

## PART 27 MEASUREMENT REPORT

**Applicant Name:**  
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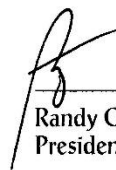
**Date of Testing:**  
11/15/2021 - 12/03/2021  
**Test Report Issue Date:**  
12/13/2021  
**Test Site/Location:**  
PCTEST Lab. Columbia, MD, USA  
**Test Report Serial No.:**  
1M2110010116-04.A3L

<b>FCC ID:</b>	<b>A3LSMS906E</b>
<b>APPLICANT:</b>	<b>Samsung Electronics Co., Ltd.</b>



**Application Type:** Certification  
**Model:** SM-S906E/DS  
**Additional Model(s):** SM-S906E  
**EUT Type:** Portable Handset  
**FCC Classification:** PCS Licensed Transmitter Held to Ear (PCE)  
**FCC Rule Part:** 27  
**Test Procedure(s):** ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01, 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.



  
Randy Ortanez  
President

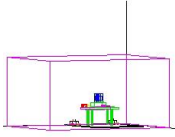


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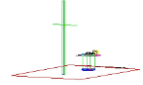
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## MEASUREMENT REPORT

### FCC Part 27





Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n66 (Ant1)	20 MHz	$\pi/2$ BPSK	1720.0 - 1770.0	0.267	24.27	18M0G7D
		QPSK	1720.0 - 1770.0	0.270	24.31	19M0G7D
		16QAM	1720.0 - 1770.0	0.222	23.47	19M0W7D
	15 MHz	$\pi/2$ BPSK	1717.5 - 1772.5	0.242	23.84	13M5G7D
		QPSK	1717.5 - 1772.5	0.259	24.13	14M1G7D
		16QAM	1717.5 - 1772.5	0.246	23.91	14M2W7D
	10 MHz	$\pi/2$ BPSK	1715.0 - 1775.0	0.238	23.77	9M01G7D
		QPSK	1715.0 - 1775.0	0.241	23.83	9M35G7D
		16QAM	1715.0 - 1775.0	0.224	23.51	9M35W7D
	5 MHz	$\pi/2$ BPSK	1712.5 - 1777.5	0.240	23.81	4M52G7D
		QPSK	1712.5 - 1777.5	0.253	24.03	4M53G7D
		16QAM	1712.5 - 1777.5	0.243	23.86	4M50W7D

**Overview Table (NR Band n66 (Ant1))**

Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP	
				Max. Power [W]	Max. Power [dBm]
NR Band n66 (Ant6)	20 MHz	$\pi/2$ BPSK	1720.0 - 1770.0	0.121	20.81
		QPSK	1720.0 - 1770.0	0.117	20.69
		16QAM	1720.0 - 1770.0	0.111	20.45
	15 MHz	$\pi/2$ BPSK	1717.5 - 1772.5	0.118	20.73
		QPSK	1717.5 - 1772.5	0.123	20.89
		16QAM	1717.5 - 1772.5	0.109	20.37
	10 MHz	$\pi/2$ BPSK	1715.0 - 1775.0	0.117	20.67
		QPSK	1715.0 - 1775.0	0.113	20.53
		16QAM	1715.0 - 1775.0	0.106	20.24
	5 MHz	$\pi/2$ BPSK	1712.5 - 1777.5	0.116	20.66
		QPSK	1712.5 - 1777.5	0.112	20.49
		16QAM	1712.5 - 1777.5	0.108	20.33

**Overview Table (NR Band n66 (Ant6))**

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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 Engineering Laboratory, Inc. 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 ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMS906E**. 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.:** 3715R, 3723R, 3892R

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (FR1), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5 & 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, UWB



### 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.

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.

### 2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

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## 3.0 DESCRIPTION OF TESTS

### 3.1 Evaluation Procedure

The measurement procedures described in the document titled “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-E-2016) and “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

### 3.2 Radiated Power and Radiated Spurious Emissions

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

The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer “Channel Power” function with the integration band set to the emissions’ occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v03r01.



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

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

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  $P_g [\text{dBm}] - \text{cable loss} [\text{dB}]$ .

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



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

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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). Measurement 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	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	AP2
-	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
-	LTx1	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx1
-	LTx2	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx2
Agilent	N9030A	50GHz PXA Signal Analyzer	1/20/2021	Annual	1/20/2022	US51350301
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6201381794
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Annual	8/27/2022	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/20/2021	Biennial	4/20/2023	00125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
Keysight Technologies	N9020A	MXA Signal Analyzer	12/22/2020	Annual	12/22/2021	MY54500644
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/21/2022	MY49430494
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/3/2021	Annual	8/3/2022	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	4/30/2021	Annual	4/30/2022	100348
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	1/21/2021	Annual	1/21/2022	101716
Rohde & Schwarz	FSW26	2Hz-26.5GHz Signal and Spectrum Analyzer	2/10/2021	Annual	2/10/2022	103187
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.

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## 6.0 SAMPLE CALCULATIONS

### Emission Designator

#### QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

#### QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated



7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

### Spurious Radiated Emission – LTE Band

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

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was  $-81.0$  dBm. The gain of the substituted antenna is  $8.1$  dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of  $-81.0$  dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is  $2.0$  dB at  $1564$  MHz. So,  $6.1$  dB is added to the signal generator reading of  $-30.9$  dBm yielding  $-24.80$  dBm. The fundamental EIRP was  $25.501$  dBm so this harmonic was  $25.501$  dBm  $- (-24.80) = 50.3$  dBc.

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## 7.0 TEST RESULTS

### 7.1 Summary



Company Name: Samsung Electronics Co., Ltd.  
 FCC ID: A3LSMS906E  
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)  
 Mode(s): LTE/NR/UL-CA

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
<b>CONDUCTED</b>	Transmitter Conducted Output Power	2.1046	N/A	PASS	See RF Exposure Report
	ULCA Conducted Output Power	2.1046	N/A	PASS	Section 7.2
	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3
	Conducted Band Edge / Spurious Emissions (NR Band n66)	2.1051, 27.53(h)	$\geq 43 + 10 \log (P[\text{Watts}])$ dB of attenuation below transmitter power	PASS	Sections 7.4, 7.5
	Peak-to-Average Ratio (NR Band n66)	27.50(d)(5)	$\leq 13$ dB	PASS	Section 7.6
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block	PASS	Section 7.9
<b>RADIATED</b>	Equivalent Isotropic Radiated Power (NR Band n66)	27.50(d)(10)	$\leq 1$ Watt max. EIRP	PASS	Section 7.7
	Radiated Spurious Emissions (NR Band n66)	2.1053, 27.53(h)	$\geq 43 + 10 \log (P[\text{Watts}])$ dB of attenuation below transmitter power	PASS	Section 7.8

**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 shown in Section 7.0 were taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST EMC Software Tool v1.0.

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## 7.2 ULCA Conducted Output Power

### §2.1046

#### Test Overview

The EUT is set up to transmit at maximum power for LTE. All power levels 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.

#### Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

#### Test Settings

1. Span = 2 x OBW to 3 x OBW
2. RBW = 1% to 5% of the OBW
3. Number of measurement points in sweep  $\geq 2 \times \text{span} / \text{RBW}$
4. Sweep = auto-couple (less than transmission burst duration)
5. Detector = RMS (power)
6. Trigger was set to enable power measurements only on full power bursts
7. Trace was allowed to stabilize
8. Spectrum analyzer's "Channel Power" function was used to compute the power by integrating the spectrum across the OBW of the signal

#### Test Setup

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

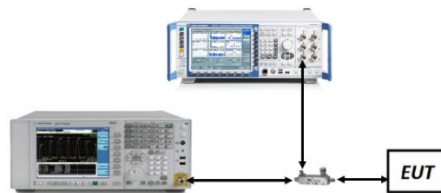




Figure 7-1. Test Instrument & Measurement Setup



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PCC					SCC					PCC Conducted Power [dBm]	SCC Conducted Power [dBm]	Inter-Band ULCA Total Tx. Power (dBm)
PCC Band	PCC Bandwidth [MHz]	PCC (UL) channel	Mod.	PCC UL RB#/Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) channel	Mod.	SCC UL RB#/Offset			
B12	10	Low	QPSK	50 / 0	B66	20	Low	QPSK	100 / 0	22.56	22.23	25.41
			QPSK	1 / 0				23.16	22.56	25.88		
			QPSK	1 / 25				23.18	22.85	26.03		
			QPSK	1 / 49				23.27	22.48	25.9		
			16Q	1 / 49				22.66	22.09	25.39		
			16Q	1 / 50				22.66	22.09	25.39		
		Mid	QPSK	50 / 0			QPSK	100 / 0	23.07	22.21	25.67	
			QPSK	1 / 0			QPSK	1 / 0	23.65	22.59	26.16	
			QPSK	1 / 25			QPSK	1 / 50	23.74	22.87	26.34	
			QPSK	1 / 49			QPSK	1 / 99	23.67	22.56	26.16	
			16Q	1 / 25			16Q	1 / 50	23.37	22.45	25.94	
			16Q	1 / 50			16Q	1 / 50	23.37	22.45	25.94	
		High	QPSK	50 / 0			QPSK	100 / 0	22.96	22.40	25.7	
			QPSK	1 / 0			QPSK	1 / 0	23.56	22.69	26.16	
			QPSK	1 / 25			QPSK	1 / 50	23.26	22.72	26.01	
			QPSK	1 / 49			QPSK	1 / 99	23.87	22.78	26.37	
			16Q	1 / 49			16Q	1 / 99	23.07	21.56	25.39	
			16Q	1 / 50			16Q	1 / 99	23.07	21.56	25.39	

Table 7-2. Conducted Power Output Data (ULCA LTE Band 12 – Band 66)

PCC					SCC					PCC Conducted Power [dBm]	SCC Conducted Power [dBm]	Inter-Band ULCA Total Tx. Power (dBm)
PCC Band	PCC Bandwidth [MHz]	PCC (UL) channel	Mod.	PCC UL RB#/Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) channel	Mod.	SCC UL RB#/Offset			
B2	20	Low	QPSK	100 / 0	B4	20	Low	QPSK	100 / 0	22.39	21.26	24.87
			QPSK	1 / 0				23.50	21.10	25.47		
			QPSK	1 / 50				23.45	21.65	25.65		
			QPSK	1 / 99				23.43	21.26	25.49		
			16Q	1 / 50				23.10	22.10	25.64		
			16Q	1 / 50				23.10	22.10	25.64		
		Mid	QPSK	100 / 0			QPSK	100 / 0	22.26	21.04	24.7	
			QPSK	1 / 0			QPSK	1 / 0	23.38	18.88	24.7	
			QPSK	1 / 50			QPSK	1 / 50	23.29	19.67	24.86	
			QPSK	1 / 99			QPSK	1 / 99	23.15	19.58	24.73	
			16Q	1 / 50			16Q	1 / 50	22.79	21.66	25.27	
			16Q	1 / 50			16Q	1 / 50	22.79	21.66	25.27	
		High	QPSK	100 / 0			QPSK	100 / 0	22.43	21.17	24.86	
			QPSK	1 / 0			QPSK	1 / 0	23.48	21.11	25.47	
			QPSK	1 / 50			QPSK	1 / 50	23.56	21.32	25.59	
			QPSK	1 / 99			QPSK	1 / 99	23.51	21.08	25.47	
			16Q	1 / 50			16Q	1 / 50	22.79	22.34	25.58	
			16Q	1 / 50			16Q	1 / 50	22.79	22.34	25.58	

Table 7-3. Conducted Power Output Data (ULCA LTE Band 4 – Band 2)

FCC ID: A3LSMS906E		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset	Page 12 of 64	

## 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

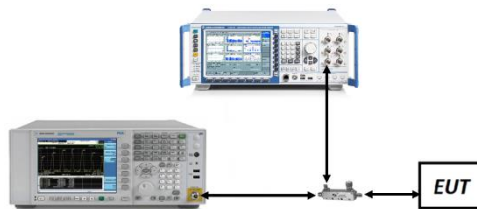
KDB 971168 D01 v03r01 – Section 4.2

### 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 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.



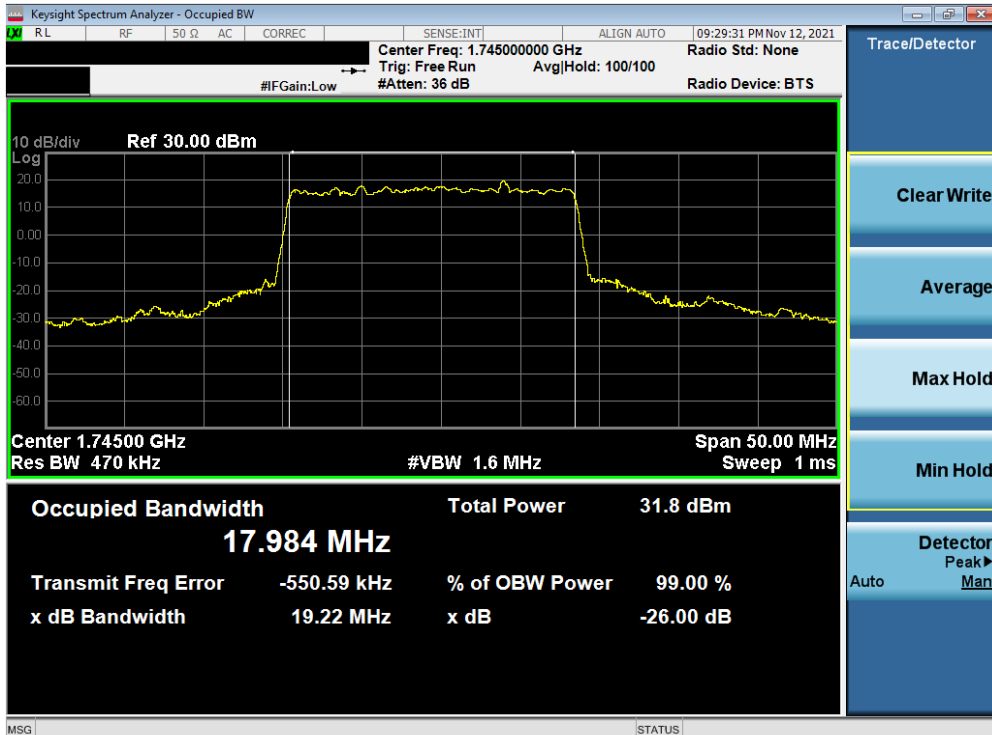
**Figure 7-2. Test Instrument & Measurement Setup**

### Test Notes

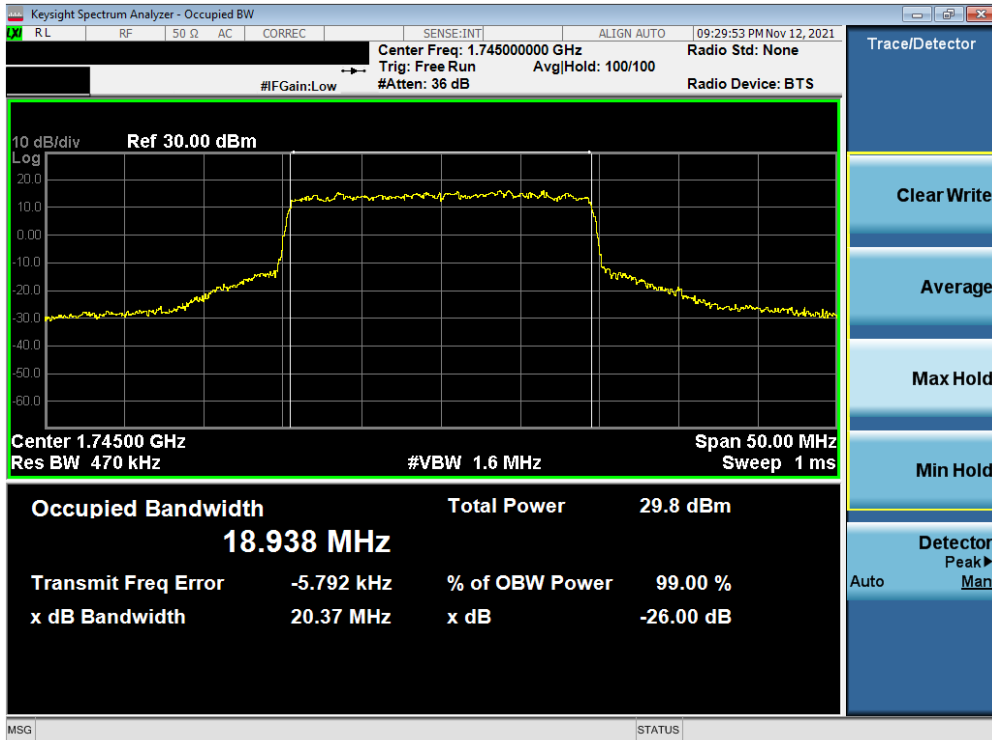
None.

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2110010116-04.A3L	<b>Test Dates:</b> 11/15/2021 - 12/03/2021	<b>EUT Type:</b> Portable Handset	Page 13 of 64	

# NR Band n66 – ANT1

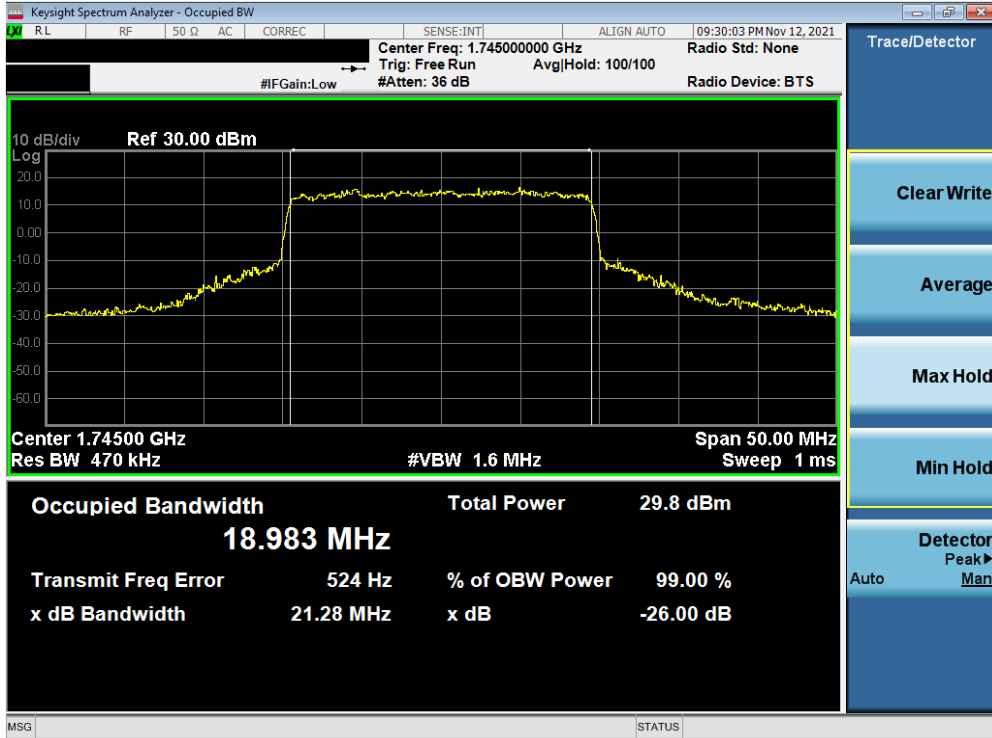


Plot 7-1. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz DFT's-OFDM BPSK - Full RB – ANT1)

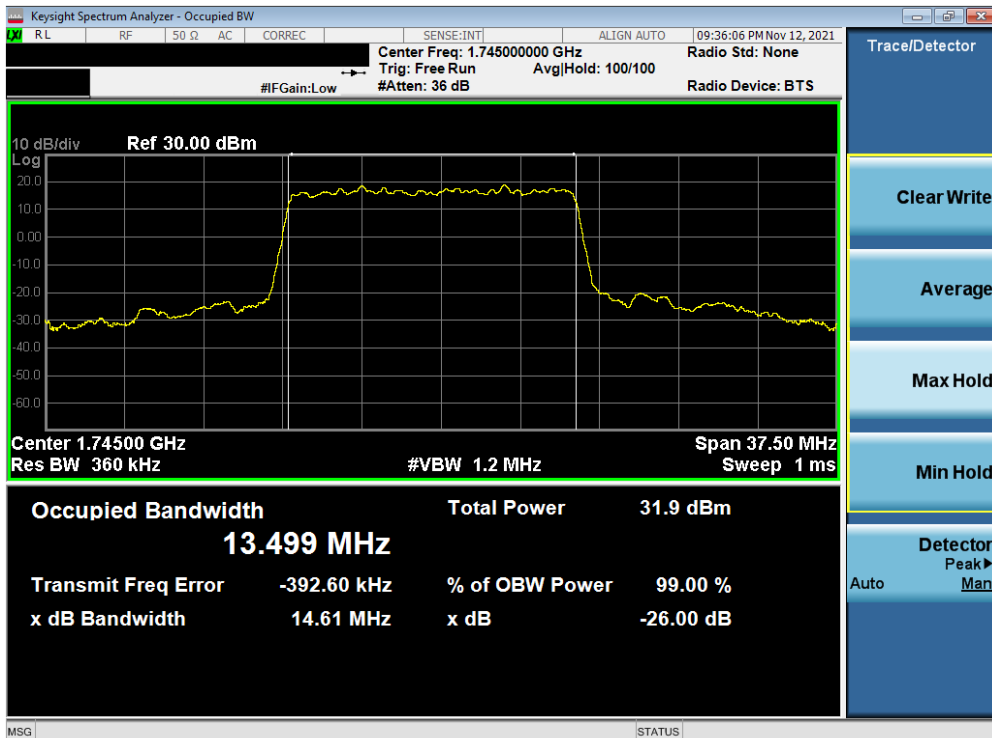


Plot 7-2. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM QPSK - Full RB – ANT1)

