

PART 22 / RSS-132 MEASUREMENT REPORT

Applicant Name:

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

Date of Testing:

5/12 – 06/01/2021

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M2106040065-04.RI7

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:

22

ISED Specification:

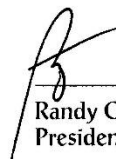
RSS-132 Issue 3

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.

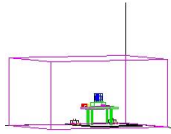

 Randy Ortanez
 President


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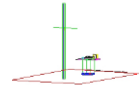
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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	ERP		EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	
GSM/GPRS	-	GMSK	824.2 - 848.8	1.434	31.57	2.352	33.72	247KGXW
EDGE	-	8-PSK	824.2 - 848.8	0.434	26.37	0.711	28.52	242KG7W
WCDMA	-	Spread Spectrum	826.4 - 846.6	0.214	23.31	0.352	25.46	4M14F9W
LTE Band 26/5	15MHz (Band 26 only)	QPSK	831.5 - 841.5	0.193	22.85	0.316	25.00	13M5G7D
		16QAM	831.5 - 841.5	0.168	22.24	0.275	24.39	13M5W7D
	10 MHz	QPSK	829.0 - 844.0	0.193	22.87	0.317	25.02	9M01G7D
		16QAM	829.0 - 844.0	0.159	22.02	0.261	24.17	9M01W7D
	5 MHz	QPSK	826.5 - 846.5	0.188	22.74	0.308	24.89	4M56G7D
		16QAM	826.5 - 846.5	0.153	21.85	0.251	24.00	4M52W7D
	3 MHz	QPSK	825.5 - 847.5	0.193	22.86	0.317	25.01	2M71G7D
		16QAM	825.5 - 847.5	0.157	21.96	0.257	24.11	2M71W7D
	1.4 MHz	QPSK	824.7 - 848.3	0.182	22.61	0.299	24.76	1M11G7D
		16QAM	824.7 - 848.3	0.149	21.74	0.245	23.89	1M11W7D

EUT Overview

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1.0 INTRODUCTION

1.1 Scope

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

1.2 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.

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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 22 & RSS-132.

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, Multi-band 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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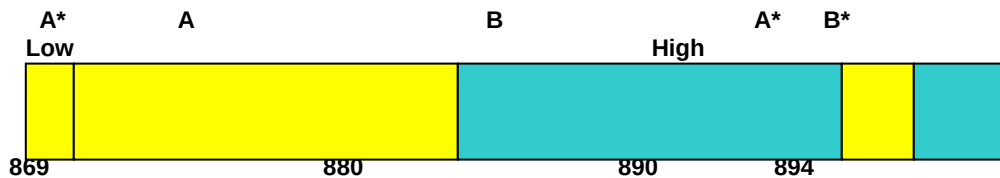
3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the “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 Cellular - Base Frequency Blocks



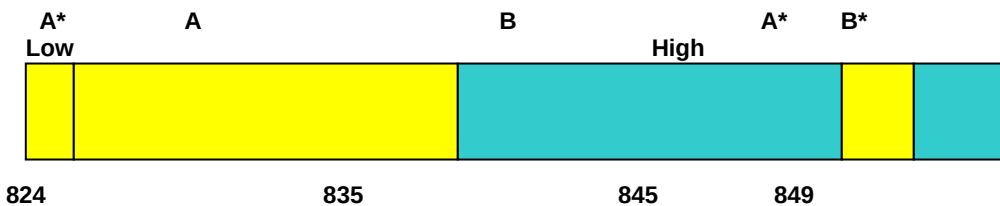
BLOCK 1: 869 – 880 MHz (A* Low + A)

BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)

BLOCK 4: 891.5 – 894 MHz (B*)

3.3 Cellular - Mobile Frequency Blocks



BLOCK 1: 824 – 835 MHz (A* Low + A)

BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)

BLOCK 4: 846.5 – 849 MHz (B*)

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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.

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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_{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. 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: R17LE910CXWWX IC:5131A-LE910CXWWX	 PART 22 / RSS-132 MEASUREMENT REPORT		Approved by: Technical Manager
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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.

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7.0 TEST RESULTS

7.1 Summary

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

Test Condition	Test Description	FCC Part Section(s)	RSS Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Transmitter Conducted Output Power/ Effective Radiated Power	2.1046, 22.913(a)(5)	RSS-132(5.4)	< 7 Watts max. ERP (FCC) < 11.5 Watts max. EIRP (ISED)	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, 22.917(a)	RSS-132(5.5)	> 43 + 10log10(P[Watts]) at Band Edge and for all out-of-band emissions	PASS	Sections 7.4, 7.5
	Peak-Average Ratio	N/A	RSS-132(5.4)	< 13 dB	PASS	Section 7.6
	Frequency Stability	2.1055, 22.355	RSS-132(5.3)	< ± 2.5ppm	PASS	Section 7.8
RADIATED	Radiated Spurious Emissions	2.1053, 22.917(a)	RSS-132(5.5)	> 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-132(5.6)	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.

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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

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

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Ant Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
15 MHz (Band 26 only)	QPSK	26865	831.5	1 / 37	23.47	1.53	22.85	0.193	38.45	-15.60	25.00	0.316	40.61	-15.61
		26915	836.5	1 / 0	23.26	1.53	22.64	0.184	38.45	-15.81	24.79	0.301	40.61	-15.82
		26965	841.5	1 / 37	23.45	1.53	22.83	0.192	38.45	-15.62	24.98	0.315	40.61	-15.62
	16QAM	26865	831.5	1 / 37	22.86	1.53	22.24	0.168	38.45	-16.21	24.39	0.275	40.61	-16.21
		26915	836.5	1 / 0	22.51	1.53	21.90	0.155	38.45	-16.56	24.05	0.254	40.61	-16.56
		26965	841.5	1 / 37	22.77	1.53	22.15	0.164	38.45	-16.30	24.30	0.269	40.61	-16.30
10 MHz	QPSK	26840	829.0	1 / 25	23.48	1.53	22.87	0.193	38.45	-15.59	25.02	0.317	40.61	-15.59
		26915	836.5	1 / 25	23.35	1.53	22.73	0.187	38.45	-15.72	24.88	0.308	40.61	-15.73
		26990	844.0	1 / 25	23.17	1.53	22.55	0.180	38.45	-15.90	24.70	0.295	40.61	-15.91
	16QAM	26840	829.0	1 / 25	22.62	1.53	22.00	0.158	38.45	-16.45	24.15	0.260	40.61	-16.46
		26915	836.5	1 / 25	22.64	1.53	22.02	0.159	38.45	-16.43	24.17	0.261	40.61	-16.44
		26990	844.0	1 / 25	22.46	1.53	21.84	0.153	38.45	-16.61	23.99	0.250	40.61	-16.62
5 MHz	QPSK	26815	826.5	1 / 12	23.36	1.53	22.74	0.188	38.45	-15.71	24.89	0.308	40.61	-15.72
		26915	836.5	1 / 12	23.19	1.53	22.57	0.181	38.45	-15.88	24.72	0.296	40.61	-15.89
		27015	846.5	1 / 12	23.08	1.53	22.46	0.176	38.45	-15.99	24.61	0.289	40.61	-16.00
	16QAM	26815	826.5	1 / 12	22.47	1.53	21.85	0.153	38.45	-16.60	24.00	0.251	40.61	-16.61
		26915	836.5	1 / 12	22.29	1.53	21.67	0.147	38.45	-16.78	23.82	0.241	40.61	-16.78
		27015	846.5	1 / 12	22.32	1.53	21.70	0.148	38.45	-16.75	23.85	0.243	40.61	-16.75
3 MHz	QPSK	26805	825.5	1 / 7	23.48	1.53	22.86	0.193	38.45	-15.59	25.01	0.317	40.61	-15.59
		26915	836.5	1 / 0	23.22	1.53	22.60	0.182	38.45	-15.85	24.75	0.299	40.61	-15.86
		27025	847.5	1 / 7	23.47	1.53	22.85	0.193	38.45	-15.60	25.00	0.316	40.61	-15.60
	16QAM	26805	825.5	1 / 7	22.41	1.53	21.79	0.151	38.45	-16.66	23.94	0.248	40.61	-16.66
		26915	836.5	1 / 0	22.41	1.53	21.79	0.151	38.45	-16.66	23.94	0.248	40.61	-16.67
		27025	847.5	1 / 7	22.58	1.53	21.96	0.157	38.45	-16.49	24.11	0.257	40.61	-16.50
1.4 MHz	QPSK	26797	824.7	1 / 0	23.10	1.53	22.48	0.177	38.45	-15.97	24.63	0.290	40.61	-15.98
		26915	836.5	1 / 3	23.20	1.53	22.58	0.181	38.45	-15.87	24.73	0.297	40.61	-15.87
		27033	848.3	1 / 0	23.23	1.53	22.61	0.182	38.45	-15.84	24.76	0.299	40.61	-15.84
	16QAM	26797	824.7	1 / 0	22.11	1.53	21.49	0.141	38.45	-16.96	23.64	0.231	40.61	-16.96
		26915	836.5	1 / 3	22.19	1.53	21.57	0.144	38.45	-16.88	23.72	0.236	40.61	-16.88
		27033	848.3	1 / 0	22.36	1.53	21.74	0.149	38.45	-16.71	23.89	0.245	40.61	-16.72

Table 7-2. ERP/EIRP Data (LTE Band 26/5)

Mode	Channel	Frequency [MHz]	Conducted Power [dBm]	Ant Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
GSM	128	824.2	31.99	1.53	31.37	1.371	38.45	-7.08	33.52	2.249	40.61	-7.09
	190	836.6	32.12	1.53	31.51	1.414	38.45	-6.95	33.66	2.320	40.61	-6.95
	251	848.8	32.11	1.53	31.49	1.409	38.45	-6.96	33.64	2.311	40.61	-6.97
GPRS	128	824.2	31.99	1.53	31.38	1.372	38.45	-7.08	33.53	2.252	40.61	-7.08
	190	836.6	32.15	1.53	31.53	1.422	38.45	-6.92	33.68	2.333	40.61	-6.93
	251	848.8	32.18	1.53	31.57	1.434	38.45	-6.89	33.72	2.352	40.61	-6.89
EDGE	128	824.2	26.99	1.53	26.37	0.434	38.45	-12.08	28.52	0.711	40.61	-12.09
	190	836.6	26.88	1.53	26.26	0.422	38.45	-12.19	28.41	0.693	40.61	-12.20
	251	848.8	26.77	1.53	26.15	0.412	38.45	-12.30	28.30	0.677	40.61	-12.30

Table 7-3. ERP/EIRP Data (GPRS Cell)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 22 / RSS-132 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 13 of 70

Mode	Channel	Frequency [MHz]	Conducted Power [dBm]	Ant Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
WCDMA (RMC)	4132	826.4	23.74	1.53	23.12	0.205	38.45	-15.33	25.27	0.337	40.61	-15.34
	4183	836.6	23.93	1.53	23.31	0.214	38.45	-15.14	25.46	0.352	40.61	-15.15
	4233	846.6	23.72	1.53	23.10	0.204	38.45	-15.35	25.25	0.335	40.61	-15.36
WCDMA (AMR)	4132	826.4	23.55	1.53	22.93	0.196	38.45	-15.52	25.08	0.322	40.61	-15.53
	4183	836.6	23.60	1.53	22.98	0.199	38.45	-15.47	25.13	0.326	40.61	-15.48
	4233	846.6	23.49	1.53	22.87	0.194	38.45	-15.58	25.02	0.318	40.61	-15.59
HSDPA (Subtest1)	4132	826.4	22.88	1.53	22.26	0.168	38.45	-16.19	24.41	0.276	40.61	-16.20
	4183	836.6	22.81	1.53	22.19	0.166	38.45	-16.26	24.34	0.272	40.61	-16.27
	4233	846.6	22.85	1.53	22.23	0.167	38.45	-16.22	24.38	0.274	40.61	-16.23
HSDPA (Subtest2)	4132	826.4	22.86	1.53	22.24	0.168	38.45	-16.21	24.39	0.275	40.61	-16.22
	4183	836.6	22.82	1.53	22.20	0.166	38.45	-16.25	24.35	0.272	40.61	-16.26
	4233	846.6	22.83	1.53	22.21	0.166	38.45	-16.24	24.36	0.273	40.61	-16.25
HSDPA (Subtest3)	4132	826.4	22.31	1.53	21.69	0.148	38.45	-16.76	23.84	0.242	40.61	-16.77
	4183	836.6	22.32	1.53	21.70	0.148	38.45	-16.75	23.85	0.243	40.61	-16.76
	4233	846.6	22.27	1.53	21.65	0.146	38.45	-16.80	23.80	0.240	40.61	-16.81
HSDPA (Subtest4)	4132	826.4	22.21	1.53	21.59	0.144	38.45	-16.86	23.74	0.237	40.61	-16.87
	4183	836.6	22.31	1.53	21.69	0.148	38.45	-16.76	23.84	0.242	40.61	-16.77
	4233	846.6	22.17	1.53	21.55	0.143	38.45	-16.90	23.70	0.234	40.61	-16.91
HSUPA (Subtest1)	4132	826.4	22.14	1.53	21.52	0.142	38.45	-16.93	23.67	0.233	40.61	-16.94
	4183	836.6	22.57	1.53	21.95	0.157	38.45	-16.50	24.10	0.257	40.61	-16.51
	4233	846.6	22.57	1.53	21.95	0.157	38.45	-16.50	24.10	0.257	40.61	-16.51
HSUPA (Subtest2)	4132	826.4	21.63	1.53	21.01	0.126	38.45	-17.44	23.16	0.207	40.61	-17.45
	4183	836.6	21.79	1.53	21.17	0.131	38.45	-17.28	23.32	0.215	40.61	-17.29
	4233	846.6	21.76	1.53	21.14	0.130	38.45	-17.31	23.29	0.213	40.61	-17.32
HSUPA (Subtest3)	4132	826.4	21.40	1.53	20.78	0.120	38.45	-17.67	22.93	0.196	40.61	-17.68
	4183	836.6	21.20	1.53	20.58	0.114	38.45	-17.87	22.73	0.188	40.61	-17.88
	4233	846.6	21.51	1.53	20.89	0.123	38.45	-17.56	23.04	0.201	40.61	-17.57
HSUPA (Subtest4)	4132	826.4	22.08	1.53	21.46	0.140	38.45	-16.99	23.61	0.230	40.61	-17.00
	4183	836.6	22.14	1.53	21.52	0.142	38.45	-16.93	23.67	0.233	40.61	-16.94
	4233	846.6	22.04	1.53	21.42	0.139	38.45	-17.03	23.57	0.228	40.61	-17.04
HSUPA (Subtest5)	4132	826.4	22.93	1.53	22.31	0.170	38.45	-16.14	24.46	0.279	40.61	-16.15
	4183	836.6	22.98	1.53	22.36	0.172	38.45	-16.09	24.51	0.283	40.61	-16.10
	4233	846.6	22.91	1.53	22.29	0.169	38.45	-16.16	24.44	0.278	40.61	-16.17

Table 7-4. ERP/EIRP Data (WCDMA Cell)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 22 / RSS-132 MEASUREMENT REPORT		Approved by: Technical Manager
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7.3 Occupied Bandwidth

Test Overview

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

Test Procedure Used

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.

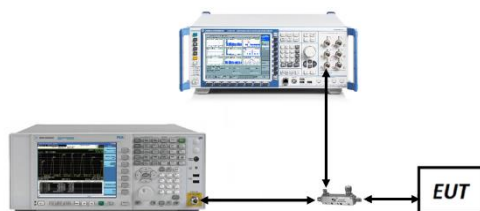


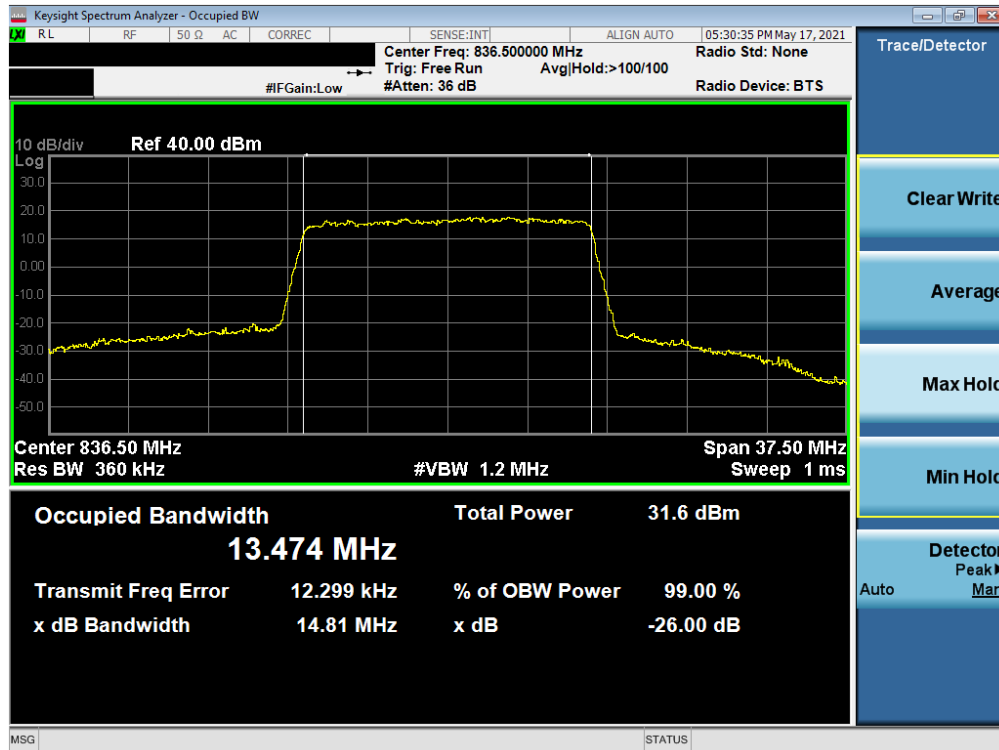
Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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LTE Band 26/5

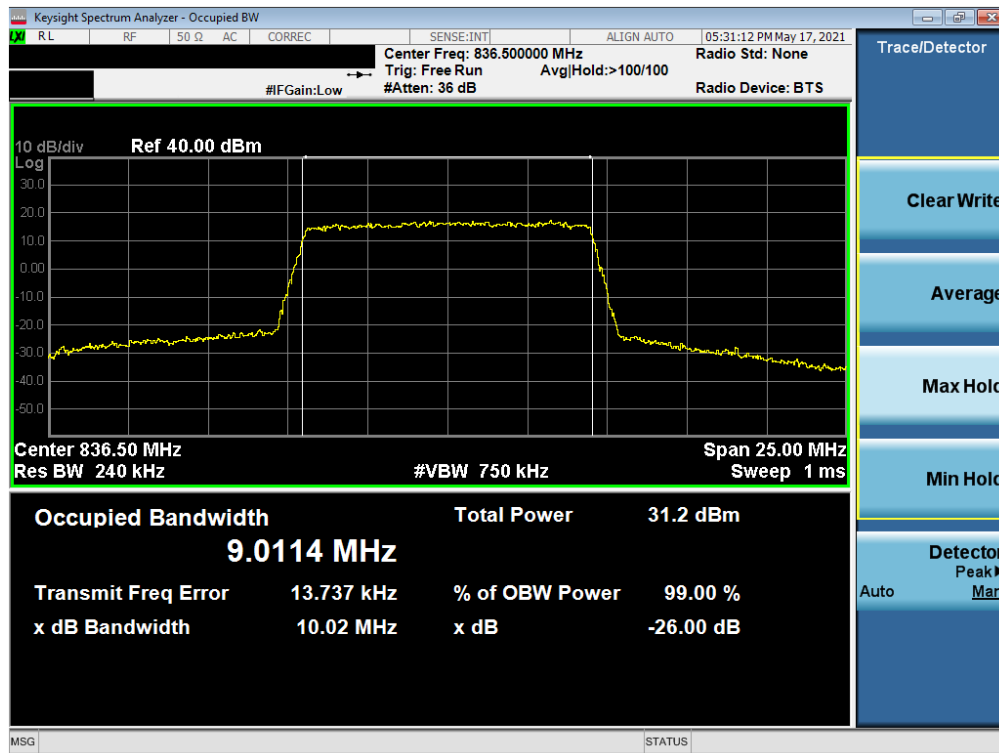


Plot 7-1. Occupied Bandwidth Plot (LTE Band 26 - 15MHz QPSK - Full RB)

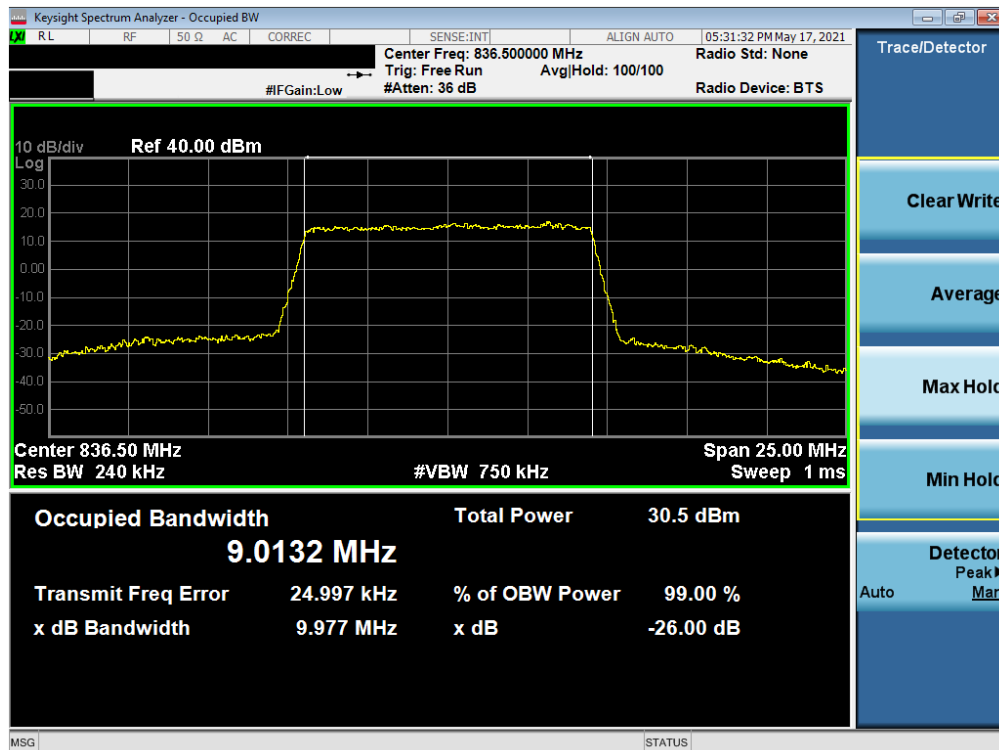


Plot 7-2. Occupied Bandwidth Plot (LTE Band 26 - 15MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 16 of 70

