



MEASUREMENT REPORT LTE

Applicant Name:
 Samsung Electronics Co., Ltd.
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Date of Testing:
 04/17 – 09/2/2020
Test Site/Location:
 PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
 1M2006240100-03.A3L

FCC ID:	A3LSMN986JPN
APPLICANT:	Samsung Electronics Co., Ltd.

Application Type: Certification
Model(s): SCG06, SC-53A
EUT Type: Portable Handset
FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s): 22, 24, & 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



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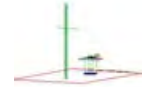
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FCC Part 22, 24, & 27



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	0.052	17.17	0.086	19.32	1M09G7D	QPSK
LTE Band 12	27	699.7 - 715.3	0.041	16.18	0.068	18.33	1M11W7D	16QAM
LTE Band 12	27	699.7 - 715.3	0.033	15.19	0.054	17.34	1M09W7D	64QAM
LTE Band 12	27	700.5 - 714.5	0.053	17.23	0.087	19.38	2M71G7D	QPSK
LTE Band 12	27	700.5 - 714.5	0.044	16.45	0.072	18.60	2M71W7D	16QAM
LTE Band 12	27	700.5 - 714.5	0.034	15.30	0.056	17.45	2M71W7D	64QAM
LTE Band 12	27	701.5 - 713.5	0.054	17.29	0.088	19.44	4M53G7D	QPSK
LTE Band 12	27	701.5 - 713.5	0.042	16.26	0.069	18.41	4M52W7D	16QAM
LTE Band 12	27	701.5 - 713.5	0.034	15.35	0.056	17.50	4M54W7D	64QAM
LTE Band 12	27	704 - 711	0.088	19.44	0.144	21.59	9M03G7D	QPSK
LTE Band 12	27	704 - 711	0.062	17.93	0.102	20.08	9M04W7D	16QAM
LTE Band 12	27	704 - 711	0.047	16.74	0.077	18.89	9M02W7D	64QAM
LTE Band 13	27	779.5 - 784.5	0.118	20.72	0.194	22.87	4M53G7D	QPSK
LTE Band 13	27	779.5 - 784.5	0.096	19.82	0.158	21.97	4M52W7D	16QAM
LTE Band 13	27	779.5 - 784.5	0.071	18.52	0.117	20.67	4M52W7D	64QAM
LTE Band 13	27	782	0.113	20.53	0.185	22.68	9M05G7D	QPSK
LTE Band 13	27	782	0.090	19.56	0.148	21.71	9M03W7D	16QAM
LTE Band 13	27	782	0.059	17.73	0.097	19.88	8M99W7D	64QAM
LTE Band 5	22H	824.7 - 848.3	0.061	17.87	0.100	20.02	1M11G7D	QPSK
LTE Band 5	22H	824.7 - 848.3	0.050	16.96	0.081	19.11	1M09W7D	16QAM
LTE Band 5	22H	824.7 - 848.3	0.042	16.20	0.068	18.35	1M10W7D	64QAM
LTE Band 5	22H	825.5 - 847.5	0.061	17.84	0.100	19.99	2M71G7D	QPSK
LTE Band 5	22H	825.5 - 847.5	0.050	16.99	0.082	19.14	2M71W7D	16QAM
LTE Band 5	22H	825.5 - 847.5	0.040	15.98	0.065	18.13	2M71W7D	64QAM
LTE Band 5	22H	826.5 - 846.5	0.061	17.87	0.100	20.02	4M54G7D	QPSK
LTE Band 5	22H	826.5 - 846.5	0.051	17.04	0.083	19.19	4M51W7D	16QAM
LTE Band 5	22H	826.5 - 846.5	0.041	16.08	0.067	18.23	4M54W7D	64QAM
LTE Band 5	22H	829 - 844	0.063	18.01	0.104	20.16	9M00G7D	QPSK
LTE Band 5	22H	829 - 844	0.053	17.21	0.086	19.36	9M02W7D	16QAM
LTE Band 5	22H	829 - 844	0.044	16.45	0.072	18.60	8M98W7D	64QAM

EUT Overview (<1 GHz)

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Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)		
LTE Band 4	27	1710.7 - 1754.3	0.225	23.53	1M10G7D	QPSK
LTE Band 4	27	1710.7 - 1754.3	0.163	22.12	1M09W7D	16QAM
LTE Band 4	27	1710.7 - 1754.3	0.147	21.68	1M09W7D	64QAM
LTE Band 4	27	1711.5 - 1753.5	0.238	23.76	2M72G7D	QPSK
LTE Band 4	27	1711.5 - 1753.5	0.166	22.21	2M71W7D	16QAM
LTE Band 4	27	1711.5 - 1753.5	0.152	21.81	2M72W7D	64QAM
LTE Band 4	27	1712.5 - 1752.5	0.228	23.58	4M55G7D	QPSK
LTE Band 4	27	1712.5 - 1752.5	0.179	22.52	4M52W7D	16QAM
LTE Band 4	27	1712.5 - 1752.5	0.150	21.75	4M53W7D	64QAM
LTE Band 4	27	1715 - 1750	0.237	23.74	9M02G7D	QPSK
LTE Band 4	27	1715 - 1750	0.173	22.38	9M03W7D	16QAM
LTE Band 4	27	1715 - 1750	0.146	21.65	9M00W7D	64QAM
LTE Band 4	27	1717.5 - 1747.5	0.237	23.74	13M5G7D	QPSK
LTE Band 4	27	1717.5 - 1747.5	0.168	22.25	13M5W7D	16QAM
LTE Band 4	27	1717.5 - 1747.5	0.156	21.94	13M5W7D	64QAM
LTE Band 4	27	1720 - 1745	0.239	23.78	18M0G7D	QPSK
LTE Band 4	27	1720 - 1745	0.200	23.00	18M0W7D	16QAM
LTE Band 4	27	1720 - 1745	0.161	22.06	18M0W7D	64QAM

EUT Overview (Mid Bands)

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	0.202	23.05	4M51G7D	QPSK
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.183	22.63	4M52W7D	16QAM
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.148	21.71	4M50W7D	64QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.208	23.18	9M00G7D	QPSK
LTE Band 41 (PC3)	27	2501 - 2685	0.185	22.67	8M99W7D	16QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.145	21.62	9M02W7D	64QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.204	23.10	13M5G7D	QPSK
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.165	22.18	13M5W7D	16QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.134	21.26	13M5W7D	64QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.209	23.20	18M0G7D	QPSK
LTE Band 41 (PC3)	27	2506 - 2680	0.193	22.85	17M9W7D	16QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.146	21.63	18M0W7D	64QAM

EUT Overview (High Bands)

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1.0 INTRODUCTION

1.1 Scope

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

1.2 PCTEST Test Location

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

1.3 Test Facility / Accreditations

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

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

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMN986JPN**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 1671M, 1786M

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, Wireless Power Transfer

2.3 Test Configuration

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

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

2.4 EMI Suppression Device(s)/Modifications

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

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3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

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

3.2 Radiated Power and Radiated Spurious Emissions

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

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

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

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

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

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

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4.0 MEASUREMENT UNCERTAINTY

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

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

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5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx2	Licensed Transmitter Cable Set	4/9/2020	Annual	4/9/2021	LTx2
-	LTx3	Licensed Transmitter Cable Set	10/30/2019	Annual	10/30/2020	LTx3
Agilent	N9038A	MXE EMI Receiver	7/17/2019	Annual	7/17/2020	MY51210133
Anritsu	MT8821C	Radio Communication Analyzer	3/10/2020	Annual	3/10/2021	6200901190
Anritsu	MS46322A	Vector Network Analyzer	8/19/2019	Annual	8/19/2020	1521001
Anritsu	36585K-2F	Precision Autocal 2-Port	7/16/2019	Annual	7/16/2020	1628014
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/9/2018	Biennial	8/9/2020	135427
Espec	ESX-2CA	Environmental Chamber	6/13/2019	Annual	6/13/2020	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biennial	2/14/2021	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
ETS-Lindgren	3115	Double Ridged Guide Horn 750MHz - 18GHz	3/12/2020	Biennial	3/12/2022	150693
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11403100002
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			107826
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			836536/0005
Rohde & Schwarz	CMW500	Radio Communication Tester	8/26/2019	Annual	8/26/2020	100976
Rohde & Schwarz	CMW500	Radio Communication Tester	6/26/2019	Annual	6/26/2020	112347
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100040
Rohde & Schwarz	TC-TA18	Cross-Pol Antenna 400MHz-18GHz	12/12/2018	Biennial	12/12/2020	101058
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/11/2019	Annual	7/11/2020	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/8/2019	Annual	7/8/2020	102133
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511

Table 5-1. Test Equipment

Notes:

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

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6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 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).

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7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMN986JPN
 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 22.917(a) 24.238(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
24.232(d)	Peak-Average Ratio	< 13 dB			Section 7.5
2.1046	Transmitter Conducted Output Power	N/A			See RF Exposure Report
22.917(a) 27.53(h)	Uplink Carrier Aggregation	$>43 + 10\log(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions			Section 7.6
2.1055 22.355 24.235 27.54	Frequency Stability	< 2.5 ppm (Part 22) and fundamental emissions stay within authorized frequency block (Part 24, 27)			Section 7.10

Table 7-1. Summary of Conducted Test Results

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FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
22.913(a)(5)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 5)	< 7 Watts max. ERP	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
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP			Section 7.6
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Undesirable Emissions (Band 12, 13, 5, 4)	> 43 + 10 log ₁₀ (P[Watts]) for all out-of-band emissions			Section 7.8
27.53(f)	Undesirable Emissions (Band 13)	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 – 1610 MHz			Section 7.8
27.53(m)	Undesirable Emissions (Band 41)	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.8
27.53(m) 27.53(c) 27.53(g)	Uplink Carrier Aggregation	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.8

Table 7-2. Summary of Radiated Test Results

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Notes:

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

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7.2 Occupied Bandwidth

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 4.2

Test Settings

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

Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

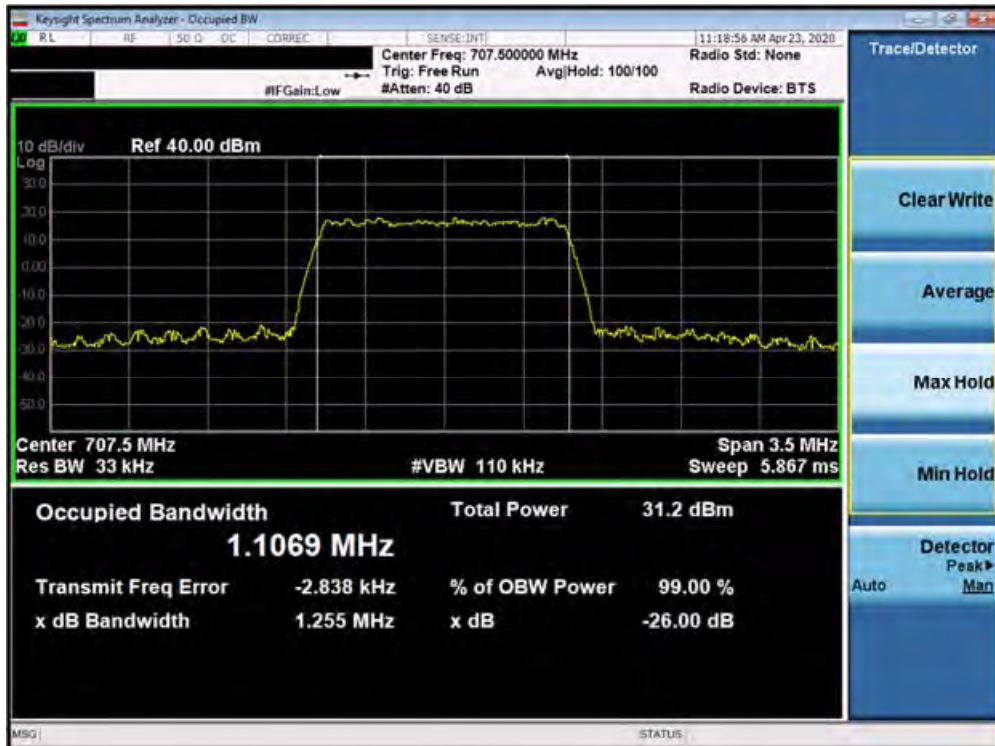
None.

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 12

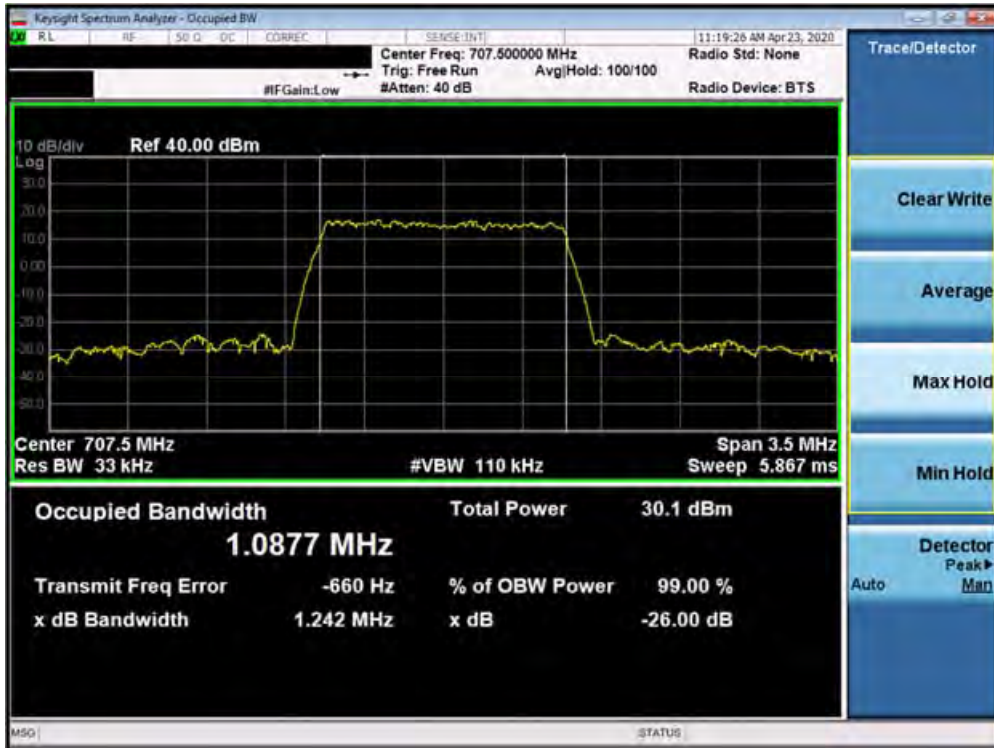


Plot 7-1. Occupied Bandwidth Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)

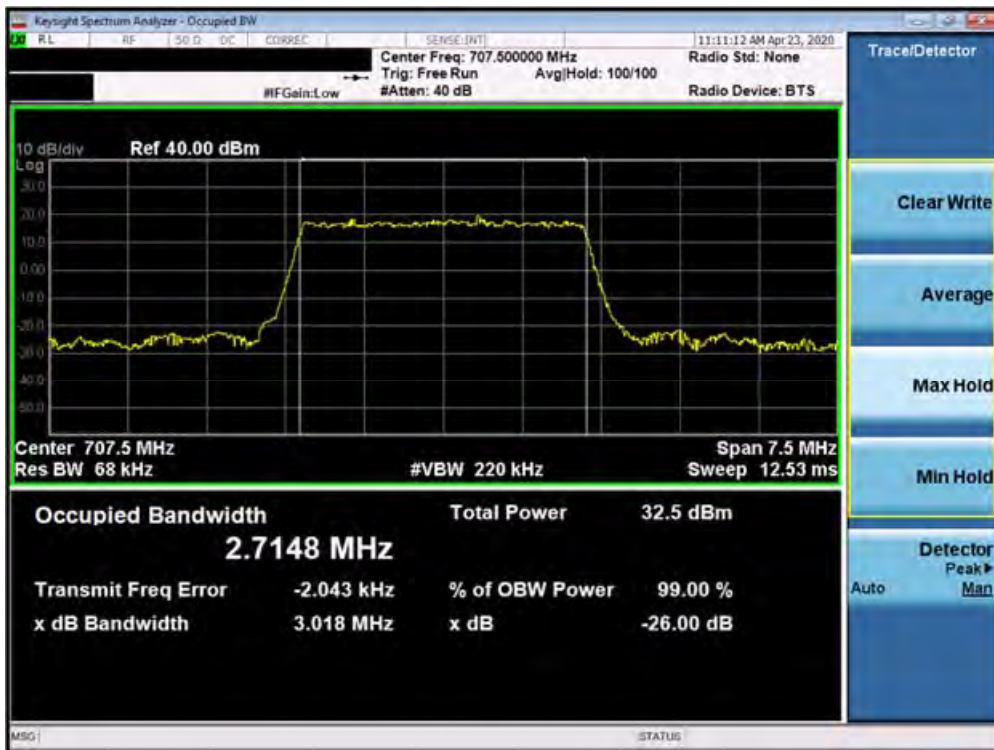


Plot 7-2. Occupied Bandwidth Plot (Band 12 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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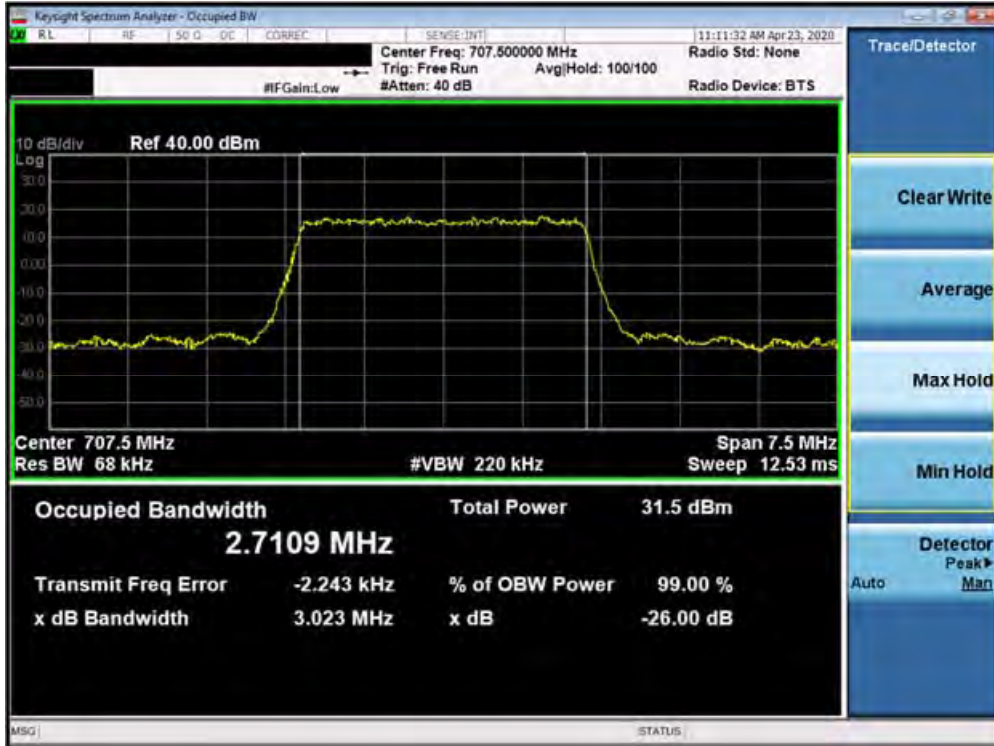


Plot 7-3. Occupied Bandwidth Plot (Band 12 - 1.4MHz 64-QAM - Full RB Configuration)

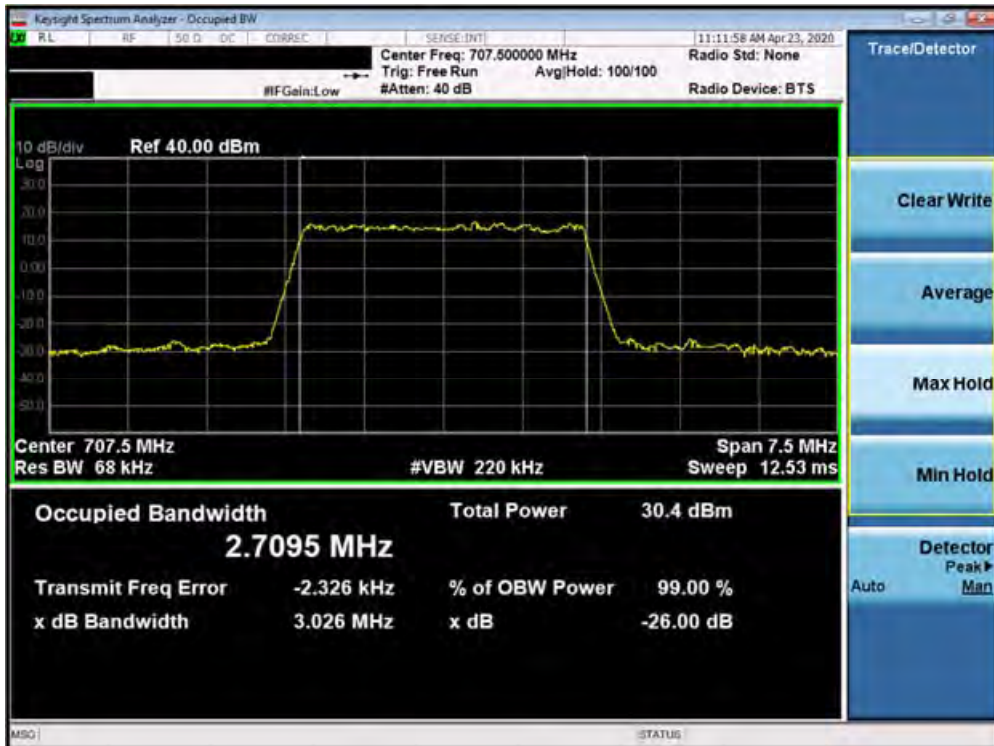


Plot 7-4. Occupied Bandwidth Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 16 of 148

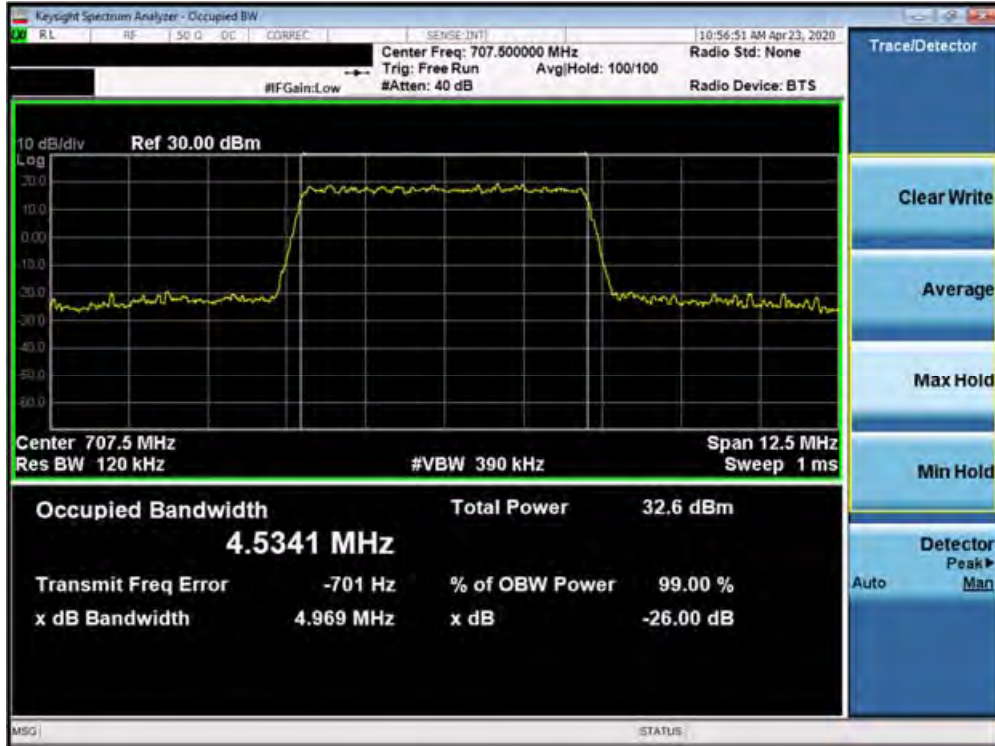


Plot 7-5. Occupied Bandwidth Plot (Band 12 - 3.0MHz 16-QAM - Full RB Configuration)

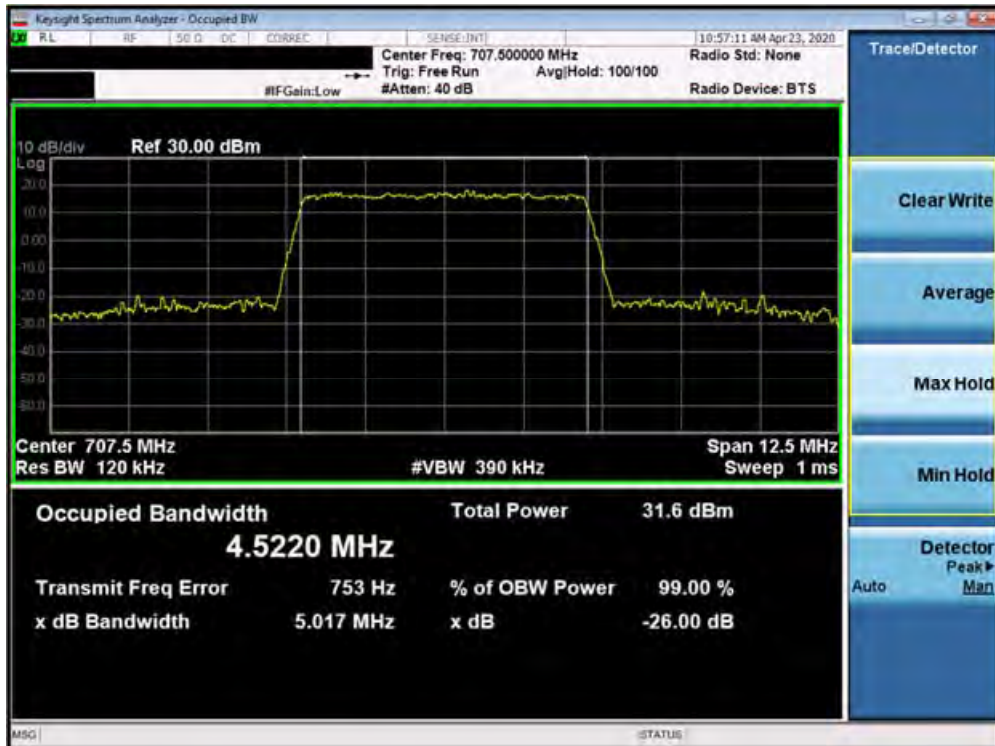


Plot 7-6. Occupied Bandwidth Plot (Band 12 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 17 of 148

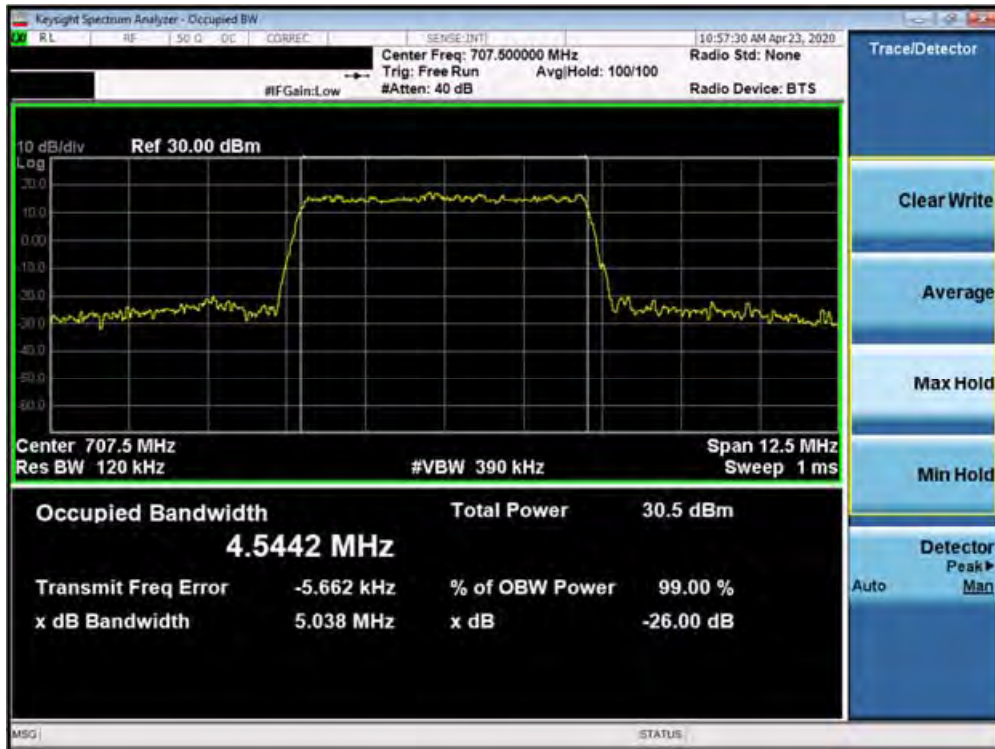


Plot 7-7. Occupied Bandwidth Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)

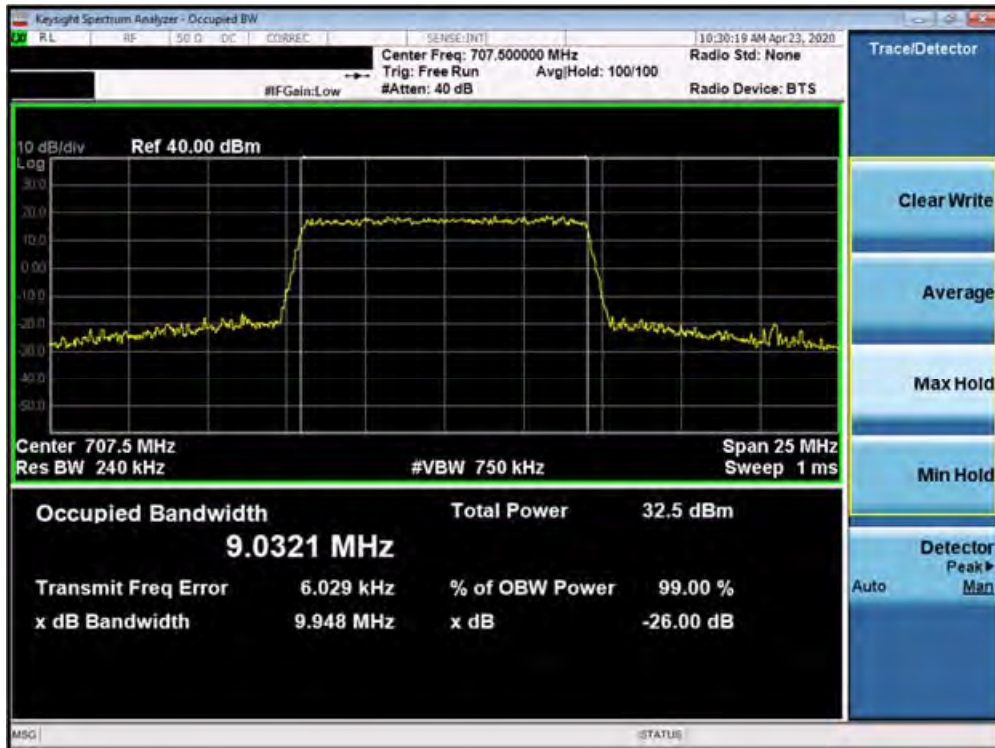


Plot 7-8. Occupied Bandwidth Plot (Band 12 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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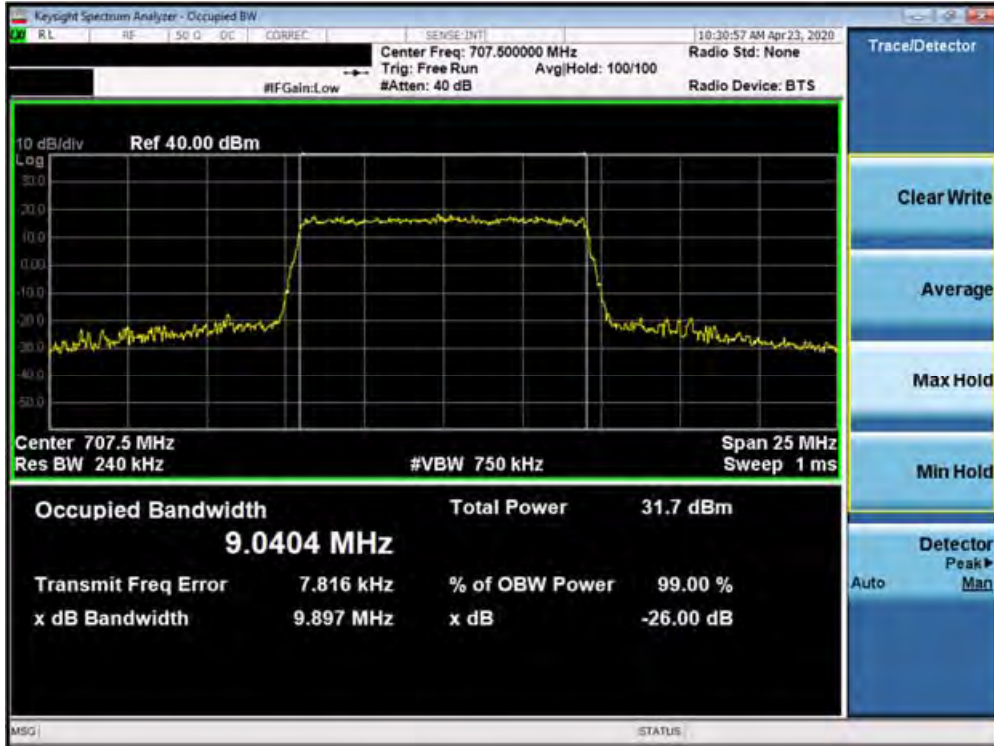


Plot 7-9. Occupied Bandwidth Plot (Band 12 - 5.0MHz 64-QAM - Full RB Configuration)

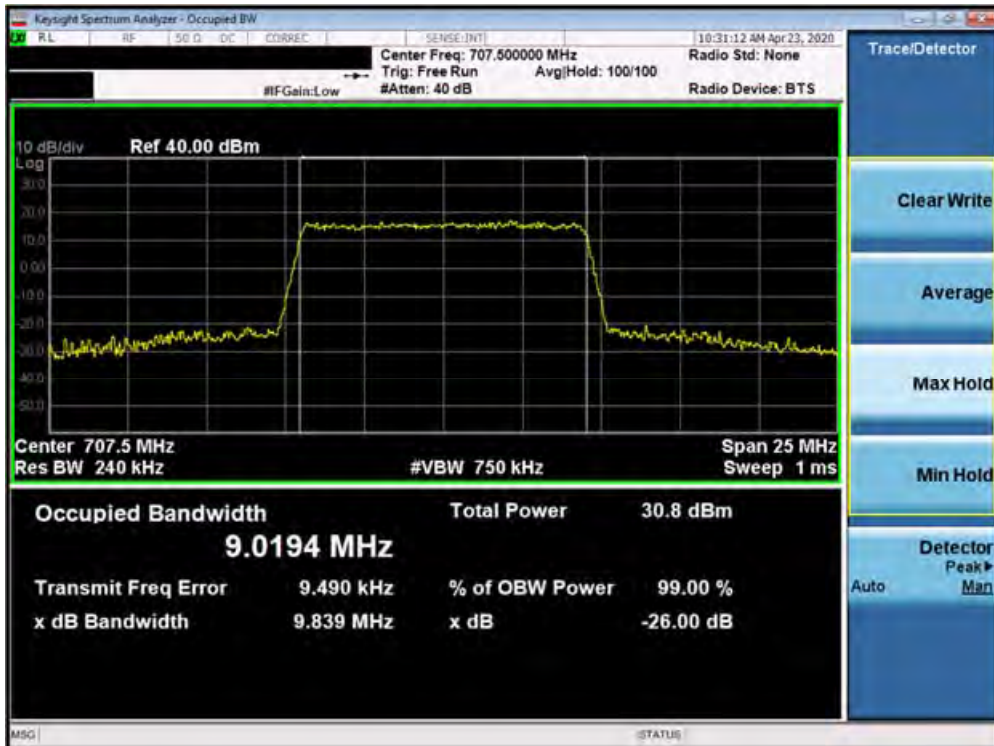


Plot 7-10. Occupied Bandwidth Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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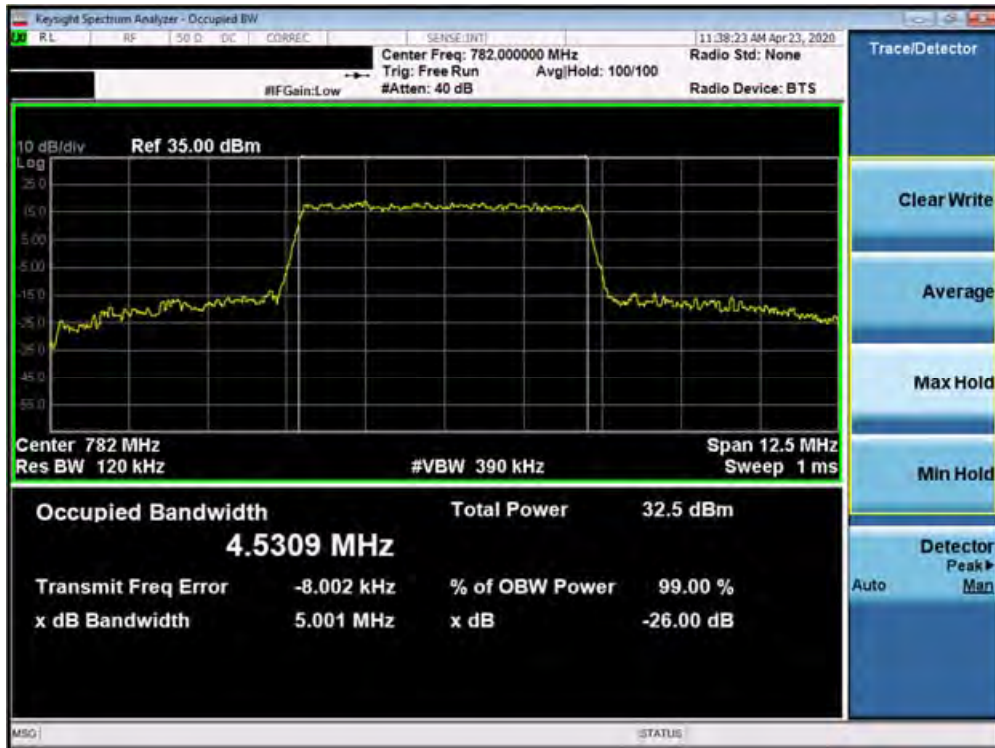
Plot 7-11. Occupied Bandwidth Plot (Band 12 - 10.0MHz 16-QAM - Full RB Configuration)



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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 13

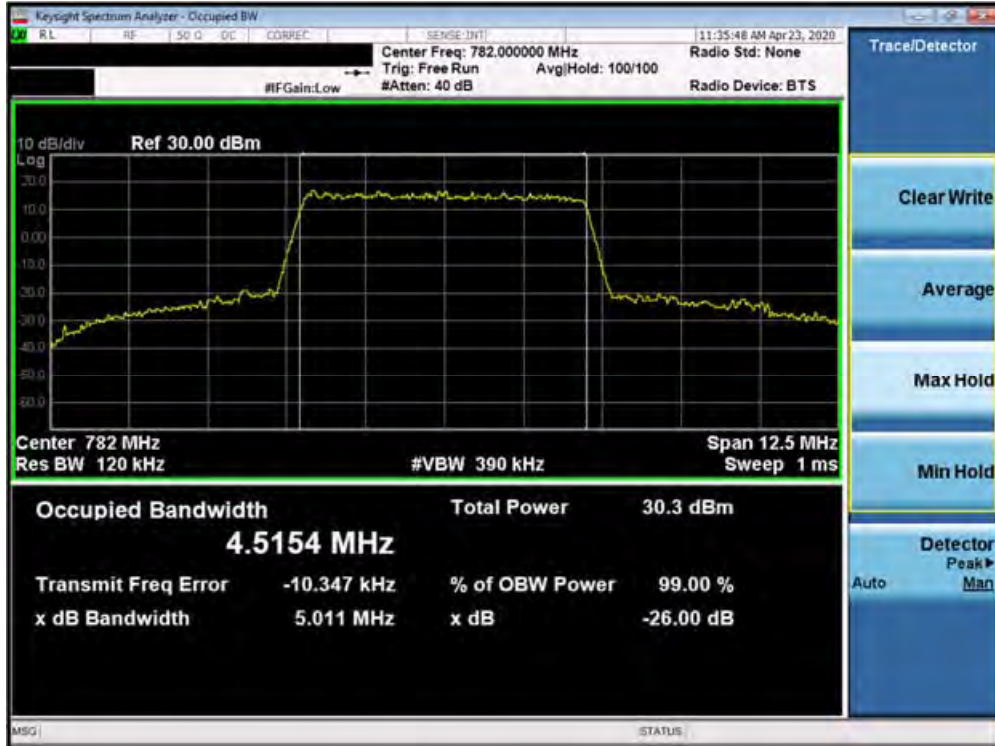


Plot 7-13. Occupied Bandwidth Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

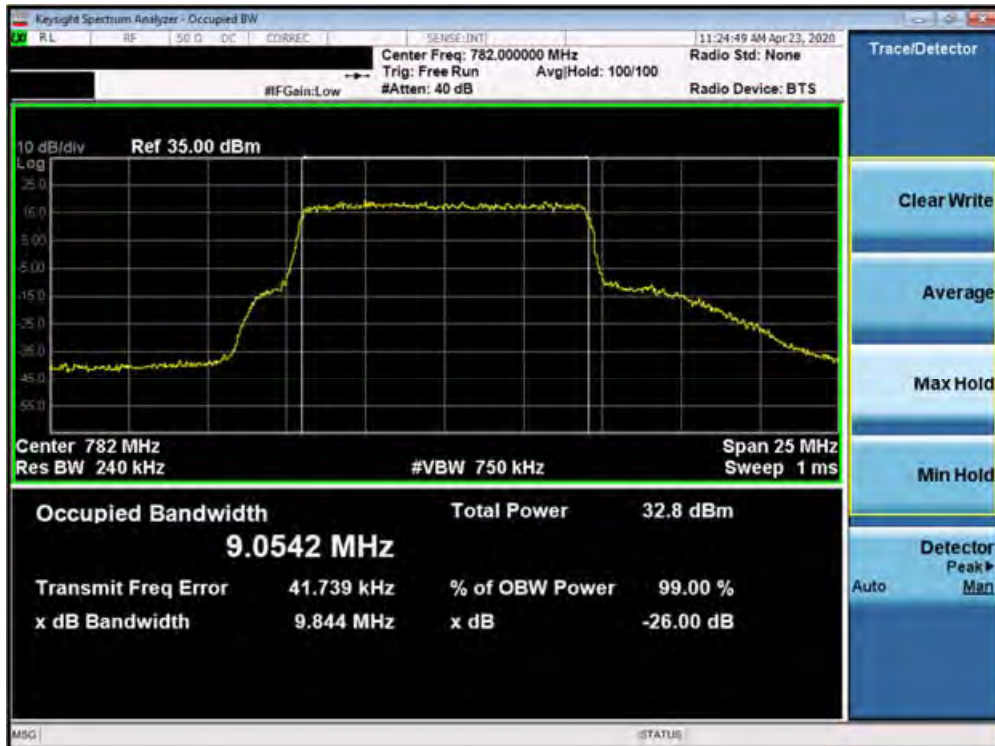


Plot 7-14. Occupied Bandwidth Plot (Band 13 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-15. Occupied Bandwidth Plot (Band 13 - 5.0MHz 64-QAM - Full RB Configuration)

