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PART 27 MEASUREMENT REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
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Date of Testing:
6/15 - 7/6/2022
Test Report Issue Date:
7/7/2022
Test Site/Location:
Element lab., Columbia, MD, USA
Test Report Serial No.:
1M2206010070-05.A3L

FCC ID:	**A3LSMF936JPN**
Applicant Name:	**Samsung Electronics Co., Ltd.**

Application Type:	Certification
Model:	SC-55C
Additional Model(s):	SCG16
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part:	27
Test Procedure(s):	ANSI C63.26-2015, KDB 648474 D03 v01r04

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

RJ Ortanez
Executive Vice President

ACCREDITED
CERT #2041.01

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PART 27 MEASUREMENT REPORT

Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 41(PC3) Ant B	20 MHz	QPSK	2506.0 - 2680.0	0.192	22.83	18M0G7D
		16QAM	2506.0 - 2680.0	0.159	22.02	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.204	23.09	13M6G7D
		16QAM	2503.5 - 2682.5	0.168	22.26	13M5W7D
	10 MHz	QPSK	2501.0 - 2685.0	0.212	23.26	9M03G7D
		16QAM	2501.0 - 2685.0	0.173	22.39	9M05W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.193	22.86	4M55G7D
		16QAM	2498.5 - 2687.5	0.152	21.81	4M54W7D
LTE Band 41(PC3) Ant F	20 MHz	QPSK	2580.0 - 2610.0	0.123	20.88	18M1G7D
		16QAM	2580.0 - 2610.0	0.102	20.06	18M0W7D
	15 MHz	QPSK	2577.5 - 2612.5	0.122	20.86	13M6G7D
		16QAM	2577.5 - 2612.5	0.102	20.10	13M5W7D
	10 MHz	QPSK	2575.0 - 2615.0	0.126	21.00	9M07G7D
		16QAM	2575.0 - 2615.0	0.109	20.39	9M04W7D
	5 MHz	QPSK	2572.5 - 2617.5	0.129	21.12	4M54G7D
		16QAM	2572.5 - 2617.5	0.093	19.68	4M54W7D

Overview Table

1.0 INTRODUCTION

1.1 Scope

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

1.2 Element Test Location

These measurement tests were conducted at the Element laboratory 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 Element lab located in Columbia, MD 21046, U.S.A.

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

- Element Washington DC LLC TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).

- Element Washington DC LLC facility is a registered (2451B) test laboratory with the site description on file with ISED.

- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreement.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMF936JPN**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: 0370M, 0402M, 0421M, 0068M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5, 6GHz), Bluetooth (1x, EDR, LE), NFC, UWB, Wireless Power Transfer

This device uses a tuner circuit that dynamically updates the antenna impedance parameters to optimize antenna performance for certain bands and modes of operation. The tuner for this device was set to simulate a "free space" condition where the transmit antenna is matched to the medium into which it is transmitting and, thus, the power is at its maximum level.

2.3 Test Configuration

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

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

This device supports two configurations: one is with screen open and one is with screen closed. Open, half opened and closed configurations are tested, and the worst case radiated emissions data is shown in this report.

2.4 Software and Firmware

Testing was performed on device(s) using software/firmware version SC55COMU0AVEE 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.

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the "American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services" (ANSI C63.26-2015) were used in the measurement of the EUT**.**

Deviation from Measurement Procedure……..……None

3.2 Radiated Power and Radiated Spurious Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

The equipment under test was transmitting while connected to its integral antenna and is placed on a 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 C63.26-2015. For emissions below 1GHz, 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:

$$P_{d\ [dBm]} = P_{g\ [dBm]} - \text{cable loss}_{\ [dB]} + \text{antenna gain}_{\ [dBd/dBi]};$$

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 $P_{g\ [dBm]}$ – cable loss $_{[dB]}$.

For radiated spurious emissions measurements, the field strength conversion method is used per the formulas in Section 5.2.7 of ANSI C63.26-2015. Field Strength (EIRP) is calculated using the following formulas:

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

And

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

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 414788 D01 v01r01.

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

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 (±dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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
-	AP2-001	EMC Cable and Switch System	1/4/2022	Annual	1/4/2023	AP2-001
-	AP2-002	EMC Cable and Switch System	3/11/2022	Annual	3/11/2023	AP2-002
-	ETS-001	EMC Cable and Switch System	12/9/2021	Annual	12/9/2022	ETS-001
-	ETS-002	EMC Cable and Switch System	3/10/2022	Annual	3/10/2023	ETS-002
-	LTx1	Licensed Transmitter Cable Set	12/19/2021	Annual	12/19/2022	LTx1
-	LTx3	LIcensed Transmitter Cable Set	8/18/2021	Annual	8/18/2022	LTx3
-	LTx5	LIcensed Transmitter Cable Set	12/19/2021	Annual	12/19/2022	LTx5
-	LTx6-40	Licensed Transmitter Cable Set	12/19/2021	Annual	12/19/2022	LTx6-40
-	WL40-1	WLAN Cable Set (40GHz)	12/19/2021	Annual	12/19/2022	WL40-1
Anritsu	MT8000A	Radio Communication Test Station	8/2/2021	Annual	8/2/2022	6272337437
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6201525694
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Annual	8/27/2022	17620
ETS-Lindgren	3116C	DRG Horn Antenna	5/11/2021	Biennial	5/11/2023	218893
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/20/2021	Biennial	4/20/2023	00125518
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/21/2022	MY49430494
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	2/14/2022	Annual	2/14/2023	MY52350166
Keysight Technologies	N9030B	PXA Signal Analyzer, Multi-touch	1/7/2022	Annual	1/7/2023	MY57141001
Keysight Technologies	N9038A	MXE EMI Receiver	1/21/2022	Annual	1/21/2023	MY51210133
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	5/25/2021	Annual	7/25/2022	100348
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	3/28/2022	Annual	3/28/2023	101716
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Test Antenna	8/13/2020	Biennial	8/13/2022	101073
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107
Sunol	JB6	LB6 Antenna	11/13/2020	Biennial	11/13/2022	A082816

Table 5-1. Test Equipment

Notes:

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

2. Equipment with a calibration date of “N/A” shown in this list was not used to make direct calibrated measurements.

6.0 SAMPLE CALCULATIONS

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.

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.

FCC ID: A3LSMF936JPN

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

Mode(s): LTE/ULCA

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Transmitter Conducted Output Power*	2.1046(a), 2.1046(c)	N/A	PASS	Section 7.2
	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3
	Conducted Band Edge / Spurious Emissions (LTE Band 41)	2.1051, 27.53(m)(4)	Undesirable emissions must meet the limits detailed in 27.53(m)(4)	PASS	Sections 7.4, 7.5
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
RADIATED	Equivalent Isotropic Radiated Power (LTE Band 41)	27.50(h)(2)	≤ 2 Watts max. EIRP	PASS	Section 7.6
	Radiated Spurious Emissions (LTE Band 41)	2.1053, 27.53(m)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Section 7.7

* The only transmitter output conducted powers included in this report are those where the Pmax value, per the tune-up document, is higher than any of the DSI power levels. For the remaining conducted power measurements, see the **RF Exposure Report**.

Table 7-1. Summary of Test Results (FCC)

Notes:

1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
4) All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized is EMC Software Tool v1.1.

7.2 Conducted Output Power Data

Test Overview

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

A-MPR is implemented in this device when operating at Power Class 2 in LTE Band 41 per the A-MPR specification in 3GPP TS 36.101. The conducted powers are shown herein to cover the different A-MPR levels specified in the standard. Measurement equipment was set up with triggering/gating on the spectrum analyzer such that powers were measured only during the on-time of the signal.

Test Procedure Used

ANSI C63.26-2015 – Section 5.2

Test Settings

1. Span = 2 x OBW to 3 x OBW
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.

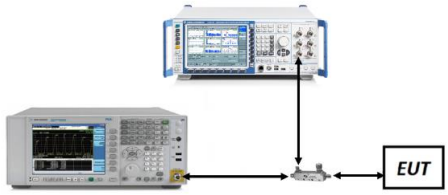


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

1. Uplink carrier aggregation is only supported in this EUT while operating in Power Class 3.

2. Conducted power measurements were evaluated using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.

3. All other conducted power measurements are contained in the RF exposure report for this filing.

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	39750	2506.0	1 / 99	23.30
		40620	2593.0	1 / 99	23.01
		41490	2680.0	1 / 99	23.37
	16-QAM	40620	2593.0	1 / 99	22.16
15 MHz	QPSK	39725	2503.5	1 / 74	23.47
		40620	2593.0	1 / 74	23.27
		41515	2682.5	1 / 74	23.52
	16-QAM	40620	2593.0	1 / 74	22.39
10 MHz	QPSK	39700	2501.0	1 / 49	23.72
		40620	2593.0	1 / 49	23.44
		41540	2685.0	1 / 49	23.55
	16-QAM	40620	2593.0	1 / 49	22.53
5 MHz	QPSK	39675	2498.5	1 / 0	23.25
		40620	2593.0	1 / 0	23.03
		41565	2687.5	1 / 12	22.96
	16-QAM	40620	2593.0	1 / 0	21.94

Table 7-1. Conducted Power Data (LTE Band 41 (PC3) – Ant B)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	39790	2510.0	1 / 50	23.72
		40620	2593.0	1 / 0	23.66
		41490	2680.0	1 / 50	23.53
	16-QAM	39790	2510.0	1 / 50	22.64
15 MHz	QPSK	39765	2507.5	1 / 37	23.69
		40620	2593.0	1 / 37	23.72
		41515	2682.5	1 / 37	23.66
	16-QAM	39765	2507.5	1 / 37	22.68
10 MHz	QPSK	39740	2505.0	1 / 49	23.84
		40620	2593.0	1 / 25	23.85
		41540	2685.0	1 / 0	23.60
	16-QAM	39740	2505.0	1 / 49	22.97
5 MHz	QPSK	39715	2502.5	1 / 12	23.96
		40620	2593.0	1 / 12	23.56
		41565	2687.5	1 / 0	23.03
	16-QAM	39715	2502.5	1 / 12	22.25

Table 7-2. Conducted Power Data (LTE Band 41 (PC3) – Ant F)

Power State	Band	Bandwidth (PCC + SCC)	PCC					SCC					ULCA Tx. Power [dBm]
			Modulation	UL Channel	UL Frequency	UL # RB	UL RB Offset	Modulation	UL Channel	UL Frequency	UL # RB	UL RB Offset	
Max	LTE B41 (PC3)	20MHz + 20MHz	QPSK	39750	2506.0	1	99	QPSK	39948	2525.8	1	0	23.5
				40620	2593.0	1	99		40818	2612.8	1	0	23.2
				41490	2680.0	1	0		41292	2660.2	1	99	23.54
			QPSK	41490	2680	100	0	QPSK	41292	2660.2	100	0	21.57
			16-QAM	41490	2680	100	0	16-QAM	41292	2660.2	100	0	20.58
			64-QAM	41490	2680	100	0	64-QAM	41292	2660.2	100	0	20.57

Table 7-3. Conducted Power Data (ULCA LTE B41(PC3) – Ant B)

7.3 Occupied Bandwidth

Test Overview

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

Test Procedure Used

ANSI C63.26-2015 – Section 5.4.4

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x 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.

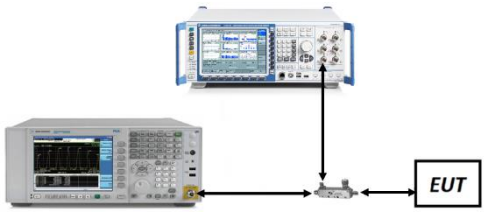
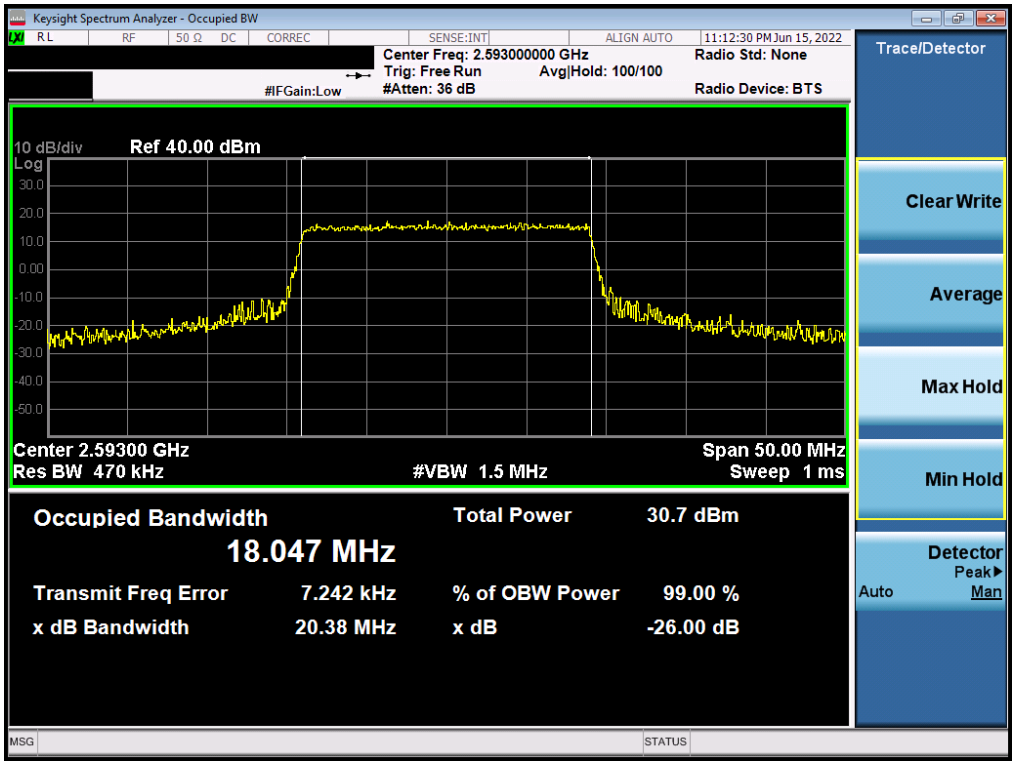


Figure 7-2. Test Instrument & Measurement Setup

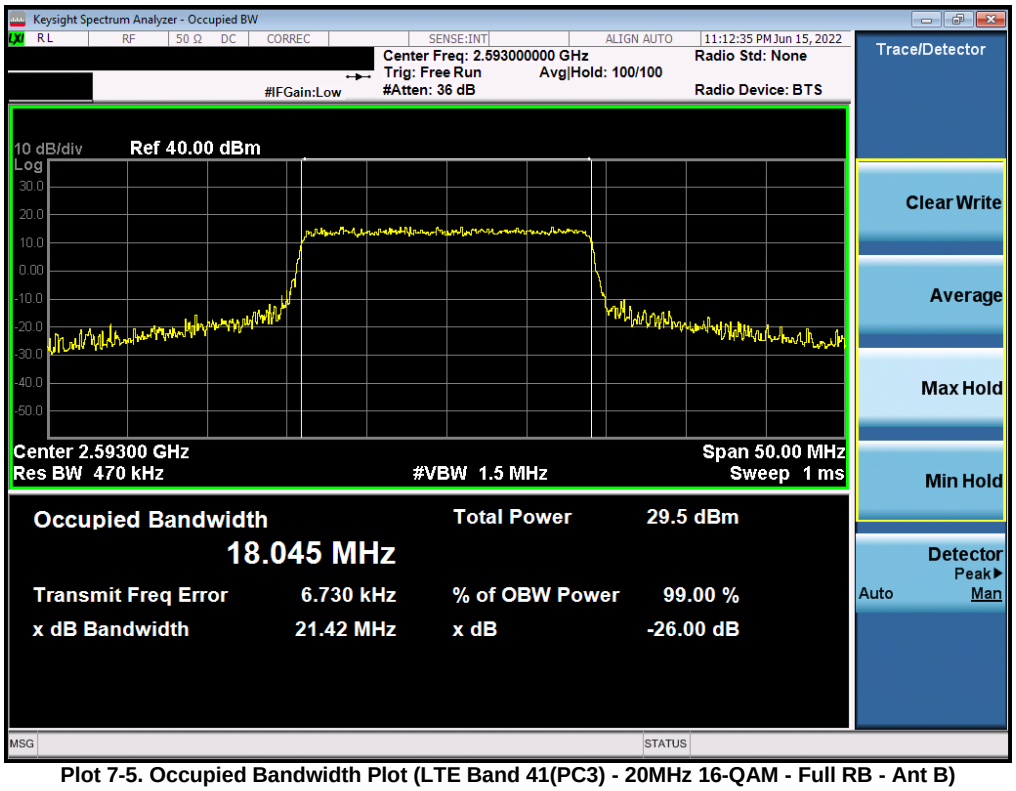
Test Notes

None.

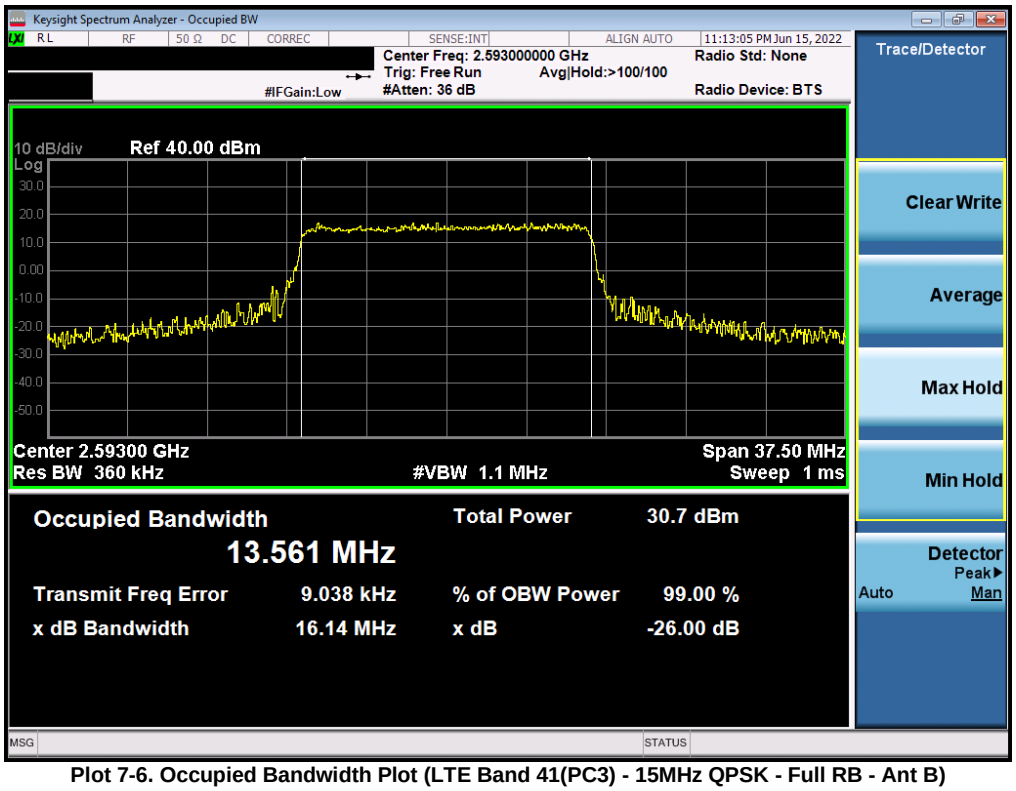
LTE Band 41(PC3) – Ant B



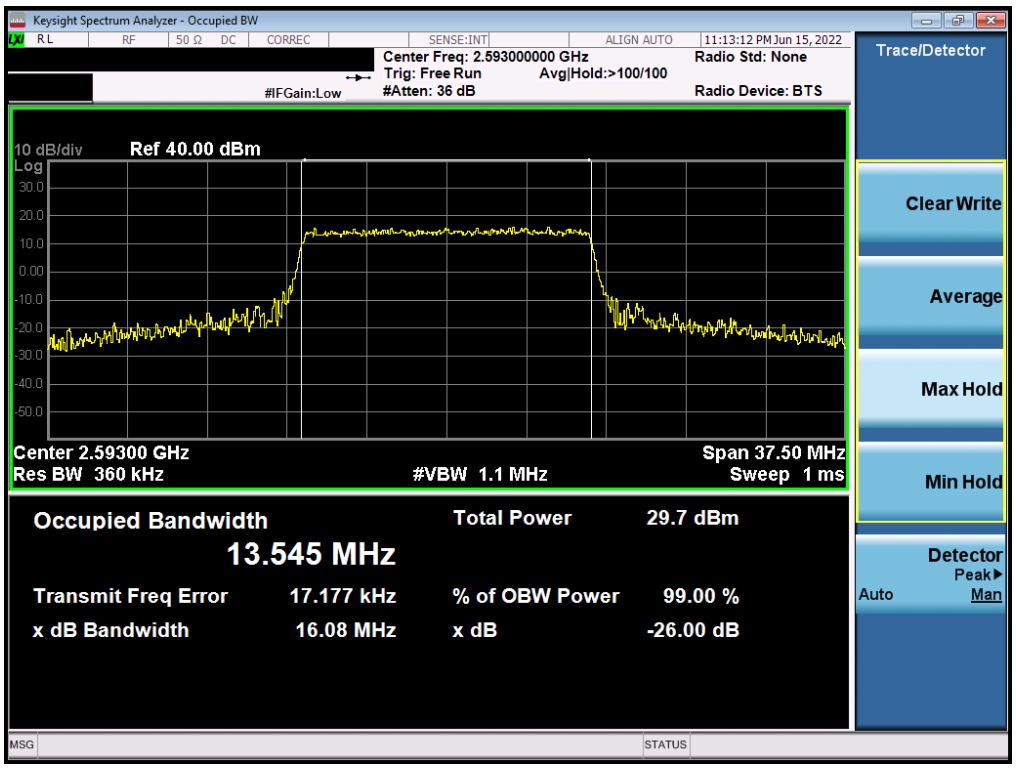
Plot 7-4. Occupied Bandwidth Plot (LTE Band 41(PC3) - 20MHz QPSK - Full RB - Ant B)



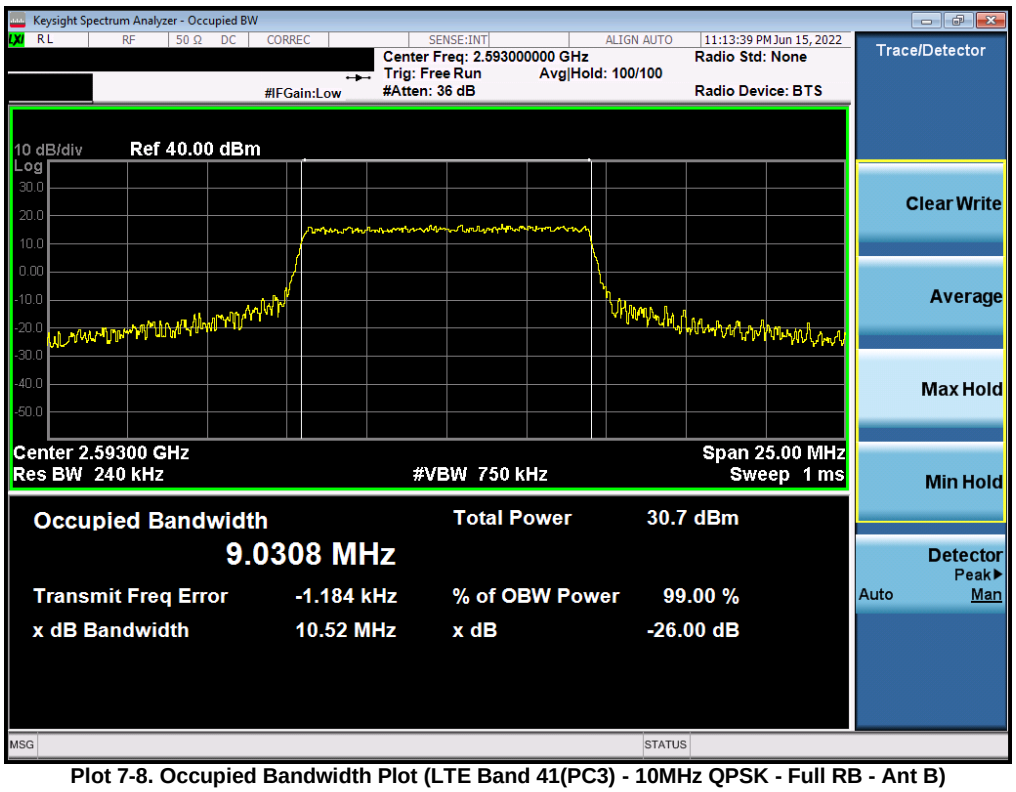
Plot 7-5. Occupied Bandwidth Plot (LTE Band 41(PC3) - 20MHz 16-QAM - Full RB - Ant B)



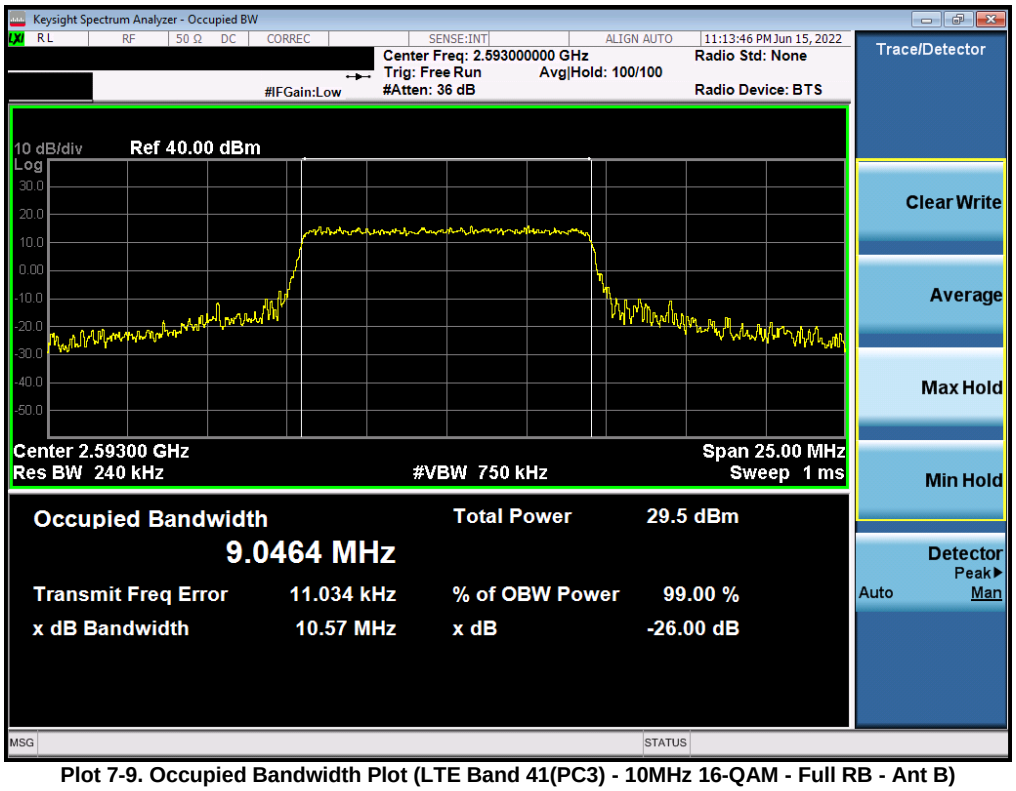
Plot 7-6. Occupied Bandwidth Plot (LTE Band 41(PC3) - 15MHz QPSK - Full RB - Ant B)



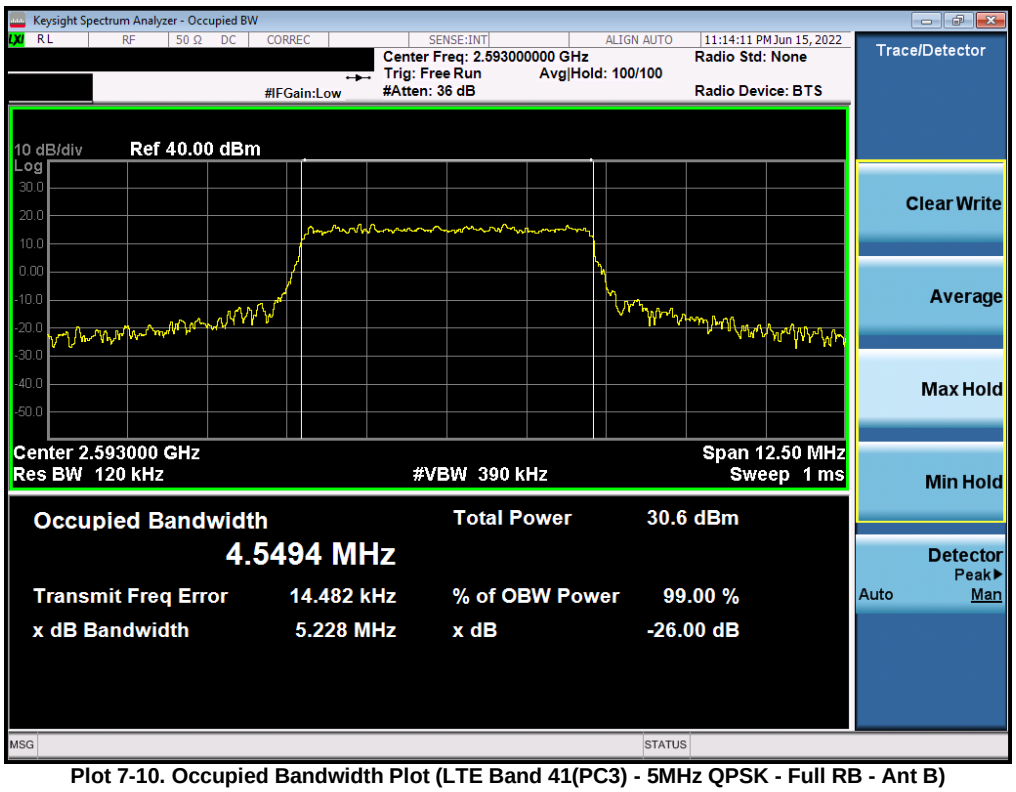
Plot 7-7. Occupied Bandwidth Plot (LTE Band 41(PC3) - 15MHz 16-QAM - Full RB - Ant B)



