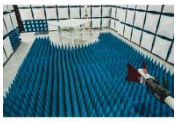
ELEMENT WASHINGTON DC LLC
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.element.com



PART 30 MEASUREMENT REPORT

Applicant Name:
Sony Corporation
1-7-1 Konan Minato-ku
Tokyo, 108-0075
Japan

Date of Testing:
4/10/2022 – 5/12/2022
Test Report Issue Date:
5/16/2022
Test Site/Location:
Element Lab., Columbia, MD, USA
Test Report Serial No.:
1M2201200003-11.PY7

FCC ID:	**PY7-57325M**
APPLICANT:	**Sony Corporation**

Application Type:	Certification
EUT Type:	Portable Handset
FCC Classification:	Part 30 Mobile Transmitter (5GM)
FCC Rule Part(s):	30
Test Procedure(s):	ANSI C63.26-2015, KDB 842590 D01 v01r02

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

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

RJ Ortanez
Executive Vice President

ACCREDITED
CERT #2041.01

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PART 30 MEASUREMENT REPORT

Band	Antenna	Bandwidth [MHz]	Tx Frequency [MHz]	CCs Active	Mode	Modulation	EIRP		Emission Designator
							Max Power [W]	Max Power [dBm]	
n261	Ant#0	100	27550 - 28300	1	SISO	QPSK	0.530	27.25	94M3G7D
					2Tx	QPSK	1.247	30.96	94M3G7D
					2Tx	π/2 BPSK	1.267	31.03	92M8G7D
					2Tx	16QAM	0.780	28.92	94M2W7D
					2Tx	64QAM	0.501	27.00	94M3W7D
				2	2Tx	QPSK	0.261	24.17	196MG7D
					2Tx	π/2 BPSK	0.262	24.19	195MG7D
					2Tx	16QAM	0.236	23.73	197MW7D
					2Tx	64QAM	0.175	22.43	197MW7D
		50	27525 - 28325	1	SISO	QPSK	0.517	27.13	45M9G7D
					2Tx	QPSK	1.267	31.03	45M9G7D
					2Tx	π/2 BPSK	1.270	31.04	45M7G7D
					2Tx	16QAM	0.747	28.73	45M6W7D
					2Tx	64QAM	0.520	27.16	45M7W7D
				2	2Tx	QPSK	0.279	24.46	95M1G7D
					2Tx	π/2 BPSK	0.280	24.47	95M0G7D
					2Tx	16QAM	0.226	23.54	95M2W7D
					2Tx	64QAM	0.174	22.41	95M8W7D
n261	Ant#1	100	27550 - 28300	1	SISO	QPSK	0.334	25.24	
					2Tx	QPSK	1.288	31.10	
					2Tx	π/2 BPSK	1.294	31.12	
					2Tx	16QAM	0.735	28.66	
					2Tx	64QAM	0.506	27.04	
				2	2Tx	QPSK	0.252	24.01	
					2Tx	π/2 BPSK	0.253	24.04	
					2Tx	16QAM	0.203	23.07	
					2Tx	64QAM	0.166	22.19	
		50	27525 - 28325	1	SISO	QPSK	0.328	25.15	
					2Tx	QPSK	1.299	31.14	
					2Tx	π/2 BPSK	1.314	31.19	
					2Tx	16QAM	0.737	28.68	
					2Tx	64QAM	0.510	27.07	
				2	2Tx	QPSK	0.246	23.91	
					2Tx	π/2 BPSK	0.246	23.91	
					2Tx	16QAM	0.229	23.60	
					2Tx	64QAM	0.154	21.89	

EUT Overview (Band n261)

Band	Antenna	Bandwidth [MHz]	Tx Frequency [MHz]	CCs Active	Mode	Modulation	EIRP		Emission Designator
							Max Power [W]	Max Power [dBm]	
n260	Ant#0	100	37050 - 39950	1	SISO	QPSK	0.734	28.66	94M0G7D
					2Tx	QPSK	1.363	31.34	94M0G7D
					2Tx	π/2 BPSK	1.334	31.25	92M0G7D
					2Tx	16QAM	0.789	28.97	94M0W7D
					2Tx	64QAM	0.526	27.21	94M2W7D
				2	2Tx	QPSK	0.251	24.00	194MG7D
					2Tx	π/2 BPSK	0.248	23.94	193MG7D
					2Tx	16QAM	0.243	23.86	193MW7D
					2Tx	64QAM	0.166	22.20	193MW7D
		50	37025 - 39975	1	SISO	QPSK	0.715	28.54	45M1G7D
					2Tx	QPSK	1.089	30.37	45M1G7D
					2Tx	π/2 BPSK	1.053	30.23	44M4G7D
					2Tx	16QAM	0.605	27.82	44M6W7D
					2Tx	64QAM	0.416	26.19	45M7W7D
				2	2Tx	QPSK	0.257	24.09	94M9G7D
					2Tx	π/2 BPSK	0.256	24.09	96M1G7D
					2Tx	16QAM	0.224	23.50	96M6W7D
					2Tx	64QAM	0.171	22.34	95M8W7D
n260	Ant#1	100	37050 - 39950	1	SISO	QPSK	0.327	25.14	
					2Tx	QPSK	0.512	27.09	
					2Tx	π/2 BPSK	0.487	26.88	
					2Tx	16QAM	0.281	24.49	
					2Tx	64QAM	0.184	22.66	
				2	2Tx	QPSK	0.094	19.74	
					2Tx	π/2 BPSK	0.091	19.59	
					2Tx	16QAM	0.085	19.31	
					2Tx	64QAM	0.069	18.41	
		50	37025 - 39975	1	SISO	QPSK	0.337	25.28	
					2Tx	QPSK	0.925	29.66	
					2Tx	π/2 BPSK	0.877	29.43	
					2Tx	16QAM	0.533	27.27	
					2Tx	64QAM	0.351	25.46	
				2	2Tx	QPSK	0.087	19.41	
					2Tx	π/2 BPSK	0.088	19.43	
					2Tx	16QAM	0.088	19.46	
					2Tx	64QAM	0.058	17.64	

EUT Overview (Band n260)

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

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.

1.2 Element Test Location

These measurement tests were conducted at the Element laboratory 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 Element laboratory located in Columbia, MD 21046, U.S.A.

- Element Washington DC LLC is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.

- Element Washington DC LLC 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).

- Element Washington DC LLC facility is a registered (2451B) test laboratory with the site description on file with ISED.

- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreement.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Sony Portable Handset FCC ID: PY7-57325M**. The test data contained in this report pertains only to the emissions due to the EUT's 5G mmWave function.

The EUT contains two patch antennas, referred to herein as Ant#0 and Ant#1. Each of the antennas is comprised of two separate antenna feeds - one for horizontal and one for vertical polarization. Only one array antenna can be active at a time.

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

Test Device Serial No.: 01021, 00981

2.2 Device Capabilities

This device contains the following capabilities:

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

2.3 Test Configuration

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

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

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

While operating in the FR2 band, this device supports anchor band operation with an LTE carrier. This was investigated during FR2 measurements.

2.4 Software and Firmware

The test was conducted with firmware version 64.0.A.0.1309 installed on the EUT.

2.5 EMI Suppression Device(s)/Modifications

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

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 were used in the measurement of the EUT.

3.2 Radiated Power and Radiated Spurious Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary 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.

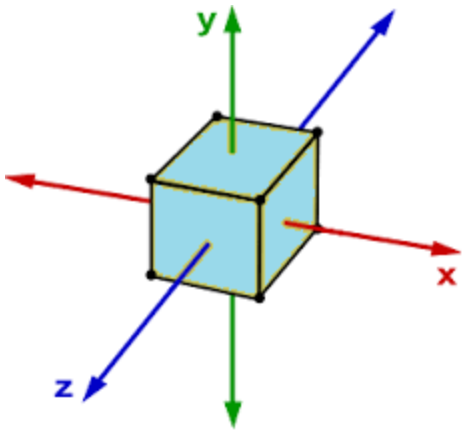


Figure 3-1. Rotation of the EUT Through Three Orthogonal Planes

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 at least 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 ANSI C63.26-2015.

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.

TBD

Notes:

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

6.0 SAMPLE CALCULATIONS

Emission Designator

π/2 BPSK/ QPSK Modulation

Emission Designator = 800MG7D

BW = 800 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 802MW7D

BW = 802 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission, telemetry, telecommand

7.0 TEST RESULTS

7.1 Summary

Company Name: Sony Corporation

FCC ID: PY7-57325M

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. Per 2.1057(a)(3), spurious emissions were investigated 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 limits first as EIRP measurements to determine if the “early-exit” condition of KDB 842590 D01 applies. If not, then additional TRP measurements are performed.
4) “CC” refers to “Component Carriers”.
5) Beam IDs were chosen based on which Beam ID produces the highest EIRP during EIRP simulation.
6) All testing was performed using FTM (Factory Test Mode) software at continuous Tx operation (100% duty cycle).
7) The CP-OFDM and DFT-s-OFDM transmission schemes were investigated fully for each test type and only the worst case data is included.

7.2 Occupied Bandwidth

Test Overview

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

Test Procedure Used

ANSI C63.26-2015 – Section 5.4.3

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

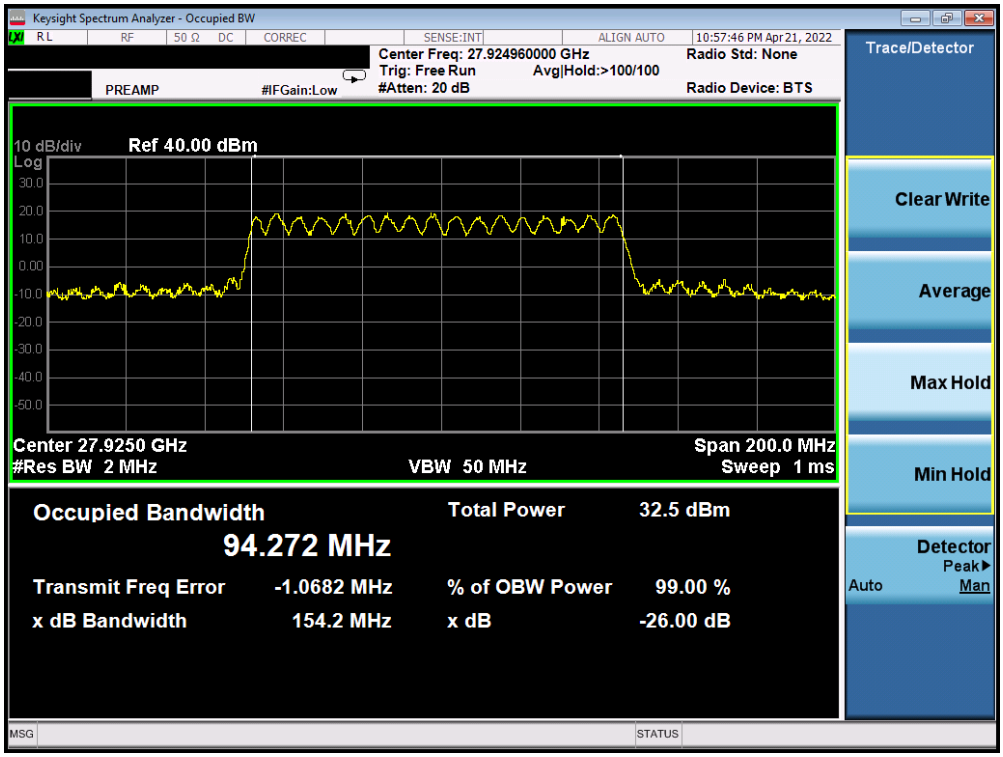
Test Notes

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 (Ant#0) for each band.

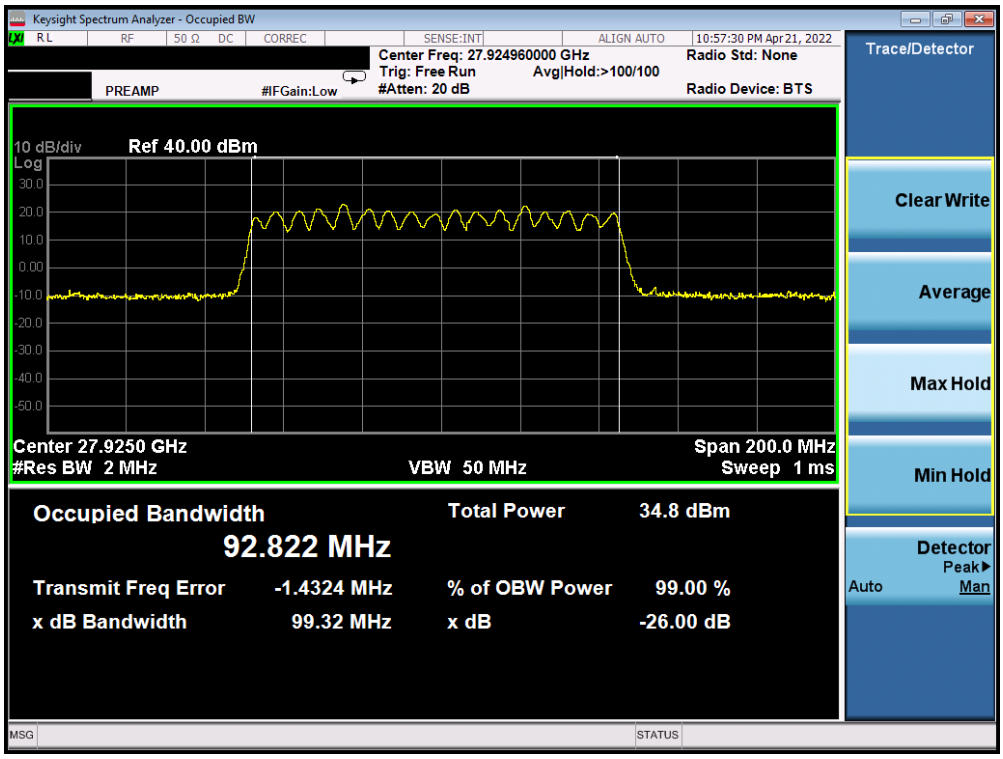
Band n261

Channel	Bandwidth	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	100	1	CP-OFDM	QPSK	94.27
			DFT-s-OFDM	π/2-BPSK	92.82
			CP-OFDM	16QAM	94.19
			CP-OFDM	64QAM	94.34
		2	CP-OFDM	QPSK	196.00
			DFT-s-OFDM	π/2-BPSK	195.16
			CP-OFDM	16QAM	197.25
			DFT-s-OFDM	64QAM	197.20
	50	1	DFT-s-OFDM	QPSK	45.89
			DFT-s-OFDM	π/2-BPSK	45.72
			CP-OFDM	16QAM	45.59
			CP-OFDM	64QAM	45.69
		2	CP-OFDM	QPSK	95.10
			DFT-s-OFDM	π/2-BPSK	94.97
			CP-OFDM	16QAM	95.19
			CP-OFDM	64QAM	95.84

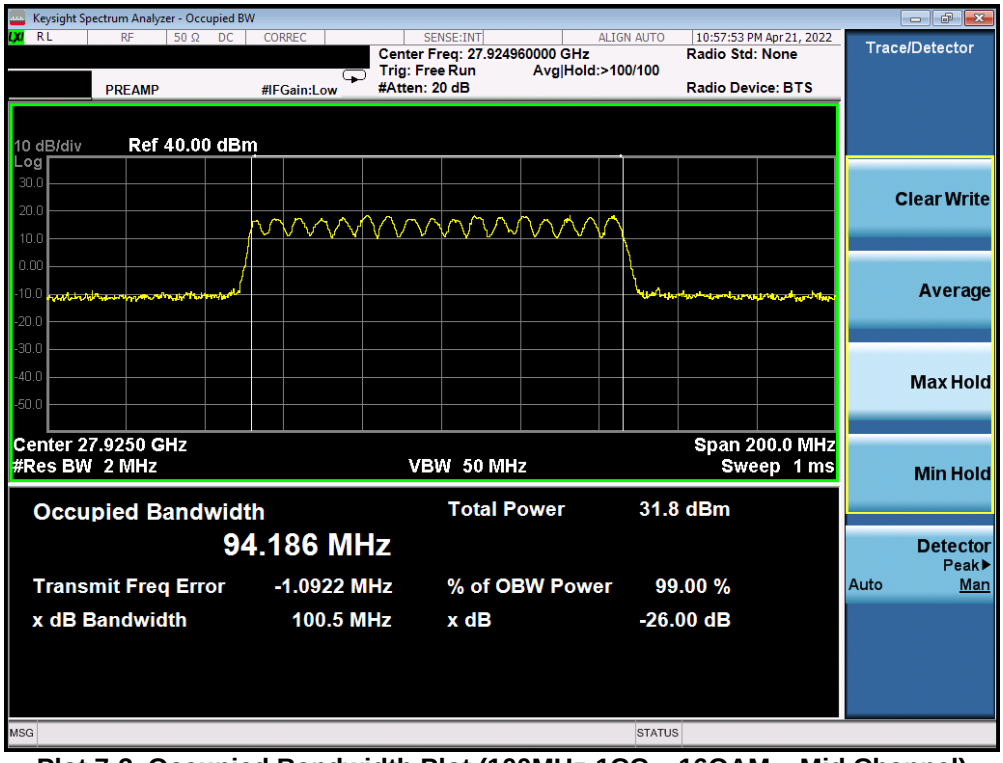
Table 7-2. Summary of Occupied Bandwidths (n261)



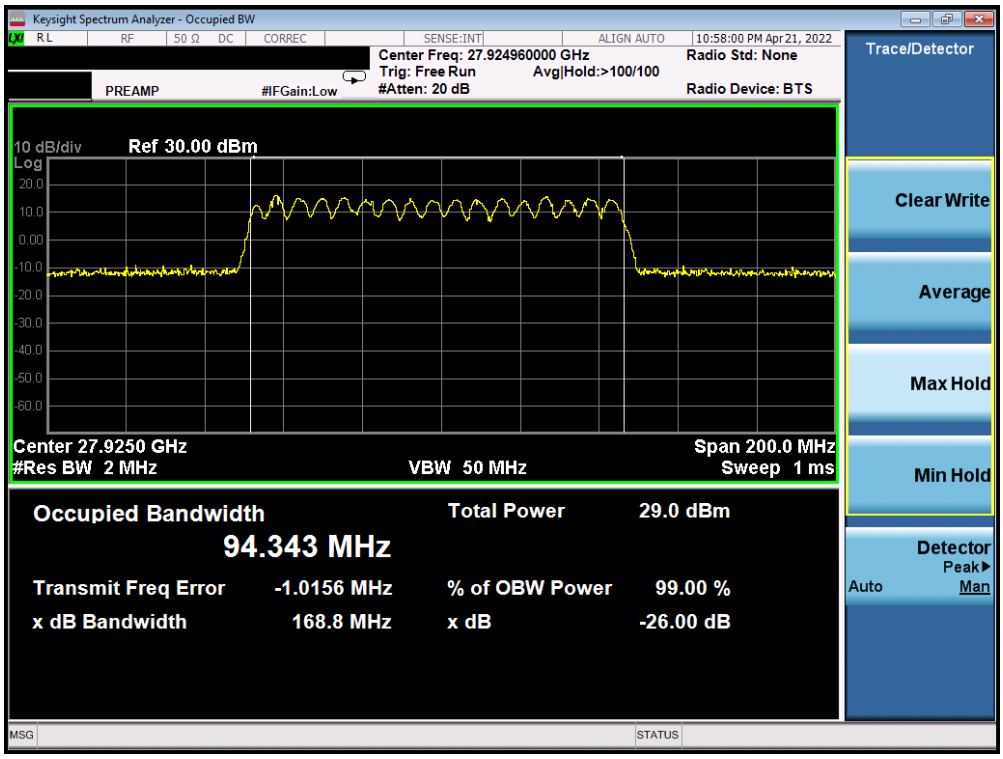
Plot 7-1. Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



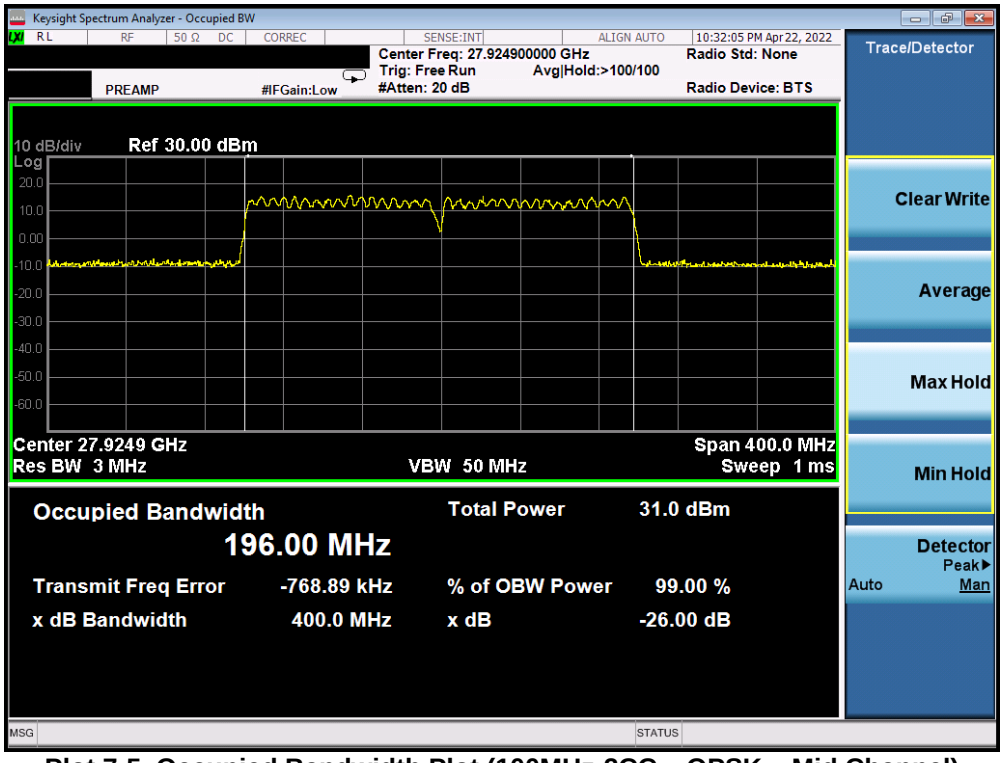
Plot 7-2. Occupied Bandwidth Plot (100MHz-1CC – π/2-BPSK – Mid Channel)



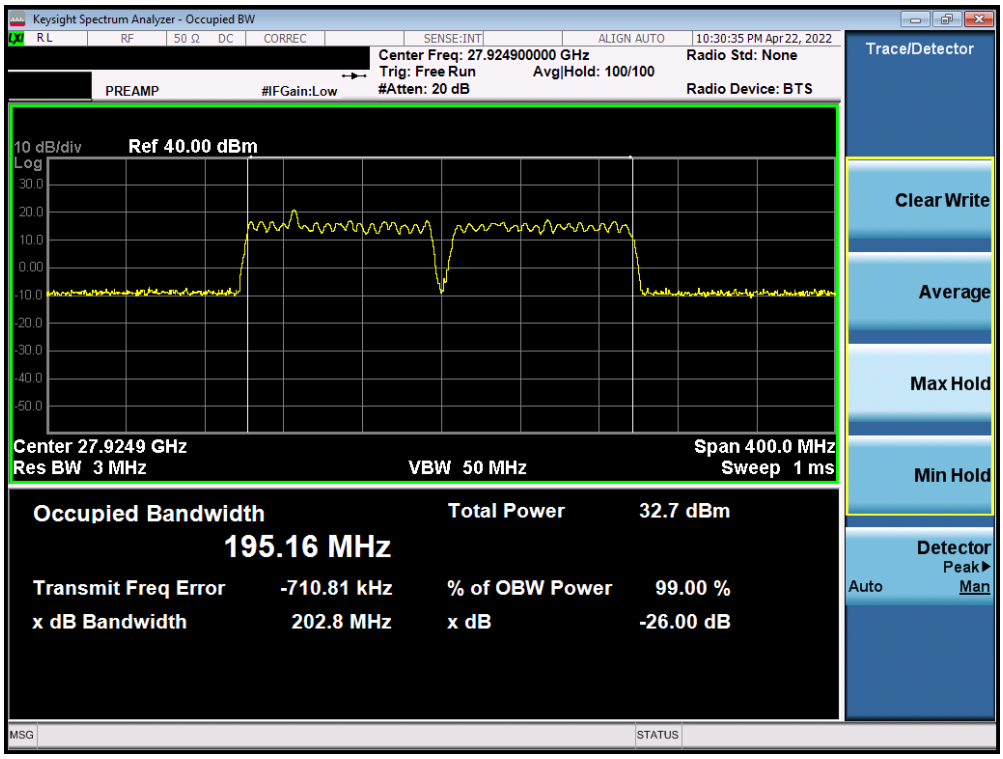
Plot 7-3. Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



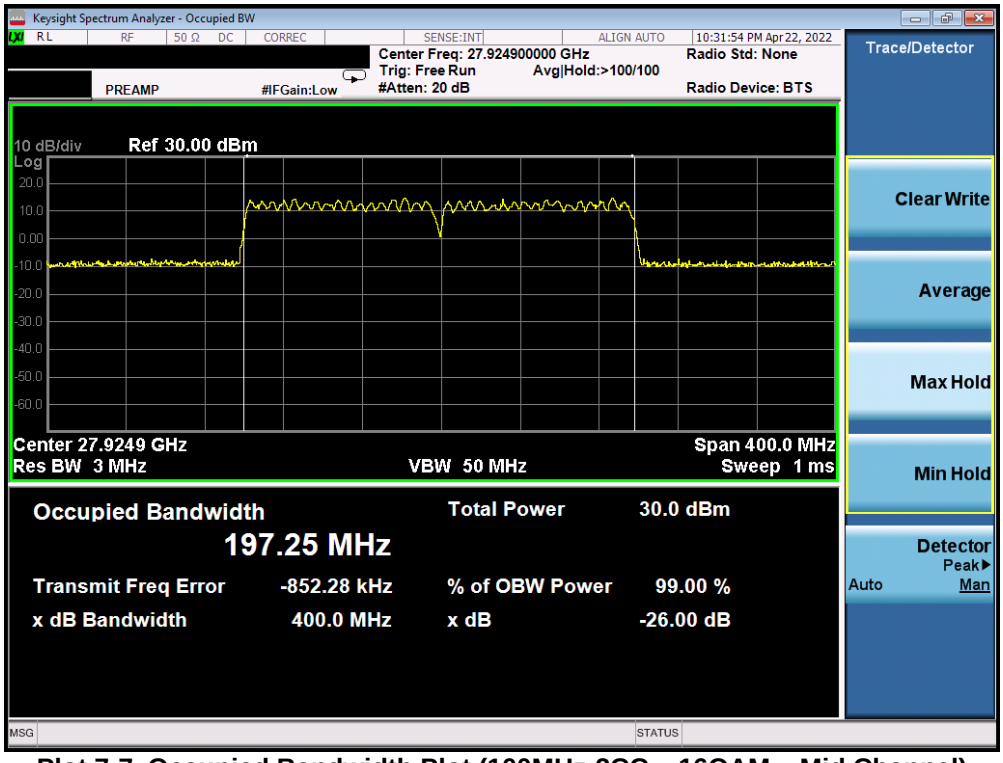
Plot 7-4. Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



