

# PCTEST

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# MEASUREMENT REPORT

FCC Part 90

#### **Applicant Name:**

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

## Date of Testing:

9/23 – 11/20/2020 **Test Site/Location:** PCTEST Lab. Columbia, MD, USA **Test Report Serial No.:** 1M2009230152-04.A3L

## FCC ID:

# A3LSMG998U

## **APPLICANT:**

# Samsung Electronics Co., Ltd.

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

Certification SM-G998U SM-G998U1 Portable Handset PCS Licensed Transmitter Held to Ear (PCE) §2.1049, §90 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



FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 1 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 1 of 60
© 2020 PCTEST		•		V 9.0 02/01/2019

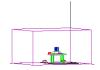


# TABLE OF CONTENTS

1.0	INTF	RODUCTION	4
	1.1	Scope	4
	1.2	PCTEST Test Location	4
	1.3	Test Facility / Accreditations	4
2.0	PRO	DUCT INFORMATION	5
	2.1	Equipment Description	5
	2.2	Device Capabilities	5
	2.3	Test Configuration	5
	2.4	EMI Suppression Device(s)/Modifications	5
3.0	DES	CRIPTION OF TESTS	6
	3.1	Evaluation Procedure	6
	3.2	Radiated Power and Radiated Spurious Emissions	6
4.0	MEA	SUREMENT UNCERTAINTY	7
5.0	TES	T EQUIPMENT CALIBRATION DATA	8
6.0	SAM	PLE CALCULATIONS	9
7.0	TES	T RESULTS	10
	7.1	Summary	10
	7.2	Occupied Bandwidth	12
	7.3	Spurious and Harmonic Emissions at Antenna Terminal	28
	7.4	Band Edge Emissions at Antenna Terminal	36
	7.5	Conducted Power Output Data	47
	7.6	Radiated Power (ERP)	48
	7.7	Radiated Spurious Emissions Measurements	51
	7.8	Frequency Stability / Temperature Variation	56
8.0	CON	ICLUSION	60

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 2 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 2 of 60
© 2020 PCTEST	·			V 9.0 02/01/2019





# MEASUREMENT REPORT FCC Part 22 & 90

Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Measurement	Max. Power [W]	Max. Power [dBm]	Emission Designator
		QPSK	821.5	ERP	0.060	17.81	13M4G7D
	15 MHz	16QAM	821.5	ERP	0.048	16.84	13M4W7D
		64QAM	821.5	ERP	0.039	15.92	13M4W7D
		256QAM	821.5	ERP	0.026	14.20	13M4W7D
		QPSK	821.5	Conducted	0.336	25.26	13M4G7D
	15 MHz	16QAM	821.5	Conducted	0.256	24.09	13M4W7D
		64QAM	821.5	Conducted	0.223	23.48	13M4W7D
		256QAM	821.5	Conducted	0.106	20.25	13M4W7D
		QPSK	819.0	Conducted	0.324	25.10	8M99G7D
		16QAM	819.0	Conducted	0.265	24.23	8M94W7D
	10 MHz	64QAM	819.0	Conducted	0.222	23.46	8M97W7D
LTE Band 26		256QAM	819.0	Conducted	0.100	20.02	8M95W7D
LIE Danu 20	TE Band 26	QPSK	816.5 - 821.5	Conducted	0.339	25.30	4M49G7D
	5 MHz	16QAM	816.5 - 821.5	Conducted	0.296	24.72	4M48W7D
	5 IVIEZ	64QAM	816.5 - 821.5	Conducted	0.225	23.52	4M49W7D
		256QAM	816.5 - 821.5	Conducted	0.109	20.37	4M48W7D
		QPSK	815.5 - 822.5	Conducted	0.330	25.18	2M69G7D
	3 MHz	16QAM	815.5 - 822.5	Conducted	0.272	24.35	2M70W7D
		64QAM	815.5 - 822.5	Conducted	0.226	23.54	2M69W7D
		256QAM	815.5 - 822.5	Conducted	0.111	20.44	2M69W7D
		QPSK	814.7 - 823.3	Conducted	0.329	25.17	1M08G7D
	4 4 6411-	16QAM	814.7 - 823.3	Conducted	0.267	24.27	1M09W7D
	1.4 MHz	64QAM	814.7 - 823.3	Conducted	0.222	23.47	1M08W7D
		256QAM	814.7 - 823.3	Conducted	0.104	20.17	1M08W7D
		QPSK	793.0	ERP	0.101	20.02	9M03G7D
	10 MHz	16QAM	793.0	ERP	0.077	18.88	8M96W7D
		64QAM	793.0	ERP	0.067	18.23	9M01W7D
		256QAM	793.0	ERP	0.042	16.20	9M00W7D
LTE Band 14		QPSK	790.5 - 795.5	ERP	0.100	20.00	4M53G7D
		16QAM	790.5 - 795.5	ERP	0.075	18.74	4M51W7D
	5 MHz	64QAM	790.5 - 795.5	ERP	0.063	18.02	4M52W7D
		256QAM	790.5 - 795.5	ERP	0.043	16.31	4M50W7D
CDMA BC10	N/A	CDMA	817.9 - 823.1	Conducted	0.283	24.52	1M27F9W

**EUT Overview** 

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 2 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 3 of 60
© 2020 PCTEST		·		V 9.0 02/01/2019



## **1.0 INTRODUCTION**

## 1.1 Scope

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

## 1.2 PCTEST Test Location

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

#### 1.3 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION))	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 4 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset	Page 4 01 60
© 2020 PCTEST	•	•	V 9 0 02/01/2019



# 2.0 PRODUCT INFORMATION

## 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG998U**. 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 22 and 90.

Test Device Serial No.: 0788M, 0722M, 0695M, 0706M, 0707M, 0752M, 0705M, 0144M

### 2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (n5, n71, n41, n66, n2, n12, n25, n30, n77, n260, n261), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, UWB

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

## 2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

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

## 2.4 EMI Suppression Device(s)/Modifications

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

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege E of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 5 of 60
© 2020 PCTEST		•		V 9.0 02/01/2019



# 3.0 DESCRIPTION OF TESTS

## 3.1 Evaluation Procedure

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

## 3.2 Radiated Power and Radiated Spurious Emissions

#### <u>§2.1053</u>

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

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

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

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

Where,  $P_d$  is the dipole equivalent power,  $P_g$  is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to  $P_{g [dBm]}$  – cable loss [dB].

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

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 474788 D01.

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 6 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 6 of 60
© 2020 PCTEST	•	•		V 9.0 02/01/2019



# 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  $U_{\text{CISPR}}$  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

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 7 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 7 of 60
© 2020 PCTEST	·			V 9.0 02/01/2019



# 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	
-	LTx2	Licensed Transmitter Cable Set	4/9/2020	4/9/2020 Annual 4/9/2021		LTx2
-	LTx4	Licensed Transmitter Cable Set	7/9/2020	Annual	7/9/2021	LTx4
-	LTx5	LIcensed Transmitter Cable Set	4/9/2020	Annual	4/6/2021	LTx5
Agilent	N9020A	MXA Signal Analyzer	8/4/2020	Annual	8/4/2021	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	7/17/2020	Annual	7/17/2021	MY52350166
Anritsu	MT8820C	Radio Communication Analyzer		N/A		6201300731
Anritsu	MT8821C	Radio Communication Analyzer		N/A		6200901190
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	2/22/2019	Biennial	2/22/2021	128338
Mini Circuits	TVA-11-422	RF Power Amp		N/A		QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11208010032
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11403100002
Rohde & Schwarz	CMU200	Base Station Simulator		N/A		836371/0079
Rohde & Schwarz	CMW500	Radio Communication Tester		N/A		112347
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	7/15/2020	Annual	7/15/2021	100342
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/21/2020	Annual	2/21/2021	102133
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107

Table 5-1. Summary of Test Results

#### 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.

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 9 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 8 of 60
© 2020 PCTEST	•	·		V 9.0 02/01/2019



# 6.0 SAMPLE CALCULATIONS

## Emission Designator

#### Emission Designator = 1M25F9W

CDMA BW = 1.25 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data) (Measured at the 99.75% power bandwidth)

### Spurious Radiated Emission – BC10

#### Example: Channel 476 CDMA BC10 Mode 3rd Harmonic (2453.70MHz)

The average spectrum analzyer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum analzyer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 2453.70 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm -(-24.80) = 50.3 dBc.

### **Emission Designator**

#### **QPSK Modulation**

#### Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

- G = Phase Modulation
- 7 = Quantized/Digital Info
- D = Data transmission, telemetry, telecommand

#### **QAM Modulation**

#### Emission Designator = 8M45W7D

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

## Spurious Radiated Emission – LTE Band

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

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

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 0 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 9 of 60
© 2020 PCTEST		•		V 9 0 02/01/2019



# 7.0 TEST RESULTS

# 7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMG998U
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	CDMA / LTE
Band:	Band Class 10 / Band 26 / Band 14

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
	Occupied Bandwidth	2.1049	N/A	PASS	Section 7.2
CTED	Conducted Band Edge / Spurious Emissions (LTE Band 14)	2.1051, 90.691(a)	On all frequencies between 769-775 MHz and 799-805 MHz, attenuation by a factor not less than 65 + 10 log(P) dB in a 6.25 kHz band segment, for mobile and portable stations. On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, attenuation by at least 43 + 10 log(P) dB	PASS	Sections 7.3, 7.4
CONDUCTED	Conducted Band Edge / Spurious Emissions (LTE Band 26)	0 4054 00 540(-)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions except	PASS	Sections 7.3, 7.4
U	Conducted Band Edge / Spurious Emissions (CDMA BC10)	2.1051, 90.543(a)	> 50 + 10 log10 (P[Watts]) at Band Edge and for all out- of-band emissions within 37.5kHz of Block Edge	PASS	Sections 7.3, 7.4
	Frequency Stability	2.1055, 90.213	< 2.5 ppm	PASS	Section 7.8
	Conducted Power	2.1046, 90.635	< 100 Watts	PASS	Section 7.5
	Effective Radiated Power (LTE Band 14)	90.542(a)(7)	< 3 Watts max. ERP	PASS	Section 7.6
	Effective Radiated Power (LTE Band 26)	22.913(a.2)	< 7 Watts max. ERP	PASS	Section 7.6
RADIATED	Radiated Spurious Emissions (LTE Band 14)	2.1053, 90.543(e)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions except emissions in the 1559 - 1610MHz band are subject to a limit of -40dBm/MHz for wideband signals	PASS	Section 7.7
RAI	Radiated Spurious Emissions (LTE Band 26)	2.1053, 90.543(e)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions except	PASS	Section 7.7
	Radiated Spurious Emissions (CDMA BC10)	2.1003, 30.343(e)	> 50 + 10 log10 (P[Watts]) at Band Edge and for all out- of-band emissions within 37.5kHz of Block Edge	PASS	Section 7.7

#### Table 7-1. Summary of Test Results

FCC ID: A3LSMG998U	PCTEST° Prcud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 10 of 60	
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 10 of 60	
© 2020 PCTEST	•	·		V 9.0 02/01/2019	



#### Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in Section 7.0 were taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "2G/3G Automation," Version 4.5.
- 5) For LTE B14 conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "LTE Automation," Version.5.3.

