

PCTEST

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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:

4/28/2021 - 6/17/2021 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M2104190044-05.A3L

FCC ID:

Applicant Name:

A3LSMF926B

Samsung Electronics Co., Ltd.

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

Certification SM-F926B SM-F926B/DS 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	0.352	25.46	18M0G7D
	20 1011 12	16QAM	2506.0 - 2680.0	0.304	24.82	17M9W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.351	25.45	13M5G7D
LTE Bond (11/DC2)		16QAM	2503.5 - 2682.5	0.291	24.63	13M5W7D
LTE Band 41(PC2)	10 MHz	QPSK	2501.0 - 2685.0	0.354	25.49	9M01G7D
		16QAM	2501.0 - 2685.0	0.300	24.77	9M00W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.362	25.59	4M52G7D
		16QAM	2498.5 - 2687.5	0.306	24.85	4M52W7D
		QPSK	2506.0 - 2680.0	0.179	22.52	18M0G7D
	20 MHz	16QAM	2506.0 - 2680.0	0.166	22.21	18M0W7D
		QPSK	2503.5 - 2682.5	0.166	22.21	13M5G7D
LTE Band 41(PC3)	15 MHz	16QAM	2503.5 - 2682.5	0.147	21.68	13M5W7D
		QPSK	2501.0 - 2685.0	0.166	22.20	9M00G7D
	10 MHz	16QAM	2501.0 - 2685.0	0.148	21.71	8M99W7D
		QPSK	2498.5 - 2687.5	0.167	22.22	4M50G7D
	5 MHz	16QAM	2498.5 - 2687.5	0.151	21.80	4M51W7D

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1.0 INTRODUCTION

1.1 Scope

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

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST 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: A3LSMF926B**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: 0450M, 0714M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR (n5, n66), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, UWB

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 3.4 of this test report for a description of the radiated and antenna port conducted emissions tests.

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

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). 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	3/4/2021	Annual	3/4/2022	AP2
-	AP1	EMC Cable and Switch System	3/9/2021	Annual	3/9/2022	AP1
-	LTx2	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx2
-	LTx5	LIcensed Transmitter Cable Set	3/3/2021	Annual	3/3/2022	LTx5
Agilent	E5515C	Wireless Communications Test Set		N/A		GB46310798
Anritsu	MT8821C	Radio Communication Analyzer		N/A		6200901190
Com-Power	AL-130R	Active Loop Antenna	8/22/2019	Biennial	8/22/2021	121085
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	8/7/2018	Triennial	8/7/2021	9203-2178
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Annual	8/27/2022	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
ETS Lindgren	3816/2NM	LISN	7/9/2020	Biennial	7/9/2022	00114451
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	7/17/2020	7/17/2020 Annual 7/17/202		MY49430494
Keysight Technologies	N9038A	MXE EMI Receiver	8/11/2020	Annual	8/11/2021	MY51210133
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11403100002
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A		100976	
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	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

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:	A3LSMF926B
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>LTE</u>

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
JCTEI	Conducted Band Edge / Spurious Emissions (LTE Band 41)	2.1051, 27.53(m)	RSS-199(4.5)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Sections 7.3, 7.4
CONDUCTED	Transmitter Conducted Output Power	2.1046	RSS-199(4.4)	N/A	PASS	See RF Exposure Report
0	Frequency Stability	2.1055, 27.54	RSS-199(4.3)	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
ADIATED	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 41)	27.50(h)(2)	RSS-199(4.4)	< 2 Watts max. EIRP	PASS	Section 7.6
RAD	Radiated Spurious Emissions (LTE Band 41)	2.1053, 27.53(m)	RSS-199(4.5)	Undesirable emissions must meet the 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 Conducted Power Output Data

Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers is measured by means of a calibrated spectrum analyzer. All emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Span = $2 \times OBW$ to $3 \times OBW$
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

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

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
<u>N</u>		39750	2506.0	1/0	24.86
H	QPSK	40620	2593.0	1 / 50	25.03
20 MHz		41490	2680.0	1 / 50	24.95
5	16-QAM	39750	2506.0	1/0	24.28
<u>N</u>	QPSK	39725	2503.5	1 / 74	24.85
MHz		40620	2593.0	1 / 37	24.95
15 1		41515	2682.5	1 / 37	24.89
~	16-QAM	39725	2503.5	1 / 74	24.09
N		39700	2501.0	1/0	24.89
MHz	QPSK	40620	2593.0	1 / 25	24.95
10		41540	2685.0	1 / 25	24.84
~	16-QAM	39700	2501.0	1/0	24.23
N		39675	2498.5	1/0	24.99
MHz	QPSK	40620	2593.0	1 / 12	24.99
5 N		41565	2687.5	1 / 12	25.05
	16-QAM	39675	2498.5	1/0	24.31

Table 7-2. Conducted Max Powers (LTE Band 41 PC2)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
Z		39750	2506.0	1 / 0	22.14
НИ	QPSK	40620	2593.0	1 / 50	22.00
20 MHz		41490	2680.0	1 / 50	22.12
3	16-QAM	39750	2506.0	1/0	21.62
N	QPSK	39725	2503.5	1 / 74	21.83
MHz		40620	2593.0	1 / 37	21.90
15 N		41515	2682.5	1 / 37	21.82
1	16-QAM	41515	2682.5	1 / 37	21.21
N		39700	2501.0	1/0	21.82
НИ	QPSK	40620	2593.0	1 / 25	22.02
10 MHz		41540	2685.0	1 / 25	21.62
-	16-QAM	40620	2593.0	1 / 25	21.13
N		39675	2498.5	1/0	21.84
MHz	QPSK	40620	2593.0	1 / 12	21.96
		41565	2687.5	1 / 12	21.68
5	16-QAM	40620	2593.0	1 / 12	21.38

Table 7-3. Conducted Max Powers (LTE Band 41 PC3)

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7.3 Occupied Bandwidth

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 - Section 4.2

Test Settings

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW \geq 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within
 - 1 5% of the 99% occupied bandwidth observed in Step 7

Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup

Test Notes

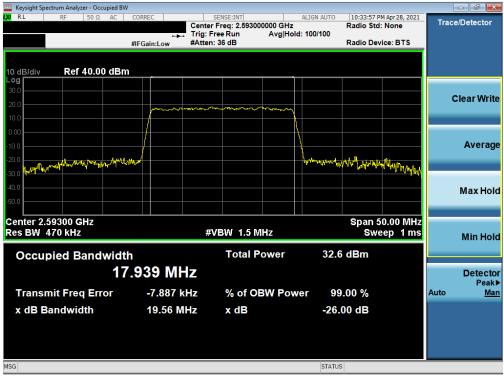
None.