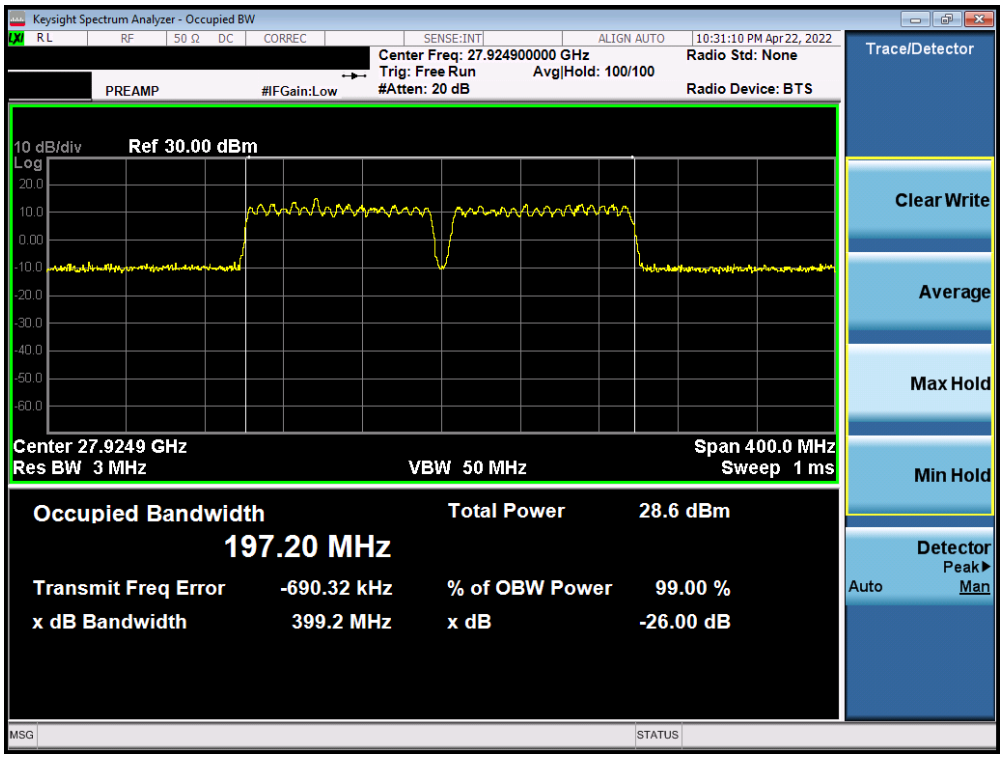
Plot 7-5. Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



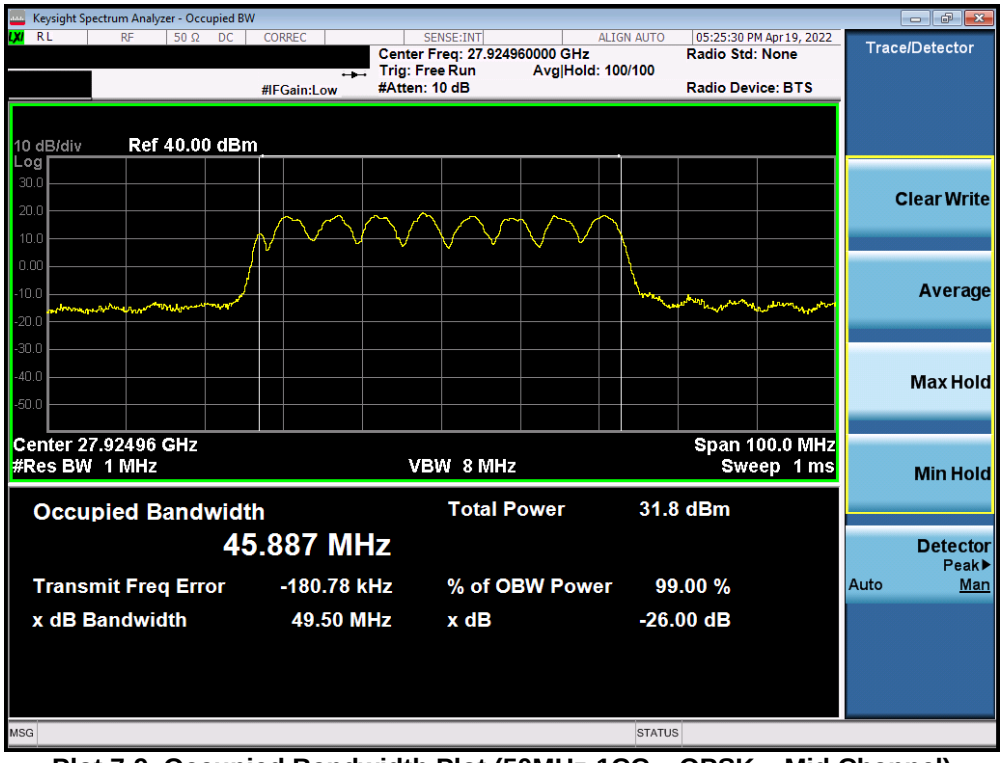
Plot 7-6. Occupied Bandwidth Plot (100MHz-2CC – π/2-BPSK – Mid Channel)



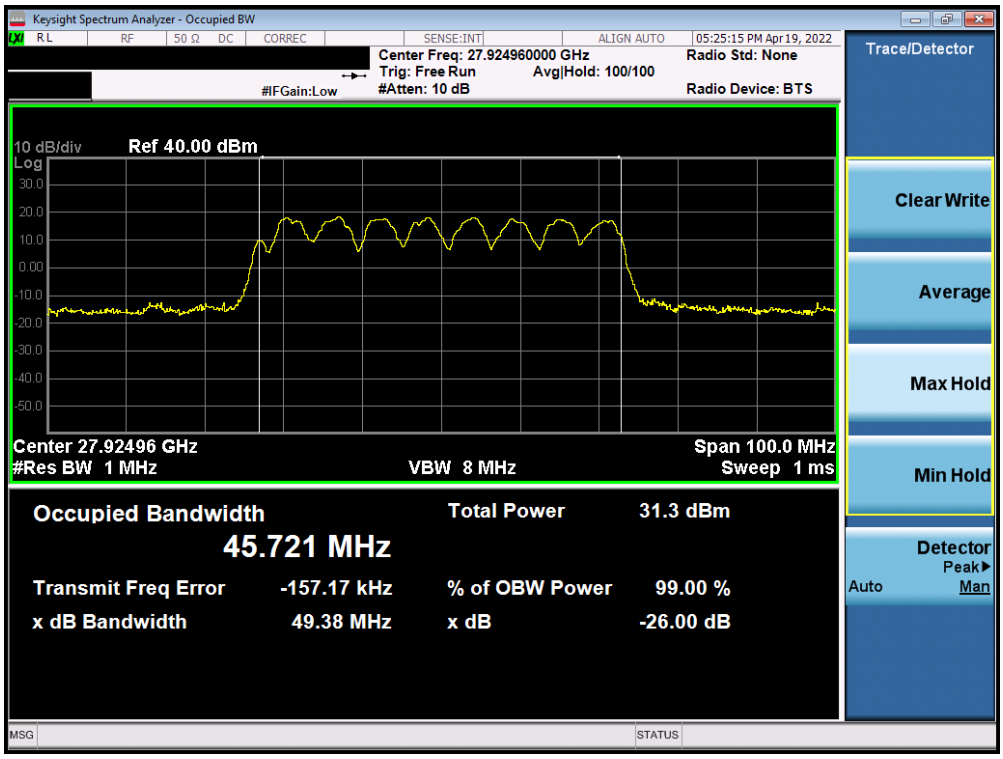
Plot 7-7. Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



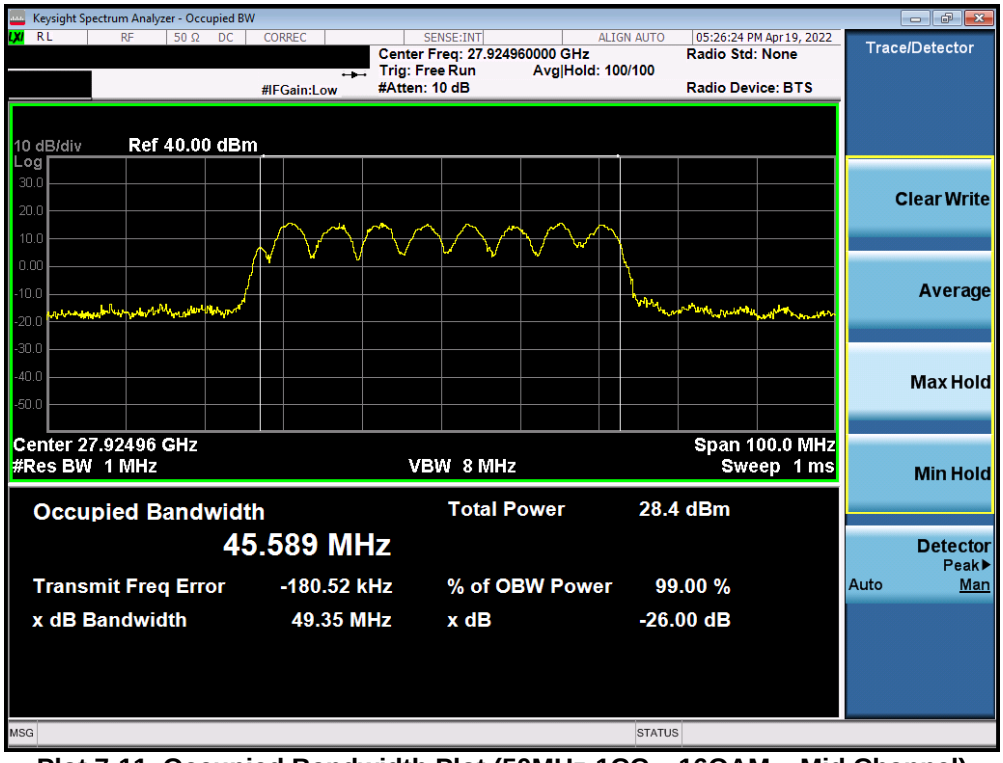
Plot 7-8. Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)



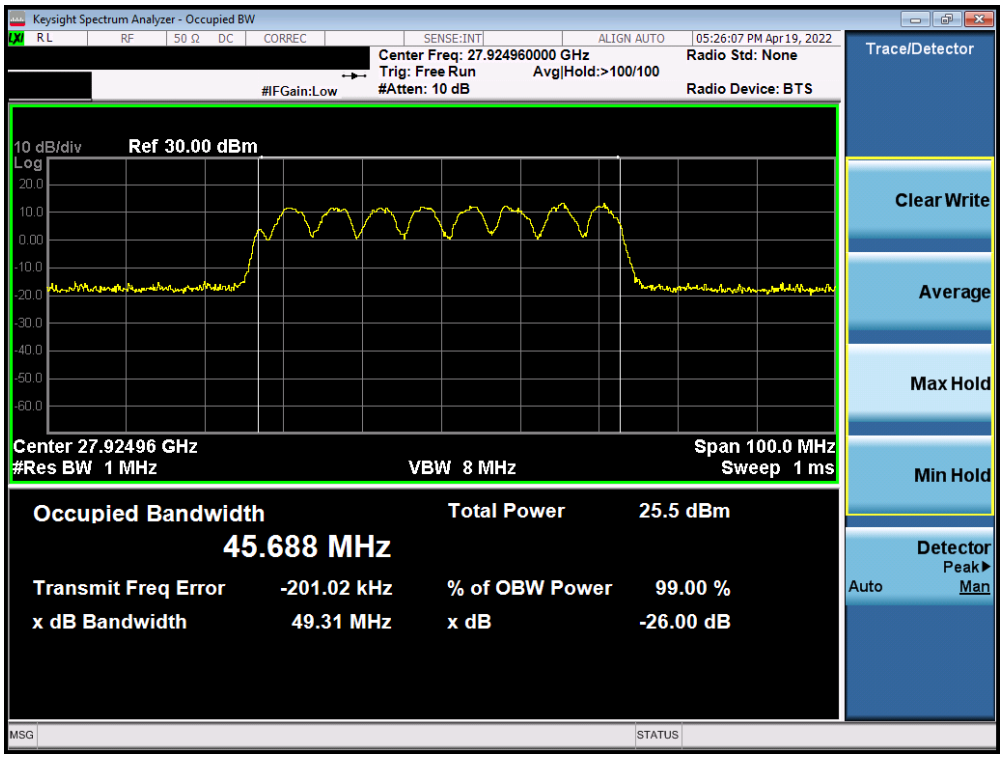
Plot 7-9. Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



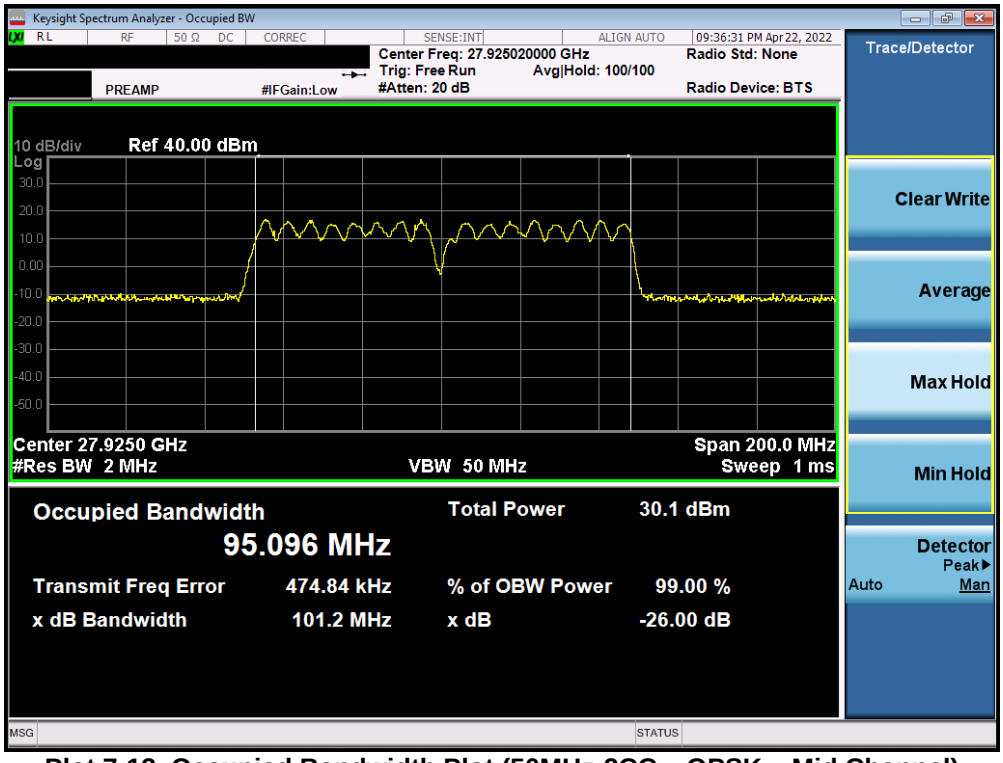
Plot 7-10. Occupied Bandwidth Plot (50MHz-1CC – π/2-BPSK – Mid Channel)



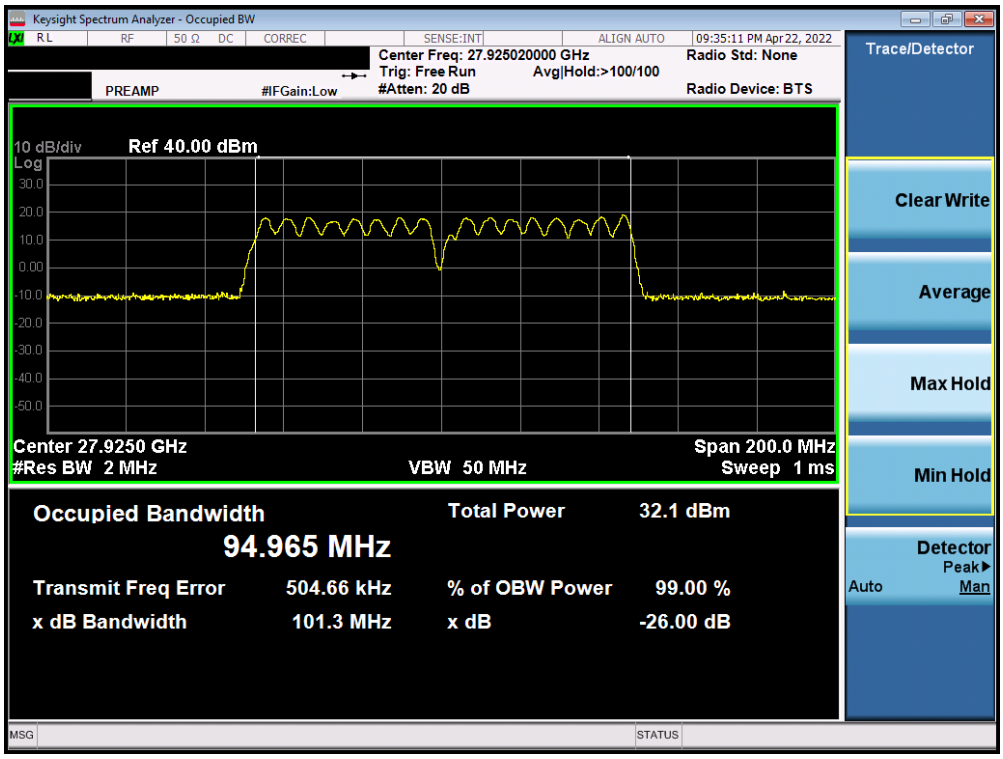
Plot 7-11. Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



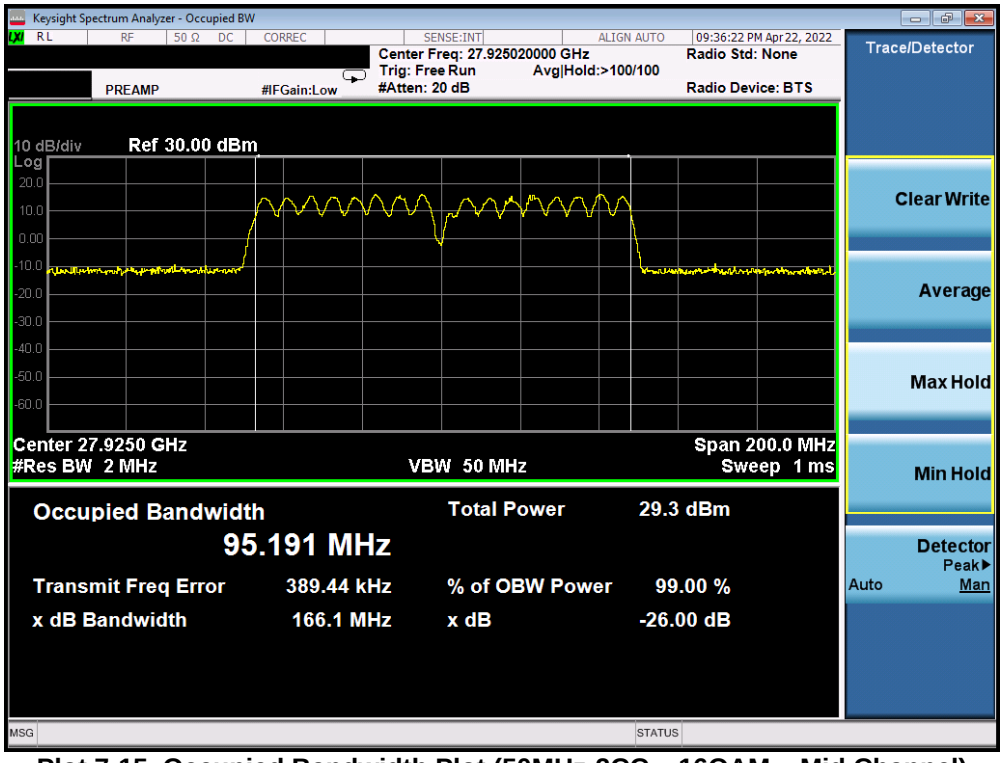
Plot 7-12. Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



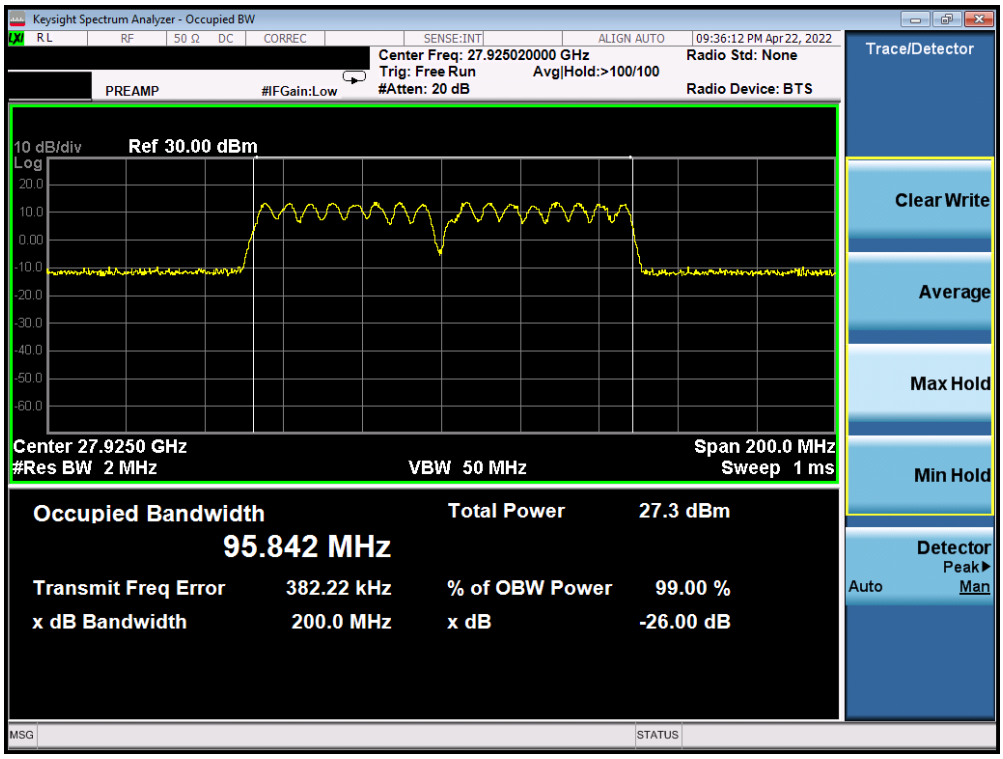
Plot 7-13. Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



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



Plot 7-15. Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)

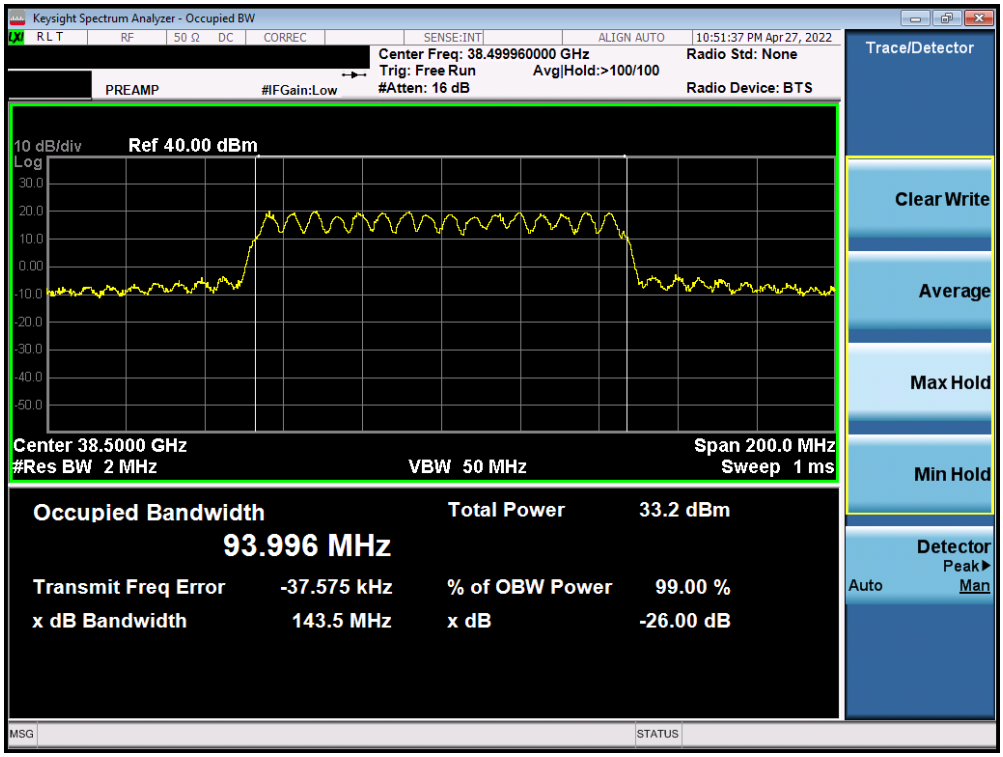


Plot 7-16. Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

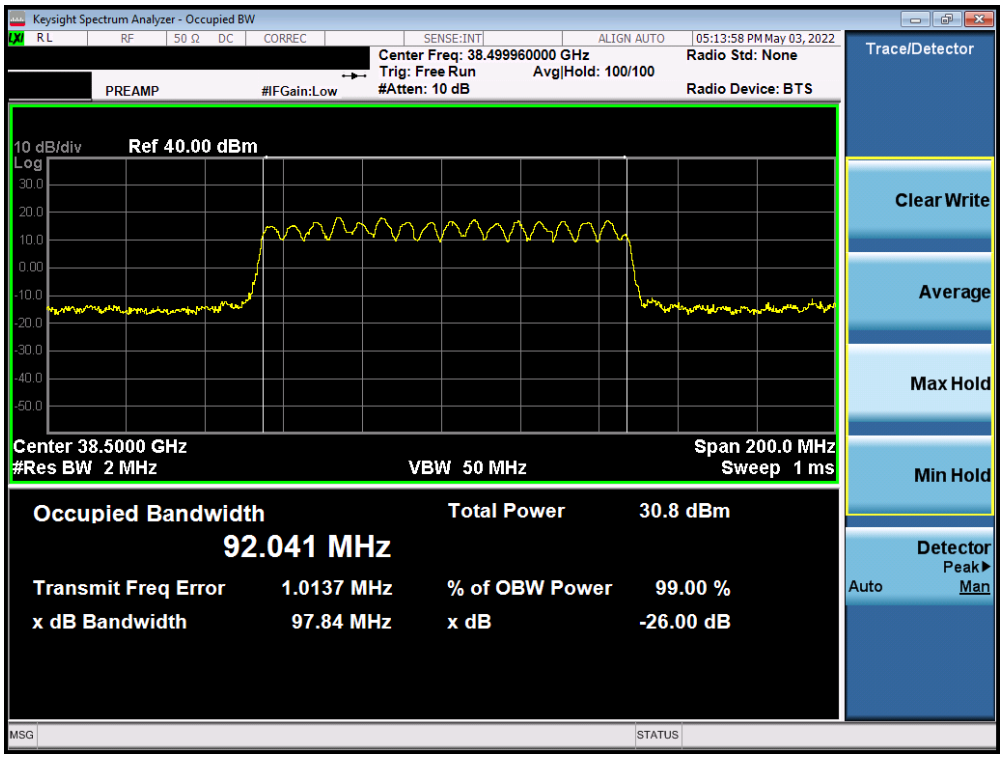
Band n260

Channel	Bandwidth	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	100	1	CP-OFDM	QPSK	94.00
			DFT-s-OFDM	π/2-BPSK	92.04
			CP-OFDM	16QAM	93.96
			CP-OFDM	64QAM	94.24
		2	CP-OFDM	QPSK	193.69
			DFT-s-OFDM	π/2-BPSK	192.63
			CP-OFDM	16QAM	192.69
			CP-OFDM	64QAM	193.34
	50	1	CP-OFDM	QPSK	45.07
			DFT-s-OFDM	π/2-BPSK	44.41
			CP-OFDM	16QAM	44.57
			CP-OFDM	64QAM	45.68
		2	CP-OFDM	QPSK	94.94
			DFT-s-OFDM	π/2-BPSK	96.09
			DFT-s-OFDM	16QAM	96.58
			CP-OFDM	64QAM	95.79