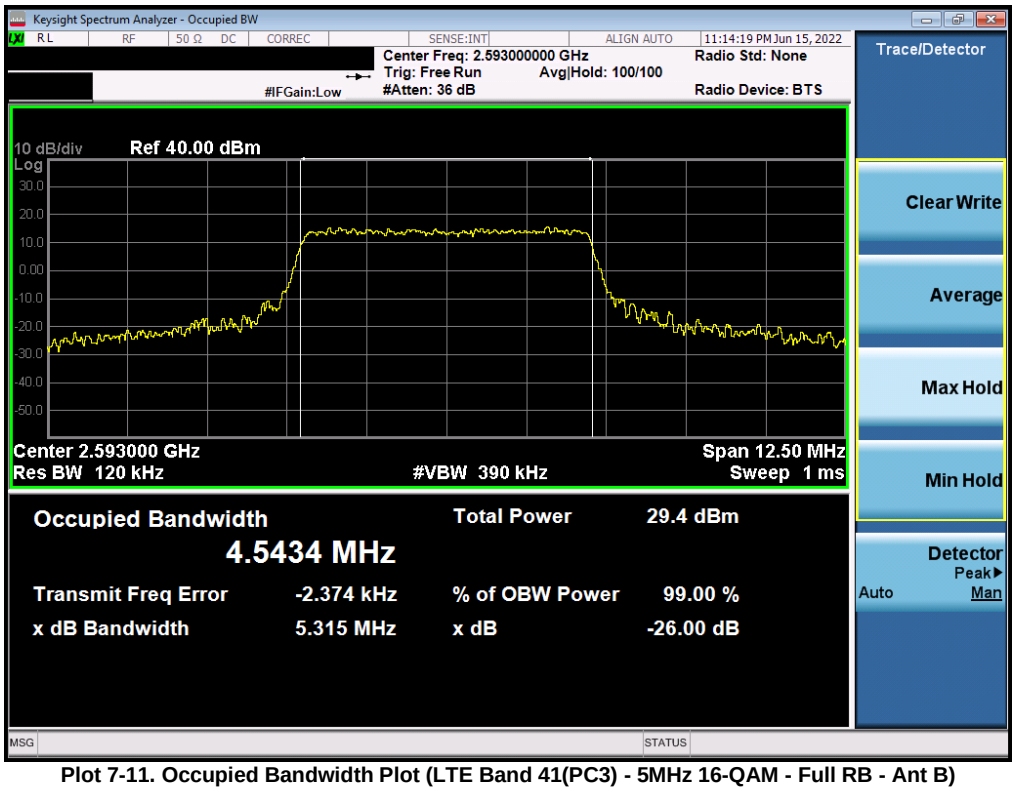
Plot 7-8. Occupied Bandwidth Plot (LTE Band 41(PC3) - 10MHz QPSK - Full RB - Ant B)



Plot 7-9. Occupied Bandwidth Plot (LTE Band 41(PC3) - 10MHz 16-QAM - Full RB - Ant B)

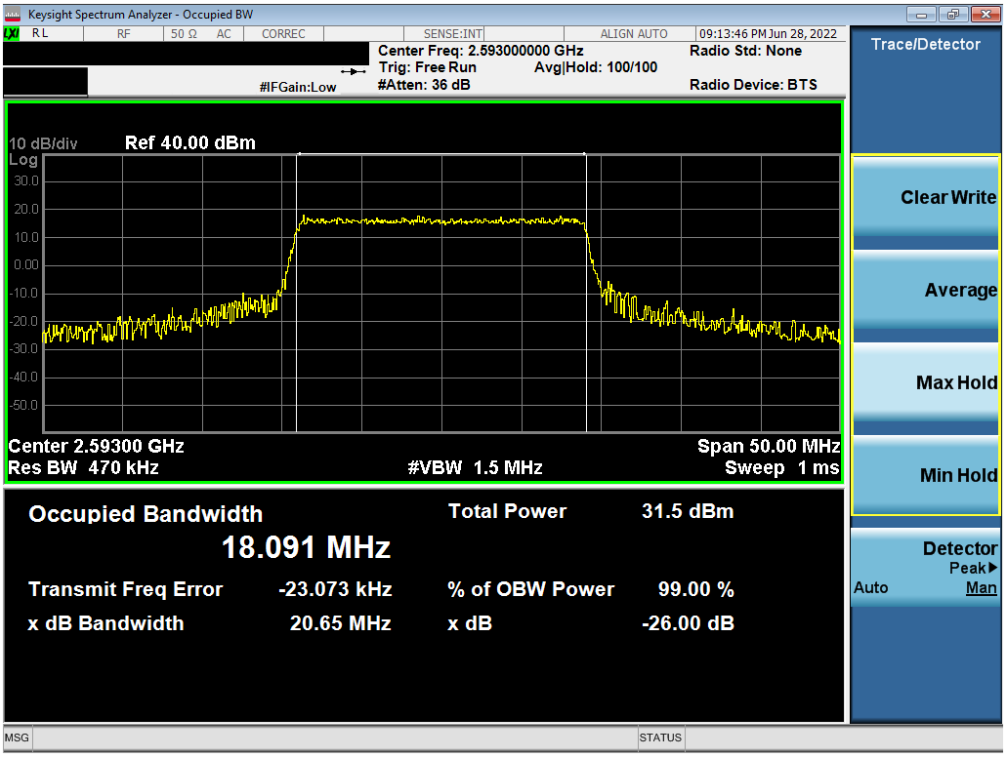


Plot 7-10. Occupied Bandwidth Plot (LTE Band 41(PC3) - 5MHz QPSK - Full RB - Ant B)

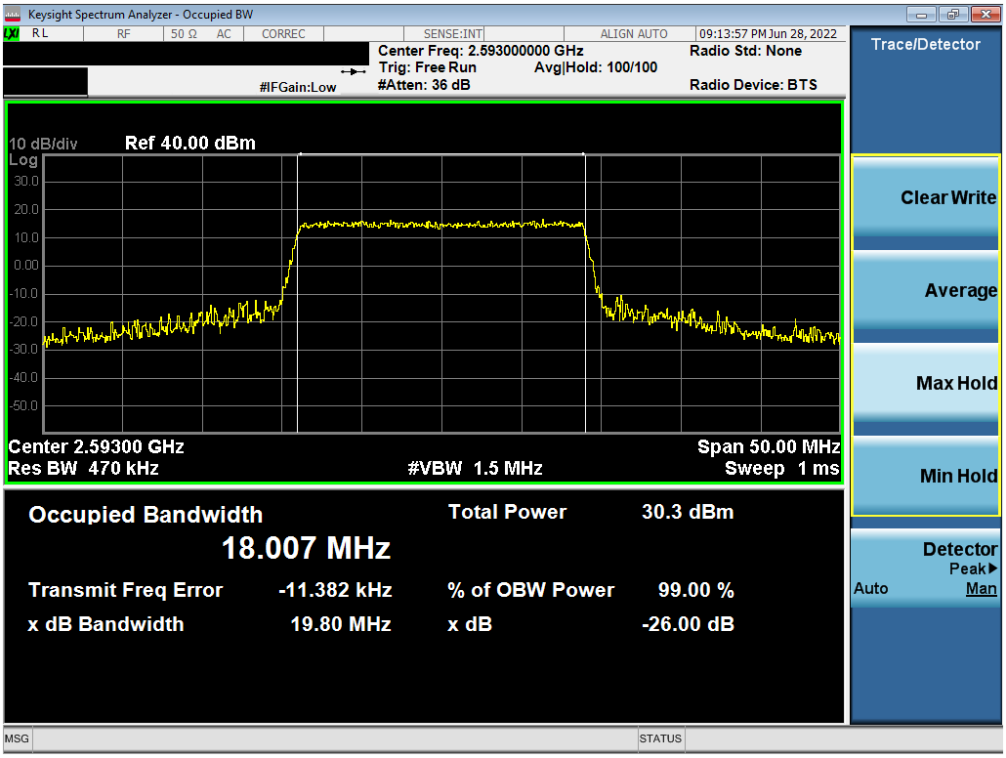


Plot 7-11. Occupied Bandwidth Plot (LTE Band 41(PC3) - 5MHz 16-QAM - Full RB - Ant B)

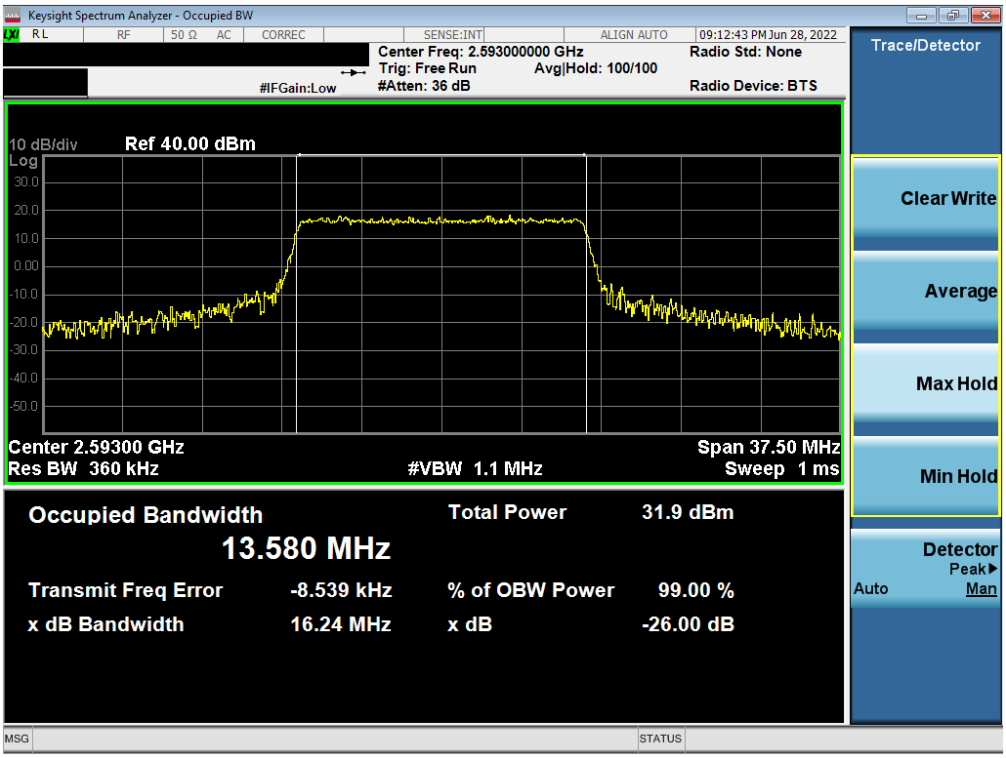
LTE Band 41(PC3) – Ant F



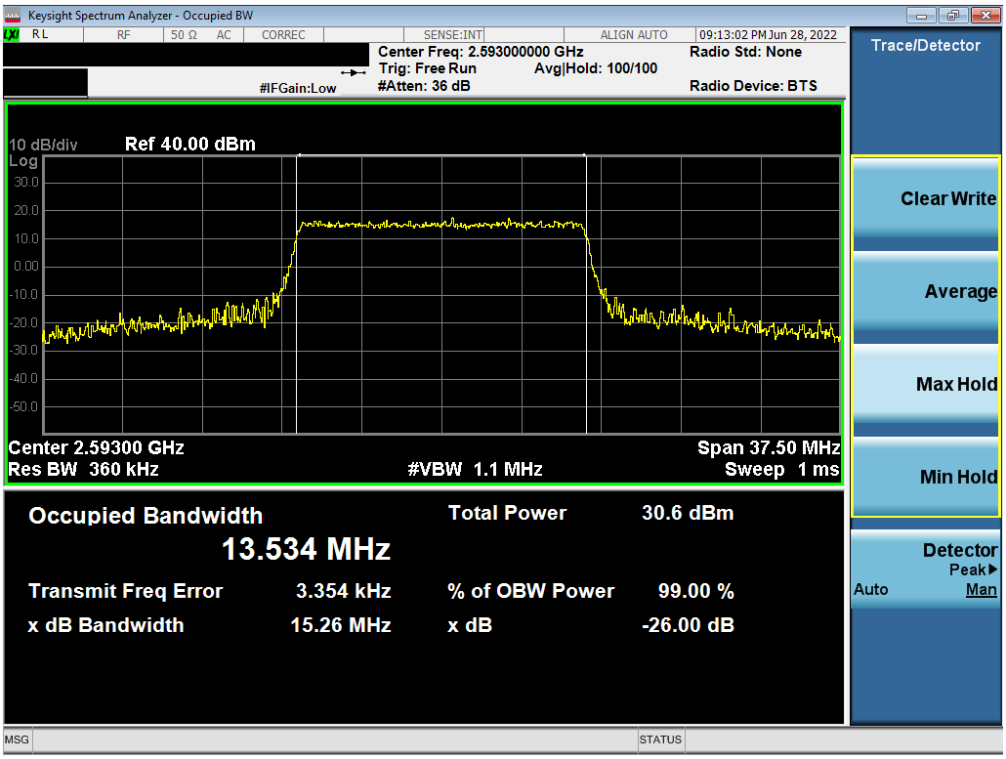
Plot 7-12. Occupied Bandwidth Plot (LTE Band 41(PC3) - 20MHz QPSK - Full RB - Ant F)



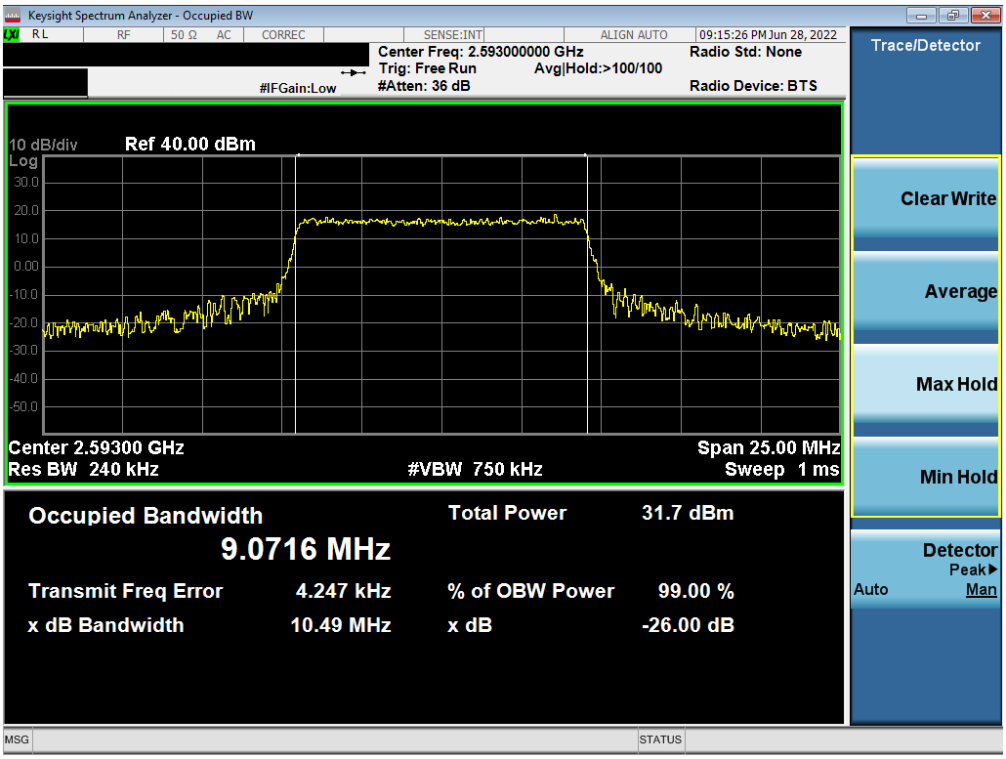
Plot 7-13. Occupied Bandwidth Plot (LTE Band 41(PC3) - 20MHz 16-QAM - Full RB - Ant F)



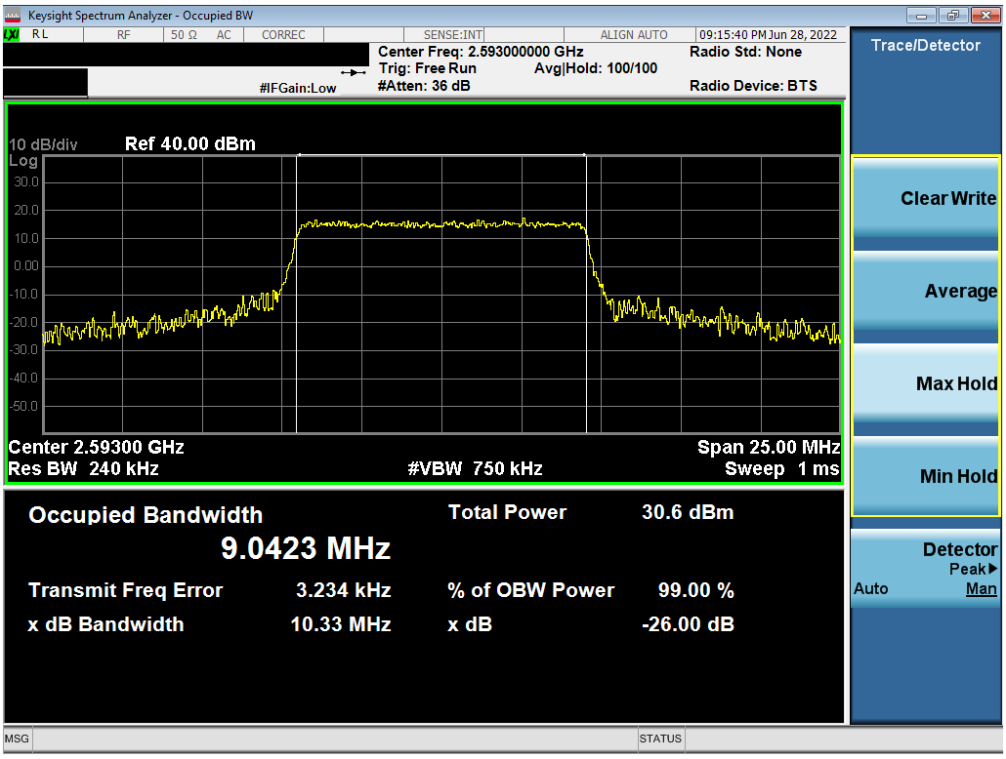
Plot 7-14. Occupied Bandwidth Plot (LTE Band 41(PC3) - 15MHz QPSK - Full RB - Ant F)



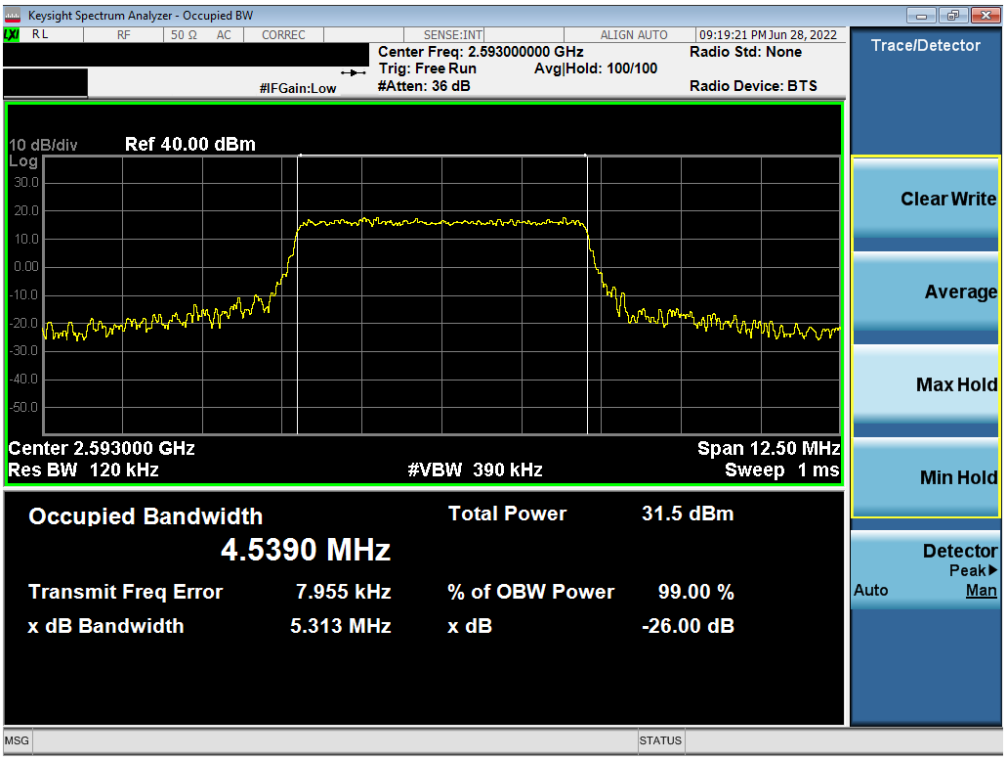
Plot 7-15. Occupied Bandwidth Plot (LTE Band 41(PC3) - 15MHz 16-QAM - Full RB - Ant F)



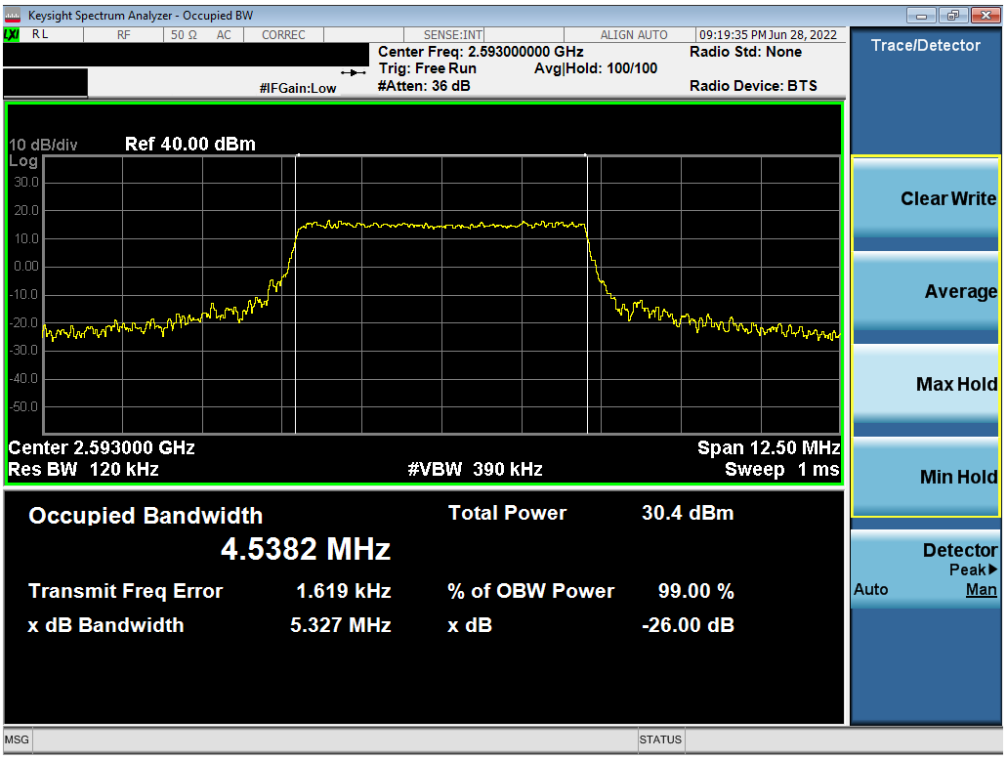
Plot 7-16. Occupied Bandwidth Plot (LTE Band 41(PC3) - 10MHz QPSK - Full RB - Ant F)



Plot 7-17. Occupied Bandwidth Plot (LTE Band 41(PC3) - 10MHz 16-QAM - Full RB - Ant F)



Plot 7-18. Occupied Bandwidth Plot (LTE Band 41(PC3) - 5MHz QPSK - Full RB - Ant F)



Plot 7-19. Occupied Bandwidth Plot (LTE Band 41(PC3) - 5MHz 16-QAM - Full RB - Ant F)

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.

For Band 41, the minimum permissible attenuation level of any spurious emission is 55 + 10log$_{10}$(P$_{[Watts]}$).

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.4

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 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.

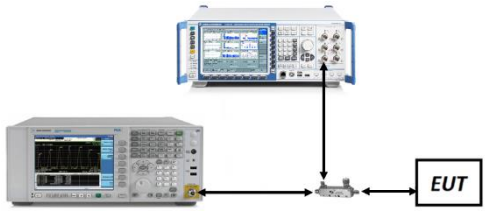
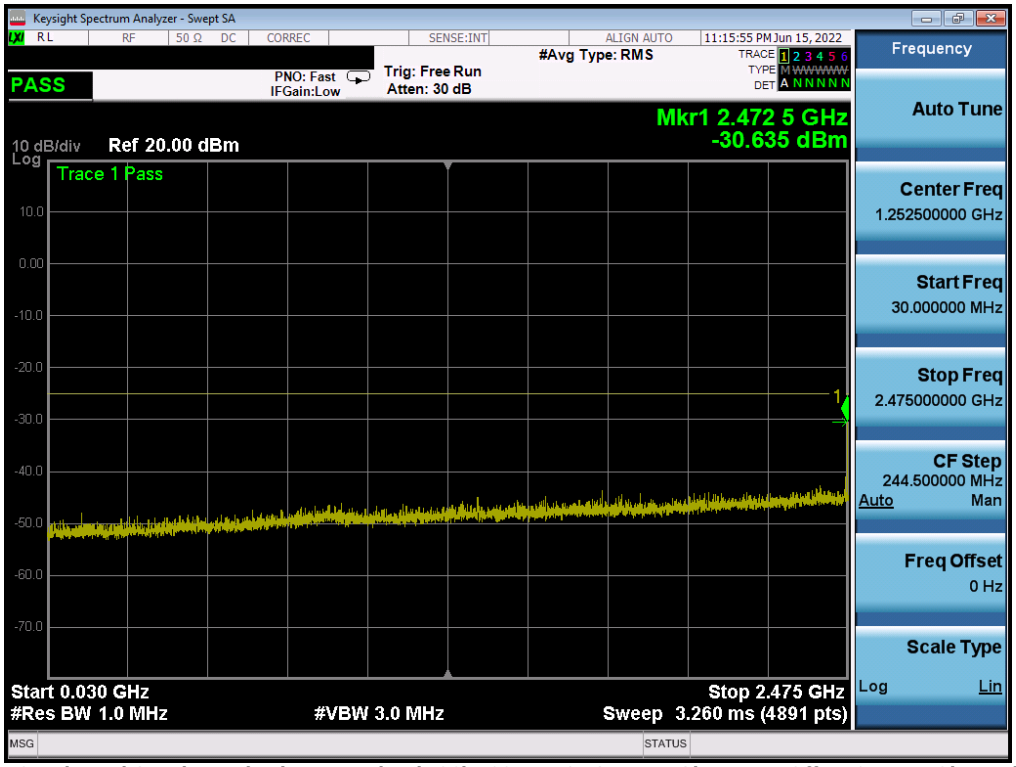


