



PART 24 / RSS-133 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.:

1M2106040065-05.R17

FCC ID:

RI7LE910CXWWX

IC:

5131A-LE910CXWWX

Applicant Name:

Telit Communications S.p.A

Application Type:

Certification

Model/HVIN:

LE910C4-WWX

Additional Model/HVIN (s):

LE910C1-WWX

EUT Type:

Data Terminal Module

FCC Classification:

PCS Licensed Transmitter (PCB)

FCC Rule Part:

24

ISED Specification:

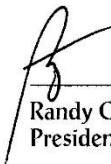
RSS-133 Issue 6 Amendment 1, SRSP-510 Issue 5

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.

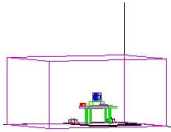

 Randy Ortanez
 President


FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.R17	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 1 of 86

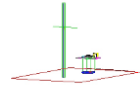
TABLE OF CONTENTS

1.0	INTRODUCTION	4
1.1	Scope	4
1.2	PCTEST Test Location.....	4
1.3	Test Facility / Accreditations.....	4
2.0	PRODUCT INFORMATION.....	5
2.1	Equipment Description	5
2.2	Device Capabilities.....	5
2.3	Test Configuration	5
2.4	Software and Firmware	5
2.5	EMI Suppression Device(s)/Modifications	5
3.0	DESCRIPTION OF TESTS	6
3.1	Evaluation Procedure	6
3.2	PCS - Base Frequency Blocks	6
3.3	PCS - Mobile Frequency Blocks.....	6
3.4	Radiated Power and Radiated Spurious Emissions	7
4.0	MEASUREMENT UNCERTAINTY	8
5.0	TEST EQUIPMENT CALIBRATION DATA	9
6.0	SAMPLE CALCULATIONS	10
7.0	TEST RESULTS.....	11
7.1	Summary.....	11
7.2	Transmitter Conducted Output Power/ Equivalent Isotropic Radiated Power	12
7.3	Occupied Bandwidth	15
7.4	Spurious and Harmonic Emissions at Antenna Terminal	24
7.5	Band Edge Emissions at Antenna Terminal	40
7.6	Peak-Average Ratio	63
7.7	Radiated Spurious Emissions Measurements	72
7.8	Frequency Stability / Temperature Variation	82
8.0	CONCLUSION.....	86

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX		 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module		Page 2 of 86



PART 24 / RSS-133 MEASUREMENT REPORT



Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
GSM/GPRS	-	GMSK	1850.2 - 1909.8	1.394	31.44	246KGXW
EDGE	-	8-PSK	1850.2 - 1909.8	0.580	27.63	243KG7W
WCDMA	-	Spread Spectrum	1852.4 - 1907.6	0.398	25.99	4M14F9W
LTE Band 25/2	20 MHz	QPSK	1860 - 1905	0.323	25.09	18M0G7D
		16QAM	1860 - 1905	0.265	24.24	18M0W7D
	15 MHz	QPSK	1857.5 - 1907.5	0.355	25.50	13M5G7D
		16QAM	1857.5 - 1907.5	0.282	24.51	13M5W7D
	10 MHz	QPSK	1855 - 1910	0.361	25.57	9M01G7D
		16QAM	1855 - 1910	0.277	24.43	9M00W7D
	5 MHz	QPSK	1852.5 - 1912.5	0.353	25.48	4M59G7D
		16QAM	1852.5 - 1912.5	0.284	24.53	4M54W7D
	3 MHz	QPSK	1851.5 - 1913.5	0.351	25.45	2M72G7D
		16QAM	1851.5 - 1913.5	0.275	24.39	2M72W7D
	1.4 MHz	QPSK	1850.7 - 1914.3	0.345	25.38	1M10G7D
		16QAM	1850.7 - 1914.3	0.269	24.30	1M11W7D

EUT Overview

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 3 of 86

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 IC: 5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 4 of 86

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 / IC:5131A-LE910CXWWX**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 24 & RSS-133.

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.

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 5 of 86

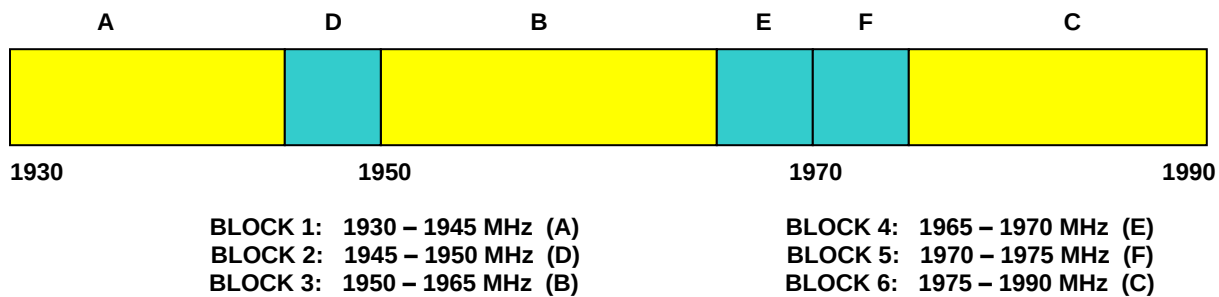
3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

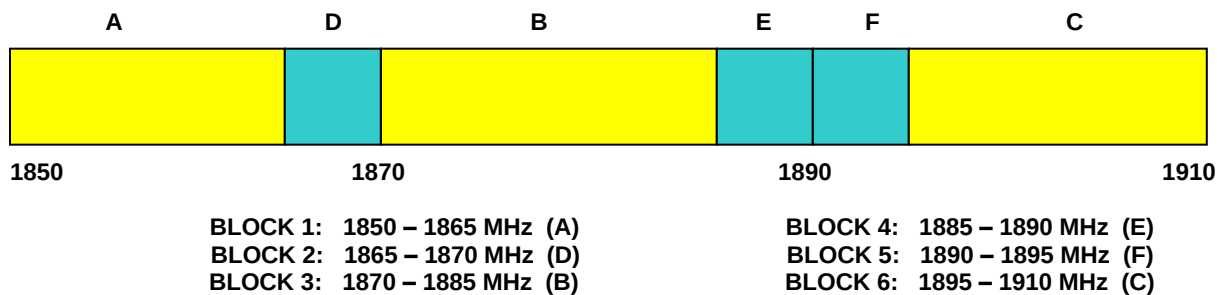
The measurement procedures described in the “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-E-2016) and “Measurement Guidance for Certification of Licensed Digital Transmitters” (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

Deviation from Measurement Procedure.....None

3.2 PCS - Base Frequency Blocks



3.3 PCS - Mobile Frequency Blocks



FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 6 of 86

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

For radiated power measurements, substitution method is used per the guidance of ANSI/TIA-603-E-2016. A half-wave dipole is 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 radiated spurious emissions measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

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

And

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

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 414788 D01.

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/TIA-603-E-2016.

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 7 of 86

4.0 MEASUREMENT UNCERTAINTY

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

Contribution	Expanded Uncertainty ($\pm$ dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module
		Page 8 of 86

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. Test Equipment

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.

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 9 of 86

6.0 SAMPLE CALCULATIONS

GSM Emission Designator

Emission Designator = 250KGXW

GSM BW = 250 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 250KG7W

EDGE BW = 250 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M16F9W

WCDMA BW = 4.16 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

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

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 10 of 86

7.0 TEST RESULTS

7.1 Summary

Company Name: Telit Communications S.p.A
 FCC ID: RI7LE910CXWWX
 IC: 5131A-LE910CXWWX
 FCC Classification: PCS Licensed Transmitter (PCB)
 Mode(s): GSM/GPRS/EDGE/WCDMA/LTE

Test Condition	Test Description	FCC Part Section(s)	RSS Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Transmitter Conducted Output Power / Equivalent Isotropic Radiated Power	2.1046, 24.232(c)	RSS-133(4.1), RSS-133(6.4)	< 2 Watts max. EIRP	PASS	Section 7.2
	Occupied Bandwidth	2.1049	RSS-Gen(6.7)	N/A	PASS	Section 7.3
	Conducted Band Edge / Spurious Emissions	2.1051, 24.238(a)	RSS-133(6.5)	> 43 + 10log10(P[Watts]) at Band Edge and for all out-of-band emissions	PASS	Sections 7.4, 7.5
	Peak-Average Ratio	24.232(d)	RSS-133(6.4)	< 13 dB	PASS	Section 7.6
	Frequency Stability	2.1055, 24.235	RSS-133(6.3)	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
RADIATED	Radiated Spurious Emissions	2.1053, 24.238(a)	RSS-133(6.5)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions	PASS	Section 7.7
	Receiver Radiated Spurious Emissions	N/A	RSS-Gen(7.3), RSS-133 (6.6)	Spurious emissions from receivers shall not exceed the radiated emissions limits detailed in RSS-Gen(7.3)	PASS	Section 7.7

Table 7-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST EMC Software Tool V1.1.

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 11 of 86

7.2 Transmitter Conducted Output Power/ Equivalent Isotropic 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)

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

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 12 of 86

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	QPSK	26140	1860.0	1 / 50	23.41	1.68	25.09	0.323	33.01	-7.92
		26365	1882.5	1 / 50	23.37	1.68	25.05	0.320	33.01	-7.96
		26590	1905.0	1 / 50	23.40	1.68	25.08	0.322	33.01	-7.93
	16-QAM	26140	1860.0	1 / 50	22.56	1.68	24.24	0.265	33.01	-8.77
		26365	1882.5	1 / 50	22.45	1.68	24.13	0.259	33.01	-8.88
		26590	1905.0	1 / 50	22.16	1.68	23.84	0.242	33.01	-9.17
15 MHz	QPSK	26115	1857.5	1 / 37	23.82	1.68	25.50	0.355	33.01	-7.51
		26365	1882.5	1 / 37	23.71	1.68	25.40	0.347	33.01	-7.61
		26615	1907.5	1 / 37	23.57	1.68	25.25	0.335	33.01	-7.76
	16-QAM	26115	1857.5	1 / 37	22.75	1.68	24.43	0.278	33.01	-8.58
		26365	1882.5	1 / 0	22.83	1.68	24.51	0.282	33.01	-8.50
		26615	1907.5	1 / 37	22.74	1.68	24.42	0.277	33.01	-8.59
10 MHz	QPSK	26090	1855.0	1 / 25	23.56	1.68	25.24	0.334	33.01	-7.77
		26365	1882.5	1 / 25	23.89	1.68	25.57	0.361	33.01	-7.44
		26640	1910.0	1 / 25	23.31	1.68	25.00	0.316	33.01	-8.02
	16-QAM	26090	1855.0	1 / 25	22.65	1.68	24.34	0.271	33.01	-8.67
		26365	1882.5	1 / 25	22.75	1.68	24.43	0.277	33.01	-8.58
		26640	1910.0	1 / 25	22.34	1.68	24.02	0.252	33.01	-8.99
5 MHz	QPSK	26065	1852.5	1 / 12	23.79	1.68	25.48	0.353	33.01	-7.53
		26365	1882.5	1 / 12	23.37	1.68	25.06	0.321	33.01	-7.95
		26665	1912.5	1 / 12	23.15	1.68	24.84	0.305	33.01	-8.17
	16-QAM	26065	1852.5	1 / 12	22.70	1.68	24.38	0.274	33.01	-8.63
		26365	1882.5	1 / 12	22.85	1.68	24.53	0.284	33.01	-8.48
		26665	1912.5	1 / 12	22.58	1.68	24.26	0.267	33.01	-8.75
3 MHz	QPSK	26055	1851.5	1 / 7	23.57	1.68	25.26	0.336	33.01	-7.75
		26365	1882.5	1 / 7	23.76	1.68	25.45	0.351	33.01	-7.56
		26675	1913.5	1 / 7	23.63	1.68	25.31	0.340	33.01	-7.70
	16-QAM	26055	1851.5	1 / 7	22.59	1.68	24.28	0.268	33.01	-8.73
		26365	1882.5	1 / 7	22.63	1.68	24.31	0.270	33.01	-8.70
		26675	1913.5	1 / 14	22.71	1.68	24.39	0.275	33.01	-8.62
1.4 MHz	QPSK	26047	1850.7	1 / 3	23.70	1.68	25.38	0.345	33.01	-7.63
		26365	1882.5	1 / 3	23.49	1.68	25.18	0.329	33.01	-7.83
		26683	1914.3	1 / 3	23.31	1.68	25.00	0.316	33.01	-8.01
	16-QAM	26047	1850.7	1 / 3	22.62	1.68	24.30	0.269	33.01	-8.71
		26365	1882.5	1 / 5	22.58	1.68	24.27	0.267	33.01	-8.75
		26683	1914.3	1 / 0	22.14	1.68	23.83	0.241	33.01	-9.18

Table 7-2. EIRP Data (LTE Band 25/2)

Mode	Channel	Frequency [MHz]	Conducted Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
GSM	512	1850.2	29.48	1.68	31.16	1.306	33.01	-1.85
	661	1880.0	29.62	1.68	31.31	1.351	33.01	-1.71
	810	1909.8	29.74	1.68	31.42	1.388	33.01	-1.59
GPRS	512	1850.2	29.33	1.68	31.01	1.263	33.01	-2.00
	661	1880.0	29.59	1.68	31.28	1.342	33.01	-1.73
	810	1909.8	29.76	1.68	31.44	1.394	33.01	-1.57
EDGE	512	1850.2	25.72	1.68	27.40	0.550	33.01	-5.61
	661	1880.0	25.83	1.68	27.51	0.564	33.01	-5.50
	810	1909.8	25.95	1.68	27.63	0.580	33.01	-5.38

Table 7-3. EIRP Data (GPRS PCS)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 13 of 86

Mode	Channel	Frequency [MHz]	Conducted Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
WCDMA (RMC)	9262	1852.4	24.31	1.68	25.99	0.398	33.01	-7.02
	9400	1880.0	24.15	1.68	25.83	0.383	33.01	-7.18
	9538	1907.6	23.86	1.68	25.54	0.358	33.01	-7.47
WCDMA (AMR)	9262	1852.4	23.86	1.68	25.54	0.358	33.01	-7.47
	9400	1880.0	23.73	1.68	25.41	0.348	33.01	-7.60
	9538	1907.6	23.85	1.68	25.53	0.358	33.01	-7.48
HSDPA (Subtest1)	9262	1852.4	22.82	1.68	24.50	0.282	33.01	-8.51
	9400	1880.0	22.78	1.68	24.46	0.280	33.01	-8.55
	9538	1907.6	22.65	1.68	24.33	0.271	33.01	-8.68
HSDPA (Subtest2)	9262	1852.4	22.83	1.68	24.51	0.283	33.01	-8.50
	9400	1880.0	22.73	1.68	24.41	0.276	33.01	-8.60
	9538	1907.6	22.68	1.68	24.36	0.273	33.01	-8.65
HSDPA (Subtest3)	9262	1852.4	22.29	1.68	23.97	0.250	33.01	-9.04
	9400	1880.0	22.33	1.68	24.01	0.252	33.01	-9.00
	9538	1907.6	22.13	1.68	23.81	0.241	33.01	-9.20
HSDPA (Subtest4)	9262	1852.4	22.24	1.68	23.92	0.247	33.01	-9.09
	9400	1880.0	22.30	1.68	23.98	0.250	33.01	-9.03
	9538	1907.6	22.07	1.68	23.75	0.237	33.01	-9.26
HSUPA (Subtest1)	9262	1852.4	22.71	1.68	24.39	0.275	33.01	-8.62
	9400	1880.0	22.77	1.68	24.45	0.279	33.01	-8.56
	9538	1907.6	22.77	1.68	24.45	0.279	33.01	-8.56
HSUPA (Subtest2)	9262	1852.4	21.74	1.68	23.42	0.220	33.01	-9.59
	9400	1880.0	21.85	1.68	23.53	0.226	33.01	-9.48
	9538	1907.6	21.76	1.68	23.44	0.221	33.01	-9.57
HSUPA (Subtest3)	9262	1852.4	21.76	1.68	23.44	0.221	33.01	-9.57
	9400	1880.0	21.32	1.68	23.00	0.200	33.01	-10.01
	9538	1907.6	21.73	1.68	23.41	0.219	33.01	-9.60
HSUPA (Subtest4)	9262	1852.4	22.15	1.68	23.83	0.242	33.01	-9.18
	9400	1880.0	22.23	1.68	23.91	0.246	33.01	-9.10
	9538	1907.6	22.28	1.68	23.96	0.249	33.01	-9.05
HSUPA (Subtest5)	9262	1852.4	23.09	1.68	24.77	0.300	33.01	-8.24
	9400	1880.0	22.92	1.68	24.60	0.289	33.01	-8.41
	9538	1907.6	22.82	1.68	24.50	0.282	33.01	-8.51

Table 7-4. EIRP Data (WCDMA PCS)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.R17	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 14 of 86

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.

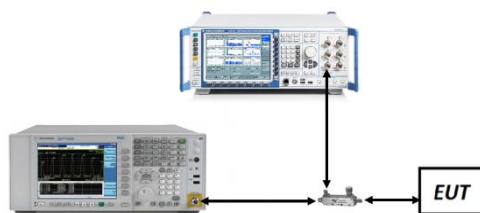


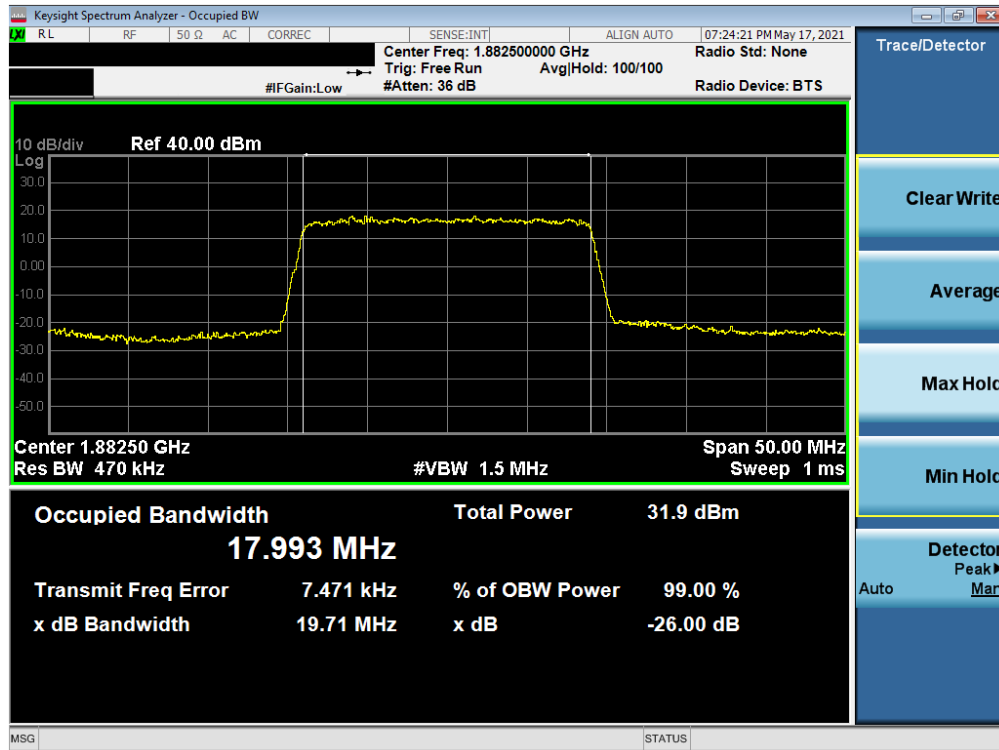
Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 15 of 86

LTE Band 25/2

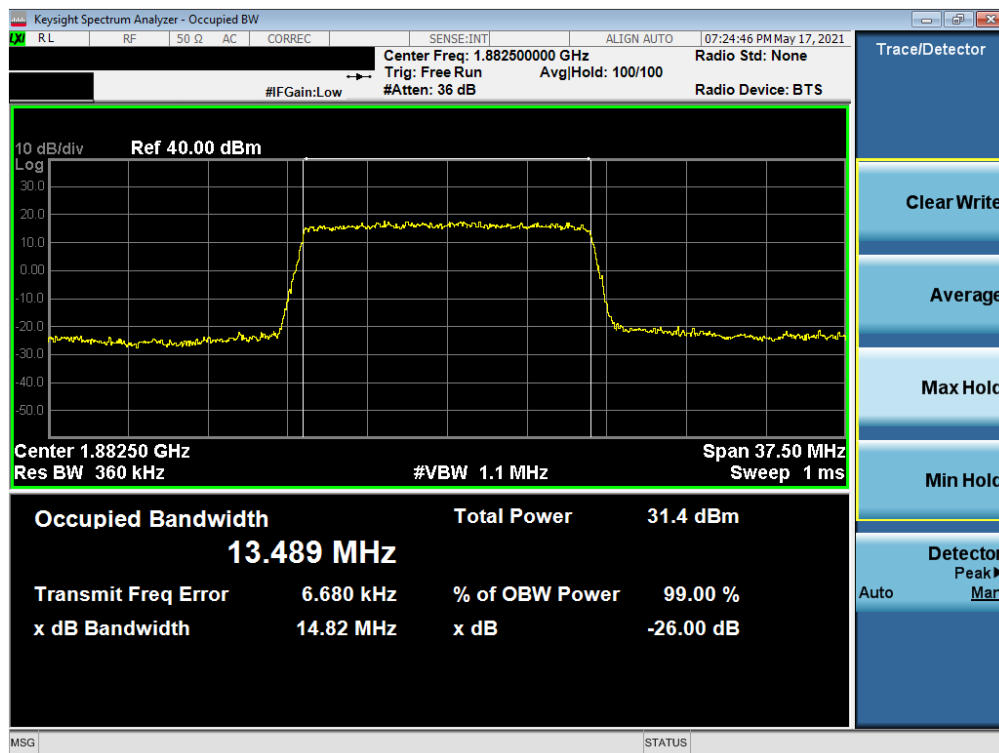


Plot 7-1. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz QPSK - Full RB)

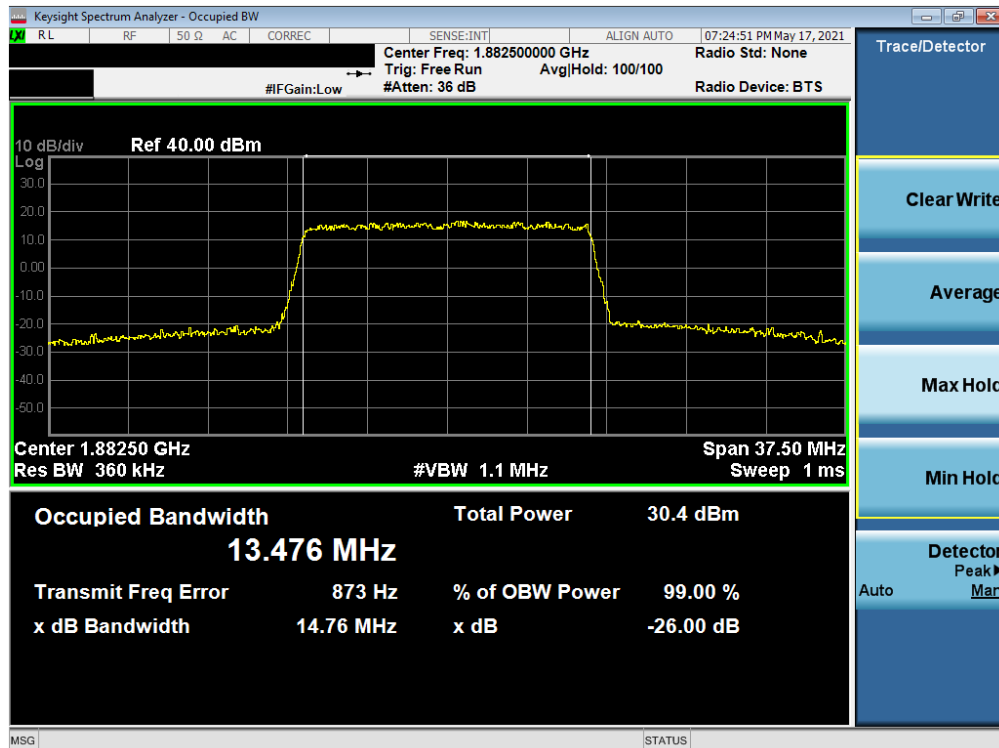


Plot 7-2. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 16 of 86

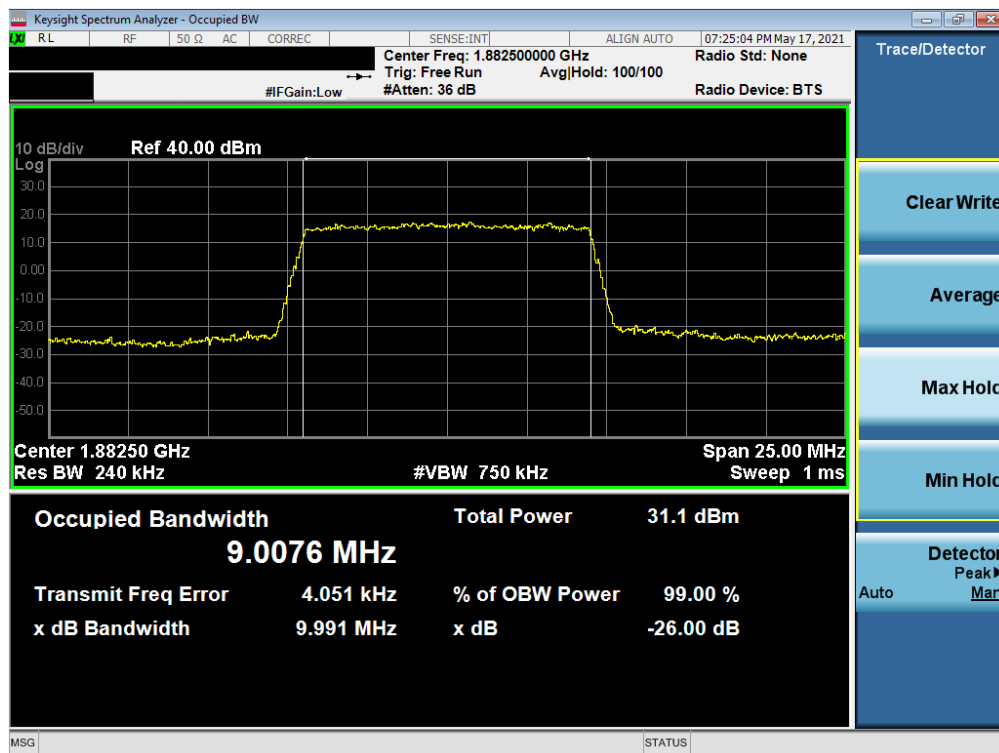


Plot 7-3. Occupied Bandwidth Plot (LTE Band 25/2 - 15MHz QPSK - Full RB)



Plot 7-4. Occupied Bandwidth Plot (LTE Band 25/2 - 15MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 17 of 86

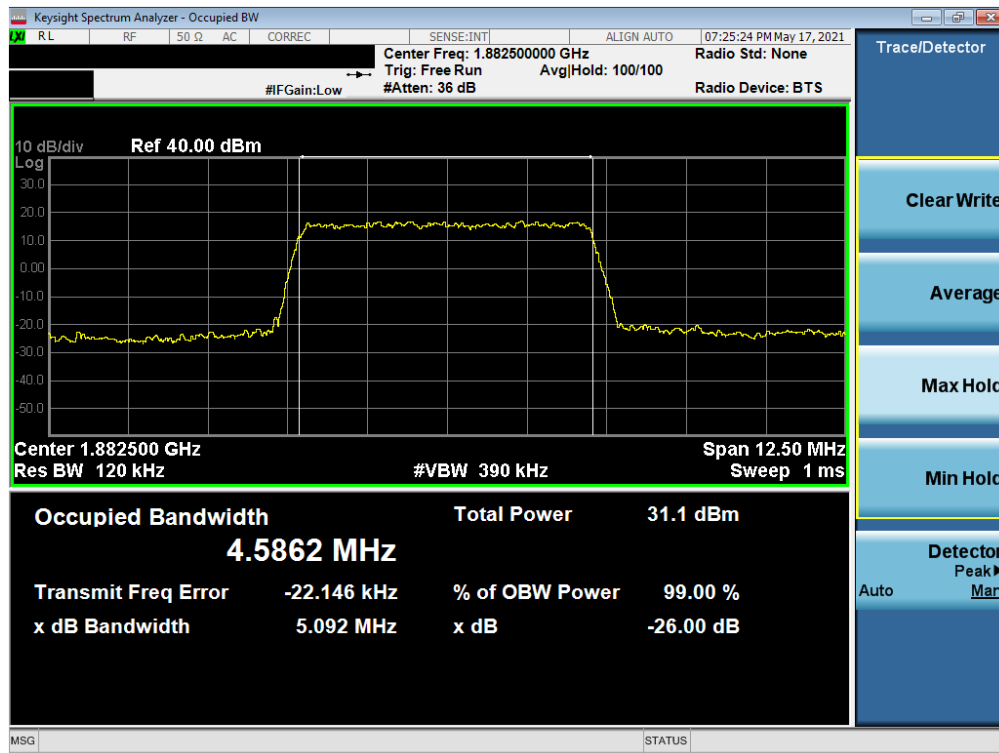


Plot 7-5. Occupied Bandwidth Plot (LTE Band 25/2 - 10MHz QPSK - Full RB)

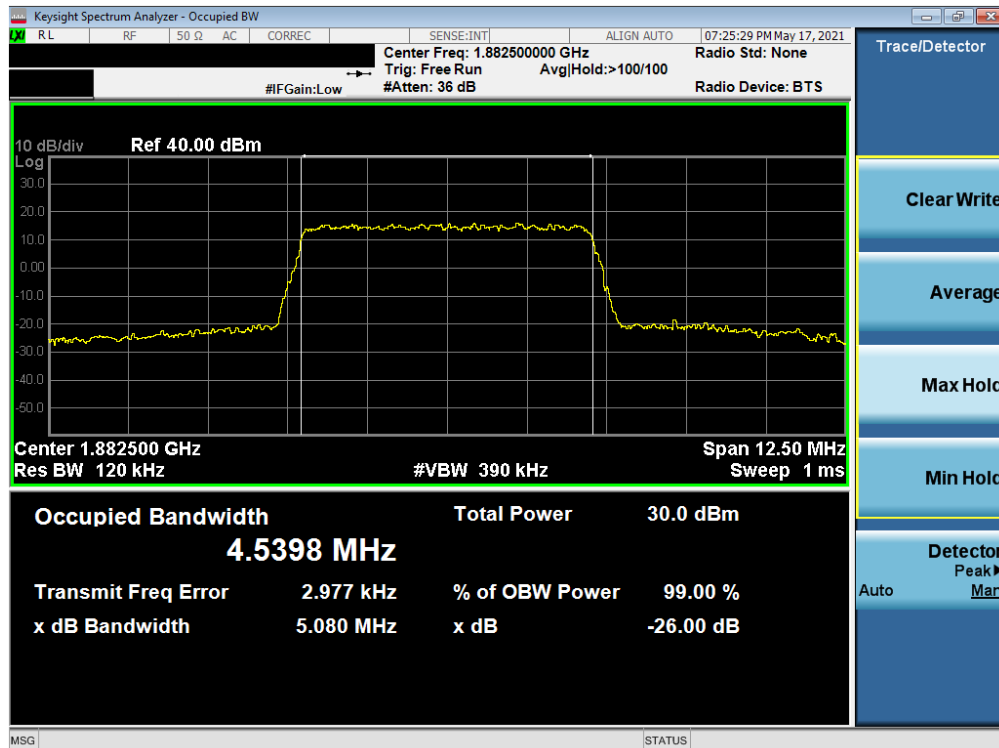


Plot 7-6. Occupied Bandwidth Plot (LTE Band 25/2 - 10MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 18 of 86

