PCTEST
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
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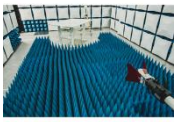


MEASUREMENT REPORT
FCC Part 30 5G mmWave

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

Date of Testing:
01/15/2021-02/24/2021
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M2101040001-06-R1.A3L

FCC ID:	**A3LSMA426U**
APPLICANT:	**Samsung Electronics Co., Ltd.**

Application Type:	Certification
Model:	SM-A426U
Additional Model(s):	SM-A426U1/DS, SM-S426DL, SM-A426U1
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

Note: This revised Test Report (S/N: 1M2101040001-06-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

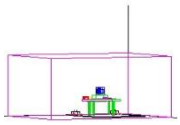
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

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.

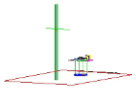
Randy Ortanez
President

ACCREDITED
CERT #2041.01

TABLE OF CONTENTS



MEASUREMENT REPORT
FCC Part 30



Band	Antenna	Bandwidth [MHz]	Tx Frequency [MHz]	CCs Active	Mode	Modulation	EIRP		Emission Designator
							Max Power [W]	Max Power [dBm]	
n261	Ant1	50	27525 - 28325	1	SISO	QPSK	0.487	26.88	45M6G7D
					2Tx	QPSK	0.980	29.91	45M6G7D
					2Tx	π/2 BPSK	0.983	**29.92**	45M5G7D
					2Tx	16QAM	0.662	28.21	45M3W7D
					2Tx	64QAM	0.406	26.08	45M2W7D
				2	2Tx	QPSK	0.505	27.03	94M9G7D
					2Tx	π/2 BPSK	0.503	27.01	94M8G7D
					2Tx	16QAM	0.361	25.58	94M8W7D
					2Tx	64QAM	0.222	23.46	94M6W7D
		100	27550 - 28300	1	SISO	QPSK	0.505	27.03	93M4G7D
					2Tx	QPSK	0.983	29.93	93M4G7D
					2Tx	π/2 BPSK	0.990	**29.96**	90M2G7D
					2Tx	16QAM	0.649	28.13	92M7W7D
					2Tx	64QAM	0.400	26.02	92M8W7D
				2	2Tx	QPSK	0.509	27.06	191MG7D
					2Tx	π/2 BPSK	0.510	27.07	191MG7D
					2Tx	16QAM	0.356	25.51	191MW7D
					2Tx	64QAM	0.222	23.46	192MW7D
n261	Ant2	50	27525 - 28325	1	SISO	QPSK	0.664	28.22	-
					2Tx	QPSK	1.077	30.32	-
					2Tx	π/2 BPSK	1.118	**30.49**	-
					2Tx	16QAM	0.729	28.62	-
					2Tx	64QAM	0.459	26.62	-
				2	2Tx	QPSK	0.508	27.06	-
					2Tx	π/2 BPSK	0.505	27.03	-
					2Tx	16QAM	0.356	25.52	-
					2Tx	64QAM	0.222	23.47	-
		100	27550 - 28300	1	SISO	QPSK	0.682	28.34	-
					2Tx	QPSK	1.057	30.24	-
					2Tx	π/2 BPSK	1.114	**30.47**	-
					2Tx	16QAM	0.733	28.65	-
					2Tx	64QAM	0.437	26.41	-
				2	2Tx	QPSK	0.530	27.24	-
					2Tx	π/2 BPSK	0.532	27.26	-
					2Tx	16QAM	0.378	25.77	-
					2Tx	64QAM	0.228	23.58	-

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	Ant1	50	37025 - 39975	1	SISO	QPSK	0.336	25.27	45M6G7D
					2Tx	QPSK	0.539	27.31	45M6G7D
					2Tx	π/2 BPSK	0.542	**27.34**	45M5G7D
					2Tx	16QAM	0.343	25.35	45M3W7D
					2Tx	64QAM	0.207	23.17	45M3W7D
				2	2Tx	QPSK	0.281	24.48	95M1G7D
					2Tx	π/2 BPSK	0.281	24.48	94M9G7D
					2Tx	16QAM	0.200	23.01	95M0W7D
					2Tx	64QAM	0.112	20.49	95M1W7D
		100	37050 - 39950	1	SISO	QPSK	0.329	25.17	93M4G7D
					2Tx	QPSK	0.552	**27.42**	93M4G7D
					2Tx	π/2 BPSK	0.501	27.00	90M8G7D
					2Tx	16QAM	0.291	24.64	93M4W7D
					2Tx	64QAM	0.196	22.93	93M2W7D
				2	2Tx	QPSK	0.262	24.19	191MG7D
					2Tx	π/2 BPSK	0.261	24.16	191MG7D
					2Tx	16QAM	0.184	22.65	191MW7D
					2Tx	64QAM	0.111	20.44	192MW7D
n260	Ant2	50	37025 - 39975	1	SISO	QPSK	0.621	27.93	-
					2Tx	QPSK	0.991	**29.96**	-
					2Tx	π/2 BPSK	0.954	29.80	-
					2Tx	16QAM	0.633	28.01	-
					2Tx	64QAM	0.379	25.79	-
				2	2Tx	QPSK	0.494	26.94	-
					2Tx	π/2 BPSK	0.496	26.96	-
					2Tx	16QAM	0.344	25.37	-
					2Tx	64QAM	0.188	22.74	-
		100	37050 - 39950	1	SISO	QPSK	0.627	27.97	-
					2Tx	QPSK	0.979	**29.91**	-
					2Tx	π/2 BPSK	0.972	29.88	-
					2Tx	16QAM	0.618	27.91	-
					2Tx	64QAM	0.392	25.93	-
				2	2Tx	QPSK	0.499	26.98	-
					2Tx	π/2 BPSK	0.505	27.03	-
					2Tx	16QAM	0.356	25.51	-
					2Tx	64QAM	0.187	22.72	-

EUT Overview (Band n260)

Note: Due to similar antenna performance from both patch antennas, 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 and the Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

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

1.3 Test Facility / Accreditations

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

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

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

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

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMA426U**. The test data contained in this report pertains only to the emissions due to the EUT's 5G mmWave function.

The EUT contains two antennas, referred to herein as Ant1 (L Patch) and Ant2 (R Patch). 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 4CC for DL, and 2CC for UL. For each CC, the EUT supports both 50MHz bandwidth and 100MHz bandwidth. The EUT supports a subcarrier spacing (SCS) of 120kHz with two transmission schemes, CP-OFDM and DFT-s-OFDM, with pi/2-BPSK, QPSK, 16-QAM, and 64-QAM modulations. Different Beam IDs are supported, each corresponding to a different position in space for each antenna. During testing, FTM (Factory Test Mode) was used to operate the transmitter. MIMO operation was achieved by enabling two Beam IDs at the same time: one is from the list of H Beam IDs and other is from the list of V Beam IDs.

Test Device Serial No.: 0112H, 0010H

2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (n5, n71, n41, n66, n2, n25, n77, n260, n261), 802.11b/g/n WLAN, 802.11a/n/ac UNII (5GHz), Bluetooth (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 2Tx (DFT-s-OFDM) and MIMO (CP-OFDM) operation. These Beam ID's were used for final measurements.

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. The FTM software was also used for the EUT operation in the EN-DC 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.

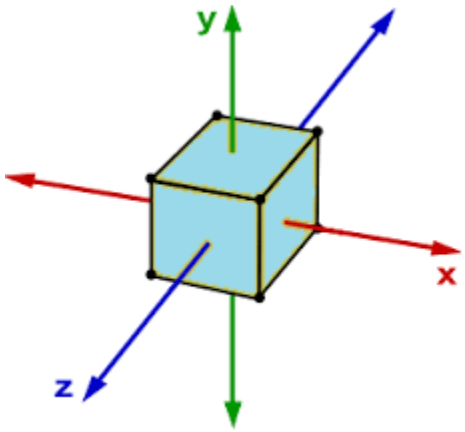


Figure 3-1. Rotation of the EUT Through Three Orthogonal Planes

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
Agilent	N9030A	PXA Signal Analyzer (44GHz)	8/17/2020	Annual	8/17/2021	MY52350166
ETS-Lindgren	3116C	DRG Horn Antenna	3/11/2019	Biennial	3/11/2021	218893
OML Inc.	M19RH	WR-19 Horn Antenna, 24dBi, 40 - 60GHz	12/30/2018	Biennial	2/30/2021	18073001
OML Inc.	M12RH	WR-12 Horn Antenna, 24dBi, 60 - 90GHz	12/30/2018	Biennial	2/30/2021	18073001
OML Inc.	M08RH	WR-08 Horn Antenna, 24dBi, 90 - 140GHz	12/30/2018	Biennial	2/30/2021	18073001
OML Inc.	M05RH	WR-05 Horn Antenna, 24dBi, 140 - 220GHz	12/30/2018	Biennial	2/30/2021	18073001
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	7/15/2020	Annual	7/15/2021	100342
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/10/2020	Annual	8/10/2021	103200
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107
Virginia Diodes Inc	SAX679	SAX Module (40 - 60GHz)	8/28/2020	Annual	8/28/2021	SAX679
Virginia Diodes Inc	SAX680	SAX Module (60 - 90GHz)	8/14/2020	Annual	8/14/2021	SAX680
Virginia Diodes Inc	SAX681	SAX Module (90 - 140GHz)	10/22/2020	Annual	10/22/2021	SAX681
Virginia Diodes Inc	SAX682	SAX Module (140 - 220GHz)	9/24/2020	Annual	9/24/2021	SAX682

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: Samsung Electronics Co., Ltd.

FCC ID: A3LSMA426U

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) Beam IDs were chosed 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

§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

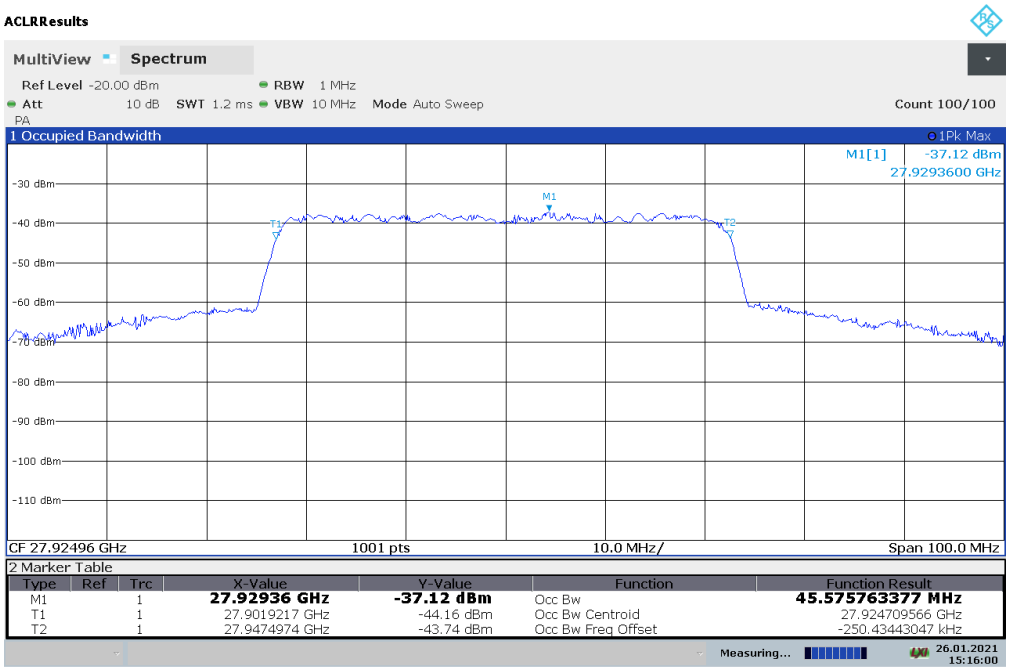
Test Notes

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	Transmission Scheme	Modulation	OBW [MHz]
Mid	50	1	CP-OFDM	QPSK	45.58
			DFT-s-OFDM	pi/2-BPSK	45.46
			CP-OFDM	16QAM	45.30
			CP-OFDM	64QAM	45.22
		2	CP-OFDM	QPSK	94.93
			DFT-s-OFDM	pi/2-BPSK	94.77
			CP-OFDM	16QAM	94.79
			CP-OFDM	64QAM	94.62
	100	1	CP-OFDM	QPSK	93.36
			DFT-s-OFDM	pi/2-BPSK	90.20
			CP-OFDM	16QAM	92.70
			CP-OFDM	64QAM	92.80
		2	CP-OFDM	QPSK	191.24
			DFT-s-OFDM	pi/2-BPSK	190.96
			CP-OFDM	16QAM	190.99
			CP-OFDM	64QAM	191.56

Table 7-2. Summary of Ant 1 Occupied Bandwidths (n261 L Patch)



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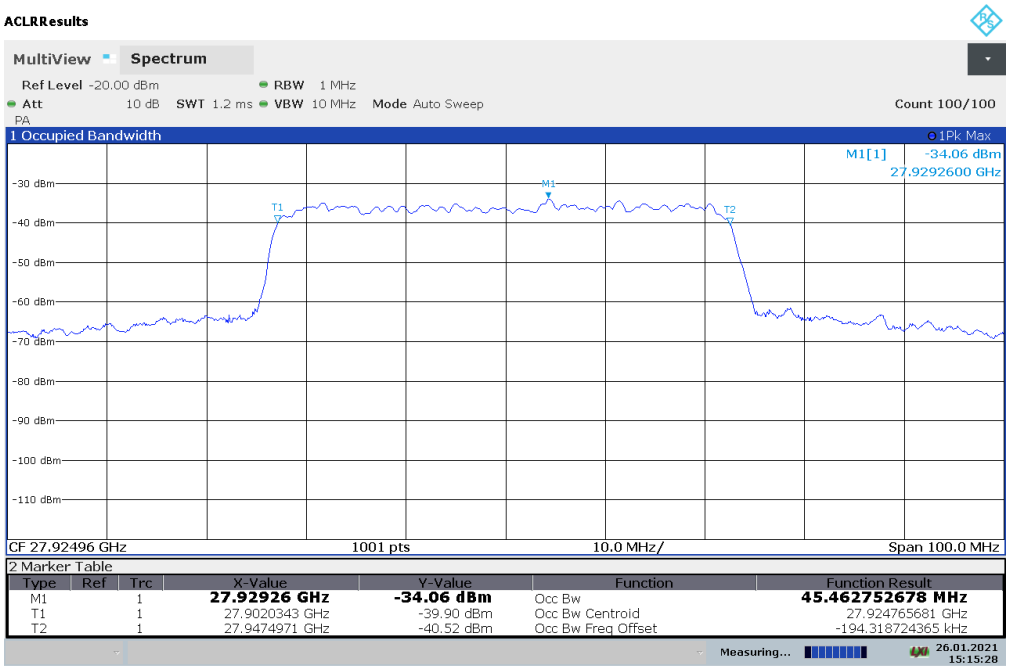
Plot 7-1. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



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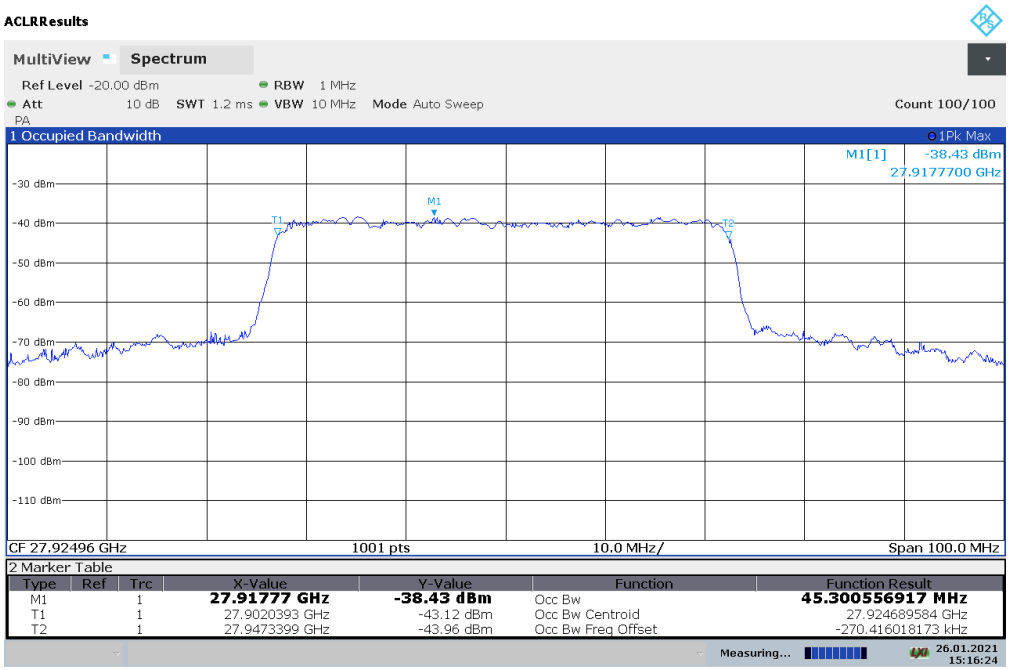
Plot 7-2. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – pi/2-BPSK – Mid Channel)



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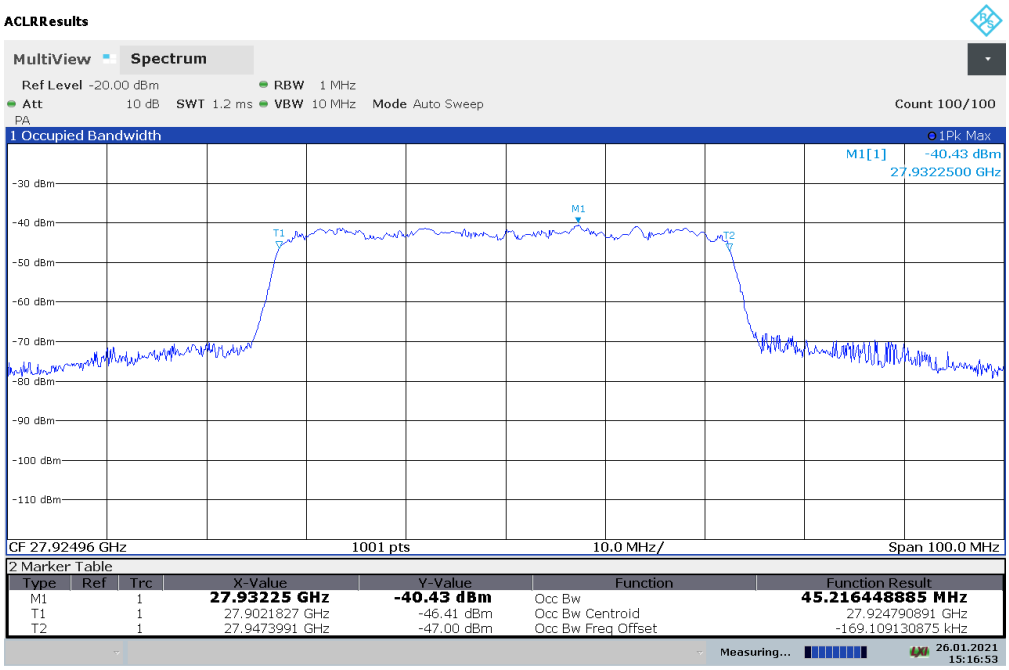
Plot 7-3. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



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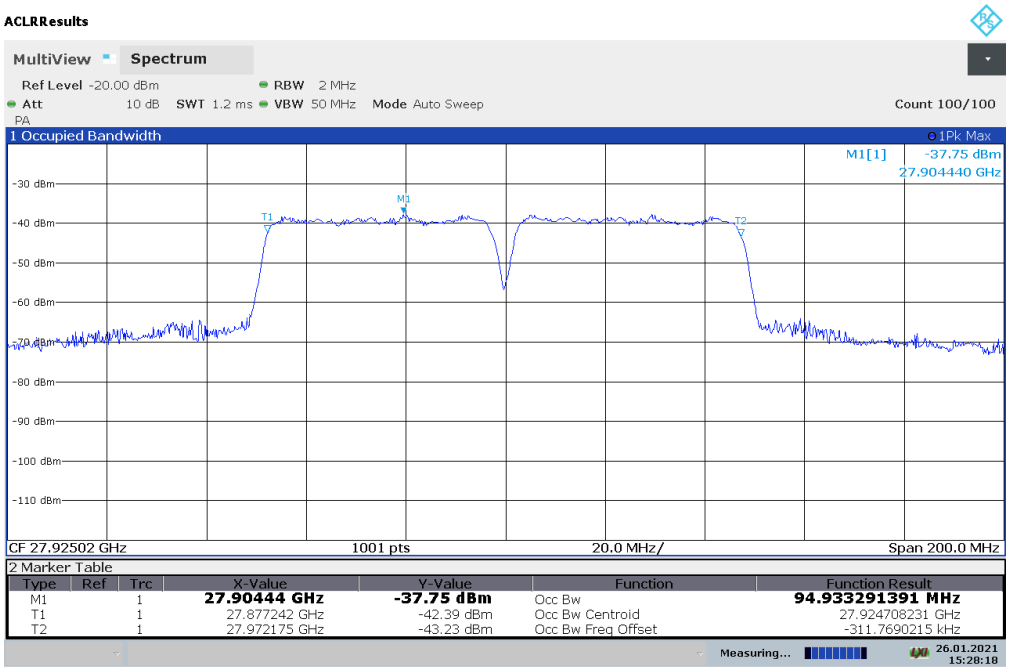
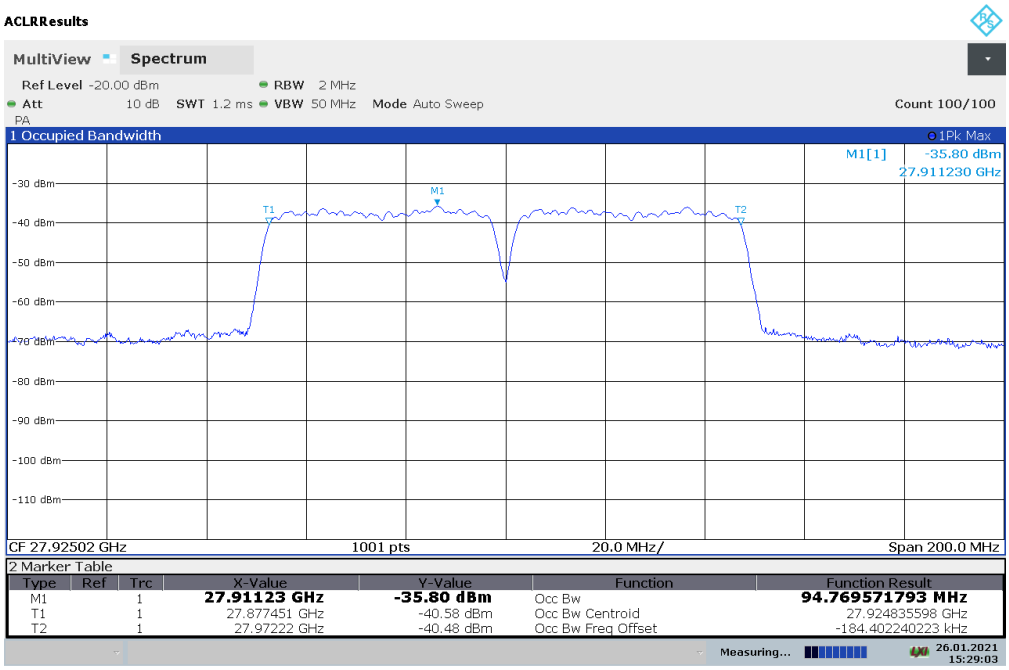
Plot 7-4. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



