

MEASUREMENT REPORT

FCC Part 30 5G mmWave

Applicant Name:

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

Date of Testing:

09/16/2021 – 11/13/2021

Test Report Issue Date:

11/15/2021

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M2109090103-06.A3L

FCC ID:

A3LSMS906U

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:

Certification

Model:

SM-S906U

Additional Models:

SM-S906U1

EUT Type:

Portable Handset

FCC Classification:

Part 30 Mobile Transmitter (5GM)

FCC Rule Part(s):

30

Test Procedure(s):

ANSI C63.26-2015, KDB 971168 D01 v03r01,
KDB 842590 D01 v01r02

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

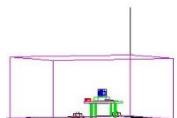


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T A B L E O F C O N T E N T S

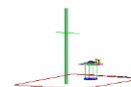
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							Max Power [W]	Max Power [dBm]	
n258 (24.25-24.45GHz)	M-Patch	100	24300 - 24400	1	SISO	QPSK	0.315	24.98	94M9G7D
					2Tx	QPSK	0.849	29.29	94M9G7D
					2Tx	$\pi/2$ BPSK	0.757	28.79	91M7G7D
					2Tx	16QAM	0.489	26.89	94M7W7D
					2Tx	64QAM	0.340	25.32	94M6W7D
				2	2Tx	QPSK	0.362	25.59	194MG7D
					2Tx	$\pi/2$ BPSK	0.358	25.54	192MG7D
					2Tx	16QAM	0.229	23.59	194MW7D
					2Tx	64QAM	0.148	21.71	193MW7D
		50	24275 - 24425	1	SISO	QPSK	0.314	24.97	46M4G7D
					2Tx	QPSK	0.881	29.45	46M4G7D
					2Tx	$\pi/2$ BPSK	0.877	29.43	45M8G7D
					2Tx	16QAM	0.533	27.27	46M0W7D
					2Tx	64QAM	0.358	25.54	46M0W7D
				2	2Tx	QPSK	0.316	24.99	95M5G7D
					2Tx	$\pi/2$ BPSK	0.316	25.00	95M4G7D
					2Tx	16QAM	0.210	23.22	95M4W7D
					2Tx	64QAM	0.132	21.20	95M5W7D
n258 (24.25-24.45GHz)	N-Patch	100	24300 - 24400	1	SISO	QPSK	0.342	25.35	-
					2Tx	QPSK	0.665	28.23	-
					2Tx	$\pi/2$ BPSK	0.662	28.21	-
					2Tx	16QAM	0.394	25.96	-
					2Tx	64QAM	0.247	23.93	-
				2	2Tx	QPSK	0.186	22.70	-
					2Tx	$\pi/2$ BPSK	0.183	22.63	-
					2Tx	16QAM	0.114	20.56	-
					2Tx	64QAM	0.071	18.54	-
		50	24275 - 24425	1	SISO	QPSK	0.285	24.55	-
					2Tx	QPSK	0.475	26.76	-
					2Tx	$\pi/2$ BPSK	0.473	26.74	-
					2Tx	16QAM	0.288	24.59	-
					2Tx	64QAM	0.172	22.35	-
				2	2Tx	QPSK	0.158	21.98	-
					2Tx	$\pi/2$ BPSK	0.161	22.07	-
					2Tx	16QAM	0.098	19.91	-
					2Tx	64QAM	0.062	17.95	-

EUT Overview (Band n258, 24.25-24.45GHz)

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Band	Antenna	Bandwidth [MHz]	Tx Frequency [MHz]	CCs Active	Mode	Modulation	EIRP		Emission Designator
							Max Power [W]	Max Power [dBm]	
n258 (24.75-25.25GHz)	M-Patch	100	24800 - 25200	1	SISO	QPSK	0.442	26.46	94M8G7D
					2Tx	QPSK	1.737	32.40	94M8G7D
					2Tx	$\pi/2$ BPSK	1.733	32.39	91M9G7D
					2Tx	16QAM	1.049	30.21	94M8W7D
					2Tx	64QAM	0.529	27.24	94M4W7D
				2	2Tx	QPSK	0.644	28.09	194MG7D
					2Tx	$\pi/2$ BPSK	0.637	28.04	192MG7D
					2Tx	16QAM	0.406	26.09	193MW7D
					2Tx	64QAM	0.262	24.18	194MW7D
		50	24775 - 25225	1	SISO	QPSK	0.357	25.52	46M2G7D
					2Tx	QPSK	1.301	31.14	46M2G7D
					2Tx	$\pi/2$ BPSK	1.292	31.11	45M8G7D
					2Tx	16QAM	0.808	29.07	45M8W7D
					2Tx	64QAM	0.509	27.06	45M8W7D
				2	2Tx	QPSK	0.551	27.41	95M4G7D
					2Tx	$\pi/2$ BPSK	0.537	27.30	95M9G7D
					2Tx	16QAM	0.341	25.33	95M5W7D
					2Tx	64QAM	0.221	23.44	95M3W7D
n258 (24.75-25.25GHz)	N-Patch	100	24800 - 25200	1	SISO	QPSK	0.478	26.80	-
					2Tx	QPSK	0.771	28.87	-
					2Tx	$\pi/2$ BPSK	0.751	28.76	-
					2Tx	16QAM	0.471	26.73	-
					2Tx	64QAM	0.292	24.66	-
				2	2Tx	QPSK	0.272	24.34	-
					2Tx	$\pi/2$ BPSK	0.272	24.35	-
					2Tx	16QAM	0.173	22.38	-
					2Tx	64QAM	0.113	20.52	-
		50	24775 - 25225	1	SISO	QPSK	0.542	27.34	-
					2Tx	QPSK	0.705	28.48	-
					2Tx	$\pi/2$ BPSK	0.670	28.26	-
					2Tx	16QAM	0.386	25.86	-
					2Tx	64QAM	0.221	23.45	-
				2	2Tx	QPSK	0.247	23.93	-
					2Tx	$\pi/2$ BPSK	0.246	23.90	-
					2Tx	16QAM	0.126	20.99	-
					2Tx	64QAM	0.069	18.41	-

EUT Overview (Band n258, 24.75-25.25GHz)

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Band	Antenna	Bandwidth [MHz]	Tx Frequency [MHz]	CCs Active	Mode	Modulation	EIRP		Emission Designator
							Max Power [W]	Max Power [dBm]	
n261	M-Patch	100	27550 - 28300	1	SISO	QPSK	1.135	30.55	94M3G7D
					2Tx	QPSK	1.599	32.04	94M3G7D
					2Tx	$\pi/2$ BPSK	1.530	31.85	91M1G7D
					2Tx	16QAM	0.950	29.78	94M4W7D
					2Tx	64QAM	0.647	28.11	94M2W7D
				2	2Tx	QPSK	0.673	28.28	194MG7D
					2Tx	$\pi/2$ BPSK	0.682	28.34	191MG7D
					2Tx	16QAM	0.444	26.48	194MW7D
					2Tx	64QAM	0.278	24.45	193MW7D
		50	27525 - 28325	1	SISO	QPSK	1.197	30.78	45M9G7D
					2Tx	QPSK	1.575	31.97	45M9G7D
					2Tx	$\pi/2$ BPSK	1.532	31.85	45M9G7D
					2Tx	16QAM	0.906	29.57	45M9W7D
					2Tx	64QAM	0.586	27.68	46M1W7D
				2	2Tx	QPSK	0.743	28.71	95M0G7D
					2Tx	$\pi/2$ BPSK	0.752	28.76	95M1G7D
					2Tx	16QAM	0.480	26.81	95M3W7D
					2Tx	64QAM	0.311	24.92	95M2W7D
n261	N-Patch	100	27550 - 28300	1	SISO	QPSK	0.439	26.42	-
					2Tx	QPSK	1.225	30.88	-
					2Tx	$\pi/2$ BPSK	1.219	30.86	-
					2Tx	16QAM	0.773	28.88	-
					2Tx	64QAM	0.484	26.85	-
				2	2Tx	QPSK	0.407	26.10	-
					2Tx	$\pi/2$ BPSK	0.416	26.19	-
					2Tx	16QAM	0.266	24.25	-
					2Tx	64QAM	0.174	22.41	-
		50	27525 - 28325	1	SISO	QPSK	0.381	25.81	-
					2Tx	QPSK	1.059	30.25	-
					2Tx	$\pi/2$ BPSK	1.045	30.19	-
					2Tx	16QAM	0.681	28.33	-
					2Tx	64QAM	0.377	25.76	-
				2	2Tx	QPSK	0.409	26.12	-
					2Tx	$\pi/2$ BPSK	0.410	26.13	-
					2Tx	16QAM	0.260	24.15	-
					2Tx	64QAM	0.167	22.23	-

EUT Overview (Band n261)

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Band	Antenna	Bandwidth [MHz]	Tx Frequency [MHz]	CCs Active	Mode	Modulation	EIRP		Emission Designator
							Max Power [W]	Max Power [dBm]	
n260	M-Patch	100	37050 - 39950	1	SISO	QPSK	0.171	22.34	94M6G7D
					2Tx	QPSK	0.419	26.22	94M6G7D
					2Tx	$\pi/2$ BPSK	0.411	26.14	91M7G7D
					2Tx	16QAM	0.272	24.34	94M3W7D
					2Tx	64QAM	0.163	22.11	94M7W7D
				2	2Tx	QPSK	0.138	21.40	194MG7D
					2Tx	$\pi/2$ BPSK	0.138	21.39	191MG7D
					2Tx	16QAM	0.096	19.84	194MW7D
					2Tx	64QAM	0.067	18.25	196MW7D
		50	37025 - 39975	1	SISO	QPSK	0.179	22.53	46M1G7D
					2Tx	QPSK	0.426	26.29	46M1G7D
					2Tx	$\pi/2$ BPSK	0.423	26.26	45M9G7D
					2Tx	16QAM	0.260	24.15	46M0W7D
					2Tx	64QAM	0.167	22.23	45M9W7D
				2	2Tx	QPSK	0.120	20.80	95M0G7D
					2Tx	$\pi/2$ BPSK	0.120	20.80	95M0G7D
					2Tx	16QAM	0.073	18.66	95M5W7D
					2Tx	64QAM	0.048	16.82	95M3W7D
n260	N-Patch	100	37050 - 39950	1	SISO	QPSK	0.340	25.32	-
					2Tx	QPSK	0.564	27.51	-
					2Tx	$\pi/2$ BPSK	0.548	27.39	-
					2Tx	16QAM	0.348	25.42	-
					2Tx	64QAM	0.229	23.60	-
				2	2Tx	QPSK	0.248	23.95	-
					2Tx	$\pi/2$ BPSK	0.255	24.07	-
					2Tx	16QAM	0.182	22.60	-
					2Tx	64QAM	0.128	21.08	-
		50	37025 - 39975	1	SISO	QPSK	0.275	24.39	-
					2Tx	QPSK	0.557	27.46	-
					2Tx	$\pi/2$ BPSK	0.566	27.53	-
					2Tx	16QAM	0.333	25.23	-
					2Tx	64QAM	0.216	23.34	-
				2	2Tx	QPSK	0.157	21.95	-
					2Tx	$\pi/2$ BPSK	0.148	21.70	-
					2Tx	16QAM	0.109	20.37	-
					2Tx	64QAM	0.084	19.25	-

EUT Overview (Band n260)

Note: Due to similar antenna performance from the antennas after thorough investigation, the Occupied Bandwidth was only measured on one antenna for each band.

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1.0 INTRODUCTION

1.1 Scope

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

1.2 PCTEST Test Location

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

1.3 Test Facility / Accreditations

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

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

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMS906U**. The test data contained in this report pertains only to the emissions due to the EUT's 5G mmWave function.

The EUT contains two patch antennas, referred to herein as Ant1 (M-Patch) and Ant2 (N-Patch). Each of the antennas is comprised of two separate antenna feeds - one for horizontal and one for vertical polarization. Only one array antenna can be active at a time.

The EUT supports up to 2CC for UL. For each CC, the EUT supports both 50MHz bandwidth and 100MHz bandwidth. The EUT supports a subcarrier spacing (SCS) of 120kHz with two transmission schemes, CP-OFDM and DFT-s-OFDM, with pi/2-BPSK, QPSK, 16-QAM, and 64-QAM modulations. Different Beam IDs are supported, each corresponding to a different position in space for each antenna. During testing, FTM (Factory Test Mode) was used to operate the transmitter. MIMO operation was achieved by enabling two Beam IDs at the same time: one is from the list of H Beam IDs and other is from the list of V Beam IDs.

Test Device Serial No.: 20101M, 20052M, 40648M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR (FR1 and FR2), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, Ultra Wideband

2.3 Test Configuration

The EUT was tested per the guidance of KDB 842590 D01 v01r02 and ANSI C63.26-2015. See Section 7.0 of this test report for a description of the radiated tests.

EIRP Simulation data for all Beam IDs was used to help determine the worst case Beam ID for SISO operation and Beam ID pair for 2Tx (DFT-s-OFDM) and MIMO (CP-OFDM) operation. Several additional Beam ID's were also investigated to determine the Beam ID's producing the highest measured EIRP.

All testing was performed using FTM (Factory Test Mode) software at continuous Tx operation. When implemented out in the field, the EUT will operate with a maximum uplink configuration as allowed by the 5G network/carrier. The FTM software was also used for the EUT operation in the EN-DC mode.

While operating in the FR2 band, this device supports anchor band operation with either an LTE carrier or an NR FR1 carrier. Both were investigated during FR2 measurements.

2.4 Software and Firmware

The test was conducted with firmware version FAS0_S906UFAU0AU13 installed on the EUT.

2.5 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 "American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services" (ANSI C63.26-2015) and the guidance provided in KDB 842590 D01 v01r02 were used in the measurement of the EUT.

3.2 Radiated Power and Radiated Spurious Emissions

§30.202, §30.203

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary for radiated emissions measurements in the spurious domain. 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 for measurements above 1GHz.

Radiated power (EIRP) measurements were performed in a full anechoic chamber (FAC) conforming to the site validation requirements of CISPR 16-1-4. Radiated spurious emission measurements from 30MHz - 18GHz were performed in a semi anechoic chamber (SAC) conforming to the site validation requirements of CISPR 16-1-4. A positioner was used to manipulate the EUT through several positions in space by rotating about the roll axis as shown in the figure below. The positioner was mounted on top of a turntable bringing the total EUT height to 1.5m.

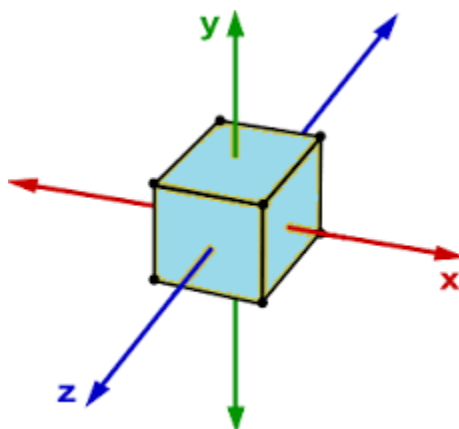


Figure 3-1. Rotation of the EUT Through Three Orthogonal Planes

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The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable. The measurement antenna is in the far field of the EUT per formula $2D^2/\lambda$ where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT. In this case, "D" is the largest dimension of the measurement antenna. The EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

Frequency Range (GHz)	Wavelength(cm)	Far Field Distance (m)	Measurement Distance (m)
18-40	0.749	0.54	1.00
40-60	0.500	1.39	1.50
60-90	0.333	0.91	1.00
90-140	0.214	0.58	1.00
140-200	0.150	0.39	1.00

Table 3-1. Far-Field Distance & Measurement Distance per Frequency Range

Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst case polarization/positioning. It was determined that H=0 degree and V=90 degree are the worst case positions when the EUT was transmitting horizontally and vertically polarized beams, respectively.

The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration bandwidth set to the emissions' occupied bandwidth. The EIRP is calculated from the raw power level measured with the spectrum analyzer using the formulas shown below.

Effective Isotropic Radiated Power Sample Calculation

The measured e.i.r.p is converted to E-field in V/m. Then, the distance correction is applied before converting back to calculated e.i.r.p, as explained in KDB 971168 D01.

$$\begin{aligned}
 \text{Field Strength [dB}\mu\text{V/m]} &= \text{Measured Value [dBm]} + \text{AFCL [dB/m]} + 107 \\
 &= -32.74 \text{ dBm} + (40.7 \text{ dB/m} + 8.78 \text{ dB}) + 107 = 123.74 \text{ dB}\mu\text{V/m} \\
 &= 10^{(123.74/20)/1000000} = 1.54 \text{ V/m} \\
 \text{e.i.r.p. [dBm]} &= 10 * \log((\text{E-Field} * D_m)^2/30) + 30 \text{ dB} \\
 &= 10 * \log((1.54 \text{ V/m} * 1.00 \text{ m})^2/30) + 30 \text{ dB} \\
 &= 18.98 \text{ dBm e.i.r.p.}
 \end{aligned}$$

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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 an accredited ISO/IEC 17025 calibration facility. 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
	AP1	EMC Cable and Switch System	9/10/2021	Annual	9/10/2022	AP1
ETS-Lindgren	3116C	DRG Horn Antenna	5/11/2021	Biennial	5/11/2023	218893
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/20/2021	Biennial	4/20/2023	125518
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Biennial	8/27/2022	17620
Keysight Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	7/21/2021	Annual	7/21/2022	MY49430494
Keysight Technologies	N9030A	50GHz PXA Signal Analyzer	1/20/2021	Annual	1/20/2022	US51350301
Megaphase	FAC mmWave	AP FAC mmWave 18ft 40GHz	3/3/2021	Annual	3/3/2022	20033003
Narda	180-442-KF	Wide Band Horn Antenna 18.0 - 40.0 GHz	11/5/2020	Biennial	11/5/2022	U157403-01
OML Inc.	M05RH	WR-05 Horn Antenna, 24dBi, 140 to 220 GHz	10/31/2019	Biennial	1/31/2022	18073001
OML Inc.	M08RH	WR-08 Horn Antenna, 24dBi, 90 to 140 GHz	10/31/2019	Biennial	1/31/2022	18073001
OML Inc.	M12RH	WR-12 Horn Antenna, 24dBi, 60 to 90 GHz	10/31/2019	Biennial	1/31/2022	18073001
OML Inc.	M19RH	WR-19 Horn Antenna, 24dBi, 40 to 60 GHz	10/31/2019	Biennial	1/31/2022	18073001
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	5/25/2021	Annual	5/25/2022	100348
Rohde & Schwarz	FSW26	2Hz-26.5GHz Signal and spectrum analyzer	2/10/2021	Annual	2/10/2022	103187
Rohde & Schwarz	SMW200A	Signal Generator		N/A		190456
Sunol Science	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107
Virginia Diodes Inc	SAX252	SAX Module (60 - 90GHz)	2/24/2021	Biennial	2/24/2023	SAX252
Virginia Diodes Inc	SAX253	SAX Module (90 - 140GHz)	2/24/2021	Biennial	2/24/2023	SAX253
Virginia Diodes Inc	SAX254	SAX Module (140 - 220GHz)	2/24/2021	Biennial	2/24/2023	SAX254
Virginia Diodes Inc	SAX411	SAX Module (40 - 60GHz)	2/24/2021	Biennial	2/24/2023	SAX411
Virginia Diodes Inc	SAX679	SAX Module (40 - 60GHz)	8/28/2020	Biennial	8/28/2022	SAX679
Virginia Diodes Inc	SAX680	SAX Module (60 - 90GHz)	8/14/2020	Biennial	9/14/2022	SAX680
Virginia Diodes Inc	SAX681	SAX Module (90 - 140GHz)	10/22/2020	Biennial	10/22/2022	SAX681
Virginia Diodes Inc	SAX682	SAX Module (140 - 220GHz)	9/24/2020	Biennial	9/24/2022	SAX682
UTiFlex	UTiFlex	FAC mmWave UTiFlex 40GHz	3/3/2021	Annual	3/3/2022	234142-001
UTiFlex	UTiFlex	FAC mmWave UTiFlex 40GHz	3/10/2021	Annual	3/10/2022	232062-001
UTiFlex	UTiFlex	1m UTiFlex 40GHz	9/10/2021	Annual	9/10/2022	232063-001

Table 5-1. Test Equipment

Notes:

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

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6.0 SAMPLE CALCULATIONS

Emission Designator

$\pi/2$ BPSK/ QPSK Modulation

Emission Designator = 800MG7D

BW = 800 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 802MW7D

BW = 802 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

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7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
FCC ID: A3LSMS906U
FCC Classification: Part 30 Mobile Transmitter (5GM)
Mode(s): TDD

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	RADIATED	PASS	Section 7.2
2.1046, 30.202	Equivalent Isotropic Radiated Power	43dBm		PASS	Section 7.3
2.1051, 30.203	Spurious Emissions	-13dBm/MHz for all out-of-band emissions		PASS	Section 7.4
2.1051, 30.203	Out-of-Band Emissions at the Band Edge	-13dBm/MHz for all out-of-band emissions, -5dBm/MHz from the band edge up to 10% of the channel BW		PASS	Section 7.5
2.1055	Frequency Stability	Fundamental emissions stay within authorized frequency block		PASS	Section 7.6

Table 7-1. Summary of Radiated Test Results

Notes:

- 1) All modes of operation and modulations were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) This report contains references to "n258-R1" and "n258-R2". These correspond to n258 Range 1, operating from 24.25 - 24.45GHz, and n258 Range 2, operating from 24.75 - 25.25GHz, respectively, as defined in Part 30.4(a).
- 3) Per 2.1057(a)(2), spurious emissions were investigated up to 100GHz for n258-R1, n258-R2 and n261. For n260, spurious emissions were investigated up to 200GHz.
- 4) The radiated RF output power and all out-of-band emissions in the spurious domain are evaluated to the EIRP limits.
- 5) "CC" refers to "Component Carriers".
- 6) Beam IDs were chosen based on which Beam ID produces the highest EIRP during EIRP simulation.
- 7) All testing was performed using FTM (Factory Test Mode) software at continuous Tx operation (100% duty cycle).
- 8) The CP-OFDM and DFT-s-OFDM transmission schemes were investigated fully for each test type and only the worst case data is included.

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7.2 Occupied Bandwidth

§2.1049

Test Overview

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

Test Procedure Used

ANSI C63.26-2015 Section 5.4.3
 KDB 842590 D01 v01r02 Section 4.3

Test Settings

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

Test Notes

1. The EUT supports CP-OFDM and DFT-s-OFDM. OBW was measured for both waveforms and the worst case has been included in the report.
2. Due to similar antenna performance from both patch antennas, the Occupied Bandwidth was only measured on one antenna (Ant 1 – M-Patch) for each band.

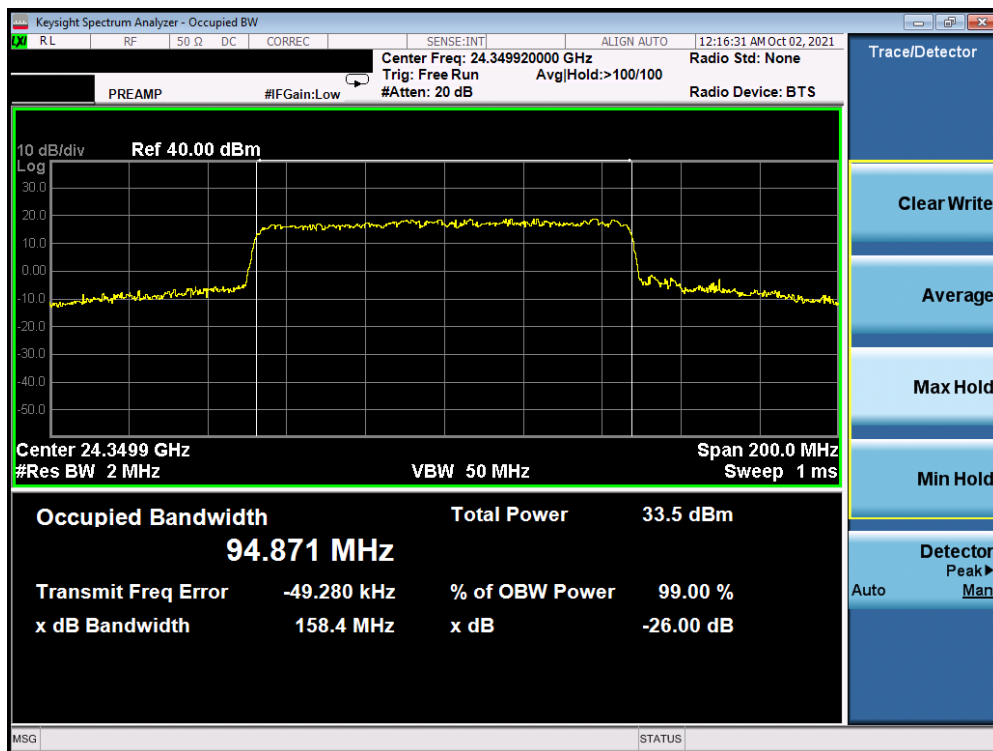
FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band n258-R1

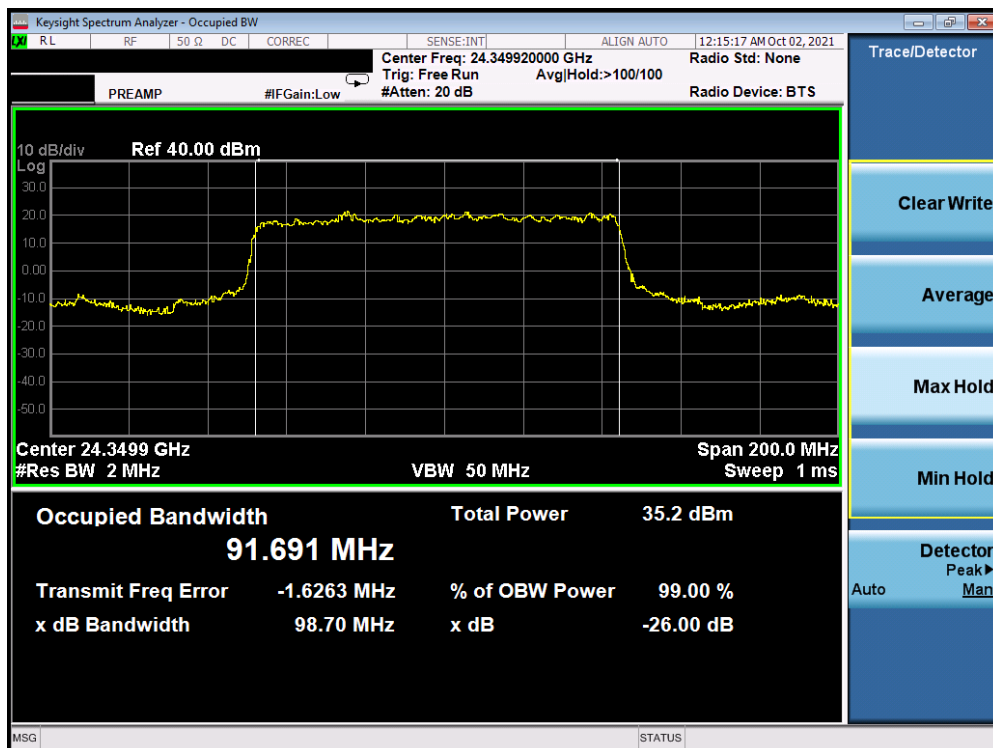
Channel	Bandwidth [MHz]	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	100	1	CP-OFDM	QPSK	94.87
			DFT-s-OFDM	$\pi/2$ BPSK	91.69
			CP-OFDM	16QAM	94.65
			CP-OFDM	64QAM	94.64
		2	CP-OFDM	QPSK	194.01
			DFT-s-OFDM	$\pi/2$ BPSK	191.64
			CP-OFDM	16QAM	193.76
			CP-OFDM	64QAM	193.49
	50	1	CP-OFDM	QPSK	46.40
			DFT-s-OFDM	$\pi/2$ BPSK	45.81
			CP-OFDM	16QAM	45.95
			CP-OFDM	64QAM	46.02
		2	CP-OFDM	QPSK	95.50
			DFT-s-OFDM	$\pi/2$ BPSK	95.42
			CP-OFDM	16QAM	95.40
			CP-OFDM	64QAM	95.46

Table 7-2. Summary of Ant 1 Occupied Bandwidths (n258-R1)

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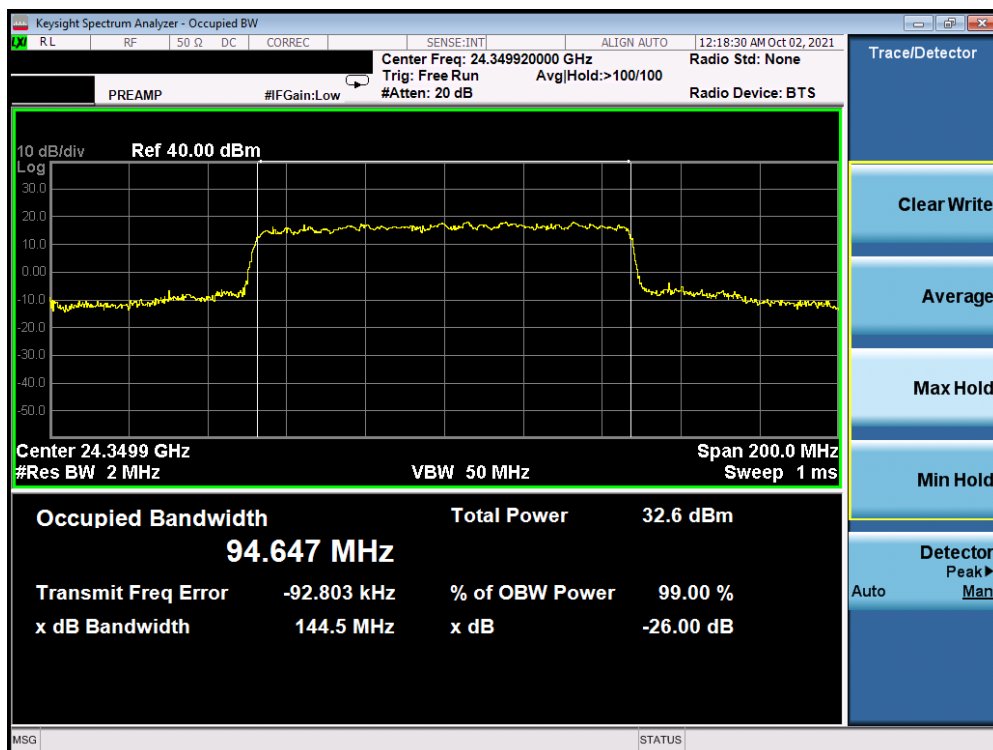


Plot 7-1. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)