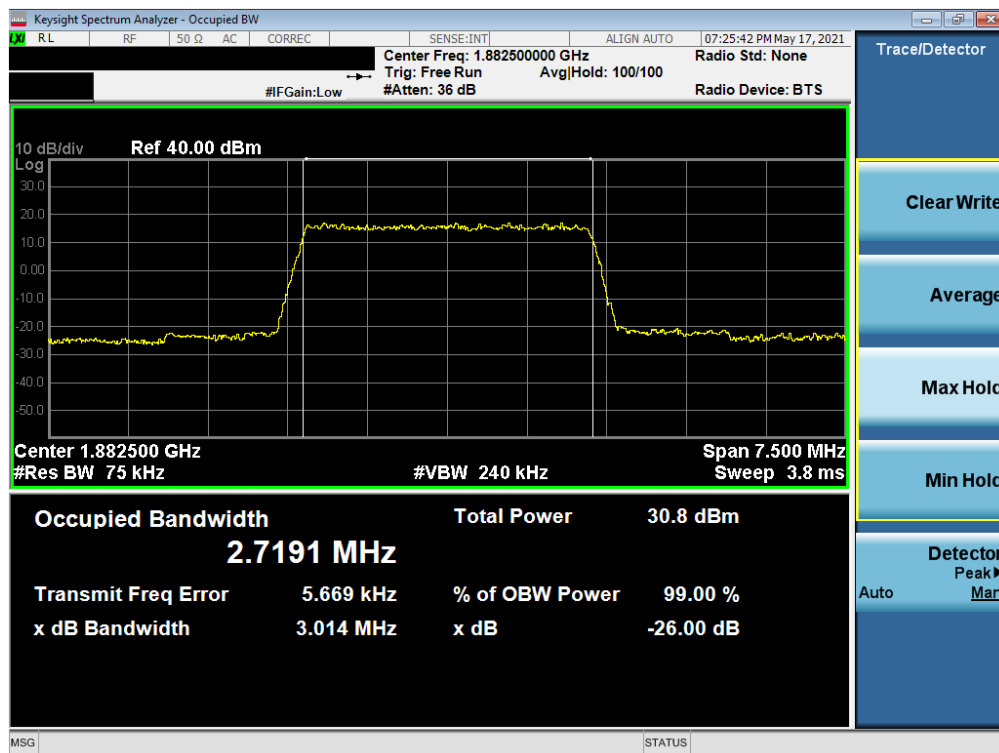


Plot 7-7. Occupied Bandwidth Plot (LTE Band 25/2 - 5MHz QPSK - Full RB)

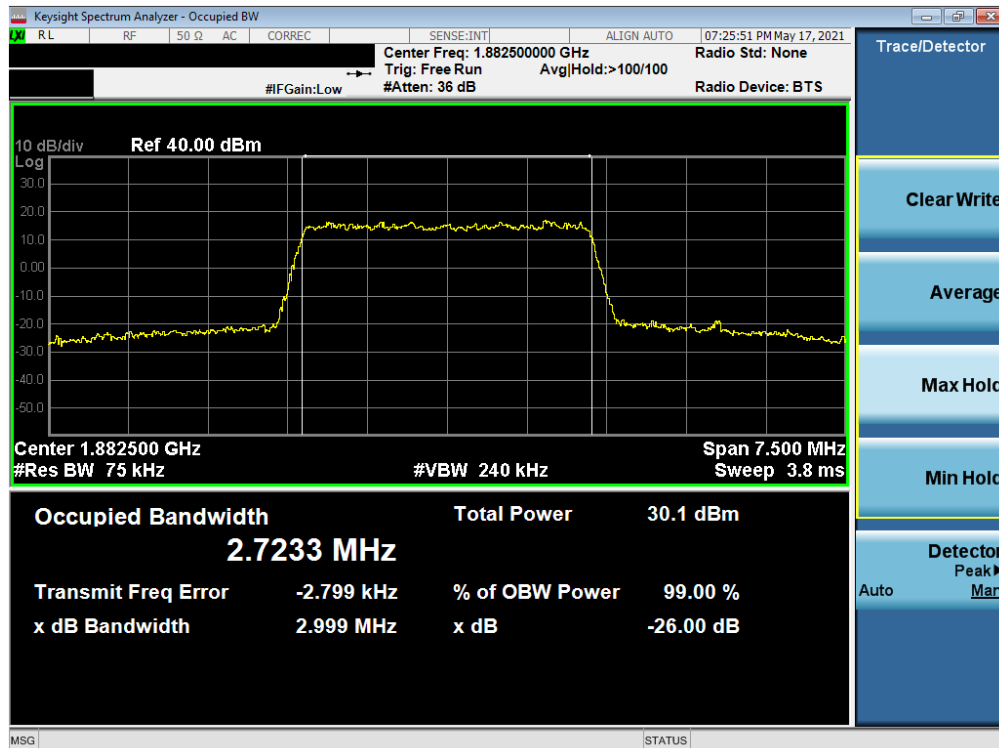


Plot 7-8. Occupied Bandwidth Plot (LTE Band 25/2 - 5MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 19 of 86

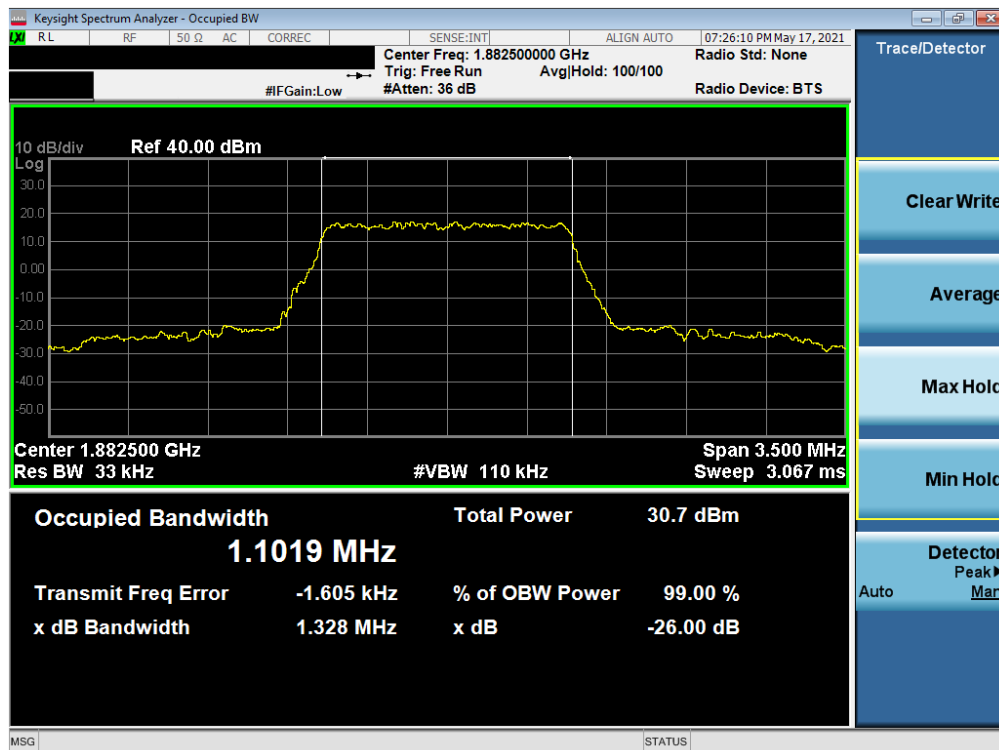


Plot 7-9. Occupied Bandwidth Plot (LTE Band 25/2 - 3MHz QPSK - Full RB)

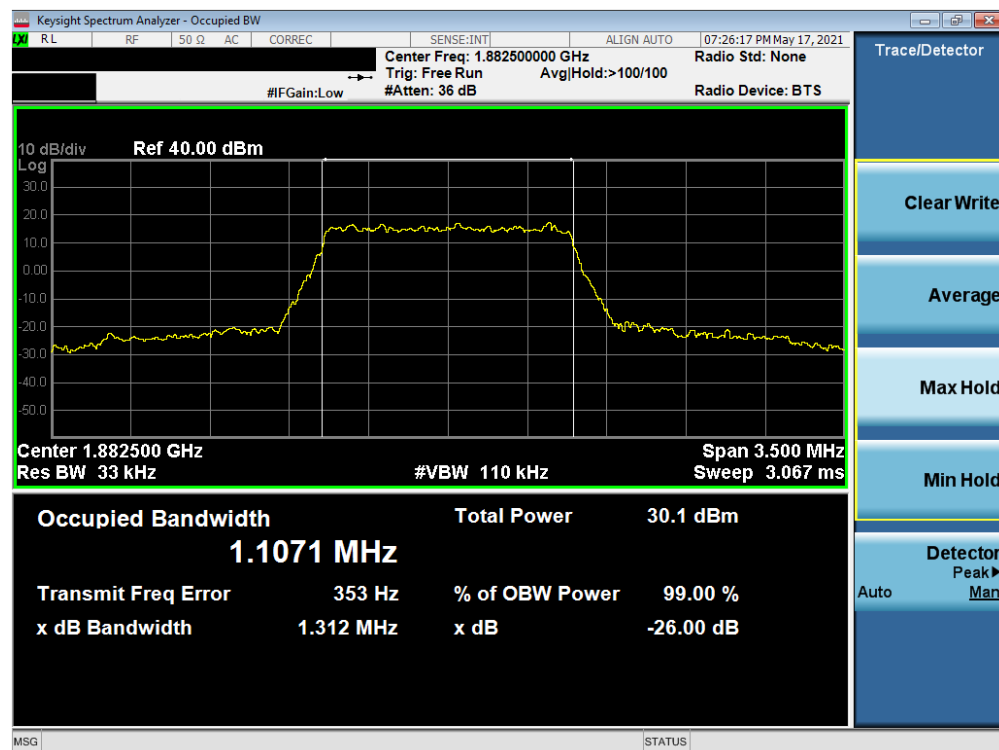


Plot 7-10. Occupied Bandwidth Plot (LTE Band 25/2 - 3MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 20 of 86



Plot 7-11. Occupied Bandwidth Plot (LTE Band 25/2 - 1.4MHz QPSK - Full RB)



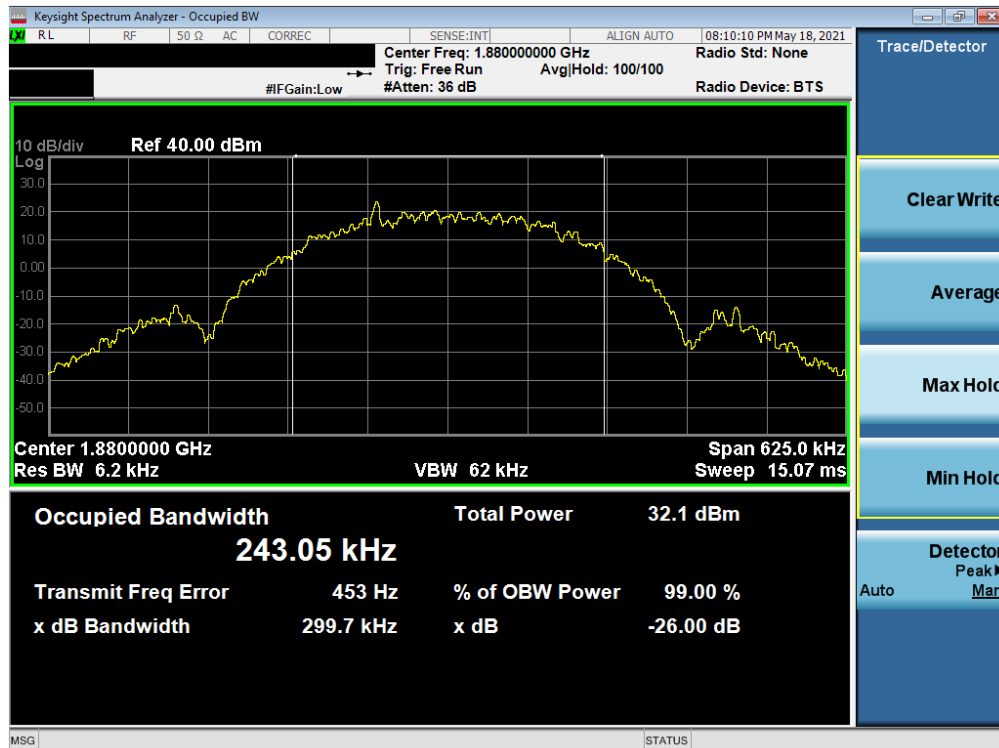
Plot 7-12. Occupied Bandwidth Plot (LTE Band 25/2 - 1.4MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 21 of 86

GSM/GPRS PCS



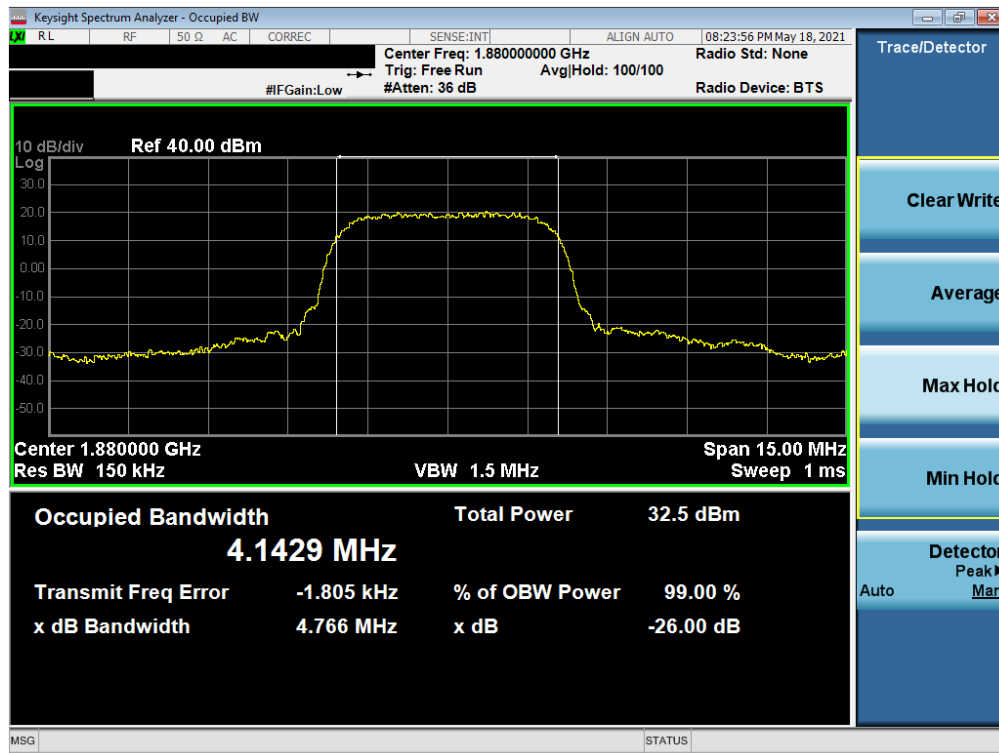
Plot 7-13. Occupied Bandwidth Plot (GPRS, Ch. 661)



Plot 7-14. Occupied Bandwidth Plot (EDGE, Ch. 661)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 22 of 86

WCDMA PCS



Plot 7-15. Occupied Bandwidth Plot (WCDMA, Ch. 9400)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 23 of 86

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 10th 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 $43 + 10 \log_{10}(P_{[Watts]})$, 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 20GHz (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

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

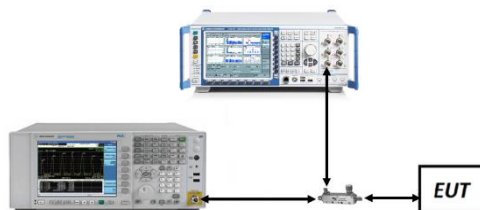


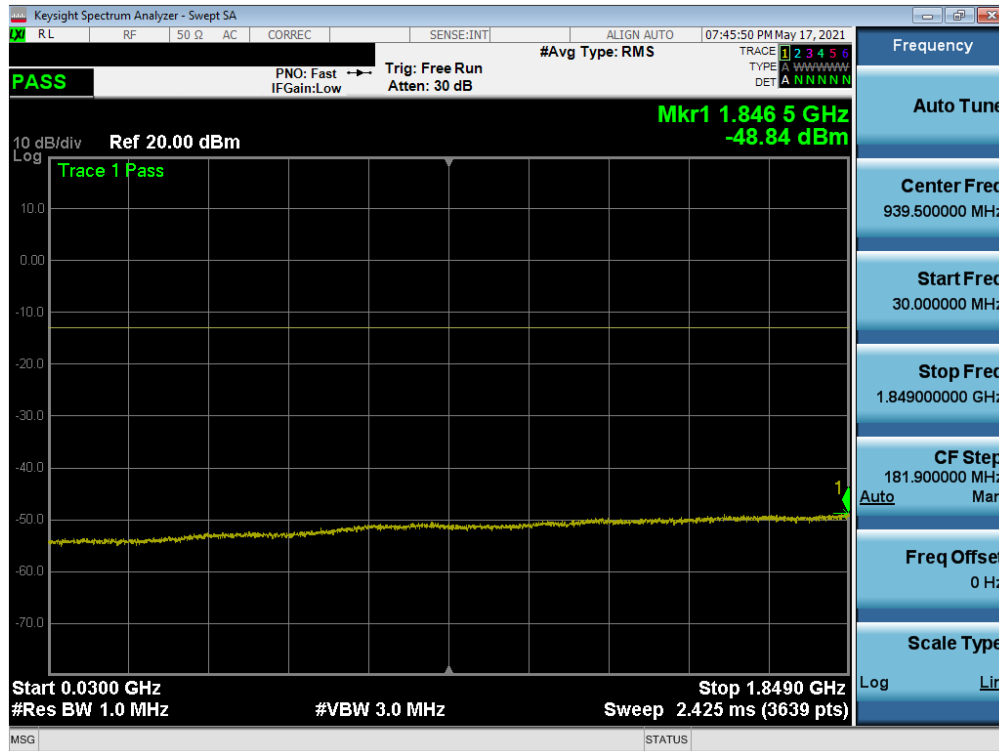
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

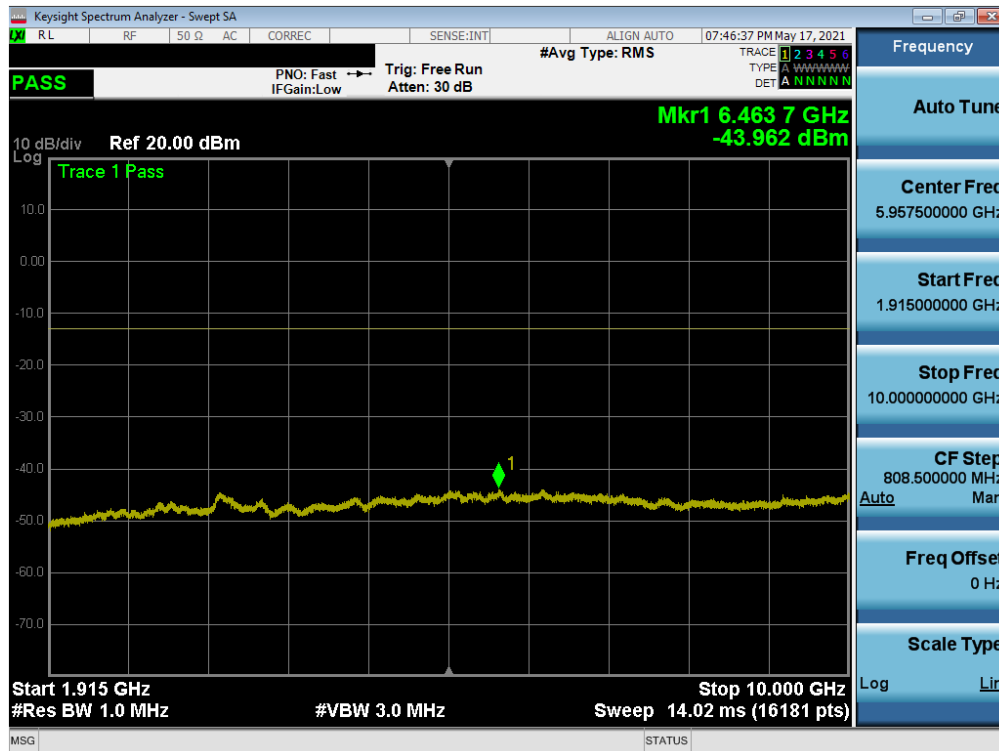
Per Part 24 and RSS-133, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz for measurements above 1GHz.. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 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 IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 24 of 86

LTE Band 25/2

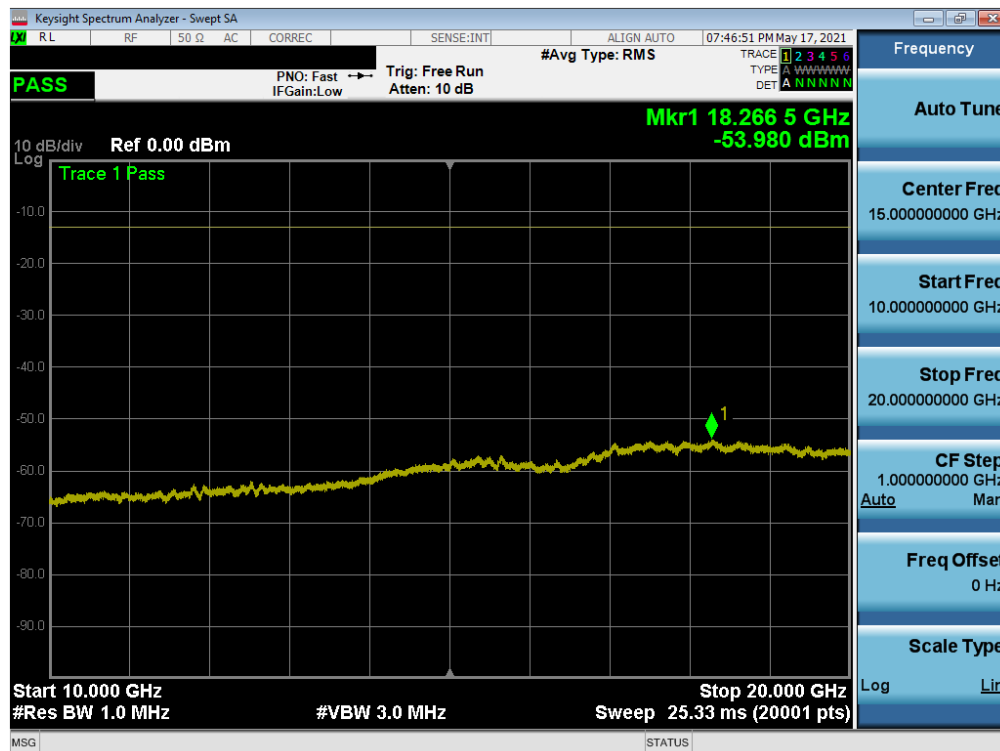


Plot 7-16. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Low Channel)

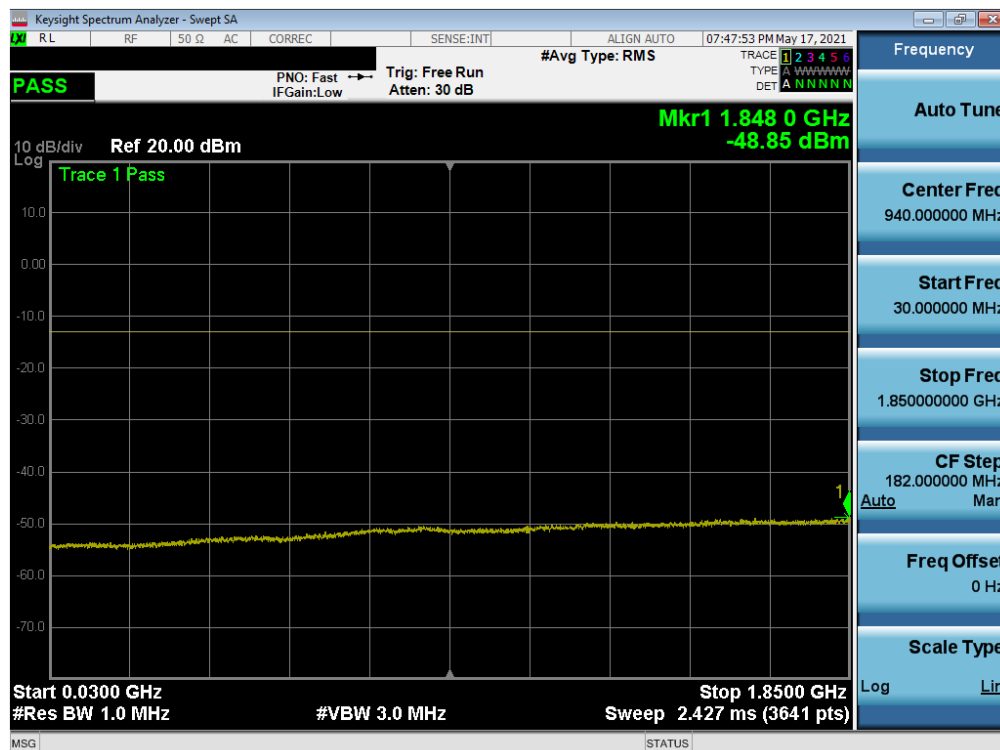


Plot 7-17. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Low Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 25 of 86

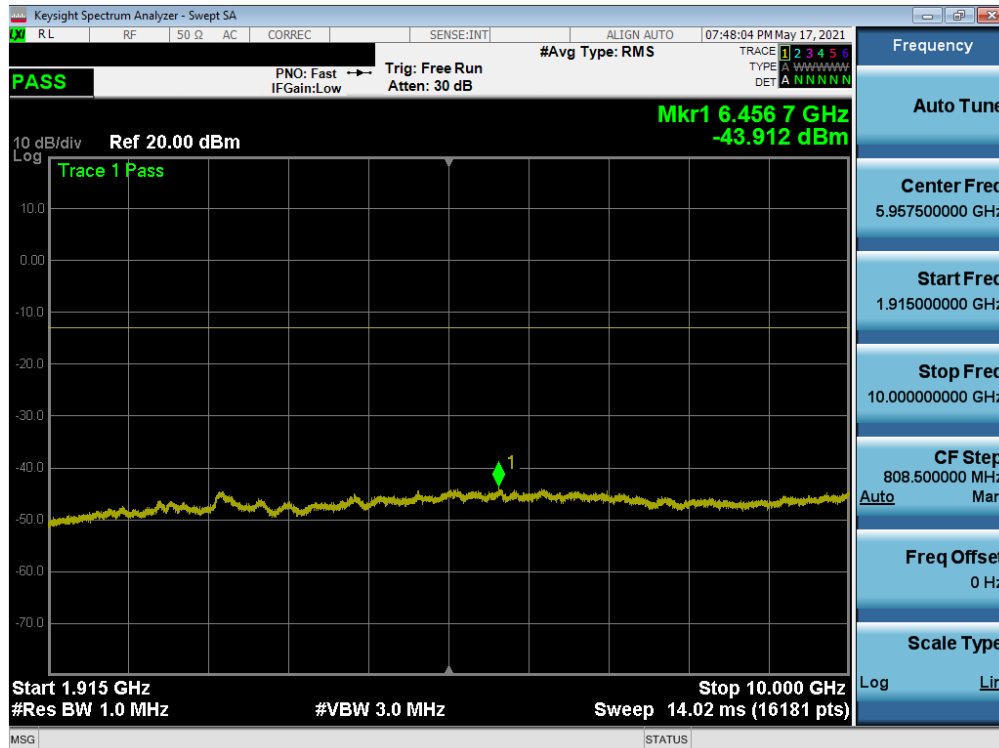


Plot 7-18. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Low Channel)