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Keysight Spectrum Analyzer - Occupied B	V						
XIRL RF 50Ω AC			ALIGN AUTO Iz Iold:>100/100	10:32:53 PI Radio Std:	M Apr 28, 2021 None	Trace/	Detector
	#IFGain:Low	#Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00 dBr Log	n						
30.0						C	ear Write
20.0	monter	handler and the second and the second s	-				
10.0							
0.00			1				Average
-10.0			٦ ١				Average
-20.0 -30.0 100 100 100 100 100 100 100 100 100	, ^{Alan} al		Manywaryh	WWW.	Name of A		
-40.0					and an and the fit		Max Hold
-50.0							
Center 2.59300 GHz				Onen F			
Res BW 470 kHz		#VBW 1.5 MHz			0.00 MHz ep 1 ms		Min Hold
Occupied Bandwidt		Total Power	32.3	5 dBm			
17	7.984 MHz	Z					Detector Peak▶
Transmit Freq Error	16.631 kH	z % of OBW Po	ower 99	.00 %		Auto	Mar
x dB Bandwidth	19.51 MH	z xdB	-26.	00 dB			
ISG			STATU	5			

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)

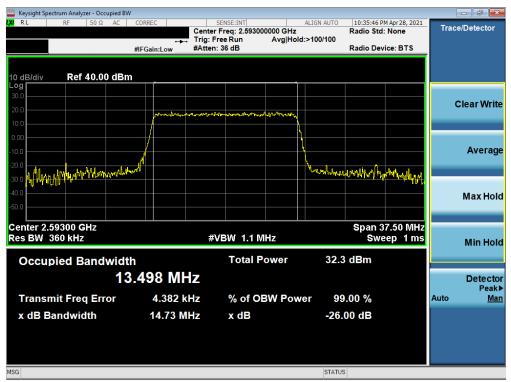
FCC ID: A3LSMF926B		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied E	W						
XX RL RF 50Ω AC	CORREC	SENSE:INT Center Freg: 2.59300	ALIGN AUTO	10:35:36 PM Radio Std:		Trace/	Detector
		Trig: Free Run	Avg Hold: 100/100				
	#IFGain:Low	#Atten: 36 dB		Radio Devi	ce: BTS		
10 dB/div Ref 40.00 dB	m _						
Log 30.0							
						CI	ear Write
20.0	monom	Ward and a large and a start and a start and a start and a start	menne				
10.0							
0.00	/						
-10.0							Average
-20.0 -20.0 Montan Martin and An	INV		Winter	hervenuheerehe	Washington a		_
-30.0 They are fully a france				II	, Lah, halenda		
-40.0							Max Hold
-50.0							
Center 2.59300 GHz Res BW 360 kHz		#VBW 1.1 M	147		7.50 MHz ep 1 ms		
Res DW JOO KIIZ		#8098 1.1 IV	112	GWC	ep Tills		Min Hold
Occupied Bandwid	th	Total P	ower 33	.1 dBm			
	3.515 MH	-					Dete ster
	3.515 MITA	2					Detector Peak▶
Transmit Freq Error	5.542 kH	z % of O	SW Power 9	9.00 %		Auto	Man
x dB Bandwidth	14.74 MH	z x dB	-26	6.00 dB			
	14.74 MIN		-20	0.00 UB			
MSG			STAT	US			





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

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Keysight Spectrum Analyzer - Occupied BV					
RL RF 50 Ω AC	CORREC	SENSE:INT	ALIGN AUTO	10:37:49 PM Apr 28, 20	Trace/Detector
		r Freq: 2.593000000 GH Free Run Avg H	iz lold: 100/100	Radio Std: None	
		n: 36 dB		Radio Device: BTS	
dB/div Ref 40.00 dBn	n		_		
) 0					
					Clear Wri
1.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~		
1.0			- <u>\</u>		
			1		
			X		Avera
.0					
.0	YIL Y		JANY II C JAIN	naunaportan tamang	
				, at le	
					Max Ho
).0					
enter 2.59300 GHz				Span 25.00 M	H7
es BW 240 kHz	#	VBW 750 kHz		Sweep 1 r	ne
5 BW 240 KH2	"	VDVV / JO KIIZ		oweep 11	Min Ho
Occupied Bandwidt	h	Total Power	33.1	dBm	
		rotari onor			
9.	0090 MHz				Detect
					Peal
Transmit Freq Error	-361 Hz	% of OBW Po	ower 99	.00 %	Auto <u>M</u>
x dB Bandwidth	9.856 MHz	x dB	-26	00 dB	
			201	00 01	
-					

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 Analyzer - Occupied BW	,				- 5 💌
CRL RF 50Ω AC		SENSE:INT enter Freq: 2.59300 rig: Free Run	ALIGN AUTO 0000 GHz Avg Hold: 100/100	10:40:09 PM Apr 28, 2021 Radio Std: None	Trace/Detector
		Atten: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00 dBm	L				
30.0					
20.0					Clear Writ
10.0					
0.00			\		
10.0					Averag
20.0 www.www.www			- Karal	MAR WWW WWW	
2010 Array Ar Plan A Plan A Plan A				. W W W W W W W W	
40.0					Max Hol
50.0					Muxilor
				O 40 50 MU	
Center 2.593000 GHz Res BW 120 kHz		#VBW 390 k	H7	Span 12.50 MHz Sweep 1 ms	
		#*BH 0301		owcep 1113	Min Hol
Occupied Bandwidt	h	Total P	ower 32.8	dBm	
4.	5222 MHz	,			Detecto
					Peak
Transmit Freq Error	-6.957 kHz	z % of O	BW Power 99	.00 %	Auto <u>Ma</u>
x dB Bandwidth	5.021 MHz	x dB	-26.	00 dB	
G			STATUS	5	

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



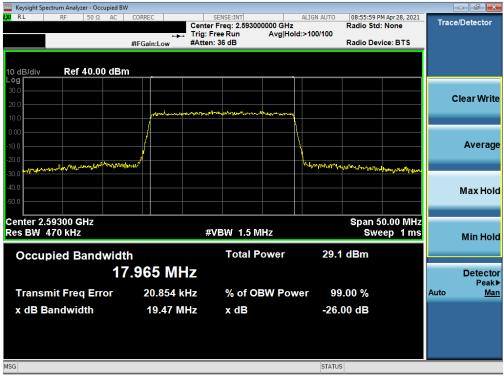
Plot 7-8. Occupied Bandwidth Plot (LTE Band 41(PC2) - 5MHz 16-QAM - Full RB)

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🔤 Keysight Spectrum Analyzer - Occupied BW	1						
LXURL RF 50Ω AC	CORREC	SENSE:INT Center Freq: 2.593000000 G Trig: Free Run Avg #Atten: 36 dB	ALIGN AUTO Hz Hold: 100/100	08:55:35 PM / Radio Std: N Radio Devic	lone	Trace/	Detector
10 dB/div Ref 40.00 dBm							
20.0 10.0 0.00			~~			CI	ear Write
-10.0 -20.0 -30.0					the start have a		Average
-40.0 -50.0 Center 2.59300 GHz				Span 50	.00 MHz		Vlax Hold
Res BW 470 kHz Occupied Bandwidt		#VBW 1.5 MHz Total Power	30.3	Swee 3 dBm	p 1ms		Min Hold
17	.969 MH	Z					Detector Peak
Transmit Freq Error	17.277 ki	Hz % of OBW P	ower 99	0.00 %		Auto	Man
x dB Bandwidth	19.63 MI	Hz x dB	-26.	00 dB			
MSG			STATU	5			

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)

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Keysight Spectrum Analyzer - Occupied BV					
RL RF 50Ω AC	CORREC	SENSE:INT Freq: 2.593000000 GH	ALIGN AUTO	08:58:00 PM Apr 28, Radio Std: None	2021 Trace/Detector
	Trig:		lold: 100/100	Radio Device: BT	
	#IFGain:Low #Atter	n: 36 dB		Radio Device: B I	5
0 dB/div Ref 40.00 dBr	n		•		
30.0					
20.0					Clear Writ
10.0	mannen	an manageration of the second	n		
3.00			N.		
	4		۲.		Averag
10.0					-
20.0 million have all the second	Nhimh		Brunnhauff	with works when we are the	- F
40.0					Max Hol
50.0					
Center 2.59300 GHz				Span 37.50 N	
Res BW 360 kHz	#	VBW 1.1 MHz		Sweep 1	P2 0
				· · ·	Min Hol
Occupied Bandwidt	h	Total Power	29.	7 dBm	
11	3.480 MHz				Detecto
					Peak
Transmit Freq Error	-4.471 kHz	% of OBW Po	ower 99	9.00 %	Auto <u>Ma</u>
x dB Bandwidth	14.65 MHz	x dB	-26	.00 dB	
G			STATU	e	
9			STATU	-	