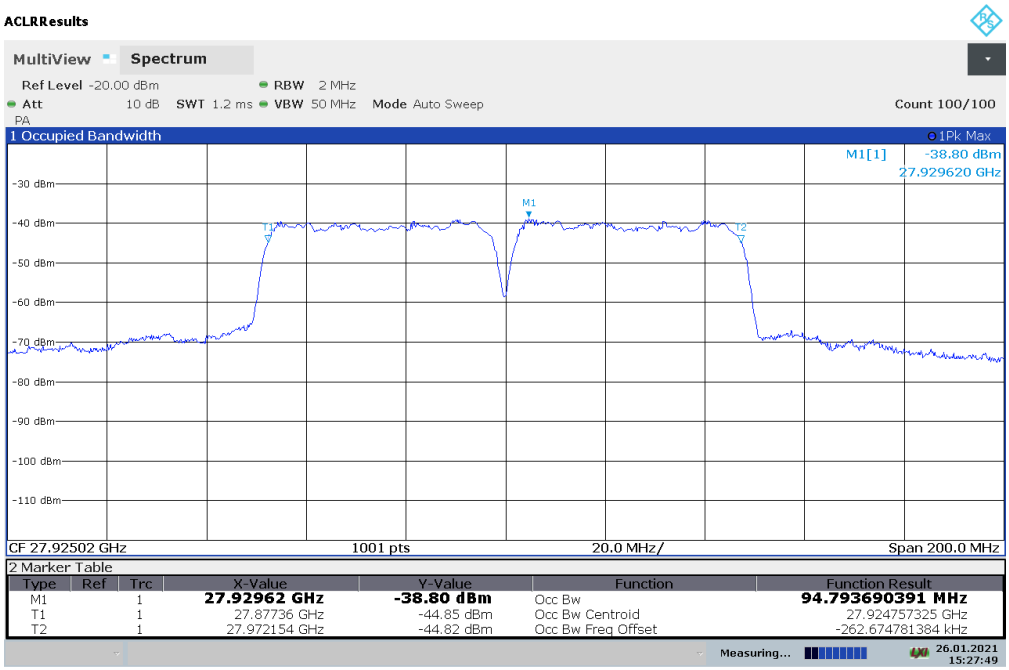
15:28:19 26.01.2021

Plot 7-5. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



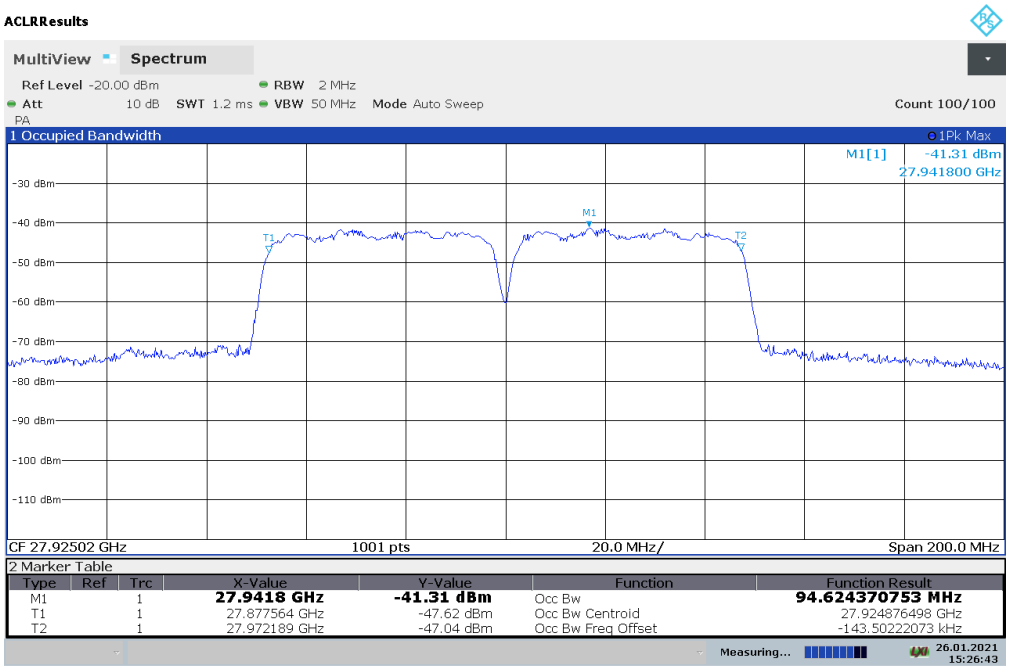
15:29:04 26.01.2021

Plot 7-6. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – pi/2-BPSK – Mid Channel)



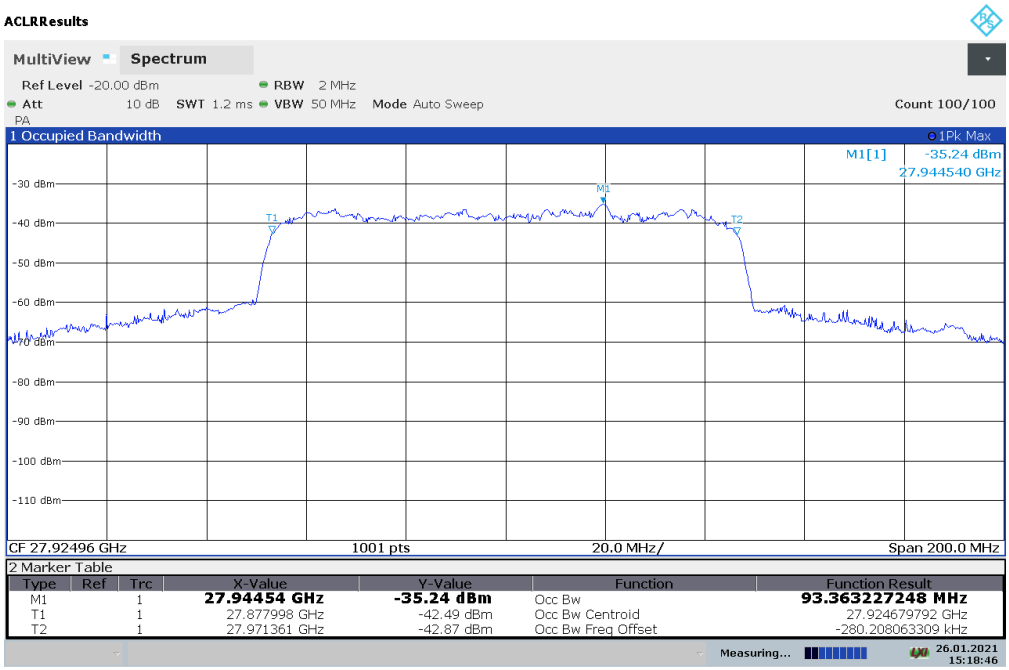
15:27:50 26.01.2021

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



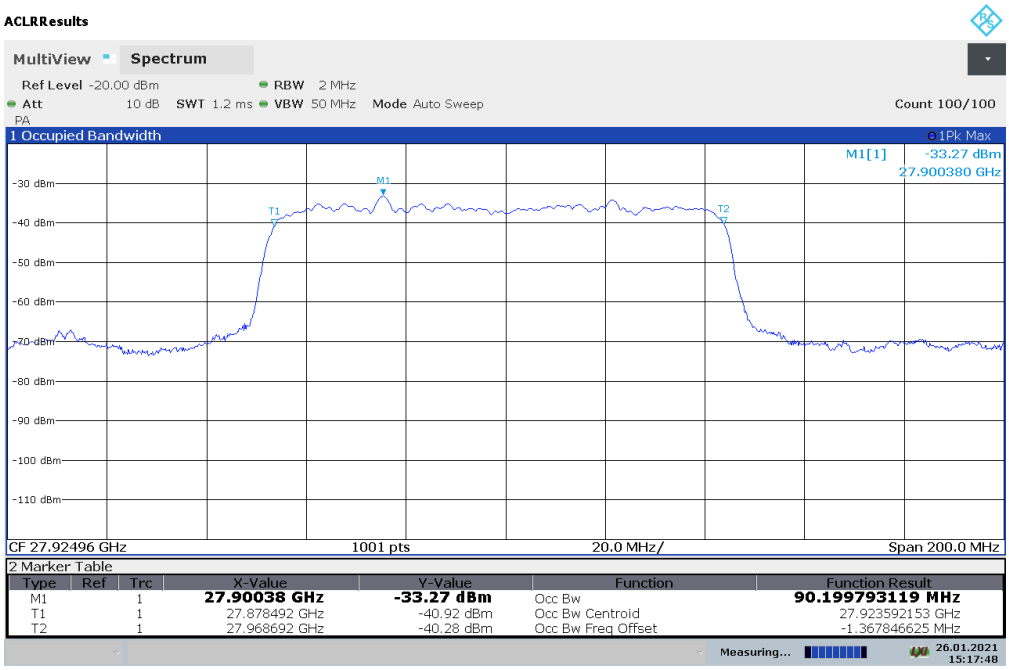
15:26:44 26.01.2021

Plot 7-8. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



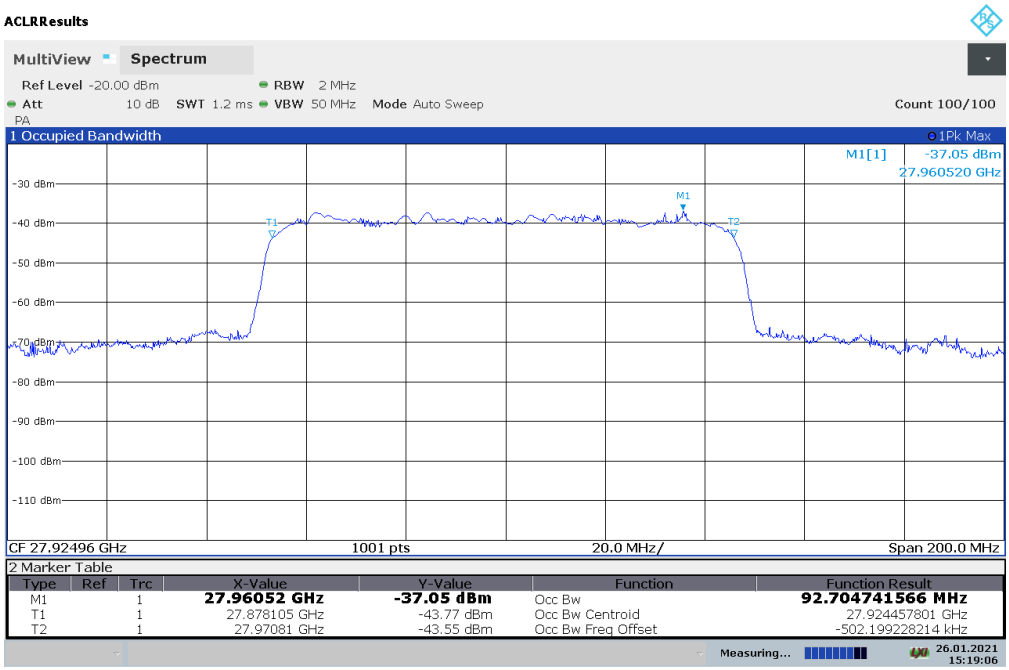
15:18:47 26.01.2021

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



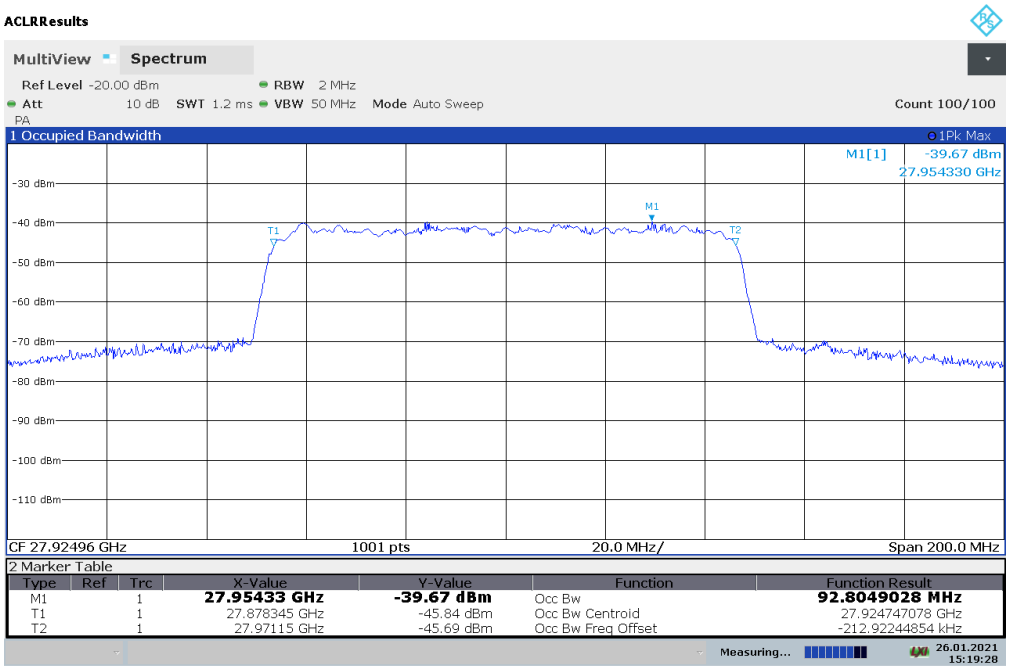
15:17:48 26.01.2021

Plot 7-10. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – pi/2-BPSK – Mid Channel)



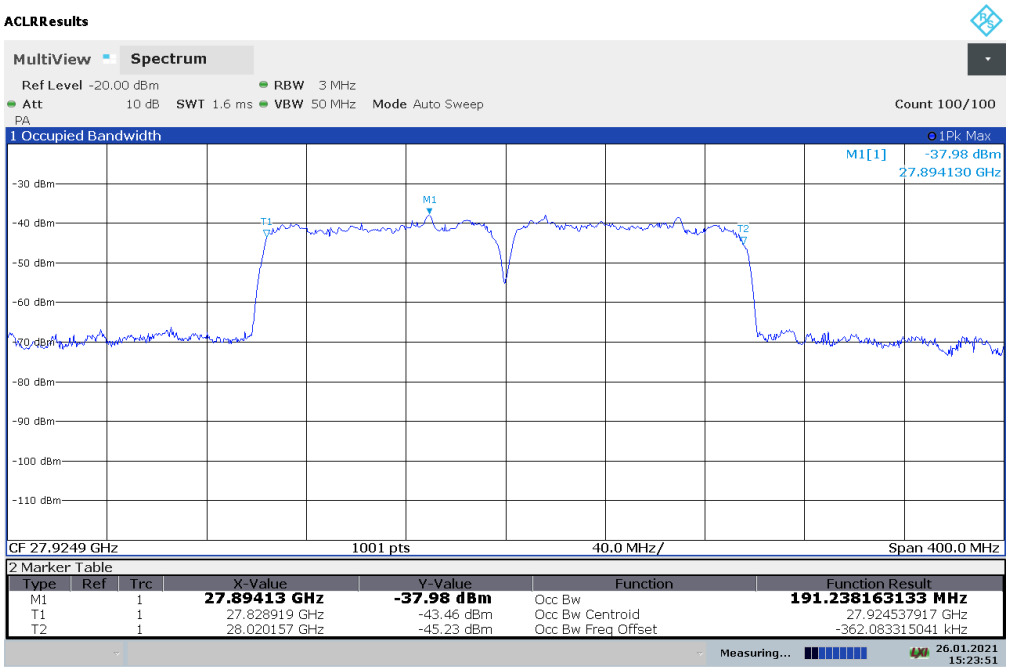
15:19:07 26.01.2021

Plot 7-11. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



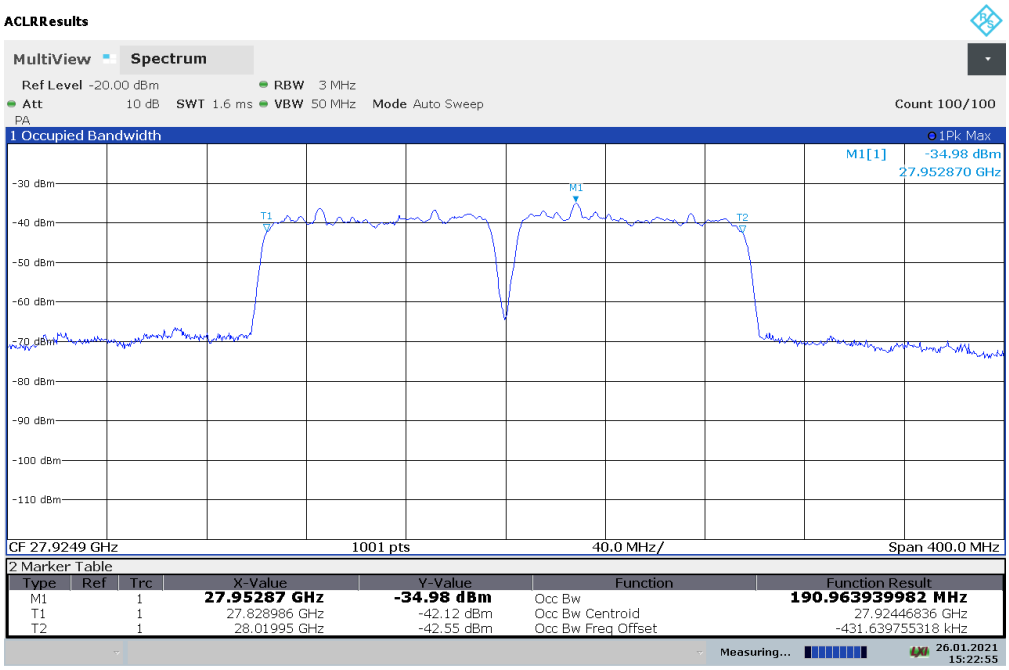
15:19:29 26.01.2021

Plot 7-12. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



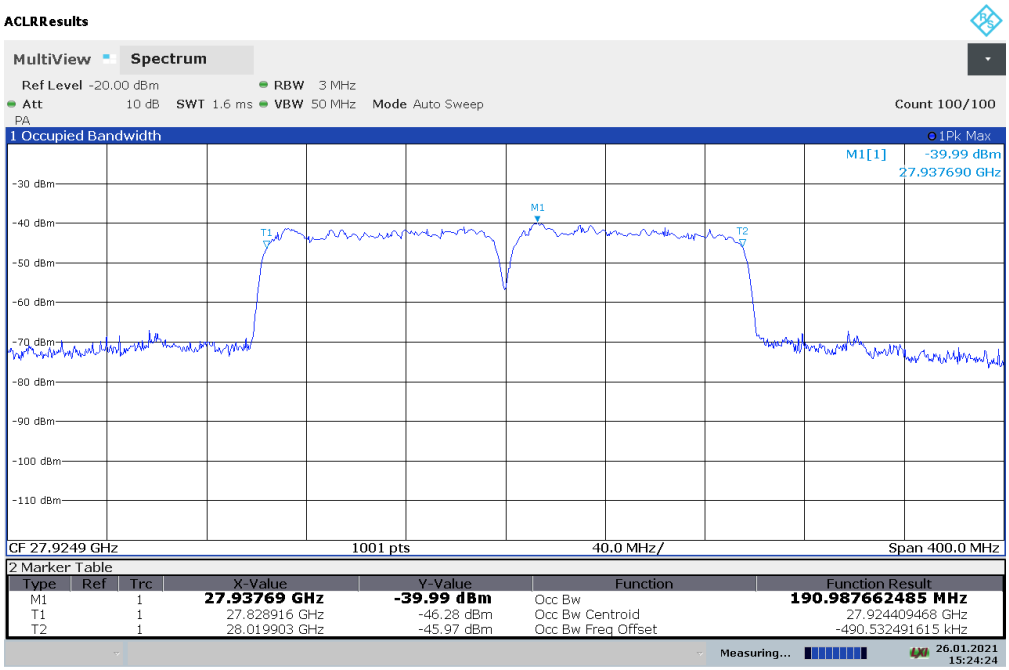
15:23:52 26.01.2021

Plot 7-13. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



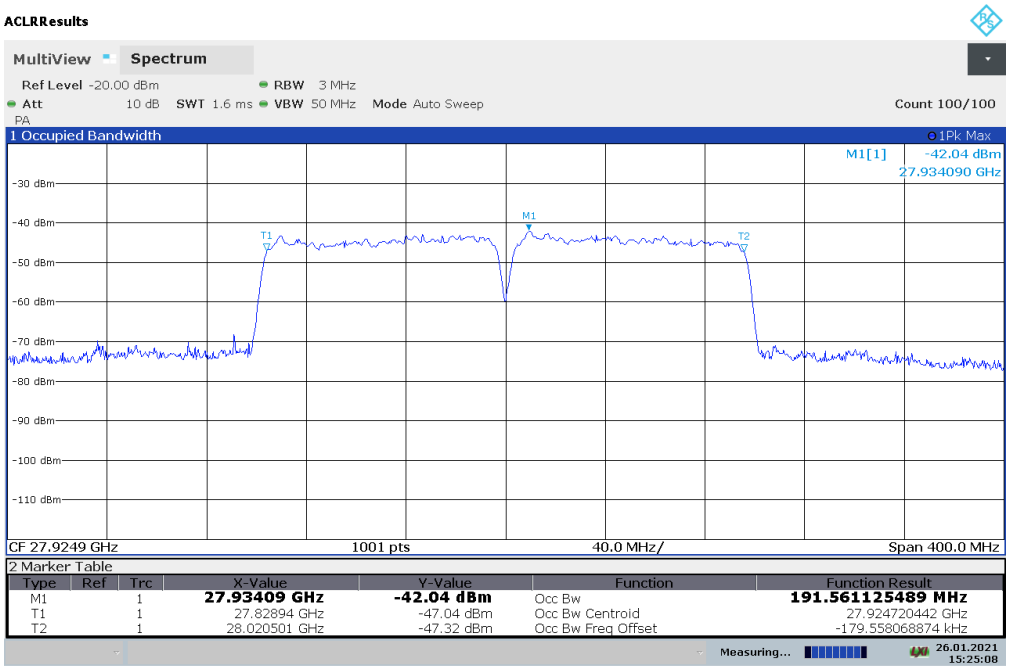
15:22:56 26.01.2021

Plot 7-14. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – pi/2-BPSK – Mid Channel)



