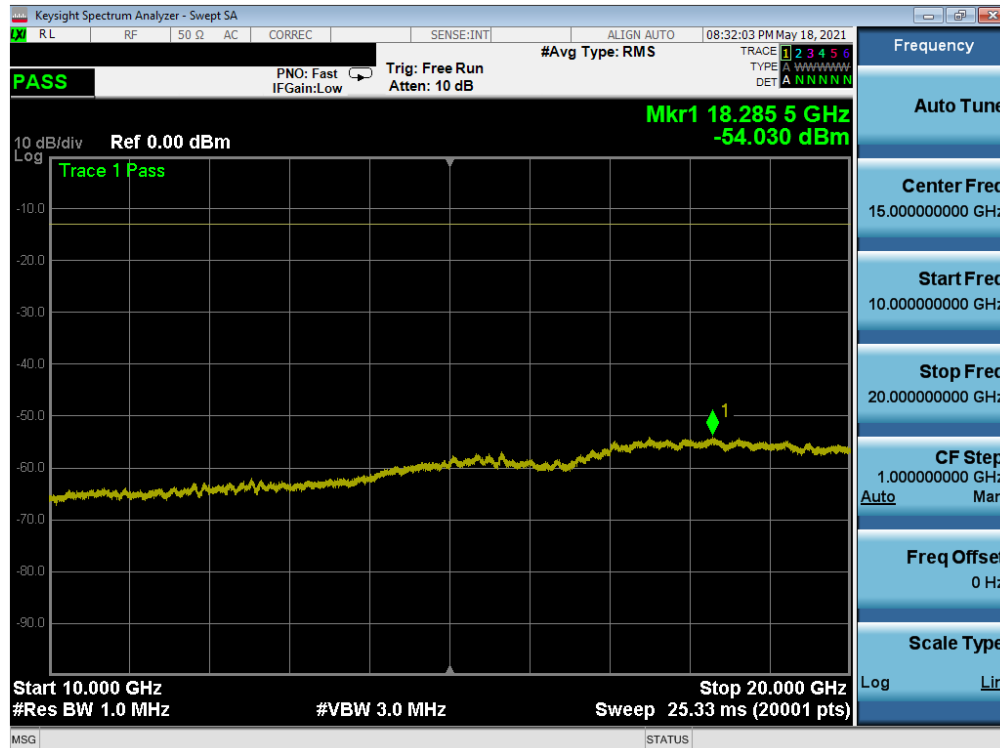


Plot 7-57. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

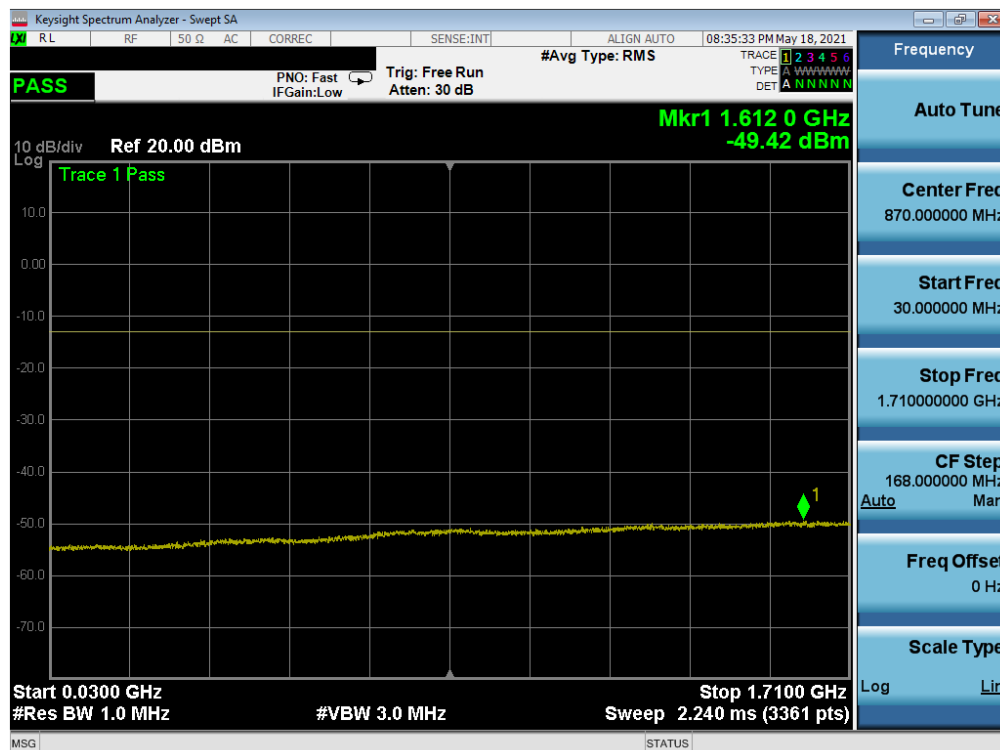


Plot 7-58. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 47 of 111                    |

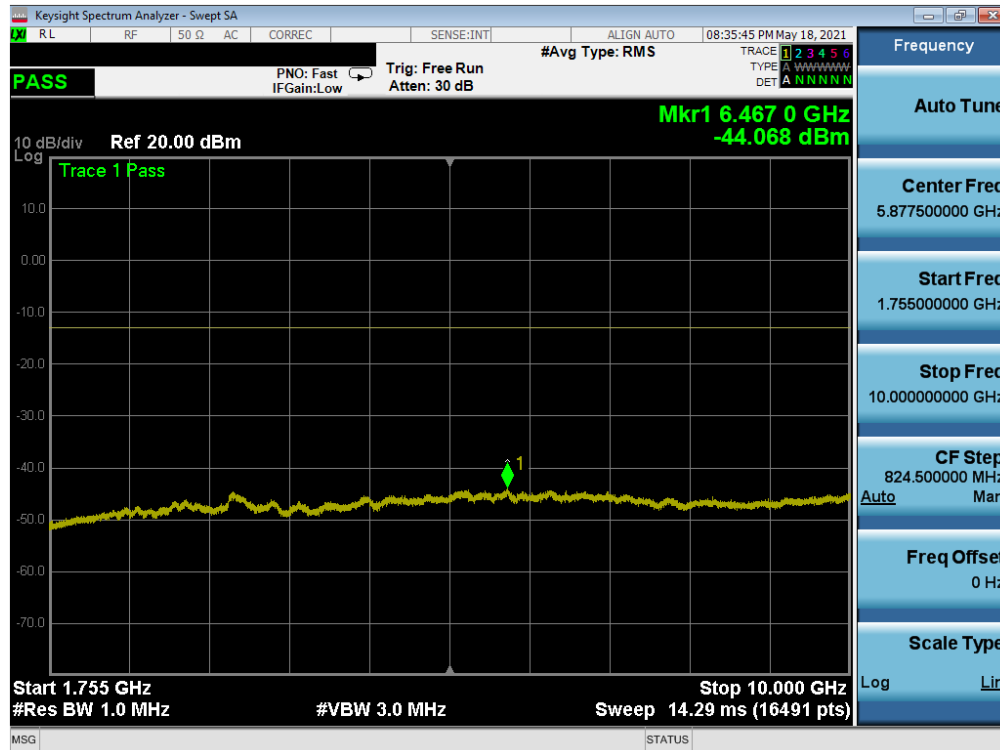


Plot 7-59. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

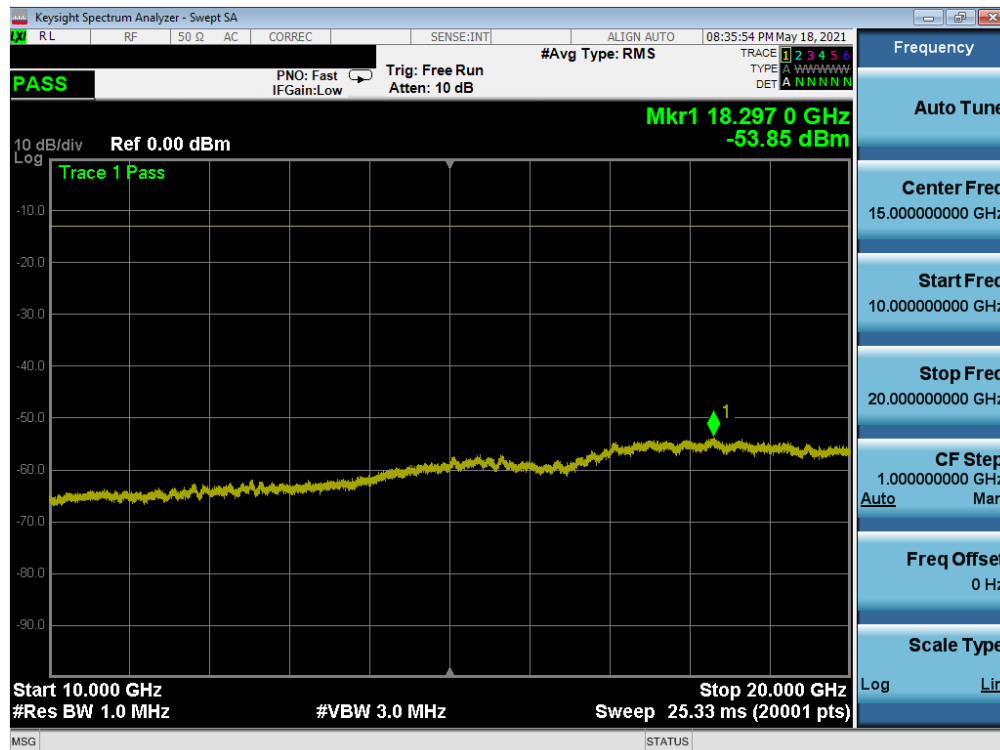


Plot 7-60. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 48 of 111                    |

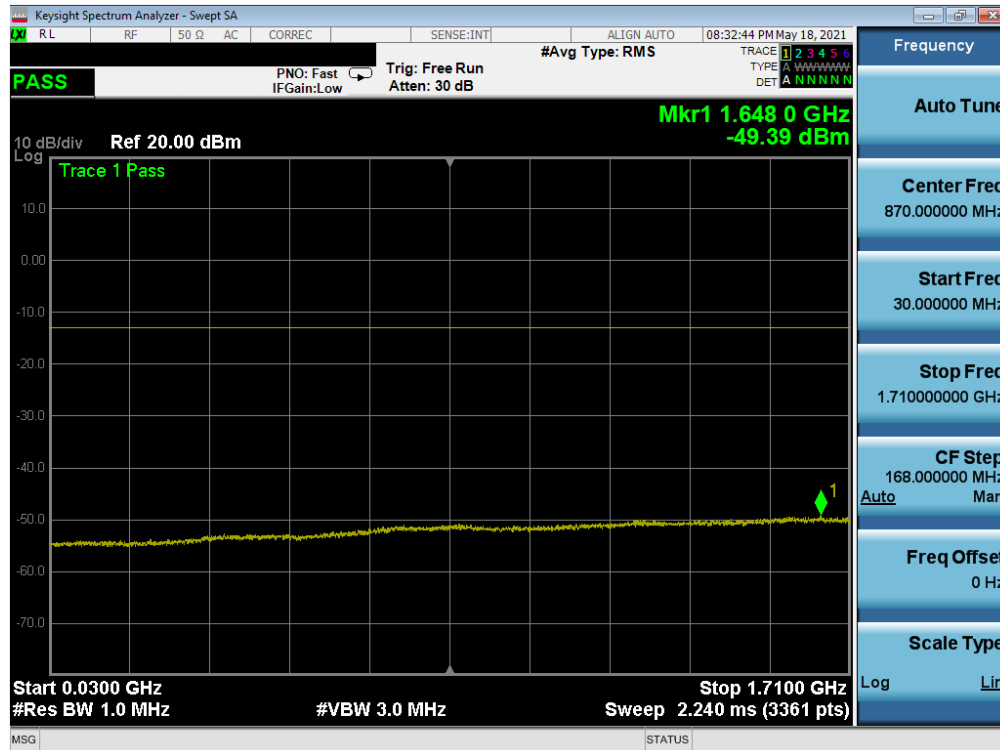


Plot 7-61. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

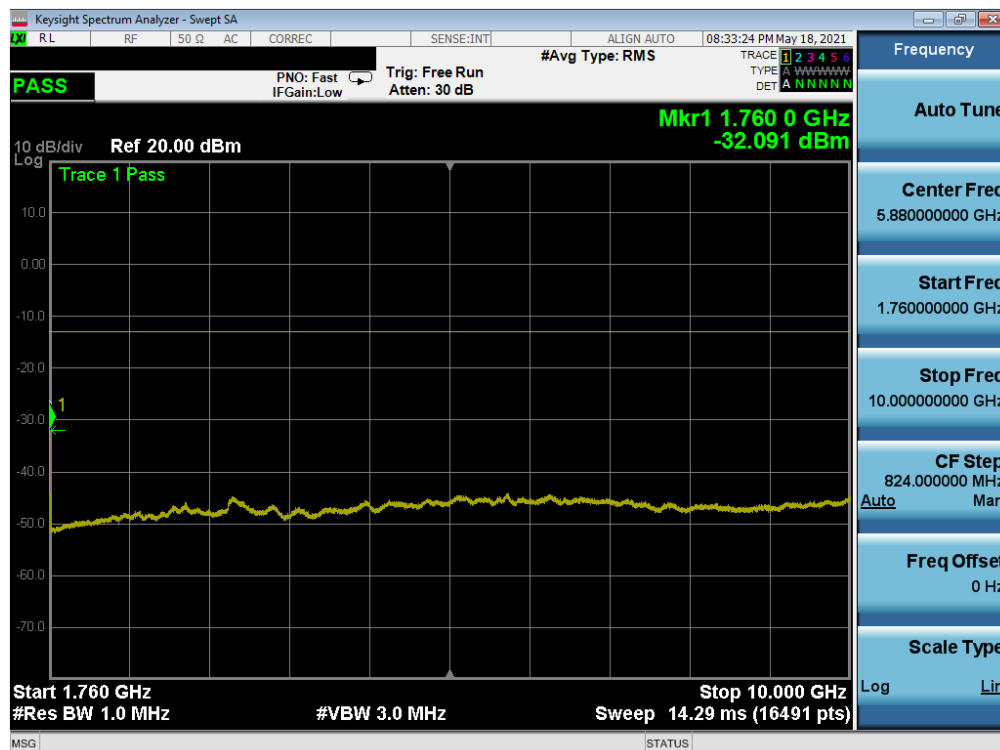


Plot 7-62. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 49 of 111                    |

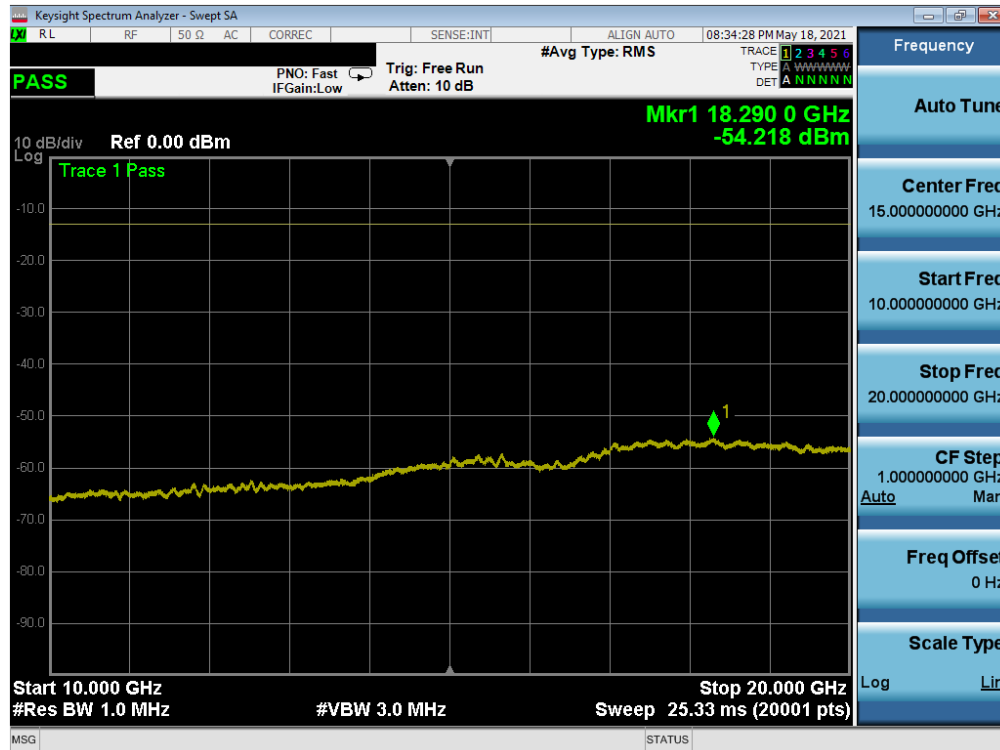


Plot 7-63. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)



Plot 7-64. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 50 of 111                    |



Plot 7-65. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

|                                         |                                                                                                                       |                                   |                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   |  <b>PART 27 MEASUREMENT REPORT</b> |                                   | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                                                                                         | EUT Type:<br>Data Terminal Module | Page 51 of 111                    |

## 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 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.

***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

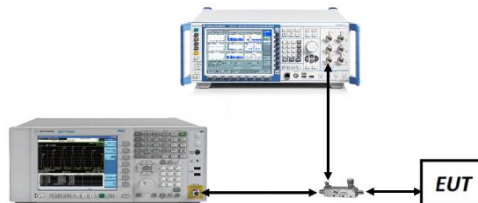
KDB 971168 D01 v03r01 – Section 6.0

### Test Settings

1. Start 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: RI7LE910CXWWX                   |  <b>PART 27 MEASUREMENT REPORT</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                                                                                         | EUT Type:<br>Data Terminal Module |
|                                         |                                                                                                                       | Page 52 of 111                    |

## Test Notes

Per 27.53(h) 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.