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 14 of 64

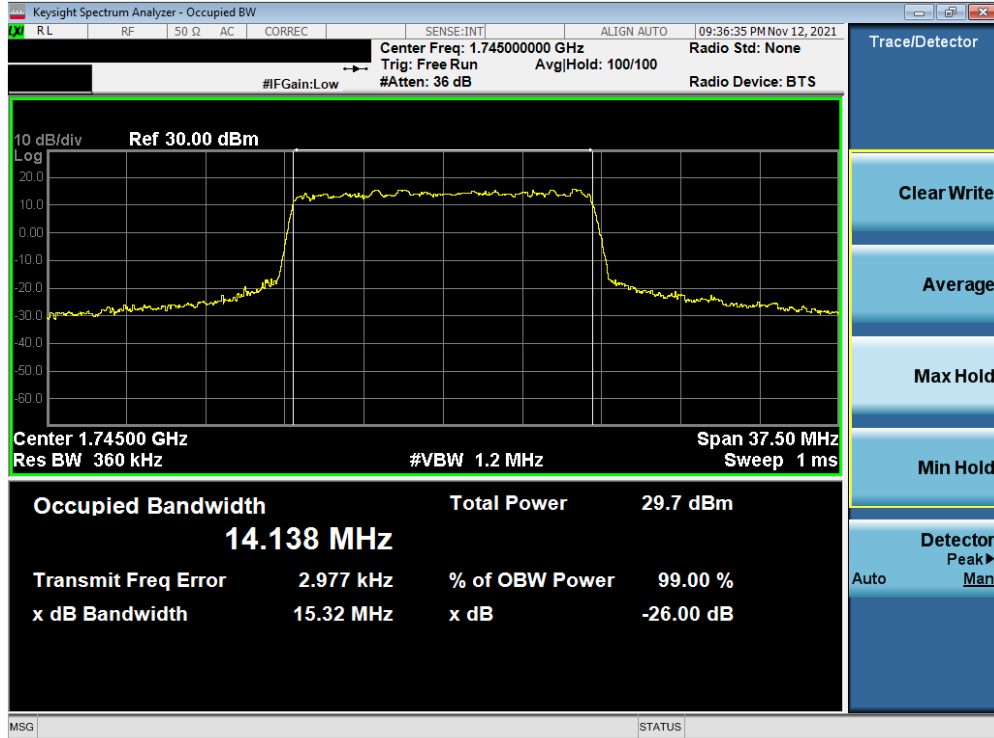


Plot 7-3. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM 16QAM - Full RB - ANT1)

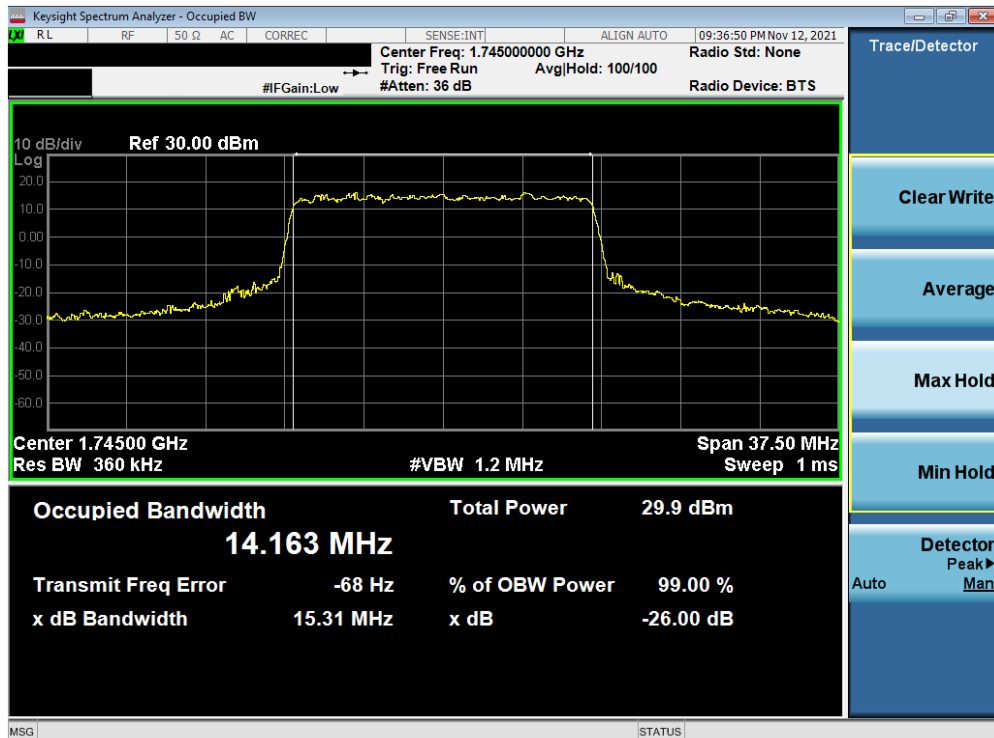


Plot 7-4. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz DFT-s-OFDM BPSK - Full RB - ANT1)



FCC ID: A3LSMS906E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 15 of 64



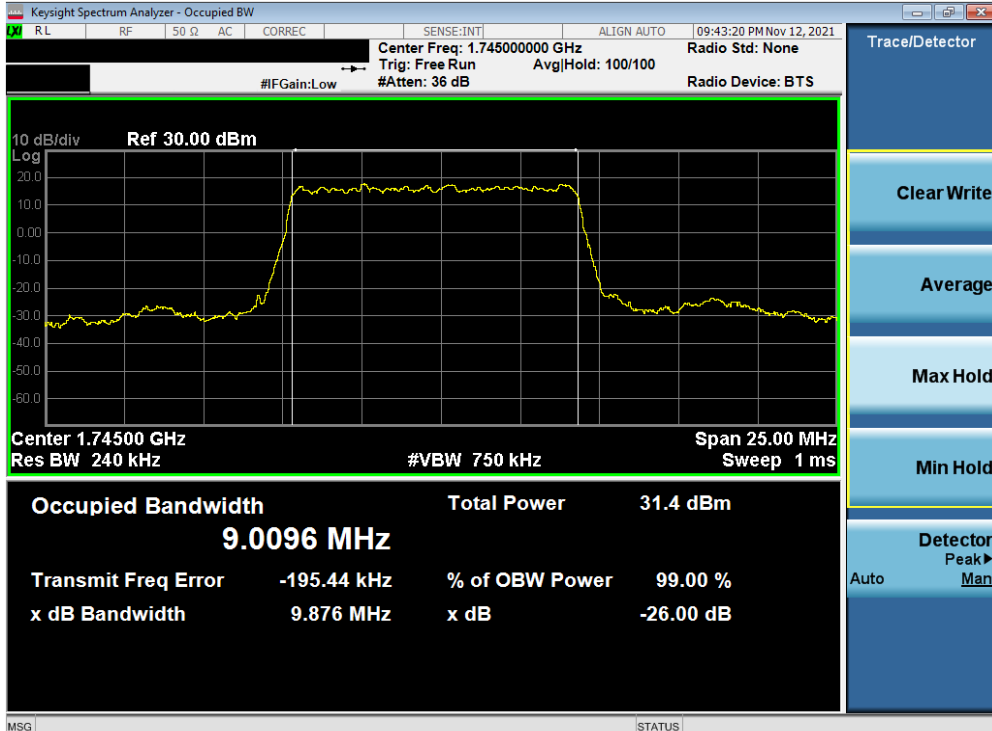
Plot 7-5. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM QPSK - Full RB - ANT1)



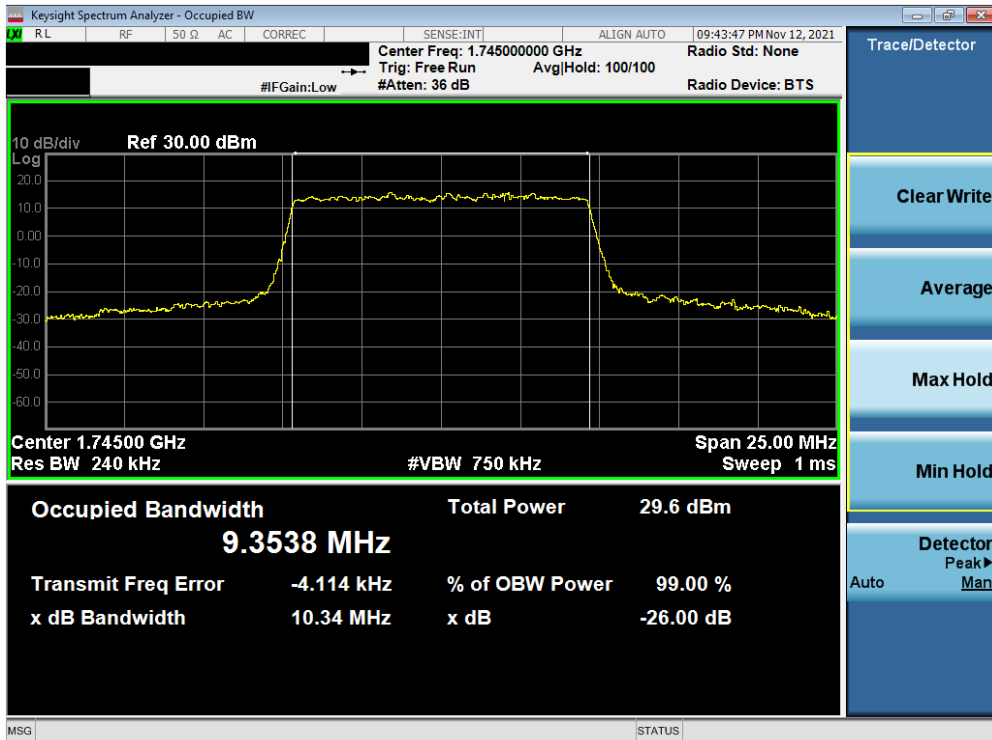
Plot 7-6. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM 16QAM - Full RB - ANT1)

FCC ID: A3LSMS906E		<b>PART 27 MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 16 of 64



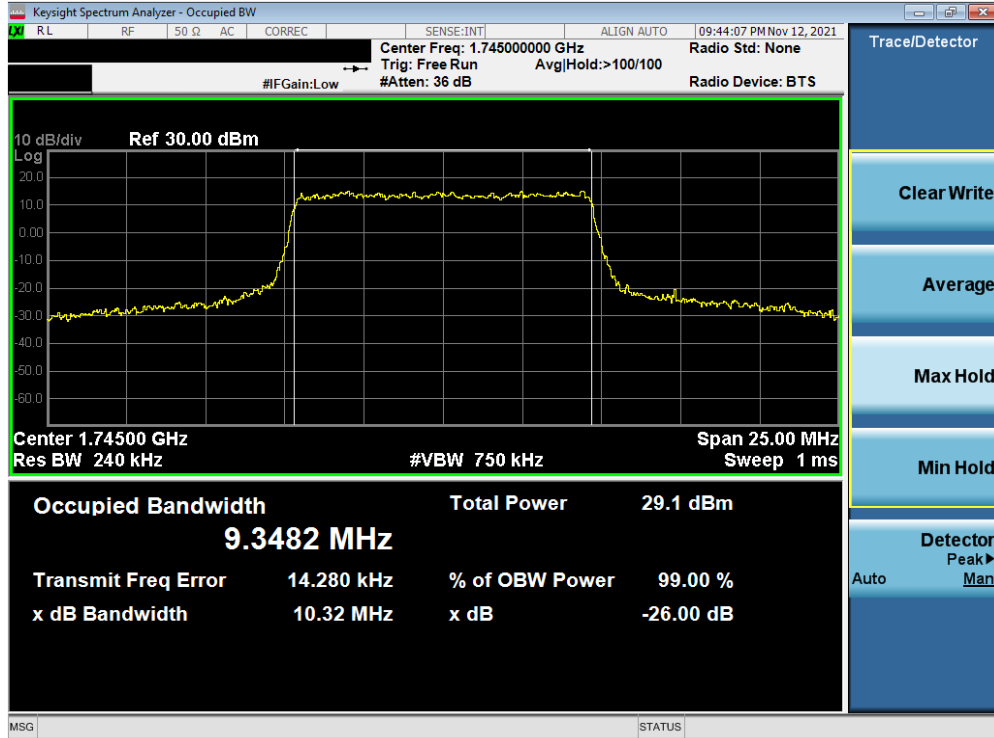


Plot 7-7. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz DFT-s-OFDM BPSK - Full RB - ANT1)

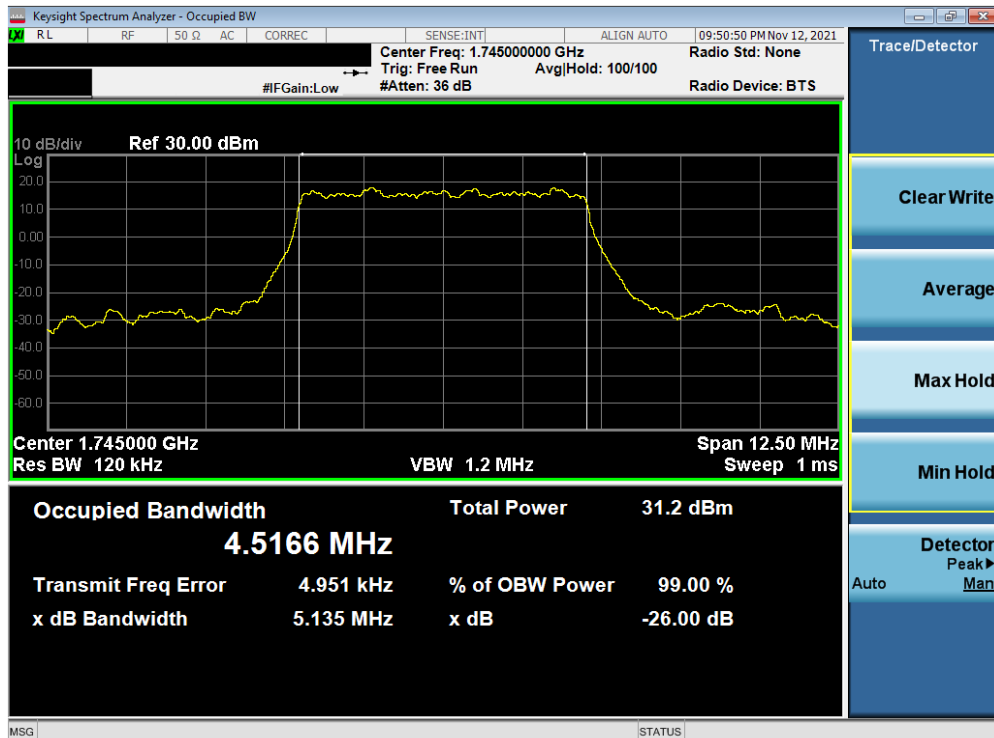


Plot 7-8. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM QPSK - Full RB - ANT1)

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 17 of 64

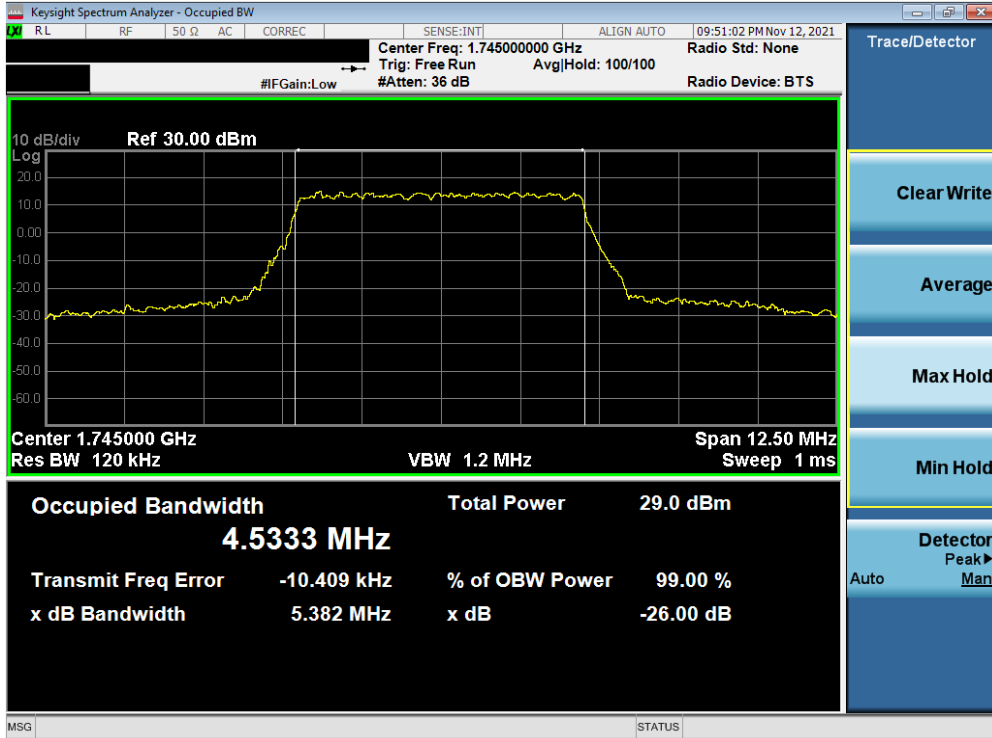


Plot 7-9. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM 16QAM - Full RB – ANT1)

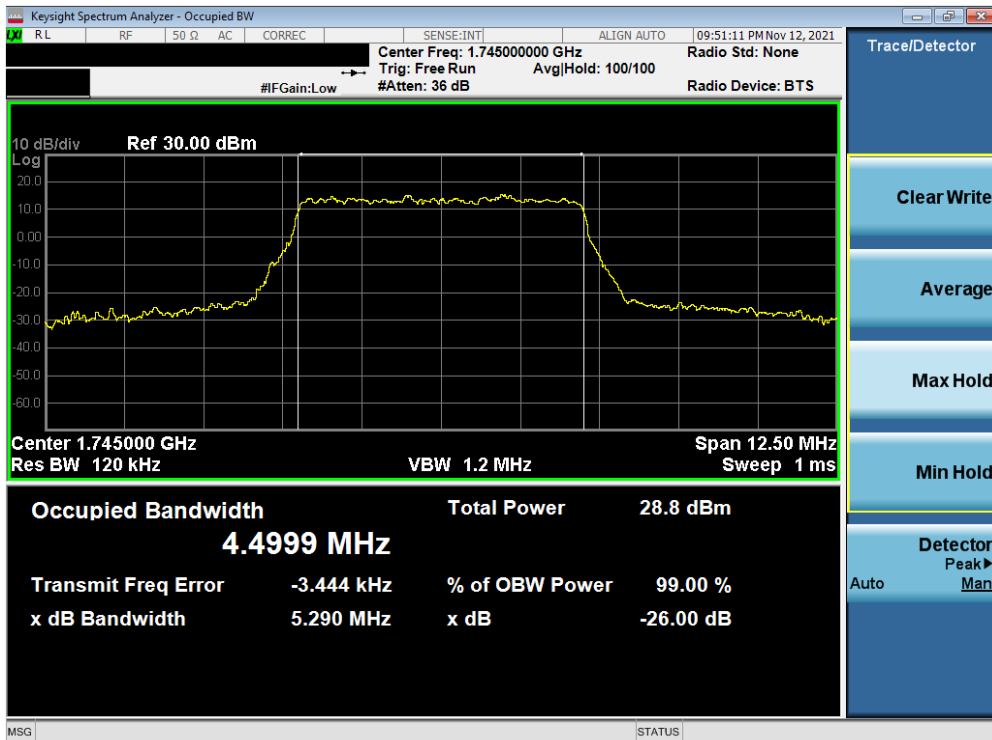


Plot 7-10. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz DFT-s-OFDM BPSK - Full RB – ANT1)

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 18 of 64



Plot 7-11. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM QPSK - Full RB - ANT1)



Plot 7-12. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM 16QAM - Full RB - ANT1)

FCC ID: A3LSMS906E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 19 of 64

## 7.4 Spurious and Harmonic Emissions at Antenna Terminal

### Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

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

### Test Procedure Used

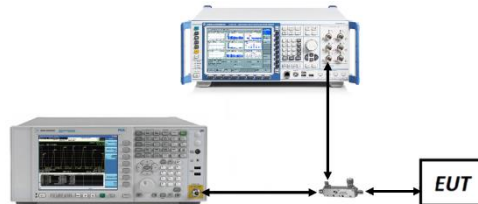
KDB 971168 D01 v03r01 – Section 6.0

### Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 18GHz (separated into at least two plots per channel)
2. RBW  $\geq$  100kHz
3. VBW  $\geq$  3 x RBW
4. Detector = RMS
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