15:24:25 26.01.2021

Plot 7-15. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



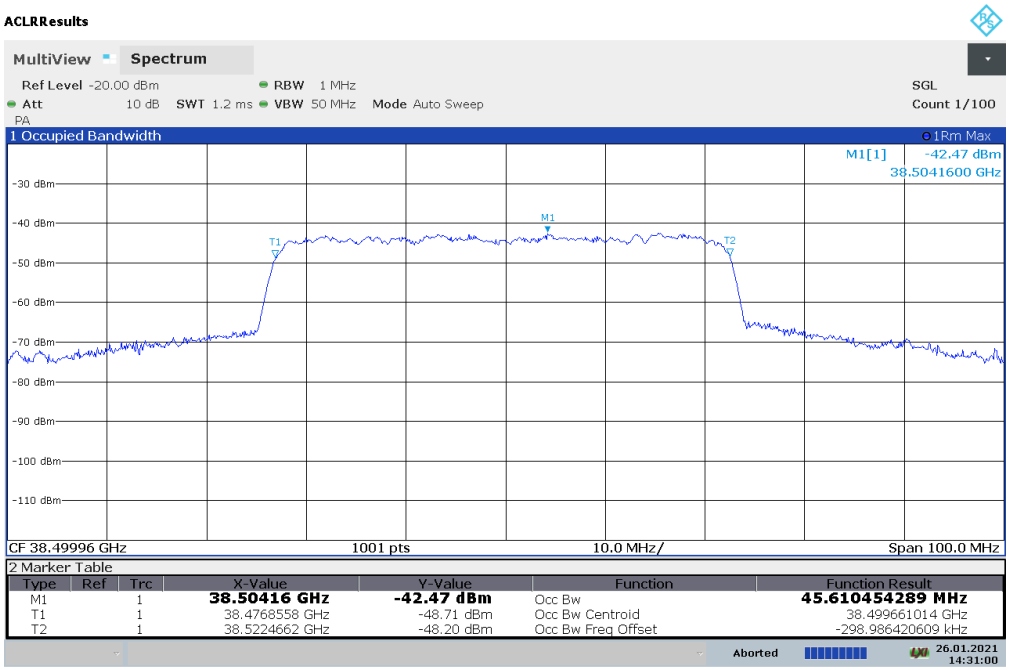
15:25:09 26.01.2021

Plot 7-16. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

Band n260

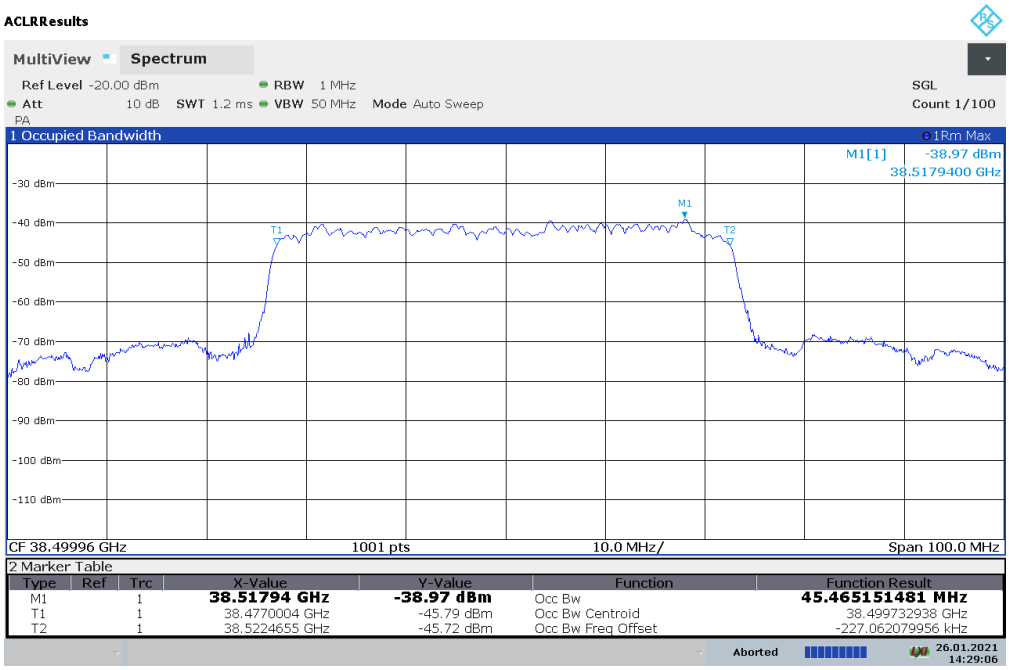
Channel	Bandwidth	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	50	1	CP-OFDM	QPSK	45.61
			DFT-s-OFDM	pi/2-BPSK	45.47
			CP-OFDM	16QAM	45.34
			CP-OFDM	64QAM	45.29
		2	CP-OFDM	QPSK	95.14
			DFT-s-OFDM	pi/2-BPSK	94.88
			CP-OFDM	16QAM	94.95
			CP-OFDM	64QAM	95.13
	100	1	CP-OFDM	QPSK	93.41
			DFT-s-OFDM	pi/2-BPSK	90.80
			CP-OFDM	16QAM	93.39
			CP-OFDM	64QAM	93.16
		2	CP-OFDM	QPSK	191.14
			DFT-s-OFDM	pi/2-BPSK	190.93
			CP-OFDM	16QAM	191.27
			CP-OFDM	64QAM	191.53

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



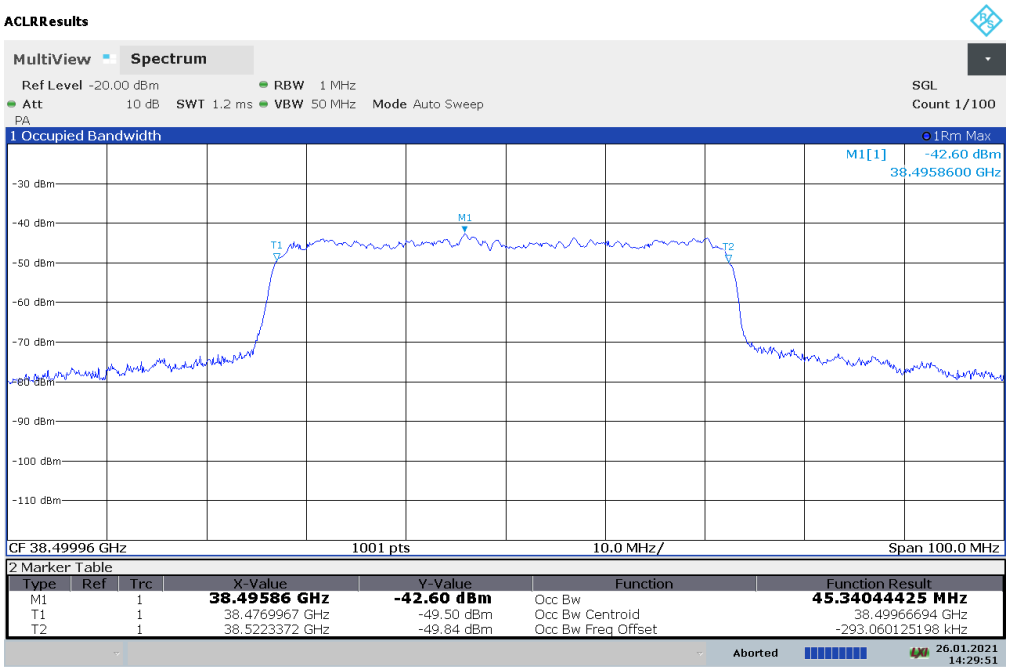
14:31:01 26.01.2021

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



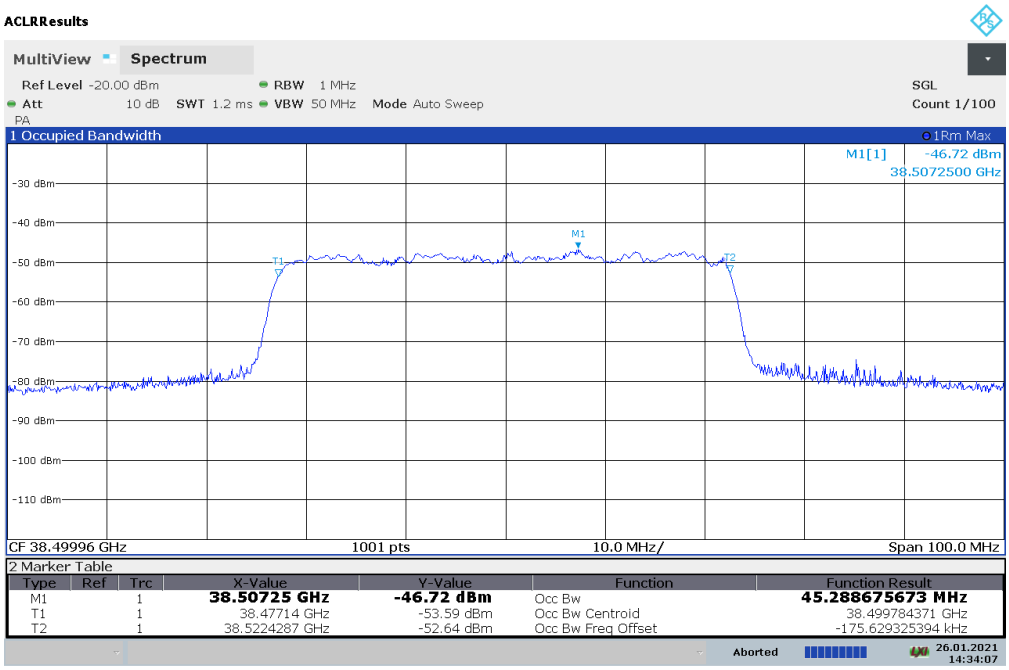
14:29:07 26.01.2021

Plot 7-18. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – pi/2-BPSK – Mid Channel)



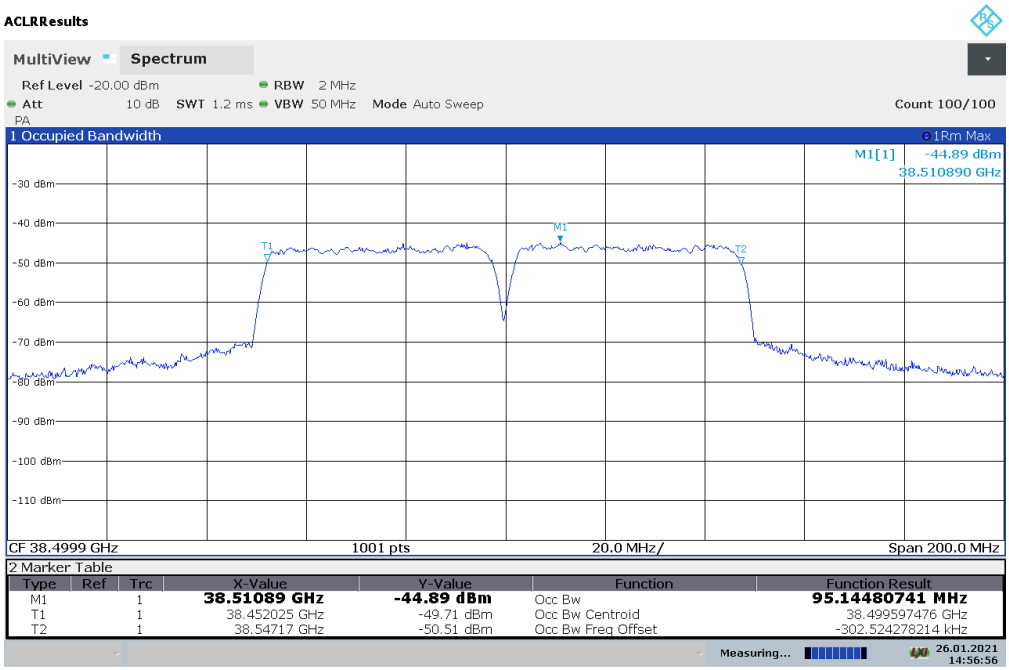
14:29:52 26.01.2021

Plot 7-19. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



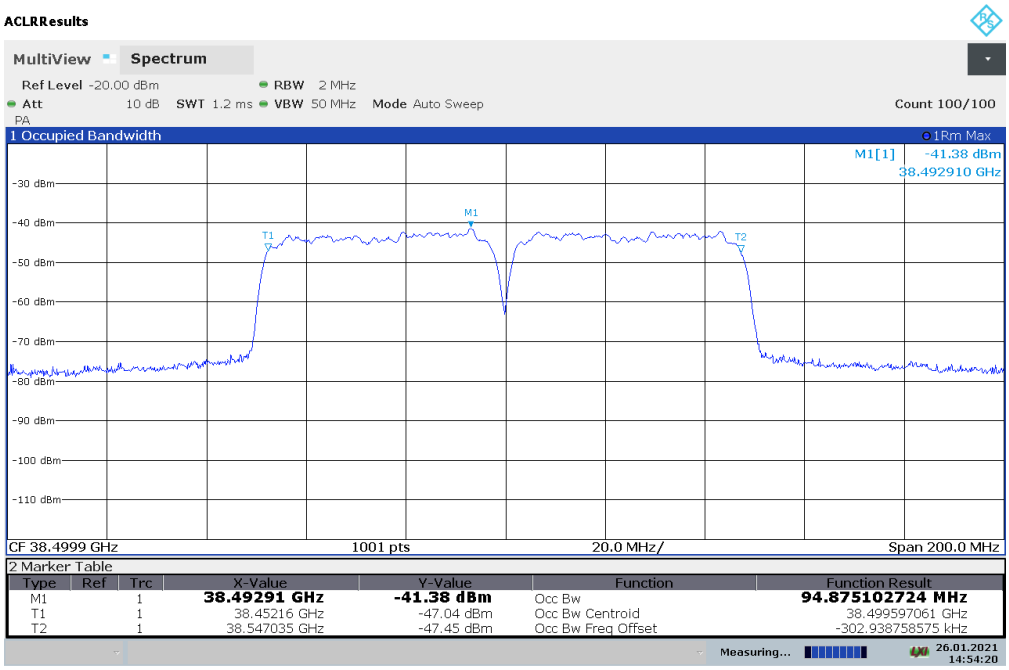
14:34:07 26.01.2021

Plot 7-20. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



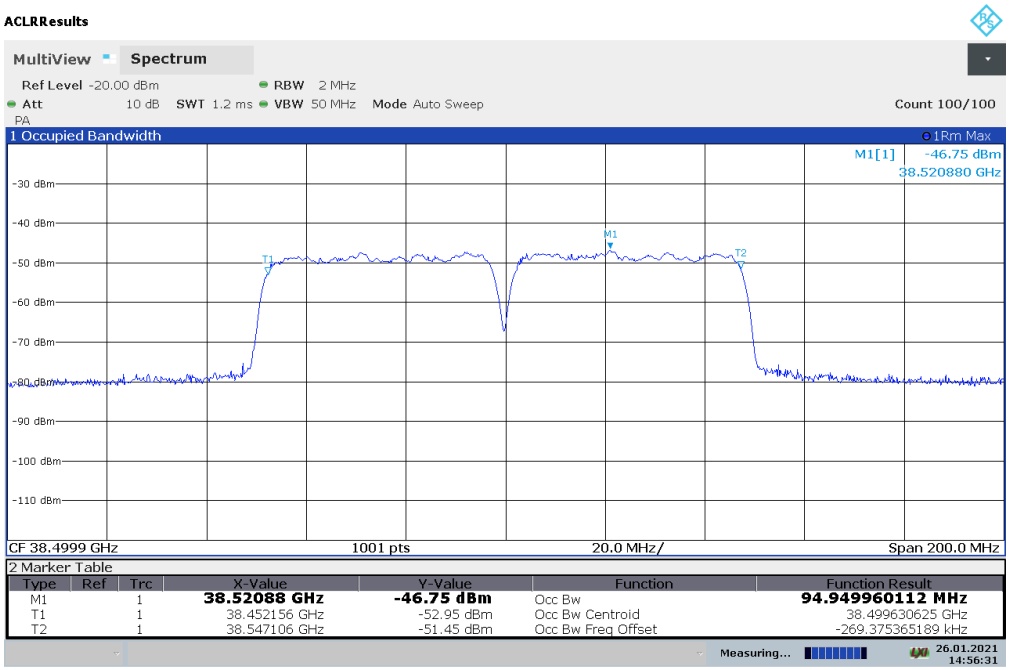
14:56:56 26.01.2021

Plot 7-21. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



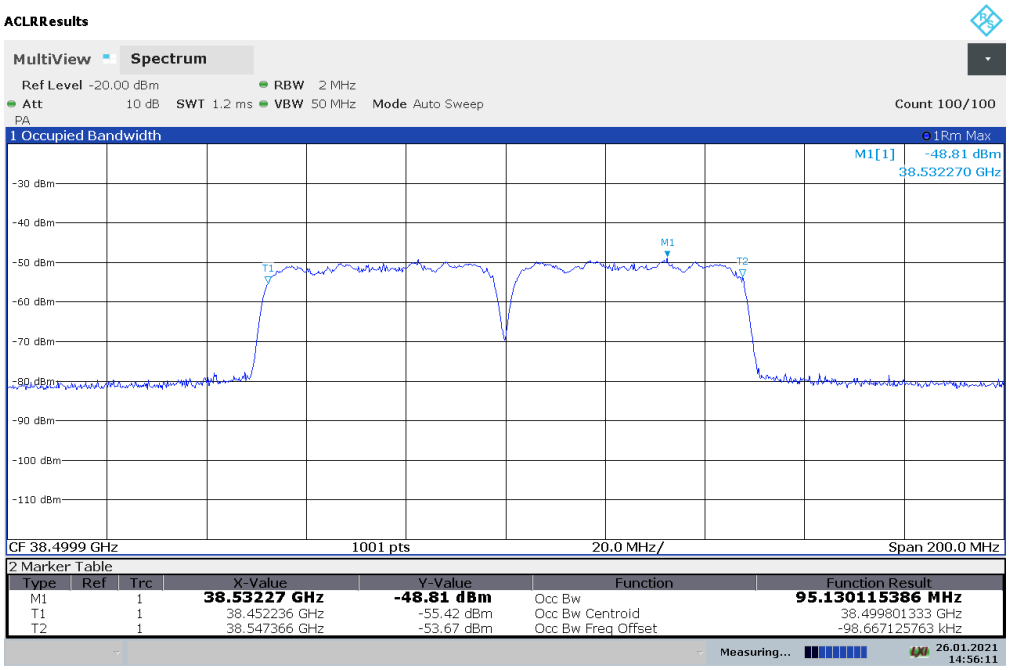
14:54:21 26.01.2021

Plot 7-22. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – pi/2-BPSK – Mid Channel)



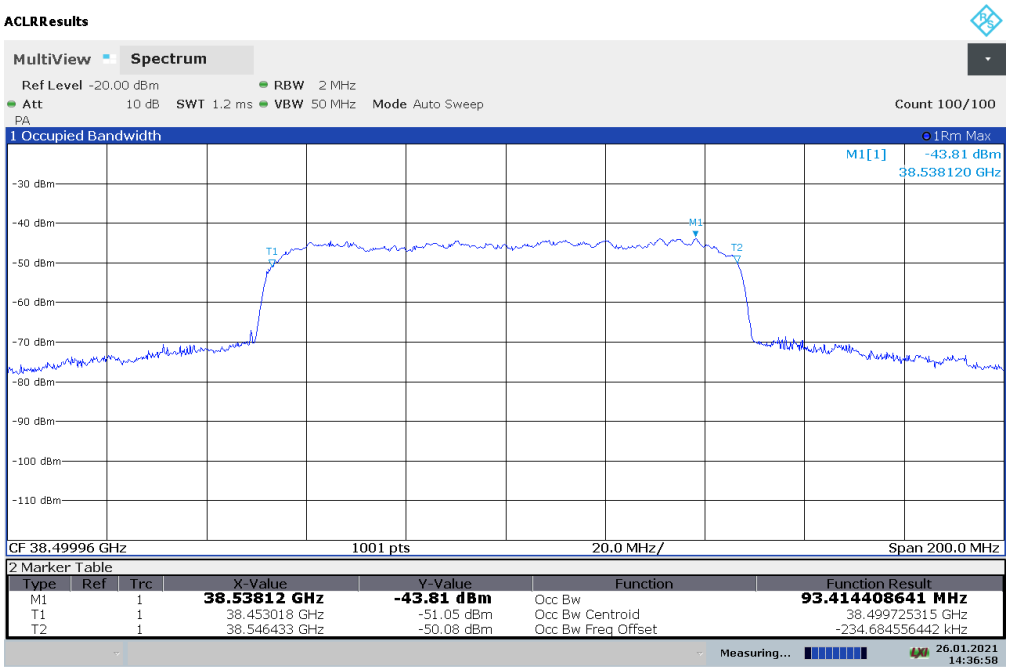
14:56:31 26.01.2021

Plot 7-23. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



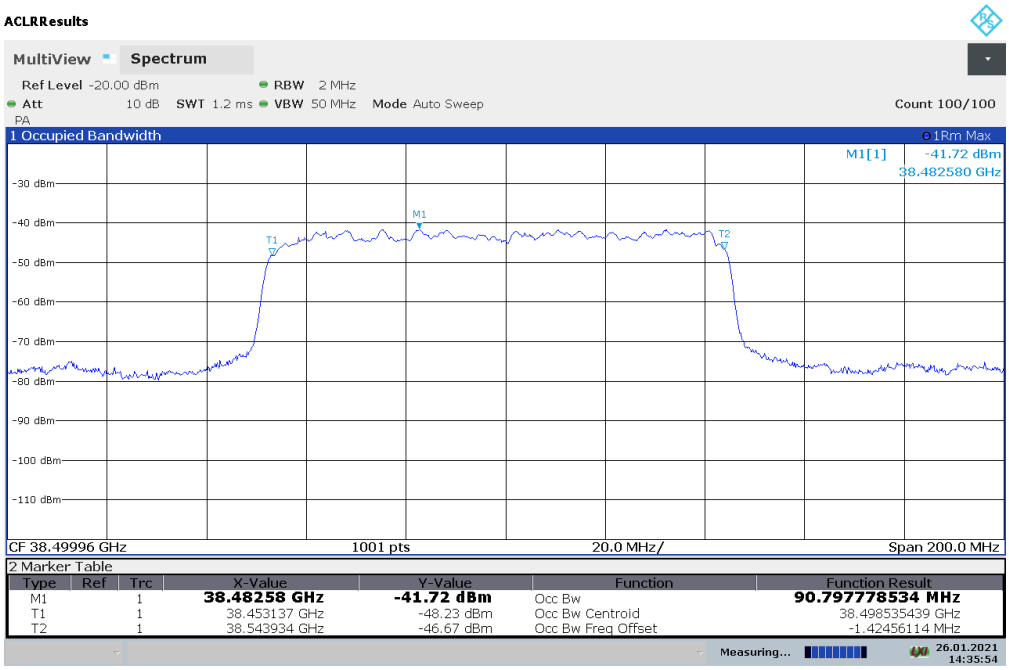
14:56:11 26.01.2021

Plot 7-24. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



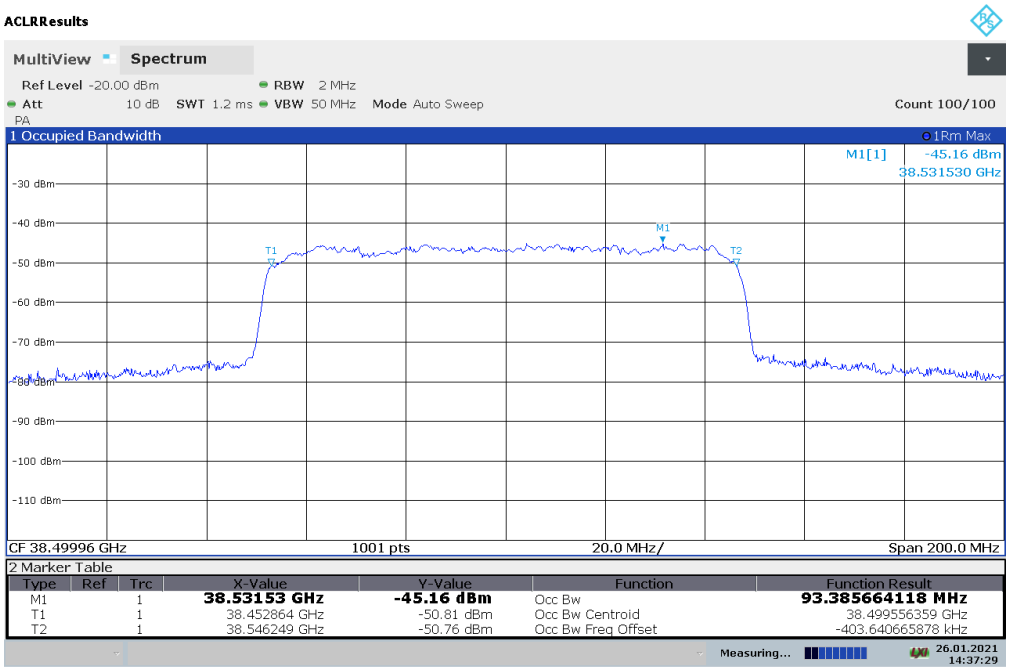
14:36:59 26.01.2021

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



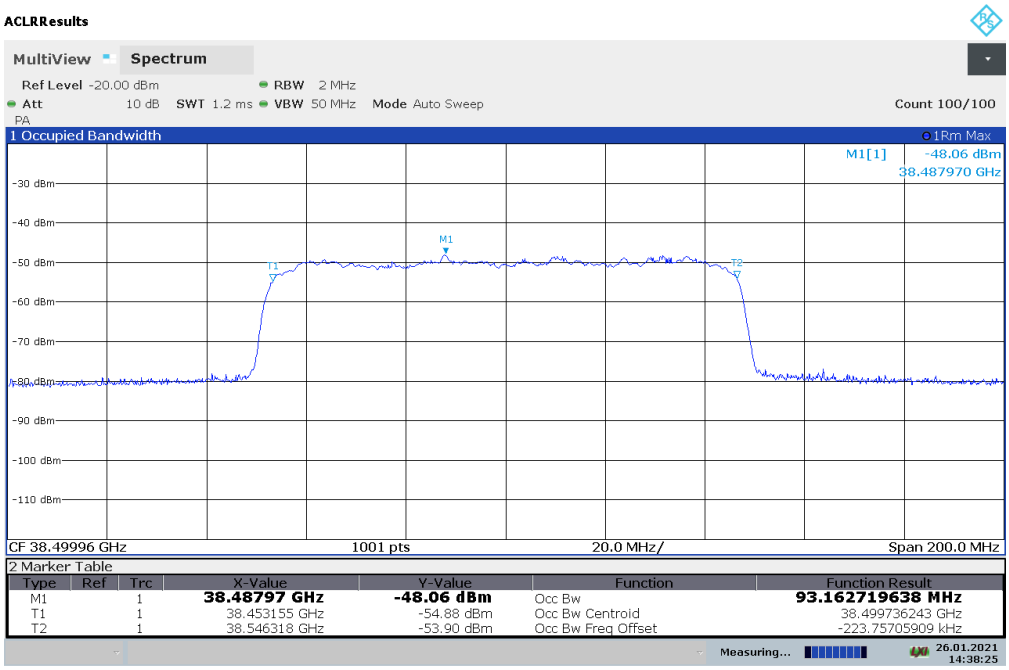
14:35:55 26.01.2021

Plot 7-26. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – pi/2-BPSK – Mid Channel)



