

PCTEST

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PART 27 MEASUREMENT REPORT

A3LSMF711B

Samsung Electronics Co., Ltd.

Applicant Name:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea

Date of Testing: 4/21/2021 - 6/25/2021 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.:

1M2104130035-05.A3L

FCC ID:

Application Type: Model: EUT Type: FCC Classification: FCC Rule Part: Test Procedure(s):

Applicant Name:

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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				EI	RP	
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator
	20 MHz	QPSK	2506.0 - 2680.0	0.348	25.41	18M0G7D
	20 1011 12	16QAM	2506.0 - 2680.0	0.286	24.56	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.401	26.03	13M5G7D
ITE Rond (11/DC2)		16QAM	2503.5 - 2682.5	0.327	25.15	13M5W7D
LTE Band 41(PC2)	10 MHz	QPSK	2501.0 - 2685.0	0.396	25.97	9M00G7D
		16QAM	2501.0 - 2685.0	0.311	24.93	8M99W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.395	25.97	4M52G7D
		16QAM	2498.5 - 2687.5	0.344	25.37	4M51W7D
	20 MH-	QPSK	2506.0 - 2680.0	0.191	22.82	18M0G7D
	20 MHz	16QAM	2506.0 - 2680.0	0.148	21.71	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.186	22.70	13M6G7D
LTE Band 41(PC3)		16QAM	2503.5 - 2682.5	0.163	22.13	13M5W7D
	10 MH-	QPSK	2501.0 - 2685.0	0.176	22.46	9M03G7D
	10 MHz	16QAM	2501.0 - 2685.0	0.142	21.52	8M99W7D
		QPSK	2498.5 - 2687.5	0.191	22.82	4M51G7D
	5 MHz	16QAM	2498.5 - 2687.5	0.150	21.77	4M51W7D

EUT Overview

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1.0 INTRODUCTION

1.1 Scope

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

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST 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 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 Capabilities

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

Deviation from Measurement Procedure.....None

3.2 Radiated Power and Radiated Spurious Emissions

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

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

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

P_{d [dBm]} = P_{g [dBm]} - 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 $P_{g \text{ [dBm]}}$ – cable loss [dB].

For radiated spurious emissions measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

$$\begin{split} E_{[dB\mu V/m]} &= Measured \ amplitude \ level_{[dBm]} + 107 + Cable \ Loss_{[dB]} + Antenna \ Factor_{[dB/m]} \\ And \\ EIRP_{[dBm]} &= E_{[dB\mu V/m]} + 20logD - 104.8; \ where \ D \ is the measurement \ distance \ in \ meters. \end{split}$$

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.

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

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4.0 MEASUREMENT UNCERTAINTY

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

Contribution	Expanded Uncertainty (±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.

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

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz G = Phase Modulation 7 = Quantized/Digital Info D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz W = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Data transmission, telemetry, telecommand

Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

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

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7.0 TEST RESULTS

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMF711B
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)

LTE

Mode(s):

Test Condition	Test Description	FCC Part Section(s)	RSS Section(s)	Test Limit	Test Result	Reference
	Occupied Bandwidth	2.1049	RSS-Gen(6.7)	N/A	PASS	Section 7.2
ED	Conducted Band Edge / Spurious Emissions (LTE Band 41)	2.1051, 27.53(m)	RSS-199(4.5)	Undesirable emissions must meet the	PASS	Sections 7.3, 7.4
CONDUCTED	Conducted Band Edge / Spurious Emissions (LTE Band 38)	2.1051, 27.55(m)	K33-199(4.5)	limits detailed in 27.53(m)	PASS	Sections 7.3, 7.4
CON	Transmitter Conducted Output Power	2.1046	RSS-199(4.4)	N/A	PASS	See RF Exposure Report
	Frequency Stability	2.1055, 27.54	RSS-199(4.3)	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 41)	27.50(h)(2)	RSS-199(4.4)	< 2 Watts max FIRP	PASS	Section 7.6
RADIATED	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 38)	27.50(1)(2)	K33-199(4.4)	< 2 Walls max. Eike	PASS	Section 7.6
RAI	Radiated Spurious Emissions (LTE Band 41)	2.1053, 27.53(m)	RSS-199(4.5)	Undesirable emissions must meet the	PASS	Section 7.7
	Radiated Spurious Emissions (LTE Band 38)	2.1033, 27.33(11)	R33-199(4.3)	limits detailed in 27.53(m)	PASS	Section 7.7

Table 7-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST EMC Software Tool Beta 8.

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7.2 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

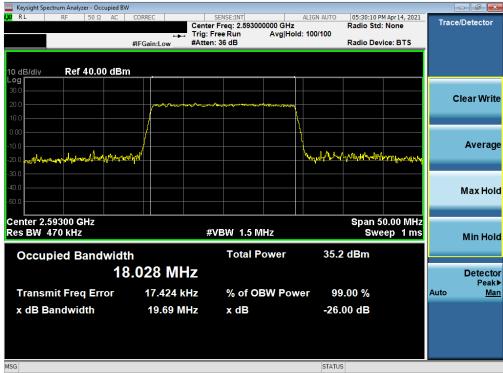
Test Notes

None.

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LTE Band 41(PC2)



Plot 7-1. Occupied Bandwidth Plot (LTE Band 41(PC2) - 20MHz QPSK - Full RB)



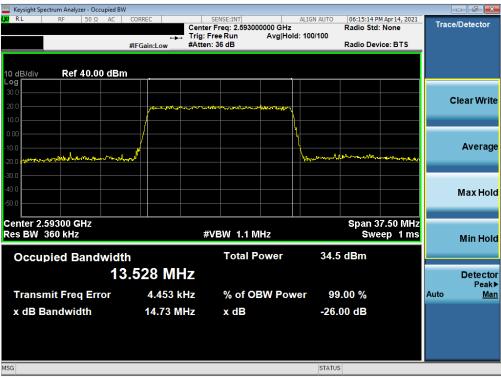
Plot 7-2. Occupied Bandwidth Plot (LTE Band 41(PC2) - 20MHz 16-QAM - Full RB)

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50								STATU	5			

Plot 7-3. Occupied Bandwidth Plot (LTE Band 41(PC2) - 15MHz QPSK - Full RB)



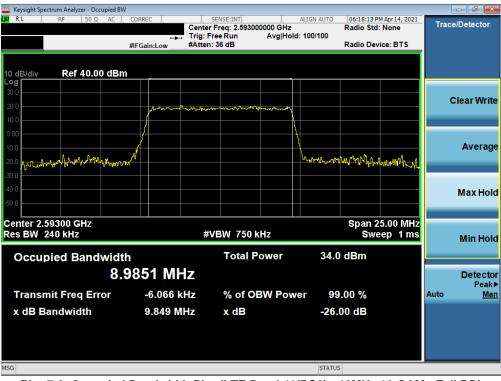
Plot 7-4. Occupied Bandwidth Plot (LTE Band 41(PC2) - 15MHz 16-QAM - Full RB)

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Keysight Spectrum Analyzer - Occupied BV							- 0 ×
CIRL RF 50Ω AC	CORREC	SENSE:INT ter Freg: 2.593000000 GH	ALIGN AUTO	06:17:49 PI Radio Std:	Apr 14, 2021	Trace	/Detector
	🛶 Trig	:Free Run Avg ⊦	lold: 100/100				
	#IFGain:Low #Att	en: 36 dB		Radio Dev	ice: BTS		
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50.0							
Center 2.59300 GHz				Span 2	5.00 MHz		
Res BW 240 kHz		#VBW 750 kHz			ep 1 ms		Min Hol
		T- t- I D	25.4				
Occupied Bandwidt		Total Power	35.0) dBm			
8.	9984 MHz						Detecto
Transmit Frog Error	4.810 kHz	% of OBW Po		.00 %		Auto	Peak Ma
Transmit Freq Error						Auto	IVIA
x dB Bandwidth	9.868 MHz	x dB	-26.	00 dB			
G			STATU	S			

Plot 7-5. Occupied Bandwidth Plot (LTE Band 41(PC2) - 10MHz QPSK - Full RB)



Plot 7-6. Occupied Bandwidth Plot (LTE Band 41(PC2) - 10MHz 16-QAM - Full RB)

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Keysight Spectrum Analyze												- 0 ×
XIRL RF	50 Ω	AC C	ORREC			NSE:INT	000000 GHz	ALIGN AUTO	06:20:15 P Radio Std	M Apr 14, 2021	Trac	e/Detector
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		#	IFGain:	Low	#Atten: 3	6 dB			Radio Dev	rice: BTS		
	0.00	dBm										
Log												
30.0												Clear Write
20.0			1	~~~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						
10.0												
0.00								1				
-10.0			4									Average
-20.0 manan	waw	- Mart						~~~~	marin	ᢣᡁᠬᡗ᠆ᢣᢦ᠆ᡥᠯᡐᠰ		
-30.0												
-40.0												Max Hold
-50.0												Max Hold
Center 2.593000 G	Hz									2.50 MHz		
Res BW 120 kHz					#VE	SW 390	KHZ		SWe	eep 1 ms		Min Hold
Occupied Ba	ndu	vidth				Total	Power	34 9	3 dBm			
Occupied Ba			407					0 11				
		4.5	197	' MH	Z							Detector Peak
Transmit Freq	Erro	r	-5	.358 kl	Iz	% of C	BW Pov	ver 99	9.00 %		Auto	Mai
x dB Bandwid				014 MH		x dB						
	un		ə. (U'14 IVIF	12	хав		-20.	.00 dB			
ISG								STATU	s			

Plot 7-7. Occupied Bandwidth Plot (LTE Band 41(PC2) - 5MHz QPSK - Full RB)