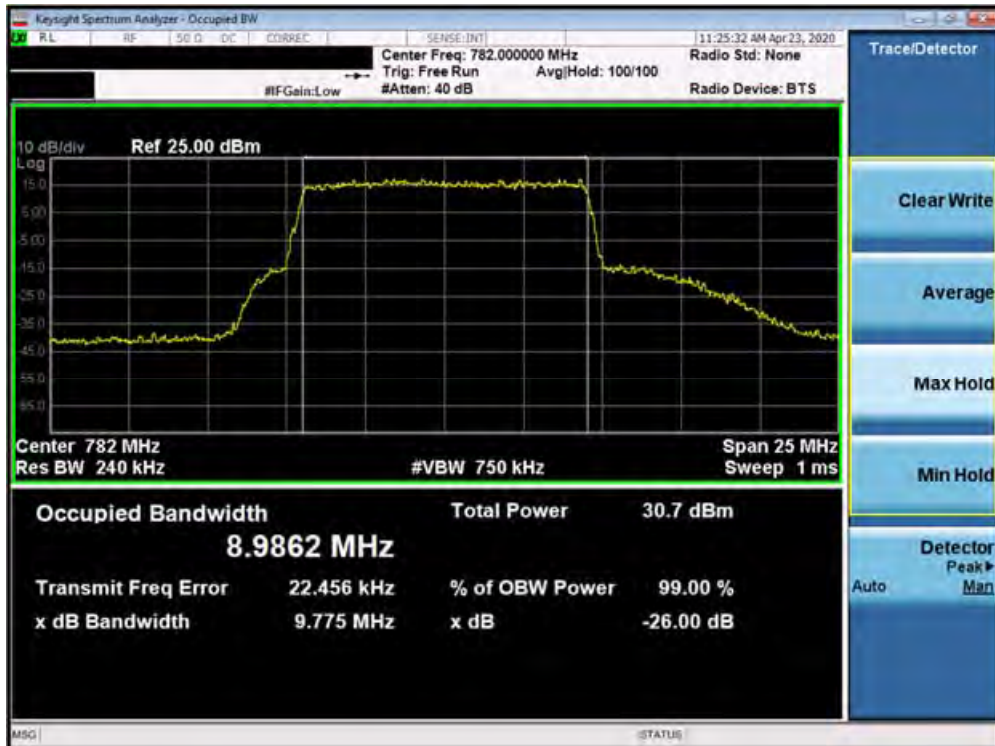


Plot 7-16. Occupied Bandwidth Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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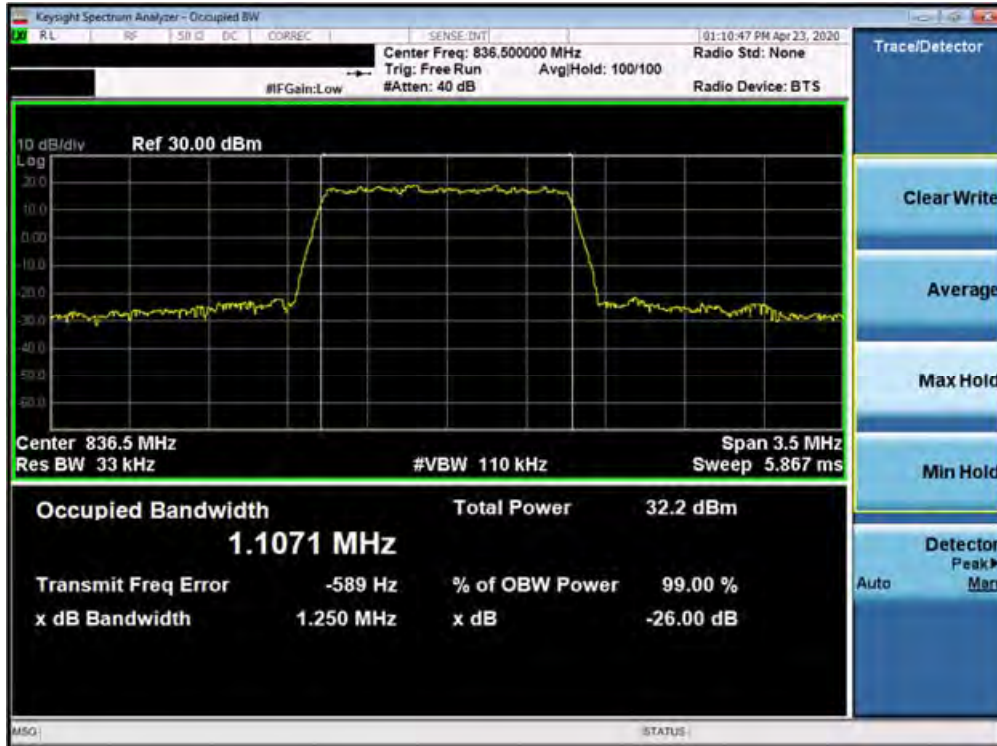
Plot 7-17. Occupied Bandwidth Plot (Band 13 - 10.0MHz 16-QAM - Full RB Configuration)



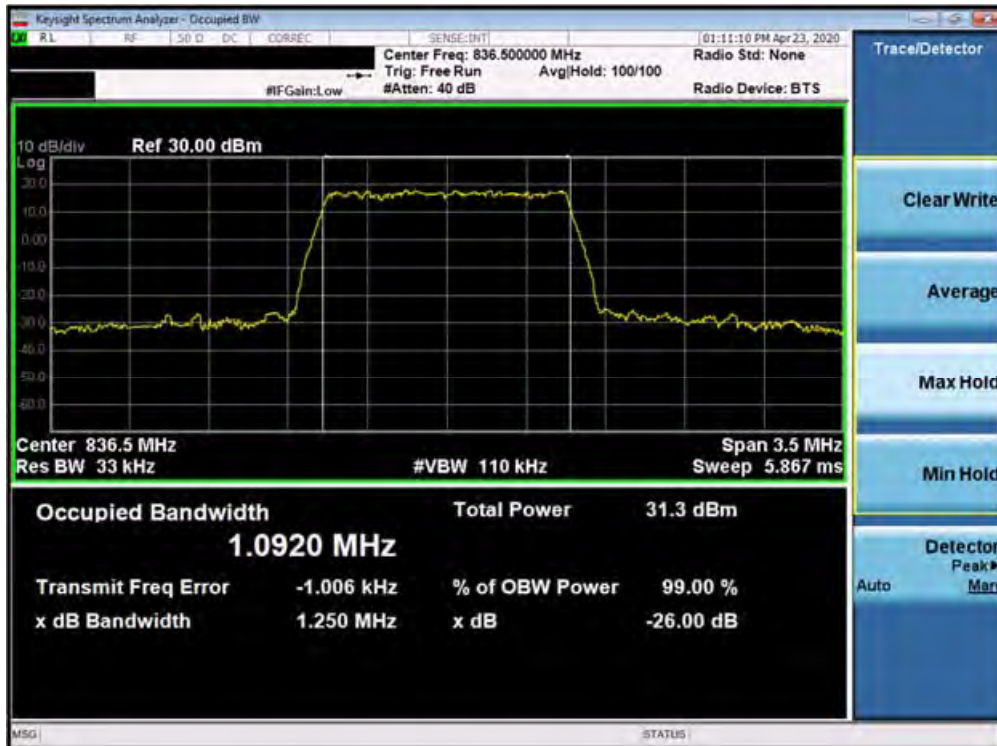
Plot 7-18. Occupied Bandwidth Plot (Band 13 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 5



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

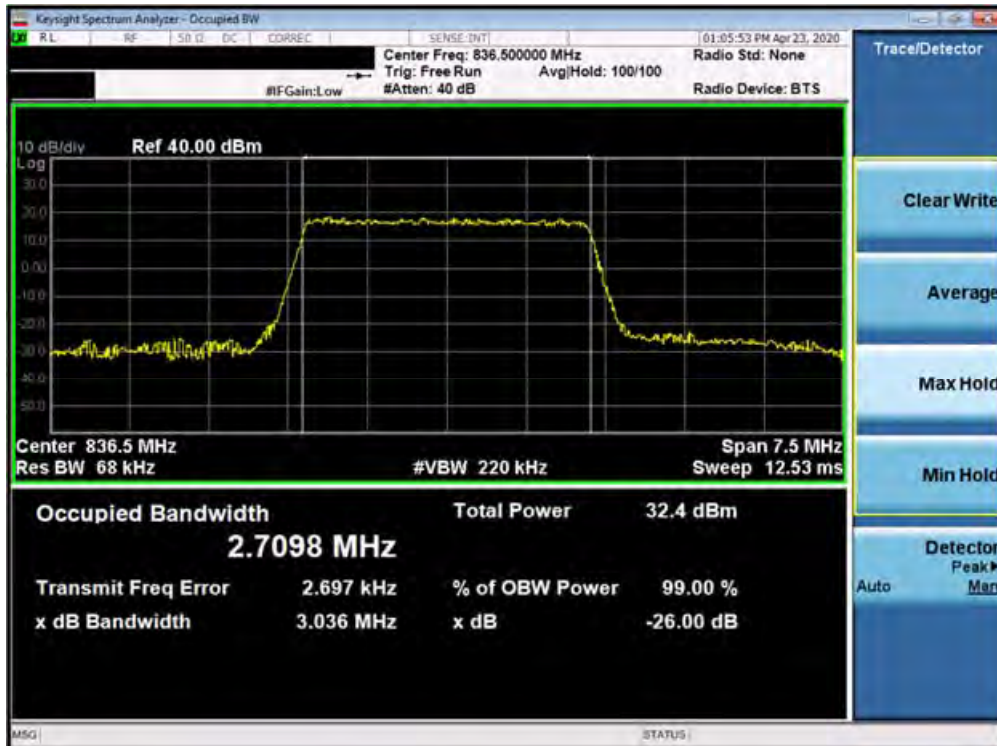


Plot 7-20. Occupied Bandwidth Plot (Band 5 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-21. Occupied Bandwidth Plot (Band 5 - 1.4MHz 64-QAM - Full RB Configuration)

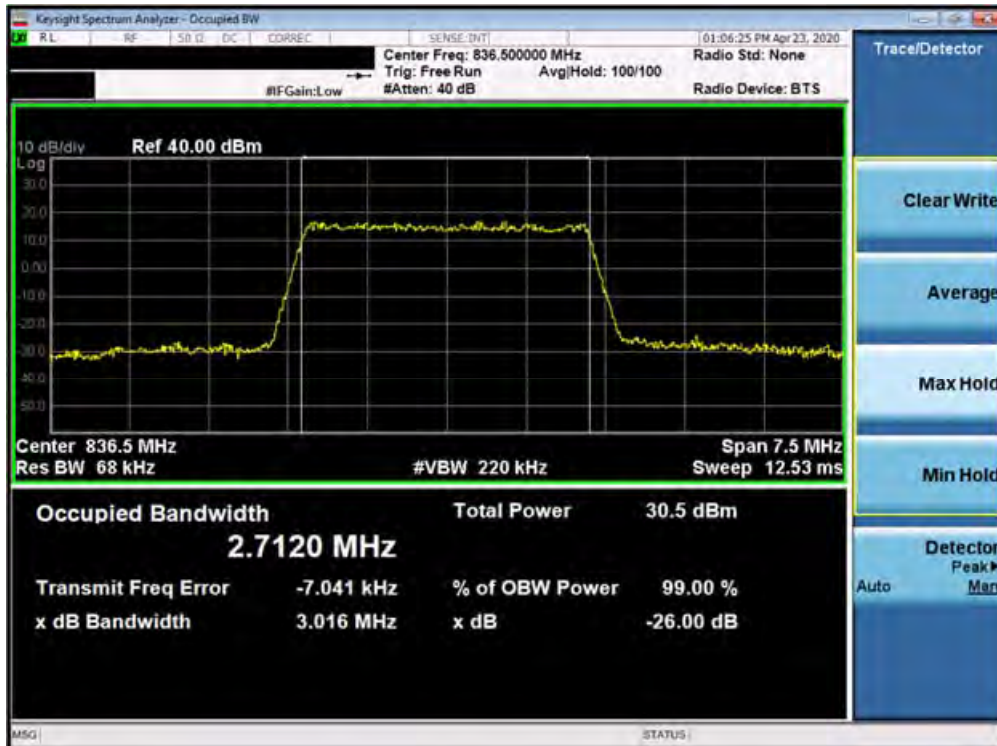


Plot 7-22. Occupied Bandwidth Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-23. Occupied Bandwidth Plot (Band 5 - 3.0MHz 16-QAM - Full RB Configuration)

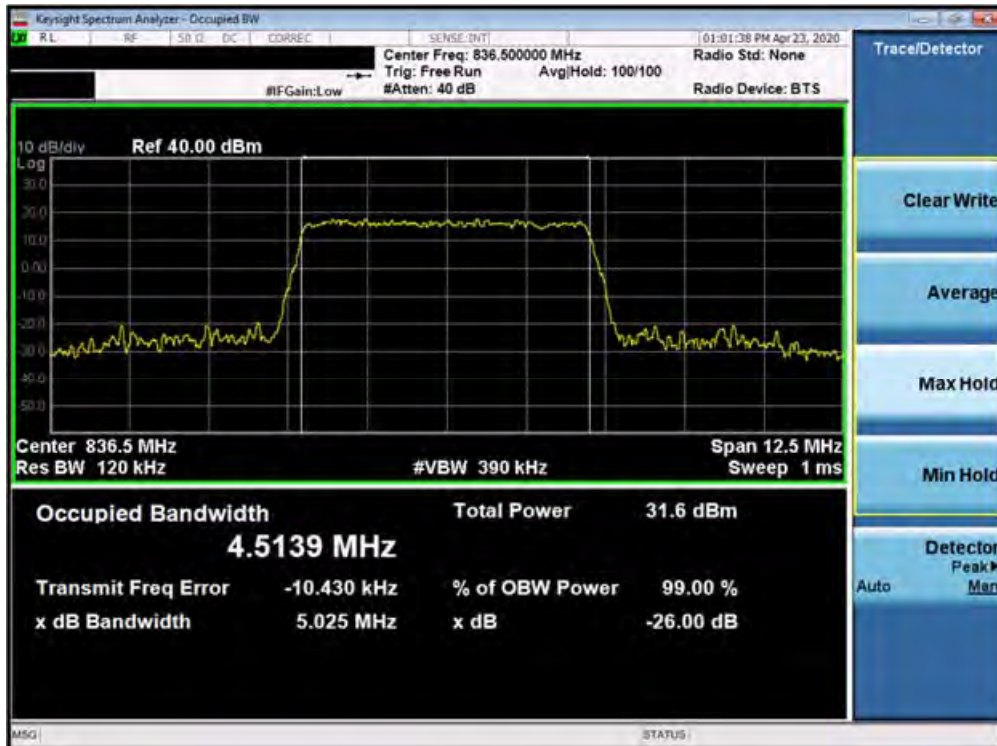


Plot 7-24. Occupied Bandwidth Plot (Band 5 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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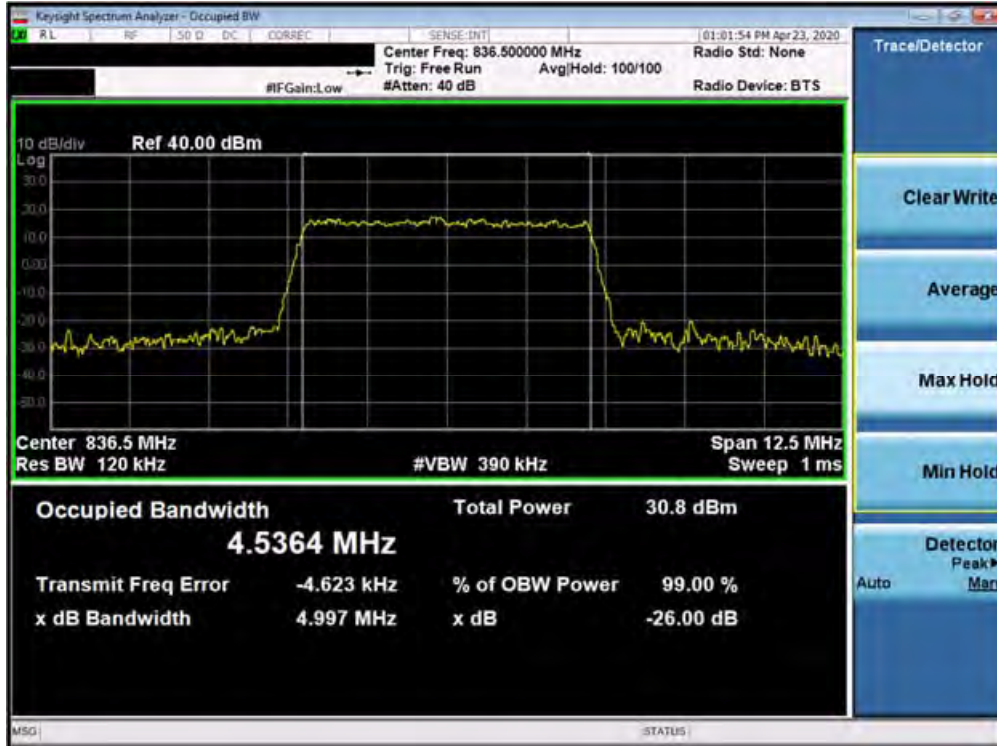


Plot 7-25. Occupied Bandwidth Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

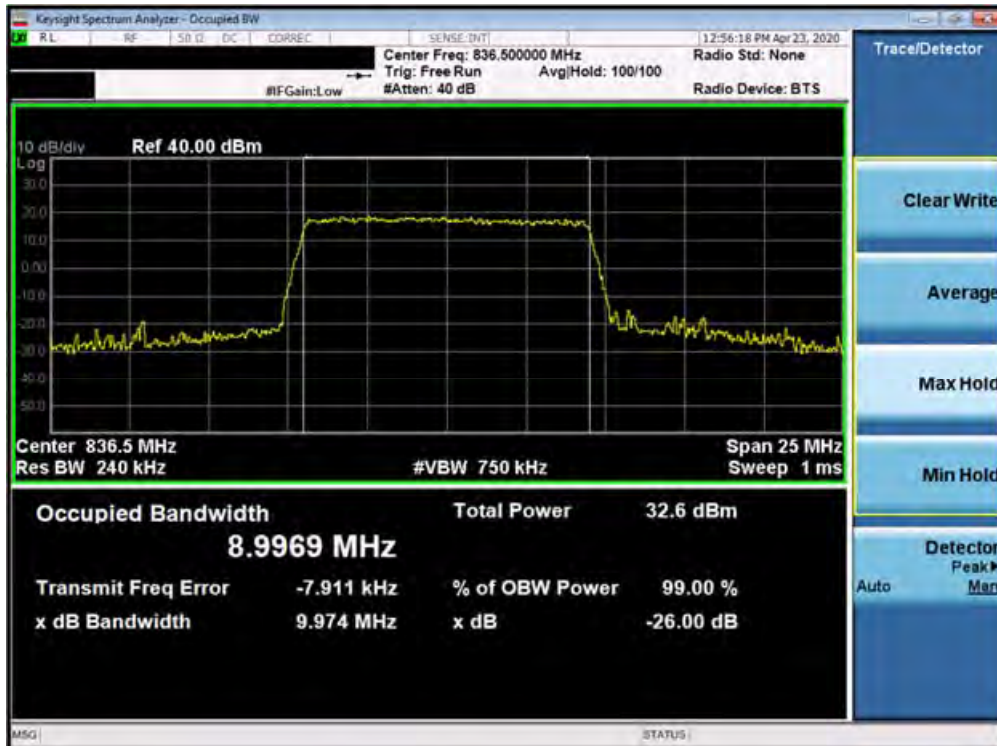


Plot 7-26. Occupied Bandwidth Plot (Band 5 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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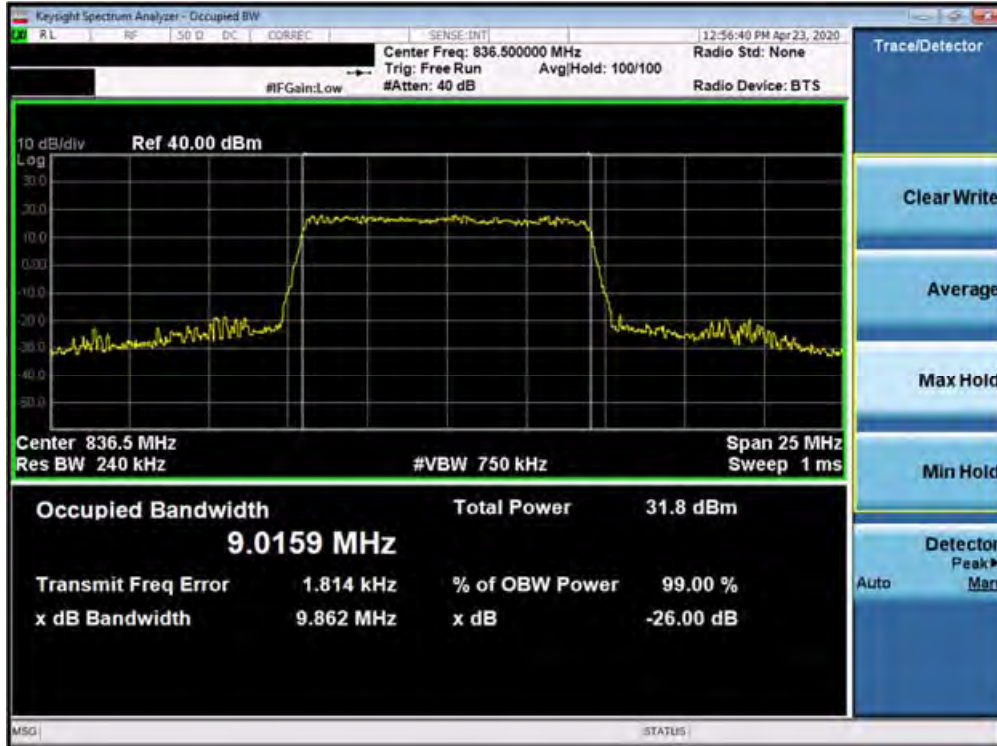


Plot 7-27. Occupied Bandwidth Plot (Band 5 - 5.0MHz 64-QAM - Full RB Configuration)

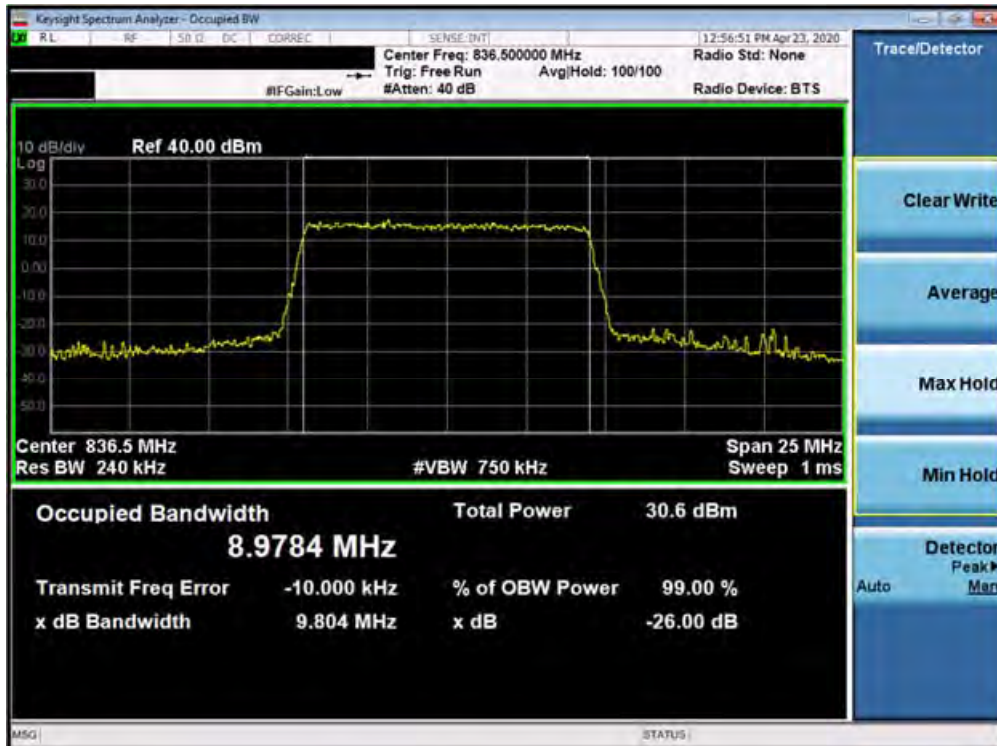


Plot 7-28. Occupied Bandwidth Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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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: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 4



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



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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-33. Occupied Bandwidth Plot (Band 4 - 1.4MHz 64-QAM - Full RB Configuration)



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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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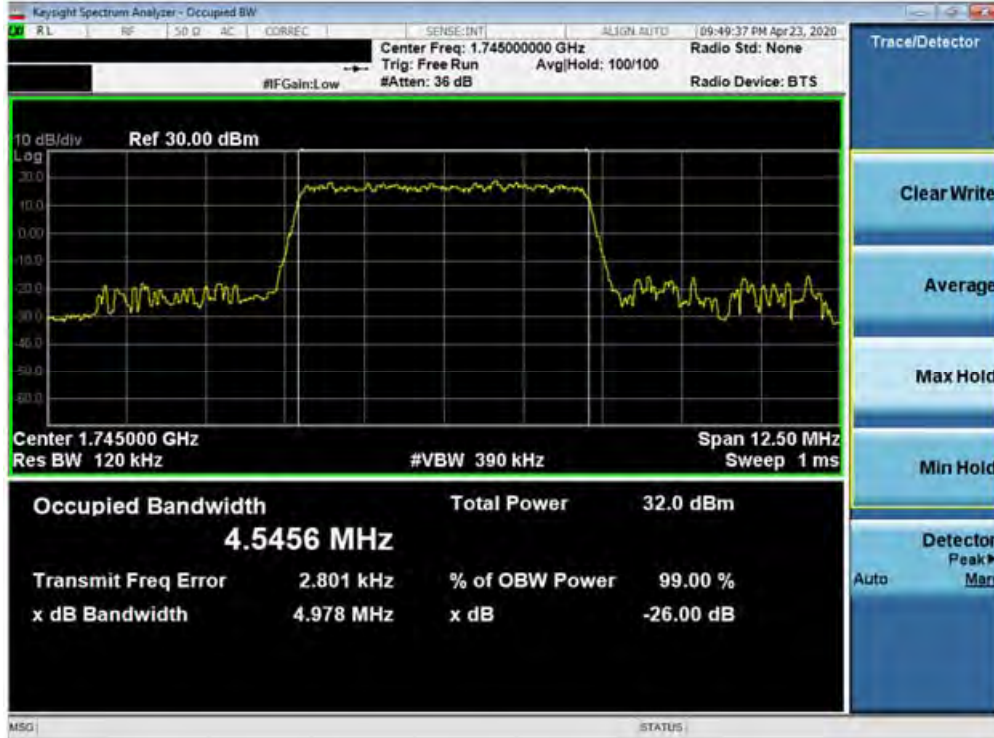


Plot 7-35. Occupied Bandwidth Plot (Band 4 - 3.0MHz 16-QAM - Full RB Configuration)



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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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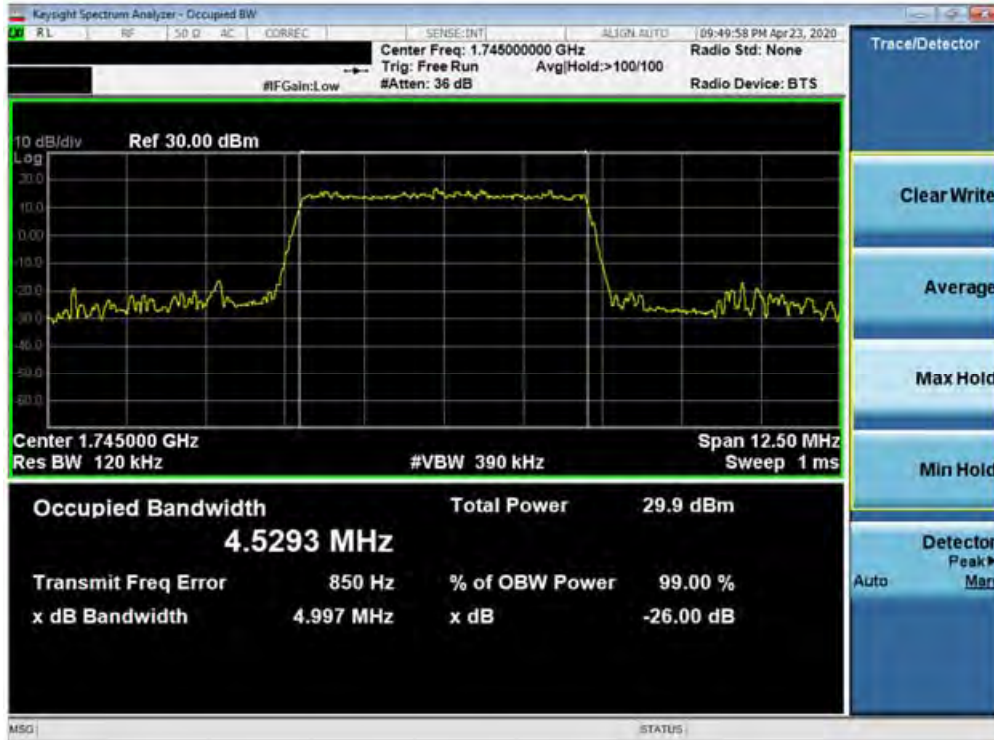


Plot 7-37. Occupied Bandwidth Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-39. Occupied Bandwidth Plot (Band 4 - 5.0MHz 64-QAM - Full RB Configuration)

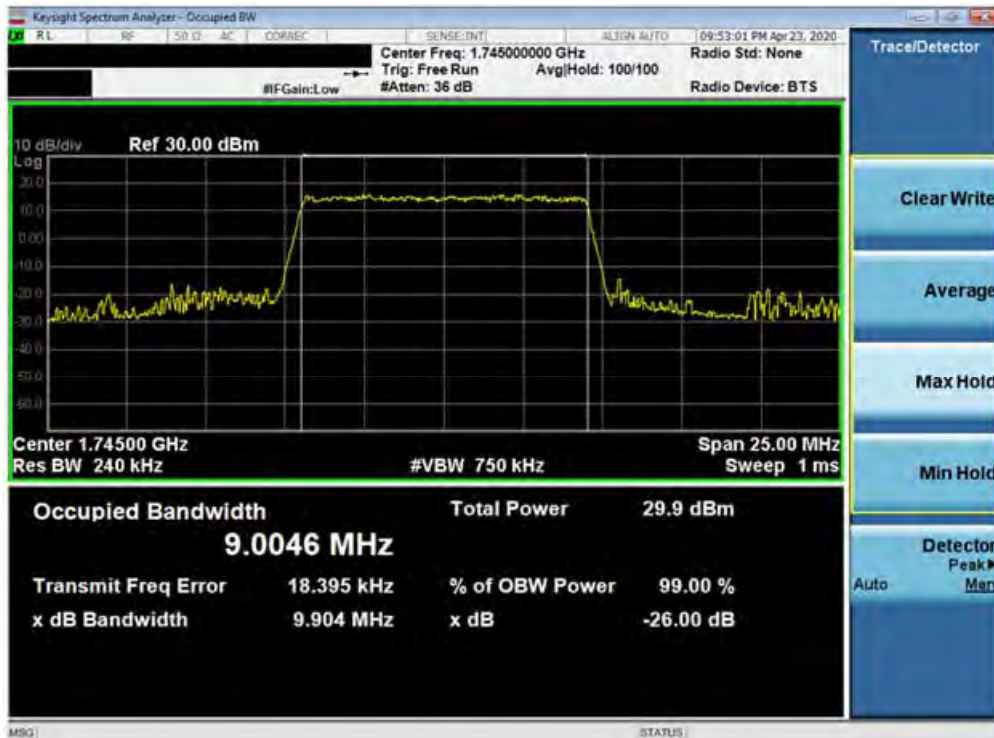


Plot 7-40. Occupied Bandwidth Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 34 of 148

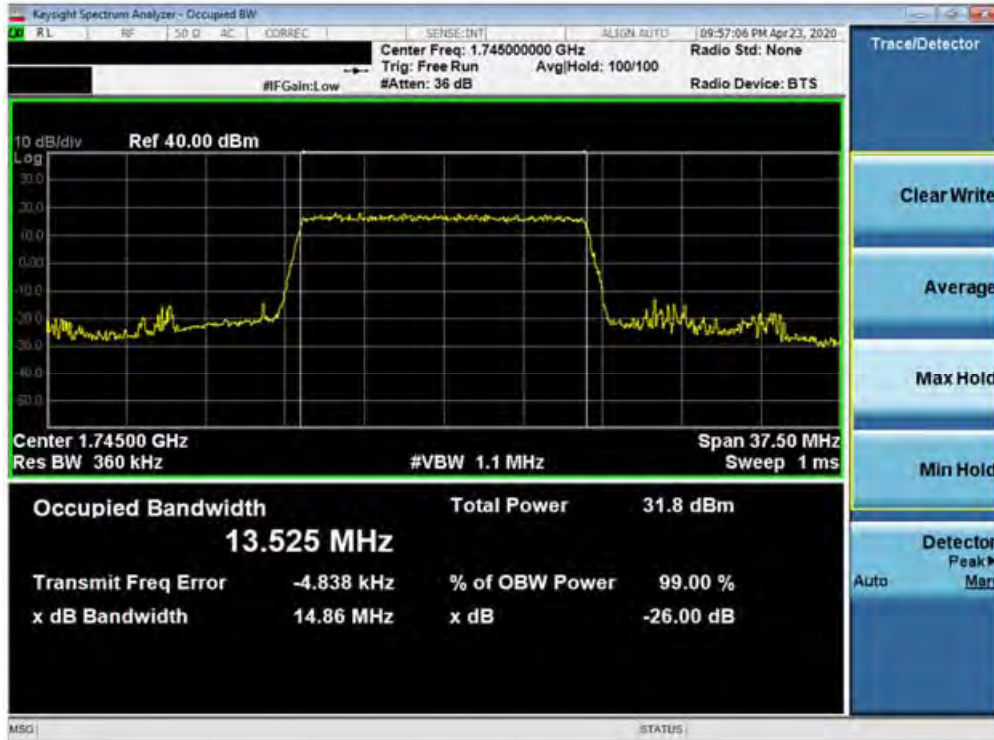


Plot 7-41. Occupied Bandwidth Plot (Band 4 - 10.0MHz 16-QAM - Full RB Configuration)



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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-43. Occupied Bandwidth Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



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

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 36 of 148

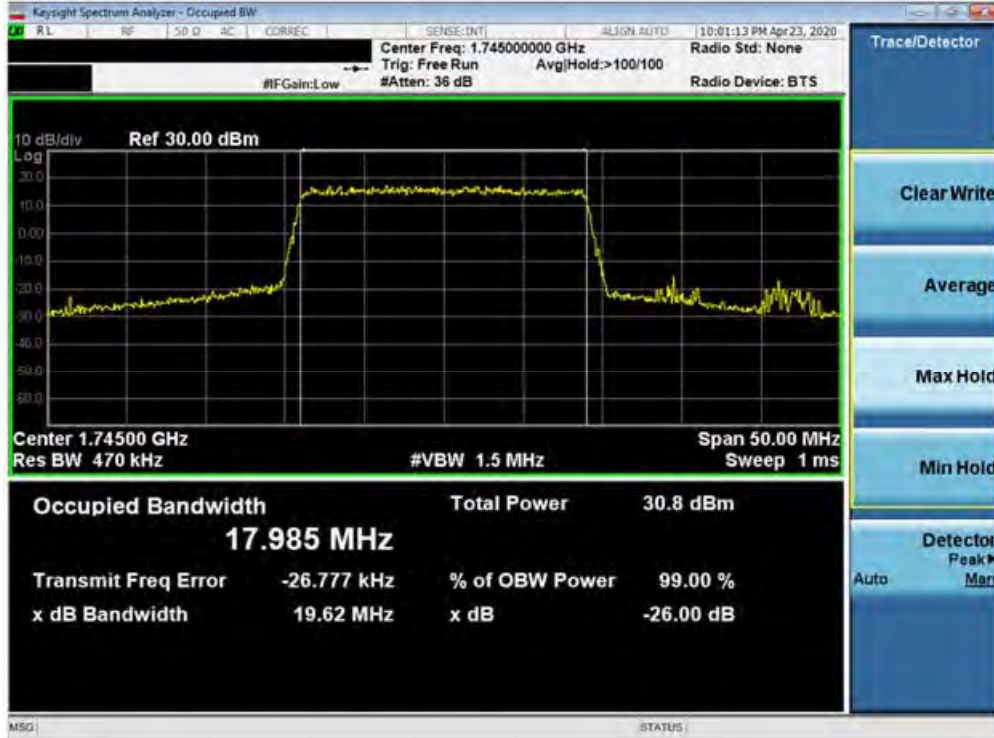


Plot 7-45. Occupied Bandwidth Plot (Band 4 - 15.0MHz 64-QAM - Full RB Configuration)



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

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-47. Occupied Bandwidth Plot (Band 4 - 20.0MHz 16-QAM - Full RB Configuration)



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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 41 (PC3)



Plot 7-49. Occupied Bandwidth Plot (Band 41 (PC3) - 5.0MHz QPSK - Full RB Configuration)



Plot 7-50. Occupied Bandwidth Plot (Band 41 (PC3) - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-51. Occupied Bandwidth Plot (Band 41 (PC3) - 5.0MHz 64-QAM - Full RB Configuration)

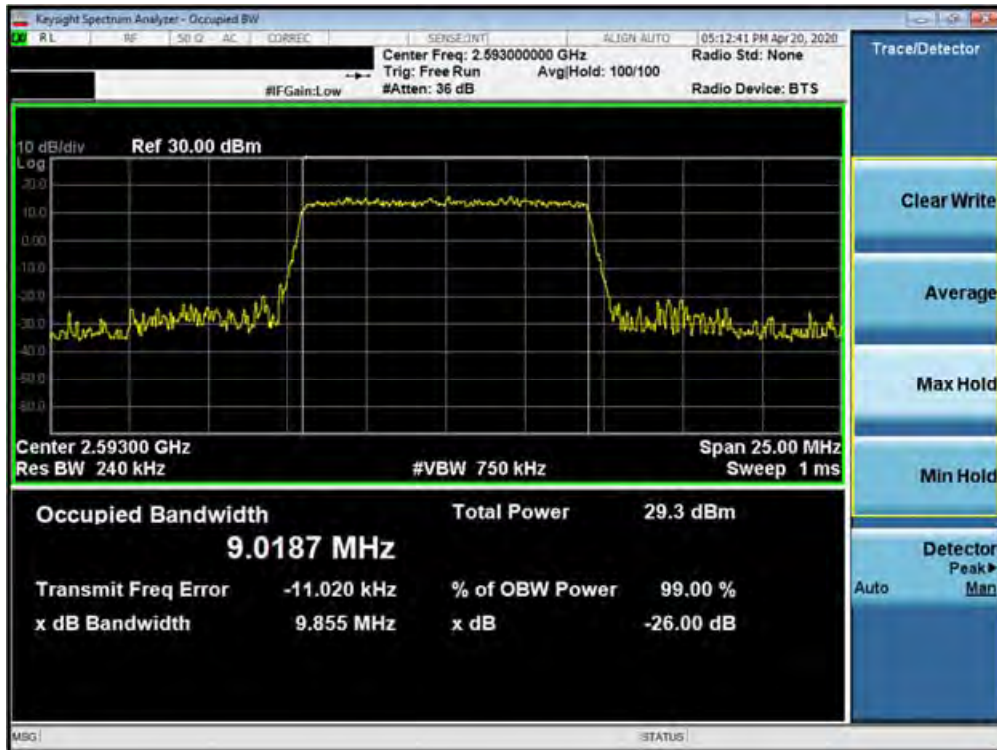


Plot 7-52. Occupied Bandwidth Plot (Band 41 (PC3) - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-53. Occupied Bandwidth Plot (Band 41 (PC3) - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-54. Occupied Bandwidth Plot (Band 41 (PC3) - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 41 of 148

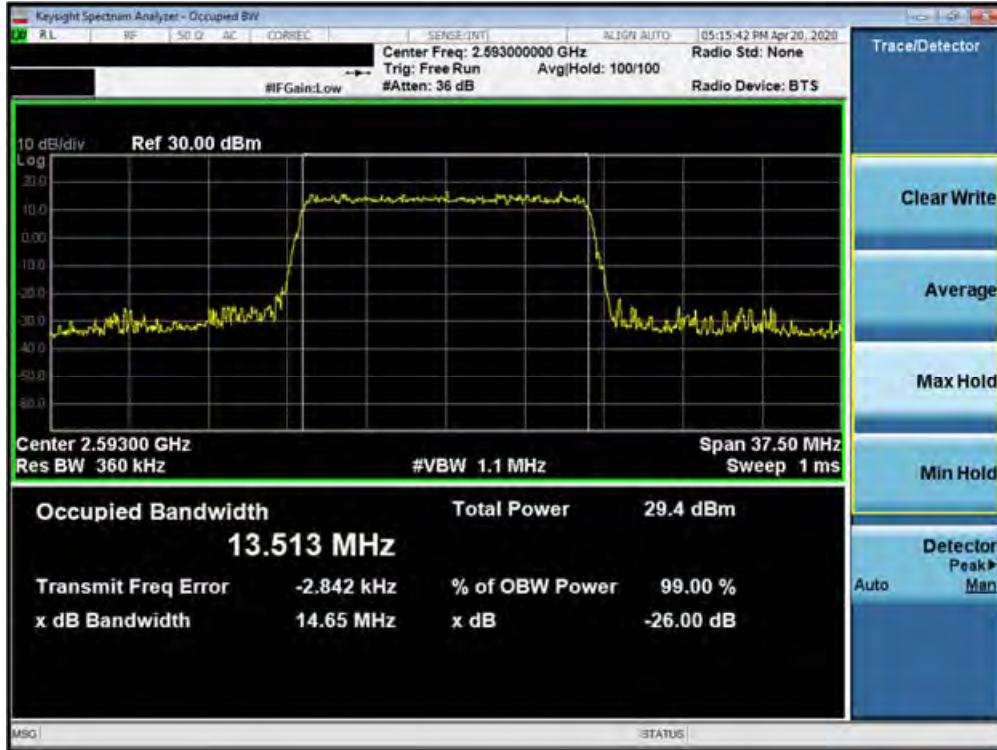


Plot 7-55. Occupied Bandwidth Plot (Band 41 (PC3) - 15.0MHz QPSK - Full RB Configuration)



Plot 7-56. Occupied Bandwidth Plot (Band 41 (PC3) - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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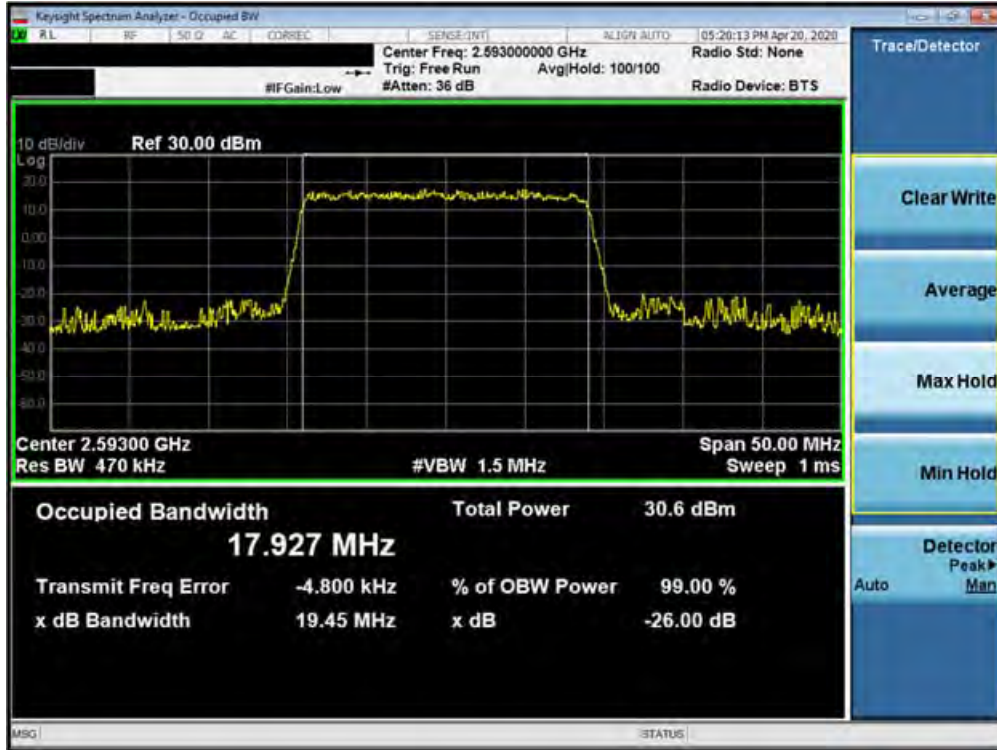


Plot 7-57. Occupied Bandwidth Plot (Band 41 (PC3) - 15.0MHz 64-QAM - Full RB Configuration)

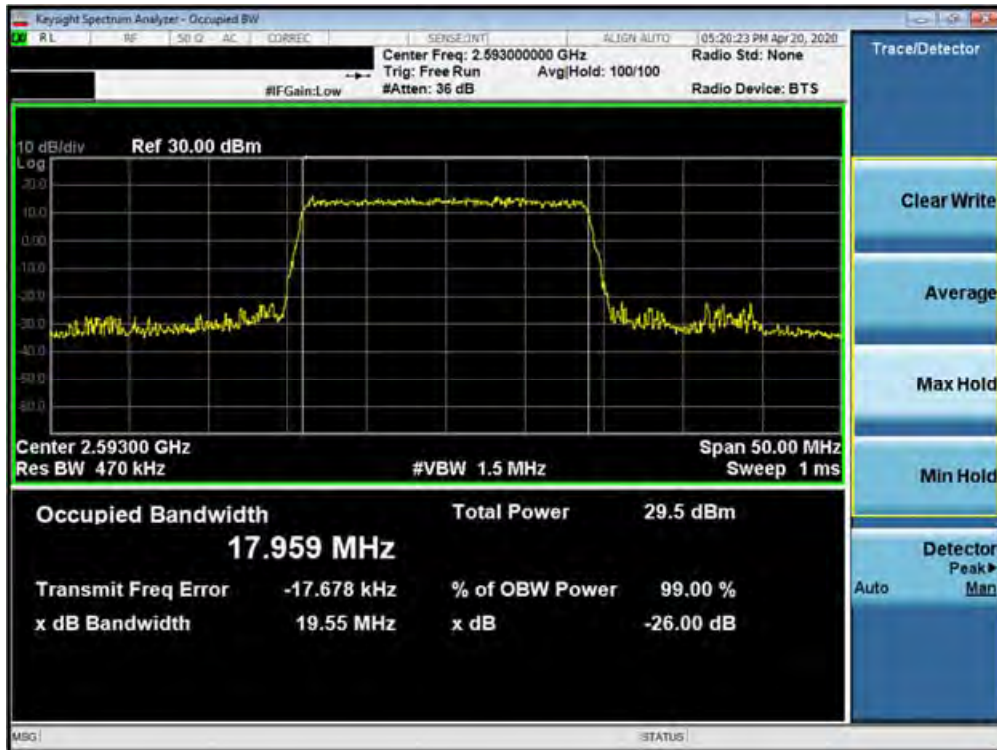


Plot 7-58. Occupied Bandwidth Plot (Band 41 (PC3) - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-59. Occupied Bandwidth Plot (Band 41 (PC3) - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-60. Occupied Bandwidth Plot (Band 41 (PC3) - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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7.3 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 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 $43 + 10 \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average
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.