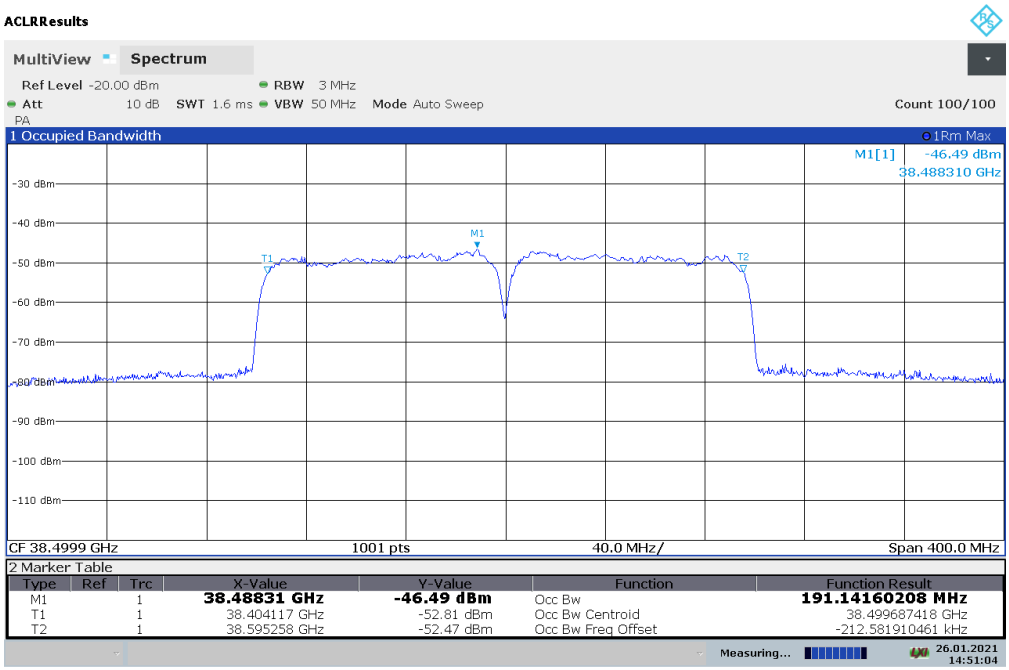
14:37:30 26.01.2021

Plot 7-27. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



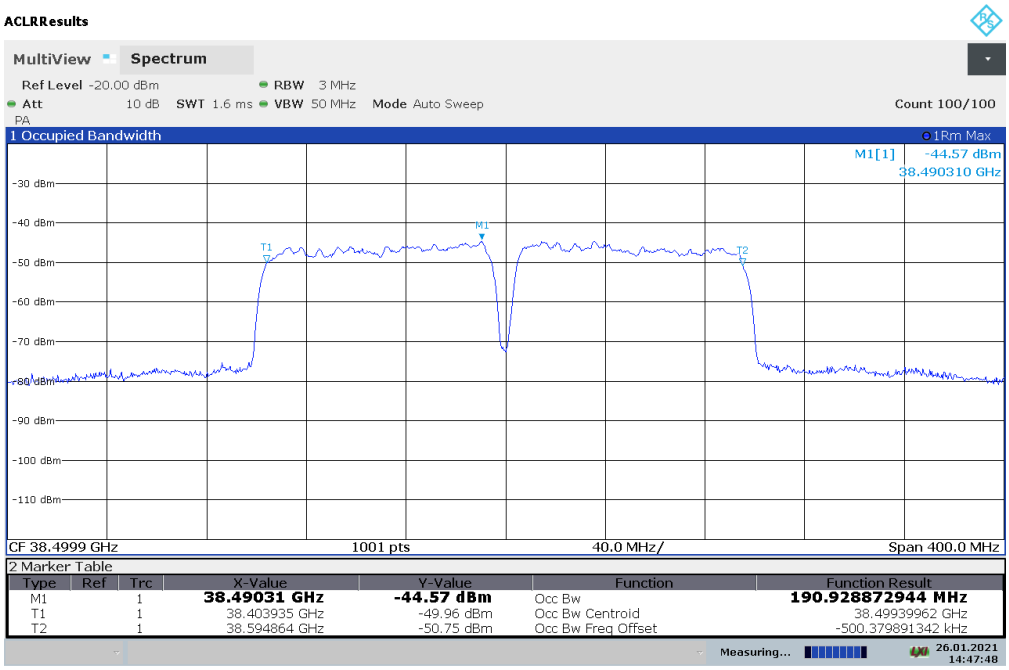
14:38:25 26.01.2021

Plot 7-28. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



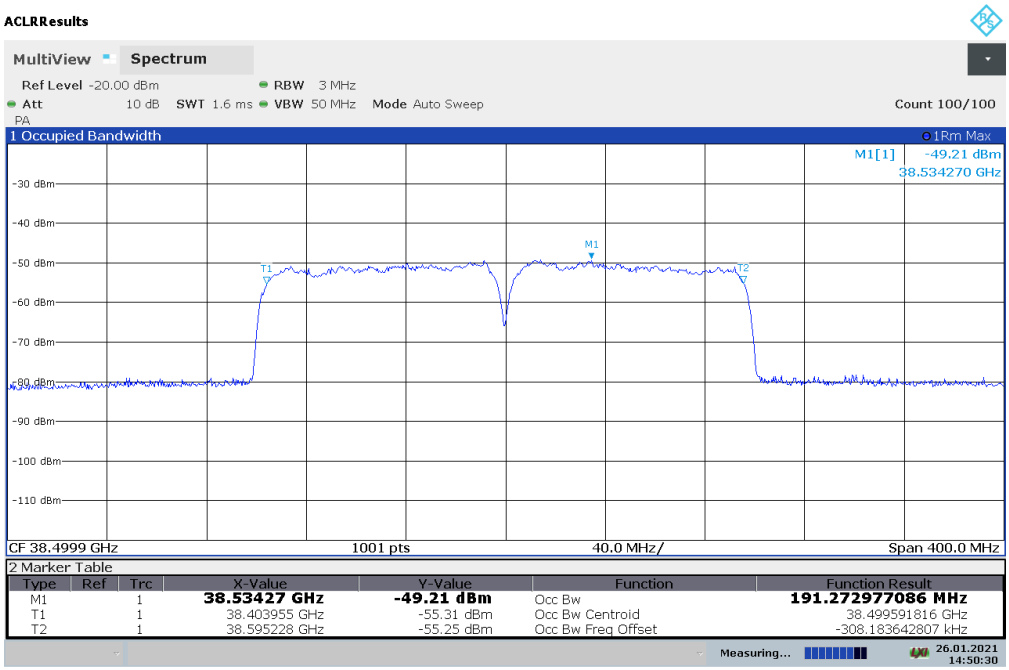
14:51:04 26.01.2021

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



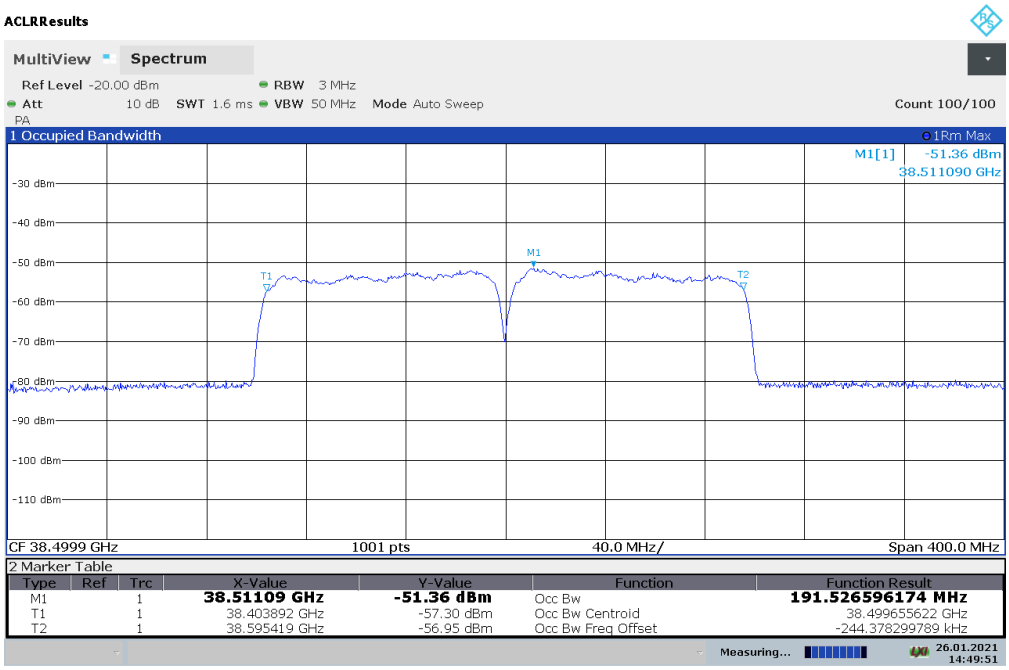
14:47:49 26.01.2021

Plot 7-30. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – pi/2-BPSK – Mid Channel)



14:50:31 26.01.2021

Plot 7-31. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



14:49:51 26.01.2021

Plot 7-32. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – 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	Beam ID Pair
SISO	Low	H	151	-
		V	15	-
	Mid	H	151	-
		V	15	-
	High	H	151	-
		V	15	-
MIMO	Low	MIMO	15	143
	Mid	MIMO	25	153
	High	MIMO	15	143

Table 7-4. Ant 1 (L Patch) Worst Case Beam ID

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	149	-
		V	29	-
	Mid	H	149	-
		V	28	-
	High	H	148	-
		V	20	-
MIMO	Low	MIMO	20	148
	Mid	MIMO	20	148
	High	MIMO	28	156

Table 7-5. Ant 2 (R Patch) Worst Case Beam ID

Band n261

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]
1	Low	27525.00	DFT-s-OFDM	QPSK	151	H	SISO	H	332	347	1 / 21	24.77
	Low	27525.00	DFT-s-OFDM	QPSK	15	V	SISO	V	11	6	1 / 21	26.88
	Low	27525.00	DFT-s-OFDM	QPSK	15 + 143	H + V	2Tx	H	12	299	1 / 21	29.91
	Low	27525.00	CP-OFDM	QPSK	151	H	SISO	H	332	347	1 / 21	21.92
	Low	27525.00	CP-OFDM	QPSK	15	V	SISO	V	11	6	1 / 21	24.27
	Low	27525.00	CP-OFDM	QPSK	15 + 143	H + V	MIMO	H	12	299	1 / 21	25.59
	Mid	27924.96	DFT-s-OFDM	QPSK	25 + 153	H + V	2Tx	H	20	25	1 / 21	27.52
	High	28324.92	DFT-s-OFDM	QPSK	15 + 143	H + V	2Tx	H	12	42	1 / 11	28.51
	Low	27525.00	DFT-s-OFDM	π/2 BPSK	15 + 143	H + V	2Tx	H	12	299	1 / 21	**29.92**
	Low	27525.00	DFT-s-OFDM	16QAM	15 + 143	H + V	2Tx	H	12	299	1 / 21	28.21
	Low	27525.00	DFT-s-OFDM	64QAM	15 + 143	H + V	2Tx	H	12	299	1 / 21	26.08

Table 7-6. Ant 1 EIRP Data (Band n261 - 50MHz-1CC)

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]
2	Low	27525.00	DFT-s-OFDM	QPSK	15 + 143	H + V	2Tx	H	12	299	32 / 0	27.03
	Low	27525.00	DFT-s-OFDM	π/2 BPSK	15 + 143	H + V	2Tx	H	12	299	32 / 0	27.01
	Low	27525.00	DFT-s-OFDM	16QAM	15 + 143	H + V	2Tx	H	12	299	32 / 0	25.58
	Low	27525.00	DFT-s-OFDM	64QAM	15 + 143	H + V	2Tx	H	12	299	32 / 0	23.46

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

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]
1	Low	27550.08	DFT-s-OFDM	QPSK	151	H	SISO	H	332	347	1 / 43	24.72
	Low	27550.08	DFT-s-OFDM	QPSK	15	V	SISO	V	11	6	1 / 43	27.03
	Low	27550.08	DFT-s-OFDM	QPSK	15 + 143	H + V	2Tx	H	12	299	1 / 43	29.93
	Low	27550.08	CP-OFDM	QPSK	151	H	SISO	H	332	347	1 / 33	21.84
	Low	27550.08	CP-OFDM	QPSK	15	V	SISO	V	11	6	1 / 43	24.52
	Low	27550.08	CP-OFDM	QPSK	15 + 143	H + V	MIMO	H	12	299	1 / 43	25.59
	Mid	27924.96	DFT-s-OFDM	QPSK	25 + 153	H + V	2Tx	H	21	40	1 / 22	27.63
	High	28299.96	DFT-s-OFDM	QPSK	15 + 153	H + V	2Tx	H	12	43	1 / 22	28.57
	Low	27550.08	DFT-s-OFDM	π/2 BPSK	15 + 143	H + V	2Tx	H	12	299	1 / 43	**29.96**
	Low	27550.08	DFT-s-OFDM	16QAM	15 + 143	H + V	2Tx	H	12	299	1 / 43	28.13
	Low	27550.08	DFT-s-OFDM	64QAM	15 + 143	H + V	2Tx	H	12	299	1 / 43	26.02

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

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]
2	Low	27550.08	DFT-s-OFDM	QPSK	15 + 143	H + V	2Tx	H	12	299	64 / 0	27.06
	Low	27550.08	DFT-s-OFDM	π/2 BPSK	15 + 143	H + V	2Tx	H	12	299	64 / 0	27.07
	Low	27550.08	DFT-s-OFDM	16QAM	15 + 143	H + V	2Tx	H	12	299	64 / 0	25.51
	Low	27550.08	DFT-s-OFDM	64QAM	15 + 143	H + V	2Tx	H	12	299	64 / 0	23.46

Table 7-9. Ant 1 EIRP Data (Band n261 - 100MHz-2CC)

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]
1	Low	27525.00	DFT-s-OFDM	QPSK	149	H	SISO	V	332	263	1 / 16	26.10
	Low	27525.00	DFT-s-OFDM	QPSK	29	V	SISO	H	330	262	1 / 16	28.22
	Low	27525.00	DFT-s-OFDM	QPSK	20 + 148	H + V	2Tx	H	27	85	1 / 11	30.32
	Low	27525.00	CP-OFDM	QPSK	149	H	SISO	V	332	263	1 / 21	21.75
	Low	27525.00	CP-OFDM	QPSK	29	V	SISO	H	330	262	1 / 11	23.94
	Low	27525.00	CP-OFDM	QPSK	20 + 148	H + V	MIMO	H	27	85	1 / 16	26.84
	Mid	27924.96	DFT-s-OFDM	QPSK	20 + 148	H + V	2Tx	H	332	261	1 / 21	29.85
	High	28324.92	DFT-s-OFDM	QPSK	28 + 156	H + V	2Tx	H	333	261	1 / 16	27.90
	Low	27525.00	DFT-s-OFDM	π/2 BPSK	20 + 148	H + V	2Tx	H	27	85	1 / 11	**30.49**
	Low	27525.00	DFT-s-OFDM	16QAM	20 + 148	H + V	2Tx	H	27	85	1 / 11	28.62
	Low	27525.00	DFT-s-OFDM	64QAM	20 + 148	H + V	2Tx	H	27	85	1 / 11	26.62

Table 7-10. Ant 2 EIRP Data (Band n261 - 50MHz-1CC)

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]
2	Low	27525.00	DFT-s-OFDM	QPSK	20 + 148	H + V	2Tx	H	27	85	32 / 0	27.06
	Low	27525.00	DFT-s-OFDM	π/2 BPSK	20 + 148	H + V	2Tx	H	27	85	32 / 0	27.03
	Low	27525.00	DFT-s-OFDM	16QAM	20 + 148	H + V	2Tx	H	27	85	32 / 0	25.52
	Low	27525.00	DFT-s-OFDM	64QAM	20 + 148	H + V	2Tx	H	27	85	32 / 0	23.47

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

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]
1	Low	27550.08	DFT-s-OFDM	QPSK	149	H	SISO	V	330	262	1 / 33	26.28
	Low	27550.08	DFT-s-OFDM	QPSK	29	V	SISO	H	330	263	1 / 33	28.34
	Low	27550.08	DFT-s-OFDM	QPSK	20 + 148	H + V	2Tx	H	27	86	1 / 22	30.24
	Low	27550.08	CP-OFDM	QPSK	149	H	SISO	V	330	262	1 / 33	21.92
	Low	27550.08	CP-OFDM	QPSK	29	V	SISO	H	330	263	1 / 33	24.11
	Low	27550.08	CP-OFDM	QPSK	20 + 148	H + V	MIMO	H	27	86	1 / 33	27.02
	Mid	27924.96	DFT-s-OFDM	QPSK	20 + 148	H + V	2Tx	H	332	260	1 / 43	29.87
	High	28299.96	DFT-s-OFDM	QPSK	28 + 156	H + V	2Tx	H	330	261	1 / 33	28.06
	Low	27550.08	DFT-s-OFDM	π/2 BPSK	20 + 148	H + V	2Tx	H	27	86	1 / 33	**30.47**
	Low	27550.08	DFT-s-OFDM	16QAM	20 + 148	H + V	2Tx	H	27	86	1 / 43	28.65
	Low	27550.08	DFT-s-OFDM	64QAM	20 + 148	H + V	2Tx	H	27	86	1 / 33	26.41

Table 7-12. Ant 2 EIRP Data (Band n261 - 100MHz-1CC)

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]
2	Low	27550.08	DFT-s-OFDM	QPSK	20 + 148	H + V	2Tx	H	27	85	64 / 0	27.24
	Low	27550.08	DFT-s-OFDM	π/2 BPSK	20 + 148	H + V	2Tx	H	27	85	64 / 0	27.26
	Low	27550.08	DFT-s-OFDM	16QAM	20 + 148	H + V	2Tx	H	27	85	64 / 0	25.77
	Low	27550.08	DFT-s-OFDM	64QAM	20 + 148	H + V	2Tx	H	27	85	64 / 0	23.58

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

Band n260 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	144	-
		V	25	-
	Mid	H	144	-
		V	25	-
	High	H	144	-
		V	14	-
MIMO	Low	MIMO	16	144
	Mid	MIMO	25	153
	High	MIMO	25	153

Table 7-14. Ant 1 (L Patch) Worst Case Beam ID

Mode	Channel	Beam Polarization	Beam ID	Beam ID Pair
SISO	Low	H	157	-
		V	30	-
	Mid	H	157	-
		V	30	-
	High	H	149	-
		V	21	-
MIMO	Low	MIMO	29	157
	Mid	MIMO	29	157
	High	MIMO	21	149

Table 7-15. Ant 2 (R Patch) Worst Case Beam ID

Band n260

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]
1	High	39975.00	DFT-s-OFDM	QPSK	144	H	SISO	H	9	345	1 / 16	23.09
	High	39975.00	DFT-s-OFDM	QPSK	14	V	SISO	V	113	332	1 / 11	23.67
	High	39975.00	DFT-s-OFDM	QPSK	25 + 153	H + V	2Tx	V	331	287	1 / 16	27.31
	High	39975.00	CP-OFDM	QPSK	144	H	SISO	H	9	345	1 / 11	19.46
	High	39975.00	CP-OFDM	QPSK	14	V	SISO	V	113	332	1 / 11	20.19
	High	39975.00	CP-OFDM	QPSK	25 + 153	H + V	MIMO	V	331	287	1 / 16	22.61
	Low	37025.04	DFT-s-OFDM	QPSK	16 + 144	H + V	2Tx	V	332	288	1 / 21	25.46
	Mid	38499.96	DFT-s-OFDM	QPSK	25 + 153	H + V	2Tx	V	331	287	1 / 21	26.36
	Mid	38499.96	DFT-s-OFDM	QPSK	144	H	SISO	H	10	341	1 / 16	24.17
	Mid	38499.96	DFT-s-OFDM	QPSK	25	V	SISO	V	336	32	1 / 16	25.27
	Mid	38499.96	CP-OFDM	QPSK	25 + 153	H + V	MIMO	V	331	287	1 / 21	23.61
	Mid	38499.96	CP-OFDM	QPSK	144	H	SISO	H	10	341	1 / 21	20.81
	Mid	38499.96	CP-OFDM	QPSK	25	V	SISO	V	336	32	1 / 21	22.56
	High	39975.00	DFT-s-OFDM	π/2 BPSK	25 + 153	H + V	2Tx	V	331	287	1 / 16	**27.34**
	High	39975.00	DFT-s-OFDM	16QAM	25 + 153	H + V	2Tx	V	331	287	1 / 16	25.35
	High	39975.00	DFT-s-OFDM	64QAM	25 + 153	H + V	2Tx	V	331	287	1 / 16	23.17

Table 7-16. Ant 1 EIRP Data (Band n260 - 50MHz-1CC)

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]
2	High	39975.00	DFT-s-OFDM	QPSK	25 + 153	H + V	2Tx	V	332	287	32 / 0	24.48
	High	39975.00	DFT-s-OFDM	π/2 BPSK	25 + 153	H + V	2Tx	V	332	287	32 / 0	24.48
	High	39975.00	DFT-s-OFDM	16QAM	25 + 153	H + V	2Tx	V	332	287	32 / 0	23.01
	High	39975.00	DFT-s-OFDM	64QAM	25 + 153	H + V	2Tx	V	332	287	32 / 0	20.49

Table 7-17. Ant 1 EIRP Data (Band n260 - 50MHz-2CC)