### Test Setup



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



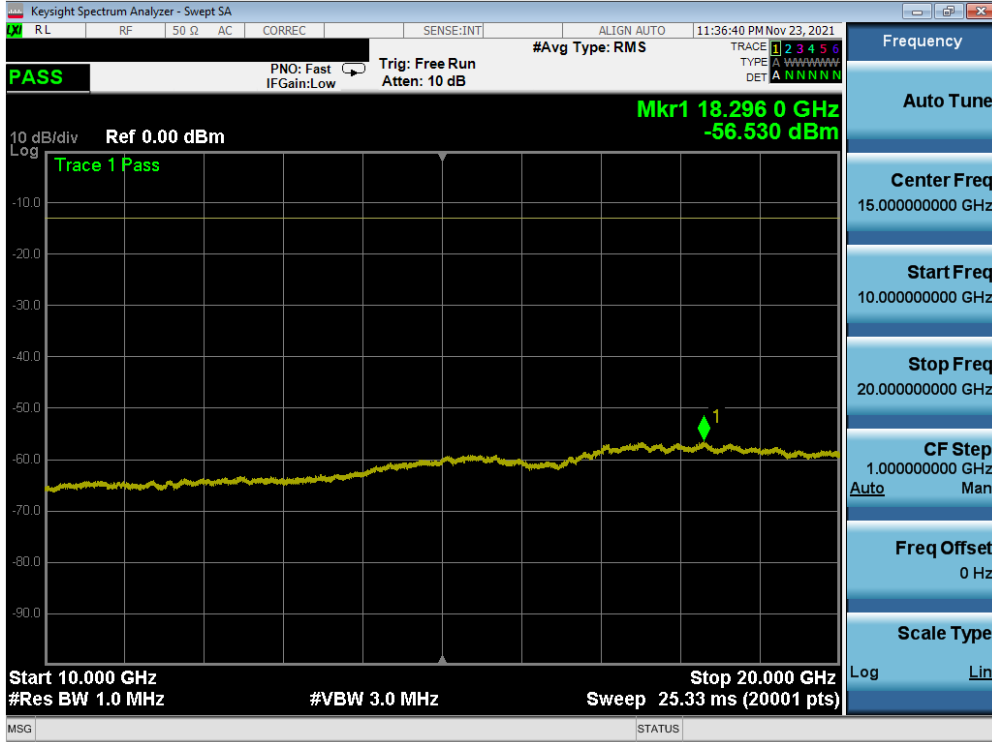
**Figure 7-3. Test Instrument & Measurement Setup**

### Test Notes

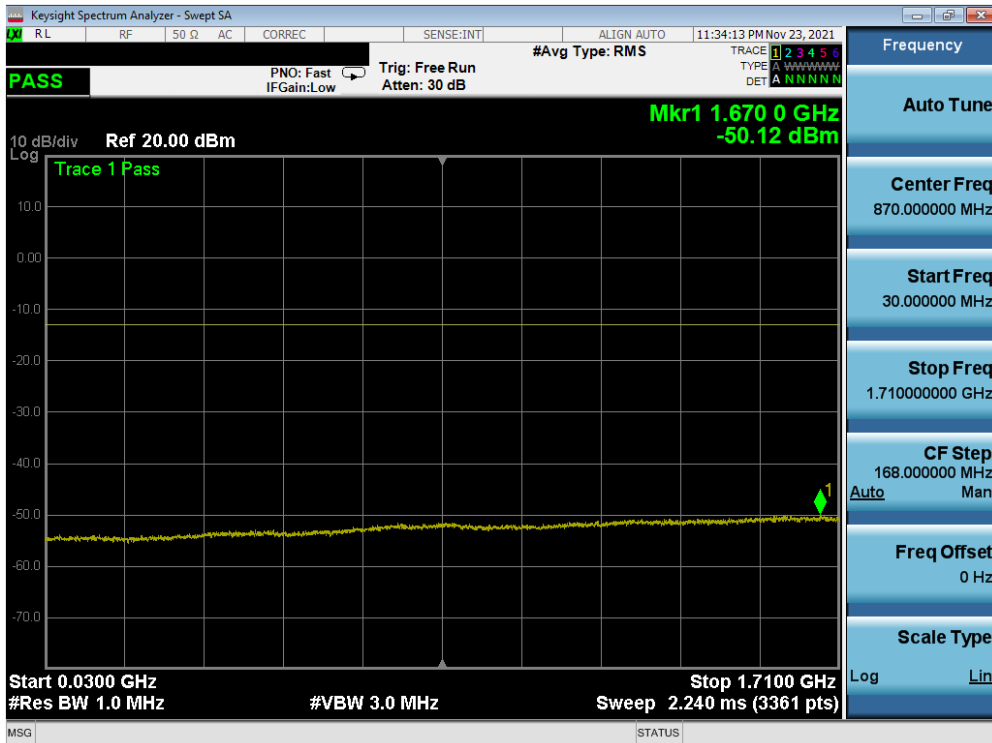
1. Per Part 27 and RSS-139, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz and a resolution bandwidth of 1MHz for measurements above 1GHz.
2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

FCC ID: A3LSMS906E	 <b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2110010116-04.A3L	<b>Test Dates:</b> 11/15/2021 - 12/03/2021	<b>EUT Type:</b> Portable Handset	Page 20 of 64	



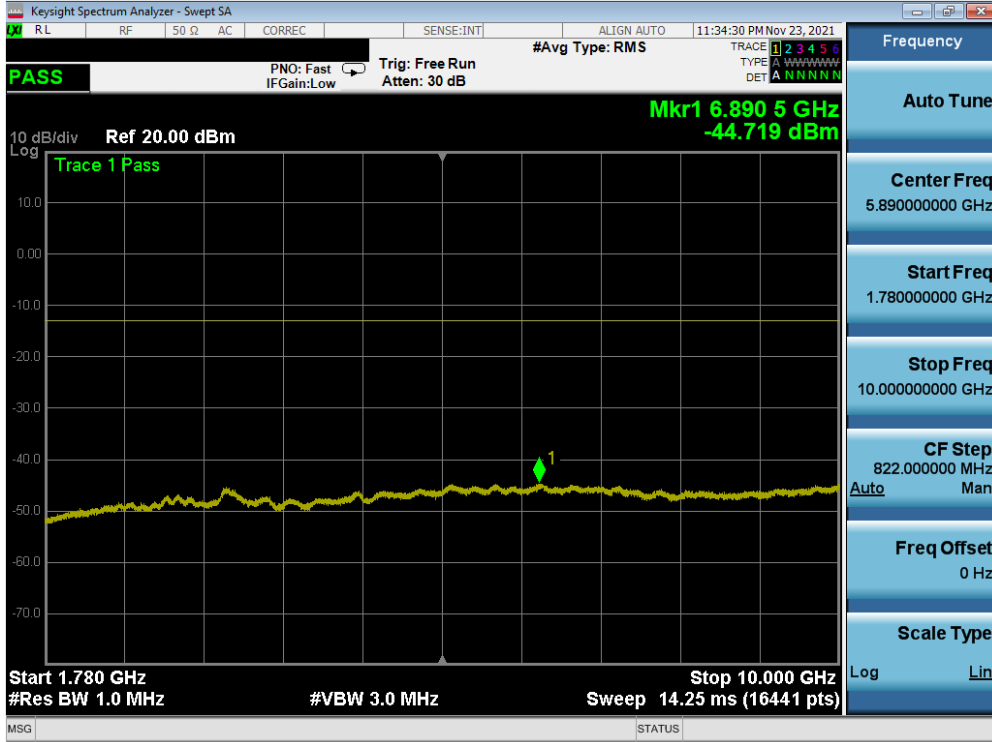


Plot 7-15. Conducted Spurious Plot (NR Band n66 - 20MHz - 1 RB - Low Channel – ANT1)

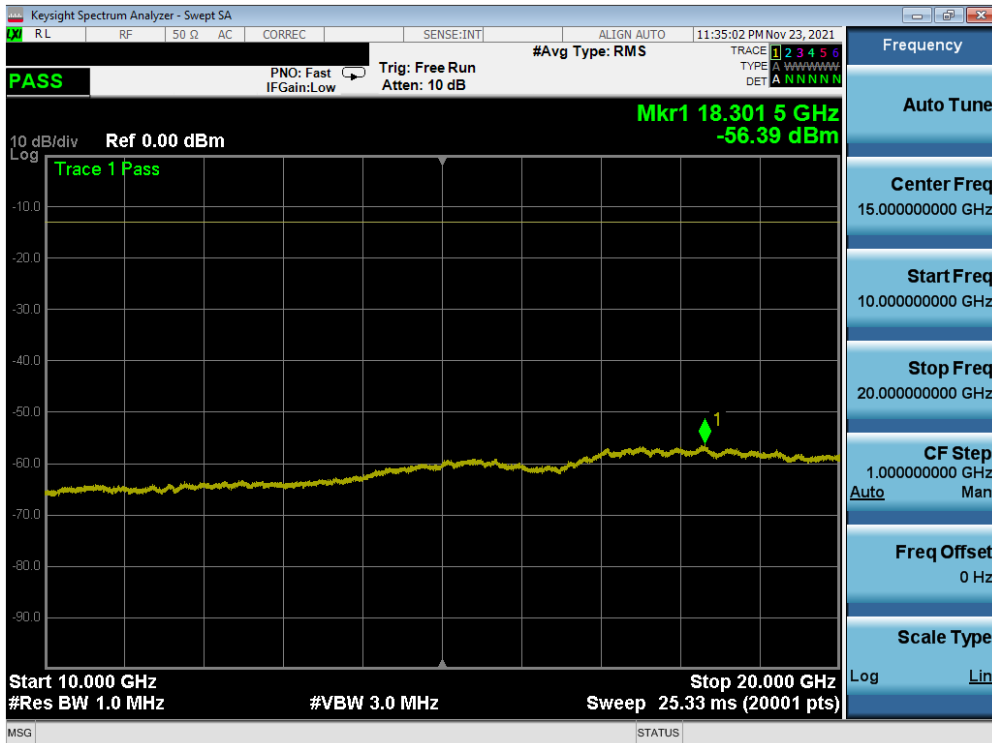


Plot 7-16. Conducted Spurious Plot (NR Band n66 - 20MHz - 1 RB - Mid Channel – ANT1)

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 22 of 64

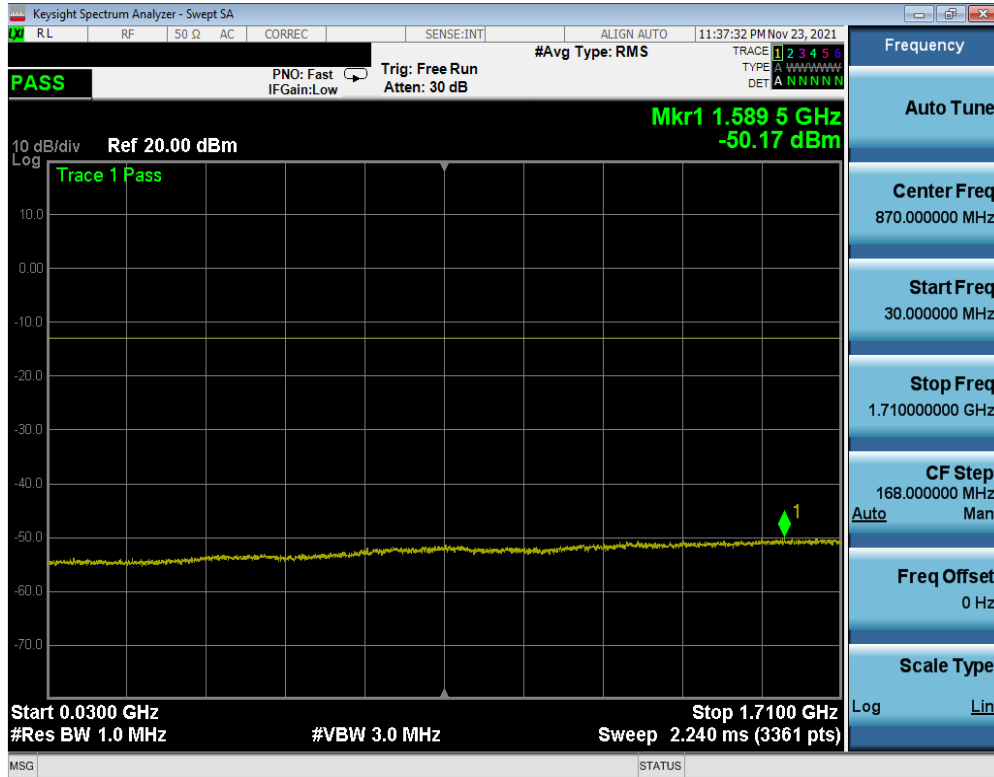


Plot 7-17. Conducted Spurious Plot (NR Band n66 - 20MHz - 1 RB - Mid Channel – ANT1)

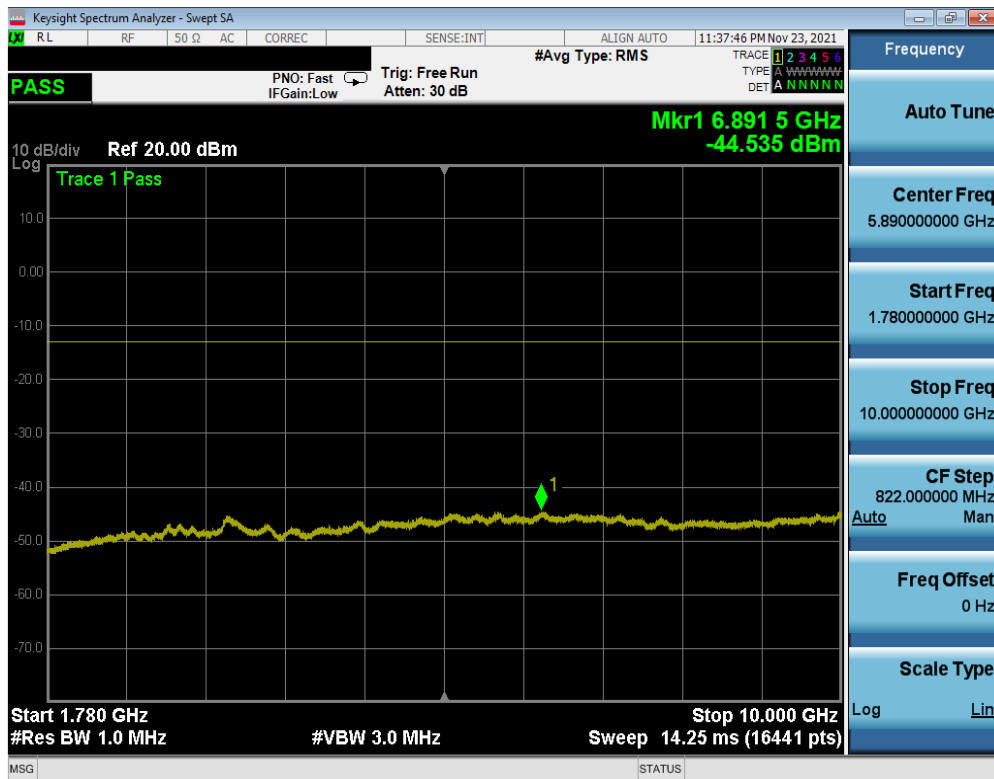


Plot 7-18. Conducted Spurious Plot (NR Band n66 - 20MHz - 1 RB - Mid Channel – ANT1)

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 23 of 64



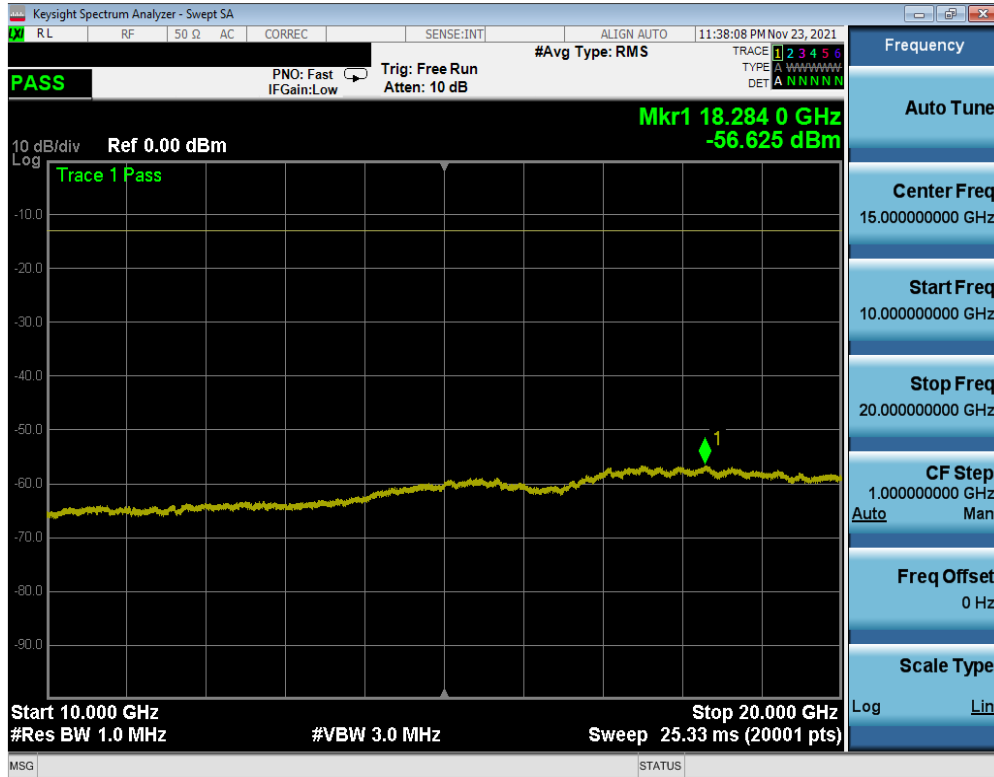
Plot 7-19. Conducted Spurious Plot (NR Band n66 - 20MHz - 1 RB - High Channel – ANT1)



Plot 7-20. Conducted Spurious Plot (NR Band n66 - 20MHz - 1 RB - High Channel – ANT1)

FCC ID: A3LSMS906E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 24 of 64

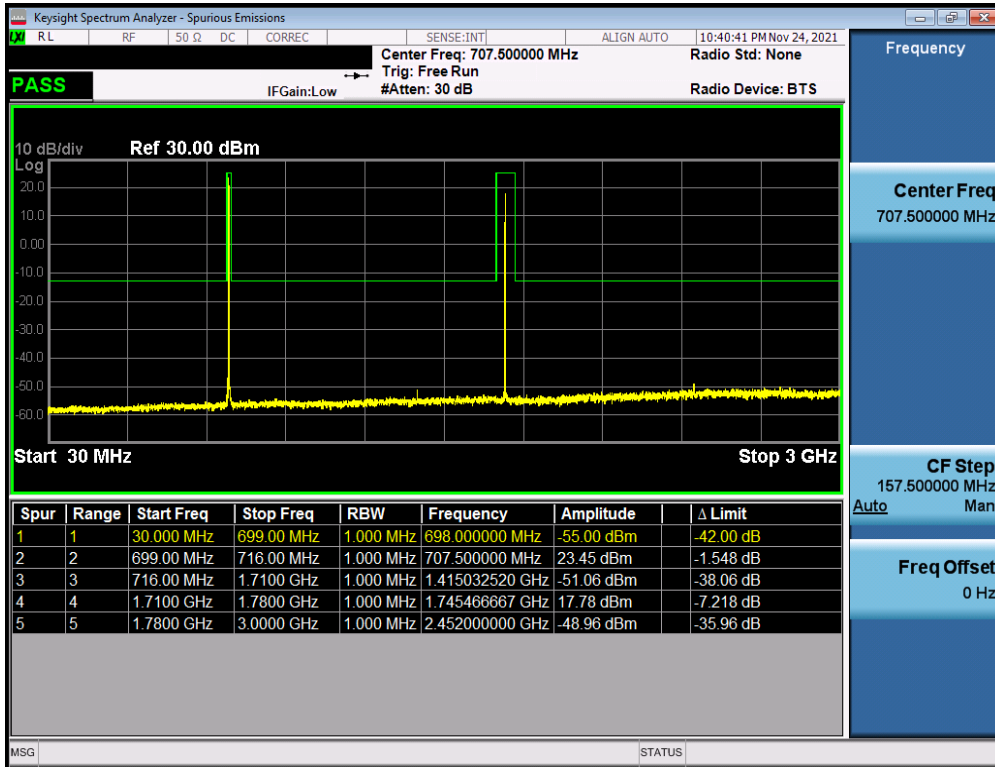




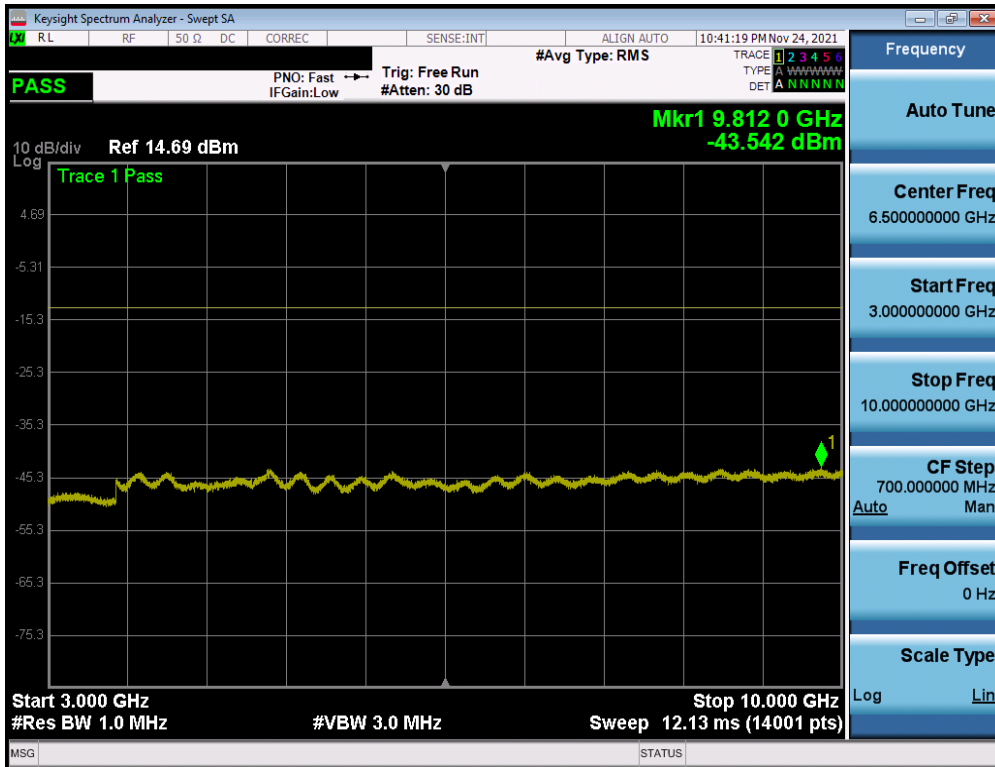
Plot 7-21. Conducted Spurious Plot (NR Band n66 - 20MHz - 1 RB - High Channel – ANT1)