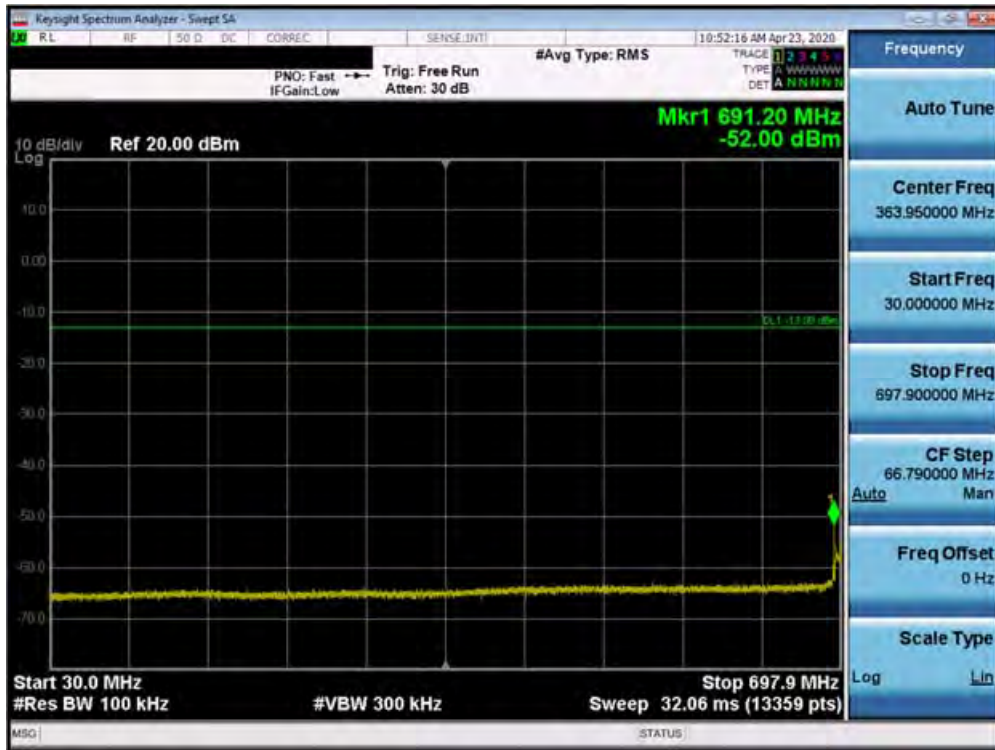
Figure 7-2. Test Instrument & Measurement Setup

Test Notes

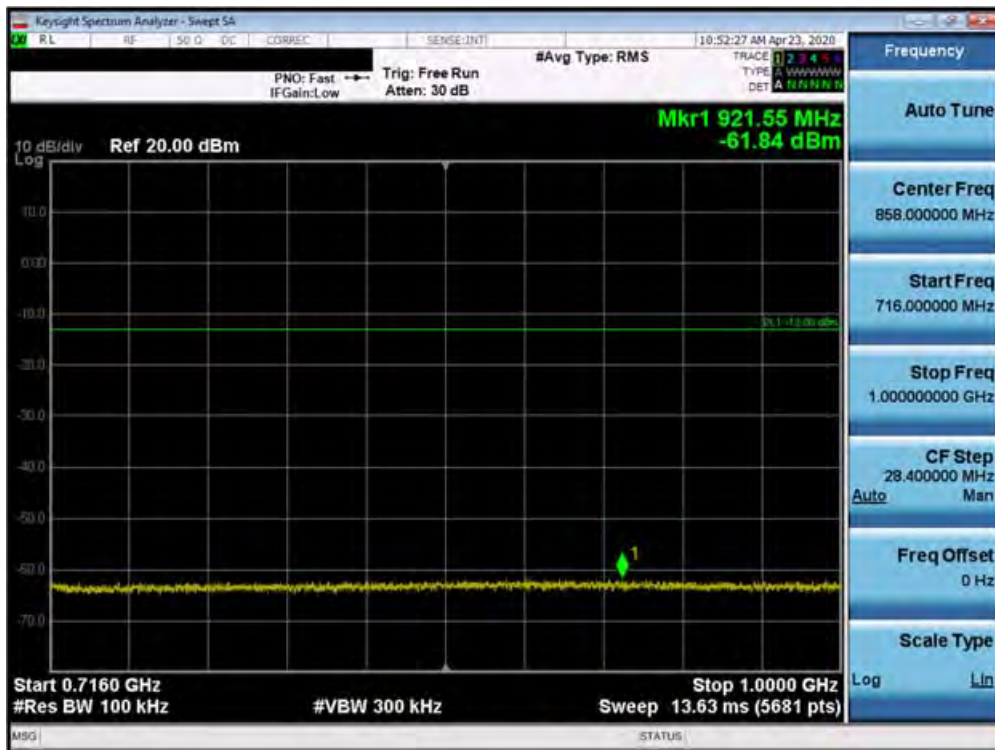
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent 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: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 12



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

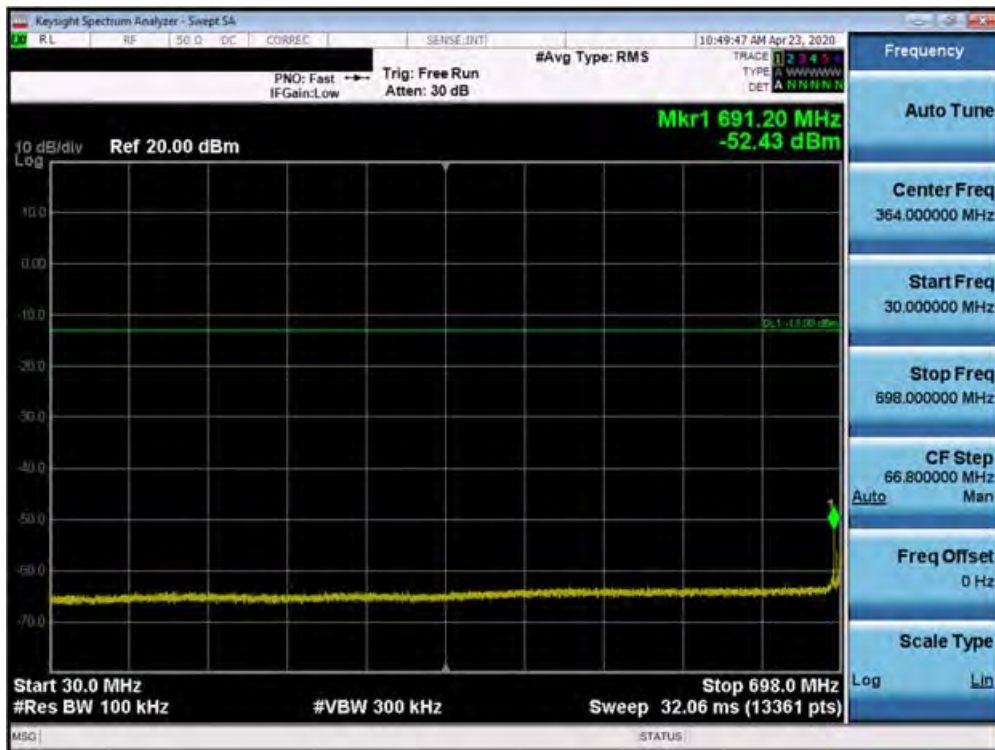


Plot 7-62. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 46 of 148

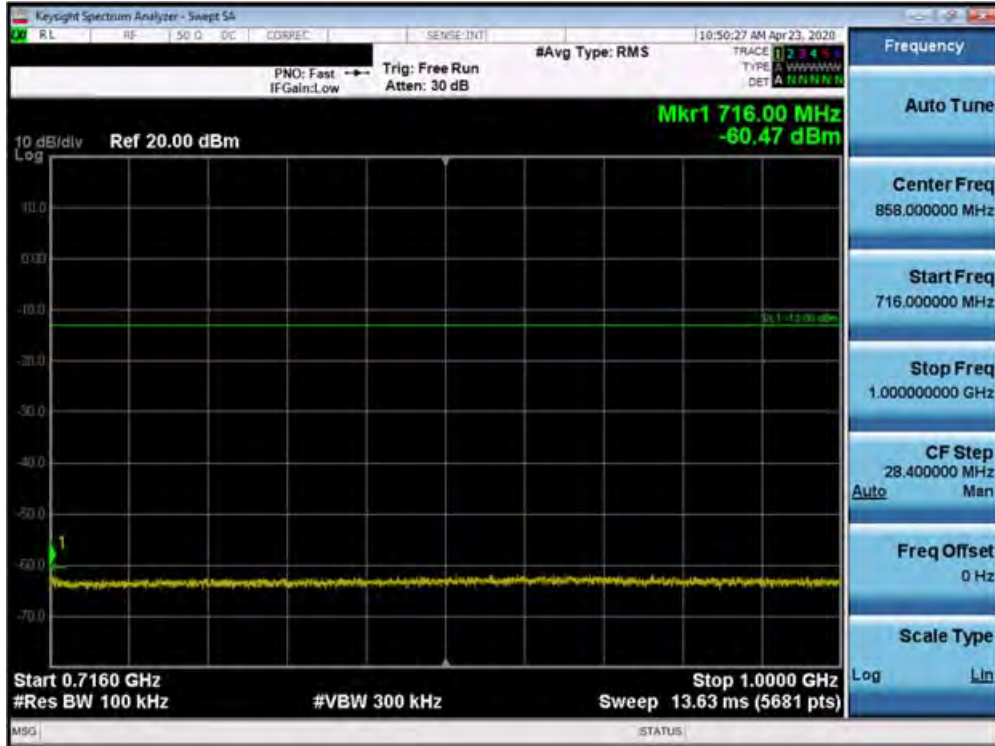


Plot 7-63. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

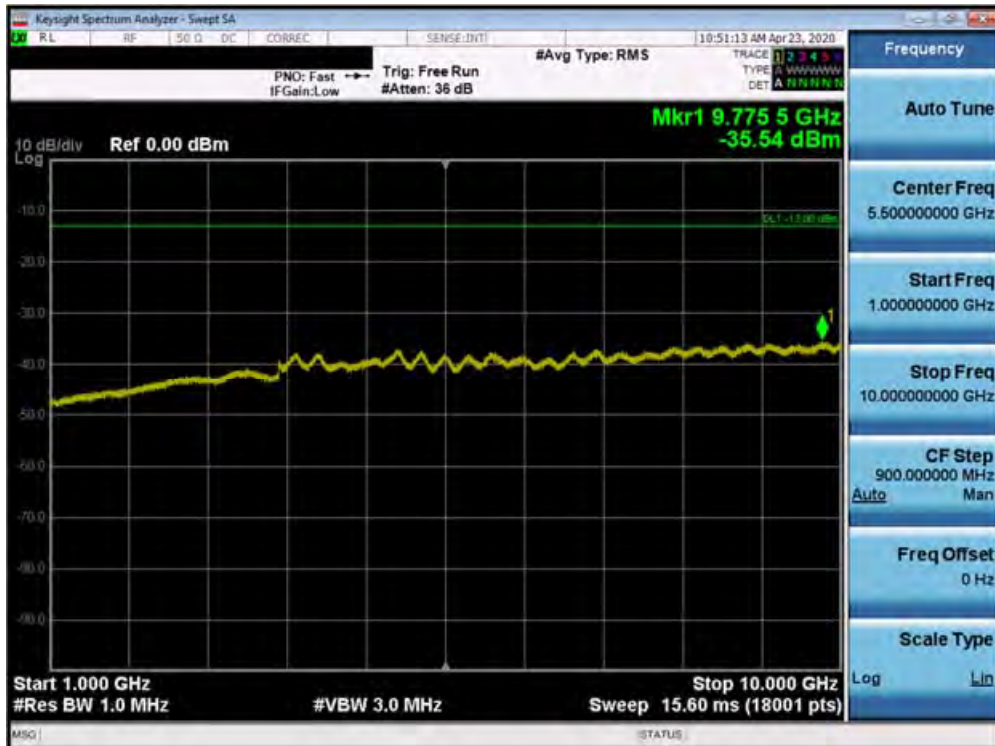


Plot 7-64. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-65. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

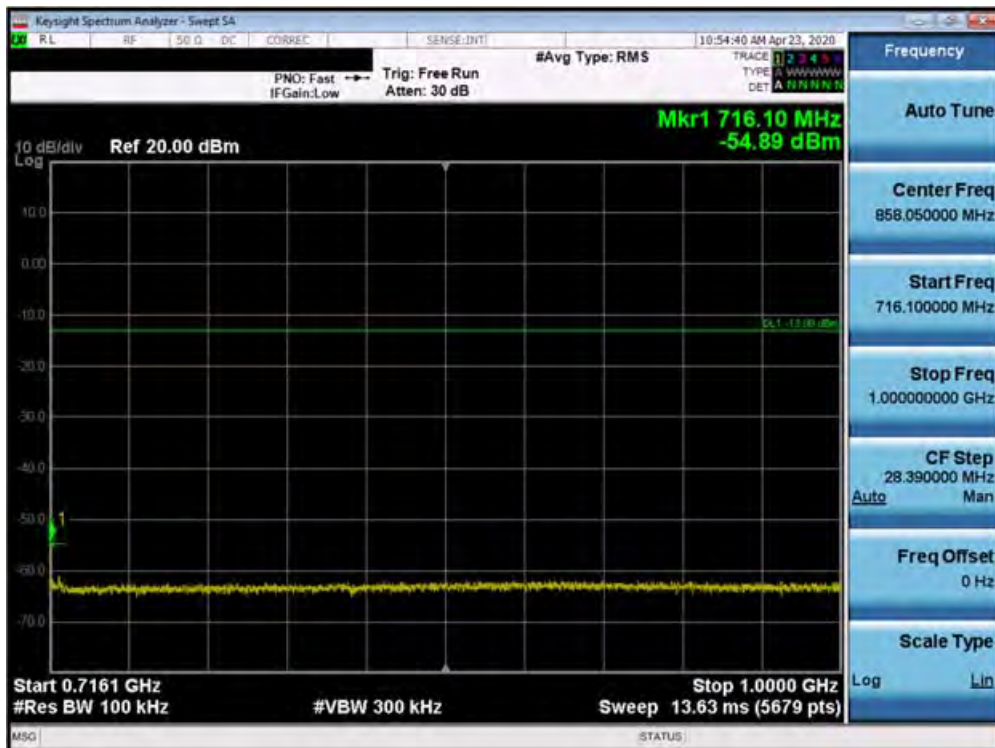


Plot 7-66. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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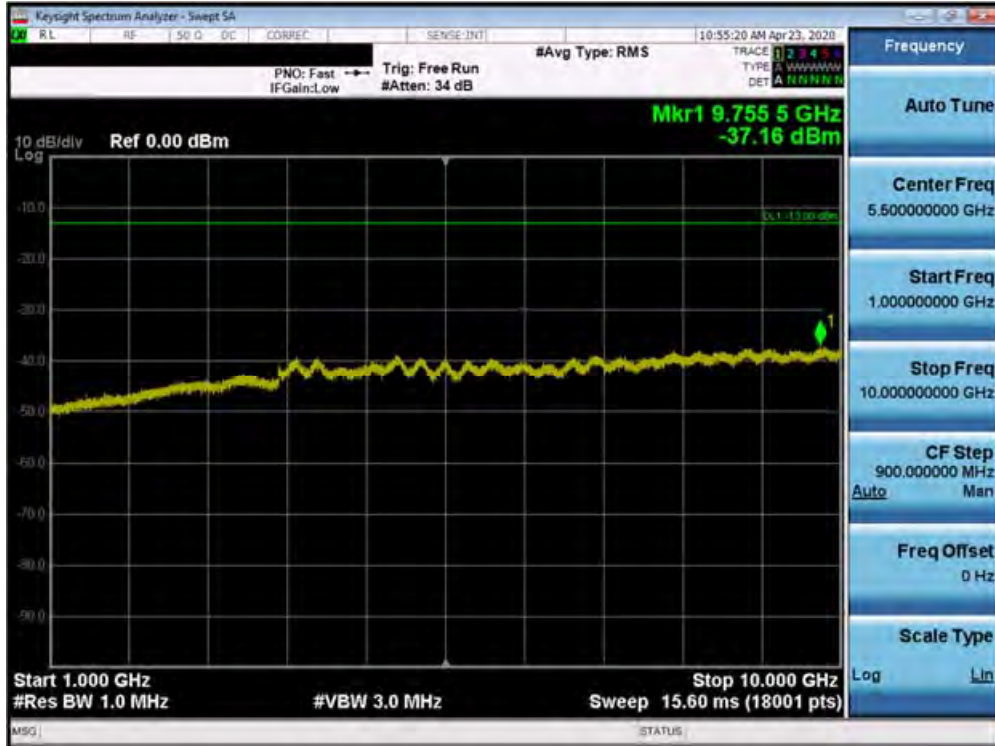


Plot 7-67. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 49 of 148



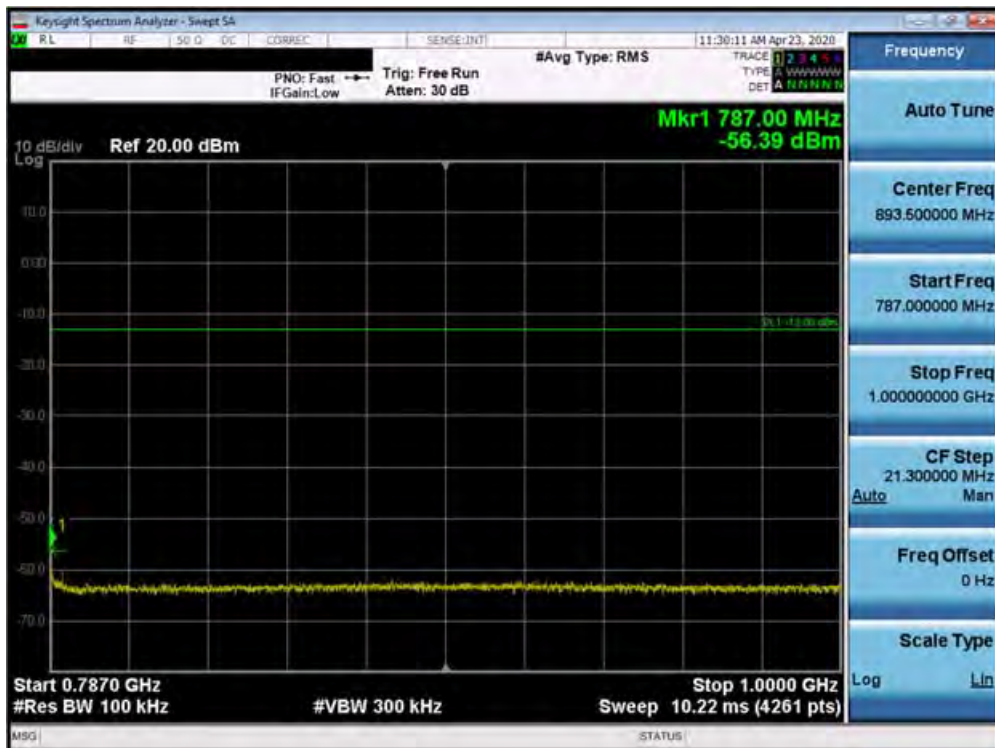
Plot 7-69. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMN986JPN	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	 Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 50 of 148

Band 13



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



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

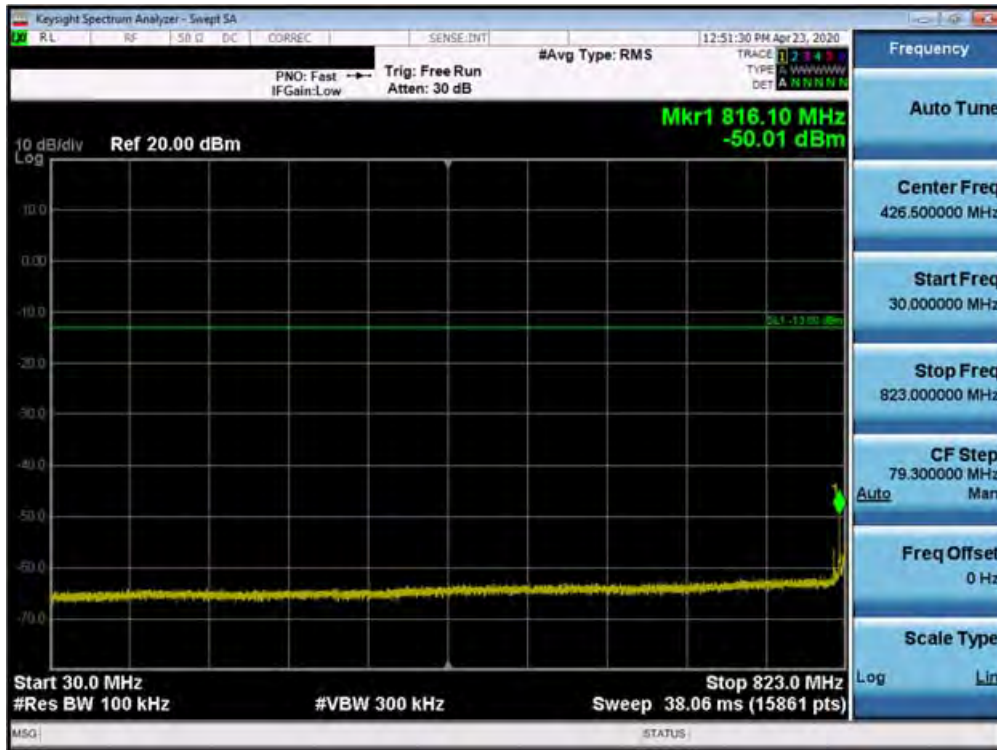
FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 51 of 148



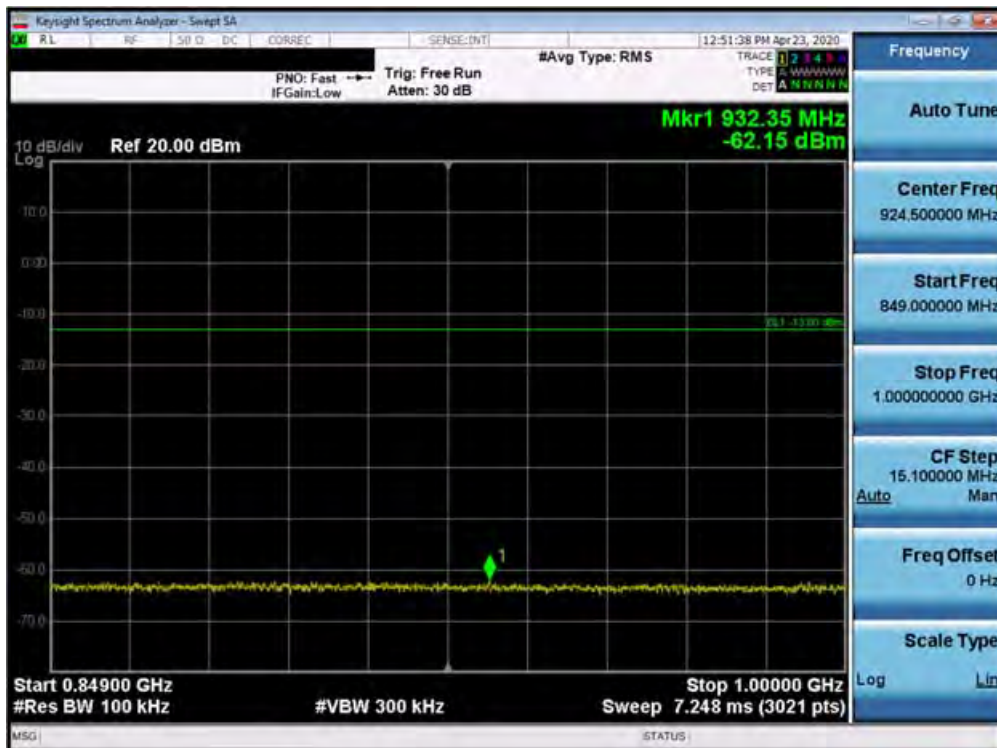
Plot 7-72. Conducted Spurious Plot (Band 13 - 10.0MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMN986JPN	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	 Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 52 of 148

Band 5

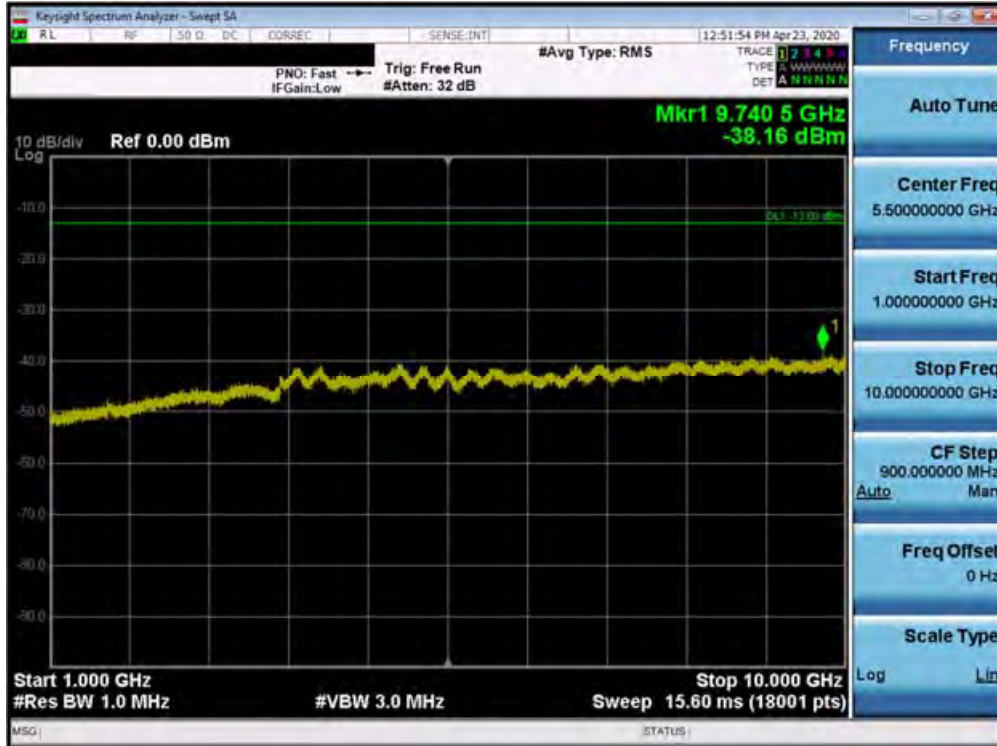


Plot 7-73. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

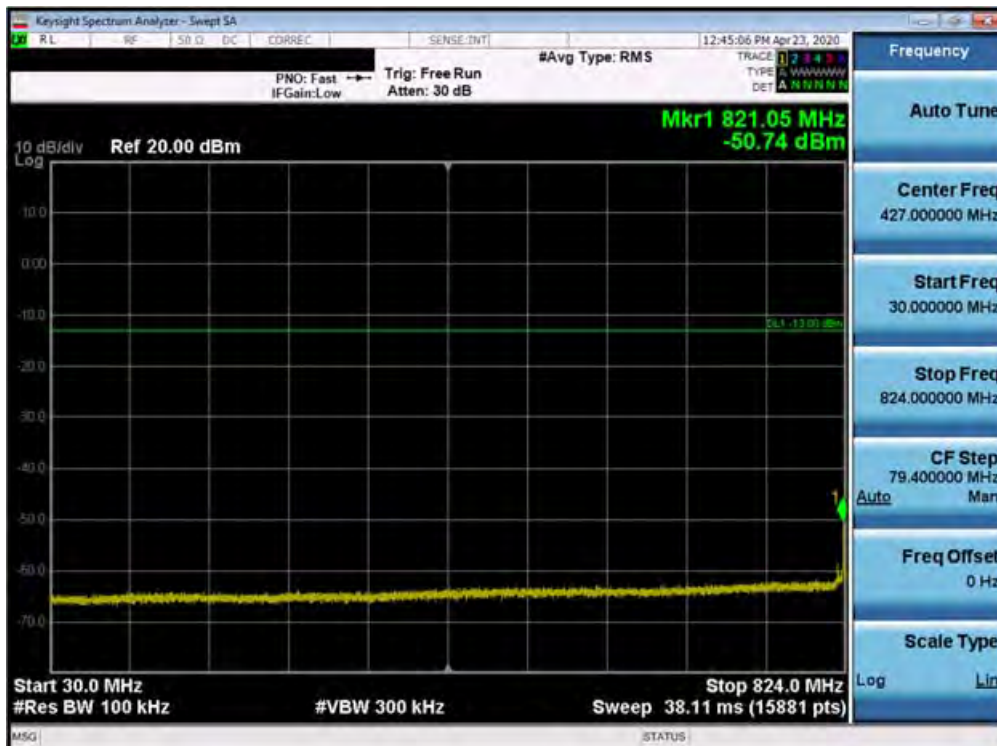


Plot 7-74. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 53 of 148

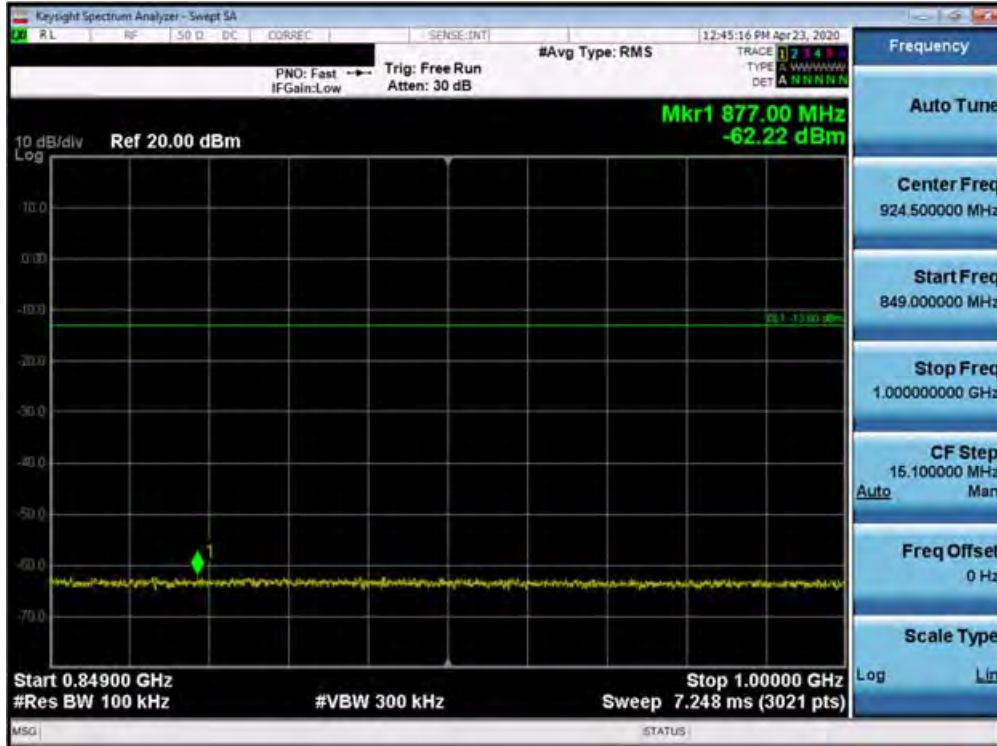


Plot 7-75. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 54 of 148



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

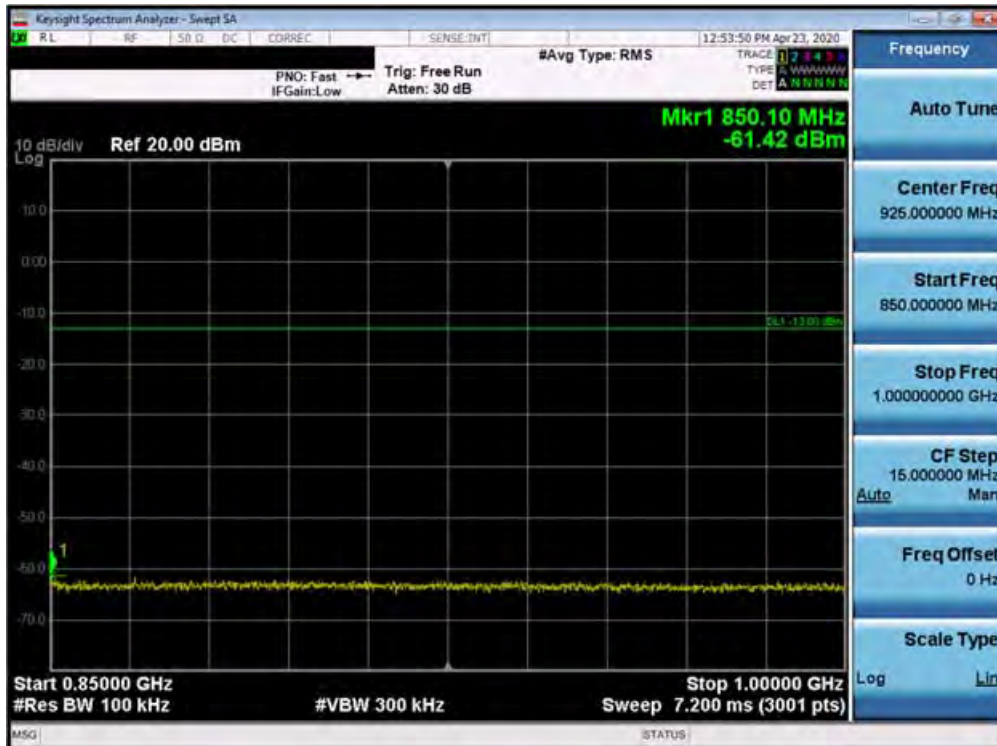


Plot 7-78. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMN986JPN	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	 Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 55 of 148

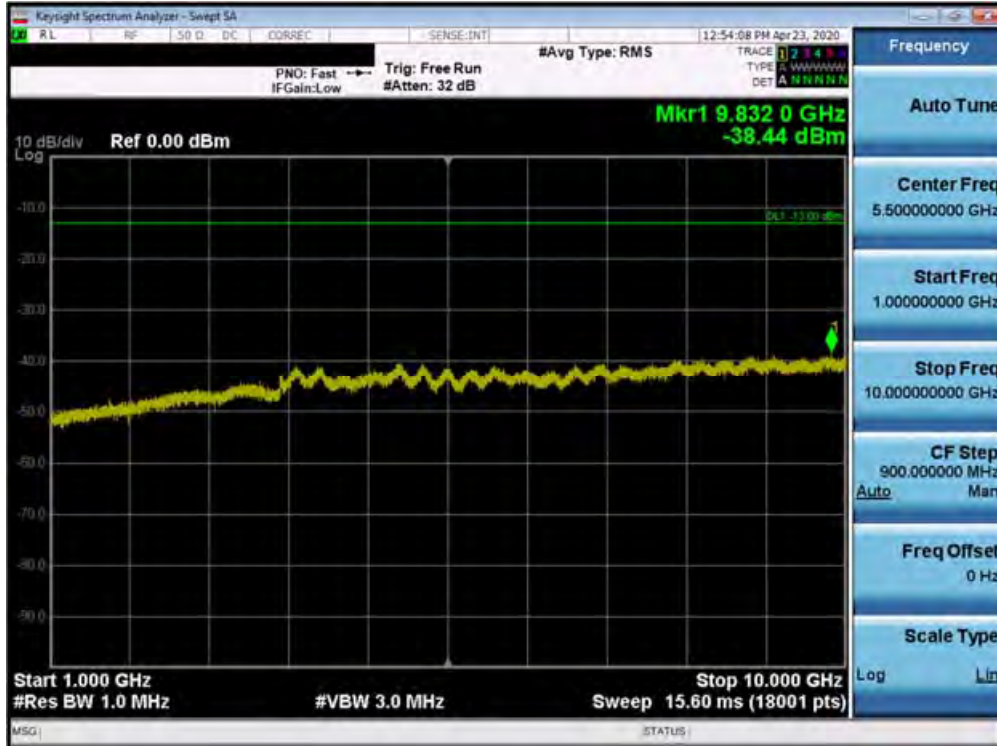


Plot 7-79. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



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

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 56 of 148



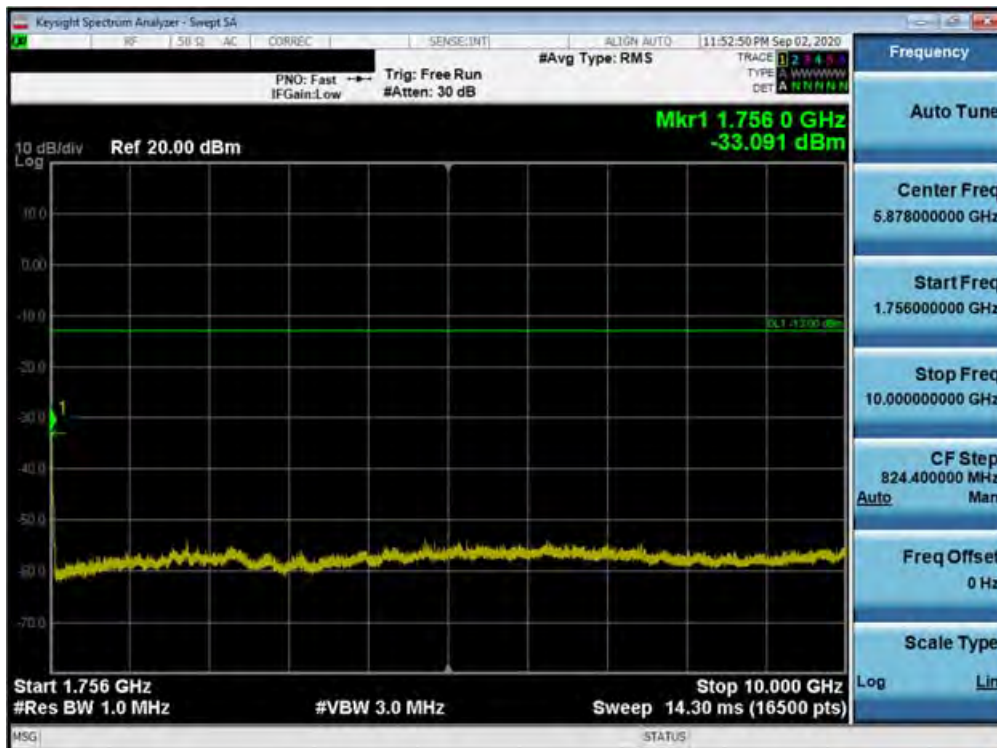
Plot 7-81. Conducted Spurious Plot (Band 5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 57 of 148

Band 4

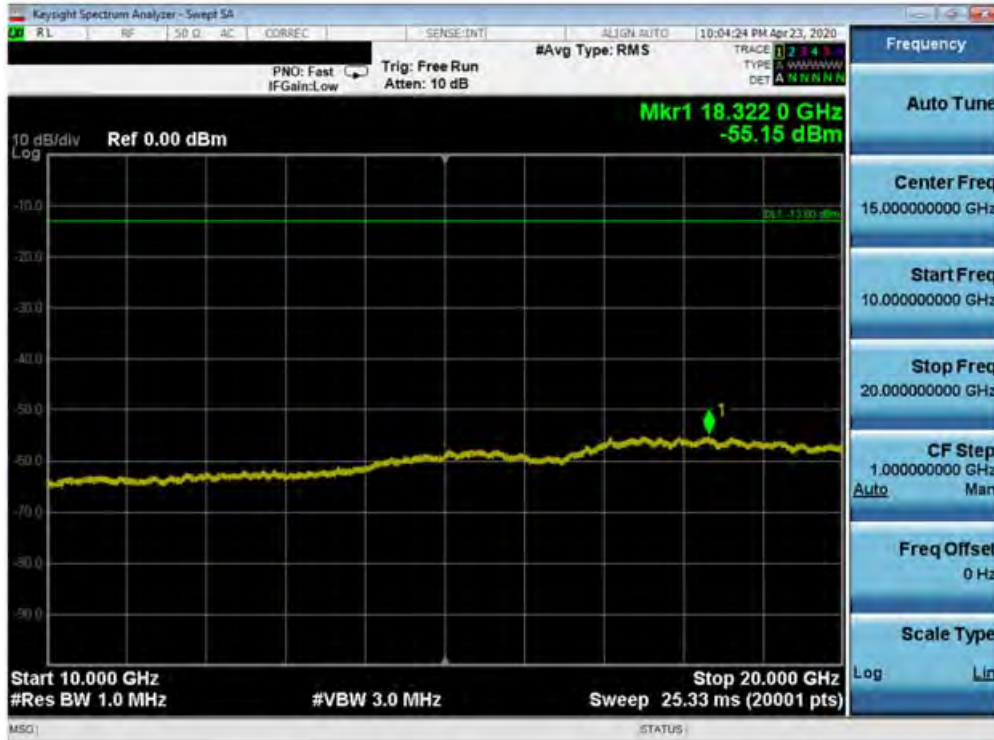


Plot 7-82. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

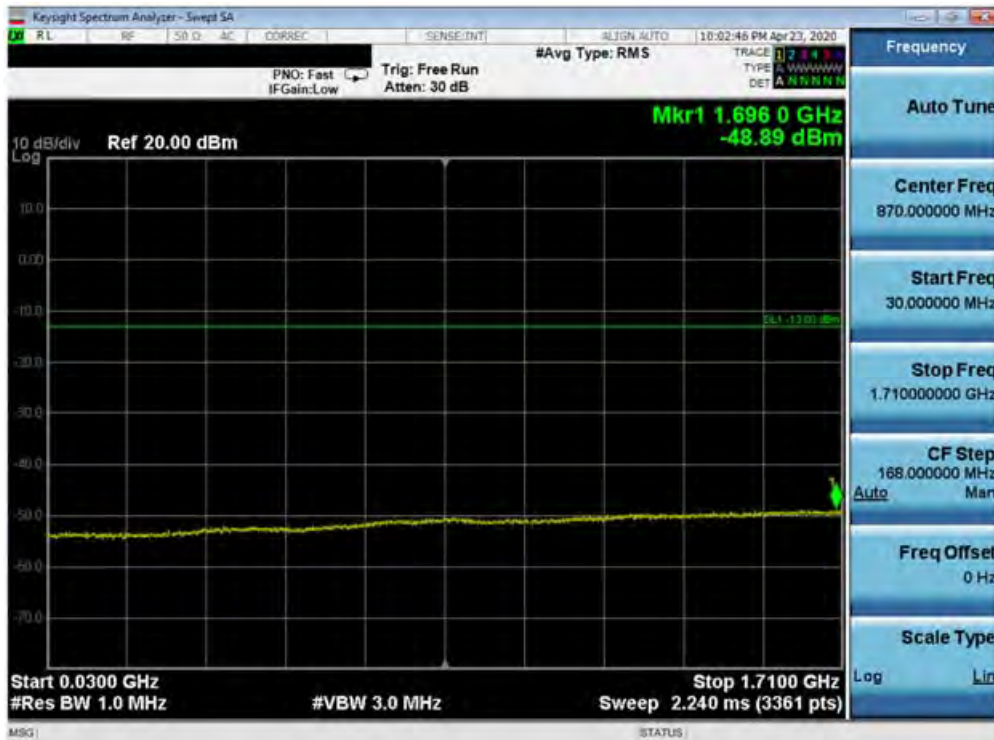


Plot 7-83. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 58 of 148



Plot 7-84. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-85. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 59 of 148