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]
1	High	39949.92	DFT-s-OFDM	QPSK	144	H	SISO	H	9	343	1 / 43	23.07
	High	39949.92	DFT-s-OFDM	QPSK	14	V	SISO	V	113	333	1 / 22	23.72
	High	39949.92	DFT-s-OFDM	QPSK	25 + 153	H + V	2Tx	V	332	286	1 / 43	**27.42**
	High	39949.92	CP-OFDM	QPSK	144	H	SISO	H	9	343	1 / 43	19.52
	High	39949.92	CP-OFDM	QPSK	14	V	SISO	V	113	333	1 / 22	20.19
	High	39949.92	CP-OFDM	QPSK	25 + 153	H + V	MIMO	V	332	286	1 / 33	22.49
	Low	37050.00	DFT-s-OFDM	QPSK	16 + 144	H + V	2Tx	V	333	289	1 / 33	25.53
	Mid	38499.96	DFT-s-OFDM	QPSK	25 + 153	H + V	2Tx	V	331	287	1 / 43	26.20
	Mid	38499.96	DFT-s-OFDM	QPSK	144	H	SISO	H	10	341	1 / 43	23.88
	Mid	38499.96	DFT-s-OFDM	QPSK	25	V	SISO	V	336	33	1 / 33	25.17
	Mid	38499.96	CP-OFDM	QPSK	25 + 453	H + V	MIMO	V	331	287	1 / 43	23.65
	Mid	38499.96	CP-OFDM	QPSK	144	H	SISO	H	10	341	1 / 33	20.36
	Mid	38499.96	CP-OFDM	QPSK	25	V	SISO	V	336	33	1 / 33	22.38
	High	39949.92	DFT-s-OFDM	π/2 BPSK	25 + 153	H + V	2Tx	V	332	286	1 / 43	27.00
	High	39949.92	DFT-s-OFDM	16QAM	25 + 153	H + V	2Tx	V	332	286	1 / 43	24.64
	High	39949.92	DFT-s-OFDM	64QAM	25 + 153	H + V	2Tx	V	332	286	1 / 43	22.93

Table 7-18. Ant 1 EIRP Data (Band n260 - 100MHz-1CC)

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]
2	High	39949.92	DFT-s-OFDM	QPSK	25 + 153	H + V	2Tx	V	335	287	64 / 0	24.19
	High	39949.92	DFT-s-OFDM	π/2 BPSK	25 + 153	H + V	2Tx	V	335	287	64 / 0	24.16
	High	39949.92	DFT-s-OFDM	16QAM	25 + 153	H + V	2Tx	V	335	287	64 / 0	22.65
	High	39949.92	DFT-s-OFDM	64QAM	25 + 153	H + V	2Tx	V	335	287	64 / 0	20.44

Table 7-19. Ant 1 EIRP Data (Band n260 - 100MHz-2CC)

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]
1	Mid	38499.96	DFT-s-OFDM	QPSK	157	H	SISO	V	333	264	1 / 11	27.93
	Mid	38499.96	DFT-s-OFDM	QPSK	30	V	SISO	H	28	82	1 / 16	26.16
	Mid	38499.96	DFT-s-OFDM	QPSK	29 + 157	H + V	2Tx	V	25	81	1 / 16	**29.96**
	Mid	38499.96	CP-OFDM	QPSK	157	H	SISO	V	333	264	1 / 11	24.53
	Mid	38499.96	CP-OFDM	QPSK	30	V	SISO	H	28	82	1 / 11	23.10
	Mid	38499.96	CP-OFDM	QPSK	29 + 157	H + V	MIMO	V	25	81	1 / 16	25.45
	Low	37025.04	DFT-s-OFDM	QPSK	29 + 157	H + V	2Tx	V	24	82	1 / 21	29.62
	High	39975.00	DFT-s-OFDM	QPSK	21 + 149	H + V	2Tx	V	25	78	1 / 21	29.52
	Mid	38499.96	DFT-s-OFDM	π/2 BPSK	29 + 157	H + V	2Tx	V	25	81	1 / 16	29.80
	Mid	38499.96	DFT-s-OFDM	16QAM	29 + 157	H + V	2Tx	V	25	81	1 / 16	28.01
	Mid	38499.96	DFT-s-OFDM	64QAM	29 + 157	H + V	2Tx	V	25	81	1 / 16	25.79

Table 7-20. Ant 2 EIRP Data (Band n260 - 50MHz-1CC)

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]
2	Mid	38499.96	DFT-s-OFDM	QPSK	29 + 157	H + V	2Tx	V	28	84	32 / 0	26.94
	Mid	38499.96	DFT-s-OFDM	π/2 BPSK	29 + 157	H + V	2Tx	V	28	84	32 / 0	26.96
	Mid	38499.96	DFT-s-OFDM	16QAM	29 + 157	H + V	2Tx	V	28	84	32 / 0	25.37
	Mid	38499.96	DFT-s-OFDM	64QAM	29 + 157	H + V	2Tx	V	28	84	32 / 0	22.74

Table 7-21. Ant 2 EIRP Data (Band n260 - 50MHz-2CC)

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]
1	Mid	38499.96	DFT-s-OFDM	QPSK	157	H	SISO	V	333	263	1 / 22	27.97
	Mid	38499.96	DFT-s-OFDM	QPSK	30	V	SISO	H	28	83	1 / 22	26.22
	Mid	38499.96	DFT-s-OFDM	QPSK	29 + 157	H + V	2Tx	V	23	86	1 / 33	**29.91**
	Mid	38499.96	CP-OFDM	QPSK	157	H	SISO	V	333	263	1 / 22	24.57
	Mid	38499.96	CP-OFDM	QPSK	30	V	SISO	H	28	83	1 / 22	23.11
	Mid	38499.96	CP-OFDM	QPSK	29 + 157	H + V	MIMO	V	23	86	1 / 43	25.96
	Low	37050.00	DFT-s-OFDM	QPSK	29 + 157	H + V	2Tx	V	25	81	1 / 33	29.38
	High	39949.92	DFT-s-OFDM	QPSK	21 + 149	H + V	2Tx	V	25	82	1 / 22	29.79
	Mid	38499.96	DFT-s-OFDM	π/2 BPSK	29 + 157	H + V	2Tx	V	23	86	1 / 33	29.88
	Mid	38499.96	DFT-s-OFDM	16QAM	29 + 157	H + V	2Tx	V	23	86	1 / 33	27.91
	Mid	38499.96	DFT-s-OFDM	64QAM	29 + 157	H + V	2Tx	V	23	86	1 / 33	25.93

Table 7-22. Ant 2 EIRP Data (Band n260 - 100MHz-1CC)

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]
2	Mid	38499.96	DFT-s-OFDM	QPSK	29 + 157	H + V	2Tx	V	28	84	64 / 0	26.98
	Mid	38499.96	DFT-s-OFDM	π/2 BPSK	29 + 157	H + V	2Tx	V	28	84	64 / 0	27.03
	Mid	38499.96	DFT-s-OFDM	16QAM	29 + 157	H + V	2Tx	V	28	84	64 / 0	25.51
	Mid	38499.96	DFT-s-OFDM	64QAM	29 + 157	H + V	2Tx	V	28	84	64 / 0	22.72

Table 7-23. Ant 2 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 = 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.

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 7-24. 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.

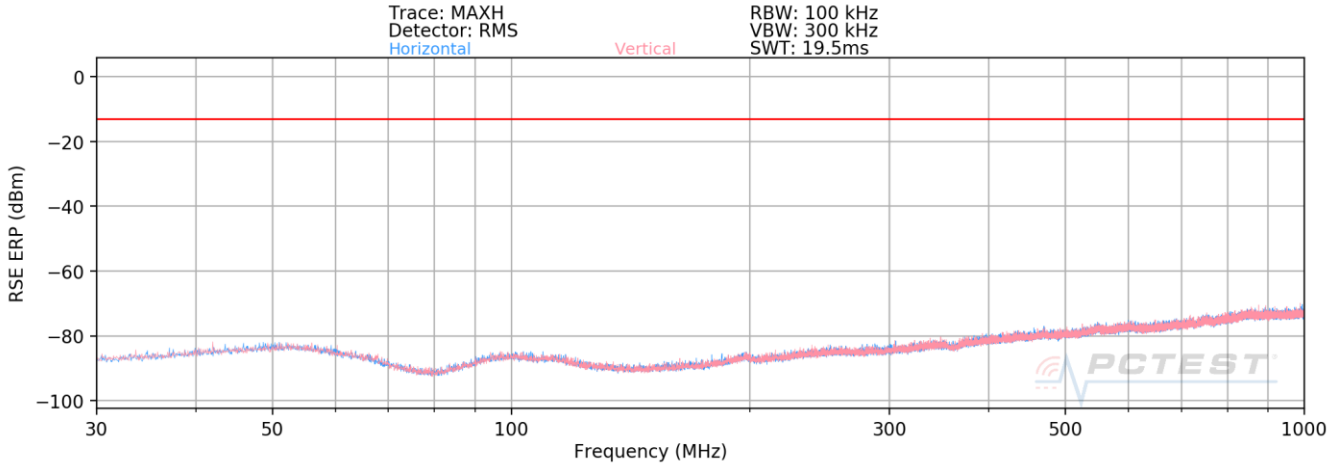
8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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. For EN-DC mode, n261 uses LTE B2, B5, B13, B48 and B66, and n260 uses LTE B2, B5, B13, B48 and B66.

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 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n261)

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

RSE ERP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 – 2.15 (dB)

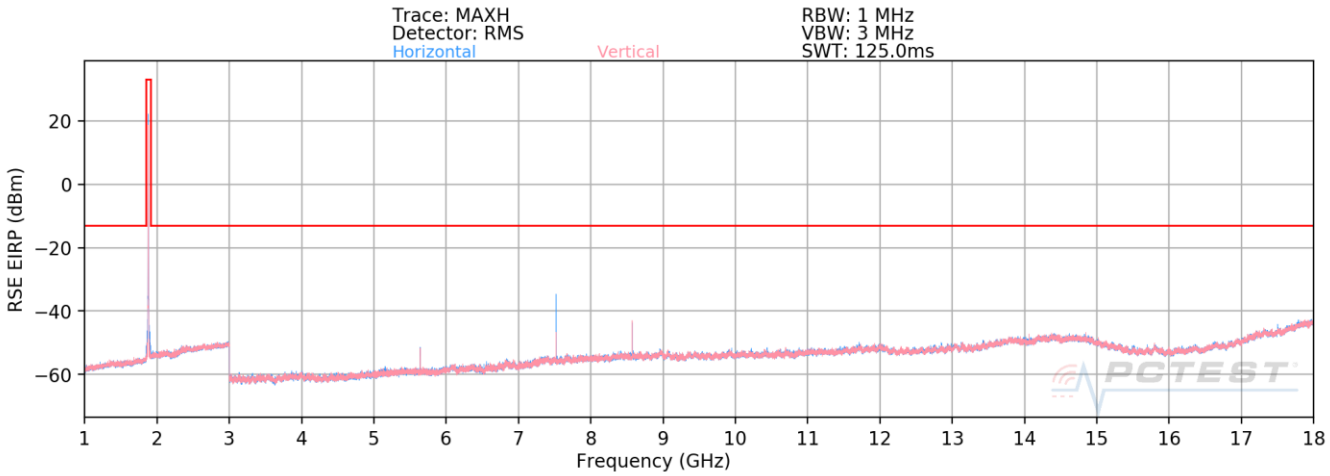
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
457.80	Mid	50	2Tx	QPSK	H	-	-	-78.16	-13.00	-65.16
852.03	Mid	50	2Tx	QPSK	H	-	-	-72.40	-13.00	-59.40
994.43	Mid	50	2Tx	QPSK	H	-	-	-71.54	-13.00	-58.54

Table 7-25. Ant 1 – 2Tx - Spurious Emissions Table (30MHz - 1GHz)

Notes

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

1GHz - 18GHz



Plot 7-34. 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 3 meter.

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

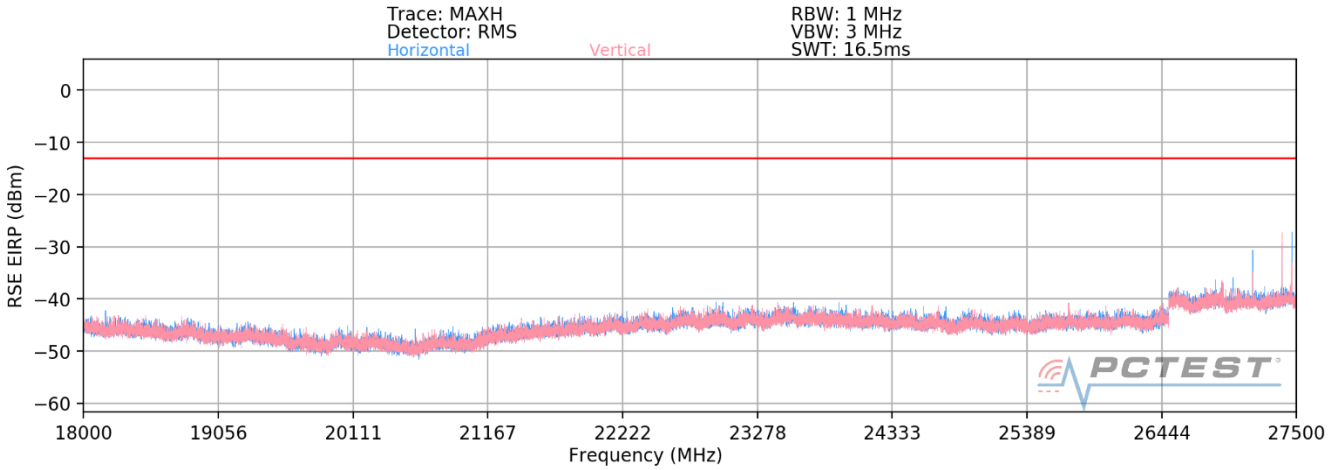
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8811.95	Low	50	2Tx	QPSK	H	303	288	-43.81	-13.00	-30.81
5640.00	Mid	50	2Tx	QPSK	H	342	247	-53.28	-13.00	-40.28
7520.00	Mid	50	2Tx	QPSK	H	45	148	-37.09	-13.00	-24.09
8571.91	Mid	50	2Tx	QPSK	H	298	363	-43.31	-13.00	-30.31
8971.92	High	50	2Tx	QPSK	H	303	364	-42.66	-13.00	-29.66

Table 7-26. Ant 1 - 2Tx - Spurious Emissions Table (1GHz - 18GHz)

Notes

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

18GHz - 27.5GHz



Plot 7-35. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC 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

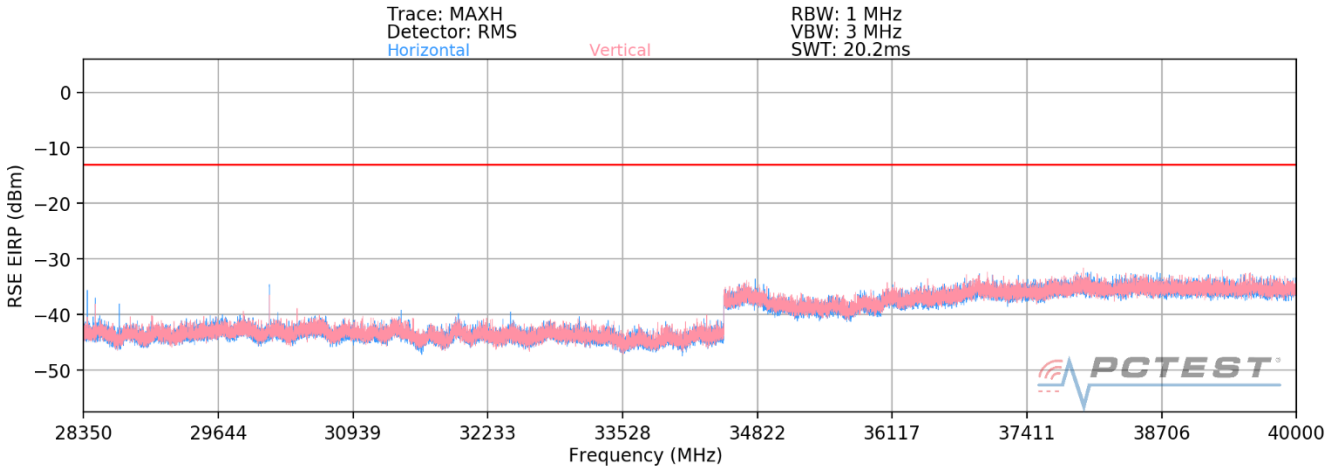
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
27064.63	Low	50	2Tx	QPSK	V	15	72	-24.83	-13.00	-11.83
27218.33	Low	50	2Tx	QPSK	V	14	69	-21.21	-13.00	-8.21
27371.84	Low	50	2Tx	QPSK	V	17	74	-24.48	-13.00	-11.48
27157.21	Mid	50	2Tx	QPSK	V	28	62	-30.45	-13.00	-17.45
27387.72	Mid	50	2Tx	QPSK	V	23	49	-28.99	-13.00	-15.99
24464.60	Mid	50	2Tx	QPSK	V	33	64	-27.91	-13.00	-14.91
27096.75	High	50	2Tx	QPSK	V	15	71	-35.43	-13.00	-22.43
27250.33	High	50	2Tx	QPSK	V	13	62	-32.05	-13.00	-19.05
27327.21	High	50	2Tx	QPSK	V	13	53	-28.87	-13.00	-15.87

Table 7-27. Ant 1 - 2Tx - 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 7-36. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC 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

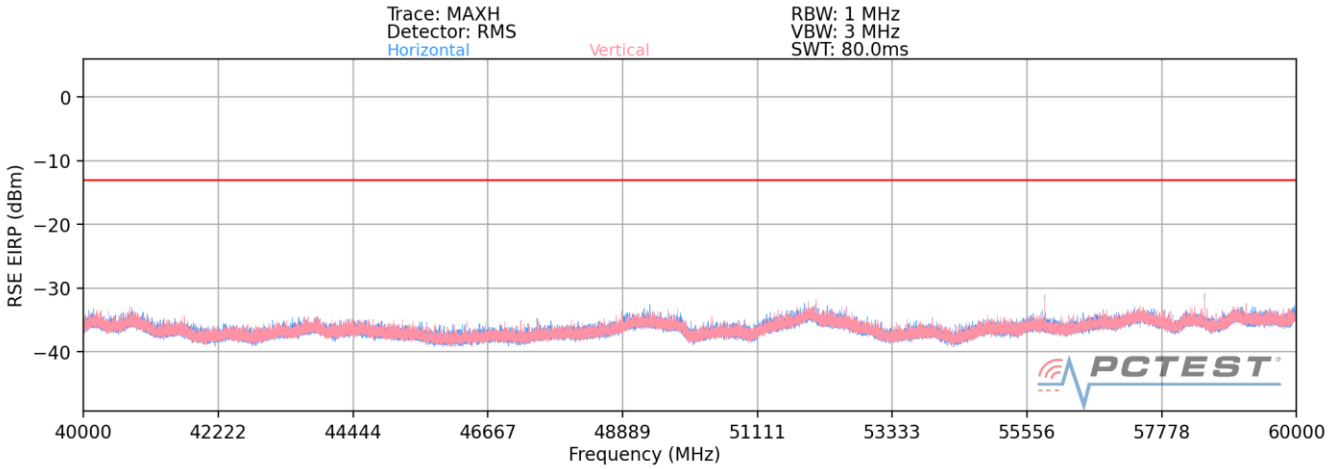
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
28523.90	Low	50	2Tx	QPSK	V	16	74	-39.22	-13.00	-26.22
28615.08	Low	50	2Tx	QPSK	V	16	75	-26.91	-13.00	-13.91
28697.55	Low	50	2Tx	QPSK	V	17	72	-40.72	-13.00	-27.72
28386.30	Mid	50	2Tx	QPSK	V	38	63	-32.51	-13.00	-19.51
28463.03	Mid	50	2Tx	QPSK	V	29	41	-34.06	-13.00	-21.06
28693.60	Mid	50	2Tx	QPSK	V	28	61	-35.50	-13.00	-22.50
30135.01	Mid	50	2Tx	QPSK	V	15	74	-30.21	-13.00	-17.21
28478.94	High	50	2Tx	QPSK	V	16	73	-29.78	-13.00	-16.78
28632.57	High	50	2Tx	QPSK	V	17	74	-31.96	-13.00	-18.96
28863.00	High	50	2Tx	QPSK	V	17	75	-33.69	-13.00	-20.69

Table 7-28. Ant 1 - 2Tx - 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 7-37. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC 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]

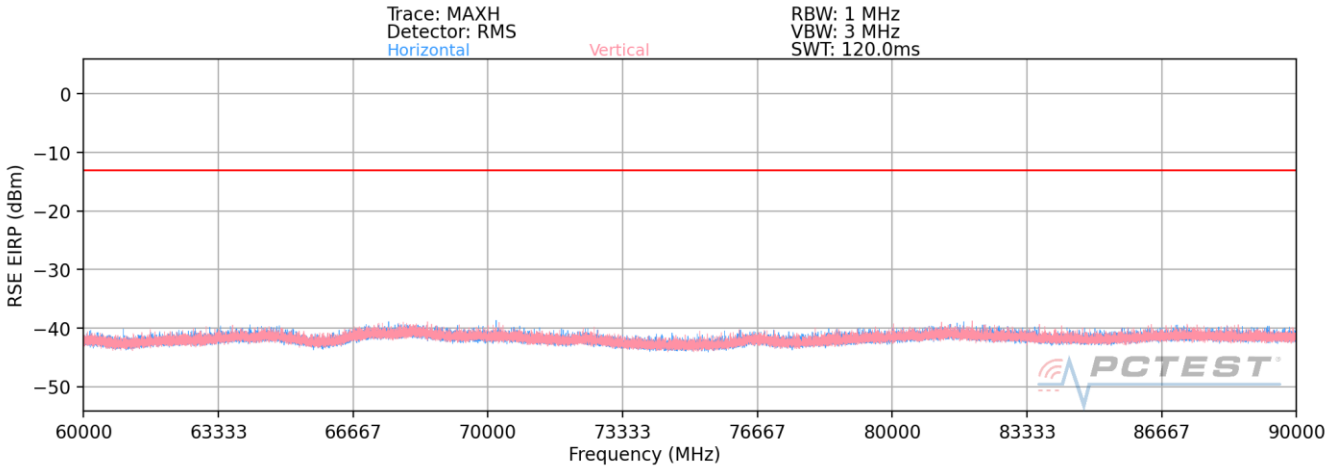
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
55041.02	Low	50	2Tx	QPSK	V	92	14	-38.35	-13.00	-25.35
55851.03	Mid	50	2Tx	QPSK	V	50	10	-36.26	-13.00	-23.26
56650.83	High	50	2Tx	QPSK	V	37	359	-38.20	-13.00	-25.20

Table 7-29. Ant 1 - 2Tx - 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 2Tx – EN-DC 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]

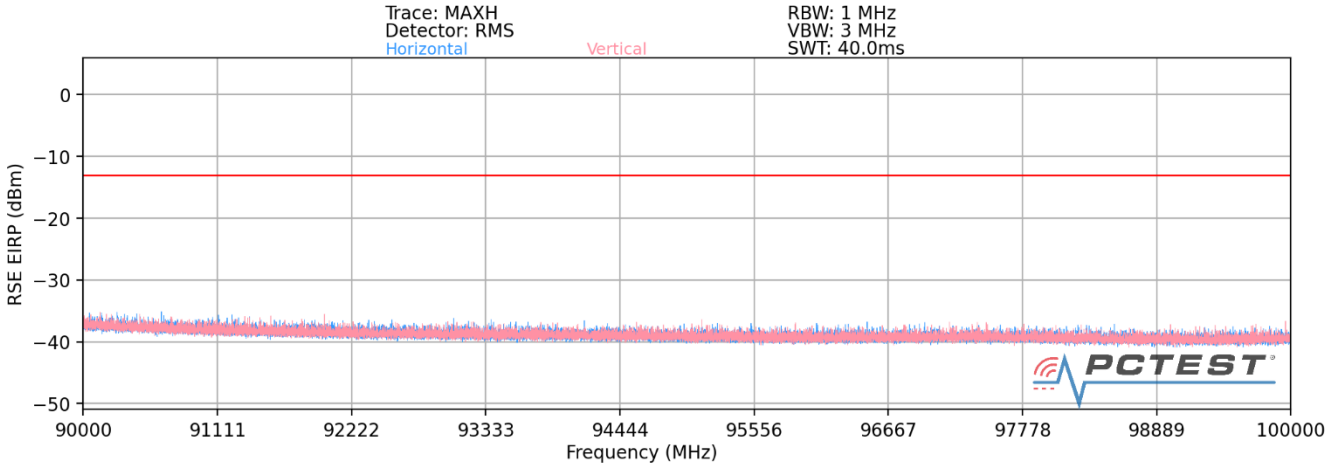
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
82576.17	Low	50	2Tx	QPSK	V	291	357	-41.72	-13.00	-28.72
85210.25	Low	50	2Tx	QPSK	V	289	358	-42.85	-13.00	-29.85
83776.13	Mid	50	2Tx	QPSK	H	254	357	-41.31	-13.00	-28.31
86410.12	Mid	50	2Tx	QPSK	H	256	1	-41.62	-13.00	-28.62
84975.90	High	50	2Tx	QPSK	V	48	0	-41.11	-13.00	-28.11
87610.68	High	50	2Tx	QPSK	V	358	288	-42.20	-13.00	-29.20