Plot 7-8. Occupied Bandwidth Plot (LTE Band 41(PC2) - 5MHz 16-QAM - Full RB)

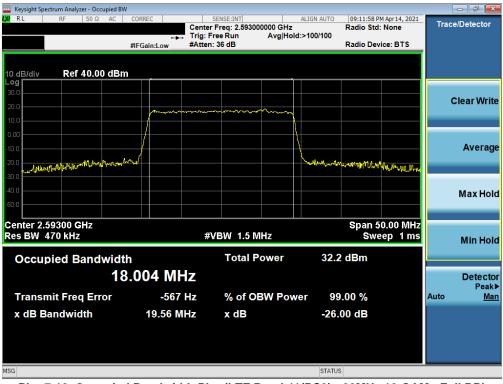
FCC ID: A3LSMF711B	Post to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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LTE Band 41(PC3)

Keysight Spectrum Analyzer - Occupied BW	1				
LXURL RF 50Ω AC		SENSE:INT r Freq: 2.593000000 GHz Free Run Avg Hold	ALIGN AUTO 09:10:29 P Radio Std :>100/100	M Apr 14, 2021 : None	Trace/Detector
		n: 36 dB	Radio Dev	vice: BTS	
10 dB/div Ref 40.00 dBm Log	<u>ا</u>				
30.0					
20.0	apatra and an	when the second second			Clear Write
10.0					
0.00					
-10.0					Average
-20.0	w di		how when the the second		
-30.0					
-40.0					Max Hold
-30.0					
Center 2.59300 GHz				0.00 MHz	
Res BW 470 kHz	#	VBW 1.5 MHz	SWO	eep 1 ms	Min Hold
Occupied Bandwidt	h	Total Power	32.6 dBm		
	.004 MHz				Detector
					Peak►
Transmit Freq Error	22.674 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	19.63 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-9. Occupied Bandwidth Plot (LTE Band 41(PC3) - 20MHz QPSK - Full RB)



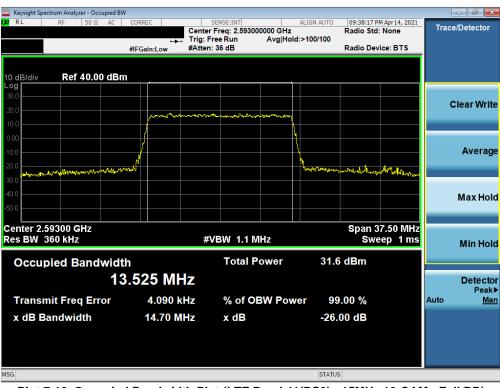
Plot 7-10. Occupied Bandwidth Plot (LTE Band 41(PC3) - 20MHz 16-QAM - Full RB)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied					
XI RL RF 50 Ω AC	CORREC	SENSE:INT ter Freg: 2.593000	ALIGN AUTO	09:37:35 PM Apr 14, 202: Radio Std: None	Trace/Detector
	🛶 Trig	g: Free Run	Avg Hold:>100/100		
	#IFGain:Low #At	ten: 36 dB		Radio Device: BTS	_
10 dB/div Ref 40.00 dB	m				
Log					
30.0					Clear Write
20.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		www		
10.0					
0.00	/		<u>\</u>		
10.0					Average
20.0 mary mary Mary Mary Mary	ment		Johnson	marrish males of the married	a.
-30.0					
-40.0					Max Hold
-50.0					
Center 2.59300 GHz				Span 37.50 MH	
Res BW 360 kHz		#VBW 1.1 M	Hz	Sweep 1 m	Min Hold
Occurried Develutio		Total P	owor 22	9 dBm	
Occupied Bandwid		Total I G	JWCI J2.	3 ubm	
1	3.550 MHz				Detector
Transmit Freq Error	22.847 kHz	% of OF	W Power 9	9.00 %	Peak) Auto Mar
					Auto <u>mar</u>
x dB Bandwidth	14.82 MHz	x dB	-26	.00 dB	
SG			STAT	JS	

Plot 7-11. Occupied Bandwidth Plot (LTE Band 41(PC3) - 15MHz QPSK - Full RB)



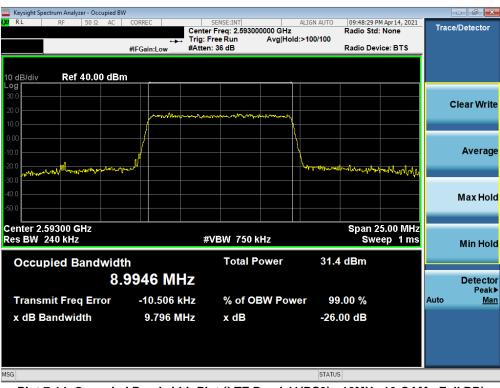
Plot 7-12. Occupied Bandwidth Plot (LTE Band 41(PC3) - 15MHz 16-QAM - Full RB)

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Keysight Spectrum Analyzer -								
RL RF 5	OΩ AC	CORREC	SENSE:INT	ALIGN	Radio Std	M Apr 14, 2021	Trace/De	tector
		₩IFGain:Low		Avg Hold: 100/				
	0.00 dBn	n						
og 30.0 20.0							Clea	ar Writ
0.00								
0.0 0.0 0.0 0.0	v-v-v-lipphu	w		- land	and the stand of the	-Ashraphy	4	verag
0.0							M	ax Ho
enter 2.59300 GHz es BW 240 kHz	z		#VBW 750	kHz		25.00 MHz eep 1 ms	м	in Ho
Occupied Bar			Total I	Power	32.9 dBm			_
	9.	0334 MH	lz				D	etect Peak
Transmit Freq E	Irror	13.024 k	Hz % of O	BW Power	99.00 %		Auto	Ma
x dB Bandwidth	1	9.921 M	lHz x dB		-26.00 dB			
G					STATUS			

Plot 7-13. Occupied Bandwidth Plot (LTE Band 41(PC3) - 10MHz QPSK - Full RB)



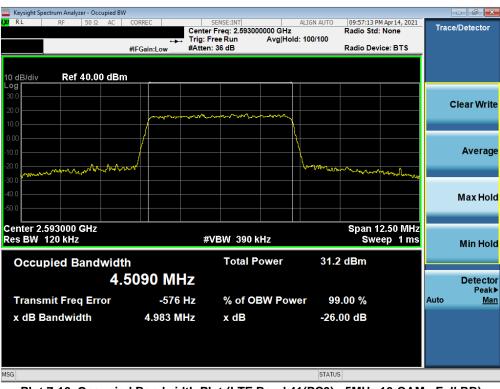
Plot 7-14. Occupied Bandwidth Plot (LTE Band 41(PC3) - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMF711B	PCTEST Proud to be part of @ element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
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Keysight Spectrum Analyze	er - Οccu 50 Ω	· · · · · · · · · · · · · · · · · · ·	CODDE			NOT INT			00.50.50.0	M A14 2021	_	
RL RF	50 Ω	AC	CORRE			INSE:INT	00000 GHz	ALIGN AUTO	Radio Std	M Apr 14, 2021	Trac	e/Detector
			#IFGai	n:Low		e Run		ld: 100/100	Radio Dev			
	10.00	dBm										
.og 30.0 20.0												Clear Writ
10.0			/	,	᠕᠆ᠬ᠕᠕᠕	~~~~	mont					
0.00			~					hy .				Average
20.0 mm/mm/ml/mm/m 30.0	محلفصه	manthy	M						ᡟ᠊ᠧᠳ᠇ᡟᠬᠴ᠉ᢛᢪᠰᠧ			
40.0 50.0												Max Hol
enter 2.593000 G tes BW 120 kHz	SHz				#VI	BW 390	kHz			2.50 MHz ep 1 ms		Min Hol
Occupied Ba	and					Total	Power	32.3	3 dBm			
		4.	506	5 MF	Z							Detecto Peak
Transmit Freq	Erro	or	•	1.403 k	Hz	% of C	BW Pov	ver 99	9.00 %		Auto	<u>Ma</u>
x dB Bandwid	th		4	.988 M	Hz	x dB		-26	.00 dB			
SG								STATU	IS			

Plot 7-15. Occupied Bandwidth Plot (LTE Band 41(PC3) - 5MHz QPSK - Full RB)



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

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7.3 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

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

For Band 41, the minimum permissible attenuation level of any spurious emission is 55 + 10log₁₀(P_[Watts]).