FCC ID: A3LSMS906E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 25 of 64

## ULCA LTE Band 12 – Band 66

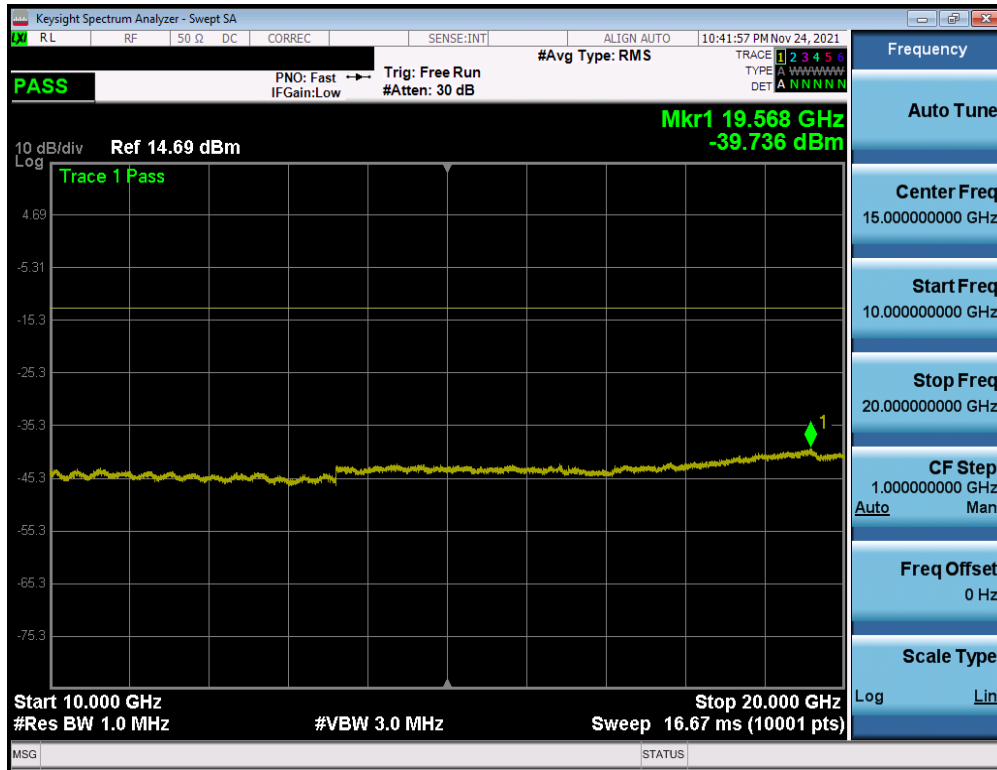


Plot 7-22. Conducted Spurious Plot (ULCA LTE B12 – B66)



Plot 7-23. Conducted Spurious Plot (ULCA LTE B12 – B66)

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 26 of 64



Plot 7-24. Conducted Spurious Plot (ULCA LTE B12 – B66)

FCC ID: A3LSMS906E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 27 of 64

## 7.5 Band Edge Emissions at Antenna Terminal

### Test Overview

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

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

### Test Procedure Used

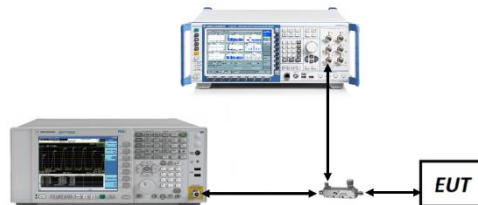
KDB 971168 D01 v03r01 – Section 6.0

### 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 x RBW
5. Detector = RMS
6. Number of sweep points  $\geq$  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**

FCC ID: A3LSMS906E		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 28 of 64

**Test Notes**

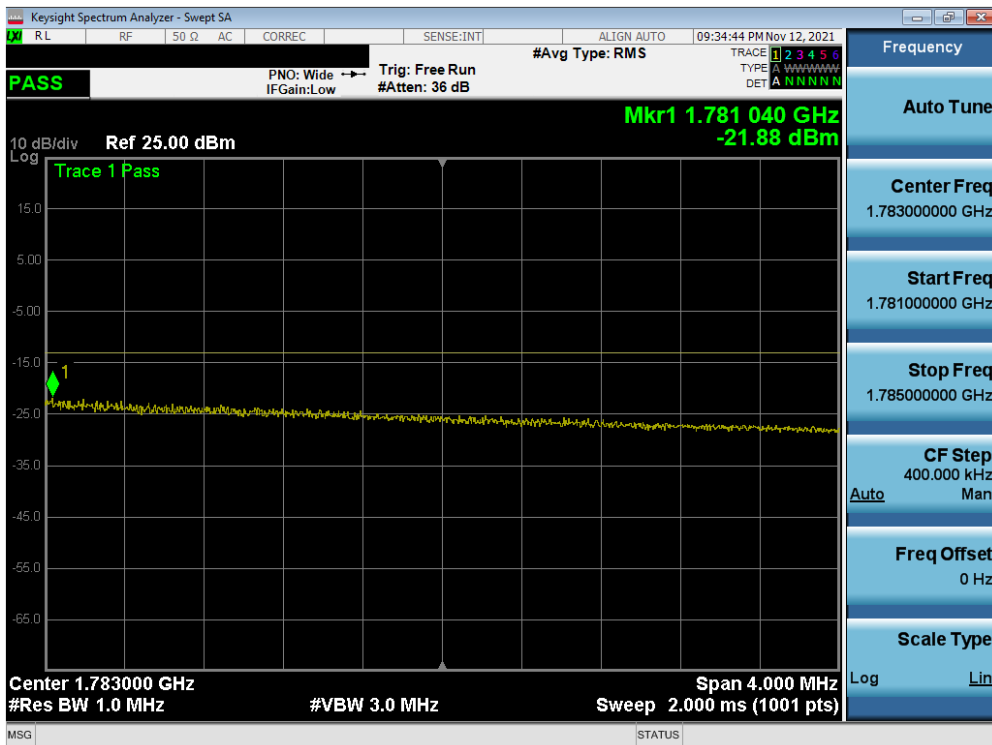
Per 27.53(h) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

<b>FCC ID:</b> A3LSMS906E		<b>PART 27 MEASUREMENT REPORT</b>	 <b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2110010116-04.A3L	<b>Test Dates:</b> 11/15/2021 - 12/03/2021	<b>EUT Type:</b> Portable Handset	Page 29 of 64



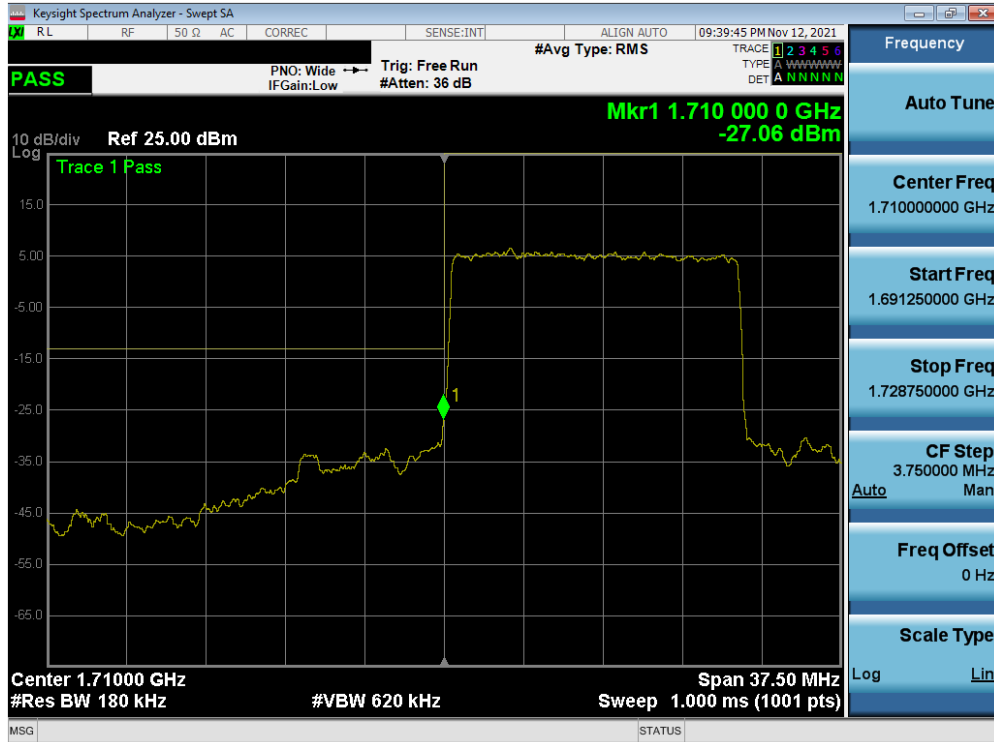


Plot 7-27. Upper Band Edge Plot (NR Band n66 – 20.0MHz - Full RB – ANT1)

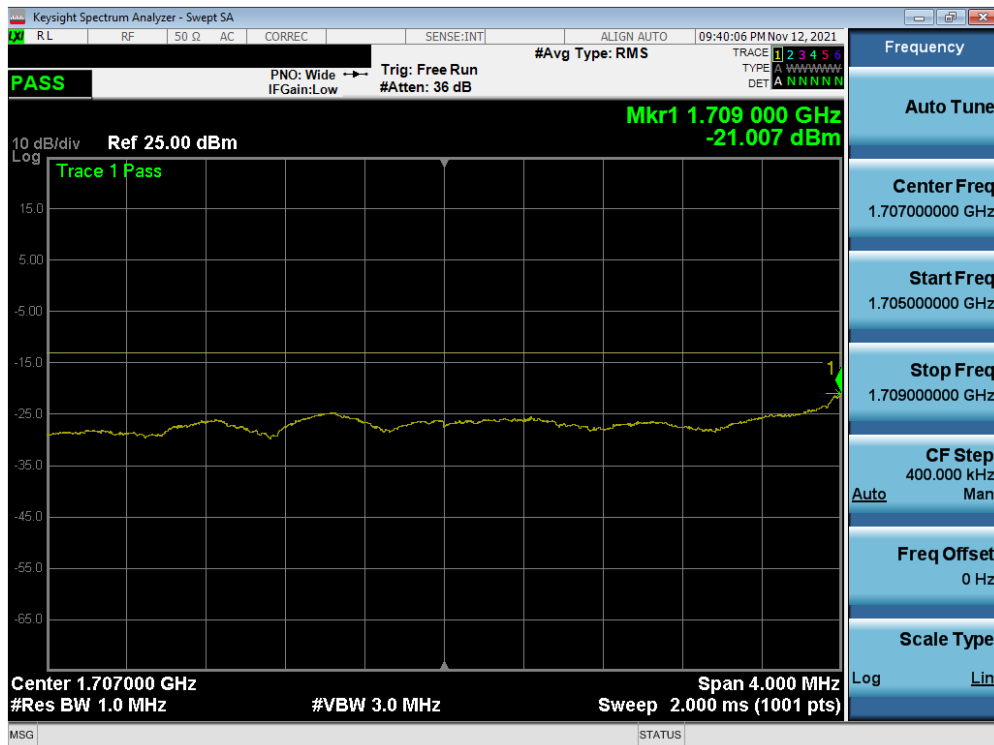


Plot 7-28. Upper Extended Band Edge Plot (NR Band n66 – 20.0MHz - Full RB – ANT1)

FCC ID: A3LSMS906E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 31 of 64



Plot 7-29. Lower Band Edge Plot (NR Band n66 – 15.0MHz - Full RB – ANT1)



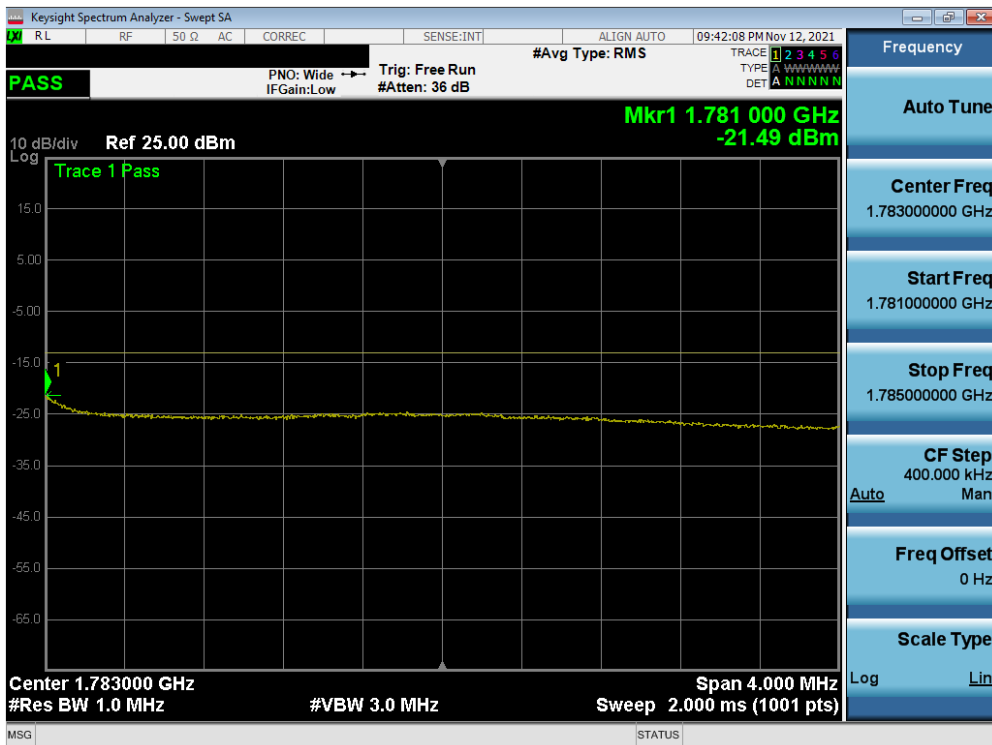
Plot 7-30. Lower Extended Band Edge Plot (NR Band n66 – 15.0MHz - Full RB – ANT1)

FCC ID: A3LSMS906E	PCTEST Proud to be part of  element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 32 of 64





Plot 7-31. Upper Band Edge Plot (NR Band n66 – 15.0MHz - Full RB – ANT1)

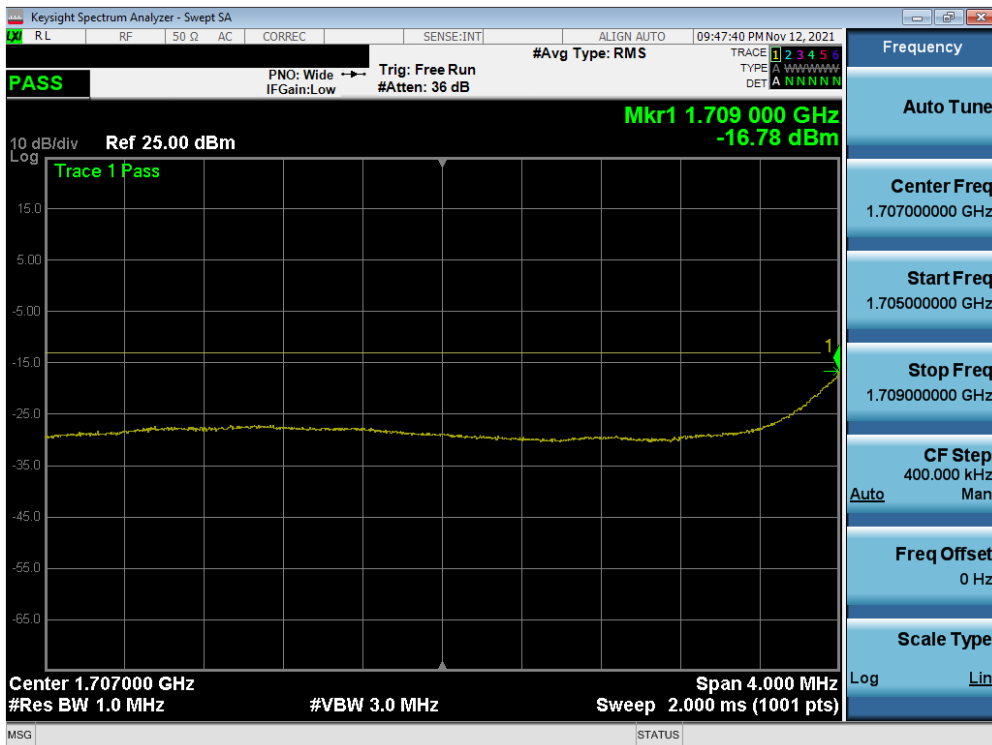


Plot 7-32. Upper Extended Band Edge Plot (NR Band n66 – 15.0MHz - Full RB – ANT1)

FCC ID: A3LSMS906E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 33 of 64



Plot 7-33. Lower Band Edge Plot (NR Band n66 – 10.0MHz - Full RB – ANT1)

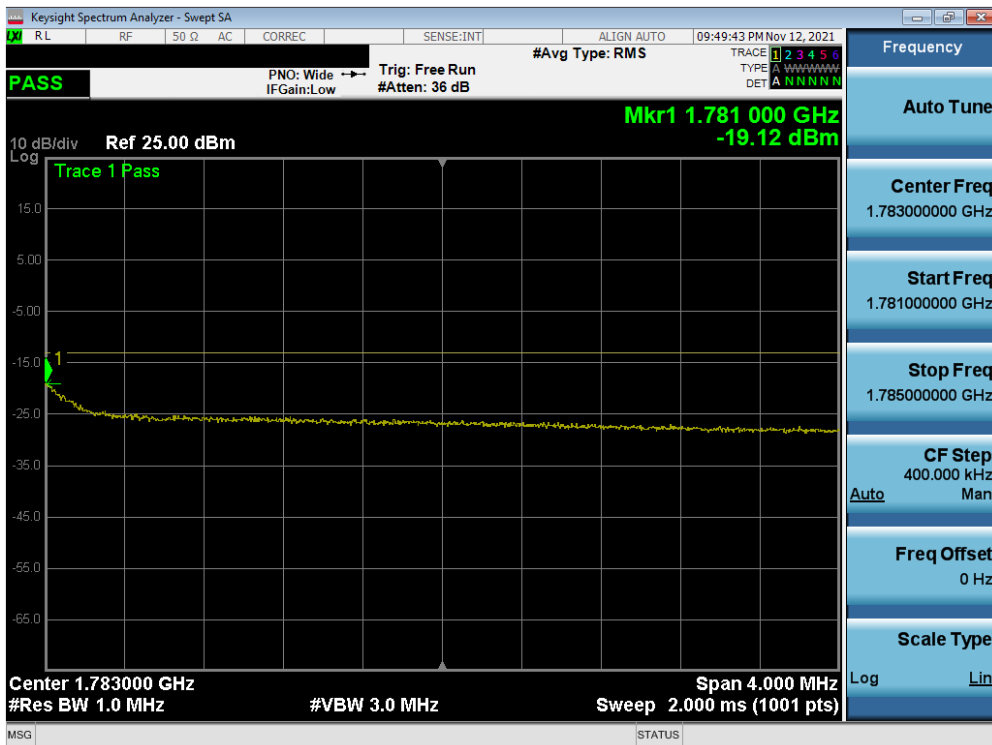


Plot 7-34. Lower Extended Band Edge Plot (NR Band n66 – 10.0MHz - Full RB – ANT1)

FCC ID: A3LSMS906E	PCTEST Proud to be part of  element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 34 of 64



Plot 7-35. Upper Band Edge Plot (NR Band n66 – 10.0MHz - Full RB – ANT1)

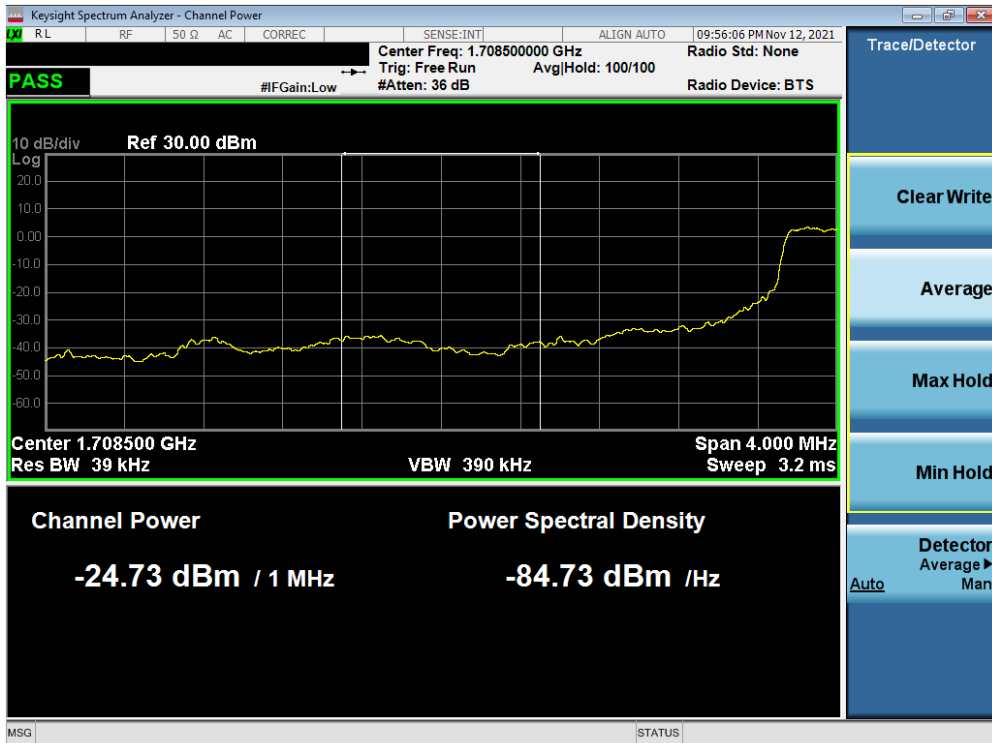


Plot 7-36. Upper Extended Band Edge Plot (NR Band n66 – 10.0MHz - Full RB – ANT1)

