

# PCTEST

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## MEASUREMENT REPORT

LTE

#### **Applicant Name:**

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

### Date of Testing: 10/22/2019 – 02/17/2020 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1911260209-03.A3L

## FCC ID:

## A3LSMG981JPN

APPLICANT:

## Samsung Electronics Co., Ltd.

Application Type: Model: Additional Model(s): EUT Type: FCC Classification: FCC Rule Part(s): Test Procedure(s): Certification SC-51A SCG01 Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 22 & 27 ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01, KDB 648474 D03 v01r04

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez President



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# MEASUREMENT REPORT FCC Part 22 & 27



				ERP EIRP		RP		
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Pow er (W)	Max. Pow er (dBm)	Max. Pow er (W)	Max. Pow er (dBm)	Emission Designator	Modulation
LTE Band 12	27	699.7 - 715.3	0.041	16.13	0.067	18.28	1M10G7D	QPSK
LTE Band 12	27	699.7 - 715.3	0.034	15.30	0.056	17.45	1M10W7D	16QAM
LTE Band 12	27	699.7 - 715.3	0.026	14.19	0.043	16.34	1M10W7D	64QAM
LTE Band 12	27	700.5 - 714.5	0.041	16.09	0.067	18.24	2M70G7D	QPSK
LTE Band 12	27	700.5 - 714.5	0.034	15.26	0.055	17.41	2M72W7D	16QAM
LTE Band 12	27	700.5 - 714.5	0.026	14.15	0.043	16.30	2M71W7D	64QAM
LTE Band 12	27	701.5 - 713.5	0.040	16.06	0.066	18.21	4M51G7D	QPSK
LTE Band 12	27	701.5 - 713.5	0.033	15.15	0.054	17.30	4M49W7D	16QAM
LTE Band 12	27	701.5 - 713.5	0.026	14.09	0.042	16.24	4M53W7D	64QAM
LTE Band 12	27	704 - 711	0.039	15.92	0.064	18.07	9M00G7D	QPSK
LTE Band 12	27	704 - 711	0.032	15.11	0.053	17.26	8M97W7D	16QAM
LTE Band 12	27	704 - 711	0.025	14.04	0.042	16.19	9M01W7D	64QAM
LTE Band 13	27	779.5 - 784.5	0.078	18.91	0.128	21.06	4M51G7D	QPSK
LTE Band 13	27	779.5 - 784.5	0.066	18.20	0.108	20.35	4M50W7D	16QAM
LTE Band 13	27	779.5 - 784.5	0.055	17.44	0.091	19.59	4M53W7D	64QAM
LTE Band 13	27	782	0.074	18.70	0.122	20.85	9M01G7D	QPSK
LTE Band 13	27	782	0.064	18.03	0.104	20.18	8M93W7D	16QAM
LTE Band 13	27	782	0.050	16.97	0.082	19.12	8M95W7D	64QAM
LTE Band 5	22H	824.7 - 848.3	0.049	16.93	0.081	19.08	1M10G7D	QPSK
LTE Band 5	22H	824.7 - 848.3	0.040	16.07	0.066	18.22	1M10W7D	16QAM
LTE Band 5	22H	824.7 - 848.3	0.040	16.07	0.066	18.22	1M10W7D	64QAM
LTE Band 5	22H	825.5 - 847.5	0.050	16.98	0.082	19.13	2M70G7D	QPSK
LTE Band 5	22H	825.5 - 847.5	0.041	16.13	0.067	18.28	2M72W7D	16QAM
LTE Band 5	22H	825.5 - 847.5	0.037	15.65	0.060	17.80	2M71W7D	64QAM
LTE Band 5	22H	826.5 - 846.5	0.050	17.00	0.082	19.15	4M51G7D	QPSK
LTE Band 5	22H	826.5 - 846.5	0.044	16.46	0.073	18.61	4M51W7D	16QAM
LTE Band 5	22H	826.5 - 846.5	0.037	15.70	0.061	17.85	4M53W7D	64QAM
LTE Band 5	22H	829 - 844	0.048	16.83	0.079	18.98	9M01G7D	QPSK
LTE Band 5	22H	829 - 844	0.039	15.89	0.064	18.04	8M99W7D	16QAM
LTE Band 5	22H	829 - 844	0.031	14.86	0.050	17.01	9M01W7D	64QAM

EUT Overview (<1 GHz)

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			EI	RP		
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Pow er (W)	Max. Pow er (dBm)	Emission Designator	Modulation
LTE Band 4	27	1710.7 - 1754.3	0.191	22.81	1M10G7D	QPSK
LTE Band 4	27	1710.7 - 1754.3	0.151	21.78	1M09W7D	16QAM
LTE Band 4	27	1710.7 - 1754.3	0.117	20.68	1M10W7D	64QAM
LTE Band 4	27	1711.5 - 1753.5	0.196	22.93	2M70G7D	QPSK
LTE Band 4	27	1711.5 - 1753.5	0.163	22.13	2M71W7D	16QAM
LTE Band 4	27	1711.5 - 1753.5	0.126	20.99	2M70W7D	64QAM
LTE Band 4	27	1712.5 - 1752.5	0.191	22.82	4M51G7D	QPSK
LTE Band 4	27	1712.5 - 1752.5	0.155	21.91	4M51W7D	16QAM
LTE Band 4	27	1712.5 - 1752.5	0.122	20.88	4M52W7D	64QAM
LTE Band 4	27	1715 - 1750	0.189	22.76	9M01G7D	QPSK
LTE Band 4	27	1715 - 1750	0.156	21.94	8M98W7D	16QAM
LTE Band 4	27	1715 - 1750	0.127	21.05	9M00W7D	64QAM
LTE Band 4	27	1717.5 - 1747.5	0.204	23.10	13M5G7D	QPSK
LTE Band 4	27	1717.5 - 1747.5	0.157	21.95	13M5W7D	16QAM
LTE Band 4	27	1717.5 - 1747.5	0.129	21.12	13M5W7D	64QAM
LTE Band 4	27	1720 - 1745	0.205	23.13	18M0G7D	QPSK
LTE Band 4	27	1720 - 1745	0.169	22.29	18M0W7D	16QAM
LTE Band 4	27	1720 - 1745	0.136	21.35	17M9W7D	64QAM

EUT Overview (Mid Bands)

			EI	RP		
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Pow er (W)	Max. Pow er (dBm)	Emission Designator	Modulation
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.222	23.46	4M52G7D	QPSK
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.179	22.54	4M51W7D	16QAM
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.143	21.55	4M53W7D	64QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.222	23.46	9M00G7D	QPSK
LTE Band 41 (PC3)	27	2501 - 2685	0.179	22.54	9M07W7D	16QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.141	21.50	9M01W7D	64QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.230	23.62	13M6G7D	QPSK
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.187	22.72	13M5W7D	16QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.142	21.53	13M5W7D	64QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.219	23.40	17M9G7D	QPSK
LTE Band 41 (PC3)	27	2506 - 2680	0.179	22.53	17M9W7D	16QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.134	21.26	17M9W7D	64QAM

EUT Overview (High Bands)

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## **1.0 INTRODUCTION**

### 1.1 Scope

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

### 1.2 PCTEST Test Location

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

### 1.3 Test Facility / Accreditations

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

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

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# 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG981JPN**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 8649M, 8620M, 8626M, 8635M, 8629M

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC, ANT+, Wireless Power Transfer

### 2.3 Test Configuration

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

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

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

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

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## 3.0 DESCRIPTION OF TESTS

### 3.1 Measurement Procedure

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

### 3.2 Radiated Power and Radiated Spurious Emissions

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

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

The calculated  $P_d$  levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of 43 + 10 log<sub>10</sub>(Power [Watts]). For Band 41, the calculated  $P_d$  levels are compared to the absolute spurious emission limit of -25dBm which is equivalent to the required minimum attenuation of 55 + 10 log<sub>10</sub>(Power [Watts]).