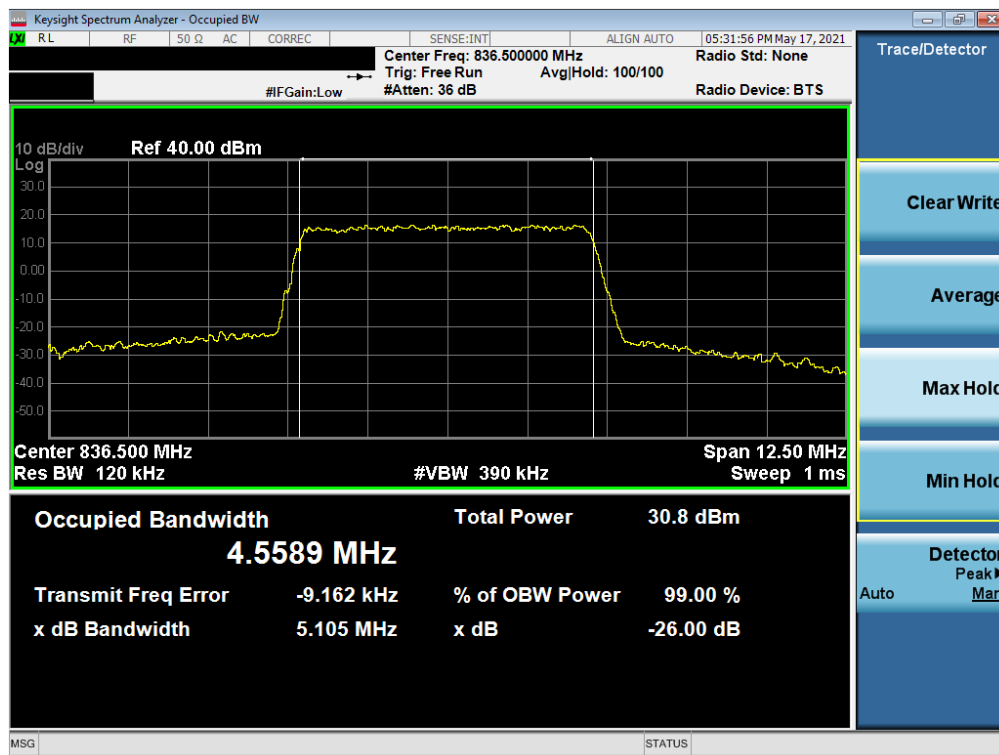


Plot 7-3. Occupied Bandwidth Plot (LTE Band 26/5 - 10MHz QPSK - Full RB)

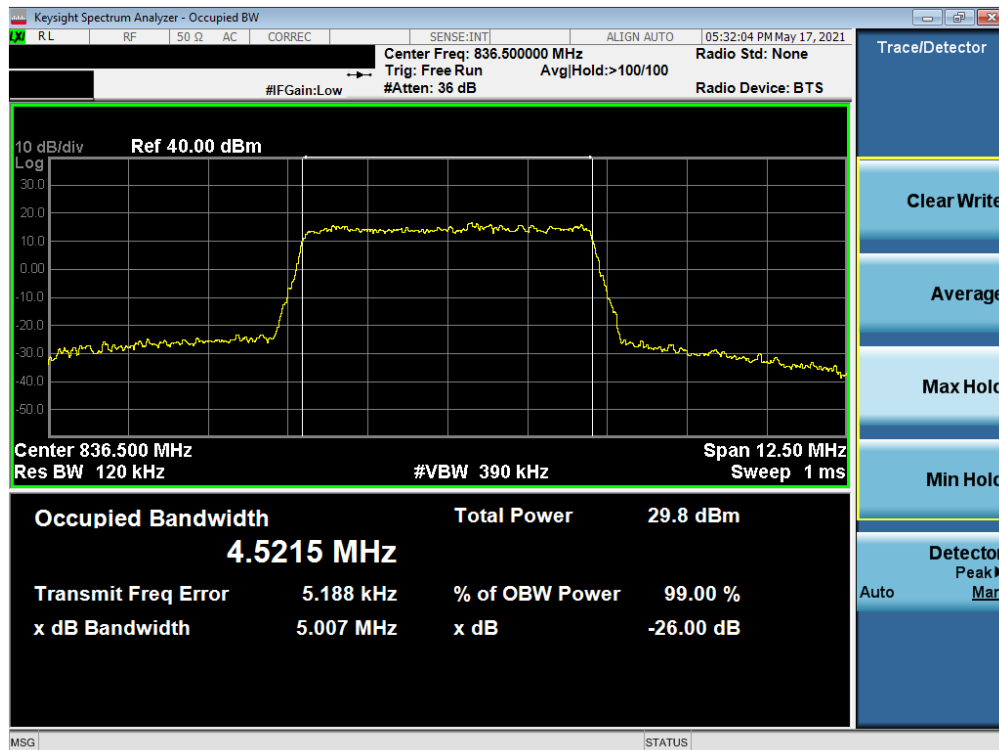


Plot 7-4. Occupied Bandwidth Plot (LTE Band 26/5 - 10MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 17 of 70

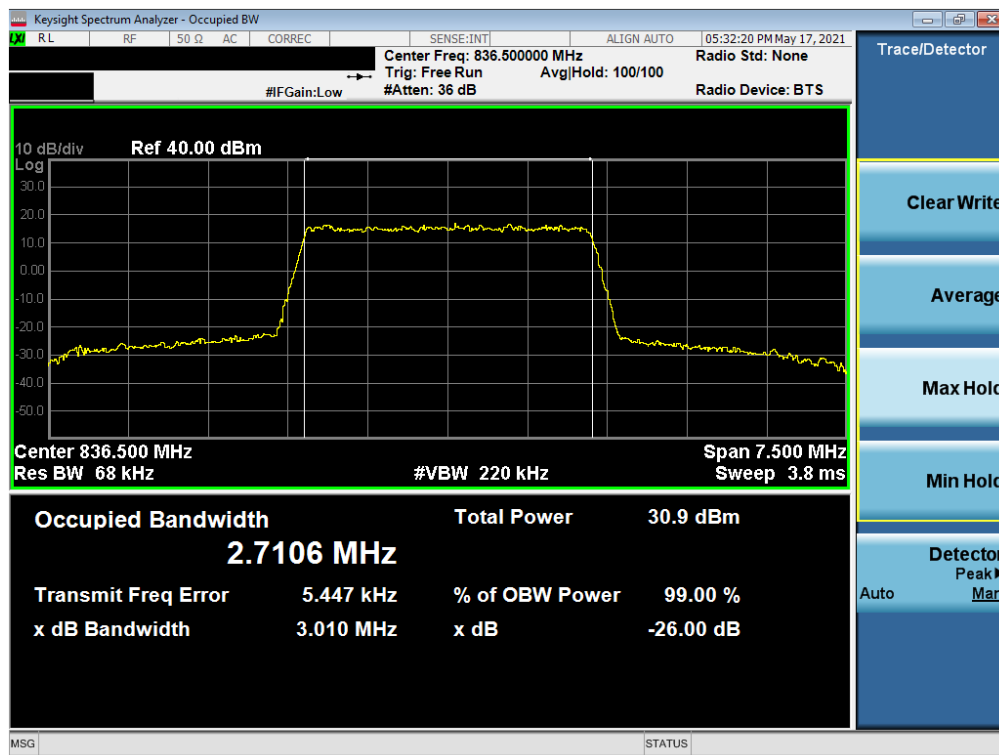


Plot 7-5. Occupied Bandwidth Plot (LTE Band 26/5 - 5MHz QPSK - Full RB)

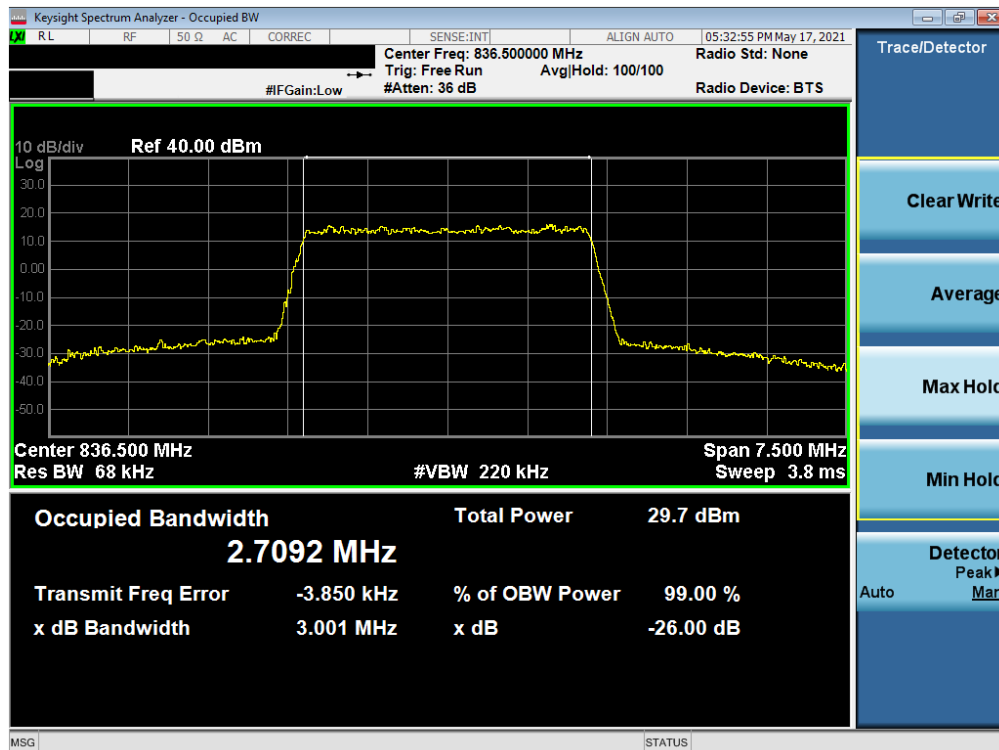


Plot 7-6. Occupied Bandwidth Plot (LTE Band 26/5 - 5MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 18 of 70

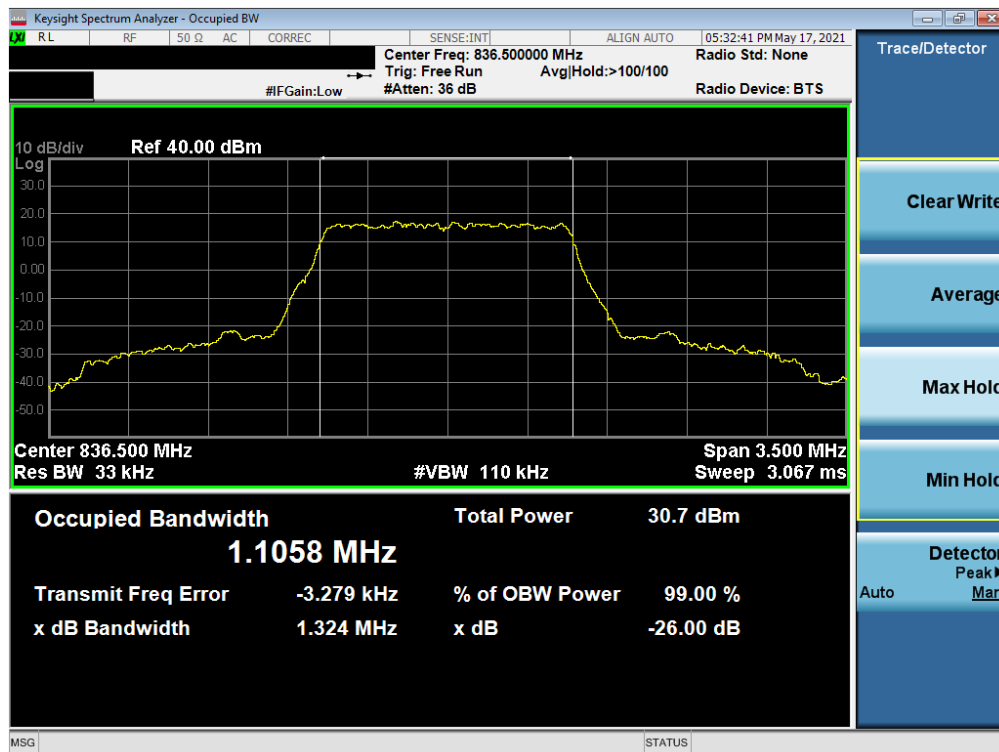


Plot 7-7. Occupied Bandwidth Plot (LTE Band 26/5 - 3MHz QPSK - Full RB)

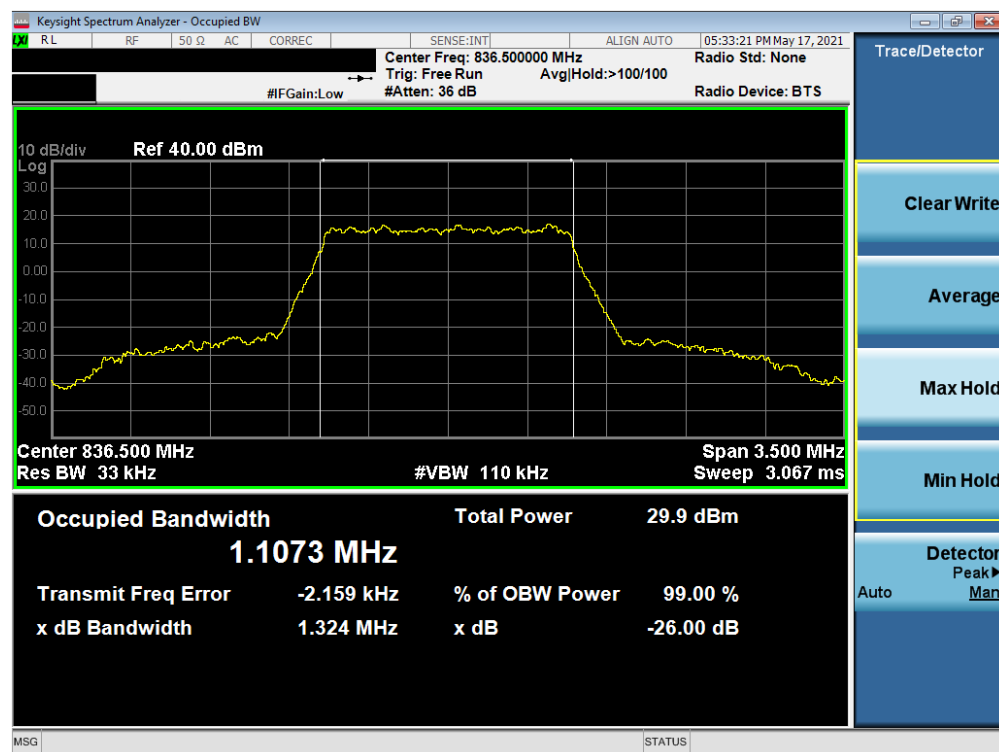


Plot 7-8. Occupied Bandwidth Plot (LTE Band 26/5 - 3MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 19 of 70



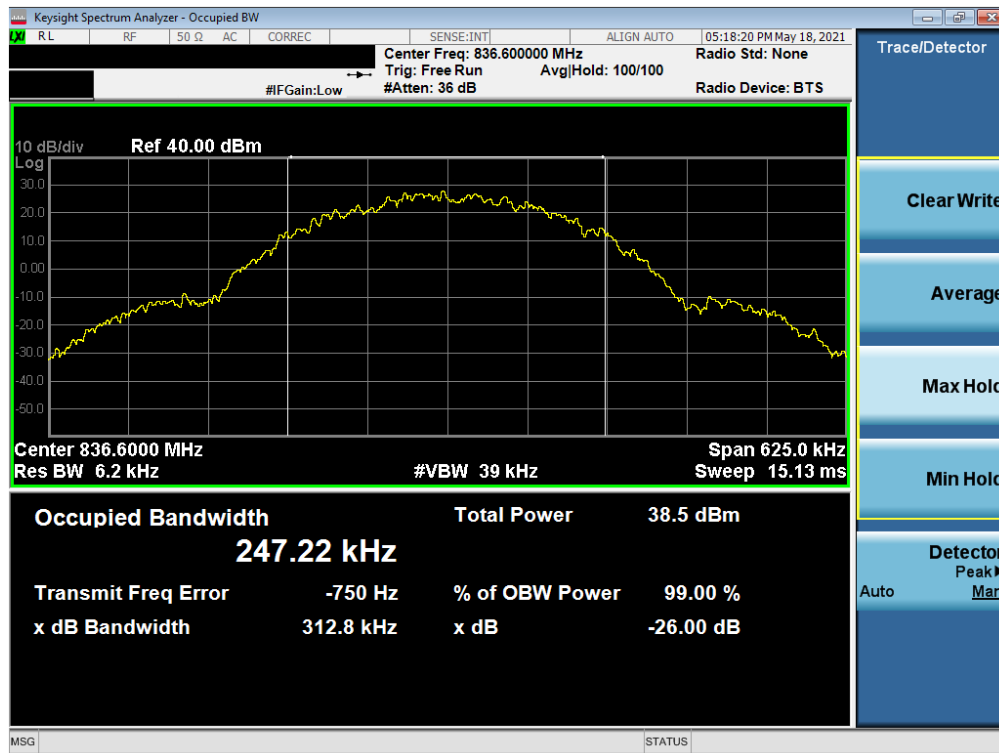
Plot 7-9. Occupied Bandwidth Plot (LTE Band 26/5 - 1.4MHz QPSK - Full RB)



Plot 7-10. Occupied Bandwidth Plot (LTE Band 26/5 - 1.4MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 20 of 70

GPRS Cell



Plot 7-11. Occupied Bandwidth Plot (GPRS, Ch. 190)



Plot 7-12. Occupied Bandwidth Plot (EDGE, Ch. 190)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 21 of 70

WCDMA Cell



Plot 7-13. Occupied Bandwidth Plot (WCDMA, Ch. 4183)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PART 22 / RSS-132 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 22 of 70

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 $43 + 10 \log_{10}(P_{\text{Watts}})$, 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 10GHz (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.

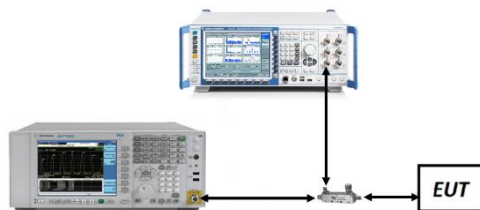


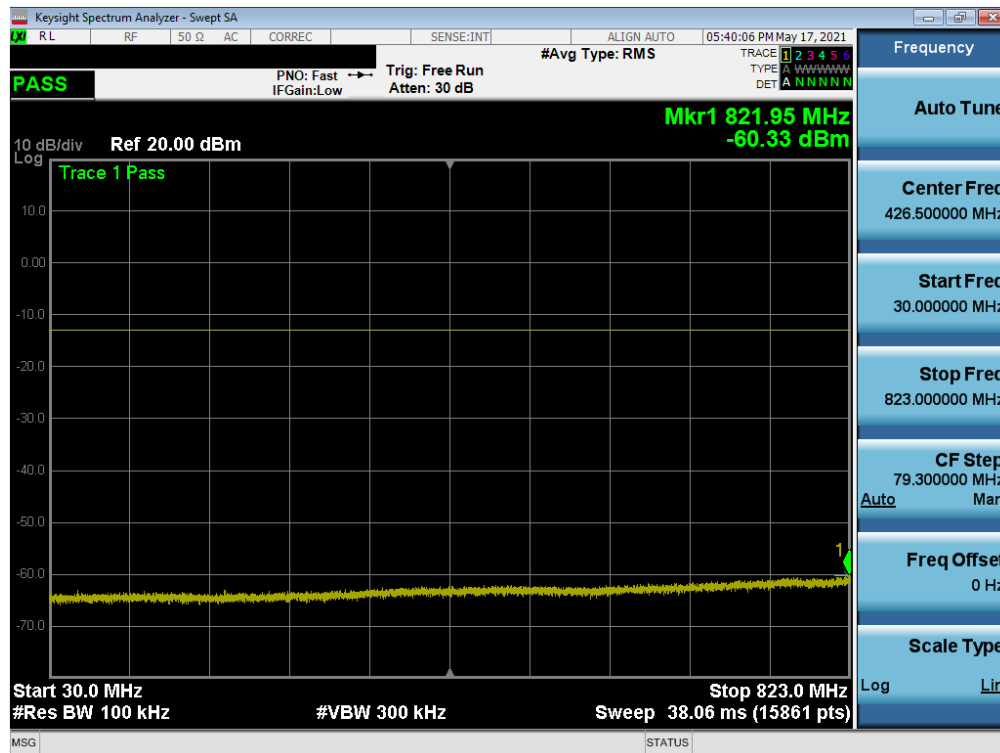
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

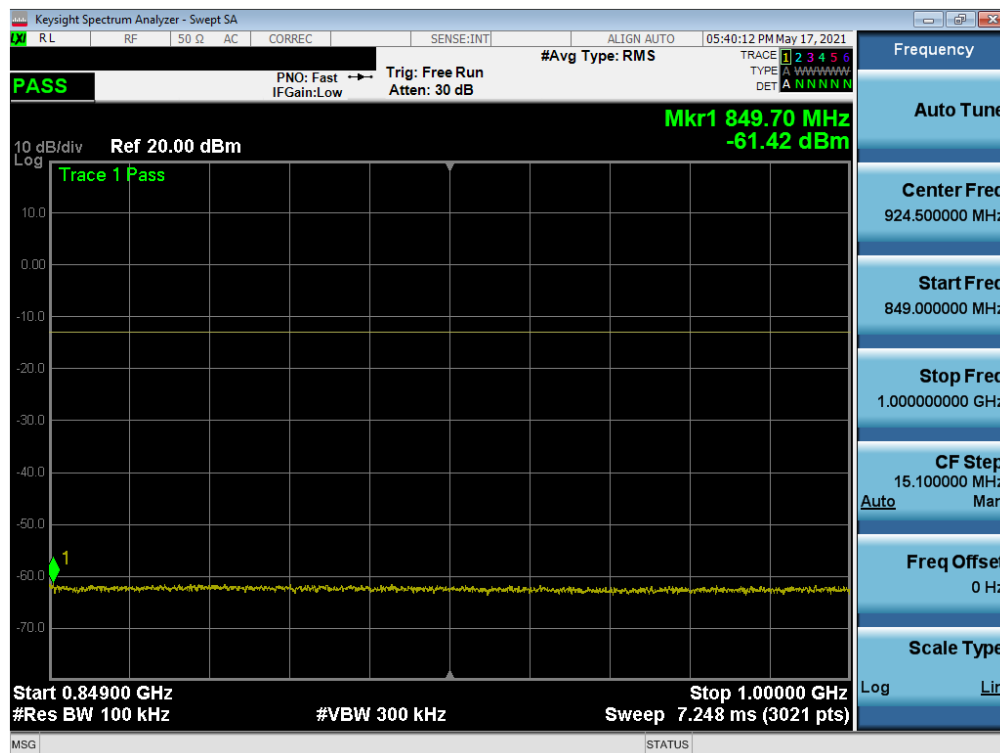
Per Part 22 and RSS-132, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth 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 IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 23 of 70

LTE Band 26/5

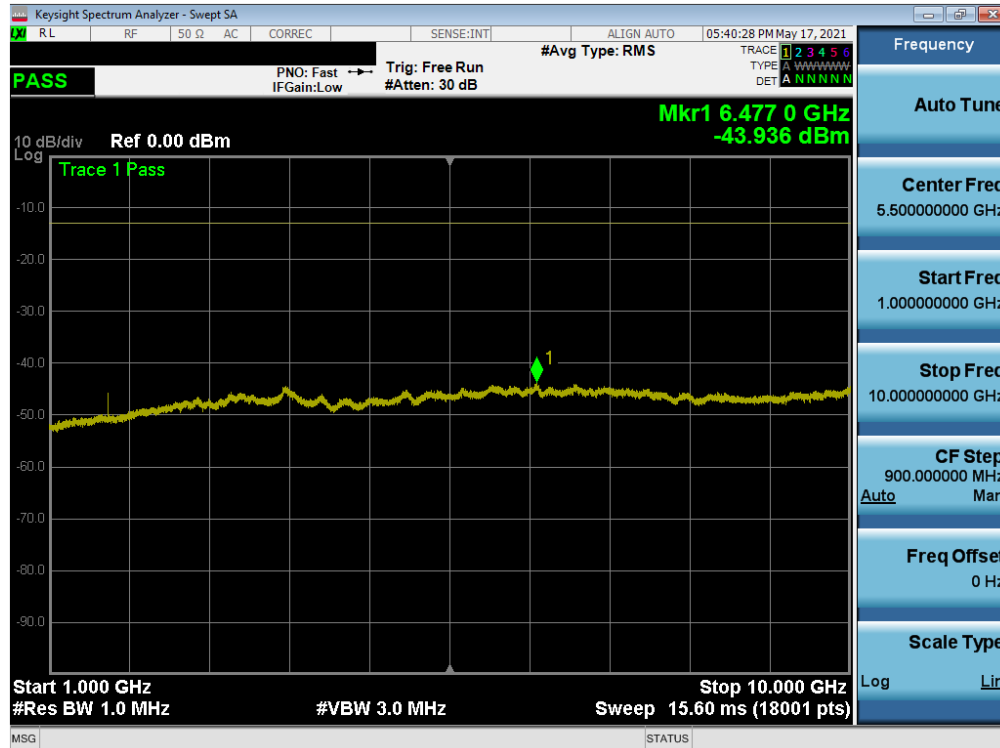


Plot 7-14. Conducted Spurious Plot (LTE Band 26/5 - 10MHz QPSK – 1 RB - Low Channel)