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 44 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 11 of 60
© 2020 PCTEST				V 9.0 02/01/2019



# 7.2 Occupied Bandwidth §2.1049

#### 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

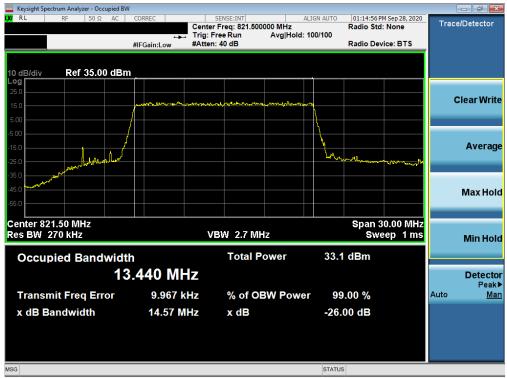
#### Test Notes

#### None.

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dego 12 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset	Page 12 of 60
© 2020 PCTEST	•		V 9.0 02/01/2019



## LTE Band 26



Plot 7-1. Occupied Bandwidth Plot (LTE Band 26 - 15MHz QPSK - Full RB Configuration)



Plot 7-2. Occupied Bandwidth Plot (LTE Band 26 - 15MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 12 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 13 of 60
© 2020 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied B <sup>1</sup>							d ×
LX/RL RF 50Ω AC	CORREC	SENSE:INT Center Freg: 821.500	ALIGN A	AUTO 01:15:17 PM Radio Std:	1 Sep 28, 2020	Trace/Det	tector
		Trig: Free Run	Avg Hold: 100/1	100			
	#IFGain:Low	#Atten: 40 dB		Radio Devi	ice: BTS		
10 dB/div Ref 35.00 dBr	m						
25.0							
						Clea	r Write
15.0	Mar Marrielland	and the second state of th	hand a start of the start of th				
5.00							
-5.00	1					_	
-15.0			<u> </u>	<b>└</b>		A	verage
-25.0				marked when the street of the	havenan		_
-45.0 mm MM						Ма	x Hold
-55.0							
Center 821.50 MHz Res BW 270 kHz		VBW 2.7 M	-		0.00 MHz		
Res BW 270 KHZ		ADAA 5'L IAIL	12	SWe	ep 1 ms	Mi	n Hold
Occupied Bandwid	th	Total P	ower	30.9 dBm			
						-	
	3.412 MH	Z				D	etector Peak▶
Transmit Freq Error	5.565 kH	z % of Ol	BW Power	99.00 %		Auto	Man
x dB Bandwidth	14.67 MH	z x dB		-26.00 dB			
MSG				STATUS			
Mog				STATUS			

Plot 7-3. Occupied Bandwidth Plot (LTE Band 26 - 15MHz 64-QAM - Full RB Configuration)



Plot 7-4. Occupied Bandwidth Plot (LTE Band 26 - 15MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	Proud to be part of (e) element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 14 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 14 of 60
© 2020 PCTEST	•			V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied						_	
L <mark>XI</mark> RL RF 50Ω AC		SENSE:INT	ALIGN AUTO	01:18:42 P	M Sep 28, 2020	Tracel	Detector
			vg Hold: 100/100	Radio Stu.	None		
	#IFGain:Low	#Atten: 40 dB		Radio Dev	ice: BTS		
10 dB/div Ref 30.00 dl	3m						
20.0							
10.0	Vannerson	when we we we wanted	- him and			С	ear Write
			L.				
0.00	1						
-10.0	1						
-20.0	V			L.M.M.	All makes		Average
-30.0				ረምሳ ብዙ ዘመርት በአንግ	a a Mana a Mi		
-40.0							
-50.0							Max Hold
-60.0							Max Holu
Center 819.00 MHz					0.00 MHz		
Res BW 180 kHz		VBW 1.8 MHz		Swe	ep 1 ms		Min Hold
Occupied Bandwid	déla	Total Pow	or 33.3	3 dBm			
				Jubiii			
8	3.9856 MH	2					Detector Peak▶
Transmit Freq Error	2.324 kH	z % of OBW	Power 99	9.00 %		Auto	Peak► <u>Man</u>
x dB Bandwidth	9.799 MH	z xdB	-26	.00 dB			
	5.755 WIT		-20.				
MSG			STATU	s			

Plot 7-5. Occupied Bandwidth Plot (LTE Band 26 - 10MHz QPSK - Full RB Configuration)



Plot 7-6. Occupied Bandwidth Plot (LTE Band 26 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 15 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 15 of 60
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🔤 Keysight Spectrum Analyzer - Occupi					
LX/RL RF 50Ω 4	AC CORREC	SENSE:INT	ALIGN AUTO 01:19:01 Radio St	PM Sep 28, 2020	Trace/Detector
		g: Free Run Avg Hold		u. None	
	#IFGain:Low #At	ten: 40 dB	Radio De	vice: BTS	
10 dB/div Ref 30.00 c	dBm				
Log					
20.0	- Common - C	man man have a second	h.		Clear Write
10.0					
0.00			$\left  \left  \left  \right  \right  \right  = \left  \left  \left  \left  \right  \right  \right  \right  \right $		
-10.0					
-20.0					Average
-30.0 allhouthhan	~~ <sup>2</sup>		how many marine	and and a start	
-40.0					
-50.0					
-60.0					Max Hold
-80.0					
Center 819.00 MHz			Span	20.00 MHz	
Res BW 180 kHz		VBW 1.8 MHz	Św	reep 1 ms	Min Hold
Occupied Bandw		Total Power	31.2 dBm		
	8.9722 MHz				Detector
					Peak▶
Transmit Freq Error	5.108 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	9.784 MHz	x dB	-26.00 dB		
MSG			STATUS		
Mod			STATUS		

Plot 7-7. Occupied Bandwidth Plot (LTE Band 26 - 10MHz 64-QAM - Full RB Configuration)



Plot 7-8. Occupied Bandwidth Plot (LTE Band 26 - 10MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	Prcut to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 16 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 16 of 60
© 2020 PCTEST				V 9.0 02/01/2019



🔤 Keysight Spectrum Ana									
LXIRL RF	50 Ω AC	CORREC	SENSE:INT Center Freg: 816.		IGN AUTO	01:21:39 PI Radio Std	M Sep 28, 2020	Trac	e/Detector
		-+-		Avg Hold: 1	00/100	Radio Stu	. None		
		#IFGain:Low	#Atten: 40 dB			Radio Dev	ice: BTS		
	f 30.00 dBm	_							
20.0									
10.0		por man and	www.planser	man and a second	7			(	Clear Write
	4	, 			X				
0.00	/				1				
-10.0									
-20.0 abol my sold with	when we allow				1	tesologiant	NI . nM		Average
-30.0 <b>-30.0</b>	in allwaret.				1.01	and the second	410000		
-40.0									
-50.0									Max Hold
-60.0									
Center 816.500 Res BW 91 kHz			VBW 910				0.00 MHz ep 5 ms		
Res DW 91KHZ			ADM AIO	NTIZ		SWE	ep 5 ms		Min Hold
Occupied I	Bandwidth	1	Total	Power	32.9	dBm			
		893 MF	l						Detector
	4.4		12						Detector Peak►
Transmit Fre	eq Error	830	Hz % of	OBW Power	99	.00 %		Auto	Man
x dB Bandw	idth	4.958 M	Hz x dB		-26.	00 dB			
		neee m			201				
MSG					STATUS				

Plot 7-9. Occupied Bandwidth Plot (LTE Band 26 - 5MHz QPSK - Full RB Configuration)



Plot 7-10. Occupied Bandwidth Plot (LTE Band 26 - 5MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 17 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 17 of 60
© 2020 PCTEST	·			V 9.0 02/01/2019



	sight Spectrum											
L <mark>XI</mark> RI	R	F 50 Ω	AC	CORREC	Cent	SENSE:INT er Freq: 816.500		LIGN AUTO	01:22:02 P	M Sep 28, 2020	Trac	e/Detector
					Trig:	Free Run	Avg Hold:	100/100				
				#IFGain:Low	#Atte	en: 40 dB			Radio Dev	ice: BTS		
10 dI	3/div	Ref 30.0	0 dBm					_				
Log 20.0												
				mann	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	malonon	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	11-1				Clear Write
10.0			ł					l l				
0.00			1					1				
-10.0												_
-20.0	λ.	Ar. Am	$\vdash$						mander	M		Average
-30.0	مەھىرىمەلك <sup>الى</sup> مىرىر	مالكمه المحصد							ARTIN MUHT h	worken the		
-40.0												
-50.0												Max Hold
-60.0												
	ter 816.50 BW 91 k					VBW 910 ki	1-			0.00 MHz		
Res	DW 91K	пг				ADM AIRVI	72		SWE	ep 5 ms		Min Hold
0	ccupied	d Band	width			Total P	ower	31.	1 dBm			
	ocupier	a Barra			41.1-							
			4.4	913								Detector Peak▶
Т	ransmit I	Freq Err	or	-4.83	0 kHz	% of O	BW Powe	r 9	9.00 %		Auto	Man
x	dB Band	width		4.934	4 MHz	x dB		-26	.00 dB			
MSG								STAT	US			

Plot 7-11. Occupied Bandwidth Plot (LTE Band 26 - 5MHz 64-QAM - Full RB Configuration)



Plot 7-12. Occupied Bandwidth Plot (LTE Band 26 - 5MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 19 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 18 of 60
© 2020 PCTEST	•			V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied BV							
LXI RL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AU	TO 01:28:22 P Radio Std	M Sep 28, 2020	Trace	e/Detector
			Avg Hold: 100/100		. None		
	#IFGain:Low #At	ten: 40 dB		Radio Dev	rice: BTS		
10 dB/div Ref 30.00 dBn	n						
Log							
20.0		man man	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			c	lear Write
10.0							
0.00				<u>\</u>			
-10.0				1			
-20.0				h h			Average
-30.0				~~~~	mm		
-40.0							
-50.0							Maxilald
-60.0							Max Hold
-00.0							
Center 815.500 MHz				Span 5	.000 MHz		
Res BW 47 kHz		VBW 470 kHz		Sweep	2.533 ms		Min Hold
		Total Po		2.9 dBm			
Occupied Bandwidt		Total Po	wer 5	2.9 abm			
2.	6888 MHz						Detector
		0/ -f op	N/ D	00.00.0/		Auto	Peak▶
Transmit Freq Error	1.251 kHz	% of OB	w Power	99.00 %		Auto	<u>Man</u>
x dB Bandwidth	2.962 MHz	x dB	-2	26.00 dB			
MSG			ST	ATUS			

Plot 7-13. Occupied Bandwidth Plot (LTE Band 26 - 3MHz QPSK - Full RB Configuration)



