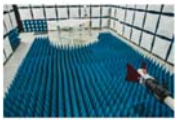
PCTEST
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.pctest.com



MEASUREMENT REPORT
FCC Part 30 5G mmWave

Applicant Name:
LG Electronics USA, Inc.
111 Sylvan Avenue, North Building
Englewood Cliffs, NJ 07632
United States

Date of Testing:
6/2/2020-7/28/2020
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M2004230076-07.ZNF

FCC ID:	**ZNFG900VM**
APPLICANT:	**LG Electronics USA, Inc.**

Application Type:	Certification
Model:	LM-G900VM
Additional Models:	LMG900VM, G900VM, LM-G900QM6, LMG900QM6, G900QM6, LM-G902V, LMG902V, G902V
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 v01r01

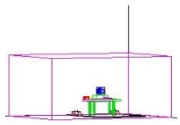
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

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.

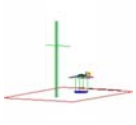
Randy Ortanez
President

ACCREDITED
CERT #2041.01

TABLE OF CONTENTS



MEASUREMENT REPORT
FCC Part 30



Antenna	Mode	Bandwidth (MHz)	CCs Active	Band	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
						Max. Power (W)	Max. Power (dBm)		
Ant1	MIMO	50	1	n261	27500 - 28350	0.347	25.40	-	QPSK
Ant1	MIMO	50	1	n261	27500 - 28350	0.317	25.01	-	π/2 BPSK
Ant1	MIMO	50	1	n261	27500 - 28350	0.248	23.94	-	16QAM
Ant1	MIMO	50	1	n261	27500 - 28350	0.169	22.27	-	64QAM
Ant1	SISO	50	1	n261	27500 - 28350	0.185	22.68	-	QPSK
Ant1	SISO	50	2	n261	27500 - 28350	0.063	18.01	-	QPSK
Ant1	MIMO	50	2	n261	27500 - 28350	0.062	17.93	-	π/2 BPSK
Ant1	MIMO	50	2	n261	27500 - 28350	0.049	16.86	-	16QAM
Ant1	MIMO	50	2	n261	27500 - 28350	0.030	14.75	-	64QAM
Ant1	MIMO	100	1	n261	27500 - 28350	0.340	25.31	-	QPSK
Ant1	MIMO	100	1	n261	27500 - 28350	0.308	24.89	-	π/2 BPSK
Ant1	MIMO	100	1	n261	27500 - 28350	0.243	23.86	-	16QAM
Ant1	MIMO	100	1	n261	27500 - 28350	0.160	22.04	-	64QAM
Ant1	SISO	100	1	n261	27500 - 28350	0.162	22.10	-	QPSK
Ant1	SISO	100	2	n261	27500 - 28350	0.067	18.28	-	QPSK
Ant1	MIMO	100	2	n261	27500 - 28350	0.061	17.82	-	π/2 BPSK
Ant1	MIMO	100	2	n261	27500 - 28350	0.047	16.70	-	16QAM
Ant1	MIMO	100	2	n261	27500 - 28350	0.034	15.29	-	64QAM

EUT Overview (QTM0 / Ant1 - Band n261)

Antenna	Mode	Bandwidth (MHz)	CCs Active	Band	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
						Max. Power (W)	Max. Power (dBm)		
Ant2	MIMO	50	1	n261	27500 - 28350	0.469	26.71	-	QPSK
Ant2	MIMO	50	1	n261	27500 - 28350	0.388	25.89	-	π/2 BPSK
Ant2	MIMO	50	1	n261	27500 - 28350	0.286	24.56	-	16QAM
Ant2	MIMO	50	1	n261	27500 - 28350	0.170	22.31	-	64QAM
Ant2	SISO	50	1	n261	27500 - 28350	0.270	24.31	-	QPSK
Ant2	SISO	50	2	n261	27500 - 28350	0.067	18.24	-	QPSK
Ant2	MIMO	50	2	n261	27500 - 28350	0.056	17.46	-	π/2 BPSK
Ant2	MIMO	50	2	n261	27500 - 28350	0.043	16.33	-	16QAM
Ant2	MIMO	50	2	n261	27500 - 28350	0.032	15.08	-	64QAM
Ant2	MIMO	100	1	n261	27500 - 28350	0.437	26.40	-	QPSK
Ant2	MIMO	100	1	n261	27500 - 28350	0.401	26.03	-	π/2 BPSK
Ant2	MIMO	100	1	n261	27500 - 28350	0.326	25.13	-	16QAM
Ant2	MIMO	100	1	n261	27500 - 28350	0.194	22.87	-	64QAM
Ant2	SISO	100	1	n261	27500 - 28350	0.265	24.23	-	QPSK
Ant2	SISO	100	2	n261	27500 - 28350	0.069	18.36	-	QPSK
Ant2	MIMO	100	2	n261	27500 - 28350	0.067	18.29	-	π/2 BPSK
Ant2	MIMO	100	2	n261	27500 - 28350	0.054	17.30	-	16QAM
Ant2	MIMO	100	2	n261	27500 - 28350	0.037	15.73	-	64QAM

EUT Overview (QTM1 / Ant2 - Band n261)

Antenna	Mode	Bandwidth (MHz)	CCs Active	Band	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
						Max. Power (W)	Max. Power (dBm)		
Ant3	MIMO	50	1	n261	27500 - 28350	0.427	26.30	45M3G7D	QPSK
Ant3	MIMO	50	1	n261	27500 - 28350	0.299	24.76	45M6G7D	π/2 BPSK
Ant3	MIMO	50	1	n261	27500 - 28350	0.227	23.56	45M4W7D	16QAM
Ant3	MIMO	50	1	n261	27500 - 28350	0.128	21.07	45M2W7D	64QAM
Ant3	SISO	50	1	n261	27500 - 28350	0.182	22.61	-	QPSK
Ant3	SISO	50	2	n261	27500 - 28350	0.058	17.64	94M8G7D	QPSK
Ant3	MIMO	50	2	n261	27500 - 28350	0.056	17.51	94M5G7D	π/2 BPSK
Ant3	MIMO	50	2	n261	27500 - 28350	0.043	16.38	94M5W7D	16QAM
Ant3	MIMO	50	2	n261	27500 - 28350	0.026	14.08	94M7W7D	64QAM
Ant3	MIMO	100	1	n261	27500 - 28350	0.415	26.18	93M2G7D	QPSK
Ant3	MIMO	100	1	n261	27500 - 28350	0.395	25.97	90M4G7D	π/2 BPSK
Ant3	MIMO	100	1	n261	27500 - 28350	0.304	24.83	93M0W7D	16QAM
Ant3	MIMO	100	1	n261	27500 - 28350	0.200	23.01	92M9W7D	64QAM
Ant3	SISO	100	1	n261	27500 - 28350	0.187	22.71	-	QPSK
Ant3	SISO	100	2	n261	27500 - 28350	0.058	17.62	189MG7D	QPSK
Ant3	MIMO	100	2	n261	27500 - 28350	0.057	17.53	189MG7D	π/2 BPSK
Ant3	MIMO	100	2	n261	27500 - 28350	0.044	16.48	189MW7D	16QAM
Ant3	MIMO	100	2	n261	27500 - 28350	0.030	14.83	189MW7D	64QAM

EUT Overview (QTM2 / Ant3 - Band n261)

Antenna	Mode	Bandwidth (MHz)	CCs Active	Band	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
						Max. Power (W)	Max. Power (dBm)		
Ant1	MIMO	50	1	n260	37000-40000	0.189	22.77	-	QPSK
Ant1	MIMO	50	1	n260	37000-40000	0.184	22.64	-	π/2 BPSK
Ant1	MIMO	50	1	n260	37000-40000	0.137	21.38	-	16QAM
Ant1	MIMO	50	1	n260	37000-40000	0.083	19.20	-	64QAM
Ant1	SISO	50	1	n260	37000-40000	0.109	20.39	-	QPSK
Ant1	SISO	50	2	n260	37000-40000	0.050	17.01	-	QPSK
Ant1	MIMO	50	2	n260	37000-40000	0.049	16.86	-	π/2 BPSK
Ant1	MIMO	50	2	n260	37000-40000	0.034	15.28	-	16QAM
Ant1	MIMO	50	2	n260	37000-40000	0.023	13.67	-	64QAM
Ant1	MIMO	100	1	n260	37000-40000	0.181	22.57	-	QPSK
Ant1	MIMO	100	1	n260	37000-40000	0.180	22.55	-	π/2 BPSK
Ant1	MIMO	100	1	n260	37000-40000	0.134	21.27	-	16QAM
Ant1	MIMO	100	1	n260	37000-40000	0.087	19.39	-	64QAM
Ant1	SISO	100	1	n260	37000-40000	0.106	20.26	-	QPSK
Ant1	SISO	100	2	n260	37000-40000	0.049	16.87	-	QPSK
Ant1	MIMO	100	2	n260	37000-40000	0.045	16.52	-	π/2 BPSK
Ant1	MIMO	100	2	n260	37000-40000	0.034	15.37	-	16QAM
Ant1	MIMO	100	2	n260	37000-40000	0.024	13.86	-	64QAM

EUT Overview (QTM0 / Ant1 - Band n260)

Antenna	Mode	Bandwidth (MHz)	CCs Active	Band	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
						Max. Power (W)	Max. Power (dBm)		
Ant2	MIMO	50	1	n260	37000-40000	0.258	24.12	-	QPSK
Ant2	MIMO	50	1	n260	37000-40000	0.203	23.08	-	π/2 BPSK
Ant2	MIMO	50	1	n260	37000-40000	0.164	22.16	-	16QAM
Ant2	MIMO	50	1	n260	37000-40000	0.103	20.11	-	64QAM
Ant2	SISO	50	1	n260	37000-40000	0.200	23.01	-	QPSK
Ant2	SISO	50	2	n260	37000-40000	0.074	18.72	-	QPSK
Ant2	MIMO	50	2	n260	37000-40000	0.073	18.63	-	π/2 BPSK
Ant2	MIMO	50	2	n260	37000-40000	0.057	17.54	-	16QAM
Ant2	MIMO	50	2	n260	37000-40000	0.039	15.86	-	64QAM
Ant2	MIMO	100	1	n260	37000-40000	0.238	23.77	-	QPSK
Ant2	MIMO	100	1	n260	37000-40000	0.208	23.19	-	π/2 BPSK
Ant2	MIMO	100	1	n260	37000-40000	0.165	22.18	-	16QAM
Ant2	MIMO	100	1	n260	37000-40000	0.101	20.03	-	64QAM
Ant2	SISO	100	1	n260	37000-40000	0.199	22.98	-	QPSK
Ant2	SISO	100	2	n260	37000-40000	0.078	18.93	-	QPSK
Ant2	MIMO	100	2	n260	37000-40000	0.077	18.86	-	π/2 BPSK
Ant2	MIMO	100	2	n260	37000-40000	0.058	17.62	-	16QAM
Ant2	MIMO	100	2	n260	37000-40000	0.036	15.61	-	64QAM

EUT Overview (QTM1 / Ant2 - Band n260)

Antenna	Mode	Bandwidth (MHz)	CCs Active	Band	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
						Max. Power (W)	Max. Power (dBm)		
Ant3	MIMO	50	1	n260	37000-40000	0.192	22.84	45M2G7D	QPSK
Ant3	MIMO	50	1	n260	37000-40000	0.187	22.73	45M5G7D	π/2 BPSK
Ant3	MIMO	50	1	n260	37000-40000	0.147	21.67	45M4W7D	16QAM
Ant3	MIMO	50	1	n260	37000-40000	0.083	19.20	45M3W7D	64QAM
Ant3	SISO	50	1	n260	37000-40000	0.080	19.05	-	QPSK
Ant3	SISO	50	2	n260	37000-40000	0.056	17.51	93M9G7D	QPSK
Ant3	MIMO	50	2	n260	37000-40000	0.056	17.49	93M6G7D	π/2 BPSK
Ant3	MIMO	50	2	n260	37000-40000	0.043	16.29	93M0W7D	16QAM
Ant3	MIMO	50	2	n260	37000-40000	0.029	14.64	94M3W7D	64QAM
Ant3	MIMO	100	1	n260	37000-40000	0.181	22.57	91M0G7D	QPSK
Ant3	MIMO	100	1	n260	37000-40000	0.175	22.43	90M8G7D	π/2 BPSK
Ant3	MIMO	100	1	n260	37000-40000	0.137	21.38	90M9W7D	16QAM
Ant3	MIMO	100	1	n260	37000-40000	0.085	19.31	91M3W7D	64QAM
Ant3	SISO	100	1	n260	37000-40000	0.083	19.17	-	QPSK
Ant3	SISO	100	2	n260	37000-40000	0.061	17.82	191MG7D	QPSK
Ant3	MIMO	100	2	n260	37000-40000	0.059	17.68	189MG7D	π/2 BPSK
Ant3	MIMO	100	2	n260	37000-40000	0.045	16.54	190MW7D	16QAM
Ant3	MIMO	100	2	n260	37000-40000	0.030	14.83	191MW7D	64QAM

EUT Overview (QTM2 / Ant3 - Band n260)

Note: Occupied Bandwiths were measured on one patch antenna.

1.0 INTRODUCTION

1.1 Scope

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

1.2 PCTEST Test Location

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

1.3 Test Facility / Accreditations

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

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.

- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).

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

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFG900VM**. The test data contained in this report pertains only to the emissions due to the EUT's 5G mmWave function.

The EUT contains 3 patch antennas, referred to herein as Ant1 (QTM0), Ant2 (QTM1), and Ant3 (QTM2). Each of the patch 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 8CC for DL, and 2CC for UL. For each CC, the EUT supports both 50MHz bandwidth and 100MHz bandwidth. For modulation, 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.

Antenna	Name
Ant1	QTM0
Ant2	QTM1
Ant3	QTM2

Test Device Serial No.: 00797, 00771

2.2 Device Capabilities

This device contains the following capabilities:
CDMA/1xRTT/EVDO, GSM/GPRS/EDGE, WCDMA/HSDPA, LTE, 5G NR sub6/mmWave, WLAN, UNII, BT(1x, EDR, LE), NFC

2.3 Test Configuration

The EUT was tested per the guidance of KDB 842590 D01 v01r01 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 determine the worst case Beam ID for SISO operation and Beam ID pair for MIMO operation. These Beam ID's were used for final measurements.

All testing was performed using FTM (Factory Test Mode) software to trasmit continuously with a duty cycle of 100%. When implemented out in the field, the EUT will operate with a maximum uplink configuration (i.e., a maximum uplink duty cycle of up to 100%). The FTM software was also used for the EUT operation in the ENDC mode.

2.4 EMI Suppression Device(s)/Modifications

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

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 v01r01 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.

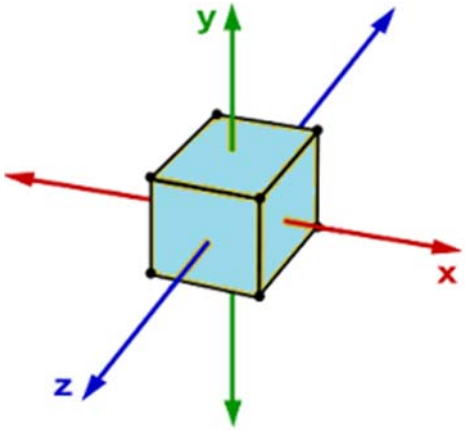


Figure 3-1. Rotation of the EUT Through Three Orthogonal Planes

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 & Measurment 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.

Field Strength [dBμV/m] = Measured Value [dBm] + AFCL [dB/m] + 107

= - 32.74 dBm + (40.7dB/m + 8.78dB) + 107 = 123.74dBuV/m

= 10^(123.74/20)/1000000 = 1.54 V/m

e.i.r.p. [dBm] = 10 * log((E-Field*D_m)^2/30) + 30dB

= 10*log((1.54V/m * 1.00m)^2/30) + 30dB

= 18.98 dBm e.i.r.p.

4.0 MEASUREMENT UNCERTAINTY

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

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

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
Espec	ESX-2CA	Environmental Chamber	6/13/2019	Annual	8/13/2020	17620
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	5/19/2018	Biennial	7/19/2020	A051107
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biennial	2/14/2021	125518
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100040
EMCO	3160-10	Small Horn (26.5 - 40GHz)	8/9/2018	Biennial	8/9/2020	130993
Rohde & Schwarz	TS-PR40	26.5-40 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100037
Agilent	N9030A	PXA Signal Analyzer (44GHz)	6/12/2019	Annual	8/12/2020	MY52350166
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	5/6/2019	Annual	7/6/2020	103200
Anritsu	MS46322A	Vector Network Analyzer	8/19/2019	Annual	8/19/2020	1521001
Anritsu	36585K-2F	Precision Autocal 2-Port	7/16/2019	Annual	7/16/2020	1628014
Virginia Diodes Inc	SAX253	SAX Module (90 - 140GHz)	9/30/2019	Annual	9/30/2020	SAX253
Virginia Diodes Inc	SAX252	SAX Module (60 - 90GHz)	9/30/2019	Annual	9/30/2020	SAX252
Virginia Diodes Inc	SAX411	SAX Module (40 - 60GHz)	10/2/2019	Annual	10/2/2020	SAX411
Virginia Diodes Inc	SAX254	SAX Module (140 - 220GHz)	9/30/2019	Annual	9/30/2020	SAX254
ETS-Lindgren	3116C	DRG Horn Antenna	3/11/2019	Biennial	3/11/2021	218893
OML Inc.	M19RH	WR-19 Horn Antenna, 24dBi, 40 to 60 GHz	7/30/2018	Biennial	7/30/2020	18073001
OML Inc.	M12RH	WR-12 Horn Antenna, 24dBi, 60 to 90 GHz	7/30/2018	Biennial	7/30/2020	18073001
OML Inc.	M08RH	WR-08 Horn Antenna, 24dBi, 90 to 140 GHz	7/30/2018	Biennial	7/30/2020	18073001
OML Inc.	M05RH	WR-05 Horn Antenna, 24dBi, 140 to 220 GHz	7/30/2018	Biennial	7/30/2020	18073001

Table 5-1. Test Equipment

6.0 SAMPLE CALCULATIONS

Emission Designator

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

7.0 TEST RESULTS

7.1 Summary

Company Name: LG Electronics USA, Inc.

FCC ID: ZNFG900VM

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) Per 2.1057(a)(2), spurious emissions were investigated up to 100GHz for n261 and up to 200GHz for n260.
3) The radiated RF output power and all out-of-band emissions in the spurious domain are evaluated to the EIRP limits.
4) “CC” refers to “Component Carriers”.
5) The Beam ID that produced the highest EIRP from simulation data was used for testing.
6) All testing was performed using FTM (Factory Test Mode) software to transmit continuously, this resulted in a 100% duty cycle.
7) The CP-OFDM and DFT-s-OFDM transmission schemes were investigated fully for each test type and only the wost case data is reported herein.

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 v01r01 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 ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

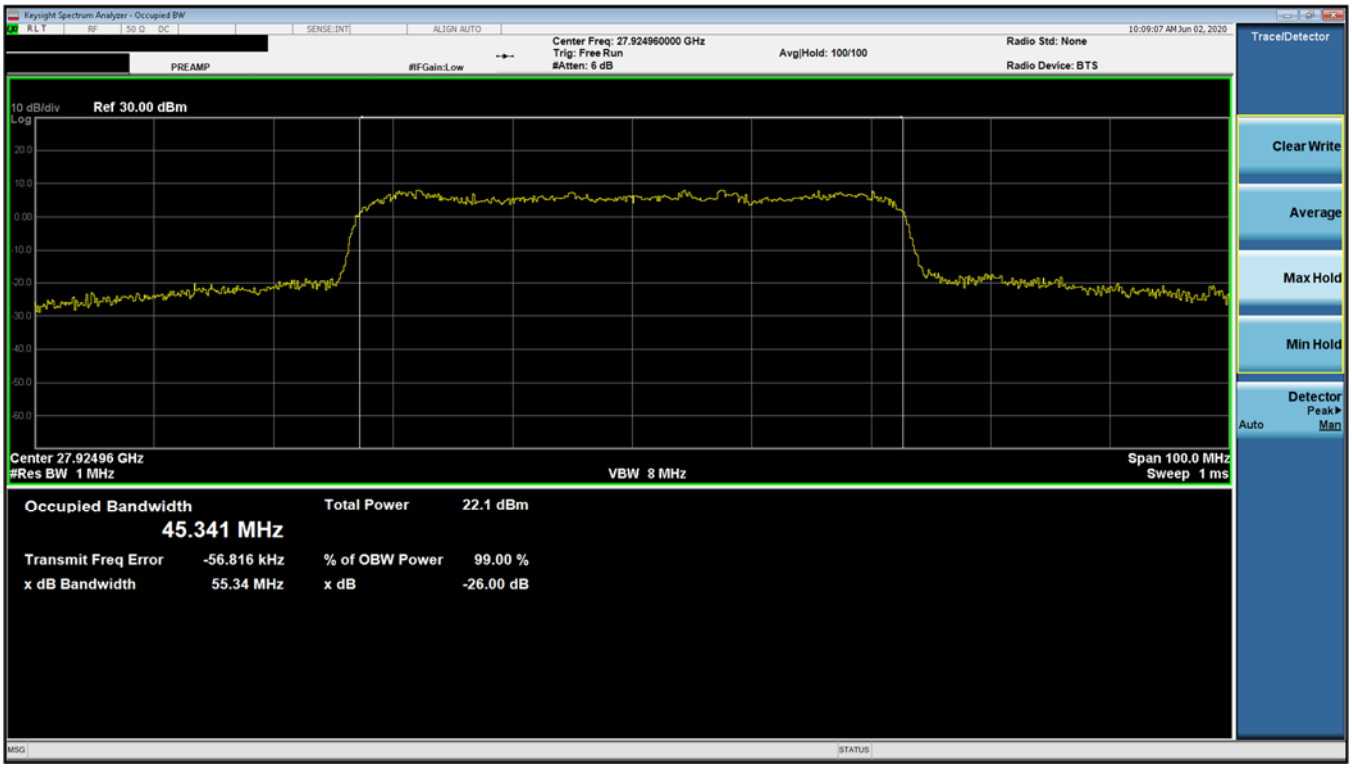
Test Notes

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 for each band.

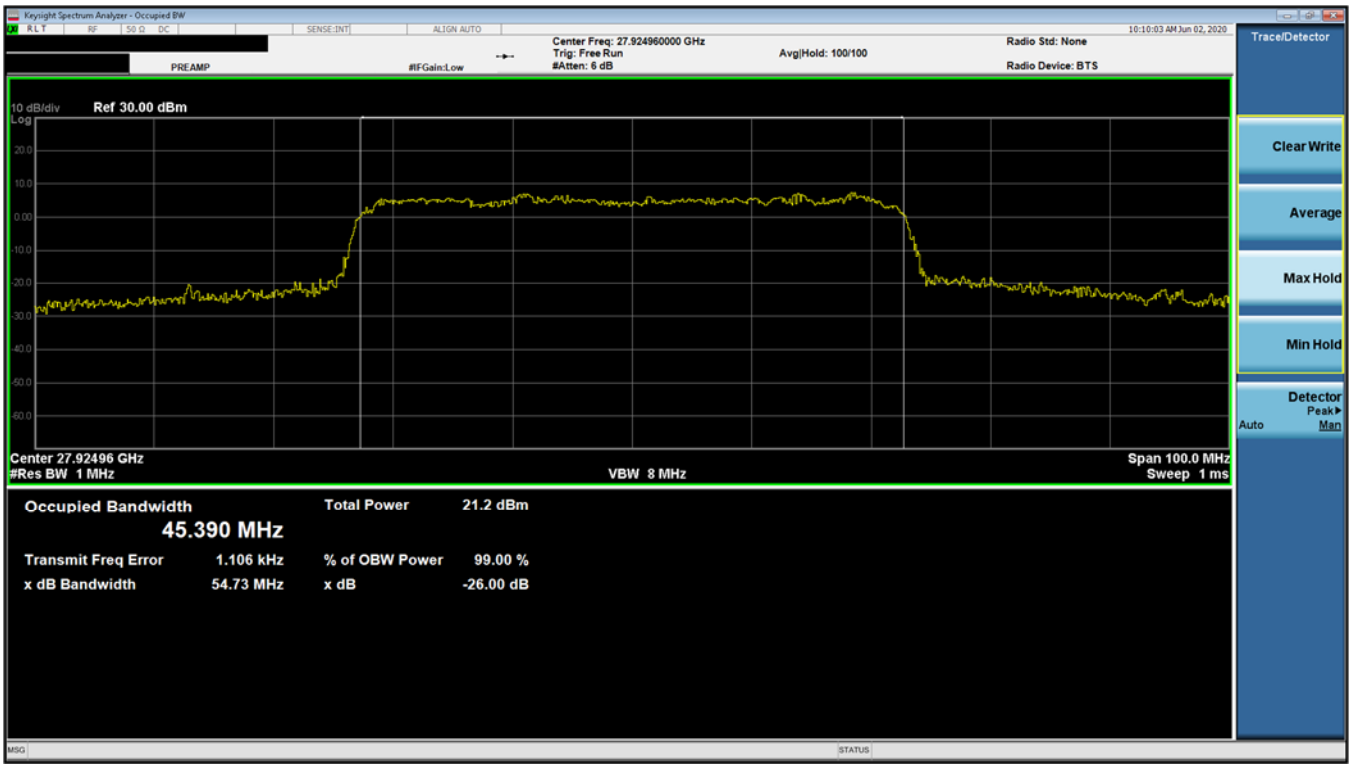
Band n261

Channel	Bandwidth	CCs Active	Transmision Scheme	Modulation	OBW [MHz]
Mid	50	1	CP-OFDM	QPSK	45.341
			CP-OFDM	16QAM	45.390
			CP-OFDM	64QAM	45.229
			DFT-s OFDM	Pi/2 BPSK	45.574
		2	CP-OFDM	QPSK	94.776
			CP-OFDM	16QAM	94.434
			CP-OFDM	64QAM	94.667
			DFT-s OFDM	Pi/2 BPSK	94.494
	100	1	CP-OFDM	QPSK	93.173
			CP-OFDM	16QAM	92.991
			CP-OFDM	64QAM	94.943
			DFT-s OFDM	Pi/2 BPSK	90.378
		2	CP-OFDM	QPSK	189.37
			CP-OFDM	16QAM	189.25
			CP-OFDM	64QAM	189.41
			DFT-s OFDM	Pi/2 BPSK	189.34

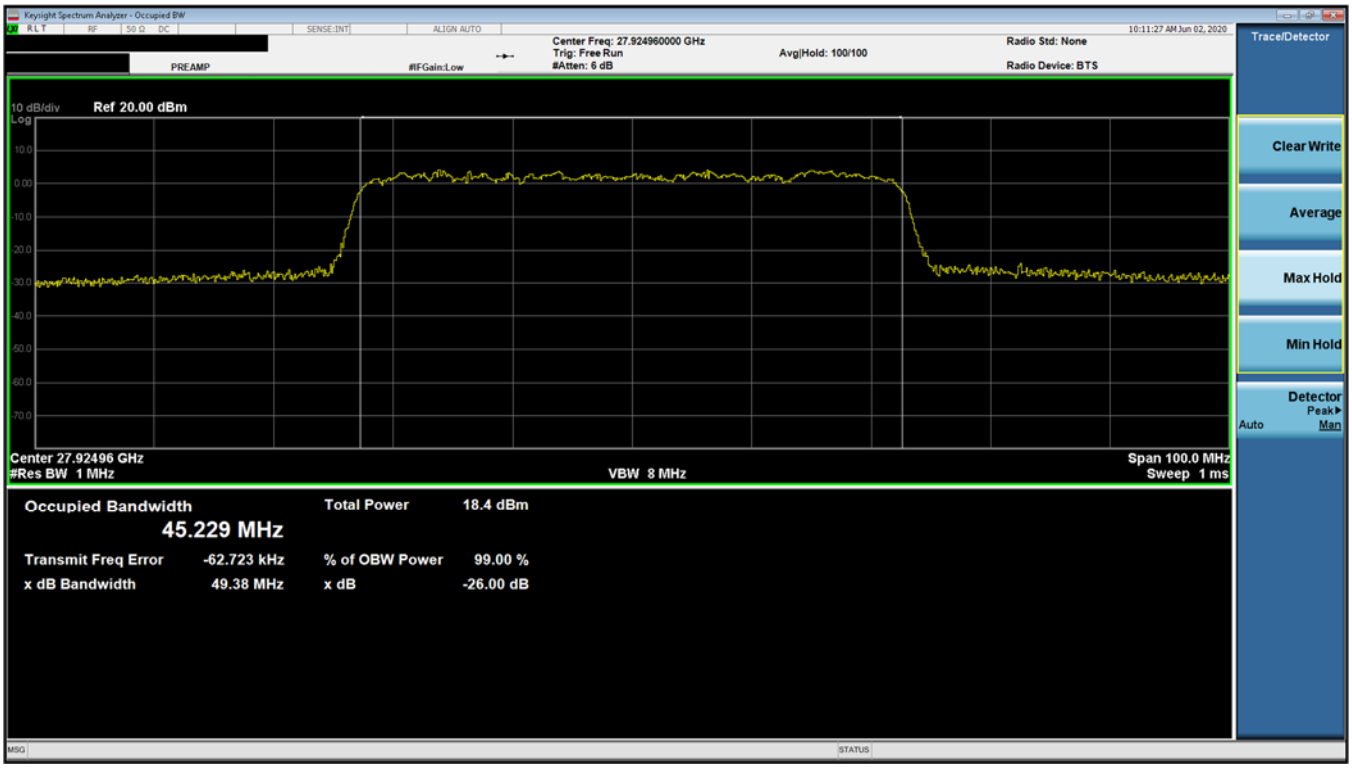
Table 7-2. Summary of Ant 3 Occupied Bandwidths (n261)



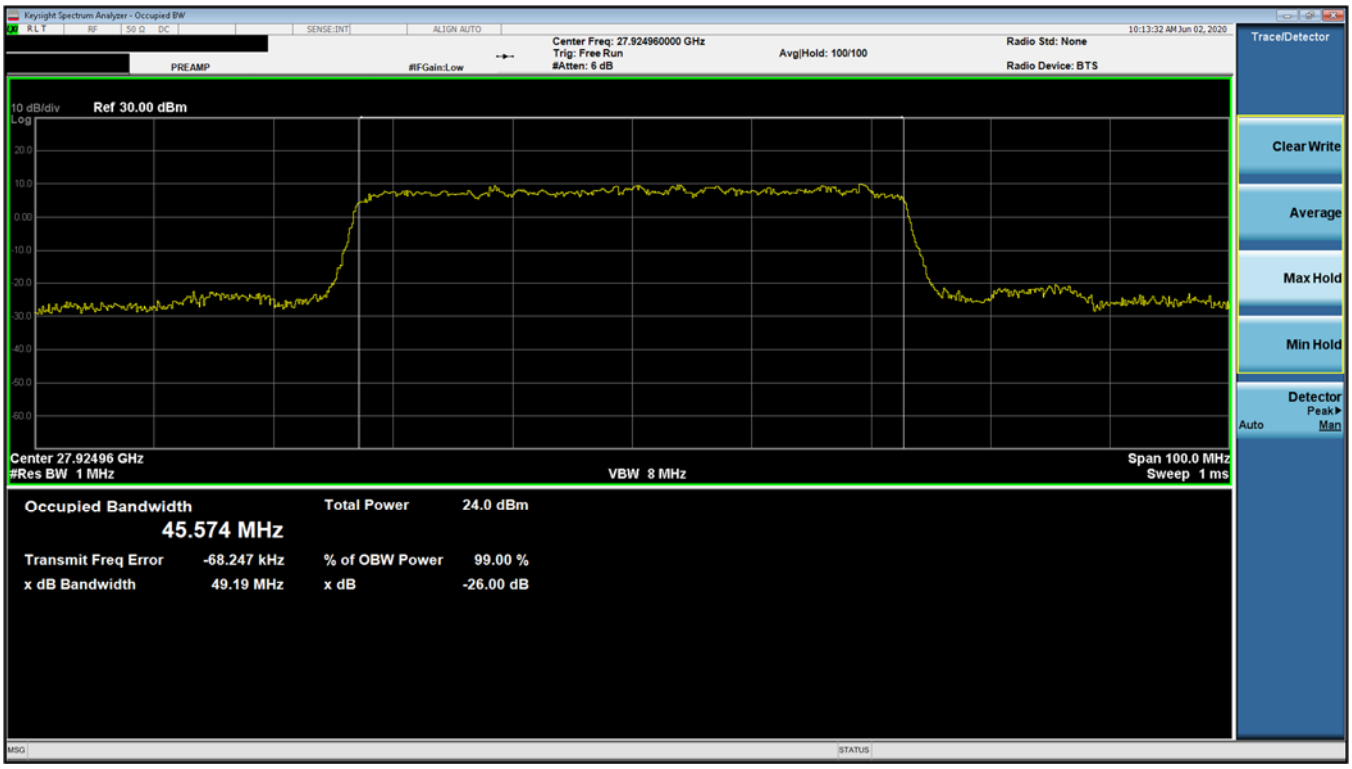
Plot 7-1. Ant 2 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