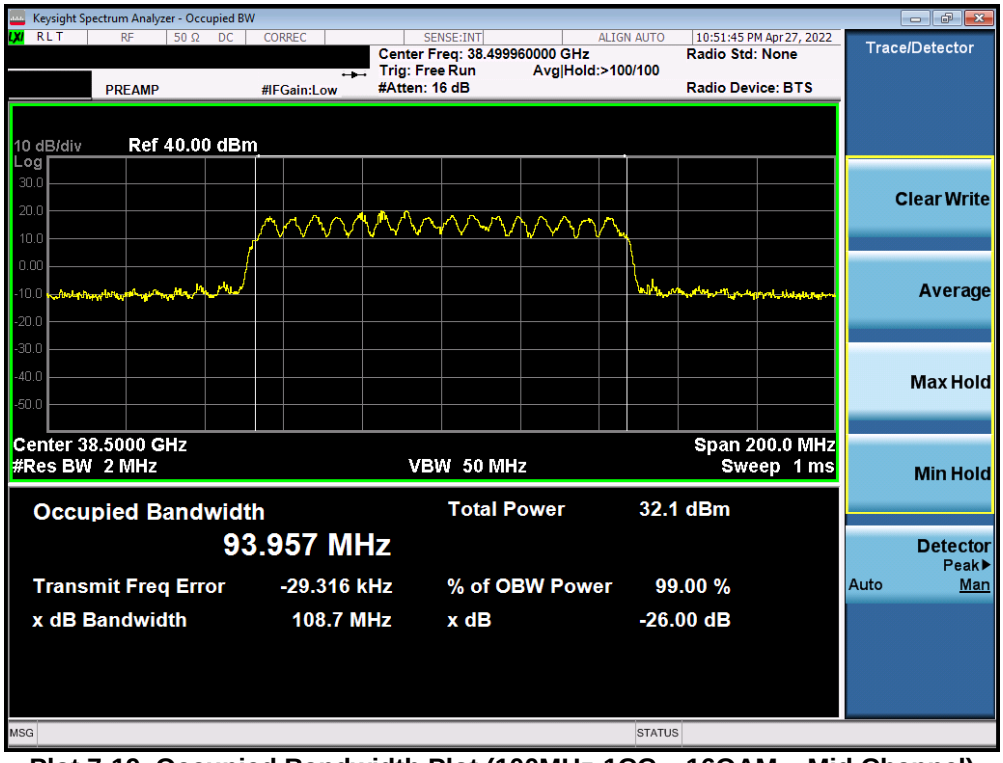
Table 7-3. Summary of Ant 1 Occupied Bandwidths (n260)



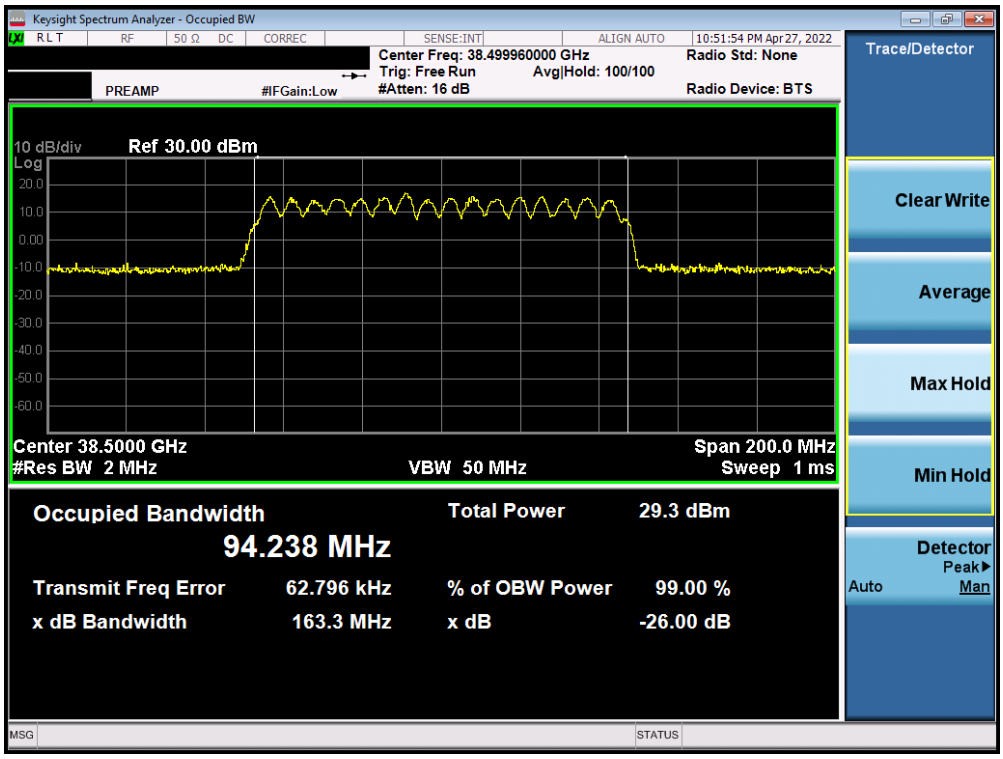
Plot 7-17. Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



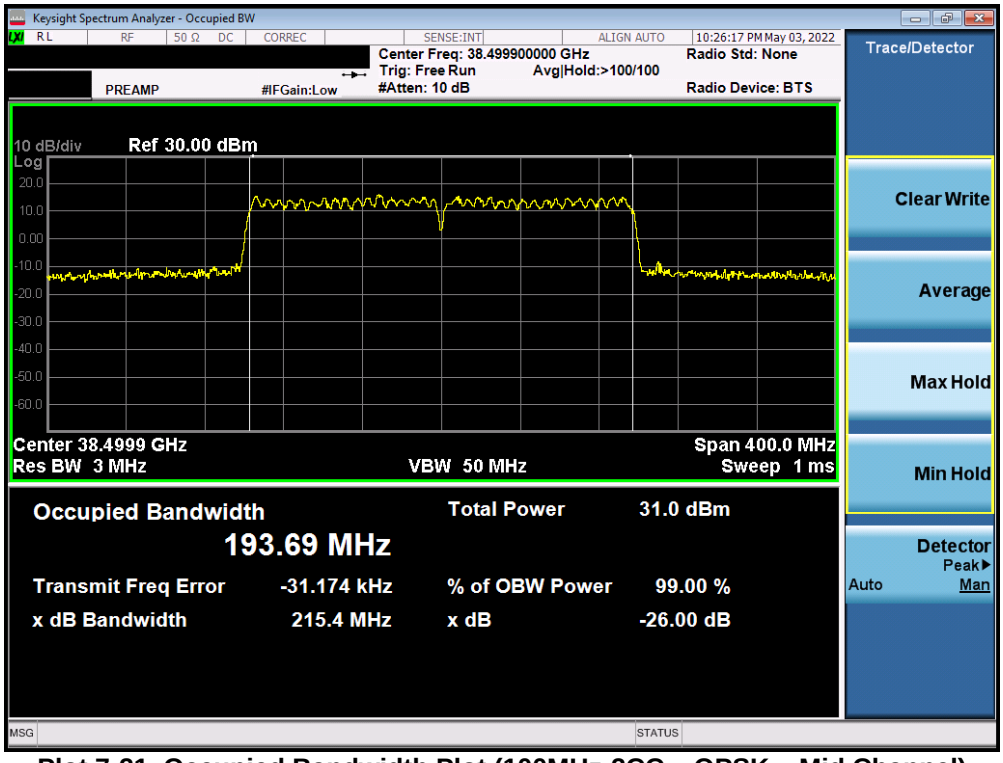
Plot 7-18. Occupied Bandwidth Plot (100MHz-1CC – π/2-BPSK – Mid Channel)



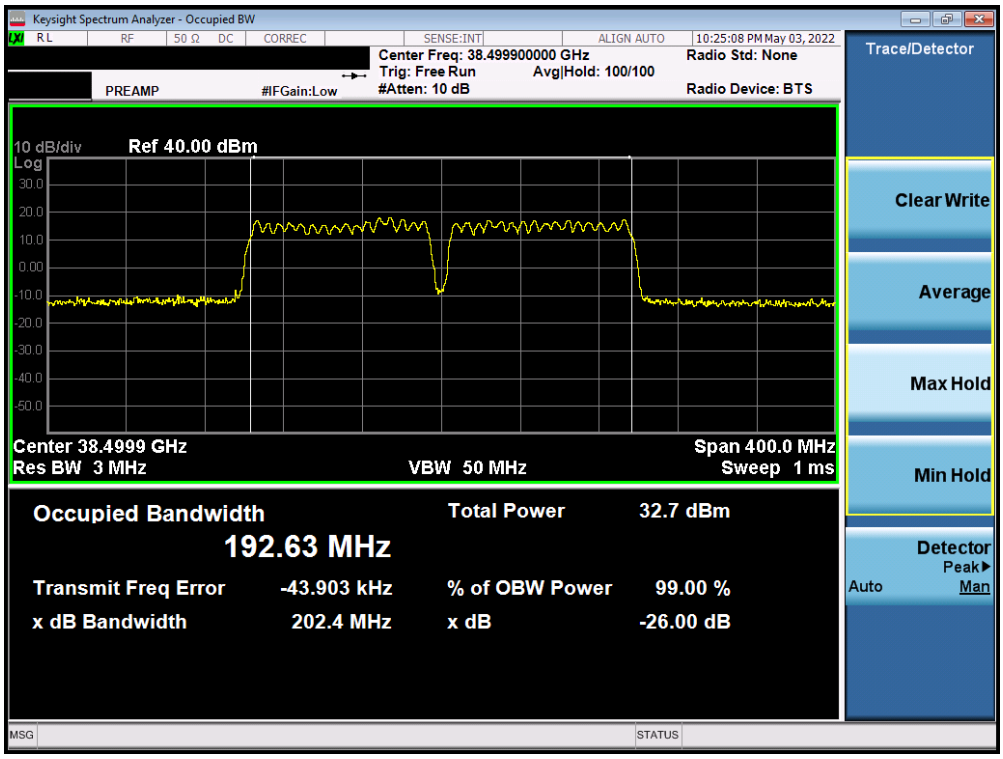
Plot 7-19. Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



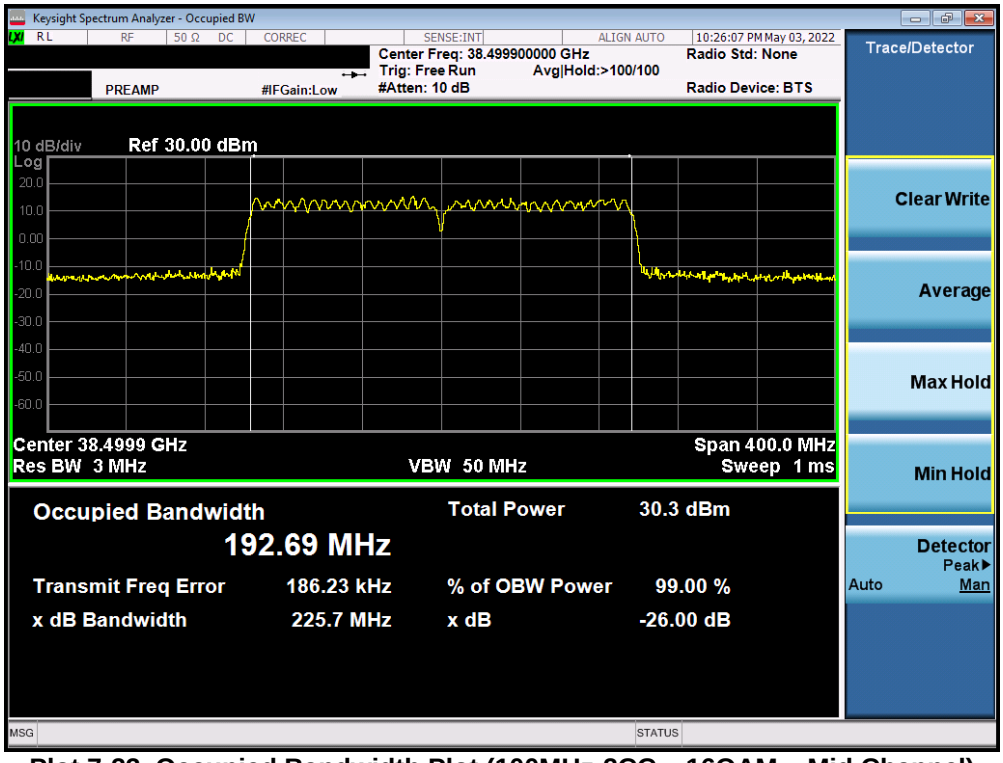
Plot 7-20. Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



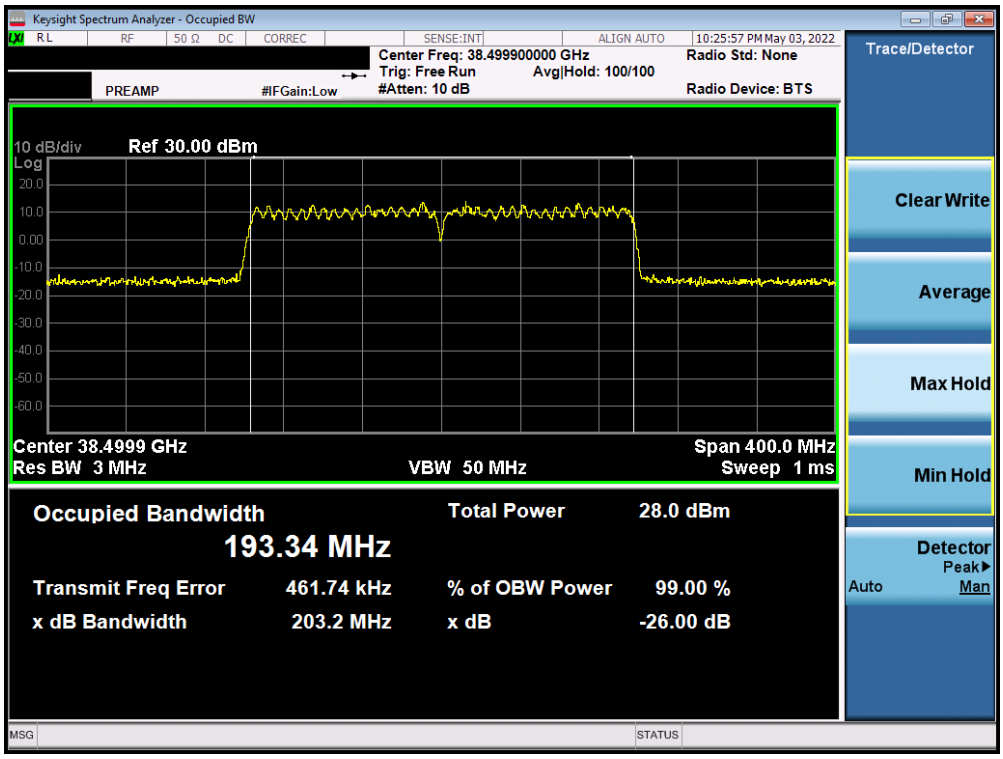
Plot 7-21. Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



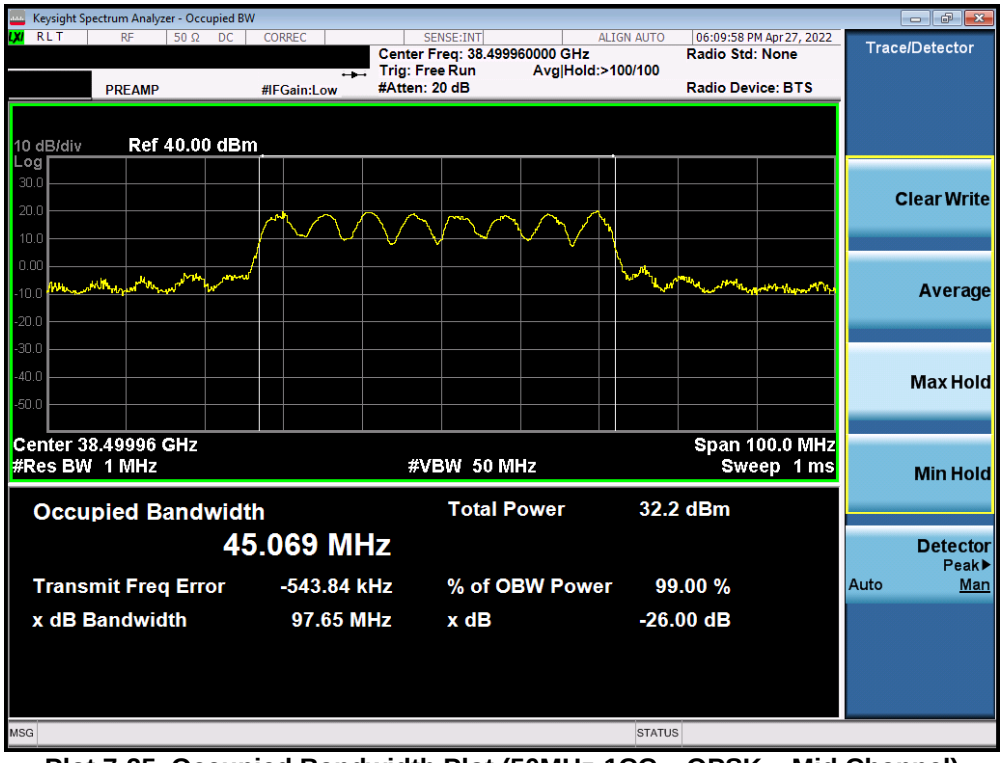
Plot 7-22. Occupied Bandwidth Plot (100MHz-2CC – π/2-BPSK – Mid Channel)



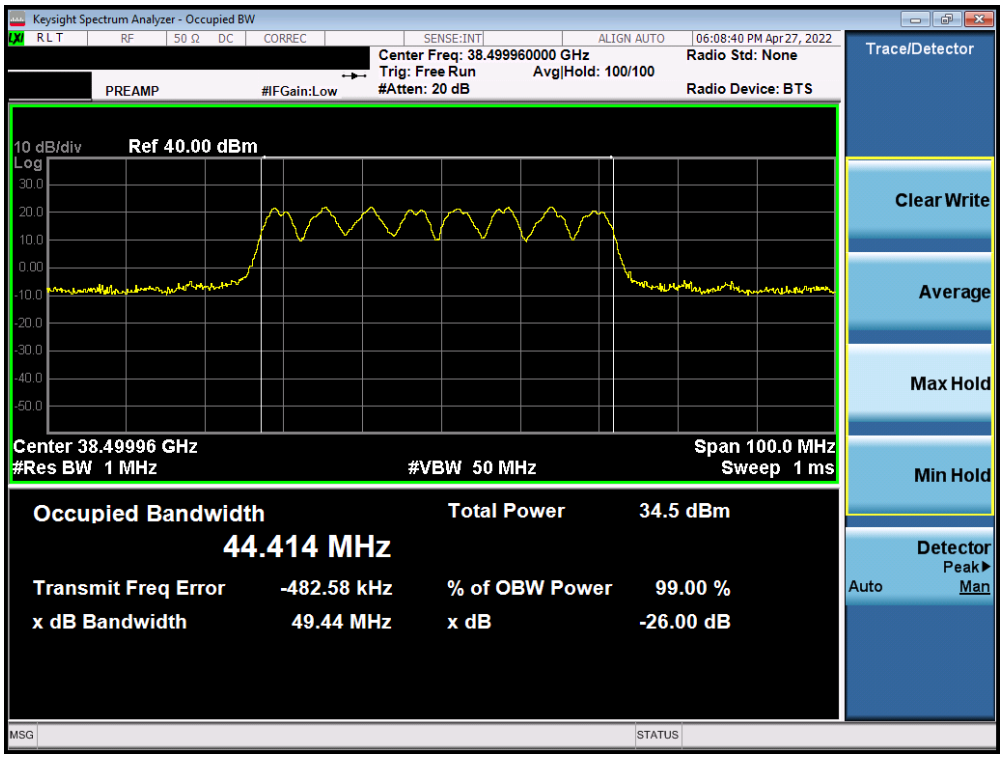
Plot 7-23. Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



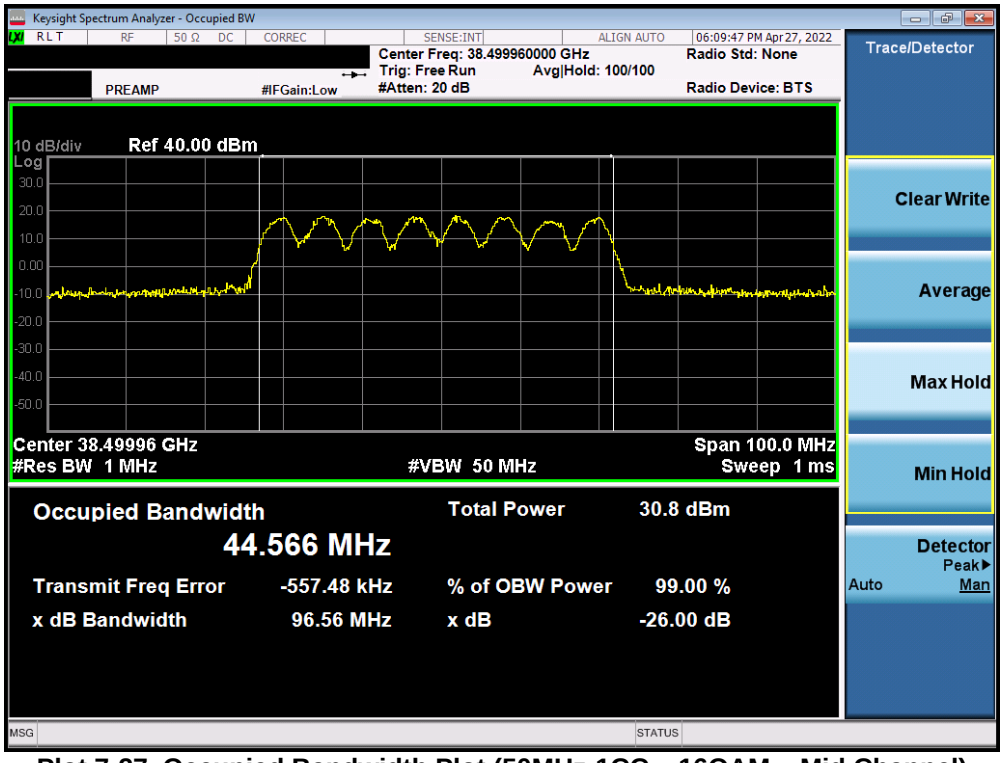
Plot 7-24. Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)



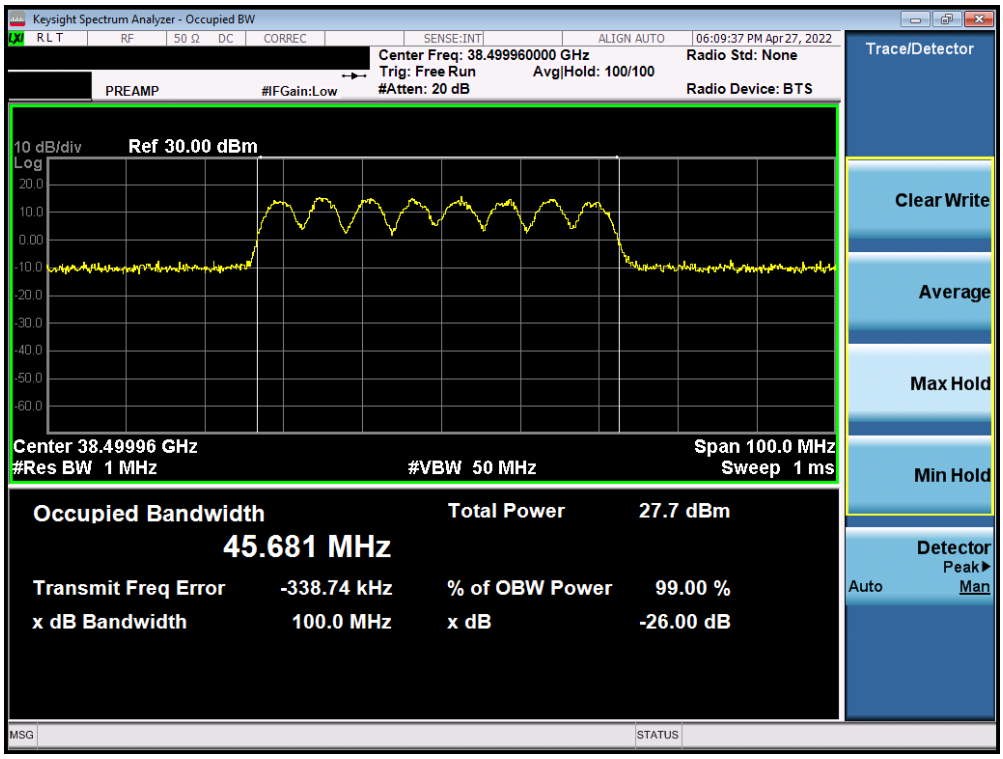
Plot 7-25. Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