Plot 7-14. Occupied Bandwidth Plot (LTE Band 26 - 3MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 10 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 19 of 60
© 2020 PCTEST	•	·		V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied	BW						
KAL RF 50Ω AC	CORREC	SENSE:INT Center Freg: 815.500	ALIGN AU	TO 01:28:42 P Radio Std	M Sep 28, 2020	Trace	Detector
			Avg Hold: 100/100		: None		
	#IFGain:Low	#Atten: 40 dB		Radio Dev	rice: BTS		
10 dB/div Ref 30.00 dE	3m						
Log							
20.0	0					-	
10.0	man and the and the					C	lear Write
0.00				Δ			
-10.0				$\mathbf{X}$			
-20.0				N.			Average
				<u>}</u>			Average
-30.0 martine have							
-40.0							
-50.0							Max Hold
-60.0							
Center 815.500 MHz			-		.000 MHz		
Res BW 47 kHz		VBW 470 kH	IZ	Sweep	2.533 ms		Min Hold
	141-	Total P	owor 2	1.2 dBm			
Occupied Bandwic			ower 5				
2	2.6879 MH	Z					Detector
							Peak▶
Transmit Freq Error	217	Hz % of OE	3W Power	99.00 %		Auto	<u>Man</u>
x dB Bandwidth	2.959 MI	Hz xdB	-	26.00 dB			
MSG			ST	ATUS			

Plot 7-15. Occupied Bandwidth Plot (LTE Band 26 - 3MHz 64-QAM - Full RB Configuration)



Plot 7-16. Occupied Bandwidth Plot (LTE Band 26 - 3MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	Proud to be part of (e) element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 20 of 60
© 2020 PCTEST				V 9.0 02/01/2019



www.www.com with the sectrum Analyzer - Occupied BW							- 0 ×
LX/ RL RF 50Ω AC	CORREC	SENSE:INT Center Freg: 814.7000		TO 01:32:38 PI Radio Std	M Sep 28, 2020	Trace	Detector
		Trig: Free Run	Avg Hold: 100/100	)			
	#IFGain:Low	#Atten: 40 dB		Radio Dev	ice: BTS		
10 dB/div Ref 30.00 dBm							
20.0							
	m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ware how have have have have have have have have			c	lear Write
10.0				λ.			
0.00				N.			
-10.0				- <u>\</u>			_
-20.0				+			Average
-30.0				- www.rh	man		
-40.0							
-50.0							Max Hold
-60.0							maxinora
Center 814.700 MHz			-		.000 MHz		
Res BW 18 kHz		VBW 180 kH	Z	sweep	5.733 ms		Min Hold
Occupied Bandwidt	h	Total P	ower 3	2.5 dBm			
							-
1.0	0831 MH	Ζ					Detector Peak▶
Transmit Freq Error	-1.215 kH	z % of OE	SW Power	99.00 %		Auto	⊢eak⊧ <u>Man</u>
x dB Bandwidth	1.222 MH	z xdB	-7	26.00 dB			
MSG			STA	ATUS			

Plot 7-17. Occupied Bandwidth Plot (LTE Band 26 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-18. Occupied Bandwidth Plot (LTE Band 26 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 21 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset	Page 21 of 60
© 2020 PCTEST			V 9.0 02/01/2019



🔤 Keysight Spectrum Analyzer - Occupied BW	1					×
LX/RL RF 50Ω AC	CORREC	SENSE:INT er Freg: 814.70000	ALIGN AUT	0 01:32:58 PM Se Radio Std: No		ctor
	🛶 Trig		Avg Hold: 100/100	Radio Device		
10 dB/div Ref 30.00 dBn	1					
20.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Manana Marana		Clear	Nrite
0.00						
-20.0					Ave	erage
-30.0 mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm				mont	man fal	
-50.0					Мах	Hold
Center 814.700 MHz				Span 2.00	00 MHz	_
Res BW 18 kHz		VBW 180 kHz		Sweep 5.	733 ms Min	Hold
Occupied Bandwidt	h	Total Po	wer 30	).8 dBm		
	0815 MHz				P	ector <sup>⊳</sup> eak
Transmit Freq Error	804 Hz	% of OB	W Power	99.00 %	Auto	Mar
x dB Bandwidth	1.214 MHz	x dB	-2	6.00 dB		
ISG			STA	TUS		

Plot 7-19. Occupied Bandwidth Plot (LTE Band 26 - 1.4MHz 64-QAM - Full RB Configuration)



Plot 7-20. Occupied Bandwidth Plot (LTE Band 26 - 1.4MHz 256-QAM - Full RB Configuration)

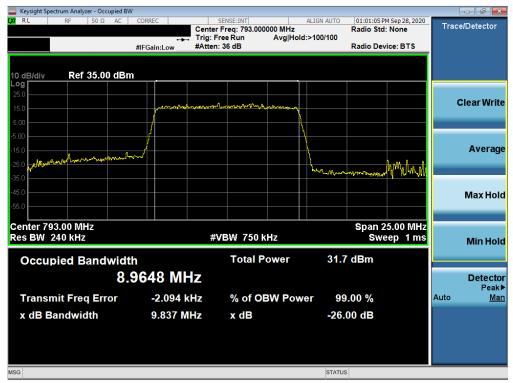
FCC ID: A3LSMG998U	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 22 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 22 of 60
© 2020 PCTEST		·		V 9.0 02/01/2019



## LTE Band 14

Keysight Spectrum Analyzer - Occupied BW					
RL RF 50Ω AC	Trig:	SENSE:INT Freq: 793.000000 MHz Free Run Avg Ho n: 36 dB	ALIGN AUTO	01:00:56 PM Sep 28, 2020 Radio Std: None Radio Device: BTS	Trace/Detector
0 dB/div Ref 35.00 dBm					
15.0		and an	N.		Clear Writ
5.00 5.00 5.0 Julie March 1997	~		h hysiannhyl	angun water	Averaç
55.0					Max Ho
enter 793.00 MHz es BW 240 kHz	#	VBW 750 kHz		Span 25.00 MHz Sweep 1 ms	Min Ho
Occupied Bandwidt	h	Total Power	33.0	dBm	
9.0	0255 MHz				Detect
Transmit Freq Error	-2.324 kHz	% of OBW Po	wer 99	.00 %	Auto <u>M</u>
x dB Bandwidth	9.853 MHz	x dB	-26.	00 dB	
G			STATUS		

Plot 7-21. Occupied Bandwidth Plot (LTE Band 14 - 10MHz QPSK - Full RB Configuration)



Plot 7-22. Occupied Bandwidth Plot (LTE Band 14 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 22 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 23 of 60
© 2020 PCTEST		•		V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied E					
LXI RL RF 50Ω AC	CORREC	SENSE:INT er Freg: 793.000000 MHz	ALIGN AUTO 01:01:15 Radio St	PM Sep 28, 2020	Trace/Detector
			old: 100/100	a: None	
		en: 36 dB	Radio De	evice: BTS	
10 dB/div Ref 35.00 dB	m				
25.0					
					Clear Write
15.0	- Anton marked a Colomba	and of the second states of the second states of the second states and t			
5.00					
-5.00					
-15.0					Average
-25.0 - And	Reproved .		h May Mark	. m. h.A. A	
-35.0			man My My Maring	Ծղթ ղ հվեզյուլ	
-45.0					
					Max Hold
-55.0					
Center 793.00 MHz			Snan	25.00 MHz	
Res BW 240 kHz	-	#VBW 750 kHz		veep 1 ms	Min Hold
					WIIITHOIG
Occupied Bandwid	lth	Total Power	30.6 dBm		
	.0054 MHz				Detector
					Peak►
Transmit Freq Error	-2.131 kHz	% of OBW Po	wer 99.00 %		Auto <u>Man</u>
x dB Bandwidth	9.832 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-23. Occupied Bandwidth Plot (LTE Band 14 - 10MHz 64-QAM - Full RB Configuration)



Plot 7-24. Occupied Bandwidth Plot (LTE Band 14 - 10MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	Proud to be part of (e) element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 24 of 60
© 2020 PCTEST	•			V 9.0 02/01/2019



🔤 Keysight Spectrum Analyzer - Occu							
LXI RL RF 50Ω	AC CORREC	SENSE:INT Center Freq: 793.0000	ALIGN AUTO	01:04:44 PM Sep Radio Std: Nor		Trace/E	Detector
		Trig: Free Run	Avg Hold: 100/100	Radio Stu. Noi			
	#IFGain:Low	#Atten: 36 dB		Radio Device:	втя		
10 dB/div Ref 40.00	) dBm						
Log 30.0							
20.0						Cle	ear Write
	mon	- Marina Marina	whene				
10.0							
0.00							
-10.0							Average
-20.0 Arralla harman	- Ala			M mAn R R.	n		
-30.0			- Al Y	r iγ .«iγ₩~	LANN		
-40.0							/lax Hold
-50.0						•	nux noru
Center 793.000 MHz				Span 12.5			
Res BW 120 kHz		#VBW 390 kH	IZ	Sweep	1 ms		Min Hold
Occupied Band	width	Total Po	ower 32.9	dBm			
	4.5253 MH						Detector
	4.5255 MIR	L					Detector Peak▶
Transmit Freq Erre	or -1.503 kH	Iz % of OB	W Power 99	.00 %		Auto	Man
x dB Bandwidth	4.957 MH	z xdB	-26.	00 dB			
MSG			STATUS				

Plot 7-25. Occupied Bandwidth Plot (LTE Band 14 - 5MHz QPSK - Full RB Configuration)



Plot 7-26. Occupied Bandwidth Plot (LTE Band 14 - 5MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 25 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 25 of 60
© 2020 PCTEST	•			V 9.0 02/01/2019



www.www.com.com.com.com.com.com.com.com.com.com	1				
KA RL RF 50Ω AC		SENSE:INT r Freq: 793.000000 MHz	ALIGN AUTO 01:05:05 Radio St	PM Sep 28, 2020	Trace/Detector
		FreeRun Avg Hold		a: None	
	#IFGain:Low #Atten	: 36 dB	Radio De	evice: BTS	
10 dB/div Ref 40.00 dBn	<u> </u>				
Log 30.0					
					Clear Write
20.0	monormore	mmmmmm			
10.0					
0.00		\			
-10.0					Average
-20.0			A		
-30.0 mayor was drasham			handwarden		
-40.0					
-50.0					Max Hold
-50.0					
Center 793.000 MHz			Span	12.50 MHz	
Res BW 120 kHz	#	VBW 390 kHz		veep 1 ms	Min Hold
Occupied Bandwidt	h	Total Power	31.0 dBm		
4.	5171 MHz				Detector
					Peak▶
Transmit Freq Error	-7.642 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	4.947 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-27. Occupied Bandwidth Plot (LTE Band 14 - 5MHz 64-QAM - Full RB Configuration)

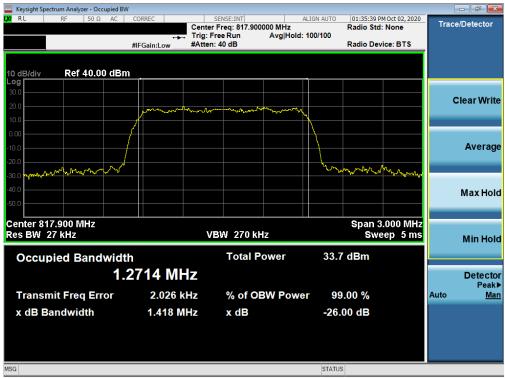


Plot 7-28. Occupied Bandwidth Plot (LTE Band 14 - 5MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 26 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 26 of 60
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## CDMA BC10



Plot 7-29. Occupied Bandwidth Plot (CDMA, Ch. 476)



#### Plot 7-30. Occupied Bandwidth Plot (CDMA, Ch. 684)

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 07 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 27 of 60
© 2020 PCTEST		•		V 9.0 02/01/2019