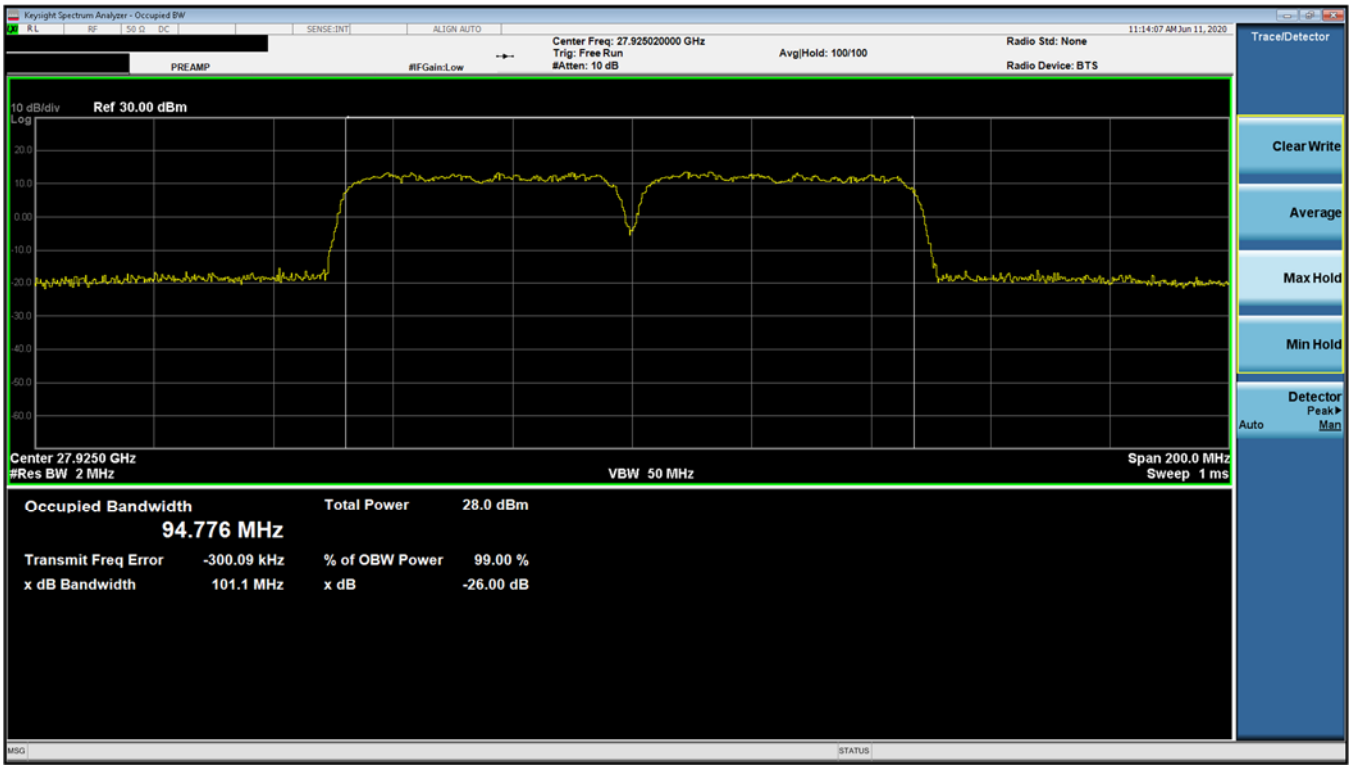
Plot 7-2. Ant 2 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



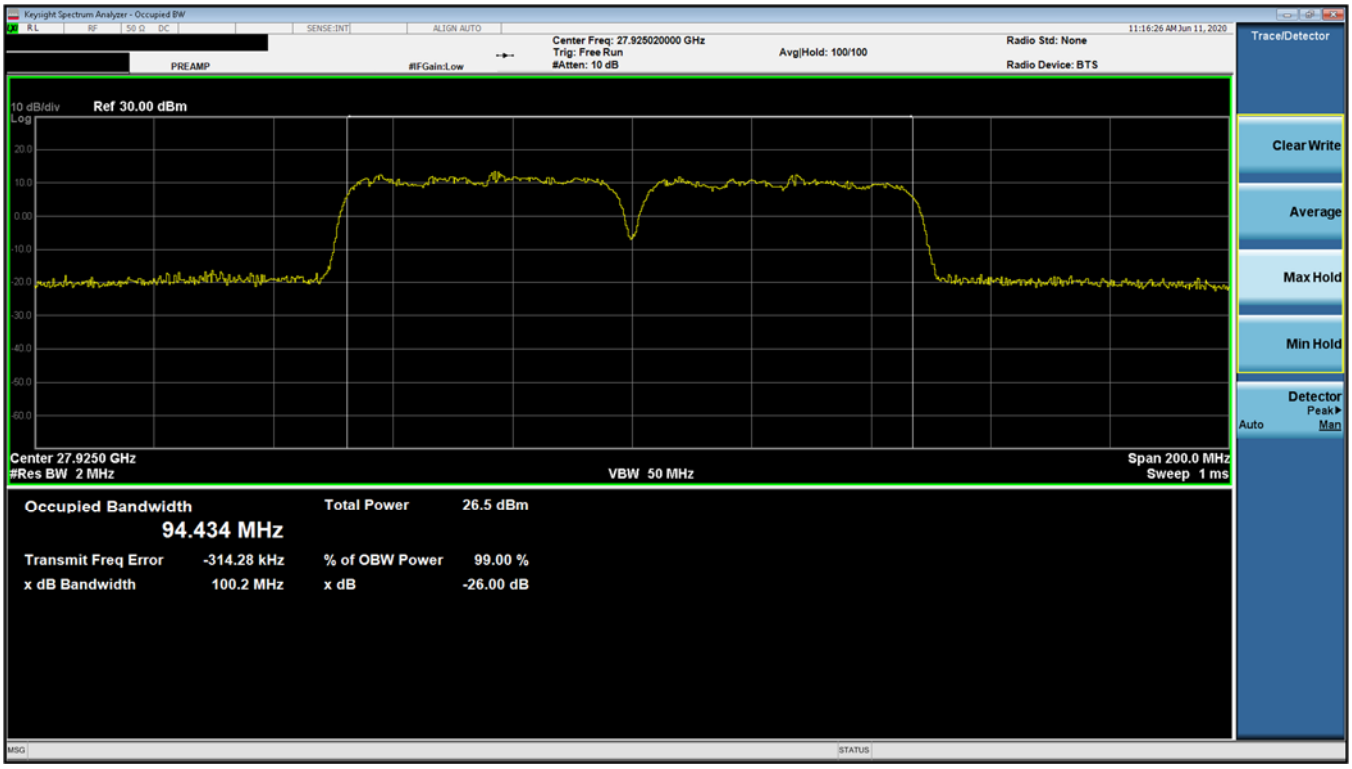
Plot 7-3. Ant 2 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



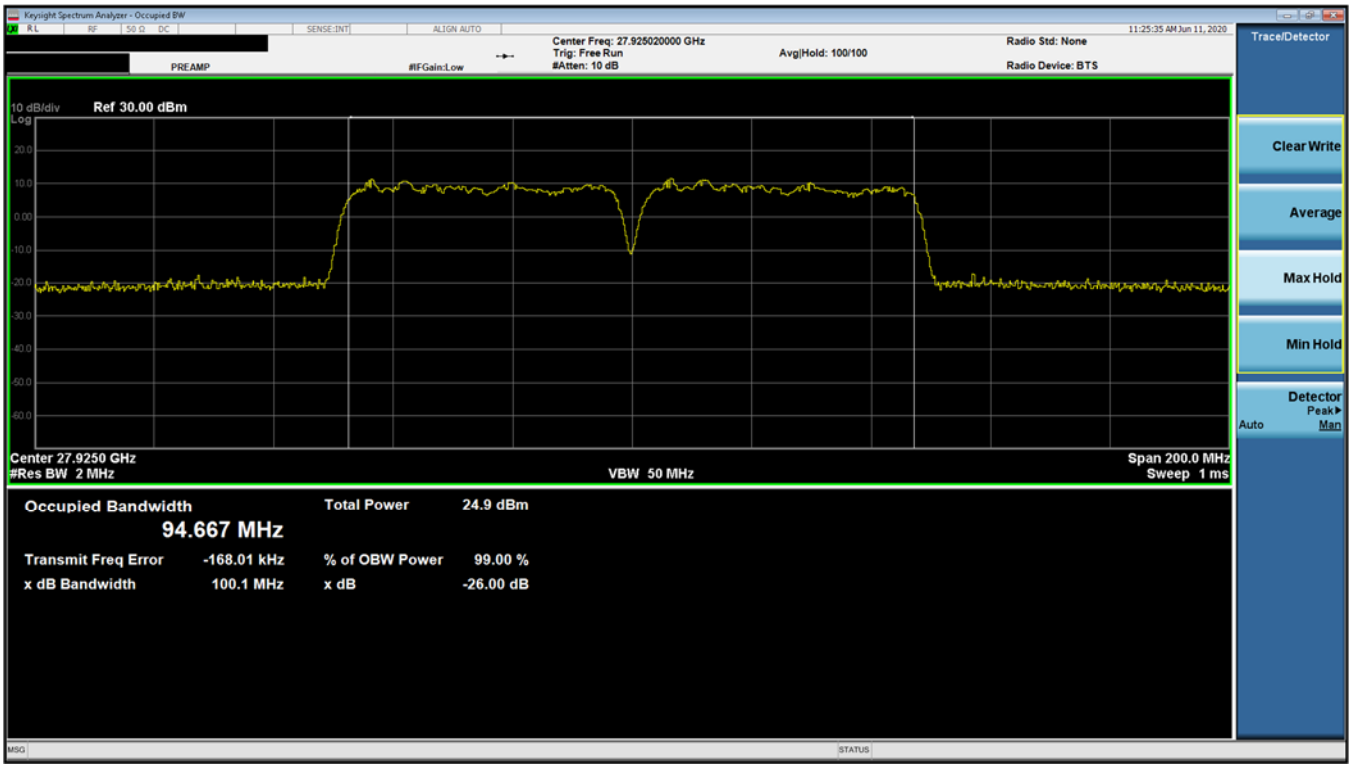
Plot 7-4. Ant 2 Occupied Bandwidth Plot (50MHz-1CC – pi/2-BPSK – Mid Channel)



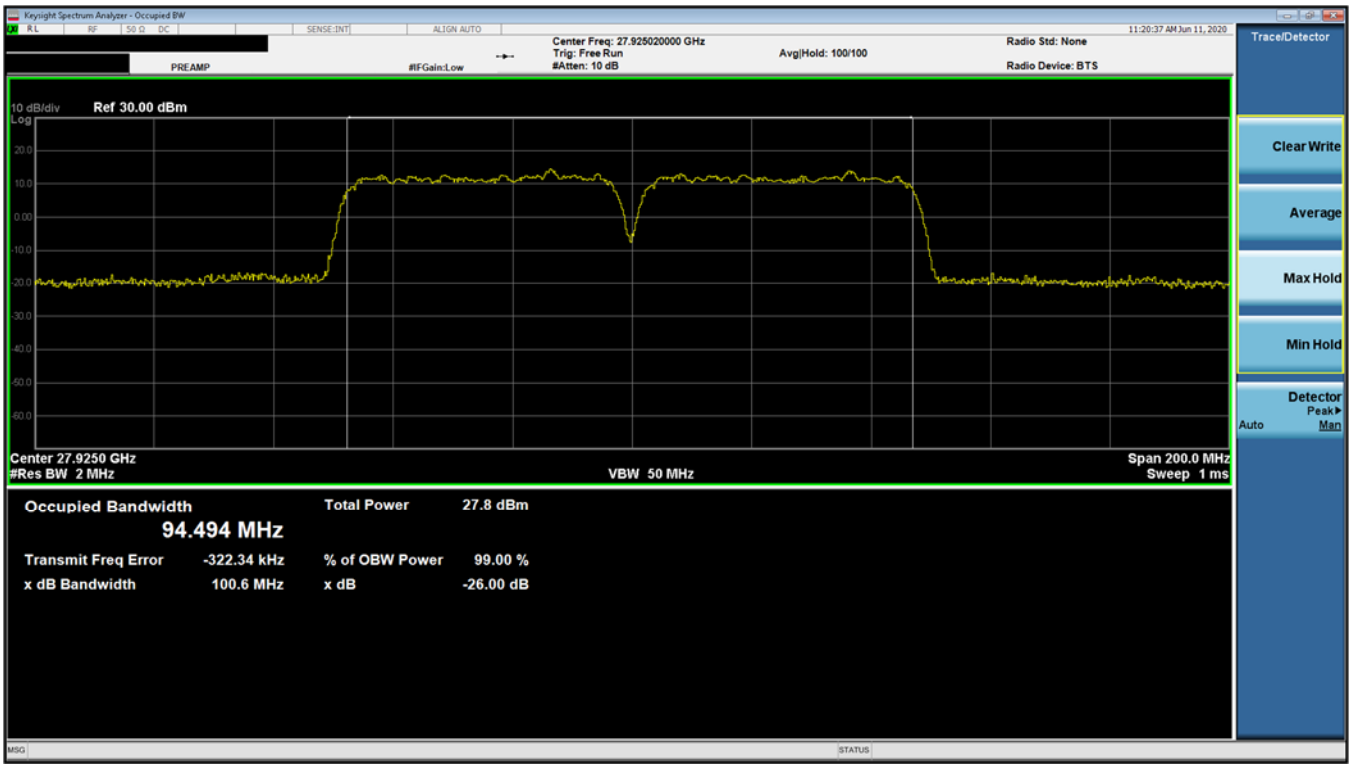
Plot 7-5. Ant 2 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



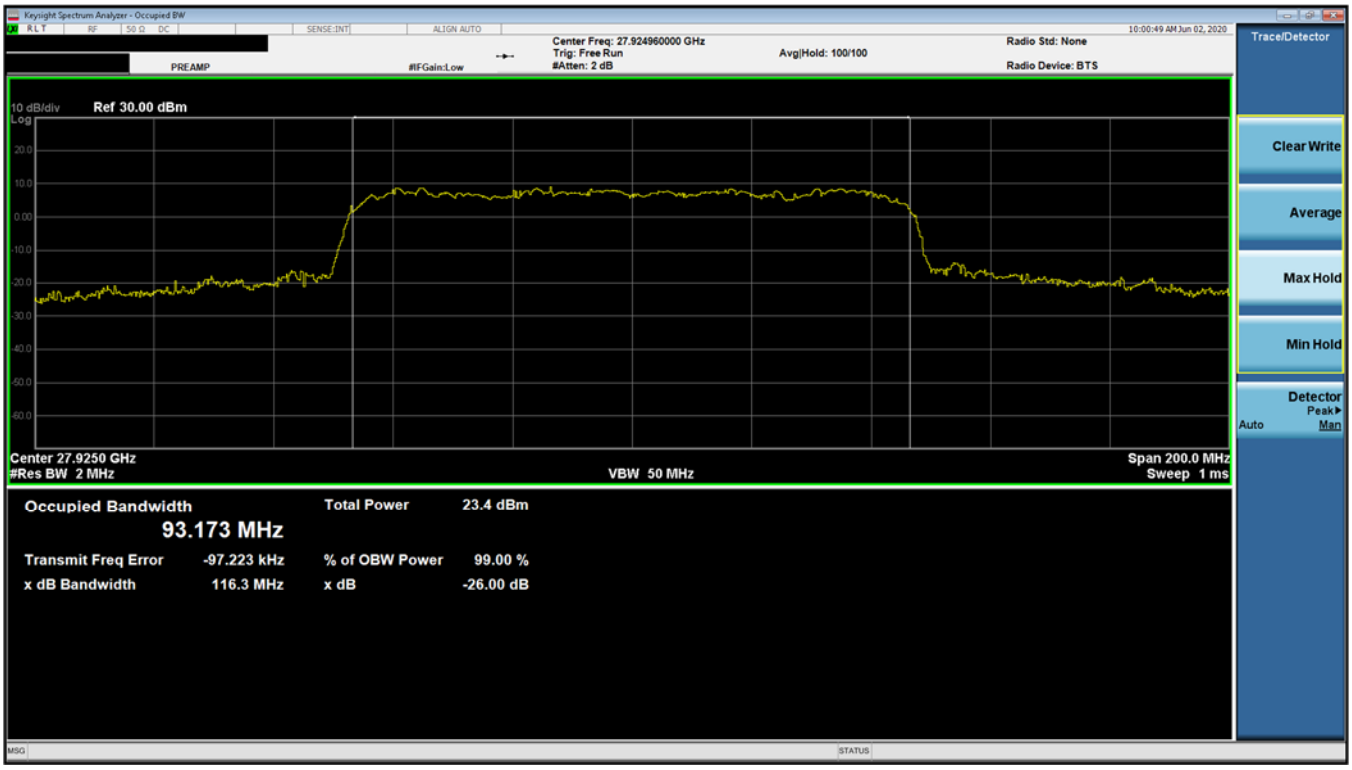
Plot 7-6. Ant 2 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



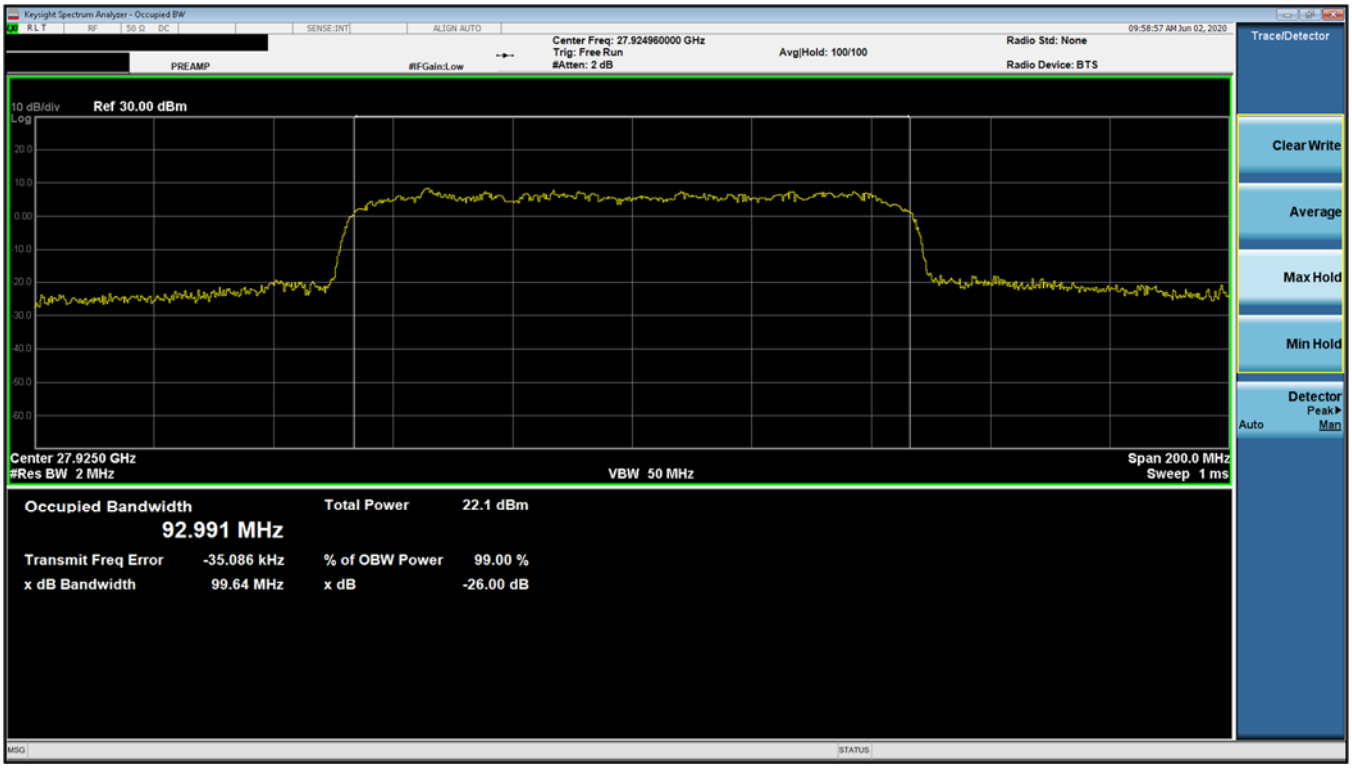
Plot 7-7. Ant 2 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



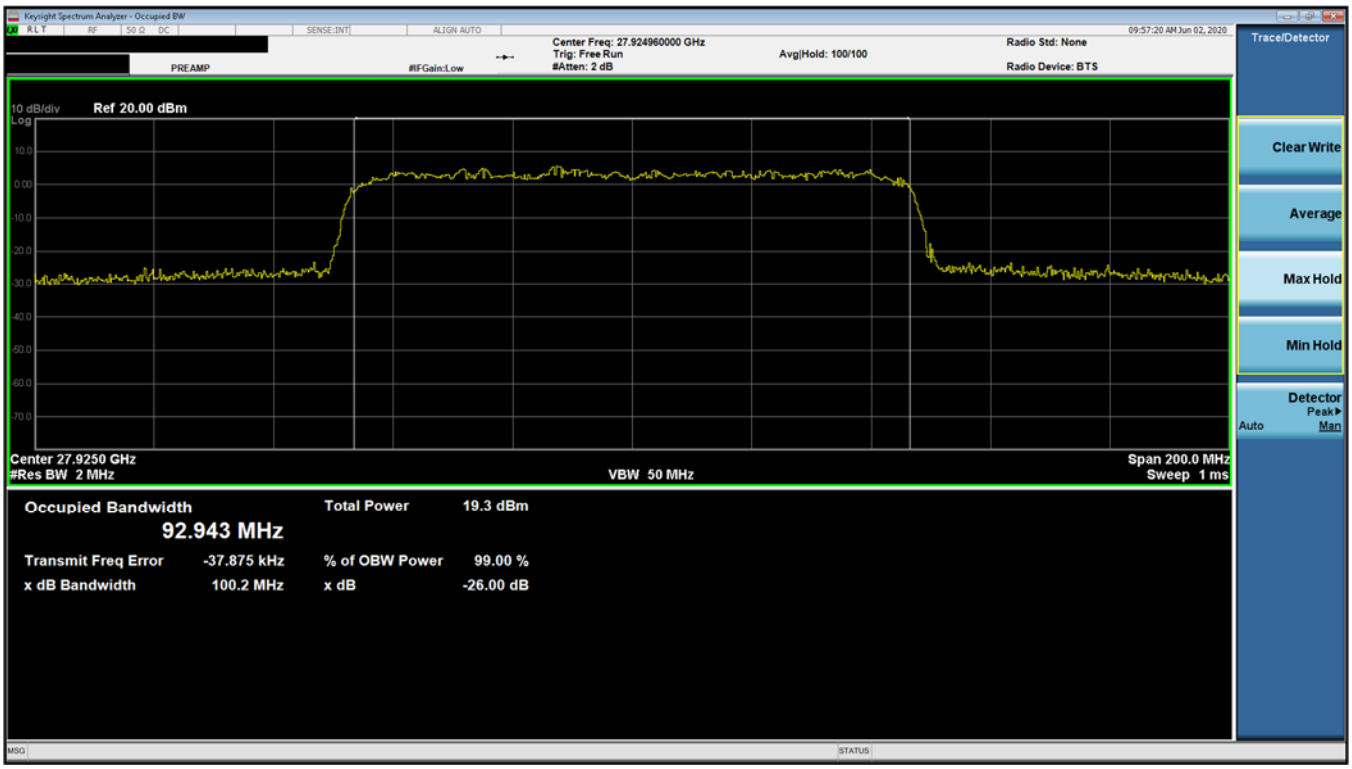
Plot 7-8. Ant 2 Occupied Bandwidth Plot (50MHz-2CC – pi/2-BPSK – Mid Channel)



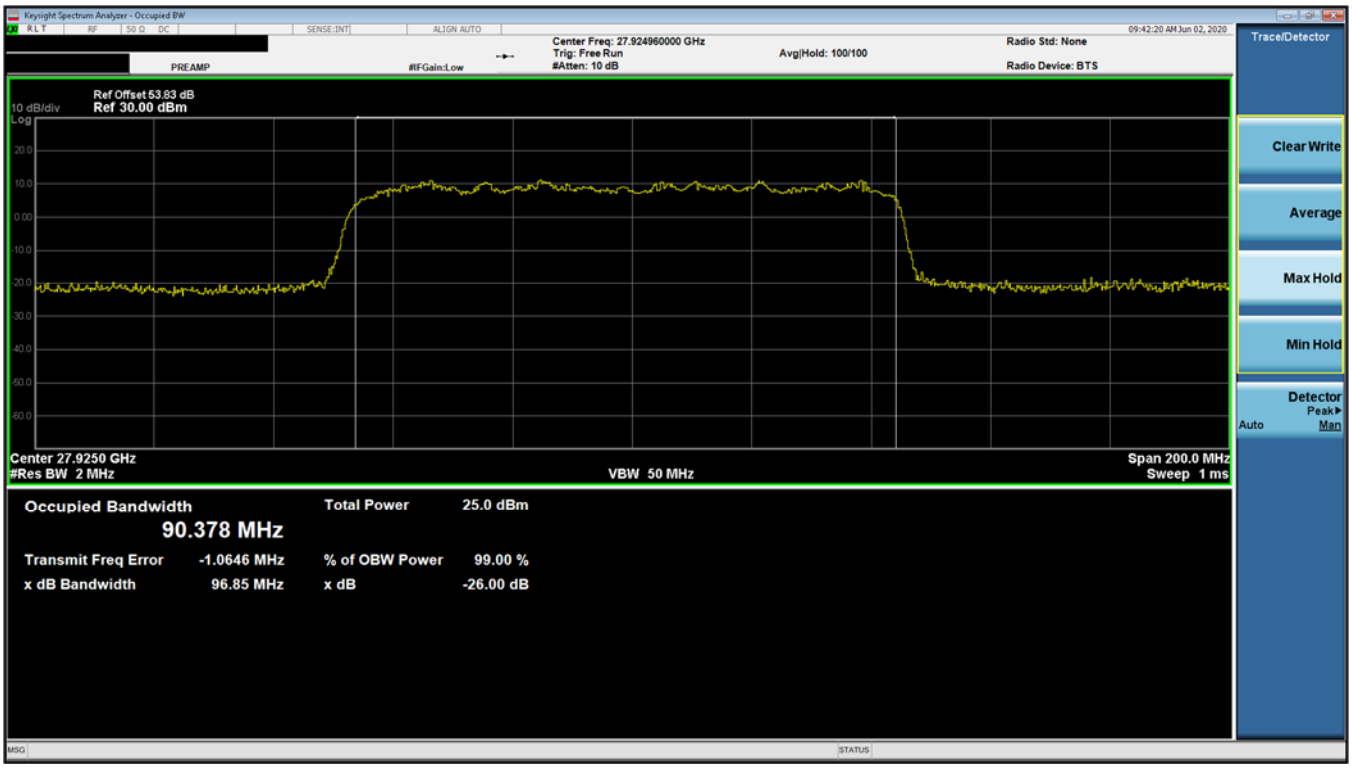
Plot 7-9. Ant 2 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



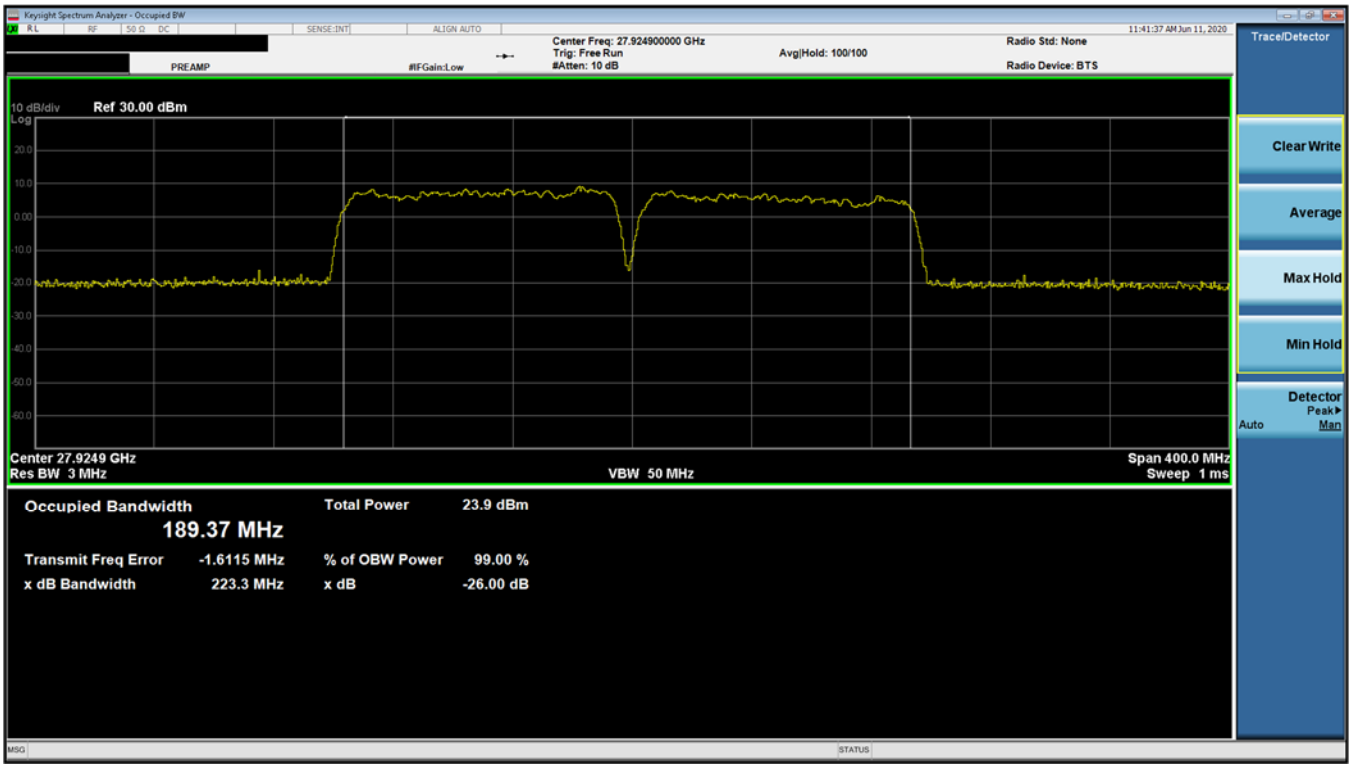
Plot 7-10. Ant 2 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



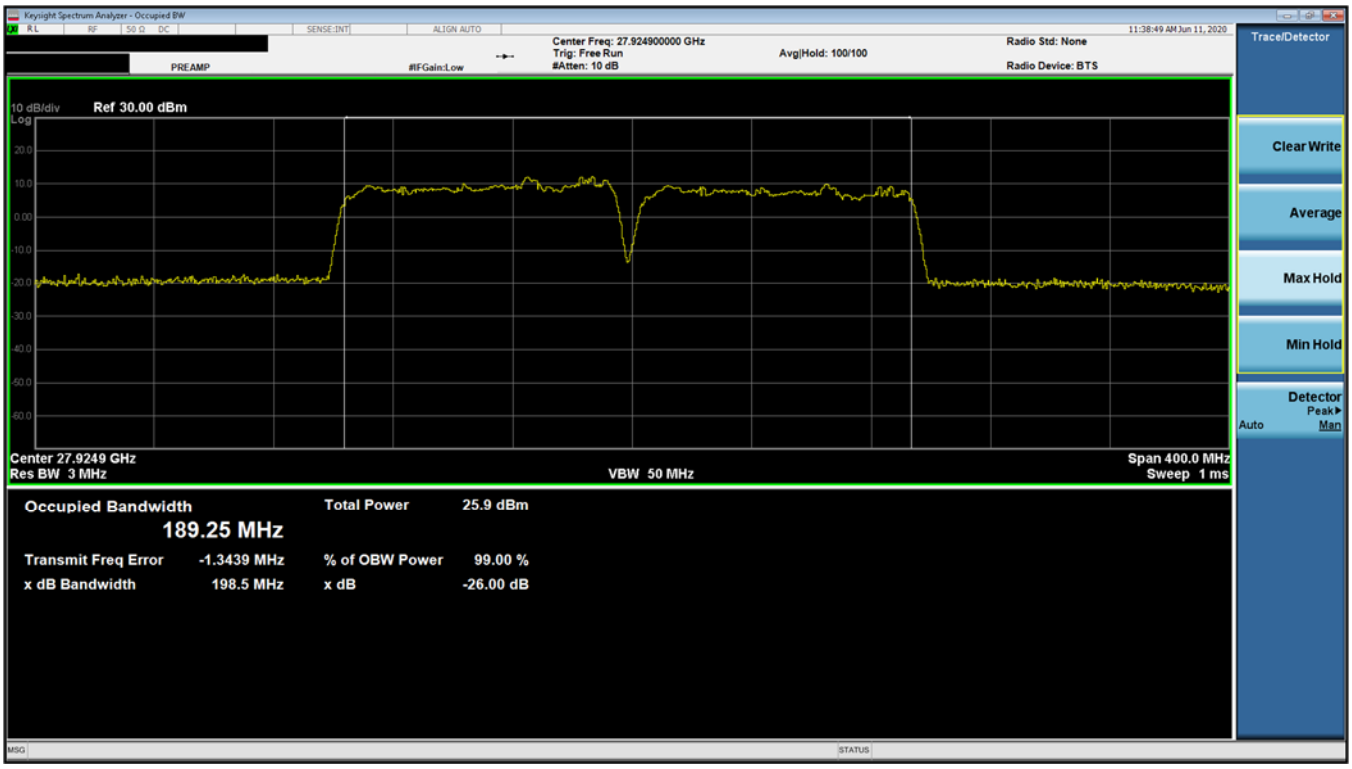
Plot 7-11. Ant 2 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