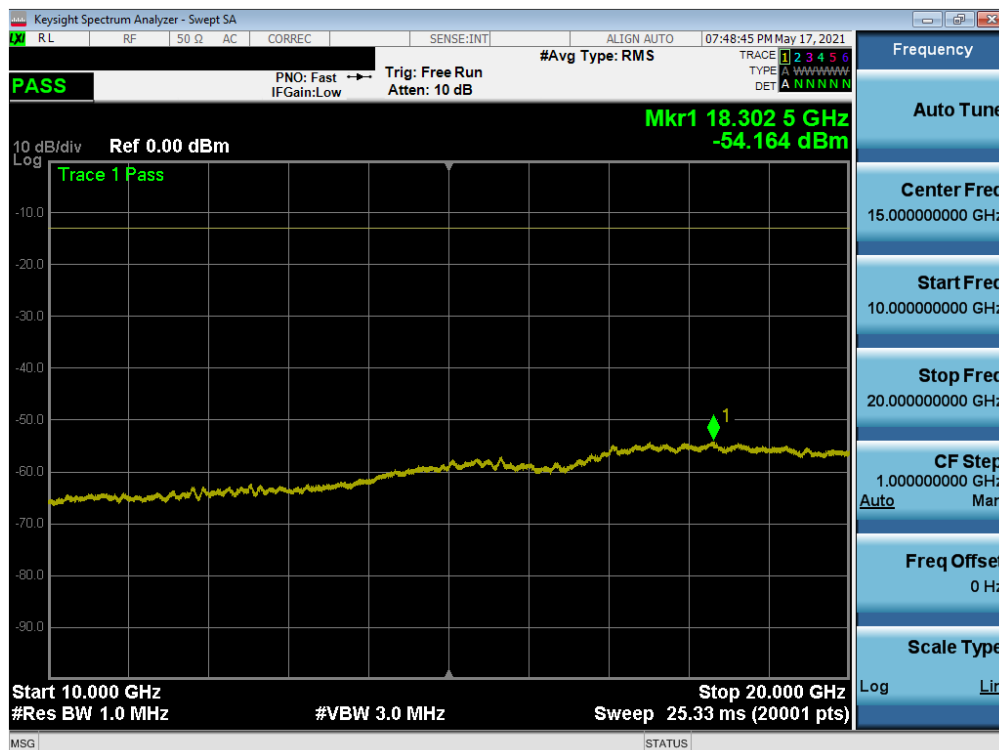


Plot 7-19. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 26 of 86

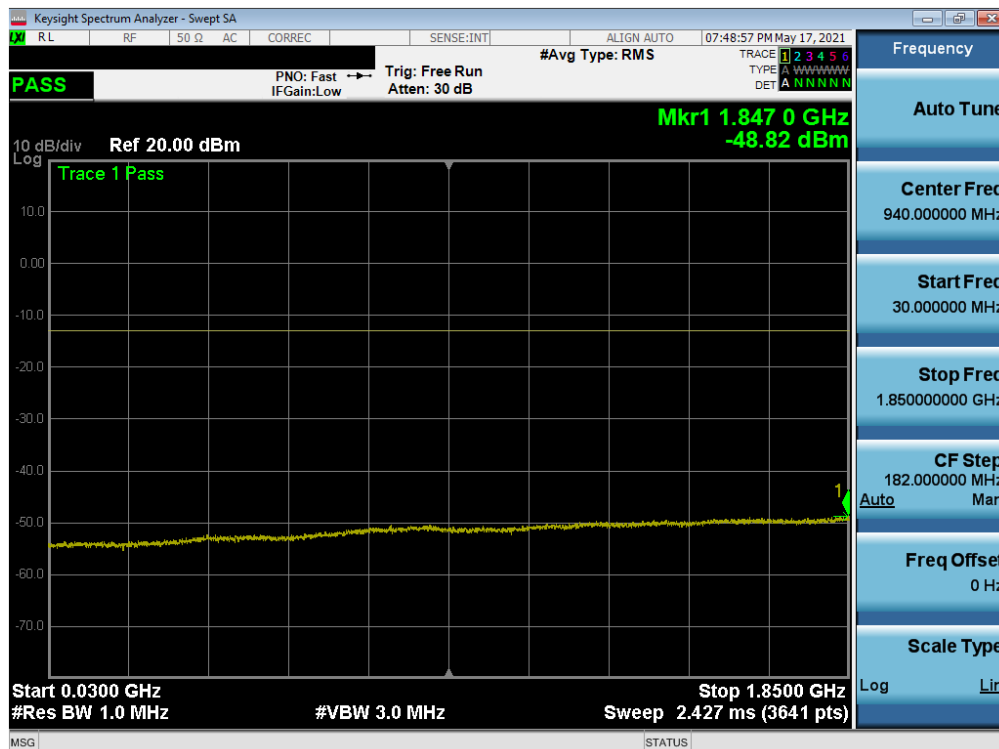


Plot 7-20. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel)

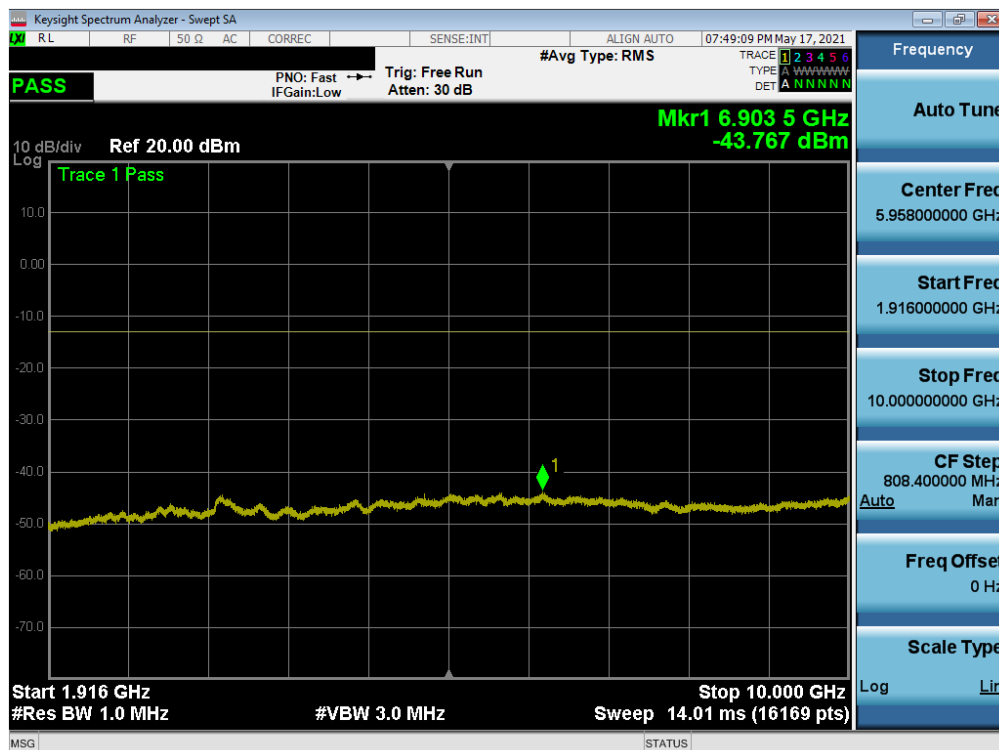


Plot 7-21. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 27 of 86

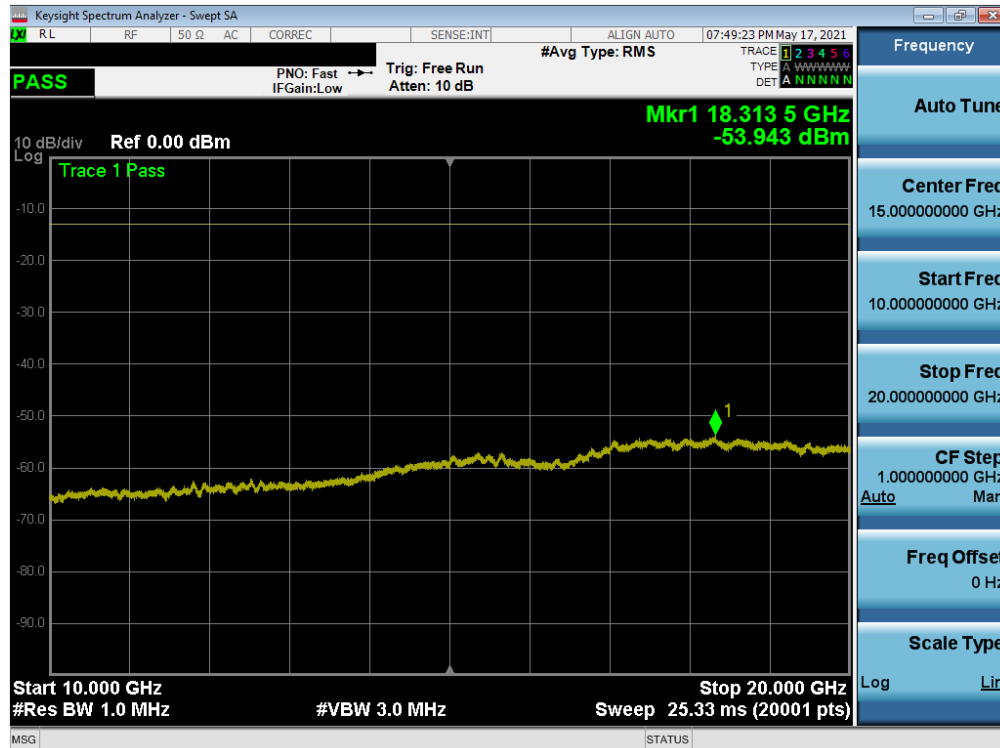


Plot 7-22. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - High Channel)



Plot 7-23. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - High Channel)

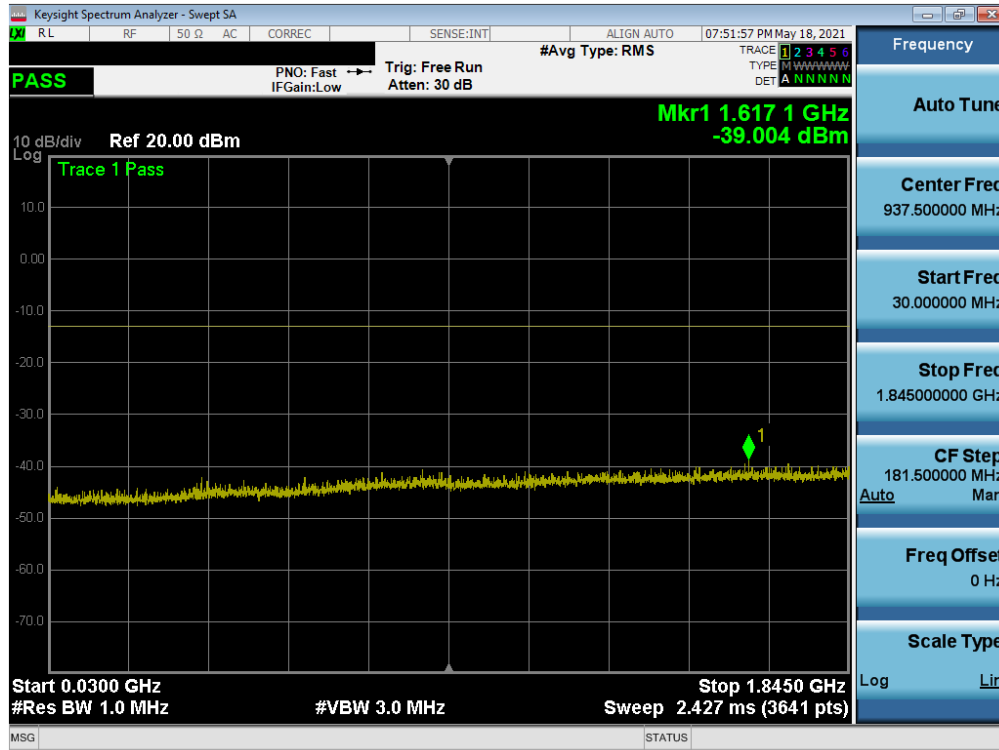
FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 28 of 86



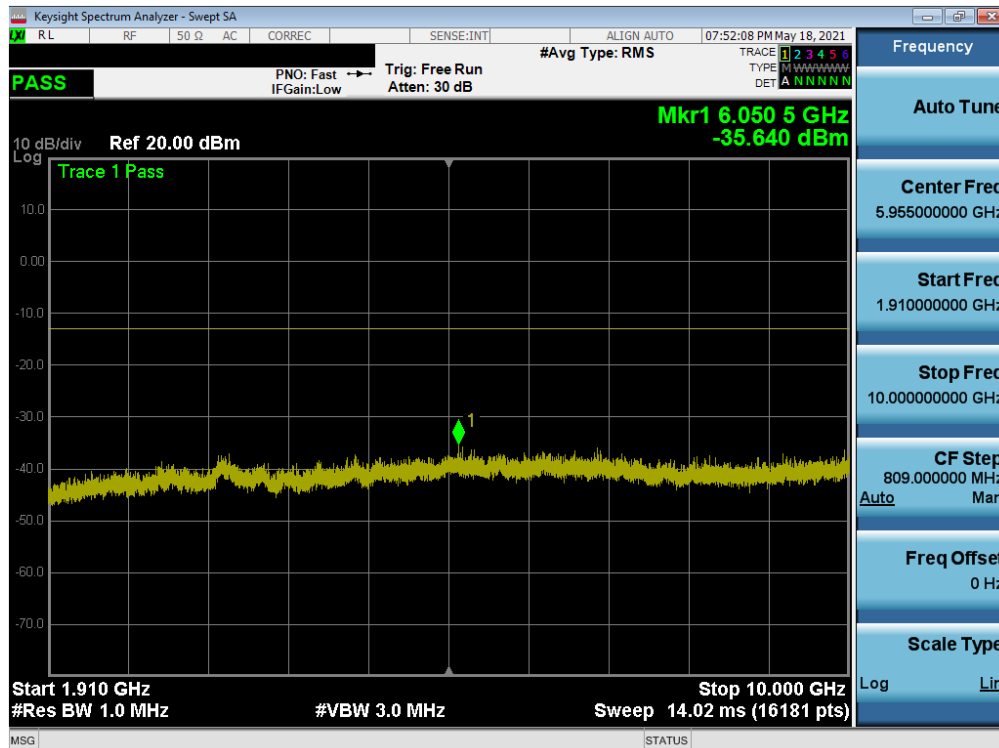
Plot 7-24. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - High Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 29 of 86

GSM/GPRS PCS

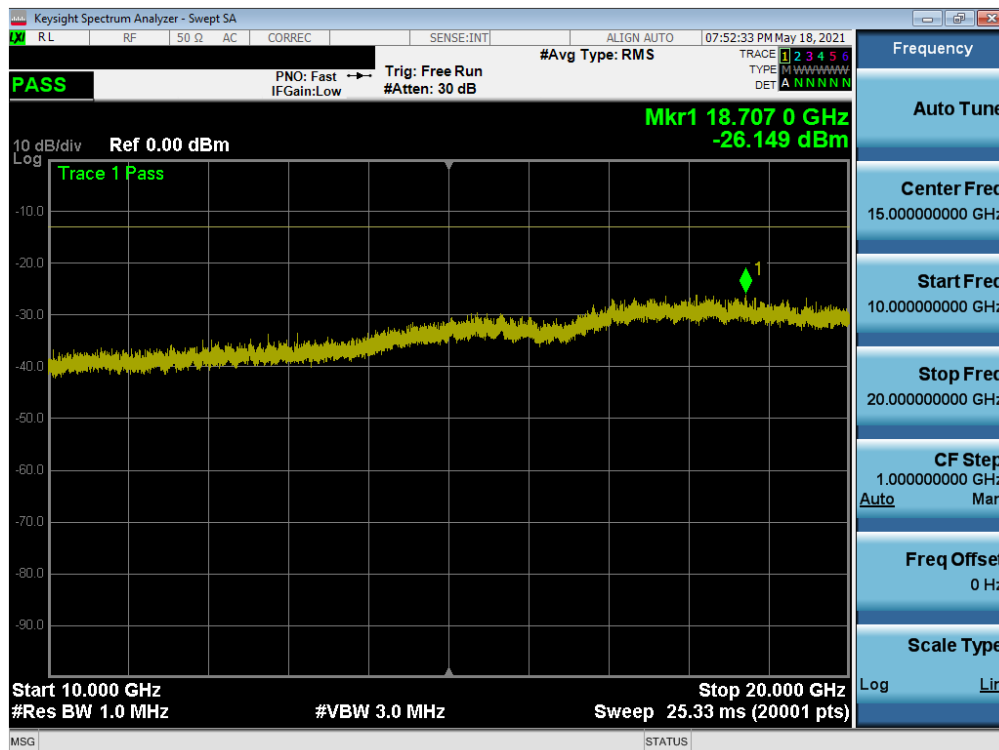


Plot 7-25. Conducted Spurious Plot (GPRS Ch. 512)

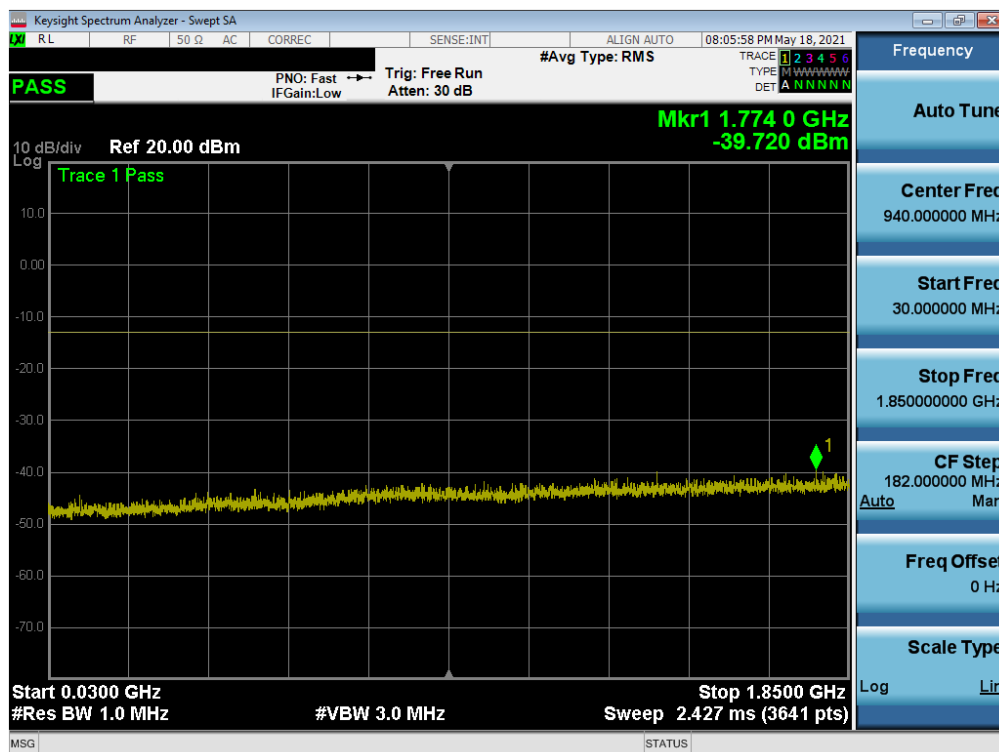


Plot 7-26. Conducted Spurious Plot (GPRS Ch. 512)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 30 of 86

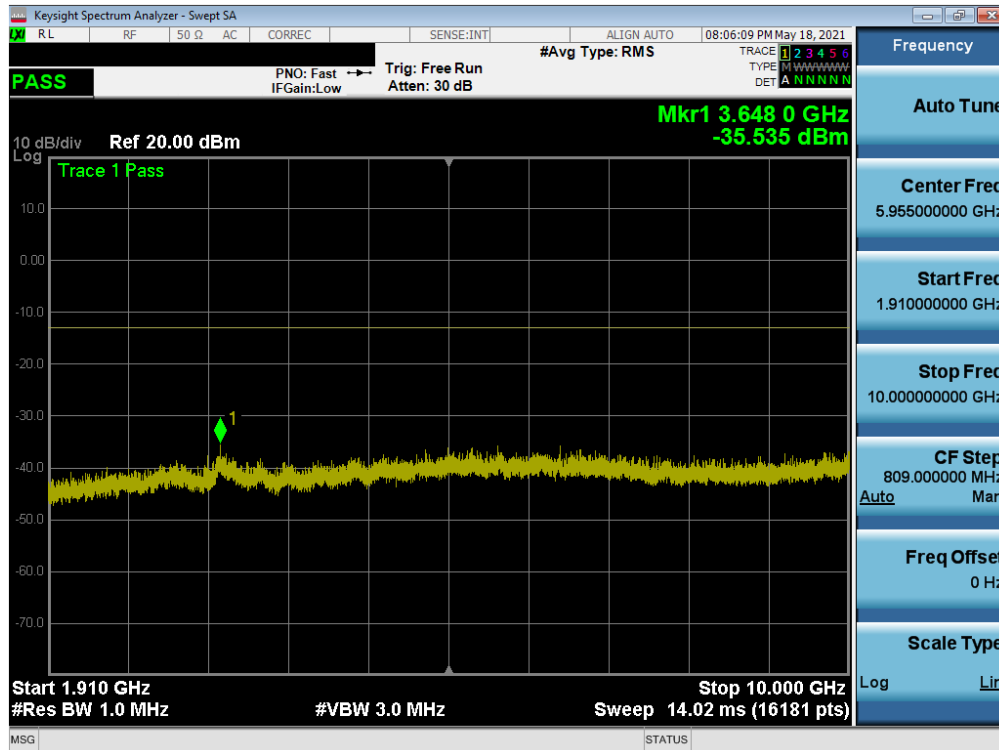


Plot 7-27. Conducted Spurious Plot (GPRS Ch. 512)

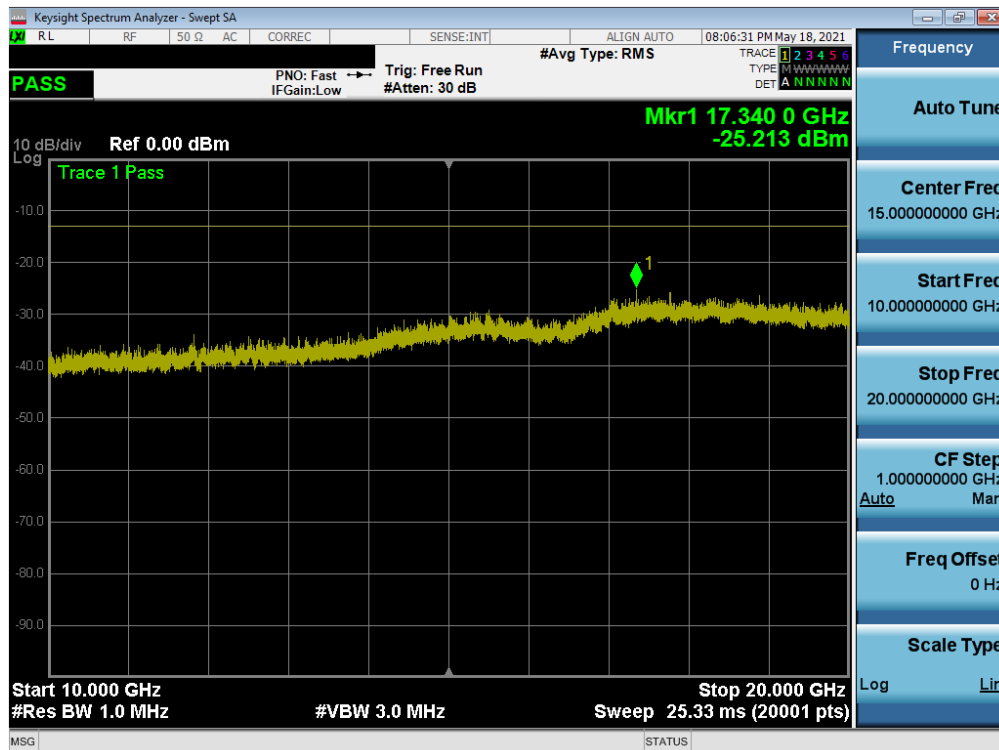


Plot 7-28. Conducted Spurious Plot (GPRS Ch. 661)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 31 of 86

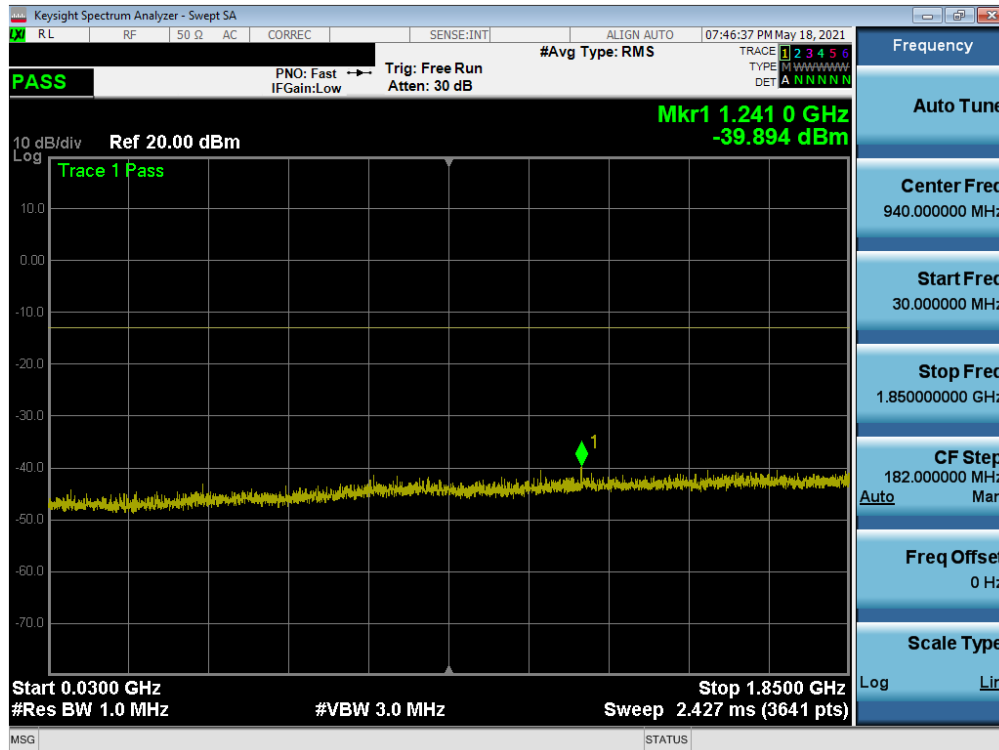


Plot 7-29. Conducted Spurious Plot (GPRS Ch. 661)

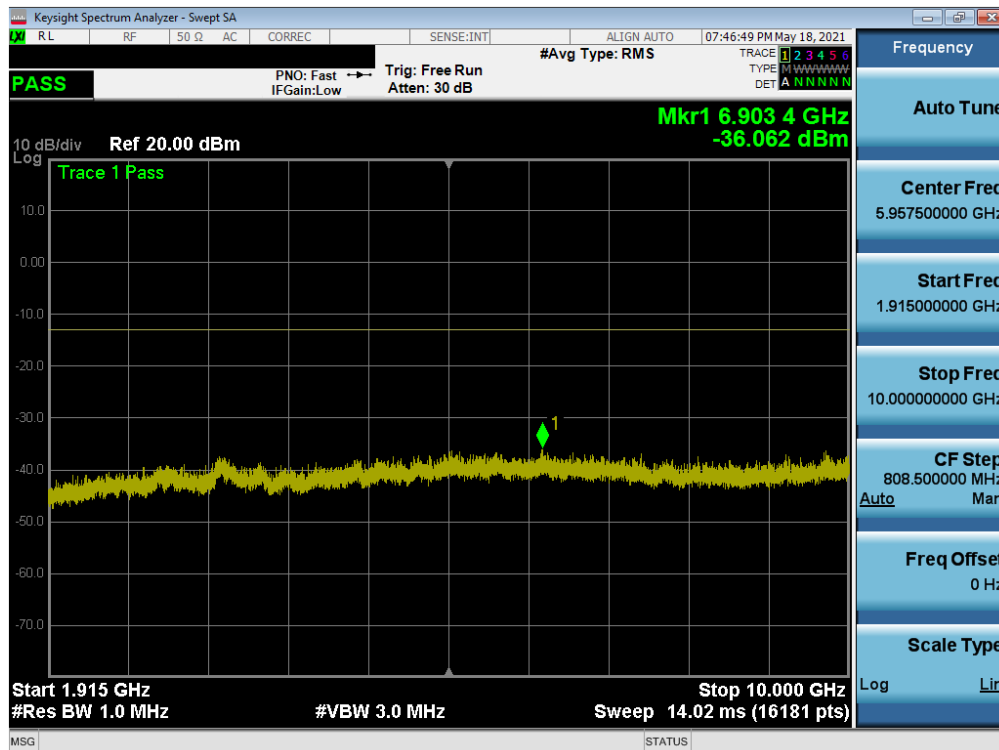


Plot 7-30. Conducted Spurious Plot (GPRS Ch. 661)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 32 of 86

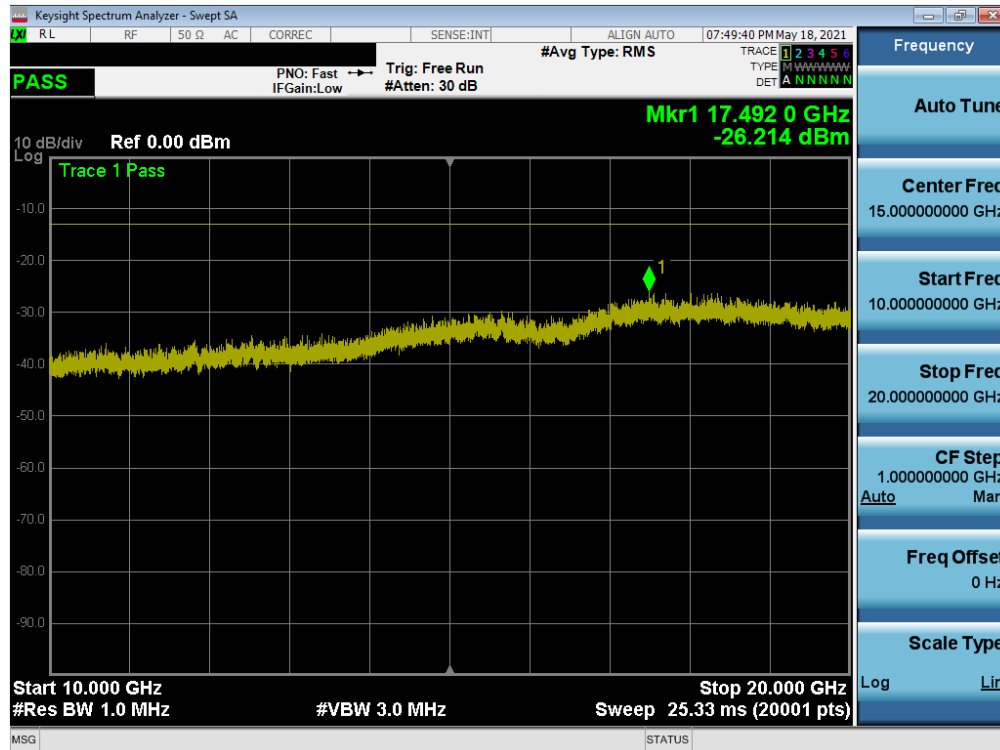


Plot 7-31. Conducted Spurious Plot (GPRS Ch. 810)



Plot 7-32. Conducted Spurious Plot (GPRS Ch. 810)

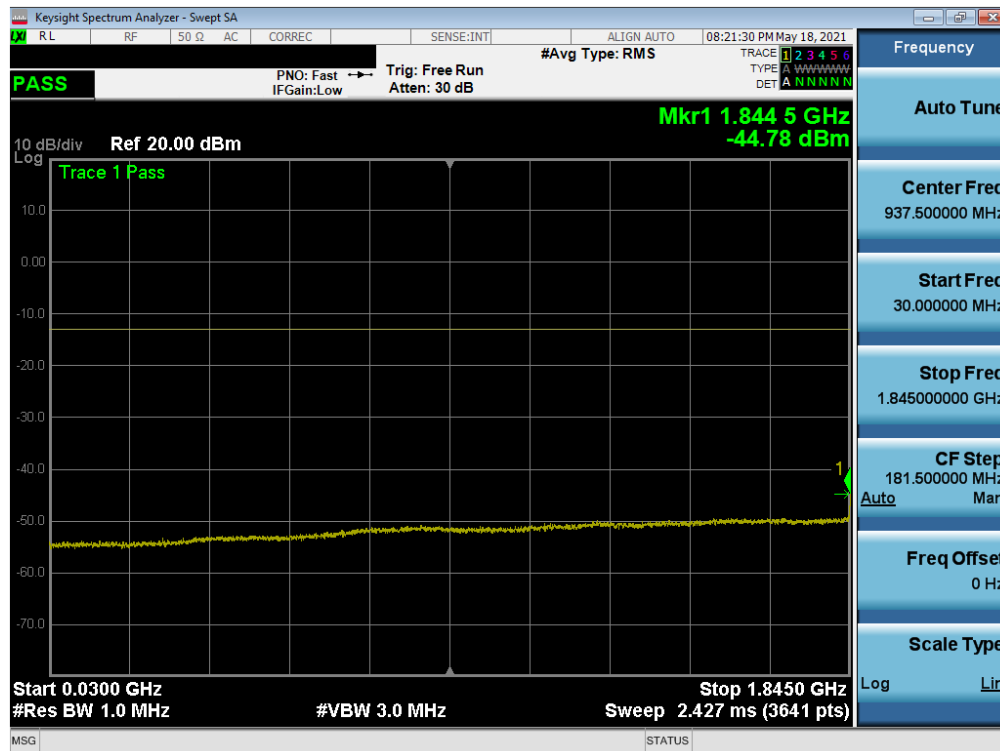
FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 33 of 86