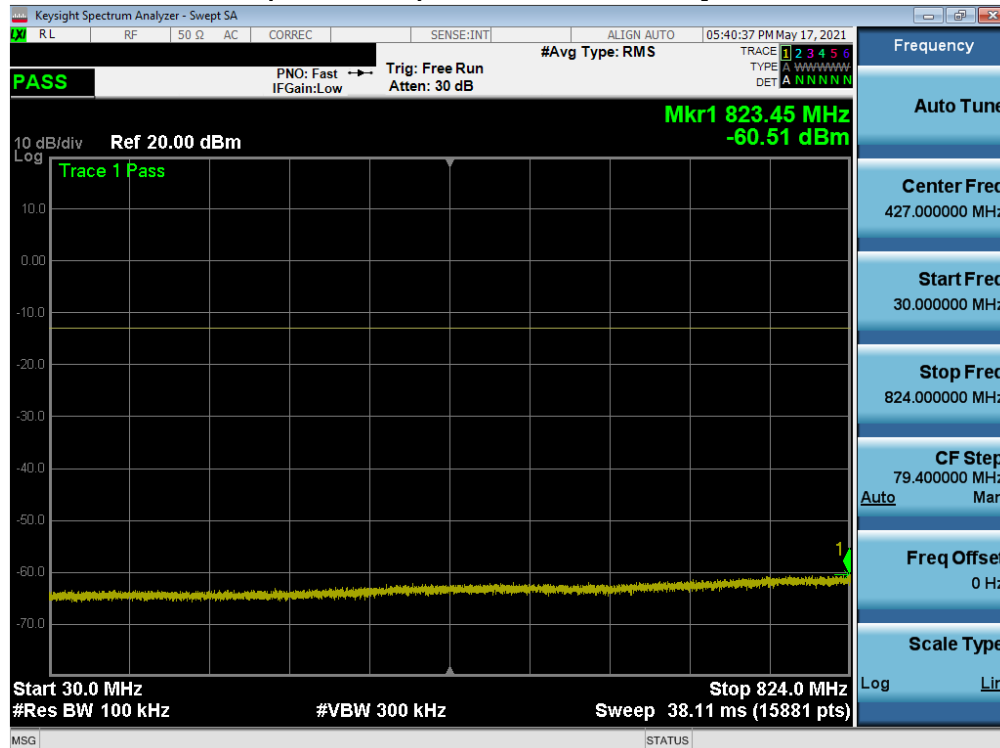


Plot 7-15. Conducted Spurious Plot (LTE Band 26/5 - 10MHz QPSK - 1 RB - Low Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 24 of 70

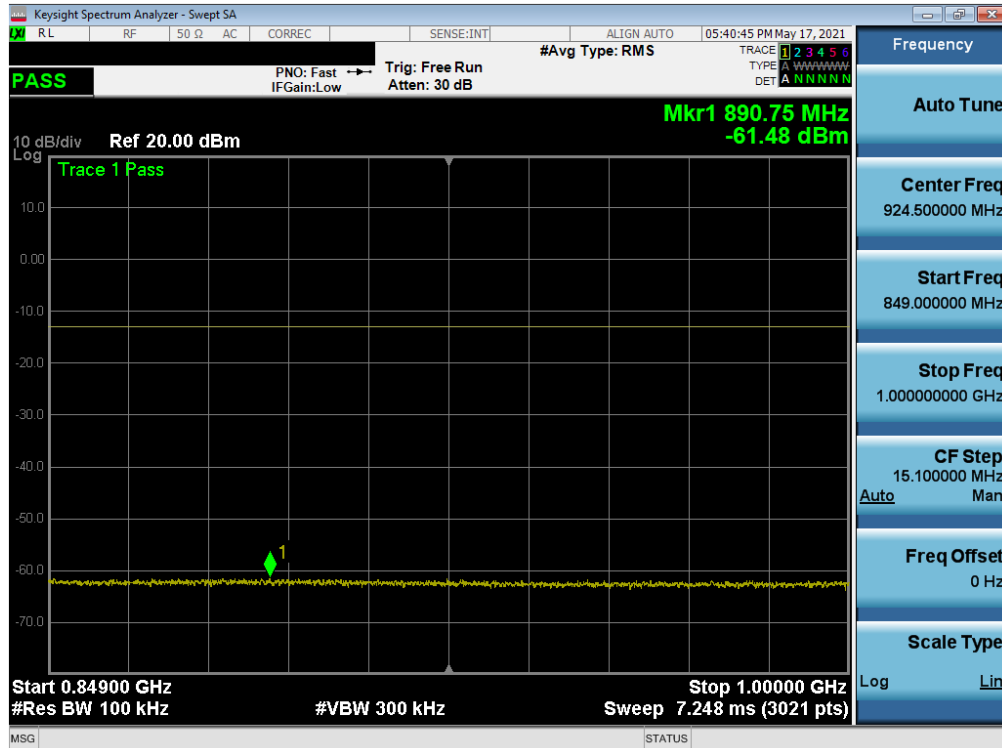


Plot 7-16. Conducted Spurious Plot (LTE Band 26/5 - 10MHz QPSK - 1 RB - Low Channel)

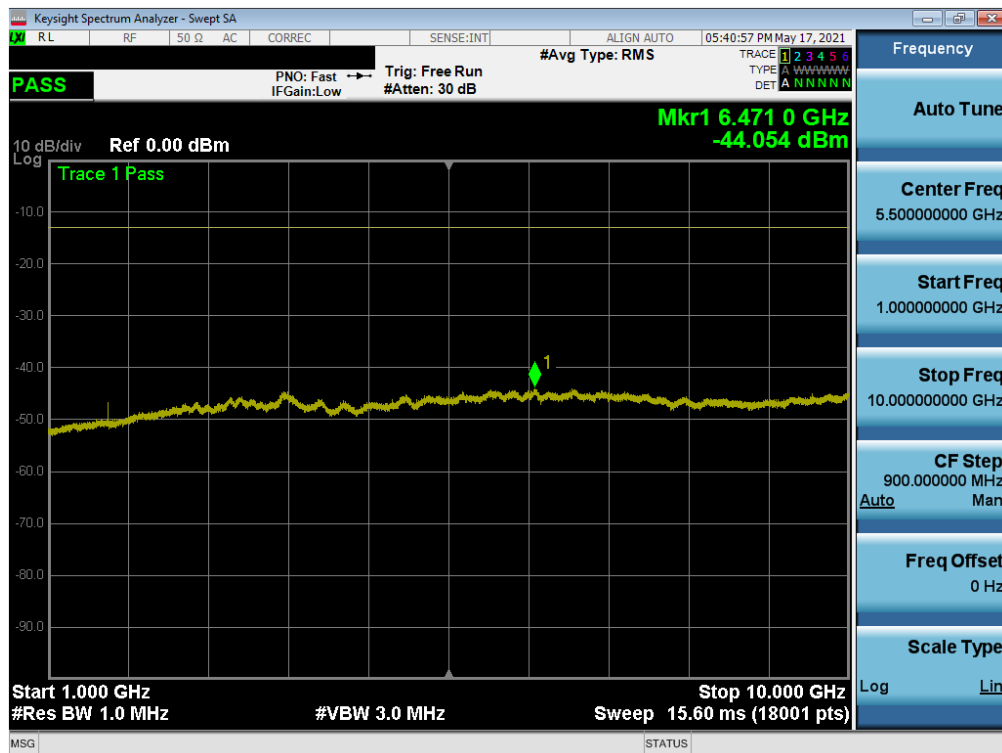


Plot 7-17. Conducted Spurious Plot (LTE Band 26/5 - 10MHz QPSK - 1 RB - Mid Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 25 of 70

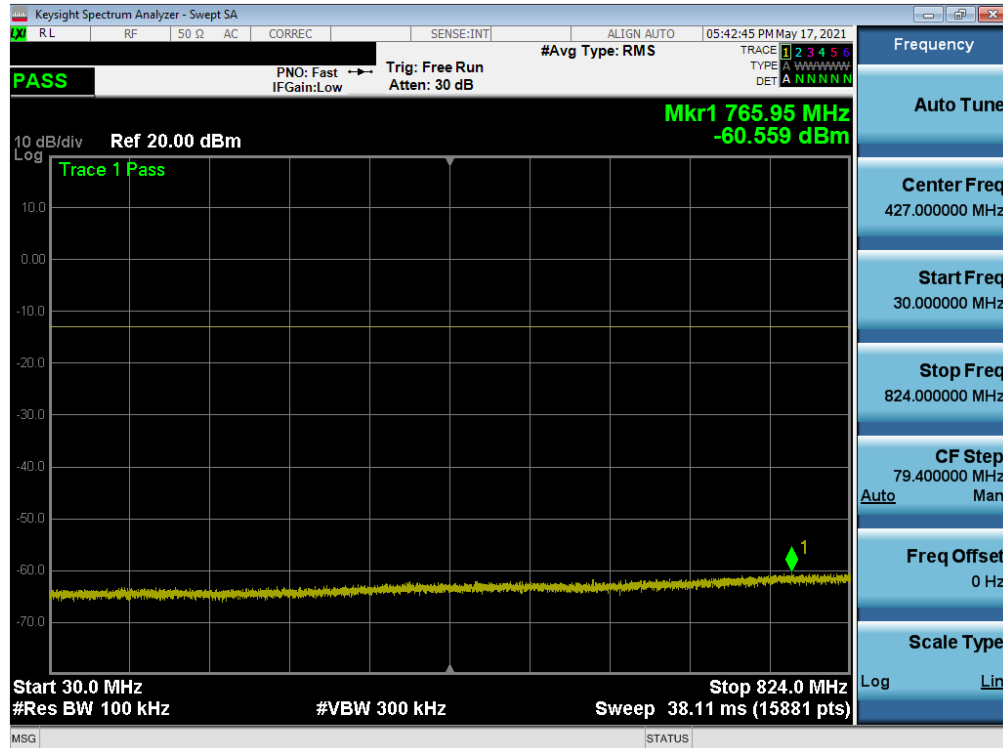


Plot 7-18. Conducted Spurious Plot (LTE Band 26/5 - 10MHz QPSK - 1 RB - Mid Channel)

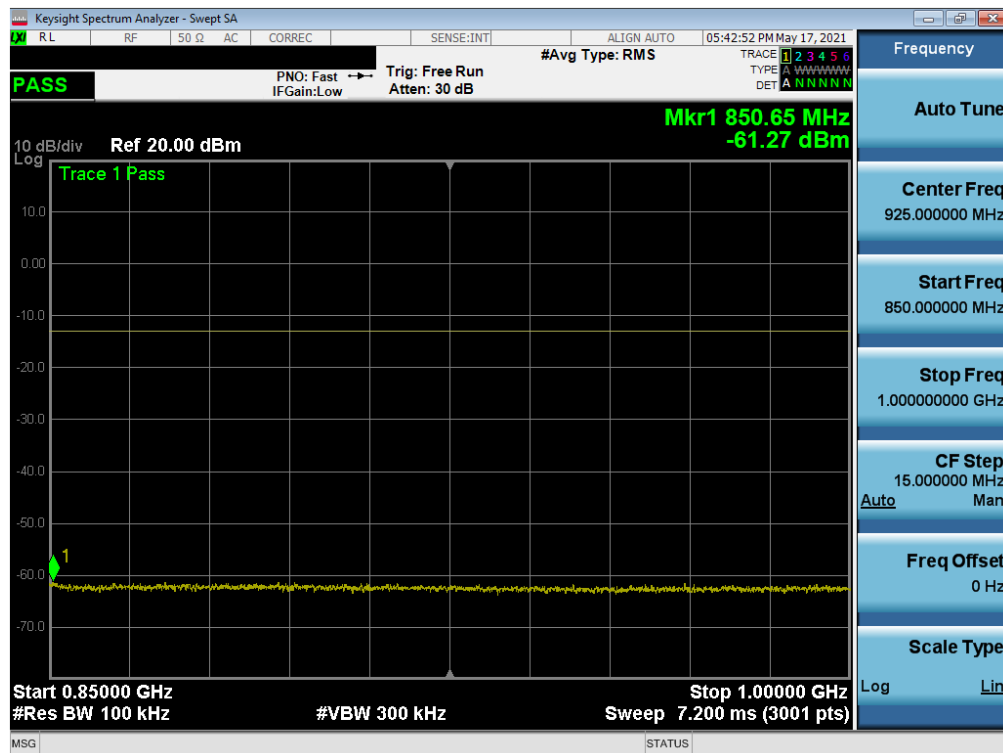


Plot 7-19. Conducted Spurious Plot (LTE Band 26/5 - 10MHz QPSK - 1 RB - Mid Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 26 of 70

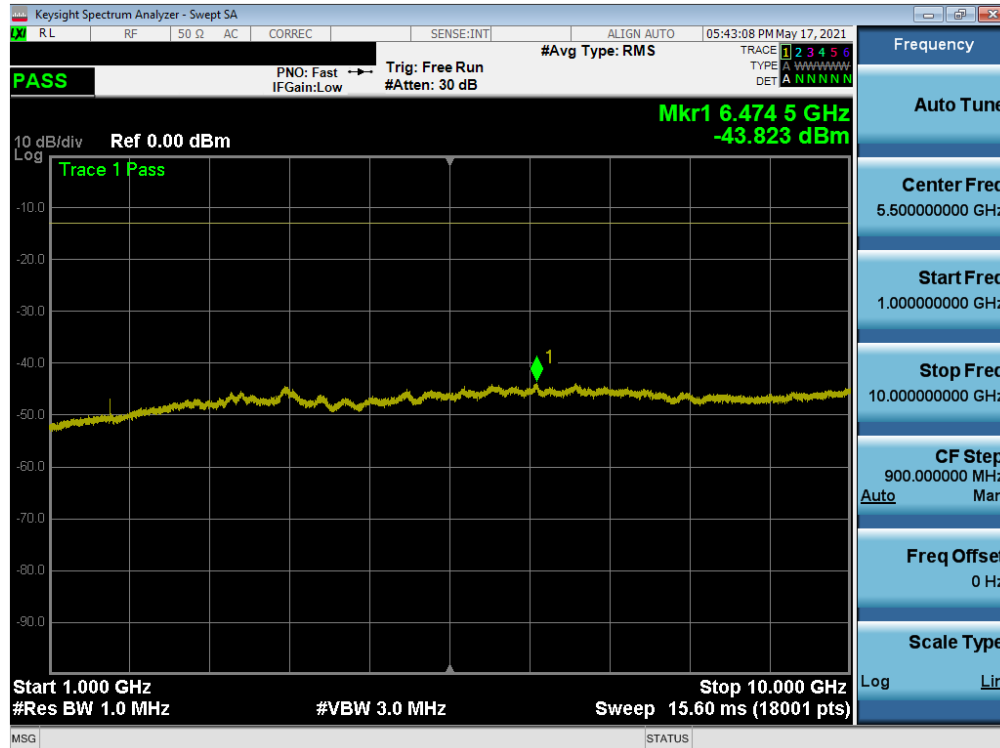


Plot 7-20. Conducted Spurious Plot (LTE Band 26/5 - 10MHz QPSK - 1 RB - High Channel)



Plot 7-21. Conducted Spurious Plot (LTE Band 26/5 - 10MHz QPSK - 1 RB - High Channel)

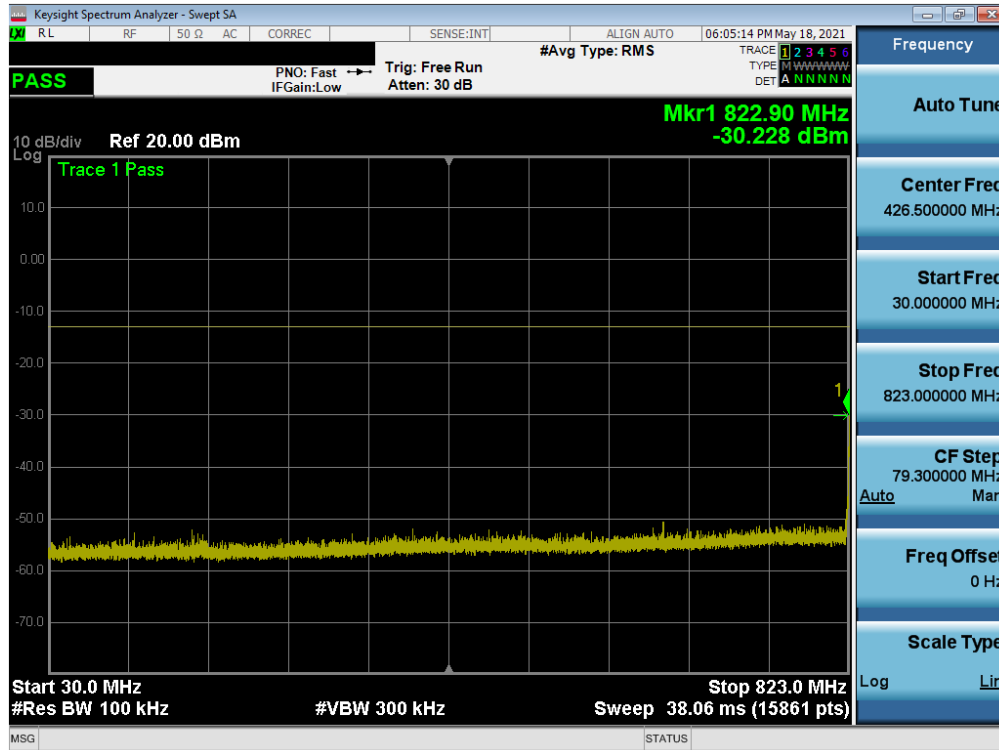
FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 27 of 70



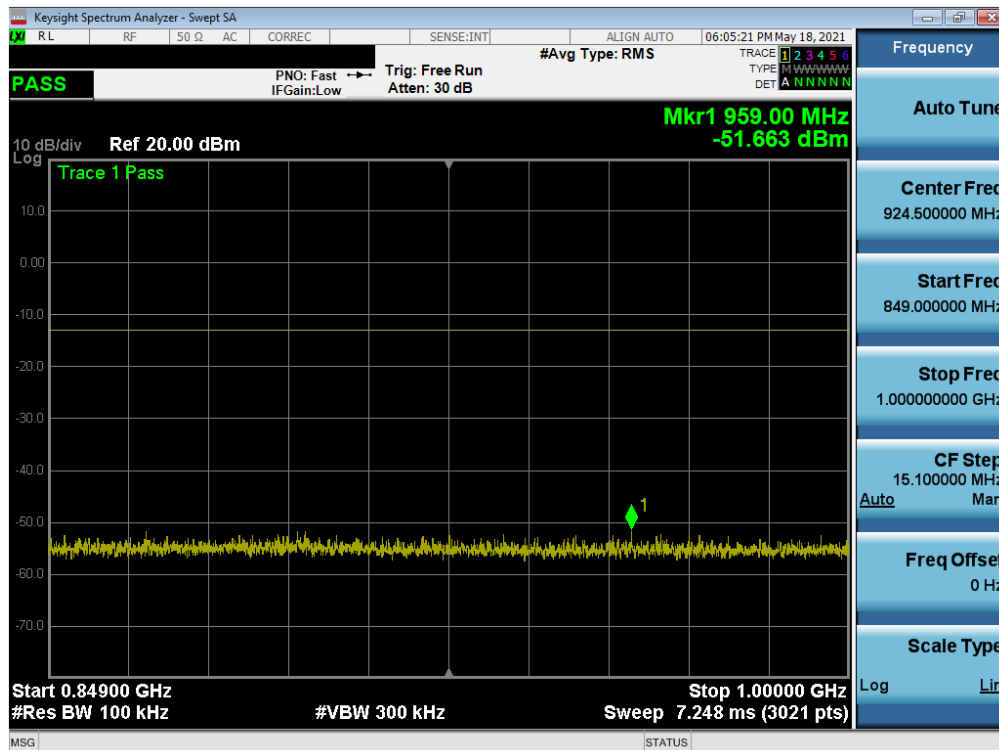
Plot 7-22. Conducted Spurious Plot (LTE Band 26/5 - 10MHz QPSK - 1 RB - High Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 28 of 70

GSM/GPRS Cell

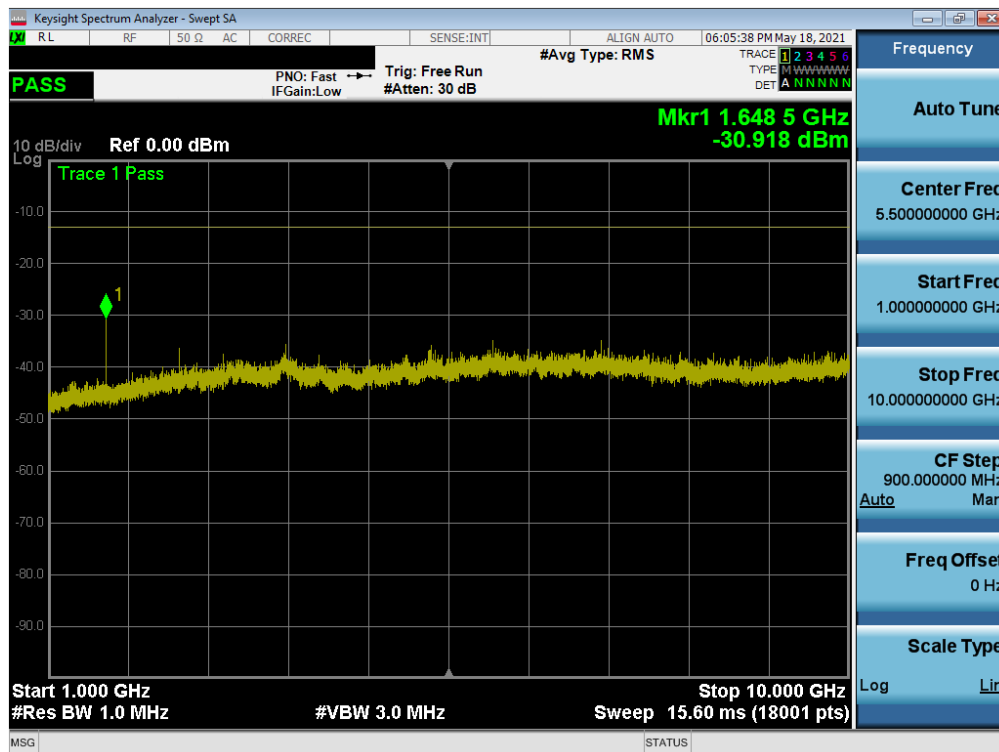


Plot 7-23. Conducted Spurious Plot (GPRS Ch. 128)