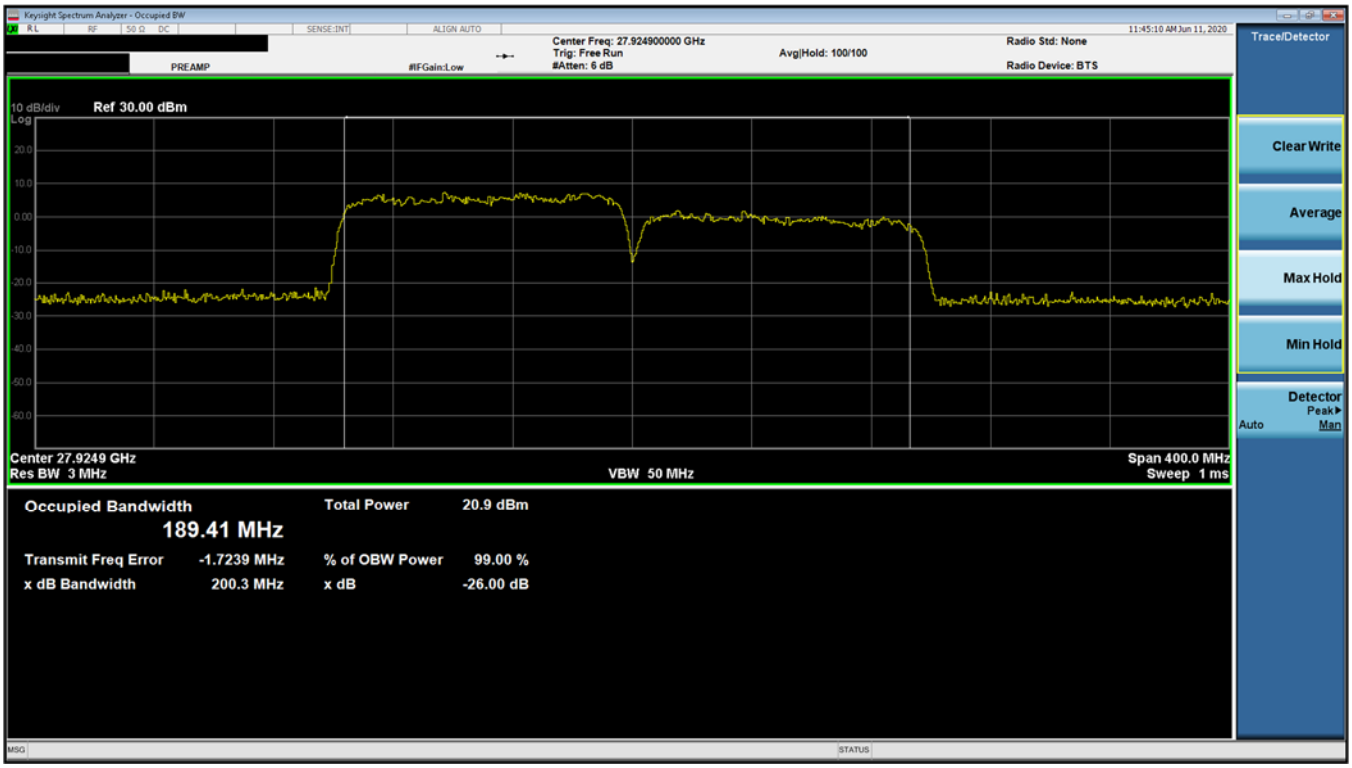
Plot 7-12. Ant 2 Occupied Bandwidth Plot (100MHz-1CC – pi/2-BPSK – Mid Channel)



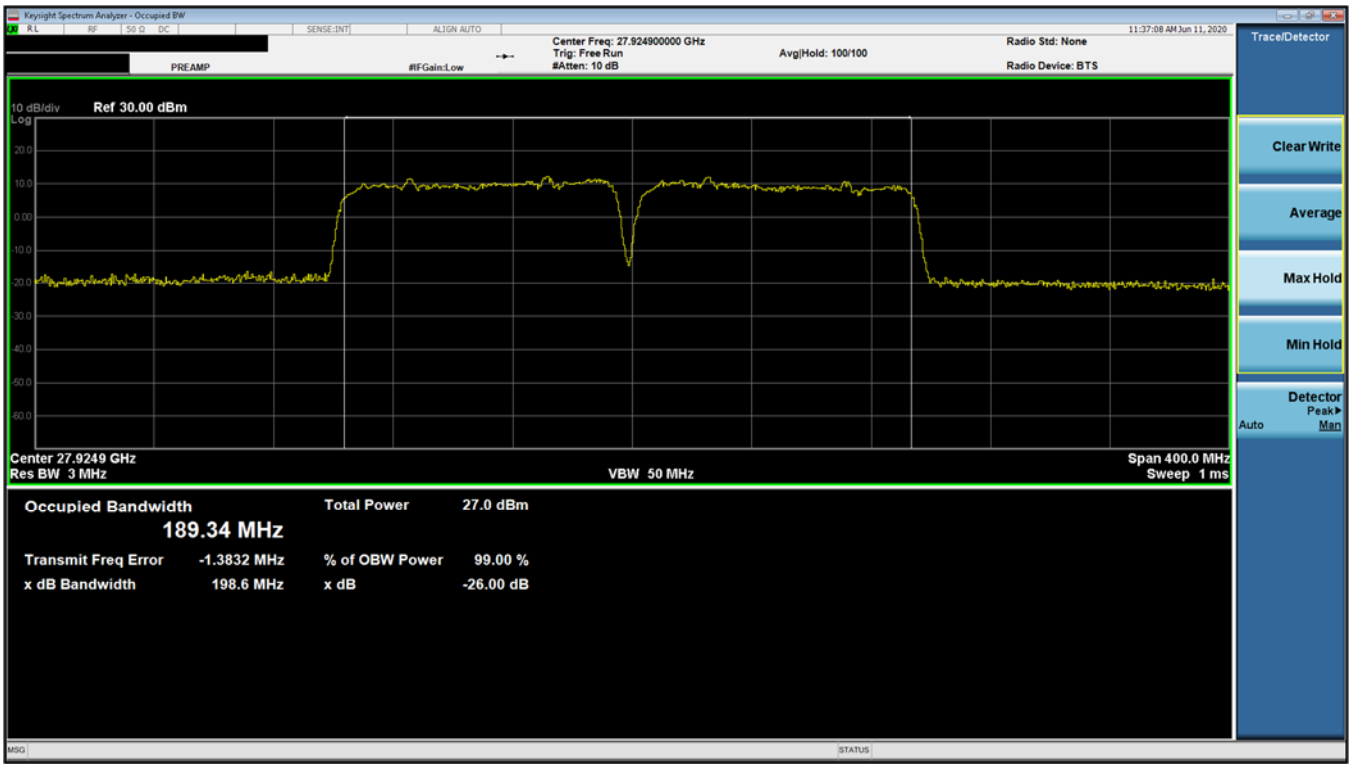
Plot 7-13. Ant 2 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



Plot 7-14. Ant 2 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



Plot 7-15. Ant 2 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

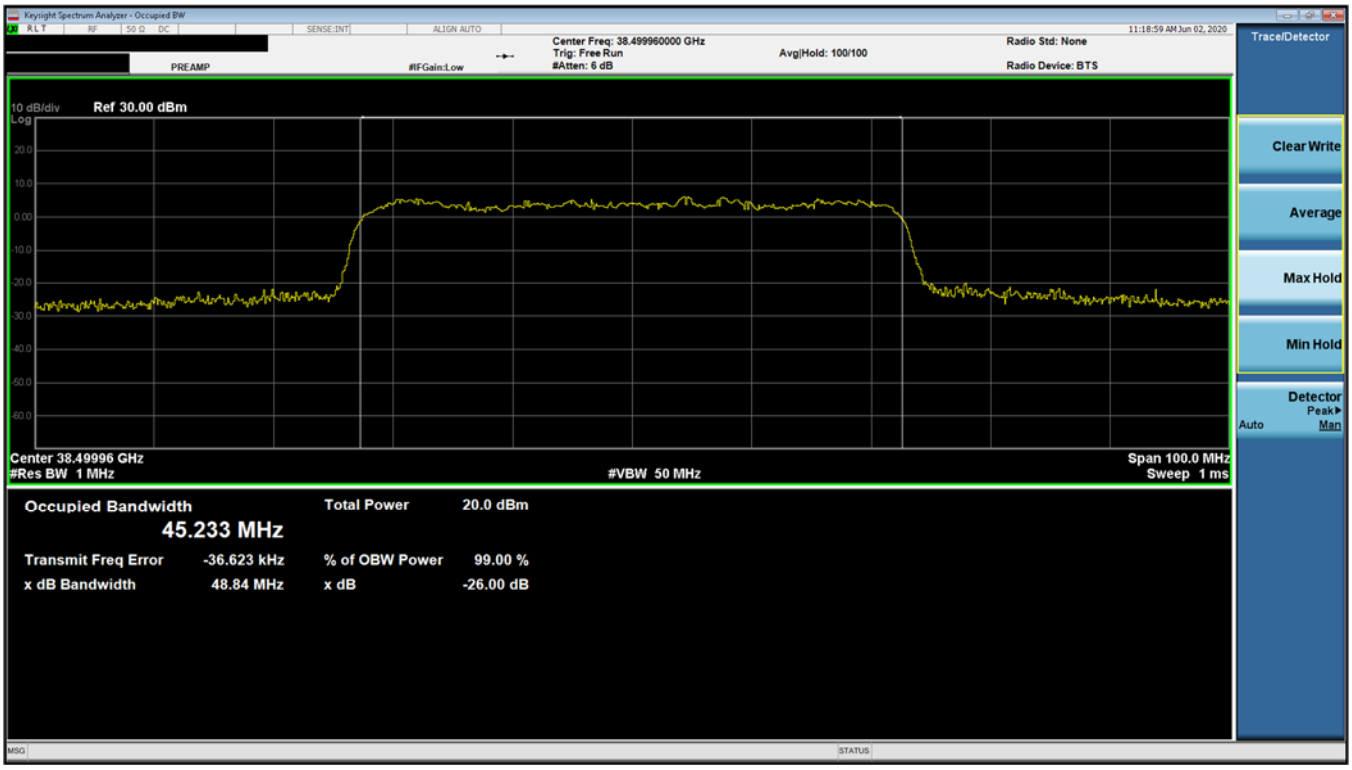


Plot 7-16. Ant 2 Occupied Bandwidth Plot (100MHz-2CC – pi/2-BPSK – Mid Channel)

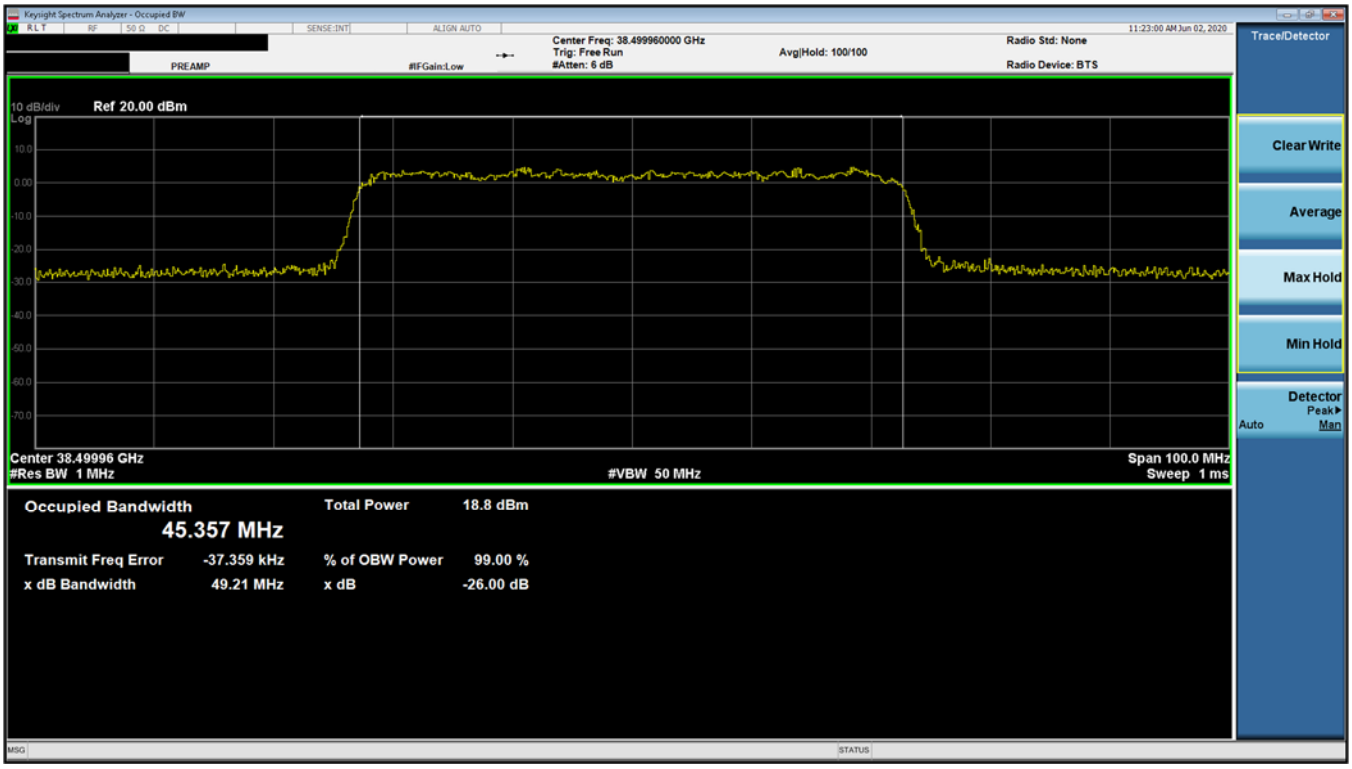
Band n260

Channel	Bandwidth	CCs Active	Transmision Scheme	Modulation	OBW [MHz]
Mid	50	1	CP-OFDM	QPSK	45.233
			CP-OFDM	16QAM	45.357
			CP-OFDM	64QAM	45.333
			DFT-s OFDM	Pi/2 BPSK	45.459
		2	CP-OFDM	QPSK	93.906
			CP-OFDM	16QAM	92.988
			CP-OFDM	64QAM	94.290
			DFT-s OFDM	Pi/2 BPSK	93.645
	100	1	CP-OFDM	QPSK	90.993
			CP-OFDM	16QAM	90.855
			CP-OFDM	64QAM	91.268
			DFT-s OFDM	Pi/2 BPSK	90.849
		2	CP-OFDM	QPSK	191.37
			CP-OFDM	16QAM	190.42
			CP-OFDM	64QAM	190.54
			DFT-s OFDM	Pi/2 BPSK	189.08

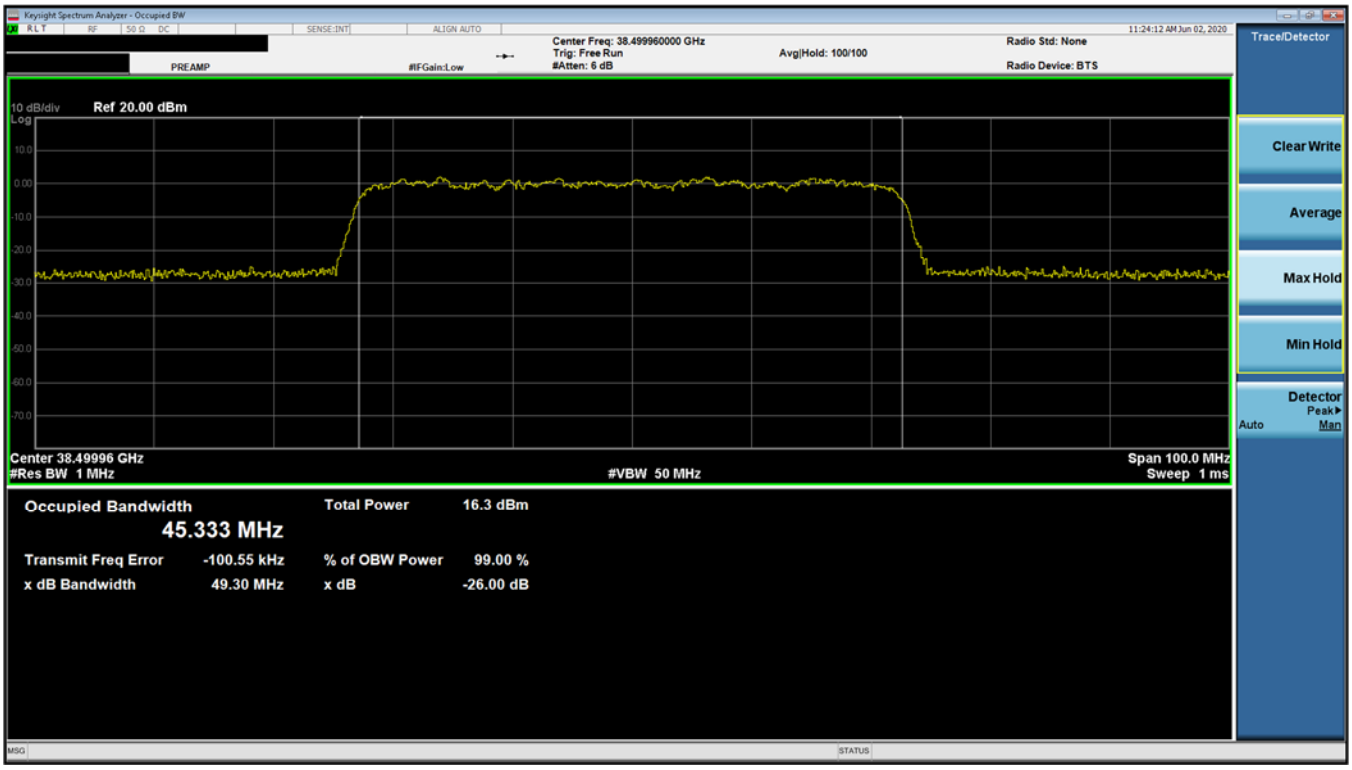
Table 7-3. Summary of Ant 3 Occupied Bandwidths (n260)



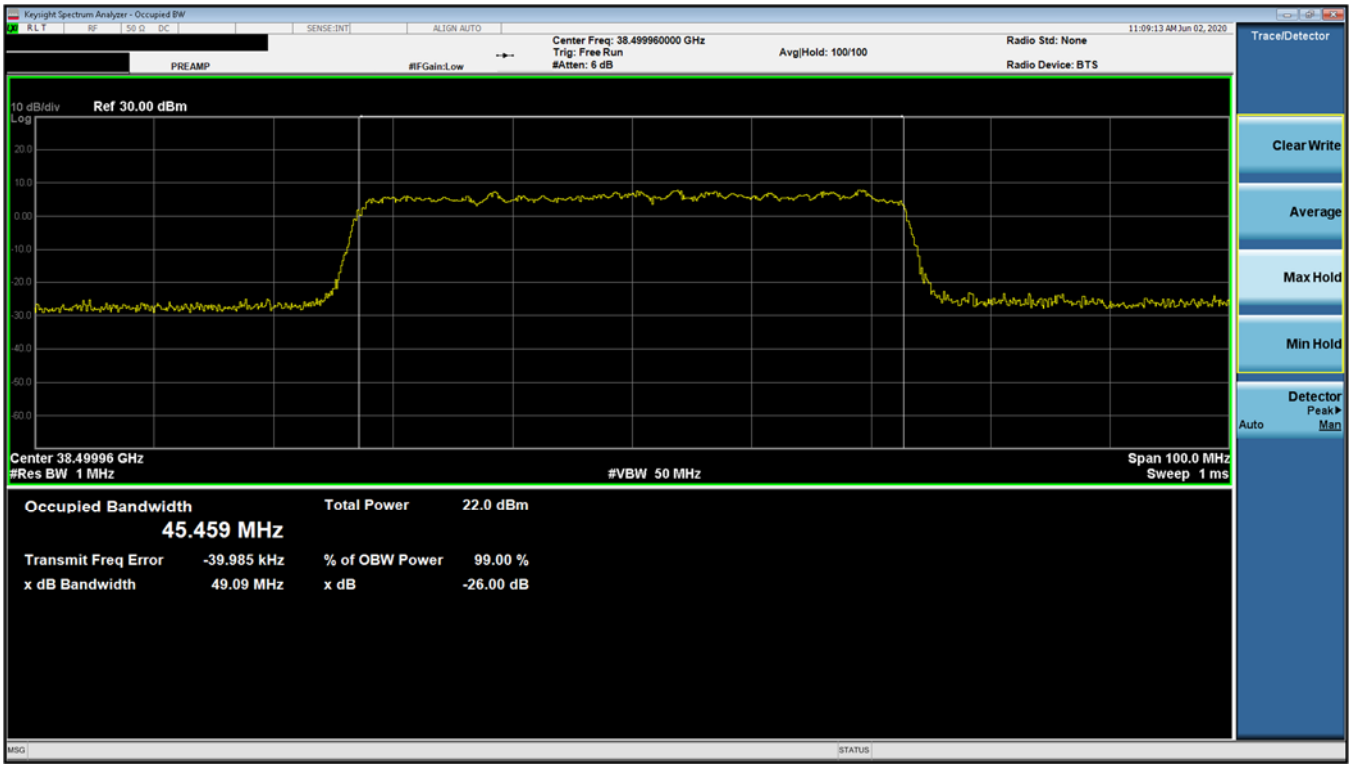
Plot 7-17. Ant 2 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



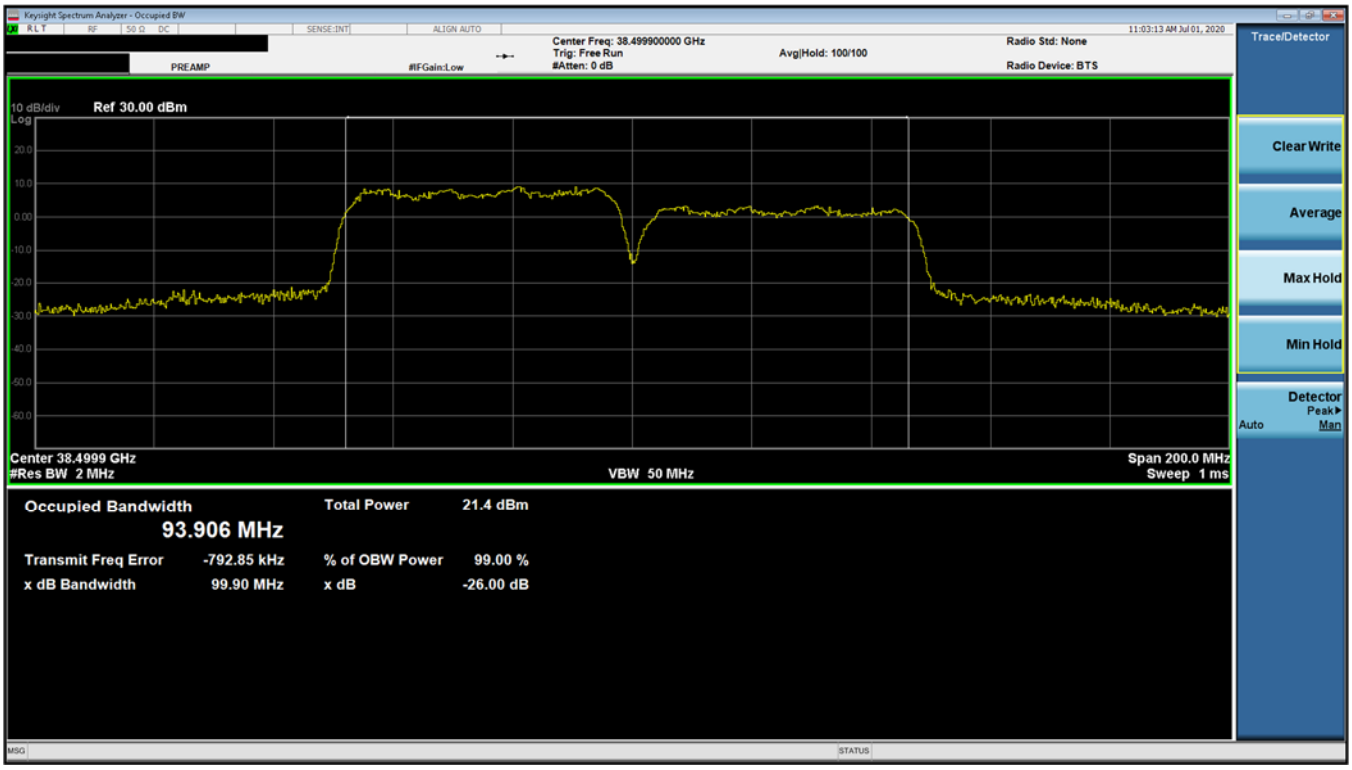
Plot 7-18. Ant 2 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



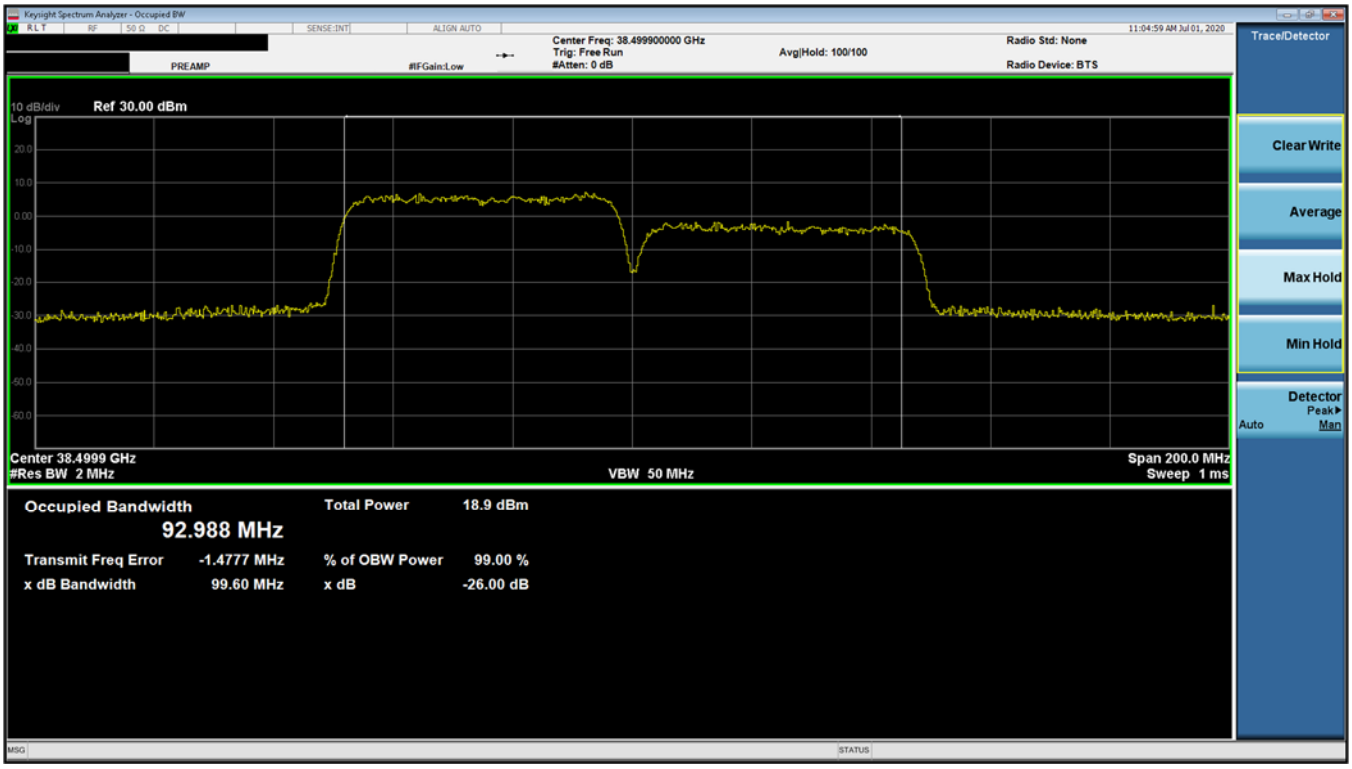
Plot 7-19. Ant 2 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



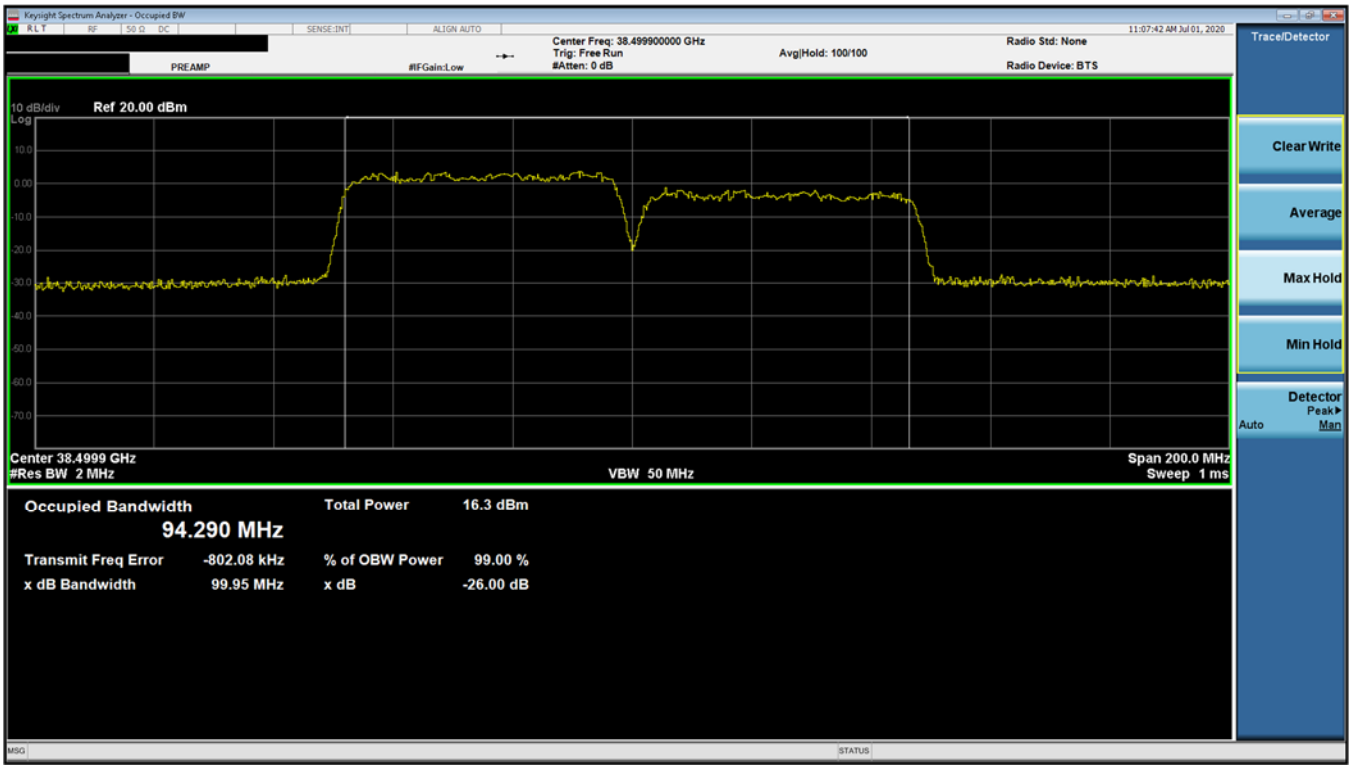
Plot 7-20. Ant 2 Occupied Bandwidth Plot (50MHz-1CC – pi/2-BPSK – Mid Channel)



