

**MEASUREMENT REPORT**
LTE**Applicant Name:**

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

Date of Testing:

10/31/2018-1/17/2019

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M1901240018-03.A3L

FCC ID:

A3LSCV42

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:

Certification

Model:

SCV42

EUT Type:

Portable Handset

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part(s):

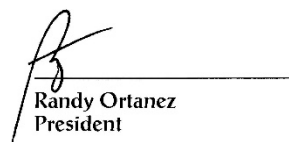
22 & 27

Test Procedure(s):

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: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 1 of 114

TABLE OF CONTENTS

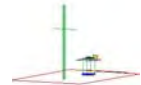
1.0	INTRODUCTION	4
1.1	Scope	4
1.2	PCTEST Test Location	4
1.3	Test Facility / Accreditations	4
2.0	PRODUCT INFORMATION	5
2.1	Equipment Description	5
2.2	Device Capabilities	5
2.3	Test Configuration	5
2.4	EMI Suppression Device(s)/Modifications	5
3.0	DESCRIPTION OF TESTS	6
3.1	Measurement Procedure	6
3.2	Block C Frequency Range	6
3.3	Block A Frequency Range	6
3.4	Cellular - Base Frequency Blocks	6
3.5	Cellular - Mobile Frequency Blocks	6
3.6	BRS/EBS Frequency Block	7
3.7	Radiated Power and Radiated Spurious Emissions	8
4.0	MEASUREMENT UNCERTAINTY	9
5.0	TEST EQUIPMENT CALIBRATION DATA	10
6.0	SAMPLE CALCULATIONS	11
7.0	TEST RESULTS	12
7.1	Summary	12
7.2	Occupied Bandwidth	14
7.3	Spurious and Harmonic Emissions at Antenna Terminal	36
7.4	Band Edge Emissions at Antenna Terminal	54
7.5	Uplink Carrier Aggregation	72
7.6	Radiated Power (ERP/EIRP)	81
7.7	Radiated Spurious Emissions Measurements	86
7.8	Uplink Carrier Aggregation Radiated Measurements	99
7.9	Frequency Stability / Temperature Variation	105
8.0	CONCLUSION	114

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 2 of 114



MEASUREMENT REPORT

FCC Part 22 & 27



Mode	FCC Rule Part	Tx Frequency (MHz)	ERP		EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)		
LTE Band 12	27	699.7 - 715.3	0.187	22.71	0.306	24.86	1M09G7D	QPSK
LTE Band 12	27	699.7 - 715.3	0.142	21.53	0.233	23.68	1M10W7D	16QAM
LTE Band 12	27	699.7 - 715.3	0.109	20.39	0.180	22.54	1M10W7D	64QAM
LTE Band 12	27	700.5 - 714.5	0.163	22.11	0.267	24.26	2M71G7D	QPSK
LTE Band 12	27	700.5 - 714.5	0.118	20.71	0.193	22.86	2M71W7D	16QAM
LTE Band 12	27	700.5 - 714.5	0.081	19.07	0.132	21.22	2M71W7D	64QAM
LTE Band 12	27	701.5 - 713.5	0.162	22.09	0.265	24.24	4M52G7D	QPSK
LTE Band 12	27	701.5 - 713.5	0.133	21.25	0.219	23.40	4M50W7D	16QAM
LTE Band 12	27	701.5 - 713.5	0.102	20.08	0.167	22.23	4M51W7D	64QAM
LTE Band 12	27	704 - 711	0.182	22.61	0.299	24.76	8M98G7D	QPSK
LTE Band 12	27	704 - 711	0.128	21.08	0.210	23.23	8M97W7D	16QAM
LTE Band 12	27	704 - 711	0.097	19.88	0.159	22.03	9M01W7D	64QAM
LTE Band 13	27	779.5 - 784.5	0.123	20.89	0.201	23.04	4M52G7D	QPSK
LTE Band 13	27	779.5 - 784.5	0.105	20.20	0.172	22.35	4M51W7D	16QAM
LTE Band 13	27	779.5 - 784.5	0.079	18.96	0.129	21.11	4M49W7D	64QAM
LTE Band 13	27	782	0.125	20.98	0.206	23.13	8M97G7D	QPSK
LTE Band 13	27	782	0.096	19.82	0.157	21.97	8M96W7D	16QAM
LTE Band 13	27	782	0.077	18.85	0.126	21.00	8M98W7D	64QAM
LTE Band 5	22H	824.7 - 848.3	0.125	20.96	0.205	23.11	1M09G7D	QPSK
LTE Band 5	22H	824.7 - 848.3	0.104	20.19	0.171	22.34	1M10W7D	16QAM
LTE Band 5	22H	824.7 - 848.3	0.086	19.36	0.142	21.51	1M09W7D	64QAM
LTE Band 5	22H	825.5 - 847.5	0.137	21.36	0.224	23.51	2M71G7D	QPSK
LTE Band 5	22H	825.5 - 847.5	0.110	20.43	0.181	22.58	2M71W7D	16QAM
LTE Band 5	22H	825.5 - 847.5	0.087	19.40	0.143	21.55	2M73W7D	64QAM
LTE Band 5	22H	826.5 - 846.5	0.130	21.13	0.213	23.28	4M52G7D	QPSK
LTE Band 5	22H	826.5 - 846.5	0.107	20.28	0.175	22.43	4M50W7D	16QAM
LTE Band 5	22H	826.5 - 846.5	0.083	19.21	0.137	21.36	4M51W7D	64QAM
LTE Band 5	22H	829 - 844	0.129	21.09	0.211	23.24	9M04G7D	QPSK
LTE Band 5	22H	829 - 844	0.108	20.32	0.177	22.47	9M01W7D	16QAM
LTE Band 5	22H	829 - 844	0.087	19.42	0.144	21.57	9M00W7D	64QAM

EUT Overview (<1GHz)

Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)		
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.132	21.2	4M52G7D	QPSK
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.139	21.42	4M52W7D	16QAM
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.088	19.44	4M53W7D	64QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.152	21.81	9M01G7D	QPSK
LTE Band 41 (PC3)	27	2501 - 2685	0.114	20.58	8M98W7D	16QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.111	20.45	9M01W7D	64QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.183	22.62	13M5G7D	QPSK
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.164	22.14	13M5W7D	16QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.130	21.14	13M5W7D	64QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.177	22.49	18M0G7D	QPSK
LTE Band 41 (PC3)	27	2506 - 2680	0.166	22.21	18M0W7D	16QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.146	21.64	18M0W7D	64QAM

EUT Overview (High Bands)

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 3 of 114

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 ISSED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISSED.

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	EUT Type: Portable Handset	Page 4 of 114	

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSCV42**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 0589M, 0547M, 1339M, 0487M, 0775M, 0968M, 0300M, 0474M, 0338M, 0500M, 0388M, 0163M, 0368M

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+

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 placed flush against the flat surface of authorized wireless charging pad (WCP) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The WCP is designed with the flat charging surface angled 45 degrees relative to a horizontal surface on which the WCP rests. 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: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 5 of 114	

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 Block C Frequency Range

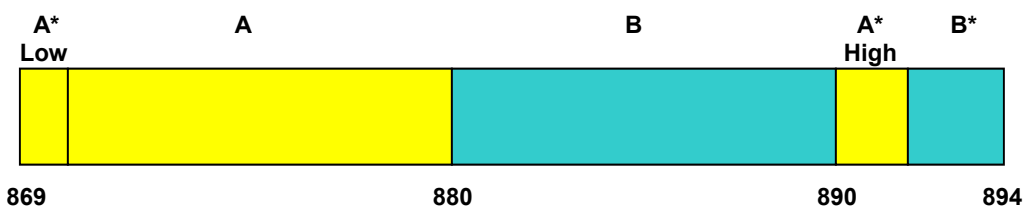
Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results do not satisfy the applicable reserve price, the spectrum in the 746-757 MHz and 776-787 MHz bands will instead be made available for assignment at a subsequent auction as follows: (i) Two paired channels of 6 megahertz each available for assignment in Block C1 in the 746-752 MHz and 776-782 MHz bands. (ii) Two paired channels of 5 megahertz each available for assignment in Block C2 in the 752-757 MHz and 782-787 MHz bands.

3.3 Block A Frequency Range

698-746 MHz band. The following frequencies are available for licensing pursuant to this part in the 698-746 MHz band: (1) Three paired channel blocks of 12 megahertz each are available for assignment as follows:

Block A: 698-704 MHz and 728-734 MHz;
Block B: 704-710 MHz and 734-740 MHz; and
Block C: 710-716 MHz and 740-746 MHz.

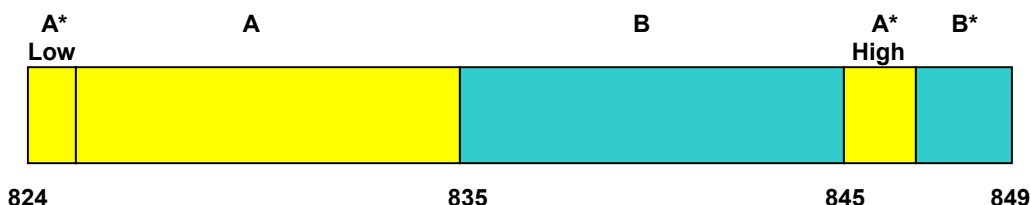
3.4 Cellular - Base Frequency Blocks



BLOCK 1: 869 – 880 MHz (A* Low + A)
BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)
BLOCK 4: 891.5 – 894 MHz (B*)

3.5 Cellular - Mobile Frequency Blocks

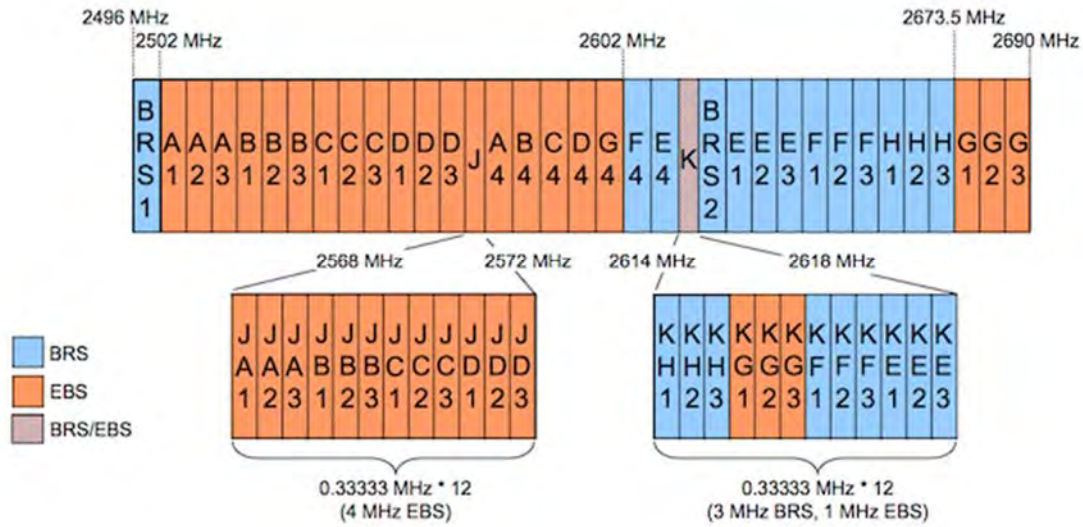


BLOCK 1: 824 – 835 MHz (A* Low + A)
BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)
BLOCK 4: 846.5 – 849 MHz (B*)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 6 of 114

3.6 BRS/EBS Frequency Block



FCC ID: A3LSCV42	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 7 of 114

3.7 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:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

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

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 $43 + 10\log_{10}(\text{Power [Watts]})$. 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 $55 + 10\log_{10}(\text{Power [Watts]})$.

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.

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 8 of 114	

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 ($\pm$ dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 9 of 114

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	1/23/2018	Annual	1/23/2019	LTX2
Agilent	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	5/25/2018	Annual	5/25/2019	MY52350166
Anritsu	MT8821C	Radio Communication Analyzer	7/24/2018	Annual	7/24/2019	6201664756
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	9/17/2018	Annual	9/17/2019	441119
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
Espec	ESX-2CA	Environmental Chamber	3/28/2018	Annual	3/28/2019	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	12/1/2016	Biennial	12/1/2018	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
Huber + Suhner	Sucoflex 102A	40GHz Radiated Cable Set	1/23/2018	Annual	1/23/2019	251425001
Keysight Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	3/20/2018	Annual	3/20/2019	MY49430494
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/30/2018	Annual	3/30/2019	11401010036
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Rohde & Schwarz	CMW500	Radio Communication Tester	9/25/2018	Annual	9/25/2019	102060
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/21/2018	Annual	5/21/2019	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	8/9/2018	Annual	8/9/2019	100348
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/18/2018	Annual	6/18/2019	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/25/2018	Annual	6/25/2019	102133
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Test Antenna	7/16/2018	Biennial	7/16/2020	101073
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	1/24/2018	Annual	1/24/2019	100040
Seekonk	NC-100	Torque Wrench	12/28/2017	Annual	12/28/2018	N/A
Sunol	DRH-118	Horn Antenna (1-18GHz)	8/11/2017	Biennial	8/11/2019	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

Table 5-1. Test Equipment

Notes:

- 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.
- Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 10 of 114

6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –81.0 dBm on the spectrum 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: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 11 of 114

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSCV42
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.2
2.1051 2.917(a) 27.53(c) 27.53(g) 27.53(h)	Out of Band Emissions	$> 43 + 10\log_{10}(P[\text{Watts}])$ 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
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 27)			Section 7.11

Table 7-1. Summary of Conducted Test Results

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 12 of 114	

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	RADIATED	PASS	Section 7.6
27.50(b)(10) 27.50(c)(10)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 12, 13)	< 3 Watts max. ERP			Section 7.6
24.232(c) 27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 41)	< 2 Watts max. EIRP			Section 7.6
2.1053 22.917(a) 27.53(c) 27.53(g) 27.53(h)	Undesirable Emissions (Band 12, 5)	> 43 + 10log ₁₀ (P[Watts]) for all out-of-band emissions			Section 7.9
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 7.9
27.53(m)	Undesirable Emissions (Band 41)	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.9
27.53(m)	Uplink Carrier Aggregation	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.10

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 4.8.
- 5) For operation <1GHz, the EIRP limits in the table above are referenced to the specifications written in the relevant Radio Standards Specifications for Innovation, Science, and Economic Development Canada.

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	EUT Type: Portable Handset	Page 13 of 114	

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 $\geq 3 \times$ 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.



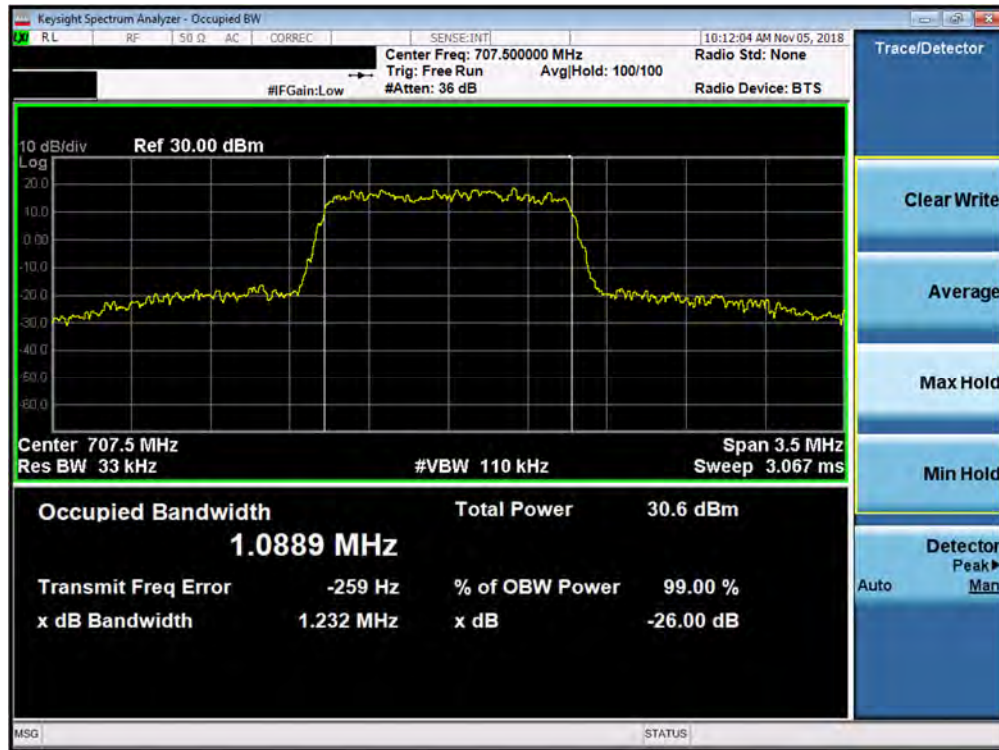
Figure 7-1. Test Instrument & Measurement Setup

Test Notes

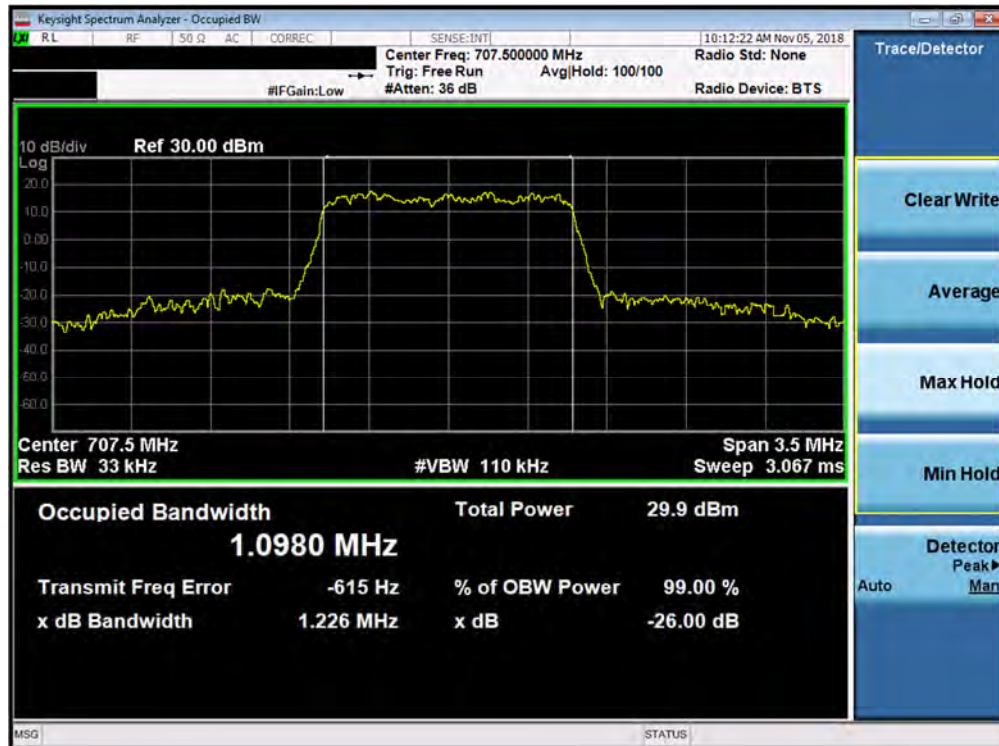
None.

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 14 of 114

Band 12

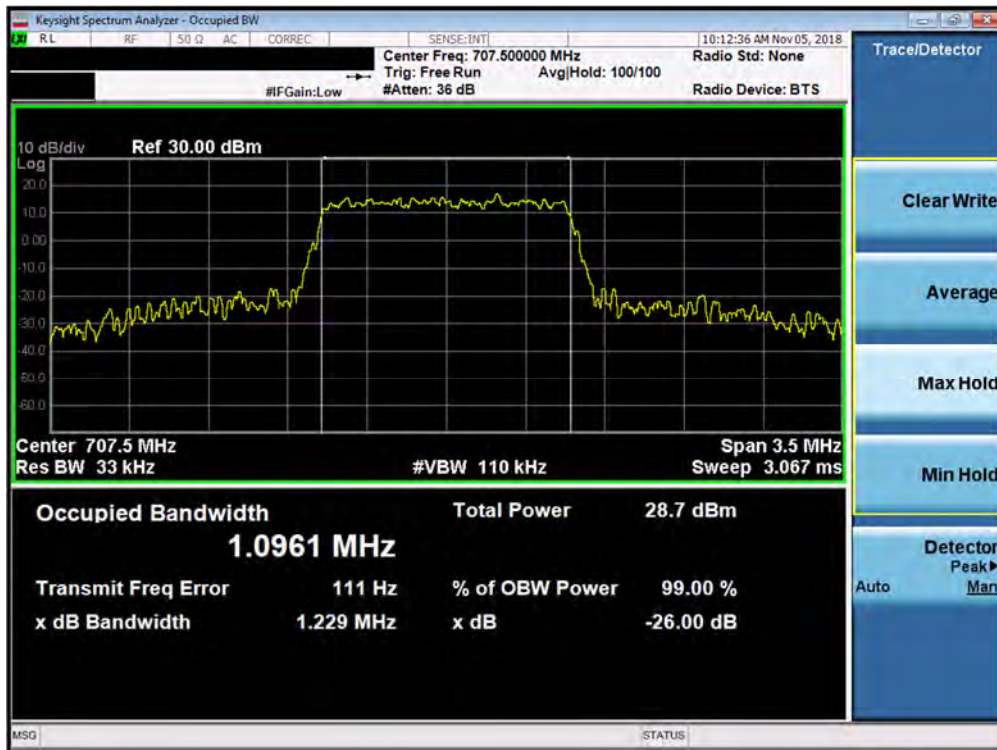


Plot 7-1. Occupied Bandwidth Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)

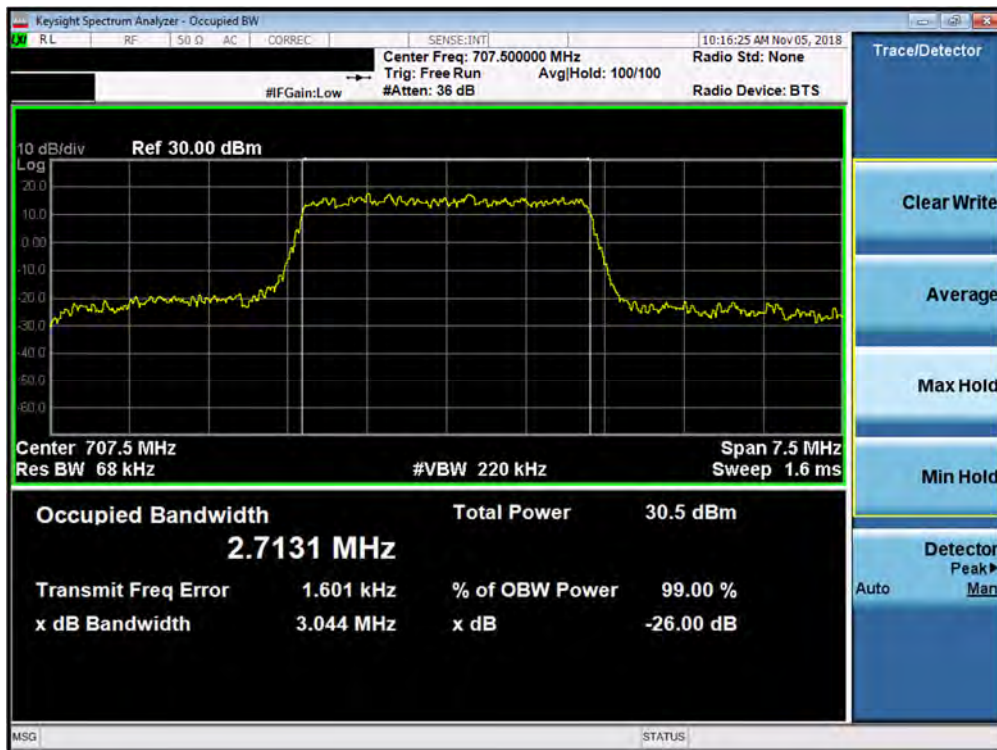


Plot 7-2. Occupied Bandwidth Plot (Band 12 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 15 of 114	

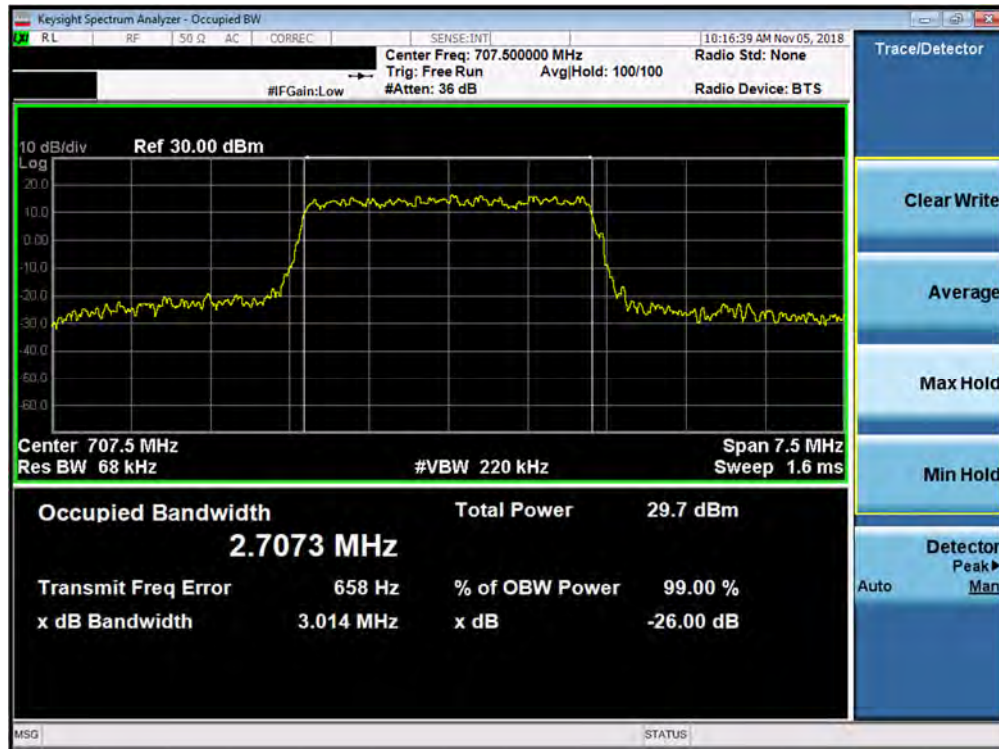


Plot 7-3. Occupied Bandwidth Plot (Band 12 - 1.4MHz 64-QAM - Full RB Configuration)

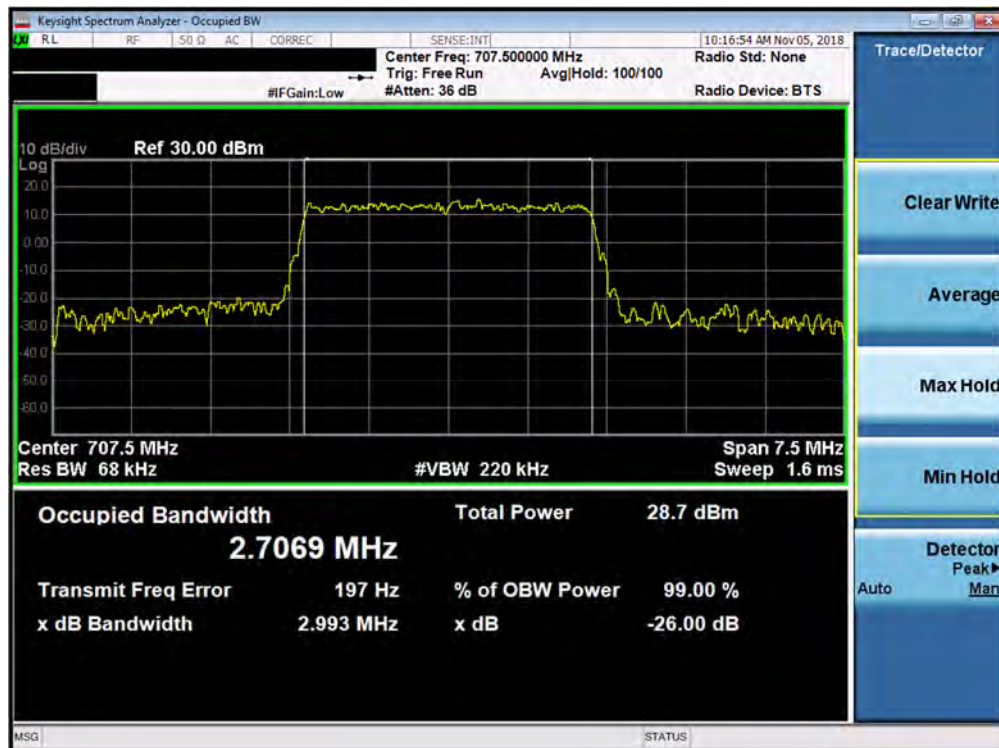


Plot 7-4. Occupied Bandwidth Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 16 of 114

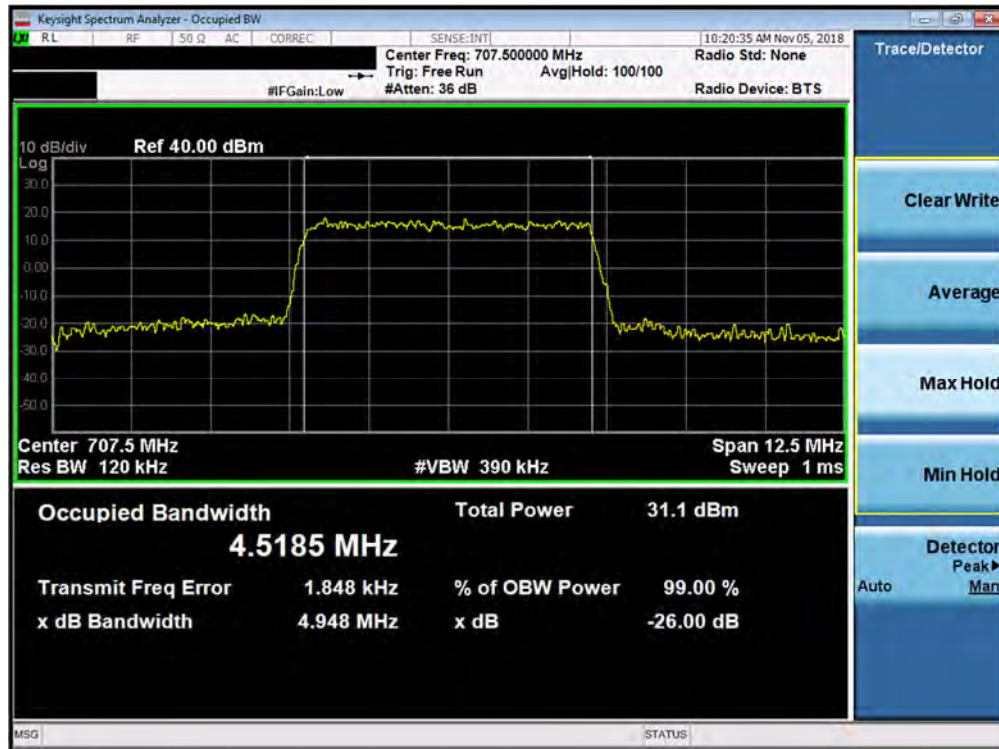


Plot 7-5. Occupied Bandwidth Plot (Band 12 - 3.0MHz 16-QAM - Full RB Configuration)

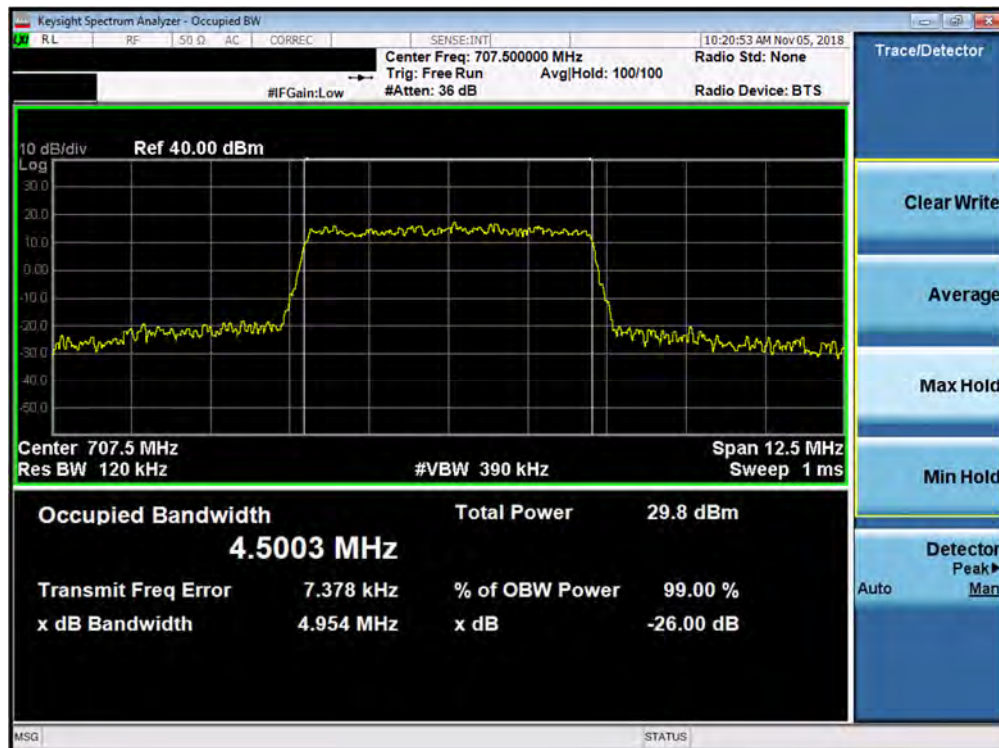


Plot 7-6. Occupied Bandwidth Plot (Band 12 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 17 of 114

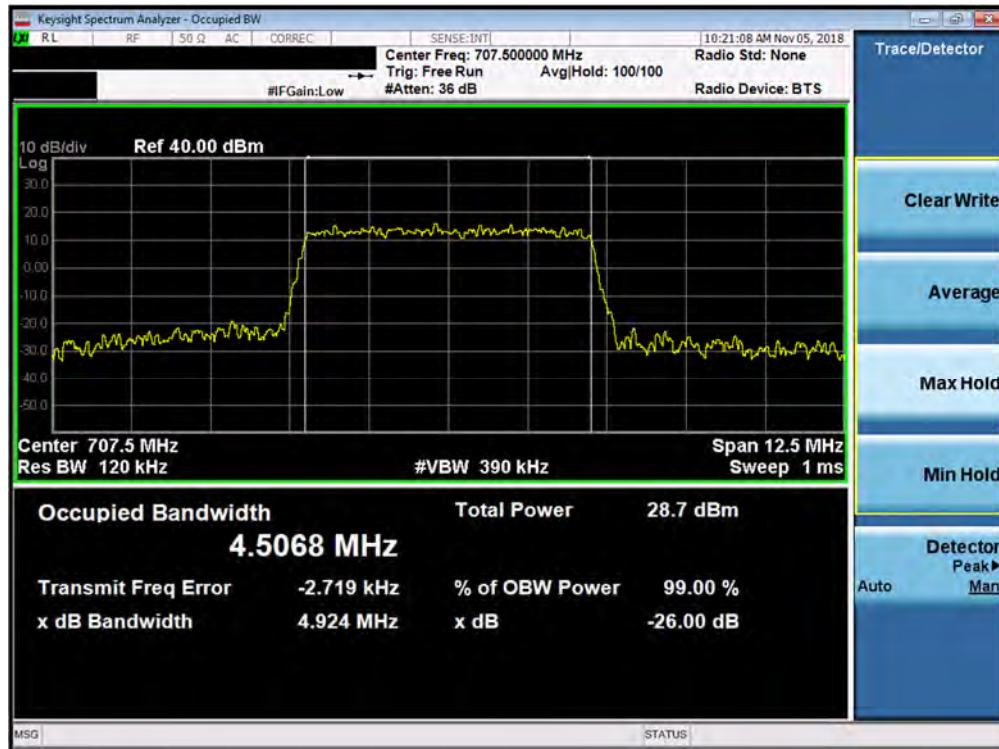


Plot 7-7. Occupied Bandwidth Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)

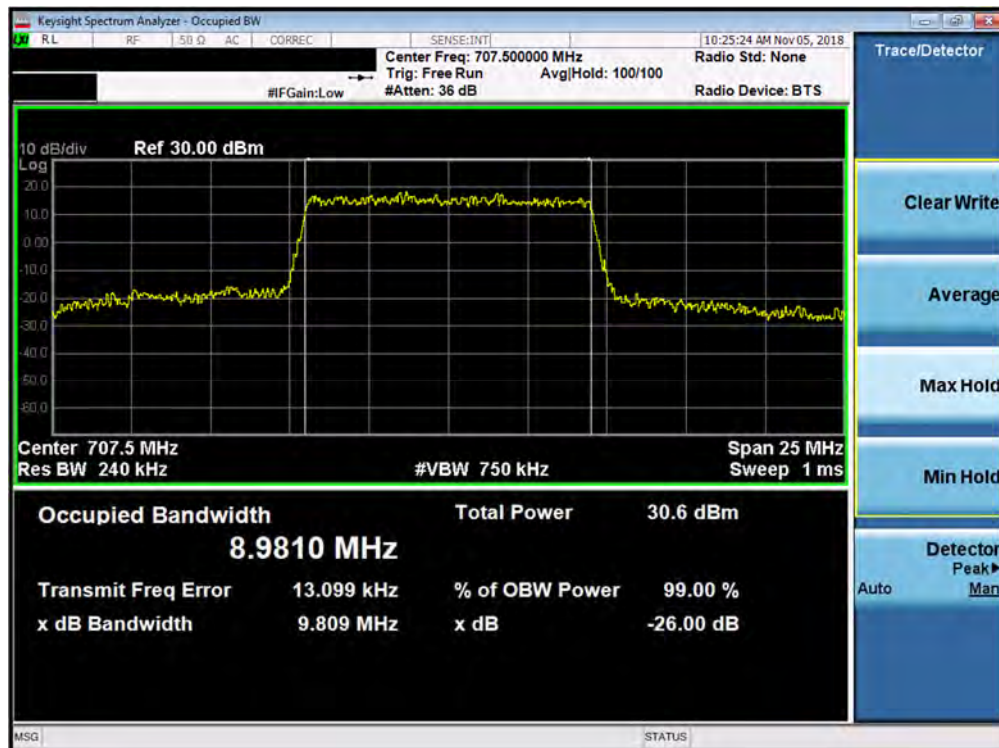


Plot 7-8. Occupied Bandwidth Plot (Band 12 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 18 of 114