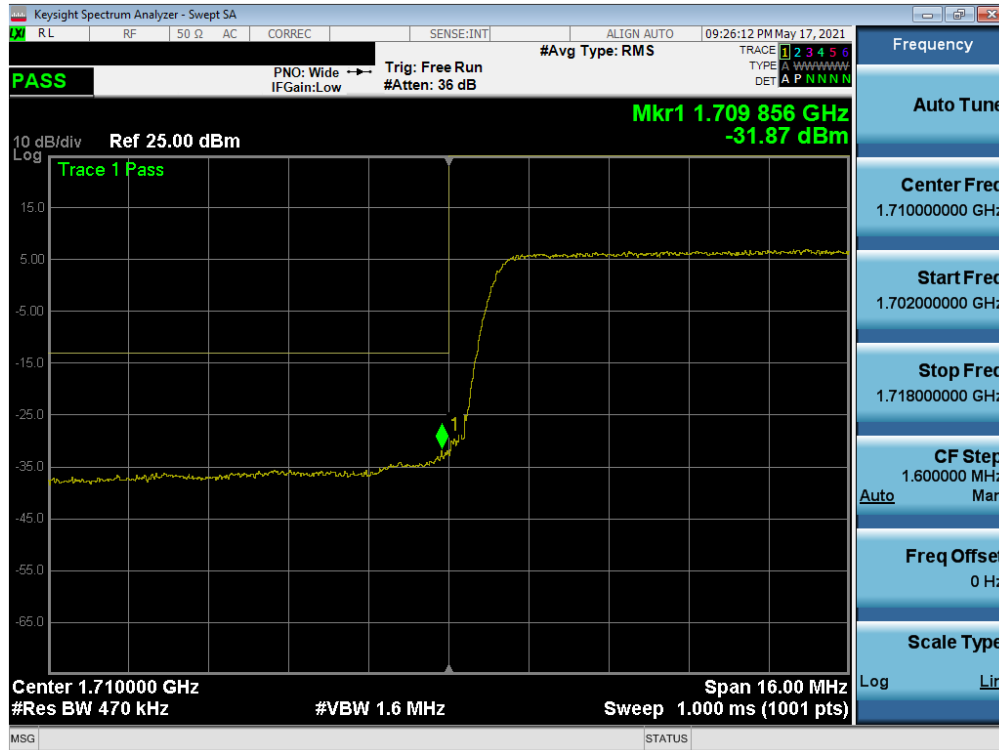
Per 27.53(g) for operations in the 663 - 698 MHz and 698 – 746MHz bands, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c)(5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

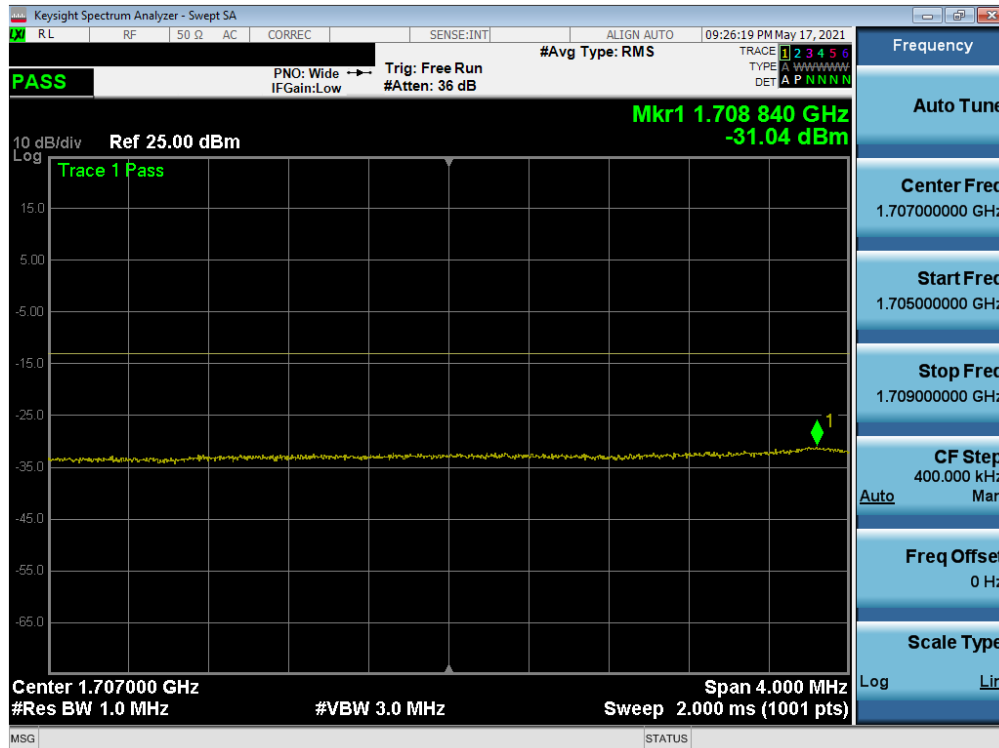
For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c)(4) is  $65 + 10 \log_{10}(P) = -35\text{dBm}$  in a 6.25kHz bandwidth.

|                                         |                                                                                                                       |                                   |                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   |  <b>PART 27 MEASUREMENT REPORT</b> |                                   | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                                                                                         | EUT Type:<br>Data Terminal Module | Page 53 of 111                    |

## LTE Band 4

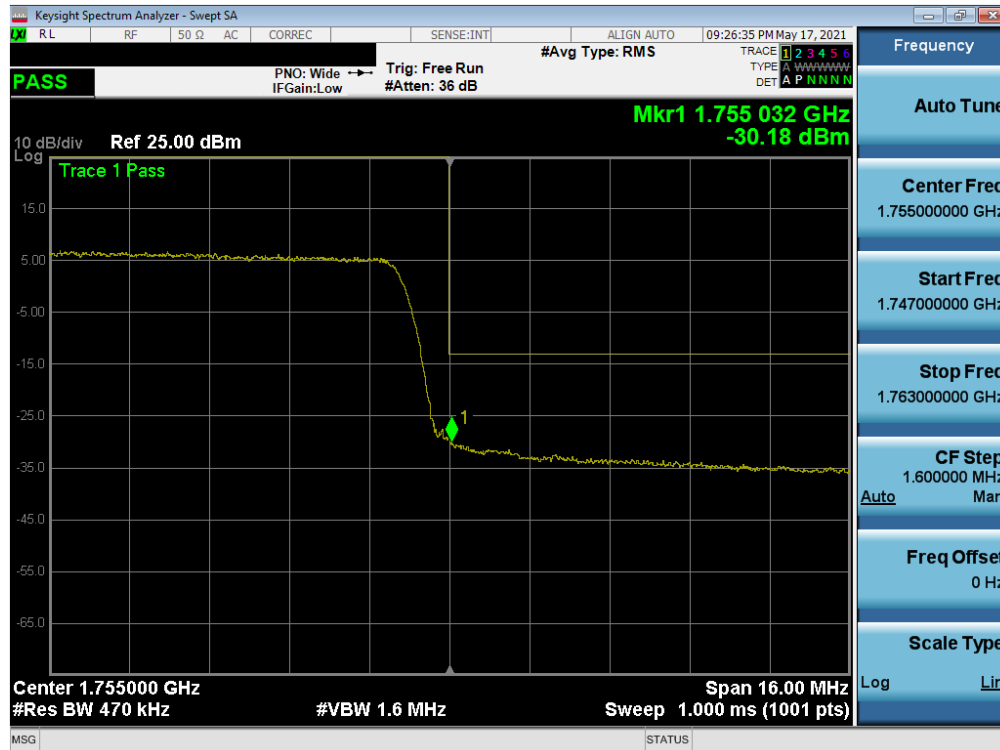


Plot 7-66. Lower Band Edge Plot (LTE Band 4 - 20MHz QPSK – Full RB)

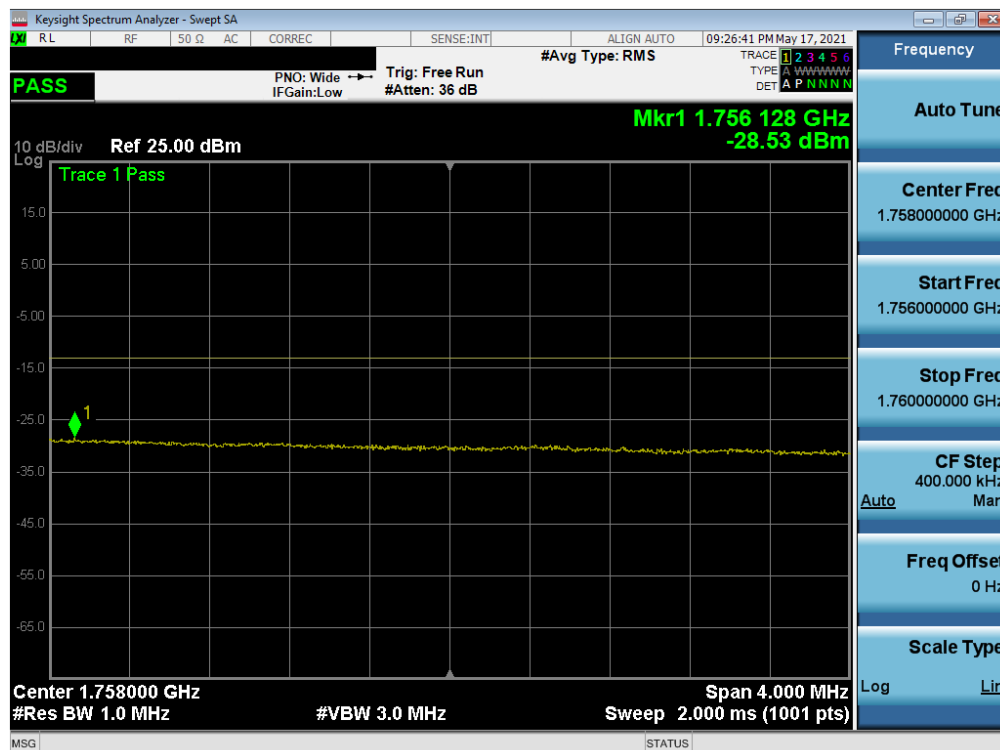


Plot 7-67. Lower Extended Band Edge Plot (LTE Band 4 - 20MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 54 of 111                    |

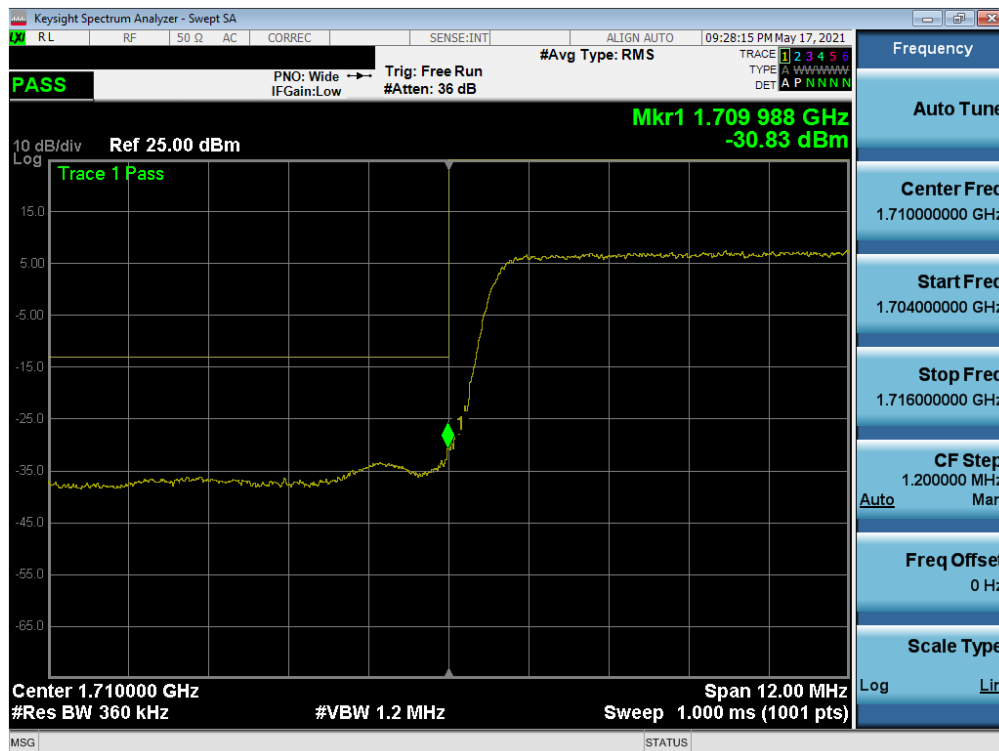


Plot 7-68. Upper Band Edge Plot (LTE Band 4 - 20MHz QPSK – Full RB)

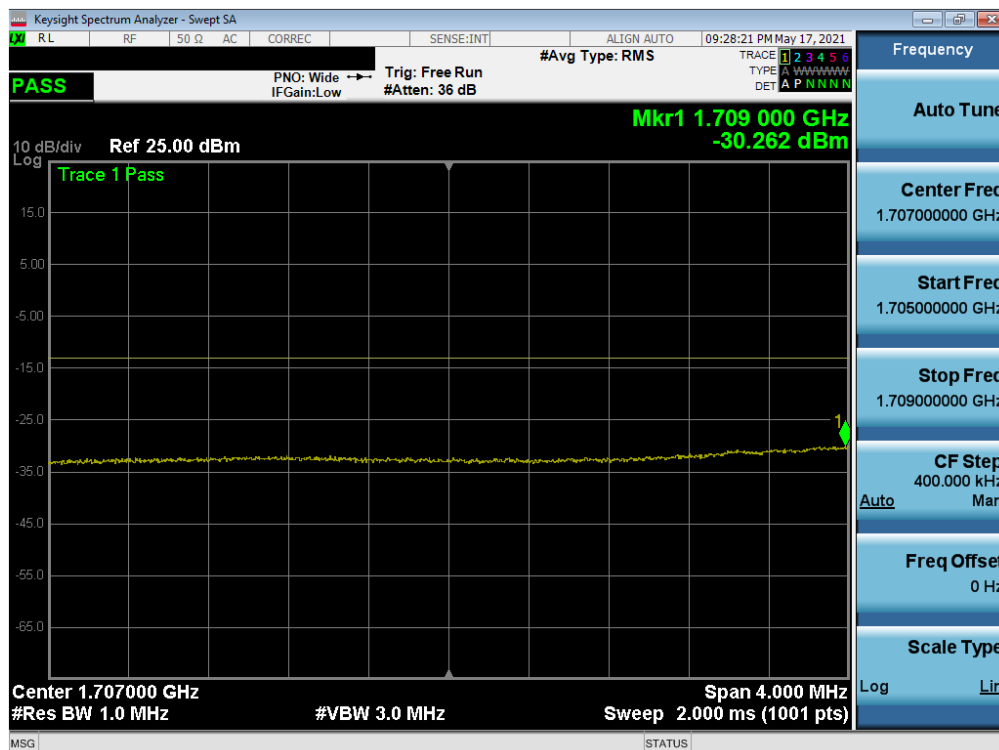


Plot 7-69. Upper Extended Band Edge Plot (LTE Band 4 - 20MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 55 of 111                    |



Plot 7-70. Lower Band Edge Plot (LTE Band 4 - 15MHz QPSK - Full RB)



Plot 7-71. Lower Extended Band Edge Plot (LTE Band 4 - 15MHz QPSK - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 56 of 111                    |

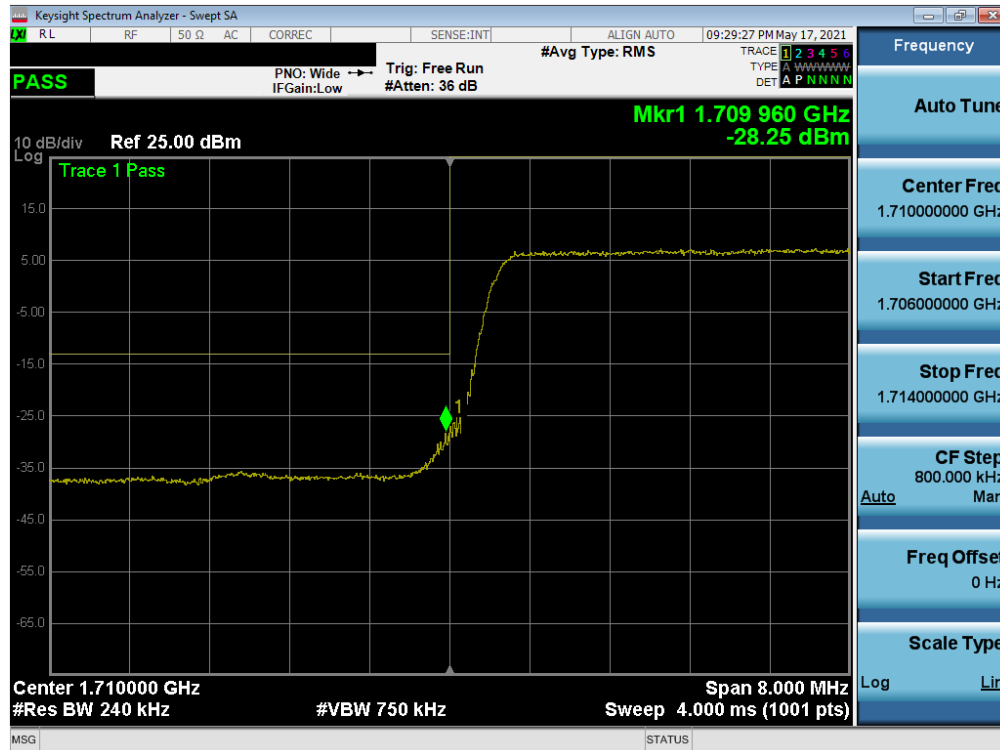


Plot 7-72. Upper Band Edge Plot (LTE Band 4 - 15MHz QPSK - Full RB)