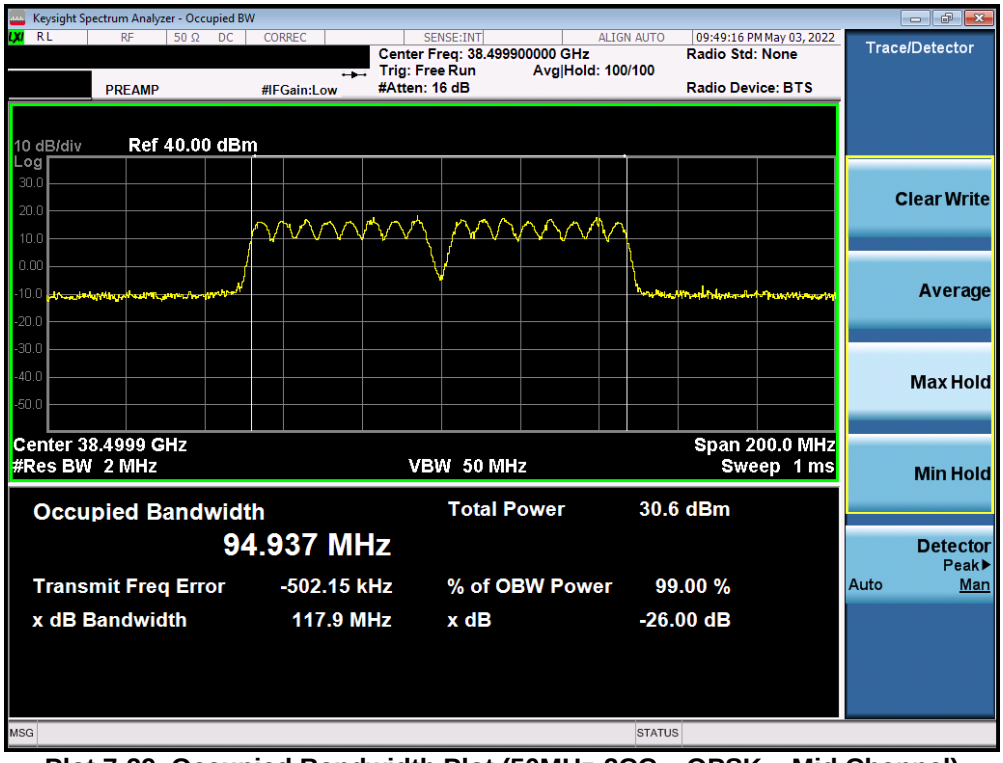
Plot 7-26. Occupied Bandwidth Plot (50MHz-1CC – π/2-BPSK – Mid Channel)



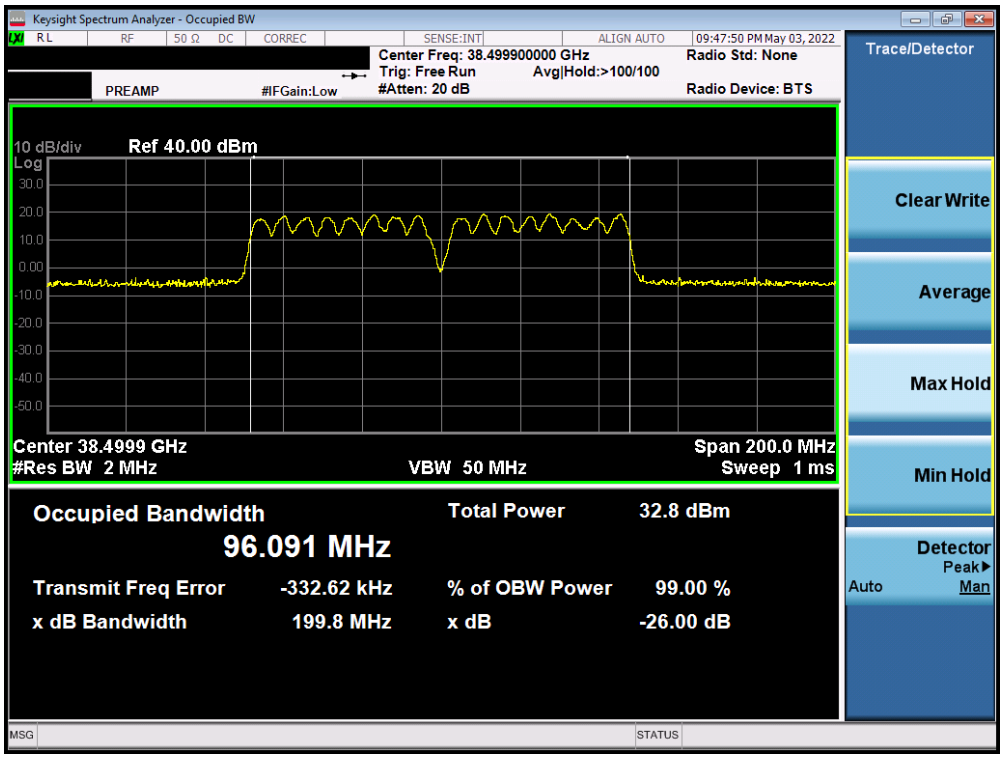
Plot 7-27. Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



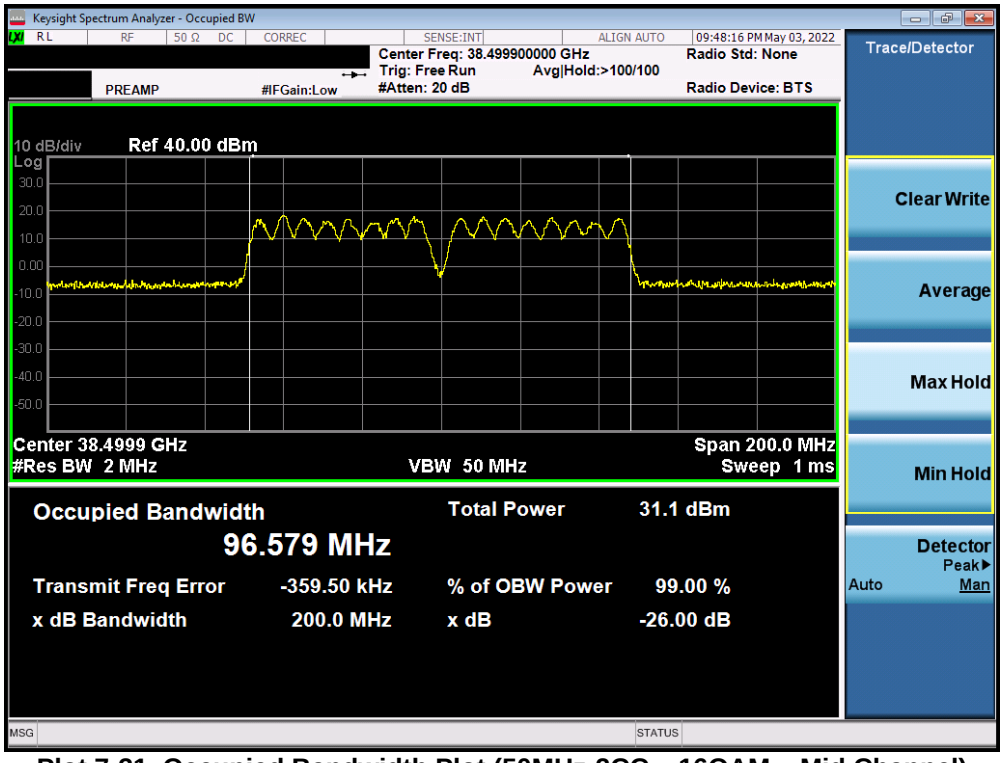
Plot 7-28. Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



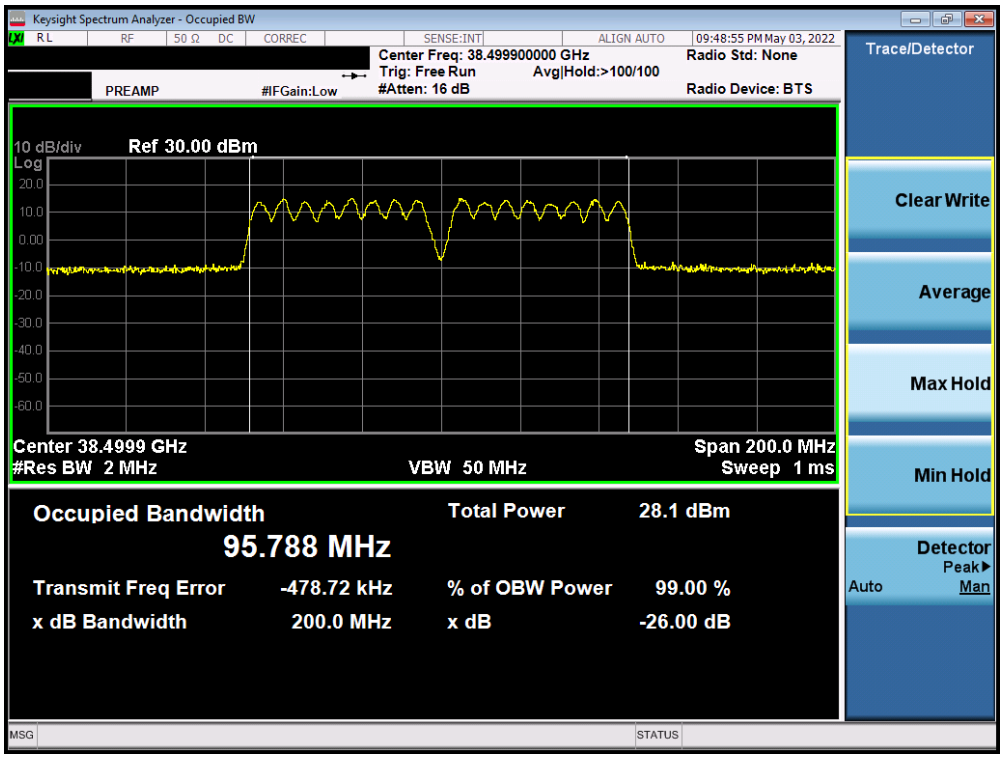
Plot 7-29. Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



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



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



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

7.3 Equivalent Isotropic Radiated Power

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

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below. Both H-Beam and V-Beam were investigated and the worst-case measurements were reported below.

2) Elements within the same antenna array are correlated to produce beamforming array gain. Antenna arrays cannot be correlated with another antenna array. During testing, only one antenna array was active.

3) EIRP measurements for all bands were taken at 1m test distance as was required for far-field conditions (see Table 3-1).

4) The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states: EIRP (dBm) = E (dBµV/m) + 20log(D) − 104.8; where D is the measurement distance (in the far field region) in m. The field strength at the antenna terminals E is calculated as: E (dBµV/m) = Spectrum Analyzer Channel Power Level (dBm) + Antenna Factor (dB/m) + Cable Loss (dB) + 107.

5) All EIRP measurements were made with the appropriate offset levels loaded into the spectrum analyzer as determined from the measurement distance, antenna factor, cable loss, and the equations in Note 4 above.

6) Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst case polarization/positioning.

7) 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.

8) Several BeamID's are investigated based on the provided simulated data to determine the worst-case BeamID.

9) For each band and antenna array configuration tested, worst case EIRP plots are displayed for all total bandwidths tested (50MHz, 100MHz, 200MHz).

Sample Calculation

The offset level loaded into the spectrum analyzer allows for a direct conversion of the raw channel power level measured by the analyzer into an EIRP. This offset level is frequency dependent and is calculated as follows:

Offset Level [dB] = Antenna Factor [dB/m] + Cable Loss [dB] + 20 Log(Distance [m]) + 107 - 104.8 .

For example, to measure an EIRP at a frequency of 24400MHz with an antenna factor of 40.40dB/m, a cable loss of 7.68dB, and a measurement distance of 1 meter, an offset level of:

Offset Level = 40.40dB/m + 7.68dB + 20 Log(1 meter) + 107 - 104.8 = **50.28 dB**

shall be loaded into the spectrum analyzer.

Band n261 Beam ID Configurations

Mode	Ch. No.	Beam Polarization	Beam ID
SISO	2077915	H	167
		V	31
MIMO	2077915	H	159
		V	31

Table 7-4. Ant#0 Worst Case Beam ID

Mode	Ch. No.	Beam Polarization	153
SISO	2077915	H	153
		V	36
MIMO	2077915	H	154
		V	26

Table 7-5. Ant#1 Worst Case Beam ID

Band n261

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
100	1	High	28299.96	DFT-s-OFDM	QPSK	167	H	SISO	H	163	41	1 / 23	26.81
		High	28299.96	DFT-s-OFDM	QPSK	31	V	SISO	V	182	45	1 / 23	27.25
		High	28299.96	DFT-s-OFDM	QPSK	159 + 31	H + V	2Tx	H	181	6	1 / 23	30.96
		High	28299.96	CP-OFDM	QPSK	159	H	SISO	H	163	41	1 / 31	23.59
		High	28299.96	CP-OFDM	QPSK	31	V	SISO	V	182	45	1 / 43	24.16
		High	28299.96	CP-OFDM	QPSK	159 + 31	H + V	MIMO	H	181	6	1 / 23	27.94
		Low	27550.08	DFT-s-OFDM	QPSK	159 + 31	H + V	2Tx	H	182	354	1 / 23	30.55
		Mid	27924.96	DFT-s-OFDM	QPSK	159 + 31	H + V	2Tx	H	184	356	1 / 23	29.83
		High	28324.92	DFT-s-OFDM	π/2 BPSK	159 + 31	H + V	2Tx	H	181	6	1 / 23	**31.03**
		High	28324.92	DFT-s-OFDM	16QAM	159 + 31	H + V	2Tx	H	181	6	1 / 23	28.92
		High	28324.92	DFT-s-OFDM	64QAM	159 + 31	H + V	2Tx	H	181	6	1 / 23	27.00
100+100	2	High	28249.98	DFT-s-OFDM	QPSK	159 + 31	H + V	2Tx	H	185	5	64 / 0	24.17
		High	28249.98	DFT-s-OFDM	π/2 BPSK	159 + 31	H + V	2Tx	H	185	5	64 / 0	24.19
		High	28249.98	DFT-s-OFDM	16QAM	159 + 31	H + V	2Tx	H	185	5	1 / 43	23.73
		High	28249.98	DFT-s-OFDM	64QAM	159 + 31	H + V	2Tx	H	185	5	1 / 43	22.43

Table 7-6. Ant#0 EIRP Data (Band n261 − 100MHz)

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
50	1	High	28324.92	DFT-s-OFDM	QPSK	167	H	SISO	H	162	41	1 / 14	26.90
		High	28324.92	DFT-s-OFDM	QPSK	31	V	SISO	V	183	49	1 / 14	27.13
		High	28324.92	DFT-s-OFDM	QPSK	159 + 31	H + V	2Tx	H	182	353	1 / 18	31.03
		High	28324.92	CP-OFDM	QPSK	167	H	SISO	H	162	41	1 / 15	23.71
		High	28324.92	CP-OFDM	QPSK	31	V	SISO	V	183	49	1 / 18	24.04
		High	28324.92	CP-OFDM	QPSK	159 + 31	H + V	MIMO	H	182	353	1 / 18	28.04
		Low	27525.00	DFT-s-OFDM	QPSK	159 + 31	H + V	2Tx	H	182	353	1 / 14	30.94
		Mid	27924.96	DFT-s-OFDM	QPSK	159 + 31	H + V	2Tx	H	182	2	1 / 18	30.04
		High	28324.92	DFT-s-OFDM	π/2 BPSK	159 + 31	H + V	2Tx	H	182	359	1 / 18	**31.04**
		High	28324.92	DFT-s-OFDM	16QAM	159 + 31	H + V	2Tx	H	182	353	1 / 18	28.73
		High	28324.92	DFT-s-OFDM	64QAM	159 + 31	H + V	2Tx	H	182	353	1 / 14	27.16
50+50	2	High	28299.90	DFT-s-OFDM	QPSK	159 + 31	H + V	2Tx	H	185	353	32 / 0	24.46
		High	28299.90	DFT-s-OFDM	π/2 BPSK	159 + 31	H + V	2Tx	H	185	353	32 / 0	24.47
		High	28299.90	DFT-s-OFDM	16QAM	159 + 31	H + V	2Tx	H	185	353	1 / 14	23.54
		High	28299.90	DFT-s-OFDM	64QAM	159 + 31	H + V	2Tx	H	185	353	1 / 14	22.41

Table 7-7. Ant#0 EIRP Data (Band n261 − 50MHz)

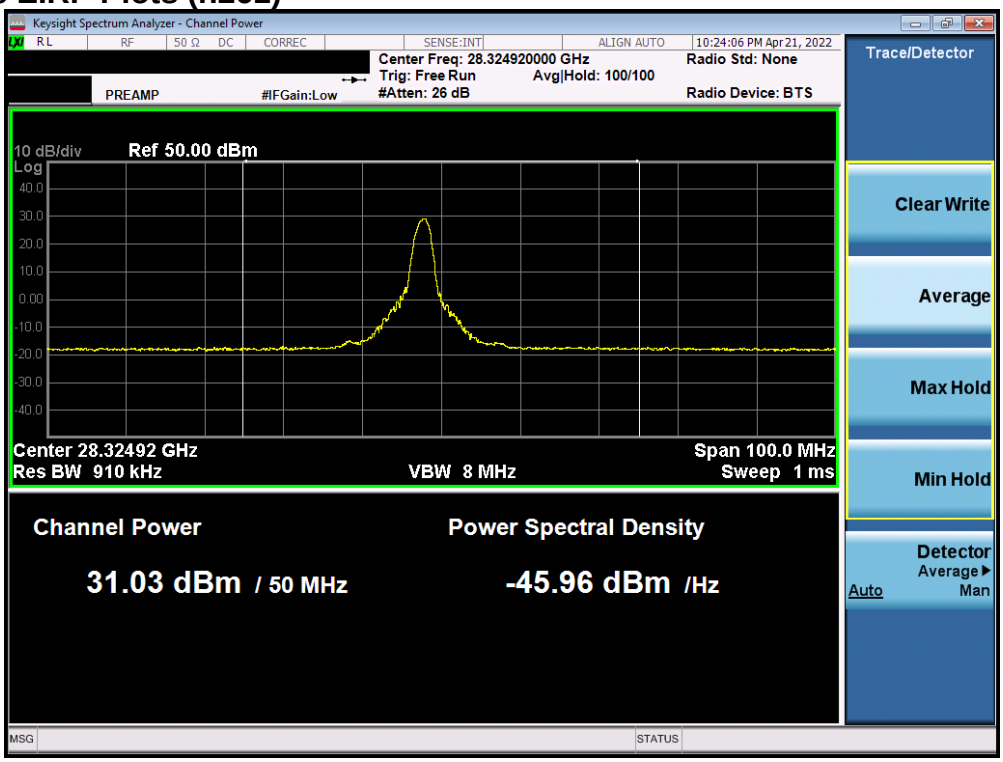
Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
100	1	High	28299.96	DFT-s-OFDM	QPSK	153	H	SISO	H	61	64	1 / 43	25.24
		High	28299.96	DFT-s-OFDM	QPSK	36	V	SISO	H	76	270	1 / 43	24.96
		High	28299.96	DFT-s-OFDM	QPSK	154 + 26	H + V	2Tx	H	93	273	1 / 23	30.42
		High	28299.96	CP-OFDM	QPSK	153	H	SISO	H	61	64	1 / 43	22.12
		High	28299.96	CP-OFDM	QPSK	36	V	SISO	H	76	270	1 / 43	21.85
		High	28299.96	CP-OFDM	QPSK	154 + 26	H + V	MIMO	H	93	273	1 / 43	27.99
		Low	27550.08	DFT-s-OFDM	QPSK	154 + 26	H + V	2Tx	H	94	267	1 / 43	30.42
		Mid	27924.96	DFT-s-OFDM	QPSK	154 + 26	H + V	2Tx	H	93	269	1 / 31	31.10
		High	28324.92	DFT-s-OFDM	π/2 BPSK	154 + 26	H + V	2Tx	H	93	269	1 / 23	**31.12**
		High	28324.92	DFT-s-OFDM	16QAM	154 + 26	H + V	2Tx	H	93	269	1 / 31	28.66
		High	28324.92	DFT-s-OFDM	64QAM	154 + 26	H + V	2Tx	H	93	269	1 / 31	27.04
100+100	2	High	28249.98	DFT-s-OFDM	QPSK	154 + 26	H + V	2Tx	H	92	270	64 / 0	24.01
		High	28249.98	DFT-s-OFDM	π/2 BPSK	154 + 26	H + V	2Tx	H	92	270	64 / 0	24.04
		High	28249.98	DFT-s-OFDM	16QAM	154 + 26	H + V	2Tx	H	92	270	1 / 43	23.07
		High	28249.98	DFT-s-OFDM	64QAM	154 + 26	H + V	2Tx	H	92	270	1 / 43	22.19

Table 7-8. Ant#1 EIRP Data (Band n261 − 100MHz)

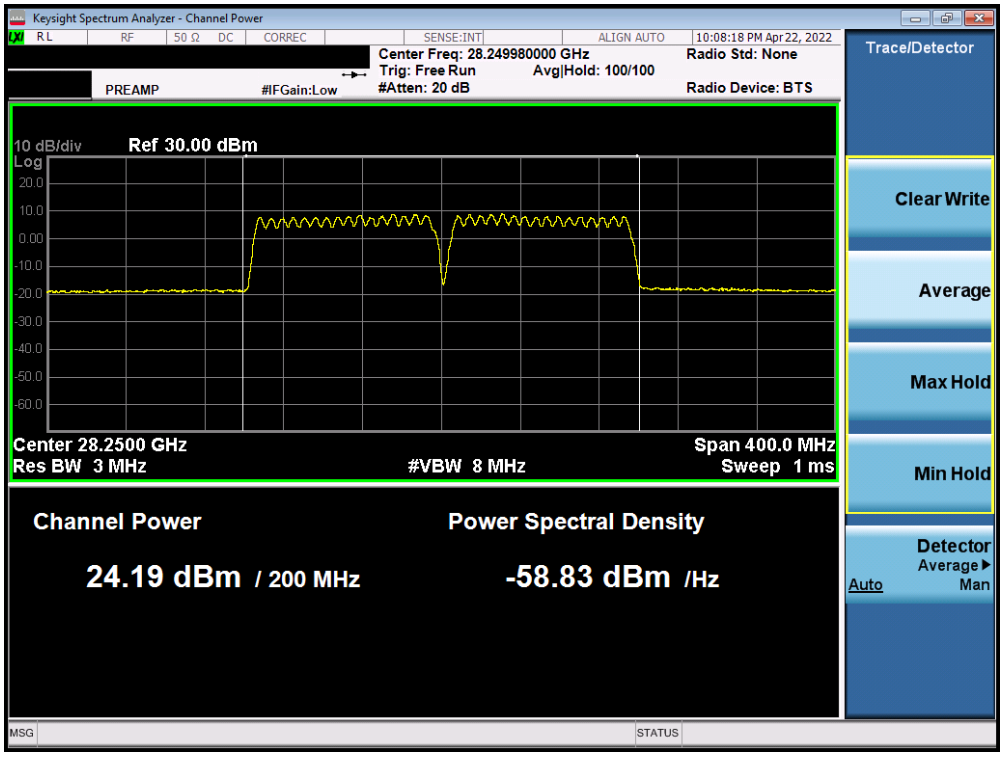
Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
50	1	High	28324.92	DFT-s-OFDM	QPSK	153	H	SISO	H	61	64	1 / 14	25.15
		High	28324.92	DFT-s-OFDM	QPSK	36	V	SISO	H	76	270	1 / 15	24.98
		High	28324.92	DFT-s-OFDM	QPSK	154 + 26	H + V	2Tx	H	93	268	1 / 18	31.14
		High	28324.92	CP-OFDM	QPSK	153	H	SISO	H	61	64	1 / 14	21.97
		High	28324.92	CP-OFDM	QPSK	36	V	SISO	H	76	270	1 / 18	21.82
		High	28324.92	CP-OFDM	QPSK	154 + 26	H + V	MIMO	H	93	268	1 / 14	28.01
		Low	27525.00	DFT-s-OFDM	QPSK	154 + 26	H + V	2Tx	H	92	270	1 / 14	30.38
		Mid	27924.96	DFT-s-OFDM	QPSK	154 + 26	H + V	2Tx	H	93	268	1 / 18	30.26
		High	28324.92	DFT-s-OFDM	π/2 BPSK	154 + 26	H + V	2Tx	H	93	268	1 / 18	**31.19**
		High	28324.92	DFT-s-OFDM	16QAM	154 + 26	H + V	2Tx	H	93	268	1 / 14	28.68
		High	28324.92	DFT-s-OFDM	64QAM	154 + 26	H + V	2Tx	H	93	268	1 / 14	27.07
50+50	2	High	28299.90	DFT-s-OFDM	QPSK	154 + 26	H + V	2Tx	H	93	263	32 / 0	23.91
		High	28299.90	DFT-s-OFDM	π/2 BPSK	154 + 26	H + V	2Tx	H	93	263	32 / 0	23.91
		High	28299.90	DFT-s-OFDM	16QAM	154 + 26	H + V	2Tx	H	93	263	1 / 14	23.60
		High	28299.90	DFT-s-OFDM	64QAM	154 + 26	H + V	2Tx	H	93	263	1 / 14	21.89

Table 7-9. Ant#1 EIRP Data (Band n261 − 50MHz)

