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PART 27 MEASUREMENT REPORT

Applicant Name:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing: 4/21/2021 - 06/25/2021 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M2104130035-06.A3L

FCC ID: A3LSMF711B APPLICANT: Samsung Electronics Co., Ltd. Application Type: Cortification

Application Type: Model: EUT Type: FCC Classification: FCC Rule Part: Test Procedure(s): Certification SM-F711B Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 27 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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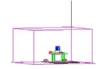


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				EF	RP	Ell	RP	
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Emission Designator
	10 MHz	QPSK	704.0 - 711.0	0.075	18.77	0.124	20.92	9M02G7D
		16QAM	704.0 - 711.0	0.064	18.09	0.106	20.24	8M96W7D
5 MIL	QPSK	701.5 - 713.5	0.076	18.83	0.125	20.98	4M50G7D	
LTE Band 10/17	LTE Band 12/17	16QAM	701.5 - 713.5	0.064	18.08	0.105	20.23	4M49W7D
LIE Danu 12/17		QPSK	700.5 - 714.5	0.075	18.75	0.123	20.90	2M71G7D
		16QAM	700.5 - 714.5	0.062	17.95	0.102	20.10	2M73W7D
		QPSK	699.7 - 715.3	0.075	18.73	0.122	20.88	1M10G7D
	1.4 MHz	16QAM	699.7 - 715.3	0.064	18.06	0.105	20.21	1M10W7D
	LTE Band 13	QPSK	782.0	0.088	19.45	0.145	21.60	9M03G7D
LTE Dond 12		16QAM	782.0	0.074	18.71	0.122	20.86	8M99W7D
LIE Dariu 13		QPSK	779.5 - 784.5	0.088	19.45	0.145	21.60	4M52G7D
	5 MHz	16QAM	779.5 - 784.5	0.066	18.19	0.108	20.34	4M51W7D

EUT Overview (< 1GHz)

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				EI	RP	
Mode Bandwidth		Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator
	20 MHz	QPSK	1720.0 - 1770.0	0.235	23.70	18M0G7D
		16QAM	1720.0 - 1770.0	0.201	23.02	18M0W7D
	15 MHz	QPSK	1717.5 - 1772.5	0.233	23.67	13M5G7D
	13 1011 12	16QAM	1717.5 - 1772.5	0.188	22.75	13M5W7D
	10 MHz	QPSK	1715.0 - 1775.0	0.245	23.89	9M01G7D
LTE Band 66/4		16QAM	1715.0 - 1775.0	0.205	23.13	8M97W7D
LIE Dallu 00/4	5 MHz	QPSK	1712.5 - 1777.5	0.241	23.82	4M51G7D
	5 IVII IZ	16QAM	1712.5 - 1777.5	0.205	23.12	4M49W7D
	3 MHz	QPSK	1711.5 - 1778.5	0.243	23.86	2M71G7D
		16QAM	1711.5 - 1778.5	0.215	23.32	2M73W7D
	1.4 MHz	QPSK	1710.7 - 1779.3	0.241	23.83	1M10G7D
		16QAM	1710.7 - 1779.3	0.210	23.22	1M10W7D
		π/2 BPSK	1720.0 - 1770.0	0.252	24.01	17M9G7D
	20 MHz	QPSK	1720.0 - 1770.0	0.250	23.98	19M1G7D
		16QAM	1720.0 - 1770.0	0.197	22.95	19M0W7D
		π/2 BPSK	1717.5 - 1772.5	0.263	24.19	13M5G7D
	15 MHz	QPSK	1717.5 - 1772.5	0.258	24.11	14M2G7D
NR Band n66	NP Bond n66	16QAM	1717.5 - 1772.5	0.186	22.69	14M2W7D
		π/2 BPSK	1715.0 - 1775.0	0.258	24.11	9M00G7D
	10 MHz	QPSK	1715.0 - 1775.0	0.249	23.97	9M35G7D
		16QAM	1715.0 - 1775.0	0.168	22.25	9M30W7D
		π/2 BPSK	1712.5 - 1777.5	0.273	24.37	4M51G7D
	5 MHz	QPSK	1712.5 - 1777.5	0.249	23.96	4M50G7D
		16QAM	1712.5 - 1777.5	0.181	22.57	4M50W7D

			Ell	RP	
Mode	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator
WCDMA1700	Spread Spectrum	1712.4 - 1752.6	0.247	23.92	4M19F9W

EUT Overview (> 1GHz)

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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: A3LSMF711B**. 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.

The Equipment Under Test (EUT) can operate in one of three physical configurations – "Open", "Half open" and "Closed". All emissions are investigated in three modes for compliance.

Test Device Serial No.: 0044M, 0050M, 0065M, 0069M, 0086M, 0089M, 0100M

2.2 Device Capa bilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (n5, n66), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer

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:

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

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 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 474788 D01.

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4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{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

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5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	AP2	EMC Cable and Switch System	9/9/2020	Annual	9/9/2021	AP2
-	AP1	EMC Cable and Switch System	9/10/2020	Annual	9/10/2021	AP1
-	LTx1	Licensed Transmitter Cable Set	5/1/2020	Annual	5/1/2021	LTx1
-	LTx2	Licensed Transmitter Cable Set	9/16/2020	Annual	9/16/2021	LTx2
-	LTx3	LIcensed Transmitter Cable Set	8/28/2020	Annual	8/28/2021	LTx3
Keysight Technologies	N9020A	MXA Signal Analyzer	8/14/2020	Annual	8/14/2021	US46470561
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	8/17/2020	Annual	8/17/2021	MY52350166
Anritsu	MT8821C	Radio Communication Analyzer		N/A		6200901190
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
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
Keysight Technologies	N9030B	PXA Signal Analyzer, Multi-touch	9/17/2020	Annual	9/17/2021	MY57141001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11208010032
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11403100002
Rohde & Schwarz	CMU200	Base Station Simulator		N/A		836536/0005
Rohde & Schwarz	CMW500	Radio Communication Tester		N/A		100976
Rohde & Schwarz	CMW500	Radio Communication Tester		N/A		112347
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	7/15/2020	Annual	7/15/2021	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/9/2020	Annual	9/9/2021	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/10/2020	Annual	8/10/2021	103200
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107

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 2nd 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 analzyer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80).

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7.0 TEST RESULTS

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
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FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	WCDMA, LTE, 5G NR

Test Condition	Test Description	FCC Part Section(s)	RSS Section(s)	Test Limit	Test Result	Reference
Δ	Occupied Bandwidth	2.1049	RSS-Gen(6.7)	N/A	PASS	Section 7.2
JCTEI	Conducted Band Edge / Spurious Emissions	2.1051, 27.53	RSS-139(6.6)	> 43 + 10log10(P[Watts]) at Band Edge and for all out-of- band emissions	PASS	Sections 7.3, 7.4
CONDUCTED	Transmitter Conducted Output Power	2.1046	RSS-139(4.1)	N/A	PASS	See RF Exposure Report
U	Frequency Stability	2.1055, 27.54	RSS-139(6.4)	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 12/17)	27.50(b)(10)	RSS-130(4.4)	< 3 Watts max. ERP < 5 Watts max. EIRP	PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 13)	27.50(c)(10)	RSS-130(4.4)	< 3 Watts max. ERP < 5 Watts max. EIRP	PASS	Section 7.6
8	Equivalent Isotropic Radiated Power (WCDMA)				PASS	Section 7.6
RADIATED	Equivalent Isotropic Radiated Power (NR Band n66)	27.50(d)(4)	RSS-139(6.5)	< 1 Watts max. EIRP	PASS	Section 7.6
RA	Equivalent Isotropic Radiated Power (LTE Band 4/66)				PASS	Section 7.6
	Radiated Spurious Emissions (LTE Band 13)	2.1053, 27.53(f)	RSS-139(6.6)	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 - 1610 MHz	PASS	Section 7.7
	Radiated Spurious Emissions	2.1053, 27.53	RSS-139(6.6)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions	PASS	Section 7.7

Table 7-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in Section 7.0 were taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is

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7.2

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 7-1. Test Instrument & Measurement Setup

Test Notes

None.