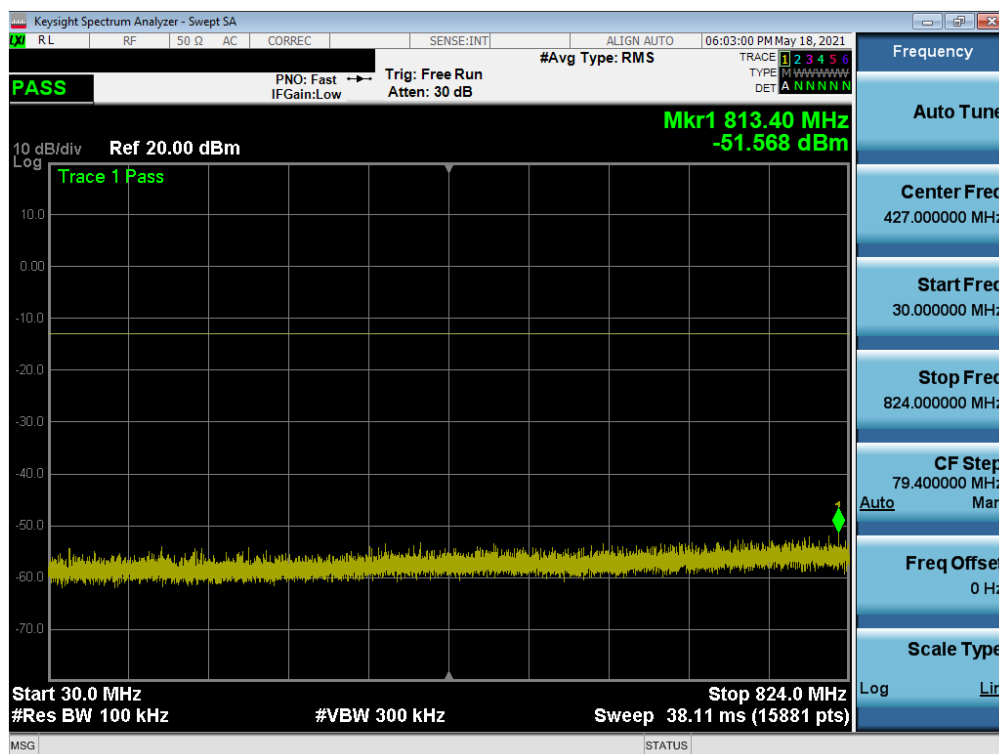


Plot 7-24. Conducted Spurious Plot (GPRS Ch. 128)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 29 of 70

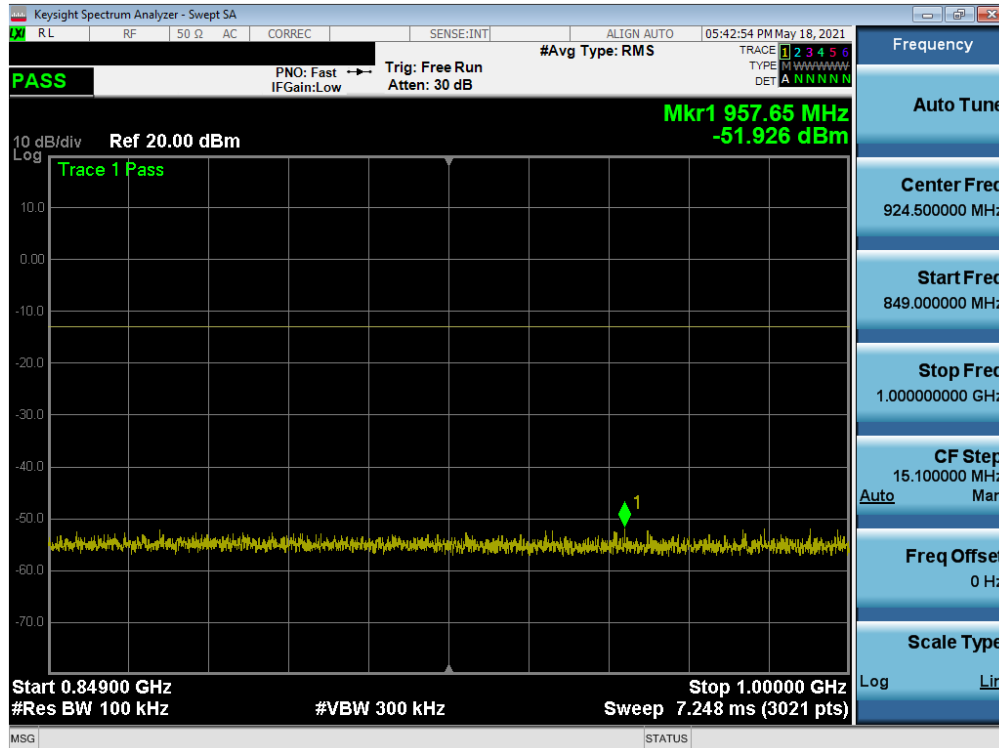


Plot 7-25. Conducted Spurious Plot (GPRS Ch. 128)

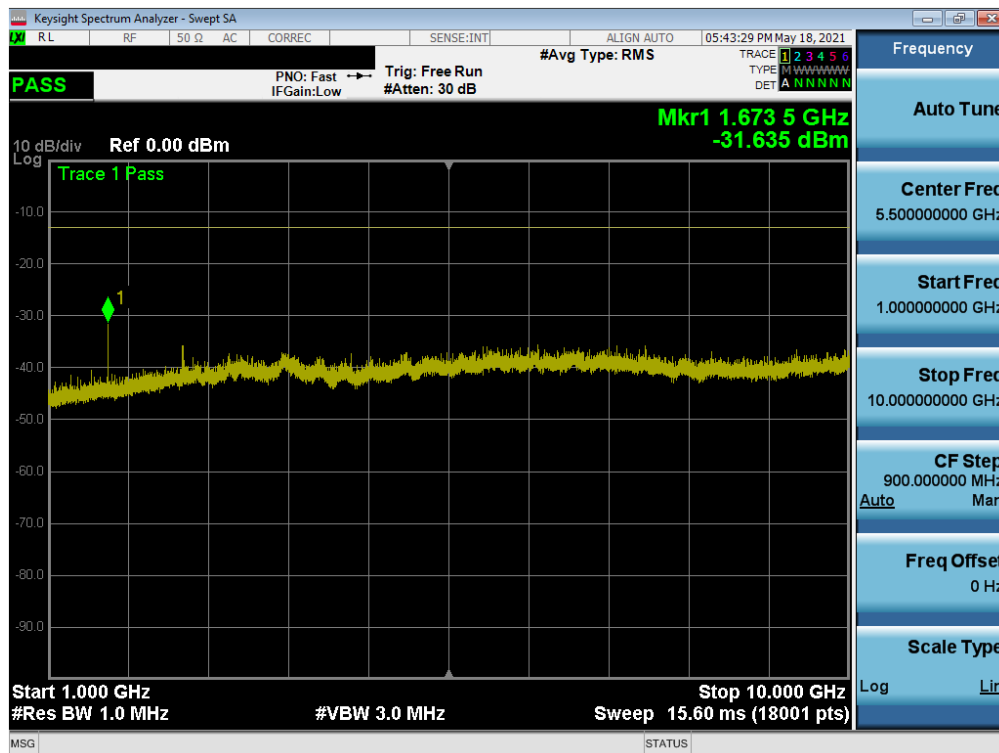


Plot 7-26. Conducted Spurious Plot (GPRS Ch. 190)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 30 of 70

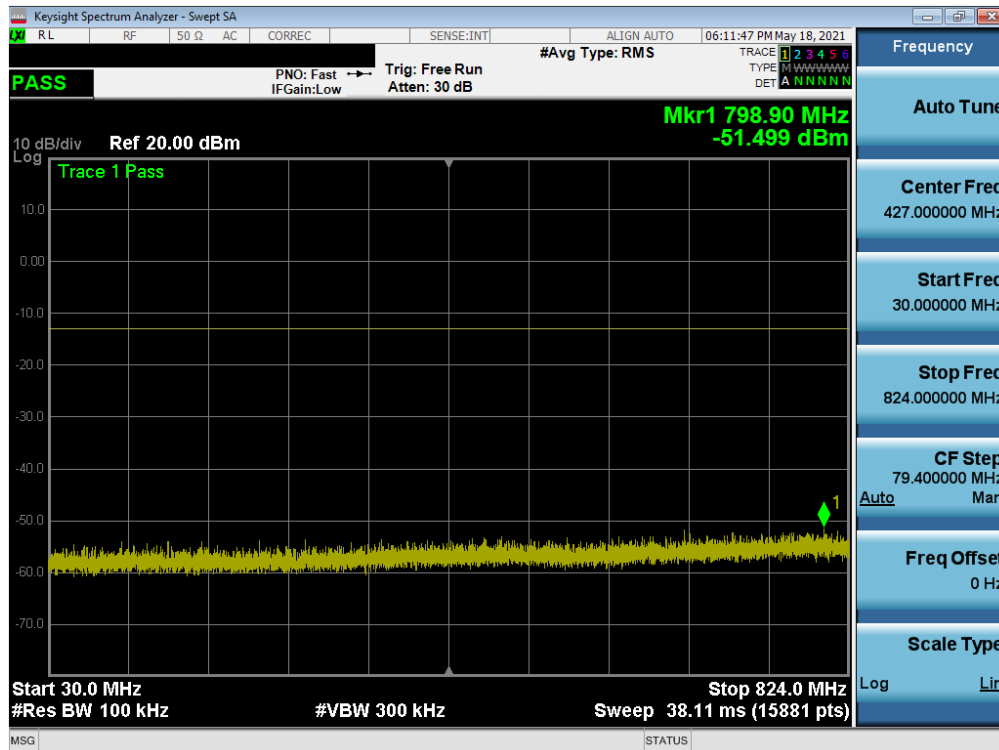


Plot 7-27. Conducted Spurious Plot (GPRS Ch. 190)

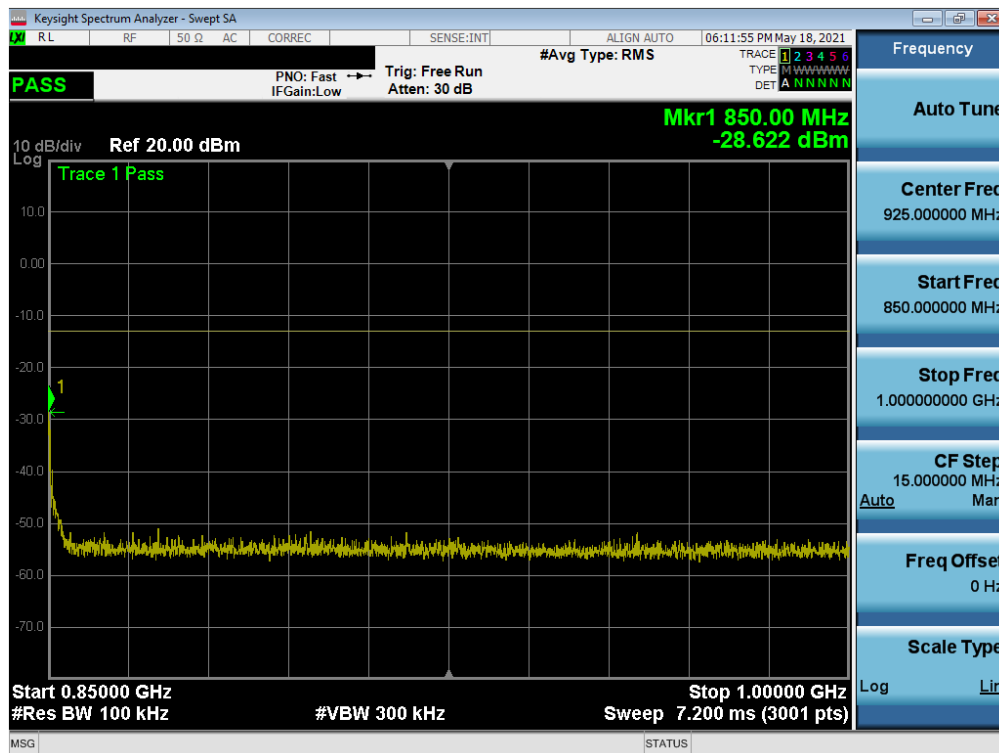


Plot 7-28. Conducted Spurious Plot (GPRS Ch. 190)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 31 of 70

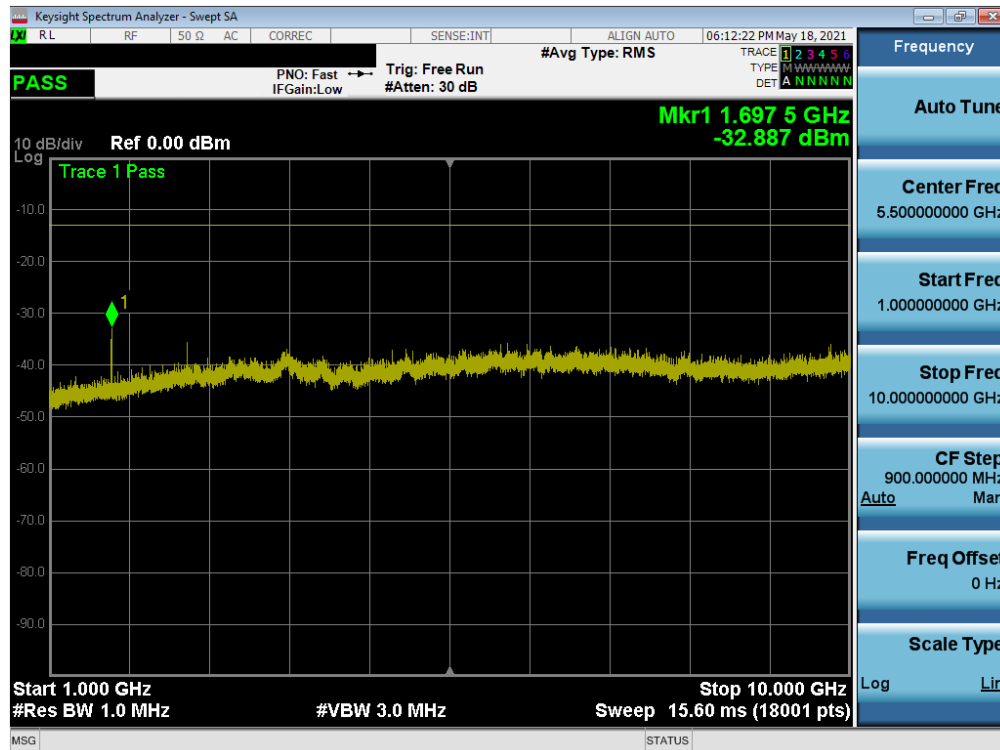


Plot 7-29. Conducted Spurious Plot (GPRS Ch. 251)



Plot 7-30. Conducted Spurious Plot (GPRS Ch. 251)

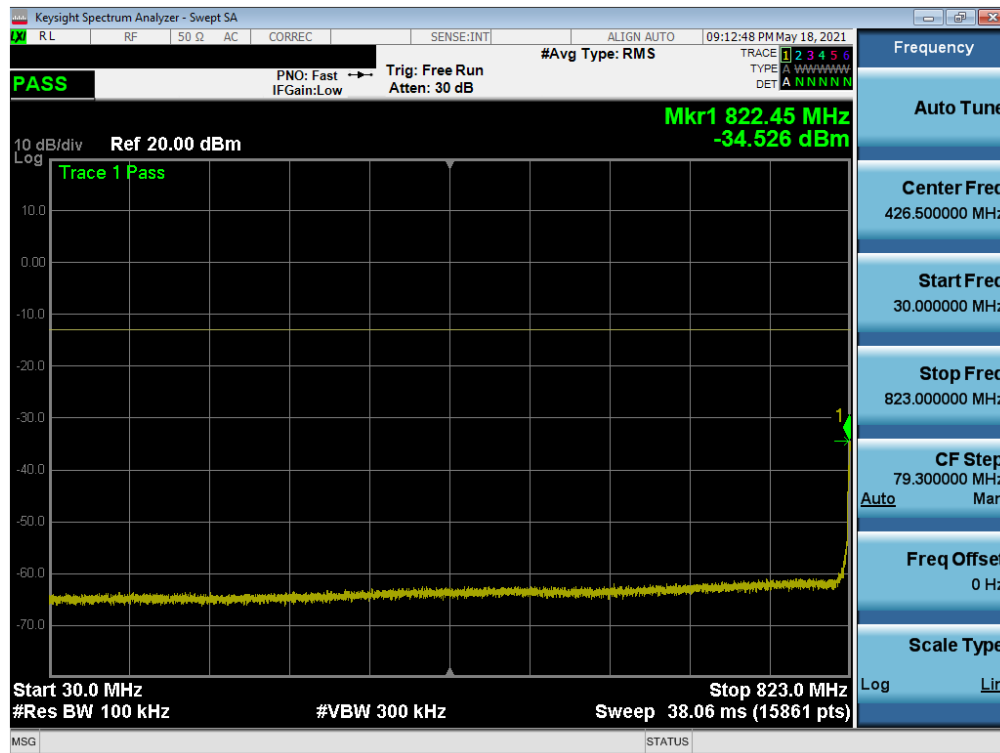
FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 32 of 70



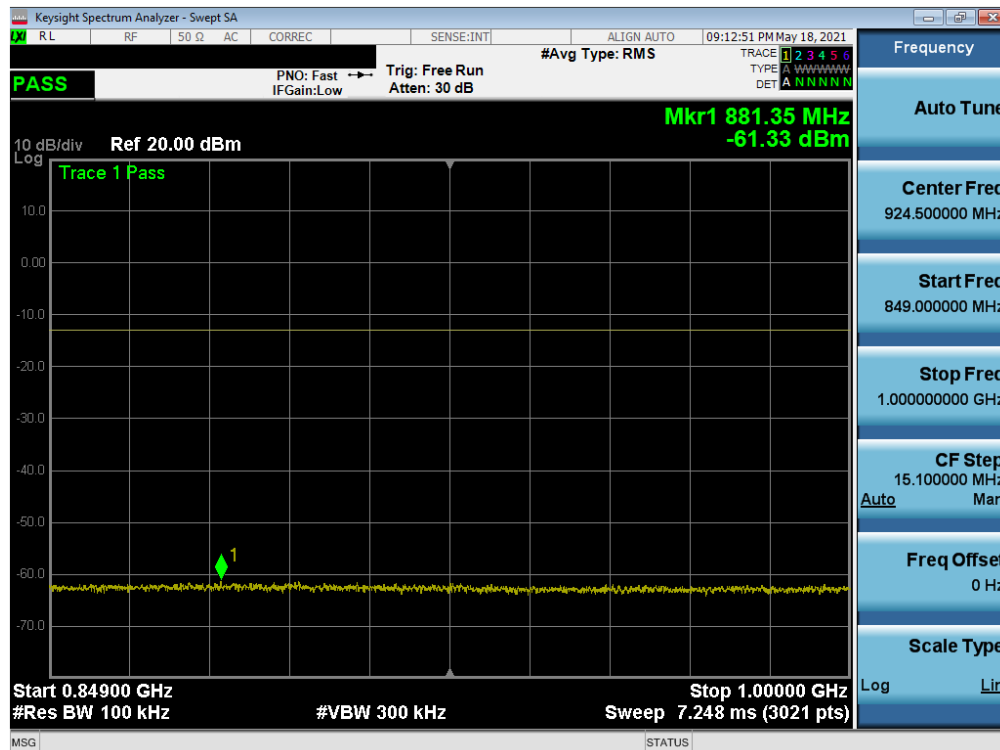
Plot 7-31. Conducted Spurious Plot (GPRS Ch. 251)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 33 of 70

WCDMA Cell

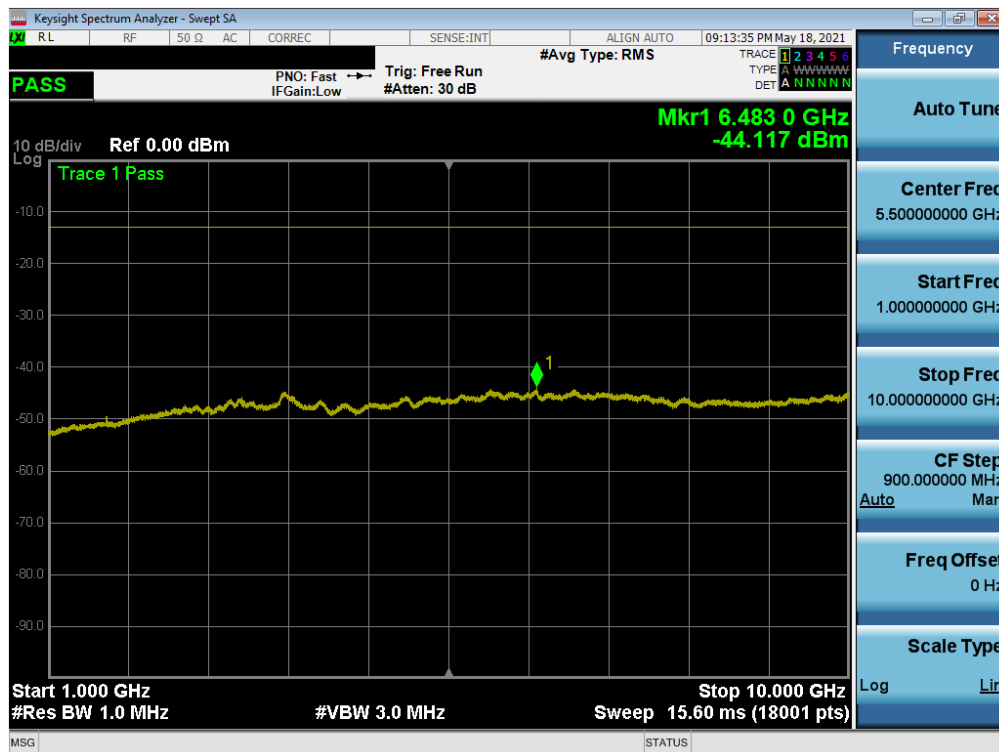


Plot 7-32. Conducted Spurious Plot (WCDMA Ch. 4132)

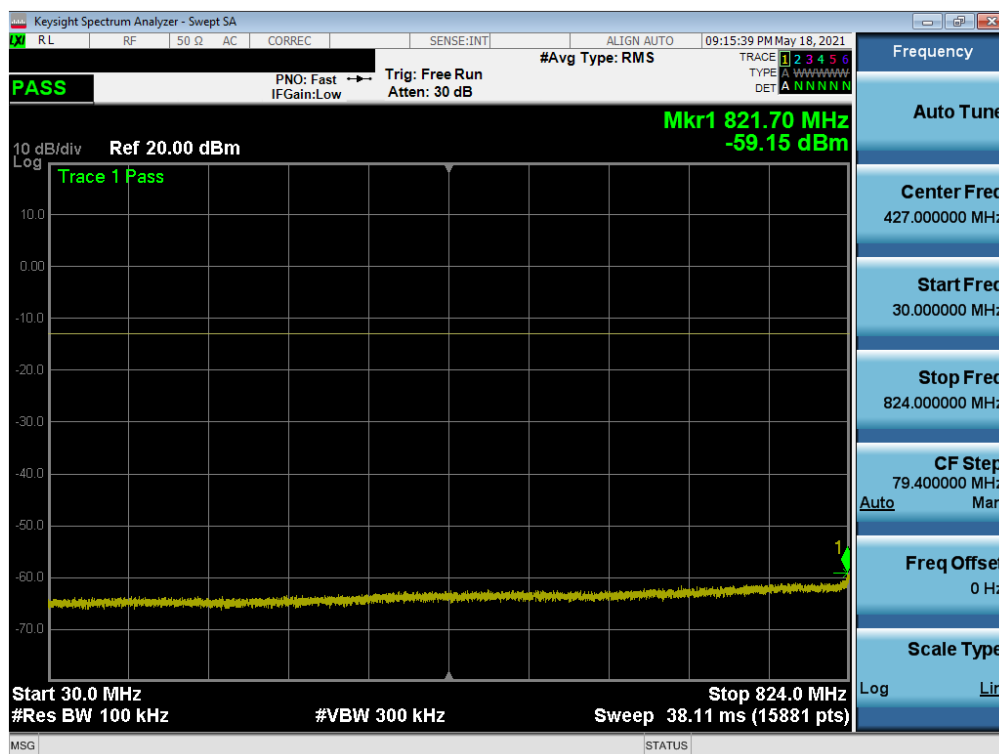


Plot 7-33. Conducted Spurious Plot (WCDMA Ch. 4132)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 34 of 70