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

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## 4.0 MEASUREMENT UNCERTAINTY

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

Contribution	Expanded Uncertainty (±dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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# 5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx1	Licensed Transmitter Cable Set	6/4/2019	Annual	6/4/2020	LTx1
-	LTx5	Licensed Transmitter Cable Set	6/5/2019	Annual	6/5/2020	LTx5
Agilent	N9020A	MXA Signal Analyzer	4/20/2019	Annual	4/20/2020	US46470561
Agilent	N9038A	MXE EMI Receiver 7/17/2019 Annual 7/17/2		7/17/2020	MY51210133	
Agilent	N9030A	PXA Signal Analyzer (44GHz)	PXA Signal Analyzer (44GHz) 6/12/2019 Annual 6/12/2		6/12/2020	MY52350166
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	5/10/2019	Annual	5/10/2020	441112
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
EMCO	3160-09	Small Horn (18 - 26.5GHz)	Small Horn (18 - 26.5GHz) 8/9/2018 Biennial 8/9		8/9/2020	135427
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biennial	2/14/2021	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	Quad Ridge Horn Antenna 2/22/2019 Biennial 2		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	PWR-SEN-4RMS	USB Power Sensor	4/20/2019	Annual	4/20/2020	11210140001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11403100002
Rohde & Schwarz	CMW500	Radio Communication Tester		N/A		100976
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	6/5/2019	Annual	6/5/2020	100342
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/11/2019	Annual	7/11/2020	102134
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	4/30/2018			9105-2403
Seekonk	NC-100	Torque Wrench (8" lb)	5/10/2018			N/A
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

Table 5-1. Test Equipment

### Notes:

- 1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.
- 2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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# 6.0 SAMPLE CALCULATIONS

### **Emission Designator**

#### **QPSK Modulation**

#### Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

#### **QAM Modulation**

#### Emission Designator = 8M45W7D

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

## Spurious Radiated Emission – LTE Band

#### Example: Middle Channel LTE Mode 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).

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# 7.0 TEST RESULTS

## 7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
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FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>LTE</u>

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A			Section 7.2
2.1051 22.917(a) 27.53(c) 27.53(g) 27.53(h)	Out of Band Emissions	> 43 + 10 log <sub>10</sub> (P[Watts]) at Band Edge and for all out-of- band emissions			Section 7.3, 7.4
27.53(m)	Out of Band Emissions	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.3, 7.4
27.50(d)	Peak-Average Ratio	< 13 dB	CONDUCTED	PASS	Section 7.5
2.1046	Transmitter Conducted Output Power	N/A			See RF Exposure Report
27.53(m)	Uplink Carrier Aggregation	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.7
2.1055 22.355 27.54	Frequency Stability	< 2.5 ppm (Part 22) and fundamental emissions stay within authorized frequency block (Part 24/27)			Section 7.10

Table 7-1. Summary of Conducted Test Results

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FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
22.913(a)(5)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 5)	< 7 Watts max. ERP			Section 7.7
27.50(b)(10) 27.50(c)(10)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 12/13)	< 3 Watts max. ERP			Section 7.7
27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 41)	< 2 Watts max. EIRP			Section 7.7
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP		5400	Section 7.7
2.1053 22.917(a) 27.53(c) 27.53(g) 27.53(h)	Undesirable Emissions (Band 12/13/5/4)	> 43 + 10 log <sub>10</sub> (P[Watts]) for all out-of-band emissions	RADIATED	RADIATED PASS	
27.53(f)	Undesirable Emissions (Band 13)	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 – 1610 MHz			Section 7.8
27.53(m)	Undesirable Emissions (Band 41)	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.8
27.53(m)	Uplink Carrier Aggregation	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.8

Table 7-2. Summary of Radiated Test Results

### Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots (Sections 7.2, 7.3, 7.4, 7.5) were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) 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 "LTE Automation," Version 5.3.

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## 7.2 Occupied Bandwidth

#### **Test Overview**

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

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 4.2

#### **Test Settings**

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

#### Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

#### Test Notes

None.

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Plot 7-1. Occupied Bandwidth Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-2. Occupied Bandwidth Plot (Band 12 - 1.4MHz 16-QAM - Full RB Configuration)

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Keysight Spectrum Analyzer - Occupied BV	V				
XX RL RF 50Ω DC		SENSE:INT r Freg: 707.500000 MHz	ALIGN AUTO 09:06:19 Radio Sto	PM Oct 28, 2019	Trace/Detector
		Free Run Avg Hold		a: None	
	#IFGain:Low #Atten	:: 36 dB	Radio De	vice: BTS	
10 dB/div Ref 30.00 dBr	n				
Log					
20.0	non	monn			Clear Write
10.0					Cical Write
0.00	/	\\\			
-10.0					
-20.0		\			Average
-30.0					-
-40.0 mpmmmmmmm	wrw.		mar and a second and a second	more	
-50.0					Max Hold
-60.0					
Center 707.500 MHz			Snan	3.500 MHz	
Res BW 33 kHz	#	VBW 110 kHz		3.067 ms	Min Hold
			·		MITHOU
Occupied Bandwidt	h	Total Power	29.5 dBm		
1	0951 MHz				Detector
					Peak▶
Transmit Freq Error	1.411 kHz	% of OBW Powe	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	1.243 MHz	x dB	-26.00 dB		
	172-15-1111/2	A GD	-20.00-010		
MSG			STATUS		

Plot 7-3. Occupied Bandwidth Plot (Band 12 - 1.4MHz 64-QAM - Full RB Configuration)



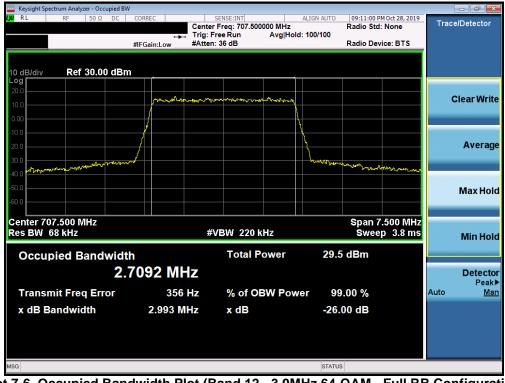
Plot 7-4. Occupied Bandwidth Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied B	CORREC	SENSE:INT	ALIGN AUTO	09:10:45 PM Oct 28, 2019	
	Cente	r Freq: 707.500000 MHz		Radio Std: None	Trace/Detector
		Free Run Avg Hol n: 36 dB	ld: 100/100	Radio Device: BTS	
	#il Gam.cow				
0 dB/div Ref 30.00 dB	m				
20.0					
10.0	production	manner			Clear Wr
			<u>}</u>		
10.0	/		ή.		
20.0	1				Avera
			<u>ا</u>		Avera
30.0			- Marrian	and have a way where the	
40.0					
50.0					Max Ho
60.0					
Center 707.500 MHz				Span 7.500 MHz	
Res BW 68 kHz	#	VBW 220 kHz		Sweep 3.8 ms	Min Ho
Occupied Bandwid	th	Total Power	30.6	5 dBm	
2	.7178 MHz				Detect
					Pea
Transmit Freq Error	3.361 kHz	% of OBW Pov	ver 99	0.00 %	Auto <u>M</u>
x dB Bandwidth	3.045 MHz	x dB	-26.	00 dB	
			07.7		
SG			STATUS		

Plot 7-5. Occupied Bandwidth Plot (Band 12 - 3.0MHz 16-QAM - Full RB Configuration)



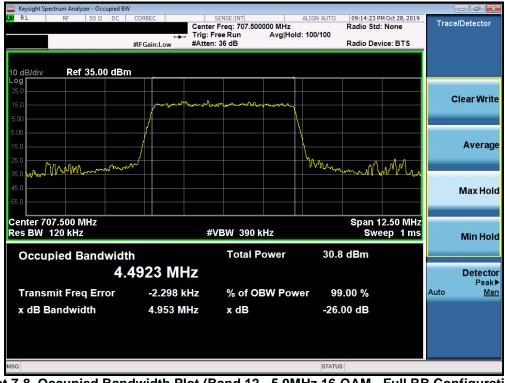
Plot 7-6. Occupied Bandwidth Plot (Band 12 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW					
LX RL RF 50Ω DC	CORREC	SENSE:INT er Freg: 707.500000 MHz	ALIGN AUTO 09:14:12 F Radio Sto	M Oct 28, 2019	Trace/Detector
	Trig:	Free Run Avg Hol	d: 100/100		
	#IFGain:Low #Atte	n: 36 dB	Radio De	VICE: BIS	
10 dB/div Ref 35.00 dBm					
25.0					
15.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	······································			Clear Write
5.00					
-5.00			\ \		
-15.0					Average
	/		0		Averuge
-25.0 -35.0 Mmmm W MMm Mg	~		My W hanne	www.	
-45.0					Max Hold
-55.0					
Center 707.500 MHz			Snan '	2.50 MHz	
Res BW 120 kHz	#	≇VBW 390 kHz		eep 1 ms	Min Hold
					MITHOL
Occupied Bandwidth		Total Power	32.1 dBm		
4.5	5111 MHz				Detector
					Peak▶
Transmit Freq Error	-1.927 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	5.000 MHz	x dB	-26.00 dB		
MSG			STATUS		
			0		

Plot 7-7. Occupied Bandwidth Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-8. Occupied Bandwidth Plot (Band 12 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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🔤 Keysight Spectrum Analyzer - Occupied E	W				
LXIRL RF 50Ω DC	CORREC	SENSE:INT er Freg: 707.500000 MHz	ALIGN AUTO 09:14:39 P Radio Std	M Oct 28, 2019	Trace/Detector
	↔ Trig:	Free Run Avg Hold	: 100/100		
	#IFGain:Low #Atte	n: 36 dB	Radio Dev	/ice: BTS	
10 dB/div Ref 35.00 dB	m				
25.0					
15.0					Clear Wri
5.00		and a second second			
-5.00			l l		Auero
-15.0					Averaç
-25.0 -35.0 -25.0 -25.0	Val len		hand the the		
-35.0 month and ball town to			Vy Wan	- may more	
-45.0					Max Ho
-55.0					
Center 707.500 MHz			Enon 1	2.50 MHz	
Res BW 120 kHz	#	¢VBW 390 kHz		eep 1 ms	
					Min Ho
Occupied Bandwid	th	Total Power	30.2 dBm		
4	.5257 MHz				Detect
					Peak
Transmit Freq Error	-12.925 kHz	% of OBW Powe	er 99.00 %		Auto <u>Ma</u>
x dB Bandwidth	4.997 MHz	x dB	-26.00 dB		
N90			074710		
MSG			STATUS		