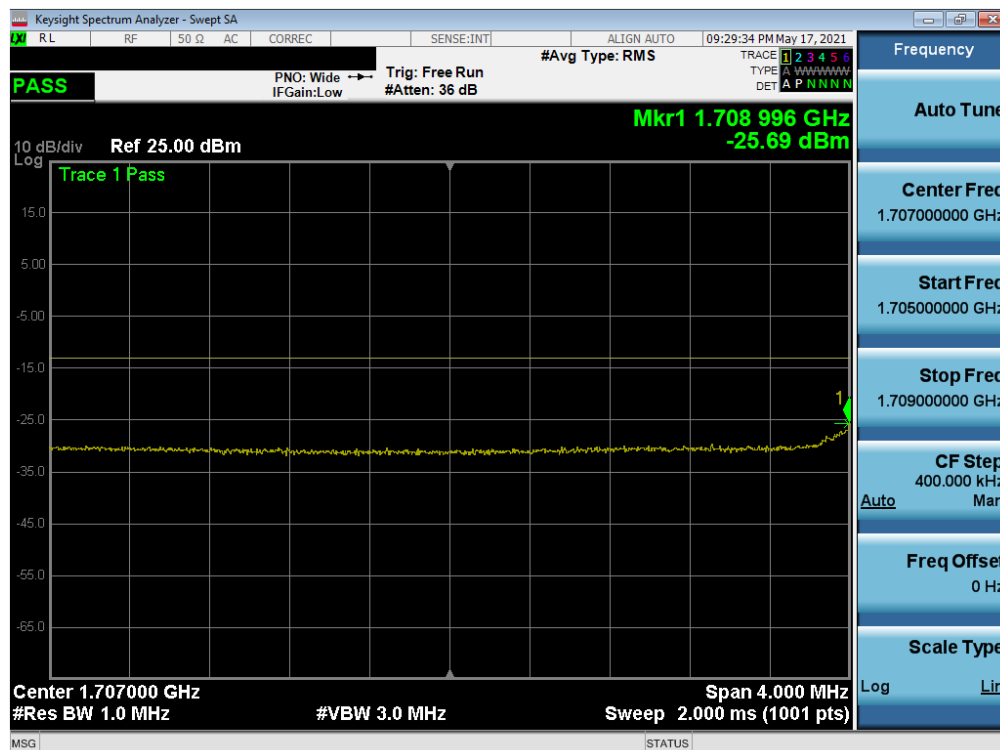


Plot 7-73. Upper Extended Band Edge Plot (LTE Band 4 - 15MHz QPSK - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 57 of 111                    |



Plot 7-74. Lower Band Edge Plot (LTE Band 4 - 10MHz QPSK – Full RB)

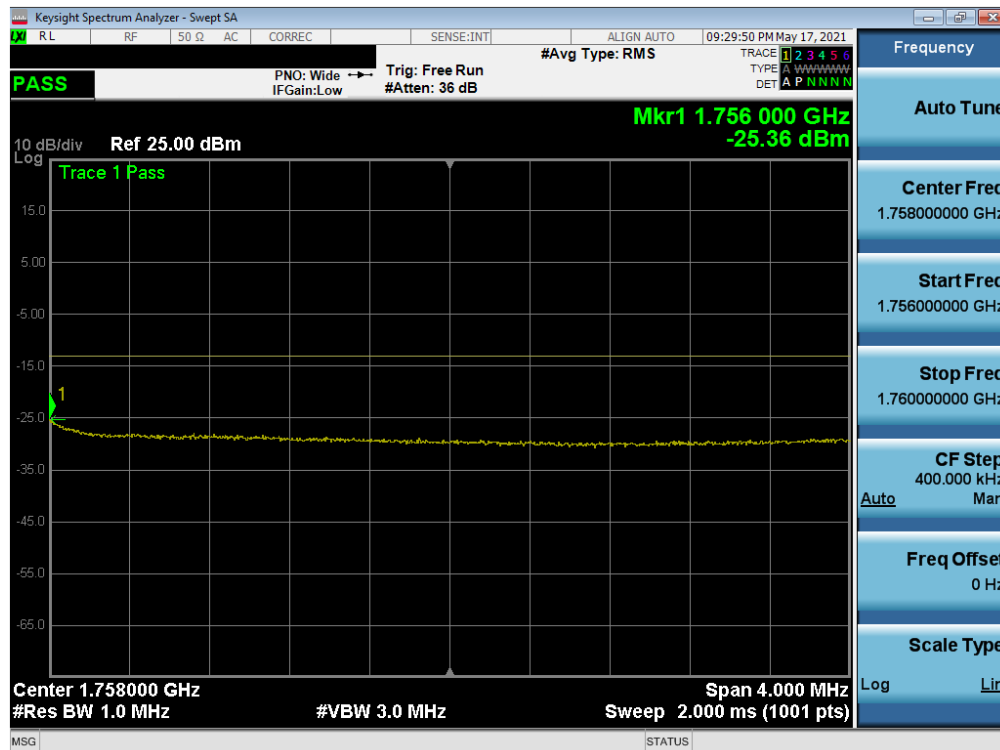


Plot 7-75. Lower Extended Band Edge Plot (LTE Band 4 - 10MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 58 of 111                    |

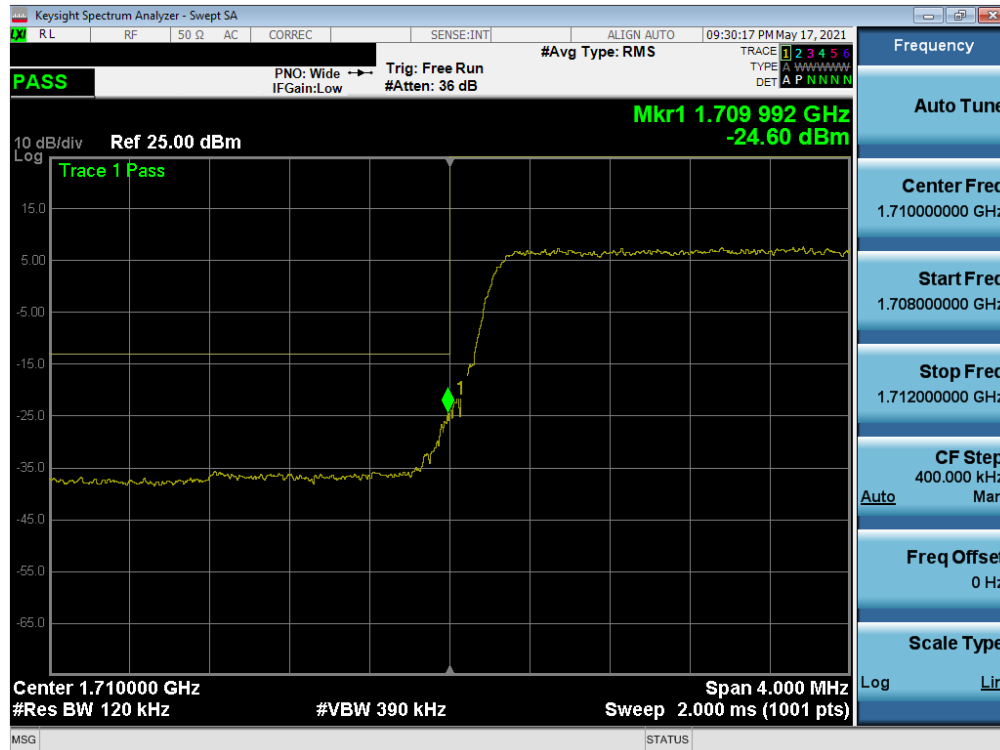


Plot 7-76. Upper Band Edge Plot (LTE Band 4 - 10MHz QPSK – Full RB)

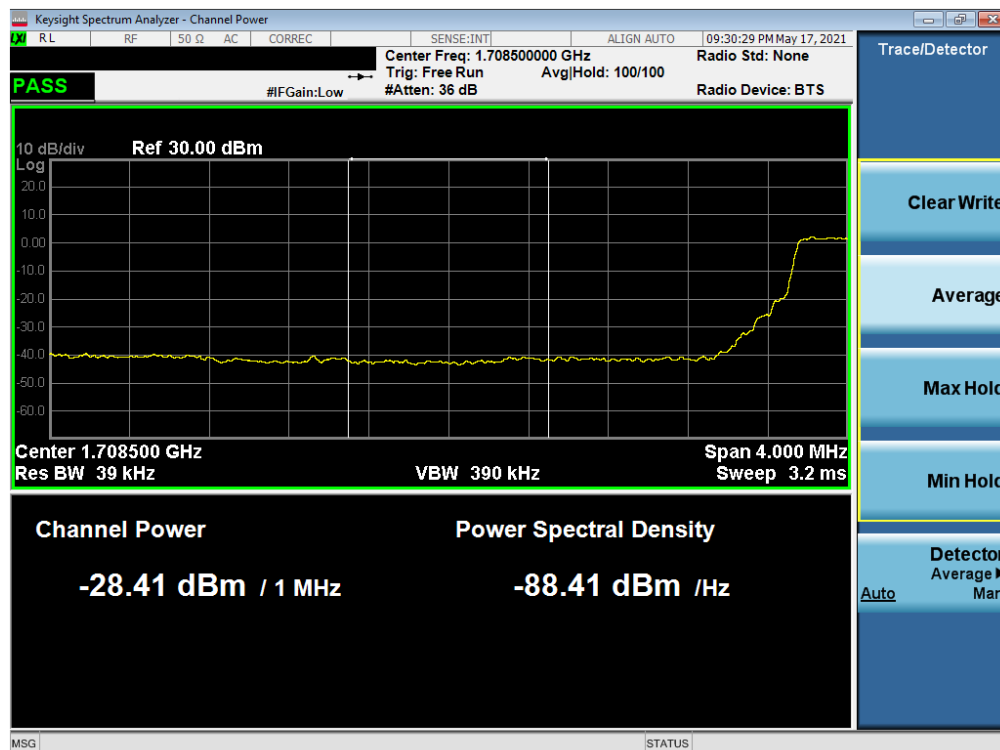


Plot 7-77. Upper Extended Band Edge Plot (LTE Band 4 - 10MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 59 of 111                    |



Plot 7-78. Lower Band Edge Plot (LTE Band 4 - 5MHz QPSK – Full RB)

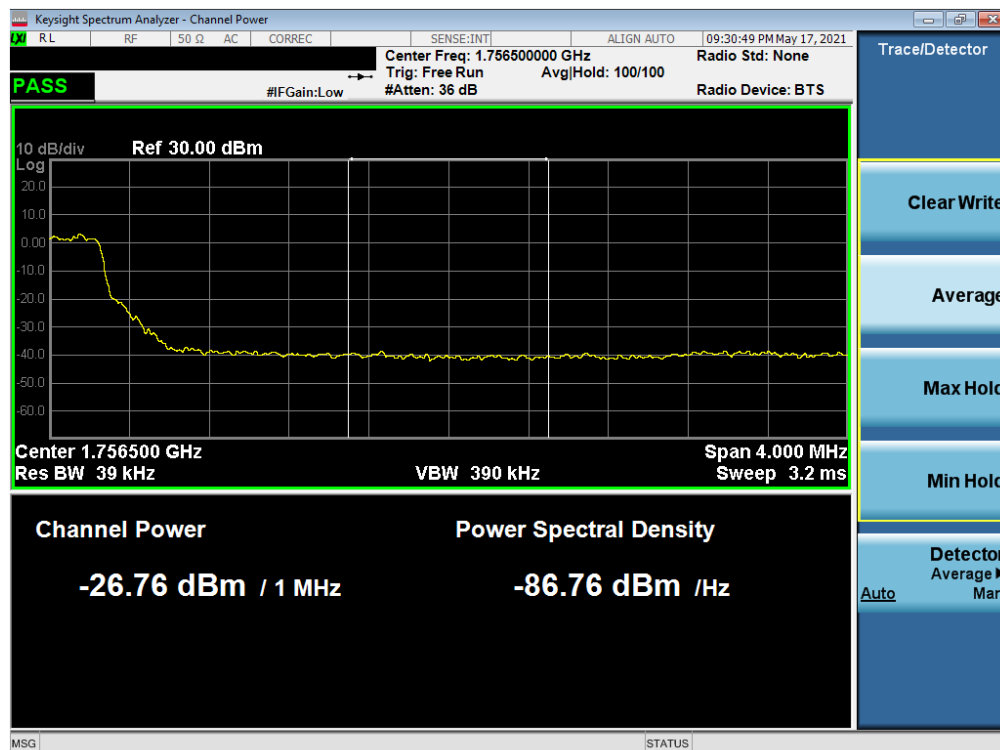


Plot 7-79. Lower Extended Band Edge Plot (LTE Band 4 - 5MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 60 of 111                    |

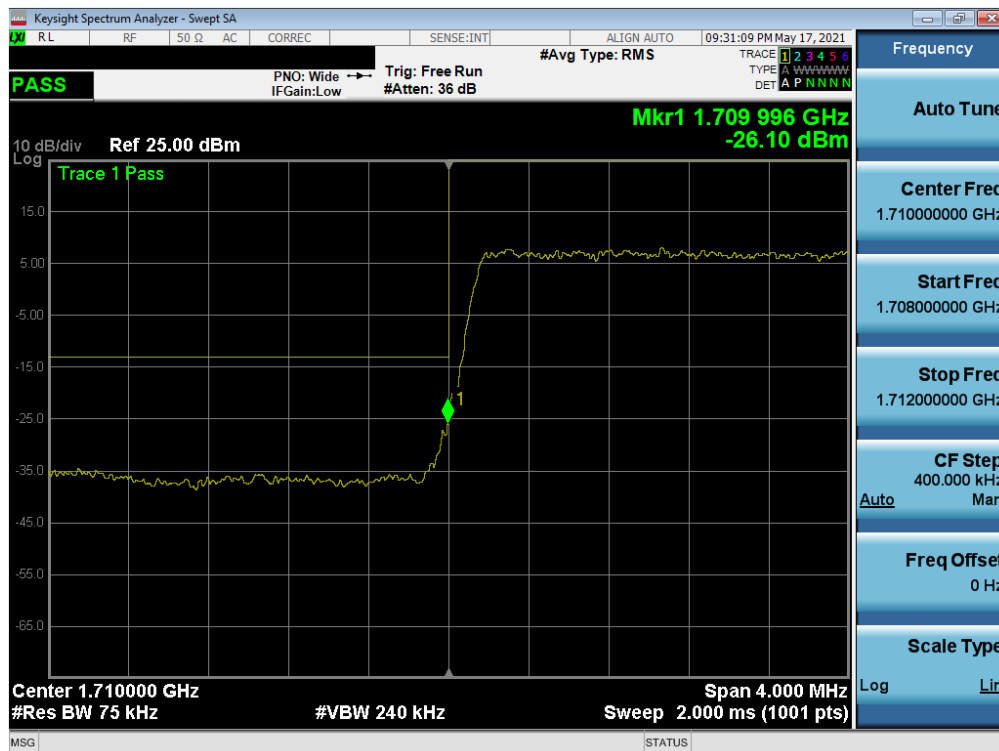


Plot 7-80. Upper Band Edge Plot (LTE Band 4 - 5MHz QPSK – Full RB)

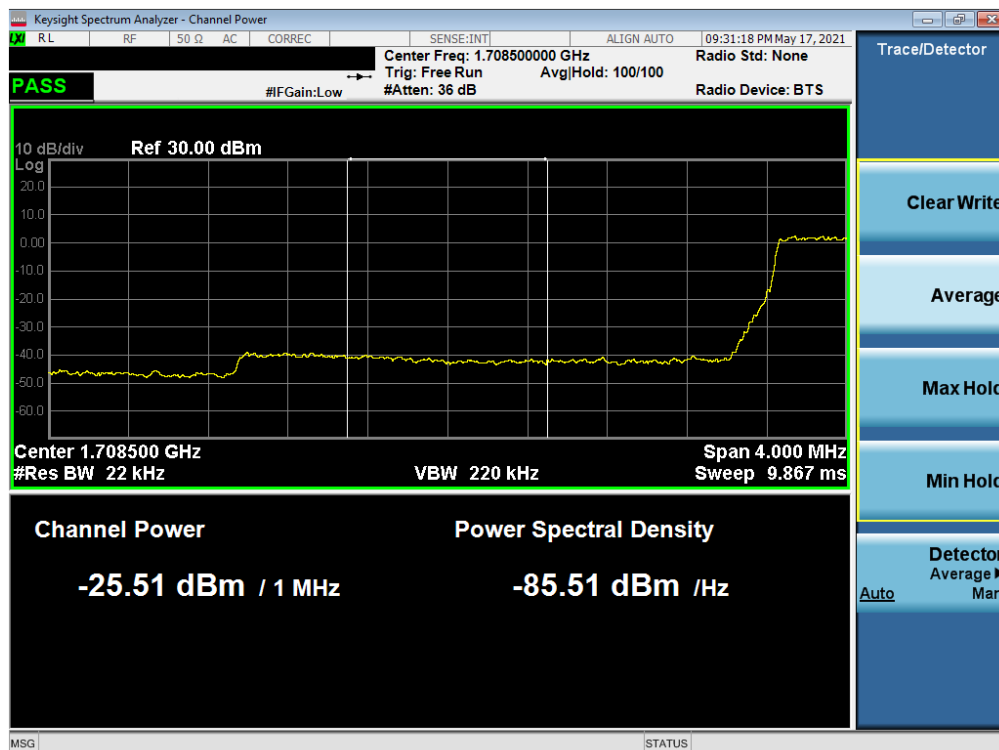


Plot 7-81. Upper Extended Band Edge Plot (LTE Band 4 - 5MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 61 of 111                    |