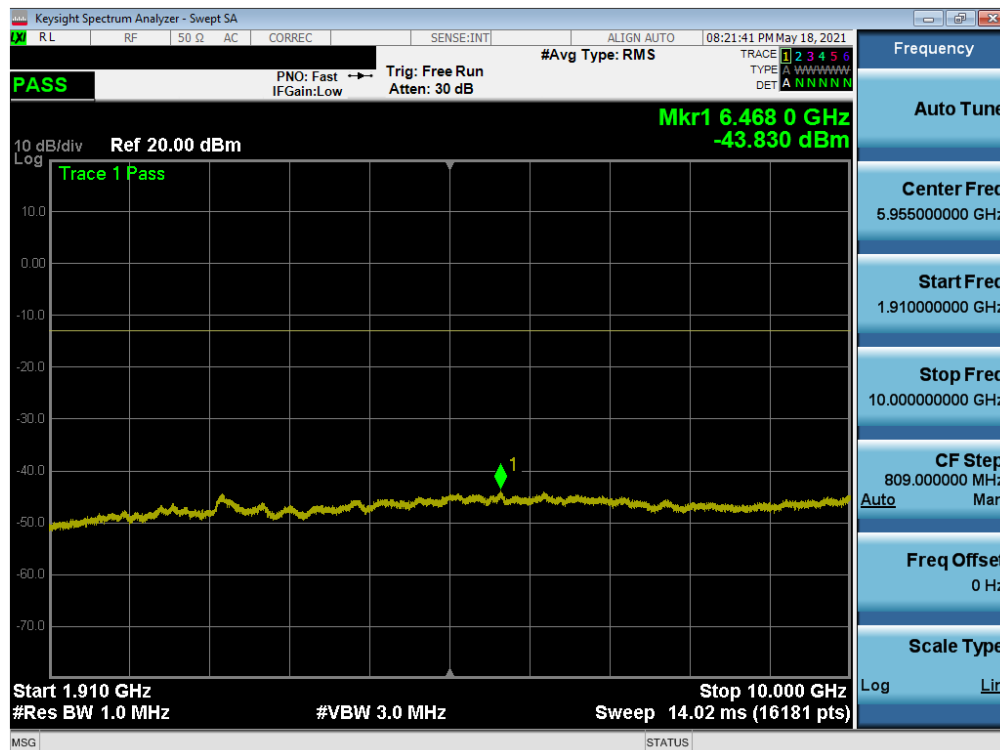
Plot 7-33. Conducted Spurious Plot (GPRS Ch. 810)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 34 of 86

WCDMA PCS

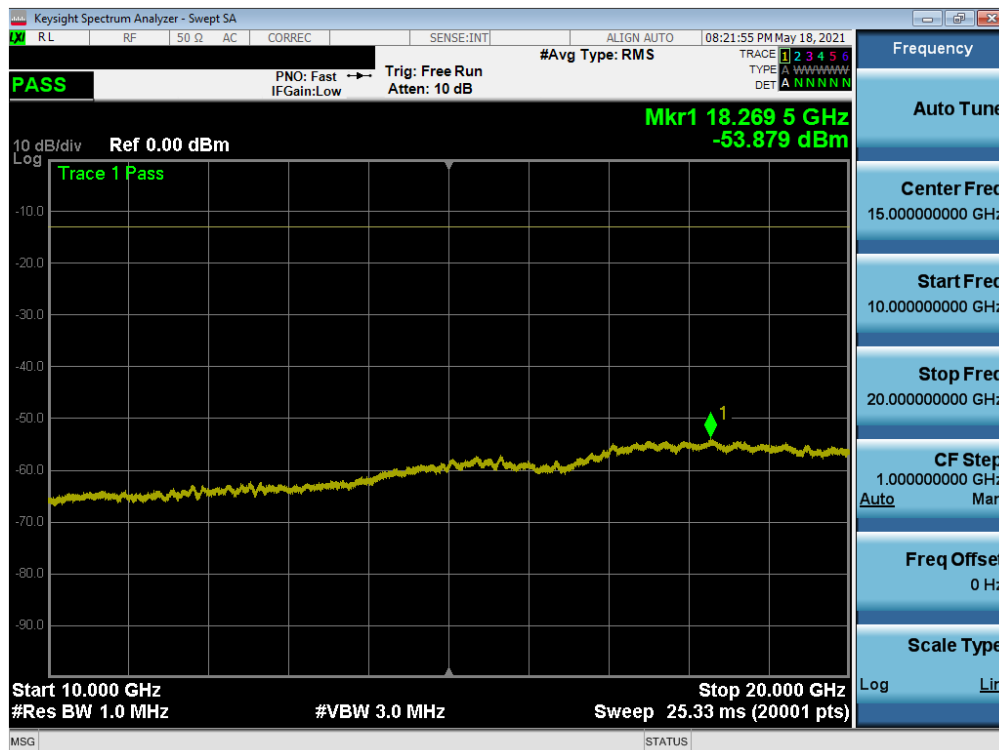


Plot 7-34. Conducted Spurious Plot (WCDMA Ch. 9262)

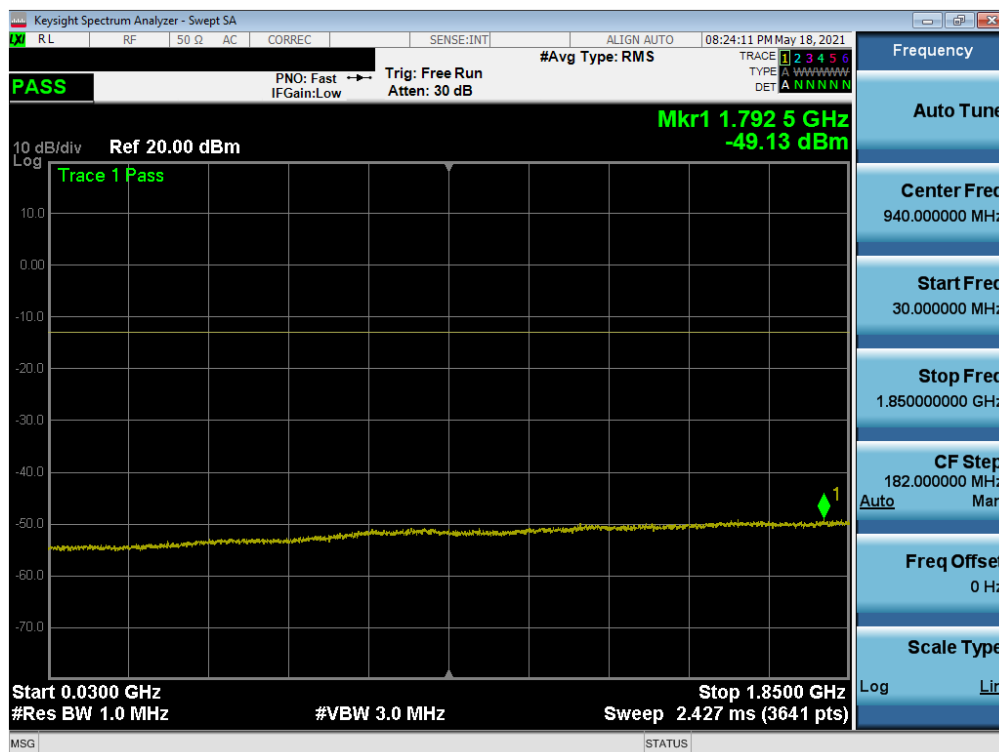


Plot 7-35. Conducted Spurious Plot (WCDMA Ch. 9262)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 35 of 86

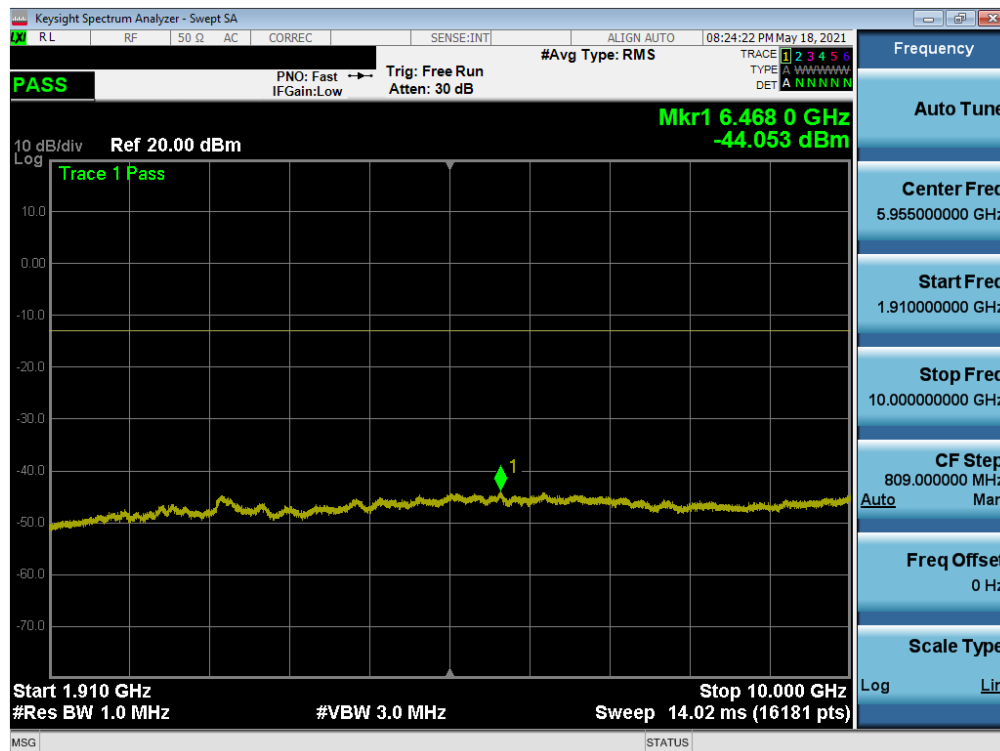


Plot 7-36. Conducted Spurious Plot (WCDMA Ch. 9262)

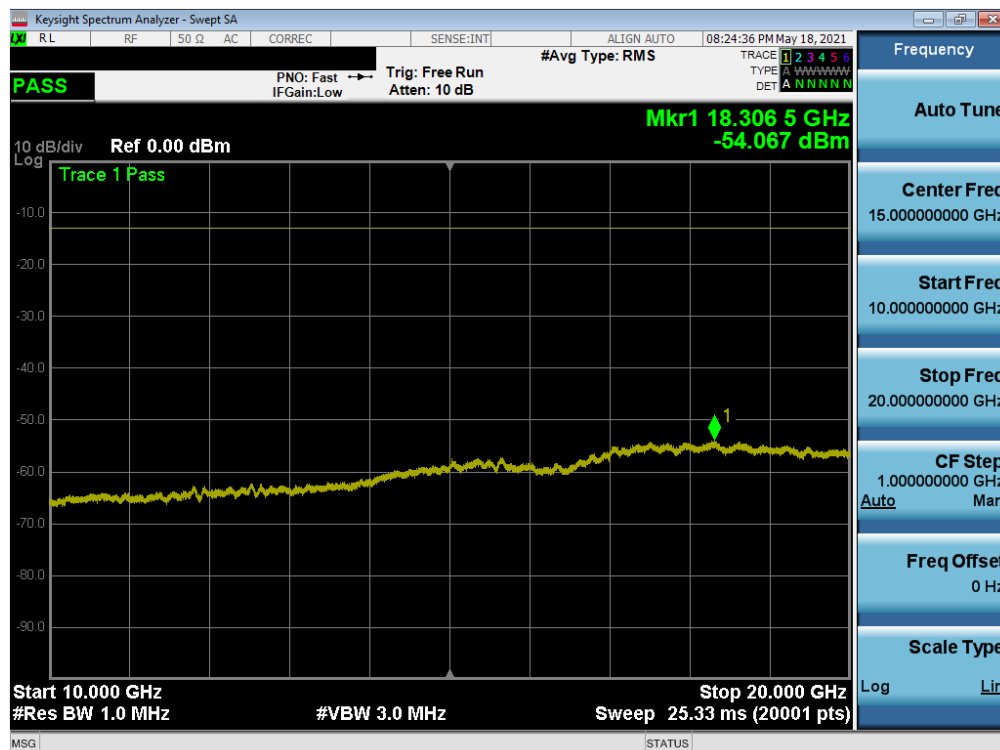


Plot 7-37. Conducted Spurious Plot (WCDMA Ch. 9400)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 36 of 86



Plot 7-38. Conducted Spurious Plot (WCDMA Ch. 9400)

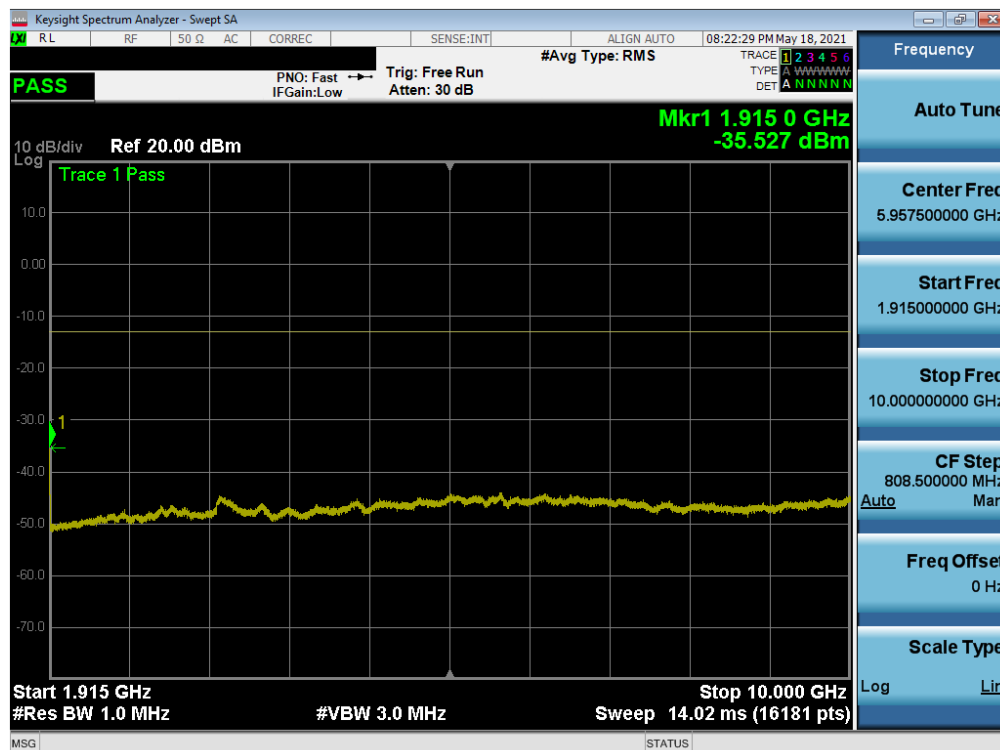


Plot 7-39. Conducted Spurious Plot (WCDMA Ch. 9400)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 37 of 86

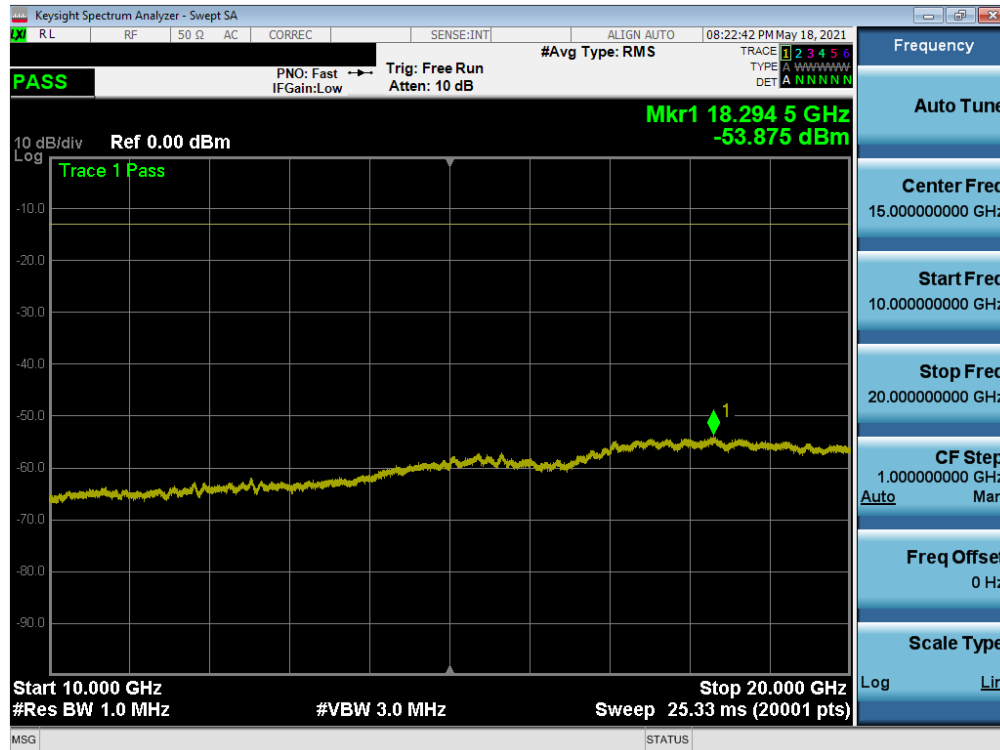


Plot 7-40. Conducted Spurious Plot (WCDMA Ch. 9538)



Plot 7-41. Conducted Spurious Plot (WCDMA Ch. 9538)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 38 of 86



Plot 7-42. Conducted Spurious Plot (WCDMA Ch. 9538)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 39 of 86

7.5 Band Edge Emissions at Antenna Terminal

Test Overview

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

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

Test Procedure Used

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.

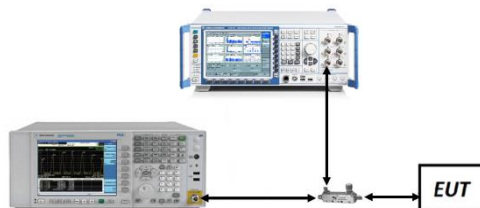


Figure 7-4. Test Instrument & Measurement Setup

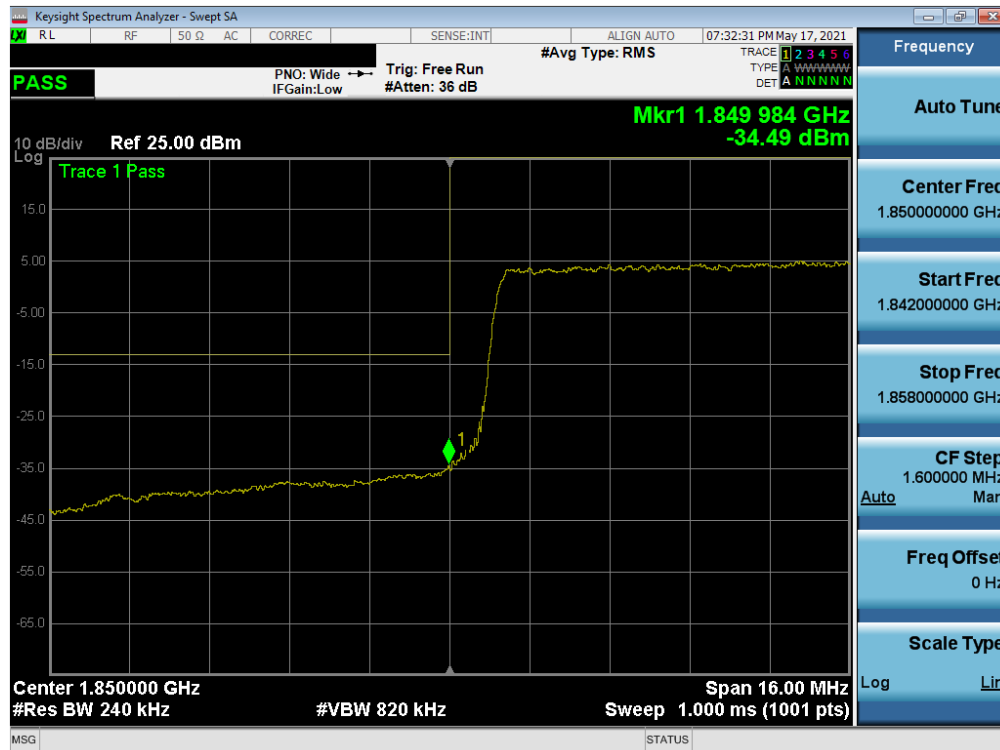
FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 40 of 86

Test Notes

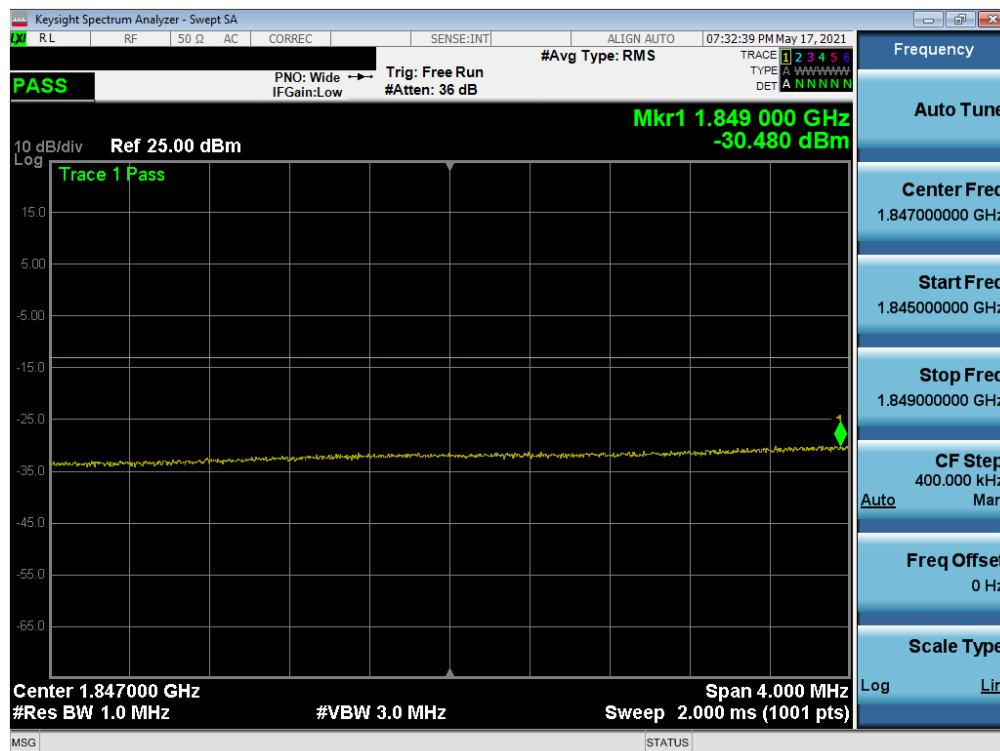
Per 24.238(a) and RSS-133(6.5), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. 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.

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 41 of 86

LTE Band 25/2

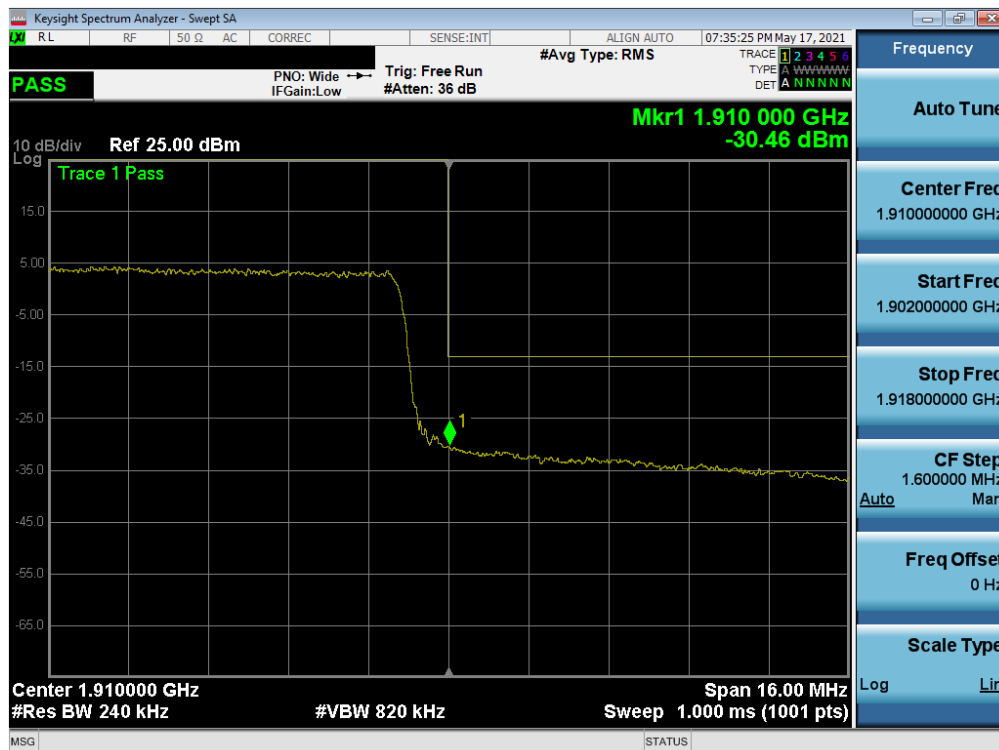


Plot 7-43. Lower Band Edge Plot (LTE Band 25/2 - 20MHz QPSK – Full RB)

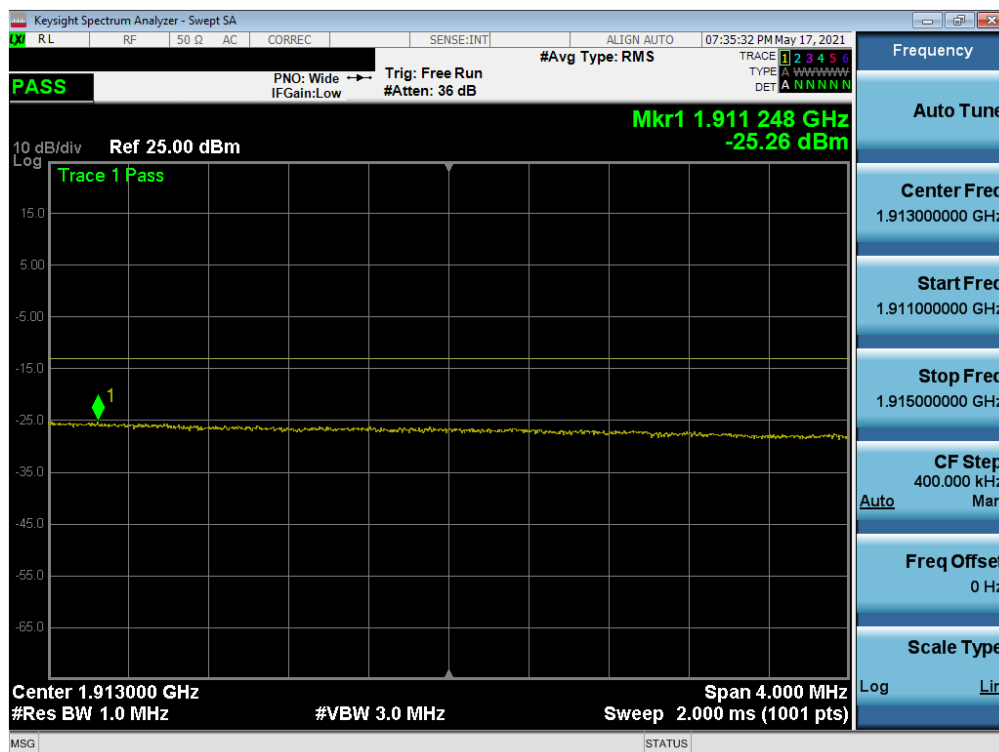


Plot 7-44. Extended Lower Band Edge Plot (LTE Band 25/2 - 20MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 42 of 86



Plot 7-45. Upper Band Edge Plot (LTE Band 2 - 20MHz QPSK – Full RB)



Plot 7-46. Extended Upper Band Edge Plot (LTE Band 2 - 20MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 43 of 86

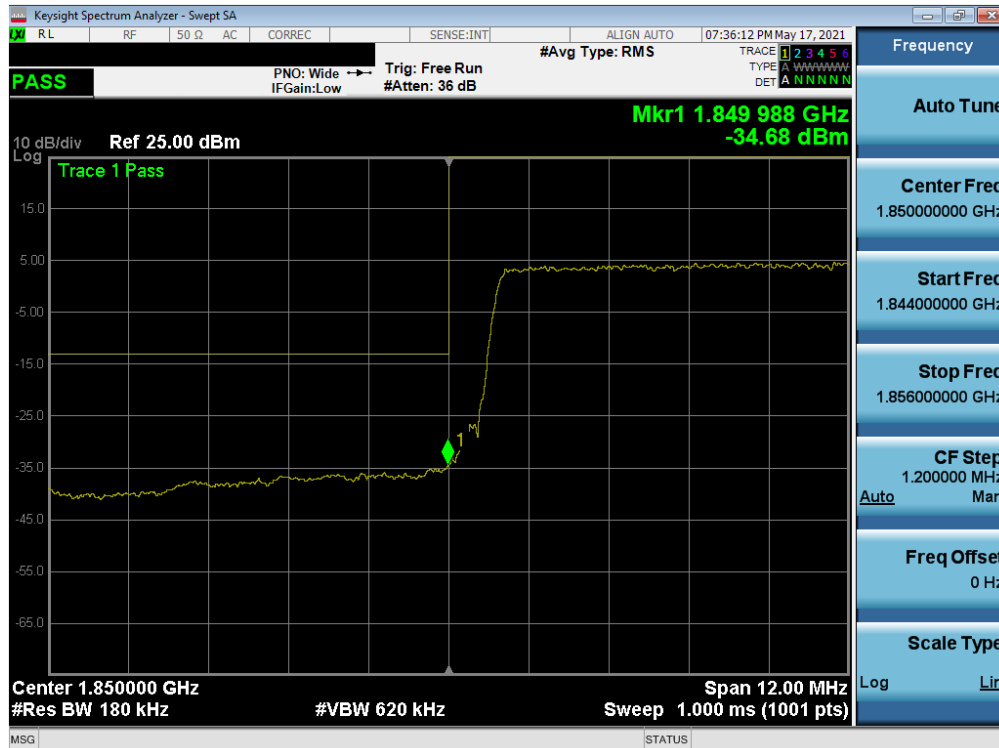


Plot 7-47. Upper Band Edge Plot (LTE Band 25 - 20MHz QPSK – Full RB)