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 10GHz (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup

Test Notes

 Per Part 27, RSS-195 and RSS-199, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

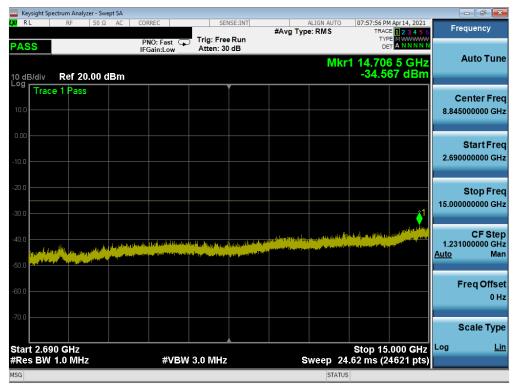
FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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LTE Band 41(PC2)

	pectrum Analy												
🗶 RL	RF	50 Ω	AC (CORREC		SEN	ISE:INT		ALIGN AUTO		M Apr 14, 2021	E	requency
					т.	rig: Free	Dun	#Avg Typ	e:RMS	TRA			requeitcy
PASS				PNO: Fast IFGain:Low	÷	tten: 30							
				II Guill.LOW	-					Alen4 0 47	E A CUL		Auto Tune
									N	/kr1 2.47	5 U GHZ		
10 dB/div Log	Ref 20).00 dE	3m							-35.6	25 dBm		
Tra	ce 1 Pass												
													Center Fre
10.0											+	1.25	2500000 GH
0.00													_
													Start Fre
												3	0.000000 MH
10.0											+1		
20.0													Stop Fre
													•
30.0												2.47	'5000000 GH
.0.0											7		
											1		CF Ste
40.0												24	4.500000 MH
								للمتعالية ومروع فيروان	والدار ومرابع	of A Hardwood Based		Auto	Ma
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100,000	State of the second second		(particular)										
													Freq Offse
60.0													0 H
70.0													
													Scale Type
Start 0.0	30 GHz									Stop 2	2.475 GHz	Log	Lii
¢Res B₩	1.0 MH;	z		#V	BW 3.0	0 MHz			Sweep	3.260 ms	(4891 pts)		
SG									STA				
									STA				

Plot 7-17. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



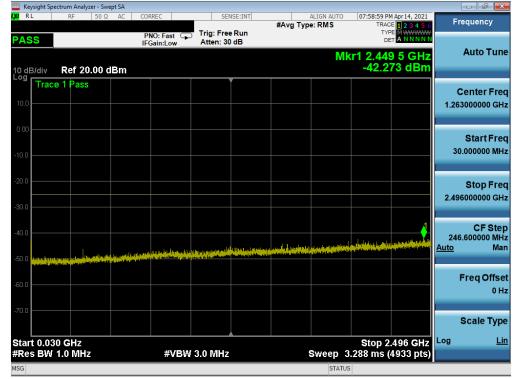
Plot 7-18. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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	sight Spectre	um Analyzer	- Swept	SA										
l <mark>XI</mark> RL		RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Ava 1	ALIGN AU	TO 07:5	8:25 PM Apr 14, 2021 TRACE 1 2 3 4 5 6	Freq	uency
PAS	S				PNO: Fa	ast 🖵 .ow	Trig: Free Atten: 10			Jpc. ruite				
										Ν	lkr1 25	.036 0 GHz		uto Tune
10 dB Log r	3/div	Ref 0.00) dBn	n							-4	4.630 dBm		
	Trace 1	Pass					,						Ce	nter Freq
-10.0														00000 GHz
-20.0													s	start Freq
-30.0														00000 GHz
-40.0											1		s	Stop Freq
											and the second second	and the second		00000 GHz
-50.0			والمتلجار	d _{ind} tras-	had webs	د. روباير اختنا	and the state of the state	ang			1999 (1999) 1999 (1999) (1999) (1999) 1999 (1999) (1999) (1999) (1999)			
-60.0	موردا بالتقريرية مرجعاته فتتحمت		and should be	alle a baile f		and the state	and a start of the second s							CF Step
													1.2000 Auto	00000 GHz Man
-70.0														
													Fr	eq Offset
-80.0														0 Hz
-90.0														
													Sc	ale Type
Star	15.000						,				Sto	p 27.000 GHz	Log	Lin
	BW 1.				;	#VBW	3.0 MHz			Sweep	30.40 m	ns (24001 pts)		
MSG										ST	ATUS			

Plot 7-19. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



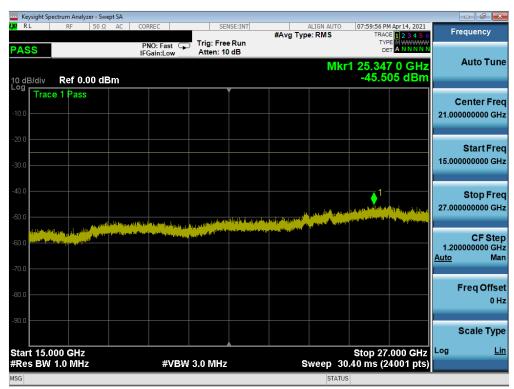
Plot 7-20. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMF711B	PCTEST. Prozet to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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		trum Analyz	er - Swe	pt SA											
l <mark>xi</mark> R	L	RF	50 Ω	AC	CORREC	2	SE	NSE:INT	#Ava	ALIGN A			M Apr 14, 2021	F	requency
PAS	SS				PNO: IFGair	Fast 🖵	Trig: Fre Atten: 30			rype. Kina	•	TYP			
											Mkr1	14.95	4 0 GHz 51 dBm		Auto Tune
10 di Log	B/div	Ref 20	.00 d	Bm								-35.1	ыавш		
	Trace	1 Pass						Ĩ							Center Freq
10.0	<u> </u>														45000000 GHz
0.00	<u> </u>														
															Start Freq
-10.0														2.6	90000000 GHz
-20.0															Stop Freq
														15.0	00000000 GHz
-30.0													1		
										ulpon (start st	ي الم	o Luddet allan	La hereiten and		CF Step
-40.0	lan a	. Ma		ուսներ	here all all	the stand of the stand	and a papel of	lastalstated		enterieren (han eine aus		ىرى يەرىپى بىر ە ھەتلەرلىرىيە	and a state of the		31000000 GHz
-50.0	1.	n opportunger og Skala skala skala		al patient	ALC: NO DECISION OF	وأدادا الدن	and the second second	and the same of the state						Auto	Man
-50.0	í i														
-60.0															Freq Offset
00.0															0 Hz
-70.0															
															Scale Type
														Log	Lin
	t 2.690 s BM 1) GHZ 1.0 MHZ				#\/R\M	3.0 MHz			Sween	24.6	Stop 15	.000 GHz 4621 pts)		Lin
MSG	5-10/14					# V LJVV	5.0 10112				TATUS		402 i pisj		
MSG										5	TATUS				

Plot 7-21. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



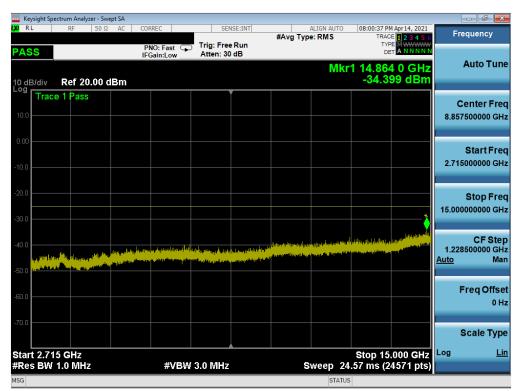
Plot 7-22. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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	ctrum Analyz													
LXI RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg	ALIGN A			M Apr 14, 2021 CE 1 2 3 4 5 6		Frequency
PASS				PNO: Fa	ast 🖵 .ow	Trig: Free Atten: 30		Ū			TY			
10 dB/div	Ref 20	.00 d	Bm							Mkı	1 2.44 -42.0	2 0 GHz 09 dBm		Auto Tune
Log Trace	e 1 Pass												1.2	Center Freq 63000000 GHz
-10.0													:	Start Freq 30.000000 MHz
-20.0													2.4	Stop Freq 96000000 GHz
-40.0		أحاليهما		unin sola	d burger and a							1 An an attack of the state of the	24 <u>Auto</u>	CF Step 46.600000 MHz Mar
-50.0			Malath IIA											Freq Offset 0 Hz
-70.0														Scale Type
Start 0.03 #Res BW	0 GHz 1.0 MHz			4	#VBW	3.0 MHz			Swee	ep 3.	Stop 2 288 ms	2.496 GHz (4933 pts)	Log	<u>Lin</u>
MSG										STATUS				

Plot 7-23. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-24. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

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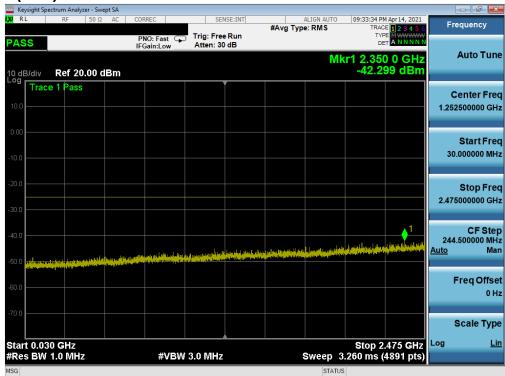
	ectrum Analyze	r - Swep	ot SA										
K <mark>I</mark> RL	RF	50 <u>Ω</u>	AC	CORREC		SEN	SE:INT	#Avg Typ	ALIGN AUT e: RMS	TR	PM Apr 14, 2021 ACE 1 2 3 4 5 6 YPE M WWWWW	F	requency
PASS	Ref 0.00	0 dB	m	PNO: Fa IFGain:L		Atten: 10			М	lkr1 25.6	68 5 GHz 163 dBm		Auto Tune
- Trac	e 1 Pass												Center Fred
30.0												15.00	Start Free
-40.0		الفائد ،	والبناء والتلاء	مراجعة المراجع				And and Apple to Apple of the state	J. J. Andrews	Avertige of all and the strend of a local Transformer and a strend of a strend of a		27.00	Stop Free
-60.0	Halettyna den gelenen.		ntgi ^{ff} haastaab.	the state of the s			italig biraya ng birati					1.20 <u>Auto</u>	CF Step 0000000 GH: Mar
80.0													Freq Offse 0 Ha
.90.0												Log	Scale Type
Start 15.0 #Res BW				#	VBW	3.0 MHz		s	weep	Stop 2 30.40 ms	27.000 GHz (24001 pts)	LUg	
ISG									ST	ATUS			