Plot 7-9. Occupied Bandwidth Plot (Band 12 - 5.0MHz 64-QAM - Full RB Configuration)



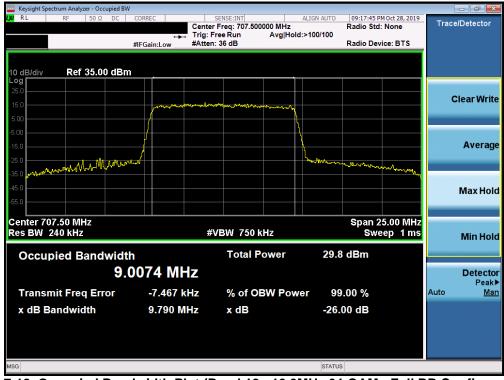
Plot 7-10. Occupied Bandwidth Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied Β R RL RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO	09:17:34 PM Oct 28, 2019	
10 002 00	Cer	nter Freq: 707.500000 MHz		Radio Std: None	Trace/Detector
			old: 100/100		
	#IFGain:Low #At	ten: 36 dB		Radio Device: BTS	-
0 dB/div Ref 35.00 dBr	n				
.og					
25.0					Clear Wr
15.0		who was a server the second of			Cical Wi
5.00					
5.00	{		\		
5.0			<u> </u>		Avera
25.0	<u>/</u>		1 1		
and the second second for the second second	Second Internet		and a start of the	matromplymaker	
45.0					Max Ho
55.0					
Center 707.50 MHz Res BW 240 kHz		#VBW 750 kHz		Span 25.00 MHz Sweep 1 ms	
Ces BW 240 KH2		#VEW / SU KHZ		sweep 1 ms	Min Ho
Occupied Bandwidt	h	Total Power	30.8	dBm	
8.	9740 MHz				Detect
Transmit Freq Error	-15.440 kHz	% of OBW Po	wor 00	.00 %	Pea Auto M
					Auto <u>m</u>
x dB Bandwidth	9.815 MHz	x dB	-26.	00 dB	
G			STATUS		
10			STATUS		

Plot 7-11. Occupied Bandwidth Plot (Band 12 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-12. Occupied Bandwidth Plot (Band 12 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-13. Occupied Bandwidth Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-14. Occupied Bandwidth Plot (Band 13 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BV	V				
LXI RE 50Ω DC	CORREC	SENSE:INT		6 PM Oct 28, 2019 td: None	Trace/Detector
		er Freq: 782.000000 MHz Free Run Avg Ho	Id: 100/100	ta: None	
		n: 36 dB		evice: BTS	
10 dB/div Ref 40.00 dBr	ń				
Log					
30.0					Clear Write
20.0					Clear write
10.0	hand	when the work			
0.00					
-10.0	/				Average
	ſ				Averuge
-20.0	n Ma		hand have have a for the second have a for t		
-20.0 -30.0			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	man	
-40.0					Max Hold
-50.0					
Center 782.000 MHz				12.50 MHz	
Res BW 120 kHz	7	≇VBW 390 kHz	5	weep 1ms	Min Hold
Occupied Bandwidt	h	Total Power	30.0 dBm		
			50.0 dBill		
4.	5263 MHz				Detector
T			00 00 0/		Peak▶ Auto Man
Transmit Freq Error	-10.277 kHz	% of OBW Pov	ver 99.00 %		Man Man
x dB Bandwidth	4.966 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-15. Occupied Bandwidth Plot (Band 13 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-16. Occupied Bandwidth Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW RE RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO	09:40:11 PM Oct 28, 2019		
		r Freq: 782.00000 MHz		Radio Std: None	Trace/D	etector
		FreeRun Avg H n:36 dB	old: 100/100	Radio Device: BTS		
					Ĩ	
0 dB/div Ref 30.00 dBm						
20.0	in the other	1 mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm			010	ar Wri
10.0		and a side of a side of the side			Cie	ar wri
0.00	/		<u> </u>			
10.0	/					
20.0						Avera
30.0			4 - 4 - 6 Web	Mar Martin		
40.0						
40.0 monoral marker of 50.0						lax Ho
50.0					IV.	Iax HO
Center 782.00 MHz				Span 25.00 MH		
les BW 240 kHz	#	VBW 750 kHz		Sweep 1 ms	N	lin Ho
Occupied Bandwidtl	h	Total Power	30.9	dBm		
					_	
8.3	9333 MHz				L L	Detect Pea
Transmit Freq Error	5.177 kHz	% of OBW Po	wer 99	.00 %	Auto	M
x dB Bandwidth	9.803 MHz	x dB	-26	00 dB		
	5.005 MITIZ	A db	-20.			
SG			STATU	5		

Plot 7-17. Occupied Bandwidth Plot (Band 13 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-18. Occupied Bandwidth Plot (Band 13 - 10.0MHz 64-QAM - Full RB Configuration)

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sight Spectrum Analyzer - Occupied BW 10:31:25 PM Oct 28, 2019 ALIGN AUTO Trace/Detector Center Freq: 836.500000 MHz Trig: Free Run Avg|He Radio Std: None Avg|Hold: 100/100 #IFGain:Low #Atten: 36 dB Radio Device: BTS l0 dB/div Ref 30.00 dBm Log **Clear Write** Average Max Hold Center 836.500 MHz Res BW 33 kHz Span 3.500 MHz Sweep 3.067 ms #VBW 110 kHz Min Hold Total Power 32.0 dBm **Occupied Bandwidth** 1.0983 MHz Detector Peak▶ <u>Man</u> -1.578 kHz Auto **Transmit Freq Error** % of OBW Power 99.00 % x dB Bandwidth 1.251 MHz x dB -26.00 dB STATUS

Plot 7-19. Occupied Bandwidth Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-20. Occupied Bandwidth Plot (Band 5 - 1.4MHz 16-QAM - Full RB Configuration)

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Plot 7-21. Occupied Bandwidth Plot (Band 5 - 1.4MHz 64-QAM - Full RB Configuration)



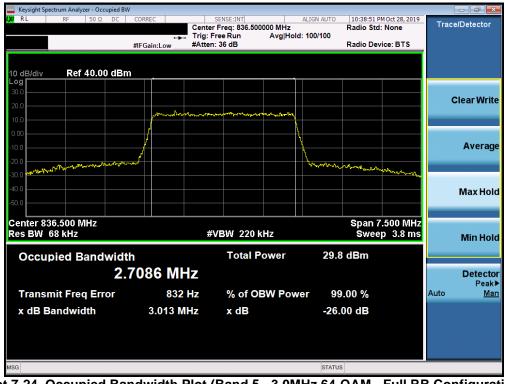
Plot 7-22. Occupied Bandwidth Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

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Keysight Spectrum Analyzer - Occupied BW RL RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO	10:38:39 PM Oct 28, 2019		
		r Freq: 836.500000 MHz		Radio Std: None	Trace/Det	ector
		FreeRun Avg H n:36 dB	lold: 100/100	Radio Device: BTS		
					ī	
	-					
0 dB/div Ref 40.00 dBn			-			
30.0						
20.0					Clea	r Wri
10.0	here and the second second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	7			
0.00	1		Γ <sub>λ</sub>			
						vera
10.0			Ч		~	/era
20.0	r P4 <sup>1</sup>		min	man and a said of the second		
30.0 <b>1</b>						
40.0					Ma	x Ho
50.0						
Center 836.500 MHz				Span 7.500 MHz		
Res BW 68 kHz	#	VBW 220 kHz		Sweep 3.8 ms		
	"				IVI	n Ho
Occupied Bandwidt	h	Total Power	30.8	3 dBm		
	7160 MHz				D	etect
2.						Pea
Transmit Freq Error	103 Hz	% of OBW Po	ower 99	.00 %	Auto	M
x dB Bandwidth	3.008 MHz	x dB	-26	00 dB		
	0.000 11112	A db	20.			
SG			STATU	3		

Plot 7-23. Occupied Bandwidth Plot (Band 5 - 3.0MHz 16-QAM - Full RB Configuration)