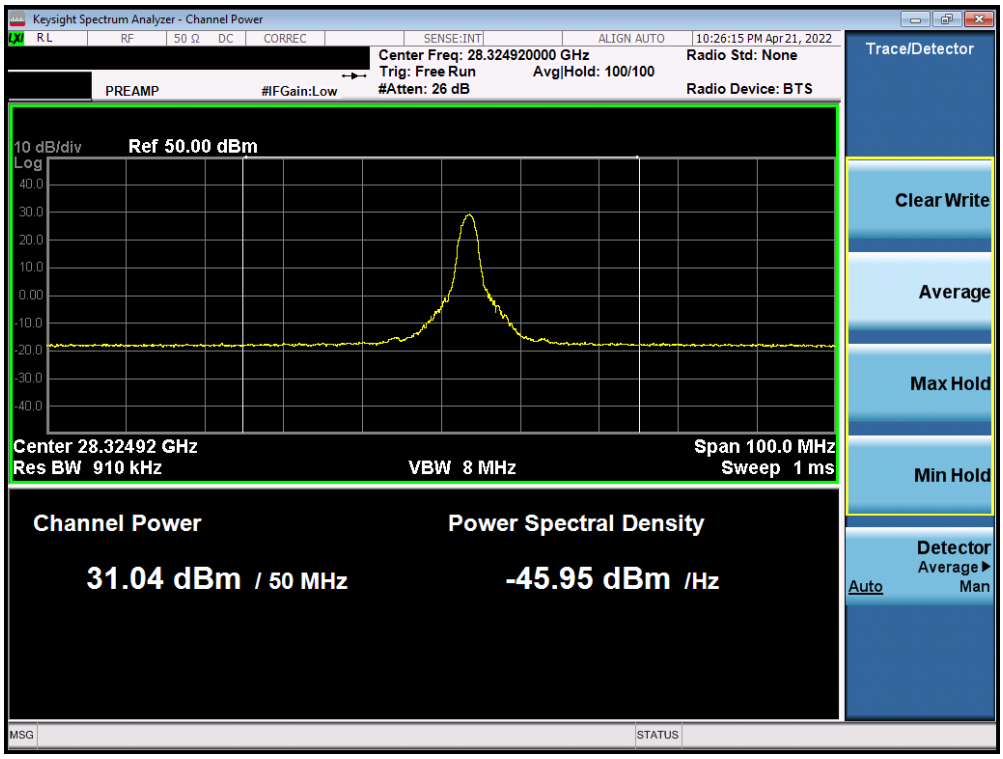
Worst-Case EIRP Plots (n261)



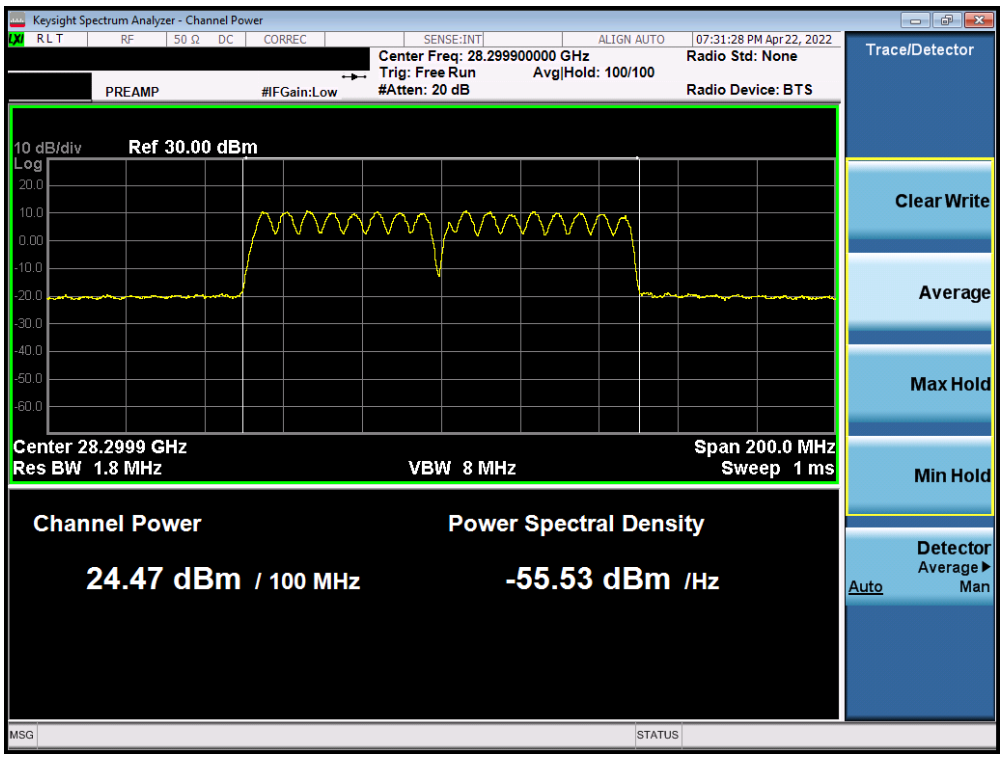
Plot 7-33. Ant#0 EIRP Plot (Band n261 − 100MHz-1CC – π/BPSK – High Channel)



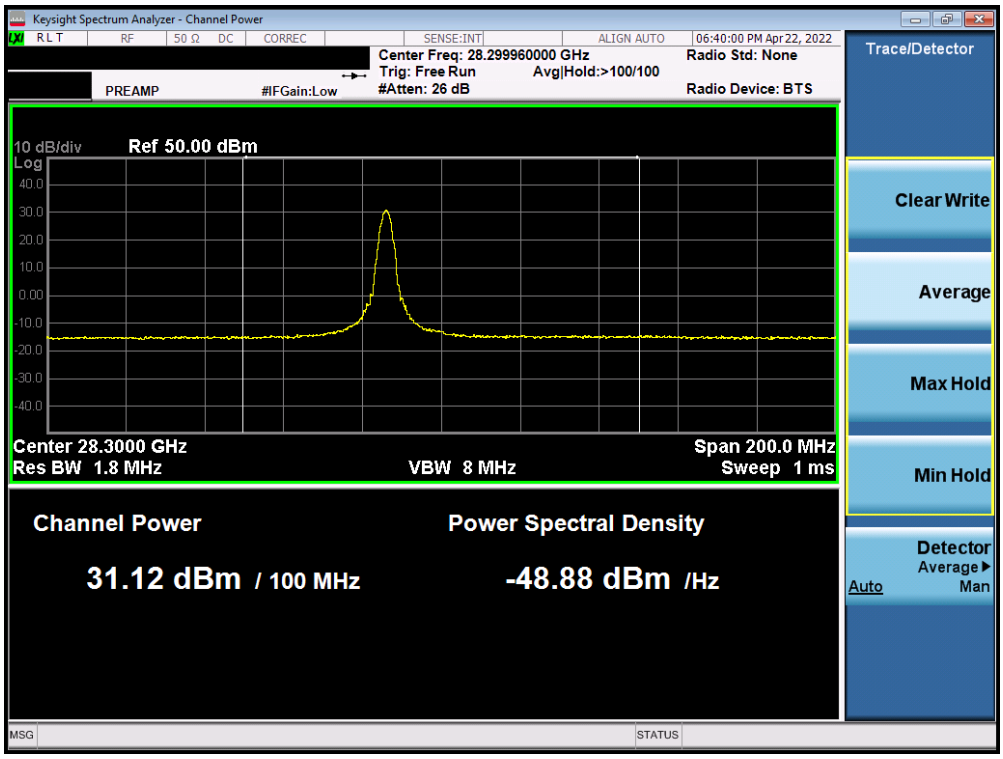
Plot 7-34. Ant#0 EIRP Plot (Band n261 − 100MHz-2CC – π/2-BPSK – High Channel)



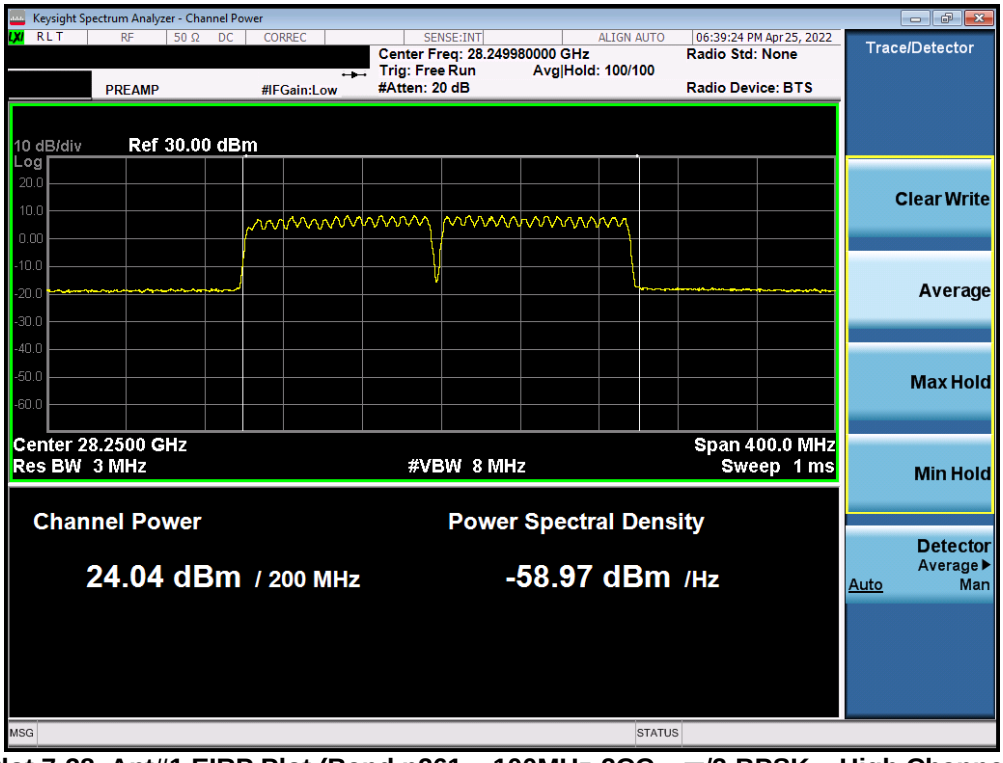
Plot 7-35. Ant#0 EIRP Plot (Band n261 − 50MHz-1CC − π/2-BPSK – High Channel)



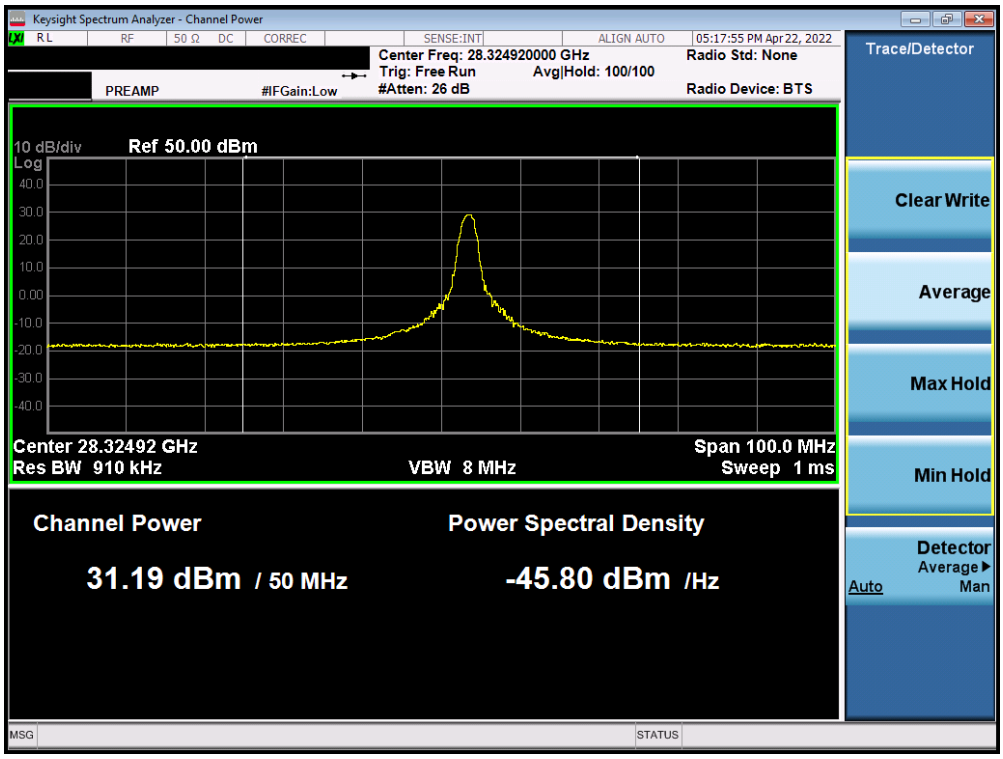
Plot 7-36. Ant#0 EIRP Plot (Band n261 − 50MHz-2CC − π/2-BPSK – High Channel)



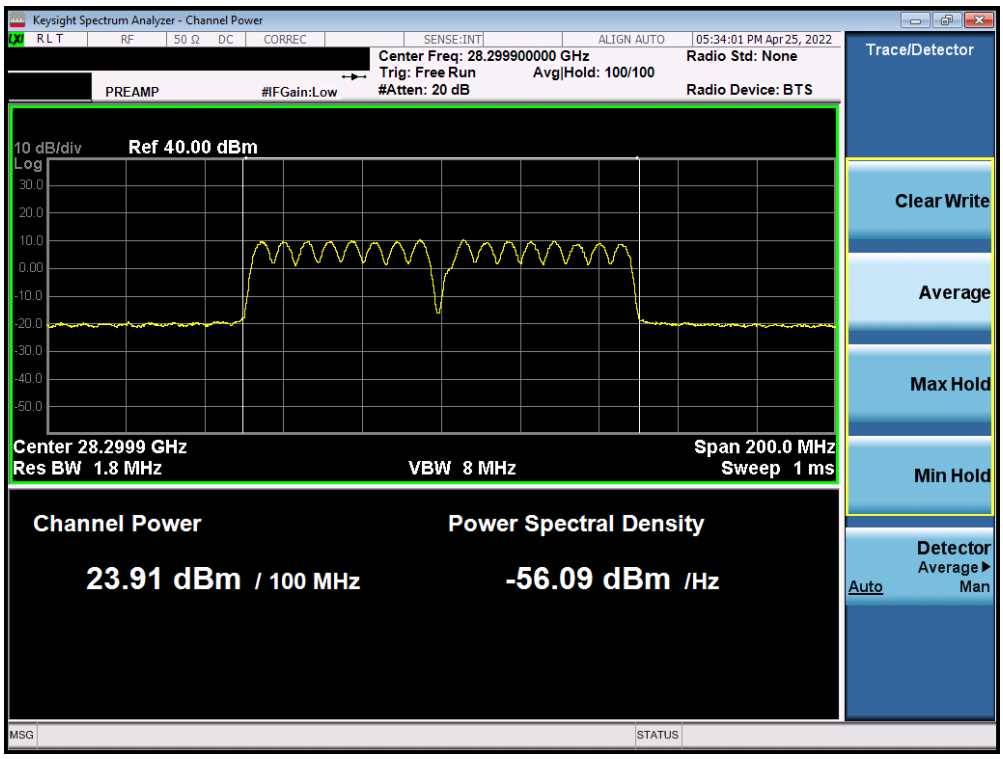
Plot 7-37. Ant#1 EIRP Plot (Band n261 − 100MHz-1CC − π/2-BPSK – High Channel)



Plot 7-38. Ant#1 EIRP Plot (Band n261 − 100MHz-2CC – π/2-BPSK – High Channel)



Plot 7-39. Ant#1 EIRP Plot (Band n261 − 50MHz-1CC − π/2-BPSK – High Channel)



Plot 7-40. Ant#1 EIRP Plot (Band n261 − 50MHz-2CC − π/2-BPSK – High Channel)

Band n260 Beam ID Configurations

Mode	Ch. No.	Beam Polarization	Beam ID
SISO	2253781	H	168
		V	40
MIMO	2253781	H	168
		V	40

Table 7-10. Ant#0 Worst Case Beam ID

Mode	Ch. No.	Beam Polarization	Beam ID
SISO	2253781	H	164
		V	26
MIMO	2253781	H	164
		V	36

Table 7-11. Ant#1 Worst Case Beam ID

Band n260

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
100	1	Mid	38499.96	DFT-s-OFDM	QPSK	168	H	SISO	V	179	233	1 / 23	28.18
		Mid	38499.96	DFT-s-OFDM	QPSK	40	V	SISO	H	185	37	1 / 23	28.66
		Mid	38499.96	DFT-s-OFDM	QPSK	168 + 40	H + V	2Tx	V	181	266	1 / 23	**31.34**
		Mid	38499.96	CP-OFDM	QPSK	168	H	SISO	V	179	233	1 / 23	25.14
		Mid	38499.96	CP-OFDM	QPSK	40	V	SISO	H	185	37	1 / 23	25.62
		Mid	38499.96	CP-OFDM	QPSK	168 + 40	H + V	MIMO	V	181	266	1 / 23	28.31
		Low	37050.00	DFT-s-OFDM	QPSK	168 + 40	H + V	2Tx	V	188	265	1 / 23	29.78
		High	39949.92	DFT-s-OFDM	QPSK	168 + 40	H + V	2Tx	V	188	270	1 / 23	30.21
		Mid	38499.96	DFT-s-OFDM	π/2 BPSK	168 + 40	H + V	2Tx	V	181	266	1 / 23	31.25
		Mid	38499.96	DFT-s-OFDM	16QAM	168 + 40	H + V	2Tx	V	181	266	1 / 23	28.97
		Mid	38499.96	DFT-s-OFDM	64QAM	168 + 40	H + V	2Tx	V	181	266	1 / 23	27.21
100+100	2	Mid	38499.96	DFT-s-OFDM	QPSK	168 + 40	H + V	2Tx	V	184	264	64 / 0	24.00
		Mid	38499.96	DFT-s-OFDM	π/2 BPSK	168 + 40	H + V	2Tx	V	184	264	64 / 0	23.94
		Mid	38499.96	DFT-s-OFDM	16QAM	168 + 40	H + V	2Tx	V	184	264	1 / 23	23.86
		Mid	38499.96	DFT-s-OFDM	64QAM	168 + 40	H + V	2Tx	V	184	264	1 / 23	22.20

Table 7-12. Ant#0 EIRP Data (Band n260 − 100MHz)

Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
50	1	Mid	38499.96	DFT-s-OFDM	QPSK	168	H	SISO	V	179	234	1 / 14	28.29
		Mid	38499.96	DFT-s-OFDM	QPSK	40	V	SISO	H	184	35	1 / 18	28.54
		Mid	38499.96	DFT-s-OFDM	QPSK	168 + 40	H + V	2Tx	V	185	287	1 / 14	**30.37**
		Mid	38499.96	CP-OFDM	QPSK	168	H	SISO	V	179	234	1 / 15	25.11
		Mid	38499.96	CP-OFDM	QPSK	40	V	SISO	H	184	35	1 / 15	25.44
		Mid	38499.96	CP-OFDM	QPSK	168 + 40	H + V	MIMO	V	185	287	1 / 14	27.14
		Low	37025.04	DFT-s-OFDM	QPSK	168 + 40	H + V	2Tx	V	184	260	1 / 14	28.15
		High	39975.00	DFT-s-OFDM	QPSK	168 + 40	H + V	2Tx	V	192	270	1 / 14	28.89
		Mid	38499.96	DFT-s-OFDM	π/2 BPSK	168 + 40	H + V	2Tx	V	185	287	1 / 14	30.23
		Mid	38499.96	DFT-s-OFDM	16QAM	168 + 40	H + V	2Tx	V	185	287	1 / 14	27.82
		Mid	38499.96	DFT-s-OFDM	64QAM	168 + 40	H + V	2Tx	V	185	287	1 / 14	26.19
50+50	2	Mid	38499.96	DFT-s-OFDM	QPSK	168 + 40	H + V	2Tx	V	180	270	32 / 0	24.09
		Mid	38499.96	DFT-s-OFDM	π/2 BPSK	168 + 40	H + V	2Tx	V	180	270	32 / 0	24.09
		Mid	38499.96	DFT-s-OFDM	16QAM	168 + 40	H + V	2Tx	V	180	270	1 / 14	23.50
		Mid	38499.96	DFT-s-OFDM	64QAM	168 + 40	H + V	2Tx	V	180	270	1 / 14	22.34

Table 7-13. Ant#0 EIRP Data (Band n260 − 50MHz)

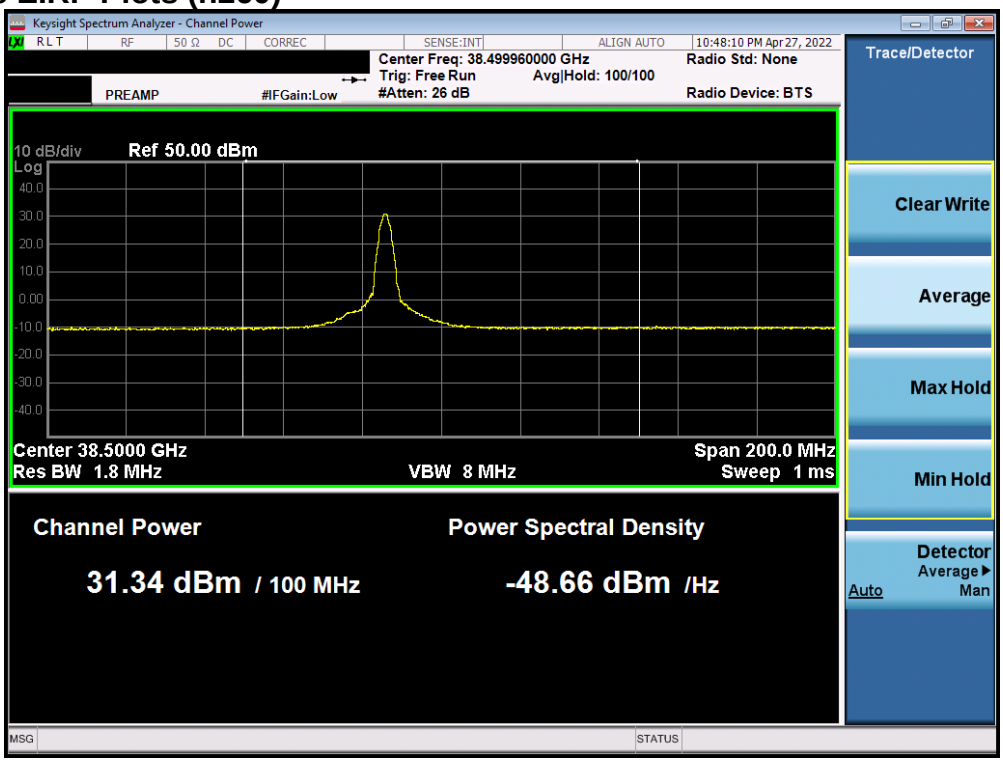
Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
100	1	Mid	38499.96	DFT-s-OFDM	QPSK	164	H	SISO	V	95	284	1 / 23	25.14
		Mid	38499.96	DFT-s-OFDM	QPSK	26	V	SISO	V	92	272	1 / 23	23.70
		Mid	38499.96	DFT-s-OFDM	QPSK	164 + 36	H + V	2Tx	V	77	245	1 / 23	**27.09**
		Mid	38499.96	CP-OFDM	QPSK	164	H	SISO	V	95	284	1 / 23	22.12
		Mid	38499.96	CP-OFDM	QPSK	26	V	SISO	V	92	272	1 / 23	20.63
		Mid	38499.96	CP-OFDM	QPSK	164 + 36	H + V	MIMO	V	77	245	1 / 23	23.73
		Low	37050.00	DFT-s-OFDM	QPSK	164 + 36	H + V	2Tx	V	75	239	1 / 23	24.15
		High	39949.92	DFT-s-OFDM	QPSK	164 + 36	H + V	2Tx	V	77	284	1 / 31	26.90
		Mid	38499.96	DFT-s-OFDM	π/2 BPSK	164 + 36	H + V	2Tx	V	77	245	1 / 23	26.88
		Mid	38499.96	DFT-s-OFDM	16QAM	164 + 36	H + V	2Tx	V	77	245	1 / 23	24.49
		Mid	38499.96	DFT-s-OFDM	64QAM	164 + 36	H + V	2Tx	V	77	245	1 / 23	22.66
100+100	2	Mid	38499.96	DFT-s-OFDM	QPSK	164 + 36	H + V	2Tx	V	79	300	1 / 23	19.74
		Mid	38499.96	DFT-s-OFDM	π/2 BPSK	164 + 36	H + V	2Tx	V	79	300	1 / 23	19.59
		Mid	38499.96	DFT-s-OFDM	16QAM	164 + 36	H + V	2Tx	V	79	300	1 / 23	19.31
		Mid	38499.96	DFT-s-OFDM	64QAM	164 + 36	H + V	2Tx	V	79	300	1 / 23	18.41

Table 7-14. Ant#1 EIRP Data (Band n260 − 100MHz)

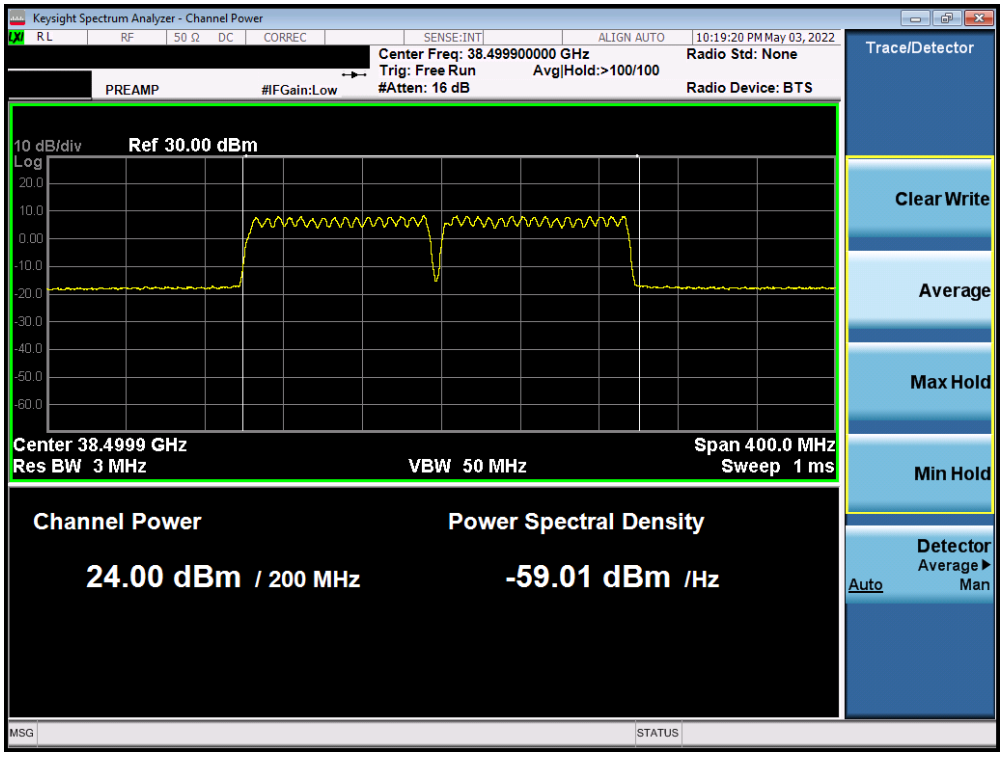
Bandwidth (MHz)	CCs Active	Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
50	1	Mid	38499.96	DFT-s-OFDM	QPSK	164	H	SISO	V	95	284	1 / 14	25.28
		Mid	38499.96	DFT-s-OFDM	QPSK	26	V	SISO	V	91	270	1 / 15	23.82
		Mid	38499.96	DFT-s-OFDM	QPSK	164 + 36	H + V	2Tx	V	92	284	1 / 14	**29.66**
		Mid	38499.96	CP-OFDM	QPSK	164	H	SISO	V	95	284	1 / 14	22.11
		Mid	38499.96	CP-OFDM	QPSK	26	V	SISO	V	91	270	1 / 15	20.56
		Mid	38499.96	CP-OFDM	QPSK	164 + 36	H + V	MIMO	V	92	284	1 / 14	26.35
		Low	37025.04	DFT-s-OFDM	QPSK	164 + 36	H + V	2Tx	V	89	278	1 / 14	27.91
		High	39975.00	DFT-s-OFDM	QPSK	164 + 36	H + V	2Tx	V	105	281	1 / 14	27.74
		Mid	38499.96	DFT-s-OFDM	π/2 BPSK	164 + 36	H + V	2Tx	V	92	284	1 / 14	29.43
		Mid	38499.96	DFT-s-OFDM	16QAM	164 + 36	H + V	2Tx	V	92	284	1 / 14	27.27
		Mid	38499.96	DFT-s-OFDM	64QAM	164 + 36	H + V	2Tx	V	92	284	1 / 14	25.46
50+50	2	Mid	38499.96	DFT-s-OFDM	QPSK	164 + 36	H + V	2Tx	V	80	244	1 / 14	19.41
		Mid	38499.96	DFT-s-OFDM	π/2 BPSK	164 + 36	H + V	2Tx	V	80	244	1 / 14	19.43
		Mid	38499.96	DFT-s-OFDM	16QAM	164 + 36	H + V	2Tx	V	80	244	1 / 14	19.46
		Mid	38499.96	DFT-s-OFDM	64QAM	164 + 36	H + V	2Tx	V	80	244	1 / 14	17.64