FCC ID: A3LSMS906E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 35 of 64



Plot 7-37. Lower Band Edge Plot (NR Band n66 – 5.0MHz - Full RB – ANT1)

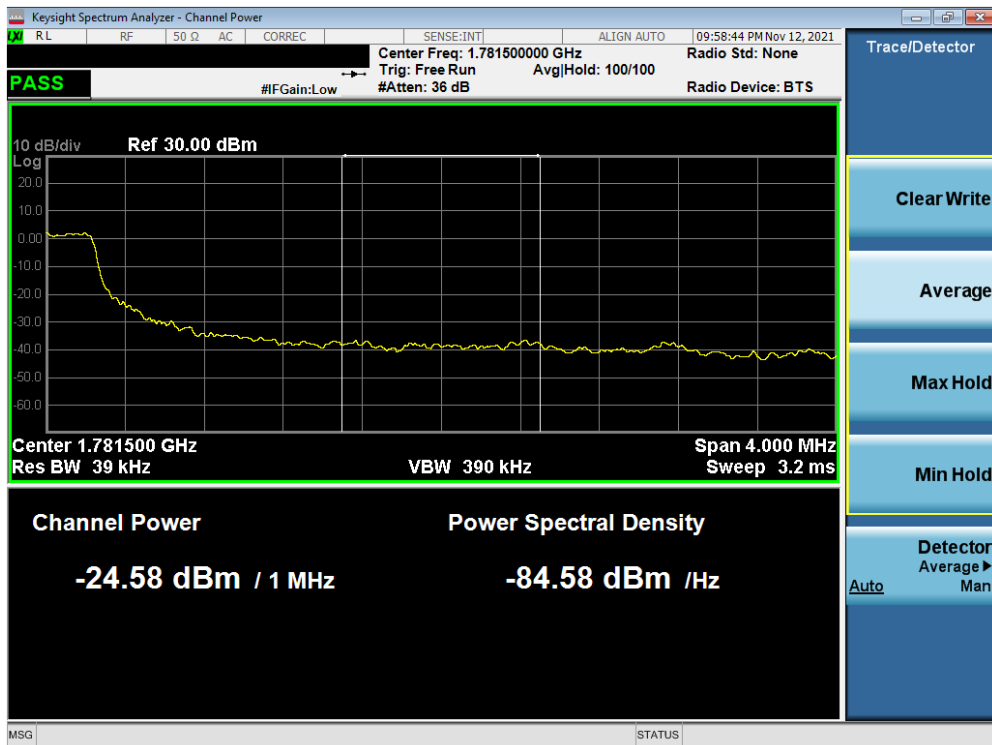


Plot 7-38. Lower Extended Band Edge Plot (NR Band n66 – 5.0MHz - Full RB – ANT1)

FCC ID: A3LSMS906E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 36 of 64



Plot 7-39. Upper Band Edge Plot (NR Band n66 – 5.0MHz - Full RB – ANT1)



Plot 7-40. Upper Extended Band Edge Plot (NR Band n66 – 5.0MHz - Full RB – ANT1)

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 37 of 64

## 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.

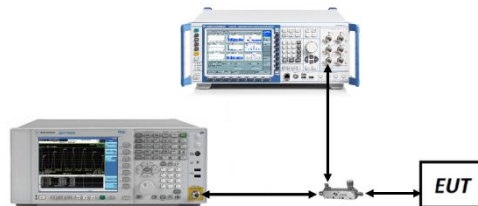




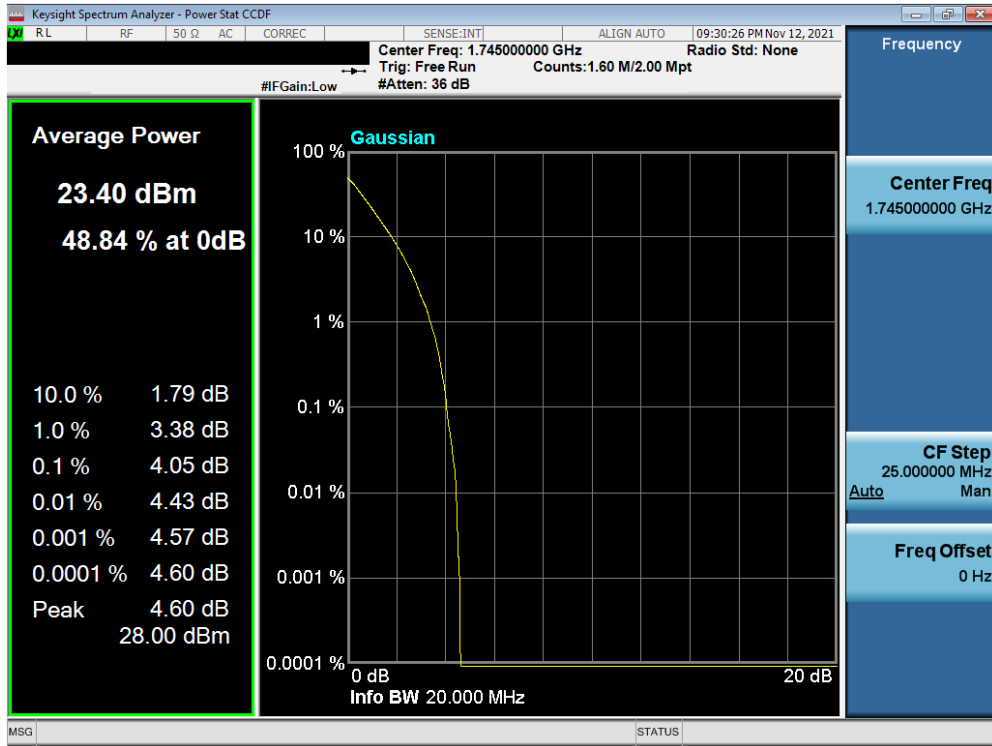
Figure 7-5. Test Instrument & Measurement Setup

### Test Notes

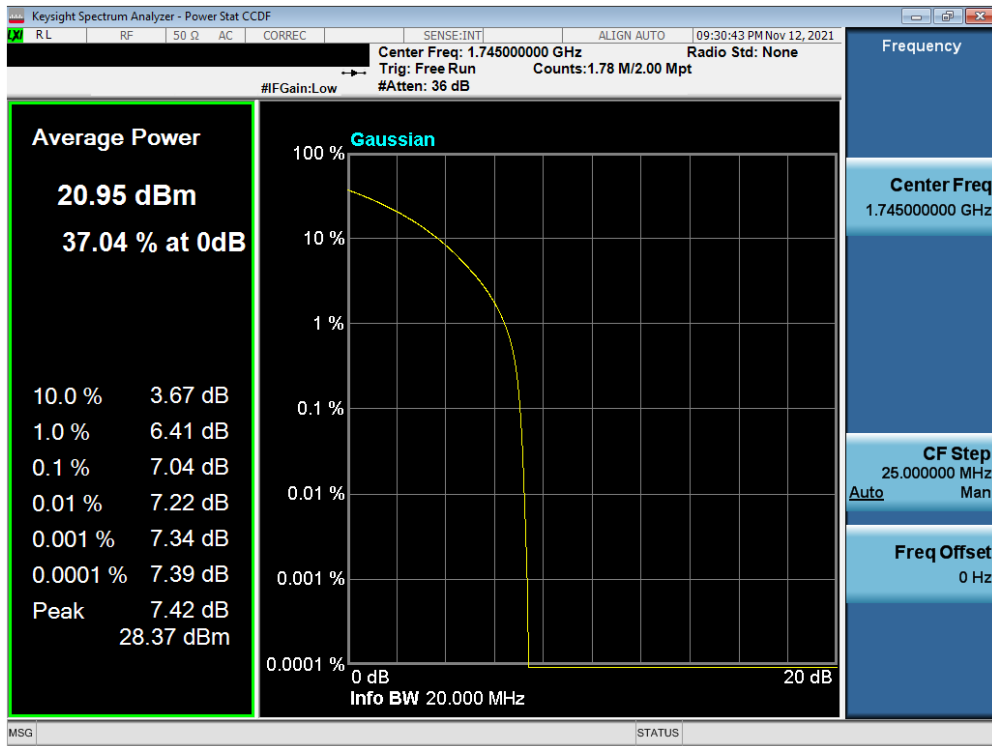
None.

FCC ID: A3LSMS906E	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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# NR Band n66 – ANT1

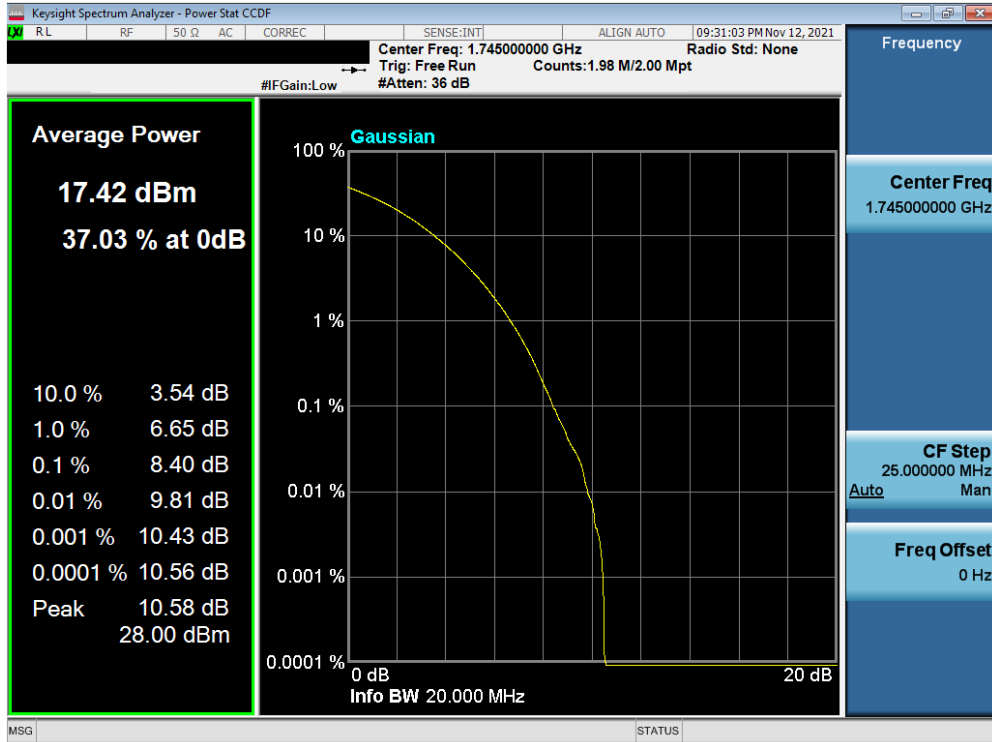


Plot 7-41. PAR Plot (NR Band n66 - 20.0MHz DFT-s-OFDM BPSK - Full RB – ANT1)

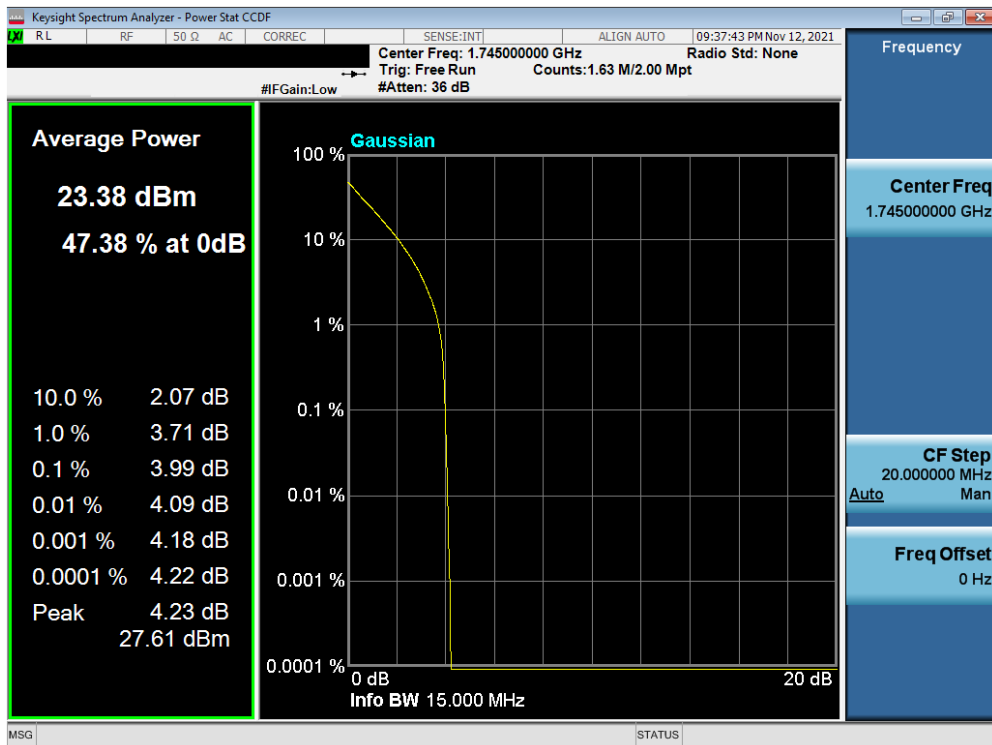


Plot 7-42. PAR Plot (NR Band n66 - 20.0MHz CP-OFDM QPSK - Full RB – ANT1)



FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 39 of 64



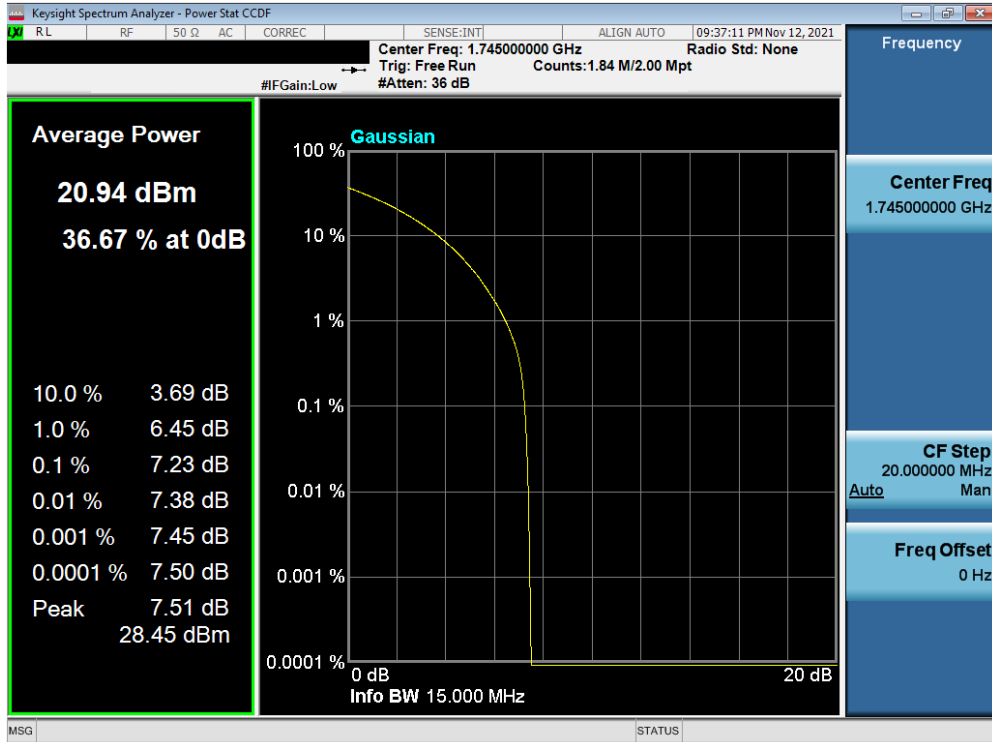
Plot 7-43. PAR Plot (NR Band n66 - 20.0MHz CP-OFDM 256-QAM - Full RB – ANT1)



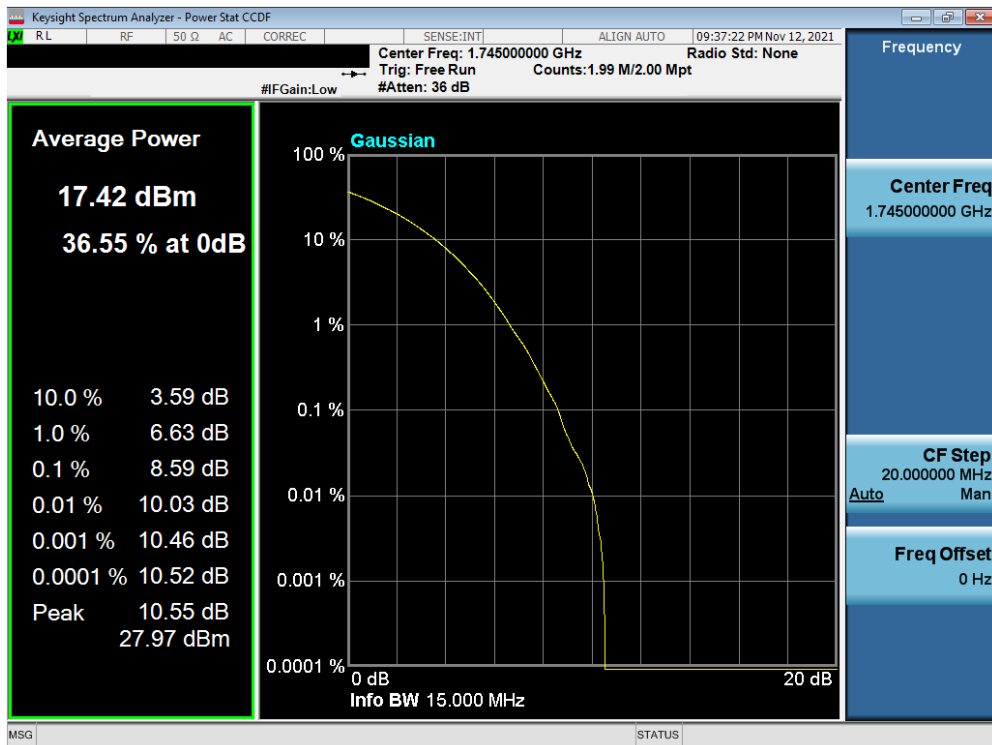
Plot 7-44. PAR Plot (NR Band n66 - 15.0MHz DFT-s-OFDM BPSK - Full RB – ANT1)

FCC ID: A3LSMS906E		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 40 of 64



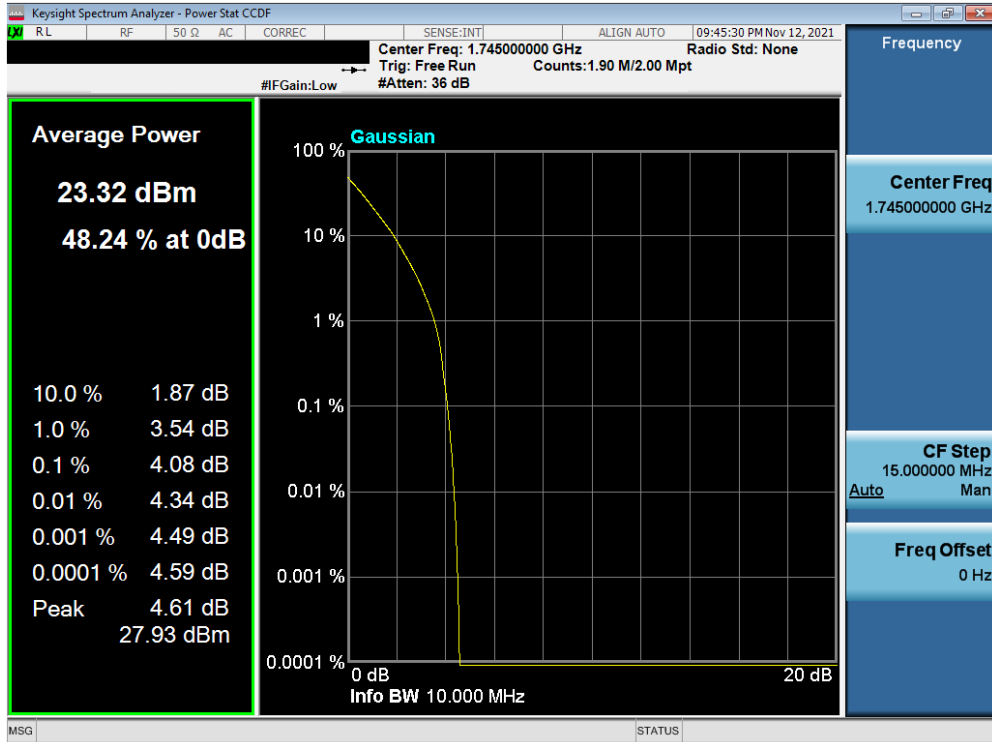


Plot 7-45. PAR Plot (NR Band n66 - 15.0MHz CP-OFDM QPSK - Full RB – ANT1)