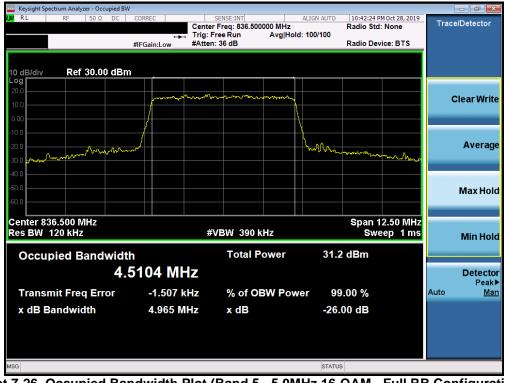
Plot 7-24. Occupied Bandwidth Plot (Band 5 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	<u> PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW K RL RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO	10:42:12 PM Oct 28, 2019	
NE N 50 22 DC	Cente	er Freq: 836.500000 MHz	2	Radio Std: None	Trace/Detector
	· · · · ·	Free Run Avg H n: 36 dB	lold: 100/100	Radio Device: BTS	
	#IFGain:Low #Atte	n: 36 dB		Radio Device: B 1 S	
0 dB/div Ref 30.00 dBm					-
20.0					
10.0	monon		$\gamma$		Clear Wri
n nn			K.		
	/		T \		
10.0					•
20.0 Whather man more more more more more more more more			mon	manthownow	Avera
30.0 VW Color Construction					
40.0					
50.0					Max Ho
50.0					
Center 836.500 MHz Res BW 120 kHz	-	≠VBW 390 kHz		Span 12.50 MHz Sweep 1 ms	
	7	FVDVV JSO KIIZ		Sweep This	Min Ho
Occupied Bandwidt	ı	Total Power	32.0	) dBm	
	5140 MHz				Detect
4.					Pea
Transmit Freq Error	-933 Hz	% of OBW Po	ower 99	.00 %	Auto <u>M</u>
x dB Bandwidth	5.038 MHz	x dB	-26	00 dB	
	5.050 Miliz	X UD	-20.		
G			STATU	3	

Plot 7-25. Occupied Bandwidth Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)



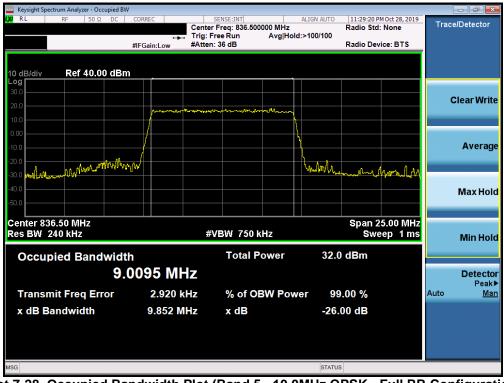
Plot 7-26. Occupied Bandwidth Plot (Band 5 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	<u> PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNE	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied X/ RL RF 50 Ω DC		SENSE:INT	ALIGN AUTO	10:42:33 PM Oct 28, 2019	
10 50% 50%	Cente	r Freq: 836.500000 MHz	2	Radio Std: None	Trace/Detector
		Free Run Avg H n:36 dB	lold: 100/100	Radio Device: BTS	
	#I Gam.Low				
0 dB/div Ref 30.00 dl	2 m				
.og	<u></u>				-
20.0					01
10.0	hunder	with a section but a first showing	۰ <u>۱</u>		Clear Wri
0.00					
10.0					
20.0	(hp)				Avera
20.0 30.0 Malman			and the solution	monorman	
40.0					
50.0					Max Ho
60.0					ινιάχ πυ
Center 836.500 MHz				Span 12.50 MHz	
Res BW 120 kHz	#	VBW 390 kHz		Sweep 1 ms	Min Ho
Occupied Bandwi	dth	Total Power	30.	1 dBm	
	.5321 MHz				Detect
					Detect Pea
Transmit Freq Error	-11.393 kHz	% of OBW Po	ower 99	9.00 %	Auto <u>M</u>
x dB Bandwidth	5.009 MHz	x dB	-26	.00 dB	
	0.000 11112	X GB	LU	.00 dB	
sg					
			STATU	s	

Plot 7-27. Occupied Bandwidth Plot (Band 5 - 5.0MHz 64-QAM - Full RB Configuration)



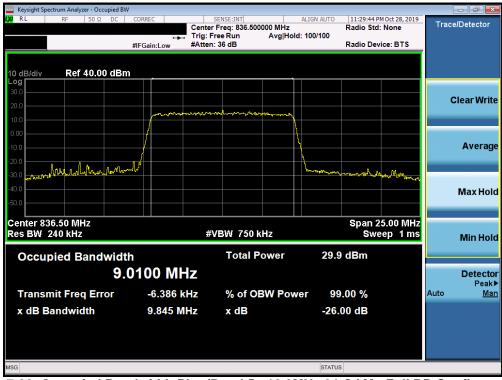
Plot 7-28. Occupied Bandwidth Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied	BW				
IX RL RF 50Ω DC	CORREC	SENSE:INT Center Freq: 836.500000 Trig: Free Run A #Atten: 36 dB	ALIGN AUTO	11:29:31 PM Oct 28, 2019 Radio Std: None Radio Device: BTS	Trace/Detector
10 dB/div Ref 40.00 dB	m				
Log 30.0 20.0		mennohnahnahnahna			Clear Write
10.0 0.00 -10.0 -20.0					Average
-20.0 -30.0	nont			and fleepflet more and and	Max Hold
Center 836.50 MHz Res BW 240 kHz		#VBW 750 kHz		Span 25.00 MHz Sweep 1 ms	
Occupied Bandwid	<sup>ith</sup> .9923 M⊦	Total Pow	ver 30.7	7 dBm	Detector Peak▶
Transmit Freq Error x dB Bandwidth	-11.633 k 9.822 M			9.00 % 00 dB	Auto <u>Man</u>
MSG			STATU	S	

Plot 7-29. Occupied Bandwidth Plot (Band 5 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-30. Occupied Bandwidth Plot (Band 5 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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sight Spectrum Analyzer - Occupied B 08:43:48 PM Oct 28, 2019 SENSE:IN ALIGN AUTO Trace/Detector Center Freq: 1.745000000 GHz Trig: Free Run Avg|Hol Radio Std: None Avg|Hold: 100/100 #IFGain:Low #Atten: 36 dB Radio Device: BTS Ref 10.00 dBm I0 dB/div \_og **Clear Write** Average Max Hold Center 1.745000 GHz Res BW 33 kHz Span 3.500 MHz Sweep 4.067 ms #VBW 30 kHz Min Hold Total Power 13.0 dBm **Occupied Bandwidth** 1.1042 MHz Detector Peak▶ <u>Man</u> 2.402 kHz Auto **Transmit Freq Error** % of OBW Power 99.00 % x dB Bandwidth 1.245 MHz x dB -26.00 dB STATUS

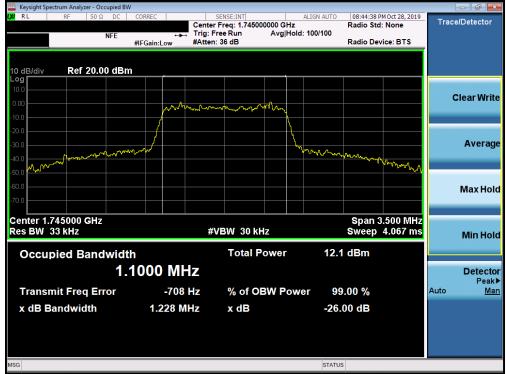
Plot 7-31. Occupied Bandwidth Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-32. Occupied Bandwidth Plot (Band 4 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dara 00 at 400	
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Plot 7-33. Occupied Bandwidth Plot (Band 4 - 1.4MHz 64-QAM - Full RB Configuration)



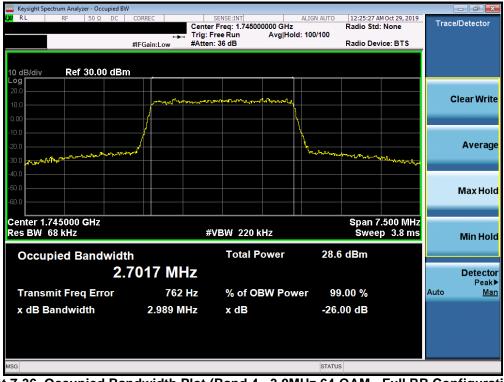
Plot 7-34. Occupied Bandwidth Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW K RL RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO	12:25:19 AM Oct 29, 2019		5
NE N 3032 DC	Cente	r Freq: 1.745000000 GH	z	Radio Std: None	Trace/Detect	or
		FreeRun Avg H n:36 dB	lold: 100/100	Radio Device: BTS		
	#IFGain:Low #Atter	1. 36 dB		Radio Device. B 1 3		
0 dB/div Ref 30.00 dBn	1		-			
20.0						
10.0	mapaneparan	work man we have made	~		Clear W	Iri
3.00	1		h, l			
	/		N I			
			Υ		Aver	
20.0	كمحدد		howwo	man for any and	AVEI	a
				and a second of		
40.0						
50.0					Max H	ło
60.0						
Center 1.745000 GHz				Span 7.500 MHz		
Res BW 68 kHz	#	VBW 220 kHz		Sweep 3.8 ms	Min H	
						10
Occupied Bandwidt	h	Total Power	29.0	6 dBm		
2	7062 MHz				Dete	ct
					Pe	eal
Transmit Freq Error	1.747 kHz	% of OBW Po	ower 99	9.00 %	Auto	M
x dB Bandwidth	3.026 MHz	x dB	-26.	00 dB		
G			STATU	e		-
			STATU			

Plot 7-35. Occupied Bandwidth Plot (Band 4 - 3.0MHz 16-QAM - Full RB Configuration)