Figure 7-3. Test Instrument & Measurement Setup

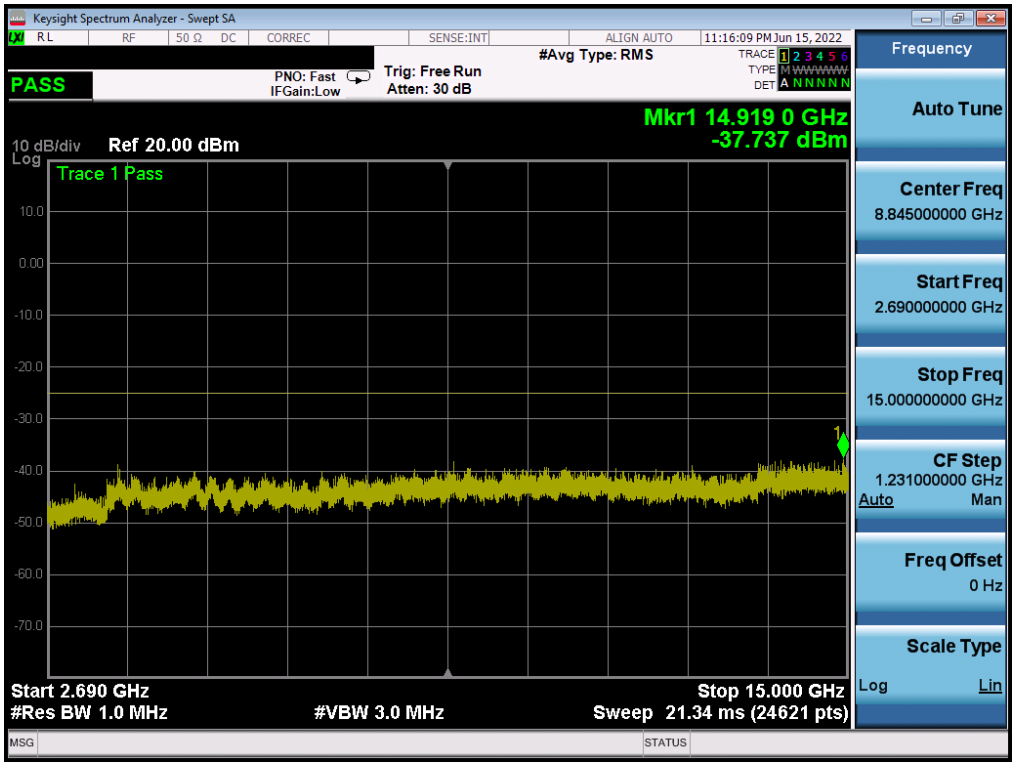
Test Notes

1. Per Part 27, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz.

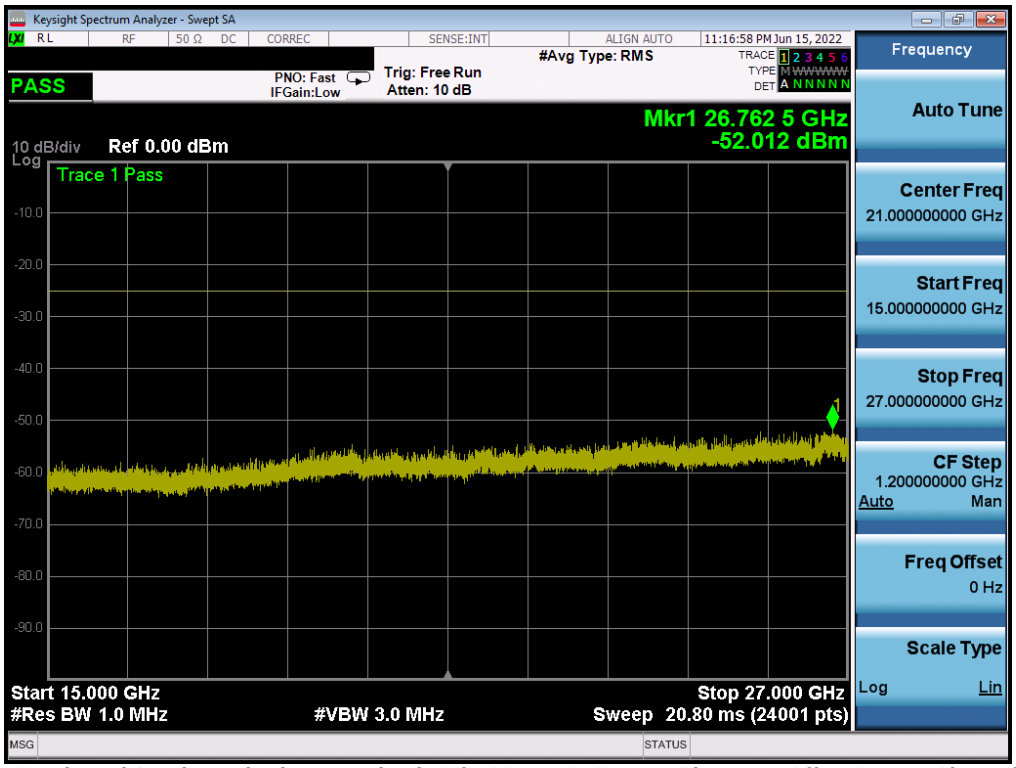
LTE Band 41(PC3) – Ant B



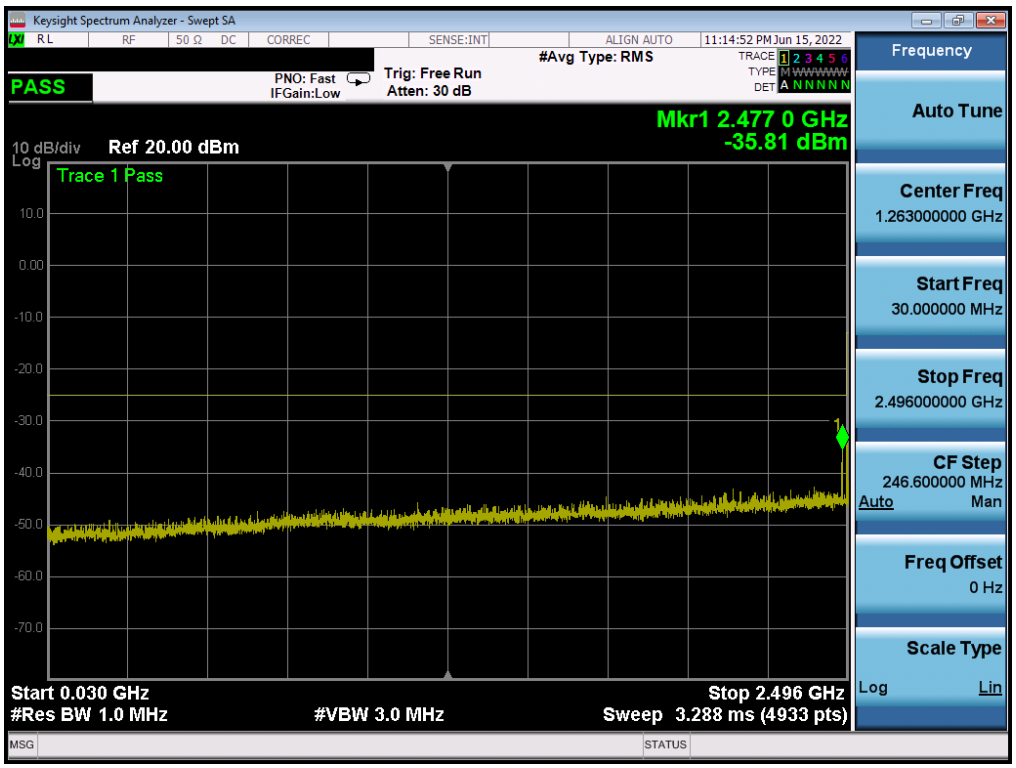
Plot 7-20. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel - Ant B)



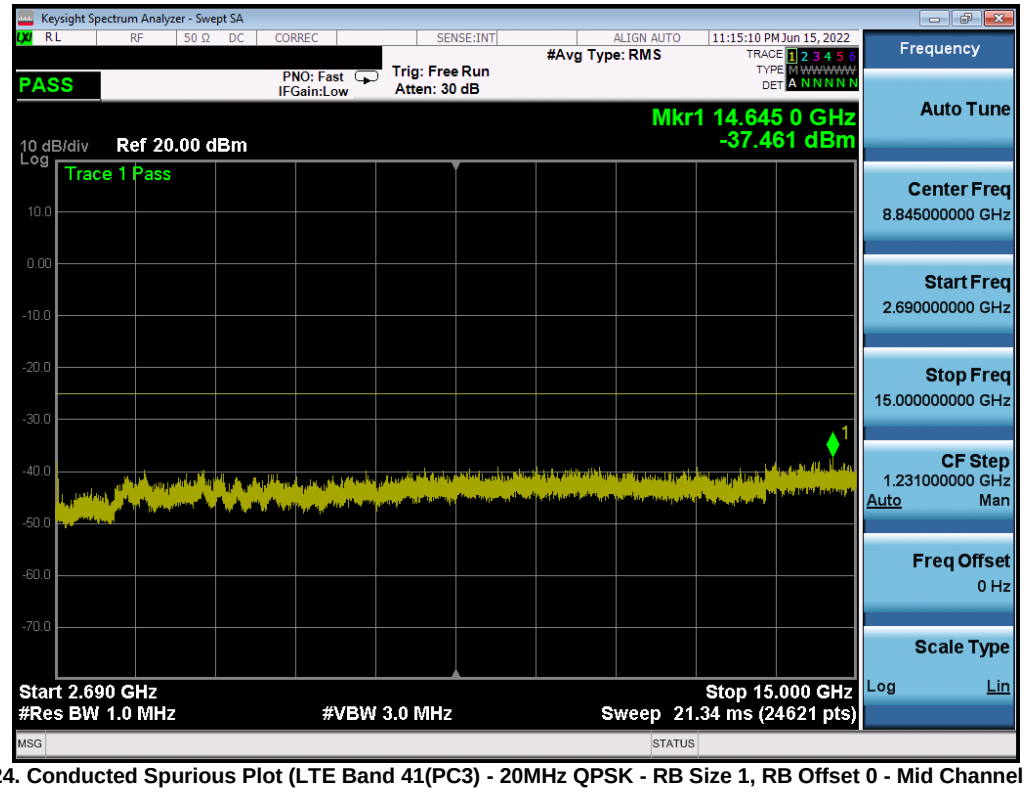
Plot 7-21. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel - Ant B)



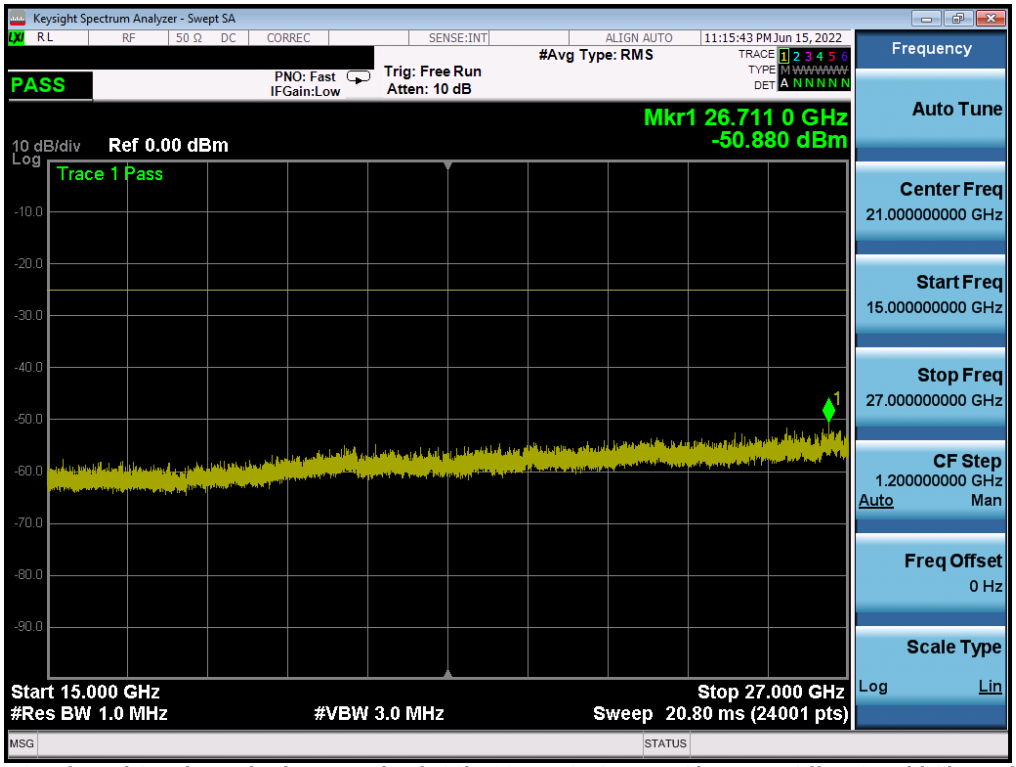
Plot 7-22. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel - Ant B)



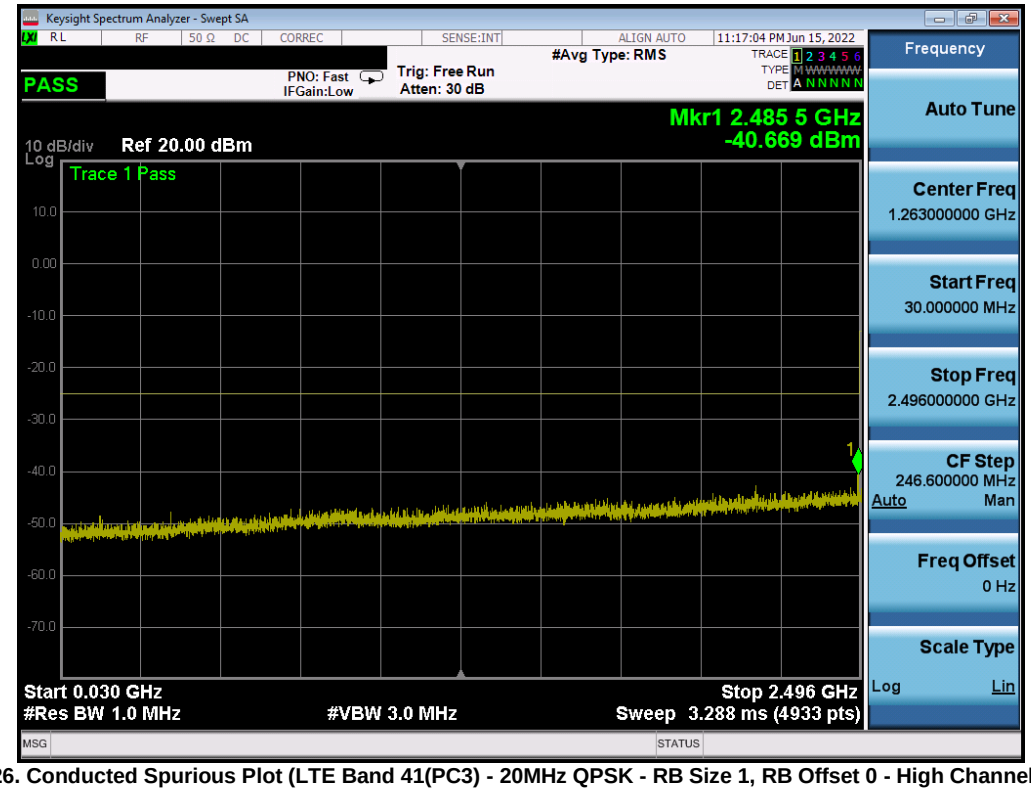
Plot 7-23. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant B)



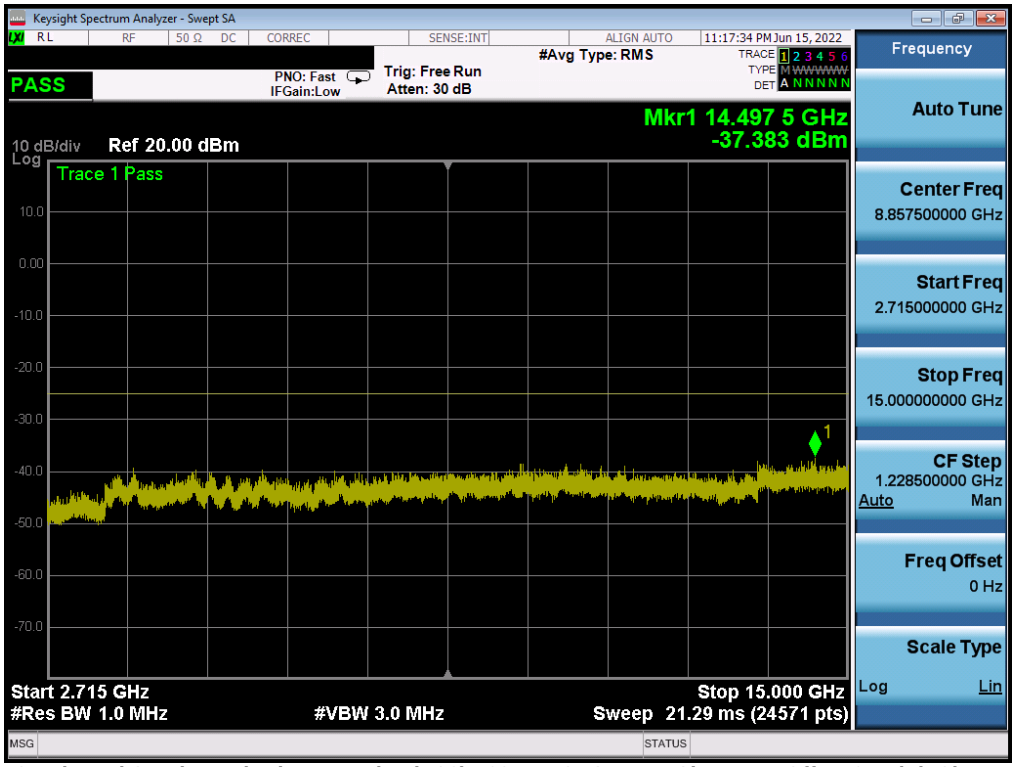
Plot 7-24. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant B)



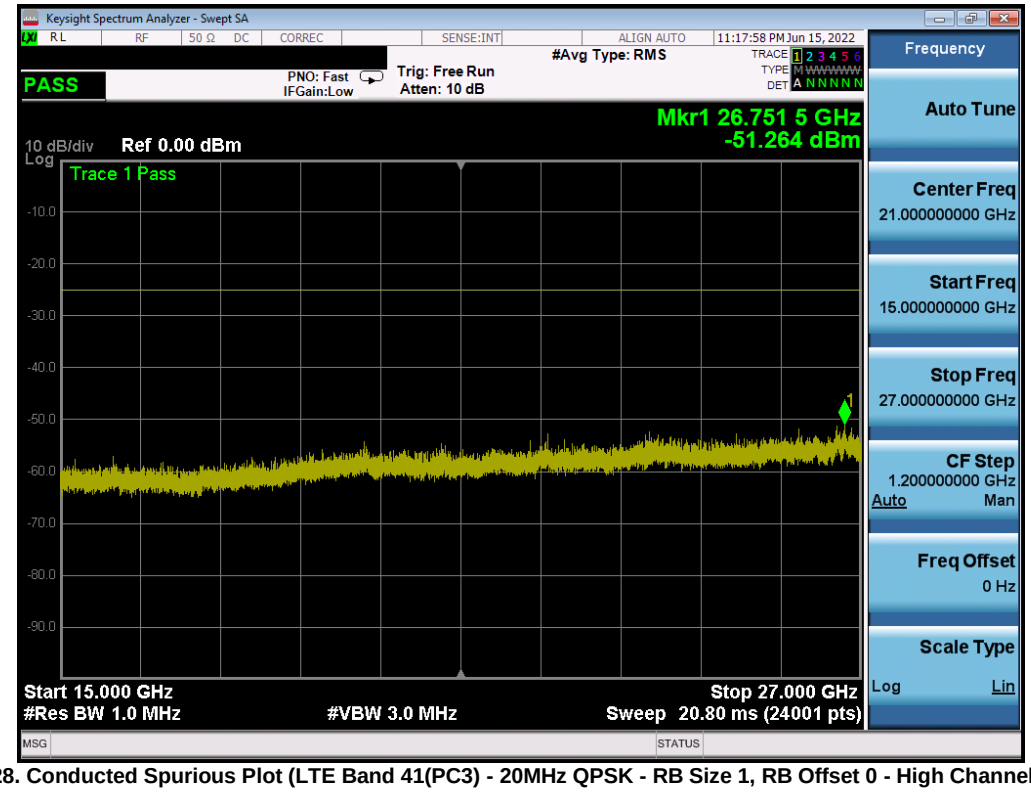
Plot 7-25. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant B)



Plot 7-26. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant B)

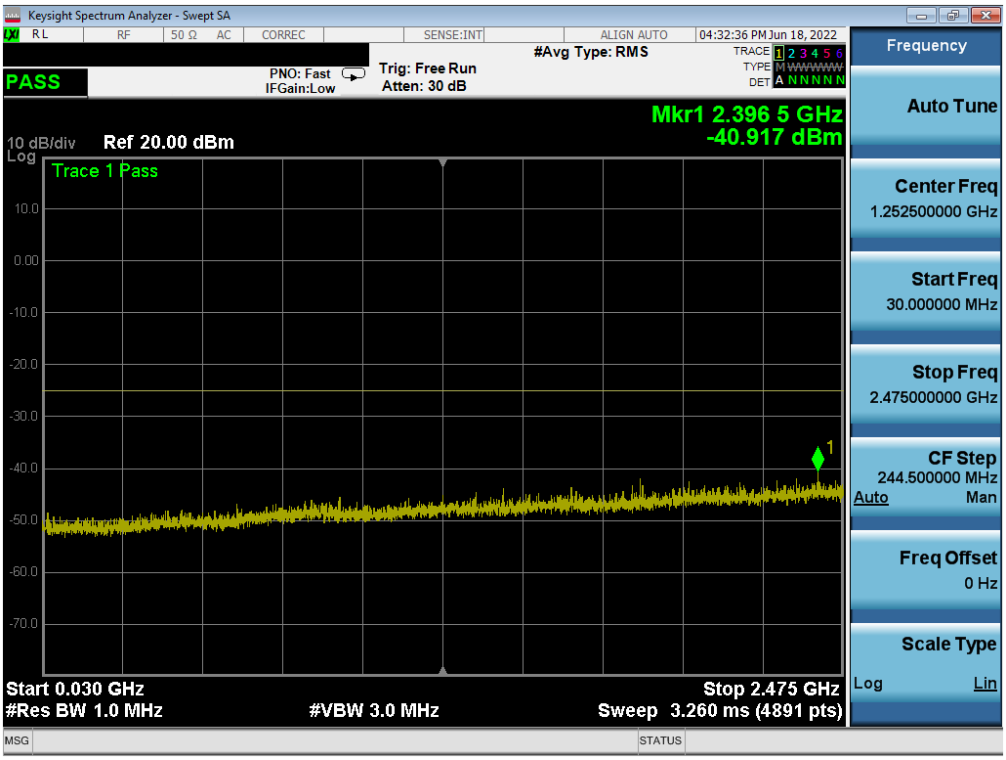


Plot 7-27. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant B)

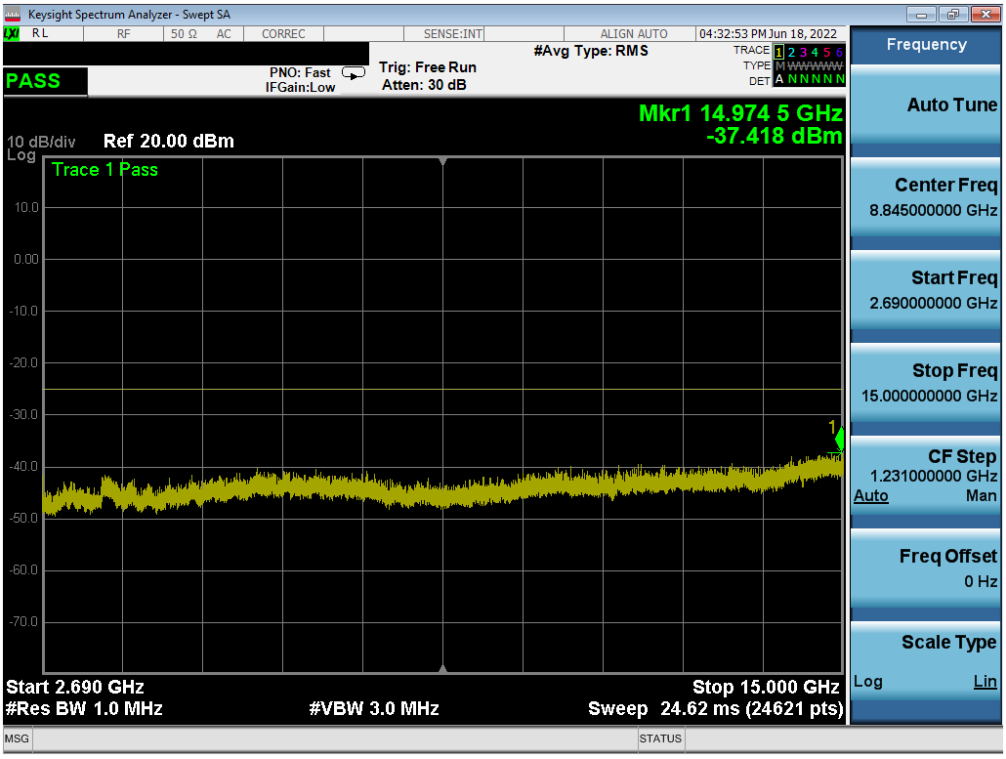


Plot 7-28. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant B)

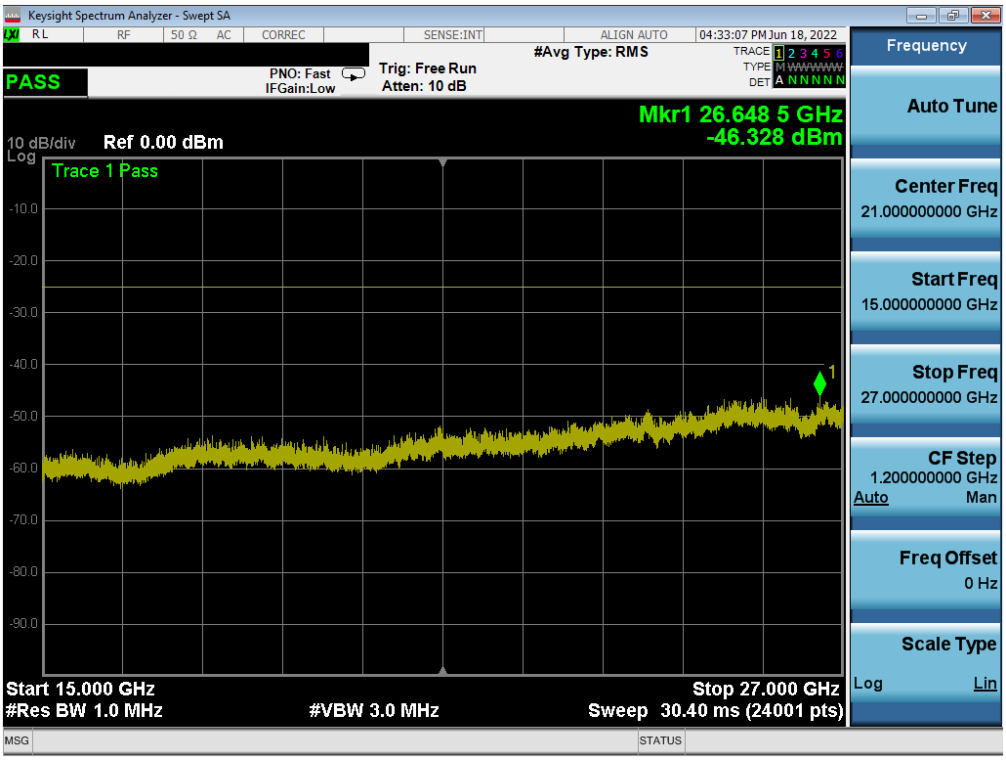
LTE Band 41(PC3) – Ant F



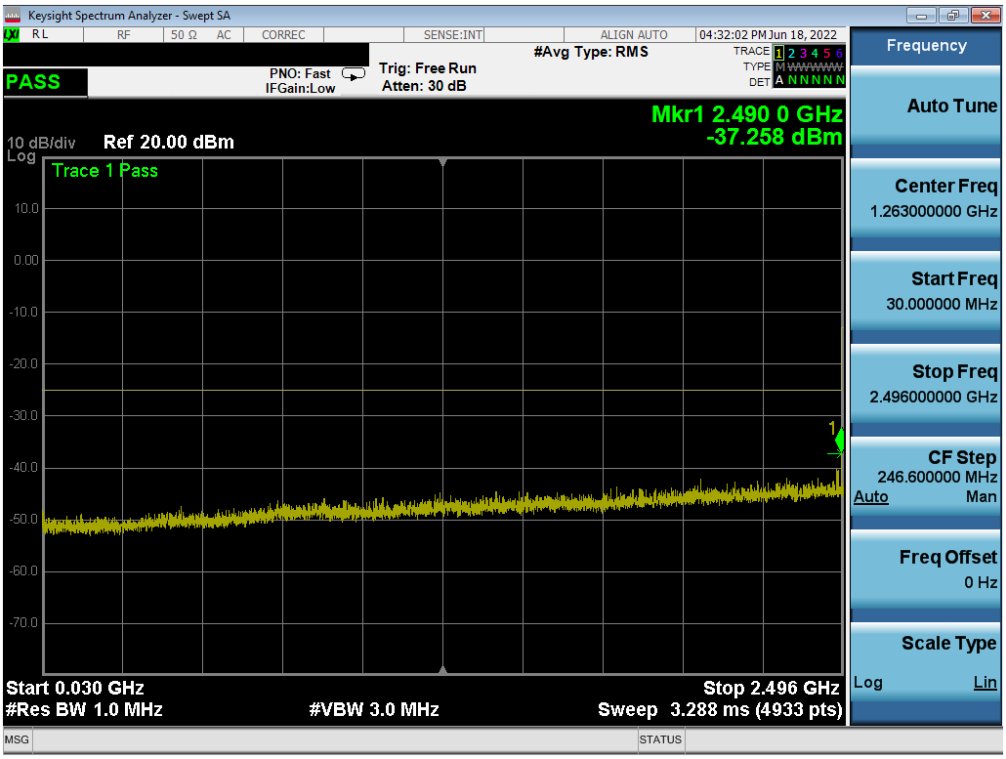
Plot 7-29. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel - Ant F)