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 - Occupied B					
🗶 RL RF 50Ω AC	CORREC	SENSE:INT r Freq: 2.593000	ALIGN AUTO	08:58:53 PM Apr 28, 2021 Radio Std: None	Trace/Detector
		Free Run	Avg Hold:>100/100	Radio Std: None	
		n: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00 dB	10				
30.0					
20.0					Clear Write
10.0	portunation	ᠰᡁᡣᠲᢧᡔᡙᠬᢛ᠆ᢣ᠙ᡰ᠆᠆ᢢᡆ	Man marine		
0.00			l l		
			l.		Average
-10.0			1		Average
20.0 here have here here here here here here here he	mu _{lor} ad		to phateman	Mary marker hours and	
-30.0					
-40.0					Max Hold
-50.0					maxitore
Center 2.59300 GHz				Span 25.00 MHz	
Res BW 240 kHz	#	VBW 750 kH	lz	Sweep 1 ms	Min Hold
		Total Po		dBm	
Occupied Bandwid		l otal Po	ower 29.3	aBm	
9.	0008 MHz				Detector
					Peak
Transmit Freq Error	-6.372 kHz	% of OB	W Power 99	.00 %	Auto <u>Man</u>
x dB Bandwidth	9.790 MHz	x dB	-26.	00 dB	
ISG			STATU	5	

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



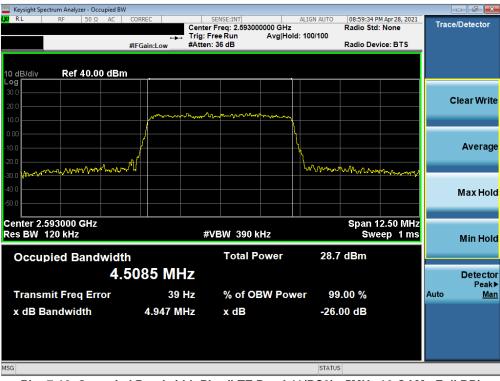
Plot 7-14. Occupied Bandwidth Plot (LTE Band 41(PC3) - 10MHz 16-QAM - Full RB)

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🚾 Keysight Spectrum Analyzer - Occupied BW	,				
XX RL RF 50Ω AC		SENSE:INT ter Freq: 2.5930000 : Free Run	ALIGN AUTO 000 GHz Avg Hold:>100/100	08:59:28 PM Apr 28, 2021 Radio Std: None	Trace/Detector
		en: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00 dBm					
30.0					
20.0					Clear Write
10.0		www.			
0.00					•
-10.0			h.		Average
-20.0	NV		Jurran and a start	man man man	
-40.0					Max Hold
-50.0					
Center 2.593000 GHz				Snop 42 50 MHz	
Res BW 120 kHz		#VBW 390 kH	z	Span 12.50 MHz Sweep 1 ms	Min Hold
Occupied Bandwidt	h	Total Po	wer 29.3	dBm	
	5039 MHz				Detector
					Peak▶
Transmit Freq Error	125 Hz	% of OB\		.00 %	Auto <u>Man</u>
x dB Bandwidth	4.977 MHz	x dB	-26.	00 dB	
ISG			STATUS	6	

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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7.4 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 10GHz (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

Test Notes

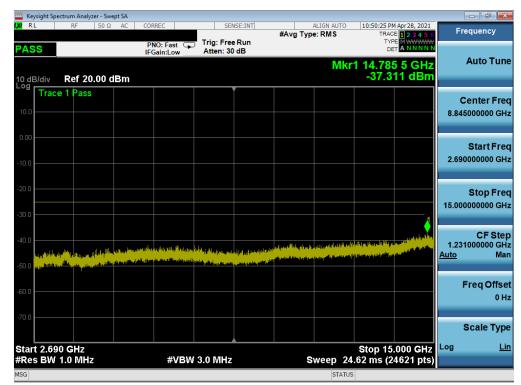
 Per Part 27, RSS-199, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of 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.

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	pectrum Analy												- 6 -
ASS	RF	<u>50</u> Ω	AC	CORREC PNO: Fa	st 😱	SEN Trig: Free Atten: 30		#Avg	ALIGN AUT Type: RMS	TR	PM Apr 28, 2021 ACE 1 2 3 4 5 6 YPE M WWWWWW DET A N N N N N	F	requency
0 dB/div	Ref 20).00 d	Bm	IFGain:Lo	ow	Atten: 00				Mkr1 2.47	70 5 GHz 049 dBm		Auto Tun
-og Trac 10.0	e 1 Pass												Center Fre
10.00												3	Start Fre
30.0												2.47	Stop Fr 5000000 G
40.0	الفريسية إدريته	الاف الداريا	والدائية والم	الانتقاد	-		hidigingshjerne			وروا المعطار والار	1 International Academic	24 <u>Auto</u>	CF St 4.500000 M M
50.0 <mark>- 1951, 196</mark> 50.0		u (a carda da c	ulter et an bei feitig										Freq Offs 0
70.0										Stop	2.475 GHz	Log	Scale Ty
	30 GHZ 1.0 MH:	z		#	VBW	3.0 MHz			Sweep	3.260 ms	2.475 GHZ (4891 pts)	-	-
SG										TUS			

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



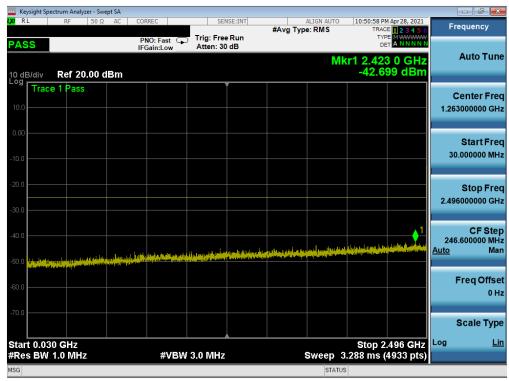
Plot 7-18. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

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	ight Spect	rum Analyzer - S										- 0 ×
L <mark>XI</mark> RL		RF 50	Ω AC	CORREC	SEI	NSE:INT	A #Avg Type	LIGN AUTO		M Apr 28, 2021	Fre	equency
PASS	S			PNO: Fast IFGain:Low	Trig: Free Atten: 10	Run	mitg type		TYF			
10 dB/ Log 🗖	/div	Ref 0.00	dBm					MI	47.5 kr1 25.73	1 0 GHz 13 dBm		Auto Tune
	Trace	1 Pass									с	enter Freq
-10.0											21.000	000000 GHz
-20.0												Start Freq
-30.0												000000 GHz
-40.0 —										1	27 000	Stop Freq
-50.0				ار باير ونظر والعرونية و	in the second second	distance produced as	and the sector of the		NUMBER OF STREET			
-60.0	e de la contra da con Contra da contra da co			A CONTRACTOR OF THE OWNER OF THE	and the local data of the second s	Contract party and the second					1 200	CF Step
-70.0											<u>Auto</u>	Man
-70.0											F	reg Offset
-80.0												0 Hz
-90.0												
	15.00											Scale Type
		0 GHz .0 MHz		#VE	3W 3.0 MHz		Sv	veep	27 Stop 30.40 ms	.000 GHz 4001 pts)	LUg	
MSG								STA	rus			