Plot 7-25. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

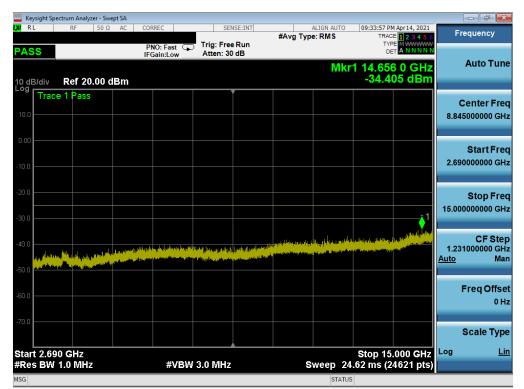
FCC ID: A3LSMF711B	PCTEST. Proud to be part of @element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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LTE Band 41(PC3)



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



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

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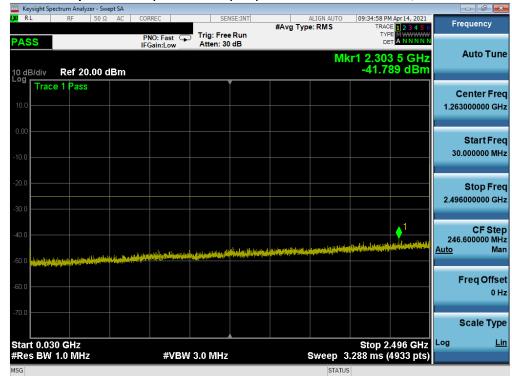
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	sight Spectr	um Analy	zer - Swej	pt SA											
L <mark>XI</mark> RL	-	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Ava	ALIGN A			M Apr 14, 2021	F	requency
PAS	•					ast 🖵	Trig: Fre			i jpe. i tilit	•	TYP			
PAS	<u> </u>				IFGain:	Low	Atten: 10	dB							Auto Tune
											MKM	25.81	90 GHz 67 dBm		/ late / alle
10 dE Log r		Ref 0.		m					_			-40.0			
	Trace	1 Pass													Center Freq
-10.0														21.0	00000000 GHz
-20.0															Otort Eron
														15.0	Start Freq 0000000 GHz
-30.0														15.00	
-40.0												(Stop Freq
50.0										h	-	plantie wee	and a start of the starts	27.0	00000000 GHz
-50.0	. 4.10		A. A.A.	alkeler.	ilde all south	deservati e e	أقلعه المربية		a de se de la sella	and a second	i de la competition de	No. Statistics	and the second second		
-60.0	rangegengeren Att is dat die	n de la constant La constant		al a the street	والمرونات الأوريالية	and a state of	Call of the second								CF Step
-00.0														1.2 Auto	00000000 GHz Man
-70.0														Auto	wan
-80.0															Freq Offset
															0 Hz
-90.0															
															Scale Type
Star	t 15.000											Stop 27	.000 GHz	Log	Lin
	BW 1.					#VBW	3.0 MHz			Sweep	p 30.4	0 ms <u>(2</u>	4001 pts)	-	
MSG											STATUS			_	

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



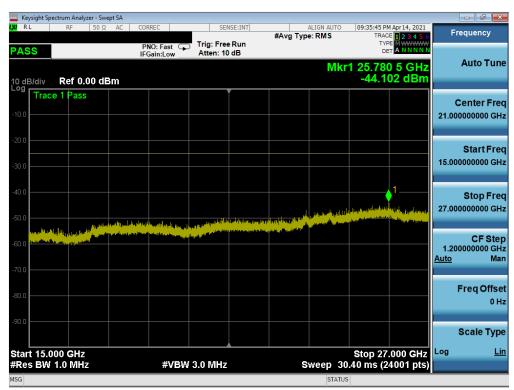
Plot 7-29. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

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🔤 Keysight Spectrum Analyzer - Swept SA					
LXIRL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AL #Avg Type: RMS		Frequency
PASS	PNO: Fast 🖵 IFGain:Low	Trig: Free Run Atten: 30 dB		TYPE M WWWW DET A N N N N N	Auto Tune
10 dB/div Ref 20.00 dBm			N	/kr1 14.814 5 GHz -34.783 dBm	Auto Tune
10.0					Center Freq 8.845000000 GHz
-10.0					Start Freq 2.690000000 GHz
-20.0					Stop Freq 15.000000000 GHz
-40.0	an ya ka kata ana kana da aya ka aya Manazar wa kata da kata kata kata kata kata kata		and a standard stand Standard standard stan		CF Step 1.231000000 GHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
-70.0 Start 2.690 GHz				Stop 15.000 GHz	Scale Type
#Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep	24.62 ms (24621 pts)	
MSG				TATUS	

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



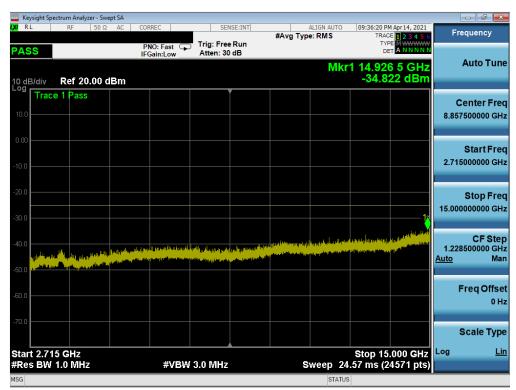
Plot 7-31. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

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	ctrum Analyz		ot SA										
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#Ava	ALIGN AL Type: RMS		2 PM Apr 14, 2021 RACE 1 2 3 4 5 6	F	requency
PASS				PNO: Fa	ast 😱 .ow	Trig: Free Atten: 30			.,,				
10 dB/div	Ref 20	.00 di	Bm							Mkr1 2.4 -40.	80 0 GHz 774 dBm		Auto Tune
Log Trace	e 1 Pass												Center Freq 3000000 GHz
-10.0												3	Start Freq 0.000000 MHz
-20.0												2.49	Stop Fred
-40.0	a	و المراجع المراجع	المراجع والمراجع	والتعراق أرأه وال	last for copiles de	(names) (na kala da pang kalakata) Sana ng Kanang kana sa sa	a, julija postalju				1 Alternational Action	24 <u>Auto</u>	CF Step 6.600000 MHz Man
-50.0			A (for) of it also										Freq Offset 0 Hz
-70.0 Start 0.03	0.047									Ston	2.496 GHz	Log	Scale Type
#Res BW				#	¢VB₩	3.0 MHz			Swee		s (4933 pts)		
MSG									ST	ATUS		_	

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



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

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PASS PNO: Fast IFGain:Low Trig: Free Run Atten: 10 dB TRACE 2.34.50 TYPE Frequency Auto Tune 0 dB/div Ref 0.00 dBm 0 dE/div Center Freq 21.000000000 GHz Auto Tune 0 dB/div Ref 0.00 dBm 0 dE/div Start Freq 10.0 Start Freq 10.0 Start Freq 15.000000000 GHz 0 dB/div Ref 0.00 dBm 0 dE/div Start Freq 10.0 Start Freq 15.000000000 GHz 0 dB/div Ref 0.00 dBm 0 dE/div Start Freq 15.000000000 GHz 0 dB/div Ref 0.00 dBm 0 dE/div Start Freq 15.000000000 GHz 0 dD 1 dE/div 1 dE/div 1 dE/div			trum Ana	lyzer - Swe											
PRO: Fast (FGain:Low Trig: Free Run Atten: 10 dB Mkr1 25,512 5 GHz -45,291 dBm Auto Tune 0 dB/div Ref 0.00 dBm	LXI RL		RF	50 Ω	AC	CORREC		SEN	ISE:INT					F	requency
Call div Ref 0.00 dBm Center Freq 21.00000000 GHz Call div Trace 1 Pass Center Freq 21.00000000 GHz Call div Start Freq 15.00000000 GHz Start Freq 27.00000000 GHz Call div Start Freq 15.00000000 GHz Start Freq 27.00000000 GHz Call div Start Freq 15.00000000 GHz Start Freq 27.0000000 GHz Start Freq 27.0000000 GHz Start Freq 27.0000000 GHz Start Freq 27.0000000 GHz	PAS	S										TY	PE M WWWWW		
Trace 1 Pass Center Freq 100 Center Freq 200 Center Freq 200 Start Freq 300 Start Freq 400 Start Freq 500		3/div	Ref 0).00 dE	3m						M	kr1 25.51 -45.2	2 5 GHz 91 dBm		Auto Tune
300 Start Freq 400 Start Freq </td <td>-10.0</td> <td>Trace</td> <td>1 Pas</td> <td>S</td> <td></td> <td>•</td>	-10.0	Trace	1 Pas	S											•
500 Stop Freq 500 Stop 27.000 GHz	-20.0 -30.0													15.00	Start Freq
60.0 CF Step 70.0 CF Step 90.0 CF Step <td>-40.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>later to</td> <td>al. al. frage</td> <td></td> <td>naprolestes al Antonio Inst</td> <td></td> <td>27.00</td> <td>Stop Freq 0000000 GHz</td>	-40.0								later to	al. al. frage		naprolestes al Antonio Inst		27.00	Stop Freq 0000000 GHz
70.0 1.20000000 GHz 80.0 Freq Offset 90.0 Scale Type Start 15.000 GHz Stop 27.000 GHz	~~~~		in the set			da, ka magana Minang kaing	angeregene Planten				الار فالعامين المعر		and the state of t		CF Step
eeuo Hz Stop 27.000 GHz Cog Ling	-70.0														
90.0 Scale Type	-80.0														-
Start 15.000 GHz Stop 27.000 GHz Log	-90.0														UHZ
Start 15.000 GHz Stop 27.000 GHz Log Lin Res BW 1.0 MHz #VBW 3.0 MHz Sweep 30.40 ms (24001 pts)															
							۶\/B)۸(3.0 MHz			woon	Stop 27	.000 GHz	Log	Lin
	#IRC+S			12		+	FVDVV	3.0 WIN2				`	400 T pts)		

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

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7.4 Band Edge Emissions at Antenna Terminal

Test Overview

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

The minimum permissible attenuation level for Band 41 is as noted in the Test Notes on the following page.