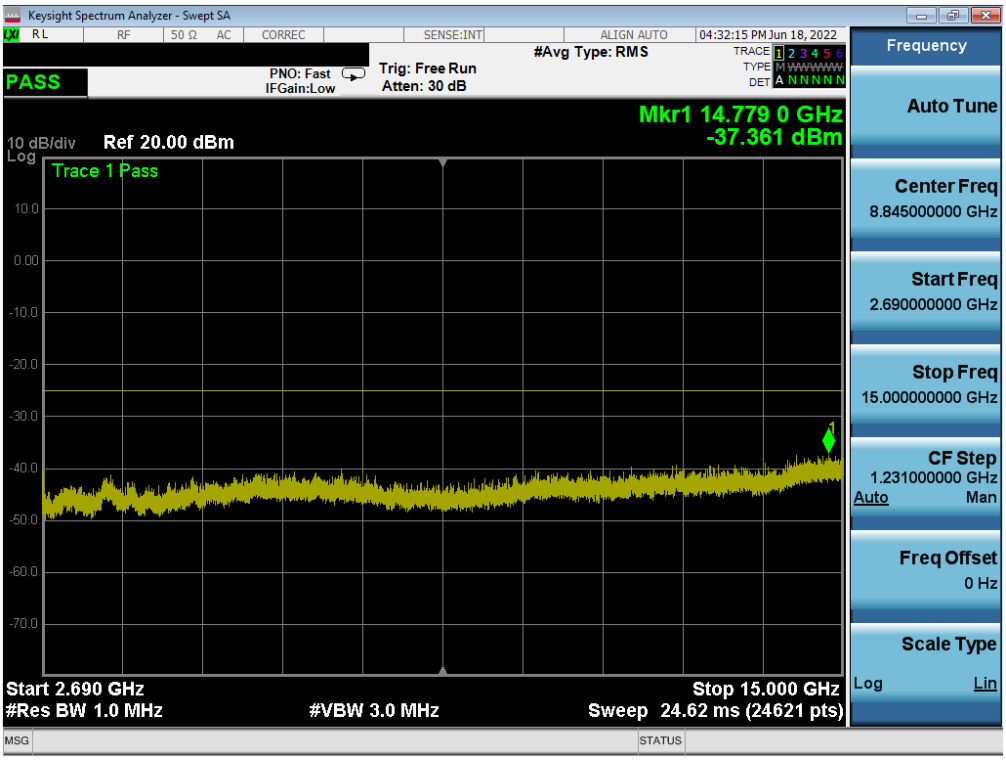
Plot 7-30. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel - Ant F)



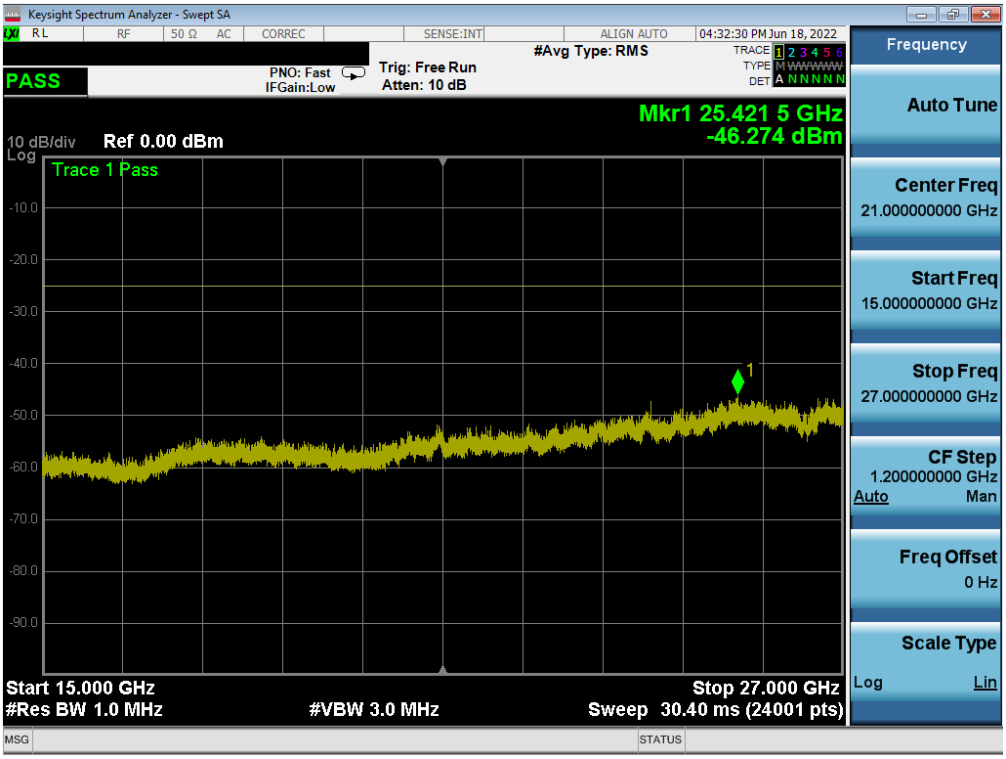
Plot 7-31. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel - Ant F)



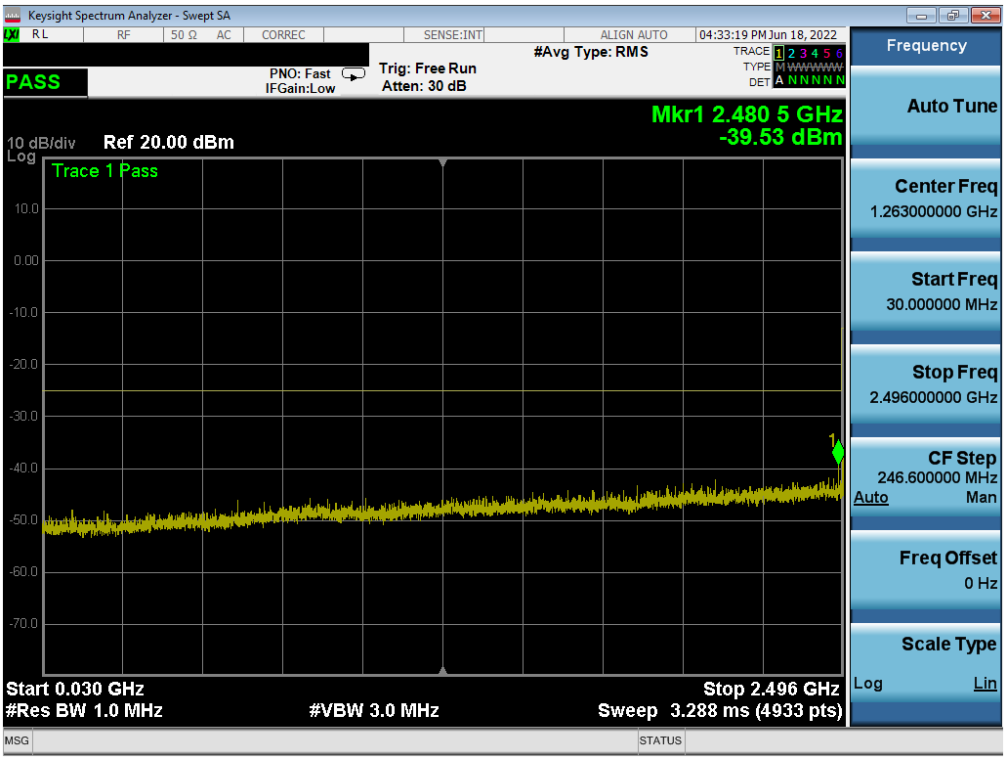
Plot 7-32. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant F)



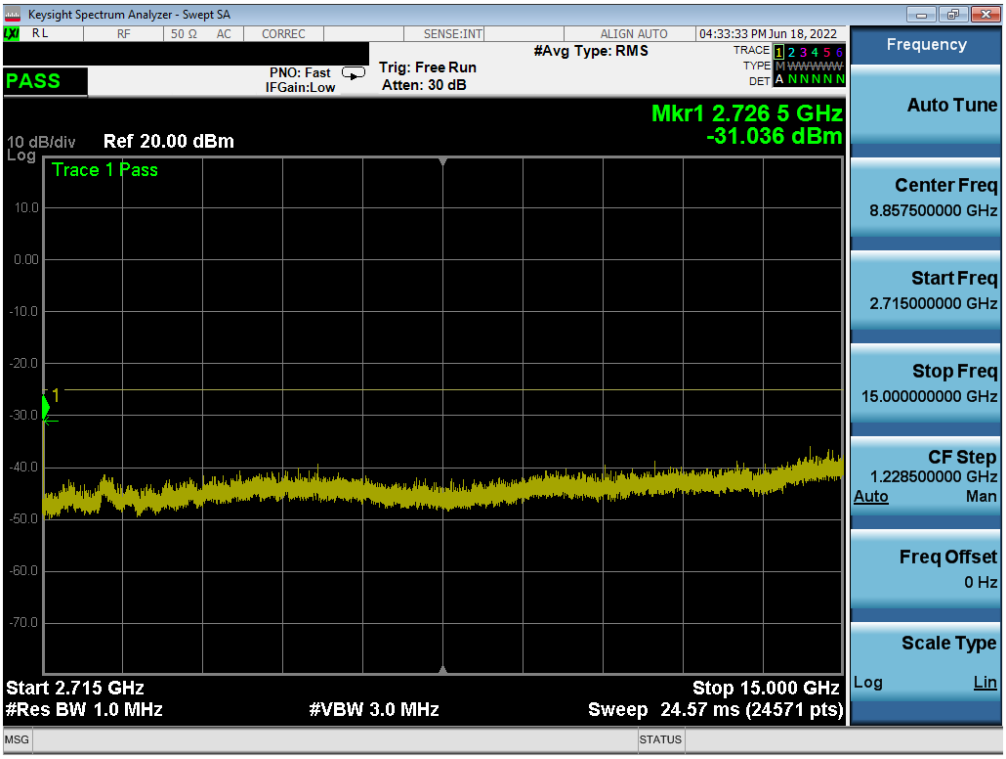
Plot 7-33. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant F)



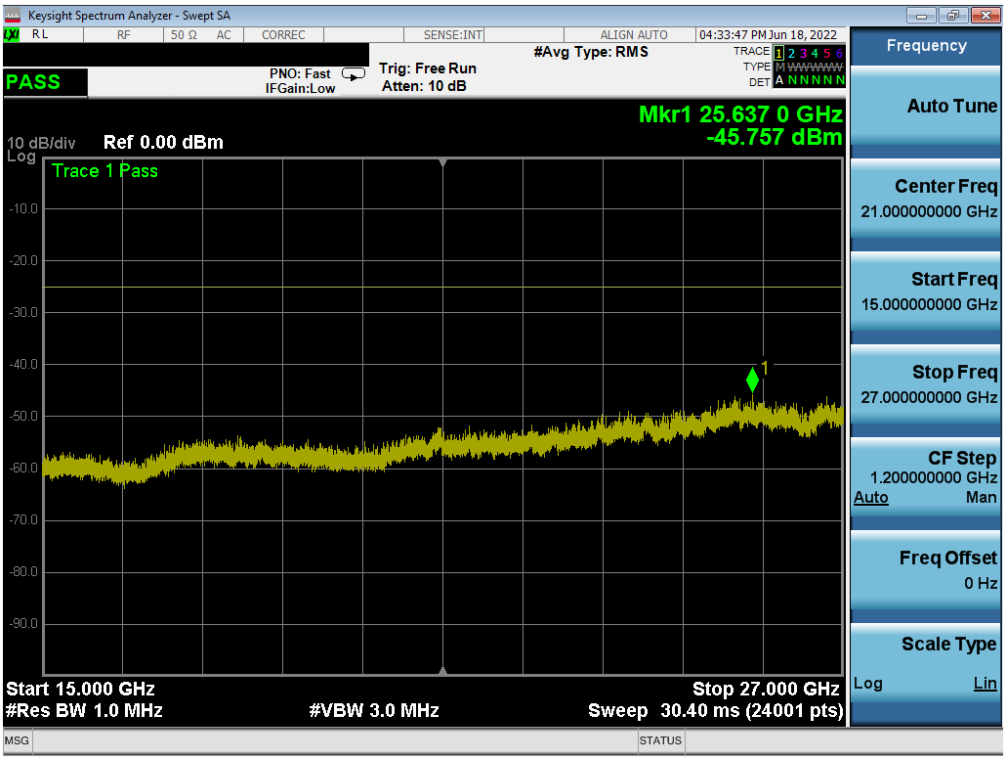
Plot 7-34. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant F)



Plot 7-35. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant F)

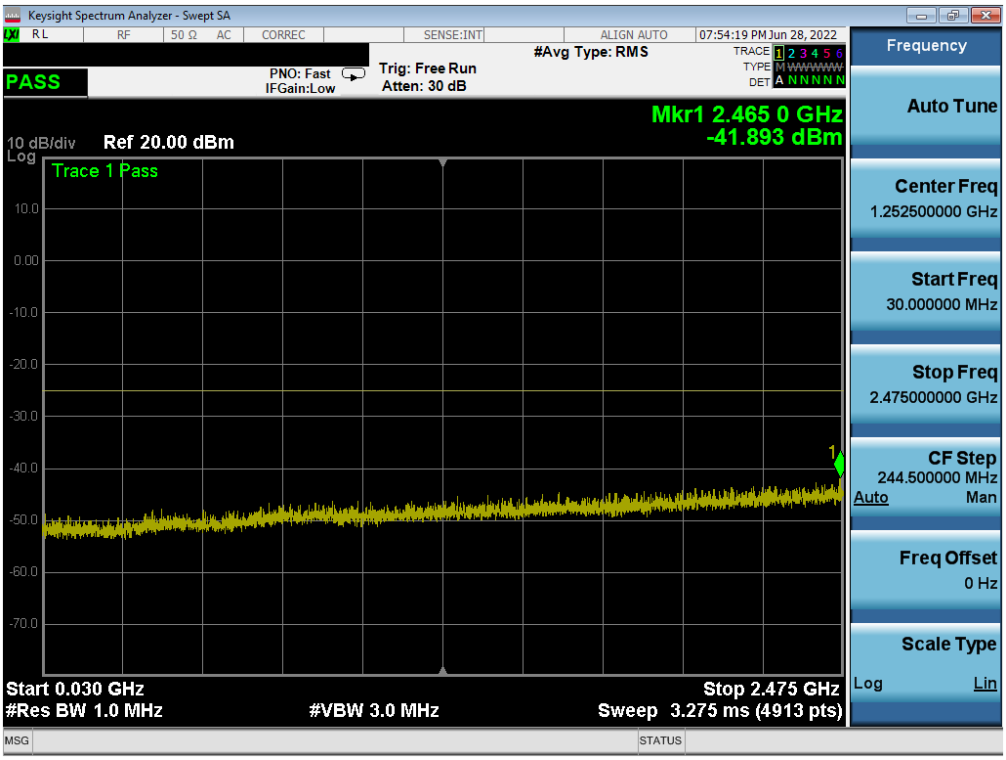


Plot 7-36. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant F)

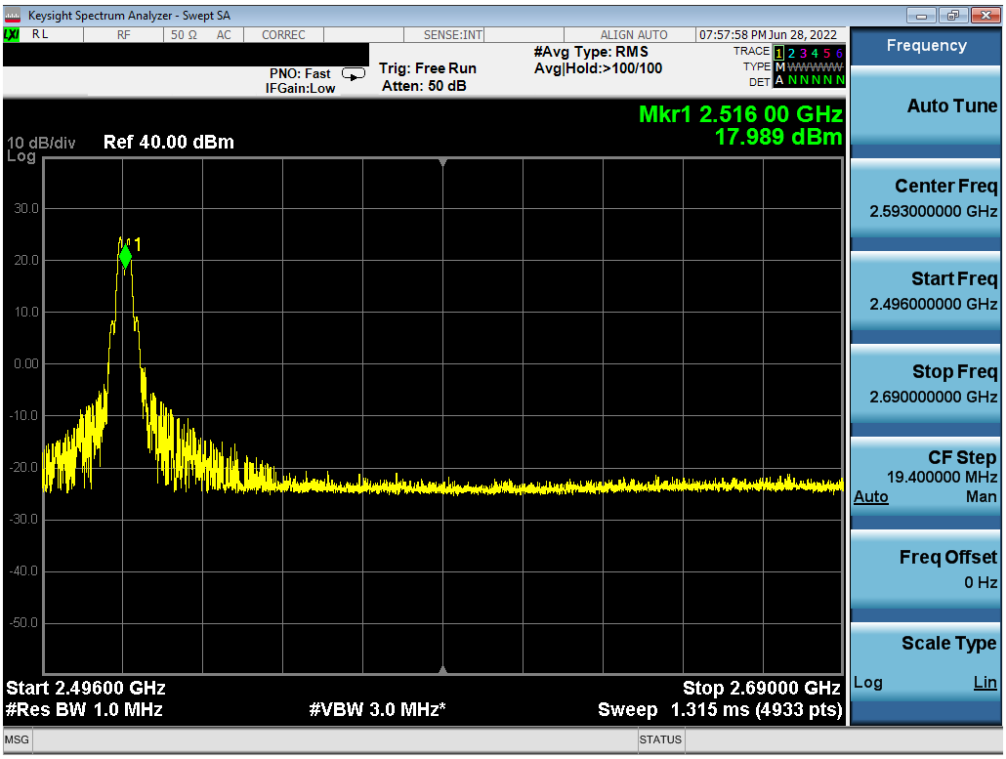


Plot 7-37. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant F)

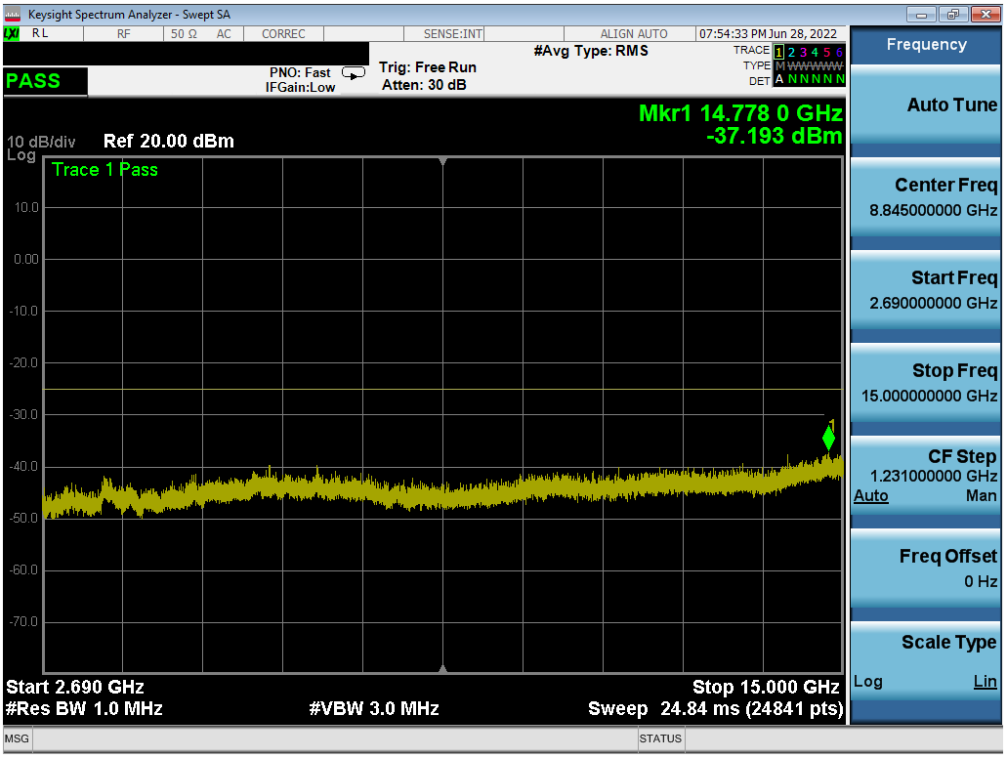
ULCA - LTE B41(PC3) – Ant B



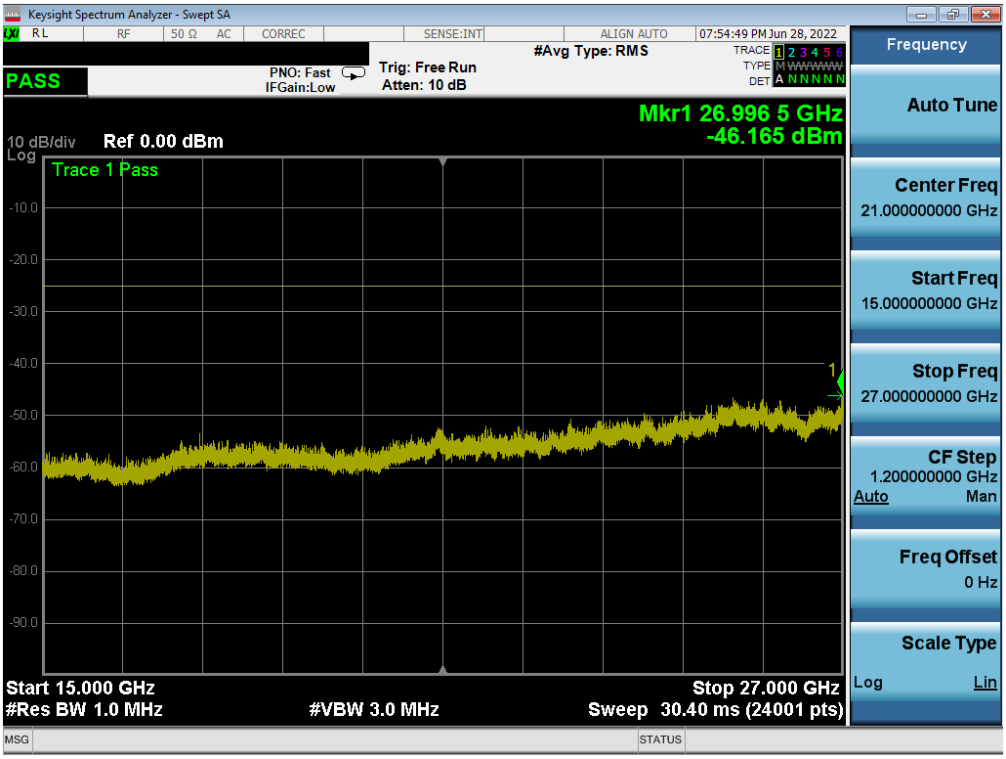
Plot 7-38. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant B)



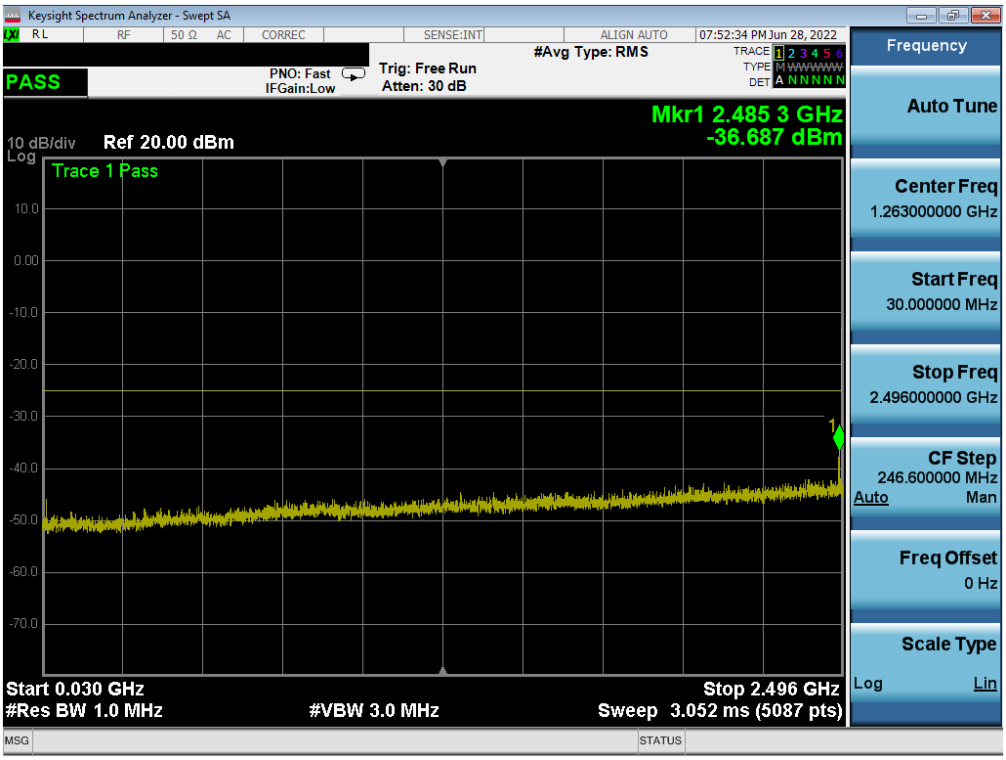
Plot 7-39. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant B)



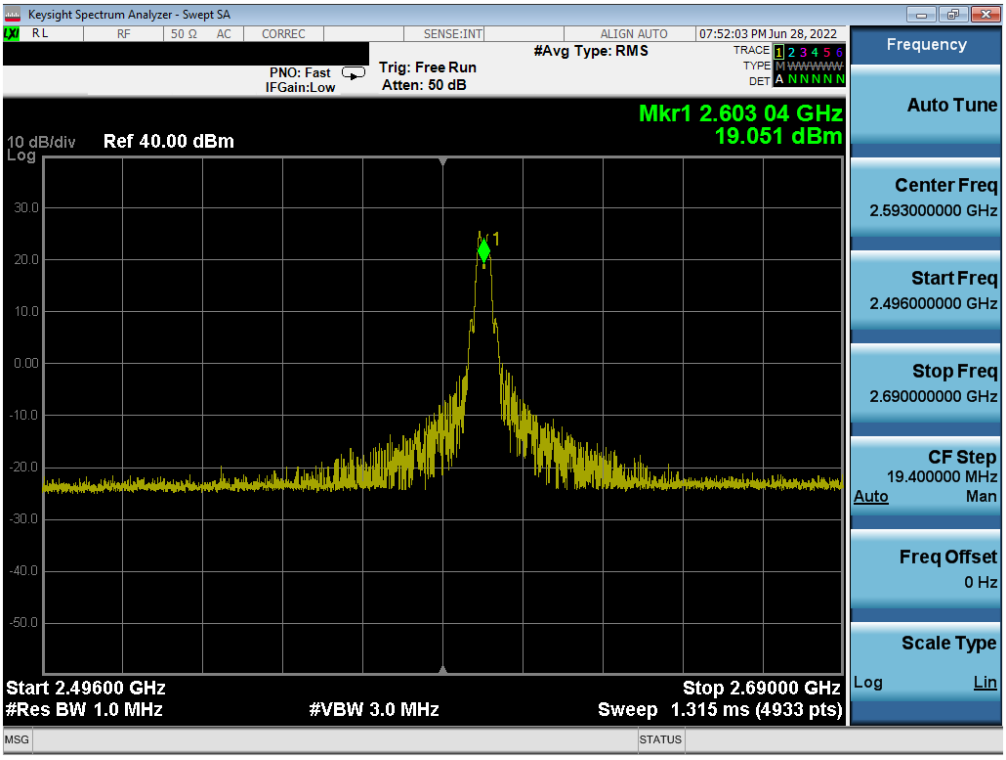
Plot 7-40. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant B)



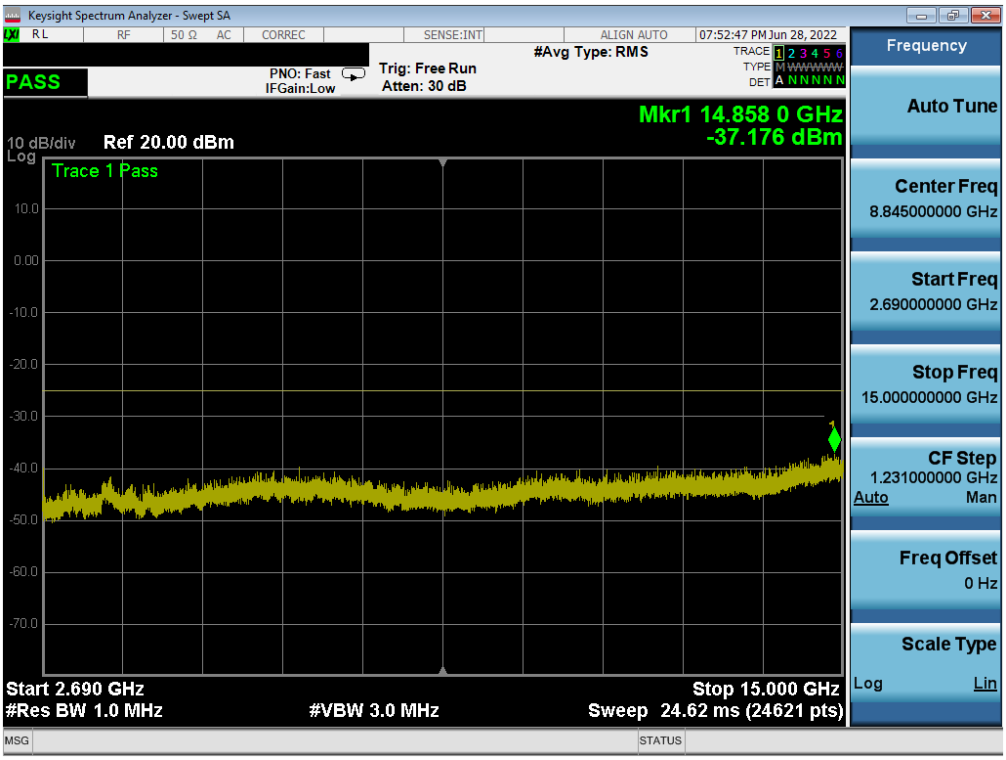
Plot 7-41. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant B)