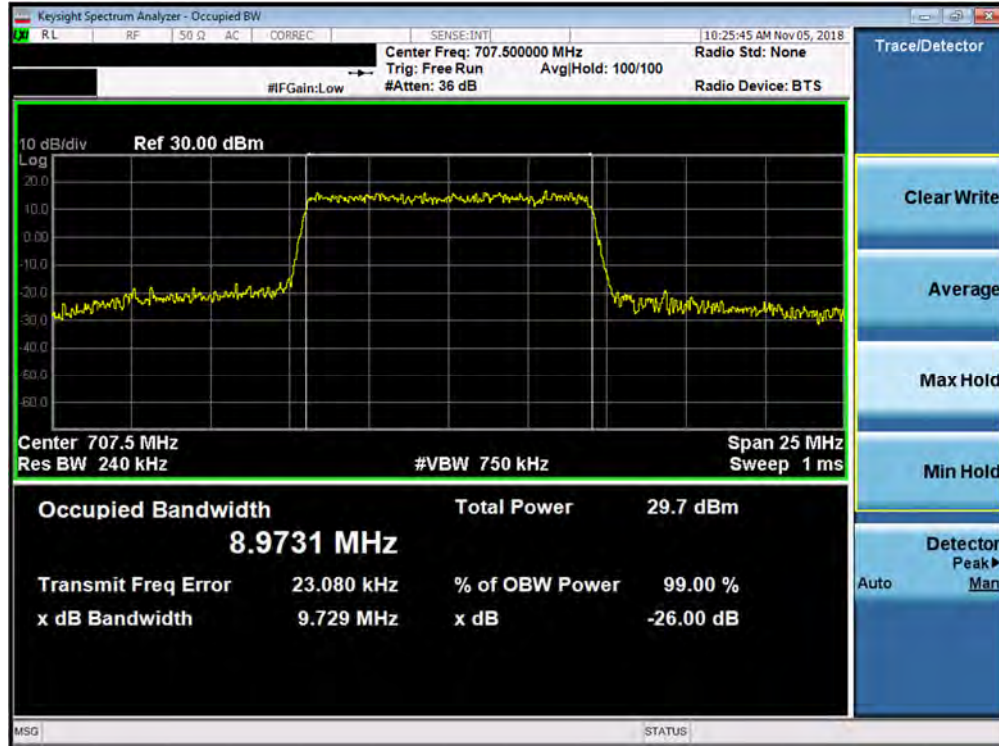


Plot 7-9. Occupied Bandwidth Plot (Band 12 - 5.0MHz 64-QAM - Full RB Configuration)

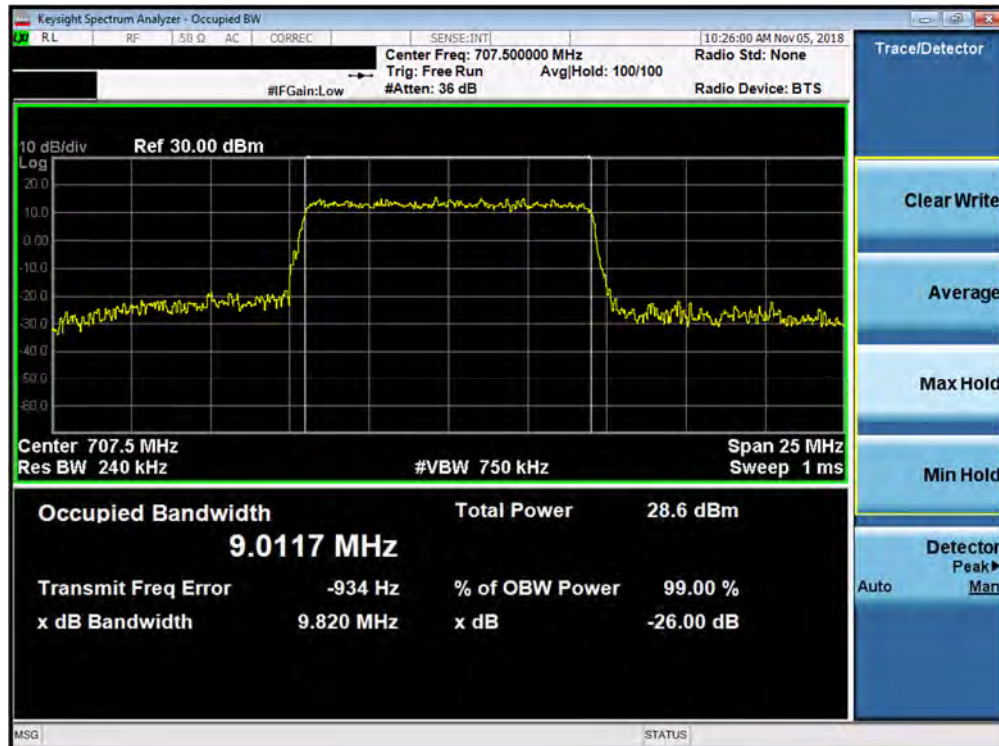


Plot 7-10. Occupied Bandwidth Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 19 of 114



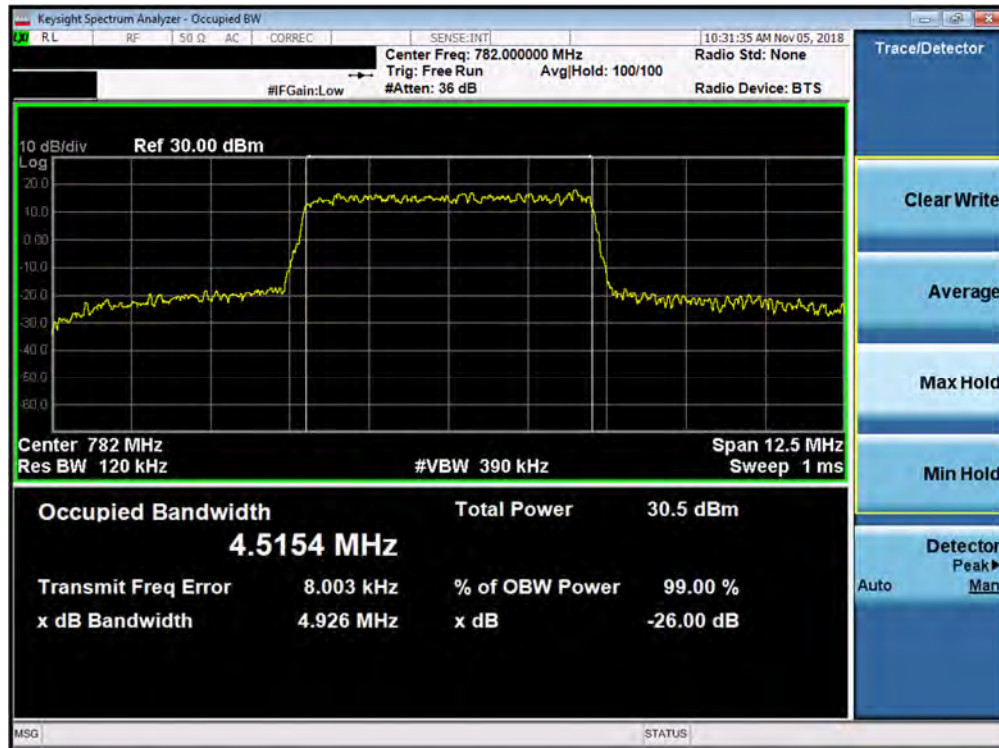
Plot 7-11. Occupied Bandwidth Plot (Band 12 - 10.0MHz 16-QAM - Full RB Configuration)



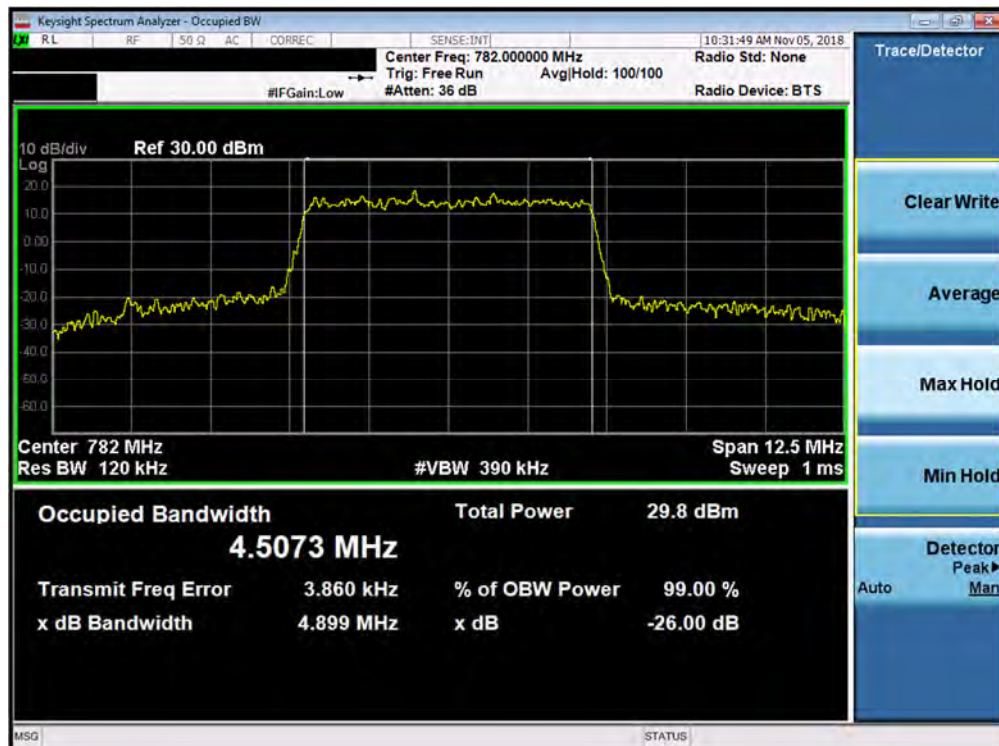
Plot 7-12. Occupied Bandwidth Plot (Band 12 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 20 of 114	

Band 13



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: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 21 of 114	

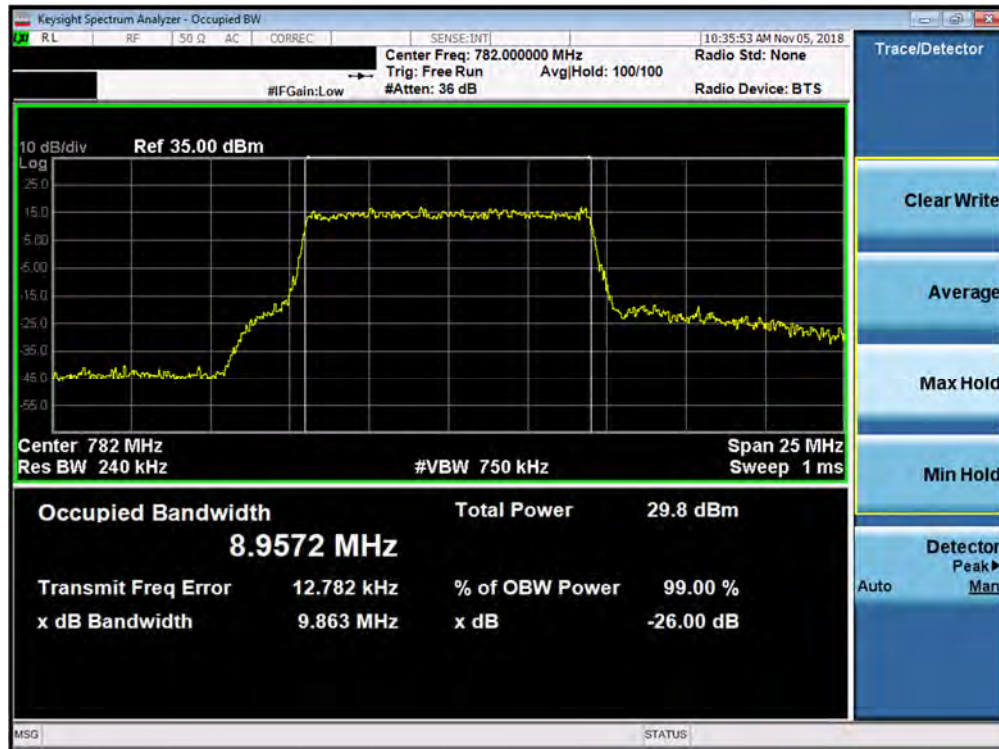


Plot 7-15. Occupied Bandwidth Plot (Band 13 - 5.0MHz 64-QAM - Full RB Configuration)

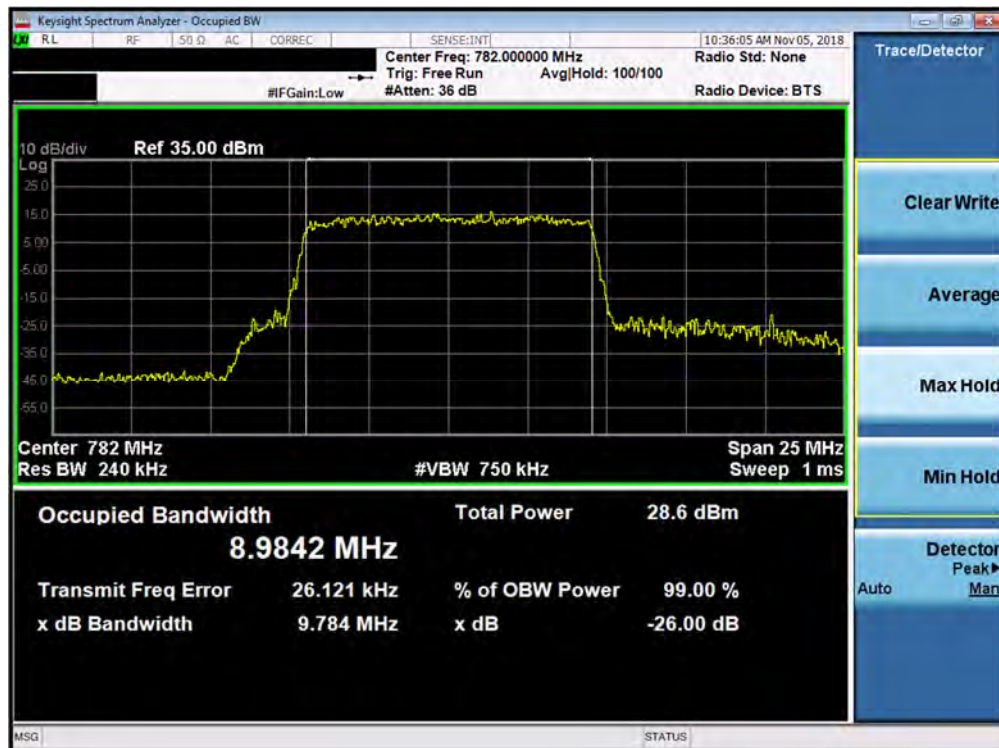


Plot 7-16. Occupied Bandwidth Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 22 of 114



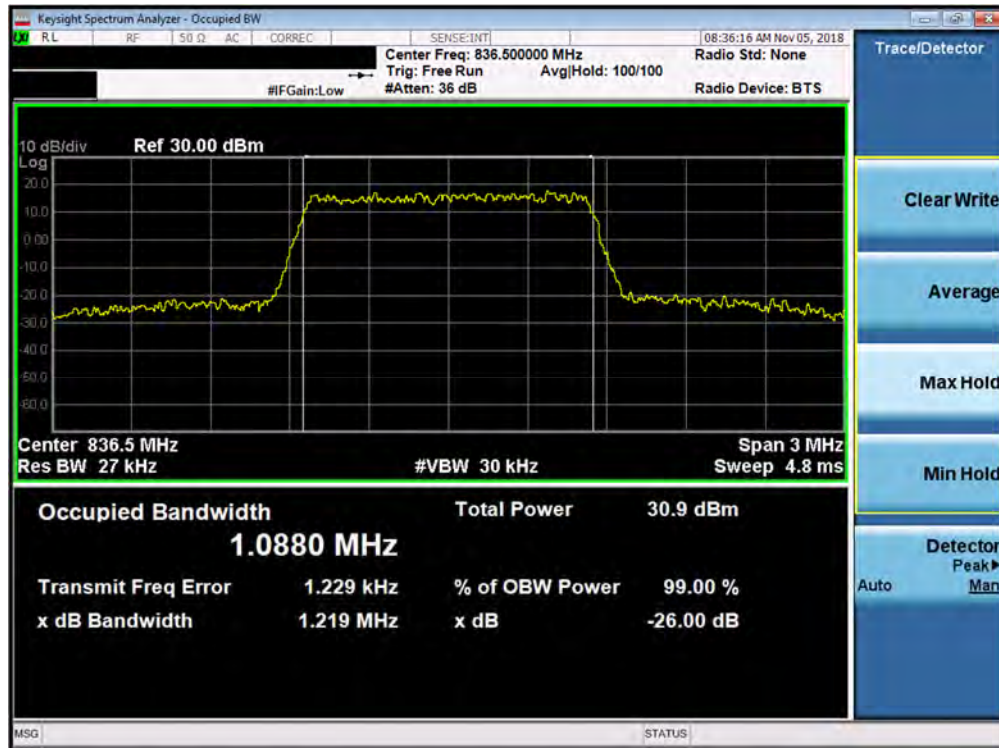
Plot 7-17. Occupied Bandwidth Plot (Band 13 - 10.0MHz 16-QAM - Full RB Configuration)



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

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 23 of 114

Band 5

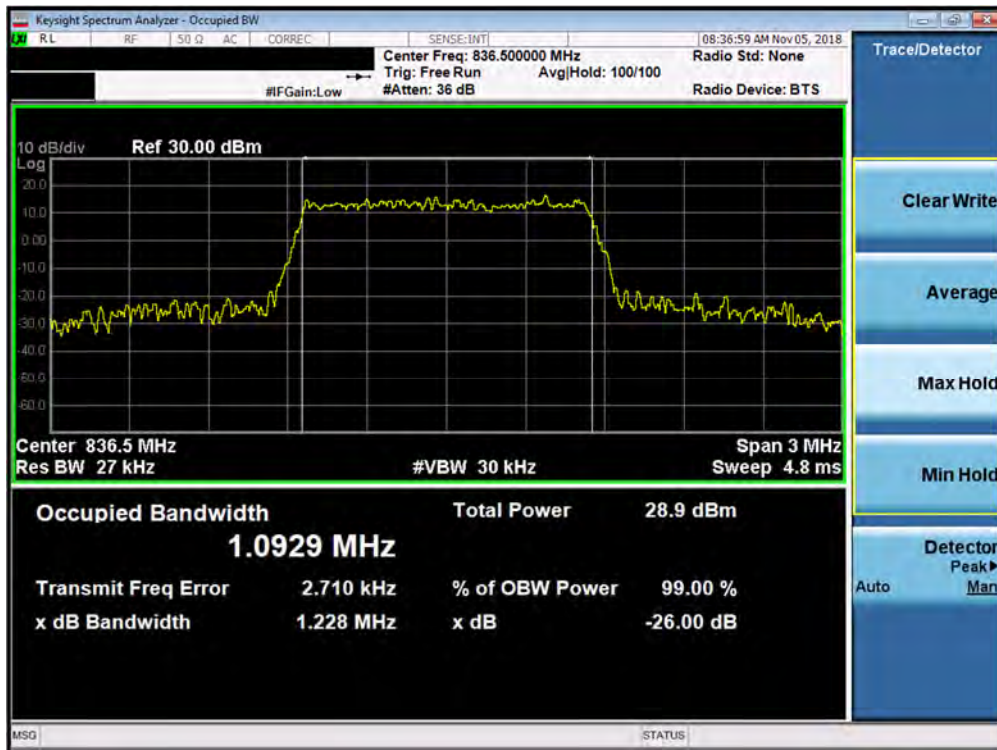


Plot 7-19. Occupied Bandwidth Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

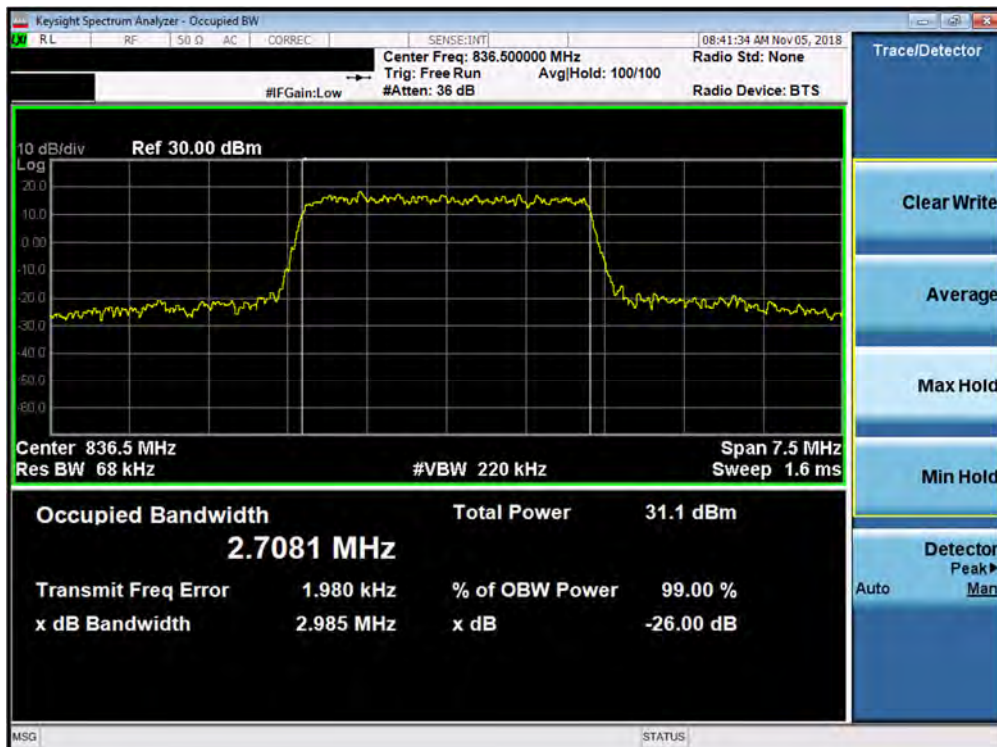


Plot 7-20. Occupied Bandwidth Plot (Band 5 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 24 of 114	

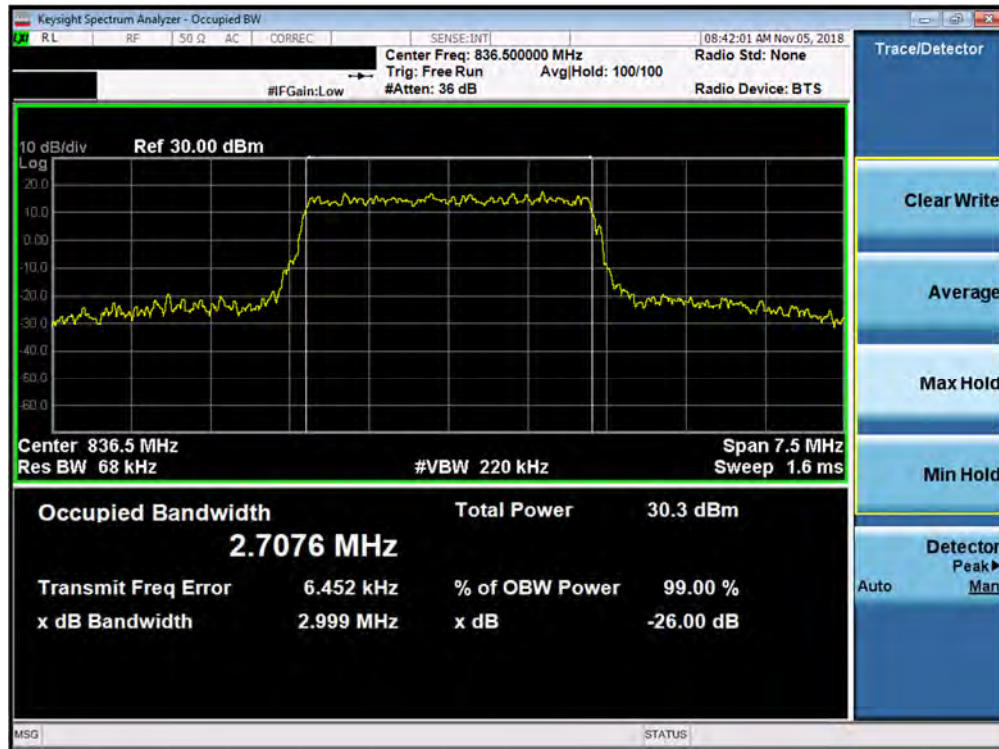


Plot 7-21. Occupied Bandwidth Plot (Band 5 - 1.4MHz 64-QAM - Full RB Configuration)

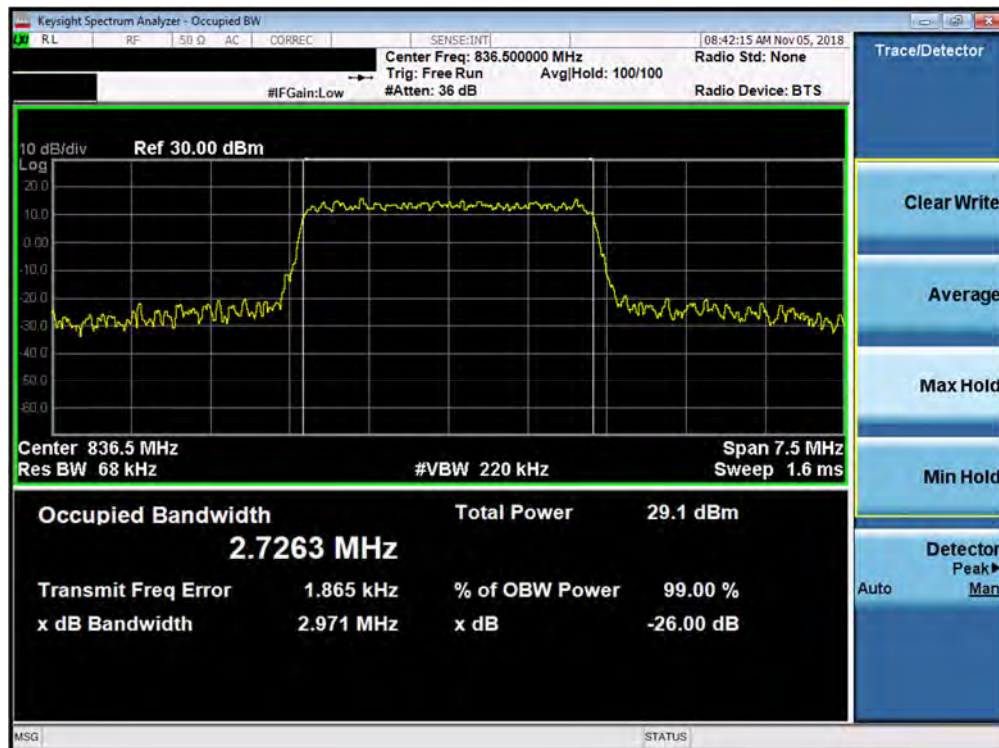


Plot 7-22. Occupied Bandwidth Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42				Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 25 of 114

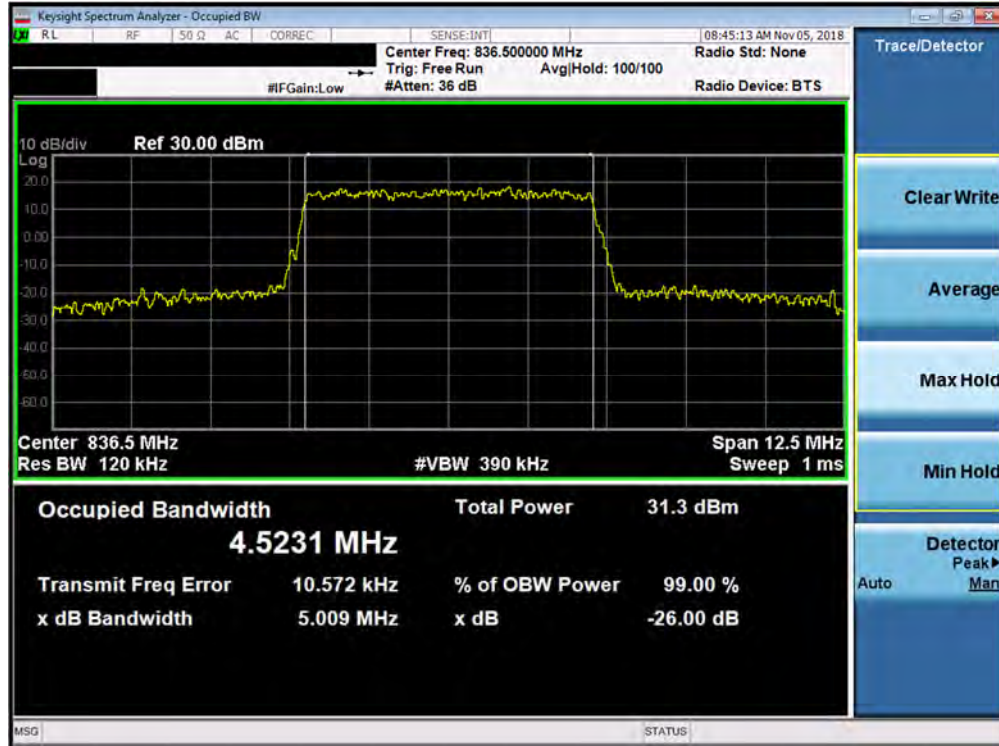


Plot 7-23. Occupied Bandwidth Plot (Band 5 - 3.0MHz 16-QAM - Full RB Configuration)

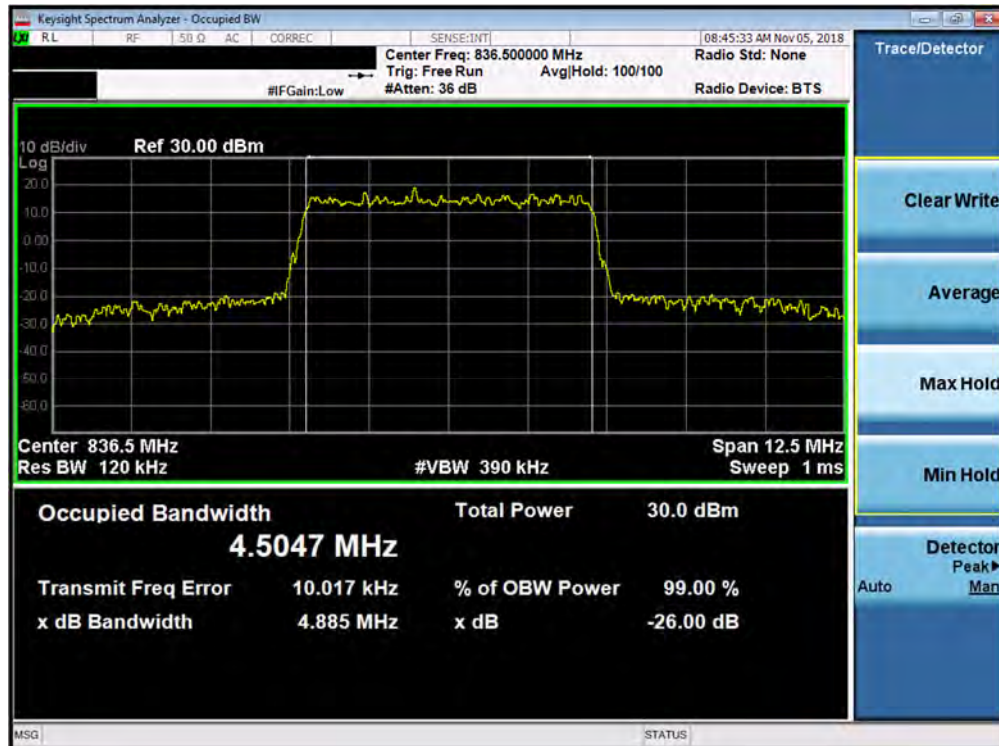


Plot 7-24. Occupied Bandwidth Plot (Band 5 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 26 of 114

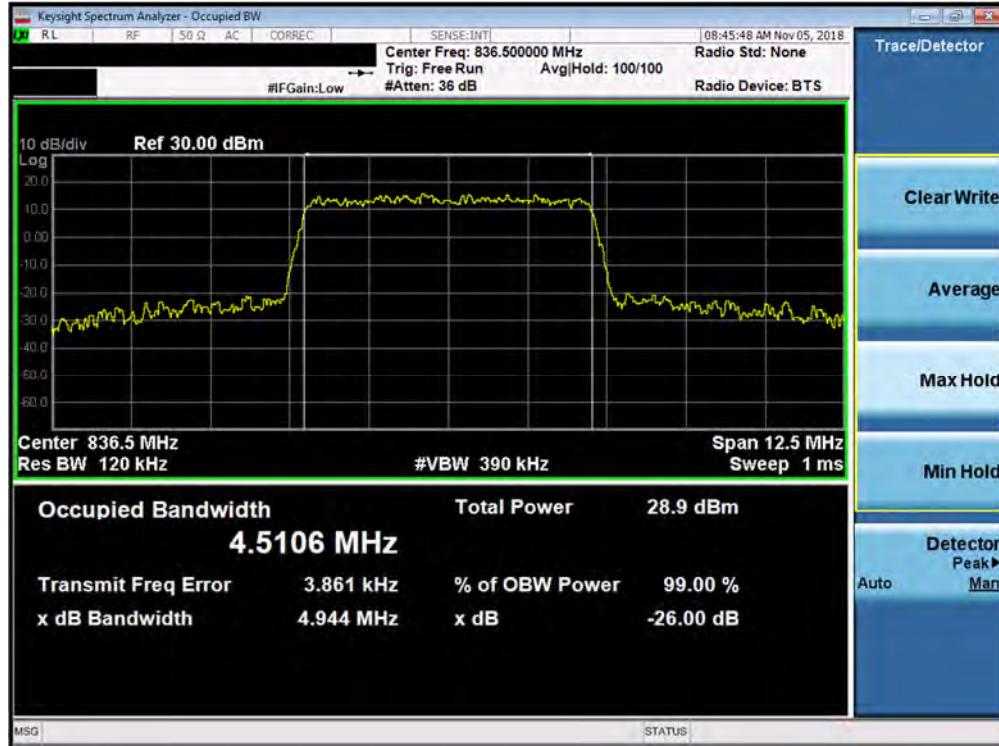


Plot 7-25. Occupied Bandwidth Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)



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

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 27 of 114



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

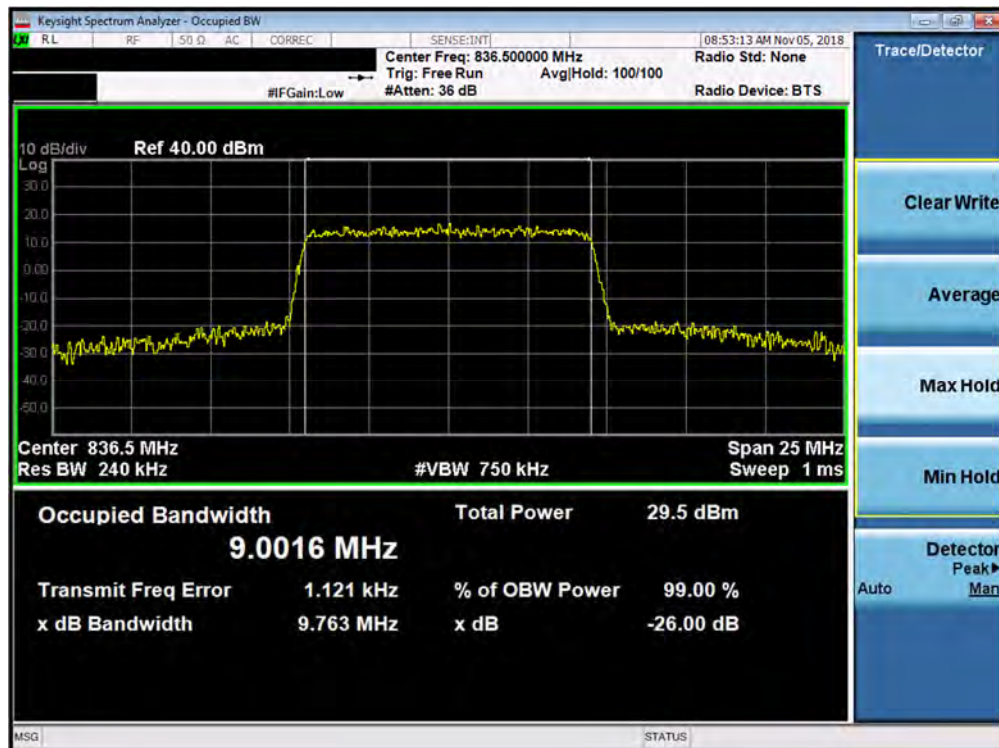


Plot 7-28. Occupied Bandwidth Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 28 of 114