# 7.3 Spurious and Harmonic Emissions at Antenna Terminal §2.1051 §90.691(a) §90.543(e)

#### Test Overview

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

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

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

#### **Test Settings**

- 1. Start frequency was set to 30MHz and stop frequency was set to 10GHz (separated into at least two plots per channel)
- 2. RBW ≥ 100kHz
- 3. VBW  $\ge$  3 x RBW
- 4. Detector = RMS
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

#### Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup

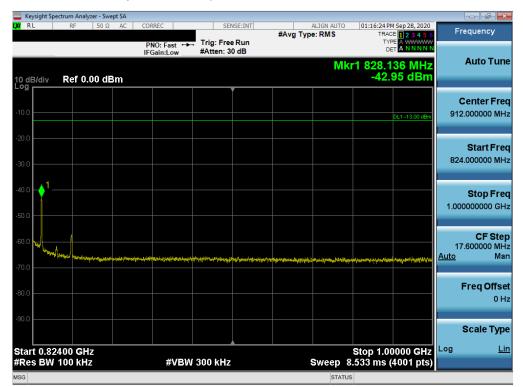
FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 29 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 28 of 60
© 2020 PCTEST				V 9.0 02/01/2019



## LTE Band 26

	ectrum Analy:		ot SA										
<mark>XI</mark> RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Sep 28, 2020 DE <b>1 2 3 4 5</b> 6	Fre	equency
				PNO: IFGain	ast ⊶⊷ Low	Trig: Fre Atten: 4				TY	PE A WWWWW ET A N N N N N		
				II Guil	2011				Mkr1	377.93	9 2 MHz		Auto Tune
10 dB/div Log	Ref 30	.00 di	Bm							-56.	51 dBm		
3							Ĭ					с	enter Frea
20.0												422.	000000 MHz
10.0													Start Freq
0.00												30.	000000 MHz
-10.0											DL1 -13.00 dBm		Stop Freq
												814.	000000 MHz
-20.0													
-30.0													CF Step
												78. Auto	400000 MHz Man
-40.0													
												F	req Offset
-50.0						<u> </u>							0 Hz
-60.0	والمراجعة والمحمد ويست	a la constante de la constante		and a second									
												5	Scale Type
Start 30.0										Stop 9	14.0 MHz	Log	Lin
#Res BW					#VBW	300 kHz		S	weep 37	.33 ms (2	20001 pts)		
MSG									STATUS				

Plot 7-31. Conducted Spurious Plot (LTE Band 26 - 15MHz QPSK - RB Size 1, RB Offset 0)



Plot 7-32. Conducted Spurious Plot (LTE Band 26 - 15MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 29 of 60
© 2020 PCTEST	•	•		V 9.0 02/01/2019



	ectrum Analyzer - Swept S	SA									
LXI RL	RF 50 Ω 4	AC CORRE	C	SEN	ISE:INT	#Avg Typ	ALIGN AUT e: RMS		M Sep 28, 2020 CE 1 2 3 4 5 6	Frequ	iency
		PNO: IFGai	Fast ↔⊷ n:Low	Trig: Free #Atten: 30							
10 dB/div Log	Ref 0.00 dBm						М	kr1 6.428 -48	35 GHz 29 dBm	Au	ito Tune
-10.0									DL1 -13.00 dBm		i <b>ter Freq</b> 0000 GHz
-20.0											a <b>rt Freq</b> 0000 GHz
-40.0						1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)		ng ta ann an tao ann an tao			t <b>op Freq</b> 0000 GHz
-60.0											<b>CF Step</b> 0000 MHz Man
-80.0										Fre	<b>q Offset</b> 0 Hz
-90.0											ale Type
Start 1.00 #Res BW			#VRM	3.0 MHz		s	ween	Stop 10 (16.00 ms	7.000 GHZ	Log	<u>Lin</u>
	ts changed; all trac		<i></i>	0.0 10112			STA	_	-ooo r pts)		

Plot 7-33. Conducted Spurious Plot (LTE Band 26 - 15MHz QPSK - RB Size 1, RB Offset 0)

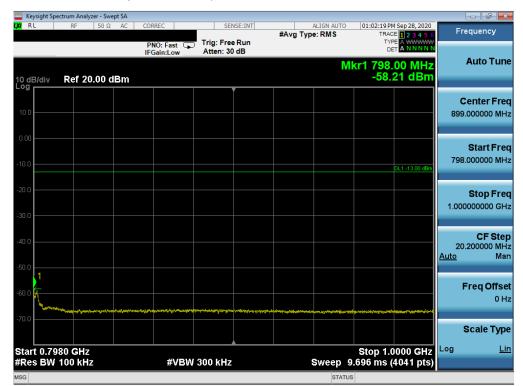
FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 30 of 60
© 2020 PCTEST		•		V 9 0 02/01/2019



## LTE Band 14

	ectrum Analyz		t SA											
XI RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Typ	ALIGN AU	TO 01	TRAC	E 1 2 3 4 5 6 E A WWWW	Fr	requency
				PNO: F IFGain:	ast 🖵 Low	Atten: 3					DE			Auto Tun
10 dB/div	Ref 20	.00 dE	3m							MKr1	786. -59.0	95 MHz 67 dBm		Auto Tun
							Ĭ							Center Fre
10.0													409	9.000000 MH
0.00														Start Fre
-10.0												DL1 -13.00 dBm	30	0.000000 MH
-20.0														Stop Fre
-30.0													788	3.000000 MH
														CF Ste
40.0													75 <u>Auto</u>	5.800000 MH Ma
50.0												1		
60.0														Freq Offse 0 H
70.0		a land a disard a su	ing to be a second of the											
														Scale Typ
Start 30.0 ≉Res BW					#VBW	300 kHz		s	weep	S 36.38	top 78 ms (1:	88.0 MHz 5161 pts)	Log	Li
ISG									ST	ATUS				

Plot 7-34. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 0)



Plot 7-35. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 21 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 31 of 60
© 2020 PCTEST				V 9 0 02/01/2019



	ectrum Analyzer - Sw										
LXU RL	RF 50 Ω	AC C	ORREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Sep 28, 2020 CE 1 2 3 4 5 6	Fr	equency
			PNO: Fast G FGain:Low	Trig: Free #Atten: 3				1kr1 6.01			Auto Tune
10 dB/div Log	Ref 0.00 dl	Зm						-42	42 abm		
-10.0									DL1 -13.00 dBm		<b>Center Freq</b> 0000000 GHz
-20.0										1.000	<b>Start Freq</b> 0000000 GHz
-40.0			$\sim$		1					10.000	Stop Freq
-60.0										900 <u>Auto</u>	<b>CF Step</b> .000000 MHz Man
-70.0										ľ	Freq Offset 0 Hz
-90.0											Scale Type
Start 1.00 #Res BW			#VBV	V 3.0 MHz		s	weep	Stop 10 15.60 ms (	).000 GHz 18001 pts)	Log	<u>Lin</u>
MSG							STAT	TUS			

Plot 7-36. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 0)

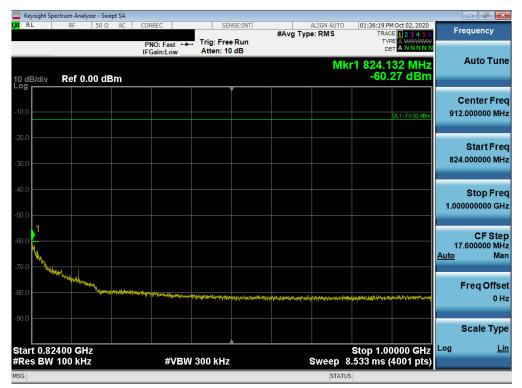
FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 32 of 60
© 2020 PCTEST		•		V 9 0 02/01/2019



# CDMA BC10

	ectrum Analyze	r - Swept SA	4									
LXI RL	RF	50 Ω AC		RREC	Tria	SENSE:IN	#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Oct 02, 2020	Fr	equency
				NO: Fast Gain:Low		n: 40 dB			D			
10 dB/div Log	Ref 30.	00 dBn	n					Mkr	1 414.86 -52.	5 6 MHz 43 dBm		Auto Tune
											c	enter Freq
20.0											422	.000000 MHz
10.0												
												Start Freq
0.00											30	.000000 MHz
-10.0										DL1 -13.00 dBm		Stop Fred
										0ET -13:00 0Bm	814	.000000 MHz
-20.0												
-30.0											79	CF Step 400000 MHz
											Auto	Mar
-40.0												
-50.0						<b>1</b>				a a la sta sta por la contra da ser	F	req Offset 0 Hz
									A Designation of the second of	and and the second second		0 H2
-60.0												Scale Type
Start 30.0	MLIZ								Stop 9	14.0 MHz		Lin
#Res BW				#VE	3W 300 I	٢Hz	S	weep 🗧	37.33 ms (2	20001 pts)		
MSG								STAT	rus			

Plot 7-37. Conducted Spurious Plot (CDMA Ch. 476- Low Channel)



#### Plot 7-38. Conducted Spurious Plot (CDMA Ch. 476- Low Channel)

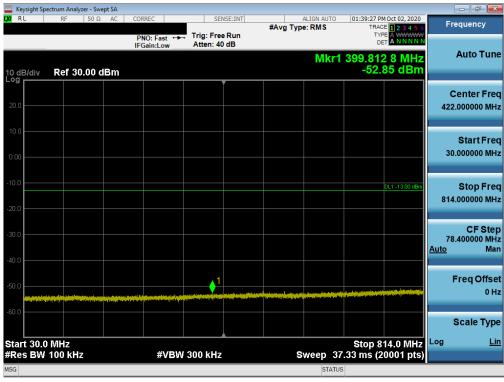
FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 22 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 33 of 60
© 2020 PCTEST	·	·		V 9.0 02/01/2019

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	ectrum Analy:	zer - Swep	ot SA										
LXVI RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Oct 02, 2020	Fre	quency
				PNO: F IFGain:l	ast ↔→ .ow	Trig: Free #Atten: 3		•		TY	ET A NNNN		
10 dB/div Log	Ref 0.0	00 dB	m						Mk	r1 9.780 -41.	40 GHz 36 dBm		Auto Tune
-10.0											DL1 -13.00 dBm		enter Freq 000000 GHz
-20.0													Start Freq 000000 GHz
-40.0				~	<b></b>								Stop Freq 000000 GHz
-60.0												900. <u>Auto</u>	CF Step 000000 MHz Man
-80.0												F	req Offset 0 Hz
-90.0													cale Type
Start 1.00 #Res BW		2		3	#VBW	3.0 MHz		s	weep 1	Stop 10 6.00 ms (2	.000 GHz 20001 pts)	Log	<u>Lin</u>
MSG									STATU	s			

Plot 7-39. Conducted Spurious Plot (CDMA Ch. 476- Low Channel)



Plot 7-40. Conducted Spurious Plot (CDMA Ch. 684- High Channel)