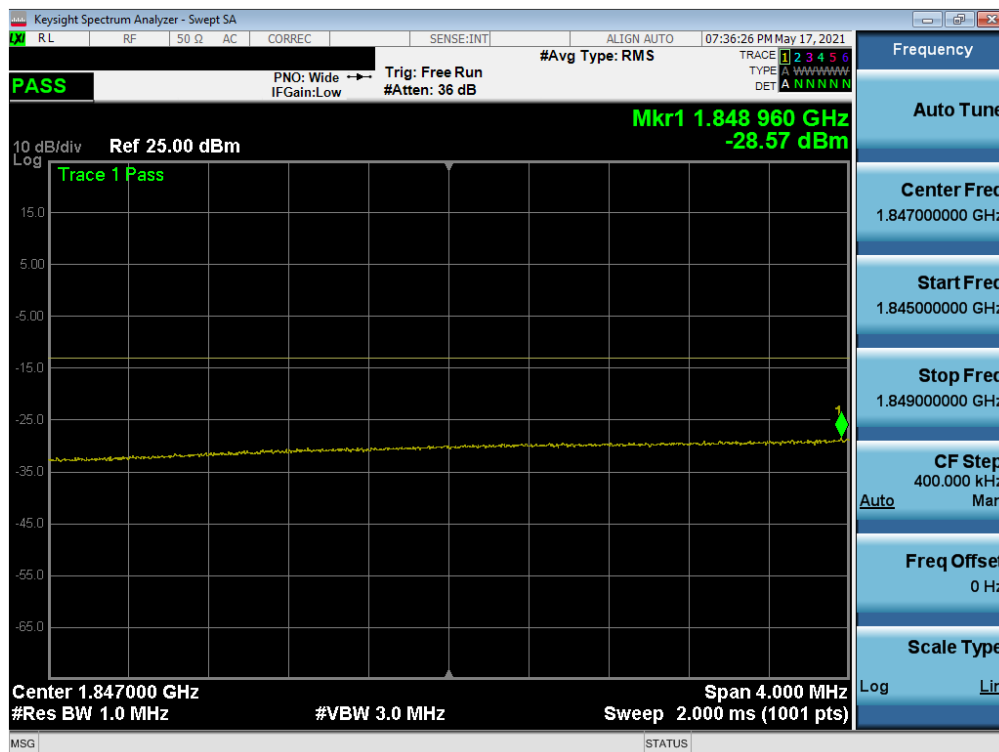


Plot 7-48. Extended Upper Band Edge Plot (LTE Band 25 - 20MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 44 of 86



Plot 7-49. Lower Band Edge Plot (LTE Band 25/2 - 15MHz QPSK – Full RB)



Plot 7-50. Extended Lower Band Edge Plot (LTE Band 25/2 - 15MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 45 of 86



Plot 7-51. Upper Band Edge Plot (LTE Band 2 - 15MHz QPSK – Full RB)



Plot 7-52. Extended Upper Band Edge Plot (LTE Band 2 - 15MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 46 of 86

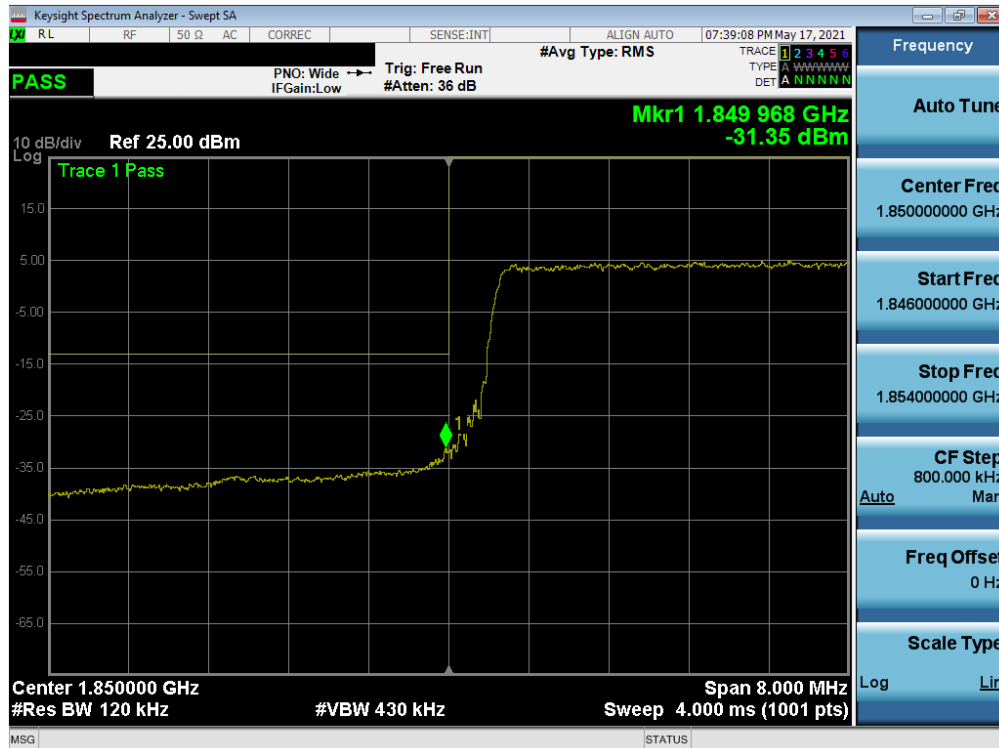


Plot 7-53. Upper Band Edge Plot (LTE Band 25 - 15MHz QPSK – Full RB)

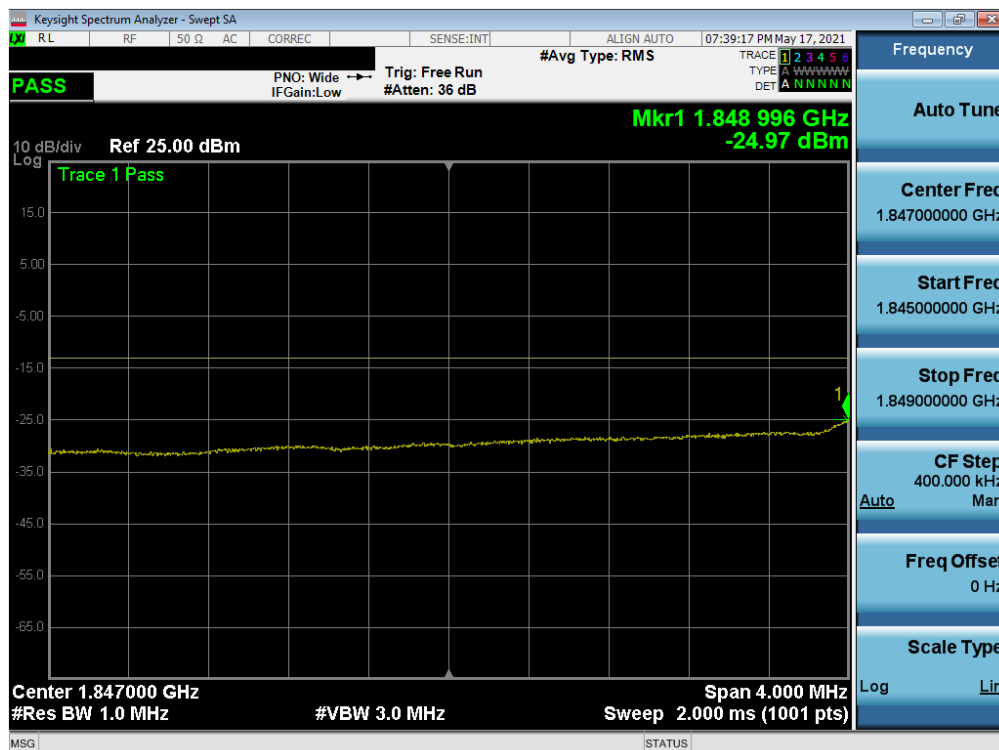


Plot 7-54. Extended Upper Band Edge Plot (LTE Band 25 - 15MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 47 of 86



Plot 7-55. Lower Band Edge Plot (LTE Band 25/2 - 10MHz QPSK – Full RB)



Plot 7-56. Extended Lower Band Edge Plot (LTE Band 25/2 - 10MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 48 of 86



Plot 7-57. Upper Band Edge Plot (LTE Band 2 - 10MHz QPSK – Full RB)



Plot 7-58. Extended Upper Band Edge Plot (LTE Band 2 - 10MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 49 of 86

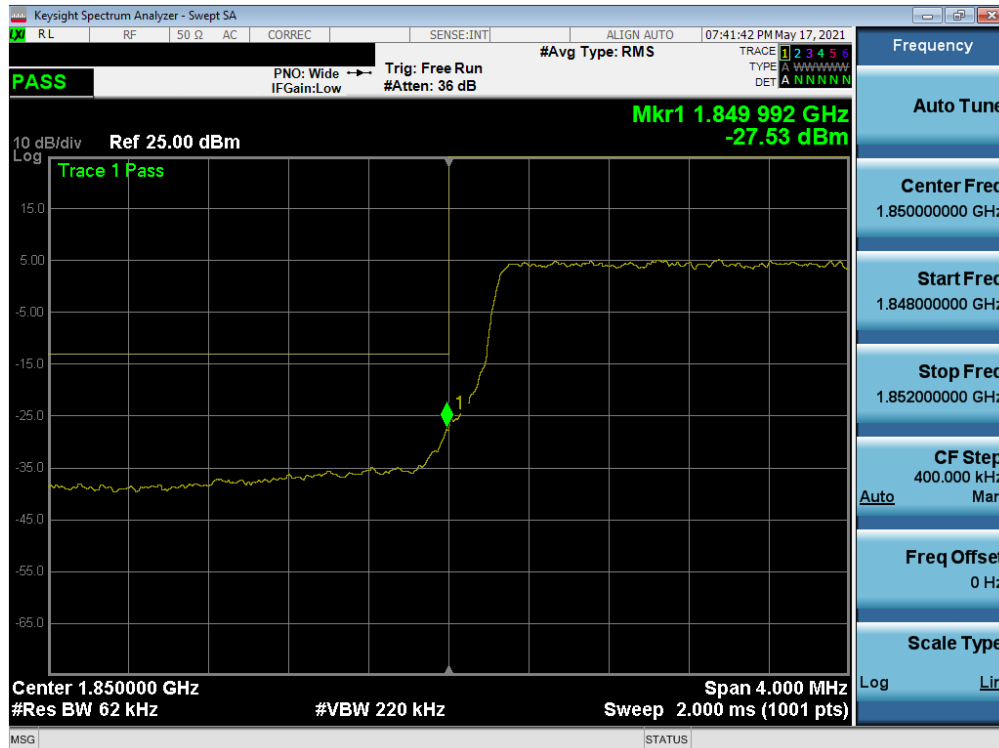


Plot 7-59. Upper Band Edge Plot (LTE Band 25 - 10MHz QPSK – Full RB)

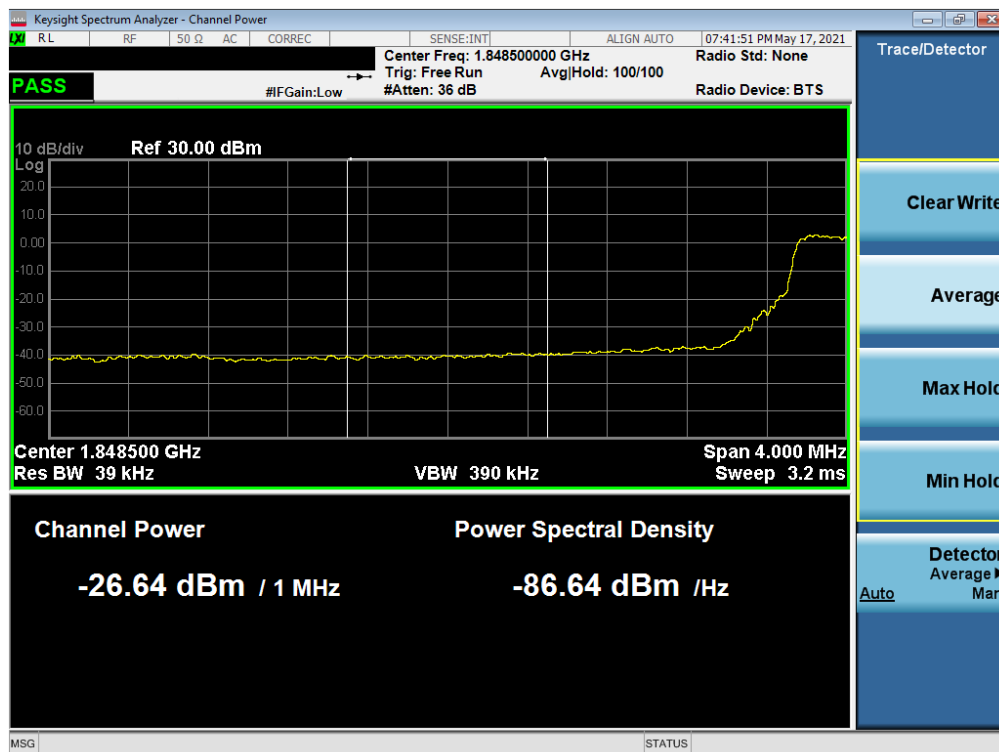


Plot 7-60. Extended Upper Band Edge Plot (LTE Band 25 - 10MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 50 of 86



Plot 7-61. Lower Band Edge Plot (LTE Band 25/2 - 5MHz QPSK – Full RB)

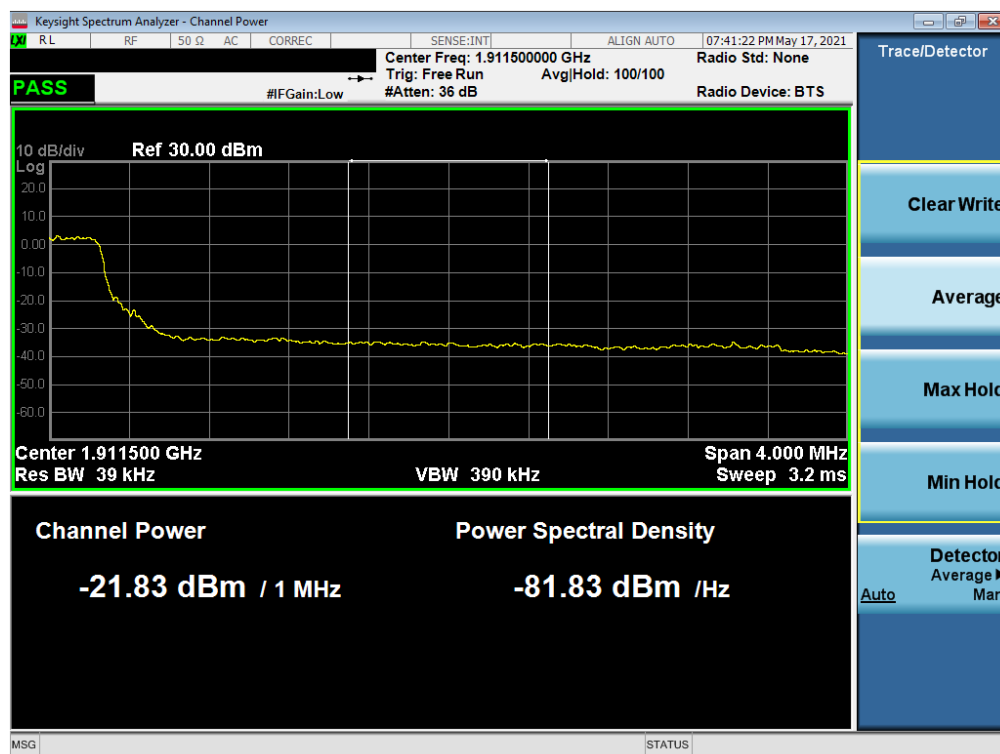


Plot 7-62. Extended Lower Band Edge Plot (LTE Band 25/2 - 5MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 51 of 86



Plot 7-63. Upper Band Edge Plot (LTE Band 2 - 5MHz QPSK – Full RB)

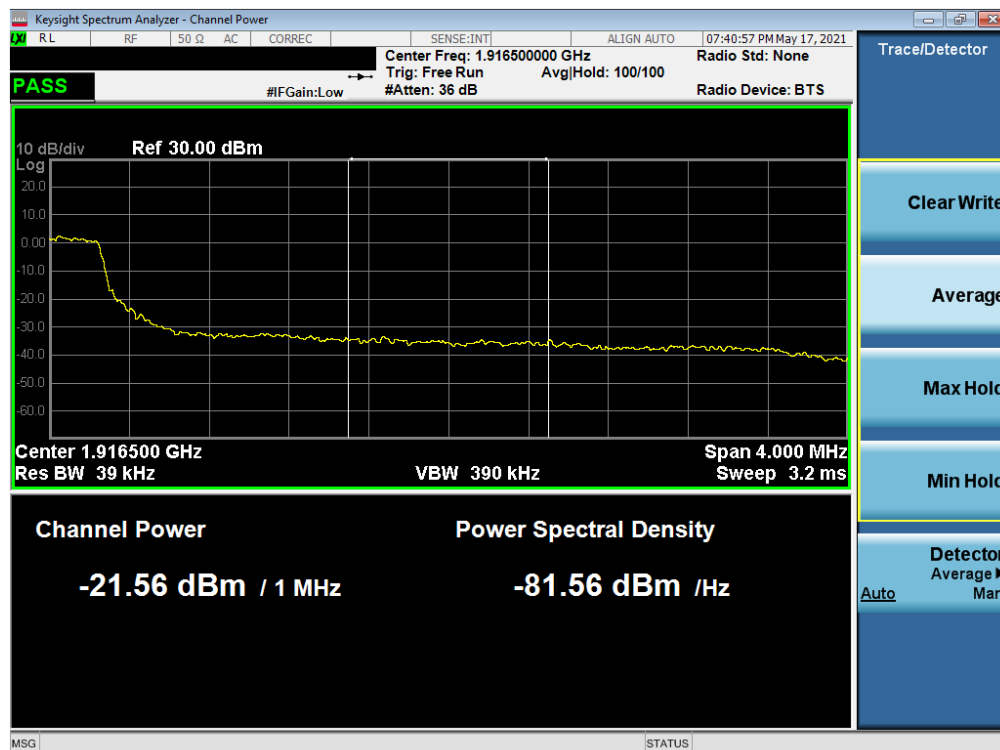


Plot 7-64. Extended Upper Band Edge Plot (LTE Band 2 - 5MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 52 of 86

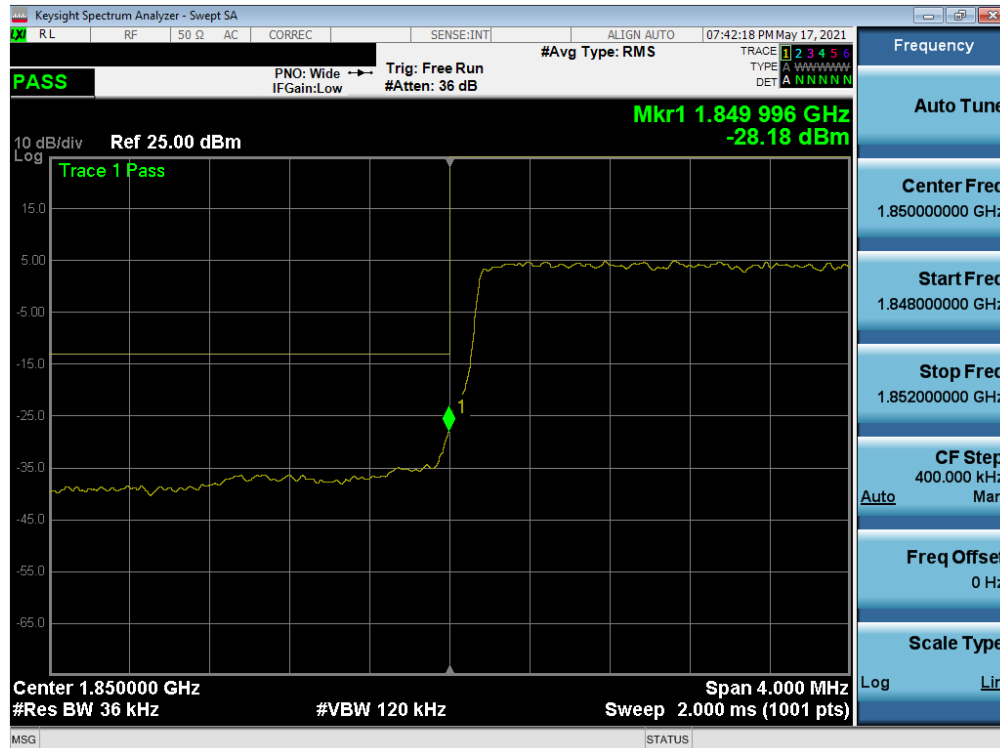


Plot 7-65. Upper Band Edge Plot (LTE Band 25 - 5MHz QPSK – Full RB)

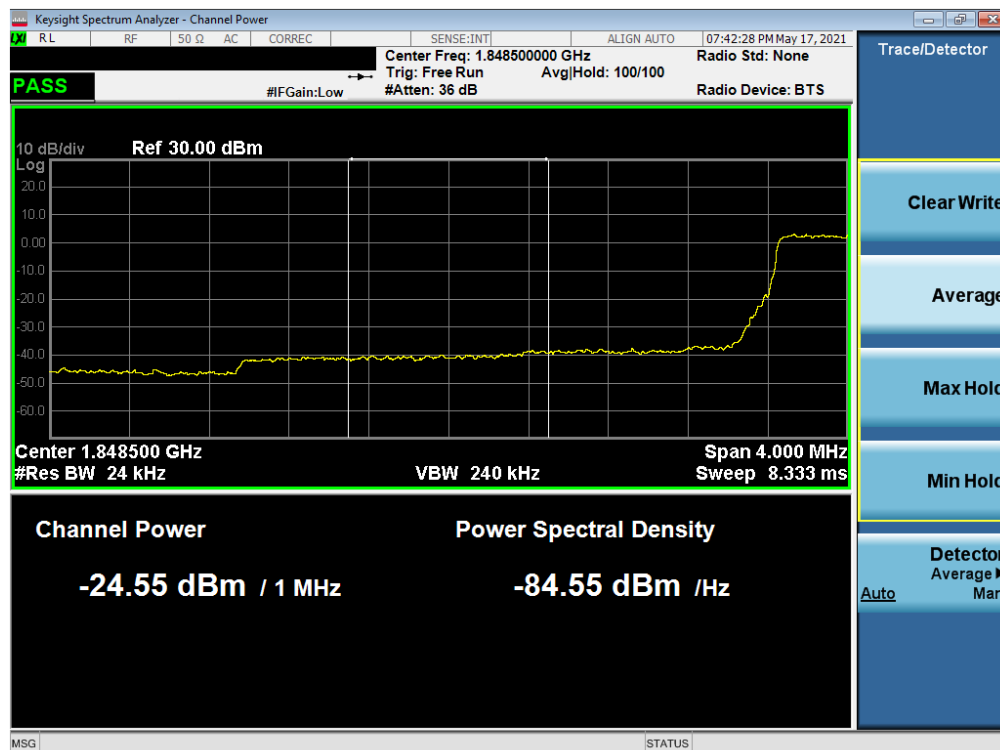


Plot 7-66. Extended Upper Band Edge Plot (LTE Band 25 - 5MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 53 of 86

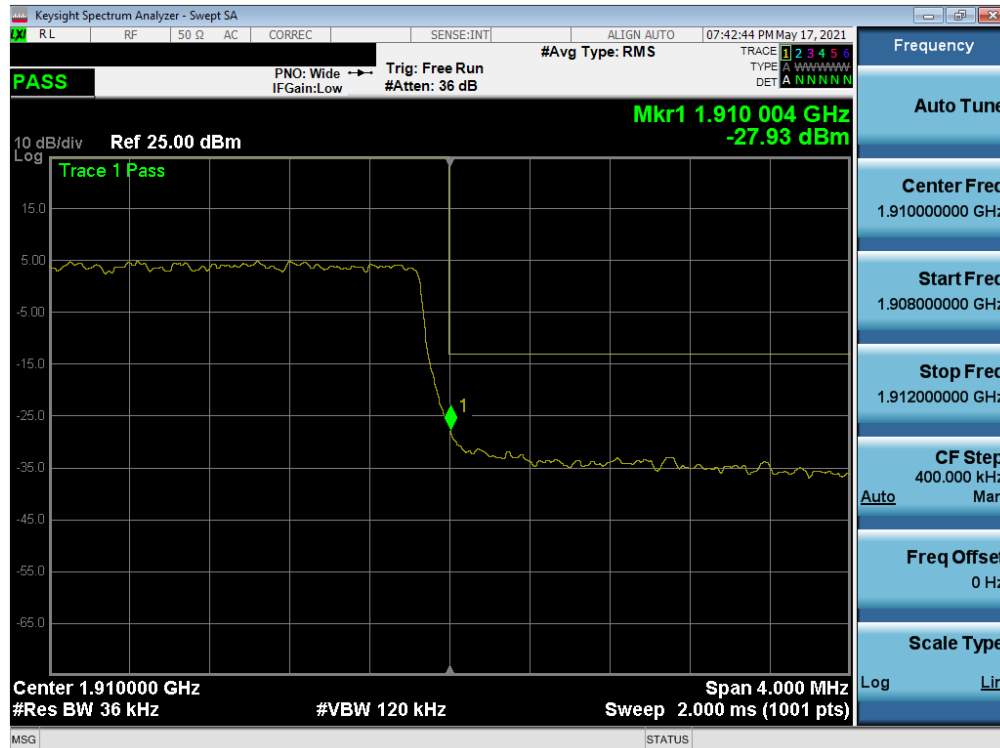


Plot 7-67. Lower Band Edge Plot (LTE Band 25/2 - 3MHz QPSK – Full RB)

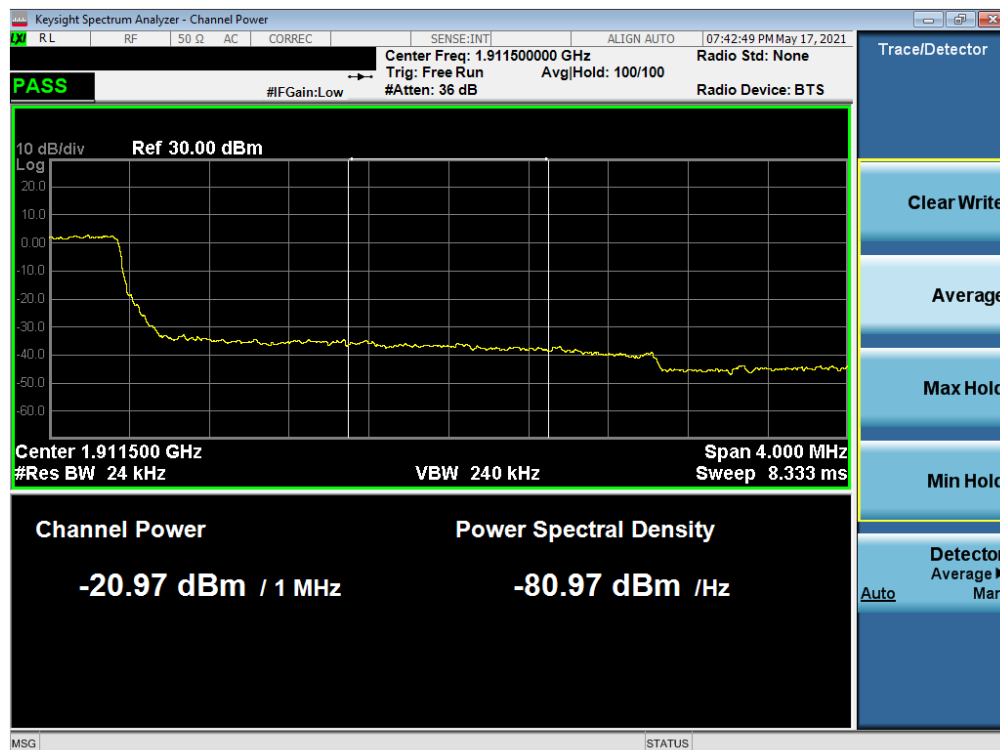


Plot 7-68. Extended Lower Band Edge Plot (LTE Band 25/2 - 3MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 54 of 86



Plot 7-69. Upper Band Edge Plot (LTE Band 2 - 3MHz QPSK – Full RB)

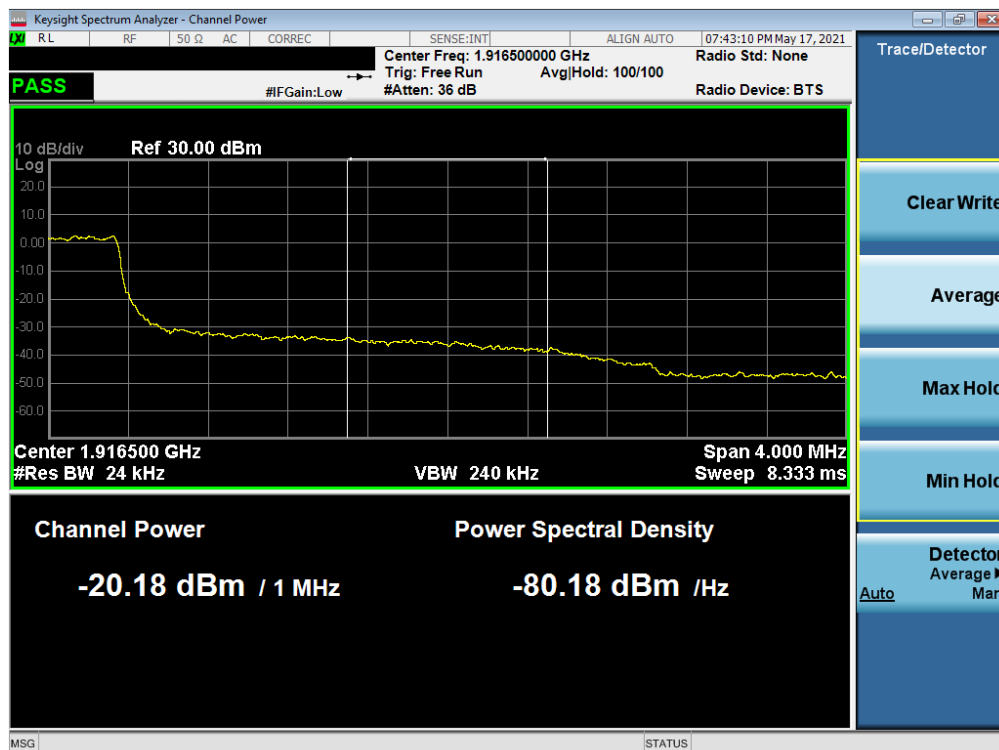


Plot 7-70. Extended Upper Band Edge Plot (LTE Band 2 - 3MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 55 of 86