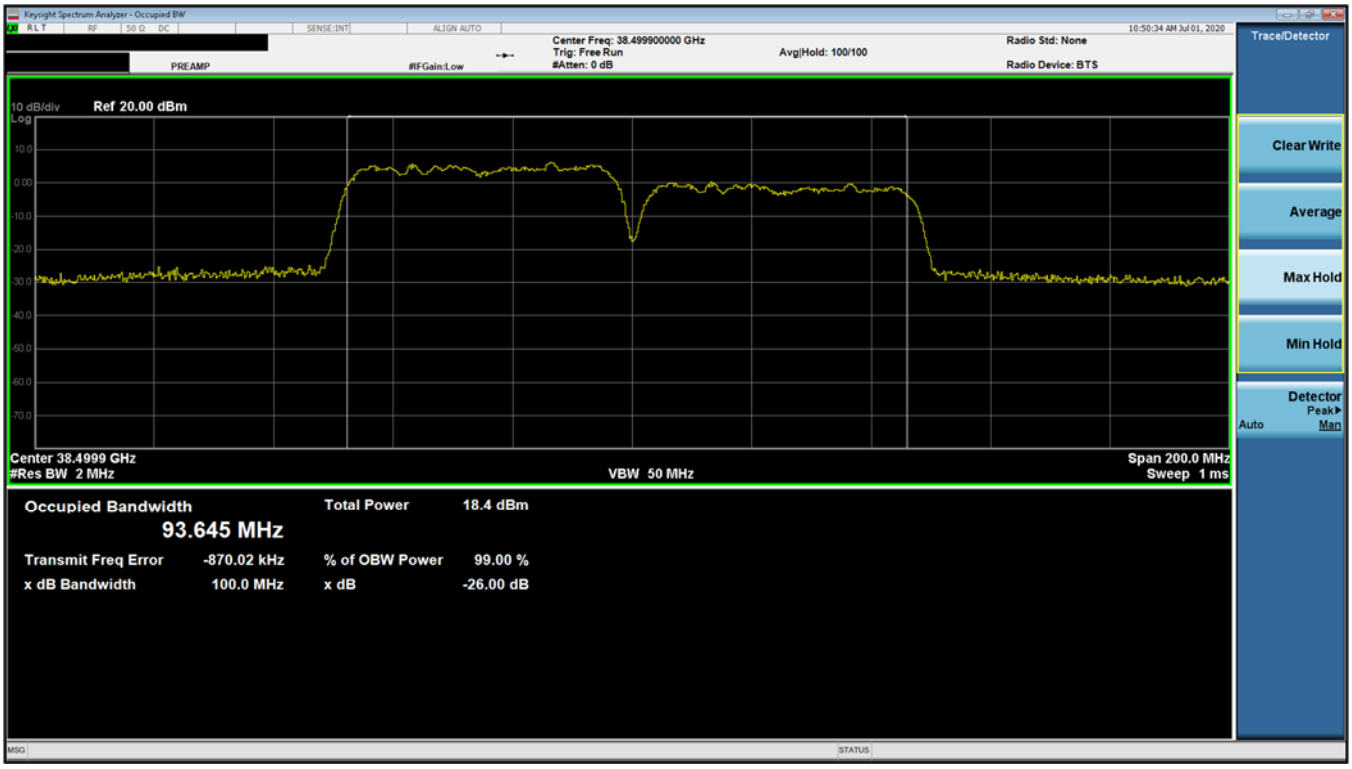
Plot 7-21. Ant 2 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



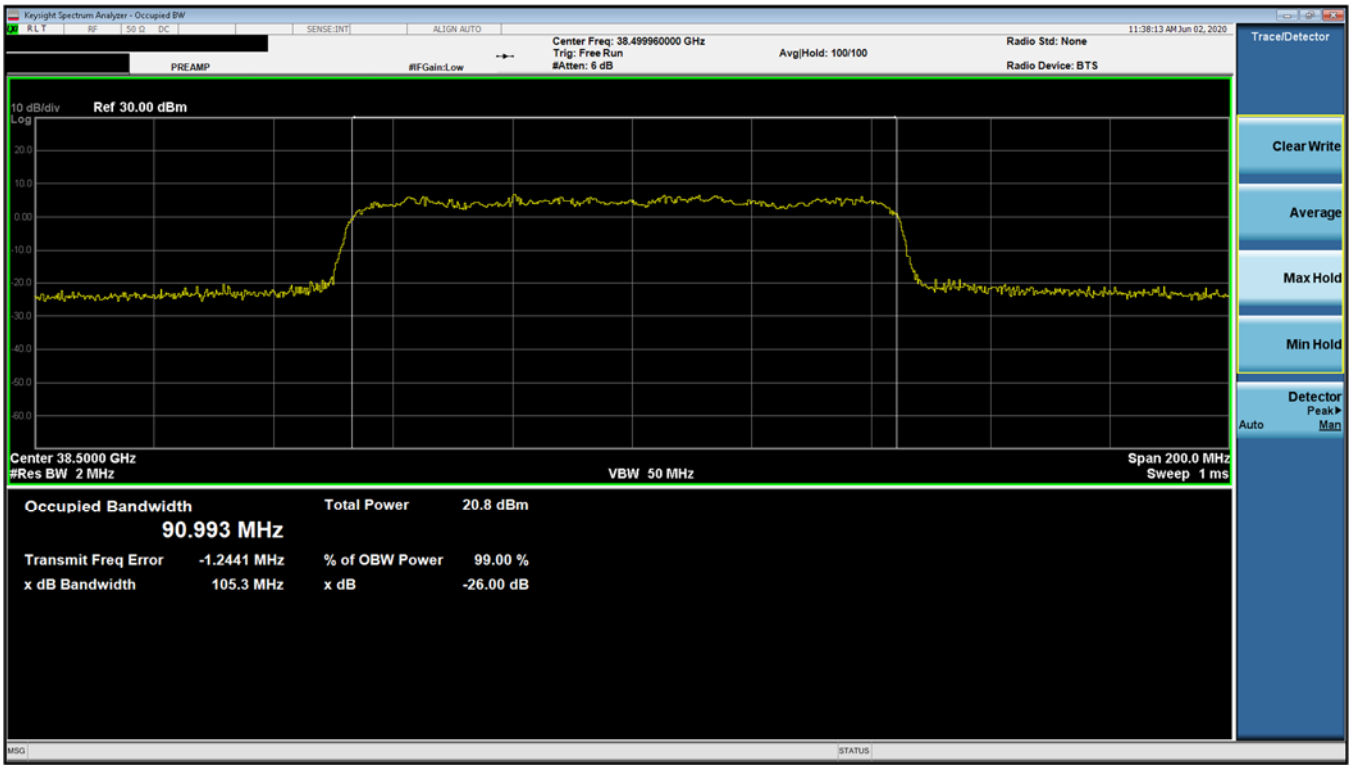
Plot 7-22. Ant 2 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



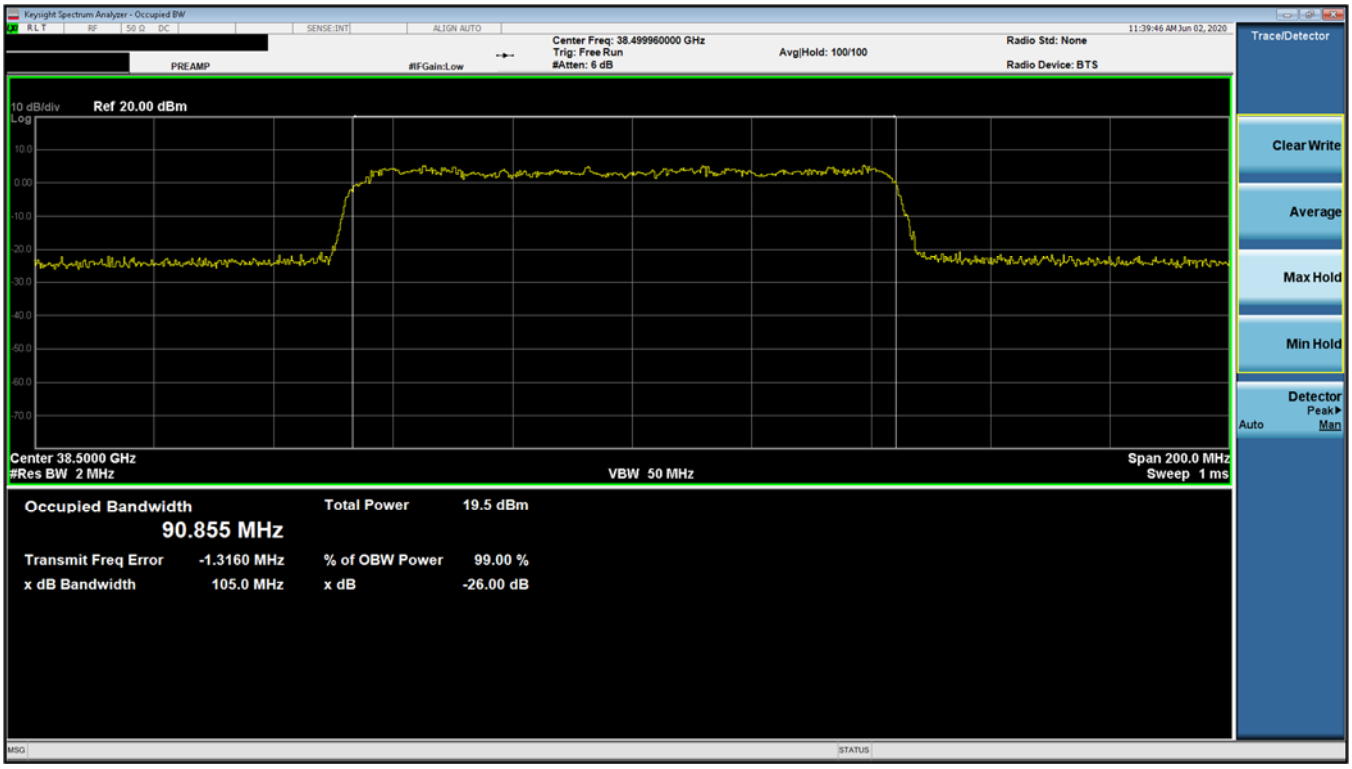
Plot 7-23. Ant 2 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



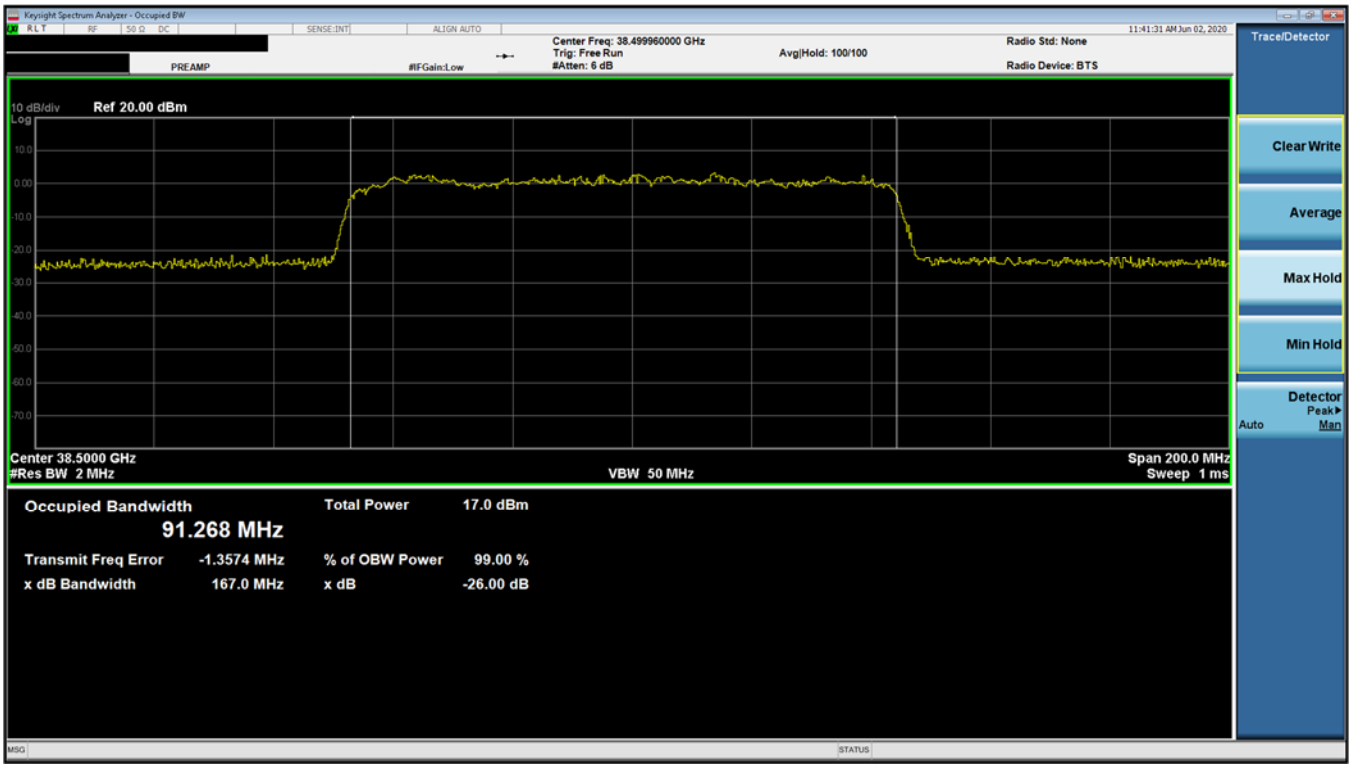
Plot 7-24. Ant 2 Occupied Bandwidth Plot (50MHz-2CC – pi/2-BPSK – Mid Channel)



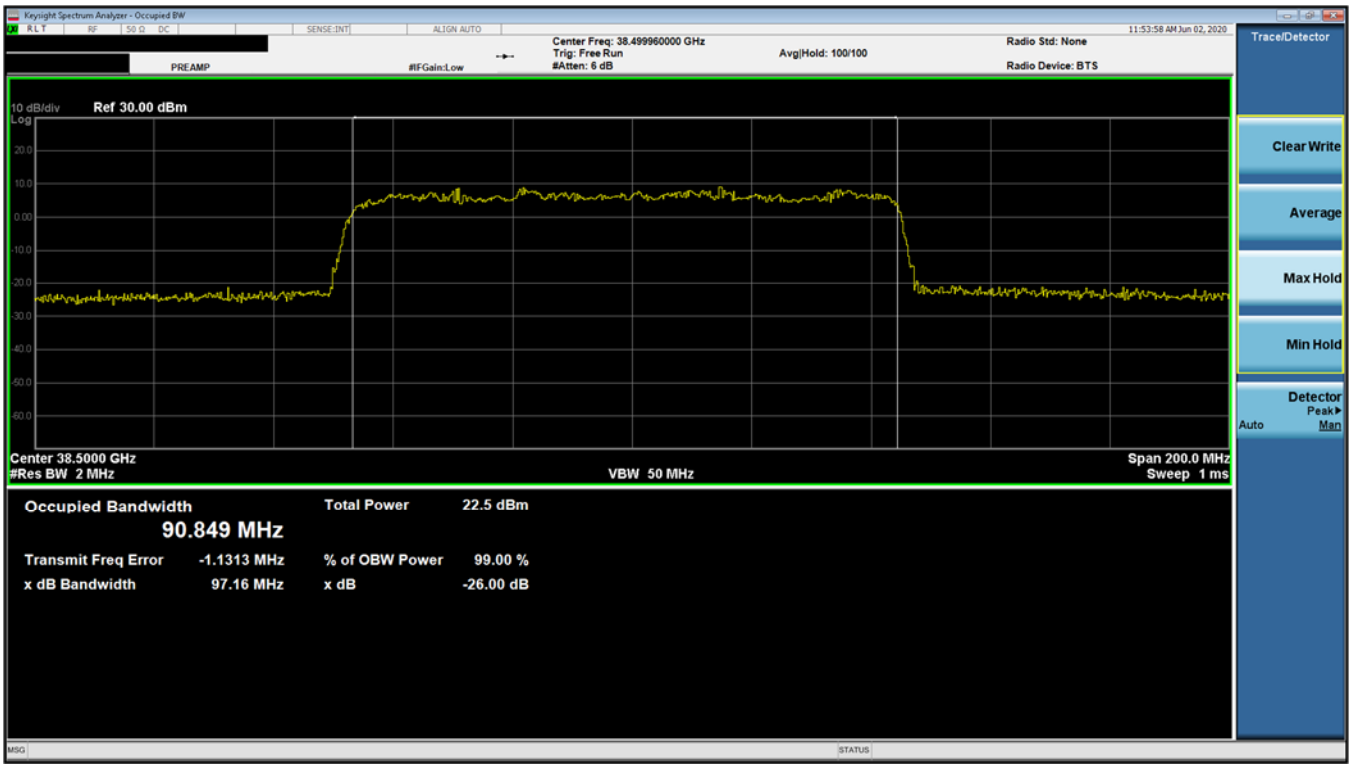
Plot 7-25. Ant 2 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



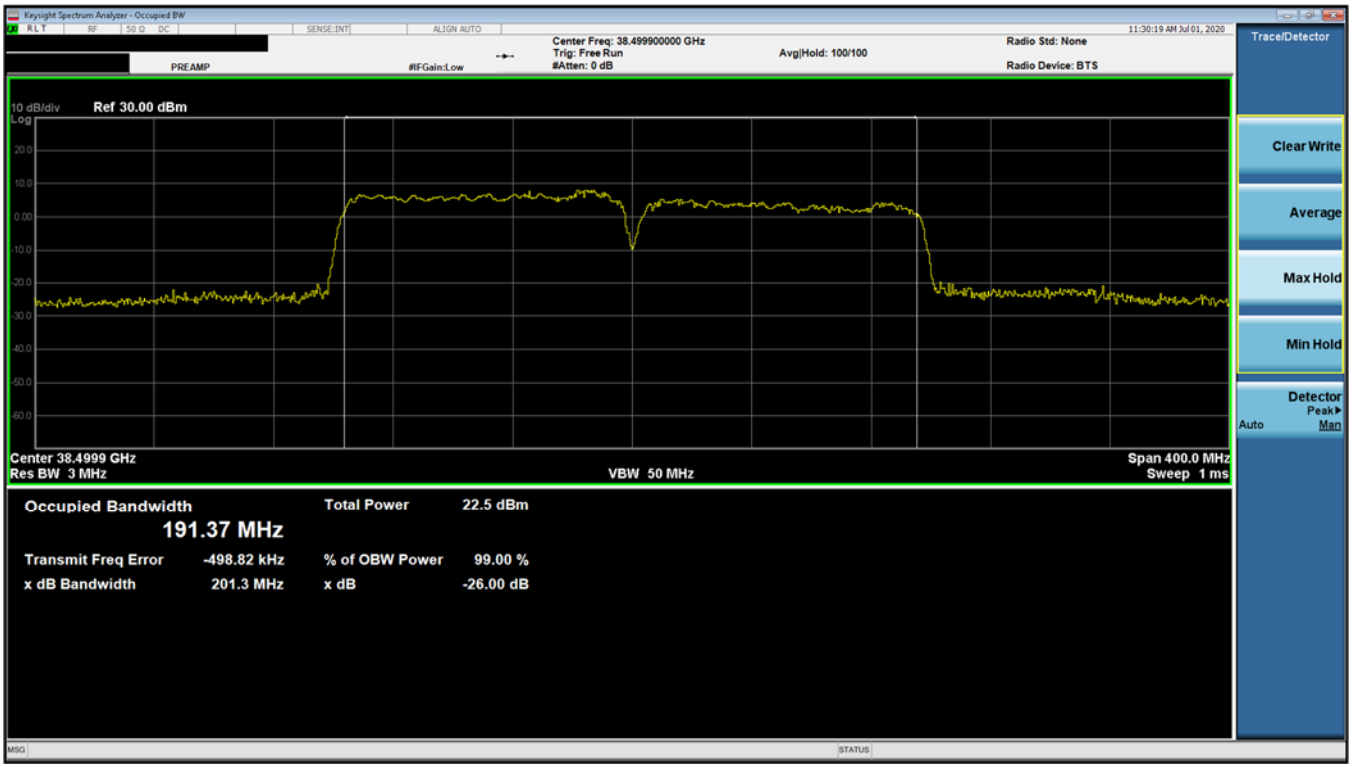
Plot 7-26. Ant 2 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



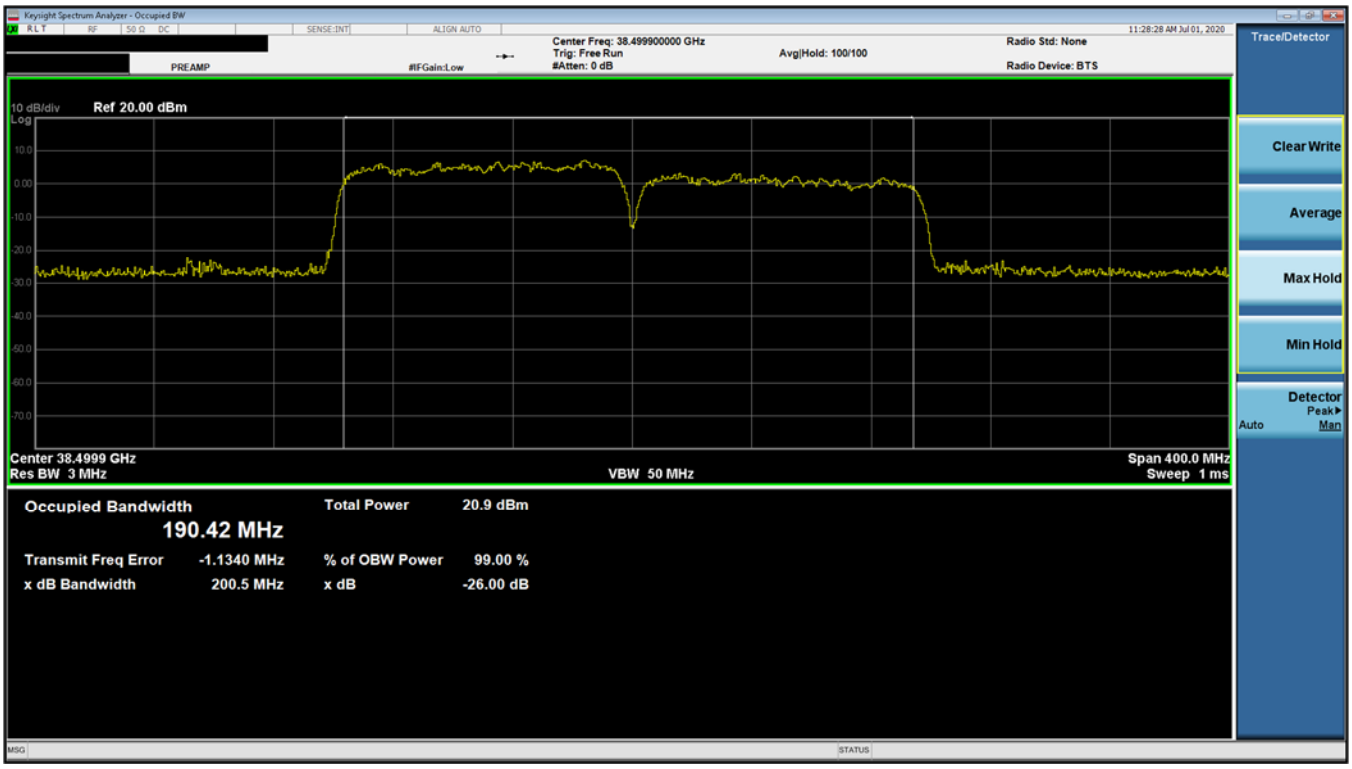
Plot 7-27. Ant 2 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



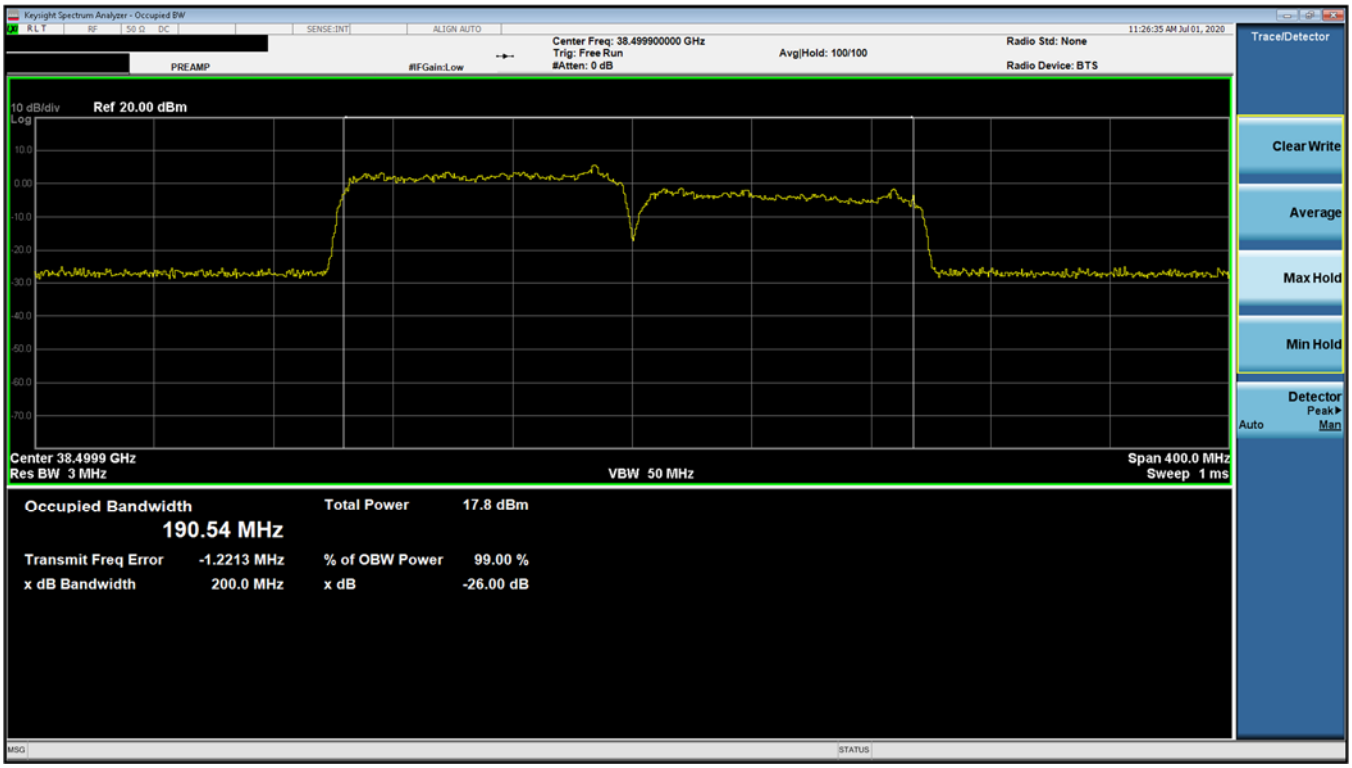
Plot 7-28. Ant 2 Occupied Bandwidth Plot (100MHz-1CC – pi/2-BPSK – Mid Channel)



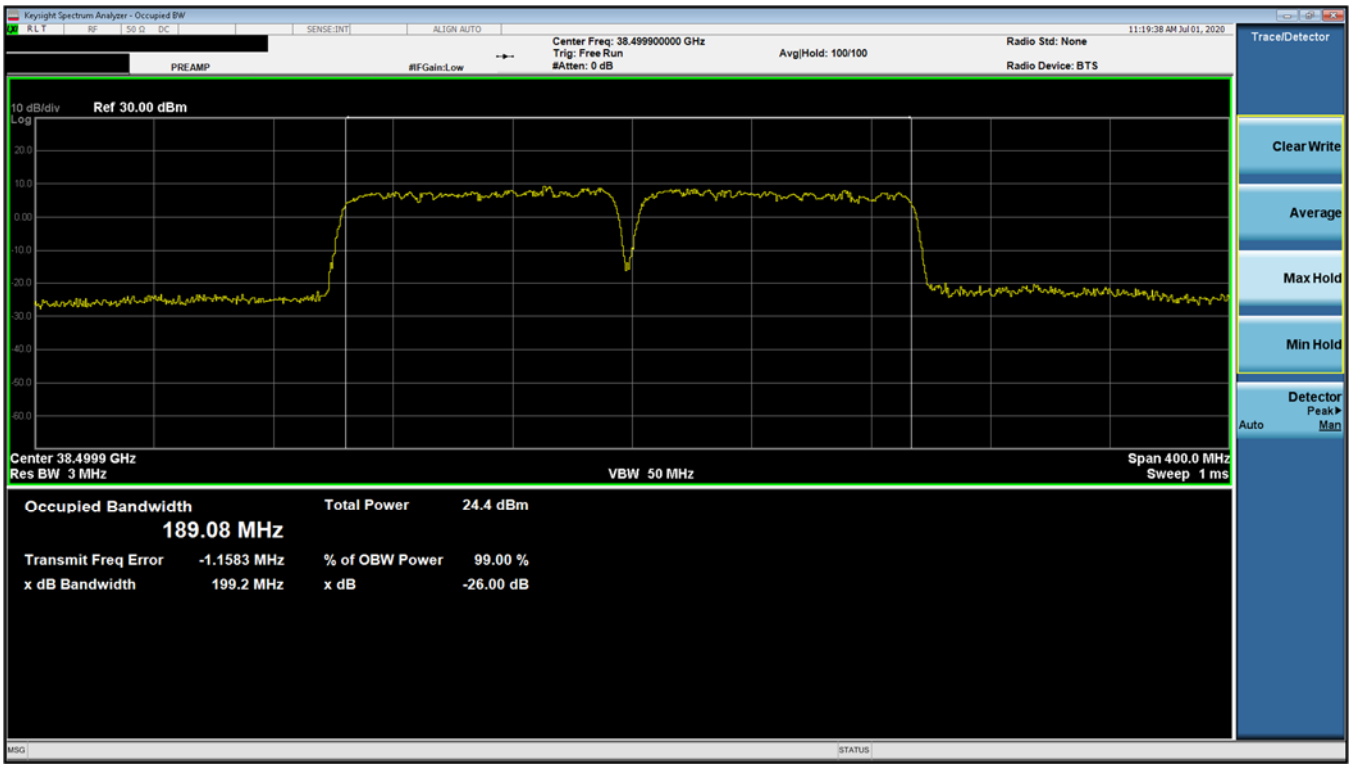
Plot 7-29. Ant 2 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



Plot 7-30. Ant 2 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



Plot 7-31. Ant 2 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)



Plot 7-32. Ant 2 Occupied Bandwidth Plot (100MHz-2CC – pi/2-BPSK – Mid Channel)

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 v01r01 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 ≥ 3 x RBW
4. Span = 2x to 3x the OBW
5. No. of sweep points ≥ 2 x 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

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 were taken at 1m test distance.

4) The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states: EIRP (dBm) = E (dBµV/m) + 20log(D) − 104.8; where D is the measurement distance (in the far field region) in m. The field strength E is calculated E (dBµV/m) = Spectrum Analyzer Channel Power Level (dBm) + Antenna Factor (dB/m) + 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.