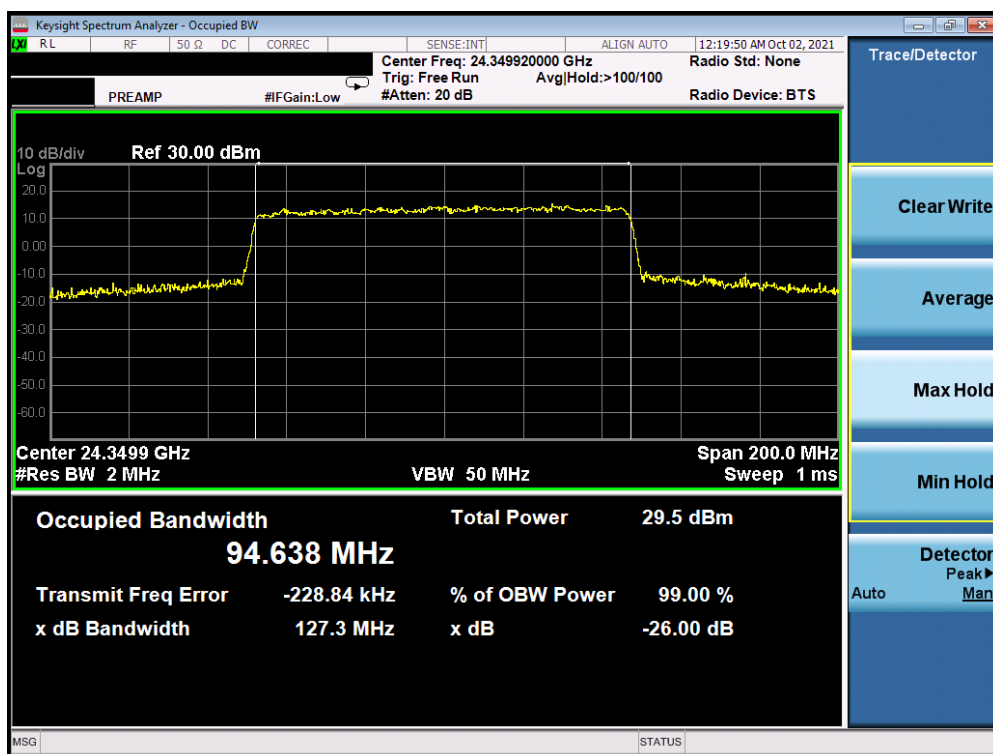


Plot 7-2. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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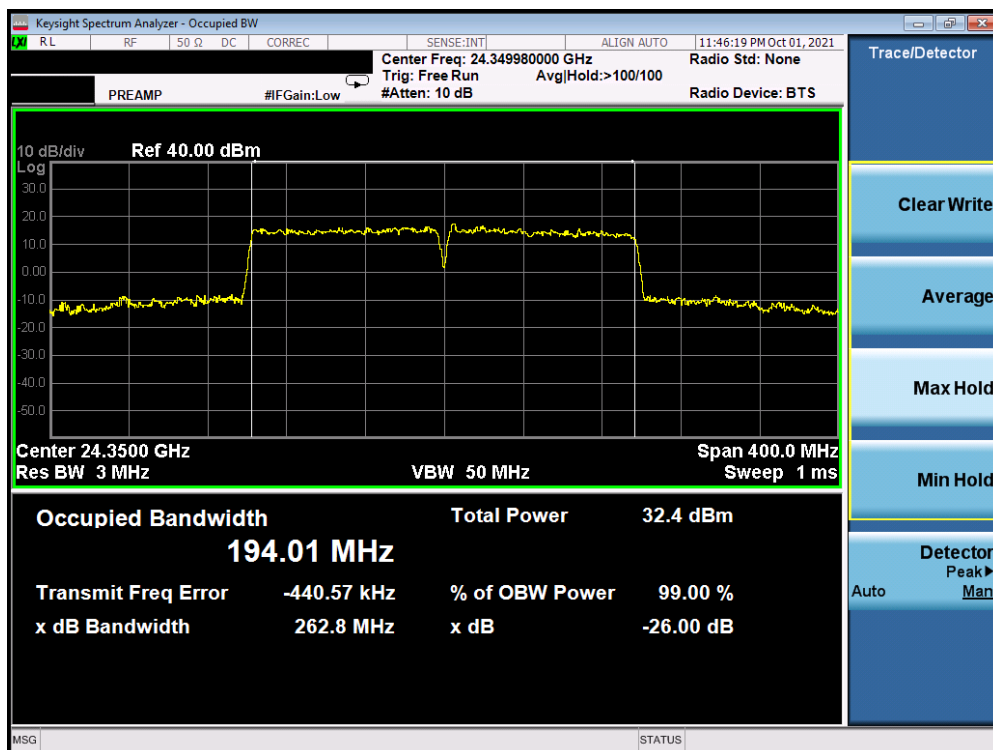


Plot 7-3. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)

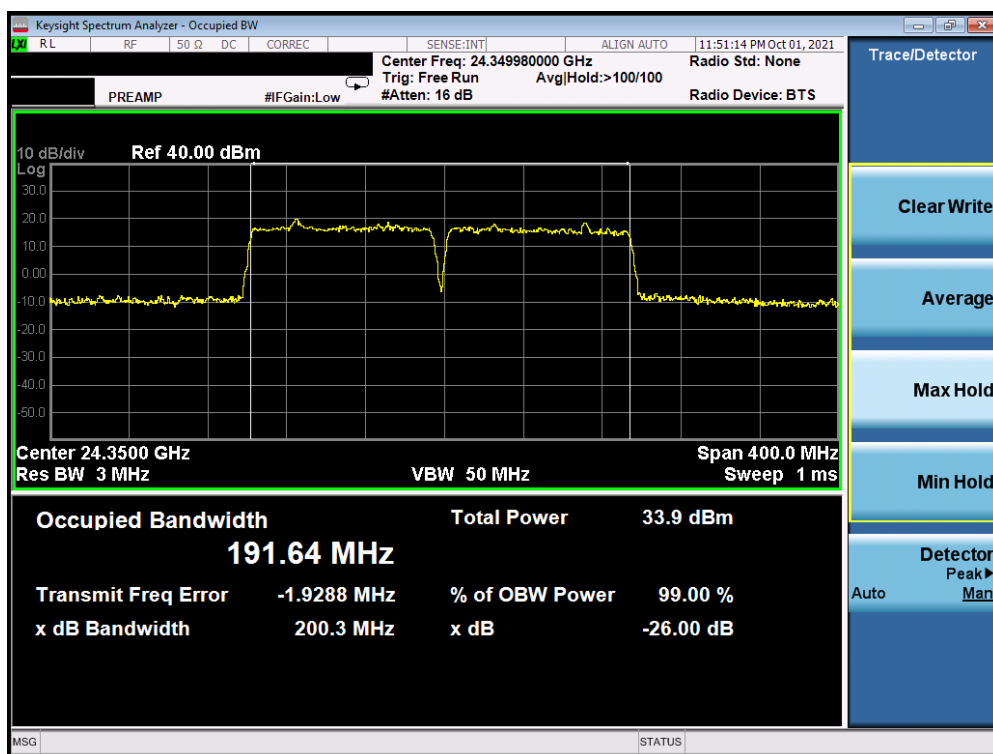


Plot 7-4. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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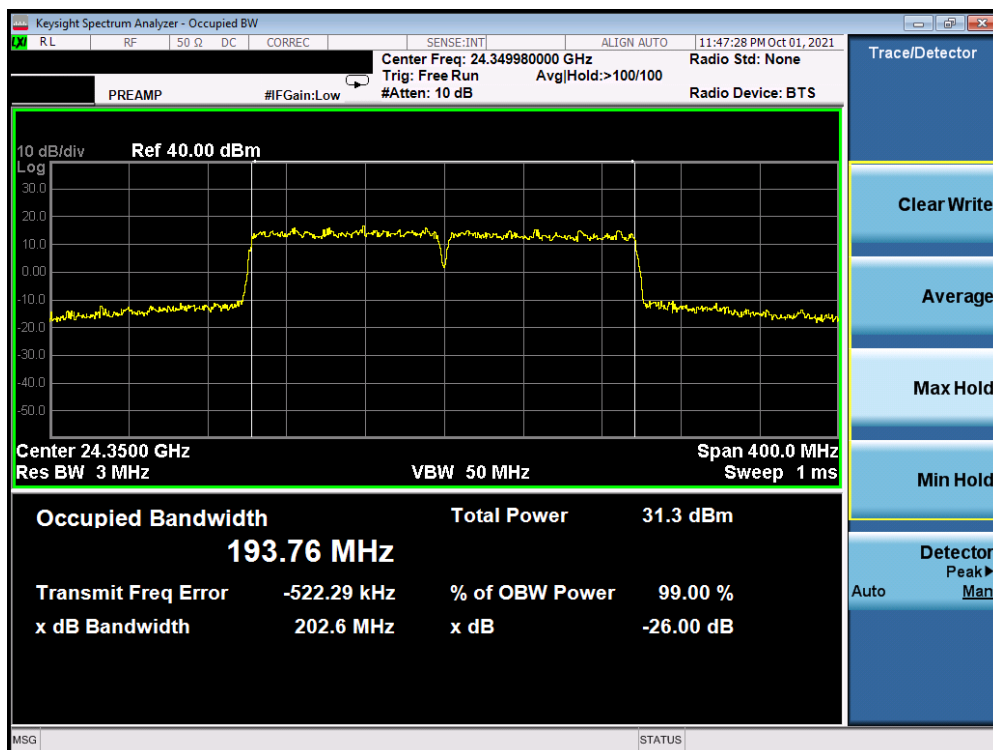


Plot 7-5. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)

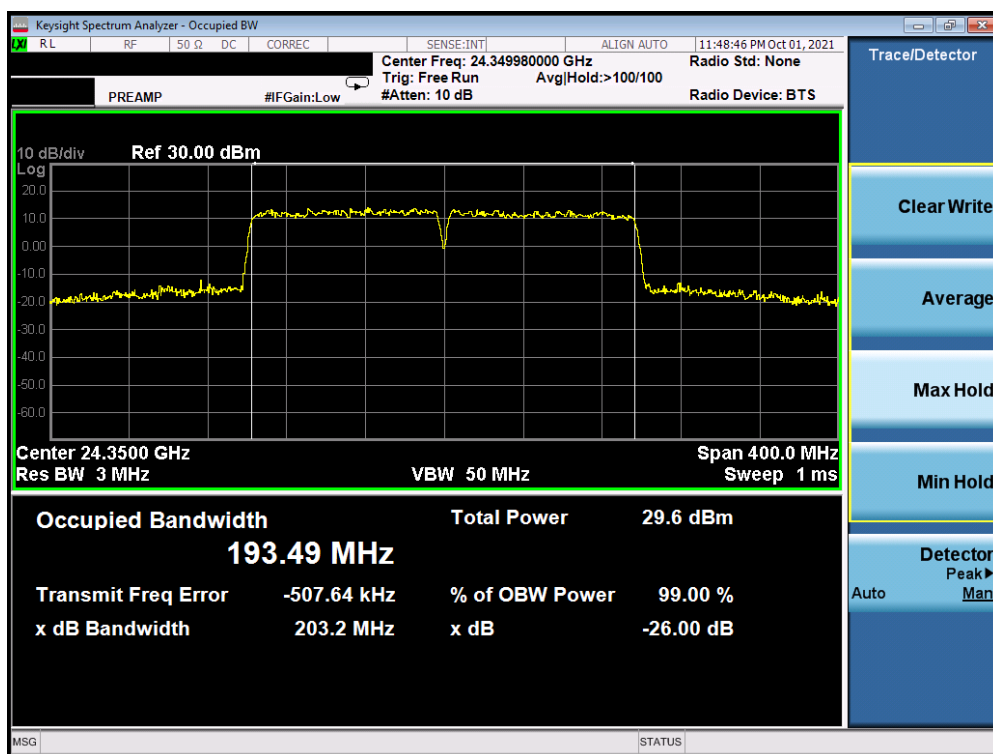


Plot 7-6. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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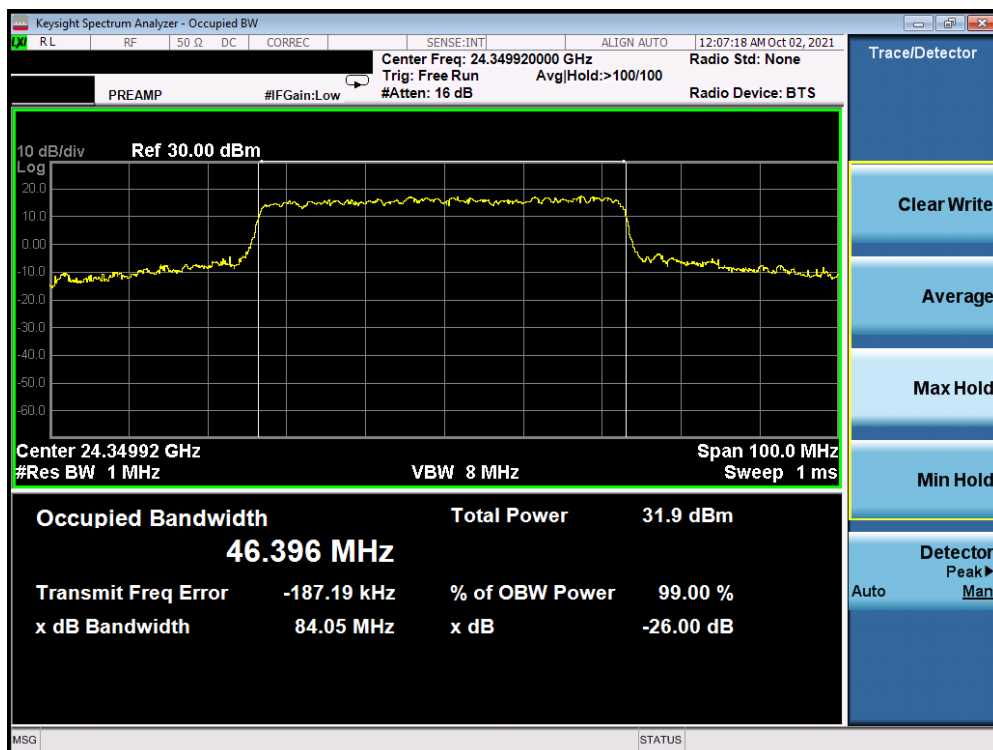


Plot 7-7. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

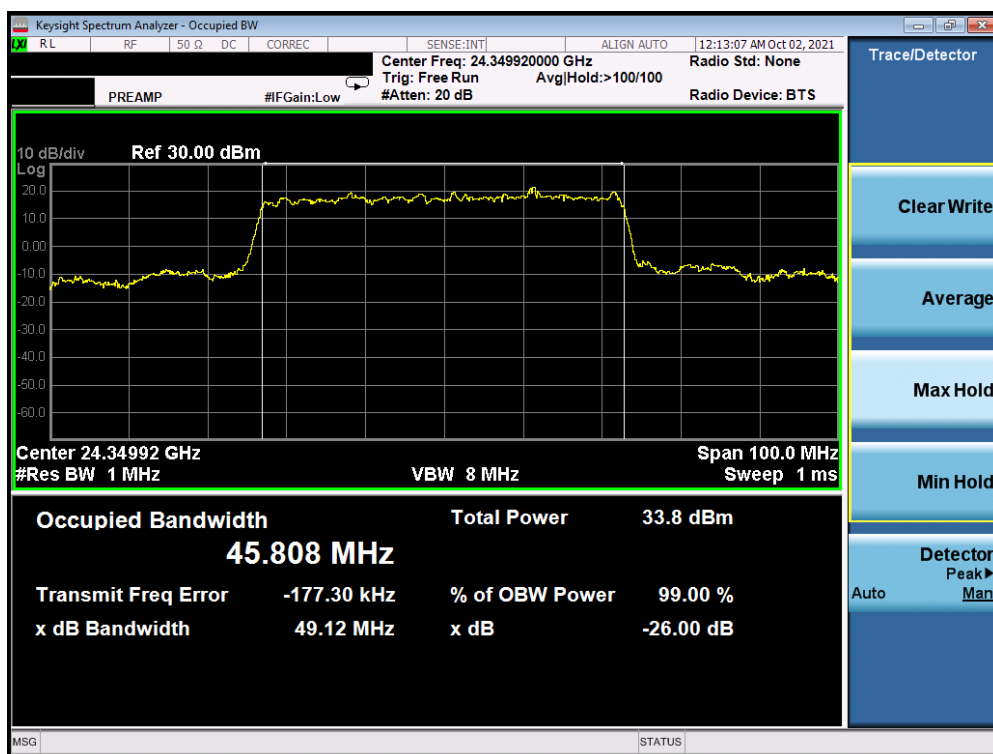


Plot 7-8. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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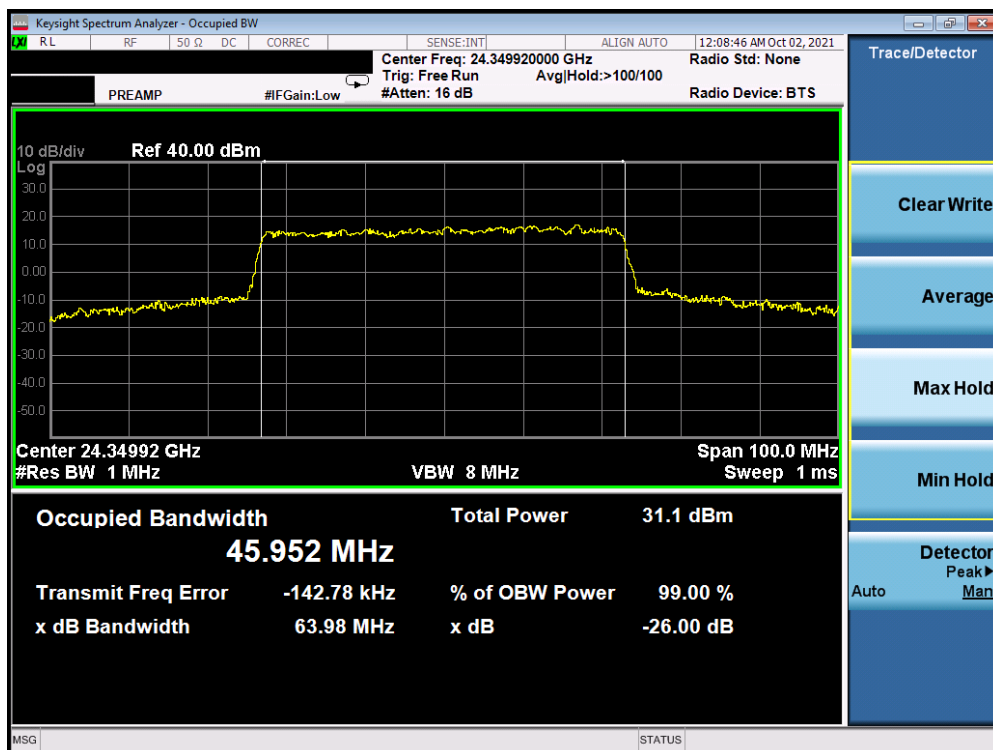


Plot 7-9. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)

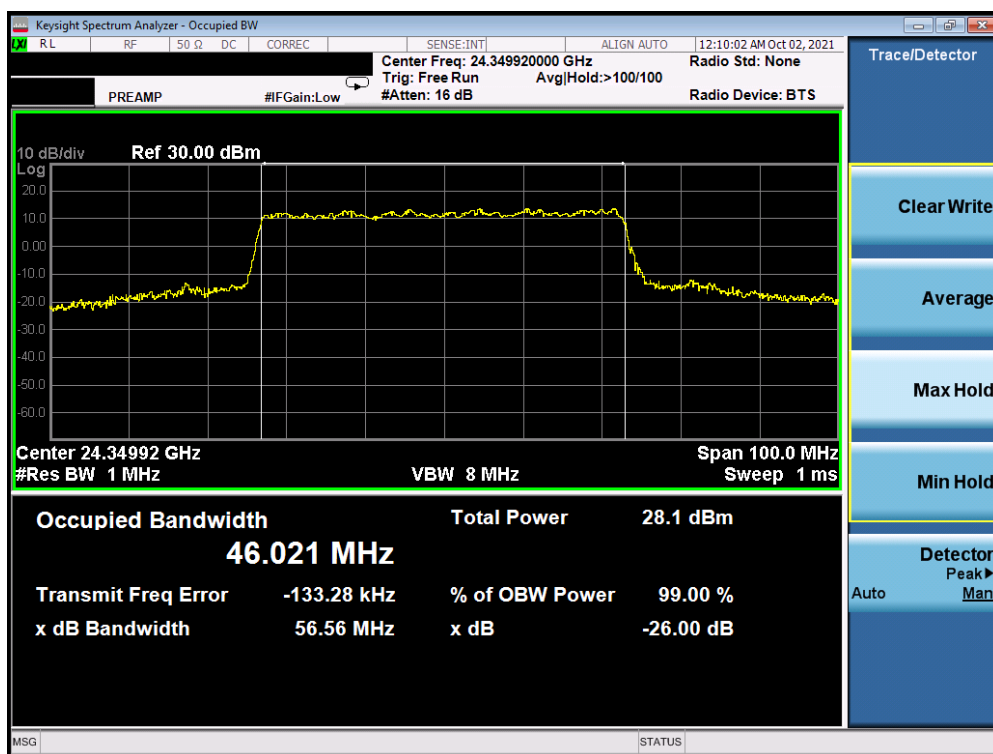


Plot 7-10. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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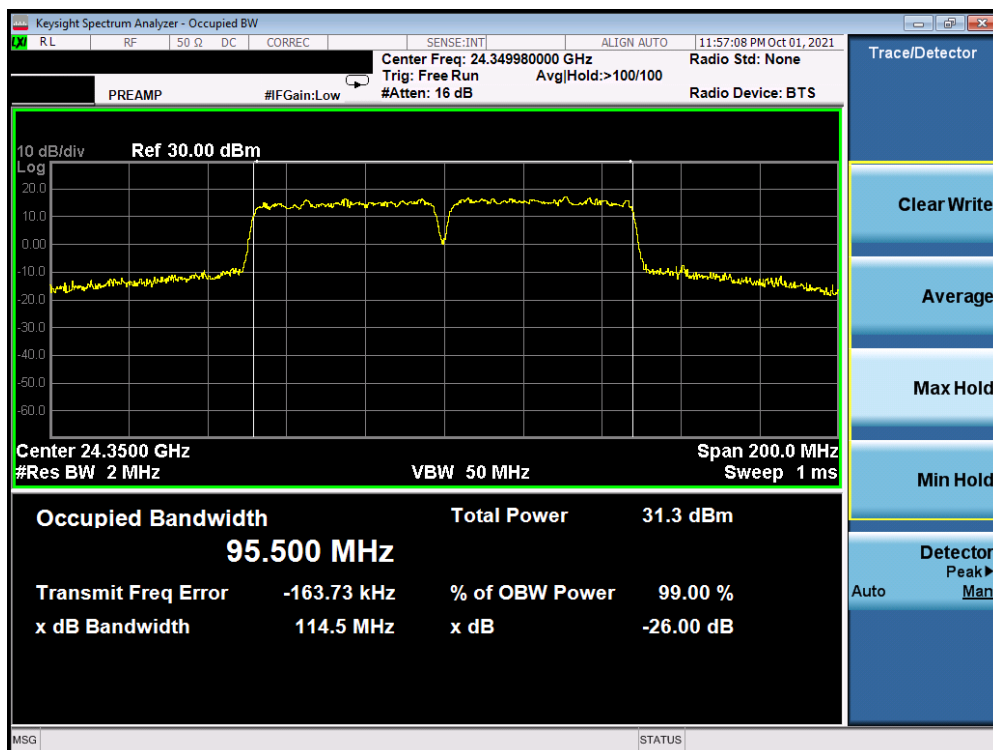


Plot 7-11. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)

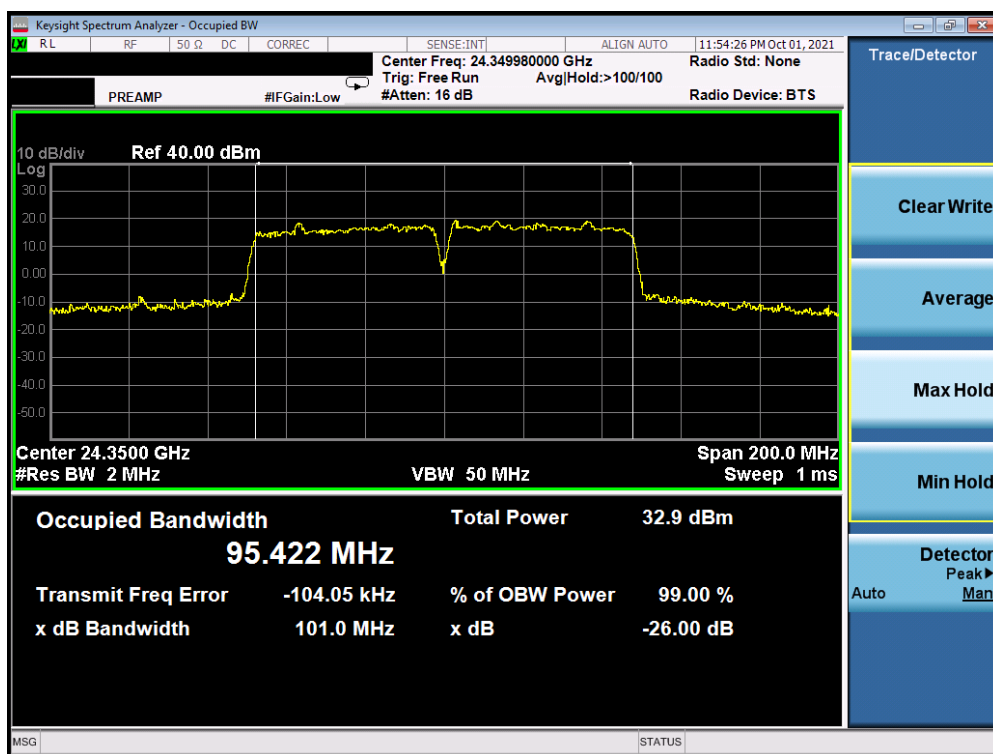


Plot 7-12. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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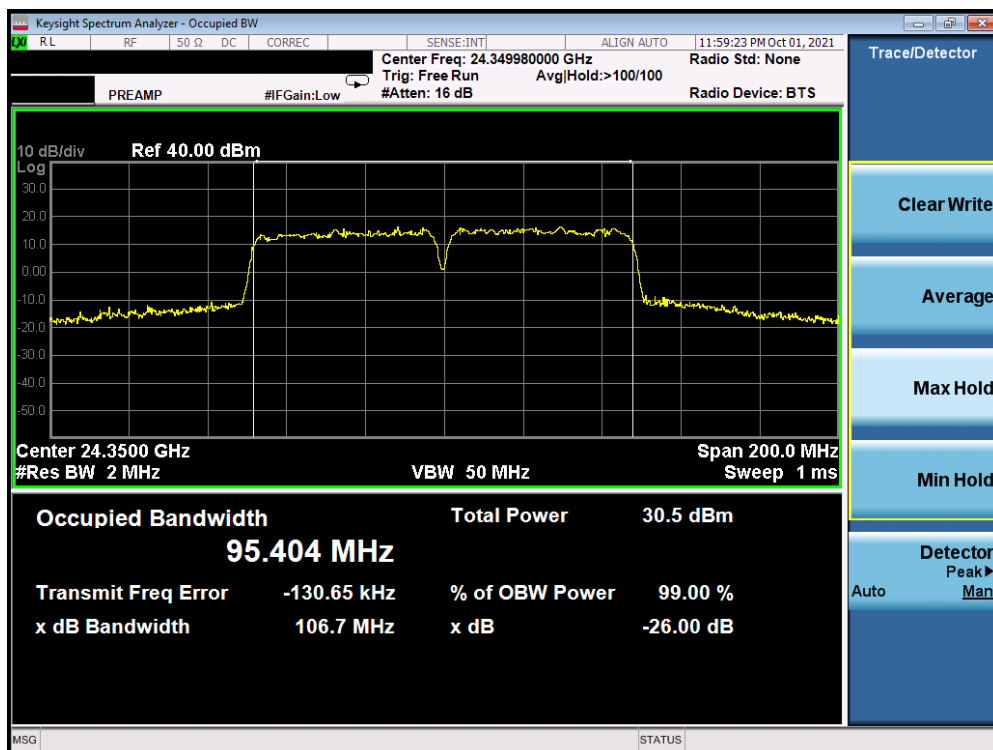


Plot 7-13. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)

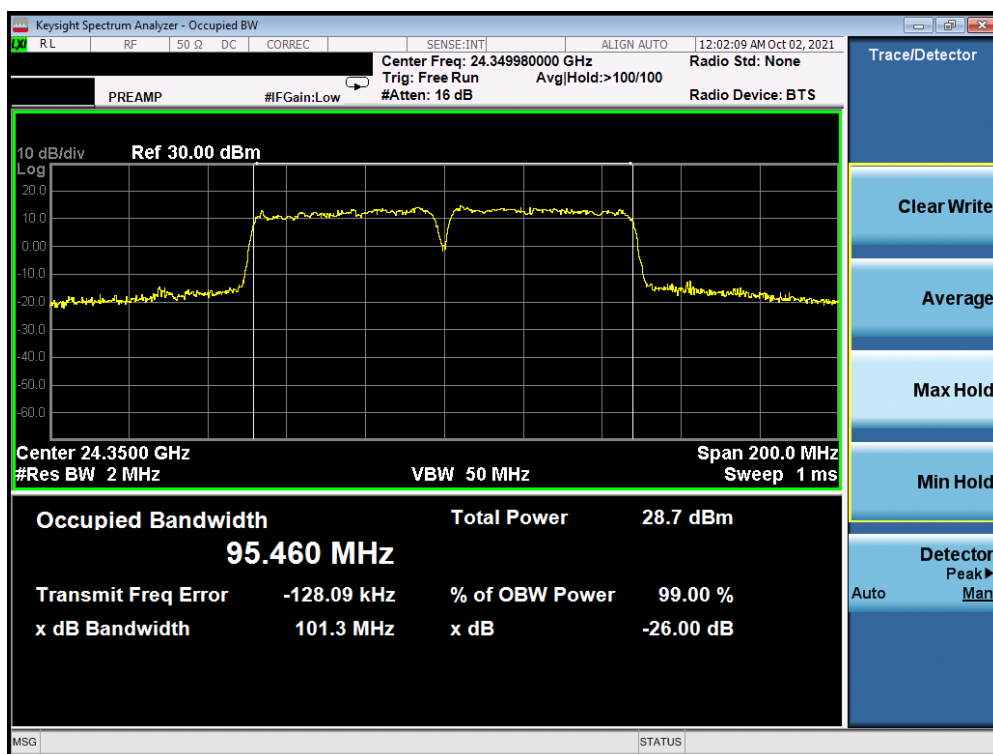


Plot 7-14. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-15. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



Plot 7-16. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

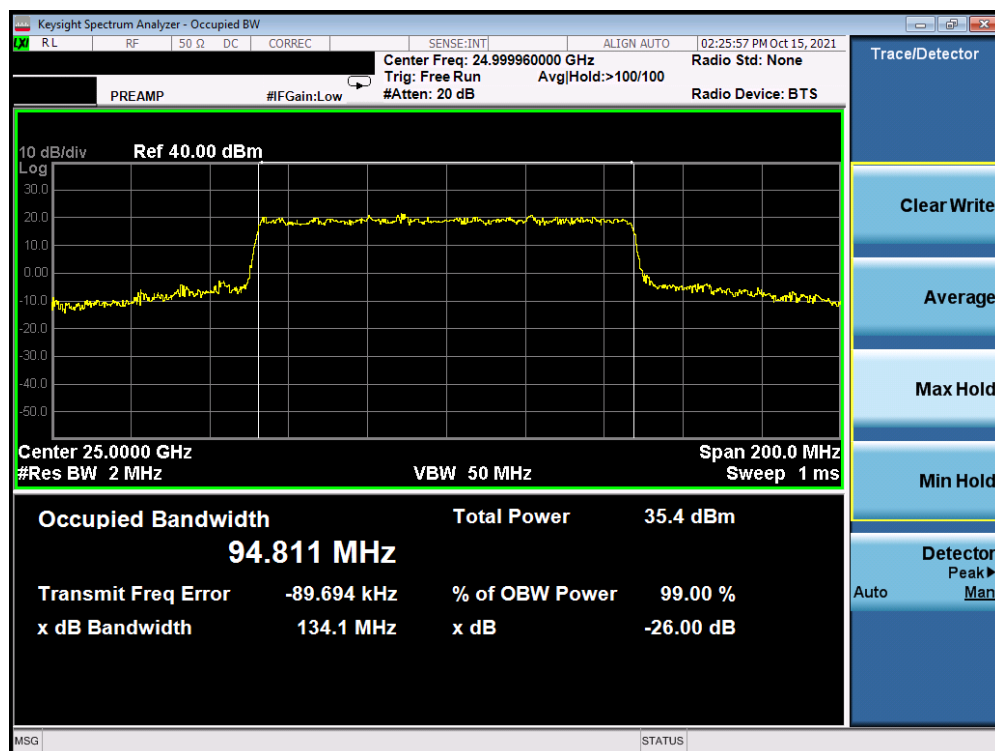
FCC ID: A3LSMS906U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Band n258-R2