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)

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	pectrum Analyz	er - Swep	ot SA											
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#Ava	ALIGN AU Type: RMS	ITO		M Apr 28, 2021 CE 1 2 3 4 5 6	F	requency
PASS				PNO: Fa	ist 😱	Trig: Free Atten: 30			rype. runo		TΥ			
1 400	_			IFGain:L	ow	Atten: 30	ав			Alered	_			Auto Tune
10 dB/div	Ref 20	.00 d	Bm						n		-36.8	7 0 GHz 02 dBm		
Log Tra	ce 1 Pass					,								Center Freg
10.0														15000000 GHz
0.00														Otort Eron
													2.60	Start Freq 9000000 GHz
-10.0													2.0.	0000000000
-20.0														
20.0													45.00	Stop Freq 0000000 GHz
-30.0													15.00	0000000 GHZ
												↓ ()		
-40.0				والمراقع المراقعان	anda Mahanatanana	le Mue	and a disc	ومراجع التلوزون	ang Payan tersang sa kara	allow state and	فر المراطقية	r pipel	1.23	CF Step 31000000 GHz
and show			and the second	and a start			and the state of the second	and the second statistics	and the second secon		and the second states of the		<u>Auto</u>	Man
-50.0	,													
-60.0														Freq Offset
														0 Hz
-70.0														
														Scale Type
Start 2.6										5	Stop 1	5.000 GHz	Log	Lin
#Res BW	1.0 MHz			#	ŧVBW	3.0 MHz			Sweep	24.6	2 ms (2	24621 pts)		
MSG									ST	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)

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	ctrum Analyz	er - Swep	ot SA									
XI RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Apr 28, 2021	Frequency
PASS				PNO: Fa		Trig: Free Atten: 30				TY		
10 dB/div Log	Ref 20.	00 di	Bm						N	lkr1 2.45 -42.0	8 0 GHz 60 dBm	Auto Tune
10.0 Trace	e 1 Pass											Center Fred 1.263000000 GHz
-10.0												Start Free 30.000000 MHz
-20.0												Stop Free 2.49600000 GHa
-30.0						ويست ولايد إيا	an an the Jacob Manager	الم الروس والداد والله وربار ال		liter interchieldine bei	da James de Maria	CF Step 246.600000 MHz Auto Mar
-50.0 wight en			ومنازله بليه				alde e ye alde billet					
-60.0												Freq Offse 0 Ha
-70.0												Scale Type
Start 0.03 #Res BW				#	¢VBW	3.0 MHz			Sweep	Stop 2 3.288 ms (.496 GHz 4933 pts)	Log <u>Lir</u>
MSG									STAT	TUS		

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		SA											
XI RL	RF	50 Ω	AC C	ORREC		SEN	ISE:INT	#Ava	ALIGN AU Type: RMS			M Apr 28, 2021	Fi	requency
PASS				PNO: Fa: FGain:Lo	st 😱	Trig: Free Atten: 10			.,,		TYP			
10 dB/div	Ref 0.0	0 dBn	n						Ν	/lkr1	25.76 -46.4	7 0 GHz 19 dBm		Auto Tune
Log Trac	e 1 Pass													Center Freq
-20.0													15.00	Start Freq
-40.0											ور الافرىد.	1	27.00	Stop Freq 0000000 GHz
-60.0	ant at the steption of the st	میں والی روزنا اندیا تھریت _ک یڈ	langgan (ng ki) Maganang katika	an The Trans			Quanter Franklyn (1975) Kanton Stad (anter b	an a			a di di setta di si d		1.20	CF Step
-70.0													<u>Auto</u>	Man
-80.0														Freq Offset 0 Hz
-90.0														Scale Type
Start 15.0 #Res BW				#	VBW	3.0 MHz			Sweep	30.4	Stop 27 0 ms (2	.000 GHz 4001 pts)	Log	Lin
MSG										TATUS				

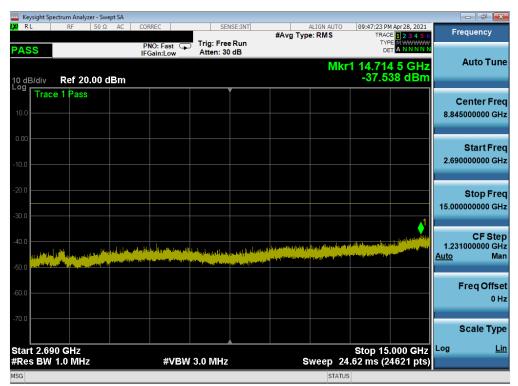
Plot 7-25. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

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			Analyzer - Sw										
L <mark>XI</mark> RI	L	RF	50 Ω	AC C	ORREC	SEI	ISE:INT	#Avg Typ	ALIGN AUTO		M Apr 28, 2021	F	requency
DAG	•				PNO: Fast	Trig: Free		#/18 I.JP	0.10110	TY			
PAS	5				IFGain:Low	Atten: 30) dB						Auto Tune
									M	kr1 2.36	6 0 GHz		Auto Tune
10 dE Log I	3/div	Rei	20.00 c	iBm						-42.5	01 dBm		
208	Trace	9 1 P	ass) Y							Center Freq
10.0													52500000 GHz
10.0												1.23	52500000 GHZ
0.00													
0.00													Start Freq
-10.0												3	0.000000 MHz
-10.0													
-20.0													
-20.0													Stop Freq
-30.0												2.47	75000000 GHz
-30.0													
-40.0											<u>1</u>		CF Step
-40.0										n al caler, constitui eletere	sector in the statistic		4.500000 MHz
-50.0	ماريك بما رام			والملاحد والعرام	ليروا كأفأتها وبالتركي	د بر المراجع الجريد الجريد المربع من المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع ا		ار بار داری امریکار در از در از استار در از استار میکرد در استار از در		a matter bisken at the		<u>Auto</u>	Man
-30.0	ويتعسطونهم	ot the late	and the second states of the	I A I A I A I A I A I A I A I A I A I A									
-60.0													Freq Offset
-00.0													0 Hz
-70.0													
-70.0													Scale Type
	t 0.03									Stop 2	.475 GHz	Log	<u>Lin</u>
#Re	s BW	1.0	ЛНz		#VBW	/ 3.0 MHz			Sweep 3	3.260 ms	4891 pts)		
MSG									STATU	s			