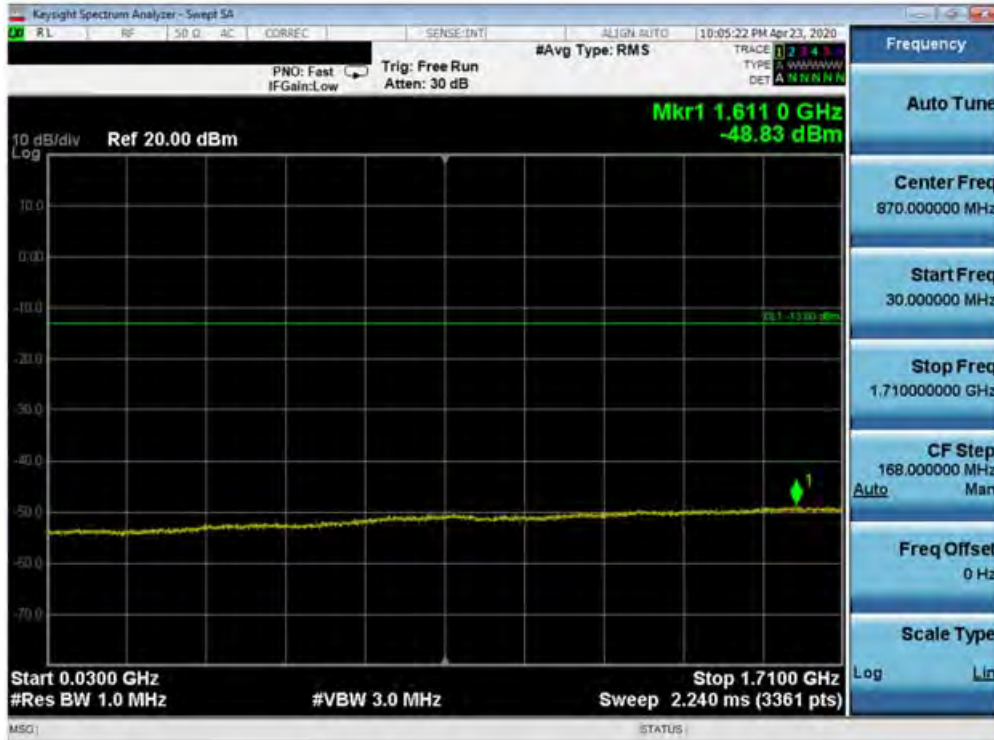


Plot 7-86. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

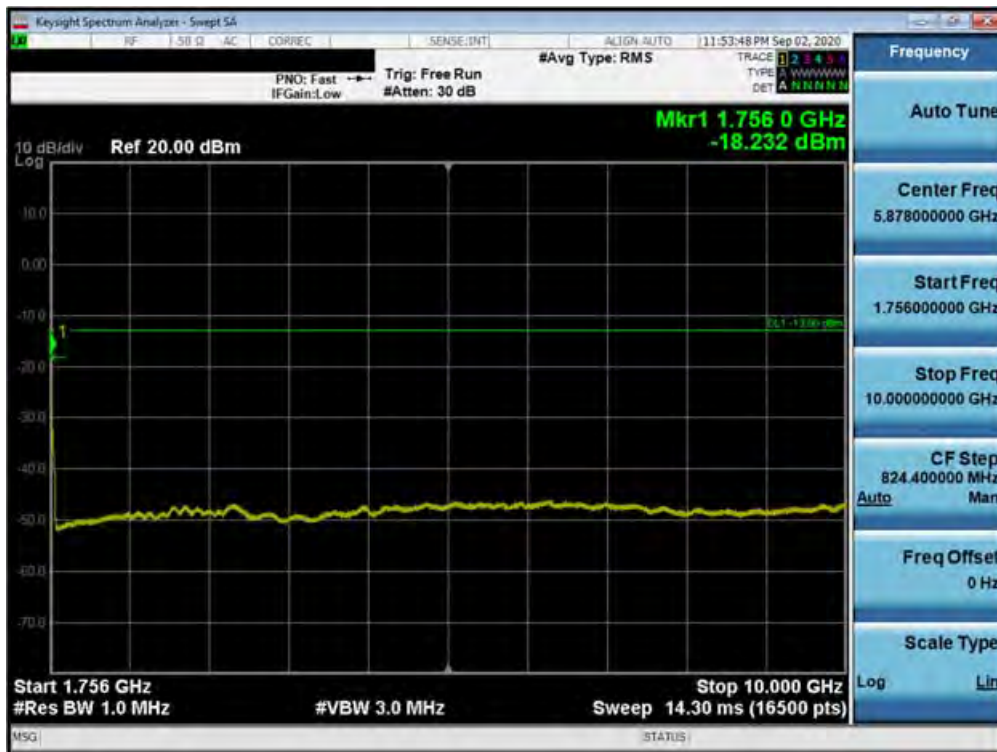


Plot 7-87. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 60 of 148

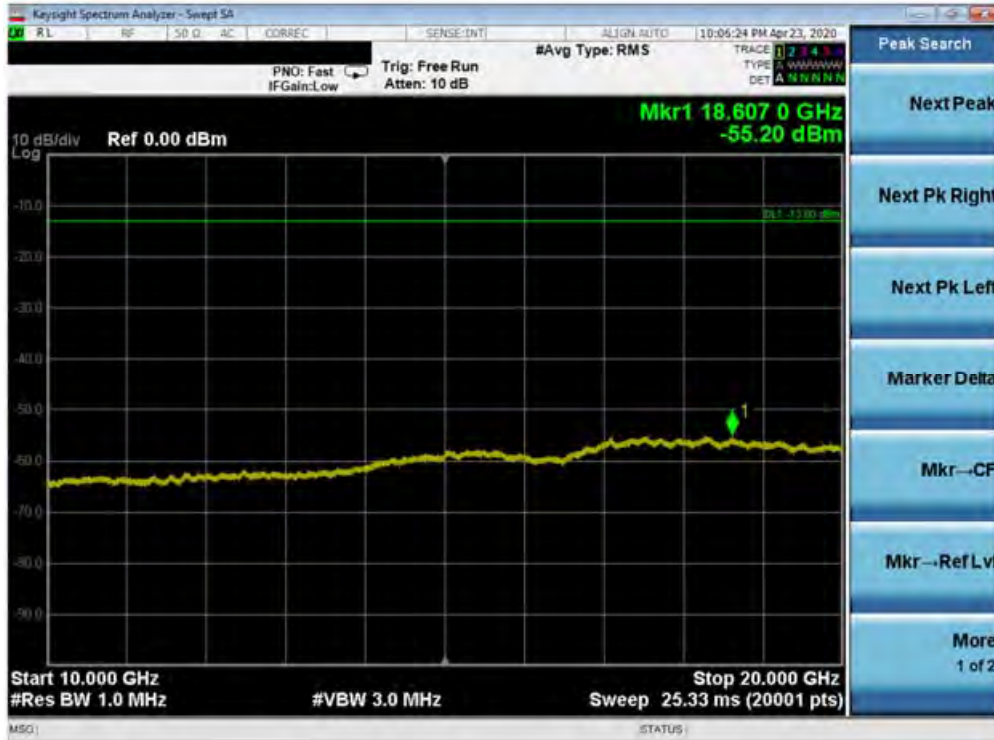


Plot 7-88. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-89. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

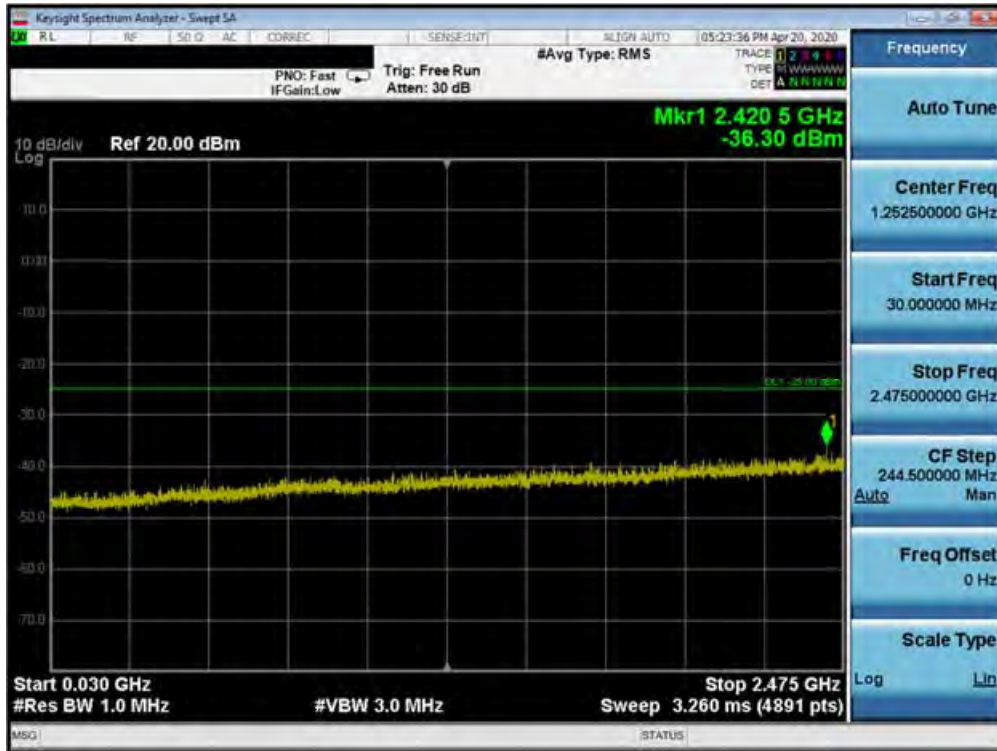
FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 61 of 148



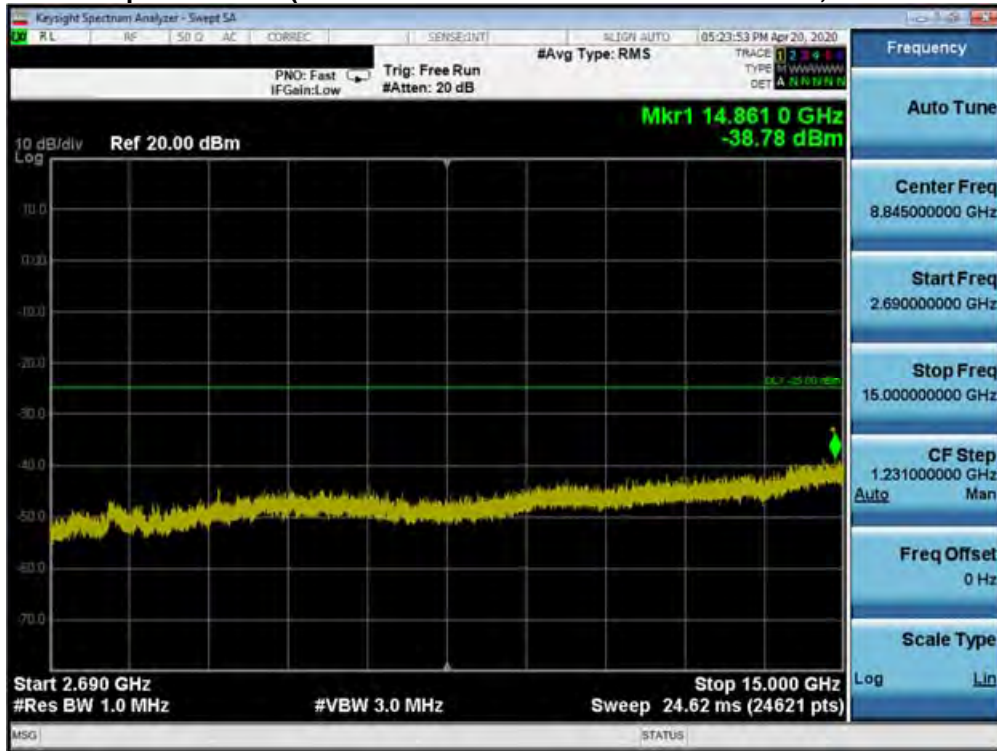
Plot 7-90. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMN986JPN	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	 Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 62 of 148

Band 41 PC3



Plot 7-91. Conducted Spurious Plot (Band 41 PC3 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

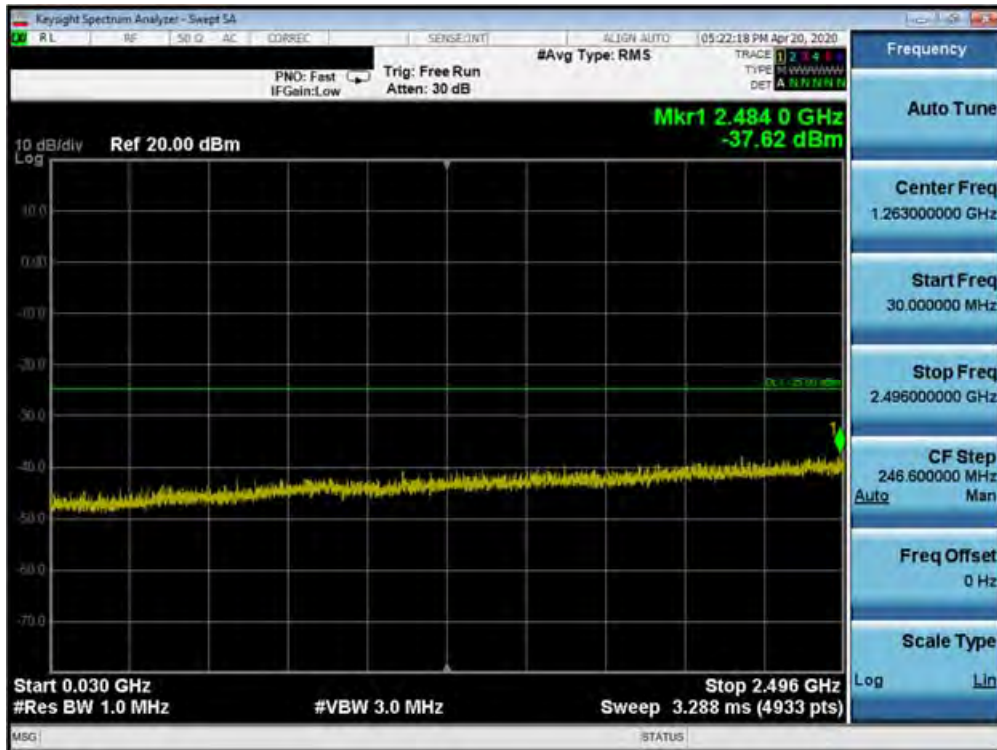


Plot 7-92. Conducted Spurious Plot (Band 41 PC3 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 63 of 148

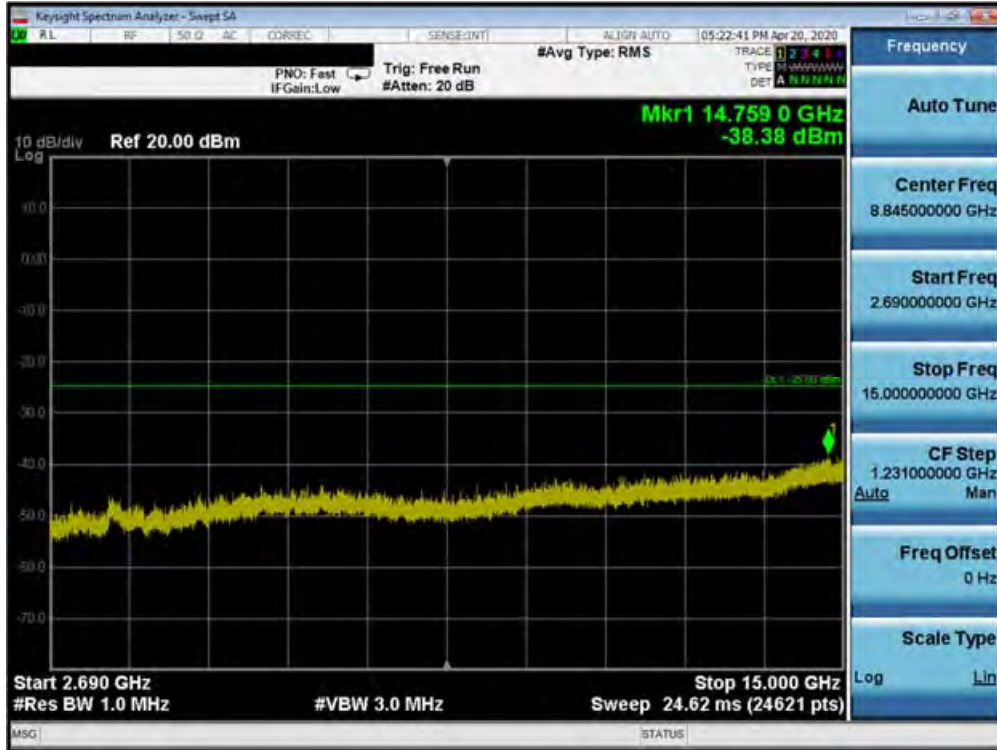


Plot 7-93. Conducted Spurious Plot (Band 41 PC3 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

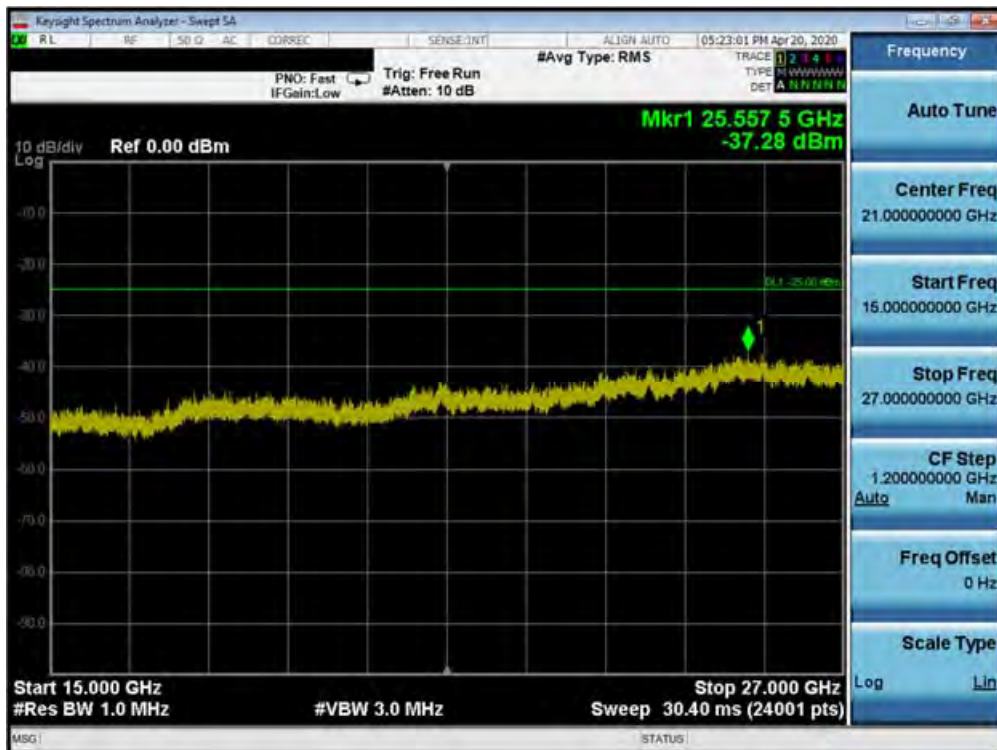


Plot 7-94. Conducted Spurious Plot (Band 41 PC3 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 64 of 148

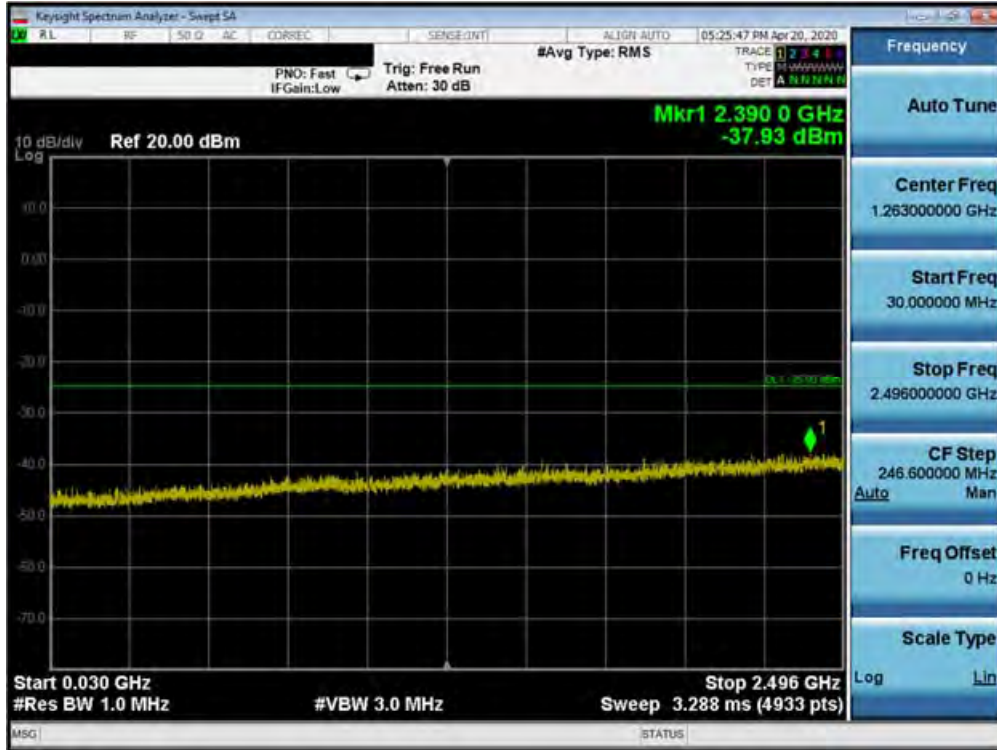


Plot 7-95. Conducted Spurious Plot (Band 41 PC3 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

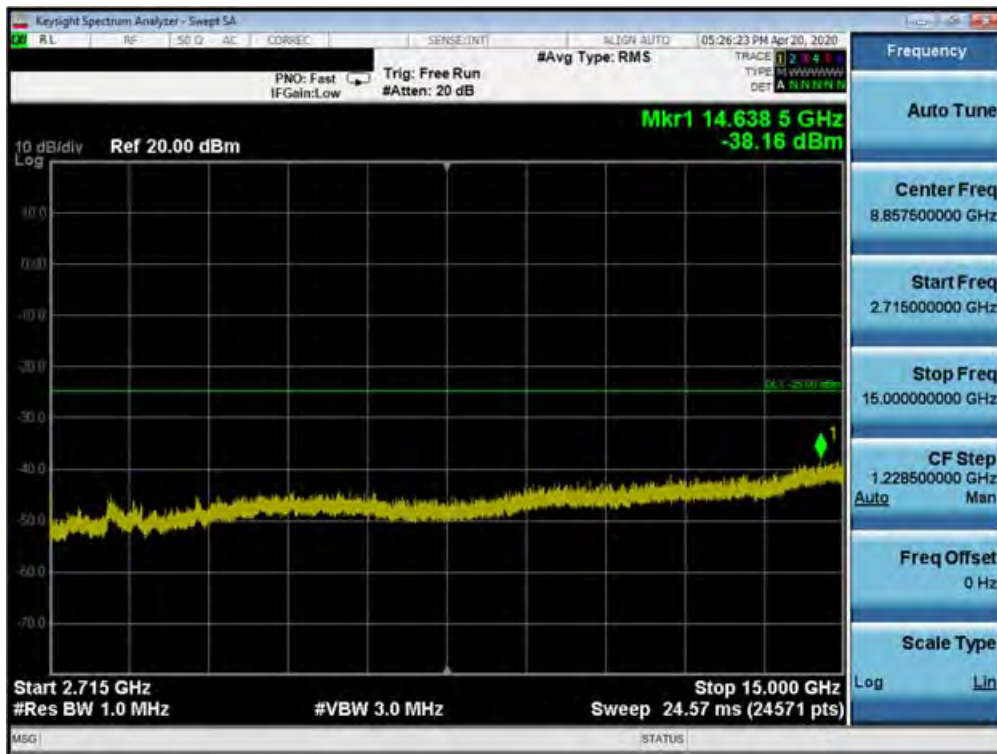


Plot 7-96. Conducted Spurious Plot (Band 41 PC3 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 65 of 148

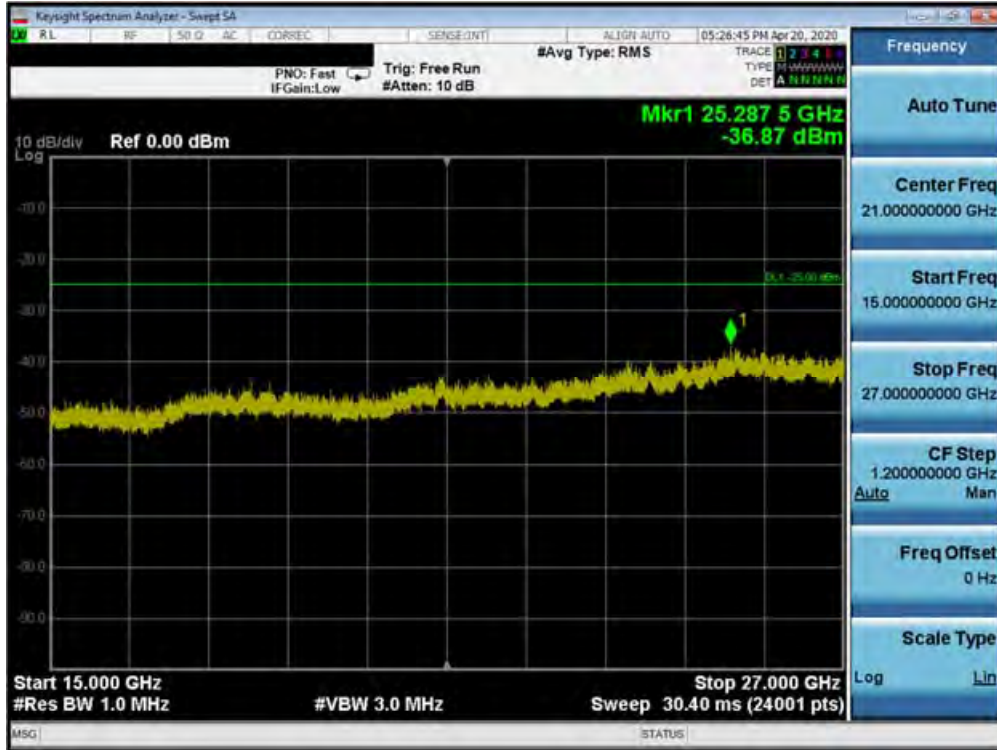


Plot 7-97. Conducted Spurious Plot (Band 41 PC3 - 20.0MHz QPSK - RB Size 1, RB Offset 99 - High Channel)



Plot 7-98. Conducted Spurious Plot (Band 41 PC3 - 20.0MHz QPSK - RB Size 1, RB Offset 99 – High Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 66 of 148



Plot 7-99. Conducted Spurious Plot (Band 41 PC3 - 20.0MHz QPSK - RB Size 1, RB Offset 99 - High Channel)

FCC ID: A3LSMN986JPN	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	 Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 67 of 148

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.

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
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

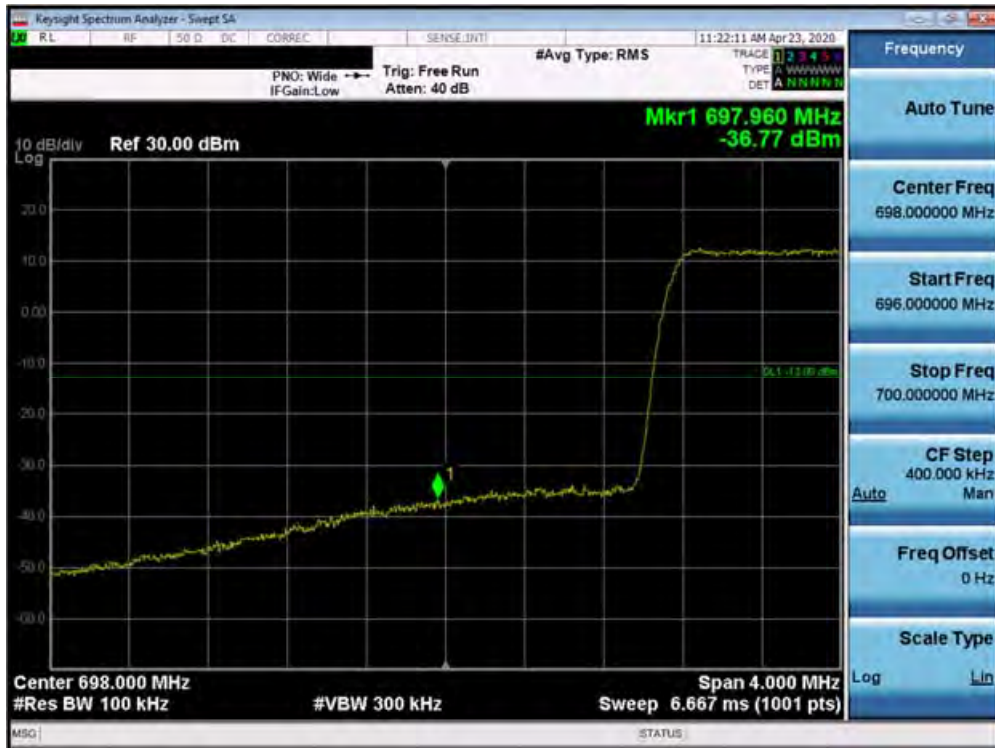
FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 68 of 148

Test Notes

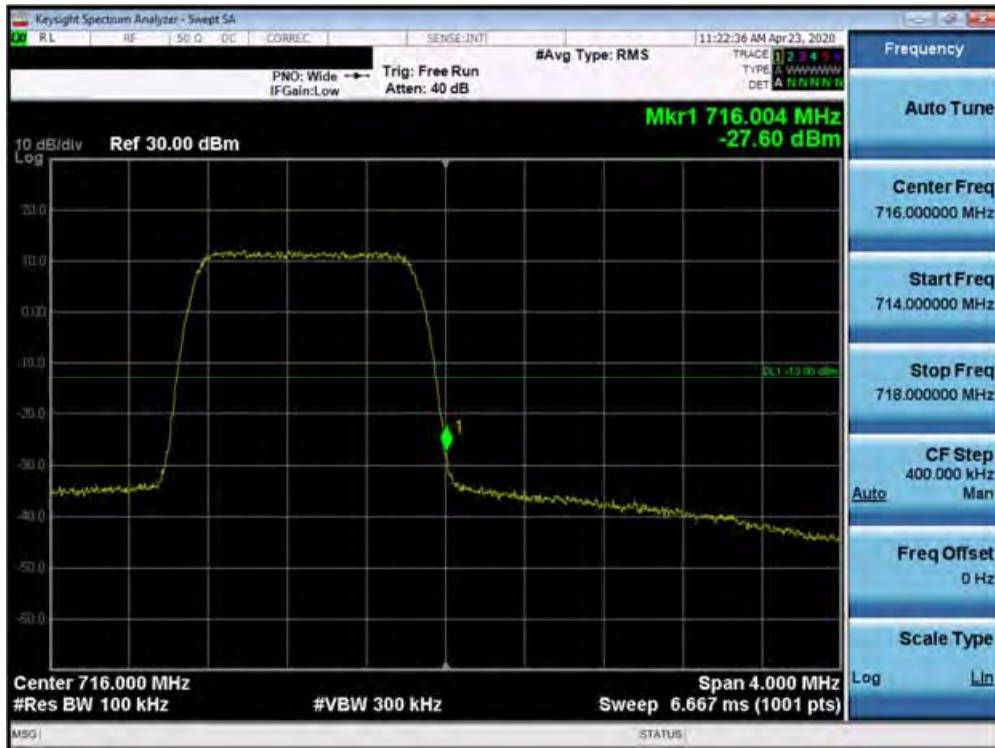
Per 22.917(b) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 5 dB below the transmitter power.

FCC ID: A3LSMN986JPN	 Proud to be part of  element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 69 of 148	

Band 12

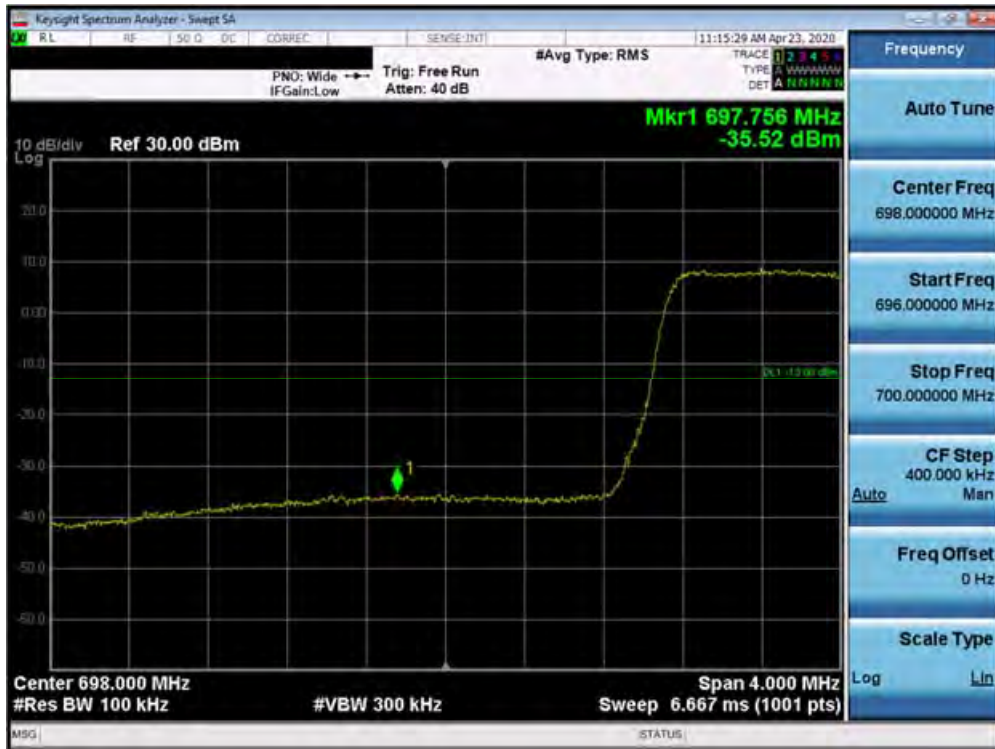


Plot 7-100. Lower Band Edge Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-101. Upper Band Edge Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-102. Lower Band Edge Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-103. Upper Band Edge Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 71 of 148

Band 13



Plot 7-108. Lower Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

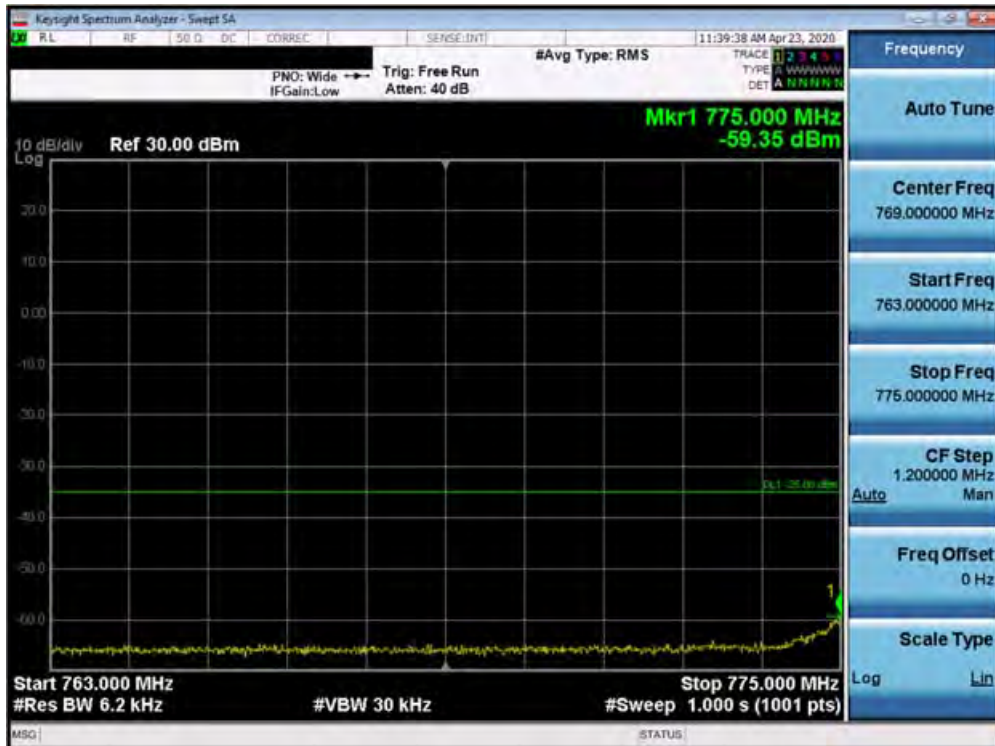


Plot 7-109. Lower Extended Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 74 of 148



Plot 7-112. Lower Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-113. Lower Extended Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 76 of 148



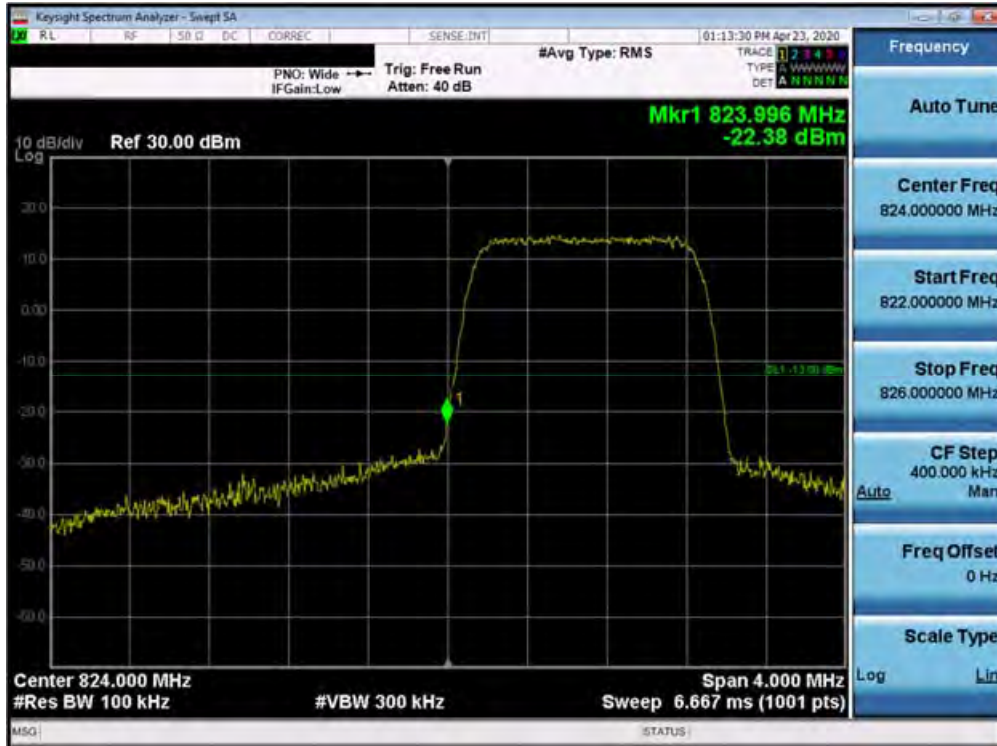
Plot 7-114. Upper Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)



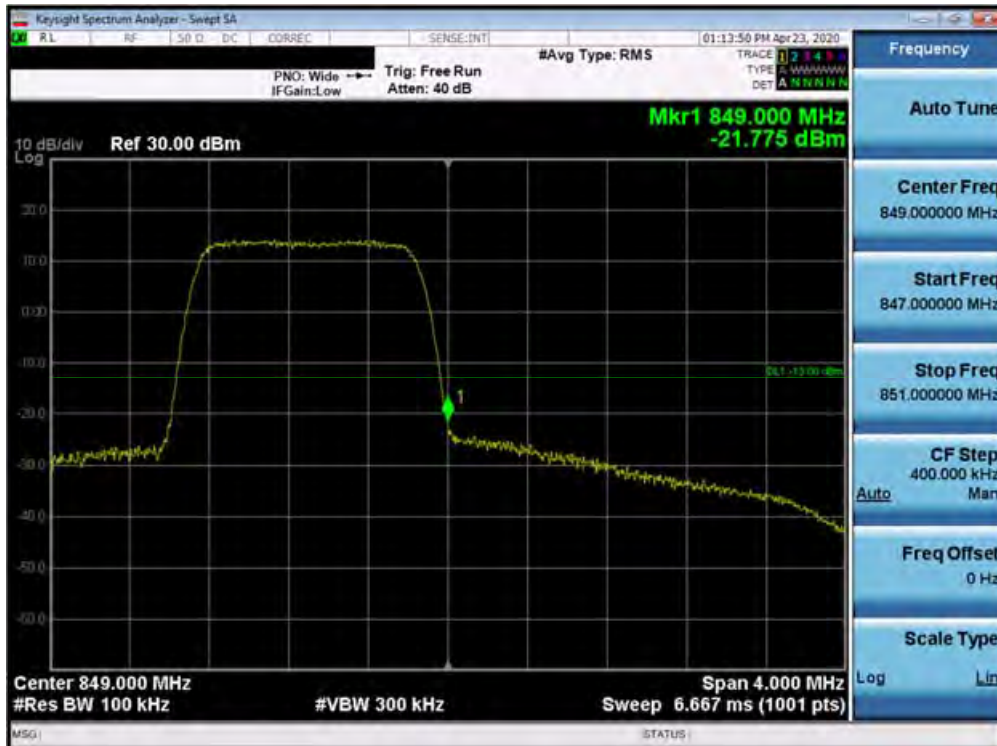
Plot 7-115. Upper Extended Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 5

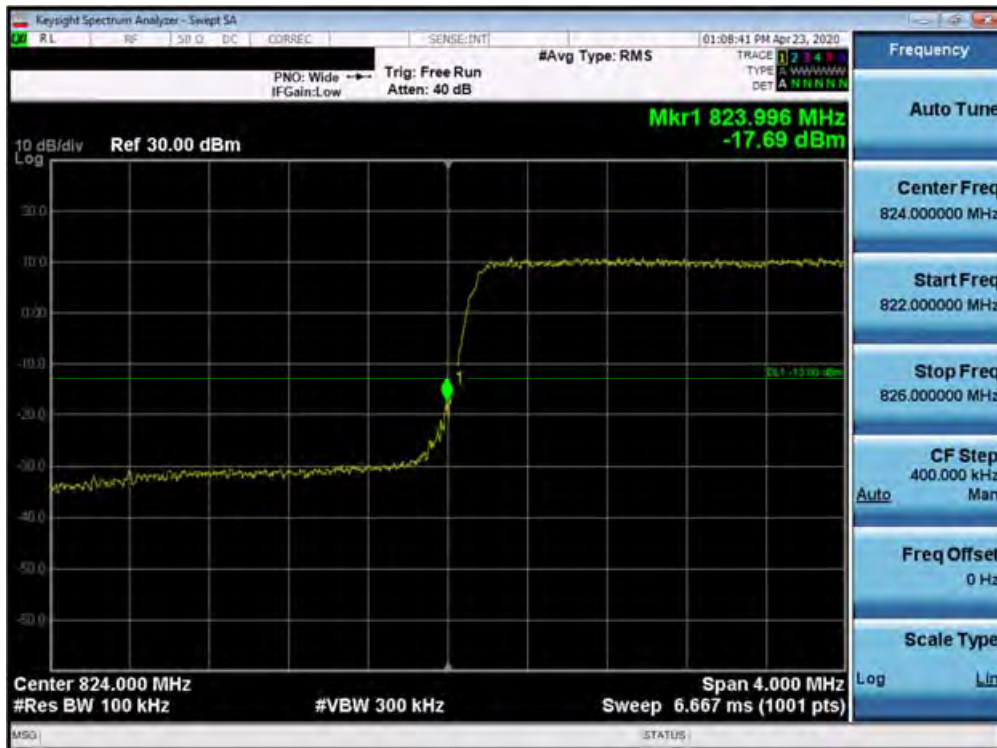


Plot 7-116. Lower Band Edge Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

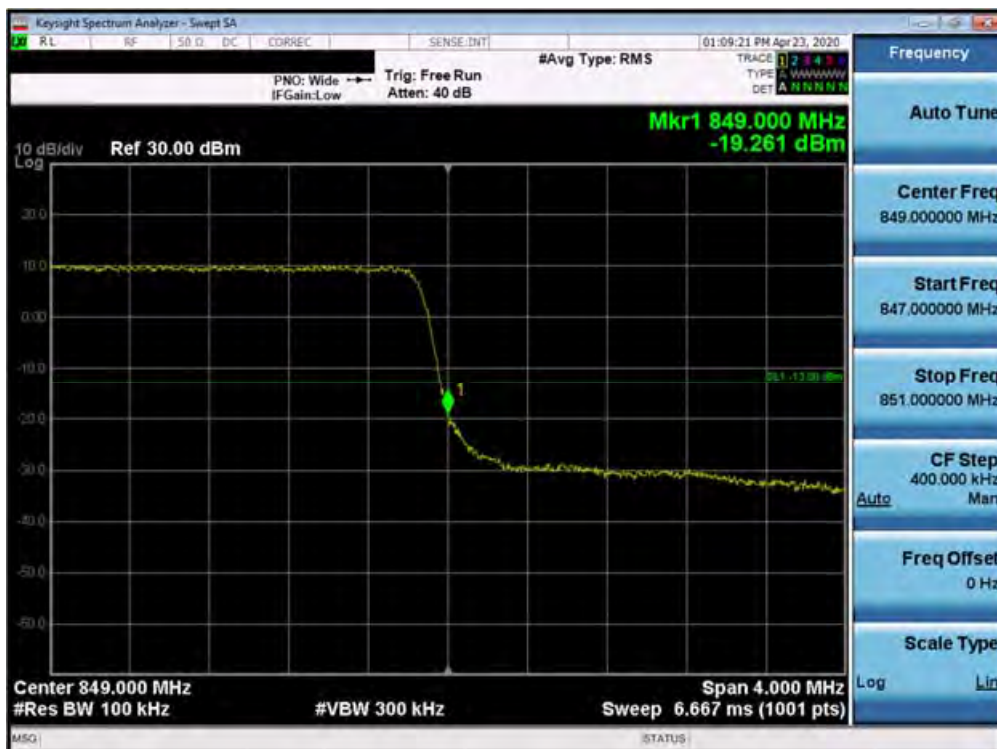


Plot 7-117. Upper Band Edge Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 78 of 148