Table 7-30. Ant 1 - 2Tx - 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 2Tx – EN-DC 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]
90915.18	Low	50	2Tx	QPSK	V	-	-	-41.75	-13.00	-28.75
90943.23	Mid	50	2Tx	QPSK	V	-	-	-42.08	-13.00	-29.08
91021.28	High	50	2Tx	QPSK	V	-	-	-40.85	-13.00	-27.85

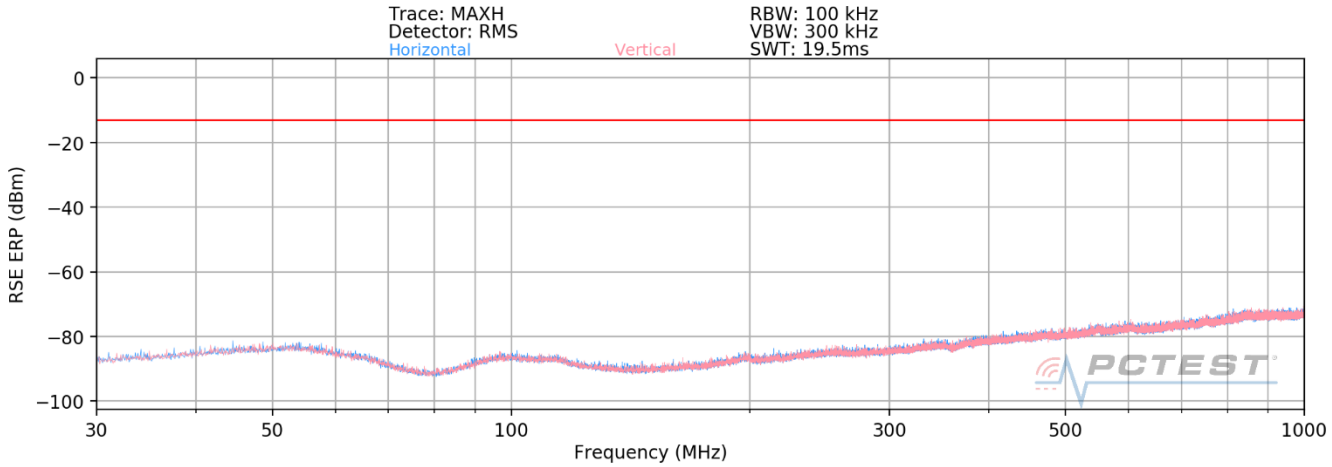
Table 7-31. Ant 1 - 2Tx - Spurious Emissions Table (90GHz - 100GHz)

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 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n261)

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

RSE ERP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 – 2.15 (dB)

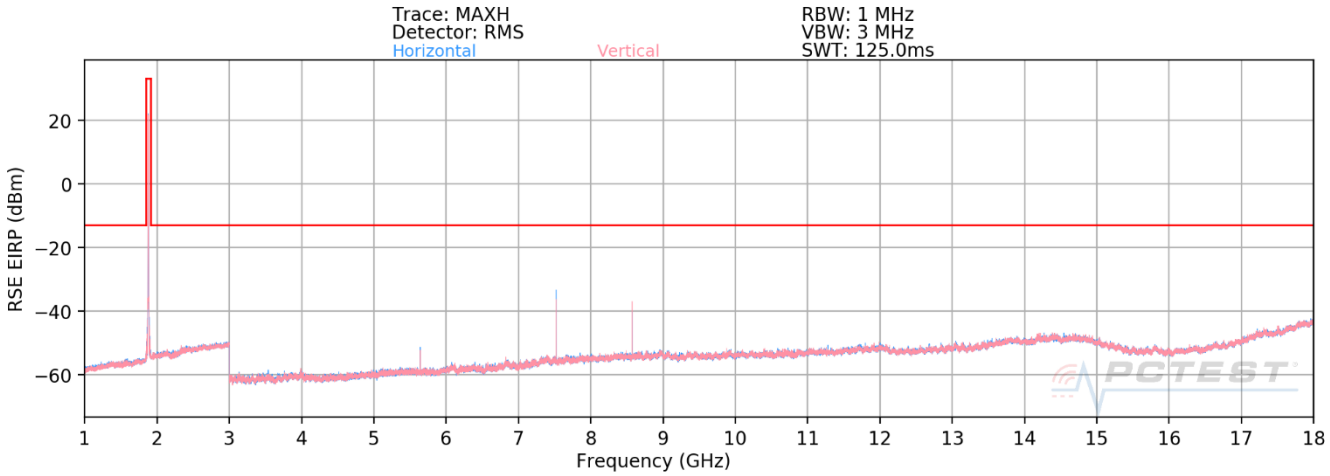
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
771.54	Mid	50	2Tx	QPSK	V	-	-	-73.93	-13.00	-60.93
867.03	Mid	50	2Tx	QPSK	V	-	-	-72.16	-13.00	-59.16
995.33	Mid	50	2Tx	QPSK	V	-	-	-71.47	-13.00	-58.47

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

Notes

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

1GHz - 18GHz



Plot 7-41. Ant 2-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 3 meter.

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

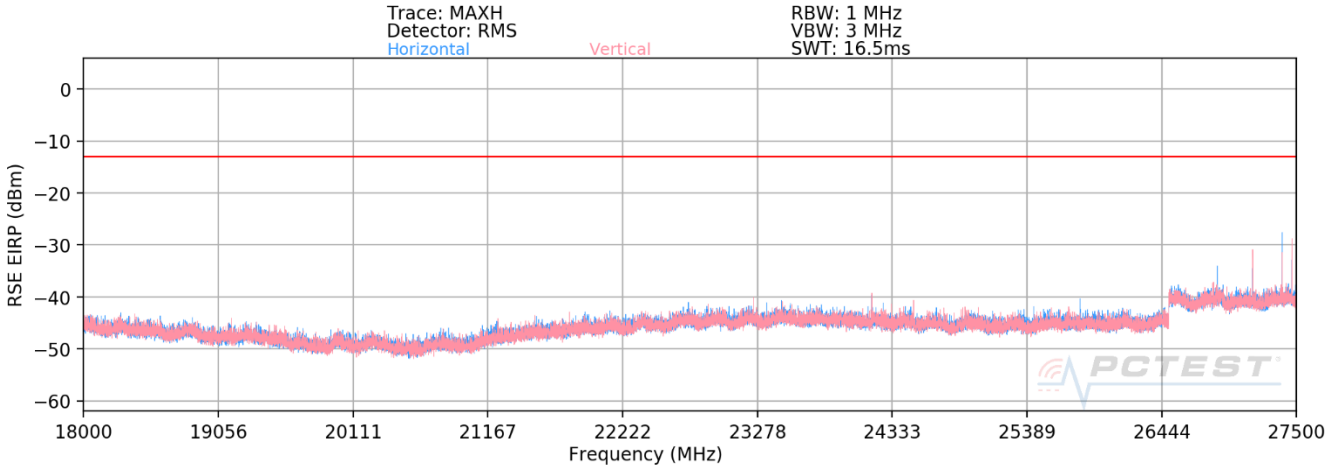
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8812.05	Low	50	2Tx	QPSK	V	341	213	-41.24	-13.00	-28.24
5640.00	Mid	50	2Tx	QPSK	V	15	142	-54.06	-13.00	-41.06
7520.00	Mid	50	2Tx	QPSK	H	340	126	-37.08	-13.00	-24.08
8572.11	Mid	50	2Tx	QPSK	V	15	140	-41.99	-13.00	-28.99
8971.92	High	50	2Tx	QPSK	V	4	160	-41.15	-13.00	-28.15

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

Notes

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

18GHz - 27.5GHz



Plot 7-42. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC 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

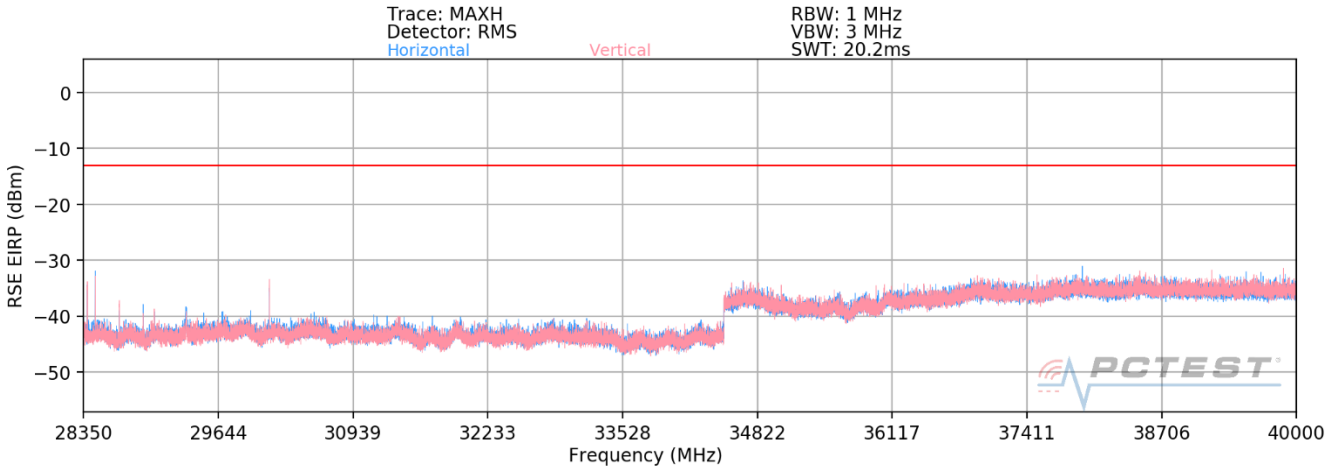
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
26975.12	Low	50	2Tx	QPSK	H	174	345	-31.65	-13.00	-18.65
27218.27	Low	50	2Tx	QPSK	H	178	360	-23.97	-13.00	-10.97
26371.94	Low	50	2Tx	QPSK	H	179	4	-25.90	-13.00	-12.90
26879.88	Mid	50	2Tx	QPSK	H	177	278	-36.16	-13.00	-23.16
27387.82	Mid	50	2Tx	QPSK	H	179	288	-30.32	-13.00	-17.32
27464.79	Mid	50	2Tx	QPSK	H	178	358	-29.81	-13.00	-16.81
26915.54	High	50	2Tx	QPSK	H	170	29	-35.85	-13.00	-22.85
27326.88	High	50	2Tx	QPSK	H	167	14	-34.27	-13.00	-21.27
27403.85	High	50	2Tx	QPSK	H	166	10	-35.66	-13.00	-22.66

Table 7-34. Ant 2 - 2Tx - 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 7-43. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC 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

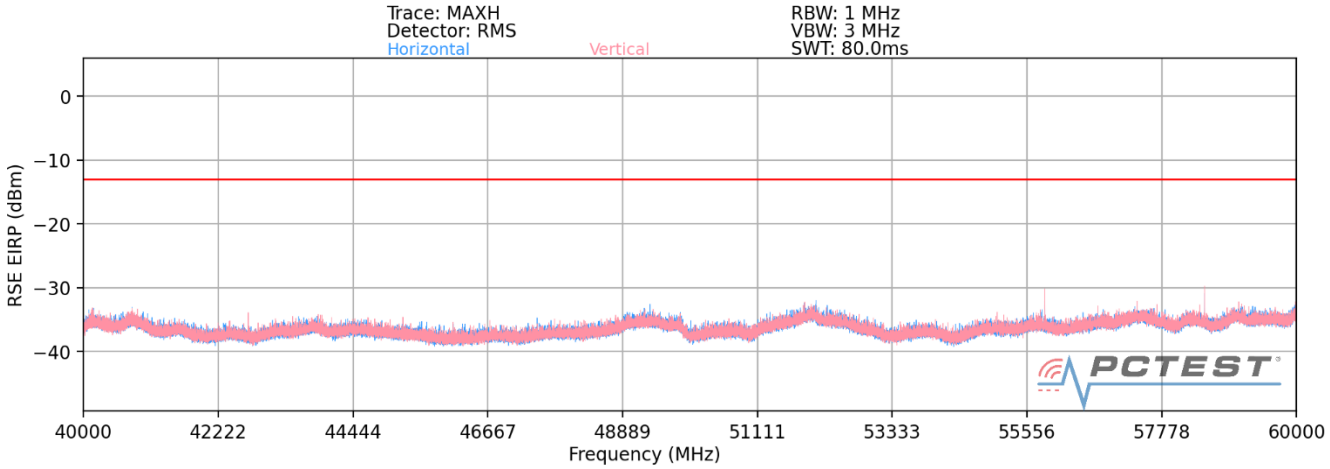
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
28524.02	Low	50	2Tx	QPSK	H	171	106	-37.30	-13.00	-24.30
28614.82	Low	50	2Tx	QPSK	H	176	23	-23.43	-13.00	-10.43
28697.46	Low	50	2Tx	QPSK	H	177	138	-37.28	-13.00	-24.28
28386.22	Mid	50	2Tx	QPSK	H	178	351	-33.38	-13.00	-20.38
28463.08	Mid	50	2Tx	QPSK	H	175	336	-32.13	-13.00	-19.13
28693.31	Mid	50	2Tx	QPSK	H	178	4	-36.07	-13.00	-23.07
30134.94	Mid	50	2Tx	QPSK	H	195	9	-28.73	-13.00	-15.73
28632.73	High	50	2Tx	QPSK	H	166	10	-32.98	-13.00	-19.98
28863.02	High	50	2Tx	QPSK	H	158	356	-34.33	-13.00	-21.33
29734.97	High	50	2Tx	QPSK	H	152	11	-30.95	-13.00	-17.95

Table 7-35. Ant 2 - 2Tx - 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 7-44. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC 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]

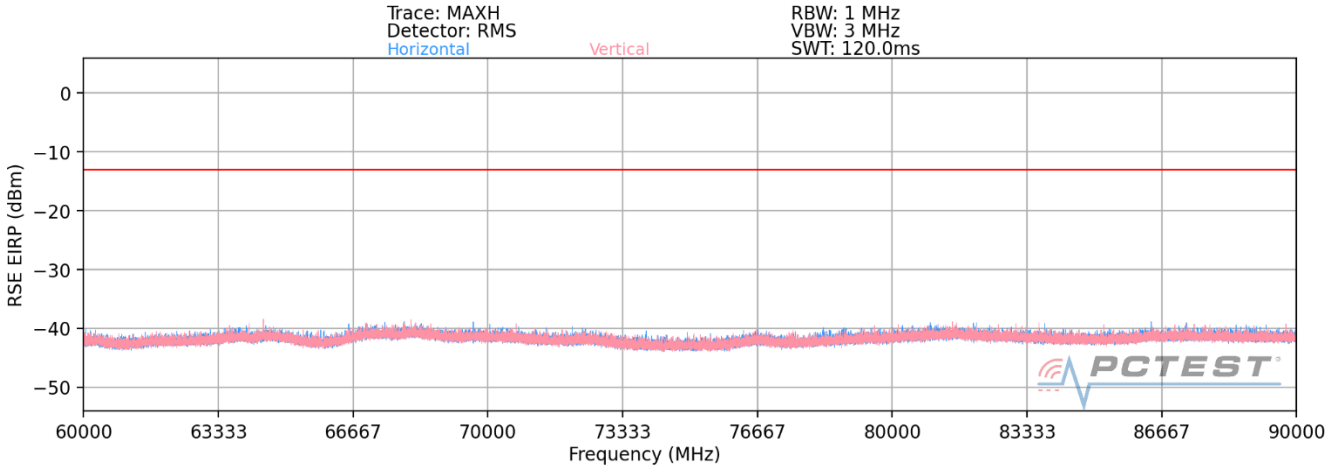
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
55050.72	Low	50	2Tx	QPSK	H	238	240	-37.42	-13.00	-24.42
55850.79	Mid	50	2Tx	QPSK	H	103	151	-33.94	-13.00	-20.94
56670.74	High	50	2Tx	QPSK	H	48	77	-33.67	-13.00	-20.67

Table 7-36. Ant 2 - 2Tx - 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 2Tx – EN-DC 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]

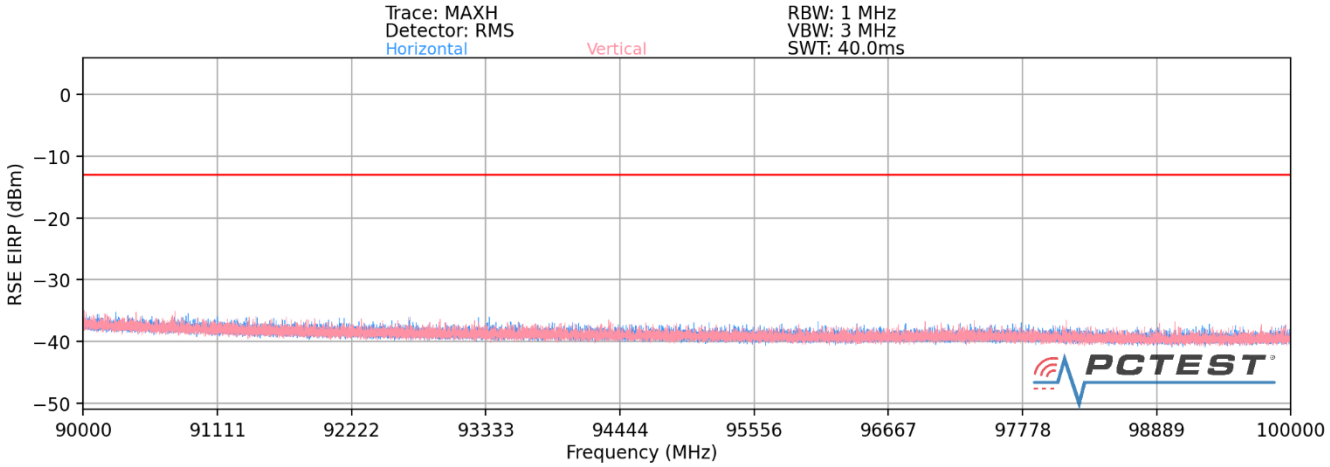
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
82576.47	Low	50	2Tx	QPSK	H	259	356	-45.41	-13.00	-32.41
85210.30	Low	50	2Tx	QPSK	H	258	358	-45.80	-13.00	-32.80
83776.04	Mid	50	2Tx	QPSK	H	264	357	-47.01	-13.00	-34.01
86410.30	Mid	50	2Tx	QPSK	H	264	7	-46.17	-13.00	-33.17
84976.02	High	50	2Tx	QPSK	H	244	238	-39.77	-13.00	-26.77
87610.30	High	50	2Tx	QPSK	H	237	268	-45.00	-13.00	-32.00

Table 7-37. Ant 2 - 2Tx - 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 2Tx – EN-DC 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]
90908.51	Low	50	2Tx	QPSK	H	-	-	-41.59	-13.00	-28.59
91021.56	Mid	50	2Tx	QPSK	H	-	-	-42.04	-13.00	-29.04
90992.96	High	50	2Tx	QPSK	H	-	-	-41.27	-13.00	-28.27

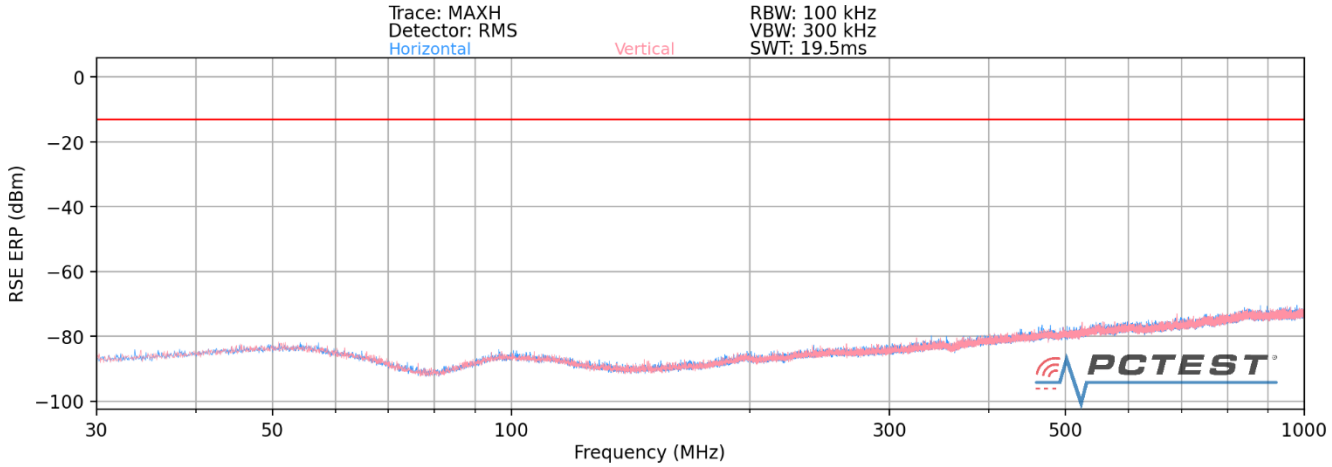
Table 7-38. Ant 2 - 2Tx - Spurious Emissions Table (90GHz - 100GHz)

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 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n260)

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

RSE ERP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 – 2.15 (dB)

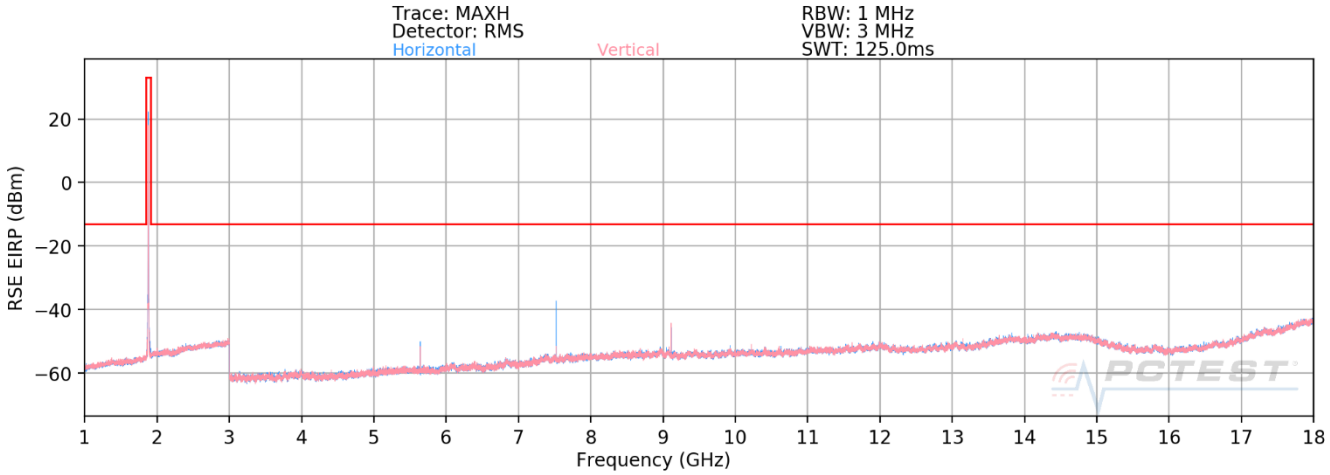
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
651.84	Mid	50	2Tx	QPSK	H	-	-	-75.90	-13.00	-62.90
897.53	Mid	50	2Tx	QPSK	H	-	-	-70.70	-13.00	-57.70
994.73	Mid	50	2Tx	QPSK	H	-	-	-71.84	-13.00	-58.84

Table 7-39. Ant 1 - 2Tx - Spurious Emissions Table (30MHz - 1GHz)

Notes

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

1GHz - 18GHz



Plot 7-48. 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 3 meter.