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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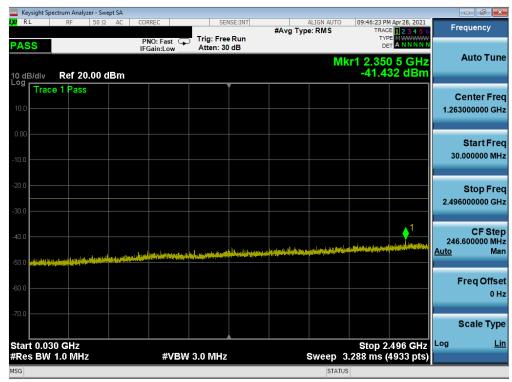
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	ectrum Analyzer - Swe										
L <mark>XI</mark> RL	RF 50 Ω	AC CO	IRREC	SEI	ISE:INT	#Avg Ty	ALIGN AU		M Apr 28, 2021	Fi	requency
PASS			NO: Fast 🕞 Gain:Low	Trig: Free Atten: 10		#/ (g) j		TY D			
10 dB/div Log	Ref 0.00 di	Зm					Μ	1kr1 25.38 -47.5	8 5 GHz 72 dBm		Auto Tune
Trac	e 1 Pass										Center Freq
-10.0										21.00	0000000 GHz
-20.0											Start Freq
-30.0										15.00	0000000 GHz
-40.0								.1			Stop Freq
-50.0							a gester i			27.00	0000000 GHz
-60.0		n (1) ^{pal} ung replacifien sinn den som bestelen	ener siller parte		esylligitiyati katipay padalahin kati katipay	ngen filmigen seiten en sin einen seiten		Second State State State	Naffan, aktoren		CF Step
بلقر والمالي ميرين										1.20 <u>Auto</u>	0000000 GHz Man
-70.0											
-80.0											Freq Offset 0 Hz
-90.0											O a a la Troma
											Scale Type
Start 15.0 #Res BW			#VBW	/ 3.0 MHz			Sweep	Stop 27 30.40 ms (2	1000 OT12	Log	Lin
MSG							ST	ATUS			

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



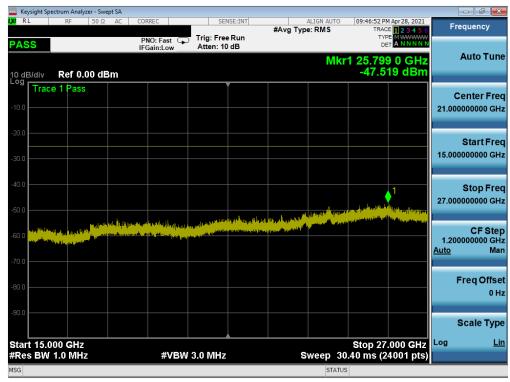
Plot 7-29. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMF926B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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M RL RF SO Ω AC CORREC SENSE:INT ALIGN AUTO 09:46:38 PM Apr 28, 2021 Frequence PASS PNO: Fast IFGain:Low Trig: Free Run Atten: 30 dB Trig: Tree Run Atten: 30 dB Trace 1 2 3 4 5 GHz -36.981 dBm Auto 1 10 dB/div Ref 20.00 dBm -36.981 dBm Center 10 0 Trace 1 Pass Center 8.845000000 0.00 Start 2.690000000 Start -10 0 Start Start Start	су
PASS PNO: Fast IFGain:Low Trig: Free Run Atten: 30 dB Tree Run Atten: 30 dB Tree Run Atten: 40 dB 10 dB/div Ref 20.00 dBm -36.981 dBm Center 10 dB/div Ref 20.00 dBm -36.981 dBm Start 10 dB/div Ref 20.00 dBm Start 2.690000000	
In Same of Same	
10 dB/div Ref 20.00 dBm 36.981 dBm 100 Trace 1 Pass Center 000 Start 2.69000000	Tune
Trace 1 Pass Center 100	
10 0 8.84500000 0.00 Start -10 0 Start 2.69000000	r Fred
-10.0 Start 2.69000000	
-10.0 Start 2.69000000	
-10.0 2.69000000	t Fred
-200 Ctop	
	Freq
-30.0	
	Step
	00 GHz Man
-500 and the first state of the	Wan
Freq O	Offeot
-60.0	0 Hz
-70.0 Scale S	Туре
Start 2.690 GHz Stop 15.000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 24.62 ms (24621 pts)	Lin
MSG STATUS	Lin

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



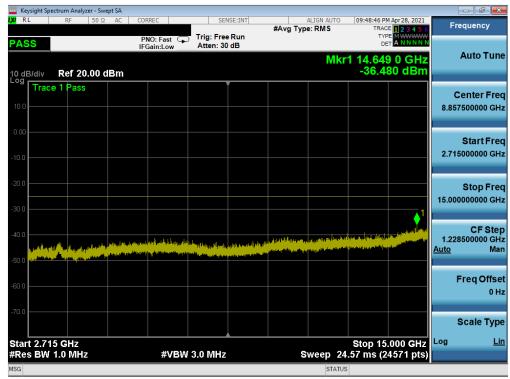
Plot 7-31. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMF926B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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	ectrum Analyz	er - Swej	pt SA									_	
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#Avg Typ	ALIGN AUTO		M Apr 28, 2021	Fred	quency
PASS				PNO: Fa	ast 😱 .ow	Trig: Free Atten: 30				TY			
10 dB/div	Ref 20	.00 d	Bm						N	1kr1 2.42 -42.3	0 0 GHz 03 dBm	Δ	uto Tune
Log Trace	e 1 Pass												enter Freq 00000 GHz
-10.0													Start Freq 00000 MHz
-20.0													Stop Freq 00000 GHz
-40.0		ى وادايەت بىر			in all a line in a	ور المانين مراد	d et anno 101	den filmen fan 18 Mei de d			1 dation internation	246.6 <u>Auto</u>	CF Step 00000 MHz Man
-50.0				<u>میں بر میں دی میں میں میں میں میں میں میں میں میں می</u>								Fi	req Offset 0 Hz
-70.0 Start 0.03	0 CH7									Stop	.496 GHz		cale Type Lin
#Res BW				3	≠vвw	3.0 MHz			Sweep	3.288 ms ((4933 pts)		
MSG									STAT	rus			

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)

FCC ID: A3LSMF926B		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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	ectrum Analyz	er - Swep	ot SA										
X/RL	RF	50 Ω	AC	CORREC			ISE:INT	#Avg	ALIGN AU Type: RMS		01 PM Apr 28, 2021	F	requency
PASS				PNO: Fa IFGain:L		Trig: Free Atten: 10							
10 dB/div	Ref 0.0	0 dB	m						N	lkr1 25.7 -47	763 5 GHz .465 dBm		Auto Tune
-10.0 Trac	e 1 Pass												Center Free 00000000 GH
-20.0												15.00	Start Free
-40.0											1 Netlinet of the later	27.00	Stop Free
-60.0			n a Taylor yn 1 aladau yn 1	an franzel og læget og s ander som en sen sen som en s ander som en som en an en som en	alter finger f		ng Digan ay parating ga Alam ng parating				and a set of the set o	1.20 <u>Auto</u>	CF Ste 00000000 GH Ma
80.0													Freq Offse 0 H
-90.0										01		Log	Scale Type
Start 15.0 #Res BW				#	VBW	3.0 MHz			Sweep	Stop 30.40 ms	27.000 GHz (24001 pts)	209	<u></u>
ISG										ATUS			

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

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7.5 Band Edge Emissions at Antenna Terminal

Test Overview

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

The minimum permissible attenuation level of any spurious emission is $43 + 10 \log_{10}(P_{[Watts]})$, 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 7-4. Test Instrument & Measurement Setup

Test Notes

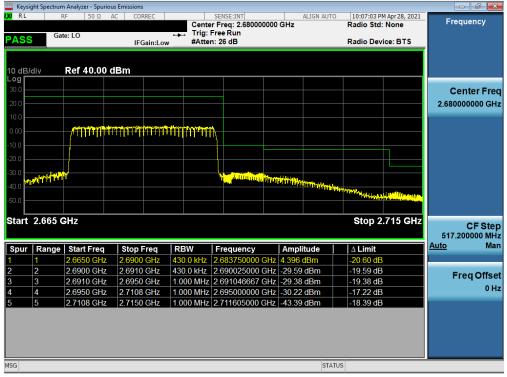
1. Per 27.53(h), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission 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.