Plot 7-82. Lower Band Edge Plot (LTE Band 4 - 3MHz QPSK – Full RB)

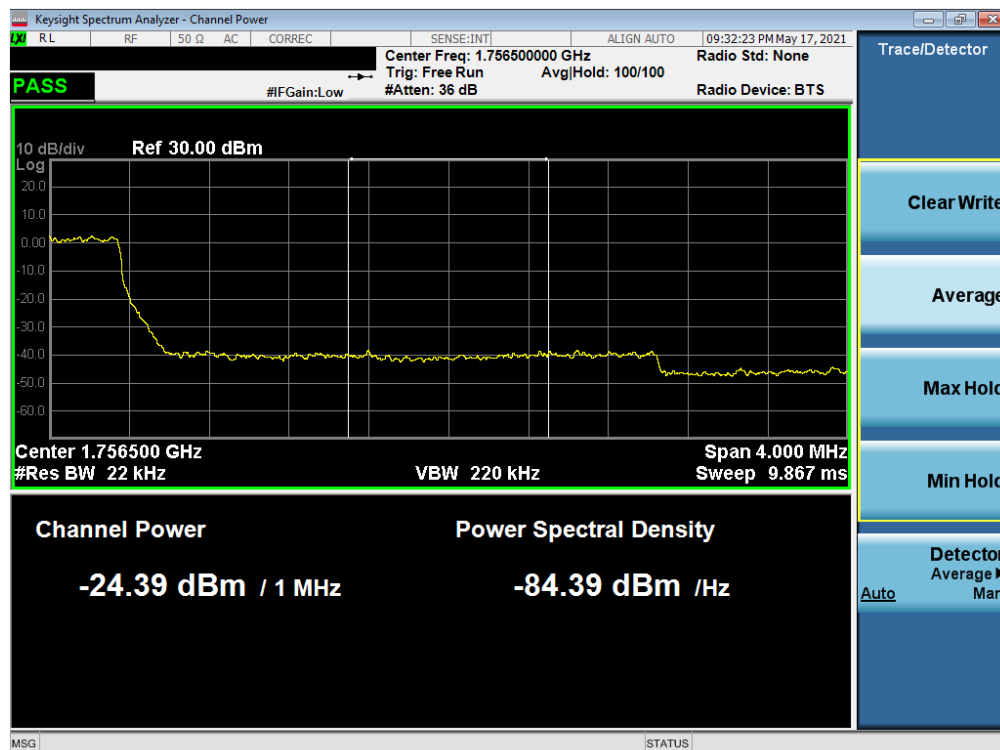


Plot 7-83. Lower Extended Band Edge Plot (LTE Band 4 - 3MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 62 of 111                    |

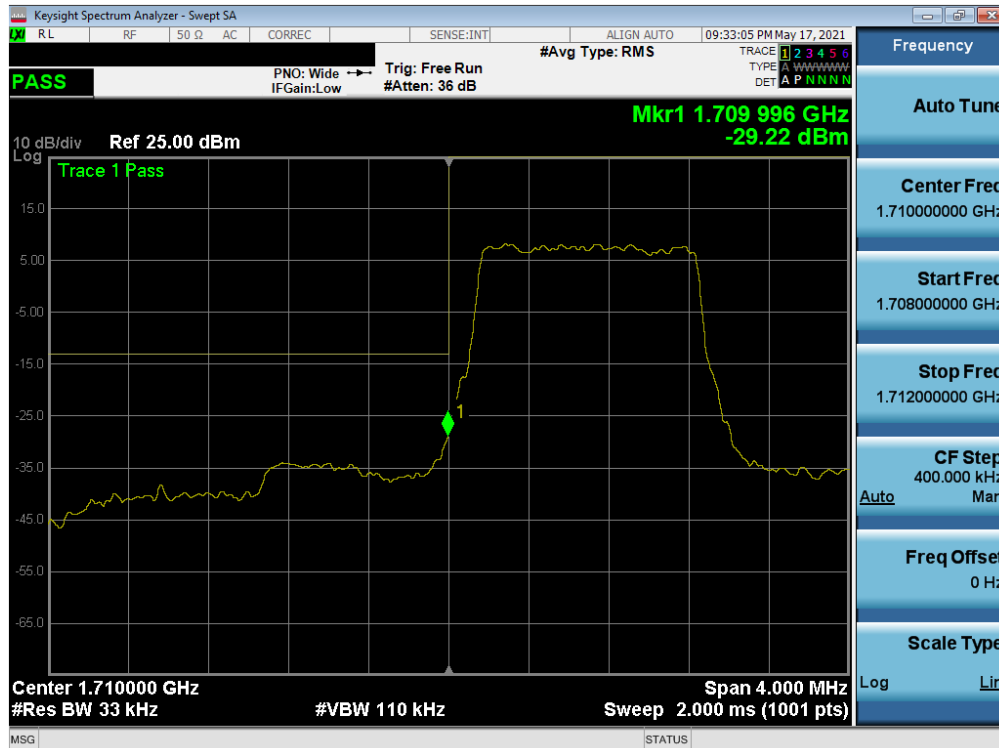


Plot 7-84. Upper Band Edge Plot (LTE Band 4 - 3MHz QPSK – Full RB)

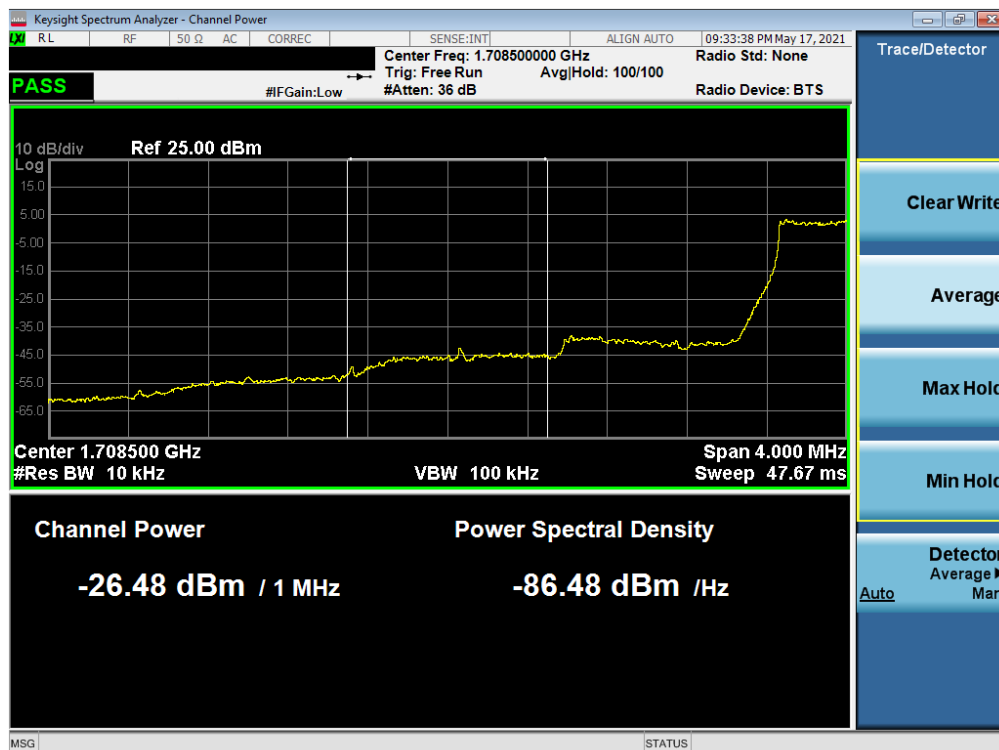


Plot 7-85. Upper Extended Band Edge Plot (LTE Band 4 - 3MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 63 of 111                    |



Plot 7-86. Lower Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB)

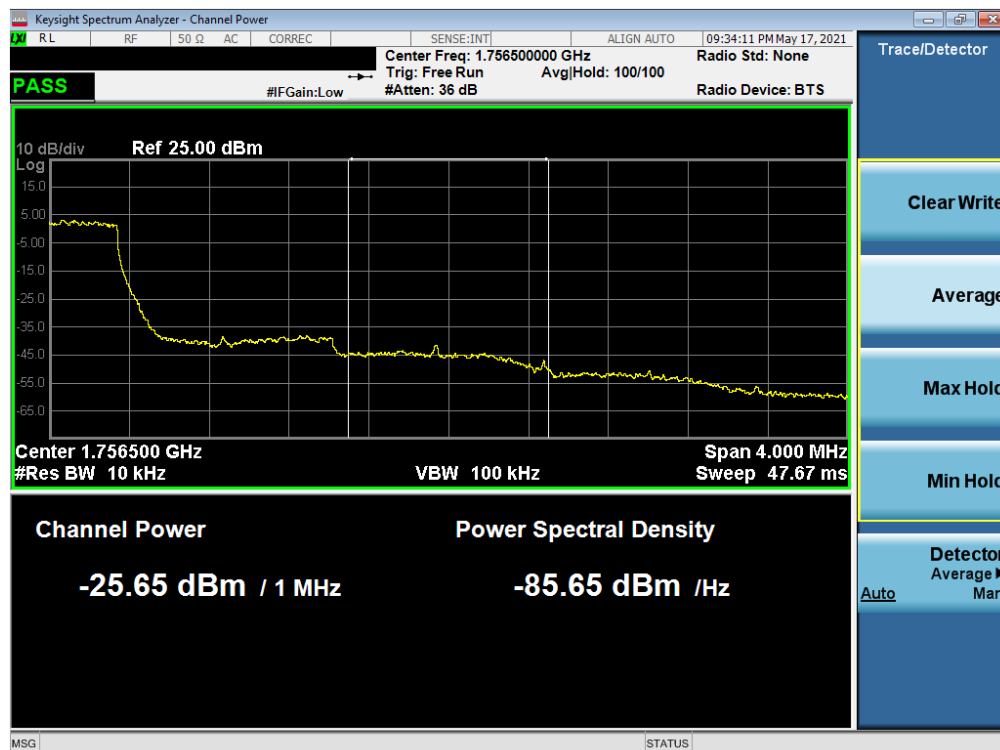


Plot 7-87. Lower Extended Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 64 of 111                    |



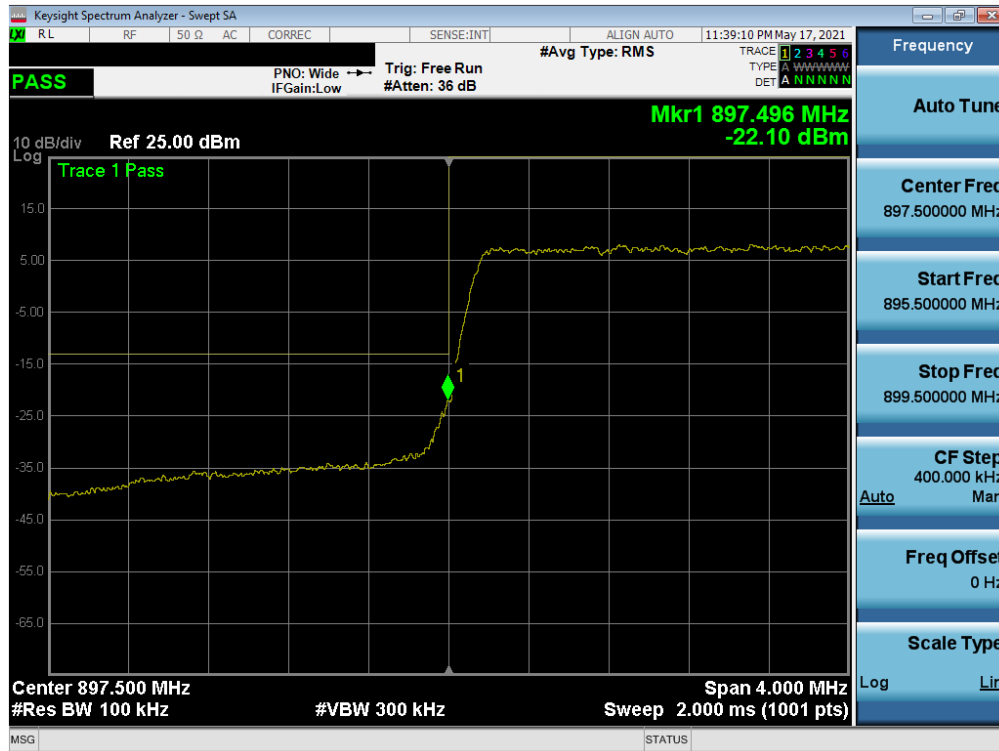
Plot 7-88. Upper Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB)



Plot 7-89. Upper Extended Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 65 of 111                    |

## LTE Band 8

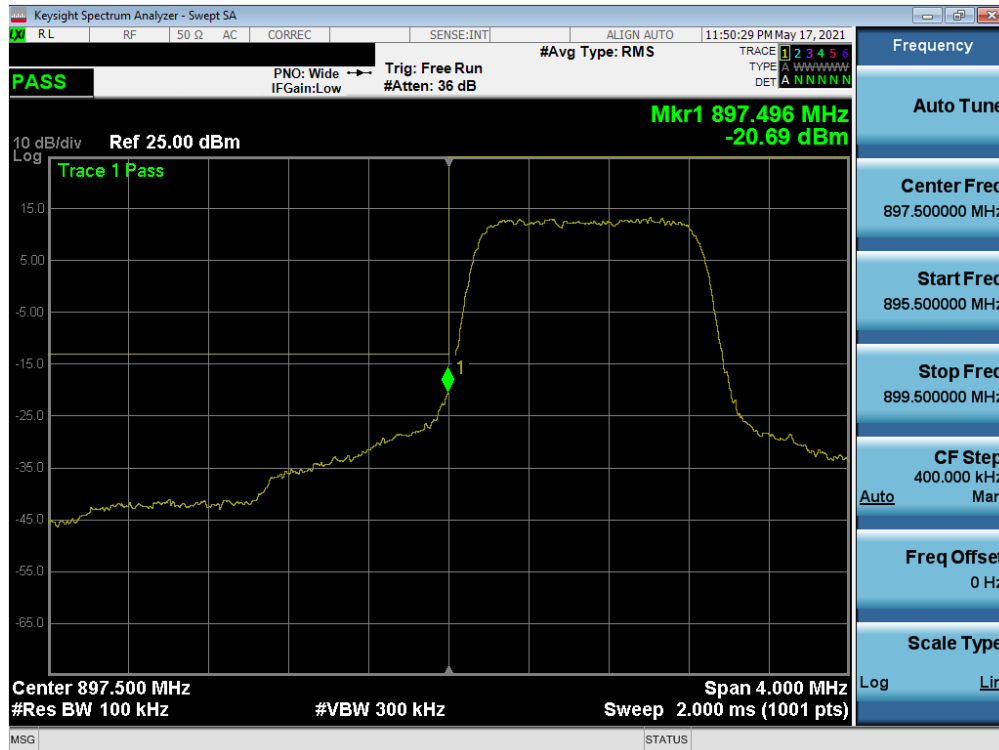


Plot 7-90. Lower Band Edge Plot (LTE BAND 8 - 3MHz QPSK – Full RB)



Plot 7-91. Upper Band Edge Plot (LTE BAND 8 - 3MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 66 of 111                    |



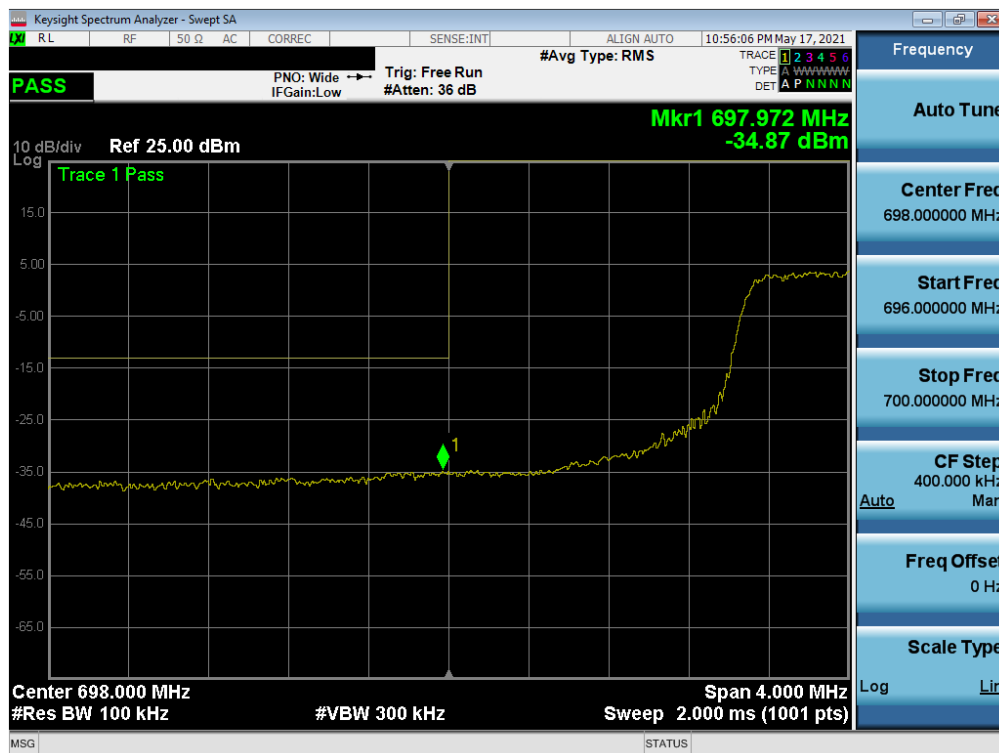
Plot 7-92. Lower Band Edge Plot (LTE BAND 8 – 1.4MHz QPSK – Full RB)