FCC ID: A3LSMG998U	Pctest Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 34 of 60
© 2020 PCTEST				V 9.0 02/01/2019



	ectrum Analyz		A									
LXI RL	RF	50 Ω A	C COR	REC	SEN	SE:INT	#Avg Typ	ALIGN AUTO		M Oct 02, 2020	Fre	quency
			PN IFC	IO: Fast ↔ Gain:Low	Trig: Free #Atten: 3				TY			
10 dB/div Log	Ref 0.0	00 dBm						Mk	r1 824.0 -27.	00 MHz 52 dBm		Auto Tune
-10.0										DL1 -13.00 dBm		enter Freq 000000 MHz
-20.0												
-30.0												Start Freq 000000 MHz
-40.0											1.000	Stop Freq 000000 GHz
-60.0	heren an	*-4+2.79-47744-0	<sup>م</sup> ور بر مربع		nethogiður stjór að laða stjór	af Trate Top - Top - Jamie Si	nland Manangal Land Malangar	ande ganthing and the state of the	patrillan, printering history	mangflambathathathathatha	17. <u>Auto</u>	CF Step 600000 MHz Man
-70.0											F	req Offset 0 Hz
-90.0												Scale Type
Start 0.82 #Res BW				#VBW	300 kHz			Sweep	Stop 1.0 8.533 m <u>s (</u>	0000 GHz 4001 pts)	Log	<u>Lin</u>
MSG								STATU	S			

Plot 7-41. Conducted Spurious Plot (CDMA Ch. 684- High Channel)



Plot 7-42. Conducted Spurious Plot (CDMA Ch. 684- High Channel)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 35 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		
© 2020 PCTEST	·	·		V 9.0 02/01/2019



# 7.4 Band Edge Emissions at Antenna Terminal §2.1051 §90.691(a) §90.543(e)

#### 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.

For LTE B26 operation under Part 90.691, the minimum permissible attenuation level of any spurious emission removed from the EA licensee's frequency block by greater than 37.5 kHz is  $43 + 10\log_{10}(P_{[Watts]})$ , where P is the transmitter power in Watts. The minimum permissible attenuation level of any spurious emission removed from the EA licensee's frequency block by up to and including 37.5 kHz is 50 +  $10\log_{10}(P_{[Watts]})$ , where P is the transmitter power in Watts.

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

#### **Test Settings**

- 1. Span was set large enough so as to capture all out of band emissions near the band edge
- 2. RBW = 100 kHz
- 3. VBW = 300 kHz
- 4. Detector = RMS
- 5. Trace mode = trace average
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

#### Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 36 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		
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### Test Notes

For channel edge emission, the signal analyzer's "ACP" measurement capability is used.

Per 22.917(b) 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.

For LTE Band 14 operation under Part 90.543, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

Additionally, for LTE Band 14 operation, on all frequencies between 769-775 MHz and 799-805 MHz, the power of any emission shall be attenuated by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

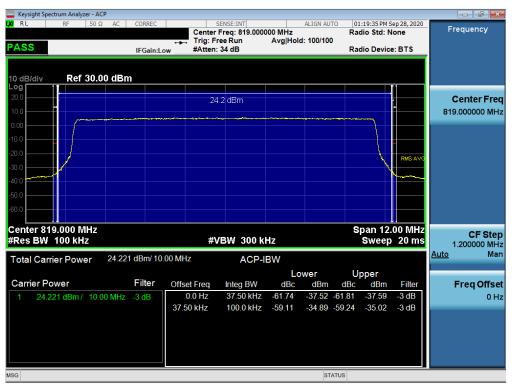
FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 27 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 37 of 60
© 2020 PCTEST				V 9 0 02/01/2019



## LTE Band 26

Keysight Spectrum Analyze	er - ACP										
XIRL RF	50 Ω A	C CORF	REC	Cent	SENSE:INT er Freq: 821.	500000 MHz	ALIGN AU		L:17:00 PM S dio Std: N		Frequency
PASS		IFG	ain:Low	Trig:	Free Run n: 26 dB		ld: 100/100	)	dio Device		
	20.00 d	Bm									
10.0	,			·	24.1 dBm		····				Center Fred 821,500000 MH;
-10.0											
-30.0										RMS AVG	
-50.0											
-70.0											
Center 821.50 MH #Res BW 100 kHz				-	#VBW 30	0 kHz		5	pan 20. Sweep	00 MHz 20 ms	2.000000 MH
Total Carrier Powe	r 24	.101 dBm	1/ 15.0	0 MHz	AC	P-IBW					<u>Auto</u> Mar
						L	ower	U	pper		
Carrier Power		Filte		Offset Freq				dBc	dBm	Filter	Freq Offse
1 24.101 dBm /	15.00 M	Hz -3 de	3	0.0 Hz	37.50 k			-62.92	-38.82	-3 dB	0 H:
				37.50 kHz	100.0 k	Hz -60.01	-35.91	-59.17	-35.07	-3 dB	
ASG							ST	ATUS			

Plot 7-43. Channel Edge Plot (LTE Band 26 - 15MHz QPSK - Mid Channel)



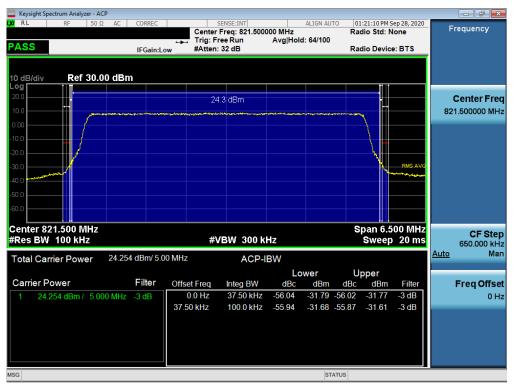
Plot 7-44. Channel Edge Plot (LTE Band 26 - 10MHz QPSK - Mid Channel)

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 38 of 60
© 2020 PCTEST	•	•		V 9.0 02/01/2019



RL RE 50.0 AC CORR								
RL RF 50 Ω AC CORR		ENSE:INT	ALIGN			Sep 28, 2020	Fre	quency
ASS	in:Low Center F		00 MHz Avg Hold: 82/1	00	lio Std: N lio Devic		110	quericy
0 dB/div Ref 30.00 dBm					tt it			
	24.	3 dBm			γ γ			enter Fre 500000 MH
					Ň	RMS AVG		
0.0								
enter 816.500 MHz Res BW 100 kHz	#V	BW 300 kl	łz			500 MHz 20 ms		CF Ste 550.000 k⊦ Ma
Total Carrier Power 24.279 dBm	/ 5.00 MHz	ACP-I	BW				<u>Auto</u>	IVIa
			Lower		oper			_
Carrier Power Filte	onserried	Integ BW	dBc dB		dBm	Filter	F	req Offse
1 24.279 dBm / 5.000 MHz -3 dB		37.50 kHz		6 -56.21	-31.93	-3 dB		0 H
	37.50 kHz	100.0 kHz	-56.22 -31.9	94 -56.29	-32.01	-3 dB		

Plot 7-45. Channel Edge Plot (LTE Band 26 - 5MHz QPSK - Low Channel)



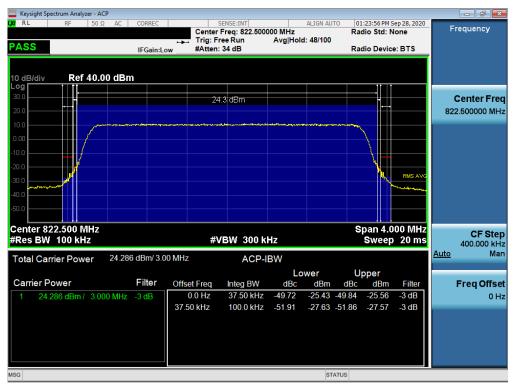
Plot 7-46. Channel Edge Plot (LTE Band 26 - 5MHz QPSK - High Channel)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 39 of 60
© 2020 PCTEST	·			V 9.0 02/01/2019



	ectrum Anal	yzer - ACP												
RL	RF	50 Ω	AC	CORREC			NSE:INT		ALIGN AUT		9:08 PM o Std:	Sep 28, 2020	F	requency
ASS				IFGain:	Low				d: 93/100			ce: BTS		, , 
) dB/div	Ref	40.00	) dBn	n										
<b>9</b> g 0.0						24.3	3 dBm				_			Center Fre
0.0													81	5.500000 MH
.00 .00		$\square$												
0.0	/	{												
0.0 0.0	1										٦L,	RMS AVG		
3.0 3.0														
0.0														
enter 8' Res BW						#VE	300 k	Hz				000 MHz p 20 ms		CF Ste
otal Car	rier Pow	ver	24.34	8 dBm/ 3.	.00 MHz		ACP-I	BW					<u>Auto</u>	Ма
								Lo	ower	Up	per			
Carrier P	ower			Filter			Integ BW	dBc	dBm	dBc	dBm			Freq Offs
1 24	348 dBm	/ 3.000	) MHz	-3 dB	(	0.0 Hz	37.50 kHz	-49.91	-25.56 -	49.51	-25.16	-3 dB		01
1 24.					37.5	0 kHz	100.0 kHz	-51.84	-27.49 -	51.25	-26.91	-3 dB		
1 24.														
1 24.														
1 24.													_	
1 24.														
1 24.														





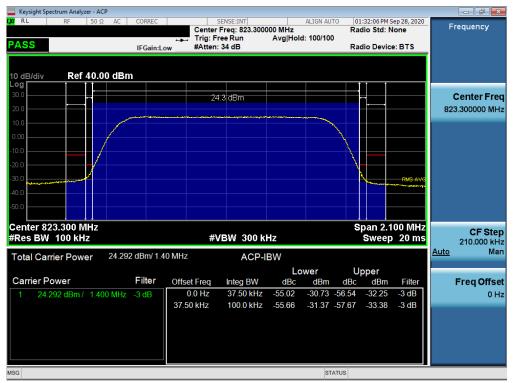
Plot 7-48. Channel Edge Plot (LTE Band 26 - 3MHz QPSK - High Channel)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 40 of 60
© 2020 PCTEST	·	·		V 9.0 02/01/2019