Test Procedure Used

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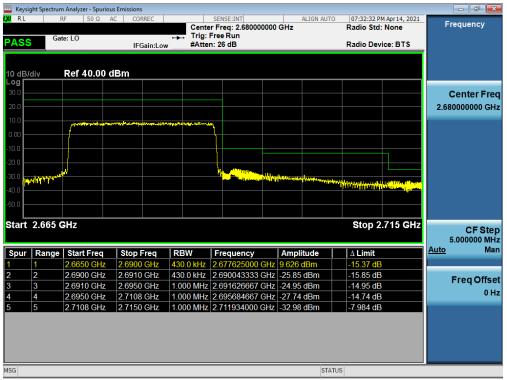
Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55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

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	ectrum Analyzer - Spur									
RL	RF 50 Ω	AC CO	DRREC	Cente	SENSE:INT r Freq: 2.50600	0000 GHz	ALIGN AUTO	07:29:22 P Radio Std	M Apr 14, 2021 : None	Frequency
ASS	Gate: LO			Trig:	Free Run 1: 26 dB			Radio Dev	in DTC	
<u> </u>		, IF	Gain:Low	#Atter	1: 20 00			Radio Dev	ICE: DIS	
0 dB/div .og	Ref 40.00	dBm								
30.0										Center Fred
20.0										2.506000000 GHz
10.0										2.300000000 GHz
					pharman	alaran de la parte de la pa	and the second	and the second	and the state of t	
0.00										
10.0										
20.0										
30.0				(Discontinues of the last					May	
40.0 <mark>minihihi</mark>	waget White warman	****	- Arristan (Arrista)	and the second second	<u></u>				· · · · ·	
50.0										
Start 2.4	75 GHz							Stop 2	.517 GHz	CF Step
										5.000000 MHz
Spur Ra	nge Start Freq	Stop	Freq	RBW	Frequency	Amp	litude	∆ Limit		
1	2.4750 GHz	2.4905		1.000 MHz	2.489673333	GHz -31.2	6 dBm	∆ Limit -6.265 dE	}	
1 2 2	2.4750 GHz 2.4905 GHz	2.4905 2.4950	5 GHz 0 GHz	1.000 MHz 1.000 MHz	2.489673333 2.494377500	GHz -31.2 GHz -28.4	6 dBm 4 dBm	-6.265 dE -15.44 dE	3	
1	2.4750 GHz	2.4905 2.4950 2.4960	5 GHz 0 GHz 0 GHz	1.000 MHz 1.000 MHz 430.0 kHz	2.489673333	GHz -31.2 GHz -28.4 GHz -29.7	6 dBm 4 dBm 6 dBm	-6.265 dE	3	

Plot 7-35. Lower ACP Plot (LTE Band 41(PC2) - 20MHz QPSK - Full RB)



Plot 7-36. Upper ACP Plot (LTE Band 41(PC2) - 20MHz QPSK – Full RB)

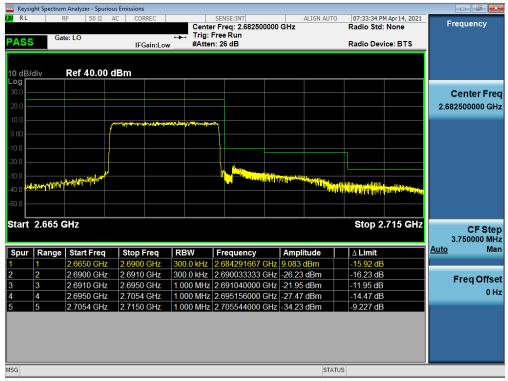
FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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	ectrum Analyz			ons												
LXU RL	RF Gate: LO	50 Ω	AC (CORREC		-		1: 2.50350	0000		ALIGN AUT		7:33:17 P dio Std	M Apr 14, 2021 : None		Frequency
PASS	Gale. EO			IFGain:L	.ow	#Atte	n: 26 d	B				Ra	dio Dev	ice: BTS		
10 dB/div	Ref	40.00	dBm													
Log 30.0																Center Freq
20.0															2.5	03500000 GHz
10.0																
0.00								nan nan nan na na na na na na na na na n		₩ ₩ ₩₩₩₩₩	ALCON (STORY) and the	al market and a	ł			
													ţ			
-10.0																
-20.0																
-30.0													N.,			
-40.0 	it in which the	n weith the	delare pietelo	- Helena		and the second line of	4						Jher	(Wielsonne) provide		
-50.0	dan u sa															
Start 2.4	75 GHz											ş	Stop 2	2.517 GHz		CF Step
																3.750000 MHz
Spur Ra	nge Star	t Freq	Sto	p Freq	R	BW	Free	quency		Ampl	itude	Δ	Limit		<u>Auto</u>	Man
1 1	2.47	50 GHz	2.49	05 GHz	. 1.0	000 MHz	2.48	4041667	GHz	-33.69	dBm	-8	.686 dE	3		
2 2	2.490)5 GHz	2.49	50 GHz				4632500				-1	5.88 dE	3		Freq Offset
3 3		50 GHz	2.49	60 GHz				5993333				-1	8.35 dE	3		•
4 4	2.496	60 GHz	2.51	70 GHz	30	0.0 kHz	2.50	55 <mark>2000</mark> 0	GHz	9.313	dBm	-1	5.69 dE	3		0 Hz
MSG											STA	TUS				
									_						_	

Plot 7-37. Lower ACP Plot (LTE Band 41(PC2) - 15MHz QPSK - Full RB)



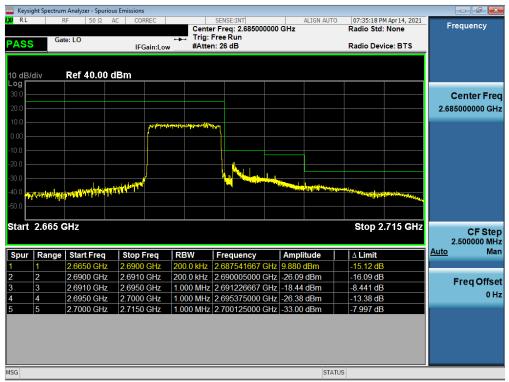
Plot 7-38. Upper ACP Plot (LTE Band 41(PC2) - 15MHz QPSK - Full RB)

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								ght Spectrun	
SENSE:INT ALIGN AUTO 07:54:57 PM Apr14, 2021 enter Freq: 2.501000000 GHz Radio Std: None Frequency		LIGN AUTO			CORREC	AC	RF 50 Ω	F	RL
enter Freq: 2.501000000 GHz Radio Std: None Frequency	Radio Std:						10		
Atten: 32 dB Radio Device: BTS	Radio Devi				IFGain:Low		te: LO	Ga	ASS
							B-6 40 00		
					m	0 dE	Ref 40.00	div	odB/ og Γ
Center									
2.50100000									0.0
A A A A A A A A A A A A A A A A A A A		-und	and the approximation						0.0
									.00 —
									0.0
		ļ	1						0.0
		- k		and the second	and he setting				0.0
Tring we have a second se	a the work of the second	"T" HIM			HITTITIC CONTRACTOR	al linn	March 1 and 1 and 1		0.0
hand have have here and here a								www.eeeeeeeeeee	0.0
									0.0
Stop 2.517 GHz	Stop 2.						GH7	2.475 (tart
Stop 2.517 SH2 CF S 516.20000									tait
CF S		ude	Frequency A	RBW	Stop Freq	q	Start Freq	Range	spur
516.200000	∆ Limit				Stop Freq .4905 GHz	_	Start Freq 2.4750 GHz	Range	
Frequency Amplitude Δ Limit AHz 2.490500000 GHz -31.01 dBm -6.009 dB 4Hz 2.40377000 GHz -23.47 dBm -10.47 dB	Δ Limit	dBm	2.490500000 GHz -3	1.000 MHz		łz			
Frequency Amplitude Δ Limit Auto HHz 2.490500000 GHz -31.01 dBm -6.009 dB -6.009 dB	Δ Limit -6.009 dB -10.47 dB	dBm dBm	2.490500000 GHz -3 2.493770000 GHz -2	1.000 MHz 1.000 MHz	.4905 GHz	iz Iz	2.4750 GHz	1	spur

Plot 7-39. Lower ACP Plot (LTE Band 41(PC2) - 10MHz QPSK - Full RB)