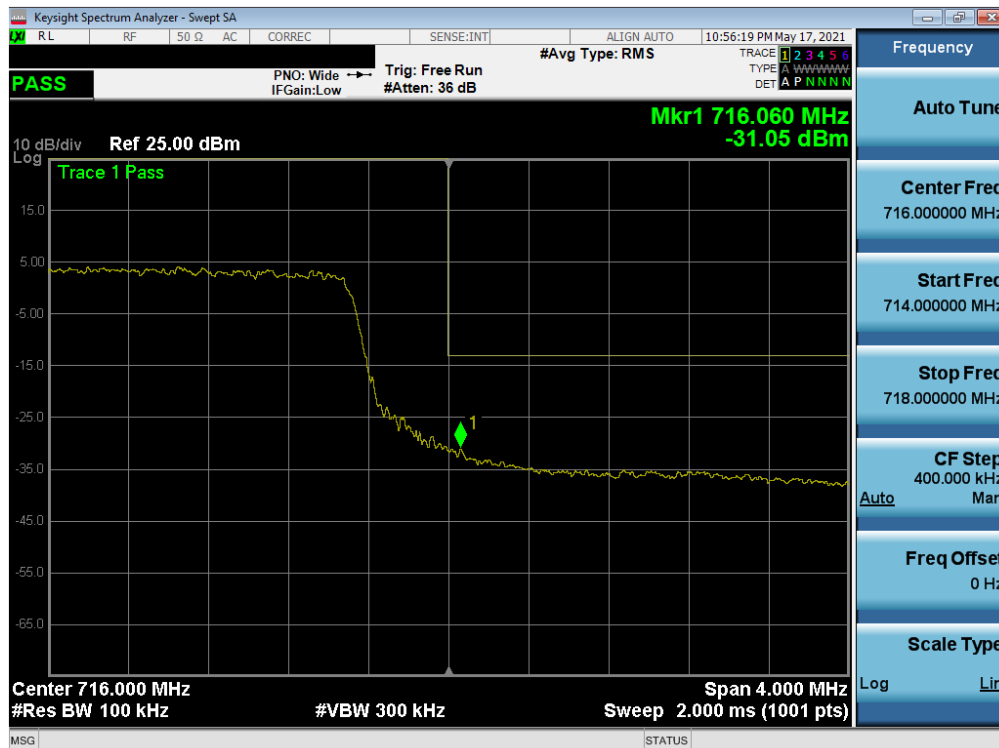
Plot 7-93. Upper Band Edge Plot (LTE BAND 8 – 1.4MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 67 of 111                    |

## LTE Band 12

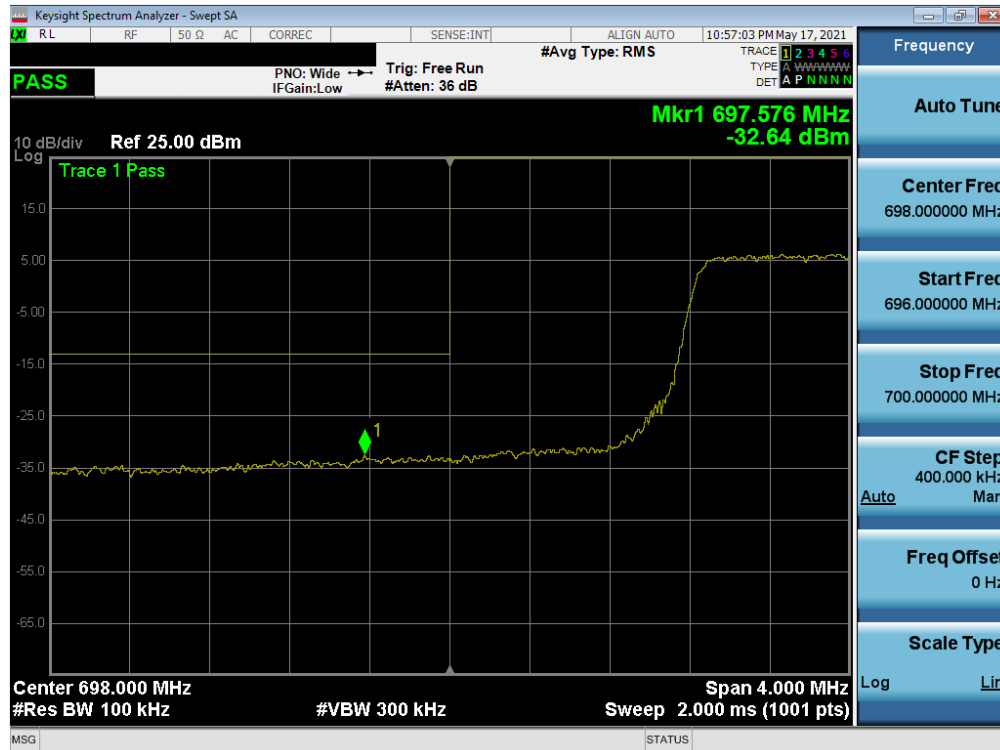


Plot 7-94. Lower Band Edge Plot (LTE Band 12 - 10MHz QPSK – Full RB)



Plot 7-95. Upper Band Edge Plot (LTE Band 12 - 10MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 68 of 111                    |

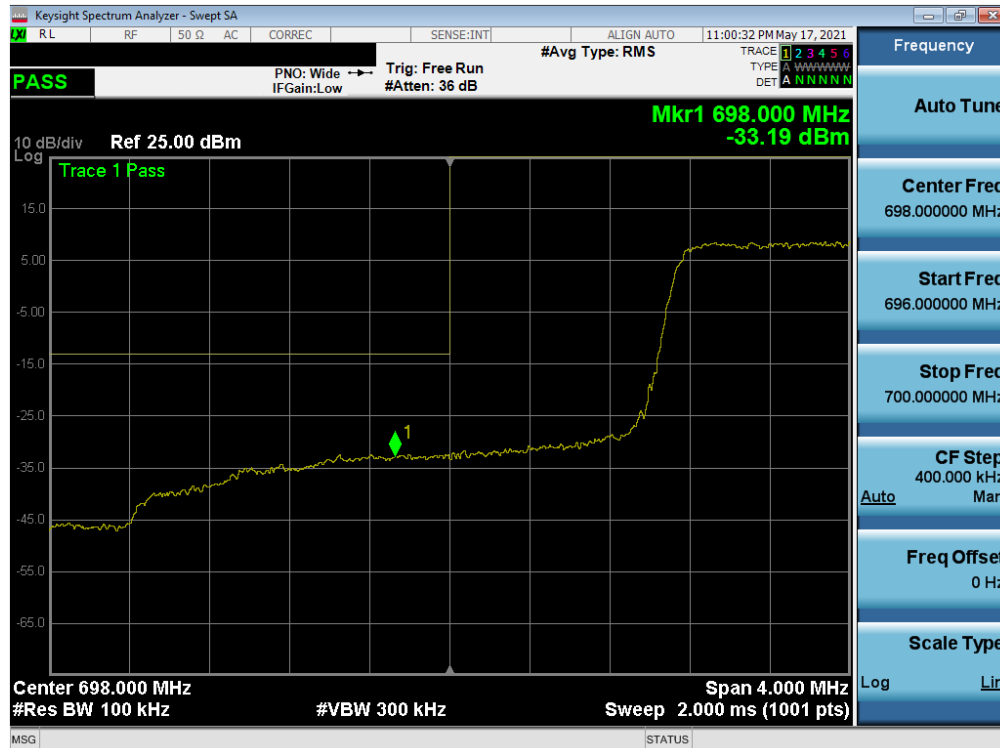


Plot 7-96. Lower Band Edge Plot (LTE Band 12 - 5MHz QPSK - Full RB)



Plot 7-97. Upper Band Edge Plot (LTE Band 12 - 5MHz QPSK - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 69 of 111                    |

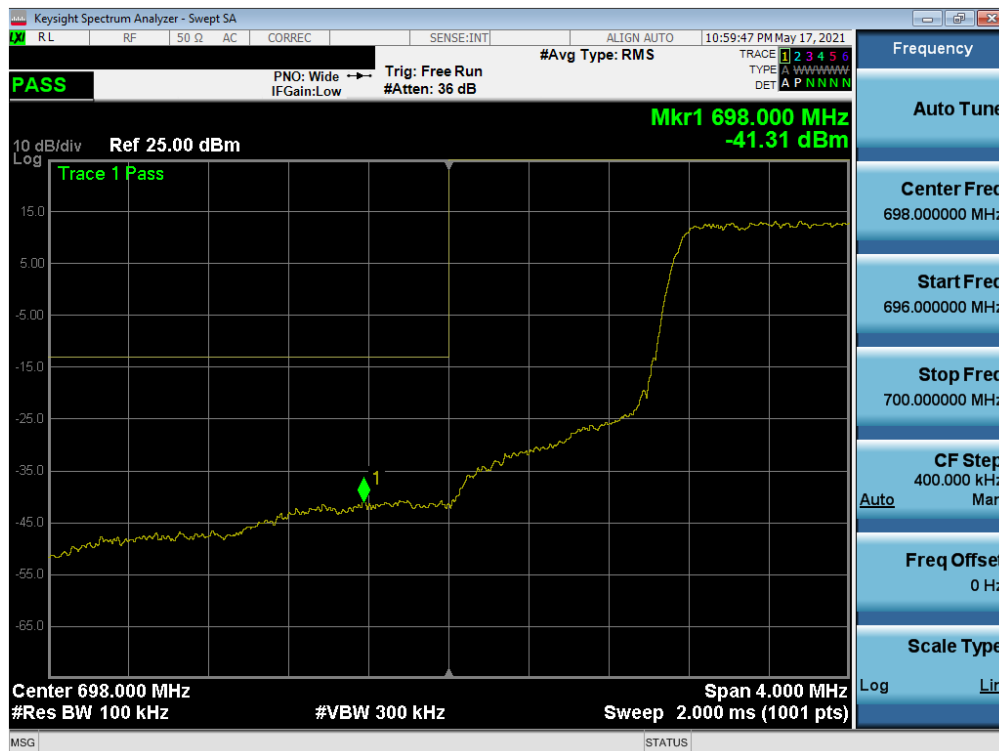


Plot 7-98. Lower Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB)



Plot 7-99. Upper Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 70 of 111                    |



Plot 7-100. Lower Band Edge Plot (LTE Band 12 - 1.4MHz QPSK - Full RB)



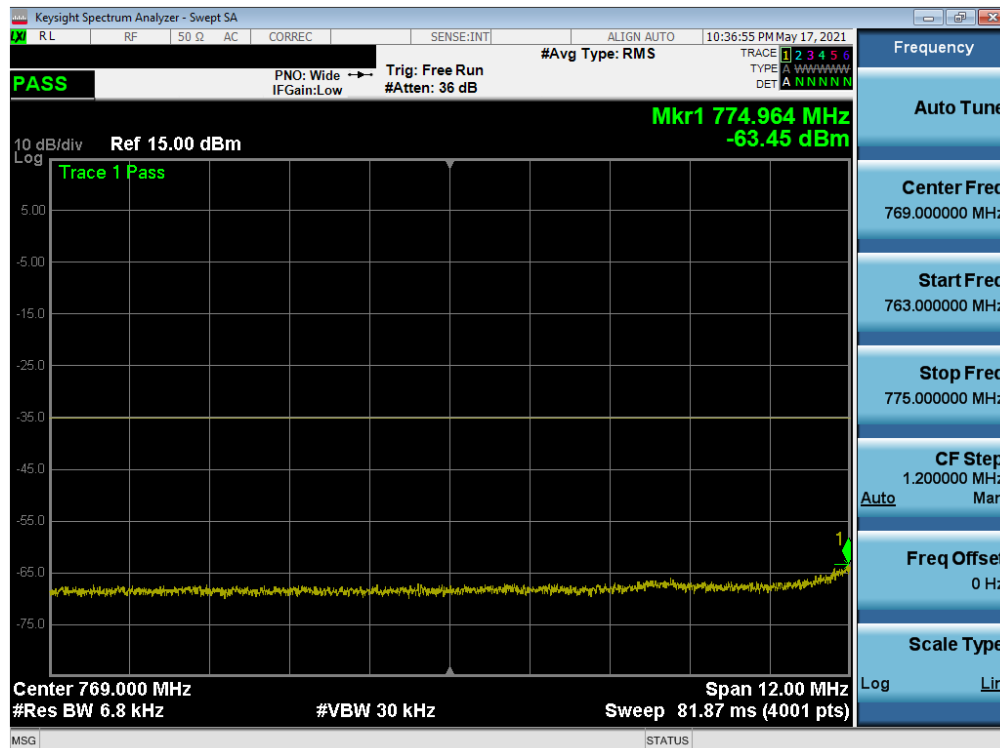
Plot 7-101. Upper Band Edge Plot (LTE Band 12 - 1.4MHz QPSK - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 71 of 111                    |

## LTE Band 13



Plot 7-102. Lower Band Edge Plot (LTE Band 13 - 10MHz QPSK – Full RB)



Plot 7-103. Lower Emission Mask Plot (LTE Band 13 - 10MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 72 of 111                    |

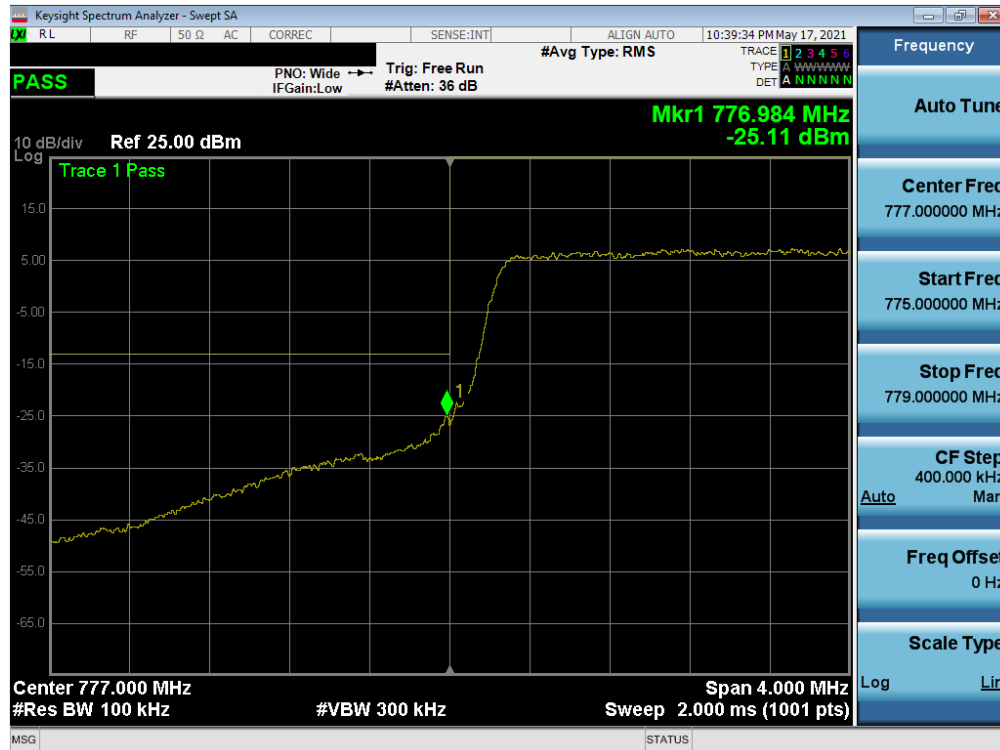


Plot 7-104. Upper Band Edge Plot (LTE Band 13 - 10MHz QPSK – Full RB)