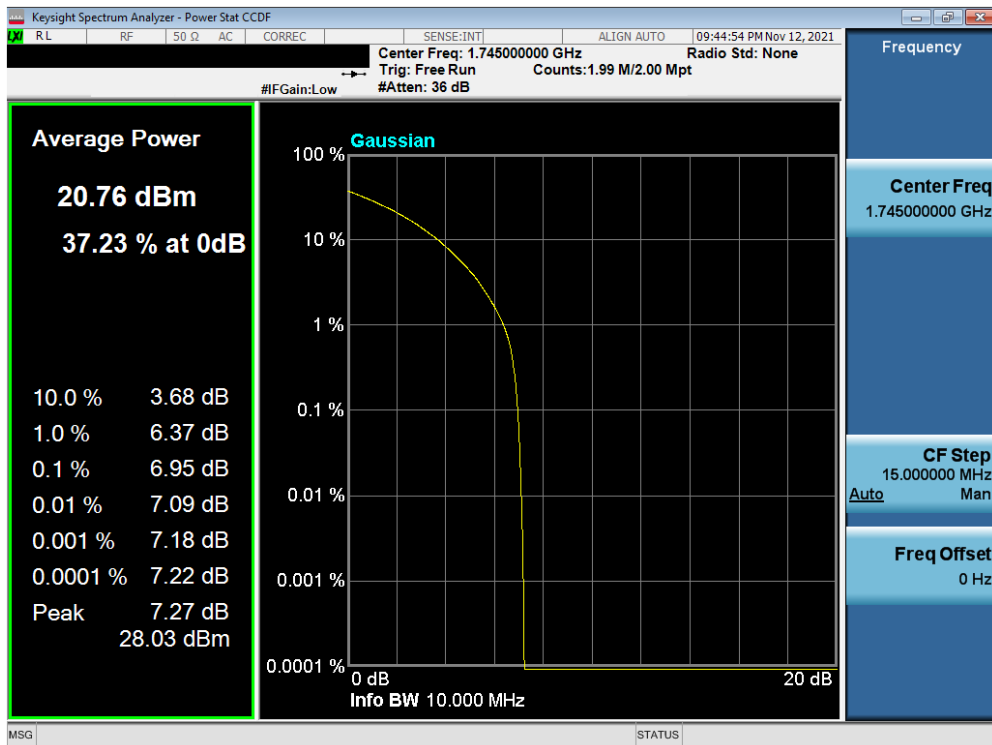


Plot 7-46. PAR Plot (NR Band n66 - 15.0MHz CP-OFDM 256-QAM - Full RB – ANT1)

FCC ID: A3LSMS906E		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 41 of 64

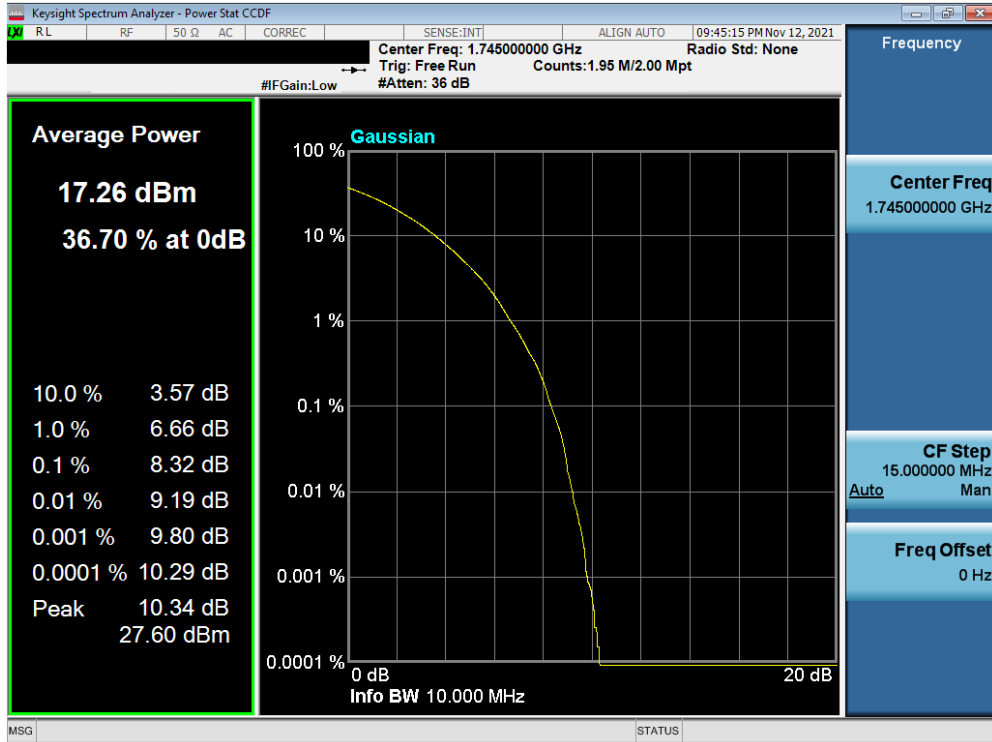


Plot 7-47. PAR Plot (NR Band n66 - 10.0MHz DFT-s-OFDM BPSK - Full RB – ANT1)

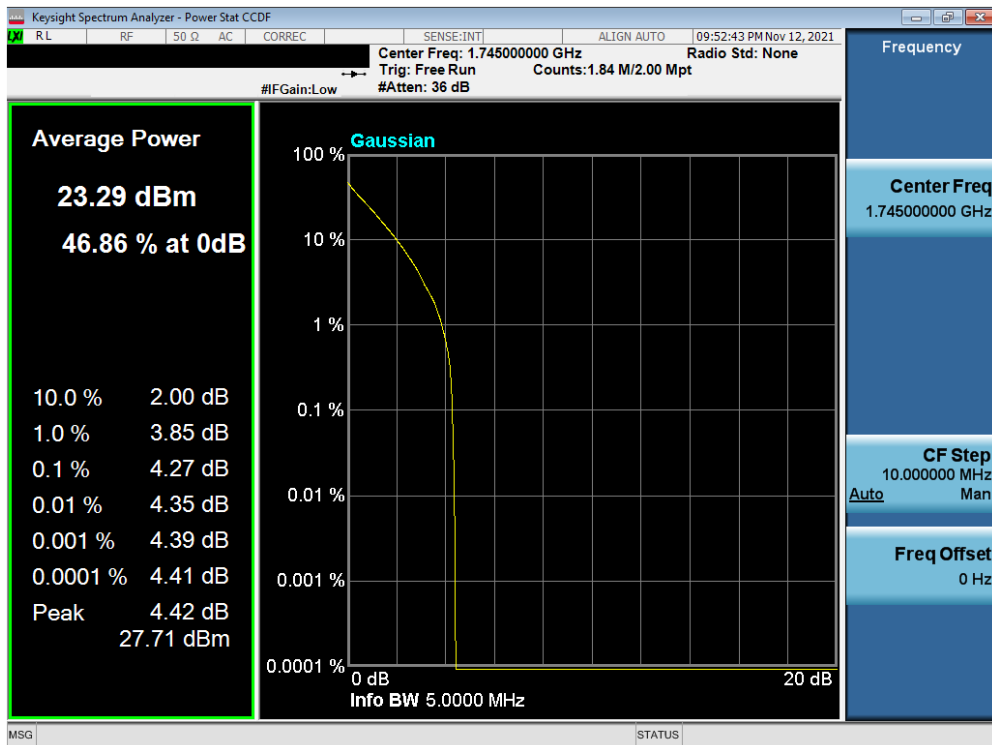


Plot 7-48. PAR Plot (NR Band n66 - 10.0MHz CP-OFDM QPSK - Full RB – ANT1)

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 42 of 64

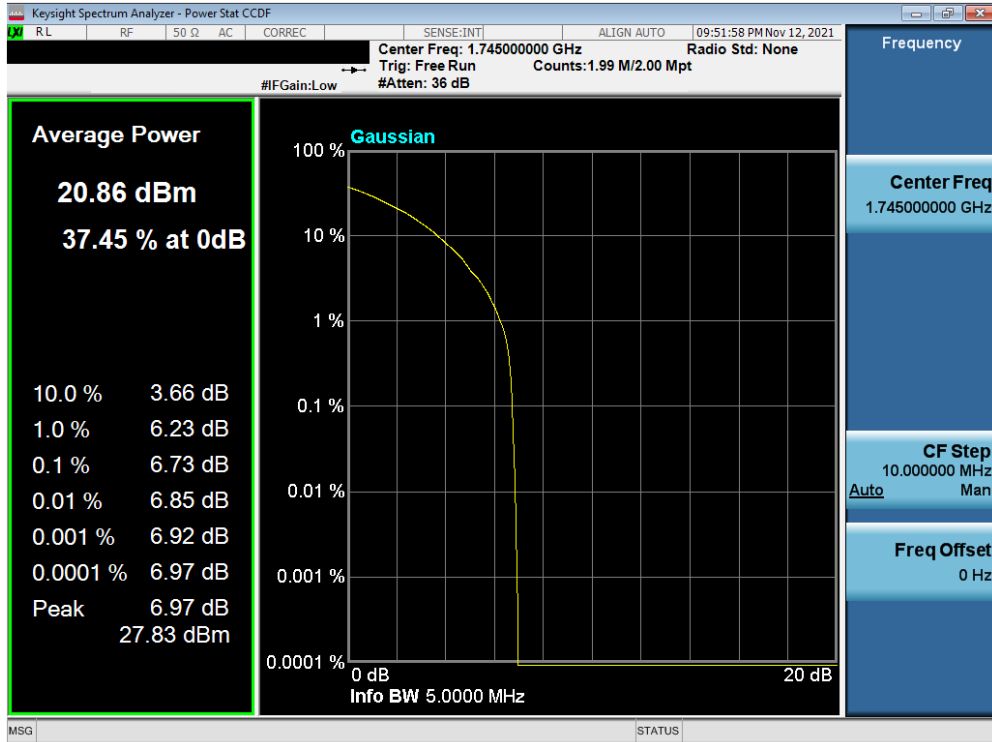


Plot 7-49. PAR Plot (NR Band n66 - 10.0MHz CP-OFDM 256-QAM - Full RB – ANT1)

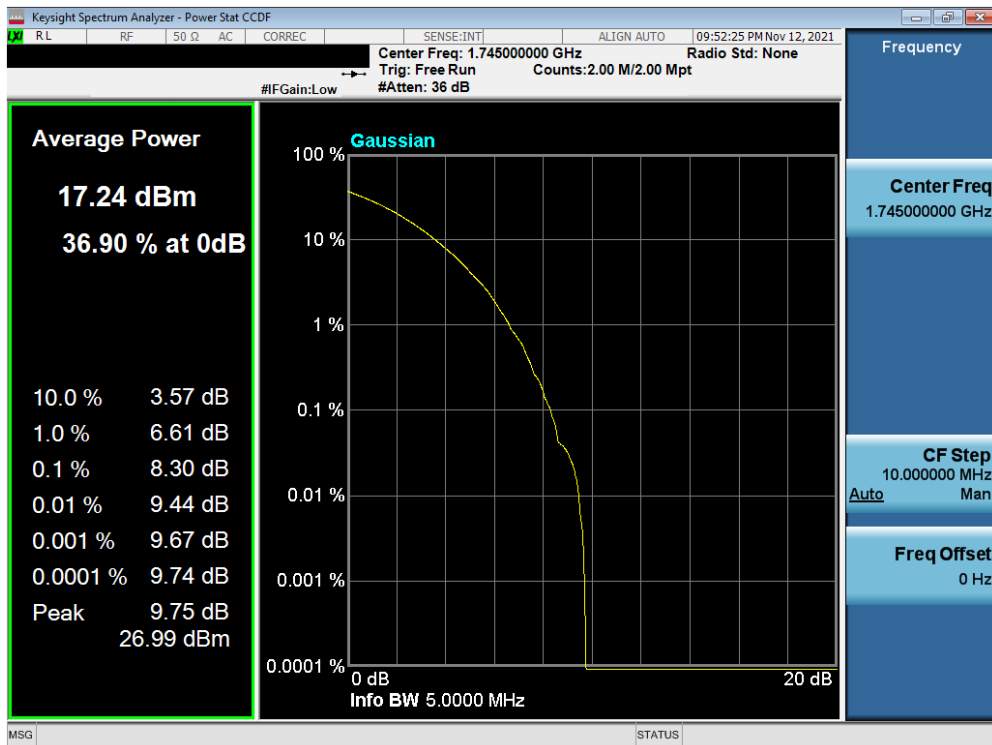


Plot 7-50. PAR Plot (NR Band n66 - 5.0MHz DFT-s-OFDM BPSK - Full RB – ANT1)

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 43 of 64



Plot 7-51. PAR Plot (NR Band n66 - 5.0MHz CP-OFDM QPSK - Full RB – ANT1)



Plot 7-52. PAR Plot (NR Band n66 - 5.0MHz CP-OFDM 256-QAM - Full RB – ANT1)

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 44 of 64

## 7.7 Radiated Power (ERP/EIRP)

### Test Overview



Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally 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 RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

### Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

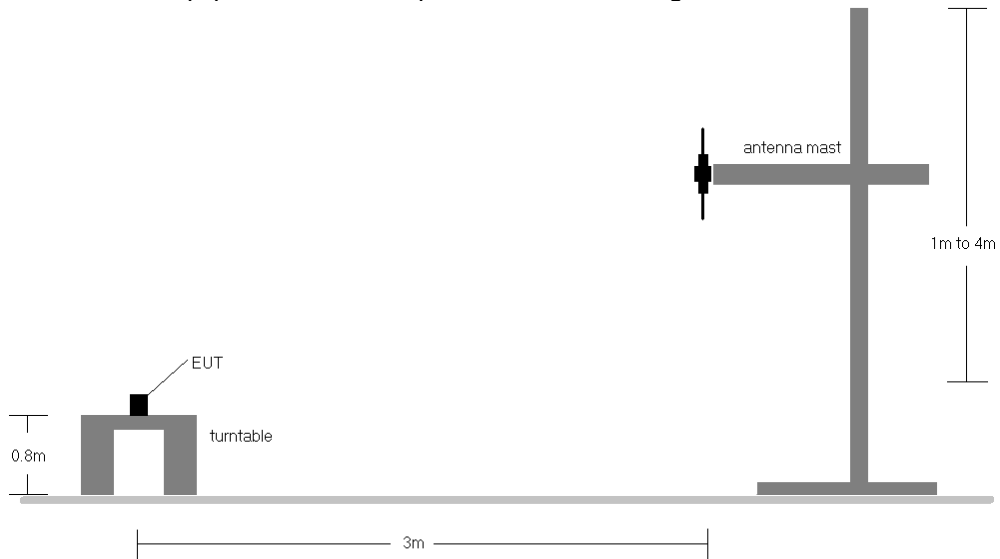
### Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW  $\geq$  3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points  $\geq$  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".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

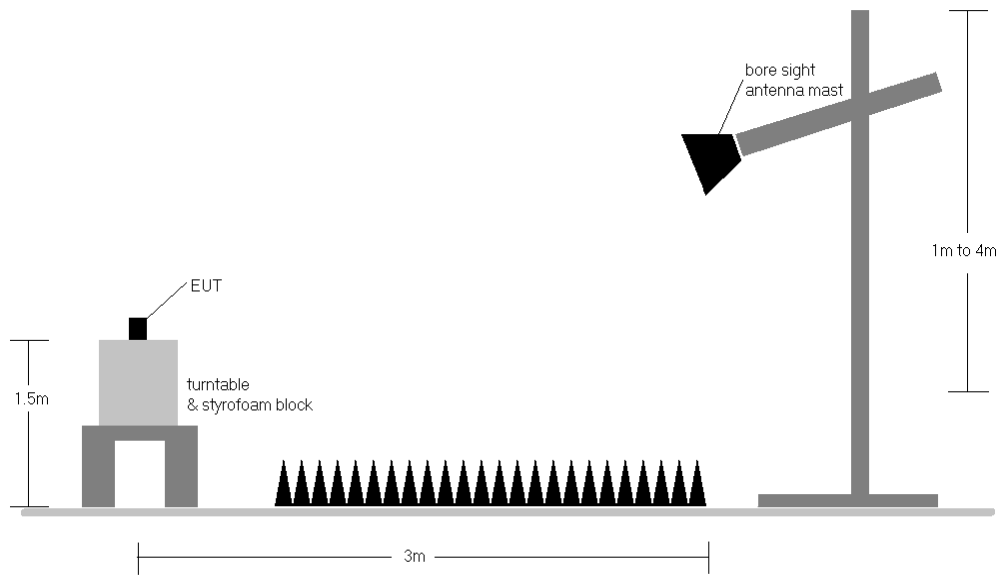
FCC ID: A3LSMS906E		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset	Page 45 of 64	

**Test Setup**

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



**Figure 7-6. Radiated Test Setup <1GHz**





**Figure 7-7. Radiated Test Setup >1GHz**

<p>FCC ID: A3LSMS906E</p>		<p><b>PART 27 MEASUREMENT REPORT</b></p>	<p><b>Approved by:</b> Technical Manager</p>
<p><b>Test Report S/N:</b> 1M2110010116-04.A3L</p>	<p><b>Test Dates:</b> 11/15/2021 - 12/03/2021</p>	<p><b>EUT Type:</b> Portable Handset</p>	<p>Page 46 of 64</p>



**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.
- 3) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

<b>FCC ID:</b> A3LSMS906E		<b>PART 27 MEASUREMENT REPORT</b>	 <b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2110010116-04.A3L	<b>Test Dates:</b> 11/15/2021 - 12/03/2021	<b>EUT Type:</b> Portable Handset	Page 47 of 64

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	$\pi/2$ BPSK	1720.0	H	135	207	9.47	1 / 79	14.80	24.27	0.267	30.00	-5.73
	$\pi/2$ BPSK	1745.0	H	127	206	9.48	1 / 79	14.37	23.85	0.243	30.00	-6.15
	$\pi/2$ BPSK	1770.0	H	120	208	9.39	1 / 26	13.65	23.04	0.201	30.00	-6.96
	QPSK	1720.0	H	135	207	9.47	1 / 79	14.84	<b>24.31</b>	0.270	30.00	-5.69
	QPSK	1745.0	H	127	206	9.48	1 / 79	14.33	23.81	0.240	30.00	-6.19
	QPSK	1770.0	H	120	208	9.39	1 / 26	13.71	23.10	0.204	30.00	-6.90
15 MHz	16-QAM	1720.0	H	135	207	9.47	1 / 79	14.00	23.47	0.222	30.00	-6.53
	$\pi/2$ BPSK	1717.5	H	135	207	9.49	1/77	14.35	23.84	0.242	30.00	-6.16
	$\pi/2$ BPSK	1745.0	H	127	206	9.48	1/1	13.87	23.35	0.216	30.00	-6.65
	$\pi/2$ BPSK	1772.5	H	120	208	9.36	1/1	13.23	22.59	0.181	30.00	-7.41
	QPSK	1717.5	H	135	207	9.49	1/77	14.64	<b>24.13</b>	0.259	30.00	-5.87
	QPSK	1745.0	H	127	206	9.48	1/77	14.16	23.64	0.231	30.00	-6.36
10 MHz	QPSK	1772.5	H	120	208	9.36	1/77	14.13	23.49	0.223	30.00	-6.51
	16-QAM	1717.5	H	135	207	9.49	1/1	14.42	23.91	0.246	30.00	-6.09
	$\pi/2$ BPSK	1715.0	H	135	207	9.52	1/26	14.25	23.77	0.238	30.00	-6.23
	$\pi/2$ BPSK	1745.0	H	127	206	9.48	1/1	13.87	23.35	0.216	30.00	-6.65
	$\pi/2$ BPSK	1775.0	H	120	208	9.34	1/50	13.24	22.58	0.181	30.00	-7.42
	QPSK	1715.0	H	135	207	9.52	1/26	14.31	<b>23.83</b>	0.241	30.00	-6.17
5 MHz	QPSK	1745.0	H	127	206	9.48	1/26	13.92	23.40	0.219	30.00	-6.60
	16-QAM	1715.0	H	135	207	9.52	1/1	13.99	23.51	0.224	30.00	-6.49
	$\pi/2$ BPSK	1712.5	H	135	207	9.54	1/23	14.27	23.81	0.240	30.00	-6.19
	$\pi/2$ BPSK	1745.0	H	127	206	9.48	1/1	13.88	23.36	0.217	30.00	-6.64
	$\pi/2$ BPSK	1777.5	H	120	208	9.31	1/23	13.23	22.54	0.179	30.00	-7.46
	QPSK	1712.5	H	135	207	9.54	1/13	14.49	<b>24.03</b>	0.253	30.00	-5.97
20 MHz	QPSK	1745.0	H	127	206	9.48	1/23	14.14	23.62	0.230	30.00	-6.38
	QPSK	1777.5	H	120	208	9.31	1/1	14.04	23.35	0.216	30.00	-6.65
	16-QAM	1712.5	H	135	207	9.54	1/1	14.32	23.86	0.243	30.00	-6.14
	QPSK (CP-OFDM)	1720.0	H	100	208	9.47	1 / 6	13.51	22.98	0.199	30.00	-7.02
20 MHz	QPSK (Opposite Pol.)	1720.0	V	111	276	9.33	1 / 18	10.01	19.34	0.086	30.00	-10.66
	QPSK (WCP)	1720.0	H	102	208	9.47	1 / 6	13.54	23.01	0.200	30.00	-6.99



Table 7-4. EIRP Data (NR Band n66 – ANT1)

FCC ID: A3LSMS906E	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset	Page 48 of 64