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		n Analyzer - Sp													×
X/RL	F	RF 50 Ω	2 AC	COR	REC	Cente	SENSE:INT er Freq: 2.50	5000000		ALIGN AUTO			M Apr 28, 2021 : None	Frequency	y
PASS	Gat	te: LO		IFC	ain:Lov		Free Run n: 26 dB				Padio	Dev	vice: BTS		
				IFG	ain:Lov	w #Atte	n. 20 ub				Raulo	Dev	ice. DT3	-	
10 dB/	div	Ref 40.0)0 dB	m											
Log 30.0														Center	Ero
20.0														2.506000000	GH
10.0															
0.00							/1111	TITT	i i i i i i i i i i i i i i i i i i i	TTTTT	וויוןוי	۳۱-			
-10.0												- 1			
-20.0															
-30.0						الأسبيت والل	and a state					5	10.1 I I		
-40.0		L.L.L.L.L.L.	a la	****	diffi th		<u>. 1</u>						TITE PARTY AND		
-50.0 🎋															
Start	2.471 0	GHZ									Sto	p 2	.521 GHz	CFS	Ster
														517.200000	
Spur	Range	Start Fre	q	Stop F	req	RBW	Frequenc	у	Ampl	itude	∆ Lin	nit		Auto	Mai
1	1	2.4710 G	Hz 2	2.4905	GHz	1.000 MHz	2.4899800	00 GHz	-33.57	′ dBm	-8.56	8 dE	}		
2	2	2.4905 G	Hz 2	2.4950	GHz	1.000 MHz	2.4936500	00 GHz	-31.34	dBm	-18.3	4 dE	}	Freq O	ffee
3	3	2.4950 G	Hz 2	2.4960	GHz	430.0 kHz	2.4959650	00 GHz	-32.73	dBm	-19.7	3 dE	3	i i cq C	0 H
4	4	2.4960 G	Hz 2	2.5210	GHz	430.0 kHz	2.5098750	00 GHz	4.327	dBm	-20.6	7 dE	3		UН
_															
SG										STA	TUS				

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)

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10:20:19 PM Apr 28, 2021					ons	us Emissior	n Analyzer - Spuriou	- ·	
adio Std: None Frequency	Radio Sto	ALIGN AUTO	SENSE:INT Freq: 2.503500000 ree Run : 26 dB	Trig:	CORREC		νF 50Ω A	6-1	V RL
						dBm	Ref 40.00 c	/div	10 dB/ -og 30.0
Center Fre 2.503500000 GH									20.0 - 10.0 -
	~*************************************	ใหญ่หนึ่งกฎมาระคุณได้เป็นปัตุรัฐสารณ์ใหญ่ มี							3.00 10.0
									20.0 - 30.0 -
Manufandardi.					Marcin Coloring and a second	in despiration	hamered for the second	ر. المراجعة المراجعة ال	40.0
Stop 2.515 GHz CF Ste 5.000000 MH	Stop 2						SHz	2.477 0	tart
A Limit Auto Ma	∆ Limit	Amplitude	Frequency	RBW	p Freq	Stop	Start Freq	Range	Spur
9.463 dB	-9.463 dl	-34.46 dBm	2.490323333 GHz	1.000 MHz	05 GHz	2.490	2.4773 GHz	1	
18.36 dB Freq Offs	-18.36 dl	-31.36 dBm	2.494921739 GHz	1.000 MHz	50 GHz	2.495	2.4905 GHz	2	
20.81 dB	-20.81 dl	-33.81 dBm	2.495696667 GHz	300.0 kHz	60 GHz	2.496	2.4950 GHz	3	
	-21.10 di		2.508062500 GHz	300.0 kHz	48 GHz		2.4960 GHz		

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



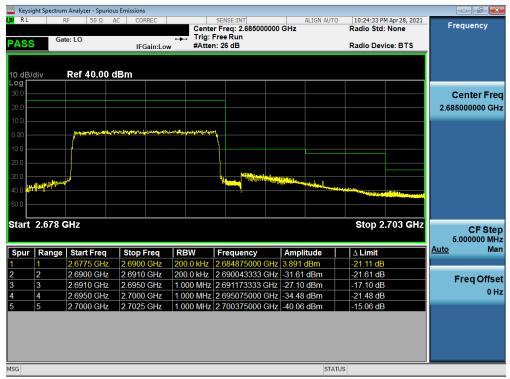
Plot 7-38. Upper ACP Plot (LTE Band 41(PC2) - 15MHz QPSK – Full RB)

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Keysight S	pectrum	n Analyz	er - Spuri	ous Emi	issions												
PASS	R Gat	if ie: LO	50 Ω	AC	CORF	REC		Trig:	SENSE er Frec Free R en: 26 c	: 2.5010 un	00000		ALIGN AUTO	Radi	o Std	M Apr 28, 2021 : None	Frequency
10 dB/div Log		Ref 4	40.00	dBn	n												
30.0 20.0 10.0																	Center Fre 2.501000000 GH
0.00										Allow Allow	pan ta a si	7447PA~4	Lanapart Indian	an fair			
20.0 30.0						haataa	Les yes and the	a link for	لم الم ال								
-40.0 -50.0	n i na ili i i i i i i i i i i i i i i i i i	edyn y Reinia	4		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,											. Jan Barran Maral Maral P	
Start 2.4	184 G	θHz												St	op 2	.509 GHz	CF Ste 5.000000 MH
Spur Ra	ange	Star	Freq	S	top F	req	RB	N	Free	uency		Ampl	itude	ΔL	imit		<u>Auto</u> Ma
1		2.483	5 GHz	2.4	4905 (GHz	1.00	0 MHz	2.489	90500	0 GHz	-38.29	dBm	-13.	29 dE	3	
2 2		2.490	5 GHz	2.4	4950 (GHz	1.00	0 MHz	2.494	81250	0 GHz	-30.43	dBm	-17.	43 dE	}	Fred Offe
3 3		2.495	i0 GHz	2.4	4960 (GHz	200.	0 kHz	2.49	71666	7 GHz	-35.62	dBm	-22.	62 dE	3	
4		2.496	0 GHz	2.5	5085 (GHz	200.	0 kHz	2.500	97916	7 GHz	4.374	dBm	-20.	63 dE	3	01
		<mark>2.483</mark> 2.490 2.495	35 GHz 05 GHz 50 GHz	2.4 2.4 2.4	4905 (4950 (4960 (<mark>GHz</mark> GHz GHz	1.00 1.00 200.	<mark>0 MHz</mark> 0 MHz 0 kHz	2.489 2.494 2.495	905000 812500 71666	0 GHz 7 GHz	- <mark>38.29</mark> -30.43 -35.62	dBm dBm dBm	-13. -17. -22.	<mark>29 dE</mark> 43 dE 62 dE	3	Auto Ma Freq Offs 0 H

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



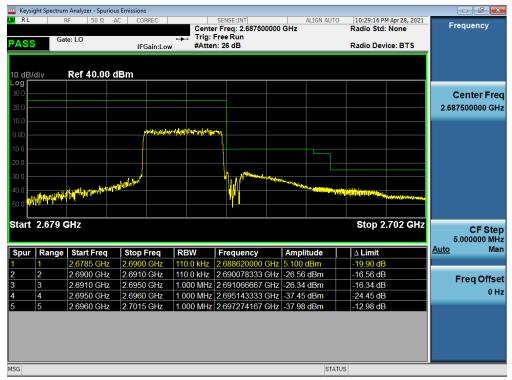
Plot 7-40. Upper ACP Plot (LTE Band 41(PC2) - 10MHz QPSK – Full RB)