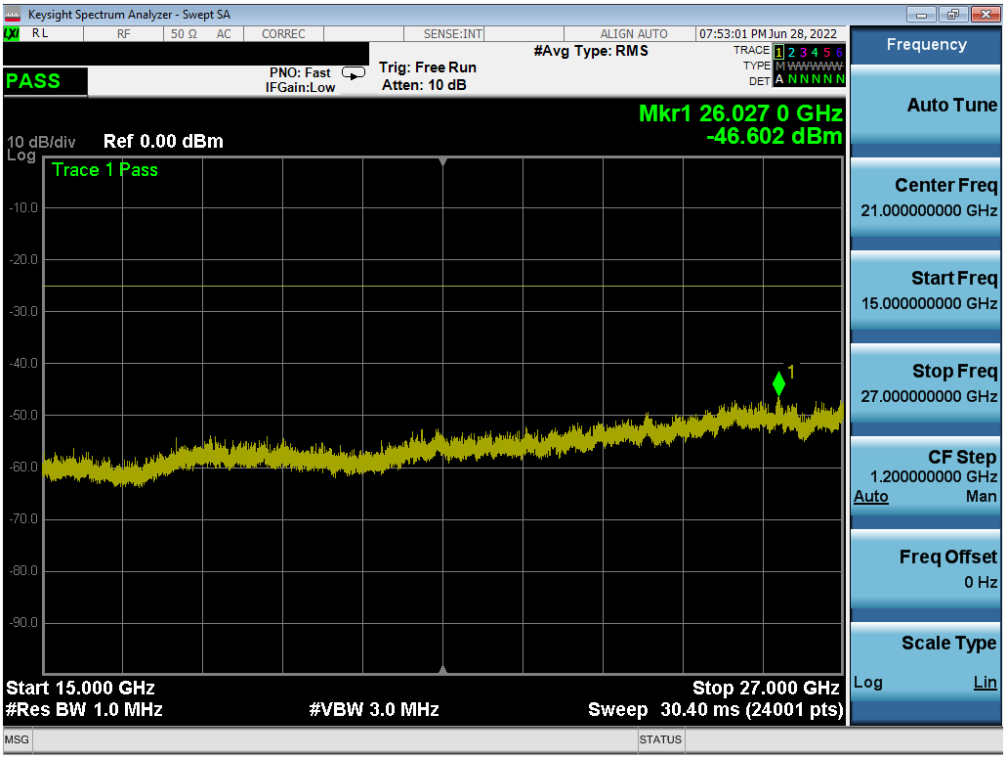
Plot 7-42. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel Ant B)



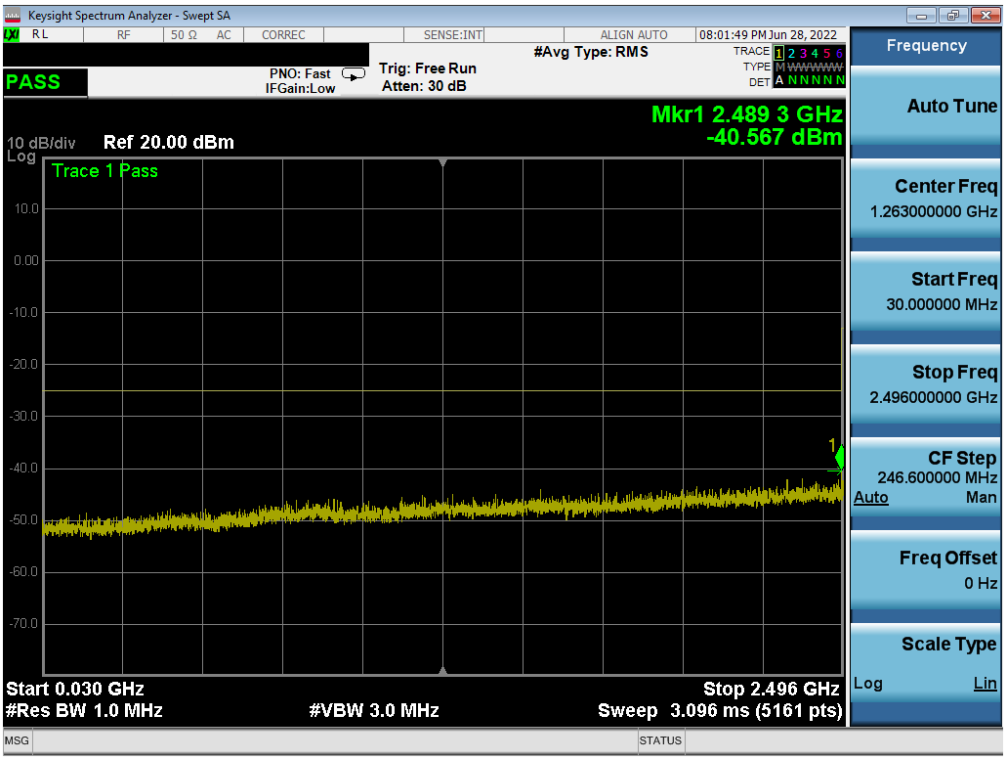
Plot 7-43. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel Ant B)



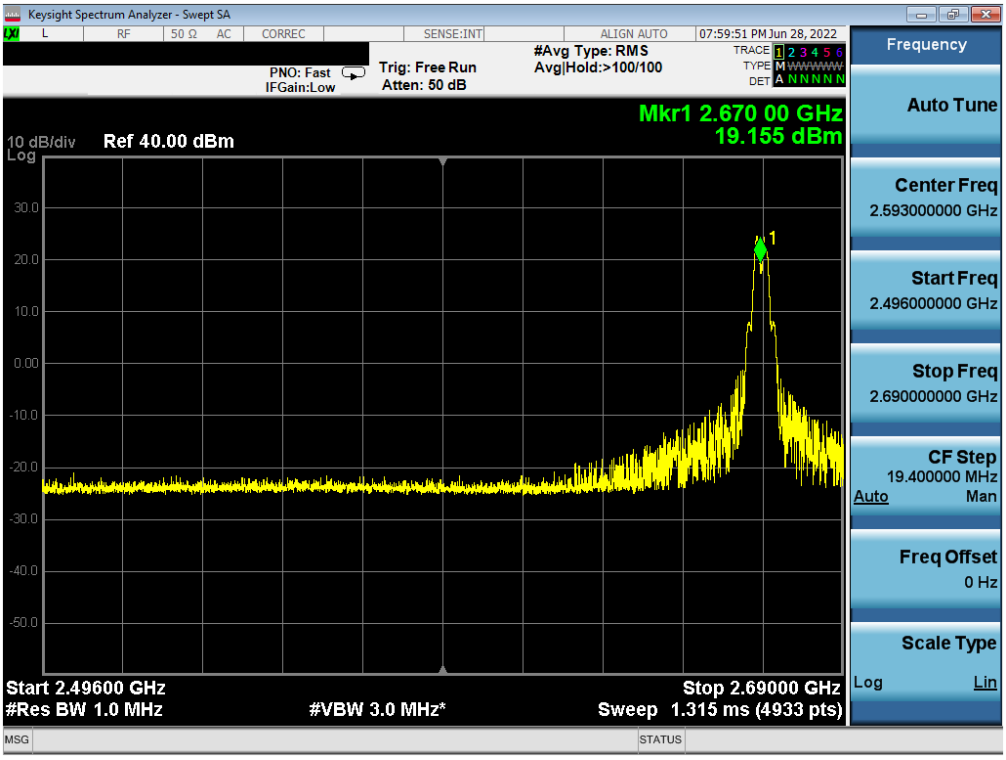
Plot 7-44. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel Ant B)



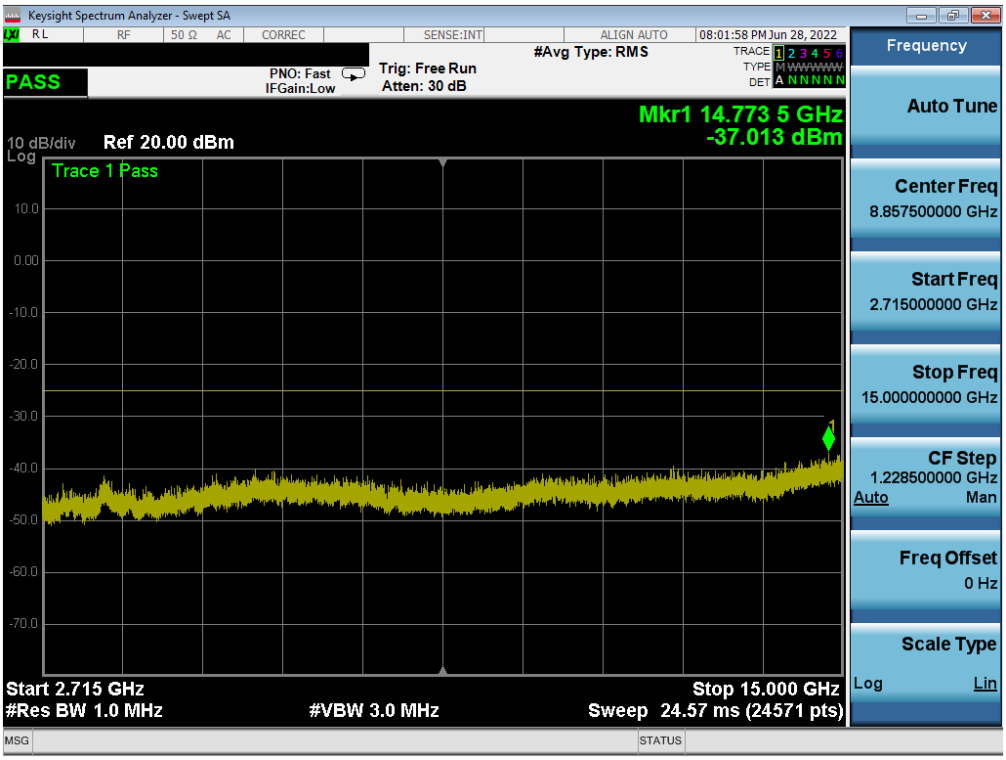
Plot 7-45. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel Ant B)



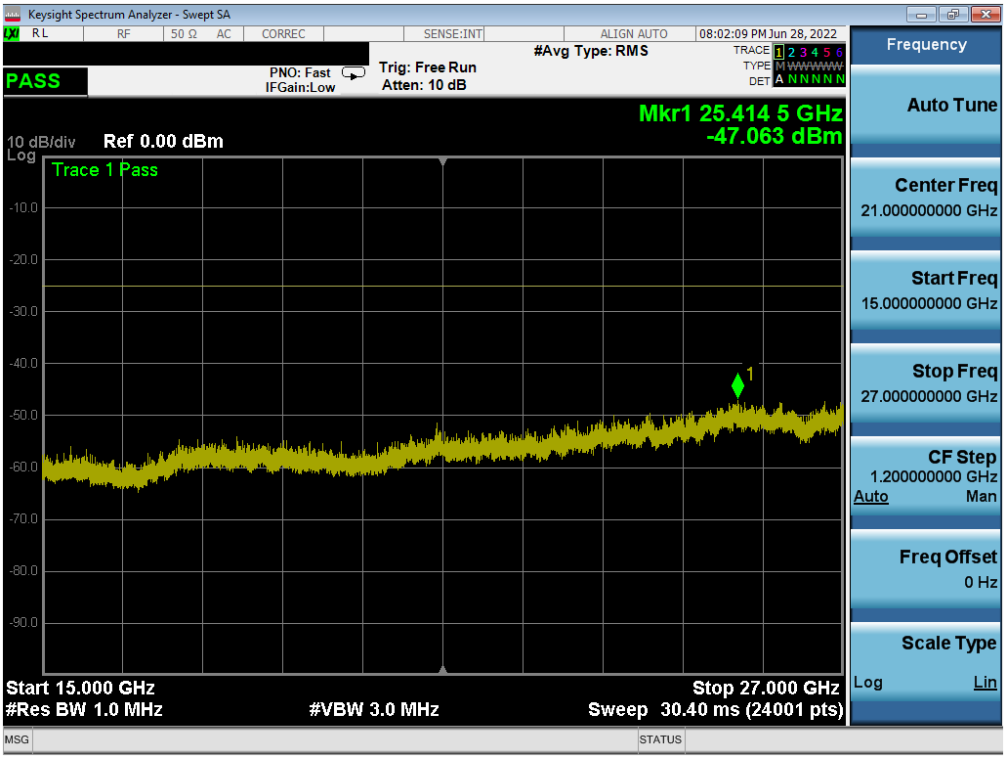
Plot 7-46. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant B)



Plot 7-47. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant B)



Plot 7-48. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant B)



Plot 7-49. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant B)

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 for Band 41 is as noted in the Test Notes on the following page.

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.3

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW ≥ 1% of the emission bandwidth
4. VBW ≥ 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x 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.

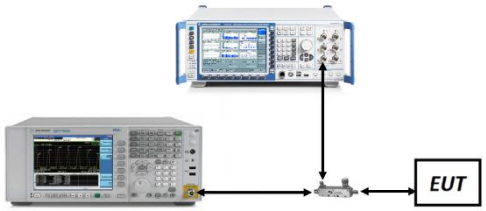


Figure 7-4. Test Instrument & Measurement Setup

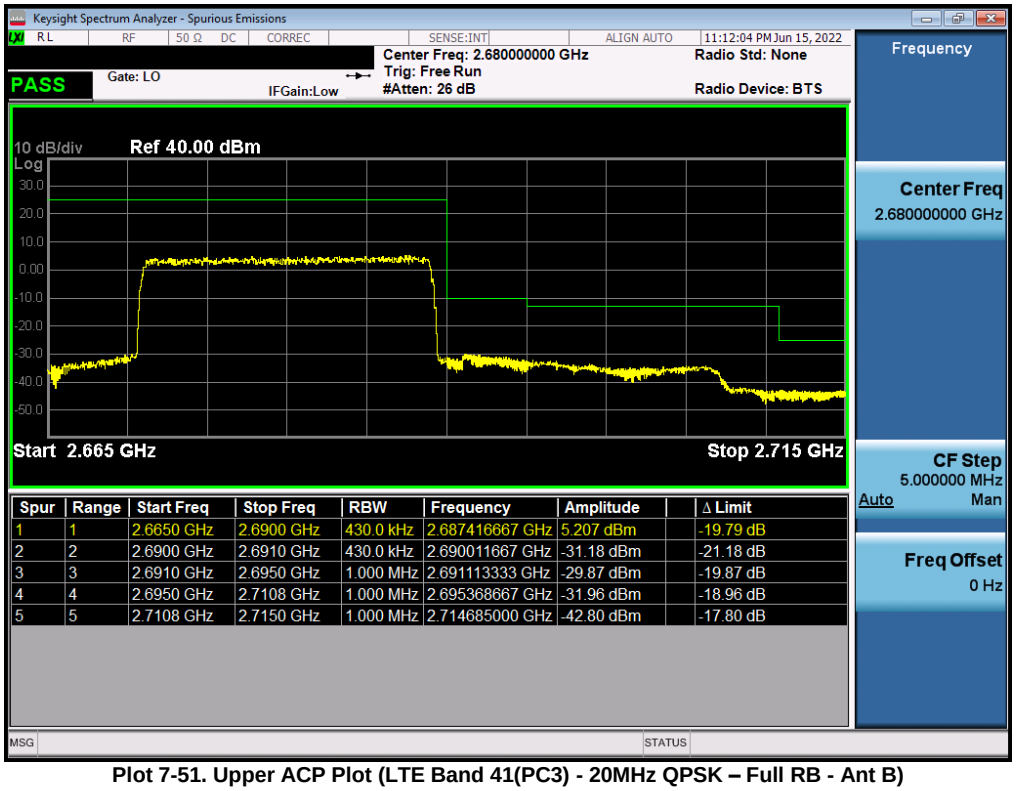
Test Notes

1. Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.

LTE Band 41(PC3) – Ant B

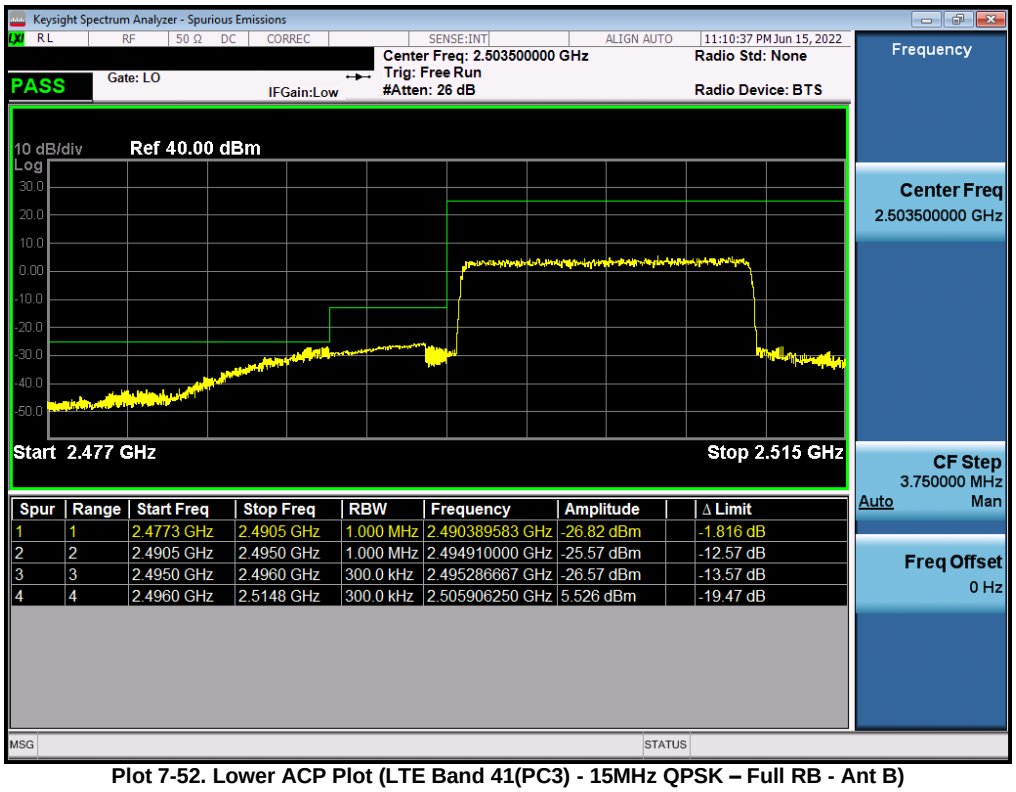
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4710 GHz	2.4905 GHz	1.000 MHz	2.490012500 GHz	-30.19 dBm	-5.194 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494565000 GHz	-27.42 dBm	-14.42 dB
3	3	2.4950 GHz	2.4960 GHz	430.0 kHz	2.495981667 GHz	-28.93 dBm	-15.93 dB
4	4	2.4960 GHz	2.5210 GHz	430.0 kHz	2.514291667 GHz	5.572 dBm	-19.43 dB

Plot 7-50. Lower ACP Plot (LTE Band 41(PC3) - 20MHz QPSK – Full RB - Ant B)



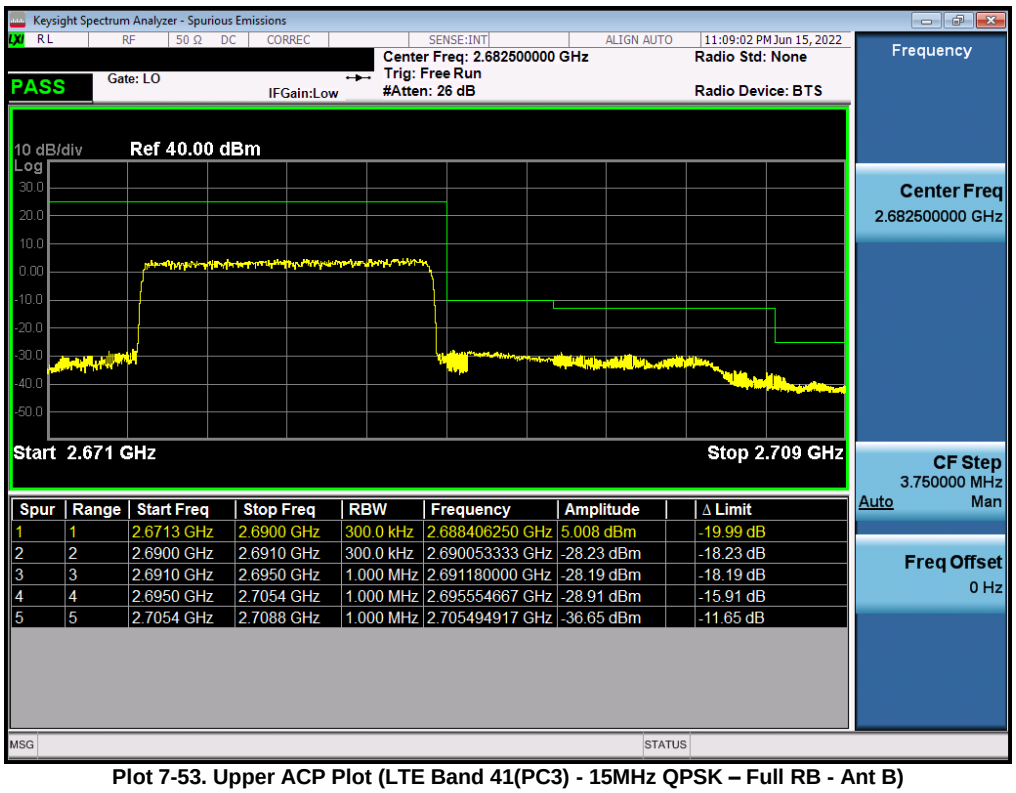
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	430.0 kHz	2.687416667 GHz	5.207 dBm	-19.79 dB
2	2	2.6900 GHz	2.6910 GHz	430.0 kHz	2.690011667 GHz	-31.18 dBm	-21.18 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691113333 GHz	-29.87 dBm	-19.87 dB
4	4	2.6950 GHz	2.7108 GHz	1.000 MHz	2.695368667 GHz	-31.96 dBm	-18.96 dB
5	5	2.7108 GHz	2.7150 GHz	1.000 MHz	2.714685000 GHz	-42.80 dBm	-17.80 dB

Plot 7-51. Upper ACP Plot (LTE Band 41(PC3) - 20MHz QPSK – Full RB - Ant B)



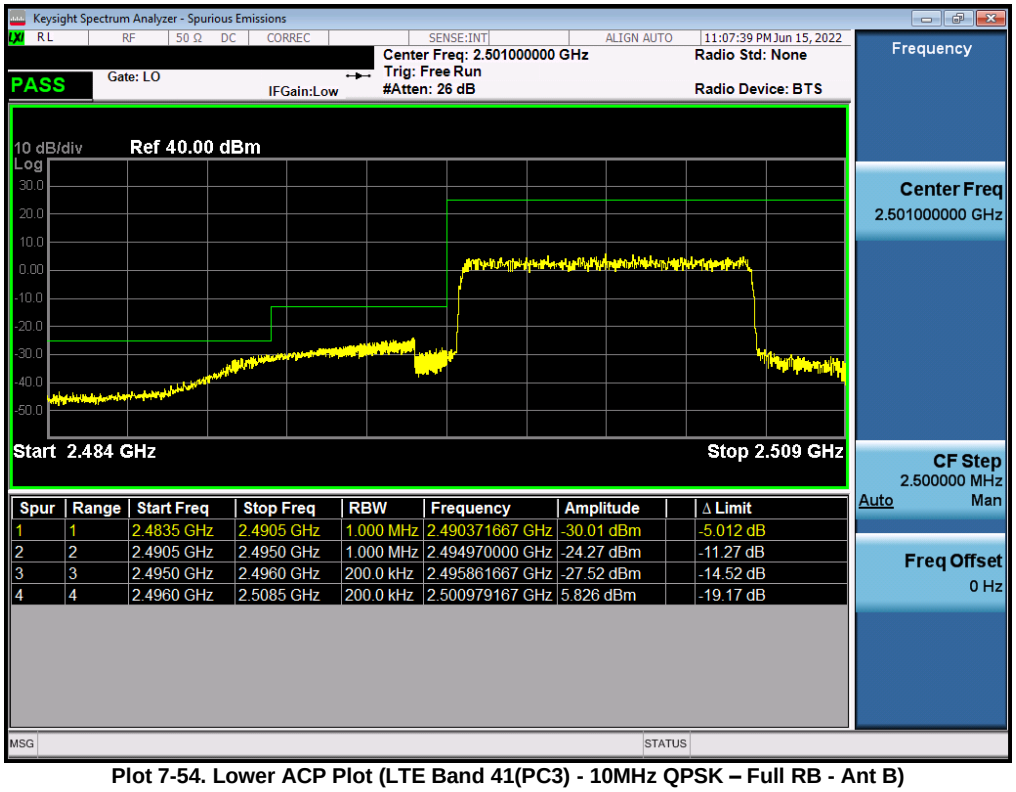
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4773 GHz	2.4905 GHz	1.000 MHz	2.490389583 GHz	-26.82 dBm	-1.816 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494910000 GHz	-25.57 dBm	-12.57 dB
3	3	2.4950 GHz	2.4960 GHz	300.0 kHz	2.495286667 GHz	-26.57 dBm	-13.57 dB
4	4	2.4960 GHz	2.5148 GHz	300.0 kHz	2.505906250 GHz	5.526 dBm	-19.47 dB

Plot 7-52. Lower ACP Plot (LTE Band 41(PC3) - 15MHz QPSK – Full RB - Ant B)

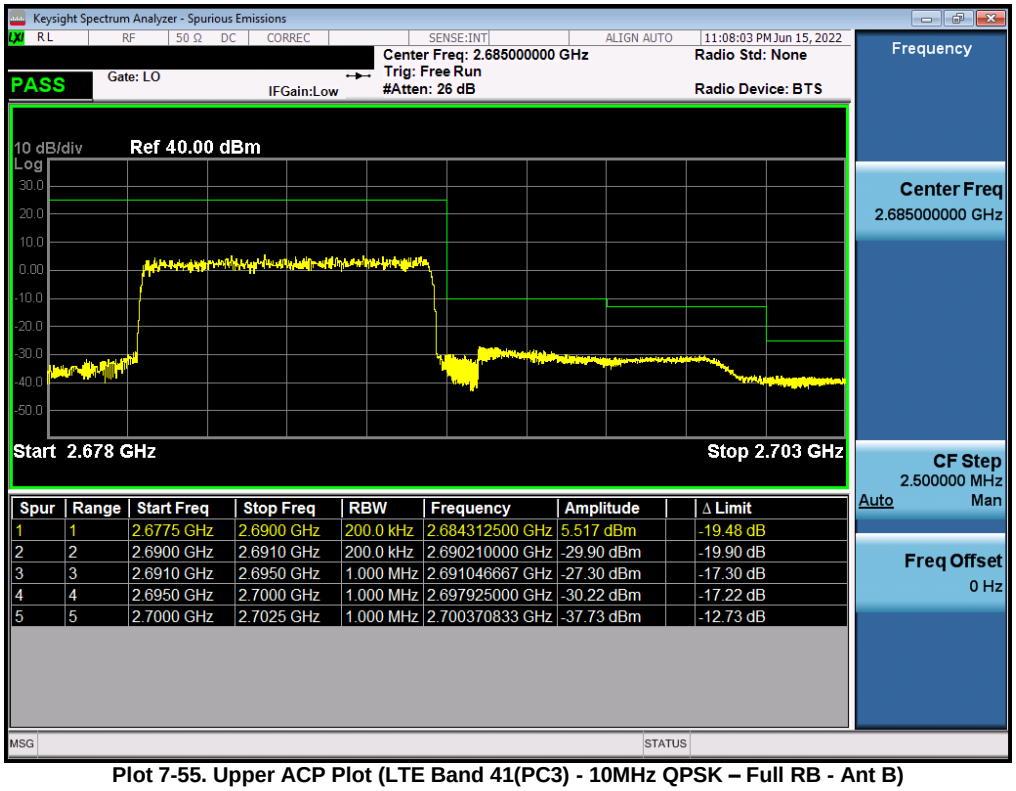


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6713 GHz	2.6900 GHz	300.0 kHz	2.688406250 GHz	5.008 dBm	-19.99 dB
2	2	2.6900 GHz	2.6910 GHz	300.0 kHz	2.690053333 GHz	-28.23 dBm	-18.23 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691180000 GHz	-28.19 dBm	-18.19 dB
4	4	2.6950 GHz	2.7054 GHz	1.000 MHz	2.695554667 GHz	-28.91 dBm	-15.91 dB
5	5	2.7054 GHz	2.7088 GHz	1.000 MHz	2.705494917 GHz	-36.65 dBm	-11.65 dB