Table 7-15. Ant#1 EIRP Data (Band n260 − 50MHz)

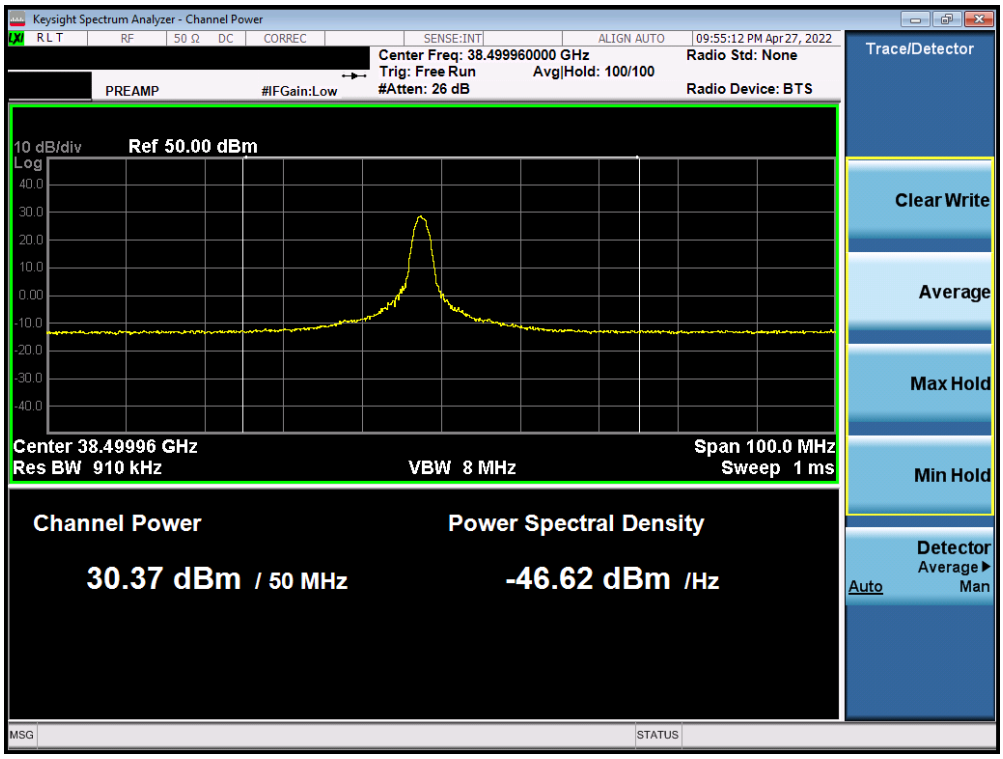
Worst-Case EIRP Plots (n260)



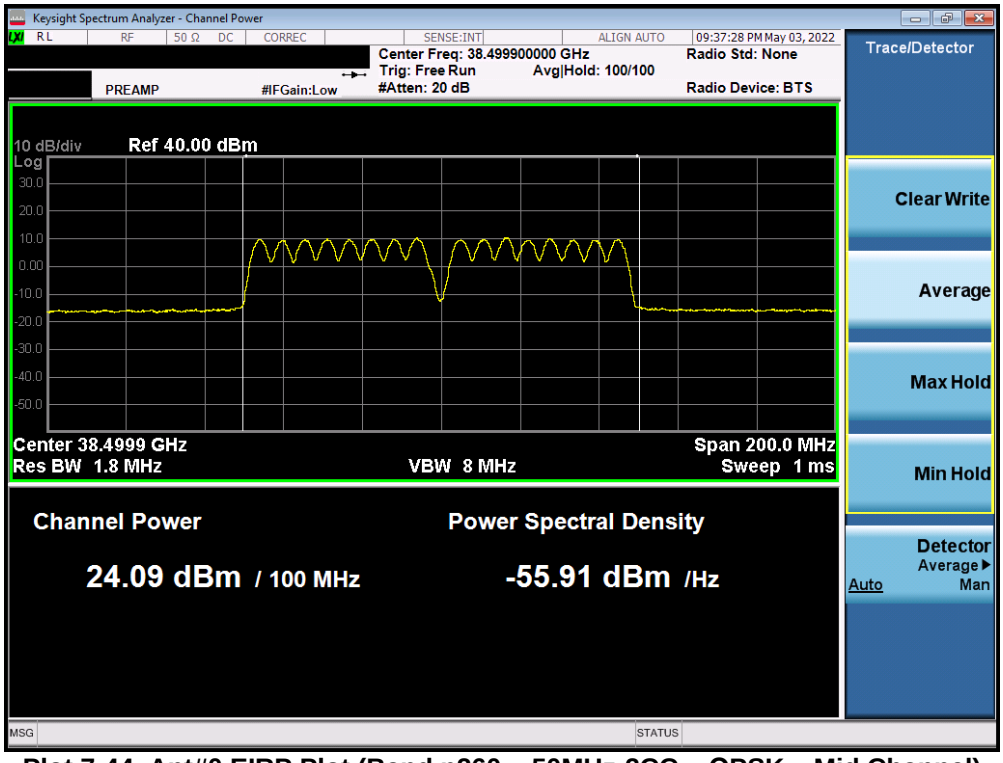
Plot 7-41. Ant#0 EIRP Plot (Band n260 − 100MHz-1CC − QPSK – Mid Channel)



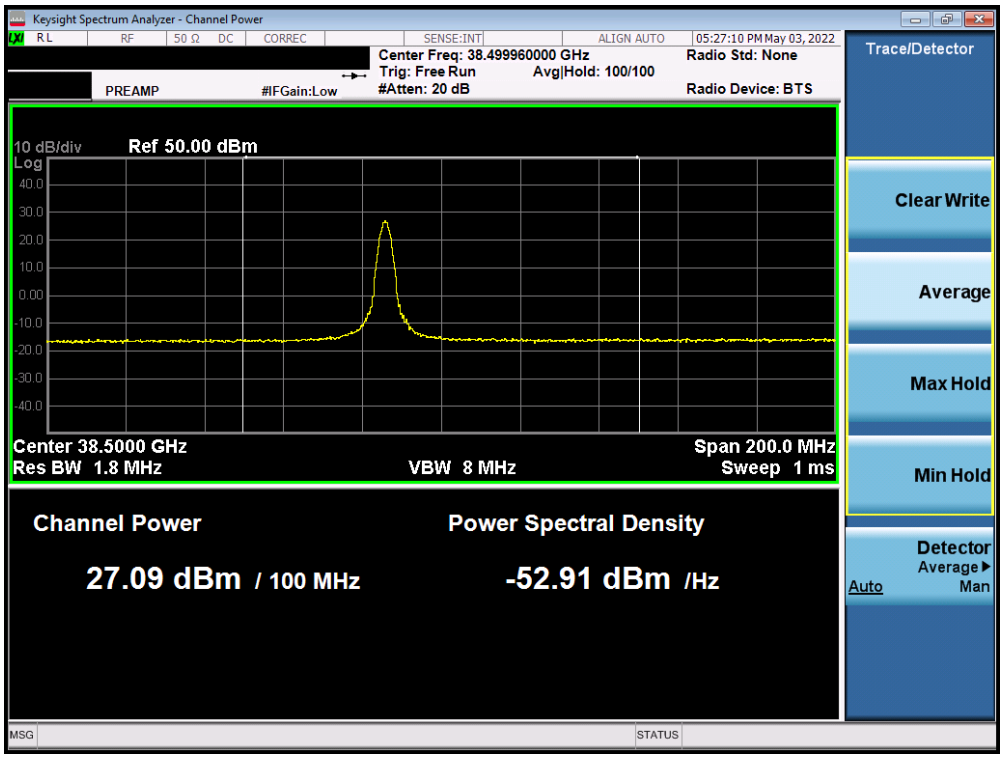
Plot 7-42. Ant#0 EIRP Plot (Band n260 − 100MHz-2CC − QPSK – Mid Channel)



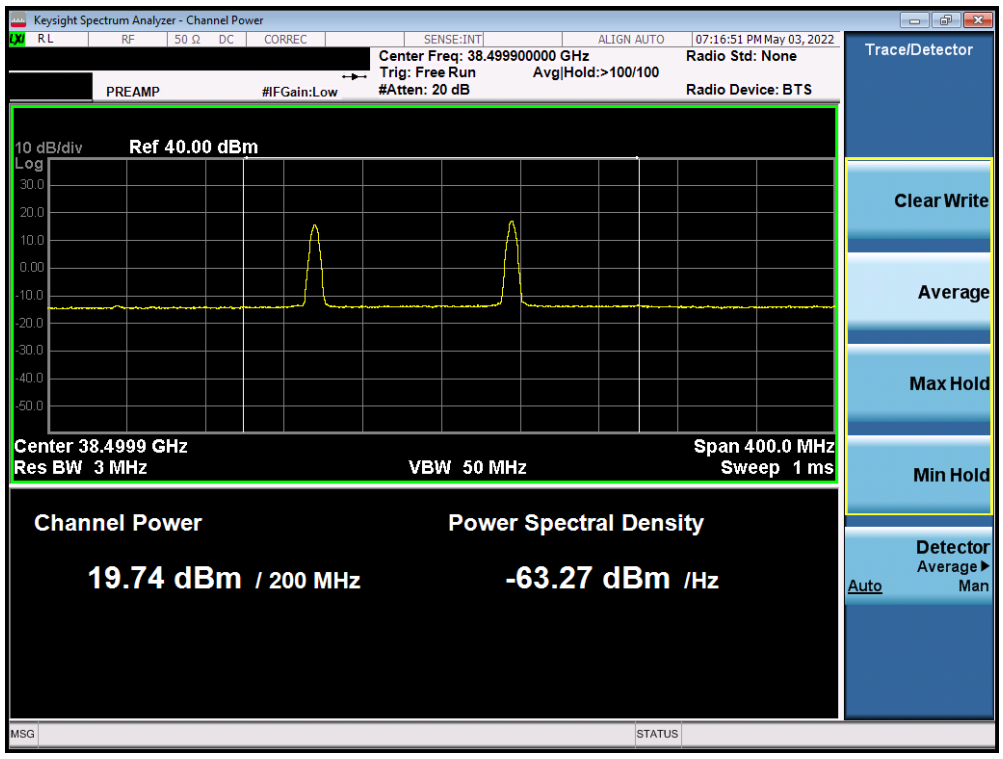
Plot 7-43. Ant#0 EIRP Plot (Band n260 − 50MHz-1CC − QPSK – Mid Channel)



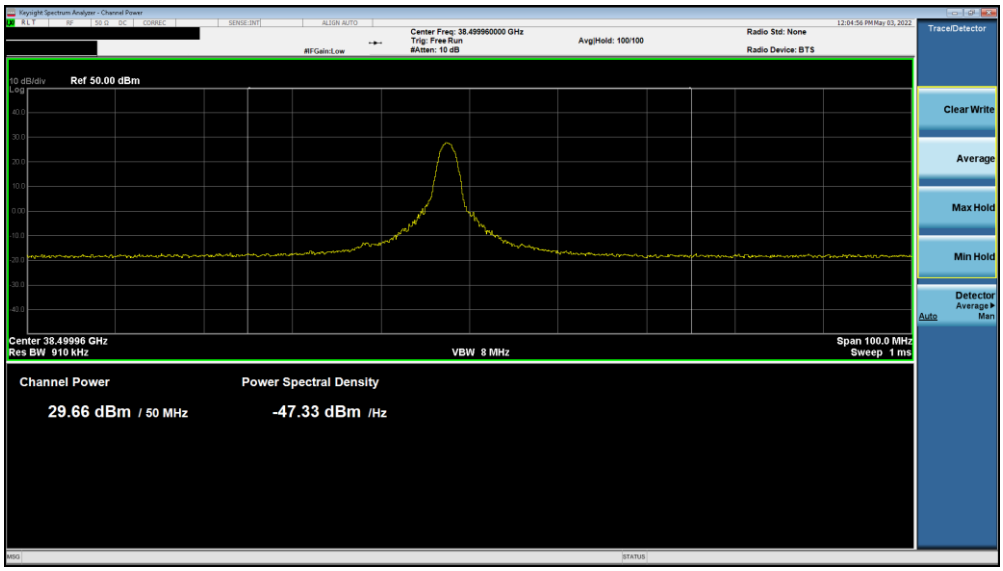
Plot 7-44. Ant#0 EIRP Plot (Band n260 − 50MHz-2CC − QPSK – Mid Channel)



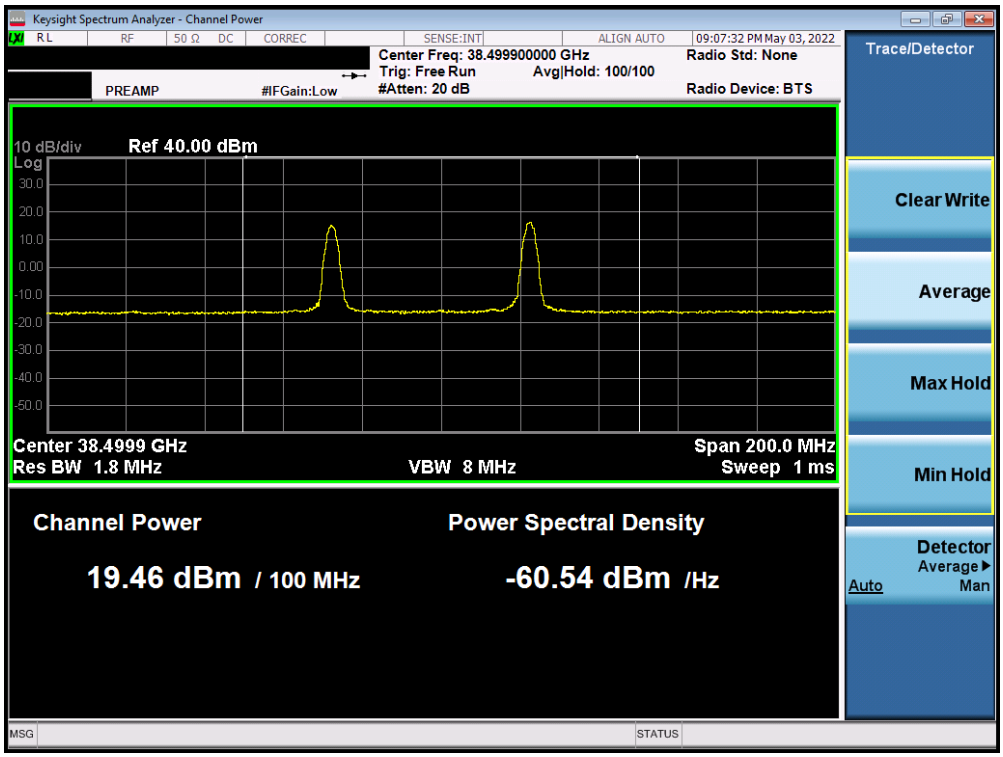
Plot 7-45. Ant#1 EIRP Plot (Band n260 − 100MHz-1CC − QPSK – Mid Channel)



Plot 7-46. Ant#1 EIRP Plot (Band n260 − 100MHz-2CC – QPSK – Mid Channel)



Plot 7-47. Ant#1 EIRP Plot (Band n260 − 50MHz-1CC − QPSK – Mid Channel)



Plot 7-48. Ant#1 EIRP Plot (Band n260 − 50MHz-2CC – 16 QAM – Mid Channel)

7.4 Radiated Spurious and Harmonic Emissions

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using hybrid (biconical/log) antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

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 5.5.4
KDB 842590 D01 – Section 4.4.3

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 100 GHz for n261 and 200GHz for n260. Several plots are used to show investigations in this entire span.
2. Detector = RMS
3. Trace mode = trace average
4. Sweep time = auto couple
5. Number of sweep points ≥ 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. Emissions that were found to be non-compliant using the EIRP method were re-measured using the Spherical Grid TRP Method per KDB 842590 D01 Section 4.4.3.3.4.

3) The plots in this section were taken with the analyzer set to max hold. All final measurements shown in the tables that accompany the plots were taken with trace averaging performed over 100 sweeps while the analyzer was triggering on a specific emission of interest.

4) Elements within the same antenna array are correlated to produce beamforming array gain. Antenna arrays cannot be correlated with another antenna array. During testing, only one antenna array was active.

5) The plots from 1 – 200GHz show corrected average EIRP levels. The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states: EIRP (dBm) = E (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 Factors and Cable Losses have been applied in the spectrum analyzer for each measurement. For measurements > 40GHz, a Harmonic Mixer Conversion Loss was also applied to the spectrum analyzer.

6) Emissions below 18GHz were measured at a 3 meter test distance, while emissions above 18GHz were measured at the appropriate far field distance. The far field of the mmWave signal is based on formula: R > 2D^2/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 7-16. Far-Field Distance & Measurement Distance per Frequency Range

7) All emissions from 18MHz - 40GHz were measured using a spectrum analyzer with an internal preamplifier. Emissions >40GHz were measured using a harmonic mixer with the spectrum analyzer.

8) All RSE's were measured with 1CC. It was determined that adding more CC's causes the overall amplitude of just 1CC to decrease, therefore, 1CC is the worst case for the purposes of spurious emissions measurements.

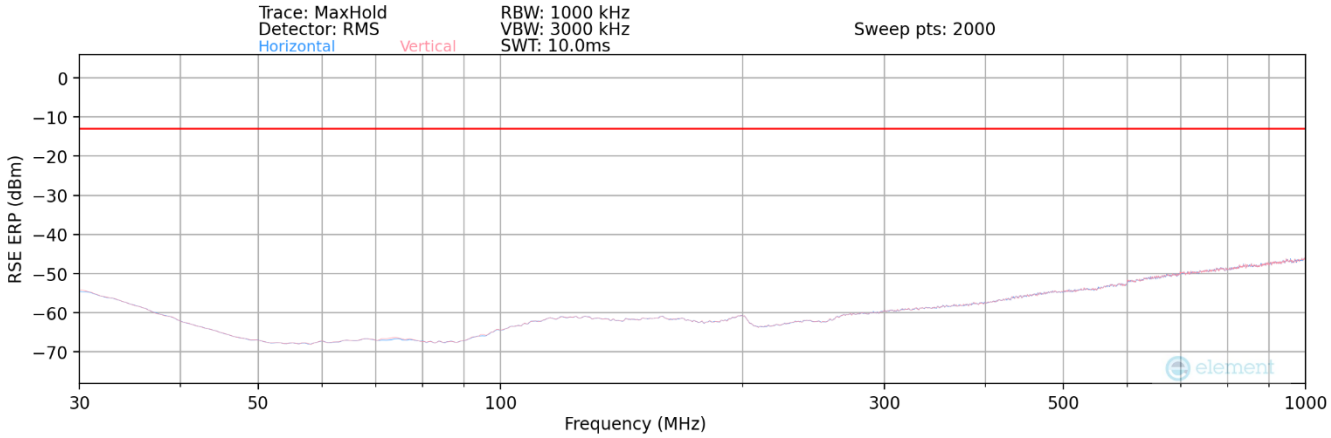
9) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

10) All RSE's were investigated in EN-DC mode and with 802.11 chipset active. It was determined that there is no new emission introduced by EN-DC mode, or the 802.11 chipset. For EN-DC mode, n261 uses LTE B2, B5, B13, B66 and B48, n260 uses LTE B2, B5, B12 and B66.

11) 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

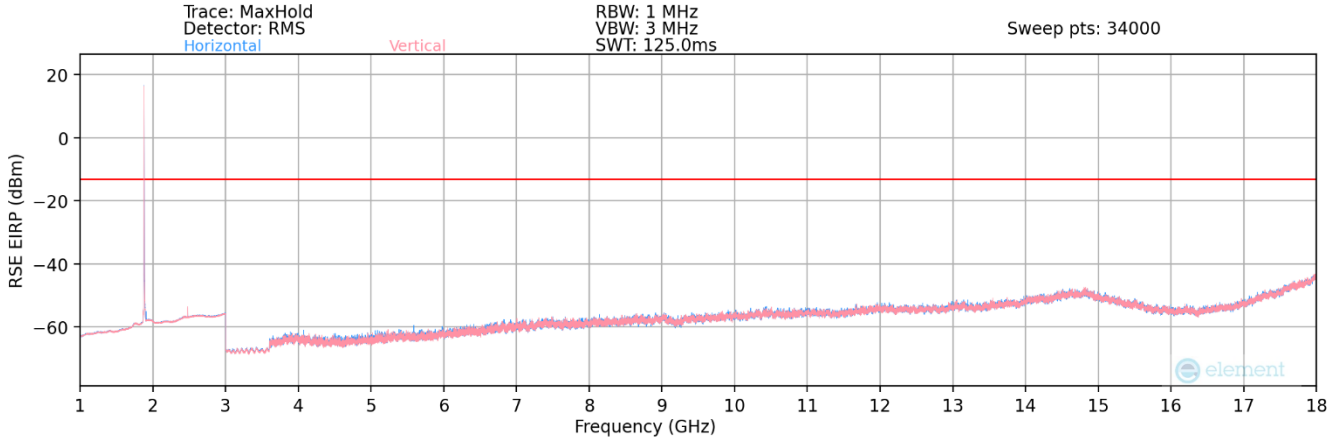
30MHz - 1GHz



Plot 7-49. Ant#0 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC Anchor Band 2)

Note: A RSE table for compliance in the 30MHz - 1GHz ranges is not included since the pre-scan shows all emissions are well below the limit.

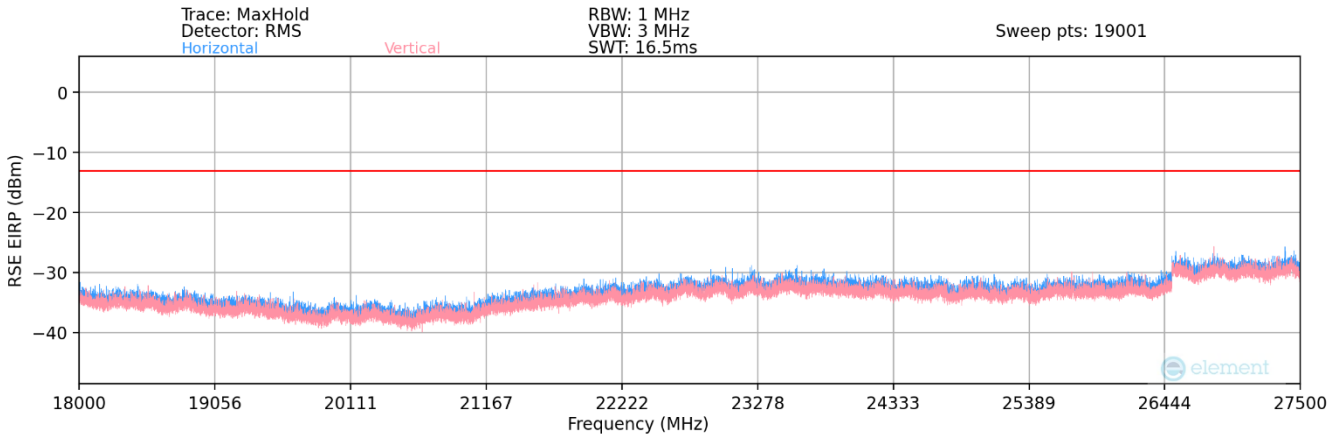
1GHz - 18GHz



Plot 7-50. Ant#0 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC Anchor Band 2)

Note: A RSE table for compliance in the 1GHz - 18GHz ranges is not included since the pre-scan shows all emissions are well below the limit.

18GHz - 27.5GHz



Plot 7-51. Ant#0 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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 1 meter.

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

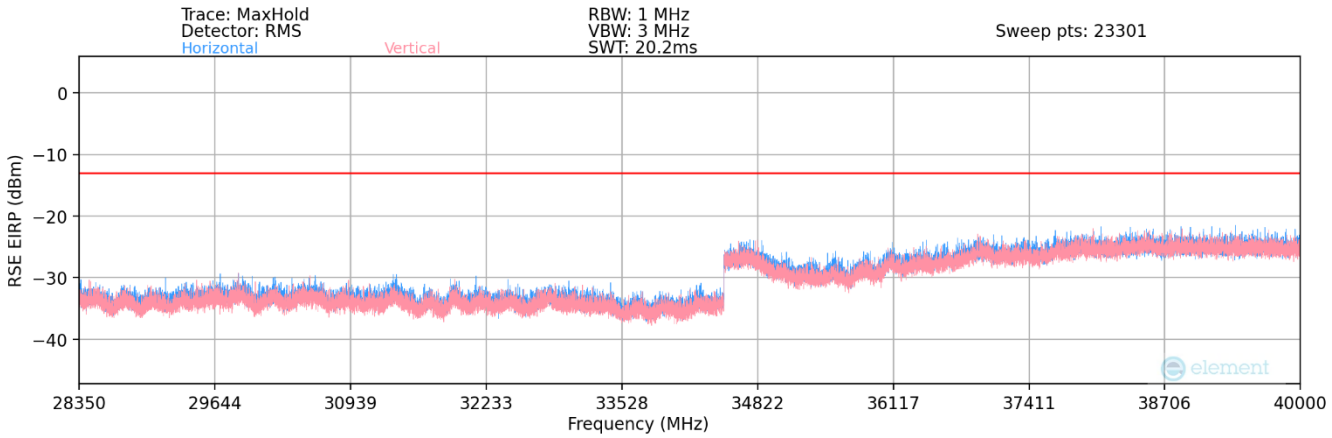
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
26959.33	Low	50	2Tx	QPSK	H	88	188	-28.16	-13.00	-15.16
27359.30	Mid	50	2Tx	QPSK	H	87	188	-28.29	-13.00	-15.29
27324.04	High	50	2Tx	QPSK	H	85	193	-31.89	-13.00	-18.89

Table 7-17. Ant#0 - n261 Radiated Spurious Emissions Table (18GHz - 27.5GHz)

Notes

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

28.35GHz - 40GHz



Plot 7-52. Ant#0 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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 1 meter.