	aiyzei	- ACP												
RL	RF 5	50Ω A	AC	CORREC			ENSE:INT		ALIGN AU			Sep 28, 2020	F	requency
ASS					••	, Trig: Fr		00 MHz Avg Hol	d: 100/10	0	adio Std: M			requeries
A55				IFGain:	_ow	#Atten:	34 dB			Ra	adio Devic	e: BTS		
0 dB/div og	Ref 4	0.00 d	IBm								•••••			
<b>0.0</b>						24	3 dBm							Center Fre
0.0							0 0.2111							4.700000 M⊢
0.0							*****							
.00		1								$\sim$				
0.0										$\lambda$				
		/												
0.0	بر													
0.0	-										-	RMS AVO		
0.0														
io.o														
		-												
		lz				40.1	BW 200 K			ę		100 MHz		CF Ste
		lz				#V	BW 300 kl	Hz		5		100 MHz 5 20 ms		210.000 kH
Res BW 10	)0 kHz		1.299	dBm/ 1.	40 MH2		BW 300 ki ACP-l			\$			Auto	210.000 kH
Res BW 10 otal Carrier	00 kHz Power				40 MH2			BW	wer				<u>Auto</u>	210.000 kH Ma
Res BW 10	00 kHz Power			dBm/ 1. Filter	Offs	z set Freq	ACP-I	BW Lo dBc	dBm	L dBc	Sweep Jpper dBm	20 ms	<u>Auto</u>	210.000 kH Ma
Res BW 10 otal Carrier	00 kHz Power	r 24		Filter	Offs	z set Freq 0.0 Hz	ACP-II Integ BW 37.50 kHz	BW Lc dBc -55.83	dBm -31.53	dBc -56.01	Sweep Jpper dBm -31.71	Filter	<u>Auto</u>	CF Ste 210.000 kH Ma Freq Offse 0 H
enter 814.7 Res BW 10 Total Carrier Carrier Powe 1 24.299	0 <b>0 kHz</b> Power	r 24		Filter	Offs	z set Freq	ACP-I	BW Lc dBc -55.83	dBm	dBc -56.01	Sweep Jpper dBm -31.71	20 ms	<u>Auto</u>	210.000 kH Ma Freq Offs
Res BW 10 Fotal Carrier Carrier Powe	0 <b>0 kHz</b> Power	r 24		Filter	Offs	z set Freq 0.0 Hz	ACP-II Integ BW 37.50 kHz	BW Lc dBc -55.83	dBm -31.53	dBc -56.01	Sweep Jpper dBm -31.71	Filter	<u>Auto</u>	210.000 kH Ma Freq Offs
Res BW 10 Fotal Carrier Carrier Powe	0 <b>0 kHz</b> Power	r 24		Filter	Offs	z set Freq 0.0 Hz	ACP-II Integ BW 37.50 kHz	BW Lc dBc -55.83	dBm -31.53	dBc -56.01	Sweep Jpper dBm -31.71	Filter	<u>Auto</u>	210.000 kH Ma Freq Offs
Res BW 10 otal Carrier Carrier Powe	0 <b>0 kHz</b> Power	r 24		Filter	Offs	z set Freq 0.0 Hz	ACP-II Integ BW 37.50 kHz	BW Lc dBc -55.83	dBm -31.53	dBc -56.01	Sweep Jpper dBm -31.71	Filter	<u>Auto</u>	210.000 kH Ma Freq Offs
Res BW 10 otal Carrier Carrier Powe	0 <b>0 kHz</b> Power	r 24		Filter	Offs	z set Freq 0.0 Hz	ACP-II Integ BW 37.50 kHz	BW Lc dBc -55.83	dBm -31.53	dBc -56.01	Sweep Jpper dBm -31.71	Filter	<u>Auto</u>	210.000 kH Ma Freq Offs

Plot 7-49. Channel Edge Plot (LTE Band 26 - 1.4MHz QPSK - Low Channel)



### Plot 7-50. Channel Edge Plot (LTE Band 26 - 1.4MHz QPSK - High Channel)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 41 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 41 of 60
© 2020 PCTEST	·	·		V 9.0 02/01/2019



## LTE Band 14

	ctrum Analyzer -									_	
L <mark>XI</mark> RL	RF 50	Ω AC	CORREC	SEN	SE:INT	#Avg Typ	ALIGN AUTO e: RMS	01:03:02 PM Se TRACE	ep 28, 2020	Fred	uency
			PNO: Wide 😱 IFGain:Low	Trig: Free Atten: 36				TYPE / DET 4		_	
10 dB/div Log	Ref 25.00	) dBm					Mk	r1 787.96 -28.82	8 MHz 2 dBm	A	uto Tune
15.0											n <b>ter Freq</b> 00000 MHz
-5.00						aganaling ang ang ang ang ang ang ang ang ang a	arand	₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	haddebaaree dyseffecte		Start Freq 00000 MHz
-15.0					1,00				-13.00 dBm		<b>Stop Freq</b> 00000 MHz
-35.0	<u>ado</u> nanayular/Afr	~~~~	drevelander och der en der	na na manana na manana na manana na manana na mana na m						8 <u>Auto</u>	<b>CF Step</b> 00.000 kHz Man
-55.0										Fr	r <b>eq Offset</b> 0 Hz
-65.0											cale Type
Center 78 #Res BW	8.000 MHz 100 kHz		#VBW	300 kHz			Sweep 4	Span 8.00 .000 ms (10	00 MHz 01 pts)	Log	<u>Lin</u>
MSG							STATUS				





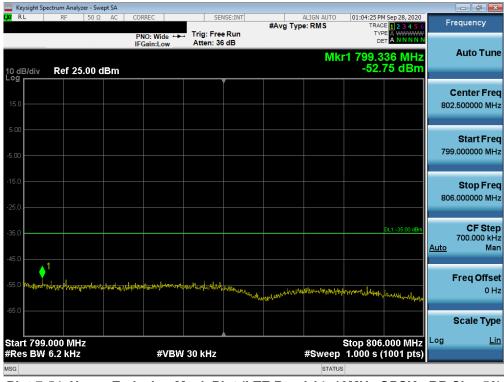
Plot 7-52. Lower Emission Mask Plot (LTE Band 14, 10MHz QPSK - RB Size 50)

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 42 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 42 of 60
© 2020 PCTEST		•		V 9 0 02/01/2019



	ctrum Analyzer - Swe									_	- 0 .
LXU RL	RF 50 Ω	AC	CORREC	SEI	ISE:INT	#Avg Typ	ALIGN AUTO		4 Sep 28, 2020	Fre	quency
			PNO: Wide G	Trig: Free Atten: 36				TYP			
10 dB/div Log	Ref 25.00 d	iBm					Mkı	1 798.0 -32.9	00 MHz 52 dBm		Auto Tune
15.0											enter Freq 000000 MHz
5.00 <del>پرمېر</del>										198.	500000 141112
-5.00				$\sum$							Start Freq
									DL1 -13.00 dBm		
-15.0				L.							Stop Freq 000000 MHz
-25.0				Pto North	1						CF Step
-35.0					M. morenet	Mar heller	mannah	Mathleman and Aver	Automania	<u>Auto</u>	800.000 kHz Man
-45.0										F	req Offset
-55.0											0 Hz
-65.0										s	cale Type
Center 79 #Res BW	8.000 MHz 100 kHz		#VBW	300 kHz			Sween 4	Span 8	.000 MHz 1001 pts)	Log	<u>Lin</u>
MSG							STATUS		noo proy		

Plot 7-53. Upper Band Edge Plot (LTE Band 14, 10MHz QPSK - RB Size 50)



Plot 7-54. Upper Emission Mask Plot (LTE Band 14, 10MHz QPSK - RB Size 50)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 42 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 43 of 60
© 2020 PCTEST		•		V 9.0 02/01/2019



	ectrum Analyze											_	
X/RL	RF	50 Ω A	IC CO	ORREC		SEN	ISE:INT	#Avg Typ	ALIGN AUTO		E 1 2 3 4 5 6	F	requency
			F	PNO: Wi Gain:L	de 🖵 ow	Trig: Free Atten: 36		•		TYF De			Auto Tune
10 dB/div	Ref 25.	00 dBr	n						IVIK	-25.	96 MHz 55 dBm		
15.0													Center Fred 3.000000 MHz
5.00							~~	manghal		mm	man		
-5.00												786	Start Fred 5.000000 MH2
-15.0							_				DL1 -13.00 dBm		Stop Free
-25.0							1					790	0.000000 MH
35.0		and compose	<del>م</del> امع	mm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	······							CF Step
45.0												<u>Auto</u>	400.000 kH Ma
-55.0													Freq Offse
65.0													0 H
													Scale Type
Center 78 #Res BW		IZ		#	VBW	300 kHz			Sweep 2	59 Span 000 m <u>s (</u>	.000 MHz 1001 pts)	Log	Lir
ISG									STATUS	-			

Plot 7-55. Lower Band Edge Plot (LTE Band 14, 5MHz QPSK - RB Size 25)



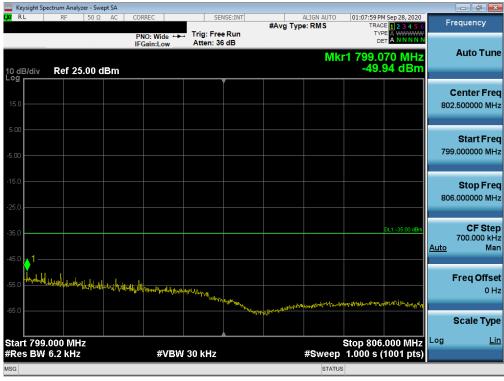
Plot 7-56. Lower Emission Mask Plot (LTE Band 14, 5MHz QPSK - RB Size 25)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 44 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 44 of 60
© 2020 PCTEST	·			V 9.0 02/01/2019



	ctrum Analyzer - S											
X/RL	RF 50	Ω AC	CORREC			SE:INT	#Avg Typ	ALIGN AUTO	TRAC	4 Sep 28, 2020	Fr	equency
			PNO: Wide IFGain:Lov		Frig: Free Atten: 36				TYI Di			
								Mk	r1 798.0	00 MHz		Auto Tune
10 dB/div _og	Ref 25.00	dBm							-25.	99 dBm		
											C	Center Freq
15.0											798	8.000000 MHz
5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~	m		v							
5.00					1							Start Freq
-5.00											796	6.000000 MHz
										DL1 -13.00 dBm		
-15.0					<u>ل</u>							Stop Freq
-25.0					\	1					800	0.000000 MHz
						4						
-35.0						4 mm	Mar Para anna					CF Step 400.000 kHz
-45.0							V. Carlyne,		mon	manna	<u>Auto</u>	Man
45.0												
-55.0												Freq Offset 0 Hz
												0 H2
-65.0												Scale Type
Center 79 #Res BW	8.000 MHz		#\	/BM 3/	00 kHz			Sween	Span 4	.000 MHz 1001 pts)	Log	Lin
ISG	NOV MILZ		70		00 MHZ			SWEEP		roo i pis)		

Plot 7-57. Upper Band Edge Plot (LTE Band 14, 5MHz QPSK - RB Size 25)

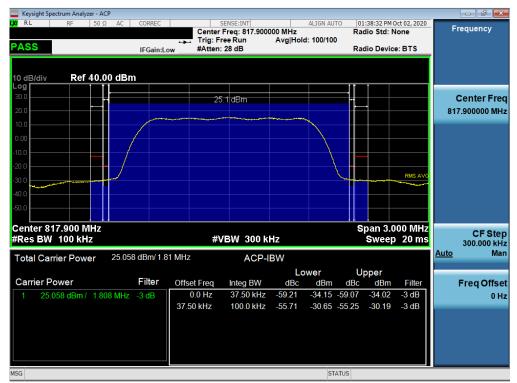


Plot 7-58. Upper Emission Mask Plot (LTE Band 14, 5MHz QPSK - RB Size 25)

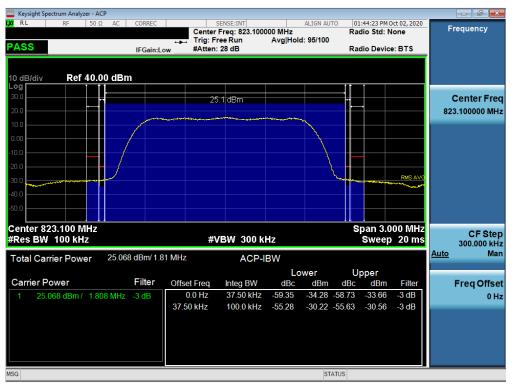
FCC ID: A3LSMG998U	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 45 of 60	
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 45 of 60	
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### CDMA BC10



Plot 7-59. Channel Edge Plot (CDMA BC10 - Ch. 476)



### Plot 7-60. Channel Edge Plot (CDMA BC10 - Ch. 684)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 46 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 46 of 60
© 2020 PCTEST		•		V 9 0 02/01/2019