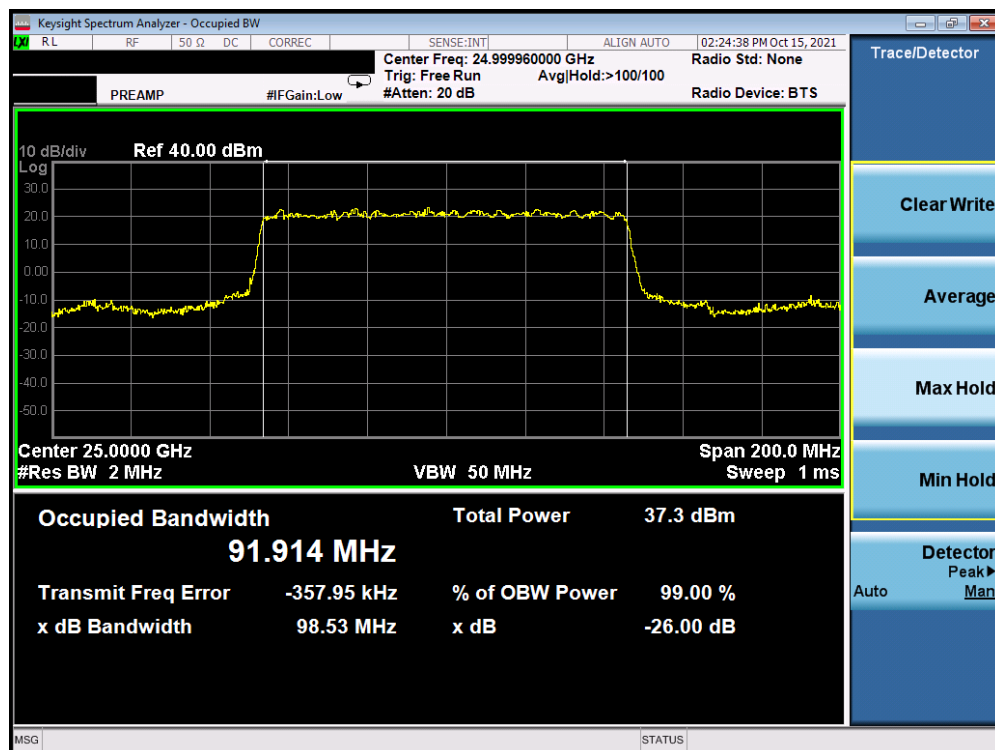
Channel	Bandwidth [MHz]	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	100	1	CP-OFDM	QPSK	94.81
			DFT-s-OFDM	$\pi/2$ BPSK	91.91
			CP-OFDM	16QAM	94.77
			CP-OFDM	64QAM	94.41
		2	CP-OFDM	QPSK	193.66
			DFT-s-OFDM	$\pi/2$ BPSK	191.53
			CP-OFDM	16QAM	193.44
			CP-OFDM	64QAM	194.11
	50	1	CP-OFDM	QPSK	46.17
			DFT-s-OFDM	$\pi/2$ BPSK	45.84
			CP-OFDM	16QAM	45.76
			CP-OFDM	64QAM	45.82
		2	CP-OFDM	QPSK	95.37
			DFT-s-OFDM	$\pi/2$ BPSK	95.89
			CP-OFDM	16QAM	95.47
			CP-OFDM	64QAM	95.31

Table 7-3. Summary of Ant 1 Occupied Bandwidths (n258-R2)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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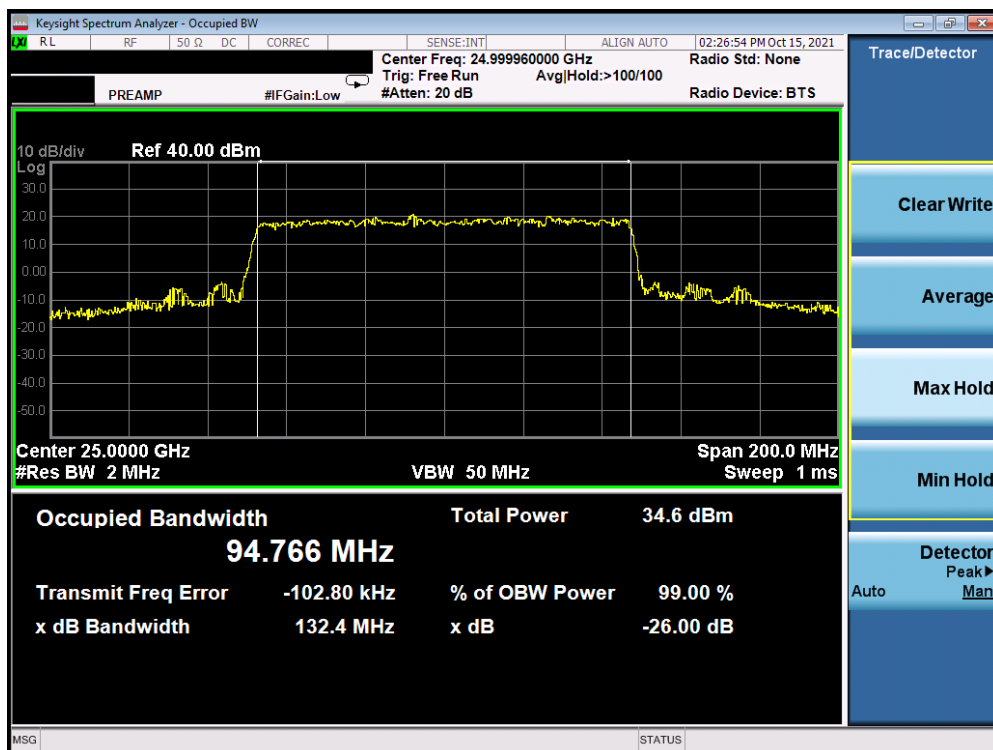


Plot 7-17. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)

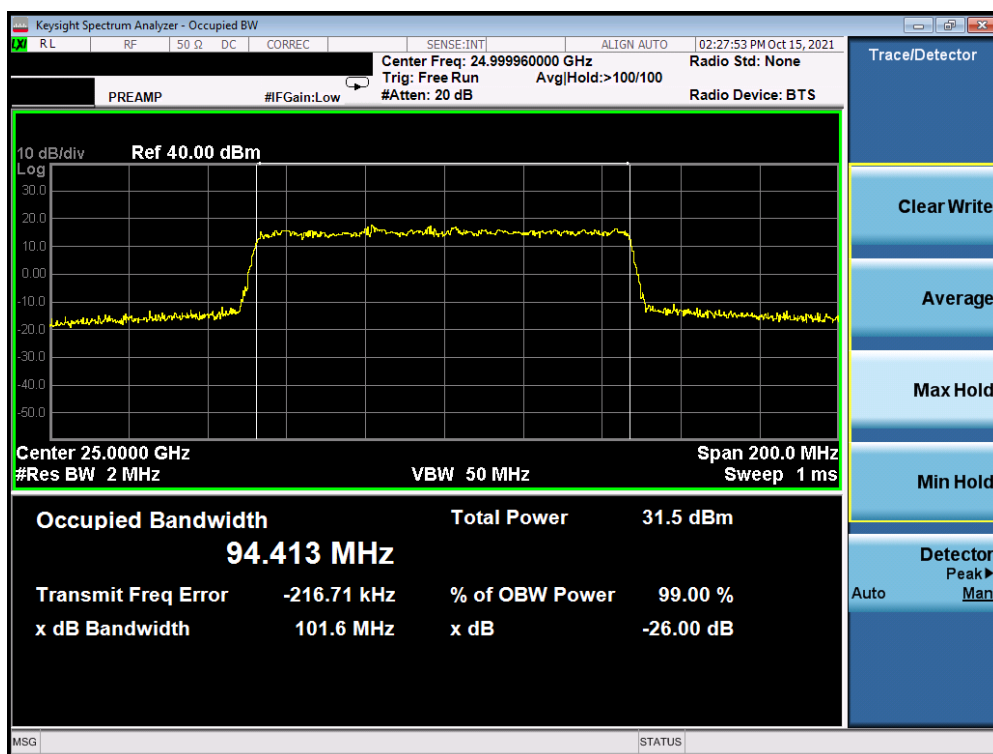


Plot 7-18. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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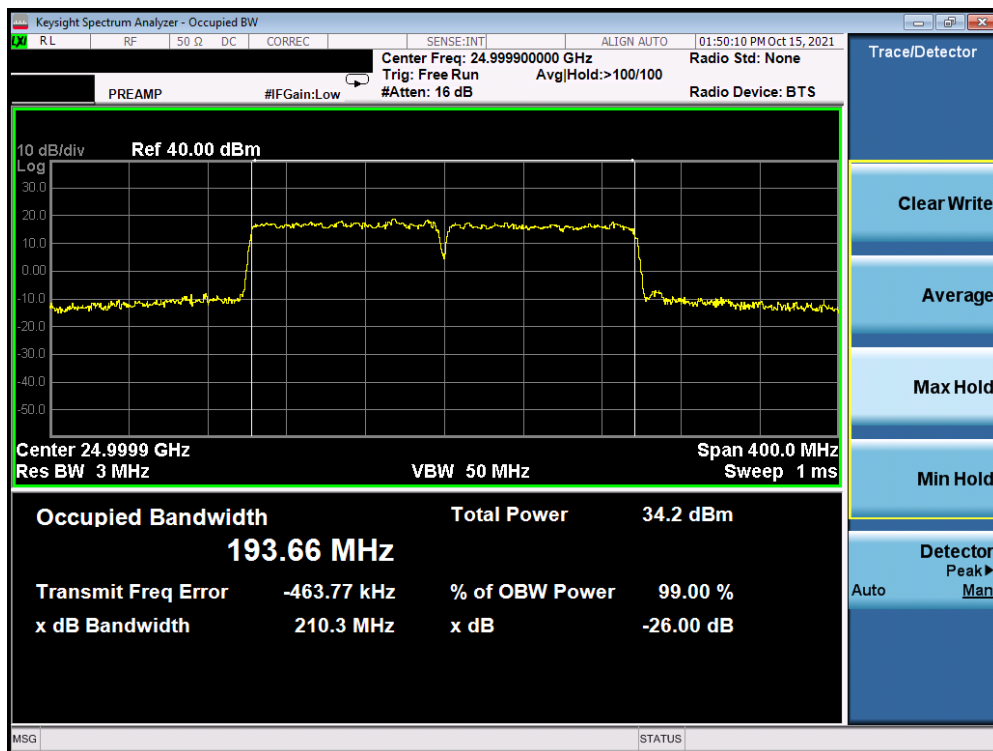


Plot 7-19. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)

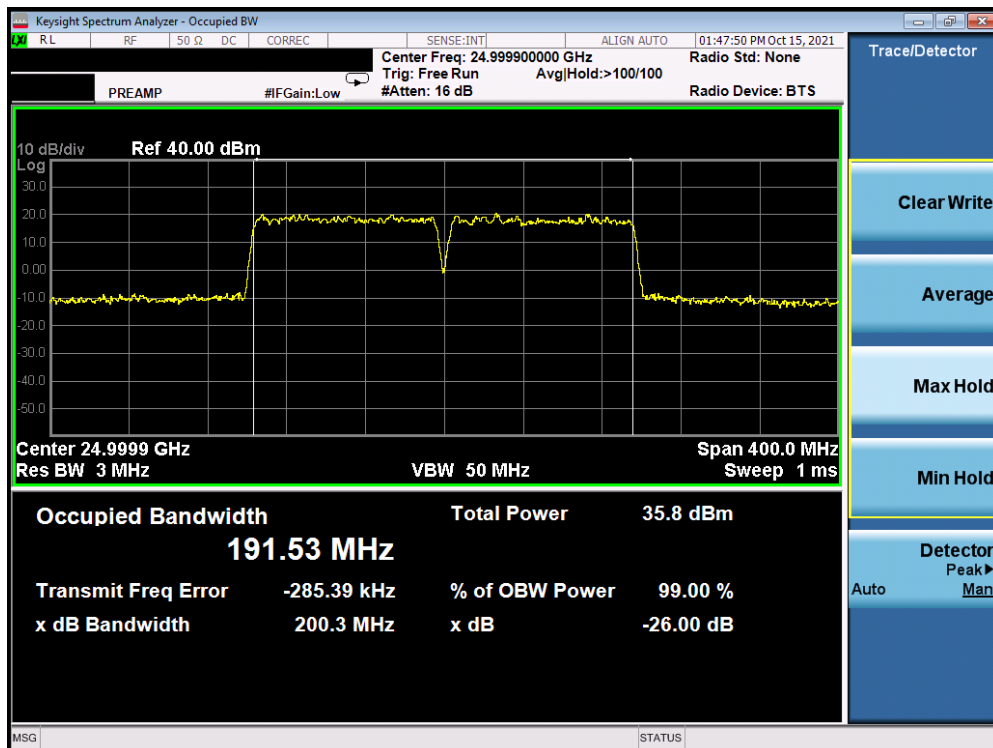


Plot 7-20. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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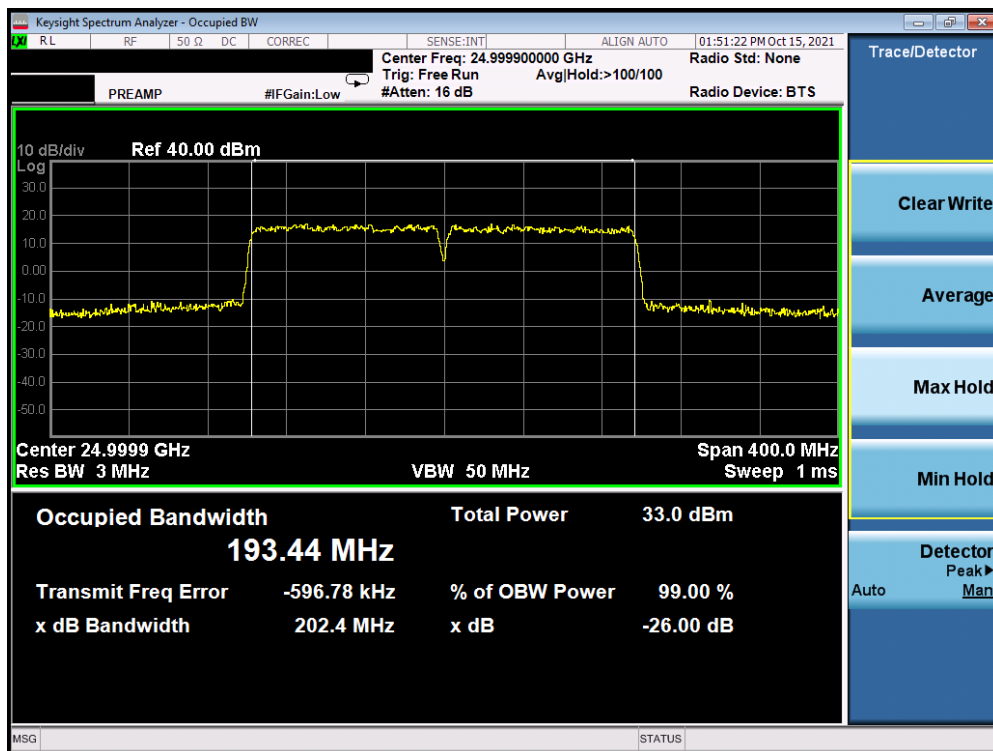


Plot 7-21. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)

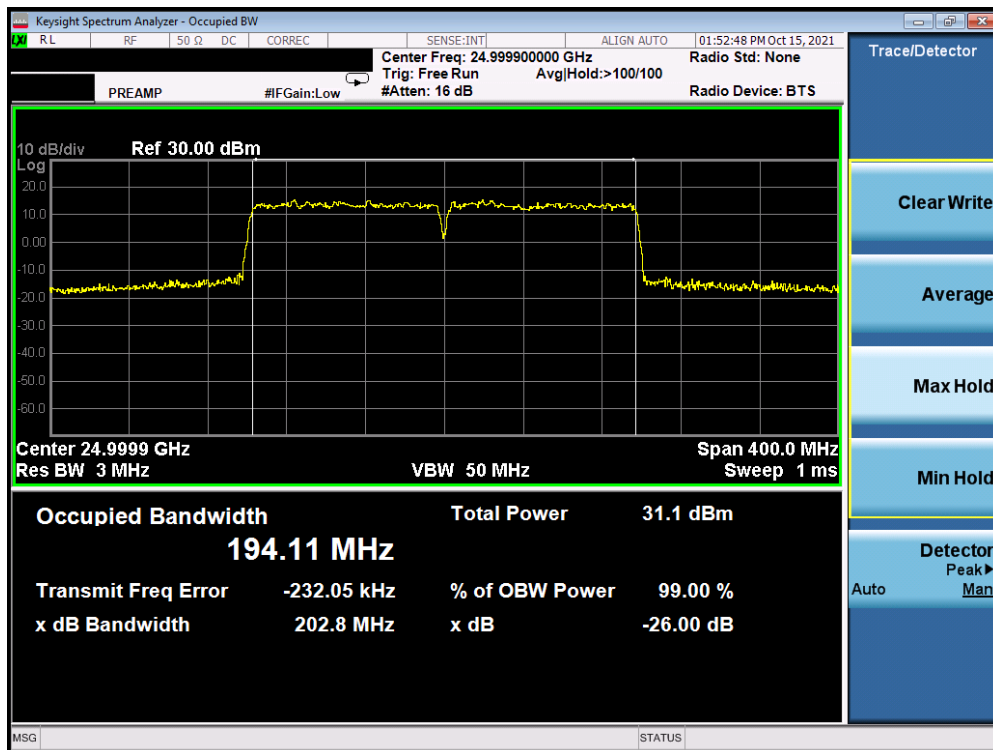


Plot 7-22. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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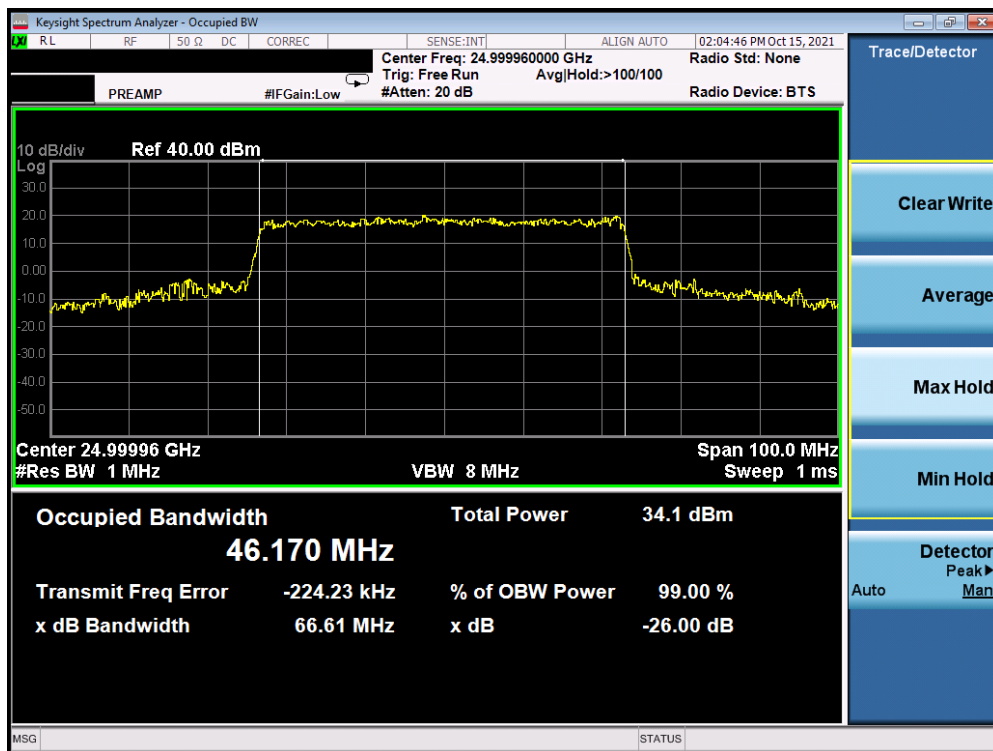


Plot 7-23. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

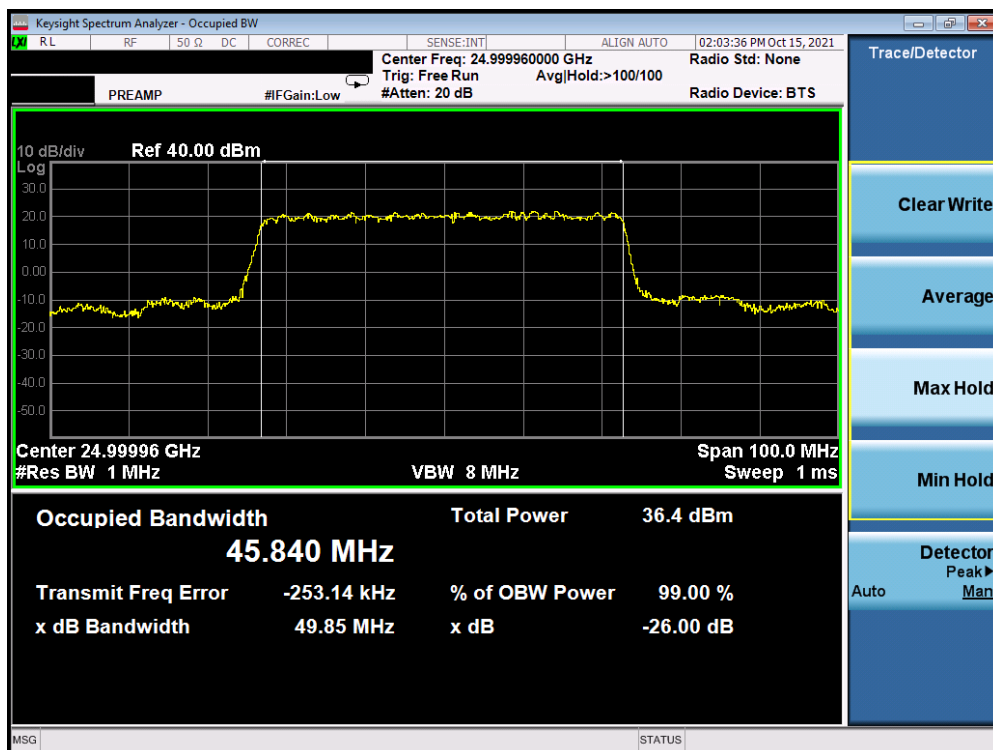


Plot 7-24. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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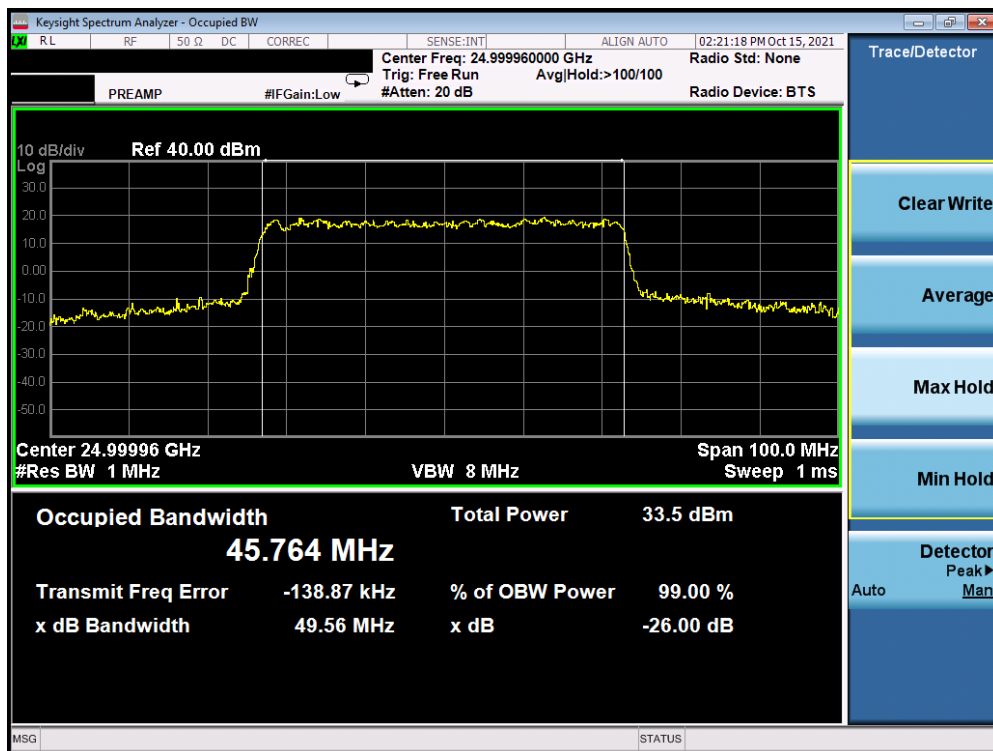


Plot 7-25. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)

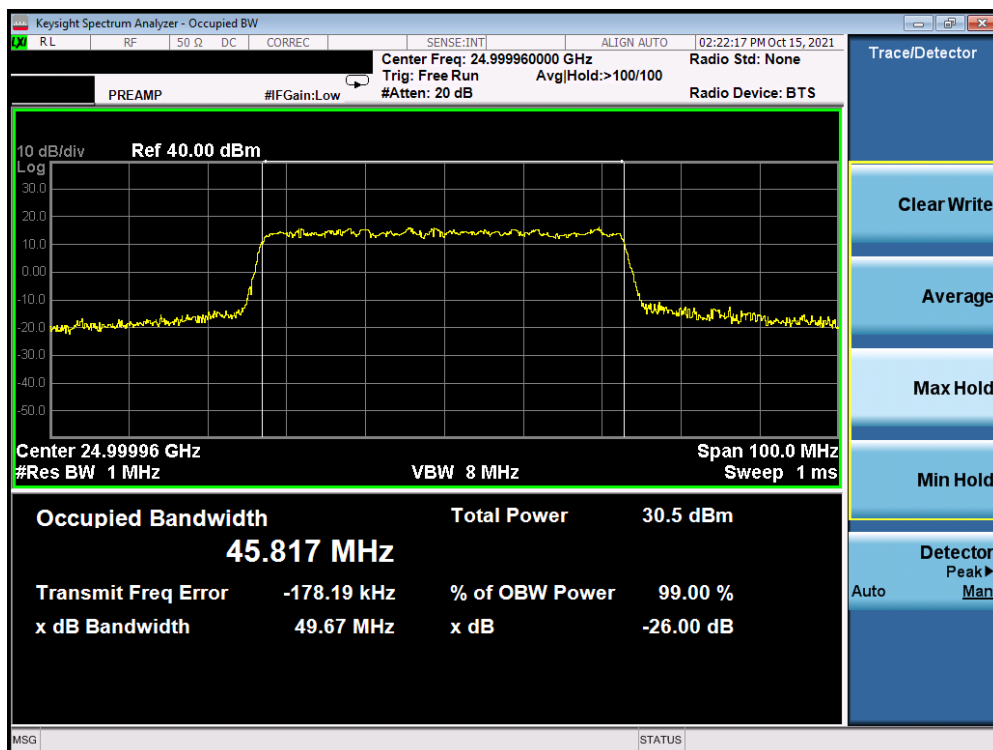


Plot 7-26. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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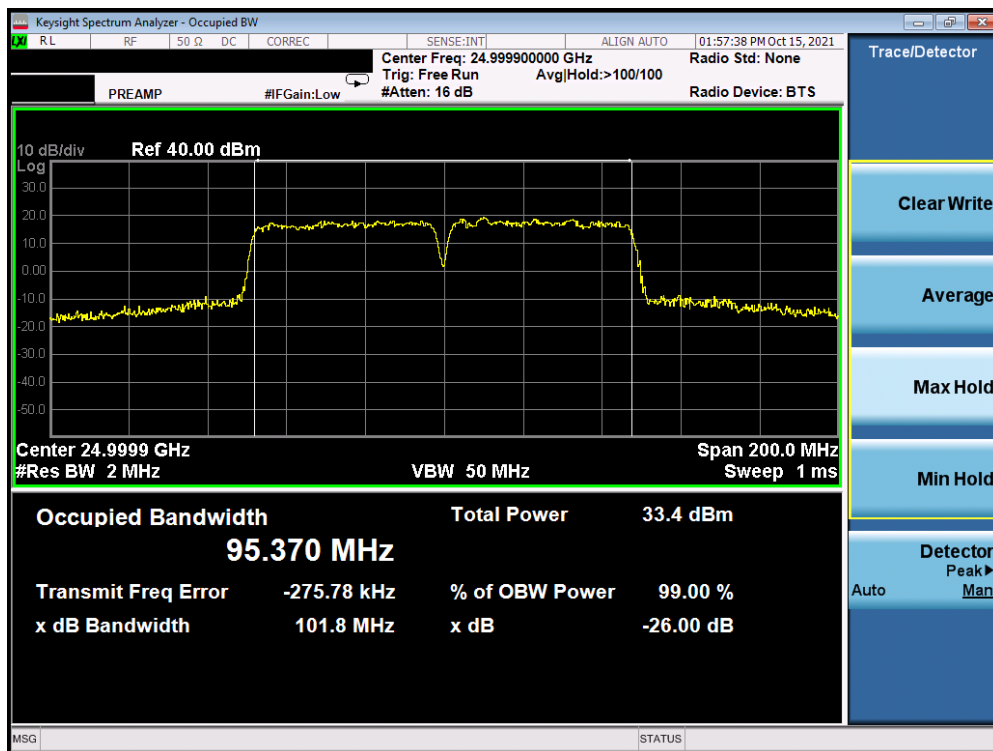


Plot 7-27. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)

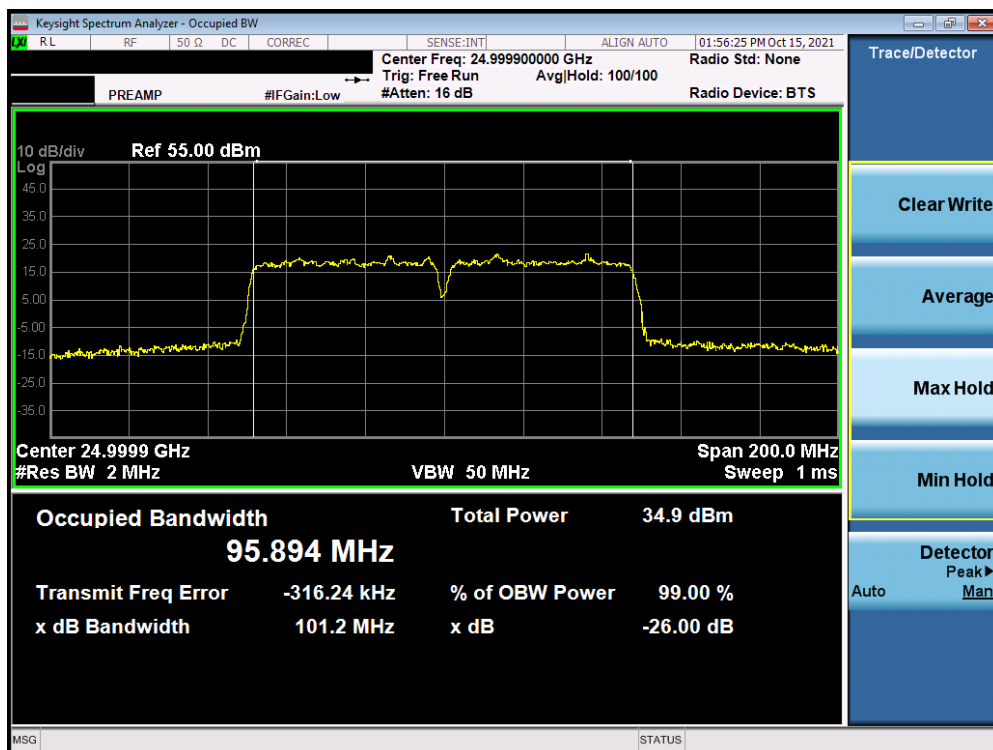


Plot 7-28. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 31 of 186

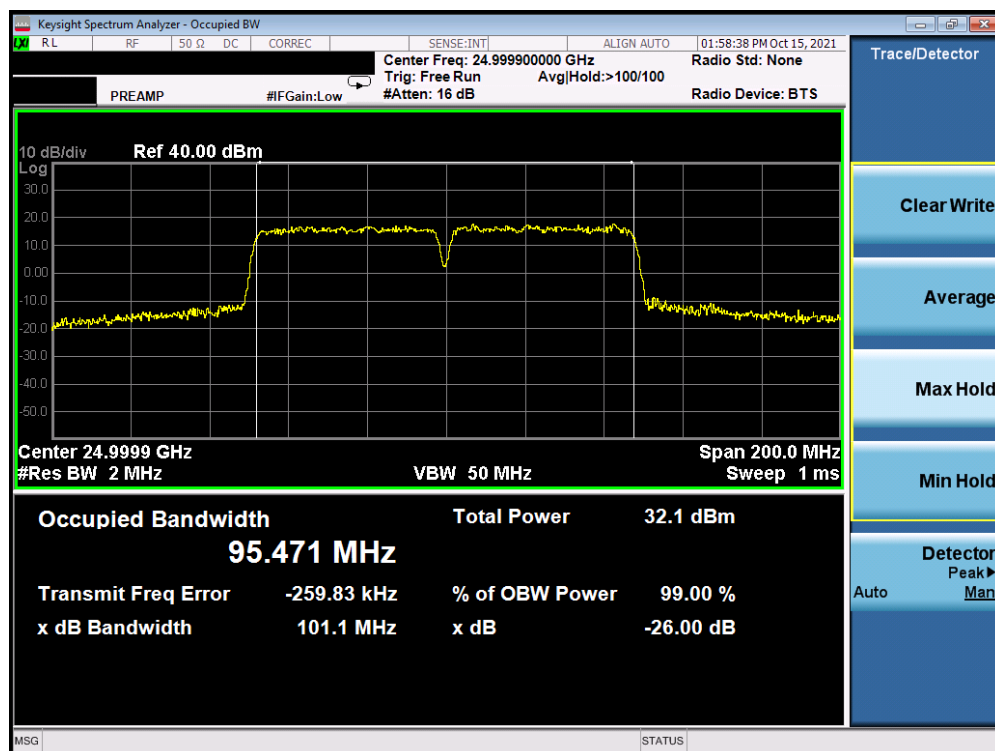


Plot 7-29. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)