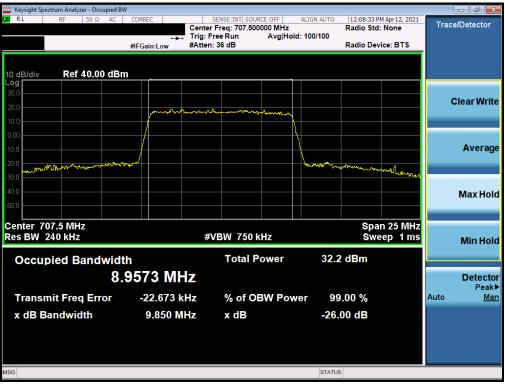
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LTE Band 12/17

Keysight Spectrum Analyzer - Occupied E					
LX/ R L RF 50 Ω AC	CORREC	SENSE:INT SOURCE OFF Center Freq: 707.500000 MHz	ALIGN AUTO	12:07:35 PM Apr 12, 2021 Radio Std: None	Trace/Detector
			ld: 100/100	Radio Device: BTS	
	#IFGain:Low	#Atten: 36 db		Radio Device: B13	
10 dB/div Ref 40.00 dB	<u>m</u>				
30.0					Clear Write
20.0		have marked and the second			Clear Write
10.0	/				
0.00					
-10.0					Average
-20.0	-man -		- monther war	and a second and a s	
-30.0					
-40.0					Max Hold
-50.0					
Center 707.5 MHz				Span 25 MHz	
Res BW 240 kHz		#VBW 750 kHz		Sweep 1 ms	Min Hold
					Minthold
Occupied Bandwid		Total Power	33.2	dBm	
9	.0222 M⊦	lz			Detector
Transmit Freq Error	-11.184 k	KHz % of OBW Pov	ver 00	.00 %	Peak▶ Auto Man
					Mari
x dB Bandwidth	9.877 M	IHz x dB	-26.0	00 dB	
MSG			STATUS		

Plot 7-1. Occupied Bandwidth Plot (LTE Band 12/17 - 10MHz QPSK - Full RB)



Plot 7-2. Occupied Bandwidth Plot (LTE Band 12/17 - 10MHz 16-QAM - Full RB)

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Keysight Spectrum Analyzer - Occupied BW	1				
L <mark>X/</mark> RL RF 50Ω AC	CORREC	SENSE:INT SOURCE OFF	ALIGN AUTO	12:22:32 PM Apr 12, 2021 Radio Std: None	Trace/Detector
	Tri	g: Free Run Avg Hold:	: 100/100		
	#IFGain:Low #A	tten: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00 dBn	n				
30.0					
20.0					Clear Write
10.0		and a second and a second and a second and a second a s			
0.00	/				
-10.0					Average
20.0	m _		Lamoren	~~~~	, j
-30.0				a man when we are	
-40.0					
-50.0					Max Hold
-50.0					
Center 707.5 MHz				Span 12.5 MHz	
Res BW 120 kHz		#VBW 390 kHz		Sweep 1 ms	Min Hold
Occupied Bandwidt	h	Total Power	33.0	dBm	
			00.0	abiii	
4.	5048 MHz				Detector Peak►
Transmit Freq Error	-8.698 kHz	% of OBW Powe	er 99.	00 %	Auto <u>Man</u>
x dB Bandwidth	5.018 MHz	x dB	-26.0	0 dB	
	3.010 MHZ	A UD	-20.0	U UB	
MSG			STATUS		





Plot 7-4. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz 16-QAM - Full RB)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BV RL RF 50 Ω AC	CORREC	SENSE:INT SOURCE OFF	ALIGN AUTO 12:51:54	PM Apr 12, 2021	
KE KP SU SZ AC	C	Center Freq: 707.500000 MHz	Radio St		Trace/Detector
		Trig: Free Run Avg Hold: #Atten: 36 dB		evice: BTS	
	#IFGain:Low #	Allen. 36 dB	Radio D	evice. B13	
0 dB/div Ref 40.00 dBn	n				
og					
					Clear Writ
20.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	·····			
0.0					
.00					
0.0					Averag
0.0			m		
0.0				• • • • • • •	
0.0					
					Max Ho
0.0					
enter 707.5 MHz			Sp	an 7.5 MHz	
Res BW 75 kHz		#VBW 240 kHz	Sweep	1.333 ms	Min Ho
					WIIIIIO
Occupied Bandwidt	h	Total Power	32.9 dBm		
2	7067 MHz	,			Detect
Σ.		_			Peak
Transmit Freq Error	-3.628 kHz	z % of OBW Powe	er 99.00 %	F	Auto <u>Ma</u>
x dB Bandwidth	3.022 MHz	z xdB	-26.00 dB		
	5.022 MIT		-20.00 00		
G			STATUS		

Plot 7-5. Occupied Bandwidth Plot (LTE Band 12 - 3MHz QPSK - Full RB)



Plot 7-6. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 16-QAM - Full RB)

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



Plot 7-8. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 16-QAM - Full RB)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 13



Plot 7-9. Occupied Bandwidth Plot (LTE Band 13 - 10MHz QPSK - Full RB)

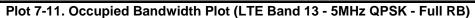


Plot 7-10. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BW							
LXI RE 50Ω AC	CORREC Cent	SENSE:INT SOURCE OFF	ALIGN AUTO	11:27:02 Al Radio Std:	M Apr 12, 2021	Tracel	Detector
	🛶 Trig:		ld: 100/100	Radio Dev			
	#IFGain:Low #Atte	en: 36 dB		Radio Dev	ICE: BIS		
10 dB/div Ref 40.00 dBm Log							
30.0							
20.0	C and the first	war war war and the second				C	lear Write
10.0		•••••••••••••••••••••••••••••••••••••••					
0.00	_/		<u>\</u>				
-10.0	~		human	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Average
-20.0 -					mr.		-
-30.0							
-40.0							MaxUala
-50.0							Max Hold
Center 782 MHz				Span	12.5 MHz		
Res BW 120 kHz		#VBW 390 kHz		Swe	ep 1 ms		Min Hold
Occupied Bandwidth	,	Total Power	33.4	dBm			
4.:	5218 MHz						Detector Peak
Transmit Freq Error	7.091 kHz	% of OBW Pov	ver 99	.00 %		Auto	Mar
x dB Bandwidth	5.070 MHz	x dB	-26	00 dB			
	0.010 11112	A GB	20.				
ISG			STATUS				





Plot 7-12. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 16-QAM - Full RB)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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WCDMA AWS

Keysight Spectrum Analyzer - Occupied BW					
🗶 RL RF 50Ω AC	CORREC Center	SENSE:INT SOURCE OFF A er Freq: 1.732600000 GHz	LIGN AUTO 03:55:22 P Radio Std	M Apr 21, 2021 None	Trace/Detector
	Trig:	Free Run Avg Hold:			
	#IFGain:Low #Atte	n: 36 dB	Radio Dev	ice: BTS	
10 dB/div Ref 40.00 dBm					
30.0					.
20.0		mar human human			Clear Write
10.0	/~~				
0.00	/				
-10.0					Average
-20.0	Jan	~~~~	Marshanghanghanghanghanghanghanghanghang berken kan kan kan kan kan kan kan kan kan ka	When and	
-30.0				ATTACK AND A	
-40.0					Max Hold
-50.0					maxmona
				4.5 BALL-	
Center 1.733 GHz Res BW 150 kHz	,	VBW 1.5 MHz		n 15 MHz ep 1 ms	
				ap The	Min Hold
Occupied Bandwidt	h	Total Power	31.9 dBm		
4	1909 MHz				Detector
					Peak▶
Transmit Freq Error	8.998 kHz	% of OBW Powe	r 99.00 %		Auto <u>Mar</u>
x dB Bandwidth	4.795 MHz	x dB	-26.00 dB		
ASG			STATUS		

Plot 7-13. Occupied Bandwidth Plot (WCDMA, Ch. 1413)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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LTE Band 66/4 -