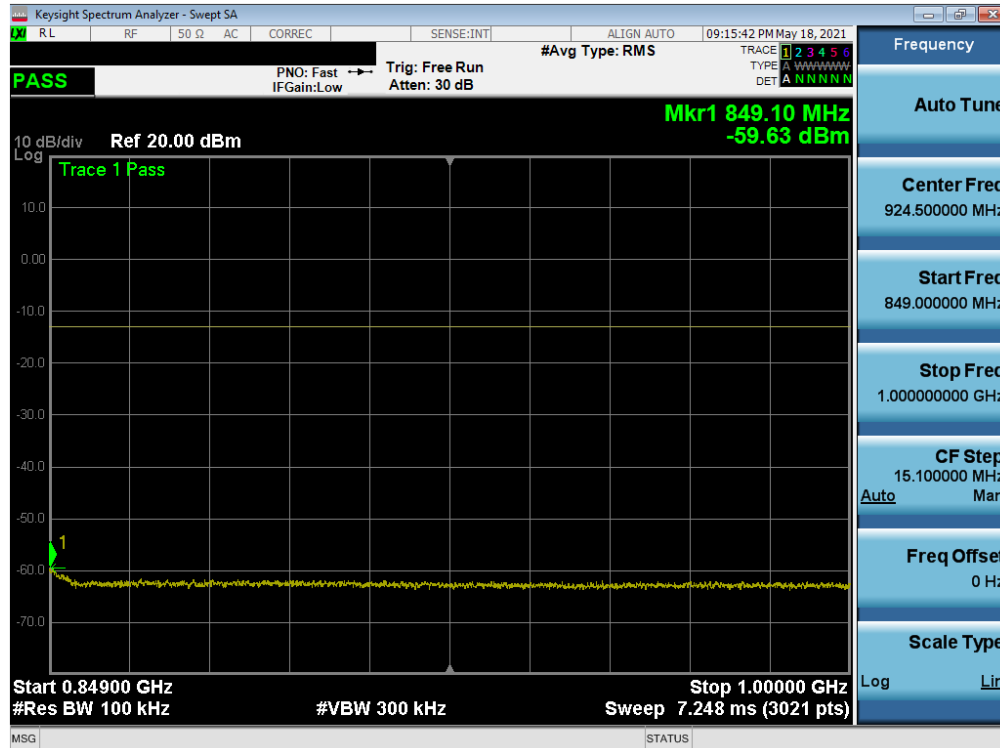


Plot 7-34. Conducted Spurious Plot (WCDMA Ch. 4132)

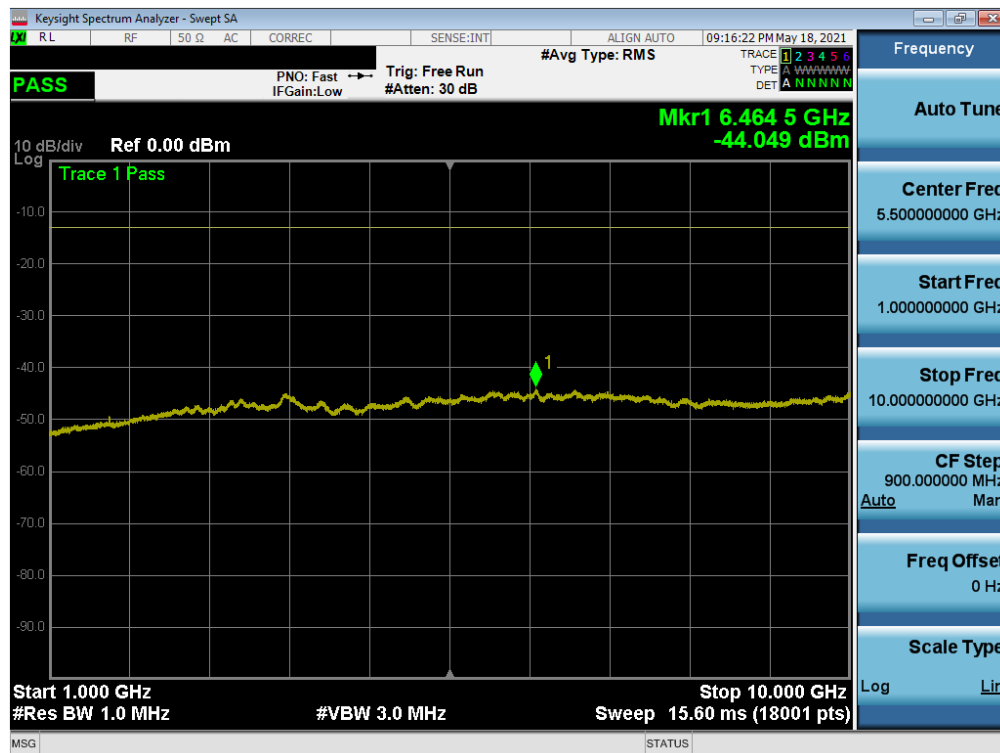


Plot 7-35. Conducted Spurious Plot (WCDMA Ch. 4183)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 35 of 70

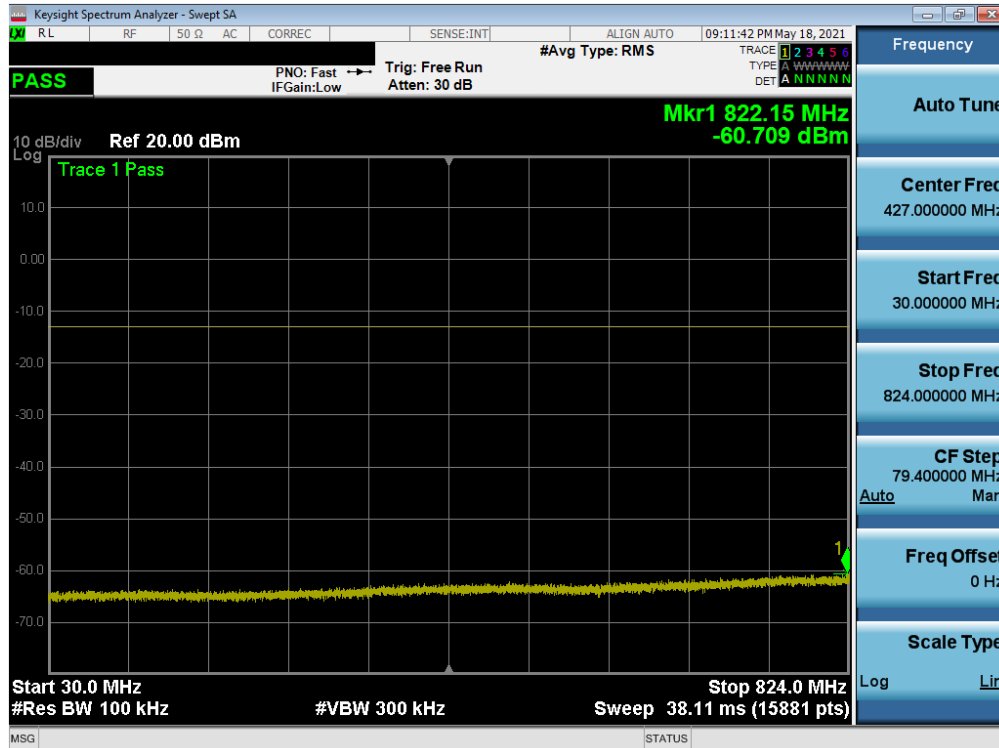


Plot 7-36. Conducted Spurious Plot (WCDMA Ch. 4183)

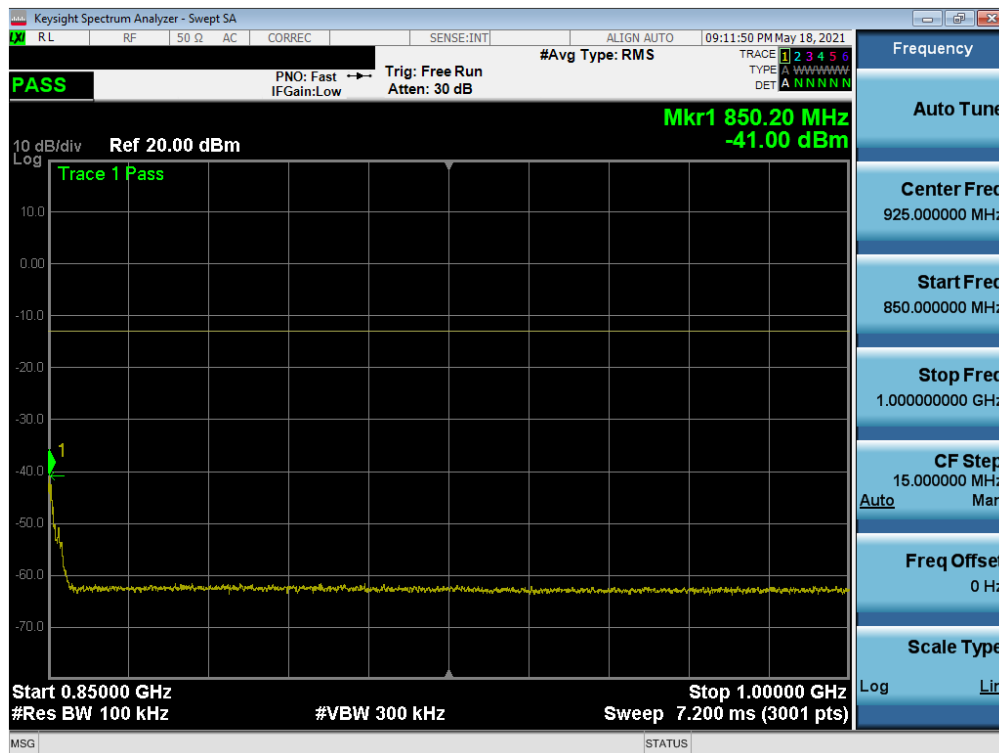


Plot 7-37. Conducted Spurious Plot (WCDMA Ch. 4183)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 36 of 70

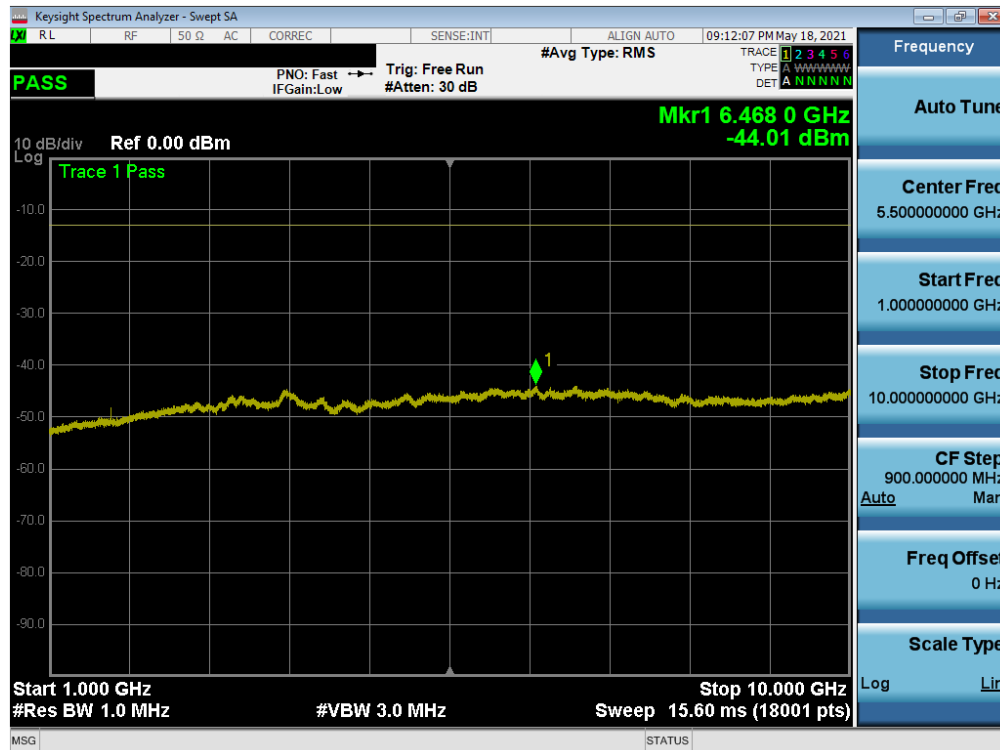


Plot 7-38. Conducted Spurious Plot (WCDMA Ch. 4233)



Plot 7-39. Conducted Spurious Plot (WCDMA Ch. 4233)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 37 of 70



Plot 7-40. Conducted Spurious Plot (WCDMA Ch. 4233)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 38 of 70

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 $\geq 2 \times \text{Span}/RBW$
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.

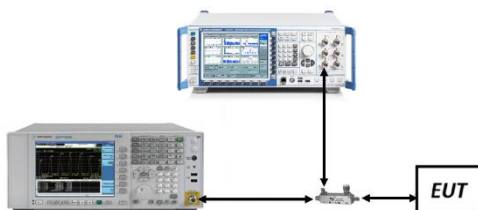


Figure 7-4. Test Instrument & Measurement Setup

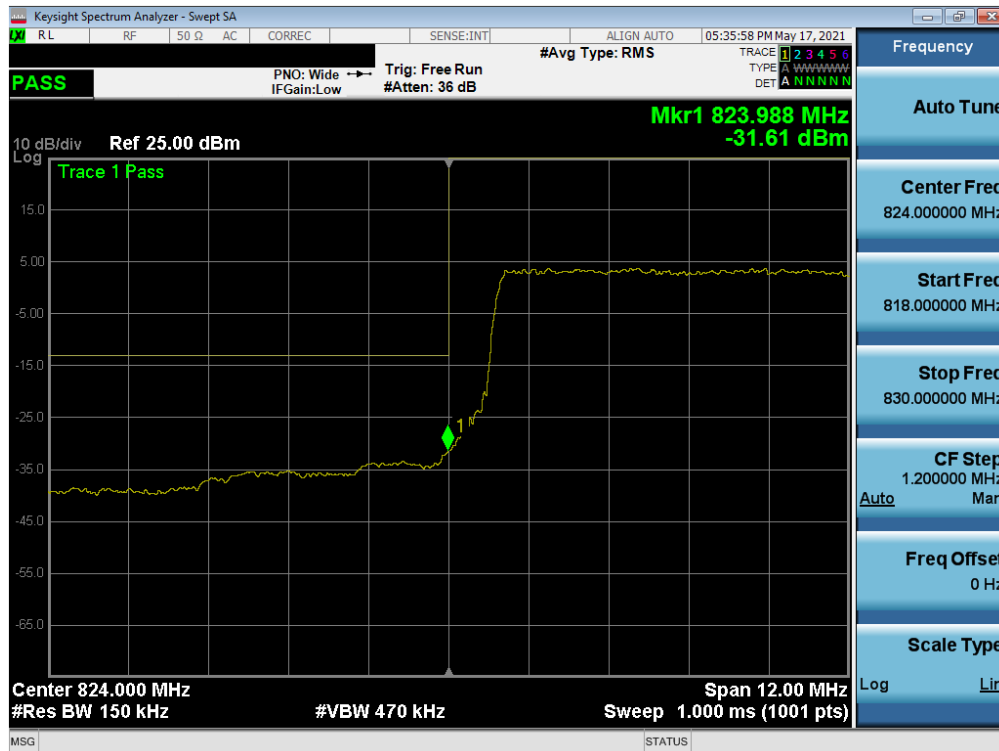
FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 22 / RSS-132 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 39 of 70

Test Notes

Per 22.917(b) and RSS-132(5.5), 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 22 / RSS-132 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 40 of 70

LTE Band 26/5

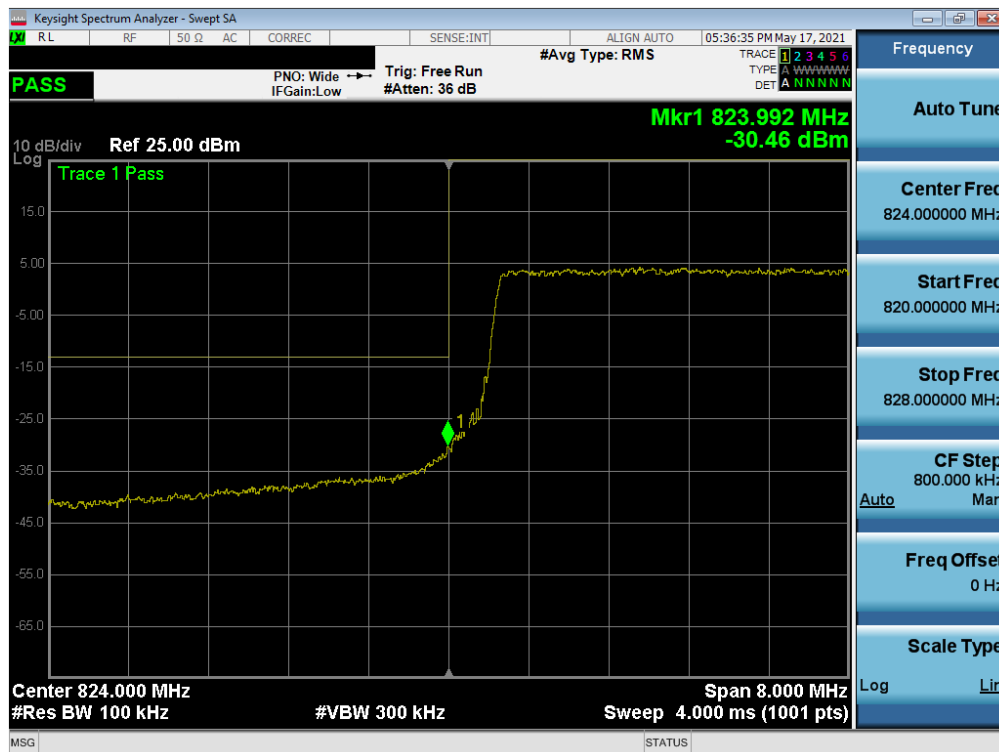


Plot 7-41. Lower Band Edge Plot (LTE Band 26 - 15MHz QPSK – Full RB)

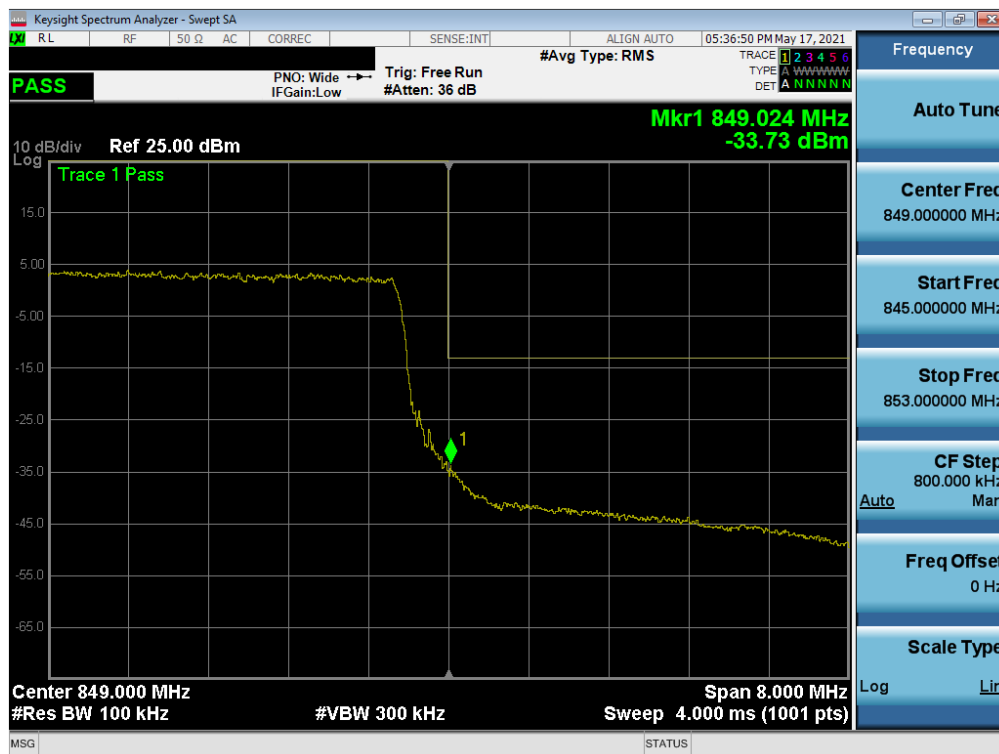


Plot 7-42. Upper Band Edge Plot (LTE Band 26 - 15MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 41 of 70

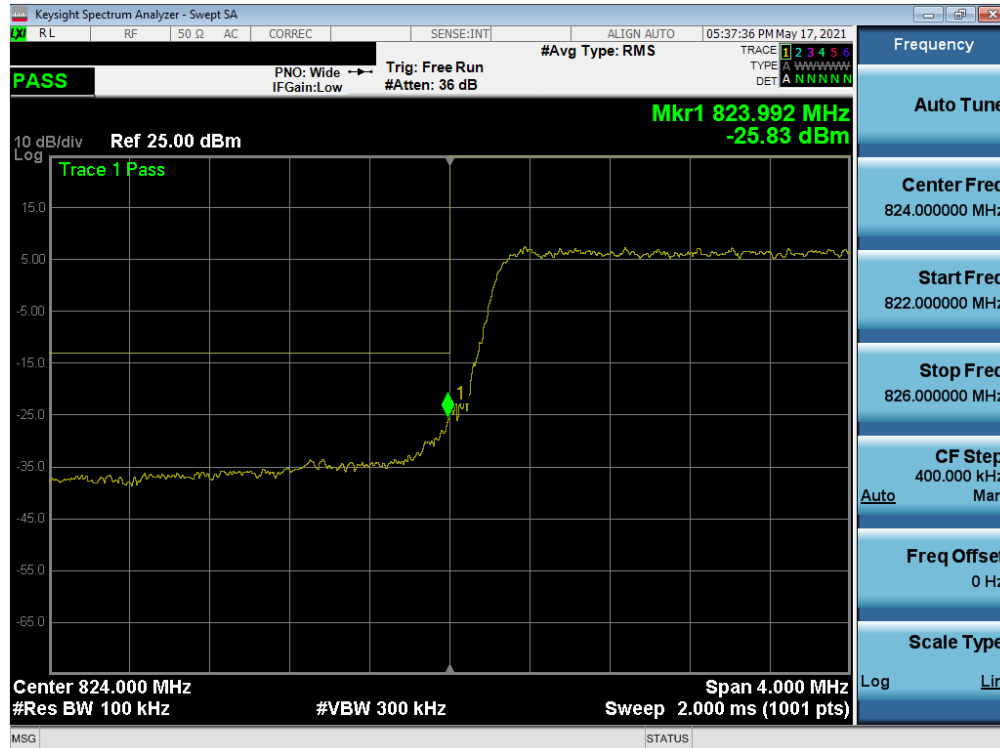


Plot 7-43. Lower Band Edge Plot (LTE Band 26/5 - 10MHz QPSK – Full RB)



Plot 7-44. Upper Band Edge Plot (LTE Band 26/5 - 10MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 42 of 70

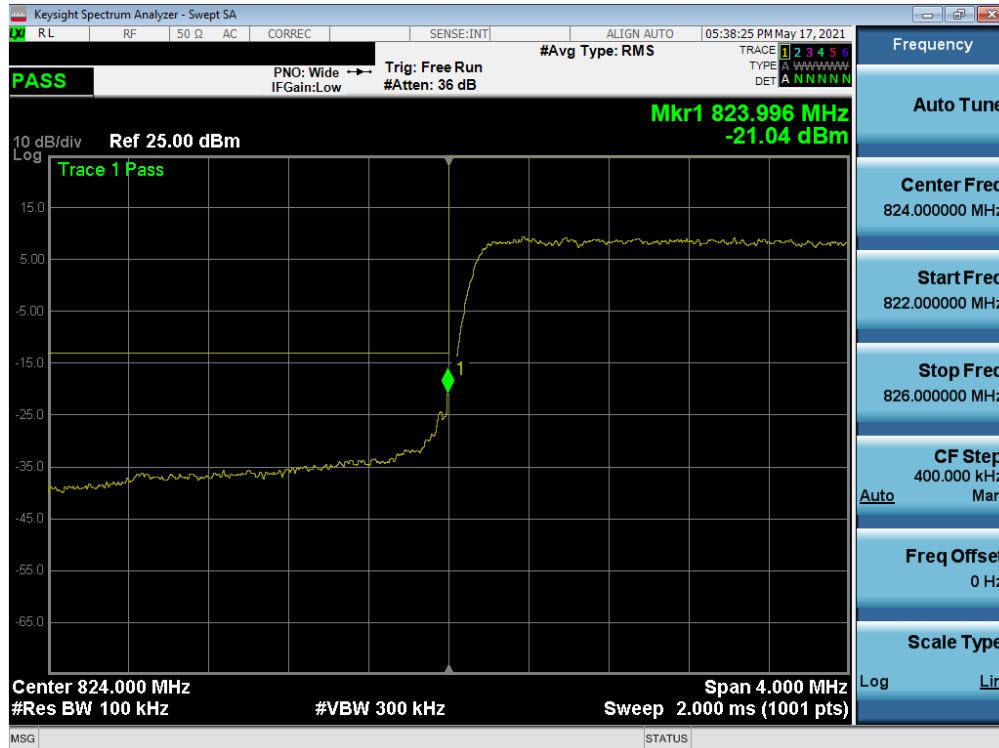


Plot 7-45. Lower Band Edge Plot (LTE Band 26/5 - 5MHz QPSK – Full RB)