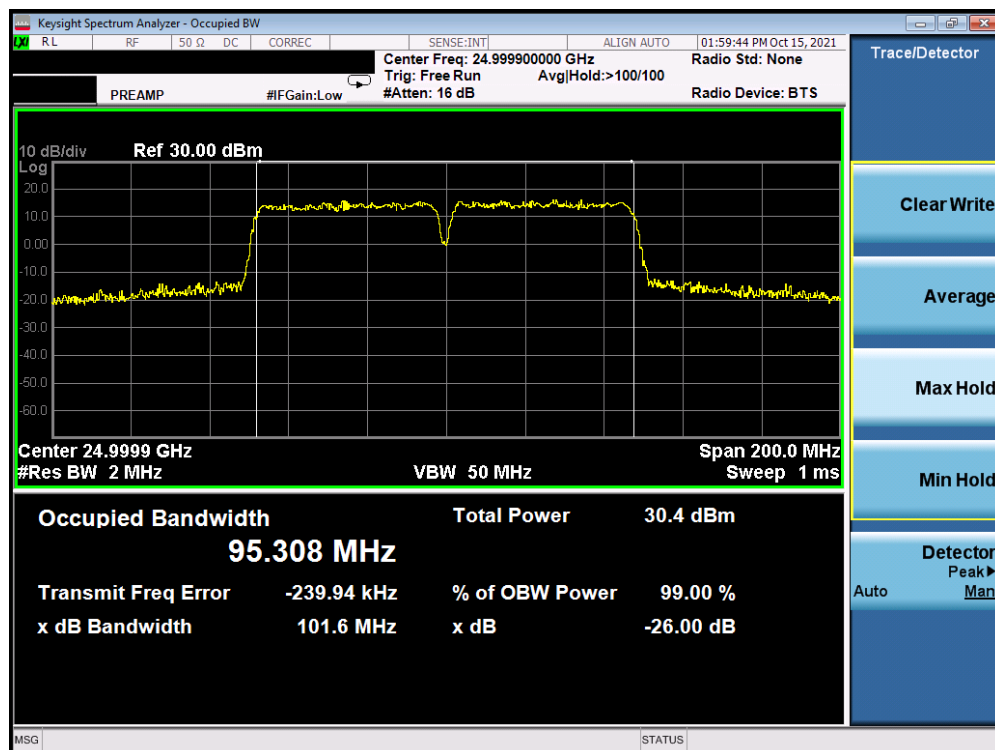


Plot 7-30. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 32 of 186



Plot 7-31. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



Plot 7-32. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

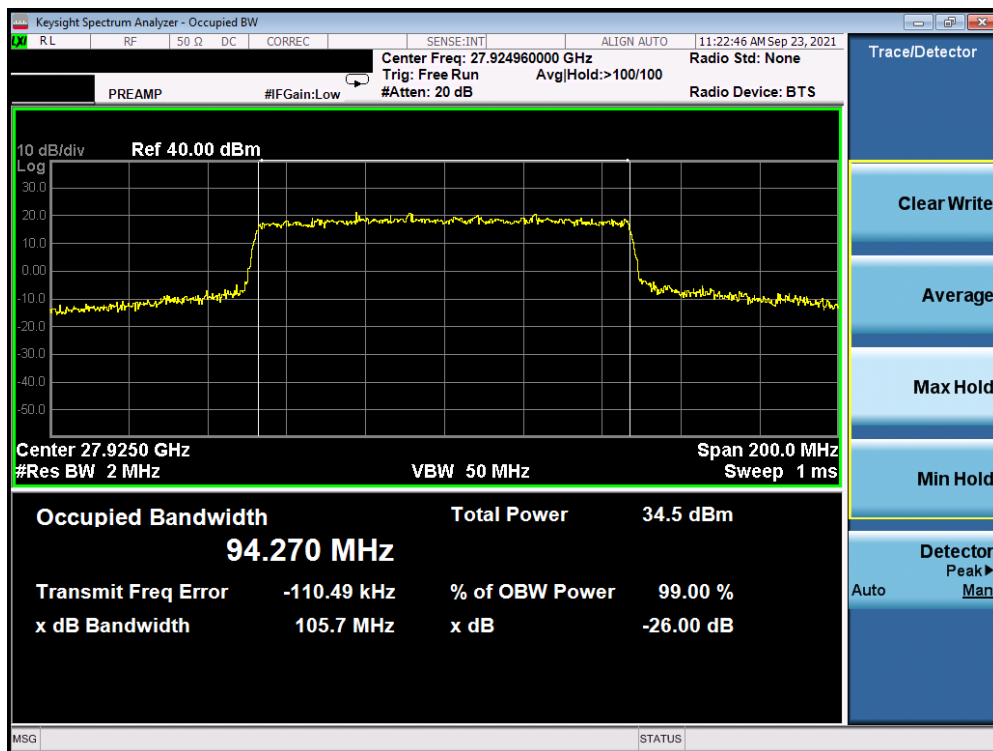
FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 33 of 186

Band n261

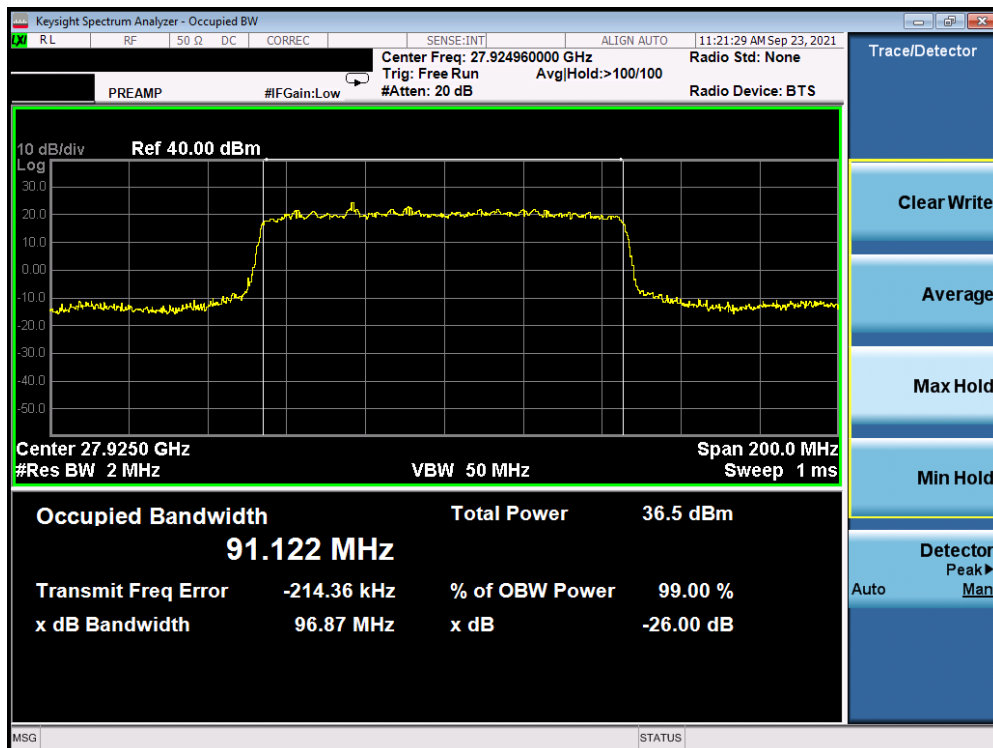
Channel	Bandwidth [MHz]	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	100	1	CP-OFDM	QPSK	94.27
			DFT-s-OFDM	$\pi/2$ BPSK	91.12
			CP-OFDM	16QAM	94.39
			CP-OFDM	64QAM	94.22
		2	CP-OFDM	QPSK	194.24
			DFT-s-OFDM	$\pi/2$ BPSK	190.94
			CP-OFDM	16QAM	193.54
			CP-OFDM	64QAM	193.42
	50	1	CP-OFDM	QPSK	45.92
			DFT-s-OFDM	$\pi/2$ BPSK	45.89
			CP-OFDM	16QAM	45.86
			CP-OFDM	64QAM	46.08
		2	CP-OFDM	QPSK	95.01
			DFT-s-OFDM	$\pi/2$ BPSK	95.05
			CP-OFDM	16QAM	95.33
			CP-OFDM	64QAM	95.19

Table 7-4. Summary of Ant 1 Occupied Bandwidths (n261)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset	Page 34 of 186	

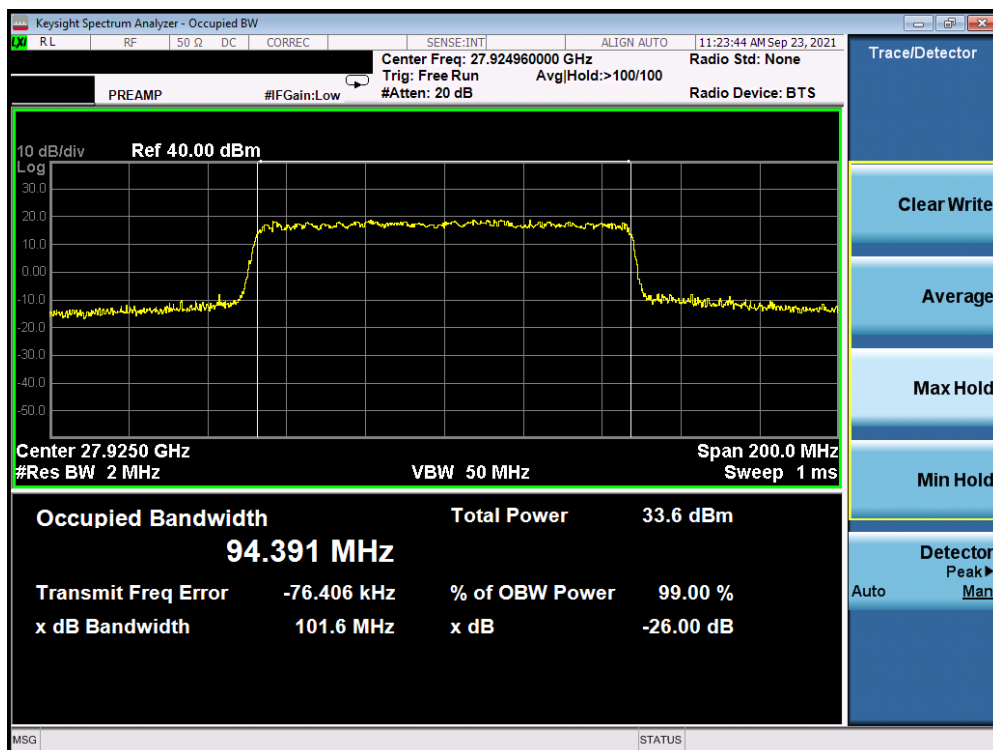


Plot 7-33. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)

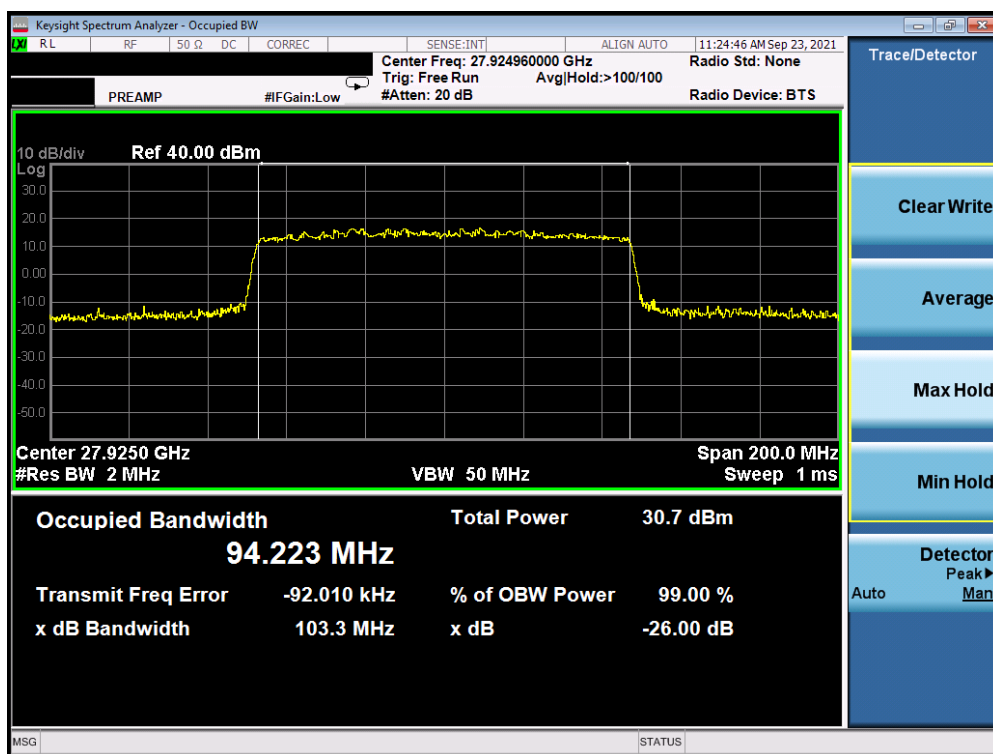


Plot 7-34. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 35 of 186

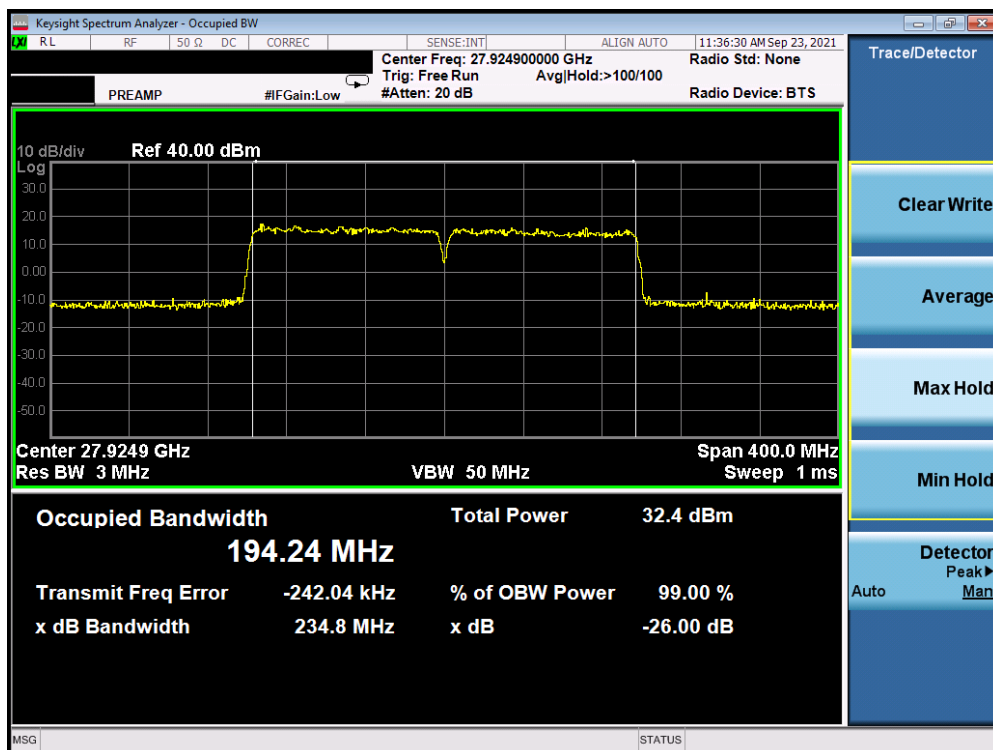


Plot 7-35. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)

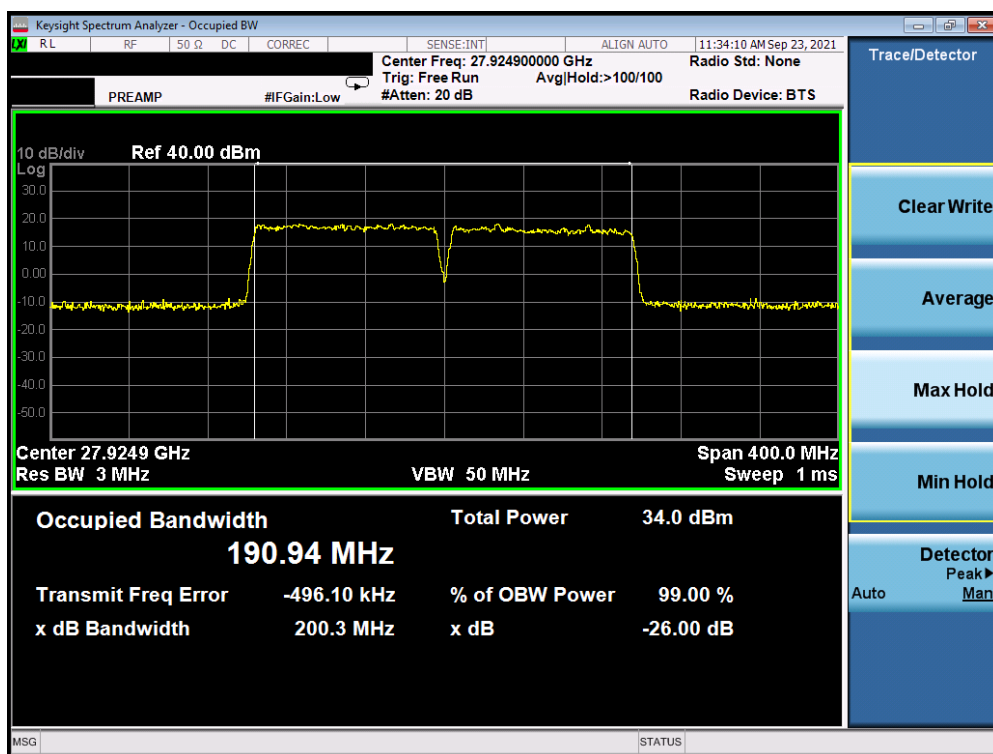


Plot 7-36. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 36 of 186

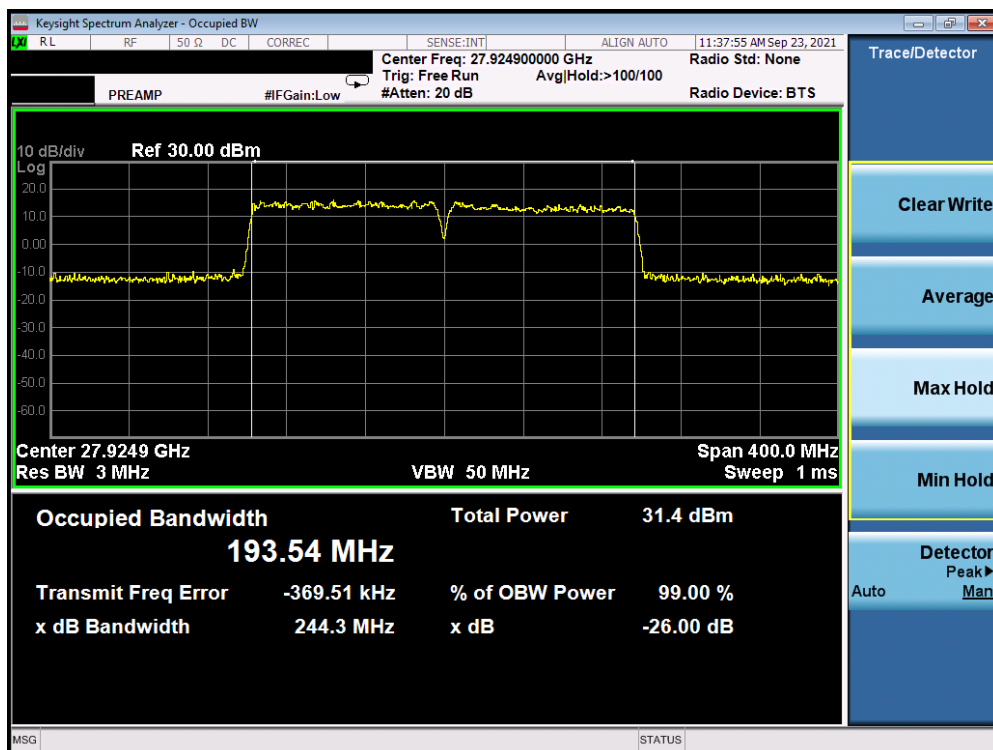


Plot 7-37. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)

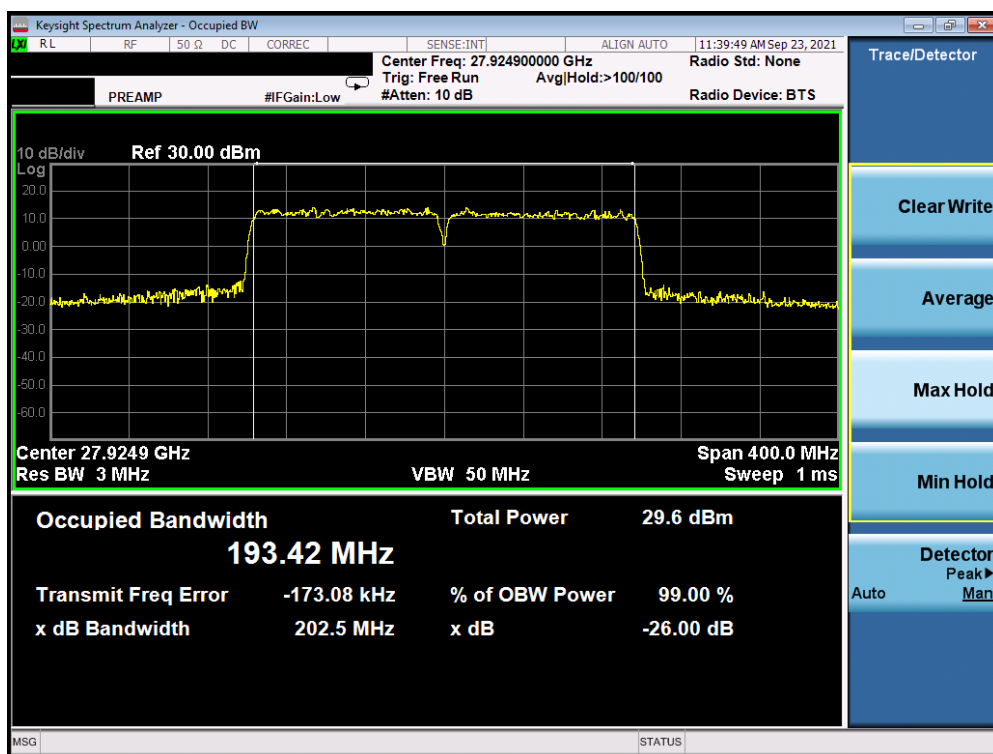


Plot 7-38. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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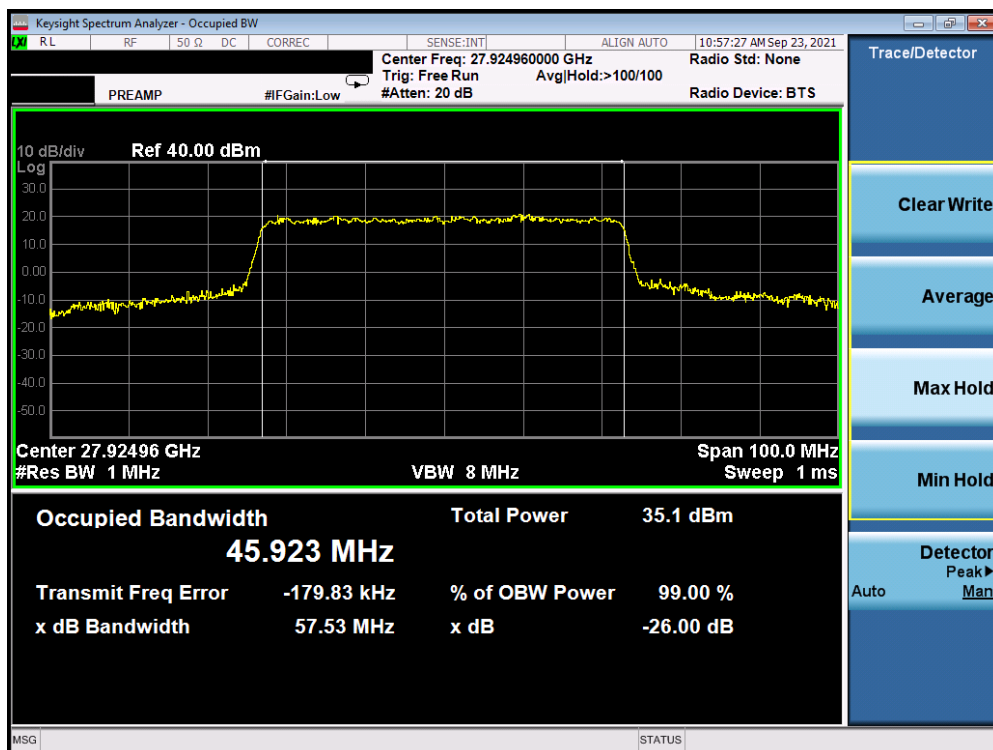


Plot 7-39. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

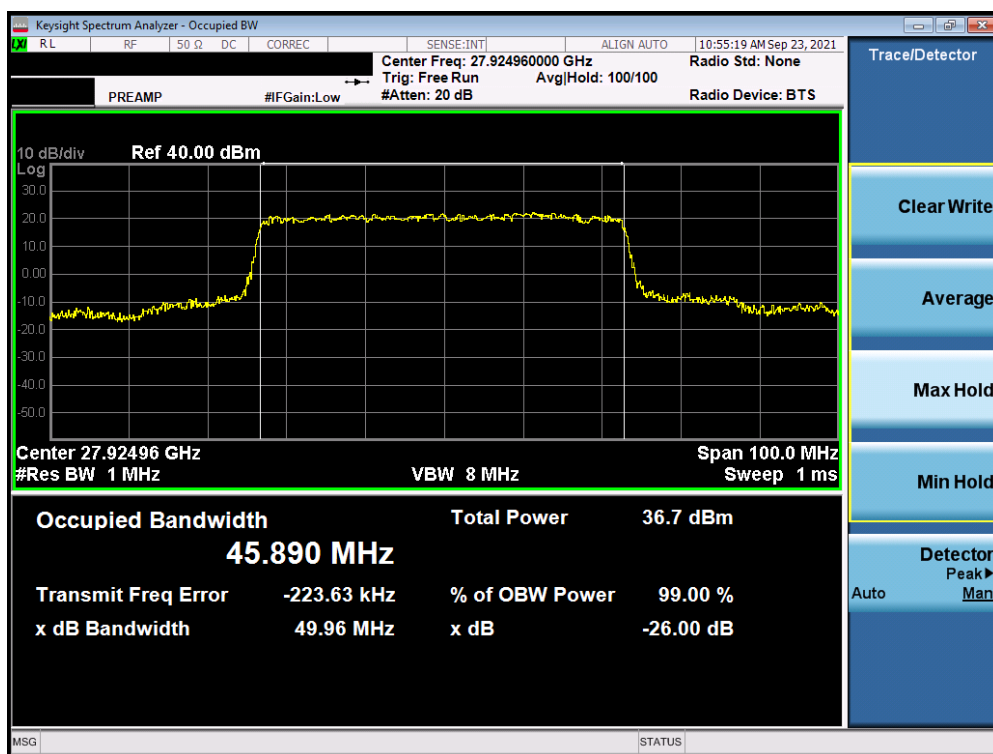


Plot 7-40. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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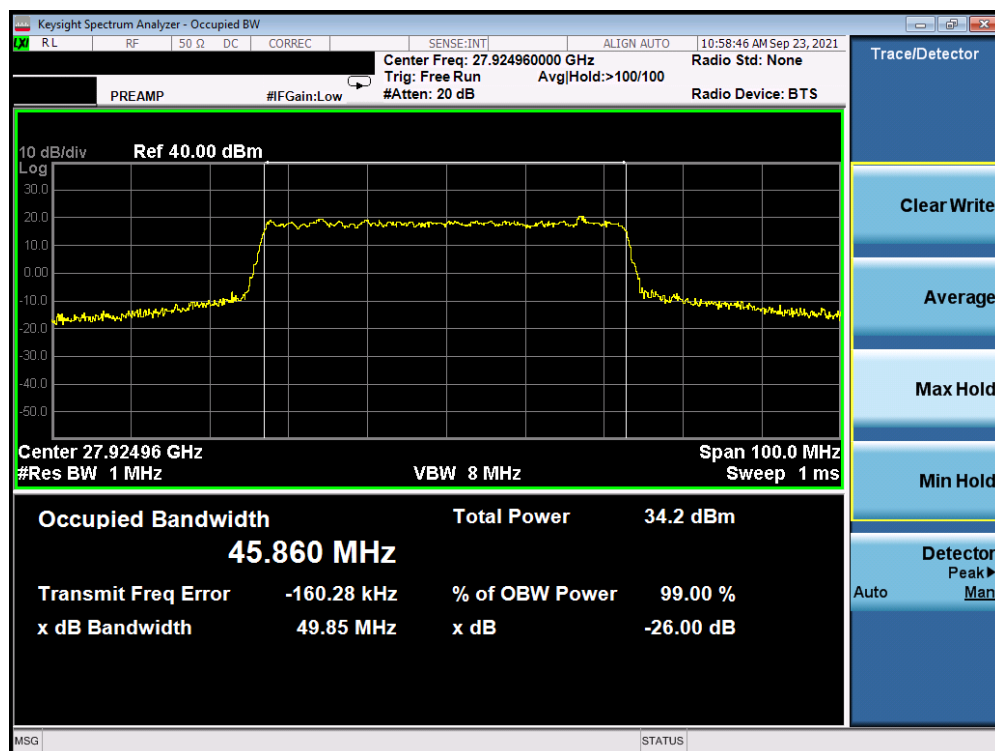


Plot 7-41. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)

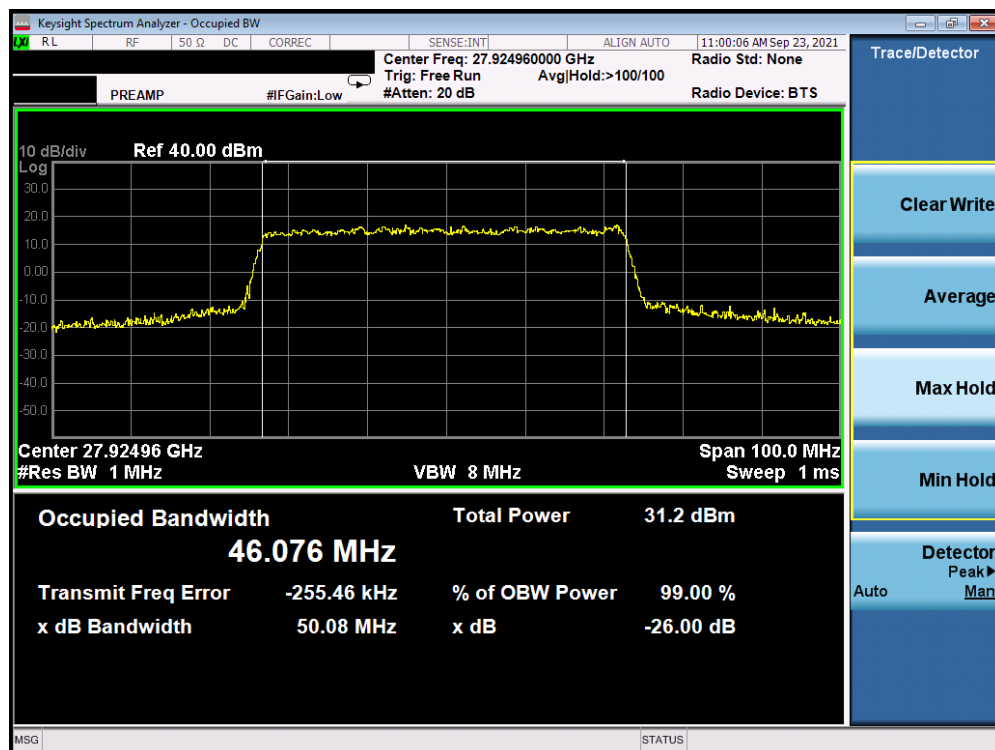


Plot 7-42. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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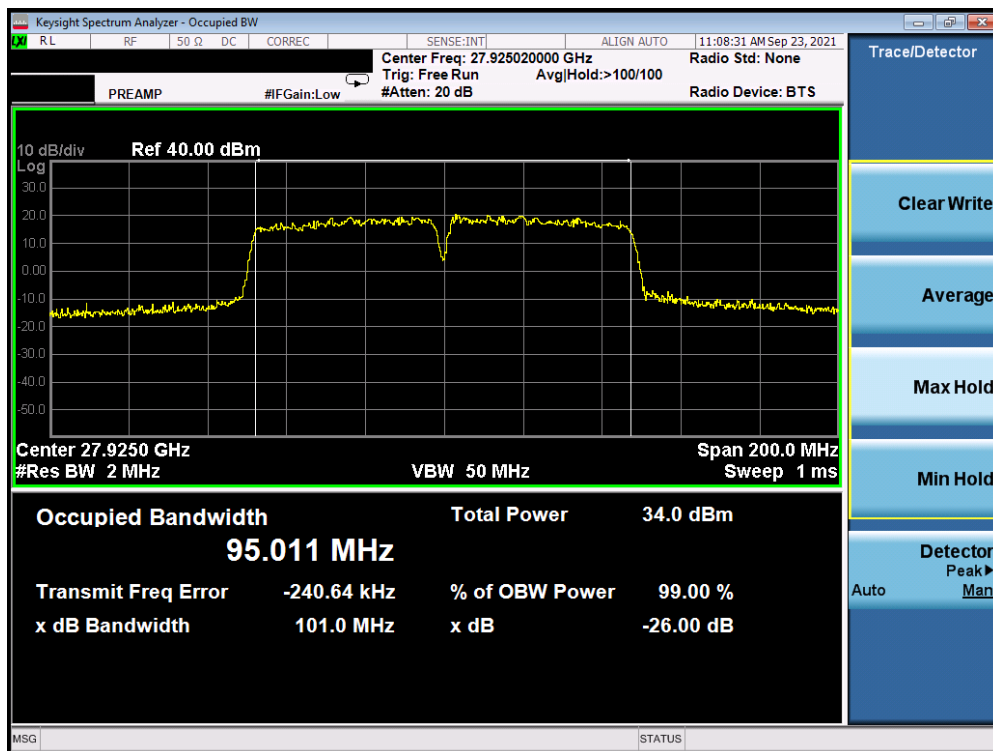