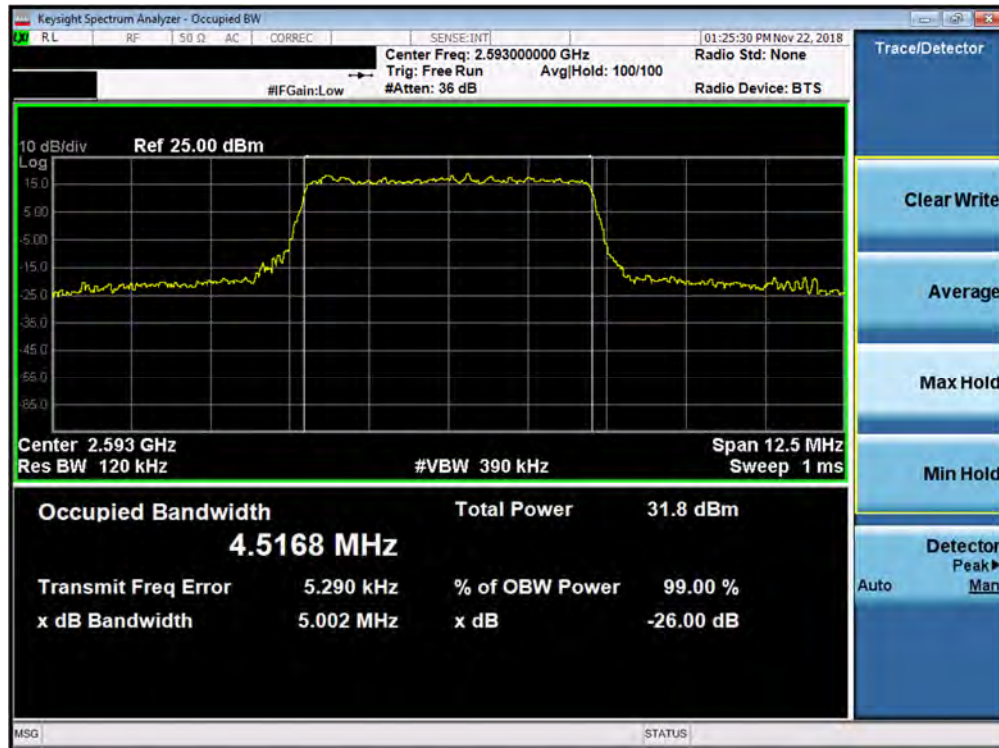
Plot 7-29. Occupied Bandwidth Plot (Band 5 - 10.0MHz 16-QAM - Full RB Configuration)



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

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 29 of 114

Band 41



Plot 7-31. Occupied Bandwidth Plot (Band 41 - 5.0MHz QPSK - Full RB Configuration)

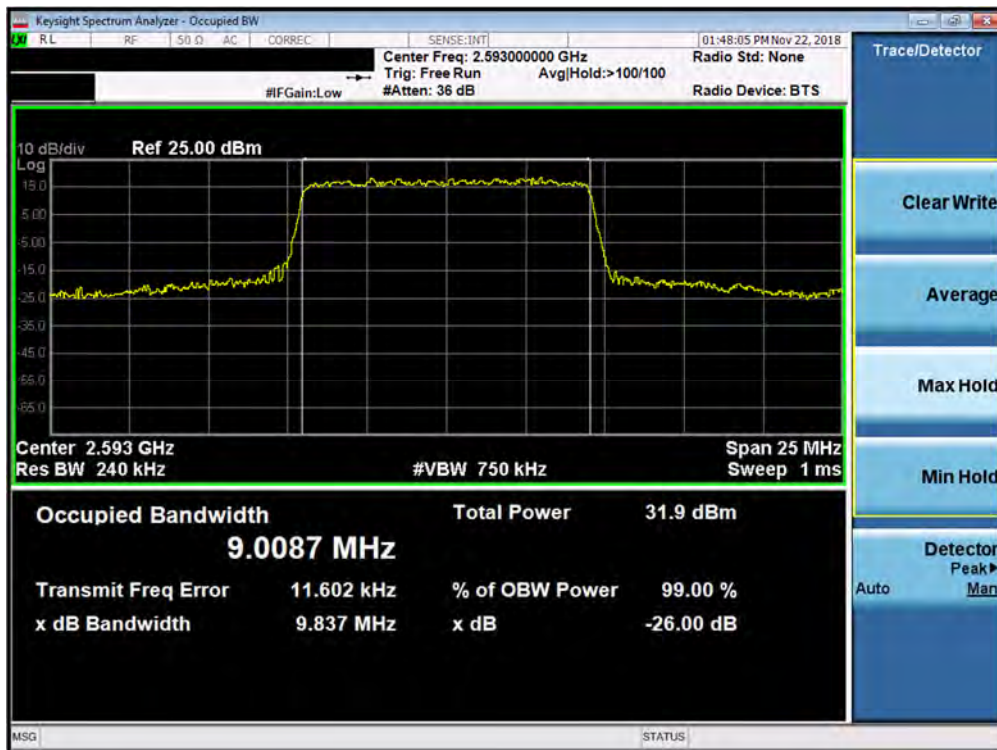


Plot 7-32. Occupied Bandwidth Plot (Band 41 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	EUT Type: Portable Handset	Page 30 of 114

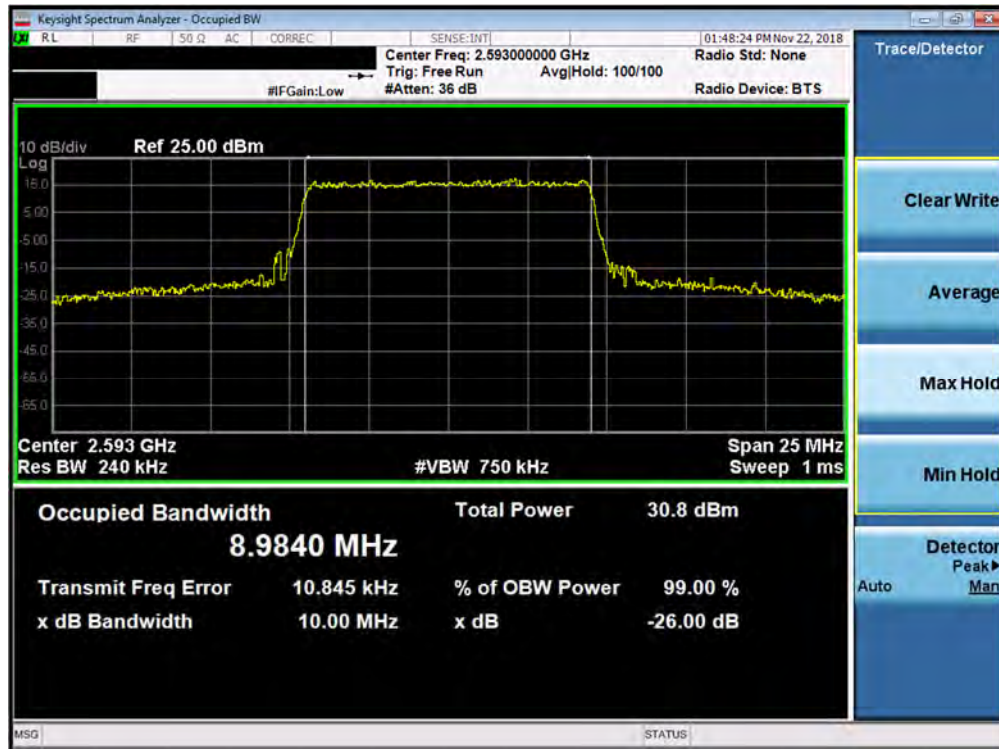


Plot 7-33. Occupied Bandwidth Plot (Band 41 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-34. Occupied Bandwidth Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 31 of 114		

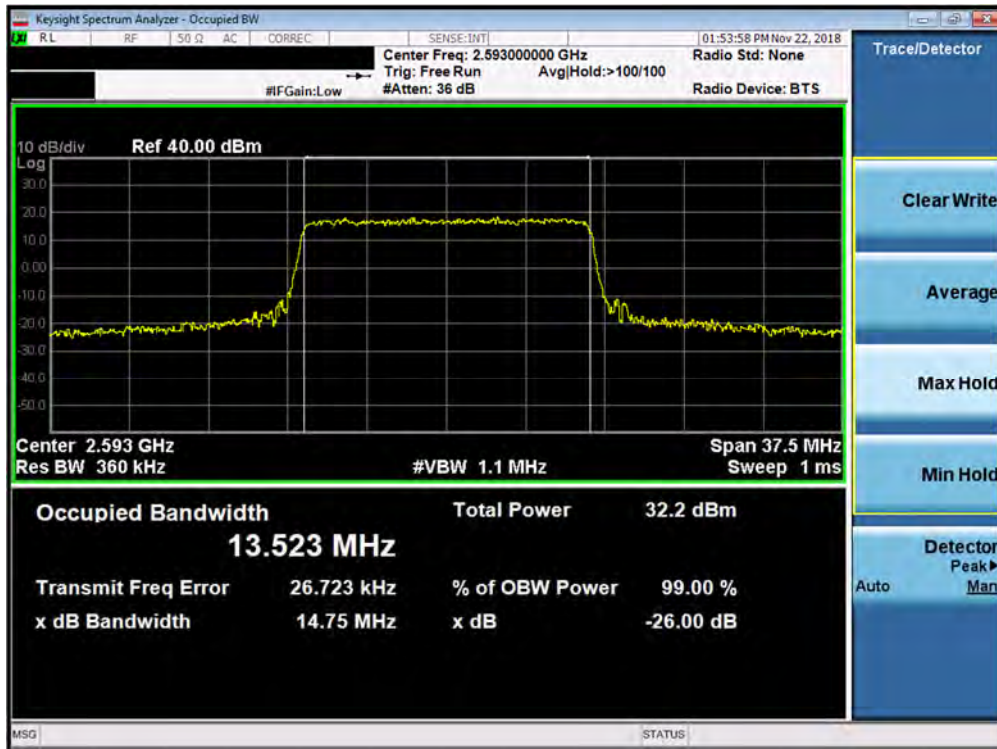


Plot 7-35. Occupied Bandwidth Plot (Band 41 - 10.0MHz 16-QAM - Full RB Configuration)

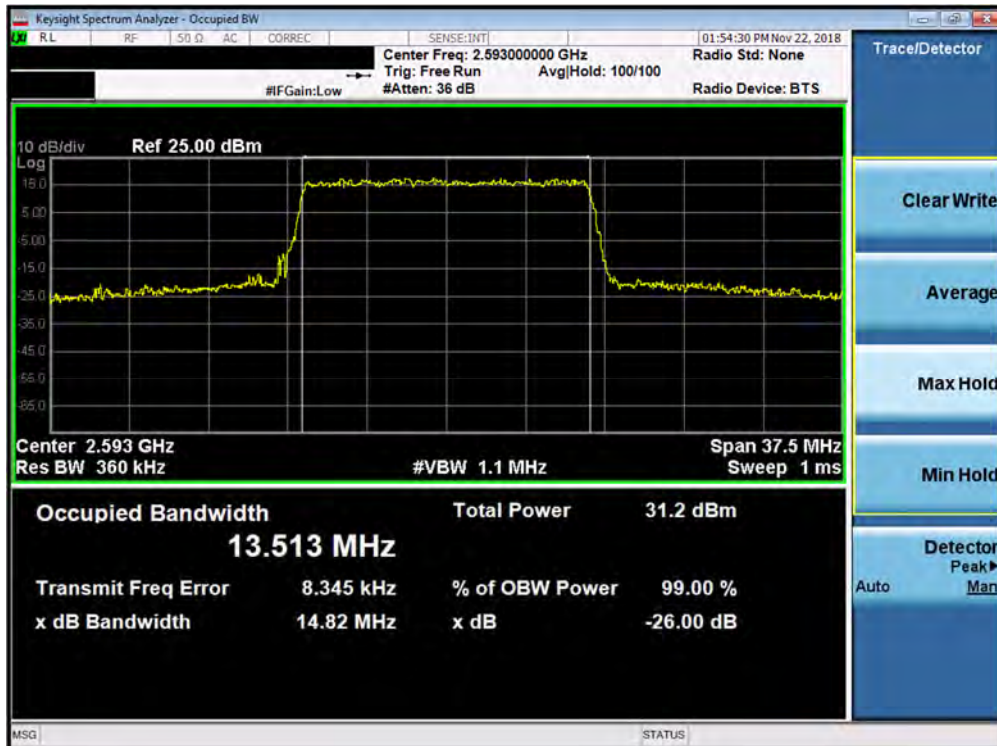


Plot 7-36. Occupied Bandwidth Plot (Band 41 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 32 of 114

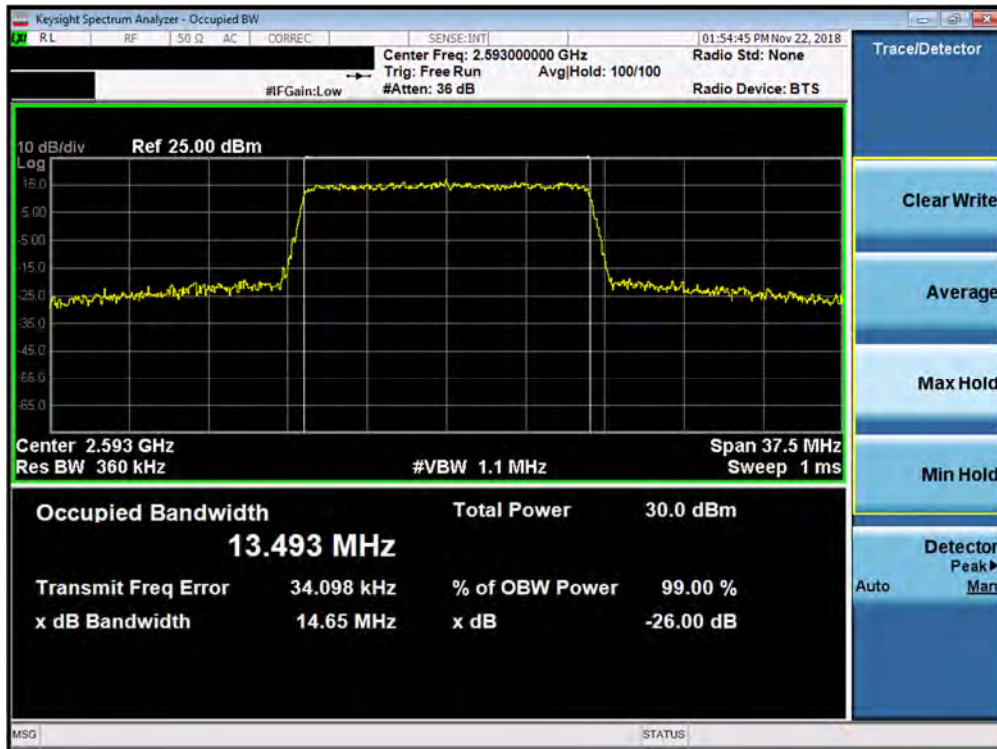


Plot 7-37. Occupied Bandwidth Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-38. Occupied Bandwidth Plot (Band 41 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 33 of 114

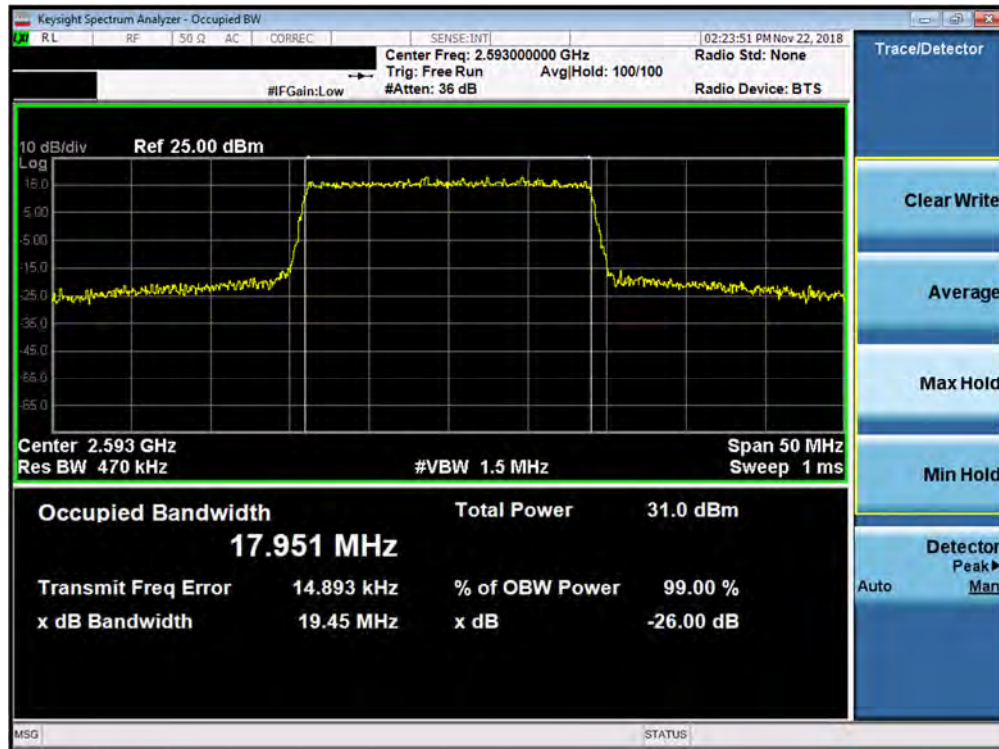


Plot 7-39. Occupied Bandwidth Plot (Band 41 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-40. Occupied Bandwidth Plot (Band 41 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 34 of 114



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



Plot 7-42. Occupied Bandwidth Plot (Band 41 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 35 of 114

7.3 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at 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 $43 + 10\log_{10}(P_{\text{Watts}})$, where P is the transmitter power in Watts.

For Band 41, the minimum permissible attenuation level of any spurious emission is $55 + 10\log_{10}(P_{\text{Watts}})$.

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 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.



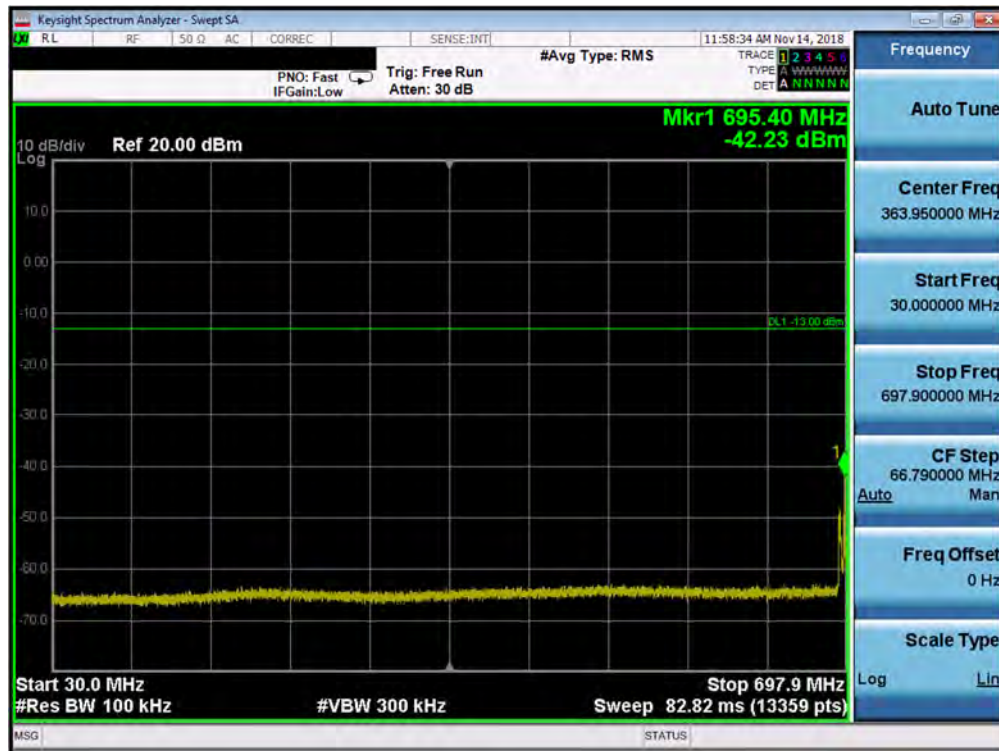
Figure 7-2. Test Instrument & Measurement Setup

Test Notes

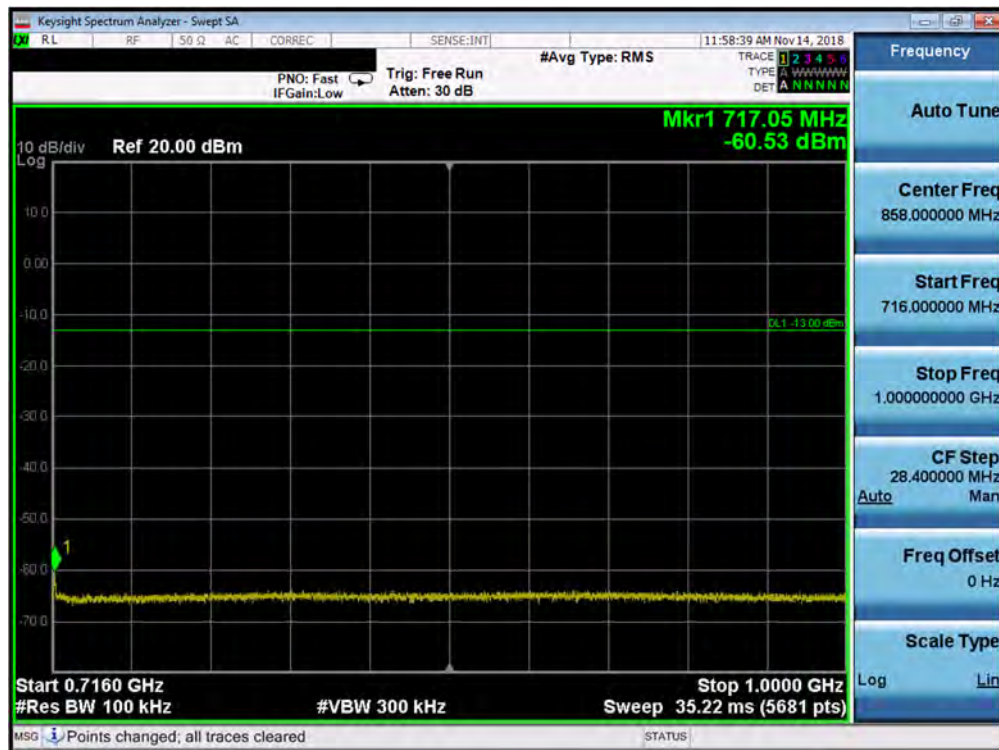
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the 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.

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 36 of 114	

Band 12

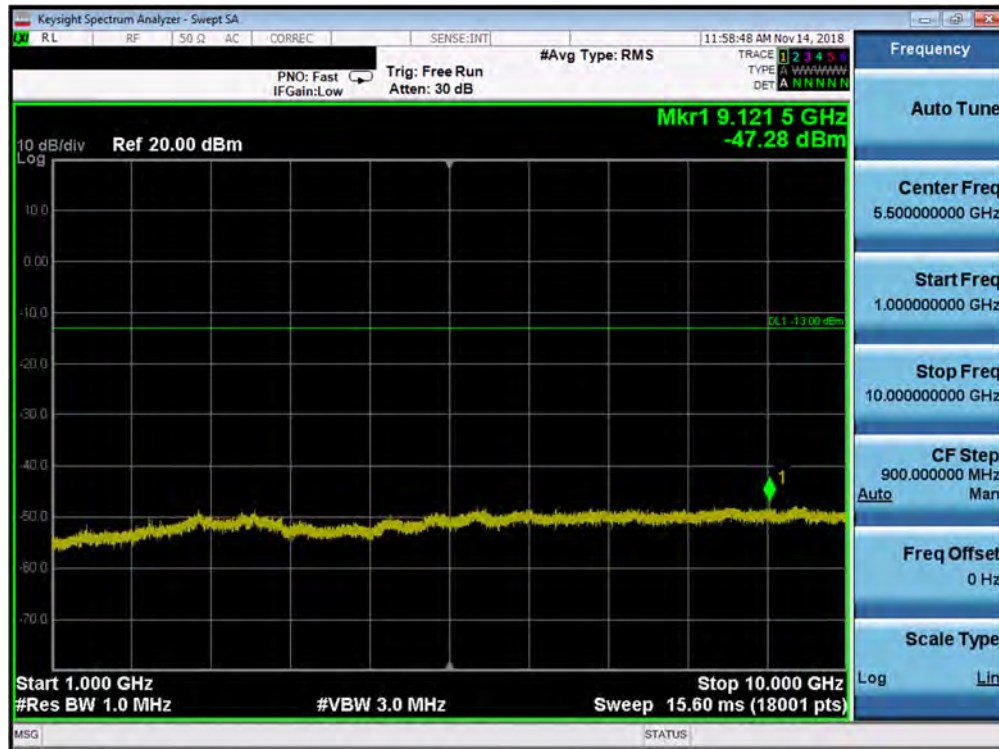


Plot 7-43. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

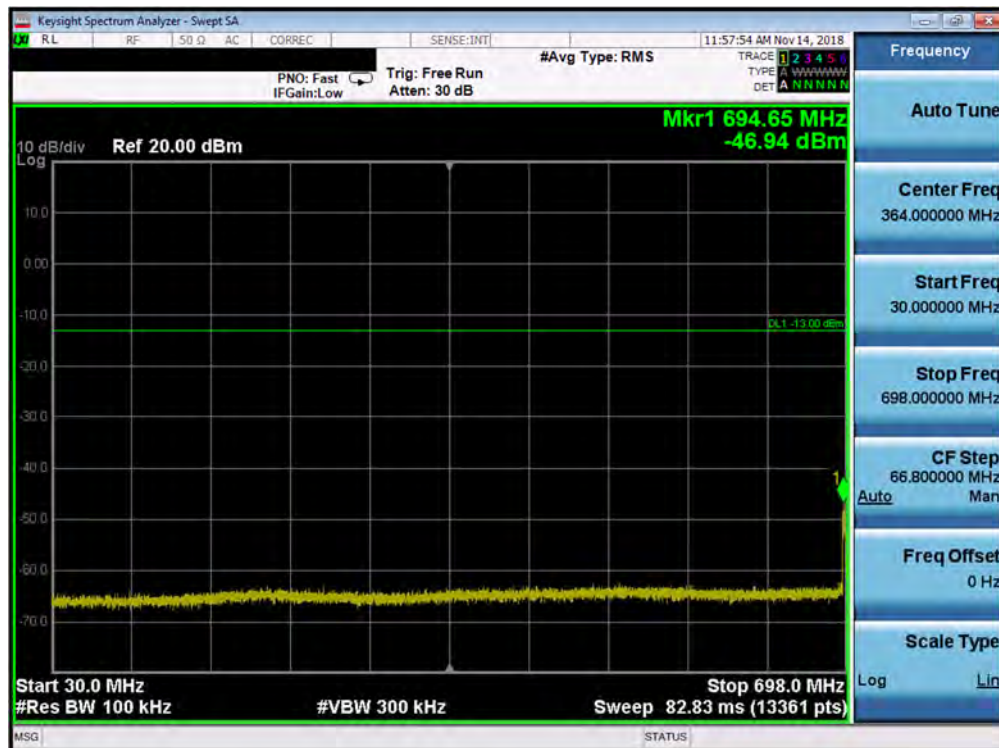


Plot 7-44. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 37 of 114

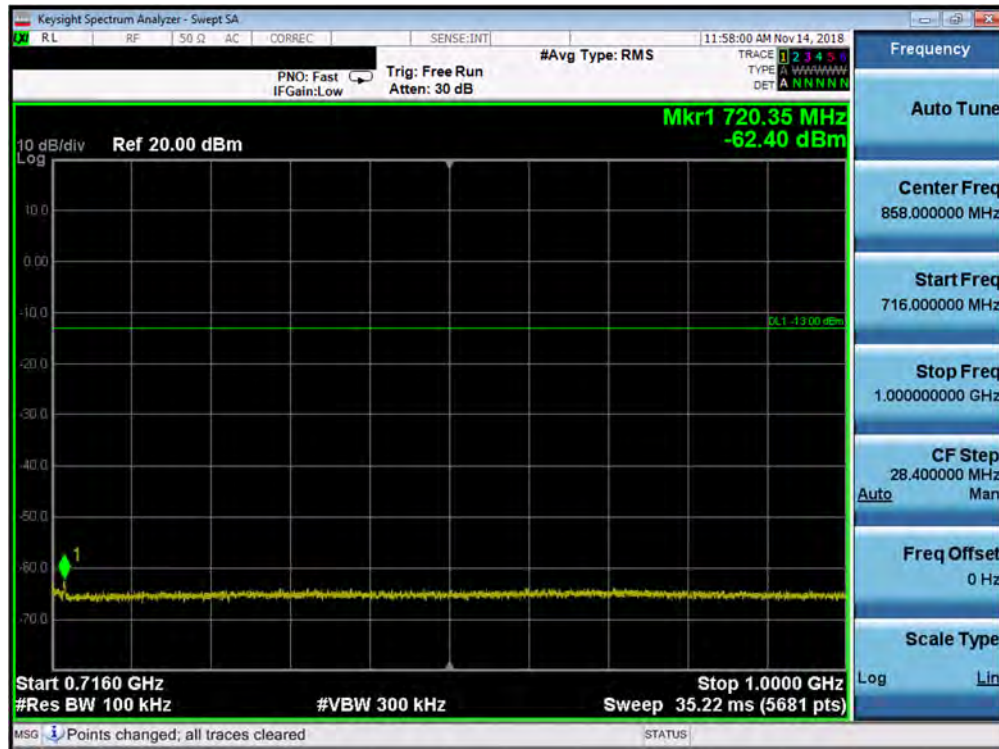


Plot 7-45. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

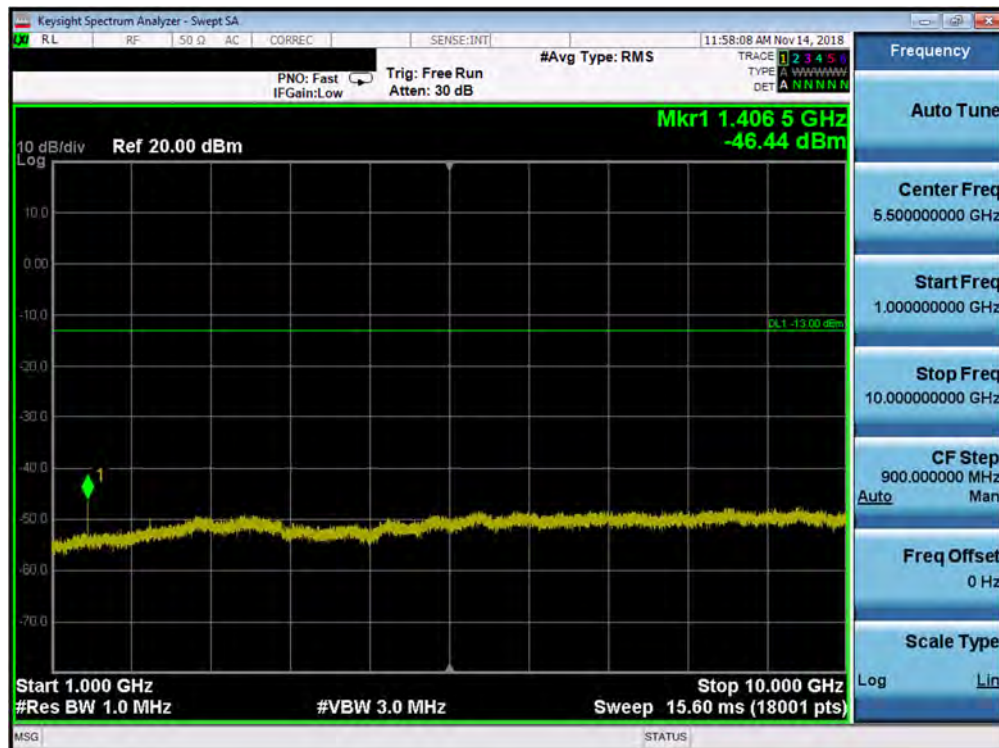


Plot 7-46. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 38 of 114	

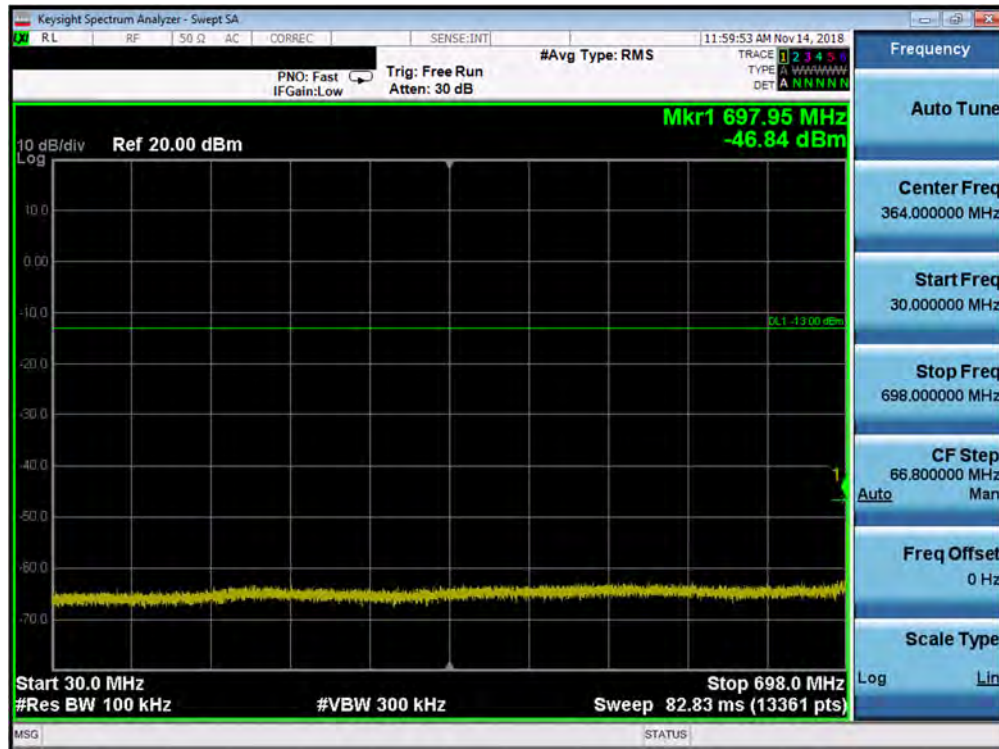


Plot 7-47. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

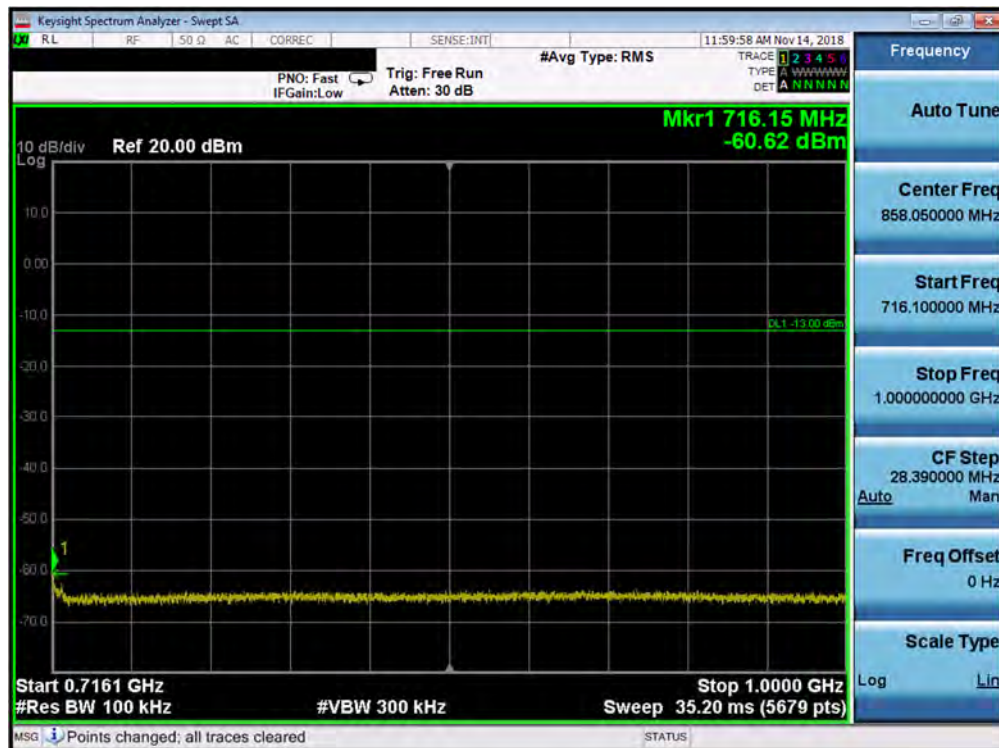


Plot 7-48. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 39 of 114

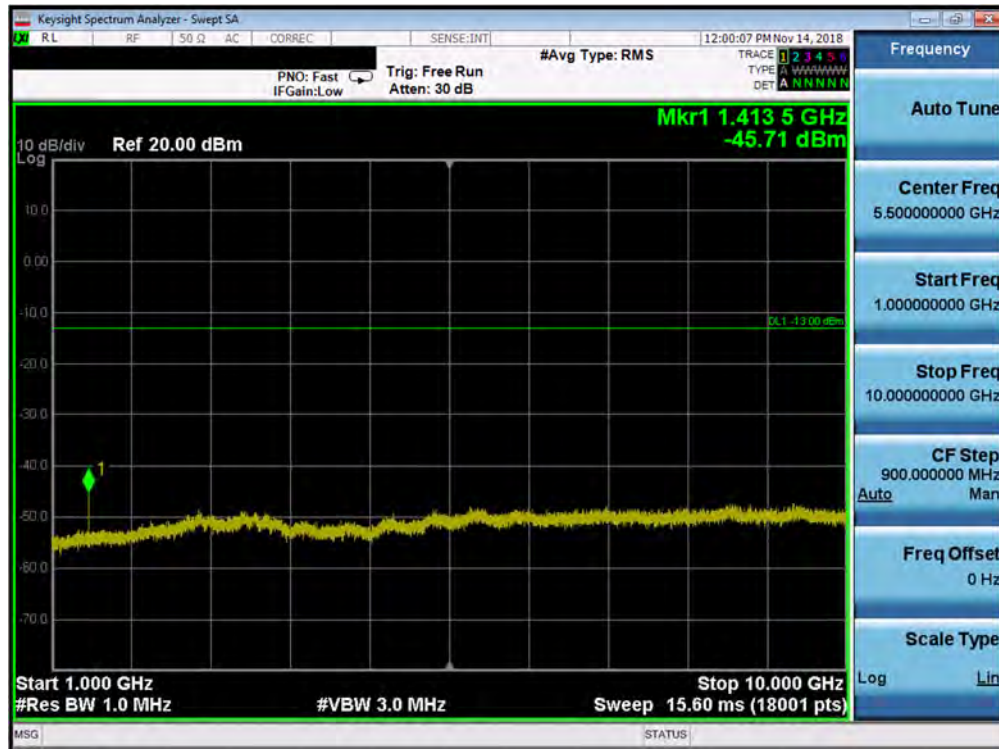


Plot 7-49. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-50. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