Plot 7-36. Occupied Bandwidth Plot (Band 4 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 04 af 400	
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Keysight Spectrum Analyzer - Occupied BW	CORREC	SENSE:INT	ALIGN AUTO	12:28:21 AM Oct 29, 2019	
	Cente	r Freq: 1.745000000 GHz		Radio Std: None	Trace/Detector
		Free Run Avg Hol n: 36 dB	d:>100/100	Radio Device: BTS	
	#IFGalli.LOW #/ tech			Radio Bevide: BTO	
0 dB/div Ref 30.00 dBn					
20.0					
0.0	mon	- www.			Clear Wr
).00					
0.0	/		1 1		
			N		Avera
20.0 manade Andrews	m l		mund	Manna	Avera
				- man man	
10.0					
50.0					Max Ho
50.0					
enter 1.745000 GHz es BW 120 kHz		VBW 390 kHz		Span 12.50 MHz Sweep 1 ms	
	<i>"</i>	VEVV J90 KHZ		Sweep This	Min Ho
Occupied Bandwidt	h	Total Power	31.2	dBm	
	5140 MHz				Deter
4.					Detect Pea
Transmit Freq Error	6.324 kHz	% of OBW Pow	ver 99	.00 %	Auto <u>M</u>
x dB Bandwidth	4.994 MHz	x dB	26	00 dB	
	4.994 MITZ	X UB	-20.	оо <b>а</b> в	
G			STATUS		

Plot 7-37. Occupied Bandwidth Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



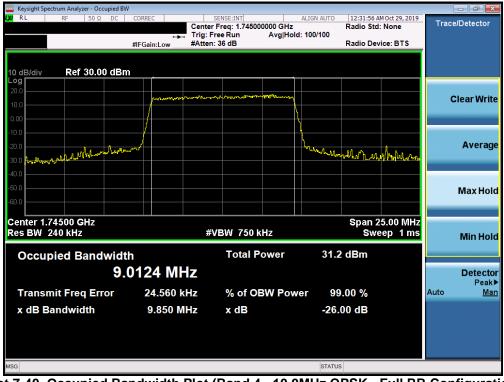
Plot 7-38. Occupied Bandwidth Plot (Band 4 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 22 of 160
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Keysight Spectrum Analyzer - Occupied BW R L RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO	12:28:42 AM Oct	29,2019	
		r Freq: 1.745000000 GHz	400/400	Radio Std: Nor	ne T	race/Detector
		Free Run Avg Hold n: 36 dB	: 100/100	Radio Device: I	втя	
0 dB/div Ref 30.00 dBm						
.og						
20.0		mann				Clear Wri
10.0	and the second s					Cicui Will
3.00						
10.0			\			
20.0	And		Jum	- A		Avera
20.0				m www.	mm	
40.0						
50.0						Max Ho
60.0						
Center 1.745000 GHz				Span 12.50		
Res BW 120 kHz	#	VBW 390 kHz		Span 12.50 Sweep		Min Ho
						MIN HO
Occupied Bandwidt	า	Total Power	29.1	dBm		
4.	5159 MHz					Detect
				00.0/	0	Peal
Transmit Freq Error	4.117 kHz	% of OBW Powe	er 99	.00 %	Auto	o <u>M</u>
x dB Bandwidth	4.967 MHz	x dB	-26.	)0 dB		
SG			STATUS			

Plot 7-39. Occupied Bandwidth Plot (Band 4 - 5.0MHz 64-QAM - Full RB Configuration)



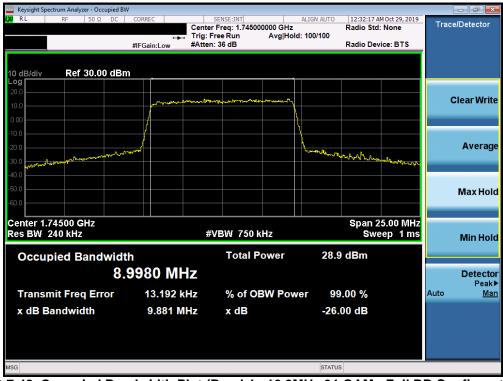
Plot 7-40. Occupied Bandwidth Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW R R RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO	12:32:07 AM Oct 2	9,2019	
		r Freq: 1.745000000 GH		Radio Std: None	e Tra	ce/Detector
		FreeRun Avg H n:36 dB	old: 100/100	Radio Device: B	TS	
	In Guilleow					
Def 20.00 dBm						
0 dB/div Ref 30.00 dBm						
20.0						
10.0	moundant	man man hange and and many had	1			Clear Wri
0.00			<u> </u>			
10.0			<u> </u>			
20.0			<u> </u>			Avera
20.0	2/11-U-		and for the fo	home hap do		
40.0						
50.0						
60.0						Max Ho
30.0						
Center 1.74500 GHz				Span 25.00		
Res BW 240 kHz	#	VBW 750 kHz		Sweep	1 ms	Min Ho
Occupied Bandwidtl		Total Power	20 0	dBm		
			201			
8.	9840 MHz					Detect Pea
Transmit Freq Error	14.737 kHz	% of OBW Po	wer 99	0.00 %	Auto	M
x dB Bandwidth	9.870 MHz	x dB	26	00 dB		
	9.070 MIHZ	XUB	-20.			
SG			STATU	S		

Plot 7-41. Occupied Bandwidth Plot (Band 4 - 10.0MHz 16-QAM - Full RB Configuration)



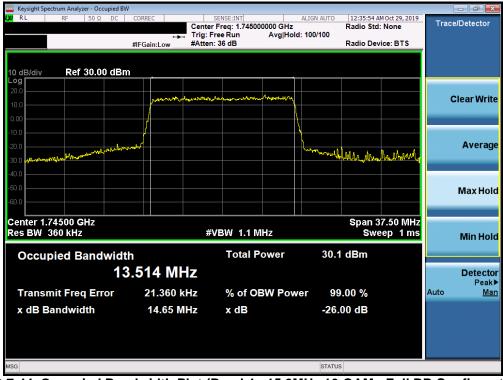
Plot 7-42. Occupied Bandwidth Plot (Band 4 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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🔤 Keysight Spectrum Analyzer - Occupied BV	V				- ē 🔀
XX RL RF 50Ω DC	Center Trig: F	r Freq: 1.745000000 GHz Free Run Avg Hold:		None	Trace/Detector
	#IFGain:Low #Atten	n: 36 dB	Radio Devid	ce: BTS	
10 dB/div Ref 30.00 dBr	n				
20.0 10.0		and the second sec			Clear Write
-10.0					
-20.0 -30.0 -30.0 -30.0 -30.0 -30.0	unor		Mundhall hand and and and and and and and and and	Norman	Average
-40.0					Max Hold
Center 1.74500 GHz Res BW 360 kHz	#	VBW 1.1 MHz		2.50 MHz 2011 ms	Min Hold
Occupied Bandwidt	h	Total Power	31.2 dBm		
	3.516 MHz				Detector Peak▶
Transmit Freq Error	51.933 kHz	% of OBW Powe	er 99.00 %	A	Auto <u>Man</u>
x dB Bandwidth	14.74 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-43. Occupied Bandwidth Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-44. Occupied Bandwidth Plot (Band 4 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied	CORREC	SENSE:INT	ALIGN AUTO	12:36:02 AM Oct 29, 2019	
		r Freq: 1.745000000 GHz		Radio Std: None	Trace/Detecto
		Free Run Avg Hol n: 36 dB	ld: 100/100	Radio Device: BTS	
	in dum.com				
0 dB/div Ref 30.00 dB					
0 dB/div Ref 30.00 dB					
20.0					01
10.0	montenengeneration	white the share building			Clear Wr
0.00	/		\		
10.0			<u>\</u>		
20.0	Autom				Avera
20.0			townshippy	whele planner where	
40.0					
50.0					Max Ho
50.0					
Center 1.74500 GHz				Span 37.50 MHz	
tes BW 360 kHz	#	VBW 1.1 MHz		Sweep 1 ms	Min Ho
Occupied Bandwid	lth	Total Power	29.0	) dBm	
					-
	3.500 MHz				Detec Pea
Transmit Freq Error	29.987 kHz	% of OBW Pov	ver 99	.00 %	Auto <u>N</u>
x dB Bandwidth	14.75 MHz	x dB	-26	00 dB	
	14.10 11112		20.		
				-	
5G			STATU		

Plot 7-45. Occupied Bandwidth Plot (Band 4 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-46. Occupied Bandwidth Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied BW RL RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO	12:39:12 AM Oct 29, 2019	
		er Freq: 1.745000000 GH		Radio Std: None	Trace/Detect
		Free Run Avg H en:36 dB	lold:>100/100	Radio Device: BTS	
	#I Gam.Low "Here				ī
0 dB/div Ref 35.00 dBm			- <b>1</b>		
25.0					
15.0	di manana di Angelanda	-	<u>_</u>		Clear W
5.00					
.00			<u>}</u>		
	/		N N		Aver
11 counterform	JAN		uninne		
25.0				monthly the main war	
45.0					Max H
55.0					
enter 1.74500 GHz				Span 50.00 MHz	,
les BW 470 kHz		#VBW 1.5 MHz		Sweep 1 ms	
Occupied Bandwidt	า	Total Power	30.2	2 dBm	
17	.970 MHz				Dete
					Pe
Transmit Freq Error	25.826 kHz	% of OBW Po	ower 99	9.00 %	Auto
x dB Bandwidth	19.48 MHz	x dB	-26.	00 dB	
			STATU		