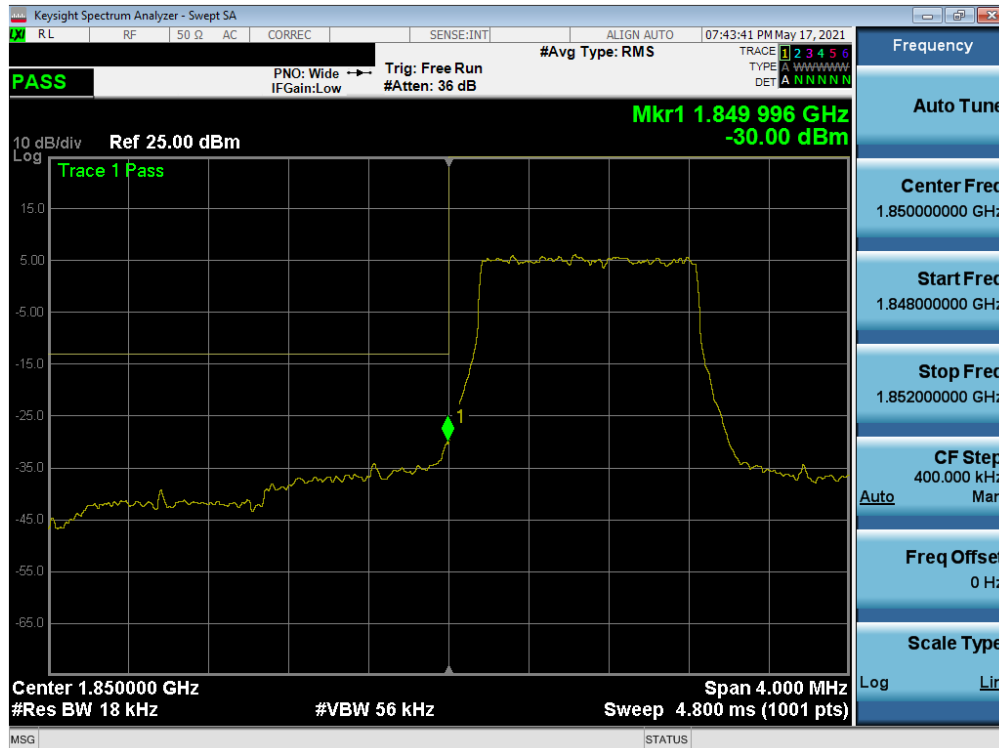


Plot 7-71. Upper Band Edge Plot (LTE Band 25 - 3MHz QPSK – Full RB)

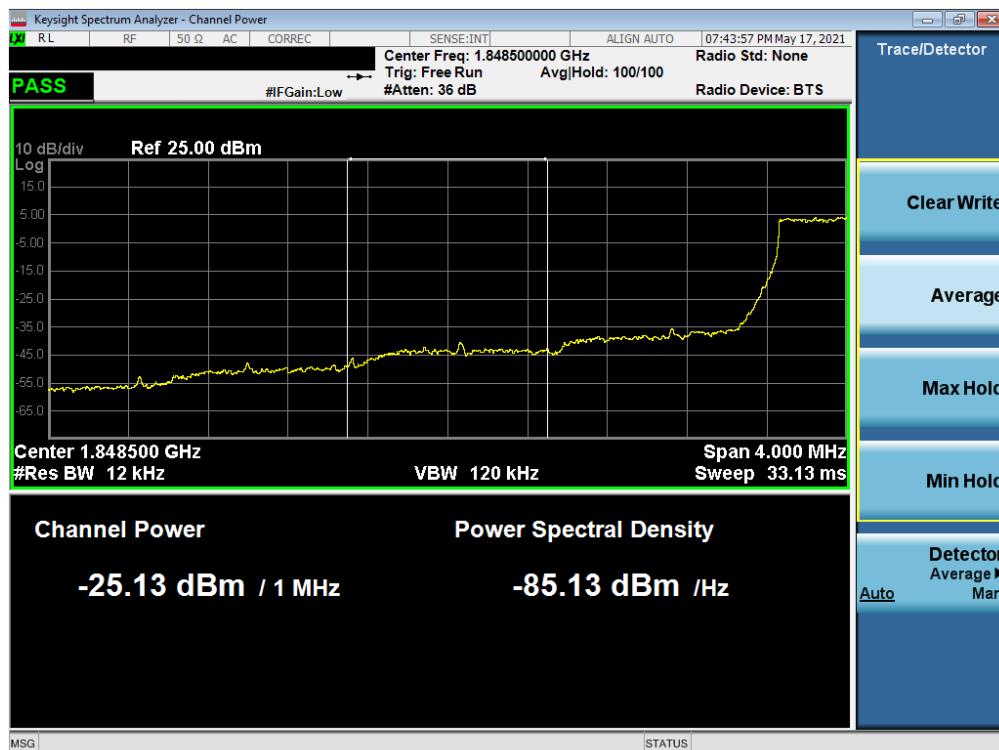


Plot 7-72. Extended Upper Band Edge Plot (LTE Band 25 - 3MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 56 of 86



Plot 7-73. Lower Band Edge Plot (LTE Band 25/2 – 1.4MHz QPSK – Full RB)

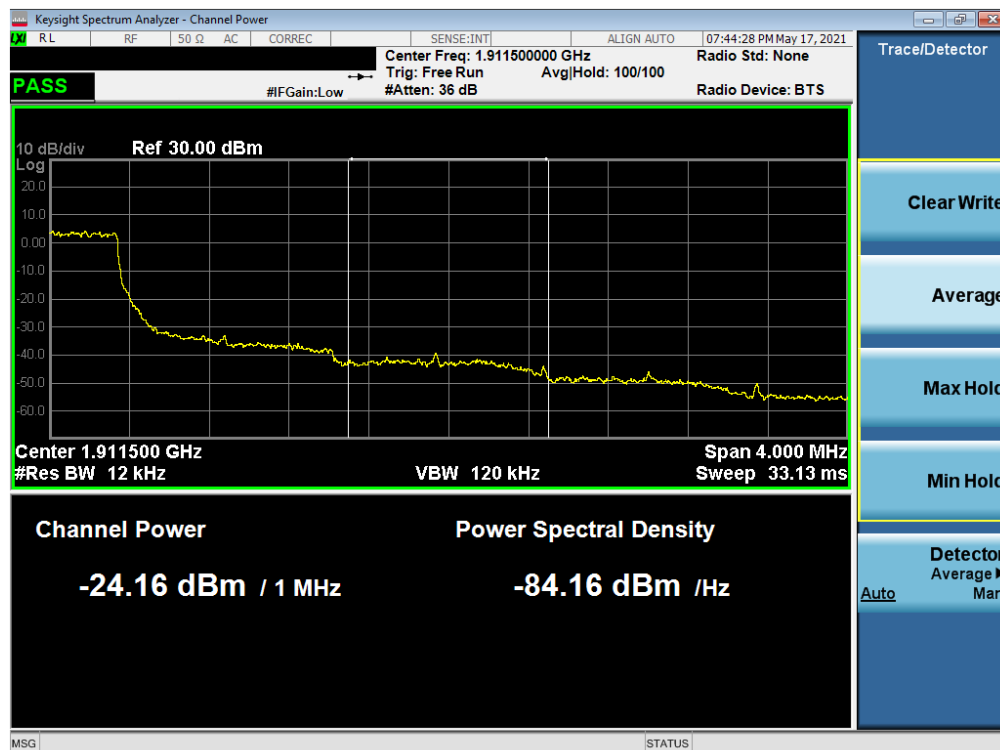


Plot 7-74. Extended Lower Band Edge Plot (LTE Band 25/2 – 1.4MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 57 of 86



Plot 7-75. Upper Band Edge Plot (LTE Band 2 – 1.4MHz QPSK – Full RB)

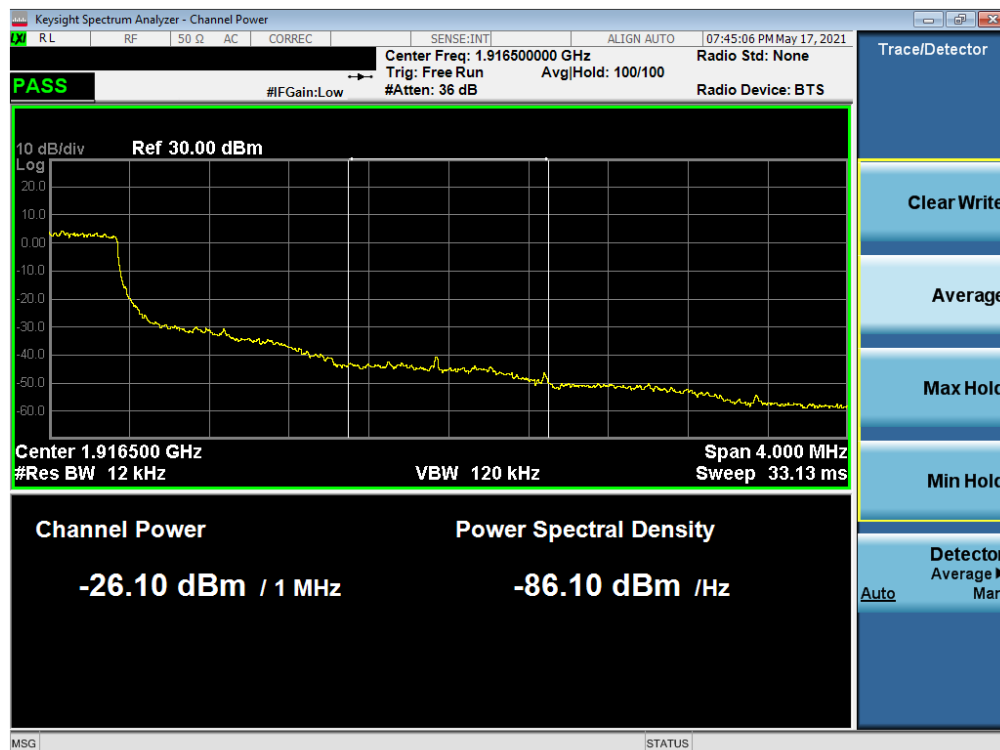


Plot 7-76. Extended Upper Band Edge Plot (LTE Band 2 – 1.4MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 58 of 86



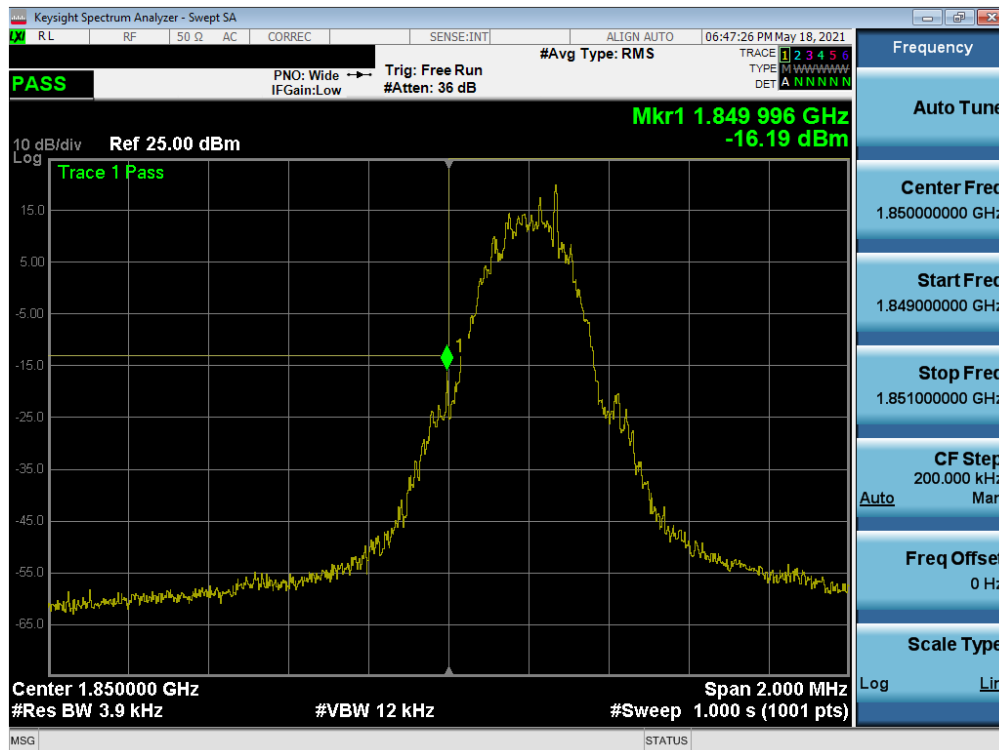
Plot 7-77. Upper Band Edge Plot (LTE Band 25 – 1.4MHz QPSK – Full RB)



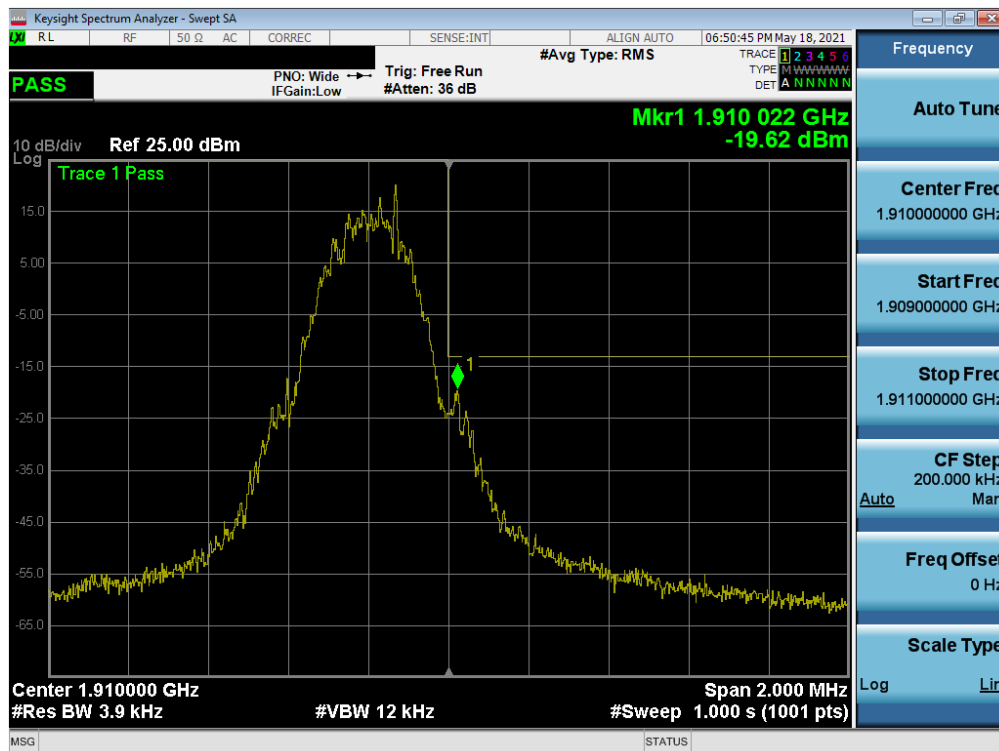
Plot 7-78. Extended Upper Band Edge Plot (LTE Band 25 – 1.4MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 59 of 86

GSM/GPRS PCS



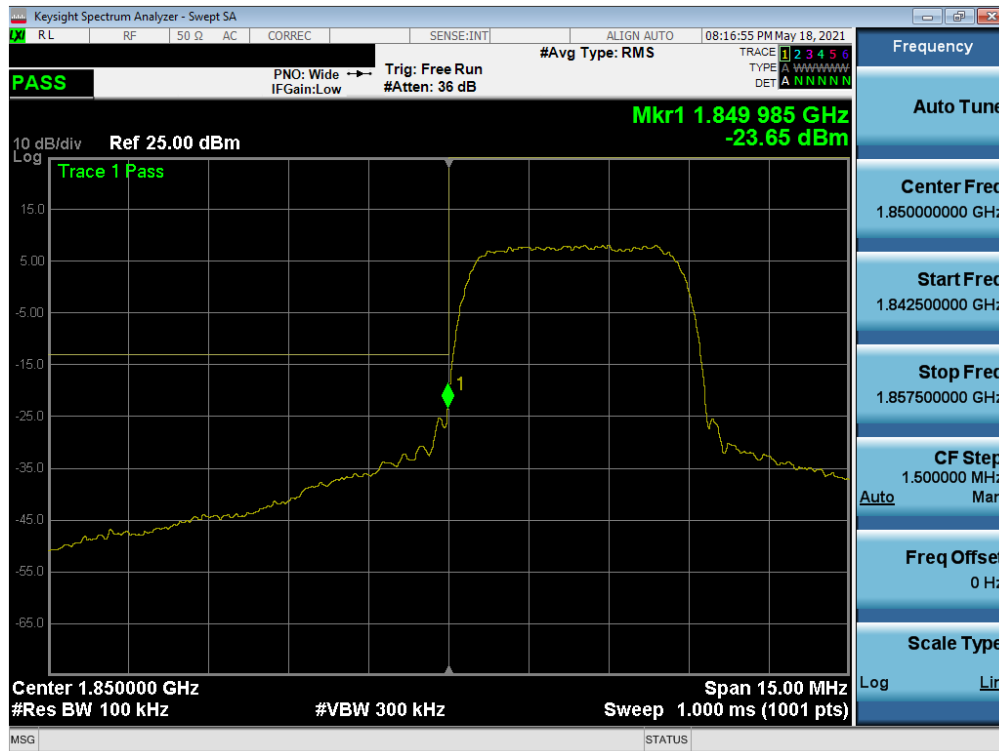
Plot 7-79. Lower Band Edge Plot (GPRS PCS – Ch. 512)



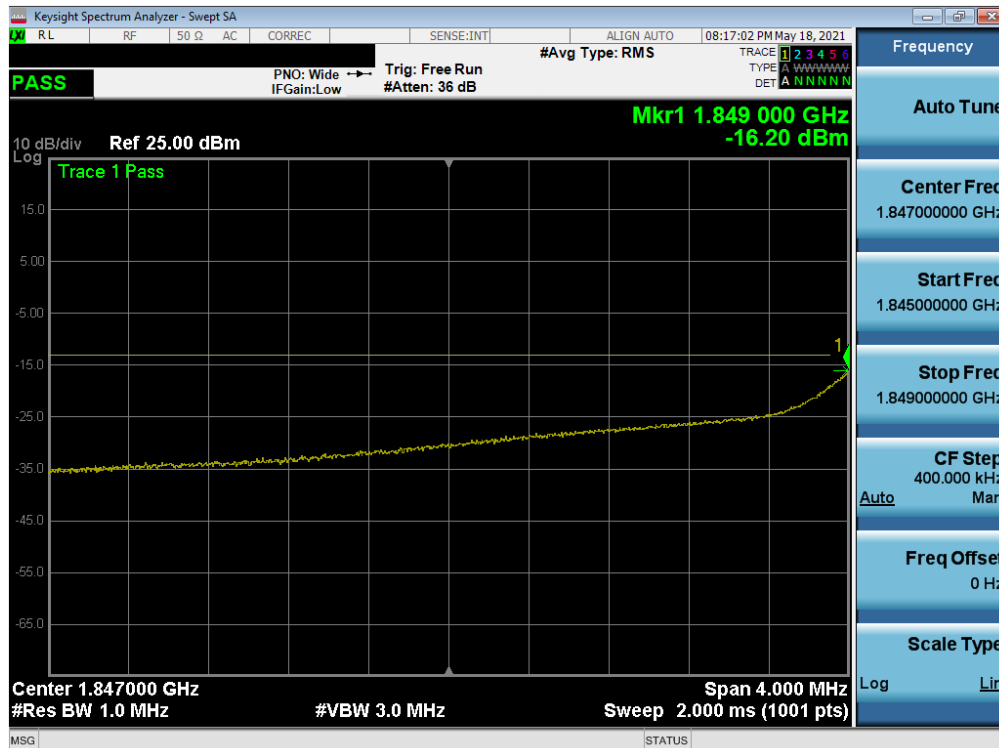
Plot 7-80. Upper Band Edge Plot (GPRS PCS – Ch. 810)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 60 of 86

WCDMA PCS



Plot 7-81. Lower Band Edge Plot (WCDMA PCS – Ch. 9262)

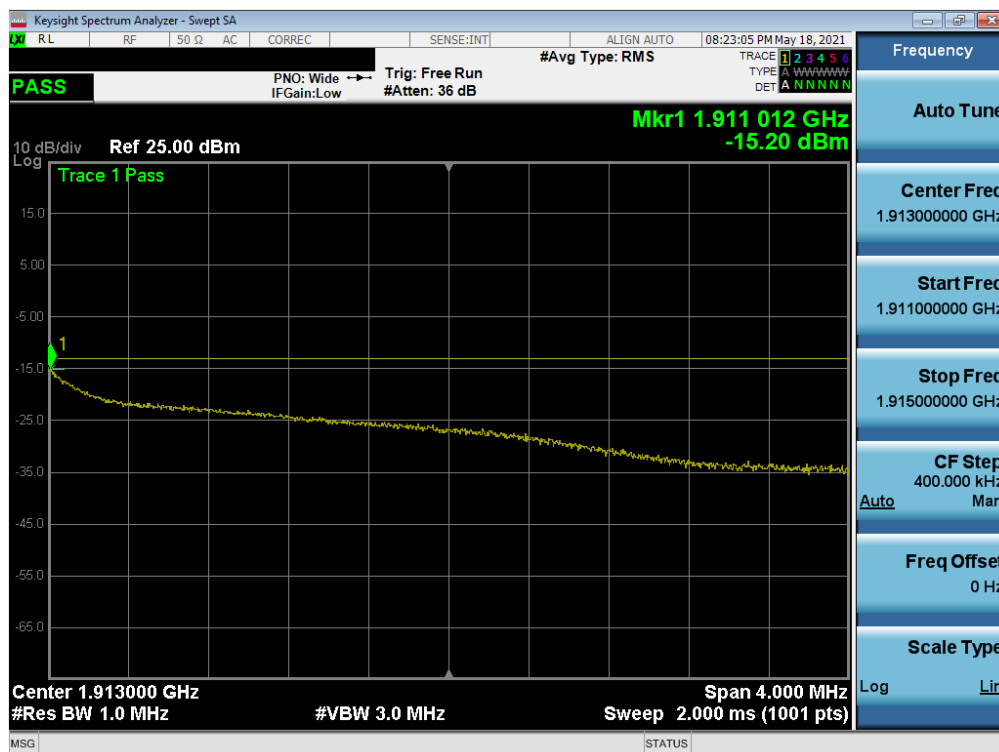


Plot 7-82. Extended Lower Band Edge Plot (WCDMA PCS – Ch. 9262)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 61 of 86



Plot 7-83. Upper Band Edge Plot (WCDMA PCS – Ch. 9538)



Plot 7-84. Extended Upper Band Edge Plot (WCDMA PCS – Ch. 9538)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 62 of 86

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.

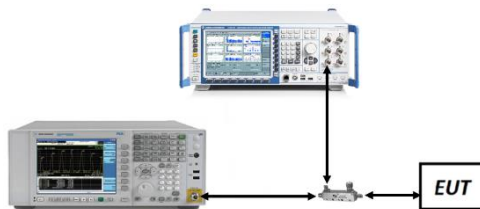


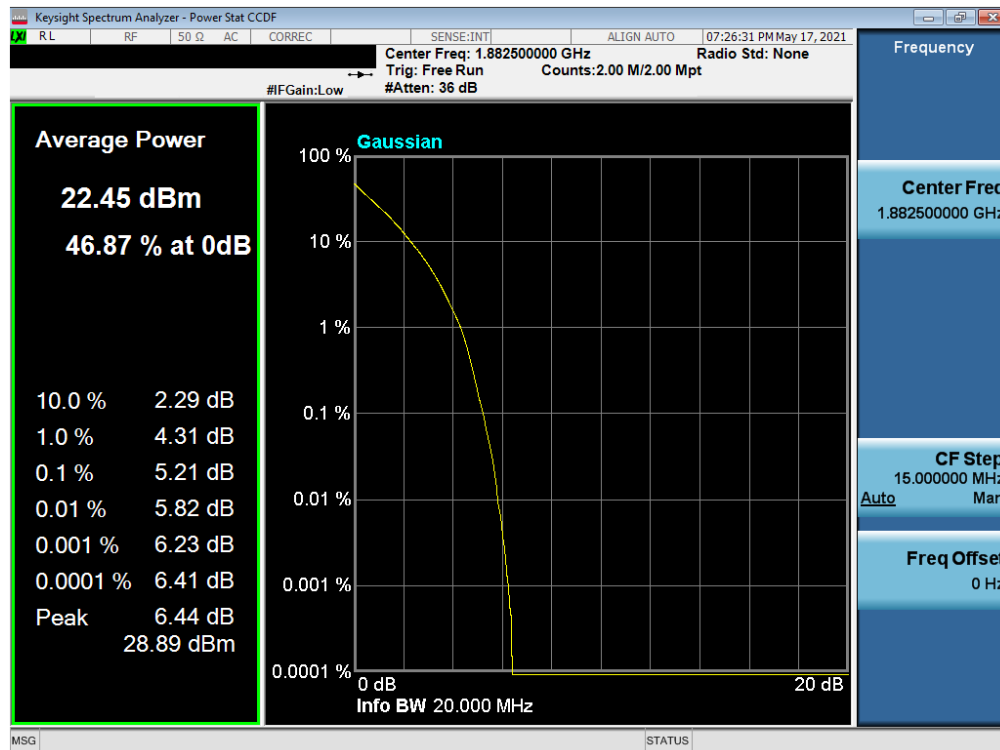
Figure 7-5. Test Instrument & Measurement Setup

Test Notes

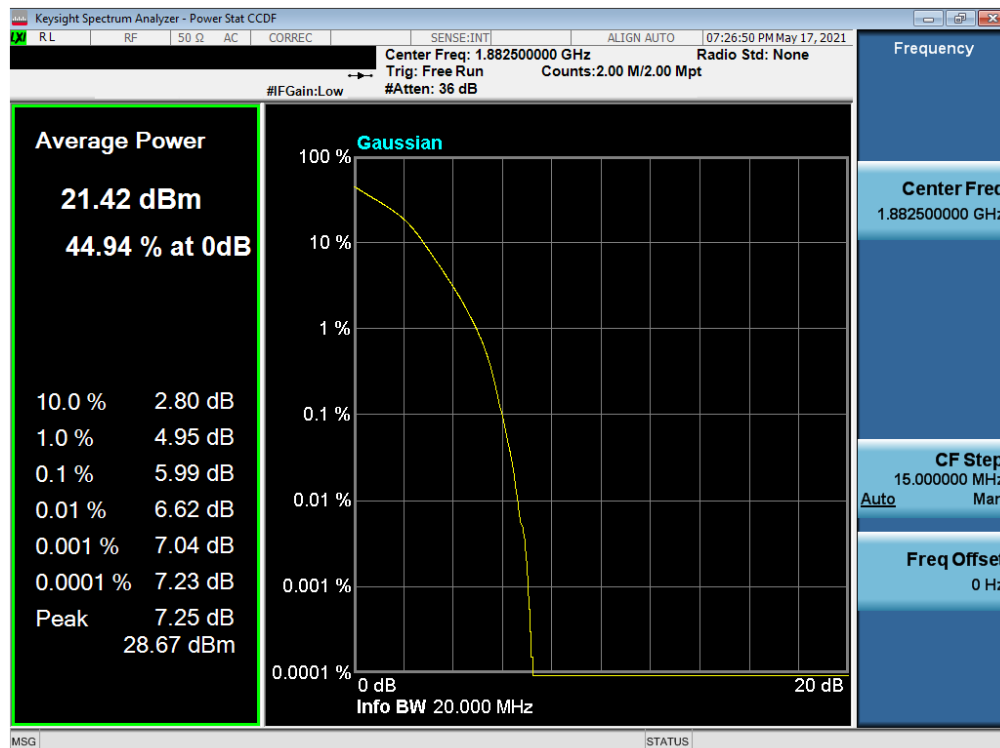
None.