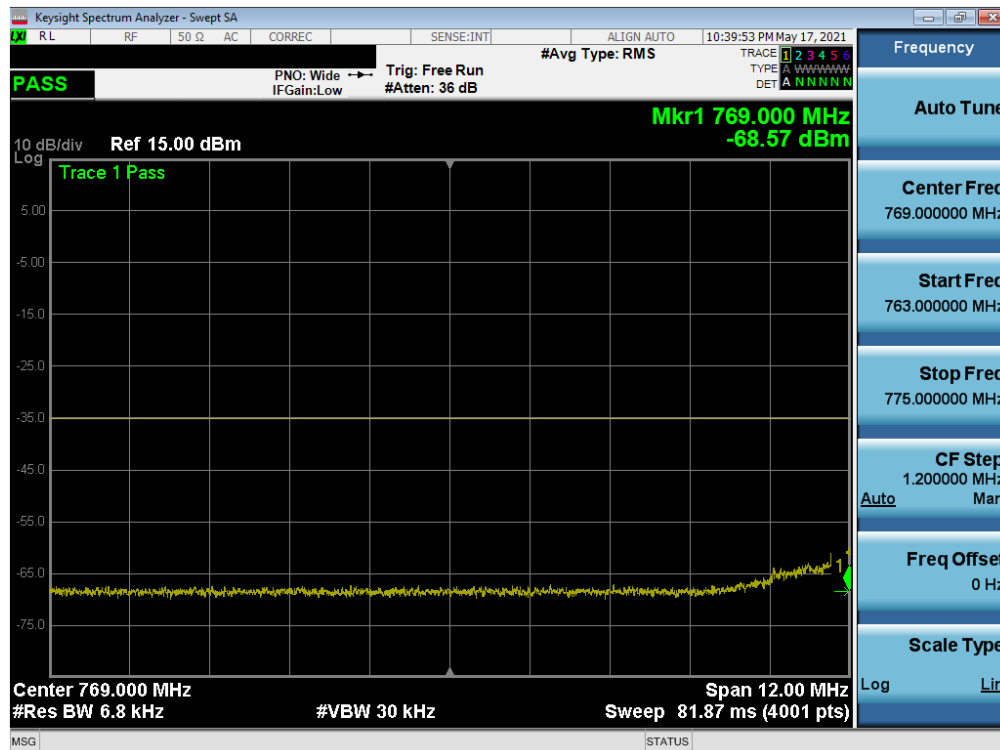


Plot 7-105. Upper Emission Mask Plot (LTE Band 13 - 10MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 73 of 111                    |



Plot 7-106. Lower Band Edge Plot (LTE Band 13 - 5MHz QPSK – Full RB)

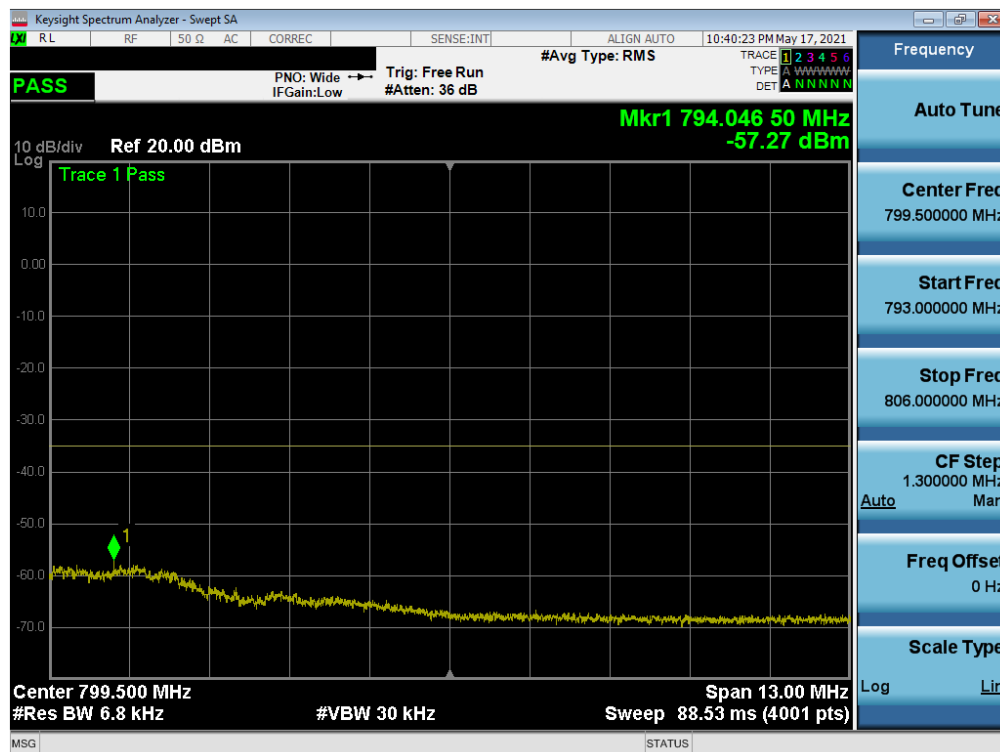


Plot 7-107. Lower Emission Mask Plot (LTE Band 13 - 5MHz QPSK – Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 74 of 111                    |



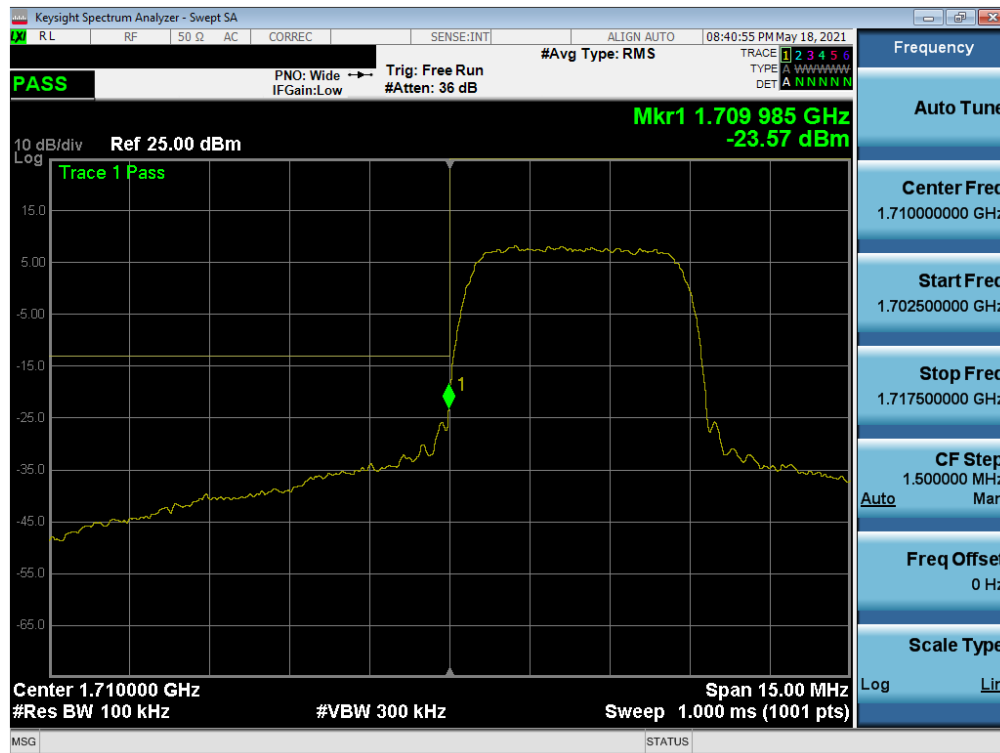
Plot 7-108. Upper Band Edge Plot (LTE Band 13 - 5MHz QPSK - Full RB)



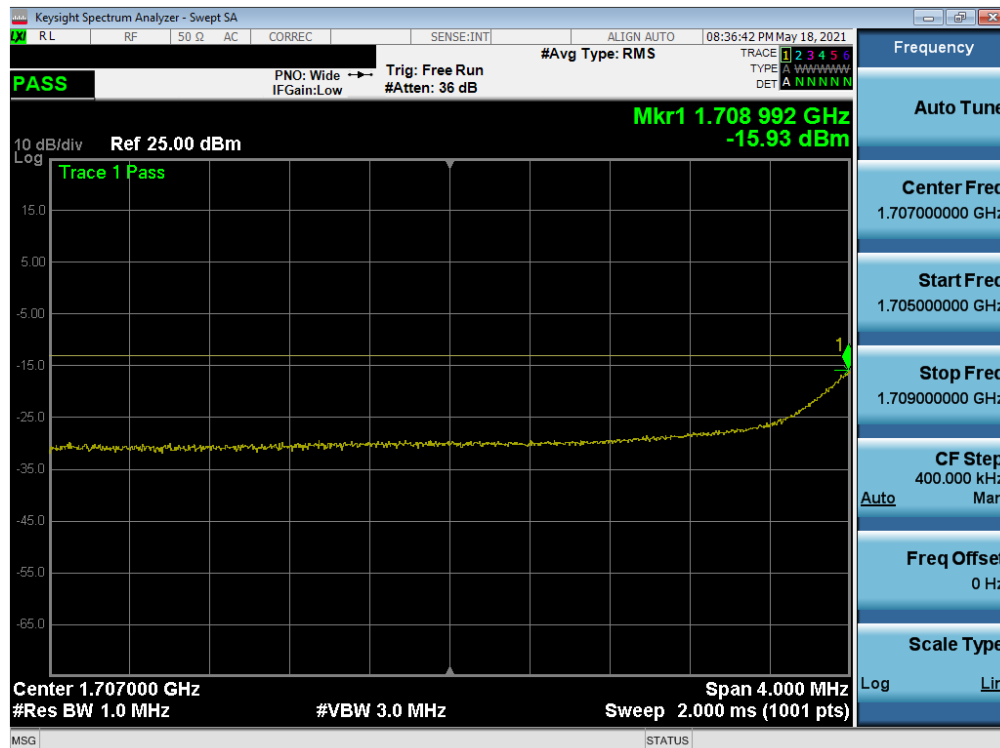
Plot 7-109. Upper Emission Mask Plot (LTE Band 13 - 5MHz QPSK - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 75 of 111                    |

## WCDMA AWS



Plot 7-110. Lower Band Edge Plot (WCDMA AWS – Ch. 1312)

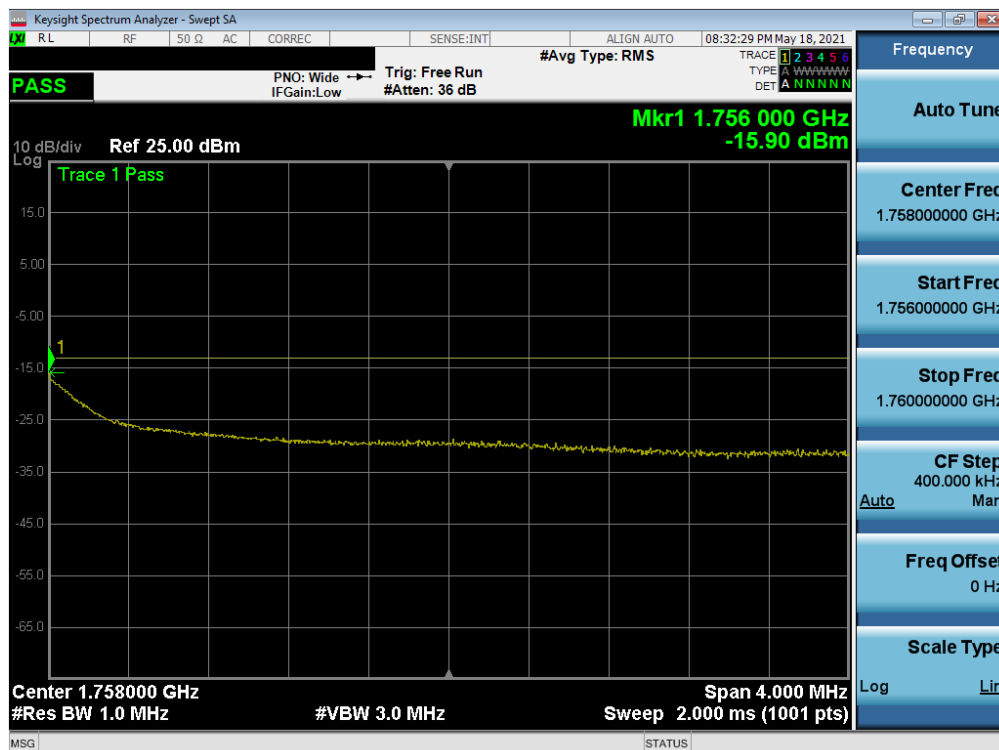


Plot 7-111. Lower Extended Band Edge Plot (WCDMA AWS – Ch. 1312)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 76 of 111                    |



Plot 7-112. Upper Band Edge Plot (WCDMA AWS – Ch. 1513)



Plot 7-113. Upper Extended Band Edge Plot (WCDMA AWS – Ch. 1513)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 77 of 111                    |

## 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.

### Test Procedure Used

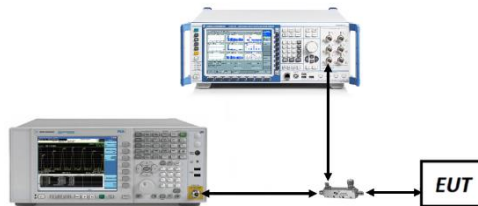
KDB 971168 D01 v03r01 – Section 5.7.1

### 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.



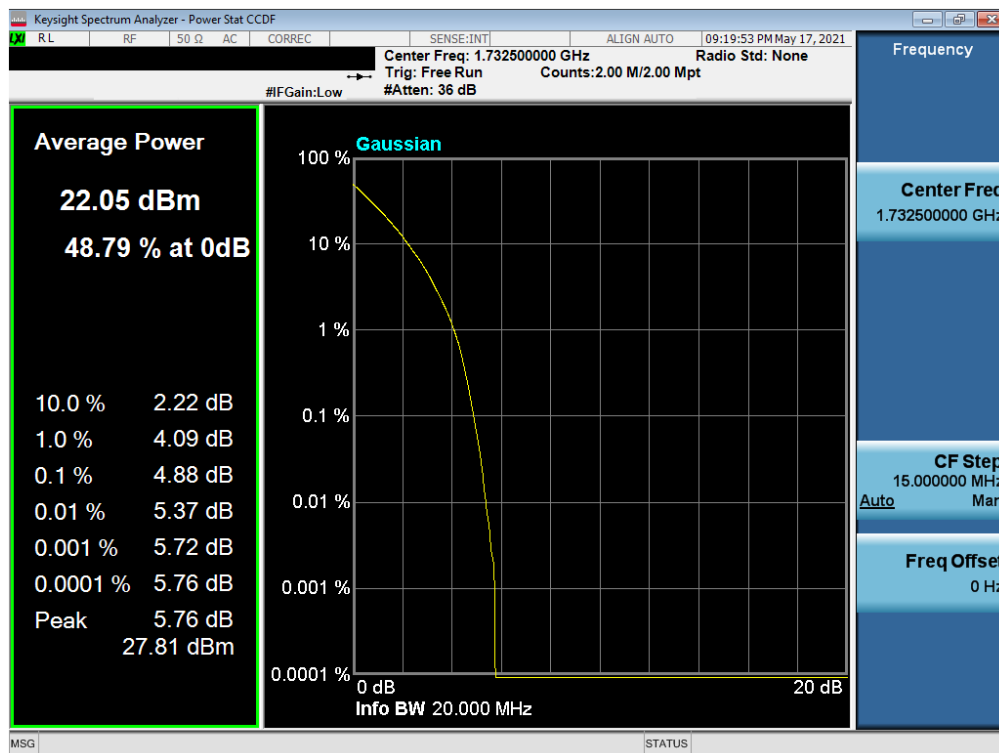
**Figure 7-5. Test Instrument & Measurement Setup**

### Test Notes

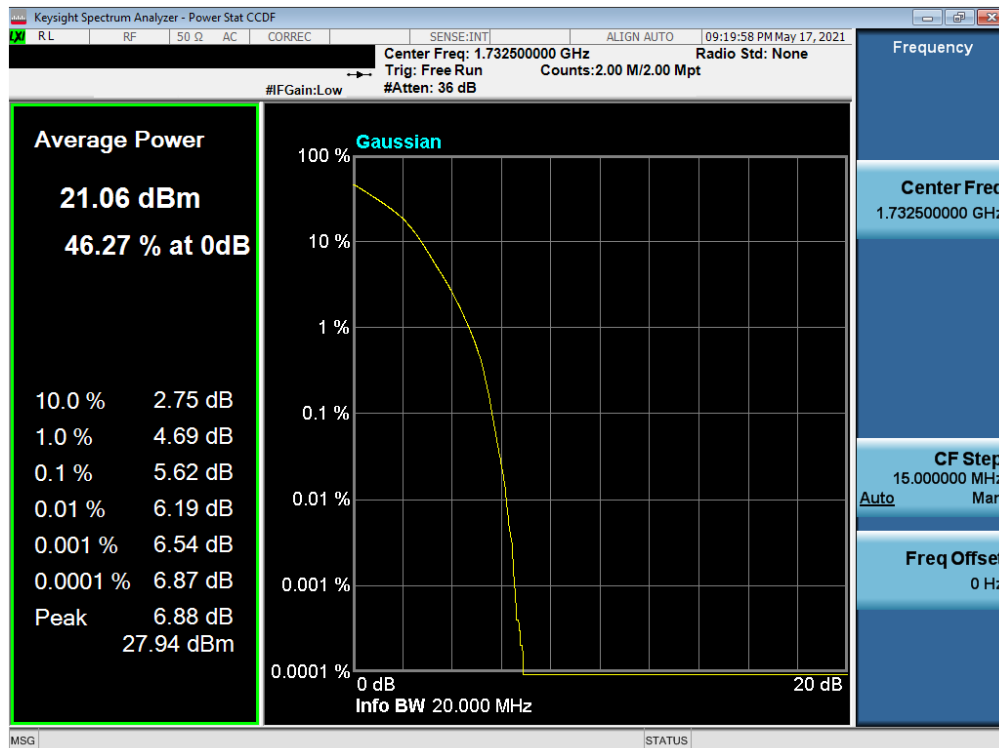
None.

|                                                |                                              |                                          |                                          |
|------------------------------------------------|----------------------------------------------|------------------------------------------|------------------------------------------|
| FCC ID: RI7LE910CXWWX                          | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b>        | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2106040065-06.RI7 | <b>Test Dates:</b><br>5/12- 6/1/2021         | <b>EUT Type:</b><br>Data Terminal Module | Page 78 of 111                           |