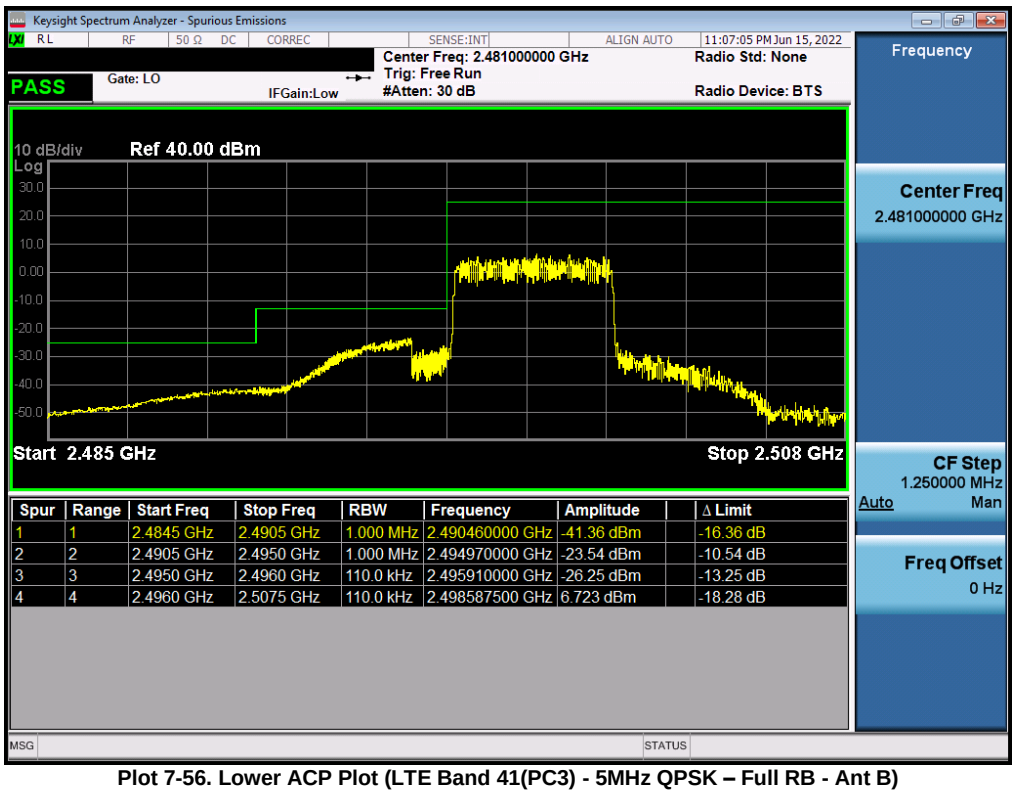
Plot 7-53. Upper ACP Plot (LTE Band 41(PC3) - 15MHz QPSK – Full RB - Ant B)



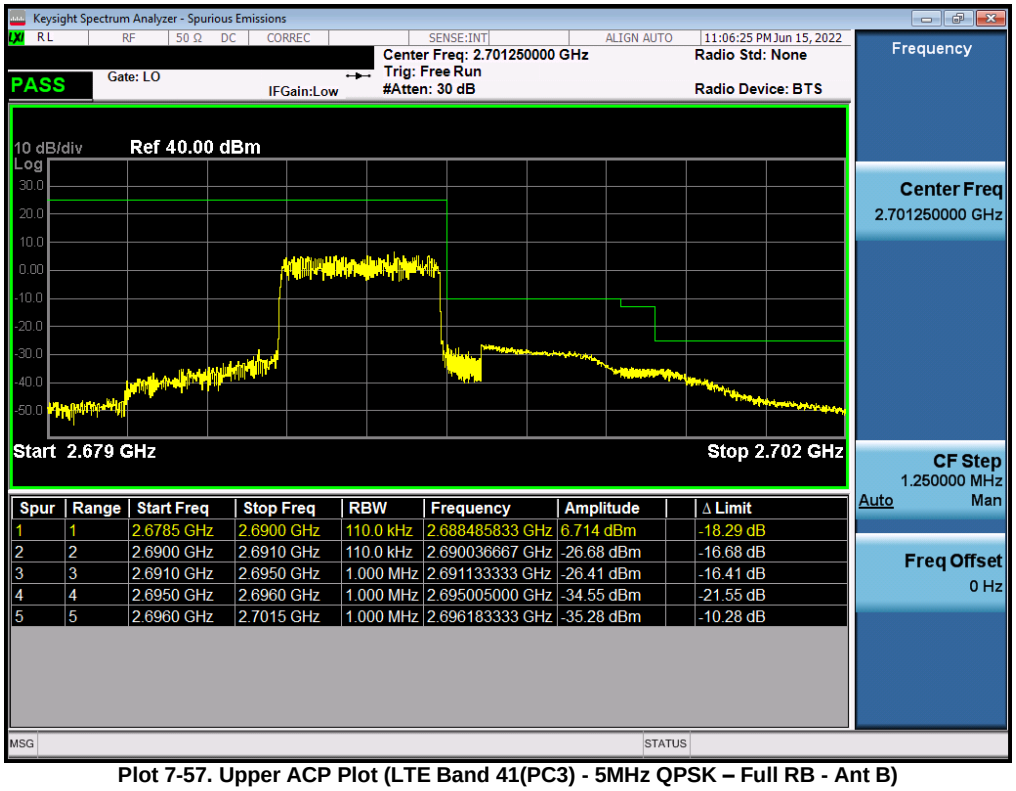
Plot 7-54. Lower ACP Plot (LTE Band 41(PC3) - 10MHz QPSK – Full RB - Ant B)



Plot 7-55. Upper ACP Plot (LTE Band 41(PC3) - 10MHz QPSK – Full RB - Ant B)

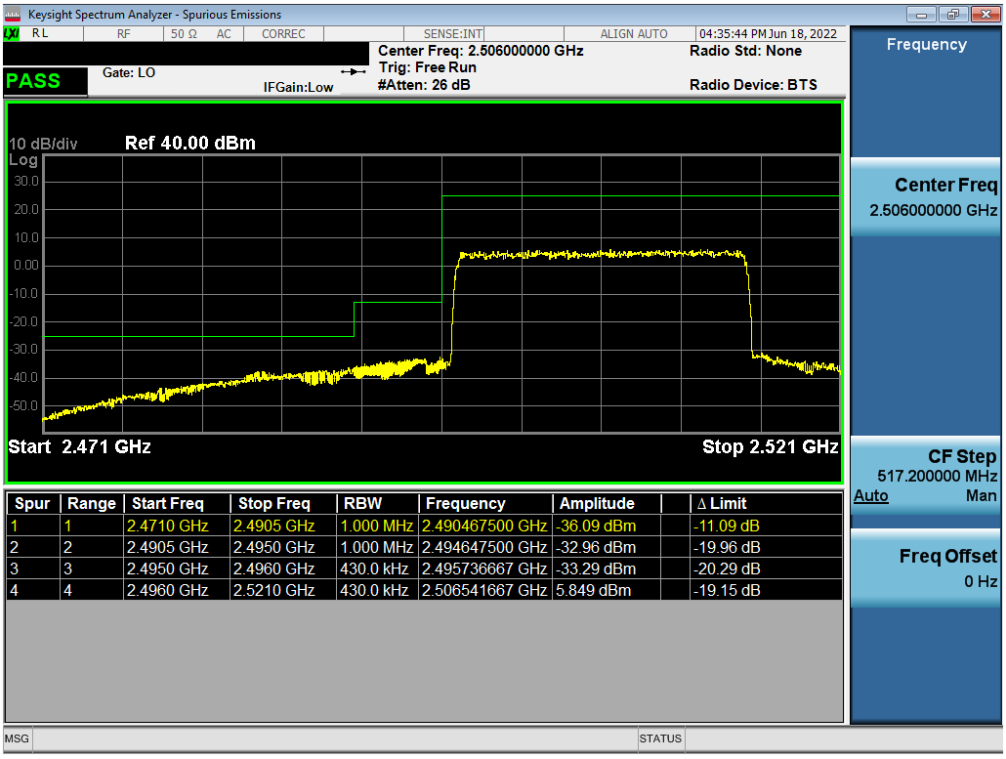


Plot 7-56. Lower ACP Plot (LTE Band 41(PC3) - 5MHz QPSK – Full RB - Ant B)



Plot 7-57. Upper ACP Plot (LTE Band 41(PC3) - 5MHz QPSK – Full RB - Ant B)

LTE Band 41(PC3) – Ant F

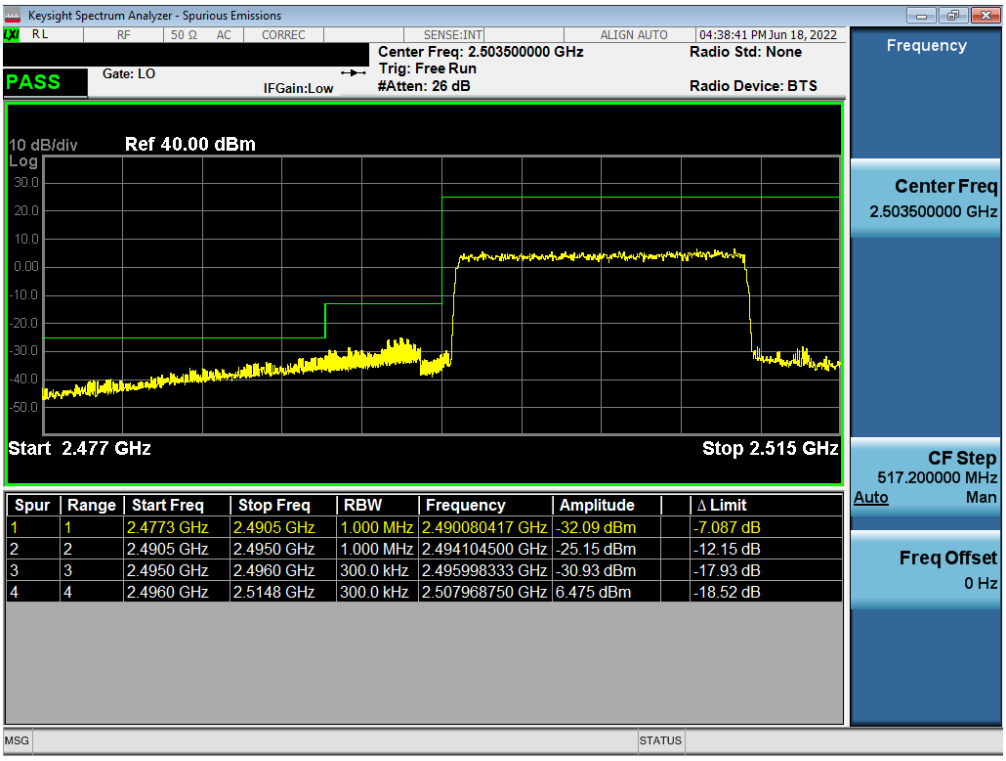


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4710 GHz	2.4905 GHz	1.000 MHz	2.490467500 GHz	-36.09 dBm	-11.09 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494647500 GHz	-32.96 dBm	-19.96 dB
3	3	2.4950 GHz	2.4960 GHz	430.0 kHz	2.495736667 GHz	-33.29 dBm	-20.29 dB
4	4	2.4960 GHz	2.5210 GHz	430.0 kHz	2.506541667 GHz	5.849 dBm	-19.15 dB

Plot 7-58. Lower ACP Plot (LTE Band 41(PC3) - 20MHz QPSK – Full RB - Ant F)

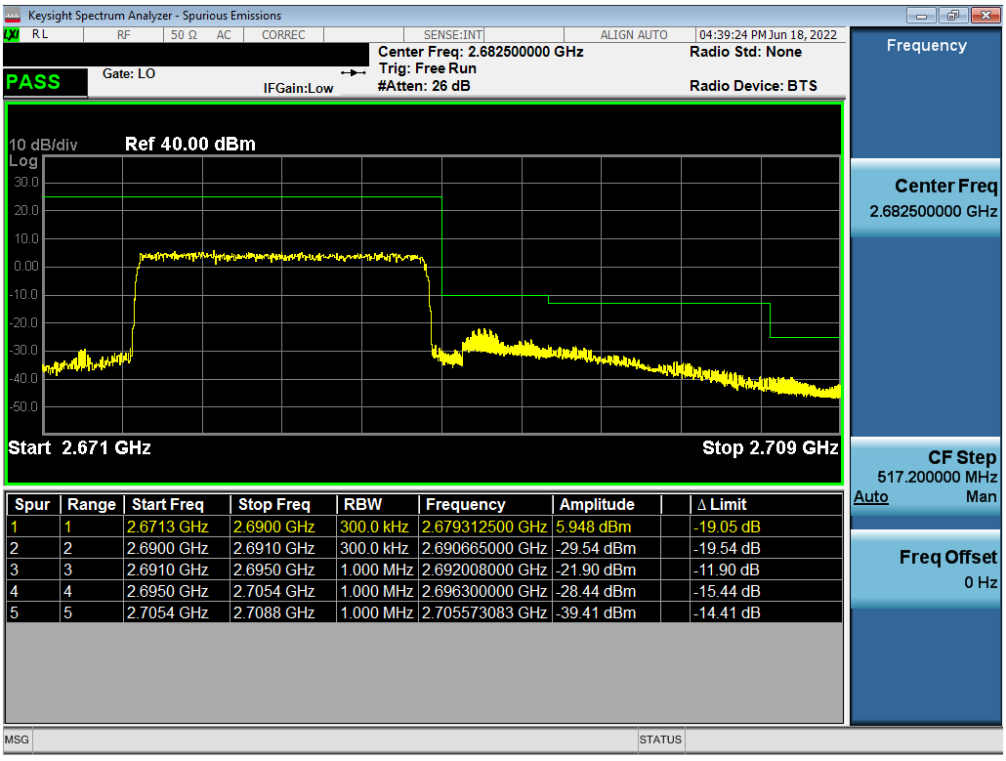
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	430.0 kHz	2.675083333 GHz	5.781 dBm	-19.22 dB
2	2	2.6900 GHz	2.6910 GHz	430.0 kHz	2.690165000 GHz	-29.71 dBm	-19.71 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692013333 GHz	-28.91 dBm	-18.91 dB
4	4	2.6950 GHz	2.7108 GHz	1.000 MHz	2.695000000 GHz	-31.23 dBm	-18.23 dB
5	5	2.7108 GHz	2.7150 GHz	1.000 MHz	2.710863000 GHz	-43.65 dBm	-18.65 dB

Plot 7-59. Upper ACP Plot (LTE Band 41(PC3) - 20MHz QPSK – Full RB - Ant F)



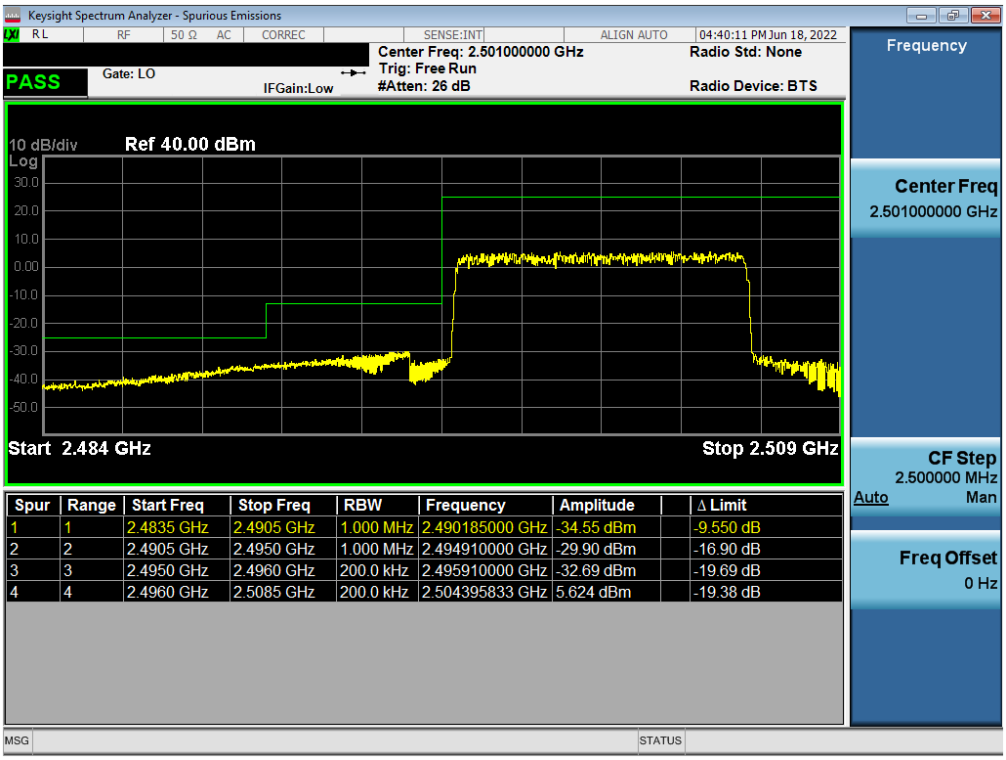
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4773 GHz	2.4905 GHz	1.000 MHz	2.490080417 GHz	-32.09 dBm	-7.087 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494104500 GHz	-25.15 dBm	-12.15 dB
3	3	2.4950 GHz	2.4960 GHz	300.0 kHz	2.495998333 GHz	-30.93 dBm	-17.93 dB
4	4	2.4960 GHz	2.5148 GHz	300.0 kHz	2.507968750 GHz	6.475 dBm	-18.52 dB

Plot 7-60. Lower ACP Plot (LTE Band 41(PC3) - 15MHz QPSK – Full RB - Ant F)



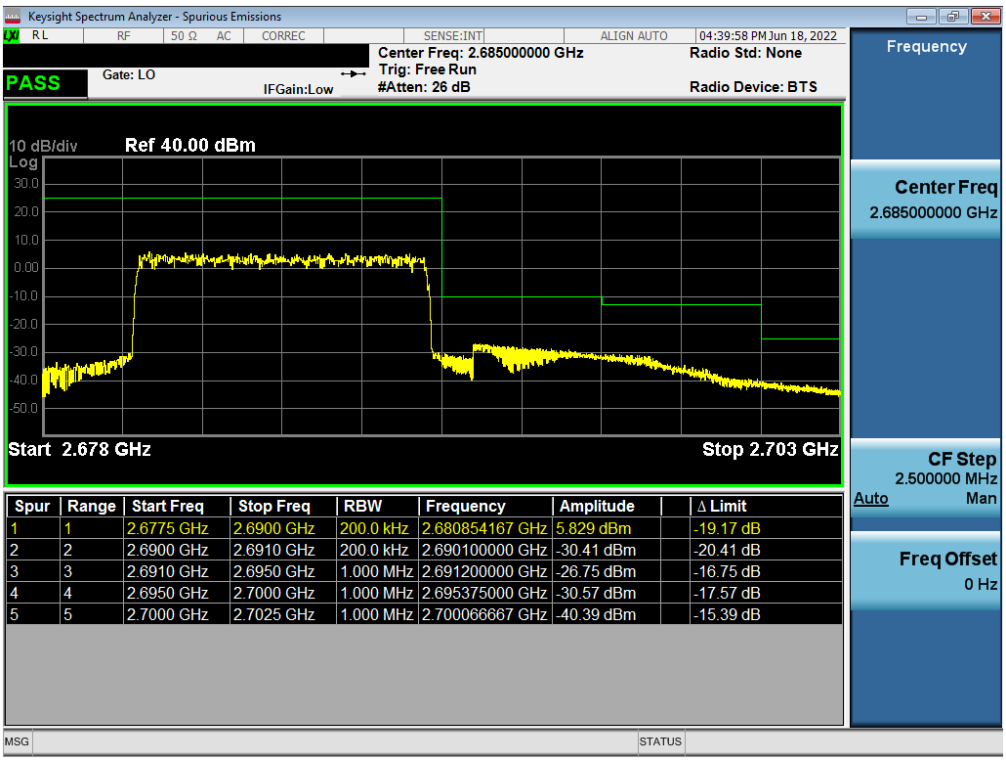
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6713 GHz	2.6900 GHz	300.0 kHz	2.679312500 GHz	5.948 dBm	-19.05 dB
2	2	2.6900 GHz	2.6910 GHz	300.0 kHz	2.690665000 GHz	-29.54 dBm	-19.54 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692008000 GHz	-21.90 dBm	-11.90 dB
4	4	2.6950 GHz	2.7054 GHz	1.000 MHz	2.696300000 GHz	-28.44 dBm	-15.44 dB
5	5	2.7054 GHz	2.7088 GHz	1.000 MHz	2.705573083 GHz	-39.41 dBm	-14.41 dB

Plot 7-61. Upper ACP Plot (LTE Band 41(PC3) - 15MHz QPSK – Full RB - Ant F)



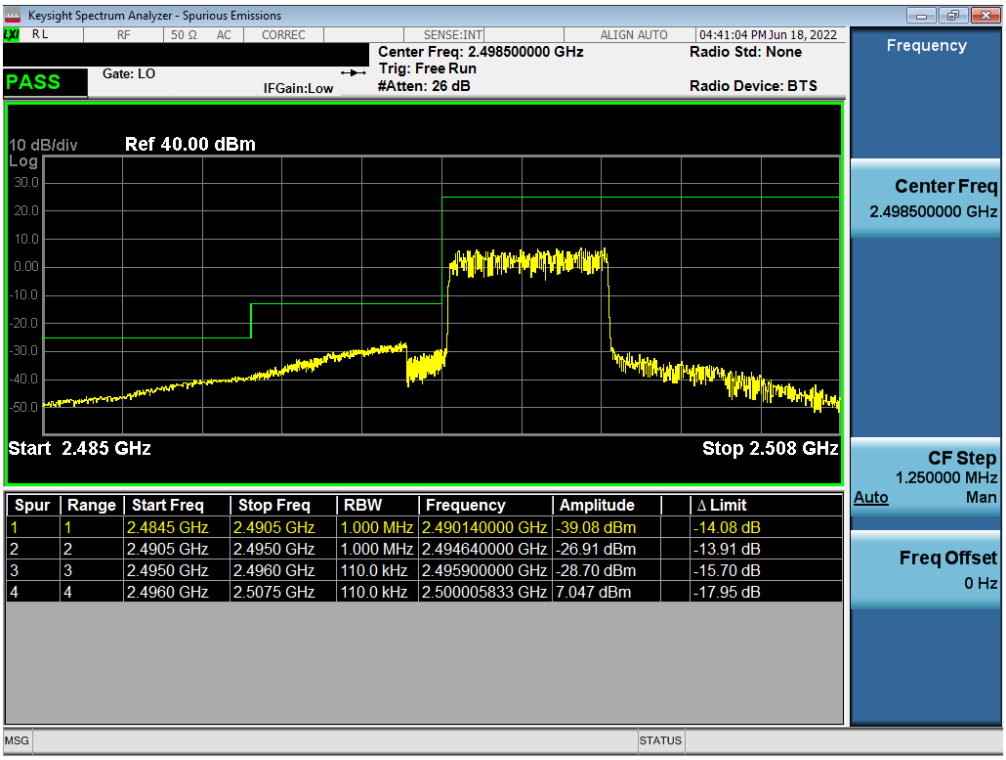
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4835 GHz	2.4905 GHz	1.000 MHz	2.490185000 GHz	-34.55 dBm	-9.550 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494910000 GHz	-29.90 dBm	-16.90 dB
3	3	2.4950 GHz	2.4960 GHz	200.0 kHz	2.495910000 GHz	-32.69 dBm	-19.69 dB
4	4	2.4960 GHz	2.5085 GHz	200.0 kHz	2.504395833 GHz	5.624 dBm	-19.38 dB

Plot 7-62. Lower ACP Plot (LTE Band 41(PC3) - 10MHz QPSK – Full RB - Ant F)



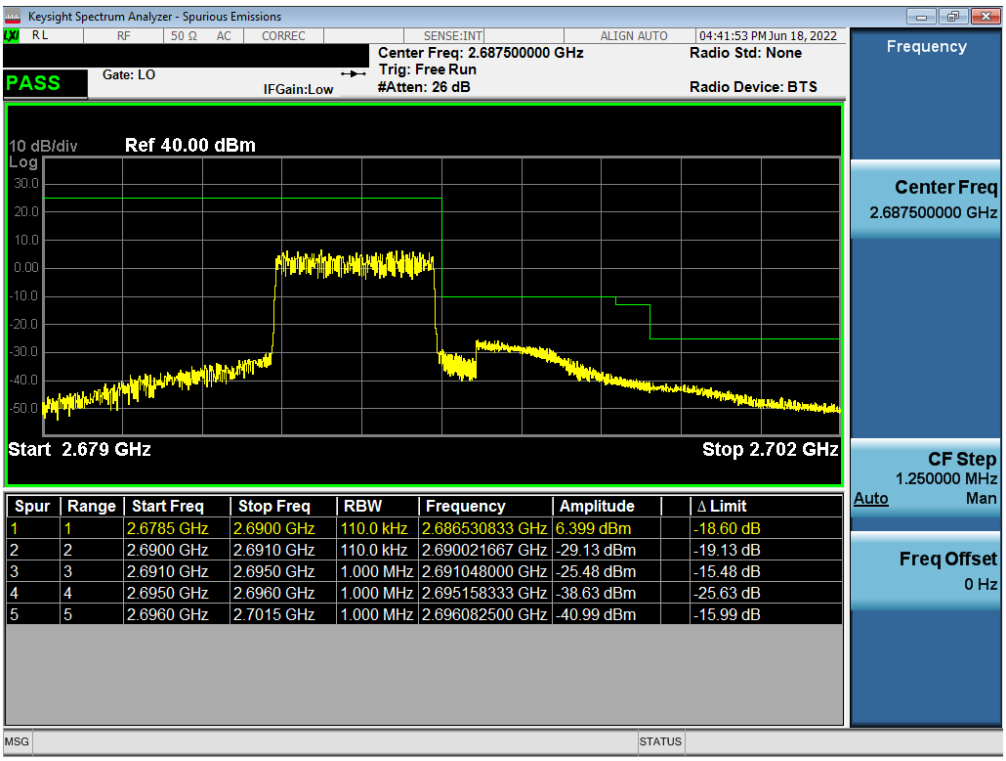
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6775 GHz	2.6900 GHz	200.0 kHz	2.680854167 GHz	5.829 dBm	-19.17 dB
2	2	2.6900 GHz	2.6910 GHz	200.0 kHz	2.690100000 GHz	-30.41 dBm	-20.41 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691200000 GHz	-26.75 dBm	-16.75 dB
4	4	2.6950 GHz	2.7000 GHz	1.000 MHz	2.695375000 GHz	-30.57 dBm	-17.57 dB
5	5	2.7000 GHz	2.7025 GHz	1.000 MHz	2.700066667 GHz	-40.39 dBm	-15.39 dB

Plot 7-63. Upper ACP Plot (LTE Band 41(PC3) - 10MHz QPSK – Full RB - Ant F)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4845 GHz	2.4905 GHz	1.000 MHz	2.490140000 GHz	-39.08 dBm	-14.08 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494640000 GHz	-26.91 dBm	-13.91 dB
3	3	2.4950 GHz	2.4960 GHz	110.0 kHz	2.495900000 GHz	-28.70 dBm	-15.70 dB
4	4	2.4960 GHz	2.5075 GHz	110.0 kHz	2.500005833 GHz	7.047 dBm	-17.95 dB

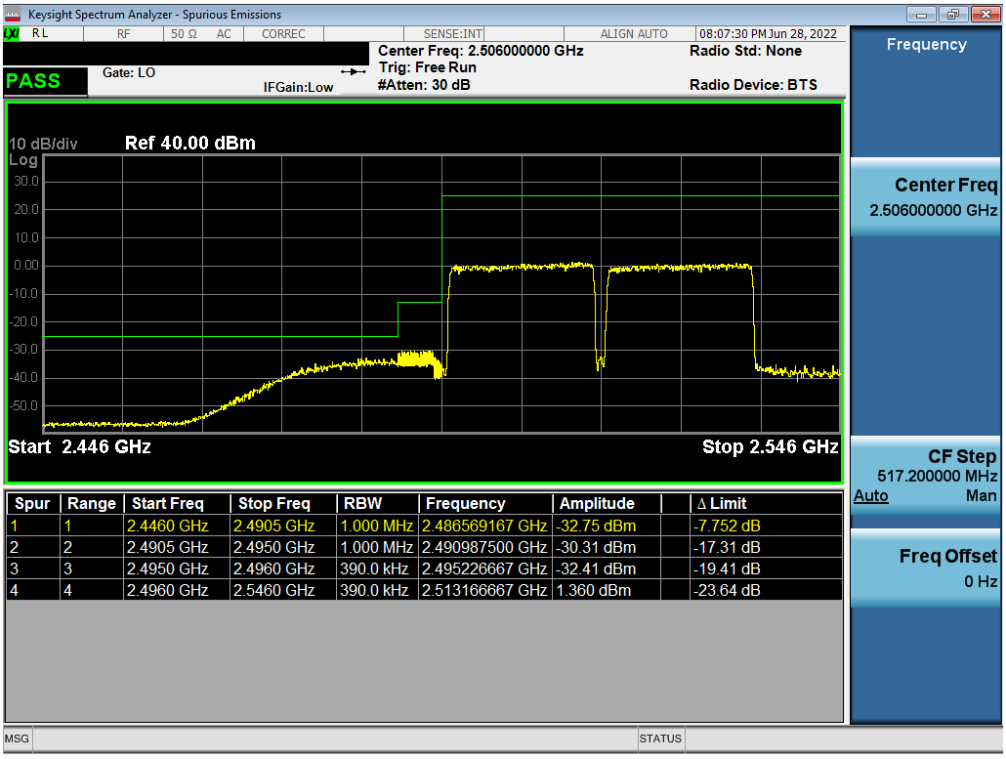
Plot 7-64. Lower ACP Plot (LTE Band 41(PC3) - 5MHz QPSK – Full RB - Ant F)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6785 GHz	2.6900 GHz	110.0 kHz	2.686530833 GHz	6.399 dBm	-18.60 dB
2	2	2.6900 GHz	2.6910 GHz	110.0 kHz	2.690021667 GHz	-29.13 dBm	-19.13 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691048000 GHz	-25.48 dBm	-15.48 dB
4	4	2.6950 GHz	2.6960 GHz	1.000 MHz	2.695158333 GHz	-38.63 dBm	-25.63 dB
5	5	2.6960 GHz	2.7015 GHz	1.000 MHz	2.696082500 GHz	-40.99 dBm	-15.99 dB