Plot 7-43. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)

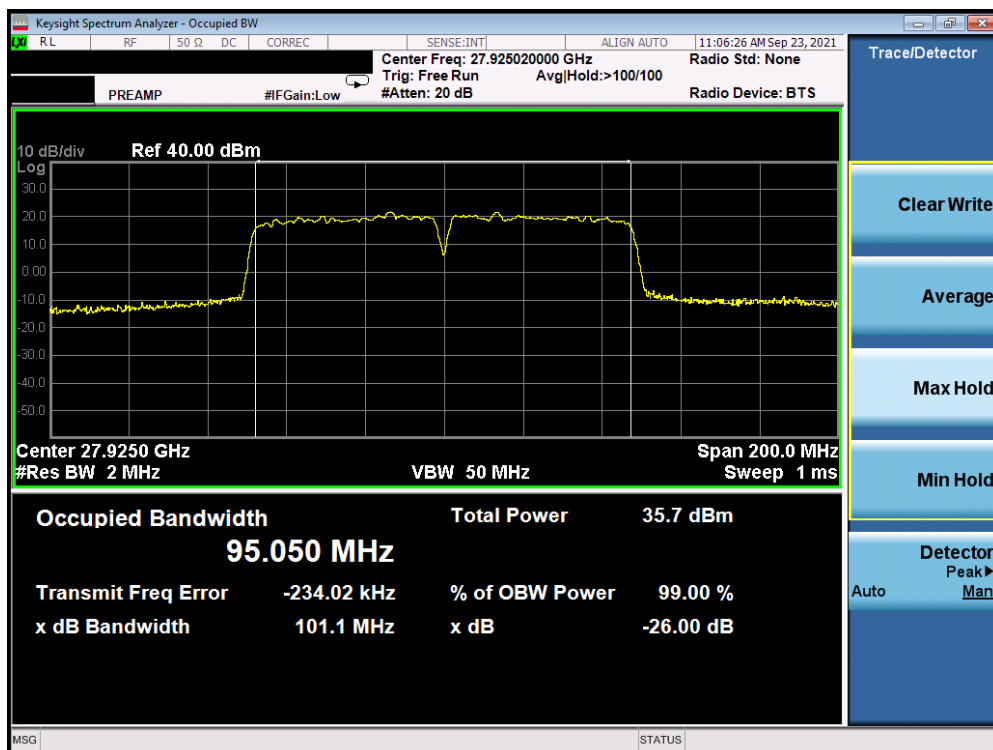


Plot 7-44. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 40 of 186

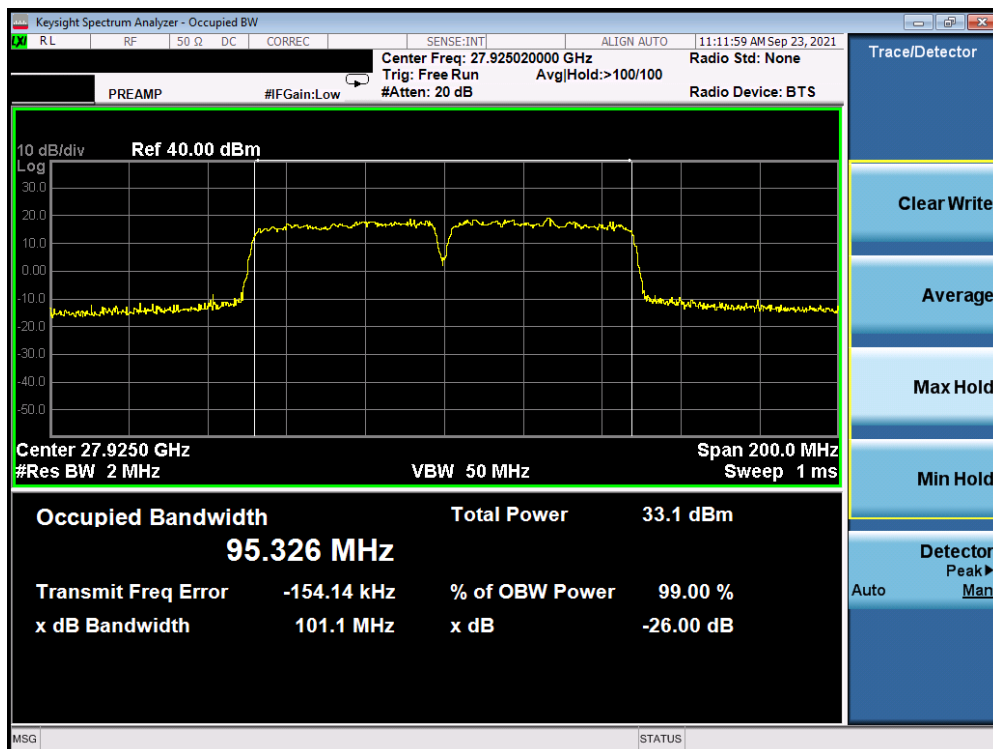


Plot 7-45. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)

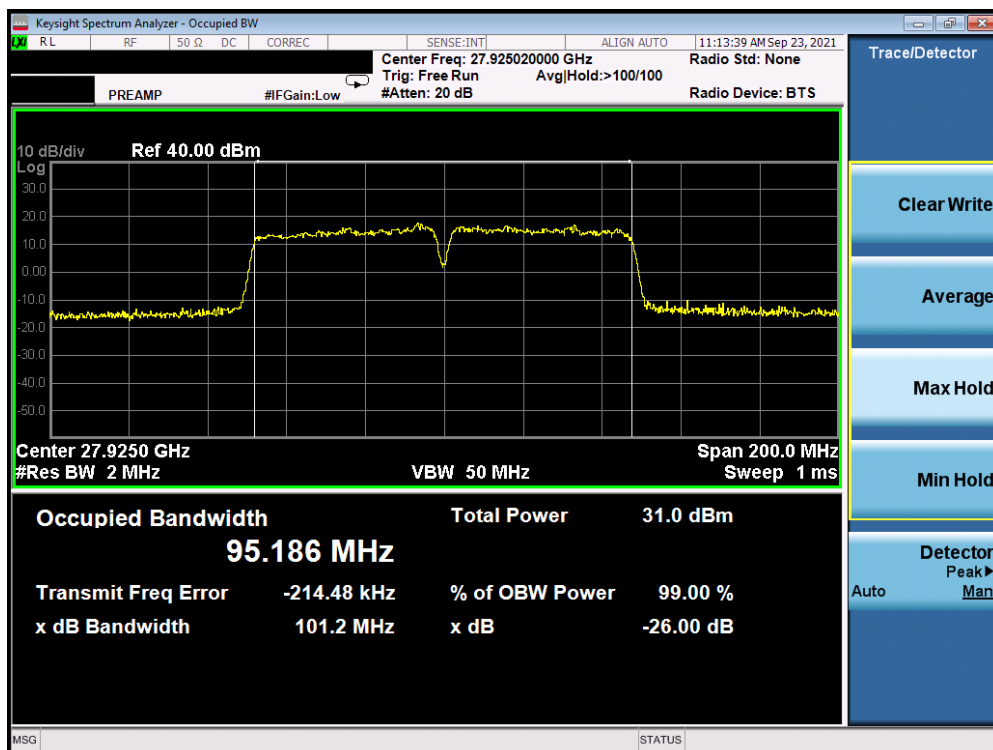


Plot 7-46. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-47. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



Plot 7-48. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

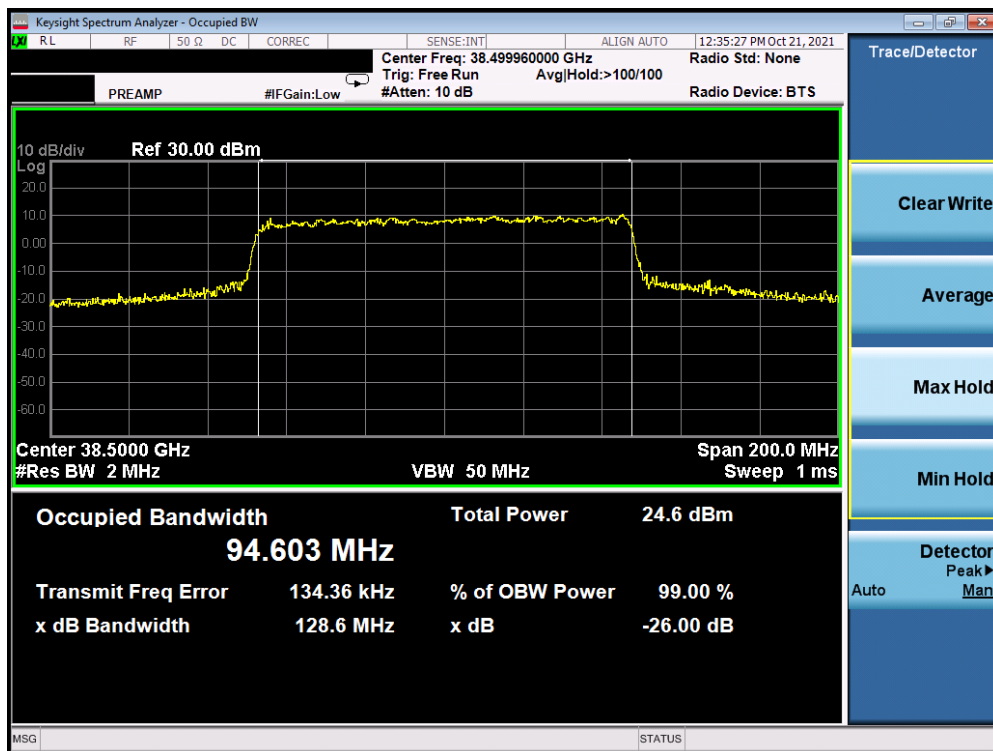
FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 42 of 186

Band n260

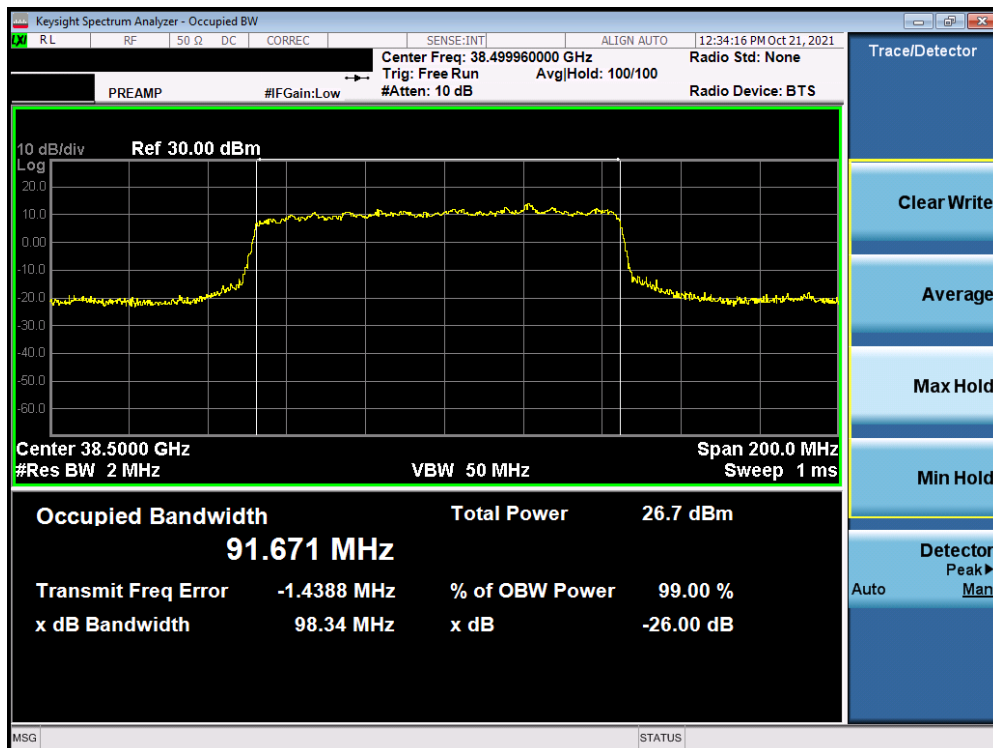
Channel	Bandwidth [MHz]	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	100	1	CP-OFDM	QPSK	94.60
			DFT-s-OFDM	$\pi/2$ BPSK	91.67
			CP-OFDM	16QAM	94.27
			CP-OFDM	64QAM	94.65
		2	CP-OFDM	QPSK	194.15
			DFT-s-OFDM	$\pi/2$ BPSK	191.18
			CP-OFDM	16QAM	194.35
			CP-OFDM	64QAM	195.71
	50	1	CP-OFDM	QPSK	46.07
			DFT-s-OFDM	$\pi/2$ BPSK	45.90
			CP-OFDM	16QAM	46.02
			CP-OFDM	64QAM	45.93
		2	CP-OFDM	QPSK	95.04
			DFT-s-OFDM	$\pi/2$ BPSK	95.02
			CP-OFDM	16QAM	95.45
			CP-OFDM	64QAM	95.28

Table 7-5. Summary of Ant 1 Occupied Bandwidths (n260)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset	Page 43 of 186	

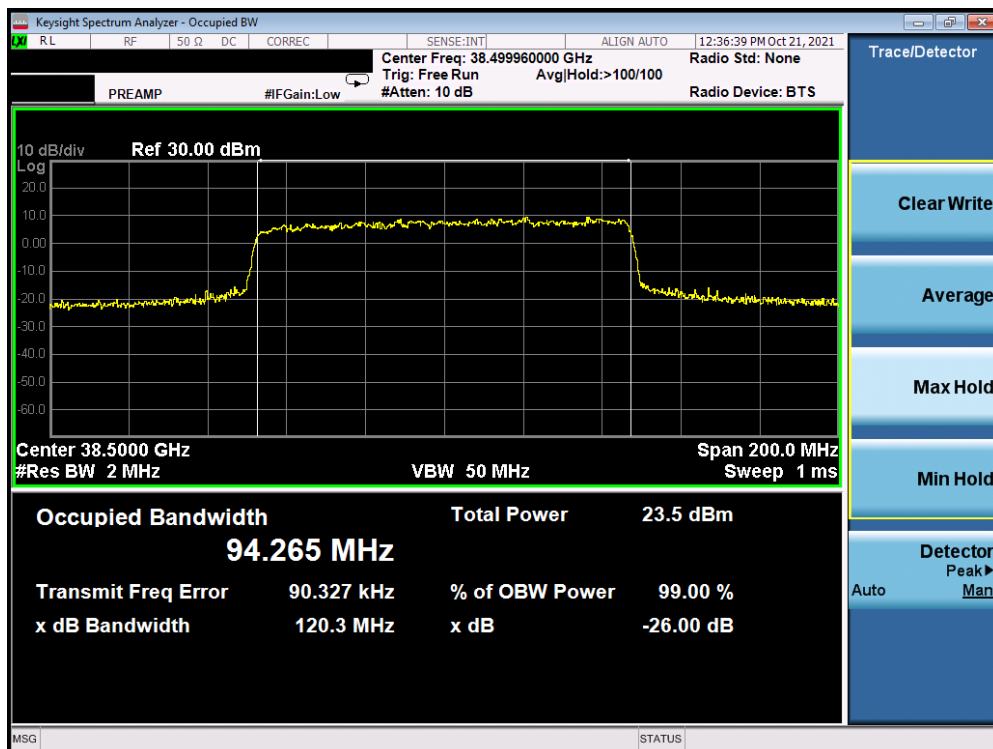


Plot 7-49. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)

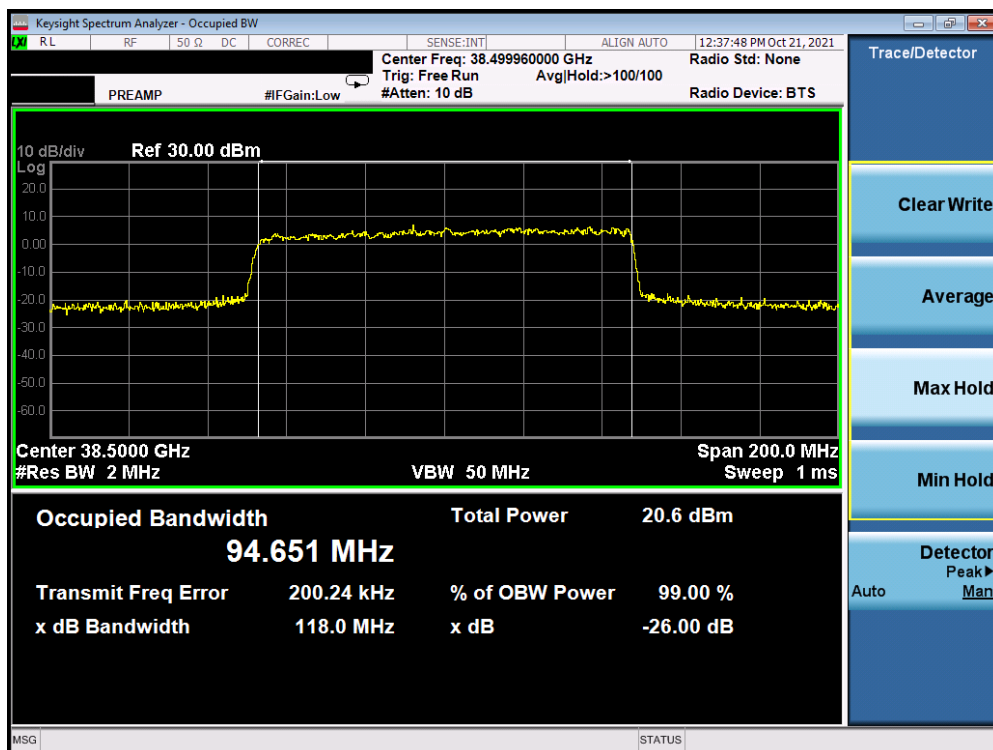


Plot 7-50. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 44 of 186

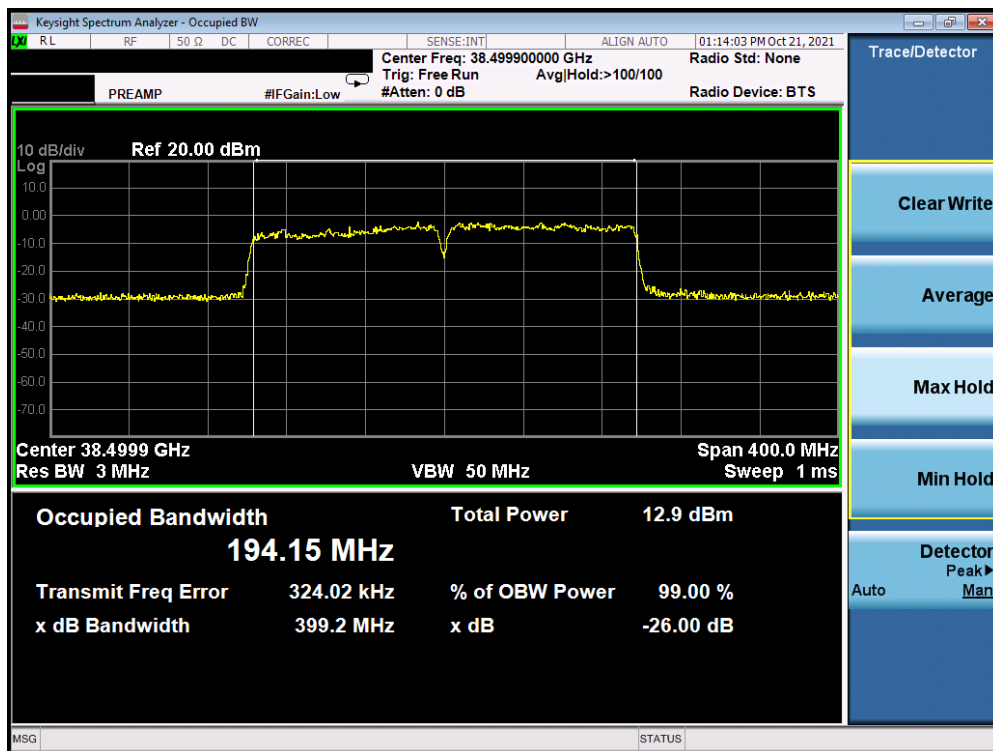


Plot 7-51. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)

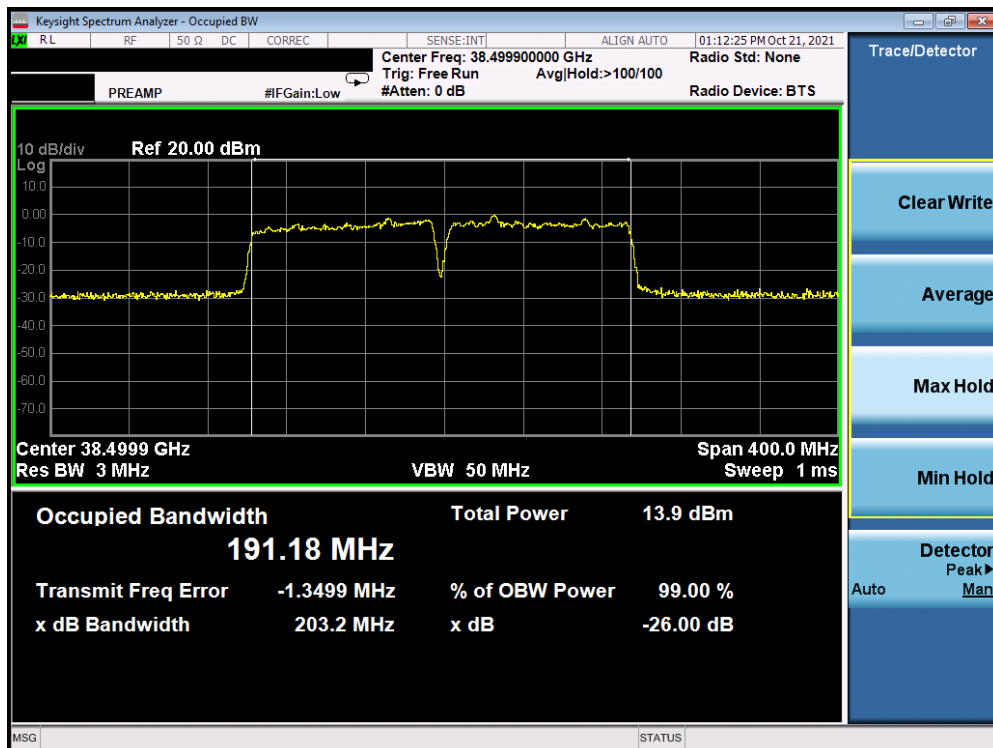


Plot 7-52. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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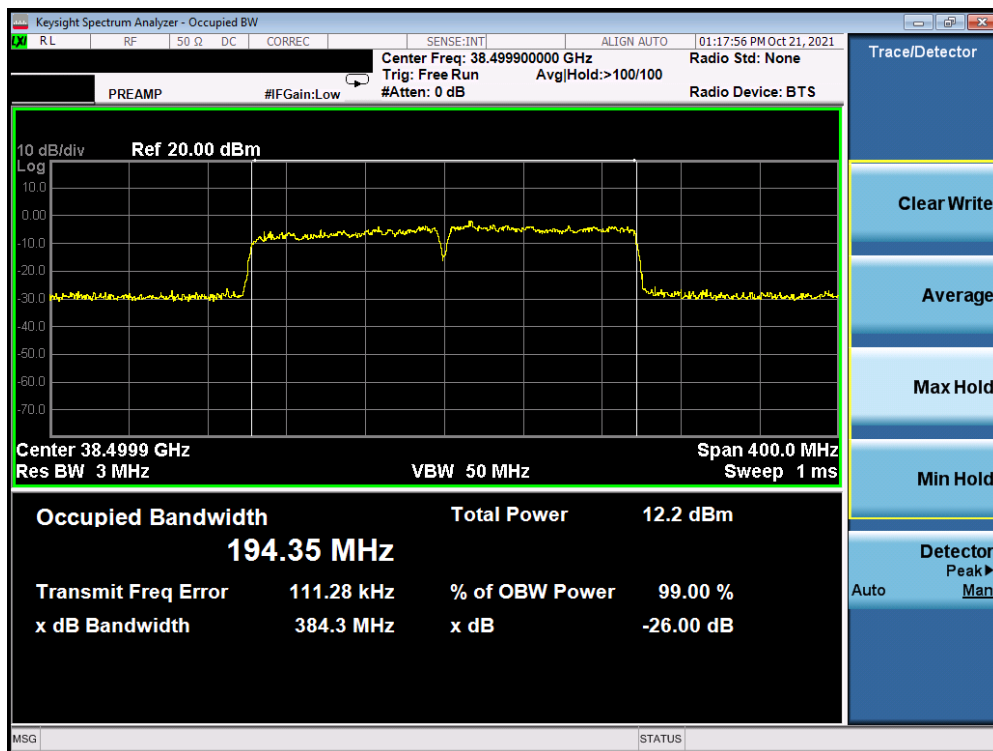


Plot 7-53. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)

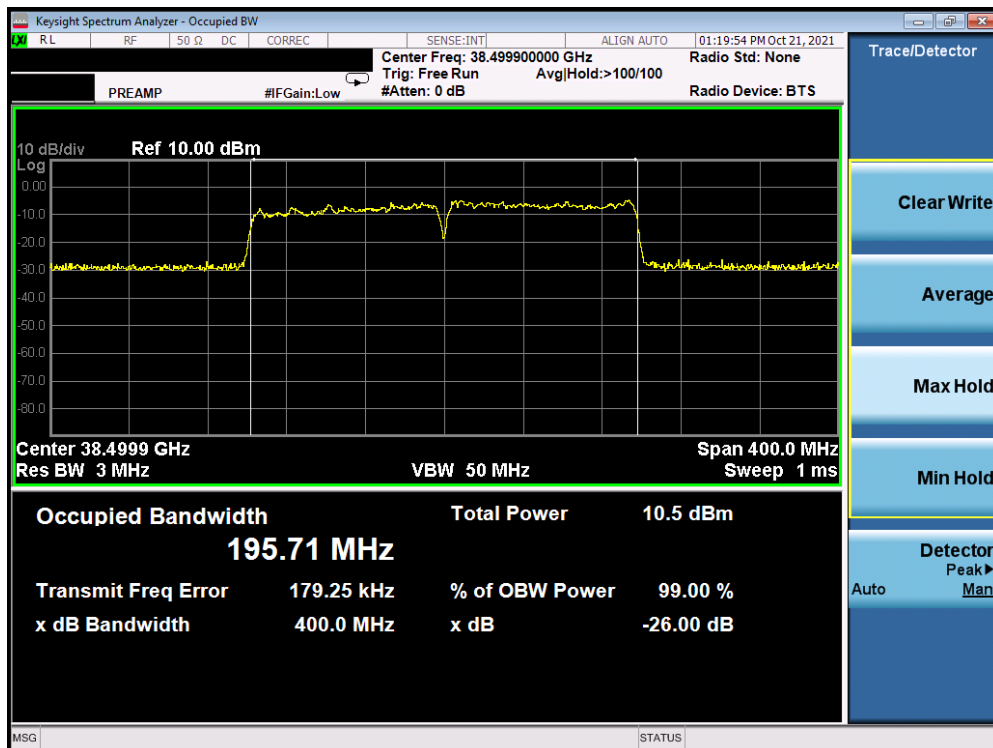


Plot 7-54. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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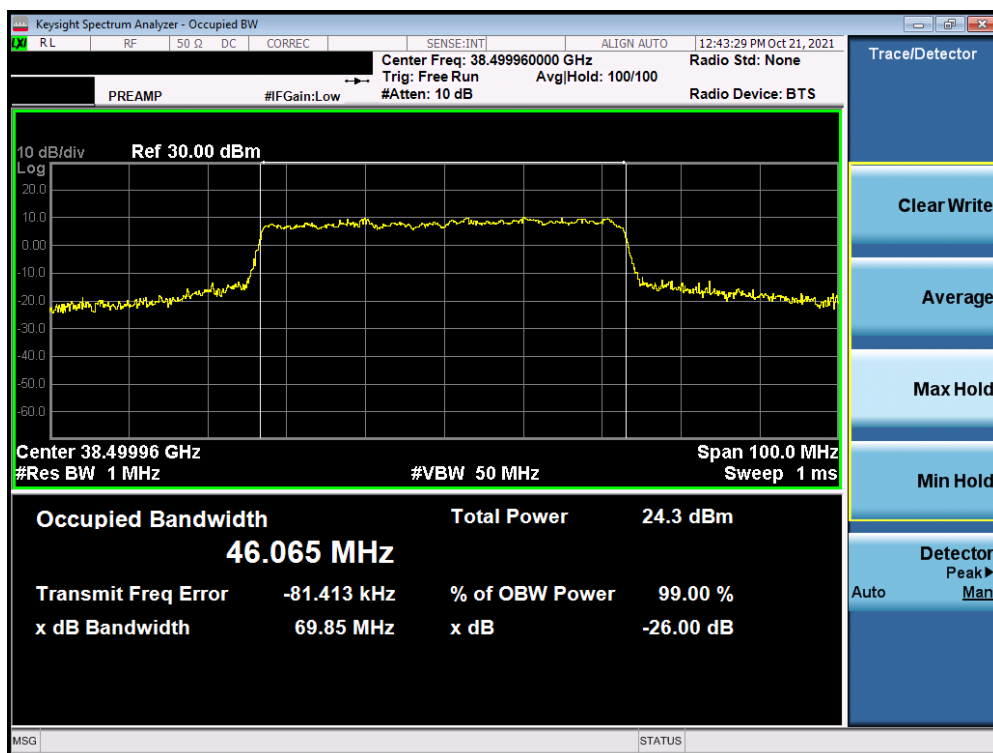