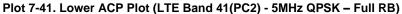


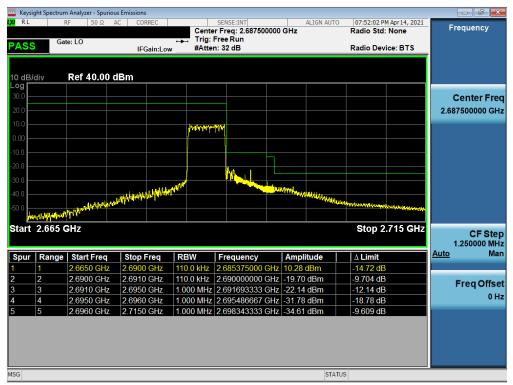


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Og Operation Oper		pectrum	n Analyzer - Spu	rious Emissi	ions									- F
O dB/div Ref 40.00 dBm 90 90 00 90 100 90 11 2.4750 GHz 2.4950 GHz 1.000 MHz 2.49950 GHz 2.4990 GHz 11 1.000 Hz 2.494955000 GHz 2.494955000 GHz 11 1.000 Hz 2.49495000 GHz							Trig: F	r Freq: 2.4985 Free Run	00000		IGN AUTO	Radio Sto	: None	Frequency
Stop 2.475 GHz Stop 2.517 GHz CF Stop 1.250000 Mi Spur Range Start Freq Stop Freq RBW Frequency Amplitude Δ Limit Δ Limit 1 2.4750 GHz 2.4905 GHz 1.000 MHz 2.489983333 GHz -30.84 dBm -5.837 dB Δ Limit Δ Limit Mi 2 2.4905 GHz 2.4950 GHz 1.000 MHz 2.49995000 GHz -27.10 dBm -14.10 dB Freq Offs 3 2.4950 GHz 2.4960 GHz 110.0 kHz 2.49600000 GHz -19.94 dBm -6.935 dB Freq Offs	0 dB/div 0 g 0 0.0 20.0 10.0 0.00 10.0 0.00 0.						مرجعه الا			htter	M			
Spur Range Start Freq Stop Freq RBW Frequency Amplitude ∆ Limit Auto M 1 2.4750 GHz 2.4905 GHz 1.000 MHz 2.499983333 GHz -30.84 dBm -5.837 dB -5.837 dB -14.10 dB Freq Offs 2 2.4905 GHz 2.4960 GHz 1.000 MHz 2.494955000 GHz -27.10 dBm -14.10 dB Freq Offs 3 2.4950 GHz 2.4960 GHz 110.0 kHz 2.496000000 GHz -19.94 dBm -6.935 dB -14.10 dB					Mark I						1.1.1.1.1.1.1	Stand Street		
1 2.4750 GHz 2.4905 GHz 1.000 MHz 2.489983333 GHz -30.84 dBm -5.837 dB 2 2.4905 GHz 2.4950 GHz 1.000 MHz 2.494955000 GHz -27.10 dBm -14.10 dB Freq Offs 3 2.4950 GHz 2.4960 GHz 110.0 kHz 2.496000000 GHz -19.94 dBm -6.935 dB			ang the second second									Stop 2	2.517 GHz	CFS
2 2.4905 GHz 2.4950 GHz 1.000 MHz 2.494955000 GHz -27.10 dBm -14.10 dB Freq Offs 3 2.4950 GHz 2.4960 GHz 110.0 kHz 2.49600000 GHz -19.94 dBm -6.935 dB Freq Offs	start 2.4	475 G	GHz		n Fred	IRB	W	Frequency				Stop 2	2.517 GHz	1.250000 N
3 2.4950 GHz 2.4960 GHz 110.0 kHz 2.49600000 GHz -19.94 dBm -6.935 dB	start 2.4 Spur R	475 G ange	GHz Start Freq	Sto	<u> </u>					Amplitu	ıde	Stop 2	2.517 GHZ	1.250000 N
	start 2.4 Spur R	475 G ange	GHz Start Freq 2.4750 GH	1 Sto z 2.49	05 GHz	1.00	0 MHz	2.489983333	3 GHz	Amplitu -30.84 d	ude Bm	Stop 2 ∆ Limit -5.837 dl	2.51 <i>1</i> GHz	1.250000 N <u>Auto</u> N
	start 2. Spur R	475 C	GHz Start Freq 2.4750 GH 2.4905 GH	r Sto z 2.49 z 2.49	05 GHz 50 GHz	1.00 1.00	00 MHz 00 MHz	2.489983333 2.494955000	<mark>3 GHz</mark>) GHz	Amplitu -30.84 d -27.10 d	ude Bm Bm	Stop 2 △ Limit -5.837 dl -14.10 dl	2.51/ GHZ B B	1.250000 N <u>Auto</u> N
	Start 2.4	475 G	GHz		p Freq	RB	W	Frequency				Stop 2	2.517 GHz	1.250000







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RL	RF	50 Ω	ous Emission	ns DRREC		SENSE:INT		ALIGN AUTO	10:28:20	PM Apr 14, 2021	
	NF	20.22	AL LL	JAREC	Cente	r Freg: 2.50600	0000 GHz	ALIGN AUTO	Radio Ste		Frequency
ASS	Gate: LC)				Free Run					
A55			IF	Gain:Lov	w #Atter	n: 26 dB			Radio De	vice: BTS	
0 dB/div	Ref	f 40.00	dBm								
-og											
30.0											Center Fre
20.0											2.506000000 GI
10.0											
0.00						Margarette	*****		and the state of the		
10.0											
20.0											
30.0					_						
40.0			ي بالالار	www.walli		" "				WWW.	
50.0		ALC: NOT								and the second	
.0.0											
start 2.4	471 GHz								Stop	2.521 GHz	
start 2.4	471 GHz								Stop	2.521 GHz	
			Stop	Frog		Frequency	Amr	litudo		2.521 GHz	CF Ste 515.700000 MH Auto Ma
Spur R	ange Sta	art Freq	Stop		RBW	Frequency		litude	∆ Limit		515.700000 Mi
Spur Ra	ange Sta	art Freq 710 GHz	2.490	5 GHz	1.000 MHz	2.490402500	GHz -36.6	2 dBm	Δ Limit -11.62 d	B	515.700000 Mł <u>Auto</u> Ma
Spur R a	ange Sta 2.4 2.4	a rt Freq 710 GHz 905 GHz	2.490 2.495	5 GHz 0 GHz	1.000 MHz 1.000 MHz	2.490402500 2.494767500	GHz -36.6 GHz -33.9	2 dBm 7 dBm	∆ Limit -11.62 d -20.97 d	B B	515.700000 Mł <u>Auto</u> Ma
Spur R a 1 2 2 3 3	ange Sta 2.4 2.49 2.49	art Freq 710 GHz 905 GHz 950 GHz	2.490 2.495 2.496	5 GHz 0 GHz 0 GHz	1.000 MHz 1.000 MHz 430.0 kHz	2.490402500 2.494767500 2.495513333	GHz -36.6 GHz -33.9 GHz -34.5	2 dBm 7 dBm 8 dBm	∆ Limit -11.62 d -20.97 d -21.58 d	<mark>B</mark> B B	515.700000 Mi
Spur R 1 1 2 2 3 3	ange Sta 2.4 2.49 2.49	a rt Freq 710 GHz 905 GHz	2.490 2.495 2.496	5 GHz 0 GHz	1.000 MHz 1.000 MHz 430.0 kHz	2.490402500 2.494767500	GHz -36.6 GHz -33.9 GHz -34.5	2 dBm 7 dBm 8 dBm	∆ Limit -11.62 d -20.97 d	<mark>B</mark> B B	515.700000 Mi <u>Auto</u> Ma Freq Offs
Spur R a 1 2 2 3 3	ange Sta 2.4 2.49 2.49	art Freq 710 GHz 905 GHz 950 GHz	2.490 2.495 2.496	5 GHz 0 GHz 0 GHz	1.000 MHz 1.000 MHz 430.0 kHz	2.490402500 2.494767500 2.495513333	GHz -36.6 GHz -33.9 GHz -34.5	2 dBm 7 dBm 8 dBm	∆ Limit -11.62 d -20.97 d -21.58 d	<mark>B</mark> B B	515.700000 Mł <u>Auto</u> Ma Freq Offs
Spur R a 1 2 2 3 3	ange Sta 2.4 2.49 2.49	art Freq 710 GHz 905 GHz 950 GHz	2.490 2.495 2.496	5 GHz 0 GHz 0 GHz	1.000 MHz 1.000 MHz 430.0 kHz	2.490402500 2.494767500 2.495513333	GHz -36.6 GHz -33.9 GHz -34.5	2 dBm 7 dBm 8 dBm	∆ Limit -11.62 d -20.97 d -21.58 d	<mark>B</mark> B B	515.700000 Mł <u>Auto</u> Ma Freq Offs
Spur R a 1 2 2 3 3	ange Sta 2.4 2.49 2.49	art Freq 710 GHz 905 GHz 950 GHz	2.490 2.495 2.496	5 GHz 0 GHz 0 GHz	1.000 MHz 1.000 MHz 430.0 kHz	2.490402500 2.494767500 2.495513333	GHz -36.6 GHz -33.9 GHz -34.5	2 dBm 7 dBm 8 dBm	∆ Limit -11.62 d -20.97 d -21.58 d	<mark>B</mark> B B	515.700000 Mł <u>Auto</u> Ma Freq Offs
Spur R a 1 2 2 3 3	ange Sta 2.4 2.49 2.49	art Freq 710 GHz 905 GHz 950 GHz	2.490 2.495 2.496	5 GHz 0 GHz 0 GHz	1.000 MHz 1.000 MHz 430.0 kHz	2.490402500 2.494767500 2.495513333	GHz -36.6 GHz -33.9 GHz -34.5	2 dBm 7 dBm 8 dBm	∆ Limit -11.62 d -20.97 d -21.58 d	<mark>B</mark> B B	515.700000 Mł <u>Auto</u> Ma Freq Offs
Spur Ra 1 2 2 3 3	ange Sta 2.4 2.49 2.49	art Freq 710 GHz 905 GHz 950 GHz	2.490 2.495 2.496	5 GHz 0 GHz 0 GHz	1.000 MHz 1.000 MHz 430.0 kHz	2.490402500 2.494767500 2.495513333	GHz -36.6 GHz -33.9 GHz -34.5	2 dBm 7 dBm 8 dBm	∆ Limit -11.62 d -20.97 d -21.58 d	<mark>B</mark> B B	515.700000 Mi <u>Auto</u> Ma Freq Offs