## LTE Band 4

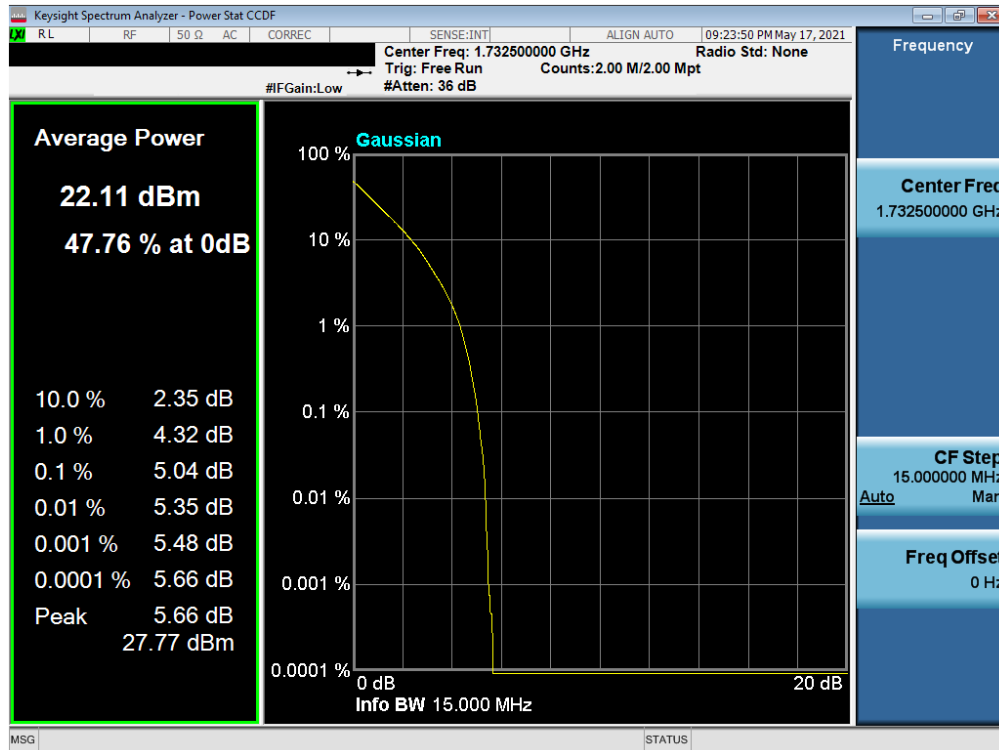


Plot 7-114. PAR Plot (LTE Band 4 - 20MHz QPSK - Full RB)

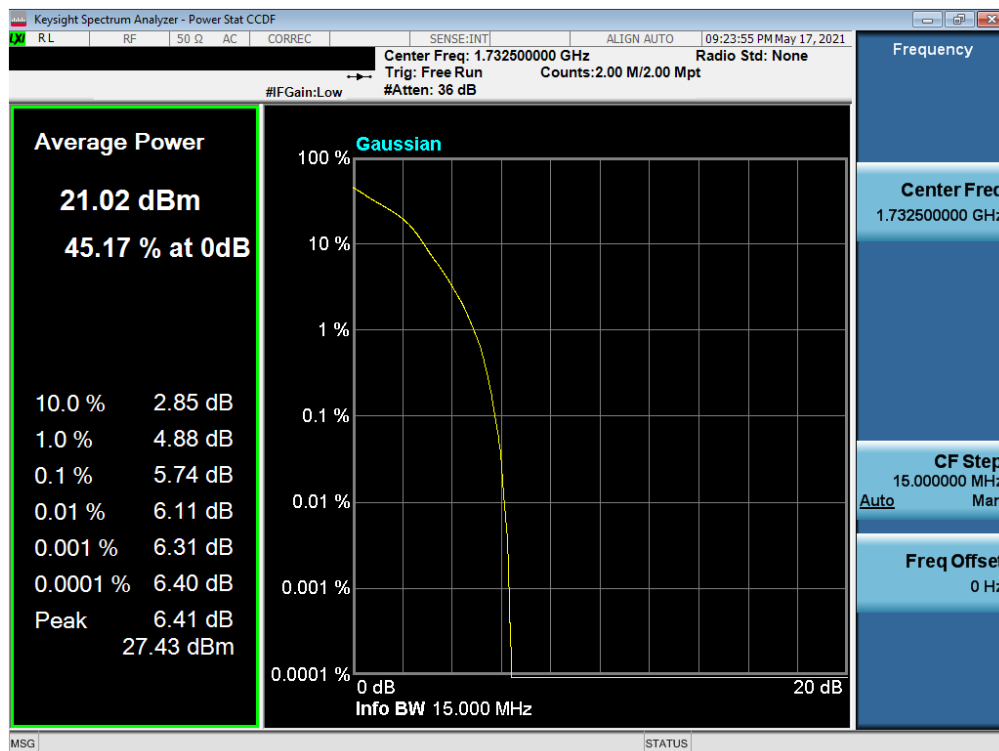


Plot 7-115. PAR Plot (LTE Band 4 - 20MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 79 of 111                    |

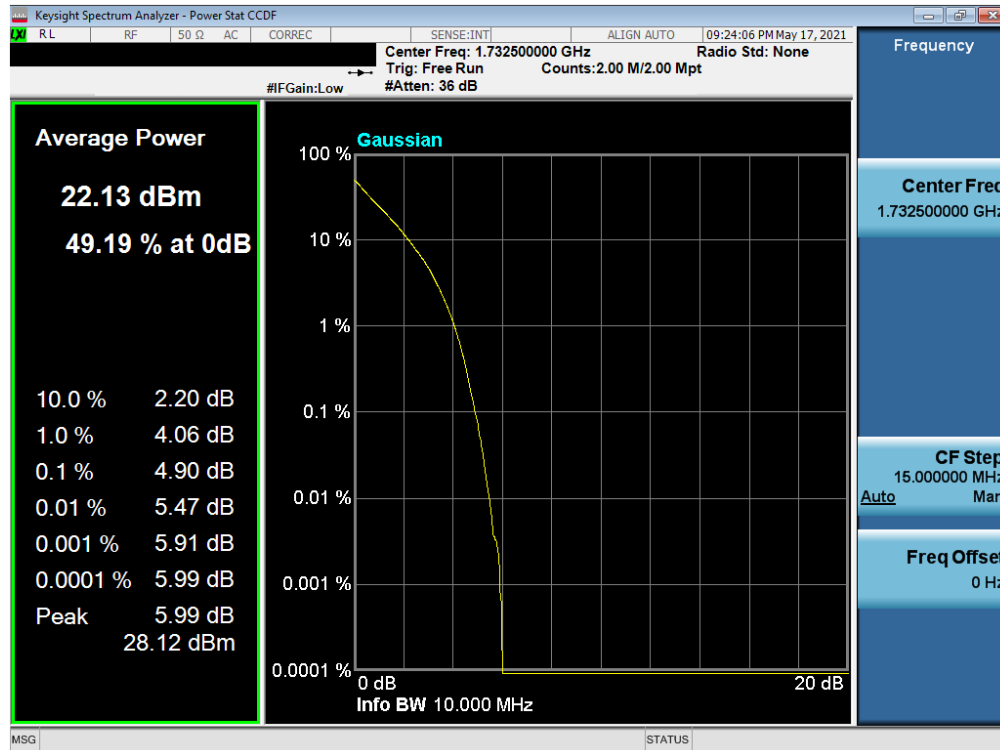


Plot 7-116. PAR Plot (LTE Band 4 - 15MHz QPSK - Full RB)

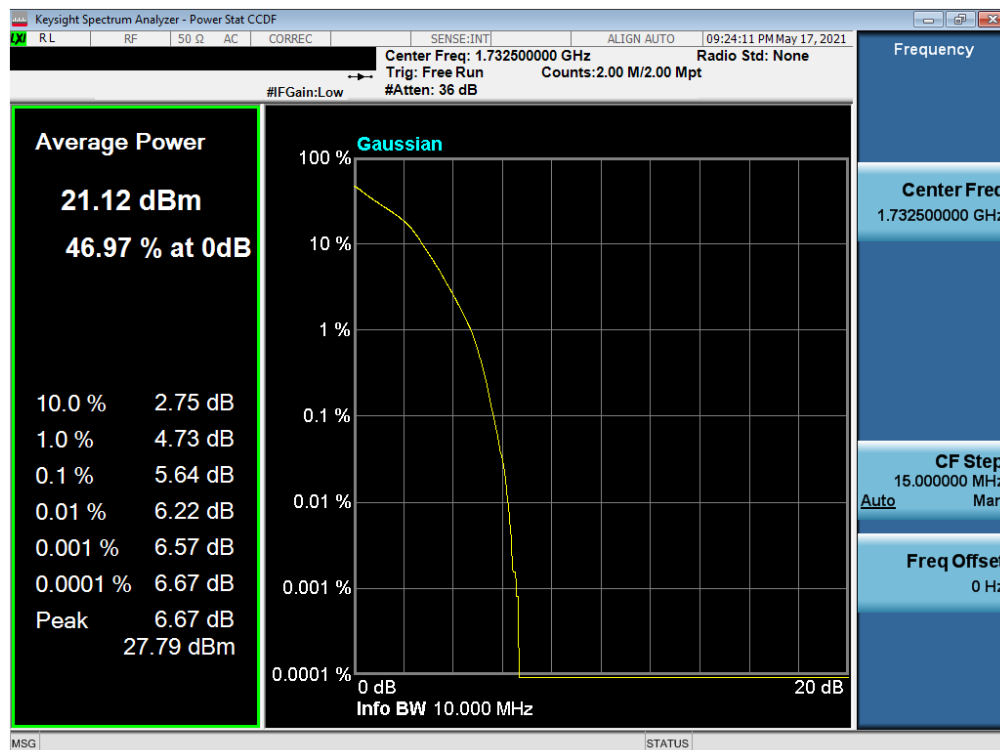


Plot 7-117. PAR Plot (LTE Band 4 - 15MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 80 of 111                    |

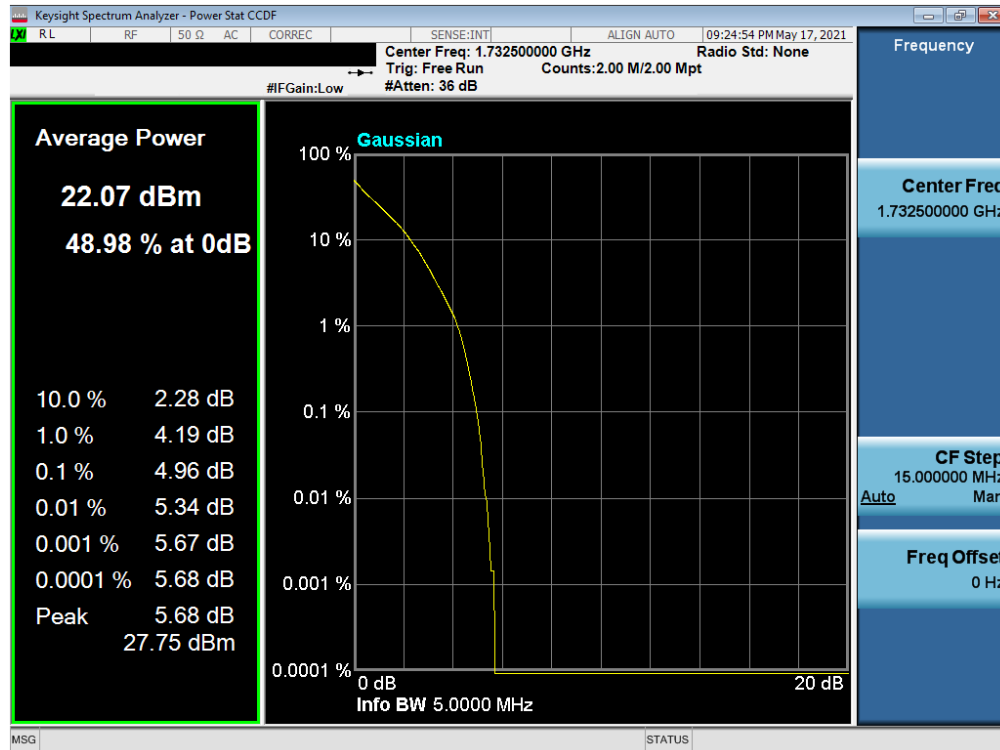


Plot 7-118. PAR Plot (LTE Band 4 - 10MHz QPSK - Full RB)

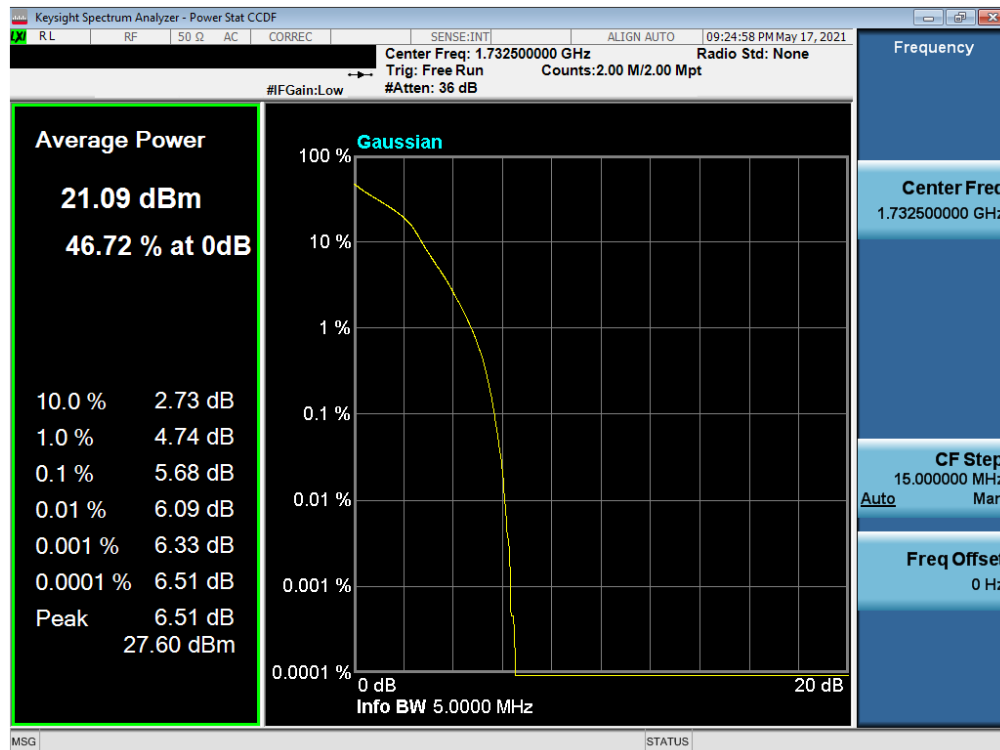


Plot 7-119. PAR Plot (LTE Band 4 - 10MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 81 of 111                    |

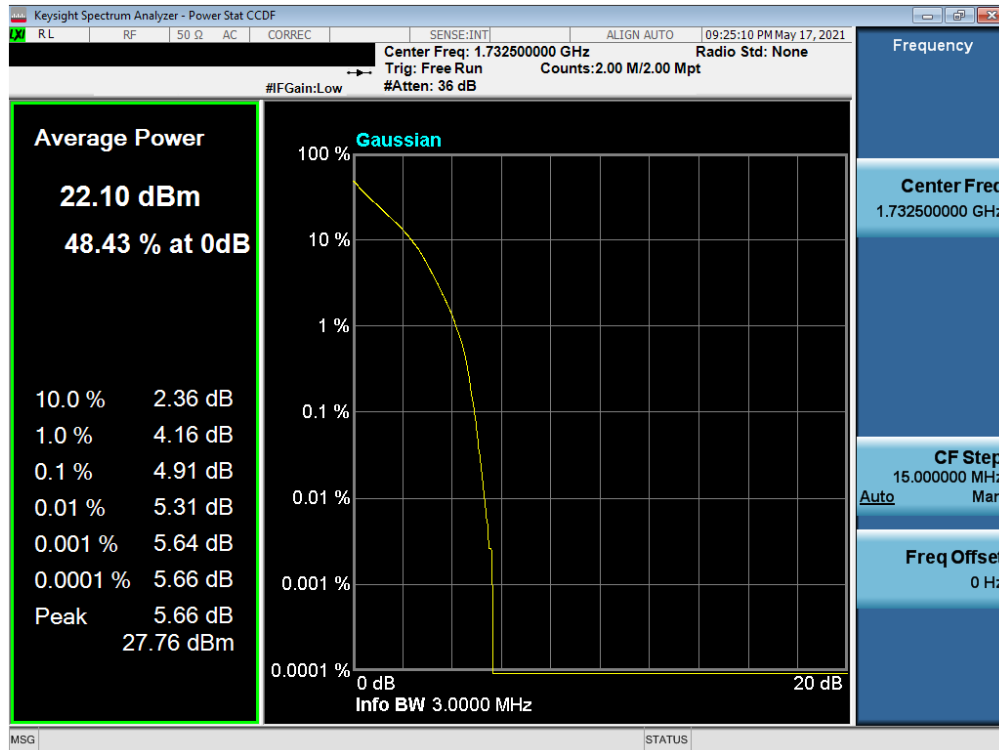


Plot 7-120. PAR Plot (LTE Band 4 - 5MHz QPSK - Full RB)