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 63 of 86

LTE Band 25/2

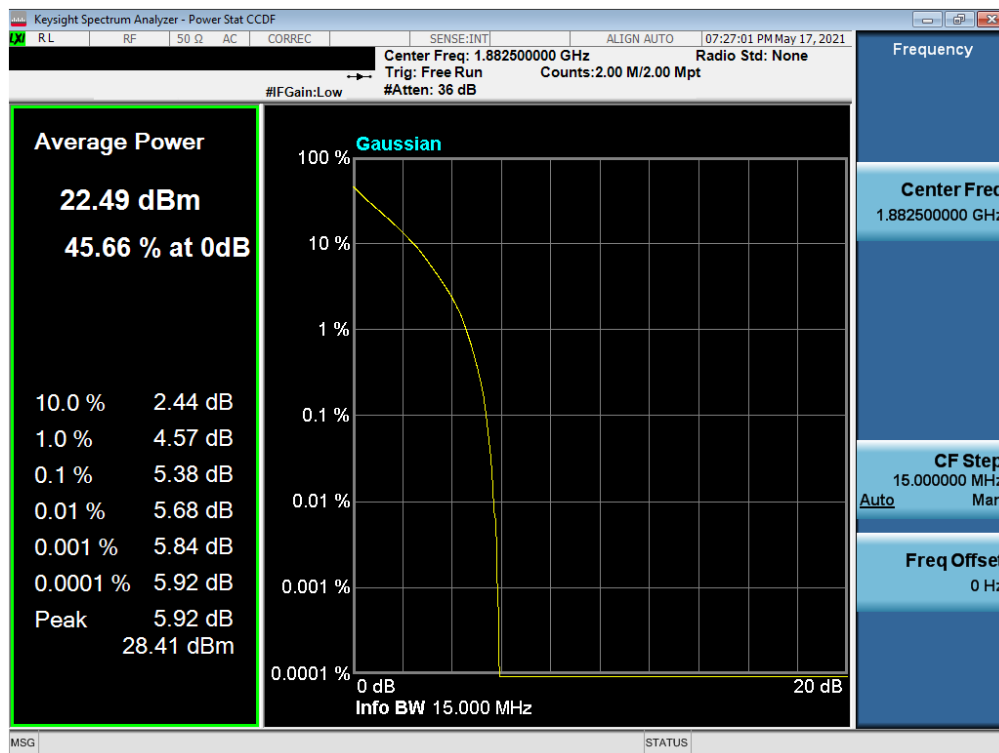


Plot 7-85. PAR Plot (LTE Band 25/2 - 20MHz QPSK - Full RB)

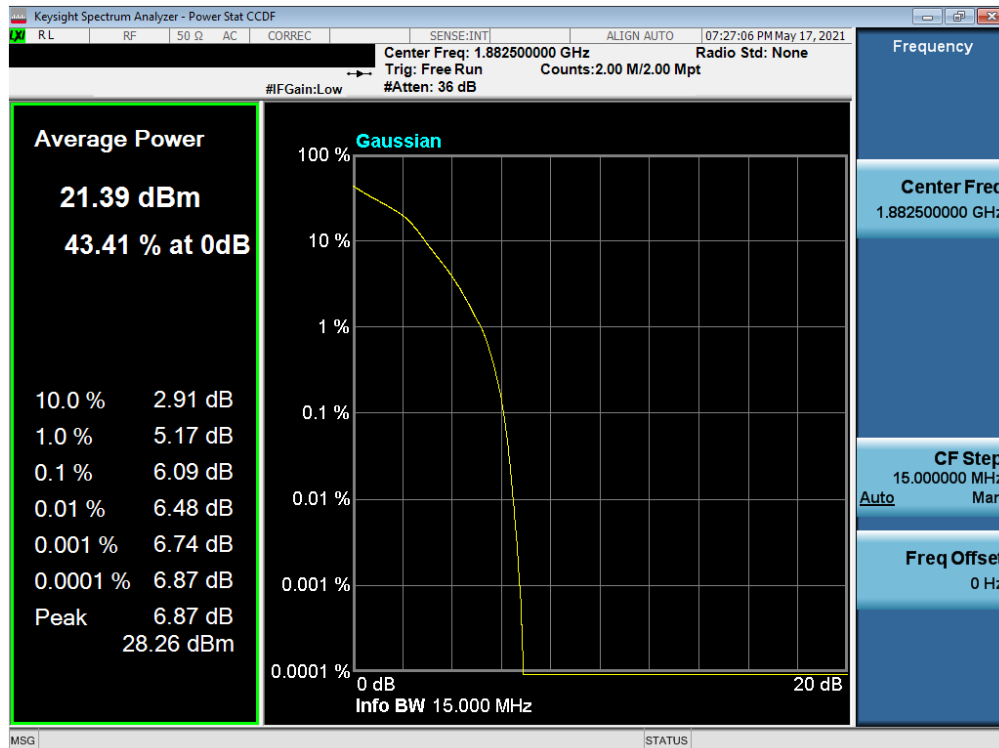


Plot 7-86. PAR Plot (LTE Band 25/2 - 20MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 64 of 86

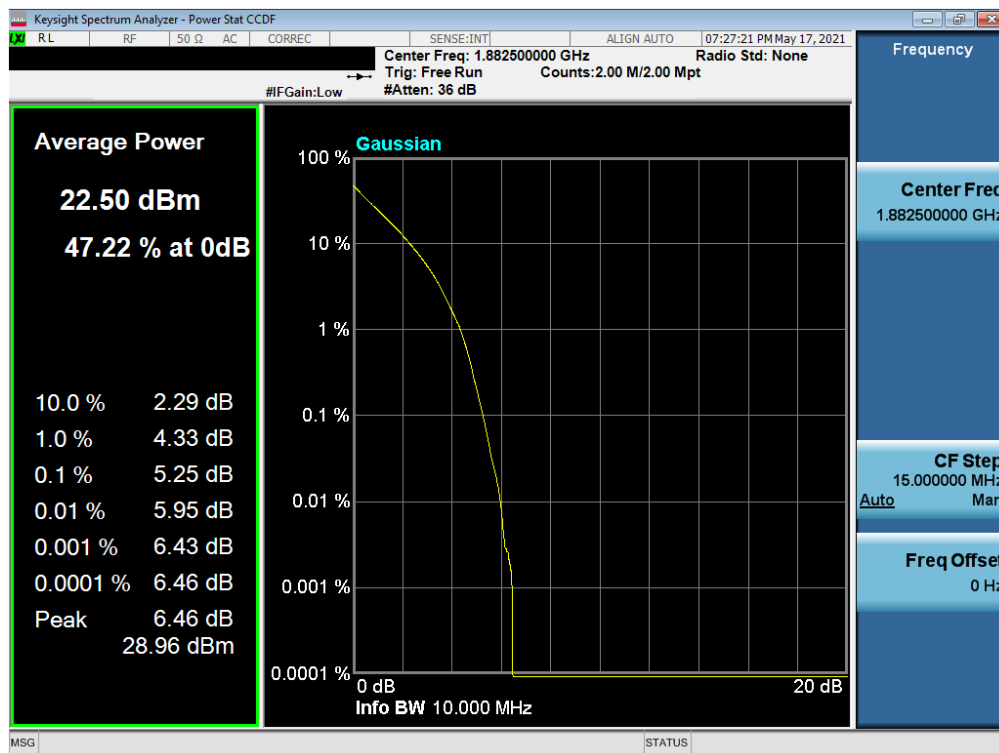


Plot 7-87. PAR Plot (LTE Band 25/2 - 15MHz QPSK - Full RB)

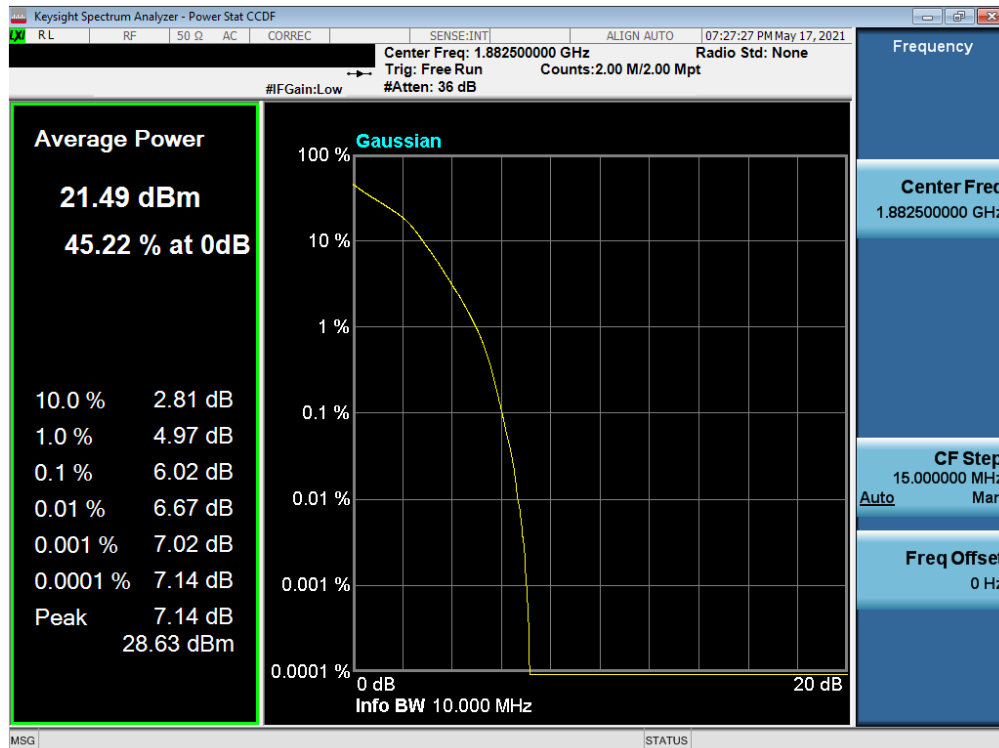


Plot 7-88. PAR Plot (LTE Band 25/2 - 15MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 65 of 86

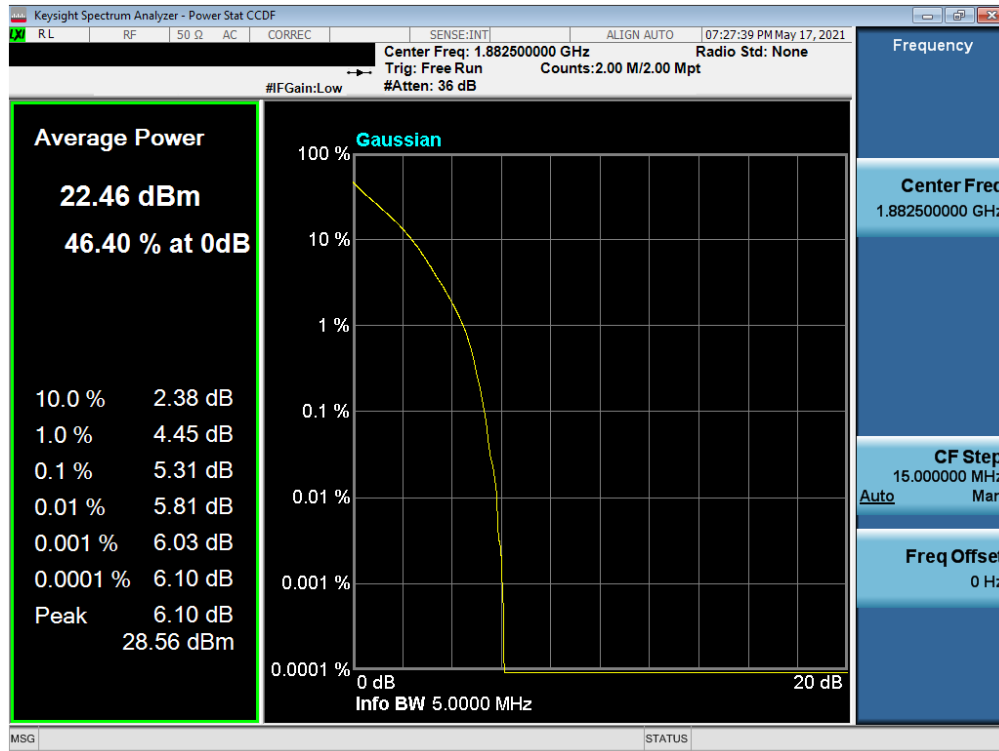


Plot 7-89. PAR Plot (LTE Band 25/2 - 10MHz QPSK - Full RB)

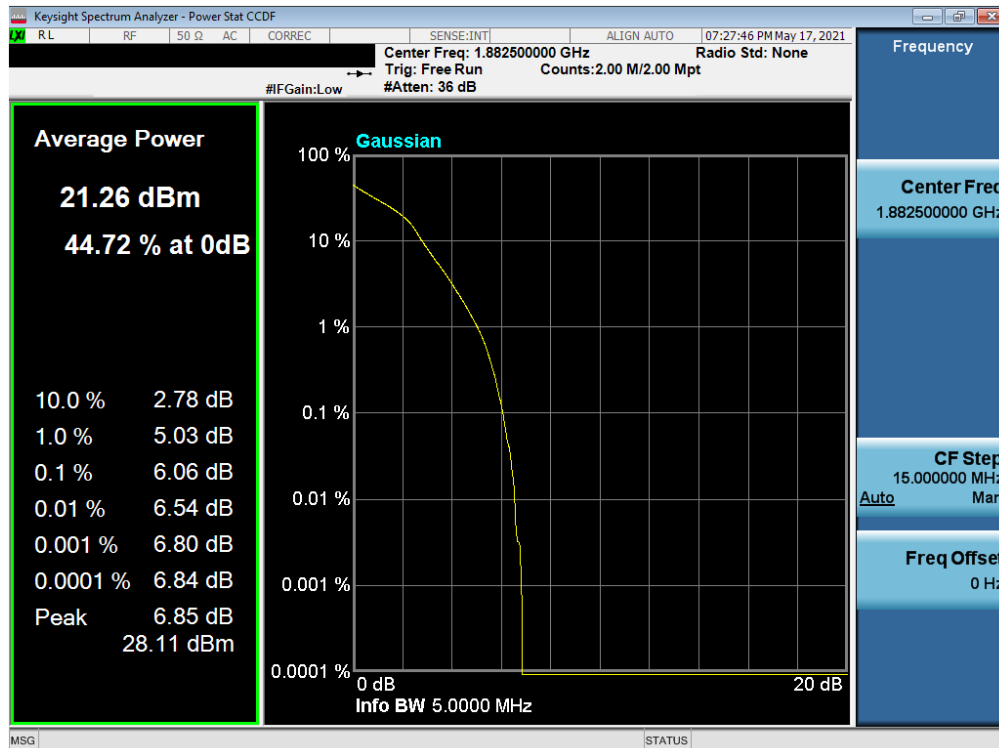


Plot 7-90. PAR Plot (LTE Band 25/2 - 10MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 66 of 86

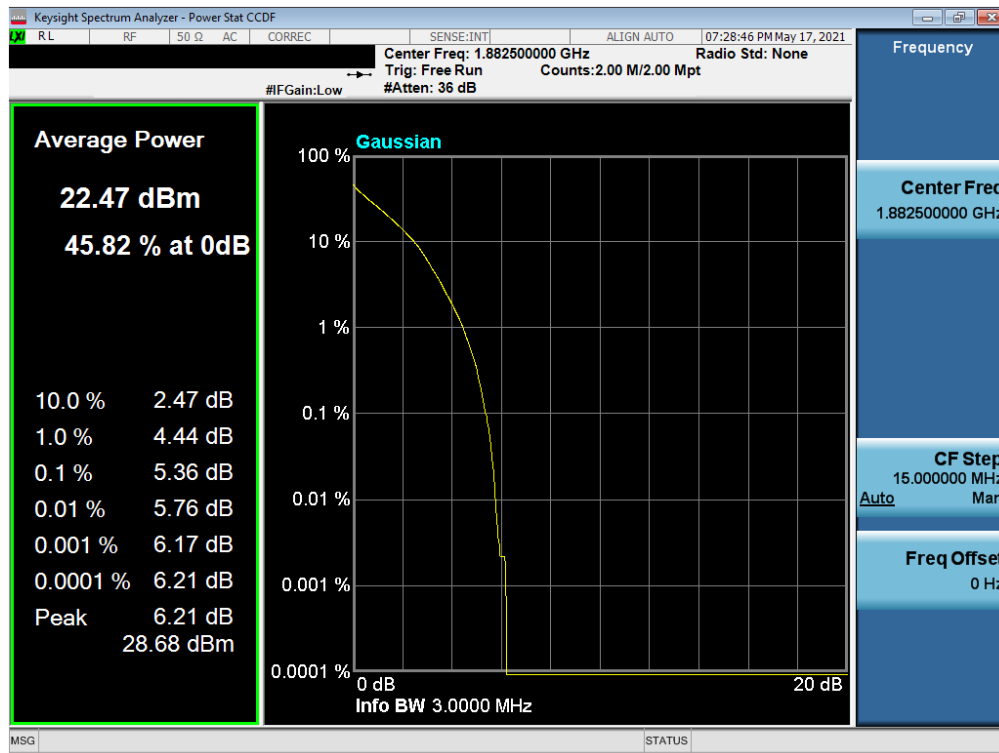


Plot 7-91. PAR Plot (LTE Band 25/2 - 5MHz QPSK - Full RB)

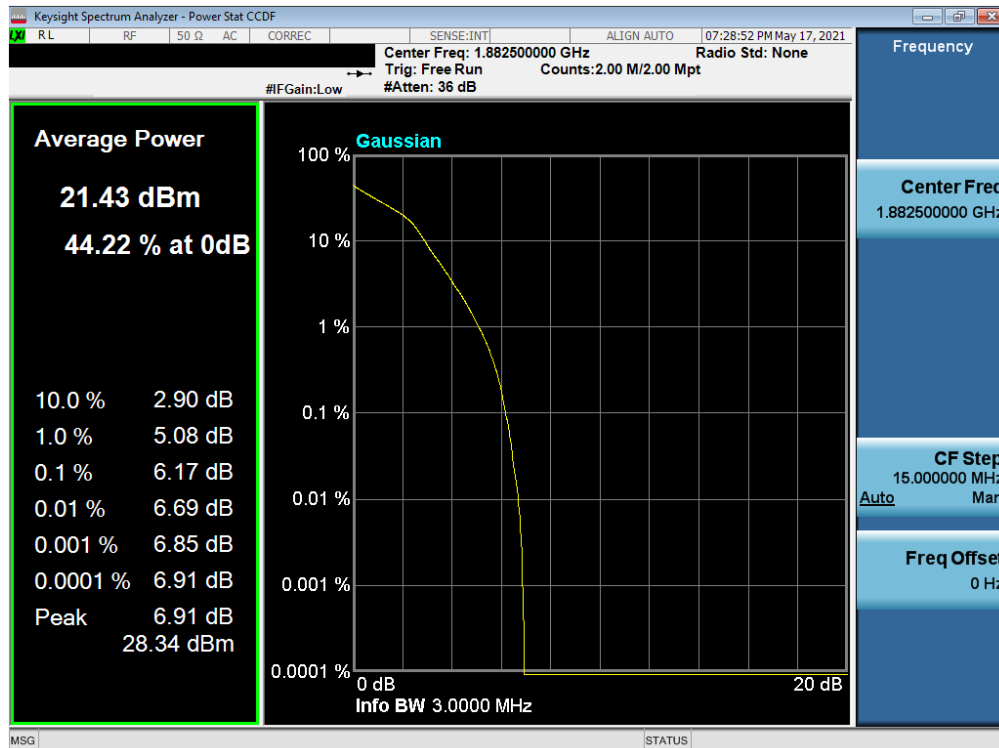


Plot 7-92. PAR Plot (LTE Band 25/2 - 5MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 67 of 86

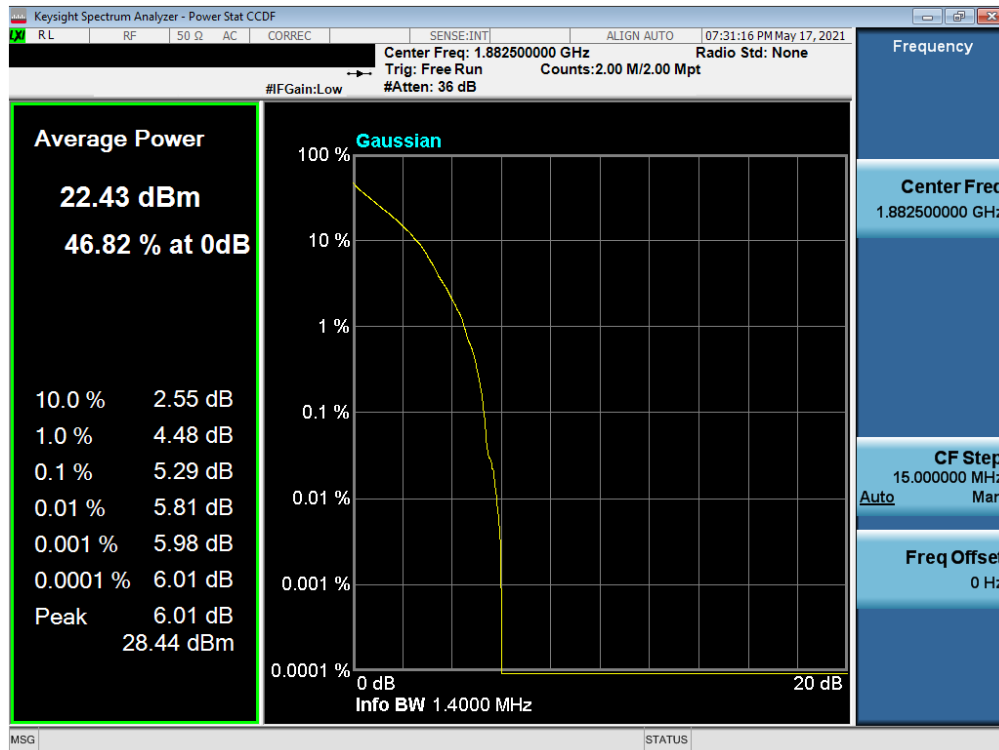


Plot 7-93. PAR Plot (LTE Band 25/2 - 3MHz QPSK - Full RB)

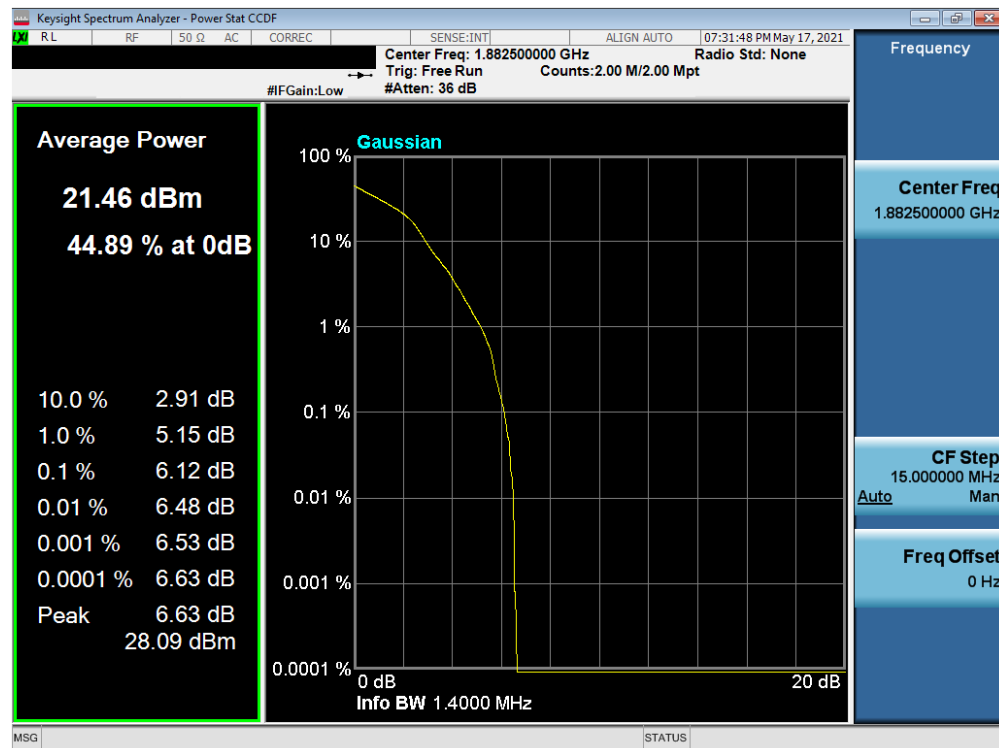


Plot 7-94. PAR Plot (LTE Band 25/2 - 3MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 68 of 86



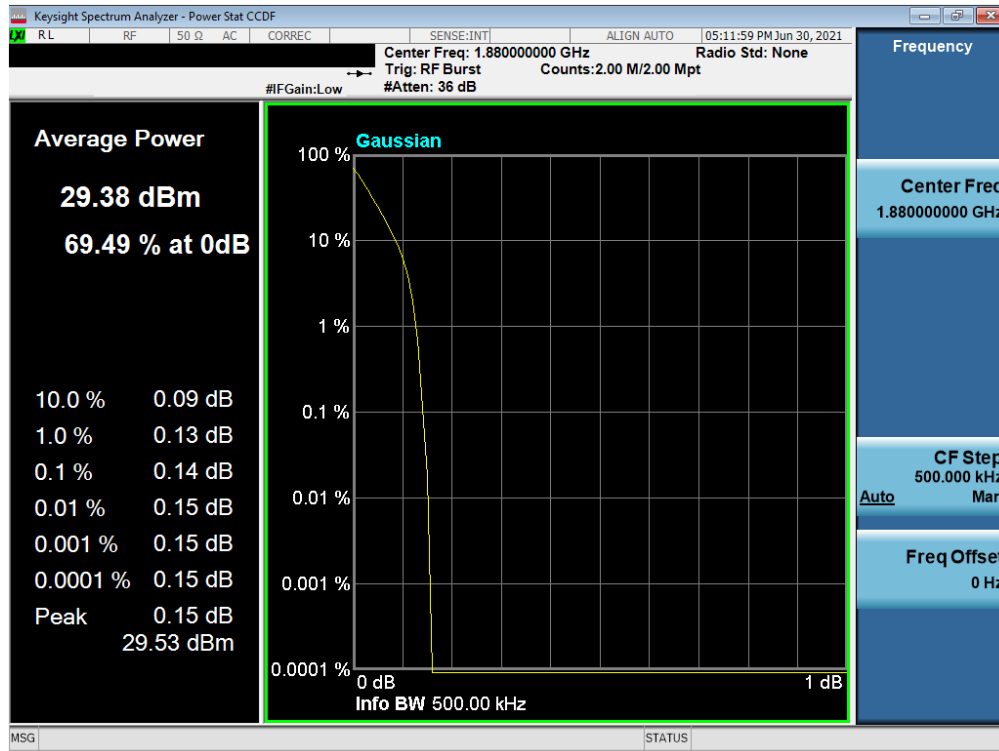
Plot 7-95. PAR Plot (LTE Band 25/2 - 1.4MHz QPSK - Full RB)



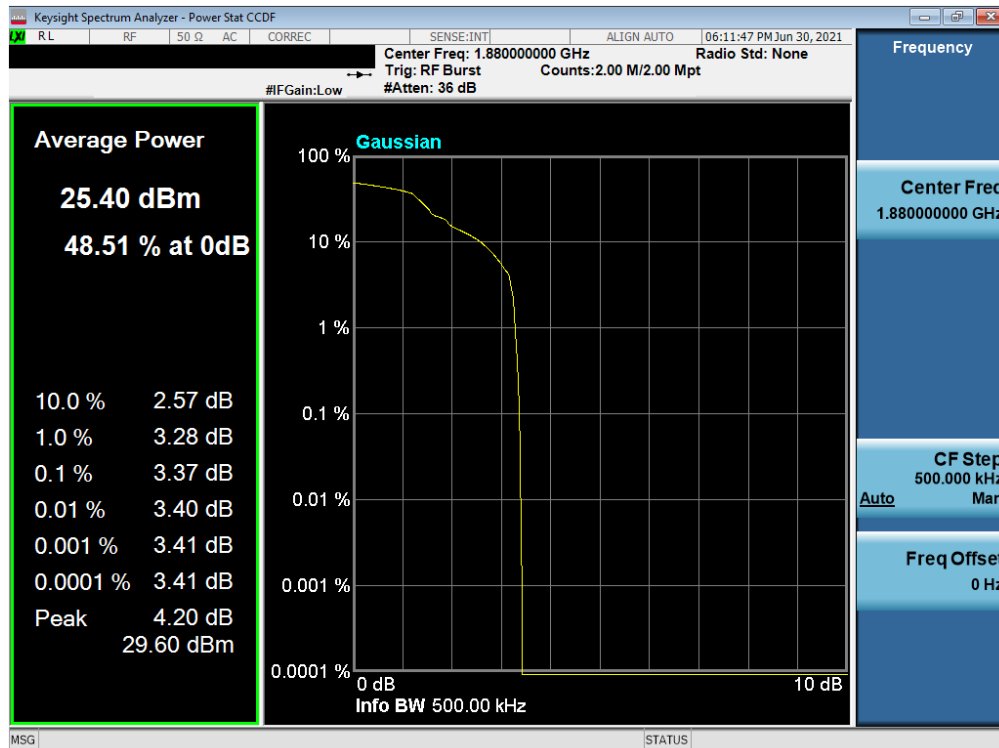
Plot 7-96. PAR Plot (LTE Band 25/2 - 1.4MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 69 of 86

GSM/GPRS PCS



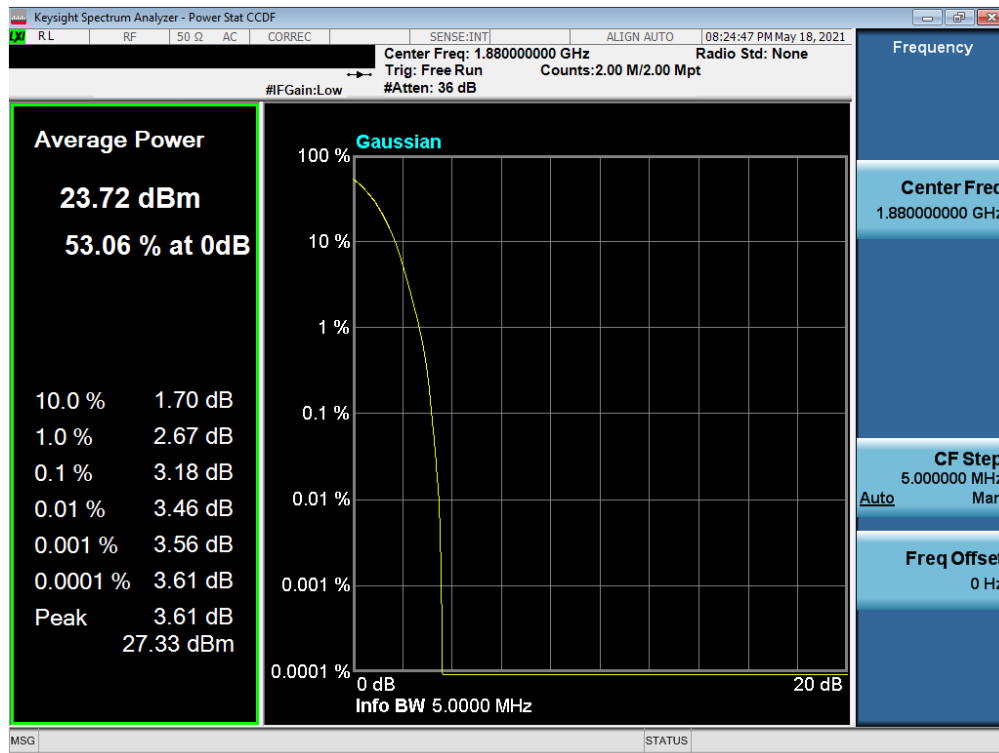
Plot 7-97. PAR Plot (GPRS, Ch. 661)



Plot 7-98. PAR Plot (EDGE, Ch. 661)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 70 of 86

WCDMA PCS



Plot 7-99. PAR Plot (WCDMA, Ch. 9400)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 71 of 86