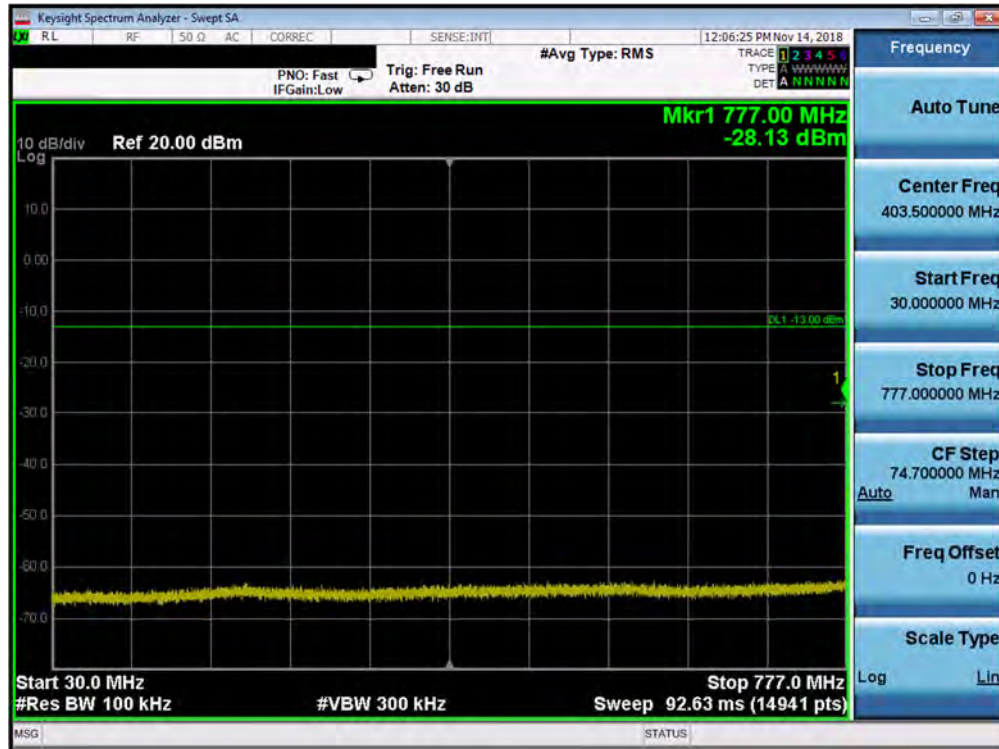
FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 40 of 114



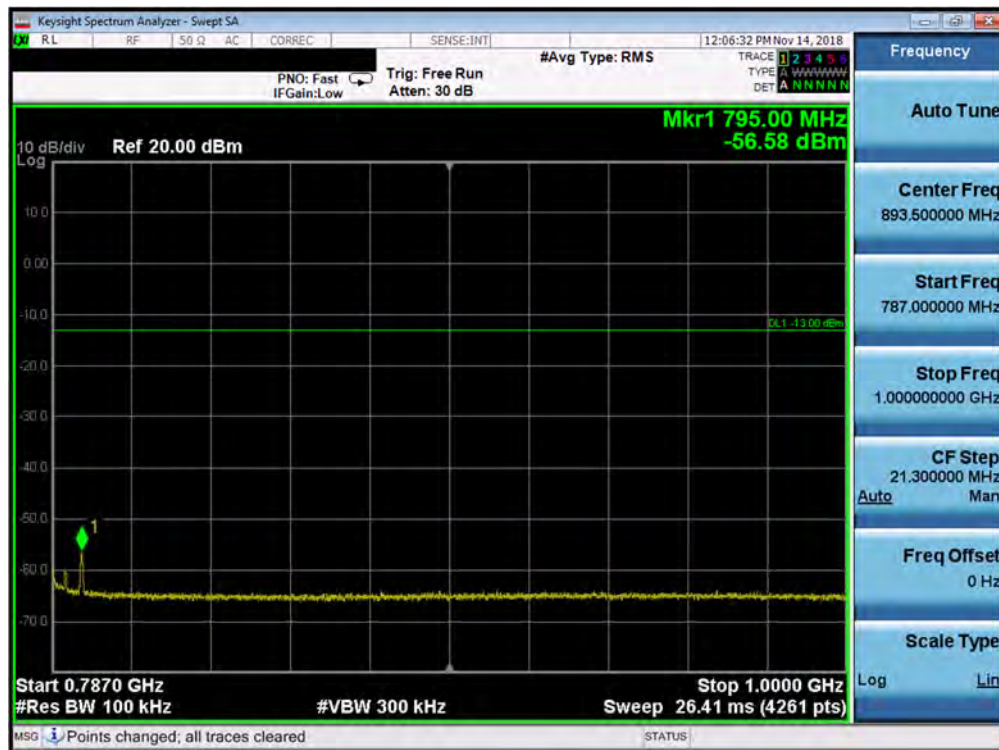
Plot 7-51. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSCV42				Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	MEASUREMENT REPORT (CERTIFICATION) EUT Type: Portable Handset		Page 41 of 114

Band 13

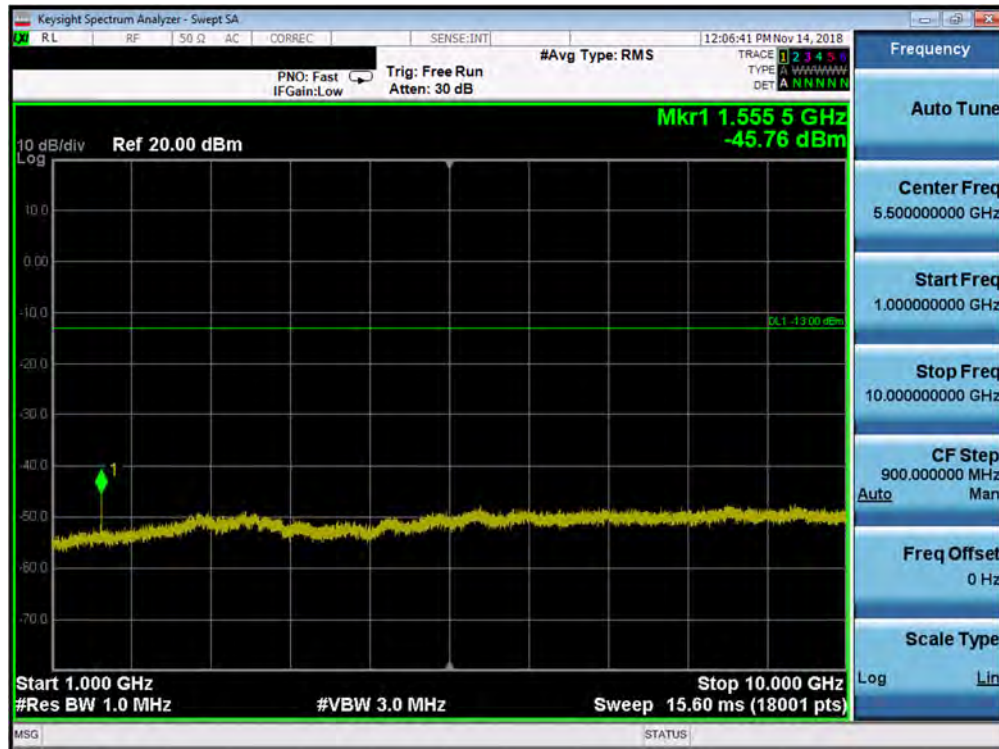


Plot 7-52. Conducted Spurious Plot (Band 13 - 10.0MHz QPSK - RB Size 1, RB Offset 0)



Plot 7-53. Conducted Spurious Plot (Band 13 - 10.0MHz QPSK - RB Size 1, RB Offset 0)

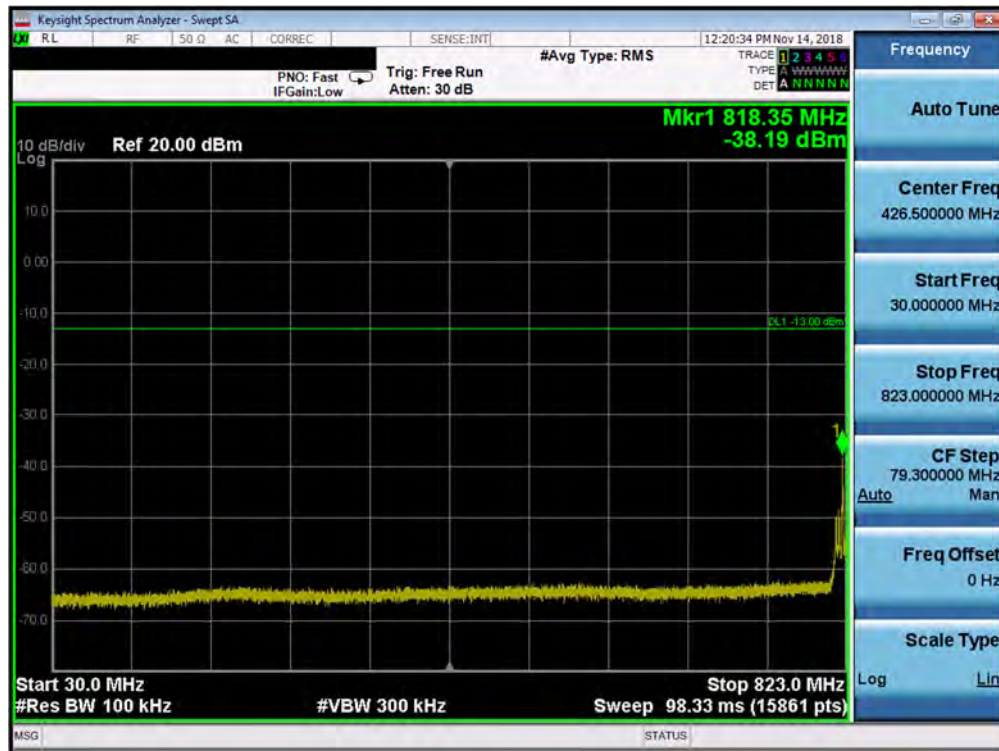
FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 42 of 114	



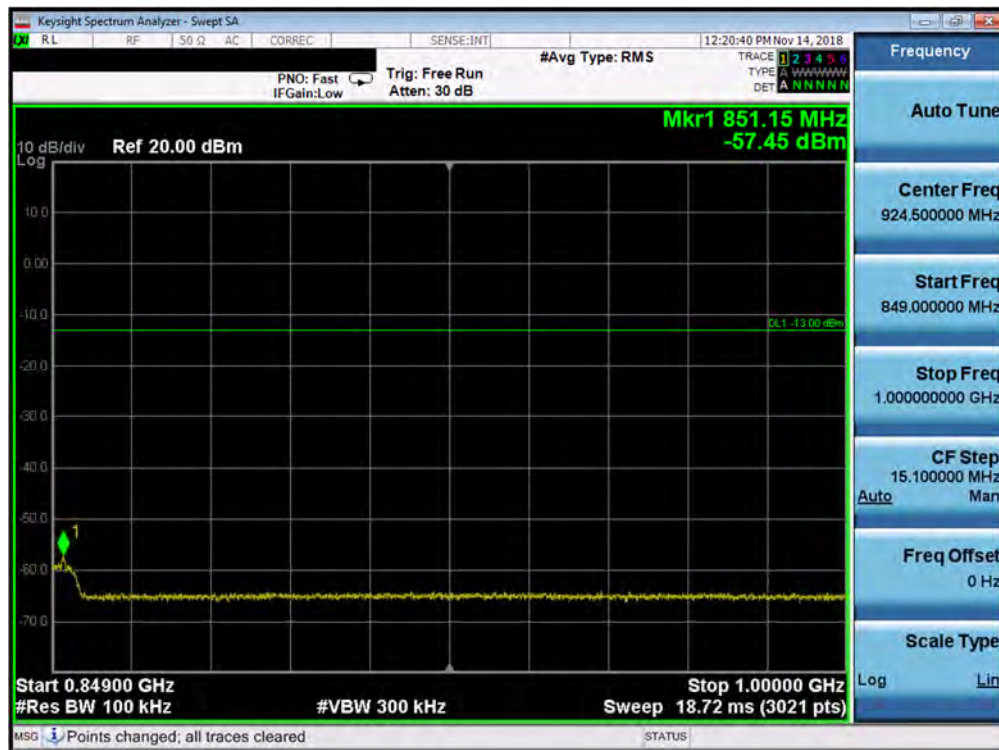
Plot 7-54. Conducted Spurious Plot (Band 13 - 10.0MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	EUT Type: Portable Handset		Page 43 of 114

Band 5

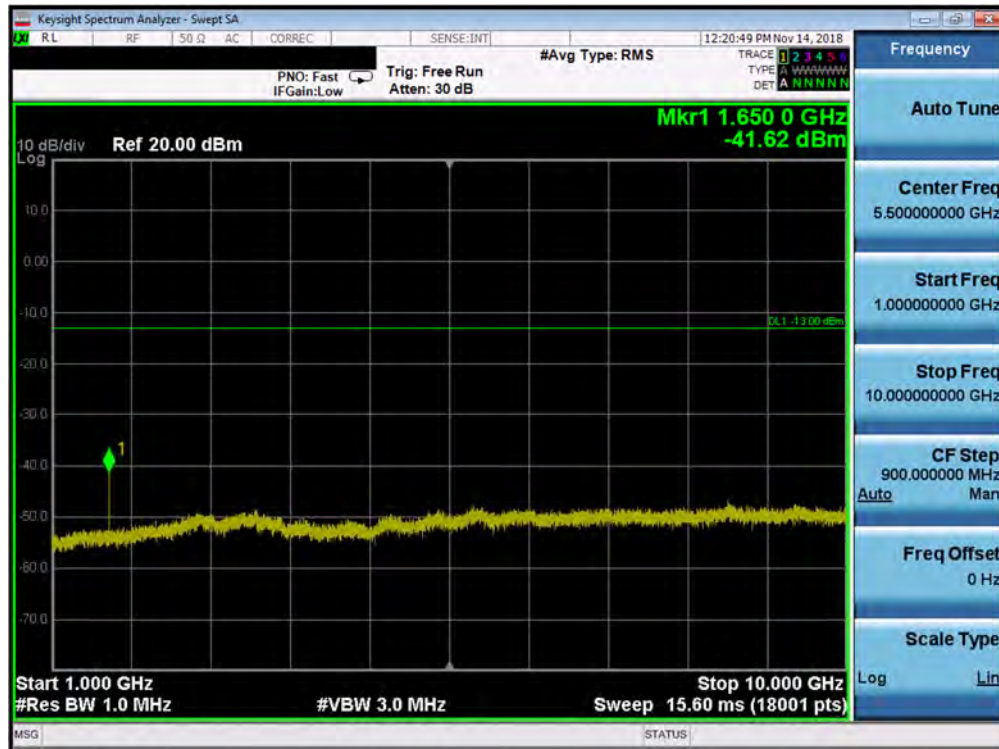


Plot 7-55. Conducted Spurious Plot (Band 5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

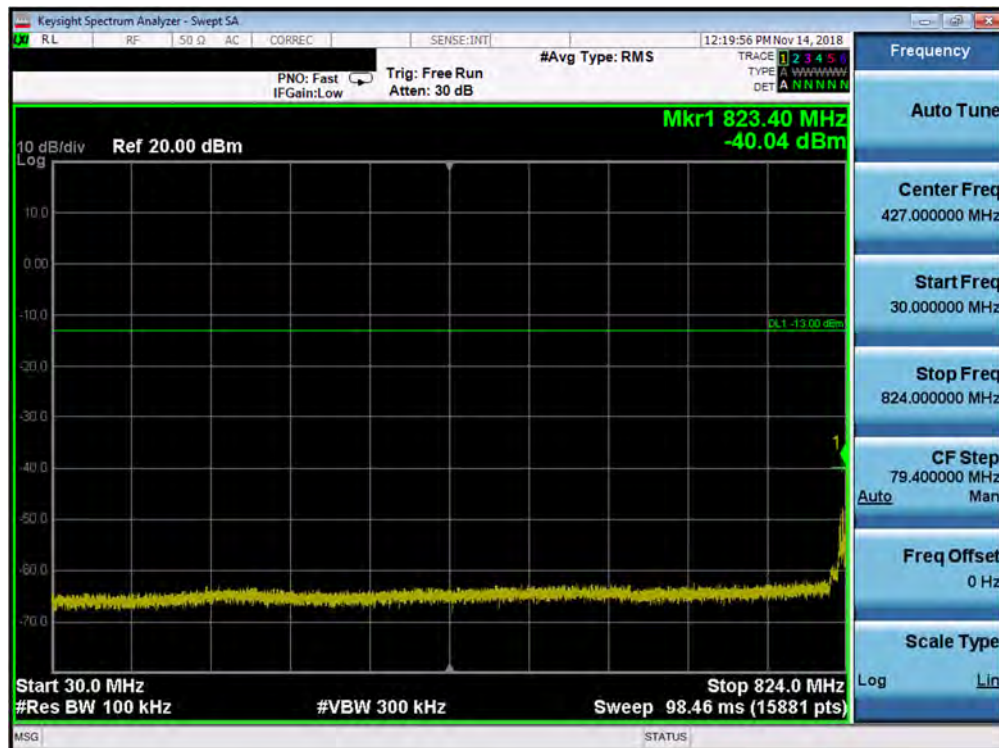


Plot 7-56. Conducted Spurious Plot (Band 5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 44 of 114	

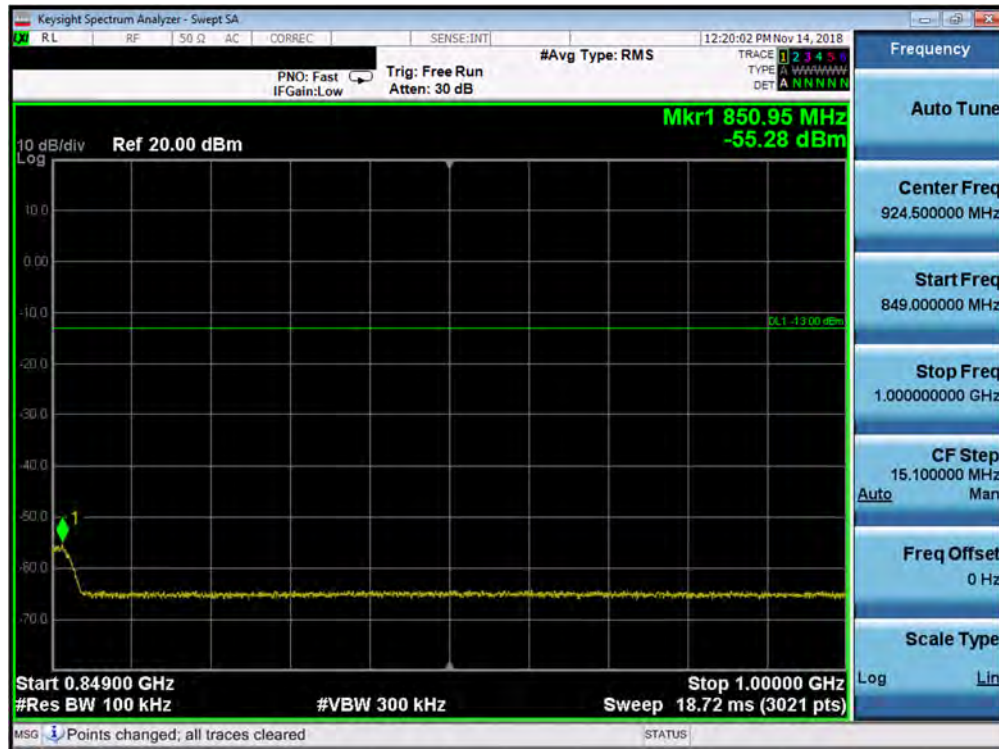


Plot 7-57. Conducted Spurious Plot (Band 5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

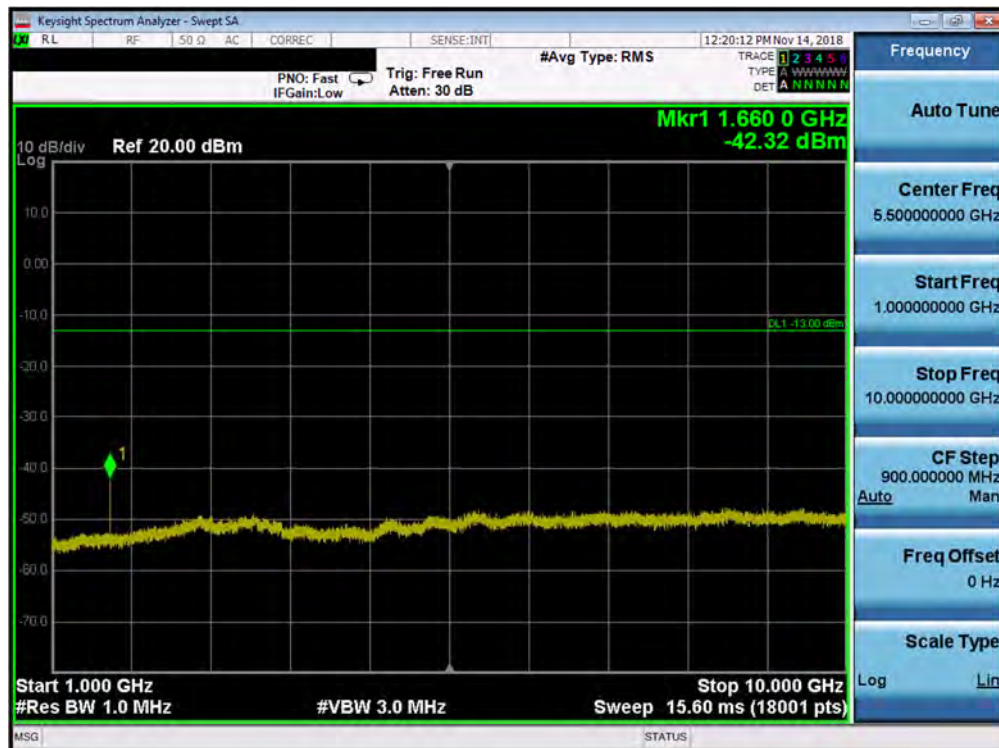


Plot 7-58. Conducted Spurious Plot (Band 5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 45 of 114		

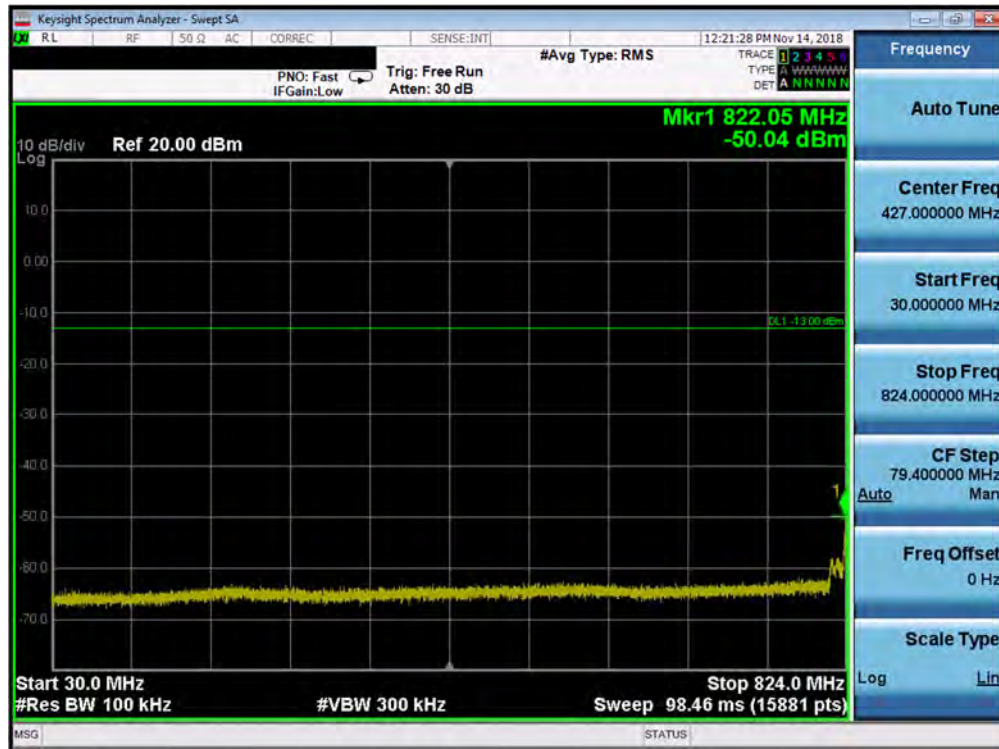


Plot 7-59. Conducted Spurious Plot (Band 5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

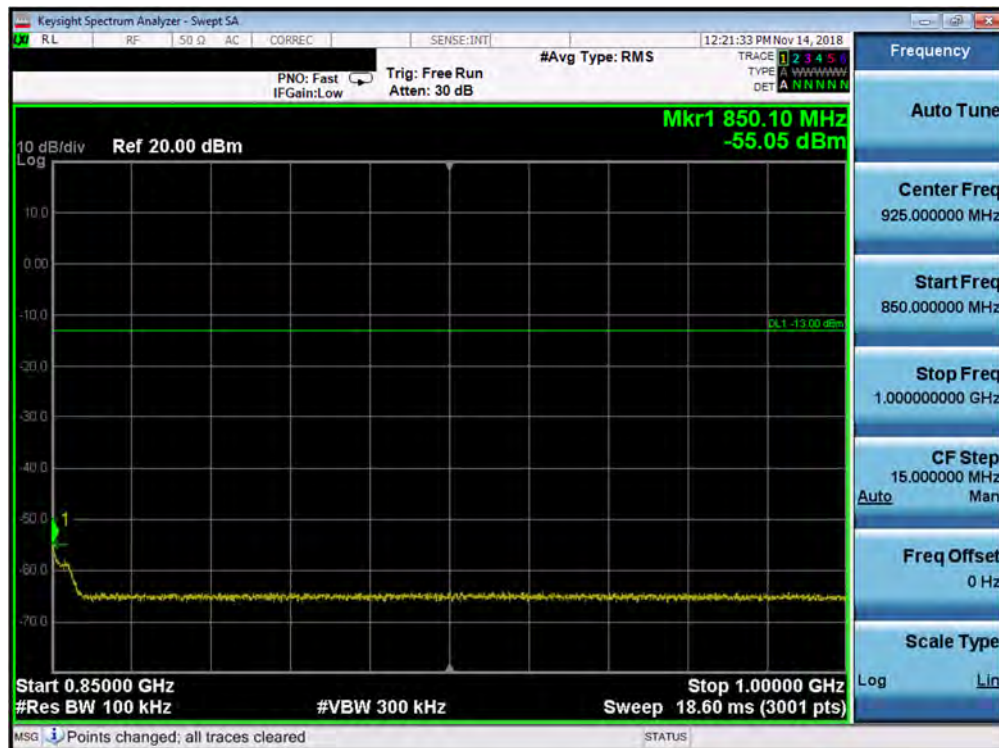


Plot 7-60. Conducted Spurious Plot (Band 5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 46 of 114

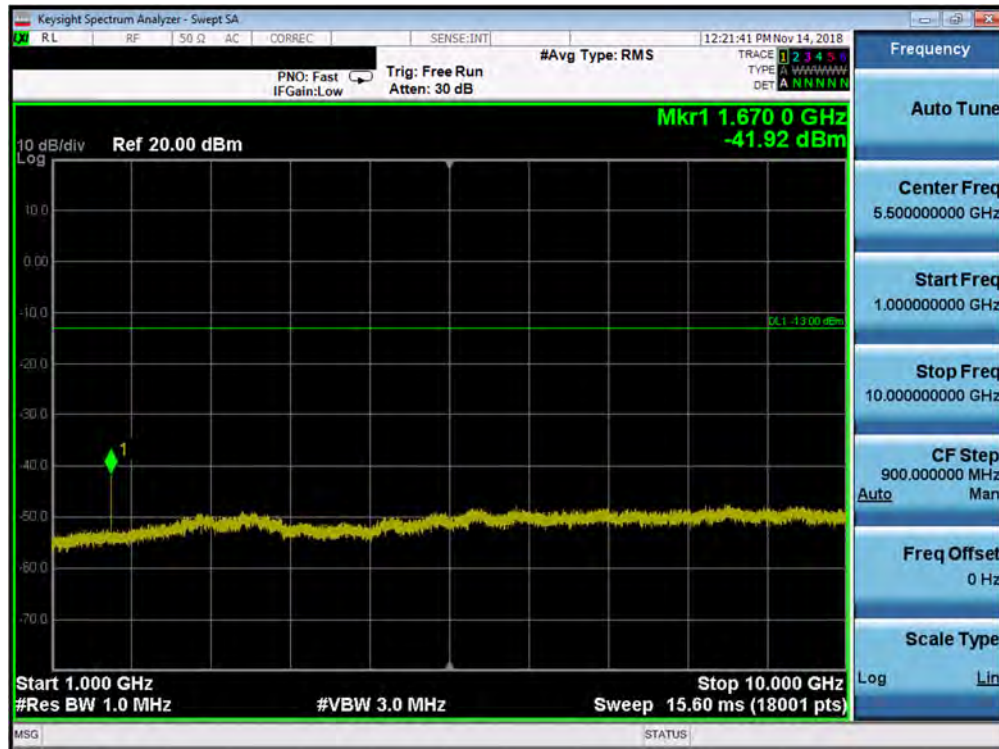


Plot 7-61. Conducted Spurious Plot (Band 5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-62. Conducted Spurious Plot (Band 5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

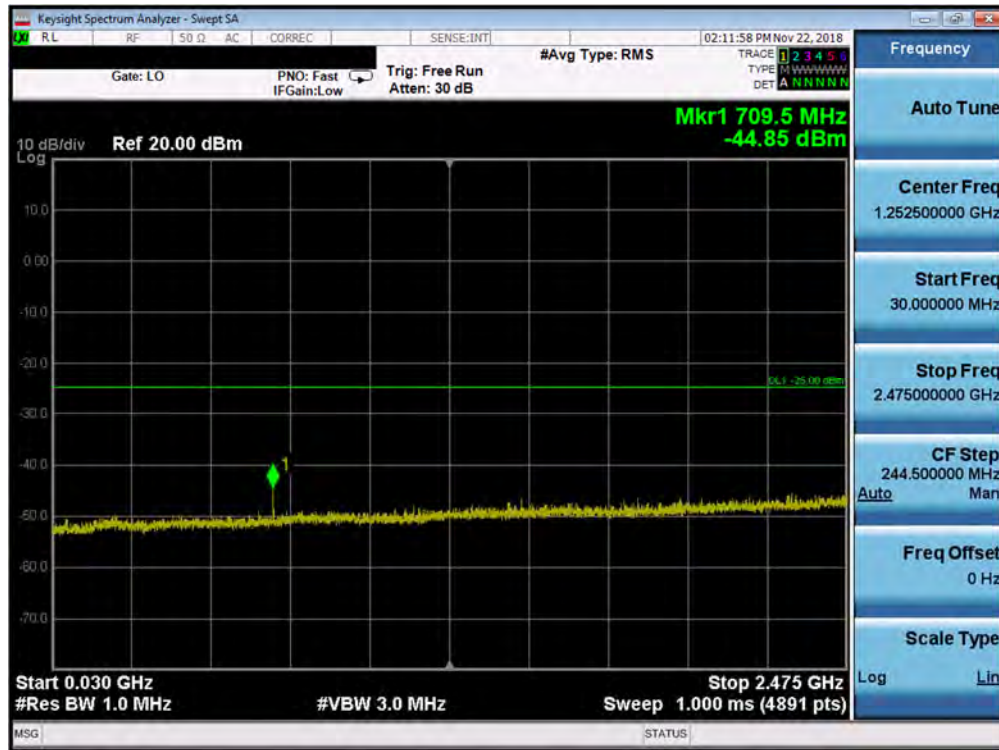
FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 47 of 114		



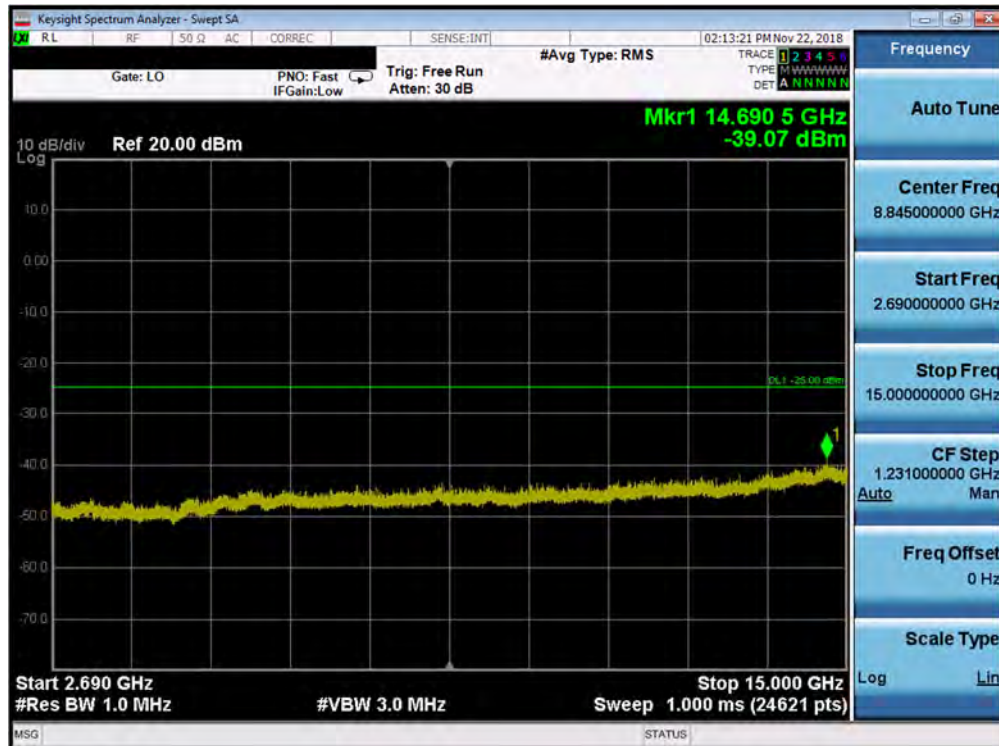
Plot 7-63. Conducted Spurious Plot (Band 5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	EUT Type: Portable Handset	Page 48 of 114

Band 41 PC3

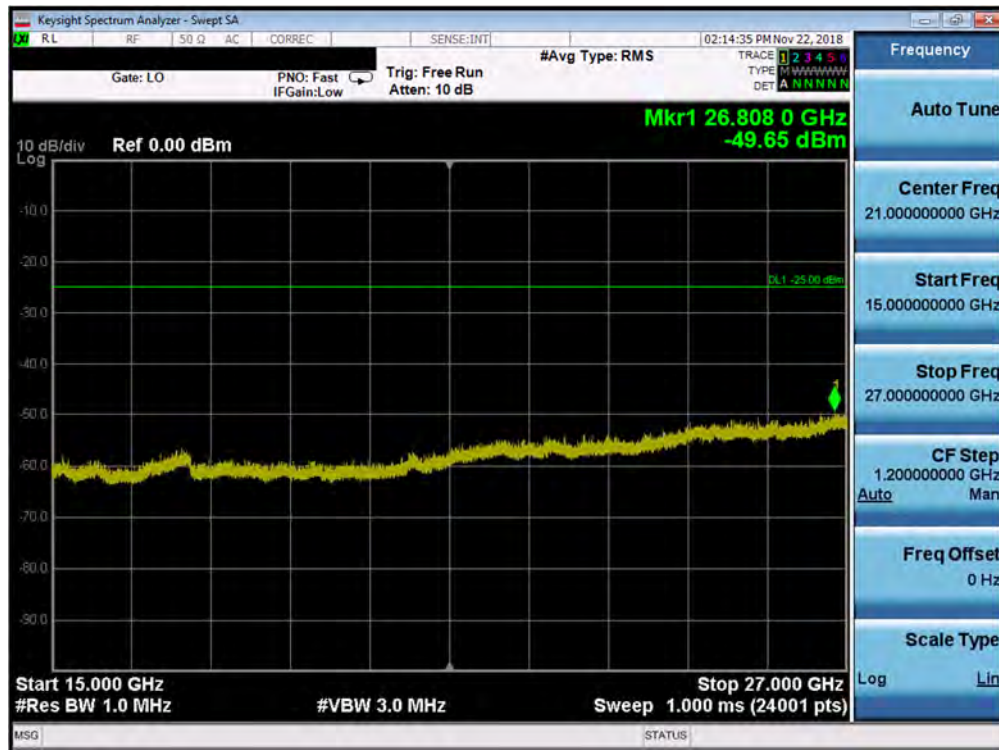


Plot 7-64. Conducted Spurious (Band 41 PC3 - 15.0MHz QPSK -RB Size 1, RB Offset 0 -Low Channel)

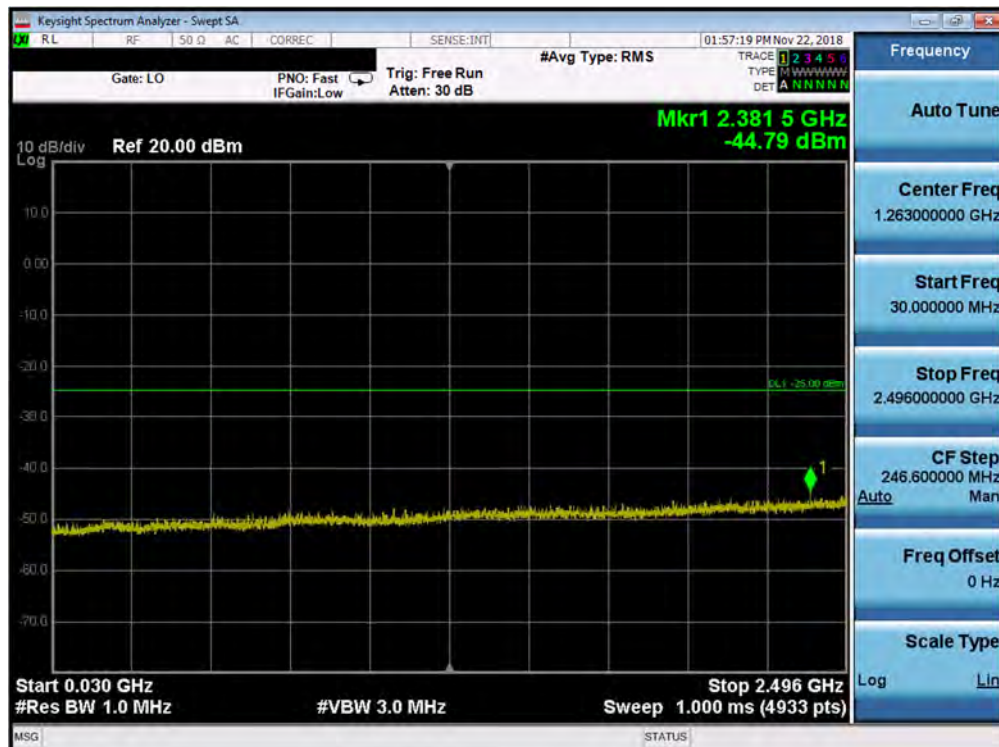


Plot 7-65. Conducted Spurious (Band 41 PC3- 15.0MHz QPSK - RB Size 1, RB Offset 0 -Low Channel)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 49 of 114