🔤 Keysight Spectrum Analyzer - Occupied BW							- @ X
00 RL RF 50 Ω AC	i 😛 Tr	sense:INT SOURCE OFF enter Freq: 1.745000000 GHz rig: Free Run Avg Hol Atten: 36 dB	ALIGN AUTO	08:53:11 A Radio Std: Radio Dev		Trace	/Detector
10 dB/div Ref 40.00 dBm Log 30.0 20.0						c	lear Write
0.00 -10.0 -20.0 -30.0			Marianalight	Had-mplan para	ndikenAgrik		Average
-40.0							Max Hold
Center 1.745 GHz Res BW 470 kHz Occupied Bandwidtl		#VBW 1.6 MHz Total Power	24.9	Spa Swe dBm	n 50 MHz ep 1 ms		Min Hold
	' .973 MHz		01.0				Detector Peak▶
Transmit Freq Error x dB Bandwidth	8.179 kHz 19.66 MHz			0.00 % 00 dB		Auto	<u>Man</u>
MSG			STATUS	5			

Plot 7-14. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz QPSK - Full RB -)



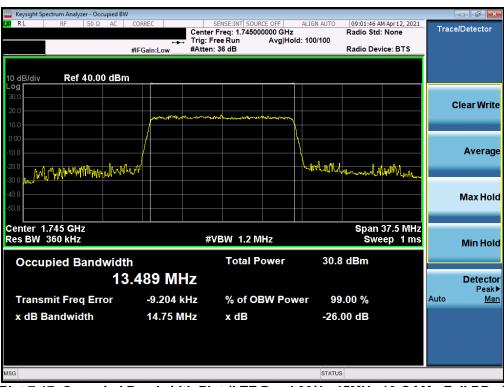
Plot 7-15. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB -)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BV							
RL RF 50Ω AC	T	SENSE:INT SOURCE OFF Center Freq: 1.745000000 GHz Frig: Free Run Avg Hol (Atten: 36 dB	ALIGN AUTO d: 100/100	Radio Std: Radio Dev		Trace/D	etector
0 dB/div Ref 40.00 dBr	n						
0.0	from the second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				Cle	ar Writ
00 0.0 0.0 0.0 0.0 0 0 0 0 0 0 0 0 0 0	p. and f		h www.m.m.m.	nt. Marina fr			Avera
						N	lax Ho
enter 1.745 GHz es BW 360 kHz		#VBW 1.2 MHz		Span Swe	37.5 MHz ep 1 ms	N	1in Ho
Occupied Bandwidt	th 3.529 MHz	Total Power	31.8	dBm			Detect
Transmit Freq Error x dB Bandwidth	19.504 kHz 14.87 MHz			.00 % 00 dB		Auto	Ma Ma
3			STATUS				





Plot 7-17. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 16-QAM - Full RB -)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied	BW				
LX/RL RF 50Ω AC	CORREC	SENSE:INT SOURCE OFF	ALIGN AUTO 09:08:52 A Radio Sto	AM Apr 12, 2021 : None	Trace/Detector
		:FreeRun Avg Hol en:36dB	ld: 100/100 Radio De	vice: BTS	
	#IFGain:Low #Att		Radio De	vice. D13	
10 dB/div Ref 40.00 dB	m .				
Log 30.0					
20.0					Clear Write
10.0	monorma	men marken and the second			
0.00	/				
-10.0	/		_ <u>_</u>		Average
-20.0	w1,~1		Warrally and war	WWWWW .	
-30'0 4 . 44 IMMALA 1 .L.	• • • • • • • • • • • • • • • • • • •			. U. Parado	
-40.0					Max Hold
-50.0					
Center 1.745 GHz			Spa	an 25 MHz	
Res BW 240 kHz		#VBW 750 kHz	Sw	eep 1 ms	Min Hold
Occupied Bandwid	lth	Total Power	31.6 dBm		
	.0142 MHz				Detector
					Peak▶
Transmit Freq Error	3.610 kHz	% of OBW Pov	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	9.863 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-18. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz QPSK - Full RB -)



Plot 7-19. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB -)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BW							
LX/ RL RF 50Ω AC	CORREC	SENSE:INT SOUR		AUTO 09:23:23 AN Radio Std:	1 Apr 12, 2021 None	Trace/Dete	ector
	• • •	Trig: Free Run #Atten: 36 dB	Avg Hold: 100/				
	#IFGain:Low	#Atten: 36 ub		Radio Devi	Ce: BIS		
10 dB/div Ref 40.00 dBn	n						
30.0							
20.0						Clear	Write
10.0			m				
0.00			\\				
-10.0						Av	erage
-20.0 more poly ANN MANN			\.	MANNAM	~~~~~	_	_
-30.0	•••• ²				1 yhn		
-40.0						Max	x Hold
-50.0							
Center 1.745 GHz				Span '	12.5 MHz		
Res BW 120 kHz		VBW 1.2 MH	z	Swe	ep 1 ms	Mir	n Hold
Occupied Bandwidt	h	Total P	ower	31.5 dBm			
4.	5138 MH	Z					tector Peak▶
Transmit Freq Error	-3.684 kH	lz % of OE	SW Power	99.00 %		Auto	Man
x dB Bandwidth	5.028 MH	lz x dB		-26.00 dB			
MSG				STATUS			

Plot 7-20. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz QPSK - Full RB -)



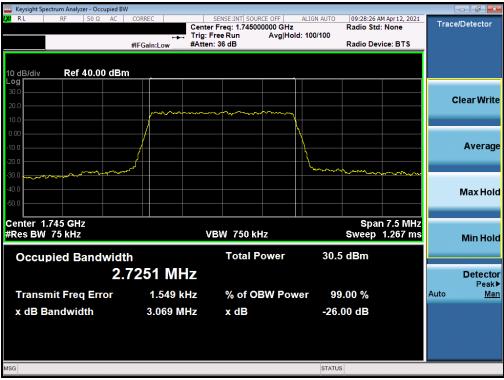
Plot 7-21. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 16-QAM - Full RB -)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BV RL RF 50 Ω AC	CORREC	Center Freq: 1.745000000 GHz	Radio Std	AM Apr 12, 2021 I: None	Trace/Detector
		Trig: Free Run Avg Hold: 10 #Atten: 36 dB	00/100 Radio Dev	vice: BTS	
0 dB/div Ref 40.00 dBr	n				
og 0.0 0.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Clear Writ
0.0					Averaç
					Max Ho
enter 1.745 GHz Res BW 75 kHz		VBW 750 kHz		n 7.5 MHz 1.267 ms	Min Ho
Occupied Bandwidt 2.	th 7070 MH2	Total Power Z	31.5 dBm		Detect
Transmit Freq Error x dB Bandwidth	-3.008 kH 3.013 MH		99.00 % -26.00 dB		Auto <u>M</u> i
G			STATUS		

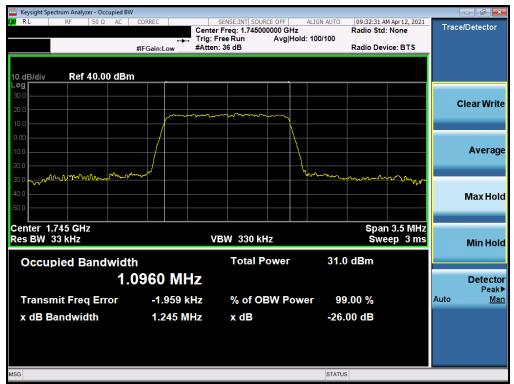
Plot 7-22. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz QPSK - Full RB -)



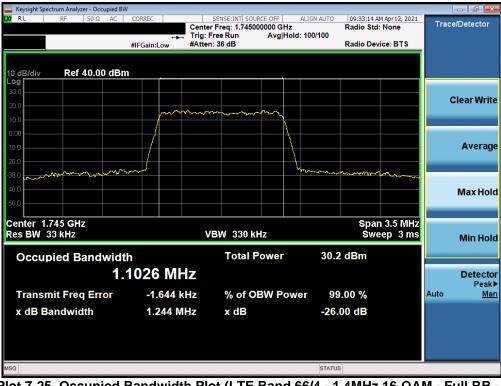
Plot 7-23. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB -)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Plot 7-24. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB -)