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

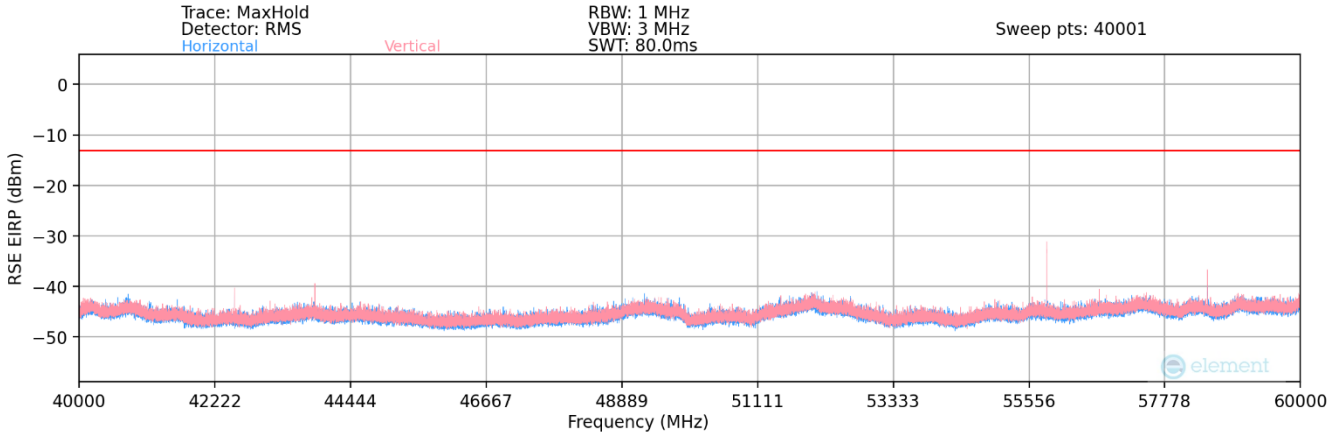
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
28520.93	Low	50	2Tx	QPSK	H	87	185	-34.68	-13.00	-21.68
28485.51	Mid	50	2Tx	QPSK	H	90	179	-30.33	-13.00	-17.33
28834.60	High	50	2Tx	QPSK	H	92	165	-28.86	-13.00	-15.86

Table 7-18. Ant#0 - n261 Radiated Spurious Emissions Table (28.35GHz - 40GHz)

Notes

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

40GHz - 60GHz



Plot 7-53. Ant#0 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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 1.5 meter.

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

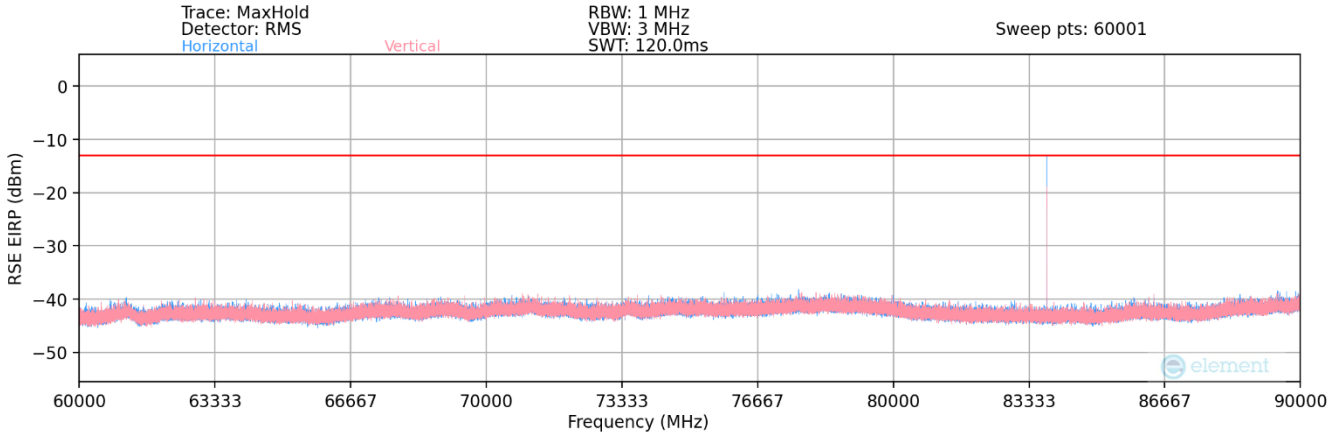
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
55045.42	Low	50	2Tx	QPSK	V	273	43	-29.65	-13.00	-16.65
55845.13	Mid	50	2Tx	QPSK	V	273	45	-29.65	-13.00	-16.65
56645.02	High	50	2Tx	QPSK	V	270	65	-29.45	-13.00	-16.45

Table 7-19. Ant#0 - n261 Radiated Spurious Emissions Table (40GHz - 60GHz)

Notes

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

60GHz - 90GHz



Plot 7-54. Ant#0 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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 1 meter.

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

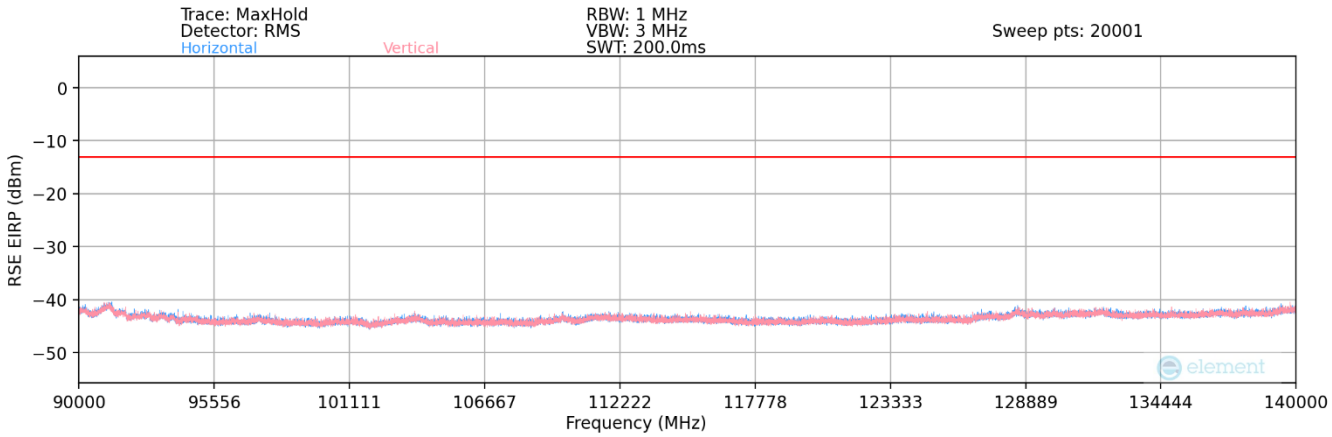
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
82568.05	Low	50	2Tx	QPSK	H	317	355	-15.53	-13.00	-2.53
83767.90	Mid	50	2Tx	QPSK	H	315	358	-15.00	-13.00	-2.00
84967.57	High	50	2Tx	QPSK	H	316	353	-15.37	-13.00	-2.37

Table 7-20. Ant#0 - n261 Radiated 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

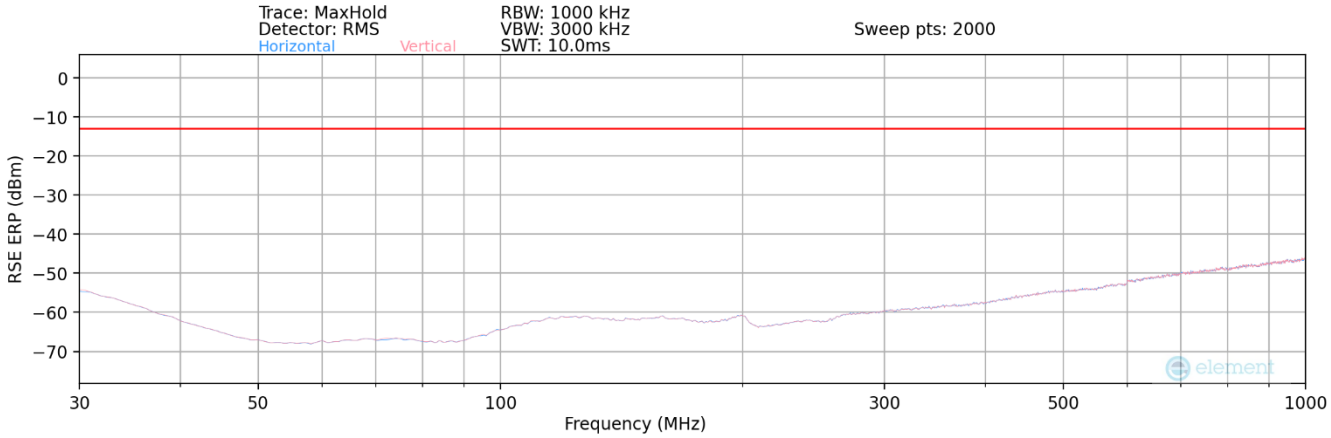


Plot 7-55. Ant#0 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC Anchor Band 2)

Note: A RSE table for compliance in the 90GHz - 100GHz ranges is not included since the pre-scan shows all emissions are well below the limit.

Band n261 – Ant 2

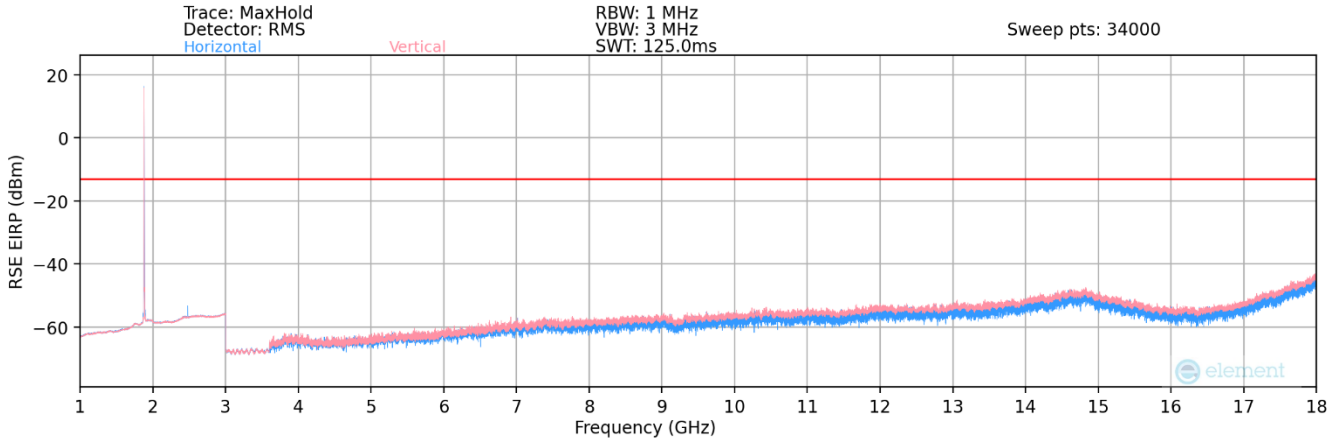
30MHz - 1GHz



Plot 7-56. Ant#1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC Anchor Band 2)

Note: A RSE table for compliance in the 30MHz - 1GHz ranges is not included since the pre-scan shows all emissions are well below the limit.

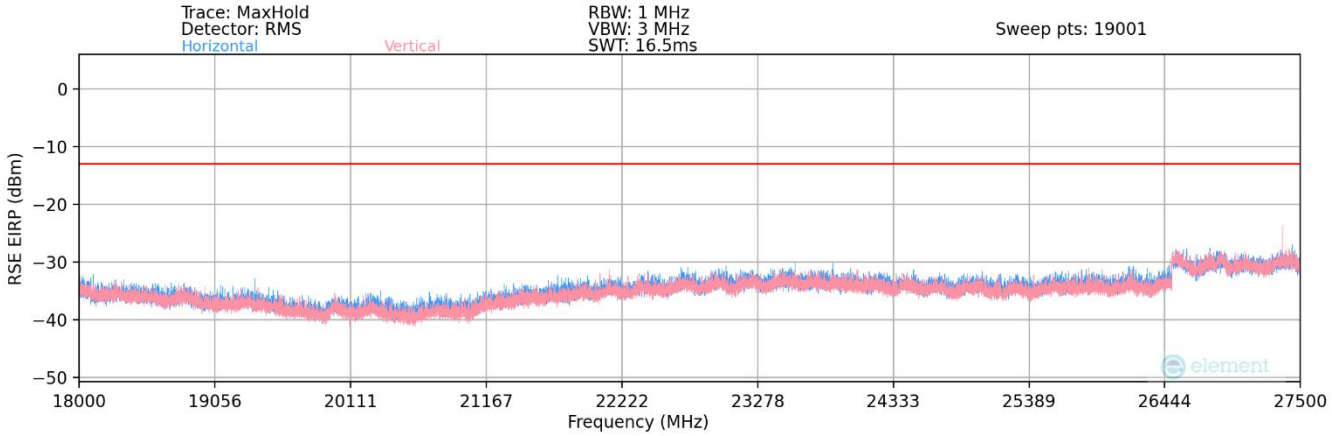
1GHz - 18GHz



Plot 7-57. Ant#1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC Anchor Band 2)

Note: A RSE table for compliance in the 1GHz - 18GHz ranges is not included since the pre-scan shows all emissions are well below the limit.

18GHz - 27.5GHz



Plot 7-58. Ant#1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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 1 meter.

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

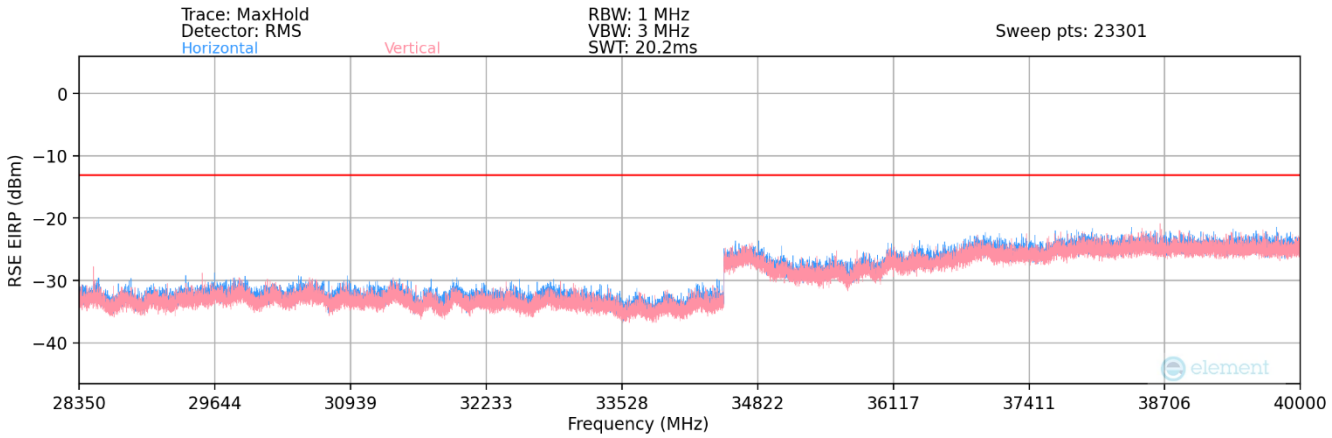
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
26959.33	Low	50	2Tx	QPSK	V	270	85	-24.34	-13.00	-11.34
27359.30	Mid	50	2Tx	QPSK	V	273	87	-26.75	-13.00	-13.75
27324.04	High	50	2Tx	QPSK	V	255	84	-33.46	-13.00	-20.46

Table 7-21. Ant#1 - n261 Radiated Spurious Emissions Table (18GHz - 27.5GHz)

Notes

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

28.35GHz - 40GHz



Plot 7-59. Ant#1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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 1 meter.

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

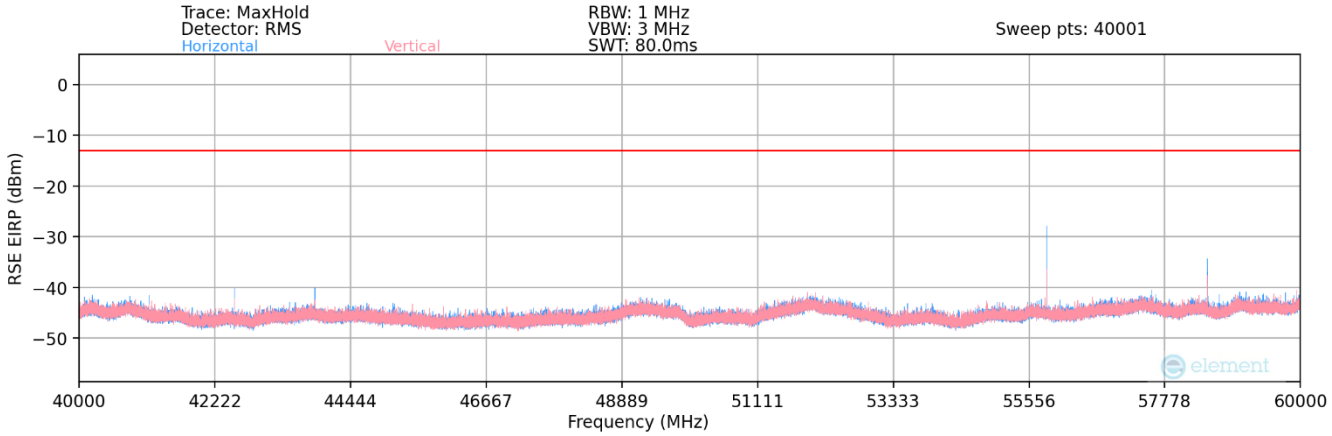
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
28520.93	Low	50	2Tx	QPSK	V	263	90	-33.84	-13.00	-20.84
28485.51	Mid	50	2Tx	QPSK	V	271	90	-26.84	-13.00	-13.84
28834.60	High	50	2Tx	QPSK	V	250	88	-26.58	-13.00	-13.58

Table 7-22. Ant#1 - n261 Radiated Spurious Emissions Table (28.35GHz - 40GHz)

Notes

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

40GHz - 60GHz



Plot 7-60. Ant#1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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 1.5 meter.

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

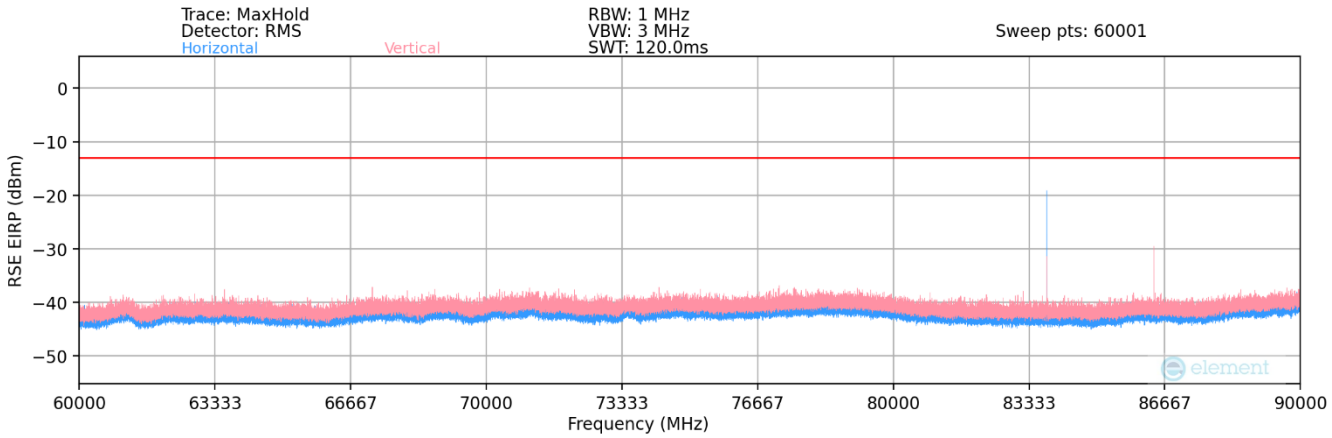
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
55044.94	Low	50	2Tx	QPSK	H	80	257	-31.95	-13.00	-18.95
55845.07	Mid	50	2Tx	QPSK	H	39	257	-28.92	-13.00	-15.92
56645.05	High	50	2Tx	QPSK	H	95	248	-32.20	-13.00	-19.20

Table 7-23. Ant#1 - n261 Radiated Spurious Emissions Table (40GHz - 60GHz)

Notes

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

60GHz - 90GHz



Plot 7-61. Ant#1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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 1 meter.

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

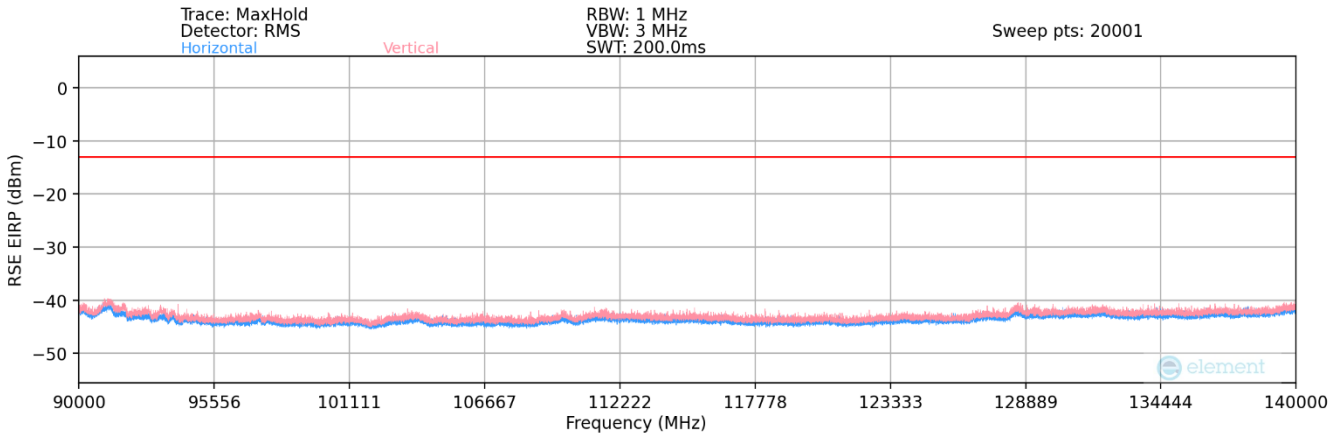
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
82567.24	Low	50	2Tx	QPSK	H	38	279	-17.93	-13.00	-4.93
83767.43	Mid	50	2Tx	QPSK	H	93	214	-18.70	-13.00	-5.70
84967.12	High	50	2Tx	QPSK	H	34	266	-22.16	-13.00	-9.16

Table 7-24. Ant#1 - n261 Radiated 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

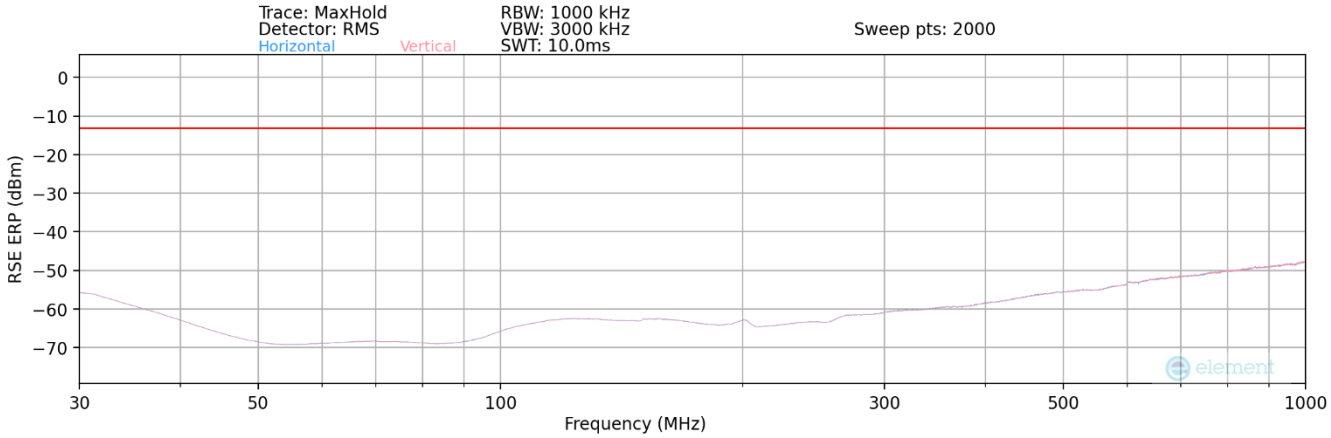


Plot 7-62. Ant#1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC Anchor Band 2)

Note: A RSE table for compliance in the 90GHz - 100GHz ranges is not included since the pre-scan shows all emissions are well below the limit.