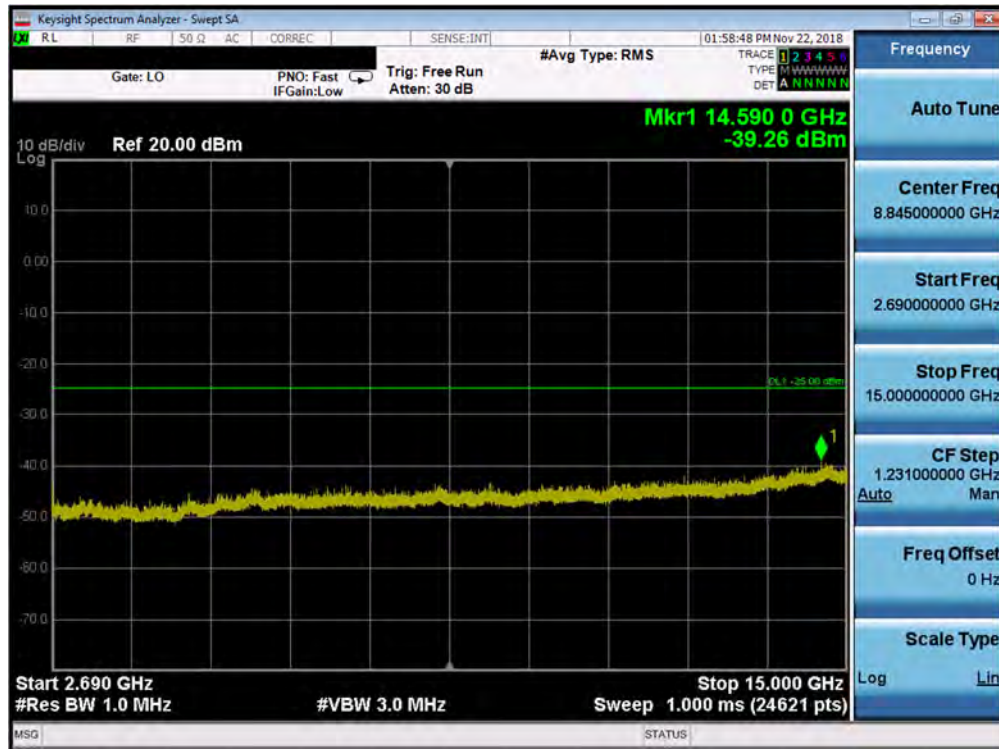


Plot 7-66. Conducted Spurious (Band 41 PC3 - 15.0MHz QPSK -RB Size 1, RB Offset 0 -Low Channel)

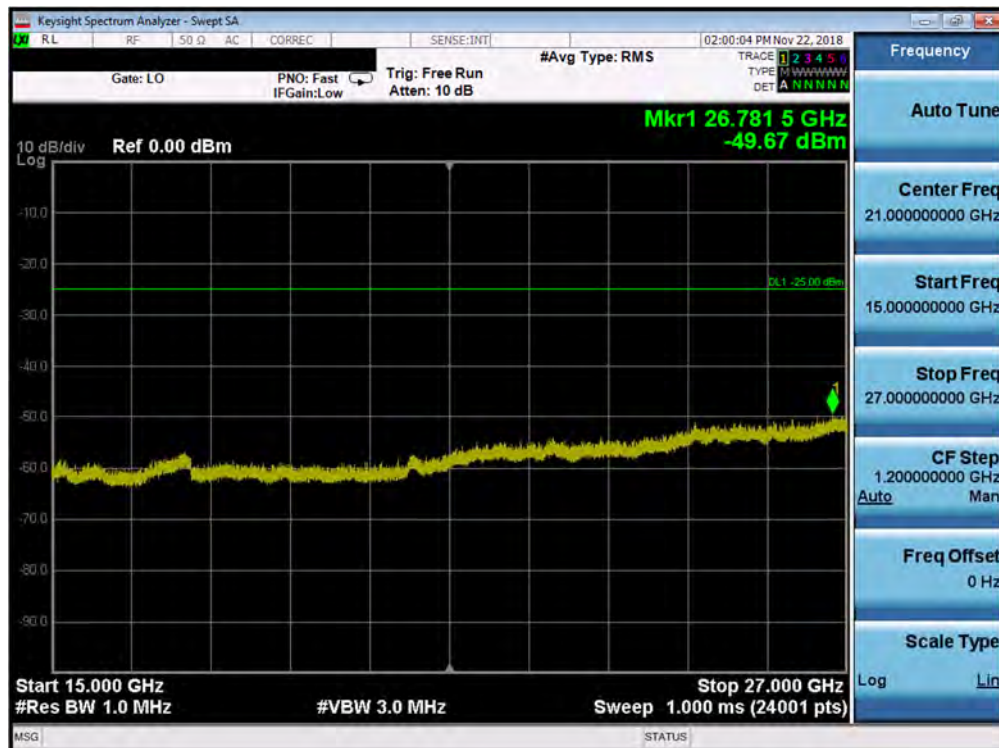


Plot 7-67. Conducted Spurious (Band 41 PC3 - 15.0MHz QPSK -RB Size 1, RB Offset 0 -Mid Channel)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 50 of 114

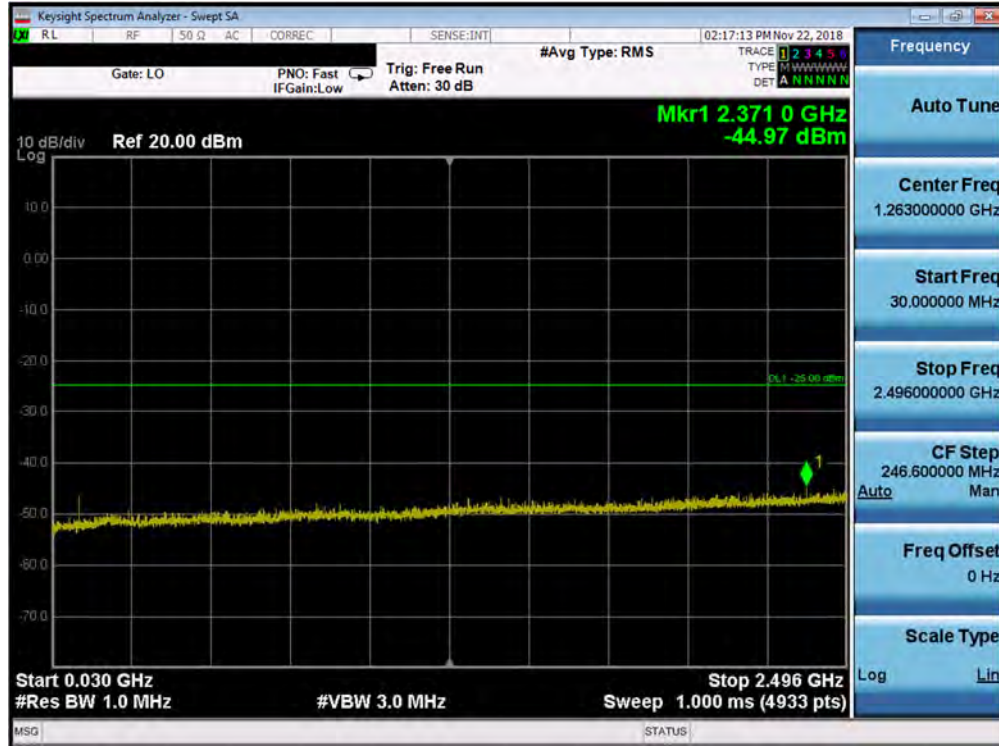


Plot 7-68. Conducted Spurious (Band 41 PC3 - 15.0MHz QPSK -RB Size 1, RB Offset 0 -Mid Channel)

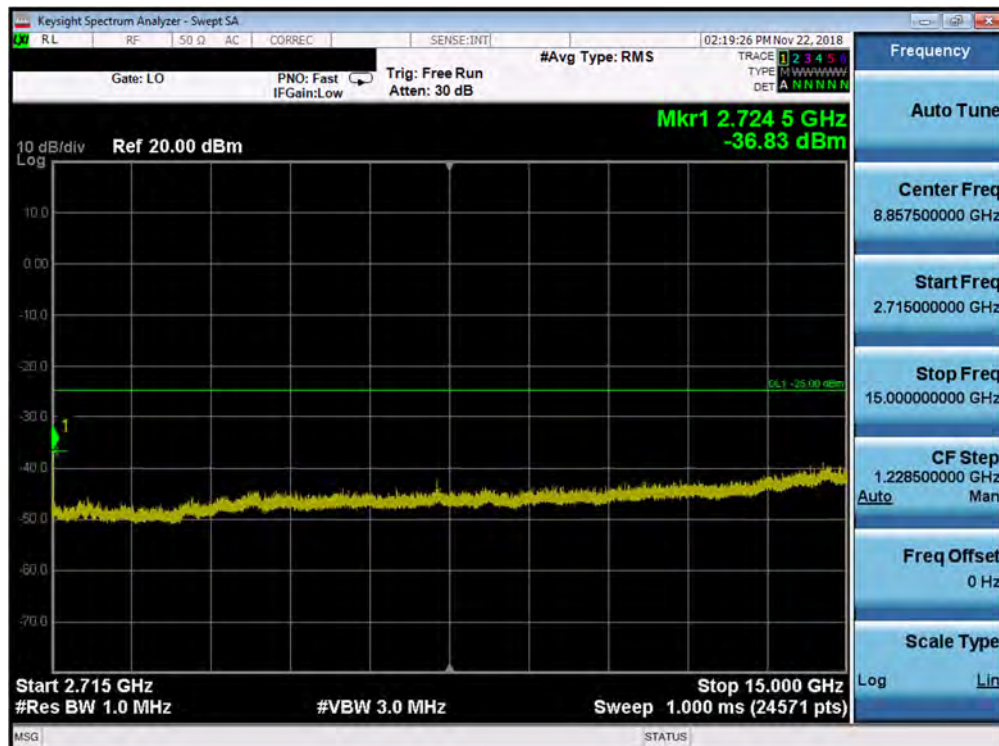


Plot 7-69. Conducted Spurious (Band 41 PC3- 15.0MHz QPSK -RB Size 1, RB Offset 0 -Mid Channel)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 51 of 114	



Plot 7-70. Conducted Spurious (Band 41 PC3- 15.0MHz QPSK RB Size 1, RB Offset 0 -High Channel)



Plot 7-71. Conducted Spurious (Band 41 PC3- 15.0MHz QPSK -RB Size 1, RB Offset 0 -High Channel)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset			Page 52 of 114



Plot 7-72. Conducted Spurious (Band 41 PC3- 15.0MHz QPSK -RB Size 1, RB Offset 0 -High Channel)

FCC ID: A3LSCV42				Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	MEASUREMENT REPORT (CERTIFICATION) EUT Type: Portable Handset		Page 53 of 114

7.4 Band Edge Emissions at Antenna Terminal

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at 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.

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

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

Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 54 of 114

Test Notes

Per 22.917(b) and 27.53(h), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

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

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

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

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

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 55 of 114	

Band 12



Plot 7-73. Lower Band Edge Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-74. Upper Band Edge Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 56 of 114

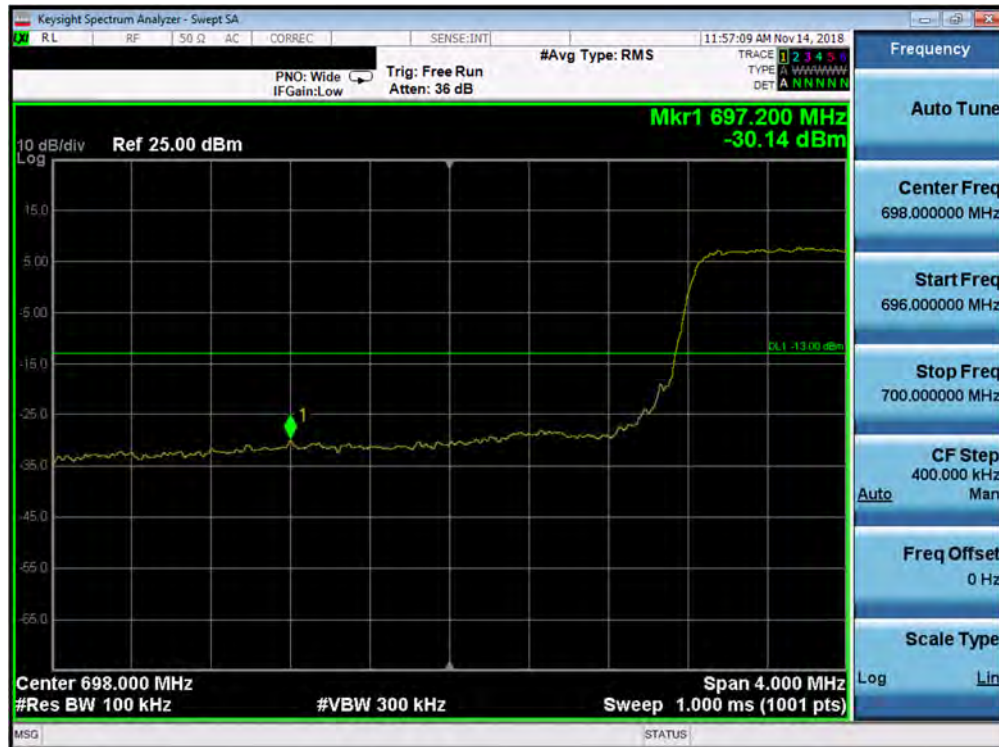


Plot 7-75. Lower Band Edge Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

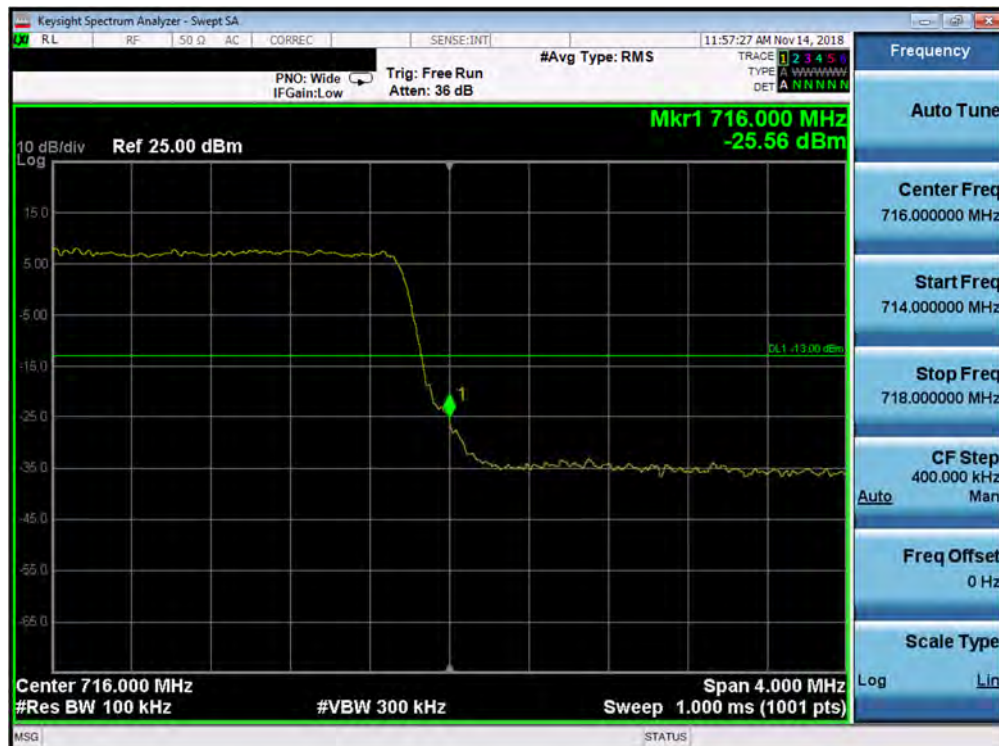


Plot 7-76. Upper Band Edge Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 57 of 114		

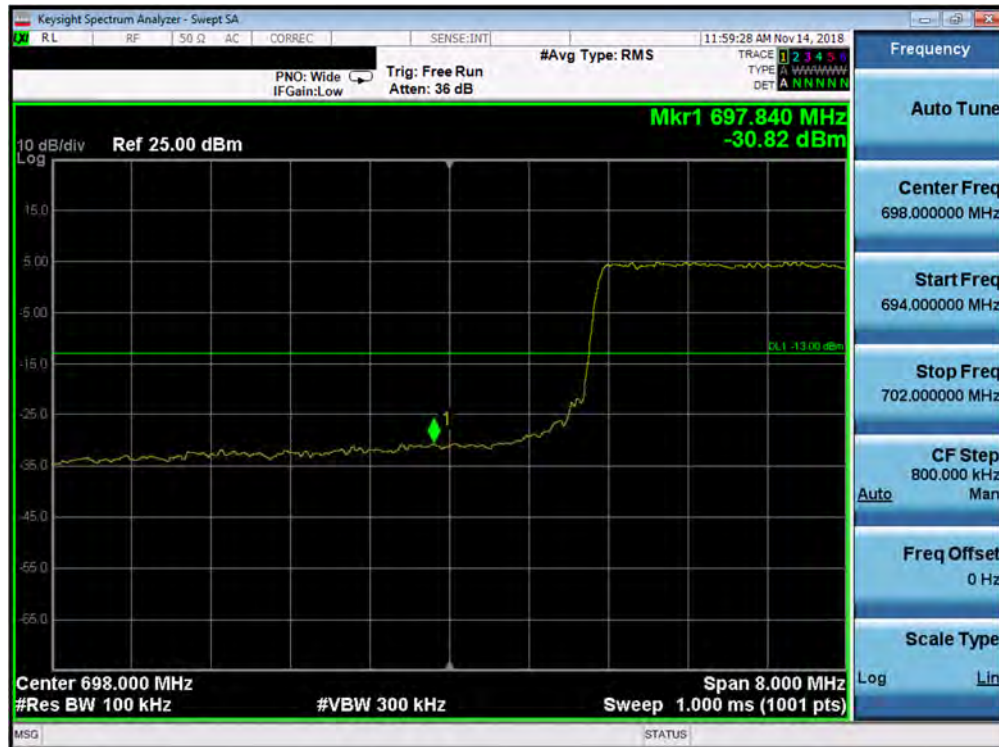


Plot 7-77. Lower Band Edge Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-78. Upper Band Edge Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 58 of 114		



Plot 7-79. Lower Band Edge Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)



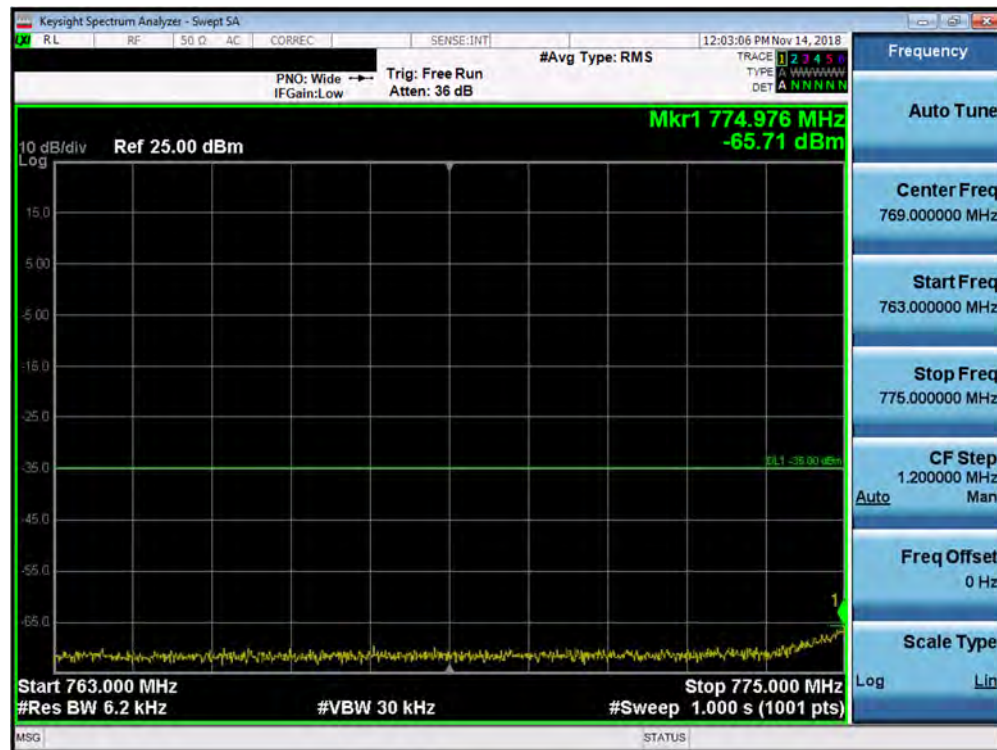
Plot 7-80. Upper Band Edge Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 59 of 114		

Band 13



Plot 7-81. Lower Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-82. Lower Emission Mask Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 60 of 114



Plot 7-83. Upper Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

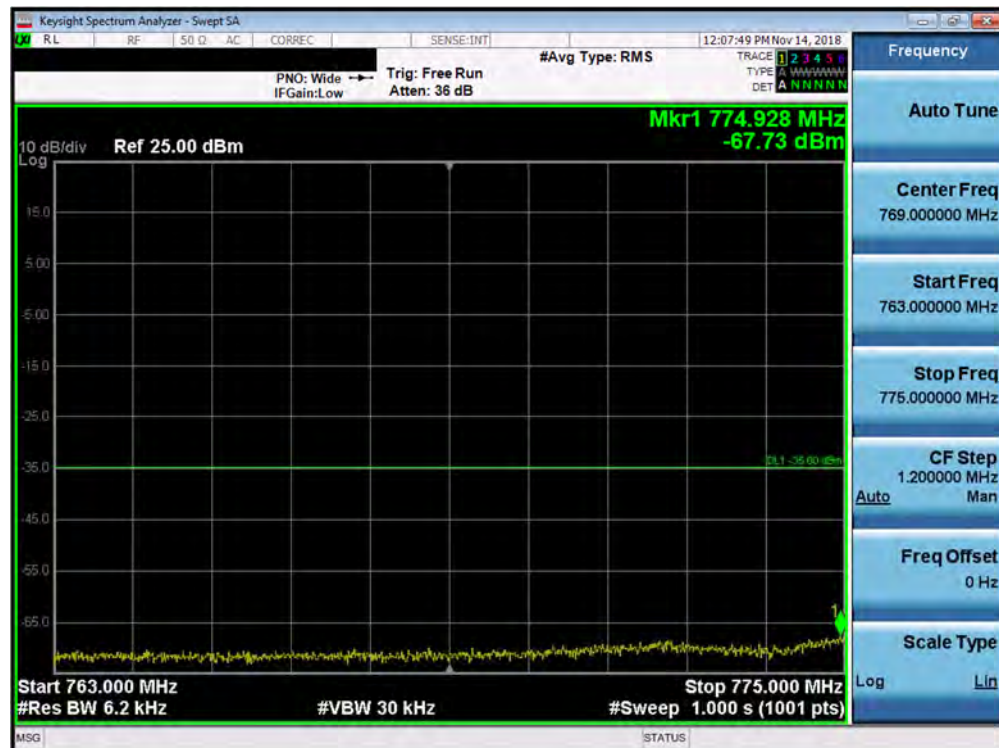


Plot 7-84. Upper Emission Mask Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 61 of 114		



Plot 7-85. Lower Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-86. Lower Emission Mask Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42				Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 62 of 114



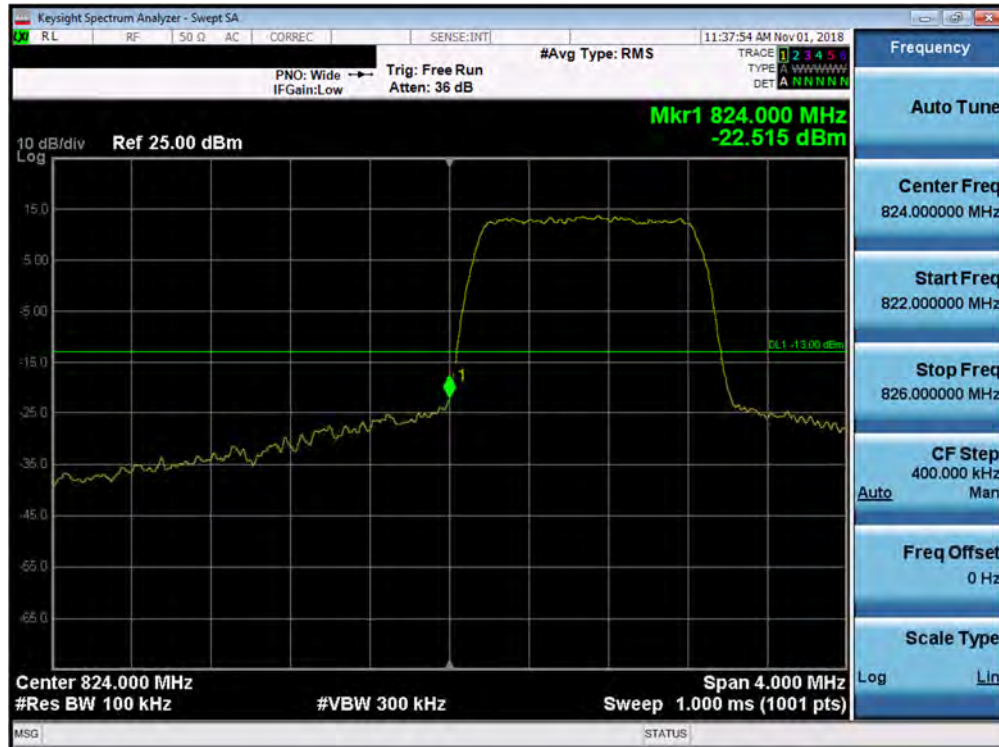
Plot 7-87. Upper Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)



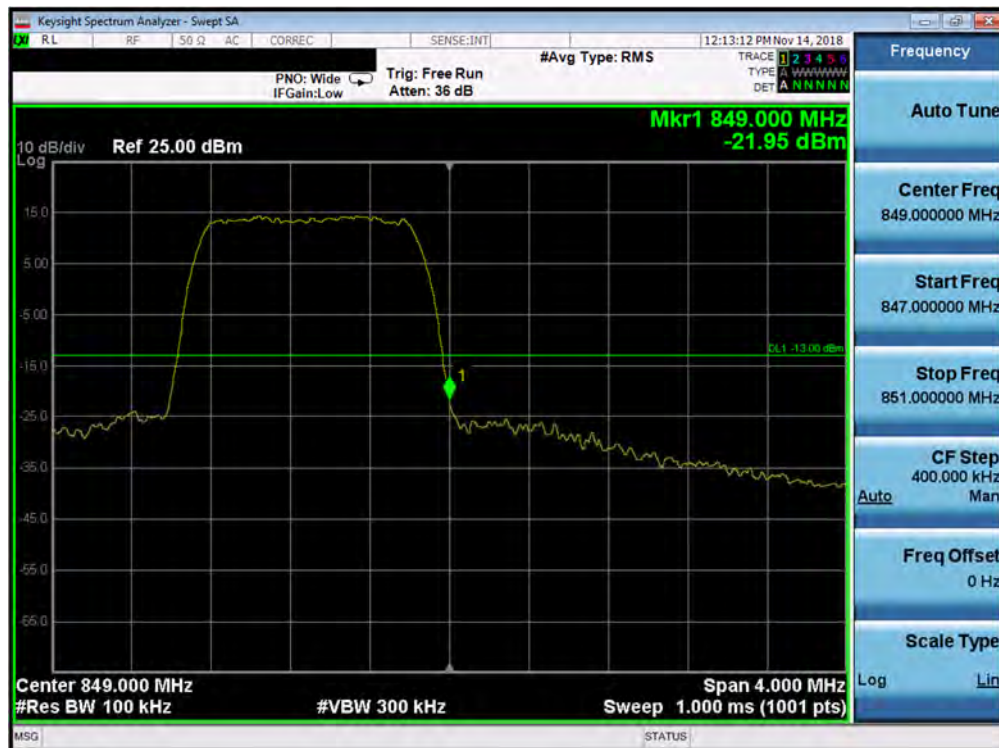
Plot 7-88. Upper Emission Mask Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 63 of 114		

Band 5

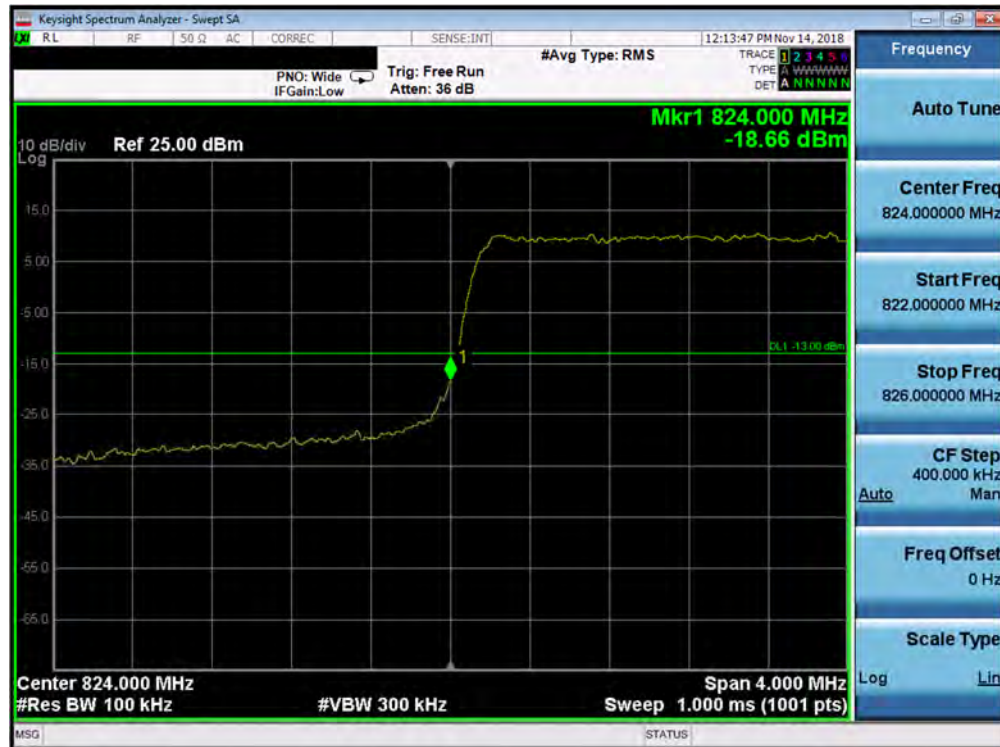


Plot 7-89. Lower Band Edge Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-90. Upper Band Edge Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 64 of 114

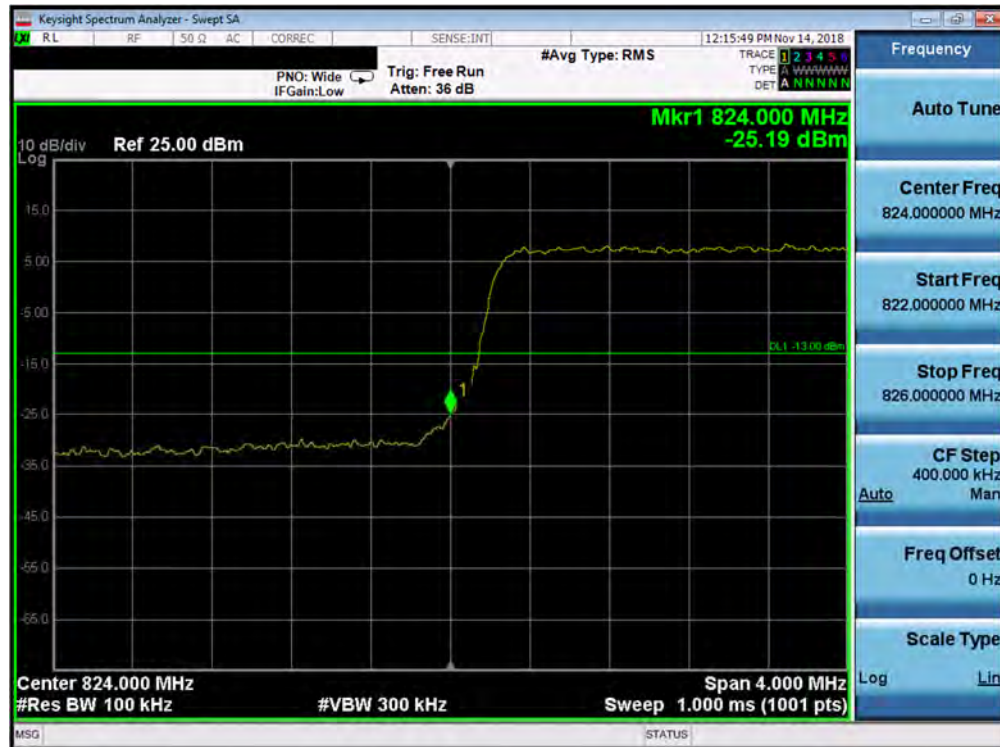


Plot 7-91. Lower Band Edge Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-92. Upper Band Edge Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	EUT Type: Portable Handset	Page 65 of 114	

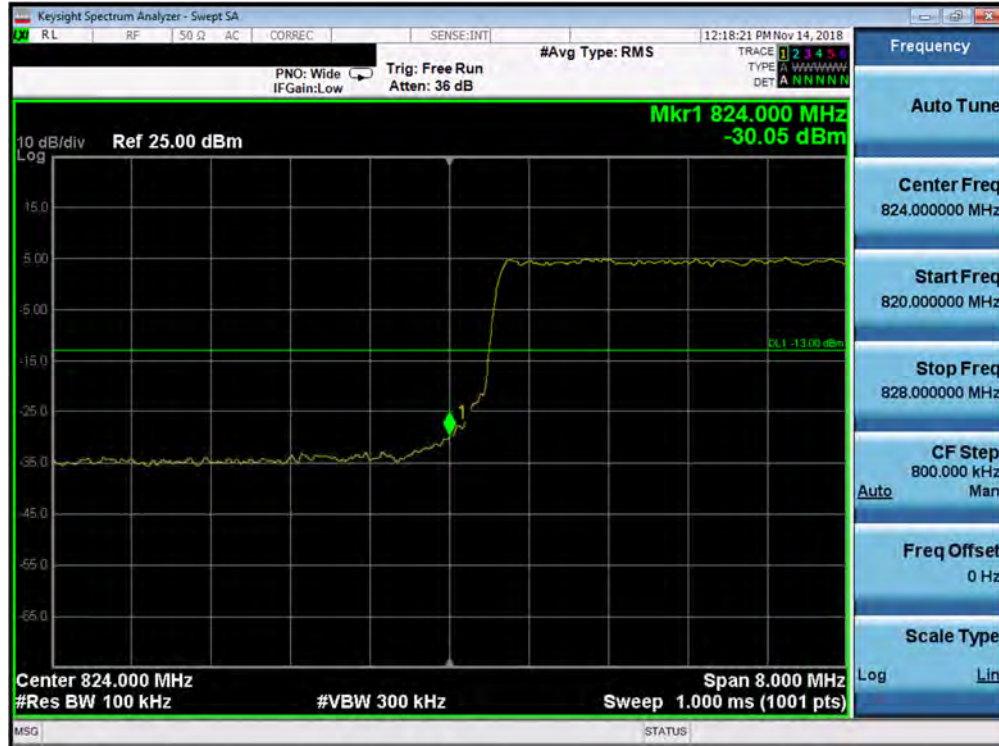


Plot 7-93. Lower Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-94. Upper Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 66 of 114



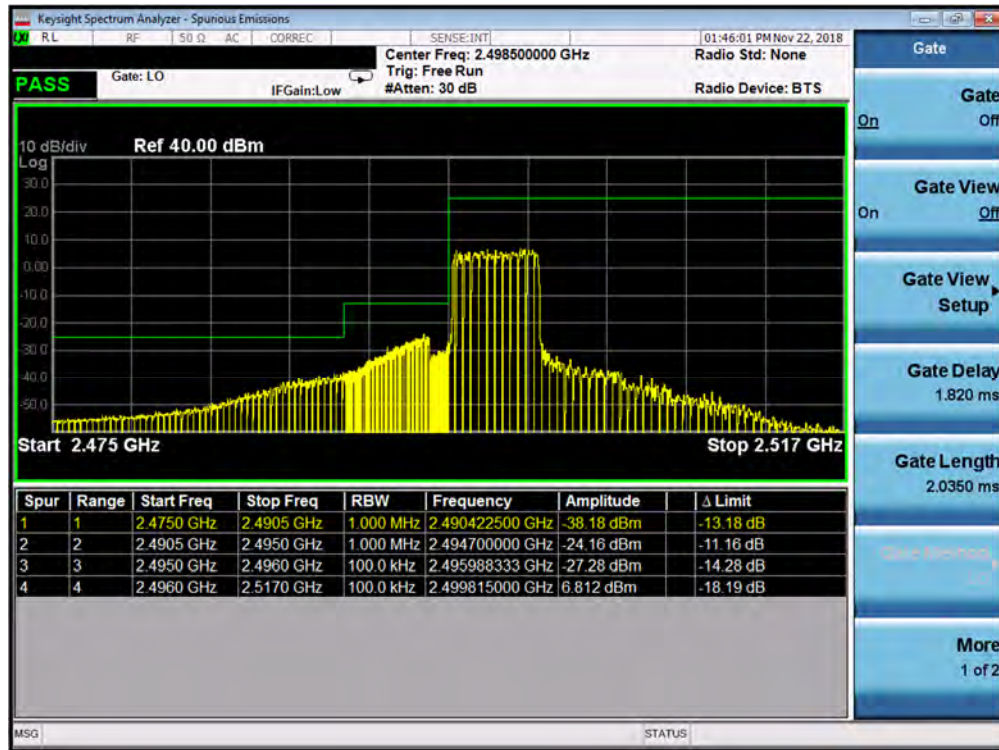
Plot 7-95. Lower Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)