Plot 7-25. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz 16-QAM - Full RB -)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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NR Band n66



Plot 7-26. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz π/2 BPSK - Full RB)



Plot 7-27. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Spectrum Occupied	Analyzer 1	+					Trace	・絵
	GHT Input: RF Coupling: DC Align: Auto/No I	Input Z: 50 Ω Corr CCorr RF Freq Ref. Int (S) NFE. Off	Atten: 36 dB	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: Avg Hold: 10 Radio Std: N		Trace Type Clear / Write	Trace Control
1 Graph							Trace Average	Detector
Scale/Div	v 10.0 dB		Ref Value 30.00	dBm			Max Hold	
20.0								
10.0		former	maynesserver	the set of the second states			Min Hold	
0.00							Restart Max Hold	
-10.0		househouse			Whater.		Restart Max Hold	
-20.0	and White and the mound of	h mar all a second			- Walt	PEA		
-40.0								
-50.0								
-60.0								
	.74500 GHz 470.00 kHz		#Video BW 1.600	0 MHz	Sw	Span 50 MH eep 1.00 ms (1001 pts		
2 Metrics								
ľ	Occupied Bandwidth 19.0	19 MHz		Total Power		28.5 dBm		
	Transmit Freq Error x dB Bandwidth	-22.367 ki 20.78 Mi		% of OBW Powe x dB	er	99.00 % -26.00 dB		
	ってし	? Apr 22, 2021 8:27:53 AM	ÐA			: 🕃 - 🔀		

Plot 7-28. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-29. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz π/2 BPSK - Full RB)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Spectrum Ana Occupied BW	lyzer 1 🔹 🕂]					₽	Trace	·
	Coupling. DC Align: Auto/No RF	Corr CCorr Freq Ref: Int (S)	Atten: 36 dB	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: Avg Hold: 10 Radio Std: N		Trace Ty Clear	pe / Write	Trace Control
LU	r	NFE: Off							Detector
1 Graph Scale/Div 10.	T O dB	-	Ref Value 30.00	dBm			Trace	Average	
Log	бав	`	ter value 50.00	dBm			💿 Max I	Hold	
20.0		pm m	www.	water market			Min H	łold	
0.00		1					Restar	t Max Hold	
	march Mar	walan			howard	want on the man shifty me	PEAK.		
-40.0									
-50.0									
Center 1.7450 Res BW 360.0		#\	/ideo BW 1.200	0 MHz	l Swi	Span 37.5 eep 1.00 ms (1001			
2 Metrics									
Occu	upied Bandwidth 14.190 N	1Hz		Total Power		29.2 dBm			
	smit Freq Error Bandwidth	-3.487 kHz 15.21 MHz		% of OBW Pow x dB	ver	99.00 % -26.00 dB			
۲	<□?	Apr 22, 2021 8:29:40 AM	2000 2000				X		

Plot 7-30. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM QPSK - Full RB)



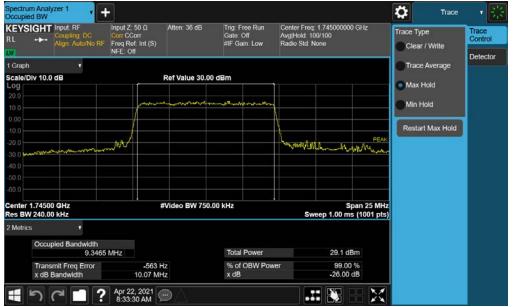
Plot 7-31. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Plot 7-32. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz π/2 BPSK - Full RB)



Plot 7-33. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Spectrum Analy Occupied BW	yzer 1 🕇 🕇						Trace	· 🔆
	Coupling: DC Align: Auto/No RF	Corr CCorr Freq Ref: Int (S)	Atten: 36 dB	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq Avg Hold: 10 Radio Std: N		Trace Type Clear / Write	Trace Control
LN .	-	NFE: Off						Detector
1 Graph Scale/Div 10.0	T dB	-	tef Value 30.00	dBm			Trace Average	
Log	Jub I	`	ter value 30.00				Max Hold	
20.0		row	up Mutan	mannyman			Min Hold	
0.00							Restart Max Hold	
-20.0	man	ann			mmoun	Munnanhanna		
-40.0								
-50.0								
Center 1.7450 Res BW 240.0		#\	/ideo BW 750.	00 kHz	Sw	Span 25 MH eep 1.00 ms (1001 pt		
2 Metrics								
Occu	pied Bandwidth 9.3036 M	MHz		Total Power		28.4 dBm		
	smit Freq Error Bandwidth	-5.107 kHz 9.959 MHz		% of OBW Pow x dB	≥r	99.00 % -26.00 dB		
۲	? 🗖 🔊	Apr 22, 2021 8:32:56 AM						

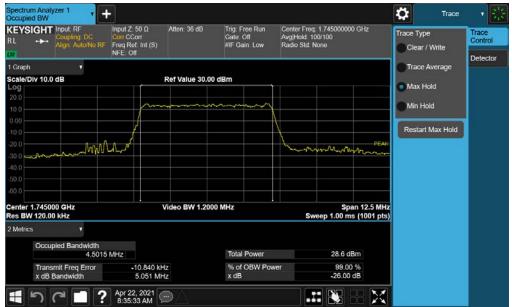
Plot 7-34. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-35. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz π/2 BPSK - Full RB)

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Plot 7-36. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM QPSK - Full RB)



Plot 7-37. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM 16QAM - Full RB)

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7.4 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

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

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

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 18GHz (separated into at least two plots per channel)
- 2. RBW ≥ 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 7-2. 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. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
- 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.

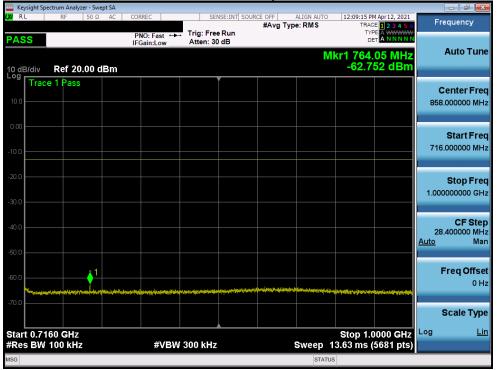
FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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LTE Band 12/17



Plot 7-38. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

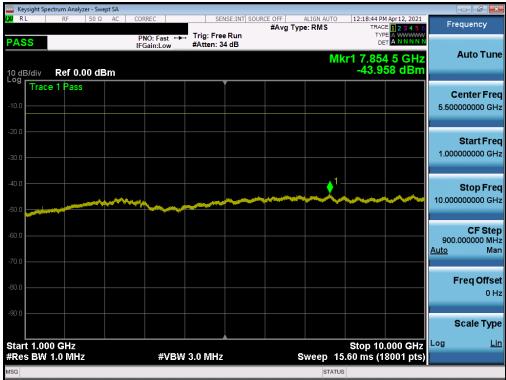


Plot 7-39. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

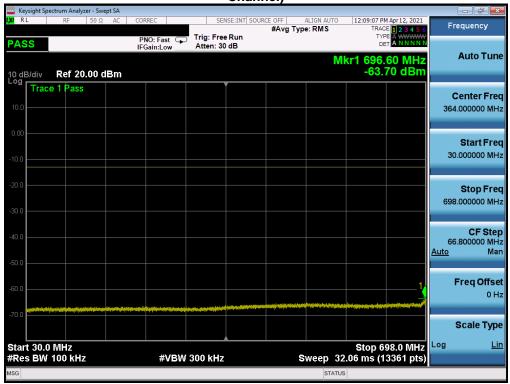
FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 22 of 122
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Plot 7-40. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-41. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMF711B	PCTEST *	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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		m Analyzer	- Swe	ot SA													_	- 6 -
L <mark>XI</mark> RL		RF	50 Ω	AC	CORR	EC			SENSE:INT	SOURC		ALIGN AU /pe: RMS	то	TRAC	M Apr 12, 2021 CE <mark>1 2 3 4 5</mark>	6	Frec	quency
PASS): Fast iin:Lov		Trig: Fi Atten:	ree Run 30 dB				Mile			-	А	uto Tun
10 dB/div Log	R	ef 20.0)0 d	Bm									IVIK	-62.7	52 dBn	ĥ		
10.0	ace 1	Pass																nter Fre
0.00																	858.0	
-10.0																		Start Fre 00000 MH
-20.0																		
-30.0																		Stop Fre 00000 GH
-40.0																		CF Ste
-50.0																A	28.4 <u>uto</u>	00000 MH Ma
-60.0			<u>^</u> 1														Fr	eq Offse
-70.0	adian (idaa)			an, iyan aya	putri tuji ko	***	na iti dinge	iner sering som der be		at for the state	nin in in in	hadidama kanaka jan	****	intlan jaar in	analan sahiri si sa ita	•		0 H
																		cale Typ
Start 0.7 #Res B\						#V	/BW	300 kH	z			Sweep	o 13	Stop 1. .63 ms (0000 GH: 5681 pts		og	Li
MSG												ST	ATUS					