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

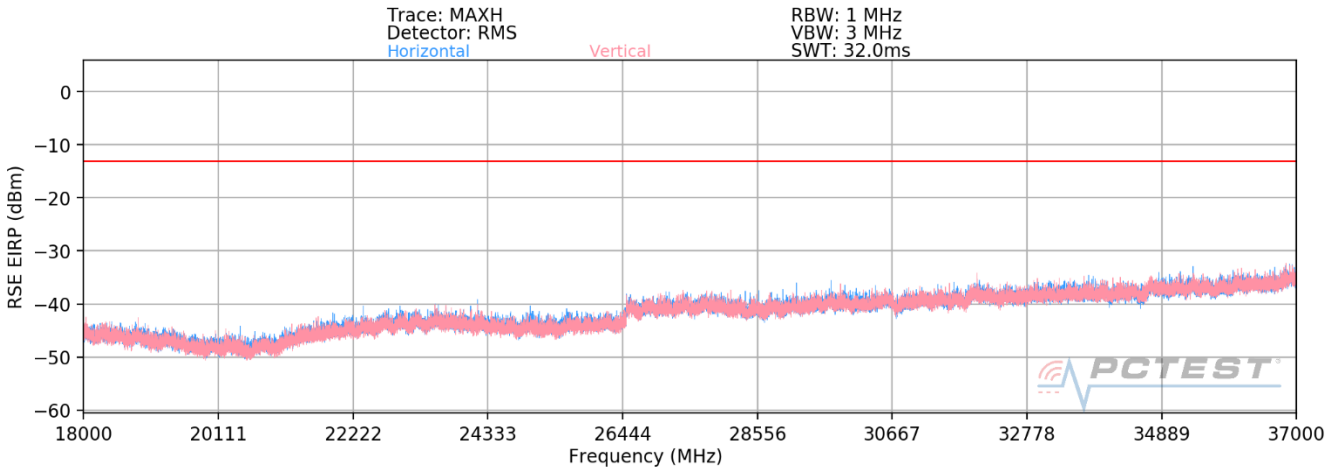
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8404.79	Low	50	2Tx	QPSK	H	51	242	-40.91	-13.00	-27.91
5640.00	Mid	50	2Tx	QPSK	H	342	153	-53.08	-13.00	-40.08
7520.00	Mid	50	2Tx	QPSK	H	48	127	-36.44	-13.00	-23.44
9111.85	Mid	50	2Tx	QPSK	H	297	264	-45.72	-13.00	-32.72
9153.15	High	50	2Tx	QPSK	H	359	120	-46.09	-13.00	-33.09

Table 7-40. Ant 1 - 2Tx - Spurious Emissions Table (1GHz - 18GHz)

Notes

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

18GHz – 37GHz



Plot 7-49. 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

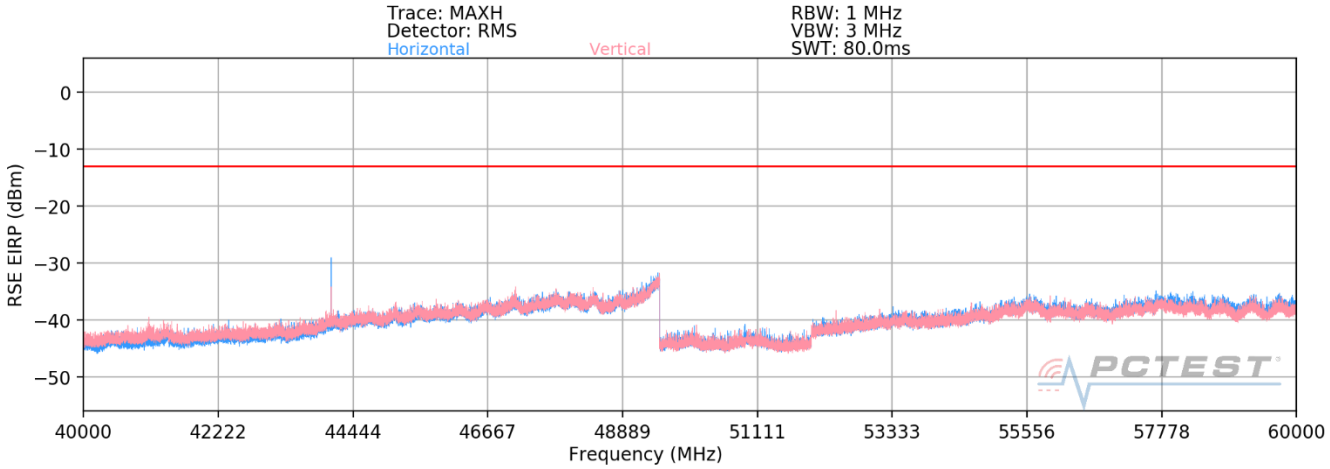
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
36718.18	Low	50	2Tx	QPSK	H	89	19	-29.01	-13.00	-16.01
36871.93	Low	50	2Tx	QPSK	H	89	18	-28.67	-13.00	-15.67
36504.05	Mid	50	2Tx	QPSK	H	-	-	-41.76	-13.00	-28.76
36874.28	Mid	50	2Tx	QPSK	H	-	-	-41.89	-13.00	-28.89
36921.23	High	50	2Tx	QPSK	H	-	-	-41.91	-13.00	-28.91

Table 7-41. Ant 1 - 2Tx - 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 7-50. 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

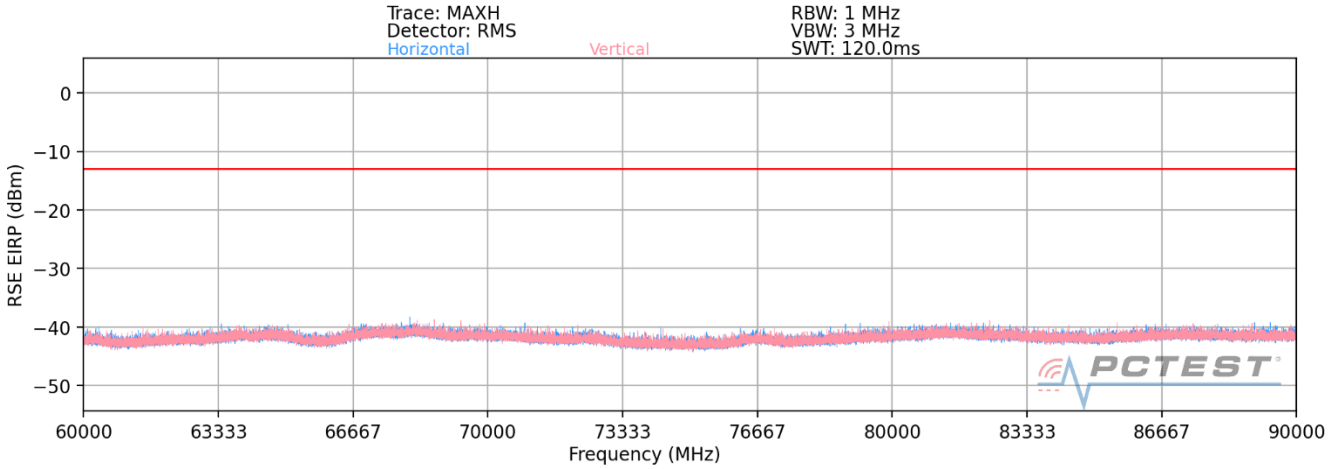
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
42930.90	Low	50	2Tx	QPSK	H	65	17	-29.49	-13.00	-16.49
44082.90	Mid	50	2Tx	QPSK	H	112	19	-30.94	-13.00	-17.94
46233.09	High	50	2Tx	QPSK	H	58	4	-37.74	-13.00	-24.74

Table 7-42. Ant 1 - 2Tx - Spurious Emissions Table (40GHz - 60GHz)

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 1.5 meter.

60GHz - 90GHz



Plot 7-51. 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]

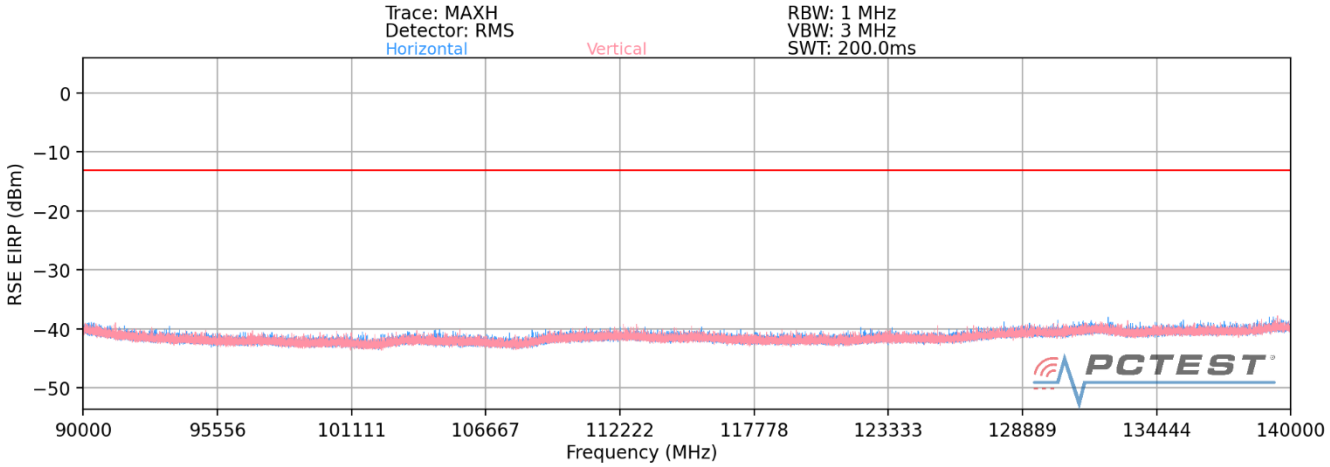
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
74050.50	Low	50	2Tx	QPSK	V	91	2	-38.57	-13.00	-25.57
76684.63	Low	50	2Tx	QPSK	V	91	357	-37.29	-13.00	-24.29
77000.19	Mid	50	2Tx	QPSK	V	75	342	-40.77	-13.00	-27.77
79634.21	Mid	50	2Tx	QPSK	V	74	336	-40.43	-13.00	-27.43
79950.03	High	50	2Tx	QPSK	V	124	9	-46.47	-13.00	-33.47
82584.76	High	50	2Tx	QPSK	V	46	247	-46.88	-13.00	-33.88

Table 7-43. Ant 1 - 2Tx - 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 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]

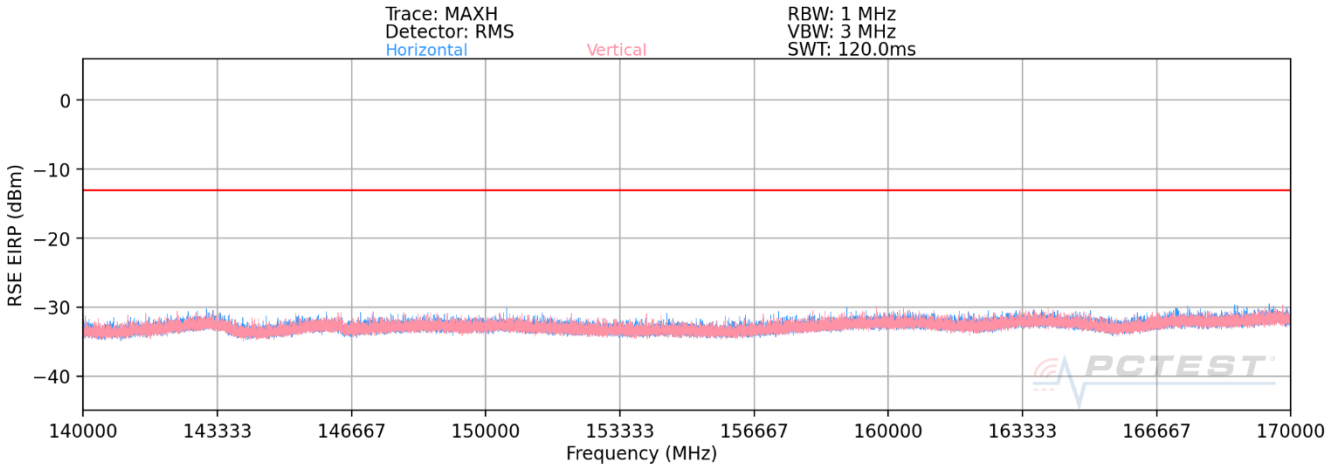
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
111076.23	Low	50	2Tx	QPSK	V	120	337	-31.94	-13.00	-18.94
113709.75	Low	50	2Tx	QPSK	V	120	339	-32.32	-13.00	-19.32
115500.35	Mid	50	2Tx	QPSK	V	108	4	-40.25	-13.00	-27.25
118134.63	Mid	50	2Tx	QPSK	V	107	2	-42.19	-13.00	-29.19
119925.48	High	50	2Tx	QPSK	V	76	9	-39.83	-13.00	-26.83
122559.66	High	50	2Tx	QPSK	V	75	7	-39.86	-13.00	-26.86

Table 7-44. Ant 1 - 2Tx - 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 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]

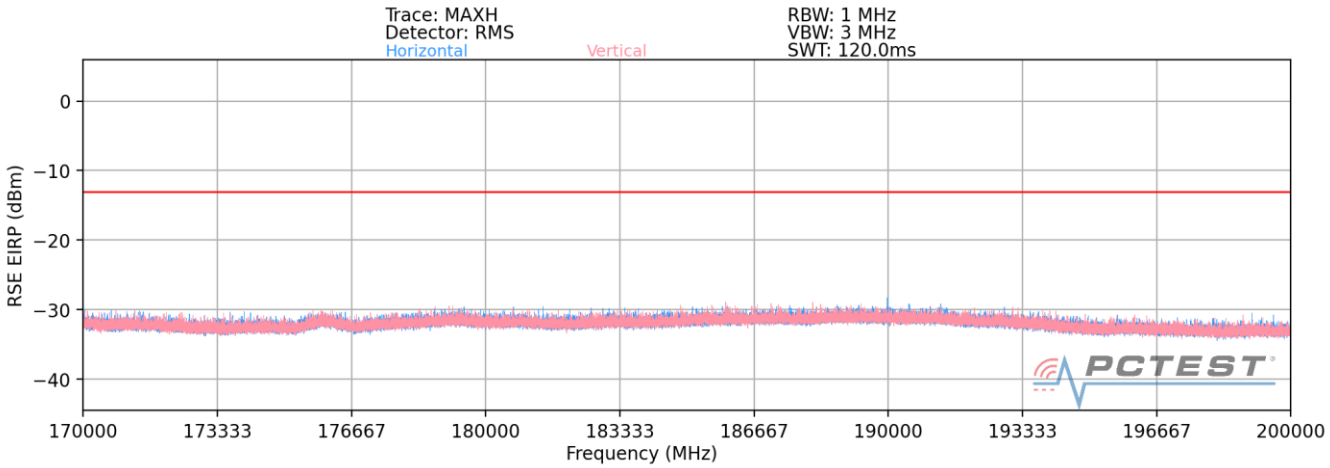
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
148098.31	Low	50	2Tx	QPSK	V	-	-	-38.23	-13.00	-25.23
154002.07	Mid	50	2Tx	QPSK	V	-	-	-38.06	-13.00	-25.06
159909.14	High	50	2Tx	QPSK	V	-	-	-37.55	-13.00	-24.55

Table 7-45. Ant 1 - 2Tx - 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 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]
185119.99	Low	50	2Tx	QPSK	V	-	-	-36.95	-13.00	-23.95
192491.08	Mid	50	2Tx	QPSK	V	-	-	-36.89	-13.00	-23.89
199873.48	High	50	2Tx	QPSK	V	-	-	-37.97	-13.00	-24.97

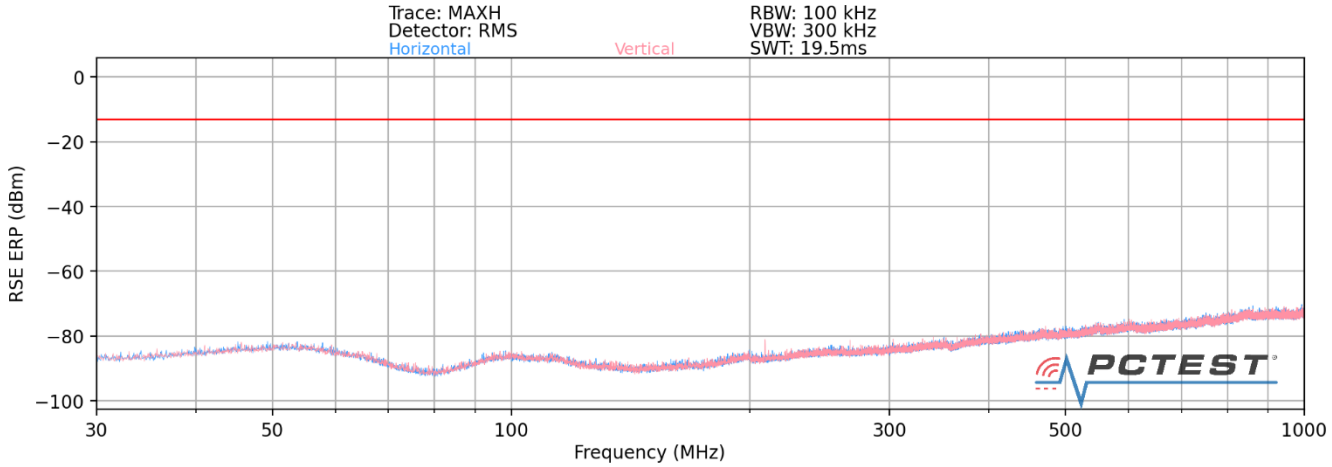
Table 7-46. Ant 1 - 2Tx - Spurious Emissions Table (170GHz - 200GHz)

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 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n260)

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

RSE ERP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 – 2.15 (dB)

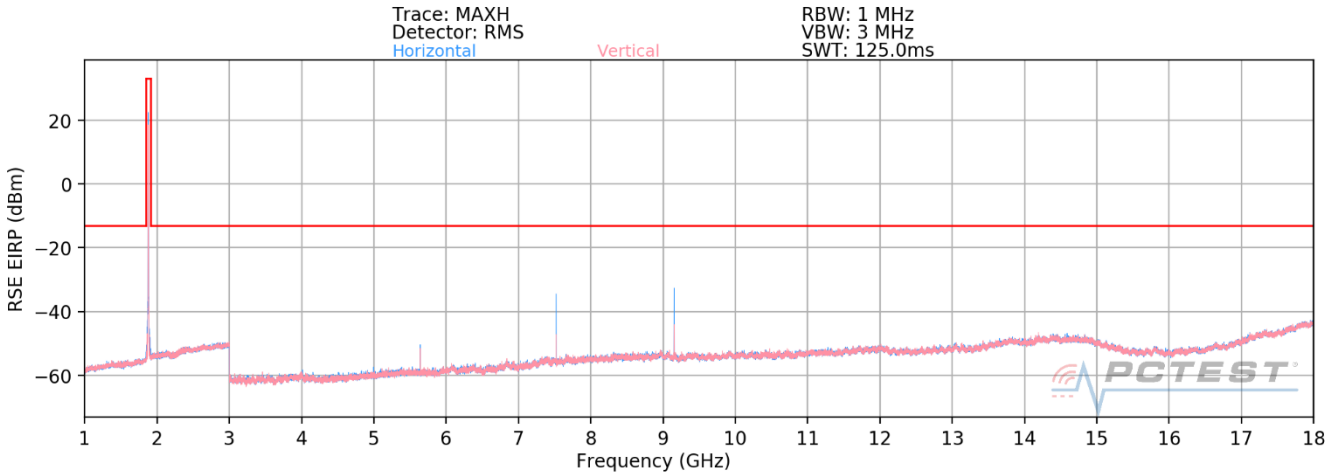
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
601.75	Mid	50	2Tx	QPSK	H	-	-	-75.92	-13.00	-62.92
854.63	Mid	50	2Tx	QPSK	H	-	-	-72.14	-13.00	-59.14
992.73	Mid	50	2Tx	QPSK	H	-	-	-70.28	-13.00	-57.28

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

Notes

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

1GHz - 18GHz



Plot 7-56. Ant 2-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 3 meter.

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

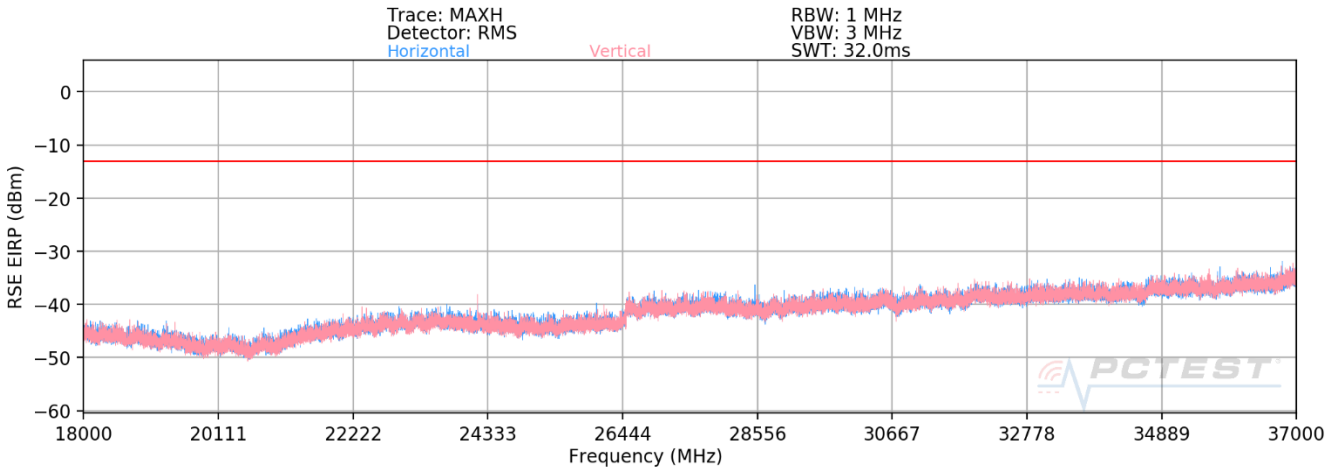
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8404.84	Low	50	2Tx	QPSK	H	348	236	-32.87	-13.00	-19.87
5640.00	Mid	50	2Tx	QPSK	H	346	269	-52.67	-13.00	-39.67
7520.00	Mid	50	2Tx	QPSK	H	342	131	-38.38	-13.00	-25.38
9111.80	Mid	50	2Tx	QPSK	H	345	193	-34.46	-13.00	-21.46
9153.20	High	50	2Tx	QPSK	H	336	202	-30.03	-13.00	-17.03

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

Notes

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

18GHz – 37GHz



Plot 7-57. Ant 2-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

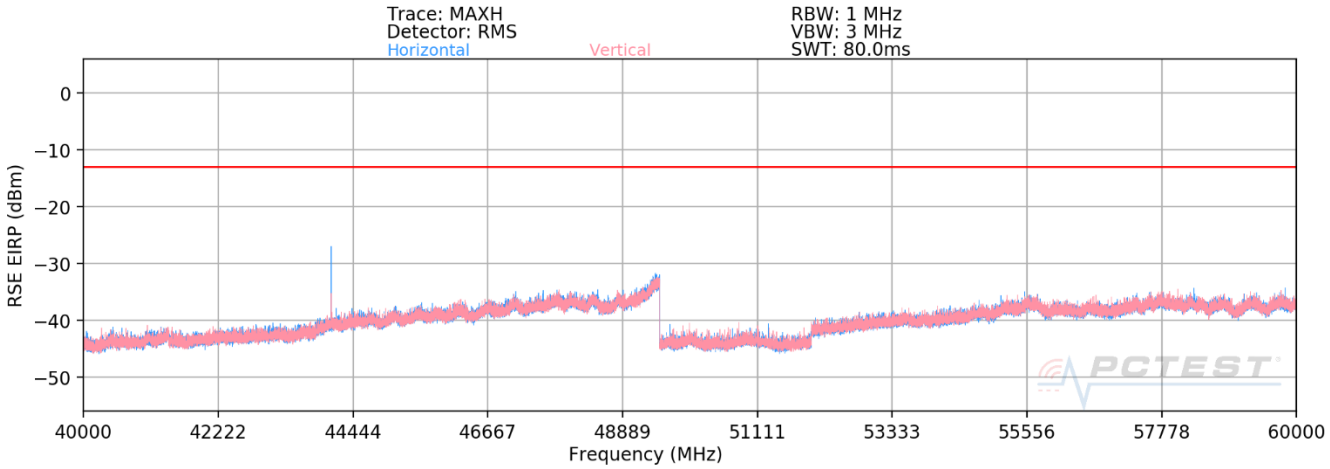
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
36718.06	Low	50	2Tx	QPSK	H	271	349	-28.66	-13.00	-15.66
36871.73	Low	50	2Tx	QPSK	H	272	353	-27.90	-13.00	-14.90
36503.43	Mid	50	2Tx	QPSK	H	273	358	-41.31	-13.00	-28.31
36908.84	Mid	50	2Tx	QPSK	H	272	10	-41.23	-13.00	-28.23
36884.59	High	50	2Tx	QPSK	H	-	-	-41.79	-13.00	-28.79

Table 7-49. Ant 2 - 2Tx - 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. Measurements were performed at a distance of 1 meter.