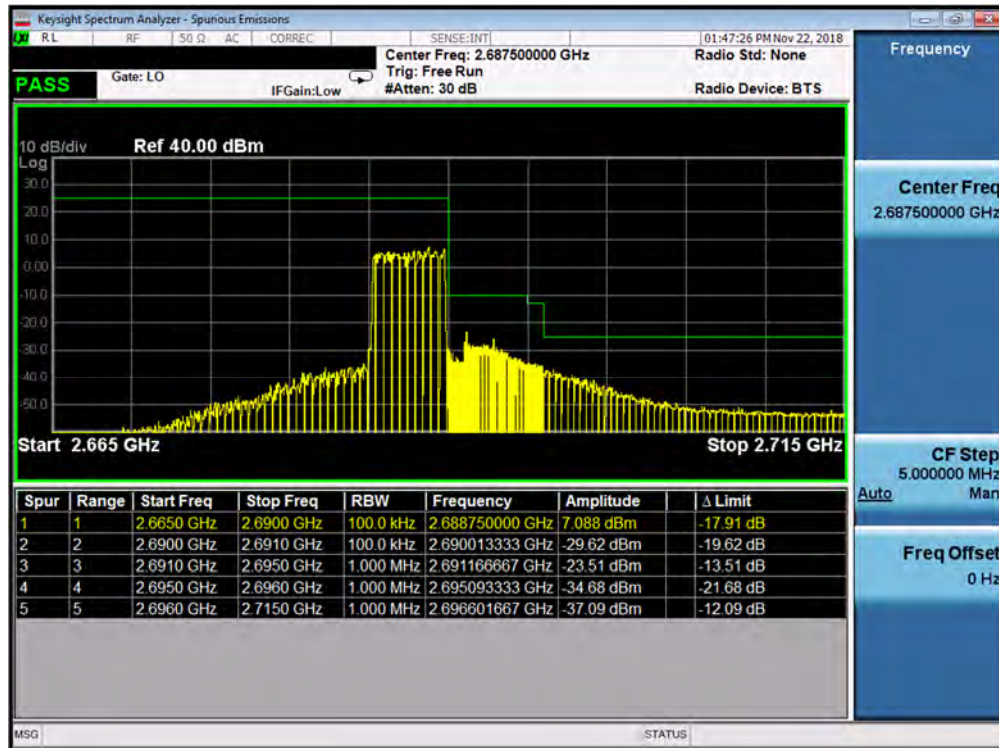
Plot 7-96. Upper Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 67 of 114	

Band 41

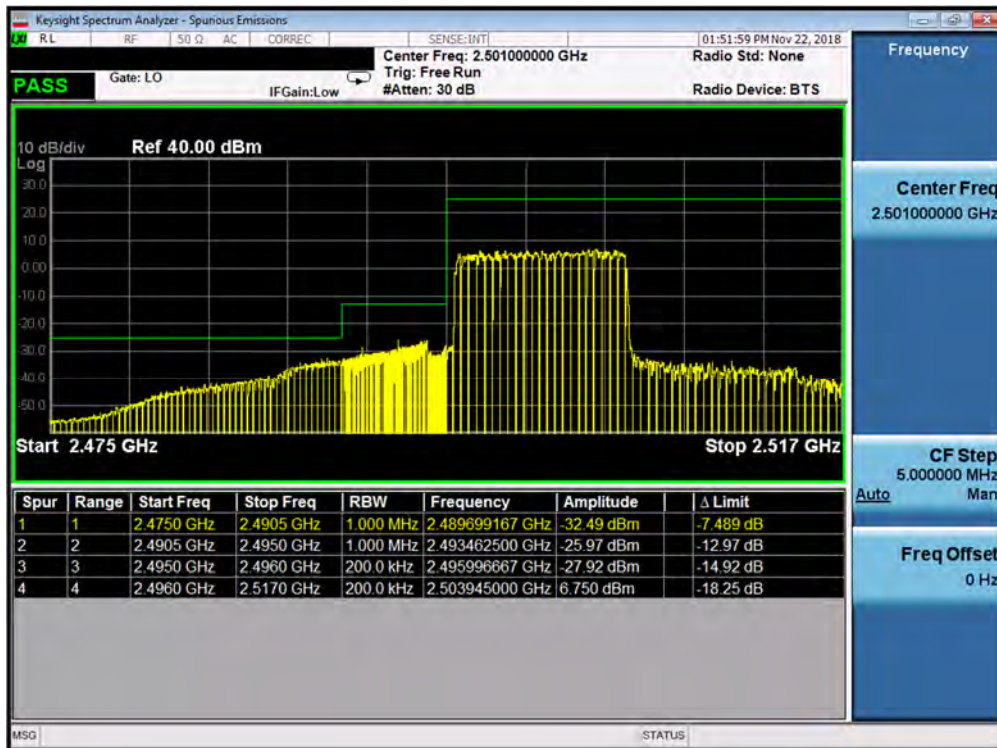


Plot 7-97. Lower ACP Plot at 2496 MHz (Band 41 - 5.0MHz QPSK - Full RB Configuration)

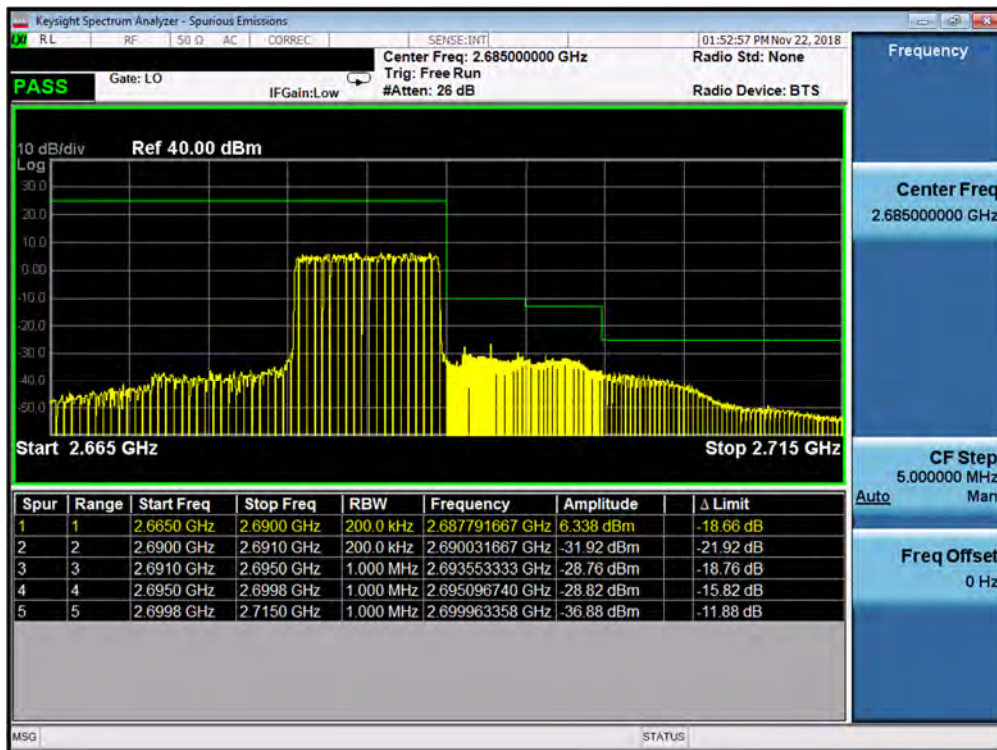


Plot 7-98. Upper ACP Plot (Band 41 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 68 of 114

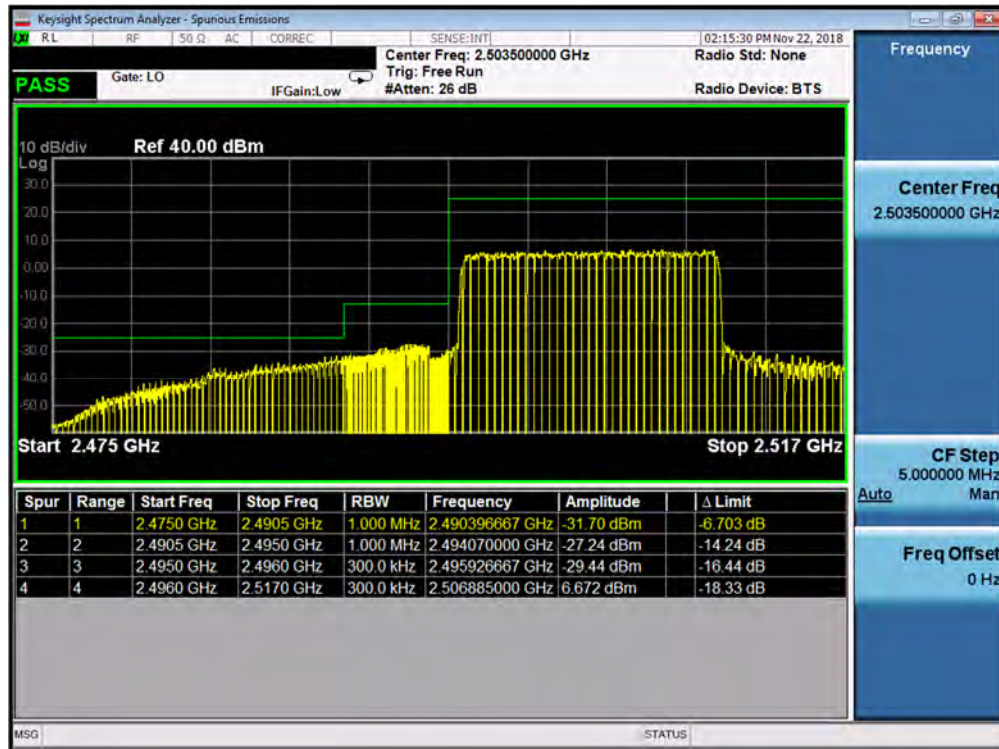


Plot 7-99. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - Full RB Configuration)

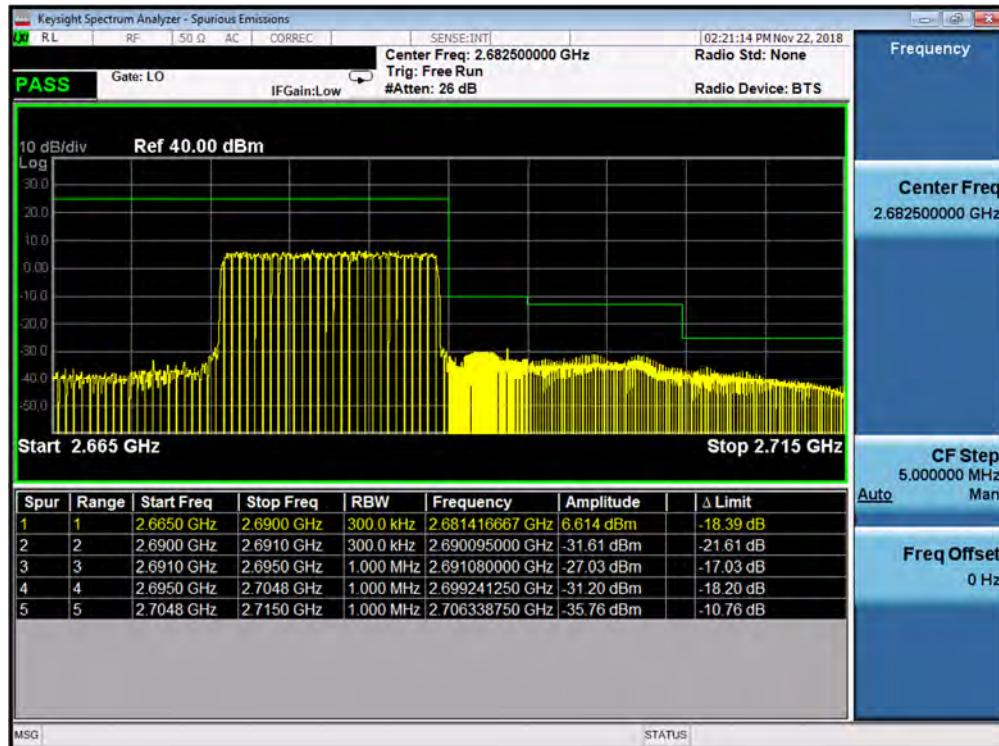


Plot 7-100. Upper ACP Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 69 of 114		

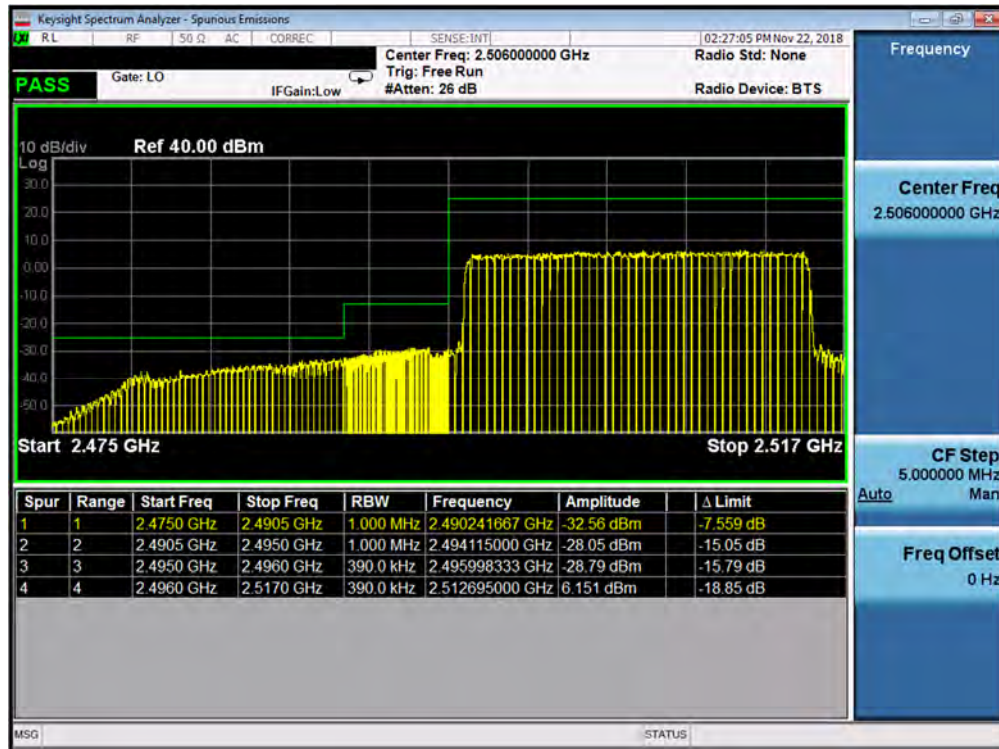


Plot 7-101. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - Full RB Configuration)

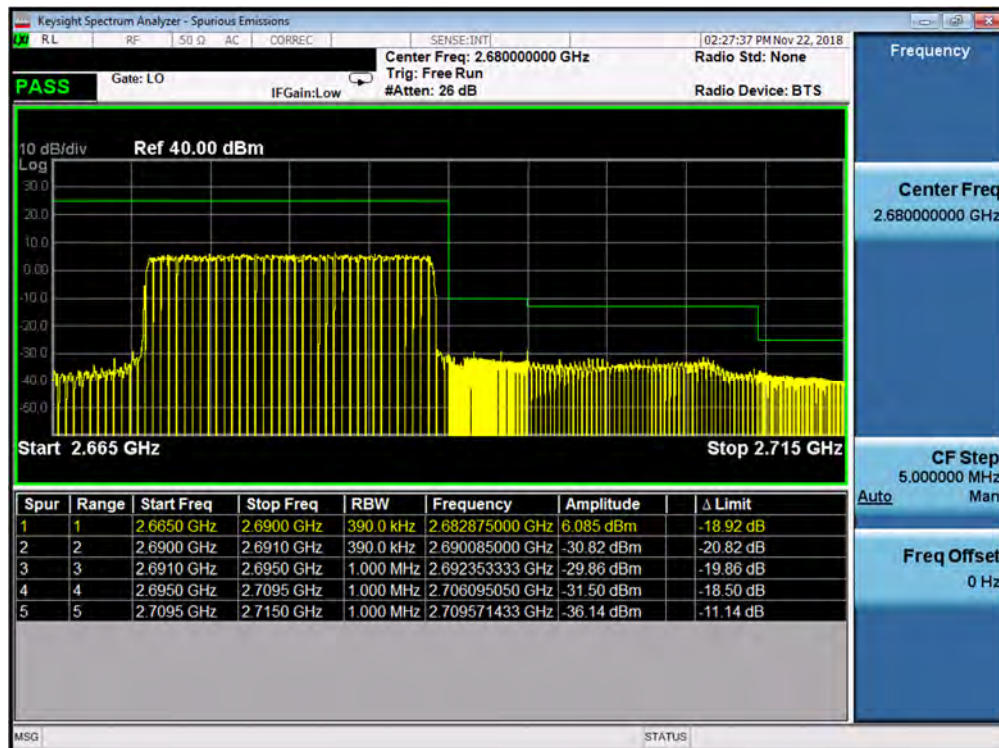


Plot 7-102. Upper ACP Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset			Page 70 of 114



Plot 7-103. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-104. Upper ACP Plot (Band 41 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 71 of 114		

7.5 Uplink Carrier Aggregation

§27.53(m)

Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at 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.

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 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 7-4. Test Instrument & Measurement Setup

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 72 of 114

Test Notes

1. Uplink carrier aggregation is only supported in this EUT while operating in Power Class 2 and 3.
2. Conducted power and spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device. The worst case (highest) powers were found while operating with QPSK modulation, as shown in Table 7-4, 7-6, 7-8, and 7-10 below, with both carriers set to transmit using 1RB.
3. 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.

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 73 of 114

Uplink CA Configuration 41C Power Class 3

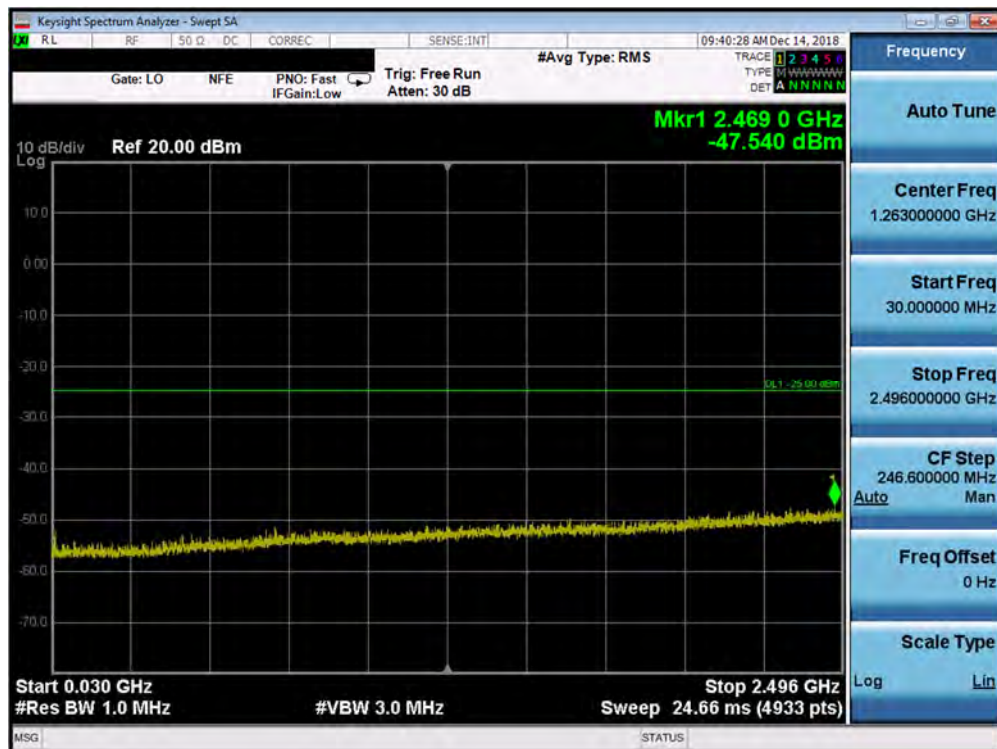
Power State	PCC							SCC							Power ULCA Tx.Power (dBm)
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	
Max	LTE B41	5	39675	2498.5	QPSK	1	24	LTE B41	20	39792	2510.2	QPSK	1	0	25.16
Max	LTE B41	10	39700	2501	QPSK	1	49	LTE B41	15	39820	2513	QPSK	1	0	24.35
Max	LTE B41	10	39700	2501	QPSK	1	49	LTE B41	20	39844	2515.4	QPSK	1	0	24.47
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	10	39845	2515.5	QPSK	1	0	24.34
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	15	39875	2518.5	QPSK	1	0	24.38
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	20	39896	2520.6	QPSK	1	0	24.27
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	5	39867	2517.7	QPSK	1	0	24.27
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	10	39894	2520.4	QPSK	1	0	24.38
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	15	39921	2523.1	QPSK	1	0	24.41
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	24.15
Max	LTE B41	10	40620	2593	QPSK	1	49	LTE B41	15	40740	2605	QPSK	1	0	24.14
Max	LTE B41	10	40620	2593	QPSK	1	49	LTE B41	20	40764	2607.4	QPSK	1	0	24.23
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	10	40740	2605	QPSK	1	0	24.12
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	15	40770	2608	QPSK	1	0	24.16
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	20	40791	2610.1	QPSK	1	0	24.06
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	5	40737	2604.7	QPSK	1	0	24.12
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	10	40764	2607.4	QPSK	1	0	24.13
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	15	40791	2610.1	QPSK	1	0	24.18
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	23.90
Max	LTE B41	5	41565	2687.5	QPSK	1	0	LTE B41	20	41448	2675.8	QPSK	1	99	25.25
Max	LTE B41	10	41540	2685	QPSK	1	0	LTE B41	15	41420	2673	QPSK	1	74	24.11
Max	LTE B41	10	41540	2685	QPSK	1	0	LTE B41	20	41396	2670.6	QPSK	1	99	24.17
Max	LTE B41	15	41515	2682.5	QPSK	1	0	LTE B41	10	41395	2670.5	QPSK	1	49	24.12
Max	LTE B41	15	41515	2682.5	QPSK	1	0	LTE B41	15	41365	2667.5	QPSK	1	74	24.12
Max	LTE B41	15	41515	2682.5	QPSK	1	0	LTE B41	20	41344	2665.4	QPSK	1	99	24.17
Max	LTE B41	20	41490	2680	QPSK	1	0	LTE B41	5	41373	2668.3	QPSK	1	24	24.16
Max	LTE B41	20	41490	2680	QPSK	1	0	LTE B41	10	41346	2665.6	QPSK	1	49	24.21
Max	LTE B41	20	41490	2680	QPSK	1	0	LTE B41	15	41319	2662.9	QPSK	1	74	24.23
Max	LTE B41	20	41490	2680	QPSK	1	0	LTE B41	20	41292	2660.2	QPSK	1	99	24.17

Table 7-3. Conducted Powers (B41 – Various Combinations of PCC: RB Size 1, SCC: RB Size 1)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 74 of 114

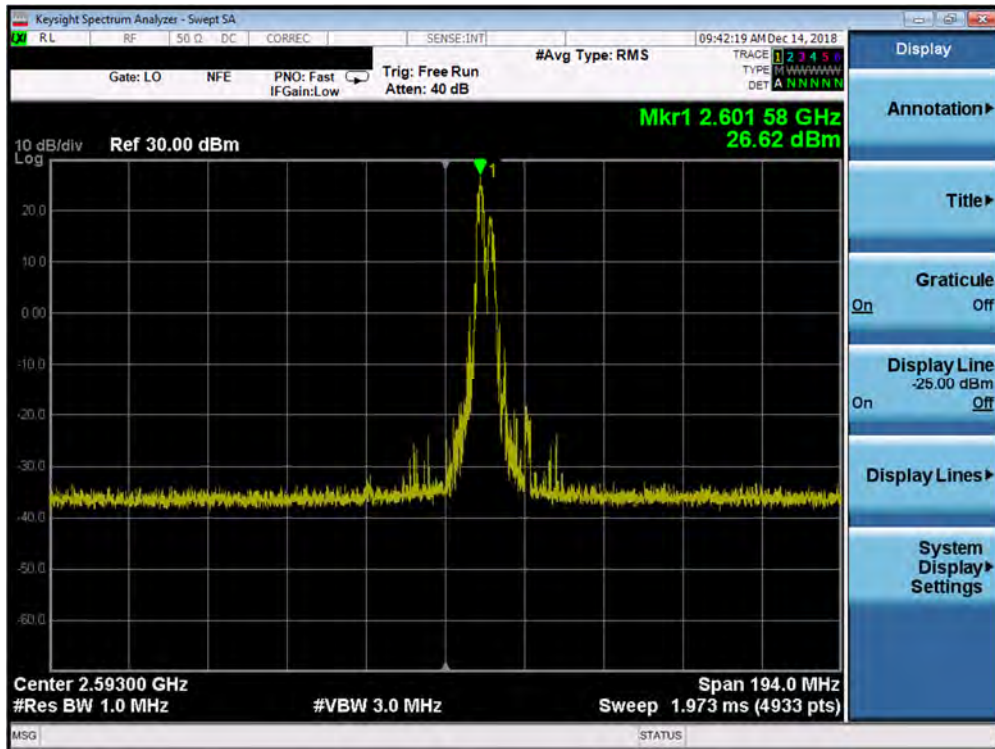
Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	0	20.55
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	99	17.50
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	99	14.10
Max	LTE B41	20	39750	2506	QPSK	1	50	LTE B41	20	39948	2525.8	QPSK	1	50	21.26
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	25.28
Max	LTE B41	20	39750	2506	QPSK	100	0	LTE B41	20	39948	2525.8	QPSK	100	0	22.74
Max	LTE B41	20	39750	2506	16-QAM	100	0	LTE B41	20	39948	2525.8	16-QAM	100	0	21.65
Max	LTE B41	20	39750	2506	64-QAM	100	0	LTE B41	20	39948	2525.8	64-QAM	100	0	20.38

Table 7-4. Conducted Powers (B41 with Various Combinations for 20+20MHz Channel Bandwidth)

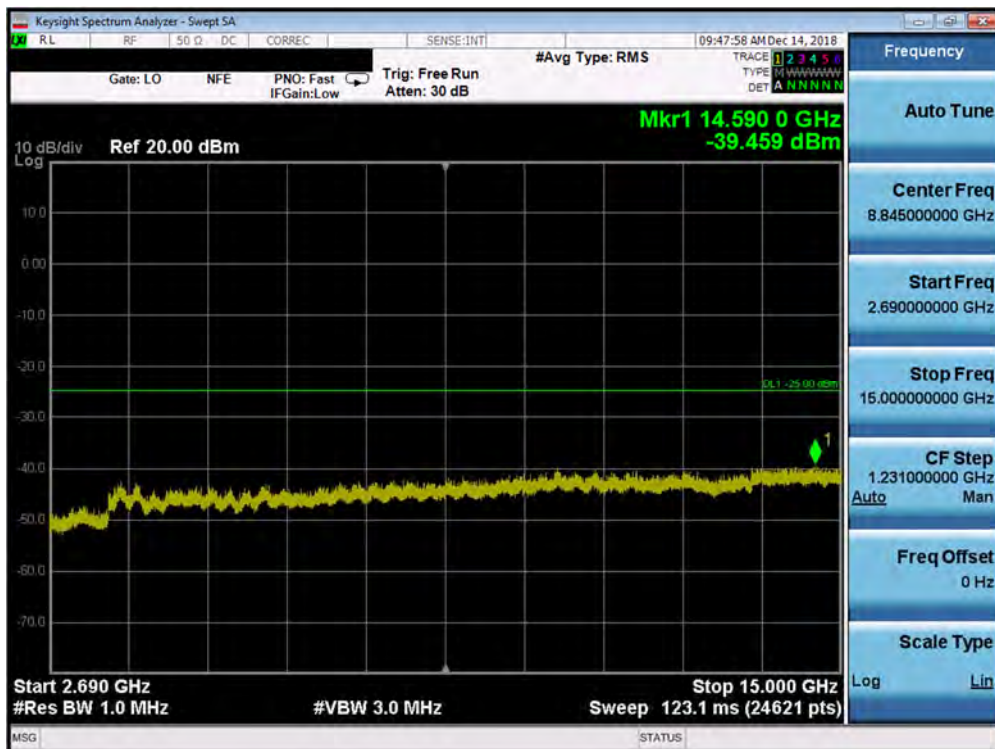


Plot 7-105. Conducted Spurious Plot (Band 41 –QPSK – 20MHz PCC 1/99, 20MHz SCC 1/0 – Mid Channel)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	EUT Type: Portable Handset		Page 75 of 114	

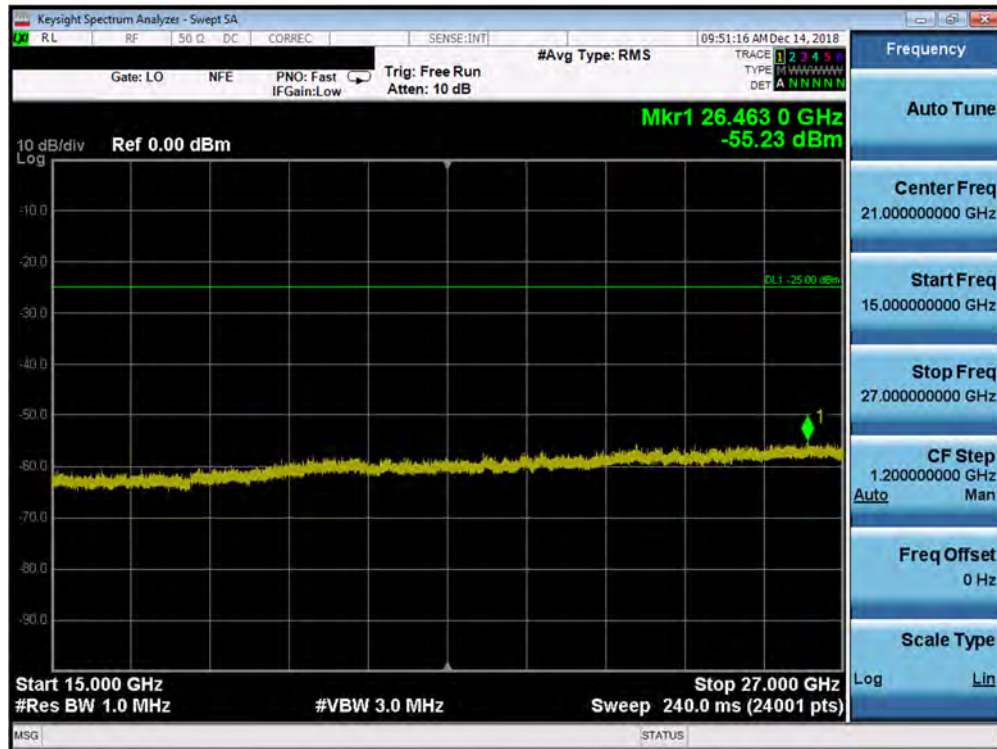


Plot 7-106. Conducted Spurious Plot (Band 41 –QPSK – 20MHz PCC 1/99, 20MHz SCC 1/0 – Mid Channel)

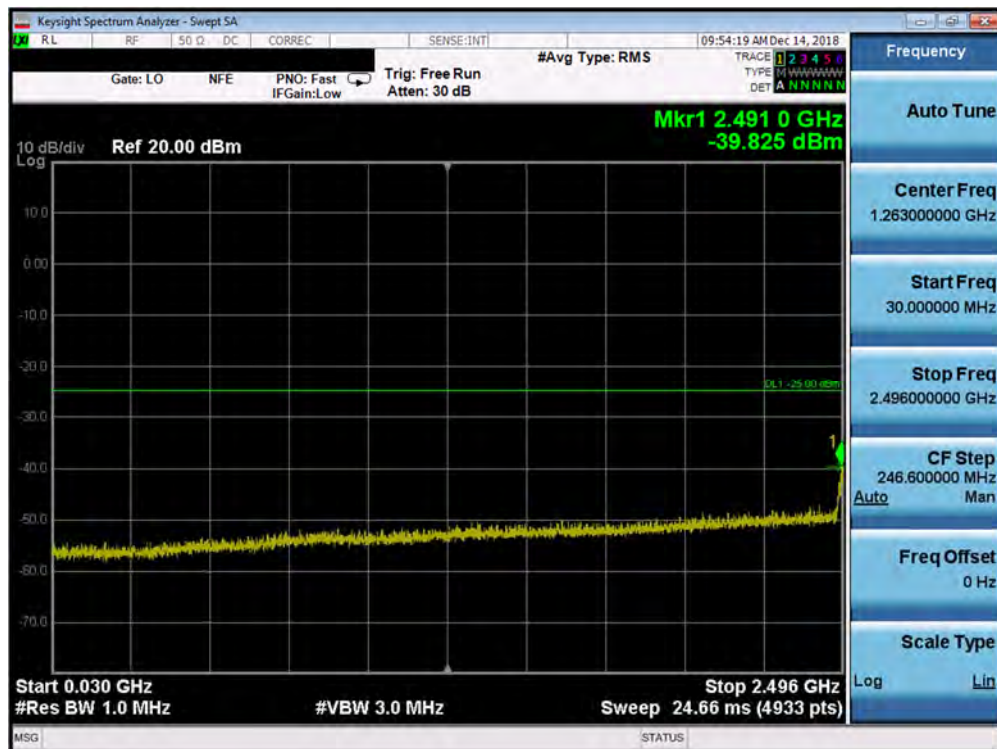


Plot 7-107. Conducted Spurious Plot (Band 41 –QPSK – 20MHz PCC 1/99, 20MHz SCC 1/0 – Mid Channel)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 76 of 114	

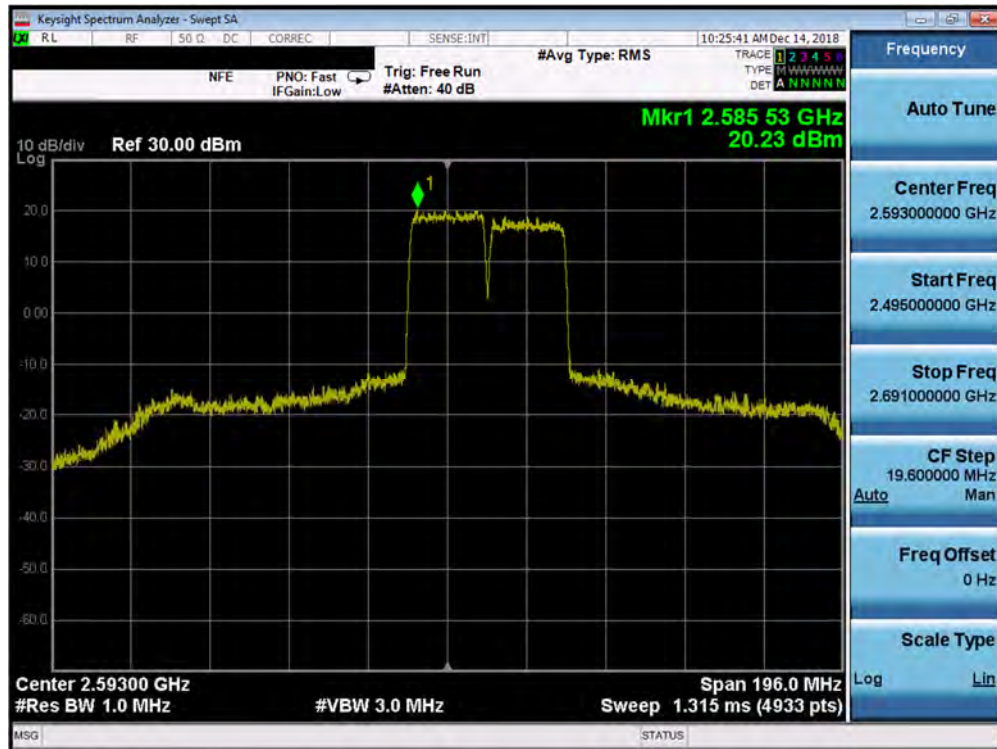


Plot 7-108. Conducted Spurious Plot (Band 41 –QPSK – 20MHz PCC 1/99, 20MHz SCC 1/0 – Mid Channel)

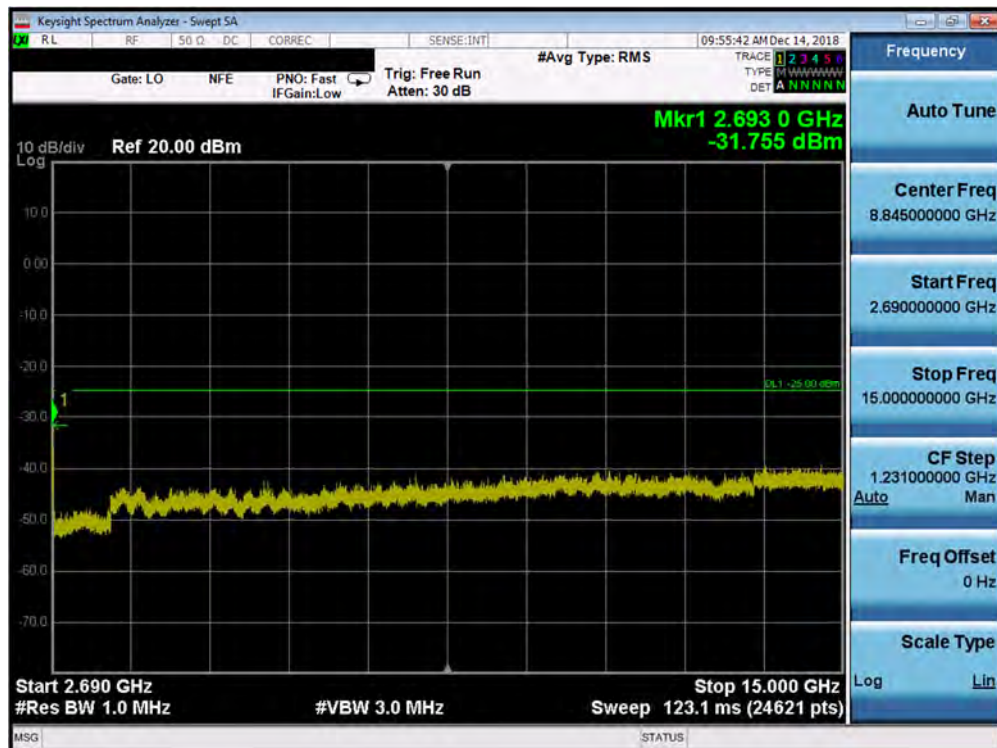


Plot 7-109. Conducted Spurious Plot (Band 41 - QPSK – 20MHz PCC 100/0, 20MHz SCC 100/0 – Mid Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 77 of 114