Band n261 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID(s)
SISO	Low	H	167
		V	40
	Mid	H	167
		V	26
	High	H	153
		V	26
MIMO	Low	H + V	24+167
	Mid	H + V	24+167
	High	H + V	24+167

Table 7-4. Ant 1 Worst Case Beam ID

Mode	Channel	Beam Polarization	Beam ID(s)
SISO	Low	H	147
		V	20
	Mid	H	163
		V	19
	High	H	148
		V	19
MIMO	Low	H + V	19+148
	Mid	H + V	19+148
	High	H + V	19+148

Table 7-5. Ant 2 Worst Case Beam ID

Mode	Channel	Beam Polarization	Beam ID(s)
SISO	Low	H	170
		V	43
	Mid	H	171
		V	43
	High	H	170
		V	43
MIMO	Low	H + V	43+157
	Mid	H + V	43+157
	High	H + V	43+157

Table 7-6. Ant 3 Worst Case Beam ID

Band n261

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	27525.00	Low	DFT-s-OFDM	QPSK	H+V	MIMO	24+167	H	310	108	1 / 16	25.13
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	167	V	318	31	1 / 16	22.68
	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	26	V	38	14	1 / 16	21.74
	27924.96	Mid	CP-OFDM	QPSK	H	SISO	167	V	318	31	1 / 16	18.31
	27924.96	Mid	CP-OFDM	QPSK	V	SISO	26	V	38	14	1 / 16	17.64
	27924.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	24+167	H	321	121	1 / 16	25.40
	27924.96	Mid	CP-OFDM	QPSK	H+V	MIMO	24+167	H	321	121	1 / 16	19.69
	28324.92	High	DFT-s-OFDM	QPSK	H+V	MIMO	24+167	H	329	124	1 / 16	25.23
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	24+167	H	321	121	1 / 16	25.01
	27924.96	Mid	DFT-s-OFDM	16QAM	H+V	MIMO	24+167	H	321	121	1 / 16	23.94
	27924.96	Mid	DFT-s-OFDM	64QAM	H+V	MIMO	24+167	H	321	121	1 / 16	22.27

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

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	26	V	36	29	32 / 0	17.56
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	167	V	320	29	32 / 0	18.01
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	H	SISO	167	V	320	29	32 / 0	17.93
	27924.96	Mid	DFT-s-OFDM	16QAM	H	SISO	167	V	320	29	32 / 0	16.86
	27924.96	Mid	DFT-s-OFDM	64QAM	H	SISO	167	V	320	29	32 / 0	14.75

Table 7-8. Ant 1 EIRP Data (Band n261 - 50MHz-2CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	27550.08	Low	DFT-s-OFDM	QPSK	H+V	MIMO	24+167	H	312	110	1 / 32	25.20
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	167	V	317	38	1 / 32	22.10
	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	26	V	38	35	1 / 32	21.68
	27924.96	Mid	CP-OFDM	QPSK	H	SISO	167	V	317	38	1 / 32	18.12
	27924.96	Mid	CP-OFDM	QPSK	V	SISO	26	V	38	35	1 / 32	17.28
	27924.96	Mid	CP-OFDM	QPSK	H+V	MIMO	24+167	H	319	119	1 / 32	25.31
	27924.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	24+167	H	319	119	1 / 32	19.73
	28299.96	High	DFT-s-OFDM	QPSK	H+V	MIMO	24+167	H	333	121	1 / 32	25.01
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	24+167	H	319	119	1 / 32	24.89
	27924.96	Mid	DFT-s-OFDM	16QAM	H+V	MIMO	24+167	H	319	119	1 / 32	23.86
	27924.96	Mid	DFT-s-OFDM	64QAM	H+V	MIMO	24+167	H	319	119	1 / 32	22.04

Table 7-9. Ant 1 EIRP Data (Band n261 - 100MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	26	V	38	27	64 / 0	17.40
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	167	V	315	40	64 / 0	18.28
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	H	SISO	167	V	315	40	64 / 0	17.82
	27924.96	Mid	DFT-s-OFDM	16QAM	H	SISO	167	V	315	40	64 / 0	16.70
	27924.96	Mid	DFT-s-OFDM	64QAM	H	SISO	167	V	315	40	64 / 0	15.29

Table 7-10. Ant 1 EIRP Data (Band n261 - 100MHz-2CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	27525.00	Low	DFT-s-OFDM	QPSK	H+V	MIMO	19+148	V	340	152	1 / 16	25.76
	27525.00	Low	DFT-s-OFDM	QPSK	V	SISO	20	V	339	165	1 / 16	24.31
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	163	H	325	149	1 / 16	21.69
	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	19	V	350	158	1 / 16	22.79
	27924.96	Mid	CP-OFDM	QPSK	H	SISO	163	H	325	149	1 / 16	18.03
	27924.96	Mid	CP-OFDM	QPSK	V	SISO	19	V	350	158	1 / 16	19.18
	27924.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	19+148	V	338	155	1 / 16	26.71
	27924.96	Mid	CP-OFDM	QPSK	H+V	MIMO	19+148	V	167	215	1 / 16	20.01
	28324.92	High	DFT-s-OFDM	QPSK	H+V	MIMO	19+148	V	342	105	1 / 16	26.07
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	19+148	V	338	155	1 / 16	25.89
	27924.96	Mid	DFT-s-OFDM	16QAM	H+V	MIMO	19+148	V	338	155	1 / 16	24.56
	27924.96	Mid	DFT-s-OFDM	64QAM	H+V	MIMO	19+148	V	338	155	1 / 16	22.31

Table 7-11. Ant 2 EIRP Data (Band n261 - 50MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	19	V	323	162	32 / 0	18.24
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	163	H	109	189	32 / 0	17.56
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	V	SISO	19	V	323	162	32 / 0	17.46
	27924.96	Mid	DFT-s-OFDM	16QAM	V	SISO	19	V	323	162	32 / 0	16.33
	27924.96	Mid	DFT-s-OFDM	64QAM	V	SISO	19	V	323	162	32 / 0	15.08

Table 7-12. Ant 2 EIRP Data (Band n261 - 50MHz-2CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	27550.08	Low	DFT-s-OFDM	QPSK	H+V	MIMO	19+148	V	343	158	1 / 32	25.89
	27525.00	Low	DFT-s-OFDM	QPSK	V	SISO	20	V	336	158	1 / 32	24.23
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	163	H	320	146	1 / 32	21.76
	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	19	V	352	163	1 / 32	22.76
	27924.96	Mid	CP-OFDM	QPSK	H	SISO	163	H	320	146	1 / 32	18.18
	27924.96	Mid	CP-OFDM	QPSK	V	SISO	19	V	352	163	1 / 32	19.23
	27924.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	19+148	V	346	159	1 / 32	26.40
	27924.96	Mid	CP-OFDM	QPSK	H+V	MIMO	19+148	V	165	201	1 / 32	19.86
	28299.96	High	DFT-s-OFDM	QPSK	H+V	MIMO	19+148	V	345	101	1 / 32	26.14
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	19+148	V	346	159	1 / 32	26.03
	27924.96	Mid	DFT-s-OFDM	16QAM	H+V	MIMO	19+148	V	346	159	1 / 32	25.13
	27924.96	Mid	DFT-s-OFDM	64QAM	H+V	MIMO	19+148	V	346	159	1 / 32	22.87

Table 7-13. Ant 2 EIRP Data (Band n261 - 100MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	19	V	320	165	64 / 0	18.36
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	163	H	108	193	64 / 0	17.61
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	V	SISO	19	V	320	165	64 / 0	18.29
	27924.96	Mid	DFT-s-OFDM	16QAM	V	SISO	19	V	320	165	64 / 0	17.30
	27924.96	Mid	DFT-s-OFDM	64QAM	V	SISO	19	V	320	165	64 / 0	15.73

Table 7-14. Ant 2 EIRP Data (Band n261 - 100MHz-2CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	27525.00	Low	DFT-s-OFDM	QPSK	H+V	MIMO	43+157	V	106	270	1 / 16	24.86
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	171	V	256	68	1 / 16	22.61
	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	43	V	267	84	1 / 16	21.34
	27924.96	Mid	CP-OFDM	QPSK	H	SISO	171	V	256	68	1 / 16	19.36
	27924.96	Mid	CP-OFDM	QPSK	V	SISO	43	V	267	84	1 / 16	18.21
	27924.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	43+157	V	278	65	1 / 16	26.30
	27924.96	Mid	CP-OFDM	QPSK	H+V	MIMO	43+157	V	278	65	1 / 16	22.76
	28324.92	High	DFT-s-OFDM	QPSK	H+V	MIMO	43+157	V	106	261	1 / 16	24.61
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	43+157	V	278	65	1 / 16	24.76
	27924.96	Mid	DFT-s-OFDM	16QAM	H+V	MIMO	43+157	V	278	65	1 / 16	23.56
	27924.96	Mid	DFT-s-OFDM	64QAM	H+V	MIMO	43+157	V	278	65	1 / 16	21.07

Table 7-15. Ant 3 EIRP Data (Band n261 - 50MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	43	V	267	84	32 / 0	16.46
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	171	V	80	263	32 / 0	17.64
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	H	SISO	171	V	80	263	32 / 0	17.51
	27924.96	Mid	DFT-s-OFDM	16QAM	H	SISO	171	V	80	263	32 / 0	16.38
	27924.96	Mid	DFT-s-OFDM	64QAM	H	SISO	171	V	80	263	32 / 0	14.08

Table 7-16. Ant 3 EIRP Data (Band n261 - 50MHz-2CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	27550.08	Low	DFT-s-OFDM	QPSK	H+V	MIMO	43+157	V	105	276	1 / 32	24.81
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	171	V	258	73	1 / 32	22.71
	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	43	V	272	79	1 / 32	21.38
	27924.96	Mid	CP-OFDM	QPSK	H	SISO	171	V	258	73	1 / 32	19.37
	27924.96	Mid	CP-OFDM	QPSK	V	SISO	43	V	272	79	1 / 32	17.96
	27924.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	43+157	V	280	64	1 / 32	26.18
	27924.96	Mid	CP-OFDM	QPSK	H+V	MIMO	43+157	V	280	64	1 / 32	22.89
	28299.96	High	DFT-s-OFDM	QPSK	H+V	MIMO	43+157	V	108	158	1 / 32	24.86
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	43+157	V	280	64	1 / 32	25.97
	27924.96	Mid	DFT-s-OFDM	16QAM	H+V	MIMO	43+157	V	280	64	1 / 32	24.83
	27924.96	Mid	DFT-s-OFDM	64QAM	H+V	MIMO	43+157	V	280	64	1 / 32	23.01

Table 7-17. Ant 3 EIRP Data (Band n261 - 100MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	27924.96	Mid	DFT-s-OFDM	QPSK	V	SISO	43	V	272	89	64 / 0	16.59
	27924.96	Mid	DFT-s-OFDM	QPSK	H	SISO	171	V	78	266	64 / 0	17.62
	27924.96	Mid	DFT-s-OFDM	π/2 BPSK	H	SISO	171	V	78	266	64 / 0	17.53
	27924.96	Mid	DFT-s-OFDM	16QAM	H	SISO	171	V	78	266	64 / 0	16.48
	27924.96	Mid	DFT-s-OFDM	64QAM	H	SISO	171	V	78	266	64 / 0	14.83

Table 7-18. Ant 3 EIRP Data (Band n261 - 100MHz-2CC)

Band n260 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID(s)
SISO	Low	H	154
		V	40
	Mid	H	167
		V	39
	High	H	167
		V	39
MIMO	Low	H + V	39+153
	Mid	H + V	39+153
	High	H + V	39+153

Table 7-19. Ant 1 Worst Case Beam ID

Mode	Channel	Beam Polarization	Beam ID(s)
SISO	Low	H	147
		V	19
	Mid	H	162
		V	19
	High	H	162
		V	33
MIMO	Low	H + V	19+147
	Mid	H + V	19+147
	High	H + V	19+147

Table 7-20. Ant 2 Worst Case Beam ID

Mode	Channel	Beam Polarization	Beam ID(s)
SISO	Low	H	158
		V	44
	Mid	H	158
		V	44
	High	H	158
		V	44
MIMO	Low	H + V	29+171
	Mid	H + V	29+171
	High	H + V	29+171

Table 7-21. Ant 3 Worst Case Beam ID

Band n260

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	37205.04	Low	DFT-s-OFDM	QPSK	H+V	MIMO	39+153	V	114	200	1 / 16	22.77
	38499.96	Mid	DFT-s-OFDM	QPSK	H	SISO	167	H	53	275	1 / 16	17.94
	38499.96	Mid	DFT-s-OFDM	QPSK	V	SISO	39	V	19	202	1 / 16	20.39
	38499.96	Mid	CP-OFDM	QPSK	H	SISO	167	H	53	275	1 / 16	14.68
	38499.96	Mid	CP-OFDM	QPSK	V	SISO	39	V	19	202	1 / 16	16.89
	38499.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	39+153	V	8	199	1 / 16	20.89
	38499.96	Mid	CP-OFDM	QPSK	H+V	MIMO	39+153	V	8	199	1 / 16	17.61
	39975.00	High	DFT-s-OFDM	QPSK	H+V	MIMO	39+153	V	38	236	1 / 16	19.10
	37205.04	Low	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	39+153	V	114	200	1 / 16	22.64
	37205.04	Low	DFT-s-OFDM	16QAM	H+V	MIMO	39+153	V	114	200	1 / 16	21.38
	37205.04	Low	DFT-s-OFDM	64QAM	H+V	MIMO	39+153	V	114	200	1 / 16	19.20

Table 7-22. Ant 1 EIRP Data (Band n260 - 50MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	39975.00	Mid	DFT-s-OFDM	QPSK	V	SISO	39	V	20	210	32 / 0	17.01
	39975.00	Mid	DFT-s-OFDM	QPSK	H	SISO	167	H	59	270	32 / 0	16.26
	39975.00	Mid	DFT-s-OFDM	π/2 BPSK	V	SISO	167	V	20	210	32 / 0	16.86
	39975.00	Mid	DFT-s-OFDM	16QAM	V	SISO	167	V	20	210	32 / 0	15.28
	39975.00	Mid	DFT-s-OFDM	64QAM	V	SISO	167	V	20	210	32 / 0	13.67

Table 7-23. Ant 1 EIRP Data (Band n260 - 50MHz-2CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	37050.00	Low	DFT-s-OFDM	QPSK	H+V	MIMO	39+153	V	115	208	1 / 32	22.57
	38499.96	Mid	DFT-s-OFDM	QPSK	H	SISO	167	H	55	267	1 / 32	17.83
	38499.96	Mid	DFT-s-OFDM	QPSK	V	SISO	39	V	23	210	1 / 32	20.26
	38499.96	Mid	CP-OFDM	QPSK	H	SISO	167	H	55	267	1 / 32	15.10
	38499.96	Mid	CP-OFDM	QPSK	V	SISO	39	V	23	210	1 / 32	17.11
	38499.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	39+153	V	5	192	1 / 32	20.80
	38499.96	Mid	CP-OFDM	QPSK	H+V	MIMO	39+153	V	5	192	1 / 32	17.53
	39949.92	High	DFT-s-OFDM	QPSK	H+V	MIMO	39+153	V	35	233	1 / 32	18.86
	37050.00	Low	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	39+153	V	115	208	1 / 32	22.55
	37050.00	Low	DFT-s-OFDM	16QAM	H+V	MIMO	39+153	V	115	208	1 / 32	21.27
	37050.00	Low	DFT-s-OFDM	64QAM	H+V	MIMO	39+153	V	115	208	1 / 32	19.39

Table 7-24. Ant 1 EIRP Data (Band n260 - 100MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	39949.92	Mid	DFT-s-OFDM	QPSK	V	SISO	39	V	21	207	64 / 0	16.87
	39949.92	Mid	DFT-s-OFDM	QPSK	H	SISO	167	H	62	268	64 / 0	16.21
	39949.92	Mid	DFT-s-OFDM	π/2 BPSK	H	SISO	167	H	62	268	64 / 0	16.52
	39949.92	Mid	DFT-s-OFDM	16QAM	H	SISO	167	H	62	268	64 / 0	15.37
	39949.92	Mid	DFT-s-OFDM	64QAM	H	SISO	167	H	62	268	64 / 0	13.86

Table 7-25. Ant 1 EIRP Data (Band n260 - 100MHz-2CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	37205.04	Low	DFT-s-OFDM	QPSK	H	SISO	147	H	299	186	1 / 16	23.01
	37205.04	Low	DFT-s-OFDM	QPSK	H+V	MIMO	19+147	H	356	154	1 / 16	24.12
	38499.96	Mid	DFT-s-OFDM	QPSK	H	SISO	162	H	144	177	1 / 16	21.70
	38499.96	Mid	DFT-s-OFDM	QPSK	V	SISO	19	H	321	168	1 / 16	21.45
	38499.96	Mid	CP-OFDM	QPSK	H	SISO	162	H	146	178	1 / 16	19.19
	38499.96	Mid	CP-OFDM	QPSK	V	SISO	19	H	327	169	1 / 16	17.83
	38499.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	19+147	H	254	171	1 / 16	21.93
	38499.96	Mid	CP-OFDM	QPSK	H+V	MIMO	19+147	H	254	171	1 / 16	18.41
	39975.00	High	DFT-s-OFDM	QPSK	H+V	MIMO	19+147	H	292	170	1 / 16	23.65
	37205.04	Low	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	19+147	H	356	154	1 / 16	23.08
	37205.04	Low	DFT-s-OFDM	16QAM	H+V	MIMO	19+147	H	356	154	1 / 16	22.16
	37205.04	Low	DFT-s-OFDM	64QAM	H+V	MIMO	19+147	H	356	154	1 / 16	20.11

Table 7-26. Ant 2 EIRP Data (Band n260 - 50MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	39975.00	Mid	DFT-s-OFDM	QPSK	V	SISO	19	H	326	168	32 / 0	18.26
	39975.00	Mid	DFT-s-OFDM	QPSK	H	SISO	162	H	119	175	32 / 0	18.72
	39975.00	Mid	DFT-s-OFDM	π/2 BPSK	H	SISO	162	H	119	175	32 / 0	18.63
	39975.00	Mid	DFT-s-OFDM	16QAM	H	SISO	162	H	119	175	32 / 0	17.54
	39975.00	Mid	DFT-s-OFDM	64QAM	H	SISO	162	H	119	175	32 / 0	15.86

Table 7-27. Ant 2 EIRP Data (Band n260 - 50MHz-2CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	37205.04	Low	DFT-s-OFDM	QPSK	H	SISO	147	H	298	180	1 / 16	22.98
	37050.00	Low	DFT-s-OFDM	QPSK	H+V	MIMO	19+147	H	354	158	1 / 32	23.77
	38499.96	Mid	DFT-s-OFDM	QPSK	H	SISO	162	H	146	178	1 / 32	21.64
	38499.96	Mid	DFT-s-OFDM	QPSK	V	SISO	19	H	321	168	1 / 32	21.22
	38499.96	Mid	CP-OFDM	QPSK	H	SISO	162	H	147	174	1 / 32	19.02
	38499.96	Mid	CP-OFDM	QPSK	V	SISO	19	H	327	170	1 / 32	17.93
	38499.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	19+147	H	261	168	1 / 32	22.71
	38499.96	Mid	CP-OFDM	QPSK	H+V	MIMO	19+147	H	261	168	1 / 32	18.64
	39949.92	High	DFT-s-OFDM	QPSK	H+V	MIMO	19+147	H	290	167	1 / 32	23.60
	39949.92	High	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	19+147	H	354	158	1 / 32	23.19
	39949.92	High	DFT-s-OFDM	16QAM	H+V	MIMO	19+147	H	354	158	1 / 32	22.18
	39949.92	High	DFT-s-OFDM	64QAM	H+V	MIMO	19+147	H	354	158	1 / 32	20.03

Table 7-28. Ant 2 EIRP Data (Band n260 - 100MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	39949.92	Mid	DFT-s-OFDM	QPSK	V	SISO	19	H	325	169	64 / 0	18.28
	39949.92	Mid	DFT-s-OFDM	QPSK	H	SISO	162	H	120	174	64 / 0	18.93
	39949.92	Mid	DFT-s-OFDM	π/2 BPSK	H	SISO	162	H	120	174	64 / 0	18.86
	39949.92	Mid	DFT-s-OFDM	16QAM	H	SISO	162	H	120	174	64 / 0	17.62
	39949.92	Mid	DFT-s-OFDM	64QAM	H	SISO	162	H	120	174	64 / 0	15.61

Table 7-29. Ant 2 EIRP Data (Band n260 - 100MHz-2CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	37205.04	Low	DFT-s-OFDM	QPSK	H+V	MIMO	29+171	V	30	207	1 / 16	21.36
	38499.96	Mid	DFT-s-OFDM	QPSK	H	SISO	158	V	32	210	1 / 16	18.21
	38499.96	Mid	DFT-s-OFDM	QPSK	V	SISO	44	V	332	156	1 / 16	19.05
	38499.96	Mid	CP-OFDM	QPSK	H	SISO	158	V	32	210	1 / 16	15.86
	38499.96	Mid	CP-OFDM	QPSK	V	SISO	44	V	332	156	1 / 16	16.76
	38499.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	29+171	V	34	215	1 / 16	22.12
	38499.96	Mid	CP-OFDM	QPSK	H+V	MIMO	29+171	V	34	215	1 / 16	16.21
	39975.00	High	DFT-s-OFDM	QPSK	H+V	MIMO	29+171	V	26	213	1 / 16	22.84
	38499.96	Mid	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	29+171	V	26	213	1 / 16	22.73
	38499.96	Mid	DFT-s-OFDM	16QAM	H+V	MIMO	29+171	V	26	213	1 / 16	21.67
	38499.96	Mid	DFT-s-OFDM	64QAM	H+V	MIMO	29+171	V	26	213	1 / 16	19.20

Table 7-30. Ant 3 EIRP Data (Band n260 - 50MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	39975.00	Mid	DFT-s-OFDM	QPSK	V	SISO	44	V	333	157	32 / 0	16.63
	39975.00	Mid	DFT-s-OFDM	QPSK	H	SISO	158	V	31	209	32 / 0	17.51
	39975.00	Mid	DFT-s-OFDM	π/2 BPSK	H	SISO	158	V	31	209	32 / 0	17.49
	39975.00	Mid	DFT-s-OFDM	16QAM	H	SISO	158	V	31	209	32 / 0	16.29
	39975.00	Mid	DFT-s-OFDM	64QAM	H	SISO	158	V	31	209	32 / 0	14.64

Table 7-31. Ant 3 EIRP Data (Band n260 - 50MHz-2CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
1	37050.00	Low	DFT-s-OFDM	QPSK	H+V	MIMO	29+171	V	32	211	1 / 32	21.45
	38499.96	Mid	DFT-s-OFDM	QPSK	H	SISO	158	V	33	216	1 / 32	18.35
	38499.96	Mid	DFT-s-OFDM	QPSK	V	SISO	44	V	330	158	1 / 32	19.17
	38499.96	Mid	CP-OFDM	QPSK	H	SISO	158	V	33	216	1 / 32	16.23
	38499.96	Mid	CP-OFDM	QPSK	V	SISO	44	V	330	158	1 / 32	17.18
	38499.96	Mid	DFT-s-OFDM	QPSK	H+V	MIMO	29+171	V	36	211	1 / 32	22.06
	38499.96	Mid	CP-OFDM	QPSK	H+V	MIMO	29+171	V	36	211	1 / 32	15.97
	39949.92	High	DFT-s-OFDM	QPSK	H+V	MIMO	29+171	V	25	210	1 / 32	22.57
	38499.96	Mid	DFT-s-OFDM	π/2 BPSK	H+V	MIMO	29+171	V	25	210	1 / 32	22.43
	38499.96	Mid	DFT-s-OFDM	16QAM	H+V	MIMO	29+171	V	25	210	1 / 32	21.38
	38499.96	Mid	DFT-s-OFDM	64QAM	H+V	MIMO	29+171	V	25	210	1 / 32	19.31

Table 7-32. Ant 3 EIRP Data (Band n260 - 100MHz-1CC)

CCs active	Frequency [MHz]	Channel	Transmission Scheme	Modulation	Beam Pol	Ant. Div.	BeamID	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
2	39949.92	Mid	DFT-s-OFDM	QPSK	V	SISO	44	V	335	152	64 / 0	16.86
	39949.92	Mid	DFT-s-OFDM	QPSK	H	SISO	158	V	35	211	64 / 0	17.82
	39949.92	Mid	DFT-s-OFDM	π/2 BPSK	H	SISO	158	V	35	211	64 / 0	17.68
	39949.92	Mid	DFT-s-OFDM	16QAM	H	SISO	158	V	35	211	64 / 0	16.54
	39949.92	Mid	DFT-s-OFDM	64QAM	H	SISO	158	V	35	211	64 / 0	14.83

Table 7-33. Ant 3 EIRP Data (Band n260 - 100MHz-2CC)

7.4 Radiated Spurious and Harmonic Emissions

§2.1051, §30.203

Test Overview

The spectrum is scanned from 30MHz to 100GHz for n261 and from 30MHz to 200GHz for n260. 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 v01r01 Section 4.4.2 and 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 = Maxhold
4. Sweep time = auto couple
5. Number of sweep points ≥ 2 x 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.

3) 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.

4) 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 (dBμV/m) + 20log(D) − 104.8; where D is the measurement distance (in the far field region) in m. The field strength E is calculated E (dBμV/m) = Spectrum Analyzer Level (dBm) + Antenna Factor (dB/m) + Cable Loss (dB) + 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.

5) 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/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 7-34. Far-Field Distance & Measurement Distance per Frequency Range

6) 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.

7) 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.

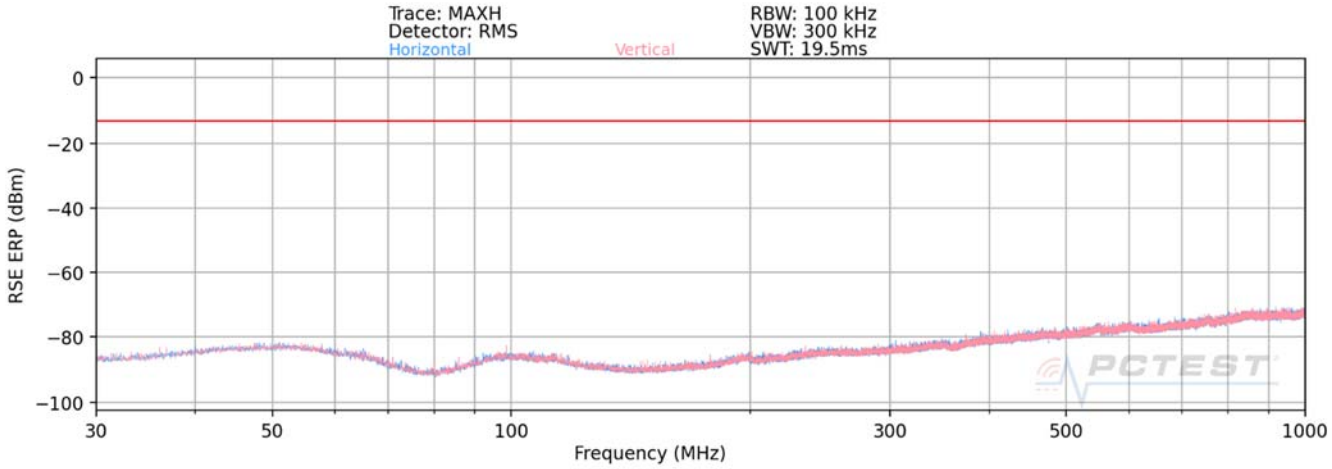
8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

9) 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.

10) There was no discernible difference in the spurious emission levels when using different LTE anchor bands. Thus, LTE Band 2 was used as a representative anchor band for EN-DC investigations.

Band n261 – Ant 1

30MHz - 1GHz



Plot 7-33. Ant 1- n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

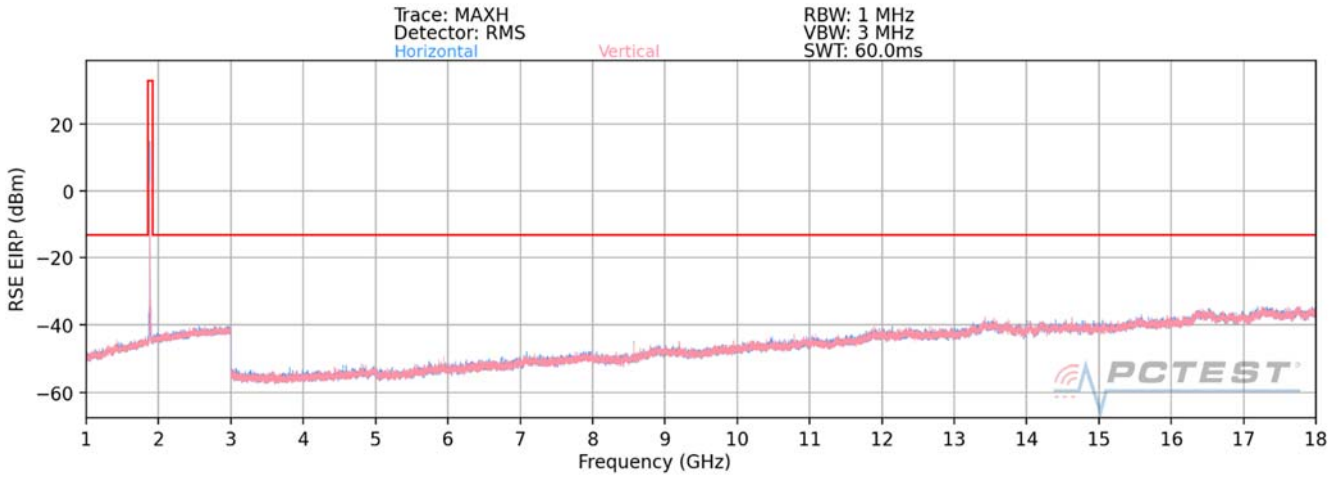
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
984.00	Low	100	H	QPSK	H	-	-	-80.61	-13.00	-67.61
962.00	Mid	100	H	QPSK	H	-	-	-79.36	-13.00	-66.36
935.00	High	100	H	QPSK	H	-	-	-78.19	-13.00	-65.19

Table 7-35. Ant 1 -Spurious Emissions Table (30MHz - 1GHz)

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 3 meter.

1GHz - 18GHz



Plot 7-34. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

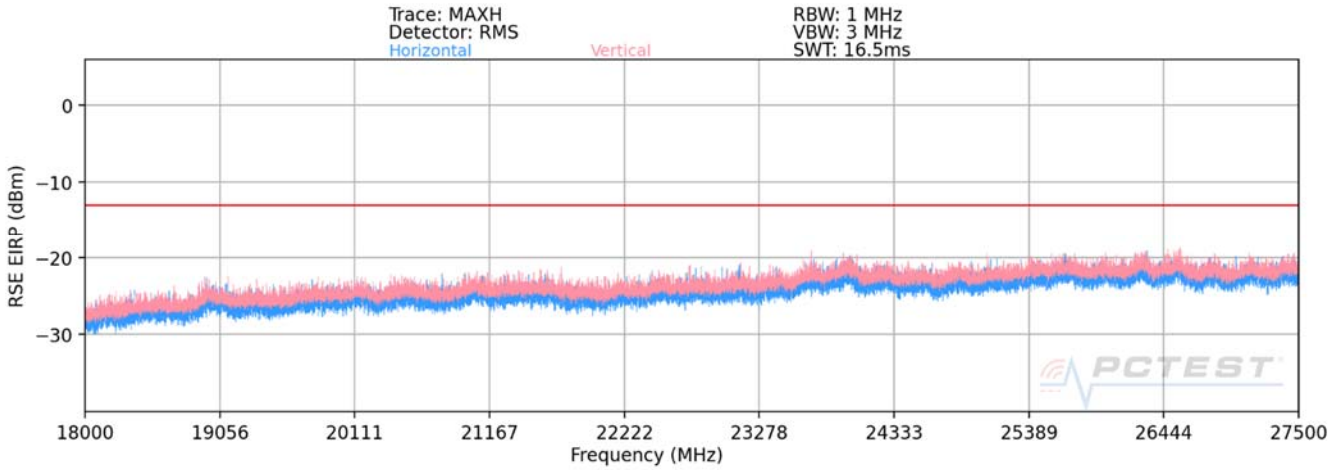
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8786.00	Low	100	H	QPSK	H	202	136	-45.39	-13.00	-32.39
8571.00	Mid	100	H	QPSK	H	197	138	-46.33	-13.00	-33.33
8996.00	High	100	H	QPSK	H	190	133	-45.48	-13.00	-32.48

Table 7-36. Ant 1 -Spurious Emissions Table (1GHz - 18GHz)

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 3 meter.

18GHz - 27.5GHz



Plot 7-35. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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

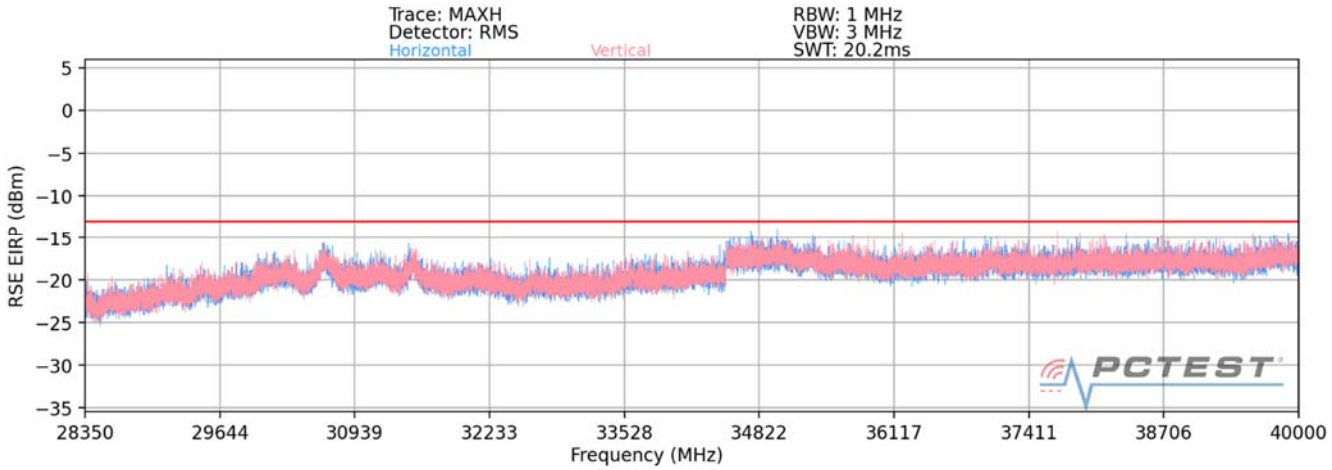
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
27413.50	Low	100	H	QPSK	H	-	-	-24.61	-13.00	-11.61
27431.80	Mid	100	H	QPSK	H	-	-	-24.62	-13.00	-11.62
27297.20	High	100	H	QPSK	H	-	-	-25.33	-13.00	-12.33

Table 7-27. Ant 1 -Spurious Emissions Table (18GHz - 27.5GHz)

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.

28.35GHz - 40GHz



Plot 7-36. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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

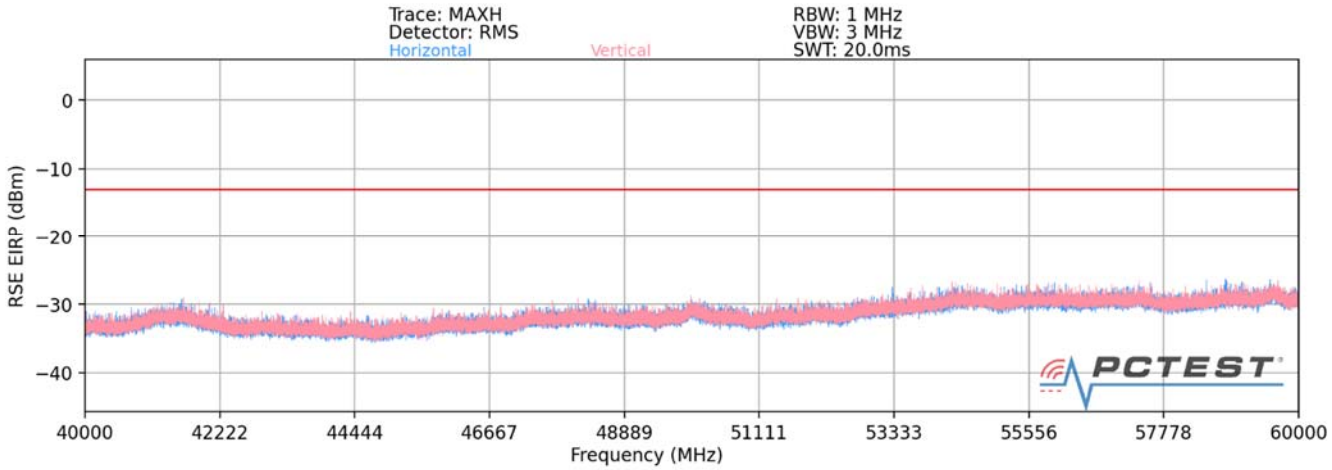
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
37318.30	Low	100	H	QPSK	H	-	-	-25.62	-13.00	-12.62
38618.60	Mid	100	H	QPSK	H	-	-	-24.39	-13.00	-11.39
37694.50	High	100	H	QPSK	H	-	-	-25.32	-13.00	-12.32

Table 7-28. Ant 1 -Spurious Emissions Table (28.35GHz - 40GHz)

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.