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								nissions	rious E	n Analyzer - Spuri	ight Spectrum	
Frequency	10:27:24 PM Apr 28, 2021 Radio Std: None Radio Device: BTS		Freq: 2.498500000 GHz Rac ree Run		📕 Trig: I		COR	AC	kF 50 Ω	Cat	RL ASS	
Í		Radio Devi			5 db	#Atter	n:Low) de	Ref 40.00		0 dBi
Center Fre												.og 30.0
2.498500000 G												20.0
			1	n af an shalo	programminista).00 —
												10.0 - 20.0 -
												30.0
	Wayahina Mada ana N	· · · · ·	And the second states					hanikain taal				40.0 – 50.0 –
CF Ste 5.000000 M	.508 GHz									GHz	2.485 0	tart
Auto M		∆ Limit	tude	Ampli	equency	RBW	eq	Stop F		Start Freq	Range	Spur
		-14.55 dB	dBm	-39.55	88676000 GHz	.000 MHz	Hz	.4905	z i	2.4845 GHz	1	
		-15.48 dB	dBm	-28.48	94632500 GHz	000 MHz	Hz	.4950	z i	2.4905 GHz	2	
Erod Offe		-18.48 dB			95648333 GHz	10.0 kHz	Hz	2.4960 GHz		2.4950 GHz	3	
Freq Offs		-10.40 UD					Hz					

Plot 7-41. Lower ACP Plot (LTE Band 41(PC2) - 5MHz QPSK - Full RB)



Plot 7-42. Upper ACP Plot (LTE Band 41(PC2) - 5MHz QPSK – Full RB)

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7.6 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 broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 - Section 5.2.1

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 \ge 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.

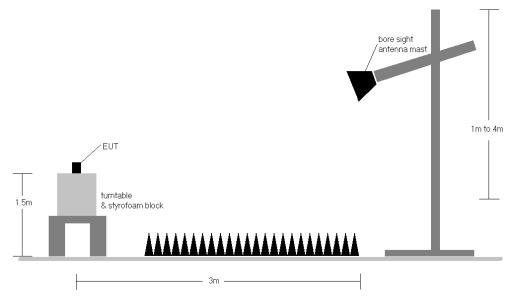


Figure 7-5. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 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	155.0	30.0	9.45	1 / 50	16.01	25.46	0.352	33.01	-7.55
MHz	QPSK	2593.0	Н	147.0	35.0	9.58	1/0	14.62	24.20	0.263	33.01	-8.81
20 1		2680.0	Н	128.0	35.0	9.86	1 / 99	14.59	24.45	0.279	33.01	-8.56
7	16-QAM	2506.0	Н	155.0	30.0	9.45	1 / 50	15.37	24.82	0.304	33.01	-8.19
N		2503.5	Н	155.0	30.0	9.45	1 / 74	16.00	25.45	0.351	33.01	-7.56
MHz	QPSK	2593.0	Н	147.0	35.0	9.58	1 / 37	14.54	24.12	0.258	33.01	-8.89
15 1		2682.5	Н	128.0	35.0	9.86	1 / 37	14.54	24.39	0.275	33.01	-8.62
-	16-QAM	2503.5	Н	155.0	30.0	9.45	1 / 74	15.18	24.63	0.291	33.01	-8.38
N		2501.0	Н	155.0	30.0	9.46	1/0	16.04	25.49	0.354	33.01	-7.52
MHz	QPSK	2593.0	Н	147.0	35.0	9.58	1 / 25	14.54	24.12	0.258	33.01	-8.89
101		2685.0	Н	128.0	35.0	9.85	1 / 25	14.49	24.34	0.272	33.01	-8.67
-	16-QAM	2501.0	Н	155.0	30.0	9.46	1/0	15.32	24.77	0.300	33.01	-8.24
N		2498.5	Н	155.0	30.0	9.46	1/0	16.13	25.59	0.362	33.01	-7.42
MHz	QPSK	2593.0	Н	147.0	35.0	9.58	1 / 12	14.58	24.16	0.261	33.01	-8.85
5 N		2687.5	Н	128.0	35.0	9.85	1 / 12	14.71	24.55	0.285	33.01	-8.46
	16-QAM	2498.5	Н	155.0	30.0	9.46	1/0	15.39	24.85	0.306	33.01	-8.16
	Opposite Pol.	2506.0	V	204	301	9.42	1 / 99	14.88	24.30	0.269	33.01	-8.71
20 MHz	Open	2506.0	Н	115	152	9.45	1/0	15.69	25.14	0.327	33.01	-7.87
	WCP	2506.0	Н	191	44	9.45	1 / 24	12.47	21.92	0.156	33.01	-11.09

Table 7-4. 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]
		2506.0	Н	101.0	326.0	9.45	1 / 50	13.07	22.52	0.179	33.01	-10.49
20 MHz	QPSK	2593.0	Н	121.0	330.0	9.58	1/0	11.51	21.09	0.129	33.01	-11.92
20 1011 12		2680.0	Н	125.0	332.0	9.86	1 / 99	10.18	20.04	0.101	33.01	-12.97
	16-QAM	2506.0	Н	101.0	326.0	9.45	1 / 50	12.76	22.21	0.166	33.01	-10.80
		2503.5	Н	101.0	326.0	9.45	1 / 74	12.76	22.21	0.166	33.01	-10.80
15 MHz	QPSK	2593.0	н	121.0	330.0	9.58	1 / 37	11.41	20.99	0.126	33.01	-12.02
13 1411 12		2682.5	Н	125.0	332.0	9.86	1 / 37	9.89	19.74	0.094	33.01	-13.27
	16-QAM	2503.5	Н	101.0	326.0	9.45	1 / 74	12.23	21.68	0.147	33.01	-11.33
	QPSK	2501.0	Н	101.0	326.0	9.46	1/0	12.75	22.20	0.166	33.01	-10.81
10 MHz		2593.0	Н	121.0	330.0	9.58	1 / 25	11.53	21.11	0.129	33.01	-11.90
10 10112		2685.0	Н	125.0	332.0	9.85	1 / 25	9.69	19.54	0.090	33.01	-13.47
	16-QAM	2501.0	Н	101.0	326.0	9.46	1/0	12.26	21.71	0.148	33.01	-11.30
		2498.5	Н	101.0	326.0	9.46	1/0	12.76	22.22	0.167	33.01	-10.79
5 MHz	QPSK	2593.0	Н	121.0	330.0	9.58	1 / 12	11.47	21.05	0.127	33.01	-11.96
5 10112		2687.5	Н	125.0	332.0	9.85	1 / 12	9.76	19.60	0.091	33.01	-13.41
	16-QAM	2498.5	Н	101.0	326.0	9.46	1/0	12.34	21.80	0.151	33.01	-11.21
	Opposite Pol.	2506.0	V	150.0	88.0	9.42	1 / 50	12.66	22.08	0.162	33.01	-10.93
20 MHz	Open	2506.0	Н	120.0	151.0	9.45	1 / 99	12.20	21.65	0.146	33.01	-11.36
	WCP	2506.0	Н	141.0	299.0	9.45	1 / 50	8.85	18.30	0.068	33.01	-14.71

Table 7-5. EIRP Data (LTE Band 41(PC3))

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7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in KDB 971168 with the EUT transmitting into an 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.