7.7 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

Test Settings

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

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 72 of 86

Test Setup

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

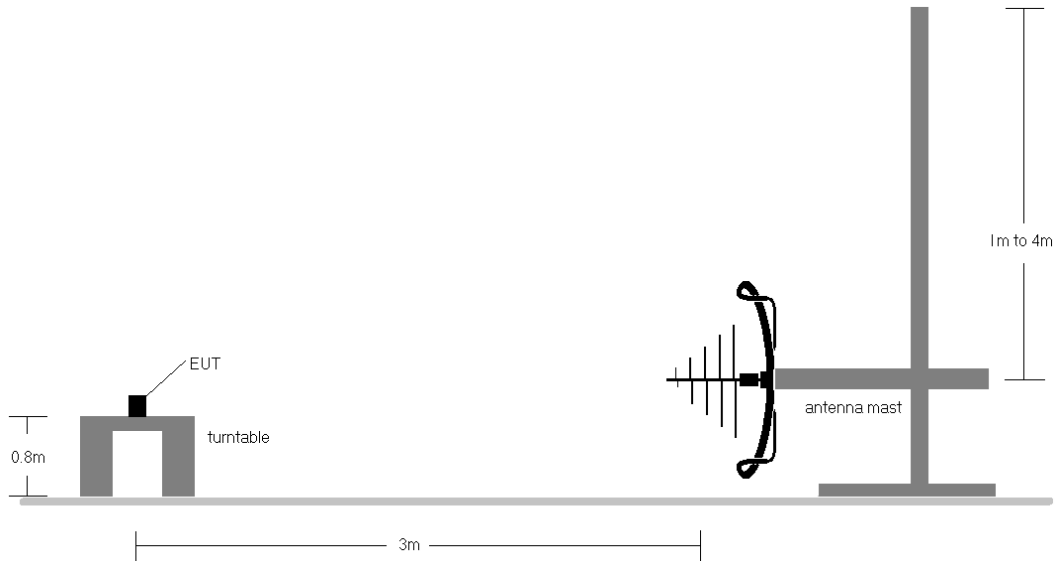


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

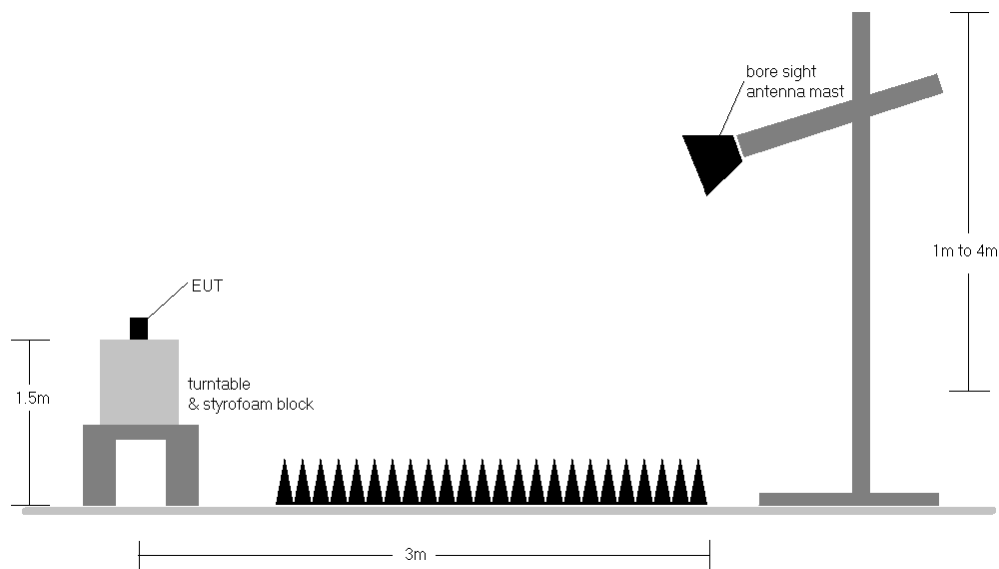


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

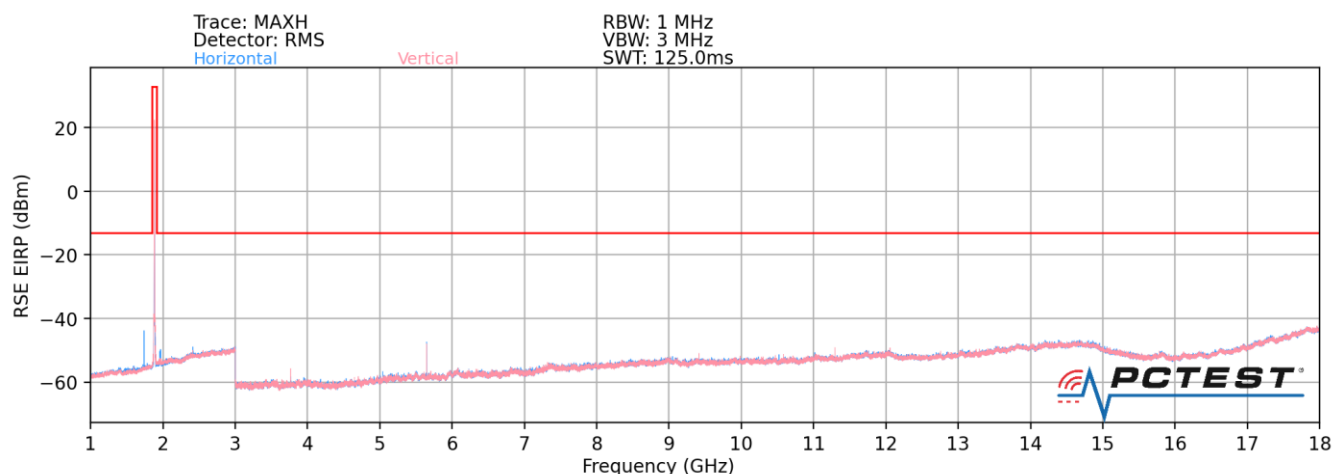
FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 73 of 86

Test Notes

- 1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
 b) $E(\text{dB}\mu\text{V/m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
 d) $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V/m}) + 20\log D - 104.8$; where D is the measurement distance in meters.
- 2) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest powers is reported in GPRS mode while transmitting with one slot active.
- 3) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1".
- 4) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 5) This unit was tested while powered by an DC power source.
- 6) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 7) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 8) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 9) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 74 of 86

LTE Band 25/2



Plot 7-100. Radiated Spurious Plot (LTE Band 25/2)

Bandwidth (MHz):	20
Frequency (MHz):	1860.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3720.0	V	111	3	-68.34	2.44	41.10	-54.15	-13.00	-41.15
5580.0	V	226	55	-69.92	5.41	42.49	-52.77	-13.00	-39.77
7440.0	V	372	272	-78.08	8.71	37.63	-57.62	-13.00	-44.62
9300.0	V	392	7	-74.14	10.96	43.82	-51.44	-13.00	-38.44
11160.0	V	272	176	-68.77	12.45	50.68	-44.58	-13.00	-31.58
13020.0	V	271	327	-78.65	14.48	42.83	-52.43	-13.00	-39.43
14880.0	V	351	150	-80.63	17.05	43.42	-51.84	-13.00	-38.84
16740.0	V	-	-	-81.88	15.60	40.72	-54.54	-13.00	-41.54

Table 7-5. Radiated Spurious Data (LTE Band 25/2 – Low Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3765.0	V	122	13	-72.19	2.88	37.69	-57.57	-13.00	-44.57
5647.5	V	250	52	-65.72	5.56	46.84	-48.42	-13.00	-35.42
7530.0	V	289	273	-78.49	8.99	37.50	-57.76	-13.00	-44.76
9412.5	V	361	7	-72.17	11.54	46.37	-48.89	-13.00	-35.89
11295.0	V	278	177	-68.15	12.43	51.28	-43.98	-13.00	-30.98
13177.5	V	261	328	-75.81	14.30	45.49	-49.76	-13.00	-36.76
15060.0	V	-	-	-80.98	15.38	41.40	-53.86	-13.00	-40.86
16942.5	V	-	-	-81.43	16.69	42.26	-52.99	-13.00	-39.99

Table 7-6. Radiated Spurious Data (LTE Band 25/2 – Mid Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 75 of 86

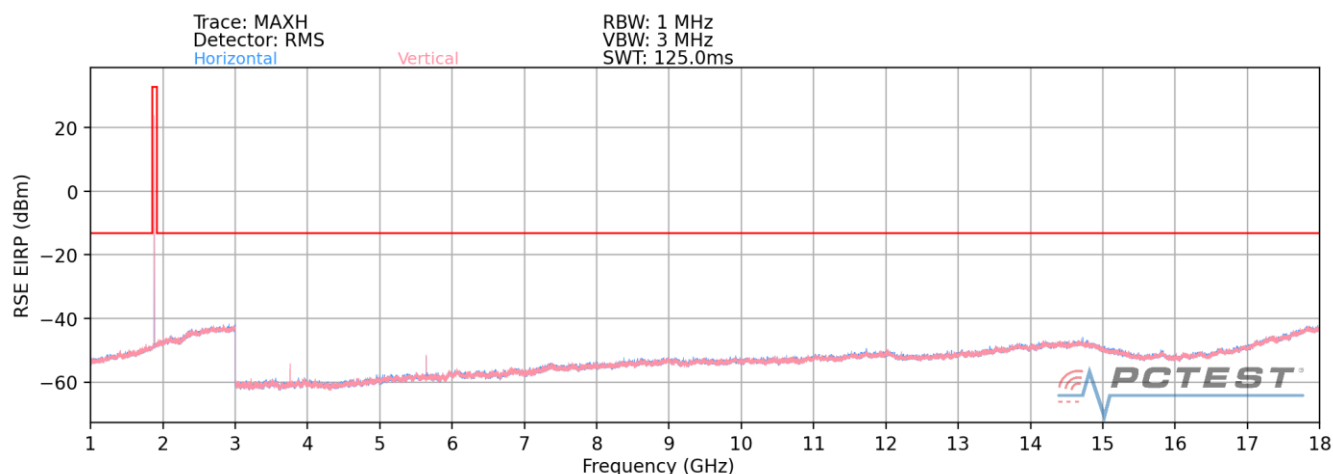
Bandwidth (MHz):	20
Frequency (MHz):	1905.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3810.00	V	123	10	-68.08	2.30	41.22	-54.04	-13.00	-41.04
5715.00	V	231	60	-61.58	5.47	50.89	-44.36	-13.00	-31.36
7620.00	V	194	275	-77.77	8.88	38.11	-57.15	-13.00	-44.15
9525.00	V	390	12	-69.06	11.06	49.00	-46.25	-13.00	-33.25
11430.00	V	281	175	-69.31	13.50	51.19	-44.07	-13.00	-31.07
13335.00	V	254	312	-72.18	14.71	49.53	-45.73	-13.00	-32.73
15240.00	V	292	278	-79.52	14.59	42.07	-53.19	-13.00	-40.19
17145.00	V	-	-	-81.45	17.88	43.43	-51.83	-13.00	-38.83

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

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module
		Page 76 of 86

GSM/GPRS PCS



Plot 7-101. Radiated Spurious Plot (GPRS PCS)

Mode:	GPRS 1 Tx Slot
Channel:	512
Frequency (MHz):	1850.2

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3700.4	H	374	305	-63.33	2.42	46.09	-49.17	-13.00	-36.17
5550.6	H	238	66	-66.21	5.17	45.96	-49.30	-13.00	-36.30
7400.8	H	-	-	-75.38	9.26	40.88	-54.38	-13.00	-41.38
9251.0	H	-	-	-75.84	10.41	41.57	-53.69	-13.00	-40.69

Table 7-8. Radiated Spurious Data (GPRS PCS – Low Channel)

Mode:	GPRS 1 Tx Slot
Channel:	661
Frequency (MHz):	1880

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3760.0	H	387	310	-62.75	2.86	47.11	-48.15	-13.00	-35.15
5640.0	H	227	70	-62.46	5.65	50.19	-45.07	-13.00	-32.07
7520.0	H	-	-	-74.74	8.87	41.13	-54.13	-13.00	-41.13
9400.0	H	-	-	-76.60	11.83	42.23	-53.03	-12.00	-41.03

Table 7-9. Radiated Spurious Data (GPRS PCS – Mid Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 77 of 86

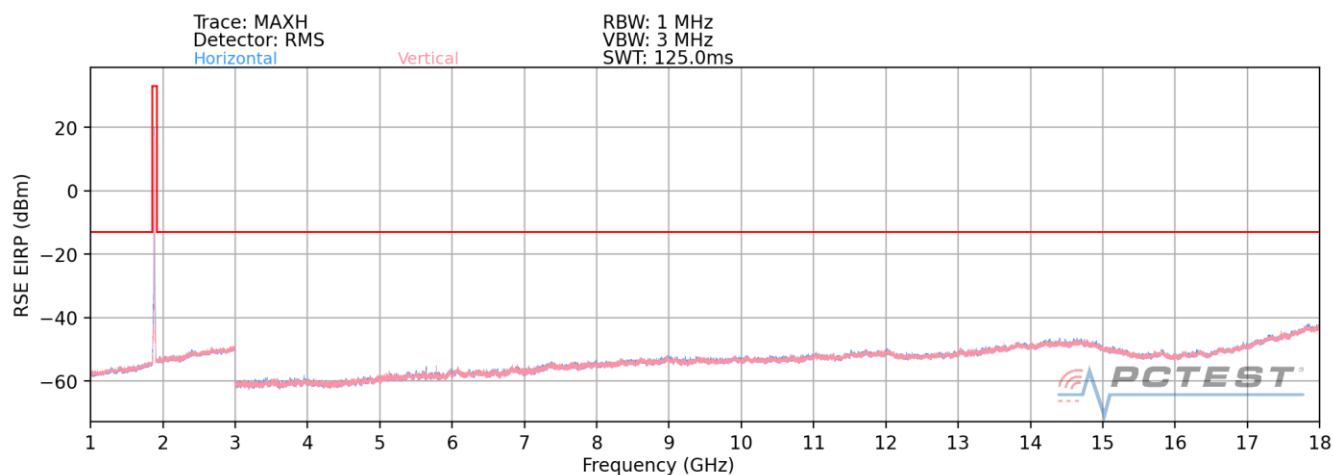
Mode:	GPRS 1 Tx Slot
Channel:	810
Frequency (MHz):	1909.8

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3819.6	H	373	93	-65.54	2.35	43.81	-51.45	-13.00	-38.45
5729.4	H	185	58	-60.22	5.37	52.15	-43.11	-13.00	-30.11
7639.2	H	-	-	-75.94	9.30	40.36	-54.89	-13.00	-41.89
9549.0	H	-	-	-76.61	11.11	41.50	-53.76	-13.00	-40.76

Table 7-10. Radiated Spurious Data (GPRS PCS – High Channel)

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 78 of 86

WCDMA PCS



Plot 7-102. Radiated Spurious Plot (WCDMA PCS)

Mode:	WCDMA RMC
Channel:	9262
Frequency (MHz):	1852.4

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3704.8	H	133	28	-75.30	2.41	34.11	-61.15	-13.00	-48.15
5557.2	H	280	63	-73.50	5.13	38.63	-56.63	-13.00	-43.63
7409.6	H	-	-	-79.41	9.01	36.60	-58.65	-13.00	-45.65
9262.0	H	-	-	-80.09	10.48	37.39	-57.87	-13.00	-44.87

Table 7-11. Radiated Spurious Data (WCDMA PCS – Low Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3760.0	H	399	299	-73.51	2.86	36.35	-58.91	-13.00	-45.91
5640.0	H	400	62	-71.22	5.65	41.43	-53.83	-13.00	-40.83
7520.0	H	-	-	-79.26	8.87	36.61	-58.65	-13.00	-45.65
9400.0	H	-	-	-80.39	11.83	38.44	-56.82	-13.00	-43.82

Table 7-12. Radiated Spurious Data (WCDMA PCS – Mid Channel)

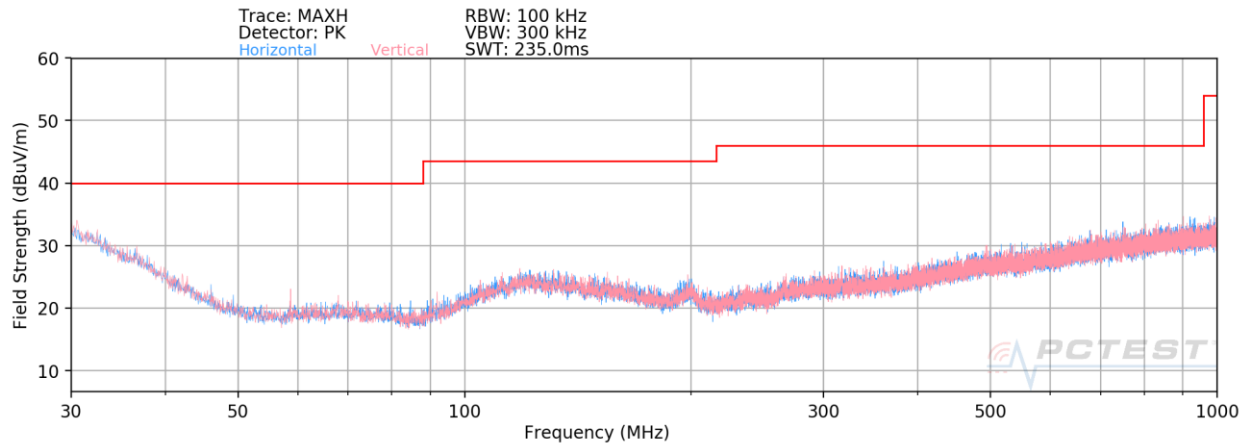
FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 79 of 86

Mode:	WCDMA RMC								
Channel:	9538								
Frequency (MHz):	1907.6								
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3815.2	H	111	50	-73.29	2.33	36.04	-59.22	-13.00	-46.22
5722.8	H	172	334	-71.26	5.43	41.17	-54.09	-13.00	-41.09
7630.4	H	-	-	-79.52	9.06	36.54	-58.72	-13.00	-45.72
9538.0	H	-	-	-79.81	11.00	38.19	-57.07	-13.00	-44.07

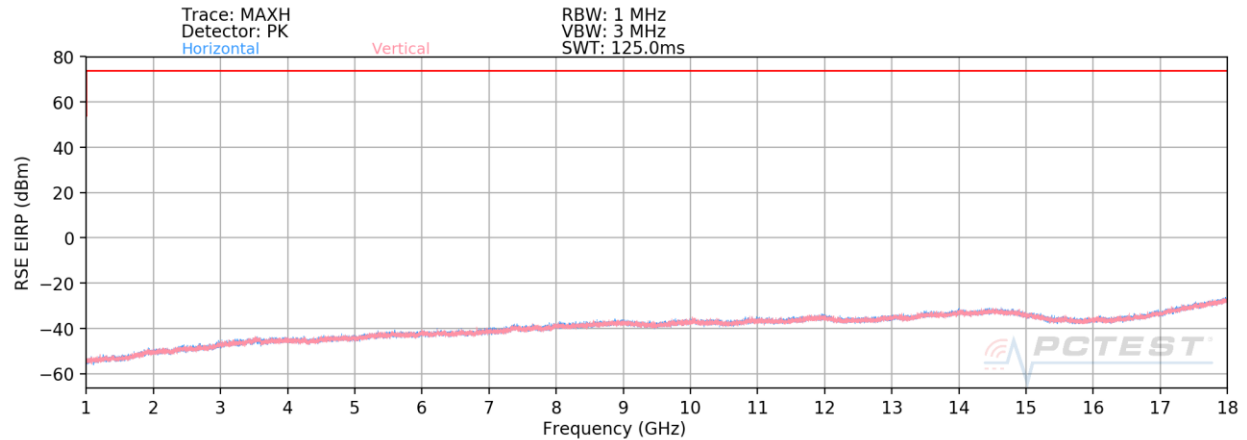
Table 7-13. Radiated Spurious Data (WCDMA PCS – High Channel)

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 80 of 86

Receiver Radiated Emissions



Plot 7-103. Radiated Spurious Plot below 1GHz



Plot 7-104. Radiated Spurious Plot above 1GHz

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
48.31	Quasi-Peak	H	396	139	-96.76	14.10	24.34	40.00	-15.66
57.58	Quasi-Peak	V	259	135	-96.49	12.45	22.96	40.00	-17.04
85.66	Quasi-Peak	H	396	107	-97.33	12.74	22.41	40.00	-17.59
194.98	Quasi-Peak	V	264	241	-96.88	16.49	26.61	43.52	-16.91
362.01	Quasi-Peak	H	211	129	-97.01	18.63	28.62	46.02	-17.41
783.69	Quasi-Peak	H	195	209	-95.30	24.20	35.90	46.02	-10.12
903.48	Quasi-Peak	V	125	46	-95.49	24.89	36.40	46.02	-9.62

Table 7-14. Radiated Measurements at 3-meters

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 81 of 86

7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

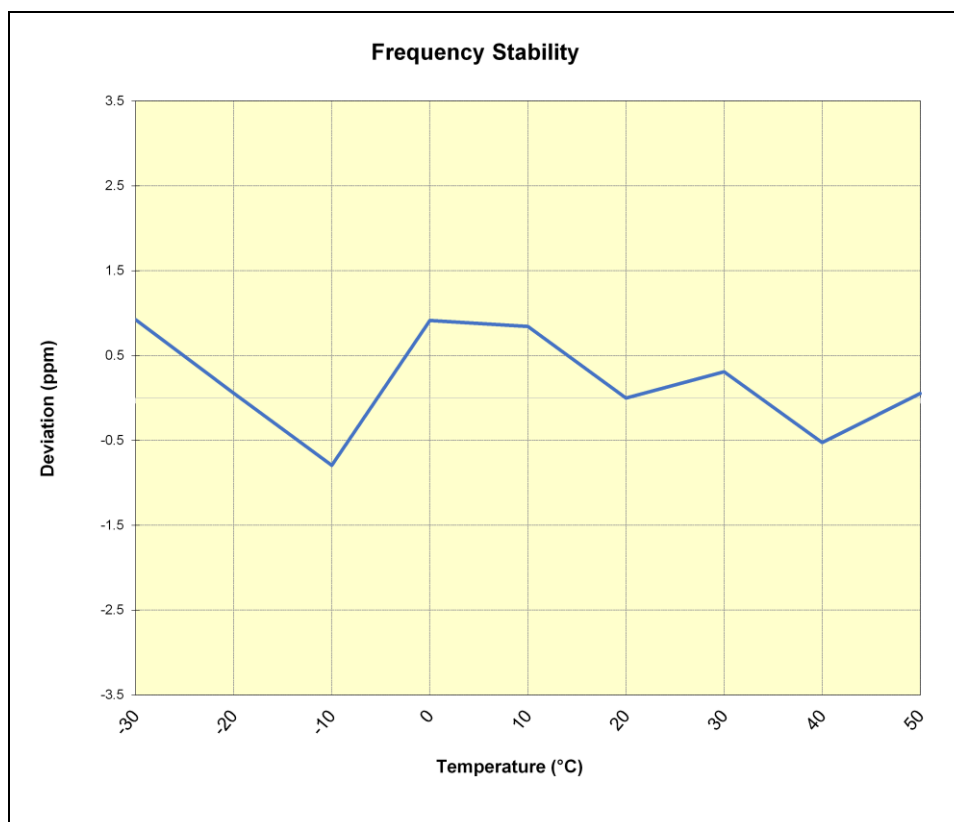
None

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 82 of 86

LTE Band 25/2

LTE Band 25/2					
Operating Frequency (Hz):			1,882,500,000		
Ref. Voltage (VDC):			3.80		
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	1,882,501,807	1,738	0.0000923
		- 20	1,882,500,177	108	0.0000057
		- 10	1,882,498,571	-1,498	-0.0000796
		0	1,882,501,789	1,720	0.0000913
		+ 10	1,882,501,655	1,586	0.0000843
		+ 20 (Ref)	1,882,500,069	0	0.0000000
		+ 30	1,882,500,653	584	0.0000310
		+ 40	1,882,499,082	-987	-0.0000525
85 %	3.23	+ 20	1,882,501,643	1,574	0.0000836
115 %	4.37	+ 20	1,882,499,829	-240	-0.0000128

Table 7-15. LTE Band 25/2 Frequency Stability Data



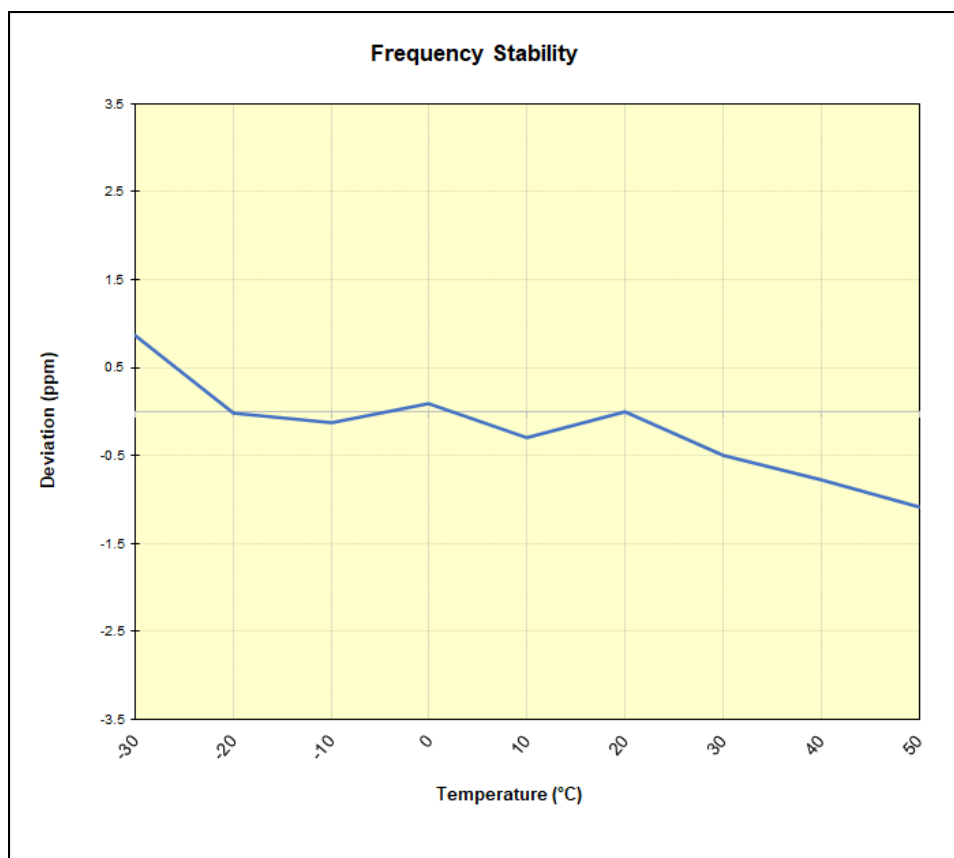
Plot 7-105. LTE Band 25/2 Frequency Stability Chart

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 83 of 86

GSM/GPRS PCS

GSM/GPRS PCS					
			Operating Frequency (Hz):	1,880,000,000	
			Ref. Voltage (VDC):	3.80	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	1,880,003,175	1,622	0.0000863
		- 20	1,880,001,535	-18	-0.0000010
		- 10	1,880,001,331	-222	-0.0000118
		0	1,880,001,741	188	0.0000100
		+ 10	1,880,001,000	-553	-0.0000294
		+ 20 (Ref)	1,880,001,553	0	0.0000000
		+ 30	1,880,000,628	-925	-0.0000492
		+ 40	1,880,000,110	-1,443	-0.0000768
85 %	3.23	+ 20	1,880,003,028	1,475	0.0000785
115 %	4.37	+ 20	1,880,000,604	-949	-0.0000505

Table 7-16. GSM/GPRS PCS Frequency Stability Data



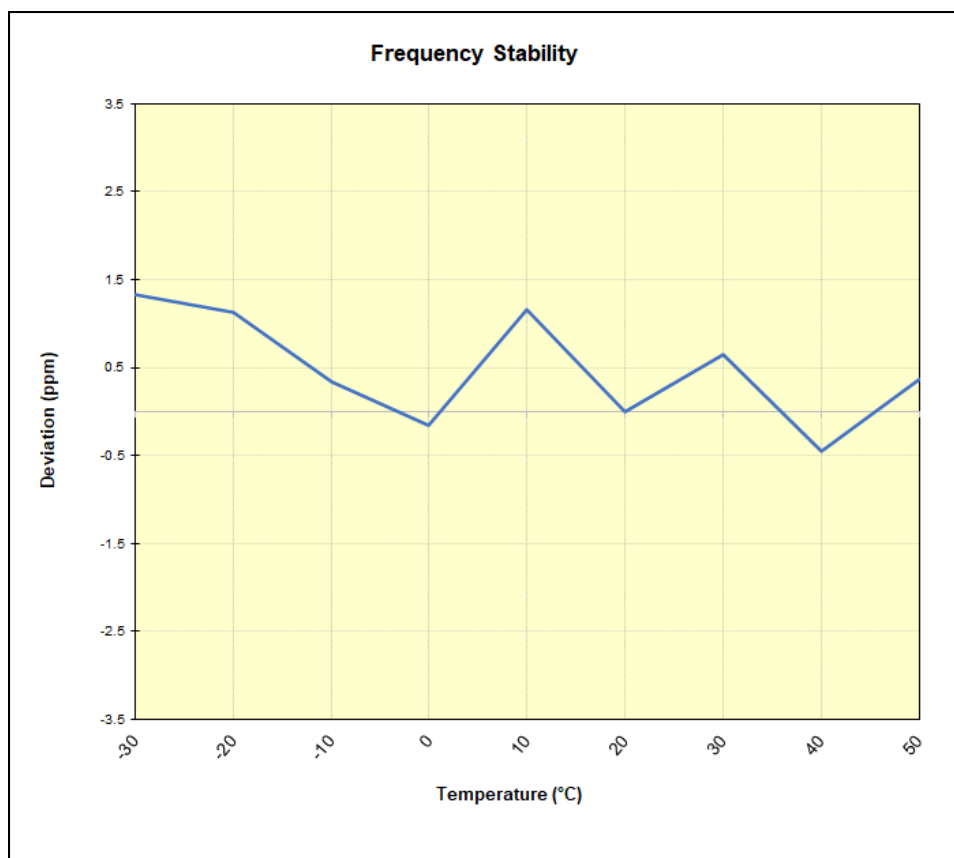
Plot 7-106. GSM/GPRS PCS Frequency Stability Chart

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 84 of 86

WCDMA PCS

WCDMA PCS					
			Operating Frequency (Hz):	1,880,000,000	
			Ref. Voltage (VDC):	3.80	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	1,880,000,415	2,500	0.0001330
		- 20	1,880,000,052	2,137	0.0001136
		- 10	1,879,998,561	646	0.0000344
		0	1,879,997,631	-285	-0.0000151
		+ 10	1,880,000,097	2,182	0.0001161
		+ 20 (Ref)	1,879,997,915	0	0.0000000
		+ 30	1,879,999,136	1,221	0.0000650
		+ 40	1,879,997,065	-850	-0.0000452
85 %	3.23	+ 20	1,879,997,279	-637	-0.0000339
115 %	4.37	+ 20	1,879,998,233	318	0.0000169

Table 7-17. WCDMA PCS Frequency Stability Data



Plot 7-107. WCDMA PCS Frequency Stability Chart

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 24 / RSS-133 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 85 of 86

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Telit Communications S.p.A Data Terminal Module FCC ID: RI7LE910CXWWX / IC:5131A-LE910CXWWX** complies with all the requirements of Part 24 of the FCC rules and RSS-133 rules.

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 PART 24 / RSS-133 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-05.RI7	Test Dates: 5/12 - 6/1/2021	EUT Type: Data Terminal Module	Page 86 of 86