Plot 7-55. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

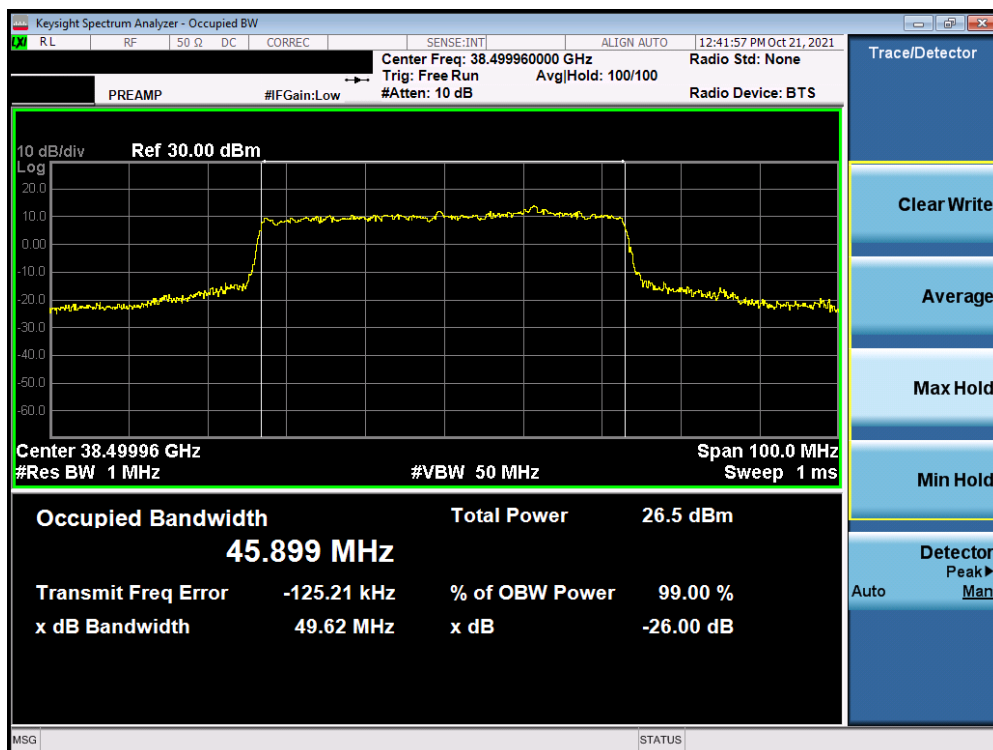


Plot 7-56. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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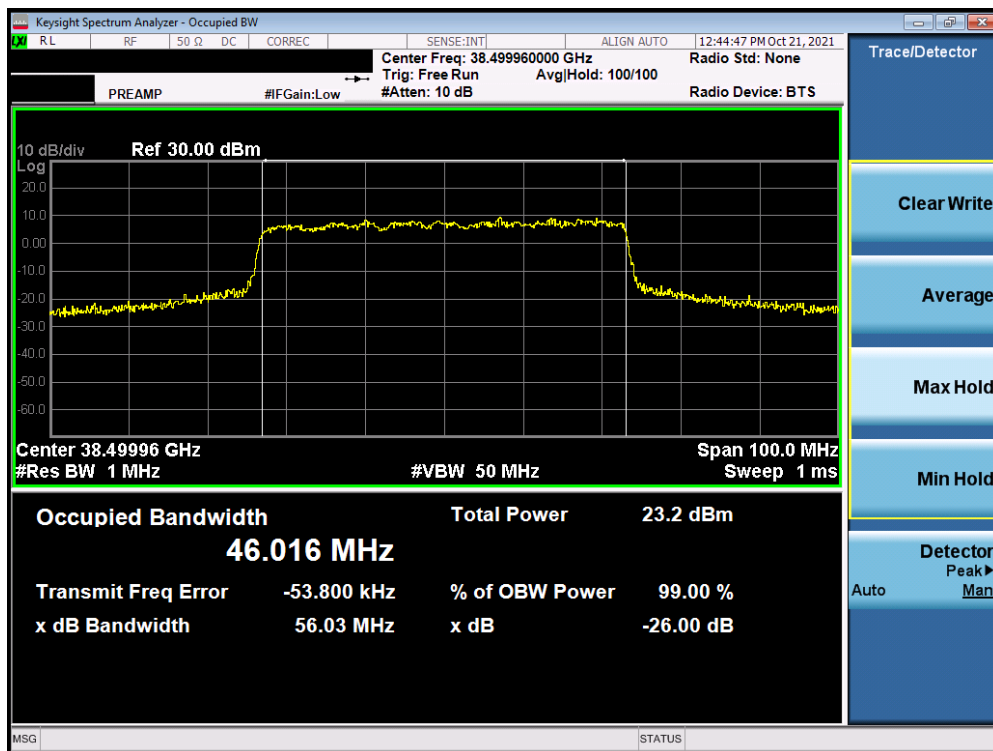


Plot 7-57. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)

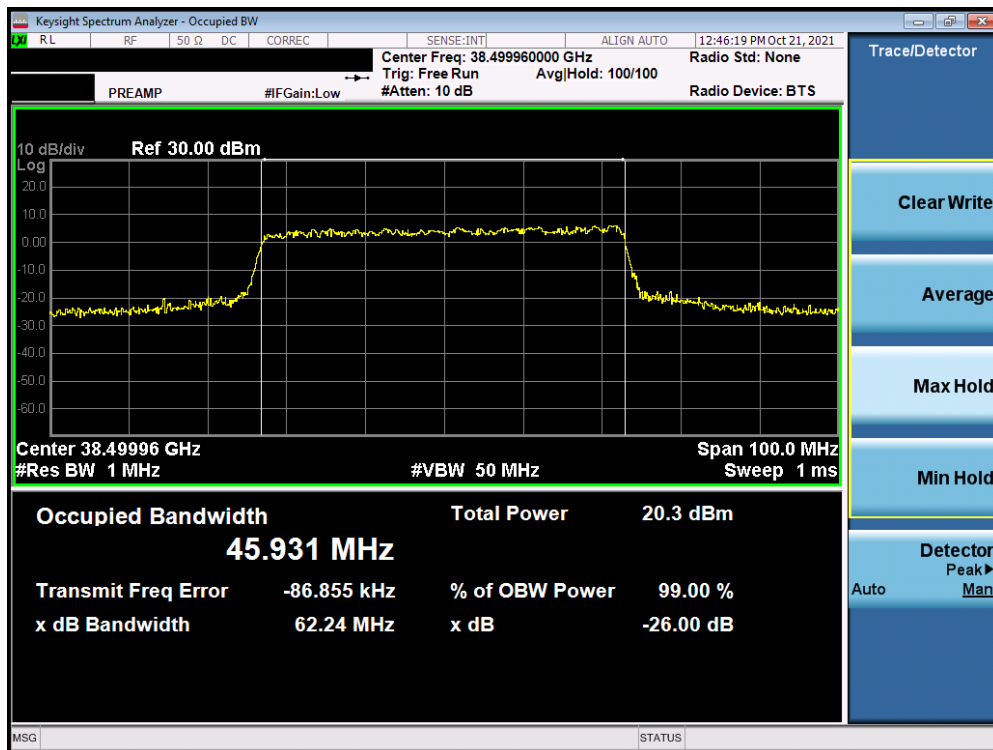


Plot 7-58. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 48 of 186

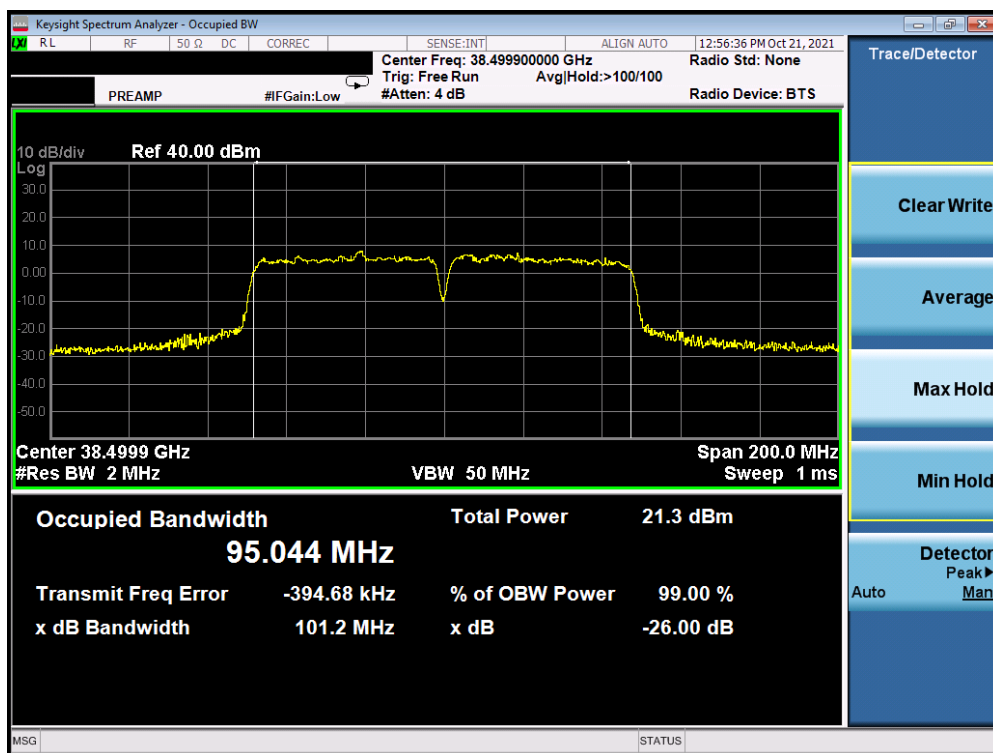


Plot 7-59. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)

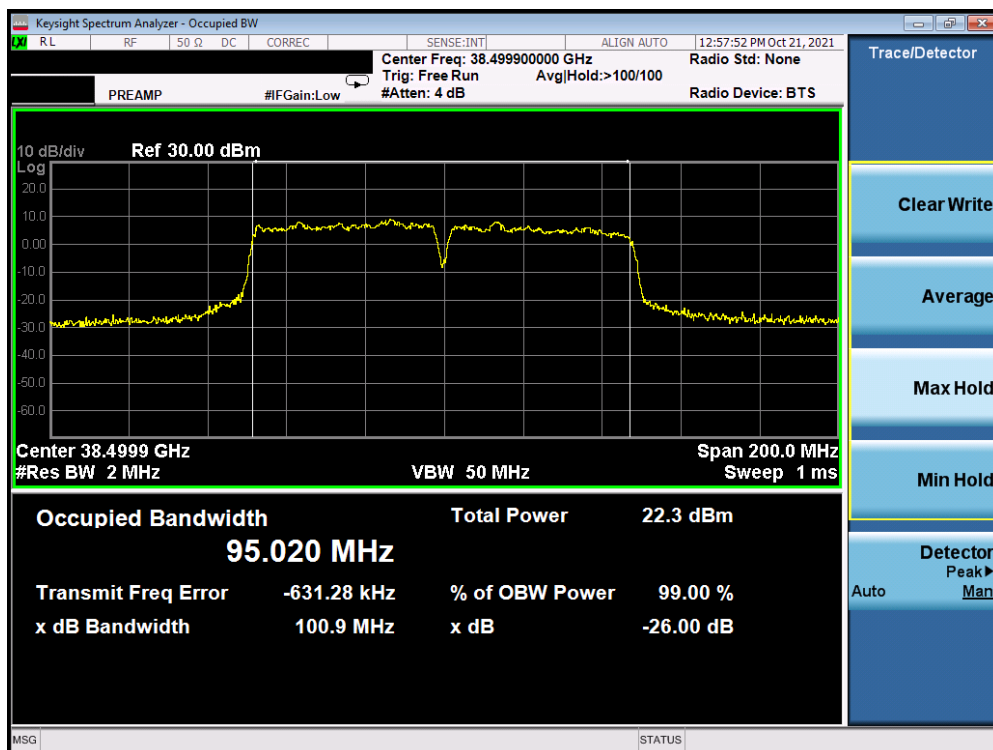


Plot 7-60. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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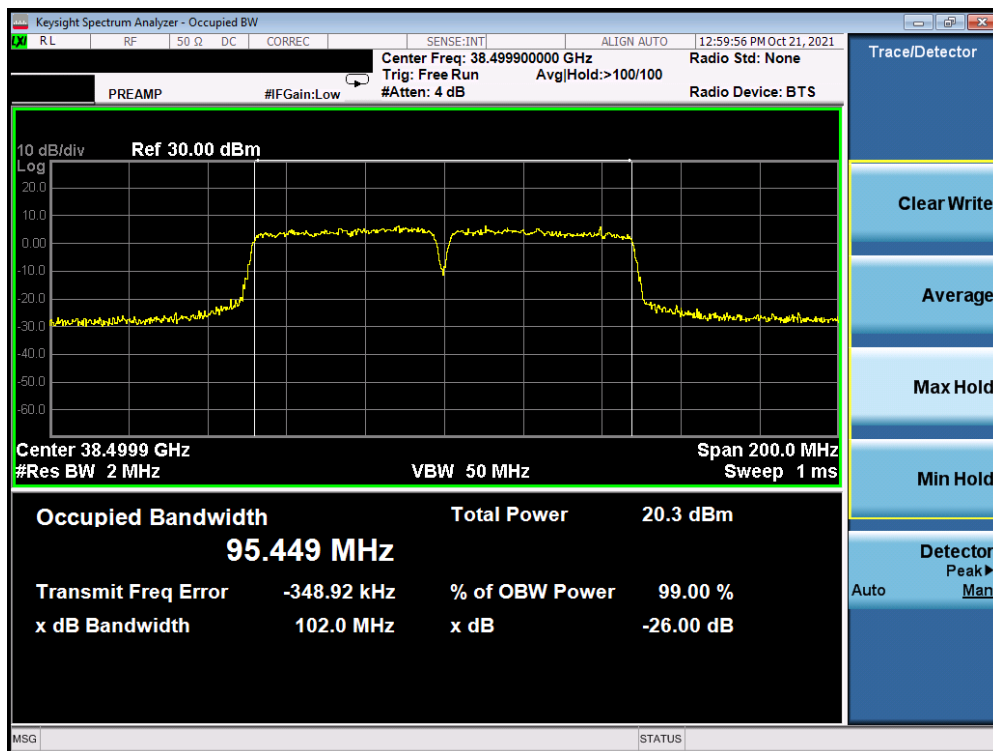


Plot 7-61. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)

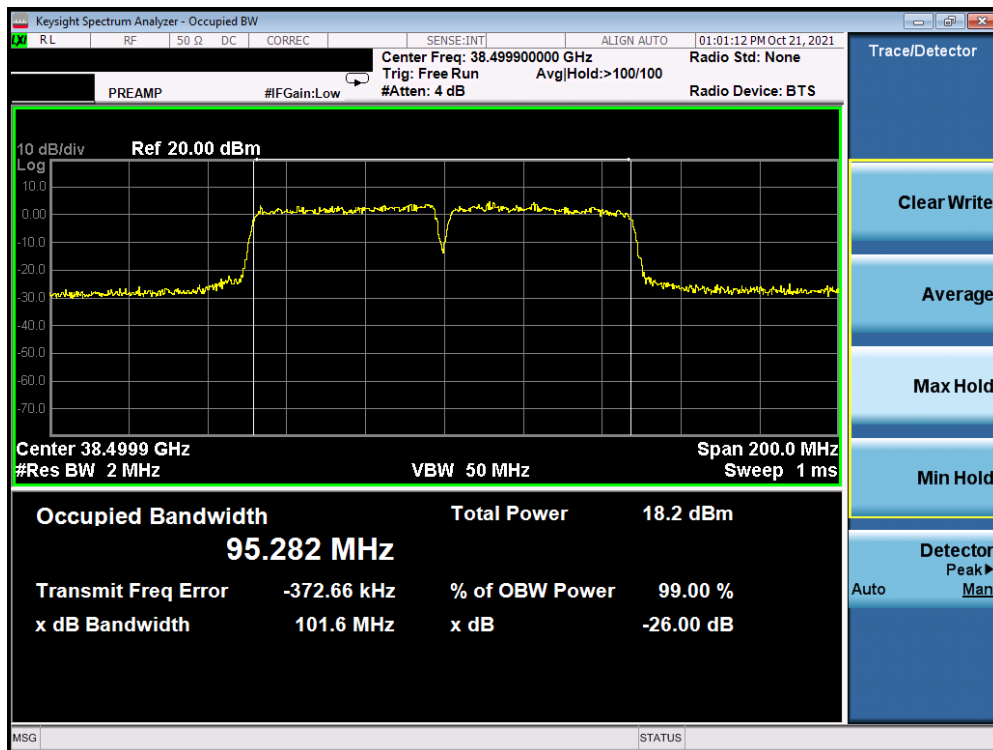


Plot 7-62. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – pi/2-BPSK – Mid Channel)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-63. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



Plot 7-64. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

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7.3 Equivalent Isotropic Radiated Power

§2.1046, §30.202

Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are performed using 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.

The average power of the sum of all antenna elements is limited to a maximum EIRP of +43 dBm.

Test Procedures Used

ANSI C63.26-2015 Section 5.2.4.4.1
KDB 842590 D01 v01r02 Section 4.2

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 $\geq 3 \times$ RBW
4. Span = 2x to 3x the OBW
5. No. of sweep points $\geq 2 \times$ span / RBW
6. Detector = RMS
7. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
8. Trace mode = trace averaging (RMS) over 100 sweeps
9. The trace was allowed to stabilize

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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. Both H-Beam and V-Beam were investigated and the worst-case measurements were reported below.
- 2) Elements within the same antenna array are correlated to produce beamforming array gain. Antenna arrays cannot be correlated with another antenna array. During testing, only one antenna array was active.
- 3) EIRP measurements for all bands were taken at 1m test distance as was required for far-field conditions (see **Table 3-1**).
- 4) The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states: $EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m. The field strength E is calculated $E (dB\mu V/m) = \text{Spectrum Analyzer Channel Power Level (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107$.
- 5) Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst case polarization/positioning.
- 6) This device supports transmission of H-polarized and V-polarized beams from the antenna array in both CP-OFDM and DFT-s-OFDM transmission schemes. SISO and MIMO operation is also supported for some configurations. As part of the testing, all modes are investigated fully on the channel showing the highest simulated EIRP using QPSK modulation. The configuration that shows the highest measured EIRP was then used to determine the EIRP for the low and high channels and for the additional modulations.
- 7) Several BeamID's are investigated based on the provided simulated data to determine the worst-case BeamID.

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Band n258-R1 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	156	-
		V	35	-
	Mid	H	156	-
		V	35	-
	High	H	156	-
		V	35	-
MIMO	Low	2Tx / MIMO	155	27
	Mid	2Tx / MIMO	155	27
	High	2Tx / MIMO	155	27

Table 7-6. Ant 1 Worst Case Beam ID

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	159	-
		V	31	-
	Mid	H	159	-
		V	31	-
	High	H	159	-
		V	31	-
MIMO	Low	2Tx / MIMO	167	39
	Mid	2Tx / MIMO	167	39
	High	2Tx / MIMO	167	39

Table 7-7. Ant 2 Worst Case Beam ID

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band n258-R1

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	24349.92	DFT-s-OFDM	QPSK	35	V	SISO	H	243.2	280.0	1 / 19	24.97
Mid	24349.92	DFT-s-OFDM	QPSK	156	H	SISO	V	71.3	21.0	1 / 19	24.26
Mid	24349.92	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	300.1	250.0	1 / 19	28.79
Mid	24349.92	CP-OFDM	QPSK	35	V	SISO	H	243.2	280.0	1 / 19	22.04
Mid	24349.92	CP-OFDM	QPSK	156	H	SISO	V	71.3	21.0	1 / 19	21.29
Mid	24349.92	CP-OFDM	QPSK	27+155	H + V	MIMO	H	300.1	250.0	1 / 19	25.97
Low	24275.04	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	300.5	250.0	1 / 15	28.42
High	24424.92	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	300.5	250.0	1 / 19	29.45
High	24424.92	DFT-s-OFDM	$\pi/2$ BPSK	27+155	H + V	2Tx	H	300.5	250.0	1 / 19	29.43
High	24424.92	DFT-s-OFDM	16QAM	27+155	H + V	2Tx	H	300.5	250.0	1 / 19	27.27
High	24424.92	DFT-s-OFDM	64QAM	27+155	H + V	2Tx	H	300.5	250.0	1 / 19	25.54

Table 7-8. Ant 1 EIRP Data (Band n258-R1 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	24424.92	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	300.4	250.0	32 / 0	24.99
High	24424.92	DFT-s-OFDM	$\pi/2$ BPSK	27+155	H + V	2Tx	H	300.4	250.0	32 / 0	25.00
High	24424.92	DFT-s-OFDM	16QAM	27+155	H + V	2Tx	H	300.4	250.0	32 / 0	23.22
High	24424.92	DFT-s-OFDM	64QAM	27+155	H + V	2Tx	H	300.4	250.0	32 / 0	21.20

Table 7-9. Ant 1 EIRP Data (Band n258-R1 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	24349.92	DFT-s-OFDM	QPSK	35	V	SISO	H	243.2	280.0	1 / 42	24.98
Mid	24349.92	DFT-s-OFDM	QPSK	156	H	SISO	V	71.3	21.0	1 / 42	24.30
Mid	24349.92	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	300.9	250.0	1 / 42	28.81
Mid	24349.92	CP-OFDM	QPSK	35	V	SISO	H	243.2	280.0	1 / 42	22.03
Mid	24349.92	CP-OFDM	QPSK	156	H	SISO	V	71.3	21.0	1 / 42	21.32
Mid	24349.92	CP-OFDM	QPSK	27+155	H + V	MIMO	H	300.9	250.0	1 / 42	25.99
Low	24300.00	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	300.8	250.0	1 / 23	28.71
High	24399.96	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	300.9	250.0	1 / 42	29.29
High	24399.96	DFT-s-OFDM	$\pi/2$ BPSK	27+155	H + V	2Tx	H	300.9	250.0	1 / 42	28.79
High	24399.96	DFT-s-OFDM	16QAM	27+155	H + V	2Tx	H	300.9	250.0	1 / 42	26.89
High	24399.96	DFT-s-OFDM	64QAM	27+155	H + V	2Tx	H	300.9	250.0	1 / 42	25.32

Table 7-10. Ant 1 EIRP Data (Band n258-R1 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	24399.96	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	300.9	250.0	64 / 0	25.59
High	24399.96	DFT-s-OFDM	$\pi/2$ BPSK	27+155	H + V	2Tx	H	300.9	250.0	64 / 0	25.54
High	24399.96	DFT-s-OFDM	16QAM	27+155	H + V	2Tx	H	300.9	250.0	64 / 0	23.59
High	24399.96	DFT-s-OFDM	64QAM	27+155	H + V	2Tx	H	300.9	250.0	64 / 0	21.71

Table 7-11. Ant 1 EIRP Data (Band n258-R1 – 100MHz-2CC)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 55 of 186

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	24424.92	DFT-s-OFDM	QPSK	31	V	SISO	H	22.5	101.0	1 / 19	24.55
High	24424.92	DFT-s-OFDM	QPSK	159	H	SISO	V	11.9	262.0	1 / 19	23.93
High	24424.92	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	11.7	7.6	1 / 19	26.76
High	24424.92	CP-OFDM	QPSK	31	V	SISO	H	22.5	101.0	1 / 19	21.27
High	24424.92	CP-OFDM	QPSK	159	H	SISO	V	11.9	262.0	1 / 19	20.75
High	24424.92	CP-OFDM	QPSK	39+167	H + V	MIMO	V	11.7	7.6	1 / 19	23.40
Low	24275.04	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	11.7	7.5	1 / 19	25.60
Mid	24349.92	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	11.5	8.0	1 / 19	25.57
High	24424.92	DFT-s-OFDM	$\pi/2$ BPSK	39+167	H + V	2Tx	V	11.7	7.6	1 / 19	26.74
High	24424.92	DFT-s-OFDM	16QAM	39+167	H + V	2Tx	V	11.7	7.6	1 / 19	24.59
High	24424.92	DFT-s-OFDM	64QAM	39+167	H + V	2Tx	V	11.7	7.6	1 / 19	22.35

Table 7-12. Ant 2 EIRP Data (Band n258-R1 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	24424.92	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	11.7	7.6	32 / 0	21.98
High	24424.92	DFT-s-OFDM	$\pi/2$ BPSK	39+167	H + V	2Tx	V	11.7	7.6	32 / 0	22.07
High	24424.92	DFT-s-OFDM	16QAM	39+167	H + V	2Tx	V	11.7	7.6	32 / 0	19.91
High	24424.92	DFT-s-OFDM	64QAM	39+167	H + V	2Tx	V	11.7	7.6	32 / 0	17.95

Table 7-13. Ant 2 EIRP Data (Band n258-R1 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	24399.96	DFT-s-OFDM	QPSK	31	V	SISO	H	22.5	101.0	1 / 42	25.35
High	24399.96	DFT-s-OFDM	QPSK	159	H	SISO	V	11.9	262.0	1 / 42	24.82
High	24399.96	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	11.7	7.6	1 / 42	28.23
High	24399.96	CP-OFDM	QPSK	31	V	SISO	H	22.5	101.0	1 / 42	22.17
High	24399.96	CP-OFDM	QPSK	159	H	SISO	V	11.9	262.0	1 / 42	21.73
High	24399.96	CP-OFDM	QPSK	39+167	H + V	MIMO	V	11.7	7.6	1 / 42	25.31
Low	24300.00	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	11.7	7.5	1 / 42	26.99
Mid	24349.92	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	11.5	8.0	1 / 42	27.52
High	24399.96	DFT-s-OFDM	$\pi/2$ BPSK	39+167	H + V	2Tx	V	11.7	7.6	1 / 42	28.21
High	24399.96	DFT-s-OFDM	16QAM	39+167	H + V	2Tx	V	11.7	7.6	1 / 42	25.96
High	24399.96	DFT-s-OFDM	64QAM	39+167	H + V	2Tx	V	11.7	7.6	1 / 42	23.93

Table 7-14. Ant 2 EIRP Data (Band n258-R1 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	24349.92	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	11.7	7.6	66 / 0	22.70
Mid	24349.92	DFT-s-OFDM	$\pi/2$ BPSK	39+167	H + V	2Tx	V	11.7	7.6	66 / 0	22.63
Mid	24349.92	DFT-s-OFDM	16QAM	39+167	H + V	2Tx	V	11.7	7.6	66 / 0	20.56
Mid	24349.92	DFT-s-OFDM	64QAM	39+167	H + V	2Tx	V	11.7	7.6	66 / 0	18.54

Table 7-15. Ant 2 EIRP Data (Band n258-R1 – 100MHz-2CC)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 56 of 186

Band n258-R2 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	156	-
		V	35	-
	Mid	H	156	-
		V	35	-
	High	H	156	-
		V	35	-
MIMO	Low	2Tx / MIMO	165	37
	Mid	2Tx / MIMO	165	37
	High	2Tx / MIMO	165	37

Table 7-16. Ant 1 Worst Case Beam ID

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	168	-
		V	31	-
	Mid	H	168	-
		V	31	-
	High	H	168	-
		V	31	-
MIMO	Low	2Tx / MIMO	168	40
	Mid	2Tx / MIMO	168	40
	High	2Tx / MIMO	168	40

Table 7-17. Ant 2 Worst Case Beam ID

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset	Page 57 of 186	

Band n258-R2

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25224.96	DFT-s-OFDM	QPSK	35	V	SISO	V	259.6	226.0	1 / 19	25.43
High	25224.96	DFT-s-OFDM	QPSK	156	H	SISO	H	45.5	243.0	1 / 19	25.52
High	25224.96	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	H	301.9	248.5	1 / 19	31.14
High	25224.96	CP-OFDM	QPSK	35	V	SISO	V	259.6	226.0	1 / 19	22.35
High	25224.96	CP-OFDM	QPSK	156	H	SISO	H	45.5	243.0	1 / 19	23.27
High	25224.96	CP-OFDM	QPSK	37+165	H + V	MIMO	H	301.9	248.5	1 / 19	27.98
Low	24775.08	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	H	302.0	248.3	1 / 11	30.60
Mid	24999.96	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	H	302.0	248.0	1 / 11	31.06
High	25224.96	DFT-s-OFDM	$\pi/2$ BPSK	37+165	H + V	2Tx	H	301.9	248.5	1 / 19	31.11
High	25224.96	DFT-s-OFDM	16QAM	37+165	H + V	2Tx	H	301.9	248.5	1 / 19	29.07
High	25224.96	DFT-s-OFDM	64QAM	37+165	H + V	2Tx	H	301.9	248.5	1 / 19	27.06

Table 7-18. Ant 1 EIRP Data (Band n258-R2 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25199.94	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	H	302.4	249.0	32 / 0	27.41
High	25199.94	DFT-s-OFDM	$\pi/2$ BPSK	37+165	H + V	2Tx	H	302.4	249.0	32 / 0	27.30
High	25199.94	DFT-s-OFDM	16QAM	37+165	H + V	2Tx	H	302.4	249.0	32 / 0	25.33
High	25199.94	DFT-s-OFDM	64QAM	37+165	H + V	2Tx	H	302.4	249.0	32 / 0	23.44

Table 7-19. Ant 1 EIRP Data (Band n258-R2 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25200.00	DFT-s-OFDM	QPSK	35	V	SISO	V	259.2	226.1	1 / 42	26.30
High	25200.00	DFT-s-OFDM	QPSK	156	H	SISO	H	45.9	244.0	1 / 42	26.46
High	25200.00	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	H	301.2	249.0	1 / 42	32.40
High	25200.00	CP-OFDM	QPSK	35	V	SISO	V	259.2	226.1	1 / 42	23.19
High	25200.00	CP-OFDM	QPSK	156	H	SISO	H	45.9	244.0	1 / 42	24.02
High	25200.00	CP-OFDM	QPSK	37+165	H + V	MIMO	H	301.2	249.0	1 / 42	28.95
Low	24800.04	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	H	302.0	248.0	1 / 42	31.91
Mid	24999.96	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	H	302.2	248.4	1 / 23	31.52
High	25200.00	DFT-s-OFDM	$\pi/2$ BPSK	37+165	H + V	2Tx	H	301.2	249.0	1 / 42	32.39
High	25200.00	DFT-s-OFDM	16QAM	37+165	H + V	2Tx	H	301.2	249.0	1 / 42	30.21
High	25200.00	DFT-s-OFDM	64QAM	37+165	H + V	2Tx	H	301.2	249.0	1 / 42	27.24

Table 7-20. Ant 1 EIRP Data (Band n258-R2 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25150.02	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	H	301.5	248.5	64 / 0	28.09
High	25150.02	DFT-s-OFDM	$\pi/2$ BPSK	37+165	H + V	2Tx	H	301.5	248.5	64 / 0	28.04
High	25150.02	DFT-s-OFDM	16QAM	37+165	H + V	2Tx	H	301.5	248.5	64 / 0	26.09
High	25150.02	DFT-s-OFDM	64QAM	37+165	H + V	2Tx	H	301.5	248.5	64 / 0	24.18

Table 7-21. Ant 1 EIRP Data (Band n258-R2 – 100MHz-2CC)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 58 of 186

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25224.96	DFT-s-OFDM	QPSK	31	V	SISO	H	15.0	266.0	1 / 19	27.34
High	25224.96	DFT-s-OFDM	QPSK	168	H	SISO	V	335.0	272.0	1 / 19	23.39
High	25224.96	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	334.6	272.0	1 / 19	27.70
High	25224.96	CP-OFDM	QPSK	31	V	SISO	H	15.0	266.0	1 / 19	24.20
High	25224.96	CP-OFDM	QPSK	168	H	SISO	V	335.0	272.0	1 / 19	20.20
High	25224.96	CP-OFDM	QPSK	40+168	H + V	MIMO	H	334.6	272.0	1 / 19	24.73
Low	24775.08	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	332.9	273.0	1 / 19	27.40
Mid	24999.96	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	331.9	273.0	1 / 19	28.48
Mid	24999.96	DFT-s-OFDM	$\pi/2$ BPSK	40+168	H + V	2Tx	H	331.9	273.0	1 / 19	28.26
Mid	24999.96	DFT-s-OFDM	16QAM	40+168	H + V	2Tx	H	331.9	273.0	1 / 19	25.86
Mid	24999.96	DFT-s-OFDM	64QAM	40+168	H + V	2Tx	H	331.9	273.0	1 / 19	23.45

Table 7-22. Ant 2 EIRP Data (Band n258-R2 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	24999.96	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	333.1	272.0	32 / 0	23.93
Mid	24999.96	DFT-s-OFDM	$\pi/2$ BPSK	40+168	H + V	2Tx	H	333.1	272.0	32 / 0	23.90
Mid	24999.96	DFT-s-OFDM	16QAM	40+168	H + V	2Tx	H	333.1	272.0	32 / 0	20.99
Mid	24999.96	DFT-s-OFDM	64QAM	40+168	H + V	2Tx	H	333.1	272.0	32 / 0	18.41