Plot 7-47. Occupied Bandwidth Plot (Band 4 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-48. Occupied Bandwidth Plot (Band 4 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied E							×
LXI RL RF 50Ω DC	CORREC	SENSE:INT ter Freg: 2.593000000 G	ALIGN AUTO	02:25:58 AM 0 Radio Std: N		Trace/Detecto	r
	🛶 Trig	: Free Run Avg	Hold: 100/100				
	#IFGain:Low #Att	en: 36 dB		Radio Device	e: BTS		
10 dB/div Ref 30.00 dB	m						
Log							
20.0	mmmm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	June .			Clear Wr	ite
10.0						0.000.000	
0.00	/						
-10.0			<u>\</u>				
-20.0	mul		- Wwww	mhonom		Avera	ge
-30.0				1.2 00 00			
-40.0							
-50.0							
						Max Ho	old
-60.0							_
Center 2,593000 GHz				Span 12.	50 MHz		
Res BW 120 kHz		#VBW 390 kHz			p 1 ms	Min Ho	hla
						WIIITIC	
Occupied Bandwid	th	Total Power	31.6	6 dBm			
4	.5172 MHz					Detect	tor
						Pea	
Transmit Freq Error	1.853 kHz	% of OBW P	ower 99	0.00 %		Auto <u>M</u>	lan
x dB Bandwidth	5.042 MHz	x dB	-26	00 dB			
		A GB	20.				
MSG			STATU	S			

Plot 7-49. Occupied Bandwidth Plot (Band 41 - 5.0MHz QPSK - Full RB Configuration)

Keysight Spectrum Analyzer - Occupied BW RL RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO	02:26:10 AM Oct 29, 2019	
KC K- 5032 DC	Center Trig:	er Freq: 2.593000000 GHz	d: 100/100	Radio Std: None	Trace/Detector
10 dB/div Ref 30.00 dBm		and from the second			Clear Write
10.0 0.00 10.0 20.0			Lowow	mmbrang -	Averag
10.0					Max Hol
Center 2.593000 GHz tes BW 120 kHz	#	≇VBW 390 kHz		Span 12.50 MHz Sweep 1 ms	Min Hol
Occupied Bandwidth 4.5	5134 MHz	Total Power	30.2	dBm	Detecto
Transmit Freq Error x dB Bandwidth	6.514 kHz 4.984 MHz	% of OBW Pow x dB		00 % 0 dB	Auto <u>Ma</u>
G			STATUS		

Plot 7-50. Occupied Bandwidth Plot (Band 41 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied	BW				
(X/RL RF 50Ω DC		SENSE:INT r Freg: 2.593000000 GHz	ALIGN AUTO 02:26:18 A Radio Std	M Oct 29, 2019	Trace/Detector
	🛶 Trig: F	ree Run Avg Hole	d: 100/100		
	#IFGain:Low #Atten	n: 36 dB	Radio Dev	vice: BTS	
10 dB/div Ref 30.00 dB	im				
20.0					
10.0	mmmmmm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Clear Write
0.00	d				
-10.0					
-20.0			\_		Average
-30.0 martin martin	~~~~		hannon	mm	
-40.0					
-50.0					
					Max Hold
-60.0					
Center 2.593000 GHz				2.50 MHz	
Res BW 120 kHz	#	VBW 390 kHz	Sw	eep 1 ms	Min Hold
Occupied Bandwid		Total Power	29.5 dBm		
		TOTALLOWEL	29.5 ubiii		
4	.5326 MHz				Detector Peak►
Transmit Freq Error	-10.420 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	5.024 MHz	x dB	-26.00 dB		
	5.024 MITZ	хив	-20.00 aB		
MSG			STATUS		

Plot 7-51. Occupied Bandwidth Plot (Band 41 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-52. Occupied Bandwidth Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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RL RF 50Ω DC	CORREC			:09 AM Oct 29, 2019	English
		r Freq: 2.593000000 GHz Free Run Avg Hold:		Std: None	Frequency
		n: 36 dB		Device: BTS	
IO dB/div Ref 30.00 dBr	n				
-og					
20.0	mon marine	-			Center Fre
10.0					2.593000000 GI
0.00					
10.0	<mark>v</mark>				
20.0 mluhandundand	-l/-		Warmanyan	doft- a- 1.1 -A	
30.0 MINING 10 10 10 10 10 10 10 10 10 10 10 10 10				and a server of the server of the	
40.0					
50.0					
60.0					
Center 2.59300 GHz Res BW 240 kHz	#	VBW 750 kHz		n 25.00 MHz Sweep 1 ms	CF Ste
103 DW 240 KH2	"	V 644 7 50 KHZ		sweep rms	2.500000 MI Auto Mi
Occupied Bandwidt	h	Total Power	33.1 dBm	1	
9	0739 MHz				
					Freq Offs
Transmit Freq Error	-27.147 kHz	% of OBW Powe	er 99.00 %	5	01
x dB Bandwidth	9.689 MHz	x dB	-26.00 dE	3	

Plot 7-53. Occupied Bandwidth Plot (Band 41 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-54. Occupied Bandwidth Plot (Band 41 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BV						×
LXIRL RF 50Ω DC		SENSE:INT AL	IGN AUTO 02:33:50 AM Radio Std:	Oct 29, 2019	Trace/Detector	-
	🛶 Trig: F	ree Run Avg Hold: 1	00/100			
	#IFGain:Low #Atten	1: 36 dB	Radio Devi	ce: BTS		
10 dB/div Ref 40.00 dBn	n					
30.0						
20.0					Clear Wr	ite
10.0	and with the part of the second					
0.00						
-10.0					Avera	ae
-20.0			angraphic and a langer for			
-20.0 And and a start for the flat and a start of the sta				WWWWWWWWWW		
-40.0						
-50.0					Max Ho	ald
-30.0						
Center 2.59300 GHz				7.50 MHz		
Res BW 360 kHz	#`	VBW 1.1 MHz	Swe	ep 1 ms	Min Ho	old
Occupied Bandwidt	b	Total Power	31.8 dBm			
			on a bin			
13	3.556 MHz				Detect Pea	
Transmit Freq Error	24.888 kHz	% of OBW Power	99.00 %			lan
x dB Bandwidth	14.80 MHz	x dB	-26.00 dB			
MSG			STATUS			

Plot 7-55. Occupied Bandwidth Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)



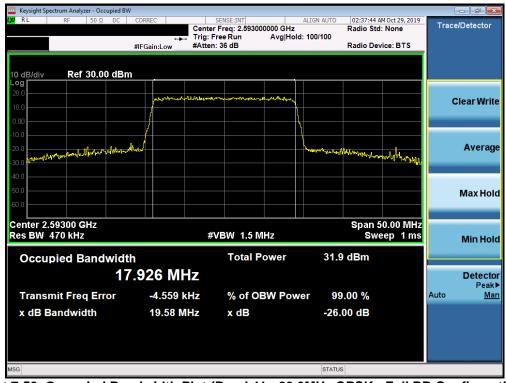
Plot 7-56. Occupied Bandwidth Plot (Band 41 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied B					
<b>ΙΧ΄ RL</b> RF 50Ω DC	Center Trig: F		Radio d: 100/100	4:11 AM Oct 29, 2019 <b>Std: None</b>	Trace/Detector
	#IFGain:Low #Atten	: 36 dB	Radio	Device: BTS	
10 dB/div Ref 40.00 dBr	n				
Log 30.0					
20.0					Clear Write
10.0	when any and	well months that and and			
0.00					
-10.0					Average
-20.0	munt		Mondalanala	vanner werking worken	
-30.0					
-50.0					Max Hold
Center 2.59300 GHz Res BW 360 kHz	#\	VBW 1.1 MHz		an 37.50 MHz Sweep 1 ms	Min Hold
Occupied Bandwidt		Total Power	29.3 dBn	n	
1:	3.509 MHz				Detector Peak▶
Transmit Freq Error	510 Hz	% of OBW Pow	ver 99.00 %	6	Auto <u>Man</u>
x dB Bandwidth	14.58 MHz	x dB	-26.00 di	3	
MSG			STATUS		

Plot 7-57. Occupied Bandwidth Plot (Band 41 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-58. Occupied Bandwidth Plot (Band 41 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG981JPN	<u> PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied RL RF 50 Ω DC		SENSE:INT	ALIGN AUTO	02:38:01 AM Oct 29, 2019	
		er Freq: 2.593000000 G		Radio Std: None	Trace/Detector
		FreeRun Avg  en:36 dB	Hold: 100/100	Radio Device: BTS	
,	#I Galit.Eow #/ tele				
0 dB/div Ref 30.00 dl	Bm				
20.0					
10.0	phanenenenen	www.www.www.mig.com	ann -		Clear Wri
0.00					
10.0	/				_
20.0 Million Mar Mar Mar Market	had marked		hand	Marin Marin Marillandiapar	Avera
30.0 Martin and the second second				and the second with the stand of the second se	
40.0					
50.0					Max Ho
50.0					Maxino
Center 2.59300 GHz				Span 50.00 MHz	
Res BW 470 kHz		#VBW 1.5 MHz		Sweep 1 ms	Min Ho
		Total Power	20.6	6 dBm	
Occupied Bandwi		Total Fower	50.0	, abiii	
	17.937 MHz				Detect
Transmit Freq Error	-10.256 kHz	% of OBW P	ower 00	9.00 %	Peal Auto M
					Auto <u>m</u>
x dB Bandwidth	19.34 MHz	x dB	-26.	00 dB	

Plot 7-59. Occupied Bandwidth Plot (Band 41 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-60. Occupied Bandwidth Plot (Band 41 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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# 7.3 Spurious and Harmonic Emissions at Antenna Terminal

### **Test Overview**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 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 its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

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

For Band 41, the minimum permissible attenuation level of any spurious emission is 55 + 10 log<sub>10</sub>(P<sub>[Watts]</sub>).