40GHz - 60GHz



Plot 7-37. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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]

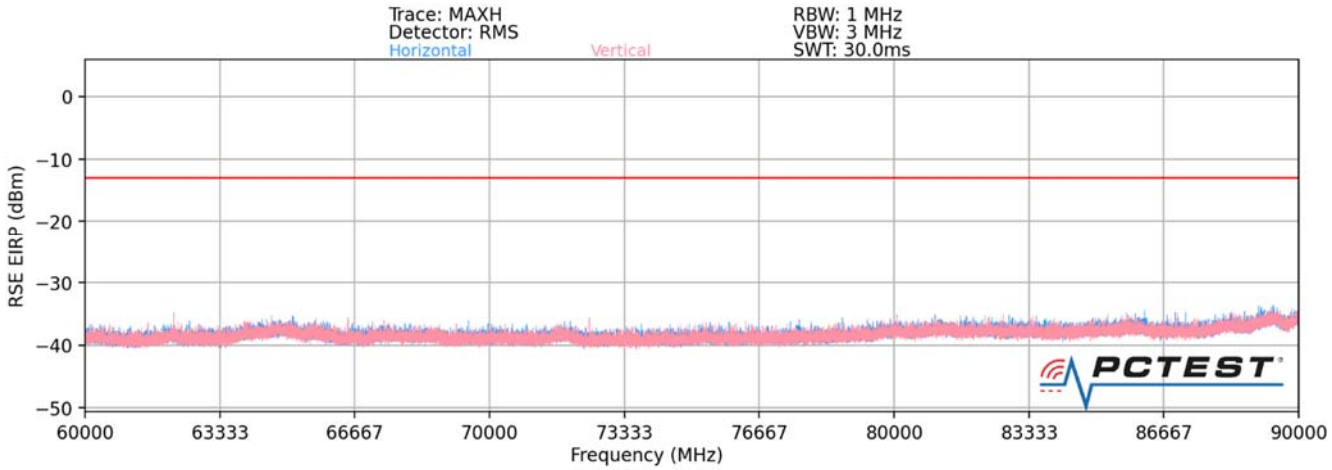
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
55100.16	Low	100	H	QPSK	H	-	-	-35.61	-13.00	-22.61
55849.92	Mid	100	H	QPSK	H	-	-	-34.28	-13.00	-21.28
56599.92	High	100	H	QPSK	H	-	-	-33.91	-13.00	-20.91

Table 7-29. Ant 1 -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.

60GHz - 90GHz



Plot 7-38. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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]

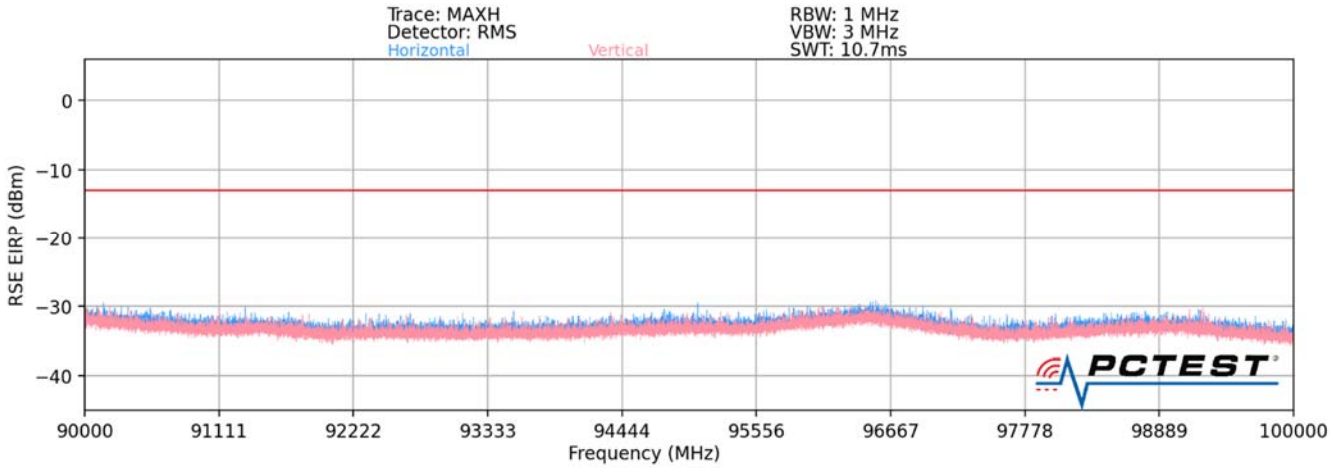
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
82650.24	Low	100	H	QPSK	H	-	-	-41.32	-13.00	-28.32
83774.88	Mid	100	H	QPSK	H	-	-	-43.62	-13.00	-30.62
84899.88	High	100	H	QPSK	H	-	-	-44.65	-13.00	-31.65

Table 7-30. Ant 1 -Spurious Emissions Table (60GHz - 90GHz)

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.

90GHz - 100GHz



Plot 7-39. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
99250.50	Low	100	H	QPSK	H	-	-	-35.32	-13.00	-22.32
90385.60	Mid	100	H	QPSK	H	-	-	-36.94	-13.00	-23.94
99261.10	High	100	H	QPSK	H	-	-	-35.84	-13.00	-22.84

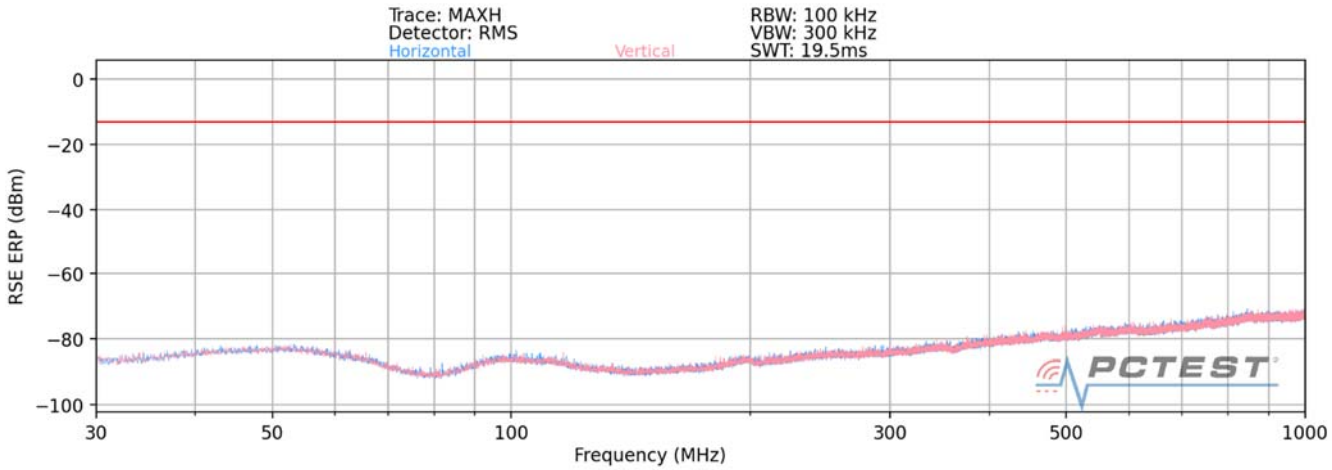
Table 7-31. Ant 1 -Spurious Emissions Table (90GHz - 100GHz)

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.

Band n261 – Ant 2

30MHz - 1GHz



Plot 7-40. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

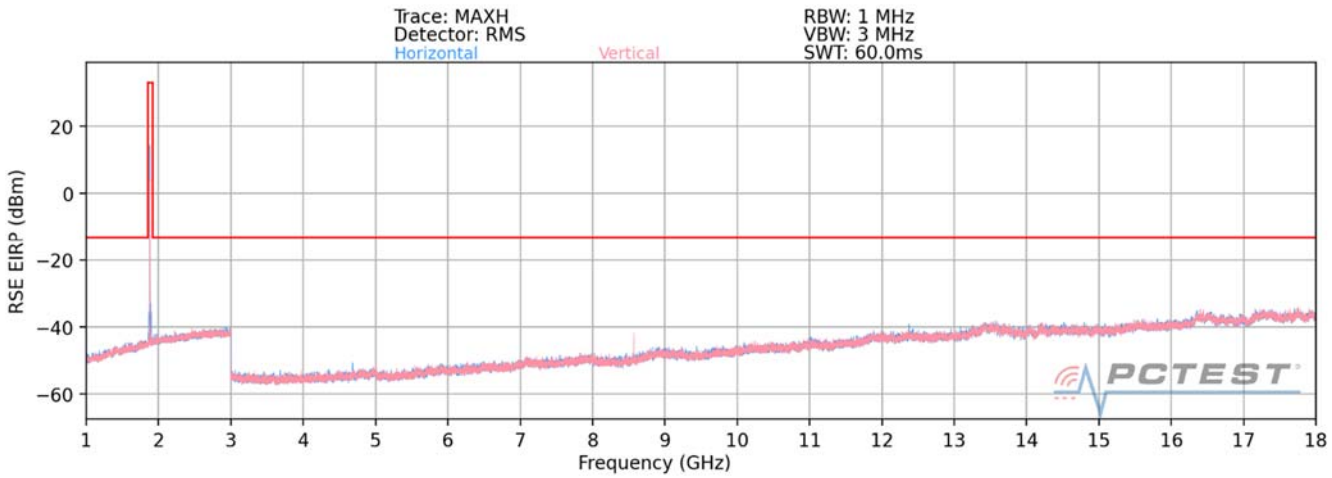
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
959.00	Low	100	V	QPSK	V	-	-	-80.38	-13.00	-67.38
938.00	Mid	100	V	QPSK	V	-	-	-78.61	-13.00	-65.61
917.00	High	100	V	QPSK	V	-	-	-81.39	-13.00	-68.39

Table 7-32. Ant 2 -Spurious Emissions Table (30MHz - 1GHz)

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 3 meter.

1GHz - 18GHz



Plot 7-41. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

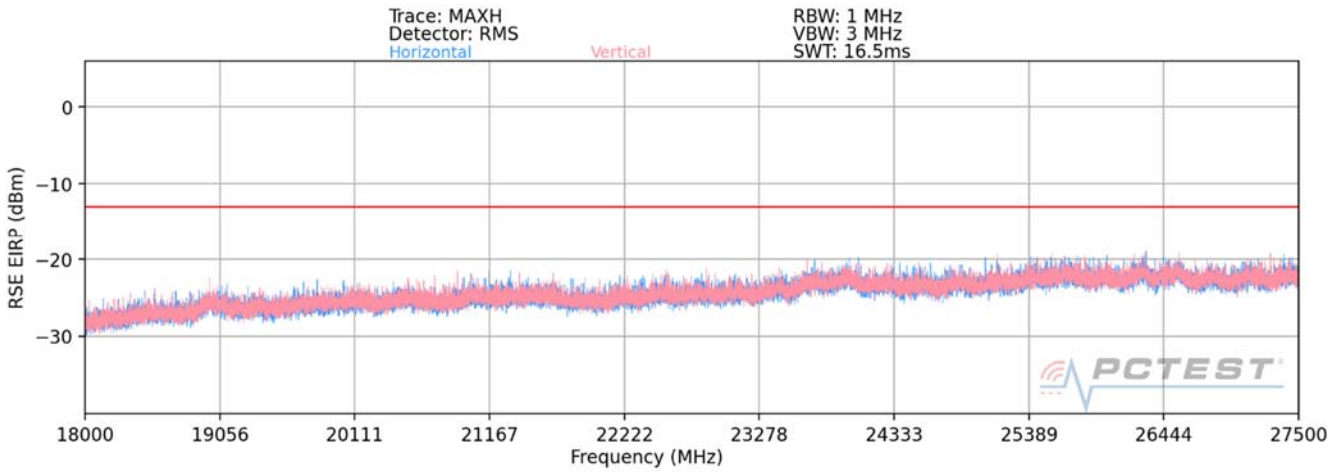
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8786.00	Low	100	V	QPSK	V	220	59	-45.10	-13.00	-32.10
8571.00	Mid	100	V	QPSK	V	212	50	-47.73	-13.00	-34.73
8996.00	High	100	V	QPSK	V	223	58	-46.28	-13.00	-33.28

Table 7-33. Ant 2 -Spurious Emissions Table (1GHz - 18GHz)

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 3 meter.

18GHz - 27.5GHz



Plot 7-42. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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

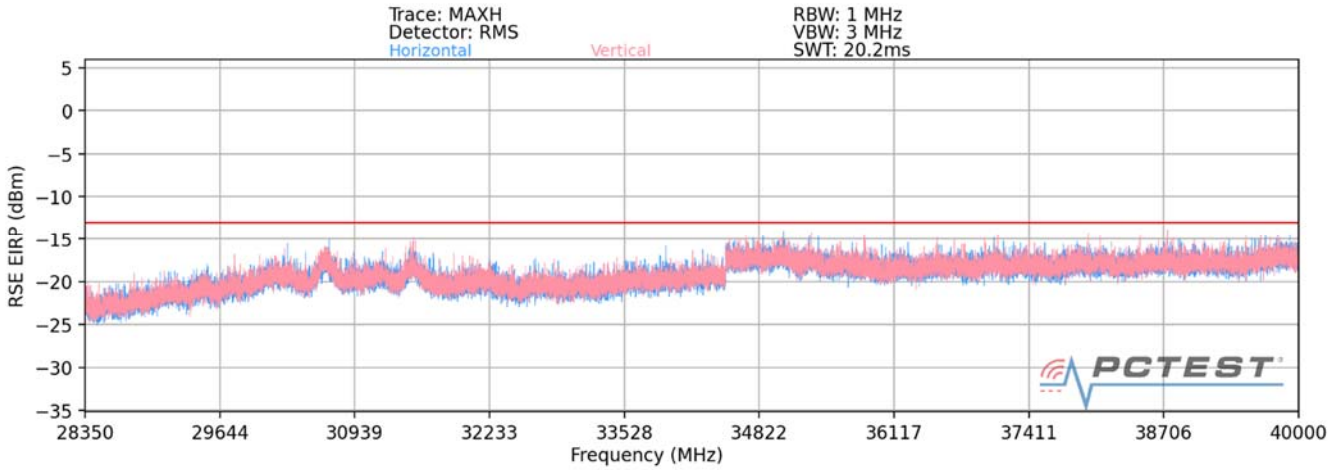
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
27361.80	Low	100	V	QPSK	V	-	-	-23.64	-13.00	-10.64
27223.90	Mid	100	V	QPSK	V	-	-	-25.86	-13.00	-12.86
26864.50	High	100	V	QPSK	V	-	-	-24.79	-13.00	-11.79

Table 7-34. Ant 2 -Spurious Emissions Table (18GHz - 27.5GHz)

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.

28.35GHz - 40GHz



Plot 7-43. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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

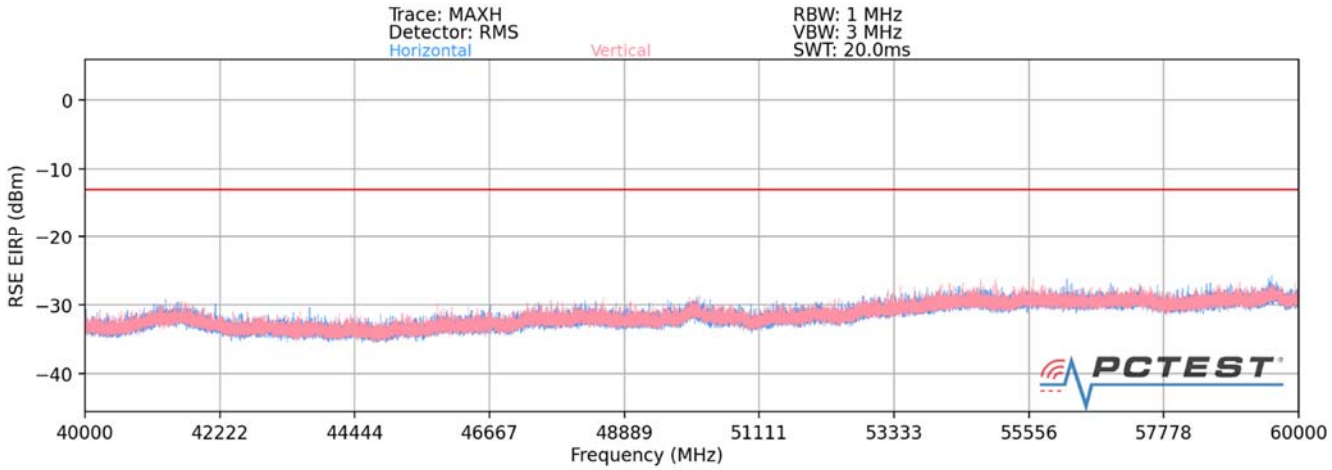
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
37959.60	Low	100	V	QPSK	V	-	-	-24.68	-13.00	-11.68
38606.40	Mid	100	V	QPSK	V	-	-	-23.95	-13.00	-10.95
37303.00	High	100	V	QPSK	V	-	-	-25.67	-13.00	-12.67

Table 7-35. Ant 2 -Spurious Emissions Table (28.35GHz - 40GHz)

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.

40GHz - 60GHz



Plot 7-44. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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]

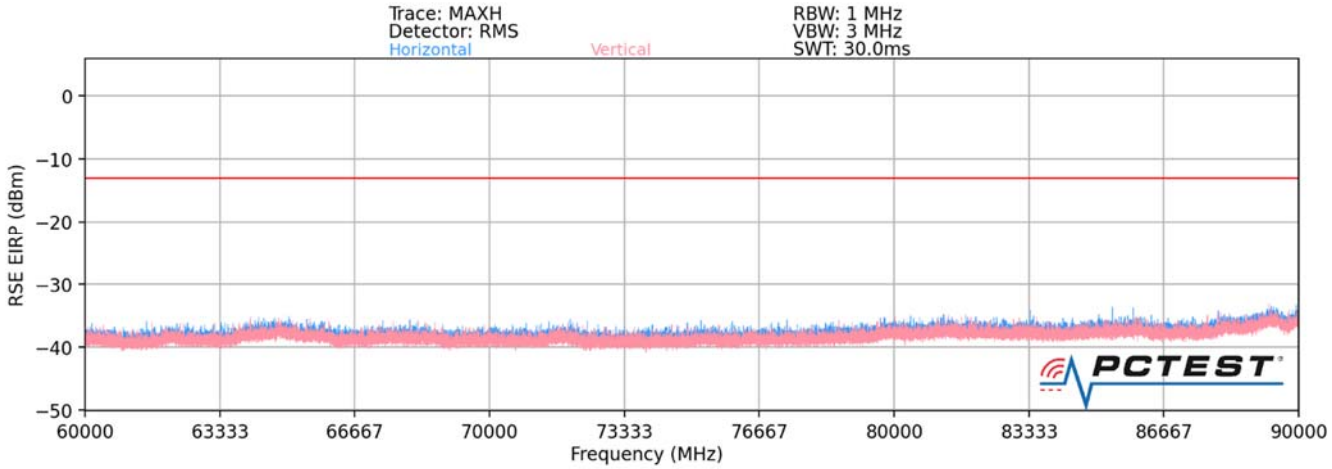
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
55100.16	Low	100	V	QPSK	V	-	-	-35.64	-13.00	-22.64
55849.92	Mid	100	V	QPSK	V	-	-	-33.84	-13.00	-20.84
56599.92	High	100	V	QPSK	V	-	-	-35.19	-13.00	-22.19

Table 7-36. Ant 2 -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.

60GHz - 90GHz



Plot 7-45. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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

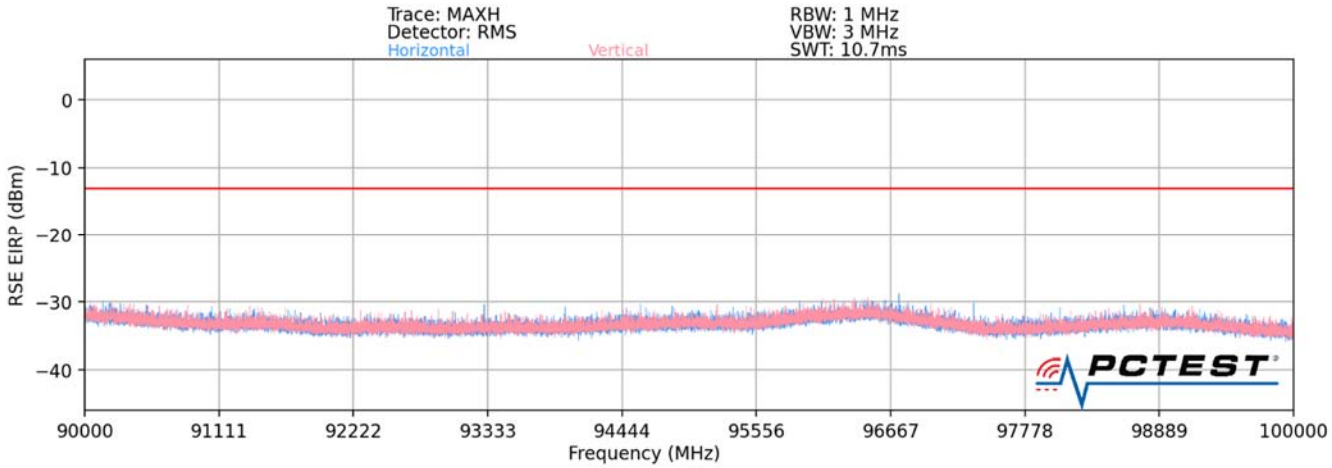
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
82650.24	Low	100	V	QPSK	V	-	-	-42.38	-13.00	-29.38
83774.88	Mid	100	V	QPSK	V	-	-	-44.36	-13.00	-31.36
84899.88	High	100	V	QPSK	V	-	-	-43.90	-13.00	-30.90

Table 7-37. Ant 2 -Spurious Emissions Table (60GHz - 90GHz)

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.

90GHz - 100GHz



Plot 7-46. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
94540.50	Low	100	V	QPSK	V	-	-	-42.46	-13.00	-29.46
96932.40	Mid	100	V	QPSK	V	-	-	-43.20	-13.00	-30.20
95070.50	High	100	V	QPSK	V	-	-	-43.69	-13.00	-30.69

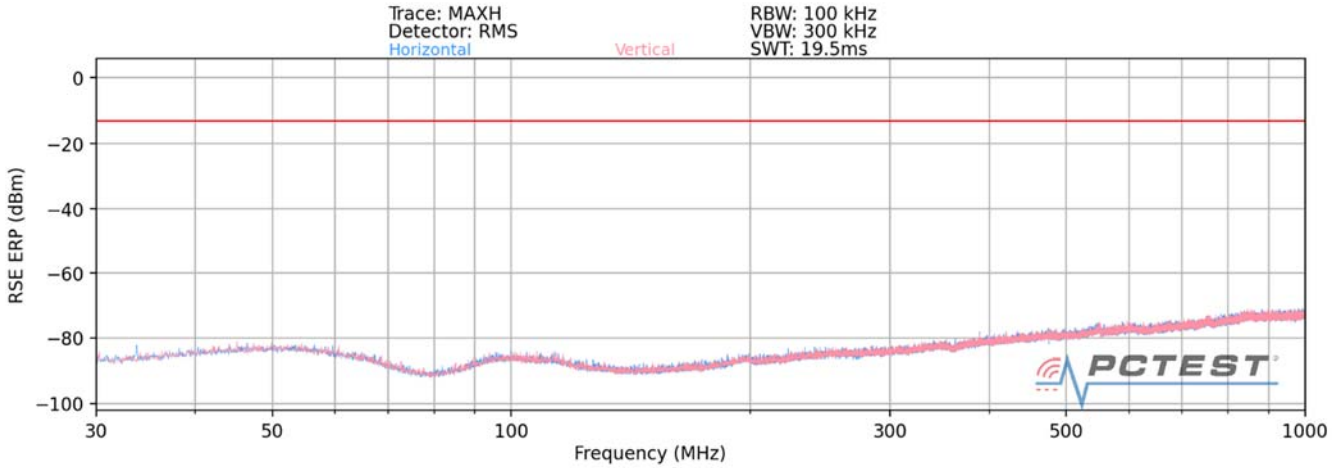
Table 7-38. Ant 2 -Spurious Emissions Table (90GHz - 100GHz)

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.

Band n261 – Ant 3

30MHz - 1GHz



Plot 7-34. Ant 3- n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

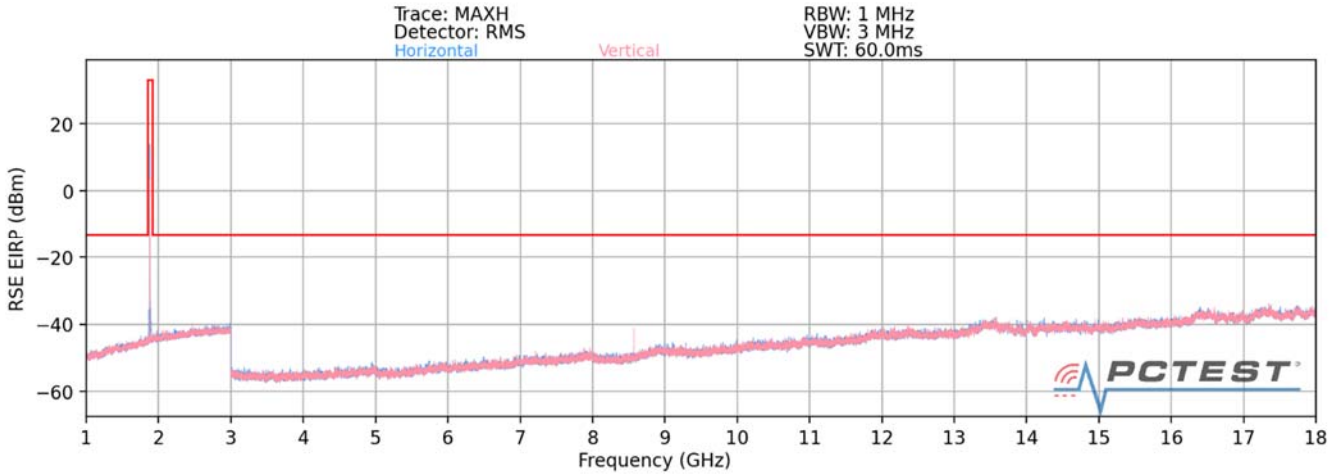
Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	100	V	QPSK	H	-	-	-82.30	-13.00	-69.30
Mid	100	V	QPSK	H	-	-	-80.31	-13.00	-67.31
High	100	V	QPSK	H	-	-	-80.75	-13.00	-67.75

Table 7-37. Ant 3 -Spurious Emissions Table (30MHz - 1GHz)

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 3 meter.

1GHz - 18GHz



Plot 7-34. Ant 3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

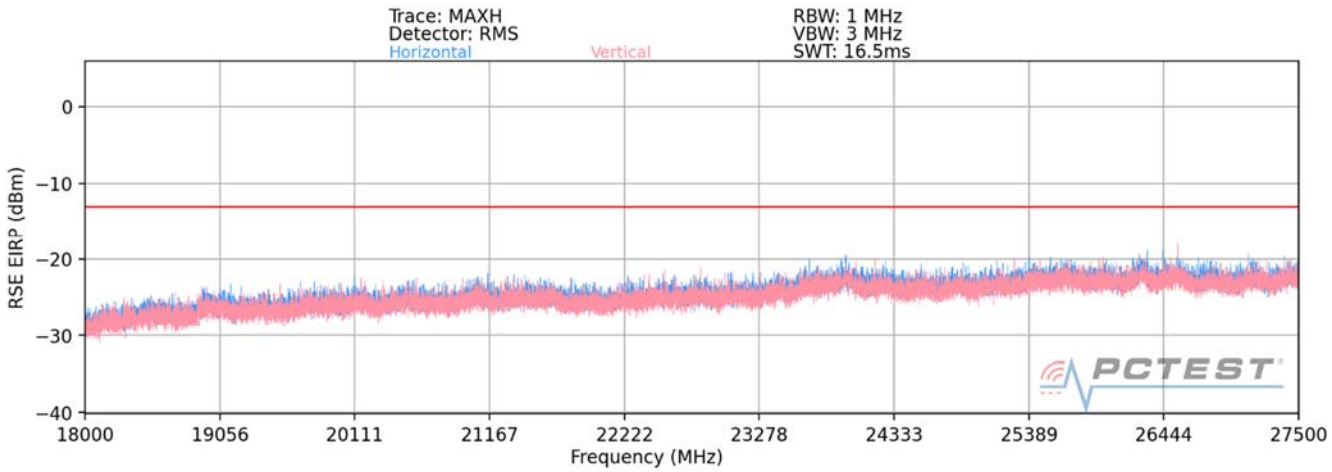
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8786.00	Low	100	V	QPSK	H	110	220	-46.28	-13.00	-33.28
8571.00	Mid	100	V	QPSK	H	105	208	-42.39	-13.00	-29.39
8996.00	High	100	V	QPSK	H	113	225	-45.15	-13.00	-32.15

Table 7-38. Ant 3 -Spurious Emissions Table (1GHz - 18GHz)

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 3 meter.

18GHz - 27.5GHz



Plot 7-35. Ant 3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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

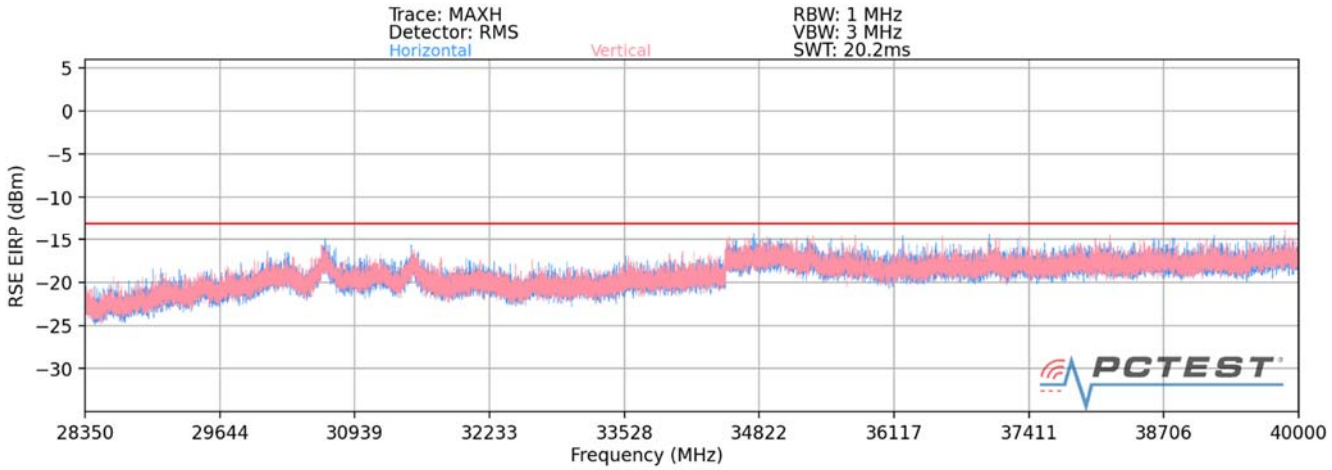
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
27238.90	Low	100	V	QPSK	H	-	-	-22.64	-13.00	-9.64
27418.80	Mid	100	V	QPSK	H	-	-	-23.67	-13.00	-10.67
27328.40	High	100	V	QPSK	H	-	-	-24.58	-13.00	-11.58

Table 7-27. Ant 3 -Spurious Emissions Table (18GHz - 27.5GHz)

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.