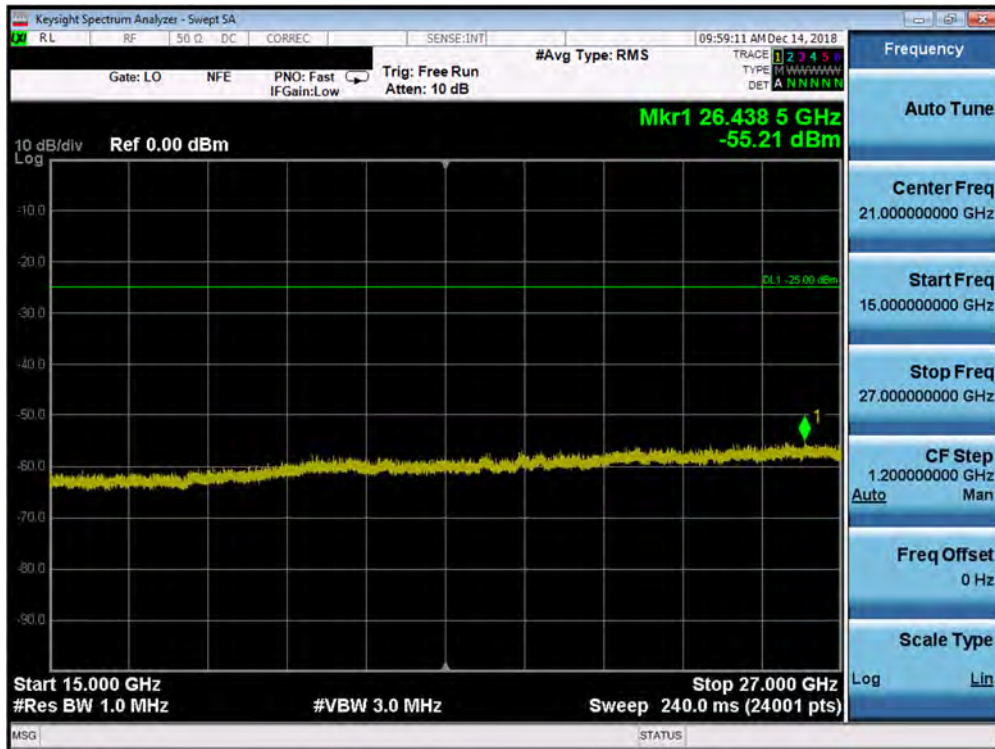


Plot 7-110. Conducted Spurious Plot (Band 41 - QPSK – 20MHz PCC 100/0, 20MHz SCC 100/0 – Mid Channel)

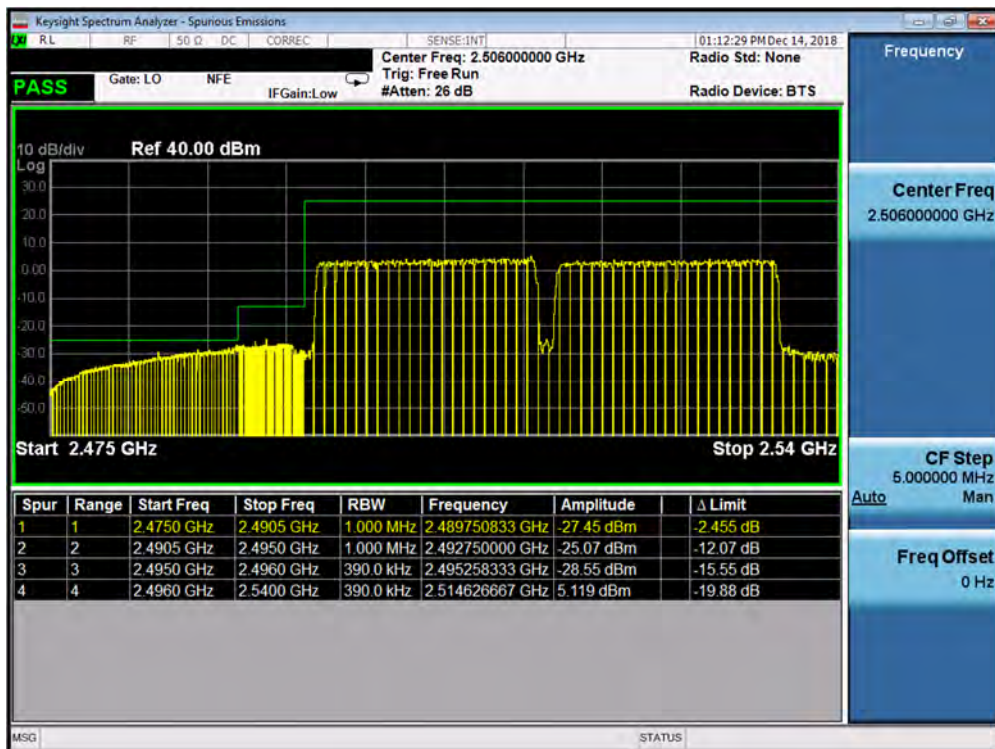


Plot 7-111. Conducted Spurious Plot (Band 41 - QPSK – 20MHz PCC 100/0, 20MHz SCC 100/0 – Mid Channel)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 78 of 114	

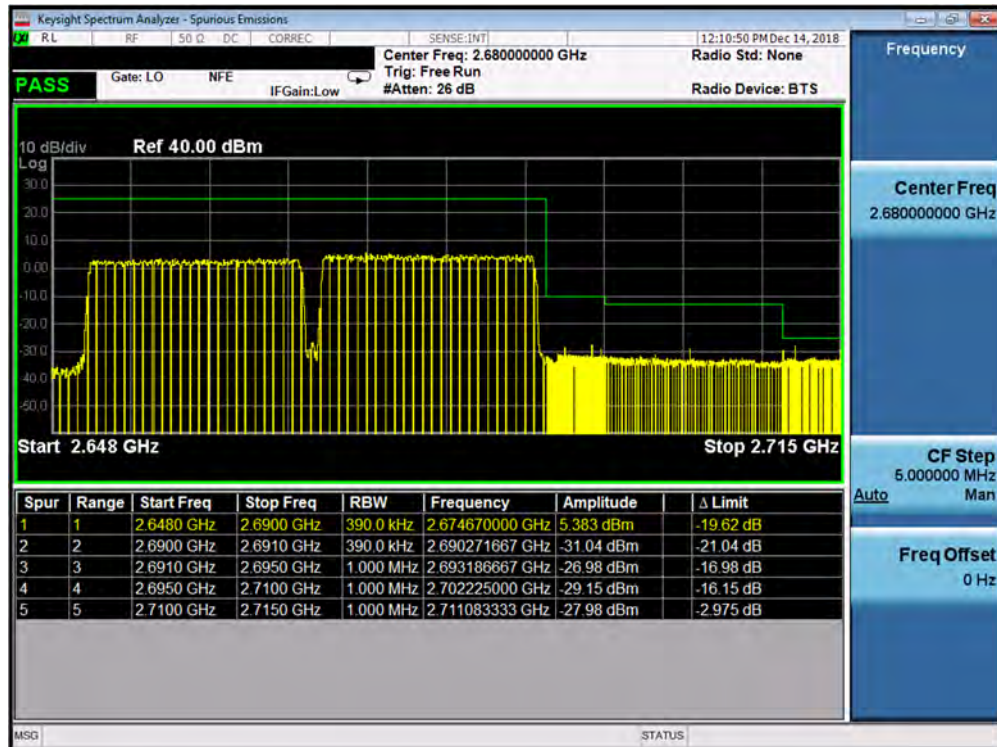


Plot 7-112. Conducted Spurious Plot (Band 41 - QPSK – 20MHz PCC 100/0, 20MHz SCC 100/0 – Mid Channel)



Plot 7-113. Lower Band Edge Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 79 of 114		



Plot 7-114. Upper Band Edge Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

FCC ID: A3LSCV42			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset			Page 80 of 114

7.6 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at 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. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $\geq 2 \times$ span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 81 of 114

Test Setup

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

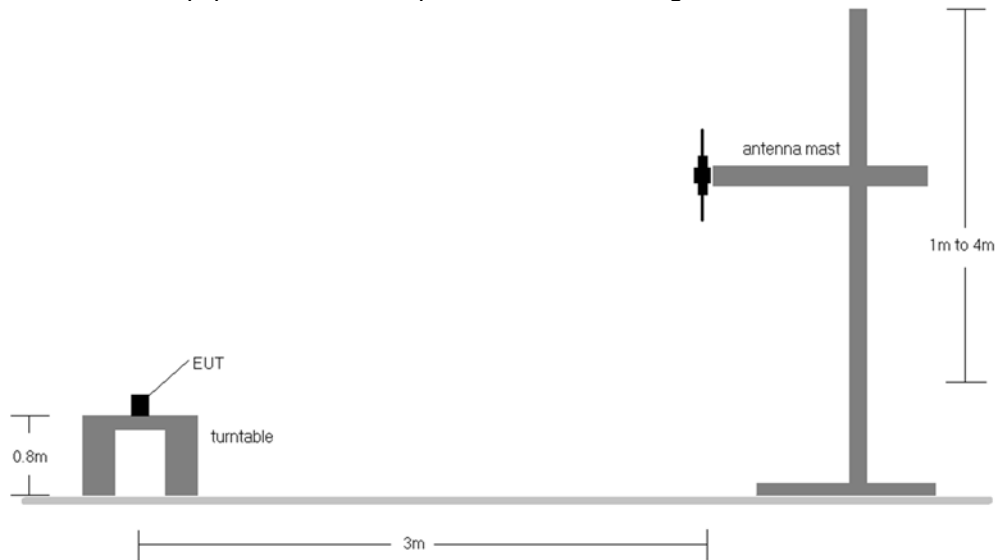


Figure 7-5. Radiated Test Setup <1GHz

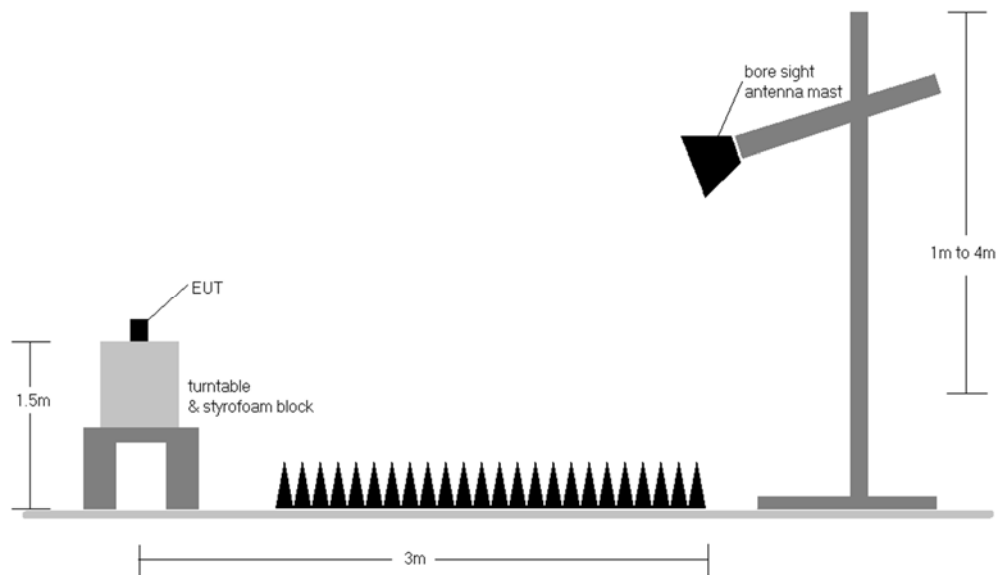


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

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

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 82 of 114

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	257	321	1 / 5	19.31	4.00	21.16	0.131	34.77	-13.61	23.31	0.214	36.99	-13.68
707.50	1.4	QPSK	H	267	306	1 / 0	20.54	4.22	22.81	0.182	34.77	-12.16	24.76	0.299	36.99	-12.23
715.30	1.4	QPSK	H	249	315	1 / 5	20.42	4.44	22.71	0.187	34.77	-12.06	24.86	0.306	36.99	-12.13
715.30	1.4	16-QAM	H	249	315	1 / 0	19.24	4.44	21.53	0.142	34.77	-13.25	23.68	0.233	36.99	-13.31
715.30	1.4	64-QAM	H	249	315	1 / 0	18.10	4.44	20.39	0.109	34.77	-14.38	22.54	0.180	36.99	-14.45
700.50	3	QPSK	H	128	158	1 / 14	17.64	4.01	19.51	0.089	34.77	-15.26	21.66	0.147	36.99	-15.33
707.50	3	QPSK	H	112	132	1 / 14	19.54	4.22	21.60	0.145	34.77	-13.17	23.75	0.237	36.99	-13.24
714.50	3	QPSK	H	124	149	1 / 0	19.85	4.41	22.11	0.163	34.77	-12.66	24.26	0.267	36.99	-12.73
714.50	3	16-QAM	H	124	149	1 / 0	18.44	4.41	20.71	0.118	34.77	-14.07	22.86	0.193	36.99	-14.13
714.50	3	64-QAM	H	124	149	1 / 0	16.81	4.41	19.07	0.081	34.77	-15.70	21.22	0.132	36.99	-15.77
701.50	5	QPSK	H	255	129	1 / 24	19.45	4.04	21.34	0.136	34.77	-13.43	23.49	0.223	36.99	-13.50
707.50	5	QPSK	H	274	123	1 / 24	20.02	4.22	22.09	0.162	34.77	-12.68	24.24	0.265	36.99	-12.75
713.50	5	QPSK	H	288	132	1 / 24	19.82	4.39	22.06	0.161	34.77	-12.71	24.21	0.264	36.99	-12.78
707.50	5	16-QAM	H	274	123	1 / 24	19.19	4.22	21.25	0.133	34.77	-13.52	23.40	0.219	36.99	-13.59
707.50	5	64-QAM	H	274	123	1 / 24	18.02	4.22	20.08	0.102	34.77	-14.69	22.23	0.167	36.99	-14.76
704.00	10	QPSK	H	280	133	1 / 49	20.23	4.12	22.19	0.166	34.77	-12.58	24.34	0.272	36.99	-12.65
707.50	10	QPSK	H	268	127	1 / 49	20.43	4.22	22.50	0.178	34.77	-12.28	24.65	0.291	36.99	-12.34
711.00	10	QPSK	H	241	148	1 / 0	20.44	4.32	22.61	0.182	34.77	-12.16	24.76	0.299	36.99	-12.23
711.00	10	16-QAM	H	241	148	1 / 49	18.91	4.32	21.08	0.128	34.77	-13.69	23.23	0.210	36.99	-13.76
711.00	10	64-QAM	H	241	148	1 / 0	17.71	4.32	19.88	0.097	34.77	-14.90	22.03	0.159	36.99	-14.96
715.30	1.4	QPSK	V	152	289	1 / 5	18.05	4.44	18.34	0.068	34.77	-16.43	20.49	0.112	36.99	-16.50
715.30	1.4 (WCP)	QPSK	H	144	183	1 / 5	14.38	4.44	16.66	0.046	34.77	-18.11	18.81	0.076	36.99	-18.18

Table 7-5. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	354	1	1 / 24	21.74	1.20	20.79	0.120	34.77	-13.98	22.94	0.197	36.99	-14.05
782.00	5	QPSK	H	354	6	1 / 24	21.84	1.20	20.89	0.123	34.77	-13.88	23.04	0.201	36.99	-13.95
784.50	5	QPSK	H	354	6	1 / 24	21.81	1.20	20.86	0.122	34.77	-13.91	23.01	0.200	36.99	-13.98
782.00	5	16-QAM	H	354	6	1 / 24	21.15	1.20	20.20	0.105	34.77	-14.57	22.35	0.172	36.99	-14.64
782.00	5	64-QAM	H	354	6	1 / 24	19.91	1.20	18.96	0.079	34.77	-15.81	21.11	0.129	36.99	-15.88
782.00	10	QPSK	H	358	6	1 / 49	21.93	1.20	20.98	0.125	34.77	-13.79	23.13	0.206	36.99	-13.86
782.00	10	16-QAM	H	358	6	1 / 49	20.77	1.20	19.82	0.096	34.77	-14.95	21.97	0.157	36.99	-15.02
782.00	10	64-QAM	H	358	6	1 / 49	19.80	1.20	18.85	0.077	34.77	-15.92	21.00	0.126	36.99	-15.99
782.00	10	QPSK	V	282	66	1 / 49	20.77	1.20	19.82	0.096	34.77	-14.95	21.97	0.157	36.99	-15.02
782.00	10 (WCP)	QPSK	H	383	48	1 / 49	11.12	6.24	15.21	0.033	34.77	-19.56	17.36	0.054	36.99	-19.63

Table 7-6. ERP Data (Band 13)

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 83 of 114	

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	367	12	1 / 5	21.38	1.50	20.73	0.118	38.45	-17.72	22.88	0.194	40.61	-17.73
836.50	1.4	QPSK	H	351	12	1 / 0	21.61	1.50	20.96	0.125	38.45	-17.49	23.11	0.205	40.61	-17.50
848.30	1.4	QPSK	H	353	14	1 / 0	20.39	1.50	19.74	0.094	38.45	-18.71	21.89	0.155	40.61	-18.72
836.50	1.4	16-QAM	H	351	12	1 / 0	20.84	1.50	20.19	0.104	38.45	-18.28	22.34	0.171	40.61	-18.27
836.50	1.4	64-QAM	H	351	12	1 / 5	20.01	1.50	19.36	0.088	38.45	-19.09	21.51	0.142	40.61	-19.10
825.50	3	QPSK	H	363	12	1 / 14	21.57	1.50	20.92	0.124	38.45	-17.53	23.07	0.203	40.61	-17.54
836.50	3	QPSK	H	357	11	1 / 0	22.01	1.50	21.36	0.137	38.45	-17.09	23.51	0.224	40.61	-17.10
847.50	3	QPSK	H	370	18	1 / 0	20.81	1.50	20.16	0.104	38.45	-18.29	22.31	0.170	40.61	-18.30
836.50	3	16-QAM	H	357	11	1 / 0	21.08	1.50	20.43	0.110	38.45	-18.02	22.58	0.181	40.61	-18.03
836.50	3	64-QAM	H	357	11	1 / 0	20.05	1.50	19.40	0.087	38.45	-19.05	21.55	0.143	40.61	-19.06
826.50	5	QPSK	H	354	12	1 / 0	21.67	1.50	21.02	0.126	38.45	-17.43	23.17	0.207	40.61	-17.44
836.50	5	QPSK	H	354	7	1 / 0	21.78	1.50	21.13	0.130	38.45	-17.32	23.28	0.213	40.61	-17.33
846.50	5	QPSK	H	3	9	1 / 0	21.38	1.50	20.73	0.118	38.45	-17.72	22.88	0.194	40.61	-17.73
836.50	5	16-QAM	H	354	7	1 / 0	20.93	1.50	20.28	0.107	38.45	-18.17	22.43	0.175	40.61	-18.18
836.50	5	64-QAM	H	354	7	1 / 0	19.86	1.50	19.21	0.083	38.45	-19.24	21.36	0.137	40.61	-19.25
829.00	10	QPSK	H	356	13	1 / 49	21.74	1.50	21.09	0.129	38.45	-17.56	23.24	0.211	40.61	-17.37
836.50	10	QPSK	H	6	5	1 / 0	21.68	1.50	21.03	0.127	38.45	-17.42	23.18	0.208	40.61	-17.43
844.00	10	QPSK	H	354	21	1 / 0	20.84	1.50	20.19	0.104	38.45	-18.26	22.34	0.171	40.61	-18.27
829.00	10	16-QAM	H	356	13	1 / 0	20.97	1.50	20.32	0.108	38.45	-18.13	22.47	0.177	40.61	-18.14
836.50	10	64-QAM	H	6	5	1 / 49	20.07	1.50	19.42	0.087	38.45	-19.03	21.57	0.144	40.61	-19.04
836.50	3	QPSK	V	90	292	1 / 0	19.06	1.50	18.43	0.070	38.45	-20.02	20.58	0.114	40.61	-20.03
836.50	3 (WCP)	QPSK	V	117	81	1 / 0	12.59	6.78	17.22	0.053	38.45	-21.23	19.37	0.086	40.61	-21.24

Table 7-7. ERP Data (Band 5)

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	EUT Type: Portable Handset	Page 84 of 114	

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	EIRP [Watts]	ERP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	H	113	295	1 / 0	13.16	7.89	21.05	0.127	33.01	-11.96
2593.00	5	QPSK	H	113	295	1 / 0	13.49	7.71	21.20	0.132	33.01	-11.81
2687.50	5	QPSK	H	113	295	1 / 0	13.13	7.52	20.65	0.116	33.01	-12.36
2593.00	5	16-QAM	H	113	295	1 / 24	13.71	7.71	21.42	0.139	33.01	-11.59
2593.00	5	64-QAM	H	113	295	1 / 0	11.73	7.71	19.44	0.088	33.01	-13.57
2505.00	10	QPSK	H	112	299	1 / 49	13.51	7.89	21.40	0.138	33.01	-11.61
2593.00	10	QPSK	H	112	299	1 / 49	14.10	7.71	21.81	0.152	33.01	-11.20
2685.00	10	QPSK	H	112	299	1 / 49	13.60	7.53	21.13	0.130	33.01	-11.88
2593.00	10	16-QAM	H	112	299	1 / 0	12.87	7.71	20.58	0.114	33.01	-12.43
2593.00	10	64-QAM	H	112	299	1 / 0	12.74	7.71	20.45	0.111	33.01	-12.56
2507.50	15	QPSK	H	115	385	1 / 0	14.96	7.88	22.84	0.192	33.01	-10.17
2593.00	15	QPSK	H	120	239	1 / 0	14.85	7.71	22.56	0.180	33.01	-10.45
2682.50	15	QPSK	H	113	203	1 / 74	14.04	7.53	21.57	0.144	33.01	-11.44
2507.50	15	16-QAM	H	115	385	1 / 0	14.34	7.88	22.22	0.167	33.01	-10.79
2507.50	15	64-QAM	H	115	385	1 / 0	13.56	7.88	21.44	0.139	33.01	-11.57
2510.00	20	QPSK	H	104	293	1 / 0	14.52	7.88	22.40	0.174	33.01	-10.61
2593.00	20	QPSK	H	104	293	1 / 0	14.78	7.71	22.49	0.177	33.01	-10.52
2680.00	20	QPSK	H	104	293	1 / 99	14.41	7.54	21.95	0.157	33.01	-11.07
2593.00	20	16-QAM	H	104	293	1 / 0	14.50	7.71	22.21	0.166	33.01	-10.80
2593.00	20	64-QAM	H	104	293	1 / 0	13.93	7.71	21.64	0.146	33.01	-11.37
2507.50	15	QPSK	V	121	299	1 / 0	14.07	7.88	21.95	0.157	33.01	-11.06
2507.50	15 (WCP)	QPSK	H	154	32	1 / 0	9.68	7.89	17.57	0.057	33.01	-15.44

Table 7-8. EIRP Data (Band 41)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 85 of 114

7.7 Radiated Spurious Emissions Measurements

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 vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

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 $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $\geq 2 \times$ span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 86 of 114

Test Setup

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

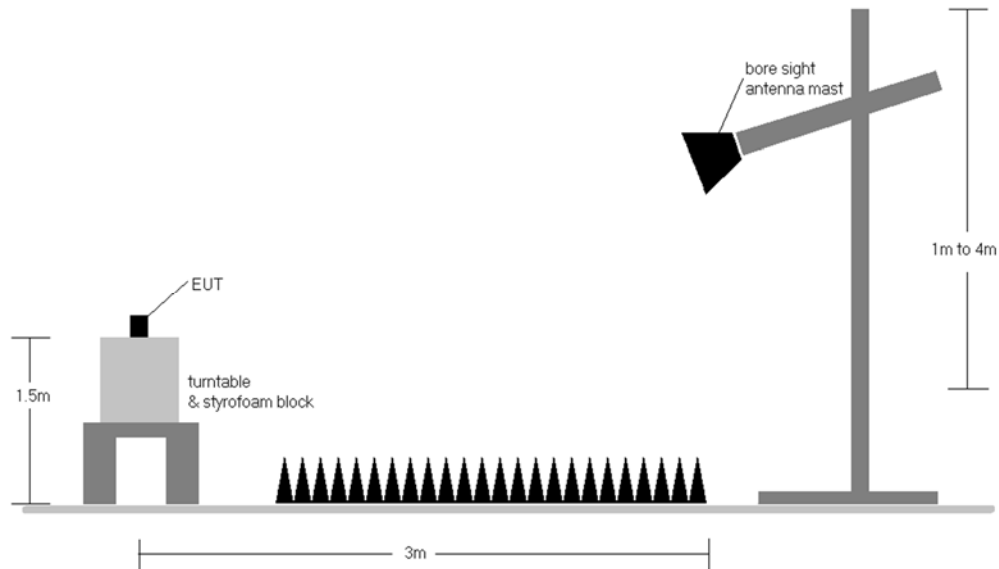


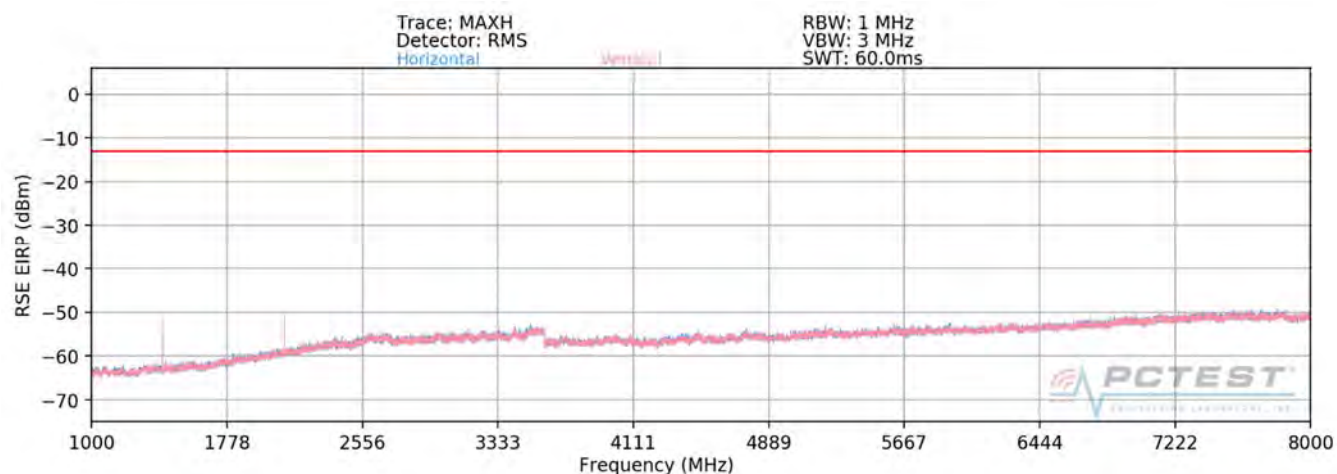
Figure 7-7. Test Instrument & Measurement Setup

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 87 of 114

Band 12



Plot 7-115. Radiated Spurious Plot above 1GHz (Band 12)

OPERATING FREQUENCY: 704.00 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 1.4 MHz
DISTANCE: 3 meters
LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1408.00	H	109	38	-62.28	7.54	-54.74	-41.7
2112.00	H	115	39	-67.93	8.85	-59.08	-46.1
2816.00	H	-	-	-71.51	10.12	-61.39	-48.4

Table 7-9. Radiated Spurious Data (Band 12 – Low Channel)

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 88 of 114

OPERATING FREQUENCY: 707.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	156	18	-62.59	7.63	-54.96	-42.0
2122.50	H	112	278	-67.52	8.86	-58.66	-45.7
2830.00	H	-	-	-71.91	10.10	-61.82	-48.8

Table 7-10. Radiated Spurious Data (Band 12 – Mid Channel)

OPERATING FREQUENCY: 711.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	145	0	-62.32	7.72	-54.60	-41.6
2133.00	H	108	330	-66.31	8.87	-57.44	-44.4
2844.00	H	-	-	-72.25	10.07	-62.18	-49.2

Table 7-11. Radiated Spurious Data (Band 12 – High Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 89 of 114

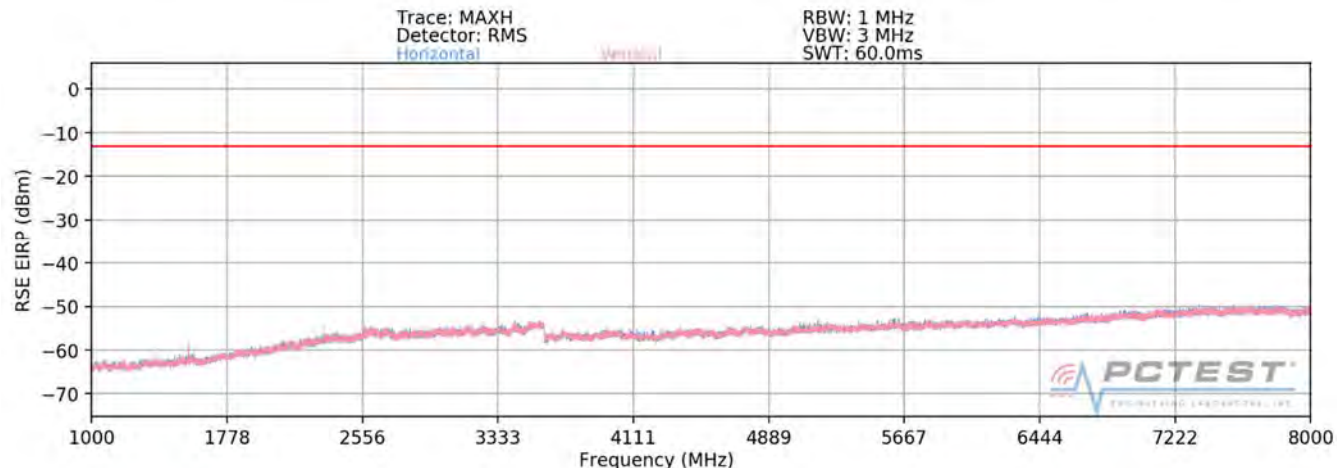
OPERATING FREQUENCY: 711.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	185	97	-64.68	7.72	-56.96	-44.0
2133.00	H	226	138	-71.22	8.87	-62.35	-49.3
2844.00	H	-	-	-72.34	10.07	-62.27	-49.3

Table 7-12. Radiated Spurious Data with WCP (Band 12 – High Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 90 of 114

Band 13



Plot 7-116. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY: 782.00 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 10.0 MHz
DISTANCE: 3 meters
LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	-	-	-71.56	9.43	-62.12	-49.1

Table 7-13. Radiated Spurious Data (Band 13 – Mid Channel)

MODULATION SIGNAL: QPSK
BANDWIDTH: 10.00 MHz
DISTANCE: 3 meters
NARROWBAND EMISSION LIMIT: -50 dBm
WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	103	97	-69.38	8.55	-60.83	-20.8

Table 7-14. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	EUT Type: Portable Handset		Page 91 of 114

MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.00 MHz
 DISTANCE: 3 meters
 NARROWBAND EMISSION LIMIT: -50 dBm
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	201	56	-73.48	8.55	-64.93	-24.9

Table 7-15. Radiated Spurious Data with WCP (Band 13 – 1559-1610MHz Band)

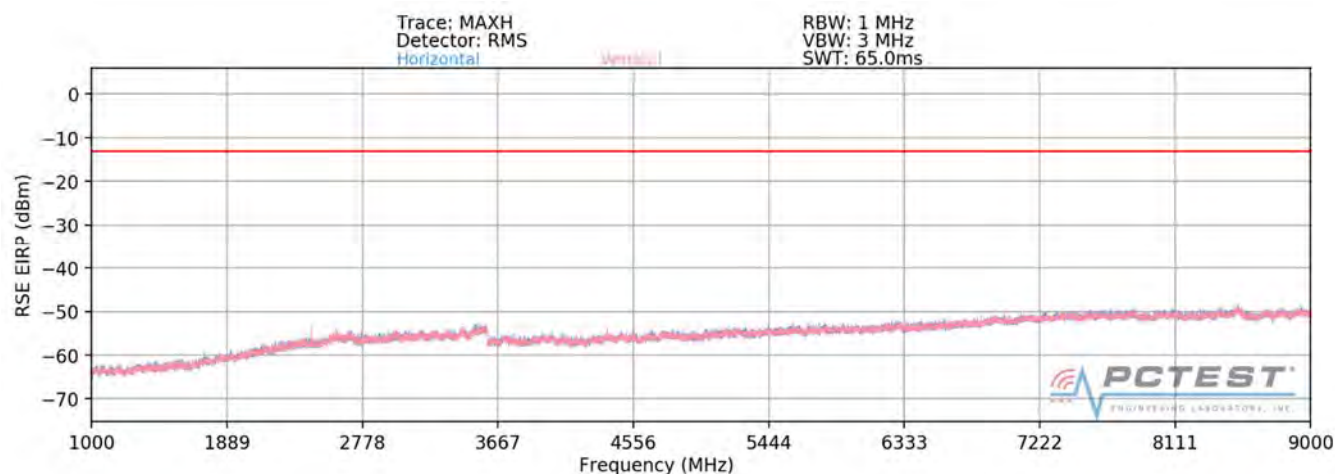
OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	108	53	-67.92	9.41	-58.51	-45.5
3128.00	H	-	-	-70.54	9.33	-61.21	-48.2

Table 7-16. Radiated Spurious Data with WCP (Band 13 – Mid Channel)

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 92 of 114

Band 5



Plot 7-117. Radiated Spurious Plot above 1GHz (Band 5)

OPERATING FREQUENCY: 825.50 MHz

MODULATION SIGNAL: QPSK

BANDWIDTH: 10.0 MHz

DISTANCE: 3 meters

LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1651.00	H	-	-	-73.36	8.95	-64.41	-64.4
2476.50	H	112	56	-67.88	9.66	-58.22	-58.2
3302.00	H	-	-	-70.76	9.58	-61.19	-61.2

Table 7-17. Radiated Spurious Data (Band 5 – Low Channel)

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 93 of 114

OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 26915
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	-	-	-73.73	8.95	-64.77	-64.8
2509.50	H	100	315	-67.41	9.75	-57.66	-57.7
3346.00	H	-	-	-70.13	9.60	-60.52	-60.5

Table 7-18. Radiated Spurious Data (Band 5 – Mid Channel)

OPERATING FREQUENCY: 847.50 MHz
 CHANNEL: 27025
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1695.00	H	-	-	-75.15	8.95	-66.20	-66.2
2542.50	H	115	208	-69.45	9.74	-59.71	-59.7
3390.00	H	-	-	-71.33	9.76	-61.57	-61.6

Table 7-19. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-11/17/2019	EUT Type: Portable Handset	Page 94 of 114

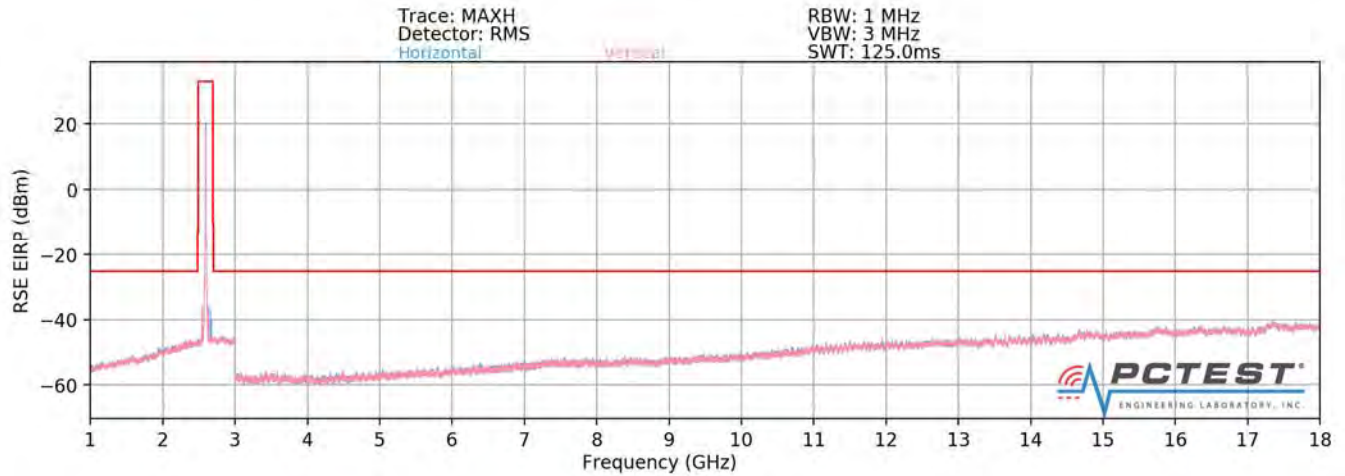
OPERATING FREQUENCY: 836.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	228	115	-72.05	8.95	-63.09	-63.1
2509.50	H	149	108	-70.14	9.75	-60.39	-60.4
3346.00	H	-	-	-70.14	9.60	-60.53	-60.5