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	$\pi/2$ BPSK	1720.0	H	136	42	9.47	1 / 79	11.24	20.71	0.118	30.00	-9.29
	$\pi/2$ BPSK	1745.0	H	127	54	9.48	1 / 79	11.33	<b>20.81</b>	0.121	30.00	-9.19
	$\pi/2$ BPSK	1770.0	H	125	54	9.39	1 / 79	10.22	19.61	0.091	30.00	-10.39
	QPSK	1720.0	H	136	42	9.47	1 / 79	11.22	20.69	0.117	30.00	-9.31
	QPSK	1745.0	H	127	54	9.48	1 / 79	10.25	19.73	0.094	30.00	-10.27
	QPSK	1770.0	H	125	54	9.39	1 / 79	10.25	19.64	0.092	30.00	-10.36
15 MHz	16-QAM	1720.0	H	136	42	9.47	1 / 79	10.98	20.45	0.111	30.00	-9.55
	$\pi/2$ BPSK	1717.5	H	136	42	9.49	1 / 20	11.18	20.67	0.117	30.00	-9.33
	$\pi/2$ BPSK	1745.0	H	127	54	9.48	1 / 58	11.25	20.73	0.118	30.00	-9.27
	$\pi/2$ BPSK	1772.5	H	125	54	9.36	1 / 58	10.24	19.60	0.091	30.00	-10.40
	QPSK	1717.5	H	136	42	9.49	1 / 20	11.40	<b>20.89</b>	0.123	30.00	-9.11
	QPSK	1745.0	H	127	54	9.48	1 / 58	10.17	19.65	0.092	30.00	-10.35
10 MHz	QPSK	1772.5	H	125	54	9.36	1 / 58	10.38	19.74	0.094	30.00	-10.26
	16-QAM	1717.5	H	136	42	9.49	1 / 20	10.88	20.37	0.109	30.00	-9.63
	$\pi/2$ BPSK	1715.0	H	136	42	9.52	1 / 13	10.71	20.23	0.105	30.00	-9.77
	$\pi/2$ BPSK	1745.0	H	127	54	9.48	1 / 26	11.19	<b>20.67</b>	0.117	30.00	-9.33
	$\pi/2$ BPSK	1775.0	H	125	54	9.34	1 / 26	10.23	19.57	0.091	30.00	-10.43
	QPSK	1715.0	H	136	42	9.52	1 / 13	11.01	20.53	0.113	30.00	-9.47
5 MHz	QPSK	1745.0	H	127	54	9.48	1 / 26	10.10	19.58	0.091	30.00	-10.42
	QPSK	1775.0	H	125	54	9.34	1 / 26	10.33	19.67	0.093	30.00	-10.33
	16-QAM	1715.0	H	136	42	9.52	1 / 13	10.72	20.24	0.106	30.00	-9.76
	$\pi/2$ BPSK	1712.5	H	136	42	9.54	1 / 6	10.71	20.25	0.106	30.00	-9.75
	$\pi/2$ BPSK	1745.0	H	127	54	9.48	1 / 6	11.18	<b>20.66</b>	0.116	30.00	-9.34
	$\pi/2$ BPSK	1777.5	H	125	54	9.31	1 / 12	10.23	19.54	0.090	30.00	-10.46
20 MHz	QPSK	1712.5	H	136	42	9.54	1 / 6	10.95	20.49	0.112	30.00	-9.51
	QPSK	1745.0	H	127	54	9.48	1 / 6	10.10	19.58	0.091	30.00	-10.42
	QPSK	1777.5	H	125	54	9.31	1 / 12	10.36	19.67	0.093	30.00	-10.33
	16-QAM	1712.5	H	136	42	9.54	1 / 6	10.79	20.33	0.108	30.00	-9.67
20 MHz	QPSK (CP-OFDM)	1745.0	H	131	51	9.48	1 / 6	10.34	19.82	0.096	30.00	-10.18
	QPSK (Opposite Pol.)	1745.0	V	101	22	9.33	1 / 18	10.89	20.22	0.105	30.00	-9.78
	QPSK (WCP)	1745.0	H	172	197	9.48	1 / 6	9.03	18.51	0.071	30.00	-11.49

Table 7-5. EIRP Data (NR Band n66 – ANT6)

FCC ID: A3LSMS906E	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset	Page 49 of 64

## 7.8 Radiated Spurious Emissions Measurements

### Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral 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 RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.



### Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

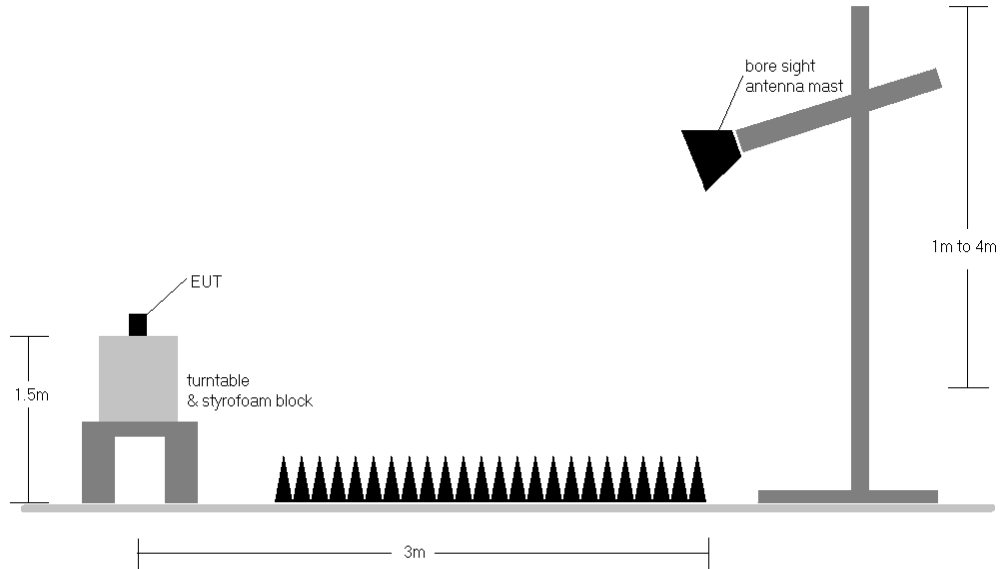
### Test Settings

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

FCC ID: A3LSMS906E		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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**Test Setup**

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



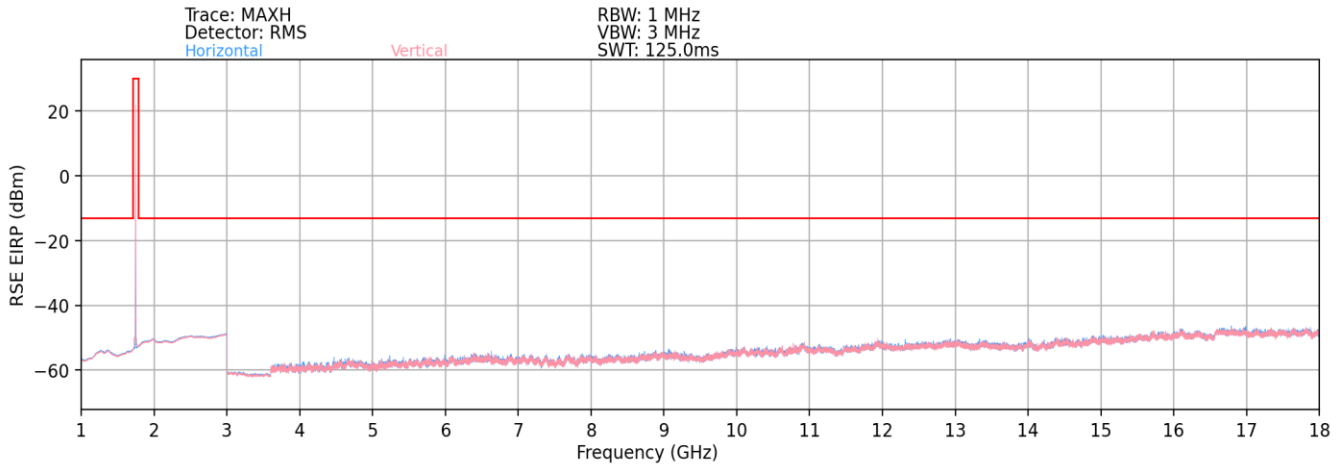
**Figure 7-8. Test Instrument & Measurement Setup**

**Test Notes**

- 1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
  - a)  $E(\text{dB}\mu\text{V}/\text{m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
  - b)  $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V}/\text{m}) + 20\log D - 104.8$ ; 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) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.
- 8) Spurious emissions shown in this section are measured while operating in EN-DC mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor). Spurious emissions from the NR carrier device, is subject to the rules under which the NR carrier operates. Spurious emission caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates.
- 9) Spurious emissions measurements are included in this section to address compliance of the NR FR1 ULCA capability. The EUT was set to transmit at the widest bandwidth and on the middle channel of each band.

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2110010116-04.A3L	<b>Test Dates:</b> 11/15/2021 - 12/03/2021	<b>EUT Type:</b> Portable Handset	Page 51 of 64	

## NR Band n66 – ANT1



Plot 7-53. Radiated Spurious Plot (NR Band n66 – ANT1)

Bandwidth (MHz):	20
Frequency (MHz):	1730
RB / Offset:	1 / 53
Mode:	Stand Alone



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]
3460.00	H	-	-	-77.74	3.71	32.97	-62.29	-13.00	-49.29
5190.00	H	114	70	-77.78	6.62	35.84	-59.41	-13.00	-46.41
6920.00	H	-	-	-80.17	8.44	35.27	-59.99	-13.00	-46.99
8650.00	H	-	-	-81.16	9.56	35.40	-59.85	-13.00	-46.85
10380.00	H	-	-	-81.73	12.33	37.60	-57.66	-13.00	-44.66

Table 7-6. Radiated Spurious Data (NR Band n66 – Low Channel – ANT1)

Bandwidth (MHz):	20
Frequency (MHz):	1745
RB / Offset:	1 / 53
Mode:	Stand Alone

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]
3490.00	H	-	-	-77.49	3.69	33.20	-62.06	-13.00	-49.06
5235.00	H	395	243	-77.32	6.14	35.82	-59.44	-13.00	-46.44
6980.00	H	-	-	-80.08	8.20	35.12	-60.14	-13.00	-47.14
8725.00	H	-	-	-80.20	8.96	35.76	-59.49	-13.00	-46.49
10470.00	H	-	-	-81.81	12.04	37.23	-58.03	-13.00	-45.03



Table 7-7. Radiated Spurious Data (NR Band n66 – Mid Channel – ANT1)

FCC ID: A3LSMS906E	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset	Page 52 of 64

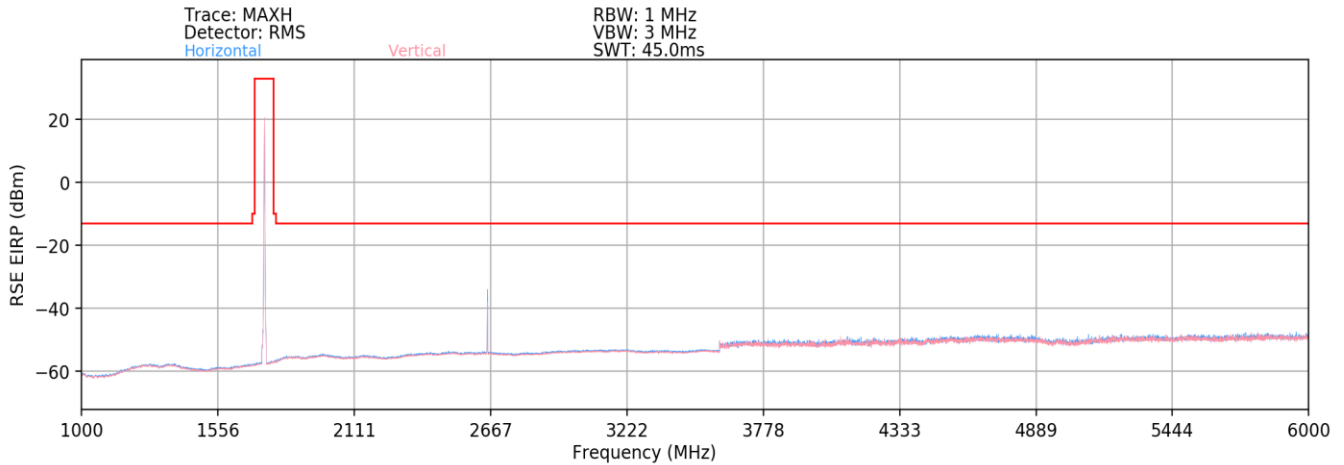
<b>Bandwidth (MHz):</b>	20
<b>Frequency (MHz):</b>	1760
<b>RB / Offset:</b>	1 / 53
<b>Mode:</b>	Stand Alone

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]
3520.00	H	-	-	-77.75	3.84	33.09	-62.16	-13.00	-49.16
5280.00	H	299	68	-75.91	6.30	37.39	-57.86	-13.00	-44.86
7040.00	H	-	-	-79.92	8.29	35.37	-59.89	-13.00	-46.89
8800.00	H	-	-	-80.67	8.97	35.30	-59.96	-13.00	-46.96
10560.00	H	-	-	-82.26	12.32	37.06	-58.20	-13.00	-45.20

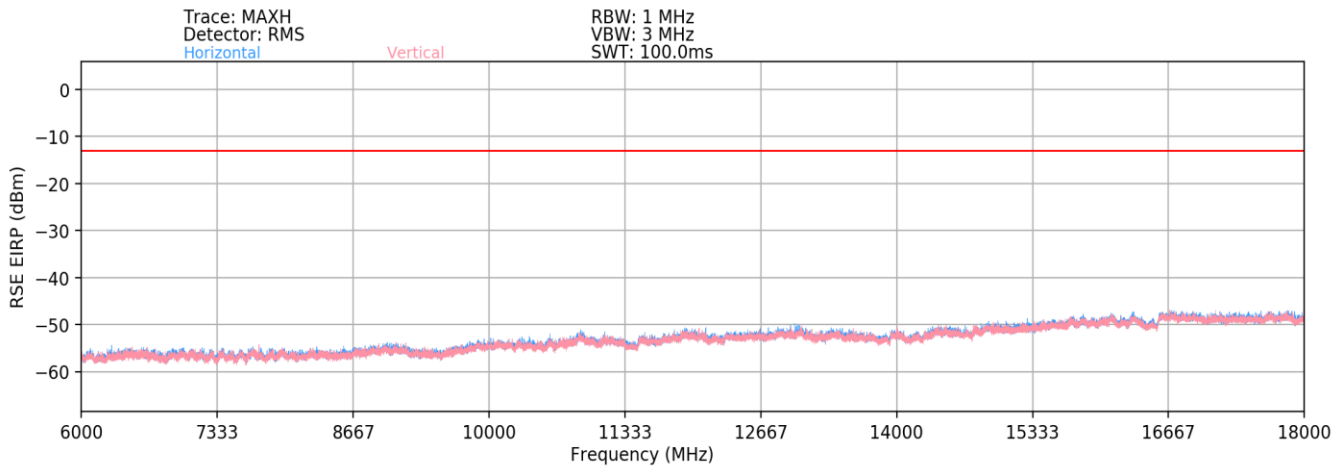
**Table 7-8. Radiated Spurious Data (NR Band n66 – High Channel – ANT1)**

<b>FCC ID:</b> A3LSMS906E	 <b>PART 27 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2110010116-04.A3L	<b>Test Dates:</b> 11/15/2021 - 12/03/2021	<b>EUT Type:</b> Portable Handset	Page 53 of 64

## EN-DC n66 (ANT1) + LTE Band 5



**Plot 7-54. Radiated Spurious Plot (EN-DC n66 (ANT1) + B5)**





**Plot 7-55. Radiated Spurious Plot (EN-DC n66 (ANT1) + B5)**

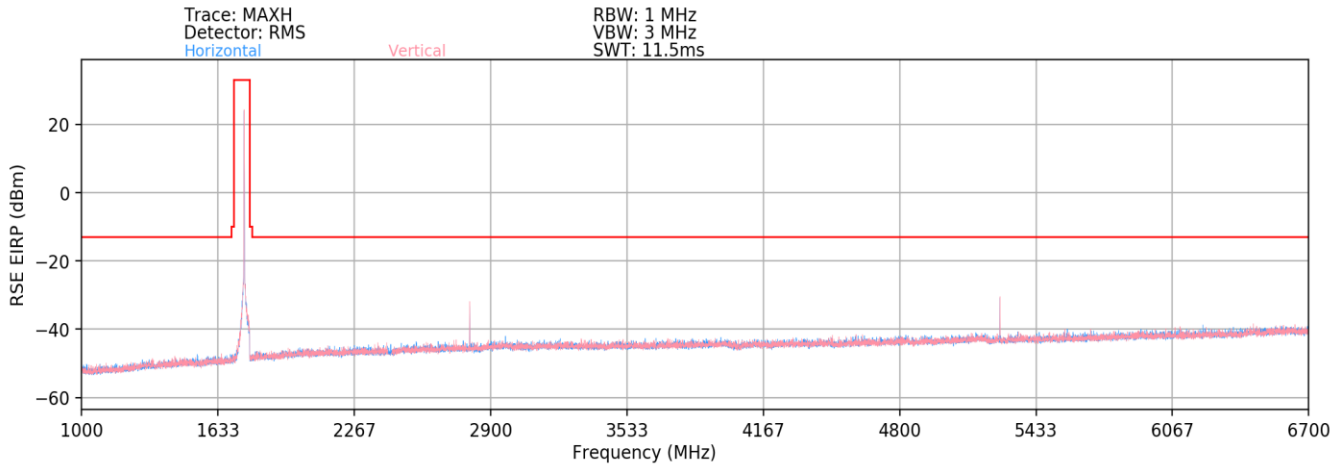
Bandwidth (MHz):	20 & 10MHz
Frequency (MHz):	1745 & 836.5
RB / Offset:	1/53 & 1/25
Mode:	EN-DC
Anchor Band:	LTE Band 5

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]
2653.50	H	155	3	-55.15	10.63	62.48	-32.78	-13.00	-19.78
5235.00	H	377	206	-76.89	14.62	44.73	-50.53	-13.00	-37.53
6287.50	H	-	-	-79.56	16.25	43.69	-51.56	-13.00	-38.56
6980.50	H	-	-	-79.40	16.92	44.52	-50.74	-13.00	-37.74
9013.00	H	-	-	-80.16	18.85	45.69	-49.57	-13.00	-36.57

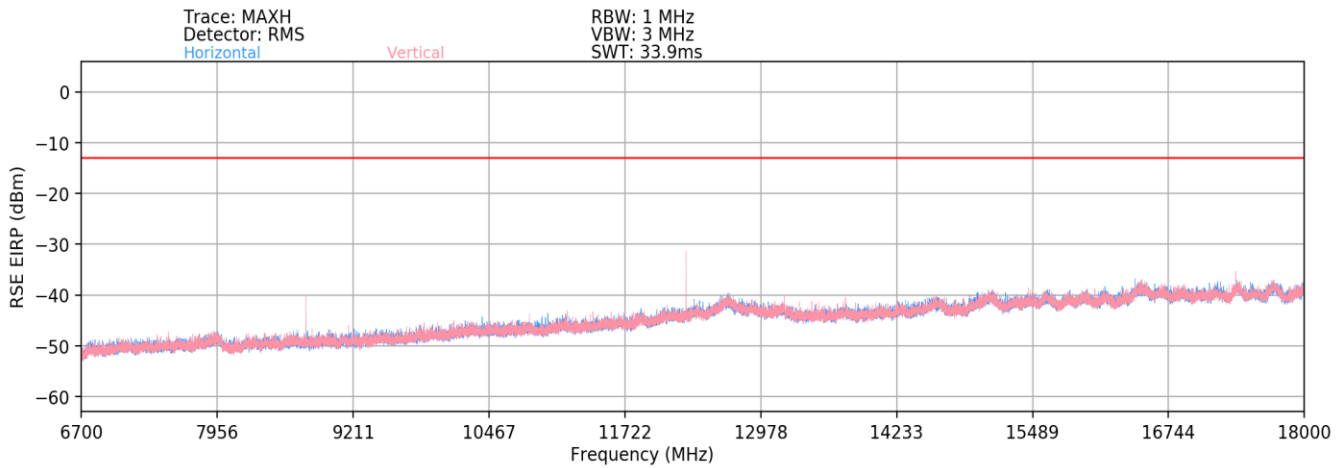
**Table 7-9. Radiated Spurious Data (EN-DC n66 (ANT1) + B5)**

FCC ID: A3LSMS906E	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset	Page 54 of 64

## EN-DC n66 (ANT1) + LTE Band 12



Plot 7-56. Radiated Spurious Plot (EN-DC n66 (ANT1) + B12)



Plot 7-57. Radiated Spurious Plot (EN-DC n66 (ANT1) + B12)

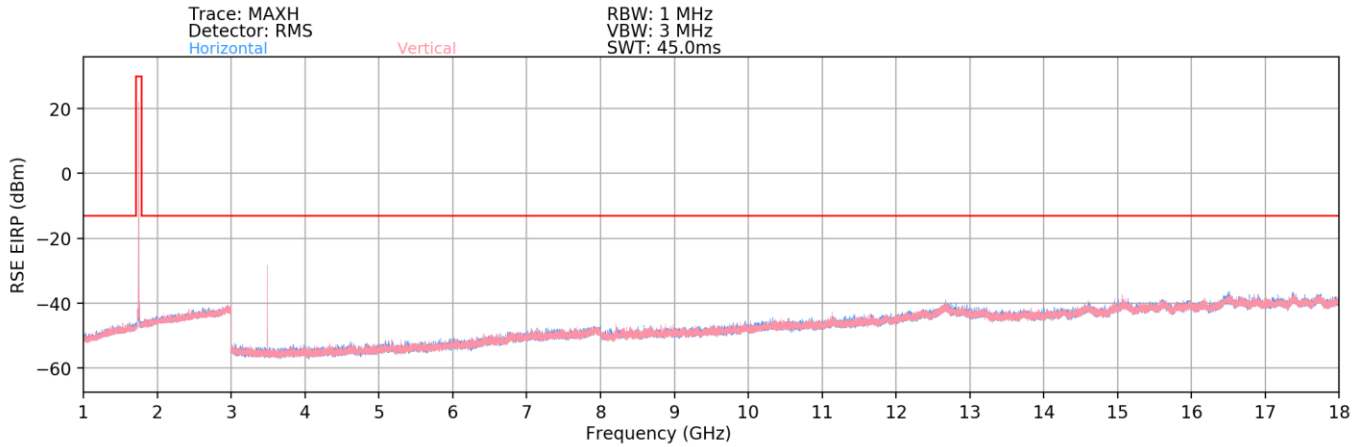
Bandwidth (MHz):	20/10 MHz
Frequency (MHz):	1745MHz/ 707.5MHz
RB / Offset:	1/54 & 1/25
Mode:	EN-DC
Anchor Band:	LTE Band 12