Plot 7-42. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



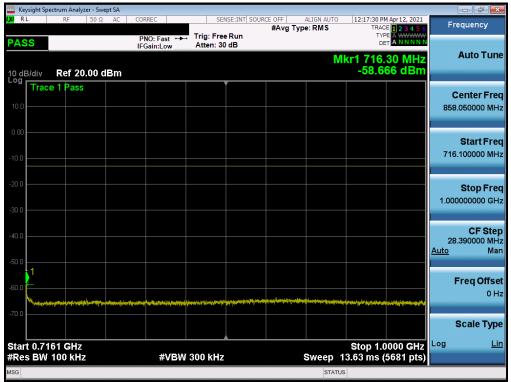
Plot 7-43. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Plot 7-44. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-45. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-46. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMF711B	PCTEST Proud to be part or the server	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 27 of 122
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LTE Band 13



Plot 7-47. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0)

	ectrum Analy										_	
RL	RF	50 Ω	AC	CORREC		SE	NSE:INT SC	ALIGN AUTO		M Apr 12, 2021	Fre	quency
PASS				PNO: IFGain	ast ⊶⊶ Low	Trig: Fre Atten: 3			TYI Di			
0 dB/div	Ref 20).00 dl	Bm					Γ	4 Mkr1 787. 60.2-	.00 MHz 83 dBm		Auto Tun
Trace	e 1 Pass						Ĭ				с	enter Fre
10.0											893.	500000 MH
												Start Fre
10.0											787.	000000 MH
20.0												
											1.000	Stop Fre
0.0												
10.0												CF Ste 300000 MI
50.0											<u>Auto</u>	Ma
1 50.0											F	req Offs
and the second sector	na			Phul-Pacture (199	erretert opp	fylasharin an	alere and a second	 مهاده وواليا أجهد والإفتياء	and a shirt of the second state			0 H
70.0											5	Scale Typ
tart 0.78	70 GHz								Ston_1	0000 GHz	Log	L
Res BW		z			#VBW	300 kHz		Sweep	10.16 ms (

Plot 7-48. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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	sight Spec	ctrum Analy	zer - Swe	pt SA									_	- 0
LXI RL		RF	50 Ω	AC	CORREC		SEN	ISE:INT SOUF		ALIGN AUTO		M Apr 12, 2021	Erec	uency
							Trig: Free		#Avg Typ	e:RMS	TRAC	E 1 2 3 4 5 6	1160	lucity
PAS	S				PNO: Fa	ast ⊶⊷	#Atten: 34				DE			
					IF Galli.L	.ow	written. o	TUD .					Δ	uto Tune
										IMI	(r1 1.56)	4 0 GHz		
10 dB	3/div	Ref 0.	00 dE	ßm							-49.	04 dBm		
Log	Trace	1 Pass)							
													Ce	nter Freq
-10.0													5.5000	00000 GHz
t														
-20.0														
-20.0														Start Freq
-30.0													1.0000	00000 GHz
-40.0														
-40.0		1											5	Stop Freq
	- A		A DESCRIPTION OF					No. of Concession, Name	a state of the second se	and the second second	The second second second		10.0000	00000 GHz
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ľ														
-60.0														CF Step
-00.0														00000 MHz
													Auto	Man
-70.0														
													_	
-80.0													Fr	eq Offset
00.0														0 Hz
-90.0														
													S	cale Type
Start	1.000) GHz									Stop 10	.000 GHz	Log	Lin
		1.0 MH:	z		7	VBW	3.0 MHz		S	weep 15		8001 pts)		
MSG										STATUS				
Mag										STATUS	>			

Plot 7-49. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0)

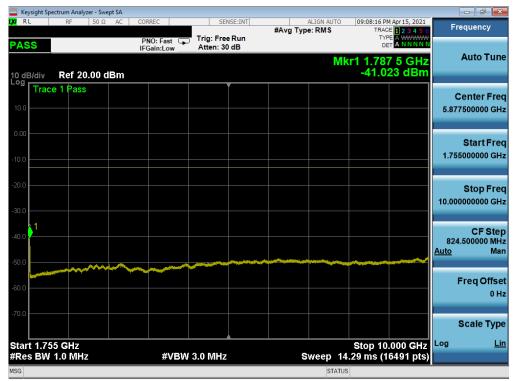
FCC ID: A3LSMF711B	PCTEST*	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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WCDMA AWS

	rum Analyzer - :										×
ASS	RF 50	Ω AC	CORREC	Trig: Free		#Avg Typ	ALIGN AUTO e: RMS	TRAC	Apr 15, 2021 E 1 2 3 4 5 6 E A WWWWWW T A N N N N N	Frequency	
0 dB/div	Ref 20.00) dBm	IFGain:Low _	Atten: 30	dB		MI	(r1 1.70		Auto T	un
-og Trace	1 Pass									Center F 867.500000 I	
10.00										Start F 30.000000 I	
20.0									1	Stop F 1.705000000	
0.0										CF S 167.500000 I <u>Auto</u>	
0.0	<u></u>	the second s	an	n Di ⁿ gan di kana da ka	ار معداد کار در ا علی برونونو	eraad at a stange of the address of the stand	a a a a a a a a a a a a a a a a a a a			Freq Off	fs 0
tart 0.030								Stop 1.7	'050 GHz	Scale T	yr F
Res BW 1	.0 MHz		#VB	W 3.0 MHz				.240 ms (3361 pts)		
G							STATUS	6			

Plot 7-50. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)



Plot 7-51. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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	ectrum Analy	zer - Swej	pt SA										
XI RL	RF	50 Ω	AC	CORREC	ast 😱	Trig: Free		#Avg Typ	ALIGN AUTO e: RMS	TRA	M Apr 15, 2021 CE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Fr	equency
PASS	Ref 0.0	00 dB	m	IFGain:L	.ow	Atten: 10) dB		M	kr1 18.33			Auto Tune
-10.0	e 1 Pass												Center Freq 0000000 GHz
-20.0												10.00	Start Freq 0000000 GHz
-40.0												20.00	Stop Fred
-60.0												1.00 <u>Auto</u>	CF Step 0000000 GHz Mar
.80.0													Freq Offse 0 Ha
-90.0										6 45 = 20		Log	Scale Type
Start 10.0 #Res BW		2		\$	¢νΒ₩	3.0 MHz		s	weep 2	Stop 20 25.33 ms (2	2112 GI12	209	
MSG									STAT	rus			

Plot 7-52. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)



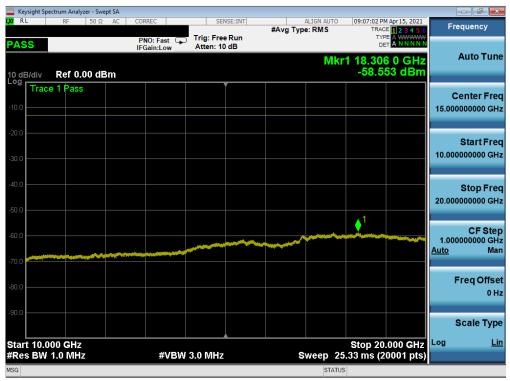
Plot 7-53. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