Band n260 – Ant 1

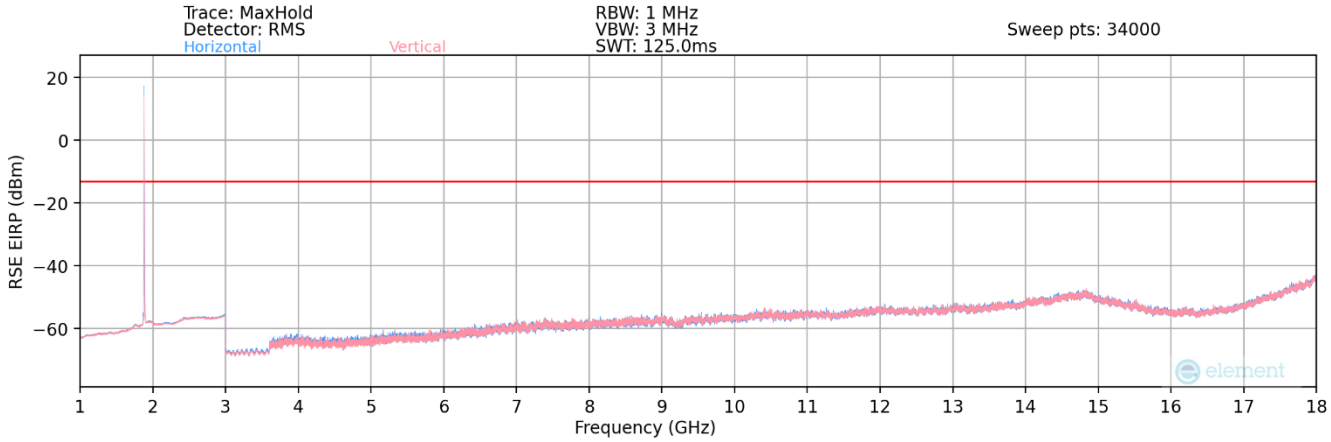
30MHz - 1GHz



Plot 7-63. Ant#0 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC Anchor Band 2)

Note: A RSE table for compliance in the 30GHz - 1GHz ranges is not included since the pre-scan shows all emissions are well below the limit.

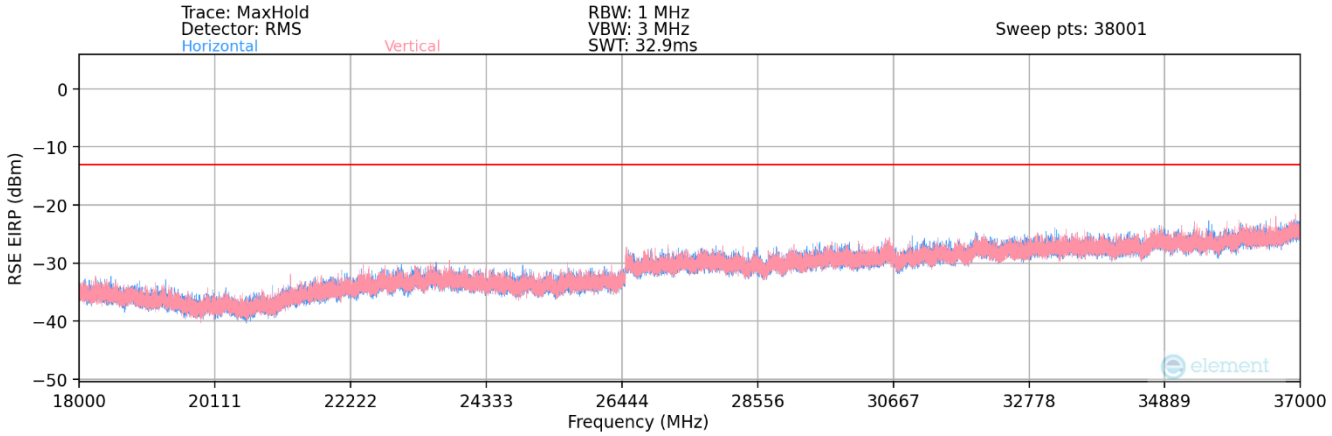
1GHz - 18GHz



Plot 7-64. Ant#0 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC Anchor Band 2)

Note: A RSE table for compliance in the 1GHz - 18GHz ranges is not included since the pre-scan shows all emissions are well below the limit.

18GHz - 37GHz



Plot 7-65. Ant#0 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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

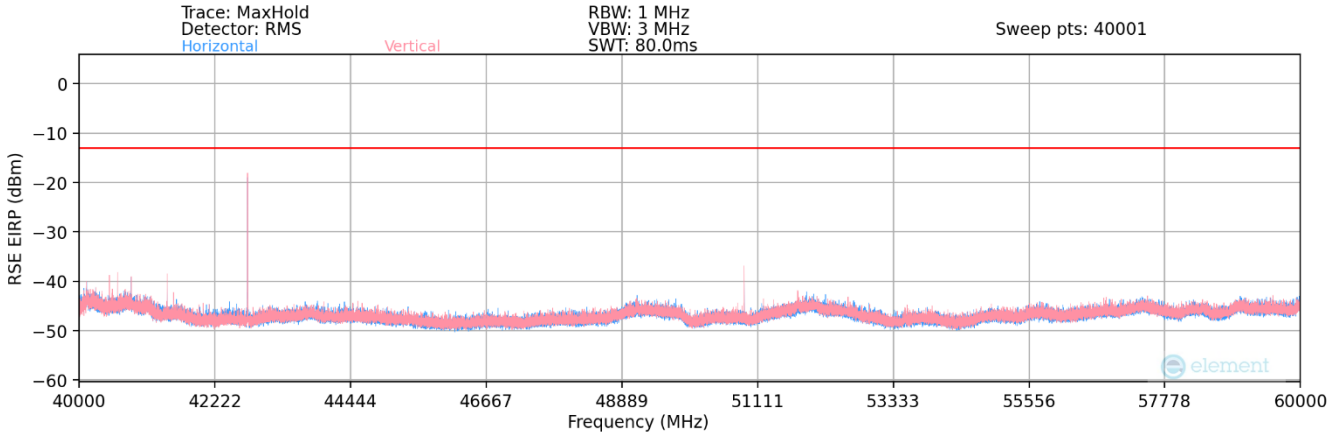
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
23510.58	Low	50	2Tx	QPSK	H	-	-	-39.57	-13.00	-26.57
28615.73	Mid	50	2Tx	QPSK	H	-	-	-37.24	-13.00	-24.24
31931.15	High	50	2Tx	QPSK	H	-	-	-33.67	-13.00	-20.67

Table 7-25. Ant#0 - n260 Radiated Spurious Emissions Table (18GHz - 37GHz)

Notes

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

40GHz - 60GHz



Plot 7-66. Ant#0 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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]

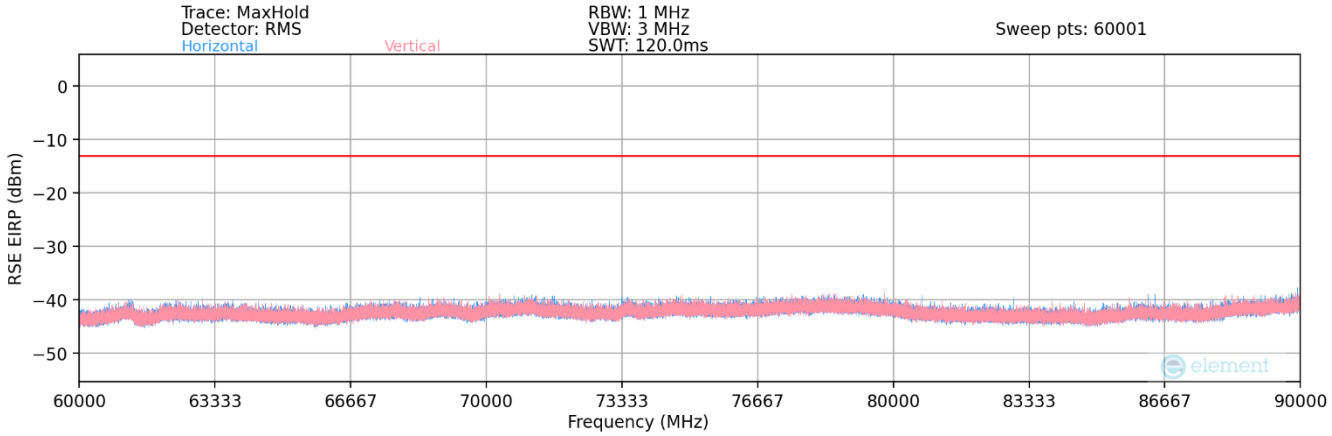
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
40391.49	Low	50	2Tx	QPSK	H	174	100	-22.72	-13.00	-9.72
42756.27	Mid	50	2Tx	QPSK	H	84	270	-22.35	-13.00	-9.35
44814.27	High	50	2Tx	QPSK	H	96	166	-25.46	-13.00	-12.46

Table 7-26. Ant#0 - n260 Radiated Spurious Emissions Table (40GHz - 60GHz)

Notes

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

60GHz - 90GHz



Plot 7-67. Ant#0 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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]

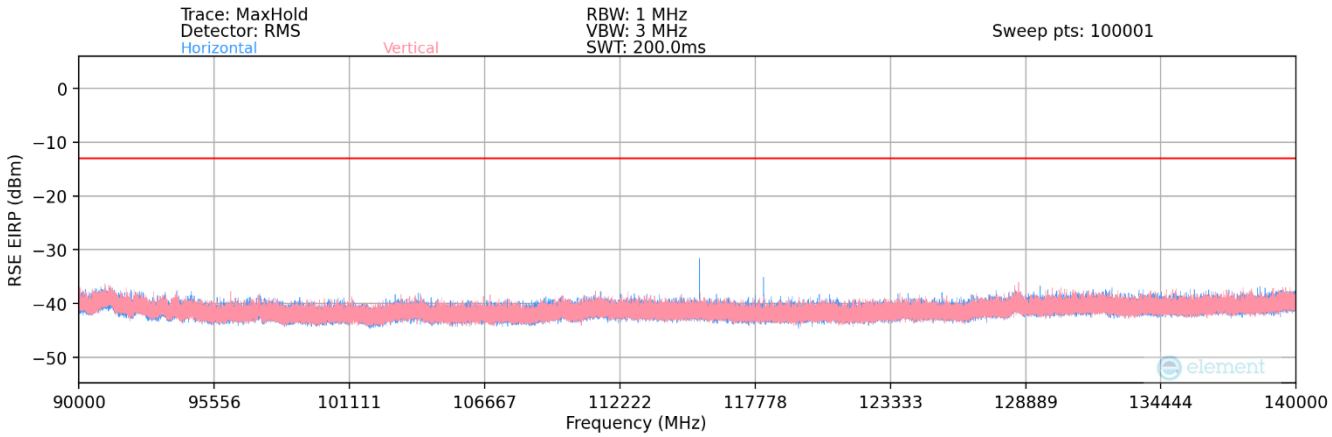
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
74045.34	Low	50	2Tx	QPSK	H	205	359	-44.85	-13.00	-31.85
76995.00	Mid	50	2Tx	QPSK	H	220	4	-40.44	-13.00	-27.44
79944.91	High	50	2Tx	QPSK	H	218	358	-39.91	-13.00	-26.91

Table 7-27. Ant#0 - n260 Radiated 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 7-68. Ant#0 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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]

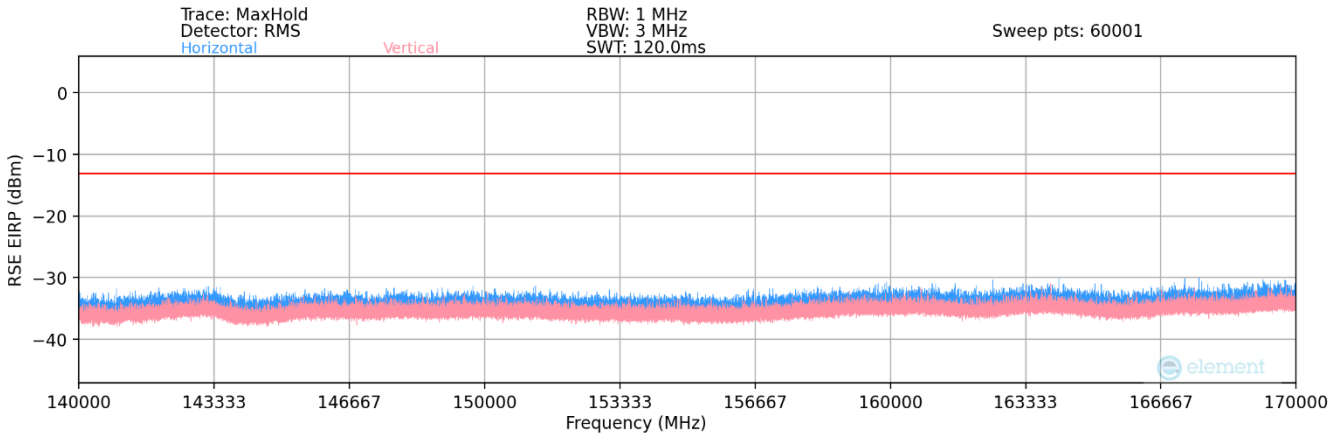
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
111067.39	Low	50	2Tx	QPSK	V	120	217	-33.23	-13.00	-20.23
115492.14	Mid	50	2Tx	QPSK	V	147	330	-32.95	-13.00	-19.95
119917.39	High	50	2Tx	QPSK	V	144	223	-43.53	-13.00	-30.53

Table 7-28. Ant#0 - n260 Radiated 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 7-69. Ant#0 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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]

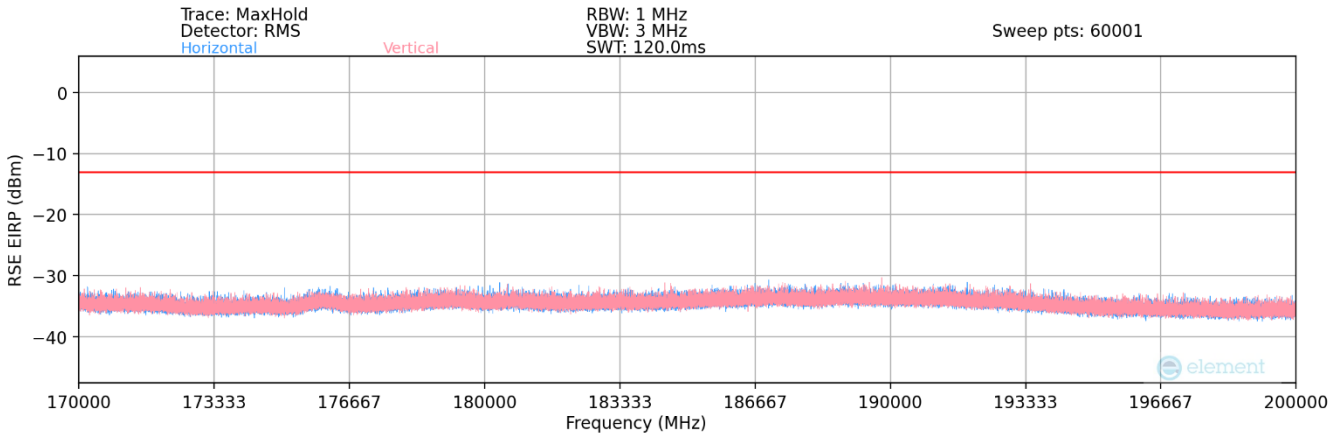
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
148088.89	Low	50	2Tx	QPSK	H	-	-	-40.06	-13.00	-27.06
153988.41	Mid	50	2Tx	QPSK	H	-	-	-40.45	-13.00	-27.45
159888.31	High	50	2Tx	QPSK	H	-	-	-39.58	-13.00	-26.58

Table 7-29. Ant#0 - n260 Radiated 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 7-70. Ant#0 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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]
185115.36	Low	50	2Tx	QPSK	H	-	-	-38.66	-13.00	-25.66
192490.21	Mid	50	2Tx	QPSK	H	-	-	-38.94	-13.00	-25.94
199863.56	High	50	2Tx	QPSK	H	-	-	-40.40	-13.00	-27.40

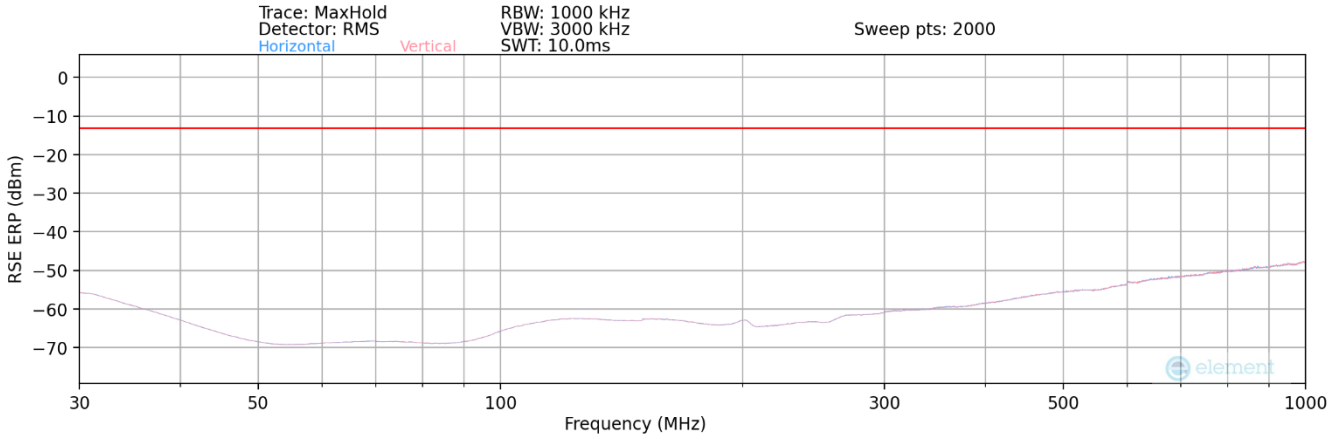
Table 7-30. Ant#0 - n260 Radiated Spurious Emissions Table (170GHz - 200GHz)

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

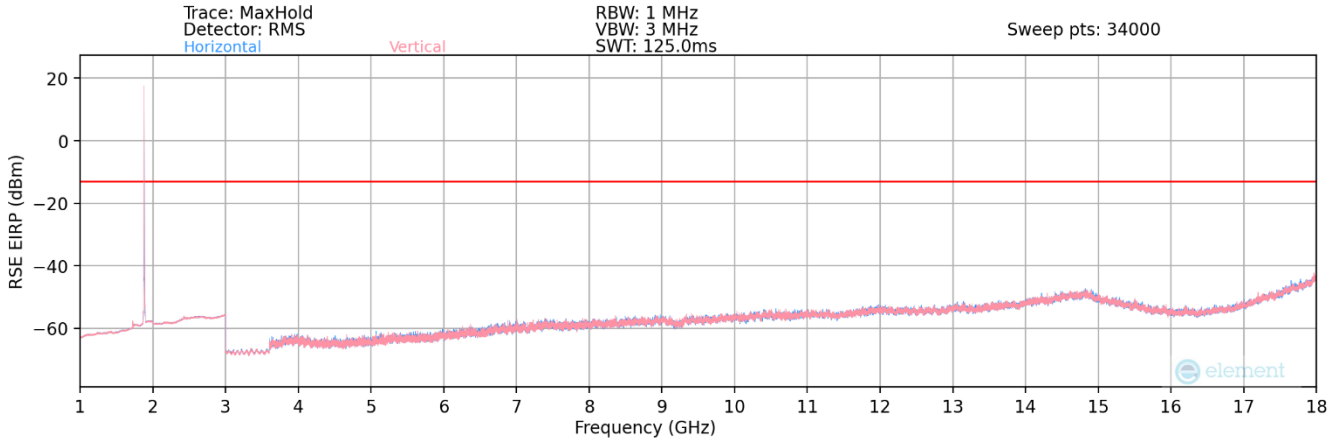
30MHz - 1GHz



Plot 7-71. Ant#1 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC Anchor Band 2)

Note: A RSE table for compliance in the 30MHz - 1GHz ranges is not included since the pre-scan shows all emissions are well below the limit.

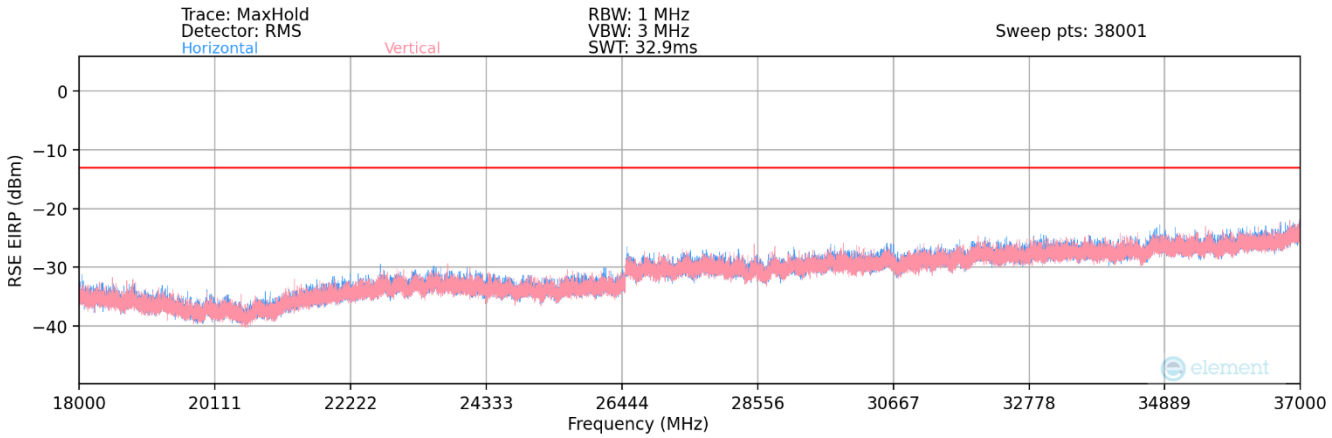
1GHz - 18GHz



Plot 7-72. Ant#1 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC Anchor Band 2)

Note: A RSE table for compliance in the 1GHz - 18GHz ranges is not included since the pre-scan shows all emissions are well below the limit.

18GHz - 37GHz



Plot 7-73. Ant#1 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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

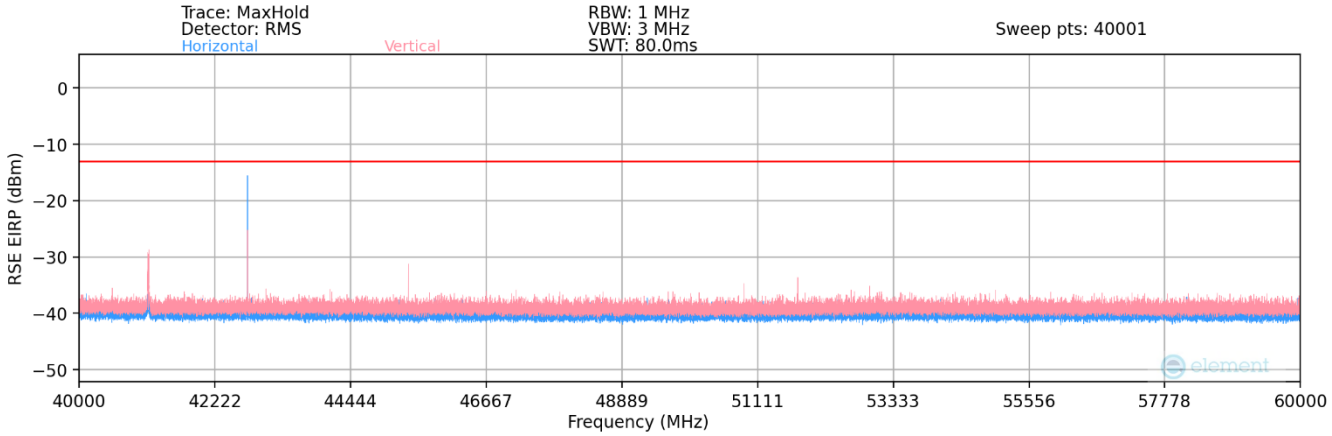
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
22762.15	Low	50	2Tx	QPSK	H	-	-	-39.29	-13.00	-26.29
28531.29	Mid	50	2Tx	QPSK	H	-	-	-36.23	-13.00	-23.23
34774.00	High	50	2Tx	QPSK	H	-	-	-32.49	-13.00	-19.49

Table 7-31. Ant#1 - n260 Radiated Spurious Emissions Table (18GHz - 37GHz)

Notes

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

40GHz - 60GHz



Plot 7-74. Ant#1 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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]

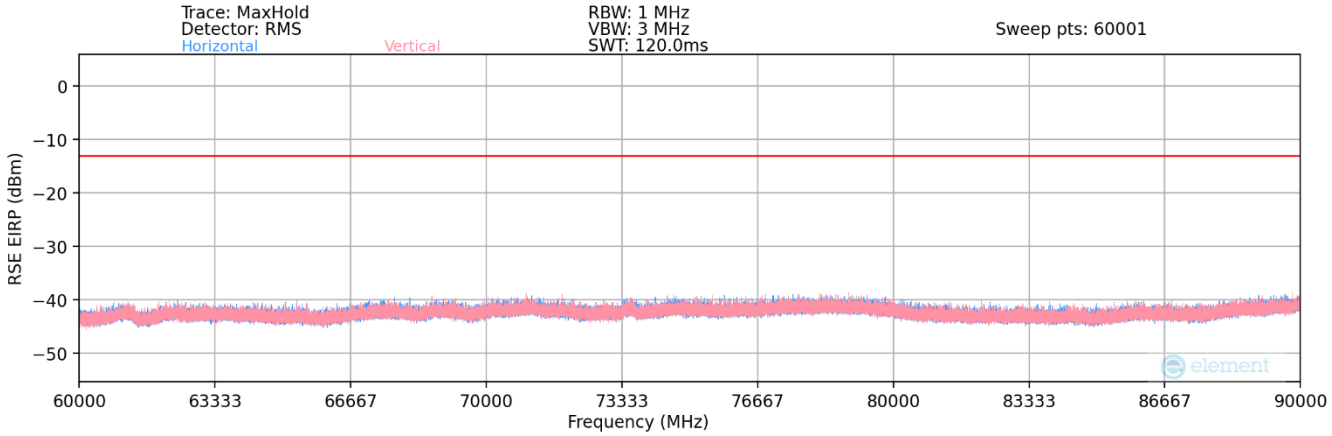
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
40395.95	Low	50	2Tx	QPSK	H	288	83	-19.73	-13.00	-6.73
42756.51	Mid	50	2Tx	QPSK	H	273	75	-19.07	-13.00	-6.07
44814.27	High	50	2Tx	QPSK	H	286	51	-19.77	-13.00	-6.77

Table 7-32. Ant#1 - n260 Radiated Spurious Emissions Table (40GHz - 60GHz)

Notes

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

60GHz - 90GHz



Plot 7-75. Ant#1 - n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx − EN-DC 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]
74044.60	Low	50	2Tx	QPSK	V	77	335	-42.68	-13.00	-29.68
76994.43	Mid	50	2Tx	QPSK	V	75	317	-40.75	-13.00	-27.75
79944.88	High	50	2Tx	QPSK	V	77	319	-39.73	-13.00	-26.73

Table 7-33. Ant#1 - n260 Radiated 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.