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]
2802.50	V	251	50	-65.21	12.84	54.63	-40.63	-13.00	-27.63
3442.50	V	-	-	-79.83	14.23	41.40	-53.86	-13.00	-40.86
3820.00	V	-	-	-79.57	14.80	42.23	-53.03	-13.00	-40.03
4952.50	V	257	344	-71.85	16.26	51.41	-43.85	-13.00	-30.85
8776.16	V	104	216	-72.68	13.93	48.25	-47.01	-13.00	-34.01
12286.00	V	202	5	-68.50	19.12	57.62	-37.64	-13.00	-24.64
16930.00	V	-	-	-78.85	24.29	52.44	-42.82	-13.00	-29.82
17307.50	V	-	-	-82.19	25.01	49.82	-45.43	-13.00	-32.43

Table 7-10. Radiated Spurious Data (EN-DC n66 (ANT1) + B12)

FCC ID: A3LSMS906E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset	Page 55 of 64

## NR Band n66 – ANT6



**Plot 7-58. Radiated Spurious Plot (NR Band n66 – ANT6)**

Bandwidth (MHz):	20
Frequency (MHz):	1730
RB / Offset:	1 / 50
Mode:	Standalone



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]
3460.00	V	400	8	-59.25	3.71	51.46	-43.80	-13.00	-30.80
5190.00	H	259	119	-77.63	6.62	35.99	-59.26	-13.00	-46.26
6920.00	H	-	-	-80.19	8.44	35.25	-60.01	-13.00	-47.01
8650.00	H	-	-	-81.47	9.56	35.09	-60.16	-13.00	-47.16
10380.00	H	-	-	-81.67	12.33	37.66	-57.60	-13.00	-44.60

**Table 7-11. Radiated Spurious Data (NR Band n66 – Low Channel – ANT6)**

Bandwidth (MHz):	20
Frequency (MHz):	1745
RB / Offset:	1 / 50
Mode:	Standalone

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]
3490.00	V	386	333	-50.77	3.69	59.92	-35.34	-13.00	-22.34
5235.00	H	196	250	-64.41	6.14	48.73	-46.53	-13.00	-33.53
6980.00	H	352	318	-77.19	8.20	38.01	-57.25	-13.00	-44.25
8725.00	H	-	-	-80.41	8.96	35.55	-59.70	-13.00	-46.70
10470.00	H	-	-	-82.16	12.04	36.88	-58.38	-13.00	-45.38
12215.00	H	-	-	-81.83	14.25	39.42	-55.84	-13.00	-42.84

**Table 7-12. Radiated Spurious Data (NR Band n66 – Mid Channel – ANT6)**



FCC ID: A3LSMS906E	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset	Page 56 of 64



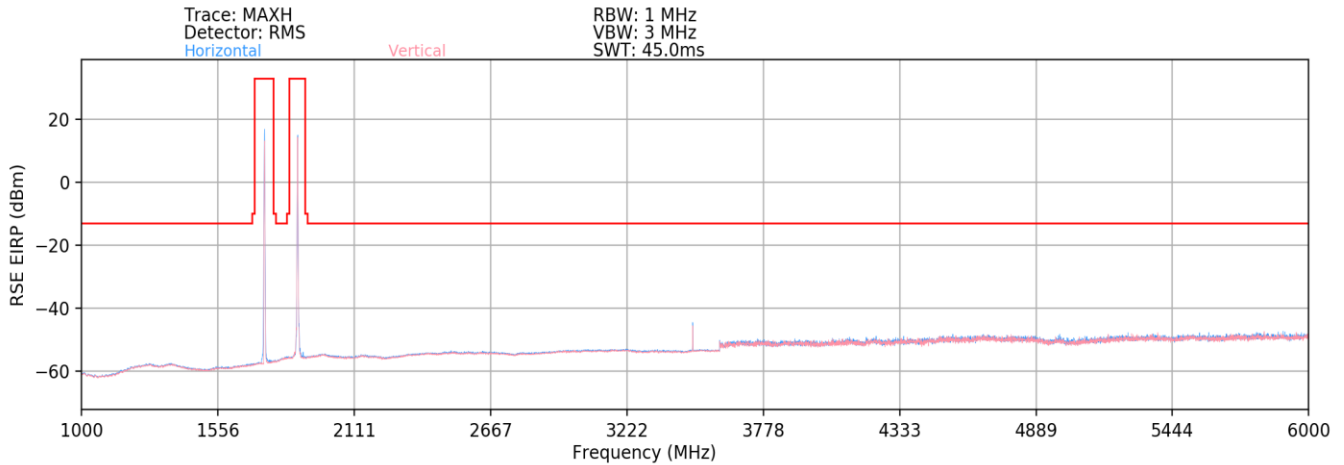
<b>Bandwidth (MHz):</b>	20
<b>Frequency (MHz):</b>	1760
<b>RB / Offset:</b>	1 / 50
<b>Mode:</b>	Standalone

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]
3520.00	V	313	1	-56.94	3.84	53.90	-41.35	-13.00	-28.35
5280.00	H	390	370	-76.01	6.30	37.29	-57.96	-13.00	-44.96
7040.00	H	333	326	-77.73	8.29	37.56	-57.70	-13.00	-44.70
8800.00	H	-	-	-80.76	8.97	35.21	-60.05	-13.00	-47.05
10560.00	H	-	-	-82.39	12.32	36.93	-58.33	-13.00	-45.33
12320.00	H	-	-	-81.90	13.87	38.97	-56.29	-13.00	-43.29

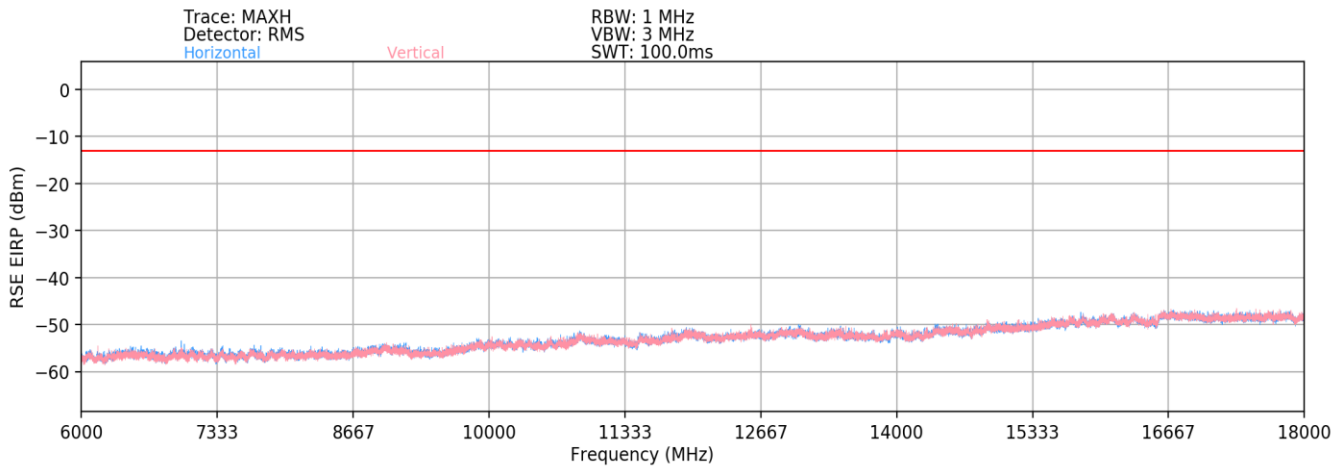
**Table 7-13. Radiated Spurious Data (NR Band n66 – High Channel – ANT6)**

<b>FCC ID:</b> A3LSMS906E	 <b>PART 27 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2110010116-04.A3L	<b>Test Dates:</b> 11/15/2021 - 12/03/2021	<b>EUT Type:</b> Portable Handset	Page 57 of 64

## EN-DC n66 (ANT6) + LTE Band 2



**Plot 7-59. Radiated Spurious Plot (EN-DC n66 (ANT6) + B2)**



**Plot 7-60. Radiated Spurious Plot (EN-DC n66 (ANT6) + B2)**

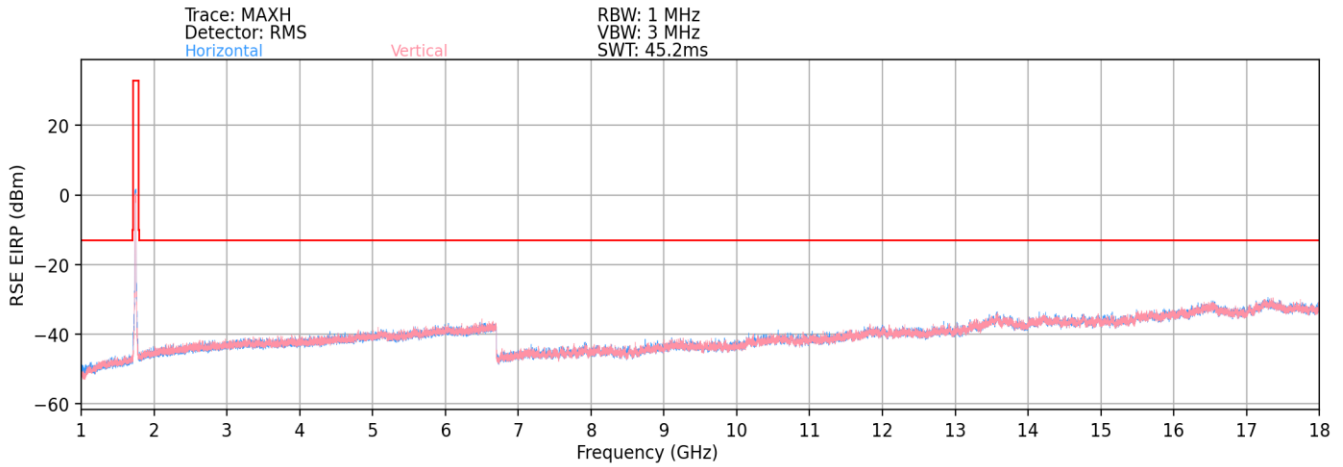
Bandwidth (MHz):	20 & 20MHz
Frequency (MHz):	1745 & 1880
RB / Offset:	1/54 & 1/50
Mode:	EN-DC
Anchor Band:	LTE Band 2

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]
3230.00	H	-	-	-78.20	11.76	40.56	-54.70	-13.00	-41.70
3365.00	H	-	-	-77.74	11.34	40.60	-54.66	-13.00	-41.66
3500.00	H	170	19	-58.05	11.62	60.57	-34.69	-13.00	-21.69
3635.00	H	194	43	-78.33	12.05	40.72	-54.54	-13.00	-41.54
3770.00	H	-	-	-78.93	12.39	40.46	-54.79	-13.00	-41.79
3905.00	H	-	-	-76.29	12.42	43.13	-52.13	-13.00	-39.13

**Table 7-14. Radiated Spurious Data (EN-DC n66 (ANT6) + B2)**

FCC ID: A3LSMS906E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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## LTE ULCA: Band 12 – Band 66





Plot 7-61. Radiated Spurious Plot (ULCA LTE B12 – B66)

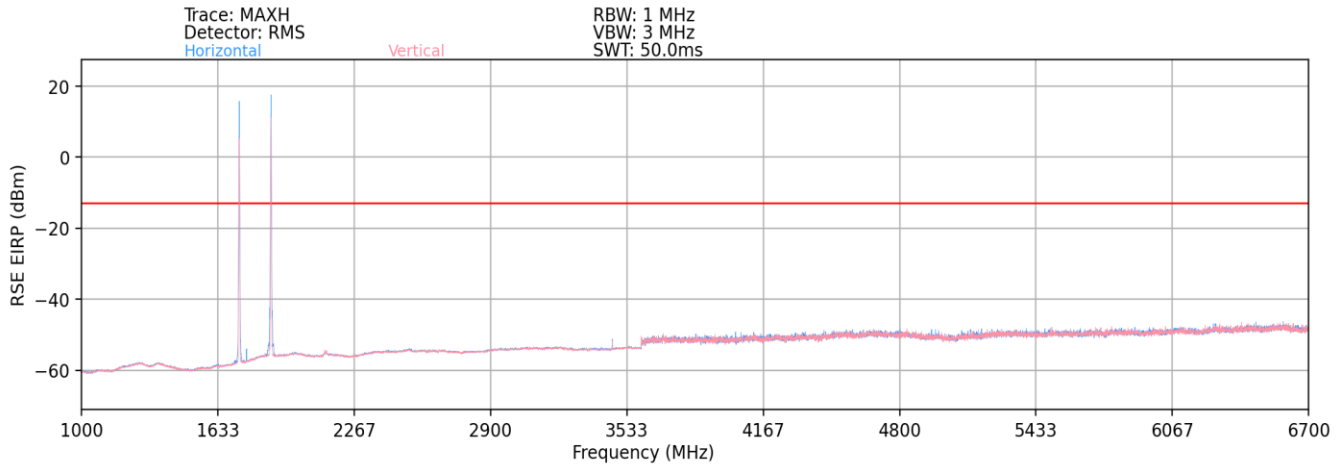
PCC Bandwidth (MHz):	10
PCC Frequency (MHz):	707.5
PCC RB / Offset:	1/25
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	1745.0
SCC RB / Offset:	1/50

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]
1037.50	V	-	-	-68.73	6.00	44.27	-50.99	-13.00	-37.99
2075.00	V	-	-	-69.33	12.77	50.44	-44.82	-13.00	-31.82
2452.50	V	-	-	-69.99	14.03	51.04	-44.22	-13.00	-31.22
3490.00	V	-	-	-70.71	16.21	52.50	-42.76	-13.00	-29.76
4197.50	V	-	-	-71.93	17.30	52.37	-42.89	-13.00	-29.89

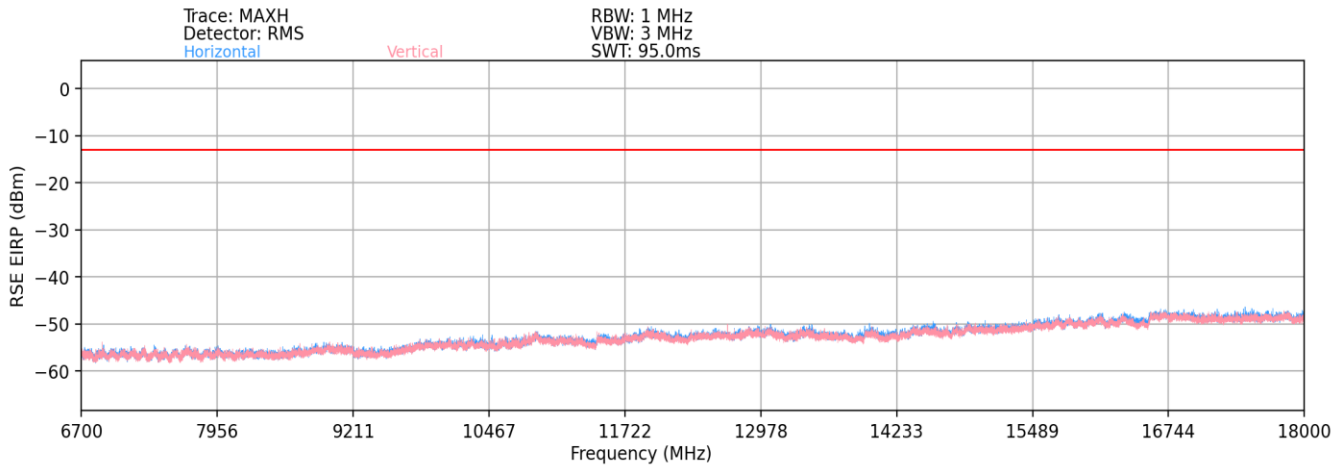
Table 7-15. Radiated Spurious Data (ULCA LTE B12 – B66)

FCC ID: A3LSMS906E	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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## LTE ULCA: Band 4 – Band 2



**Plot 7-62. Radiated Spurious Plot (ULCA LTE B4 – B2)**





**Plot 7-63. Radiated Spurious Plot (ULCA LTE B4 – B2)**

FCC ID: A3LSMS906E	 <b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 60 of 64

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	1732.5
PCC RB / Offset:	1 / 50
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	1880.0
SCC 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]
2027.50	V	-	-	-77.50	9.28	38.78	-56.47	-13.00	-43.47
2130.24	V	299	60	-72.90	9.32	43.42	-51.84	-13.00	-38.84
3355.00	V	-	-	-80.42	11.38	37.96	-57.30	-13.00	-44.30
3502.50	V	292	179	-79.31	11.64	39.33	-55.93	-13.00	-42.93
3650.00	V	-	-	-78.57	12.16	40.59	-54.67	-13.00	-41.67
4092.50	V	-	-	-78.69	12.67	40.98	-54.28	-13.00	-41.28
4240.00	V	-	-	-78.09	12.61	41.52	-53.74	-13.00	-40.74

**Table 7-16. Radiated Spurious Data (ULCA LTE B4 – B2)**

FCC ID: A3LSMS906E	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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## 7.9 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 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.***

### 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

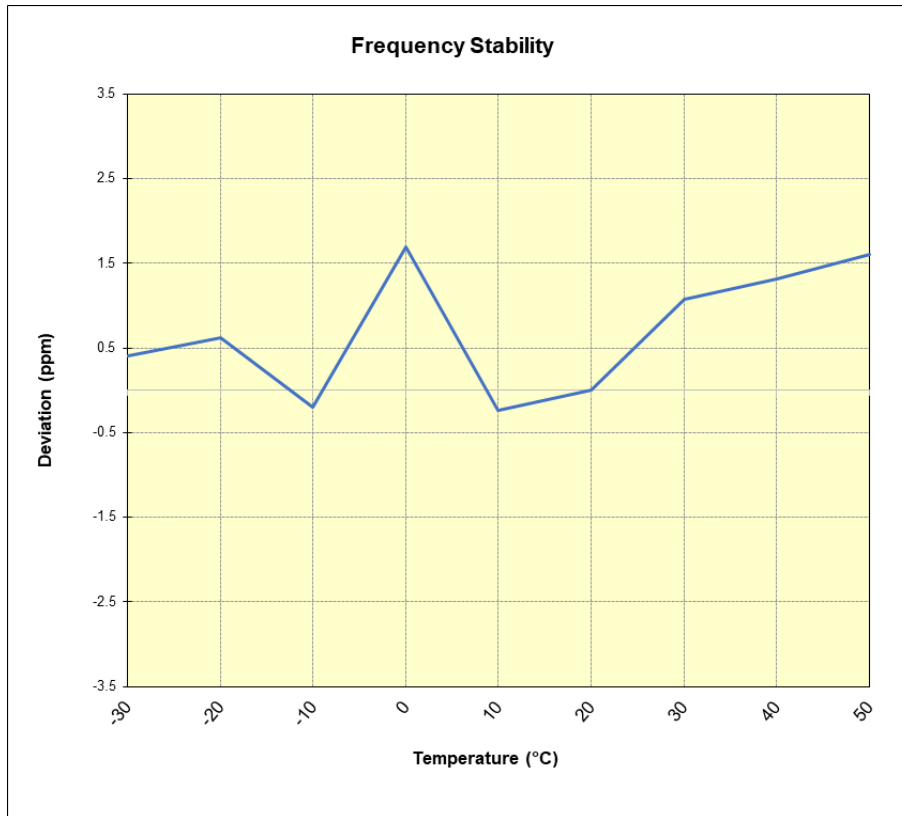
None

FCC ID: A3LSMS906E	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 62 of 64

## Frequency Stability / Temperature Variation

<b>NR Band n66</b>					
		Operating Frequency (Hz):		1,745,000,000	
		Ref. Voltage (VDC):		4.43	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.43	- 30	1,745,089,304	721	0.0000413
		- 20	1,745,089,667	1,084	0.0000621
		- 10	1,745,088,232	-351	-0.0000201
		0	1,745,091,550	2,967	0.0001700
		+ 10	1,745,088,176	-408	-0.0000234
		+ 20 (Ref)	1,745,088,583	0	0.0000000
		+ 30	1,745,090,452	1,869	0.0001071
		+ 40	1,745,090,873	2,290	0.0001312
		+ 50	1,745,091,385	2,802	0.0001606
Battery Endpoint	3.80	+ 20	1,745,089,721	1,138	0.0000652

**Table 7-17. NR Band n66 Frequency Stability Data**





**Plot 7-64. NR Band n66 Frequency Stability Chart**

FCC ID: A3LSMS906E	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Technical Manager
Test Report S/N: 1M2110010116-04.A3L	Test Dates: 11/15/2021 - 12/03/2021	EUT Type: Portable Handset		Page 63 of 64

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMS906E** complies with all the requirements of Part 27 of the FCC rules.

FCC ID: A3LSMS906E		PART 27 MEASUREMENT REPORT		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1M2110010116-04.A3L	<b>Test Dates:</b> 11/15/2021 - 12/03/2021	<b>EUT Type:</b> Portable Handset	Page 64 of 64	