FCC ID: A3LSMF711B	PCTEST Prinzel to be part of @ likeneed	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 41 of 122
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	ectrum Analyz	ter - Swep	ot SA										
ARL PASS	RF	50 Ω	AC		ast 🖵	Trig: Fre		#Avg Ty	ALIGN AUTO	TRAC	M Apr 15, 2021 DE 1 2 3 4 5 6 DE A WWWWW T A N N N N N	Freq	uency
10 dB/div	Ref 20	.00 dl	Bm	IFGain:L	.ow	Atten: 3	80 dB		M	(r1 9.77	9 5 GHz 35 dBm	A	uto Tune
10.0 Trac	e 1 Pass												nter Freq 00000 GHz
-10.00													tart Freq 00000 GHz
20.0 30.0													top Fred
40.0			-					و المعاولة و المعالم الم			<u>^1</u>	824.50 <u>Auto</u>	CFStep 00000 MHz Mar
60.0		~~~										Fr	eq Offset 0 Hz
-70.0 Start 1.75										Stop 10		Sc Log	ale Type: <u>Lin</u>
#Res BW	1.0 MHz			;	¢VBW	3.0 MH:	z		Sweep 14		6491 pts)		

Plot 7-54. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)



Plot 7-55. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spe		zer - Swep	ot SA										- @ X
XI RL	RF	50 Ω	AC	CORREC	ast 🗔	Trig: Fr		#Avg	ALIGN AUTO Type: RMS	TRA	PM Apr 15, 2021 ACE 1 2 3 4 5 6 YPE A WWWWWW DET A N N N N N	Fr	equency
PASS	Ref 20	.00 dl	Bm	IFGain:L	.ow	Atten: 3	30 dB		Μ	kr1 1.70)0 5 GHz .62 dBm		Auto Tune
10.0 Trace	e 1 Pass												enter Fred .000000 MH:
10.00												30	Start Free
20.0												1.71	Stop Free
40.0											1	168 <u>Auto</u>	CF Ste 000000 MH. Ma
60.0 ****** **	an de calendaria da secondaria da secondaria da secondaria da secondaria da secondaria da secondaria da second			n, ad all so that a gran of a last			- UN 25 1990 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994	algen Algeran and an					Freq Offse 0 H
70.0						0.0 844				Stop 1	.7100 GHz		Scale Type Lii
#Res BW	1.0 MHz			7	¥VBW	3.0 MH	2		Sweep		(3361 pts)		

Plot 7-56. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)



Plot 7-57. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum											_	- 6 💌
X RL RF	50 Ω	AC	CORREC PNO: Fa	st 😱	Trig: Fre		#Avg Ty	ALIGN AUTO	TRA	M Apr 15, 2021 CE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Fred	quency
PASS	f 0.00 dB	m	IFGain:L	ow	Atten: 1) dB		Mk	r1 18.30	3 5 GHz 72 dBm	4	uto Tune
10.0	'ass											enter Free 000000 GH
30.0												Start Fre
40.0 50.0									1			Stop Fre 00000 GH
70.0		a lage the state					-				1.0000 <u>Auto</u>	CF Ste 000000 GH Ma
80.0											Fi	eq Offs 0 F
start 10.000 G									Stop 20	NOVO OTIZ	S: Log	cale Typ <u>Li</u>
Res BW 1.0 I	MHz		#	VBW	3.0 MHz			Sweep 2		20001 pts)		

Plot 7-58. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

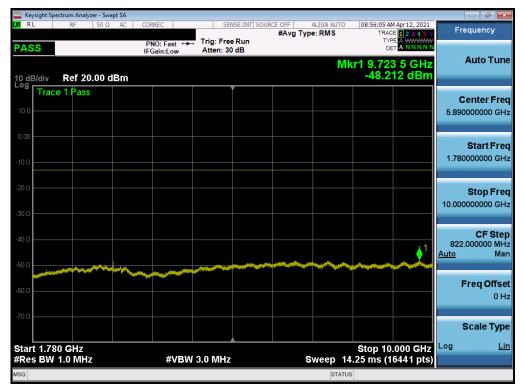
FCC ID: A3LSMF711B	PCTEST . Proved by the port of the element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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LTE Band 66/4



Plot 7-59. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-60. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMF711B	And to be peri d . identer	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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	ectrum Analyz												
LXI RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT SOU		ALIGN AUTO	TRAC	M Apr 12, 2021	Frequer	ncy
PASS				PNO: Fas IFGain:Lo	st ↔→	Trig: Free Atten: 10			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	TY	PE A WWWWW ET A N N N N N		
				IFGain:Lo	w	Atten. To	ub		Mkr	1 17 31	4 0 GHz	Auto	Tune
10 dB/div	Ref 0.0	00 dB	m							-60.7	4 0 GHz 81 dBm		
Log	e 1 Pass											Cente	r Freq
-10.0												15.0000000	
-20.0												Star	tFreq
-30.0												10.0000000	
-30.0													
-40.0												Stor	p Freq
												20.0000000	
-50.0													
-60.0												CI	F Step
-60.0						-	-	A way was a second	and the second second		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1.0000000 Auto	00 GHz Man
-70.0		_	<i>1940</i>		~							Auto	Iviali
												Fred	Offset
-80.0												Treq	0 Hz
-90.0													
-90.0												Scale	е Туре
										0 4 0 0		Log	Lin
Start 10.0 #Res BW				#	VBW	3.0 MHz			Sweep 25	Stop 20 5.33 ms (2		209	<u></u>
MSG									STATUS				
		-	-		-								

Plot 7-61. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-62. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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		ctrum Analy		pt SA									_	
l,XI RI	L	RF	50 Ω	AC	CORREC		SEI	ISE:INT SOU	RCE OFF	ALIGN AUTO		AM Apr 12, 2021 CE 1 2 3 4 5 6	Fi	requency
PAS	S				PNO: Fa	ast ⊶⊶ .ow	Trig: Free Atten: 30				נד			Auto Tune
10 dE Log	3/div	Ref 20).00 d	Bm						M	lkr1 9.71 -48.0	8 0 GHz)18 dBm		Autorune
	Trace	e 1 Pass												Center Freq
10.0													5.89	0000000 GHz
0.00														Start Freq
-10.0													1.78	0000000 GHz
-20.0														Stop Freq
-30.0													10.00	0000000 GHz
														CF Step
-40.0												∮ ¹	822 <u>Auto</u>	2.000000 MHz Man
-50.0			,	-			ليورد الجرير الايمر	te giphilitik gelet			and the second designed to the second designe			
-60.0														Freq Offset 0 Hz
-70.0														
														Scale Type
		0 GHz 1.0 MH	7		1	≇VBW	3.0 MHz		5	weep 1	Stop 10	0.000 GHz 16441 pts)	Log	Lin
MSG										STAT		e na proj		

Plot 7-63. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



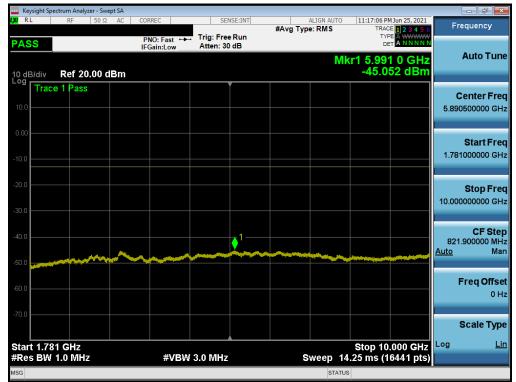
Plot 7-64. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMF711B	PCTEST Visual & le port of & clement	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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	ectrum Analy											(- 7
RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT SO		ALIGN AUTO		M Apr 12, 2021 CE 1 2 3 4 5 6	Fre	quency
\ss				PNO: F IFGain:	ast ⊶⊶ Low	Trig: Free Atten: 30		#Avg	ype. Kwis	TY			
dB/div	Ref 20).00 d	iBm						М	lkr1 1.70 -52.6	5 5 GHz 45 dBm		Auto Tur
^{og} Trac	e 1 Pass	;											enter Fre 000000 MF
0.00													Start Fre
0.0 0.0												1.710	Stop Fr 000000 G
).0											1,	168. <u>Auto</u>	CF Sto 000000 M M
	naariya Tayihaar	مور بندر الفر الفرانين		ور بارور و میکند. مرابع	lading down fly with a side	ni i sin sa	e stratenets a	innaligentariet.	angen enterneringen und	<i>الان الحيود الجاري المراجعية على المراجعية المالية المراجعية المالية المراجعة المراجعية المراجع المراجع المراجع</i> المراجع المراجع ا	and a state of the	F	r eq Offs 0 I
													Scale Ty
tart 0.03 Res BW					#\/D\A	3.0 MHz			Swoon		7100 GHz (3361 pts)	Log	L
355 DW	T.V IVIT.				#VDVV	3.0 IVIH2			Sweep	2.240 ms	(aao i pis)		