28.35GHz - 40GHz



Plot 7-36. Ant 3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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

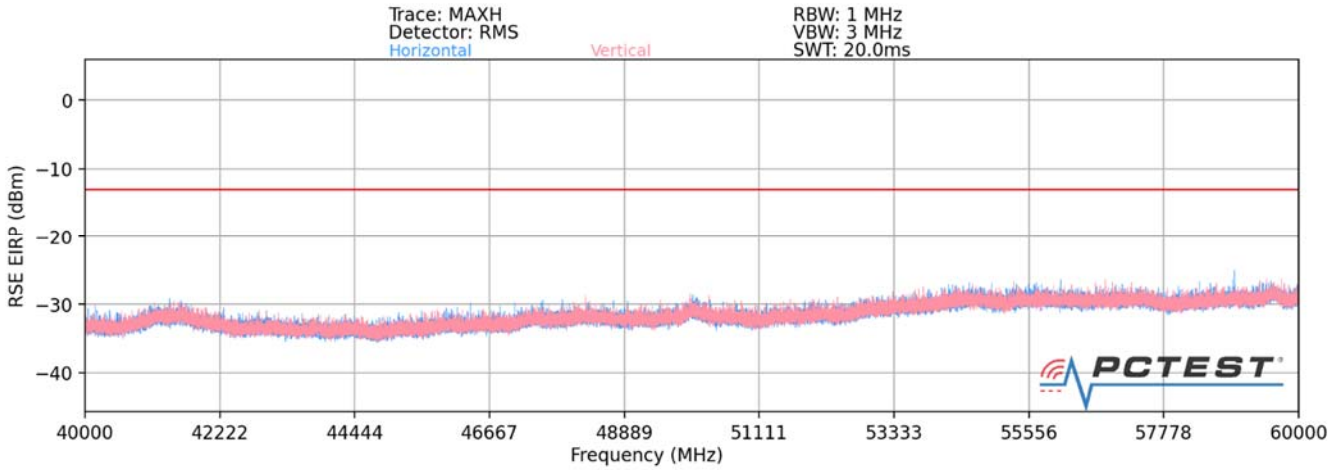
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
38618.40	Low	100	V	QPSK	H	-	-	-23.84	-13.00	-10.84
37892.50	Mid	100	V	QPSK	H	-	-	-22.68	-13.00	-9.68
37468.20	High	100	V	QPSK	H	-	-	-24.96	-13.00	-11.96

Table 7-28. Ant 3 -Spurious Emissions Table (28.35GHz - 40GHz)

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.

40GHz - 60GHz



Plot 7-37. Ant 3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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]

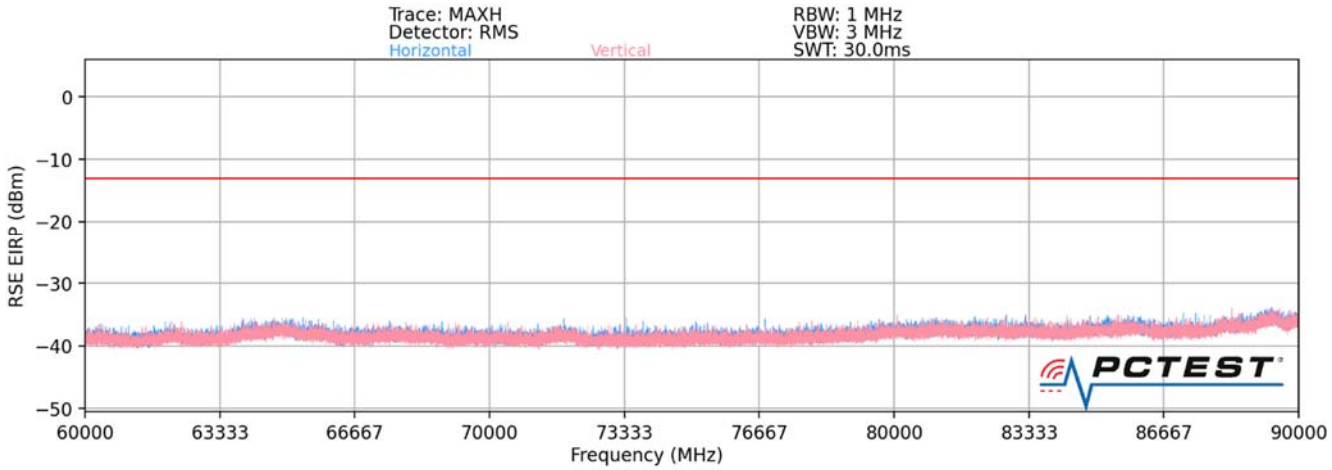
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
55100.16	Low	100	V	QPSK	H	-	-	-33.34	-13.00	-20.34
55849.92	Mid	100	V	QPSK	H	-	-	-34.94	-13.00	-21.94
56599.92	High	100	V	QPSK	H	-	-	-33.87	-13.00	-20.87

Table 7-29. Ant 3 -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.

60GHz - 90GHz



Plot 7-38. Ant 3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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]

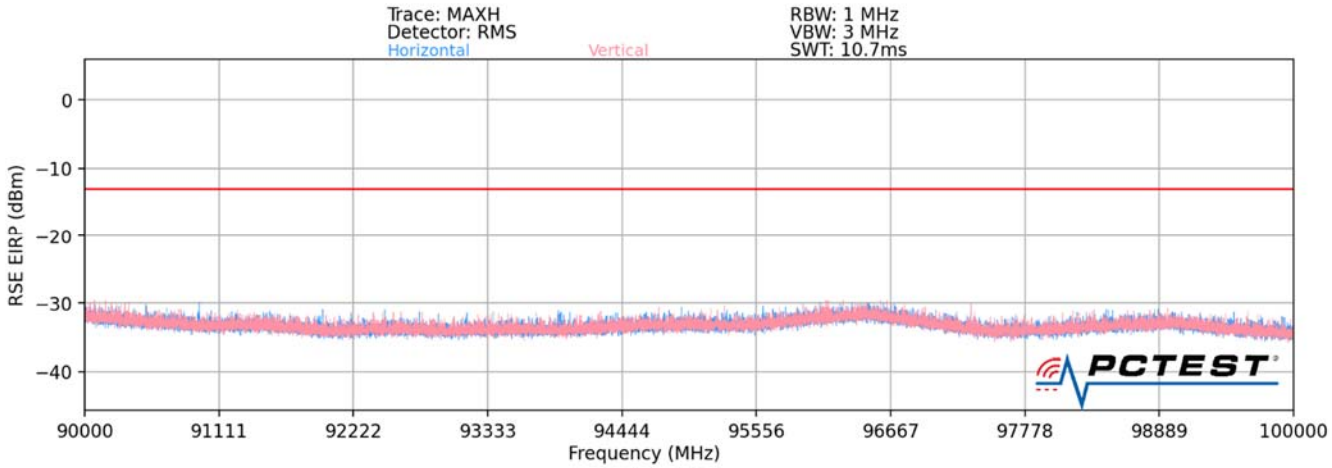
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
82650.24	Low	100	V	QPSK	H	-	-	-43.62	-13.00	-30.62
83774.88	Mid	100	V	QPSK	H	-	-	-44.31	-13.00	-31.31
84899.88	High	100	V	QPSK	H	-	-	-42.67	-13.00	-29.67

Table 7-30. Ant 3 -Spurious Emissions Table (60GHz - 90GHz)

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.

90GHz - 100GHz



Plot 7-39. Ant 3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

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]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
95613.80	Low	100	V	QPSK	H	-	-	-43.67	-13.00	-30.67
96458.20	Mid	100	V	QPSK	H	-	-	-44.68	-13.00	-31.68
95348.20	High	100	V	QPSK	H	-	-	-42.55	-13.00	-29.55

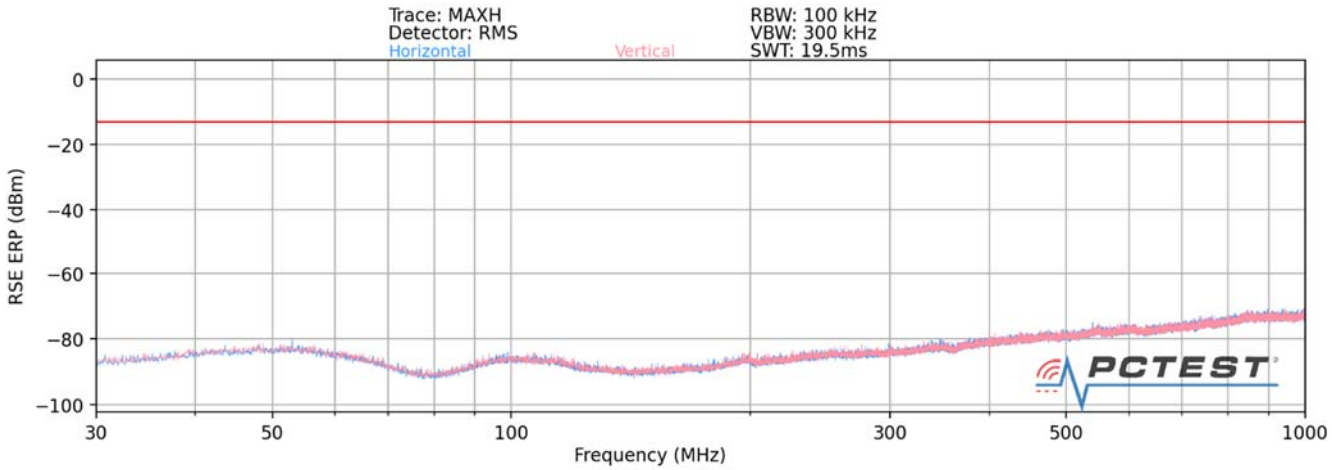
Table 7-31. Ant 3 -Spurious Emissions Table (90GHz - 100GHz)

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.

Band n260- Ant 1

30MHz - 1GHz



Plot 7-47. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

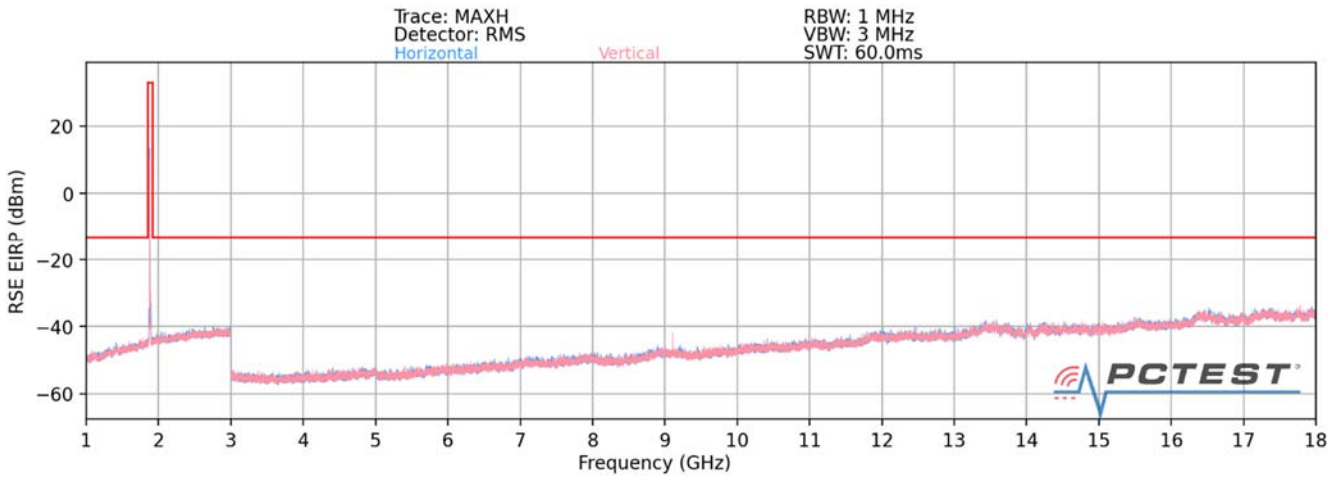
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
937.00	Low	100	H	QPSK	H	-	-	-78.51	-13.00	-65.51
961.00	Mid	100	H	QPSK	H	-	-	-79.94	-13.00	-66.94
982.00	High	100	H	QPSK	H	-	-	-80.76	-13.00	-67.76

Table 7-39. Ant 1 -Spurious Emissions Table (30MHz - 1GHz)

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 3 meter.

1GHz - 18GHz



Plot 7-48. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

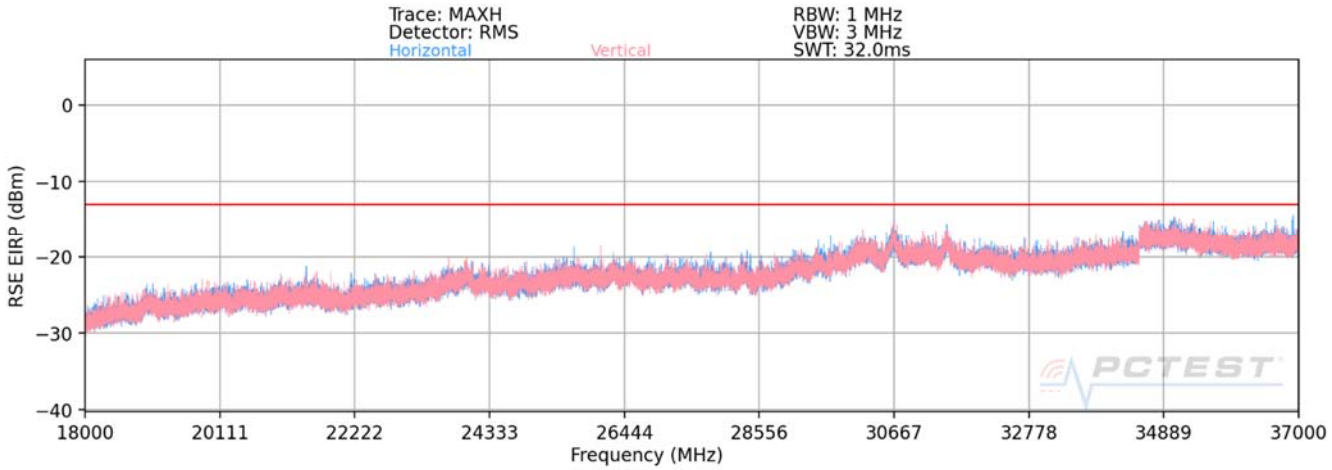
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8379.00	Low	100	H	QPSK	H	261	338	-41.23	-13.00	-28.23
9111.00	Mid	100	H	QPSK	H	256	336	-42.27	-13.00	-29.27
9180.00	High	100	H	QPSK	H	255	345	-43.34	-13.00	-30.34

Table 7-40. Ant 1 -Spurious Emissions Table (1GHz - 18GHz)

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 3 meter.

18GHz – 37GHz



Plot 7-49. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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

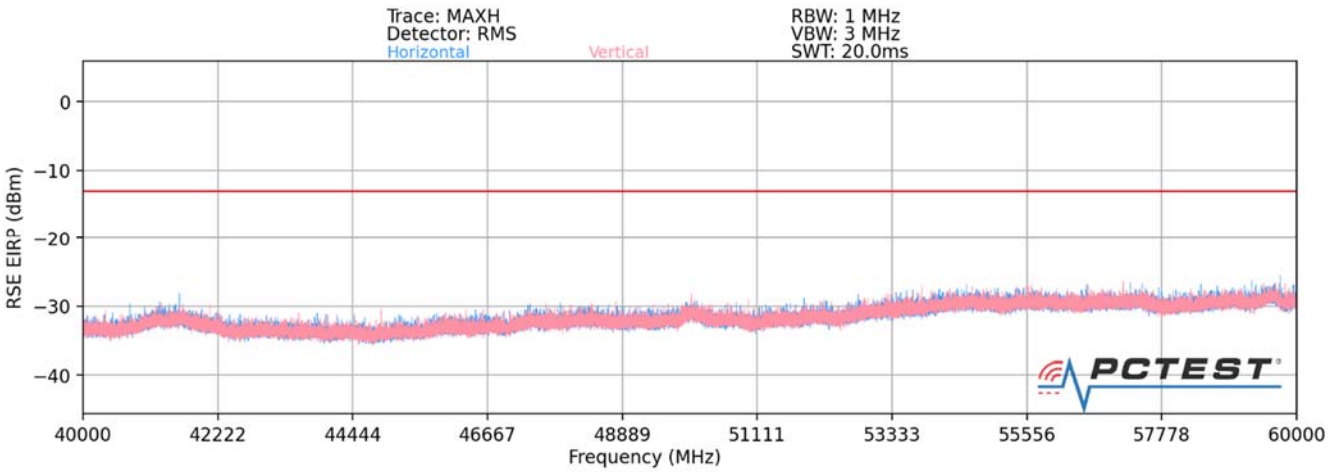
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
35983.40	Low	100	H	QPSK	H	-	-	-25.94	-13.00	-12.94
36247.60	Mid	100	H	QPSK	H	-	-	-26.87	-13.00	-13.87
36519.20	High	100	H	QPSK	H	-	-	-25.94	-13.00	-12.94

Table 7-41. Ant 1 -Spurious Emissions Table (18GHz – 37GHz)

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.

40GHz - 60GHz



Plot 7-50. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

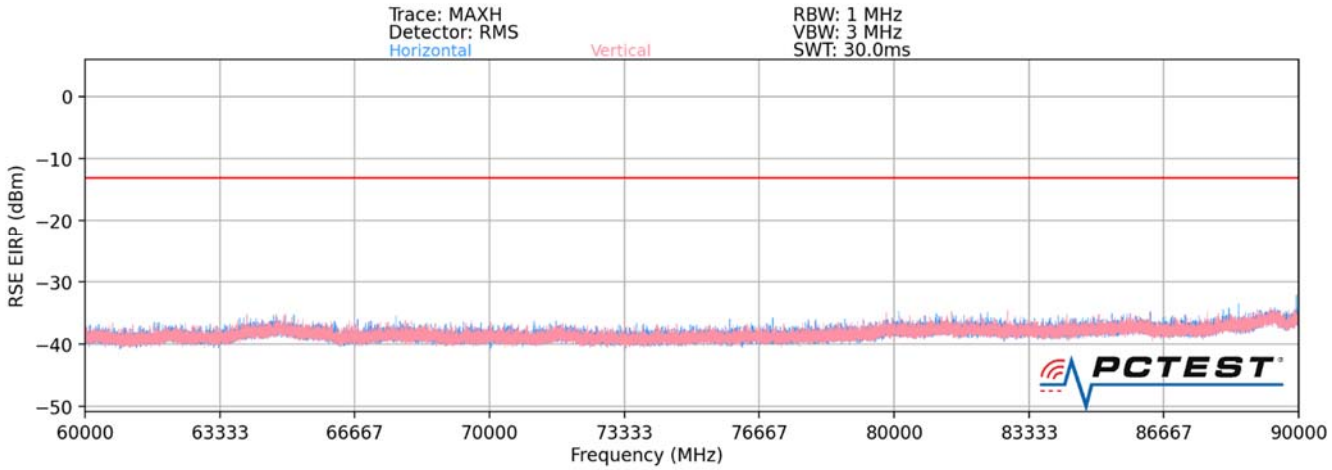
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
48781.30	Low	100	H	QPSK	H	-	-	-36.62	-13.00	-23.62
50960.70	Mid	100	H	QPSK	H	-	-	-35.92	-13.00	-22.92
51613.80	High	100	H	QPSK	H	-	-	-34.92	-13.00	-21.92

Table 7-42. Ant 1 -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.

60GHz - 90GHz



Plot 7-51. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

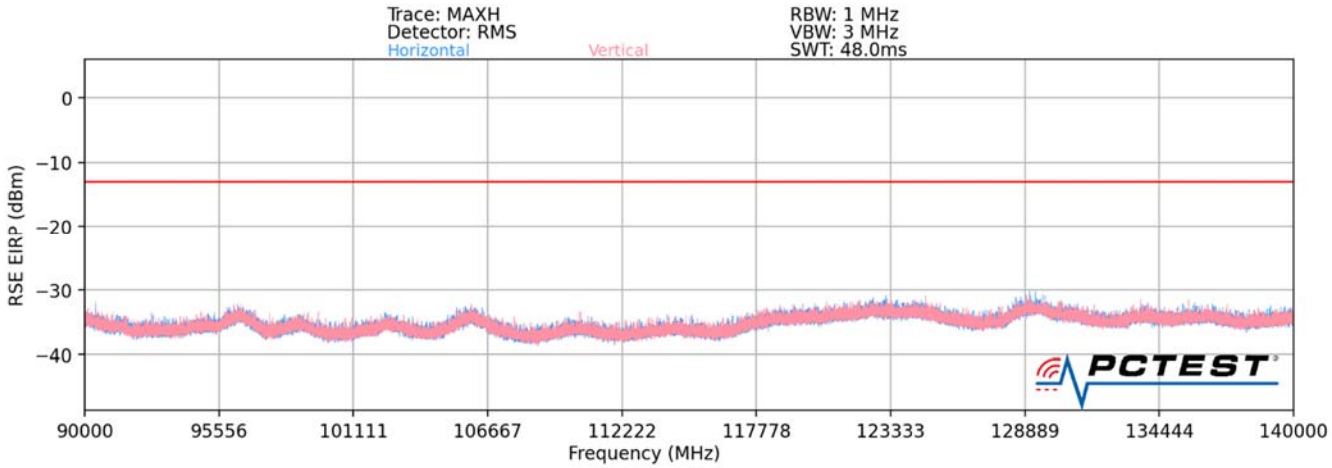
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
74100.00	Low	100	H	QPSK	H	235	21	-35.41	-13.00	-22.41
76999.92	Mid	100	H	QPSK	H	22	10	-37.99	-13.00	-24.99
79899.84	High	100	H	QPSK	H	135	205	-36.47	-13.00	-23.47

Table 7-43. Ant 1 -Spurious Emissions Table (60GHz - 90GHz)

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.

90GHz - 140GHz



Plot 7-52. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

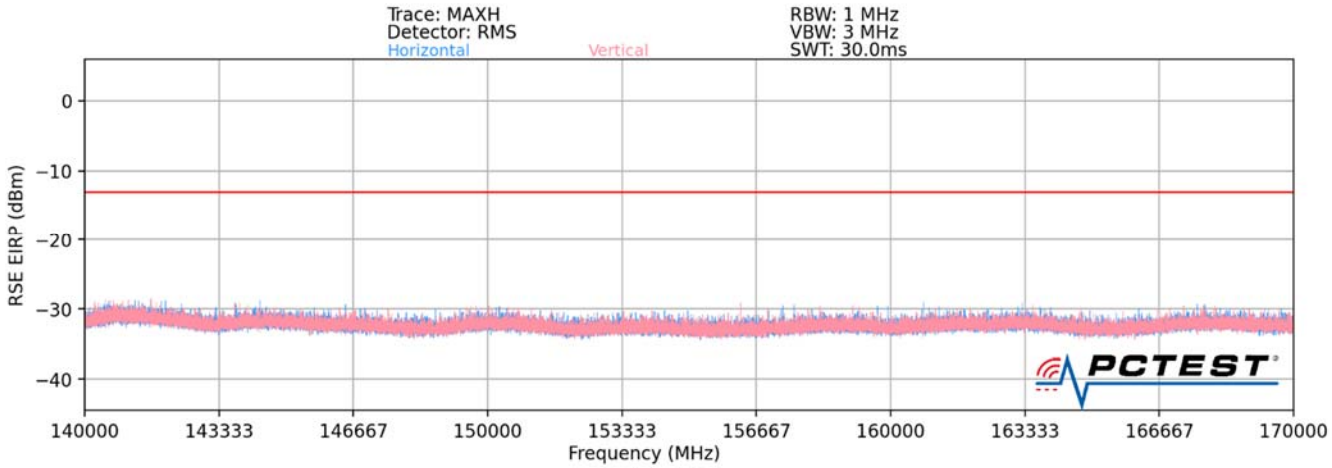
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
111150.00	Low	100	H	QPSK	H	-	-	-26.95	-13.00	-13.95
115499.88	Mid	100	H	QPSK	H	-	-	-25.88	-13.00	-12.88
119849.76	High	100	H	QPSK	H	-	-	-26.35	-13.00	-13.35

Table 7-44. Ant 1 -Spurious Emissions Table (90GHz - 140GHz)

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.

140GHz - 170GHz



Plot 7-53. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

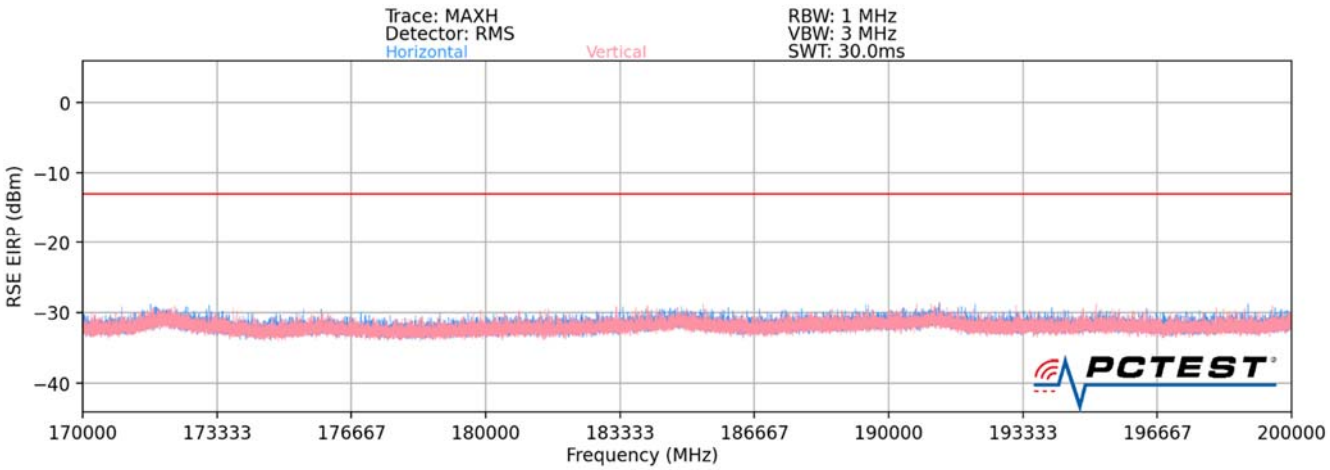
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
148200.00	Low	100	H	QPSK	H	-	-	-25.61	-13.00	-12.61
153999.84	Mid	100	H	QPSK	H	-	-	-26.27	-13.00	-13.27
159799.68	High	100	H	QPSK	H	-	-	-26.20	-13.00	-13.20

Table 7-45. Ant 1 -Spurious Emissions Table (140GHz - 170GHz)

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.

170GHz - 200GHz



Plot 7-54. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
185250.00	Low	100	H	QPSK	H	-	-	-27.18	-13.00	-14.18
192499.80	Low	100	H	QPSK	H	-	-	-26.27	-13.00	-13.27
199749.60	Mid	100	H	QPSK	H	-	-	-26.61	-13.00	-13.61

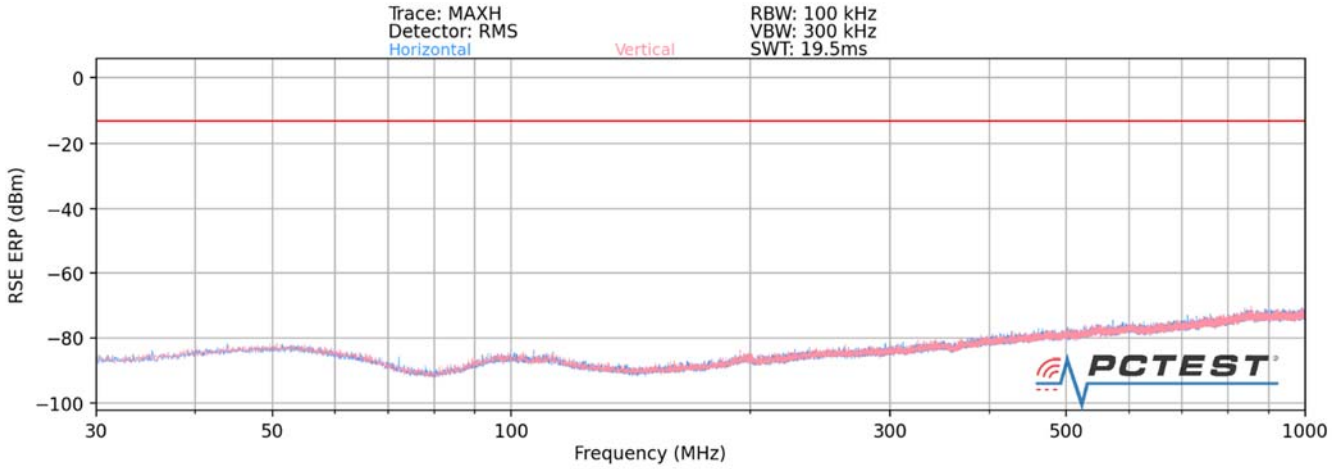
Table 7-46. Ant 1 -Spurious Emissions Table (170GHz - 200GHz)

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.

Band n260- Ant 2

30MHz - 1GHz



Plot 7-55. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

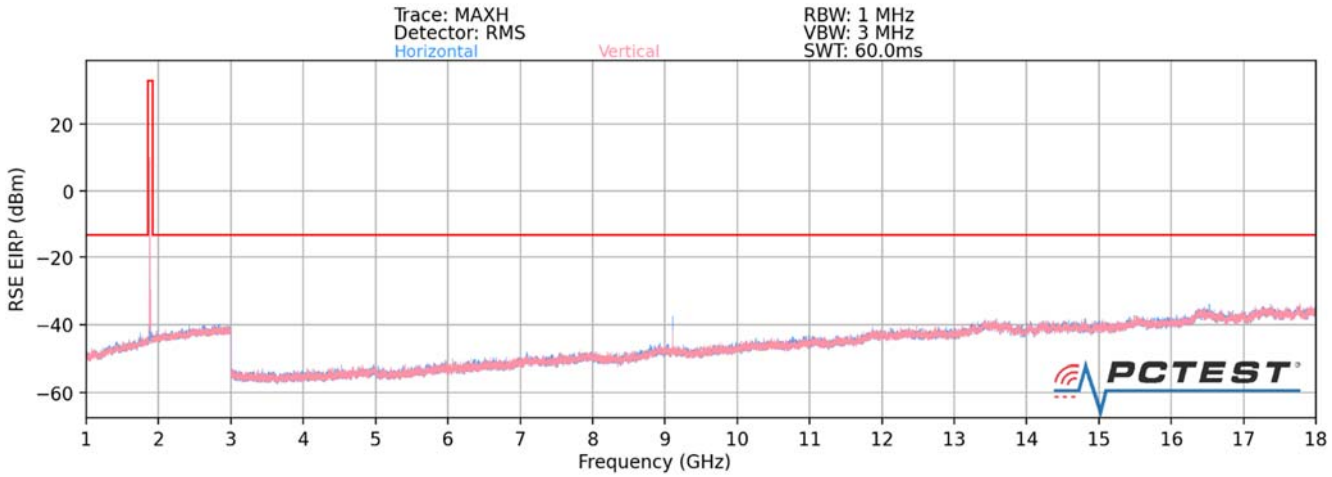
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
956.00	Low	100	H	QPSK	H	-	-	-81.61	-13.00	-68.61
964.00	Mid	100	H	QPSK	H	-	-	-80.28	-13.00	-67.28
952.00	High	100	H	QPSK	H	-	-	-81.84	-13.00	-68.84

Table 7-47. Ant 2 -Spurious Emissions Table (30MHz - 1GHz)

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 3 meter.

1GHz - 18GHz



Plot 7-56. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

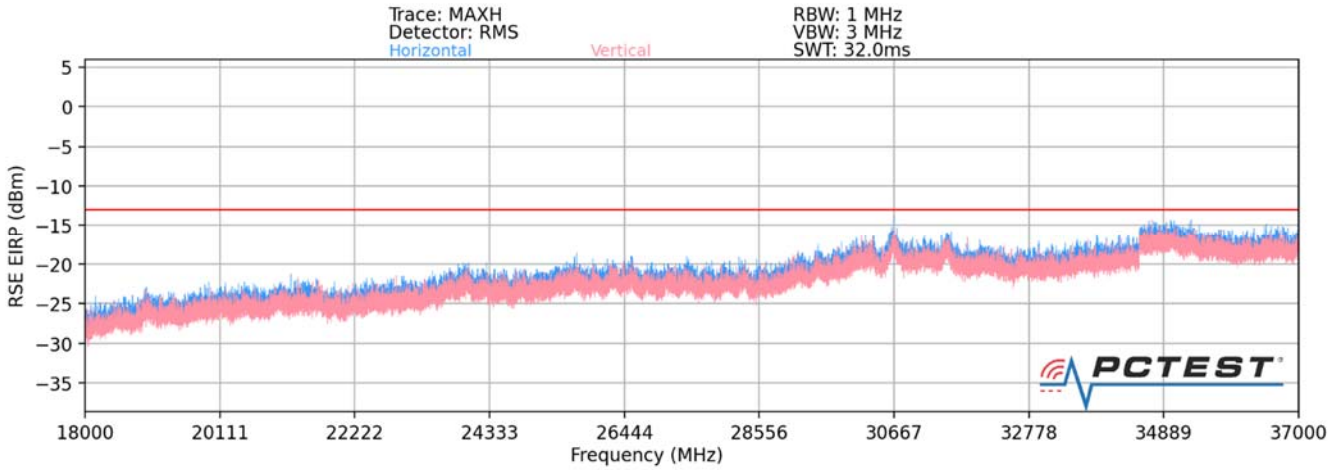
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8379.00	Low	100	H	QPSK	H	239	52	-35.29	-13.00	-22.29
9111.00	Mid	100	H	QPSK	H	226	47	-37.82	-13.00	-24.82
9180.00	High	100	H	QPSK	H	230	53	-38.18	-13.00	-25.18

Table 7-48. Ant 2 -Spurious Emissions Table (1GHz - 18GHz)

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 3 meter.