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

#### Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup

#### Test Notes

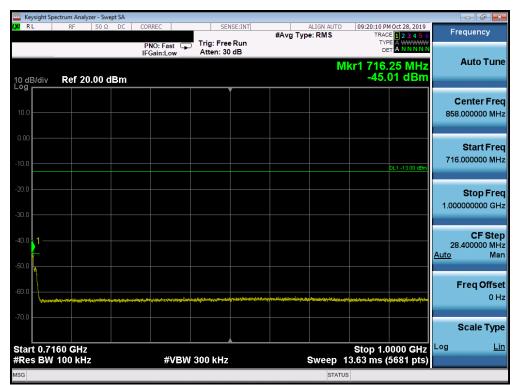
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the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

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U RL	RF	50 Ω	DC	CORREC		SEI	SE:INT		ALIGN AUTO	) 09:20:04	PM Oct 28, 2019		
				PNO: F IFGain:	ast 🖵 Low	Trig: Free Atten: 30	Run	#Avg Ty		TR	ACE 1 2 3 4 5 6 YPE A WWWW DET A NNNNN	Fre	equency
	Ref 20	.00 d	Bm						ľ	Mkr1 697 -41	.70 MHz .23 dBm		Auto Tun
10.0													enter Fre 950000 MH
10.00											DL1 -13.00 dBm	30	Start Fre
30.0												697	Stop Fre 900000 MI
40.0												66 <u>Auto</u>	CF Ste 790000 MI M
60.0			ladan talaya gara	nijem pratej							na dara takan per	F	F <b>req Offs</b> 0
70.0													Scale Typ
Start 30.0 N Res BW 10					#VBW	300 kHz			weep (	Stop 32.06 ms (	697.9 MHz 13359 pts)	Log	L

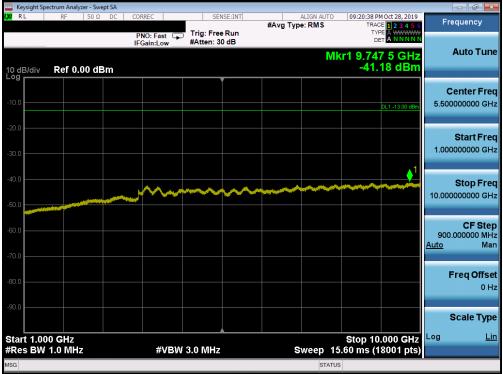
Plot 7-61. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



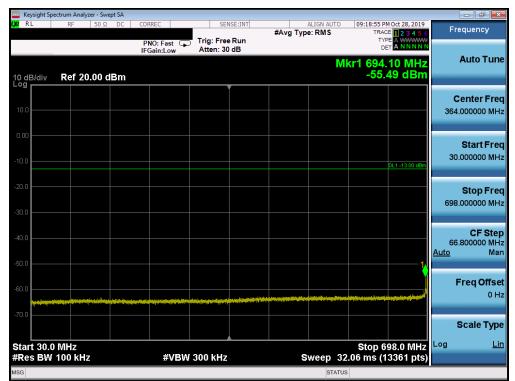
Plot 7-62. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-63. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-64. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ight Spec		alyzer - Swe															- 6	×
l <mark>XI</mark> RL		RF	50 Ω	DC	CORRE	C		SEN	ISE:INT	#A	/ yg Type	ALIGN AUTO	09:1		Oct 28, 201		Fre	equency	
10 dB/	/div	Ref	20.00 c	IBm	PNO IFGai	:Fast ⊂ in:Low		g: Free ten: 30					/kr1 7	TYPI DE	00 MH	VWV N IN		Auto Tun	ıe
10.0																		enter Fre .000000 M⊦	
-10.0															0L1 -13.00 dl	3m	716	Start Fre .000000 M⊦	
-20.0 -																	1.000	<b>Stop Fre</b> 0000000 G⊦	1
-40.0																	28 <u>Auto</u>	<b>CF Ste</b> 400000 MH Ma	İz
-60.0	1 		alay hary an poly of the Pyr		يالنانوناني ويوتع	jiyaalise-ise-saaq	utige of the second	fygellerikigsjande		er-ingeligerien	******	yennilyes'sendjog	the state of the s	*****	las, and phinamy and	~~	F	Freq Offso 0 ⊢	
Start #Res						#VB	W 300	) kHz				Sweep	Sto	p 1.0 ms (f	000 GH		tog	Scale Typ	in
MSG												STAT	_						

Plot 7-65. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



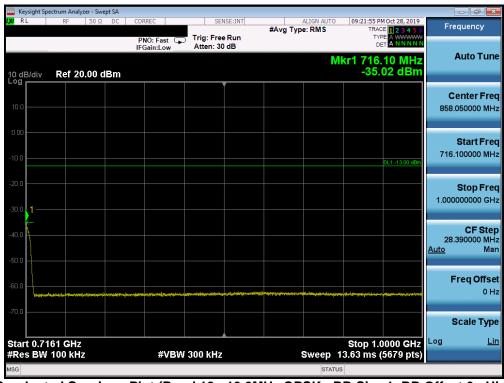
Plot 7-66. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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		ctrum Analyz	er - Swep	t SA										- • ×
<b>lxi</b> R	L	RF	50 Ω	DC	CORREC		SE	NSE:INT	#Avg Typ	ALIGN AUTO		1 Oct 28, 2019 E 1 2 3 4 5 6	Fr	requency
					PNO: F IFGain:	Fast 🖵 Low	Trig: Fre Atten: 3				TYP De	65 MHz		Auto Tune
10 di Log	B/div	Ref 20	.00 dE	3m				•			-47.3	36 dBm		
10.0														Center Freq
10.0													364	4.000000 MHz
0.00														Start Freq
-10.0												DL1 -13.00 dBm	30	0.000000 MHz
-20.0														Stop Freq
-30.0													698	3.000000 MHz
-40.0														CF Step
-40.0												1	66 <u>Auto</u>	5.800000 MHz Man
-50.0												1		
-60.0		the second second				ويتعار والمراد	- Internet and a start to be							Freq Offset 0 Hz
-70.0				and a second sector of		No. of Contrast								
														Scale Type
	rt 30.0 s BW	MHz 100 kHz				#VBW	300 kHz		s	weep <u>32</u>	Stop 6 06 ms_/1	98.0 MHz 3361 pts)	Log	Lin
MSG										STATUS				

Plot 7-67. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-68. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG981JPN	<u> PCTEST</u>	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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		n Analyzer - Sw										
L <mark>XI</mark> RL	F	F 50 Ω	DC	CORREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO		M Oct 28, 2019	Fre	equency
				PNO: Fast IFGain:Low	Trig: Free #Atten: 3				TYI Di			Auto Tune
10 dB/c Log	div Re	ef 0.00 dl	Bm					MI	kr1 9.99 -41.	2 5 GHz 35 dBm		Auto Tune
						Í						enter Freq
-10.0										DL1 -13.00 dBm	5.500	000000 GHz
-20.0												Start Freq
-30.0											1.000	0000000 GHz
10.0										1		
-40.0				J~~~		$\sim$	-	~~~			10.000	Stop Freq
-50.0	الوندان فابتعنقون											
-60.0												CF Step .000000 MHz
-70.0											<u>Auto</u>	Man
-80.0											F	Freq Offset
-00.0												0 Hz
-90.0												Scale Type
Start	1.000 G	H7							Stop 10	.000 GHz	Log	Lin
#Res I	BW 1.0	MHz		#VBW	/ 3.0 MHz		s	weep 15	5.60 ms (1	8001 pts)		
MSG								STATUS	5			

Plot 7-69. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Swept SA	CORREC	SENSE:INT	ALIGN AUTO	09:41:43 PM Oct 28, 2019	
KL   KF   50 32 DC	PNO: Fast	rig: Free Run	#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
0 dB/div Ref 20.00 dBm			М	kr1 777.00 MHz -33.34 dBm	Auto Tun
10.0					Center Fre 403.500000 MH
10.0				DL1 -13.00 dBm	Start Fre 30.000000 M⊦
30.0				1	Stop Fre 777.000000 Mi
40.0					CF Ste 74.700000 Mi <u>Auto</u> Mi
			n ja kisen a sena sama ng mangan ng mang Ng mangan ng mangang ng		Freq Offs 0 H
70.0					Scale Typ
Start 30.0 MHz Res BW 100 kHz	#VBW 30	0 kHz	Sweep 35	Stop 777.0 MHz i.86 ms (14941 pts)	Log <u>L</u>