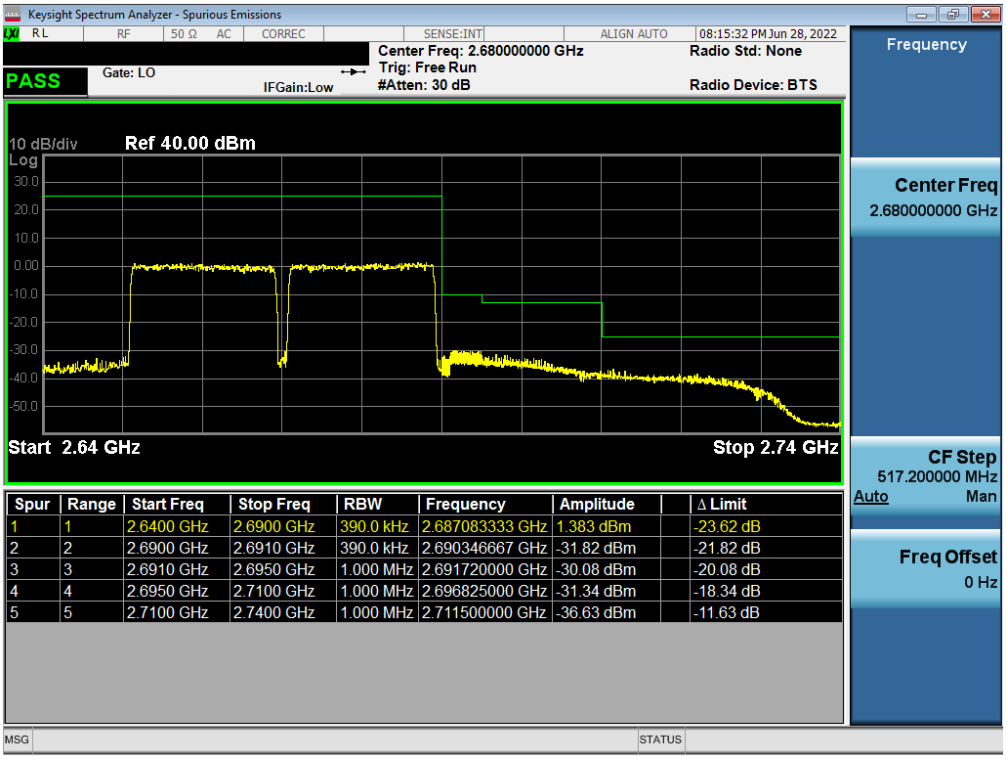
Plot 7-65. Upper ACP Plot (LTE Band 41(PC3) - 5MHz QPSK – Full RB - Ant F)

ULCA - LTE Band 41(PC3) – Ant B



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4460 GHz	2.4905 GHz	1.000 MHz	2.486569167 GHz	-32.75 dBm	-7.752 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.490987500 GHz	-30.31 dBm	-17.31 dB
3	3	2.4950 GHz	2.4960 GHz	390.0 kHz	2.495226667 GHz	-32.41 dBm	-19.41 dB
4	4	2.4960 GHz	2.5460 GHz	390.0 kHz	2.513166667 GHz	1.360 dBm	-23.64 dB

Plot 7-66. Lower ACP Plot (ULCA LTE B41(PC3) - 20MHz QPSK – Full RB - Ant B)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6400 GHz	2.6900 GHz	390.0 kHz	2.687083333 GHz	1.383 dBm	-23.62 dB
2	2	2.6900 GHz	2.6910 GHz	390.0 kHz	2.690346667 GHz	-31.82 dBm	-21.82 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691720000 GHz	-30.08 dBm	-20.08 dB
4	4	2.6950 GHz	2.7100 GHz	1.000 MHz	2.696825000 GHz	-31.34 dBm	-18.34 dB
5	5	2.7100 GHz	2.7400 GHz	1.000 MHz	2.711500000 GHz	-36.63 dBm	-11.63 dB

Plot 7-67. Upper ACP Plot (ULCA LTE B41(PC3) - 20MHz QPSK – Full RB - Ant B)

7.6 Radiated Power (EIRP)

Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

ANSI C63.26-2015 – Section 5.2.4.4

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration.
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize.

Test Setup

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

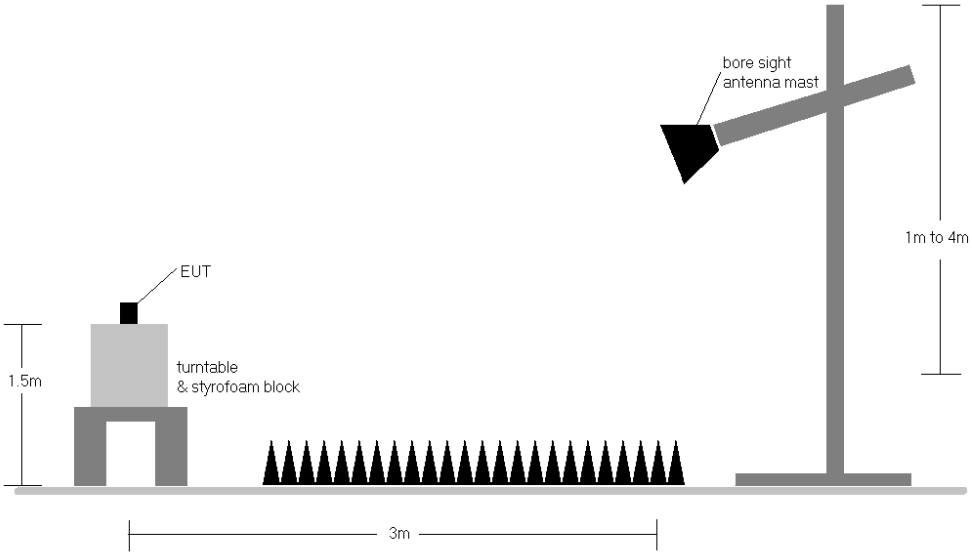


Figure 7-5. Radiated Test Setup >1GHz

Test Notes

1) 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.

2) This unit was tested with its standard battery.

Radiated Power (EIRP)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	QPSK	2506.0	H	102	152	9.54	1 / 0	12.75	22.29	0.170	33.01	-10.72
	QPSK	2593.0	H	116	150	9.46	1 / 50	13.37	**22.83**	0.192	33.01	-10.18
	QPSK	2680.0	H	133	149	9.51	1 / 0	12.42	21.93	0.156	33.01	-11.08
	16-QAM	2593.0	H	116	150	9.46	1 / 50	12.56	22.02	0.159	33.01	-10.99
15 MHz	QPSK	2503.5	H	102	152	9.54	1 / 74	12.92	22.46	0.176	33.01	-10.55
	QPSK	2593.0	H	116	150	9.46	1 / 74	13.63	**23.09**	0.204	33.01	-9.92
	QPSK	2682.5	H	133	149	9.51	1 / 74	12.57	22.08	0.161	33.01	-10.93
	16-QAM	2593.0	H	116	150	9.46	1 / 74	12.80	22.26	0.168	33.01	-10.75
10 MHz	QPSK	2501.0	H	102	152	9.54	1 / 49	13.17	22.71	0.187	33.01	-10.30
	QPSK	2593.0	H	116	150	9.46	1 / 49	13.80	**23.26**	0.212	33.01	-9.75
	QPSK	2685.0	H	133	149	9.51	1 / 49	12.60	22.11	0.163	33.01	-10.90
	16-QAM	2593.0	H	116	150	9.46	1 / 49	12.93	22.39	0.173	33.01	-10.62
5 MHz	QPSK	2498.5	H	102	152	9.54	1 / 0	12.70	22.24	0.168	33.01	-10.77
	QPSK	2593.0	H	116	150	9.46	1 / 0	13.40	**22.86**	0.193	33.01	-10.15
	QPSK	2687.5	H	133	149	9.51	1 / 12	12.01	21.52	0.142	33.01	-11.49
	16-QAM	2593.0	H	116	150	9.46	1 / 0	12.35	21.81	0.152	33.01	-11.20
20 MHz	QPSK (Opposite Pol.)	2593.0	V	275	264	9.49	1 / 50	12.41	21.90	0.155	33.01	-11.11
	QPSK (Half Open)	2593.0	H	139	149	9.46	1 / 50	12.41	21.87	0.154	33.01	-11.14
	QPSK (WCP)	2593.0	H	143	145	9.46	1 / 50	12.01	21.47	0.140	33.01	-11.54

Table 7-2. EIRP Data (LTE Band 41(PC3) – Ant B)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	QPSK	2506.0	H	128	34	9.54	1 / 50	11.34	**20.88**	0.123	33.01	-12.13
	QPSK	2593.0	H	114	348	9.46	1 / 50	11.27	20.73	0.118	33.01	-12.28
	QPSK	2680.0	H	102	347	9.51	1 / 0	11.13	20.64	0.116	33.01	-12.37
	16-QAM	2506.0	H	128	34	9.54	1 / 50	10.52	20.06	0.102	33.01	-12.95
15 MHz	QPSK	2503.5	H	128	34	9.54	1 / 37	11.31	**20.86**	0.122	33.01	-12.15
	QPSK	2593.0	H	114	348	9.46	1 / 37	11.33	20.79	0.120	33.01	-12.22
	QPSK	2682.5	H	102	347	9.51	1 / 37	11.26	20.77	0.120	33.01	-12.24
	16-QAM	2503.5	H	128	34	9.54	1 / 37	10.56	20.10	0.102	33.01	-12.91
10 MHz	QPSK	2501.0	H	128	34	9.54	1 / 49	11.45	**21.00**	0.126	33.01	-12.01
	QPSK	2593.0	H	114	348	9.46	1 / 25	11.47	20.93	0.124	33.01	-12.08
	QPSK	2685.0	H	102	347	9.51	1 / 0	11.20	20.71	0.118	33.01	-12.30
	16-QAM	2501.0	H	128	34	9.54	1 / 49	10.85	20.39	0.109	33.01	-12.62
5 MHz	QPSK	2498.5	H	128	34	9.54	1 / 12	11.58	**21.12**	0.129	33.01	-11.89
	QPSK	2593.0	H	114	348	9.46	1 / 12	11.18	20.64	0.116	33.01	-12.37
	QPSK	2687.5	H	102	347	9.51	1 / 0	10.63	20.14	0.103	33.01	-12.87
	16-QAM	2498.5	H	128	34	9.54	1 / 12	10.13	19.68	0.093	33.01	-13.33
20 MHz	QPSK (Opposite Pol.)	2506.0	V	280	24	9.50	1 / 0	9.94	19.44	0.088	33.01	-13.57
	QPSK (Half Open)	2506.0	H	164	6	9.54	1 / 50	10.08	19.62	0.092	33.01	-13.39
	QPSK (WCP)	2506.0	H	235	239	9.54	1 / 50	7.37	16.91	0.049	33.01	-16.10

Table 7-3. EIRP Data (LTE Band 41(PC3) – Ant F)

7.7 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

ANSI C63.26-2015 – Section 5.5.4

Test Settings

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

Test Setup

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

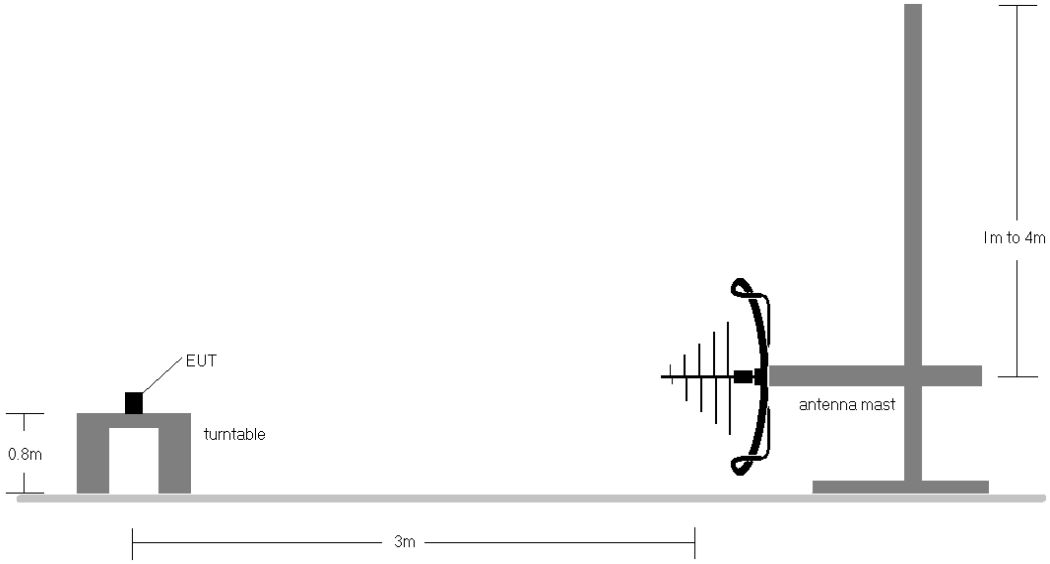


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

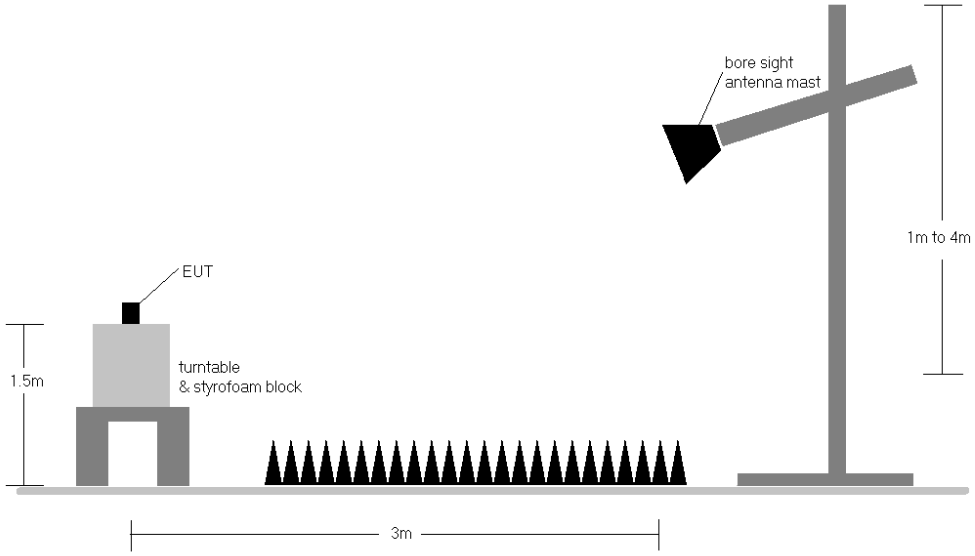


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

Test Notes

1) Field strengths are calculated using the Measurement quantity conversions in ANSI C63.26-2015 Section 5.2.7:
   a) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
   b) EIRP (dBm) = E(dBµV/m) + 20logD – 104.8; where D is the measurement distance in meters.

2) 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.

3) This unit was tested with its standard battery.

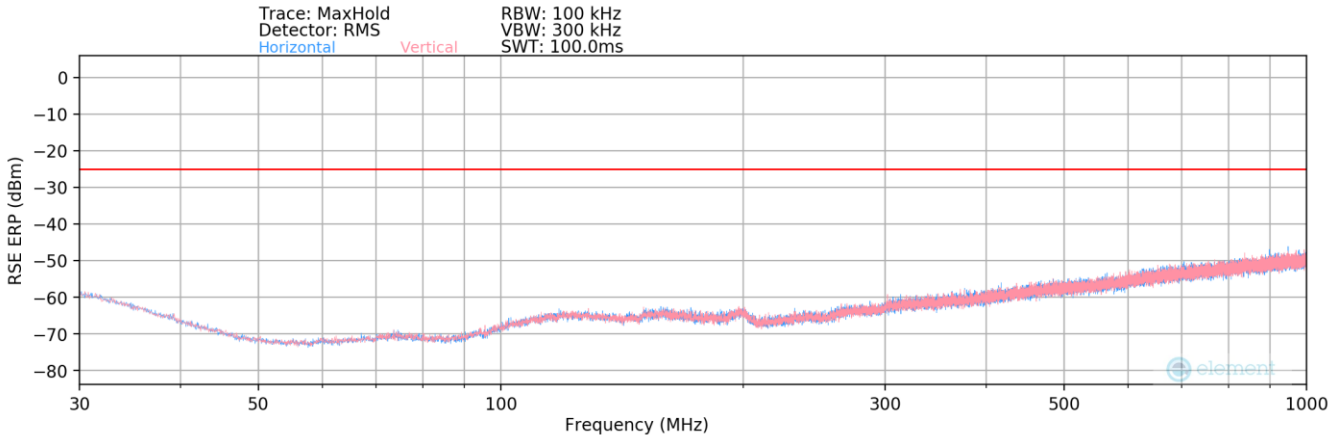
4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

5) 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.

6) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

7) ULCA spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.

LTE Band 41(PC3) – Ant B

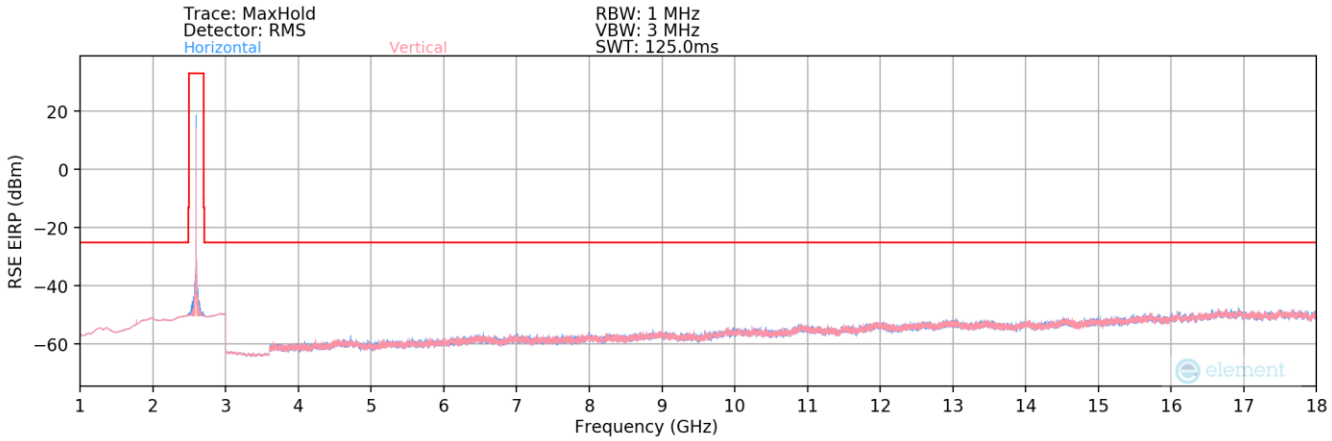


Plot 7-68. Radiated Spurious Plot (LTE Band 41(PC3) – Ant B)

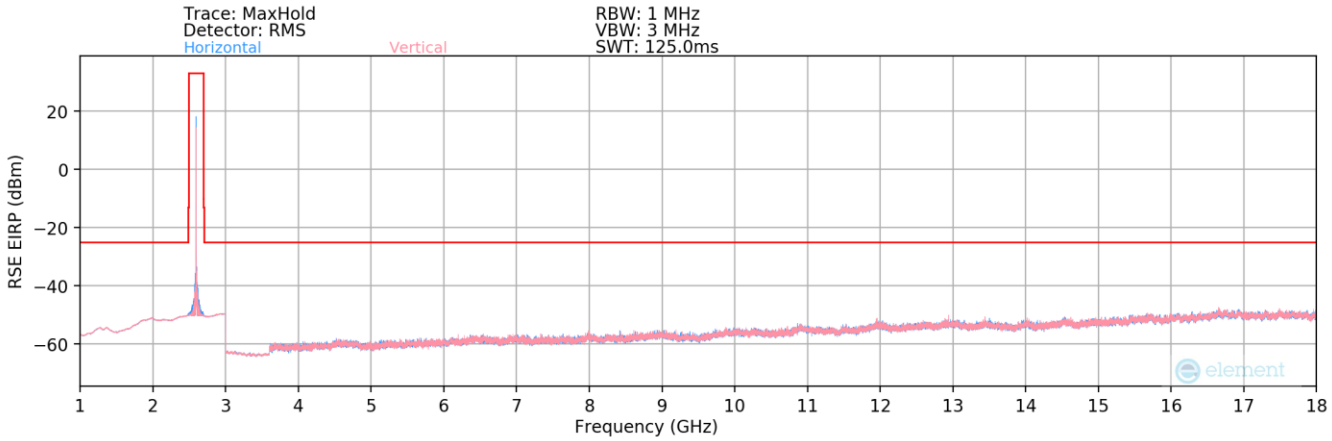
Bandwidth (MHz):	20
Frequency (MHz):	2593.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
735.32	H	-	-	-90.64	29.23	45.59	-51.82	-25.00	-26.82
901.72	H	-	-	-90.94	31.24	47.30	-50.11	-25.00	-25.11
918.44	H	-	-	-90.73	31.54	47.81	-49.60	-25.00	-24.60

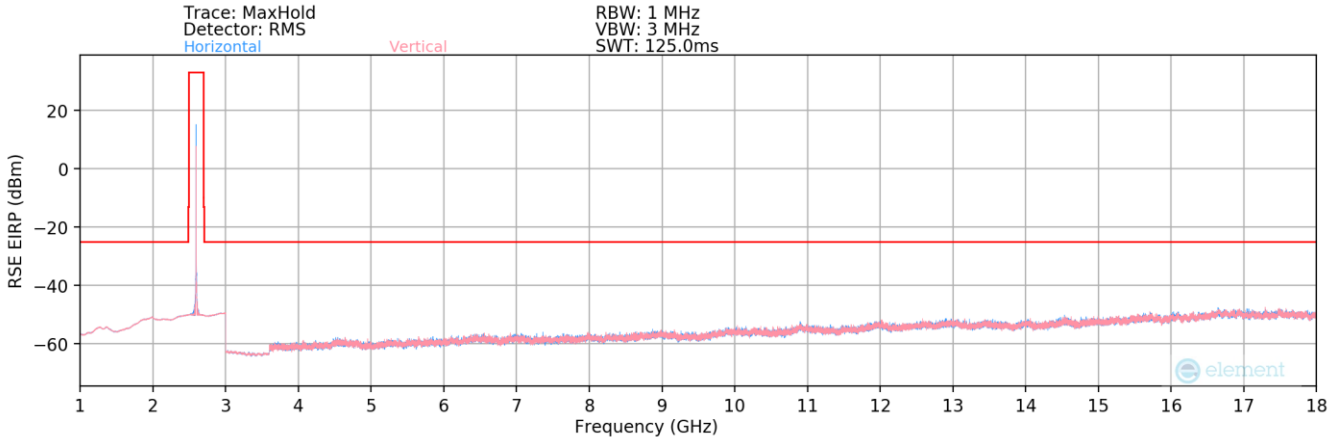
Table 7-4. Radiated Spurious Data (LTE Band 41(PC3) – Mid Channel – Ant B)



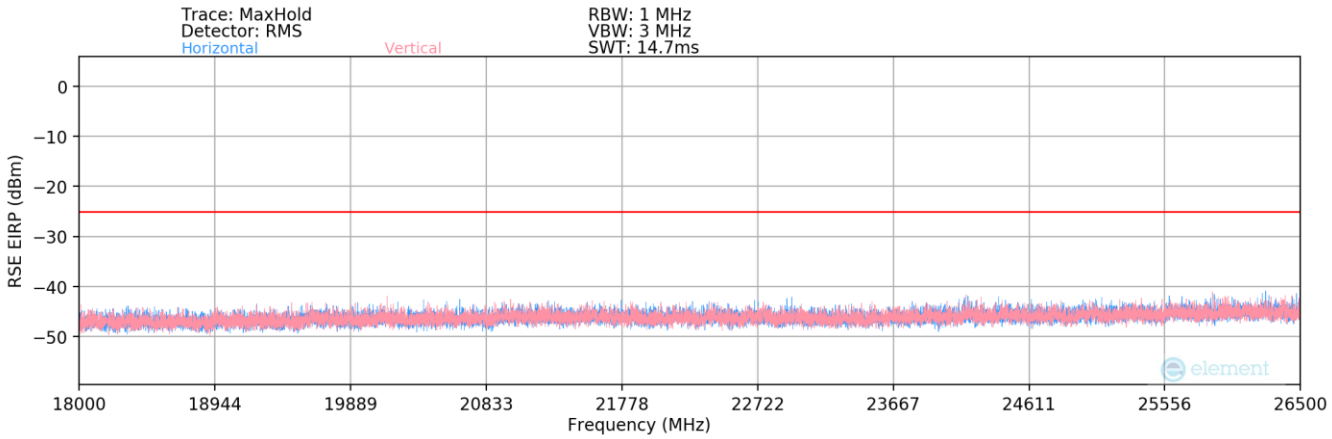
Plot 7-69. Radiated Spurious Plot (LTE Band 41(PC3) – Ant B) _OPEN



Plot 7-70. Radiated Spurious Plot (LTE Band 41(PC3) – Ant B) _HALF



Plot 7-71. Radiated Spurious Plot (LTE Band 41(PC3) – Ant B) _CLOSED



Plot 7-72. Radiated Spurious Plot (LTE Band 41(PC3) – Ant B)

Bandwidth (MHz):	20
Frequency (MHz):	2506.0
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]
5012.00	H	329	66	-74.81	4.32	36.51	-58.74	-25.00	-33.74
7518.00	H	128	314	-75.05	7.81	39.76	-55.50	-25.00	-30.50
10024.00	H	-	-	-76.25	10.39	41.14	-54.12	-25.00	-29.12
12530.00	H	-	-	-78.15	13.85	42.70	-52.56	-25.00	-27.56
15036.00	H	-	-	-78.56	15.63	44.07	-51.18	-25.00	-26.18
17542.00	H	-	-	-77.60	17.80	47.20	-48.06	-25.00	-23.06

Table 7-5. Radiated Spurious Data (LTE Band 41(PC3) – Low Channel – Ant B)

Bandwidth (MHz):	20
Frequency (MHz):	2593.0
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]
5186.00	H	332	56	-74.66	5.18	37.52	-57.74	-25.00	-32.74
7779.00	H	242	79	-74.62	7.47	39.85	-55.41	-25.00	-30.41
10372.00	H	-	-	-77.47	11.18	40.71	-54.54	-25.00	-29.54
12965.00	H	-	-	-77.47	14.27	43.80	-51.45	-25.00	-26.45
15558.00	H	-	-	-77.41	16.00	45.59	-49.67	-25.00	-24.67
18151.00	H	-	-	-52.29	1.74	56.46	-48.34	-25.00	-23.34

Table 7-6. Radiated Spurious Data (LTE Band 41(PC3) – Mid Channel – Ant B)

Bandwidth (MHz):	20
Frequency (MHz):	2680.0
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]
5360.00	H	136	72	-74.66	5.17	37.51	-57.75	-25.00	-32.75
8040.00	H	-	-	-76.83	8.11	38.28	-56.98	-25.00	-31.98
10720.00	H	-	-	-77.29	11.72	41.43	-53.83	-25.00	-28.83
13400.00	H	-	-	-78.25	14.19	42.94	-52.32	-25.00	-27.32
16080.00	H	-	-	-78.22	17.01	45.79	-49.47	-25.00	-24.47
18760.00	H	-	-	-51.88	2.06	57.18	-47.62	-25.00	-22.62

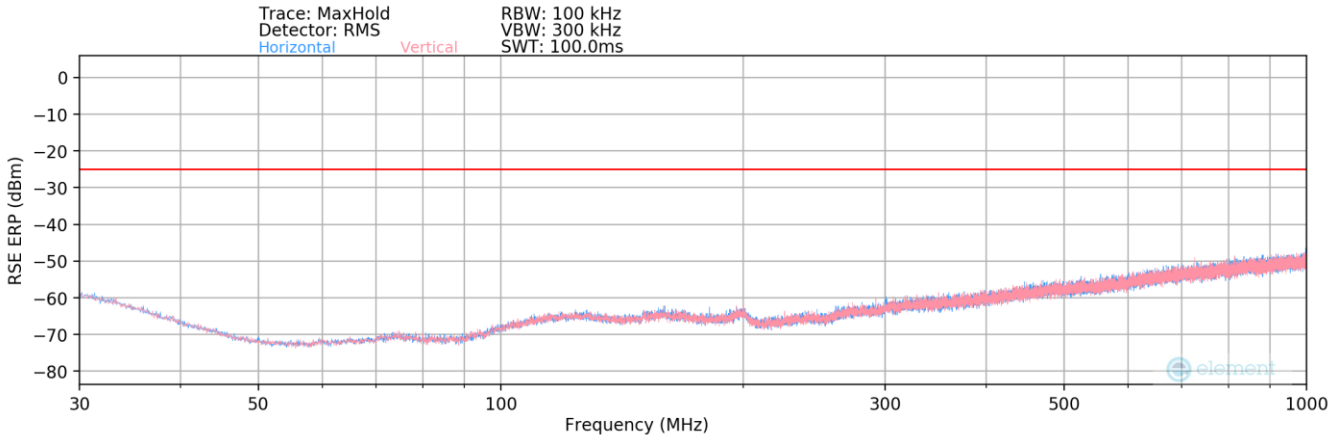
Table 7-7. Radiated Spurious Data (LTE Band 41(PC3) – High Channel – Ant B)