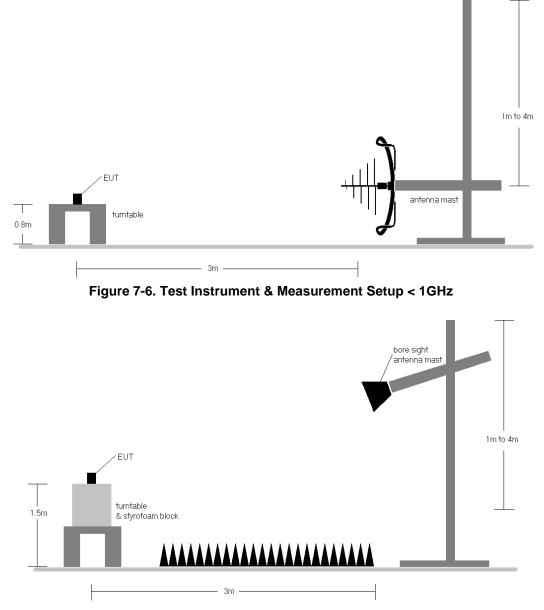


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

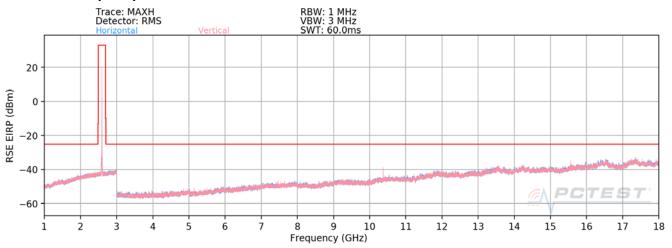
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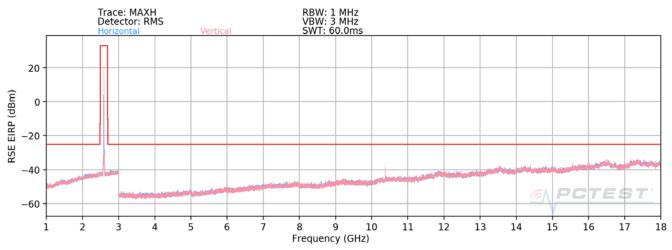
- Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
 b) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
 d) EIRP (dBm) = E(dBµV/m) + 20logD 104.8; where D is the measurement distance in meters.
- 2) The EUT 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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Plot 7-44. Radiated Spurious Plot (LTE Band 41(PC2)) - CLOSED

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	-	-	-73.03	10.13	44.10	-51.16	-25.00	-26.16
7518.0	V	-	-	-75.12	16.03	47.91	-47.35	-25.00	-22.35
10024.0	V	100	136	-69.38	19.52	57.14	-38.11	-25.00	-13.11
12530.0	V	-	-	-76.01	23.72	54.71	-40.55	-25.00	-15.55
15036.0	V	100	101	-76.08	28.01	58.93	-36.33	-25.00	-11.33
17542.0	V	-	-	-76.93	31.75	61.82	-33.43	-25.00	-8.43
20048.0	V	-	-	-59.02	4.38	52.36	-52.44	-25.00	-27.44
22554.0	V	-	-	-58.58	5.48	53.90	-50.90	-25.00	-25.90

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

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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	-	-	-73.23	10.42	44.19	-51.06	-25.00	-26.06
7779.0	V	-	-	-74.48	16.35	48.87	-46.38	-25.00	-21.38
10372.0	V	101	141	-67.31	20.17	59.86	-35.40	-25.00	-10.40
12965.0	V	-	-	-79.90	25.13	52.23	-43.02	-25.00	-18.02
15558.0	V	100	64	-72.11	29.09	63.98	-31.28	-25.00	-6.28
18151.0	V	-	-	-58.89	3.68	51.79	-43.47	-25.00	-18.47
20744.0	V	-	-	-59.25	4.52	52.27	-52.53	-25.00	-27.53
23337.0	V	-	-	-59.28	5.37	53.09	-51.71	-25.00	-26.71

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

20
2680.0
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]
5360.0	V	-	-	-72.94	11.06	45.12	-50.14	-25.00	-25.14
8040.0	V	-	-	-75.10	16.68	48.58	-46.68	-25.00	-21.68
10720.0	V	103	225	-66.20	20.87	61.67	-33.59	-25.00	-8.59
13400.0	V	-	-	-77.35	25.62	55.27	-39.99	-25.00	-14.99
16080.0	V	101	140	-70.67	28.88	65.21	-30.05	-25.00	-5.05
18760.0	V	-	-	-58.13	4.05	52.92	-42.34	-25.00	-17.34
21440.0	V	-	-	-58.93	5.17	53.24	-51.56	-25.00	-26.56
24120.0	V	-	-	-58.76	6.07	54.31	-50.49	-25.00	-25.49

Table 7-8. Radiated Spurious Data (LTE Band 41(PC2) – High Channel)

Case:	WCP
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	-	-	-73.73	11.06	44.33	-50.93	-25.00	-25.93
8040.0	V	-	-	-75.67	16.68	48.01	-47.25	-25.00	-22.25
10720.0	V	112	3	-73.80	20.87	54.07	-41.19	-25.00	-16.19
13400.0	V	-	-	-76.73	25.62	55.89	-39.37	-25.00	-14.37
16080.0	V	127	42	-73.78	28.88	62.10	-33.16	-25.00	-8.16
18760.0	V	-	-	-58.77	4.05	52.28	-42.98	-25.00	-17.98
21440.0	V	-	-	-58.66	5.17	53.51	-41.75	-25.00	-16.75
24120.0	V	-	-	-58.42	6.07	54.65	-40.61	-25.00	-15.61

Table 7-9. Radiated Spurious Data (LTE Band 41(PC2) – High Channel – WCP)

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7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

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

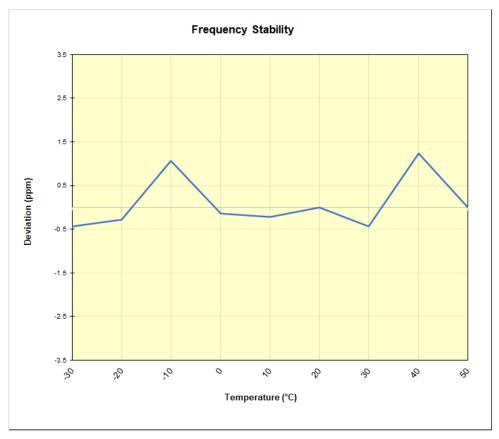
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LTE Band 41								
	Operating F	requency (Hz):	2,593,00	00,000				
	Ref.	Voltage (VDC):	4.3	6				
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)			
		- 30	2,592,999,601	-1,135	-0.0000438			
		- 20	2,593,000,021	-715	-0.0000276			
		- 10	2,593,003,489	2,753	0.0001062			
		0	2,593,000,376	-360	-0.0000139			
100 %	4.36	+ 10	2,593,000,165	-571	-0.0000220			
		+ 20 (Ref)	2,593,000,736	0	0.0000000			
		+ 30	2,592,999,607	-1,128	-0.0000435			
		+ 40	2,593,003,951	3,216	0.0001240			
		+ 50	2,593,000,753	17	0.0000007			
Battery Endpoint	2.46	+ 20	2,593,001,445	709	0.0000273			

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



Plot 7-45. LTE Band 41(PC2) Frequency Stability Chart

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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: A3LSMF926B** complies with all the requirements of Part 27 of the FCC rules.

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