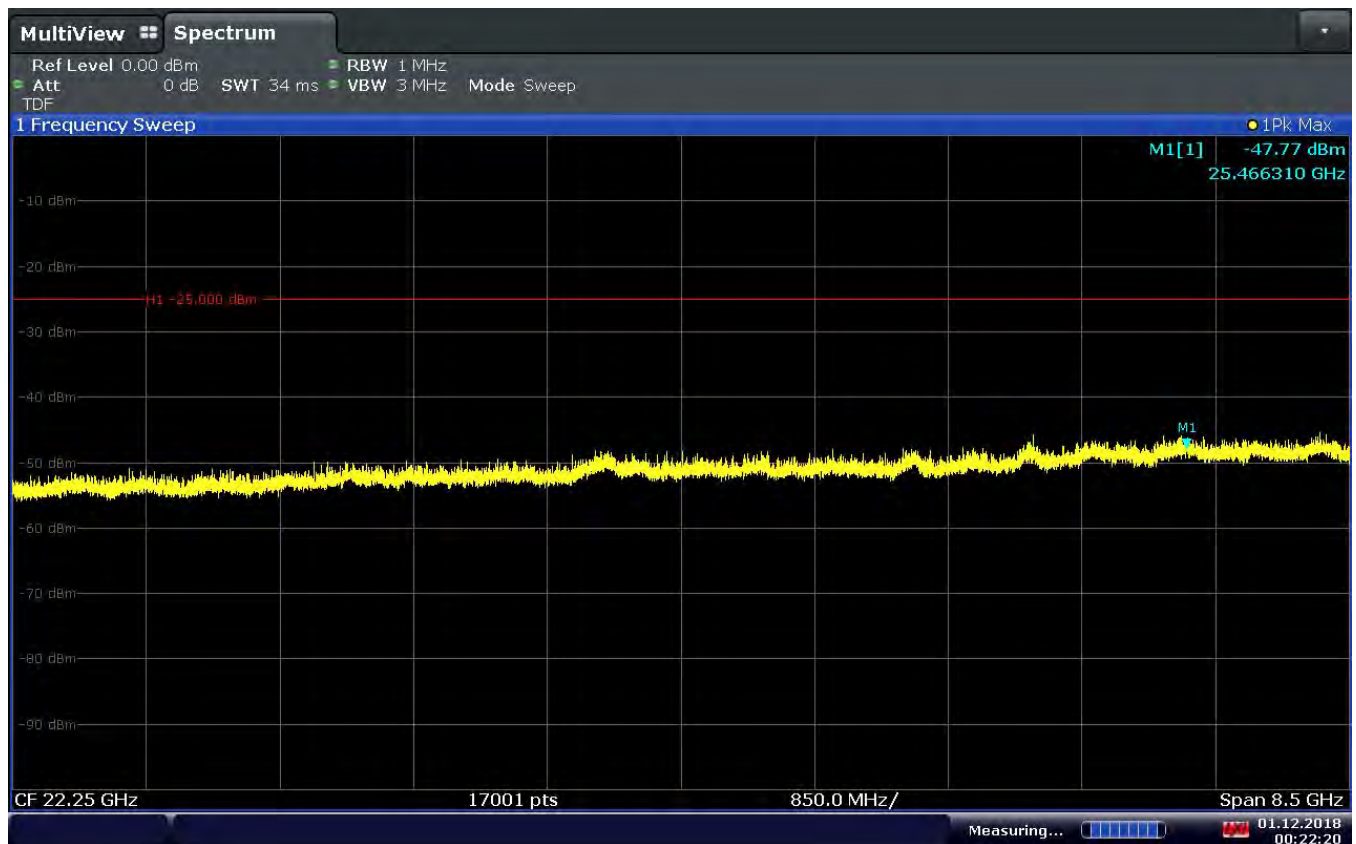
Table 7-20. Radiated Spurious Data with WCP (Band 5 – Mid Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 95 of 114

Band 41



Plot 7-118. Radiated Spurious Plot 1GHz - 18GHz (Band 41)



Plot 7-119. Radiated Spurious Plot 18GHz - 26.5GHz (Band 41)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 96 of 114

OPERATING FREQUENCY: 2506.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5012.00	H	138	207	-70.89	10.88	-60.01	-35.0
7518.00	H	167	67	-62.34	11.13	-51.21	-26.2
10024.00	H	-	-	-66.98	11.99	-55.00	-30.0

Table 7-21. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	H	116	294	-69.55	10.74	-58.81	-33.8
7779.00	H	121	60	-63.16	11.44	-51.72	-26.7
10372.00	H	-	-	-67.10	12.42	-54.67	-29.7

Table 7-22. Radiated Spurious Data (Band 41 – Mid Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	
			Page 97 of 114

OPERATING FREQUENCY: 2680.00 MHz
 CHANNEL: 41490
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5360.00	H	126	204	-68.26	10.70	-57.56	-32.6
8040.00	H	115	39	-60.63	11.16	-49.47	-24.5
10720.00	H	-	-	-66.59	12.59	-53.99	-29.0

Table 7-23. Radiated Spurious Data (Band 41 – High Channel)

OPERATING FREQUENCY: 2506.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5012.00	H	115	10	-69.75	10.74	-59.01	-34.0
7518.00	H	238	255	-64.14	11.44	-52.70	-27.7
10024.00	H	-	-	-67.09	12.42	-54.66	-29.7

Table 7-24. Radiated Spurious Data with WCP (Band 41 – Low Channel)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 98 of 114

7.8 Uplink Carrier Aggregation Radiated Measurements

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 vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak 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 v02r02 – 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 $\geq 3 \times$ RBW
3. No. of sweep points $\geq 2 \times$ span / RBW
4. Detector = RMS
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. The trace was allowed to stabilize

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 99 of 114	

Test Setup

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

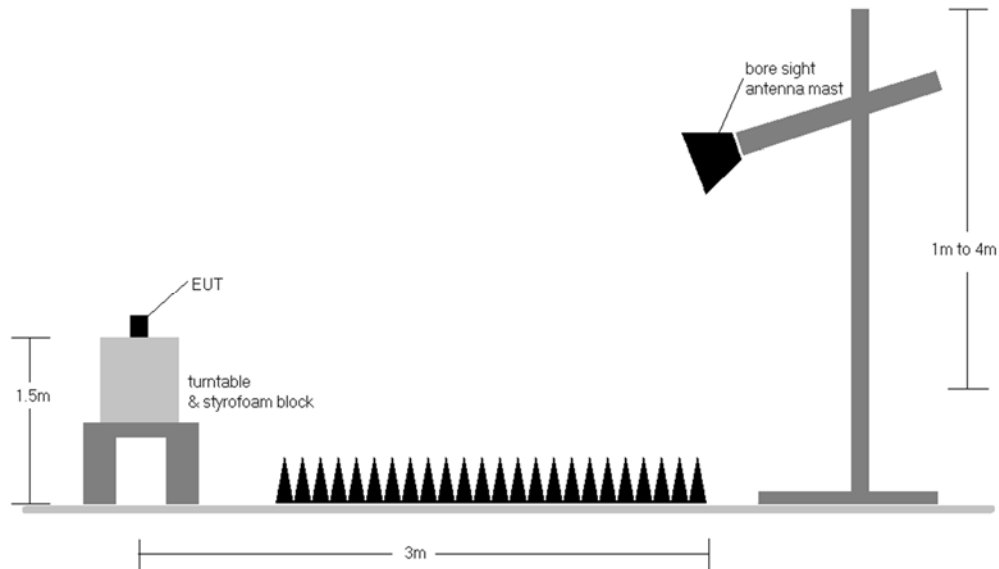


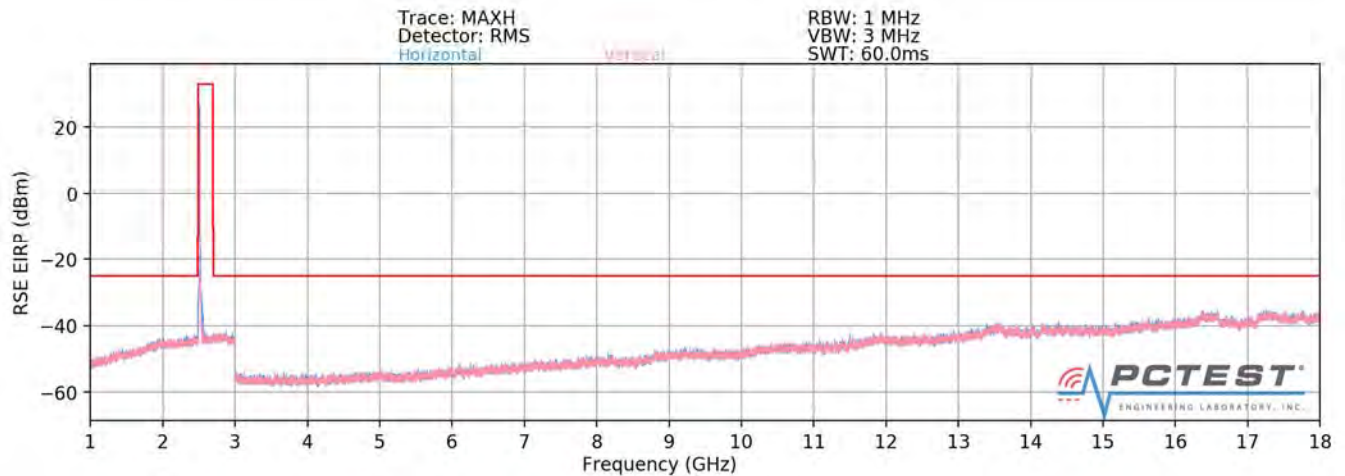
Figure 7-8. Test Instrument & Measurement Setup

Test Notes

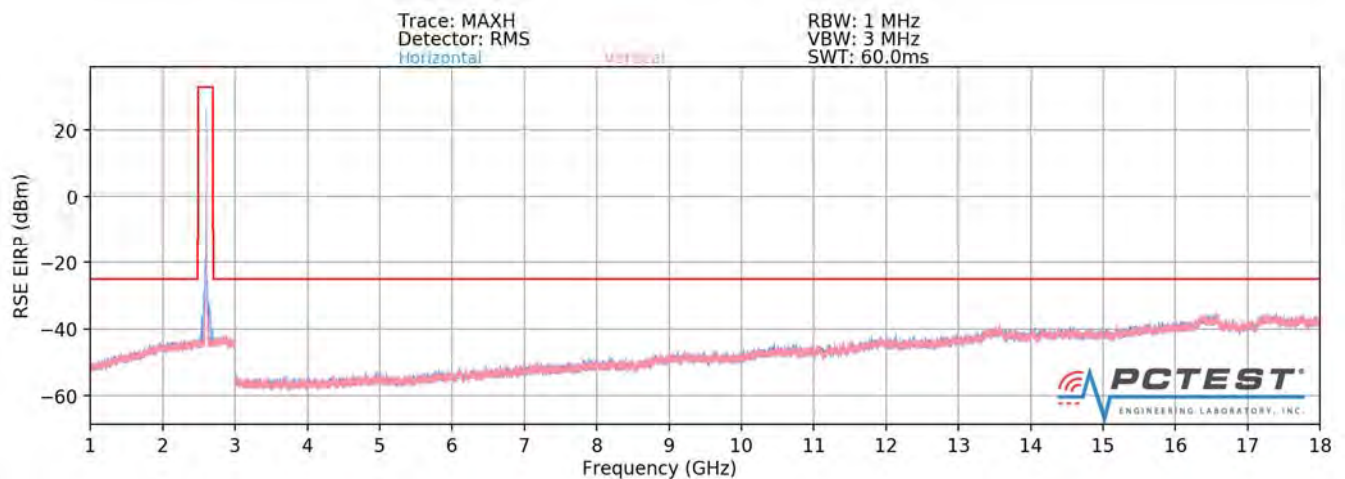
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 100 of 114

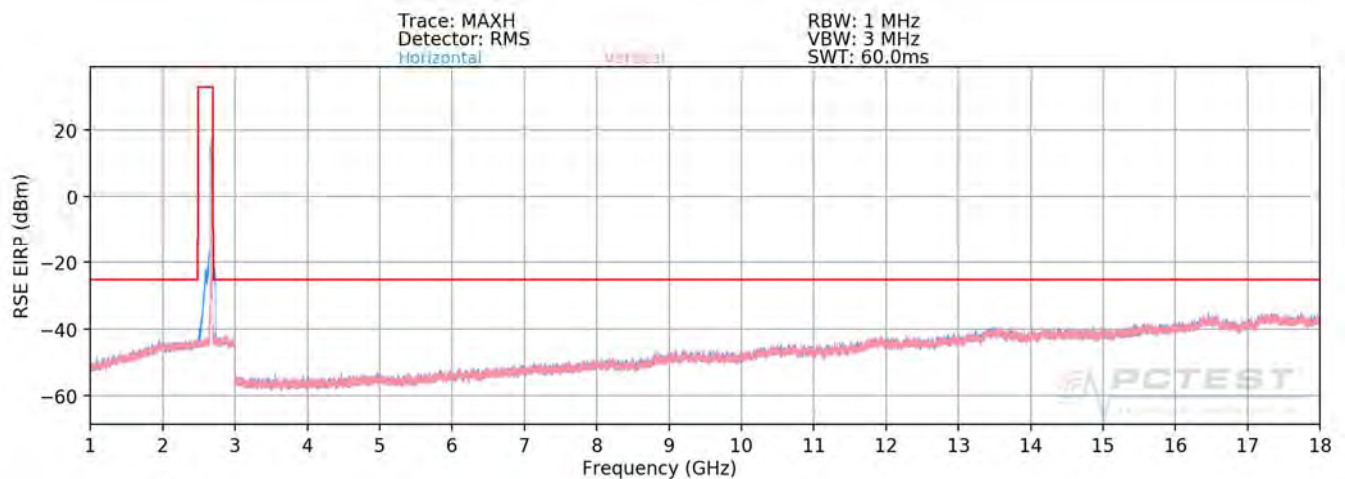
Uplink CA Configuration 41C Power Class 3



Plot 7-120. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Low Channel)

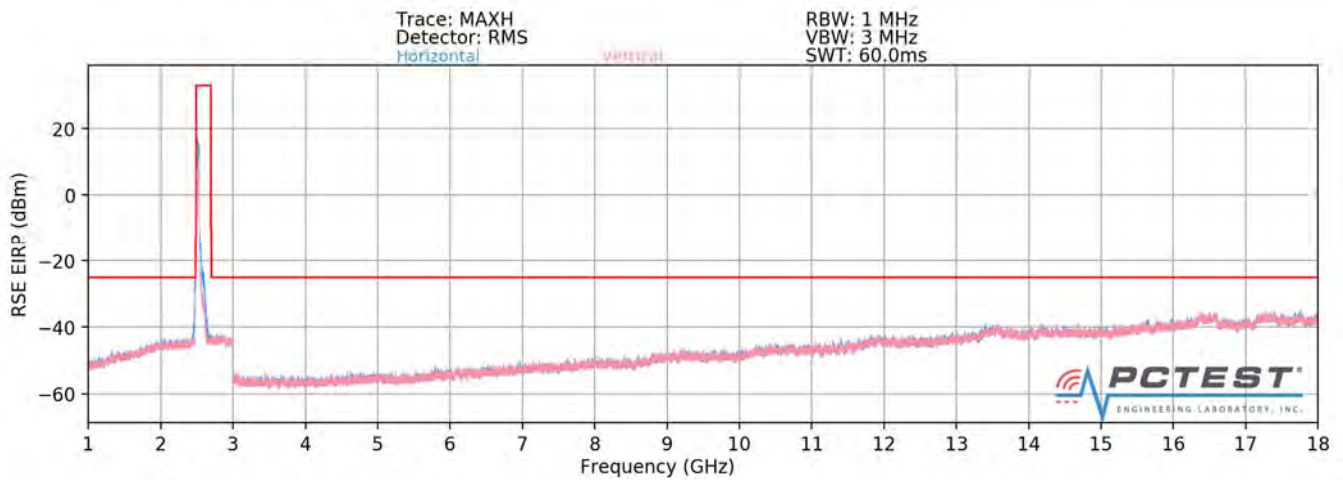


Plot 7-121. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Mid Channel)

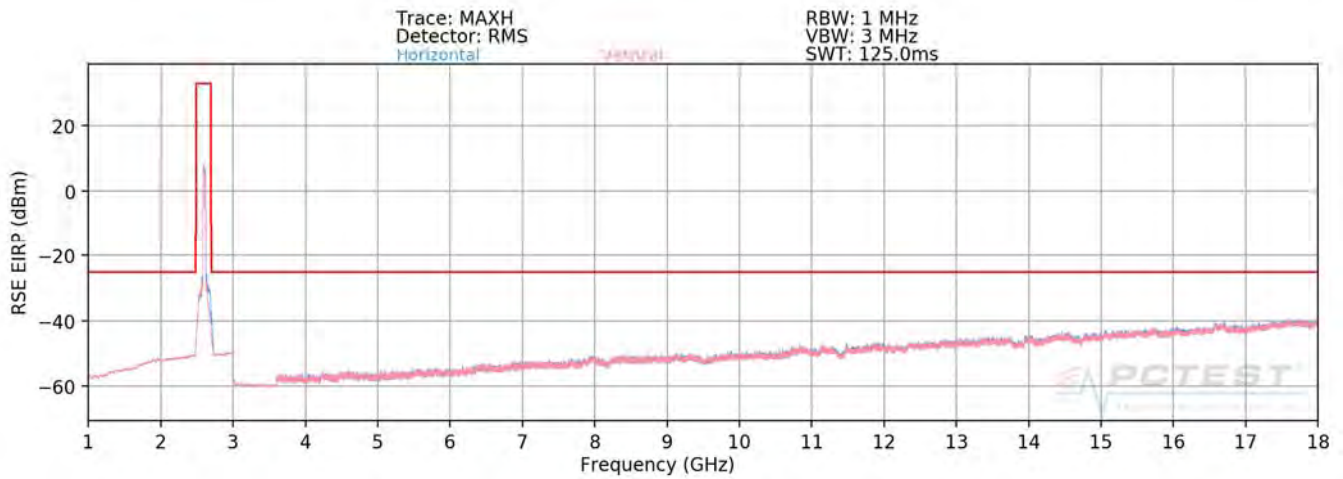


Plot 7-122. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99 – High Channel)

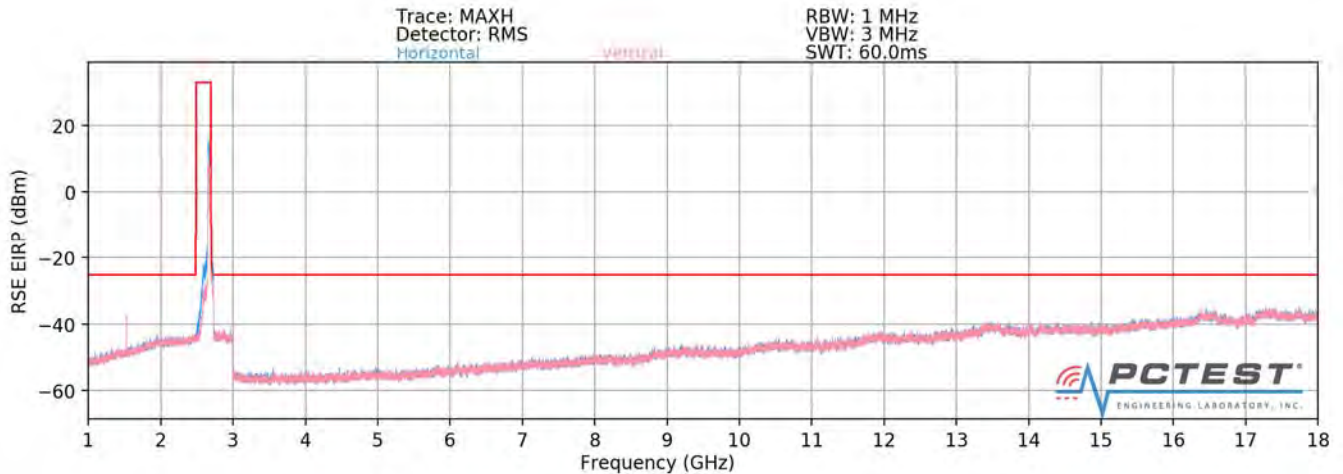
FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 101 of 114



Plot 7-123. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0 – Low Channel)



Plot 7-124. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0 – Mid Channel)



Plot 7-125. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0 – High Channel)

FCC ID: A3LSCV42	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 102 of 114

OPERATING FREQUENCY (PCC): 2498.50 MHz
 OPERATING FREQUENCY (SCC): 2510.20
 CHANNEL (PCC): 39675
 CHANNEL (SCC): 39792
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 + 20 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
4997.00	H	-	-	-59.06	8.35	-50.72	-25.7
7495.50	H	113	34	-55.56	8.45	-47.11	-22.1
9994.00	H	-	-	-54.51	9.84	-44.67	-19.7

Table 7-25. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 24, SCC: RB 1 Offset 0 – Low Channel)

OPERATING FREQUENCY (PCC): 2593.00 MHz
 OPERATING FREQUENCY (SCC): 2604.70
 CHANNEL (PCC): 40620
 CHANNEL (SCC): 40737
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 + 20 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	H	-	-	-60.87	8.45	-52.42	-27.4
7779.00	H	291	112	-56.59	8.75	-47.84	-22.8
10372.00	H	-	-	-54.43	9.73	-44.71	-19.7

Table 7-26. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 24, SCC: RB 1 Offset 0 – Mid Channel)

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 103 of 114

OPERATING FREQUENCY (PCC): 2687.50 MHz
 OPERATING FREQUENCY (SCC): 2675.80
 CHANNEL (PCC): 41565
 CHANNEL (SCC): 41448
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 + 20 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5375.00	H	-	-	-58.81	8.40	-50.41	-25.4
8062.50	H	-	-	-56.06	9.19	-46.88	-21.9

Table 7-27. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 24, SCC: RB 1 Offset 0 – High Channel)

OPERATING FREQUENCY (PCC): 2498.50 MHz
 OPERATING FREQUENCY (SCC): 2510.20
 CHANNEL (PCC): 39675
 CHANNEL (SCC): 39792
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 + 20 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	V	-	-	-60.54	8.35	-52.20	-27.2
7530.00	V	-	-	-56.98	8.45	-48.53	-23.5

Table 7-28. Radiated Spurious Data with WCP (ULCA B41 PCC: RB 1 Offset 1, SCC: RB 24 Offset 0 – High Channel)

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 104 of 114

7.9 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

For Part 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 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: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 105 of 114	

Band 12 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz
 CHANNEL: 23790
 REFERENCE VOLTAGE: 4.29 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	+ 20 (Ref)	707,500,126	0	0.0000000
100 %		- 30	707,500,324	198	0.0000280
100 %		- 20	707,500,266	140	0.0000198
100 %		- 10	707,500,063	-63	-0.0000089
100 %		0	707,500,084	-42	-0.0000059
100 %		+ 10	707,500,221	95	0.0000134
100 %		+ 20	707,499,796	-330	-0.0000466
100 %		+ 30	707,500,159	33	0.0000047
100 %		+ 40	707,500,072	-54	-0.0000076
100 %		+ 50	707,500,009	-117	-0.0000165
BATT. ENDPOINT	3.67	+ 20	707,500,108	-18	-0.0000025

Table 7-29. Frequency Stability Data (Band 12)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	
			Page 106 of 114

Band 12 Frequency Stability Measurements

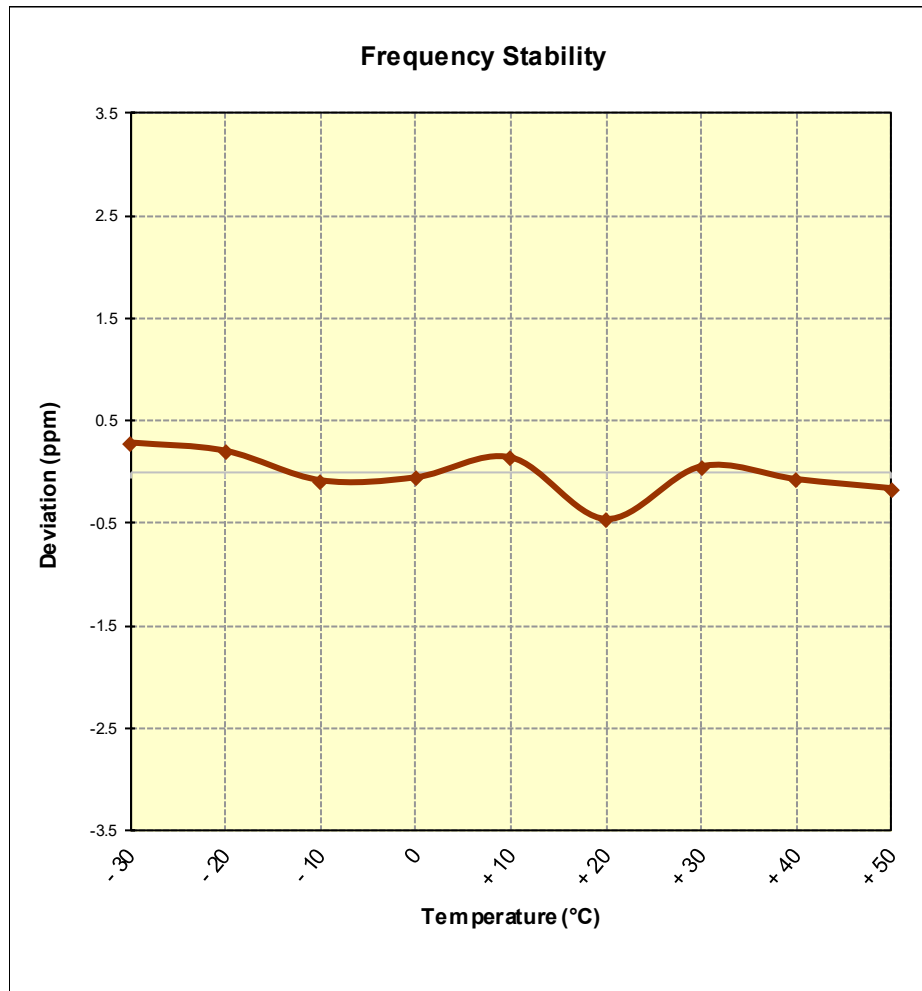


Figure 7-9. Frequency Stability Graph (Band 12)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 107 of 114

Band 13 Frequency Stability Measurements

OPERATING FREQUENCY: 782,000,000 Hz
 CHANNEL: 23230
 REFERENCE VOLTAGE: 4.29 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	+ 20 (Ref)	782,000,071	0	0.0000000
100 %		- 30	782,000,006	-65	-0.0000083
100 %		- 20	782,000,023	-48	-0.0000061
100 %		- 10	782,000,066	-5	-0.0000006
100 %		0	781,999,868	-203	-0.0000260
100 %		+ 10	782,000,091	20	0.0000026
100 %		+ 20	781,999,932	-139	-0.0000178
100 %		+ 30	781,999,934	-137	-0.0000175
100 %		+ 40	781,999,699	-372	-0.0000476
100 %		+ 50	782,000,556	485	0.0000620
BATT. ENDPOINT	3.67	+ 20	782,000,126	55	0.0000070

Table 7-30. Frequency Stability Data (Band 13)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 108 of 114

Band 13 Frequency Stability Measurements

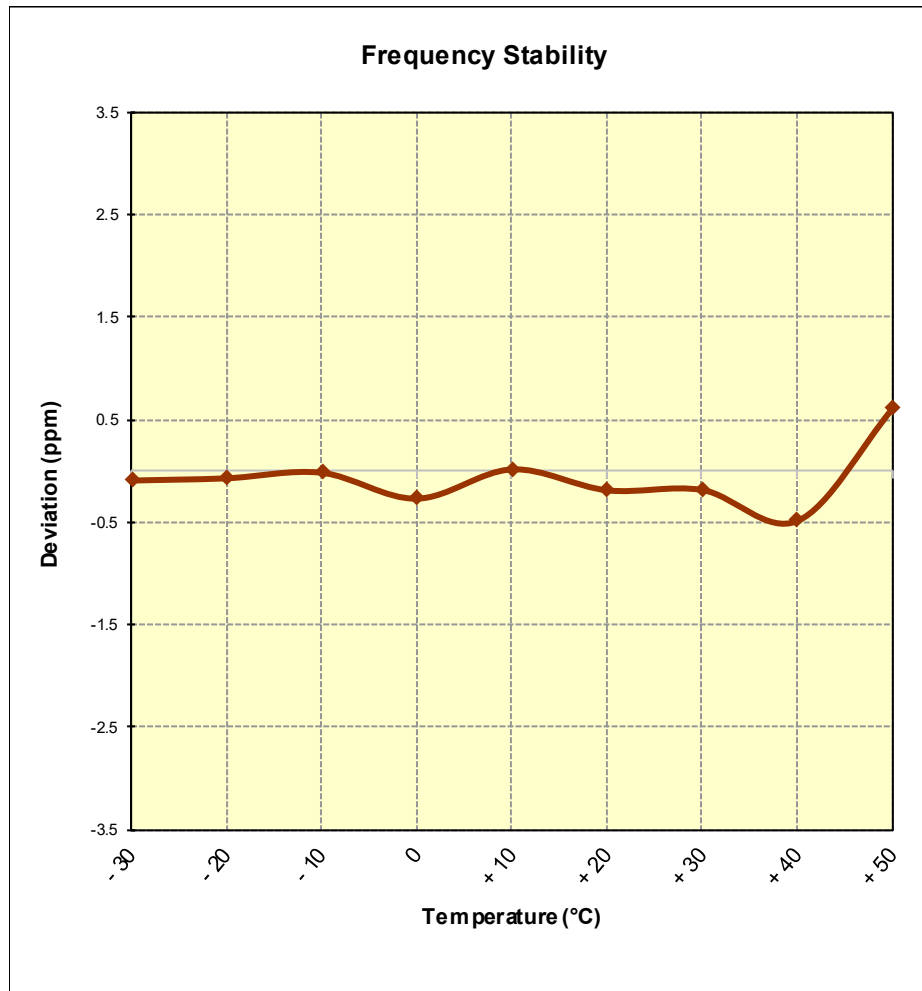


Figure 7-10. Frequency Stability Graph (Band 13)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 109 of 114

Band 5 Frequency Stability Measurements

OPERATING FREQUENCY: 831,500,000 Hz

CHANNEL: 26865

REFERENCE VOLTAGE: 4.29 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	+ 20 (Ref)	831,500,029	0	0.0000000
100 %		- 30	831,500,132	103	0.0000124
100 %		- 20	831,499,842	-187	-0.0000225
100 %		- 10	831,500,508	479	0.0000576
100 %		0	831,499,915	-114	-0.0000137
100 %		+ 10	831,500,097	68	0.0000082
100 %		+ 20	831,500,057	28	0.0000034
100 %		+ 30	831,499,671	-358	-0.0000431
100 %		+ 40	831,500,442	413	0.0000497
100 %		+ 50	831,500,398	369	0.0000444
BATT. ENDPOINT	3.67	+ 20	831,500,231	202	0.0000243

Table 7-31. Frequency Stability Data (Band 5)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 110 of 114

Band 5 Frequency Stability Measurements

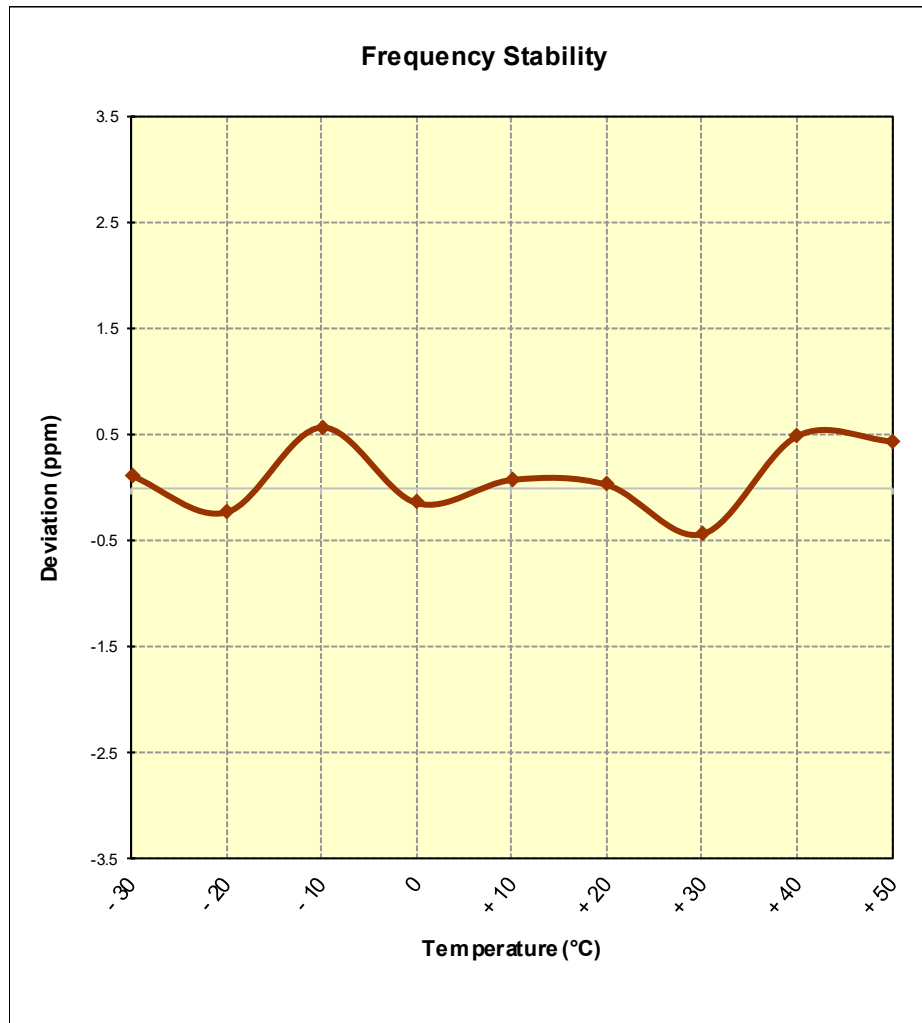


Figure 7-11. Frequency Stability Graph (Band 5)

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 111 of 114

Band 41 Frequency Stability Measurements

OPERATING FREQUENCY: 2,593,000,000 Hz
 CHANNEL: 40620
 REFERENCE VOLTAGE: 4.29 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	+ 20 (Ref)	2,592,999,626	0	0.0000000
100 %		- 30	2,592,999,687	61	0.0000024
100 %		- 20	2,592,999,707	81	0.0000031
100 %		- 10	2,592,999,723	97	0.0000037
100 %		0	2,592,999,580	-46	-0.0000018
100 %		+ 10	2,592,999,739	113	0.0000044
100 %		+ 20	2,592,999,774	148	0.0000057
100 %		+ 30	2,592,999,670	44	0.0000017
100 %		+ 40	2,592,999,360	-266	-0.0000103
100 %		+ 50	2,592,999,754	128	0.0000049
BATT. ENDPOINT	3.67	+ 20	2,592,999,694	68	0.0000026

Table 7-32. Frequency Stability Data (Band 41)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: A3LSCV42	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 112 of 114

Band 41 Frequency Stability Measurements

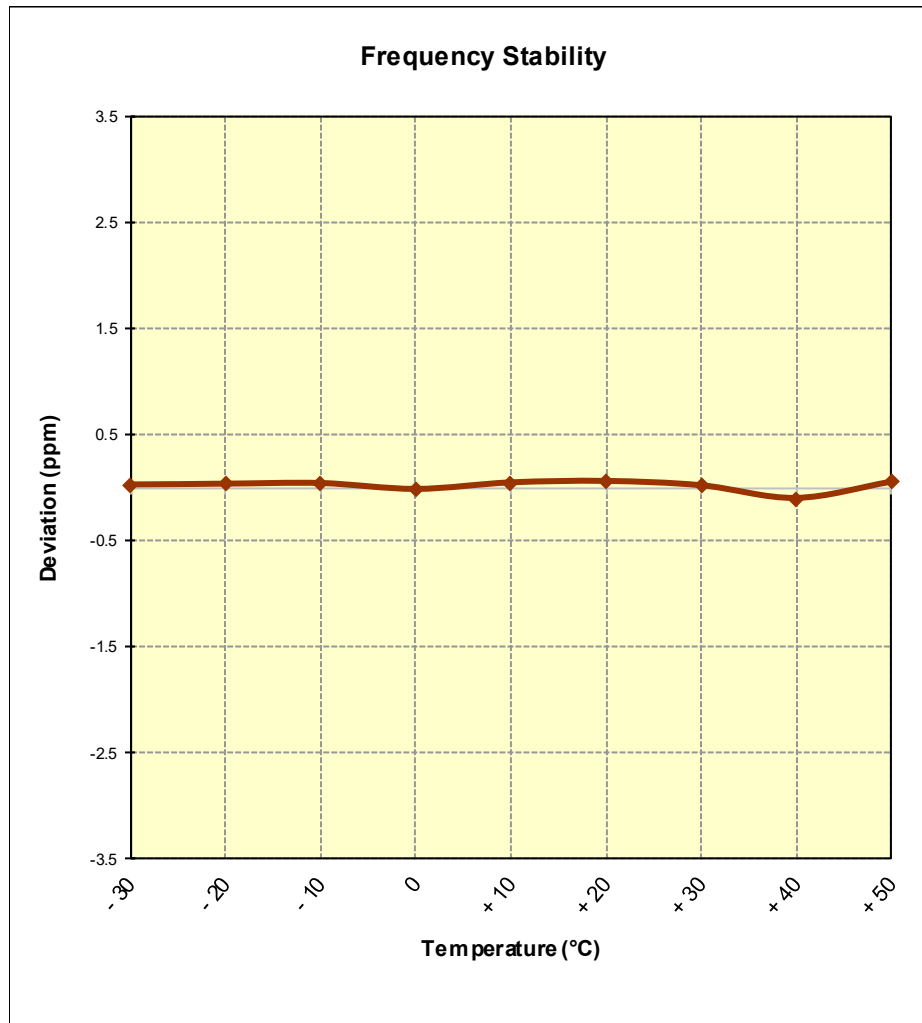


Figure 7-12. Frequency Stability Graph (Band 41)

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset	Page 113 of 114	

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSCV42** complies with all the requirements of Part 22 & 24 of the FCC Rules for LTE operation only.

FCC ID: A3LSCV42		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901240018-03.A3L	Test Dates: 10/31/2018-1/17/2019	EUT Type: Portable Handset		Page 114 of 114