40GHz - 60GHz



Plot 7-58. Ant 2-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

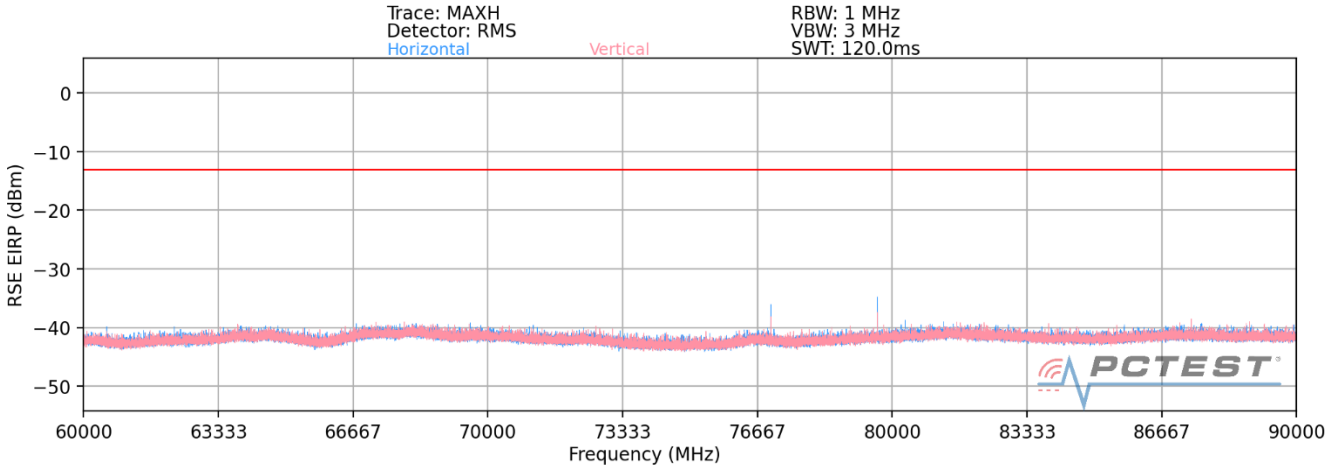
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
42930.90	Low	50	2Tx	QPSK	H	264	349	-26.87	-13.00	-13.87
44082.99	Mid	50	2Tx	QPSK	H	256	2	-27.13	-13.00	-14.13
46233.24	High	50	2Tx	QPSK	H	246	351	-33.83	-13.00	-20.83

Table 7-50. Ant 2 - 2Tx - 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. Measurements were performed at a distance of 1.5 meter.

60GHz - 90GHz



Plot 7-59. Ant 2-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]

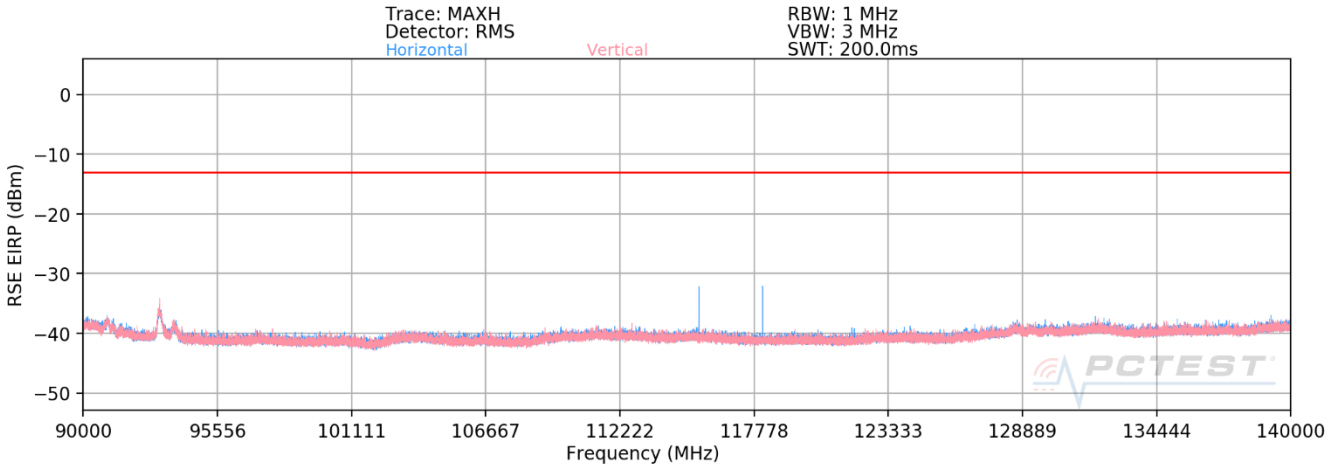
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
74050.65	Low	50	2Tx	QPSK	H	268	353	-41.14	-13.00	-28.14
76684.45	Low	50	2Tx	QPSK	H	268	349	-40.85	-13.00	-27.85
77000.16	Mid	50	2Tx	QPSK	H	234	349	-37.62	-13.00	-24.62
79634.24	Mid	50	2Tx	QPSK	H	235	352	-37.21	-13.00	-24.21
79950.60	High	50	2Tx	QPSK	H	225	349	-42.01	-13.00	-29.01
82584.84	High	50	2Tx	QPSK	H	224	351	-42.87	-13.00	-29.87

Table 7-51. Ant 2 - 2Tx -S purious 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 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]

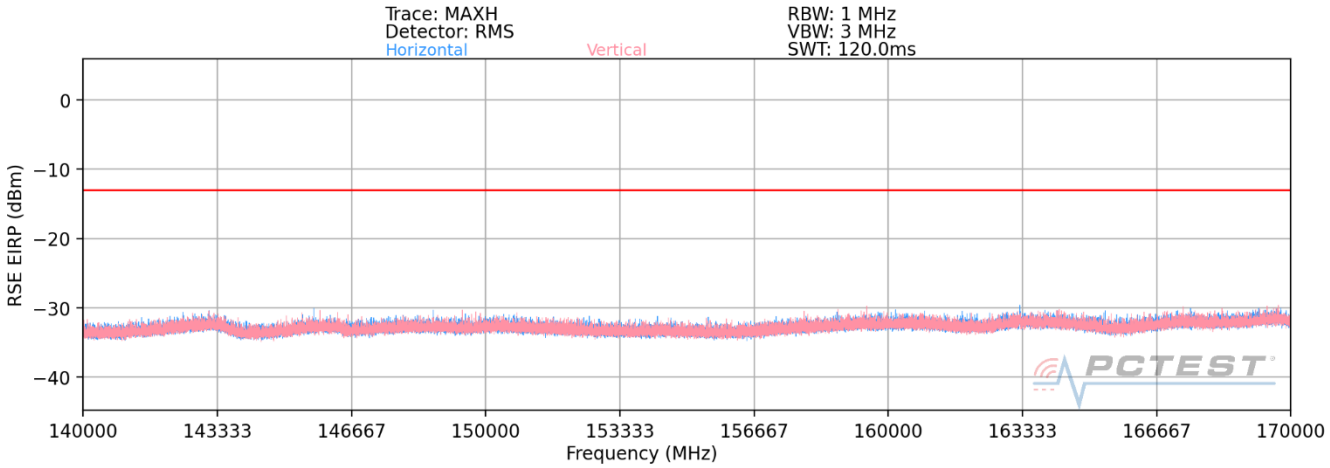
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
111076.08	Low	50	2Tx	QPSK	H	295	358	-37.33	-13.00	-24.33
113710.11	Low	50	2Tx	QPSK	H	396	359	-37.91	-13.00	-24.91
115500.92	Mid	50	2Tx	QPSK	H	237	8	-32.70	-13.00	-19.70
118134.21	Mid	50	2Tx	QPSK	H	238	4	-33.58	-13.00	-20.58
119926.23	High	50	2Tx	QPSK	H	284	359	-37.36	-13.00	-24.36
122559.99	High	50	2Tx	QPSK	H	285	356	-36.98	-13.00	-23.98

Table 7-52. Ant2 -2Tx - 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 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]

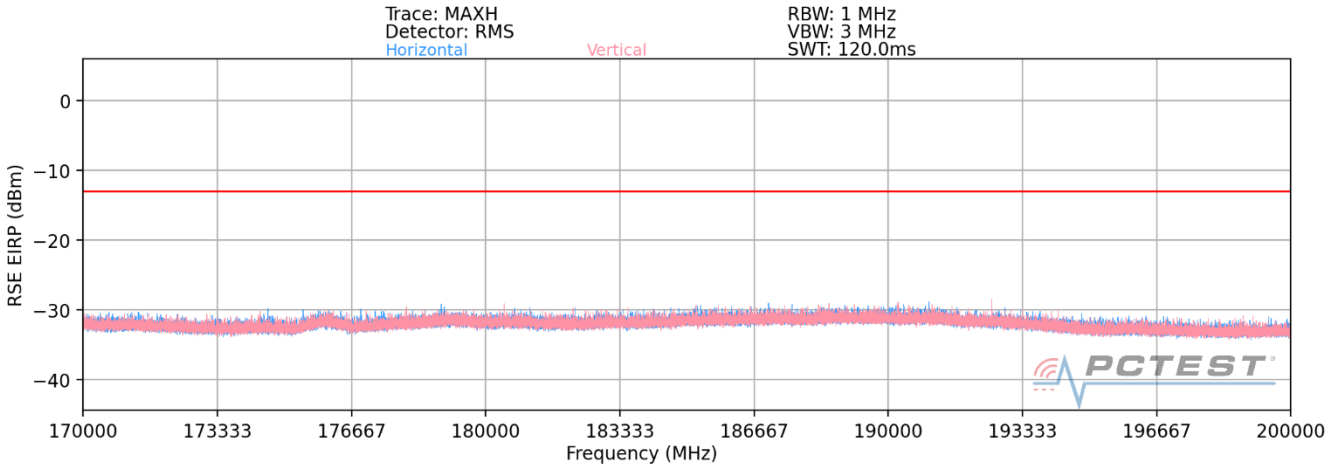
Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
148092.17	Low	50	2Tx	QPSK	H	-	-	-37.35	-13.00	-24.35
154014.38	Mid	50	2Tx	QPSK	H	-	-	-38.05	-13.00	-25.05
159914.63	High	50	2Tx	QPSK	H	-	-	-37.41	-13.00	-24.41

Table 7-53. Ant 2 - 2Tx - 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 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]
185115.26	Low	50	2Tx	QPSK	H	-	-	-35.97	-13.00	-22.97
192517.94	Mid	50	2Tx	QPSK	H	-	-	-36.76	-13.00	-23.76
199890.77	High	50	2Tx	QPSK	H	-	-	-37.92	-13.00	-24.92

Table 7-54. Ant 2 - 2Tx - 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 & 4.4.2.2

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.

7) Since some of Band Edge EIRP exceed esmission limit, the TRP measurement was performed as the alternative method. The plots measured as TRP are labeled as “TRP” in the captions.

Sample Analyzer Offset Calculation (at 27.5GHz)

Measurement Antenna Factor = 40.70dB/m

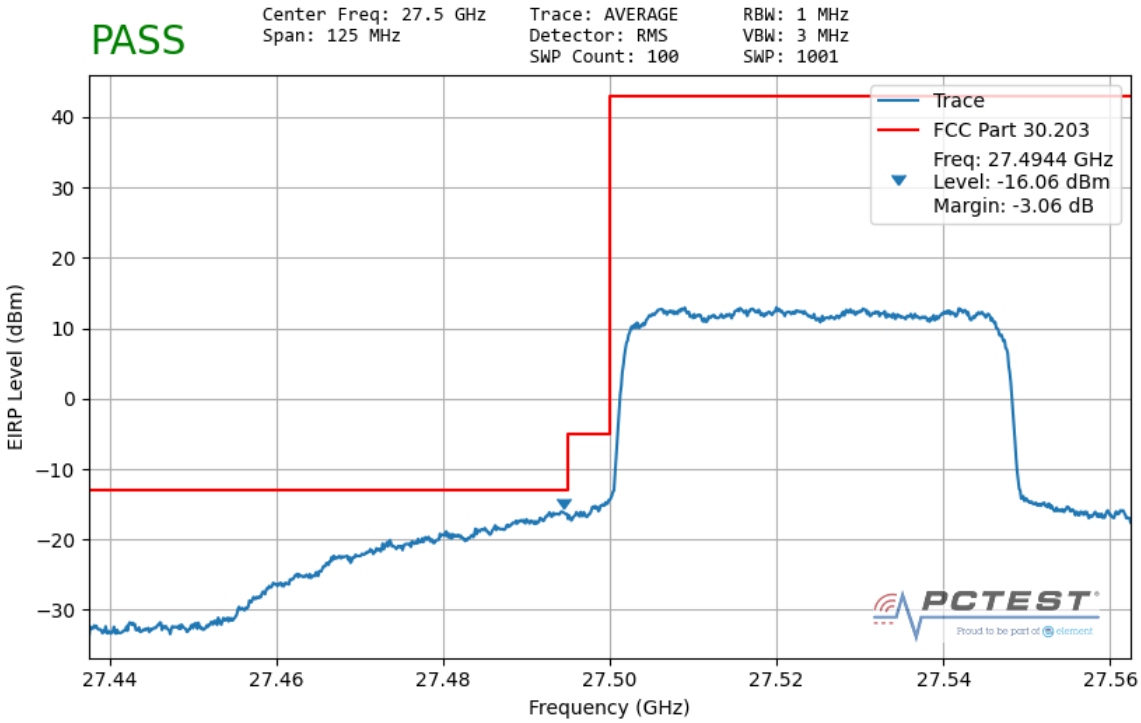
Cable Loss = 8.82dB

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

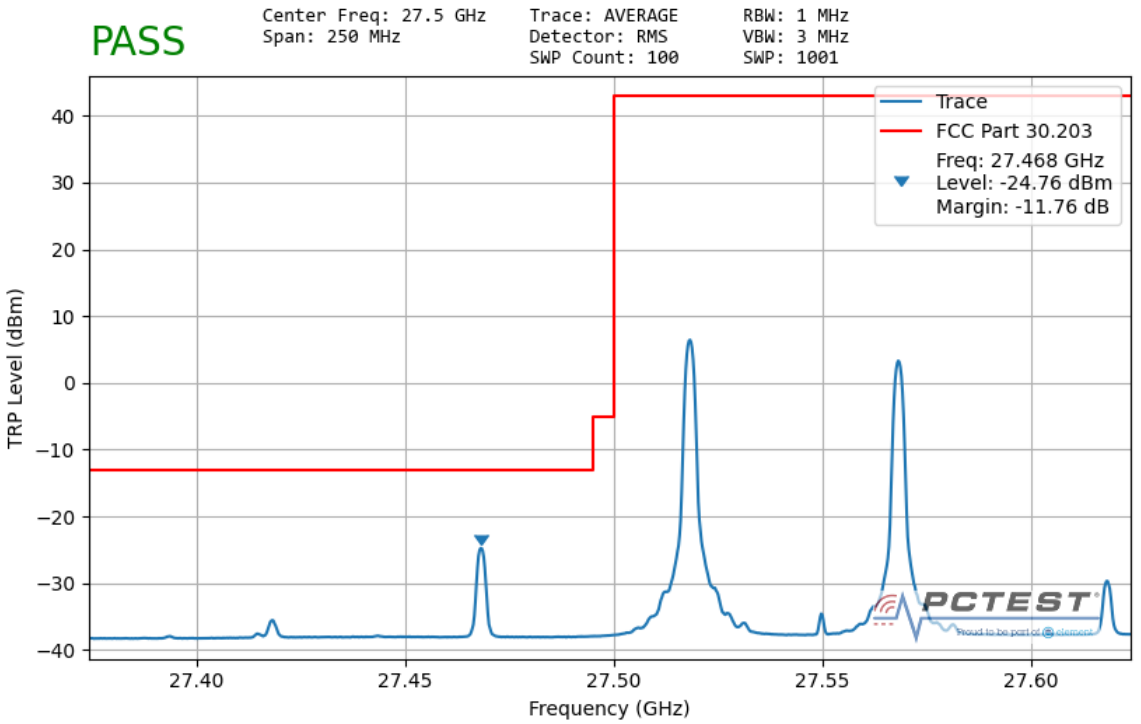
= 40.70dB/m + 8.82dB + 107 + $20\log_{10}(1m)$ – 104.8dB

= 51.72dB

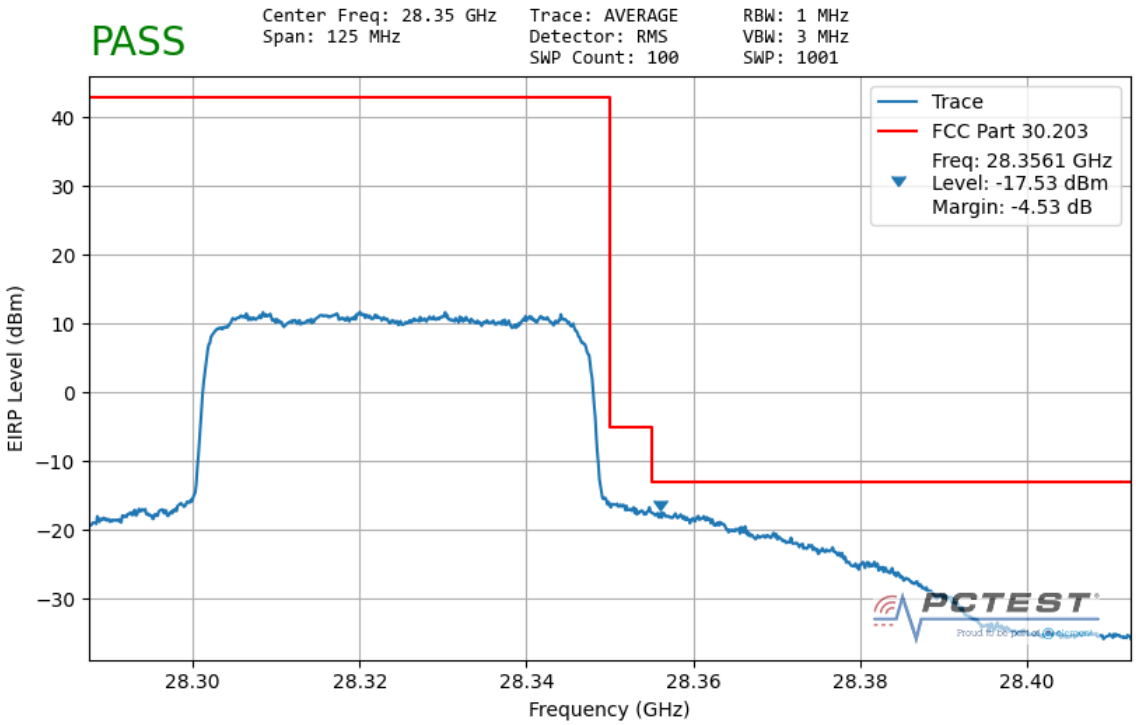
Band n261 – Worst-Case



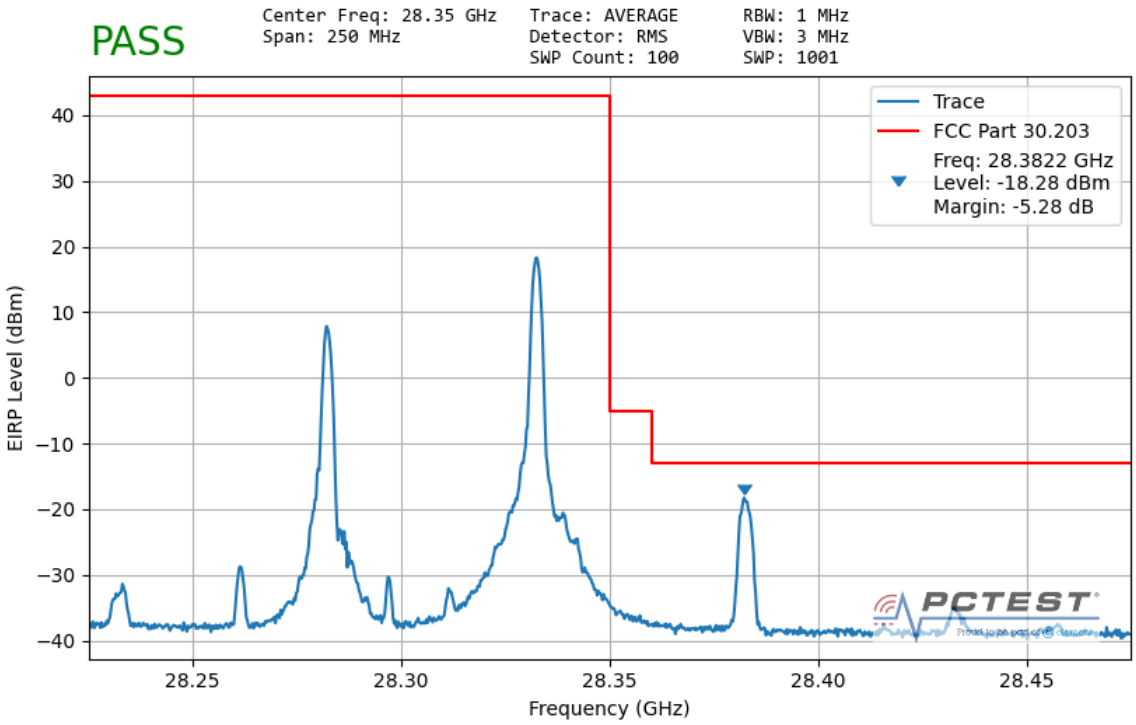
Plot 7-63. Ant 1 Lower Band Edge (50MHz-1CC – QPSK Full RB)



Plot 7-64. Ant 1 Lower Band Edge – TRP (50MHz-2CC – QPSK 1 RB)



Plot 7-65. Ant 1 Upper Band Edge (50MHz-1CC – QPSK Full RB)



Plot 7-66. Ant 1 Upper Band Edge (50MHz-2CC – QPSK 1 RB)