Table 7-23. Ant 2 EIRP Data (Band n258-R2 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25200.00	DFT-s-OFDM	QPSK	40	V	SISO	H	14.8	263.0	1 / 42	26.80
High	25200.00	DFT-s-OFDM	QPSK	168	H	SISO	V	334.8	273.0	1 / 42	23.93
High	25200.00	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	334.2	274.0	1 / 23	28.87
High	25200.00	CP-OFDM	QPSK	40	V	SISO	H	14.8	263.0	1 / 42	23.83
High	25200.00	CP-OFDM	QPSK	168	H	SISO	V	334.8	273.0	1 / 42	20.96
High	25200.00	CP-OFDM	QPSK	40+168	H + V	MIMO	H	334.2	274.0	1 / 23	25.64
Low	24800.04	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	334.7	273.0	1 / 42	27.85
Mid	24999.96	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	333.4	274.0	1 / 23	28.27
High	25200.00	DFT-s-OFDM	$\pi/2$ BPSK	40+168	H + V	2Tx	H	334.2	274.0	1 / 23	28.76
High	25200.00	DFT-s-OFDM	16QAM	40+168	H + V	2Tx	H	334.2	274.0	1 / 23	26.73
High	25200.00	DFT-s-OFDM	64QAM	40+168	H + V	2Tx	H	334.2	274.0	1 / 23	24.66

Table 7-24. Ant 2 EIRP Data (Band n258-R2 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25150.02	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	334.1	274.0	64 / 0	24.34
High	25150.02	DFT-s-OFDM	$\pi/2$ BPSK	40+168	H + V	2Tx	H	334.1	274.0	64 / 0	24.35
High	25150.02	DFT-s-OFDM	16QAM	40+168	H + V	2Tx	H	334.1	274.0	64 / 0	22.38
High	25150.02	DFT-s-OFDM	64QAM	40+168	H + V	2Tx	H	334.1	274.0	64 / 0	20.52

Table 7-25. Ant 2 EIRP Data (Band n258-R2 – 100MHz-2CC)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset			Page 59 of 186

Band n261 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	165	-
		V	36	-
	Mid	H	165	-
		V	36	-
	High	H	165	-
		V	36	-
MIMO	Low	2Tx / MIMO	165	37
	Mid	2Tx / MIMO	165	37
	High	2Tx / MIMO	165	37

Table 7-26. Ant 1 Worst Case Beam ID

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	167	-
		V	40	-
	Mid	H	167	-
		V	40	-
	High	H	167	-
		V	40	-
MIMO	Low	2Tx / MIMO	159	31
	Mid	2Tx / MIMO	168	40
	High	2Tx / MIMO	168	40

Table 7-27. Ant 2 Worst Case Beam ID

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset	Page 60 of 186	

Band n261

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Low	27525.00	DFT-s-OFDM	QPSK	36	V	SISO	H	288.0	93.0	1 / 19	27.00
Low	27525.00	DFT-s-OFDM	QPSK	165	H	SISO	H	119.1	115.0	1 / 15	30.78
Low	27525.00	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	V	112.3	110.0	1 / 19	31.97
Low	27525.00	CP-OFDM	QPSK	36	V	SISO	H	288.0	93.0	1 / 19	23.92
Low	27525.00	CP-OFDM	QPSK	165	H	SISO	H	119.1	115.0	1 / 15	27.78
Low	27525.00	CP-OFDM	QPSK	37+165	H + V	MIMO	V	112.3	110.0	1 / 19	28.87
Mid	27924.96	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	V	295.0	256.0	1 / 19	31.23
High	28324.92	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	V	299.6	250.0	1 / 11	30.23
Low	27525.00	DFT-s-OFDM	$\pi/2$ BPSK	37+165	H + V	2Tx	V	112.3	110.0	1 / 19	31.85
Low	27525.00	DFT-s-OFDM	16QAM	37+165	H + V	2Tx	V	112.3	110.0	1 / 19	29.57
Low	27525.00	DFT-s-OFDM	64QAM	37+165	H + V	2Tx	V	112.3	110.0	1 / 19	27.68

Table 7-28. Ant 1 EIRP Data (Band n261 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Low	27525.00	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	V	300.7	249.0	32 / 0	28.71
Low	27525.00	DFT-s-OFDM	$\pi/2$ BPSK	37+165	H + V	2Tx	V	300.7	249.0	32 / 0	28.76
Low	27525.00	DFT-s-OFDM	16QAM	37+165	H + V	2Tx	V	300.7	249.0	32 / 0	26.81
Low	27525.00	DFT-s-OFDM	64QAM	37+165	H + V	2Tx	V	300.7	249.0	32 / 0	24.92

Table 7-29. Ant 1 EIRP Data (Band n261 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Low	27550.08	DFT-s-OFDM	QPSK	36	V	SISO	H	288.4	93.0	1 / 33	27.88
Low	27550.08	DFT-s-OFDM	QPSK	165	H	SISO	H	118.5	111.0	1 / 33	30.55
Low	27550.08	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	V	114.7	110.0	1 / 42	32.04
Low	27550.08	CP-OFDM	QPSK	36	V	SISO	H	288.4	93.0	1 / 42	24.77
Low	27550.08	CP-OFDM	QPSK	165	H	SISO	H	118.5	111.0	1 / 33	27.43
Low	27550.08	CP-OFDM	QPSK	37+165	H + V	MIMO	V	114.7	110.0	1 / 42	29.19
Mid	27924.96	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	V	114.6	111.0	1 / 23	31.97
High	28299.96	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	V	298.5	251.0	1 / 33	31.81
Low	27550.08	DFT-s-OFDM	$\pi/2$ BPSK	37+165	H + V	2Tx	V	114.7	110.0	1 / 42	31.85
Low	27550.08	DFT-s-OFDM	16QAM	37+165	H + V	2Tx	V	114.7	110.0	1 / 42	29.78
Low	27550.08	DFT-s-OFDM	64QAM	37+165	H + V	2Tx	V	114.7	110.0	1 / 42	28.11

Table 7-30. Ant 1 EIRP Data (Band n261 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Low	27550.08	DFT-s-OFDM	QPSK	37+165	H + V	2Tx	V	304.0	248.0	64/0	28.28
Low	27550.08	DFT-s-OFDM	$\pi/2$ BPSK	37+165	H + V	2Tx	V	304.0	248.0	64/0	28.34
Low	27550.08	DFT-s-OFDM	16QAM	37+165	H + V	2Tx	V	304.0	248.0	64/0	26.48
Low	27550.08	DFT-s-OFDM	64QAM	37+165	H + V	2Tx	V	304.0	248.0	64/0	24.45

Table 7-31. Ant 1 EIRP Data (Band n261 – 100MHz-2CC)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 61 of 186

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	28324.92	DFT-s-OFDM	QPSK	40	V	SISO	V	10.0	8.0	1 / 15	25.81
High	28324.92	DFT-s-OFDM	QPSK	167	H	SISO	V	11.7	260.0	1 / 15	25.56
High	28324.92	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	16.0	60.0	1 / 11	28.47
High	28324.92	CP-OFDM	QPSK	40	V	SISO	V	10.0	8.0	1 / 15	22.69
High	28324.92	CP-OFDM	QPSK	167	H	SISO	V	11.7	260.0	1 / 15	22.34
High	28324.92	CP-OFDM	QPSK	40+168	H + V	MIMO	H	16.0	60.0	1 / 11	25.46
Low	27525.00	DFT-s-OFDM	QPSK	31+159	H + V	2Tx	H	12.0	260.0	1 / 19	30.25
Mid	27924.96	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	14.6	57.0	1 / 19	30.08
Low	27525.00	DFT-s-OFDM	$\pi/2$ BPSK	31+159	H + V	2Tx	H	12.0	260.0	1 / 19	30.19
Low	27525.00	DFT-s-OFDM	16QAM	31+159	H + V	2Tx	H	12.0	260.0	1 / 19	28.33
Low	27525.00	DFT-s-OFDM	64QAM	31+159	H + V	2Tx	H	12.0	260.0	1 / 19	25.76

Table 7-32. Ant 2 EIRP Data (Band n261 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Low	27525.00	DFT-s-OFDM	QPSK	31+159	H + V	2Tx	H	12.0	260.0	32 / 0	26.12
Low	27525.00	DFT-s-OFDM	$\pi/2$ BPSK	31+159	H + V	2Tx	H	12.0	260.0	32 / 0	26.13
Low	27525.00	DFT-s-OFDM	16QAM	31+159	H + V	2Tx	H	12.0	260.0	32 / 0	24.15
Low	27525.00	DFT-s-OFDM	64QAM	31+159	H + V	2Tx	H	12.0	260.0	32 / 0	22.23

Table 7-33. Ant 2 EIRP Data (Band n261 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	28299.96	DFT-s-OFDM	QPSK	40	V	SISO	V	11.0	12.0	1 / 33	26.42
High	28299.96	DFT-s-OFDM	QPSK	167	H	SISO	V	12.0	262.0	1 / 33	26.24
High	28299.96	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	16.0	58.0	1 / 42	29.22
High	28299.96	CP-OFDM	QPSK	40	V	SISO	V	11.0	12.0	1 / 33	23.41
High	28299.96	CP-OFDM	QPSK	167	H	SISO	V	12.0	262.0	1 / 33	23.26
High	28299.96	CP-OFDM	QPSK	40+168	H + V	MIMO	H	16.0	58.0	1 / 42	26.22
Low	27550.08	DFT-s-OFDM	QPSK	31+159	H + V	2Tx	H	12.0	260.0	1 / 23	30.88
Mid	27924.96	DFT-s-OFDM	QPSK	40+168	H + V	2Tx	H	14.6	57.0	1 / 42	30.18
Low	28299.96	DFT-s-OFDM	$\pi/2$ BPSK	31+159	H + V	2Tx	H	12.0	260.0	1 / 23	30.86
Low	28299.96	DFT-s-OFDM	16QAM	31+159	H + V	2Tx	H	12.0	260.0	1 / 23	28.88
Low	28299.96	DFT-s-OFDM	64QAM	31+159	H + V	2Tx	H	12.0	260.0	1 / 23	26.85

Table 7-34. Ant 2 EIRP Data (Band n261 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Low	28299.96	DFT-s-OFDM	QPSK	31+159	H + V	2Tx	H	12.0	260.0	64 / 0	26.10
Low	28299.96	DFT-s-OFDM	$\pi/2$ BPSK	31+159	H + V	2Tx	H	12.0	260.0	64 / 0	26.19
Low	28299.96	DFT-s-OFDM	16QAM	31+159	H + V	2Tx	H	12.0	260.0	64 / 0	24.25
Low	28299.96	DFT-s-OFDM	64QAM	31+159	H + V	2Tx	H	12.0	260.0	64 / 0	22.41

Table 7-35. Ant 2 EIRP Data (Band n261 – 100MHz-2CC)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 62 of 186

Band n260 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	163	-
		V	35	-
	Mid	H	163	-
		V	35	-
	High	H	163	-
		V	35	-
MIMO	Low	2Tx / MIMO	155	27
	Mid	2Tx / MIMO	155	27
	High	2Tx / MIMO	155	27

Table 7-36. Ant 1 Worst Case Beam ID

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	168	-
		V	39	-
	Mid	H	168	-
		V	39	-
	High	H	168	-
		V	39	-
MIMO	Low	2Tx / MIMO	167	39
	Mid	2Tx / MIMO	167	39
	High	2Tx / MIMO	158	30

Table 7-37. Ant 2 Worst Case Beam ID

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 63 of 186

Band n260

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	39975.00	DFT-s-OFDM	QPSK	35	V	SISO	H	92.8	258.0	1 / 19	22.53
High	39975.00	DFT-s-OFDM	QPSK	163	H	SISO	H	255.8	274.0	1 / 19	20.90
High	39975.00	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	246.3	238.0	1 / 15	26.29
High	39975.00	CP-OFDM	QPSK	35	V	SISO	H	92.8	258.0	1 / 19	20.33
High	39975.00	CP-OFDM	QPSK	163	H	SISO	H	255.8	274.0	1 / 15	17.90
High	39975.00	CP-OFDM	QPSK	27+155	H + V	MIMO	H	246.3	238.0	1 / 15	23.14
Low	37025.04	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	248.2	239.0	1 / 11	24.20
Mid	38499.96	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	254.1	239.0	1 / 11	23.00
High	39975.00	DFT-s-OFDM	$\pi/2$ BPSK	27+155	H + V	2Tx	H	246.3	238.0	1 / 15	26.26
High	39975.00	DFT-s-OFDM	16QAM	27+155	H + V	2Tx	H	246.3	238.0	1 / 15	24.15
High	39975.00	DFT-s-OFDM	64QAM	27+155	H + V	2Tx	H	246.3	238.0	1 / 15	22.23

Table 7-38. Ant 1 EIRP Data (Band n260 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	39975.00	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	254.4	237.0	32 / 0	20.80
High	39975.00	DFT-s-OFDM	$\pi/2$ BPSK	27+155	H + V	2Tx	H	254.4	237.0	32 / 0	20.80
High	39975.00	DFT-s-OFDM	16QAM	27+155	H + V	2Tx	H	254.4	237.0	32 / 0	18.66
High	39975.00	DFT-s-OFDM	64QAM	27+155	H + V	2Tx	H	254.4	237.0	32 / 0	16.82

Table 7-39. Ant 1 EIRP Data (Band n260 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	39949.92	DFT-s-OFDM	QPSK	35	V	SISO	H	94.7	258.0	1 / 42	22.34
High	39949.92	DFT-s-OFDM	QPSK	163	H	SISO	H	256.3	275.0	1 / 42	21.24
High	39949.92	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	250.3	238.0	1 / 23	26.22
High	39949.92	CP-OFDM	QPSK	35	V	SISO	H	94.7	258.0	1 / 42	19.18
High	39949.92	CP-OFDM	QPSK	163	H	SISO	H	256.3	275.0	1 / 42	18.23
High	39949.92	CP-OFDM	QPSK	27+155	H + V	MIMO	H	250.3	238.0	1 / 23	23.17
Low	37050.00	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	250.9	237.0	1 / 23	24.41
Mid	38499.96	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	247.8	237.0	1 / 23	22.38
High	39949.92	DFT-s-OFDM	$\pi/2$ BPSK	27+155	H + V	2Tx	H	250.3	238.0	1 / 23	26.14
High	39949.92	DFT-s-OFDM	16QAM	27+155	H + V	2Tx	H	250.3	238.0	1 / 23	24.34
High	39949.92	DFT-s-OFDM	64QAM	27+155	H + V	2Tx	H	250.3	238.0	1 / 23	22.11

Table 7-40. Ant 1 EIRP Data (Band n260 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	39949.92	DFT-s-OFDM	QPSK	27+155	H + V	2Tx	H	250.8	237.0	64 / 0	21.40
High	39949.92	DFT-s-OFDM	$\pi/2$ BPSK	27+155	H + V	2Tx	H	250.8	237.0	64 / 0	21.39
High	39949.92	DFT-s-OFDM	16QAM	27+155	H + V	2Tx	H	250.8	237.0	64 / 0	19.84
High	39949.92	DFT-s-OFDM	64QAM	27+155	H + V	2Tx	H	250.8	237.0	64 / 0	18.25

Table 7-41. Ant 1 EIRP Data (Band n260 – 100MHz-2CC)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 64 of 186

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	38499.96	DFT-s-OFDM	QPSK	39	V	SISO	H	267.1	11.0	1 / 19	24.39
Mid	38499.96	DFT-s-OFDM	QPSK	168	H	SISO	V	339.9	28.0	1 / 19	22.29
Mid	38499.96	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	24.6	101.0	1 / 19	26.46
Mid	38499.96	CP-OFDM	QPSK	39	V	SISO	H	267.1	11.0	1 / 19	21.45
Mid	38499.96	CP-OFDM	QPSK	168	H	SISO	V	339.9	28.0	1 / 19	19.07
Mid	38499.96	CP-OFDM	QPSK	39+167	H + V	MIMO	V	24.6	101.0	1 / 19	23.38
Low	37025.04	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	15.2	326.0	1 / 19	27.46
High	39975.00	DFT-s-OFDM	QPSK	30+158	H + V	2Tx	V	70.2	30.0	1 / 19	26.01
Low	37025.04	DFT-s-OFDM	$\pi/2$ BPSK	39+167	H + V	2Tx	V	15.2	326.0	1 / 19	27.53
Low	37025.04	DFT-s-OFDM	16QAM	39+167	H + V	2Tx	V	15.2	326.0	1 / 19	25.23
Low	37025.04	DFT-s-OFDM	64QAM	39+167	H + V	2Tx	V	15.2	326.0	1 / 19	23.34

Table 7-42. Ant 2 EIRP Data (Band n260 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Low	37025.04	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	14.7	331.0	32 / 0	21.95
Low	37025.04	DFT-s-OFDM	$\pi/2$ BPSK	39+167	H + V	2Tx	V	14.7	331.0	32 / 0	21.70
Low	37025.04	DFT-s-OFDM	16QAM	39+167	H + V	2Tx	V	14.7	331.0	32 / 0	20.37
Low	37025.04	DFT-s-OFDM	64QAM	39+167	H + V	2Tx	V	14.7	331.0	32 / 0	19.25

Table 7-43. Ant 2 EIRP Data (Band n260 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	38499.96	DFT-s-OFDM	QPSK	39	V	SISO	H	267.7	9.0	1 / 42	25.32
Mid	38499.96	DFT-s-OFDM	QPSK	168	H	SISO	V	339.6	28.0	1 / 42	22.88
Mid	38499.96	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	24.4	101.0	1 / 23	27.18
Mid	38499.96	CP-OFDM	QPSK	39	V	SISO	H	267.7	9.0	1 / 42	22.21
Mid	38499.96	CP-OFDM	QPSK	168	H	SISO	V	339.6	28.0	1 / 42	20.11
Mid	38499.96	CP-OFDM	QPSK	39+167	H + V	MIMO	V	24.4	101.0	1 / 23	24.01
Low	37050.00	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	14.8	310.0	1 / 33	27.51
High	39949.92	DFT-s-OFDM	QPSK	30+158	H + V	2Tx	V	70.7	31.0	1 / 23	26.14
Low	37050.00	DFT-s-OFDM	$\pi/2$ BPSK	39+167	H + V	2Tx	V	14.8	310.0	1 / 33	27.39
Low	37050.00	DFT-s-OFDM	16QAM	39+167	H + V	2Tx	V	14.8	310.0	1 / 33	25.42
Low	37050.00	DFT-s-OFDM	64QAM	39+167	H + V	2Tx	V	14.8	310.0	1 / 33	23.60

Table 7-44. Ant 2 EIRP Data (Band n260 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Low	37050.00	DFT-s-OFDM	QPSK	39+167	H + V	2Tx	V	14.7	327.0	64 / 0	23.95
Low	37050.00	DFT-s-OFDM	$\pi/2$ BPSK	39+167	H + V	2Tx	V	14.7	327.0	64 / 0	24.07
Low	37050.00	DFT-s-OFDM	16QAM	39+167	H + V	2Tx	V	14.7	327.0	64 / 0	22.60
Low	37050.00	DFT-s-OFDM	64QAM	39+167	H + V	2Tx	V	14.7	327.0	64 / 0	21.08

Table 7-45. Ant 2 EIRP Data (Band n260 – 100MHz-2CC)

FCC ID: A3LSMS906U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2109090103-06.A3L	Test Dates: 09/16/2021–11/13/2021	EUT Type: Portable Handset		Page 65 of 186

7.4 Radiated Spurious and Harmonic Emissions

§2.1051, §30.203

Test Overview

The spectrum is scanned from 30MHz to 100GHz for n258-R1, n258-R2, and n261. For n260, the spectrum is scanned from 30MHz to 200GHz. All out of band emissions are measured in a radiated test setup while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All modulations 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 conductive power or total radiated power of any emissions outside a licensee's frequency block shall be -13dBm/1MHz.

Test Procedure Used

ANSI C63.26-2015 Section 5.7.4

KDB 842590 D01 v01r02 Section 4.4.3

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 100 GHz for n261 and 200GHz for n260. Several plots are used to show investigations in this entire span.
2. Detector = RMS
3. Trace mode = trace average
4. Sweep time = auto couple
5. Number of sweep points $\geq 2 \times \text{Span/RBW}$
6. The trace was allowed to stabilize
7. RBW = 1MHz, VBW = 3MHz

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) All radiated spurious emissions were measured as EIRP to compare with the §30.203 TRP limits. Emissions that were found to be non-compliant using the EIRP method were re-measured using the Spherical Grid TRP Method per KDB 842590.
- 3) The plots in this section were taken with the analyzer set to max hold. All final measurements shown in the tables that accompany the plots were taken with trace averaging performed over 100 sweeps while the analyzer was triggering on a specific emission of interest.
- 4) Elements within the same antenna array are correlated to produce beamforming array gain. Antenna arrays cannot be correlated with another antenna array. During testing, only one antenna array was active.

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- 5) The plots from 1-200GHz show corrected average EIRP levels. The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states: $EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m. The field strength E is calculated $E (dB\mu V/m) = \text{Spectrum Analyzer Level (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + \text{Harmonic Mixer Conversion Loss (dB)} + 107$. All appropriate Antenna Factor and Cable Loss have been applied in the spectrum analyzer for each measurement. For measurements > 40GHz, Harmonic Mixer Conversion Loss was also applied to the spectrum analyzer.
- 6) Emissions below 18GHz were measured at a 3 meter test distance, while emissions above 18GHz were measured at the appropriate far field distance. The far field of the mmWave signal is based on formula: $R > 2D^2/\text{wavelength}$, where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT. In this case, D is the largest dimension of the measurement antenna.

Frequency Range (GHz)	Wavelength(cm)	Far Field Distance (m)	Measurement Distance (m)
18-40	0.749	0.54	1.00
40-60	0.500	1.39	1.50
60-90	0.333	0.91	1.00
90-140	0.214	0.58	1.00
140-200	0.150	0.39	1.00

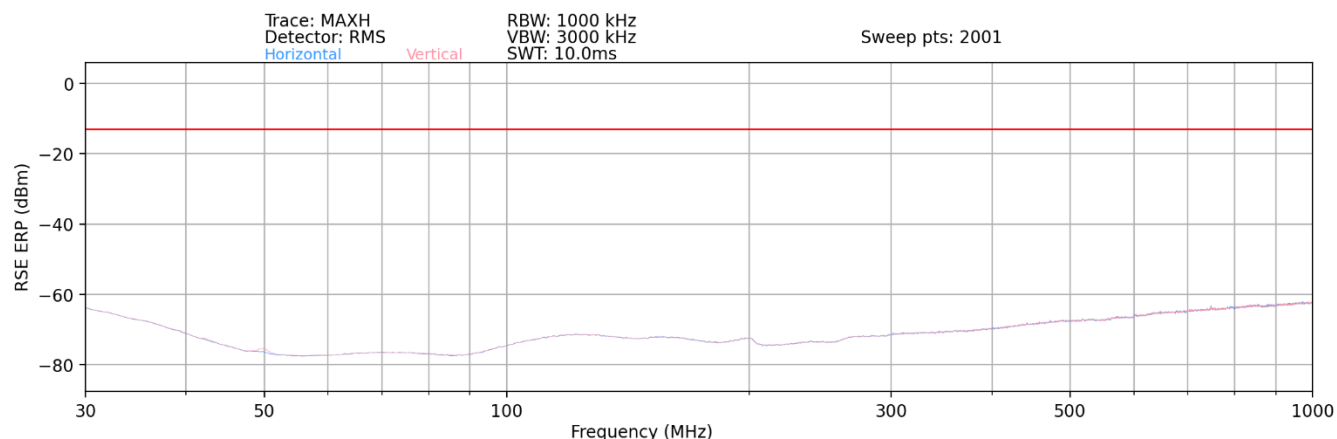
Table 7-46. Far-Field Distance & Measurement Distance per Frequency Range

- 7) All emissions from 30MHz - 40GHz were measured using a spectrum analyzer with an internal preamplifier. Emissions >40GHz were measured using a harmonic mixer with the spectrum analyzer.
- 8) All RSE's were measured with 1CC. It was determined that adding more CC's causes the overall amplitude of just 1CC to decrease, therefore, 1CC is the worst case for the purposes of spurious emissions measurements.
- 9) The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 10) All RSE's were investigated in EN-DC mode and with 802.11 chipset active. It was determined that there is no new emission introduced by EN-DC mode, or the 802.11 chipset. For EN-DC mode, n261 uses LTE B2, B5, B12, B13, B48 and B66, n260 uses LTE B2, B5, B12, B13, B14, B30, B48 and B66 and n258 uses LTE B2, B5, B12, B14, B30, and B66.
- 11) Additionally, this device supports anchor bands operating in FR1 spectrum. The n261 band uses NR Bands n2, n5, n66, and n77 as anchor bands. The n260 band uses NR Bands n2, n5, n12, n30, n66, and n77 as anchor bands. The n258 band uses NR Bands n2, n5, n12, n14, n30, and n66 as anchor bands.
- 12) There was no discernible difference in the spurious emission levels when using different LTE and NR FR1 anchor bands. Thus, LTE Band 2 was used as a representative anchor band for EN-DC investigations.

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Band n258-R1 – Ant 1

30MHz - 1GHz



Plot 7-65. Ant 1 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
205.00	Low	50	2Tx	QPSK	H	-	-	-74.17	-13.00	-61.17
404.31	Mid	50	2Tx	QPSK	H	-	-	-67.00	-13.00	-54.00
747.80	High	50	2Tx	QPSK	H	356	250	-61.02	-13.00	-48.02

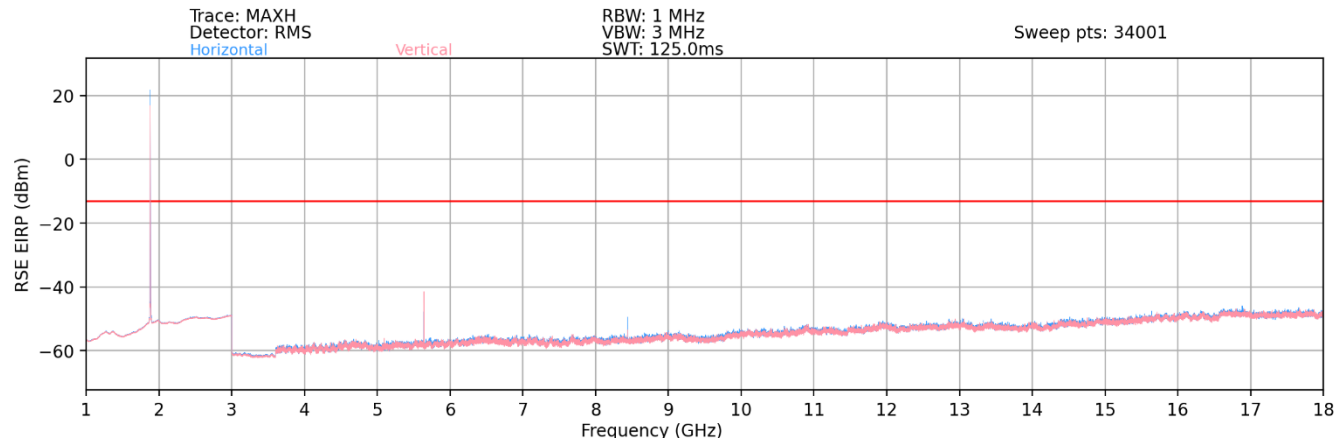
Table 7-47. Ant 1 - n258-R1 Radiated Spurious Emissions Table (30MHz - 1GHz)

Notes

The RSE ERP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

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1GHz - 18GHz



Plot 7-66. Ant 1 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5640.50	Low	50	2Tx	QPSK	V	160	113	-42.10	-13.00	-29.10
8442.50	Mid	50	2Tx	QPSK	H	23	129	-48.25	-13.00	-35.25
13180.00	High	50	2Tx	QPSK	H	-	-	-56.03	-13.00	-29.10

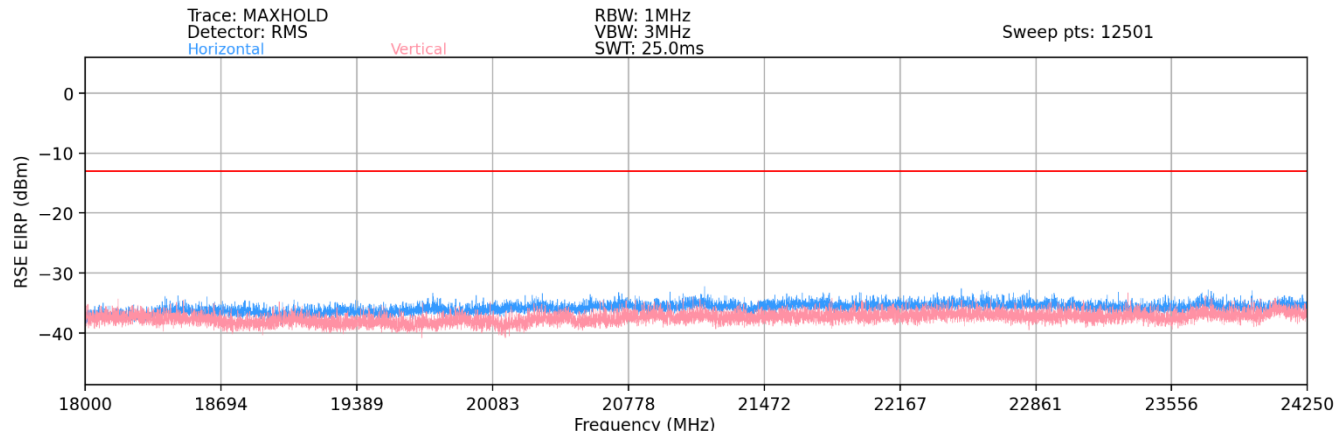
Table 7-48. Ant 1 - n258-R1 Radiated Spurious Emissions Table (1GHz - 18GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

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18GHz - 24.25GHz



Plot 7-67. Ant 1 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
18994.05	Low	50	2Tx	QPSK	H	-	-	-43.56	-13.00	-30.56
21606.62	Mid	50	2Tx	QPSK	H	-	-	-41.50	-13.00	-28.50
23437.57	High	50	2Tx	QPSK	H	-	-	-41.56	-13.00	-28.56

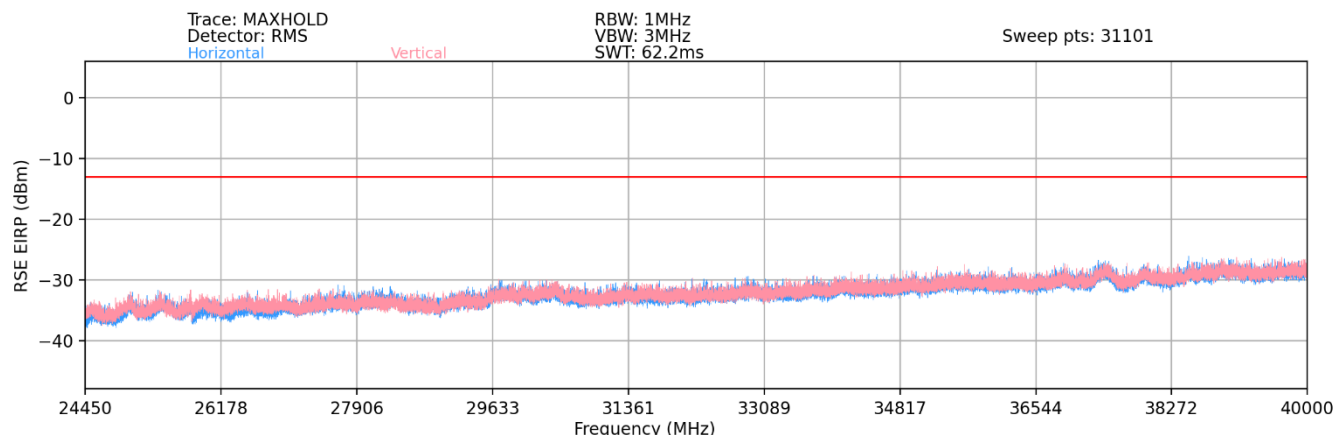
Table 7-49. Ant 1 - n258-R1 Radiated Spurious Emissions Table (18GHz - 24.25GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

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24.45GHz - 40GHz



Plot 7-68. Ant 1 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
28296.42	Low	50	2Tx	QPSK	H	-	-	-40.31	-13.00	-27.31
32187.57	Mid	50	2Tx	QPSK	H	-	-	-36.64	-13.00	-23.64
38545.32	High	50	2Tx	QPSK	H	-	-	-30.41	-13.00	-17.41

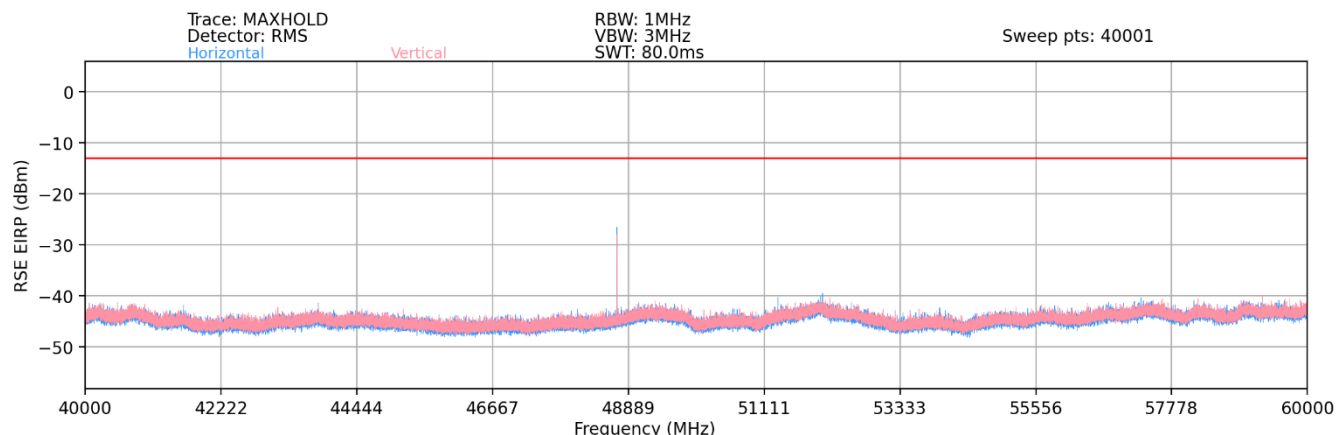
Table 7-50. Ant 1 - n258-R1 Radiated Spurious Emissions Table (24.45GHz - 40GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter

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40GHz - 60GHz



Plot 7-69. Ant 1 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
48550.08	Low	50	2Tx	QPSK	H	205	337	-26.58	-13.00	-13.58
48699.84	Mid	50	2Tx	QPSK	H	213	324	-27.01	-13.00	-14.01
48849.84	High	50	2Tx	QPSK	H	205	332	-28.34	-13.00	-15.34

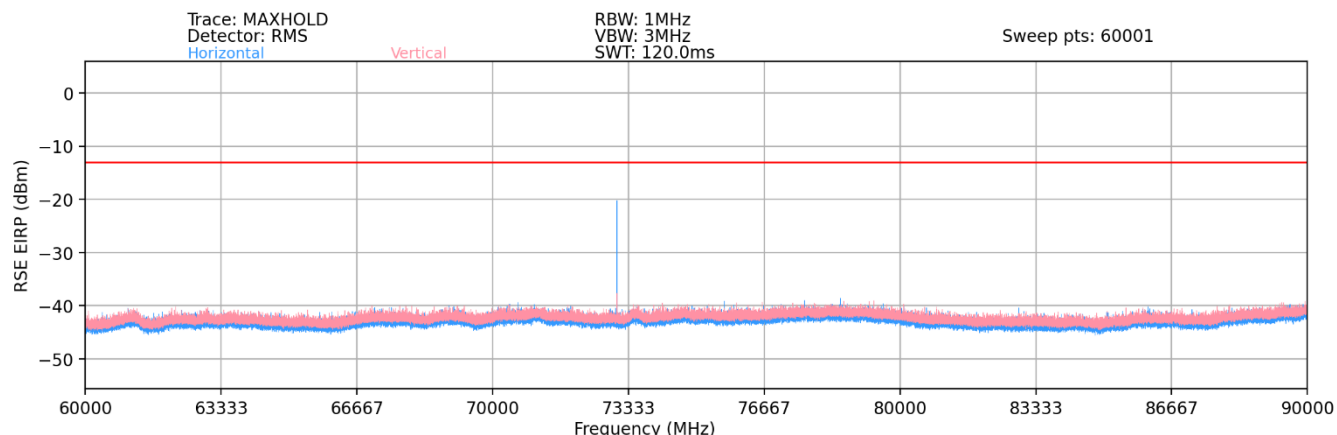
Table 7-51. Ant 1 - n258-R1 Radiated Spurious Emissions Table (40GHz - 60GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1.5 meter.