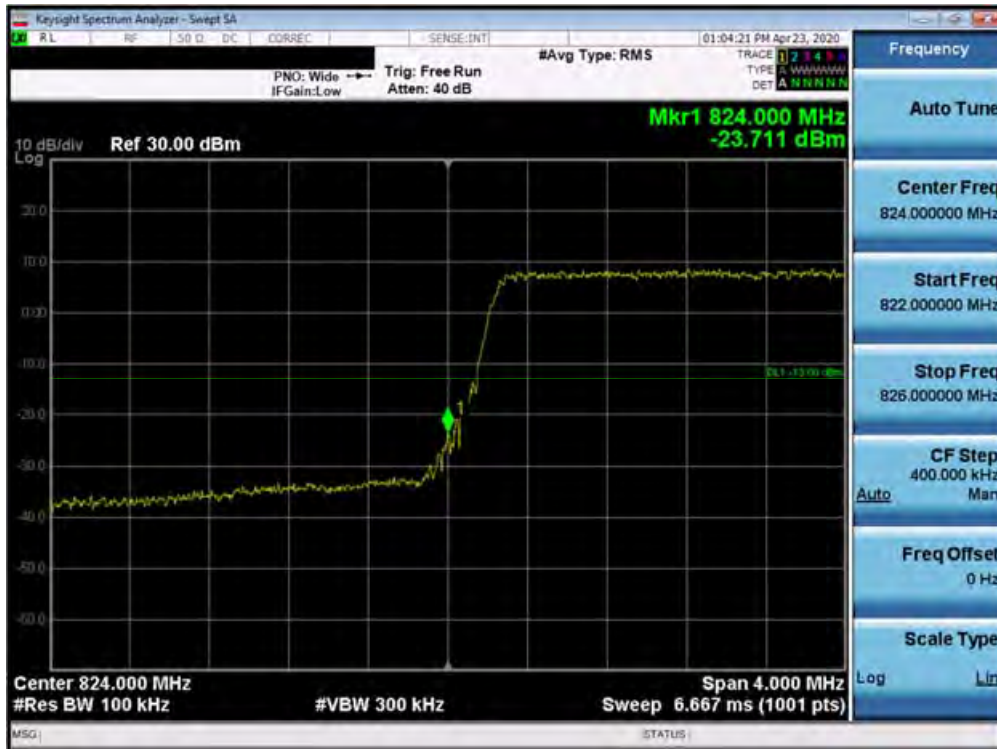


Plot 7-118. Lower Band Edge Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

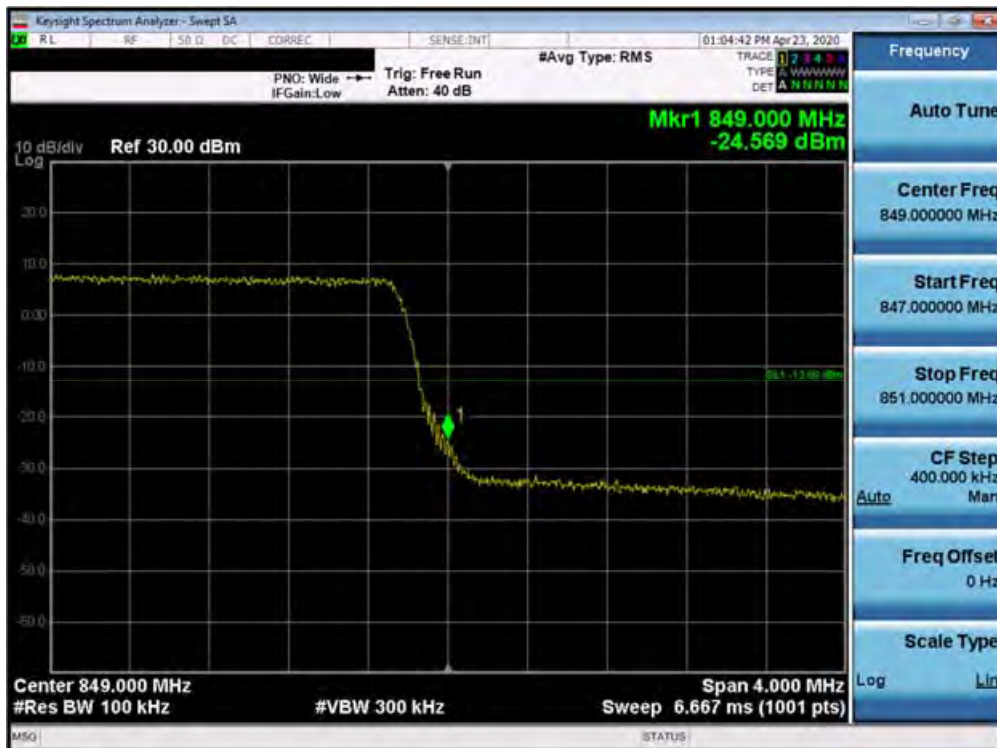


Plot 7-119. Upper Band Edge Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 79 of 148

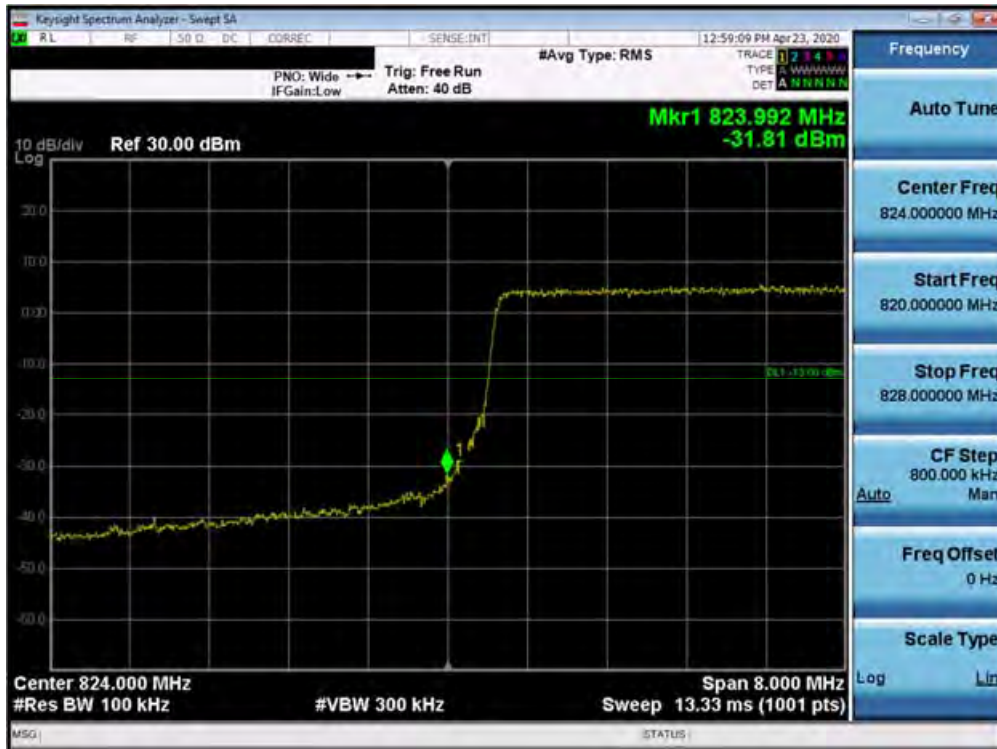


Plot 7-120. Lower Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

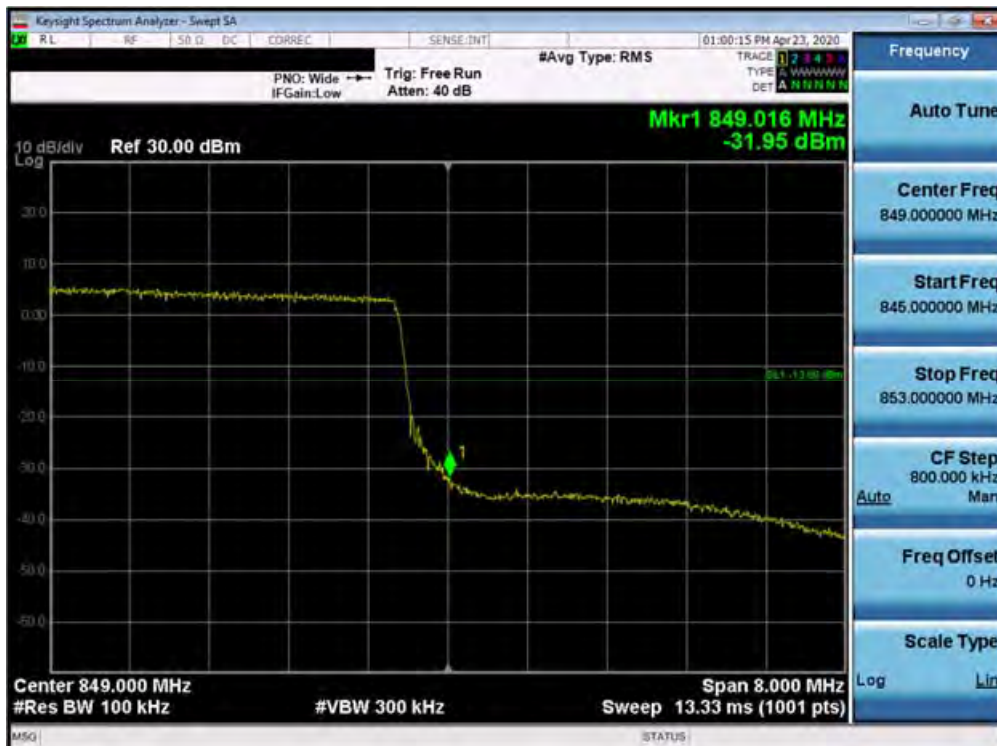


Plot 7-121. Upper Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 80 of 148



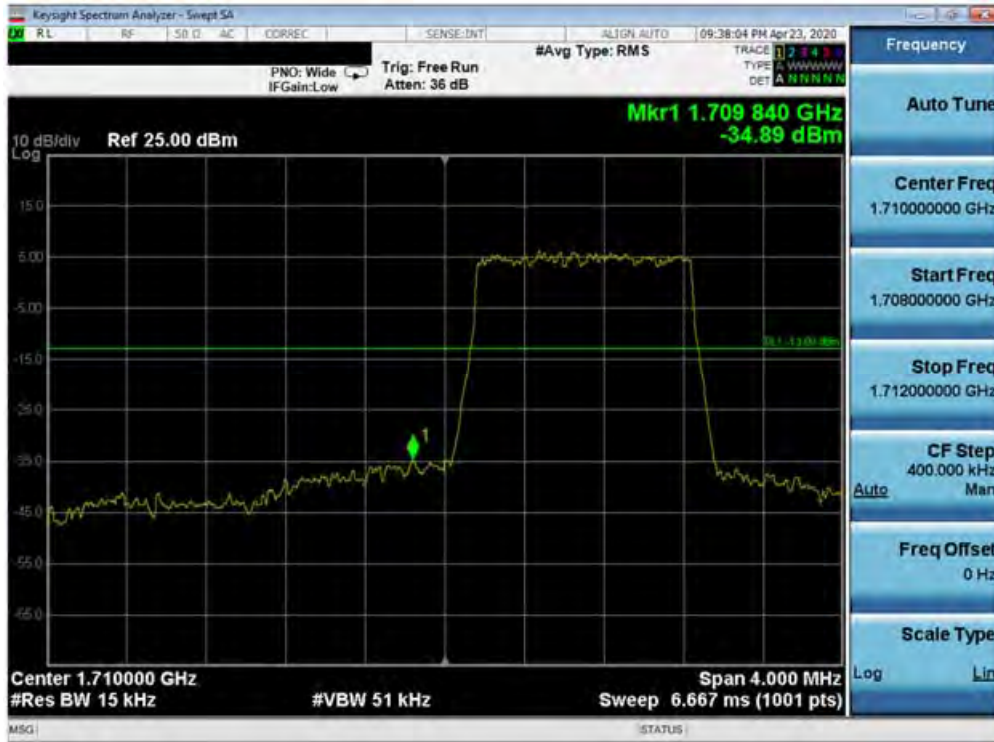
Plot 7-122. Lower Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)



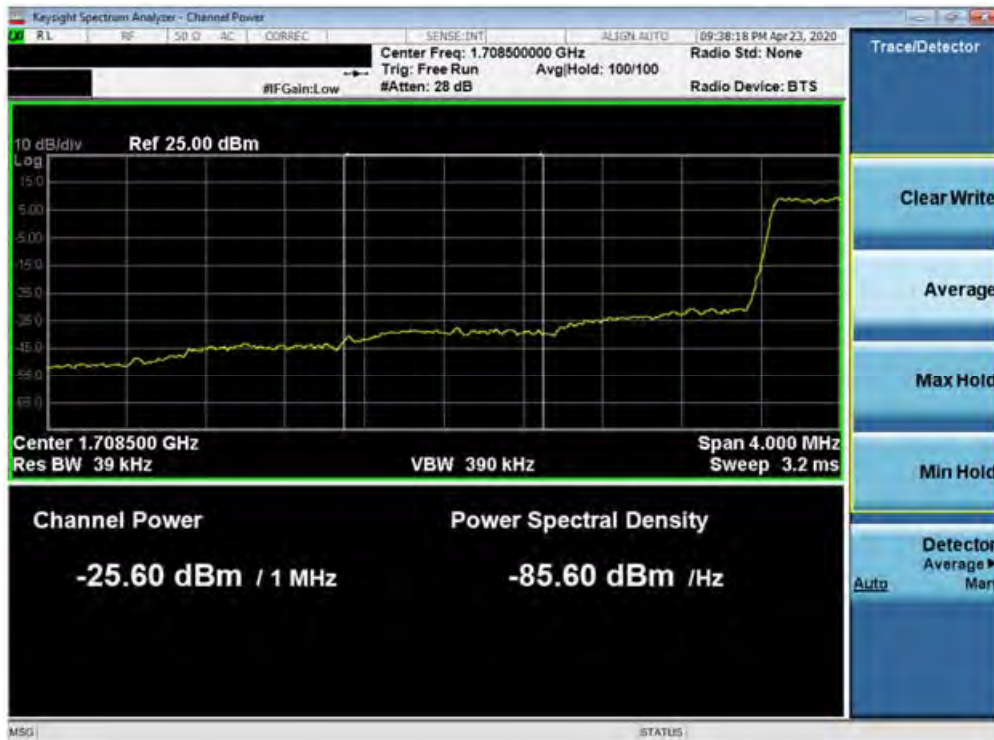
Plot 7-123. Upper Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 81 of 148

Band 4



Plot 7-124. Lower Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

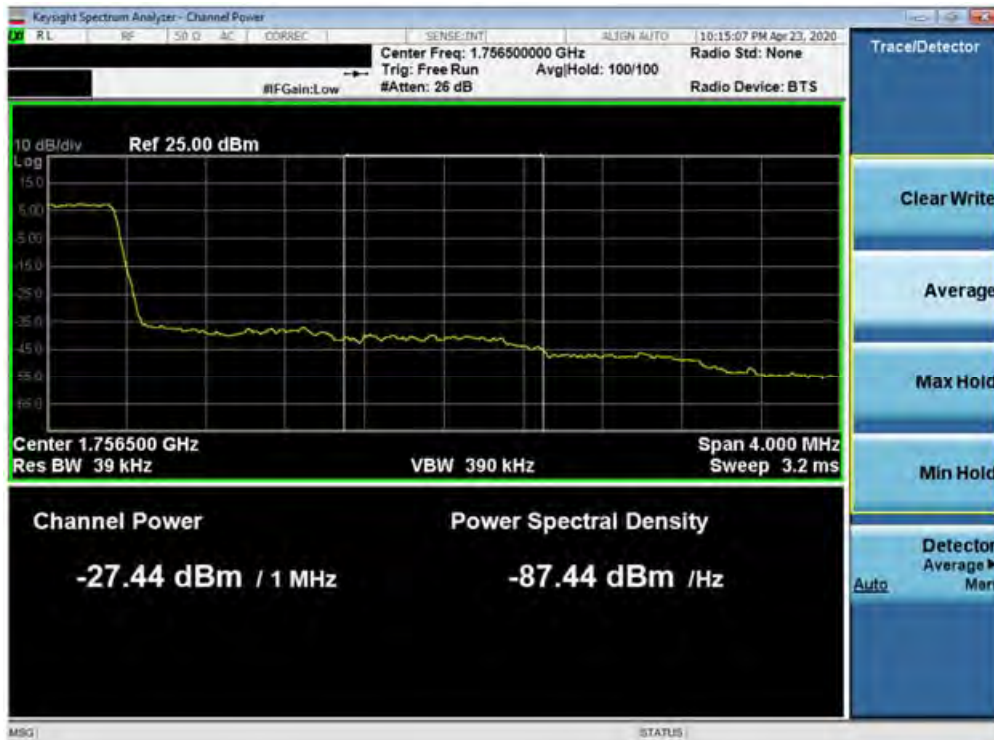


Plot 7-125. Lower Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 82 of 148

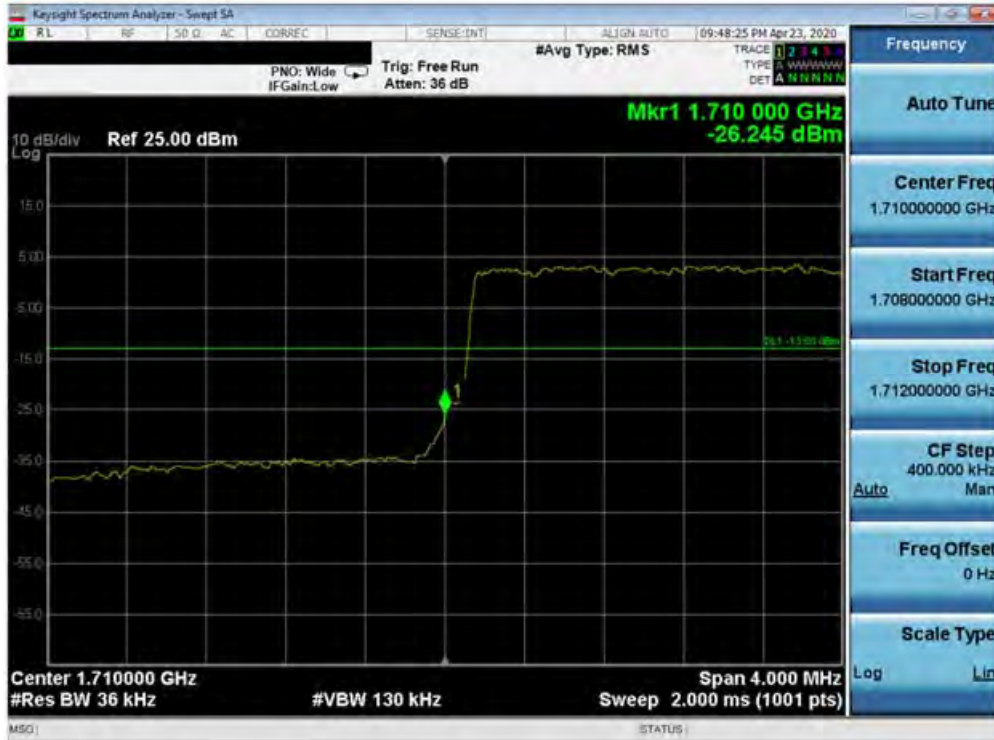


Plot 7-126. Upper Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

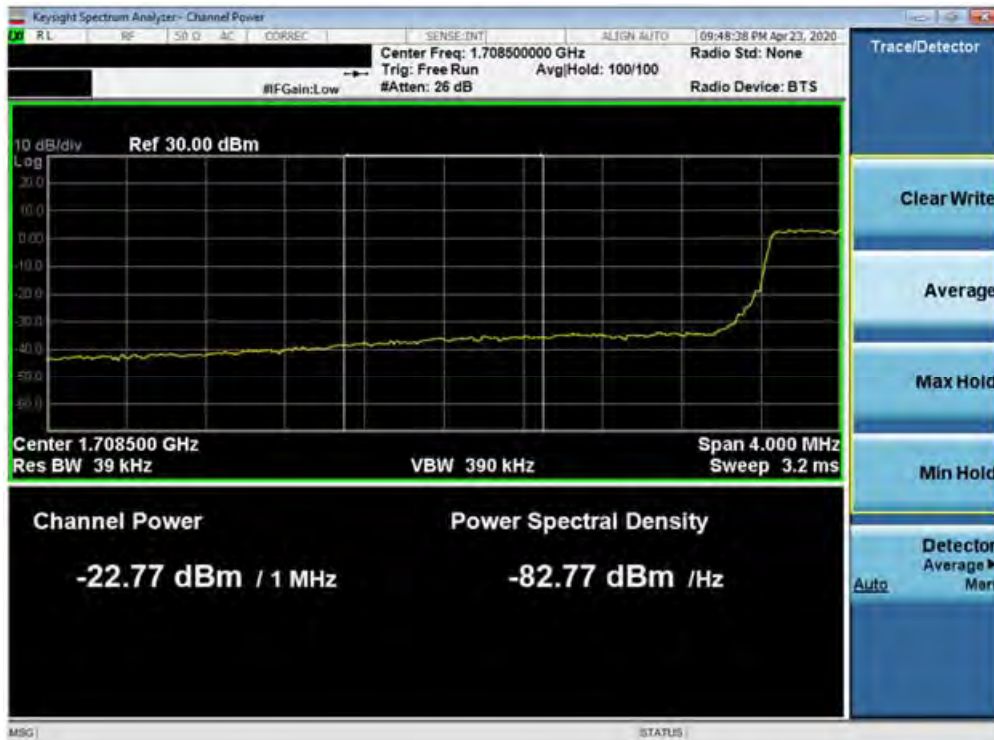


Plot 7-127. Upper Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 83 of 148



Plot 7-128. Lower Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

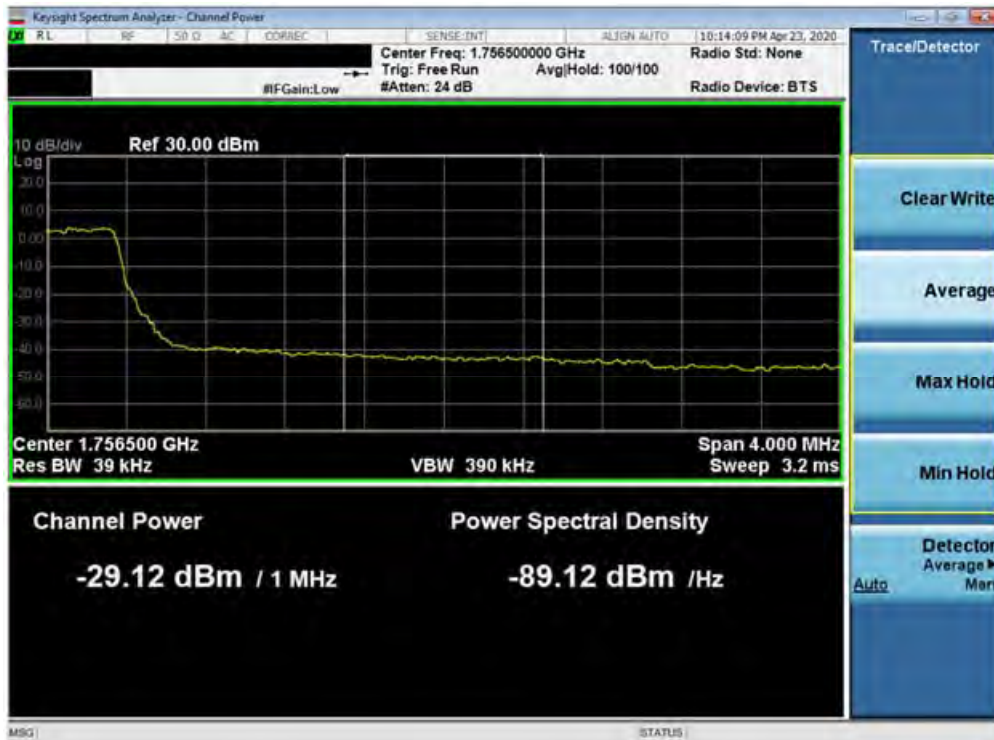


Plot 7-129. Lower Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 84 of 148



Plot 7-130. Upper Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

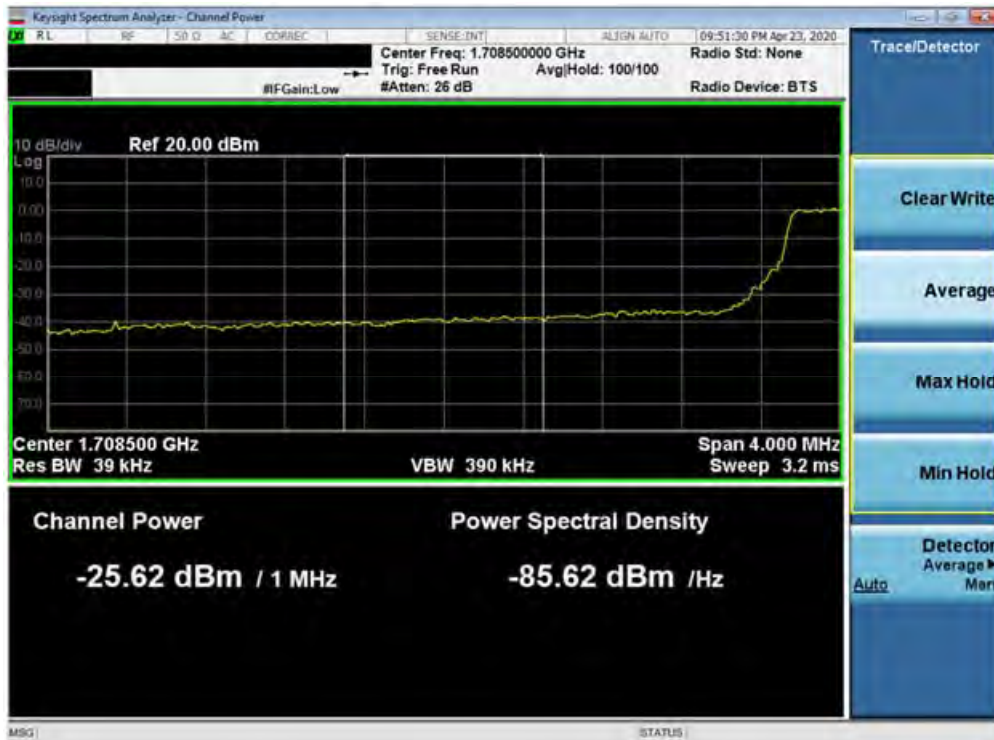


Plot 7-131. Upper Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 85 of 148



Plot 7-132. Lower Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

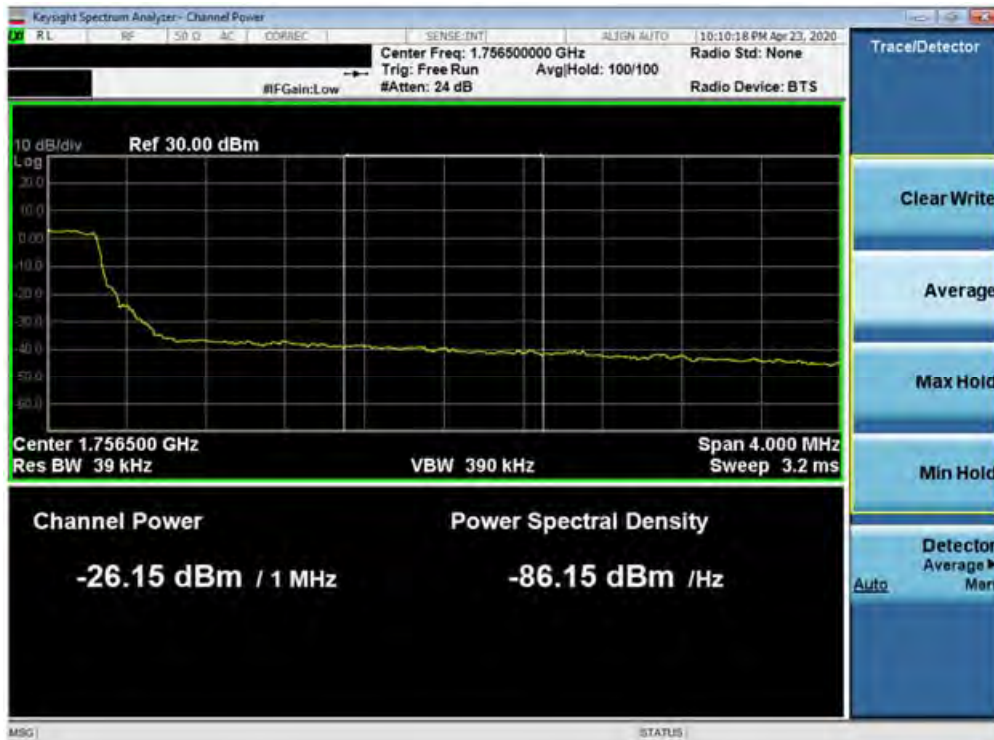


Plot 7-133. Lower Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 86 of 148

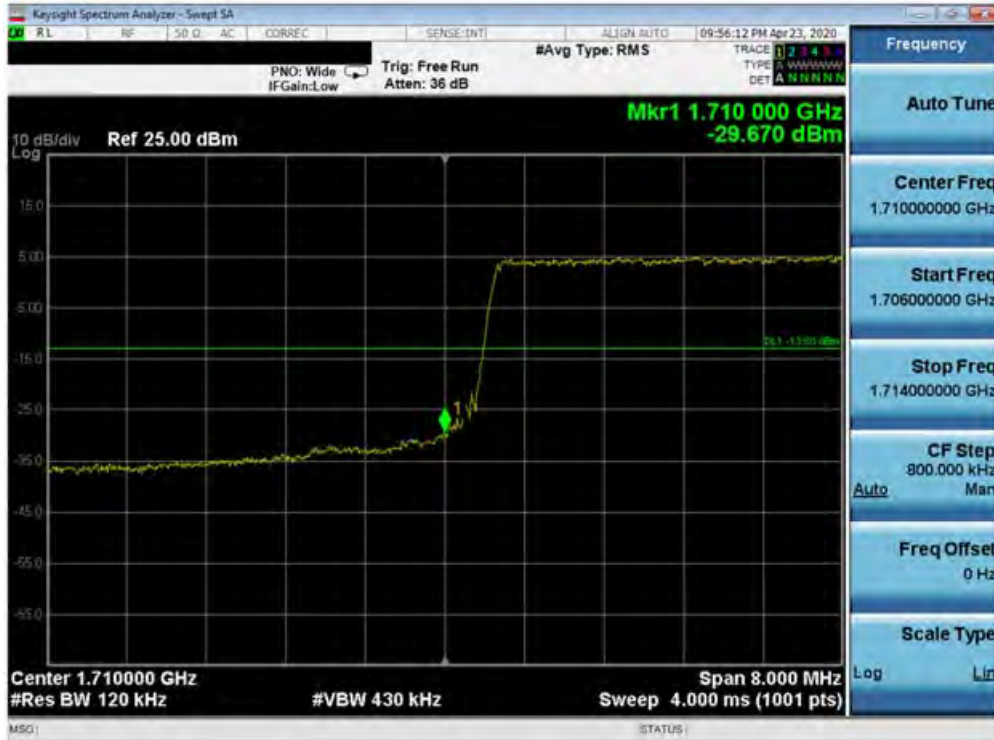


Plot 7-134. Upper Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

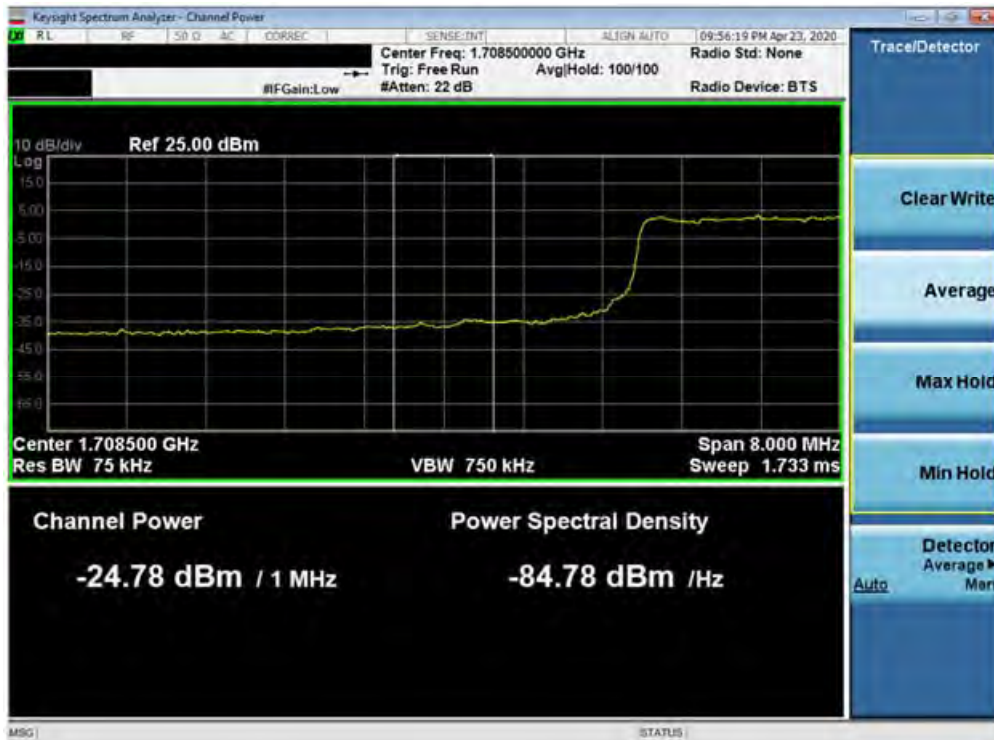


Plot 7-135. Upper Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 87 of 148



Plot 7-136. Lower Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

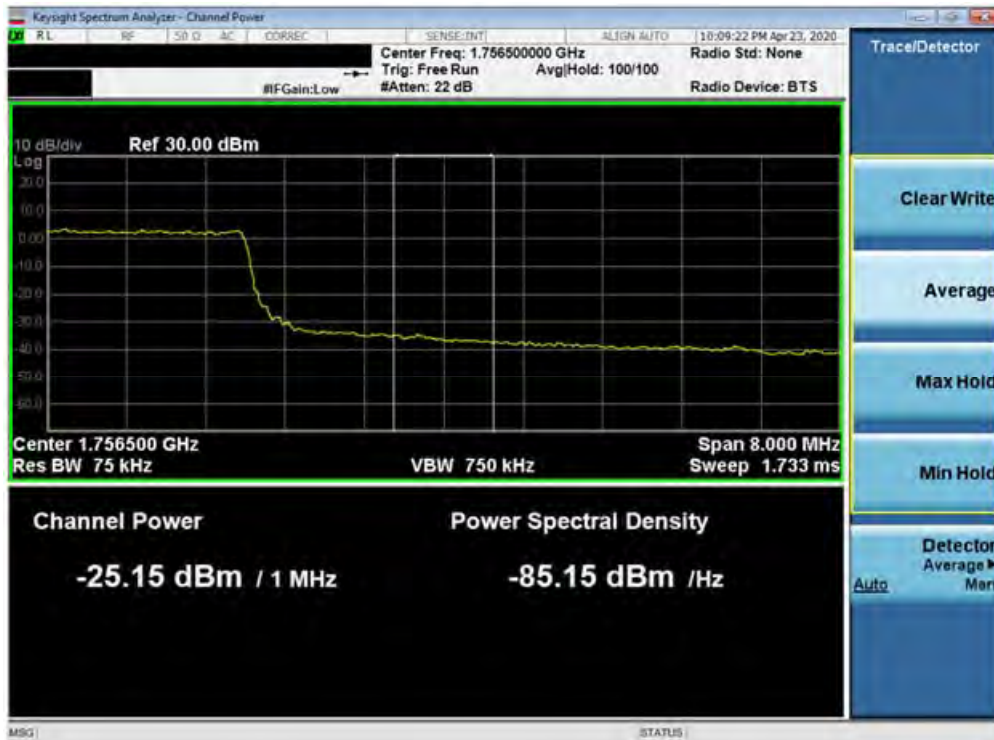


Plot 7-137. Lower Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 88 of 148



Plot 7-138. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

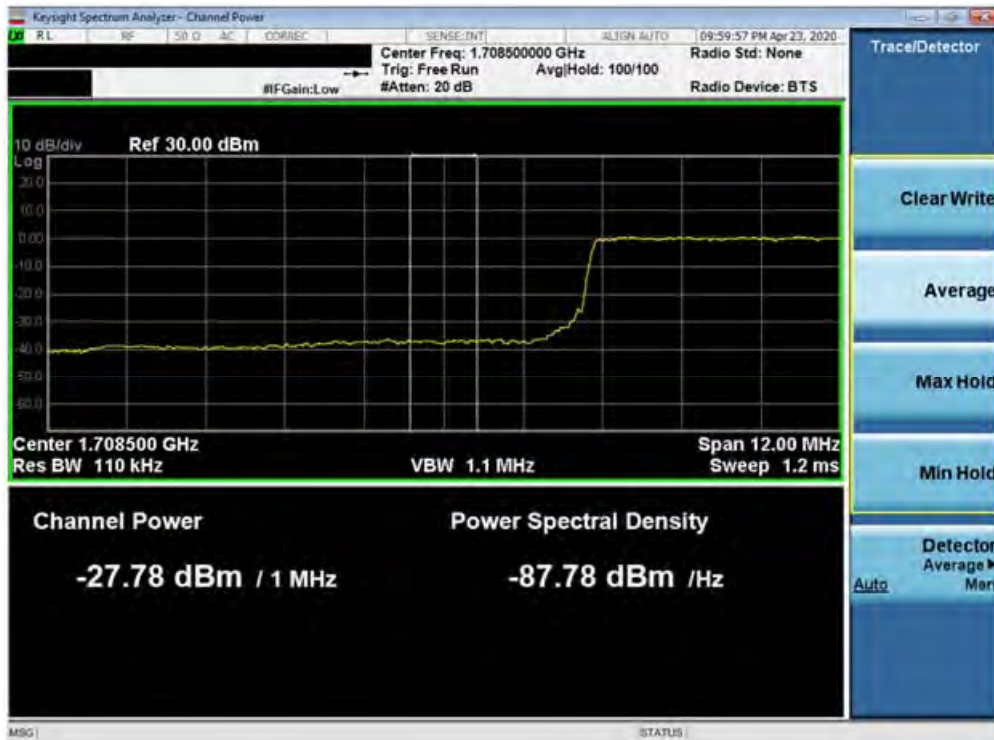


Plot 7-139. Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 89 of 148



Plot 7-140. Lower Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

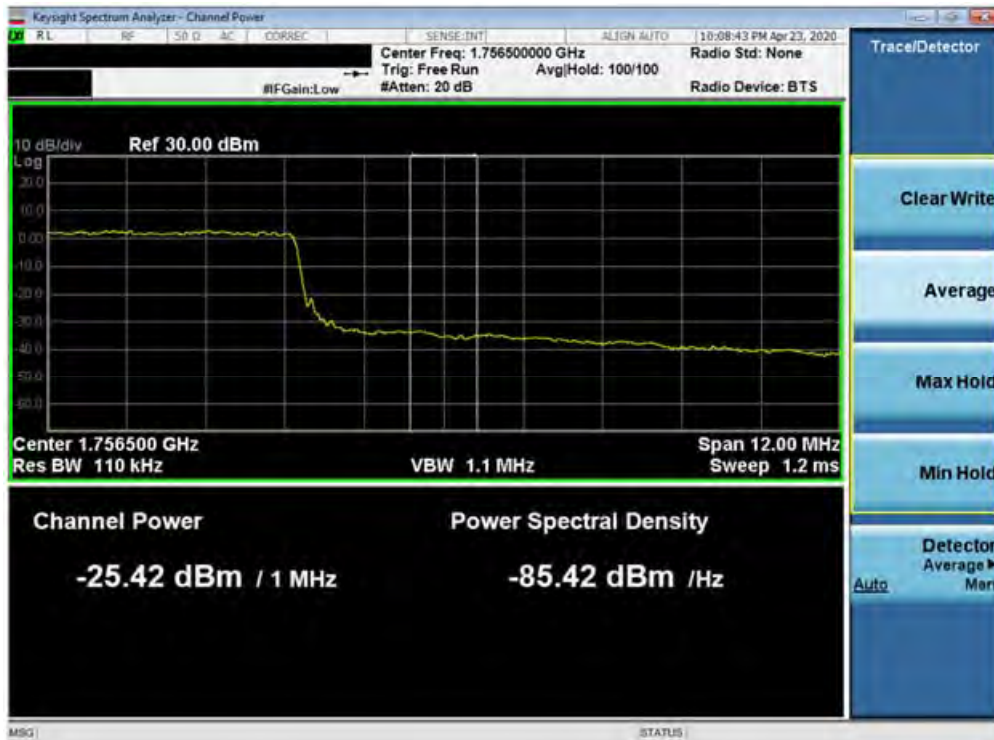


Plot 7-141. Lower Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 90 of 148

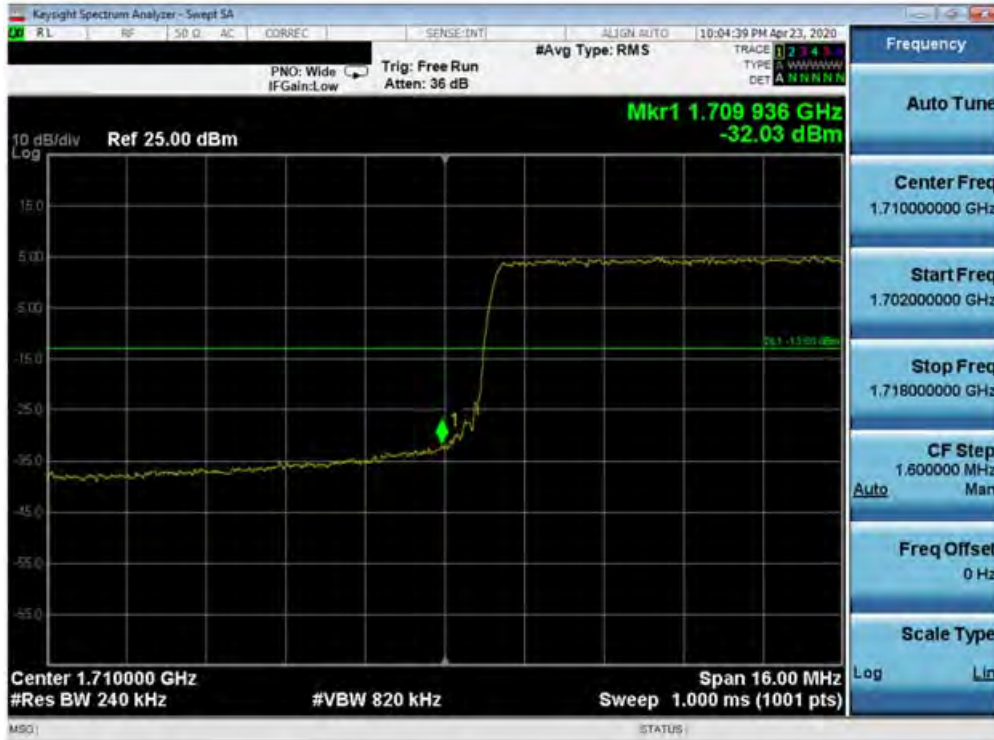


Plot 7-142. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

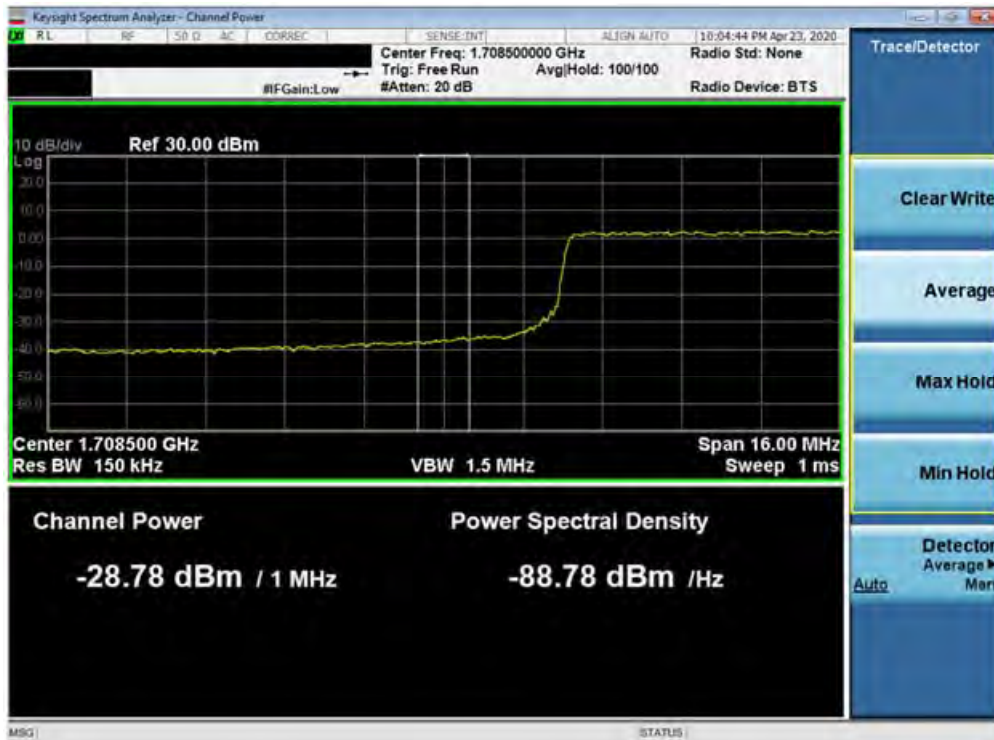


Plot 7-143. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 91 of 148

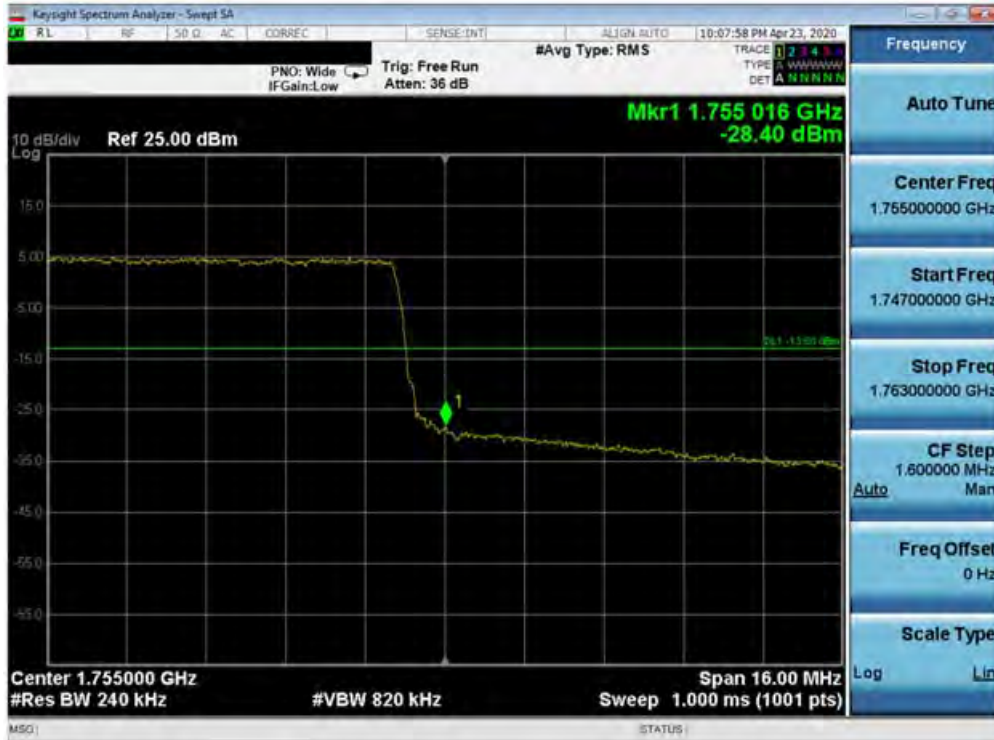


Plot 7-144. Lower Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

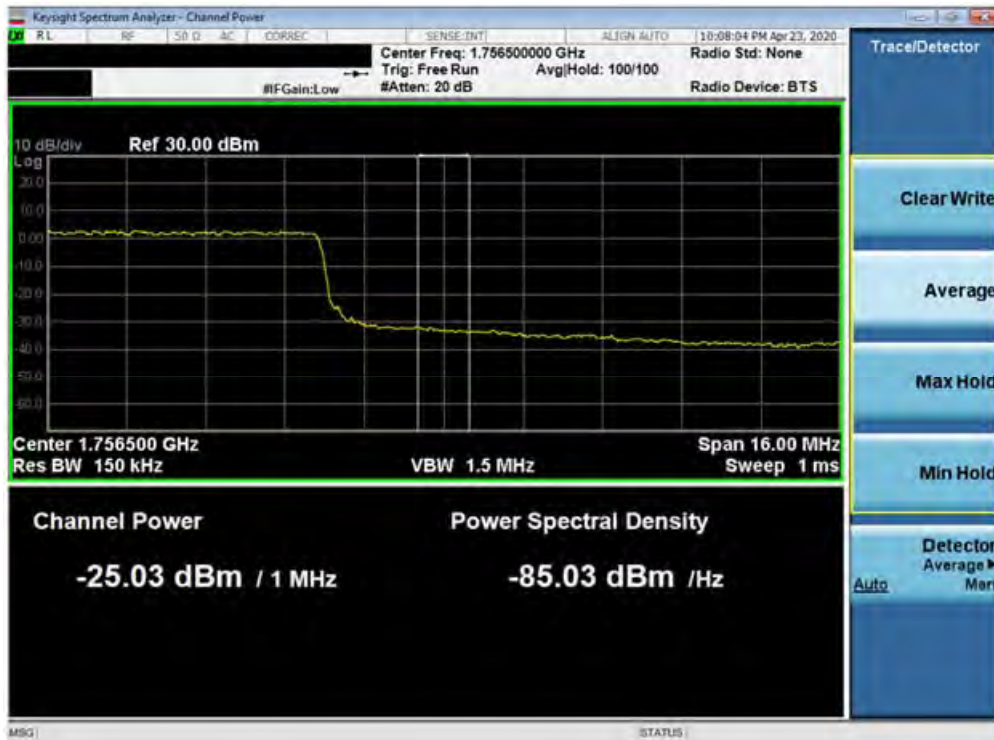


Plot 7-145. Lower Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 92 of 148



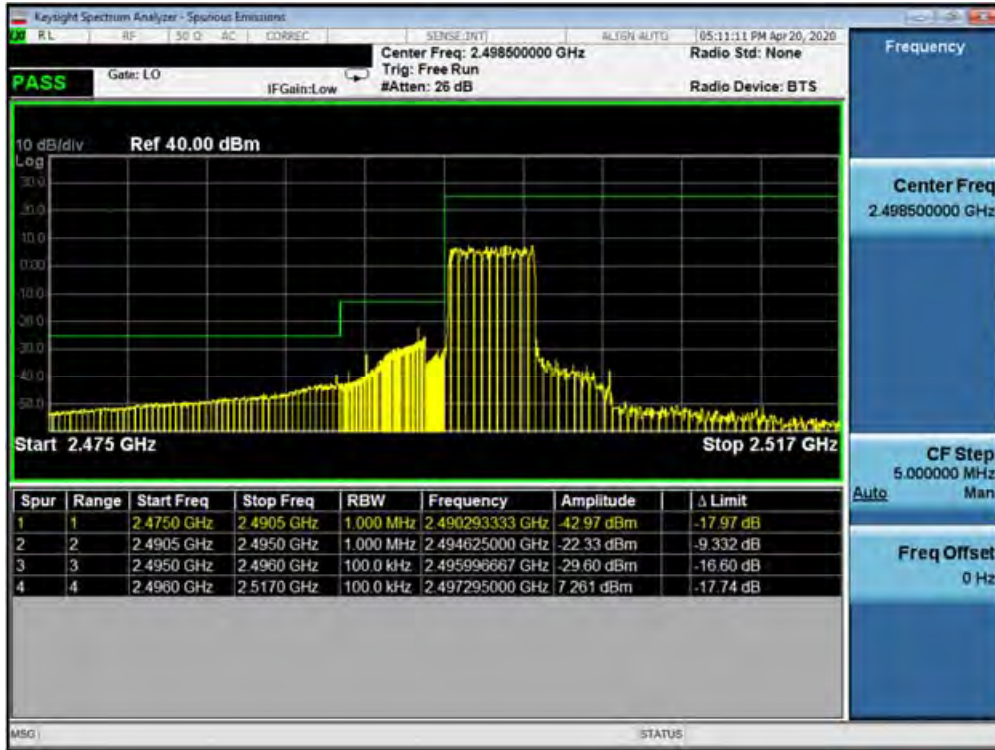
Plot 7-146. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