# 7.5 Conducted Power Output Data §2.1046 §2.1046 §90.635

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [Watts]	Conducted Power Limit [dBm]	Margin [dB]
	QPSK	26765	821.5	1 / 36	25.26	0.336	50.00	-24.74
15 MHz	16-QAM	26765	821.5	1 / 36	24.09	0.256	50.00	-25.91
	64-QAM	26765	821.5	1 / 36	23.48	0.223	50.00	-26.52
2	256-QAM	26765	821.5	1 / 36	20.25	0.106	50.00	-29.75
	QPSK	26740	819.0	1 / 0	25.10	0.324	50.00	-24.90
10 MHz	16-QAM	26740	819.0	1 / 0	24.23	0.265	50.00	-25.77
	10 MHZ 64-QAM	26740	819.0	1 / 0	23.46	0.222	50.00	-26.54
	256-QAM	26740	819.0	1 / 49	20.02	0.100	50.00	-29.98
	QPSK	26715	816.5	1 / 24	25.30	0.339	50.00	-24.70
	QFOR	26765	821.5	1 / 24	25.20	0.331	50.00	-24.80
5 MHz	16-QAM	26765	821.5	1 / 24	24.72	0.296	50.00	-25.28
	64-QAM	26765	821.5	1 / 24	23.52	0.225	50.00	-26.48
	256-QAM	26715	816.5	1 / 24	20.37	0.109	50.00	-29.63
	QPSK	26705	815.5	1 / 0	25.18	0.330	50.00	-24.82
	QFOR	26775	822.5	1 / 7	25.16	0.328	50.00	-24.84
3 MHz	16-QAM	26775	822.5	1 / 14	24.35	0.272	50.00	-25.65
	64-QAM	26705	815.5	1 / 14	23.54	0.226	50.00	-26.46
	256-QAM	26775	822.5	1 / 7	20.44	0.111	50.00	-29.56
	QPSK	26697	814.7	1 / 0	25.16	0.328	50.00	-24.84
	QFSK	26783	823.3	1 / 0	25.17	0.329	50.00	-24.83
1.4 MHz	16-QAM	26697	814.7	1 / 0	24.27	0.267	50.00	-25.73
	64-QAM	26697	814.7	1 / 0	23.47	0.222	50.00	-26.53
	256-QAM	26783	823.3	1 / 0	20.17	0.104	50.00	-29.83

Table 7-2. Conducted Power Output Data (LTE Band 26)

Frequency [MHz]	Channel	Battery Type	Conducted Power [dBm]	Conducted Power [Watts]	Conducted Power Limit [dBm]	Margin [dB]
817.90	476	Standard	24.51	0.282	50.00	-25.49
823.10	<mark>684</mark>	Standard	24.52	0.283	50.00	-25.48

Table 7-3. Conducted Power Output Data (CDMA BC10)

### NOTES:

- 1. For CDMA mode, this device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 2. For LTE mode, the device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with 1 RB.

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 47 of 60	
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 47 of 60	
© 2020 PCTEST	·	•		V 9.0 02/01/2019	



### 7.6 Radiated Power (ERP) §90.542(a)(7), §22.913(a)(2)

### Test Overview

Effective Radiated Power (ERP) 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. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, 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

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

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 49 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 48 of 60
© 2020 PCTEST	•	•		V 9.0 02/01/2019



### Test Setup

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

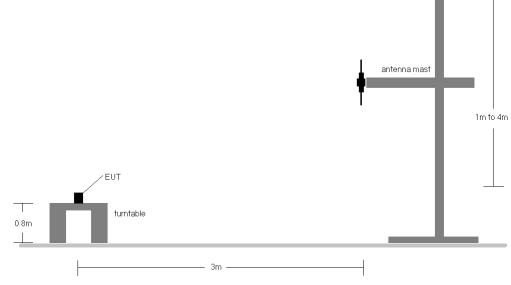


Figure 7-4. Radiated Test Setup <1GHz

### 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.

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 40 of 60	
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 49 of 60	
© 2020 PCTEST	•	-		V 9.0 02/01/2019	



Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
	QPSK	821.5	V	155	248	6.32	1 / 37	13.64	17.81	0.060	38.45	-20.64
15 MHz	16-QAM	821.5	V	155	248	6.32	1 / 37	12.67	16.84	0.048	38.45	-21.61
13 141112	64-QAM	821.5	V	155	248	6.32	1 / 37	11.75	15.92	0.039	38.45	-22.53
	256-QAM	821.5	V	155	248	6.32	1 / 37	14.11	18.28	0.067	38.45	-20.17
	QPSK	819.0	V	155	248	6.29	1/0	13.51	17.65	0.058	38.45	-20.80
10 MHz	16-QAM	819.0	V	155	248	6.29	1/0	12.84	16.98	0.050	38.45	-21.47
	64-QAM	819.0	V	155	248	6.29	1/0	11.76	15.90	0.039	38.45	-22.55
	256-QAM	819.0	V	155	248	6.29	1 / 49	13.91	18.05	0.064	38.45	-20.40
	QPSK	816.5	V	155	248	6.27	1 / 24	13.73	17.85	0.061	38.45	-20.60
	QFSK	821.5	V	155	248	6.32	1 / 24	13.58	17.75	0.060	38.45	-20.70
5 MHz	16-QAM	821.5	V	155	248	6.32	1 / 24	13.30	17.47	0.056	38.45	-20.98
	64-QAM	821.5	V	155	248	6.32	1 / 24	11.79	15.96	0.039	38.45	-22.49
	256-QAM	816.5	V	155	248	6.27	1 / 24	14.28	18.40	0.069	38.45	-20.05
	QPSK	815.5	V	155	248	6.26	1/0	13.62	17.73	0.059	38.45	-20.72
	GION	822.5	V	155	248	6.33	1/7	13.53	17.71	0.059	38.45	-20.74
3 MHz	16-QAM	822.5	V	155	248	6.33	1 / 14	12.92	17.10	0.051	38.45	-21.35
	64-QAM	815.5	V	155	248	6.26	1 / 14	11.87	15.98	0.040	38.45	-22.47
	256-QAM	822.5	V	155	248	6.33	1/7	14.29	18.47	0.070	38.45	-19.98
	QPSK	814.7	V	155	248	6.25	1/0	13.61	17.71	0.059	38.45	-20.74
	GION	823.3	V	155	248	6.34	1/0	13.53	17.72	0.059	38.45	-20.73
1.4 MHz	16-QAM	814.7	V	155	248	6.25	1/0	12.92	17.02	0.050	38.45	-21.43
	64-QAM	814.7	V	155	248	6.25	1/0	11.81	15.91	0.039	38.45	-22.54
	256-QAM	823.3	V	155	248	6.34	1/0	14.01	18.20	0.066	38.45	-20.25
	QPSK	816.5	Н	233	64	6.32	1 / 37	12.66	16.83	0.048	38.45	-21.62
	QPSK (WCP)	821.5	V	214	302	6.32	1 / 37	12.54	16.71	0.047	38.45	-21.74

### Table 7-4. ERP Data (LTE Band 26)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
	QPSK	793.0	V	139	296	6.11	1 / 25	16.06	20.02	0.101	34.77	-14.75
10 MHz	16-QAM	793.0	V	139	296	6.11	1 / 25	14.92	18.88	0.077	34.77	-15.89
	64-QAM	793.0	V	139	296	6.11	1 / 25	14.27	18.23	0.067	34.77	-16.54
	256-QAM	793.0	V	139	296	6.11	1 / 25	12.24	16.20	0.042	34.77	-18.57
		790.5	V	139	296	6.09	1/0	15.92	19.85	0.097	34.77	-14.92
	QPSK	793.0	V	139	296	6.11	1/0	16.04	20.00	0.100	34.77	-14.77
5 MHz		795.5	V	139	296	6.24	1/0	15.74	19.83	0.096	34.77	-14.94
5 1411 12	16-QAM	793.0	V	139	296	6.11	1/0	14.78	18.74	0.075	34.77	-16.03
	64-QAM	793.0	V	139	296	6.11	1/0	14.06	18.02	0.063	34.77	-16.75
	256-QAM	793.0	V	139	296	6.11	1/0	12.35	16.31	0.043	34.77	-18.46
	QPSK	795.5	Н	191	245	5.91	1 / 25	13.18	16.94	0.049	34.77	-17.83
	QPSK (WCP)	790.5	V	170	75	5.91	1 / 25	11.27	15.03	0.032	34.77	-19.74

Table 7-5. ERP Data (LTE Band 14)

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 50 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 50 of 60
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# 7.7 Radiated Spurious Emissions Measurements §2.1053

### **Test Overview**

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

### **Test Procedures Used**

KDB 971168 D01 v03r01 - Section 5.8

ANSI/TIA-603-E-2016 - Section 2.2.12

### **Test Settings**

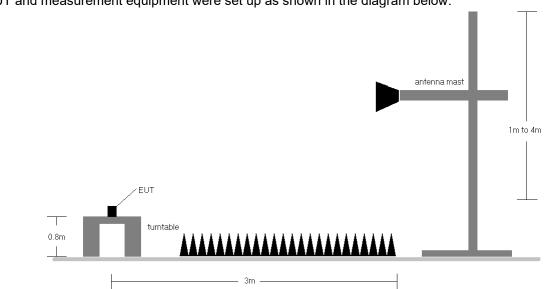
- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW  $\geq$  3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points > 2 x span / RBW
- 5. Detector = RMS
- 6. Trace mode = Average (Max Hold for pulsed emissions)
- 7. The trace was allowed to stabilize

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 51 of 60
1M2009230152-04.A3L	M2009230152-04.A3L 9/23 – 11/20/2020 Portable Handset			Page 51 of 60
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### Test Setup



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

Figure 7-5. Test Instrument & Measurement Setup

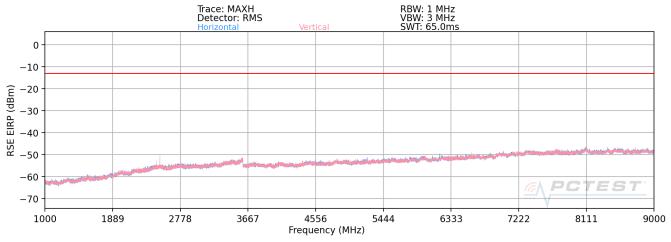
### Test Notes

- 1. For CDMA mode, this device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 2. For LTE mode, the device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with 1 RB.
- 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 "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 6. Per 90(f), emissions in the 1559 1610MHz band are subject to a limit of -40dBm/MHz for wideband signals. These emission measurements are shown in this section below.