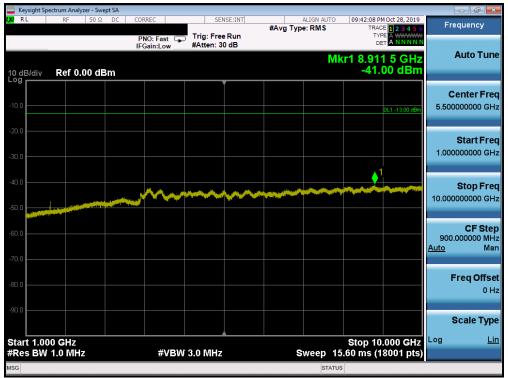
Plot 7-70. Conducted Spurious Plot (Band 13 - 10.0MHz QPSK - RB Size 1, RB Offset 0)

Keysight Spectrum Analyzer - Swept S			
RL RF 50 Ω D	PNO: Fast Trig: Free Run IFGain:Low Atten: 30 dB	ALIGN AUTO 09:41:50 PM Oct 28, 2019 #Avg Type: RMS TRACE 23:43 0 TYPE ANNIN N DET ANNIN N	Frequency
0 dB/div Ref 20.00 dBr	n	Mkr1 787.00 MHz -54.56 dBm	Auto Tur
10.0			Center Fre 893.500000 MH
0.00		DL1 -13.00 dBm	<b>Start Fre</b> 787.000000 Mi
0.0			<b>Stop Fre</b> 1.000000000 GF
0.0 1			CF Sto 21.300000 M <u>Auto</u> M
	ng kada penghang kada penghang penghang penghan penghan penghan penghan penghan penghan penghan penghan penghan	nan da an Yan hang hain da an ghaige san ta na an anna hige da ga dhan da an da ang	Freq Offs 0
tart 0.7870 GHz		Stop 1.0000 GHz	Scale Typ
Res BW 100 kHz	#VBW 300 kHz	Sweep 10.22 ms (4261 pts)	

Plot 7-71. Conducted Spurious Plot (Band 13 - 10.0MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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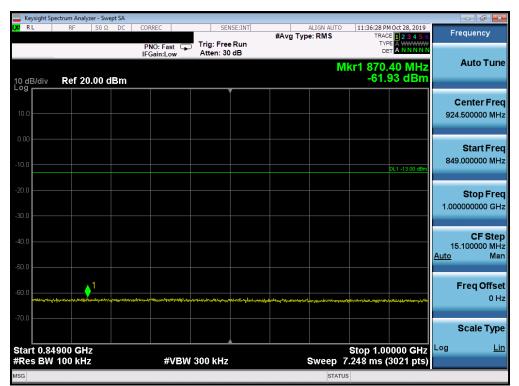
Plot 7-72. Conducted Spurious Plot (Band 13 - 10.0MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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RL RF	50 Ω DC	CORREC	SEN	SE:INT		ALIGN AUTO	11:36:21 PM	Oct 28, 2019		d 💌
		PNO: Fast G	Trig: Free Atten: 30		#Avg Typ	e: RMS	TRACI TYP DE	1 2 3 4 5 6 A WWWW A N N N N N	Frequei	
0 dB/div Ref 2	.0.00 dBm					M	kr1 822. -45.	95 MHz I0 dBm	Auto	o Tun
10.0									Cente 426.5000	
10.00								DL1 -13.00 dBm	Sta 30.0000	r <b>t Fre</b> 00 M⊢
20.0									<b>Sto</b> 823.0000	<b>р Fre</b> 00 м⊦
40.0								1 →	<b>C</b> 79.3000 <u>Auto</u>	F Ste 00 MH Ma
	ter låter skan stor beset på store efter som det som det som det som store som store som store som store som s	ana ay ara ina ata tatin infana		la se prime de la classe par la company de la company de la company	fan seren filmt titte in stafe	Strand Blancon and the State		)	Freq	Offs 0⊦
70.0									Scal	е Тур
itart 30.0 MHz Res BW 100 kH	lz	#VBV	V 300 kHz		s	weep <u>38</u>	Stop 82 .06 ms (1	23.0 MHz 5861 pts)	Log	L

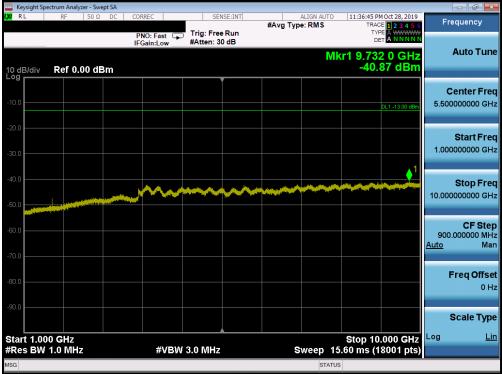
Plot 7-73. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-74. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-75. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



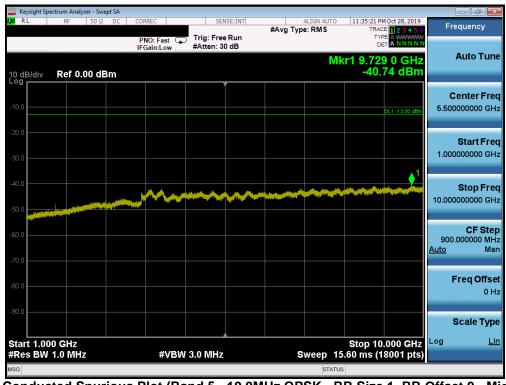
Plot 7-76. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG981JPN	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	NG	Approved by: Quality Manager
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	ectrum Analyzer - Sw									- 6 -
LXI RL	RF 50 Ω	DC	CORREC	SENS		#Avg Type	ALIGN AUTO		1 Oct 28, 2019 E 1 2 3 4 5 6	Frequency
			PNO: Fast G	Trig: Free F Atten: 30 d	Run	0 ,1		TYP	E A WWWWW T A N N N N N	
10 dB/div Log	Ref 20.00	dBm					M	kr1 849. -61.3	80 MHz 82 dBm	Auto Tune
10.0										Center Freq 924.500000 MHz
0.00										Start Freq 849.000000 MHz
-10.0									DL1 -13.00 dBm	Stop Freq
-30.0										1.00000000 GHz
-40.0										<b>CF Step</b> 15.100000 MHz <u>Auto</u> Man
-60.0		ndar (hy spinster da)	สาร์และสูบราวูกลุกัสสาร์สุกรุกษายา	under ausse and a standard and	**************************************	nfähetsmes-senim	านสารระบาราย	ารสารการสารการสารประวัติสารา	/\$+}+	<b>Freq Offset</b> 0 Hz
-70.0										Scale Type
Start 0.84 #Res BW			#VBW	300 kHz		ŝ	Sweep 7	-	000 GHz 3021 pts)	Log <u>Lin</u>
MSG							STATUS			

Plot 7-77. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



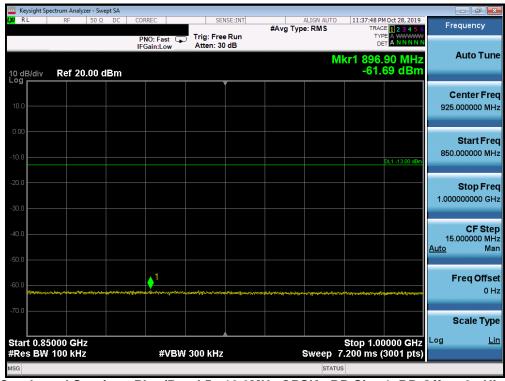
Plot 7-78. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

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			alyzer - Swe	pt SA										- • ×
l <mark>,XI</mark> R	L	RF	50 Ω	DC	CORRE	C		SENSE:INT	#Ave	ALIGN AUTO Type: RMS		M Oct 28, 2019 DE 1 2 3 4 5 6	Fi	requency
10 dl	B/div	Ref :	20.00 d	Bm	PNO: IFGair	Fast ⊂ n:Low		Free Run n: 30 dB			TY			Auto Tune
Log 10.0														Center Freq 7.000000 MHz
0.00 -10.0												DL1 -13.00 dBm	30	Start Freq 0.000000 MHz
-20.0 -30.0													824	Stop Freq 1.000000 MHz
-40.0 -50.0													79 <u>Auto</u>	CF Step 9.400000 MHz Man
-60.0					er an in dilatio					na slite on a think that the last sectored		1. 		Freq Offset 0 Hz
-70.0													Log	Scale Type Lin
	t 30.0 s BW		Hz			#VBV	/ 300 k	Hz		Sweep 3	8 Stop 1 8.11 ms (1	24.0 MHz 5881 pts)	_	<u></u>
MSG										STAT				

Plot 7-79. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-80. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

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Plot 7-81. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

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