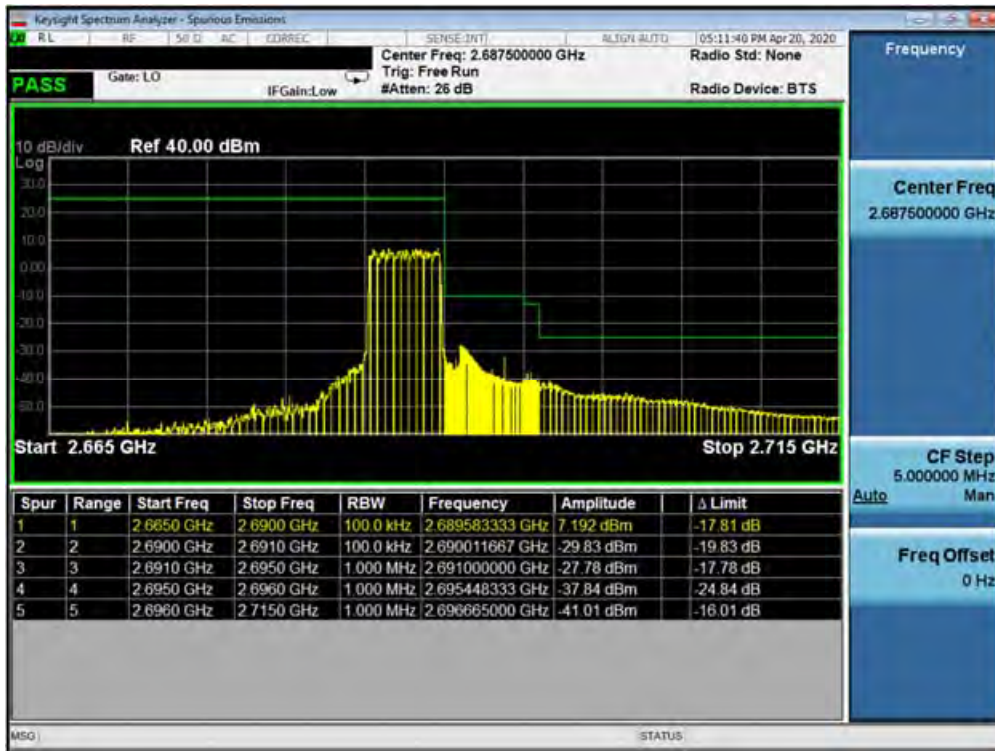
Plot 7-147. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 93 of 148

Band 41 PC3

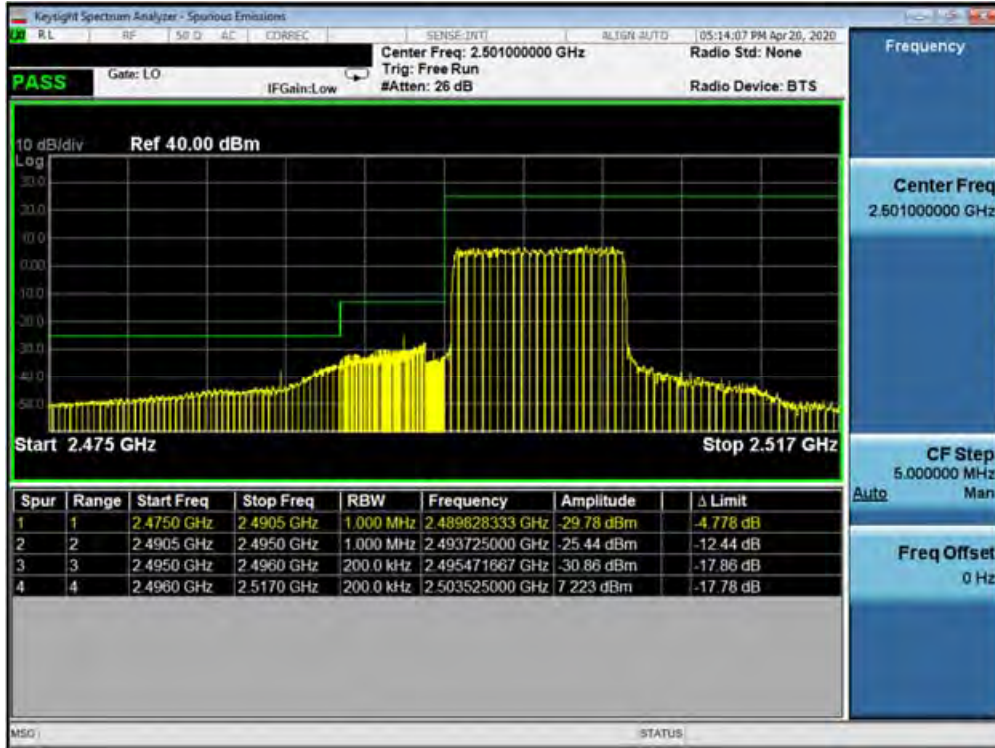


Plot 7-148. Lower ACP Plot at 2496 MHz (Band 41 PC3- 5.0MHz QPSK - Full RB Configuration)

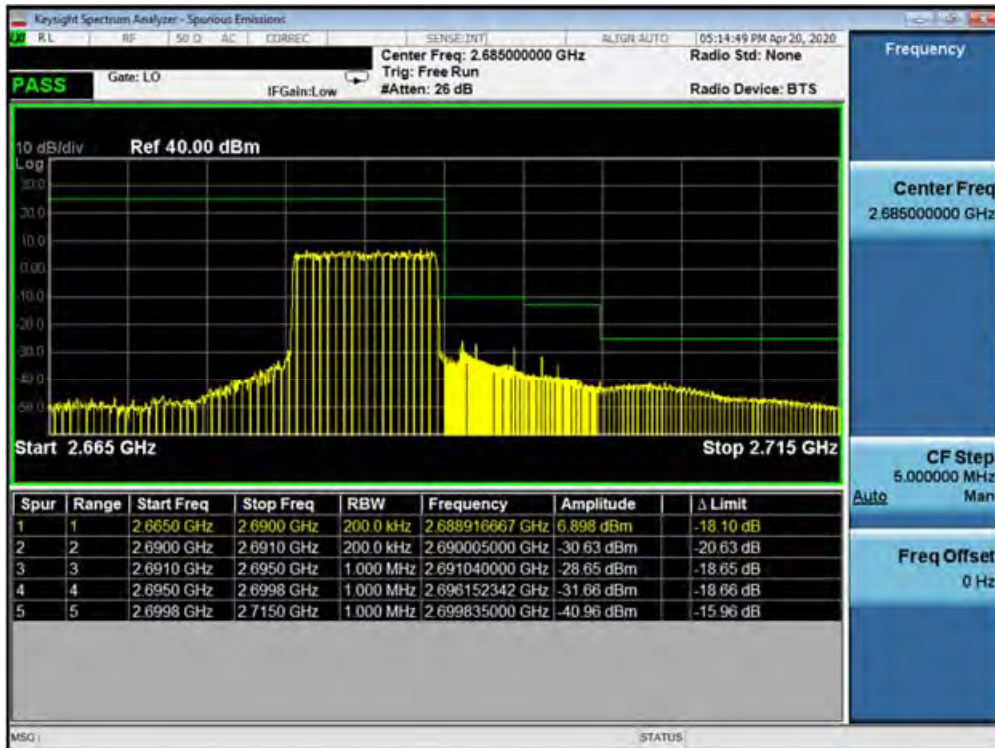


Plot 7-149. Upper ACP Plot (Band 41 PC3- 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 94 of 148



Plot 7-150. Lower ACP Plot at 2496 MHz (Band 41 PC3- 10.0MHz QPSK - Full RB Configuration)

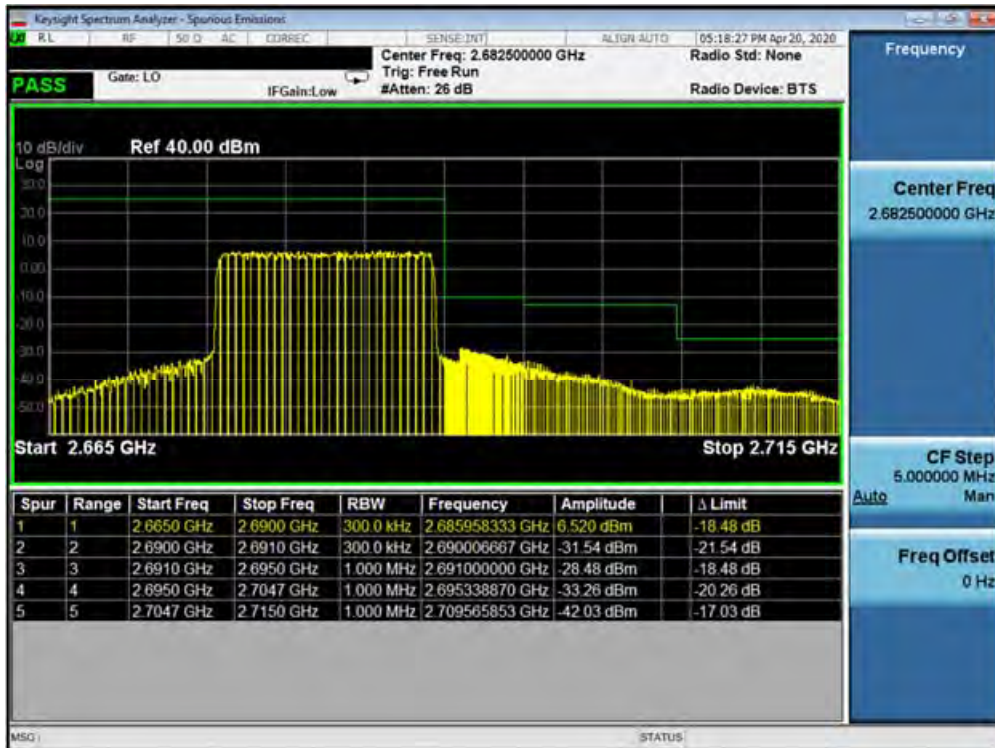


Plot 7-151. Upper ACP Plot (Band 41 PC3- 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 95 of 148



Plot 7-152. Lower ACP Plot at 2496 MHz (Band 41 PC3- 15.0MHz QPSK - Full RB Configuration)



Plot 7-153. Upper ACP Plot (Band 41 PC3- 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 96 of 148



Plot 7-154. Lower ACP Plot at 2496 MHz (Band 41 PC3 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-155. Upper ACP Plot (Band 41 PC3 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 97 of 148

7.5 Peak-Average Ratio

Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW \geq OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.

Test Setup

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



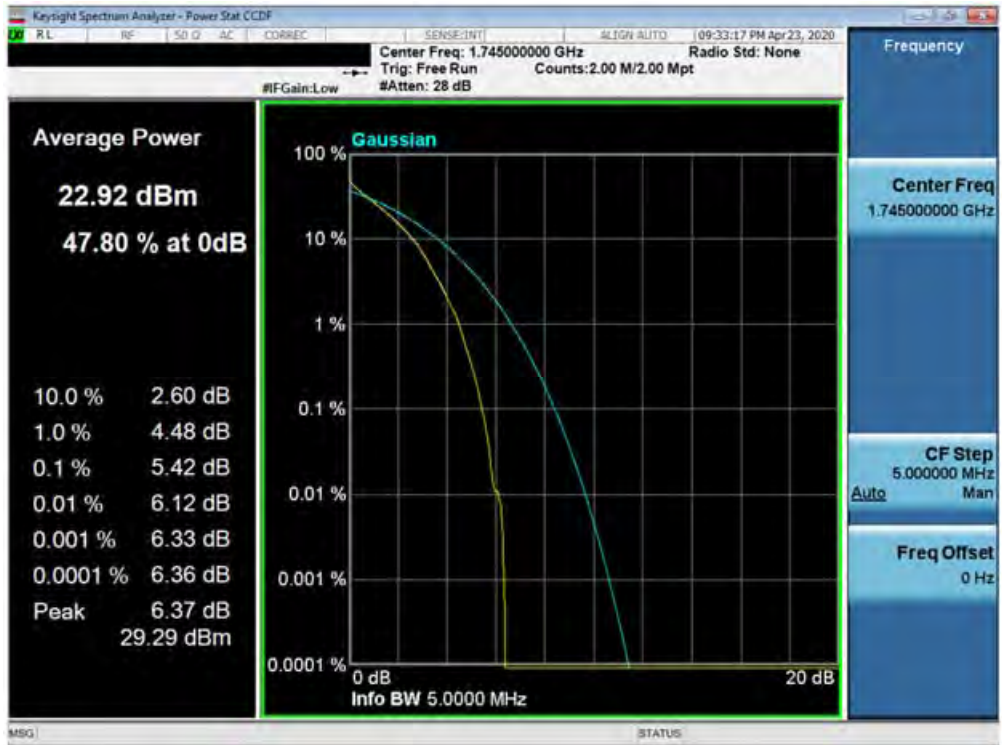
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

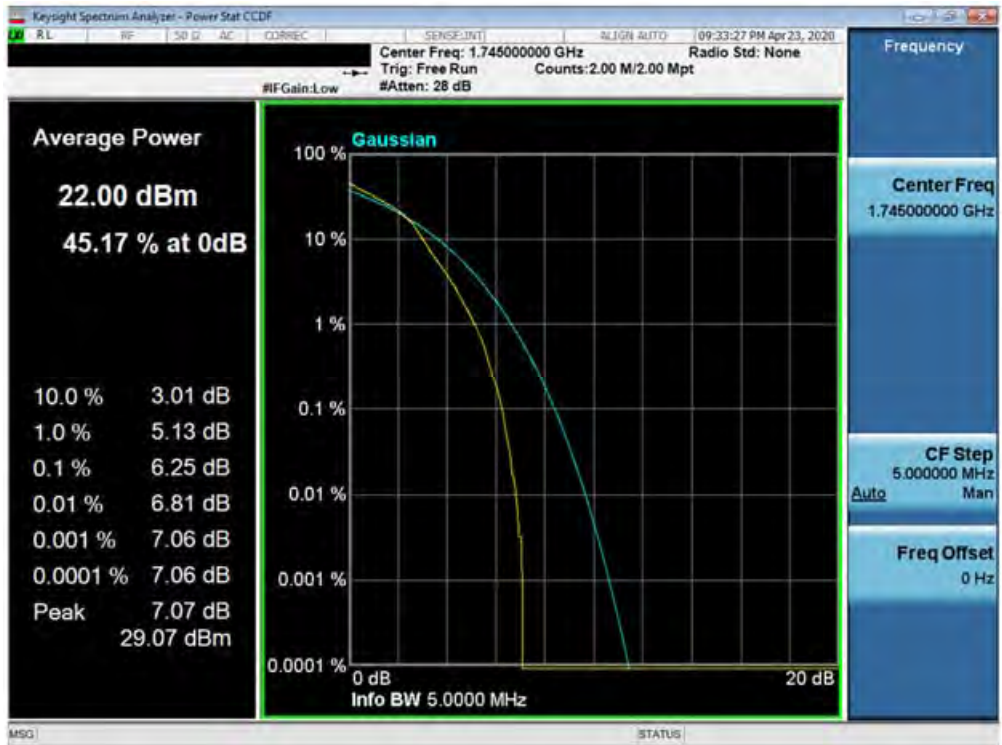
None.

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 98 of 148

Band 4

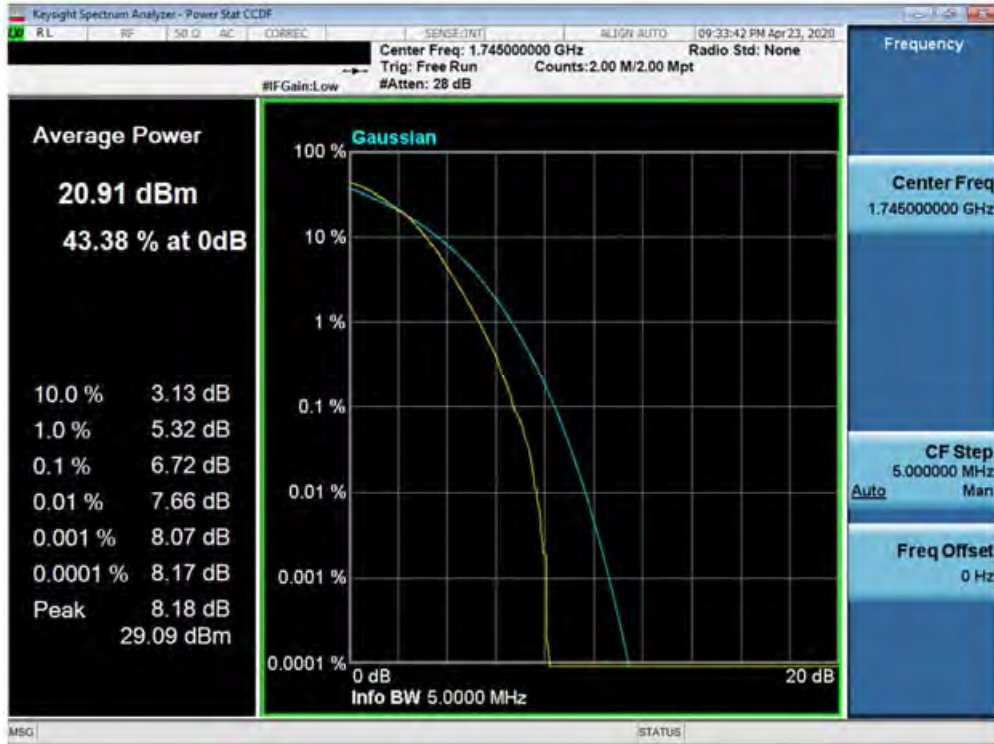


Plot 7-156. PAR Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

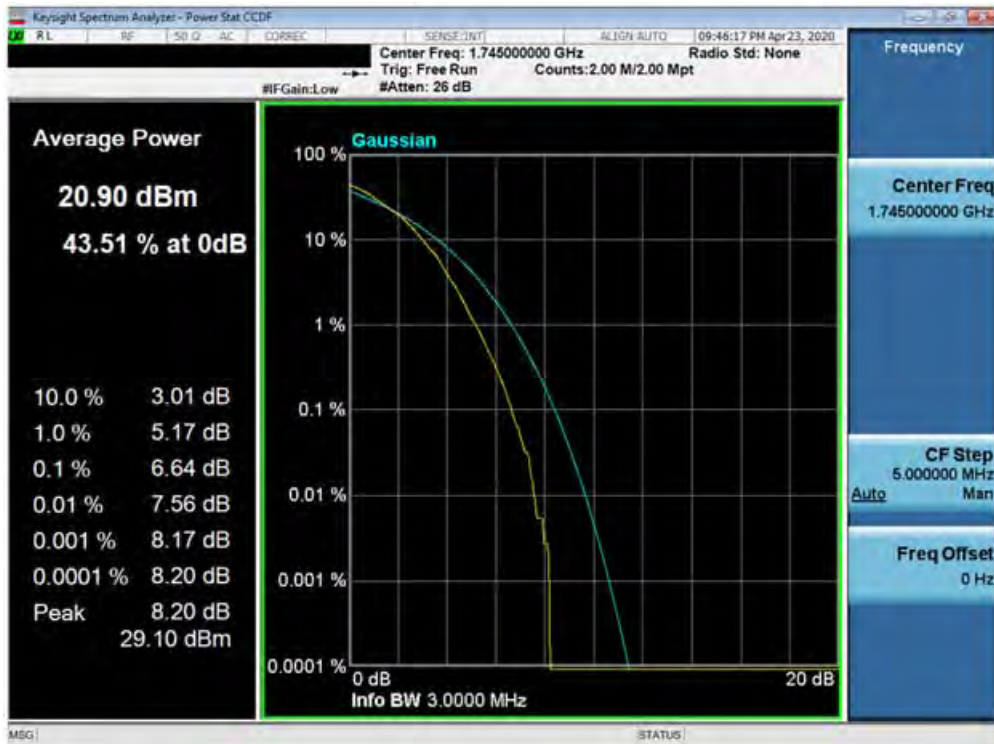


Plot 7-157. PAR Plot (Band 4 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 99 of 148

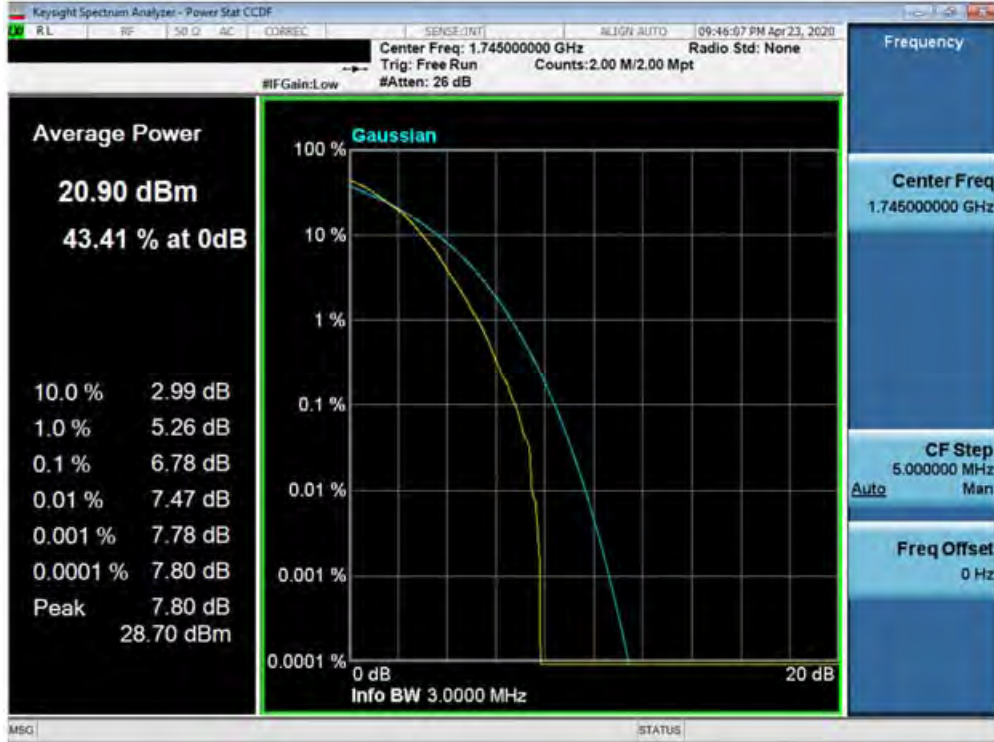


Plot 7-158. PAR Plot (Band 4 - 1.4MHz 64-QAM - Full RB Configuration)

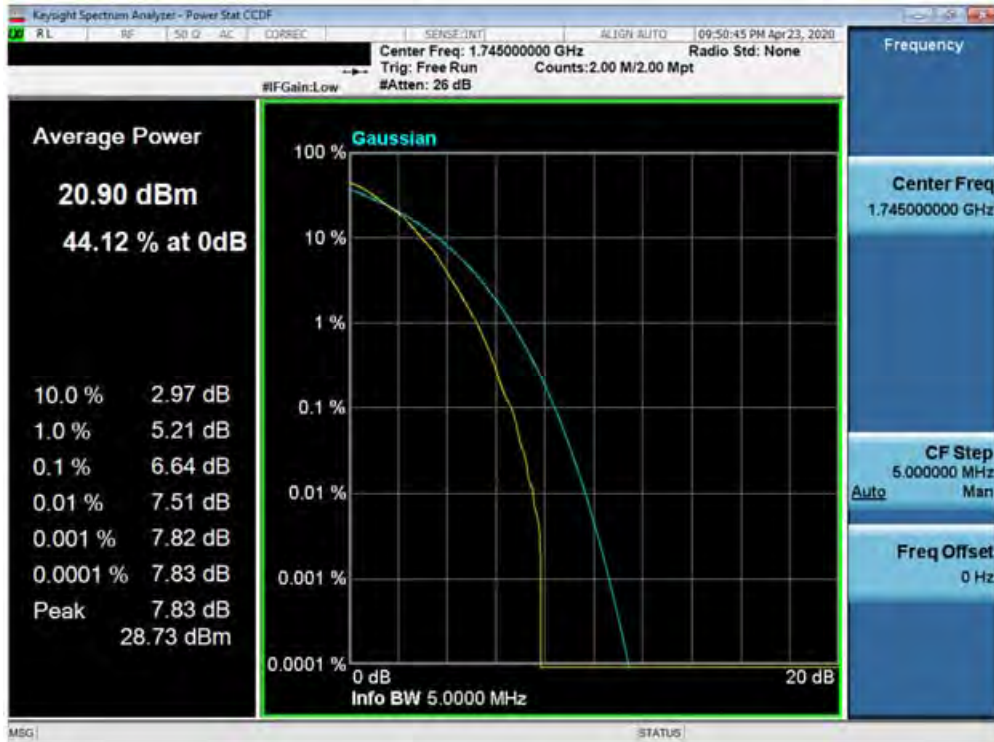


Plot 7-159. PAR Plot (Band 4 - 3.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 100 of 148

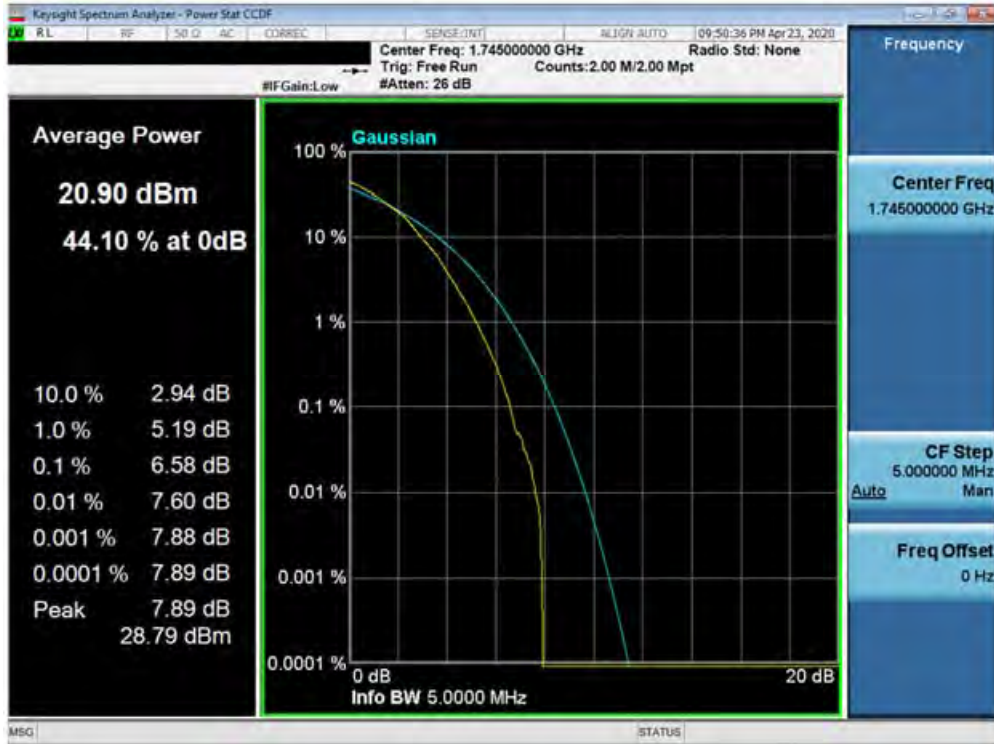


Plot 7-160. PAR Plot (Band 4 - 3.0MHz 64-QAM - Full RB Configuration)

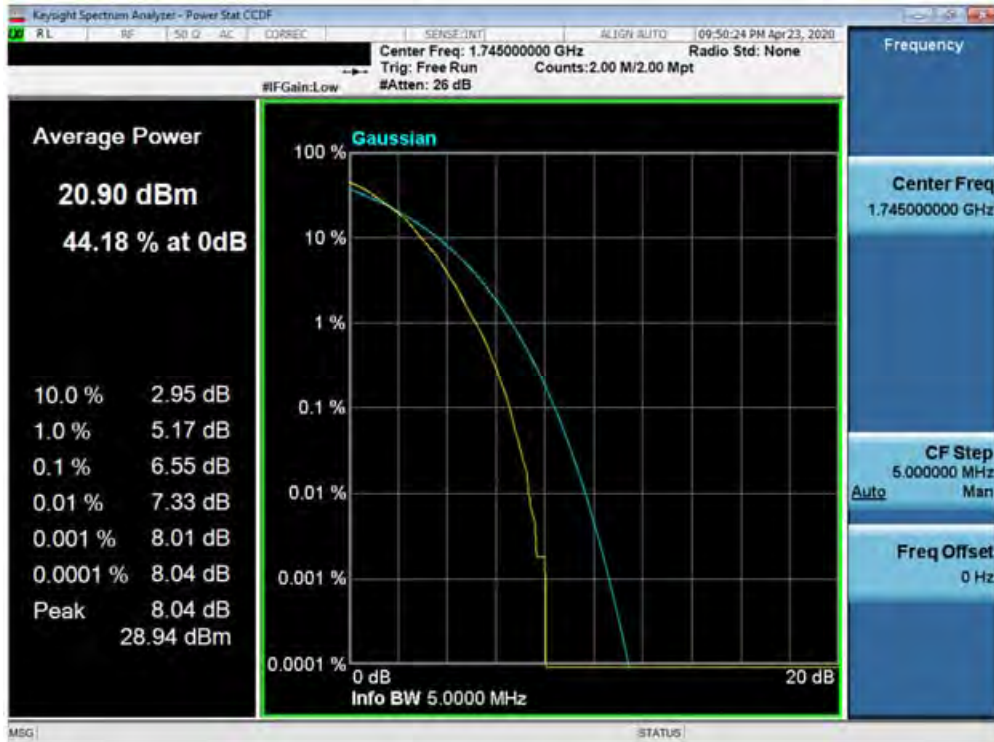


Plot 7-161. PAR Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 101 of 148

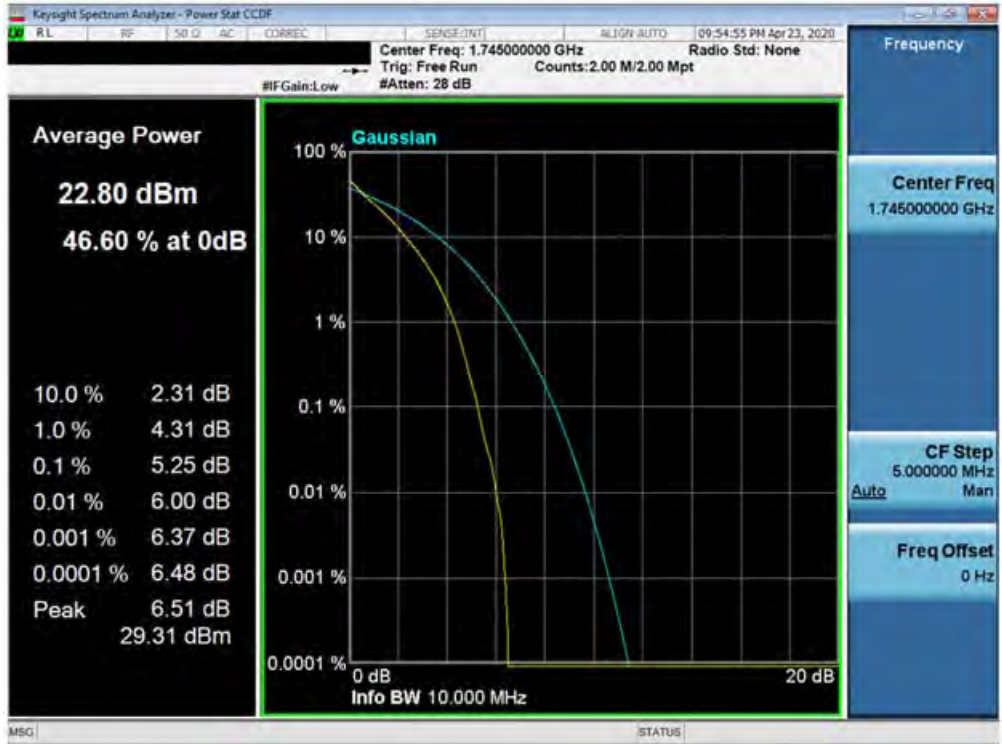


Plot 7-162. PAR Plot (Band 4 - 5.0MHz 16-QAM - Full RB Configuration)

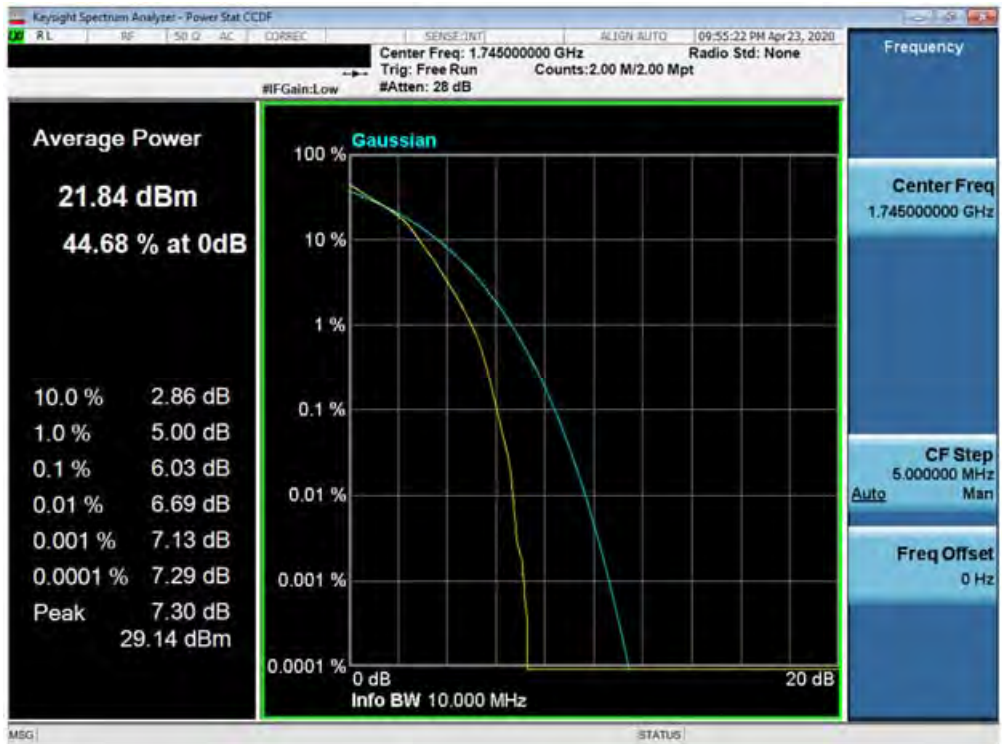


Plot 7-163. PAR Plot (Band 4 - 5.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 102 of 148

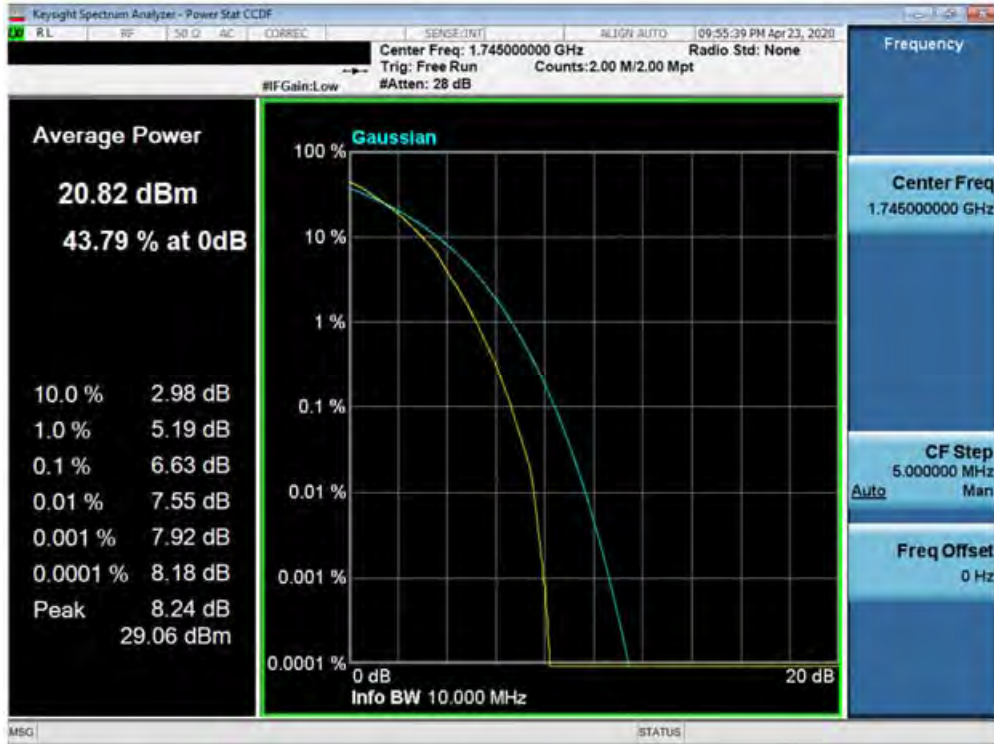


Plot 7-164. PAR Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

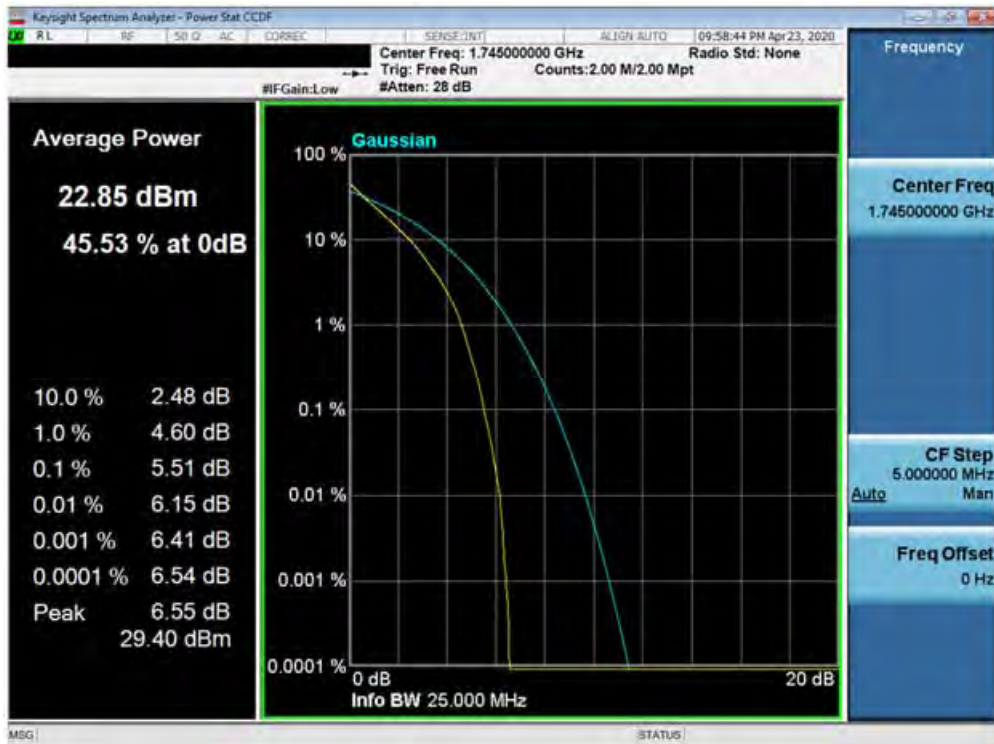


Plot 7-165. PAR Plot (Band 4 - 10.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 103 of 148