Plot 7-43. Lower ACP Plot (LTE Band 41(PC3) - 20MHz QPSK - Full RB)



Plot 7-44. Upper ACP Plot (LTE Band 41(PC3) - 20MHz QPSK - Full RB)

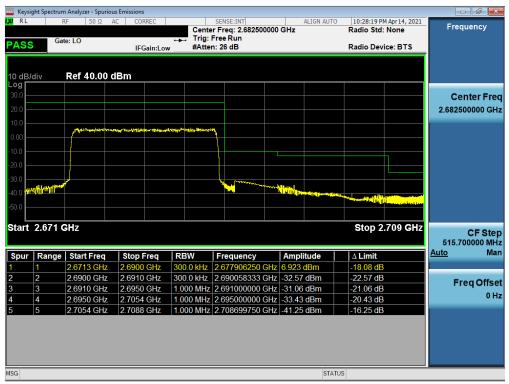
FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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			ous Emissio	ins							
<mark>0</mark> RL	RF	50 Ω	AC C	ORREC		SENSE:INT er Freq: 2.503500 Free Run	0000 GHz	ALIGN AUTO	10:27:42 Radio Sto	PM Apr 14, 2021 d: None	Frequency
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I0 dB/div	R	ef 40.00	dBm								
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start 2.4	477 GH ange S			o Freq)5 GHz		Frequency	Ampl		Stop 2	2.515 GHz	515.700000 MH
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spur Ra 2 3 3	477 GH ange S 2. 2. 2.	Iz Start Freq 4773 GHz 4905 GHz	2.490 2.495 2.496	05 GHz 50 GHz	1.000 MHz 1.000 MHz 300.0 kHz	2.490190833 (2.495000000 (GHz -35.43 GHz -34.04 GHz -35.05	dBm dBm dBm	Δ Limit -10.43 d	2.515 GHz B B B	515.700000 MH <u>Auto</u> Ma Freq Offs
Spur Ra	477 GH ange S 2. 2. 2.	Iz Start Freq 4773 GHz 4905 GHz 4950 GHz	2.490 2.495 2.496	05 GHz 50 GHz 50 GHz	1.000 MHz 1.000 MHz 300.0 kHz	2.490190833 (2.495000000 (2.495936667 (GHz -35.43 GHz -34.04 GHz -35.05	dBm dBm dBm	Δ Limit -10.43 d -21.04 d	2.515 GHz B B B	515.700000 MH <u>Auto</u> Ma

Plot 7-45. Lower ACP Plot (LTE Band 41(PC3) - 15MHz QPSK - Full RB)



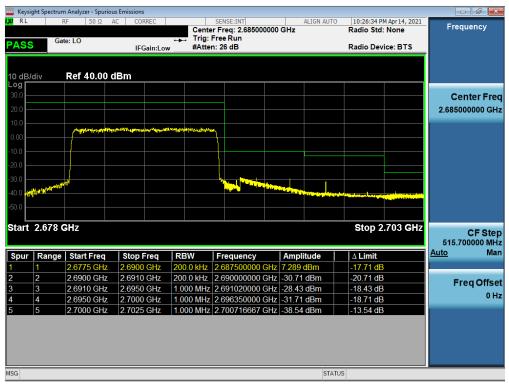


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	ght Spectrum	n Analyzer - Spur	ious Emissio	ns							
M RL		kF 50 Ω te: LO		DRREC	Trig:	SENSE:INT r Freq: 2.5010 Free Run h: 26 dB	00000 G	ALIGN AUTO	10:25:54 F Radio Sto Radio De		Frequency
10 dB/d	div	Ref 40.00		Gain:Lov							
30.0 — 20.0 —											Center Free 2.501000000 GH
10.0 — 0.00 —						Augulation of	ire ryayooli	hand the second	+/****		
-10.0											
40.0	ter territal		and an distance		and the second second					When Britting and	
Start	2.484 0	GHz							Stop 2	2.509 GHz	CF Ste 515.700000 MH
Spur	Range	Start Freq	Stop	Freq	RBW	Frequency	1	Amplitude	∆ Limit		<u>Auto</u> Ma
	1	2.4835 GHz	2.490	5 GHz	1.000 MHz	2.48928666	7 GHz 🗔	31.06 dBm	-6.062 dl	3	
	2	2.4905 GHz	2.495	0 GHz	1.000 MHz	2.49429500) GHz 🟒	26.91 dBm	-13.91 dl	3	Freq Offse
2	0	2.4950 GHz	2.496	0 GHz	200.0 kHz	2.49583666	7 GHz 🖃	31.59 dBm	-18.59 dl	3	
	3			5 OU1	000 0 1 11	2 50224250		064 dBm	-18.04 dl	3	0 H
	3	2.4960 GHz	2.508	5 GHz	200.0 kHz	2.302312300		.304 ubm	-10.04 di	,	
2 3 4			2.508	5 GHz	200.0 KHZ	2.30231230			-10.04 0		

Plot 7-47. Lower ACP Plot (LTE Band 41(PC3) - 10MHz QPSK - Full RB)

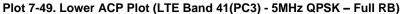




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Frequency	10:24:39 PM Apr 14, 2021							
	Radio Std: None	ALIGN AUTO	SENSE:INT		CORREC	F 50 Ω A		RL
	Radio Device: BTS		Free Run n: 30 dB		IFGain:Low	e: LO	Gat	ASS
					m	Ref 40.00 d	/div	0 dB/
					<u> </u>			°g 30.0
Center Fre 2.498500000 G								20.0
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ี เกิดเ	Stop 2.508 GHz					Hz	2.485 0	tart
CF Ste 515.700000 M <u>Auto</u> M		blitude	Frequency	RBW	Stop Freq	Hz Start Freq		tart Spur
515.700000 M	Stop 2.508 GHz	plitude	Frequency 2.490440000 GHz		Stop Freq 4905 GHz			
515.700000 M Auto M	Stop 2.508 GHz	olitude 18 dBm		1.000 MHz		Start Freq	Range	
515.700000 M	Stop 2.508 GHz ∆ Limit -16.28 dB	blitude 8 8 dBm 7 dBm	2.490440000 GHz	1.000 MHz 1.000 MHz	4905 GHz	Start Freq 2.4845 GHz	Range 1 2	Spur







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7.5 Radiated Power (EIRP)

Test Overview

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 tuned dipole antennas. Measurements on signals operating above 1GHz 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

ANSI/TIA-603-E-2016 - Section 2.2.17

Test Settings

- Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW \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". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
- 9. Trace mode = Trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize

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

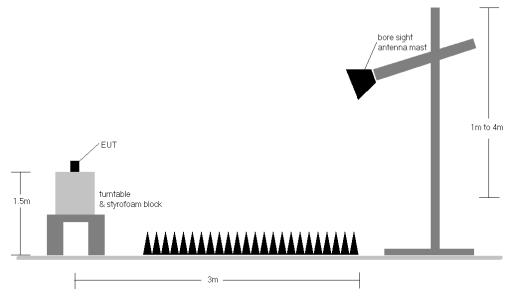


Figure 7-4. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

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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]
N		2506.0	Н	117	204	9.45	1 / 99	15.50	24.95	0.313	33.01	-8.06
Ē	QPSK	2593.0	Н	102	202	9.58	1 / 50	15.83	25.41	0.348	33.01	-7.60
20 MHz		2680.0	Н	114	201	9.86	1/0	15.50	25.36	0.344	33.01	-7.65
2	16-QAM	2680.0	Н	114	201	9.86	1/0	14.70	24.56	0.286	33.01	-8.45
N		2503.5	Н	117	204	9.45	1 / 37	16.07	25.53	0.357	33.01	-7.48
MHz	QPSK	2593.0	Н	102	202	9.58	1/0	16.45	26.03	0.401	33.01	-6.98
LC LC		2682.5	Н	114	201	9.86	1/0	15.76	25.62	0.365	33.01	-7.39
	16-QAM	2682.5	Н	114	201	9.86	1/0	15.29	25.15	0.327	33.01	-7.86
N		2501.0	Н	117	204	9.46	1 / 25	16.25	25.71	0.372	33.01	-7.30
MHz	QPSK	2593.0	Н	102	202	9.58	1 / 25	16.39	25.97	0.396	33.01	-7.04
101		2685.0	Н	114	201	9.85	1/0	15.80	25.65	0.367	33.01	-7.36
-	16-QAM	2685.0	Н	114	201	9.85	1 / 25	15.08	24.93	0.311	33.01	-8.08
N		2498.5	Н	117	204	9.46	1/0	16.24	25.70	0.371	33.01	-7.31
MHz	QPSK	2593.0	Н	102	202	9.58	1 / 12	16.39	25.97	0.395	33.01	-7.04
2		2687.5	Н	114	201	9.85	1/0	15.72	25.56	0.360	33.01	-7.45
	16-QAM	2498.5	Н	117	204	9.46	1 / 24	15.91	25.37	0.344	33.01	-7.64
	Opposite Pol.	2593.0	V	352	297	9.59	1 / 50	14.64	24.23	0.265	33.01	-8.78
20 MHz	Half	2593.0	Н	110	195	9.58	1 / 50	15.80	25.38	0.345	33.01	-7.63
	WCP	2593.0	Н	109	209	9.58	1 / 50	13.57	23.15	0.207	33.01	-9.86

Table 7-2. EIRP Data (LTE Band 41(PC2))