FCC ID: A3LSMG998U	PCTEST <sup>®</sup> Prcud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 52 of 60
1M2009230152-04.A3L 9/23 - 11/20/2020 P		Portable Handset	Page 52 of 60	
© 2020 PCTEST		•		V 9 0 02/01/2019



# LTE Band 26



Bandwidth (MHz):	10
Frequency (MHz):	819.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 25

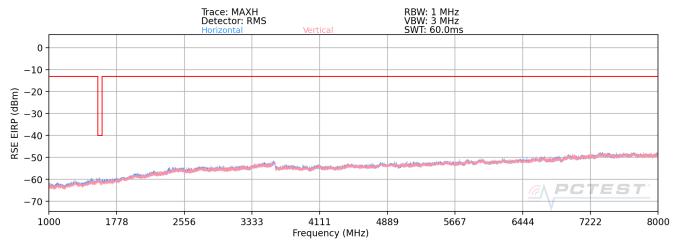
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1638.0	V	-	-	-67.62	-1.44	37.94	-57.31	-13.00	-44.31
2457.0	V	142	255	-63.24	3.13	46.89	-48.36	-13.00	-35.36
3276.0	V	-	-	-70.01	4.14	41.13	-54.13	-13.00	-41.13
4095.0	V	-	-	-74.48	6.43	38.95	-56.30	-13.00	-43.30

Table 7-6. Radiated Spurious Data (LTE Band 26)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 52 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 53 of 60
© 2020 PCTEST				V 9.0 02/01/2019



# LTE Band 14





Bandwidth (MHz):	10
Frequency (MHz):	793.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 25

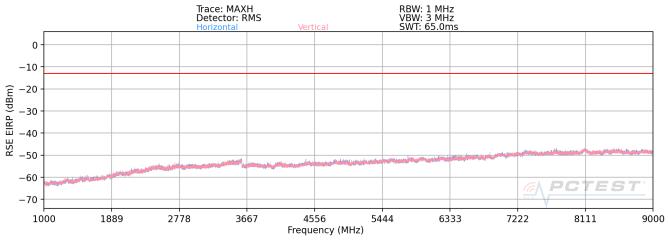
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1586.0	Н	-	-	-70.01	-1.11	35.88	-59.37	-40.00	-19.37
2379.0	Н	120	231	-55.34	2.34	54.00	-41.26	-13.00	-28.26
3172.0	Н	-	-	-69.16	3.85	41.69	-53.57	-13.00	-40.57
3965.0	Н	-	-	-74.83	5.78	37.95	-57.31	-13.00	-44.31

Table 7-7. Radiated Spurious Data (LTE Band 14 – Mid Channel)

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege E4 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 54 of 60
© 2020 PCTEST		·		V 9.0 02/01/2019



# CDMA BC10



Plot 7-63. Radiated Spurious Plot (CDMA BC10)

Frequency (MHz):	817.9								
Modulation:	CDMA BC10								
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]
1635.8	Н	-	-	-66.22	0.52	41.30	-53.95	-13.00	-40.95
2453.7	Н	-	-	-66.65	4.86	45.21	-50.05	-13.00	-37.05

Table 7-8. Radiated Spurious Data (CDMA BC10 - Ch. 476)

Frequency (MHz):	820.5								
Modulation:	CDMA BC10								
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]
1641.0	Н	-	-	-66.66	0.51	40.85	-54.40	-13.00	-41.40
2461.5	Н	-	-	-66.37	4.90	45.53	-49.73	-13.00	-36.73
3282.0	Н	-	-	-66.89	6.80	46.91	-48.35	-13.00	-35.35
Table 7.9 Badiated Spurious Data (CDMA BC10 Ch. 580)									

Table 7-9. Radiated Spurious Data (CDMA BC10 – Ch. 580)

823.1								
CDMA BC10								
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]
Н	-	-	-66.58	0.50	40.92	-54.34	-13.00	-41.34
Н	-	-	-67.91	4.99	44.08	-51.18	-13.00	-38.18
	CDMA BC10 Ant. Pol. [H/V] H	CDMA BC10 Ant. Pol. [H/V] [H/V] H -	CDMA BC10       Ant. Pol. [H/V]     Antenna Height [cm]     Turntable Azimuth [degree]       H     -     -	CDMA BC10       Ant. Pol. [H/V]     Antenna Height [cm]     Turntable Azimuth [degree]     Analyzer Level [dBm]       H     -     -     -66.58	CDMA BC10       Ant. Pol. [H/V]     Antenna Height [cm]     Turntable Azimuth [degree]     Analyzer Level [dBm]     AFCL [dB/m]       H     -     -     -66.58     0.50	CDMA BC10       Antenna       Turntable       Analyzer       AFCL       Field         Image: H/V]       Antenna       Height       Azimuth       Level       Image: AFCL       Field         H       -       -       -66.58       0.50       40.92	CDMA BC10       Antenna       Turntable       Analyzer       AFCL       Field       EIRP Spurious         [H/V]       Height       Image: Azimuth       Azimuth       Level       Image: AFCL       Image: AFCL       Image: AFCL       EIRP Spurious         H       -       -       -66.58       0.50       40.92       -54.34	CDMA BC10       Antenna       Turntable       Analyzer       AFCL       Field       EIRP Spurious       Limit         [H/V]       Height       Turntable       Analyzer       Level       Image: Comparison of the comparison of

Table 7-10. Radiated Spurious Data (CDMA BC10 – Ch. 684)

FCC ID: A3LSMG998U	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage EE of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 55 of 60
© 2020 PCTEST	<u>.</u>	·		V 9.0 02/01/2019



# 7.8 Frequency Stability / Temperature Variation §2.1055 §90.213

### 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.

# The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ( $\pm 2.5$ ppm) of the center frequency.

### Test Procedure Used

ANSI/TIA-603-E-2016

#### Test Settings

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

### Test Setup

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

### Test Notes

None

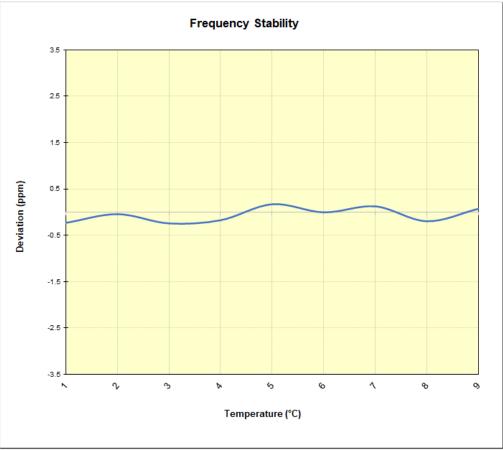
FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga E6 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 56 of 60
© 2020 PCTEST	-	•		V 9.0 02/01/2019



# Frequency Stability / Temperature Variation

LTE Band 26							
	Operating F	requency (Hz):	819,00	00,000	]		
	Ref.	Voltage (VDC):	4.	18			
		Deviation Limit:	± 0.00025%	or 2.5 ppm			
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)		
		- 30	818,999,827	-184	-0.0000225		
		- 20	818,999,979	-32	-0.000039		
		- 10	818,999,817	-194	-0.0000237		
		0	818,999,873	-138	-0.0000168		
100 %	4.18	+ 10	819,000,154	143	0.0000175		
		+ 20 (Ref)	819,000,011	0	0.0000000		
		+ 30	819,000,116	105	0.0000128		
		+ 40	818,999,855	-156	-0.0000190		
		+ 50	819,000,074	63	0.0000077		
Battery Endpoint	2.98	+ 20	819,000,236	225	0.0000275		

### Table 7-9. LTE Band 26 Frequency Stability Data



### Table 7-9. LTE Band 26 Frequency Stability Chart

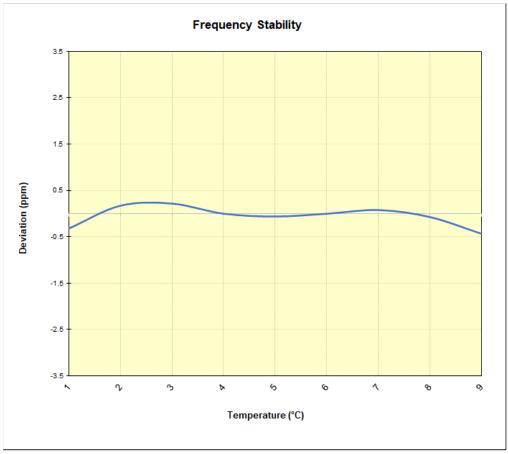
			-	
FCC ID: A3LSMG998U	CTEST	MEASUREMENT REPORT	SAMSUNG	Approved by:
FCC ID: A3LSMG9980	Proud to be part of element	(CERTIFICATION))	Chim South	Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege EZ of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 57 of 60
© 2020 PCTEST				V 9.0 02/01/2019



# Frequency Stability / Temperature Variation

LTE Band 14						
	Operating F	requency (Hz):	793,00	00,000	]	
	Ref.	Voltage (VDC):	4.	18	]	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	
		- 30	792,999,677	-250	-0.0000315	
		- 20	793,000,064	137	0.0000173	
		- 10	793,000,099	172	0.0000217	
		0	792,999,928	1	0.0000001	
100 %	4.18	+ 10	792,999,880	-47	-0.0000059	
		+ 20 (Ref)	792,999,927	0	0.0000000	
		+ 30	792,999,990	63	0.0000079	
		+ 40	792,999,871	-56	-0.0000071	
		+ 50	792,999,587	-340	-0.0000429	
Battery Endpoint	2.98	+ 20	793,000,091	164	0.0000207	

Table 7-9. LTE Band 14 Frequency Stability Data



### Table 7-9. LTE Band 14 Frequency Stability Chart

FCC ID: A3LSMG998U	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 59 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 58 of 60
© 2020 PCTEST		·		V 9.0 02/01/2019

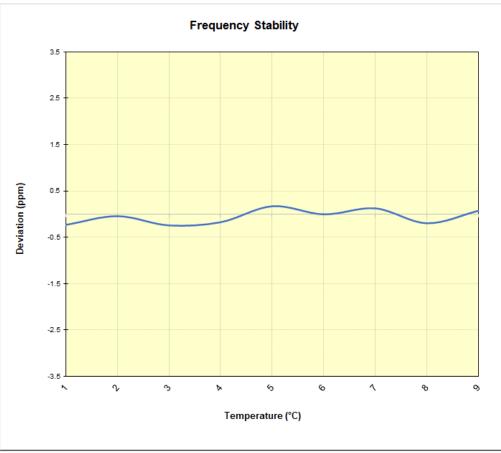
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# Frequency Stability / Temperature Variation

CDMA BC10							
	Operating F	requency (Hz):	817,90	00,000	]		
	Ref.	Voltage (VDC):	4.	18			
		Deviation Limit:	± 0.00025%	or 2.5 ppm			
					-		
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)		
		- 30	818,999,827	-184	-0.0000225		
		- 20	818,999,979	-32	-0.000039		
		- 10	818,999,817	-194	-0.0000237		
		0	818,999,873	-138	-0.0000168		
100 %	4.18	+ 10	819,000,154	143	0.0000175		
		+ 20 (Ref)	819,000,011	0	0.0000000		
		+ 30	819,000,116	105	0.0000128		
		+ 40	818,999,855	-156	-0.0000190		
		+ 50	819,000,074	63	0.0000077		
Battery Endpoint	2.98	+ 20	819,000,236	225	0.0000275		

### Table 7-9. CDMA BC10 Frequency Stability Data



# Table 7-9. CDMA BC10 Frequency Stability Chart

FCC ID: A3LSMG998U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege E0 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 59 of 60
© 2020 PCTEST	<u>.</u>			V 9.0 02/01/2019

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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: A3LSMG998U** complies with all the requirements of Parts 22(H) and 90 of the FCC rules.

FCC ID: A3LSMG998U	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION))	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 60 of 60
1M2009230152-04.A3L	9/23 - 11/20/2020	Portable Handset		Page 60 of 60
© 2020 PCTEST	•	•		V 9.0 02/01/2019