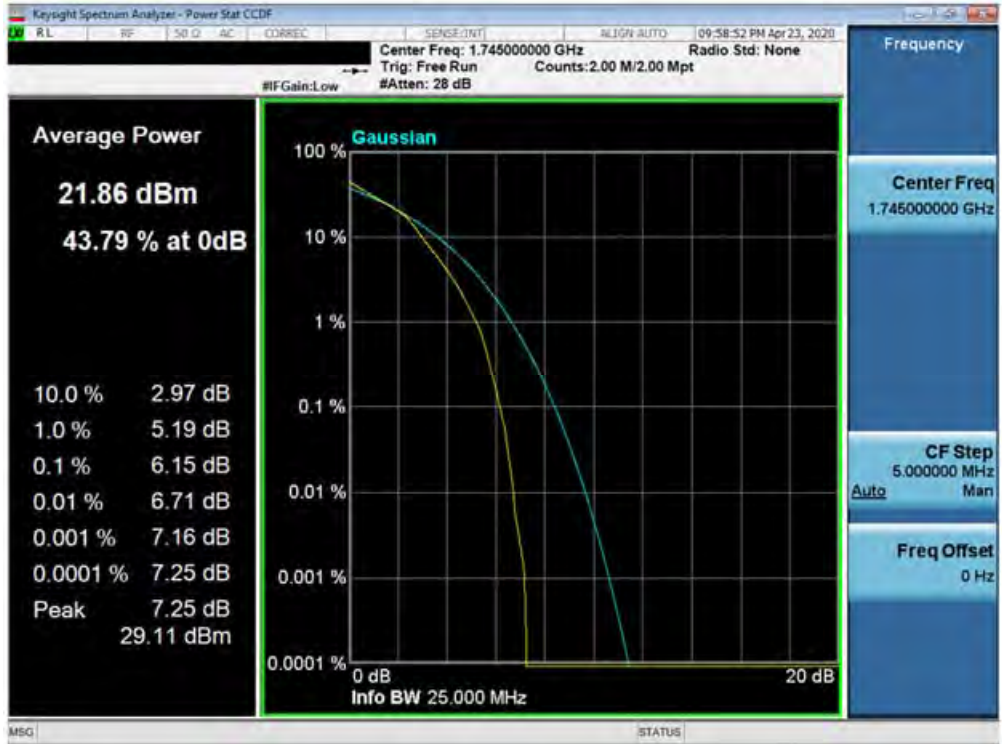


Plot 7-166. PAR Plot (Band 4 - 10.0MHz 64-QAM - Full RB Configuration)

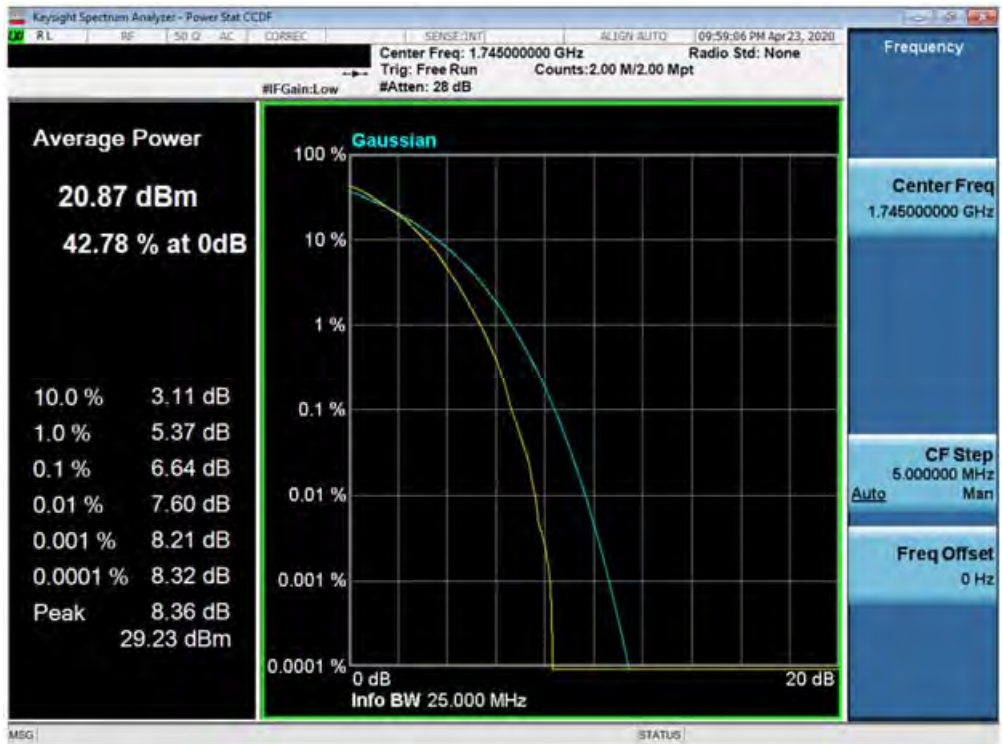


Plot 7-167. PAR Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 104 of 148

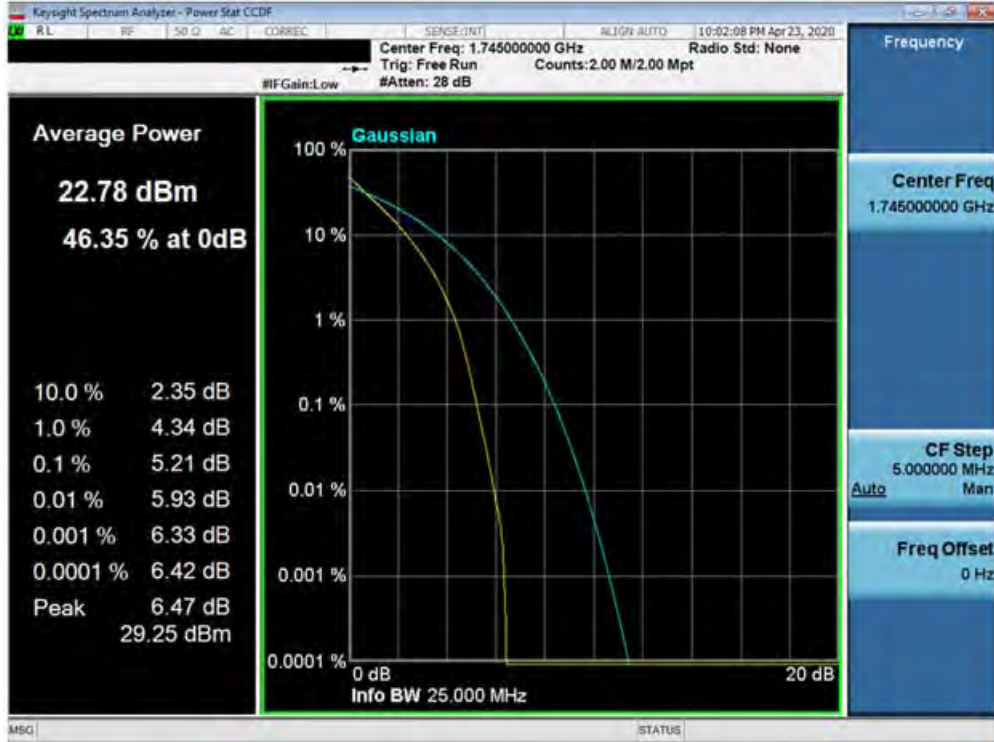


Plot 7-168. PAR Plot (Band 4 - 15.0MHz 16-QAM - Full RB Configuration)

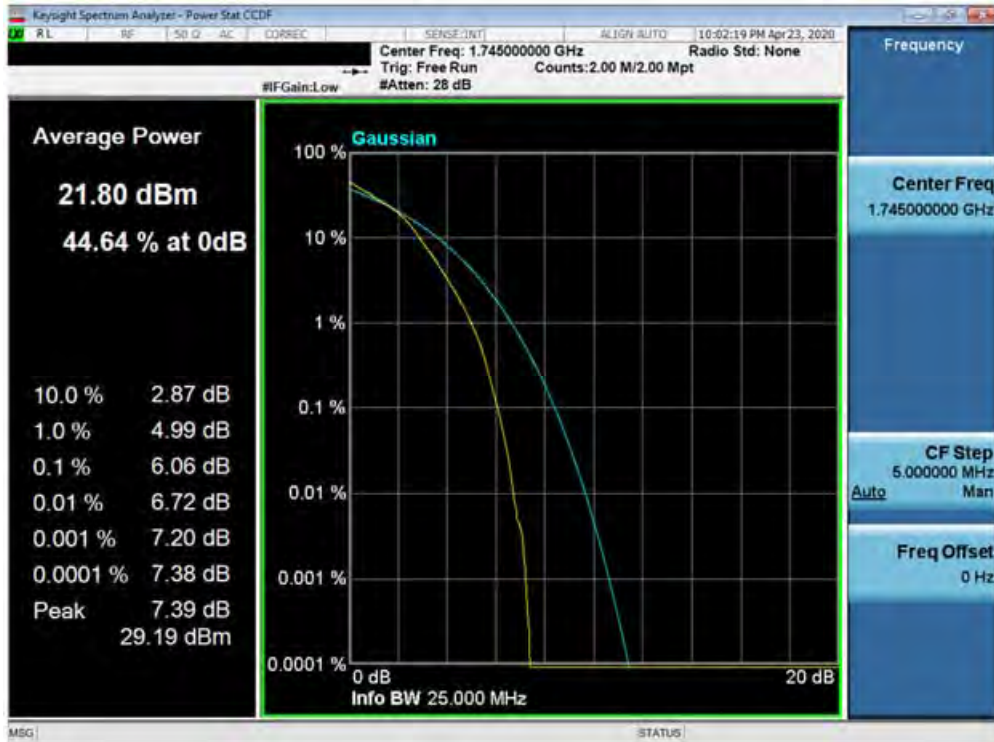


Plot 7-169. PAR Plot (Band 4 - 15.0MHz 64-QAM - Full RB Configuration)

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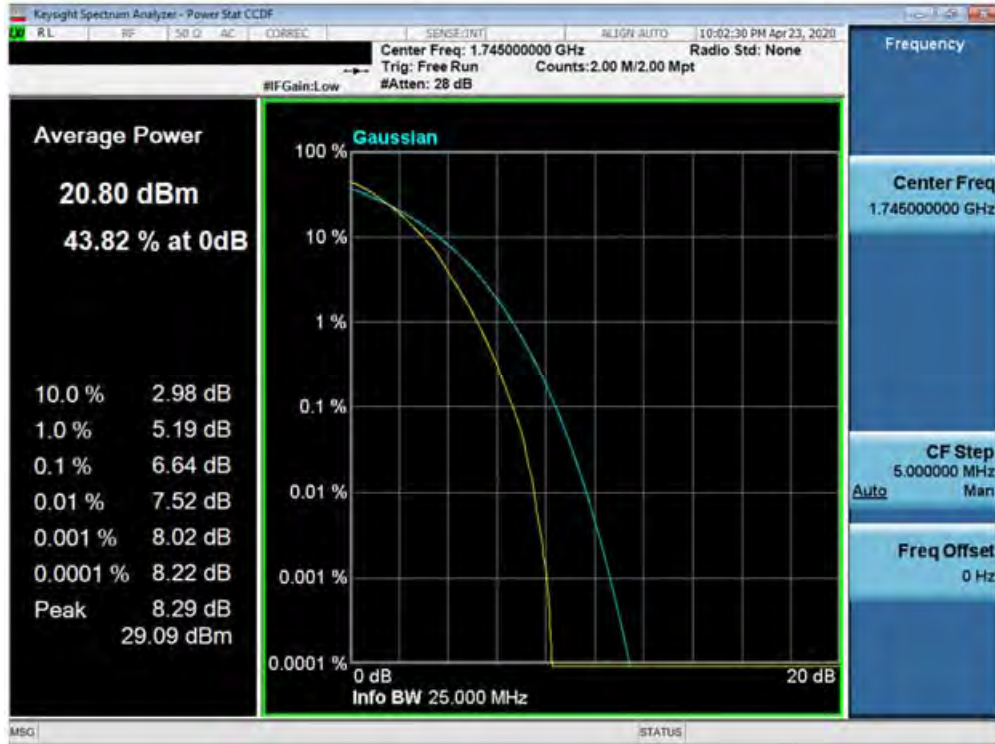


Plot 7-170. PAR Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-171. PAR Plot (Band 4 - 20.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-172. PAR Plot (Band 4 - 20.0MHz 64-QAM - Full RB Configuration)

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7.6 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 38/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 7-5. Test Instrument & Measurement Setup

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Test Notes

1. 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 7-503 and 7-504 below, with both carriers set to transmit using 1RB.

2. 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.

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Uplink CA Configuration 41C

PCC						SCC						ULCA Tx.Power (dBm)
Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	
39750	2506.0	20	QPSK	1	99	39948	2525.8	20	QPSK	1	0	26.01
40620	2593.0	20	QPSK	1	99	40818	2612.8	20	QPSK	1	0	26.48
41490	2680.0	20	QPSK	1	0	41292	2660.2	20	QPSK	1	99	26.00

Table 7-3. Conducted Powers (B41 – Left Carrier: RB Size 1 Offset Max Right Carrier: RB Size 1 Offset 0)

Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	Channel	Frequency [MHz]	BW [MHz]	Mod.	RB Size	RB Offset	ULCA Tx.Power (dBm)
39650	2496.0	20	QPSK	100	0	39948	2525.8	20	QPSK	100	0	24.32
39650	2496.0	20	16-QAM	100	0	39948	2525.8	20	16-QAM	100	0	23.18
39650	2496.0	20	64-QAM	100	0	39948	2525.8	20	64-QAM	100	0	22.01

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

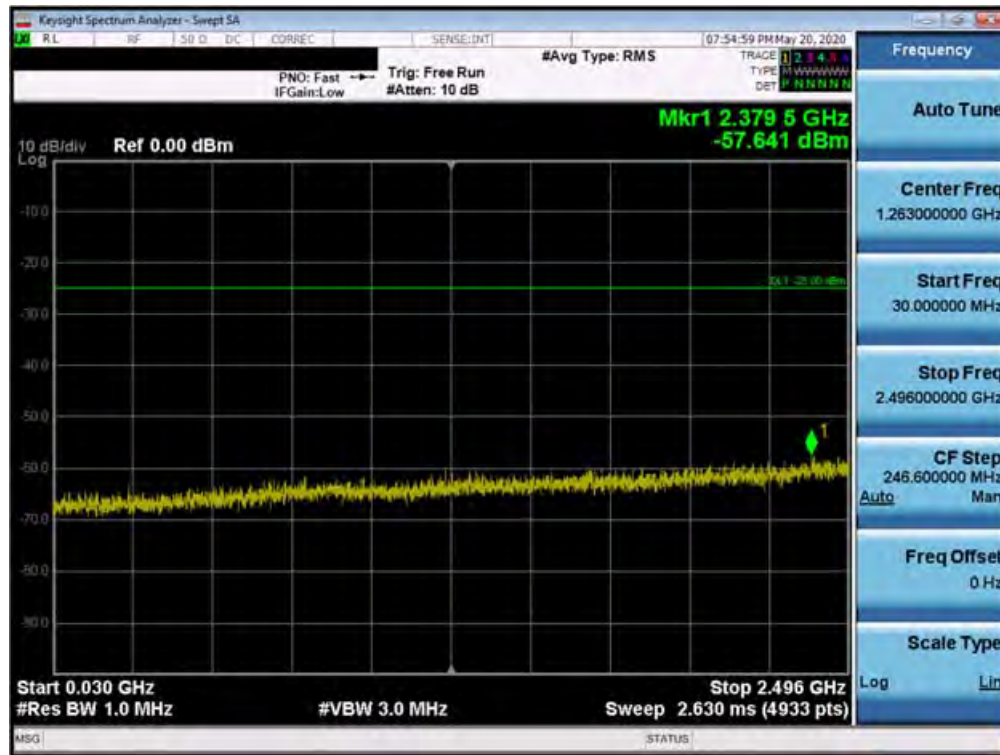


Table 7-173. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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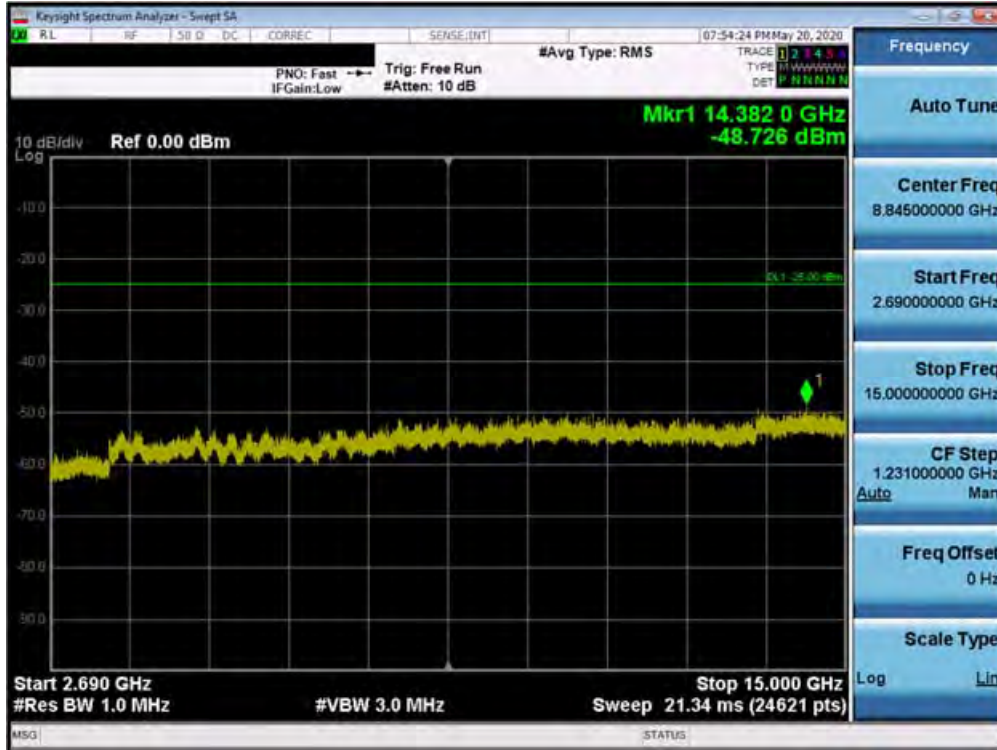


Table 7-174. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

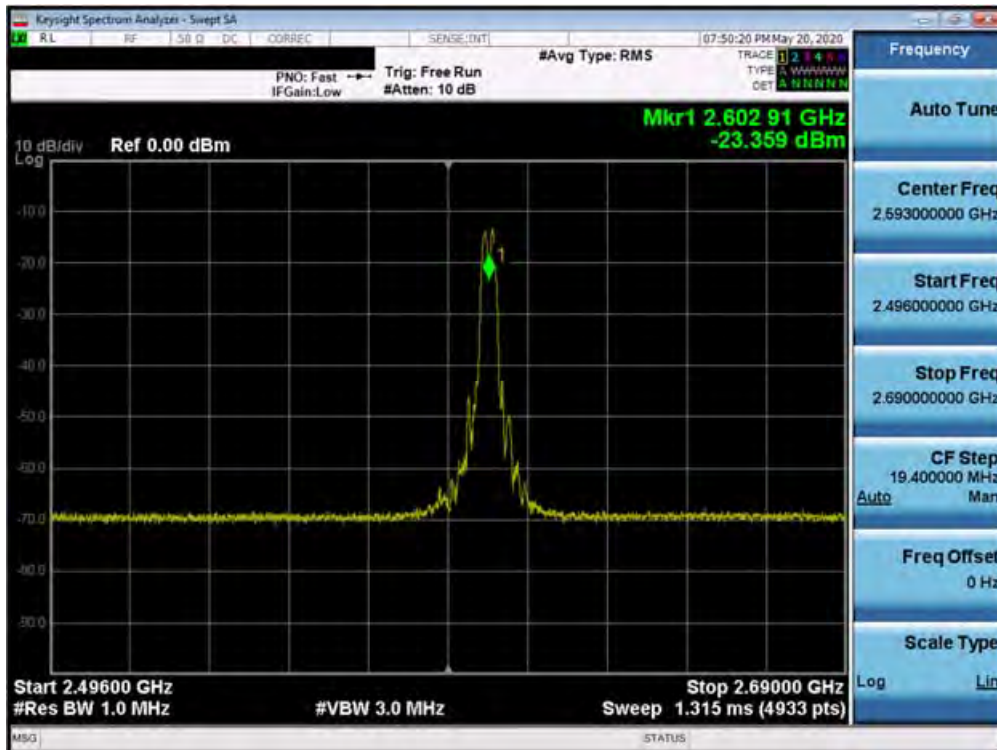


Table 7-175. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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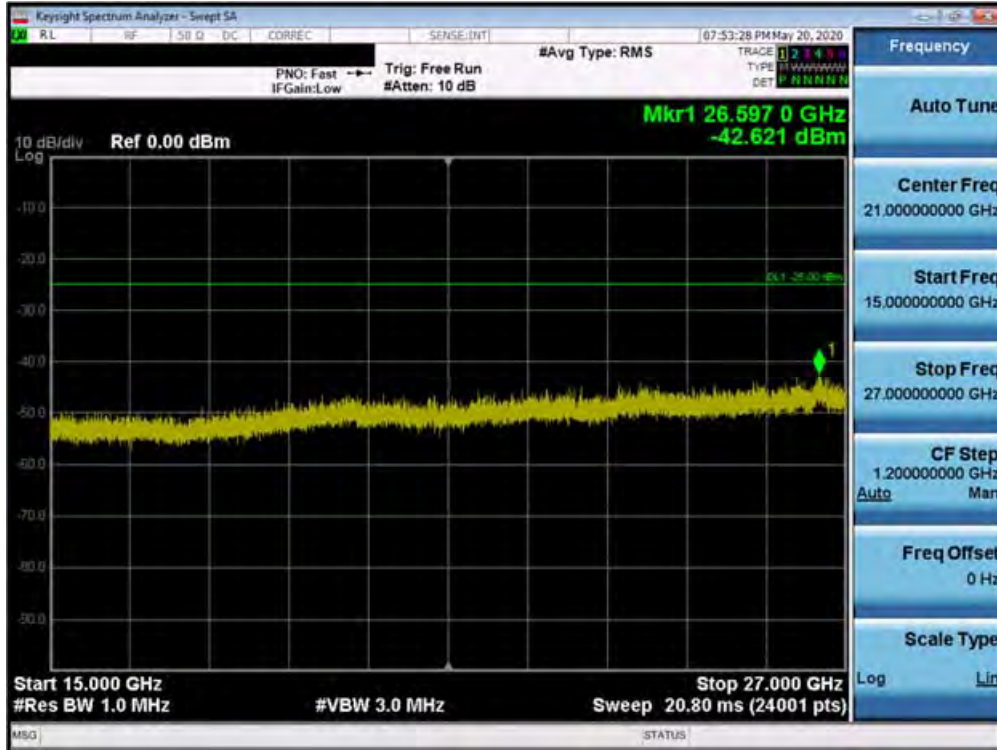


Table 7-176. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)



Table 7-177. Lower ACP Plot (Band 41 QPSK – Left Carrier:20 MHz Right Carrier:20 MHz – Full RB)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Table 7-178. Upper ACP Plot (Band 41 QPSK – Left Carrier:20 MHz Right Carrier:20 MHz – Full RB)

FCC ID: A3LSMN986JPN	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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7.7 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.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW \geq 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points \geq 2 x span / RBW
6. Detector = RMS
7. Trigger is set to “free run” for signals with continuous operation with the sweep times set to “auto”.
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

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Test Setup

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

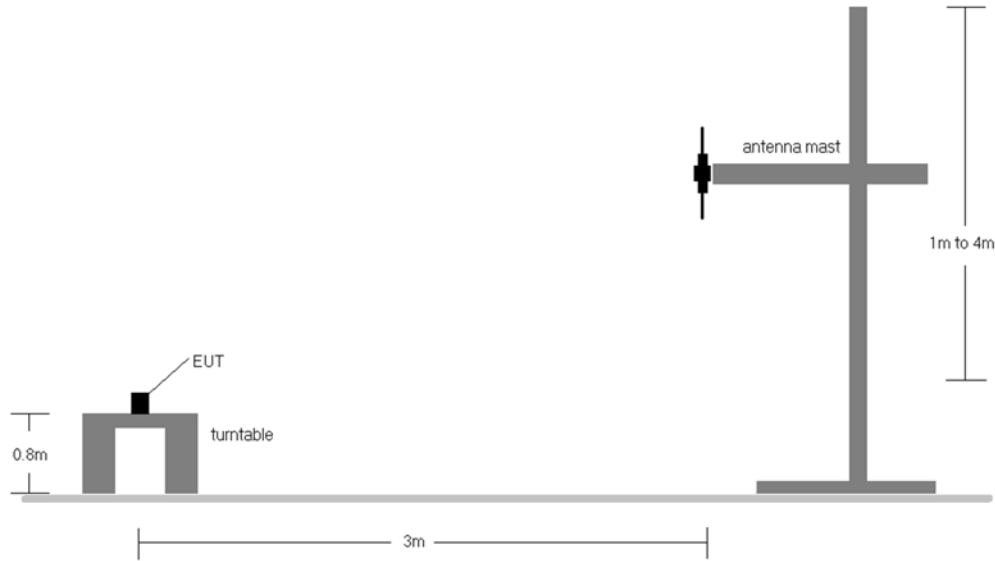


Figure 7-6. Radiated Test Setup <1GHz

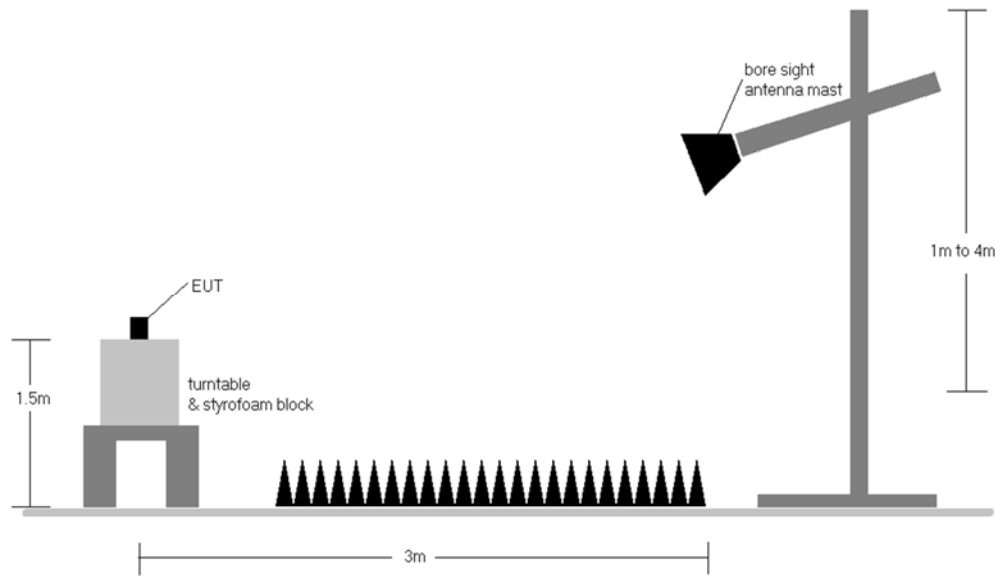


Figure 7-7. Radiated Test Setup >1GHz

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: A3LSMN986JPN	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	 Approved by: Quality Manager
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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	V	150	108	1 / 5	14.76	4.56	17.17	0.052	34.77	-17.60	19.32	0.086	36.99	-17.67
707.50	1.4	QPSK	V	104	95	1 / 5	14.57	4.62	17.04	0.051	34.77	-17.73	19.19	0.083	36.99	-17.80
715.30	1.4	QPSK	V	111	48	1 / 5	14.30	4.72	16.87	0.049	34.77	-17.90	19.02	0.080	36.99	-17.97
699.70	1.4	16-QAM	V	150	108	1 / 5	13.77	4.56	16.18	0.041	34.77	-18.59	18.33	0.068	36.99	-18.66
715.30	1.4	64-QAM	V	111	48	1 / 5	12.62	4.72	15.19	0.033	34.77	-19.58	17.34	0.054	36.99	-19.65
700.50	3	QPSK	V	150	108	1 / 14	14.79	4.59	17.23	0.053	34.77	-17.54	19.38	0.087	36.99	-17.61
707.50	3	QPSK	V	104	95	1 / 14	14.67	4.62	17.14	0.052	34.77	-17.63	19.29	0.085	36.99	-17.70
714.50	3	QPSK	V	111	48	1 / 14	14.41	4.71	16.97	0.050	34.77	-17.80	19.12	0.082	36.99	-17.87
700.50	3	16-QAM	V	150	108	1 / 14	14.01	4.59	16.45	0.044	34.77	-18.32	18.60	0.072	36.99	-18.39
700.50	3	64-QAM	V	150	108	1 / 14	12.86	4.59	15.30	0.034	34.77	-19.47	17.45	0.056	36.99	-19.54
701.50	5	QPSK	V	150	108	1 / 24	14.31	4.60	16.76	0.047	34.77	-18.01	18.91	0.078	36.99	-18.08
707.50	5	QPSK	V	104	95	12 / 6	14.82	4.62	17.29	0.054	34.77	-17.48	19.44	0.088	36.99	-17.55
713.50	5	QPSK	V	111	48	1 / 0	14.31	4.70	16.86	0.048	34.77	-17.91	19.01	0.080	36.99	-17.98
707.50	5	16-QAM	V	104	95	1 / 12	13.79	4.62	16.26	0.042	34.77	-18.51	18.41	0.069	36.99	-18.58
707.50	5	64-QAM	V	104	95	1 / 12	12.88	4.62	15.35	0.034	34.77	-19.42	17.50	0.056	36.99	-19.49
704.00	10	QPSK	V	175	140	1 / 0	16.58	4.58	19.01	0.080	34.77	-15.76	21.16	0.131	36.99	-15.83
707.50	10	QPSK	V	179	128	1 / 49	16.78	4.62	19.25	0.084	34.77	-15.52	21.40	0.138	36.99	-15.59
711.00	10	QPSK	V	179	133	1 / 49	16.92	4.67	19.44	0.088	34.77	-15.33	21.59	0.144	36.99	-15.40
704.00	10	16-QAM	V	175	140	1 / 0	15.50	4.58	17.93	0.062	34.77	-16.84	20.08	0.102	36.99	-16.91
704.00	10	64-QAM	V	175	140	1 / 0	14.31	4.58	16.74	0.047	34.77	-18.03	18.89	0.077	36.99	-18.10
711.00	10	QPSK	H	147	206	1 / 49	13.21	4.62	15.68	0.037	34.77	-19.09	17.83	0.061	36.99	-19.16
711.00	10 (WCP)	QPSK	V	177	223	1 / 49	12.11	4.62	14.58	0.029	34.77	-20.19	16.73	0.047	36.99	-20.26

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	231	72	12 / 6	16.86	5.82	20.53	0.113	34.77	-14.25	22.68	0.185	36.99	-14.31
782.00	5	QPSK	H	237	79	1 / 0	16.98	5.89	20.72	0.118	34.77	-14.05	22.87	0.194	36.99	-14.12
784.50	5	QPSK	H	229	83	1 / 0	16.69	5.92	20.46	0.111	34.77	-14.31	22.61	0.182	36.99	-14.38
782.00	5	16-QAM	H	237	79	1 / 0	16.08	5.89	19.82	0.096	34.77	-14.95	21.97	0.158	36.99	-15.02
779.50	5	64-QAM	H	231	72	12 / 6	14.85	5.82	18.52	0.071	34.77	-16.26	20.67	0.117	36.99	-16.32
782.00	10	QPSK	H	237	79	1 / 0	16.79	5.89	20.53	0.113	34.77	-14.24	22.68	0.185	36.99	-14.31
782.00	10	16-QAM	H	237	79	1 / 0	15.82	5.89	19.56	0.090	34.77	-15.21	21.71	0.148	36.99	-15.28
782.00	10	64-QAM	H	237	79	1 / 0	13.99	5.89	17.73	0.059	34.77	-17.04	19.88	0.097	36.99	-17.11
782.00	5	QPSK	V	145	128	1 / 0	15.62	5.89	19.36	0.086	34.77	-15.41	21.51	0.142	36.99	-15.48
782.00	5 (WCP)	QPSK	V	156	201	1 / 0	12.93	5.89	16.67	0.046	34.77	-18.10	18.82	0.076	36.99	-18.17

Table 7-6. ERP Data (Band 13)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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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]
824.70	1.4	QPSK	V	145	125	1 / 3	13.46	6.36	17.67	0.058	38.45	-20.78	19.82	0.096	40.61	-20.79
836.50	1.4	QPSK	V	143	130	1 / 3	13.64	6.38	17.87	0.061	38.45	-20.58	20.02	0.100	40.61	-20.59
848.30	1.4	QPSK	V	143	116	1 / 3	12.91	6.50	17.26	0.053	38.45	-21.19	19.41	0.087	40.61	-21.20
836.50	1.4	16-QAM	V	143	130	1 / 3	12.73	6.38	16.96	0.050	38.45	-21.49	19.11	0.081	40.61	-21.50
836.50	1.4	64-QAM	V	143	130	1 / 3	11.97	6.38	16.20	0.042	38.45	-22.25	18.35	0.068	40.61	-22.26
825.50	3	QPSK	V	145	125	1 / 14	13.35	6.36	17.56	0.057	38.45	-20.89	19.71	0.094	40.61	-20.90
836.50	3	QPSK	V	143	130	1 / 14	13.61	6.38	17.84	0.061	38.45	-20.61	19.99	0.100	40.61	-20.62
847.50	3	QPSK	V	143	116	1 / 14	13.26	6.49	17.60	0.058	38.45	-20.85	19.75	0.094	40.61	-20.86
836.50	3	16-QAM	V	143	130	1 / 14	12.76	6.38	16.99	0.050	38.45	-21.46	19.14	0.082	40.61	-21.47
836.50	3	64-QAM	V	143	130	1 / 14	11.75	6.38	15.98	0.040	38.45	-22.47	18.13	0.065	40.61	-22.48
826.50	5	QPSK	V	145	125	1 / 12	13.38	6.37	17.60	0.058	38.45	-20.85	19.75	0.094	40.61	-20.86
836.50	5	QPSK	V	143	130	1 / 12	13.64	6.38	17.87	0.061	38.45	-20.58	20.02	0.100	40.61	-20.59
846.50	5	QPSK	V	143	116	1 / 12	13.31	6.48	17.64	0.058	38.45	-20.81	19.79	0.095	40.61	-20.82
836.50	5	16-QAM	V	143	130	1 / 12	12.81	6.38	17.04	0.051	38.45	-21.41	19.19	0.083	40.61	-21.42
836.50	5	64-QAM	V	143	130	1 / 12	11.85	6.38	16.08	0.041	38.45	-22.37	18.23	0.067	40.61	-22.38
829.00	10	QPSK	V	145	125	1 / 0	13.65	6.40	17.90	0.062	38.45	-20.55	20.05	0.101	40.61	-20.56
836.50	10	QPSK	V	143	130	1 / 0	13.76	6.38	17.99	0.063	38.45	-20.46	20.14	0.103	40.61	-20.47
844.00	10	QPSK	V	143	116	1 / 0	13.70	6.46	18.01	0.063	38.45	-20.44	20.16	0.104	40.61	-20.45
836.50	10	16-QAM	V	143	130	1 / 0	12.98	6.38	17.21	0.053	38.45	-21.24	19.36	0.086	40.61	-21.25
836.50	10	64-QAM	V	143	130	1 / 0	12.22	6.38	16.45	0.044	38.45	-22.00	18.60	0.072	40.61	-22.01

Table 7-7. ERP Data (Band 5)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	130	150	13.18	9.47	22.65	0.184	30.00	-7.35
1732.50	1.4	QPSK	H	128	164	13.39	9.26	22.65	0.184	30.00	-7.35
1754.30	1.4	QPSK	H	122	160	14.24	9.29	23.53	0.225	30.00	-6.47
1732.50	1.4	16-QAM	H	128	164	12.86	9.26	22.12	0.163	30.00	-7.88
1710.70	1.4	64-QAM	H	130	150	12.21	9.47	21.68	0.147	30.00	-8.32
1711.50	3	QPSK	H	140	160	14.29	9.47	23.76	0.238	30.00	-6.24
1732.50	3	QPSK	H	128	147	14.27	9.26	23.53	0.225	30.00	-6.47
1753.50	3	QPSK	H	130	157	14.16	9.28	23.44	0.221	30.00	-6.56
1732.50	3	16-QAM	H	128	147	12.95	9.26	22.21	0.166	30.00	-7.79
1711.50	3	64-QAM	H	140	160	12.34	9.47	21.81	0.152	30.00	-8.19
1712.50	5	QPSK	H	130	111	14.06	9.46	23.52	0.225	30.00	-6.48
1732.50	5	QPSK	H	128	127	14.32	9.26	23.58	0.228	30.00	-6.42
1752.50	5	QPSK	H	131	160	14.25	9.28	23.53	0.225	30.00	-6.47
1712.50	5	16-QAM	H	130	111	13.06	9.46	22.52	0.179	30.00	-7.48
1712.50	5	64-QAM	H	130	111	12.29	9.46	21.75	0.150	30.00	-8.25
1715.00	10	QPSK	H	128	163	14.17	9.44	23.61	0.230	30.00	-6.39
1732.50	10	QPSK	H	131	160	14.34	9.26	23.60	0.229	30.00	-6.40
1750.00	10	QPSK	H	124	170	14.46	9.28	23.74	0.237	30.00	-6.26
1750.00	10	16-QAM	H	124	170	13.10	9.28	22.38	0.173	30.00	-7.62
1715.00	10	64-QAM	H	128	163	12.21	9.44	21.65	0.146	30.00	-8.35
1717.50	15	QPSK	H	141	162	14.31	9.43	23.74	0.237	30.00	-6.26
1732.50	15	QPSK	H	128	154	14.41	9.26	23.67	0.233	30.00	-6.33
1747.50	15	QPSK	H	131	152	14.36	9.27	23.63	0.231	30.00	-6.37
1747.50	15	16-QAM	H	131	152	12.98	9.27	22.25	0.168	30.00	-7.75
1717.50	15	64-QAM	H	141	162	12.51	9.43	21.94	0.156	30.00	-8.06
1720.00	20	QPSK	H	133	157	14.37	9.41	23.78	0.239	30.00	-6.22
1732.50	20	QPSK	H	128	157	14.47	9.26	23.73	0.236	30.00	-6.27
1745.00	20	QPSK	H	122	167	12.45	9.27	21.72	0.149	30.00	-8.28
1720.00	20	16-QAM	H	133	157	13.59	9.41	23.00	0.200	30.00	-7.00
1720.00	20	64-QAM	H	133	157	12.65	9.41	22.06	0.161	30.00	-7.94
1720.00	20	QPSK	V	137	343	13.75	9.41	23.16	0.207	30.00	-6.84
1720.00	20 (WCP)	QPSK	H	295	359	12.67	9.41	22.08	0.162	30.00	-7.92

Table 7-8. EIRP Data (Band 4)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 118 of 148

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	H	141	141	12.59	9.46	22.05	0.160	33.01	-10.96
2593.00	5	QPSK	H	110	136	13.47	9.58	23.05	0.202	33.01	-9.96
2687.50	5	QPSK	H	122	133	12.21	9.85	22.06	0.161	33.01	-10.95
2593.00	5	16-QAM	H	110	136	13.05	9.58	22.63	0.183	33.01	-10.38
2593.00	5	64-QAM	H	110	136	12.13	9.58	21.71	0.148	33.01	-11.30
2501.00	10	QPSK	H	141	141	12.80	9.46	22.26	0.168	33.01	-10.75
2593.00	10	QPSK	H	110	136	13.60	9.58	23.18	0.208	33.01	-9.83
2685.00	10	QPSK	H	122	133	12.28	9.85	22.13	0.163	33.01	-10.88
2593.00	10	16-QAM	H	110	136	13.09	9.58	22.67	0.185	33.01	-10.34
2593.00	10	64-QAM	H	110	136	12.04	9.58	21.62	0.145	33.01	-11.39
2503.50	15	QPSK	H	141	141	12.74	9.45	22.19	0.166	33.01	-10.82
2593.00	15	QPSK	H	110	136	13.52	9.58	23.10	0.204	33.01	-9.91
2682.50	15	QPSK	H	122	133	12.09	9.86	21.95	0.157	33.01	-11.06
2593.00	15	16-QAM	H	110	136	12.60	9.58	22.18	0.165	33.01	-10.83
2593.00	15	64-QAM	H	110	136	11.68	9.58	21.26	0.134	33.01	-11.75
2506.00	20	QPSK	H	119	146	13.10	9.45	22.55	0.180	33.01	-10.46
2593.00	20	QPSK	H	104	136	13.62	9.58	23.20	0.209	33.01	-9.81
2680.00	20	QPSK	H	115	131	12.68	9.86	22.54	0.180	33.01	-10.47
2593.00	20	16-QAM	H	104	136	13.27	9.58	22.85	0.193	33.01	-10.16
2593.00	20	64-QAM	H	104	136	12.05	9.58	21.63	0.146	33.01	-11.38
2593.00	20	QPSK	V	101	91	11.06	9.58	20.64	0.116	33.01	-12.37
2593.00	20	QPSK	V	135	211	10.56	9.58	20.14	0.103	33.01	-12.87

Table 7-9. EIRP Data (Band 41)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 119 of 148	

7.8 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: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 120 of 148	

Test Setup

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

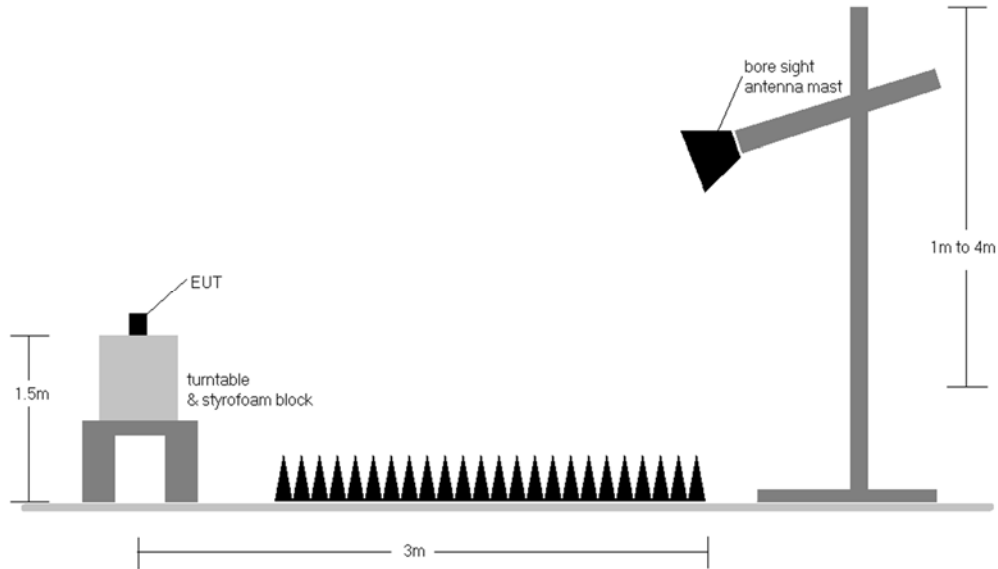


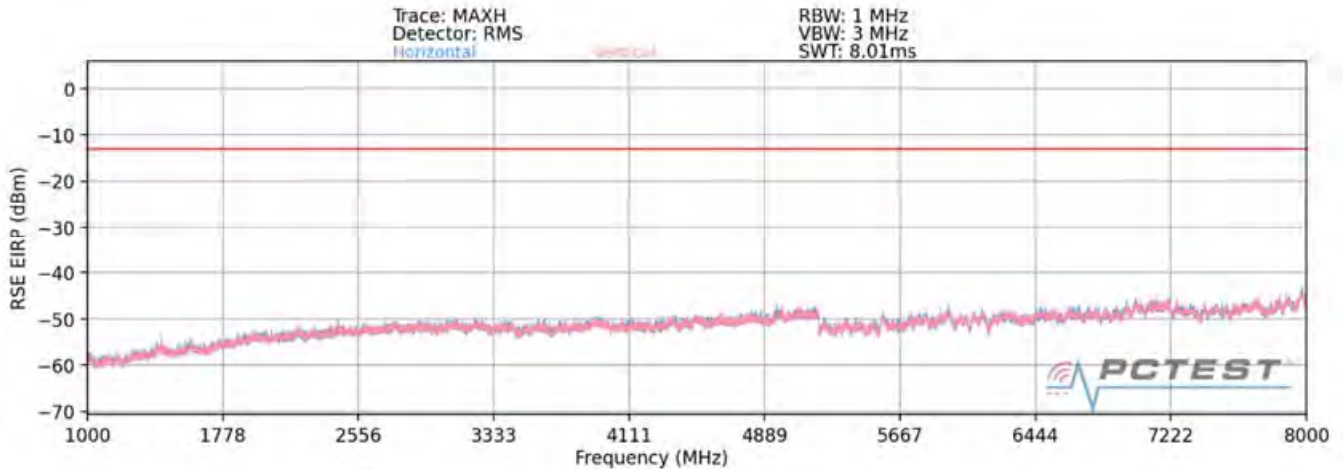
Figure 7-8. Test Instrument & Measurement Setup

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) 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: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 121 of 148

Band 12



Plot 7-179. Radiated Spurious Plot above 1GHz (Band 12)

OPERATING FREQUENCY: 704.00 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]
1408.00	H	101	173	-62.52	2.30	-60.22	-47.2
2112.00	H	126	189	-61.09	3.12	-57.97	-45.0
2816.00	H	-	-	-67.03	4.82	-62.20	-49.2
3520.00	H	-	-	-68.23	6.48	-61.75	-48.8

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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 122 of 148

OPERATING FREQUENCY: 707.50 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]
1415.00	H	107	218	-62.80	2.39	-60.41	-47.4
2122.50	H	102	191	-62.59	3.14	-59.45	-46.5
2830.00	H	-	-	-66.91	4.87	-62.05	-49.0
3537.50	H	-	-	-68.76	6.45	-62.31	-49.3