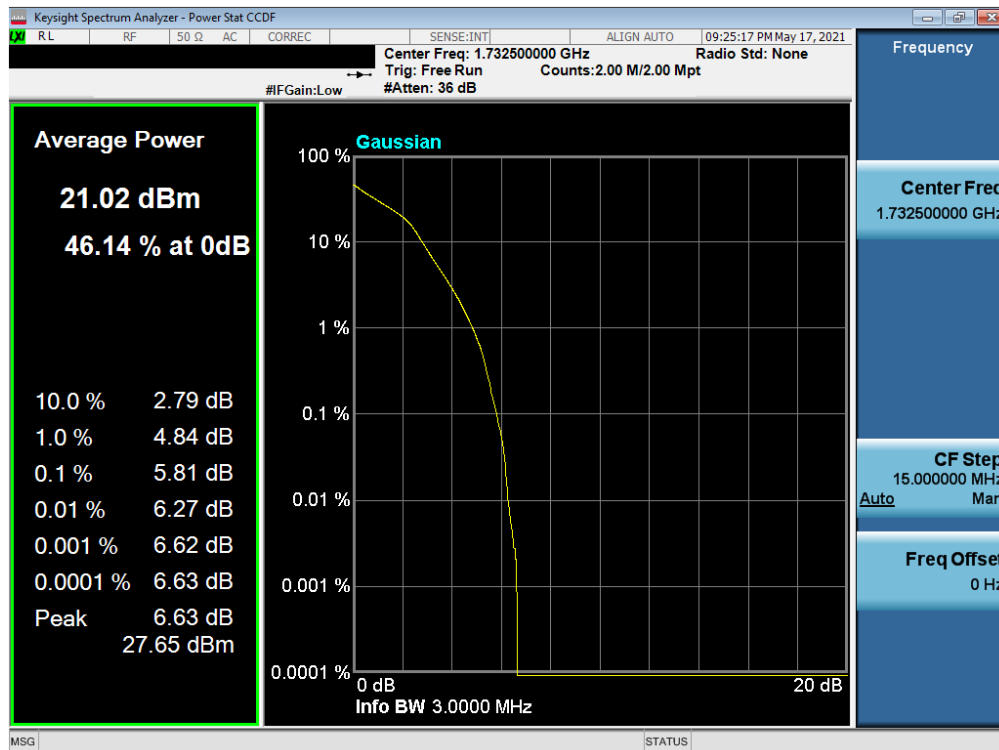


Plot 7-121. PAR Plot (LTE Band 4 - 5MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 82 of 111                    |

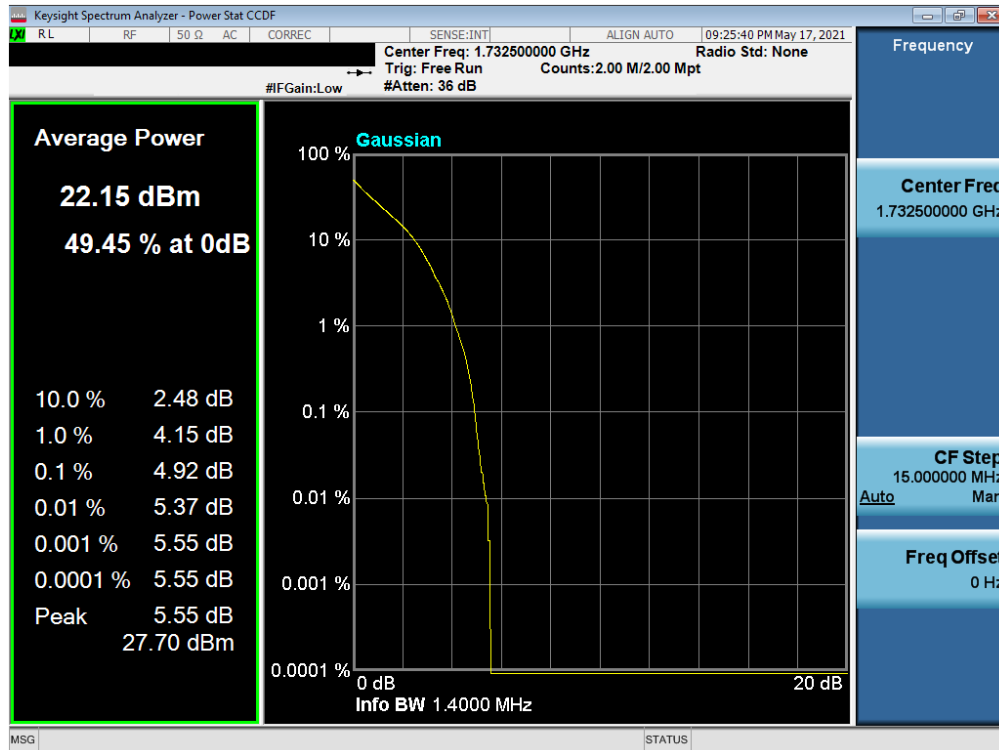


Plot 7-122. PAR Plot (LTE Band 4 - 3MHz QPSK - Full RB)

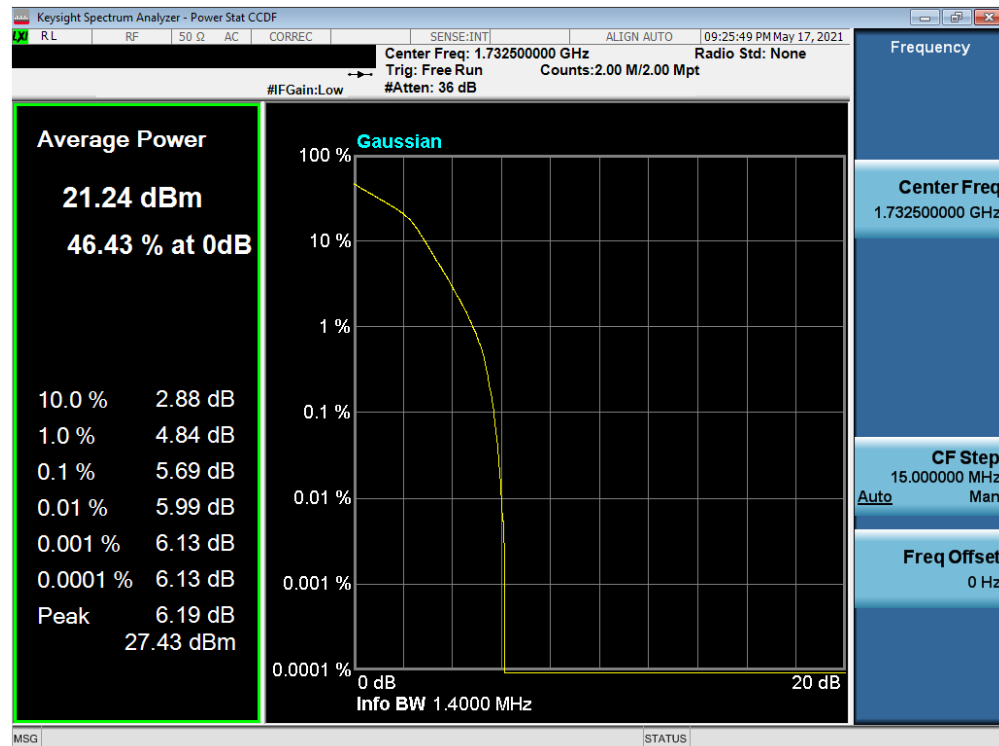


Plot 7-123. PAR Plot (LTE Band 4 - 3MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 83 of 111                    |



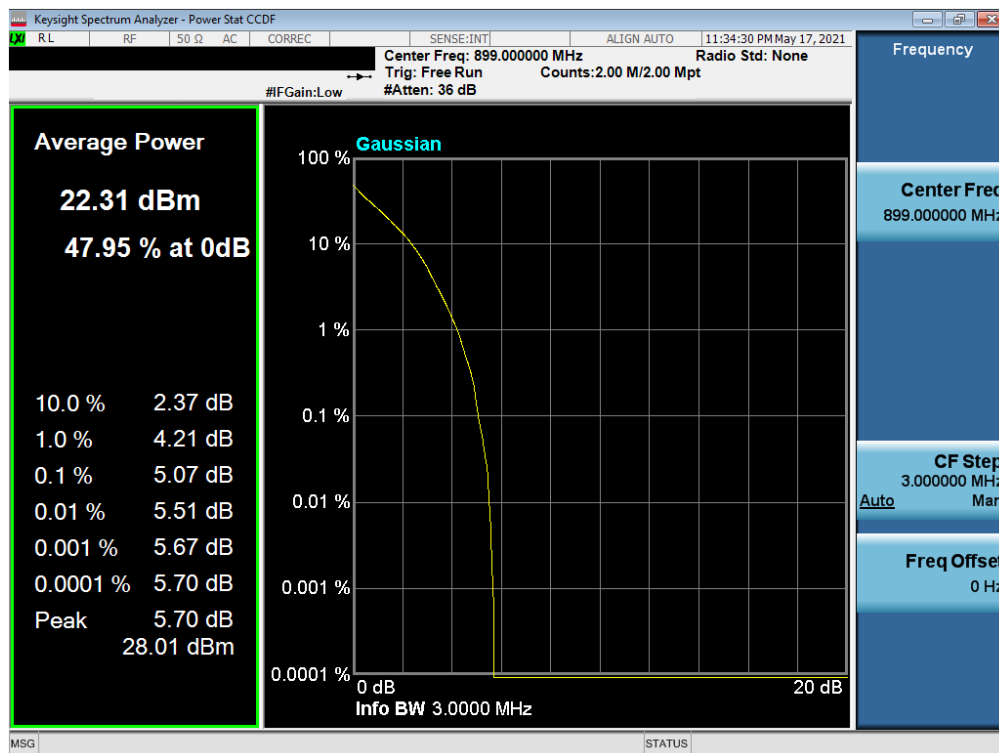
Plot 7-124. PAR Plot (LTE Band 4 - 1.4MHz QPSK - Full RB)



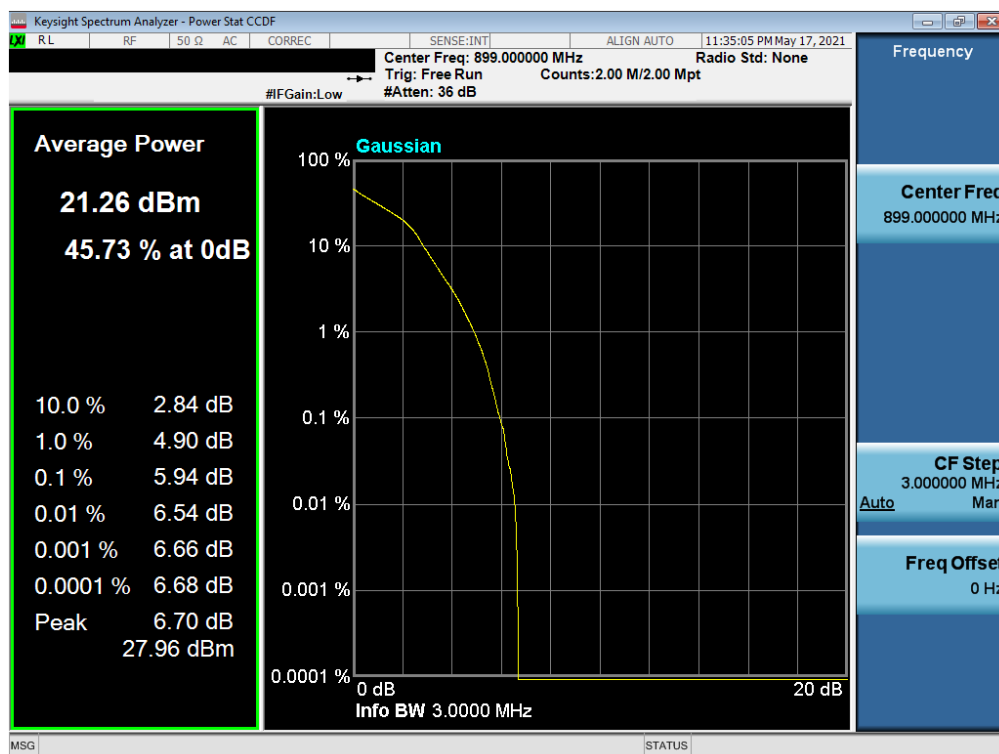
Plot 7-125. PAR Plot (LTE Band 4 - 1.4MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 84 of 111                    |

## LTE Band 8

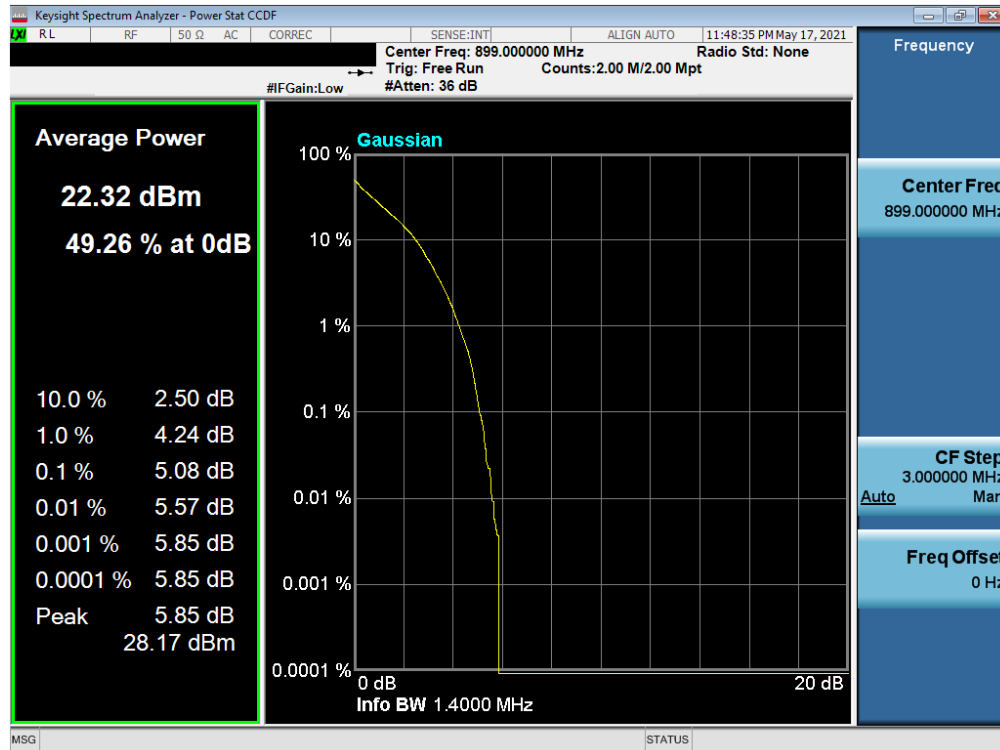


Plot 7-126. PAR Plot (LTE BAND 8 - 3MHz QPSK - Full RB)

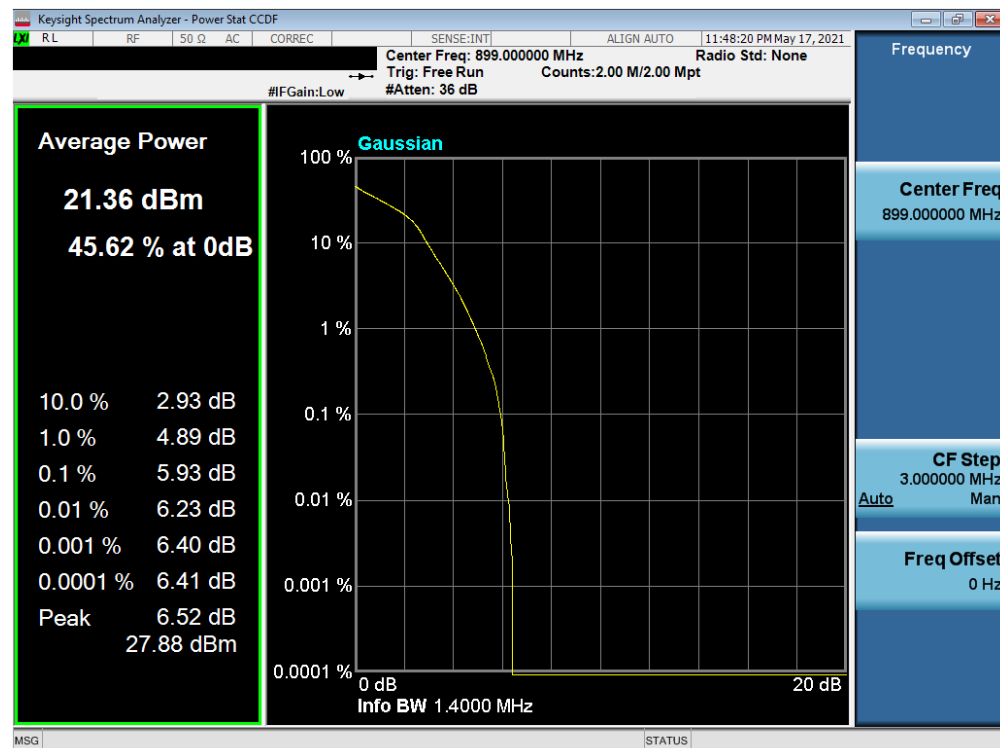


Plot 7-127. PAR Plot (LTE BAND 8 - 3MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | PART 27 MEASUREMENT REPORT        | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.RI7 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 85 of 111                    |



Plot 7-128. PAR Plot (LTE BAND 8 - 1.4MHz QPSK - Full RB)



Plot 7-129. PAR Plot (LTE BAND 8 - 1.4MHz 16-QAM - Full RB)

|                                         |                                              |                                   |                                   |
|-----------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| FCC ID: RI7LE910CXWWX                   | <b>PCTEST</b><br>Proud to be part of element | <b>PART 27 MEASUREMENT REPORT</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2106040065-06.R17 | Test Dates:<br>5/12- 6/1/2021                | EUT Type:<br>Data Terminal Module | Page 86 of 111                    |