Plot 7-46. Upper Band Edge Plot (LTE Band 26/5 - 5MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 43 of 70

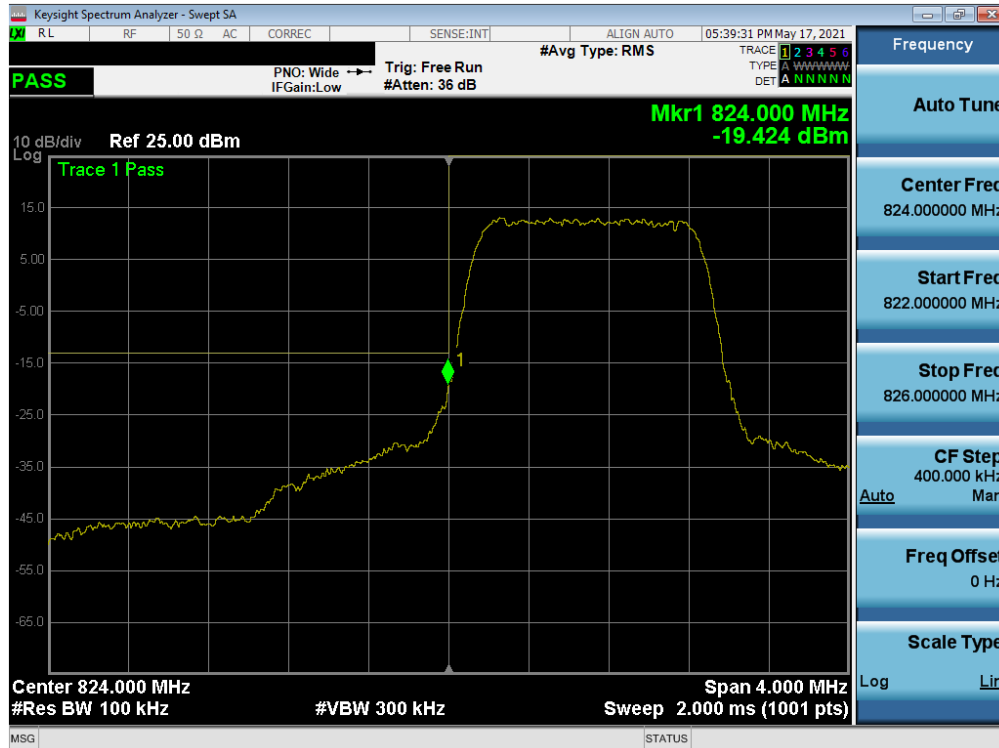


Plot 7-47. Lower Band Edge Plot (LTE Band 26/5 - 3MHz QPSK – Full RB)



Plot 7-48. Upper Band Edge Plot (LTE Band 26/5 - 3MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 44 of 70



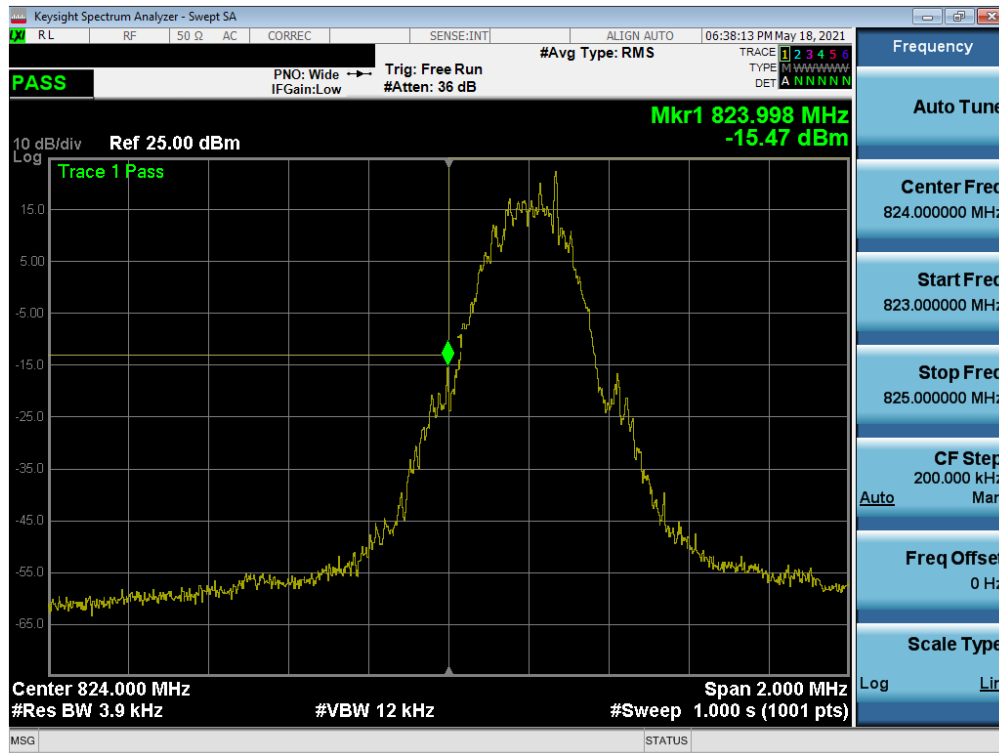
Plot 7-49. Lower Band Edge Plot (LTE Band 26/5 – 1.4MHz QPSK – Full RB)



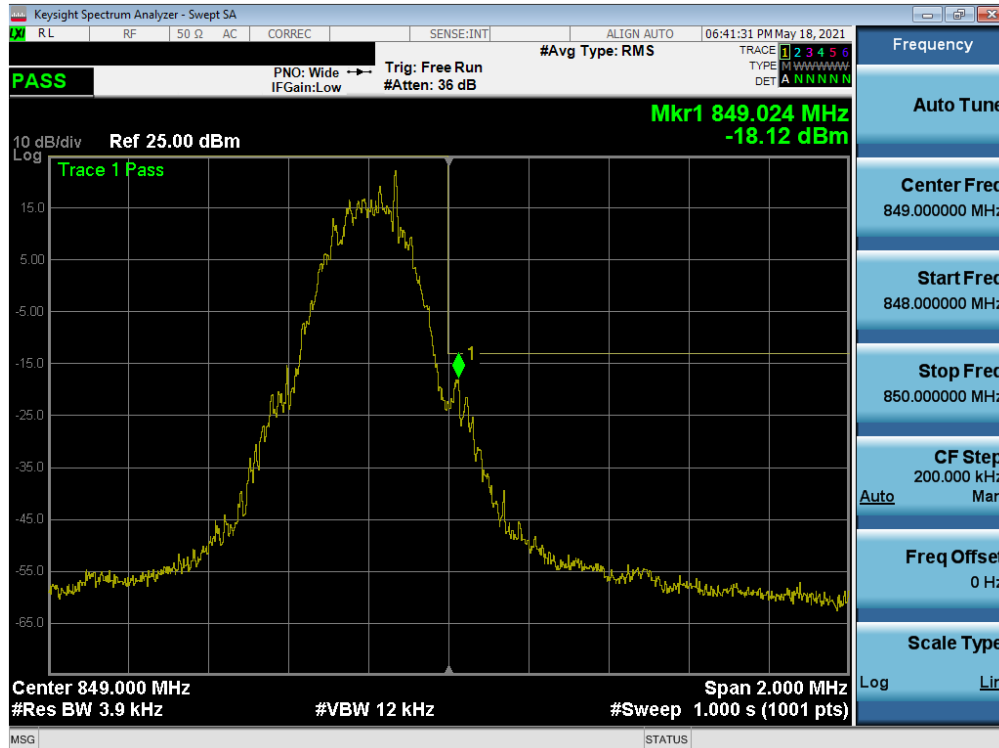
Plot 7-50. Upper Band Edge Plot (LTE Band 26/5 – 1.4MHz QPSK – Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 45 of 70

GSM/GPRS Cell



Plot 7-51. Lower Band Edge Plot (GPRS Cell – Ch. 128)



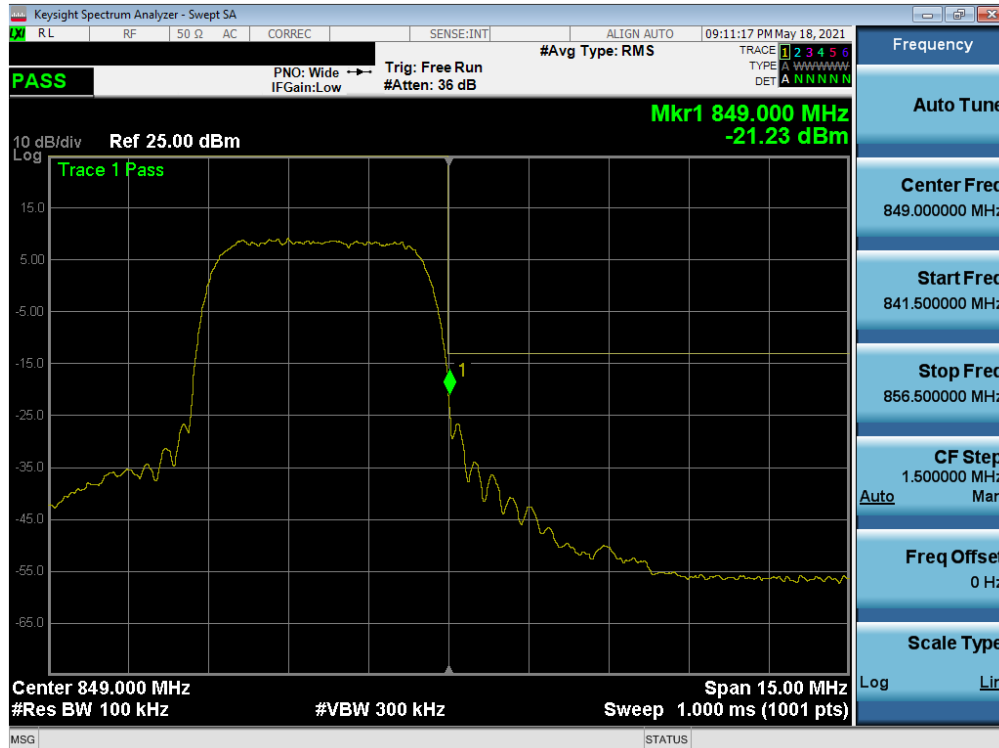
Plot 7-52. Upper Band Edge Plot (GPRS Cell – Ch. 251)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 46 of 70

WCDMA Cell



Plot 7-53. Lower Band Edge Plot (WCDMA Cell – Ch. 4132)



Plot 7-54. Upper Band Edge Plot (WCDMA Cell – Ch. 4233)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 47 of 70

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.

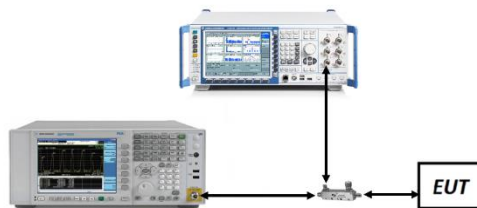


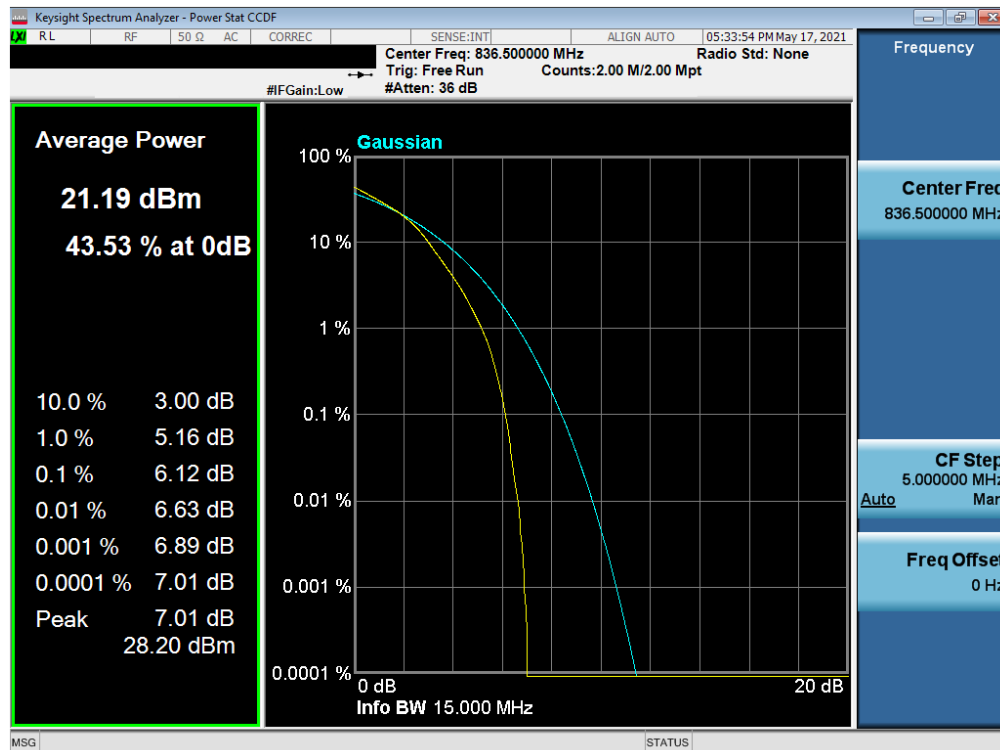
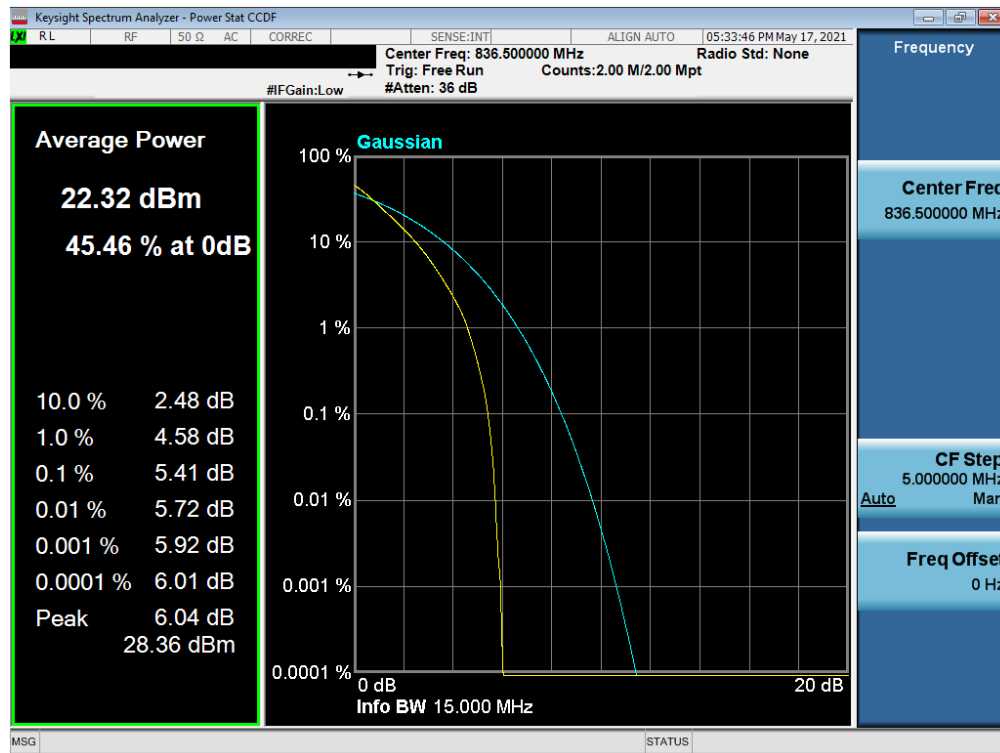
Figure 7-5. Test Instrument & Measurement Setup

Test Notes

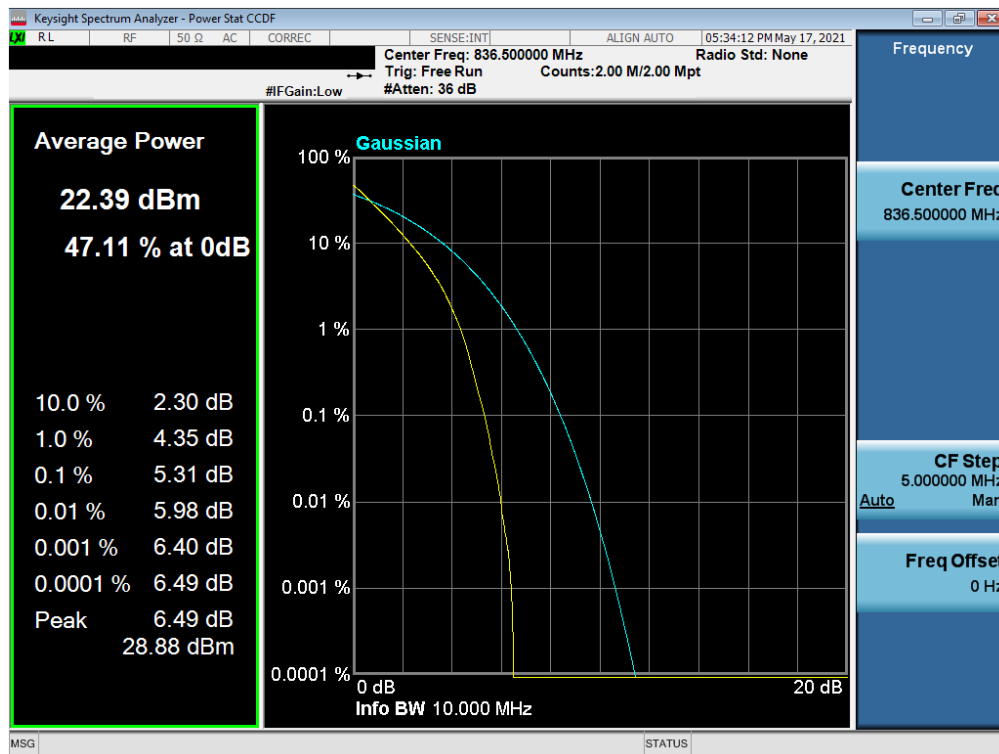
None.

FCC ID: R17LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.R17	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 48 of 70

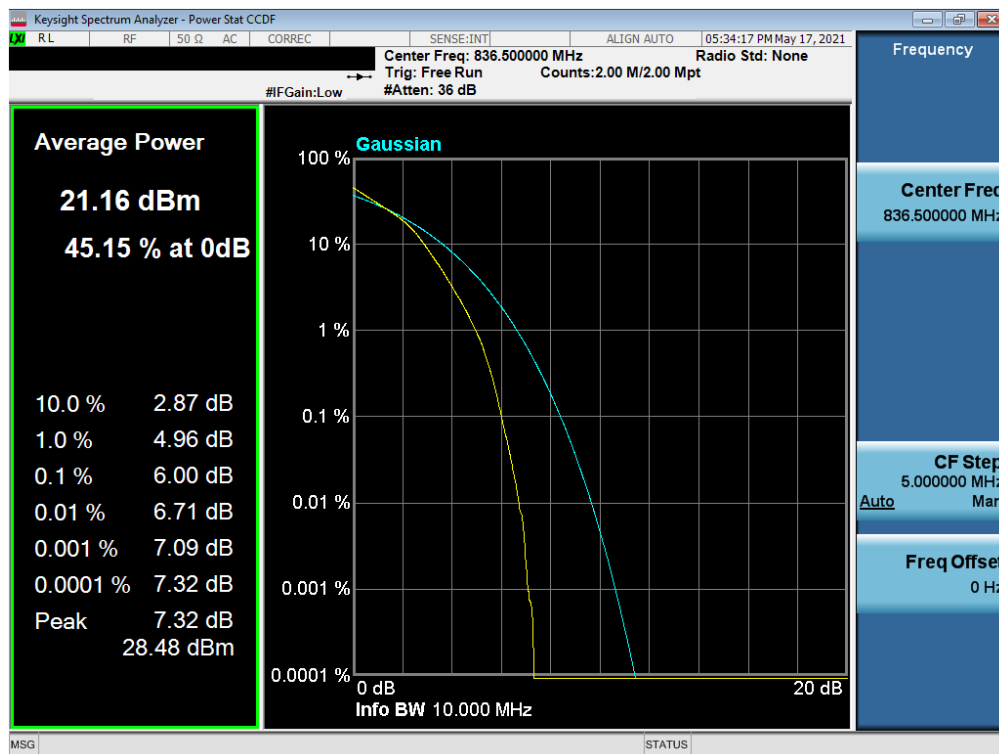
LTE Band 26/5



FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 49 of 70

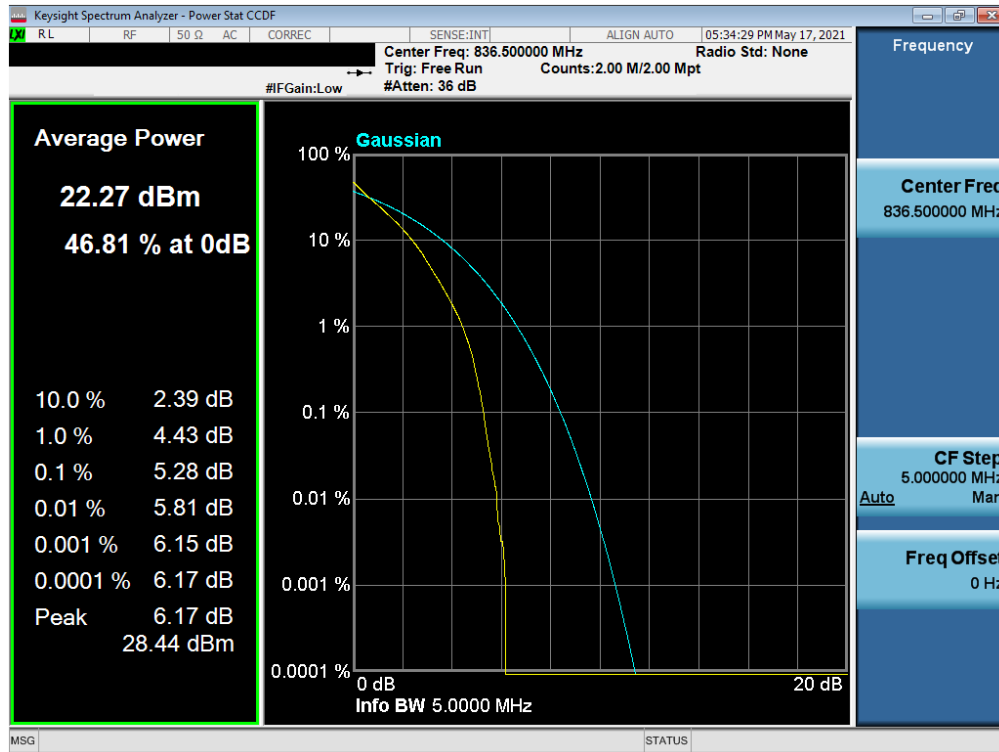


Plot 7-57. PAR Plot (LTE Band 26/5 - 10MHz QPSK - Full RB)