Plot 7-65. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-66. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High **Channel)**

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Plot 7-67. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

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NR Band n66

KEYSIGHT Input RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	#Avg Type: Power (Trig: Free Run	RMS 1 2 3 4 5 6 A WWWWW A N N N N N	Center Frequency 870.000000 MHz	Settings
Spectrum v cale/Div 10 dB	Topologica da	Ref Level 20.00	dBm		1.706 5 GHz 41.415 dBm	Span 1.68000000 GHz Swept Span Zero Span	
^o Trace 1 Pass						Full Span	
						Start Freq 30.000000 MHz	
						Stop Freq 1.710000000 GHz	
40.0					1	AUTO TUNE	
50.0	and the second		********	and the survey of the second	anner a ser a s	168.000000 MHz Auto Man	
						Freq Offset 0 Hz	
tart 0.0300 GHz Res BW 1.0 MHz		#Video BW 3.0	MHz		Stop 1.7100 GHz 24 ms (3361 pts)	X Axis Scale Log Lin	
	May 27, 2021 1:25:05 PM	$\bigcirc \triangle$				Signal Track (Sean Zoom)	1

Plot 7-68. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-69. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Low Channel)

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KEYSIGHT Input: RF RL Coupling: DC Align: Auto Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 10 dB	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	#Avg Type: Pow Trig: Free Run	er (RMS <mark>1</mark> 23456 A WW WW W A N N N N N	Center Frequency 15.000000000 GHz Span	Settings
Spectrum v cale/Div 10 dB		Ref Level 0.00	dBm	Mkr1	19.986 0 GHz -57.986 dBm	10.0000000 GHz Swept Span Zero Span	
Trace 1 Pass						Full Span	
30.0						Start Freq 10.000000000 GHz	
						Stop Freq 20.000000000 GHz	
					1	AUTO TUNE	
70.0			WMALLAND, Jon Land Mala Part (1994)			CF Step 1.000000000 GHz Auto Man	
						Freq Offset 0 Hz	
tart 10.000 GHz Res BW 1.0 MHz		#Video BW 3.0	MHz	Sweep ~	Stop 20.000 GHz 19.1 ms (20001 pts)	X Axis Scale Log Lin	_
- う つ	May 27, 2021 1:26:13 PM	\square				Signal Track (Span Zoom)	

Plot 7-70. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-71. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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L Align: Auto	Input Ζ: 50 Ω Corr CCorr Freq Ref. Int (S) NFE: Off	Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	#Avg Type: Power Trig: Free Run	r (RMS <mark>123456</mark> A WWWWW A N N N N N	Center Frequency 5.89000000 GHz Span	Settings
Spectrum v cale/Div 10 dB		Ref Level 20.00	dBm	Mkr1	9.770 5 GHz -42.397 dBm	8.22000000 GHz Swept Span Zero Span	
Trace 1 Pass						Full Span	
00						Start Freq 1.780000000 GHz	
						Stop Freq 10.000000000 GHz	
					1	AUTO TUNE	
0.0	~~~~	\sim			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	CF Step 822.000000 MHz	
0						Auto Man Freq Offset	
						0 Hz	
art 1.780 GHz les BW 1.0 MHz		#Video BW 3.0	MHz	Sweep ~15	Stop 10.000 GHz 5.4 ms (16441 pts)	X Axis Scale Log Lin	
501?	May 27, 2021 1:20:22 PM	\square				Signal Track (Soan Zoom)	1

Plot 7-72. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Mid Channel)



Plot 7-73. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMF711B	PCTEST Proad to be part of @ skener	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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EYSIGHT Input: RF L +++ Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	#Avg Type: Power Trig: Free Run	(RMS 1 2 3 4 5 6 A WWWWW A N N N N N	Center Frequency 870.000000 MHz Span	Settings
Spectrum v cale/Div 10 dB		Ref Level 20.00	dBm		1.684 0 GHz -50.505 dBm	1.68000000 GHz Swept Span Zero Span	
¹ Trace 1 Pass						Full Span	
10.0						Start Freq 30.000000 MHz	
						Stop Freq 1.710000000 GHz	
0.0						AUTO TUNE	
				مود موجود ورو مراجع المراجع الم		CF Step 168.000000 MHz	
50.0	an a					Man Freq Offset	
						0 Hz X Axis Scale	
tart 0.0300 GHz Res BW 1.0 MHz		#Video BW 3.0	MHz	Sweep 2	Stop 1.7100 GHz 2.24 ms (3361 pts)	Log Lin	

Plot 7-74. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - High Channel)



Plot 7-75. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - High Channel)

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KEYSIGHT Input RF R L + Coupling DC Align Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 10 dB	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	#Avg Type: F Trig: Free Ru	Power (RMS 1 2 3 4 5 In A WW WW A N N N N	15.00000000 GHz
Spectrum v Scale/Div 10 dB		Ref Level 0.00	dBm	Mk	r1 19.191 0 GH -57.687 dBr	Z 10.0000000 GHz
10.0 Trace 1 Pass						Zero Span Full Span
						Start Freq 10.000000000 GHz
						Stop Freq 20.00000000 GHz
50.0 60.0			والمراجع وا		·····	AUTO TUNE CF Step
70.0						1.00000000 GHz Auto Man
90.0						Freq Offset 0 Hz
Start 10.000 GHz Res BW 1.0 MHz		#Video BW 3.0	MHz	Sweep	Stop 20.000 GF p ~19.1 ms (20001 pt	
- n C - 1	May 27, 2021 1:33:55 PM	\square			: 💽 🕂 🔀	Signal Track (Sean Zoom)

Plot 7-76. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - High Channel)

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7.5 Band Edge Emissions at Antenna Terminal

Test Overview

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

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

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW \geq 1% of the emission bandwidth
- 4. VBW \geq 3 x RBW
- 5. Detector = RMS
- 6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

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Test Notes

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

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

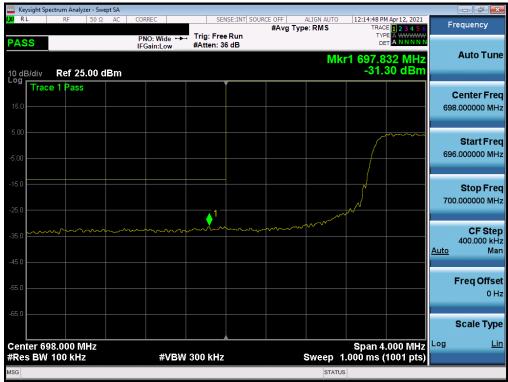
Per 27.53(c)(5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

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

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LTE Band 12/17



Plot 7-77. Lower Band Edge Plot (LTE Band 12 - 10MHz QPSK – Full RB)