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]
N		2506.0	Н	109	31	9.45	1 / 50	12.50	21.95	0.157	33.01	-11.06
MHz	QPSK	2593.0	Н	100	34	9.58	1 / 99	13.24	22.82	0.191	33.01	-10.19
20 1		2680.0	Н	103	30	9.86	1/0	10.43	20.29	0.107	33.01	-12.72
5	16-QAM	2593.0	Н	100	34	9.58	1 / 99	12.13	21.71	0.148	33.01	-11.30
N		2503.5	Н	109	31	9.45	1 / 37	12.51	21.96	0.157	33.01	-11.05
MHz	QPSK	2593.0	Н	100	34	9.58	1 / 37	13.12	22.70	0.186	33.01	-10.31
15		2682.5	Н	103	30	9.86	1 / 37	10.53	20.39	0.109	33.01	-12.62
-	16-QAM	2593.0	Н	100	34	9.58	1 / 37	12.55	22.13	0.163	33.01	-10.88
N		2501.0	Н	109	31	9.46	1 / 25	12.22	21.68	0.147	33.01	-11.33
MHz	QPSK	2593.0	Н	100	34	9.58	1/0	12.88	22.46	0.176	33.01	-10.55
101		2685.0	Н	103	30	9.85	1 / 25	10.58	20.44	0.111	33.01	-12.57
-	16-QAM	2593.0	Н	100	34	9.58	1/0	11.94	21.52	0.142	33.01	-11.49
N		2498.5	Н	109	31	9.46	1 / 24	12.24	21.70	0.148	33.01	-11.31
MHz	QPSK	2593.0	Н	100	34	9.58	1 / 24	13.24	22.82	0.191	33.01	-10.19
2		2687.5	Н	103	30	9.85	1 / 24	10.35	20.19	0.105	33.01	-12.82
	16-QAM	2593.0	Н	100	34	9.58	1 / 24	12.18	21.77	0.150	33.01	-11.24
	Opposite Pol.	2593.0	V	102	122	9.59	1/0	10.92	20.51	0.112	33.01	-12.50
20 MHz	Half	2593.0	Н	185	28	9.58	1 / 50	9.66	19.24	0.084	33.01	-13.77
	WCP	2593.0	Н	104	41	9.58	1 / 99	11.32	20.90	0.123	33.01	-12.11

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

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7.6 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in KDB 971168 with the EUT transmitting into an 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 peak measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 - Section 5.8

Test Settings

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

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

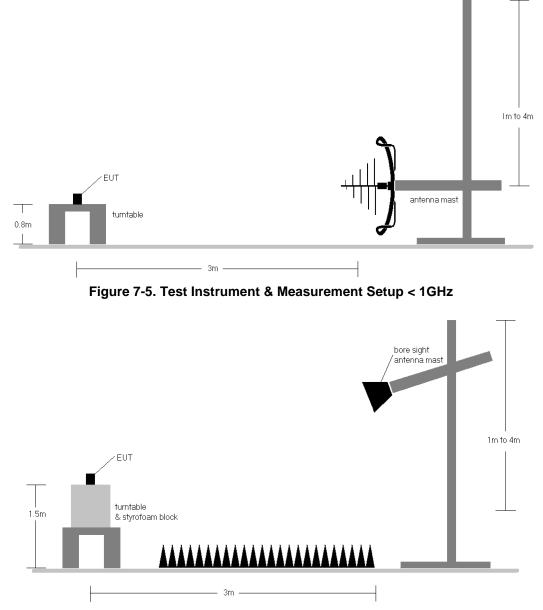


Figure 7-6. Test Instrument & Measurement Setup >1 GHz

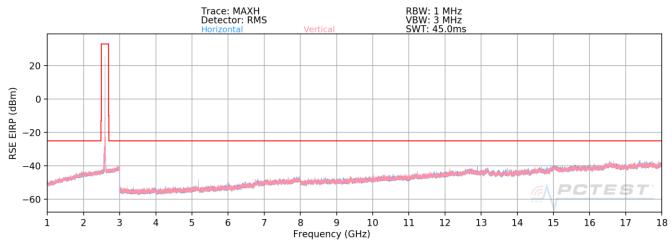
FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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- Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
 b) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
 d) EIRP (dBm) = E(dBµV/m) + 20logD 104.8; where D is the measurement distance in meters.
- 2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 3) This unit was tested with its standard battery.
- 4) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 5) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 6) 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.
- 7) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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Bandwidth (MHz):	20
Frequency (MHz):	2506.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5012.0	V	118	334	-67.56	7.36	46.80	-48.46	-25.00	-23.46
7518.0	V	-	-	-71.45	12.75	48.30	-46.96	-25.00	-21.96
10024.0	V	-	-	-72.50	15.19	49.69	-45.57	-25.00	-20.57
12530.0	V	181	342	-72.97	18.72	52.75	-42.51	-25.00	-17.51
15036.0	V	-	-	-73.47	22.22	55.75	-39.50	-25.00	-14.50
17542.0	V	-	-	-74.85	25.47	57.62	-37.63	-25.00	-12.63

Table 7-4. Radiated Spurious Data (LTE Band 41(PC2) – Low Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5186.0	V	109	328	-66.78	7.32	47.54	-47.72	-25.00	-22.72
7779.0	V	-	-	-71.94	12.58	47.64	-47.62	-25.00	-22.62
10372.0	V	-	-	-72.98	15.75	49.77	-45.49	-25.00	-20.49
12965.0	V	-	-	-73.65	18.98	52.33	-42.93	-25.00	-17.93
15558.0	V	-	-	-74.31	22.69	55.38	-39.87	-25.00	-14.87

Table 7-5. Radiated Spurious Data (LTE Band 41(PC2) – Mid Channel)

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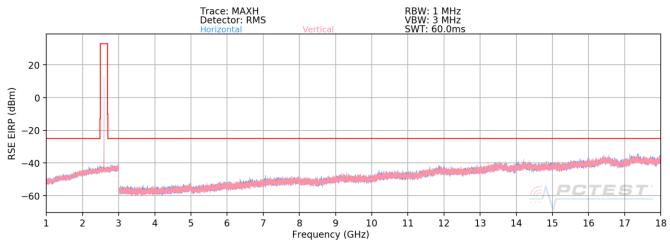
Bandwidth (MHz):	20
Frequency (MHz):	2680.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5360.0	V	109	318	-66.28	8.14	48.86	-46.40	-25.00	-21.40
8040.0	V	-	-	-72.69	12.93	47.24	-48.02	-25.00	-23.02
10720.0	V	185	15	-72.85	16.12	50.27	-44.99	-25.00	-19.99
13400.0	V	-	-	-73.71	19.75	53.04	-42.22	-25.00	-17.22
16080.0	V	-	-	-74.72	23.25	55.53	-39.73	-25.00	-14.73

Table 7-6. Radiated Spurious Data (LTE Band 41(PC2) – High Channel)

FCC ID: A3LSMF711B	PCTEST: Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Plot 7-52. Radiated Spurious Plot (LTE Band 41(PC3))

20
2506.0
1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5012.0	V	130	86	-72.22	10.13	44.91	-50.35	-25.00	-25.35
7518.0	V	-	-	-73.34	16.03	49.69	-45.57	-25.00	-20.57
10024.0	V	-	-	-75.29	19.52	51.23	-44.02	-25.00	-19.02
12530.0	V	-	-	-75.96	23.72	54.76	-40.50	-25.00	-15.50

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

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5186.0	V	129	86	-73.15	10.42	44.27	-50.98	-25.00	-25.98
7779.0	V	-	-	-73.84	16.35	49.51	-45.74	-25.00	-20.74
10372.0	V	-	-	-75.10	20.17	52.07	-43.19	-25.00	-18.19

Table 7-8. Radiated Spurious Data (LTE Band 41(PC3) – Mid Channel)

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Bandwidth (MHz):	20
Frequency (MHz):	2680.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5360.0	V	-	-	-72.29	11.06	45.77	-49.49	-25.00	-24.49
8040.0	V	-	-	-73.17	16.68	50.51	-44.75	-25.00	-19.75
10720.0	V	-	-	-75.85	20.87	52.02	-43.24	-25.00	-18.24

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

FCC ID: A3LSMF711B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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7.7 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

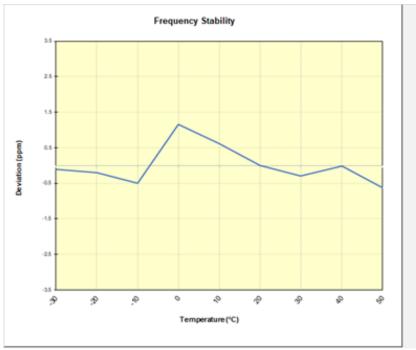
None

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LTE Band 41								
	Operating F	requency (Hz):	2,593,000	,000				
	Ref.	Voltage (VDC):	4.32					
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)			
		- 30	2,593,001,238	-293	-0.0000113			
		- 20	2,593,001,023	-509	-0.0000196			
		- 10	2,593,000,216	-1,315	-0.0000507			
		0	2,593,004,527	2,996	0.0001155			
100 %	4.32	+ 10	2,593,003,136	1,605	0.0000619			
		+ 20 (Ref)	2,593,001,531	0	0.0000000			
		+ 30	2,593,000,764	-768	-0.0000296			
		+ 40	2,593,001,475	-56	-0.0000022			
		+ 50	2,592,999,919	-1,612	-0.0000622			
Battery Endpoint	3.51	+ 20	2,592,999,469	-2,062	-0.0000795			

 Table 7-10. LTE Band 41(PC2) Frequency Stability Data



Plot 7-53. LTE Band 41(PC2) Frequency Stability Chart

FCC ID: A3LSMF711B	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the Samsung **Portable Handset FCC ID: A3LSMF711B** complies with all the requirements of Part 27 of the FCC rules.

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Test Report S/N:	Test Dates:	EUT Type:		Page 53 of 53
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