Case:	w/ Wireless Charging Pad
Bandwidth (MHz):	20
Frequency (MHz):	2593.0
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]
5186.00	H	-	-	-75.90	5.18	36.28	-58.98	-25.00	-33.98
7779.00	H	-	-	-76.04	7.47	38.43	-56.83	-25.00	-31.83
10372.00	H	-	-	-77.18	11.18	41.00	-54.25	-25.00	-29.25
12965.00	H	-	-	-78.09	14.27	43.18	-52.07	-25.00	-27.07
15558.00	H	-	-	-77.52	16.00	45.48	-49.78	-25.00	-24.78

Table 7-8. Radiated Spurious Data with WCP (LTE Band 41(PC3) – Ant B)

LTE Band 41(PC3) – Ant F

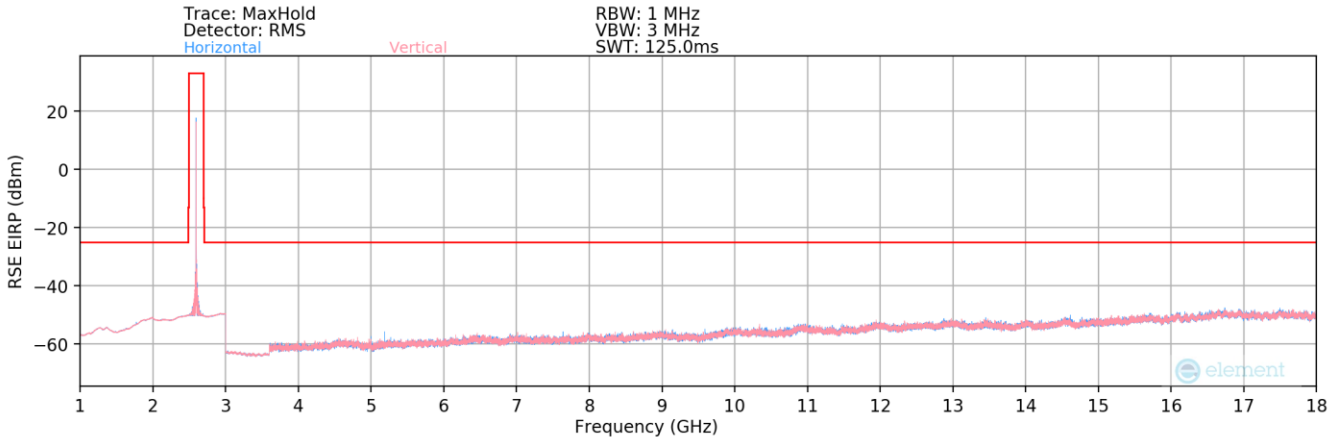


Plot 7-73. Radiated Spurious Plot (LTE Band 41(PC3) – Ant F)

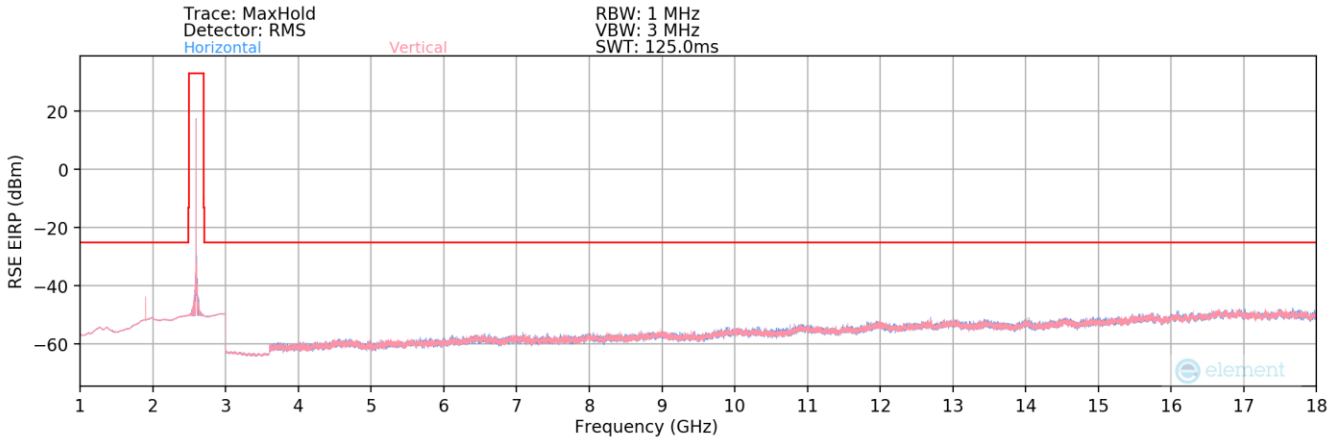
Bandwidth (MHz):	20
Frequency (MHz):	2593.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
188.66	H	-	-	-89.67	18.68	36.01	-61.39	-25.00	-36.39
710.62	H	-	-	-88.21	28.86	47.65	-49.75	-25.00	-24.75

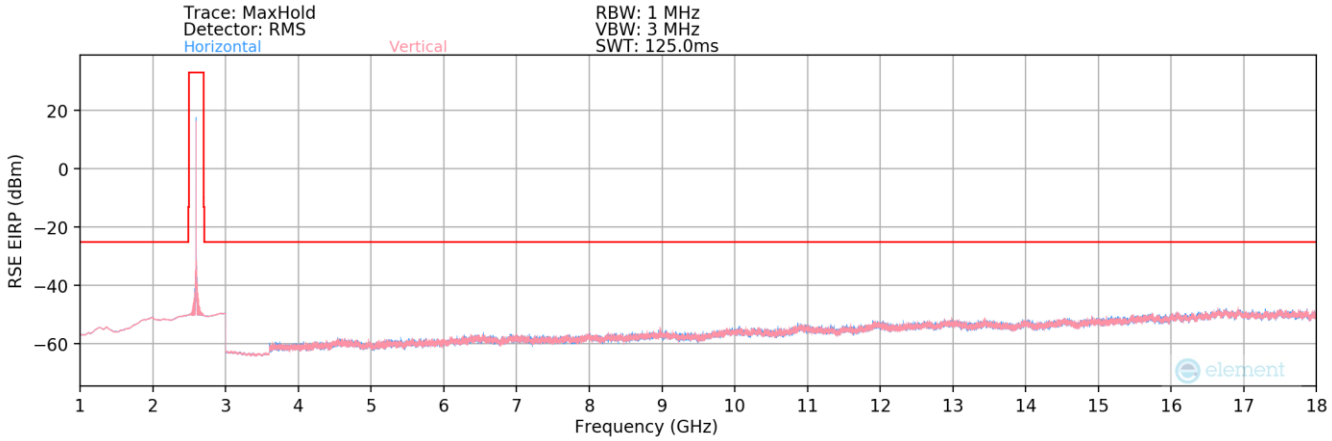
Table 7-9. Radiated Spurious Data (LTE Band 41(PC3) – Mid Channel – Ant F)



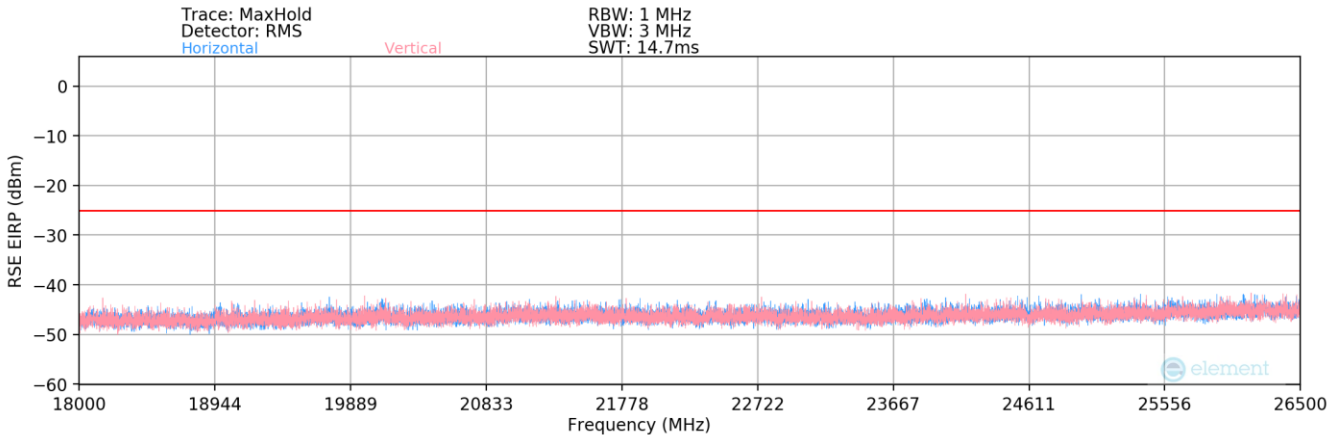
Plot 7-74. Radiated Spurious Plot (LTE Band 41(PC3) – Ant F) _CLOSED



Plot 7-75. Radiated Spurious Plot (LTE Band 41(PC3) – Ant F) _HALF



Plot 7-76. Radiated Spurious Plot (LTE Band 41(PC3) – Ant F) _ OPEN



Plot 7-77. Radiated Spurious Plot (LTE Band 41(PC3) – Ant F)

Bandwidth (MHz):	20
Frequency (MHz):	2510.0
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]
5020.00	H	314	306	-69.04	4.51	42.47	-52.78	-25.00	-27.78
7530.00	H	164	25	-75.46	7.87	39.41	-55.85	-25.00	-30.85
10040.00	H	-	-	-77.48	10.41	39.93	-55.33	-25.00	-30.33
12550.00	H	-	-	-78.22	14.06	42.84	-52.42	-25.00	-27.42
15060.00	H	-	-	-78.14	15.50	44.36	-50.90	-25.00	-25.90
17570.00	H	-	-	-77.57	17.55	46.98	-48.28	-25.00	-23.28

Table 7-10. Radiated Spurious Data (LTE Band 41(PC3) – Low Channel – Ant F)

Bandwidth (MHz):	20
Frequency (MHz):	2593.0
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]
5186.00	H	336	39	-69.86	5.18	42.32	-52.94	-25.00	-27.94
7779.00	H	169	350	-75.82	7.47	38.65	-56.61	-25.00	-31.61
10372.00	H	-	-	-77.69	11.18	40.49	-54.76	-25.00	-29.76
12965.00	H	-	-	-78.01	14.27	43.26	-51.99	-25.00	-26.99
15558.00	H	-	-	-77.85	16.00	45.15	-50.11	-25.00	-25.11
18151.00	H	-	-	-52.54	1.74	56.21	-48.59	-25.00	-23.59

Table 7-11. Radiated Spurious Data (LTE Band 41(PC3) – Mid Channel – Ant F)

Bandwidth (MHz):	20
Frequency (MHz):	2680.0
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]
5360.00	H	154	315	-72.06	5.17	40.11	-55.15	-25.00	-30.15
8040.00	H	-	-	-77.10	8.11	38.01	-57.25	-25.00	-32.25
10720.00	H	-	-	-77.37	11.72	41.35	-53.91	-25.00	-28.91
13400.00	H	-	-	-78.22	14.19	42.97	-52.29	-25.00	-27.29
16080.00	H	-	-	-78.03	17.01	45.98	-49.28	-25.00	-24.28

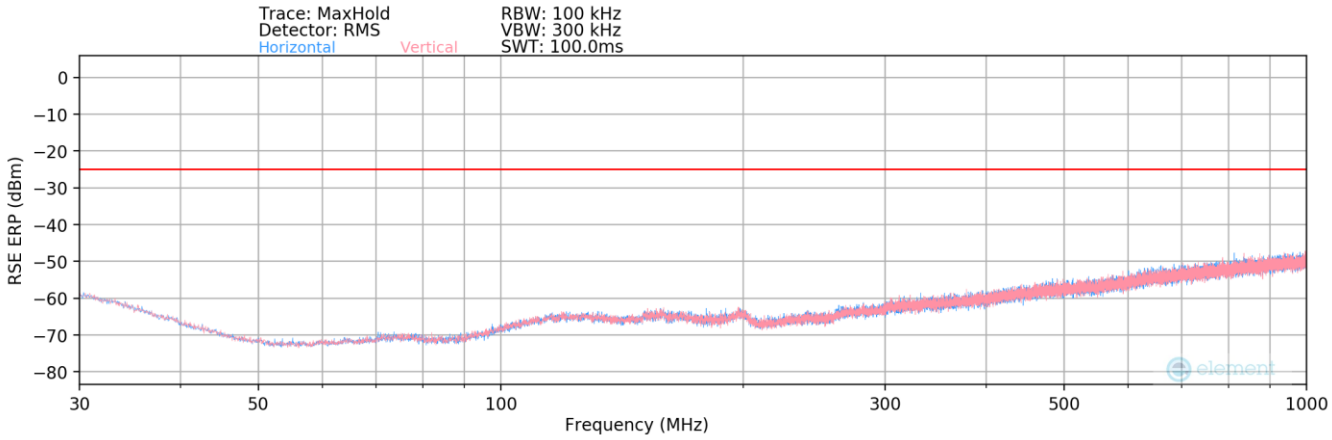
Table 7-12. Radiated Spurious Data (LTE Band 41(PC3) – High Channel – Ant F)

Case:	w/ Wireless Charging Pad
Bandwidth (MHz):	20
Frequency (MHz):	2510.0
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]
5020.00	H	187	340	-73.12	4.51	38.39	-56.86	-25.00	-31.86
7530.00	H	238	327	-76.13	7.87	38.74	-56.52	-25.00	-31.52
10040.00	H	-	-	-77.05	10.41	40.36	-54.90	-25.00	-29.90
12550.00	H	-	-	-78.46	14.06	42.60	-52.66	-25.00	-27.66
15060.00	H	-	-	-78.48	15.50	44.02	-51.24	-25.00	-26.24

Table 7-13. Radiated Spurious Data with WCP (LTE Band 41(PC3) – Ant F)

ULCA - LTE B41(PC3) – Ant B

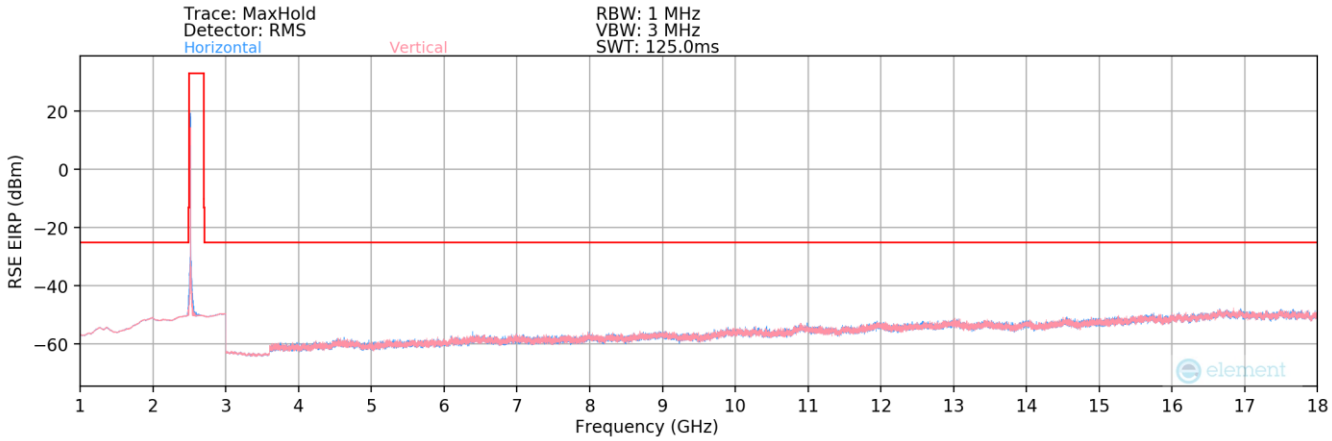


Plot 7-78. Radiated Spurious Plot (ULCA LTE B41(PC3) – Ant B)

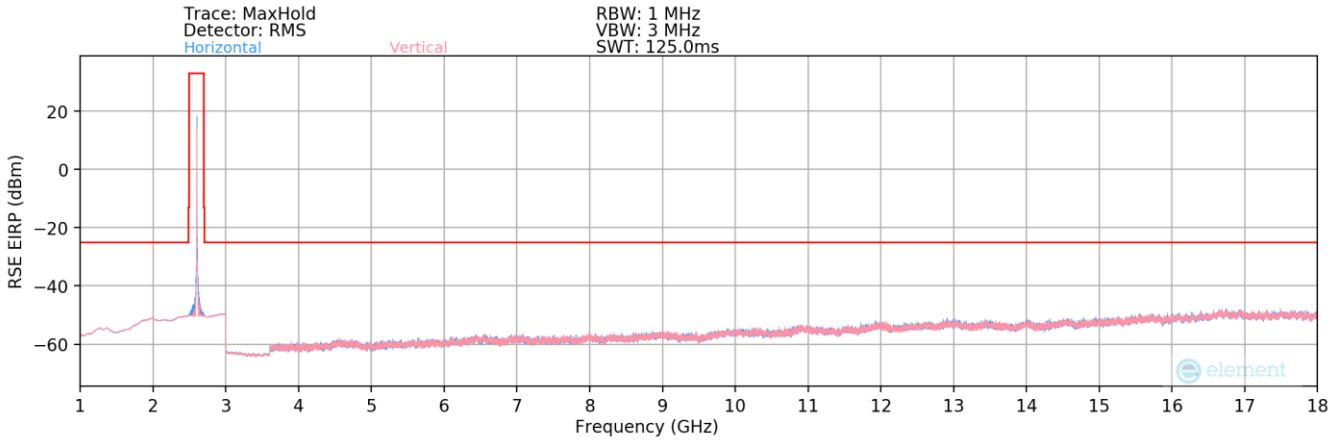
PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	2593.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	2612.8
SCC RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
336.76	H	-	-	-93.03	21.97	35.94	-61.47	-25.00	-36.47
773.82	H	-	-	-91.37	29.78	45.41	-52.00	-25.00	-27.00
806.50	H	-	-	-90.56	29.85	46.29	-51.12	-25.00	-26.12

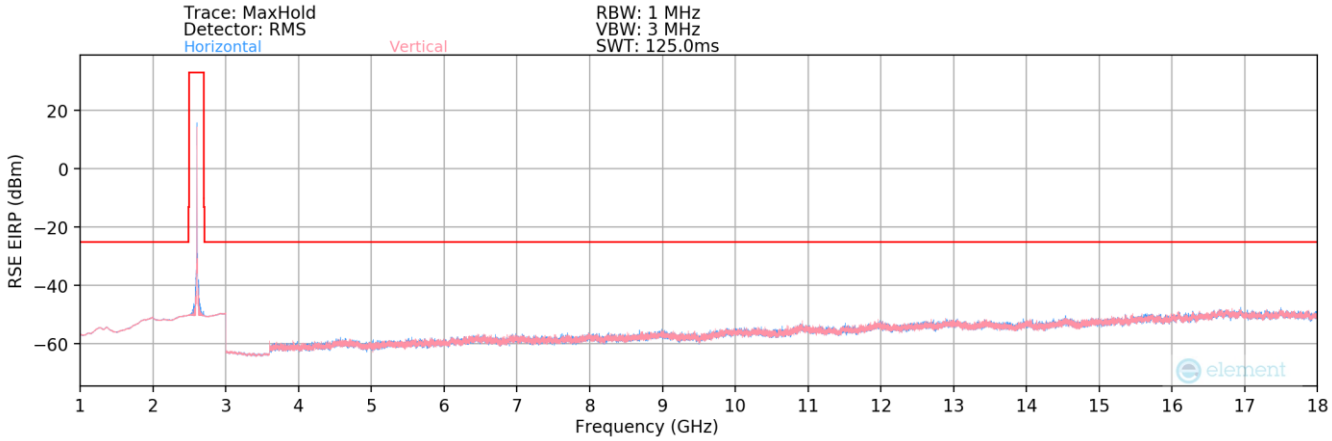
Table 7-14. Radiated Spurious Data (ULCA LTE B41(PC3) – Mid Channel – Ant B)



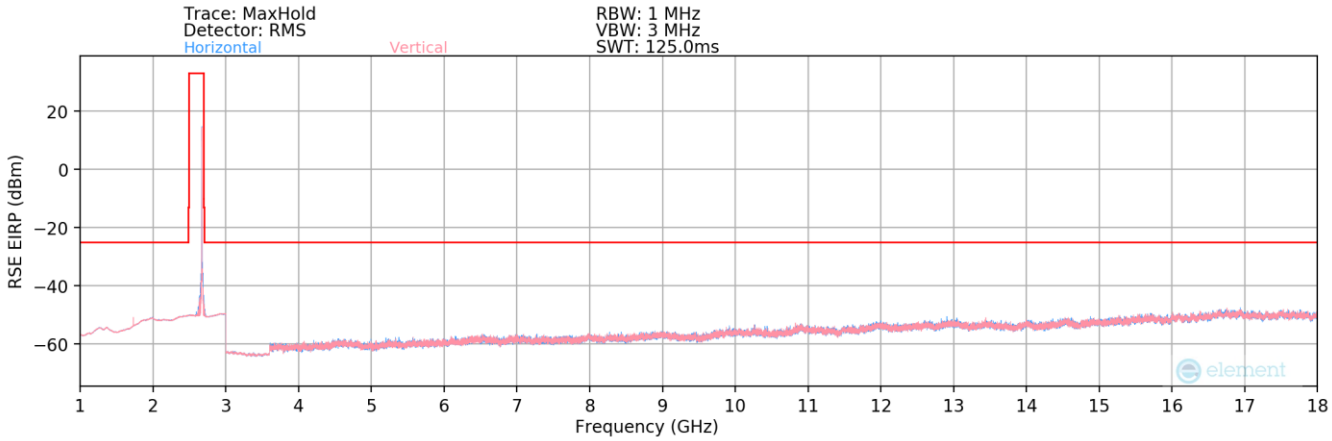
Plot 7-79. Radiated Spurious Plot (ULCA LTE B41(PC3) – Low Channel – Ant B) _OPEN



Plot 7-80. Radiated Spurious Plot (ULCA LTE B41(PC3) – Mid Channel – Ant B) _OPEN



Plot 7-81. Radiated Spurious Plot (ULCA LTE B41(PC3) – Mid Channel – Ant B) _HALF



Plot 7-82. Radiated Spurious Plot (ULCA LTE B41(PC3) – High Channel – Ant B) _OPEN

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	2506.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	2525.8
SCC RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5031.80	H	258	339	-75.42	4.46	36.04	-59.22	-25.00	-34.22
7547.70	H	204	68	-75.13	7.51	39.38	-55.87	-25.00	-30.87
10063.60	H	-	-	-76.96	10.59	40.63	-54.62	-25.00	-29.62
12579.50	H	-	-	-78.04	13.93	42.89	-52.37	-25.00	-27.37
15095.40	H	-	-	-78.65	15.23	43.58	-51.68	-25.00	-26.68

Table 7-15. Radiated Spurious Data (ULCA LTE B41(PC3) – Low Channel – Ant B)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	2593.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	2612.8
SCC RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5205.80	H	240	358	-74.96	5.09	37.13	-58.12	-25.00	-33.12
7808.70	H	244	43	-74.37	7.34	39.97	-55.29	-25.00	-30.29
10411.60	H	-	-	-78.07	11.33	40.26	-55.00	-25.00	-30.00
13014.50	H	-	-	-77.92	14.32	43.40	-51.86	-25.00	-26.86
15617.40	H	-	-	-77.96	15.84	44.88	-50.38	-25.00	-25.38
18220.30	H	-	-	-50.94	1.59	57.64	-47.16	-25.00	-22.16

Table 7-16. Radiated Spurious Data (ULCA LTE B41(PC3) – Mid Channel – Ant B)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	2680.0
PCC RB / Offset:	1 / 0
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	2660.2
SCC RB / Offset:	1 / 99

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5340.20	H	233	356	-73.96	4.74	37.78	-57.47	-25.00	-32.47
8010.30	H	185	77	-75.51	7.73	39.22	-56.04	-25.00	-31.04
10680.40	H	-	-	-78.03	11.75	40.72	-54.54	-25.00	-29.54
13350.50	H	-	-	-77.83	13.80	42.97	-52.28	-25.00	-27.28
16020.60	H	-	-	-77.84	16.51	45.67	-49.58	-25.00	-24.58

Table 7-17. Radiated Spurious Data (ULCA LTE B41(PC3) – High Channel – Ant B)

Case:	w/ Wireless Charging Pad
PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	2593.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	2612.8
SCC RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5205.80	H	167	344	-75.30	5.09	36.79	-58.46	-25.00	-33.46
7808.70	H	291	33	-76.59	7.34	37.75	-57.51	-25.00	-32.51
10411.60	H	-	-	-77.93	11.33	40.40	-54.86	-25.00	-29.86
13014.50	H	-	-	-77.90	14.32	43.42	-51.84	-25.00	-26.84
15617.40	H	-	-	-78.11	15.84	44.73	-50.53	-25.00	-25.53

Table 7-18. Radiated Spurious Data with WCP (ULCA LTE B41(PC3) – Ant B)

7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

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

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI C63.26-2015 – Section 5.6

Test Settings

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

Test Setup

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

Test Notes

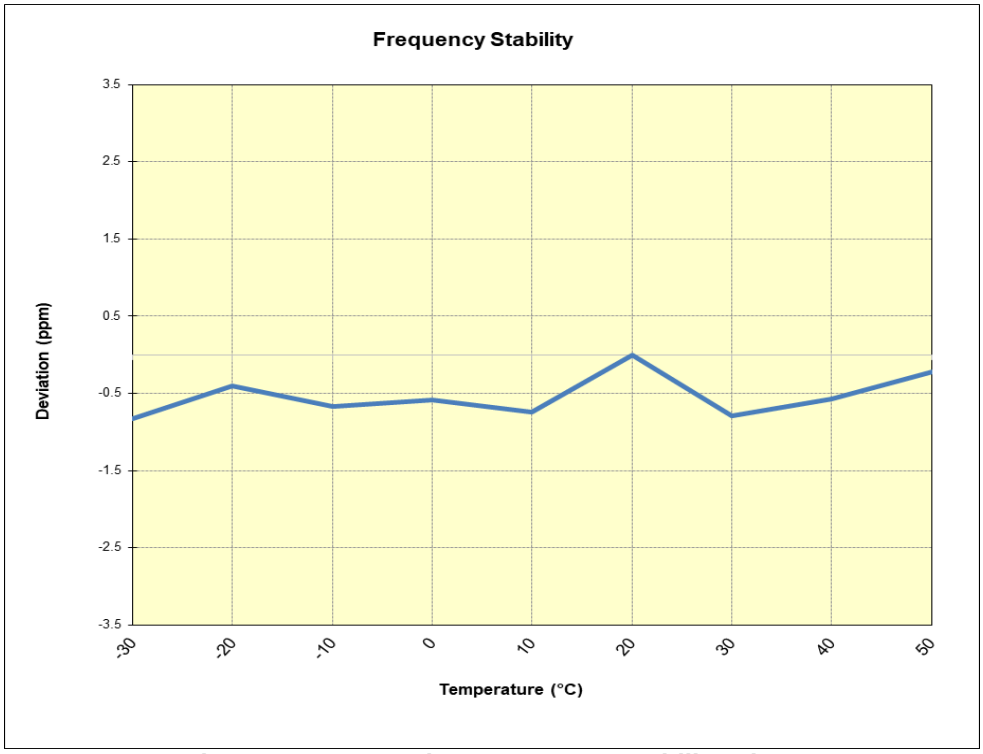
None

LTE Band 41

Operating Frequency (Hz):	2,593,000,000
Ref. Voltage (VDC):	4.38

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.38	- 30	2,593,000,420	-2,145	-0.0000827
		- 20	2,593,001,515	-1,050	-0.0000405
		- 10	2,593,000,823	-1,742	-0.0000672
		0	2,593,001,056	-1,510	-0.0000582
		+ 10	2,593,000,629	-1,936	-0.0000747
		+ 20 (Ref)	2,593,002,565	0	0.0000000
		+ 30	2,593,000,520	-2,046	-0.0000789
		+ 40	2,593,001,090	-1,476	-0.0000569
		+ 50	2,593,001,982	-584	-0.0000225
Battery Endpoint	3.35	+ 20	2,593,001,867	-698	-0.0000269

Table 7-19. LTE Band 41 Frequency Stability Data



Plot 7-83. LTE Band 41 Frequency Stability Chart

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMF936JPN** complies with all the requirements of Part 27 of the FCC rules.