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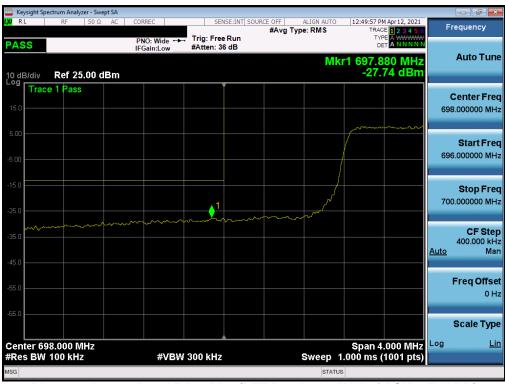
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🚾 Keysight Spectrum Analyzer - Swept					
LXI RL RF 50Ω	AC CORREC	SENSE:INT SOURCE OF	F ALIGN AUTO	12:15:07 PM Apr 12, 2021 TRACE 1 2 3 4 5 6	Frequency
PASS		rig: Free Run Atten: 36 dB		DET A NNNN	Auto Turo
10 dB/div Ref 25.00 dB	m		Mkr	1 716.004 MHz -27.52 dBm	Auto Tune
15.0 Trace 1 Pass					Center Freq 716.000000 MHz
5.00	~~~~~				Start Freq 714.000000 MHz
-15.0	M.				Stop Freq 718.000000 MHz
-35.0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	CF Step 400.000 kHz <u>Auto</u> Man
-55.0					Freq Offset 0 Hz
-65.0					Scale Type
Center 716.000 MHz #Res BW 100 kHz	#VBW 30	0 kHz	Sweep 1.	Span 4.000 MHz 000 ms (1001 pts)	Log <u>Lin</u>
MSG			STATUS		

Plot 7-79. Upper Band Edge Plot (LTE Band 12/17 - 10MHz QPSK – Full RB)



Plot 7-80. Lower Band Edge Plot (LTE Band 12 - 5MHz QPSK – Full RB)

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www.www.www.com.com/www.com/www.com/www.com/www.com/www.com/www.com/www.com/www.com/www.com/www.com/www.com/ww					
LX/ RL RF 50Ω	2 AC CORREC	SENSE:INT SOURCE C	ALIGN AUTO	12:50:51 PM Apr 12, 2021 TRACE 1 2 3 4 5 6	Frequency
PASS	PNO: Wide ↔ IFGain:Low	Trig: Free Run #Atten: 36 dB		TYPE A WWWW DET A NNNN	Auto Tune
10 dB/div Ref 25.00	dBm		Mkr	1 703.988 MHz -23.11 dBm	Auto Tune
15.0 Trace 1 Pass				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Center Freq 704.000000 MHz
-5.00					Start Fred 702.000000 MHz
-15.0		1			Stop Freq 706.000000 MHz
-35.0					CF Step 400.000 kHz <u>Auto</u> Mar
-55.0					Freq Offse 0 H:
-65.0					Scale Type
Center 704.000 MHz #Res BW 100 kHz	#VBW	300 kHz	Sweep 1.	Span 4.000 MHz 000 ms (1001 pts)	Log <u>Lin</u>
MSG			STATUS		

Plot 7-81. Lower Band Edge Plot (LTE Band 17 - 5MHz QPSK – Full RB)



Plot 7-82. Upper Band Edge Plot (LTE Band 12/17 - 5MHz QPSK – Full RB)

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RL RF	50 Ω AC	CORREC PNO: Wide ↔→→ IFGain:Low		Run	g Type: RMS	TRAC	M Apr 12, 2021 DE 1 2 3 4 5 6	Fi	requency
	15 00 dBm			Run	g type. tuno	TYF			
						DE			
10 dB/div Ref 2	25.00 dBm				Μ	kr1 697.8 -26.	84 MHz 92 dBm		Auto Tune
Trace 1 Pas	S		Ĭ						Center Freq
15.0							·····	698	3.000000 MHz
5.00						/			Start Freq
-5.00								696	5.000000 MHz
-15.0									Stop Freq
-25.0			1	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m			700).000000 MHz
-35.0									CF Step 400.000 kHz
-45.0								<u>Auto</u>	Mar
-55.0									Freq Offset
									0 Hz
-65.0									Scale Type
Center 698.000 #Res BW 100 kl		#\/B\M	300 kHz		Sween	Span 4 1.000 ms (1000 1911 12	Log	Lin
ISG			500 KHZ		SWEEP		roor pts)		

Plot 7-83. Lower Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB)



Plot 7-84. Upper Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB)

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Plot 7-85. Lower Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB)



Plot 7-86. Upper Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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LTE Band 13

🔤 Keysight Spo													
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC		S	ENSE:INT SOU		ALIGN AUTO		M Apr12, 2021	F	requency
PASS				PNO: \ IFGain	Wide ↔ :Low	Trig: Fr #Atten:				TY D			
10 dB/div Log	Ref 25	5.00 d	Bm						Mł	r1 776.9 -25.	96 MHz 04 dBm		Auto Tune
Trac	e 1 Pass												Center Freq
15.0												77	7.000000 MHz
5.00								~					Start Fred
-5.00								ļ/				77	5.000000 MHz
-15.0													
							ر سم ا	¢.				77	Stop Fred 9.000000 MHz
-25.0	~~~~	<i>~~~~</i>		~~~~	~~~~~		hors						05.04
-35.0												Auto	CF Step 400.000 kHz Mar
-45.0												Auto	WEI
-55.0													Freq Offset
-65.0													0112
													Scale Type
Center 77 #Res BW					#VBW	300 kH:	7		Sweep	Span 4	.000 MHz (1001 pts)	Log	Lin
MSG									STATU		nee pro/		

Plot 7-87. Lower Band Edge Plot (LTE Band 13 - 10MHz QPSK – Full RB)



Plot 7-88. Lower Emission Mask Plot (LTE Band 13 - 10MHz QPSK - Full RB)

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	ectrum Analyz	er - Swep	t SA										
XI RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT SO		ALIGN AUTO	11:26:06 A	M Apr12, 2021	F	requency
PASS				PNO: W IFGain:L	ide ↔ .ow	Trig: Free #Atten: 3		#AVg 1	ype. Kwo	TYF			
10 dB/div Log	Ref 25	.00 dE	Зm						Mł	r1 787.0 -21.	08 MHz 80 dBm		Auto Tune
15.0 Trac	e 1 Pass												Center Freq 7.000000 MHz
-5.00		\$ ~~~ ~~		~~~~···								78:	Start Fred 3.000000 MH2
-15.0						h	1	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		79 [.]	Stop Freq 1.000000 MHz
-35.0												<u>Auto</u>	CF Step 800.000 kH: Mar
-55.0													Freq Offse 0 H
-65.0													Scale Type
Center 78 #Res BW				#	¢VBW	300 kHz			Sweep	Span 8 1.000 ms (1000 1911 12	Log	Lin
MSG									STATU	IS			

Plot 7-89. Upper Band Edge Plot (LTE Band 13 - 10MHz QPSK – Full RB)



Plot 7-90. Upper Emission Mask Plot (LTE Band 13 - 10MHz QPSK – Full RB)

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	ectrum Analyzer - S						
XI RL	RF 50	Ω AC	CORREC	SENSE:INT SC	URCE OFF ALIGN AUT #Avg Type: RMS	0 12:03:53 PM Apr 12, 2021 TRACE 1 2 3 4 5 6	Frequency
PASS			PNO: Wide ↔ IFGain:Low	Trig: Free Run #Atten: 36 dB	#ring Type.rine		
10 dB/div	Ref 25.00	dBm			N	lkr1 776.996 MHz -22.01 dBm	Auto Tune
15.0 Trace	e 1 Pass					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Center Fred 777.000000 MH
5.00							Start Free 775.000000 MH
-15.0		~~~~					Stop Free 779.000000 MH:
35.0							CF Step 400.000 kH <u>Auto</u> Mar
55.0							Freq Offse 0 H
65.0							Scale Typ
Center 77 Res BW	7.000 MHz 100 kHz		#VBW	300 kHz	Sweep	Span 4.000 MHz 1.000 ms (1001 pts)	Log <u>Li</u>
ISG						TUS	

Plot 7-91. Lower Band Edge Plot (LTE Band 13 - 5MHz QPSK – Full RB)



Plot 7-92. Lower Emission Mask Plot (LTE Band 13 - 5MHz QPSK – Full RB)

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