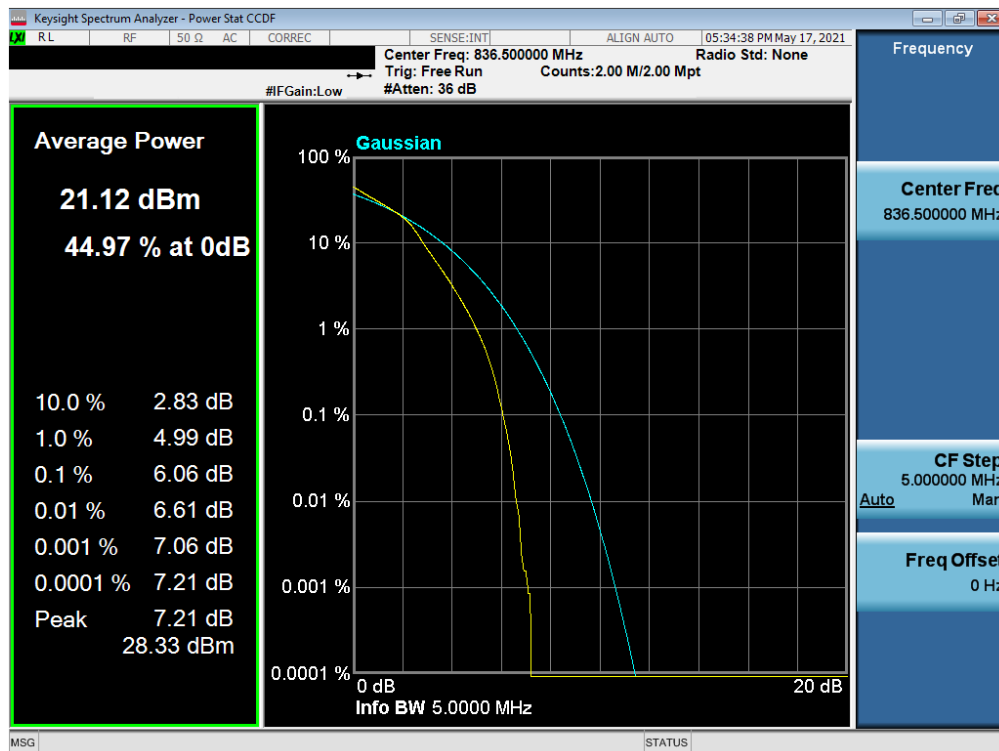


Plot 7-58. PAR Plot (LTE Band 26/5 - 10MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 50 of 70

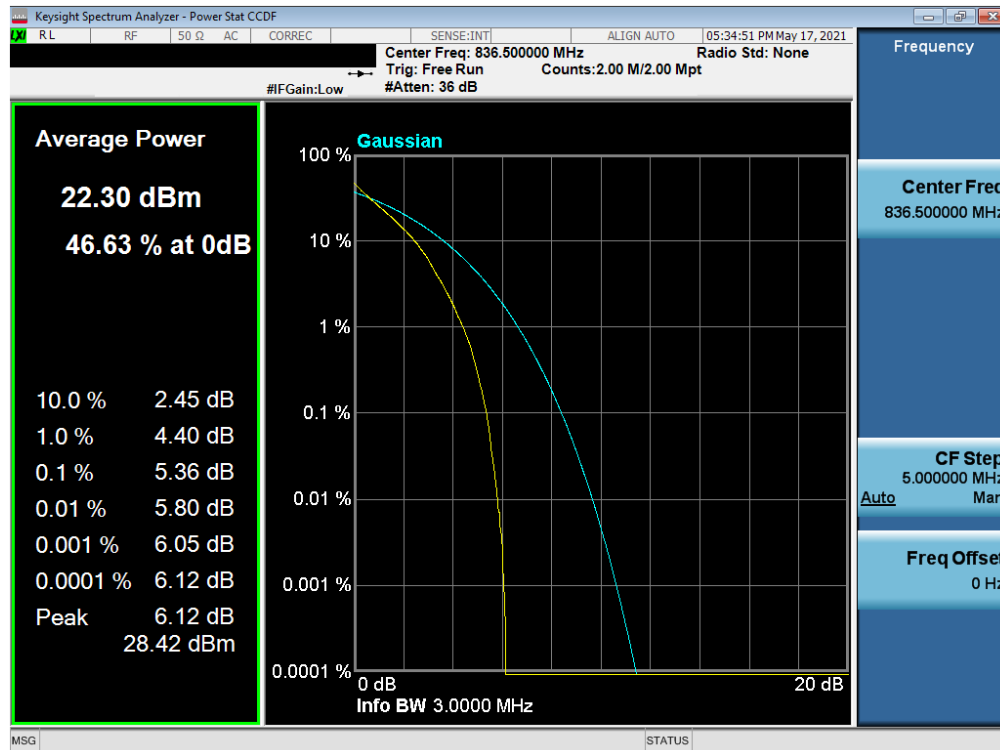


Plot 7-59. PAR Plot (LTE Band 26/5 - 5MHz QPSK - Full RB)

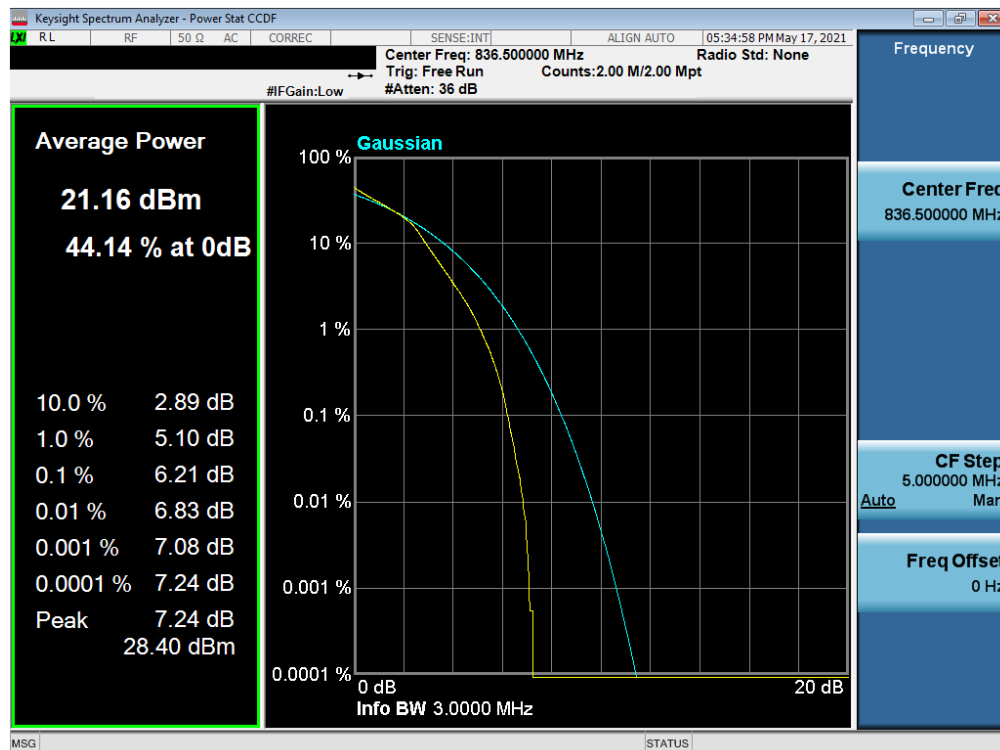


Plot 7-60. PAR Plot (LTE Band 26/5 - 5MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 51 of 70

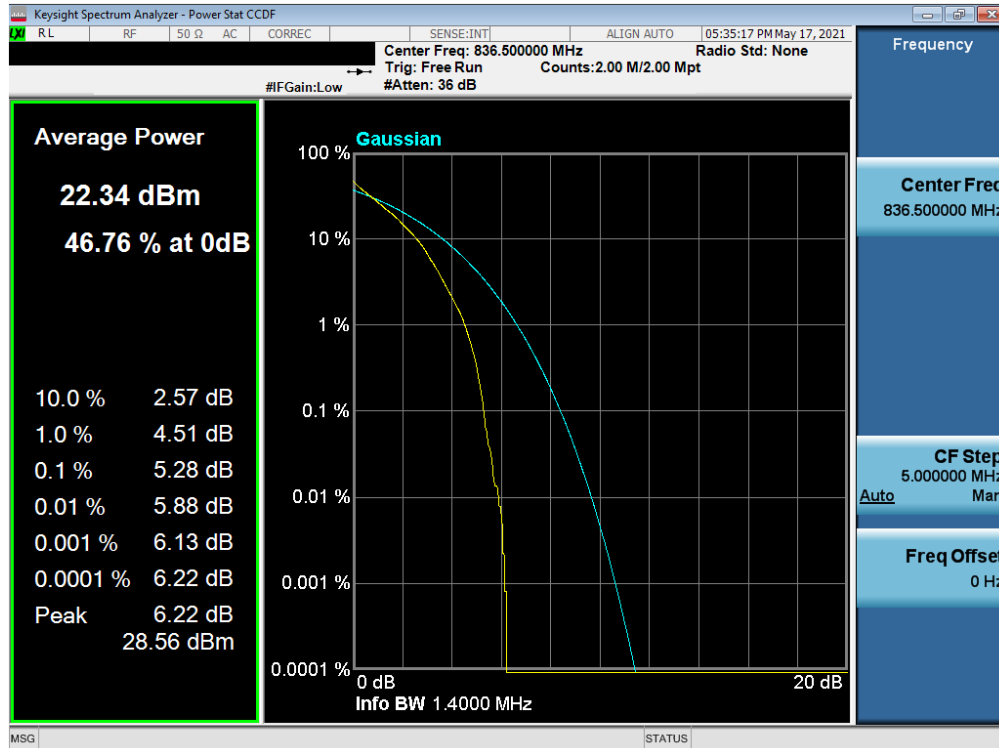


Plot 7-61. PAR Plot (LTE Band 26/5 - 3MHz QPSK - Full RB)

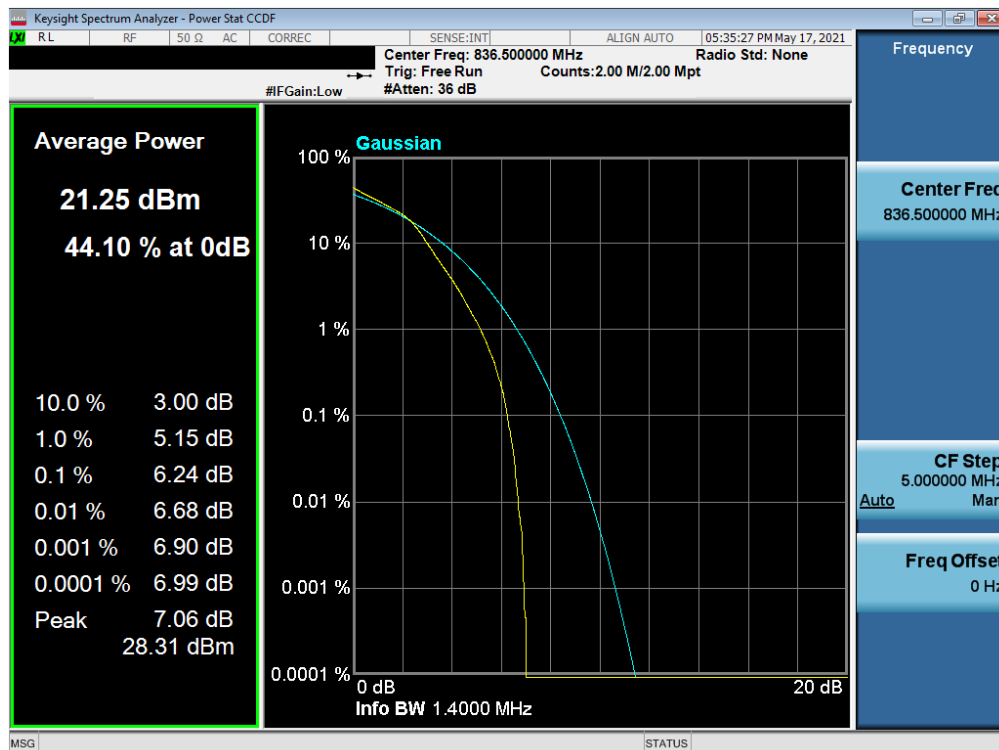


Plot 7-62. PAR Plot (LTE Band 26/5 - 3MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 - 06/01/2021	EUT Type: Data Terminal Module	Page 52 of 70



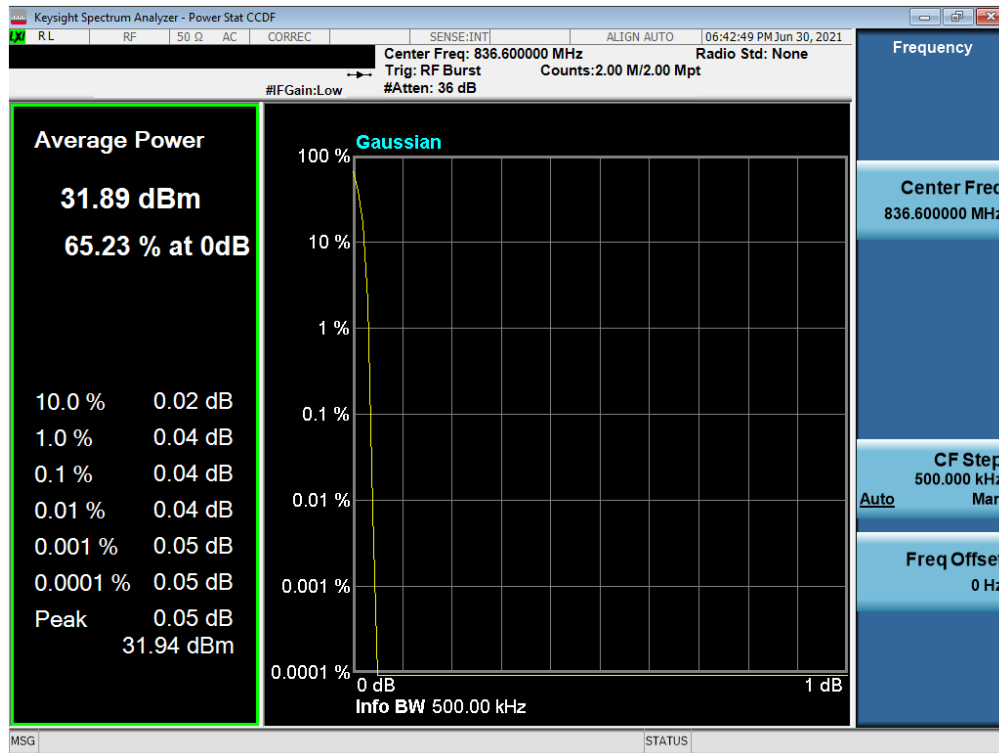
Plot 7-63. PAR Plot (LTE Band 26/5 – 1.4MHz QPSK - Full RB)



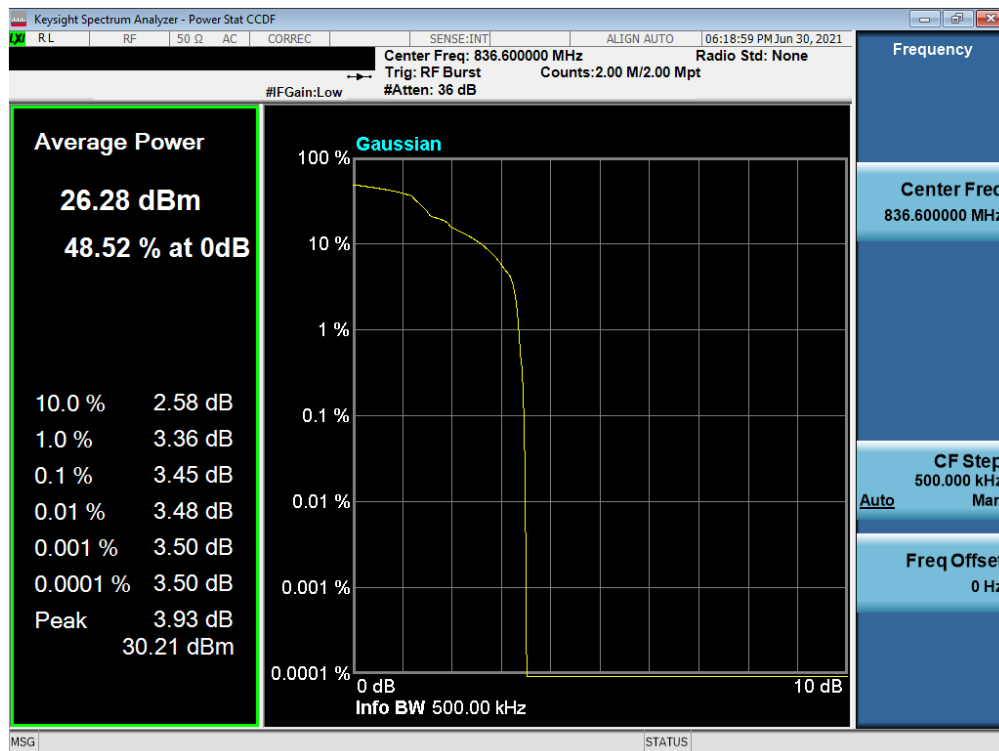
Plot 7-64. PAR Plot (LTE Band 26/5 – 1.4MHz 16-QAM - Full RB)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 53 of 70

GPRS/EDGE Cell



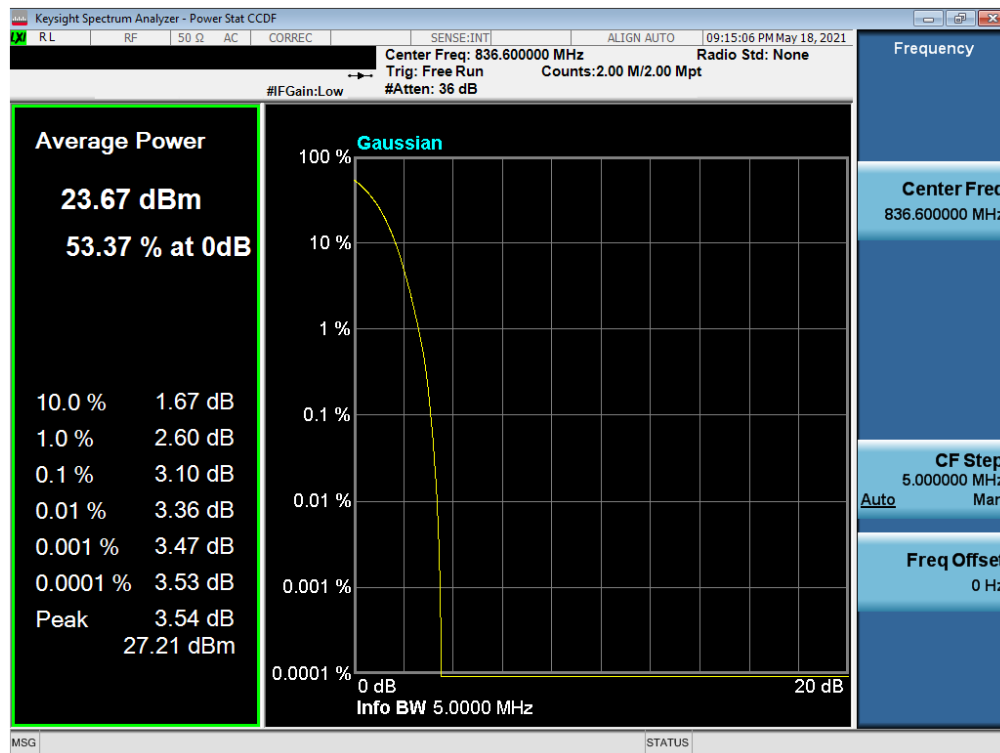
Plot 7-65. PAR Plot (GPRS, Ch. 190)



Plot 7-66. PAR Plot (EDGE, Ch. 190)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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WCDMA Cell



Plot 7-67. PAR Plot (WCDMA, Ch 4183)

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7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in 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

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Test Setup

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

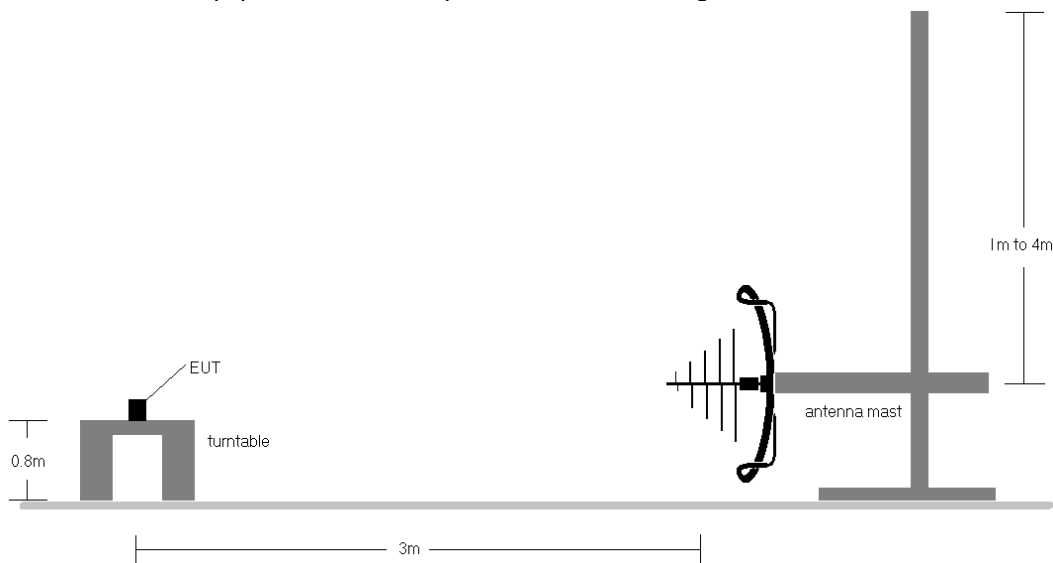


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

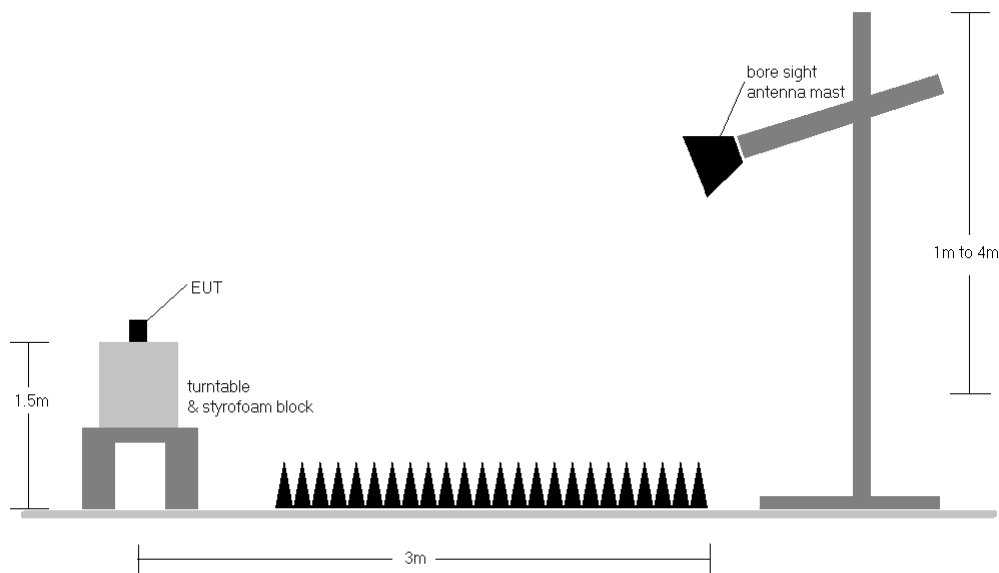


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

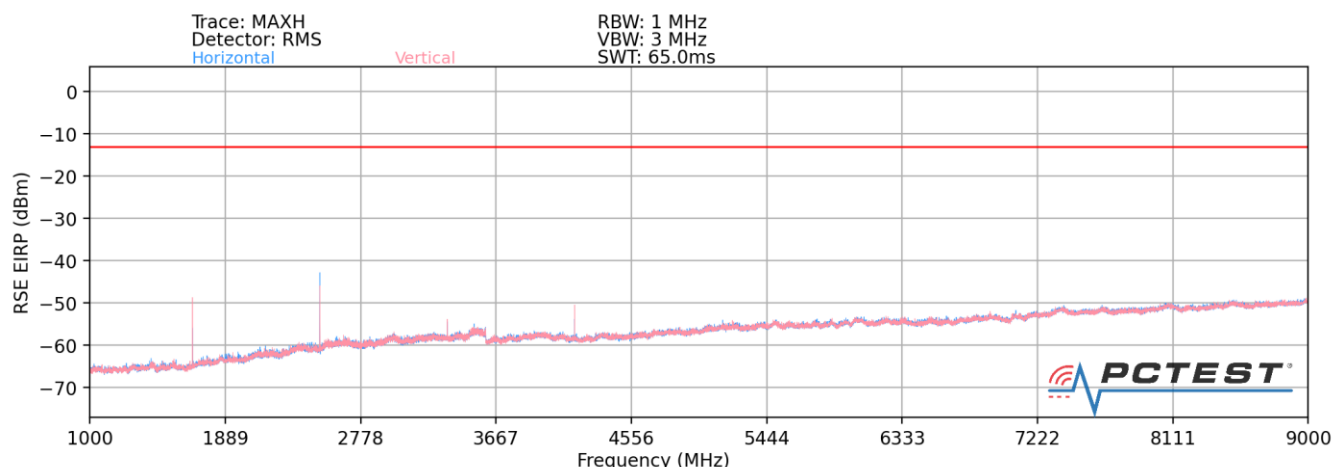
FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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Test Notes

- 1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
 - b) $E(\text{dB}\mu\text{V}/\text{m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
 - d) $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V}/\text{m}) + 20\log D - 104.8$; 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.