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60GHz - 90GHz



Plot 7-70. Ant 1 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
* 72825.12	Low	50	2Tx	QPSK	H	80	42	-24.54	-13.00	-11.54
* 73049.76	Mid	50	2Tx	QPSK	H	80	42	-25.04	-13.00	-12.04
* 73274.76	High	50	2Tx	QPSK	H	80	49	-23.26	-13.00	-10.26

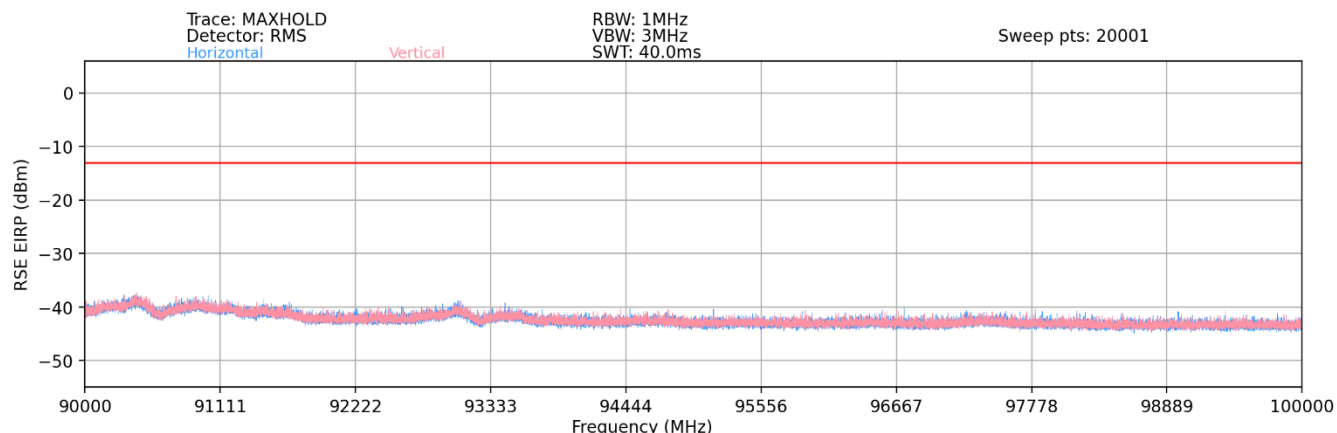
Table 7-52. Ant 1 - n258-R1 Radiated Spurious Emissions Table (60GHz - 90GHz)

Notes

- 1) The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
- 2) Rows marked with * indicate a spurious emission level that was measured using the Spherical Grid TRP Method per KDB 842590.

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90GHz - 100GHz



Plot 7-71. Ant 1 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
97100.16	Low	50	2Tx	QPSK	H	-	-	-41.70	-13.00	-28.70
97399.68	Mid	50	2Tx	QPSK	H	-	-	-42.34	-13.00	-29.34
97699.68	High	50	2Tx	QPSK	H	-	-	-42.52	-13.00	-29.52

Table 7-53. Ant 1 - n258-R1 Radiated Spurious Emissions Table (90GHz - 100GHz)

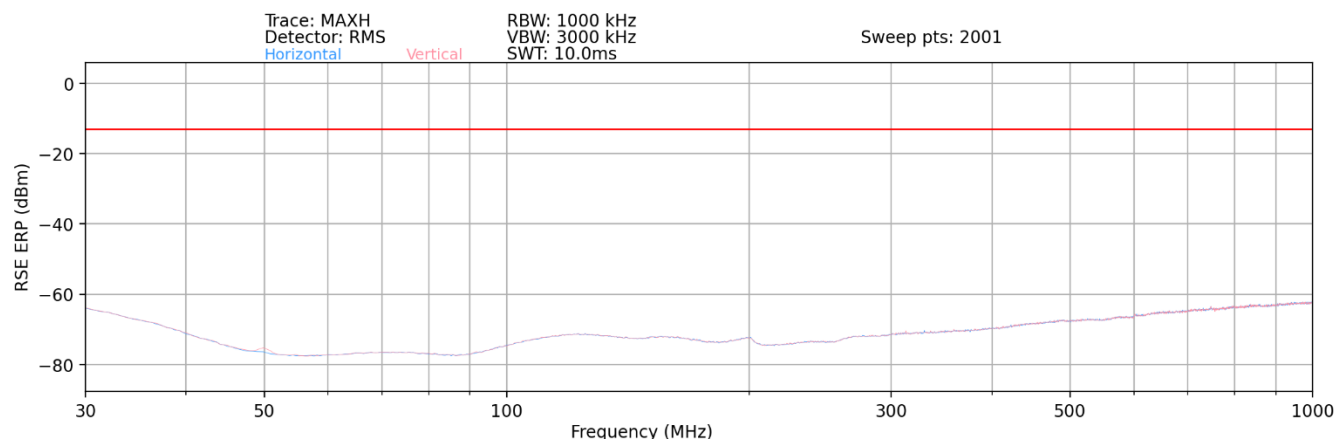
Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

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Band n258-R1 – Ant 2

30MHz - 1GHz



Plot 7-72. Ant 2 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
248.46	Low	50	2Tx	QPSK	H	-	-	-71.67	-13.00	-58.67
640.07	Mid	50	2Tx	QPSK	H	-	-	-61.98	-13.00	-48.98
772.81	High	50	2Tx	QPSK	H	-	-	-61.62	-13.00	-48.62

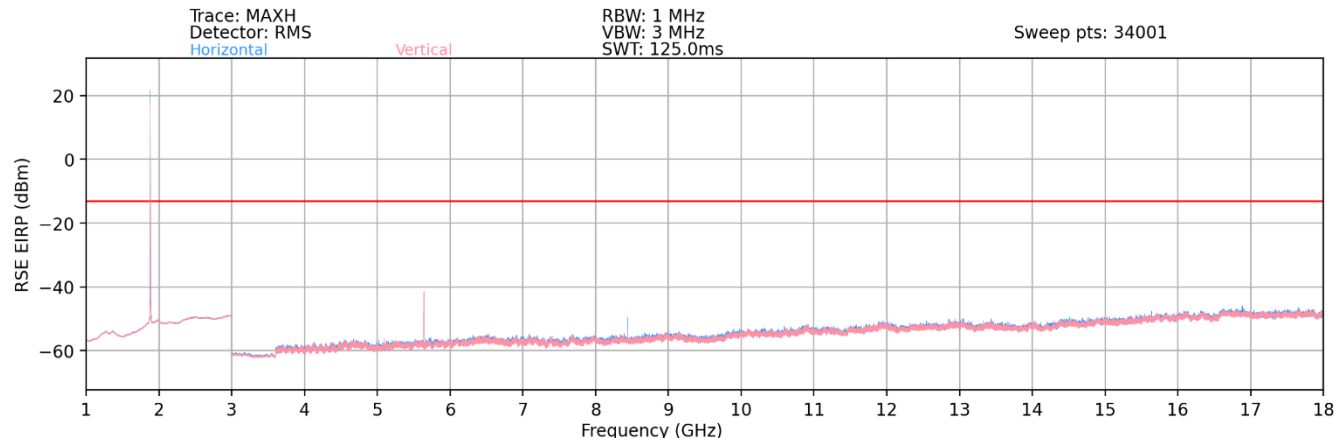
Table 7-54. Ant 2 - n258-R1 Radiated Spurious Emissions Table (30MHz - 1GHz)

Notes

The RSE ERP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

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1GHz - 18GHz



Plot 7-73. Ant 2 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3991.15	Low	50	2Tx	QPSK	H	-	-	-61.90	-13.00	-48.90
8442.00	Mid	50	2Tx	QPSK	H	29	123	-48.50	-13.00	-35.50
13003.84	High	50	2Tx	QPSK	H	-	-	-54.47	-13.00	-41.47

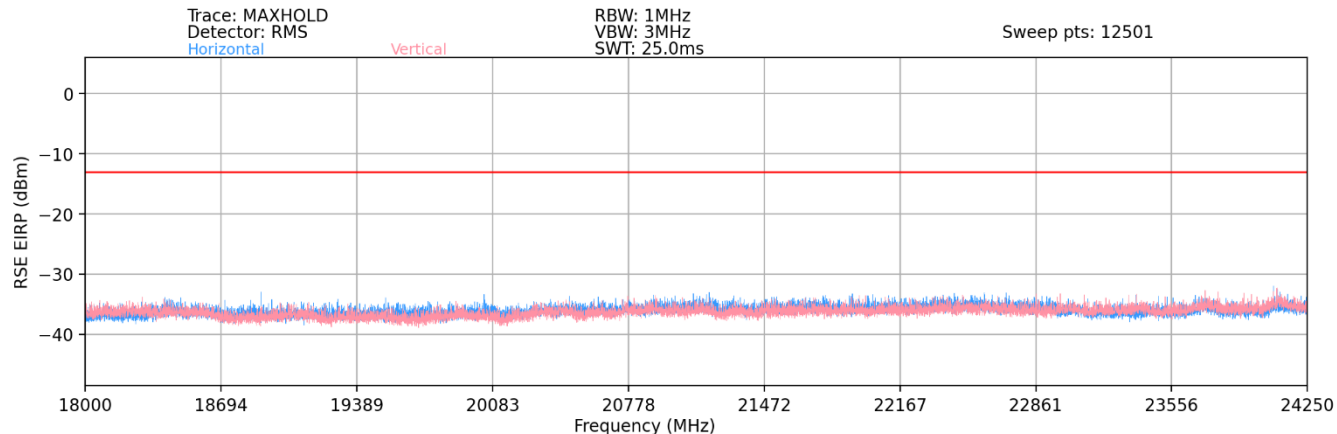
Table 7-55. Ant 2 - n258-R1 Radiated Spurious Emissions Table (1GHz - 18GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

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18GHz - 24.25GHz



Plot 7-74. Ant 2 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
19577.39	Low	50	2Tx	QPSK	V	-	-	-46.23	-13.00	-33.23
21123.28	Mid	50	2Tx	QPSK	V	-	-	-43.34	-13.00	-30.34
23828.32	High	50	2Tx	QPSK	V	-	-	-41.62	-13.00	-28.62

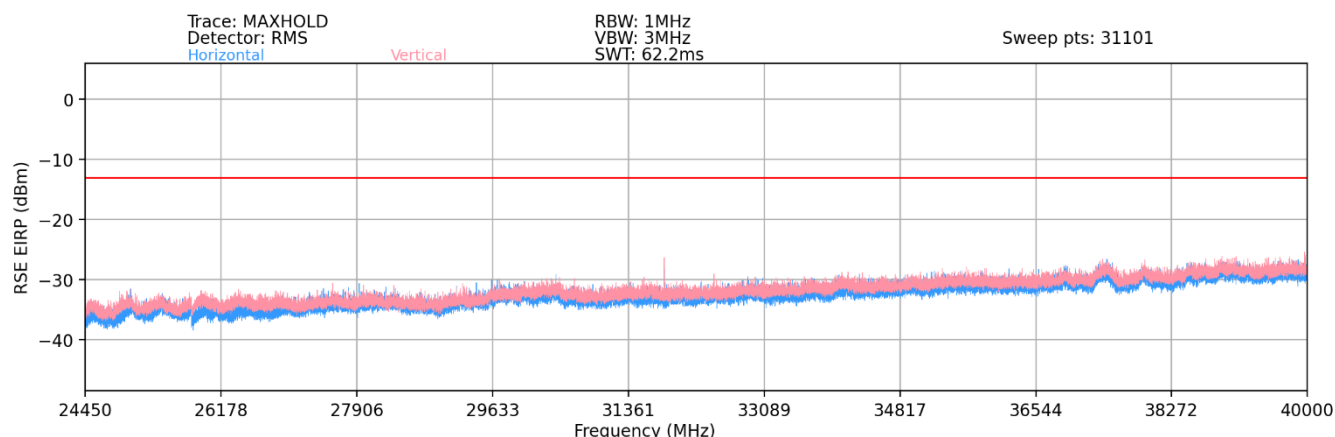
Table 7-56. Ant 2 - n258-R1 Radiated Spurious Emissions Table (18GHz - 24.25GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

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24.45GHz - 40GHz



Plot 7-75. Ant 2 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
31816.80	Low	50	2Tx	QPSK	V	16	0	-28.47	-13.00	-15.47
31816.80	Mid	50	2Tx	QPSK	V	16	351	-28.74	-13.00	-15.74
31816.80	High	50	2Tx	QPSK	V	16	359	-28.53	-13.00	-15.53

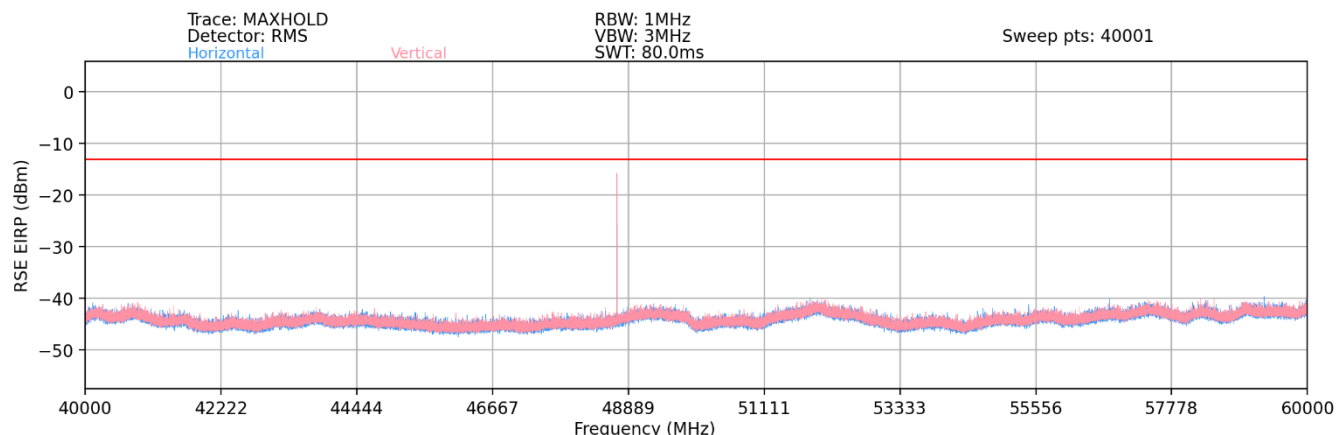
Table 7-57. Ant 2 - n258-R1 Radiated Spurious Emissions Table (24.45GHz - 40GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter

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40GHz - 60GHz



Plot 7-76. Ant 2 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
48550.08	Low	50	2Tx	QPSK	V	12	348	-18.25	-13.00	-5.25
48699.84	Mid	50	2Tx	QPSK	V	13	340	-17.30	-13.00	-4.30
48849.84	High	50	2Tx	QPSK	V	13	340	-16.82	-13.00	-3.82

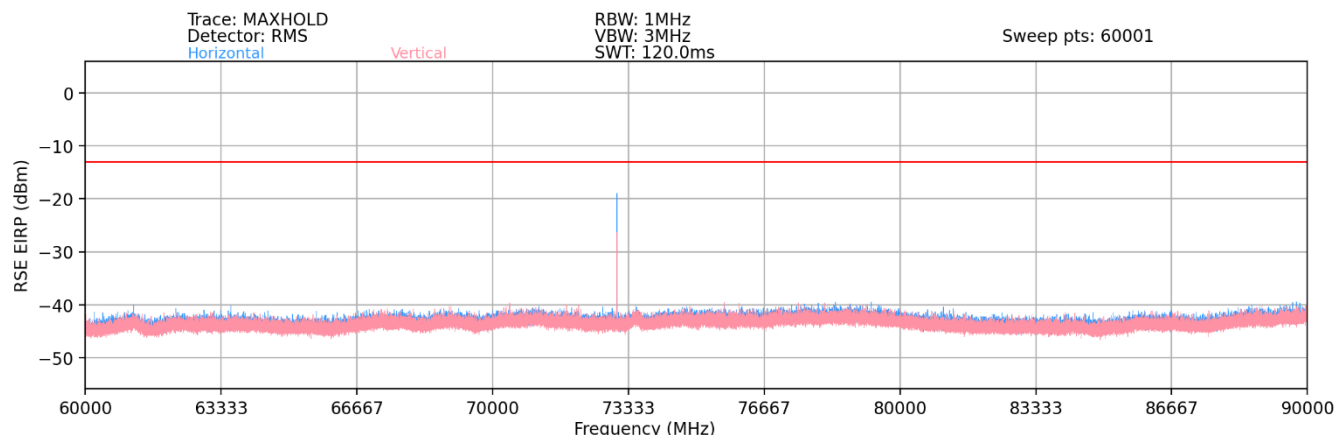
Table 7-58. Ant 2 - n258-R1 Radiated Spurious Emissions Table (40GHz - 60GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1.5 meter.

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60GHz - 90GHz



Plot 7-77. Ant 2 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
72825.12	Low	50	2Tx	QPSK	V	6	13	-17.89	-13.00	-4.89
* 73049.76	Mid	50	2Tx	QPSK	V	70	224	-26.00	-13.00	-13.00
73274.76	High	50	2Tx	QPSK	V	6	36	-16.37	-13.00	-3.37

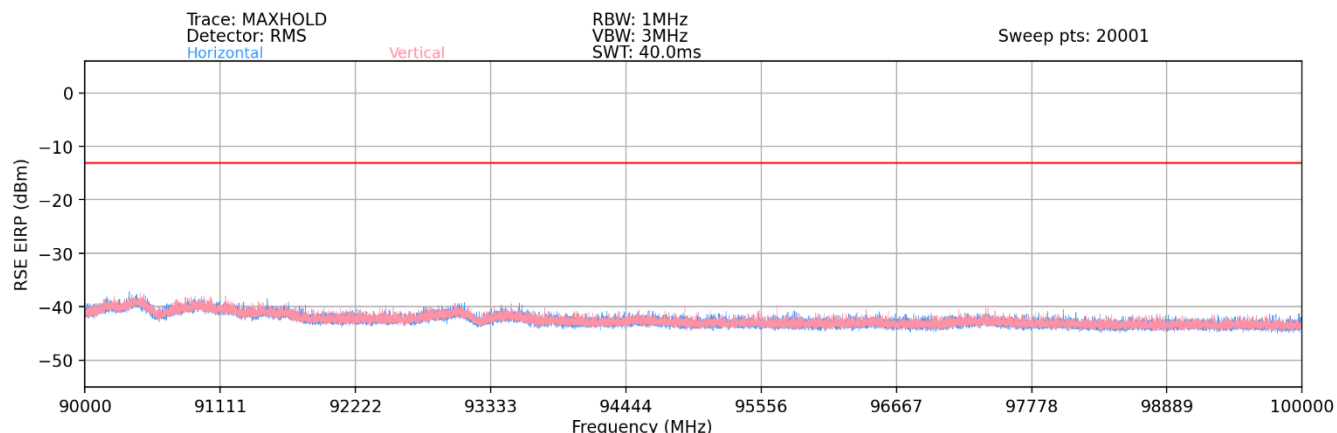
Table 7-59. Ant 2 - n258-R1 Radiated Spurious Emissions Table (60GHz - 90GHz)

Notes

- 1) The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
- 2) Rows marked with * indicate a spurious emission level that was measured using the Spherical Grid TRP Method per KDB 842590.

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90GHz - 100GHz



Plot 7-78. Ant 2 - n258-R1 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
97100.16	Low	50	2Tx	QPSK	H	-	-	-41.70	-13.00	-28.70
97399.68	Mid	50	2Tx	QPSK	H	-	-	-42.34	-13.00	-29.34
97699.68	High	50	2Tx	QPSK	H	-	-	-42.52	-13.00	-29.52

Table 7-60. Ant 2 - n258-R1 Radiated Spurious Emissions Table (90GHz - 100GHz)

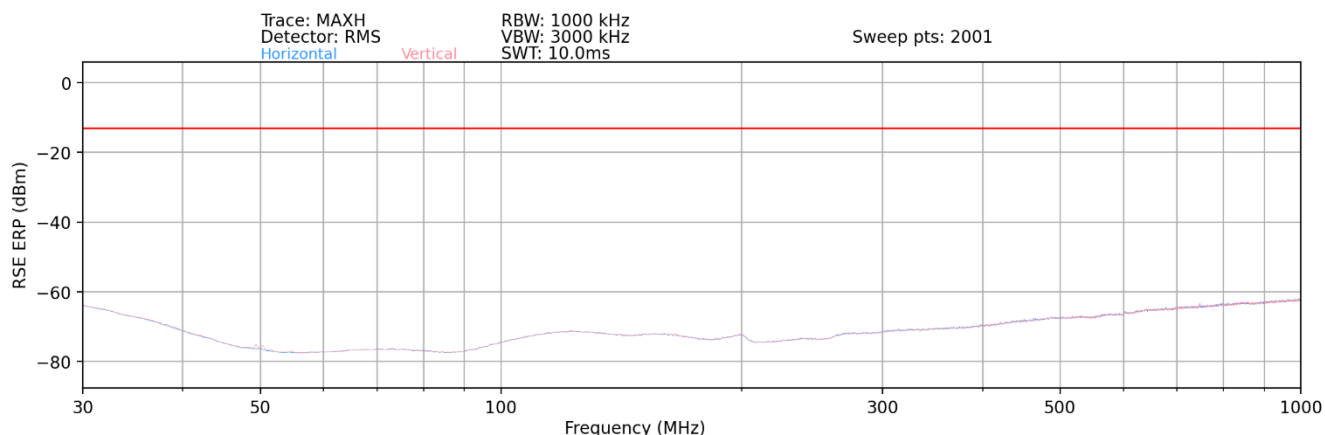
Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

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Band n258-R2 – Ant 1

30MHz - 1GHz



Plot 7-79. Ant 1 - n258-R2 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
287.00	Low	50	2Tx	QPSK	H	-	-	-72.78	-13.00	-59.78
486.00	Mid	50	2Tx	QPSK	H	-	-	-66.13	-13.00	-53.13
748.31	High	50	2Tx	QPSK	H	148	156	-60.94	-13.00	-47.94

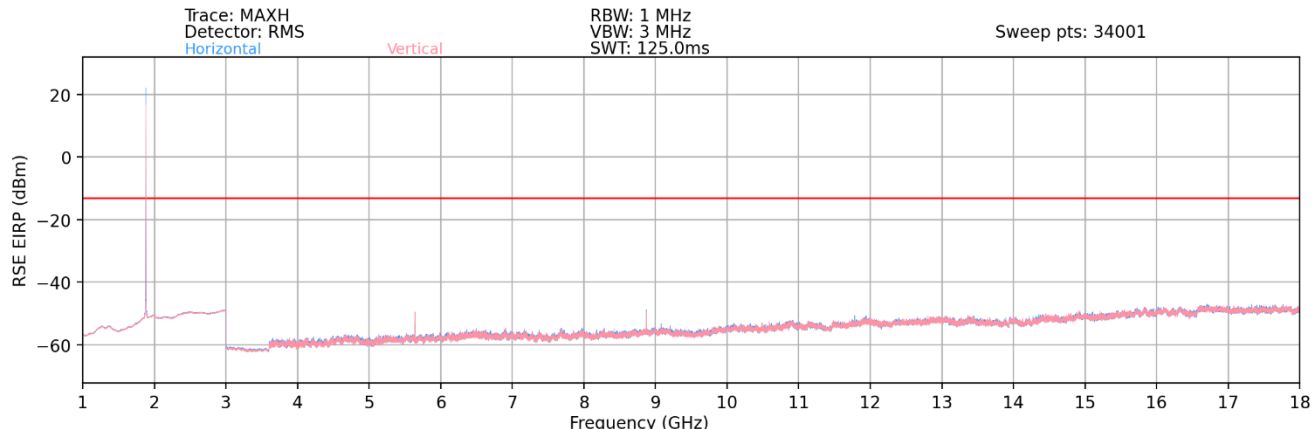
Table 7-61. Ant 1 - n258-R2 Radiated Spurious Emissions Table (30MHz - 1GHz)

Notes

The RSE ERP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

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1GHz - 18GHz



Plot 7-80. Ant 1 - n258-R2 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown for a test distance of 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5640.00	Low	50	2Tx	QPSK	V	28	150	-39.24	-13.00	-26.24
8872.10	Mid	50	2Tx	QPSK	V	318	277	-48.21	-13.00	-35.21
11800.00	High	50	2Tx	QPSK	V	-	-	-56.76	-13.00	-43.76

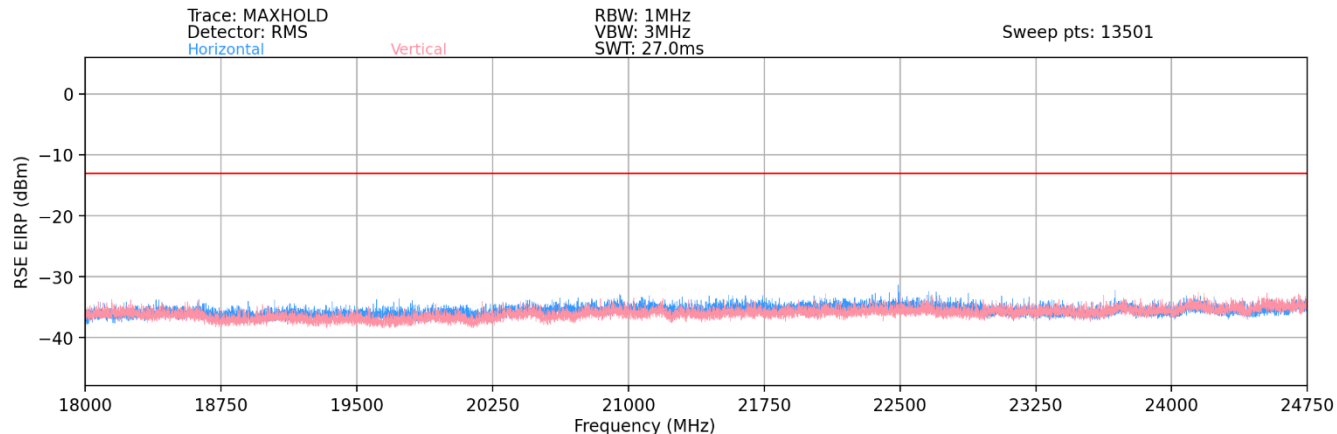
Table 7-62. Ant 1 - n258-R2 Radiated Spurious Emissions Table (1GHz - 18GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

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18GHz - 24.75GHz



Plot 7-81. Ant 1 - n258-R2 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
20116.22	Low	50	2Tx	QPSK	H	-	-	-41.05	-13.00	-28.05
21606.63	Mid	50	2Tx	QPSK	H	-	-	-42.10	-13.00	-29.10
23548.60	High	50	2Tx	QPSK	H	-	-	-41.62	-13.00	-28.62

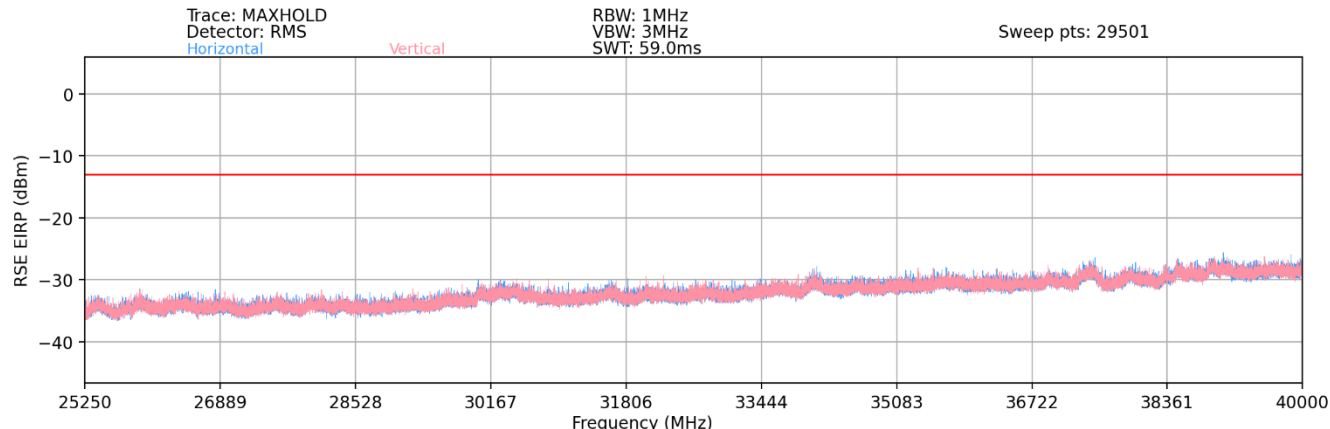
Table 7-63. Ant 1 - n258-R2 Radiated Spurious Emissions Table (18GHz - 24.75GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

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25.25GHz - 40GHz



Plot 7-82. Ant 1 - n258-R2 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth [MHz]	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
28859.30	Low	50	2Tx	QPSK	H	-	-	-38.40	-13.00	-25.40
34565.95	Mid	50	2Tx	QPSK	H	-	-	-36.32	-13.00	-23.32
38609.30	High	50	2Tx	QPSK	H	-	-	-34.23	-13.00	-21.23

Table 7-64. Ant 1 - n258-R2 Radiated Spurious Emissions Table (25.25GHz - 40GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter

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