18GHz – 37GHz



Plot 7-57. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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

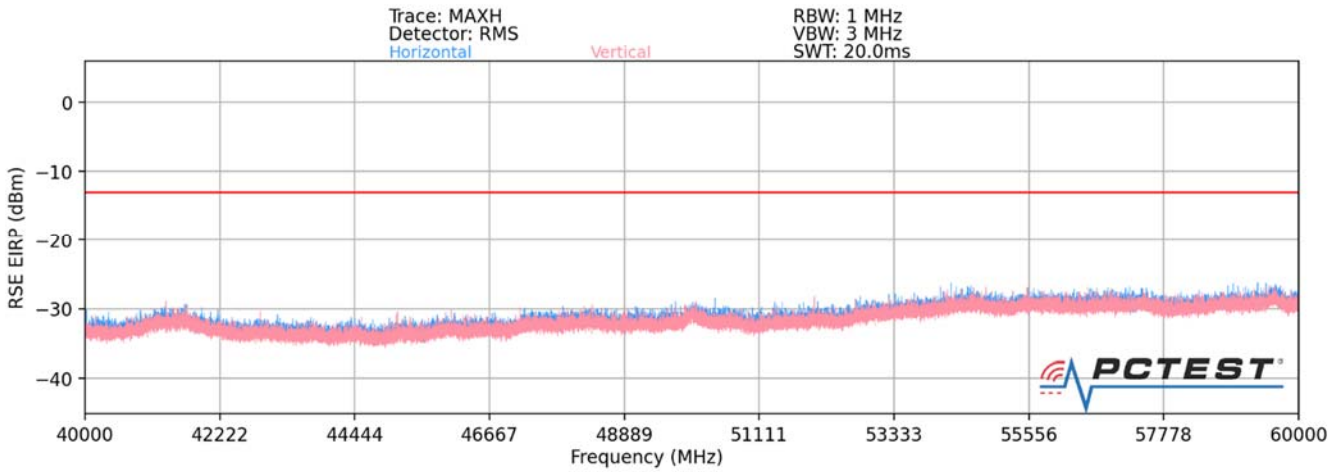
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
35894.50	Low	100	H	QPSK	H	-	-	-26.51	-13.00	-13.51
36586.50	Mid	100	H	QPSK	H	-	-	-25.97	-13.00	-12.97
35054.60	High	100	H	QPSK	H	-	-	-26.31	-13.00	-13.31

Table 7-49. Ant 2 -Spurious Emissions Table (18GHz – 37GHz)

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.

40GHz - 60GHz



Plot 7-58. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

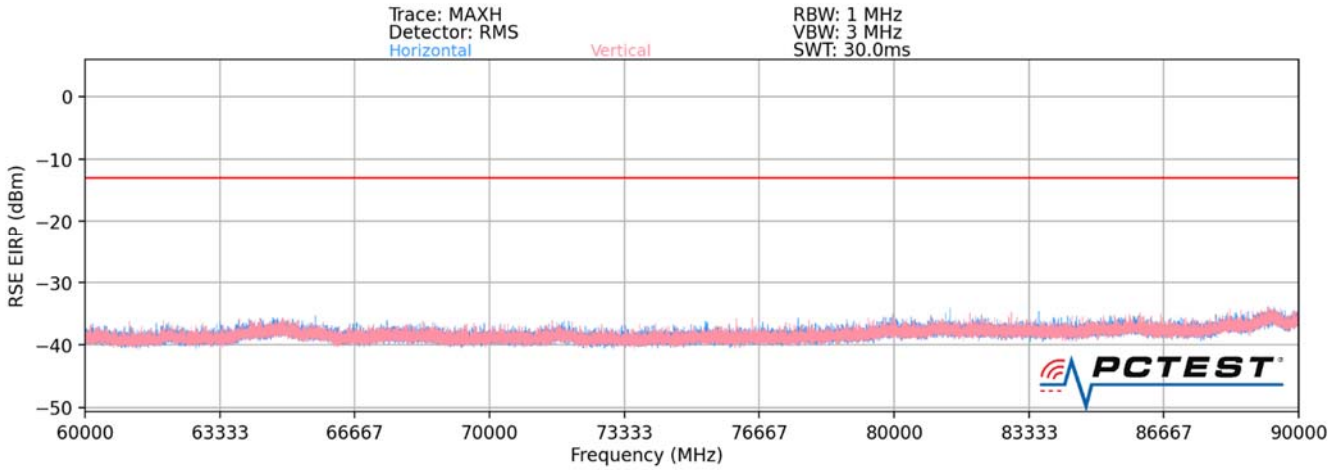
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
47760.70	Low	100	H	QPSK	H	-	-	-35.61	-13.00	-22.61
50409.30	Mid	100	H	QPSK	H	-	-	-34.60	-13.00	-21.60
57566.70	High	100	H	QPSK	H	-	-	-36.95	-13.00	-23.95

Table 7-50. Ant 2 -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.

60GHz - 90GHz



Plot 7-35. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

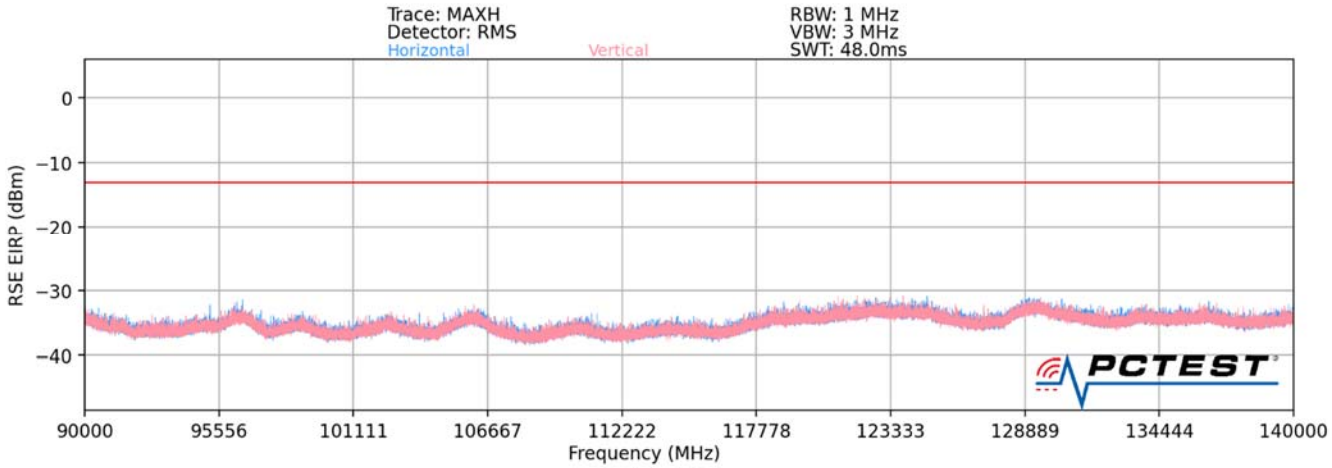
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
74100.00	Low	100	H	QPSK	H	236	135	-35.18	-13.00	-22.18
76999.92	Mid	100	H	QPSK	H	318	132	-37.30	-13.00	-24.30
79899.84	High	100	H	QPSK	H	244	139	-36.28	-13.00	-23.28

Table 7-51. Ant 2 -Spurious Emissions Table (60GHz - 90GHz)

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.

90GHz - 140GHz



Plot 7-60. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

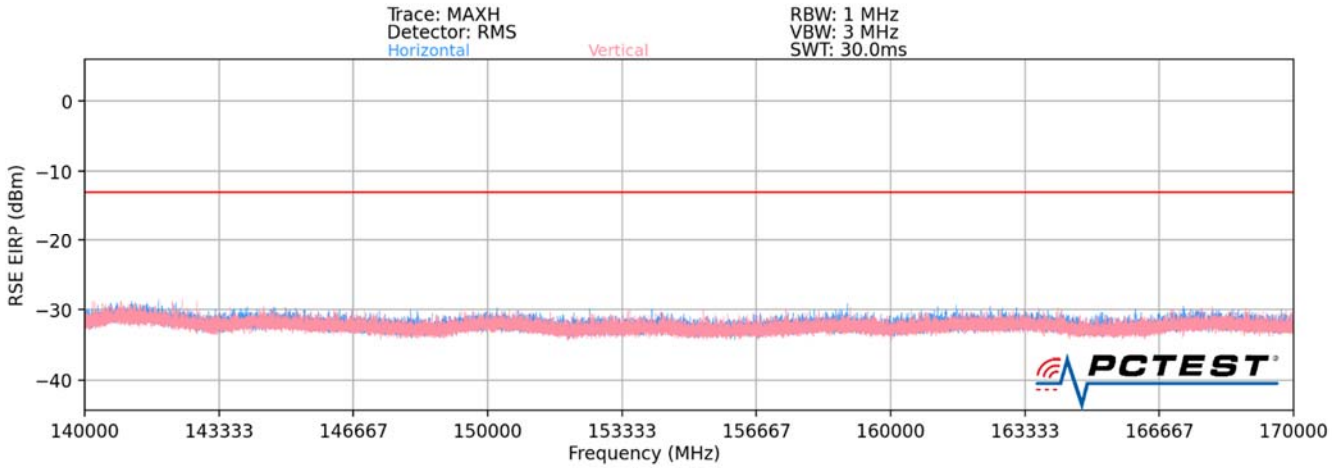
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
111150.00	Low	100	H	QPSK	H	-	-	-25.62	-13.00	-12.62
115499.88	Mid	100	H	QPSK	H	-	-	-25.55	-13.00	-12.55
119849.76	High	100	H	QPSK	H	-	-	-25.98	-13.00	-12.98

Table 7-52. Ant2 -Spurious Emissions Table (90GHz - 140GHz)

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.

140GHz - 170GHz



Plot 7-61. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

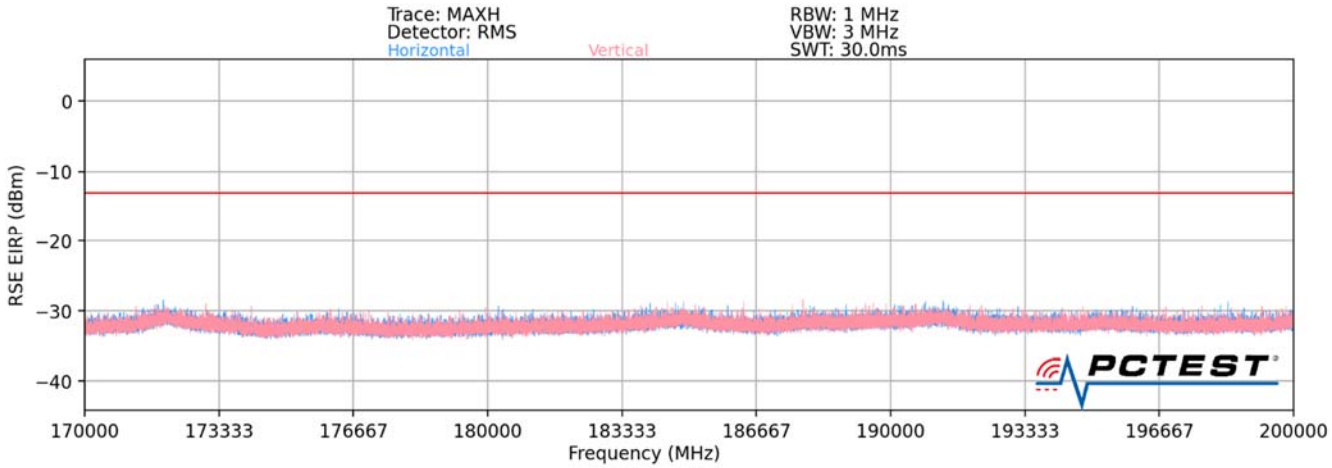
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
148200.00	Low	100	H	QPSK	H	-	-	-26.61	-13.00	-13.61
153999.84	Mid	100	H	QPSK	H	-	-	-25.62	-13.00	-12.62
159799.68	High	100	H	QPSK	H	-	-	-25.91	-13.00	-12.91

Table 7-53. Ant 2 -Spurious Emissions Table (140GHz - 170GHz)

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.

170GHz - 200GHz



Plot 7-62. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
185250.00	Low	100	H	QPSK	H	-	-	-26.97	-13.00	-13.97
192499.80	Mid	100	H	QPSK	H	-	-	-27.61	-13.00	-14.61
199749.60	High	100	H	QPSK	H	-	-	-26.64	-13.00	-13.64

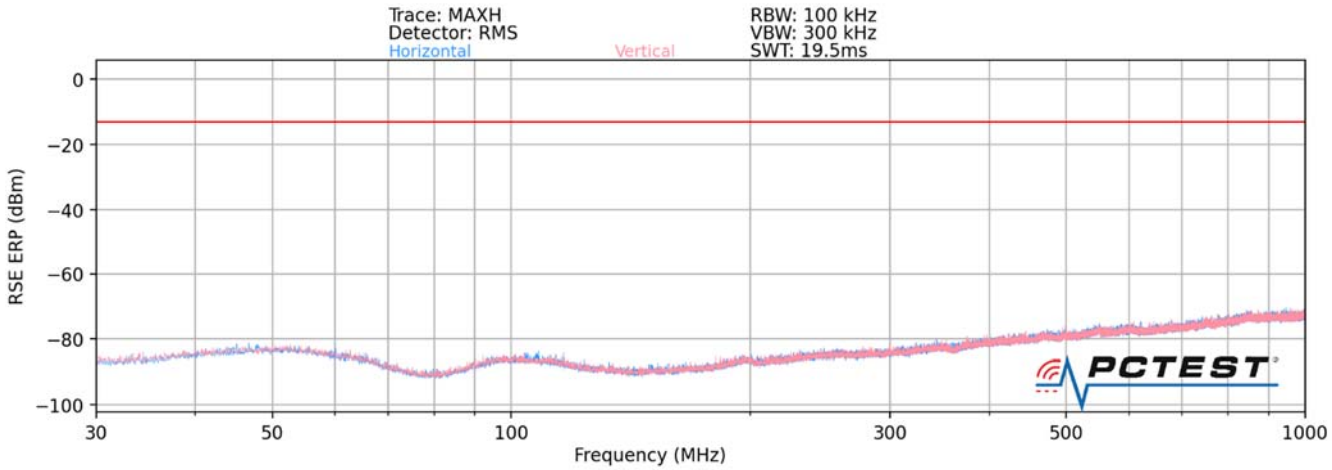
Table 7-54. Ant 2 -Spurious Emissions Table (170GHz - 200GHz)

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.

Band n260- Ant 3

30MHz - 1GHz



Plot 7-47. Ant 3-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

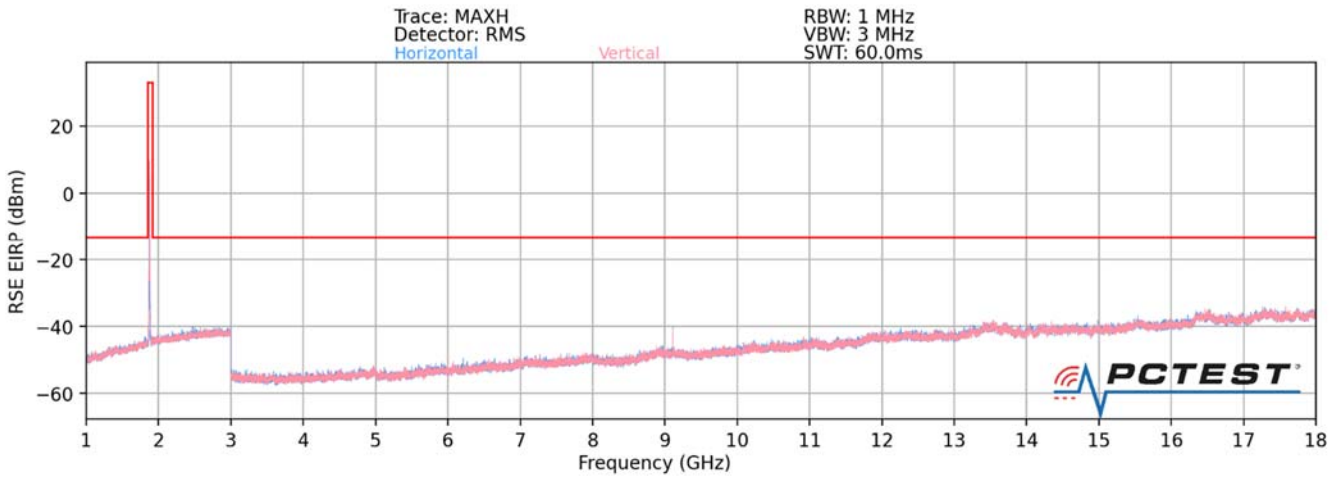
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
926.00	Low	100	H	QPSK	H	-	-	-78.66	-13.00	-65.66
963.00	Mid	100	H	QPSK	H	-	-	-80.31	-13.00	-67.31
954.00	High	100	H	QPSK	H	-	-	-79.64	-13.00	-66.64

Table 7-39. Ant 3 -Spurious Emissions Table (30MHz - 1GHz)

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 3 meter.

1GHz - 18GHz



Plot 7-48. Ant 3-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

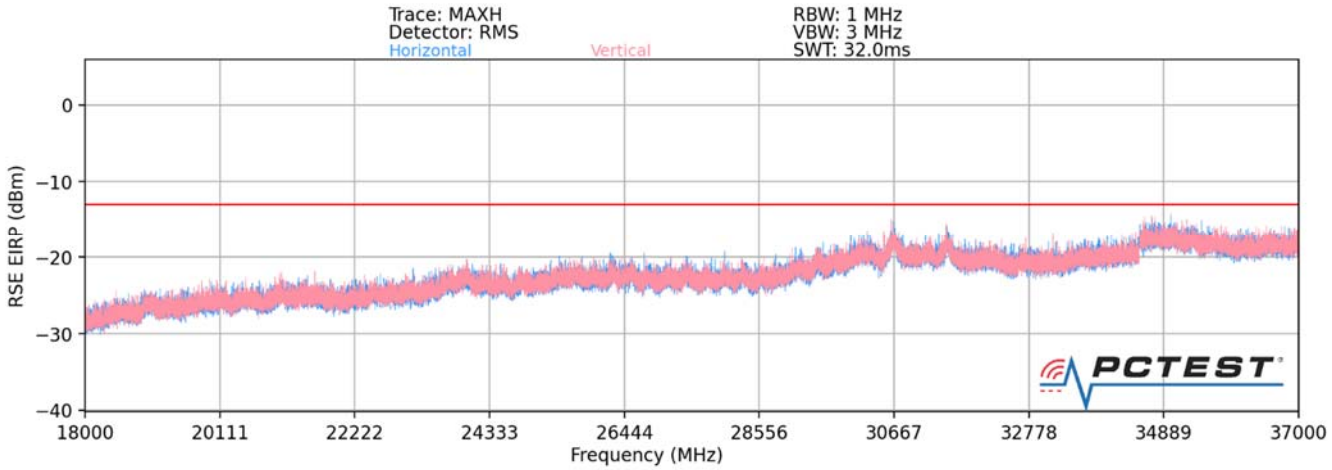
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8379.00	Low	100	H	QPSK	H	208	36	-41.38	-13.00	-28.38
9111.00	Mid	100	H	QPSK	H	218	32	-42.40	-13.00	-29.40
9180.00	High	100	H	QPSK	H	210	38	-43.61	-13.00	-30.61

Table 7-40. Ant 3 -Spurious Emissions Table (1GHz - 18GHz)

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 3 meter.

18GHz – 37GHz



Plot 7-49. Ant 3-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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

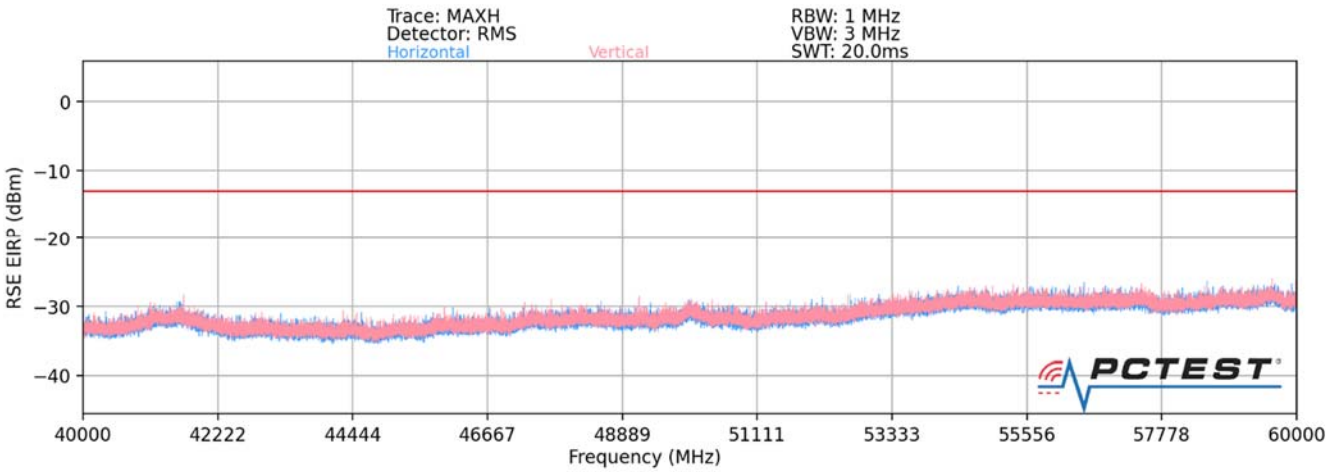
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
37861.40	Low	100	H	QPSK	H	-	-	-25.78	-13.00	-12.78
36153.20	Mid	100	H	QPSK	H	-	-	-25.64	-13.00	-12.64
36491.10	High	100	H	QPSK	H	-	-	-27.86	-13.00	-14.86

Table 7-41. Ant 3 -Spurious Emissions Table (18GHz – 37GHz)

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.

40GHz - 60GHz



Plot 7-50. Ant 3-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

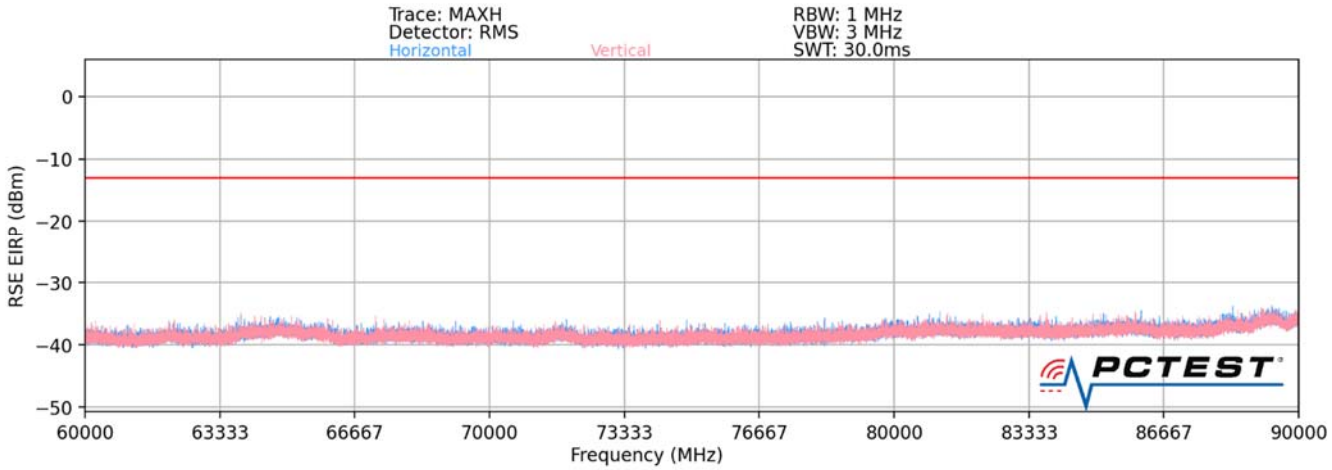
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
42414.30	Low	100	H	QPSK	H	-	-	-36.62	-13.00	-23.62
44618.60	Mid	100	H	QPSK	H	-	-	-35.86	-13.00	-22.86
51308.30	High	100	H	QPSK	H	-	-	-36.68	-13.00	-23.68

Table 7-42. Ant 3 -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.

60GHz - 90GHz



Plot 7-51. Ant 3-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

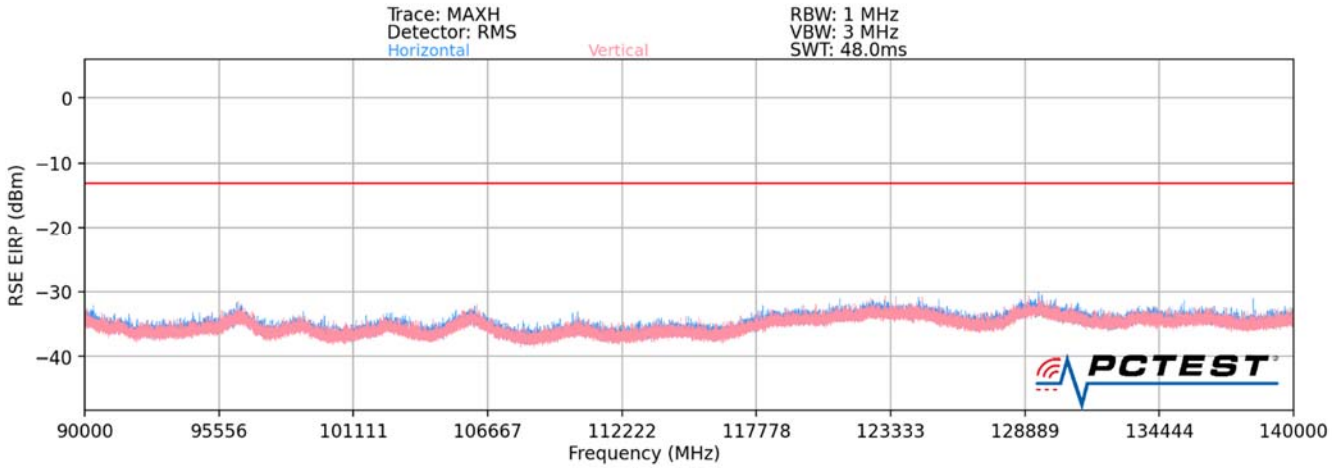
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
74100.00	Low	100	H	QPSK	H	40	198	-36.99	-13.00	-23.99
76999.92	Mid	100	H	QPSK	H	282	20	-37.61	-13.00	-24.61
79899.84	High	100	H	QPSK	H	-	-	-36.37	-13.00	-23.37

Table 7-43. Ant 3 -Spurious Emissions Table (60GHz - 90GHz)

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.

90GHz - 140GHz



Plot 7-52. Ant 3-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

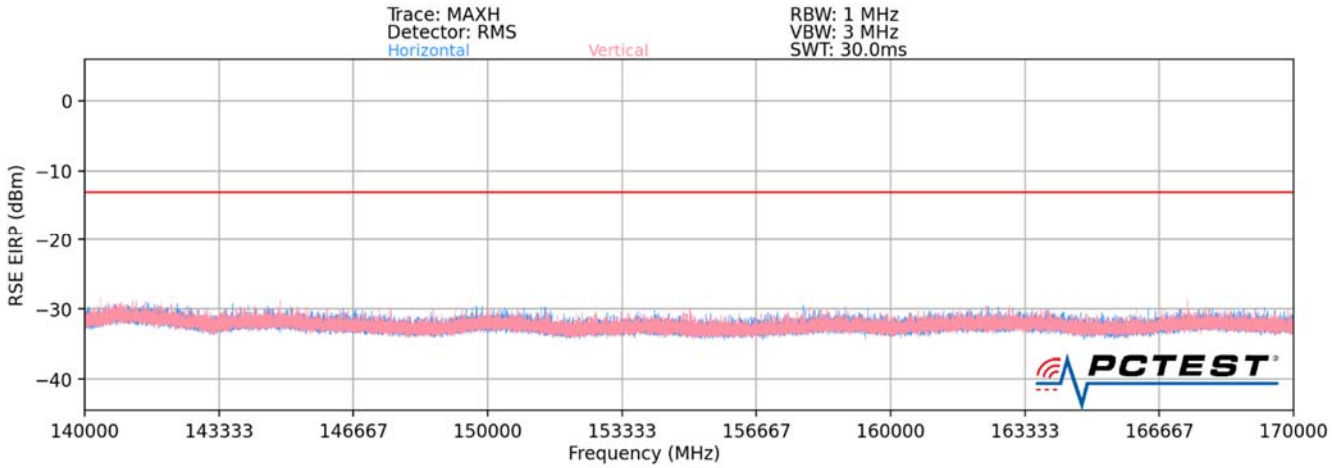
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
111150.00	Low	100	H	QPSK	H	-	-	-25.62	-13.00	-12.62
115499.88	Mid	100	H	QPSK	H	-	-	-24.62	-13.00	-11.62
119849.76	High	100	H	QPSK	H	-	-	-25.37	-13.00	-12.37

Table 7-44. Ant 3 -Spurious Emissions Table (90GHz - 140GHz)

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.

140GHz - 170GHz



Plot 7-53. Ant 3-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]

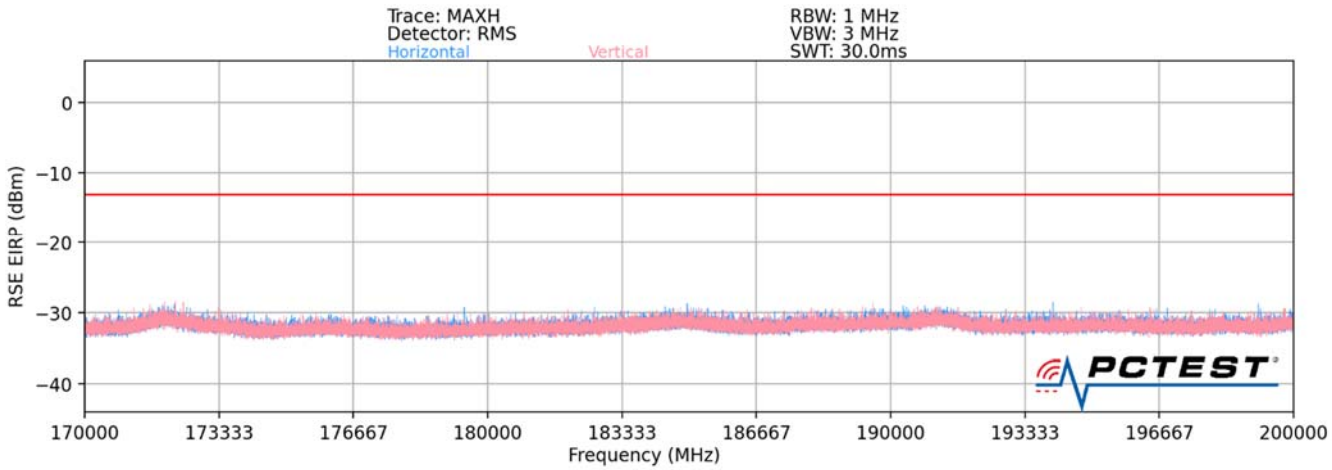
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
148200.00	Low	100	H	QPSK	H	-	-	-27.61	-13.00	-14.61
153999.84	Mid	100	H	QPSK	H	-	-	-27.92	-13.00	-14.92
159799.68	High	100	H	QPSK	H	-	-	-25.38	-13.00	-12.38

Table 7-45. Ant 3 -Spurious Emissions Table (140GHz - 170GHz)

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.

170GHz - 200GHz



Plot 7-54. Ant 3-n260 Radiated Spurious Plot (1CC QPSK Mid Channel MIMO – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n260)

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]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
185250.00	Low	100	H	QPSK	H	-	-	-27.62	-13.00	-14.62
192499.80	Mid	100	H	QPSK	H	-	-	-27.89	-13.00	-14.89
199749.60	High	100	H	QPSK	H	-	-	-26.31	-13.00	-13.31

Table 7-46. Ant 3 -Spurious Emissions Table (170GHz - 200GHz)

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.

7.5 Band Edge Emissions

§2.1051, §30.203

Test Overview

All out of band emissions are measured in a radiated 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 minimum permissible attenuation level of any spurious emission is -13dBm/1MHz. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower.

Test Procedure Used

ANSI C63.26-2015 Section 5 and ANSI C63.26-2015 Section 6.4
KDB 842590 D01 v01r01 Section 4.4.2.5

Test Settings

1. Start and stop frequency were set such that both upper and lower band edges are measured.
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW = 1MHz
4. VBW ≥ 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning.
2) Band Edge emissions were measured at a 1 meter distance.
3) The spectrum analyzer for each measurement shows an offset value that was determined using the measurement antenna factor, cable loss, far field measurement distance. A sample calculation is shown on the following page.
4) 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 were fully investigated and only the worst case has been included in this report.
5) All combinations of 1CC and 2CC were fully investigated, and only the worst case has been included in this report.
6) All 2CC cases were investigated with PCC prioritization feature, which was the higher PCC at the band edge for the worst case.

Sample Analyzer Offset Calculation (at 27.5GHz)

Measurement Antenna Factor = 40.70dB/m

Cable Loss = 8.82dB

Analyzer Offset (dB) = AF (dB/m) + CL (dB) + 107 + $20\log_{10}(D)$ – 104.8dB, where D = 1m

= 40.70dB/m + 8.82dB + 107 + $20\log_{10}(1m)$ – 104.8dB

= 51.72dB

Note:

While it is allowed to use the antenna gain subtraction method in the band edge as it is defined in Part 30, the device meets the requirements via early exit condition as specified in KDB publication 842590 D01.