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LTE Band 26/5



Plot 7-68. Radiated Spurious Plot (LTE Band 26/5)

Bandwidth (MHz):	15
Frequency (MHz):	831.5
RB / Offset:	1 / 37

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]
1663.0	H	146	116	-66.50	-5.53	34.97	-60.29	-13.00	-47.29
2494.5	H	117	146	-62.03	-2.63	42.34	-52.92	-13.00	-39.92
3326.0	H	118	118	-73.65	0.44	33.79	-61.47	-13.00	-48.47
4157.5	H	262	279	-74.03	1.86	34.83	-60.43	-13.00	-47.43
4989.0	H	-	-	-78.28	3.78	32.50	-62.76	-13.00	-49.76
5820.5	H	-	-	-79.14	5.49	33.35	-61.91	-13.00	-48.91

Table 7-5. Radiated Spurious Data (LTE Band 26/5 – Low Channel)

Bandwidth (MHz):	15
Frequency (MHz):	836.5
RB / Offset:	1 / 37

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]
1673.0	H	111	127	-57.91	-5.40	43.69	-51.57	-13.00	-38.57
2509.5	H	118	147	-52.87	-2.54	51.59	-43.67	-13.00	-30.67
3346.0	H	391	352	-66.95	0.30	40.35	-54.90	-13.00	-41.90
4182.5	H	318	277	-68.11	2.02	40.91	-54.35	-13.00	-41.35
5019.0	H	360	30	-78.42	4.16	32.74	-62.52	-13.00	-49.52
5855.5	H	372	275	-79.14	5.98	33.84	-61.41	-13.00	-48.41
6692.0	H	-	-	-79.49	6.59	34.10	-61.15	-13.00	-48.15
7528.5	H	-	-	-79.32	8.89	36.57	-58.69	-13.00	-45.69

Table 7-6. Radiated Spurious Data (LTE Band 26/5 – Mid Channel)

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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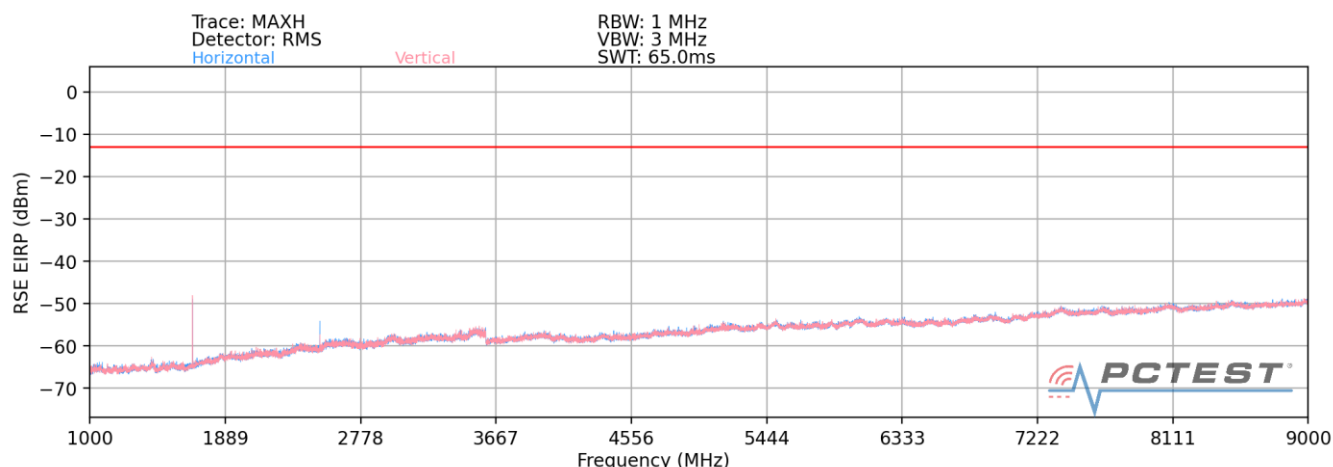
Bandwidth (MHz):	15
Frequency (MHz):	841.5
RB / Offset:	1 / 37

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]
1683.00	H	217	122	-59.45	-5.26	42.29	-52.96	-13.00	-39.96
2524.50	H	114	144	-49.83	-2.10	55.07	-40.19	-13.00	-27.19
3366.00	H	155	149	-69.15	0.28	38.13	-57.13	-13.00	-44.13
4207.50	H	306	280	-70.31	1.90	38.59	-56.67	-13.00	-43.67
5049.00	H	-	-	-78.87	4.52	32.65	-62.60	-13.00	-49.60
5890.50	H	-	-	-79.42	5.92	33.50	-61.75	-13.00	-48.75

Table 7-7. Radiated Spurious Data (LTE Band 26/5 – High Channel)

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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GSM/GPRS Cell



Plot 7-69. Radiated Spurious Plot (GPRS Cell)

Mode:	GPRS 1 Tx Slot
Channel:	128
Frequency (MHz):	824.2

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]
1648.4	V	325	188	-47.65	-5.66	53.69	-41.57	-13.00	-28.57
2472.6	V	377	194	-60.35	-2.31	44.34	-50.92	-13.00	-37.92
3296.8	V	388	338	-72.82	0.66	34.84	-60.41	-13.00	-47.41
4121.0	V	-	-	-73.70	2.01	35.31	-59.95	-13.00	-46.95
4945.2	V	-	-	-74.26	3.61	36.35	-58.90	-13.00	-45.90

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

Mode:	GPRS 1 Tx Slot
Channel:	190
Frequency (MHz):	836.6

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]
1673.2	V	338	185	-50.78	-5.40	50.82	-44.43	-13.00	-31.43
2509.8	V	398	193	-63.87	-2.54	40.59	-54.67	-13.00	-41.67
3346.4	V	400	119	-69.82	0.30	37.48	-57.77	-13.00	-44.77
4183.0	V	-	-	-73.16	2.02	35.86	-59.40	-13.00	-46.40
5019.6	V	-	-	-75.12	4.16	36.04	-59.21	-13.00	-46.21

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

FCC ID: R17LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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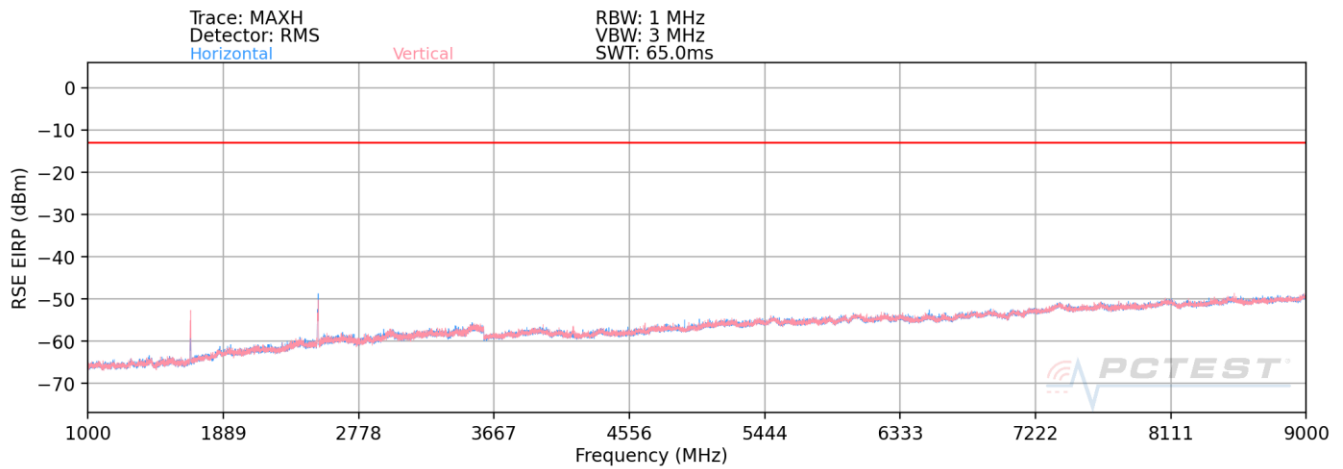
Mode:	GPRS 1 Tx Slot
Channel:	251
Frequency (MHz):	848.8

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]
1697.6	V	340	181	-57.87	-5.01	44.12	-51.14	-13.00	-38.14
2546.4	V	113	4	-58.51	-1.28	47.21	-48.04	-13.00	-35.04
3395.2	V	400	285	-70.83	0.46	36.63	-58.62	-13.00	-45.62
4244.0	V	-	-	-73.80	1.91	35.11	-60.14	-13.00	-47.14
5092.8	V	-	-	-74.92	4.62	36.70	-58.55	-13.00	-45.55

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

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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WCDMA Cell



Plot 7-70. Radiated Spurious Plot (WCDMA Cell)

Mode:	WCDMA RMC
Channel:	4132
Frequency (MHz):	826.4

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]
1652.8	H	260	69	-69.04	-5.63	32.33	-62.93	-13.00	-49.93
2479.2	H	113	146	-62.26	-2.41	42.33	-52.93	-13.00	-39.93
3305.6	H	150	146	-75.84	0.62	31.78	-63.48	-13.00	-50.48
4132.0	H	363	205	-76.94	1.84	31.90	-63.36	-13.00	-50.36
4958.4	H	-	-	-78.03	3.69	32.66	-62.60	-13.00	-49.60
5784.8	H	-	-	-79.36	5.73	33.37	-61.88	-13.00	-48.88

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

Mode:	WCDMA RMC
Channel:	4183
Frequency (MHz):	836.6

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]
1673.2	H	15	90	-65.17	-5.40	36.43	-58.82	-13.00	-45.82
2509.8	H	135	142	-58.88	-2.54	45.58	-49.68	-13.00	-36.68
3346.4	H	400	352	-72.63	0.30	34.67	-60.58	-13.00	-47.58
4183.0	H	397	220	-75.03	2.02	33.99	-61.27	-13.00	-48.27
5019.6	H	-	-	-79.17	4.16	31.99	-63.26	-13.00	-50.26
5856.2	H	-	-	-79.07	6.00	33.93	-61.32	-13.00	-48.32

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

FCC ID: R17LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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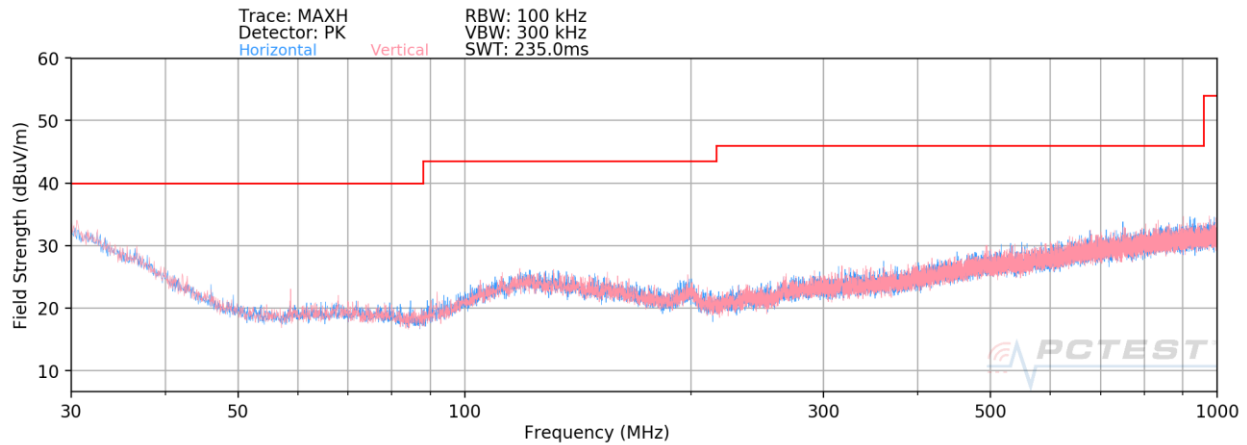
Mode:	WCDMA RMC
Channel:	4233
Frequency (MHz):	846.6

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]
1693.2	H	203	106	-67.44	-5.09	34.47	-60.78	-13.00	-47.78
2539.8	H	117	143	-57.18	-1.51	48.31	-46.95	-13.00	-33.95
3386.4	H	381	341	-74.51	0.36	32.85	-62.40	-13.00	-49.40
4233.0	H	171	337	-77.85	1.78	30.93	-64.33	-13.00	-51.33
5079.6	H	-	-	-78.95	4.66	32.71	-62.55	-13.00	-49.55
5926.2	H	-	-	-79.11	5.84	33.73	-61.53	-13.00	-48.53

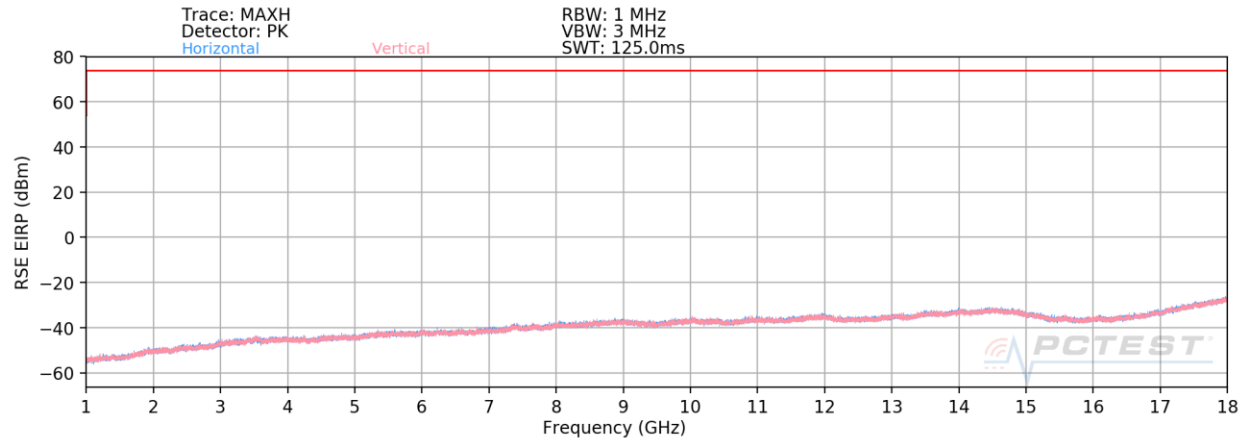
Table 7-13. Radiated Spurious Data (WCDMA Cell – High Channel)

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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Receiver Radiated Emissions



Plot 7-71. Radiated Spurious Plot below 1GHz



Plot 7-72. 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: R17LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

For Part 22 and RSS-132, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

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

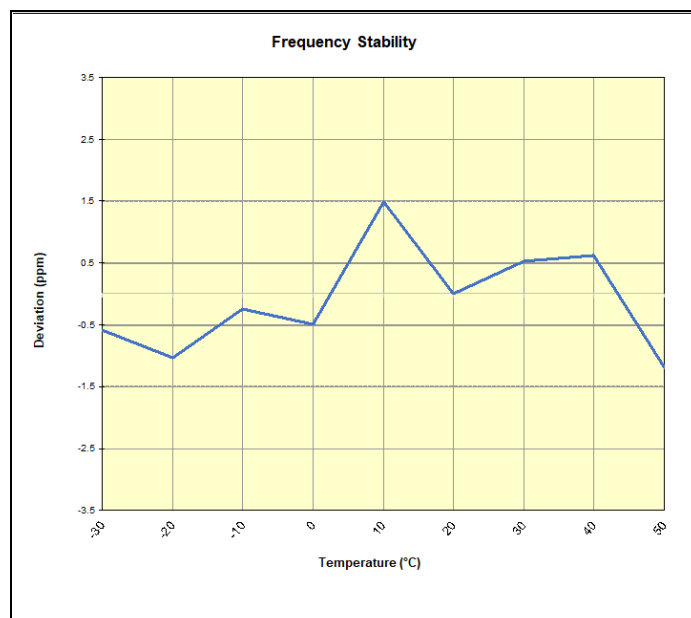
None

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	 PART 22 / RSS-132 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 26/5

LTE Band 26/5					
		Operating Frequency (Hz):		836,500,000	
		Ref. Voltage (VDC):		3.80	
		Deviation Limit:		± 0.00025% or 2.5 ppm	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	836,501,982	-488	-0.0000583
		- 20	836,501,602	-868	-0.0001038
		- 10	836,502,270	-200	-0.0000239
		0	836,502,058	-412	-0.0000493
		+ 10	836,503,718	1,248	0.0001492
		+ 20 (Ref)	836,502,470	0	0.0000000
		+ 30	836,502,908	438	0.0000524
		+ 40	836,502,992	522	0.0000624
		+ 50	836,501,478	-993	-0.0001186
85 %	3.23	+ 20	836,502,231	-239	-0.0000285
115 %	4.37	+ 20	836,501,435	-1,035	-0.0001238

Table 7-15. LTE Band 26/5 Frequency Stability Data



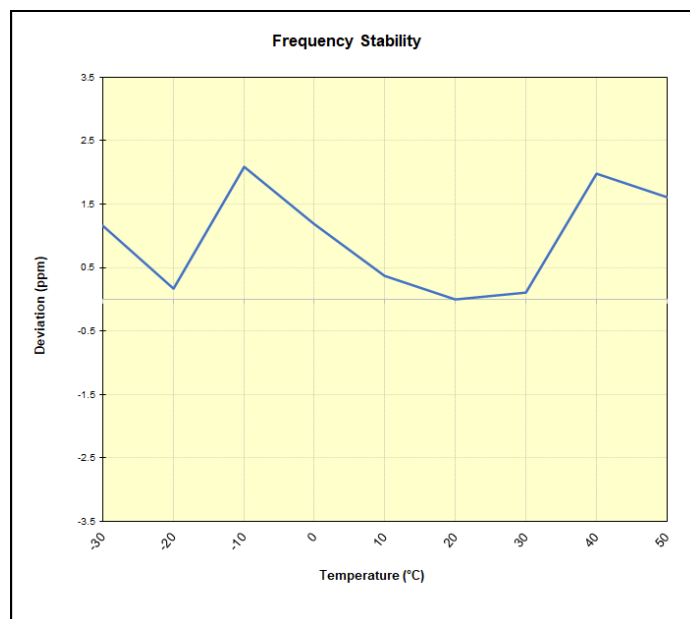
Plot 7-73. LTE Band 26/5 Frequency Stability Chart

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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GSM/GPRS Cell

GSM/GPRS Cellular					
		Operating Frequency (Hz):		836,600,000	
		Ref. Voltage (VDC):		3.80	
		Deviation Limit:		± 0.00025% or 2.5 ppm	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	836,598,887	966	0.0001155
		- 20	836,598,061	140	0.0000168
		- 10	836,599,668	1,748	0.0002089
		0	836,598,918	998	0.0001193
		+ 10	836,598,231	310	0.0000371
		+ 20 (Ref)	836,597,921	0	0.0000000
		+ 30	836,598,011	91	0.0000108
		+ 40	836,599,579	1,658	0.0001982
85 %	3.23	+ 20	836,597,483	-438	-0.0000523
115 %	4.37	+ 20	836,597,546	-375	-0.0000448

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



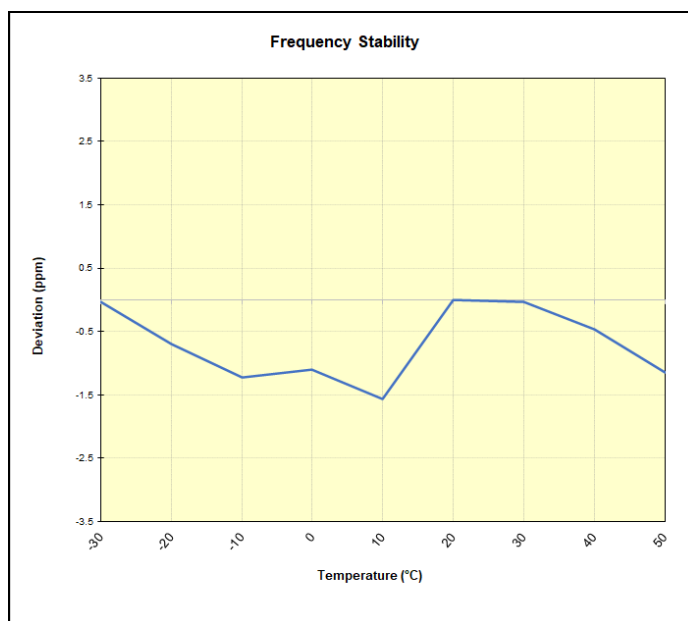
Plot 7-74. GSM/GPRS Cell Frequency Stability Chart

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
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WCDMA Cell

WCDMA Cellular					
		Operating Frequency (Hz):	836,600,000		
		Ref. Voltage (VDC):	3.80		
		Deviation Limit:	± 0.00025% or 2.5 ppm		
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	836,606,137	-30	-0.0000035
		- 20	836,605,588	-579	-0.0000692
		- 10	836,605,144	-1,023	-0.0001223
		0	836,605,253	-914	-0.0001092
		+ 10	836,604,858	-1,309	-0.0001565
		+ 20 (Ref)	836,606,167	0	0.0000000
		+ 30	836,606,144	-23	-0.0000027
		+ 40	836,605,781	-386	-0.0000461
		+ 50	836,605,214	-953	-0.0001139
85 %	3.23	+ 20	836,606,625	458	0.0000548
115 %	4.37	+ 20	836,607,075	908	0.0001086

Table 7-17. WCDMA Cell Frequency Stability Data



Plot 7-75. WCDMA Cell Frequency Stability Chart

FCC ID: RI7LE910CXWWX IC:5131A-LE910CXWWX	PCTEST Proud to be part of element	PART 22 / RSS-132 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 69 of 70

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 22 of the FCC rules and RSS-132 rules.

FCC ID: RI7LE910CXWWX IC: 5131A-LE910CXWWX	 PART 22 / RSS-132 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2106040065-04.RI7	Test Dates: 5/12 – 06/01/2021	EUT Type: Data Terminal Module	Page 70 of 70