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

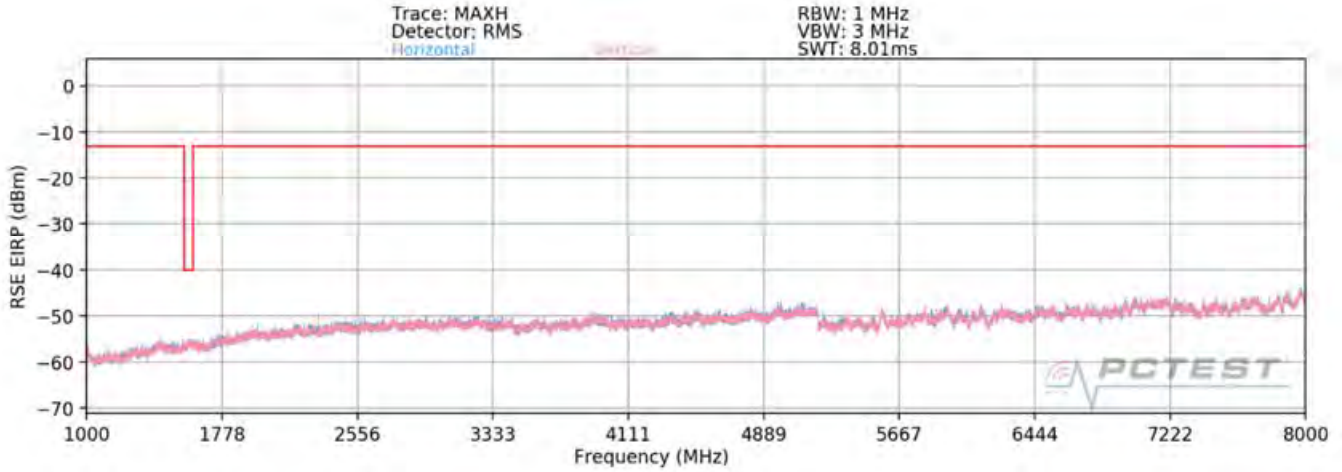
OPERATING FREQUENCY: 711.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
1422.00	H	147	169	-63.23	2.53	-60.71	-47.7
2133.00	H	117	190	-62.62	3.11	-59.51	-46.5
2844.00	H	-	-	-66.82	4.91	-61.91	-48.9
3555.00	H	-	-	-68.14	6.46	-61.69	-48.7

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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 123 of 148

Band 13



Plot 7-180. 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	V	107	135	-57.25	4.00	-53.25	-40.3
3128.00	V	-	-	-65.06	5.38	-59.68	-46.7
3910.00	V	-	-	-66.86	7.09	-59.77	-46.8
4692.00	V	-	-	-67.30	8.37	-58.94	-45.9

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

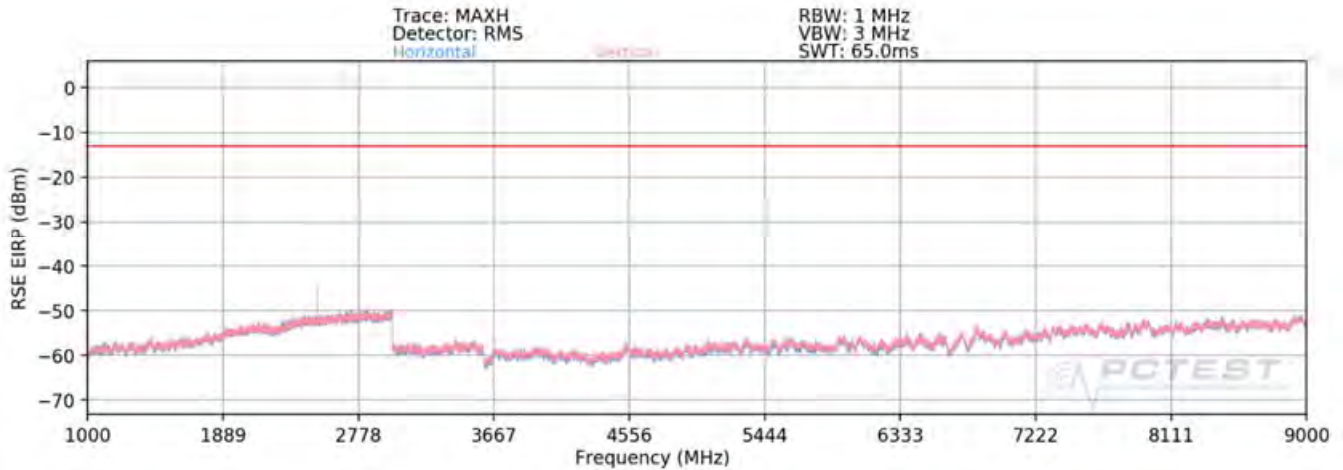
MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.00 MHz
 DISTANCE: 3 meters
 NARROWBAND EMISSION LIMIT: -50 dBm
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

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	V	138	130	-66.39	3.53	-62.86	-22.9

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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 124 of 148

Band 5



Plot 7-181. Radiated Spurious Plot above 1GHz (Band 5)

OPERATING FREQUENCY: 829.00 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]
1658.00	V	-	-	-75.16	3.12	-72.04	-59.0
2487.00	V	112	147	-55.40	3.87	-51.53	-38.5
3316.00	V	-	-	-72.33	6.01	-66.32	-53.3
4145.00	V	-	-	-73.01	7.77	-65.24	-52.2

Table 7-15. Radiated Spurious Data (Band 5 – Low Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 125 of 148

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	V	-	-	-75.29	3.10	-72.20	-59.2
2509.50	V	113	147	-56.01	4.02	-51.99	-39.0
3346.00	V	-	-	-71.97	6.03	-65.94	-52.9
4182.50	V	-	-	-72.74	7.79	-64.95	-52.0

Table 7-16. Radiated Spurious Data (Band 5 – Mid Channel)

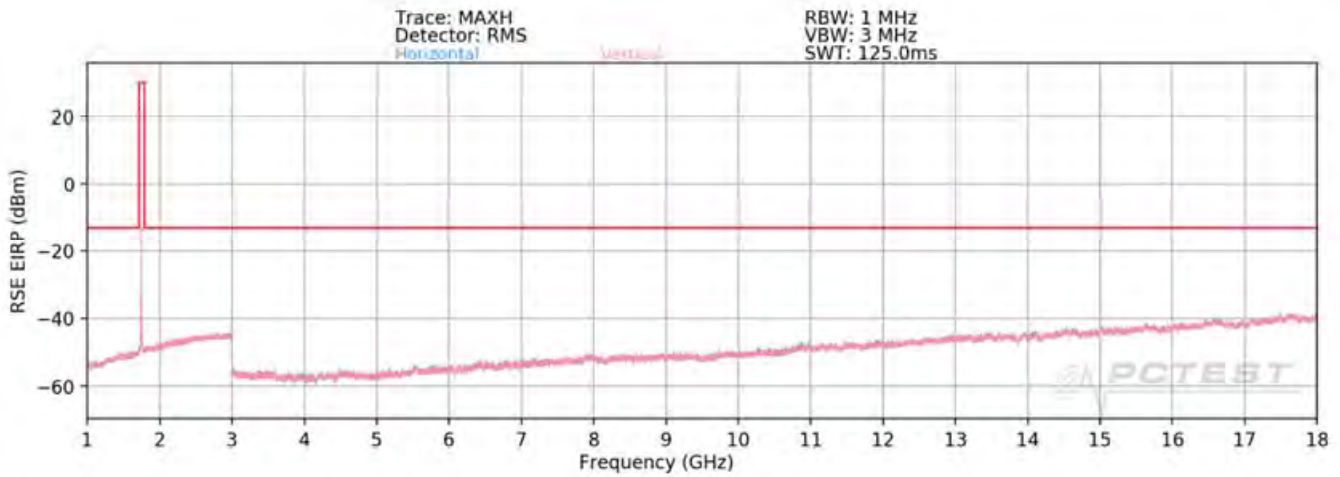
OPERATING FREQUENCY: 844.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
1688.00	V	-	-	-75.46	3.18	-72.28	-59.3
2532.00	V	111	134	-56.57	4.10	-52.47	-39.5
3376.00	V	-	-	-72.81	6.15	-66.66	-53.7
4220.00	V	-	-	-73.42	7.88	-65.54	-52.5

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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 126 of 148	

Band 4



Plot 7-182. Radiated Spurious Plot above 1GHz (Band 4)

OPERATING FREQUENCY: 1720.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
3440.00	H	-	-	-64.77	6.28	-58.49	-45.5
5160.00	H	-	-	-69.66	8.98	-60.67	-47.7
6880.00	H	123	150	-66.91	9.42	-57.49	-44.5
8600.00	H	-	-	-67.30	9.62	-57.68	-44.7
10320.00	H	-	-	-65.42	9.56	-55.85	-42.9

Table 7-18. Radiated Spurious Data (Band 4 – Low Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 127 of 148	

OPERATING FREQUENCY: 1732.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
3464.00	H	398	155	-65.31	6.47	-58.84	-45.8
5196.00	H	-	-	-69.54	8.97	-60.57	-47.6
6928.00	H	113	149	-68.33	9.23	-59.10	-46.1
8660.00	H	-	-	-66.29	9.59	-56.69	-43.7
10392.00	H	-	-	-66.15	9.43	-56.72	-43.7

Table 7-19. Radiated Spurious Data (Band 4 – Mid Channel)

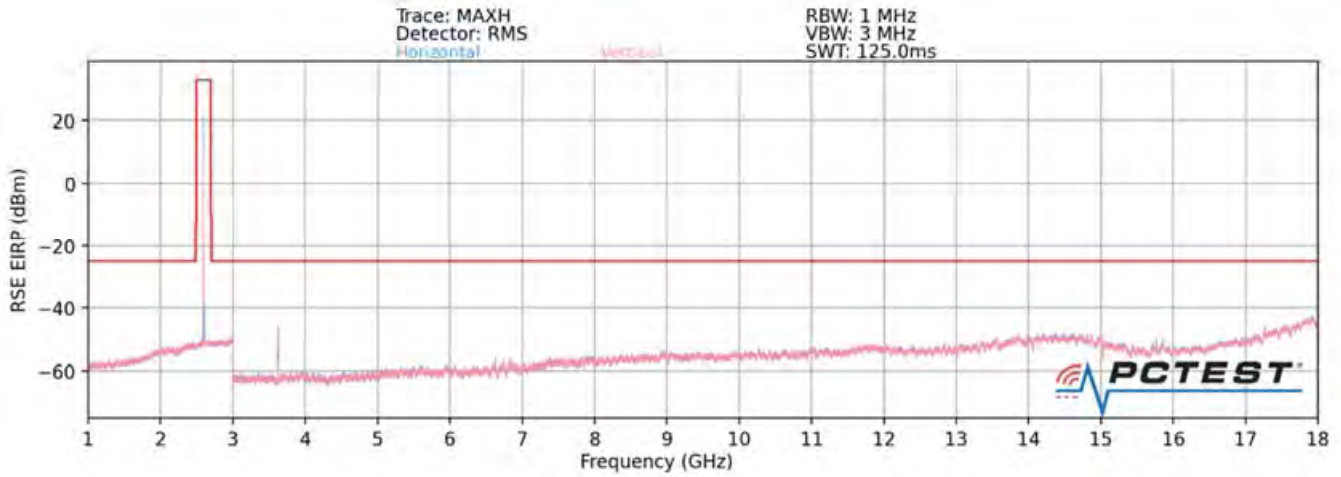
OPERATING FREQUENCY: 1745.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
3490.00	H	40	160	-63.95	6.45	-57.50	-44.5
5235.00	H	-	-	-69.21	9.09	-60.12	-47.1
6980.00	H	112	149	-67.94	9.17	-58.77	-45.8
8725.00	H	-	-	-67.14	9.57	-57.57	-44.6
10470.00	H	-	-	-65.16	9.55	-55.61	-42.6

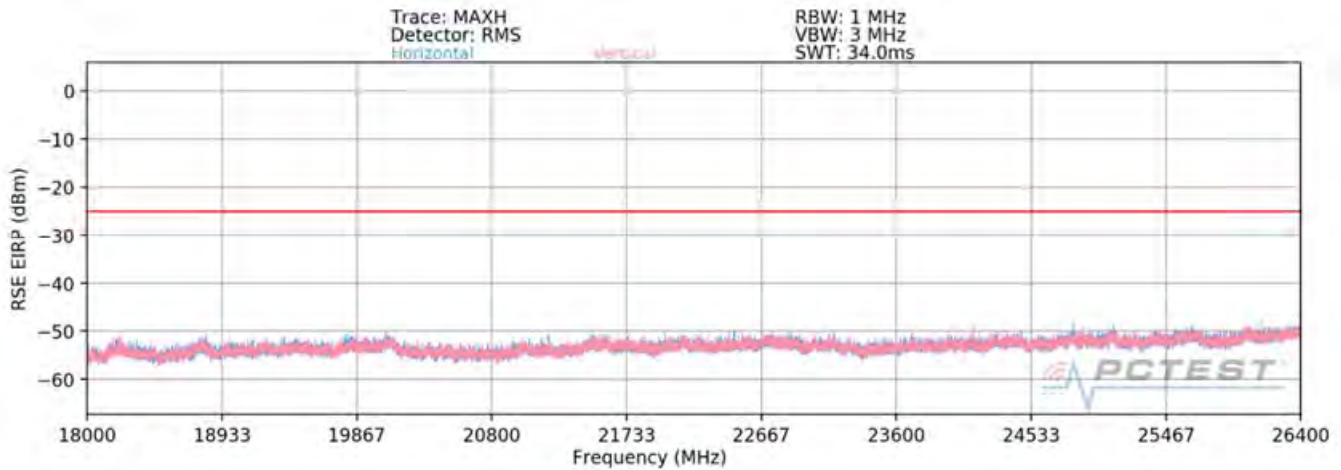
Table 7-20. Radiated Spurious Data (Band 4 – High Channel)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 128 of 148

Band 41



Plot 7-183. Radiated Spurious Plot above 1GHz (Band 41/38)



Plot 7-184. Radiated Spurious Plot 18GHz – 5.5GHz (Band 41/38)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 129 of 148	

OPERATING FREQUENCY: 2510.00 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]
5020.00	V	176	301	-59.97	8.78	-51.18	-26.2
7530.00	V	-	-	-56.21	9.31	-46.90	-21.9
10040.00	V	-	-	-55.16	9.78	-45.38	-20.4
12550.00	V	-	-	-49.37	8.80	-40.57	-15.6
15060.00	V	-	-	-45.77	8.89	-36.89	-11.9

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

OPERATING FREQUENCY: 2535.00 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]
5070.00	V	172	289	-55.86	8.89	-46.97	-22.0
7605.00	V	176	300	-55.97	9.25	-46.72	-21.7
10140.00	V	-	-	-53.19	9.75	-43.44	-18.4
12675.00	V	-	-	-45.54	8.89	-36.66	-11.7
15210.00	V	-	-	-43.37	8.73	-34.64	-9.6

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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset		Page 130 of 148

OPERATING FREQUENCY: 2560.00 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]
5120.00	V	106	191	-58.01	8.91	-49.09	-24.1
7680.00	V	107	200	-52.06	9.28	-42.79	-17.8
10240.00	V	-	-	-51.60	9.66	-41.95	-16.9
12800.00	V	-	-	-46.21	8.87	-37.33	-12.3
15360.00	V	-	-	-42.73	8.44	-34.29	-9.3

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

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2006240100-03.A3L	Test Dates: 07/21 - 08/21/2020	EUT Type: Portable Handset	Page 131 of 148	

7.9 Uplink Carrier Aggregation Radiated Measurements §2.1053.

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 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-D-2010 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW \geq 3 x RBW
3. No. of sweep points \geq 2 x 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

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Test Setup

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

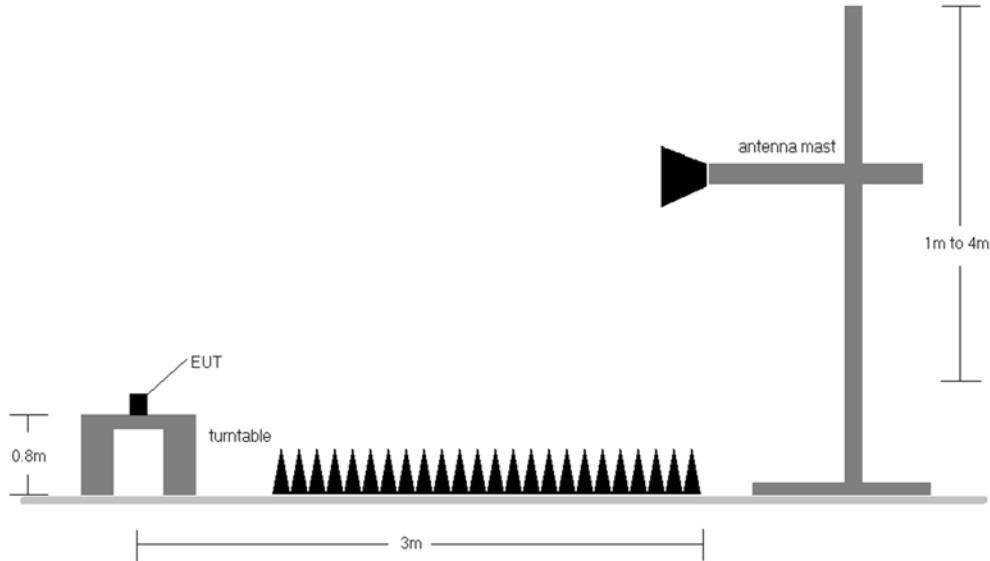


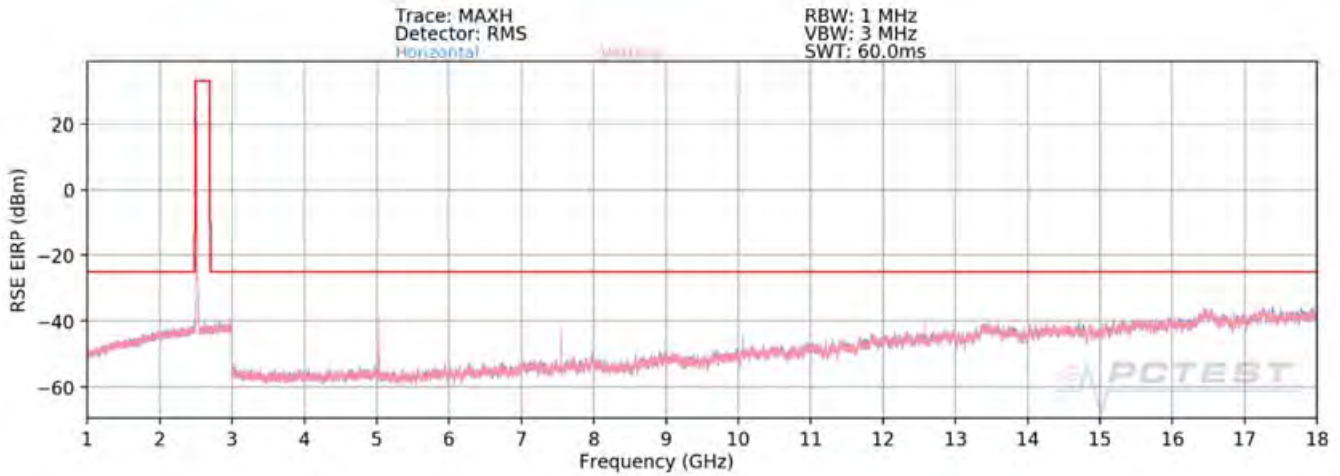
Figure 7-9. Test Instrument & Measurement Setup

Test Notes

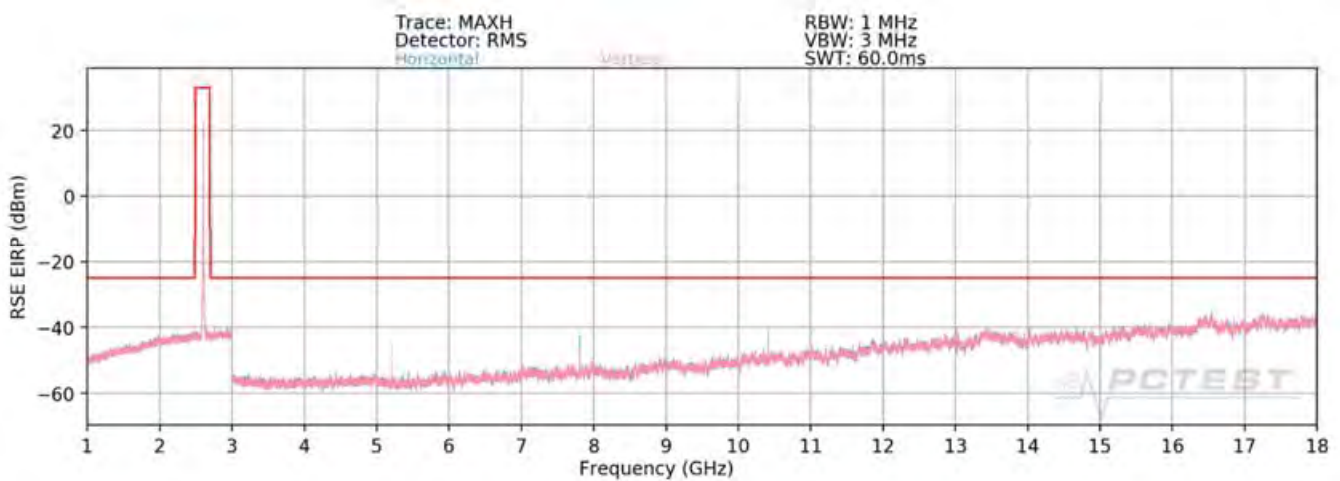
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery. 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.
- 6) No significant emissions were found as a result of two uplink carriers operating contiguously.

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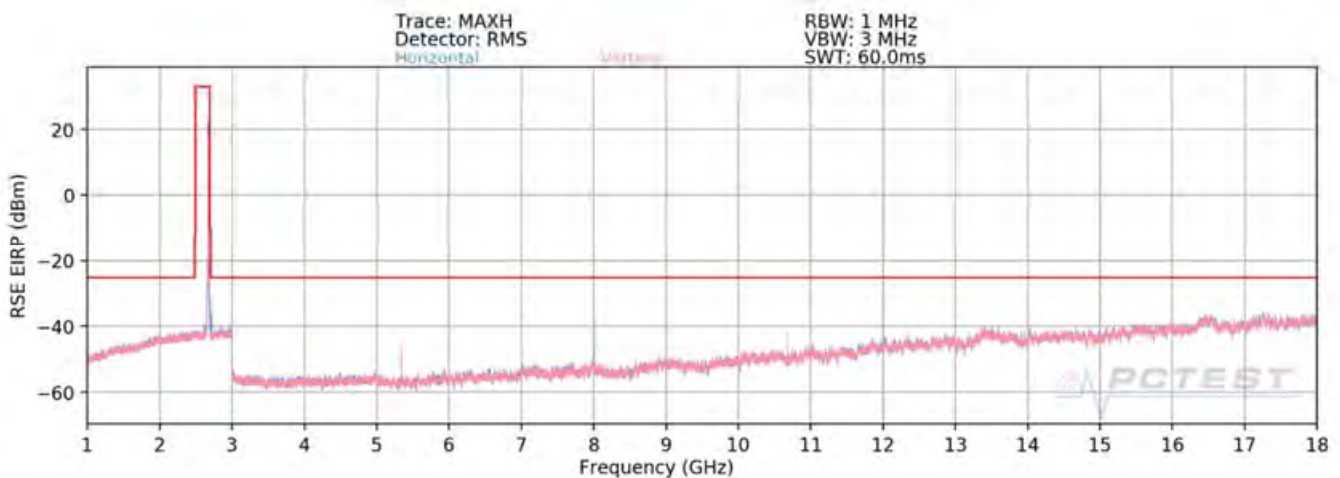
ULCA Band 41



Plot 7-185. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 41 Low Channel – PCC/SCC: 1RB)



Plot 7-186. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 41 Mid Channel – PCC/SCC: 1RB)



Plot 7-187. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 41 High Channel – PCC/SCC: 1RB)

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OPERATING FREQUENCY (PCC): 2506.00 MHz
 OPERATING FREQUENCY (SCC): 2525.80 MHz
 CHANNEL (PCC): 39750
 CHANNEL (SCC): 39948
 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	V	306	6	-58.46	11.39	-47.07	-22.1
7518.00	V	0	102	-56.10	11.08	-45.02	-20.0
10024.00	V	152	13	-53.65	12.31	-41.34	-16.3
12530.00	V	209	348	-48.07	12.85	-35.22	-10.2
15036.00	V	199	26	-57.51	12.67	-44.84	-19.8
17542.00	V	-	-	-60.18	11.37	-48.81	-23.8

Plot 7-24. Radiated Spurious Plot (ULCA B41 Left Carrier: RB 1 Offset 99, Right Carrier: RB 1 Offset 0)

OPERATING FREQUENCY (PCC): 2593.00 MHz
 OPERATING FREQUENCY (SCC): 2612.80 MHz
 CHANNEL (PCC): 40620
 CHANNEL (SCC): 40818
 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	V	255	32	-58.24	11.02	-47.22	-22.2
7779.00	V	243	15	-52.39	11.49	-40.91	-15.9
10372.00	V	349	9	-56.21	12.66	-43.55	-18.5
12965.00	V	201	355	-53.93	12.44	-41.49	-16.5
15558.00	V	202	33	-62.57	15.04	-47.53	-22.5

Plot 7-25. Radiated Spurious Plot (ULCA B41 Left Carrier: RB 100 Offset 0, Right Carrier: RB 100 Offset 0)

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OPERATING FREQUENCY (PCC): _____ 2680.00 MHz
 OPERATING FREQUENCY (SCC): _____ 2660.20 MHz
 CHANNEL (PCC): _____ 41490
 CHANNEL (SCC): _____ 41292
 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	V	142	306	-67.97	11.15	-56.82	-31.8
8040.00	V	240	18	-54.40	11.42	-42.98	-18.0
10720.00	V	200	7	-55.59	12.92	-42.67	-17.7
13400.00	V	214	354	-58.57	12.15	-46.42	-21.4
16080.00	V	230	34	-65.00	16.11	-48.89	-23.9

Plot 7-26. Radiated Spurious Data (ULCA B41 Left Carrier: RB 1 Offset 0, Right Carrier: RB 1 Offset 99)

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7.10 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

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Band 12 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz
 CHANNEL: 23790
 REFERENCE VOLTAGE: 4.21 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	707,500,067	67	0.0000095
100 %		- 20	707,499,985	-15	-0.0000021
100 %		- 10	707,499,731	-269	-0.0000380
100 %		0	707,499,864	-136	-0.0000192
100 %		+ 10	707,500,215	215	0.0000304
100 %		+ 20	707,499,939	-61	-0.0000086
100 %		+ 30	707,499,895	-105	-0.0000148
100 %		+ 40	707,499,712	-288	-0.0000407
100 %		+ 50	707,500,017	17	0.0000024
BATT. ENDPOINT		2.84	+ 20	707,499,884	-116

Table 7-27. 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.

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Band 12 Frequency Stability Measurements

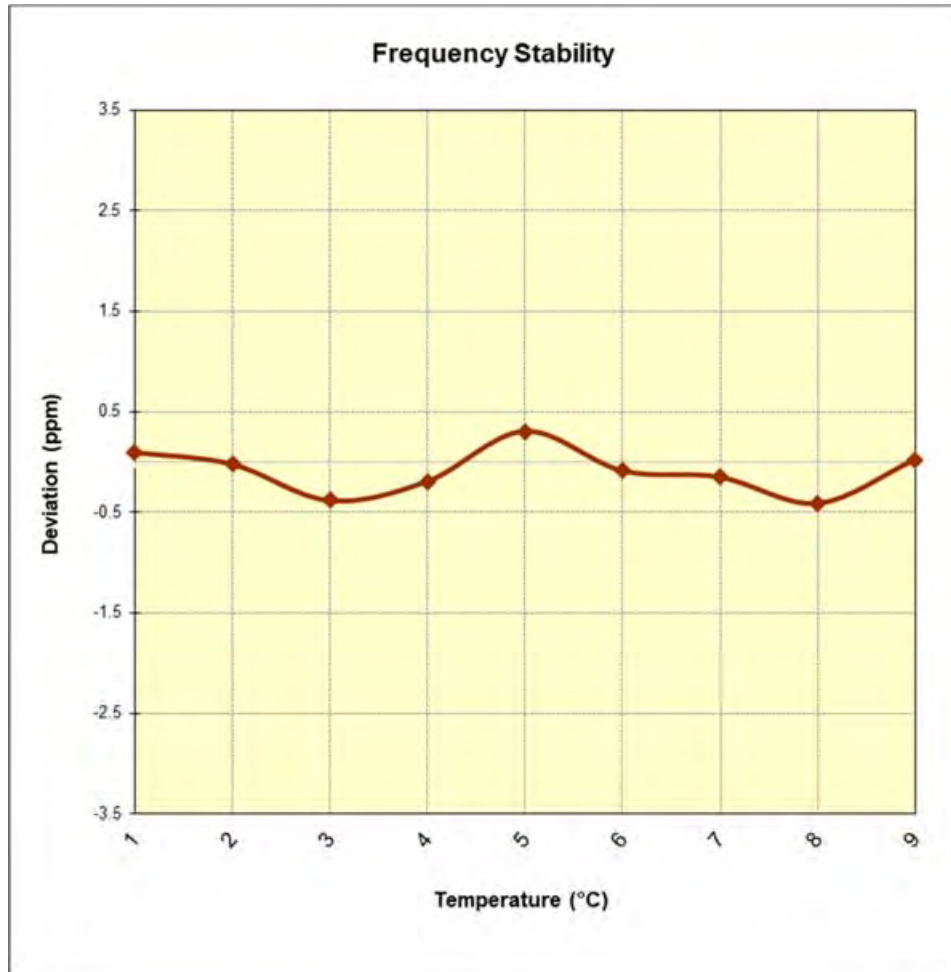


Figure 7-10. Frequency Stability Graph (Band 12)

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Band 13 Frequency Stability Measurements

OPERATING FREQUENCY: 782,000,000 Hz
 CHANNEL: 23230
 REFERENCE VOLTAGE: 4.21 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	782,000,188	188	0.0000240
100 %		- 20	781,999,798	-202	-0.0000258
100 %		- 10	782,000,091	91	0.0000116
100 %		0	782,000,038	38	0.0000049
100 %		+ 10	782,000,155	155	0.0000198
100 %		+ 20	782,000,143	143	0.0000183
100 %		+ 30	781,999,884	-116	-0.0000148
100 %		+ 40	782,000,013	13	0.0000017
100 %		+ 50	781,999,815	-185	-0.0000237
BATT. ENDPOINT		2.84	+ 20	781,999,863	-137

Table 7-28. 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.

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Band 13 Frequency Stability Measurements

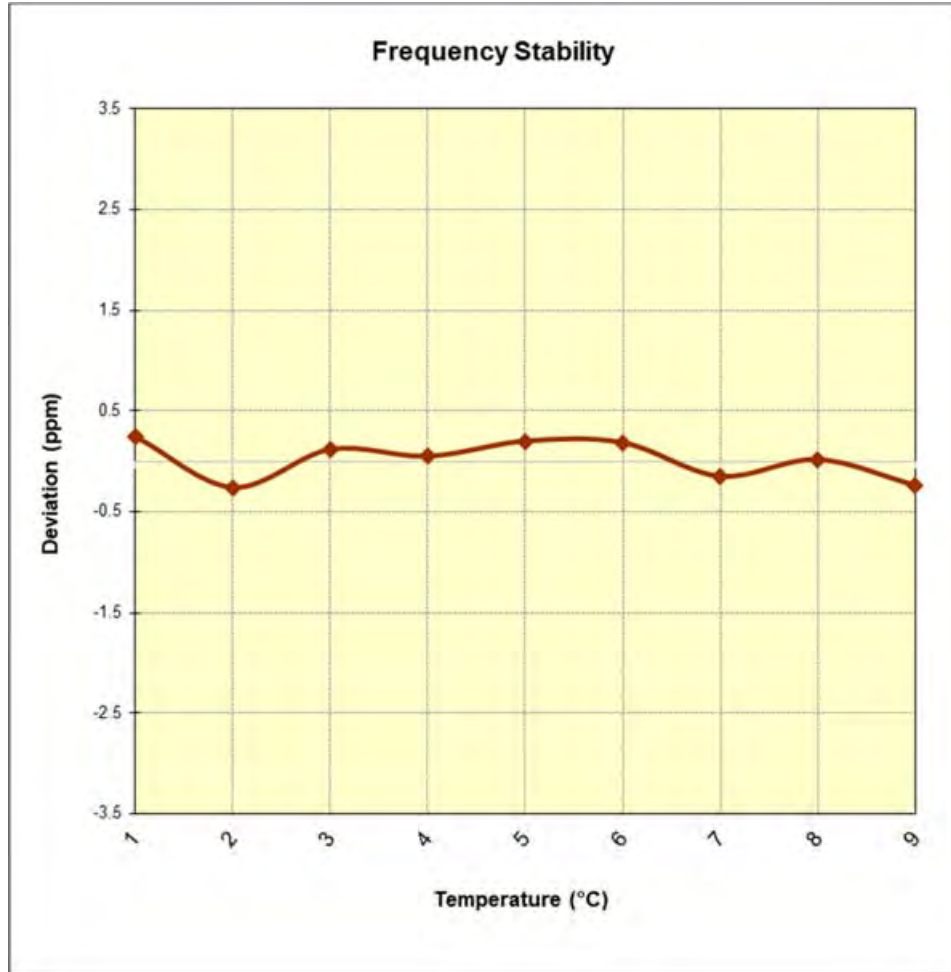


Figure 7-11. Frequency Stability Graph (Band 13)

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Band 5 Frequency Stability Measurements

OPERATING FREQUENCY: 831,500,000 Hz
 CHANNEL: 26865
 REFERENCE VOLTAGE: 4.21 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	831,500,002	2	0.0000002
100 %		- 20	831,500,361	361	0.0000434
100 %		- 10	831,500,151	151	0.0000182
100 %		0	831,499,900	-100	-0.0000120
100 %		+ 10	831,499,897	-103	-0.0000124
100 %		+ 20	831,499,938	-62	-0.0000075
100 %		+ 30	831,500,261	261	0.0000314
100 %		+ 40	831,500,274	274	0.0000330
100 %		+ 50	831,500,061	61	0.0000073
BATT. ENDPOINT		2.84	+ 20	831,500,183	183

Table 7-29. Frequency Stability Data (Band 5)

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.

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Band 5 Frequency Stability Measurements

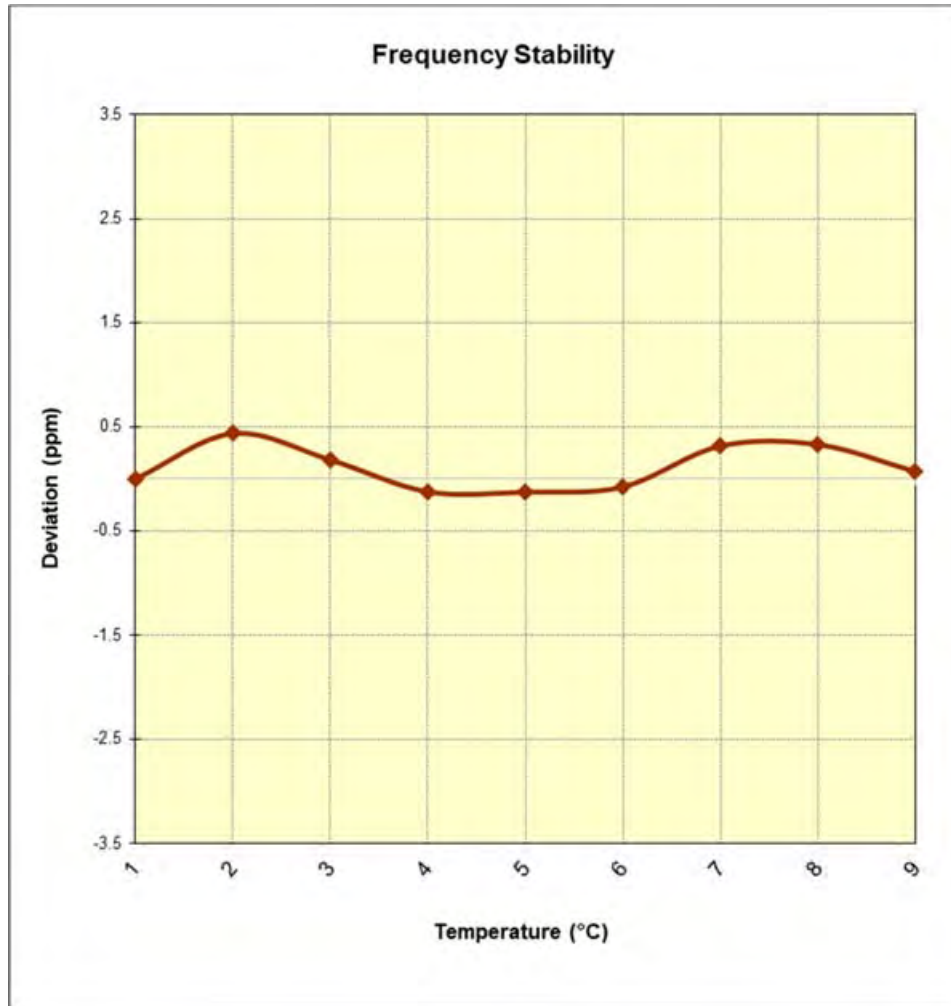


Figure 7-12. Frequency Stability Graph (Band 5)

FCC ID: A3LSMN986JPN		MEASUREMENT REPORT (CERTIFICATION)	 Approved by: Quality Manager
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Band 4 Frequency Stability Measurements

OPERATING FREQUENCY: 1,745,000,000 Hz
 CHANNEL: 132322
 REFERENCE VOLTAGE: 4.21 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	1,744,999,689	-311	-0.0000178
100 %		- 20	1,744,999,624	-376	-0.0000215
100 %		- 10	1,744,999,871	-129	-0.0000074
100 %		0	1,745,000,009	9	0.0000005
100 %		+ 10	1,745,000,013	13	0.0000007
100 %		+ 20	1,745,000,277	277	0.0000159
100 %		+ 30	1,745,000,038	38	0.0000022
100 %		+ 40	1,744,999,960	-40	-0.0000023
100 %		+ 50	1,745,000,113	113	0.0000065
BATT. ENDPOINT		2.84	+ 20	1,745,000,215	215

Table 7-30. Frequency Stability Data (Band 4)

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.

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Band 4 Frequency Stability Measurements

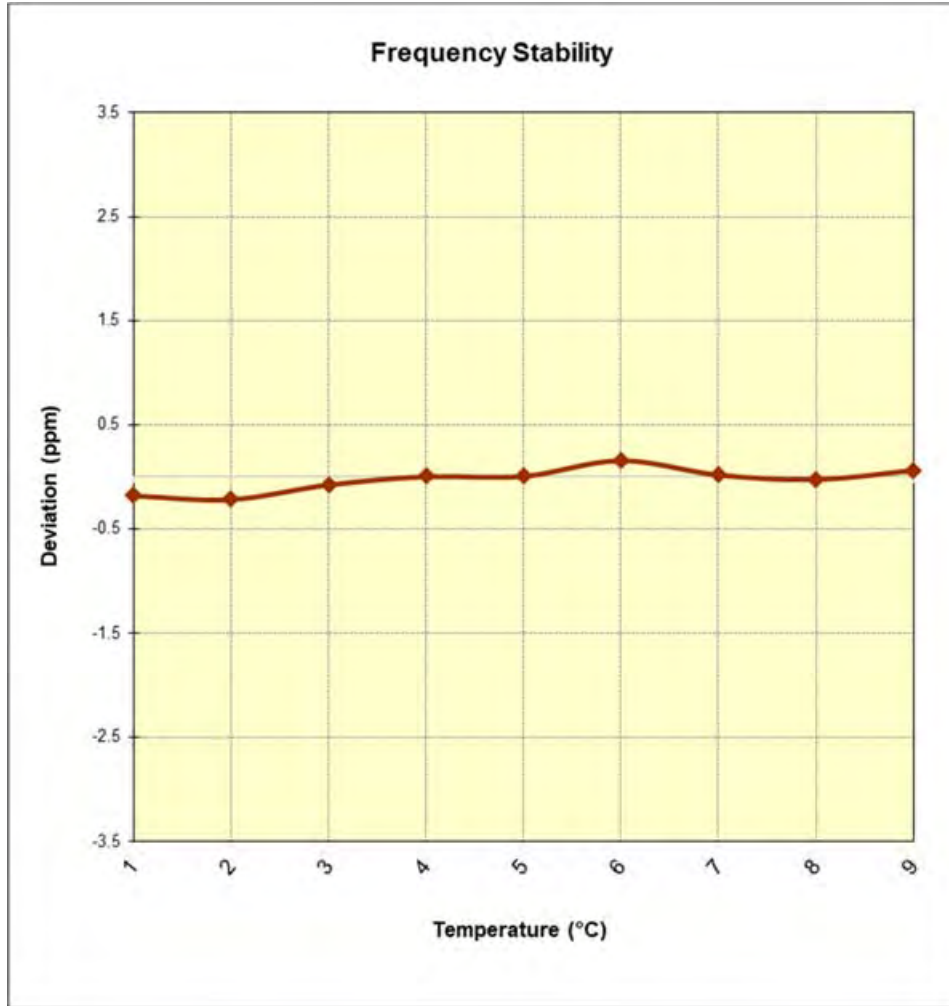


Figure 7-13. Frequency Stability Graph (Band 4)

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Band 41 Frequency Stability Measurements

OPERATING FREQUENCY: 2,593,000,000 Hz
 CHANNEL: 40620
 REFERENCE VOLTAGE: 4.21 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	2,593,000,002	2	0.0000001
100 %		- 20	2,593,000,316	316	0.0000122
100 %		- 10	2,592,999,663	-337	-0.0000130
100 %		0	2,592,999,984	-16	-0.0000006
100 %		+ 10	2,593,000,178	178	0.0000069
100 %		+ 20	2,593,000,467	467	0.0000180
100 %		+ 30	2,592,999,920	-80	-0.0000031
100 %		+ 40	2,592,999,693	-307	-0.0000118
100 %		+ 50	2,593,000,293	293	0.0000113
BATT. ENDPOINT		2.84	+ 20	2,593,000,023	23

Table 7-31. 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.

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Band 41 Frequency Stability Measurements

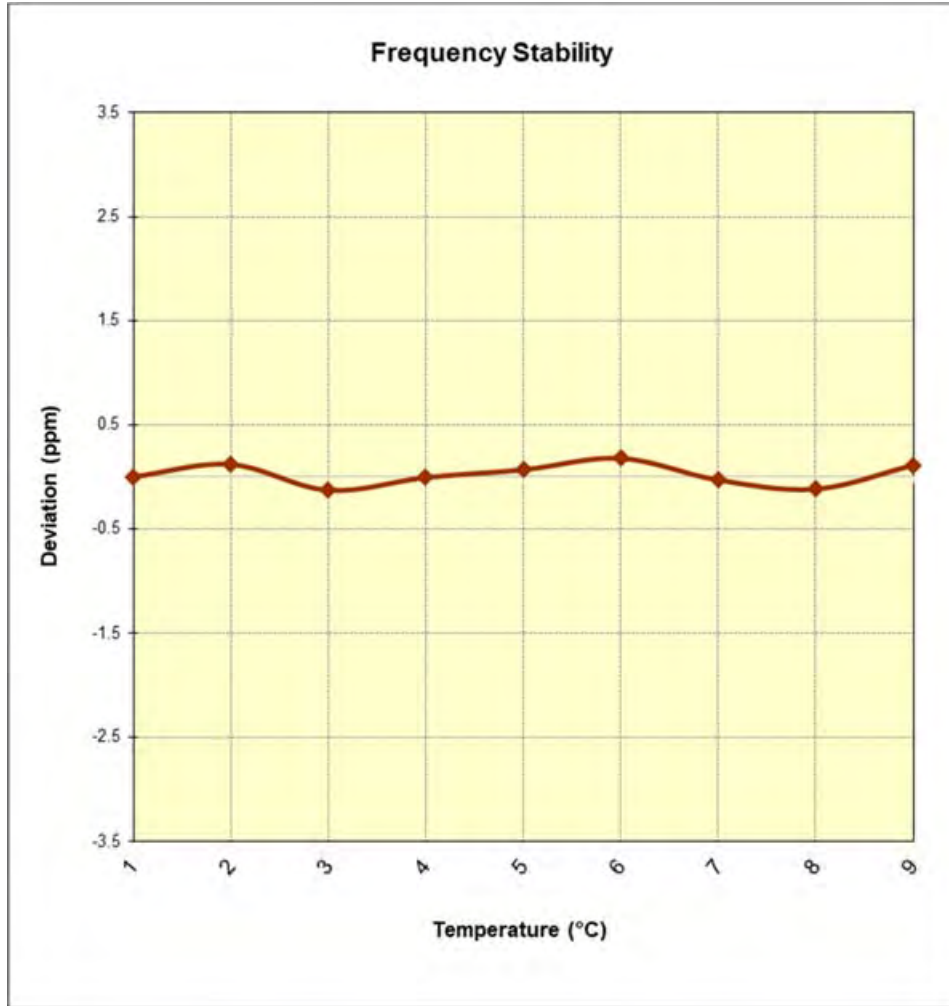


Figure 7-14. Frequency Stability Graph (Band 41)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMN986JPN** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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